



2007-04-20  
11:00 AM  
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April 20, 2007

Richard Boyd, Chief  
Medium and Heavy Vehicle Division  
Office of Defects Investigation  
National Highway Traffic Safety Administration  
400 Seventh Street, S.W.  
Washington, D.C. 20590

**Re: NVS-214sjm / PE07-012**

Mr. Boyd:

On behalf of Thomas Built Buses, a wholly-owned subsidiary of Freightliner, LLC, we hereby submit the attached in response to the above referenced request for information concerning allegations of the front exit (service) doors operating erratically of certain Thomas Built C2 Buses.

Your specific requests, with identification codes, are repeated verbatim in the following pages. Freightliner LLC's response follows each request in **bold**.

If you have any questions, please contact me.

Sincerely yours,

Nasser Zamani

Attachments  
Certified Mail# 70063450000384084592

1. State, by model year, and model, the number of subject vehicles Freightliner has manufactured for sale or lease in the United States.

Model Year	Model	Number of Vehicles
2005	Saf-T-Liner C2	47
2006	Saf-T-Liner C2	1442
2007	Saf-T-Liner C2	5175
2008	Saf-T-Liner C2	5396*

\*As of 4/3/07

Provide the table in Microsoft Access 2000, or a compatible format, entitled "PRODUCTION DATA."

See file "PRODUCTION DATA.xls" on enclosed compact disk.

2. State, by model year, and model, the number of each of the following, received by Freightliner, or of which Freightliner is otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles. Provide a copy of each such claim:
  - a. Consumer complaints, including those from fleet operators;  
None
  - b. Field reports, including dealer field reports;

Model Year	Model	Number of Dealer Field Reports
2006	Saf-T-Liner C2	6
2007	Saf-T-Liner C2	3

- c. Reports involving a crash, injury, or fatality, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;  
None
- d. Property damage claims;  
None
- e. Third-party arbitration proceedings where Freightliner is or was a party to the arbitration;  
and  
None
- f. Lawsuits, both pending and closed, in which Freightliner is or was a defendant or codefendant.  
None

For subparts "a" through "d," state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle are to be counted separately. Multiple reports of the same incident are also to be counted separately

(i.e., a consumer complaint and a field report involving the same incident in which a crash occurred are to be counted as a crash report, a field report and a consumer complaint).

In addition, for items "c" through "f," provide a summary description of the alleged problem and causal and contributing factors and Freightliner's assessment of the problem, with a summary of the significant underlying facts and evidence. For items e and f, identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed. Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER TWO DATA."

3. Separately, for each item (complaint, report, claim, notice, or matter) within the scope of your response to Request No. 2, state the following information:
  - a. Freightliner's file number or other identifier used;
  - b. The category of the item, as identified in Request No. 2 (i.e., consumer complaint, field report, etc.);
  - c. Vehicle owner or fleet name (and fleet contact person), address, and telephone number;
  - d. Vehicle's VIN;
  - e. Vehicle's make, model, model year, and engine;
  - f. Vehicle's mileage at time of incident;
  - g. Incident date;
  - h. Report or claim date;
  - i. Whether property damage is alleged;
  - j. Number of alleged injuries, if any;
  - k. Number of alleged fatalities, if any;
  - l. Summary description of the complaints; and,
  - m. Freightliner's opinion/assessment of the incidents. Provide a copy of the claim or repair order, any/all field reports and any documents related to or produced by freightliner during their evaluation of this issue.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER THREE DATA."

