RECEIVED
2008 MAR 18 - 10:00 AM
OFFICE OF RECALL
MANAGEMENT DIVISION

08V-121
(46 Pages)

March 12, 2008

BY EMAIL

National Highway Traffic Safety Administration,
1200 New Jersey Avenue, SE.
Washington, DC 20590;
Attention: Ms. Patricia Wallace

Re: AMENDED PART 573 NOTICE - MCI G4500 TAG SWING AXLE ARM
NHTSA CAMPAIGN NO.: 06V458000

Dear Ms. Wallace:

I have enclosed Motor Coach Industries, Inc.'s ("MCI") amended Part 573 Notice, draft customer letter, and draft MCI Service Bulletin No. 289.

Please confirm receipt of this document and advise if NHTSA has any comments or recommendations.

Thanks for your assistance with this matter.

Sincerely,
MOTOR COACH INDUSTRIES, INC.
per:

By: Robert Zeaton
Vice President – Product Safety Engineering
(256) 343-1828

Enclosures
c/c: Timothy J. Nalepka, Paul Murphy

PART 573 Defect and Noncompliance Report

On November 28, 2006, Motor Coach Industries, Inc. ("MCI") notified the National Highway Traffic Safety Administration, in accordance with 49 CFR Part 573 Defect and Noncompliance Reports, that a defect which relates to motor vehicle safety exists in the motor vehicles listed below. This notice will serve as MCI's Amended Part 573 Defect and Non-compliance Report.

Date this report was prepared: March 11, 2008

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

MCI Customer letter and Bulletin are attached for review.

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.

Paul Murphy
Director, Regulatory Compliance
Telephone Number: (204) 287-4982
Fax No.: (204) 478-2814

Name and Title of Person who prepared this report.

Robert Zeaton
Vice President – Product Safety Engineering

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:

MCI has expanded the population of coaches included in this amended campaign. It now includes all G4100 coaches as well as all G4500 units. It is important to note that there have been no reported failures of tag axle arm assemblies in the G4100 units.

Make(s):		**MCI**		
Model Years and Models Involved:		**2000 – 2004 G4100 and G4500**		
Production Dates:	**Beginning:**	**Dec. 1999**	**Ending: Feb. 2000**	**G4100**
	Beginning:	**Jan. 2000**	**Ending: Mar. 2004**	**G4500**
VIN Range:	**Beginning:**	**80001**	**Ending: 80015**	**G4100 MEX**
	Beginning:	**80016**	**Ending: 80518**	**G4500 MEX**
	Beginning	**62536**	**Ending: 62561**	**G4500 WPG**

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.

100% of the coach models identified above.

II. Identify the Recall Population

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

Total Number Potentially Affected by the Recall: 542

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

5% of the coach models identified above.

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:

The beginning and ending units of the recalled models were determined based on MCI's records of its coaches that were manufactured with the tag axle arm assembly in question.

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.

In late June of 2003, MCI received reports of cracks located on the tag axle arm assembly where it meets the pivot spindle tube. In July and August 2003, MCI removed and inspected several arm assemblies to determine if the cracks were the result of a limited product anomaly, a fatigue related failure, or a design or manufacturing defect.

After MCI completed its engineering analysis and review, MCI determined that insufficient weld metal and/or weld penetration noted on the failed components could result in development of early stress and fatigue cracks at a weld joining the tag axle arm assembly to the pivot spindle tube assembly. Accordingly, beginning in late 2003 MCI conducted a safety recall (03V-411) of the affected coaches, which involved repairing or replacing the tag axle arm assembly as necessary. See attached MCI Service Bulletin 212 that references Recall 03V-411.

In June of 2006, Greyhound Lines, Inc. ("GLI") notified MCI that GLI had observed certain instances of the tag axle arm assembly breaking away. MCI conducted further analysis and determined that some of the axles that had been repaired during Recall 03V-411 may have been repaired with unidentified micro-fractures and/or welds with insufficient penetration.

After extensive discussions with the NHTSA Office of Defects Investigation staff, MCI decided to install a new tag axle swing arm design assembly to replace the existing components on all affected G4500 units.

MCI therefore undertook an extensive design review and development of the new assembly. Between January and September of 2007, MCI developed two new tag axle assembly designs (referred to herein as Proto 1 and Proto 2), and conducted extensive testing of Protos 1 and 2 as well as the original design as a baseline.

The tag axle arm assembly of the G4500 coach is rated for 6000 lbs and consists primarily of a bearing box, attached to the rear leg of the rear bogie assembly, and a swing arm that pivots about the bearing box. The tag axle arm assembly is arranged in a trailing configuration and has provisions to accept the wheel end assembly, brakes, air springs and shock absorbers.

Based on force data collected during MCI's testing, a simulated drive file consisting of a variety of typical road events was generated and applied to a representative tag

axle specimen along its three principal axes. Strain data collected during the initial stages of the evaluation were used to generate accumulated damage sums, which were compared to the strain and accumulated damage data collected during field trials conducted. This comparison was necessary to ensure that an accurate correlation existed between the simulated laboratory-based assessments and the field trials.

As previously noted, MCI tested three tag axle assembly designs: one baseline (original design) sample and two redesigned samples designated Proto 1 and Proto 2, with Proto 2 having an increased wall thickness of the main tube. To eliminate system response problems related to compliance in the assembly, MCI removed the air spring and replaced it with a solid link.

The baseline tag axle sample accumulated 5 million simulated miles before crack initiation occurred, and MCI ran the baseline sample to 6.5 million simulated miles to assess crack propagation characteristics. Proto 1 accumulated 2.52 million simulated miles before crack initiation was noted. MCI ran Proto 1 to 3.56 million simulated miles before terminating the test. Proto 2 accumulated 6.64 million simulated miles before crack initiation was confirmed. MCI ran Proto 2 to 9.42 million simulated miles before terminating the test. To have a more accurate comparison to Proto 2, MCI reinstalled the baseline sample in the fixture and ran if from the original 6.5 million simulated miles to 9.42 million simulated miles.

From this FMEA data and subsequent test evaluation, MCI determined that both the original design and the Proto 2 design have similar duty cycle and life expectancy. The above testing and analysis also support MCI's conclusion that the few reported tag axle arm assembly failures that occurred on coaches that had been repaired during Recall 03V-411 were due to then-unidentified micro-fractures and/or welds with insufficient penetration and not any design defects.

In view of the foregoing, MCI has decided to amend Recall 06V-458 by eliminating the replacement of all tag axle arm assemblies on all affected coaches regardless of their condition. Instead, MCI will conduct a re-inspection of all tag axle arm assemblies on all MCI G4100 and G4500 model coaches. If the re-inspection identifies cracks or incorrect welds in the previously-repaired areas on either of the coach's tag axle arm assemblies, MCI will replace both assemblies. MCI has attached a draft copy of MCI Service Bulletin No. 289 describing the contemplated course of action.

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

In June of 2006, GLI notified MCI that GLI had observed certain instances of the tag axle swing arm breaking away. MCI conducted further analysis and determined that some of the axles that had been repaired during Recall 03V-411 may have been repaired with unidentified micro-fractures and/or welds with insufficient penetration.

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

If tag axle swing arm cracks exist and remain undetected by the operator despite recommended routine inspection and maintenance procedures, the cracks can

spread and potentially result in a partial or total separation of the tag axle assembly from the coach.

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

The subject cracks would likely develop and spread over a period of months, and therefore should be readily visible to the coach maintenance personnel along and around the main tag axle swing arm tube during recommended routine inspection and maintenance procedures.

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

The subject components were designed by MCI and supplied to MCI by:

Canadian Anglo Machine & Iron Works, S.A. de C.V.
Carretera a Huinala No. 220
Apodaca, N.L., 66600
Mexico

THOR Manufacturing
77 Beghin Avenue
Winnipeg, MB
R2J 3S8

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

To MCI's knowledge Canadian Anglo Machine & Iron Works, S.A. de C.V. is no longer in business. MCI does not currently have any information regarding that entity's chief executive officer or knowledgeable representative.

THOR Manufacturing- Jim Johnston – President; (204) 982-8350

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.

See previously filed 573 notice relating to this subject.

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 has decided that it is amending Recall 06V-458 so as to conduct a re-inspection of tag axle arm assemblies on all MCI G4100 and G4500 model coaches. If this re-inspection identifies cracks or incorrect welds in the previously repaired areas, both right and left tag arm assemblies will be replaced. If no problems are identified, MCI will re-install the existing tag axle arm assemblies with new hardware. A draft copy of MCI Service Bulletin No. 289 covering this action is attached.

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

MCI has decided that it is amending Recall 06V-458 so as to conduct a re-inspection of tag axle arm assemblies on all MCI G4100 and G4500 model coaches. If this re-inspection identifies cracks or incorrect welds in the previously repaired areas, both right and left tag arm assemblies will be replaced. If no problems are identified, MCI will re-install the existing tag axle arm assemblies with new hardware. A draft copy of MCI Service Bulletin No. 289 covering this action is 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.

Although MCI has not manufactured any G model coaches since unit 62561, the new tag axle swing arm design will be used in the production of any new G4500 coaches that may be built by MCI in the future.

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.

MCI has determined that a re-inspection of all G model coach tag axle arm assemblies for identifiable cracks or incorrect welds in the previously repaired areas will be done. If any related issue is identified, both right and left tag arm assemblies will be replaced. If no problems are identified, MCI will re-install the existing tag axle arm assemblies with new hardware. MCI intends to send affected customers a letter and service bulletin informing them of the planned retrofit campaign within 2 business weeks of approval of this plan from the NHTSA. A draft copy of MCI Service Bulletin No. 289 covering this action is attached.

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.

Draft copies of the letter and MCI Service Bulletin No. 289 are attached for your review.

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: G4500 TAG AXLE ARM ASSEMBLY ASSEMBLIES

March 12, 2008

Ref.: **NHTSA # 06V-458**
TRANSPORT CANADA # 06-353
MCI Service Bulletin 289

Attention Owner:

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

Motor Coach Industries, Inc. ("MCI") has determined that a defect which relates to motor vehicle safety may exist on MCI G4500 model coaches.

In June of 2006, MCI received complaints from Greyhound lines, Inc. ("GLI") that certain reworked tag axle arm assemblies had been identified with new cracks forming. MCI conducted further analysis and determined that some of the tag axle arm assembly that had previously been repaired during Recall 03V-411 may have been repaired with unidentified micro fractures and/or insufficient weld penetration.

MCI has decided to conduct a re-inspection of tag axle arm assemblies on all MCI G4100 and G4500 model coaches. If this re-inspection identifies cracks or incorrect welds in the previously repaired areas, both right and left tag arm assemblies will be replaced. If no problems are identified, MCI will re-install the existing tag axle arm assemblies with new hardware.

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

«**unit**_number»

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
1200 New Jersey Avenue, SE.,
Washington, DC 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 the 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 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 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.

Sincerely,

Motor Coach Industries
Warranty Department

Service Bulletin No. 289

MODEL	TYPE	SECTION/GROUP	DATE
G Series Coaches	Field Change Program	2 – Tag Axle	

SUBJECT: **TAG AXLE RETROFIT**

CONDITIONS:

DRAFT

Ref. NHTSA Recall No.: 06V–458

Ref. Transport Canada Recall No.: 2006–353

Customer Complaint:

Some customers have reported cracking originating at the heat–affected zone of the weld on tag axle arm assemblies reworked during MCI Campaign 212, released in December 2003 (Ref. NHTSA Recall No.: 03V–411, Ref. TC Recall No.: 03–251).

Cause:

Incorrect identification/inspection of the tag axle arm assemblies for identifiable cracks or incorrect welds in the previously repaired areas.

Corrective Action:

MCI will make arrangements for a re-inspection of all G model tag axle arms for identifiable cracks or incorrect welds in the previously repaired areas. If any related issue is identified, both right and left tag axle arm assemblies will be replaced with newly designed assemblies.

As a result, MCI advises that owners of G4500 model coaches between the range of, and including, unit numbers 80001 to 80518 and 62536 to 62561 implement the specified steps in this procedure by contacting MCI to make an appointment to have this inspection completed.

NOTE

REFER TO PAGE 2 OF THIS BULLETIN FOR REQUIRED PARTS LIST.

G4500 MODEL COACHES BETWEEN THE RANGE OF, AND INCLUDING, 80026–80035, 80046–80055, 80071–80171, 80182–80190, 80195–80214, 80237–80253, 80266–80288, 80310–80359, 80388–80500, 62536–62561 ARE EQUIPPED WITH DANA AXLES.

G4500 MODEL COACHES BETWEEN THE RANGE OF, AND INCLUDING, 80036–80045, 80056–80070, 80172–80181, 80191–80194, 80215–80236, 80254–80265, 80289–80309, 80360–80387, 80501–80518 ARE EQUIPPED WITH ARVINMERITOR AXLES.

Service Procedure:

General notes

Read this entire procedure before beginning work.

Use Safe Shop Practices At All Times.

REFER TO MANUAL

Refer to Section 2B / Trailing Axle, in the MCI G Series Maintenance Manual, in conjunction with this procedure.

Printed in Canada

Parts Required If Cracks Are NOT Present Upon Inspection

Qty.	New P/N	Description
a/r	**26-02-0001**	**Kit - Hardware, Tag Axle, Field Retrofit (as per Inspection)**
		Kit Contents Are:
2	02-06-6036	Bearing – Tapered, Outer
2	2L-6-349	Seal, Oil
2	02-06-1069	Washer
2	02-06-1070	Nut, Lock
2	02-06-6079	O–ring
a/r	21-7512-2	Gear Lube

Parts Required If Cracks Are Present Upon Inspection

Qty.	DANA AXLE	ARVINMERITOR AXLE	Description
a/r	**02-06-1071**	**02-06-1077**	**Kit - Tag Axle, LH, Retrofit (as per Inspection)**
			Kit Contents Are:
1	02-06-1056	02-06-1056	Tag Axle Arm Assy, LH
1	02-06-1052	02-06-1052	Bearing – Tapered, Outer
1	02-06-1069	02-06-1069	Washer
1	02-06-1070	02-06-1070	Nut, Lock
1	02-06-6037	02-06-6037	Bearing – Tapered, Inner
1	02-06-6079	02-06-6079	O–ring
8	15-05-1006	15-05-1006	Capscrew
1	15-05-6036	15-05-6036	Gasket, Hub Cap
1	15-05-6038	15L-5-167	Hub Seal, Oil
8	15-05-6051	15-05-6051	Nut, Lock
8	15-05-6052	15-05-6052	Washer, Flat
4	19-01-6228	19-01-6228	Capscrew, M24–2 x 50
4	19-02-6076	19-02-6076	Washer, M24–25 ID, 44OD
1	2L-6-349	2L-6-349	Seal, Oil
a/r	21-7512-2	21-7512-2	Gear Lube
a/r	23-01-0029	23-01-0029	Gear Oil

AND

Qty.	DANA AXLE	ARVINMERITOR AXLE	Description
a/r	**02-06-1054**	**02-06-1078**	**Kit - Tag Axle, RH, Field Retrofit (as per Inspection)**
			Kit Contents Are:
1	02-06-1034	02-06-1034	Tag Axle Arm Assy, RH
1	02-06-1052	02-06-1052	Bearing – Tapered, Outer
1	02-06-1069	02-06-1069	Washer
1	02-06-1070	02-06-1070	Nut, Lock
1	02-06-6037	02-06-6037	Bearing – Tapered, Inner
1	02-06-6079	02-06-6079	O–ring
8	15-05-1006	15-05-1006	Capscrew
1	15-05-6036	15-05-6036	Gasket, Hub Cap
1	15-05-6038	15L-5-167	Hub Seal, Oil
8	15-05-6051	15-05-6051	Nut, Lock
8	15-05-6052	15-05-6052	Washer, Flat
4	19-01-6228	19-01-6228	Capscrew, M24–2 x 50
4	19-02-6076	19-02-6076	Washer, M24–25 ID, 44OD
1	2L-6-349	2L-6-349	Seal, Oil
a/r	21-7512-2	21-7512-2	Gear Lube
a/r	23-01-0029	23-01-0029	Gear Oil

Printed in Canada

1. Turn the main battery disconnect switch to the OFF position.

NOTE

Raise the coach to the desired height. Position jackstands at the front and rear frame support points, according to Figure 1, to ensure that the coach is securely supported before attempting work underneath the coach.

