Service Bulletin No. 335

MODEL	TYPE	SECTION/GROUP	DATE
D Series Coaches w/ Luminator Destination Signs	Field Change Program	3 – Body	Nov. 6, 2009

SUBJECT: **LUMINATOR HORIZON LED SIDE DESTINATION AND ROUTE SIGNS**

CONDITIONS:

Ref. NHTSA Luminator Recall No.: 09E–054

Ref. NHTSA MCI Recall No.: 09V–432

Ref. Transport Canada MCI Recall No.: 09–318

Defect:

Luminator Holding, LP (Luminator) has reported to Motor Coach Industries (MCI) that a defect relating to motor vehicle safety exists in certain Luminator Horizon LED display side destination and route signs. Luminator reports that the affected signs are those signs equipped with the 506476 connector board that is used to "daisy chain" the side destination sign to other signs in the sign system. When there is no rear sign one connector is left uncovered by the missing cable. This creates an open connector condition that allows debris to collect inside the connector and provides a path for moisture to ingress along the pins of the connector down to the PWA board itself, causing corrosion on the solder connection between the open connector and PWA board. The corrosion allows for a conductive path between battery voltage and ground. This corrosion will allow a potential short and the sign will fail. In rare instances, this corrosion will cause the sign to smoke and possibly flame. Please see the attached Luminator Defect and Noncompliance Report, Service Bulletin 9230 and Field Modification Instructions.

Due to the manner in which MCI installs the signs in MCI coaches, the recall affects only those coaches that have a Luminator Horizon LED display side destination or route sign, and not a rear sign.

Cause:

Luminator reports that the corrosion is caused by an accumulation of moisture under the connector, but that none of the connectors which have a cable attached to them show any sign of corrosion. The base of the connector is too close to the board to effectively coat the solder connections with conformal coating (a corrosion preventative). This corrosion creates the conductive path between battery voltage and ground pins. Certain cleaning practices (i.e., spraying water and cleaning agents) used by operators introduce more moisture into the connector and increase the likelihood of the corrosion.

Corrective Action:

MCI recommends that the side destination and route signs on affected coaches be inspected and have new parts installed as per the attached Luminator Service Bulletin 9230 and Field Modification Instructions. Due to the manner in which MCI installs the signs in MCI coaches, the recall affects only those coaches that have a Luminator Horizon LED display side destination or route sign, and not a rear sign.

Accordingly, MCI advises that owners of D model coaches between the range of, and including, unit numbers 54819–59097 and containing a Luminator Horizon LED display side destination or route sign without a rear sign implement the specified steps in the attached Luminator Service Bulletin 9230 and Field Modification Instructions.

Service Information:

The Luminator signs have a product label that includes a date code (refer to Figure 1). The first two digits of the date code indicate the year the sign was manufactured. The second two digits indicate the week of the manufacture.

Figure 1. Reference photo of date code product label located on top of the side sign frame.

For signs manufactured prior to 2008 (i.e., date codes prior to 0801), Luminator will replace the connector board with a newly designed board. Luminator advises that the new board eliminates the possibility of arcing by putting the ground and battery voltage on separate layers of the board. The traces have also been moved to allow the maximum spacing. In addition, conformal coating has been applied below the connector and a cap is installed on all open connectors to prevent the incursion of moisture and debris which would allow corrosion to develop.

For signs manufactured in 2008 or later, Luminator will provide a vinyl cap for any open connectors and a moisture displacing corrosion inhibitor spray and procedure to be used to clean the connectors and thereby eliminate the conditions that permitted moisture to ingress and produce the corrosion.

Required parts and labor allowance for this recall will be provided by Luminator. MCI customers are instructed to contact Luminator at 1-972-516-3074 for all inquiries.

Service Procedure:

General notes

Read this entire procedure before beginning work.

Use Safe Shop Practices At All Times.

1. Turn the main battery disconnect switch to the OFF position.
2. Open the engine door. Position the ENGINE RUN and ENGINE START switches on the engine remote box to the OFF position.

REFER TO MANUAL

Refer to Section 3B3 / Destination Sign System, in the MCI D Series Maintenance Manual, in conjunction with this procedure.

3. Gain access to the sign by loosening the bottom capscrew and removing the top capscrew from the panel on the sign assembly (refer to Figure 2). Using two hands, support the panel as it rotates downward. Retain top capscrew.

