

SUSPENSION

GROUP 04

(3000 & 5000)

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SECTION 04-00 Suspension—Service

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VEHICLE APPLICATION

Taurus / Sable.

DESCRIPTION

The section covers Adjustments and Cleaning and Inspection procedures for the front and rear suspensions. Refer to the appropriate section in this group for Diagnosis, Removal and Installation and Disassembly and Assembly procedures.

CLEANING AND INSPECTION

Suspension, Front

Inspection

Do not check alignment without first making the following inspection for front end damage or wear:

1. Check for specified air pressure in all four tires.

2. Raise front of vehicle off floor. Refer to Section 00-02. Grasping upper and lower surfaces of tire, move each front wheel in and out to check front suspension ball joints and mounts for looseness, wear and damage. Tighten all loose nuts and bolts to specification. Replace all worn parts. Refer to Section 04-01.

CLEANING AND INSPECTION (Continued)

3. Check steering gear mountings and tie rod connections for looseness. Tighten all mountings to specification. If tie rods are worn or bent, replace parts. Refer to Section 11-02.
4. Spin each front wheel with wheel spinner and check and balance each wheel as necessary. Refer to Section 04-01.
5. Check action of shock absorbers and suspension springs. If they are not in good condition, vehicle may not settle in normal / level position.

Ball Joint, Lower

Inspection

1. Raise vehicle until wheels fall to full down position. Refer to Section 00-02.
2. Have an assistant grasp lower edge of tire and move wheel and tire assembly in and out.
3. As wheel is being moved in and out, observe lower end of knuckle and lower control arm. Any movement indicates abnormal ball joint wear.
4. If any movement is observed, install new lower control arm assembly.

Suspension, Rear

At regular intervals, the following rear suspension checks should be made:

1. Check for evidence of fluid leaks on rear shock absorbers. (A light film of fluid is permissible. Make sure fluid is not from sources other than shock absorber.)
2. Check shock absorber operation.
3. Check condition of upper and lower suspension arms pivot bushings and tension strut bushings.

Replace any damaged or worn components. Refer to procedures under Removal and Installation.

Shock Absorber Checks

All vehicles are equipped with low-pressure gas-filled hydraulic shock absorber struts of the direct acting type. They are non-adjustable and non-refillable. They cannot be serviced as a cartridge and must be serviced as an assembly.

1. **Oil Leak:** A light film of oil (weepage) on the upper portion of the shock absorber is permissible and is a result of proper shock lubrication. Weepage is a condition in which a thin film of oil may be deposited on the shock outer tube (body) and is normally noticed due to the collection of dust in this area. Shock absorbers which exhibit this weepage condition are functional units and should not be replaced. Leakage is a condition in which the entire shock body is covered with oil and the oil will drip from the shock onto the pavement. If this condition exists:
 - a. Ensure that fluid observed is not from sources other than the shock absorber.
 - b. Replace the worn or damaged shock absorber.
2. **Vehicle Sag:** Many times shock absorbers are replaced in an effort to solve a vehicle sag concern. Shock absorbers by design are hydraulic damping units only, and unlike suspension springs, do not support any suspension loads. Therefore, replacing a shock absorber will not correct a vehicle sag concern.
3. **Replacement in Pairs:** In the past it was recommended that shock absorbers be replaced in pairs if one unit became unserviceable. Improved sealing, due to new materials and design and improved rod machining and hardening techniques along with improved manufacturing quality checks have added to the functional reliability of shock absorbers. **Therefore, shocks no longer need to be replaced in pairs when only one unit is not serviceable.**

Vehicle Inspection

1. Check all tires for proper inflation pressure.
2. Check tire condition to confirm proper front end alignment, tire balance and overall tire condition such as separation or bulges.
3. Check the vehicle for optional suspension equipment such as heavy duty handling or trailer tow suspensions. These suspensions will have a firmer ride feeling than standard suspensions.
4. Check vehicle attitude for evidence of possible overload or sagging. Check luggage compartment area.
5. Road test vehicle to confirm customer concern after performing above Steps.

Hoist Check

1. **Noise:** Noise can be caused by loose suspension or shock attachments. Verify that all attachments or the suspension components and shock absorbers are tight. Replace any worn or damaged upper stud insulators. Replace any shock absorber that has a damaged integral lower mounting bushing. Check shock absorbers for external damage.

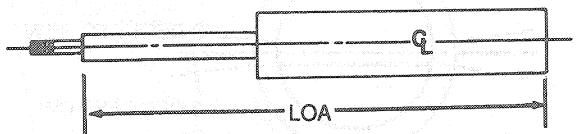
CLEANING AND INSPECTION (Continued)

2. **Bottom/Hopping:** Check condition of the rubber suspension travel stops (jounce/rebound bumpers). Replace if worn or missing. Examine for evidence of previous overload or damaged components.
3. **Force-Check:** Support lower arm or axle, and remove lower shock attachment. Stroke shock absorber body using as much travel as possible. The action should be smooth and uniform throughout each stroke. Damping forces should be equivalent on both sides of the vehicle.
4. Replace only the worn or damaged shock absorber. **Shock absorbers do not require replacement in pairs, unless both units are worn or damaged.**

Bench Test

The shock absorbers are gas-pressurized, which results in the shocks being fully extended when not restrained. If a shock does not fully extend, it is damaged and should be replaced. Check length overall (LOA). If the shock does not meet the length overall requirement, there is a good indication something internal is not to specification and the shock should be replaced.

With the shock in the normal upright position, compress it and allow it to extend three times to purge the pressure chamber of any gas that may have been introduced during handling.



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SHOCK LOA SPECIFICATION

Front	Rear
541-533mm (21.30-20.98 in.)	646-636mm (25.4-25 in.)

Place the shock absorber right side up in a vise. Hand stroke the shock absorber as fast as possible using as much travel as possible. Action should become smooth and uniform throughout each stroke. Higher resistance on extension than on compression is normal.

CAUTION: If the combination dust shield/jounce bumper has been removed from the shock absorber, care must be taken to avoid excessive bottoming of the rod during the compression stroke to avoid internal damage.

The following conditions are abnormal:

- A lag or skip at reversal of travel near mid-stroke when shock is properly primed and in the installed position
- Seizing
- Noise, other than a faint swish, such as a clicking upon fast stroke reversal
- Excessive fluid leakage
- With rod fully extended, any lateral motion of rod in relation to outer can

If shock absorber action remains erratic after purging air, install a new shock absorber, replacing only the damaged unit. Shock absorbers are not to be replaced as sets. Refer to Section 04-01 for Front Shocks or Section 04-02 for Rear Shocks.

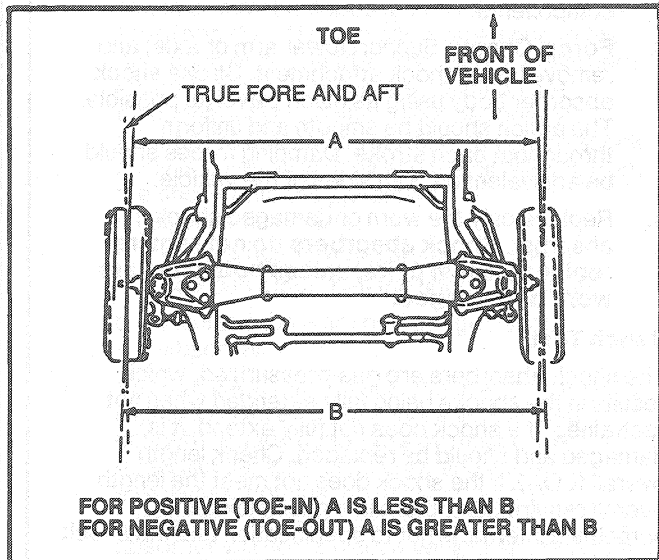
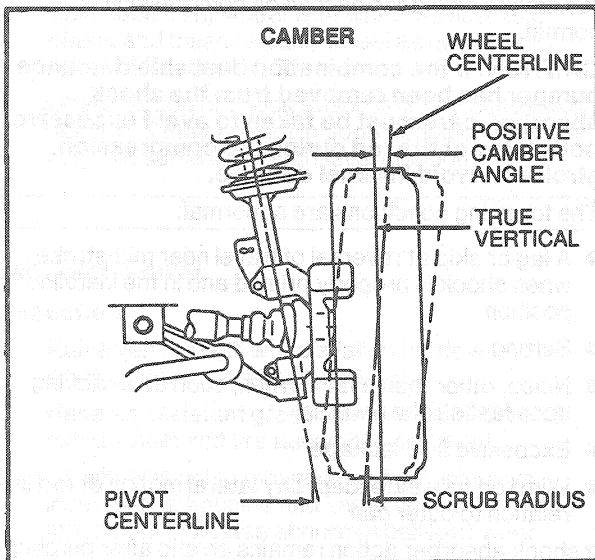
ADJUSTMENTS

Equipment Installation

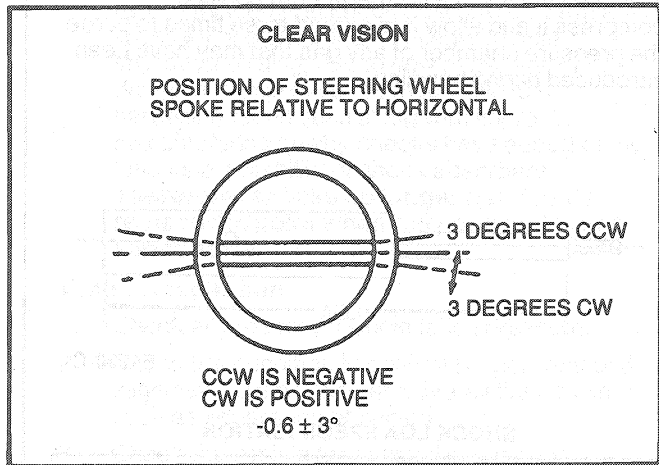
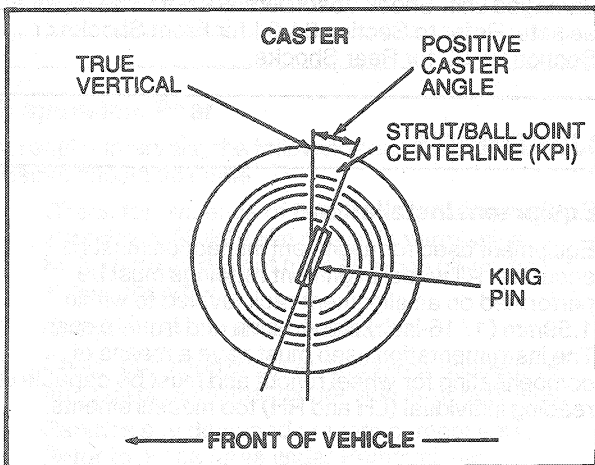
Equipment used for alignment inspection must be accurate. All wheel alignment readings must be performed on an alignment rack leveled to within 1.59mm (1/16-inch) side-to-side and front-to-rear. The instrumentation used must have a means of compensating for wheel runout and must be capable of reading individual (LH and RH) toe measurements.

ADJUSTMENTS (Continued)

Reference Definitions, Front



FOR POSITIVE (TOE-IN) A IS LESS THAN B
FOR NEGATIVE (TOE-OUT) A IS GREATER THAN B



SIDE-TO-SIDE

SIDE-TO-SIDE MEANS THE VALUE OF THE LEFT SIDE MINUS THE VALUE OF THE RIGHT SIDE
EXAMPLE:
LEFT CAMBER = + 3/4 DEGREES
RIGHT CAMBER = + 1/4 DEGREES
SIDE-TO-SIDE = 3/4 DEGREES —
1/4 DEGREES = + 1/2 DEGREES
EXAMPLE:
LEFT CAMBER = + 1/4 DEGREES
RIGHT CAMBER = +3/4 DEGREES
SIDE-TO-SIDE = 1/4 DEGREES -3/4 DEGREES =
+1/2 DEGREES

NOMINAL

THE NOMINAL VALUE IS THE PREFERRED VALUE

TOLERANCE

THE TOLERANCE IS THE RANGE OF ACCEPTABLE VALUES AROUND THE NOMINAL VALUE
EXAMPLE:
S-S CAMBER = + 1/2 DEGREES (NOM.) ± 3/4 DEGREES (TOL.) MEANS THAT VALUES BETWEEN +1-1/4 DEGREES AND -1/4 DEGREES ARE ACCEPTABLE.

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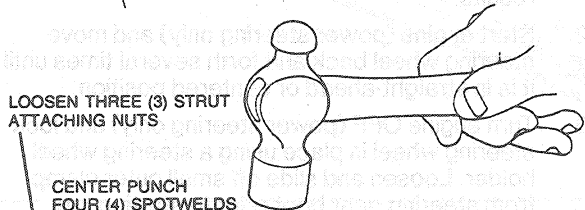
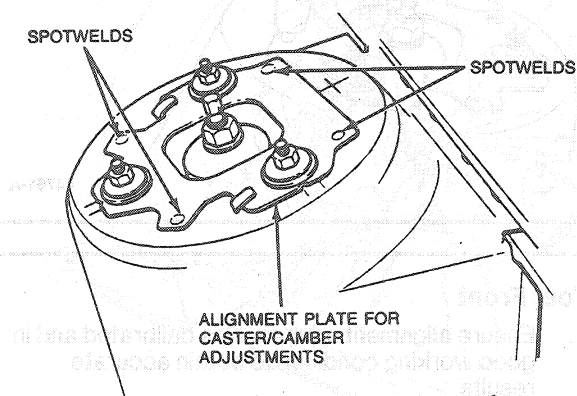
ADJUSTMENTS (Continued)

Caster and Camber, Front

NOTE: Refer to Section 02-01 to check subframe alignment before caster / camber adjustments are performed.

