

Group 8 Wheels and Tires

GENERAL: This group contains information on the coach wheels and wheel mounting components, including tires.

SPECIFIC: As applicable

- ...Drive Flanges
- ...Hub Cap
- ...Hubs and Drums
- ...Mud Guards
- ...Tires and Tubes
- ...Wheel and Rims
- ...Wheel Bearings
- ...Wheel Covers



FMC Corporation
Recreational Vehicle Division
333 Brokaw Road Box 564 Santa Clara, California 95052

GROUP 8
WHEELS AND TIRES

TABLE OF CONTENTS

<u>PARAGRAPH</u>	<u>PAGE</u>
8-1 DESCRIPTION	8-3
a. General	8-3
b. Wheels	8-3
c. Tires	8-3
8-2 TROUBLESHOOTING	8-3
8-3 REMOVAL/INSTALLATION	8-5
a. General	8-5
b. Wheel Removal	8-5
c. Wheel Installation	8-5
d. Tire and Tube (from Wheel) Removal	8-6
e. Tire and Tube (on Wheel) Installation	8-7
f. Front Hub and Drum Removal	8-7
g. Front Hub and Drum Installation	8-7
h. Rear Hub and Drum Removal	8-8
i. Rear Hub and Drum Installation	8-8
8-4 DISASSEMBLY	8-8
a. General	8-8
b. Hub and Drum Disassembly	8-8
8-5 INSPECTION/CLEANING	8-9
a. General	8-9
b. Tire and Wheel Inspection	8-9
c. Tube Leak Check	8-11
d. Wheel and Tire Trueness	8-11
e. Hub and Drum Cleaning	8-11
f. Wheel and Side Ring Cleaning	8-11
8-6 REPAIR	8-12
a. General	8-12
b. Tube Repair	8-12
c. Tire Repair	8-12
8-7 ASSEMBLY	8-12
a. General	8-12
b. Hub and Drum Assembly	8-12
8-8 GENERAL INFORMATION	8-12
a. Introduction	8-12
b. Fluids and Lubricants	8-12
c. Tire and Wheel Data	8-13
d. Torque Requirements	8-13
e. Repacking Outer and Inner Bearing Cones	8-13
f. Rotating Tires	8-14
g. Wheel Balancing	8-14

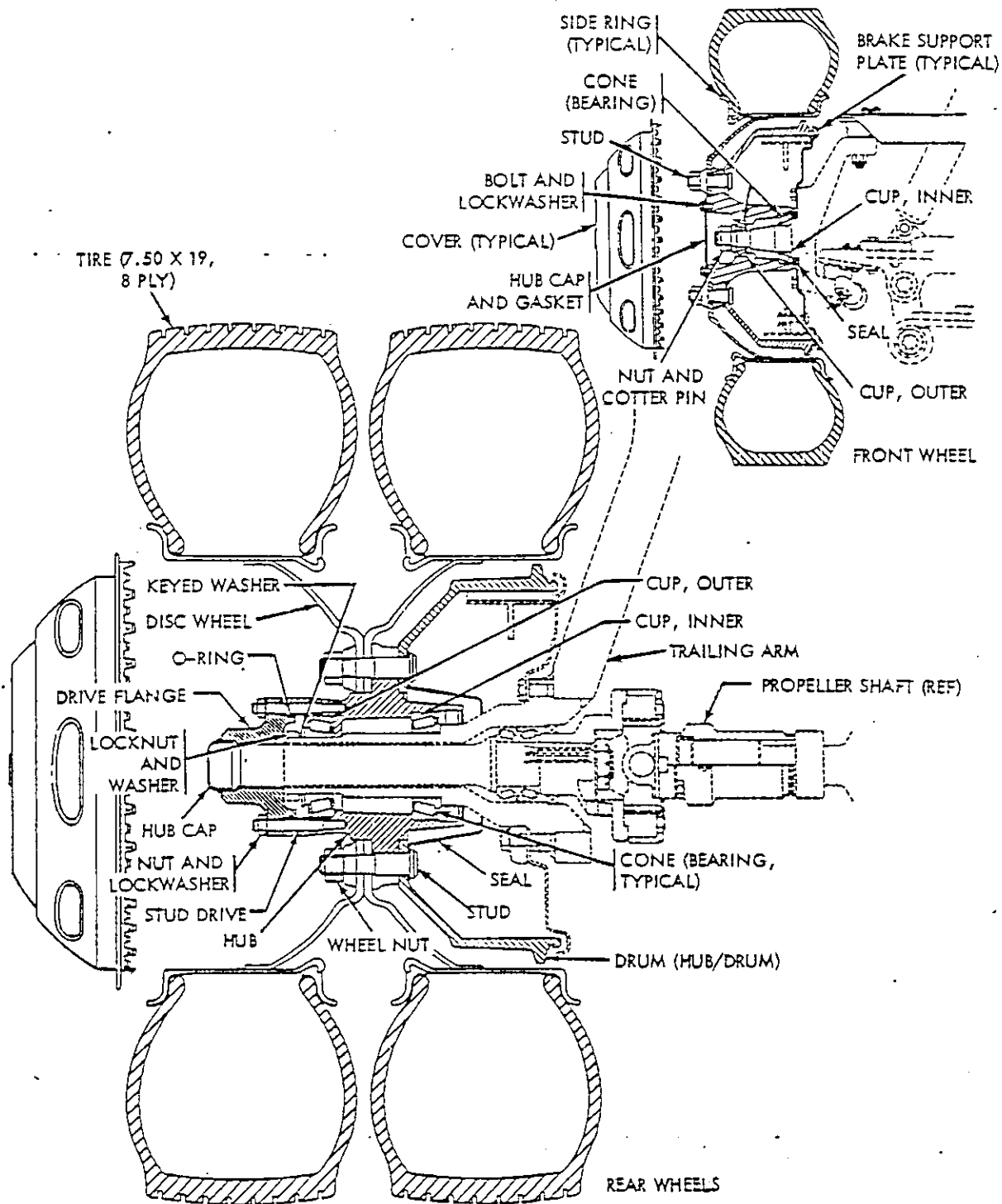


Figure 8-1. Wheels and Tires

SD-192

GROUP 8

WHEELS AND TIRES

8-1. DESCRIPTION

a. General (fig. 8-1). The front wheels of the coach are mounted on steerable spindles and the rear dual wheels are mounted on trailing arms which are torsion bar anchored to the coach frame. As a result, all wheels are independently sprung to bring about a smooth level ride. Wheel servicing should be done only by experienced tire shop specialists using equipment normally used for heavy-duty wheels and tires. Special jacking points, two front and two rear, are provided to lift the coach during tire and wheel servicing. All wheels are 5-hole disc-type attached to hub and drum studs by five cone-type locknuts. Tighten the cone-type locknuts to the torque values given in this group when servicing. The wheel nut torque should be checked each 2,000 miles of coach travel and always when lubricating the coach.

