

SUSPENSION

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WHEEL ALIGNMENT

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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.
- (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.

DIAGNOSIS AND TESTING (Continued)

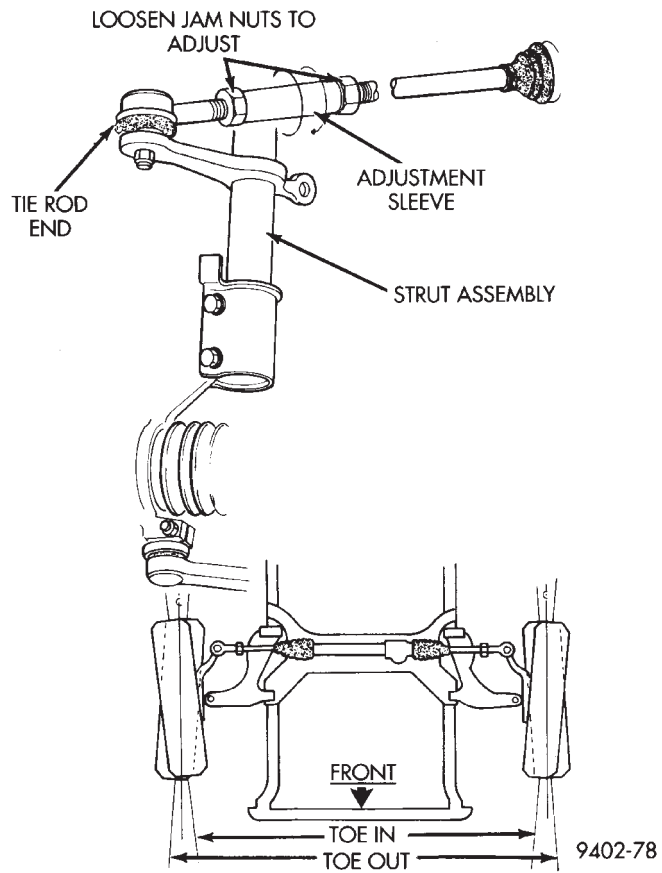


Fig. 1 Wheel Toe Adjustment

DIAGNOSIS AND TESTING

SUSPENSION AND STEERING DIAGNOSIS

CONDITION	POSSIBLE CAUSES	CORRECTION
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 3. Worn or broken C/V joint 4. Loose wheel lug nuts 5. Incorrect wheel alignment 6. Worn tires 7. Front strut pin in upper strut mount	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 7. Replace the front strut upper mount and bearing
Front End Clunk Or Snap On Turns	1. Loose lug nuts 2. Worn or broken C/V joint 3. Worn or loose tie rod 4. Worn or loose ball joint 5. Worn/loose control arm bushing 6. Loose stabilizer bar. 7. Loose strut mount to body attachment 8. Loose crossmember bolts	1. Verify wheel lug nut torque 2. Replace C/V joint 3. Tighten or replace tie rod end 4. Tighten or replace ball joint 5. Replace control arm bushing 6. Tighten stabilizer bar to specified torque 7. Tighten strut attachment to specified torque 8. Tighten crossmember bolts 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 4. Worn or defective transaxle gears or bearings	1. Replace wheel bearing 2. Check and reset wheel alignment 3. Replace tires 4. Replace transaxle gears or bearings
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 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 8. Worn tie rod end	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. Replace control arm bushing 7. Tighten crossmember bolts to specified torque 8. Replace tie rod end

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
Road Wander	1. Incorrect tire pressure 2. Incorrect front or rear wheel toe 3. Worn wheel bearings 4. Worn control arm bushings 5. Excessive friction in steering gear 6. Excessive friction in steering shaft coupling 7. Excessive friction in strut upper bearing	1. Inflate tires to recommended pressure 2. Check and reset wheel toe 3. Replace wheel bearing 4. Replace control arm bushing 5. Replace steering gear 6. Replace steering coupler 7. Replace strut bearing
Lateral Pull	1. Unequal tire pressure 2. Radial tire lead 3. Incorrect front wheel camber 4. Power steering gear imbalance 5. Wheel braking	1. Inflate all tires to recommended pressure 2. Perform lead correction procedure 3. Check and reset front wheel camber 4. Replace power steering gear 5. Correct braking condition causing lateral pull
Excessive Steering Free Play	1. Incorrect Steering Gear Adjustment 2. Worn or loose tie rod ends 3. Loose steering gear mounting bolts 4. Loose or worn steering shaft coupler	1. Adjust Or Replace Steering Gear 2. Replace or tighten tie rod ends 3. Tighten steering gear bolts to specified torque 4. Replace steering shaft coupler
Excessive Steering Effort	1. Low tire pressure 2. Lack of lubricant in steering gear 3. Low power steering fluid level 4. Loose power steering pump drive belt 5. Lack of lubricant in ball joints 6. Steering gear malfunction 7. Lack of lubricant in steering coupler	1. Inflate all tires to recommended pressure 2. Replace steering gear 3. Fill power steering fluid reservoir to correct level 4. Correctly adjust power steering pump drive belt 5. Lubricate or replace ball joints 6. Replace steering gear 7. Replace steering coupler

PRE-WHEEL ALIGNMENT INSPECTION

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

(1) Check and inflate all tires to recommended pressure. All tires should be the same size and in good condition and have approximately the same wear. Note the type of tread wear which will aid in diagnosing, see Wheels and Tires, Group 22.

(2) Check front wheel and tire assembly for radial runout.

(3) Inspect lower ball joints and all steering linkage for looseness.

(4) Check for broken or sagged front and rear springs.

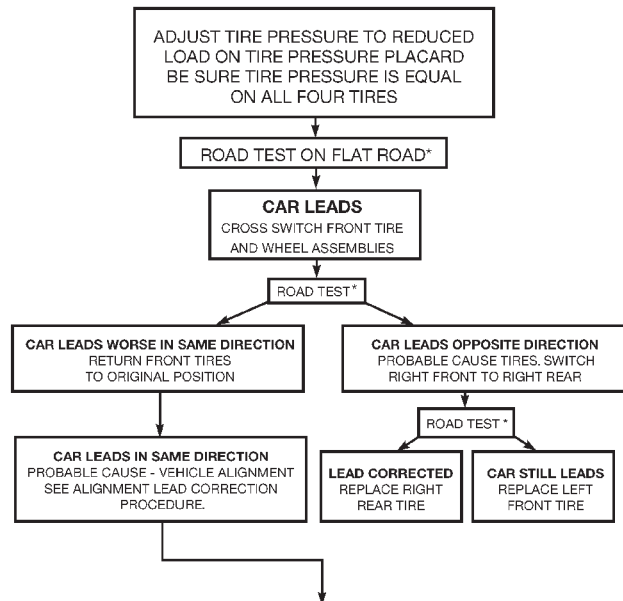
(5) Check vehicle ride height to verify it is within specifications.

(6) Alignment **MUST** only be checked after the vehicle has the following areas inspected and or adjusted. Recommended tire pressures, full tank of fuel, no passenger or luggage compartment load and is on a level floor or a properly calibrated alignment rack.

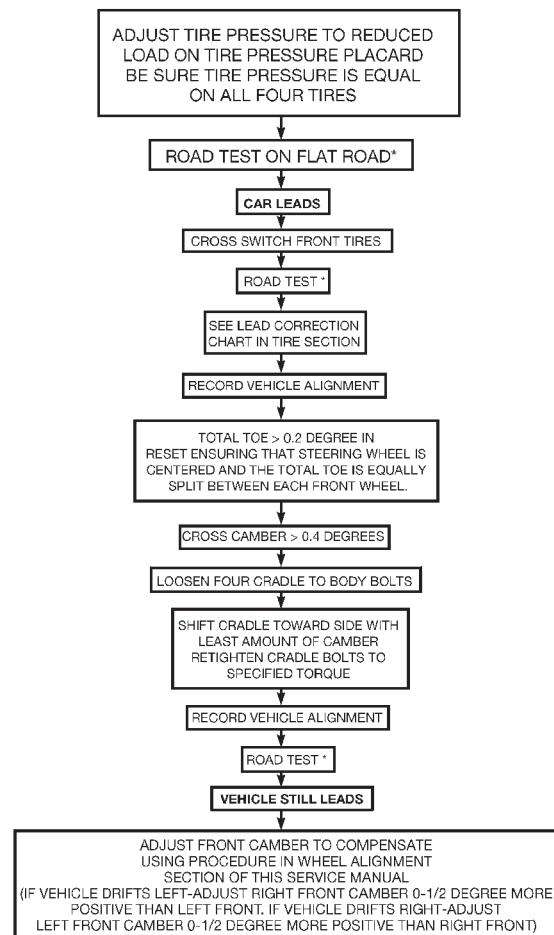
VEHICLE LEAD CORRECTION CHART

Use the following chart to diagnose a vehicle that has a complaint of a drift or lead condition. The use of the chart will help to determine if the lead condition is the result of a bad tire or is caused by the front wheel alignment.

VEHICLE LEAD DIAGNOSIS TIRE LEAD DIAGNOSIS AND CORRECTION PROCEDURE



ALIGNMENT LEAD DIAGNOSIS AND CORRECTION PROCEDURE



* VERIFY LEAD/PULL IS NOT INCLUDED BY ROAD CROWN OR CROSS WINDS

SERVICE PROCEDURES

WHEEL ALIGNMENT CHECK AND ADJUSTMENT PROCEDURE

CASTER AND CAMBER

Front wheel Caster and Camber settings on this vehicle are determined at the time the vehicle is designed. This is done by determining the precise mounting location of the vehicle's suspension components throughout the design and assembly processes of the vehicle. This is called a Net Build vehicle and results in no normal requirement to adjust the Caster and Camber after a 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 should be checked during the alignment procedure to ensure they meet the manufacturers specifications.

If a vehicle has a drift or lead condition, and it is determined that the drift or lead is not caused by road conditions, and front camber is not within specifications it can be adjusted using the following camber adjustment procedure.

If camber does not meet required specifications, the vehicles suspension components should be inspected for any signs of damage or bending and the vehicle ride height should be checked to verify it is within required specification. **This inspection must be done before performing the camber setting procedure.**

CAUTION: Do not attempt to adjust the vehicles Caster or Camber by heating, bending or by performing any other modification to the vehicle's front suspension components.

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

NOTE: Prior to reading each alignment specification, front and rear of vehicle should be jounced 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.

(2) Correctly jounce vehicle and then read the vehicle's current front and rear alignment settings. Compare the vehicle's current alignment settings to the vehicle specifications for camber, caster and Toe-in. See Alignment Specifications in this group of the

service manual for the required specifications. **If front and rear camber readings are within required specifications proceed to Front Wheel Toe Adjustment for the Toe adjustment procedure if required. If Camber readings are not within specifications refer to step Step 1 in the following front camber adjustment procedure.**

CAMBER ADJUSTMENT PROCEDURE

(1) If the front camber readings obtained are not within the vehicle's specifications, use the following procedure to provide camber adjustment.

(2) Verify that the strut and steering knuckle are not bent or otherwise damaged. If either component is bent or show other signs of damage, replace required component(s) and check the camber setting again. Refer to Strut Damper Assembly Service in this group of the service manual for the required strut replacement procedure.

(3) If no component is bent or damaged, use the following procedure for modifying the strut clevis bracket and adjusting the camber setting.

(4) Raise front of vehicle until tires are not supporting the weight of the vehicle. Remove wheel and tire assembly from the location on the vehicle requiring the strut clevis modification.

CAUTION: When removing the steering knuckle from the strut clevis bracket, do not put a strain on the brake flex hose. Also, do not let the weight of the steering knuckle assembly be supported by the brake flex hose when removed from the strut assembly. If necessary use a wire hanger to support the steering knuckle assembly or if required remove the caliper from the steering knuckle.

(5) Remove the stabilizer bar attaching link from the strut (Fig. 2).

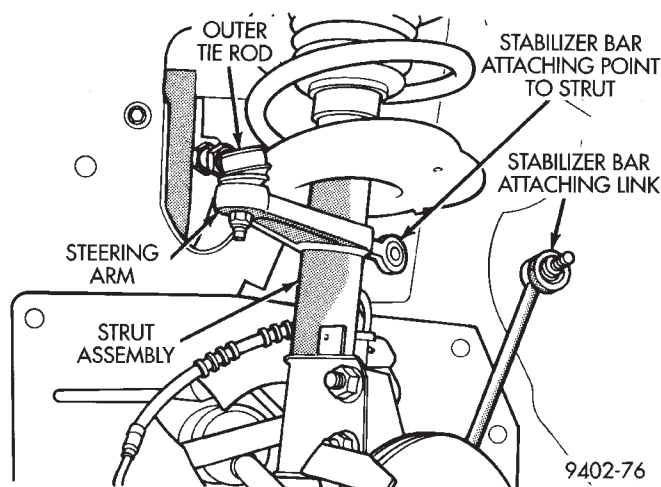


Fig. 2 Stabilizer Bar Attaching Link

SERVICE PROCEDURES (Continued)

(6) Loosen but do not remove the outer tie rod end attaching nut (Fig. 3). Remove outer tie rod end from steering arm using Puller, Special Tool, MB-990635 or equivalent (Fig. 3).

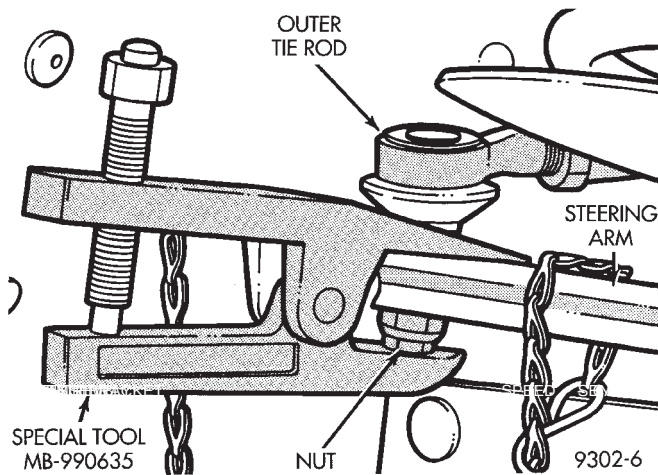


Fig. 3 Tie Rod End Removal

(7) If vehicle is equipped with antilock brakes, remove the routing bracket for the wheel speed sensor cable from the strut (Fig. 4).

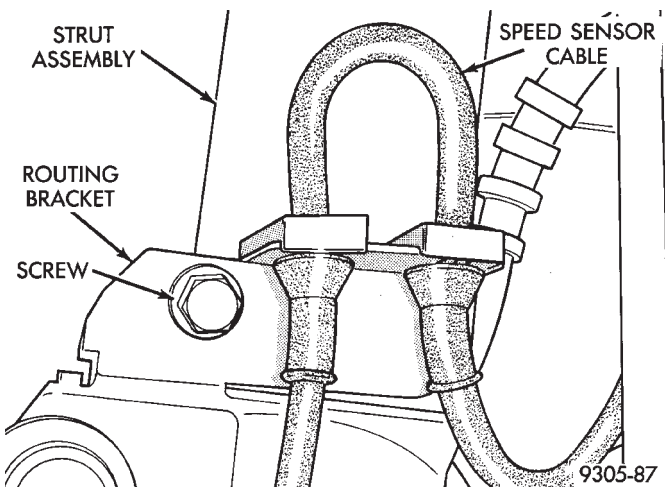


Fig. 4 Speed Sensor Cable Routing Bracket

CAUTION: The bolts attaching the strut to the steering knuckle are serrated in the area where they go through the steering knuckle and strut. When removing do not turn the bolts in the steering knuckle. If bolts are turned in the steering knuckle damage to the steering knuckle will result.

(8) Remove the top and bottom bolt, (Fig. 5) attaching the strut to the steering knuckle. Separate the steering knuckle from the strut and position steering knuckle so it is out of the way of the strut.

CAUTION: When grinding the bottom mounting hole in the strut to create the slot, do not enlarge

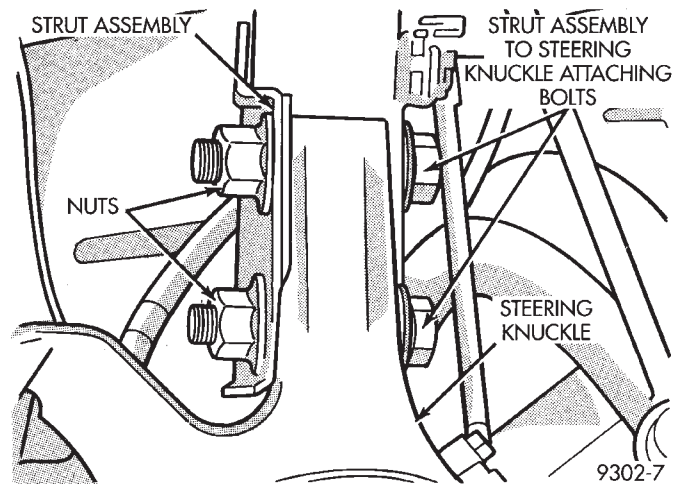


Fig. 5 Strut To Steering Knuckle Attaching Bolts

the hole more than 2 mm in either direction as shown in (Fig. 6) if the strut is not marked to show the shape of the slot.

(9) Using an appropriate grinder and cutting tool, slot the bottom hole (Fig. 6) in both sides of the strut clevis bracket. **When grinding slot do not go beyond the indentation area on the sides of the clevis bracket (Fig. 6).**

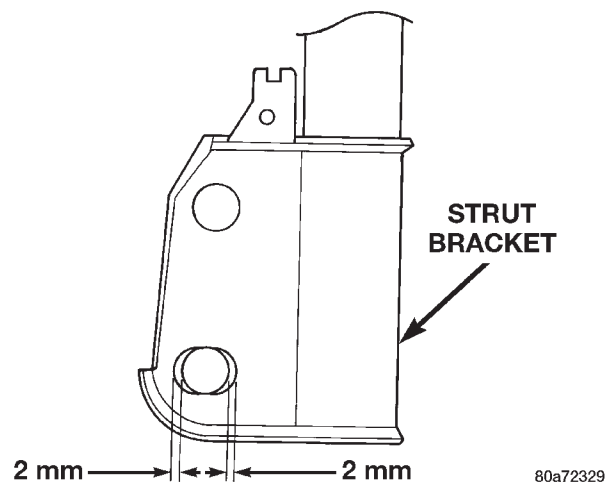


Fig. 6 Strut Bracket Hole Grinding Area

(10) Install the steering knuckle in the strut bracket.

(11) Loosely install the bolts (Fig. 5) attaching the strut to the steering knuckle.

(12) If removed, install the routing bracket (Fig. 4) for the wheel speed sensor on the strut.

(13) Install outer tie rod on strut. Install outer tie rod attaching nut. Tighten the tie rod attaching nut to a torque 37 N·m (27 ft. lbs.).

(14) Install stabilizer bar attaching link on strut (Fig. 2). Tighten the stabilizer bar attaching link nut to a torque of 95 N·m (70 ft. lbs.).

SERVICE PROCEDURES (Continued)

- (15) Install the wheel and tire assemblies.
- (16) Lower vehicle until the full weight of the vehicle is supported by the vehicle's suspension.
- (17) Correctly jounce the front and rear of vehicle an equal amount of times.
- (18) Adjust the front camber to the preferred setting by pushing in or pulling outward on the top of the wheel and tire as required. When camber is correctly set, tighten the upper and lower attaching bolt (Fig. 5) enough to not allow the steering knuckle to move in the strut bracket. Again jounce front and rear of vehicle an equal amount of times and verify front camber setting. See Alignment Specifications in this group of the service manual for required specifications.

(19) When front camber is correctly set, torque both front strut to steering knuckle attaching bolts to 170 N·m (125 ft. lbs.).

(20) Check the front wheel Toe settings. If Toe readings obtained are not within the required specification range, adjust Toe to meet the preferred specification setting. Adjust front Toe to the preferred the Toe specification using the Toe setting procedure.

(21) Road test the vehicle. If vehicle still drifts or leads, repeat the camber adjustment procedure but bias the cross car camber setting opposite of the direction in which the vehicle has the tendency to lead. **For example, if the vehicle leads left, compensate by setting left front camber to 0.0 degrees and right front camber to + 0.6 degrees. The cross car camber is now at + 0.6 degrees, the maximum allowed per the alignment specification.**

FRONT WHEEL TOE ADJUSTMENT

- (1) Prepare vehicle as described in the Pre-Alignment procedure.
- (2) Center steering wheel and hold with steering wheel clamp.
- (3) Loosen tie rod adjustment sleeve jamnuts. Rotate adjustment sleeve to align toe to specifications (Fig. 7).

CAUTION: When setting Toe on vehicle, the maximum dimension of exposed threads allowed on inner and outer tie rod can not exceed the distance shown in (Fig. 8). If the maximum distance is exceeded, inadequate retention of either inner or outer tie rod may result. Ensure that adjustment sleeve jam nuts are torqued to required specification when Toe setting procedure is completed.

CAUTION: When torquing adjustment sleeve jam nuts. The following procedure must be followed to ensure adequate torquing and retention of the adjustment sleeve jam nuts is obtained. Not follow-

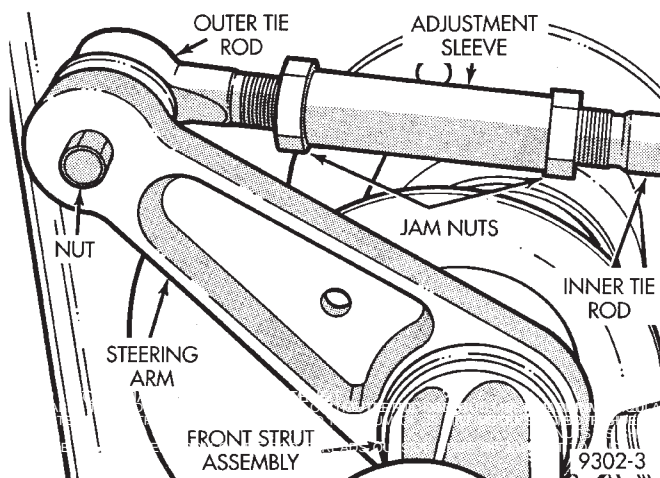


Fig. 7 Front Wheel Toe Adjustment Location

ALLOWABLE THREADS EXPOSED PAST EDGE OF THE TIE ROD JAM NUTS IS, A MAXIMUM OF 20 MILLIMETERS ON EITHER SIDE OR A COMBINED MAXIMUM OF 35 MILLIMETERS ON BOTH SIDES.
NOTE: DISTANCE IS MEASURED FROM OF TIE ROD THREADS OUTSIDE EDGE OF JAM NUT TO END

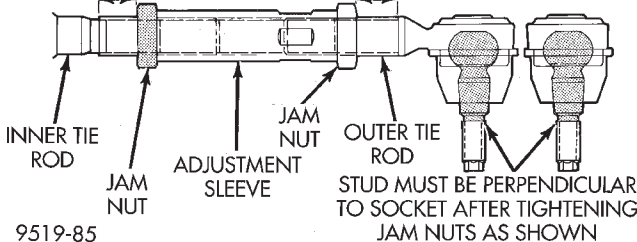


Fig. 8 Tie Rod Thread Engagement Requirements

ing this procedure, could result in the Toe Setting Adjustment changing and/or loosening of the inner or outer tie rod ends.

(4) After completion of tie rod end installation and to Toe adjustment procedure, tighten inner tie rod adjusting sleeve jam nut (Fig. 8) to a torque of 75 N·m (55 ft. lbs.). When tightening jam nut, use a 27 mm crow foot and a clicker type torque wrench to obtain required torque. **To avoid losing Toe set adjustment and prevent adjusting sleeve from turning, a 23 mm wrench of sufficient size to resist the tightening torque of the jam nut must be used to hold adjusting sleeve.**

(5) Use an appropriate tool on neck area of outer tie rod to maintain the correct perpendicular orientation of the tie rod end stud within the tie rod end (Fig. 8).

CAUTION: While tightening and torquing the outer tie rod jam nut, the adjusting sleeve must not be allowed to turn. Any turning movement of the adjusting sleeve can cause the inner tie rod jam nut to loosen. This condition is most likely to occur if jam nut is not tightened to the specified torque.

SERVICE PROCEDURES (Continued)

(6) Tighten the outer tie rod jam nut (Fig. 8) to a torque of 75 N·m (55 ft. lbs.). When tightening jam nut, use a 27 mm crow foot and a clicker type torque wrench to obtain required torque. **To avoid losing Toe set adjustment and prevent adjusting sleeve from turning, a 23 mm wrench of sufficient size to resist the tightening torque of the jam nut must be used to hold adjusting sleeve.**

REAR WHEEL TOE ADJUSTMENT

(1) Loosen lateral link, adjustment link jamnuts (Fig. 9). Rotate adjustment links as required to set rear wheel Toe to specifications. **Do not exceed the maximum length dimensions of the lateral links shown in (Fig. 10). Both dimensions must be checked to ensure they do not exceed maximums allowed.**

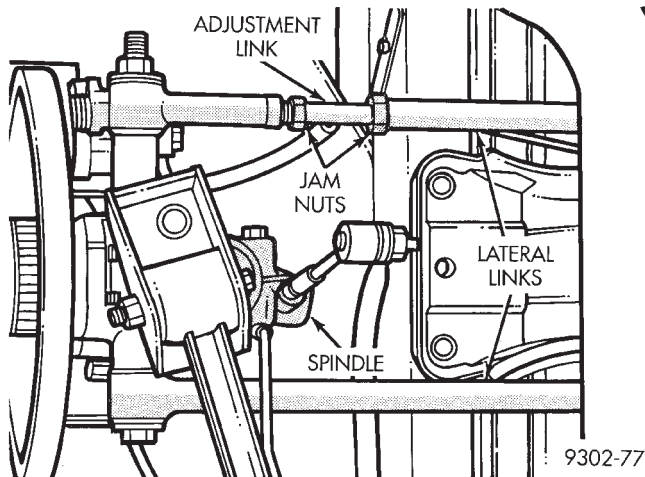


Fig. 9 Rear Wheel Toe Adjustment

CAUTION: When setting rear "Toe In" on vehicle. The maximum lengths of the adjustable lateral link at the locations shown in (Fig. 10) must not be exceeded. If these maximum lengths are exceeded, inadequate retention of adjustment link to the inner and outer link may result. Ensure that the adjustment sleeve jam nuts are torqued to the required specifications when the Toe setting procedure is completed.

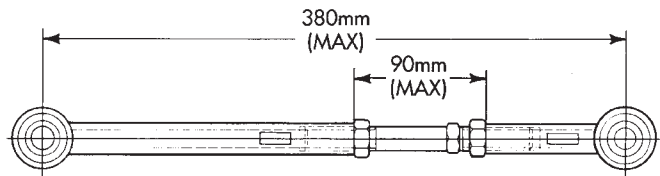


Fig. 10 Lateral Link Maximum Length Dimensions

(2) Tighten lateral link, adjustment link locknuts to 65 N·m (48 ft. lbs.) torque.

SPECIFICATIONS

ALIGNMENT SPECIFICATIONS AT VEHICLE CURB HEIGHT

FRONT WHEEL ALIGNMENT	ACCEPTABLE ALIGNMENT RANGE AT CURB HEIGHT	PREFERRE SETTING
CAMBER.....	-0.6° to $+0.6^{\circ}$	$+0.0^{\circ}$
Side To Side Differential	0.7 degrees or less	0.0
TOTAL TOE..... Specified In Degrees (See Note)	0.4°in to 0.0°out	0.2° in
CASTER* (Reference Angle)..... *Side To Side Caster Difference Not To Exceed.....	$+2.0^{\circ}$ to $+4.0^{\circ}$ 1.0° or less	$+3.0^{\circ}$ 0.0°
REAR WHEEL ALIGNMENT	ACCEPTABLE ALIGNMENT RANGE AT CURB HEIGHT	PREFERRE SETTING
CAMBER.....	-0.6° to $+0.4^{\circ}$	-0.1°
TOTAL TOE..... Specified In Degrees (See Note) TOE OUT: When Backed On Alignment Rack Is TOE In When Driving	0.2° Out to 0.4° In	0.1° in
THRUST ANGLE.....	-0.15° to $+0.15^{\circ}$	
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

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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.

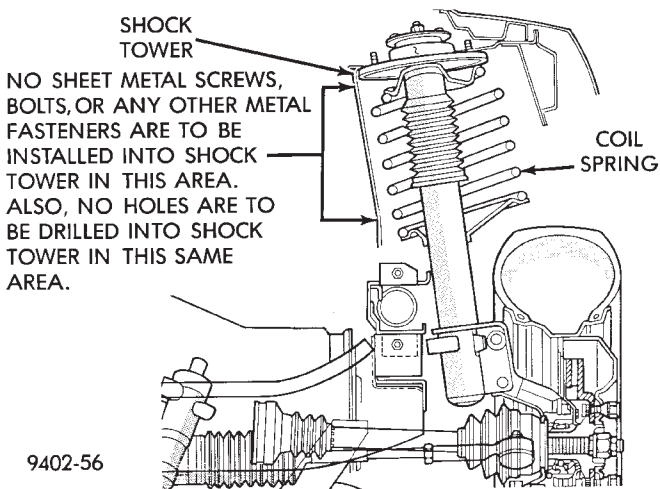


**Fig. 1 Strut Tower To Coil Spring
Minimum Clearance Area**

DESCRIPTION AND OPERATION

FRONT SUSPENSION SYSTEM

This vehicle uses a MacPherson strut front suspension design (Fig. 2). The MacPherson strut assembly includes the following components. A rubber isolated strut upper mount and bearing assembly, spring seat, coil spring and coil spring lower insulator. The MacPherson strut assembly is attached to the vehicle at the shock tower using 3 studs which are part of the isolated top mount. The lower end of the MacPherson strut assembly is attached to the upper leg of the steering knuckle. Attachment of the MacPherson strut assembly to the steering knuckle is by 2 serrated bolts. A forged lower control arm assembly (Fig. 2) is attached to the front cradle and steering knuckle. A tension strut (Fig. 2) connects the lower control arm assembly to the front cradle. 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.

McPHERSON STRUT

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 (Fig. 3) 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 with two serrated through bolts and prevailing torque nuts. Caster is a fixed setting (net build) on all vehicles and is not adjustable.

STEERING KNUCKLE

The front suspension knuckle (Fig. 3) provides for steering control of the vehicle. Supports the brake caliper and absorbs the loads exerted during vehicle braking. It also supports the front (driving) hub and bearing and stub axle assembly.

The front suspension knuckle also provides the ability to align the front wheels of the vehicle. This is done by allowing for front wheel Toe adjustment.

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 and bearing assembly using a prevailing torque nut.

LOWER CONTROL ARM

The lower control arm (Fig. 3) is a steel forging with 2 rubber bushings isolating the lower control arm from the front cradle assembly. The isolator bushings consist of a metal encased pivot bushing and a solid rubber tension strut bushing. The lower control arm is bolted to the cradle assembly using a pivot bolt through the center of the rubber pivot bushing and at the tension strut isolator bushing (Fig. 3).

The ball joint is an integral part of the control arm and has a non-tapered stud with a notch for clamp bolt clearance. The stud is clamped and locked into the steering knuckle leg with a clamp bolt. The ball joint used on this vehicle is non-serviceable and if defective must be serviced as part of the lower control arm.

STABILIZER BAR

The stabilizer bar (Fig. 3) interconnects the front McPherson struts 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 through the stabilizer bar, this helps to minimize the body roll of the vehicle during suspension movement.

Attachment of the stabilizer bar to the front suspension cradle is through 2 rubber-isolator bushings and bushing retainers (Fig. 3). The stabilizer bar to strut attachment is done utilizing rubber isolated stabilizer bar attaching links (Fig. 3). All parts of the stabilizer bar are serviceable, and the stabilizer bar to front suspension cradle bushings are split for easy removal and installation. The split in the stabilizer bar to front suspension cradle bushings must be positioned toward the front of the vehicle, when the stabilizer bar is installed.

