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DEFECTS INVESTIGATION  
RECALL MGMT DIV.

February 6, 2008

**BY E-MAIL**

08V-063  
(17 pages)

National Highway Traffic Safety Administration  
400 Seventh Street, N.W.  
Washington, DC 20590  
Attention: Ms. Patricia Wallace

**PART 573 NOTICE RE: TRW TAS85 STEERING GEAR**

Dear Ms. Wallace:

I have enclosed Motor Coach Industries, Inc.'s ("MCI") Part 573 Defect and Noncompliance Report and proposed customer notification letter and enclosure in connection with the referenced matter.

Please confirm receipt of these documents and advise if NHTSA has any comments or recommendations prior to MCI sending the customer notifications. If not, please provide NHTSA's reference number at your earliest convenience so that we may send the notifications.

Thanks for your assistance with this matter.

Sincerely,  
MOTOR COACH INDUSTRIES, INC.

By: Robert Zeaton  
Vice President – Product Safety Engineering

Enclosures  
cc: Timothy J. Nalepka, Paul Murphy (w/encl.)

**Safety Defect and Noncompliance Report Guide for Vehicles**  
**PART 573 Defect and Noncompliance Report**

On November 26, 2007, Motor Coach Industries, Inc. ("MCI") was informed that TRW Automotive U.S. LLC ("TRW") had determined that a defect that relates to motor vehicle safety may exist in certain steering gears manufactured by TRW between August 17, 2007 and September 13, 2007. According to TRW, twenty-five (25) TAS85 steering gears may have been installed into MCI coaches. TRW furnished a copy of its notification to the National Highway Traffic Safety Administration in accordance with 49 CFR Part 573 Defect and Noncompliance Reports, a copy of which is attached to this document for reference.

**Date this report was prepared:** February 6, 2008

**Furnish the manufacturer's identification code for this recall (if applicable):**

MCI Service Bulletin 296 (draft attached)

**1. Identify the full corporate name of the fabricating manufacturer of the vehicle being recalled. If the recalled vehicle is imported, provide the name and mailing address of the designated agent as prescribed by 49 U.S.C. §30164.**

Motor Coach Industries, Inc.  
1700 E. Golf Road  
Suite 300  
Schaumburg, IL 60173

**Identify the corporate official, by name and title, which the agency should contact with respect to this recall.**

Paul Murphy  
Director, Regulatory Compliance  
Office : 204-287-4982 Fax: 502-318-8224

**Name and Title of Person who prepared this report.**

Mr. Robert Zeaton  
Vice President – Product Safety Engineering  
(256) 343-1828

**Signed:** \_\_\_\_\_

## **I. Identify the Vehicle Models Involved in the Recall**

**2. Identify the Vehicles Involved in the Recall, for each make and model or applicable vehicle line (provide illustrations or photographs as necessary to describe the vehicle), provide:**

**Make(s):** MCI

**Model Years and Models Involved:**

TRW's initial notice to NHTSA referred to thirty (30) affected parts being supplied to MCI. TRW subsequently informed MCI that only twenty-five (25) affected parts had been supplied to MCI. MCI has identified twenty-three (23).

MCI furnished one of the affected parts to a customer in Canada as part of an aftermarket service installation in an MCI G4500 model coach. MCI has notified the customer, who is in the process of identifying the coach in which the part may have been installed.

- Seven (7) are installed on coaches that have not been sold or delivered to the end user and are currently being reworked with new steering gears
- Fifteen (15) are installed on coaches that have been delivered to the end user and will be reworked with new steering gears
- One (1) unit has been shipped to an aftermarket customer in Canada for an MCI G4500 model coach. This customer has been contacted by MCI.
- MCI has reviewed its records and cannot locate the 25<sup>th</sup> steering gear reported by TRW. MCI has no record of receiving the reported additional affected part, installing it on a new coach, or shipping it to an aftermarket customer. MCI will update when additional information is available.
- Total Number Potentially Affected by the Recall: 24