NOTE: Vehicles that require camber / caster adjustment can be corrected by loosening the subframe retaining bolts and shifting the subframe as required. If further adjustment is required, use the following procedure:

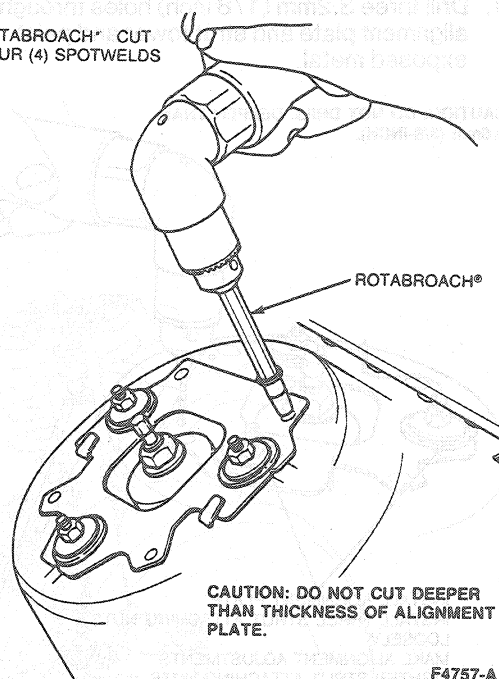
1. Center punch four spot welds on alignment plate(s).



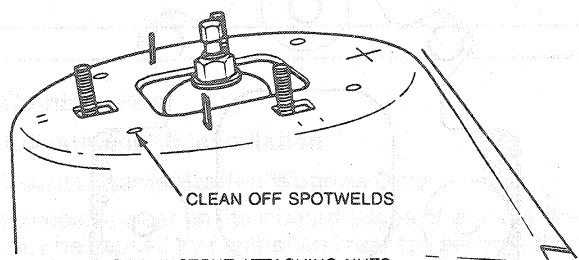
2. Loosen three nuts attaching strut to vehicle.
3. Use Rotabroach® or an equivalent to remove four welds.

CAUTION: Do not cut deeper than necessary to remove alignment plate.

USE ROTABROACH® CUT OUT FOUR (4) SPOTWELDS



4. Remove three nuts attaching strut mount to tower.
5. Remove alignment plate.
6. Clean burrs from tower and alignment plate and paint exposed metal on strut tower and plate.



REMOVE THREE (3) STRUT ATTACHING NUTS; REMOVE ALIGNMENT PLATE. CLEAN BURRS AND SPOTWELDS FROM STRUT TOWER. STRAIGHTEN ALIGNMENT PLATE. PAINT EXPOSED METAL TO PREVENT CORROSION.

7. Install alignment plate.
8. Install three strut mount nuts, loosely.

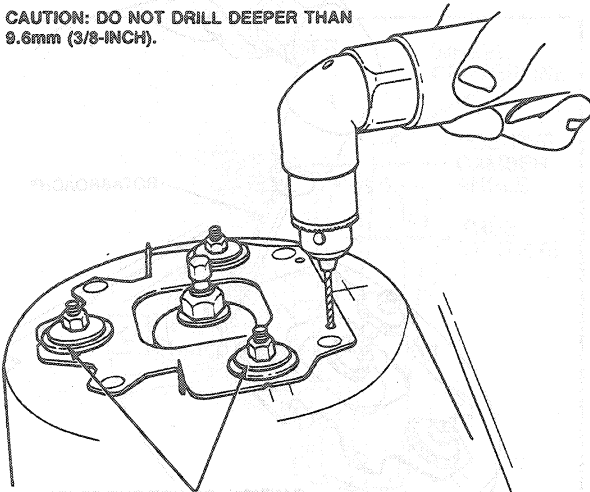
NOTE: Caster measurements must be made on the LH side by turning the LH wheel through the prescribed angle of sweep and on the RH side by turning the RH wheel through the prescribed angle of sweep.

NOTE: When using alignment equipment designed to measure caster on both the RH and LH side, turning only one wheel will result in a significant error in the caster angle for the opposite side.
9. Make alignment-camber / caster adjustments.
10. Tighten three strut mount nuts to 27-41 N·m (20-30 lb-ft).

ADJUSTMENTS (Continued)

11. Drill three 3.2mm (1/8 inch) holes through alignment plate and strut tower and paint exposed metal.

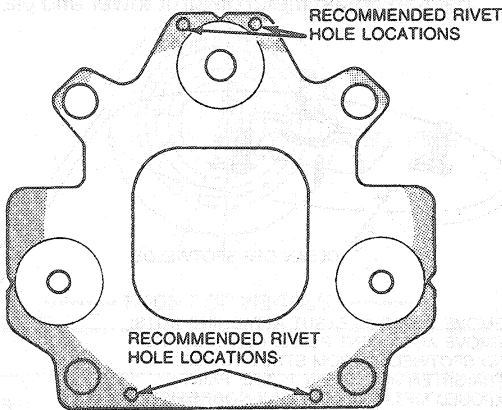
CAUTION: DO NOT DRILL DEEPER THAN 9.6mm (3/8-INCH).



INSTALL ALIGNMENT PLATE
INSTALL THREE STRUT ATTACHING NUTS
LOOSELY
MAKE ALIGNMENT ADJUSTMENTS
TIGHTEN STRUT ATTACHING NUTS
DRILL THREE HOLES FOR RIVETS

F4759-B

CAUTION: Do not drill deeper than 9.6mm (3/8 inch) into shock tower.

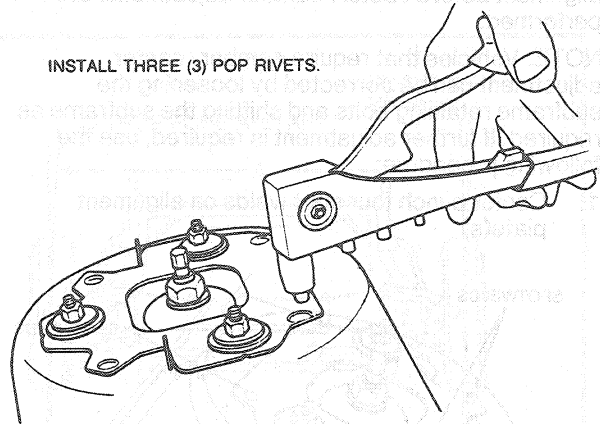


DRILL THREE (3) HOLES IN ALIGNMENT PLATE
FOR 3.2mm (1/8-INCH)
DRILL IN SHADED AREA ONLY

F4760-A

12. Install three pop-rivets 3.2mm (1/8 inch) diameter x 6.4mm (1/4 inch) grip range.

INSTALL THREE (3) POP RIVETS.



F4761-A

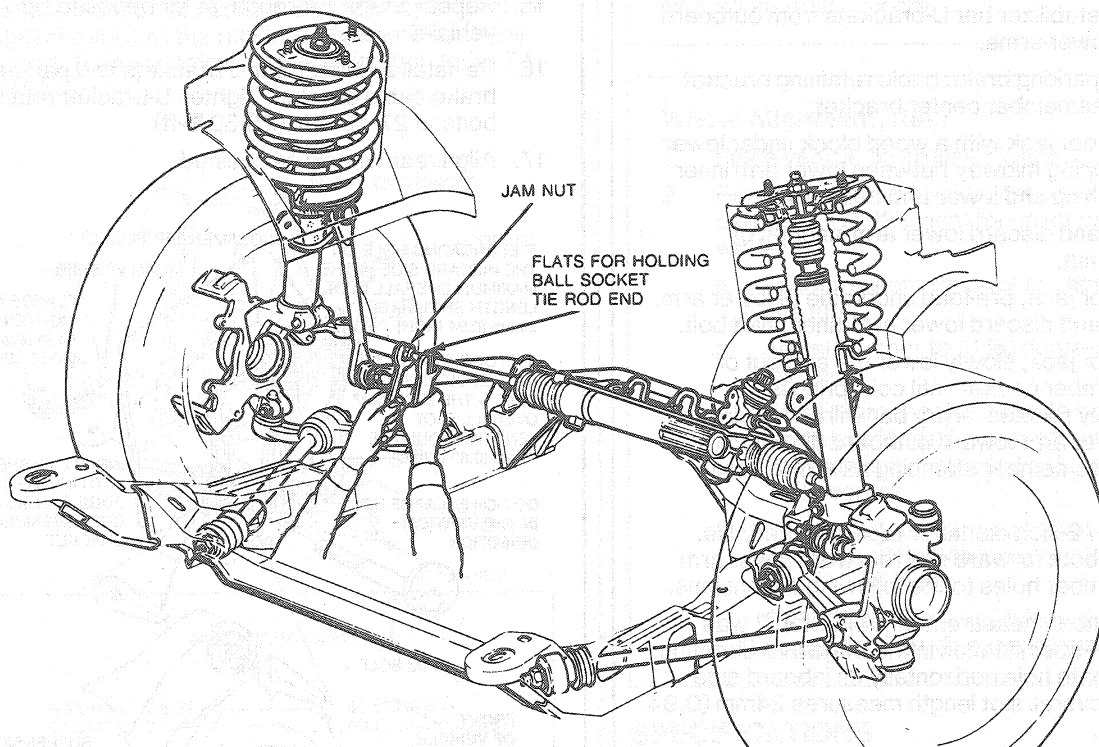
Toe, Front

1. Ensure alignment equipment is calibrated and in good working condition to obtain accurate results.
2. Start engine (power steering only) and move steering wheel back and forth several times until it is in straight-ahead or centered position.
3. Turn engine OFF (power steering only) and lock steering wheel in place using a steering wheel holder. Loosen and slide off small outer clamp from steering gear boot prior to starting toe adjustment to prevent boot from twisting.

NOTE: When jam nuts are loosened for toe adjustment, the nuts must be tightened to 48-68 N·m (35-50 lb·ft). Attach boot clamp after setting is completed and ensure boot is not twisted.

ADJUSTMENTS (Continued)

4. Adjust LH and RH tie rods until each wheel has one-half of desired total toe specification. Correct toe setting is given in Specifications.



F4229-A

Wheel Turning Angle, Front

The turning angle cannot be adjusted directly because it is a result of the combination of caster, camber and toe adjustments and should, therefore, be measured only after the toe adjustment has been made. When the inside wheel is turned 20 degrees, turning angle of outside wheel should be as specified in Specifications.

NOTE: If the turning angle does not measure to specification, check the steering knuckle or other suspension or steering parts for a bent or loose condition.

Steering Pull/Drift

NOTE: When trying to correct for pull/drift, refer to the following conditions:

Vehicle will pull/drift:

- Toward the side with the most positive camber.
- Toward the side with the least positive caster.

NOTE: Rear camber is preset at the factory for the sedan and wagon. However, if the rear camber for the station wagon is out of specification, refer to Camber, Rear.

Camber, Rear**Adjustment Kit Installation****Taurus/Sable Station Wagons Only**

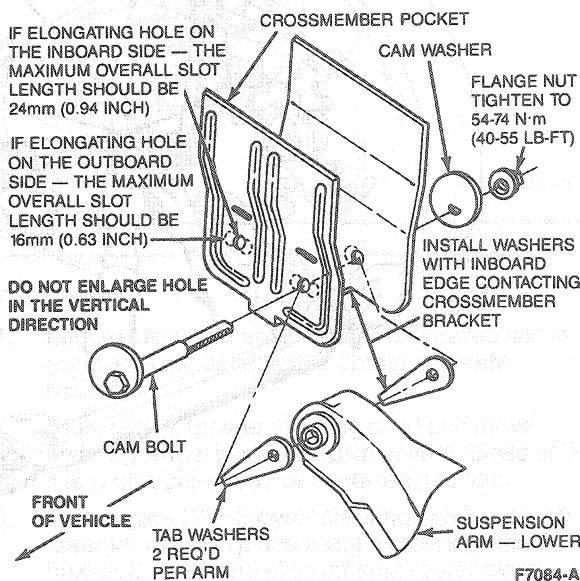
Excessive wear on the inboard edges of the rear tires may be caused by camber and rear toe settings that are not within specification. To correct this, reset rear camber and rear toe to specification. If camber cannot be set to specification, install an adjustable camber kit if not previously installed, using the following service procedure.

- Inspect rear suspension for damage. Replace any damaged components before continuing.
- Measure and record vehicle rear wheel alignment settings for LH camber, RH camber, LH toe and RH toe.
 - If vehicle is in specification for camber but out of specification for toe, reset toe to nominal specification of +0.06 degrees toe-in for each individual wheel.
 - If both camber and toe are within specification, reset toe to nominal specification of +0.06 degrees toe-in for each individual wheel.
 - If vehicle is out of specification for camber on either side, proceed with Step 3.

ADJUSTMENTS (Continued)

3. Obtain Rear Camber Adjustment Kit E7DZ-5K75 1-A or equivalent.
4. Raise vehicle using frame hoist. Refer to Section 00-02.
5. Remove stabilizer bar U-brackets from outboard ends of lower arms.
6. Remove parking brake cable retaining bracket from crossmember center bracket.
7. Place a floor jack with a wood block under lower arm stamping midway between lower arm inner pivot bushing and lower arm coil spring.
8. Remove and discard lower arm inner pivot retaining nut.
9. Using floor jack, pre-load underside of lower arm. Remove and discard lower arm inner pivot bolt.
10. Using floor jack, slowly lower the arm out of crossmember pocket until coil spring is completely relaxed. A pry bar will be required to guide lower arm toward outboard direction to clear crossmember stamping as arm is being lowered.
11. Using a 1/2-inch diameter tapered rotary file, elongate both forward and rearward lower arm crossmember holes to the following dimensions.
 - a. If camber measurement from Step 2 was out-of-specification in the negative direction, elongate hole horizontally on inboard side until overall slot length measures 24mm (0.94 inch).
 - b. If camber measurement from Step 2 was out-of-specification in the positive direction, elongate hole horizontally on outboard side until overall slot length measures 16mm (0.63 inch).
12. Using floor jack, raise lower arm back up into crossmember pocket.
13. Install kit inner pivot cam bolt from front side of crossmember. As cam bolt is being installed, the two kit tab washers are to be installed on bolts so that one washer is trapped between each end of inner pivot bushing inner sleeve and inside surface of crossmember pocket.