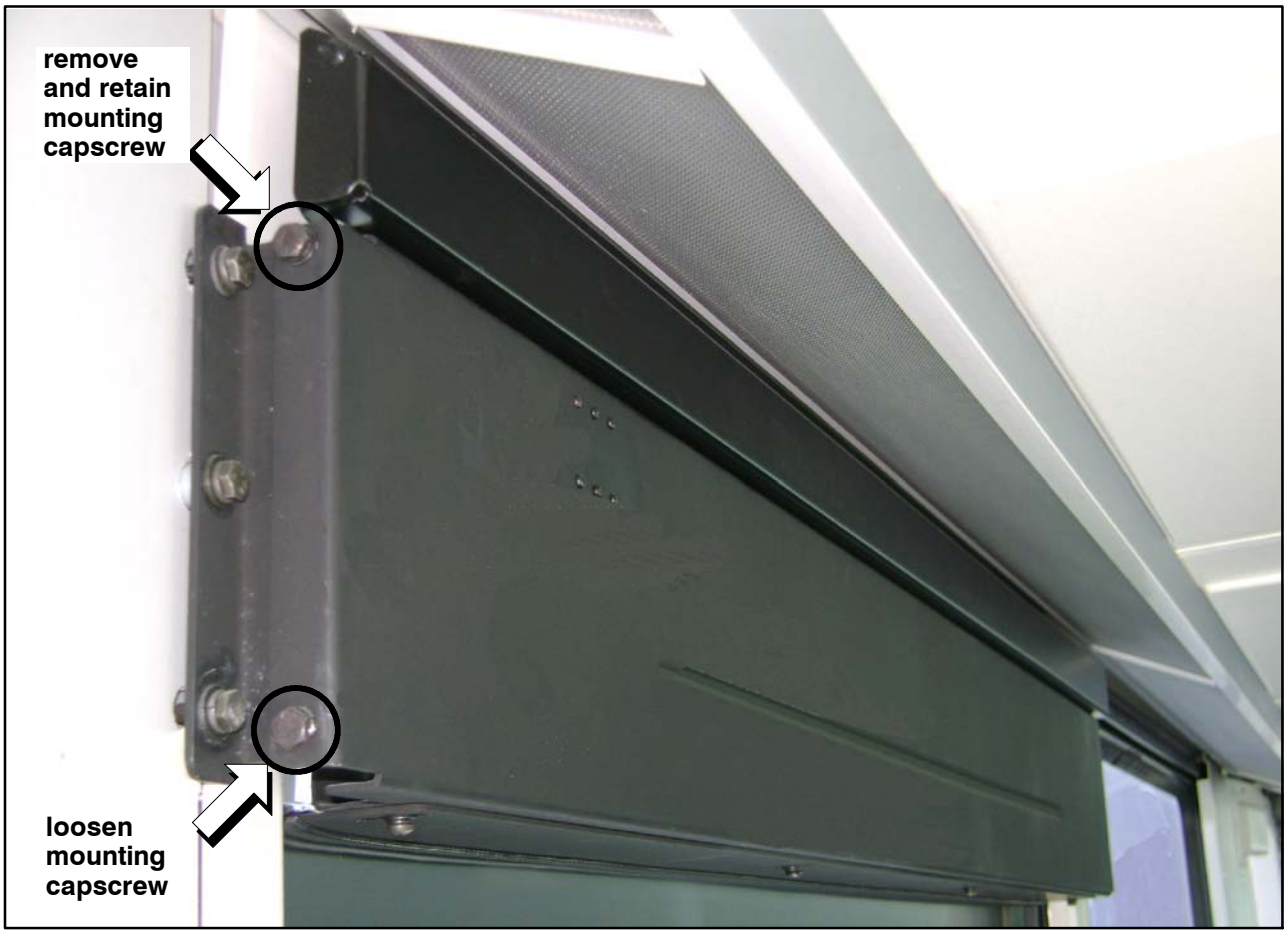


Figure 2. Reference photo of side sign assembly.

4. Perform the outlined steps in the attached Luminator Service Bulletin 9230 and Field Modification Instructions.
5. Upon completion of attached Luminator Service Bulletin 9230 and Field Modification Instructions, align and re-connect the power / data cable. Spin the collar counter-clockwise to secure plug.
6. Close panel and re-install top capscrew removed in Step 3. Tighten top and bottom capscrews to secure.
7. Position the ENGINE RUN and ENGINE START switches on the engine remote box to the ON position. Close the engine door.
8. Turn the main battery disconnect switch to the ON position.
9. Verify to ensure proper function of sign(s).

Procedure complete.

Field Change Program Conditions:

Luminator will provide the materials and labor to complete this recall at no charge.

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.

Form Approved: O.M.B. No. 2127-0004

Safety Defect and Noncompliance Report Guide for Equipment
PART 573 Defect and Noncompliance Report[1]

On August , 31, 2009 Luminator Holding, LP decided that a defect which relates to motor vehicle safety exits in items of motor vehicle equipment 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: September 11, 2009

Furnish the manufacturer's identification code for this recall (if applicable): CAGE Code 17744

1. Identify the full corporate name of the fabricating manufacturer/brand name/trademark owner of the recalled item of equipment. If the recalled item of equipment is imported, provide the name and mailing address of the designated agent as prescribed by 49 U.S.C. §30164.

Luminator Holding, LP, 900 Klein Road, Plano, TX 75074

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

David Major, Controller

Telephone Number: 972-516-3033 **Fax No.:** 972-423-1540.

Name and Title of Person who prepared this report.

Eric Marquet

Director of Quality Assurance

Signed: Eric 11/04/2009

I. Identify the Recalled Items of Equipment

2. Identify the Items of Equipment Involved in this Recall, *for each make and model or applicable item of equipment product line (provide illustrations or photographs as necessary to describe the item of equipment), provide*:

Generic name of the item:

Make: Luminator **Model:** Horizon LED Side Destination Sign, PWA Connector,

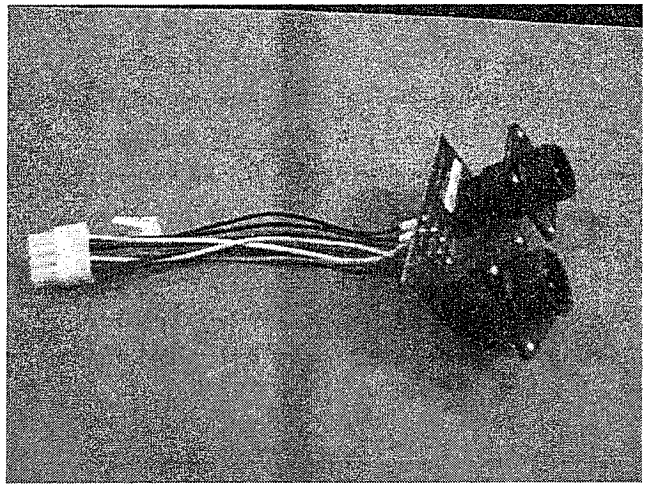
Part Number: 506746(-001), (-002), (-004), **Size:** NA

Function: The connector board allows the sign system interconnecting cables to attach to the sign and provide power, ground and communications from the bus to the side destination sign.

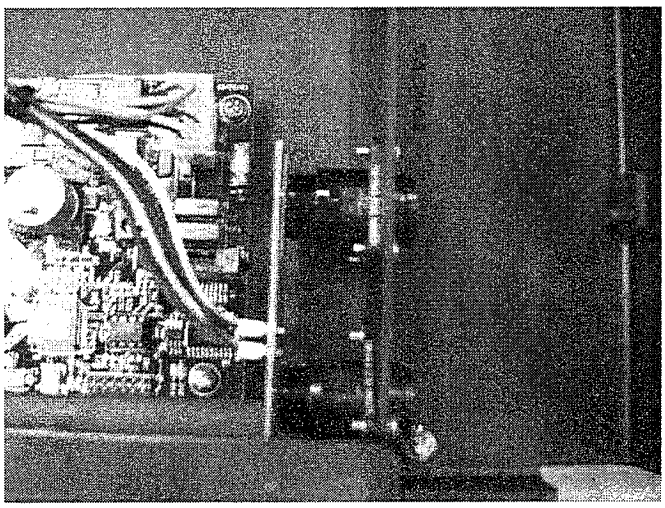
Model Years Involved: 2001-2009

Other information which characterizes/distinguishes the items of equipment to be recalled:

