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October 19, 2012

Ms. Jennifer Timian
Chief, Recall Management Division
Office of Defects Investigation
1200 New Jersey Avenue SE
Washington, DC 20590

Re: Stabilus, Inc. – ODI Equipment Query, EQ12-010

Dear Ms. Timian:

On behalf of Stablius, Inc. (“Stabilus”), I am writing in response to your letter dated October 1, 2012 regarding the Office of Defects Investigation (“ODI”), Recall Management Division (“RMD”) equipment query investigation related to Stabilus’ gas-filled struts (“struts”) for use on vehicles equipped with a power liftgate.¹ Specifically, ODI has requested information regarding the struts that were involved in the following four (4) recalls:

- American Honda Motor Company (“Honda”) – February 16, 2012 recall involving 2008 through 2009 Odyssey vehicles (Recall No. 12V-062);
- Honda – February 18, 2010 recall involving 2005 Odyssey vehicles (Recall No. 10V-055);
- Toyota Motor Corporation (“Toyota”) – May 30, 2008 recall involving 2004 through 2006 Sienna vehicles (Recall No. 08V-244)
- Ford Motor Company (“Ford”) – March 6, 2006 recall involving 2005 through 2006 Freestar and Mercury Monterey vehicles (Recall No. 06V-069)

ODI has also requested that Stabilus submit a written response, including all supporting documents, analysis and/or test reports, if it does not agree with Honda, Ford and Toyota that the struts involved in those recalls contained a safety-related defect.

As a preliminary matter, it is important to note that the Ford recall of Freestar and Mercury Monterey vehicles did not involve the replacement of Stabilus struts. Instead, as noted in Ford’s

¹ Although the original deadline for responding to the letter was October 11, 2012, Stabilus requested an extension to respond until October 19, 2012, which you approved on October 9, 2012.

March 6, 2006 letter to the National Highway Traffic Safety Administration (“NHTSA”) (a copy of which is attached to your letter), the remedy for the recall was to have the Power Liftgate Control Module reprogrammed to prevent the liftgate from falling freely without warning. Moreover, as explained in more detail in point 3 below, although the other three recalls did involve the replacement of Stabilus struts, Stabilus disagrees with the conclusion that its struts contain a safety-related defect.

Please be advised that Stabilus considers the information being submitted in certain attachments to this letter to be confidential pursuant to 5 U.S.C. § 552(b)(4) and, in accordance with the requirements of 49 CFR Part 512, we are submitting a confidentiality request and all the required supporting information and materials to NHTSA’s Office of Chief Counsel contemporaneously with this submission. Stabilus is requesting that this confidential information not be released to the public. In accordance with the regulations, we are submitting a complete copy of this response as well as a redacted copy.

The following are Stabilus’ responses to ODI’s requests for information:

- 1. Provide a list of all customers that received the same or similarly affected Stabilus gas-filled struts and provide their company name, line of business (i.e. vehicle manufacturer, equipment manufacturer, distributor, etc.) address, phone number, contact person, quantity sold to each, and sale date.**

Stabilus supplies struts for nearly all motor vehicles produced in North America; however, Stabilus did not supply the “same” struts like the Honda Odyssey, Toyota Sienna or Ford Freestar struts to any (other) customer as these struts were manufactured for those specific vehicles only. Each vehicle utilizes a custom strut comprised of a unique combination of length, diameter, force and internal components. These parameters are dependent on the vehicle structure and customer requirements and differ from vehicle to vehicle.

The most general classification of “similarly-affected” struts can be established with the common design trait between the Odyssey, Freestar and Sienna struts. The struts for these three vehicles employed a combination of a small diameter rod with a relatively large diameter tube and – in the specific applications affected by NHTSA’s inquiry – were used together with a power liftgate option. These designs were dictated according to the customer’s desired force profile and vehicle packaging constraints. Details regarding the differences in design are provided in Attachment No. 1, “Technical Comparison.”

Stabilus believes that there are no customers who received “similarly affected” struts:

The Honda Odyssey employs a Ø10mm rod and a Ø28mm tube (10x28). The Honda Odyssey was the only vehicle utilizing such a strut construction in combination with a power liftgate vehicle. This particular strut was also required in a length, 726mm, which is the longest 10x28

product ever used by Stabilus in an automotive application.² Stabilus can therefore confidently confirm that there are no struts similar to the Odyssey strut which were sold to (other) customers.

