



Service Bulletin No. 296

MODEL D-Series Coaches	TYPE Field Change Program	SECTION/GROUP 11-Steering	DATE Feb. 11, 2008
SUBJECT TRW AUTOMOTIVE TAS85 STEERING GEAR			
CONDITIONS			

NHTSA Recall (TRW): 07E-101000

NHTSA Recall (MCI): 06V-063

Customer Complaint:

TRW Automotive U.S. LLC has advised MCI that certain steering gears provided to MCI may be defective and that those steering gears may restrict the turning angle of the coach.

Cause:

TRW has advised MCI that certain steering gears were manufactured with defective sector shafts. The inner surface of the outer sector shaft teeth may have an incorrect gear tooth profile. The incorrect gear tooth profile on the sector shaft may interfere with the rack-piston teeth, resulting in a "stick or bind" condition. This condition has the potential to cause the steering gear to stall and restrict the turning angle of the coach.

Corrective Action:

MCI strongly encourages customers to participate in TRW Automotive Field Change Program by replacing the existing TAS85 steering gear installed on MCI coaches.

As a result, MCI advises that owners of D model coaches between the range of, and including, unit numbers 58311 to 58319, 58323 to 58334, 58321 and 58356 implement the specified steps.

Parts

Qty.	New P/N	Description
1	11L1-4	Steering Gear
1	11-08-6071	Filter, Power Steering Reservoir
a/r	21-7512-7	Lubricant
a/r		Power Steering Fluid

Service Procedure:

General notes

Read this entire procedure before beginning work.

Use Safe Shop Practices At All Times.



WARNING

All steering components are safety critical. Failure to observe the following procedures and instructions may result in loss of steering. If there is abnormal wear or damage to the steering column or if you encounter circumstances not covered in the Maintenance Manual, stop and consult the MCI Service Department.

The steering gear weighs approximately 110 lbs. (50 kg) dry. Before proceeding with removal, support the gear to prevent it from falling from the frame after the mounting bolts have been removed.



REFER TO MANUAL

Refer to Section 11 / Steering, in the MCI D Series Maintenance Manual, in conjunction with this procedure.

1. Position the steering wheel so that the front wheels are straight ahead. Verify that the steering wheel is centered.
2. Turn the main battery disconnect switch to the OFF position. Check both sides of the tires.



CAUTION

Wheel and tire assemblies weigh more than 100 pounds. Use caution when handling wheel and tire units.

3. Open the roadside, front side service and spare tire compartments. Remove spare tire and place aside to be re-installed at a later step in this procedure.
4. Remove the steering column cover assembly (Figure 1). Place aside to be re-installed at a later step in this procedure.