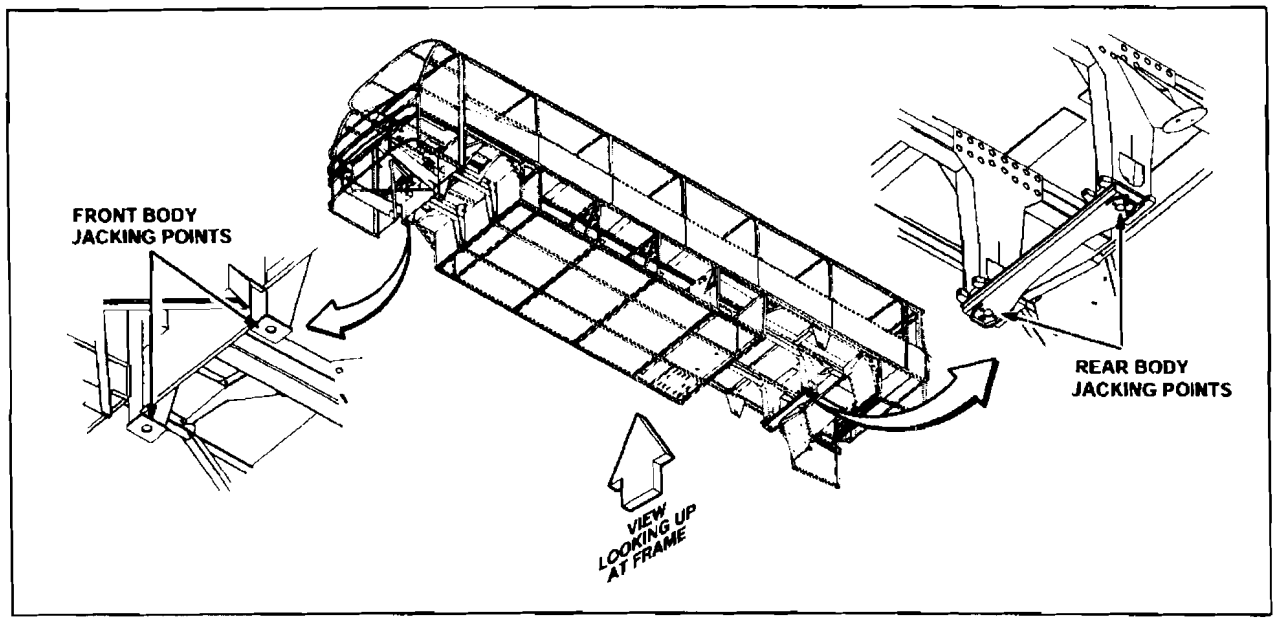

Figure 1. Underframe Jackstand Support Points (Section 3H / Maintenance Manual)

REFER TO MANUAL

Refer to Section 3H / Towing and Jacking, in the MCI G Series Maintenance Manual, for the basic rules, procedures and safety precautions that must be followed before a coach is to be lifted.

NOTE

The tag axle should be lifted only when the tag axle's suspension air bellows are exhausted. Close the tag axle suspension shut–off valves, located in the RH, rear service compartment (Figure 2).

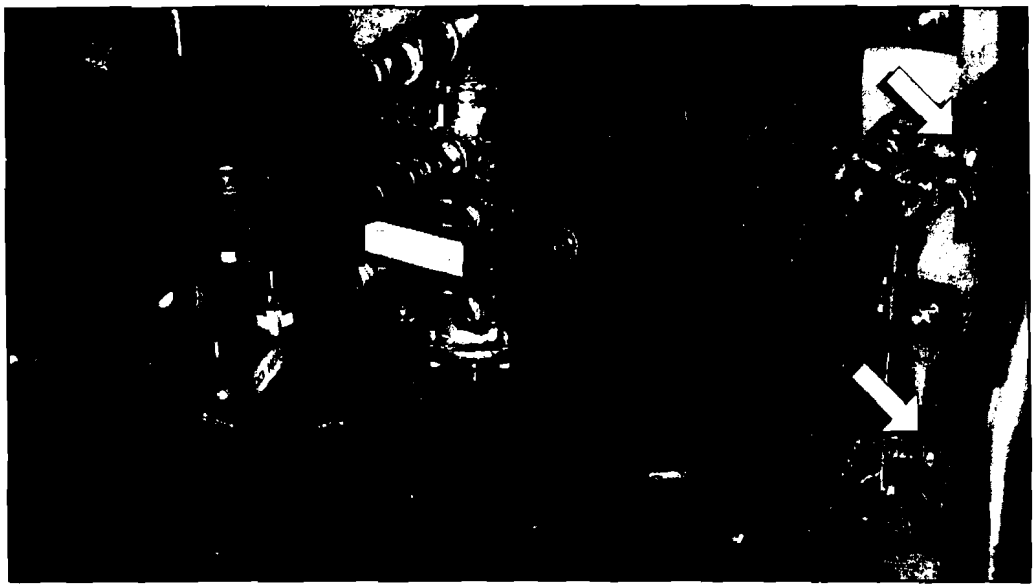

Figure 2.

2. Support the drive and tag axles.
3. Remove the drive and tag axle wheels.

REFER TO MANUAL

Refer to the Maintenance Manual / Section 15 / Wheels, Hubs and Tires, for the basic procedures on wheel removal and installation.

Use caution during wheel removal as wheel and tire assemblies weigh in excess of 100 pounds.

4. Disconnect the air lines from tag axle suspension air spring bellows and brake chamber air fittings.
5. Using a twisting motion, remove the ABS sensor, located in the inner top of LH / RH brake spider mounting flanges, with bushing from the axle housing's flange.
6. Unfasten the suspension air spring bellows from the chassis mounting pads.

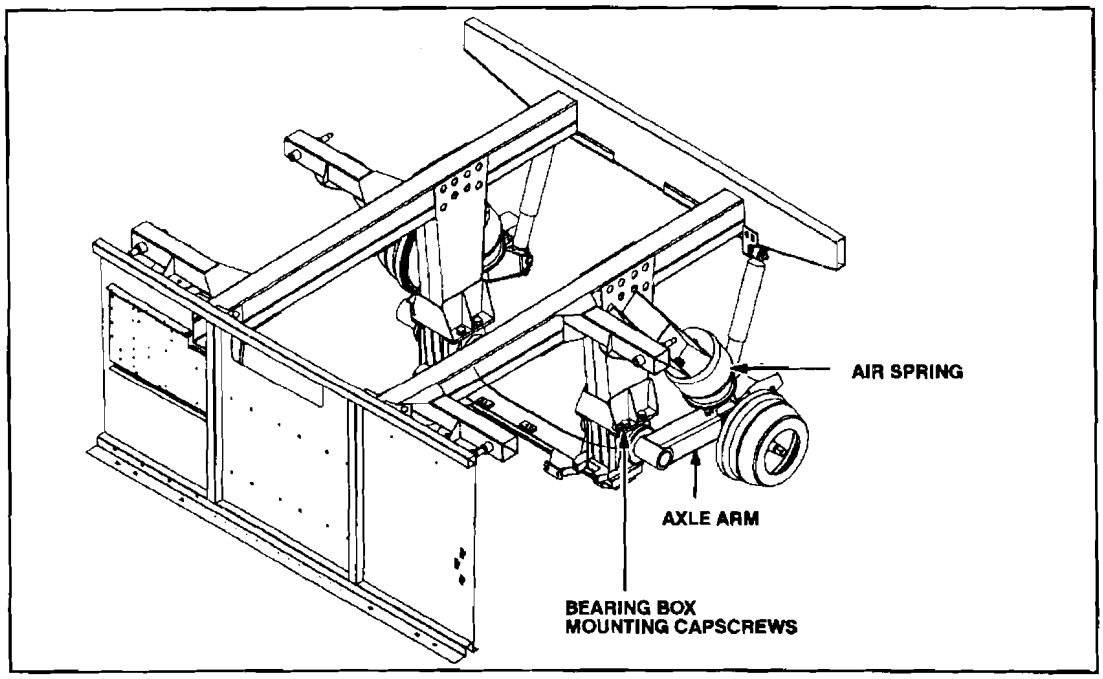

Figure 3.

7. Using solvent and a wire brush as necessary, carefully clean the welded joints on both tag axle assemblies. Visually inspect the LH and RH tag axle arm assemblies for cracks, paying particular attention to the welded areas.

DO NOT PROCEED PRIOR TO READING

IF NO CRACKS ARE PRESENT ON EITHER THE LH AND RH TAG AXLE ARM ASSEMBLIES INSTALL RETROFIT KIT P/N 26-02-0001, FOLLOWING THE OUTLINED STEPS 8. to 23.

IF CRACKS ARE PRESENT UPON TAG AXLE ARM INSPECTION ON EITHER OR BOTH THE LH AND RH TAG AXLE ARM ASSEMBLIES, NEW TAG AXLE ARMS WILL NEED TO BE INSTALLED ON BOTH SIDES OF THE THE COACH. PROCEED TO STEP 24.

Printed in Canada

Steps 8 to 23 cover the installation of retrofit kit p/n 26-02-0001 for coaches where NO CRACKS are found upon inspection

8. Remove the shock absorber from the tag axle arm pin. Retain the bushings, washers and nut to be re-installed at a later step in this procedure.
9. Remove the drain plug from the bearing box. Dispose of oil in an appropriate manner. Remove and retain the retaining ring and closing plate from the bearing box assembly (Figure 4). Remove and discard the o-ring from the bearing box. Remove and discard the shaft nut and washer from the end of the tag axle arm trunnion shaft.
10. Remove the cone of the inner bearing (p/n 02-06-6037). Take care to protect the bearing from contamination and place aside to be re-installed at a later step in this procedure. Inspect the bearing, ensuring that it is in good condition. Remove the tag axle arm from the bearing box, being carefull not to damage the cup (outer race) of the inner bearing or the threads and the end of the trunnion shaft. Remove and discard the outer bearing (p/n 02-06-6036) and seal (p/n 2L-6-349), using a long punch through the bearing box to carefully remove the outer race.
11. Re-assemble the bearing box and tag axle arm using a new outer bearing (p/n 02-06-6036), oil seal (p/n 2L-6-349) and re-using the existing inner bearing (p/n 02-06-6037) removed in Step 10. (Figure 4). Install the new washer (p/n 02-06-1069) and lock nut (p/n 02-06-1070).

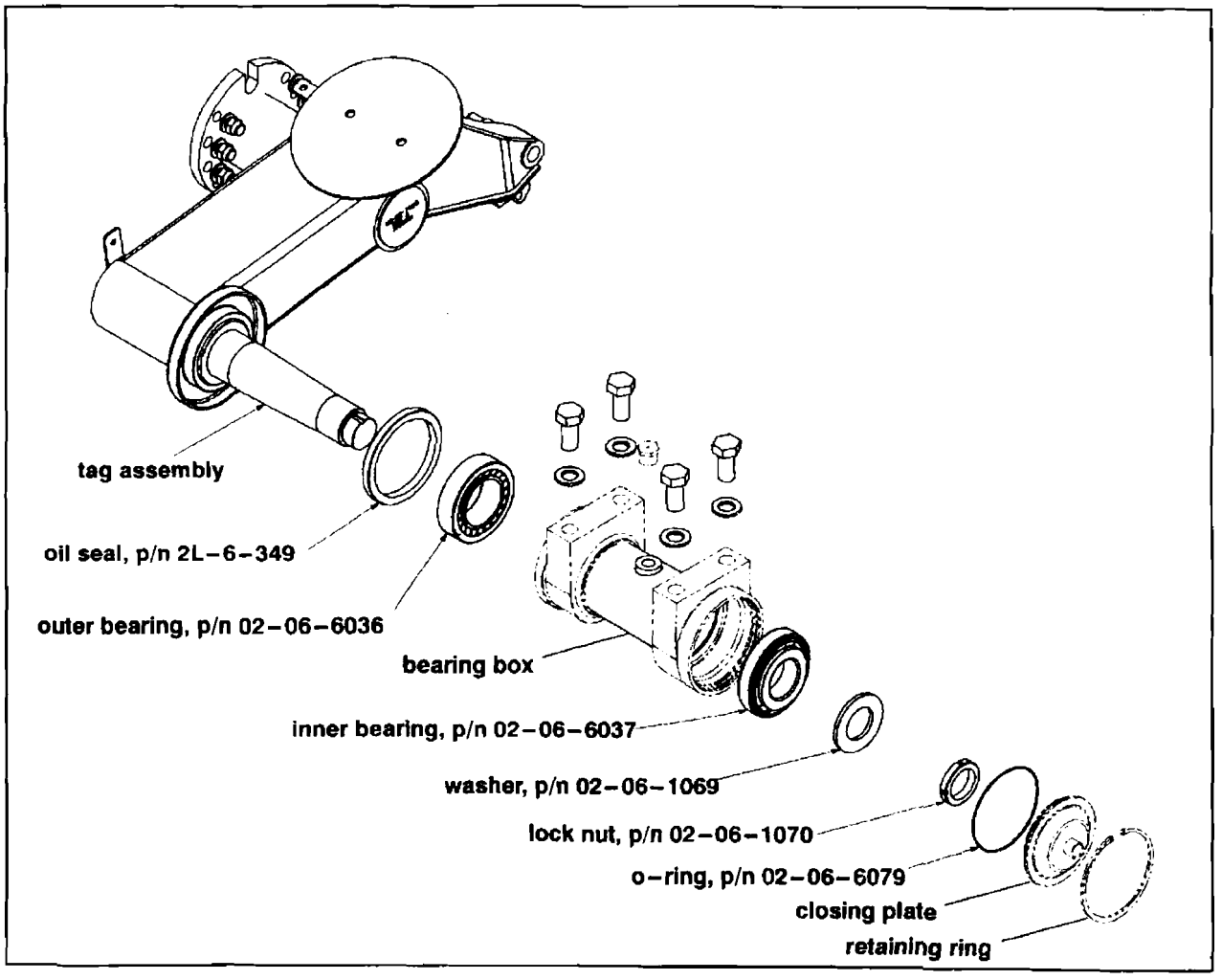

Figure 4.

