

HEHR INTERNATIONAL INC, 3333 CASITAS AVE LOS ANGELES, CA 90039

October 28, 2009

**VIA E-MAIL AND U.S. MAIL**

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NVS-215  
United States Department of Transportation  
National Highway Traffic Safety Administration  
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Re: Hehr International Inc's Response to NHTSA Letter Regarding Safety Recall 09V-318, Investigation Number EQ09-007 (Tip-In Transom Windows)

Dear Ms. Timian:

This letter responds to NHTSA's September 2, 2009 letter requesting information from Hehr International Inc. ("Hehr") regarding safety recall investigation number EQ09-007, initiated by Daimler Buses North America, Inc. ("Daimler Buses"). The investigation involves Daimler Buses' model years 2006-2009 Orion VII buses. Specifically, Daimler Buses provided notice to NHTSA that the screws for the upper tip-in transom portion of the windows manufactured by Hehr may loosen, allowing the upper window to dislodge and fall into the bus.<sup>1</sup> Hehr is aware of three incidents that occurred between June 20 and July 31, 2009 involving dislodged upper transoms in Toronto, Canada.

Hehr is dedicated to the quality of its products and takes seriously its responsibility to provide accurate and complete information to NHTSA. In this regard, Hehr has conducted a diligent investigation by analyzing historical reliability data, performing field inspections and directing testing of the screws in the brackets holding the upper transom windows.

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<sup>1</sup> A diagram of the Hehr 1500 series window subject to this recall is attached hereto as Attachment A. As illustrated, the top portion of the Hehr bus window has a latch allowing it to open and close. The upper transom is supported when opened by two metal props and four brackets. Each bracket has two screws. The brackets and props prevent the upper transom from dislodging when opened.

As explained further herein, the upper transom windows as designed are not defective. The screws in the brackets are fully tightened when Hehr delivers the windows to its customers. Screws that are fully tightened do not loosen on their own, even when subjected to significant long term road vibration. If the screws and brackets are in place, the upper transom windows do not dislodge. However, if screws are intentionally loosened, for instance as a result of maintenance or adjustments by customers, and then not fully re-tightened, the screws may continue to loosen or back out due to road vibrations. This may cause the brackets holding the windows to eventually "drop" the windows. This would be similar to loosening the screws in the brackets holding a cabinet door in place. Eventually, the brackets for the cabinet door will fall, and the door will fall as well.

Hehr's responses to NHTSA's specific inquiries are below:

**Question No. 1**

*Please state whether Hehr International sold or shipped the same windows as are involved in safety recall 09V-318, or windows substantially similar to those, and that may contain the same safety defect, to anyone other than Daimler Buses. If your answer is "no," then please so state. You may then disregard the remaining questions.*

*If your answer is "yes," then please state the total number of those windows that were distributed and the beginning and ending dates of their manufacture. Identify all design or supplier changes, or any other factors, that determine those beginning and ending dates. Please also state the number of windows that still remain in the custody of Hehr International.*

**Response to Question No. 1**

Hehr has determined that the upper transoms of these windows do not contain a safety defect. The basis for this conclusion is set forth in response to Question No. 2. The windows subject to this recall investigation are Hehr's 1557 and 1558 Model windows. Daimler Buses is the exclusive customer for these windows. Hehr has not sold these 1557 and 1558 Model windows for use by any customer other than Daimler Buses.

Although the upper transoms are not defective, in an abundance of caution and in response to NHTSA's request, Hehr undertook to determine whether it may have supplied "substantially similar" windows to customers other than Daimler Buses.<sup>2</sup> Relying on an

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<sup>2</sup> Though there is no direct authority for the definition of "substantially similar" in this context, Hehr reasonably relies on the definition of "substantially similar" from 49 CFR Part 579 (Reporting of Information and Communications About Potential Defects). The definition provides as follows: "An item of motor vehicle equipment . . . is identical or substantially similar . . . if such equipment [has] one or more components or systems that

expansive interpretation of the term "substantially similar," Hehr does manufacture other window models that use a prop and bracket system with screws to allow its upper transom windows to open, although these models may have other structural differences. These other models have also not exhibited any defects. Hehr is providing the model numbers, dates of distribution and total number of these windows, based on reasonably available information from the past eight years, as presented in Figure 1 below:

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are the same, and the components or system performs the same function. . . ." [49 CFR § 579.4(d)(2)]

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The windows included in Figure 1 are built to order for specified customers, and Hehr does not have any of these windows currently in its custody.