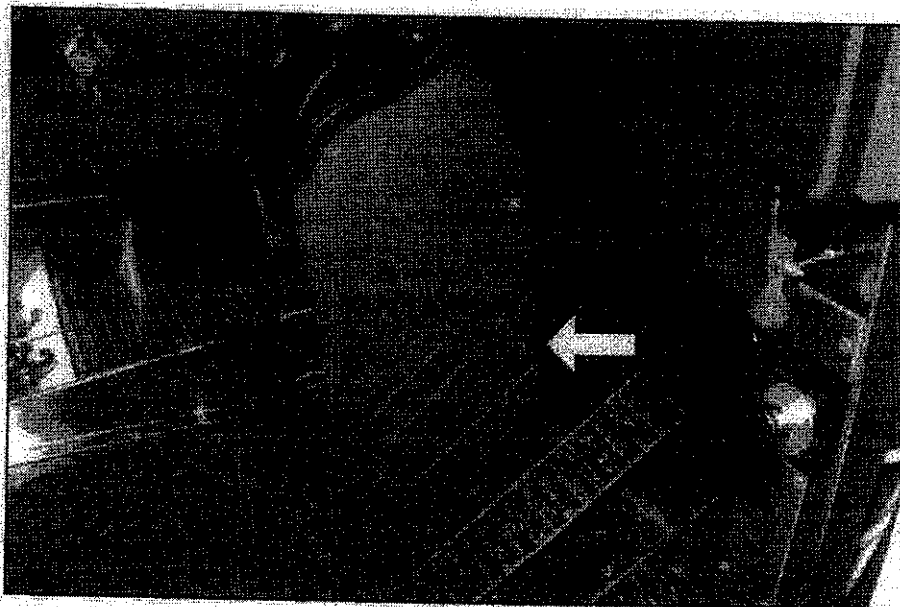
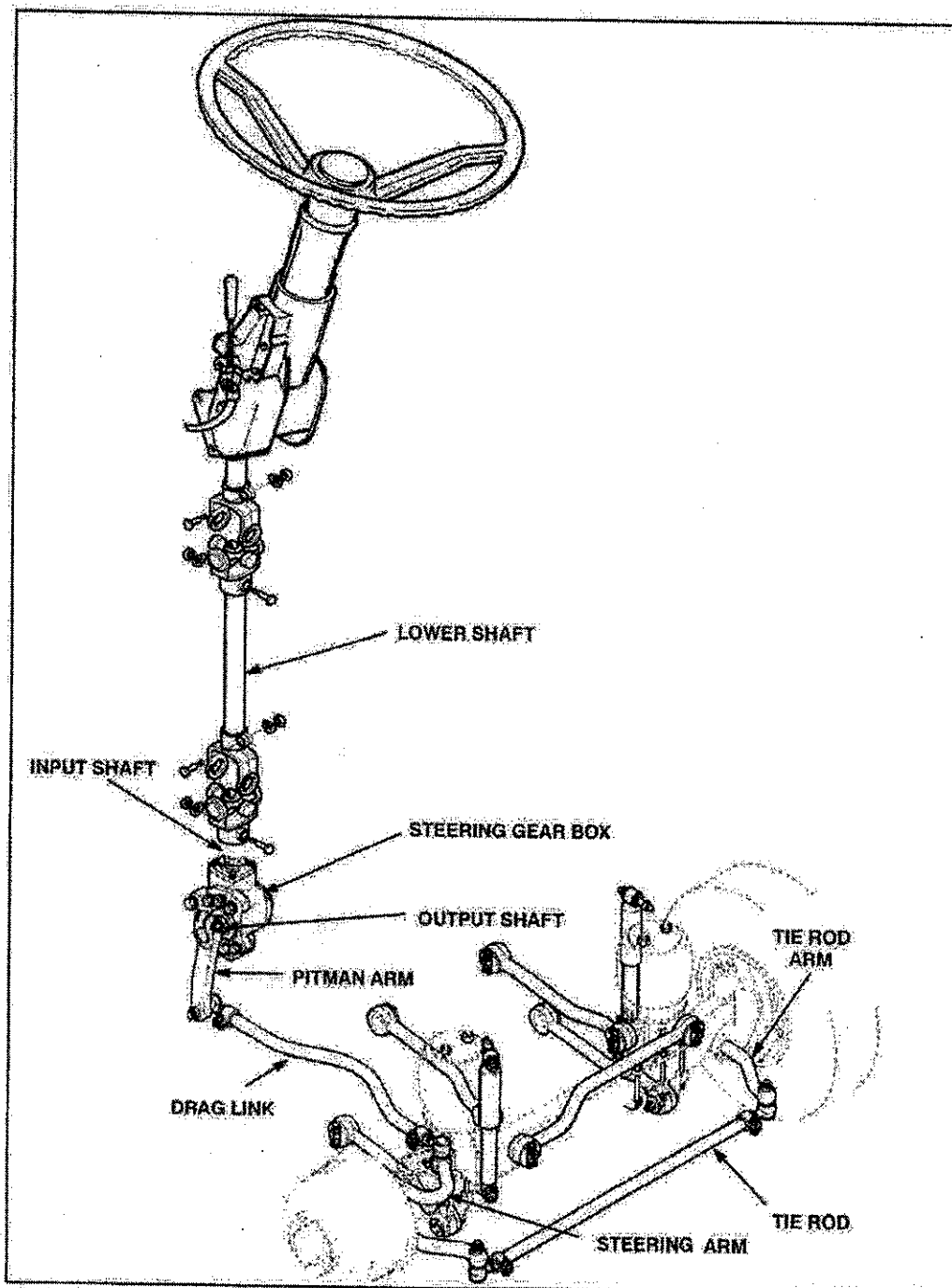


Figure 1. Steering column cover assembly.

5. Unfasten and loosen the lower shaft clamp yoke that connects the lower column section to the steering gear's input shaft. Retain any parts removed to be re-installed at a later step in this procedure.