12. Torque nut (p/n 02-06-1070) to 95-105 ft-lbs while rotating or rocking the suspension arm. Back-off and re-torque to 19-22 ft-lbs while rotating the arm. Torque lock nut set screw to 5-7 ft-lbs.

13. Mount a dial indicator magnetic base to the side of the bearing box. Position the indicator against the end of the arm trunnion shaft to monitor the end play of the bearings. Using a pry bar and light controlled force, push the tag axle arm back and forth laterally, and monitor the dial indicator for bearing end play. If bearing end play is more than 0.005 or less than 0.001, loosen the shaft nut and repeat Step 12. until end play is measured between 0.001 and 0.005 inch.
14. Install new o-ring (p/n 02-06-6079) on bearing box.
15. Re-install closing plate and retaining ring.
16. Fill bearing box with gear lube (p/n 21-7512-2). Check fill level and add as required to completely fill.
17. Push the ABS sensor completely into sensor bushing by hand until it stops against the tone ring. The ABS sensor is properly installed and adjusted when it is touching the tone ring.

NOTE

The ABS sensor must slide freely in and out of the mounting sleeve bore. Operating the vehicle with seized components will damage the speed sensor and the tone ring.

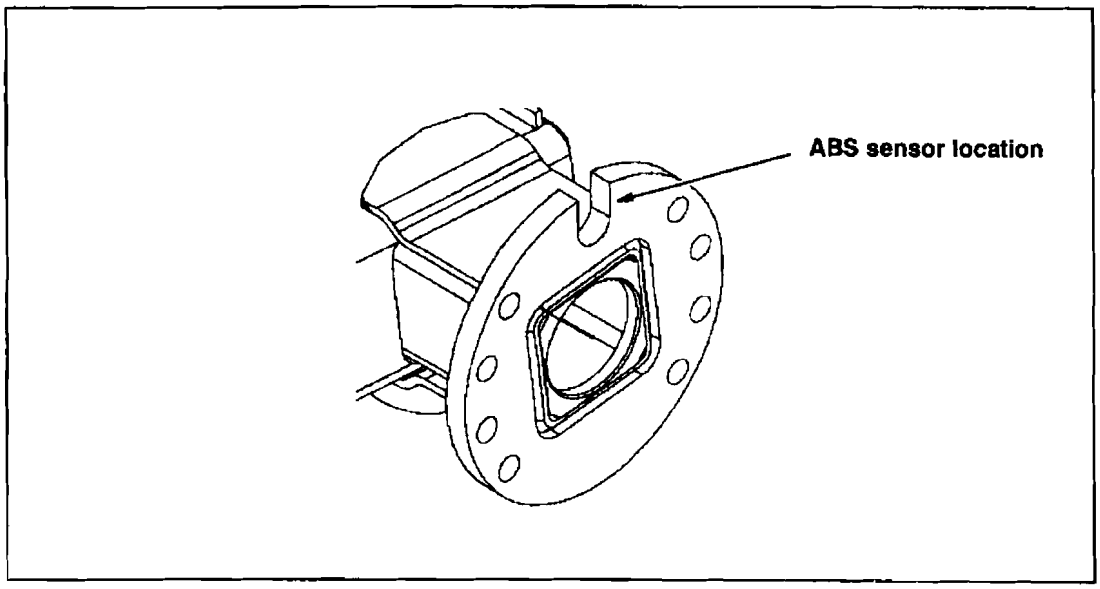

Figure 5.

18. Fasten the air spring to the chassis mounting pads. Torque air spring mounting fasteners to 50 lb-ft
19. Re-connect the air lines from tag axle suspension air spring bellows and brake chamber air fittings.
20. Re-assemble the shock absorber to the tag axle arm and torque the nut until the bushing retaining washer bottoms out on the shoulder bolt. Re-install the wheel assembly. Torque all wheels to 450-500 lb-ft (610-678 Nm) using an alternating sequence as outlined in the maintenance manual.

REFER TO MANUAL

Refer to the Maintenance Manual / Section 15 / Wheels, Hubs and Tires, for the basic procedures on wheel installation, torque and torque sequence.

21. Check for air leaks and proper bellows operation.
22. Repeat Steps 8. to 21. for the opposite side tag axle.
23. Test drive the vehicle and verify that the ABS warning lamp operates properly.

Procedure complete for coaches where <u>NO cracks</u> were found upon inspection.

Steps 24 to 54 cover the installation of new tag axle arms where CRACKS ARE FOUND upon inspection

NOTE

Step 24. (listed below) is a continuation of Steps 1 to 7. at the beginning of this Service Bulletin (as it relates to the tag axle arm removal part of this bulletin).

24. Back off the slack adjuster (counter–clockwise) and remove brake drum. Carefully clean any brake dust from inside drum using a clean cloth moistened with " Brake Kleen " or similar cleaner.

NOTE

DO NOT use compressed air to clean brake components.

25. Remove hub cap and carefully drain oil from hub into an appropriate container. Dispose of the oil in an appropriate manner.
26. Remove wheel bearing adjusting nut and lockwashers. Carefully remove the hub from the spindle, taking care to prevent the bearings from becoming contaminated, and to prevent oil from contaminating brake shoes. Set aside to be re-installed at a later step in this procedure.
27. Remove the 8 capscrews mounting the brake spider and spindle to the spindle mounting plate. Retain fasteners, to be re–installed at a later step in this procedure. Set aside any shims mounted between the spindle and the mounting plate.
28. Remove the drain plug and drain the oil from the bearing box. Dispose of the oil in an appropriate manner.
29. Remove the fasteners that mount the bearing box to the bogie leg. Retain the fasteners, to be re–installed at a later step in this procedure.
30. Remove and retain the retaining ring and closing plate from the bearing box assembly (Figure 4). Remove and discard the o-ring from the bearing box. Remove and discard the shaft nut and washer from the end of the tag axle arm trunnion shaft.

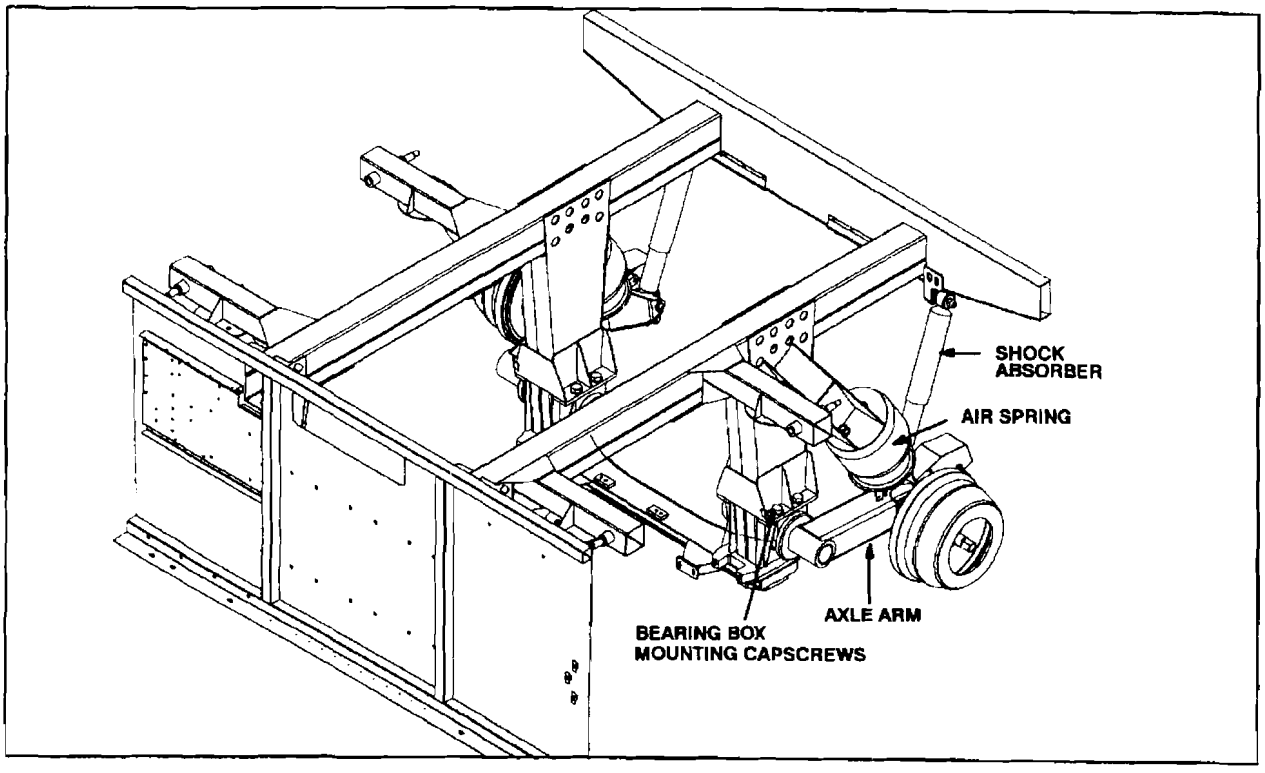

Figure 6. Tag axle arm.

31. Remove the tag axle arm assembly from the coach.

REFER TO MANUAL

Refer to the MCI G Series Maintenance Manual, for the basic rules, procedures and safety precautions that must be followed before air spring, bearing box and hub assembly removal / installation.

REFER TO MANUAL

Refer to Section 2B / Trailing Axle in the MCI G Series Maintenance Manual, for information relating to bearing box removal / installation.

NOTE

Inspect the tag axle bearing box bearings, ensuring that they are free of rust, that no pitting has occurred and they roll freely.

32. Remove the bearing box from the arm.

NOTE

Install new bearing cup, p/n 02-06-1052, in the outer end of the box, next to the tag axle arm.

33. Carefully remove bearing cups from bearing box, ensuring no damage to the bearing box. Discard existing bearings. Install new bearing cups (p/n 02-06-6037 and 02-06-1052) into bearing box.
34. Insert the cone of the outer bearing, p/n 02-06-1052, into the outer race and carefully press the new oil seal (part number 2L-6-349) into the housing of the box.
35. After lubricating the inner lips of the seal, install bearing box assembly onto the new tag arm assy. Take care to prevent side loading the seal as the box is being assembled to prevent damage to the seal. Install the inner race of the inner bearing, p/n 02-06-6037, washer, p/n 02-06-1069 and lock nut (p/n 02-06-1070) (Figure 7). Torque the lock nut to 95-105 lb-ft while rotating the bearing box. Back off, and re-torque to 19-22 lb-ft, while again rotating the bearing box. Torque lock nut set screw to 5-7 ft-lbs.
36. Mount a dial indicator magnetic base to the side of the bearing box. Position the indicator against the end of the arm trunnion shaft to monitor the end play of the bearings. Using a pry bar and light controlled force, push the tag axle arm back and forth laterally, and monitor the dial indicator for bearing end play. If bearing end play is more than 0.005 or less than 0.001, loosen the shaft nut and repeat Step 35. until end play is measured between 0.001 and 0.005 inch.
37. Install the new o-ring (part number 02-06-6079). Carefully install the end cap and retaining ring.

NOTE

Ensure that the retaining ring is properly seated.

38. Fill bearing box with gear lube (p/n 21-7512-2). Check fill level and add as required to completely fill.

NOTE

Ensure that bearing box stays mounted upright to prevent oil loss.

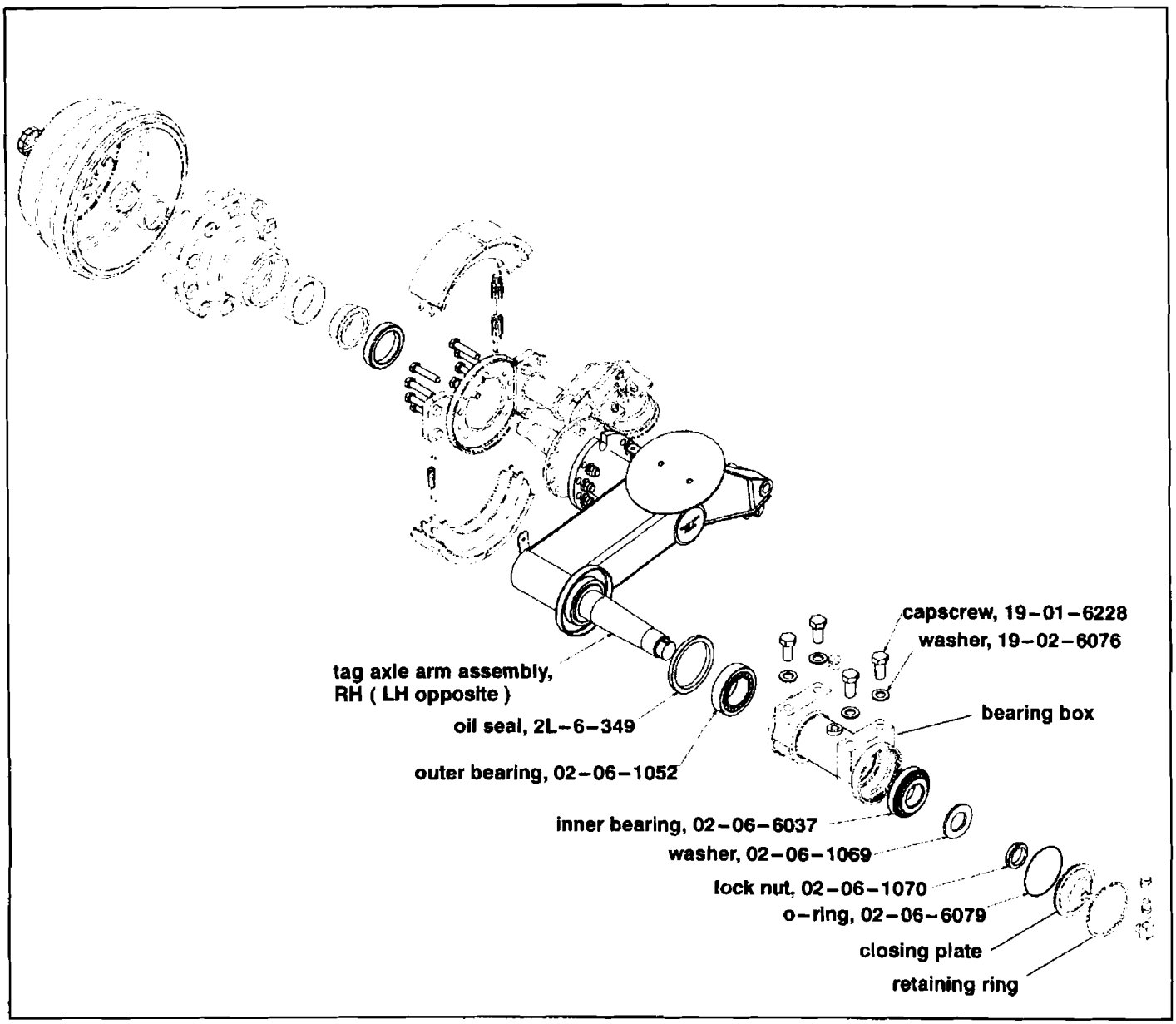

Figure 7. Tag axle arm assembly, RH.