**See file "REQUEST NUMBER THREE DATA.xls" on enclosed compact disk.**

4. Produce copies of all documents related to each item within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Freightliner used for organizing the documents.  
**See attachments 1 through 9, and files "Ref Num 1536258.pdf", "Ref Num 1709667.pdf", "Ref Num 1815669.pdf", "Ref Num 1815967.pdf", "Ref Num 1888798.pdf", "Ref Num 2167514.pdf", "Ref Num 2183028.pdf", "Ref Num 2262005.pdf", and "Ref Num 2428935.pdf" on enclosed compact disk.**
5. State, by model year, and model, a total count for all of the following categories of claims, collectively, that have been paid by Freightliner to date that relate to, or may relate to, the alleged defect in the subject vehicles:

a. Warranty claims;

<b>Model Year</b>	<b>Model</b>	<b>Number of Warranty Claims</b>
<b>2005</b>	<b>Saf-T-Liner C2</b>	<b>1</b>
<b>2006</b>	<b>Saf-T-Liner C2</b>	<b>135</b>
<b>2007</b>	<b>Saf-T-Liner C2</b>	<b>182</b>
<b>2008</b>	<b>Saf-T-Liner C2</b>	<b>17</b>

- b. Extended warranty claims;
- c. Claims for good will services that were provided;
- d. Field, zone, or similar adjustments and reimbursements; and
- e. Warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.

**C2 5-4: Switch Bank Gel Pac Gasket, code 7552**

<b>Model Year</b>	<b>Model</b>	<b>Number of C2 5-4 Claims</b>
<b>2005</b>	<b>Saf-T-Liner C2</b>	<b>5</b>
<b>2006</b>	<b>Saf-T-Liner C2</b>	<b>294</b>
<b>2007</b>	<b>Saf-T-Liner C2</b>	<b>578</b>
<b>2008</b>	<b>Saf-T-Liner C2</b>	<b>5</b>

**C2 1-5: Sealing Driver's Window, code 7404**

<b>Model Year</b>	<b>Model</b>	<b>Number of C2 1-5 Claims</b>
<b>2005</b>	<b>Saf-T-Liner C2</b>	<b>1</b>
<b>2006</b>	<b>Saf-T-Liner C2</b>	<b>232</b>
<b>2007</b>	<b>Saf-T-Liner C2</b>	<b>279</b>
<b>2008</b>	<b>Saf-T-Liner C2</b>	<b>73</b>

Separately, for each such claim, state the following documentation/information:

- a. Freightliner's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. VIN and repair date;
- d. Vehicle mileage at time of repair;
- e. Repairing dealers' or facility's name, telephone number, city and state or ZIP code;
- f. Labor operation number;
- g. Problem code;
- h. Replacement part number(s) and description(s);
- i. Concern stated by customer;

- j. Provide a copy of any document including the claim or repair order;  
**See attachment 28 and files "PE07-012 warranty claims 1 of 5.pdf",  
"PE07-012 warranty claims 2 of 5.pdf", "PE07-012 warranty claims 3 of 5.pdf",  
"PE07-012 warranty claims 4 of 5.pdf", and "PE07-012 warranty claims 5 of 5.pdf"  
on enclosed compact disk.**
- k. Comment, if any, by dealer/technician relating to claim and/or repair; and.
- l. Freightliner's assessment.

Provide this information in Microsoft Access 2000, or a compatible format, entitled  
"WARRANTY DATA."

**See file "WARRANTY DATA.XLS" on enclosed compact disk.**

- 6. Describe in detail the search criteria used by Freightliner to identify the claims identified in response to Request No. 2 and No. 5, including the labor operations, problem codes, part numbers and any other pertinent parameters used. Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect in the subject vehicles. State, by make and model year, the terms of the new vehicle warranty coverage offered by Freightliner on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered). Describe any extended warranty coverage option(s) that Freightliner offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.  
**Customer complaints and field reports were searched using the key word "entrance" to find any and all reports for entrance doors. Specific warranty information regarding claims against a particular component was searched using that part number. Part numbers 104539, 100139, 103223, 103298 and 130596 were searched for in the warranty database system. These are the three different types of entrance door switches that are used, the old switch bank and the new harness that replaced it. Problem codes were used to determine other potential claims against door operation. Problem codes 0205 which is: Service O/O control/hinge/cylinder/linkage, 0505 which is: Circuit breakers, fuses, electrical connectors and buss bars, 0513 which is: Switches and buzzers (body only), 0509 which is: Wiring Harness – other, 0565 which is Switch Hub Module, 7552 which is the electronic warranty code for the PSB published for the installation of the Gel Pac, and 7404 which is the electronic warranty code for the PSB published for resealing the driver's window were searched. Warranty for door controls is one year, unlimited miles. No extended warranty was offered for the subject vehicles.**
- 7. State, by model, and model year, the number of all buses, excluding subject vehicles, that utilize a similar designed front exist door component as the subject vehicles that Freightliner has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by Freightliner, state the following:  
**None**
  - a. Vehicle identification number (VIN);
  - b. Make;

