



Timothy J. Nalepka
Senior Vice President & General Counsel

Direct Line: (847) 285-2085
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May 26, 2009

BY EMAIL AND
BY CERTIFIED MAIL

Associate Administrator for Enforcement
National Highway Traffic Safety Administration
Attention: Recall Management Division (NVS – 215)
1200 New Jersey Avenue, SE.
Washington, DC 20590

Re: PART 573 NOTICE RE MERITOR WABCO STEER ANGLE SENSORS

Dear Sir or Madam:

I have enclosed Motor Coach Industries, Inc.'s ("MCI") Part 573 Defect and Noncompliance Report. MCI's proposed customer notification letter and enclosure will be sent subsequently under separate cover.

Please confirm receipt of this notice and provide NHTSA's reference number.

Thanks for your assistance with this matter.

Sincerely,
MOTOR COACH INDUSTRIES, INC.

By: Timothy J. Nalepka
Senior Vice President &
General Counsel

Enclosure

RECEIVED
2009 JUN -1 P 3:07
OFFICE OF DEFECTS
INVESTIGATION

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

On May 13, 2009, Motor Coach Industries, Inc. decided that a defect which relates to motor vehicle safety exists in the motor vehicles listed below, and is furnishing notification to the National Highway Traffic Safety Administration in accordance with 49 CFR Part 573 Defect and Noncompliance Reports.

Date this report was prepared: May 26, 2009

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

MCI Service Bulletins 327 (D model series) and 328 (J model series)

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, whom the agency should contact with respect to this recall.

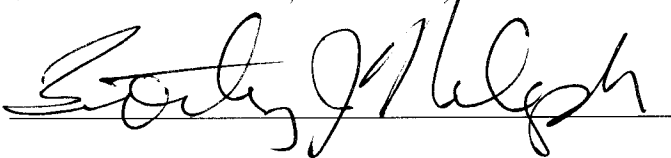
Bryan Couch, Vice President, Product Planning & Project Management

Telephone Number: (204) 287-4447 **Fax No.:** (204) 478-2867

Name and Title of Person who prepared this report.

Timothy J. Nalepka
Senior Vice President, General Counsel & Secretary

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: 1. 2009 D4000ISTV, D4500, D4505
2. 2008 and 2009 J4500

Production Dates:

1. 2009 D4000ISTV, D4500, D4505 **Beginning:** January 2009 **Ending:** April 2009
2. 2008 and 2009 J4500 **Beginning:** October 2007 **Ending:** April 2009

VIN Range:

1. 2009 D4000ISTV, D4500, D4505 **Beginning:** 58890 **Ending:** 59015
2. 2008 and 2009 J4500 **Beginning:** 64618 **Ending:** 65337

58890	58907	58980 – 58987	58990	58992 – 59000
59002	59004 – 59011	59013	59015	
64618	64918	64919	64948 – 64950	64953 – 64964
64966	64968	64970	64972	64974
64976	64978 – 64988	64990 – 65004	65006	65011
65013 – 65032	65035 – 65082	65086 – 65098	65106	65108
65110	65112 – 65118	65120	65122	65124 – 65147
65149	65151 – 65170	65172	65174	65176
65178	65180	65182	65184	65186 – 65188
65190 – 65194	65196 – 65213	65215 – 65237	65239	65240
65243 – 65255	65257	65259 – 65282	65284	65285
65287	65289 – 65303	65305 – 65309	65311 – 65319	65323 – 65326
65337				

Descriptive information which characterizes /distinguishes the recalled vehicles from those model vehicles not included in the recall:

The vehicles that are the subject of the recall are the coaches manufactured with Meritor WABCO's Electronic Stability Control ("ESC") System, which has a Steer Angle Sensor ("SAS") as a component thereof, and bearing a Meritor WABCO serial number below 3000. Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009. The subject Steer Angle Sensors were included in steering columns furnished to MCI by Douglas Autotech Corp. MCI is not able to correlate specific SAS serial numbers to specific MCI coaches.

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.

The recalled 2009 D4000ISTV, D4500, and D4505 model population represents approximately 25% of the total 2009 D4000ISTV, D4500, and D4505 model coaches manufactured during the inclusive dates.

The recalled 2008 and 2009 J4500 model population represents approximately 48% of the total 2008 and 2009 J4500 model coaches manufactured during the inclusive dates.

II. Identify the Recall Population

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

<u>MODELS</u>	<u>MODEL YEARS</u>	<u>NUMBER OF VEHICLES POTENTIALLY INVOLVED</u>
J4500	2008	49
J4500	2009	270
D4500	2009	19
D4505	2009	3
D4000 ISTV	2009	9

Total Number Potentially Affected by the Recall: 350

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

The percentage of coaches having SAS with serial numbers below 3000 is not currently known.