39. Install new tag axle arm (p/n 02-06-1034 and 02-06-1056), taking care not to allow oil to drain from bearing box. Torque the bearing box mounting capscrews to 300-310 lb-ft.
40. Re-assemble the brake assembly, spider, and spindle to the new tag axle arm, using the 8 capscrew previously removed in Step 27. Take care to ensure that the ABS sensor hole in the spindle is aligned with the slots in the brake spider and the top of the spindle mounting plate. DO NOT install any shims at this time. Shims are used to correct any misalignment observed when the coach is aligned.
41. Replace brake hardware kit (S-cam rollers and springs), carefully applying brake grease to the contact points between rollers and brake shoes. DO NOT apply grease to the contact surface between rollers and S-cam. Check to ensure that the S-cam is properly located at this time.

42. Replace wheel bearing hub seal (part number 15-05-6038). Press the new seal into the hub. Be sure that inner bearing cone is installed into the hub before the seal is pressed in.
43. Install the hub onto the spindle, taking care to support and align the hub so that the hub seal is not damaged. Install the outer wheel bearing, flatwasher, adjusting nut and retaining washer. Torque the adjusting nut to 100 lb-ft while rotating the hub. Back off the adjusting nut 1 full turn. Re-torque to 50 lb-ft while rotating the hub. Back off 1/4 turn. Torque outer jam nut to 300-400 lb-ft. Using a dial indicator, verify that end play is 0.001-0.005 inch.
44. Torque hub cap bolts to 13-15 lb-ft (Figure 5). Fill hub cavity until gear oil (part number 23-01-0029) appears at the level mark of the hub cap's plastic sight glass. Reinstall the rubber plug, and recheck level after coach operation. DO NOT overfill the hubs.
45. Carefully install the brake drum.
46. Adjust slack adjuster by turning the adjusting screw clockwise until brake shoes contact the drum. Back off 1/2 turn, plus any backlash observed.

NOTE

Replace the hub cap gasket (part number 15-05-6036) and hub oil seal (part number 15-05-6038 or 15L-5-167) after every hub assembly / disassembly (Figure 5).

The slack adjuster will have to be backed off to allow for brake drum removal.

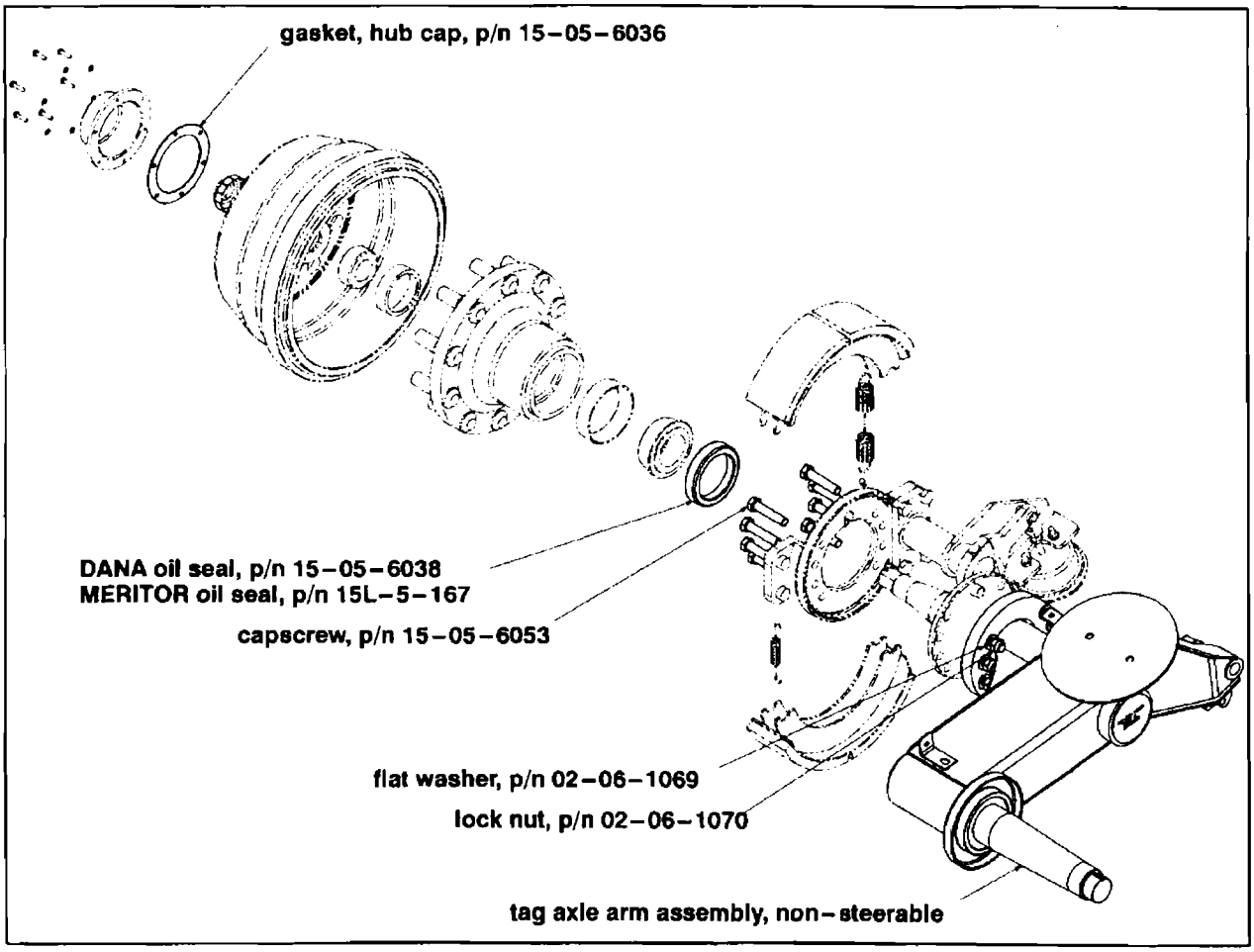

Figure 8. Wheel end components.

47. Push the ABS sensor completely into sensor bushing by hand until it stops against the tone ring. The ABS sensor is properly installed and adjusted when it is touching the tone ring (Figure 5).

NOTE

The ABS sensor must slide freely in and out of the mounting sleeve bore. Operating the vehicle with seized components will damage the speed sensor and the tone ring.

48. Fasten the air spring to the chassis mounting pads. Torque air spring mounting fasteners to 50 lb-ft.
49. Reconnect the air lines from tag axle suspension air spring bellows and brake chamber air fittings.
50. Re–assemble the shock absorber to the tag axle arm and torque the nut until the bushing retaining washer bottoms out on the shoulder bolt. Re–install the wheel assembly. Torque all wheels to 450–500 lb-ft (610–678 Nm) using an alternate sequence as outlined in the maintenance manual.

REFER TO MANUAL

Refer to the Maintenance Manual / Section 15 / Wheels, Hubs and Tires, for the basic procedures on wheel installation, torque and torque sequence.

51. Verify proper brake function by starting the coach, building up air pressure and verifying that full brake strokes are obtained when the brake pedal is applied. Verify that the brake stroke does not exceed CVSA re-adjustment limits.

NOTE

The CVSA power stroke re-adjustment limits for type 20 brake chambers is 1.75 inches.

The power stroke measurement is the difference between the brakes fully applied and fully released

If the power stroke does not exceed the CVSA readjustment limits for the chamber size, then the power stroke inspection is complete.

If the power stroke exceeds the allowable stroke for the chamber size, the cause of the overstroke condition must be identified and corrected. The power stroke should be retested to confirm compliance.

52. Check for air leaks and proper bellows operation.
53. Repeat Steps 24. to 52. for the opposite side tag axle, installing new tag axle arm (p/n 02-06-1071 or 02-06-1054).
54. Test drive the vehicle and verify that the ABS warning lamp operates properly.

NOTE

Verify proper brake function, ensuring correct brake installation.

Note that up to 20 brake applications while to vehicle is operating may be required to have the automatic slack adjusters properly adjust the brake clearance.

Be sure that several brake applications are made under light load in an open location to avoid problems while the slack adjuster is making initial adjustments.

Procedure complete.

Printed in Canada

DO NOT PROCEED PRIOR TO READING

THE ALIGNMENT PROCEDURE LISTED BELOW IS ONLY REQUIRED FOR COACHES THAT HAVE NEW TAG AXLE ARMS INSTALLED.

IF ALIGNMENT IS REQUIRED, THE OIL SEALS, O-RINGS AND HUB CAP GASKET WILL HAVE TO BE REPLACED, AS THEY ARE A ONE TIME USE ITEM.

ALIGNMENT: TAG AXLE

Periodic inspection of the axle assembly should be made to see that all wheel end spindle flange and/or bearing box mounting hardware are tight and that no damage or distortion has taken place.

NOTE

All suspension mounting hardware should be checked and tightened to the torque specifications shown in sub-section 12A.

The following alignment specifications or provided as a general guide only. Toe-in – (0.03" ± 0.03"), or approximately 1/64 inch per wheel end when measured relative to the coach centerline. Alignment – (0.25 degree positive ± 0.44 degrees). Tag axle wheel track is 84.9 inches (2156 mm) at center of tread. Coaches with a Toe-In/Toe-Out condition, beyond that of limit shown above should be re-aligned.

If the toe measurement is out of specification more than 0.62" on a side, the bearing box must be adjusted on the chassis. Loosen the four bearing box mounting bolts and rotate the box in the direction needed. Take a preliminary alignment measurement to aid in locating box correctly. Tighten the mounting bolts to the proper torque value and ensure that bolts are seated properly.

If the toe measurement is out of specification less than 0.62" per side, adjust the wheel end using shims. Install only one of these shims per side of the vehicle (Figure 9). Disassemble tag wheel end and install shim between swing arm and wheel spindle. Reassemble wheel end. Torque all components to the proper torque value and verify alignment is within specifications. Fill the hub with oil.

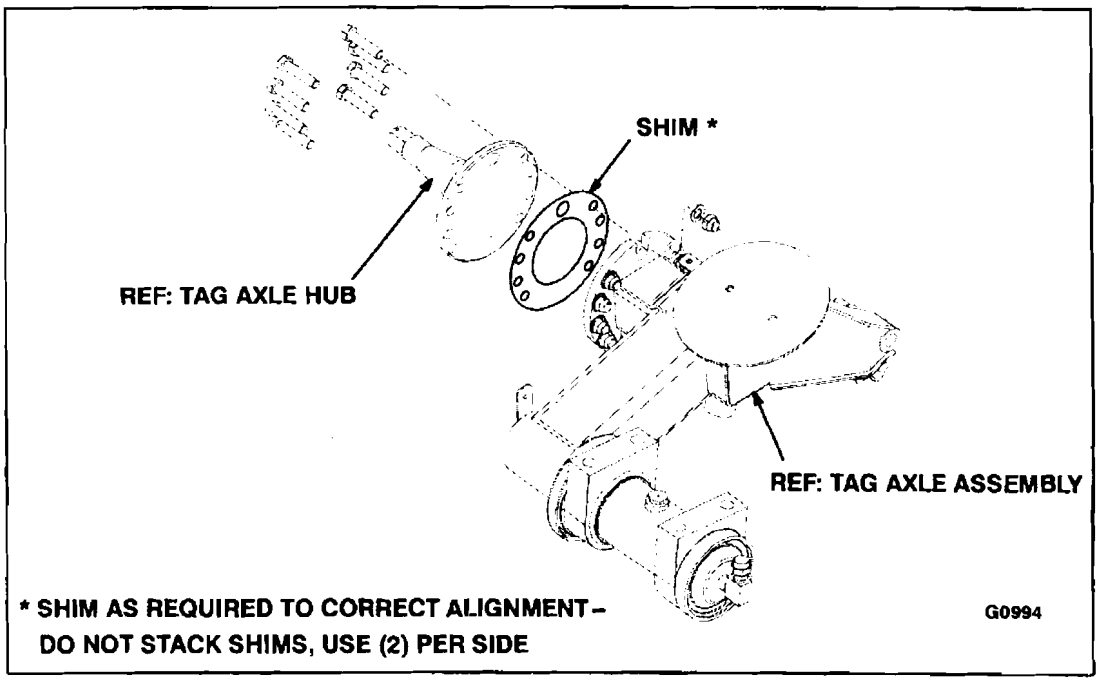

Figure 9. Tag Axle Shim Installation.

ALIGNMENT: TAG AXLE

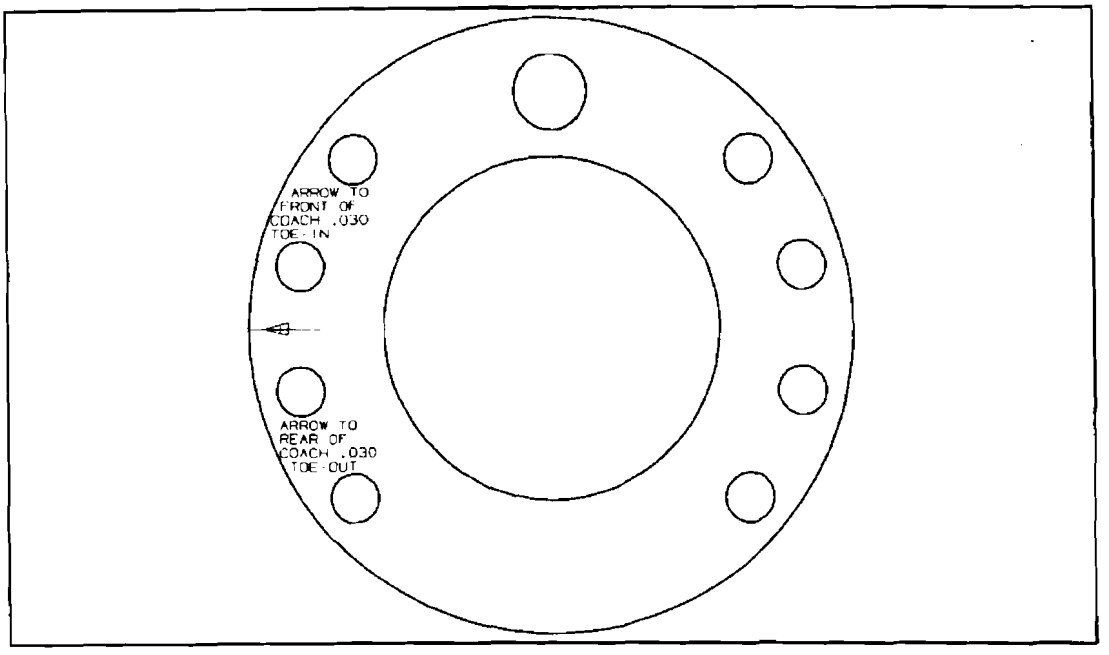

Figure 10. Tag Axle Shim.

NOTE

Only 2 shims allowed per side.

Tag Axle Alignment Procedure complete.

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 4.0 hours will be granted against claim SB289.1, for the procedure of inspecting and installing hardware kit on existing tag axle arms on G4500 model coaches.

A labor allowance of 19.0 hours will be granted against claim SB289.2, for the procedure of installing a new LH and RH tag axle arm on G4500 model coaches. An allowance of 2 hours for the alignment of the tag axle on G4500 model coaches is included in the 19.0 labor allowance.

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.

