

Group 6 Rear Suspension

GENERAL: This group contains information on the rear wheel suspension components designed to suspend the coach above the ground.

SPECIFICS: As applicable

...Coil Springs

...Control Arms and Associated Parts

...Leaf Springs

...Shock Absorbers

...Torsion Bars



GROUP 6

REAR SUSPENSION

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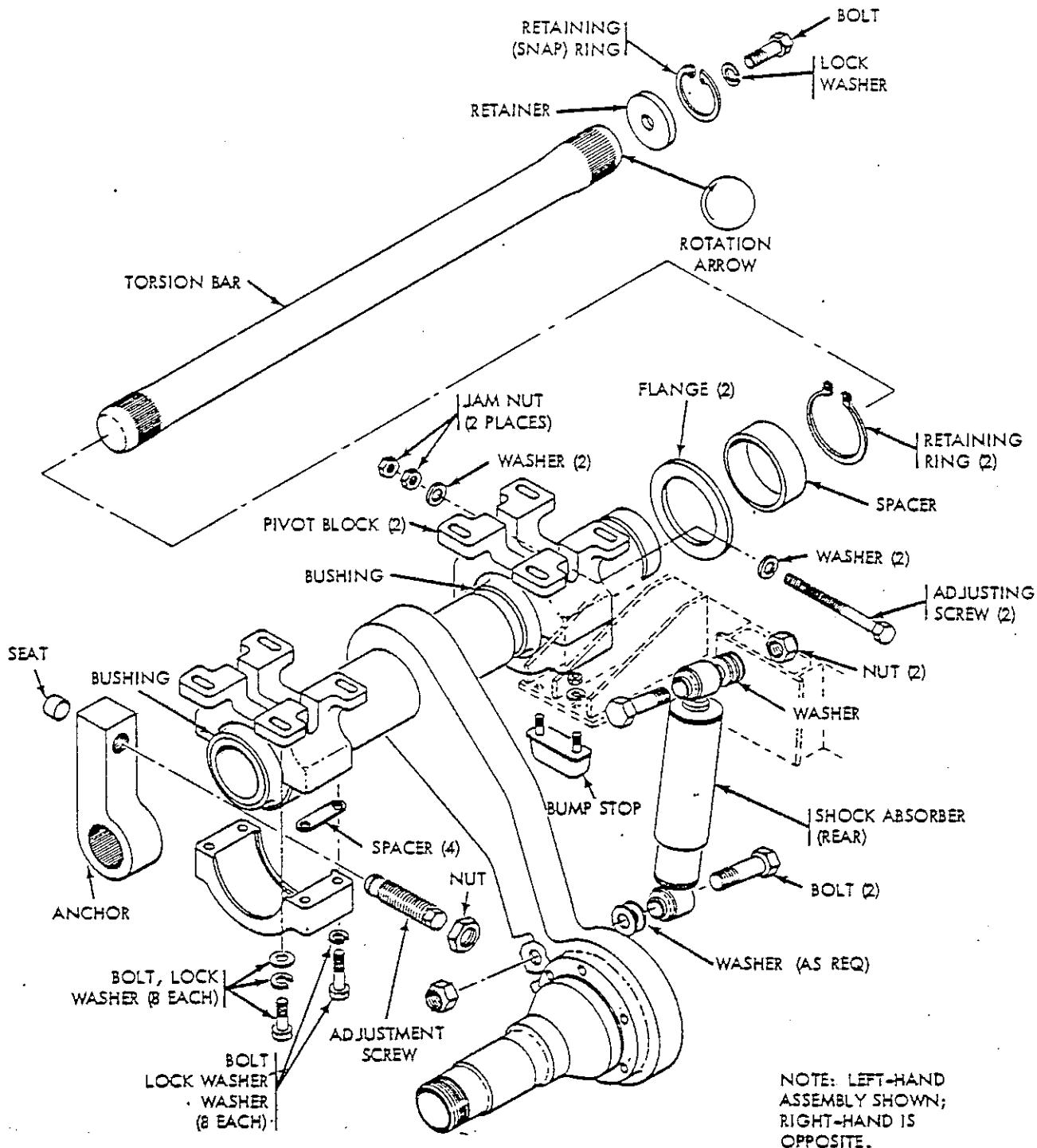