Certain 2008 D4505, D4500, D4000ISTV model coaches were equipped with the affected parts: VIN's 58311 – 58319, 58321, 58323 – 58334 and 58356

**Identify the approximate percentage of the production of all the recalled models manufactured by your company between the inclusive dates of manufacture provided above, that the recalled model population represents. For example, if the recall involved Widgets equipped with certain items of equipment from January 1, 1996 through April 1, 1997, then what was the percentage of the recalled Widgets of all Widgets manufactured during that time period.**

TRW reports that approximately 52 percent of the steering gears produced by TRW during the recall period contain a potentially defective sector shaft. TRW believes that approximately 52 percent of the steering gears supplied to MCI and covered by this determination actually contain the potential defect.

## **II. Identify the Recall Population**

**3. Furnish the total number of vehicles recalled potentially containing the defect or noncompliance.**

### **Models and Model Years Potentially Involved**

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Certain 2008 D4505, D4500, D4000ISTV model coaches were equipped with the affected parts: VIN's 58311 – 58319, 58321, 58323 – 58334 and 58356

**4. Furnish the approximate percentage of the total number of vehicles estimated to actually contain the defect or noncompliance:**

TRW reports that approximately 52 percent of the steering gears produced by TRW during the recall period contain a potentially defective sector shaft. TRW believes that approximately 52 percent of the steering gears supplied to MCI and covered by this determination actually contain the potential defect.

**Identify and describe how the recall population was determined--in particular how the recalled models were selected and the basis for the beginning and final dates of manufacture of the recalled vehicles:**

MCI reviewed TRW shipping data and MCI's Final Vehicle Record data to identify coaches equipped with affected parts, and identified one (1) part shipped for aftermarket field service.

### **III. Describe the Defect or Noncompliance**

**5. Describe the defect or noncompliance. The description should address the nature and physical location of the defect or noncompliance. Illustrations should be provided as appropriate.**

Refer to TRW documentation attached

**Describe the consequence(s) of the defect or noncompliance condition.**

Refer to TRW documentation attached

**Identify any warning which can (a) precede or (b) occur.**

Refer to TRW documentation attached

**If the defect or noncompliance is in a component or assembly purchased from a supplier, identify the supplier by corporate name and address.**

TRW Automotive U.S. LLC (TRW)  
TRW Automotive  
12001 Tech Center Drive  
Livonia, MI 48150

**Identify the name and title of the chief executive officer or knowledgeable representative of the supplier:**

Jeff Cooper  
Assistant Secretary  
734-855-2672.

### **IV. Provide the Chronology in Determining the Defect/Noncompliance**

**If the recall is for a defect, complete item 6, otherwise item 7.**

**6. With respect to a defect, furnish a chronological summary (including dates) of all the principle events that were the basis for the determination of the defect. The summary should include, but not be limited to, the number of reports, accidents, injuries, fatalities, and warranty claims.**

Refer to TRW documentation attached

**7. With respect to a noncompliance, identify and provide the test results or other data (in chronological order and including dates) on which the noncompliance was determined.**

N/A

#### **V. Identify the Remedy**

**8. Furnish a description of the manufacturer's remedy for the defect or noncompliance. Clearly describe the differences between the recall condition and the remedy.**

MCI is instructing its customers to replace the TAS85 Steering gear found on affected vehicles. Customers are being supplied with replacement components from TRW at no cost to the customers.

**Clearly describe the distinguishing characteristics of the remedy component/assembly versus the recalled component/assembly.**

Refer to TRW documentation attached

**Identify and describe how and when the recall condition was corrected in production. If the production remedy was identical to the recall remedy in the field, so state. If the product was discontinued, so state.**

N/A

#### **VI. Identify the Recall Schedule**

**9. Furnish a schedule or agenda (with specific dates) for notification to other manufacturers, dealers/retailers, and purchasers. Please, identify any foreseeable problems with implementing the recall.**

Within ten days of MCI's receipt of NHTSA's recall number and approval of MCI's customer notification letter, MCI will notify by mail all affected customers. Implementation of the campaign repairs specified in MCI's bulletins can begin immediately. At the present time MCI does not foresee any delays in having the parts available for prompt completion of the campaign repairs.