14. Place kit cam washer and nut on bolt, position tab washers to be in contact with crossmember bracket, and tighten nut to 54-74 N·m (40-55 lb-ft).
15. Repeat Steps 7 through 14 for opposite side of vehicle.
16. Reinstall stabilizer bar U-brackets and parking brake cable bracket. Tighten U-bracket retaining bolts to 27-40 N·m (20-30 lb-ft).
17. Align rear wheels as outlined.



NOTE: If the turning angle does not measure to specification, check the steering knuckle or other suspension or steering parts for a bent or loose condition.

NOTE: Rear camber is equal at 0° turn for the sedan and wagon, however, if the rear camber for the station wagon is out of specification, refer to Camber, front.

NOTE: When trying to correct for camber, refer to the following conditions:

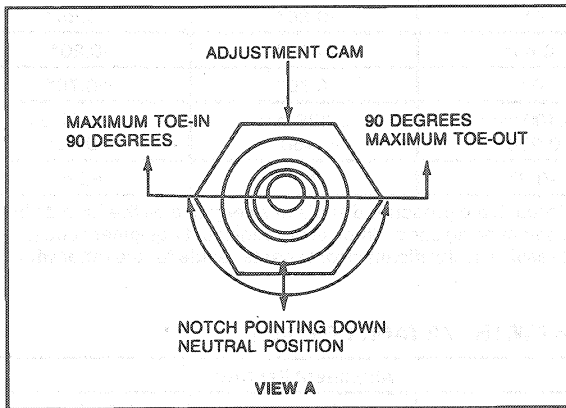
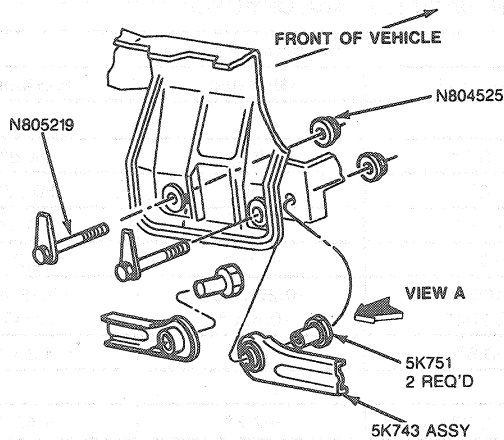
Vehicle will pull left:

- a. Toward the side with the most positive camber.
- b. Toward the side with the least positive camber.

ADJUSTMENTS (Continued)

Toe, Rear

Toe-in and Toe-out can be adjusted when it is determined that the vehicle is not within alignment specification. To adjust the toe of either wheel, loosen the bolt attaching rear control arm to body and rotate alignment cam until the required alignment setting is obtained. Tighten control arm retaining bolt to 54-74 N·m (40-55 lb-ft).



Place a ruler on the center of the front wheel and note where the vertical line of light crosses the scale. Do the same for the other side.

The difference between the two readings should not exceed 25.4mm (1 inch).

Wheel Alignment, Rear

1. Place vehicle on alignment rack.
 2. Reset rear toe to nominal specification of +0.06 degrees (+0.031 inch) toe-in for each individual wheel.
 - a. Loosen lower arm pivot nut approximately one turn.
 - b. Adjust camber to -0.90 degrees by rotating cam bolt.
- NOTE: Rim of cams will ride against ribs which are formed in crossmember bracket. The cam is not intended to be turned a full 360 degrees.
- c. Hold cam bolt head in position with a back-up wrench and tighten inner pivot nut to 54-74 N·m (40-55 lb-ft).

CAUTION: Use care when tightening so as not to disturb cam/alignment setting.

SPECIFICATIONS

FRONT WHEEL TURNING ANGLE

Vehicle	Turning Angle at Outside Wheel with Inside Wheel Turned 20 Degrees
Taurus / Sable	Left Wheel and Right Wheel 18.25°

Wheel Toe, Rear—Individual

NOTE: If the alignment equipment is Rotunda, computerized 4-wheel alignment system 006-01803 or equivalent, the following method for determining individual rear wheel toe can be used instead of sighting the rear wheels.

SPECIFICATIONS (Continued)

WHEELBASE AND TREAD WIDTH

Vehicle	Wheelbase		Tread Width			
	mm	Inches	Front		Rear	
			mm	Inches	mm	Inches
Taurus/Sable						
Sedan	2694	106.1	1565.6	61.6	1520.8	59.9
Wagon	2694	106.1	1565.6	61.6	1518	59.8

FRONT WHEEL ALIGNMENT (CURB HEIGHT WITH 1/2 TANK OF FUEL)

Item	Alignment Factors		
	Nominal	Minimum	Maximum
Taurus/Sable Sedan			
Caster ^a	+3.8°	+2.8°	+4.8°
Caster Difference Side-to-Side (left minus right)	0°	-0.85°	+0.85°
Camber	-0.5°	-1.1°	+0.1°
Camber Difference Side-to-Side (left minus right)	0°	-0.70°	+0.70°
Total Toe (left plus right)	-0.100 inch -0.200°	-0.225 inch -0.450°	+0.15 inch +0.30°
Clear Vision ^b	-0.6°	-3.6°	+2.4°
Taurus/Sable Station Wagon			
Caster ^a	+3.7°	+2.7°	+4.7°
Caster Difference Side-to-Side (left minus right)	0°	-0.85°	+0.85°
Camber	-0.40°	-1.00°	-0.20°
Camber Difference Side-to-Side (left minus right)	0°	-0.70°	+0.70°
Total Toe (left plus right)	-0.100 inch -0.200°	-0.225 inch -0.450°	+0.15 inch +0.30°
Clear Vision ^b	-0.6°	-3.6°	+2.4°

- a Caster measurements must be made on the LH side by turning left wheel through the prescribed angle of sweep and on the RH side by turning the right wheel through the prescribed angle of sweep for the equipment being used. When using alignment equipment designed to measure caster on both the RH and LH side, turning only one wheel will result in a significant error in caster angle for the other wheel.
- b Steering wheel angle—negative is ccw.

REAR WHEEL ALIGNMENT (CURB HEIGHT WITH 1/2 TANK OF FUEL)

Item	Alignment Factors		
	Nominal	Minimum	Maximum
Taurus/Sable Sedan			
Camber ^a	-0.90°	-1.60°	-0.20°
Camber Difference ^a Side-to-Side (left minus right)	0°	-1.20°	+1.20°
Toe (Individual sides)	+0.030 inch +0.06°	-0.095 inch -0.19°	+0.155 inch +0.31°
Total Toe (left plus right)	+0.060 inch +0.12°	-0.060 inch -0.13°	+0.185 inch +0.37°
Taurus/Sable Station Wagon			
Camber ^b	-0.90°	-1.90°	+0.10°
Camber Difference ^b Side-to-Side (left minus right)	0°	-1.20°	+1.20°
Toe (individual sides)	+0.030 inch +0.06°	-0.095 inch -0.19°	+0.155 inch +0.31°
Total Toe (left plus right)	+0.060 inch +0.12°	-0.060 inch -0.13°	+0.185 inch +0.37°

- a Camber is factory set and cannot be adjusted.
- b Adjustable with kit, Part No. E70Z-5K751-A.

SPECIFICATIONS (Continued)

TORQUE SPECIFICATIONS

Description	N·m	Lb·Ft
Strut Top Mount Nuts	27-41	20-30
Tie Rod Jam Nuts	48-68	35-50
Rear Control Arm Bolt	61-88	45-65
Rear Alignment Kit Cam Nut	54-74	40-55
Rear Stabilizer U-Bracket Bolts	27-40	20-30

SPECIAL SERVICE TOOLS

ROTUNDA EQUIPMENT

Model	Description
006-01803	Computerized 4-Wheel Alignment System

SECTION 04-01 Suspension and Wheel Ends, Front

SUBJECT	PAGE	SUBJECT	PAGE
ADJUSTMENTS		REMOVAL AND INSTALLATION (Cont'd.)	
Wheel Bearings	04-01-17	Shock Absorber Strut, Spring, Bearing and Seat Assembly, and Upper Mount	04-01-12
DESCRIPTION		Stabilizer Bar/Link Assembly and/or Insulators	04-01-8
Component Replacement	04-01-2	Steering Knuckle	04-01-16
Components	04-01-2	Tension Strut-to-Subframe Insulators	04-01-8
Suspension Fasteners	04-01-3	SPECIAL SERVICE TOOLS	04-01-18
Wheel Assembly	04-01-5	SPECIFICATIONS	04-01-17
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Control Arm, Lower	04-01-6		
Hub and Wheel Bearings	04-01-9		

VEHICLE APPLICATION

Taurus/Sable.

DESCRIPTION

The front-wheel drive front suspension is a MacPherson gas-pressurized strut design. The shock absorber strut assembly includes a rubber isolated top mount, seat and bearing assembly and coil spring insulator, and is attached at the top by three bolts retaining the top mount of the strut to the body side apron. The lower end of the assembly is inserted into a pinch joint designed into the knuckle. A forged lower arm assembly is attached to the subframe and steering knuckle. A tension strut connects to the lower arm and to the subframe. A sealed cartridge bearing is pressed into the steering knuckle and retained with a snap ring. The front-wheel hub is pressed into the bearing. A halfshaft outboard CV joint spline is pressed through the hub and is retained by a prevailing torque nut.

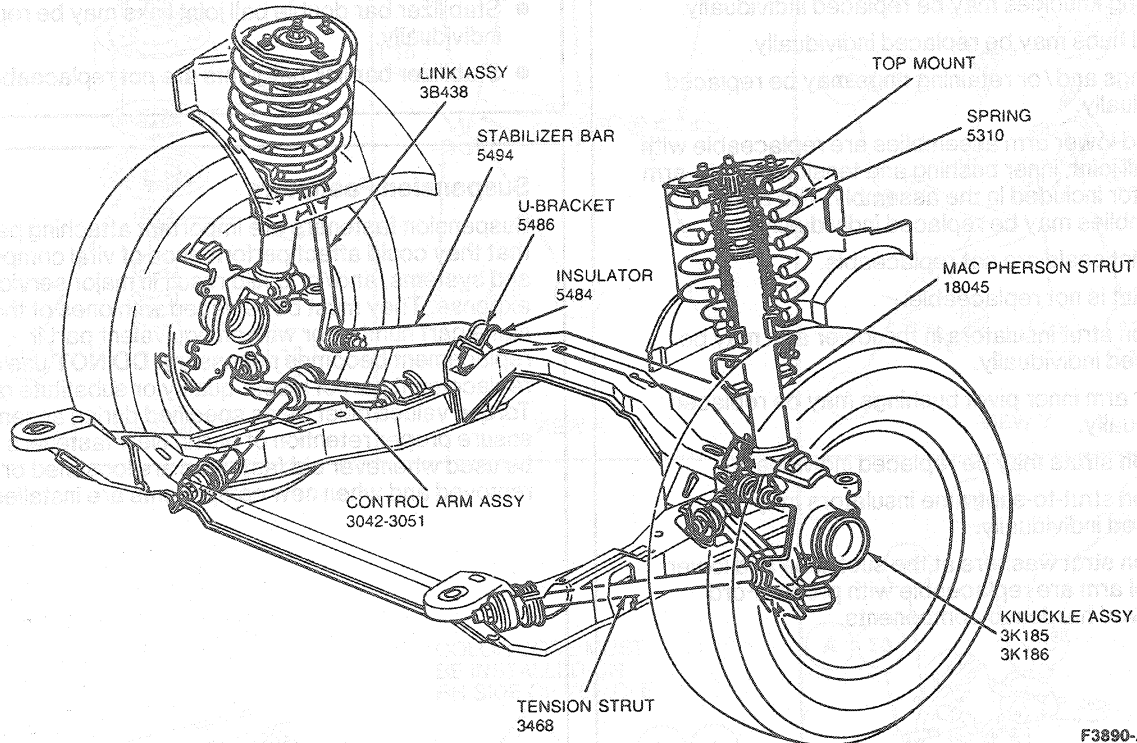
WARNING: ALL VEHICLES ARE EQUIPPED WITH GAS-PRESSURIZED SHOCK ABSORBERS WHICH WILL EXTEND UNASSISTED. DO NOT APPLY HEAT OR FLAME TO THE SHOCK STRUT DURING REMOVAL.

When a gas-pressurized shock strut is held in a vertical position, it is normal for it to be fully extended because the strut is charged with a gas pressure of up to 593 kPa (86 psi) above the oil level which results in an extending force on the piston rod that can produce a fully extended preload of up to 222 N (50 lb) on the piston rod.

Due to the preload, it will take up to 222 N (50 lb) to push the strut rod down into the cylinder tube (outer can). **This is normal and does not indicate a binding condition.**

DESCRIPTION (Continued)

When installed on the vehicle, the gas-pressurized shock strut will exhibit more oscillation (bounce) when the vehicle is bounced up/down at the front bumper than with a conventional strut. This is due to the gas pressure and valving and is a normal condition.



F3890-A

Components

- **Strut Upper Mounts:** Isolate strut and spring from body.
- **Seat and Bearing Assembly:** Provides a bearing pivot point and retains suspension spring.
- **Coil Springs:** Allow proper setting of suspension ride heights and control suspension travel during driving/handling maneuvers.
- **Steering Knuckles:** Transmit steering input pivoting about the lower control arm ball joints and upper mount bearing, house driveline components which propel vehicle, and support brake caliper through pins.
- **Forged Lower Control Arms:** Control lateral (side-to-side) movement of each front wheel. Inner pivot attachment is pivot point for suspension.
- **Ball Joints:** Connect steering knuckle to outer ends of forged lower control arms. They are pivot points for suspension travel and turning.
- **Tension Struts:** Control longitudinal (fore-and-aft) movement of wheels to reduce harshness when wheels hit sudden irregularities in road surface.
- **Stabilizer Bar:** Transmits forces to control vehicle roll during cornering.