Printed in Canada

Service Bulletin No. 212

MODEL	TYPE	SECTION/GROUP	DATE
G4500 Series Coaches	Field Change Program	2B – Trailing Axle	Dec. 04, 2003

SUBJECT: **TAG AXLE WELD REWORK**

CONDITIONS:

Ref. NHTSA Recall No.: 03V–411

Ref. Transport Canada Recall No.: 03–251

Description:

MCI has made design changes to improve the durability and reliability of the tag axle installation. As a result, MCI advises that all G model coaches between the range of unit numbers 80026 to 80518 implement the specified steps in this procedure.

Parts

Qty. (per side)	New P/N	Description
1	02-06-0002	Plate
1	02-06-6156	Strap - Weld On
a/r	02-06-6143	Bracket - Brake Hose (reference only)

NOTE

Welding may only be done by an experienced and qualified person. All welding must conform to AWS D1.1 Structural Welding Code - Steel. All applicable instructions and prohibitions must be followed.

Follow the welding disconnect procedure for non-multiplex and multiplexed coaches on Pages 10 & 11.

The following procedure can be done using either welding method listed below:

1. SHIELDED METAL ARC WELDING (SMAW)
   a. 1 / 8 rod - 7018 rod
2. METAL CORE ARC WELDING (MCAW)
   a. 0.045 diameter ER70C-6 wire (shielding gas - 90% Argon, 10% CO_2)

WARNING

Wear safe eye protection at all times while performing maintenance to prevent serious personal injury.

Service Procedure:

General notes

Read this entire procedure before beginning work.

Use Safe Shop Practices At All Times.

REFER TO MANUAL

Refer to Section 2B / Trailing Axle, in the MCI G Series Maintenance Manual, in conjunction with this procedure.

1. Turn the main battery disconnect switch to the OFF position.

NOTE

Raise the coach to the desired height. Position jackstands at the front and rear frame support points, according to Figure 1, to ensure that the coach is securely supported before attempting work underneath the coach.

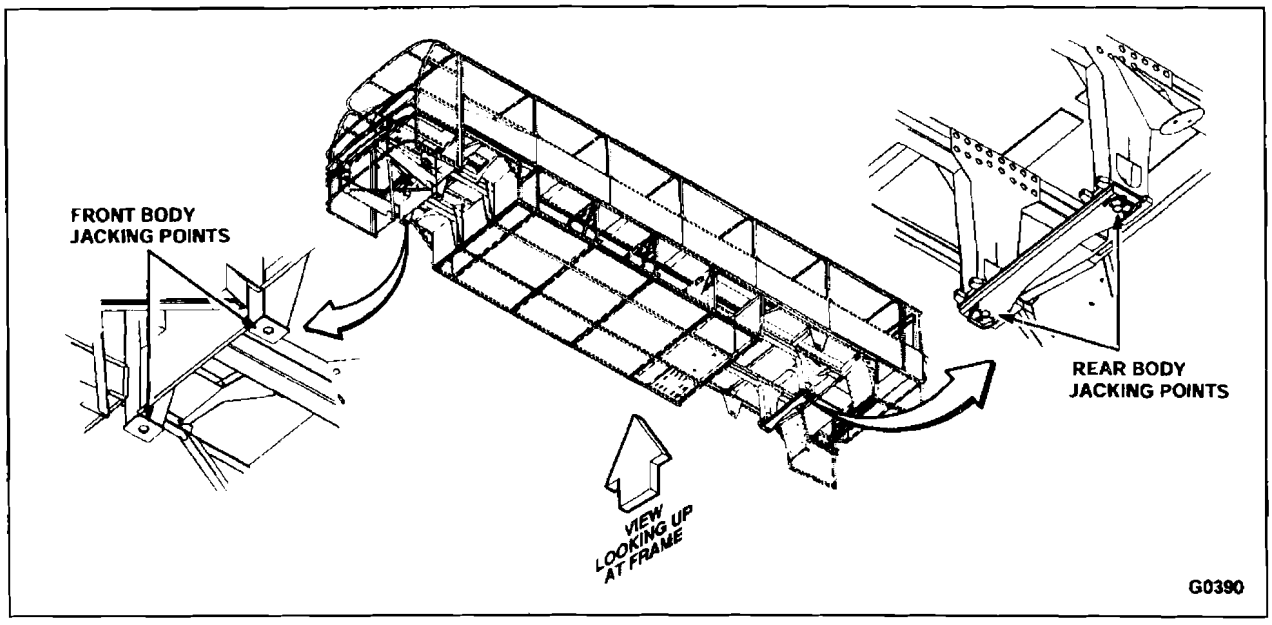

Figure 1. Underframe Jackstand Support Points (Section 3H / Maintenance Manual)

REFER TO MANUAL

Refer to Section 3H / Towing and Jacking, in the MCI G Series Maintenance Manual, for the basic rules, procedures and safety precautions that must be followed before a coach is to be lifted.

NOTE

The trailing axle should be lifted only when the trailing axle's suspension air bellows are exhausted. Close the tag axle suspension shut–off valves, located in the RH, rear service compartment (Figure 2).

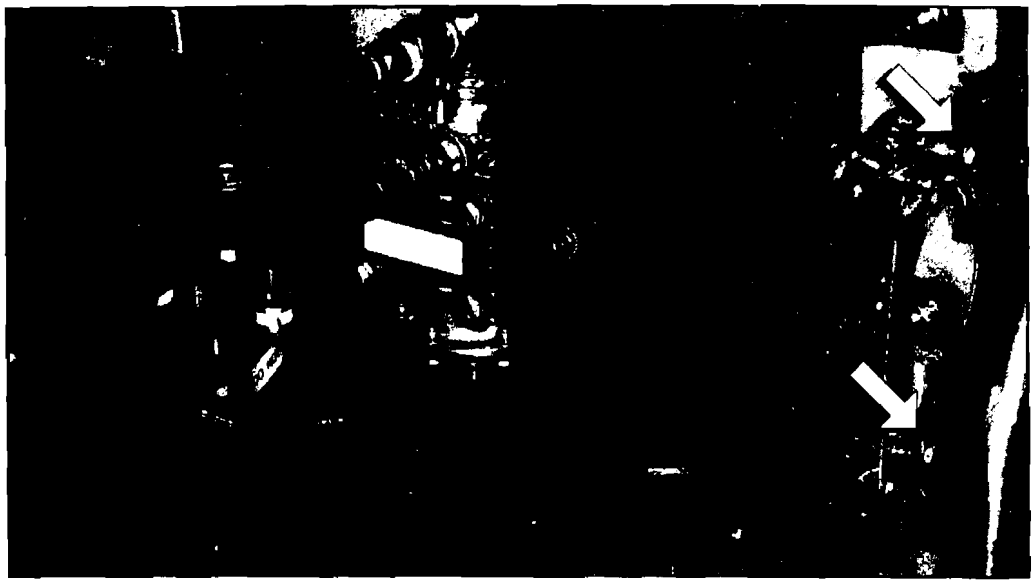

Figure 2.

2. Support the drive and tag axles.
3. Remove the drive and tag axle wheels.

REFER TO MANUAL

Refer to the Maintenance Manual / Section 15 / Wheels, Hubs and Tires, for the basic procedures on wheel removal and installation.

Use caution during wheel removal as wheel and tire assemblies weigh in excess of 100 pounds.

4. Disconnect the air lines from trailing axle suspension air spring bellows and brake chamber air fittings.
5. Using a twisting motion, remove the ABS sensor, located in the inboard top of LH / RH brake spider mounting flanges, with bushing from the axle housing's flange.
6. Unfasten the suspension air spring bellows from the chassis mounting pads.

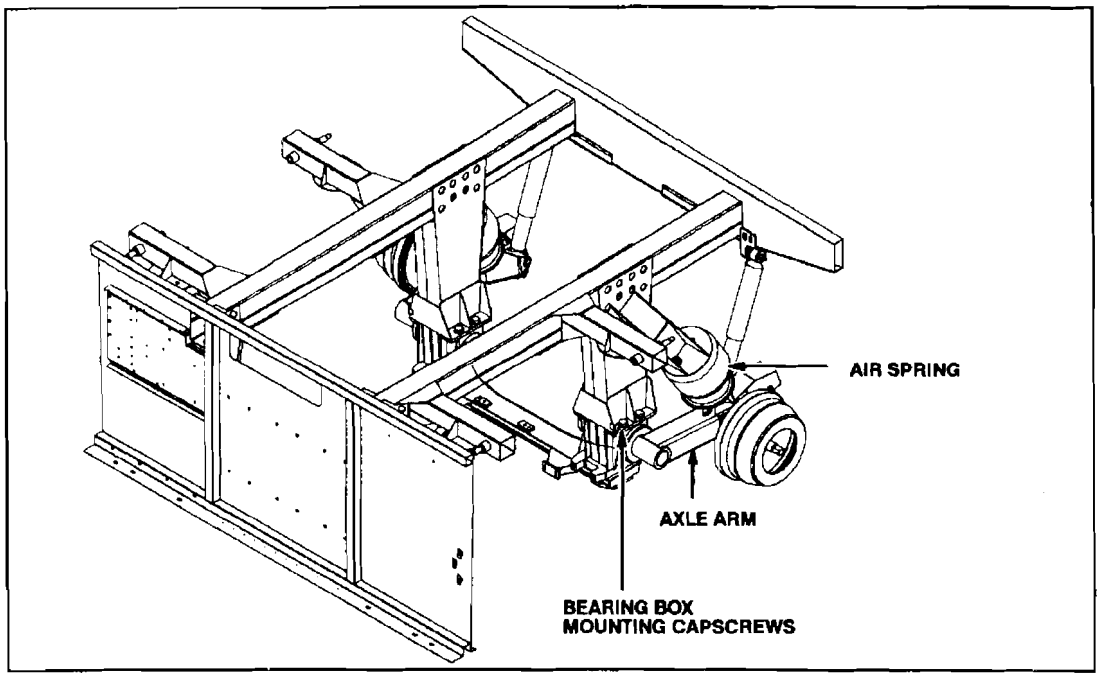

Figure 3.

7. Visually inspect the tag axle arm assembly for cracks.

NOTE

The tag axle arm assembly is NOT repairable if:

A. Cracks propagate thru the arm assembly tube.

B. Cracks are present at lower wheel spindle end of the arm assembly (Figure 4).

C. Arm assembly tube and spindle cylinder are not in contact due to bending deformation after cracks are initiated (if cracks are more than 0.010 inch) (Figure 4).

DO NOT PROCEED PRIOR TO READING

IF THE TAG AXLE ARM IS REPAIRABLE, FOLLOW THE OUTLINED STEPS ON PAGES 5 TO 11 USING THE PARTS LIST ON PAGE 1 ONLY.

IF THE TAG AXLE ARM FAILS ANY OR ALL OF THE CRITERIA LISTED ABOVE, A NEW TAG AXLE ARM WILL NEED TO BE INSTALLED ON THE COACH.

REFER TO PAGES 12 TO 21 OF THIS SERVICE BULLETIN FOR THE PROCEDURE STEPS AND PARTS LIST REQUIRED FOR TAG AXLE ARM REMOVAL AND INSTALLATION. NO WELDING WILL BE REQUIRED FOR THIS PHASE OF THE CAMPAIGN.

10. Using a steel brush, clean the area around the crack to remove all the dirt, rust, grease and paint.
11. Upon inspection if a crack is present at the upper weld, grind and/or gouge out the crack, to create a u-groove sufficient to ensure complete joint weld penetration. Weld the crack, and grind smooth.
12. Remove and retain the brake hose bracket. Grind off the welded portion.

NOTE

PRIOR TO WELDING, ENSURE THAT THE GROUND WIRE FROM THE WELDER IS CONNECTED TO THE TAG AXLE ARM, MINIMIZING THE CURRENT TRAVELLING THROUGH THE PIVOT BEARINGS.

Prior to welding on coach, ensure that all the steps have been followed in the Pre-Welding Disconnect Procedure on Pages 9 and 10.

If necessary, grind the area to allow proper fit.

13. Position the plate (part number 02-06-0002), ensuring that it sits flush and in full contact with the arm tube and spindle (Figure 4).
14. Remove any sharp burrs on the inside edge of the hole in the plate (part number 02-06-0002).
15. Position the plate (part number 02-06-0002) and strap (part number 02-06-6156) in place, ensuring proper fit and installation (Figure 4). Using clamps, secure the plate and strap in position.
16. Preheat the entire assembly to 400 degrees F. Use a temperature stick to verify that proper preheat temperature has been achieved.
17. Weld around inside edge of hole using SMAW process and E7018-1 electrodes (Figure 4).
18. Hold electrode at approximately 45 degrees to horizontal plane of attachment plate with electrode centered at fillet corner.
19. Complete entire joint (360 degrees) in one operation.
20. Weld the strap and reweld the brake hose bracket (removed in Step 12.), according to welding symbols in Figure 4. DO NOT weld across arm assembly.

NOTE

Welding may be achieved by using 3/32 inch electrodes at approximately 100 amps or 1/8 inch electrodes at approximately 130 amps.

When using 3/32 inch electrodes, a second pass may be required to provide a full fillet weld.

CAUTION

DO NOT QUENCH. Allow sufficient time for the weld to cool off.

Always have a fire watch person and a fire extinguisher present, when welding on a coach.

21. Perform a visual inspection of the final weld and note any defects that do not meet the requirements of AWS D1.1 Clause 4.8.1.

Reference from the American Welding Society (AWS) D1.1/D1.1M Structural Welding Code – Steel
4.8.1 Visual Inspection. For acceptable qualification, welds shall meet the following requirements;
(1) The weld shall be free of cracks.
(2) All craters shall be filled to the full cross section of the weld.
(3)The face of the weld shall be flush with the face of the base metal, and the weld shall merge smoothly with the base metal. Undercut shall not exceed 1/32 in. (1 mm). Weld reinforcement shall not exceed 1/8in.(3mm).
(4) The root of the weld shall be inspected, and there shall be no evidence of cracks, incomplete fusion, or in adequate joint penetration. A concave root surface is permitted within the limits shown below, provided the total weld thickness is equal to or greater than that of the base metal.
(5) The maximum root surface concavity shall be 1/16 in. (2 mm) and the maximum melt-through shall be 1/8 in. (3 mm). For tubular T-, Y-, and K. connections, melt-through at the root is considered desirable and shall not be cause for rejection.