**Figure 2.**

6. Unfasten and remove the drag link from the pitman arm.
7. Remove the pinch bolt on the pitman arm.
8. Drive a wedge into the groove at the top of the arm to loosen it from the sector shaft. Slide the pitman arm off the shaft.
9. Clean the area around the fittings.
10. Drain the fluid from the power steering system by disconnecting the hoses. Place hoses into a suitable sized container to collect power steering fluid.



WARNING

The steering gear weighs approximately 110 lbs. (50 kg) dry. Before continuing with the removal procedure, support the gear to prevent it from falling from the frame after the mounting bolts have been removed.

11. Using two people, remove the seven bolts that hold the gear to the mounting plate and carefully remove the gear.
12. Position the new steering gear (p/n 11L-1-4) on the mounting plate at the same orientation as the old gear.
13. Align steering gear housing with mounting holes in frame.
14. Install gear bolts with hard steel washers. Torque the 7/8 inch bolt to 475-525 ft-lbs (644-712 Nm). Torque the 3/4inch bolts to 295-325 ft.-lbs (400-441 Nm) (see Figure 3 / Torque Chart).

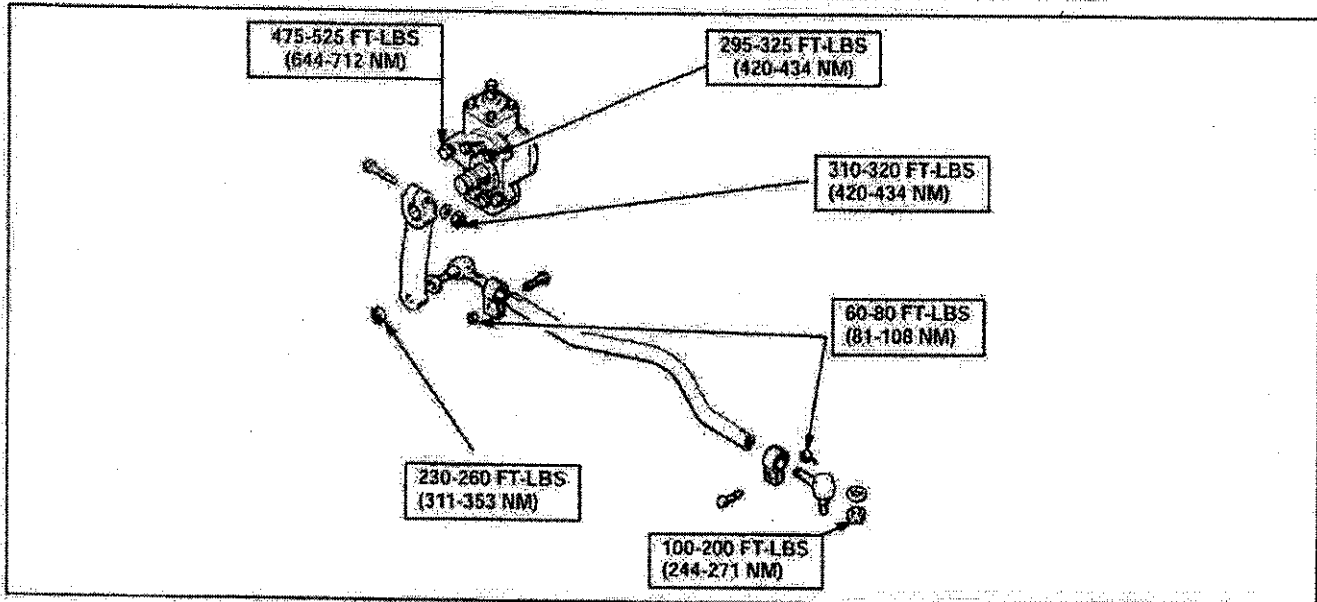


Figure 3. Torque Chart

15. Apply Never-Seize to the output shaft splines prior to installing the pitman arm (lubricant p/n 21-7512-7), to ensure against seizure of the pitman arm to the output shaft splines of the steering gear.
16. Rotate the steering gear input shaft as required to orient the timing marks scribed on the end of the sector shaft in a horizontal position (Figure 4).