## **VII. Furnish Recall Communications**

**10. Furnish a final copy of all notices, bulletins, and other communications that relate directly to the defect or noncompliance and which are sent to more than one manufacturer, distributor, or purchaser. This includes all communications (including both original and follow-up) concerning this recall from the time your company determines the defect or noncompliance condition on, not just the initial notification. *A DRAFT copy of the notification documents should be submitted to this office by Fax (202-366-7882) for review prior to mailing.***

Please see attached proposed customer notification letter and draft MCI Service Bulletin 296.

**Note that these documents are to be submitted separately from those provided in accordance with Part 573.8 requirements.**

«Customer»  
«attention»  
«address»  
«c», «s» «zip»

**SUBJECT: TRW TAS85 STEERING GEAR**

February 6, 2008

Ref.: **TRW - NHTSA # 07E101000**  
**MCI - NHTSA #**  
**MCI Service Bulletin 296**

Attention Owner:

This notice is sent to you in accordance with the National Highway Traffic and Motor Vehicle Safety Act and with the Canadian Motor Vehicle Safety Act - Notice of Safety Defects.

Motor Coach Industries, Inc. ("MCI") has been advised that TRW Automotive U.S. LLC ("TRW") has determined that a defect that relates to motor vehicle safety may exist in certain steering gears manufactured by TRW between August 17, 2007 and September 13, 2007. TRW further advised that the affected steering gears contain potentially defective sector shafts produced by TRW between August 13, 2007 and September 13, 2007, and that TRW shipped twenty-five (25) of the affected components to MCI.

If this steering gear is not replaced it could potentially lead to the loss of steering and control of the coach, creating a risk of injury or death as a consequence if not corrected. At the request of TRW, MCI is instituting a Field Change Program to replace the TAS steering gear and the purpose of this letter is to ask your co-operation with installing a new component that TRW will supply at no cost to you. MCI Service Bulletin 296 describes the procedures for properly replacing the steering gear in the affected D series coaches.

MCI records indicate that you are the owner or operator of the following unit(s) included in this recall.

«unit\_number»

MCI will furnish the parts required for the replacement at no charge to you. MCI estimates that it will take approximately 8 hours on the D series coaches, as described in the enclosed a copy of Service Bulletin 296. Upon completion of the retrofit to the unit(s) listed above and MCI's receipt of the affected steering gear and a completed Warranty Claim Form, MCI will credit the appropriate labor allowance amount to your MCI parts account. Submittal of MCI Warranty Claim Forms may be completed on MCI's website at <http://fleetsupportiw.mcicoach.com/iwarranty/signon> (click on Customer Care System), or a photocopy of the Warranty Claim Form found in the Warranty Manual can be mailed / faxed to the MCI Warranty Department. Please refer to your OWNER LIMITED WARRANTY MANUAL for more detailed information. Customers may submit only one (1) MCI Warranty Claim Form per coach for this Field Change Program.

If you have any questions about this recall campaign, you may contact the MCI Customer Service Line at 1-800-241-2947.

After contacting MCI Customer Service, if you are still unable to have the safety defect remedied without charge and within a reasonable time, you may submit a complaint:

For the U.S.:

The Administrator,  
National Highway Traffic Safety Administration,  
400 Seventh Street, S.W.,  
Washington, D.C. 20590,  
or call the toll-free Vehicle Safety Hotline at 1-888-327-4236; (TTY: 1-800-424-9153); or go to  
<http://www.safercar.gov>.

For Canada:

Road Safety and Motor Vehicle  
Regulation Directorate  
Transport Canada  
Tower C, Place de Ville  
330 Sparks Street  
Ottawa, Ontario  
K1A 0N5  
or call the Transport Canada's Information Centre at 1-800-333-0371.