This group provides service instructions for the wheel and tire components. For service information on related systems such as the service brakes, refer to Group 9. When applicable, reference is made to other groups in this service manual. For information on part numbers and procurement of replacement parts, refer to Group 8 in the 2900R Parts Catalog.

b. Wheels. The tapered disc wheels are welded to rims and a split-type side (locking) ring fits snugly in a groove to secure the tire, tube, and flap in position. Five cone-type locknuts secure the wheel to each hub and drum assembly. Wheel covers are mounted inside the outer rim of each wheel and are tapped into place. In an emergency, a rear inboard wheel and tire may be used as a

front wheel. When this occurs, coach speed must be kept low until a replacement wheel and tire is installed. Any single wheel, when mounted in place of a pair of rear wheels, must be mounted in the outer position to maintain coach stability.

c. Tires. The tires are 7.50-17, 8-ply radial-type and each contains a tube and a protective flap. Each tube has an inflation valve with a rotatable stem, removable core, and stem cap. The tires are designed for long safe use and with proper maintenance - and particularly proper tire pressures - should be relatively trouble free. It is important that tire pressures be checked before and after long drives, or when operating under adverse conditions such as rough or off-road operation. It is recommended that tire pressures be checked once a week, and during trips every few hundred miles or whenever a rest or fuel stop is made. Vibration or noise, caused by tires, should be investigated and corrected as soon as noticed.

8-2. TROUBLESHOOTING

Wheel and tire trouble could originate in the steering mechanism or wheel alignment, as well as from defects in the wheels, tires, bearings, or hubs. Additional causes could be poor driving habits and neglect of maintenance - particularly incorrect lubrication or tire inflation. Damage could also occur from striking hard objects, abnormal wear, or manufacturing imperfections. Prior to troubleshooting the wheels and tires, visually inspect all parts as specified in paragraph 8-5. Troubleshoot malfunctions of the wheels and tires according to table 8-1.

Table 8-1. Troubleshooting Wheels and Tires

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Wheel noisy	Loose mounting nuts(s)	Tighten; refer to paragraph 8-3c
	Loose, dry, or damaged bearing	Tighten, lubricate or replace bearing; refer to paragraph 8-3
	Defective brakes	Repair brakes; refer to Group 9

Table 8-1. Troubleshooting Wheels and Tires (Continued)

Malfunction (symptoms)	Probable causes	Corrective action (remedies)
Tire squeals when cornering Tire wear uneven or excessive, and/ or wheel wobbles	Foreign matter in tread, or between dual wheels	Remove foreign matter and repair tire as necessary; refer to paragraph 8-6c
	Underinflated tire	Inflate tire to 75 psi
	Out-of balance wheel	Balance wheel; refer to paragraph 8-8g
	Incorrect front wheel camber or toe-in	Align front; refer to Group 7
	Incorrect tire pressure	Inflate tires to 75 psi
	Brakes dragging or grabbing	Repair brake; refer to Group 9
	Damaged, misshaped or aged tire	Replace tire; refer to paragraph 8-6e. Check for out-of-true condition; refer to paragraph 8-5d
	Loose wheel nut(s)	Tighten; refer to paragraph 8-3c
	Worn stud mounting hole(s) damaged or out-of-round wheel or side ring	Replace defective part; refer to paragraph 8-3. Check for out-of-true condition; refer to paragraph 8-5d
	Defective or loose wheel bearing	Replace or tighten bearing; refer to paragraph 8-3g
Tire loses pressure	Defective or mis-aligned steering mechanism	Repair or align steering mechanism; refer to Group 7
	Defective wheel suspension	Check and correct as necessary; refer to Groups 5 and 6
	Tire side ring opening not opposite tire valve	Dismount tire and remount with split tire ring 180 degrees from tire valve
	Valve stem cap missing and core leaking	Replace
	Defective valve or core	Replace inner tube; refer to paragraph 8-3d and 8-3e
	Porous, cracked, or pierced inner tube (defect may open only when tire flexes in motion)	Replace or repair inner tube; refer to paragraph 8-3 or 8-6b

8-3. REMOVAL/INSTALLATION

a. General. Step-by-step instructions for replacement of the wheel and tire components are provided in this section. Replacement parts should be procured from those listed in the 2900R Parts Catalog.

b. Wheel Removal. Special tools/materials required for this procedure are jack stand, wheel blocks, lug wrench, jack, torque wrench, and threadlube. If possible, a tire-jacking dolly should be utilized. To remove wheel, proceed as follows:

(1) Turn off engine and apply hand brake. Make certain wheels remaining on ground are blocked against movement.

(2) Place lifting pad of hydraulic jack under solid part of vehicle frame or center of front spring.

Caution

Never attempt to lift vehicle by a bumper. The bumper energy absorber mechanism could be damaged.

(3) Operate jack to raise vehicle, then place truck jack stand(s) under closest pads at vehicle jacking points; see figure 8-2.

(4) Lower vehicle to rest on truck jack stand(s). Check that vehicle is securely supported by stand(s), and that wheels on ground are securely blocked.

Caution

If either rim or split rings are damaged or split ring appears to be unseated, the tire should be deflated prior to removal of the tire and rim assembly from the coach. Depress valve core to lower pressure, then remove valve core to insure complete deflation.

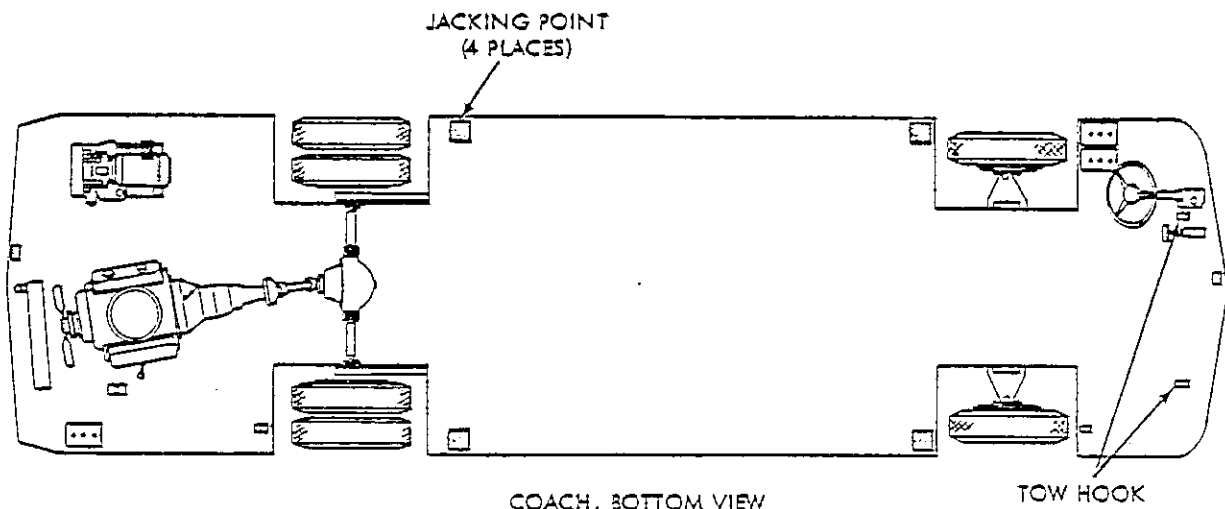
(5) Remove wheel cover.

(6) Mark one wheel stud and mating wheel hole, then remove five wheel-attaching cone lock-nuts.

(7) Remove wheel/tire, taking care to avoid damage to stud threads. If work is to be done on only one of a rear wheel pair, secure other wheel in position on hub with several nuts installed finger-tight.

c. Wheel Installation. To install wheel, proceed as follows:

(1) Install serviceable wheel/tire in place of removed wheel/tire. If a removed wheel is installed, align marked hole with previously marked stud.



SD-193

Figure 8-2. Jacking Points

(2) Lightly lubricate threads of wheel mounting studs with threadlube, then install cone locknuts on studs.