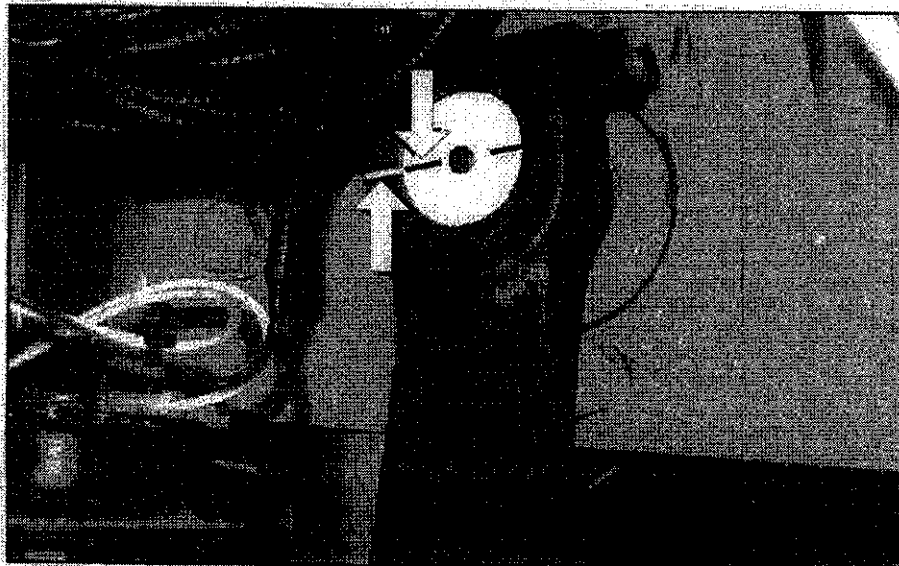


Figure 4.

17. Install Pitman arm on steering gear output shaft with alignment marks aligned. Tighten pitman arm hex nut to 310-320 ft-lbs (420-434 Nm) torque.

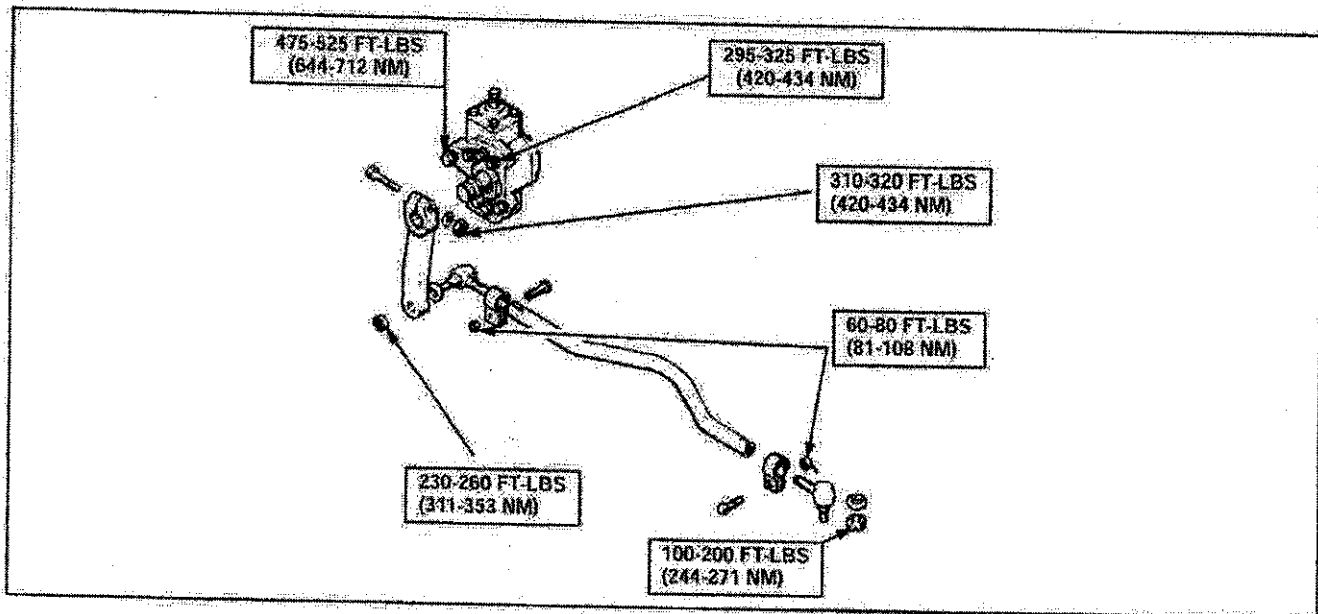


Figure 5. Torque Chart

18. Rotate the steering gear input shaft as required to align pitman arm with drag link. Attach drag link to pitman arm. Torque nut to 230-260 ft-lbs. Install a new cotter pin. DO NOT adjust draglink and ball joint.