- **Stabilizer Bar Link Assembly:** Provides increased roll control by attaching the stabilizer bar to the shock strut.
- **Shock Absorber Struts:** Provide dynamic damping of suspension, limit downward movement of wheels by an internal rebound stop and upward movement with an external jounce bumper. Provide lateral, longitudinal and vertical support for the front wheels.

All suspension mounting points are rubber insulated to minimize transfer of road noise and vibration to body and interior.

Component Replacement

The following components may be replaced either individually or as an assembly:

- Gas-pressurized shock absorber struts must be replaced as an assembly. The strut is not serviceable. Replace only the damaged shock absorber strut. Shock absorbers are not to be replaced as sets.
- Strut upper mounts may be replaced individually.

DESCRIPTION (Continued)

- Bearing and seat assemblies may be replaced individually.
- Coil springs may be replaced individually.
- Lower coil spring insulator may be replaced individually.
- Steering knuckles may be replaced individually.
- Wheel hubs may be replaced individually.
- Bearings and /or retaining rings may be replaced individually.
- Forged lower arm assemblies are replaceable with the ball joint, inner bushing and tension strut-to-arm insulator included in the assembly. The arm assemblies may be replaced individually.
- Ball joint seals are not replaceable.
- Ball joint is not replaceable.
- Tension strut insulators in the lower arm may be replaced individually.
- Lower arm inner pivot bushings may be replaced individually.
- Tension struts may be replaced individually.
- Tension strut-to-subframe insulators may be replaced individually.
- Tension strut washers at the subframe and lower control arm are replaceable with proper Ford approved hardened components.

- Stabilizer bar may be replaced.
- Stabilizer bar-to-subframe insulators may be replaced individually.
- Stabilizer bar brackets may be replaced individually.
- Stabilizer bar double ball joint links may be replaced individually.
- Stabilizer bar link ball joints are not replaceable.

Suspension Fasteners

Suspension fasteners are important attaching parts in that they could affect performance of vital components and systems, and /or could result in major service expense. They must be replaced with ones of the same part number or with an equivalent part if replacement becomes necessary. **DO NOT** use a replacement part of lesser quality or substitute design. Torque values must be as specified during assembly to ensure proper retention of parts. New fasteners must be used whenever old fasteners are loosened or removed and when new components are installed.

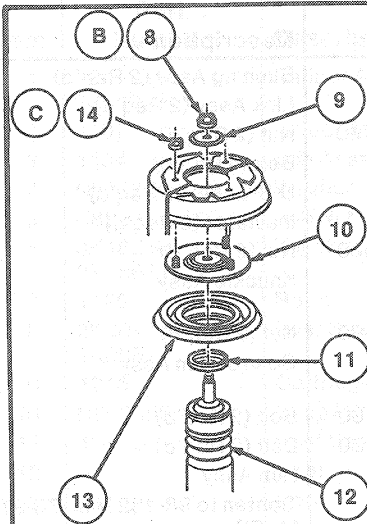
- Front Upper Mount: Isolates strut and spring from body.
- Seat and Bearing Assembly: Provides a bearing pivot point and retains suspension spring.
- Coil Springs: Allow proper seating of suspension; help height and control suspension travel during churning /ranching maneuvers.
- Steering Knuckles: Transmit steering input pivoting about the lower control arm ball joints and upper mount bearing; house steering components which propel vehicle, and support brake caliper /braking pins.
- Forged Lower Control Arms: Control lateral (side-to-side) movement of each front wheel; inner pivot attachment is pivot point for suspension.
- Ball Joints: Connect steering knuckle to outer ends of forged lower control arms; they are pivot points for suspension travel and turning.
- Tension Struts: Control longitudinal (fore-and-aft) movement of wheels to reduce harshness when wheels hit sudden irregularities in road surface.
- Stabilizer Bar: Transmits forces to control vehicle for driving cornering.

Component Replacement

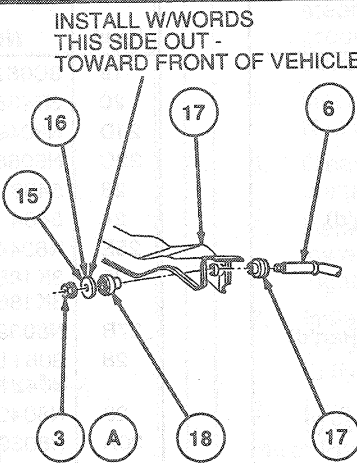
The following components may be replaced either individually or as an assembly:

- Gas-pressurized shock absorber struts must be replaced as an assembly. The struts not replaceable. Repair only the damaged shock absorber strut. Shock absorbers are not to be replaced as sets.
- Strut upper mounts may be replaced individually.

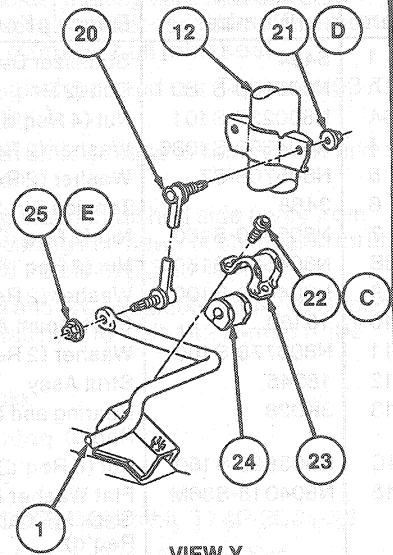
DESCRIPTION (Continued)



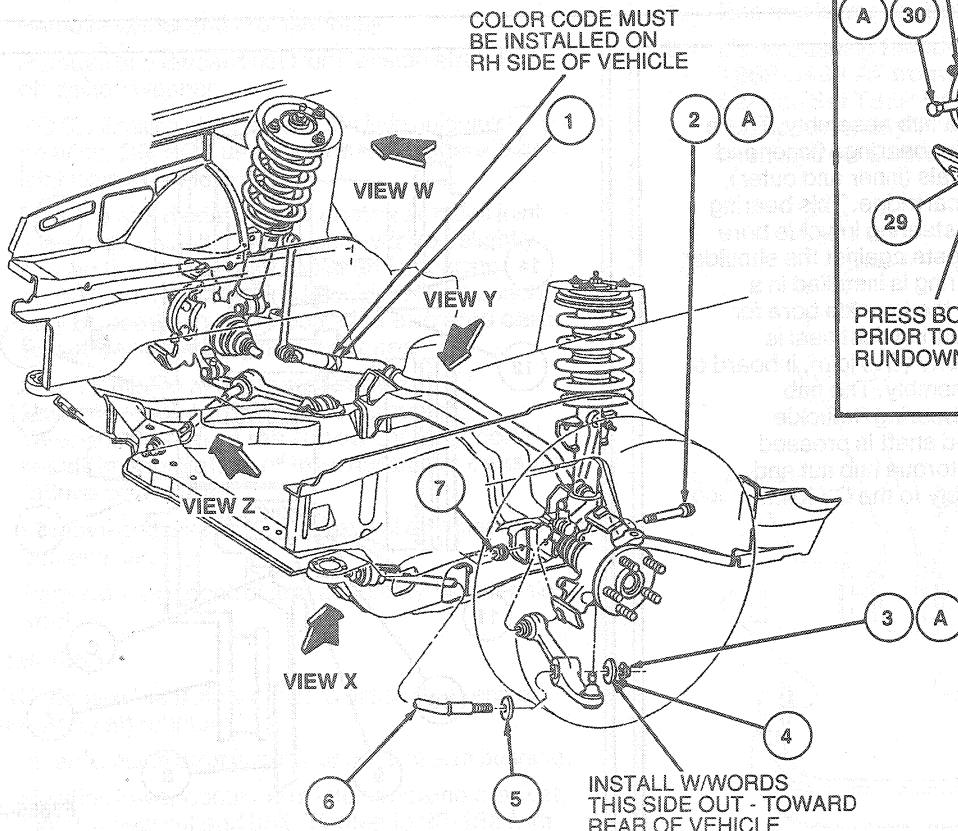
VIEW W



VIEW X



VIEW Y



VIEW W

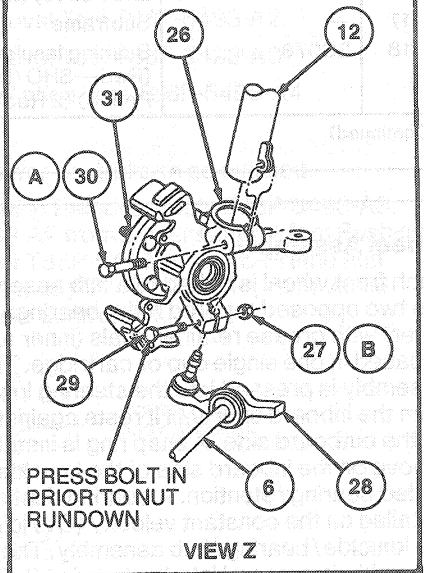
VIEW Y

VIEW Z

VIEW X

COLOR CODE MUST BE INSTALLED ON RH SIDE OF VEHICLE

INSTALL W/WORDS THIS SIDE OUT - TOWARD REAR OF VEHICLE



VIEW Z

PRESS BOLT IN PRIOR TO NUT RUNDOWN

F3891-H

DESCRIPTION (Continued)

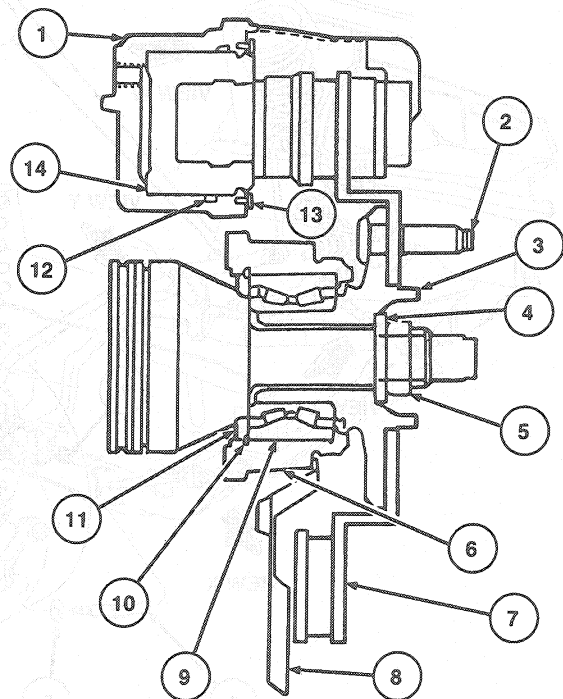
Item	Part Number	Description
1	5494	Stabilizer Bar
2A	N803990-S160	Bolt (2 Req'd)
3A	N800237-S101	Nut (4 Req'd)
4	N804350-S1036	Washer (2 Req'd)
5	N805708-S7	Washer (2 Req'd)
6	3468	Tension Strut (2 Req'd)
7	N805480-S160	Nut (2 Req'd)
8B	N804608-S150	Nut (2 Req'd)
9	N804002-S100	Washer (2 Req'd)
10	18183	Strut Mount Assy (2 Req'd)
11	N806779-S100	Washer (2 Req'd)
12	18045	Strut Assy
13	3K028	Bearing and Seat Assy (2 Req'd)
14C	N803826-S150	Nut (6 Req'd)
15	N804018-S36M	Flat Washer (Except SHO/MTX and Police) (2 Req'd)
16	N805627-S36M	Cupped Washer (SHO/MTX and Police) (2 Req'd)
17	—	Subframe
18	3C078	Bushing Insulator (Red—SHO/MTX and Police) (2 Req'd)

(Continued)

Item	Part Number	Description
19	3C067	Bushing Assy (2 Req'd)
20	3B438	Link Assy (2 Req'd)
21D	N804911-S160	Nut (2 Req'd)
22C	N806899-S7	Bolt (4 Req'd)
23	5486	U-Bracket (2 Req'd)
24	5484	Insulator (2 Req'd)
25E	N804446-S160	Nut (2 Req'd)
26	3K185 RH 3K186 LH	Knuckle Assy
27B	N803985-S160	Nut (2 Req'd)
28	3051 LH 3042 RH	Control Arm Assy
29	N804021-S160	Bolt (2 Req'd)
30A	N803989-S160	Bolt (2 Req'd)
31	1104	Hub Assy
A		Tighten to 98-132 N-m (73-97 Lb-Ft)
B		Tighten to 53-72 N-m (40-53 Lb-Ft)
C		Tighten to 30-40 N-m (23-29 Lb-Ft)
D		Tighten to 77-103 N-m (57-75 Lb-Ft)
E		Tighten to 47-63 N-m (35-46 Lb-Ft)

Wheel Assembly

Each front wheel is bolted to a hub assembly. There are two opposed tapered roller bearings (inner and outer) with grease retainer seals (inner and outer), encased in one single cup or cartridge. This bearing assembly is pressed into the steering knuckle bore from the inboard side until it rests against the shoulder on the outboard side. A snap ring is installed in a groove on the inboard side of the knuckle bore for added bearing retention. A bearing dust seal is installed on the constant velocity (CV) joint, inboard of the knuckle/bearing/hub assembly. The hub assembly is pressed into the bearing/knuckle assembly. The CV joint splined shaft is pressed through the hub. A prevailing torque hub nut and washer retain the hub assembly to the CV joint.