(3) Tighten front wheel cone-locknuts 300 to 350 foot pounds, and rear wheel cone-locknuts 300 to 330 foot pounds. Tighten nuts gradually in opposite-rotational pattern; tighten one nut, then the opposite nut; move to next nut in clockwise position. Repeat pattern until all nuts reach the required torque.

(4) Repeat procedure for each wheel being installed.

(5) Install wheel cover.

NOTE

If wheel cover is loose, remove it and apply up to three or four 8-inch strips of heavy self-adhesive cloth tape equally spaced on wheel mating surfaces for cover. Remove, or add, tape strips until cover fits securely in wheel.

(6) When service is complete, raise vehicle by operating hydraulic jack at a jack point.

(7) Remove truck jack stand(s).

(8) Operate hydraulic jack to lower wheels to ground.

(9) Remove wheel blocking.

(10) Check tire pressure, and inflate, as required.

d. Tire and Tube (from Wheel) Removal (fig. 8-3). To remove tire and tube from wheel, proceed as follows:

Caution

Tires should be changed by qualified personnel. Avoid tire/wheel handling which could result in damage and unsafe conditions. Deflate by depressing valve core until pressure lowers, then remove core from valve.

(1) Remove wheel; refer to paragraph 8-3h.

(2) Place tire on mounting/dismounting stand with wheel side ring up.

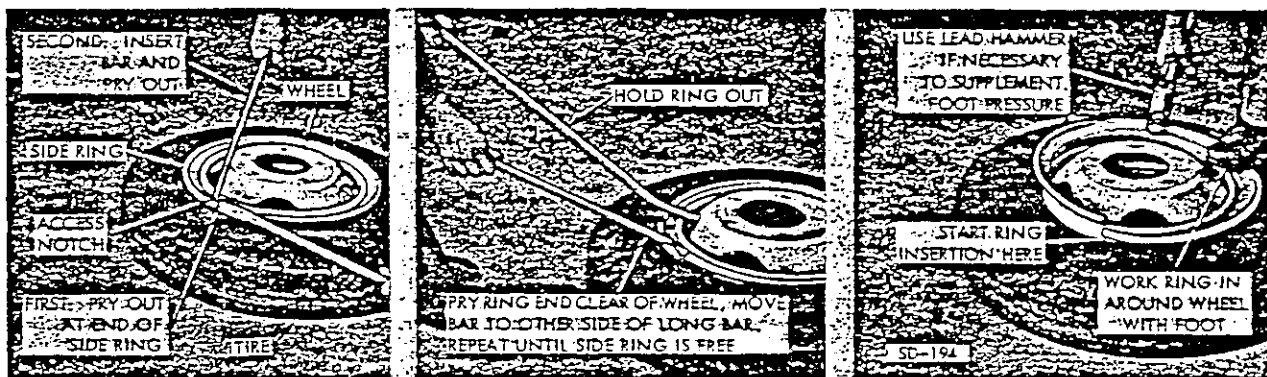
Caution

Avoid damage to the tire beads and innertube during removal/installation procedures.

(3) Press on tire to assure that it is completely deflated, then use large pry bar to move notched end of side ring outward. Move side ring outward until small pry bar can be engaged in notch. Pry outward and up with both bars until side ring end remains out of groove.

(4) Use large pry bar to remove side ring from wheel.

(5) Remove tire, flap, and tube from wheel. It may be necessary to turn the wheel over and strike tire near bead to break it loose from wheel.



OPENING SIDE RING

REMOVING SIDE RING

INSTALLING SIDE RING

Figure 8-3. Wheel Side Ring Replacement

(6) If available, place tire on a tire spreader and spread tire open.

(7) Carefully pull flap and innertube out of tire.

e. Tire and Tube (on Wheel) Installation (fig. 8-3). To install tire and tube on wheel, proceed as follows:

Warning

If tire side rings are not firmly seated during inflation, tire could slip off rim with explosive force. Refer to 2900R Parts Catalog, Group 8, when ordering replacement parts. Wheels with damage, foreign matter or corrosion in the tire seating areas should be cleaned or replaced. Do not use tires that are damaged on side walls or seating surfaces.

(1) Install tube in tire, then position a serviceable flap in tire to cover exposed area of tube.

(2) With wheel on floor, rim side down, lay tire on top of wheel, then turn tire so tube valve stem is beside wheel hole which has a locating lug at each side.

(3) Rotate valve stem downward, then move tire onto wheel and valve stem into hole.

(4) Rotate stem back to face upward.

(5) Lay side ring on wheel, with opening (split) at opposite side of wheel from tube valve. Engage one end of side ring in wheel groove by pushing it in by foot, then walk around side ring to drive it into groove. Check that side ring is securely positioned in groove of wheel. If necessary, use a lead hammer to aid in installing the side ring.

(6) Place tire in a safety cage. If possible, use a clip-on type air chuck so that operator can stand a safe distance from tire during inflating. Install serviceable core in valve stem. Inflate tire to 75 psi. If a used tube has been installed, deflate tire to assure correct tube seating (without pinching), then increase pressure again to the recommended value.

(7) Install valve stem cap.

f. Front Hub and Drum Removal. To remove front hub and drum and bearing, proceed as follows:

(1) Remove wheel; refer to paragraph 8-3b.

(2) Remove six bolts and washers, then hub cap and gasket.

(3) Remove cotterpin in axle nut; then remove nut and washer.

(4) Pull off hub and drum; catch outer wheel bearing cone as hub is pulled off.

(5) Use bearing puller (with large jaws) to remove hub inner bearing seal, then remove inner bearing cone from hub.

(6) Remove old grease from hub cavity and flush clean.

(7) Repack bearings, as required; refer to paragraph 8-9e.

g. Front Hub and Drum Installation. To install front hub and drum and bearing, proceed as follows:

(1) Install repacked inner bearing cone in hub and drum.

(2) Install new seal over bearing; seal may be driven in with a wooden block by tapping block with a hammer or with an arbor press.

NOTE

Wheel hub cavities should be packed with sufficient grease (NLGI Grade 2) to form a dam around the bearing mount areas to hold the grease in place in both inner and outer bearing areas.

(3) Install hub and drum over brake shoes and onto spindle.

(4) Position repacked outer bearing cone on spindle and against bearing cup in hub.

(5) Install washer and axle nut.

(6) Tighten nut until no side play is present, then secure nut with new cotter pin.

(7) Lubricate threads of hub cap mounting bolts with threadlube.

(8) Secure hub cap and gasket on hub with six washers and bolts; tighten 73 to 79 INCH pounds.

(9) Install wheel; refer to paragraph 8-3c.

h. Rear Hub and Drum Removal. To remove rear hub and drum assembly and bearing, proceed as follows:

- (1) Remove wheel; refer to paragraph 8-3b.
- (2) Remove hub cap.
- (3) Remove eight nuts and washers, then remove drive flange.
- (4) Remove bearing retainer locknut and lockwasher.
- (5) Remove keyed washer, then pull off hub and drum assembly.
- (6) Remove outer bearing from hub.
- (7) Use bearing puller (with large jaws) to remove hub inner bearing seal, then remove inner bearing from hub.
- (8) Remove old grease from hub cavity and flush clean.
- (9) Repack bearings, as required; refer to paragraph 8-9e.

i. Rear Hub and Drum Installation. To install rear hub and drum assembly and bearing, proceed as follows:

- (1) Install repacked inner bearing in drum.
- (2) Install new seal over inner bearing; seal may be driven in with a wooden block tapped with a hammer or with an arbor press.