- c. Model;
- d. Model Year;
- e. Engine;
- f. Date of manufacture;
- g. Date warranty coverage commenced; and
- h. The state in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

Provide the table in Microsoft Access 2000, or a compatible format, entitled "PRODUCTION DATA."

8. Provide the same data requested in question Number 2 and question Number 5 for any vehicles identify in question Number 7.

**None**

9. Describe how Freightliner first became aware of the alleged defect and state the date on which Freightliner first became aware of the possibility of the alleged defect. Provide a detailed **chronology** of all known events regarding the subject defect, starting from the time Freightliner first became aware of this issue to present. Include all information and provide a copy of any document used at any internal/external meeting(s), meetings with the part supplier, or other manufacturers.

**Thomas Built Buses (TBB) first became aware of erratic door operation on April 20, 2005, but at the time did not understand the scope of the problem. A total of eight door operation related dealer complaints were logged through telephone conversations dated from 4/20/05 to 12/9/06. Moisture and water intrusion into driver's window was linked to performance issues with the body electrical system. As a result there were two PSB's issued. One was for resealing the driver's window and the second was for a Gel Pak to seal out any moisture that could potentially reach the switch bank. Carling's Engineering Department was contacted about switch failures on 2/5/07. TBB Engineering sent Carling Engineering samples of failed field switches 2/26/07. Carling visited TBB on 3/14/07 to provide results of their initial analysis. More switches were sent to Carling on 3/16/07. TBB performed cycle tests on new switches starting on 3/21/07 and concluding 3/29/07. Switches were shipped to Materials Evaluation and Engineering, Inc. on 4/5/07 and received were received by them on 4/10/07.**

10. Produce copies of any/all service bulletins, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Freightliner has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Freightliner is planning to issue within the next 120 days.

**See attachments 10 and 11, and files "C2 05-04 Switch Bank Gel Pak PSB.pdf", "C2 01-05 Sealing Driver's Window PSB.pdf" on enclosed compact disk.**

11. For each such document provide in responding to question 10, provide a detail explanation as to what precipitated the issuance of the service bulletin/document and its relevancy to the alleged defect.

**Reports of water intrusion from driver's window entering side switch panel precipitated the PSB for sealing the driver's window. Reports of moisture present in the switch banks precipitated the PSB for the Gel Pac. The Gel Pac goes between the smart switches and the switch bank to seal out any moisture that could potentially enter.**

12. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, Freightliner. For each such action, provide the following information:
- Action title or identifier;
  - The actual or planned start date;
  - The actual or expected end date;
  - Brief summary of the subject and objective of the action;
  - Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
  - A brief summary of the findings and/or conclusions resulting from the action.

**Action 1**

- TR TBB Feb07: Test of Failed Samples**
  - 2/28/07**
  - Unclear**
  - Test was conducted to determine the resistance values between terminals T2 and T9 that operate the door function on multiple failed samples.**
  - TBB / Carling**
  - Results varied by switch condition when received.**
- Also see Email string from Carling's Walt Sadowski.**

**Action 2**

- SLI-1448: SEM/EDS Analysis of Contacts**
- Unclear**
- 3/23/07**
- To analyze failed switch to determine the presence of any kind of contaminants on the switch contacts.**
- TBB / Carling / SEM Lab**
- Silicone lubricant mixed with hydrocarbon or polymeric contamination and salts were found present.**