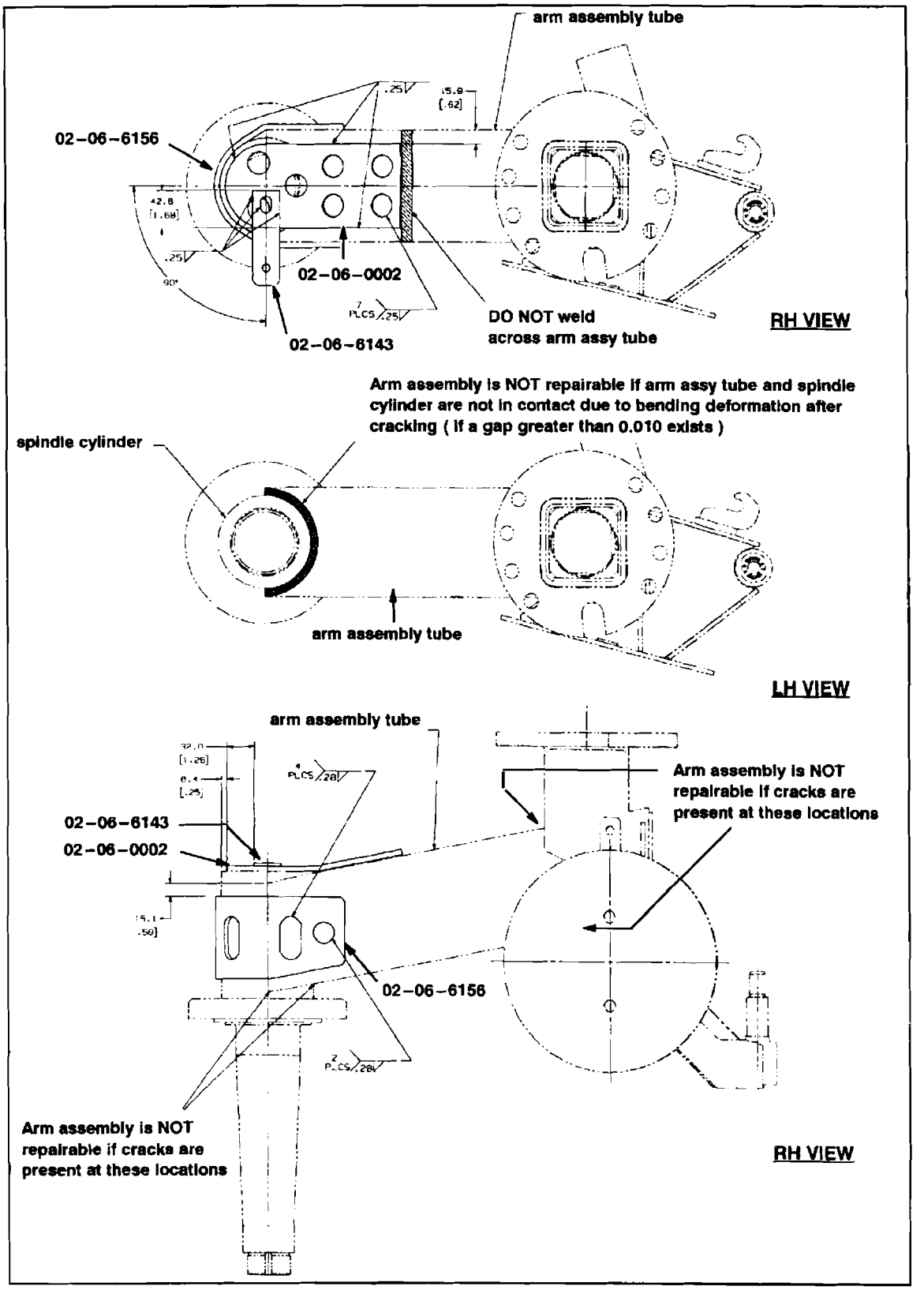
arm assembly tube
02-06-6156
02-06-0002
02-06-6143
DO NOT weld
across arm assy tube
RH VIEW
Arm assembly is NOT repairable if arm assy tube and spindle cylinder are not in contact due to bending deformation after cracking (if a gap greater than 0.010 exists)
spindle cylinder
arm assembly tube
LH VIEW
arm assembly tube
Arm assembly is NOT repairable if cracks are present at these locations
02-06-6143
02-06-0002
02-06-6156
Arm assembly is NOT repairable if cracks are present at these locations
RH VIEW

Figure 4.

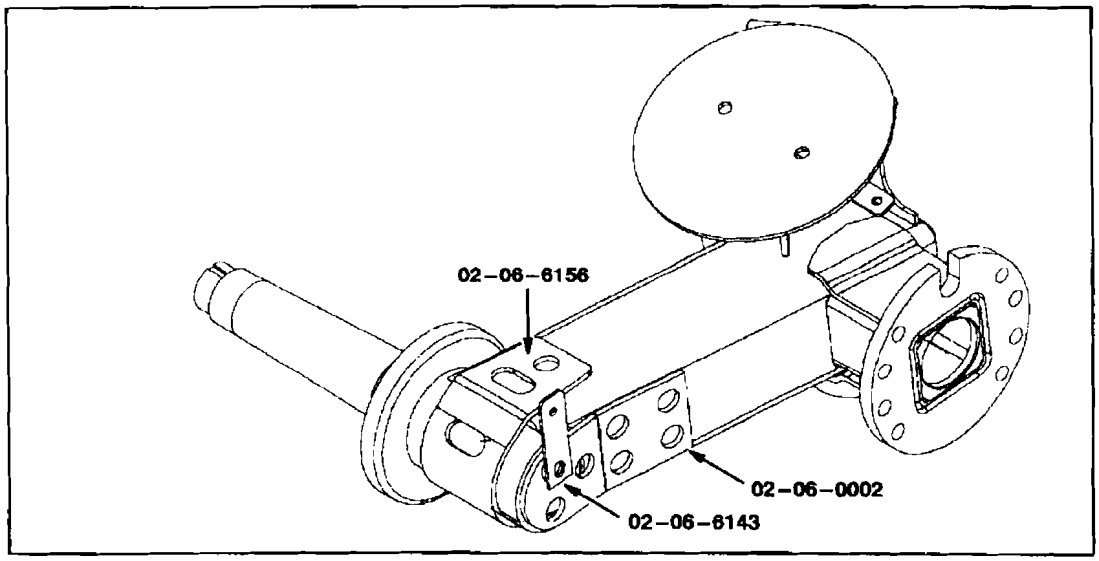

Figure 5. Re-worked tag axle arm.

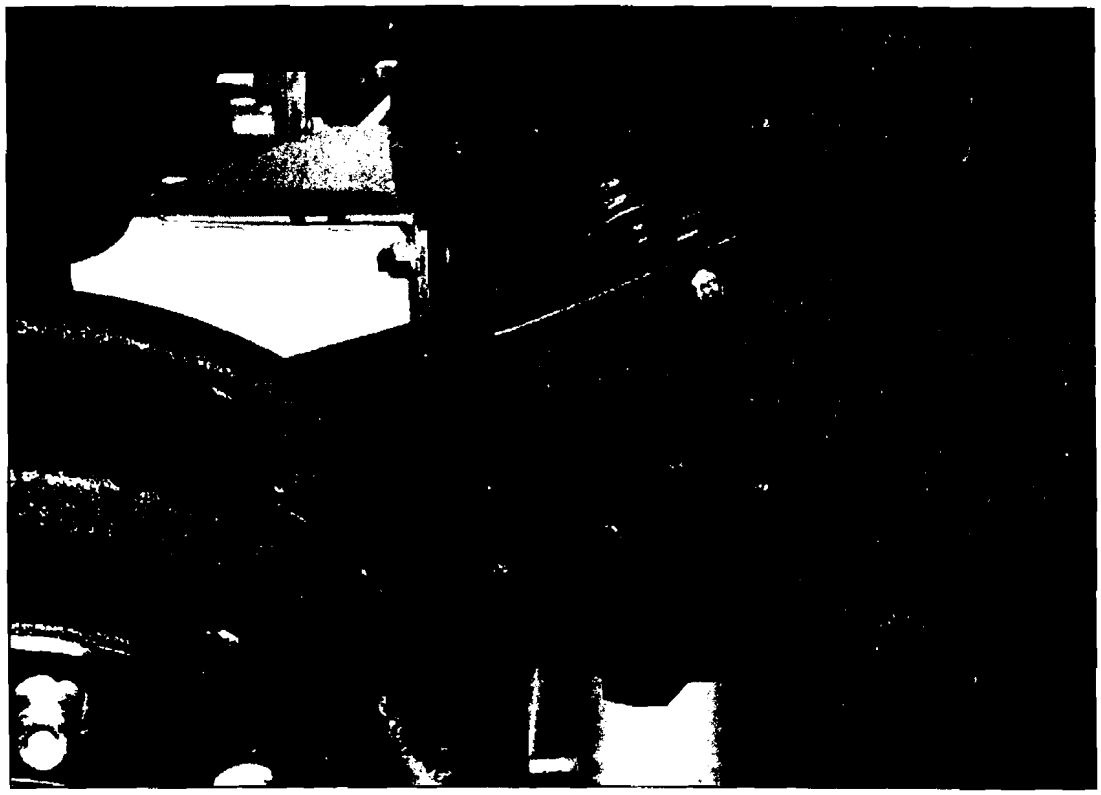

Figure 6.

22. Push the ABS sensor completely into sensor bushing by hand until it stops against the tone ring. The ABS sensor is properly installed and adjusted when it is touching the tone ring.

NOTE

The ABS sensor must slide freely in and out of the mounting sleeve bore. Operating the vehicle with seized components will damage the speed sensor and the tone ring.

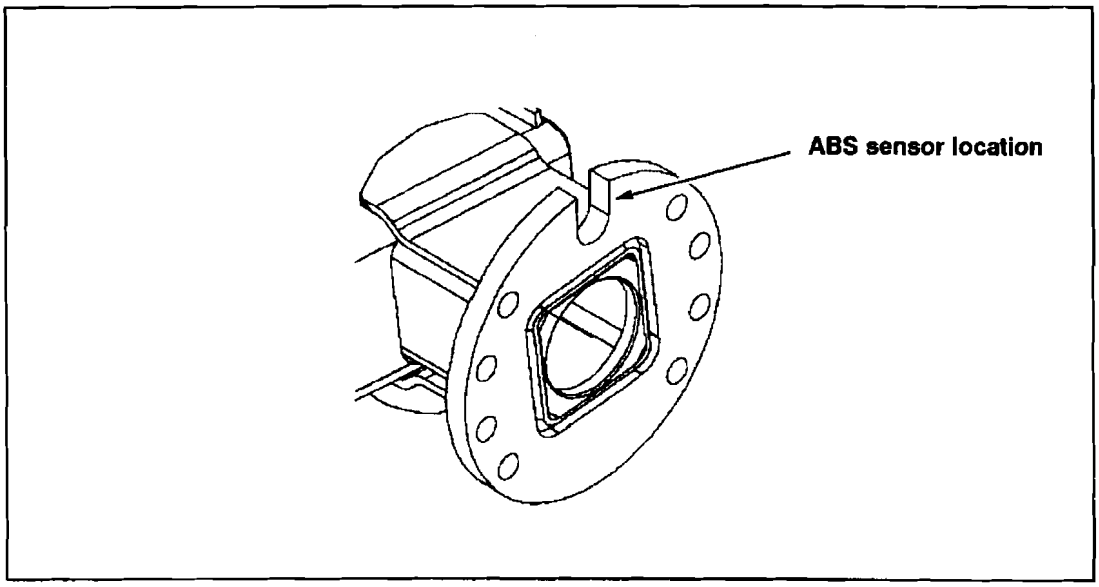

Figure 7.

23. Fasten the air spring to the chassis mounting pads. Torque air spring mounting fasteners to 50 lb.-ft.
24. Re-connect the air lines from trailing axle suspension air spring bellows and brake chamber air fittings.
25. Re-install the wheel assembly. Torque all wheels to 450-500 lb.-ft. (610-678 Nm).

REFER TO MANUAL

Refer to the Maintenance Manual / Section 15 / Wheels, Hubs and Tires, for the basic procedures on wheel installation, torque and torque sequence.

26. Check for air leaks and proper bellows operation.
27. Repeat all steps for the opposite side tag axle.
28. Test drive the vehicle and verify that the ABS warning lamp operates properly.

Procedure complete.

NON-MULTIPLEX WELDING CAUTION

The following information must be read before beginning any welding. The prohibitions and requirements must be followed to prevent personal injury and damage to electrical components. Also follow any welding instructions and cautions associated with the specific component being repaired.

Welding may only be done by an experienced and qualified person. All welding must conform to AWS D1.1 Structural Welding Code - Steel. All applicable instructions and prohibitions must be followed.

Position ground contacts and barriers as close as possible to the weld area to protect components (wiring, brake lines, bearings, hydraulic lines, etc.) from heat, contact by weld splatter and arcing.

PRE-WELDING DISCONNECTION ON G4500 NON-MULTIPLEX COACHES (UNIT NUMBERS 80026 - 80412 AND 80418 - 80451)

1. **Switch the main battery disconnect OFF.**
2. In the **BATTERY COMPARTMENT**, in the order given:
   a. Disconnect the ground.
   b. Disconnect the 12-volt cable at the battery and tape terminals.
   c. Disconnect the 24-volt cable at the battery and tape terminals.
3. In the **FRONT JUNCTION BOX COMPARTMENT**, in the order given:
   a. Disconnect the transmission ECU (3 connectors).
   b. Disconnect the ABS ECU (5 connectors).
   c. Disconnect the 2 connectors from the HVAC controller.
4. In the **ENGINE COMPARTMENT**, in the order given:
   a. Disconnect all connectors on the engine ECM (5 connectors).
   b. Disconnect the transmission main plug (1 connector).
5. In the **DRIVERS CONSOLE**:
   a. Disconnect the translator module (P-15).
6. In the **INSTRUMENT PANEL**:
   a. Disconnect the black connector (P-19).
7. On the **STEERING COLUMN**:
   a. Disconnect the 3 connectors (P-AA, P-BB and P-183).
8. In the **WIPER CONTROL MODULE**:
   a. Disconnect the 2 connectors (P-10 and P-11).
9. In the **CRUISE CONTROL MODULE**:
   a. Disconnect the 3 connectors (J-2, J-3 and P-31).
10. In the **LEFT HAND SWITCH PANEL**:
    a. Disconnect the HVAC driver's control module.
11. In the **PROHEAT CONTROL MODULE**:
    a. Disconnect the Proheat power cable at the Proheat control module.

Pre-welding Disconnection Procedure complete.

MULTIPLEX WELDING CAUTION

The following information must be read before beginning any welding. The prohibitions and requirements must be followed to prevent personal injury and damage to electrical components. Also follow any welding instructions and cautions associated with the specific component being repaired.

Welding may only be done by an experienced and qualified person. All welding must conform to AWS D1.1 Structural Welding Code - Steel. All applicable instructions and prohibitions must be followed.

Position ground contacts and barriers as close as possible to the weld area to protect components (wiring, brake lines, bearings, hydraulic lines, etc.) from heat, contact by weld splatter and arcing.

PRE-WELDING DISCONNECTION ON G4500 MULTIPLEXED COACHES (UNIT NUMBERS 80413 – 80417 AND 80452 – 80518)

1. **Switch the main battery disconnect OFF.**
2. In the **BATTERY COMPARTMENT**, in the order given:
   a. Disconnect the ground.
   b. Disconnect the 12–volt cable at the battery and tape terminals.
   c. Disconnect the 24–volt cable at the battery and tape terminals.
3. In the **FRONT JUNCTION BOX COMPARTMENT**, in the order given:
   a. Disconnect the transmission ECU (3 connectors).
   b. Disconnect the ABS ECU (5 connectors).
   c. Disconnect the 2 connectors from the HVAC controller.
4. In the **ENGINE COMPARTMENT**, in the order given:
   a. Disconnect all connectors on the engine ECM (5 connectors).
   b. Disconnect the transmission main plug (1 connector).
5. In the **DRIVERS CONSOLE**:
   a. Disconnect the translator module (P–15).
6. In the **INSTRUMENT PANEL**:
   a. Disconnect the red connector (P–19).
7. On the **STEERING COLUMN**:
   a. Disconnect the 3 connectors (P–AA, P–BB and P–183).
8. In the **WIPER CONTROL MODULE**:
   a. Disconnect the 2 connectors (P–10 and P–11).
9. In the **CRUISE CONTROL MODULE**:
   a. Disconnect the 3 connectors (J–2, J–3 and P–31).
10. In the **LEFT HAND SWITCH PANEL**:
    a. Disconnect the HVAC driver's control module.
11. At the **MBC MODULE BLACK**:
    a. Disconnect connector.
12. In the **PROHEAT CONTROL MODULE**:
    a. Disconnect the Proheat power cable at the Proheat control module.