NOTE

Wheel hub cavities should be packed with sufficient grease (NLG1 Grade 2) to form a dam around the bearing mount areas to hold the grease in place in both inner and outer bearing areas.

- (3) Install hub and drum over brake shoes and onto axle.
- (4) Position repacked outer bearing on axle and against seat in hub.
- (5) Install keyed washer, bearing lockwasher, then bearing locknut.

(6) Manually turn hub counterclockwise while tightening locknut until binding is felt; back off 1/6 of a turn, then bend locking washer tab into nut. Check that wheel turns freely, without any sideplay.

(7) Lightly lubricate threads of drive flange mounting studs with threadlube.

(8) Install new O-ring in drive flange groove.

(9) Secure flange with eight washers and nuts; tighten nuts 39 to 43 foot pounds.

(10) Install hub cap in flange.

(11) Install wheel; refer to paragraph 8-3c.

8-4. DISASSEMBLY

a. General. Disassembly of the hub and drum may be accomplished only after tire is removed in accordance with paragraph 8-3d.

b. Hub and Drum Disassembly. To disassemble the hub and drum proceed as follows:

NOTE

The hub and drum may be disassembled for replacement of any part except the hub itself. If a hub is defective, it must be replaced with the entire hub and drum assembly. Replacement of the drum, or rear wheel oil shield, requires removal of the drum from the hub. Special tools required are an arbor press and a bearing puller.

(1) Remove front hub and drum assembly per paragraph 8-3f; remove rear hub and drum assembly per paragraph 8-3h.

(2) Use a bearing puller to remove any bearing cones to be replaced.

(3) Use an arbor press to press any defective studs out of hub and drum assembly. If a brake drum or rear wheel oil seal is to be replaced, remove all studs.

(4) On rear wheel hub, remove any defective drive flange mounting stud. To remove stud, use (as required) penetrating oil, vice-grippers, drill, and/or an easy-out tool. Alternate method: use two

nuts securely tightened against each other, with wrench on inner nut, to unscrew (counterclockwise) stud from wheel hub.

NOTE

Heating of hub, while cooling stud, may aid removal of a "frozen" stud.

8-5. INSPECTION/CLEANING

a. General. Procedures in this section cover tire, tube, and wheel inspection and cleaning.

b. Tire and Wheel Inspection. Frequent visual inspection of the tires and wheels, when mounted on the vehicle, can reveal developing troubles before they become major. Especially important is looking for signs of damage, loose mounting, under-inflation, and unusual tire wear. For checking indications of wheel or tire noise or any unusual motion (such as vibrating), refer to table 8-1, Troubleshooting. When problems are suspected, and at least once a month, inspect mounted tires and wheels, then correct any defects as soon as possible. Inspect tire, wheel, and related parts according to table 8-2.

Table 8-2. Component Inspection

Component	Inspect visually for	Corrective action
Wheel and side ring, mounted	Foreign matter	Remove any material caught between dual wheels, tire and wheel, or in tire treads.
	Cracks and other damage, especially on or near mounting surfaces and bolt holes	Replace
	Trueness; use dial indicator according to par. 8-5d	Replace if eccentric or out-of-round
	Lubricant leakage on wheel, tire or brake drum	Correct leakage
Wheel and side ring, dismantled: (Tire-mounting surfaces, especially tire-bead mating areas)	Dents, cracks, tool damage, imbedded foreign matter, and corrosion	Remove minor damage and clean part; refer to paragraph 8-5f. Replace unserviceable part
	Bare metal	Clean and refinish; refer to paragraph 8-5a
Cone locknuts	Looseness, when installed; also check by torque wrench	Tighten loose locknuts; refer paragraph 8-3c, step (3)
	Any damage that affects correct seating or that weakens part	Replace
Hub and drum	Damage, especially if it could prevent correct wheel mounting	Replace unserviceable part; refer to paragraph 8-3. If brakes are at fault, refer to Group 9

Table 8-2. Component Inspection (Continued)

Component	Inspect visually for	Corrective action
	<p>Drum contamination, cracks, thin or scorched spots, heat checking (network of fine cracks), scoring (grooves around braking surfaces), glazing (usually from lubricant contamination), and braking surface that is tapered or too thin</p>	<p>Clean as necessary; refer to paragraph 8-5e. If damage or wear not excessive, cam-grind drum. Replace excessively thin, rough, scorched, or tapered drum. If brakes are at fault, refer to Group 9</p> <p style="text-align: center;">NOTE</p> <p>Heat-checking of drum interior occurs during normal heating and cooling from brake operation. Unless cracks are wide and/or deep, the drum is considered serviceable (if otherwise sound).</p>
Tire, mounted	<p>Damage, foreign objects, age-checking, scuff or wear that exposes cord, worn thread, cracks, and ruptures</p>	<p>Replace unserviceable tire. Remove foreign objects from serviceable tire and, if cord is exposed in small area(s), have tire repaired at manufacturer's service center</p>
	<p>Air leaks through tube or tube valve stem; apply non-corrosive soap solution to locate leaks</p>	<p>Replace defective valve core, then replace cap. Repair tube leak; refer to paragraph 8-6b; or replace unserviceable tube; refer to paragraphs 8-3d and 8-3e.</p>
Tire, dismounted: Bead	<p>Damage, especially cutting or nicking by tire tools, worn or undersize mounting edges, and signs of corrosion and/or metal reaction with bead material</p>	<p>Check same area of wheel for related defects, refer to wheel inspection above. Replace unserviceable tire</p>
Tire, interior: tube	<p>Punctures, foreign matter, weak spots, exposed cord, and manufacturing defects</p> <p>Punctures, age-checking, fold-over damage, thin spots, porosity, cracks (especially around valve stem), and manufacturing defects</p>	<p>Replace unserviceable tube. Have minor exposed cord repaired at manufacturer's service center</p> <p>Check same area of tire for related defects. Replace unserviceable tube. Repair punctured tube; refer to paragraph 8-6b</p>

Table 8-2. Component Inspection (Continued)

Component	Inspect visually for	Corrective action
Bearing and cup	Damage, and especially for worn or bent retainers, loose rollers, metal particles in grease, and evidence of incorrect lubrication	Replace unserviceable bearing. Repack serviceable bearing; refer to paragraph 8-8f.

c. Tube Leak Check. To check for leakage, inflate tube to full normal size (less than 1 psi), then use a mild soap solution or a water bath to find leaks. Mark leak areas. Repair leaks according to paragraph 8-6b.

d. Wheel and Tire Trueness. A wheel or tire may have out-of-true defects by being out-of-round (radial deviation, "eccentric") or not in perpendicular alignment with its rotational axis (lateral deviation, "wobble"). To check for wheel and tire radial and lateral deviation, proceed as follows:

(1) Raise wheel suspected of being out-of-true; refer to steps 8-3b(1) through (4).

(2) Check wheel manually for firm, even mounting on hub and bearing. Correct any loose condition: front wheel, paragraph 8-3f and 8-3g; rear wheel, paragraphs 8-3h and 8-3i.

(3) Manually spin wheel and visually check for any wobble (lateral deviation) or vertical changing of bottom of spinning tire (axial deviation).

