



GENERAL MOTORS CORPORATION

Vehicle Structure & Safety Integration

April 17, 2009

Thomas Z. Cooper, Chief
Vehicle Integrity Division
Office of Defects Investigation
National Highway Traffic Safety Administration
1200 New Jersey Ave., S. E., Room W46-409
Washington, D.C. 20590

N090049

NVS-212.pco
RQ09-001

Dear Mr. Cooper:

This letter is General Motors (GM) response to your recall query (RQ), dated February 25, 2009, to investigate allegations of failure of the brake lamps (including the center high-mounted stop lamp) to illuminate or the failure of the cruise control to disengage when the brake pedal is depressed that lead to the replacement of the brake lamp switch. NHTSA defines the subject vehicles to include the following vehicles manufactured by GM for sale or lease in the United States; model year (MY) 2004-2006 Colorado/Canyon light duty truck vehicles, MY 2006 Isuzu I280/I350 and other GM and Isuzu vehicles equipped with the recall remedy brake lamp switch used in 06V-139.

Since additional MY vehicles also used the recall remedy brake switch, the subject vehicles for which GM is providing information are certain 2004-2009 MY Chevrolet Colorado/GMC Canyon and 2006-2008 MY Isuzu I-280/I-290/I-350/I-370 pickup trucks manufactured for sale or lease in the United States.

Your questions and our corresponding replies, including the information provided by Isuzu Motors America, are as follows:

1. State within the body of the response letter, by model and model year, the total number of subject vehicles GM has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by GM, state the following:
 - a. Make;
 - b. Model (also tagged as I-280/I-350 if available);
 - c. Model Year;
 - d. Vehicle identification number (VIN);
 - e. Date of manufacture (in "yyyy/mm/dd" date format);
 - f. Date warranty coverage commenced (in "yyyy/mm/dd" date format) or "Unsold" if not sold;
 - g. The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease);
 - h. If brake lamp switch was replaced under Recall 06V-139; and
 - i. Date brake lamp switch was replaced with Recall 06V-139 (in "yyyy/mm/dd" date format).

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

Product Investigations

Mail Code: 480-210-G11 • 30001 Van Dyke • Warren, MI 48090
RQ09-001 N090049 IR Response.docx

General Motors is providing the number of subject vehicles produced for sale or lease in the United States, as of March 10, 2009, by make, model and model year in Table 1-1 below:

MAKE/MODEL	2004 MY	2005 MY	2006 MY	2007 MY	2008 MY	2009 MY	TOTAL
Chevrolet Colorado	71,840	109,469	73,233	70,458	67,054	19,163	411,217
GMC Canyon	16,734	32,041	18,916	18,127	18,050	5,913	109,781
TOTAL	88,574	141,510	92,149	88,585	85,104	25,076	520,998

TABLE 1-1 GM SUBJECT VEHICLE PRODUCTION

The GM production information requested in 1a-1i is provided on the Att_1_GM disk in the folder labeled "Q_01" refer to the Microsoft Access 2000 file labeled, "Q_01_PRODUCTION DATA". The date format is the defined Microsoft Access date format. GM is providing the state where the vehicle was shipped in response to request 1g. For some of the subject vehicles, which have incomplete warranty files, the GM warranty system does not contain a warranty start date or state where the vehicle was shipped and, therefore, these fields are blank in the Microsoft Access 2000 file.

Isuzu Motors America (Isuzu) is providing the number of subject vehicles produced for sale or lease in the United States, as of March 26, 2009, by make, model and model year in Table 1-2 below:

Make/Model	2004 MY	2005 MY	2006 MY	2007 MY	2008 MY	2009 MY	Total
Isuzu I280/I290	N/A	N/A	2,574	3,290	2,308	N/A	8,172
Isuzu I350/I370	N/A	N/A	647	824	669	N/A	2,140
TOTAL	N/A	N/A	3,221	4,114	2,977	N/A	10,312

TABLE 1-2 ISUZU SUBJECT VEHICLE PRODUCTION
N/A – NOT APPLICABLE

The production information requested in 1a-1i that has been provided by Isuzu is contained on the Att_3_Isuzu disk in the folder labeled "Q_01" refer to the Microsoft Access 2000 file labeled, "Q_01_ISUZU PRODUCTION DATA". The date format is the defined Microsoft Access date format. GM is providing the data as received from Isuzu in response to GM's request for assistance responding to this IR.