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 determined the vehicle recall population by listing all coaches that were manufactured with the Electronic Stability Control feature, and then eliminating those coaches that have been checked and found to have a Meritor WABCO serial number of 3000 or above, as well as the coaches in which the SAS has been replaced with an SAS bearing a Meritor WABCO serial number of 3000 or above.

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.

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009. The SAS is located at the lower end of the steering column, behind a steering column cover, as shown in the following photograph.



Describe the cause(s) of the defect or noncompliance condition.

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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

MCI is not aware of any warning expected to precede or occur when a failure is experienced.

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

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009. Meritor WABCO supplied the SAS to Douglas Autotech Corp., 300 Albers Rd, Bronson, MI, and MCI purchased the steering columns from Douglas Autotech.

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

The knowledgeable representative of Meritor WABCO is Alan Korn, Director – Vehicle Dynamics & Control. Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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 principal 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.

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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.

Not applicable.

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.

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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.

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009.

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.

Please see the attached Meritor WABCO Part 573 Defect Information Report dated May 11, 2009. MCI anticipates sending notifications to customers within one week after receiving the necessary information from Meritor WABCO and approval by NHTSA of MCI's draft customer notification.

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.*

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

MCI will submit its proposed customer notification letter under separate cover.

MERITOR WABCO

Meritor WABCO Vehicle Control Systems
2135 West Maple Road
Troy, MI 48084-7121
Telephone 248.435.8001
Facsimile 248.435.8002
www.wabco.com

May 11, 2009

Daniel C. Smith, Esq.
Associate Administrator for Enforcement
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Fax: 202-366-7882

Re: Part 573 Defect Information Report relating to certain Electronic Stability Control Steering Angle Sensors shipped by Meritor WABCO Vehicle Control Systems between July 2007 and November 3, 2008

Meritor WABCO File: To Be Assigned

NHTSA File: To Be Assigned

Dear Mr. Smith:

Meritor WABCO Vehicle Control Systems submits this Defect Information Report in accordance with the requirements of the National Motor Vehicle Safety Act of 1966 as set forth in 49 CFR 573.5. This document corresponds to the sub paragraphs of section 573.5 (c).

§573.6(c)(1) – This report is submitted by:

Meritor WABCO Vehicle Control Systems
2135 West Maple Road
Troy, Michigan 48084-7186

§573.6(c)(2) – Identification of vehicle or items of motor vehicle equipment:

This report covers the following Steering Angle Sensor (SAS) part numbers supplied by Meritor WABCO Vehicle Control Systems:

441 120 004 0	400 850 666 0
400 850 647 0	

These potentially suspect Steering Angle Sensors with serial numbers below 3000 were mainly shipped by Meritor WABCO to the steering column supplier. This supplier installed the SAS in the column and then shipped the completed assembly to a number of North American coach and specialty OEMs.

The Steer Angle Sensor is a component of the Meritor WABCO Electronic Stability Control System. The SAS provides the Electronic Stability Control (ESC) system with the driver

selected steering angle, a critical input necessary to help detect loss of directional vehicle stability. When a loss of control event occurs, the ESC automatically applies individual foundation brakes on the vehicle to generate a counteractive force to help regain stability and mitigate the risk of a crash.

§573.6(c)(3) – Total number of vehicles or items of motor vehicle equipment affected:

Meritor WABCO estimates 664 Steering Angle Sensors were shipped between July 2007 and November 3, 2008 (serial numbers below 3000). A list of affected customer and quantities is contained in Appendix A of this notice.

§573.6(c)(4) – Percentage of vehicles or items of motor vehicle equipment affected:

Meritor WABCO has determined that 100% of the above mentioned population contains the original SAS design that potentially could perform as described in the following paragraph.

§573.6(c)(5) – Description of the defect:

Meritor WABCO recently received reports from six motor coaches and two fire trucks equipped with Meritor WABCO Electronic Stability Control (ESC) alleging unexpected brake activations during low speed turning maneuvers. Meritor WABCO's investigation revealed the rotor driving tab of the Steer Angle Sensor used in the ESC system was sheared off on three of the coaches and two of the fire trucks. All of the affected Steer Angle Sensors were the original design with serial numbers below 3000. There have been no crashes or injuries relating to this sensor issue to date.

The Steer Angle Sensor driving tab fits in a groove in the steering column shaft, causing the sensor rotor to turn with the steering wheel. The SAS provides the Electronic Stability Control system with the driver selected steering angle, a critical input necessary to detect loss of directional stability. With a broken SAS driving tab, the ESC yaw rate sensor and lateral accelerometer will measure a difference in vehicle direction when the driver makes a turn without a corresponding change in steer angle. This could be interpreted by the ESC as a directional instability, requiring intervention by brake activation of a selected wheel.