(4) If either deviation is wide, replace tire (refer to paragraphs 8-3d and 8-3e), then recheck per step 3 above. After tire is replaced with a new one, if deviation is still wide, the wheel is likely out-of-true; replace wheel (refer to paragraphs 8-3d and 8-3e), then repeat step 3 above.

(5) If closer checking is desired, set up a dial indicator (on a firm base) against side of tire to be checked; spin wheel and record range of dial indications. Set dial indicator against high point of front or back of tire; spin wheel and record dial indications. Indicated range on dial should not exceed 0.05 inch. If range is excessive, repeat procedures in step (4).

NOTE

Wheel manufacturers deviation allowance is 0.041 maximum, on wheel alone.

(6) To check the wheel alone repeat step (5), but set dial indicator to contact outside of main bead-contacting surfaces (wheel horizontal perimeter and vertical perimeter).

(7) Lower wheel to ground; refer to paragraph 8-3c.

e. Hub and Drum Cleaning. Remove excessive external corrosion and grease, dirt, or oil deposits with solvents and wire brush. Remove any oil or glazing with denatured alcohol and fine abrasive paper, then clean braking surface thoroughly with clean dry cloths, and/or pressurized air.

Caution

Avoid using pressurized air in any manner which might cause the air or propelled objects to strike anyone. Do not use petroleum products on any braking surfaces.

f. Wheel and Side Ring Cleaning. It is recommended that no repair be attempted on the wheels or wheel side rings; however, their serviceability can be enhanced by correct cleaning and repainting when corroded, or if the base metal is bared. Inspect parts according to table 8-2. Clean and refinish corroded/bare areas according to the following procedures:

(1) Remove rust, dirt, and foreign materials from all wheel surfaces. Use denatured alcohol to remove petroleum products. Use a wire brush for other contaminants. If contamination is excessive, sand blasting may be applied.

(2) Check carefully for any damage revealed by cleaning process; refer to table 8-2.

(3) Spray a fast-drying metal primer on all cleaned or bare metal surfaces.

Caution

Avoid excessive buildup of primer/paint on wheel locknut seating surfaces. Thick primer/paint in these areas could interfere with maintaining correct nut torque.

(4) When primer has dried completely, lightly sand any thick or rough primer, then paint only the wheel outside surfaces with finish coat.

8-6. REPAIR

a. General. Repair of the wheels is limited to repair of tires and tubes, and balancing of the mounted wheel. In emergencies, a wheel from a rear pair can be used to replace an unusable front wheel (mount remaining single rear wheel in the outer position only, to maintain coach balance).

b. Tube Repair. Tube damage may be repaired using a Rema patch and patch kit (or equal). Remove tube from tire; refer to paragraph 8-3d, then proceed as follows:

(1) Place tube on a stable surface with damaged area exposed.

(2) Use patch kit tool to roughen area to be patched.

(3) Wipe area clean with kit solvent and clean cloth.

(4) After solvent evaporates, peel backing from patch and press it in position centered over tube damage.

(5) Firmly rub patch into tube contact with kit roller.

(6) Install tube on wheel; refer to paragraph 8-3e.

c. Tire Repair. Any repair of tires should be performed by qualified personnel. Tire repairs that are possible include replacement of damaged steel cord and buildup of cured rubber over exposed cord or abraded areas (in any section of the tire).

8-7. ASSEMBLY

a. General. Procedures for assembly of the wheel and hub and drum are as follows:

b. Hub and Drum Assembly.

(1) Install serviceable bearing cone in place of removed cone, using arbor press.

(2) If brake drum or rear wheel oil seal was removed, install new parts, then install serviceable studs fully into assembly with arbor press.

(3) To install a rear drive flange mounting stud, install two nuts on stud threads near stud outer end and tighten them securely against each other. Use wrench on outer nut to screw (clockwise) stud into wheel hub, then remove nuts from stud.

8-8. GENERAL INFORMATION

a. General. This section contains general information related to procedures contained in previous sections.

b. Fluids and Lubricants. Fluids, lubricants and other materials used for service and maintenance of the wheel and hub and drum are listed in table 8-3.

Table 8-3. Fluids/Lubricants/Materials

Item	Specification	Quantity/use
Pressurized air	Not less than 75 psi (filtered of particles and moisture)	Use as required for tire inflation and air-jet cleaning
Thread lubricant	Threadlube	Use as specified
Bearing lubricant	NLGI Grade 2 wheel bearing grease	Use as specified
Cleaning solvent	Denatured alcohol	General cleaning, especially of brake parts and removing primer from braking surface of drum

c. Tire and Wheel Data. Data on the wheels, tires, and tube is contained in tables 8-4 and 8-5.

(1) Inspect condition of lubricant in drum hub cup areas for contamination (dirt, metal particles, rust, etc.).

Table 8-4. Tire Data

Item	Size	Ply	Load capacity (lbs)	Inflation
Front tires	7.50 x 17	8	2,540 rating; 5,000 (max) combined	75
Rear tires	7.50 x 17	8	2,460 rating; 9,500 (max) combined (two pairs)	75
Tubes				

Table 8-5. Wheel Data

Type	Size	Weight (lbs)	Side ring weight (lbs)	Studs	Load at highway speeds	Bolt circle	Bore
Disc, side-ring (split)	17 x 600S	41	10	5	3,180 pounds capacity	8 inch	6 inch

d. Torque Requirements. Torque requirements for threaded parts used in the wheel and hub and drum are contained in table 8-6.

NOTE

If contamination is found, clean (wash) all lubricant from drum hub cup areas and bearing cones.

Table 8-6. Torque Requirements

Part secured	Attaching part	Torque range
Front wheel	Mounting nut	300 to 350 foot pounds
Hub cap	Bolt	73 to 79 INCH pounds
Rear wheel	Mounting nut	300 to 330 foot pounds
Drive flange	Nut	39 to 43 foot pounds

(2) Replace bearing cups in drum hub.

(3) Apply wheel bearing grease NIG1 Grade 2 to drum hub cup areas.

NOTE

Wheel hub cavities should be packed with sufficient grease to form a dam around the bearing mount areas to hold the grease in place in both inner and outer bearing areas.

(4) Using Croft T310 bearing packer, place small end of bearing cone to press down on tool cup.

(5) Position packer handle cone on top of bearing.

e. Repacking Outer and Inner Bearing Cones.

(6) Press down on handle to force lube through bearing recesses.

NOTE

With bearing cone in packer, apply only moderate pressure on handle to ensure even grease flow into bearing recesses.

(7) Lift handle and slide bearing out over edge of bearing cup.

(8) Install inner bearing cone in drum hub cup.

(9) Install new inner bearing seal in drum hub.

NOTE

Retain outer bearing cone for insertion in outer drum cup after drum is placed on axle.

f. Rotating Tires. If tire inspection, refer to paragraph 8-5, reveals unequal wear on the tires, they should be rotated to equalize wear on the set. Tires should be rotated by qualified personnel to assure correct matching and rotation. Rear dual wheel pairs should be as closely matched in weight and size as possible. (These values include results of tread wear.) When only two new tires are added to a set of six, they should be mounted in the front as a safety factor, to minimize possibility of loss of steering control in blowouts, and as a break-in factor: the lighter weight of the front end permits the tire to break-in slower, which can result in longer tire life.

g. Wheel Balancing. Original wheels on the coach are all dynamically balanced; therefore any wheel can usually be safely used on the coach

front end where balance is critical to safe vibrationless driving. If an unbalanced wheel must be used, it should be mounted in the coach rear, and should (if possible) be statically balanced. Tires which have been balanced can "wander" out of balance again from tire flexing, from rapid stopping that causes uneven wear and stretching, and from loss of balancing weights. To balance wheels, proceed as follows:

(1) Static balance wheels (if impossible to balance dynamically) by placing wheel on a bubble-balance fixture. Lay wheel weights on outer rim of tire ring until bubble comes to rest in center of fixture window. Push wheel out of balance; wheel should recover its former position with bubble centered in fixture window. When balance is satisfactory, mark position of weights, then drive weight clamps firmly onto tire ring at marked positions.