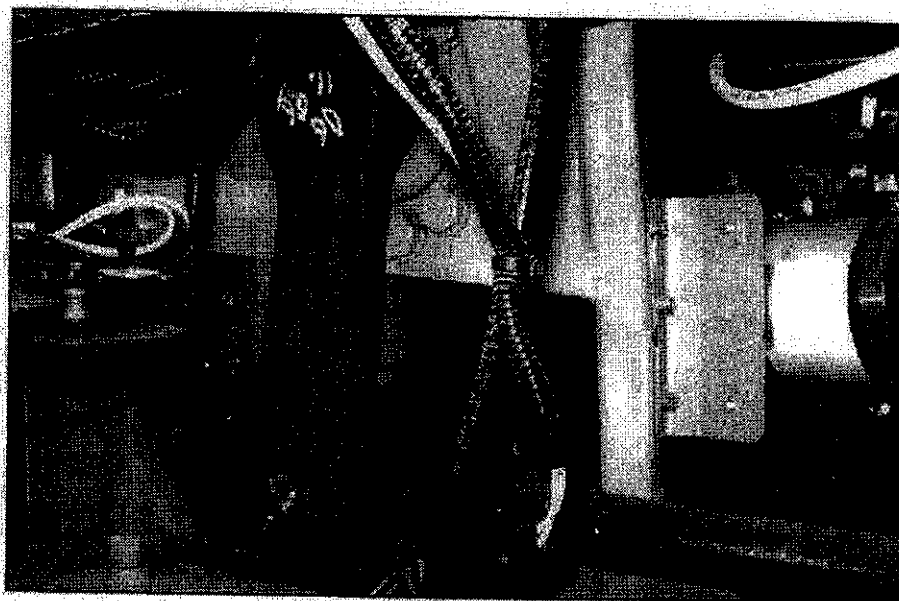


Figure 6.

19. Center steering wheel, then secure the lower column section to the steering gear input shaft with the lower shaft yoke clamp. Torque to 30-35 ft-lbs

NOTE: Torques should be re-checked to the values shown in Figure 7.

20. Connect steering column lower shaft to steering gear input shaft. Install clamp bolt with washer and nut.

21. Drain all power steering fluid from power steering reservoir and lines. Remove and discard the existing filter from power steering reservoir. Install a new power steering reservoir filter (p/n 11-08-6071).
22. Remove protective caps from the new power steering gear and connect the lines to the gear. Install the protective caps removed from the new steering gear on the old steering gear after all of the fluid has been drained.



CAUTION

Proper installation of the steering column covers and closing seals will keep any debris from interfering with steering function.