If you had the retrofit work done before you received this letter, you may be eligible to receive reimbursement from MCI for the cost of obtaining a pre-notification remedy of the problem associated with this recall. For more information, contact the MCI Customer Service Line at 1-800-241-2947.

**If you are the lessor of this vehicle, Federal law requires that you forward this notice to the lessee within ten days of your receipt of this notice.**

If you have sold or otherwise transferred the vehicle(s) identified above, please immediately contact MCI Customer Service Line at 1-800-241-2947 with all of the information you have regarding the current owner/operator of the vehicle(s), so that we can ensure that the vehicles are corrected.

Motor Coach Industries apologizes for any inconvenience this may cause, but urges you to implement the Field Change Program as soon as possible.

Sincerely,  
*Motor Coach Industries*  
Warranty Department  
Enclosure: MCI Service Bulletin 296



# Service Bulletin No. 296

MODEL <b>D Series Coaches</b>	TYPE <b>Field Change Program</b>	SECTION/GROUP <b>11 – Steering</b>	DATE
SUBJECT <b>TRW AUTOMOTIVE TAS85 STEERING GEAR</b>			
CONDITIONS			

**NHTSA Recall ( TRW ): 07E-101000**

**NHTSA Recall ( MCI ): 08-TBA**

### **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**

<b>Qty.</b>	<b>New P/N</b>	<b>Description</b>
1	11L-1-4	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.**

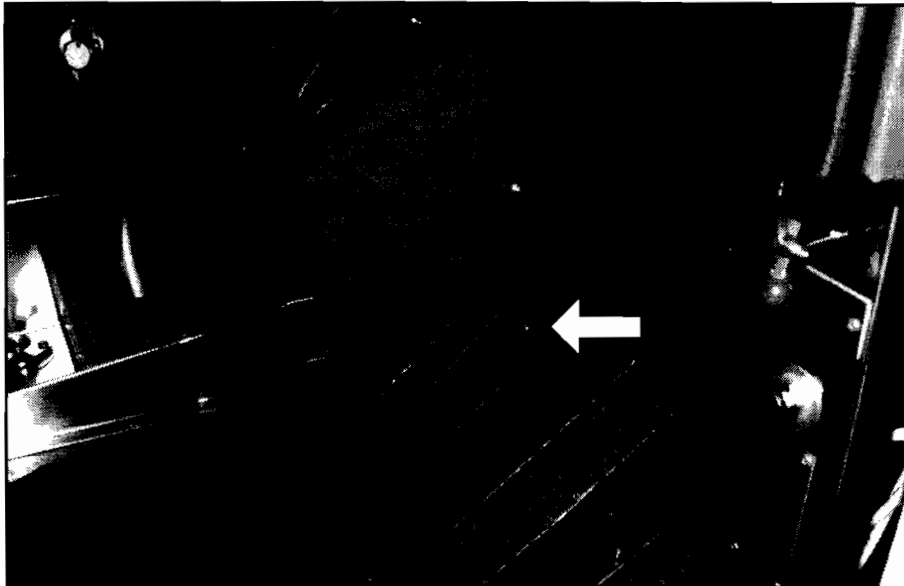
1. Position the steering wheel so that the front wheels are straight ahead. Verify that the steering wheel is centered.
2. Turn the main battery disconnect switch to the OFF position. Chock both sides of the tires.