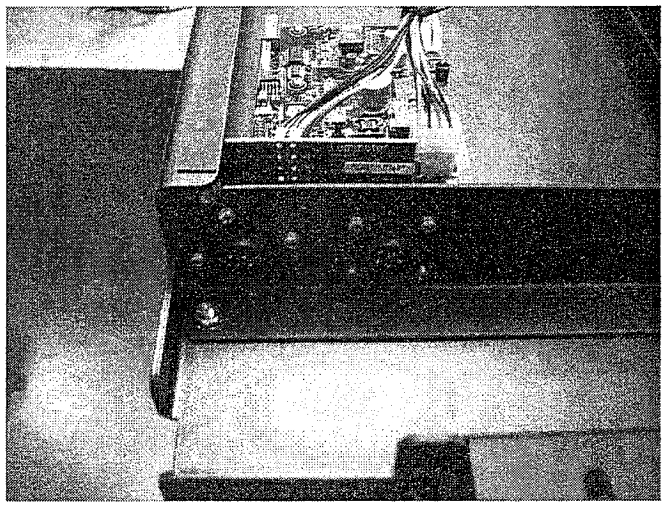
Side Destination Sign Connector Board



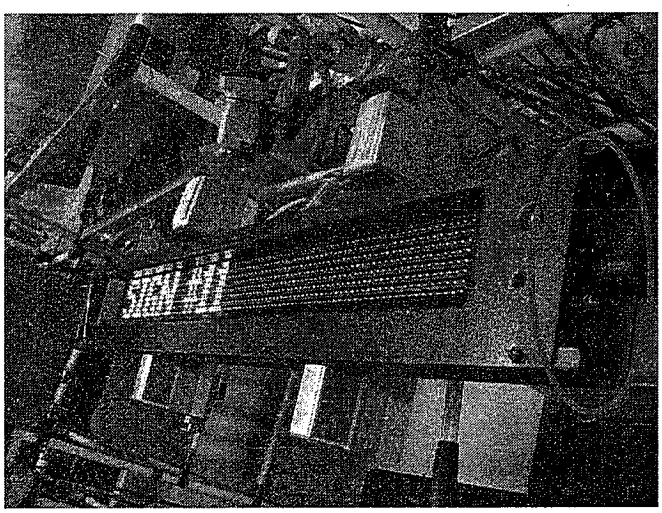
Connector Board Installed in a typical Side Destination Sign Housing



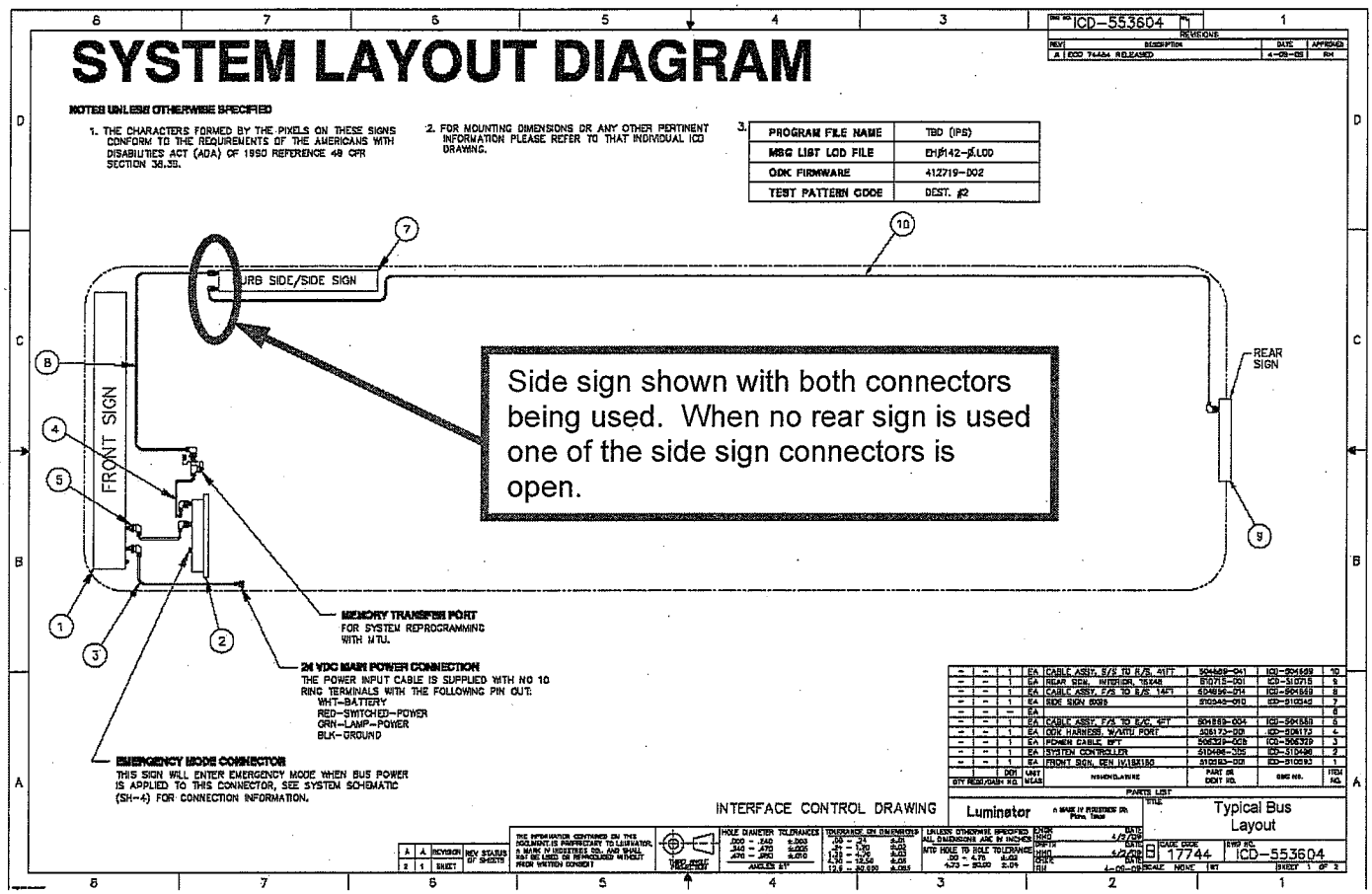
Side Destination Sign with cable connected to board



Side Destination Sign installed in Transit Bus



Typical Destination Sign Layout on Transit Buses



The following Side Destination Signs manufactured by Luminator contain the 506746 Connector board:

Make: Luminator **Model:** Horizon LED Side Destination Sign

Part Number: 510544-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

Make: Luminator **Model:** Horizon LED Side Rout Sign

Part Number: 510565-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

Make: Luminator **Model:** Horizon LED Side Rout Sign

Part Number: 510545-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

Make: Luminator **Model:** Horizon LED Side Destination Sign

Part Number: 510553-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

Make: Luminator **Model:** Horizon LED Side Destination Sign

Part Number: 510564-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

Make: Luminator **Model:** Horizon LED Side Destination Sign

Part Number: 510594-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

Make: Luminator **Model:** Horizon LED Front/Side Destination Sign

Part Number: 510587-All **Size:** NA

Function: Display destination and route information to the exterior of the bus

Model Years Involved: 2001-2009

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.