2. State within the body of the response letter, the number of each of the following, received by GM, or of which GM is otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles:
 - a. Consumer complaints, including those from fleet operators;
 - b. Field reports, including dealer field reports;
 - c. Reports involving a crash/fire, 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;
 - d. Property damage claims (including own vehicle); and
 - e. Third-party arbitration proceedings where GM is or was a party to the arbitration; and
 - f. Lawsuits, both pending and closed, in which GM is or was a defendant or codefendant.

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). Identify reports that are a duplicate report with other manufacture reports/claims or with other ODI reports/claims.

In addition, for subparts "d" through "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.

Table 2-1 below summarizes GM records that may relate to the alleged defect. GM has organized the records by the GM file number within each attachment.

TYPE OF REPORT	GM REPORTS	SUBCATEGORIES			
		CORRESPONDING TO NHTSA REPORTS	NUMBER WITH PROPERTY DAMAGE	NUMBER WITH CRASH	NUMBER WITH INJURIES/ FATALITIES
Owner Reports	72	0	0	0	0
Field Reports	27	0	0	0	0
Not-In-Suit Claims	0	0	0	0	0
Subrogation Claims	0	0	0	0	0
Third Party Arbitration Proceedings	0	0	0	0	0
Product Liability Lawsuits	0	0	0	0	0
Total Reports	99	0	0	0	0
Total Vehicles with Reports (Unique VIN)	97	0	0	0	0

TABLE 2-1: GM SUBJECT VEHICLE - MAY RELATE TO ALLEGED DEFECT - REPORT CLASSIFICATION

Table 2-2 below summarizes the Isuzu records that may relate to the alleged defect provided by Isuzu Motors America, Inc. GM has organized the records by the Isuzu file number within each attachment.

TYPE OF REPORT	ISUZU REPORTS	SUBCATEGORIES			
		CORRESPONDING TO NHTSA REPORTS	NUMBER WITH PROPERTY DAMAGE	NUMBER WITH CRASH	NUMBER WITH INJURIES/ FATALITIES
Owner Reports	16	0	0	0	0
Field Reports	6	0	0	0	0
Not-In-Suit Claims	0	0	0	0	0
Subrogation Claims	0	0	0	0	0
Third Party Arbitration Proceedings	0	0	0	0	0
Product Liability Lawsuits	0	0	0	0	0
Total Reports	22	0	0	0	0
Total Vehicles with Reports (Unique VIN)	21	0	0	0	0

TABLE 2-2: ISUZU SUBJECT VEHICLE - MAY RELATE TO ALLEGED DEFECT - REPORT CLASSIFICATION

The sources of the requested information and the last date the searches were conducted are tabulated in Table 2-3 below.

SOURCE SYSTEM	LAST DATE GATHERED
Customer Assistance Center	3/09/2009
Technical Assistance Center	3/18/2009
Field Information Network Database (FIND)	3/13/2009
Field Product Report Database (FPRD)	3/11/2009
Company Vehicle Evaluation Program (CVEP)	3/10/2009
Captured Test Fleet (CTF)	3/10/2009
Early Quality Feedback (EQF)	3/10/2009
Legal / Employee Self Insured Services (ESIS)/Product Liability Claims/ Lawsuits	3/13/2009
Isuzu Motors America, Inc Customer Relations Tracking System(CATS)	3/19/2009
Isuzu Motors America, Inc Product Legal	3/17/2009
Isuzu Motors America, Inc Technical Assistance Line (TAL)	4/08/2009

TABLE 2-3: DATA SOURCES

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. GM'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 and model year;

- f. Vehicle's mileage at time of incident;
- g. Incident date (in "yyyy/mm/dd" date format);
- h. Report or claim date (in "yyyy/mm/dd" date format);
- i. Whether a crash is alleged;
- j. Whether property damage is alleged;
- k. Number of alleged injuries, if any;
- l. Number of alleged fatalities, if any; and
- m. Identify reports that are a duplicate report with other manufacture reports/claims or with other ODI reports/claims.