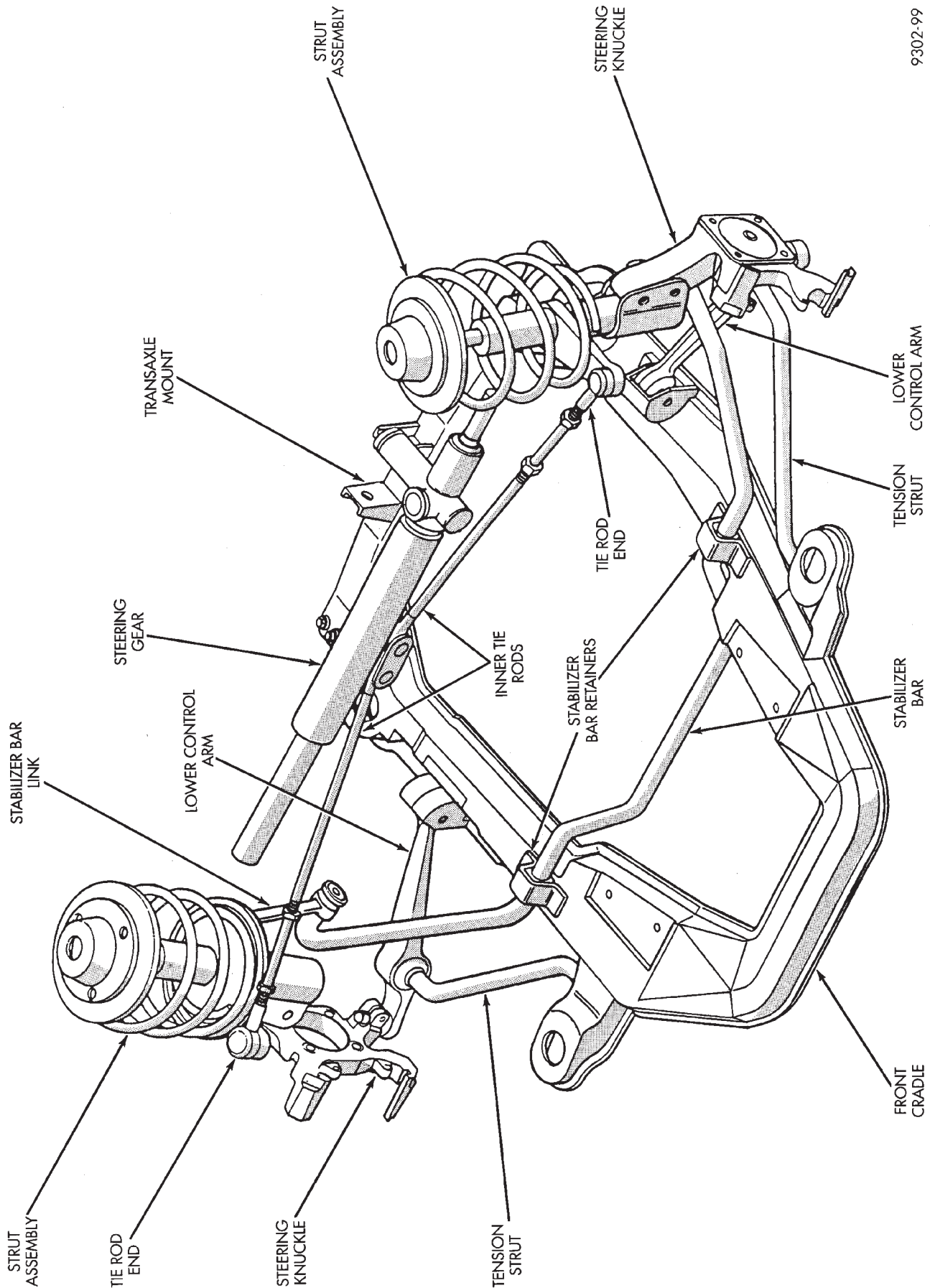
STABILIZER BAR LINK

The stabilizer bar link assembly (Fig. 3) is used to attach the stabilizer bar to the front strut assemblies. This reduces the fore-and-aft rate of the stabilizer bar from the rest of the suspension.

HUB AND BEARING

The hub and bearing unit is serviced only as a complete assembly. It is mounted to the steering knuckle by 3 mounting bolts that are removed from the rear of the steering knuckle.

DESCRIPTION AND OPERATION (Continued)



9302-99

Fig. 2 L.H. Front Suspension

DESCRIPTION AND OPERATION (Continued)

TENSION STRUT

This vehicle uses a tension strut (Fig. 3) on each side of the vehicles front suspension, between the lower control arm and front suspension cradle. The tension strut controls longitudinal (for-and-aft) movement of the front wheels of the vehicles. Controlling the longitudinal movement of the wheels reduces harshness when wheels hit sudden irregularities in the road surface.

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 front suspension lower control arm ball joints operate with no free play. See Inspection Ball Joint

Wear in the Diagnosis And Testing Section in this group of the service manual to determine if the ball joint is worn and requires replacement.

The ball joints are not replaceable as a separate component of the lower control arm assembly. If a ball joint is found to be defective, the entire lower control arm will need to be replaced. Do not attempt any type of repair on the ball joint assembly.

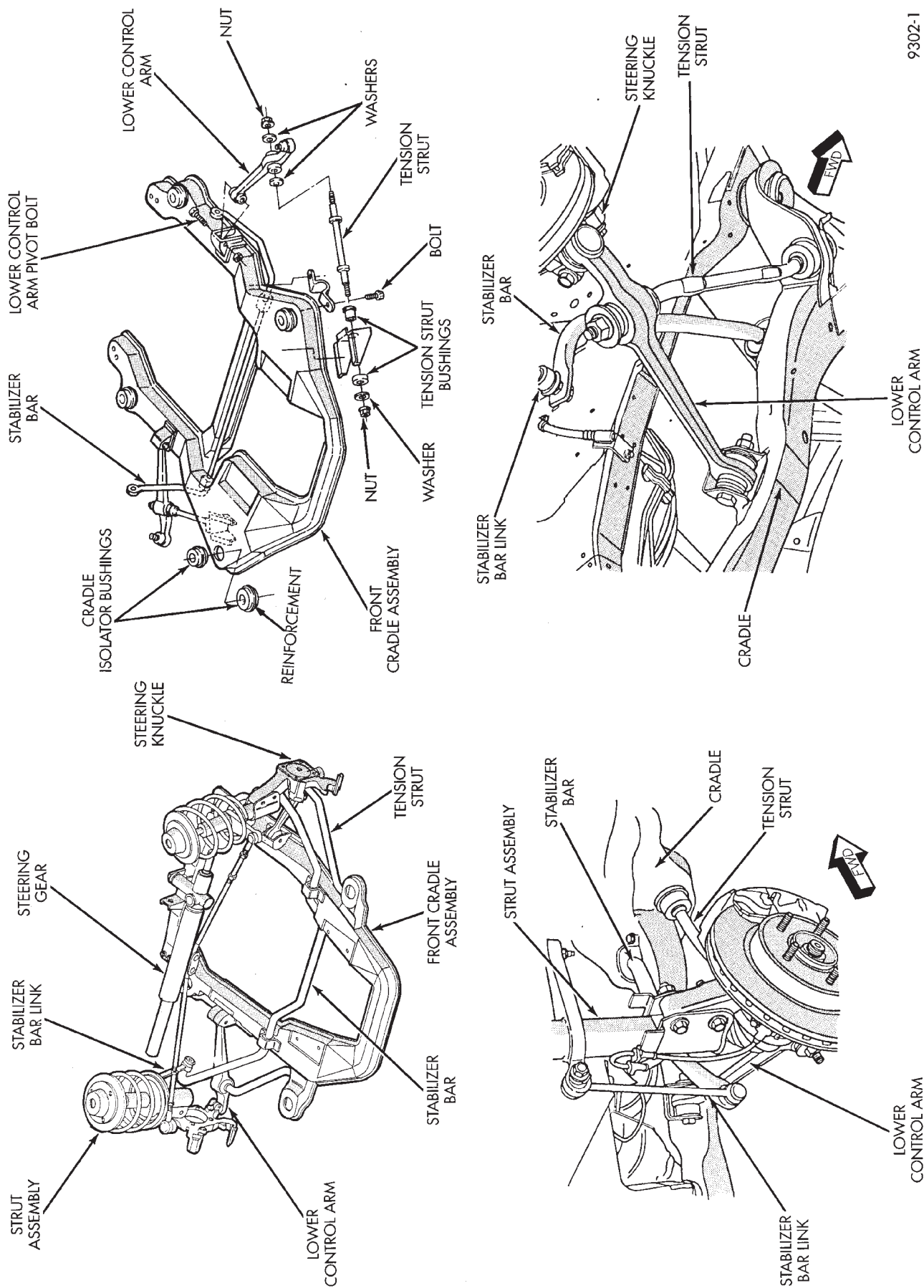
WHEEL MOUNTING STUDS

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 axle to replace the wheel attaching studs in the hub and bearing assembly.

DESCRIPTION AND OPERATION (Continued)



9302-1

Fig. 3 L.H. Front Suspension Components

DIAGNOSIS AND TESTING

McPHERSON STRUT ASSEMBLY

- (1) Inspect for damaged or broken coil springs.
- (2) Inspect for torn or damaged strut assembly dust boots.
- (3) 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. Also inspect jounce bumpers for signs of damage or deterioration.

STEERING KNUCKLE

The front suspension knuckle (Fig. 4) is not a serviceable component. Do not attempt to straighten or repair the front suspension knuckle in any way.

Service repair or replacement of the front (drive) hub and bearing, (Fig. 4) can be done with the front suspension knuckle remaining on the vehicle.

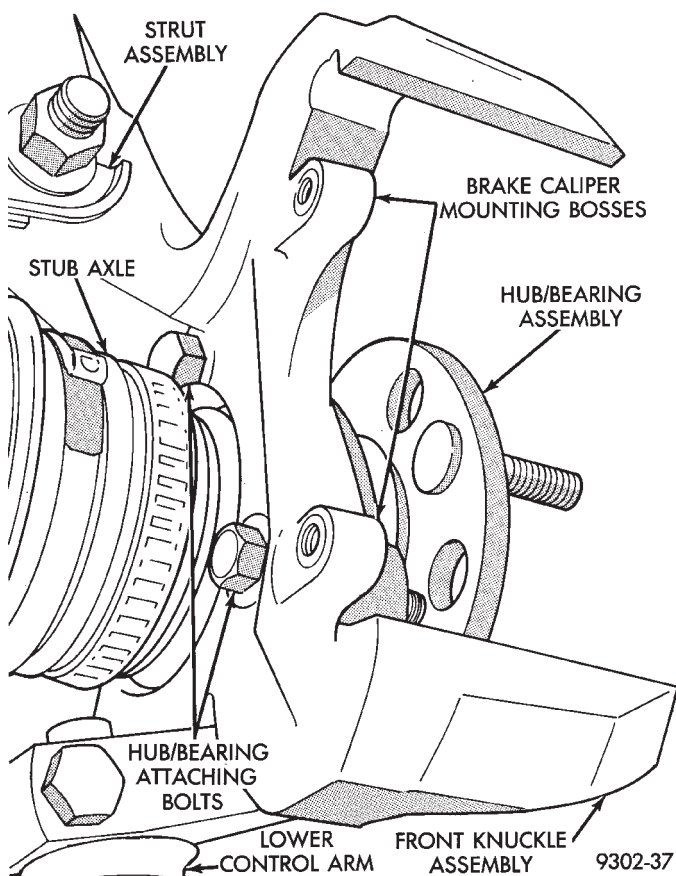


Fig. 4 Steering Knuckle

LOWER CONTROL ARM

The lower control arm if damaged, is serviced only as a complete component. **Do not attempt to repair or straighten a broken or bent lower control**

arm. Inspect the lower control arm for signs of damage from contact with the ground or road debris. If the lower control arm shows any sign of damage, inspect the lower control arm to see if it is bent.

The only serviceable components of the lower control arm are, the pivot bushing, ball joint seal and tension strut bushing. The service procedure to replace these components is detailed in the specific component Service Procedures Sections in this group of this service manual.

BALL JOINT

Raise front of vehicle using jack stands or a frame contact type hoist, until front suspension is in full rebound and tires are not in contact with the ground. Grasp tire at top and bottom, and apply an in and out on the wheel and tire. While applying force to the tire, look for any movement between the lower ball joint and lower control arm. If any movement is evident the lower ball joint is worn and the lower control arm requires replacement.

STABILIZER BAR

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. The stabilizer bar to cradle assembly bushings, should be positioned on stabilizer bar, so slit in bushing is positioned toward the front of the vehicle when the stabilizer bar is installed (Fig. 5).

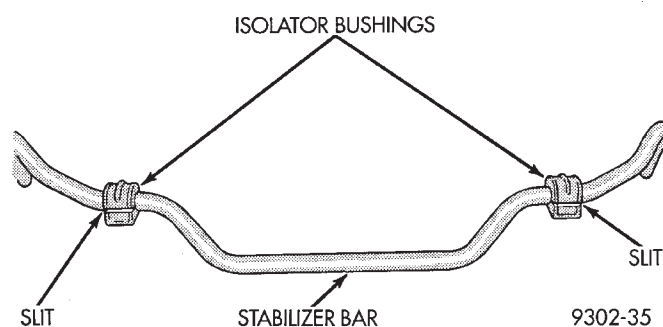


Fig. 5 Stabilizer Bar And Isolator Bushings

HUB AND BEARING

The front 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 front 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 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.

DIAGNOSIS AND TESTING (Continued)

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

SERVICE PROCEDURES

STABILIZER BAR ISOLATOR BUSHING

If only the stabilizer bar isolator bushings require service without any service to the stabilizer bar. The stabilizer bar isolator bushings can be removed from the stabilizer bar without requiring the stabilizer bar to be removed from the vehicle.

REMOVE

(1) Remove the 2 bolts each, attaching the stabilizer bushing retainer and bushing to cradle assembly (Fig. 6).

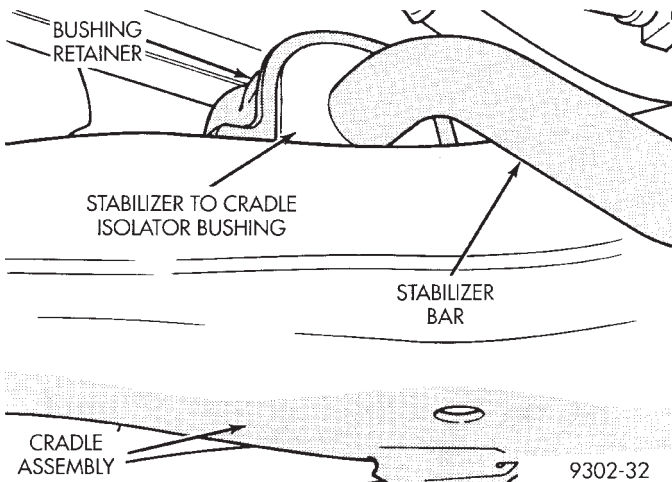


Fig. 6 Stabilizer Bar Isolator Bushing Attachment To Cradle

(2) Remove the stabilizer bar isolator bushing retainers from the isolator bushings.

(3) 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. The stabilizer bar to cradle assembly bushings, should be positioned on stabilizer bar, so slit in bushing is positioned toward front of vehicle (Fig. 7).

INSTALL

(1) Install the isolator bushing retainers back on the stabilizer bar isolator bushings.

CAUTION: When stabilizer bar is installed. Position stabilizer bar, so lower part of stabilizer bar is centered in the middle of the cradle assembly. Failure

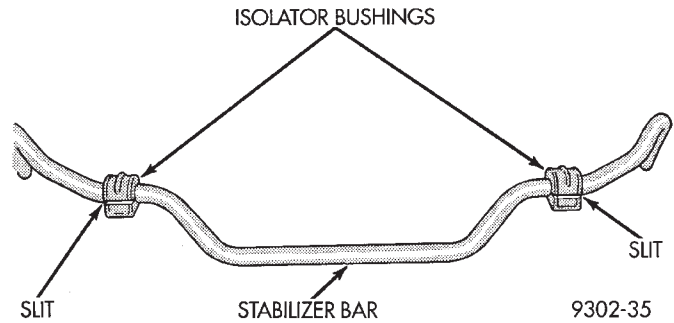


Fig. 7 Isolator Bushings Installed On Stabilizer Bar
to do this may cause stabilizer bar to come in contact with other suspension components.

(2) Align the stabilizer bar bushing retainers with the mounting holes in the cradle assembly (Fig. 6). **Install but do not tighten the 4 bushing retainer to cradle assembly mounting bolts. The 4 retaining bolts will be torqued when vehicle is lowered to the ground.**

(3) Lower vehicle to the ground.

(4) With the full weight of the vehicle supported by the suspension. Use a long extension, and torque the 4 stabilizer bar bushing retainer to cradle assembly attaching bolts to 55 N·m (40 ft. lbs.).

REMOVAL AND INSTALLATION

McPHERSON STRUT

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 front wheel and tire assembly from the vehicle.

(3) Remove the stabilizer bar attaching link from the strut assembly (Fig. 8).

(4) Loosen but do not remove the outer tie rod end to strut assembly attaching nut (Fig. 9). Then remove outer tie rod end from steering arm using Puller, Special Tool MB-990635 or equivalent (Fig. 9).

(5) If vehicle is equipped with antilock brakes, remove the speed sensor cable routing bracket from the strut assembly (Fig. 10).

(6) Remove the 2 guide pin bolts mounting the caliper assembly to the steering knuckle (Fig. 11).

(7) Remove brake caliper assembly from steering knuckle and braking disc. Refer to the Brake Section in this service manual for the required caliper removal procedure. Support caliper assembly by hanging it from frame of vehicle with wire or some

REMOVAL AND INSTALLATION (Continued)

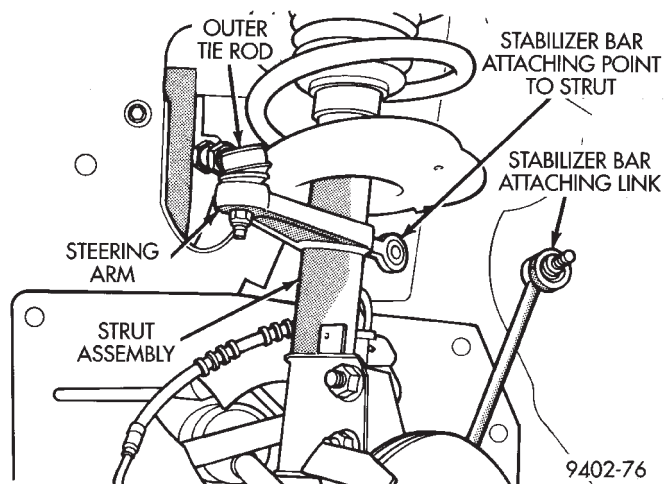


Fig. 8 Stabilizer Bar Link Removed From Strut

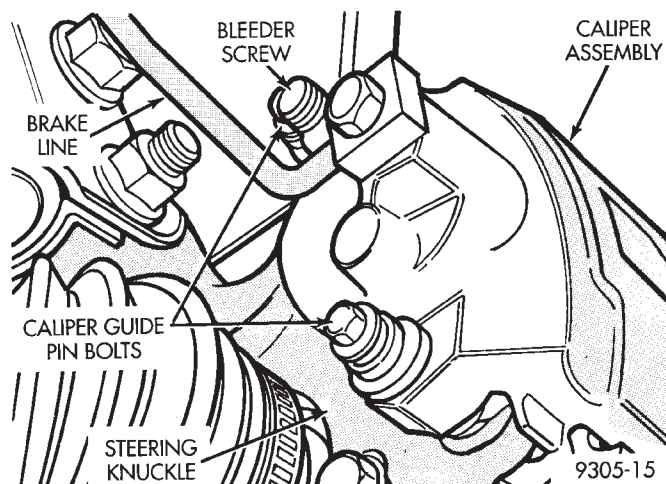


Fig. 11 Caliper Guide Pin Bolts

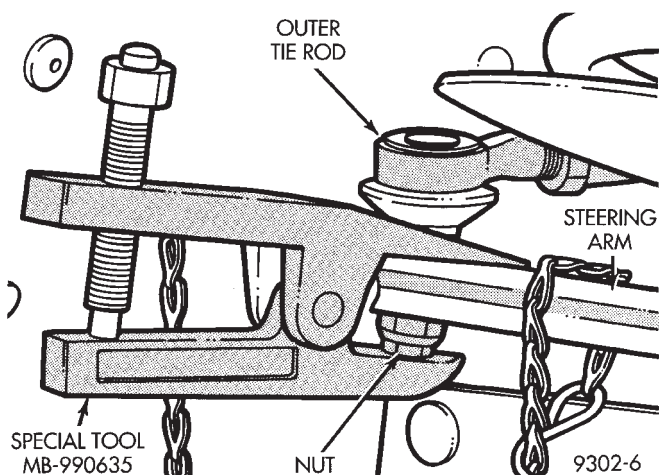


Fig. 9 Removing Outer Tie Rod From Steering Arm

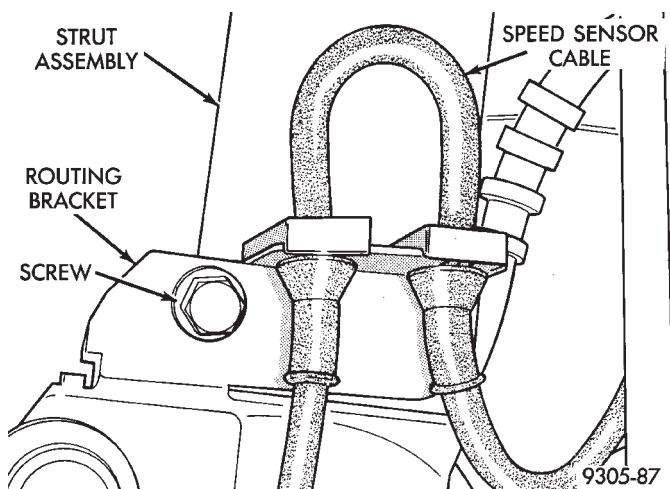


Fig. 10 Speed Sensor Cable Routing Bracket

other method, (Fig. 12) do not let caliper assembly hang by brake hose. Remove front braking disc from hub.

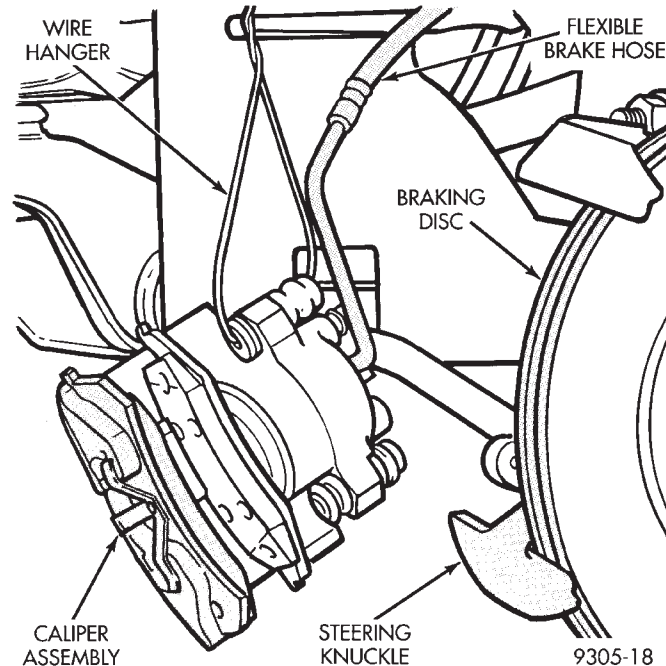


Fig. 12 Removal And Storage Of Front Caliper

CAUTION: The strut assembly to steering knuckle bolts are serrated where they go through strut assembly and steering knuckle. When removing bolts, turn nuts off bolts **DO NOT TURN BOLTS IN STEERING KNUCKLE**. If bolts are turned damage to steering knuckle will result.

(8) Remove the strut assembly to steering knuckle attaching bolts (Fig. 13).

(9) Remove the 3 strut assembly upper mount to strut tower mounting nut and washer assemblies (Fig. 14).

(10) Remove the strut assembly from the vehicle for inspection and or disassembly.

REMOVAL AND INSTALLATION (Continued)

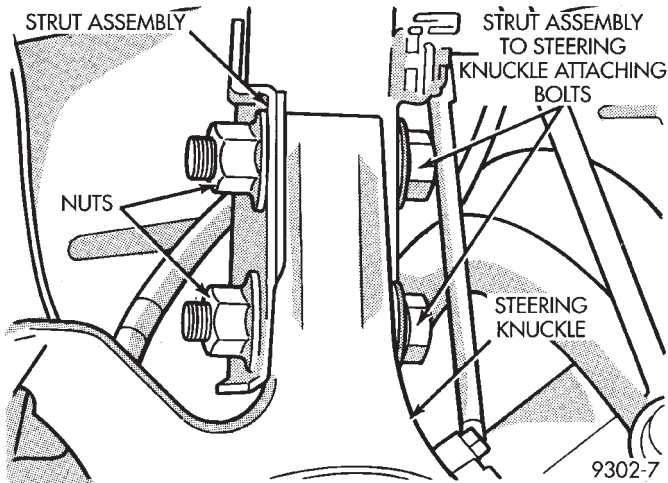


Fig. 13 Strut Assembly To Steering Knuckle Attaching Bolts

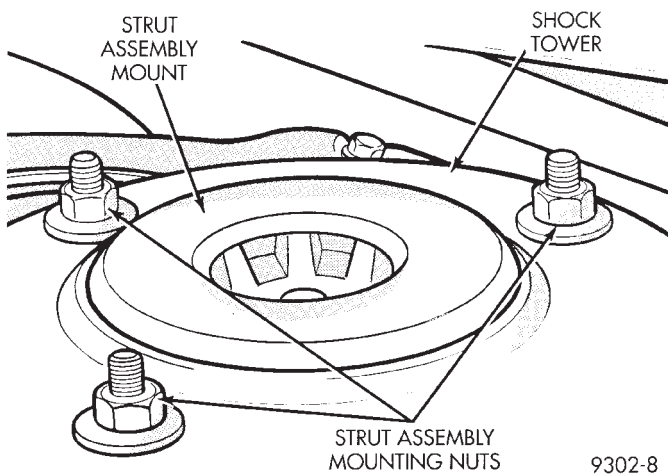


Fig. 14 Strut Assembly Mounting

INSTALL

(1) Install front strut assembly into shock tower. Install the 3 strut assembly upper mount to shock tower attaching nuts (Fig. 14). Tighten the 3 strut mount to strut tower attaching nuts to a torque of 33 N·m (25 ft. lbs.) torque.

(2) Position steering knuckle into strut assembly.

CAUTION: The strut assembly to steering knuckle bolts are serrated were they go through strut assembly and steering knuckle. When installing bolts, turn nuts onto bolts **DO NOT TURN BOLTS IN STEERING KNUCKLE**. If bolts are turned damage to steering knuckle will result.

(3) Install the strut assembly to steering knuckle attaching bolts (Fig. 13). Install nuts on attaching bolts. Tighten the strut assembly to steering knuckle attaching bolt nuts to a torque of 169 N·m (125 ft. lbs.).

(4) Install braking disc back on front hub and bearing assembly. Install front brake caliper assembly on steering knuckle. Install the 2 caliper assembly to steering knuckle attaching bolts (Fig. 11). Tighten the caliper assembly guide pin bolts to a torque of 19 N·m (192 in. lbs.).

(5) If the vehicle is equipped with antilock brakes. Install the front speed sensor cable routing bracket onto the front strut assembly (Fig. 10).

(6) Install outer tie rod on strut assembly. Install tie rod attaching nut. Tighten the tie rod attaching nut to a torque of 37 N·m (27 ft. lbs.).

(7) Install stabilizer bar link on strut (Fig. 8). Tighten the stabilizer link attaching nut to a torque of 95 N·m (70 ft. lbs.).

(8) Install the wheel and tire assembly.

(9) Tighten the wheel mounting 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.).

(10) Lower vehicle.

STEERING 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 front wheel and tire assembly from the vehicle.

(3) Remove the front caliper assembly from the front steering knuckle assembly (Fig. 15). Refer to Front Disc Brake Service in the Brake Section of this service manual for caliper removal procedure.

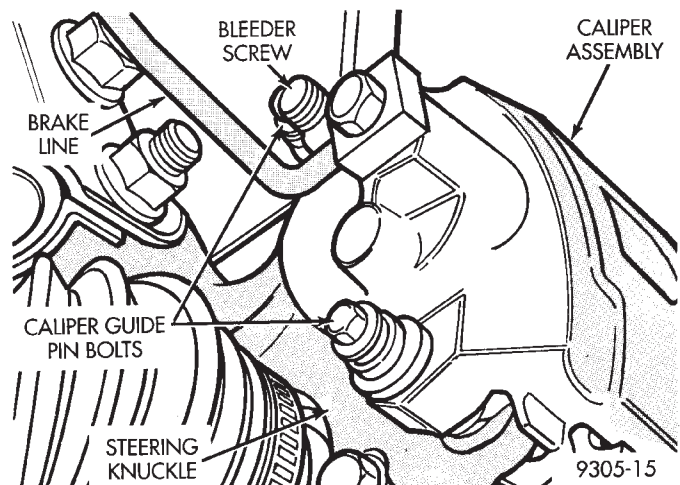
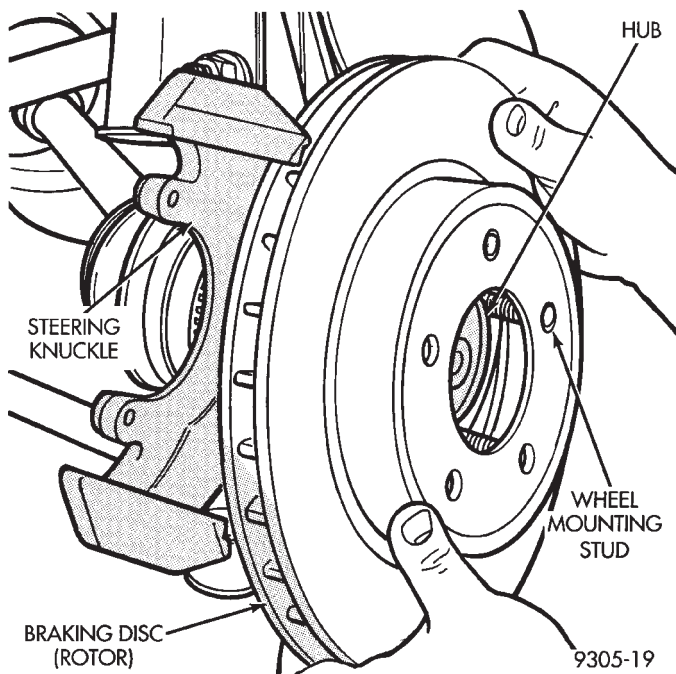


Fig. 15 Disc Brake Caliper Mounting

(4) Remove front rotor from hub (Fig. 16).

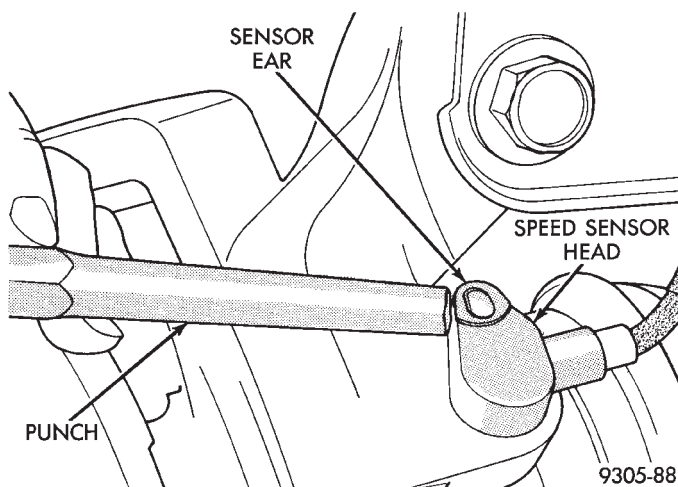
(5) Remove screw attaching wheel speed sensor head to steering knuckle. **Speed sensor head**

REMOVAL AND INSTALLATION (Continued)

**Fig. 16 Brake Rotor**

should be removed from steering knuckle, to avoid damage to speed sensor by outer C/V joint when hub and bearing is removed.

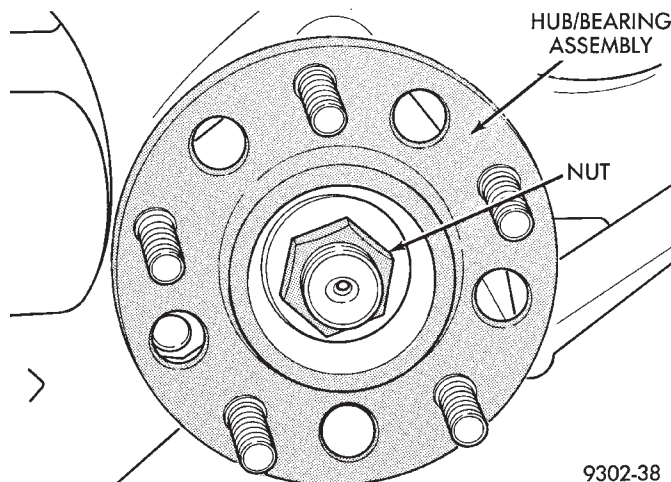
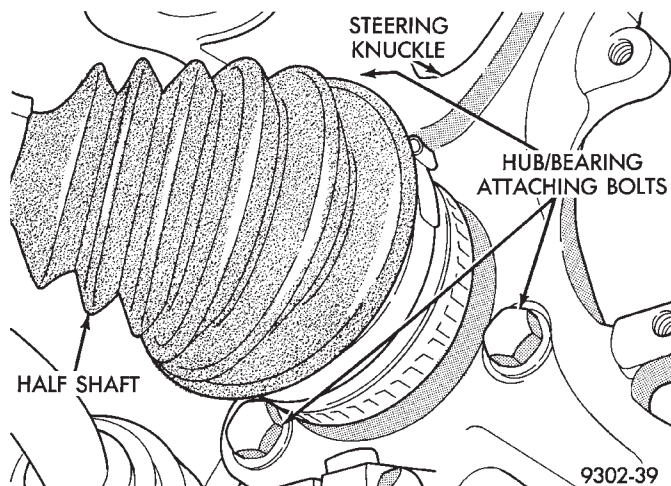
(6) Carefully, remove sensor head from steering knuckle. If the sensor has seized, due to corrosion, **DO NOT USE PLIERS ON SENSOR HEAD**. Use a hammer and punch (Fig. 17) to tap edge of sensor ear, rocking sensor side to side until free.