100%

II. Identifying the Recall Population

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

		Number of Items
Model: PWA Connector Board	**Year: 2001-2009**	**Potentially Involved: 18,620**

The destination signs listed above are installed on transit and paratransit buses sold in the US and Canada. These signs are sold by Luminator to Bus manufacturers and also to transit authorities directly. The signs shipped to the Bus manufacturers are installed prior to delivery to the transit authorities, The signs delivered directly to the transit authority are installed by the authority, Luminator or a third party installer.

This board is used on all side destination signs manufactured by Luminator as listed above. Only the signs with an open connector on the side sign connector board are affected. It is estimated that of the 18,620 signs that have been built and shipped by Luminator, about 50% meet the configurations described above.

Total Number Potentially Affected by the Recall: 8,879 est.

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

8.5%, this number is based on the results of our analysis of boards in the sample population as outlined below (see table).

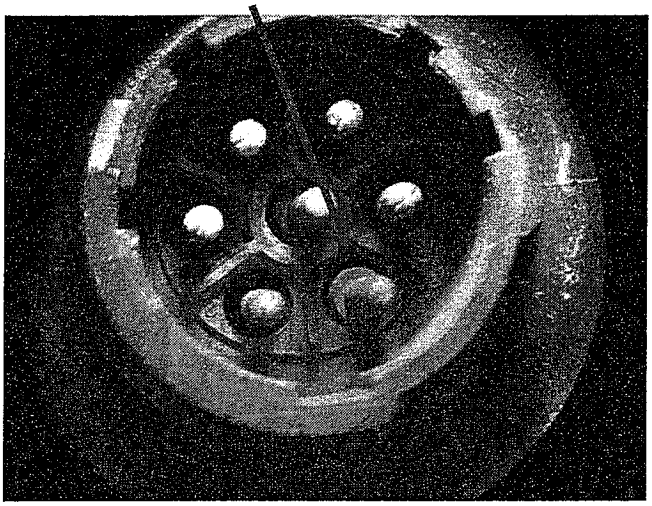
Identify and describe how the recall population was determined--in particular how the recalled models were selected and the basis for the beginning and final dates of manufacture of the recalled items of equipment:

An analysis was done on a sample population of 269 sign connector boards from buses built with the specific configuration at risk which is multiple side signs and a single side sign with no rear sign. These boards were from different transit authority locations from the Midwest to the East Coast. This population consisted of samples from various years, bus models and environmental conditions. The analysis consisted of removing the connector and microscopically examining the PWA surface below the connector for evidence of corrosion. Based on the corrosion found, it was determined that all boards 2007 and older needed to be replaced. This connector board design was first used in 2001.

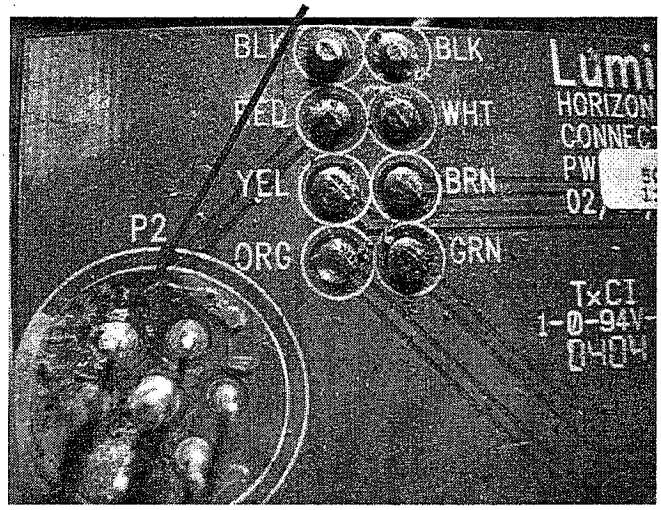
Sample Population of Connector Boards from Transit Authorities

Year of Mfg of Connector Board	Number of Boards	Corrosion found (visually)	Percentage of Boards with Corrosion
2001	30	0	0%
2002	15	1	6%
2003	65	2	3%
2004	50	13	20%
2005	10	0	0%
2006	70	9	11%
2007	4	0	0%
2008	15	0	0%
Totals	**269**	**25**	**8.5%**

Corrosion on Open Connector



Corrosion on board under connector



III. Describe the Defect or Noncompliance

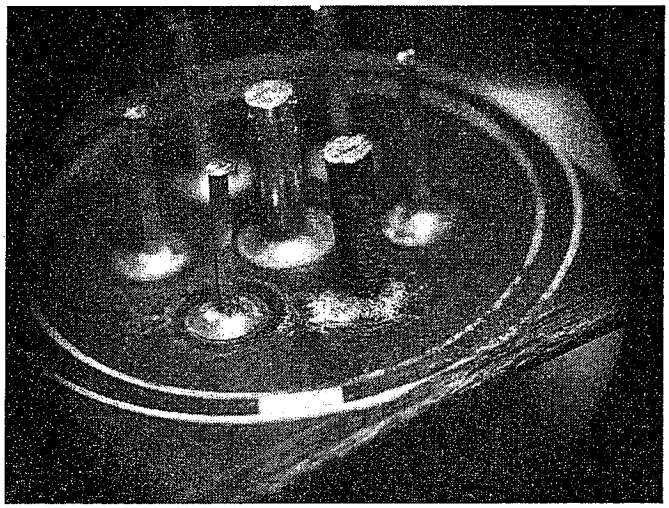
5. Describe the defect or noncompliance. The description should address the nature and physical location of the defect or noncompliance. Illustrations should be provided as appropriate.

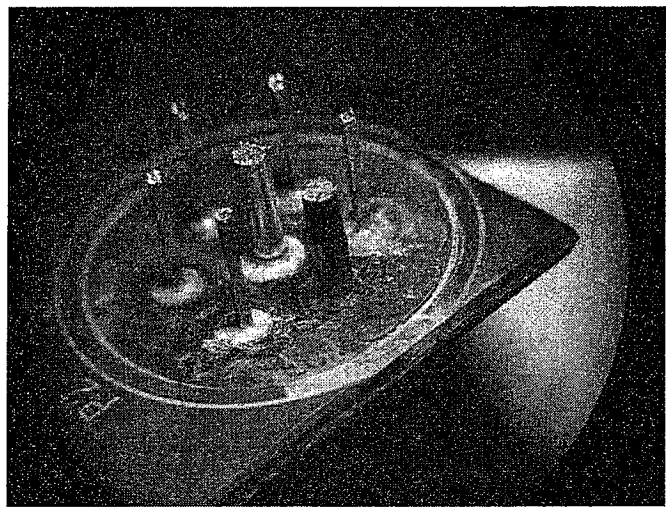
The signs listed above are equipped with the 506746 connector board that is used to "daisy chain" the Side Destination sign to other signs in the sign system. When there is no rear sign, or there are multiple side signs, one connector is left uncovered by the missing cable. This creates an open connector condition that allows debris to collect inside the connector and provides a path for moisture to ingress along the pins of the connector down to the PWA board itself causing corrosion on the solder connection between the open connector and PWA board. The corrosion allows for a conductive path between battery voltage and ground. This corrosion will allow a potential short and the sign will fail. In rare instances, this corrosion will cause the sign to smoke and possibly flame.