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

The requested GM information is provided on the Att_1_GM disk in the folder labeled "Q_03"; refer to the Microsoft Access 2000 file labeled, "Q_03_REQUEST NUMBER TWO DATA". Some incident reports may not contain sufficient reliable information to accurately answer all parts of question 3.

The requested Isuzu information as provided by Isuzu is contained on the Att_3_Isuzu disk in the folder labeled "Q_03" refer to the Microsoft Access 2000 file labeled, "Q_03_ISUZU REQUEST NUMBER TWO DATA". GM is providing the data as received from Isuzu in response to GM's request for assistance responding to this IR.

- 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 GM used for organizing the documents.**

Copies of the records summarized in Table 2-1 are on the Att_1_GM disk embedded in the folder labeled "Q_03"; refer to the Microsoft Access 2000 file labeled, "Q_03_REQUEST NUMBER TWO DATA". GM has organized the records by the GM file number within each attachment.

The Isuzu records summarized in Table 2-2 are on the Att_3_Isuzu disk in the folder labeled "Q_03" refer to the files labeled, "Q_03_ISUZU CATS DATA", and "Q_03_ISUZU TAL DATA". GM is providing the data as received from Isuzu in response to GM's request for assistance responding to this IR.

- 5. State within the body of the response letter, by model and model year, a total count for all of the following categories of claims, collectively, that have been paid by GM to date that relate to, or may relate to, the alleged defect in the subject vehicles: warranty claims; extended warranty claims; claims for good will services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.**

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

- a. GM's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. VIN;
- d. Repair date (in "dd/mm/yyyy" date format);
- e. Vehicle mileage at time of repair;
- f. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;
- g. Labor operation number;
- h. Problem code;

- i. Replacement part number(s) and description(s);
- j. Concern stated by customer; and
- k. Comment, if any, by dealer/technician relating to claim and/or repair.

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

Table 5-1 summarizes the GM regular warranty and Table 5-2 summarizes the MIC and UWC service contract claims for the GM subject vehicles that were collected by searching the labor codes that are related to the alleged defect.

Table 5-3 summarizes the Isuzu regular warranty claims for the Isuzu subject vehicles that were collected by searching for any and all claims that included the subject component part number as a replacement part. MIC and UWC did not identify any service contract claims that may be related to the alleged defect for Isuzu subject vehicles.

A summary of the GM warranty claims and MIC/UWC service contract claims for GM vehicles, including the information requested in 5(a-k), is provided on the Att_1_GM disk in the folder labeled "Q_05"; refer to the Microsoft Access 2000 file labeled, "Q_05_GM WARRANTY DATA".

A summary of the Isuzu warranty claims, including the information requested in 5(a-k), is provided on the Att_3_Isuzu disk in the folder labeled "Q_05"; refer to the Microsoft Access 2000 file labeled, "Q_05_ISUZU WARRANTY DATA".

MAKE/MODEL	2004	2005	2006	2007	2008	2009	TOTAL
Chevrolet Colorado	248	846	1,301	1,431	286	3	4,115
GMC Canyon	46	230	340	330	69	0	1,015
TOTAL	294	1,076	1,641	1,761	355	3	5,130

TABLE 5-1 GM REGULAR WARRANTY CLAIMS

MAKE/MODEL	2004	2005	2006	2007	2008	2009	TOTAL
Chevrolet Colorado	60	102	49	3	0	0	214
GMC Canyon	10	35	12	0	0	0	57
TOTAL	70	137	61	3	0	0	271

TABLE 5-2 MIC AND UWC SERVICE CONTRACT CLAIMS FOR GM VEHICLES

MAKE/MODEL	2006	2007	2008	TOTAL
Isuzu I280/I290	62	49	9	120
Isuzu I350/I370	13	26	2	41
TOTAL	75	75	11	161

TABLE 5-3 ISUZU REGULAR WARRANTY CLAIMS

The sources of the requested information and the last date the searches were conducted are tabulated in Table 5-4 below.