The Freestar and Sienna struts both utilize a Ø8mm rod and a Ø22mm tube (8x22). There are four other vehicles which utilize the 8x22 configuration with a similar construction to the Freestar and Sienna:

- Ford 2008 Freestyle / 2009 Taurus-X (Same vehicle, different branding)
- General Motors Chevy Traverse (MY2009 – Current)
- General Motors Buick Enclave (MY2008 – Current)
- General Motors Saturn View / GMC Acadia (Same Vehicle MY2008 – Current)

However, the 8x22 configuration alone is not necessarily prone to failure nor is it indicative of similarity between the struts used in these four (4) platforms compared to those utilized in the Freestar and Sienna. There were several mitigating factors as well as improvements made to the struts as a result of the previous campaigns. These improvements were all implemented prior to the launch of the above four (4) platforms. Thus, other than the same rod and tube lengths, the struts in these vehicles are not similar to those utilized in the 2005/2006 Freestar or the 2004-2006 Sienna. Details of the improvements are included in Attachment No. 2, “Technical Improvements.” Furthermore, the Ford Freestar/Monterey vehicle was recalled due to a software problem, not because of the struts.

Therefore, since these other aforementioned 8x22 struts were manufactured and sold after the Sienna improvements (i.e., improvements 1 and 2 of Attachment No. 2 “Technical Improvements”), it is Stabilus’ position that there are no other vehicles for which Stabilus manufactured and sold ‘similarly affected’ struts. Consequently, there are no customers who received ‘similarly affected’ Stabilus struts.

Stabilus’ position in this regard can be verified through warranty analysis which shows that the warranty level of the Sienna and Odyssey struts involved in the recall was not approached by any of the above listed “peer” vehicles. The warranty data for the recalled vehicles and the “peer” vehicles is provided in Attachment No. 3, “Warranty Analysis.”³

² The lengths of the various struts are contained in the “EXT” column of Attachment No. 1.

³ Please note that the warranty analysis in Attachment No. 3 is based on the warranty data that has been provided to Stabilus at the time of this letter.

2. **State whether Stabilus manufactured and sold or distributed any equipment containing the defect involved in the aforementioned recalls reports in the replacement market and, if so, provide a list of all customers that received the same or similarly affected Stabilus gas-filled struts and provide their company name, line of business (i.e. vehicle manufacturer, equipment manufacturer, distributor, etc.), address, phone number, contact person, quantity sold to each, and sale date.**

Stabilus has identified that 258 Honda Odyssey struts manufactured prior to December 2008 that did not include the improvements implemented as a result of the power liftgate recall action were sold into the replacement market (for purposes of this response, Stabilus assumes that “replacement market” means the independent aftermarket, not the service by the OEMs, which is supplied via the OEMs, not by Stabilus).

The remainder of Stabilus struts sold in the replacement market did not include the “defect” in the aforementioned recalls. These struts either included the improvements per Attachment No. 2 and/or a different product design.

The replacement market design is common for both manual and power lift gate vehicles. Stabilus is not able to identify what percent of sales are for manual versus powerlift gate applications. However, the power liftgate option rate at the time for these vehicles is estimated at 25%. In addition, replacement market sales generally occurred after the power liftgate vehicle recall period. Therefore, it is reasonable to conclude that the majority of struts sold into the replacement market were for manual liftgate replacements and thus not relevant to this discussion or the ODI equipment query.

It is also important to note that Stabilus only supplies about 20% to 30% of the replacement market struts. The majority of the replacement market is supplied by both domestic and import re-manufacturers providing non-OEM approved replacement struts. This is another reason why it would be more effective to focus on the “catch a falling gate” function - like was done in the Ford Freestar/Monterey recall – than on the Stabilus struts. A properly working “catch a falling gate” function protects the end customer irrespective of which manufacturer’s struts are being used and irrespective of any early failure rates of the struts (see further explanation in response to point 3, below).

The following is a list of the sales into the replacement market segment for the Ford, Honda, and Toyota recall vehicles:

- Ford Freestar/Monterey 2005 thru 2006 Model Years
 - No strut manufacturing defects identified or recall corrective actions required by Ford (Ford implemented a “catch a falling gate” function to its controller software during recall);
 - Apart from that, the number of struts sold is relatively small: 1,288 struts were sold to Stabilus’ distributor, ZF Trading (“ZF”) (contact information below).