The photos below (taken from the sample population) show the impact of the corrosion on the board itself after the connector barrel has been removed.

Corrosion Starting on Battery Voltage Pin

Corrosion advanced to a conductive condition





Describe the cause(s) of the defect or noncompliance condition.
The corrosion is caused by an accumulation of moisture under the connector. None of the connectors which have a cable attached to them show any sign of corrosion. The base of the connector is too close to the board to effectively coat the solder connections with conformal coating (a corrosion preventative). This corrosion creates the conductive path between battery voltage and ground pins. Certain cleaning practices, (i.e. spraying water and cleaning agents) used at the Transit Authorities facilities introduces more moisture into the connector and increases the likelihood of the corrosion.

Describe the consequence(s) of the defect or noncompliance condition.
This corrosion will allow a potential short and the sign will fail. In rare instances, this corrosion will cause the sign to smoke and possibly flame.

Identify any warning which can (a) precede or (b) occur.
In some situations the circuit breaker will trip. This is not a consistent occurrence.

If the defect or noncompliance is in a component or assembly purchased from a supplier, identify the supplier by corporate name and address.
The 506746 has been purchased from several suppliers however the defect is not process related. The board is manufactured exactly to the Luminator requirements. This defect is application based in that closed connectors (those with a cable attached to them) do not have this condition.

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

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.

The following events lead to the identification of the root cause. Each event occurred on a bus without a rear sign and with a single open connector on the side destination sign.

1. Thermal Event Atlanta, MARTA, January, 2006 (smoke and fire, sign destroyed, unable to determine root cause)
2. Thermal Event Atlanta, MARTA, December, 2008 (smoke only, sign in tact, partial root cause identified)
3. Electrical Event Richmond, January, 2009 (smoke only, tripped breaker 3 times then failed)
4. Thermal Event, St Louis, June, 2009 (smoke only, root cause fully determined)
5. Thermal Event, MARTA, Atlanta, August, 2009 (smoke and fire, sign destroyed, fleet replacement completed 8/21/09)

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.

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.

On all buses built before 2008 (2001-2007 inclusive) the connector board will be replaced with a newly designed board. The new board eliminates the possibility of arcing by putting the ground and battery voltage on separate layers of the board. The traces have also been moved to allow the maximum spacing. In addition conformal coating has been applied below the connector and a cap is installed on all open connectors to prevent the incursion of moisture and debris which would allow corrosion to develop.

On all buses built since 2008, there has been no evidence of corrosion. By cleaning the connector with a moisture displacing corrosion inhibitor and subsequently capping the open connector with a vinyl cap, the conditions that allow the moisture to ingress and produce the corrosion will be eliminated.

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

1. New Connector Board, part number 508331-001 (replaces 506746-001, see Appendix 2 for drawings)
2. Ground and power on two separate layers of PWA,
3. Traces are more widely spaced,
4. Connector assembled to the board with a gap so the conformal coating can be applied to the connector solder joints.

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.

Since May of 2009 all signs built by Luminator have been shipped with a vinyl cap covering all connectors. These caps are to remain in place unless a cable is attached to the connector.
The connector board change has gone in effect as of 09/20/2009

VI. Identify the Recall Schedule

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 Attached Timeline, Appendix 1 for notification timeline

We have concerns regarding notification of all customers. We hope for assistance from the various OEMs that have installed our equipment on their buses. Since the OEMs have done the actual installation of the signs on the buses, they will have more accurate information on the bus configurations. Since some OEMs purchase materials on blanket POs we are not always advised of the actual configuration on a specific bus and must rely on second hand information.

VII. Furnish Recall Communications

9. 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: These documents are to be submitted separately from those provided in accordance with Part 573.8 requirements.

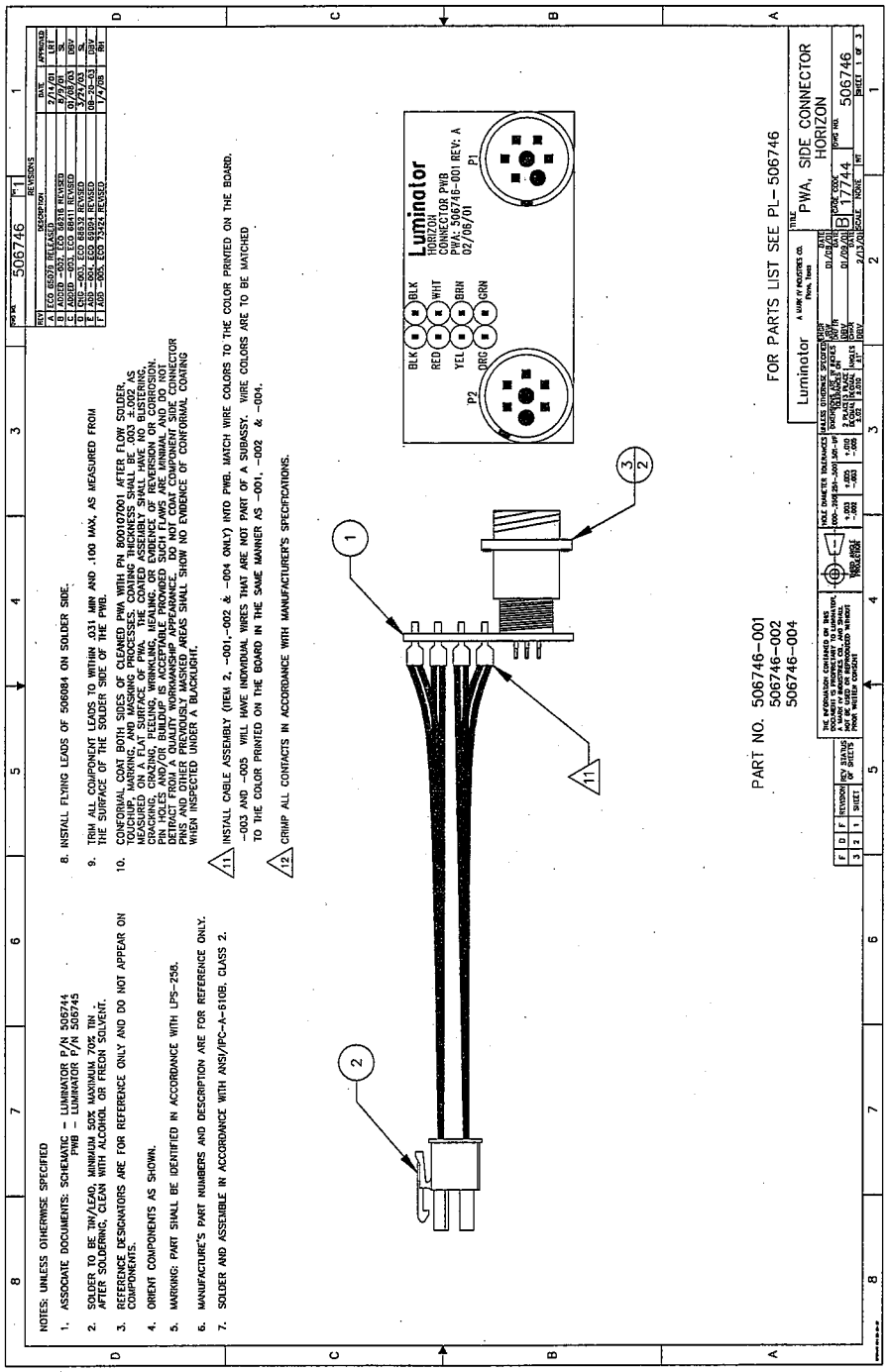
See Attached Field Modification Instructions, Document # 904666 and Service Bulletin Document # 9230