**Fig. 17 Speed Sensor Head Removal**

(7) Remove the hub and bearing to stub axle retaining nut (Fig. 18).

(8) Remove the 3 steering knuckle to hub and bearing assembly attaching bolts (Fig. 19).

CAUTION: If metal seal (Fig. 20) on hub and bearing assembly is seized to steering knuckle and

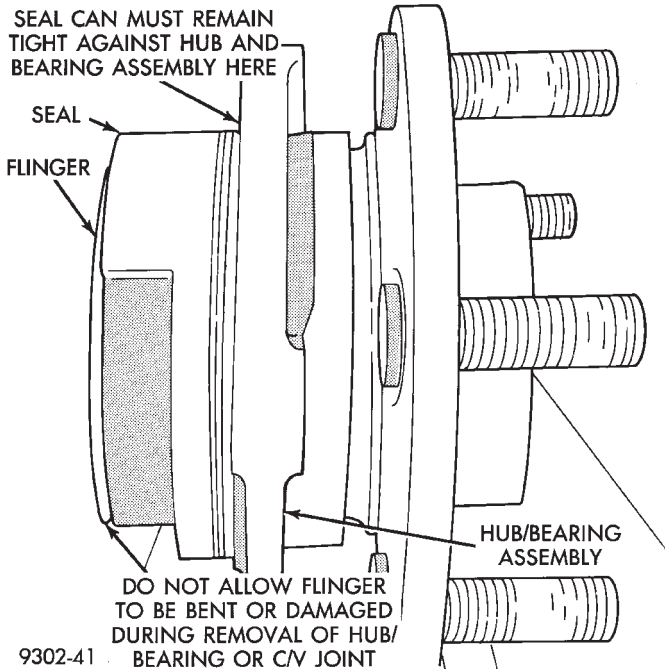
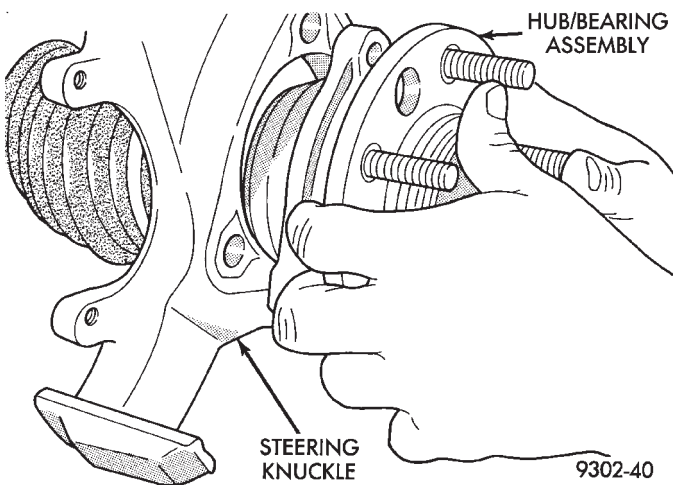
**Fig. 18 Hub And Bearing Retaining Nut****Fig. 19 Hub And Bearing Retaining Bolts**

becomes dislodged on hub and bearing assembly during bearing removal the hub and bearing assembly **MUST** not be re-used and **MUST** be replaced with a new hub and bearing assembly. Also if flinger disc (Fig. 20) becomes damaged (bent or dented) during removal, hub and bearing assembly must be replaced with a new hub and bearing assembly.

(9) Remove hub and bearing assembly from steering knuckle. It is removed by sliding it straight out of steering knuckle and off end of stub axle (Fig. 21). If hub and bearing assembly will not slide out of knuckle, insert a pry bar between hub and bearing assembly and steering knuckle (Fig. 22) and gently pry hub and bearing from knuckle. If stub shaft is frozen to hub and bearing assembly tap end of stub shaft with soft face hammer to free it from hub and bearing spline.

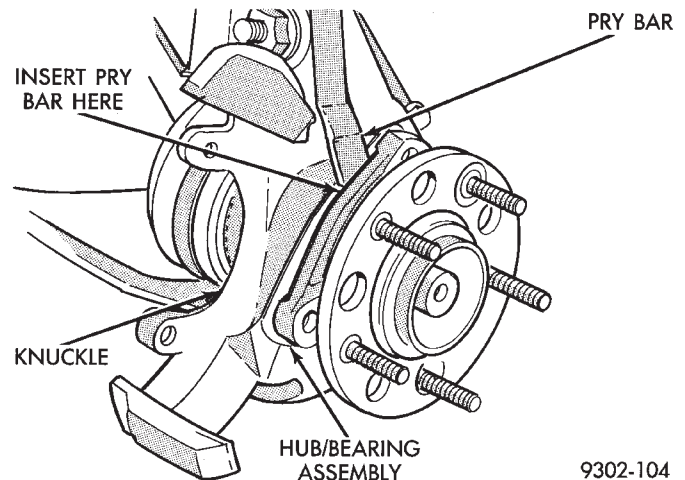
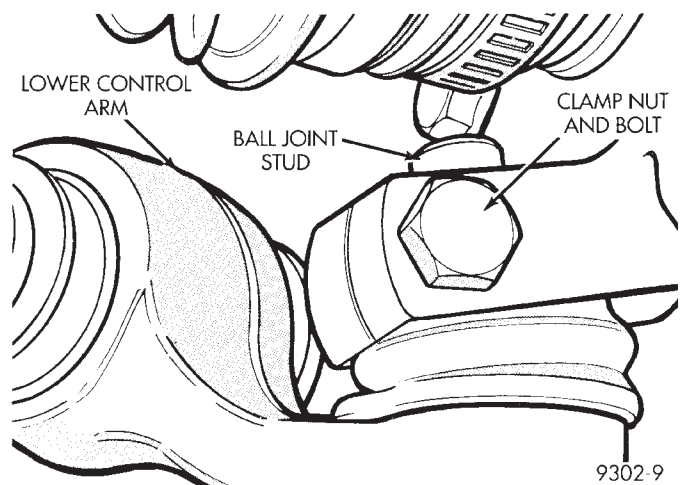
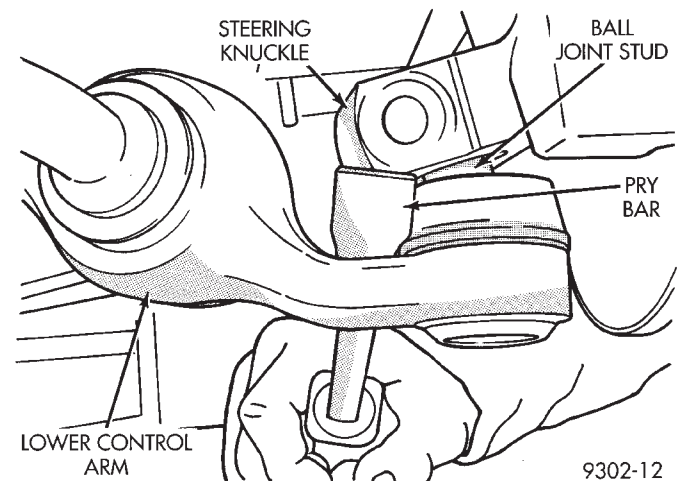
(10) Remove the ball joint stud to steering knuckle attaching nut and bolt (Fig. 23).

REMOVAL AND INSTALLATION (Continued)

**Fig. 20 Hub And Bearing Assembly Seal****Fig. 21 Hub And Bearing Assembly Removal And Installation**

CAUTION: When lower control arm is separated from steering knuckle, do not let ball joint seal hit up against steering knuckle. If ball joint seal hits steering knuckle, seal damage may occur. If ball joint seal becomes torn, replace seal before assembling lower control arm to knuckle.

(11) Carefully insert a pry bar between lower control arm and steering knuckle (Fig. 24). Push down on pry bar to separate ball joint stud from steering knuckle (Fig. 24).

**Fig. 22 Prying Hub And Bearing Assembly From Steering Knuckle****Fig. 23 Control Arm To Steering Knuckle Attachment****Fig. 24 Separating Ball Joint From Steering Knuckle**

REMOVAL AND INSTALLATION (Continued)

CAUTION: The strut assembly to steering knuckle bolts are serrated where they go through strut assembly and steering knuckle. When removing bolts, turn nuts off bolts **DO NOT TURN BOLTS IN STEERING KNUCKLE**. If bolts are turned damage to steering knuckle will result.

(12) Remove the strut assembly to steering knuckle attaching bolts (Fig. 25).

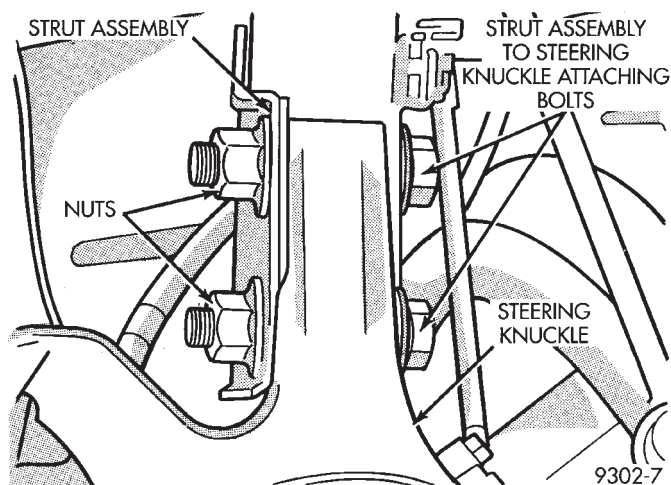


Fig. 25 Strut To Steering Knuckle Attaching Bolts

(13) Remove the steering knuckle from the vehicle.

INSTALL

(1) Install steering knuckle on ball joint stud. Install steering knuckle to lower ball joint attaching bolt and nut into steering knuckle (Fig. 23). Tighten the attaching bolt to a torque of 55 N·m (40 ft. lbs.).

(2) Position steering knuckle into strut assembly.

CAUTION: The strut assembly to steering knuckle bolts are serrated where they go through strut assembly and steering knuckle. When installing bolts, turn nuts onto bolts **DO NOT TURN BOLTS IN STEERING KNUCKLE**. If bolts are turned damage to steering knuckle will result.

(3) Install the strut assembly to steering knuckle attaching bolts (Fig. 25). Install nuts on attaching bolts (Fig. 25). Tighten the strut to steering knuckle attaching bolt nuts to a torque of 169 N·m (125 ft. lbs.).

CAUTION: Hub and bearing assembly mounting surfaces on steering knuckle and halfshaft (Fig. 26) must be smooth and completely free of foreign material or nicks.

CAUTION: When installing hub and bearing assembly into steering knuckle, be careful not to damage the flinger disc (Fig. 20) on hub and bear-

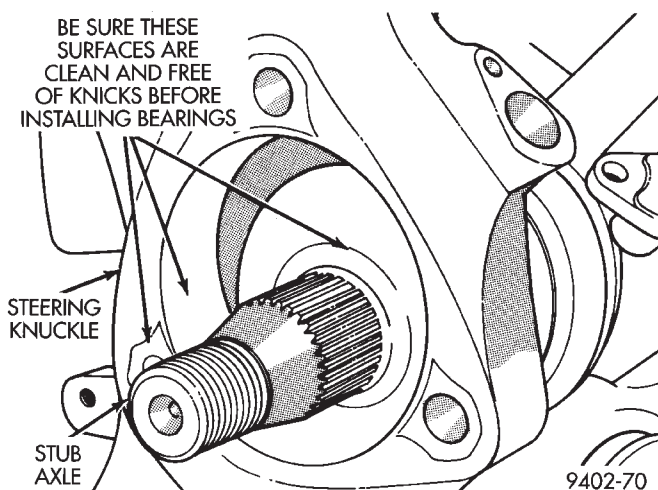


Fig. 26 Hub And Bearing Assembly Mounting Surfaces

ing assembly. If flinger disc becomes damaged, hub and bearing assembly **MUST** not be used and **MUST** be replaced with a new hub and bearing assembly.

(4) Install hub and bearing assembly onto stub shaft and into steering knuckle until squarely seated on face of steering knuckle.

(5) Install the 3 steering knuckle to hub and bearing assembly attaching bolts (Fig. 19). Equally tighten all 3 mounting bolts until hub and bearing assembly is squarely seated against front of steering knuckle. Then tighten all 3 hub and bearing assembly mounting bolts to a torque of 110 N·m (80 ft. lbs.).

CAUTION: The hub and bearing assembly to stub shaft retaining nut (Fig. 18) is a prevailing torque nut and can not be re-used. A **NEW** retaining nut **MUST** be used when assembled.

(6) Install a **NEW** hub and bearing assembly to stub shaft retaining nut (Fig. 18). **Tighten, but do not torque the hub nut at this time.**

(7) Coat speed sensor head with High Temperature Multi-purpose E.P. Grease before installing into the steering knuckle. Install speed sensor head into steering knuckle. Install screw and tighten to a torque of 7 N·m (60 in. lbs.).

(8) Install the braking disk back on the hub and bearing assembly (Fig. 16).

(9) Install front brake caliper on steering knuckle. Refer to Front Disc Brake Service in the Brake Section of this service manual for caliper installation procedure. Install the caliper to steering knuckle attaching bolts (Fig. 15) and tighten them to a torque of 19 N·m (168 in. lbs.).

(10) Install wheel and tire assembly on vehicle. Tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specifica-

REMOVAL AND INSTALLATION (Continued)

tion. Then repeat the tightening sequence to the full specified torque of 129 N·m (95 ft. lbs.).

(11) Lower vehicle to the ground.

CAUTION: When torquing hub and bearing assembly to stub shaft retaining nut, do not exceed the maximum torque of 163 N·m $\pm$ 14 N·m (120 ft. lbs. $\pm$ 10 ft. lbs.). If the maximum torque is exceeded this may result in a failure of the drive shaft.

(12) Apply the brakes to keep the vehicle from moving, then tighten the **NEW** stub axle retaining nut to a torque of 163 N·m $\pm$ 14 N·m (120 ft. lbs. $\pm$ 10 ft. lbs.) (Fig. 27).

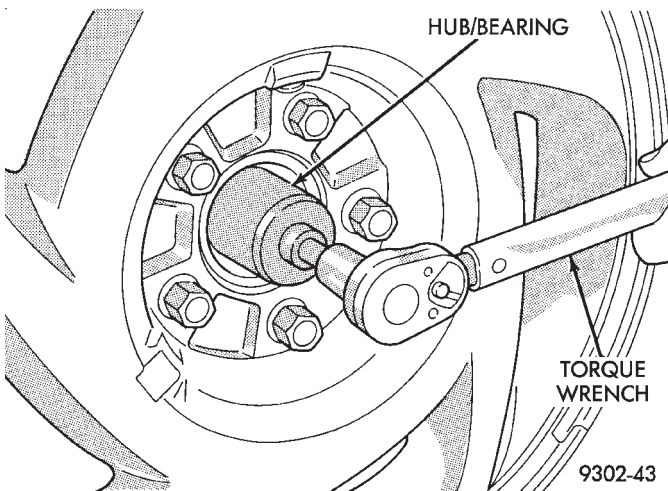


Fig. 27 Torquing Hub And Bearing Retaining Nut
LOWER CONTROL ARM

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 wheel and tire assembly from the vehicle.

(3) Remove the ball joint stud to steering knuckle attaching nut and bolt (Fig. 28).

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

CAUTION: When lower control arm is separated from steering knuckle, do not let ball joint seal hit up against steering knuckle. If ball joint seal hits steering knuckle, seal damage may occur. If ball joint seal becomes torn, replace seal before assembling lower control arm to knuckle.

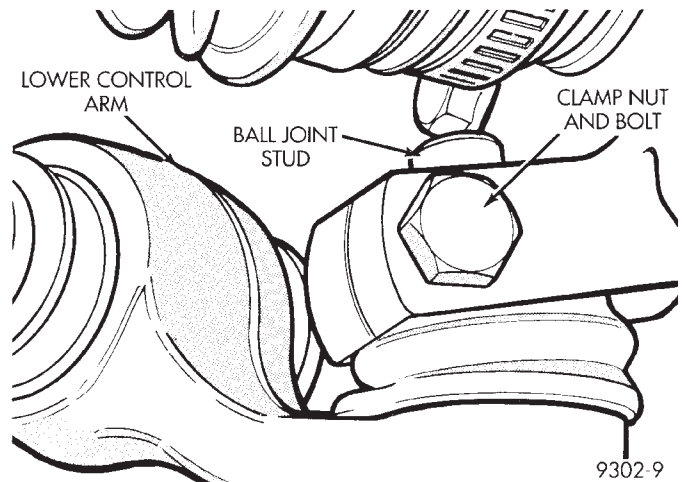


Fig. 28 Control Arm To Steering Knuckle Attachment

(4) Carefully insert a pry bar between lower control arm and steering knuckle (Fig. 29). Push down on pry bar to separate ball joint stud from steering knuckle (Fig. 29).

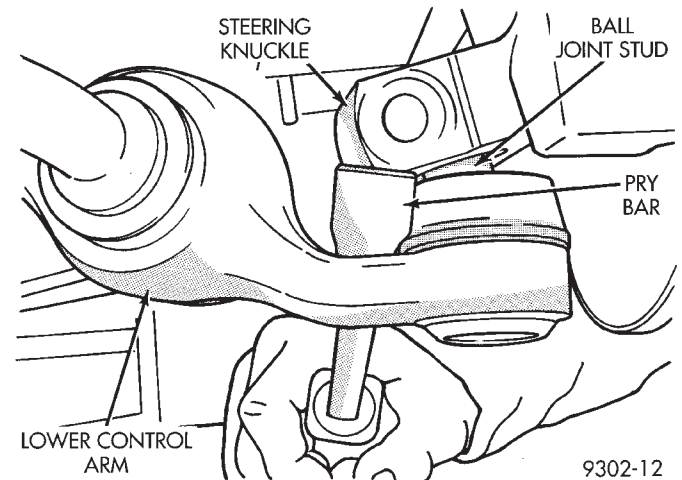


Fig. 29 Separating Ball Joint From Steering Knuckle

(5) Remove tension strut to cradle attaching nut and washer from end of tension strut (Fig. 30). When removing tension strut nut, keep strut from turning by holding tension strut at flat using open end wrench (Fig. 30). **Discard tension strut to cradle retaining nut. A NEW tension strut to cradle nut must be used when installing tension strut.**

(6) Loosen and remove lower control arm pivot bushing to cradle assembly pivot bolt (Fig. 31).

(7) Separate lower control arm and tension strut from the cradle as an assembly. Lower control arm is removed from cradle, by first removing pivot bushing from cradle and then sliding tension strut out of isolator bushing (Fig. 32).

(8) Inspect lower control arm and tension strut (Fig. 33) for distortion. Check all bushings for signs

REMOVAL AND INSTALLATION (Continued)

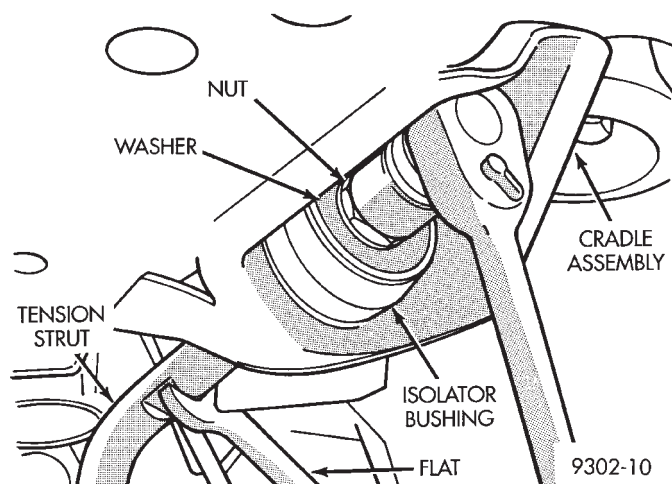


Fig. 30 Tension Strut To Cradle Mounting

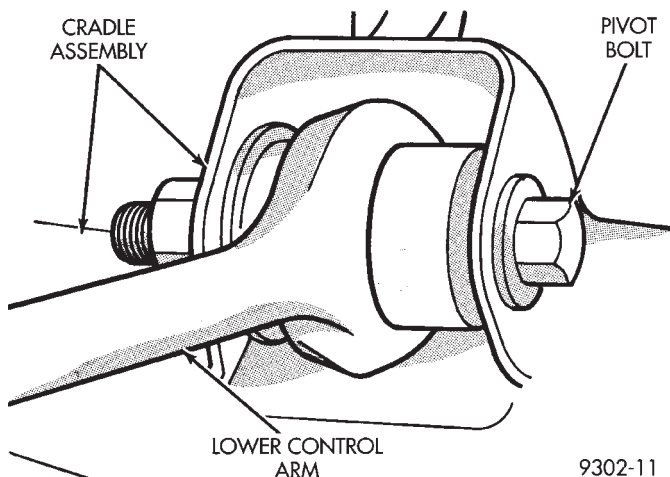


Fig. 31 Lower Control Arm Pivot Bolt

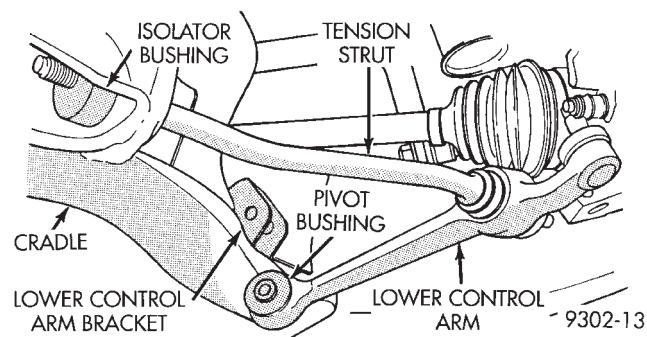


Fig. 32 Lower Control Arm Remove/Install

of sever deterioration. Replace any bushings that show signs of sever deterioration.

INSTALL

(1) Install the lower control arm on the cradle using the following sequence. Install tension strut and isolator bushing into cradle first, then install lower control arm pivot bushing into bracket on cradle (Fig. 32).

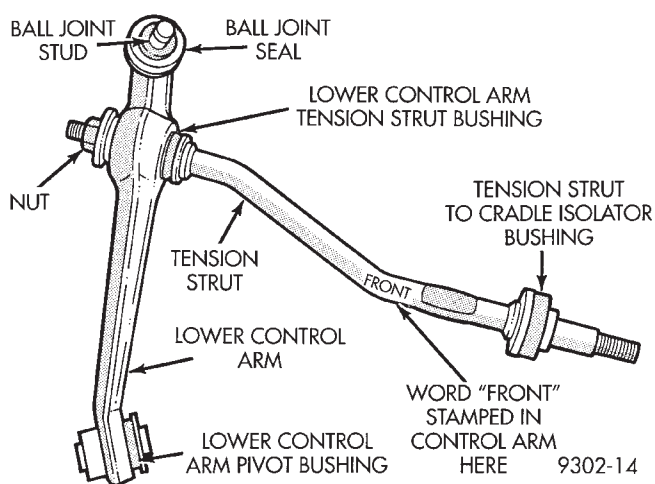


Fig. 33 Lower Control Arm And Tension Strut

(2) Install the lower control arm to cradle bracket attaching pivot bolt and nut (Fig. 31). **Do not tighten the lower control arm to cradle bracket attaching bolt at this time.**

(3) Install washer on end of tension strut (Fig. 30). Install a **NEW** tension strut to cradle bracket nut, on tension strut (Fig. 30). Tighten the tension strut to cradle bracket retaining nut to a torque of 150 N·m (110 ft. lbs.). When torquing tension strut nut, keep tension strut from turning by holding tension strut at flat using an open end wrench (Fig. 30).

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

CAUTION: When ball joint stud is installed into steering knuckle, do not let ball joint seal hit up against steering knuckle. If ball joint seal hits steering knuckle, seal damage may occur. If ball joint seal becomes torn, replace seal before assembling lower control arm to knuckle.

(4) Install lower ball joint stud into steering knuckle. Install steering knuckle to lower ball joint stud, clamp bolt and nut into steering knuckle (Fig. 28). Tighten the clamping bolt to a torque of 55 N·m (40 ft. lbs.).

(5) Install the wheel and tire assembly.

(6) 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.).

(7) Lower vehicle so the suspension is supporting vehicles weight (control arm at design height). Tighten the lower control arm pivot bushing to cradle bracket attaching bolt (Fig. 31) to a torque of 123 N·m (90 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

TENSION STRUT TO CRADLE BUSHING

To remove tension strut to cradle bushings from vehicle for replacement, the tension strut and lower control arm first **MUST** be removed as an assembly from the vehicle.

REMOVE

(1) Remove lower control arm and tension strut as an assembly from the vehicle. See Lower Control Arm in the Removal and Installation section of this service manual for the required removal procedure.

(2) Remove the tension strut to cradle isolator bushing from the tension strut. Install replacement isolator bushing on tension strut until it is seated against retaining washer (Fig. 34).

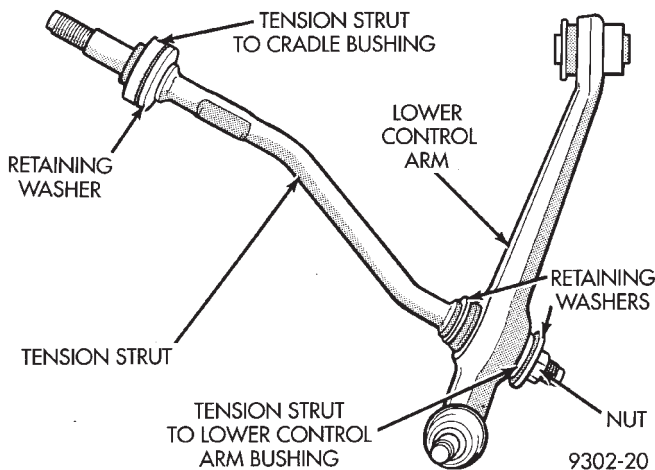


Fig. 34 Tension Strut Bushing Installation On Tension Strut

(3) Remove the tension strut to cradle isolator bushing from the cradle assembly. Install replacement tension strut to cradle isolator bushing into cradle, until squarely seated against cradle assembly (Fig. 35).

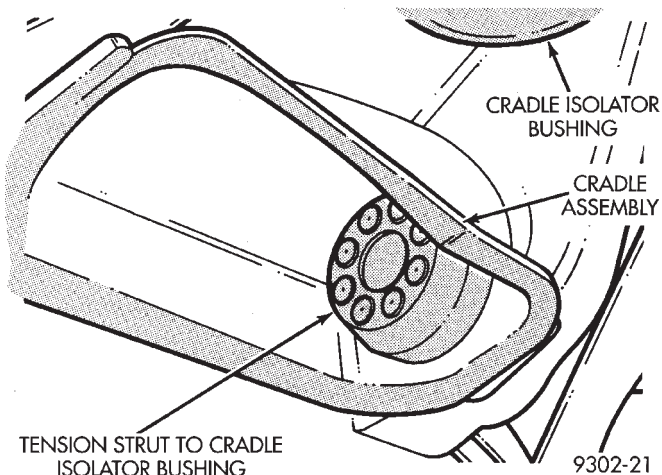


Fig. 35 Tension Strut Bushing Installed In Cradle

INSTALL

(1) Install lower control arm and tension strut as an assembly back on the vehicle. See Lower Control Arm in the Removal and Installation section of this service manual for the required installation procedure.

(2) Install washer on end of tension strut (Fig. 36). Install a **NEW** tension strut to cradle bracket nut, on tension strut (Fig. 36). Tighten the tension strut to cradle bracket retaining nut to a torque of 150 N·m (110 ft. lbs.). When torquing tension strut nut, keep tension strut from turning by holding tension strut at flat using an open end wrench (Fig. 36).

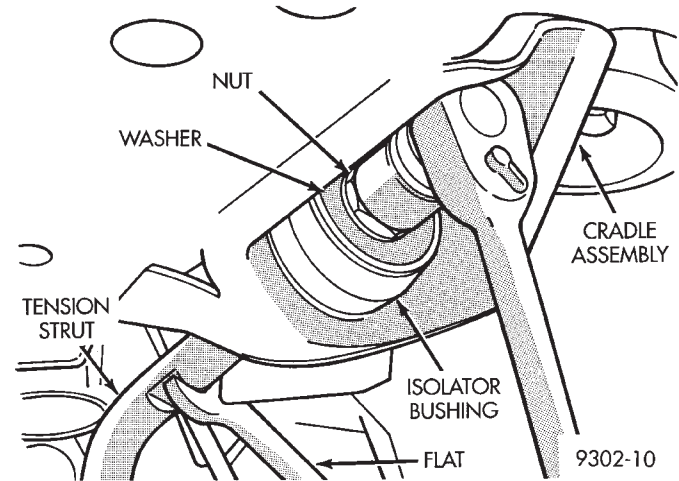


Fig. 36 Tension Strut To Cradle Mounting

(3) Install the wheel and tire assembly.

(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 129 N·m (95 ft. lbs.).

(5) Lower the vehicle to the ground so the suspension is supporting the full weight of the vehicle (control arm at design height). Tighten the lower control arm pivot bushing attaching bolt (Fig. 37) to a torque of 123 N·m (90 ft. lbs.).

STABILIZER BAR**REMOVE**

When removing the front stabilizer bar from this vehicle, it is necessary to remove the entire front cradle module as an assembly (Fig. 38) from the vehicle.

SUPPORTING 3.3 Ltr. ENGINE ASSEMBLY

To allow for removal of the cradle module assembly from the vehicle. It will be necessary to support the engine and transaxle assembly using Fixture, Engine Support, Special Tool 7137 or equivalent.

REMOVAL AND INSTALLATION (Continued)

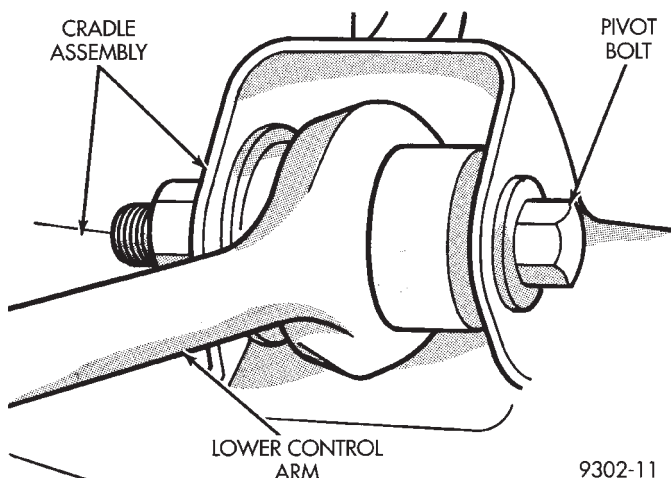


Fig. 37 Lower Control Arm Pivot Bushing Bolt

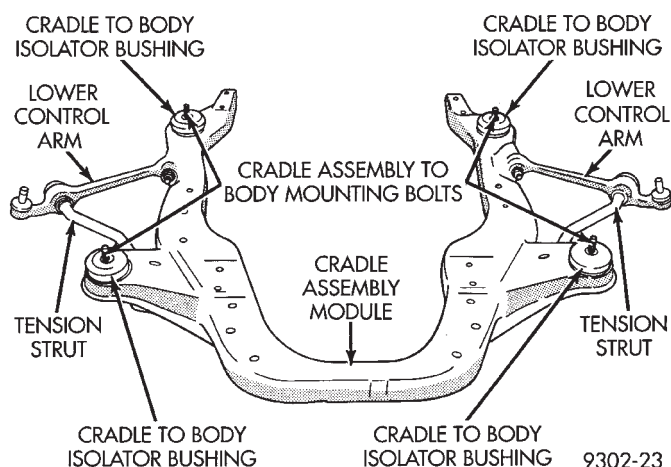


Fig. 38 Front Suspension Cradle Module

CAUTION: No attempt should be made to support or lift either engine application using the intake manifold, or any other location on engine not specified below.

(1) Mount Fixture, Engine Support Special Tool 7137 or equivalent across engine compartment (Fig. 39). Using nylon webbing material such as seat belt material or equivalent, mount it to the following locations on the engine.

(2) Remove bolt attaching A/C compressor bracket to front of engine. Install webbing material hook on A/C compressor bolt, install bolt and tighten (Fig. 40).

(3) Loosen but do not remove generator to engine mounting bolt, remove spacer between generator and engine. Install webbing material hook between generator and engine, re-install and tighten original bolt (Fig. 40).