- Honda Odyssey 2005
 - 258 “Same As” recall struts sold to ZF (sales details below) prior to December 2008 (prior to product improvements);
 - The other 3,500 struts for the Odyssey replacement market were delivered to ZF after December 2008 and include the product improvements.

- Toyota Sienna 2004 thru 2006 Model Years
 - The struts utilized on the Sienna 2004 through 2006 MY vehicles were not sold in the replacement market. Rather, Stabilus sold 28,350 struts for the Sienna replacement market which had a specific replacement market 10x28 design (the Sienna 2004 through 2006 MY recalled strut design was an 8x22);
 - These specific replacement market struts were sold to ZF from October 2006 to present.

Details of Stabilus’ distributor ZF

Company name: ZF Trading
 Line of business: Automotive Aftermarket Parts Distributor
 Address: 777 Hickory Hills Drive, Vernon Hills, IL 60061
 Phone number: (847) 472-6773
 Contact person: Carlos Garcia-Escobar
 Quantity sold: 258 parts for the Odyssey
 Sale date(s): 3 Shipments:

- August 30, 2007 – 103 pc, invoice #97388815;
- January 21, 2008 – 99 pc, invoice #97410825;
- April 28, 2008 – 56 pc, invoice #97426260.

3. If your company does not agree with Honda, Ford, and Toyota that these gas-filled struts contain a safety related defect, you must submit a written response explaining your decision including all supporting documents, analysis and or test reports.

Stabilus disagrees with the statement that the struts contain a safety related defect. Importantly, Toyota and Honda also formally disagreed with NHTSA that struts with a higher than normal failure rate constitute a safety defect. This was clearly stated by Honda and Toyota in letters sent to NHTSA (attached to your letter):

- February 26, 2010 letter from Honda to NHTSA – “Though Honda does not agree with NHTSA that this constitutes a safety defect...”;
- May 30, 2008 letter from Toyota to NHTSA – “Although Toyota is willing to identify this campaign as a safety recall..., Toyota has not determined that the condition described above is a ‘safety-related defect’ within the meaning of the federal vehicle safety laws.” Toyota further explained that it had “previously communicated its reasons for declining to identify the strut deterioration as a ‘safety-related defect’” to NHTSA.

As mentioned above, Ford, of course, recalled the software for the power liftgate, and never claimed that the Stabilus strut contained a safety defect.

Despite this dispute, Stabilus understands the safety concerns expressed by NHTSA surrounding the function of a power liftgate and does not intend to minimize the severity of complaints which eventually led to the aforementioned recalls. Furthermore, Stabilus does not deny that there were in some cases a higher than normal warranty rate which led it to make robustness improvements to the struts. However, no distinct defect was ever identified, rather the higher than normal warranty rate was due to a combination of mitigating factors that reduced the robustness of the struts.

Stabilus maintains that the burden of safety when a strut fails for whatever reason lies with the overall system design, specifically the control software. Stabilus took exception to the Toyota and Honda recalls and formally informed both customers with regards to the following two key points:

1. The strut technology and design were carried over from manual liftgate applications with their well understood failure mode: *all struts will eventually and gradually lose pressure*. No additional robustness requirements were introduced when applying struts in the power system, nor were safety designations applied to the strut function. Therefore, pressure loss is, and was, clearly an accepted condition of the power liftgate system design; and
2. The occurrence of strut force loss is acknowledged and understood industry-wide with the implementation of software necessary to detect a failed strut. This software is known as “Jam-Pro” or “Catch a falling gate” or “strut management mode.”

Furthermore, in March 2006, in response to the Freestar recall campaign, Stabilus formally informed all of its customers on a worldwide basis of these points. An example of the correspondence that was sent to all OEM's is included under Attachment No. 4.

Strut Technology

Although designed and validated for automotive usage, the strut is a pressure vessel which is subject to gas loss. In addition to the normal static pressure loss expected over time, the most common failure mechanism is rod wear/damage which will eventually compromise the seal and allow pressure loss. This rod wear can be caused by a variety of possibilities, including, but not limited to, side wear, buckling, user induced side loading, and contamination. Moreover, regardless of rod wear issues, the normal (and unavoidable) static loss will ensure that over time, all struts will start to lose pressure and hold open capabilities will be diminished, especially at cooler temperatures.