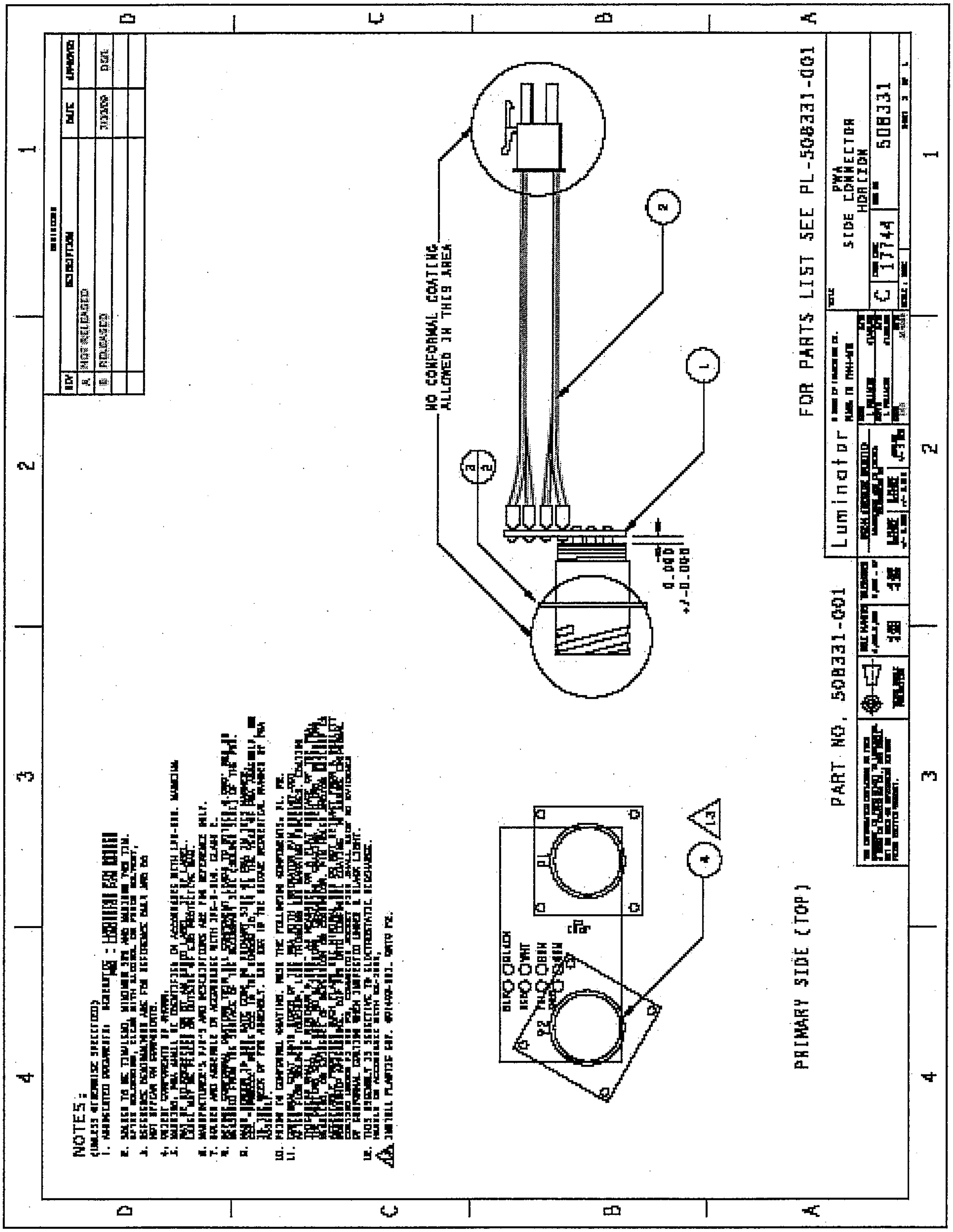
The Privacy Act of 1974 - Public Law 93-579, As Amended: This information is requested pursuant to the authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond to this questionnaire. Your response maybe used to assist the NHTSA in determining whether a manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administration enforcement or litigation against a manufacturer, your response, or statistical summary thereof, may be used in support of the agency's action.