(4) Remove electronic ignition coil, mounting bracket bolt from rear of engine. Install webbing material hook on bracket bolt and re-install and

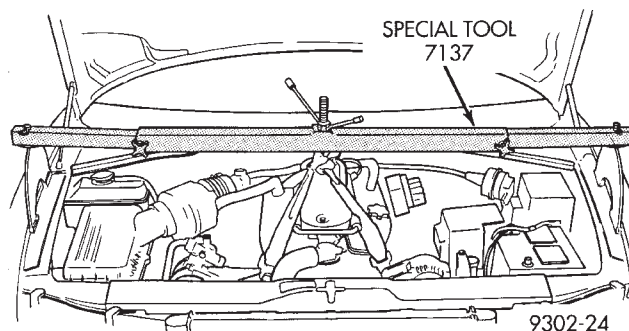


Fig. 39 Engine Supporting Fixture Installed

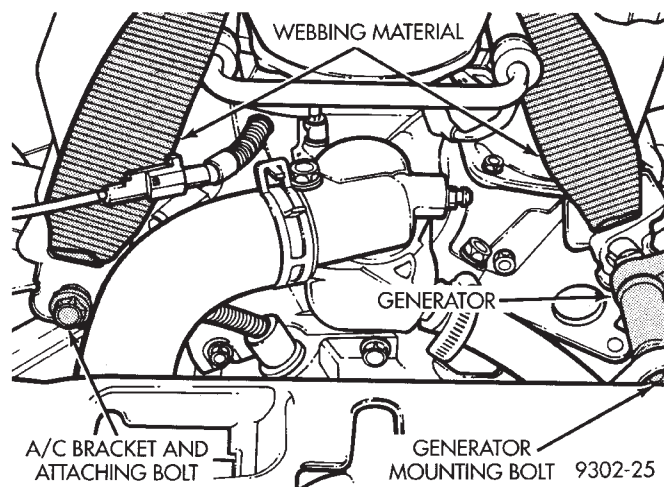


Fig. 40 Front Engine Support Attaching Locations

tighten bolt. **Note:** Route webbing material between fuel injector rail and valve cover, not between fuel injector rail and intake manifold.

(5) Mount remaining piece of webbing material to left cylinder head using threaded hole on back of cylinder head. Using a bolt of the correct thread size and length, install webbing hook on bolt. Then install bolt into threaded hole on back of cylinder head and tighten bolt.

(6) Securely attach pieces of webbing material to hook on engine holding fixture (Fig. 39). Tighten hook on engine holding fixture until all slack is removed from all 4 pieces of webbing material.

SUPPORTING 3.5 Ltr. ENGINE ASSEMBLY

To allow for removal of the cradle module assembly from the vehicle. It will be necessary to support the engine and transaxle assembly using Fixture, Engine Support, Special Tool 7137 or equivalent.

CAUTION: No attempt should be made to support or lift either engine application using the intake manifold, or any other location on engine not specified below.

REMOVAL AND INSTALLATION (Continued)

(1) Mount Fixture, Engine Support Special Tool 7137 or equivalent across engine compartment (Fig. 41). Using nylon webbing material such as seat belt material or equivalent, mount it to the following locations on the engine.

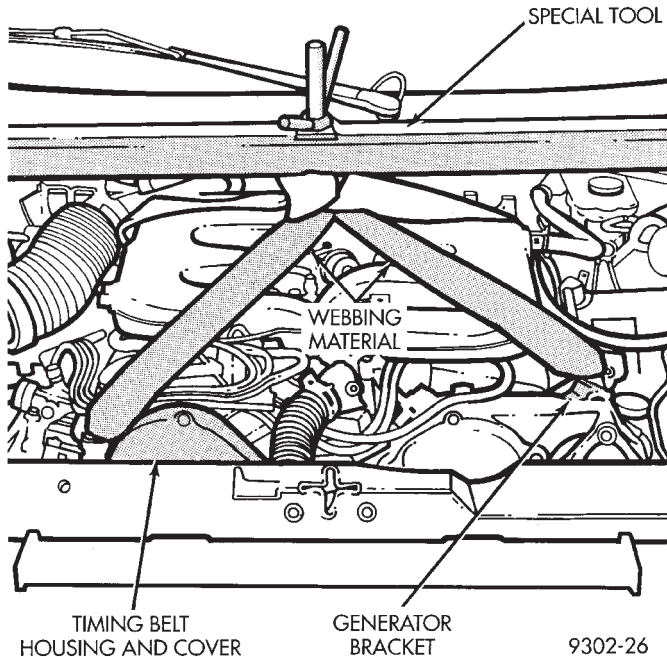


Fig. 41 Engine Supporting Fixture Installed 3.5 Ltr.

(2) Remove bolt attaching timing belt housing to front of engine assembly (Fig. 41) and (Fig. 42). Install webbing material hook on timing belt housing attaching bolt, install bolt and tighten (Fig. 42).

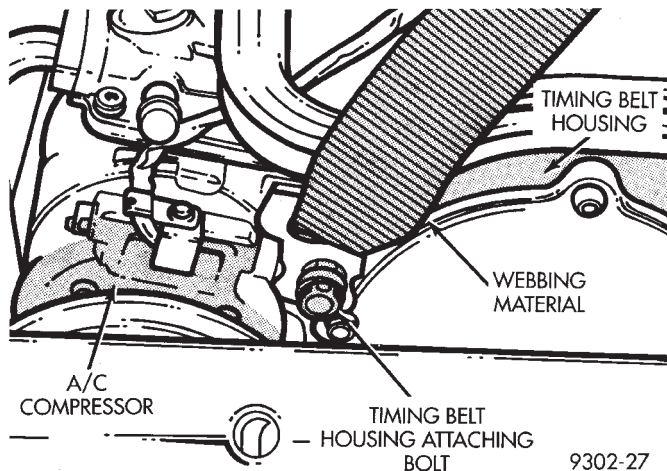


Fig. 42 Engine Support Attachment To Timing Belt Housing

(3) Remove generator to generator mounting bracket attaching nut and bolt (Fig. 43). Install webbing material hook on generator mounting bolt, re-install and tighten original nut and bolt (Fig. 43).

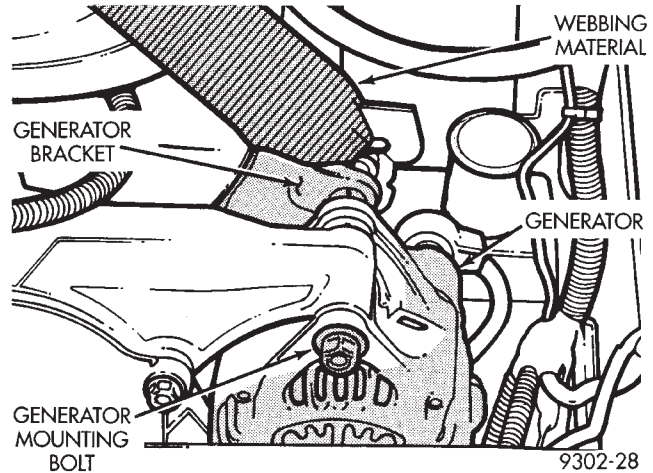


Fig. 43 Engine Support Attachment To Generator Bracket

(4) Mount remaining pieces of webbing material to back of right and left cylinder head using the threaded hole on back of cylinder heads. Using a bolt of the correct thread size and length, install webbing hook on bolt. Then install bolt into threaded hole on back of cylinder heads and tighten bolt.

(5) Securely attach pieces of webbing material to hook on engine holding fixture (Fig. 41). Tighten hook on engine holding fixture until all slack is removed from all 4 pieces of webbing material.

CRADLE ASSEMBLY REMOVAL ALL ENGINES

(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 front wheel and tire assemblies from the vehicle.

(3) Remove left and right ball joint stud to steering knuckle attaching nut and bolt (Fig. 44).

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

CAUTION: When lower control is separated from steering knuckle, do not let ball joint seal hit up against steering knuckle. If ball joint seal hits steering knuckle, seal damage may occur. If ball joint seal becomes torn, replace seal before assembling lower control arm to knuckle.

(4) Carefully insert a pry bar between lower control arm and steering knuckle (Fig. 45), to separate ball joint stud from steering knuckle. **Use caution when separating ball joint stud from steering knuckle so ball joint seal does not get cut.**

REMOVAL AND INSTALLATION (Continued)

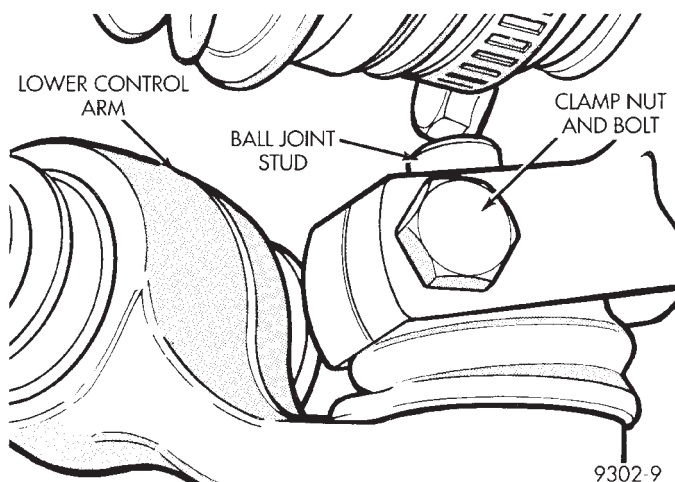


Fig. 44 Control Arm To Steering Knuckle Attachment

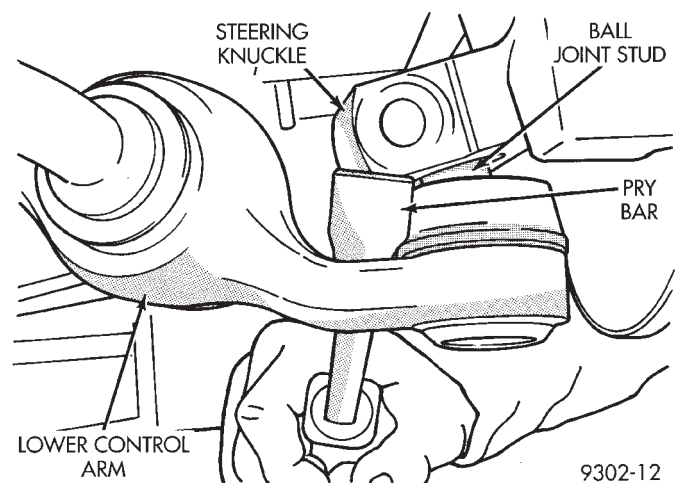


Fig. 45 Separating Ball Joint From Steering Knuckle

(5) Remove ground strap from cradle assembly. Ground strap is located on right side of cradle below driveshaft (Fig. 46).

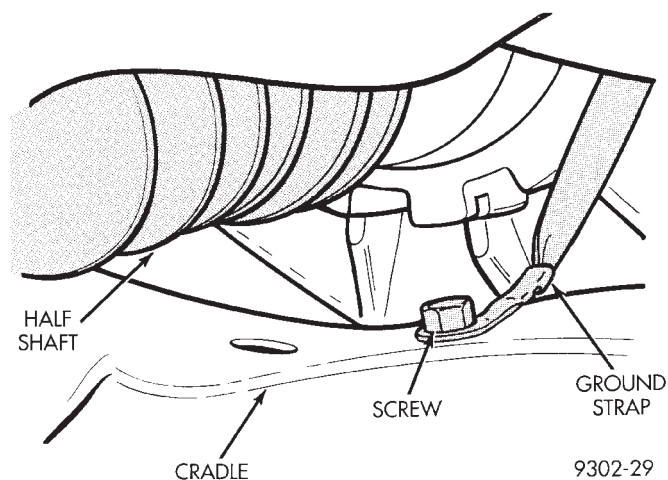


Fig. 46 Ground Strap

(6) Remove the 4 nuts attaching the motor mounts to the cradle assembly (Fig. 47).

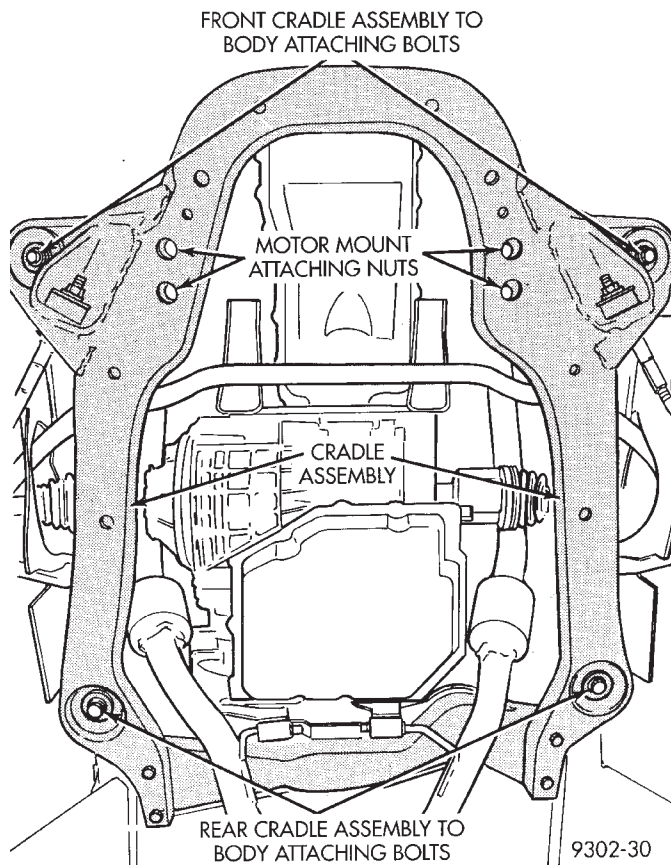


Fig. 47 Motor Mount To Cradle Assembly Attachment

(7) Remove the 4 bolts attaching the transaxle mount to the rear of the cradle assembly (Fig. 48).

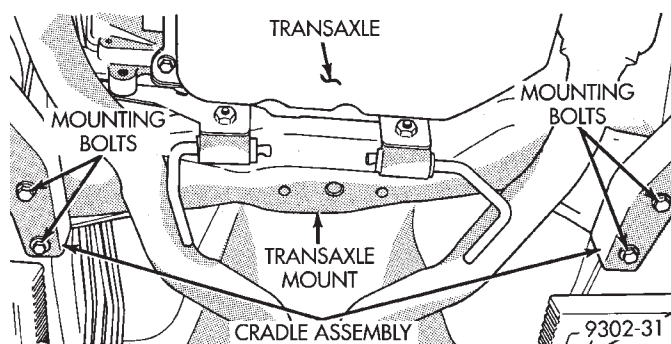


Fig. 48 Transmission Mount To Cradle Mounting Bolts

(8) Remove the 4 bolts (2 each) attaching the stabilizer bar isolator bushing retainers and bushings to the cradle assembly (Fig. 49).

REMOVAL AND INSTALLATION (Continued)

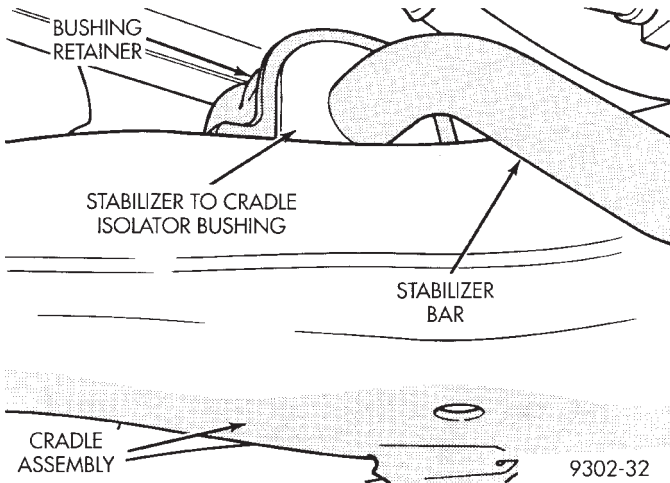


Fig. 49 Stabilizer Bar Isolator Bushing Attachment To Cradle

WARNING: JACK STANDS ARE REQUIRED TO SUPPORT THE CRADLE ASSEMBLY AND TRANSAXLE ASSEMBLY DURING CRADLE ASSEMBLY REMOVAL FROM THE VEHICLE. DO NOT ATTEMPT TO REMOVE CRADLE WITHOUT USING JACK STANDS TO SUPPORT COMPONENTS.

(9) Position a jack stand under front of cradle and at center of transaxle to cradle assembly mount (Fig. 50). Raise jack stand at transaxle mount until transaxle mount just lifts off cradle assembly.

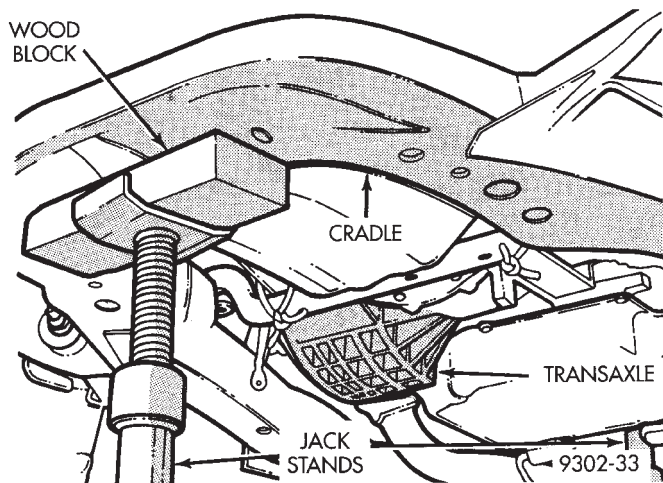


Fig. 50 Jack Stands Supporting Cradle And Transaxle

(10) Cradle assembly is now ready to be removed from vehicle using the following procedure. **A helper will be required when removing cradle assembly from vehicle .**

- Loosen but do not fully remove the 2 rear cradle assembly to body attaching bolts (Fig. 47).
- Loosen and remove the 2 front cradle assembly to body attaching bolts (Fig. 47).

- With a helper supporting rear of cradle assembly and the jack stand supporting transaxle. Remove the 2 rear cradle assembly to body attaching bolts (Fig. 47).

- Slowly lower front jack stand until weight of engine is supported by engine support fixture and motor mount bolts are clear of cradle assembly. With a helper at rear of cradle assembly, lift front of cradle assembly off jack stand and remove from vehicle.

(11) After cradle assembly is removed from vehicle. Remove the 2 stabilizer bar, to stabilizer bar link attaching nuts (Fig. 51). Remove stabilizer bar assembly from vehicle.

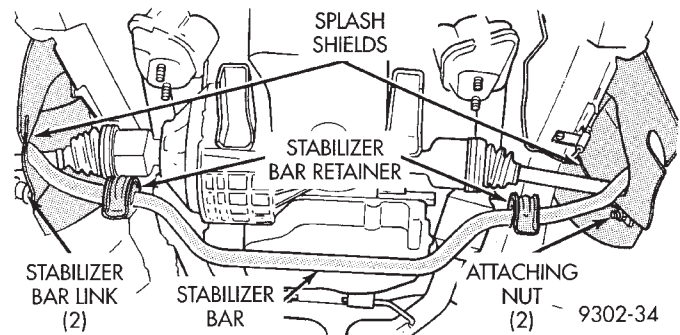


Fig. 51 Stabilizer Bar Removal And Installation

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. The stabilizer bar to cradle assembly bushings, should be positioned on stabilizer bar, so slit in bushing is positioned toward front of vehicle (Fig. 52).

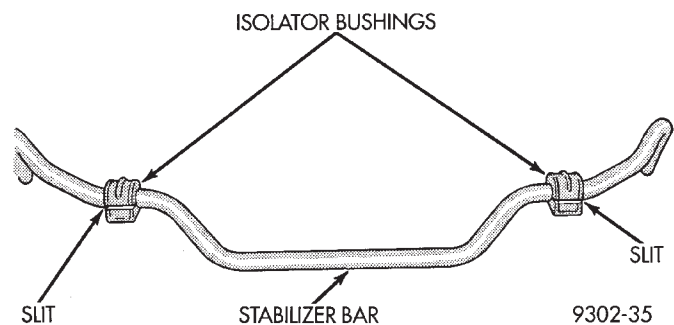


Fig. 52 Isolator Bushings Installed On Stabilizer Bar
CRADLE ASSEMBLY INSTALLATION ALL ENGINES

(1) Install stabilizer bar, isolator bushings and retainers back in vehicle as an assembly (Fig. 51). Be sure stabilizer bar is installed through openings in splash shields (Fig. 51). Install the stabilizer bar link to stabilizer bar attaching nuts. Tighten the two stabilizer bar links to stabilizer bar attaching nuts to a torque of 95 N·m (70 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

(2) Tie the stabilizer bar up against the 2 transaxle to engine block brackets (Fig. 53). This will keep stabilizer bar out of the way when installing cradle assembly.

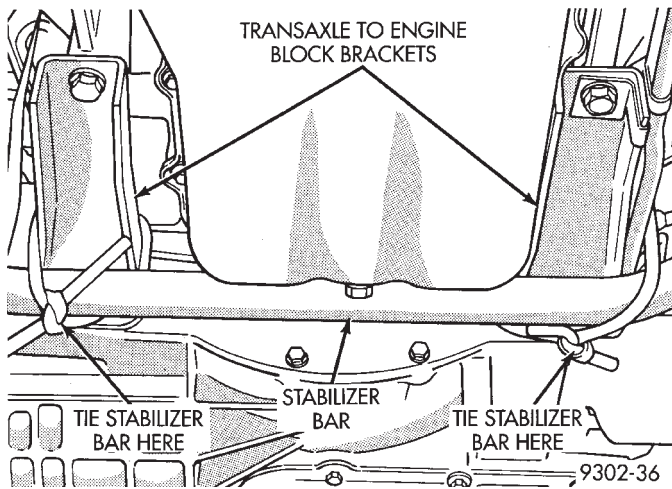


Fig. 53 Stabilizer Bar Stored For Cradle Installation

(3) With the aid of a helper raise cradle assembly back up into vehicle, resting front of cradle assembly on a jack stand. Then use following procedure to install cradle assembly back into vehicle.

- With the aid of a helper, raise rear of cradle assembly up far enough by hand to start the 2 rear cradle assembly to body attaching bolts (Fig. 47). Install bolts far enough to securely hold cradle assembly in place but **DO NOT TIGHTEN**.

- Using jack stand raise front of cradle assembly up against bottom of motor mounts. Be sure all 4 motor mount studs come through holes in cradle assembly.

- Continue to raise cradle assembly and engine using jack stand until the 2 front cradle assembly to body attaching bolts (Fig. 47) can be started.

- Lower transaxle and align transaxle mount with the 4 transaxle mount attaching holes in the cradle assembly. Install **BUT DO NOT TIGHTEN** the 4 transaxle mount to cradle assembly attaching bolts (Fig. 48). **The 2 long bolts go in the front cradle assembly to transaxle mount holes.**

CAUTION: Before tightening cradle assembly to body attaching bolts. Check that all 4 cradle assembly to body mounting bolts are installed straight into mounting plates in frame rails and mounting plates are not cocked inside the frame rails.

- Using a crisscross pattern, tighten all 4 cradle assembly to body attaching bolts (Fig. 47) until cradle is seated up against body. Then repeating the crisscross pattern, tighten all 4 cradle assembly to body mounting bolts to a torque of 155 N·m (115 ft. lbs.).

(4) Tighten the 4 transaxle mount to cradle mounting bolts (Fig. 48).

CAUTION: When stabilizer bar is installed. Position stabilizer bar, so lower part of stabilizer bar is centered in the middle of the cradle assembly. Failure to do this may cause stabilizer bar to come in contact with other suspension components.

(5) Untie the stabilizer bar from brackets and position it on cradle assembly. Align the stabilizer bar bushing retainers with the mounting holes in the cradle assembly. Install but do not tighten the 4 bushing retainer to cradle assembly mounting bolts (Fig. 49). The 4 retaining bolts will be torqued when vehicle is lowered to the ground.

(6) Install the 4 motor mount to cradle assembly attaching nuts (Fig. 47). Tighten the 4 nuts to a torque of 61 N·m (45 ft. lbs.).

(7) Install ground strap on cradle assembly (Fig. 46). Be sure ground strap to cradle screw is securely tightened.

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

CAUTION: When ball joint stud is installed into steering knuckle, do not let ball joint seal hit up against steering knuckle. If ball joint seal hits steering knuckle, seal damage may occur. If ball joint seal becomes torn, replace seal before assembling lower control arm to knuckle.

(8) Install lower ball joint studs into steering knuckles. Install steering knuckle to lower ball joint stud attaching bolts and nuts into steering knuckles (Fig. 44). Tighten attaching bolt to a torque of 55 N·m (40 ft. lbs.).

(9) Install the wheel and tire assembly.

(10) 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.).

(11) Lower vehicle to the ground.

(12) With the full weight of the vehicle supported by the suspension. Use a long extension, and tighten the 4 stabilizer bar bushing retainer attaching bolts to a torque of 55 N·m (40 ft. lbs.).

(13) Remove the webbing material from the engine. Remove the engine support fixture from the vehicle.

(14) Position the vehicle on an alignment rack and check that the vehicle's Toe is within specifications. Adjust the vehicle Toe setting if not within specifications.

REMOVAL AND INSTALLATION (Continued)

HUB AND BEARING

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 front wheel and tire assembly from the vehicle.

(3) Remove the 2 guide pin bolts mounting the caliper assembly to the steering knuckle (Fig. 54). Remove the caliper from the front steering knuckle. Refer to Disc Brake Caliper in the Removal And Installation Section in the Brake Group of this service manual for the caliper removal procedure.

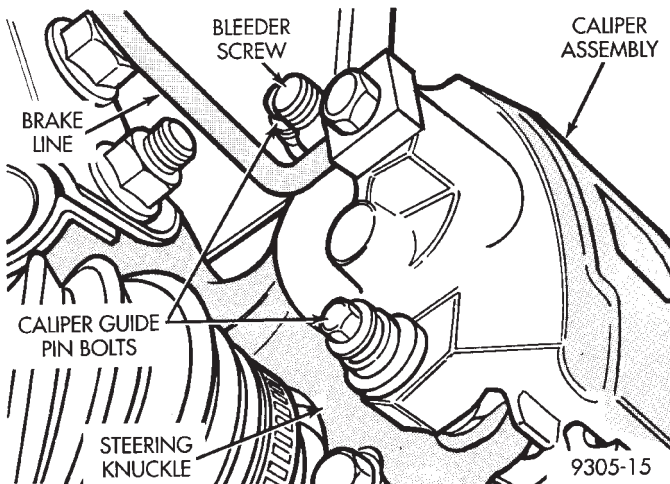


Fig. 54 Disc Brake Caliper Mounting

(4) Remove rotor from hub by pulling it straight off wheel mounting studs (Fig. 55).

(5) Remove the hub and bearing retaining nut (Fig. 56).

(6) Remove the 3 hub and bearing assembly to steering knuckle attaching bolts (Fig. 57).

CAUTION: When removing hub and bearing assembly from steering knuckle, be careful not to damage the flinger disc (Fig. 60) on hub and bearing assembly. If flinger disc becomes damaged, hub and bearing assembly **MUST** not be used and **MUST** be replaced with a new hub and bearing assembly.

(7) Remove hub and bearing assembly from steering knuckle, by sliding it straight out of steering knuckle and off end of stub axle (Fig. 58). If hub and bearing assembly will not slide out of knuckle. Insert a pry bar between hub and bearing assembly and steering knuckle (Fig. 59) and gently pry hub and bearing from knuckle. If stub shaft is frozen to hub and bearing assembly tap end of stub shaft with soft face hammer to free it from hub and bearing spline.

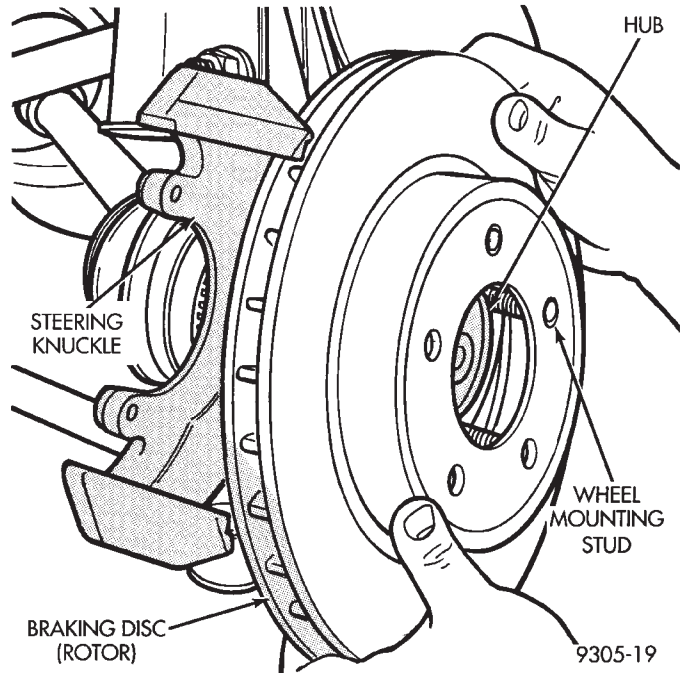


Fig. 55 Removing Rotor

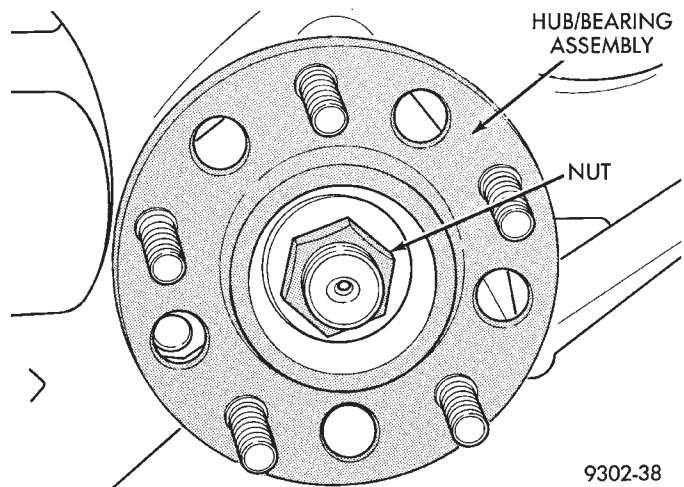


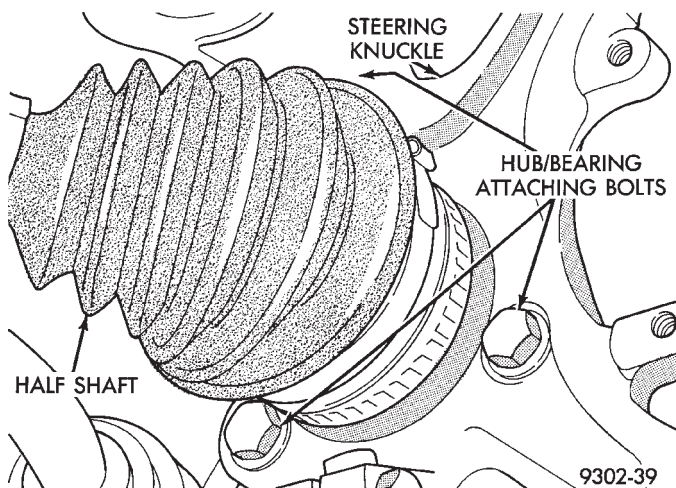
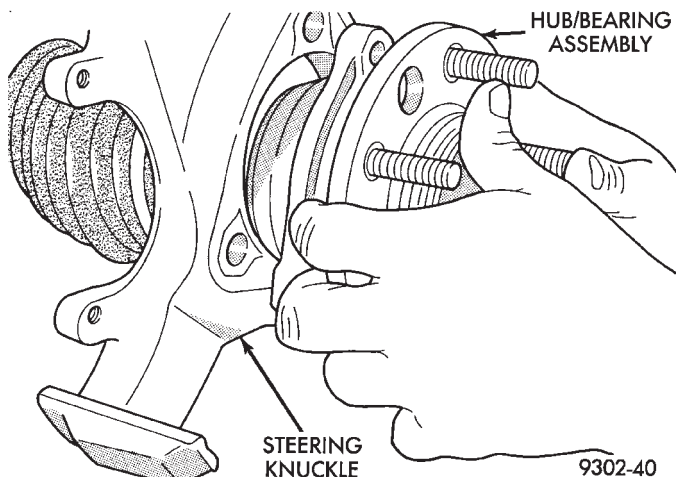
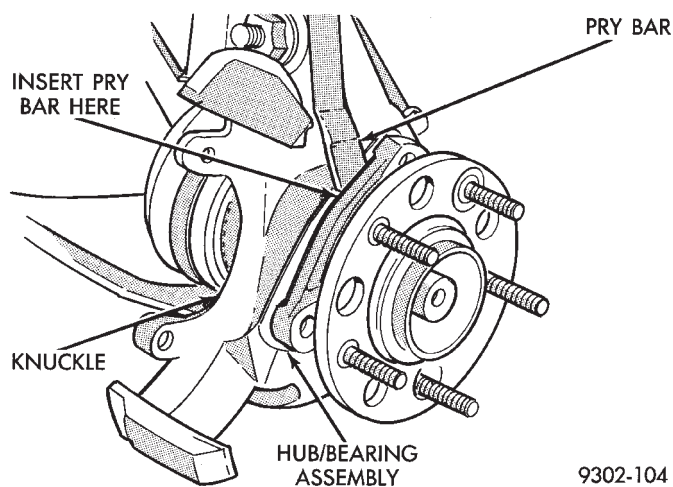
Fig. 56 Hub And Bearing Retaining Nut

CAUTION: If metal seal (Fig. 60) on hub and bearing assembly is seized to steering knuckle and becomes dislodged on hub and bearing assembly during bearing removal. The hub and bearing assembly **MUST** not be reused and **MUST** be replaced with a new hub and bearing assembly.