SOURCE SYSTEM	LAST DATE GATHERED
GART - Regular Warranty	3/20/2009
Motors Insurance Corporation (MIC) - Service Contract Claims	3/10/2009
Universal Warranty Corporation (UWC) - Service Contract Claims	3/10/2009
Isuzu Motors America - Light Vehicle Warranty Data Warehouse	4/13/2009

TABLE 5-4: DATA SOURCES

For this response, GM searched the GM Global Analysis and Reporting Tool (GART-regular warranty), the Motors Insurance Corporation (MIC- service contract claims), and the Universal Warranty Corporation (UWC- service contract claims) databases to collect the GM vehicle warranty data and Isuzu searched the Isuzu Motors America Light Vehicle Warranty Data Warehouse. The warranty data was last gathered on the dates indicated in Table 5-4.

GM's warranty database does not contain the vehicle owner's name or telephone number. Some of the replacement part numbers; part descriptions and customer concern code descriptions are not included in the GM warranty database. GM is providing a field labeled "Verbatim Text". The verbatim text is an optional field in the GM warranty system for the dealer to enter any additional comments that may be applicable to the warranty claim. The verbatim text field is not required to be completed for every warranty claim.

The MIC- service contract claims database does not contain the vehicle owner information. The UWC extended warranty system does not use the GM labor code or labor code description and it does not contain the repairing dealer code, trouble code or trouble code description.

The warranty data provided has limited analytical value in analyzing the field performance of a motor vehicle component. The warranty records do not contain sufficient information to establish the condition of the part at the time of the warranty correction and service personnel may not consistently use the appropriate labor and trouble codes. Warranty numbers represent claims by our dealers for reimbursement for parts and labor costs incurred in performing warranty service for our customers.

6. Describe in detail the search criteria used by GM to identify the claims identified in response to Request 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 (including the subject component) offered by GM 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 GM 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.

NHTSA defines the subject vehicles to include the following vehicles manufactured by GM for sale or lease in the United States; model year (MY) 2004-2006 Colorado/Canyon light duty truck vehicles, MY 2006 Isuzu I280/I350 and other GM and Isuzu vehicles equipped with the recall remedy brake lamp switch used in 06V-139. The 2007-2009 MY Chevrolet Colorado/GMC Canyon vehicles and the 2007-2008 MY Isuzu I290/I370 vehicles were equipped with the recall remedy brake lamp switch when built.

The recall remedy brake lamp switch used in 06V-139 was available to dealers for service beginning on October 20, 2006. Consequently, for the 2004-2006 MY Colorado/Canyon vehicles and the 2006 MY Isuzu I280/I350 vehicles brake lamp switch replacement warranty

repairs, prior to October 20, 2006, did not use the recall remedy brake lamp switch (subject component). The GM warranty database may contain a warranty claim for replacement of the brake lamp switch in some of the subject vehicles prior to October 20, 2006. However the brake lamp switch replaced was not the recall remedy brake lamp switch, consequently, GM is not providing those claims in this response.

GM is providing the GM and Isuzu warranty claims, MIC service contract claims and UWC service contract claims for the subject vehicles equipped with the subject component that may be related to the alleged defect.

To search for and collect the GM warranty data for this response, the GM Global Analysis and Reporting Tool (GART-regular warranty) regular warranty database and the Motors Insurance Corp (MIC) service contract claims database were searched using the labor codes that may be related to the alleged defect in the subject vehicles, listed in Table 6-1 Universal Warranty Corporation (UWC) does not use labor codes. GM did not use trouble codes or customer codes to search for claims that may be related to the alleged condition.

LABOR CODE	DESCRIPTION:
N2440	SWITCH - STOP LAMP - REPLACE
Z1241	PRODUCT LIABILITY/INVESTIGATION REP PR (GOODWILL)
Z1242	PAR - REPAIRS/REIMBURSEMENT (GOODWILL)
Z1243	BUSINESS RESOURCE CENTER INSPECTION

TABLE 6-1 LABOR CODES USED IN WARRANTY SEARCH

To search for and collect the Isuzu warranty data for this response, Isuzu searched the Isuzu Light Vehicle Warranty Data Warehouse for any and all claims that included the subject component part number as a replacement part, regardless of labor operation, trouble code or customer complaint code. For the 2006 MY Isuzu I280/I350 warranty claims Isuzu verified that the recall remedy brake lamp switch was the part being replaced, consequently, Isuzu is providing warranty claims that may be related to the alleged defect in the subject vehicles.

