



GENERAL MOTORS LLC
Global Interior and Safety Center

June 22, 2012

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

N120081

NVS-213krh
PE12-010
Complete

Dear Mr. Quandt:

This letter completes General Motors (GM) response to your Preliminary Evaluation (PE), received on April 10, 2012, regarding allegations of fires originating in the engine compartment in model year (MY) 2011 through 2012 Chevrolet Cruze vehicles manufactured by General Motors Corporation and to request certain information.

GM sent a response dated May 11, 2012, to requests 1-6 and 8-11. This letter responds to requests 7 and 12.

Your requests and our corresponding replies are as follows:

7. 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 that have been conducted, are being conducted, are planned, or are being planned by, or for, GM. For each such action, provide the following information:

- a. Action title or identifier;
- b. The actual or planned start date;
- c. The actual or expected end date;
- d. Brief summary of the subject and objective of the action;
- e. Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
- f. A brief summary of the findings and/or conclusions resulting from the action.

The response to this request should include a detailed description of all past, present and future actions by any and all engineering working groups (e.g., engine damage task force) of which GM is an active member or is otherwise aware. This includes, at a minimum, all of the information requested in items "a" through "f."



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.

The requested information and the location of the responsive documentation, is contained on the ATT_1_GM disk; folder labeled "Q_07", in the file named "Q_07 Actions".

General Motors requested assistance and documents from suppliers in responding to this request. Documents and supporting information, including those received from suppliers, are included in the Attachments as noted in the Q_07 Actions file.

12. Furnish GM's assessment of the alleged defect in the subject vehicle, including:

- a. **The causal or contributory factor(s);**
- b. **The failure mechanism(s);**
- c. **The failure mode(s);**
- d. **The risk to motor vehicle safety that it poses;**
- 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**

The information provided in response to request 7 also contains the responsive information to this request.

On June 19, 2012, General Motors decided to conduct a Safety Recall to modify the engine shield. The Part 573 letter to the NHTSA dated June 21, 2012, contained on the ATT_1_GM disk, in the folder labeled "Q_12", also contains responsive information.

* * *

General Motors requested assistance and documents from suppliers in responding to request 7 and this response includes all of the information and documents received from suppliers as of June 20, 2012.

This response is based on searches of GM locations where documents determined to be responsive to your request would ordinarily be found. As a result, the scope of this search did not include, nor could it reasonably include, "all of its divisions, subsidiaries (whether or not incorporated) and affiliated enterprises and all of their headquarters, regional, zone and other offices and their employees, and all agents, contractors, consultants, attorneys and law firms and other persons engaged directly or indirectly (e.g., employee of a consultant) by or under the control of GM (including all business units and persons

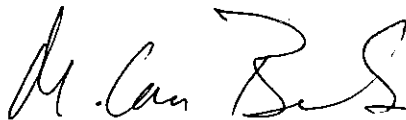
previously referred to), who are or, in or after January 1, 2000, were involved in any way with any of the following related to the alleged defect in the subject vehicles:

- a. Design, engineering, analysis, modification or production (e.g. quality control);
- b. Testing, assessment or evaluation;
- c. Consideration, or recognition of potential or actual defects, reporting, record-keeping and information management, (e.g., complaints, field reports, warranty information, part sales), analysis, claims, or lawsuits; or
- d. Communication to, from or intended for zone representatives, fleets, dealers, or other field locations, including but not limited to people who have the capacity to obtain information from dealers."

This response was compiled and prepared by this office upon review of the documents produced by various GM locations, and does not include documents generated or received at those GM locations subsequent to their searches.

Please contact me if you require further information about this response or the nature or scope of our searches.

Sincerely,



M. Carmen Benavides, Director
Product Investigations and Safety Regulations

Attachments

PE12-010 Request 7 Response

7. 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 that have been conducted, are being conducted, are planned, or are being planned by, or for, GM. For each such action, provide the following information:

- a. Action title or identifier;
- b. The actual or planned start date;
- c. The actual or expected end date;
- d. Brief summary of the subject and objective of the action;
- e. Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
- f. A brief summary of the findings and/or conclusions resulting from the action.