F7655-A

DESCRIPTION (Continued)

Item	Part Number	Description
1	2B118 RH 2B119 LH	Caliper Assy
2	1107	Wheel Bolt Assy
3	1104	Hub Assy
4	N801336-S101	Washer
5	N804199-S191	Hub Nut
6	3K185 RH 3K186 LH	Knuckle Assy
7	1125	Rotor
8	2K004 RH 2K005 LH	Dust Shield
9	1215	Cartridge Bearing Assy
10	N803955-S	Snap Ring
11	1N013	Dust Seal Assy
12	—	Seal
13	—	Boot
14	—	Piston

REMOVAL AND INSTALLATION

Control Arm, Lower

Removal

1. Raise vehicle on a hoist. Refer to Section 00-02.
2. Remove wheel and tire assembly.
3. Remove and discard nut from tension strut. Pull off dished washer.
NOTE: Ensure steering column is in unlocked position. **DO NOT** use a hammer to separate ball joint from knuckle.
4. Remove and discard lower control arm ball joint nut and pinch bolt. Using a screwdriver, slightly spread the knuckle pinch joint and separate control arm from steering knuckle. A drift punch may be used to remove bolt. **Use extreme care to not damage ball joint boot seal.**
CAUTION: Do not allow steering knuckle/halfshaft to move outward. Over-extension of the tripod CV joint could result in separation of internal parts, causing failure of the joint.
5. Remove and discard lower control arm inner pivot bolt and nut.
6. Remove lower control arm assembly from tension strut.

Installation

NOTE: Ensure the front washer is present at tension strut-to-arm attachment.

1. Insert tension strut into lower control arm bushing.
2. Position lower control arm into subframe bracket. Install a new nut and bolt. Tighten to 98-132 N·m (73-97 lb-ft).

3. Assemble lower control arm ball joint stud to steering knuckle, making sure that ball stud groove is properly positioned. **Use extreme care to not damage ball joint seal.**
4. Insert a new pinch bolt and nut. Tighten to 53-72 N·m (40-53 lb-ft).
5. Clean tension strut threads to remove dirt and contamination.
6. Install dished washer, dished side away from lower arm bushing and new nut on tension strut. Tighten to 98-132 N·m (73-97 lb-ft).
7. Install wheel and tire assembly. Refer to Section 04-04. Tighten nuts to 109-142 N·m (81-105 lb-ft).
8. Lower vehicle.

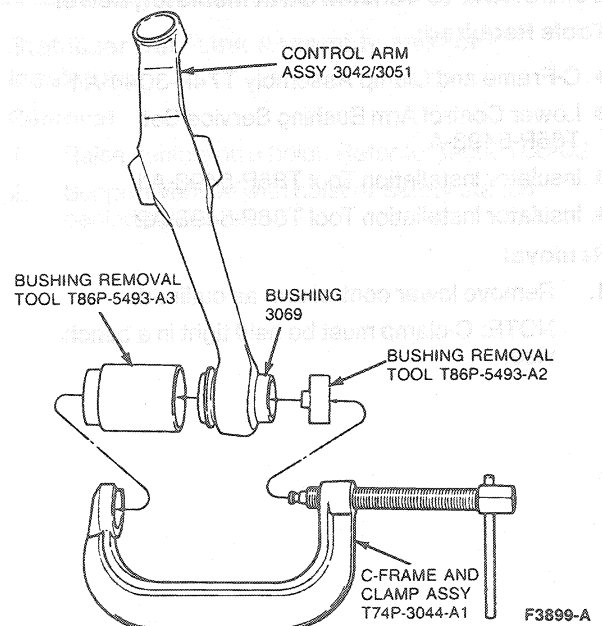
Inner Pivot Bushing

Tools Required:

- C-Frame and Clamp Assembly T74P-3044-A1
- Lower Control Arm Bushing Service Set T86P-5493-A
- Bushing Removal Tool T86P-5493-A2
- Bushing Removal Tool T86P-5493-A3
- Bushing Installation Tool T86P-5493-A4

Removal

1. Remove lower control arm as outlined.
2. Using Bushing Removal Tools T86P-5493-A3, T86P-5493-A2 from Lower Control Arm Bushing Service Set T86P-5493-A, and C-Frame and Clamp Assembly T74P-3044-A1, remove old bushing from control arm.



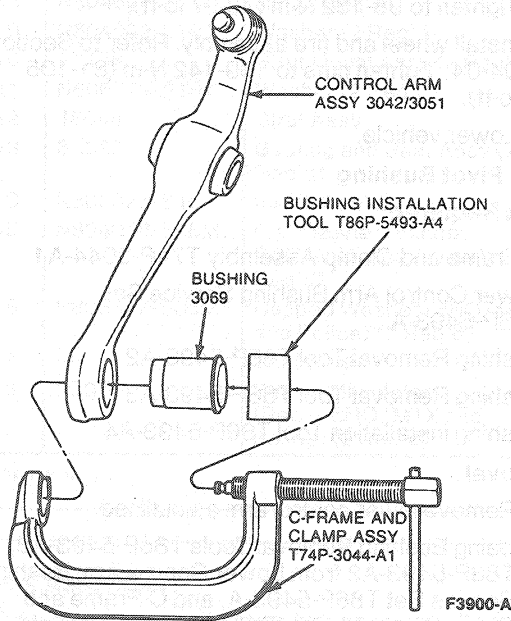
NOTE: C-clamp must be held tight in a bench vise.

REMOVAL AND INSTALLATION (Continued)

Installation

NOTE: Ensure that the bushing flange is at front of the arm.

- Using Bushing Installation Tool T86P-5493-A4 from Lower Control Arm Bushing Service Set T86P-5493-A, and C-Frame and Clamp Assembly T74P-3044-A 1, install new bushing in lower control arm by tightening C-clamp slowly until the tool bottoms on arm. Tool sets the bushing to correct installation depth.



- Install lower control arm as outlined.

Control Arm-to-Tension Strut Insulator, Lower
Tools Required:

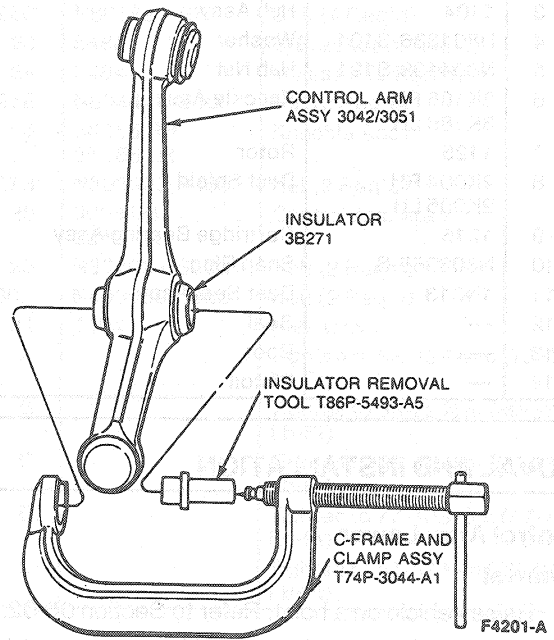
- C-Frame and Clamp Assembly T74P-3044-A 1
- Lower Control Arm Bushing Service Set T86P-5493-A
- Insulator Installation Tool T86P-5493-A 1
- Insulator Installation Tool T86P-5493-A2

Removal

- Remove lower control arm as outlined.

NOTE: C-clamp must be held tight in a bench vise.

- Using Insulator Removal Tool T86P-5493-A5 from Lower Control Arm Bushing Service Set T86P-5493-A, and C-Frame and Clamp Assembly T74P-3044-A 1, remove old bushing from control arm.



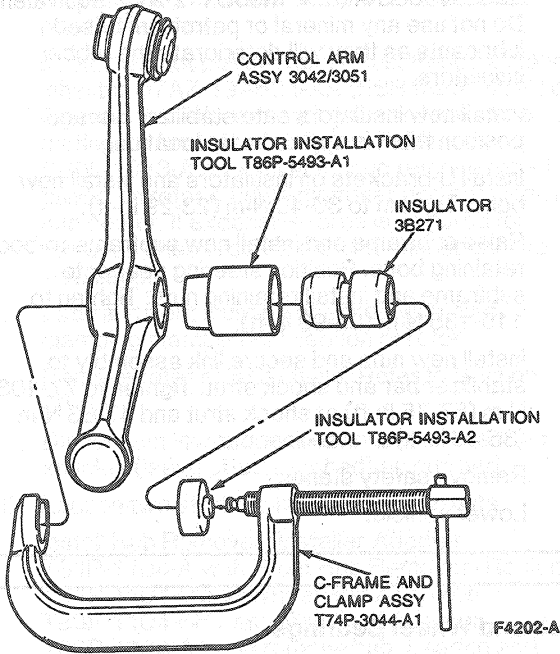
Installation

NOTE: Saturate new bushing and lower arm with vegetable oil such as Mazola® or an equivalent oil. Use only vegetable oil. Any mineral or petroleum based oil or brake fluid will deteriorate the rubber bushing.

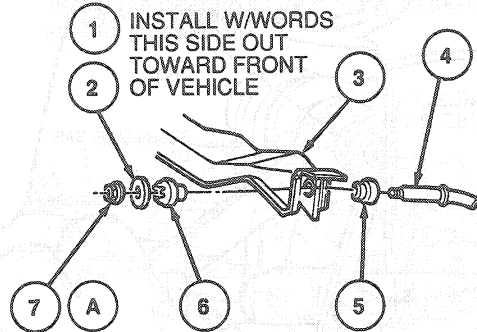
- Using Insulator Installation Tools T86P-5493-A 1, T86P-5493-A2 from Lower Control Arm Bushing Service Set T86P-5493-A, and C-Frame and Clamp Assembly T74P-3044-A 1, install new insulator bushing in lower control arm by tightening the C-clamp very slowly until bushing pops into place.

REMOVAL AND INSTALLATION (Continued)

2. Install lower control arm as outlined.



4. Install new washer and new nut. Tighten to 98-132 N-m (73-97 lb-ft).
5. Install lower control arm as outlined.



Item	Part Number	Description
1	N8040 18-S36M	Flatwasher (Except SHO /MTX and Police) (2 Req'd)
2	N805627-S36M	Cupped Washer (SHO and Police) (2 Req'd)
3	—	Subframe
4	3468	Tension Strut (2 Req'd)
5	3C078	Insulator (2 Req'd)
6	3C067	Bushing Assy (2 Req'd)
7A	N800237-S 101	Nut (2 Req'd)
A		Tighten to 98- 132 N-m (73-97 Lb-Ft)

Tension Strut-to-Subframe Insulators

Removal

1. Remove lower control arm as outlined.
2. Remove and discard nut, washer and insulator from front of tension strut and pull strut rearward to remove from subframe.
3. Remove and discard insulator from tension strut.

Installation

1. Install new insulator on tension strut end and insert into subframe.
2. Install new front insulator.
3. Clean tension strut threads to remove dirt and contamination.

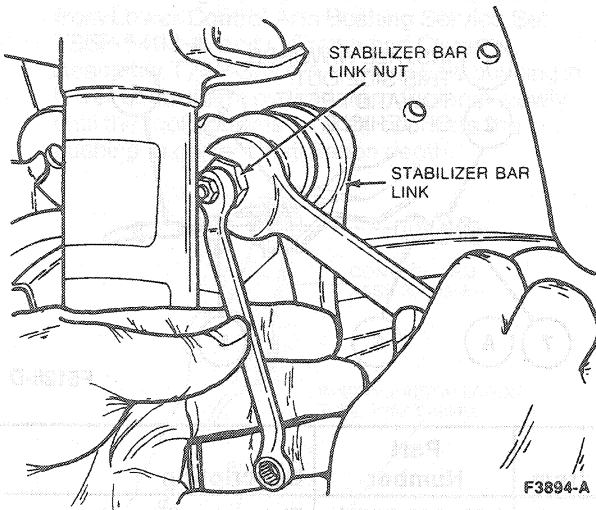
Stabilizer Bar /Link Assembly and/or Insulators

Removal

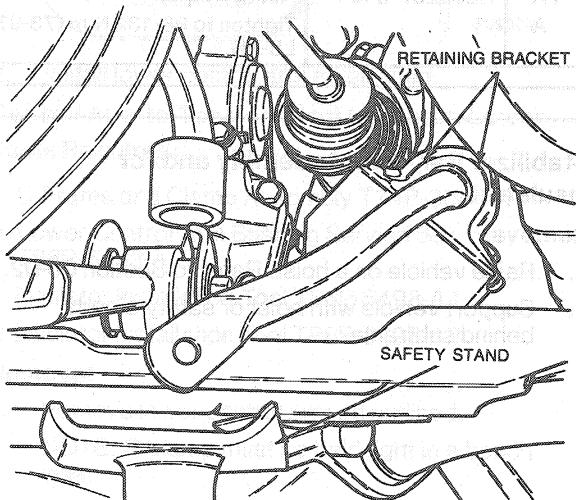
1. Raise vehicle on a hoist. Refer to Section 00-02.
2. Support vehicle with hoist or safety stands behind subframe.

REMOVAL AND INSTALLATION (Continued)

3. Remove and discard nuts retaining link assembly to stabilizer bar and shock strut with a 8mm closed-end wrench and 18mm open-end wrench.



4. Remove nuts retaining steering gear to subframe, and move gear off the subframe.
5. With another set of support safety stands under subframe, remove two rear subframe retaining bolts. Lower rear of the subframe to obtain access to stabilizer bar mounting brackets.



6. Remove stabilizer bar U-bracket bolts and replace insulators, U-brackets and / or stabilizer bar as required. Discard insulators and bolts.

Installation

1. Clean stabilizer bar to remove dirt and contamination in area of stabilizer bar insulator installation position.

2. Lubricate inside diameter of new insulators with Rubber Suspension Insulator Lube E25Y-19553-A (ESF-M99B112-A) or equivalent. Do not use any mineral or petroleum based lubricants as they will deteriorate the rubber insulators.
3. Install new insulators onto stabilizer bar and position them in approximate location.
4. Install U-brackets on insulators and install new bolts. Tighten to 30-40 N·m (23-29 lb-ft).
5. Raise subframe and install new subframe-to-body retaining bolts. Position steering gear onto subframe and install retaining nuts. Tighten to 115-135 N·m (85-99 lb-ft).
6. Install new nuts and secure link assembly to stabilizer bar and shock strut. Tighten to 77-103 N·m (57-75 lb-ft) at shock strut and 47-63 N·m (35-46 lb-ft) at stabilizer bar.
7. Remove safety stands.
8. Lower vehicle.