(2) Check wheel to be dynamically balanced for soundness, correct tire mounting, correct pressure, and full engagement of tire ring. Dynamically balance wheel on a reliable rotating stand according to instructions of the stand manufacturer. Install wheel weights as required to eliminate all tire wobble. If wheel and tire will not balance or appear to move up and down, inspect wheel and tire; refer to section 8-5.

Warning

Do not spin a mounted wheel that is defective or below safety standards in any other way. Make certain that wheel is securely mounted on stand axle. An unsafe wheel or insecure mounting could result in serious injury to personnel and damage to equipment.



URGENT

ROUTINE

MANDATORY

INFORMATIONAL

Service Bulletin

DATE May 15, 1974

NUMBER 2908 40001

ATTENTION: SERVICE MANAGERS AND OWNERS				GROUP 8																								
<p>In order to provide an improved ride in the FMC 2900R Motor Home, the tire pressure can be reduced from the previously specified 75 psi. The schedule below should be followed in establishing the tire pressures you use.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">FRONT AXLE WEIGHT (LBS)</th> <th style="text-align: center;">FRONT TIRE PRESSURE (PSI)</th> <th style="text-align: center;">REAR AXLE WEIGHT (LBS)</th> <th style="text-align: center;">REAR TIRE PRESSURE (PSI)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">4300</td> <td style="text-align: center;">50</td> <td style="text-align: center;">7960</td> <td style="text-align: center;">50</td> </tr> <tr> <td style="text-align: center;">4650</td> <td style="text-align: center;">55</td> <td style="text-align: center;">8640</td> <td style="text-align: center;">55</td> </tr> <tr> <td style="text-align: center;">5000</td> <td style="text-align: center;">60</td> <td style="text-align: center;">9340</td> <td style="text-align: center;">60</td> </tr> <tr> <td style="text-align: center;">5335</td> <td style="text-align: center;">65</td> <td style="text-align: center;">10,090</td> <td style="text-align: center;">65</td> </tr> <tr> <td style="text-align: center;">5510</td> <td style="text-align: center;">70</td> <td style="text-align: center;">10,480</td> <td style="text-align: center;">70</td> </tr> </tbody> </table>				FRONT AXLE WEIGHT (LBS)	FRONT TIRE PRESSURE (PSI)	REAR AXLE WEIGHT (LBS)	REAR TIRE PRESSURE (PSI)	4300	50	7960	50	4650	55	8640	55	5000	60	9340	60	5335	65	10,090	65	5510	70	10,480	70	SUBJECT TIRE PRESSURES
FRONT AXLE WEIGHT (LBS)	FRONT TIRE PRESSURE (PSI)	REAR AXLE WEIGHT (LBS)	REAR TIRE PRESSURE (PSI)																									
4300	50	7960	50																									
4650	55	8640	55																									
5000	60	9340	60																									
5335	65	10,090	65																									
5510	70	10,480	70																									
<p>The enclosed blocks indicate the tire pressures recommended by the Michelin Company for the FMC 2900R. If you operate your vehicle at axle weights less than those specified in the enclosed blocks, then the tire pressures can be further reduced accordingly.</p> <p>For long distance, high-speed travel with a fully loaded vehicle, it is recommended that the 60 psi in front tires and 65 psi in rear tires be increased by 10 percent.</p>				MODEL (S) AFFECTED 2900R MOTOR HOME																								
<p style="text-align: center;"><i>John L. Strever</i></p> <p style="text-align: center;">JOHN L. STREVER Service Manager</p>				(Factory Use Only) Information added to: OWNER MANUAL (S) SERVICE MANUAL (S) PARTS MANUAL (S) WARRANTY MANUAL (S) OTHER																								

FMC CORPORATION
MOTOR COACH DIVISION
P. O. BOX 664
SANTA CLARA, CA 95052

5-15-74

8

TIRE LEAD CORRECTION

Vehicles equipped with radial ply tires will occasionally exhibit a consistent lead in one direction, either left or right. This is caused by the vehicle reacting to a sideways force caused by the rigid steel belts in the radial tires. Road crown and crosswinds will affect a lead condition and should be considered when selecting a route for road testing.

Assure that the tires are inflated at the recommended pressures and the power steering gear valve is centered properly. If a road test reveals the vehicle still exhibits a "lead" condition, follow the diagnostic chart on the reverse side for correction.

STEERING WHEEL OSCILLATION

Certain vehicles equipped with radial ply tires may exhibit an oscillation in the steering wheel predominantly in the 50-60 mph range. This oscillation, also found occasionally with bias-belted tires, can usually be improved or eliminated with an off-car dynamic balance or an on-car balance using equipment that corrects both the static and dynamic unbalance.

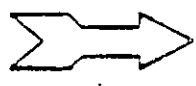
Static balancing with a high speed spin balancer will probably not produce the improvement desired. If the condition persists after balance, switch the tires front to rear. If on-car ~~balancing~~ balancing has been performed, re-balancing will be necessary.

NOTE: IT IS ESSENTIAL THAT THE TIRE PRESSURES BE ADJUSTED TO THE RECOMMENDED PRESSURES AFTER ROTATION, PARTICULARLY ON STATION WAGONS WHERE IMPROPER FRONT TO REAR TIRE PRESSURE DIFFERENTIAL WILL AFFECT VEHICLE STABILITY CHARACTERISTICS.

(over)

CORRECTION - RADIAL PLY TIRE PULL

Adjust tire pressure to reduced load on pressure placard.
Adjust power steering valve to center, if necessary.



ROAD TEST → OK



CAR LEADS
Cross Switch Front Tire & Wheel Assemblies



ROAD TEST → OK



CAR LEADS OPPOSITE DIRECTION
Probable cause - tires
Switch tires frt to rr
LF to LR RF to RR
LR to LF RR to RF



ROAD TEST → OK



CAR STILL LEADS
Cross switch front tires



ROAD TEST → OK



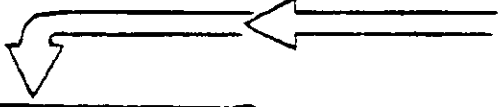
CAR STILL LEADS
Switch R.F. and spare



ROAD TEST → OK



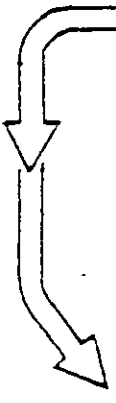
CAR STILL LEADS
Lead caused by LF tire - replace



CAR LEADS SAME DIRECTION
Probable cause-vehicle
Check front alignment
Toe-Caster-Camber



ALIGNMENT NOT OK
Adjust alignment to preferred settings.



ROAD TEST



ALIGNMENT OK	
CHANGE CASTER SETTING	
LEADS LEFT	LEADS RIGHT
Increase left caster $1\frac{1}{2}^{\circ}$ higher than right.	Increase right caster $1\frac{1}{2}^{\circ}$ higher than left.