Pre–welding Disconnection Procedure complete.

POST-WELDING RE-CONNECTION ON G4500 MODEL COACH

1. When welding is complete, re-connect all items in the ***exact reverse order*** from disconnection. Re-connection order is critical to safety.

WARNING

To prevent personal injury, exercise extreme caution at power-up.

2. Verify that all connections are complete and secure.
3. Warn all personnel in the area that the power is going to be switched on.
4. Ensure that all personnel are clear of the immediate area.
5. Switch the main battery disconnect ON.

Post-Welding Connection Procedure complete.

NOTE

AFTER POST-WELDING CONNECTION PROCEDURE IS COMPLETE, TEST ALL COACH SYSTEMS TO ENSURE PROPER FUNCTIONING OF EACH COMPONENT.

DO NOT PROCEED PRIOR TO READING

THE PARTS LIST AND PROCEDURE STEPS ON PAGES 12 TO 20 ARE REQUIRED FOR THE REMOVAL AND INSTALLATION OF TAG AXLE ARMS THAT FAILED ANY OR ALL OF THE CRITERIA LISTED ON PAGE 4 OF THIS SERVICE BULLETIN. NO WELDING WILL BE REQUIRED FOR THIS PHASE OF THE CAMPAIGN.

Parts List for Tag Axle Arm Removal / Installation

Qty.	Old P/N	New P/N	Description
1	02-06-6125		Tag Axle - LH, Non - Str (reference only)
1		02-06-0001	Tag Axle - LH, Non - Str (reference only)
1	02-06-6126		Tag Axle - RH, Non - Str (reference only)
1		02-06-0003	Tag Axle - RH, Non - Str (reference only)
1		2L-6-349	Seal - Oil, Bearing Box
1		02-06-6079	O-Ring, Bearing Box
4 Ltr			Gear Lubricant - EP75W90 Synth.
1		02-06-6037	Bearing - Tapered (if required upon inspection / not covered by campaign)
1		02-06-6036	Bearing - Tapered (if required upon inspection / not covered by campaign)
1		15-05-6038	Seal - Oil, Wheel End
1		15-05-6036	Gasket, Hub Cap
2		02-06-8000	Shim, 0.40 (as required per alignment)
2		02-06-8001	Shim, 0.80 (as required per alignment)
2		02-06-8002	Shim, 0.03 (as required per alignment)
2		02-06-8003	Shim, 0.08 (as required per alignment)
2		02-06-8004	Shim, 0.16 (as required per alignment)

NOTE

Step 10 (listed below) is a continuation of Steps 1 to 9 at the beginning of this Service Bulletin (as it relates to the tag axle arm removal part of this bulletin).

10. Back off the slack adjuster (counter–clockwise) and remove brake drum. Carefully clean any brake dust from inside drum using a clean cloth moistened with " Brake Kleen " or similar cleaner.

NOTE

DO NOT use compressed air to clean brake components.

11. Remove hub cap and carefully drain oil from hub. Collect oil drained, and dispose in an appropriate manner.
12. Remove wheel bearing adjusting nut and lockwashers. Carefully remove the hub from the spindle, taking care to prevent the bearings from becoming contaminated, and to prevent oil from contaminating brake shoes.
13. Remove the 8 capscrews mounting the brake spider and spindle to the spindle mounting plate. Retain fasteners, to be re–installed at a later step in this procedure. Set aside any shims mounted between the spindle and the mounting plate.
14. Unfasten and remove the fasteners that mount the bearing box to the bogie leg. Retain the fasteners, to be re–installed at a later step in this procedure.

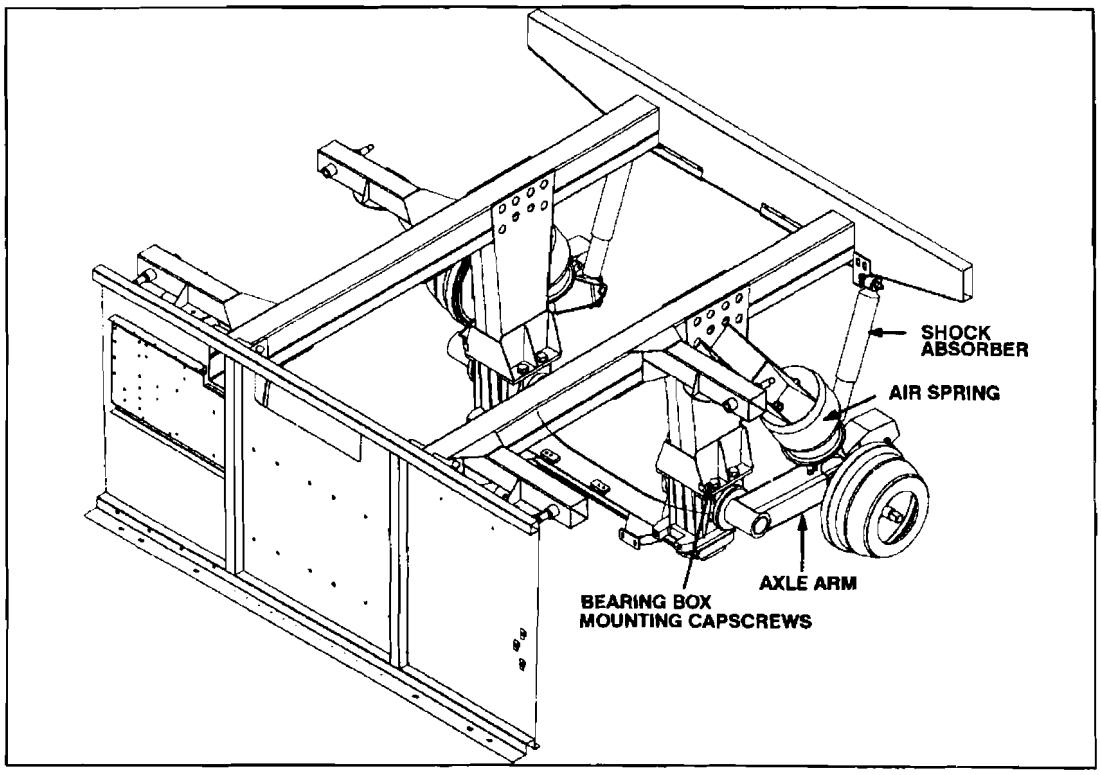

Figure 8.

15. Remove the axle arm assembly from the coach.

REFER TO MANUAL

Refer to the MCI G Series Maintenance Manual, for the basic rules, procedures and safety precautions that must be followed before air spring, bearing box and hub assembly removal / installation.

16. Remove the air spring from the existing tag arm assembly. Install the air spring on the re–worked tag arm assembly (part number 02-06-0001 / 02-06-0003).

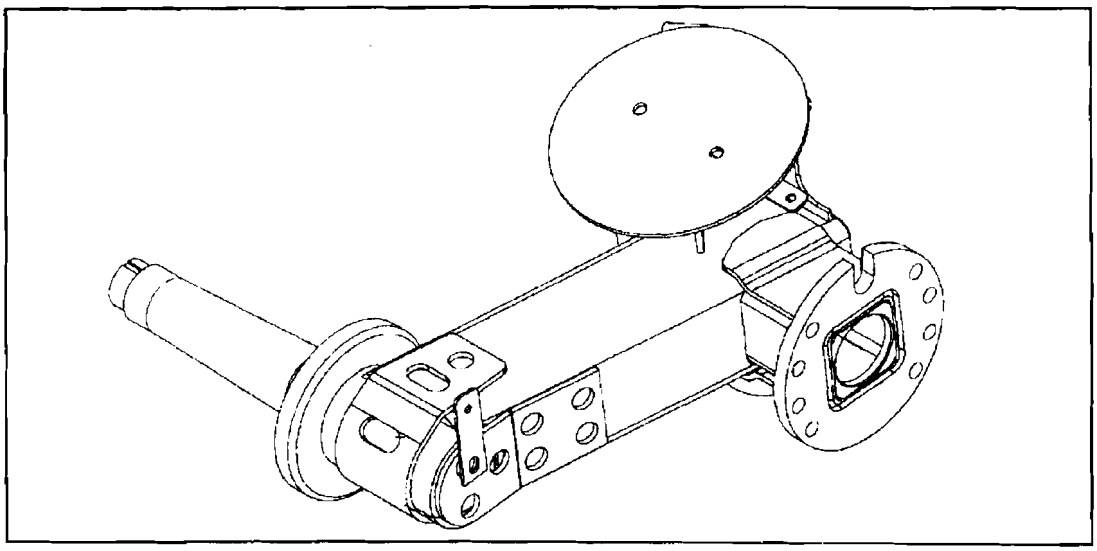

Figure 9. Re–worked tag axle arm.

REFER TO MANUAL

Refer to Section 2B / Trailing Axle in the MCI G Series Maintenance Manual, for information relating to bearing box removal / installation.

NOTE

Replace the oil seal (part number 2L-6-349), o-ring (part number 02-06-6079) and bearing box lubricant after every disassembly (Figure 10).

Inspect the trailing axle bearing box's bearings, ensuring that they are free of rust, no pitting has occurred and they move freely.

17. Remove drain plug and drain oil from the bearing box. Dispose of used oil in an appropriate manner.
18. Remove bearing box end cap and disassemble pivot arm bearing adjusting nut.
19. Remove tag arm assembly, carefully ensuring that bearings are not contaminated. Remove and discard the oil seal from bearing box. Press the new oil seal (part number 2L-6-349) into the housing.
20. Install bearing box assembly onto the re-worked tag arm assy, taking care to ensure that the seal is not damaged. Install "outer" bearing, flat washer, star washer, and lock nut (Figure 10). Torque the nut to 95-105 lb-ft. while rotating the bearings on the arm. Back off, and re-torque to 29 - 32 lb-ft., while again rotating the bearings on the arm. Bend a tab from the star washer into one of the notches in the nut. Replace o-ring (part number 02-06-6079) and install end cap and snap ring (Figure 10).
21. Fill bearing box with oil lubricant.

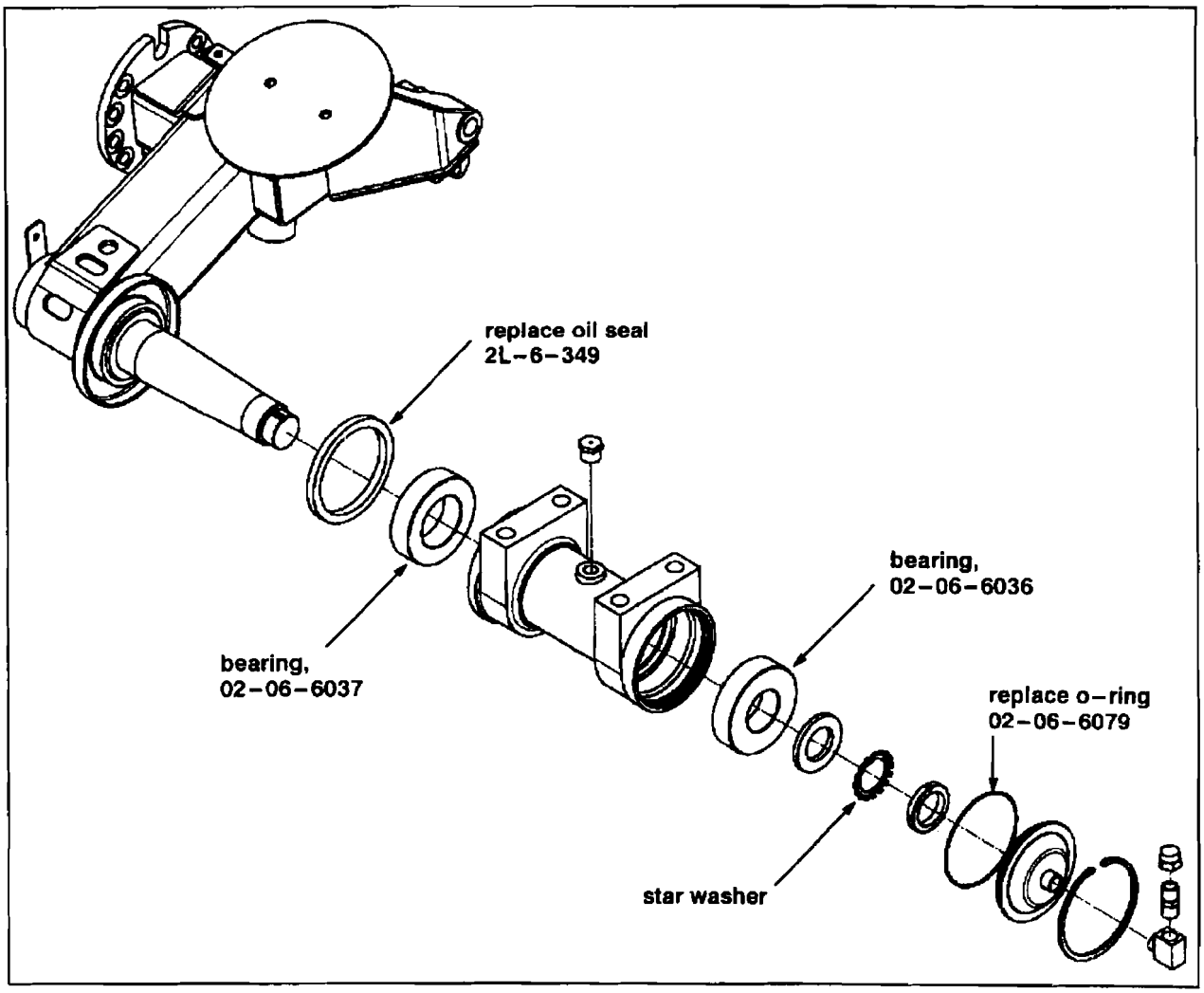

Figure 10.