The response to this request should include a detailed description of all past, present and future actions by any and all engineering working groups (e.g., engine damage task force) of which GM is an active member or is otherwise aware. This includes, at a minimum, of all of the information requested in items "a" through "f".

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.

Action 7-1: 2011-2012 Chevrolet Cruze Issue SharePoint Database

Start Date: April 9, 2012

End Date: April 30, 2012

Objective of Action: GM records containing an allegation of a fire based on the meaning found in 49CFR579.4, related to 2011-12 MY Chevrolet Cruze vehicles were gathered and included in the referenced SharePoint Access data base for investigation, evaluation and resolution.

Engineering Group: GM Global Engineering; General Motors North American (GMNA) GM Compact Car Engineering, GM Powertrain Family 0 Engine Engineering, GM Powertrain Family 1 NA Region Engine Engineering, GM Powertrain GF6 Automatic Transmission Engineering, GM Powertrain DTC Manual Transmission Engineering, GM Chassis and Accessories Brake System Engineering, GMNA Interior and Safety Engineering, GM Body, Exterior and Dimensional Engineering, GM Chassis/Thermal Chassis/HVAC Engineering, GM Global Compact Car Architecture/PSDS Engineering, GM Product Investigation, Safety Certification and Regulation and Field Performance.

Attachments: ATT_1_GM_ disk; folder labeled "Q_7-1".

Summary of findings: GM records contained in the SharePoint database were reviewed and evaluated by the System Management Team (SMT) responsible for the particular vehicle partition involved.

Action 7-2: Field Performance Assessment (FPA) root cause investigation, experimentation and evaluation of some vehicles with under hood fire allegation.

Start Date: February 15, 2011

End Date: Continuing

Objective of action: To investigate, evaluate and analyze information, vehicles and vehicle components to identify the root cause for subject vehicle engine compartment fire allegations.

Engineering Group: GM Field Performance Assessment, GM Powertrain Engineering, GM Vehicle Performance and Vehicle Development Engineering.

Attachments: ATT_1_GM_ disk; folder labeled "Q_7-2",
ATT_2_GM_ CONF disk; folder labeled "Q_7-2"

Summary of findings: GM utilized this information as well as information from actions 7-3 through 7-5 to identify the root causes. As a result GM developed a corrective action to modify the engine shield and the service procedure for engine oil change.

Action 7-3: Evaluation of missing and partially installed oil fill caps, 1.4L and 1.8L engines.

Start Date: April 13, 2012

Start Date: April 20, 2012

Objective of action: Determine how much, if any, oil may be expelled when the oil fill cap is missing or improperly installed while the engine is running and the vehicle is being driven.

Engineering Group: GM Field Performance Assessment, GM Powertrain Engineering, GM Vehicle Performance and Vehicle Development Engineering.

Attachments: ATT_1_GM_disk; folder labeled "Q_7-3",
ATT_2_GM_CONF disk; folder labeled "Q_7-3".

Summary of findings: There was no oil expulsion with an improperly partially installed oil cap. Partially installed oil caps did not loosen or fall off while being evaluated on any of the vehicle driving schedules. A partially installed or missing oil cap will illuminate an SES light.

There was more oil expelled when the vehicle was driven on the vehicle driving schedules, with no oil cap installed (missing), than when no oil cap was installed during engine dynamometer tests.

GM utilized this information to identify root cause associated with the alleged defect and to develop a corrective action to modify the engine shield.

Action 7-4: Assessment of oil filter service/oil change procedures to identify and understand failures modes/mechanisms including the effects of oil that may collect on engine shield.

Start Date: April 13, 2012

End Date: June 15, 2012

Objective of action: Evaluate oil filter service/change procedures failure modes and mechanisms, including those that may be related to the oil filter cap improper removal and re-installation, missing or improperly installed O-rings, improper tightening of oil filter cap and over-tightening of oil filter cap.