Figure 6-1. Rear Suspension

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GROUP 6

REAR SUSPENSION

6-1. DESCRIPTION (fig. 6-1)

a. General The coach is equipped with a torsion bar rear suspension system which allows each rear wheel (duals) to act independently of the other. Trailing arms attached to the coach frame by a torsion bar and pillow block arrangement carry the rear wheels and suspend the coach. Each trailing arm contains a tube on its upper end which fits into pivot blocks on the frame. The arm then rotates to move the wheels up and down. The torsion bar fits into the tube of the arm and is locked in position. The bar will twist to force the trailing arm down after the wheel has passed over an obstruction. The trailing arms carry the rear wheel spindles on their lower ends. Each end of the spring steel torsion bar is splined and the inner end fits into the internal splines of the trailing arm. The outboard splines are anchored into an adjustable anchor just forward of the rear wheel wells. Shock absorbers connect the trailing arms to the coach frame and dampen the up and down movement of the rear wheels.

b. Trailing Arm. The trailing arm is a solid steel arm, with a pivot tube welded in the upper end and a wheel spindle welded in the lower end. The pivot tube section is mounted on the vehicle chassis with two bushings inside two pivot blocks. The torsion bar mounts inside the pivot tube. The spindle on the rear end of the trailing arm supports the rear wheels, the rear brakes, and the rear axle shaft.

c. Torsion Bar and Anchor. The torsion bar is a specially heat-treated steel bar with external splines on each end to engage splines inside the

trailing arm pivot tube and the torsion bar anchor. The anchor, which fits in a recess of the chassis, has an adjustment screw mechanism on the upper end for adjusting tension of the torsion bar. A nut locks the adjustment screw in the adjusted position. A removable plate in the chassis provides access to the torsion bar anchor.

Caution

Do not drop, strike, scratch, or dent torsion bar with tools; the bar is susceptible to damage when exposed, because of special heat-treating.

d. Shock Absorber. The shock absorber is a standard type, with a rubber bushing at each end for mounting to the trailing arm and the vehicle chassis.

e. Pivot Block. The pivot tube section of each trailing arm is mounted on the vehicle chassis by two pivot blocks. Each pivot block has a base and a cap which mount around each bushing on the pivot tube. A screw through the pivot block base engages in a threaded bracket on the chassis, for lateral alignment of the trailing arm. Two nuts on one end of the bolt are tightened against each other to lock the screw in the adjusted position.

6-2. TROUBLESHOOTING

Instructions for troubleshooting the rear suspension system are contained in table 6-1. Prior to troubleshooting, a preliminary visual inspection, to assist in locating the problem, should be made as outlined in paragraph 6-4.

Table 6-1. Troubleshooting Rear Suspension

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Excessive noise in rear suspension system	Defective shock absorber loose; loose pivot block	Tighten loose mounting nuts to 212 to 234 foot pounds. Replace defective shock absorber: refer to paragraphs 6-3b and 6-3c. Tighten mounting bolts 86 to 94 foot pounds.

Table 6-1. Troubleshooting Rear Suspension (Continued)

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Excessive noise and/or vibration in rear suspension system	Missing or defective bump stop	Install new stop; refer to paragraphs 6-3l and 6-3m
	Damaged wheel bearing or spindle (spindle is an integral part of trailing arm assembly)	Replace bearing; refer to Group 8. Replace spindle; refer to paragraphs 6-3d and 6-3e
	System out of alignment	Align; refer to Group 7
	Defective tire or wheel	Replace; refer to Group 8
	Defective trailing arm bushing	Replace; refer to paragraphs 6-3j and 6-3k
Suspension system has collapsed	If suspension system has collapsed, torsion bar or anchor is broken, the securing splines are stripped, or bar has come loose	Replace defective part(s); refer to paragraph 6-3. Reposition serviceable loose bar; refer to applicable installation steps in paragraph 6-3e
Suspension system operation too stiff	Torsion bar out of adjustment	Adjust; refer to paragraph 6-5d
	Defective shock absorber	Replace; refer to paragraphs 6-3b and 6-3c

6-3. REMOVAL/INSTALLATION

a. General Step-by-step instructions for replacement of the rear suspension components are provided in this section. Replacement parts should be procured from those listed in the 2900R Parts Catalog. The rear dual wheels, drive flange, hub and drum, and associated parts should be removed before performing these procedures (except for shock absorber replacement). The trailing arm may be removed as a unit, with related components attached to it.

NOTE

Use a thin coat of threadlube on all external threads during installation procedures.

b. Rear Shock Absorber Removal.

(1) With motor off, parking brake on, and wheels blocked, jack up vehicle at jacking point to relieve all pressure on shock absorber.

(2) Position jack stand under jacking point and lower vehicle to rest on stand.

(3) Remove nut, washer, and bolt from lower end of shock absorber.