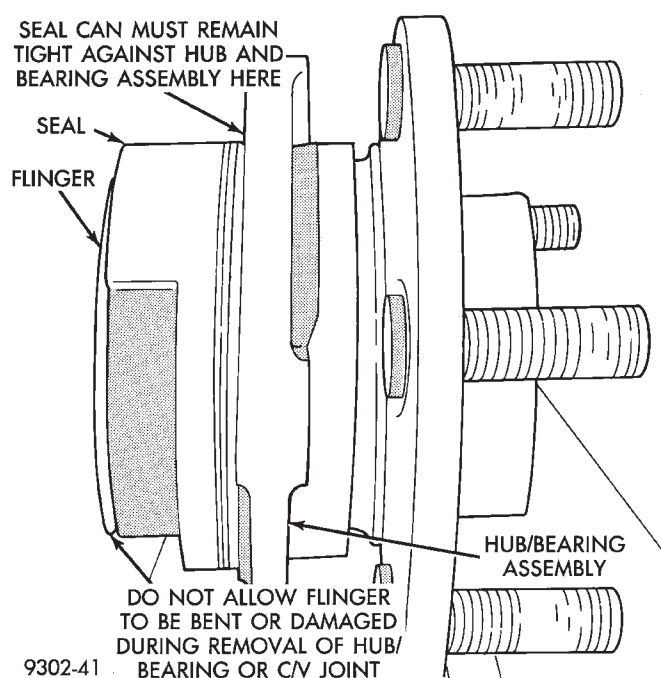
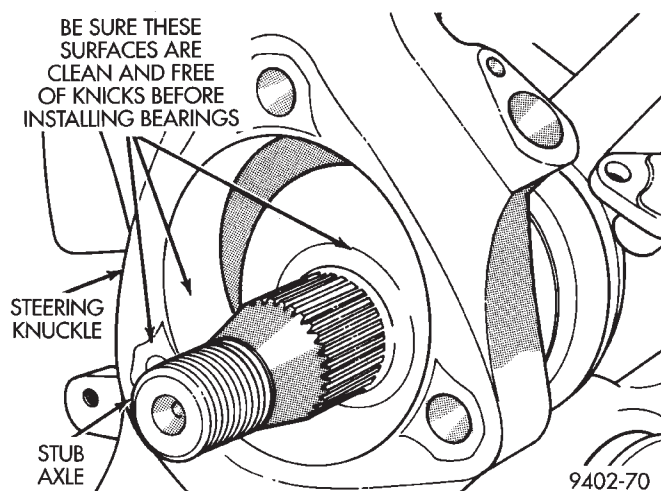
INSTALL

CAUTION: Hub and bearing assembly mounting surfaces on steering knuckle and driveshaft (Fig. 61) must be smooth and completely free of foreign material or nicks.

REMOVAL AND INSTALLATION (Continued)

**Fig. 57 Hub And Bearing Assembly Retaining Bolts****Fig. 58 Hub And Bearing Removal And Installation****Fig. 59 Prying Hub And Bearing Assembly From Steering Knuckle**

CAUTION: When installing hub and bearing assembly into steering knuckle, be careful not to damage the flinger disc (Fig. 60) on hub and bear-

**Fig. 60 Hub And Bearing Assembly Seal****Fig. 61 Hub And Bearing Mounting Surfaces**

ing assembly. If flinger disc becomes damaged, hub and bearing assembly **MUST** not be used and **MUST** be replaced with a new hub and bearing assembly.

(1) Install hub and bearing assembly onto stub shaft and into steering knuckle until squarely seated on face of steering knuckle

(2) Install the 3 hub and bearing assembly to steering knuckle attaching bolts (Fig. 57). Equally tighten all 3 mounting bolts until hub and bearing assembly is squarely seated against front of steering knuckle. Then tighten the 3 hub and bearing assembly mounting bolts to a torque of 110 N·m (80 ft. lbs.)

REMOVAL AND INSTALLATION (Continued)

CAUTION: The hub and bearing assembly to stub shaft retaining nut (Fig. 56) is a prevailing torque nut and can not be re-used. A **NEW** retaining nut **MUST** be used when assembled.

(3) Install a **NEW** hub and bearing assembly to stub shaft retaining nut (Fig. 56). **Tighten, but do not torque the hub nut at this time.**

(4) Install the rotor on the hub and bearing assembly (Fig. 55).

(5) Install front brake caliper back over braking disc and align with caliper mounting holes on steering knuckle. Refer to Disc Brake Caliper in the Removal And Installation Section in the Brake Group of this service manual for the caliper installation procedure. Install the caliper to steering knuckle guide pin bolts (Fig. 54) and tighten to a torque of 19 N·m (168 in. lbs.).

(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 the tightening sequence to the full specified torque of 129 N·m (95 ft. lbs.).

(7) Lower the vehicle to the ground.

CAUTION: When torquing hub and bearing assembly to stub shaft retaining nut, do not exceed the maximum torque of 163 N·m $\pm$ 14 N·m (120 ft. lbs. $\pm$ 10 ft. lbs.). If the maximum torque is exceeded this may result in a failure of the drive shaft.

(8) With vehicle brakes applied to keep vehicle from moving, tighten the **NEW** stub shaft to hub and bearing assembly retaining nut to 163 N·m $\pm$ 14 N·m (120 ft. lbs. $\pm$ 10 ft. lbs.) (Fig. 62).

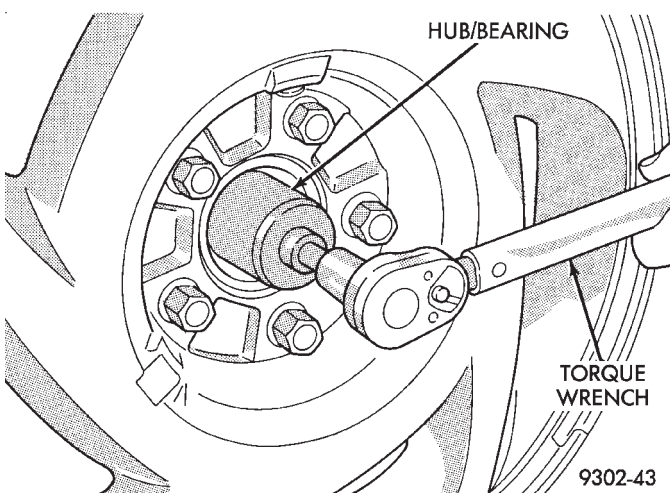


Fig. 62 Torquing Hub And Bearing Retaining Nut

(9) Check the Toe setting on the vehicle and reset if not within specifications.

WHEEL MOUNTING STUDS

CAUTION: If a wheel attaching stud needs 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.

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

NOTE: 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.

(2) Remove the 2 guide pin bolts mounting the caliper assembly to the steering knuckle (Fig. 63). Remove the caliper from the front steering knuckle. Refer to Disc Brake Caliper in the Removal And Installation Section in the Brake Group of this service manual for the caliper removal procedure.

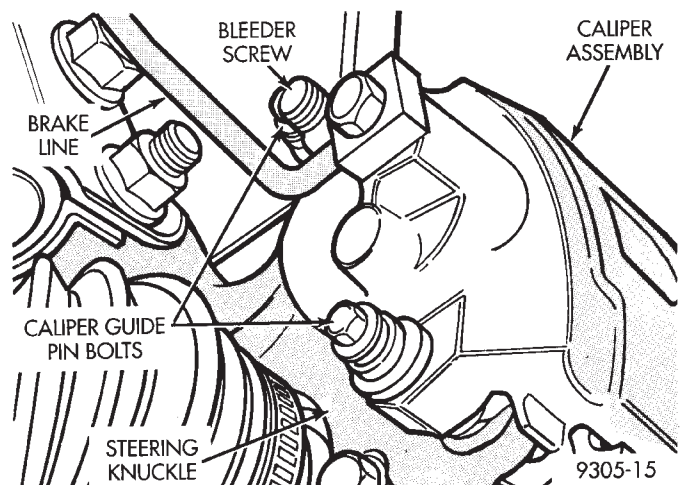
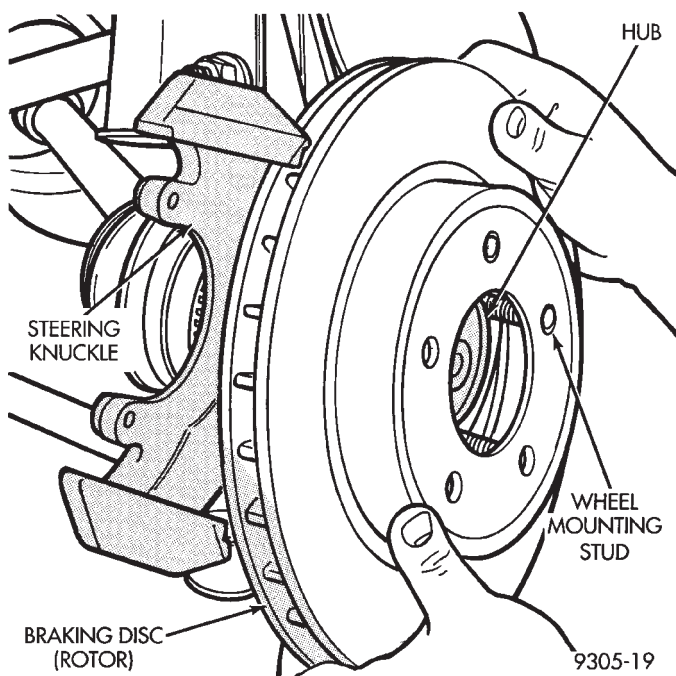
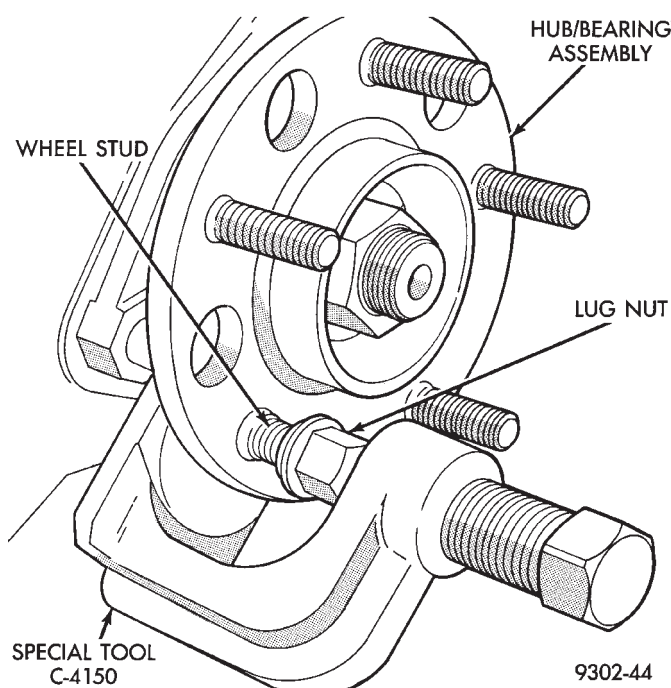


Fig. 63 Caliper Mounting

(3) Remove rotor from hub by pulling it straight off wheel mounting studs (Fig. 64).

(4) Install a lug nut on the wheel stud to be removed from the hub and bearing assembly (Fig. 65) so the threads on stud are even with end of lug nut. Install Remover, Special Tool C-4150 on hub and bearing assembly flange and wheel stud (Fig. 65).

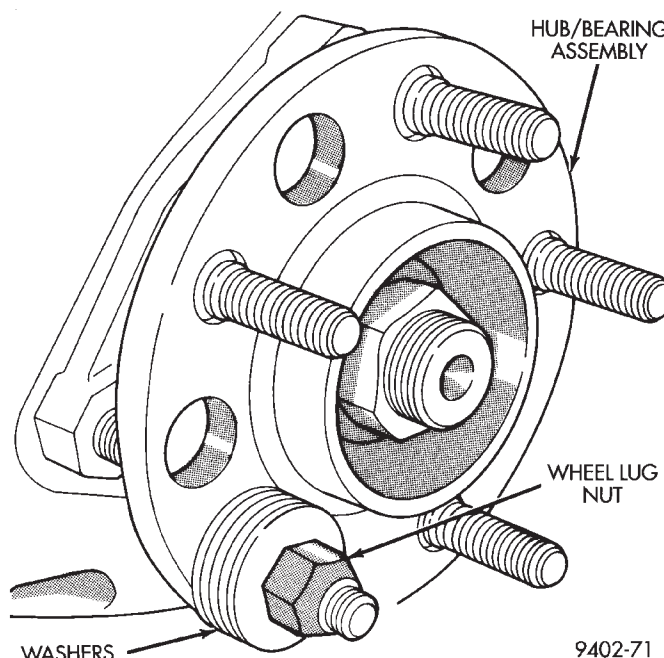
REMOVAL AND INSTALLATION (Continued)

**Fig. 64 Removing Rotor****Fig. 65 Removing Wheel Stud From Hub And Bearing**

(5) Tighten down on special tool, to push wheel stud out of the hub and bearing assembly. When shoulder of wheel stud is past flange remove special tool from hub and bearing assembly. Remove lug nut from stud and remove wheel stud from flange.

INSTALL

(1) Install wheel stud into of hub and bearing assembly. Install washers on wheel stud, then install a wheel lug nut on stud with flat side of lug nut against washers (Fig. 66).

**Fig. 66 Installing Wheel Stud Into Hub And Bearing**

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

(3) Install the rotor on the hub and bearing assembly (Fig. 64).

(4) Install front brake caliper back over braking disc and align with caliper mounting holes on steering knuckle. Refer to Disc Brake Caliper in the Removal And Installation Section in the Brake Group of this service manual for the caliper installation procedure. Install the caliper to steering knuckle guide pin bolts (Fig. 63) and tighten to a torque of 19 N·m (168 in. lbs.).

(5) 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.).

(6) Lower the vehicle to the ground.

DISASSEMBLY AND ASSEMBLY

McPHERSON STRUT

The front strut 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 and high rate be sure spring is replaced with a spring of the correct rate.)
- Dust shield
- Mount assembly
- Seat And Bearing
- Jounce Bumper
- Lower Spring Isolator
- Shaft Nut

DISASSEMBLY

(1) Remove strut assembly requiring service from the vehicle. Refer to McPherson Strut in the Removal And Installation Section in this group of the service manual for the required procedure.

(2) Position the strut assembly in a vise, by clamping the strut by the steering arm. Using paint or equivalent, mark the strut unit, lower spring isolator, spring and upper strut mount for indexing of the parts at assembly (Fig. 67).

CAUTION: When installing spring compressors (Fig. 67) on coil spring, do not position the spring compressors on the sleeves of the coil spring. Positioning the spring compressors on the sleeves could cause the sleeve to dislodge from the coil spring when it is compressed. This would result in the required replacement of the coil spring.

WARNING: Do not install the spring compressor on the coil spring in an area of the spring covered by a sleeve. If the sleeve moves when compressing the spring, the spring could come out of compressor resulting in personal injury.

(3) Position Spring Compressors, Special Tool C-4838 on the strut assembly spring (Fig. 67). Compress coil spring until all load is removed from upper strut mount assembly.

(4) Install Strut Rod Socket, Special Tool, L-4558 or L-4558A on strut shaft nut (Fig. 68). Using a 10 mm socket on end of strut shaft to keep strut shaft from turning, (Fig. 68) remove strut shaft nut.

(5) Remove the upper strut mount assembly from the strut (Fig. 69).

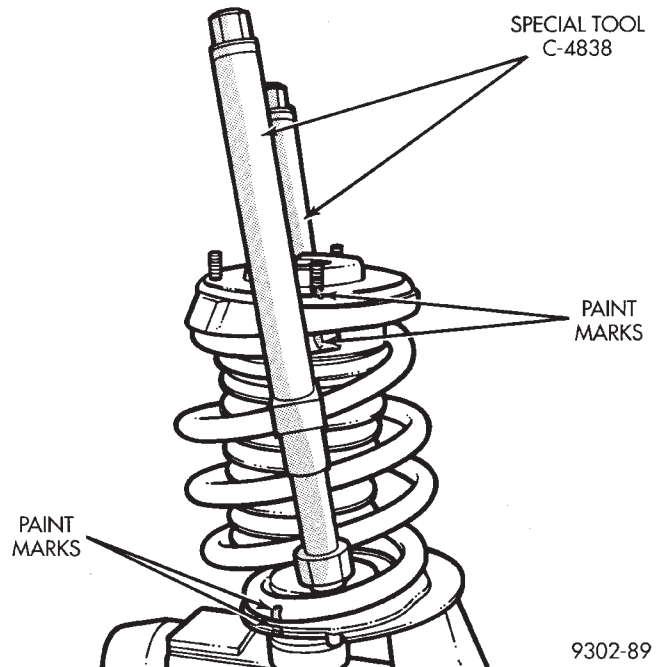


Fig. 67 Compressing Strut Assembly Coil Spring

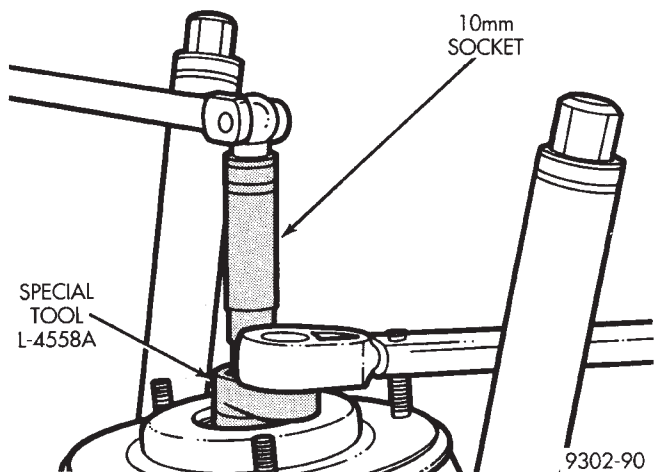


Fig. 68 Remove/Install Strut Shaft Nut

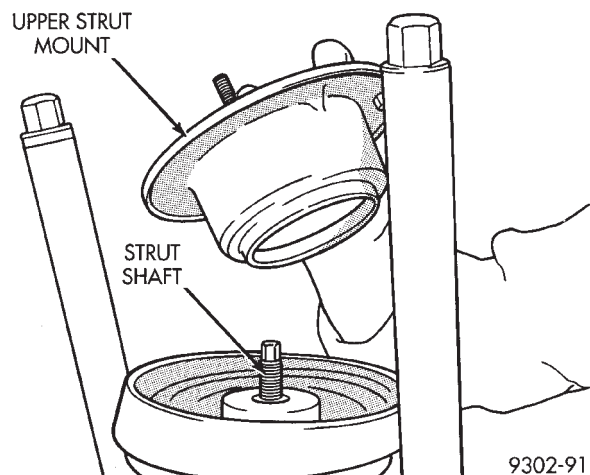
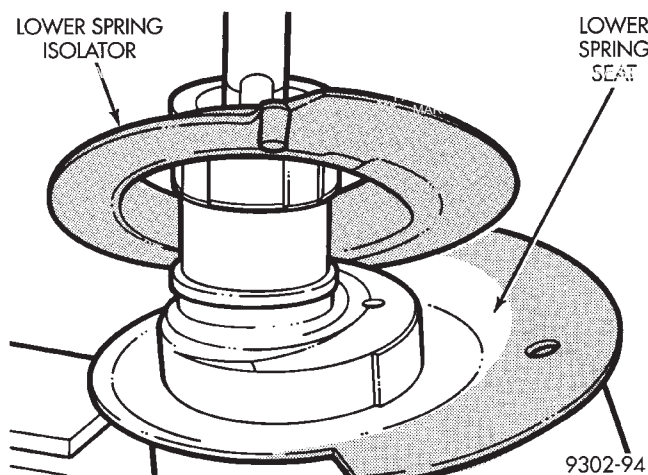
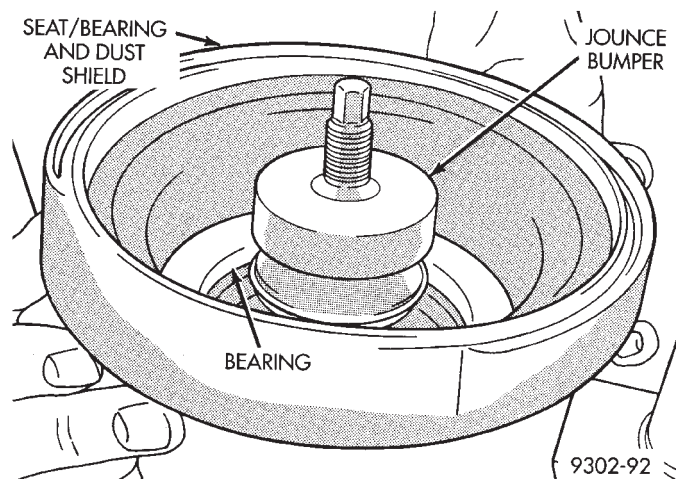
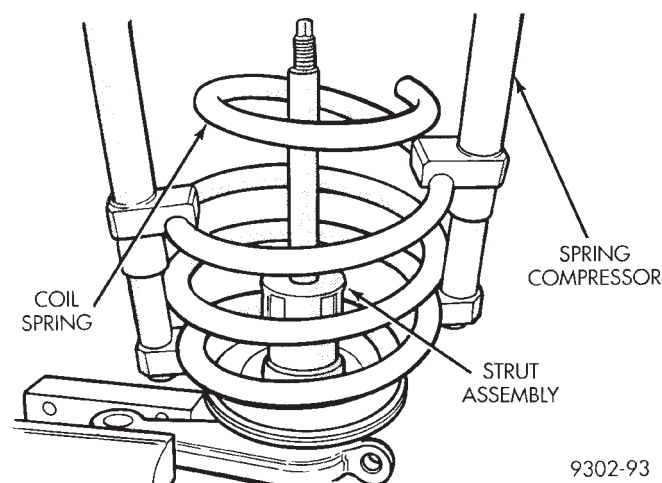
(6) Remove the jounce bumper, spring seat/pivot bearing and dust shield as an assembly, from the strut (Fig. 70).

(7) Remove the coil spring and the spring compressor as an assembly from the strut (Fig. 71).

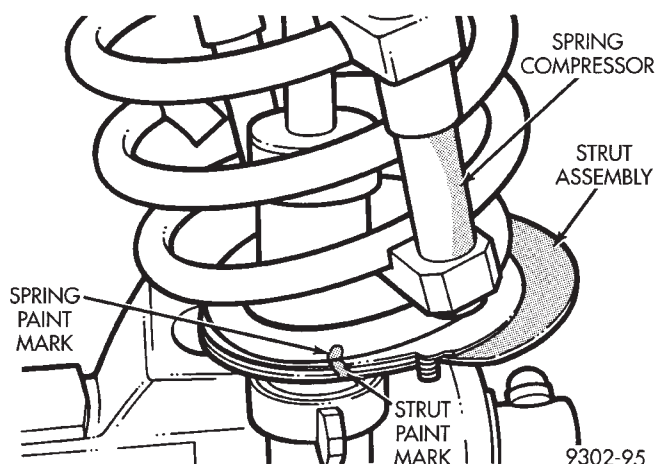
(8) Remove the coil spring isolator from the lower spring seat on the strut (Fig. 72).

(9) 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 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.

DISASSEMBLY AND ASSEMBLY (Continued)

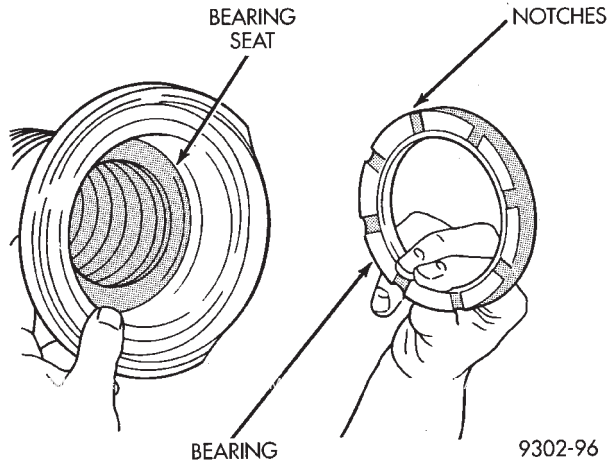
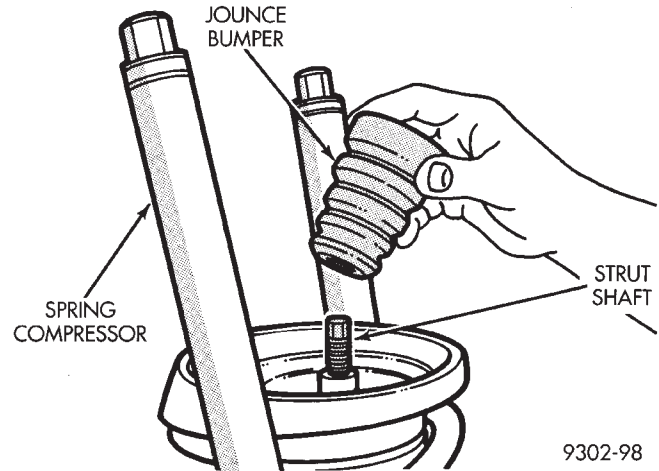
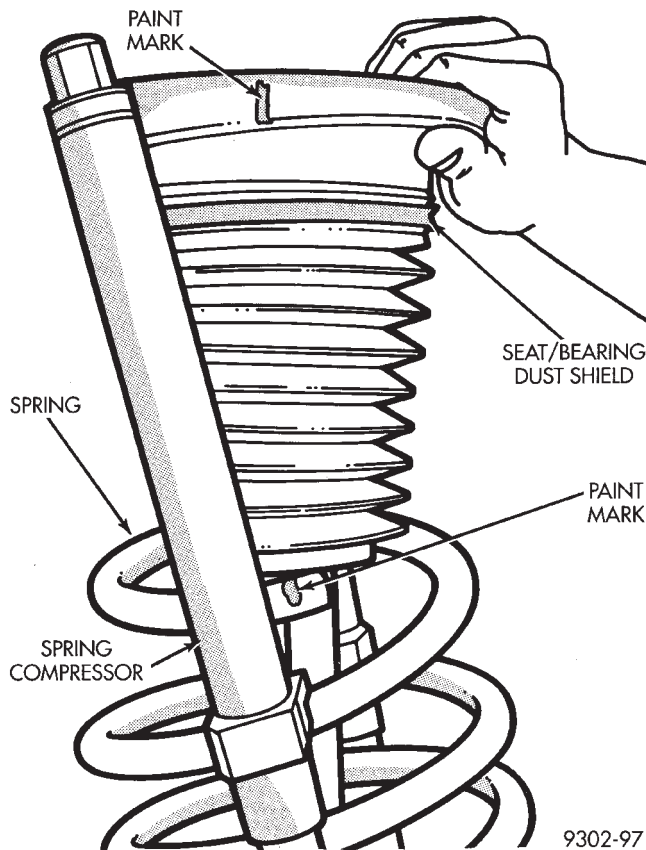
**Fig. 69 Upper Strut Mount****Fig. 72 Spring Isolator****Fig. 70 Jounce Bumper Spring Seat/Pivot Bearing And Dust Shield****Fig. 71 Coil Spring And Compressor****ASSEMBLY**

- (1) Install the original, or a new if required, lower spring isolator on the lower spring seat of the strut (Fig. 72).
- (2) Install compressed coil spring onto strut assembly aligning paint mark on spring with paint mark on strut assembly (Fig. 73).

**Fig. 73 Spring Installation On Strut**

- (3) Install the strut bearing into the bearing seat (Fig. 74). Bearing must be installed into seat with notches on bearing facing down (Fig. 74).
- (4) Lower spring seat/pivot bearing and dust shield onto the strut and coil spring. Align paint mark on seat/bearing and dust shield, with paint mark on the spring (Fig. 75).
- (5) Install jounce bumper onto shaft of strut assembly (Fig. 76).
- (6) Install the strut upper mount onto the strut shaft, aligning paint marks (Fig. 69). Install the upper strut mount to strut shaft retaining nut on strut shaft.

DISASSEMBLY AND ASSEMBLY (Continued)

**Fig. 74 Bearing Installation****Fig. 76 Jounce Bumper****Fig. 75 Seat/Bearing And Dust Shield Installation**

(7) Install Strut Rod Socket, Special Tool, L-4558 or L-4558A on strut shaft nut (Fig. 68). Using a 10 mm socket on end of strut shaft to keep strut shaft from turning, (Fig. 68) tighten strut shaft nut to a torque of 94 N·m (70 ft. lbs.).

(8) 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.

(9) Install the strut assembly on the vehicle. Refer to McPherson Strut in the Removal And Installation Section in this group of the service manual for the required procedure.

TENSION STRUT

To replace the tension strut, the tension strut and lower control arm first **MUST** be removed as an assembly from the vehicle.

DISASSEMBLY

(1) Raise vehicle using a frame contact type hoist or supported as required using jack stands. See Hoisting in the Lubrication and Maintenance group of this service manual for the required hoisting or jacking procedure to be used for this vehicle.

(2) Remove the wheel and tire from the car.

(3) Remove lower control arm and tension strut as an assembly from the vehicle. See Lower Control Arm Removal in this section of the service manual for the required removal procedure.

(4) Separate the tension strut from the lower control arm assembly.

(5) Inspect tension strut bushing in lower control arm for excessive wear or deterioration. If tension strut bushing is found to be defective replace lower control tension strut bushing at this time. Refer to Lower Control Arm Bushing Service in this section of the service for tension strut removal and installation procedure.

ASSEMBLY

(1) Position tension strut in lower control as shown in (Fig. 77), with word FRONT stamped in tension strut positioned away from control arm (Fig. 77). With an open end wrench on flat of tension strut to keep tension strut from turning. Tighten **NEW** tension strut to lower control retaining nut to a torque of 150 N·m (110 ft. lbs.).

DISASSEMBLY AND ASSEMBLY (Continued)

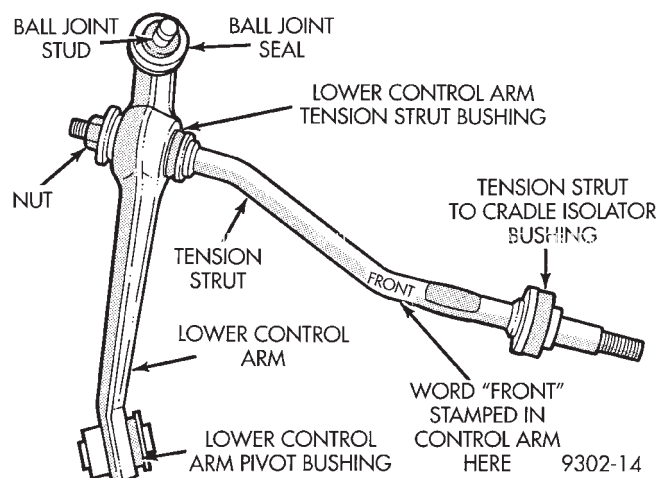


Fig. 77 Tension Strut Installed In Lower Control Arm.

(2) Install lower control arm and tension strut as an assembly back on the vehicle. See Lower Control Arm Installation in this section of the service manual for the required installation procedure.

(3) Install washer on end of tension strut (Fig. 78). Install a **NEW** tension strut to cradle bracket nut, on tension strut (Fig. 78). Tighten the tension strut to cradle bracket retaining nut to a torque of 150 N·m (110 ft. lbs.). When torquing tension strut nut, keep tension strut from turning by holding tension strut at flat using a large open end wrench (Fig. 78).

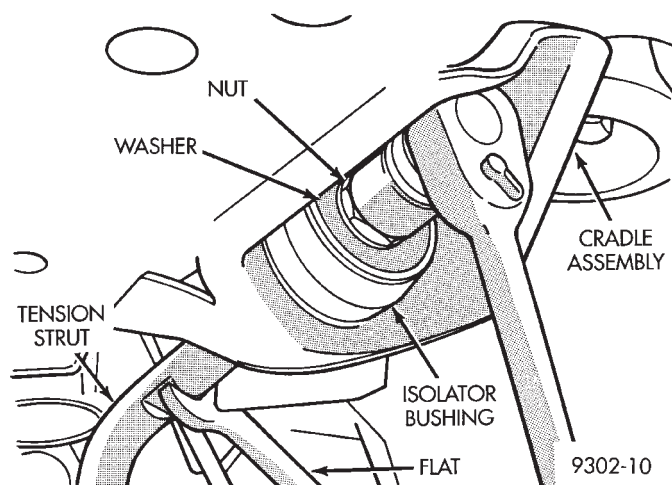


Fig. 78 Tension Strut To Cradle Mounting

(4) Install the wheel and tire assembly.
 (5) 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.).

(6) Lower the vehicle to the ground so the suspension is supporting the vehicles full weight (control arm at design height). Tighten the lower control arm

pivot bushing to cradle bracket attaching bolt (Fig. 79) to a torque of 123 N·m (90 ft. lbs.).

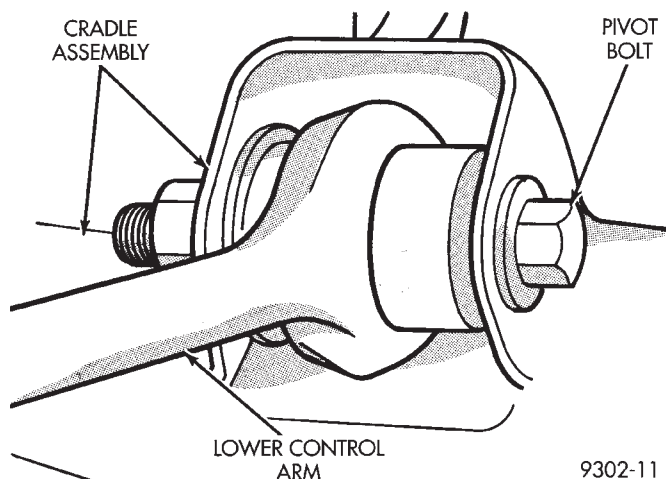


Fig. 79 Lower Control Arm Pivot Bolt

LOWER CONTROL ARM PIVOT BUSHING

To replacement the lower control arm pivot bushing, the control arm and tension strut assembly must be removed from the vehicle. The removal and replacement of the lower control arm pivot bushing must be performed using an arbor press.