Determine how much, if any, oil may leak due to each of the failure modes/mechanisms related to oil filter service/change and understand the effect on vehicle performance as a result.

Engineering Group: GM Field Performance Assessment, GM Powertrain Engineering, GM Vehicle Performance and Vehicle Development Engineering.

Attachments: ATT_1_GM_disk; folder labeled "Q_7-4"
ATT_2_GM_CONF disk; folder labeled "Q_7-4".

Summary of findings: A missing O-ring allows expulsion of fluid under pressure that may contact the engine block, exhaust manifold and/or catalytic converter. A mis-installed O-ring, or untightened/unseated filter cap, may allow low pressure leakage from the cap flange; the oil may flow down the outside wall of the oil filter housing and drip onto the vehicle engine shield and/or the exhaust downpipe. The filter cap will break at 180 Nm. The tightening specification of the oil filter cap is 25 Nm; typical failure mode is cracking at the base of the hex feature where it meets the cap.

Oil was poured onto the engine shield until it was observed dripping from the shield. Due to drainage, oil would continue to drip off of the engine shield for some time. The testing occurred after drainage had stopped. Under numerous driving conditions (side wind, rear wind etc.) and road surfaces, GM was unable to demonstrate that oil collected on the engine shield pan can contact a hot surface and ignite. GM utilized this information to develop a corrective action to modify the engine shield and the service procedure for engine oil change.

Action 7-5: Worn clutch evaluation on manual transmissions.

Start Date: April 13, 2012

End Date: April 27, 2012

Objective of action: Deliberately wear off all clutch friction material to determine effect of vehicle performance. Evaluate various engine shield configurations and wiring harness modifications by introducing hydraulic fluid with a dye into the bell housing while driving the vehicle under various conditions and road surfaces that identified the impingement patterns of the hydraulic fluid that may exit the transmission bell housing through the drain hole.

Engineering Group: GM Field Performance Assessment, GM Powertrain Engineering, GM Vehicle Performance and Vehicle Development Engineering.

Attachments: ATT_2_GM_CONF disk; folder labeled "Q_7-5".

Summary of findings: Simulating abuse needed to wear all friction material from a clutch, GM was able to recreate the loss of hydraulic fluid (brake fluid) resulting from clutch caused by continued abuse of a completely worn clutch. The fluid ignited on a single dynamometer test; however, smoke only was produced on another dynamometer test. The fluid did not ignite on any vehicle tests. Most fluid impingement was on metallic surfaces aft of the engine and transmission location. An engine shield configuration and wiring harness modification was evaluated that ensured no fluid would impinge on any plastic surfaces. GM utilized this information to develop a corrective action to modify the engine shield.

Action 7-6: GM Powertrain Family 0 and Family 1 NA Region Engine Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into the SharePoint Access data base created on April 9, 2012.

Start Date: April 9, 2012

End Date: June 15, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Powertrain Engine Engineering SMTs.

Engineering Group: GM Powertrain Family 0 and Family 1 NA Region Engine Engineering.

Attachments: ATT_1_GM_disk; folder labeled "Q_07-6",
ATT_2_GM_CONF disk; folder labeled "Q_07-6".

Summary of findings: Actions were taken to review each issue identified. The service procedure for engine oil change was modified.

Action 7-7: GM Chassis and Accessories Brake System Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into the SharePoint Access data base created on April 9, 2012.

Start Date: April 9, 2012

End Date: April 27, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Chassis and Accessories Brake System Engineering SMT.

Engineering Group: GM Chassis and Accessories Brake System Engineering.

Attachments: ATT_2_GM_CONF disk; folder labeled "Q_07-7".

Summary of findings: Actions were taken to review each issue identified. There were no issues found that related to the alleged defect.

Action 7-8: GM Body, Exterior and Dimensional Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into the SharePoint Access data base created on April 9, 2012.

Start Date: October 16, 2011

End Date: June 11, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Body, Exterior and Dimensional Engineering SMT.

Engineering Group: GM Body, Exterior and Dimensional Engineering.