Hub and Wheel Bearings**Tools Required:**

- Hub Remover / Replacer T81P-1104-C
- Front Bearing Remover T83P-1104-AH2
- Wheel Bolt Adapters T83P-1104-BH1
- Drive Tube T83T-3132-A1
- Two Stud Adapter T86P-1104-A1
- Front Bearing Spacer T86P-1104-A2
- Bearing Installer T86P-1104-A3
- Bearing Dust Seal Installer T86P-1104-A4
- Shaft Protector D80L-625-1
- Front Hub Puller D80L-1002-L
- Three-Jaw Puller D80L-1013-A

Removal

1. Remove wheelcover / hub cover from wheel and tire assembly and loosen wheel lug nuts.
2. Remove hub nut retainer and washer by applying sufficient torque to the nut to overcome prevailing torque feature of crimp in nut collar. Do not use an impact-type tool to remove hub nut retainer. Hub nut retainer must be discarded after removal.
3. Raise vehicle on hoist. Refer to Section 00-02.
4. Remove wheel and tire assembly.
5. Remove brake caliper by loosening caliper locating pins and rotating caliper off rotor, starting from lower end of caliper and lifting upward. Do not remove caliper pins from caliper assembly. Lift caliper off rotor and hang it free of rotor. Do not allow caliper assembly to hang from brake hose. Support caliper assembly with a length of wire.

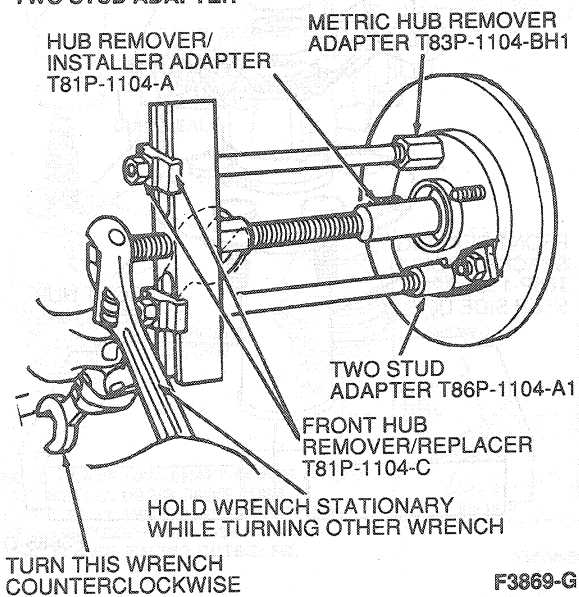
REMOVAL AND INSTALLATION (Continued)

6. Remove rotor from hub by pulling it off the hub bolts. If rotor is difficult to remove from hub, strike rotor sharply between studs with a rubber or plastic hammer.

If rotor will not pull off, apply Rust Penetrant and Inhibitor D7AZ-19A501-AA (ESR-M99C56-A) or equivalent to inboard and outboard rotor hub mating surfaces. Install 3-Jaw Puller D80L-1013-A or equivalent and remove rotor by pulling on rotor outside diameter and pushing on hub center. If excessive force is required for removal, check rotor for lateral runout prior to installation.

7. Lateral runout must be checked with nuts clamping stamped hat section of rotor.
8. Remove rotor splash shield. Refer to Section 06-03.
9. Disconnect lower control arm and tie rod from knuckle (leave strut attached) as outlined.
10. Loosen two strut top mount-to-apron nuts.
11. Install Hub Remover / Installer Adapter T81P-1104-A with Front Hub Remover / Replacer T81P-1104-C and Wheel Bolt Adapters T83P-1104-BH1 and Two Stud Adapter T86P-1104-A1 and remove hub, bearing and knuckle assembly by pushing out CV joint outer shaft until it is free of assembly.

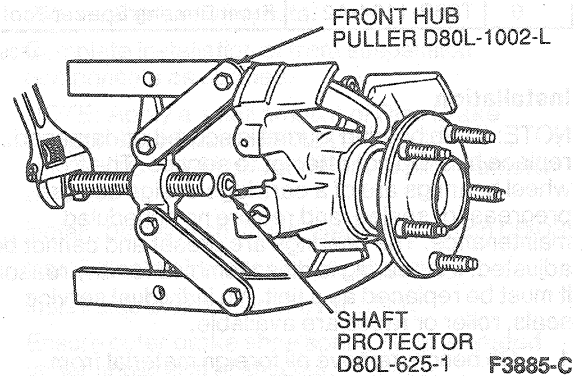
MAKE SURE THE HUB REMOVER ADAPTER IS FULLY THREADED ONTO THE HUB STUD AND IS POSITIONED OPPOSITE THE TWO STUD ADAPTER



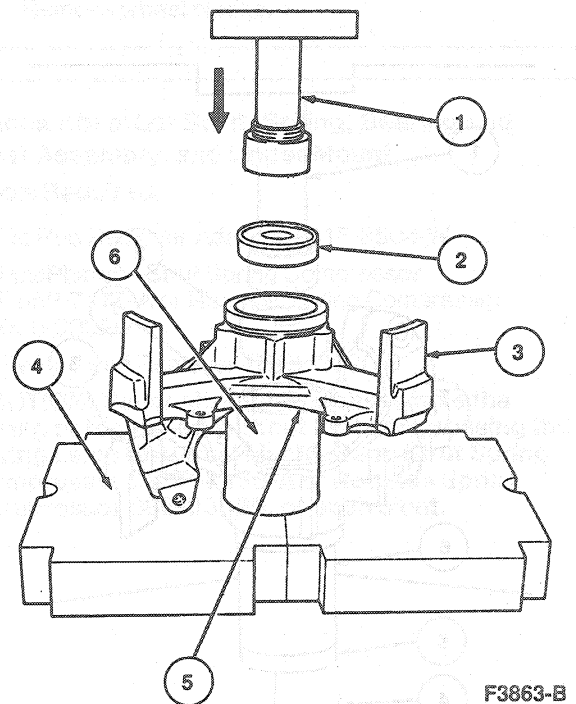
12. Support knuckle with a length of wire, remove strut bolt and slide hub / bearing / knuckle assembly off strut.
13. Carefully remove support wire, and carry hub / bearing / knuckle assembly to a bench.

14. On the bench, install Front Hub Puller D80L-1002-L and Shaft Protector D80L-625-1 or equivalent, with jaws of puller on knuckle bosses and remove hub.

NOTE: Ensure the shaft protector is centered, clears the bearing ID, and rests on the end face of the hub journal.



15. Remove snap ring, which retains bearing in knuckle assembly, with snap ring pliers and discard.
16. Using a hydraulic press, place Front Bearing Spacer T86P-1104-A2 step side up on press plate and position knuckle (outboard side up) on the spacer. Install Front Bearing Remover T83P-1104-AH2 centered on the bearing inner race and press bearing out of the knuckle.
17. Discard bearing.



REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
1	—	Arbor Press
2	T83P-1104-AH2	Front Bearing Remover Tool
3	—	Knuckle-Outboard Side Up
4	—	Face Plate
5	—	Step Side Up
6	T86P-1104-A2	Front Bearing Spacer Tool

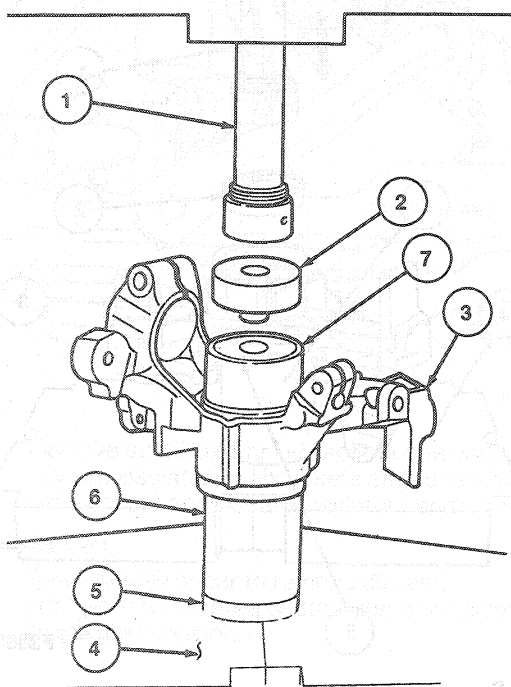
TF3863B

Installation

NOTE: If hub bearing journal is scored or damaged, replace hub. Do not attempt to service. The front wheel bearings are of a cartridge design and are pregreased, sealed, and require no scheduled maintenance. The bearings are preset and cannot be adjusted. If a bearing is disassembled for any reason, it must be replaced as a unit. No individual service seals, roller or races are available.

1. On bench, remove all foreign material from knuckle bearing bore and hub bearing journal to ensure correct seating of new bearing.
2. Place Front Bearing Spacer T86P-1104-A2 step side down on hydraulic press plate and position knuckle (outboard side down) on spacer. Position a new bearing in inboard side of knuckle. Install Bearing Installer T86P-1104-A3 (undercut side facing bearing), on bearing outer race and press bearing into knuckle. Ensure that bearing seats completely against shoulder of knuckle bore.

CAUTION: Bearing Installer T86P-1104-A3 must be positioned as indicated above to prevent bearing damage during installation.

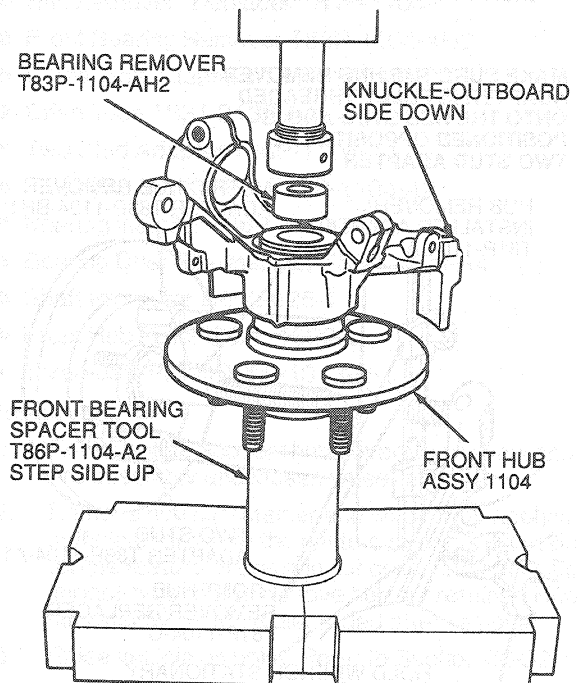


F3864-D

Item	Part Number	Description
1	—	Arbor Press
2	T86P-1104-A3	Bearing Installer Tool (Must be Positioned with Undercut Side Facing Bearing)
3	—	Knuckle-Outboard Side Down
4	—	Face Plate
5	—	Step Side Down
6	T86P-1104-A2	Front Bearing Spacer Tool
7	1215	Bearing Assy

TF3864D

3. Install a new snap ring (part of bearing kit) in knuckle groove using snap ring pliers.
4. Place Front Bearing Spacer T86P-1104-A2 on the arbor press plate and position hub on tool with lugs facing downward. Position knuckle assembly (outboard side down) on the hub barrel. Place Bearing Remover T83P-1104-AH2 flat side down, centered on inner race of the bearing and press down on tool until bearing is fully seated onto hub. Ensure that hub rotates freely in knuckle after installation.

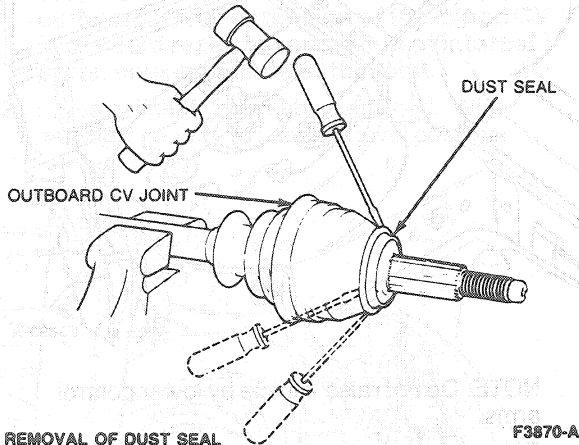


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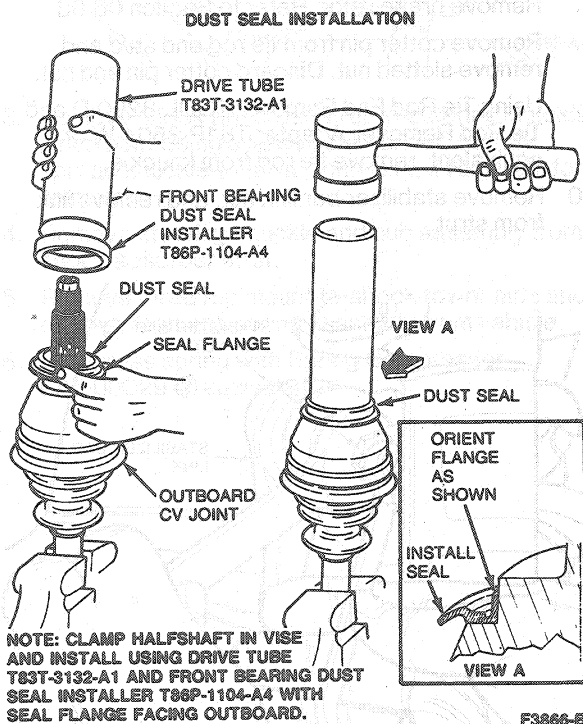
REMOVAL AND INSTALLATION (Continued)

5. Prior to hub/bearing/knuckle installation, replace bearing dust seal on the outboard CV joint with new seal from bearing kit.

NOTE: TAP UNIFORMLY TO REMOVE DUST SEAL, USING LIGHT DUTY HAMMER AND SCREWDRIVER.



6. Install new dust seal, ensuring seal flange faces outboard toward bearing. Use Drive Tube T83T-3132-A1 and Front Bearing Dust Seal Installer T86P-1104-A4.