DISASSEMBLY

(1) Raise vehicle using a frame contact type hoist or supported as required using jackstands. See Hoisting in the Lubrication and Maintenance group of this service manual for the required hoisting procedure to be used for this vehicle.

(2) Remove lower control arm and tension strut as an assembly from the vehicle. See Lower Control Arm Removal in this section of the service manual for the required removal procedure.

(3) Separate the tension strut from the lower control arm assembly.

(4) Position lower control arm in arbor press with large end of pivot bushing inside Receiver, Special Tool MB-990799, and special tool supporting lower control arm (Fig. 80). Position Remover, Special Tool, 6642-2 on top of pivot bushing (Fig. 80). Using the arbor press, press the lower control arm pivot bushing out of lower control arm.

(5) Remove the pressed out lower control arm pivot bushing from the Receiver, Special Tool MB-990799 and discard.

ASSEMBLY

(1) Turn the lower control arm over in the arbor press. Position the lower control arm so it is supported by Receiver, Special Tool, MB-990799 as shown in (Fig. 81).

(2) Position new pivot bushing in lower control arm so it is square with the bushing hole. Position

DISASSEMBLY AND ASSEMBLY (Continued)

(4) Separate the tension strut from the lower control arm assembly.

(5) Position lower control arm in arbor press with tension strut bushing inside Receiver, Special Tool MB-990799 and special tool supporting lower control arm (Fig. 84). Position Remover, Special Tool, 6644-4 on top of tension strut bushing (Fig. 84). Press Remover, Special Tool, 6644-4 down through the tension strut bushing until the arbor press can push it no farther. As Remover, Special Tool, 6644-4 is pressed down through tension strut bushing it will cut the bushing into two pieces.

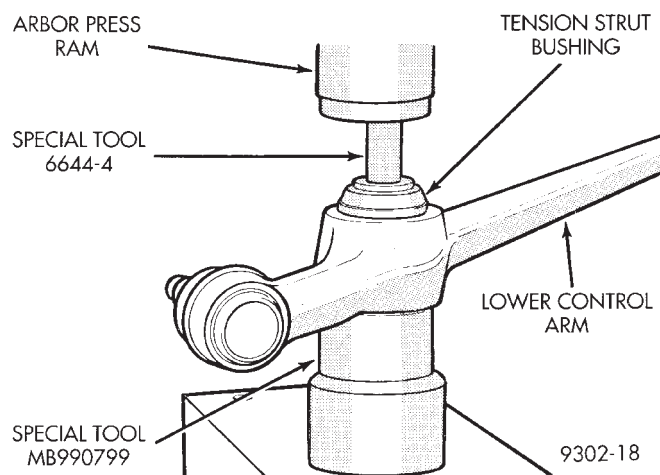


Fig. 84 Removing Lower Control Arm Tension Strut Bushing

(6) Remove lower control arm assembly from arbor press. Remove pieces of tension strut and Remover, Special Tool 6644-4, from lower control arm.

ASSEMBLY

(1) Thoroughly lubricate the replacement tension strut bushing, lower control arm and Installer, Special Tool 6644-3 using Mopar® Silicone Spray Lube or an equivalent.

(2) By hand, install tension strut bushing into large end of Installer, Special Tool 6644-3. Press bushing into installer as far as it will go by hand.

(3) Position lower control arm in arbor press, so tension strut hole in lower control arm is centered on Receiver, Special Tool MB-990799 (Fig. 85). Position Installer, Special Tool 6644-3 with previously installed bushing, inside of tension strut bushing hole in lower control arm (Fig. 85). Position Installer, Special Tool 6644-2 on top of tension strut bushing (Fig. 85). Using the arbor press, press the tension strut bushing into the lower control arm. As the bushing is being pressed into the control arm a pop will be heard. When the pop is heard Installer, Special Tool 6644-3 will slightly move up off the control arm. At this time remove the control arm assembly

from the arbor press and pull Special Tool 6644-3 off the tension strut bushing in the control arm. Tension strut bushing is now installed.

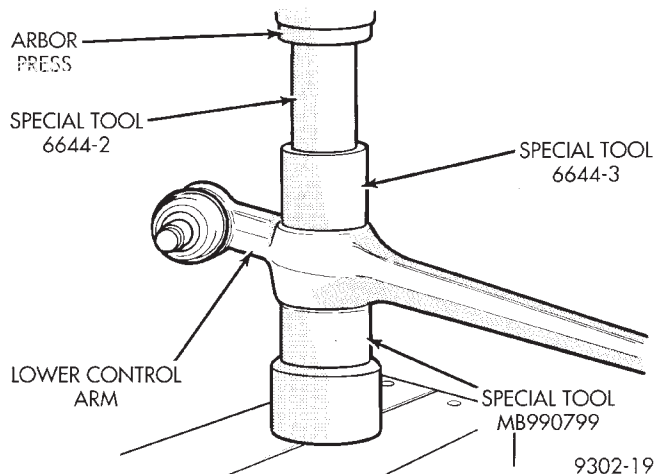


Fig. 85 Installing Tension Strut Bushing Into Lower Control Arm

BALL JOINT SEAL

(1) Remove the ball joint seal requiring replacement from the lower control arm. Ball joint seal is removed by prying it off lower control arm with a screwdriver.

(2) By hand, initially install the replacement ball joint seal on the lower control arm.

(3) Support the lower control arm for installation of the ball joint seal using a 1 1/4 inch socket (Fig. 86). Position the 1 1/4 inch socket, lower control arm and Seal Installer, Special Tool MB-990800 in an arbor press (Fig. 86).

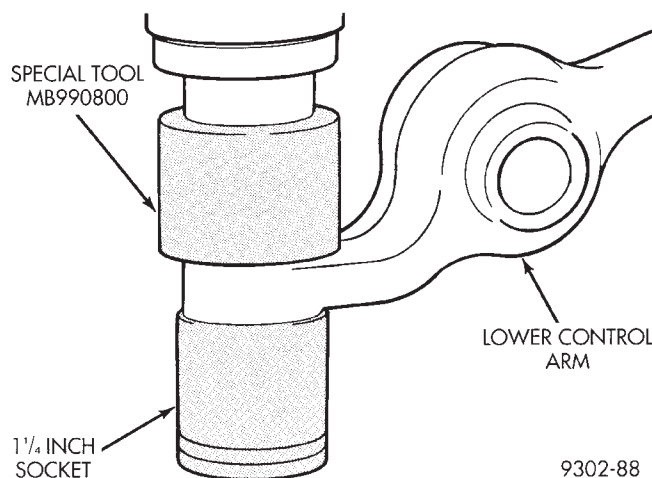


Fig. 86 Installing Ball Joint Seal

(4) Using Installer, Special Tool MB-990800, press seal onto ball joint housing until it is squarely seated against top surface of control arm (Fig. 86).

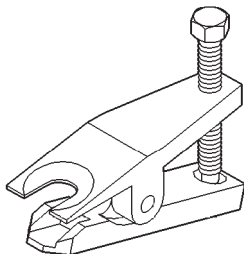
SPECIFICATIONS

FRONT SUSPENSION FASTENER TORQUES

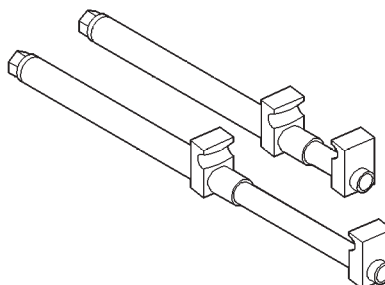
DESCRIPTION	TORQUE
McPHERSON STRUT:	
To Strut Tower Attaching Nuts . .	37 N·m (28 ft. lbs.)
Clevis Bracket To Steering	
Knuckle	170 N·m (125 ft. lbs.)
Strut Shaft Nut	95 N·m (70 ft. lbs.)
To Stabilizer Bar Attaching	
Link Nut	23 N·m (17 ft. lbs.)
STEERING KNUCKLE:	
Ball Joint Stud To Steering	
Knuckle Nut/Bolt	55 N·m (40 ft. lbs.)
Disc Brake Caliper Bolts	22 N·m (16 ft. lbs.)
STEERING GEAR:	
To Body Attaching Bolts	61 N·m (45 ft. lbs.)
Tie Rod End Adjusting	
Sleeve Nut	75 N·m (55 ft. lbs.)
Tie Rod End To Strut	
Steering Arm Nut	37 N·m (27 ft. lbs.)
FRONT SUSPENSION CRADLE:	
To Body Attaching Bolts	155 N·m (115 ft. lbs.)
Lower Control Arm Pivot Bolt .	123 N·m (90 ft. lbs.)
Tension Strut Mounting Nut . .	150 N·m (110 ft. lbs.)
STABILIZER BAR:	
Bushing Retainer To	
Suspension Cradle Bolts	55 N·m (40 ft. lbs.)
To Strut Attaching Link Nut . . .	95 N·m (70 ft. lbs.)
HUB AND BEARING:	
To Steering Knuckle Bolts	110 N·m (80 ft. lbs.)
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

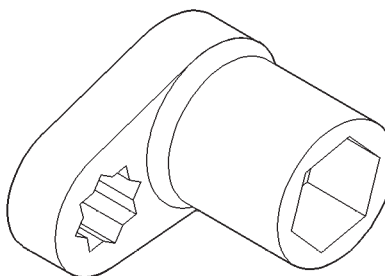
FRONT SUSPENSION



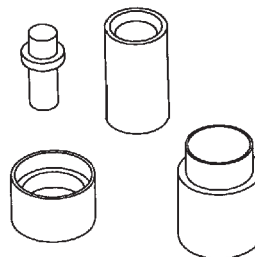
8011d9e6
Remover Tie Rod End MB-990635



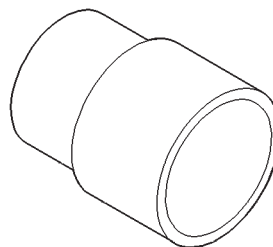
Compressor Strut Coil Spring C-4838



Socket/Holder Front Strut Nut L-4558A

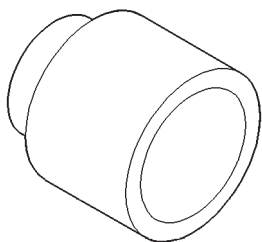


Remover/Installer Lower Control Arm Bushings 6644

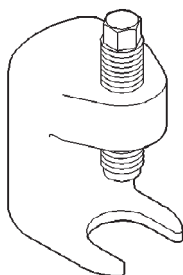


Remover Ball Joint MB-990799

SPECIAL TOOLS (Continued)



Installer, Ball Joint MB-990800



Remover Lower Ball Joint C-4150A

REAR SUSPENSION

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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 SYSTEM

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

A forged rear spindle bolts to each rear strut assembly. The movement of the rear spindle is controlled laterally using lateral links going from the front and rear of the spindle to the rear cross member. Fore and aft movement of the spindle is controlled by a trailing arm

The lateral links and trailing arm have rubber isolator bushings at each end. The lateral links are attached to the rear crossmember and spindle, using a common bolt and nut assembly at each end. The trailing arm bolts to the bottom of the spindle and to a bracket attached to the floor pan of the vehicle.

Lateral links, trailing arms and spindles 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 the underbody dimensions are not correct, the frame of the vehicle must be straightened, before replacement suspension components are installed.

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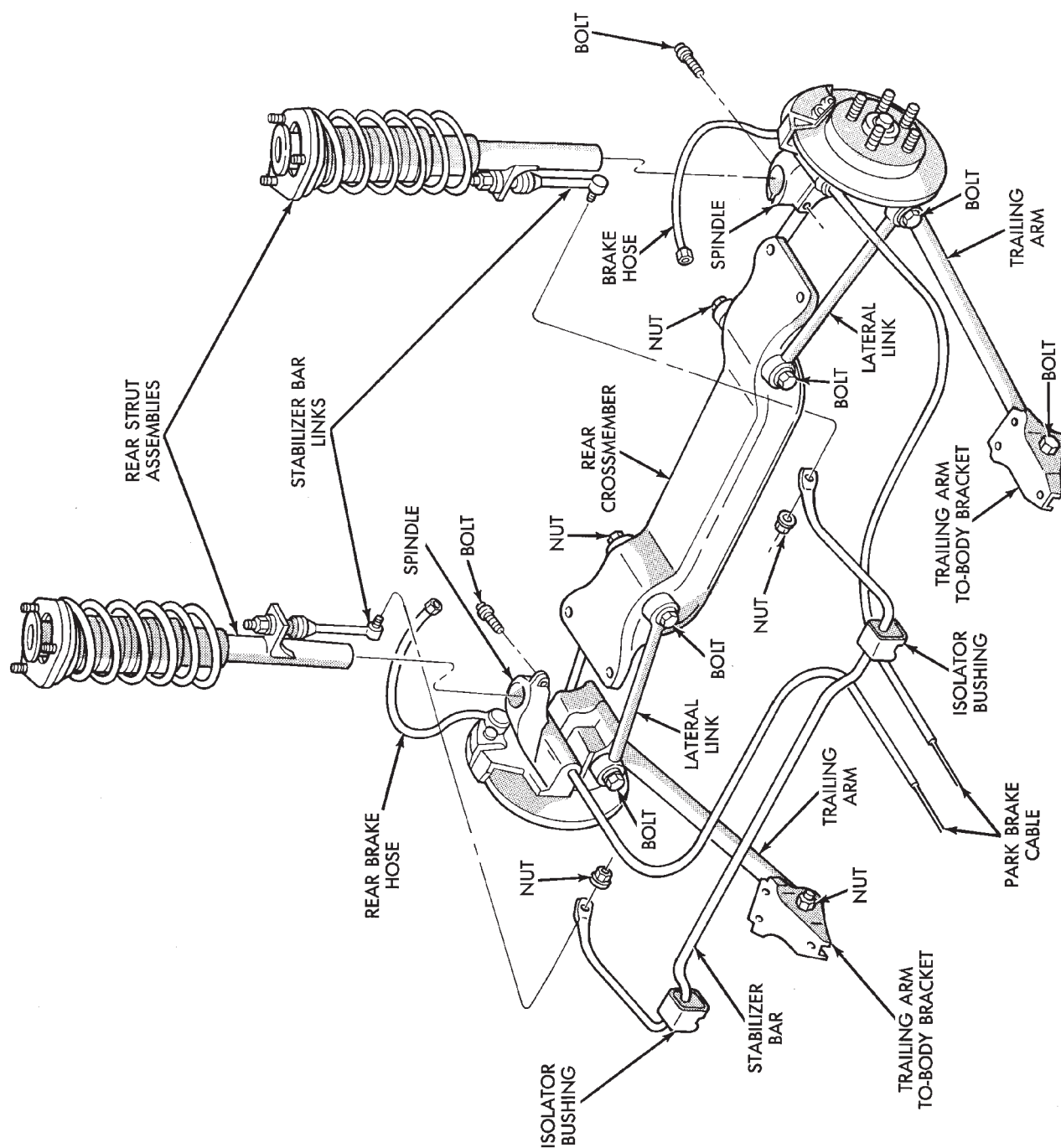


Fig. 1 Fully Independent Rear Suspension

DESCRIPTION AND OPERATION (Continued)

REAR SUSPENSION CROSSMEMBER

This vehicle is available with two different rear crossmembers depending on the suspension package the vehicle was built with. The crossmembers visually look the same between the standard and performance suspension packages, but the mounting location for the lateral links is different. The performance suspension crossmember is identified by a identification hole in the crossmember (Fig. 2). The performance crossmember identification hole is located on left side of crossmember on the rear vertical wall. **If the rear suspension crossmember is replaced, be sure the correct crossmember is installed or the handling of the vehicle will be adversely affected.**

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.

Strut attachment to the rear spindle is accomplished using a split collar on the rear spindle. The collar uses a pinch bolt to retain the spindle to the strut.

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

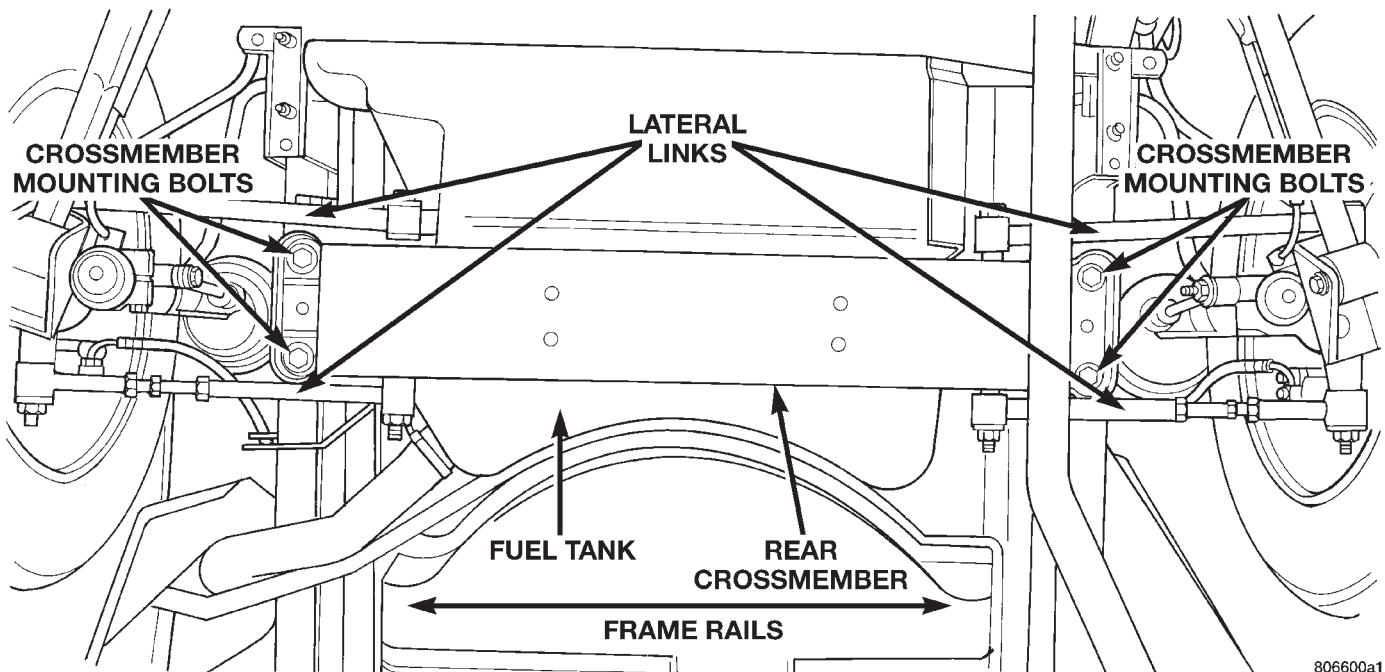
The stabilizer bar interconnects both rear strut assemblies and is attached to the rear frame rails of the vehicle.

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.

SPINDLE

A forged rear spindle bolts to each rear strut assembly. The movement of the rear spindle is controlled laterally using two lateral links attached to the spindle. The outboard ends of the two lateral links are mounted forward and rearward of the spin-



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Fig. 2 Rear Suspension Crossmember

DESCRIPTION AND OPERATION (Continued)

dle centerline, and the inboard ends are mounted to the rear suspension crossmember. Fore and aft movement of the knuckle is controlled by using a trailing arm.

LATERAL LINKS AND TRAILING ARMS

The purpose of the lateral links and trailing arms is to control the movement of the rear spindle. The lateral links control the lateral movement of the rear spindle while the trailing arms control the fore and aft movement of the spindle. The lateral links and trailing arms have rubber isolator bushings at each end. The lateral links are attached to the rear crossmember and the spindle, using a bolt and nut assembly at each end. The trailing arms are attached to the spindle and the body of the vehicle. The trailing arm to rear spindle attachment is through a bracket which is attached to the bottom of the spindle. The trailing arm attaches to the body using a bracket attached to the floor pan. The rear lateral link incorporates a threaded adjustment link to provide a means for rear wheel Toe adjustment.

Lateral links, trailing arms 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 ASSEMBLY**

- (1) Inspect for damaged or broken coil springs (Fig. 3).
- (2) Inspect for torn or damaged strut assembly dust boots (Fig. 3).
- (3) Inspect for damaged lower spring isolator (Fig. 3).
- (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. 4). Also inspect jounce bumpers for signs of damage or deterioration.

SPINDLE

The rear suspension spindle is not a repairable component of the rear suspension. If it is determined that the spindle is broken or bent when servicing the vehicle, no attempt is to be made to repair or to straighten the spindle. **THE SPINDLE MUST BE**

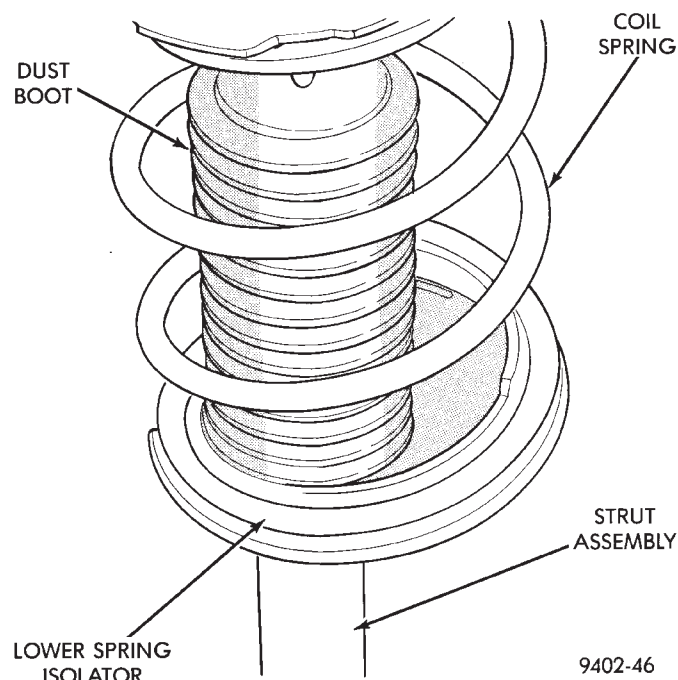


Fig. 3 On Vehicle Strut Assembly Inspection

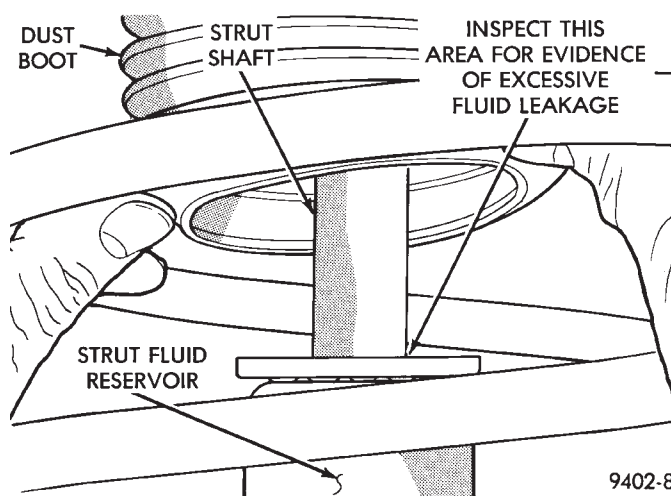


Fig. 4 Strut Assembly Leakage Inspection

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 lat-

DIAGNOSIS AND TESTING (Continued)

eral link is bent or damaged, the lateral link will require replacement. **Do not attempt to repair or straighten a lateral link.**

TRAILING ARM

Inspect the trailing arm and trailing arm bushings for signs of deterioration and or damage. If the trailing arm bushings are deteriorated or the trailing arm is damaged in any way, replacement of the trailing arm will be required.

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

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 stabilizer 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) If vehicle is equipped with rear disc brakes, remove the rear caliper assembly from the adapter. Refer to Rear Disk Brakes in Group 5 Brakes of this Service manual for required caliper removal procedure. After removing caliper assembly store caliper by hanging it from vehicle (Fig. 5). Do not let rear caliper assembly hang from flexible brake hose. If vehicle is equipped with rear drum brakes, remove the brake flex hose bracket from the support plate and wheel cylinder (Fig. 6).

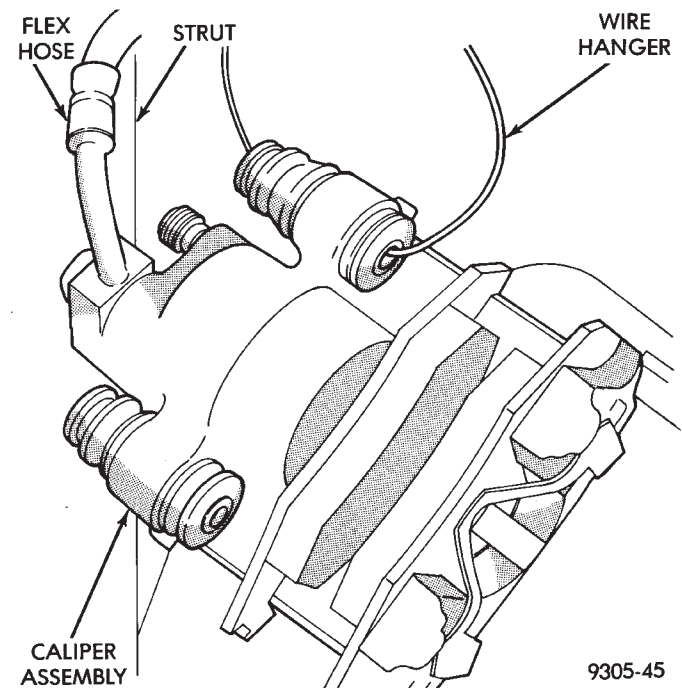


Fig. 5 Storing Rear Caliper Assembly

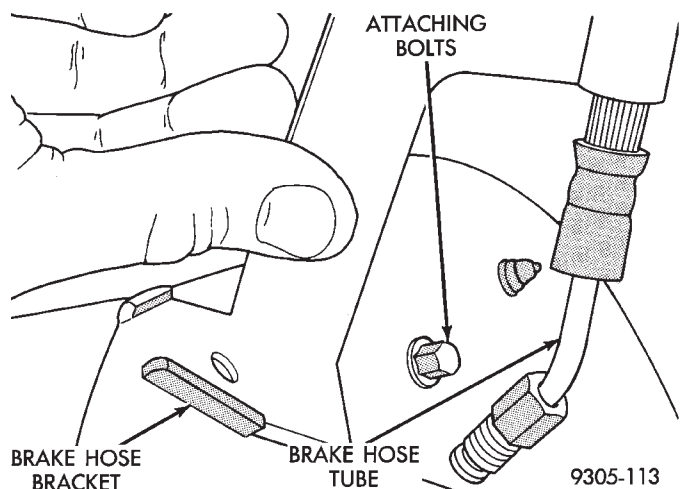


Fig. 6 Brake Hose Bracket And Tube

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

(5) If vehicle is equipped with rear disc brakes, remove the speed sensor cable from the trailing arm (Fig. 7). **If spindle and trailing arm assembly is**

REMOVAL AND INSTALLATION (Continued)

lowered from the strut with the speed sensor cable attached, damage to speed sensor cable may occur.

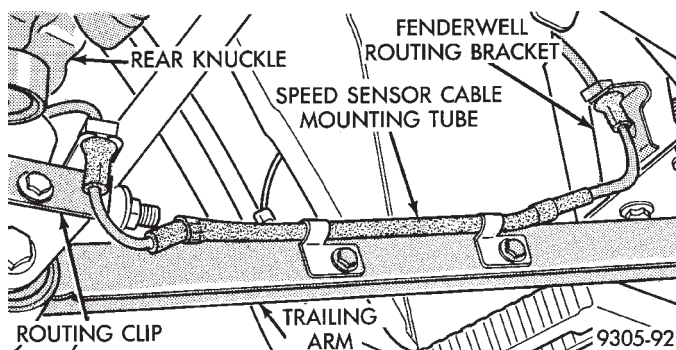


Fig. 7 Wheel Speed Sensor Cable

(6) Remove the lateral links (Fig. 8) from the spindle.

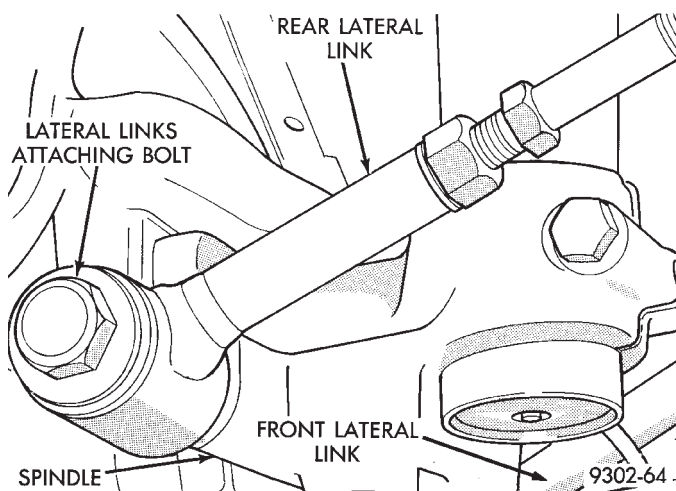


Fig. 8 Lateral Links

(7) Install a thin open end wrench, on the hex of attaching link stud to keep the stud from turning in link. Then remove nut from stabilizer bar to strut assembly attaching link stud, at the stabilizer bar (Fig. 9). The attaching link does not have to be removed from strut assembly.

(8) Loosen and fully remove, the rear spindle to strut assembly pinch bolt (Fig. 10).

CAUTION: When inserting center punch into rear spindle, use care so point of center punch does not puncture strut assembly.

(9) Insert a center punch into the hole on the spindle (Fig. 11). Center punch must be tapped into spindle until jammed into hole. This will spread spindle casting allowing it to be removed from strut assembly.

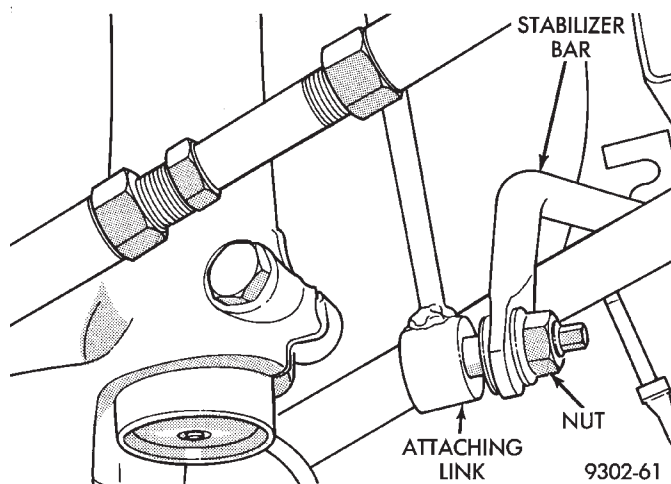


Fig. 9 Link Attachment To Stabilizer Bar

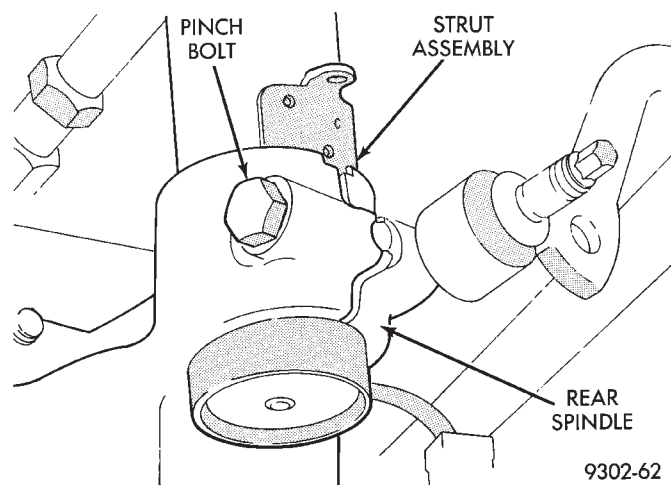


Fig. 10 Spindle To Strut Assembly Pinch Bolt

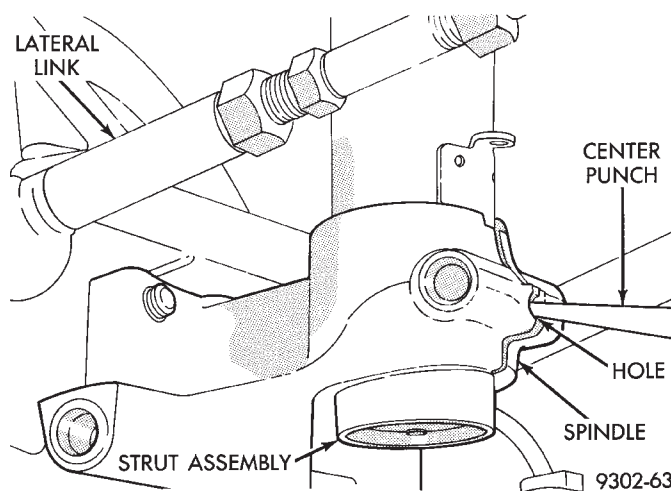


Fig. 11 Center Punch Installed In Spindle

(10) Using a hammer, tap on top surface of spindle driving it down and off the end of the strut assembly (Fig. 12).