The warranty data provided has limited analytical value in analyzing the field performance of a motor vehicle component. The warranty records do not contain sufficient information to establish the condition of the part at the time of the warranty correction and service personnel may not consistently use the appropriate labor and trouble codes. Warranty numbers represent claims by our dealers for reimbursement for parts and labor costs incurred in performing warranty service for our customers.

The GM subject vehicles are covered by a bumper-to-bumper new vehicle warranty for three years or 36,000 miles, whichever occurs first. The Isuzu subject vehicles covered by a basic limited new vehicle warranty for three years or 50,000 miles, whichever occurs first. Many different extended warranty options are available through GM and Isuzu dealerships. They are offered at different prices and for varying lengths of time, based on customer's preference, up to 7 years from the date of purchase or up to a total of 100,000 vehicle miles.

The General Motor's warranty system does not contain information on the number of vehicles that have extended warranty coverage. The number of extended service contracts on the GM and Isuzu subject vehicles, that have been sold by MIC and UWC regardless of status (in-force, expired, cancelled), as of March 10, 2008 is contained in Tables 6-2 and 6-3.

MAKE/MODEL	2004	2005	2006	2007	2008	2009	TOTAL
Chevrolet Colorado	9,805	16,032	11,802	7,515	6,192	384	51,730
GMC Canyon	2,250	4,720	3,190	1,789	1,563	81	13,593
Isuzu I280	N/A	N/A	28	0	0	N/A	28
Isuzu I350	N/A	N/A	4	0	0	N/A	4
TOTAL	12,055	20,752	15,024	9,304	7,755	465	65,355

TABLE 6-2: SUBJECT VEHICLE MIC SERVICE COVERAGE CONTRACTS SOLD

MAKE/MODEL	2004	2005	2006	2007	2008	2009	TOTAL
Chevrolet Colorado	729	950	543	213	332	31	2,798
GMC Canyon	189	324	181	68	130	16	908
Isuzu I280	N/A	N/A	5	0	0	N/A	5
Isuzu I350	N/A	N/A	2	0	0	N/A	2
TOTAL	918	1,274	731	281	462	47	3,713

TABLE 6-3: UWC EXTENDED SERVICE COVERAGE CONTRACTS SOLD

7. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles (all issued revisions), that GM 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 GM is planning to issue within the next 120 days.

GM has not issued any service, warranty or other documents to dealers, regional or zone offices, regarding the subject component that may relate to the subject condition in the subject vehicles.

General Motors is not planning to issue in the next 120 days, any service, warranty or other technical documents or communications to its dealers, regional offices, zone offices or other entities regarding the subject condition in the subject vehicles.

The preceding information was collected from GM Service Operations. The data collection was completed on March 11, 2009.

8. 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, 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.

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 information listed in Table 8 below is a summary of actions that have been conducted, are being conducted, are planned, or are being planned by or for GM regarding the subject condition on the subject vehicles as of March 30, 2009. Documents and additional supporting information are included in the Attachments as noted in the table.