**Action 3**

- a) **TBB TR-92535: Cycle Test to Determine Effects of Wear on Resistance**
- b) **3/21/07**
- c) **3/29/07**
- d) **Cycle testing three new entrance door switches to determine the effects of wear and the resulting resistance as measured between terminal T2 and T9. Switches underwent 51,000 cycles.**
- e) **TBB**
- f) **Switches remained within acceptable limits of operation during test.**

**Action 4**

- a) **TR4024-006: Carling Technologies Contact Resistance Mechanical Life test**
- b) **3/23/07**
- c) **4/9/07**
- d) **Cycle testing to determine the affects of lubricant to decrease pivot wear.**
- e) **TBB / Carling**
- f) **At 25,000 cycles group B, (current production) had actuators that felt "spongy" and one sample exhibits change in value.**

**Action 5**

**Materials Evaluation and Engineering is to conduct chemical analysis of the inside of a failed switch to determine the presence of any contaminants and their chemical composition. MEE will also conduct full failure mode analysis of a failed switch. Samples have shipped and have been received.**

For each action identified, provide copies of all documents related to the action, regardless of whether the documents are in interim, draft, or final form. Organize the documents chronologically by action.

**See attachments 12 through 17, and files "TR\_TBB\_Feb-07 (Action 1).pdf", "Walter Sadowski email.txt", "SLI - 1448 (Action 2).pdf", "TBB TR - 92535 (Action 3).doc", "TBB TR - 92535 log (Action 3).xls", and "TR4024-006 (Action 4).pdf".**

13. Describe all modifications or changes made by, or on behalf of, Freightliner in the design, material composition, manufacture, quality control, supply, or installation of the subject component, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. For each such modification or change, provide the following information:

**Smart switch bank replaced by smart switch harness**

- a. The date or approximate date on which the modification or change was incorporated into vehicle production;  
**Production changeover 9/18/2006**
- b. A detailed description of the modification or change;  
**Switch bank P/N TBB103298 was replaced by harness P/N TBB130596. P/N TBB103 is a rigid type switch bank which is capable of accepting multiple smart switches and coupling them to the Switch Hub Module (SHM) via a single**

- connector. Switch harness P/N TBB130596 has individual harness connectors for each switch which are joined into one connector to couple with the SHM.**
- c. The reason(s) for the modification or change;  
**Part availability of the switch bank P/N TBB103298.**
  - d. The part numbers (service and engineering) of the original component;  
**TBB103298, 103298**
  - e. The part number (service and engineering) of the modified component;  
**TBB130596, 130596**
  - f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;  
**P/N TBB103298 was withdrawn from production on 9/18/2006. P/N TBB103298 is still available as a service part.**
  - g. When the modified component was made available as a service component; and  
**Availability of P/N TBB130596 as a service part coincided with the production changeover on 9/18/2006.**
  - h. Whether the modified component can be interchanged with earlier production components.  
**Yes, P/N TBB103298 is interchangeable with P/N TBB 130596.**

Also, provide the above information for any modification or change that Freightliner is aware of which may be incorporated into vehicle production within the next 120 days.

- 14. Produce a sample of any replacement part or kits that have been released, or developed, by Freightliner for use in service repairs to the subject component/assembly, which relate, or may relate, to the alleged defect in the subject vehicles.  
**A sample of the Gel Pac material used in PSB C2 05-04 is enclosed along with drawing 124989. See attachment 18 and file "124989.pdf" on the enclosed compact disk.**
- 15. Provide the nomenclature for part number TBB130596. Identify where this component is used and the purpose of this component, and why dealers are replacing this part. Also, provide a detailed electrical schematic showing all electric components energized and/or de-energized during the operation of the service door. Provide a detail explanation of each component and how they are linked to the door operation.  
**Part number TBB130596 is a wiring harness for switch bank C. This component is used to connect individual smart switches to the switch hub model. Dealers are using TBB130596 as a service replacement for TBB103298. Please refer to the attachments 19 through 23 - drawings and electrical schematics numbers 106348, 125535, 119437, 126531, and 103524 - for details of the individual components and how they are linked to the door operation. Also see files "106348.pdf", "125535.pdf", "119437.pdf", "126531.pdf", and "103524.pdf" on the enclosed compact disk.**
- 16. Provide a copy of the section from the service manual applicable to the repair and maintenance of the front service door.  
**See attachments 24 through 27 and files "TBB 72.00 Front Door Service.pdf", "TBB**