REMOVAL AND INSTALLATION (Continued)

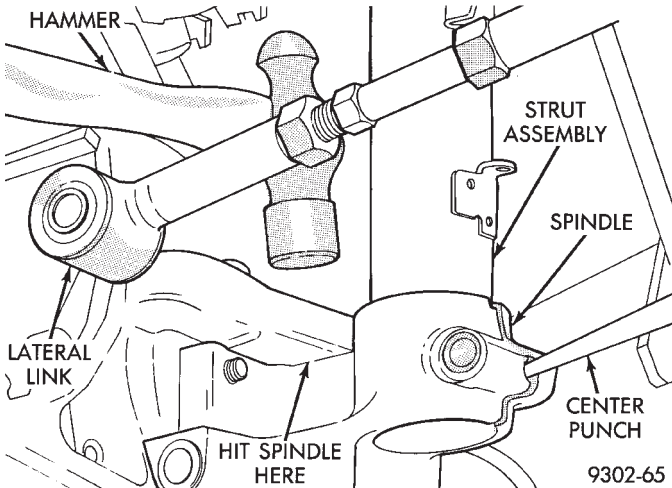


Fig. 12 Removing Spindle From Strut Assembly

(11) Let the rear spindle and assembled components hang from trailing arm (Fig. 13) while strut assembly is out of the vehicle.

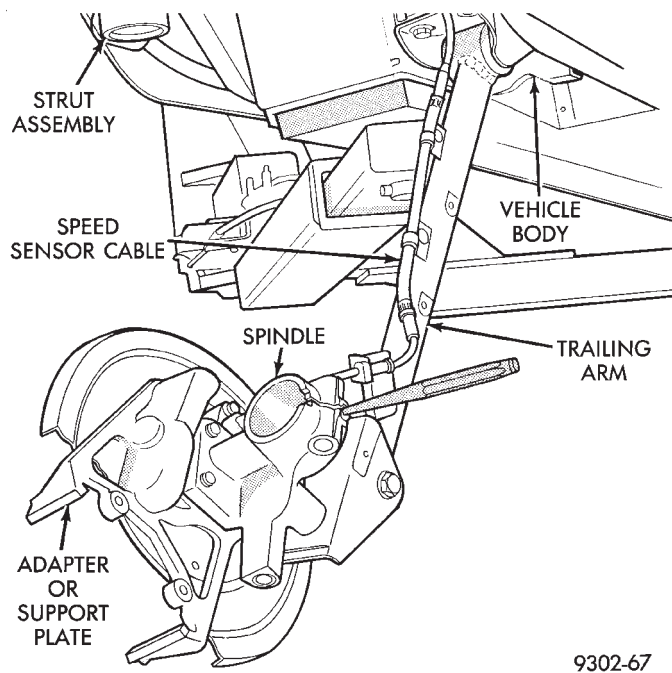


Fig. 13 Spindle Assembly Removed From Strut

(12) Lower vehicle.

NOTE: NOTE: When removing rear strut assembly from vehicle, access for the 3 rear strut assembly to strut tower attaching nuts is through the trunk of the vehicle. See (Fig. 14) for access location of the strut assembly attaching nuts in trunk of vehicle.

(13) Remove the 3 strut assembly to rear strut tower mounting nuts (Fig. 14) and remove strut assembly from vehicle.

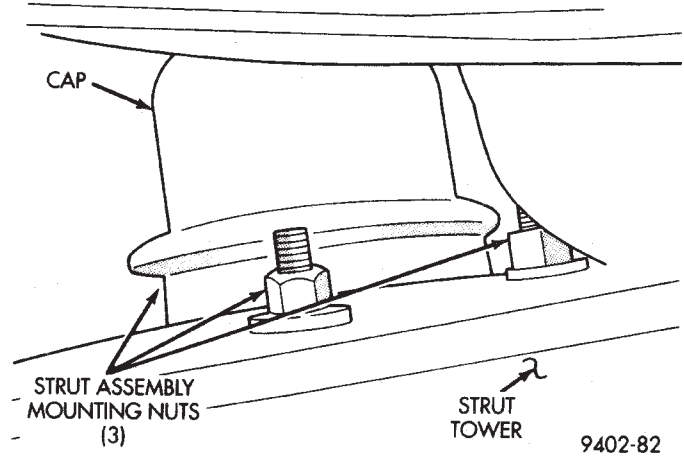


Fig. 14 Strut Assembly Mounting Nuts

INSPECTION

Inspect for evidence of fluid leakage from upper end of reservoir. (Actual leakage will be a stream of fluid running down and leaking off lower end). Slight seepage is not unusual and will not effect performance.

INSTALL

(1) Position strut assembly back in vehicle with the 3 studs on the strut mount through holes in strut tower. Install the 3 strut mount to body attaching nuts onto mount studs (Fig. 14). Using a crow foot and 3/8 in. torque wrench, tighten the 3 strut mount attaching nuts to a torque of 28 N·m (20 ft. lbs).

(2) Install spindle onto bottom of the strut assembly. Push and or tap spindle assembly onto strut, until notch in spindle is tightly seated against locating tap on strut assembly (Fig. 15). Then remove center punch from hole in spindle. Install spindle to strut assembly pinch bolt into spindle (Fig. 15). Torque spindle to strut assembly pinch bolt to 55 N·m (40 ft. lbs.).

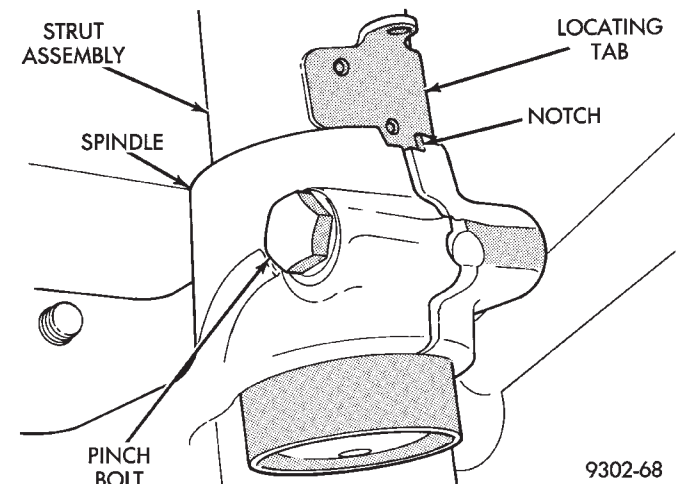


Fig. 15 Spindle Attachment To Strut

REMOVAL AND INSTALLATION (Continued)

(3) Install the lateral links on the spindle (Fig. 8). Tighten the lateral links to spindle attaching bolt to a torque of 140 N·m (105 ft. lbs.).

(4) Install stabilizer bar attaching link onto stabilizer bar (Fig. 9). Install stabilizer link to stabilizer bar attaching nut (Fig. 9). Tighten the stabilizer link to stabilizer bar attaching nut to a torque of 95 N·m (70 ft. lbs.).

(5) Install rear speed sensor cable on rear trailing arm (Fig. 7). Then mount speed sensor cable routing clip (Fig. 7) to the trailing arm to rear spindle bracket.

(6) 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 rear caliper assembly to adapter mounting bolts to 22 N·m (192 in. lbs.). If required, refer to Rear Disc Brakes in Group 5 Brakes of this service manual for required rear brake caliper installation procedure.

(7) If vehicle is equipped with rear drum brakes install rear brake flex hose onto wheel cylinder and support plate (Fig. 6). First tighten the brake hose to wheel cylinder tube nut to a torque of 17 N·m (145 in. lbs.). Then tighten the brake hose bracket to brake support plate bolt to a torque of 8 N·m (75 in. lbs.).

(8) If vehicle has rear drum brakes, brake system will require bleeding. Refer to Bleeding Brake System in the Service Adjustments Section of Group 5 Brakes in this service manual.

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

(10) Lower vehicle to the ground.

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

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.) to ensure installation in original position. **If the coils springs require replacement, be sure that the springs being replaced, 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, be sure that the first full top and bottom coil of the spring is captured by the jaws of spring compressor.

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

REAR SUSPENSION CROSSMEMBER

This vehicle is available with two different rear crossmembers depending on the suspension package the vehicle was built with. The crossmembers visually look the same between the standard and performance suspension packages, but the mounting location for the lateral links is different. The performance suspension crossmember is identified by a identification hole in the crossmember (Fig. 16). The performance crossmember identification hole is located on left side of crossmember on the rear vertical wall. **If the rear suspension crossmember is replaced, be sure the correct crossmember is installed or the handling of the vehicle will be adversely affected.**

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) Position a transmission jack under the fuel tank just forward of the crossmember to help support fuel tank when crossmember is removed.

(4) Remove the nut and bolt on each side of vehicle attaching the lateral links to the spindle (Fig. 17).

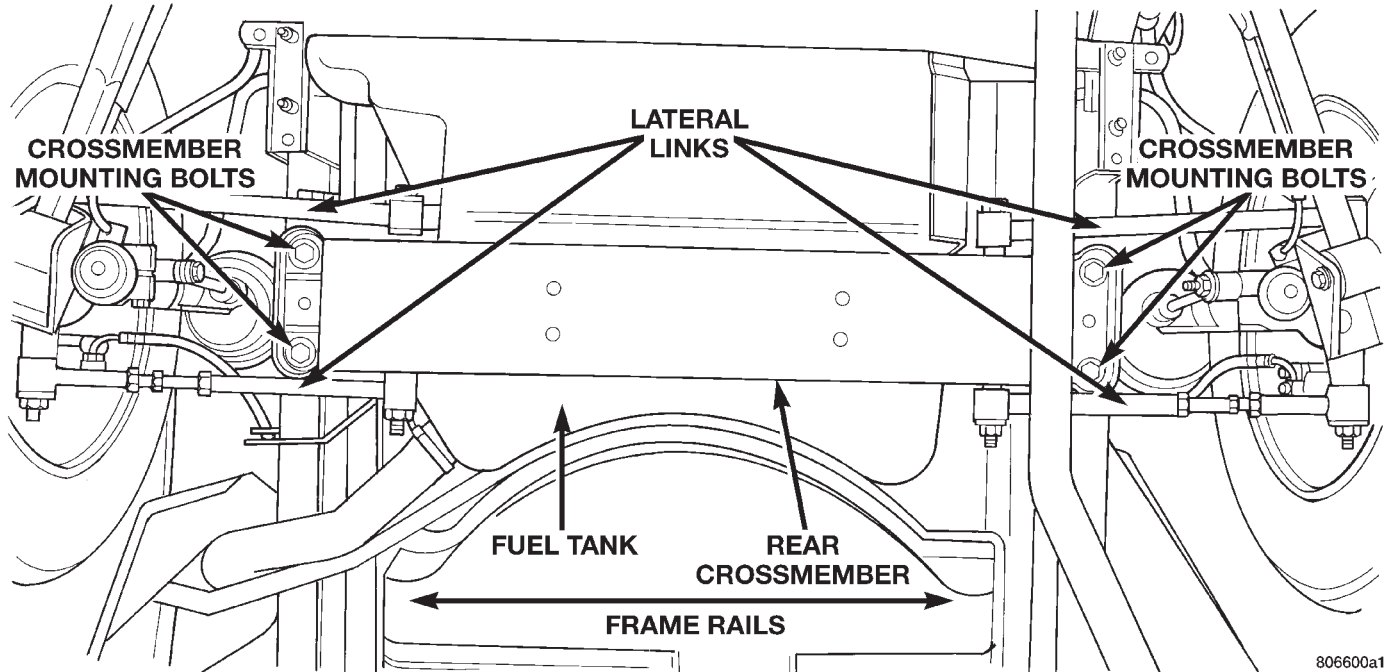
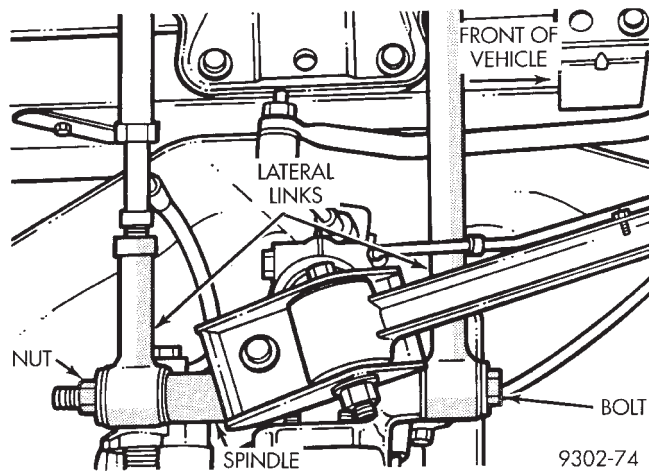
(5) Remove the 4 bolts attaching the rear suspension crossmember to the frame rails (Fig. 18).

(6) Lower the crossmember and lateral links as an assembly out of the vehicle.

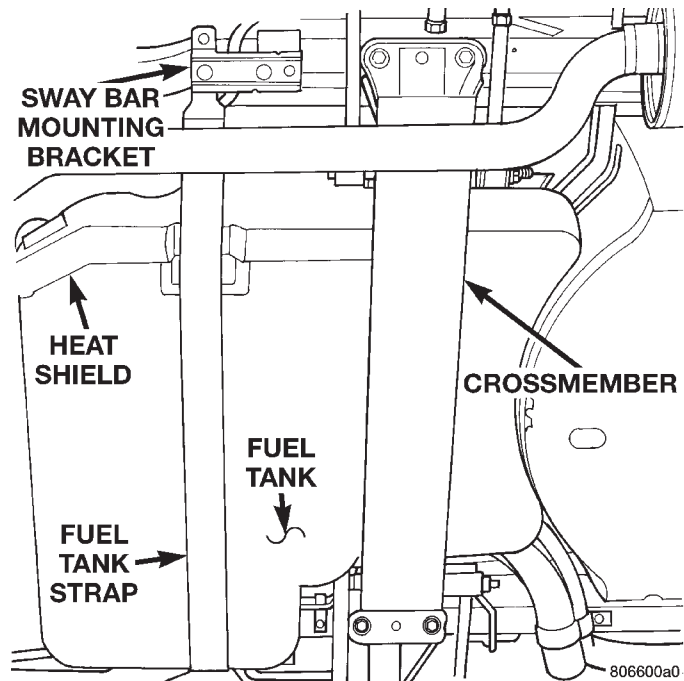
NOTE: When installing the lateral link to crossmember bolts, the bolts must be installed so the head of the bolt will be facing the front of the vehicle when the crossmember is installed in the vehicle.

(7) Transfer the lateral links to the replacement crossmember before installing crossmember back in vehicle. **The adjustable lateral links are to be positioned to the rear of the vehicle when they are installed on the crossmember.** Tighten both lateral link to crossmember attaching bolts to a torque of 140 N·m (105 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

*Fig. 16 Rear Suspension Crossmember**Fig. 17 Lateral Link Attachment To Spindle***INSTALL**

- (1) Install the crossmember and lateral links back into vehicle as an assembly.
- (2) Position crossmember on frame rails and install the 4 crossmember to frame rail attaching bolts (Fig. 18). Tighten the crossmember attaching bolts to a torque of 95 N·m (70 ft. lbs.).
- (3) Align lateral links with spindles and install the lateral link attaching bolts (Fig. 17). Tighten the lateral link to spindle attaching bolts to a torque of 140 N·m (105 ft. lbs.).
- (4) Remove transmission jack supporting fuel tank.
- (5) Install wheel and tire assembly on vehicle.

*Fig. 18 Crossmember Attaching Bolts*

- (6) 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.).
- (7) Lower vehicle to the ground.
- (8) Check and reset rear wheel TOE to specifications if required.

REMOVAL AND INSTALLATION (Continued)

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) Position a transmission jack under the fuel tank just forward of the crossmember to help support fuel tank when crossmember is removed.

(4) Remove the 4 rear suspension crossmember to frame rail attaching bolts (Fig. 19).

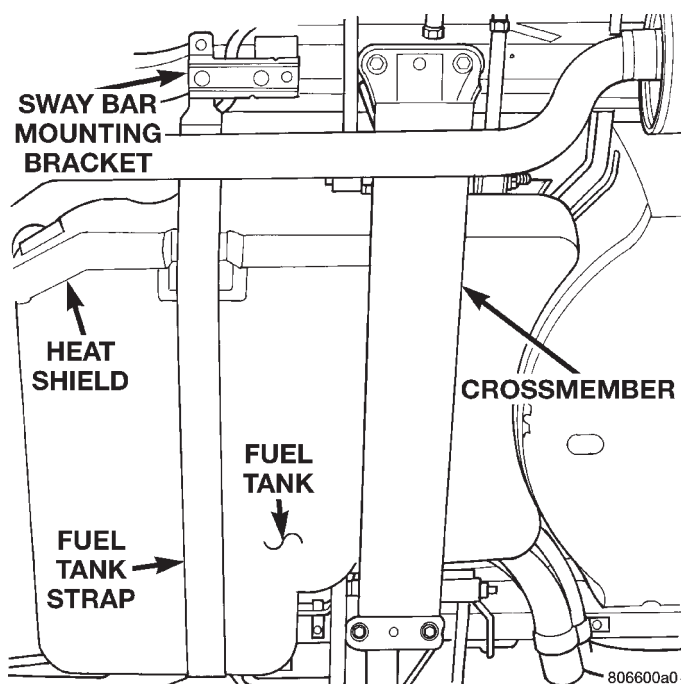


Fig. 19 Crossmember To FrameRail Attaching Bolts

(5) Remove fuel tank. Refer to Group 14 Fuel, in this service manual for the required fuel tank removal procedure.

(6) Remove the stabilizer bar attaching link nut at the stabilizer bar (Fig. 20).

(7) Remove stabilizer bar and isolator bushings as an assembly from the vehicle.

INSPECTION

Inspect for broken or distorted stabilizer bar bushing retainers and or bushings. If bushing replacement is required, bushing can be removed by opening slit in bushing and removing bushing from around stabilizer bar.

INSTALL

(1) Install the stabilizer bar and isolator bushings back into the vehicle as an assembly. Position stabi-

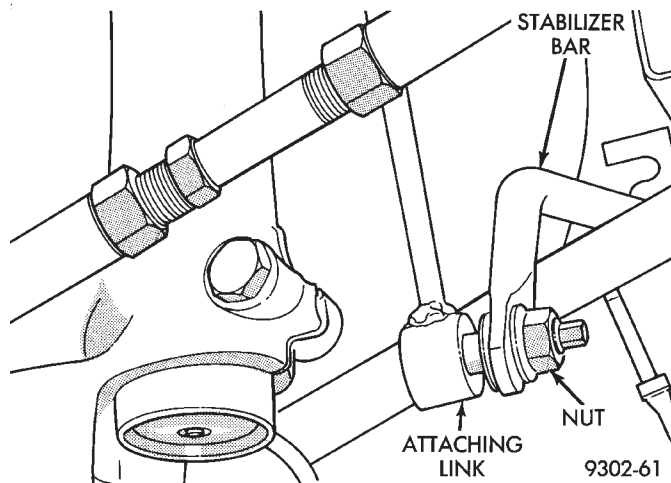


Fig. 20 Stabilizer Bar Attaching Link

lizer bar so it is centered in the vehicle so it does not contact other suspension components or vehicle body.

(2) Install the stabilizer bar attaching link on the stabilizer bar. Install the attaching link to stabilizer bar attaching nut (Fig. 20). Tighten the stabilizer bar attaching link to stabilizer bar nut to a torque of 95 N·m (70 ft. lbs.).

(3) Install fuel tank back in vehicle. Refer to Group 14 Fuel, in this service manual for the required fuel tank installation procedure.

CAUTION: The sway bar bracket bolts must be replaced after loosening or removing them. Only use original equipment bolts as replacements.

(4) Position crossmember on frame rails. Install the 4 crossmember to frame rail attaching bolts (Fig. 19). Torque the crossmember to frame rail attaching bolts to 95 N·m (70 ft. lbs.).

(5) Remove transmission jack supporting fuel tank.

(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 the tightening sequence to the full specified torque of 129 N·m (95 ft. lbs.).

(7) Lower vehicle to the ground.

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

REAR SPINDLE

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 rear wheel and tire assembly from the vehicle.

(3) If vehicle is equipped with rear disc brakes, remove the rear caliper assembly from the adapter. Refer to Rear Disk Brakes in Group 5 Brakes of this Service manual for required caliper removal procedure. After removing caliper assembly store caliper by hanging it from frame of vehicle (Fig. 21). Do not let weight of rear caliper assembly hang from flexible brake hose. If vehicle is equipped with rear drum brakes, remove the brake flex hose bracket from the support plate and wheel cylinder (Fig. 22).

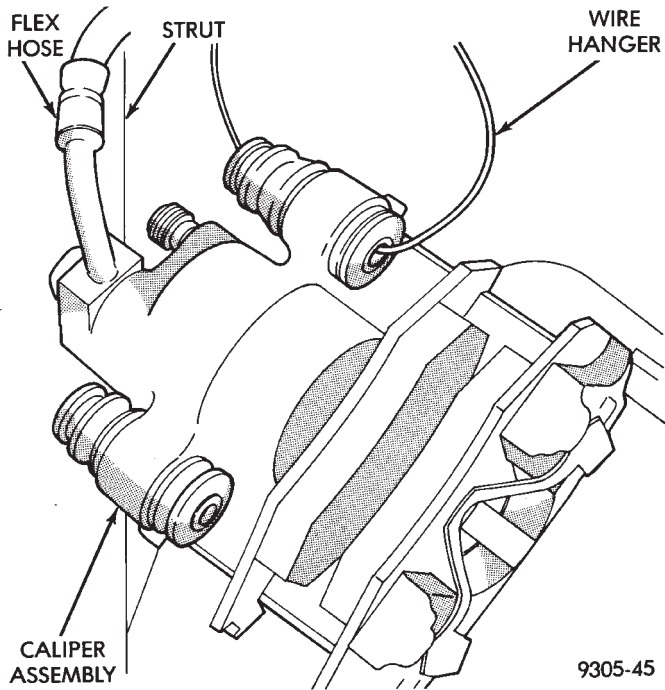


Fig. 21 Storing Caliper

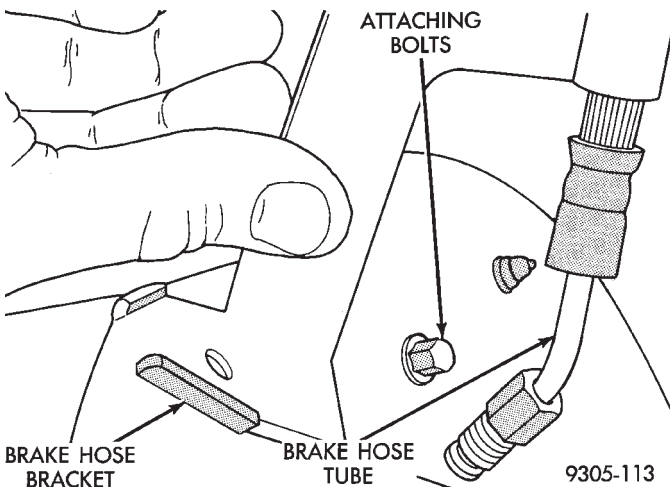


Fig. 22 Brake Hose Bracket And Tube

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

equipped with rear drum brakes, remove the brake drum from the hub.

(5) Remove rear hub and bearing assembly cotter pin and nut retainer (Fig. 23). Remove the hub and bearing retaining nut and washer from the spindle (Fig. 23). Then remove hub and bearing assembly from spindle.

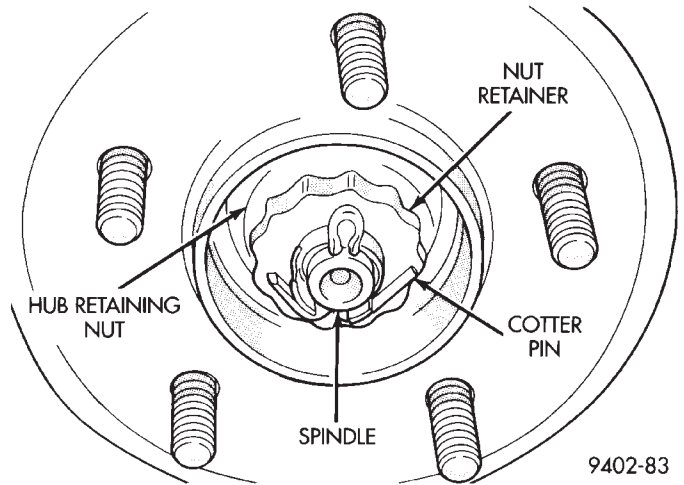


Fig. 23 Hub And Bearing Retaining Nut and Washer

(6) On vehicles equipped with rear drum brakes, remove the 4 bolts attaching the rear brake support plate to the spindle (Fig. 24). Then remove the rear brake support plate, with parking the brake cable attached, from the spindle.

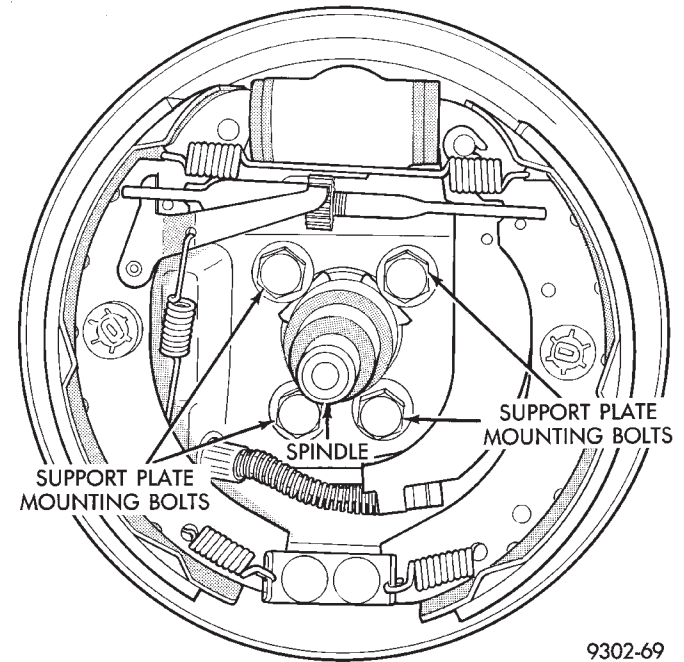
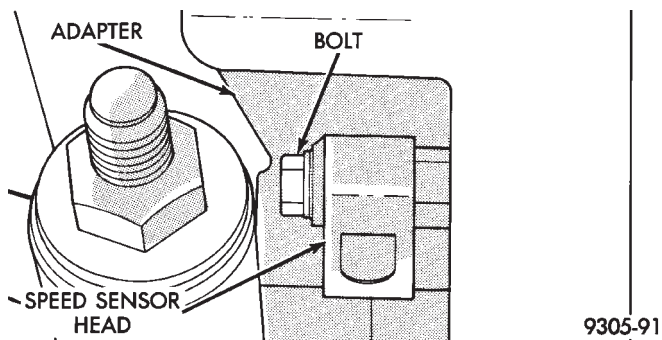


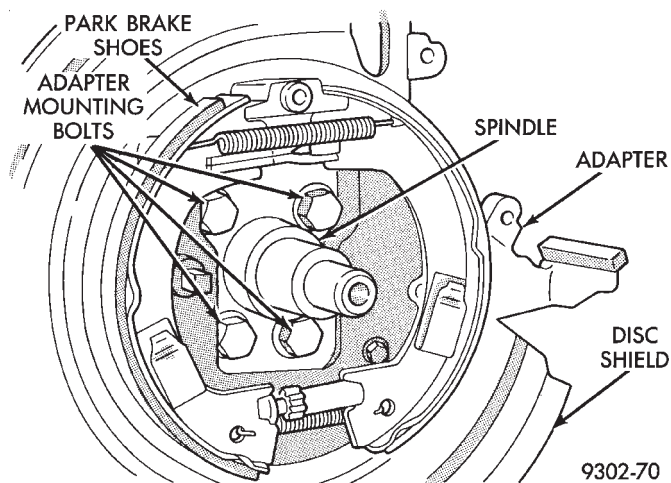
Fig. 24 Brake Support Plate Mounting Bolts

(7) If vehicle is equipped with antilock brakes, remove the speed sensor head from the rear disc brake adapter (Fig. 25).

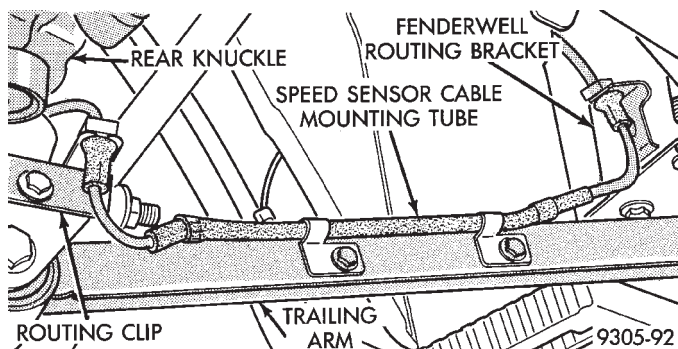
REMOVAL AND INSTALLATION (Continued)

**Fig. 25 Speed Sensor Head**

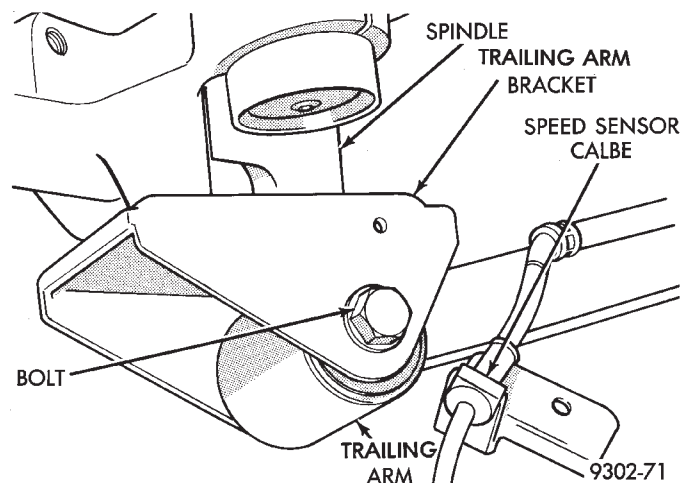
(8) On vehicles equipped with rear disc brakes, remove the 4 bolts attaching the disc brake adapter to the rear spindle (Fig. 26). Then remove the adapter, disc shield, park brake shoes and park brake cable as an assembly from the spindle.

**Fig. 26 Disc Brake Adapter Mounting**

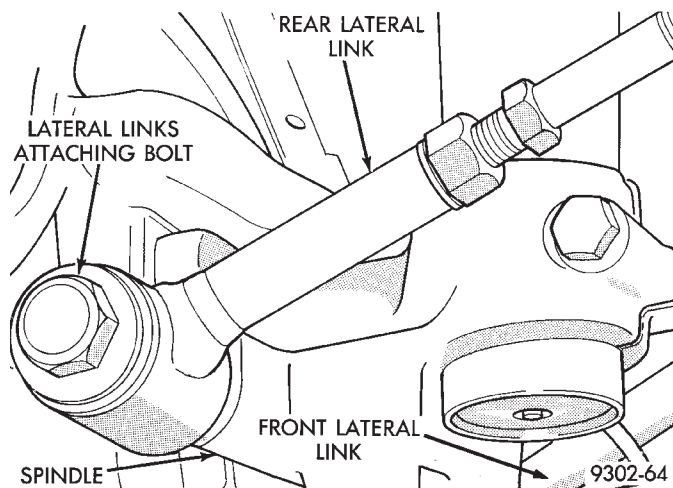
(9) If vehicle is equipped with antilock brakes, remove the speed sensor cable from the trailing arm and the routing bracket from the trailing arm bracket on the spindle (Fig. 27). **If the trailing arm is lowered from the strut with the speed sensor cable attached, damage to speed sensor cable may occur.**

**Fig. 27 Speed Sensor Cable And Bracket**

(10) Remove the bolt attaching the trailing arm to the bracket on the bottom of the spindle (Fig. 28).

**Fig. 28 Trailing Arm To Bracket Bolt**

(11) Remove the bolt (Fig. 29) attaching the lateral links to the spindle.