Action 8-1: GM Internal Investigation 2004-2006 MY GMT355 (Pre-Recall Remedy Brake Switch) Start Date: 12/2005 End Date: 12/2006 Engineering Group: GM Engineering Attachments: ATT_2_GM_Conf disk; folder labeled, "Q_8-1", in the files labeled "Q_8-1_FPE Summary", "Q_8-1_EFADC Potential Field Action Summ and Recommendation", "Q_8-1_EFADC Approved Recall Summary", "Q_8-1_GMT355 Brake Switch Test Update", "Q_8-1_GMT355 Brk Sw Bench Probe Test", "Q_8-1_Product Field Action Announcement", and "Q_8-1_Prevenative Action Documentation". ATT_1_GM_disk; folder labeled, "Q_8-1_Bulletins", in the files labeled "GM Recall Bulletin" and "Isuzu Recall Bulletin". Description: Information and documentation regarding GM Internal Investigation 2004-2006 MY GMT355 Pre-Recall Remedy Brake Switch dated after the GM response to PE05-065. Summary: GM decision to conduct a Safety Recall implementing recall remedy brake switch.
Action 8-2: Engineering changes Start Date: 06/2006 End Date: 10/2006 Engineering Group: GM Engineering, Mallory Controls Attachments: ATT_2_GM_Conf disk; folders labeled, "Q_9_CNFGT" and "Q_8-2_Validation". ATT_4_MALLORY_Conf disk; folder labeled "Q_8-2_Process Control Plan". Description: GM's Engineering Work Order documentation, change in process control and validation related to the brake lamp switch modification and implementation of the recall remedy brake lamp switch. Summary: The changes made to the brake lamp switch #15186470 resulting in recall remedy brake lamp switch #2579681. The subject component passed all validation tests.

Action 8-3: GM Internal Investigation Recall Remedy Brake Switch

Start Date: 11/2008

End Date: Continuing

Engineering Group: GM Engineering, Mallory Controls

Attachments: ATT_2_GM_Conf disk; in the folder "Q_08", in the folder labeled "Q_8-3":

- Q_8-3a_Part Return Analysis Summary
- Q_8-3b_GMT355 Baseline Measurements
- Q_8-3c_R&D Analysis Reports
- Q_8-3d_ISR_FPERC Presentation
- Q_8-3e_Investigation Meetings Status Documents
- Q_8-3f_Warranty Analysis
- Q_8-3g_Survival Analysis

ATT_1_GM disk; folder labeled "Q_8-3_GM Investigation", in the folders labeled:

- Q_8-3_Buyback Vehicle
- Q_8-3_BRC Buyback Documents
- Q_8-3_VOQ Customer Surveys
- Q_8-3_Test Request

ATT_4_MALLORY_Conf disk; folder labeled "Q_8-3_GM Investigation", in the folders labeled:

- Q_8-3_Manufactured Parts
- Q_8-3_Plating Documents

ATT_5_MALLORY disk; folder labeled "Q_8-3_GM Investigation", in the folders labeled:

- Q_8-3_Contact Force Certification (Documents being translated GM will provide an English translation when available)
- Q_8-3_Switch Supplier Analysis

Description: GM's investigation of the alleged defect in the subject component including warranty analysis, analysis of returned parts, vehicle analysis and measurement, customer surveys, testing and evaluations.

Summary: General Motors is continuing to investigate the subject component and the effect of the alleged defect on vehicle performance.

9. Describe all modifications or changes made by, or on behalf of GM, in the design, material composition, manufacturing, quality control, supply, or installation of the original part (including the increase plating thickness & any other changes in support of the recall) and 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:

- a. The date or approximate date on which the modification or change was incorporated into vehicle production identifiable by MY, date of build or VIN in the "PRODUCTION DATA" table of Request No. 1;
- b. A detailed description of the modification or change;
- c. The reason(s) for the modification or change;
- d. The part numbers (service and engineering) of the original component;
- e. The part number (service and engineering) of the modified component;
- f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
- g. When the modified component was made available as a service component; and
- h. Whether the modified component can be interchanged with earlier production components.

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

GM is providing a summary of the product engineering information requested in 9(a-h) on the Att_1_GM disk in the folder labeled "Q_9"; refer to the file labeled, "Q_9_Modifications". The Engineering Work Orders (EWO) related to the modifications are on the Att_2_GM_Conf disk in the folder labeled "Q_9", refer to the files labeled, "Q_9_CHLDF", "Q_9_CKSKT" and "Q_9_CNFGT".

GM is investigating implementation into vehicle production of a lower current design brake lamp system that may be incorporated within the next 120 days pending successful analysis and validation. The information requested in 9(a-h) is dependent on successful completion of analysis and validation.