### **Question No. 2**

*Explain the nature of the defect and how Hehr International believes it is related to motor vehicle safety. If Hehr International does not believe that there is a defect, or that the defect is safety-related, please so state and explain in detail any reasoning, testing, methodology, analysis, or any other information, that supports this conclusion.*

### **Response to Question No. 2**

Hehr has conducted a thorough investigation and concludes that there is no defect associated with its transom windows. Screws in the brackets supporting the upper transom props are tightened upon leaving Hehr's facility. Hehr's investigation reveals that screws in a fully tightened position do not come loose or back out, including when subject to significant road vibration conditions as would be experienced on an operating bus. However, screws in brackets that have been intentionally loosened (such as during maintenance activities by the transit company), can eventually fall out. To again put this into context, this is similar to loosening a screw on a cupboard door hinge or bracket. After repeatedly opening and closing the cupboard door, the door will eventually fall off the bracket. This is not a design defect.

Hehr's conclusion that its product is not defective is based on the following: (a) until the three upper transom window incidents in Toronto, Canada, Hehr had never been notified for the past eight years by Daimler Buses or any other customer about dislodged upper transom windows; (b) in response to the recall investigation, Hehr has conducted field inspections of hundreds of windows on operating buses in locales throughout the United States and Canada, and discovered that only approximately 1.3% of the screws in the transom windows were not fully tight - the very low percentage indicating road conditions do not affect tight screws; and (c) testing by a nationally recognized independent third party firm demonstrates that tightened screws as shipped from Hehr do not loosen when subjected to road vibration and stopping and starting conditions, even over a long period of time. Loosened screws are presumably caused by manual manipulation after leaving Hehr's facility.

#### Hehr's Review of Historical Data Concerning Windows

Hehr reviewed data since 2001 regarding its manufacture of the 1557 and 1558 Model windows and other windows using brackets and props. Although the other window models are different, Hehr reviewed data beyond the 1500 Series in order to further examine reliability. Of the thousands of these windows supplied by Hehr (*see* Figure 1), the only transom window dislodging incidents of which Hehr is aware are the three incidents reported by Daimler Buses that occurred in Toronto, Canada during a period of approximately six weeks from June –

July 2009. The lack of reported incidents with upper transom windows dislodging despite thousands of opportunities for failure suggests that there is no defect in the performance, construction, a component or materials associated with the upper transoms. The window design is proven to be reliable. What occurred in Toronto – three upper transom windows dislodging in a short period of time – suggests that screws may have been loosened in the field while conducting some maintenance activity, after which the screws were not properly re-tightened.

#### Summary of Hehr's Field Investigations

Promptly upon being notified of the incidents in Toronto, Hehr began inspecting windows on buses operated by transit authorities throughout the United States and Canada, examining the transoms for loose screws in brackets. To date, after physically examining thousands of screws, Hehr has discovered that approximately 1.3% of the screws in the brackets supporting the props for the upper transom windows on these operational buses are no longer fully tightened.<sup>3</sup> If road conditions alone caused screws to loosen, it would be reasonable to expect a higher percentage of loose screws in the field. Regular road conditions do not appear to have any effect on tightened screws.

#### Summary of Independent Testing

Hehr retained a nationally recognized independent testing agency, National Testing Systems (NTS), in order to test the design of the screw and bracket system supporting the upper transom window props on the 1500 series windows. NTS' direction was to determine whether and under what circumstances screws could come out of the bracket, potentially causing the upper transoms to fall out.

NTS tested a protocol to simulate road conditions that affect a bus window. NTS identified a vibrational spectra (including shock) that had been measured in the past on buses in the New York City Transit Authority, and supplemented it with data measured on a bus in the Los Angeles Transit Authority using accelerometers and recorders. Between the two profiles, NTS developed a worst-case spectrum for the "g" forces on a bus window as an emulation of the forces that would be experienced on an Hehr window in Toronto, Canada.