Attachments: ATT_1_GM_disk; folder labeled "Q_07-8",
ATT_2_GM_CONF disk; folder labeled "Q_07-8".

Summary of findings: Actions were taken to review each issue identified that resulted in modifications to the engine shield.

Action 7-9: GM Chassis/Thermal Chassis/HVAC Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into the SharePoint Access data base created on April 9, 2012.

Start Date: April 9, 2012

End Date: April 27, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Chassis/Thermal Chassis/HVAC Engineering SMT.

Engineering Group: GM Chassis/Thermal Chassis/HVAC Engineering, Delphi Corporation, KRAH Gruppe, Robert Bosch GmbH, Cooper-Standard Automotive, Inc., Sensta Technologies, Inc.

Attachments: ATT_1_GM_disk; folder labeled "Q_07-9",
ATT_2_GM_CONF disk; folder labeled "Q_07-9",
ATT_3_DELPHI_CONF disk; folder labeled "Q_07-9",
ATT_5_KRAH_GRUPPE_CONF disk; folder labeled "Q_07-9",
ATT_6_BOSCH_GmbH_CONF disk; folder labeled "Q_07-9",
ATT_7_COOPER_STANDARD_CONF disk; folder labeled "Q_07-9",
ATT_8_SENSATA_CONF, folder labeled "Q_07-9".

Summary of findings: Actions were taken to review each issue identified. No issues were identified that could lead to engine compartment fires.

Action 7-10: GM Powertrain GF6 Automatic Transmission Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into the SharePoint Access data base created on April 9, 2012, including failure or malfunction of the Transmission Electro Hydro Control Module (TECHM).

Start Date: April 9, 2012

End Date: April 27, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Powertrain GF6 Automatic Transmission Engineering SMT.

Engineering Group: GM Powertrain GF6 Automatic Transmission Engineering.

Attachments: ATT_1_GM_ disk; folder labeled "Q_07-10",
ATT_2_GM_CONF disk; folder labeled "Q_07-10",

Summary of findings: Actions were taken to review each issue identified. It was concluded that failure or malfunction of the TECHM is not a contributing factor to any alleged subject vehicle engine compartment fires.

Action 7-11: GM Global Compact Car Architecture/PSDS Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into the SharePoint Access data base created on April 9, 2012, including failure or malfunction of the fuse block.

Start Date: April 9, 2012

End Date: April 27, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Global Compact Car Architecture/PSDS Engineering SMT.

Engineering Group: GM Global Compact Car Architecture/PSDS Engineering, Delphi Corporation, Johnson Controls Battery Group.

Attachments: ATT_1_GM_ disk; folder labeled "Q_07-11",
ATT_2_GM_CONF disk; folder labeled "Q_07-11",
ATT_4_JOHNSON_CONTROLS_CONF disk, folder labeled "Q_07-11",
ATT_3_DELPHI_CONF disk, folder labeled "Q_07-11".

Summary of findings: Actions were taken to review each issue identified. It was concluded that failure or malfunction of the fuse block is not a contributing factor to any alleged subject vehicle engine compartment fires.

Action 7-12: GM Powertrain DTC Manual Transmission Engineering investigation, evaluation and resolution of items that were identified in the TREAD database and inserted into in the SharePoint Access data base created on April 9, 2012.

Start Date: April 9, 2012

End Date: April 27, 2012

Objective of Action: To investigate, evaluate and resolve issues identified by the GM records and warranty claims contained in the SharePoint Access data base on April 9, 2012, that are encompassed within the responsibility of the GM Powertrain DTC Manual Transmission Engineering SMT.

Engineering Group: GM Powertrain DTC Manual Transmission Engineering, FTE Automotive USA, Inc., LuK GmbH & Co. KG, LuK USA LLC.

Attachments: ATT_1_GM_ disk; folder labeled "Q_07-12",
ATT_2_GM_CONF disk; folder labeled "Q_07-12",
ATT_9_FTE_CONF disk, folder labeled "Q_07-12",
ATT_10_LUK_CONF disk, folder labeled "Q_07-12".