10. Produce two each of the following:

- a. Exemplar samples of both the original design and the recall remedy design (and any subsequent design/mod) of the subject component; and**
- b. Field return samples of the subject component exhibiting the suspected failure mode.**

Enclosure 10a-1 contains two exemplar samples of the original design brake switch part No. 15186470. Enclosure 10a-2 contains two exemplar samples of the recall remedy design brake switch part No. 2579681.

Enclosure 10b contains two field return samples of the subject component replaced by dealers and returned to GM because they were believed to be exhibiting the suspected failure mode. GM has not completely analyzed these field return samples because it would require disassembly of the parts.

11. State the number of subject component that GM 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. Subject component; and**
- b. Any kits that have been release, or developed, by GM for use in service repairs to the subject component/assembly.**

For each component part number, provide the supplier's name, address, and appropriate point of contact (name, title, and telephone number).

An electronic summary table of the requested service part information for the subject components is provided on the Att_1_GM disk in the folder labeled "Q_11", refer to the Microsoft Excel file labeled, "Q_11_Part Sales".

GM does not offer any kits that have been released or developed for use in service repairs to the subject component.

These sales numbers represent sales to dealers in the US and Canada. This data has limited analytical value in analyzing the field performance of a motor vehicle component because the records do not contain sufficient information to establish the reason for the part sale. It is not possible, from this data, to determine the number of these parts that have been installed in the subject vehicles or the number remaining in dealer or replacement part supplier inventory.

This table contains service part numbers, part description, part usage information including the GM vehicles that contain the identical component, part sales figures by month and calendar year, and the supplier's name and address.

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**
- f. The reports included with this inquiry.**

The "actions" detailed in response to item 8 above, that have been and are being conducted by General Motors to evaluate and assess the alleged defect, indicate that some of the brake switches installed in the subject vehicles may exhibit a condition that can result in:

- (1) a loss of brake lamp illumination, or
- (2) a constant brake lamp illumination, accompanied with:
- (3) the cruise control not engaging.

GM continues to test and analyze the subject component to identify root cause of these conditions.

a. The potential causal or contributory factors identified to date include the following:

- 1. Switch contamination due to the presence of silicone external to the switch, is believed to be the primary contributory factor leading to the majority of the switch replacements:
 - If the brake switch becomes contaminated with silicone during customer use, the contaminants may contribute to higher resistance at the switch contacts, higher temperatures, a sticking switch and potential failure of the brake lamps to illuminate. This contributory factor may instead result in constant illumination of the brake lamps; however, this outcome is less likely. Analysis has shown that the propagation of silicone in vapor form is much more likely to occur when ambient temperatures are higher. This is the case even if the silicone was applied in one of the cleaning forms described below.
 - GM has been investigating to determine the potential sources of silicone. First the brake lamp switch was evaluated throughout the entire manufacturing and assembly process at each stage in the process. No silicone was found that would contribute to the alleged defect. Next, GM is investigating sources of silicone in any other parts manufactured into the subject vehicles. To date GM has determined that the brake pedal pushrod enclosure under the dash is lubricated with grease that is silicone based. Current analysis indicates that this grease is not a contributor because the type of silicone in this grease does not vaporize even under extreme interior temperatures that can be experienced in the vehicle, however, further investigation is continuing related to its potential impact. Finally, GM has determined that there are a number of silicone based cleaners and other products which could be applied or installed by the owner. Generally, these are cleaners, polishes and shampoos. Additionally, after-market products such as floor mats have been found to contain silicone based products.
- 2. Improperly adjusted brake switch.
 - In rare instances, switches which are not properly adjusted can result in continuous illumination or higher internal temperatures resulting in a sticking switch and potential failure of the brake lamps to illuminate.

3. Damaged brake switch retainer during vehicle assembly.

In rare instances, a damaged brake switch retainer may result in an under adjusted brake switch. Under adjustment may contribute to higher internal temperatures resulting in a sticking switch and potential failure of the brake lamps to illuminate.

b. The failure mechanisms:

Contributory factor 1, silicone contamination, contributes to higher resistance at the anode and cathode contacts inside the switch. Silicone, when subjected to current under normal operation of the switch, forms silica which may increase the resistance across the contacts. Sufficient silica may be built up on the contacts to prevent proper connection of the contacts.