Appendix 1
Thermal Time Line

Event	Date Started	Date Complete
Thermal Event at Marta	Mon 10/30/06	Mon 10/30/06
Tim McManus Evaluation	Tue 10/31/06	Tue 10/31/06
In house investigation	Wed 11/1/06	Wed 11/1/06
Thermal Event at MARTA	Wed 12/17/08	Wed 12/17/08
Tim McManus Evaluation	Wed 12/17/08	Wed 12/17/08
In house investigation	Thu 12/18/08	Thu 12/18/08
Test effectiveness of Corrosion X spray and caps	Mon 2/2/09	Fri 2/6/09
Modify process to include caps on all signs on line	Fri 2/27/09	Fri 2/27/09
Thermal event at GRT	Wed 1/28/09	Wed 1/28/09
Tim McManus evaluation	Wed 1/28/09	Wed 1/28/09
In house investigation	Thu 1/29/09	Thu 1/29/09
Thermal Event St Louis	Wed 6/17/09	Wed 6/17/09
Tim McManus Evaluation	Thu 6/18/09	Thu 6/18/09
In house investigation	Fri 6/19/09	Fri 6/19/09
Collection of date coded equipment from field	Mon 7/20/09	Wed 7/22/09
Evaluate collected boards and ODKs	Thu 7/23/09	Thu 7/23/09
Determined date for replacement vs spray and cap	Fri 7/24/09	Fri 7/24/09
Build prototypes of newly designed boards	Mon 7/6/09	Fri 7/10/09
Test prototypes fo newly designed boards	Mon 7/13/09	Mon 7/13/09
Release drawings for new board	Wed 7/29/09	Wed 7/29/09
Get part number for Corrosion X in system.	Thu 7/30/09	Thu 7/30/09
Complete FMI	Mon 6/29/09	Wed 8/5/09
Complete Service bulletin	Mon 8/3/09	Wed 8/5/09
Determine first round quantities	Tue 7/28/09	Wed 7/29/09
Order materials for FMI	Wed 7/29/09	Fri 8/14/09
Determine customers for priority notification	Fri 7/17/09	Thu 7/30/09
Determine customers for 2nd round priority	Fri 7/31/09	Tue 8/11/09
Start sending notification to customers	Mon 8/3/09	Fri 8/7/09
Receive needed materials	Mon 8/17/09	Mon 8/17/09
Begin field mods	Tue 8/18/09	Fri 10/30/09

Appendix 2
Drawings




NOTES:
PRIMARY SIDE (TOP)
PART NO. 508331-001
FOR PARTS LIST SEE PL-508331-001
NO CONFORMAL COATING ALLOWED IN THIS AREA
0.040 +/-0.040
Luminator
PWA SIDE CONNECTOR HORIZON
C
17744
508331
NOT RELEASED
RELEASED

Luminator Bulletin

Section 1				
Service Bulletin Number: **9230**	Part number and description: 506746 PWA, SIDE CONNECTOR HORIZON			
Date: **08/11/2009**	Quality Bulletin Type: **Service**	Responsibility: **Luminator**	Drawing/Specification: **506746 (dwg.)**	Revision: **F**

Other information:

Luminator Contact Information:

Materials	Technical
A. Brett	T. Zagaruyka
972-516-3074	972-516-3021

Problem description:

This notice is to alert operators that corrosion on connector pins may result in premature product failure. Corrosion may potentially form in a high humidity environment or where moisture is present. This corrosion raises the potential of pin shorting that may result in failure. If not addressed the failure could result in a potential electrical short or lead to smoking or in rare instances fire. This notice only affects buses equipped with the following configurations:

Front and side sign but no rear sign
Curb and roadside side and/or route signs

Corrective Action:

The corrosion on the pins must be removed and all exposed connectors must to be covered to eliminate the possibility of additional corrosion. Buses 2007 and older are more likely to have corrosion to such an extent that the failure may occur. These buses will have the connector boards replaced.

Section 2

Action(s) to be taken:

Do not leave buses running unattended for more than 30 minutes.

Transit Authority:

1. Notify Luminator of the number, age and location of all buses with configurations outlined above. (See attached format)
2. Once modifications are completed, all paperwork will be filled out and returned to Luminator for tractability.

Luminator:

1. Once this information is received by Luminator Field Modification Instructions (FMI) and materials will be provided to all operators to make the necessary modifications to their buses.
2. If assistance is needed Luminator will provide field service personnel to complete modifications.

Effectivity date: 8/17/2009

Section 3

Comments:

Issued by: Eric Marquet	Title: Director of Quality Assurance	Date: 09/10/2009

		REVISIONS				
NEXT ASSY	USED ON	REV	ECO	DESCRIPTION	DATE	CHECK
		A	74834	INITIAL RELEASE	09/17/09	RH
		B				

FIELD MODIFICATION INSTRUCTIONS

FOR

HORIZON SIDE SIGN OPEN CONNECTOR INSTALLATION AND CONNECTOR PWA REPLACEMENT

Project Engineer Masias, Marty	DATE 09/04/2009	**Luminator** A MARK IV INDUSTRIES COMPANY PLANO, TEXAS	
Checker R. Harness	DATE 09/17/2009	TITLE **FIELD MODIFICATION INSTRUCTIONS FOR HORIZON SIDE SIGN OPEN CONNECTOR COVER**	
Project Manager Konecki, Nancy	DATE 09/04/2009		
		SIZE **A**	**CODE IDENT. NO.** **17744**	**DRAWING NO.** **904666**
		SCALE NONE	**REV. B**	**SHEET 1 OF 10**

WARNINGS

BE SURE ELECTRIC POWER IS OFF BEFORE WORKING ON WIRING. FAILURE TO DO SO MAY RESULT IN DAMAGE TO SIGN EQUIPMENT AND RENDER SIGN INOPERATIVE.

USE CAUTION WHEN SPRAYING CORROSION X TO AVOID SPRAY DRIPPING ON SURROUNDING MATERIALS. SAFETY GLASSES SHOULD BE WORN WHEN USING AEROSOL CLEANING AGENTS TO AVOID EYE INJURY. IF SPRAY CONTACTS SKIN, WASH AS DIRECTED ON CAN.

1.0 OBJECTIVE

This Field Modification procedure contains instructions for reworking Horizon LED display side signs and side route signs with an open connector on buses without a rear sign.

On 2007 and older buses the connector PWA part number 506746-001 will be replaced with connector board part number 508331-001 and with vinyl cap part number 801403-001.

On 2008 and newer buses, a vinyl cap, part number 801403-001 will be added to the open connector.

NOTE: Some Transit Properties may have a street side and curb side sign. Every side sign and side route signs will require a vinyl cap if there is an open connector.

2.0 REASON FOR CHANGES

On signs with an open connector, debris, moisture, corrosion, etc. can cause a short to develop between power connections possibly resulting in sign failure and in rare instances smoke and/or fire.

3.0 REFERENCE DOCUMENTS

Luminator Part Number	Description	ICD Drawing
510545-ALL	Horizon LED side sign	ICD510545
510544-ALL	Horizon LED Side Sign, 4"	ICD510544
510565 ALL	Horizon LED Side Route Sign	ICD510565

4.0 COMPONENTS REQUIRED

Description	2007 and Older Required Part Numbers	2008 and newer Part Numbers
Cap, Vinyl, .75 INCH ID	801403-001	801403-001
Corrosion X Cleaner/Penetration spray	801409-001	801409-001
Connector PWA	508331-001	
Hardware retained from signs at removal	NA	NA
Label, FMI	NA	NA

5.0 TOOLS REQUIRED

- Safety Glasses
- Screwdriver, No. 2 and No. 3 Phillips
- 3/8” Wrench and/or Ratchet with 3/8” socket
- 7/16” Nut driver and/or Ratchet with 7/16” socket

6.0 PROCEDURES AND RECOMMENDATIONS

PART 1 – 2007 AND OLDER BUSES SEE SECTION 6.1

PART 2 – 2008 AND NEWER BUSES SEE SECTION 6.2

6.1 CONNECTOR BOARD INSTALLATION IN BUSES 2007 AND OLDER

1 Verify sign operation before proceeding.

2 Gain access to power/data connector located on end panel of sign by removing top 2 mounting bolts and rotating sign downwards. Retain hardware for sign reinstallation. Vehicle type and manufacturer will determine access to cable connector. **See Fig. 3**

Note: Sign may need to be removed completely if there is not enough clearance between the sign and the window frame.