### ***CAUTION***

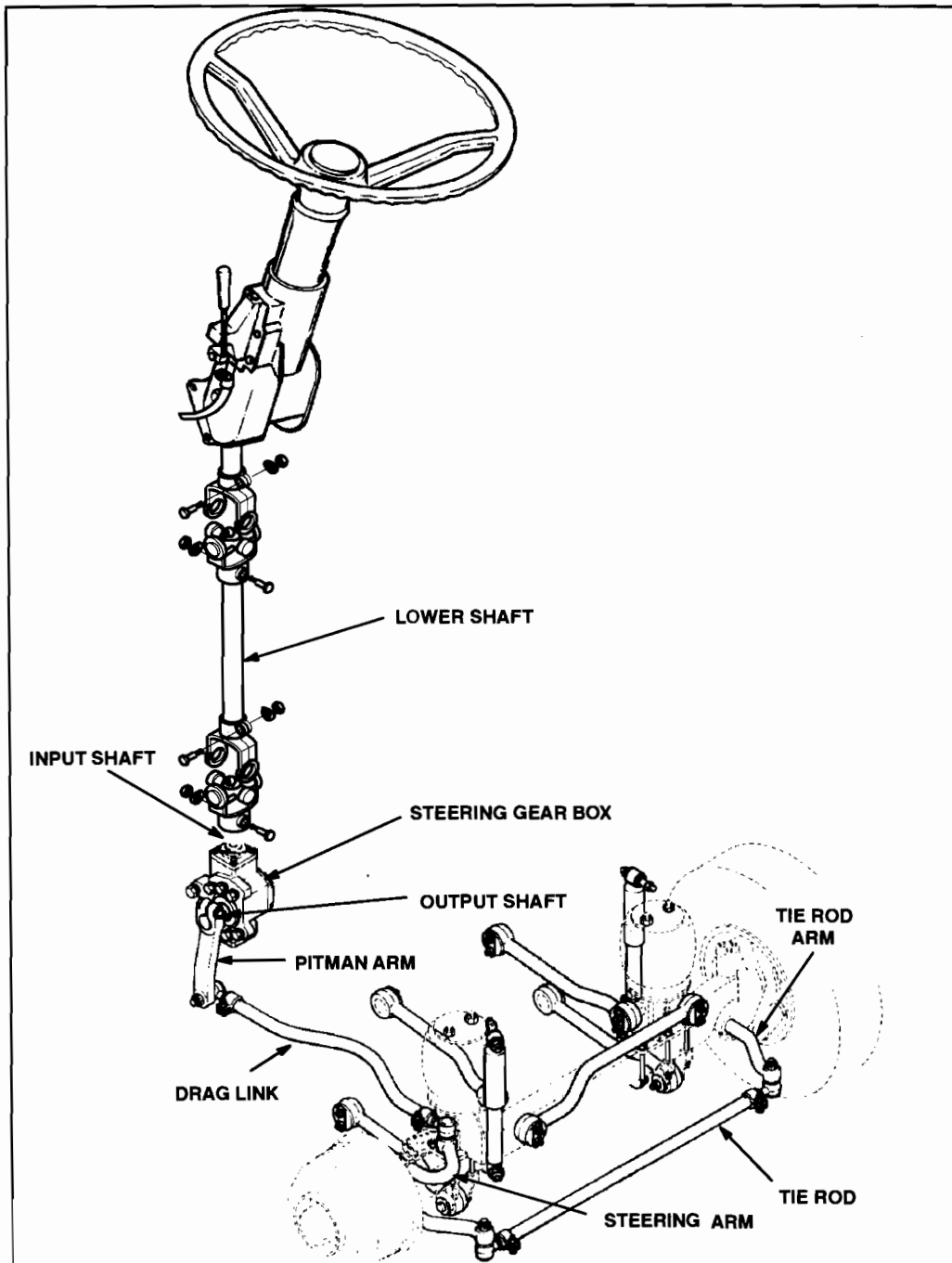
***Wheel and tire assemblies weigh more than 100 pounds. Use caution when handling wheel and tire units.***

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 ).