The buildup of silica can also result in higher resistance and elevated temperatures at the contacts. The resulting higher temperatures from the above mechanism may cause either:

1. The contact spring terminal inside the switch to melt a divot in the switch plunger over time. When cooled, the contact spring terminal may then stick to the plunger at that divot and not allow the anode and cathode contacts to close when the brake is applied. Depending on the depth of the melted divot into the switch plunger it can also cause the anode and cathode contacts to stick in the closed position.
2. The back side of the anode (moveable contact) to touch the switch housing when the brake pedal is in the at rest position. When experiencing higher temperatures in this condition, the contact may melt a small amount of the housing material which then can hold the contact apart when the material cools.

Contributory factors 2 & 3, under adjusted switch or damaged retainer, may contribute to the same failure mechanisms described above. In rare instances, higher temperatures at the anode and cathode contacts may result if the contacts experience a rapid and repeated opening and closing. The resulting higher temperatures can then cause either failure of the brake lamps to illuminate or the brake lamps to be constantly illuminated.

c. The failure modes:

The three failure modes related to the contributing factors identified in 12a may in some subject vehicles be; (1) failure of the brake lamps to illuminate, (2) brake lamps continuously illuminate, and (3) failure to engage cruise control.

No Contributory factors defined above contribute to the potential failure of cruise control to disengage on brake pedal apply. There are three primary inputs to the Powertrain Control Module (PCM) for the cruise control on this application:

- One input, the "Cruise 12V Mode Switch", is for the mode switches (Set, Resume and On/Off). This input has a resistive ladder circuit for the switches and connects to the PCM. This input, however, would not come into play in disengaging cruise control via a brake pedal apply.
- The second input is for a discrete cruise control switch input "Cruise/ETC/TCC/Brake".
- The third input is for a discrete brake switch input "Brake Lamp Switch" (the subject component).

If a malfunction in either of the two discrete switch inputs above is detected in the brake pedal applied state, cruise control will disengage. Additionally, if a switch was failed in the applied state, cruise control would not engage at all.

Further, the cruise control function uses a feature referred to as "Brake Before Cruise". "Brake Before Cruise" requires that both switches be functional at vehicle startup or the cruise control will not be allowed to engage during that ignition cycle. Consequently, the only way a brake pedal apply would not disengage cruise control would be if after the initial check during the ignition cycle, both discrete switches fail, and cruise control has been engaged prior to both switches failing. Both discrete switches would then have to fail prior to the driver attempting to disengage the cruise control by a brake pedal apply. This is considered unlikely. GM has no additional data to support any occurrences as alleged in the one customer VOQ (10247536) to NHTSA.

d. Risk to motor vehicle safety:

General Motors continues to investigate the subject component and the effect of the alleged defect on vehicle performance to identify and assess the risk to motor vehicle safety.

To date, GM has no reports of crashes, injuries or fatalities as a result of the alleged defect.

e. Warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring:

Individuals outside the vehicle may notice that the brake lamps did not illuminate and advise the driver of the vehicle.

Further, all of the subject vehicles are equipped with cruise control. As described above, although not a direct indicator to the driver of a brake lamp issue, inability to engage cruise control may provide an indication to the driver that service is necessary.

f. The reports included with this inquiry:

General Motors' assessment of the 9 reports included with this inquiry indicates that the condition reported may have resulted from the contributory factors noted above. GM has examined 1 of 9 of the brake switches that are the subject of the reports; therefore, GM has not identified the specific contributory factors related to all of the alleged brake switch failures. GM's assessment of the one VOQ (10242703) inoperative brake switch examined was determined to be the result of Contributory factor 1, silicone contamination.

* * *

General Motors requested assistance and documents from Isuzu Motors America in responding to items 1, 2, 3, 4, 5, 6, 7, and 8 and this response includes those documents received from Isuzu. General Motors also requested assistance and documents from suppliers in responding to items 8 and 9 and this response includes those documents received from suppliers.

This response is based on searches of General Motors Corporation (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 their 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 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,



Gay P. Kent
Director
Product Investigations

Attachments