**54.16 Smart Switch Service.pdf”, “TBB 54.11 Switch Hub Module Service.pdf”, and  
“TBB 54.12 Switch Expansion Module Service.pdf”**

17. State the number of each of the following that Freightliner has sold that may be used in the subject vehicles by component name, part number (both service and engineering/production), model and model year of the vehicle in which it is used and month/year of sale (*including the cut-off date for sales, if applicable*):

- a. Any kits that have been released, or developed, by Freightliner for use in service repairs to the subject component/assembly; and

**P/N TBB124989 - Gel Pac gaskets used in conjunctions with PSB C2 05-04. This part is applicable to model year 2005, 2006, 2007, and 2008 Saf-T-Liner C2 buses built prior to 9/18/2006**

Month / Year	Usage
05/06	7,216
06/06	3,958
07/06	3,818
08/06	1,045
09/06	3003
10/06	1,428
11/06	187
12/06	94
01/07	1,091
02/07	255
03/07	214
04/04	156*

\*As of 4/12/07

- b. Any replacement part that have been released, or developed, by Freightliner for use in service repairs to the subject component/assembly, and;

**None**

- c. Item covered under part number TBB130596

**P/N TBB130596 harness. This part is a direct replacement part Saf-T-Liner C2 buses built after 9/18/2006, and can be used as an optional replacement part on model year 2005, 2006, 2007, and 2008 Saf-T-Liner C2 buses built prior to 9/18/2006.**

Month / Year	Usage
11/06	3

For each component part number, provide the supplier's name, address, and appropriate point of contact (name, title, and telephone number) Also identify by make, model and model year, any other vehicles of which Freightliner is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.

**Gel Pac supplier:**  
**Precision Gasket Company**  
**5625 West 78th Street**  
**Minneapolis, MN 55439**  
**Phone 952-942-6711**

**P/N TBB 130596 Harness supplier:**  
**St. Clair Technologies**  
**845 E. Ohio #103**  
**Tucson, AZ 85714**

**These parts are not used on any other TBB Vehicles.**

18. Furnish Freightliner's assessment of the alleged defect in the subject vehicle, including:
- a. The causal or contributory factor(s);  
**Incorrect electrical signals to the door control mechanism. These faulty signals may originate in the switch, or be due to a loose connection or corrosion between the switch and the base.**
  - b. The failure mechanism(s);  
**The door control mechanism detects erratic resistance signals and inadvertently changes mode.**
  - c. The failure mode(s);  
**Doors may close or open unexpectedly without input from the driver.**
  - d. The risk to motor vehicle safety that it poses;  
**Warning lights and stop arm may shut off before students have safely boarded or exited the vehicle.**
  - e. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and  
**Entrance door would close and the light monitor (if equipped) would indicate that the warning lights had cancelled.**
  - f. The reports included with this inquiry.  
**See enclosed file "REQUEST NUMBER THREE DATA.xls" for TBB's assessment of dealer field reports.**

19. Identify what action Freightliner intends to take in this matter.  
**Thomas Built is actively pursuing the scope and root cause of the issue.**

**TBB is analyzing the effectiveness of the Gel Pac in eliminating moisture and the connection between the switch and the switch bank.**

**Switches have been and are currently being tested by TBB, switch manufacturer (Carling) as well as an independent lab. Cycle tests have been conducted by both TBB**

**and Carling to determine the affects of wear on new samples taken randomly from production. Carling has conducted chemical analysis of a faulty switch to determine if chemicals on the contacts could cause an adverse affect of switch operation. TBB has contracted an independent lab to conduct similar chemical analysis of a faulty switch as well as full failure mode analysis.**