ROAD TEST



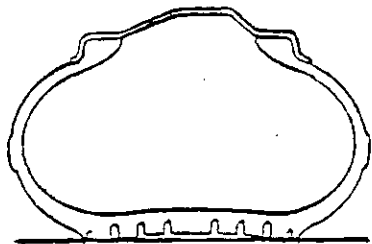
STILL LEADS LEFT
Continue increasing left caster until pull is eliminated

STILL LEADS RIGHT
Continue increasing right caster until pull is eliminated

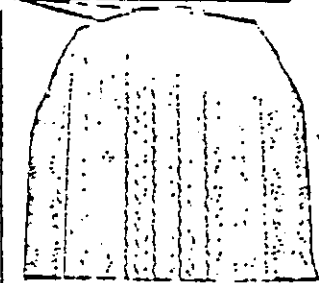
TIRE WEAR CHART

5-15-74

8

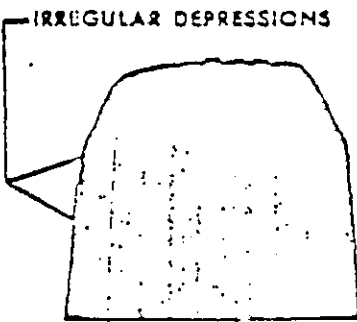


TREAD CONTACT WITH ROAD
UNDERINFLATION



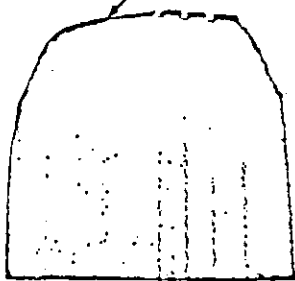
UNDERINFLATION

SHOULDERS OF TREAD WORN

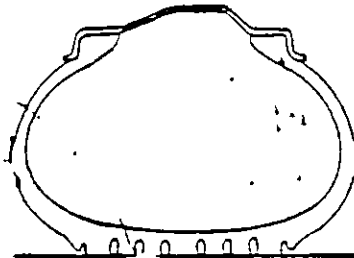


MULTI-PROBLEM

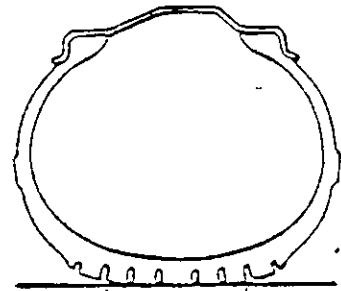
ONE SIDE OF TREAD WORN



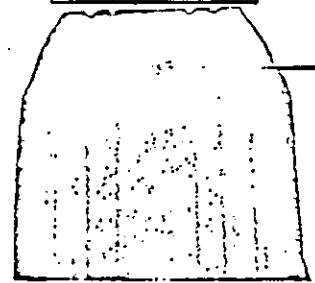
CAMBER WEAR



TREAD CONTACT WITH ROAD
PROPER INFLATION

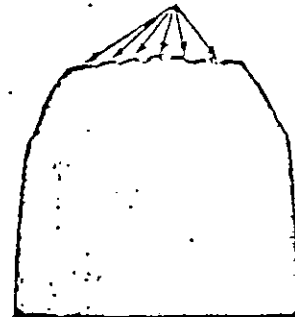


TREAD CONTACT WITH ROAD
OVERINFLATION



OVERINFLATION

CENTER OF TREAD WORN
FEATHERED EDGE

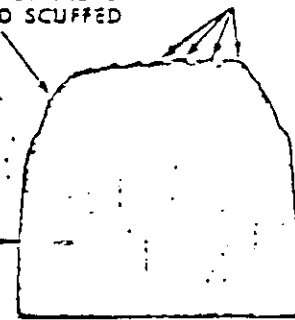


TOE-IN WEAR

SHOULDER OF TREAD
WORN AND SCUFFED

FINS

ROUGH
SURFACE



CORNERING WEAR



URGENT

ROUTINE

MANDATORY

INFORMATIONAL

Service Bulletin

DATE January 15, 1976

NUMBER 2908 30001

<p>ATTENTION: SERVICE MANAGERS</p>	<p>GROUP T8</p>
<p><u>DESCRIPTION</u></p> <p>This bulletin is issued to cover instructions for determining if the wheel mounting studs on the vehicle have been correctly heat-treated.</p> <p><u>COMPLIANCE</u></p> <p>Vehicles affected by this bulletin will be completed by March 1, 1976. The accomplishment of this bulletin prior to the above mentioned date will not jeopardize your existing warranty. You are urged to comply by the above date to avoid possible adverse consequences.</p> <p><u>MANPOWER</u></p> <p>Estimated accomplishment time is as follows:</p> <p>... To wet torque all wheel studs - 1 hour. ... To replace one stud on one wheel - 1-1/4 hours. ... For each additional stud on same wheel - 1/4 hour.</p> <p><u>WARRANTY REIMBURSEMENT</u></p> <p>FMC Motor Coach Division will allow labor reimbursement as outlined above upon receipt of a properly filled out Warranty Claim (RVD 69) for this torque test and stud replacement.</p> <p><u>PARTS FURNISHED</u></p> <p>New wheel studs (5106613-01 and 5106613-02) will be furnished on a no charge basis to all transit operators for replacement purposes.</p> <p><u>ACCOMPLISHMENT INSTRUCTIONS</u></p> <ol style="list-style-type: none"> 1. Loosen wheel lug nuts one at a time and apply threadlube to each stud. 2. Tighten each wheel lug nut to 330 pound feet. 3. If stud does not fail, it has been properly heat treated. 4. If stud fails when torque is applied replace with a new one. 5. Use penetrating oil or "liquid wrench" to loosen stud nut from brake disc. 6. Use a large "C" clamp to force old stud from brake disc. 	<p>SUBJECT</p> <p>WHEEL STUDS TORQUE TEST</p>
	<p>MODEL (S) AFFECTED</p> <p>ALL TRANSITS WITH DISC BRAKES SERIAL 00652 & UP</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);"> F.M.C., AS OF 12/31/75, HAS ACCUMULATED HONORS PARTS CREDIT BALANCE REIMBURSEMENT AS OUTLINED IN THIS BULLETIN </p>



FMC Corporation
Motor Coach Division
333 Brokaw Road Box 664 Santa Clara California 95052

URGENT ROUTINE
 MANDATORY INFORMATIONAL

Service Bulletin

DATE January 15, 1976

NUMBER 2908 30001

ATTENTION: SERVICE MANAGERS	GROUP T8
<p><u>ACCOMPLISHMENT INSTRUCTIONS (CONT)</u></p> <p>7. When replacing a stud use a new nut (M-17029, 3/4-16 distorted thread metallic locknut) to hold stud to brake disc.</p> <p>8. Test any new stud in same manner as outlined above before releasing coach for service.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">See Group T8 of Transit Series Service Manual for details pertaining to wheel removal and installation.</p> <p style="text-align: center;"><i>W. Biondi</i></p> <p style="text-align: center;">W. BIONDI SERVICE MANAGER</p>	<p>SUBJECT WHEEL STUDS TORQUE TEST</p> <p>MODEL (S) AFFECTED ALL TRANSITS WITH DISC BRAKES SERIAL 00652 & UP</p>