(4) Remove upper nut, washer, and bolt from shock absorber. Remove shock absorber.

c. Rear Shock Absorber Installation.

(1) Install upper end of shock absorber with washer, nut, and bolt.

(2) Install lower end of shock absorber with washer, nut, and bolt.

(3) Torque mounting nuts 212 to 234 foot pounds.

(4) Remove jack stand.

(5) Lower vehicle to ground, then remove wheel blocking.

d. Trailing Arm and Torsion Bar Removal. To remove a trailing arm as a unit (with associated parts: torsion bar, bushings, etc.), proceed as follows:

(1) Remove rear hub and drum assembly; refer to Group 8.

(2) Remove rear shock absorber; refer to paragraph 6-3h (leave coach on jack and jack stand).

(3) At wheel end of propeller shaft, remove four screws from spider-bearing assembly and slip yoke. Disconnect yoke from spider bearing.

Caution

Do not drop, strike, scratch, or dent torsion bar with tools; the bar is sensitive to damage when exposed, because of special heat-treating.

(4) At outboard end of pivot tube, remove four screws and access plate to torsion bar anchor.

(5) Loosen nut on adjusting screw in anchor, then turn screw to release all pressure on screw.

(6) At inboard end of trailing arm pivot tube, remove internal retaining ring, bolt, washer, and retainer disc. Reengage bolt in torsion bar end by about four turns (to aid in torsion bar removal).

(7) Support trailing arm below pivot tube with hydraulic jack, remove four bolts and washers, then remove each pivot block cap with two shims.

(8) Pry on bolt in torsion bar inboard end to release bar from its anchor, lower the trailing arm about 3 inches for work clearance, then remove torsion bar.

(9) If trailing arm is to be removed, lower and remove from beneath vehicle.

(10) To inspect trailing arm or torsion bar refer to paragraph 6-4.

e. Trailing Arm and Torsion Bar Installation (fig. 6-1).

(1) Use hydraulic jack to position trailing arm under vehicle, then raise it almost into position, about 3 inches below pivot block bases (for torsion bar insertion).

(2) Carefully insert torsion bar into pivot tube, with arrow (on the bar inboard end) pointing clockwise on left-hand bar and, for right-hand bar, counterclockwise.

NOTE

The left-hand and the right-hand torsion bar part numbers differ; refer to the 2900R Parts Catalog. Make sure bar is installed in correct location and the position specified in step (2).

(3) Move trailing arm up into contact with pivot block bases, then secure each pivot block cap in place with two shims, four washers, and four bolts.

(4) With a hydraulic jack, adjust height of trailing arm end until torsion bar splines engage in anchor and in pivot tube.

(5) Tighten all eight pivot block cap-securing bolts 86 to 94 foot pounds.

(6) On trailing arm inboard end, install retainer disc, retaining ring, lockwasher and bolt. Torque bolt 107 to 118 foot pounds.

(7) Adjust torsion bar; refer to paragraph 6-5c.

(8) At wheel end of propeller shaft, install spider-bearing assembly on slip yoke with four lubricated screws. Tighten screws 70 to 80 foot pounds.

(9) Install rear shock absorber; refer to paragraph 6-3c.

f. Pivot Block Removal.

(1) Remove trailing arm as a unit; refer to paragraph 6-3d.

(2) Mark position of pivot block on chassis by scribing a line around it.

(3) Remove pivot block base bolts and washers (four each).

(4) Remove two jam nuts, two washers, and pivot block base adjustment bolt; remove pivot block base.

g. Pivot Block Installation.

(1) Secure adjustment bolt in pivot block base with a washer on each side and two jam nuts on the threaded end.

(2) Adjust bolt so pivot block base is in marked position. Tighten inner nut, then back it off 1/10 to 2 full turns. Tighten outer nut against inner nut.

(3) Install pivot block base on vehicle chassis with four bolts and eight washers. Torque bolts 86 to 94 foot pounds.

(4) Install trailing arm unit; refer to paragraph 6-3e.

h. Torsion Bar Anchor Removal.

(1) Prepare torsion bar for removal, paragraph 6-3e, steps (1) through (5) only.

(2) Back torsion bar adjustment screw out as far as possible.

(3) Pry on bolt in torsion bar inboard end to release bar from its anchor.

(4) Remove torsion bar anchor through its access hole.

i. Torsion Bar Anchor Installation.

(1) Install torsion bar anchor through its access hole.

(2) Hold anchor top forward as far as it can go.

(3) With hydraulic jack, adjust height of trailing arm end until torsion bar splines engage splines in anchor and pivot tube.