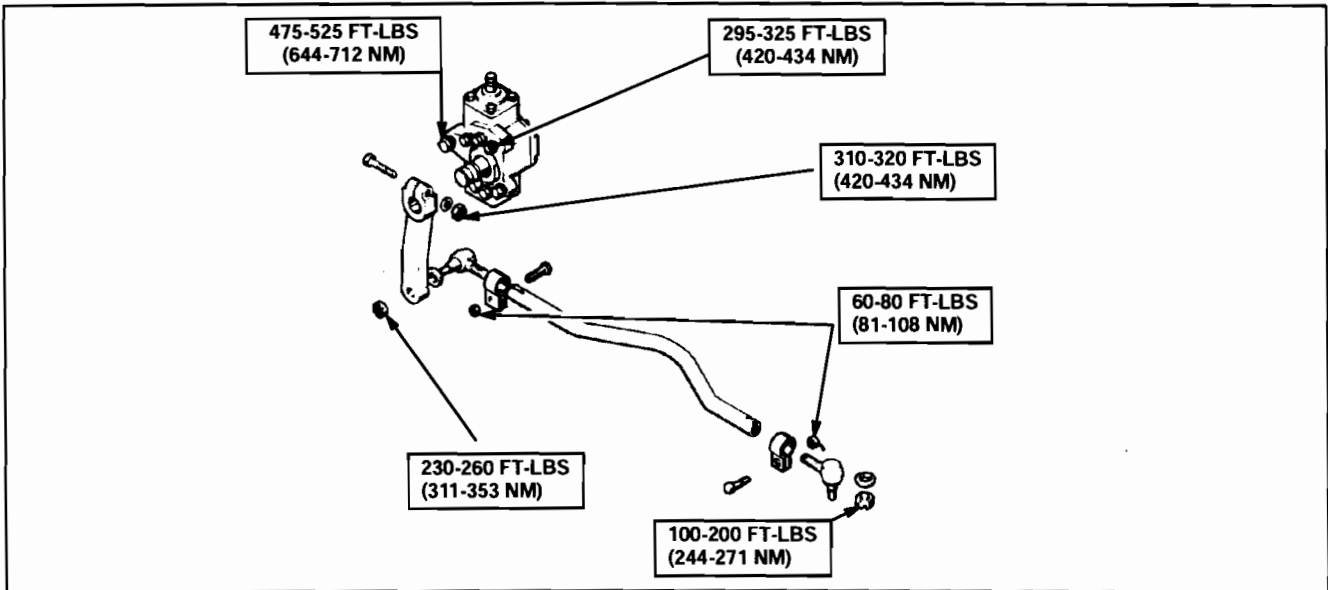


Figure 3. Torque Chart

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 ).

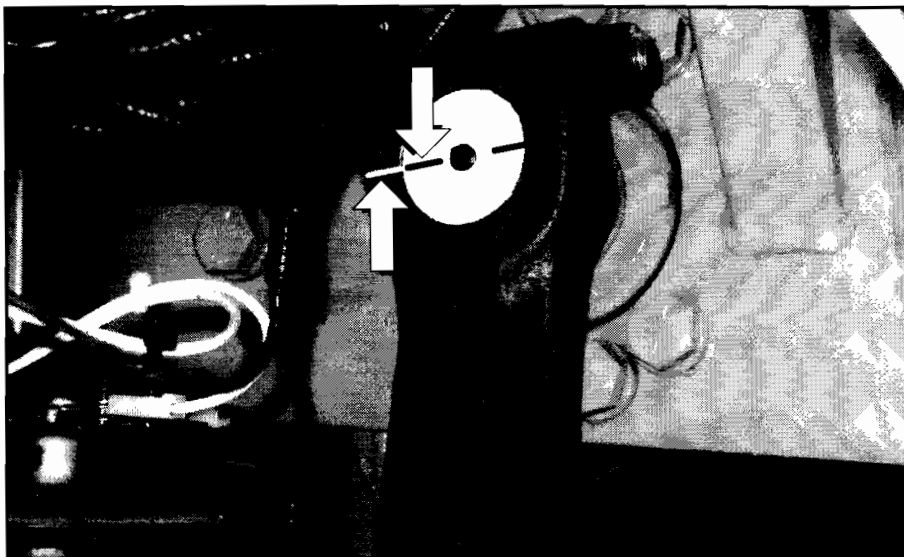


Figure 4.

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.