Fig. 3 Sign Mounting

3 Remove power/data cable.

4 Remove the plastic front cover by removing 8 Phillips head screws. Retain hardware for sign reassembly. See Fig. 4a.

5 Disconnect the 8 pin J1 connector from the unicard. See Fig.4b

Fig.4a Exterior of side sign

Fig. 4b Internal of Side Sign

Luminator A Mark IV Industries Company Plano, Texas	**SIZE** **A**	**CODE IDENT. NO.** **17744**	**DWG. NO.** **904666**
	SCALE NONE	**REV. B**	**SHEET 5**

6 Depending on sign type a Phillips screw driver or a 7/16 socket will be needed to remove the connector board. Retain hardware for sign reassembly. See Fig. 5 and 6

Fig. 5 (screw mounting)

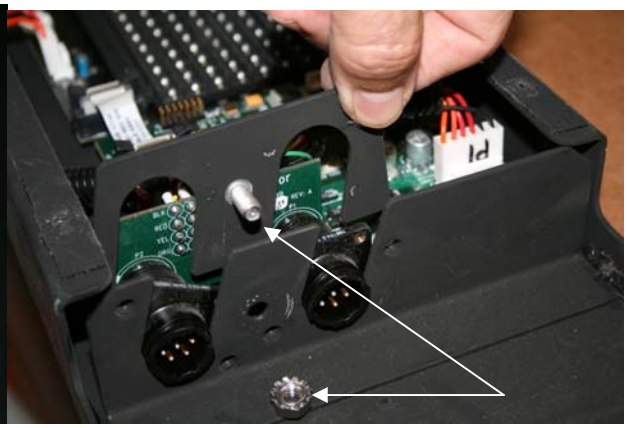


Fig. 6 (Bracket mounting)

7 For screw mounting (Figure 5) Remove 2 mounting nuts and rotate bracket outwards to remove. Remove 7 screws to release connector from bracket. Reverse procedure to install new connector board

8 For Bracket Mounting (Figure 6) Remove mounting nut and slide bracket back and pull up to remove. Pull connector board up and out. Reverse procedure to install new connector board.

9 Reassemble sign by performing Steps 8 – 2 in reverse order.

10 Confirm that light pipe is still properly installed per Figure 7.

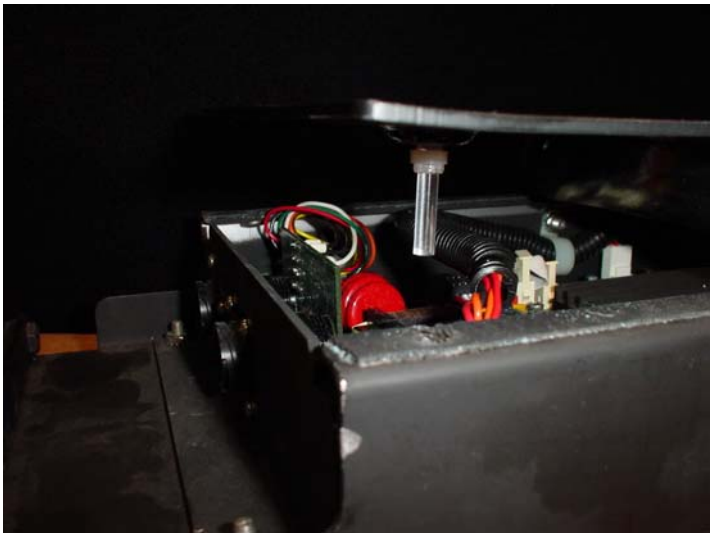


Figure 7, Light Pipe Installation

11 Reattach power/data cable.

12 Install vinyl cap on open (unused) connector.

13 Reinstall sign assembly on bus.

14 Check sign for proper operation. Cycling power to the sign system may be required for the side sign to be recognized.

15 Record bus number, bus type, technician performing work, type of work completed and date work was completed on the FMI log sheet. See section 7 for Disposition of Materials

16 Install FMI label near part number label on the top of the sign.

6.2 VINYL CAP INSTALLATION PROCEDURE FOR 2008 AND NEWER BUSES

1 Verify sign operation before proceeding.

2 Gain access to power/data connector located on end panel of sign by removing top 2 mounting bolts and rotating sign downwards. Retain hardware for reassembly. Vehicle type and manufacturer will determine access to cable connector. See **Fig. 1**

Note: Sign may need to be removed completely if there is not enough clearance between the sign and the window frame.

Fig. 1 Sign Mounting

3 Note which connector has the power/data cable connected. Disconnect cable from sign. This connector will not require Corrosion X.

4 Spray Corrosion X into the uncovered connector for about 2 second so that it penetrates into the connector down to the PWA inside the sign. See **Fig. 2**

Fig. 2 Spray Corrosion X in unused connector

5 Install vinyl cap on same connector.

6 Reattach power/data cable. Corrosion X is a dielectric. Power may be applied to the sign immediately after application.

7 Reinstall sign assembly on bus.

8 Check sign for proper operation. Cycling power to the sign system may be required for the side sign to be recognized.

9 Record bus number, technician performing work, date work was completed and type of work performed (I.e. spray and cap or PWA replacement) on the FMI log sheet. See section 7 for Disposition of Materials

10 Install FMI label near part number label on the top of the sign.

7.0 SCHEDULE OF WORK/RESPONSIBILITY FOR MODIFICATION

7.1 Material

Luminator will provide all materials and procedures to complete modifications at no charge.

7.2 Labor

At the customer's option, they can perform the procedures and be responsible for the work.

7.3 Disposition of Materials

1. Collect all removed connector PWA boards.

2. Using prepaid label provided, return all defective connector board PWAs and the FMI Log Sheet, signed by local Maintenance Supervisor to:

   Luminator
   900 Klein Road
   Plano, TX 75074
   Attn: A. Brett

8.0 RECORD OF FIELD MODIFICATIONS COMPLETED

FMI No. 904666, Horizon Connector Board PWA

Bus No	Bus Type	Technician Initials	Date of FMI Completion	Work performed

Transit Authority, Name (printed)

Transit Authority (signature)

Luminator, Name (printed)

Luminator (signature)