NTS then conducted experiments to answer two questions:

- A. Can screws properly tightened loosen due to road conditions?

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<sup>3</sup> Hehr's field inspections consisted of physically examining screws in brackets on operational buses to determine whether the screws were fully tightened. Of the more than 6,500 screws inspected by Hehr throughout the United States, only approximately 1.3% were not at maximum tightness.

B. Do screws that are manually loosened from the fully tightened position continue to loosen, eventually causing the bracket to fail?

To answer Question A, NTS performed a HALT (Highly Accelerated Life Test) on a Hehr 1557 Model window. The 1557 and 1558 Model windows use the identical screw and bracket system to support the upper transom window props such that the test results would apply equally to both. The test was conducted over a two-day period that "aged" the window under simulated driving conditions for well over ten equivalent years of use. Over the entire course of testing, no screws ever came loose on the window. This confirms there is no defect in the transom bracket and screw design.

To answer Question B, screws were loosened on the bracket for the window (backed off fractions of a turn from fully tight). Where screws were intentionally loosened, screws moved in and out, ultimately loosening themselves further and widening the mounting hole. The screw thread contained aluminum debris from the vibration motion, demonstrating that this vibration helped ream the mounting hole themselves. Intentionally loosened screws can potentially be pulled out by any force on the transom and may potentially cause the tip-transom itself to fall out.

#### Summary of Conclusion That There is No Defect

In summary, Hehr's reliability data of transom windows over the past eight years, combined with the results of Hehr's physical inspections of operating buses and also the analysis conducted by a third party testing facility leads to the conclusion that Hehr's tip-in transom windows are not defective as manufactured.

Though Hehr concludes that the transom windows are not defective, maintenance or other manipulation or tampering of its windows by Daimler's Buses customers may result in a potential safety concern. Therefore, in an abundance of caution and in keeping with its commitment to protect the public, Hehr is providing notice to Daimler Buses as well as other customers who have purchased windows with tip-in transoms (*see* Figure 1 for Series and Models) to ensure loosened screws are properly re-tightened. The language of the notice is set forth in Attachment B.

Hehr's customers receiving the notice will be responsible for advising their own customers to tighten loose screws. Hehr believes that this proactive approach will resolve any remaining concerns about the transom window screws.

#### **Question No. 3**

*List all Hehr International customers that purchased or otherwise received the same or substantially similar windows, and provide their name, address, phone number, contact*

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*person, and state the quantity sold to each, the date(s) of sale, and whether that customer is a manufacturer of motor vehicles.*

**Response to Question No. 3**

Although Hehr does not believe there is a defect, Hehr will, in good faith and in an abundance of caution, provide notice in the manner set forth in Attachment B to the following customers:

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**Question No. 4**

*To the extent any of the customers you identified in response to question 3 are not vehicle manufacturers, please advise us whether or not Hehr International intends to notify these customers of the defect in accordance with 49 U.S.C. § 30118(c)(1) and § 30119(d)(2).*

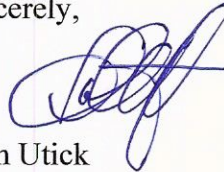
**Response to Question No. 4**

As far as Hehr is aware, all customers identified in response to Question 3 are vehicle manufacturers.