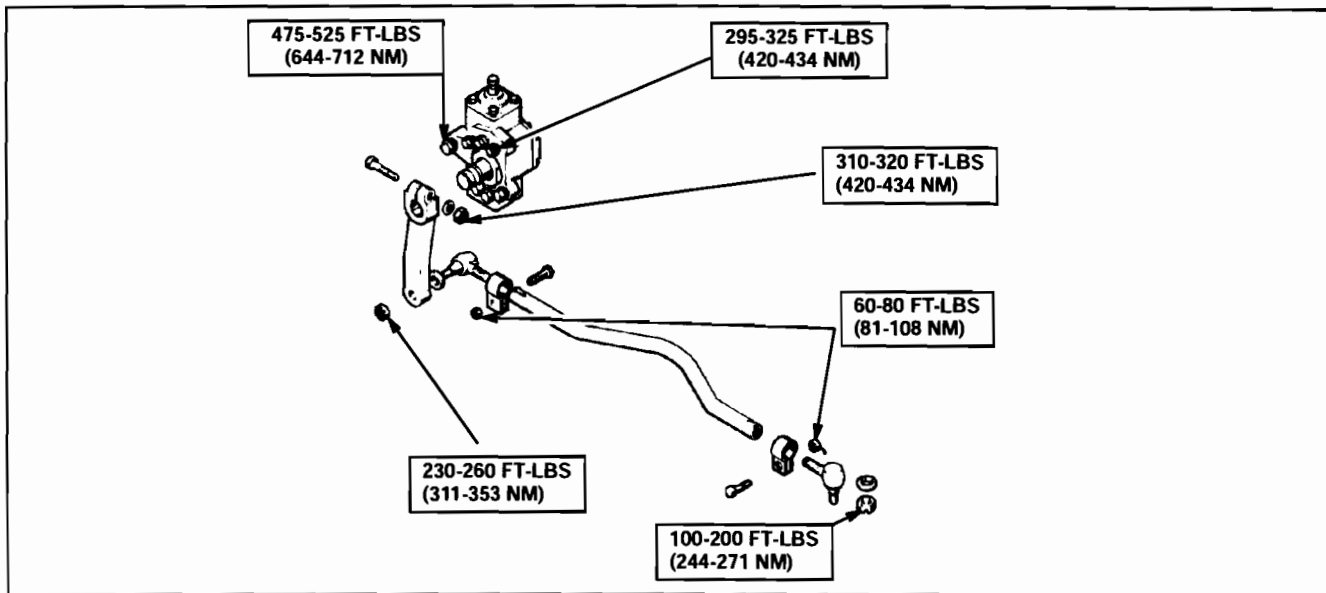


Figure 5. Torque Chart

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.

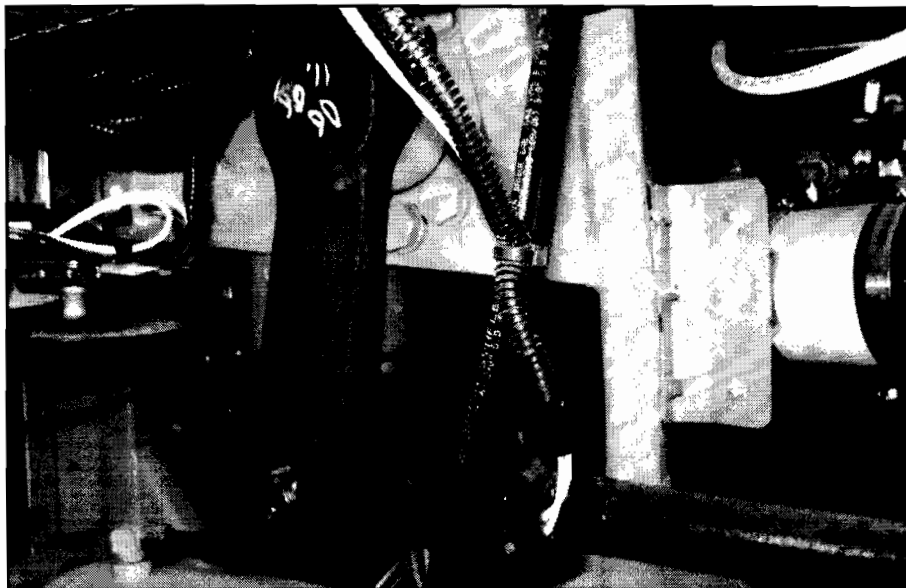


Figure 6.