22. Install new tag axle arm and bearing box assembly, taking care not to allow oil to drain from bearing box. Torque the bearing box mounting capscrews (4) to 300–310 lb–ft. (Figure 3).
23. Re–assemble the brake assembly, spider, and spindle to the new tag axle arm, using the 8 capscrew previously removed in Step 13. Take care to ensure that the ABS sensor hole in the spindle is aligned with the slots in the brake spider and the top of the spindle mounting plate. DO NOT install any shims at this time. Shims are used to correct any misalignment observed when the coach is aligned.
24. Replace brake hardware kit (S–cam rollers and springs), carefully applying brake grease to the contact points between rollers and brake shoes. DO NOT apply grease to the contact surface between rollers and S–cam. Check to ensure that the S–cam is properly located at this time.
25. Replace wheel bearing hub seal (part number 15-05-6038). Press the new seal into the hub. Be sure that inner bearing cone is installed into the hub before the seal is pressed in.
26. Install the hub onto the spindle, taking care to support and align the hub so that the hub seal is not damaged. Install the outer wheel bearing, flatwasher, adjusting nut and retaining washer. Torque the adjusting nut to 95–105 lb–ft. while rotating the hub. Back off the adjusting nut 1 full turn and re–torque to 19–21 lb–ft. while rotating the hub. Back off 1/3 turn. Verify that end play is 0.03–0.13.
27. Torque hub cap bolts to 13–15 lb–ft. (Figure 7). Fill hub cavity until oil (part number 21-7512-2) appears at the white level mark of the hub cap's plastic sight glass. Reinstall the rubber plug, and recheck level after coach operation. DO NOT overfill the hubs.

Be sure to have and read all 21 pages before using any of the above information

28. Carefully install the brake drum.
29. Re–adjust slack adjuster by turning the adjusting screw clockwise until brake shoes contact the drum. Back off 1/2 turn.

NOTE

Replace the hub cap gasket (part number 15-05-6036) and oil seal (part number 15-05-6038) after every hub assembly disassembly (Figure 7).

The slack adjuster will have to be backed off, to allow for brake drum removal.

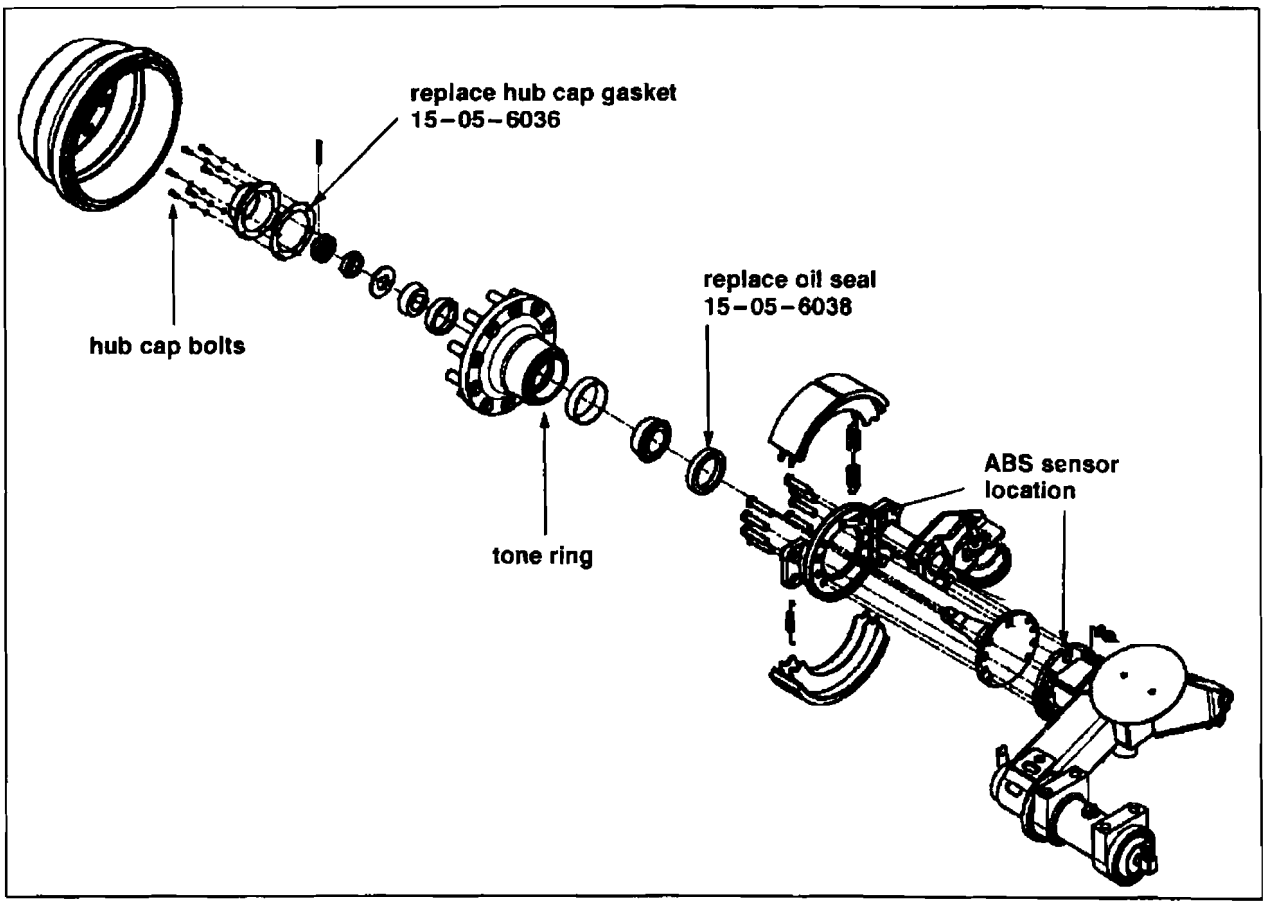

Figure 11. Wheel End.

30. Push the ABS sensor completely into sensor bushing by hand until it stops against the tone ring. The ABS sensor is properly installed and adjusted when it is touching the tone ring (Figure 7).

NOTE

The ABS sensor must slide freely in and out of the mounting sleeve bore. Operating the vehicle with seized components will damage the speed sensor and the tone ring.

31. Fasten the air spring to the chassis mounting pads. Torque air spring mounting fasteners to 50 lb.-ft.
32. Reconnect the air lines from trailing axle suspension air spring bellows and brake chamber air fittings.
33. Re-install the tire wheel assembly. Torque all stud-piloted steel wheels to 450-500 lb.-ft. (610-678 Nm).

REFER TO MANUAL

Refer to the Maintenance Manual / Section 15 / Wheels, Hubs and Tires, for the basic procedures on wheel installation, torque and torque sequence.

34. Verify proper brake function by starting the coach, building up air pressure and verifying that full brake strokes are obtained when the brake pedal is applied. Verify that the brake stroke does not exceed CVSA readjustment limits.

NOTE

The CVSA readjustment limits for chamber size 20 (tag axle) is 1.75 inches.

The power stroke measurement is the difference between the brakes fully applied and fully released

If the power stroke does not exceed the CVSA readjustment limits for the chamber size, then the power stroke inspection is complete.

If the power stroke exceeds the allowable stroke for the chamber size, the cause of the overstroke condition must be identified and corrected. The power stroke should be retested to confirm compliance.

35. Check for air leaks and proper bellows operation.
36. Repeat all steps for the opposite side tag axle.
37. Test drive the vehicle and verify that the ABS warning lamp operates properly.

NOTE

Verify proper brake function, ensuring correct brake installation.

Note that up to 20 brake applications while to vehicle is operating may be required to have the automatic slack adjusters properly adjust the brake clearance.

Be sure that several brake applications are made under light load in an open location to avoid problems while the slack adjuster is making initial adjustments.

Procedure complete.

DO NOT PROCEED PRIOR TO READING

THE ALIGNMENT PROCEDURE LISTED BELOW IS ONLY REQUIRED FOR COACHES THAT INSTALLED A NEW TAG AXLE ARM.

ALIGNMENT: TRAILING AXLE

Periodic inspection of the axle assembly should be made to see that all wheel end spindle flange and/or bearing box mounting hardware are tight and that no damage or distortion has taken place.

NOTE

All suspension mounting hardware should be checked and tightened to the torque specifications shown in sub–section 12A.

The following alignment specifications or provided as a general guide only. Toe-In should be 0.03" (± .03"), or approximately 1/64 inch per wheel end when measured relative to the coach centerline. Axle camber angle adjustment is (0.25° positive ± .44°). Trailing wheel track is 84.9 inches (2156 mm) at center of tread. Coaches with a Toe-In/Toe-Out condition, beyond that of limit shown above should be re-aligned.

If the toe measurement is out of specification more than 0.62" on a side, the bearing box must be adjusted on the chassis. Loosen the four bearing box mounting bolts and rotate the box in the direction needed. Take a preliminary alignment measurement to aid in locating box correctly. Tighten the mounting bolts to the proper torque value and that bolts are seated properly.

If the toe measurement is out of specification less than 0.62" per side, adjust the wheel end using shims. Install only one of these shims per side of the vehicle (Figure 12). Disassemble tag wheel end and install shim between swing arm and wheel spindle. Reassemble wheel end. Torque all components to the proper torque value and verify alignment is within specifications. Fill the hub with oil.

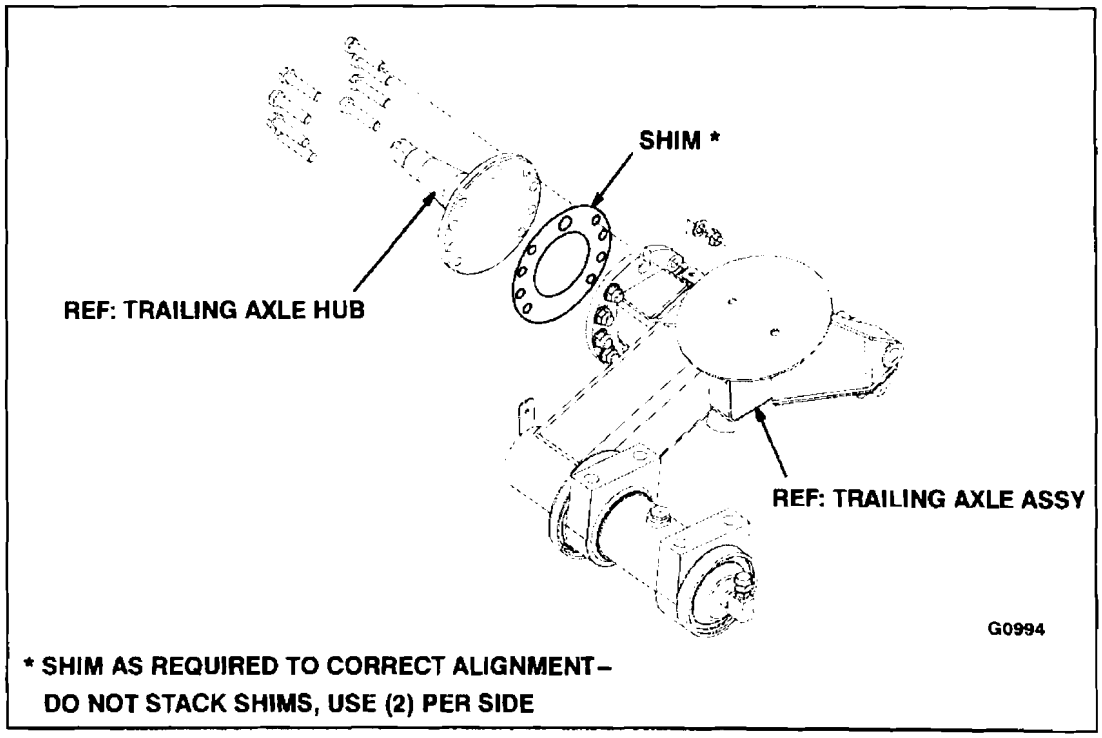

Figure 12. Trailing Axle Shim Installation.

ALIGNMENT: TRAILING AXLE

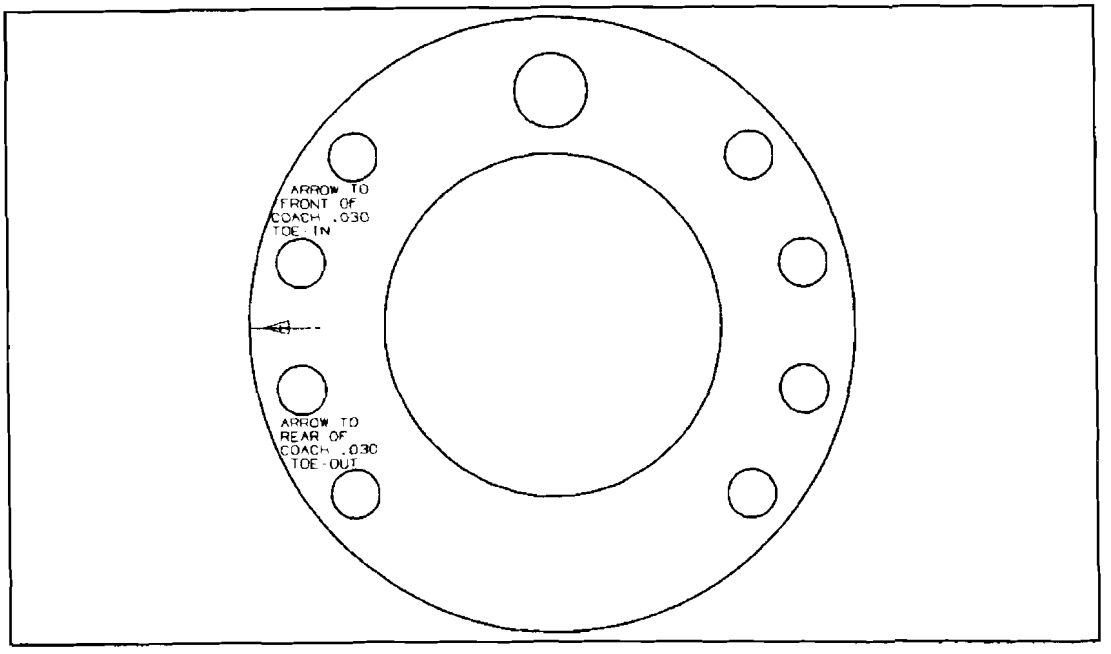

Figure 13. Trailing Axle Shim.

NOTE

Only 2 shims allowed per side.

Trailing Axle Alignment Procedure complete.

NOTE

IF ALIGNMENT IS REQUIRED, THE OIL SEALS, O-RINGS AND HUB CAP GASKET WILL HAVE TO BE REPLACED, AS THEY ARE A ONE TIME USE ITEM.

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

MCI Warranty Department
1475 Clarence Avenue
Winnipeg, MB R3T 1T5
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 6.0 hours will be granted against claim SB212.1, for the procedure of reworking both existing tag axle arms on G4500 model coaches.

A labor allowance of 14.0 hours will be granted against claim SB212.2, for the procedure of reworking the existing LH tag axle arm and installing a new RH tag axle arm on G4500 model coaches. An allowance of 3 hours for the alignment of the trailing axle on G4500 model coaches is included in the 14.0 labor allowance.

A labor allowance of 14.0 hours will be granted against claim SB212.3, for the procedure of installing a new LH tag axle arm and reworking the existing RH tag axle arm on G4500 model coaches. An allowance of 3 hours for the alignment of the trailing axle on G4500 model coaches is included in the 14.0 labor allowance.

A labor allowance of 19.0 hours will be granted against claim SB212.4, for the procedure of installing a new LH and RH tag axle arm on G4500 model coaches. An allowance of 3 hours for the alignment of the trailing axle on G4500 model coaches is included in the 19.0 labor allowance.

Only 1 claim SB212.1, 212.2, 212.3 or 212.4 can be charged against the coach VIN number.

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.

This program will close six (6) months from the date you receive this notification.

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.