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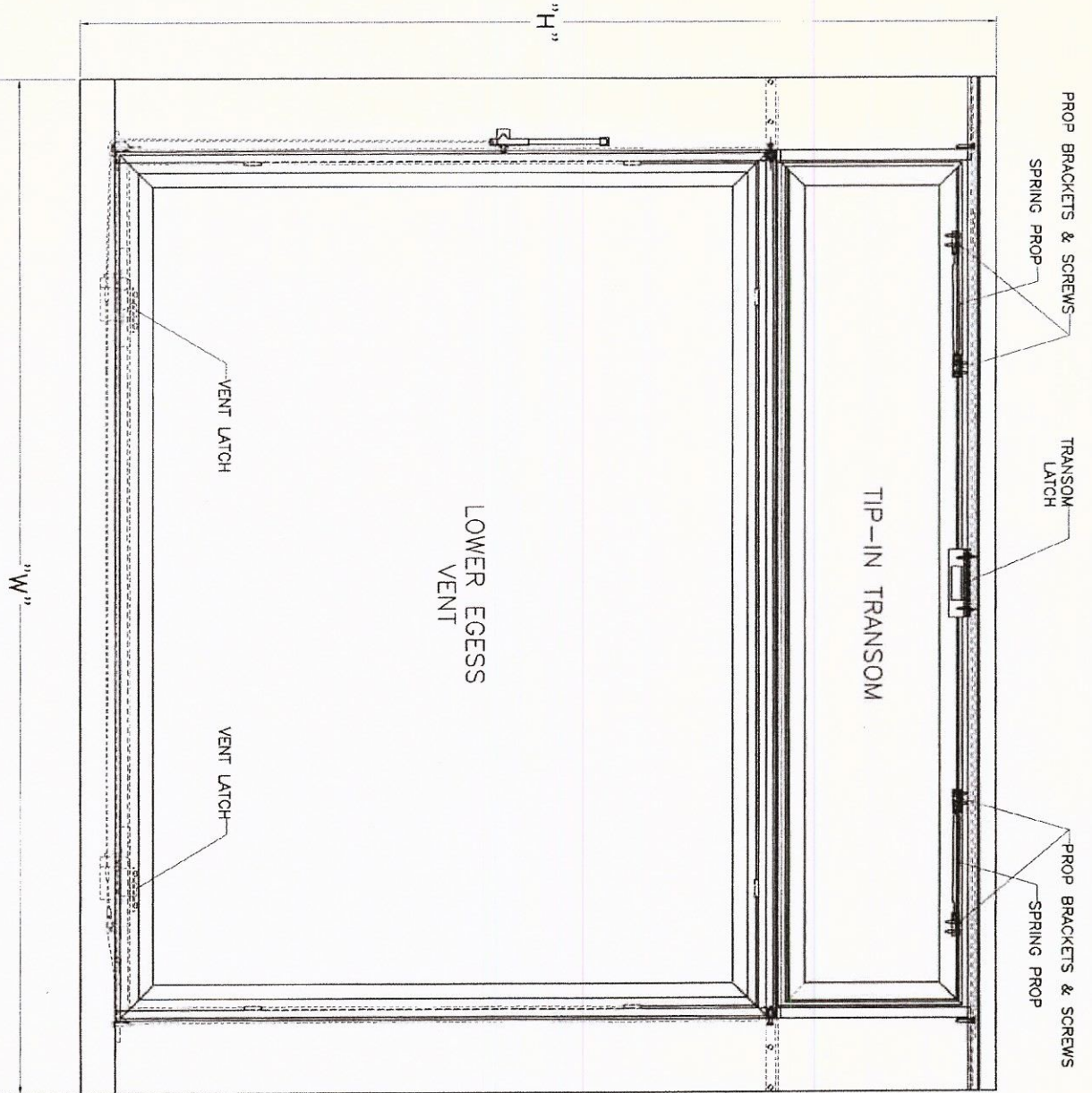
Hehr has conducted a diligent investigation, and believes that the conclusions and proposals set forth in this letter will resolve any remaining concerns about the upper transom window brackets. If you have any further questions or comments, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to be 'John Utick', written in a cursive style.

John Utick

ATTACHMENT A



INSIDE VIEW

1557/1558 TRANSOM WINDOW

file: 1557-10-1 inside.pdf

## **ATTACHMENT B**

Hehr recommends that you inspect the screws in the brackets supporting the props of the upper transom windows on a regular basis. Screws that have been loosened and are not fully re-tightened may continue to back out because of road vibration, and ultimately may result in the upper transom window dislodging if the brackets fall out. All screws should be restored back to their fully tightened position. If a screw has been left loose for any period of time, the hole may widen. A larger screw should therefore be used to secure the bracket. The new, larger screw should be fully tightened.