7. Suspend the hub/bearing/knuckle assembly on the vehicle with wire and attach the strut loosely to the knuckle. Lubricate the CV joint stub shaft splines with SAE 30 weight motor oil and insert shaft into hub splines as far as possible using hand pressure only. Check that splines are properly engaged.

8. Temporarily fasten rotor to hub with washers and two lug nuts. Insert a steel rod into rotor diameter and rotate clockwise to contact knuckle.

CAUTION: Do not use power or impact-type tools to tighten the hub nut.

9. Install hub nut washer and new hub nut retainer. Rotate nut clockwise to seat CV joint. Tighten nut to 230-275 N·m (170-202 lb-ft). Remove steel rod, washers and lug nuts.

10. Complete installation of front suspension components as outlined.

NOTE: Apply a small amount of Disc Brake Caliper Slide Grease D7AZ-19590-A (ESA-M1C172-A) or equivalent to pilot diameter of rotor.

11. Install rotor splash shield. Refer to Section 06-03.
12. Install disc brake rotor to hub assembly.
13. Install disc brake caliper over rotor.
14. Ensure outer brake shoe spring hook is seated under upper arm of knuckle.
15. Install wheel and tire assembly, tightening wheel lug nuts finger-tight.
16. Lower vehicle and block wheels to prevent vehicle from rolling.

WARNING: REPLACEMENT LUG NUTS OR STUDS MUST BE OF THE SAME TYPE AND SIZE AS THOSE BEING REPLACED.

17. Tighten wheel lug nuts to 115-142 N·m (85-105 lb-ft).
18. Install wheelcover or hub cover and lower vehicle completely to the ground.
19. Remove wheel blocks.

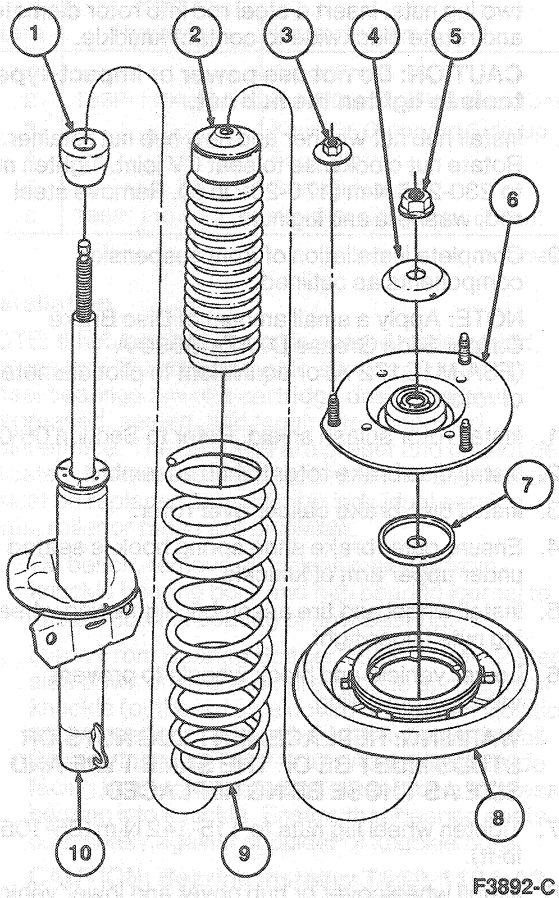
Shock Absorber Strut, Spring, Bearing and Seat Assembly, and Upper Mount

Tools Required:

- Tie Rod Remover Adapter T81P-3504-W
- MacPherson Strut Spring Compressor D85P-7178-A or Rotunda Spring Compressor D86-00029
- Tie Rod End Remover TOOL-3290-D

CAUTION: Never attempt to disassemble the spring or top mount without first compressing the spring using Universal MacPherson Strut Spring Compressor D85P-7178-A or Rotunda Spring Compressor D86-00029, or equivalent.

REMOVAL AND INSTALLATION (Continued)



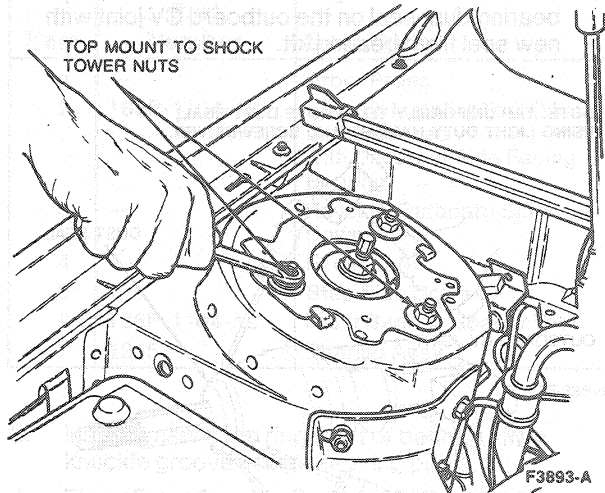
F3892-C

Item	Part Number	Description
1	18A085	Jounce Bumper
2	18K005	Dust Boot
3	N803826-S100	Nut (3 Req'd)
4	N804002-S100	Washer
5	N804104-S36	Nut
6	18183	Top Mount Bracket Assy
7	N806779-S100	Washer
8	3K028	Bearing and Seat Assy
9	5310	Front Spring
10	18045	Shock Strut

Removal

1. Turn ignition to OFF position to place steering column in unlocked position.
2. Remove hub nut as outlined.
3. Loosen, but do not remove, three top mount-to-shock tower nuts.

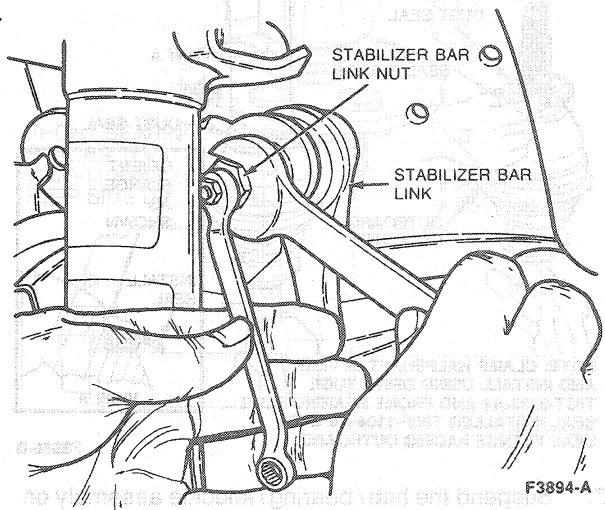
REMOVAL AND INSTALLATION (Continued)



F3893-A

NOTE: Do not raise vehicle by lower control arms.

4. Raise vehicle on a hoist. Refer to Section 00-02.
5. Remove tire and wheel assembly. Refer to Section 04-04.
6. Move brake caliper and wire out of the way. Refer to Section 06-03.
7. Remove brake rotor. Refer to Section 06-03.
8. Remove cotter pin from tie rod end stud and remove slotted nut. Discard cotter pin and nut.
9. Using Tie Rod End Remover TOOL-3290-D and Tie Rod Remover Adapter T81P-3504-W or equivalent, remove tie rod from knuckle.
10. Remove stabilizer bar link nut, and remove link from strut.



F3894-A

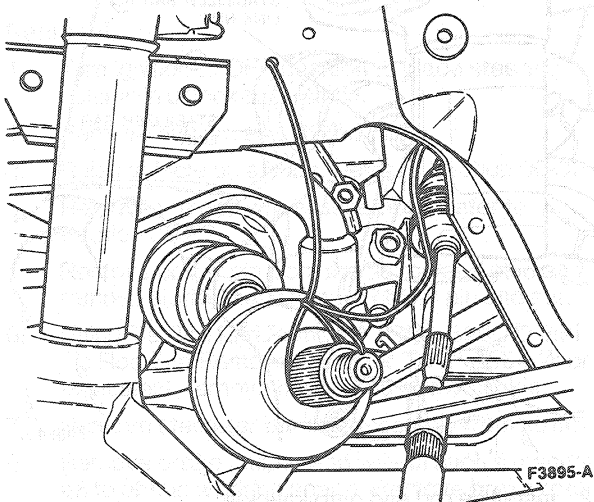
CAUTION: Use extreme care to not damage the ball joint boot seal.

REMOVAL AND INSTALLATION (Continued)

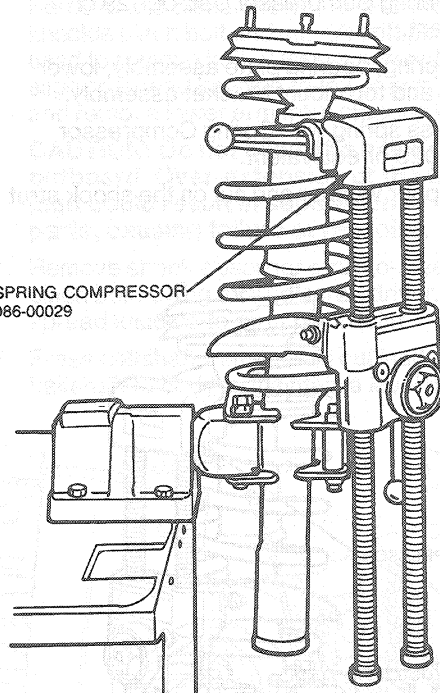
11. Remove and discard lower arm-to-steering knuckle pinch bolt and nut. (A drift punch may be used to remove bolt.) Using a screwdriver, slightly spread knuckle-to-lower arm pinch joint and remove lower arm from steering knuckle.

CAUTION: Do not allow the halfshaft to move outboard. Over-extension of the tripod CV joint could result in separation of internal parts, causing failure of the joint.

12. Press halfshaft from hub as outlined. Wire halfshaft to body to maintain level position.

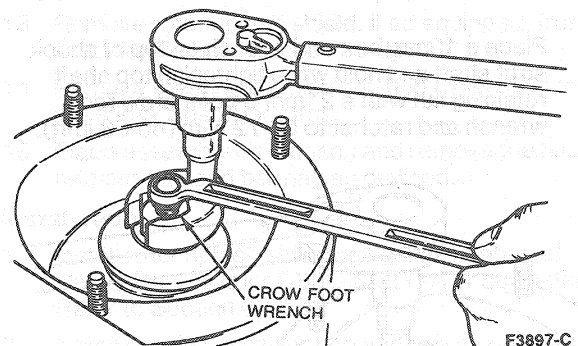


13. Remove shock absorber strut-to-steering knuckle pinch bolt. Using a large screwdriver, slightly spread knuckle-to-strut pinch joint, if required, for removal.
14. Remove steering knuckle and hub assembly from shock absorber strut.
15. Remove three top mount-to-shock tower nuts and remove strut and spring assembly from vehicle.
16. Compress spring with Spring Compressor 086-00029 or equivalent.



CAUTION: It is important that the retaining nut be turned and rod held still to prevent fracture of the rod at the base of the hex.

17. Place 10mm box-end wrench on top of shock strut shaft and hold while removing top shaft retaining nut with a 21mm 6-point crow foot wrench and ratchet.



18. Loosen Spring Compressor 086-00029 or equivalent, then remove top mount bracket assembly, bearing plate assembly and spring.

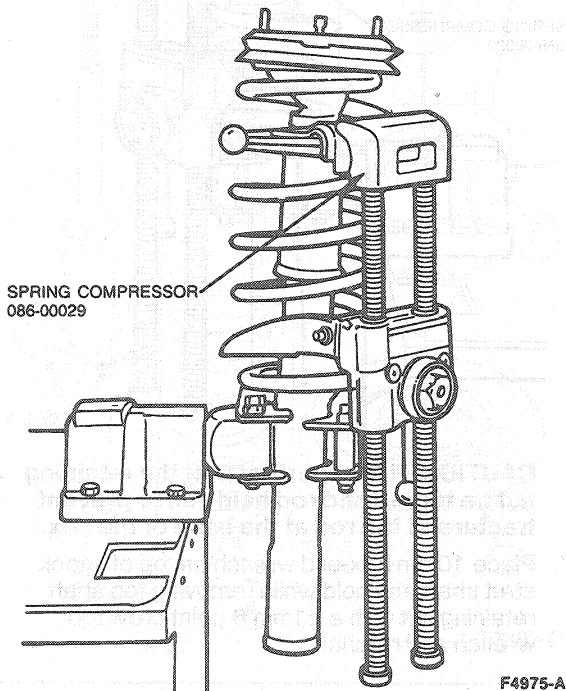
Installation

CAUTION: Make sure that the correct assembly sequence and proper positioning of bearing and seat assembly are followed. The bearing and seat assembly is press-fit onto the upper mount.

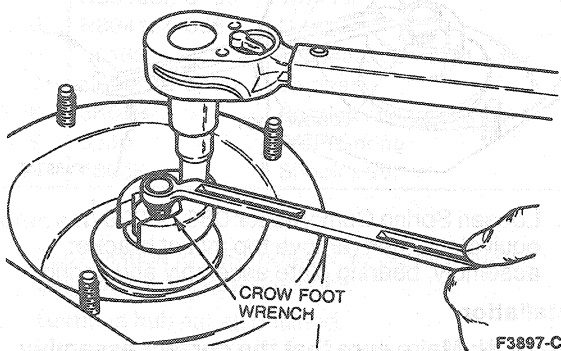
NOTE: When servicing, check the spring insulator for damage before assembly. If the outer metal splash shield is bent or damaged, it must be bent back carefully so that it does not touch the locator tabs on the bearing and seal assembly.

REMOVAL AND INSTALLATION (Continued)

1. Install Spring Compressor 086-00029 or equivalent.
2. Install spring, bearing plate assembly, lower washer and top mount bracket assembly.
3. Compress spring with Spring Compressor 086-00029 or equivalent.
4. Install upper washer and nut on the shock strut shaft.

