



August 13, 2009

Jeffrey L. Quandt, Chief
Vehicle Control Division
Office of Defects Investigation
National Highway Traffic Safety Administration
1200 New Jersey Ave., S. E., Room W48-307
Washington, D.C. 20590

Dear Mr. Quandt:

At your request, GM is providing this response to the e-mail you received on May 27, 2009 from Mr. Joe Trubak.

The beginning of Mr. Trubak's e-mail reads as follows:

"As I explained to you, the purpose of my call was to express my frustration of how I thought GM was purposely misdirecting their response regarding the letter that Gay Kent sent to you dated May 13, 2009 regarding the Microheat Transient report.

Per the May 13th letter, the first M-Heat Claim is that in 2006 GM requested Microheat to increase a protection diode to 400V due to vehicle transients.

GM's response focused on a PV test issue in 2008. Everything they state in the paragraph is true. However, it is regarding a different diode change, diode D4 & D5, that has absolutely nothing to do with the Microheat test report. The Microheat Engineering Test Report specifically references components D1, Q1, C33, Q6, Q7 and D13 through D16."

General Motors' response to these comments:

GM's response did not focus nor address D4 and D5 as stated by M-Heat; our comments regarding the MH37 design were specifically for diode D1. GM's reply in the May 13th letter regarding this diode and its 400V rating was in reference to a review of the MH37 proposed design during the 2nd quarter of 2007. At that point, there were four reports of thermal issues (smoke, melted wires) with the MH35 design on GMC Acadia and Saturn Outlook vehicles and the MH37 design was a proposal by Microheat to resolve the issue. GM provided comments on the proposed MH37 electrical schematics and circuit board parts placement design changes provided by George Marutz of Microheat prior to any parts being produced. No design validation (DV) data existed for this MH37 unit, as it was simply a proposal. There would not have been any production validation (PV) data at that time. The D1 diode was recommended for replacement to a 1N4004 diode for the reason stated in the original reply of May 13, 2009 (to reduce the

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high-frequency response bandwidth). Note that diode D4 is a 15V, 500 milliwatt Zener diode which functionally cannot be replaced by a 1N4004. Diode D5 is a Schottky diode which could be replaced by a 1N4004 diode, but GM did not suggest that this diode be changed.

GM understands that the Microheat Engineering Test Report (refer to GM letter of May 13, 2009) specifically references components D1, Q1, C3, as well as Q6 and Q7 with their corresponding voltage clamp elements D13-D14 and D15-D16, respectively.

Mr. Trubak's e-mail reads:

"Furthermore, in our conversation you referenced moisture causing field issues. Up until this transient testing, all testing focused on contaminated moisture on the printed circuit board. This contaminated moisture test showed signs of copper trace etching and different component failures not present in the field failures. The Transient Test Report conclusion goes into detail comparing the field failures with the lab transient failures and their similarities."

General Motors' response to these comments:

GM had personnel from GM's Electrical System Management Team witness many of the tests that used contaminated moisture on printed circuit boards. GM's red-x testing demonstrated that the damage to the copper trace elements and other board components for the contaminated moisture tests are consistent with the field failures. In addition, similar damage would be expected from contaminated moisture tests and the unrealistic transient tests since both affect the same area of the printed circuit board.

Mr. Trubak's e-mail reads:

"The second point GM addressed is the transient on the battery (not switched) line. The GM specification calls for the transient test to be run on this line. GM's statement that they are "unaware of any warranty claims on other electronic modules related to voltage transients" is quite amazing. GM engineers requested Microheat to increase the input diode D1 voltage rating to 400 volts in 2006 because they were experiencing other field failures."

General Motors' response to these comments:

GM does recognize transients exist on battery lines and this is comprehended in the GMW3097 EMC specification. However, the transients injected by Microheat (-400v, 4 ohm, pulse #1) were significantly higher energy than the GM validation requirements and what is typical of vehicle transients on battery lines. The intent of the original wording in GM's letter of May 13, 2009 was that if it assumed that these alleged transients, as suggested by Microheat, exist on these vehicles, we (GM) would expect to find instances of other electronic module failures for these same vehicles because those other modules were not designed for this -400 volt transient as imposed on the Microheat module during their testing. These other modules should be exposed to the same alleged transients at some point in the life of the vehicle. As stated, GM is not aware of such warranty claims for these affected vehicles.

Mr. Trubak's e-mail reads:

"GM personnel and the NHTSA web site state that GM has numerous unwanted activations of heaters, windows, seats, etc., and fires that they can't explain. All of these could be a result of a transient issue. In addition, in the past Microheat was accused of a GM vehicle fire that ultimately was determined to be caused by the Bussed Electrical Center (BEC). This particular device is mounted within inches of the heated wash unit in the vehicle. This BEC device is full of high current circuits with a multilayer printed circuit board and I would assume susceptible to transients."

General Motors' response to these comments:

GM investigated an incident at the Milford Proving Grounds that was first thought to be related to the heated washer fluid system (HWFS) module. After the vehicle was inspected by Field Performance Analysis engineers, the fire was determined to be due to a chafed wire on the fender inner flange, which is in close proximity to the BEC. This issue had nothing to do with the BEC itself. GM provided information regarding this incident to the NHTSA during the investigation of PE08-010. As of this date, GM is not aware of any fires that have originated at the BEC.

Mr. Trubak's e-mail reads:

"Although I do not have access to the actual cause of each vehicle fire, in GM's conclusion they refer to Microheat's (non-conclusive) failures as a trend while they appear to ignore "miscellaneous electrical systems" and "unknown" as possible transient failure modes."

General Motors' response to these comments:

As explained in GM's May 13, 2009 letter, during the NHTSA investigation, GM identified 41 reports of underhood fire incidents in the nearly 2.5 million subject vehicles and 64 reports of underhood fire incidents in over one million peer vehicles. These reports alleged multiple causes for underhood fires including: engine oil, transmission oil, coolant, gasoline, power steering fluid, heated washer fluid module, miscellaneous electrical systems, wire chaffing, non-GM installed aftermarket accessories and unknown. With the exception of the HWFS, no additional trends were found.

Mr. Trubak's e-mail reads:

"GM's closing statement, "To date, GM has not identified any additional underhood fires related to the HWFS module on GMT900 vehicles in which the recall service was performed." is extremely narrow. Some questions that I would like to see answers to are: How many vehicles had the recall service? Why did they only mention GMT900, what about the other platforms that had the recall service? Being that the actual recall fix of adding the fuse only protects the vehicle wire harness, the heated wash unit should still short and fail. On vehicles that had the recall service performed, did any of the heated wash units fail? Most importantly, did they have additional incidences on vehicles without heated wash?"

General Motors' response to these comments:

As of June 30, 2009, the completion rate for recall 08V-441 is 73% out of 858,852 vehicles. This included the following vehicles with the HWFS:

- 2006-2008 MY Buick Lucerne, Cadillac DTS, Hummer H2
- 2007-2008 MY Cadillac Escalade, Chevrolet Avalanche, Chevrolet Silverado, Chevrolet Suburban, Chevrolet Tahoe, GMC Acadia, GMC Sierra, GMC Yukon, Saturn Outlook
- 2008 MY Buick Enclave

Conclusion:

GM maintains that the conclusions and field remedy that resulted from the original investigation are correct.

Sincerely,



Gay P. Kent
Director
Product Investigations