URGENT

ROUTINE

MANDATORY

INFORMATIONAL

Service Bulletin

DATE: 8-14-78

NUMBER

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP

8 and 17

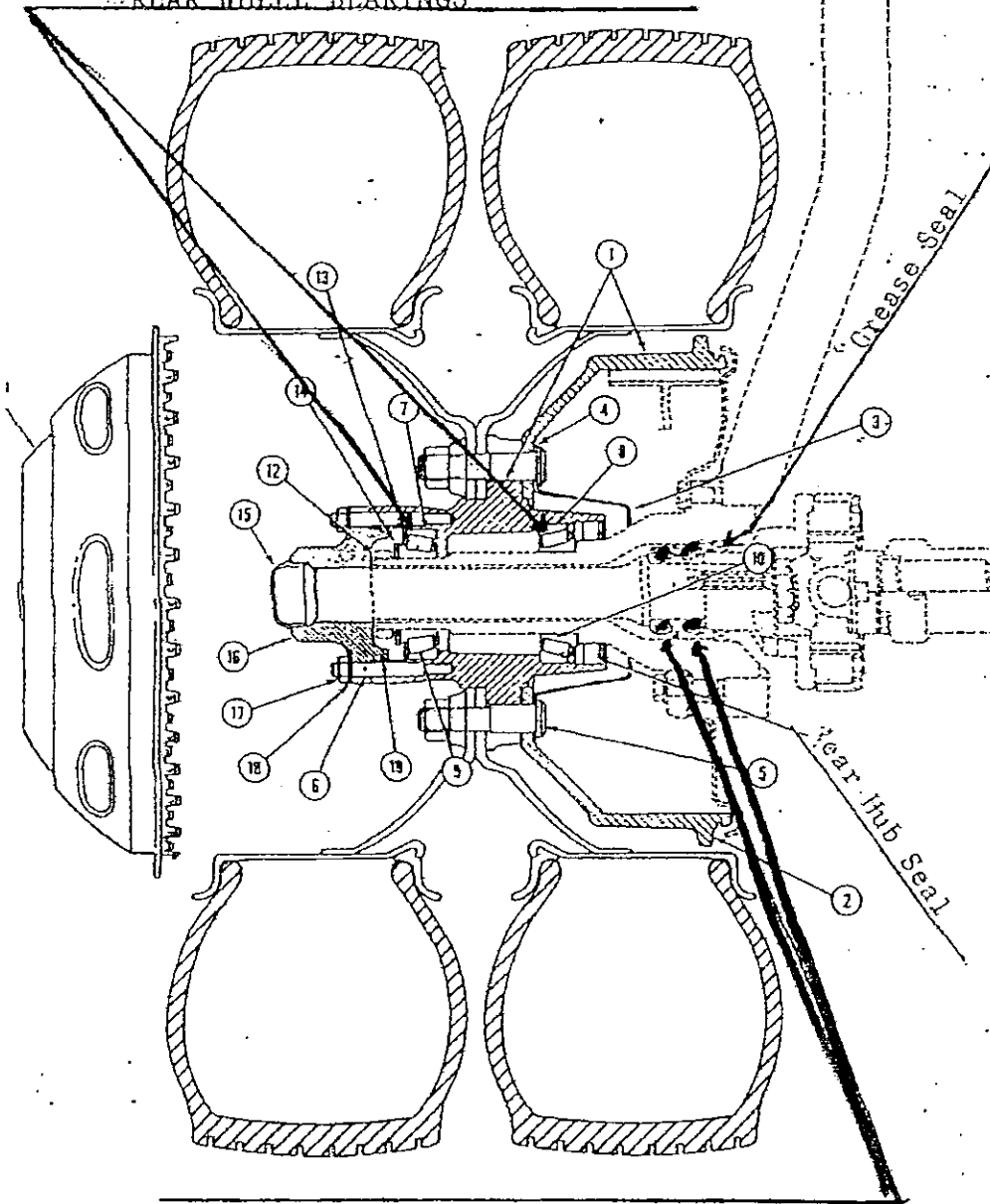
LUBRICATE AT 12 MONTHS OR 12,000 MILES
REAR WHEEL BEARINGS

SUBJECT

Lubrication
of Drive Axle
Bearings

Lubrication
of Front and
rear wheel
bearings.

MODEL (S)
AFFECTED



DRIVE AXLE BEARINGS

Lubricate at 24 months or 24,000 miles

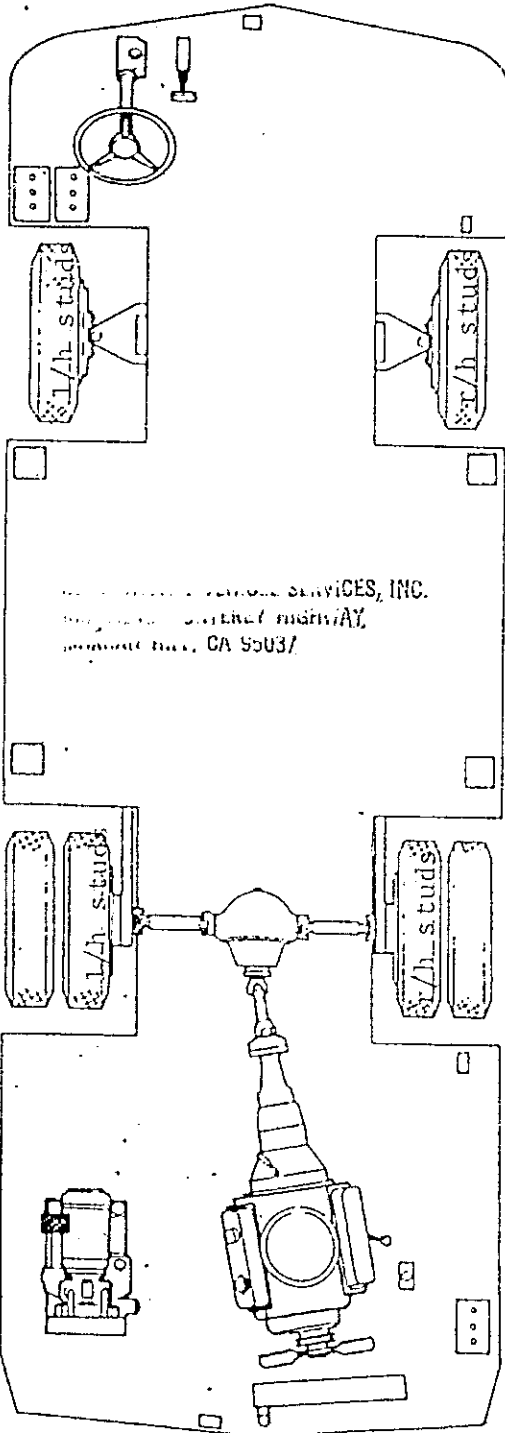
URGENT ROUTINE MANDATORY INFORMATIONAL

Service Bulletin

DATE October 1989

NUMBER _____

ATTENTION: SERVICE MANAGERS AND OWNERS

GROUP Alcoa
Wheels

1. Remove wheel lug studs from left front-left rear-right rear hub/drum assemblies.
2. Install used studs removed from left front hub/drum assembly into right rear hub/drum assembly
3. Install left hand studs furnished by RVS Corporation in both left side hub/drum assemblies
4. Please note studs have serated area which presses into hub/drum assembly. By hand locate stud serated stud area into serated impression in hub/drum holes This is important to enable studs to be pressed into place without gauling either stud or hole area.
5. Use nuts provided to mount Alcoa wheels.