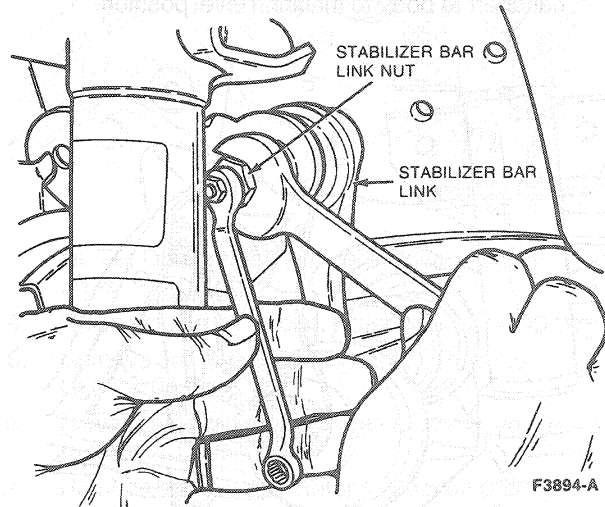


5. Place a 10mm box-end wrench on top of shock strut shaft and hold while tightening top shaft retaining nut with a 21mm 6-point crow foot wrench and ratchet to 53-72 N-m (40-53 lb-ft).

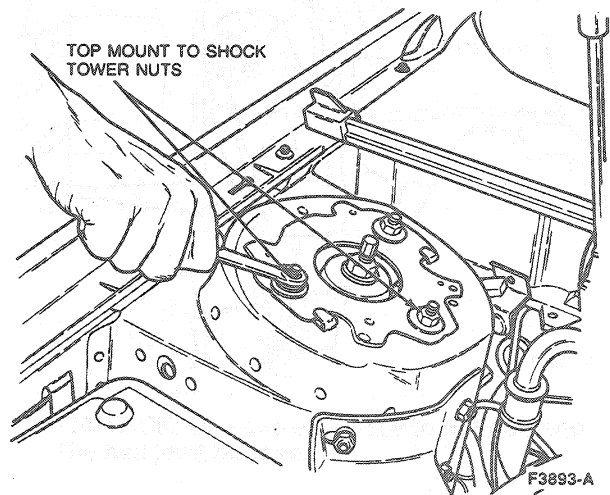


6. Install strut and spring assembly and three top mount-to-shock tower nuts.
7. Install steering knuckle and hub assembly to shock absorber strut.
8. Install a new shock absorber strut-to-steering knuckle pinch bolt. Tighten to 98-132 N-m (73-97 lb-ft).

9. Install halfshaft into hub as outlined.
10. Install lower arm to steering knuckle ensuring that ball stud groove is properly positioned. Use extreme care to not damage ball joint seal. Install a new pinch bolt and nut. Tighten to 53-72 N-m (40-53 lb-ft).
11. Install stabilizer bar link to strut and install a new stabilizer bar link nut. Tighten to 77-103 N-m (57-75 lb-ft).



12. Install tie rod end onto knuckle.
13. Install a new tie rod end slotted nut. Tighten to 31-47 N-m (23-34 lb-ft).
14. Install a new slotted nut retaining cotter pin.
15. Install brake rotor. Refer to Section 06-03.
16. Install brake caliper. Refer to Section 06-03.
17. Install tire and wheel assembly.
18. Tighten three top mount-to-shock tower nuts to 30-40 N-m (23-29 lb-ft).



REMOVAL AND INSTALLATION (Continued)

19. Lower vehicle and tighten hub nut to 230-275 N·m (170-202 lb-ft).
20. Depress brake pedal several times prior to moving vehicle.

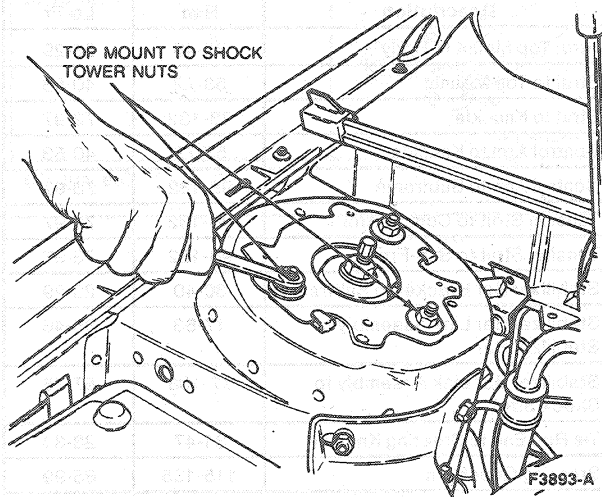
Steering Knuckle

Tools Required:

- Tie Rod End Remover Adapter T81P-3504-W
- Heavy Duty Riveter D80L-23200-A

Removal

1. Turn ignition to OFF position to place steering column in unlocked position.
2. Remove hub nut as outlined.
3. Raise vehicle on a hoist. Refer to Section 00-02.
4. Remove tire and wheel assembly. Refer to Section 00-02.
5. Remove cotter pin from the tie rod end stud and remove slotted nut. Discard cotter pin and nut.
6. Using Tie Rod End Remover TOOL-3290-D and Tie Rod End Remover Adapter T81P-3504-W or equivalent, remove tie rod end from knuckle.
7. Remove stabilizer bar link assembly from strut.
8. Remove brake caliper and wire in such a manner as to obtain working space. Remove brake rotor. Refer to Section 06-03.
9. Loosen, but do not remove, three top retaining nuts (top mount-to-shock tower).

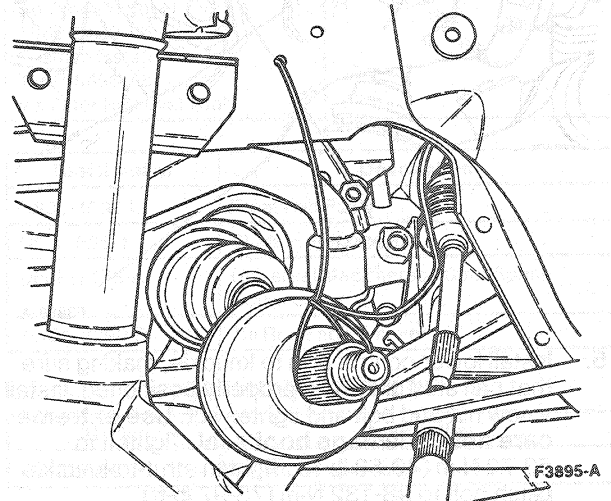


NOTE: Ensure steering column is in unlocked position, and do not use a hammer to separate ball joint from knuckle. Use extreme care not to damage boot seal.

10. Remove and discard lower arm-to-steering knuckle pinch bolt and nut. (A drift punch may be used to remove bolt.) Using a screwdriver, slightly spread knuckle-to-lower arm pinch joint and remove lower arm from steering knuckle.

CAUTION: Do not allow the halfshaft to move outboard. Over-extension of the tripod CV joint could result in separation of internal parts, causing failure of the joint.

11. Remove shock absorber strut-to-steering knuckle pinch bolt. Using a large screwdriver, slightly spread knuckle-to-strut pinch joint.
12. Press halfshaft from hub as outlined. Wire halfshaft to body to maintain a level position.



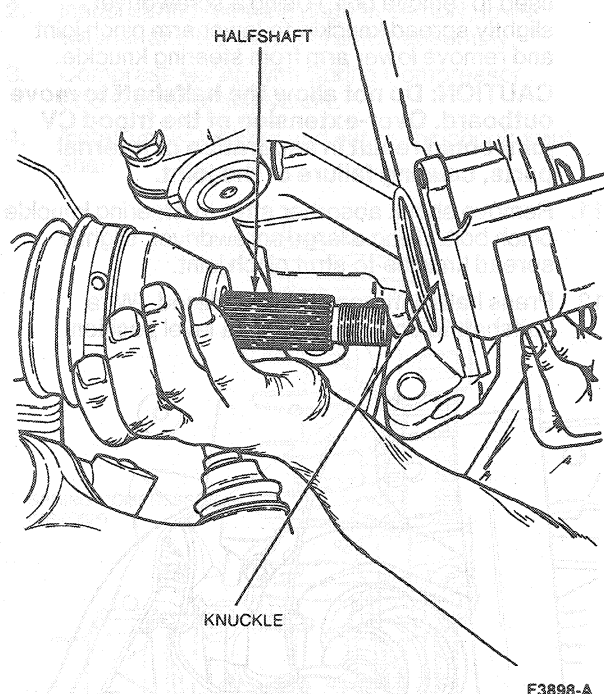
13. Remove rotor splash shield, if so equipped, from knuckle. Refer to Section 06-03.
14. Remove steering knuckle and hub assembly from the shock absorber strut.
15. Place assembly on a bench and remove the hub, retainer ring and bearing as outlined.

Installation

1. Install rotor splash shield using new rivets and Heavy Duty Riveter D80L-23200-A or equivalent. Refer to Section 06-03.
2. Install bearing, retainer ring and hub as outlined. Replace seal pressed on outboard CV joint, if required.
3. Install steering knuckle onto shock absorber strut and loosely install a new pinch bolt in knuckle to retain strut.

REMOVAL AND INSTALLATION (Continued)

4. Install steering knuckle and hub on halfshaft.



5. Install lower control arm to knuckle, making sure that ball stud groove is properly positioned. Install a new nut and bolt and tighten nut. **Use extreme care not to damage boot seal.** Tighten to 53-72 N·m (40-53 lb-ft). Tighten strut-to-knuckle pinch bolt to 98-132 N·m (73-97 lb-ft).
6. Install the rotor and brake caliper. Tighten caliper locking pins to 25-34 N·m (19-25 lb-ft). Refer to Section 06-03.
7. Position tie rod end into knuckle, install a new slotted nut and tighten. If necessary, advance nut to align slot and install a new cotter pin. Tighten to 31-47 N·m (23-34 lb-ft).
8. Install stabilizer bar link assembly to strut and install a new nut. Tighten to 77-103 N·m (57-75 lb-ft).
9. Install tire and wheel assembly. Refer to Section 00-02.
10. Lower vehicle.
11. Install the three nuts retaining top mount to apron. Tighten to 30-40 N·m (23-29 lb-ft). Tighten hub nut to 230-275 N·m (170-202 lb-ft).
12. Pump brake pedal prior to moving vehicle to position brake linings.

ADJUSTMENTS

Wheel Bearings

The front wheel bearings are of a cartridge design and are pregreased, sealed and require no scheduled maintenance. The bearings are preset and cannot be adjusted. If a bearing is disassembled for any reason, it must be replaced as a unit. No individual service seals, roller or races are available. The hub nut torque of 230-275 N·m (170-202 lb-ft) restricts bearing / hub relative movement and maintains axial position of the hub. Due to the importance of the hub nut torque / tension relationship, take the following precautions during service:

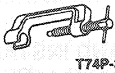
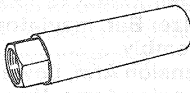
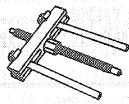

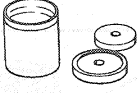
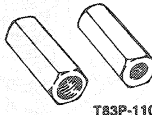
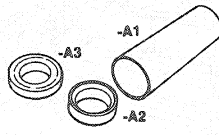
1. Since the bearing cannot be adjusted, the hub nut retainer must not be backed off after reaching the required torque of 230-275 N·m (170-202 lb-ft) during installation.
2. The hub nut must be replaced with a new nut whenever the nut is backed off or removed. Never reuse the nut.
3. Impact-type tools must not be used to tighten the hub nut or bearing damage will result.
4. The hub and CV joint splines have an interference fit requiring special tools for disassembly. The hub nut retainer must not be used to accomplish assembly. Refer to Section 05-04.
5. To remove the hub nut retainer, apply sufficient torque to the nut to overcome the prevailing torque feature of the nut collar.

SPECIFICATIONS

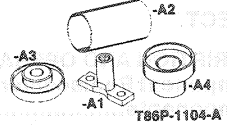
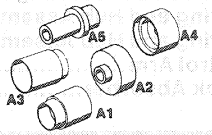
TORQUE SPECIFICATIONS

Description	N·m	Lb·Ft
Strut Top Mount to Body	30-40	23-29
Strut to Top Mount	53-72	40-53
Strut to Knuckle	98-132	73-97
Control Arm to Knuckle	53-72	40-53
Control Arm to Subframe	98-132	73-97
Tension Strut to Control Arm	98-132	73-97
Tension Strut to Sub-Frame	98-132	73-97
Stabilizer Bar Bracket to Subframe	30-40	23-29
Stabilizer Bar Link Assembly to Stabilizer Bar	47-63	35-46
Stabilizer Bar Link Assembly to Shock Strut	77-103	57-75
Tie Rod End to Steering Knuckle	31-47	23-34
Steering Gear Nuts	115-135	85-99
Caliper Locking Pins	25-34	19-25
Hub Nut	230-275	170-202
Lug Nuts	115-142	85-105

SPECIAL SERVICE TOOLS

Tool Number / Description	Illustration
T74P-3044-A1 C-Frame and Clamp	
T81P-1104-A Hub Remover / Installer Adapter	
T81P-1104-C Front Hub Remover / Installer	
T81P-3504-W Tie Rod Remover Adapter	
T83P-1104-AH2 Front Bearing Remover	
T83P-1104-BH1 Wheel Bolt Adapters	
T83T-3132-A1 Drive Tube	

(Continued)

Tool Number / Description	Illustration
T86P-1104-A1 Two Stud Adapter T86P-1104-A2 Front Bearing Spacer T86P-1104-A3 Bearing Installer T86P-1104-A4 Front Bearing Dust Seal Installer	
T86P-5493-A1 Insulator Installation Tool T86P-5493-A2 Bushing Removal / Insulator Installation Tool T86P-5493-A3 Bushing Removal Tool T86P-5493-A4 Bushing Installation Tool T86P-5493-A5 Insulator Removal Tool	

Tool Number	Description
D80L-1002-L	Front Hub Puller
D80L-625-1	Shaft Protector
D85P-7178-A	Universal MacPherson Strut Spring Compressor
TOOL-3290-D	Tie Rod End Remover

ROTUNDA EQUIPMENT

Model	Description
086-00029	Spring Compressor