Summary of findings: Actions were taken to review each issue identified that resulted in the issue being understood. GM utilized this information as well as information from actions 7-2 through 7-5 to identify the root causes and potential improvements. As a result GM developed a corrective action to modify the engine shield and add protective tape to the power steering wiring harness.



June 21, 2012

Ms. Nancy Lewis
Associate Administrator for Enforcement
National Highway Traffic Safety Administration
Recall Management Division (NVS-215)
1200 New Jersey Avenue, SE – Room W45-306
Washington, DC 20590

Dear Ms. Lewis:

The following information is submitted pursuant to the requirements of 49 CFR 573.6 as it applies to a determination by General Motors to conduct a safety related recall for certain 2011-2012 model year Chevrolet Cruze vehicles.

573.6(c)(1): Chevrolet Brand of General Motors Company

573.6(c)(2)(3)(4): This information is shown on the attached sheet.

573.6(c)(5): General Motors has decided that a defect, which relates to motor vehicle safety, exists in certain 2011 and 2012 model year Chevrolet Cruze vehicles. Improper engine oil change procedures on these vehicles can result in the spilling or dripping of oil. If oil contacts hot engine or exhaust system surfaces, and the engine shield, the shield may ignite and burn, resulting in a possible engine compartment fire.

In addition, on manual transmission vehicles, continuing to drive with a completely worn clutch may cause hydraulic fluid to be expelled from the clutch housing vent hole. Under certain circumstances, the fluid could be burning as it exits the vent hole. If the burning fluid contacts the engine shield, the shield may ignite and burn, resulting in a possible engine compartment fire.

573.6(c)(6): On March 29, 2012, GM received NHTSA PE12-010 to investigate allegations of fire or smoke from the engine compartment. The resulting investigation by GM identified the two potential root causes, as described in paragraph 573.6(c)(5).

The issue was presented to the Field Performance Evaluation Review Committee and on June 19, 2012, the Executive Field Action Decision Committee decided to conduct a safety recall.

573.6(c)(8): Dealers are to modify the engine shield to prevent fluid from contacting the shield. Also, on vehicles with a manual transmission, dealers are to apply a protective tape to the electronic power steering wire harness.



GM anticipates sending the dealer bulletin on June 22, 2012 and mailing owner letters on July 11, 2012.

Pursuant to 577.11(e), GM does not plan to provide notice about reimbursement to owners because all involved vehicles are covered under the new vehicle warranty.

573.6(c)(10): GM will provide copies of the dealer bulletin and owner letter under separate cover.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Carmen Benavides". The signature is fluid and cursive, with a large initial "M" and a stylized "B" at the end.

M. Carmen Benavides, Director
Product Investigations and Safety Regulations

12081
Attachment

573.6(c)(2),(3),(4)

**VEHICLES POTENTIALLY AFFECTED BY MAKE, MODEL, AND MODEL YEAR
PLUS INCLUSIVE DATES OF MANUFACTURE**

<u>MAKE</u>	<u>MODEL SERIES</u>	<u>MODEL YEAR</u>	<u>NUMBER INVOLVED</u>	<u>INCLUSIVE MANUFACTURING DATES (FROM)</u>	<u>(TO)</u>	<u>DESCRIPTIVE INFO. TO PROPERLY IDENT. VEH.</u>	<u>EST. NO. W/CONDITION</u>
Chevrolet	P	2011	177,403	10/02/2009	06/20/2011	Cruze	*
Chevrolet	P	2012	235,745	02/08/2011	05/31/2012	Cruze	"
GM Total:			413,148				

* All involved vehicles will be corrected as necessary.

573.6(c)(2)(iv): GM has not identified a defect in the engine shield. However, since the engine shield is the component that is being modified GM is supplying the name of the supplier.

Supplier: Hanwha
Contact Name: Jaeho Lim
Phone: 82-2-729-2869
EMAIL: abaz1027@hanwha.co.kr
Country of Origin: Korea