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.

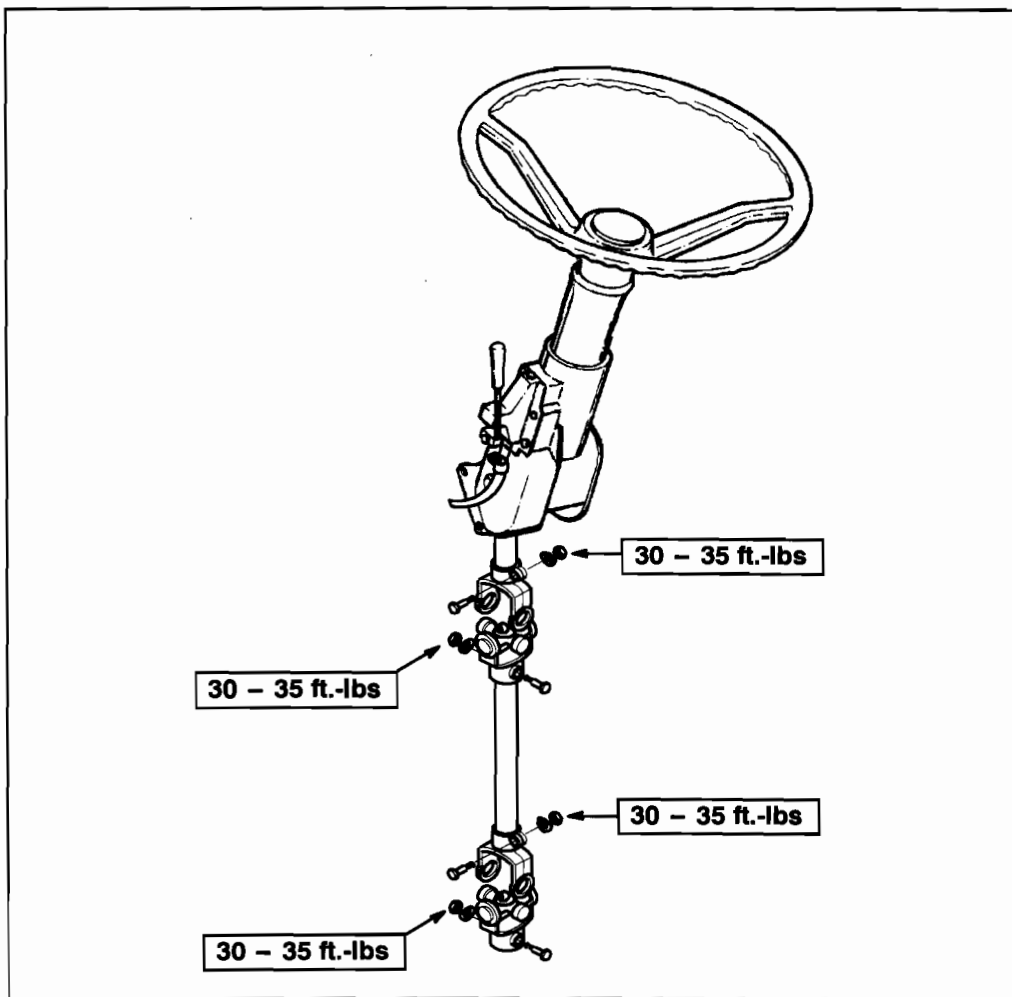
20. Connect steering column lower shaft to steering gear input shaft. Install clamp bolt with washer and nut.

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.