**Fig. 29 Lateral Links To Spindle Attaching Bolt**

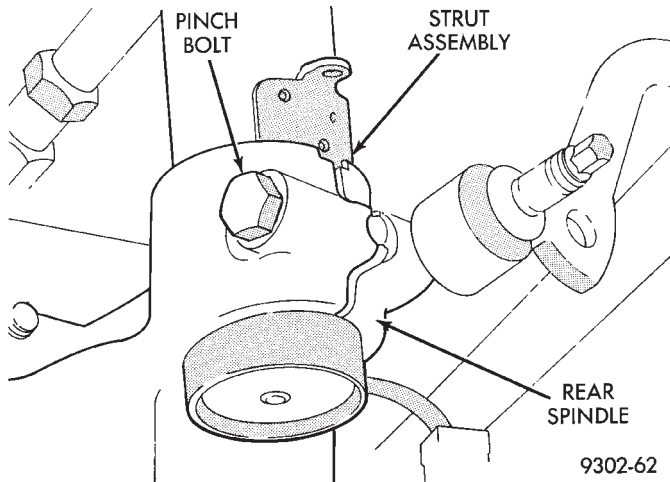
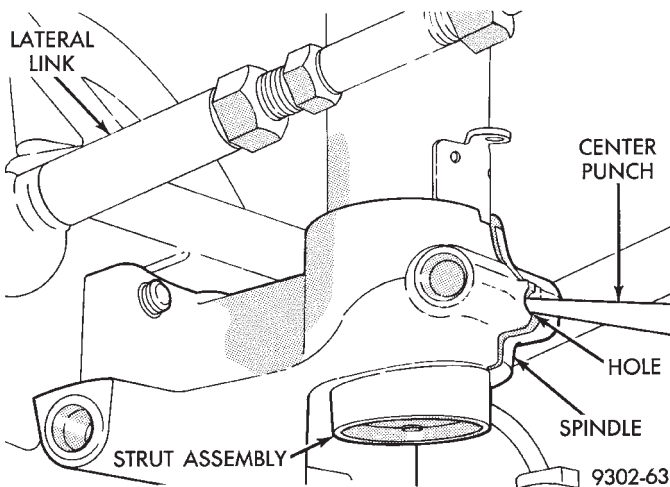
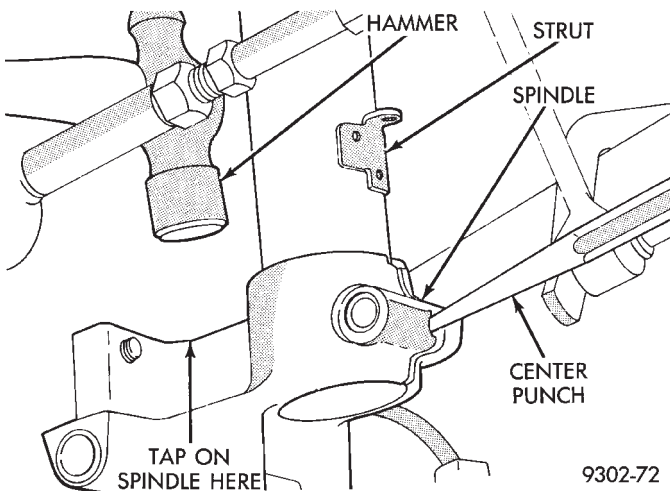
(12) Remove the pinch bolt from the spindle (Fig. 30).

CAUTION: When inserting center punch into rear spindle, use care so point of center punch does not puncture strut assembly.

(13) Insert a center punch into the hole on the spindle (Fig. 31). Center punch must be tapped into the hole in the spindle until jammed into place. This will spread the spindle casting allowing it to be removed from strut assembly.

(14) Tap on top surface of spindle, (Fig. 32) driving it off the end of the strut assembly.

REMOVAL AND INSTALLATION (Continued)

**Fig. 30 Spindle Pinch Bolt****Fig. 31 Center Punch Inserted In Spindle****Fig. 32 Removing Spindle From Strut****INSTALL**

(1) Install the spindle on the strut assembly. Push and or tap spindle assembly onto strut, until notch in spindle is tightly seated against locating tap on strut

assembly (Fig. 30). Then remove center punch from hole in spindle. Install the pinch bolt in the spindle (Fig. 30). Tighten the pinch bolt to a torque of 55 N·m (40 ft. lbs.).

(2) Install the lateral links on the spindle (Fig. 29). Tighten the lateral links attaching bolt to a torque of 140 N·m (105 ft. lbs.).

(3) Install bolt attaching trailing arm to trailing arm bracket on bottom of spindle (Fig. 28). Tighten the trailing arm attaching bolt to a torque of 100 N·m (74 ft. lbs.).

(4) If vehicle is equipped with antilock brakes, mount rear speed sensor cable on the trailing arm and the speed sensor cable routing bracket to the trailing arm bracket at the spindle (Fig. 27).

(5) On vehicles equipped with rear drum brakes, install the rear brake support plate onto the spindle. Install the 4 bolts attaching the rear brake support plate to the spindle (Fig. 24). Tighten the brake support plate to mounting bolts to a torque of 115 N·m (85 ft. lbs.).

(6) On vehicles equipped with rear disc brakes, install the disc brake adapter back on the spindle. Install the 4 bolts attaching the disc brake adapter to the rear spindle (Fig. 26). Tighten the disc brake adapter mounting bolts to a torque of 115 N·m (85 ft. lbs.).

(7) If vehicle is equipped with antilock brakes, install the speed sensor head into the rear disc brake adapter (Fig. 25). Tighten the speed sensor head attaching bolt to a torque of 7 N·m (60 in. lbs.).

(8) Install the rear hub and bearing assembly on the rear spindle. Install hub and bearing assembly retaining washer and nut on spindle (Fig. 23). Tighten the hub and bearing retaining nut to a torque of 168 N·m (124 ft. lbs.).

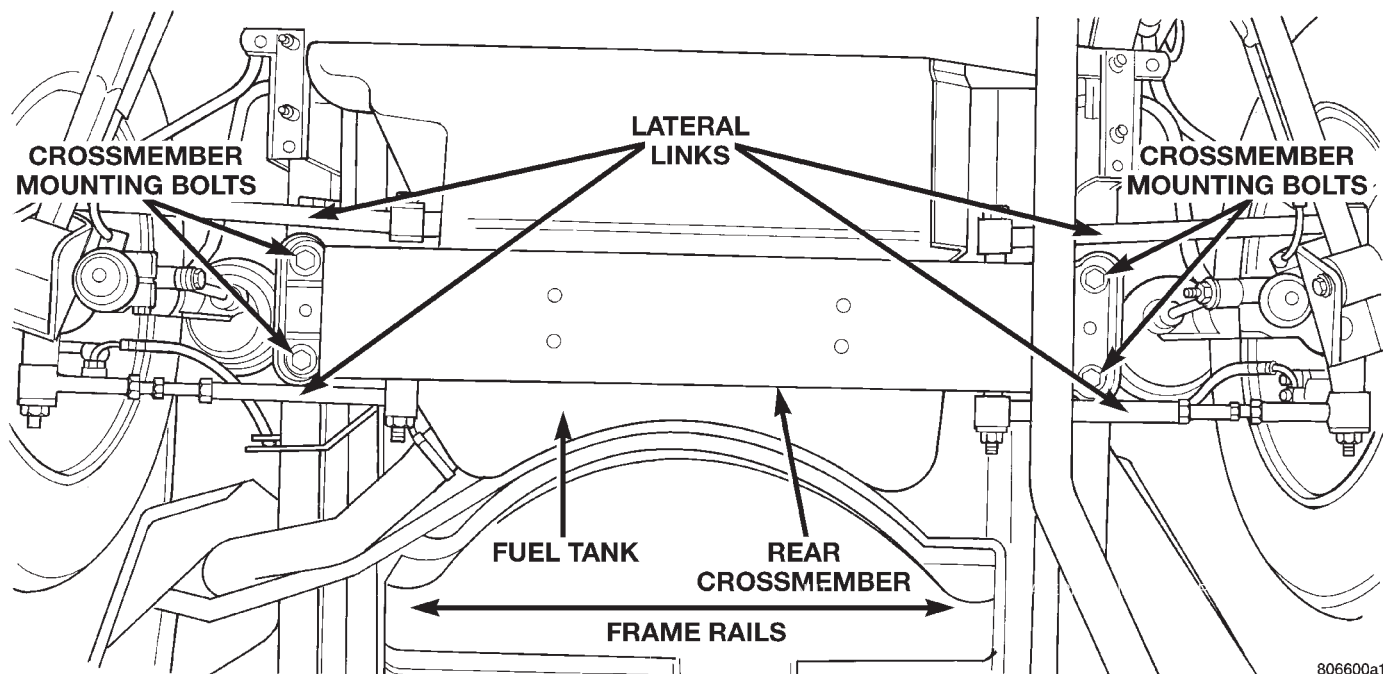
(9) If vehicle is equipped with rear disc brakes, install rotor on hub. If vehicle is equipped with rear drum brakes, install the brake drum on hub.

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

(11) If vehicle is equipped with rear drum brakes install rear brake flex hose onto wheel cylinder and support plate (Fig. 22). Tighten the brake hose tube nut to a torque of 17 N·m (145 in. lbs.). Tighten the brake hose bracket attaching bolt to a torque of 8 N·m (75 in. lbs.).

(12) If vehicle has rear drum brakes, brake system will require bleeding. Refer to Bleeding Brake System in the Service Adjustments Section of Group 5 Brakes in this service manual.

REMOVAL AND INSTALLATION (Continued)

**Fig. 33 Rear Suspension Lateral Links**

(13) 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.).

(14) Lower vehicle to the ground.

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

LATERAL LINKS

The lateral links (Fig. 33) are only serviced as complete assemblies. The isolator bushings used in the lateral links are not serviced as separate components. The left and right lateral links are serviced using different procedures. See procedures below for the side of the vehicle requiring service to the lateral links.

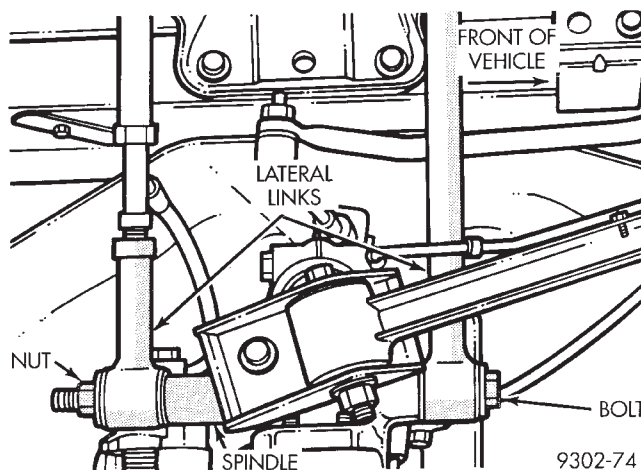
LEFT LATERAL LINKS**REMOVE**

(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 left rear wheel and tire assembly from the vehicle.

(3) Remove the nut and bolt attaching the left lateral links to the spindle (Fig. 34).

(4) Remove the nut and bolt attaching the left lateral links to the rear suspension crossmember (Fig. 35). Remove the lateral links from the vehicle.

**Fig. 34 Lateral Link Attachment To Spindle****INSTALL**

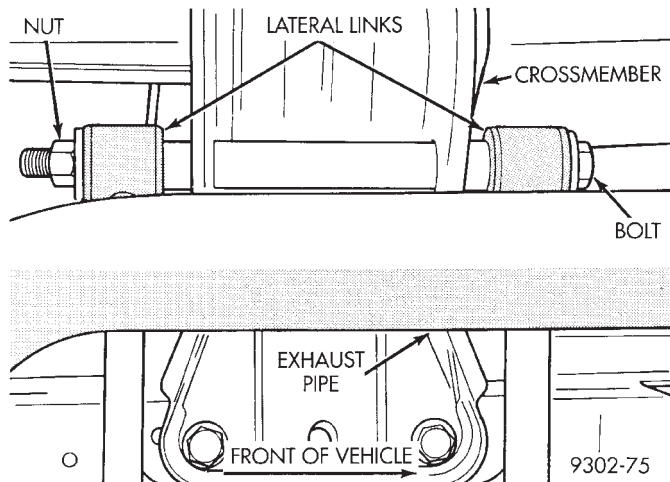
(1) Replacement lateral links are installed on the crossmember in the following order.

- Solid lateral link is installed on crossmember toward the front of the vehicle (Fig. 33).
- The adjustable lateral link is installed on crossmember toward the rear of the vehicle, with the adjustable link positioned toward the spindle (Fig. 33).

(2) Install the lateral link attaching bolt at the spindle and crossmember. **Note: Both lateral link attaching bolts must be install, so head of bolt is facing front of vehicle (Fig. 34) and (Fig. 35).**

(3) Tighten both lateral link attaching bolts to a torque of 140 N·m (105 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

**Fig. 35 Left Lateral Links To Crossmember Bolt**

(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 vehicle to the ground.

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

RIGHT LATERAL LINKS

To allow for removal of right rear lateral links to rear crossmember attaching bolt. The rear crossmember will have to be lowered so attaching bolt will clear fuel tank for removal and installation.

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 right rear wheel and tire assembly from the vehicle.

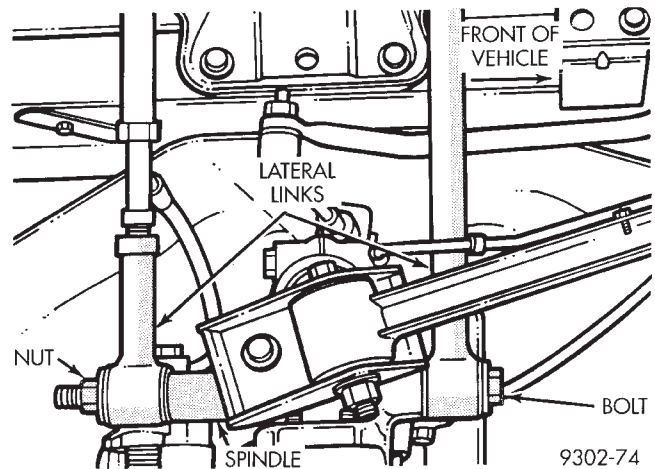
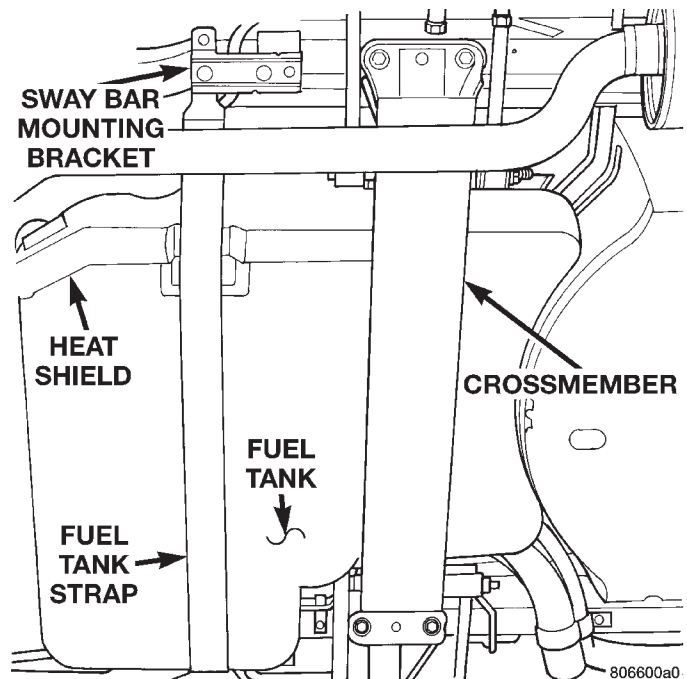
(3) Remove the nut and bolt attaching the right lateral links to the spindle (Fig. 36).

(4) Position a transmission jack under the fuel tank just forward of the crossmember to help support fuel tank when crossmember is lowered.

(5) Remove the 4 rear suspension crossmember to frame rail attaching bolts (Fig. 37).

(6) Lower the rear suspension crossmember enough so that the right lateral links to crossmember attaching bolt will clear fuel tank.

(7) Remove the nut and bolt attaching the right lateral links to the rear suspension crossmember (Fig. 38). Remove the lateral links from the vehicle.

**Fig. 36 Lateral Link Attachment To Spindle****Fig. 37 Crossmember To Frame Rail Attaching Bolts INSTALL**

(1) Replacement lateral links are installed on the crossmember in the following order.

- Solid lateral link is to be installed on crossmember toward the front of the vehicle (Fig. 33).
- The adjustable lateral link is to be installed on crossmember toward the rear of the vehicle, with the adjustable link positioned toward the spindle (Fig. 33).

(2) Install the right lateral links attaching bolt at the crossmember. **Note: Right lateral link attaching bolts MUST be install, so head of bolt is facing front of vehicle (Fig. 36) and (Fig. 38).**

(3) Position crossmember on frame rails and install the 4 crossmember to frame rail attaching

REMOVAL AND INSTALLATION (Continued)

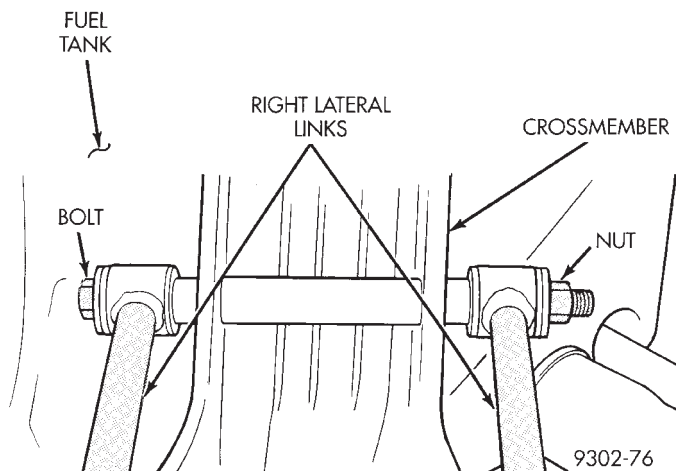


Fig. 38 Right Lateral Links To Crossmember Bolt

bolts (Fig. 37). Tighten the rear suspension crossmember attaching bolts to a torque of 95 N·m (70 ft. lbs.).

(4) Tighten the lateral links to crossmember attaching bolt (Fig. 38) to a torque of 140 N·m (105 ft. lbs.).

(5) Align right lateral links with spindle and install the lateral link to spindle attaching bolt (Fig. 36). Tighten the lateral link to spindle attaching bolt to a torque of 140 N·m (105 ft. lbs.).

(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 the tightening sequence to the full specified torque of 129 N·m (95 ft. lbs.).

(7) Lower the vehicle to the ground.

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

DISASSEMBLY AND ASSEMBLY

STRUT ASSEMBLY

The rear strut 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 and high rate be sure spring is replaced with a spring of the correct rate.)
- Dust shield
- Mount assembly
- Jounce Bumper
- Lower Spring Isolator
- Shaft Nut

DISASSEMBLE

(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. 39). Using paint or equivalent, mark the strut unit, lower spring isolator, spring and upper strut mount for indexing of the parts at assembly.

CAUTION: When installing spring compressors (Fig. 39) on coil spring, do not position the spring compressors on the sleeves of the coil spring. Positioning the spring compressors on the sleeves could cause the sleeve to dislodge from the coil spring when it is compressed. This would result in the required replacement of the coil spring.

WARNING: Do not install the spring compressor on the coil spring in an area of the spring covered by a sleeve. If the sleeve moves when compressing the spring, the spring could come out of compressor resulting in personal injury.

(3) Position Spring Compressors, Special Tool C-4838 on the strut assembly spring (Fig. 39). Compress coil spring until all load is removed from upper strut mount assembly.

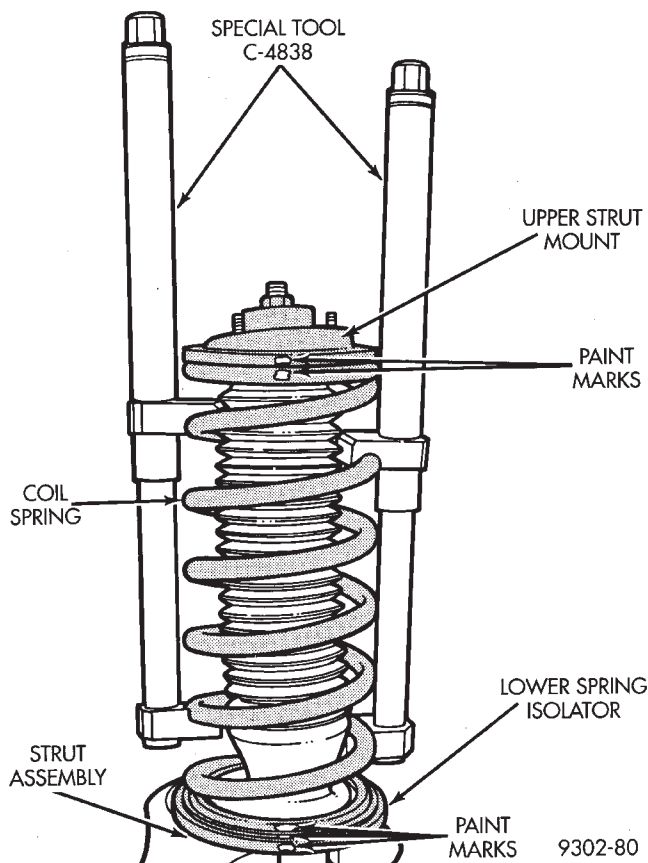


Fig. 39 Compressing Strut Assembly Coil Spring

DISASSEMBLY AND ASSEMBLY (Continued)

(4) Install Strut Rod Socket, Special Tool, L-4558 on strut shaft nut (Fig. 40). Use a 8 mm allen wrench inserted into end of strut shaft to keep strut shaft from turning (Fig. 40). Remove the nut from the strut shaft.

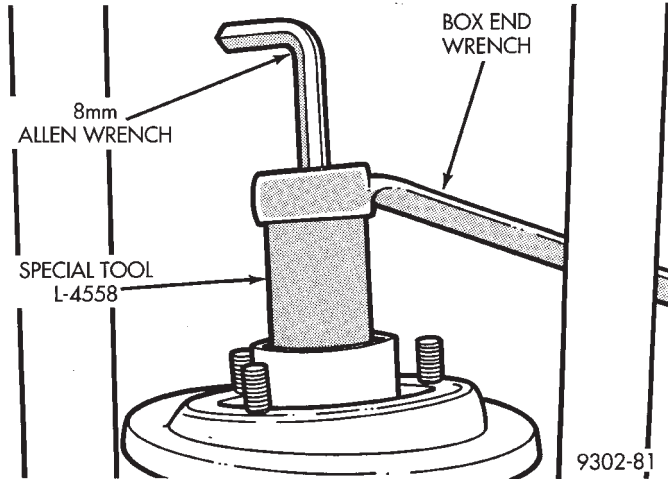


Fig. 40 Removing Strut Shaft Nut

(5) Remove the strut upper mount assembly from the strut (Fig. 41).

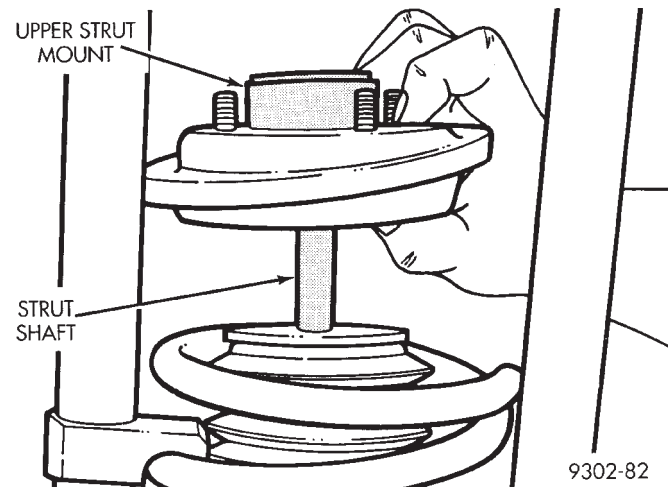


Fig. 41 Upper Strut Mount

(6) Remove the coil spring and the spring compressor as an assembly from the strut (Fig. 42).

(7) Remove the plate, dust shield and jounce bumper as an assembly from the strut (Fig. 43).

(8) Remove the coil spring lower isolator from the strut (Fig. 44).

(9) 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 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

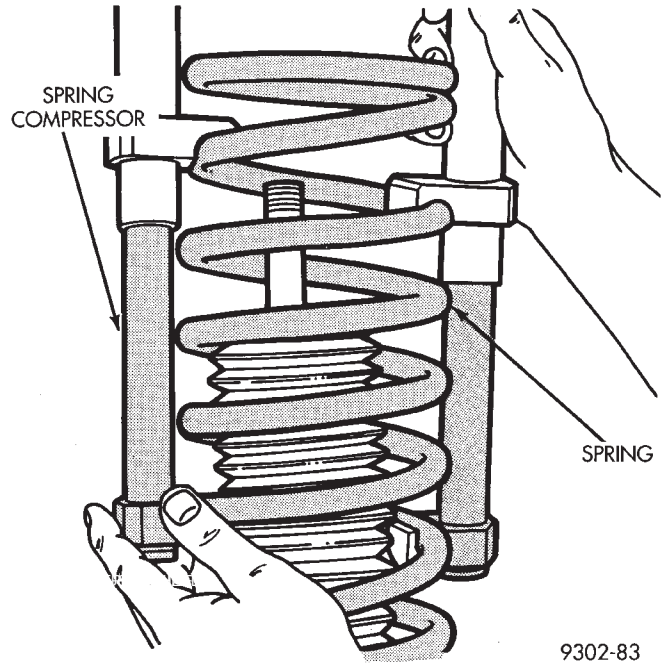


Fig. 42 Coil Spring Remove And Install

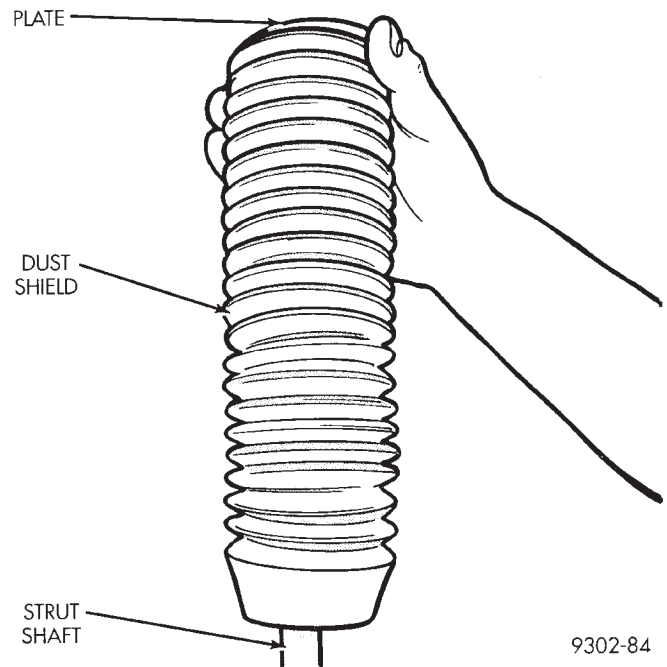


Fig. 43 Plate, Dust Shield And Jounce Bumper

shaft does not return to its fully extended position replace strut unit.

ASSEMBLE

(1) Install original or new, lower spring isolator on strut unit (Fig. 44). If installing original isolator align paint marks on isolator and strut unit.

(2) Install jounce bumper into dust shield (Fig. 45). Install plate on top of dust shield and into jounce bumper (Fig. 46).

DISASSEMBLY AND ASSEMBLY (Continued)

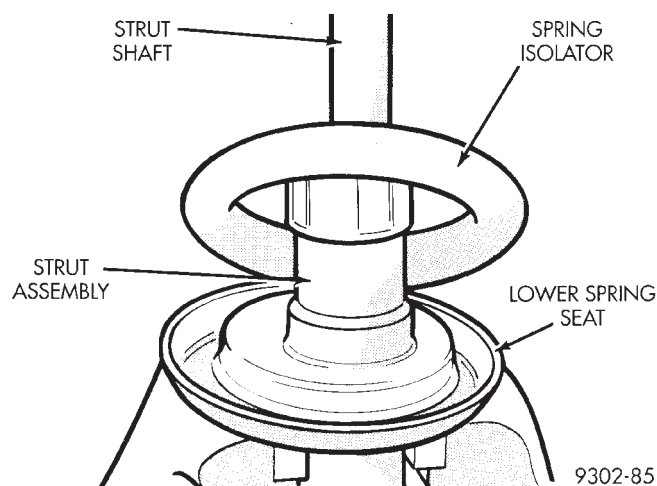


Fig. 44 Coil Spring Lower Isolator

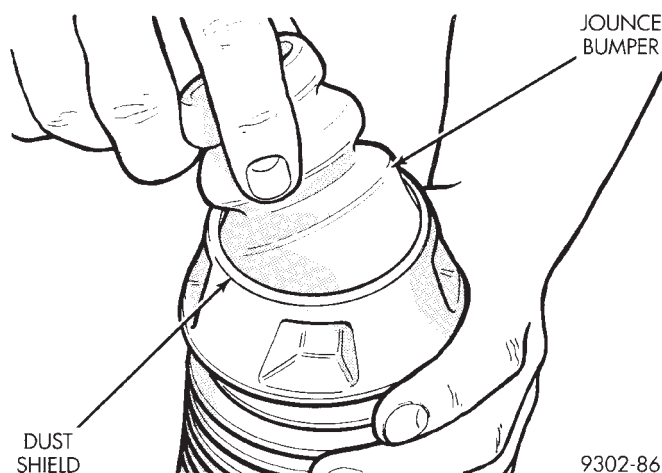


Fig. 45 Jounce Bumper Installed Into DustShield

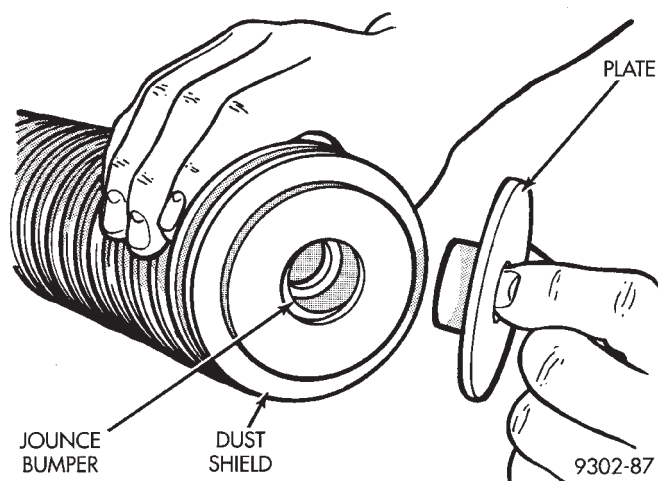


Fig. 46 Plate Installation Into Jounce Bumper And Dust Shield

(3) Install the dust shield, jounce bumper and top plate as an assembly onto the strut unit (Fig. 43).

(4) Lower the coil spring and compressor onto the strut unit (Fig. 42). Align the paint mark on the spring with the paint mark on the strut unit (Fig. 39).

(5) Install the upper strut mount assembly onto the strut shaft, aligning paint marks (Fig. 41). Install the upper strut mount to strut shaft retaining nut on strut shaft.

(6) Using Strut Rod Socket, Special Tool, L-4558 and a 8 mm allen wrench to keep the strut shaft from turning, tighten the strut shaft nut to a torque of 95 N·m (70 ft. lbs.).

(7) 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.

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

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

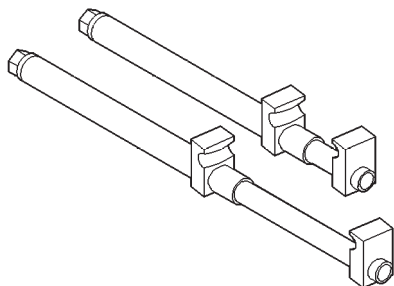
SPECIFICATIONS

REAR SUSPENSION FASTENER TORQUE SPECIFICATIONS

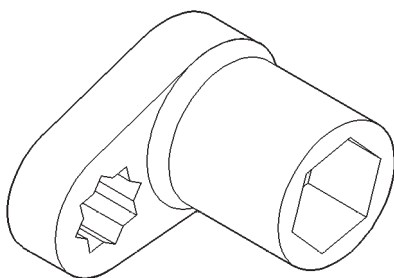
DESCRIPTION	TORQUE
Brakes:	
Support Plate Mounting Bolts . . .	109 N·m (80 ft. lbs.)
Brake Hose Mounting Bolt	45 N·m (35 ft. lbs.)
Brake Hose Bracket Bolt	23 N·m (17 ft. lbs.)
Caliper Adapter To Spindle Bolts . .	115 N·m (85 ft. lbs.)
Caliper To Adapter Mounting Bolts .	22 N·m (16 ft. lbs.)
Strut Assembly:	
Mounting Bracket To Body Nuts . . .	28 N·m (21 ft. lbs.)
To Spindle Pinch Bolt	95 N·m (70 ft. lbs.)
Rod To Upper Mount Nut	68 N·m (50 ft. lbs.)
To Stabilizer Bar Link Attaching Nut .	23 N·m (17 ft. lbs.)
Stabilizer Bar:	
Isolator Bushing Retainer Bolt	55 N·m (40 ft. lbs.)
To Strut Attaching Link Nut	95 N·m (70 ft. lbs.)
Trailing Arm:	
Attaching Nuts And Bolts	100 N·m (75 ft. lbs.)
Bracket To Body Mounting Bolts . .	70 N·m (50 ft. lbs.)
Lateral Links:	
To Spindle Bolts/Nuts	140 N·m (105 ft. lbs.)
Jam Nuts	65 N·m (48 ft. lbs.)
To Suspension Crossmember Bolts .	140 N·m (105 ft. lbs.)
Hub And Bearing Assembly:	
To Spindle Retaining Nut	170 N·m (125 ft. lbs.)
Wheel Stud Lug Nuts	109-150 N·m (80-110 ft. lbs.)
Rear Suspension Crossmember:	
To Body Attaching Bolts	92 N·m (70 ft. lbs.)

SPECIAL TOOLS

REAR SUSPENSION



Compressor Strut Coil Spring C-4838



Socket / Holder Strut Nut L-4558A