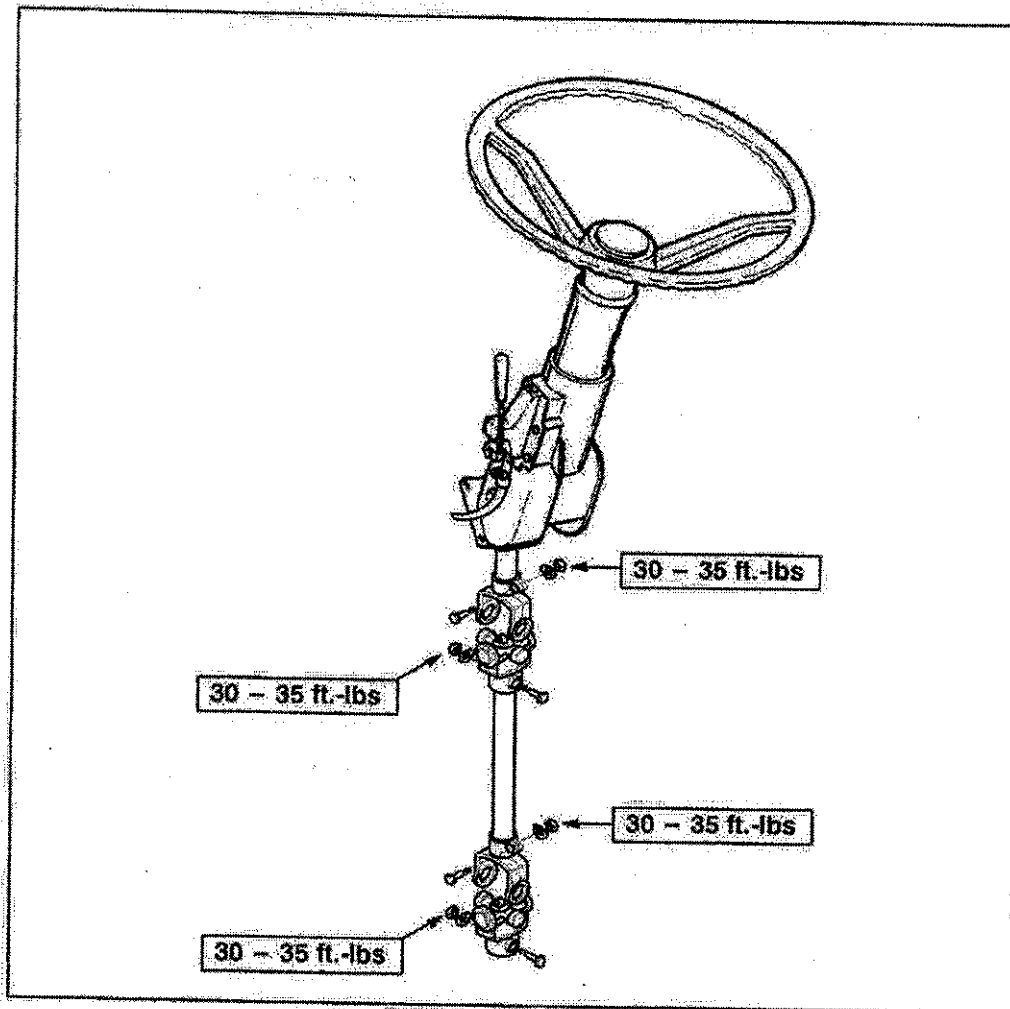


Figure 7.

23. Fill the power steering reservoir with new fluid :

NOTE: Do not turn the steering wheel until directed to do so. Otherwise, air will enter the system.

- a. Fill the reservoir nearly full.
- b. Crank the engine for 10 seconds. Do not start the engine. If the engine starts, shut it off immediately.
- c. Check and refill the reservoir as necessary.
- d. Repeat steps a. through c. three times; check and refill reservoir each time.



CAUTION

Do not allow the fluid to drop significantly or run out of the system. This will allow air into the system.

- e. Start the engine; operate at idle for two minutes. Shut the engine off and check the fluid level in the reservoir. Add fluid as necessary.
- f. Start the engine; operate at idle.
- g. With the engine idling, turn the steering wheel from full left to full right at least six times. Monitor the oil level and top off as necessary. Continue turning the steering wheel until air bubbles stop surfacing in the reservoir.
- h. When the air is displaced and the reservoir oil level stabilizes, top off the oil until the sight glass is full.
- i. Replace cap on reservoir.



NOTE

Air in the fluid system will cause spongy action and noisy operation. Bleed air from the system when any hose has been disconnected, after filter changes or when fluid has been lost for any reason.

24. Install the steering column cover assembly, using the mounting hardware removed in Step 4.
25. Verify that the steering wheel is centered when the wheels are straight ahead. If not, remove the steering wheel to straighten.

Procedure complete.

Mail or fax the completed warranty claim form to MCI's warranty department, or photocopy and mail it to:

MCI Fleet Support
Attn: Warranty Department
7001 Universal Coach Drive
Louisville, KY 40258
Fax Number 1-800-360-8886

to receive credit for the hours used to complete this task. Contact the MCI Fleet Support Technical Center at 1-800-241-2947 for any further information.

Field Change Program Conditions:

The parts required for this change will be supplied without charge.

A labor allowance of 8.0 hours will be granted for the procedure of installing the specified part(s) in this bulletin on D model coaches.

NO PAYMENT WILL BE ISSUED BY MOTOR COACH INDUSTRIES UNTIL BOTH THE COMPLETED WARRANTY CLAIM FORM AND THE EXISTING STEERING GEAR WITH A TAG CLEARLY STATING THE COACH VIN HAS BEEN RECEIVED / CONFIRMED BY MCI.

Ensure that all of the power steering fluid has been drained from the old steering gear box and that the protective caps referred to in Step 22 have been installed.

This labor allowance will be credited to your MCI Fleet Support Parts Account on receipt of a "Warranty Claim Form" as detailed in your Owner Warranty manual.

Motor Coach apologizes for any inconvenience resulting from this campaign, but urges you to implement this change as soon as possible.

Sincerely,

Motor Coach Industries
U.S. and Canadian Service Departments