Some of the incident reports from the prior recalls suggest a sudden loss of pressure, which Stabilus believes is an inaccurate representation. Typically, gas loss occurs either while the liftgate is closed or incrementally over cycles. Stabilus is not aware of any confirmed reports of sudden and complete gas loss while the liftgate is open. The erroneous perception of sudden gas loss is most likely a result of the power liftgate system which executes an opening sequence with a low pressure gas spring and then disengages the clutch, allowing rapid movement of the liftgate.

Software

Although the details of the software are different for each OEM, the industry state-of-the-art for power liftgates is to protect against the inevitable gas loss with software which recognizes a failed strut or any type of failed counterbalance. Typically, the software will monitor the liftgate position immediately after reaching the end position. If rapid closure is detected, the liftgate will drop until the ECU reacts and drives the liftgate back to the full open position, issues a chime, and then lowers it in a controlled manner. Proper software execution should also maintain the obstacle detection capabilities. In other words, if the liftgate encounters an obstacle during the closing sequence, it should reverse to allow the obstacle to be removed. The complaints all mentioned that the injury or alarm happened either during the initial drop or because the liftgate failed to reverse when encountering an obstacle (such as a person).

There were two benchmark recalls where the corrective action was properly determined to be with the software, not the strut. These were NHTSA recall no. 07V334000 for the Audi A6 Avant and Audi Q7 and the aforementioned NHTSA recall no. 06V-069 for the Ford Freestar. In both of these cases, the software was not present and/or not operating properly and the recall action was to update the software, not to exchange the strut.

Evidence from the Toyota Sienna recall indicates that the safety issue was with the software, not the strut. In the Toyota Sienna case, NHTSA tested the system and seemed to conclude that the

software was not effective. NHTSA's report no. EA06-020 from June 2008 concludes in section VI:

" ... [The Liftgate] can exert a significant force in order to stop closing and automatically reopen."

"The jam protection feature does not prevent the injuries, both minor and serious, inflicted upon the owners of vehicles with failed liftgate struts".

"... the audible warning (beeping sound) when the liftgate begins to power-close may not always occur and when it does, may not be a sufficient warning ..."

NHTSA's conclusion was echoed verbatim in some of the customer complaints on the NHTSA website which also indicated that the software did not function as intended. A sample of representative complaints involving the Toyota Sienna from the NHTSA website is included in Attachment No. 5.

Similarly, in the Honda Odyssey case, NHTSA's report no. EA08-015 concludes:

"The "auto-reverse" feature does not prevent the injuries inflicted upon the owners of vehicles with failed liftgate struts.

"The audible warning (continuous beeping sound) when the liftgate begins to power-close has to be a sufficient warning to an owner and is not effective in preventing injuries."

In Honda's letter to NHTSA dated February 26, 2010, Honda reported that "... Struts with diminished performance will result in the liftgate closing under its own power, possibly unexpectedly, with potential risk of injury and inconvenience to the users." This report does not acknowledge the intended function of the software, nor the deficiencies identified by NHTSA, erroneously placing the burden of safety on the strut.

In conclusion, it appears that either the recalled vehicles had software defects which were not effective in preventing injury or the industry standard state-of-the-art for power liftgate software may not be effective in preventing injury.

Stabilus would welcome an opportunity to discuss these points with NHTSA to help NHTSA better understand Stabilus' concerns with superimposing the safety classification on the struts, despite the well-known and eventual failure mode, while the intended safety feature in the software has either not been fully acknowledged or emphasized.

We hope that this letter responds appropriately to ODI's October 1, 2012 request for information. If you have any questions or require any additional information, please do not hesitate to contact me.

Very truly yours,



David G. Wix

Cc: Anthony Haba, Stabilus, Inc.
David Sabet, Stabilus, Inc.

Attachments:

- No. 1 – Technical Comparison
- No. 2 – Technical Improvements
 - 2a. Stabilus Report TRF 06-4811L
 - 2b. Honda Durability Testing Overview
- No. 3 – Warranty Analysis
- No. 4 – Example Letter to OEMs regarding software
- No. 5 – Sample of representative complaints from NHTSA website re: Toyota Sienna