Diagnostics that are integrated in the ESC software may or may not detect a broken SAS driving tab after a period of time during the ignition cycle once a failure has occurred. On subsequent ignition cycles, ESC power-up diagnostics will likely prevent the ESC from initializing with a broken SAS driving tab, eliminating the possibility of erroneous low speed brake activations.

Meritor WABCO's investigation indicates that internal SAS friction can develop between the sensor gears and sensor housing as a result of external forces experienced on the vehicle including vibration. If the developed friction is great enough, the driving tab can shear as the driver turns the steering wheel. Laboratory test data indicates incorporation of grease on SAS components during assembly significantly reduces the likelihood of internal frictional increases resulting in adequate SAS durability when properly installed in the steering column.

§§573.6(c)(6) – Chronology of principal events:

- **November 3, 2008** – Last shipment of original sensor design from Meritor WABCO (serial numbers below 3000).
- **November 7, 2008** – First shipment of improved sensor design which included grease lubrication on internal components (serial number above 3000).
- **March 16, 2009** – Motor Coach Industries (MCI) reports to Meritor WABCO that a driver experienced unexpected stability control activations while performing tire testing at a test track in low speed figure eight maneuvers and while driving straight after completion of the maneuver. Upon cycling the ignition the behavior could not be reproduced.
- **March 16 - 25, 2009** – MCI receives several reports of similar behavior on other coaches and attempts to capture data during an event for Meritor WABCO review. All attempts to duplicate the event were unsuccessful.
- **March 27 – April 8, 2009** – MCI provides a suspect coach to Meritor WABCO for evaluation. Results indicated the Steer Angle Sensor (SAS) drive tab was completely sheared off and the subsequent lack of driver selected steer angle resulted in erroneous brake activation during the ignition cycle where the failure occurred.
- **April 2, 2009** – Meritor WABCO checks inventory and determines zero stock of any affected SAS part numbers.
- **April 9, 2009** – Meritor WABCO call-in service center receives report of unexpected ESC activations on a Pierce fire truck. Call-in center advises technician to inspect condition of SAS and the driving tab is found to be sheared off.
- **April 20, 2009** – Measurements of a steering column installed with a SAS containing a sheared drive indicate critical dimensions are within specifications.
- **May 7, 2009** – Meritor WABCO management reviews the information and decides to campaign affected Steer Angle Sensors shipped prior to November 3, 2008.

§573.6(c)(7) – Test results or data supporting non-compliance:

Not applicable.

§573.6(c)(8) – Description of remedy:

The identified defect will be remedied by notifying buyers of vehicles built with the affected product and requesting that they take the vehicles to certified dealers capable of inspecting the Steer Angle Sensors' serial numbers and replacing suspect Steer Angle Sensors, having a serial number below 3000, with the most recent SAS design level provided by Meritor WABCO. On vehicles requiring Steer Angle Sensor replacement, an ESC calibration procedure will have to be conducted prior to the vehicle returning to service.

MERITOR WABCO

Meritor WABCO Vehicle Control Systems
2135 West Maple Road
Troy, MI 48064-7121
Telephone 248.435.8001
Facsimile 248.435.8002
meritorwabco.com

The following is an approximate time schedule for the program:

- By May 25, 2009: Meritor WABCO notification to affected customers
- By June 1, 2009: Complete service instructions and procure inventory for replacement Steer Angle Sensors
- By June 1, 2009: OEMs begin notifying customers and initiate the sensor replacement action where necessary

Information Requested under §573.6(c)(9)

We trust that the information provided in this document is fully responsive to the requirements of 49 CFR §573.5. All additions or modifications to any of the information given will be reported promptly to NHTSA. Any questions with respect to the information provided should be directed to the undersigned.

Respectfully Submitted,



Anne Balkcom
Sr. Mgr. - Quality Assurance
Meritor WABCO Vehicle Control Systems
845 Lindbergh Court
Hebron, KY 41048
Ph 859.525.3676 Cell 859.380.7516
Anne.Balkcom@MeritorWabco.com

Enclosures:

- Appendix A: Summary of Affected Customers and Quantities Shipped
- Appendix B: Illustration of Steer Angle Sensor

Appendix A:
List of Affected Customers and Quantities Shipped

OEM	Quantity
BAE Systems TVS LP 5000 I-10 WEST SEALY, Texas 77474	9
Douglas Autotech Corp 300 Albers Rd Bronson, Mich. 49028	592
Emergency - One 3611 S.W. 20TH Street Ocala, FL 34474	14
Spartan Motors, Inc. 1165 Reynolds Road Charlotte, Mich. 48813	6
Pierce Manufacturing 2600 American Drive P.O. Box 2017 Appleton, WI 54912	18
Motor Coach Industries (MCI) 1475 Clarence Avenue; Door 10, NPD Winnipeg, Manitoba R3T 1T5, Canada	24 + 1 service part

Appendix B: Illustration of Steer Angle Sensor