(4) Complete installation and adjustment of torsion bar; refer to paragraph 6-3e, steps (6) through (9).

j. Trailing Arm Bushing Removal.

(1) Remove trailing arm; refer to paragraph 6-3d.

(2) Drive bushing off trailing arm.

k. Trailing Arm Bushing Installation.

(1) Install two bushing keepers in grooves in trailing arm pivot tube.

(2) Drive bushing onto trailing arm.

(3) Install trailing arm; refer to paragraph 6-3e.

l. Bump Stop Removal. To remove the trailing arm bump stop (mounted on a chassis bracket above the arm), proceed as follows:

(1) Remove two nuts and washers.

(2) Remove bump stop (the two bolts and steel faceplate are an integral part of the bump stop).

m. Bump Stop Installation. To install the trailing arm bump stop, lubricate bolts, threads, then reverse removal procedures above. Torque nuts 22 to 24 foot pounds.

6-4. INSPECTION AND CLEANING

a. General. The following procedures provide information necessary for inspection and cleaning of the rear suspension system.

b. Rear Suspension System Inspection (fig. 6-1).

(1) With the engine not operating, parking brakes on, and the wheels securely blocked against movement, inspect the suspension system for evidence of loose parts, contamination, excessive play, cracked welds, and damaged parts. Clean foreign matter from parts with water and/or compressed air, as necessary. Replace damaged parts.

(2) Check all fasteners for secure mounting, and especially check trailing arm mounts (pivot blocks) for security and soundness.

(3) Check that shock absorber has not collapsed to less than 20 inches between the two mounting bolts. Original distance was approximately 22 ($\pm 1/8$) inch. Check that shock absorber rubber sleeves are in good condition and do not allow excessive end play in the mounting bushings. Replace defective shock absorber; or remove and test shock absorber.

(4) Check, and correct, as necessary, alignment of trailing arm, and adjustment of torsion bar; refer to paragraph 6-5.

c. Trailing Arm Component Inspection. To inspect the trailing arm and components, refer to table 6-2.

Table 6-2. Trailing Arm Components Inspection

Component (and area)	Inspect visually for	Corrective action
Trailing arm, spindle, and pivot tube	Bends, cracks (especially in splines and welds), and other damage	If cracked or with major damage, replace
Pivot bushing and rubber insert	Major damage and deteriorated rubber	Replace if unserviceable
Pivot block, cap, base, and threaded parts	Cracks (especially at mounting holes) stripped threads, and other damage	Replace parts with cracks, major damage, or stripped threads
Torsion bar anchor seat and threaded parts	Cracks, stripped thread, and other damage. Especially check splines	Replace parts with cracks, major damage, or stripped threads
Torsion bar, finish coat	Nicks, scratches, looseness, or ruptures (ruptures may hide serious cracks or other damage)	Replace as required
Torsion bar, metal torque surface (area between splines)	Nicks, scratches, and cracks	Replace
<p>NOTE</p> <p>Damage is considered major if it could create a "stress riser," which could lead quickly to a crack and failure of the torsion bar.</p>		
Torsion bar splines	Nicks, scratches, and cracks (wipe clean to aid inspection)	Replace
Torsion bar end internal threads	Damage that could interfere with screw installation	If extensive, replace bar

6-5. GENERAL INFORMATION

a. General. This section contains general information related to data contained in the previous paragraphs.

b. Rear Suspension System Data. General data on the rear suspension system is contained in table 6-3.

Table 6-3. Rear Suspension System Data

Item	Data
Height difference from one end of coach to other	1/8 inch lower at rear than at front (original height to jacking pad from ground is about 14 inches); refer to levelling in Group 7
Setting of locking nuts on pivot block base adjustment bolt	Tighten inner nut, then back it off 1/10 to 2 full turns. Secure in position with outer jam nut
Lubricant	Threadlube

c. Torquing Requirements. Torquing requirements for attaching parts used in the rear suspension system are contained in table 6-4.

Table 6-4. Torque Requirements

Part secured	Attaching part(s)	Torque
Shock absorber	Bolt	212 to 234 foot pounds
Retainer disc	Screw	107 to 118 foot pounds
Slip yoke	Screw	70 to 80 foot pounds
Pivot block: Cap	Screw	86 to 94 foot pounds
Base	Screw	86 to 94 foot pounds
Rubber bumper	Nut	22 to 24 foot pounds

d. Torsion Bar Adjustment. Torsion bar adjustment is covered in coach leveling procedures; refer to Group 7.

e. Trailing Arm Toe-In Alignment. Trailing arm toe-in alignment is covered in coach wheel alignment procedures; refer to Group 7.