GENERAL MOTORS CORPORATION
Vehicle Structure & Safety Integration

May 22, 2008

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

N080111

NVS-213dlr
PE08-016

Dear Mr. Quandt:

This letter is General Motors (GM) response to your information request (IR), dated April 7, 2008, regarding Preliminary Evaluation (PE08-016), to investigate allegations of excessive brake pedal effort after cold engine start in model year (MY) 2008 Pontiac Solstice and Saturn Sky vehicles equipped with 2.0L turbocharged engines and manufactured by General Motors Corporation.

GM is also providing peer vehicle information for the 2008 MY Pontiac Solstice and Saturn Sky vehicles with naturally aspirated engines and all 2007 MY Pontiac Solstice and Saturn Sky vehicles.

Your questions and our corresponding replies are as follows:

1. **State, by model, engine, transmission (automatic or manual) and model year, the number of subject and peer vehicles GM has manufactured for sale or lease in the United States. Separately, for each subject and peer vehicle manufactured to date by GM, state the following:**

   a. **Vehicle identification number (VIN);**
   b. **Make;**
   c. **Model;**
   d. **Engine;**
   e. **Transmission (automatic or manual);**
   f. **Model Year;**
   g. **Date of manufacture;**
   h. **Date warranty coverage commenced; and**
   i. **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 2003, or a compatible format, entitled "PE08-016 PRODUCTION DATA." See Enclosure, Data Collection Disc, for a pre-formatted table - which provides further details regarding this submission.

   General Motors is providing the number of subject and peer vehicles produced for sale or lease in the United States by make, model and model year in Tables 1-1 and 1-2 below:

MAKE	MODEL GROUP	2008
Pontiac	Solstice	5,876
Saturn	Sky	7,123
	Total	12,999

TABLE 1 - 1 SUBJECT VEHICLES (TURBOCHARGED ENGINE)

MAKE	MODEL GROUP	2007	2008*	TOTAL
Pontiac	Solstice	21,310	6,936	28,246
Saturn	Sky	15,549	3,831	19,380
	Total	36,859	10,767	47,626

TABLE 1 - 2 PEER VEHICLES (TURBOCHARGED AND NORMALLY ASPIRATED ENGINE)
*2008 MY VEHICLES WITH TURBOCHARGED VEHICLES ARE LISTED ABOVE

The production information requested in 1a-1e 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." GM is providing the state where the vehicle was shipped in response to request 1e. 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.

2. State 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 and the peer vehicles:

a. Consumer complaints, including those from fleet operators;
b. Field reports, including dealer field reports;
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;
d. Property damage claims; 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).

In addition, for items "c" through "f' provide a summary description of the alleged problem and causal and contributing factors and GM'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.

Tables 2-1 and 2-2 below summarize records that could relate to the alleged condition. 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	14	0	0	0	0
Field Reports	213	16	0	0	0
Not-In-Suit Claims	1	0	1	1	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 (Including Duplicates)	228	16	1	1	0
Total Vehicles with Reports (Unique VIN)	212	12	1	1	0

Table 2-1: Subject Vehicles Report Breakdown

Type of Report	GM Reports	Subcategories			
		Corresponding to NHTSA Reports	Number with Property Damage	Number with Crash	Number with Injuries/ Fatalities
Owner Reports	0	0	0	0	0
Field Reports	1	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 (Including Duplicates)	1	0	0	0	0
Total Vehicles with Reports (Unique VIN)	1	0	0	0	0

Table 2-2: Peer Vehicles Report Breakdown

To date, GM's investigation of the alleged defect has not included an assessment of the cause(s) of each incident responsive to Request No. 2. Some incident reports may not contain sufficient reliable information to accurately assess cause.

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	4/30/2008
Technical Assistance Center	5/9/2008
Field Information Network Database (FIND)	4/24/2008
Field Product Report Database (FPRD)	4/24/2008
Company Vehicle Evaluation Program (CVEP)	4/24/2008
Captured Test Fleet (CTF)	4/24/2008
Early Quality Feedback (EQF)	4/24/2008
Legal / Employee Self Insured Services (ESIS)/Product Liability Claims/ Lawsuits	4/25/2008

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;**
   h. **Report or claim date;**
   i. **Whether the report or claim date is after TSB 07-05-25-007 was performed (if it was performed).**
   j. **Whether a crash is alleged;**
   k. **Whether property damage is alleged;**
   l. **Number of alleged injuries, if any; and**
   m. **Number of alleged fatalities, if any.**

   Provide this information in Microsoft Access 2003, or a compatible format, entitled "PE08-016 REQUEST NUMBER TWO DATA." See Enclosure, Data Collection Disc, for a preformatted table which provides further details regarding this submission.

   The requested information is provided the database 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.

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 Tables 2-1 and 2-2 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.

5. State, 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 and the peer 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 (TSB) or customer satisfaction campaign. This should include TSB 07-05-25-007.

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;
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 2003, or a compatible format, entitled "PE08-016 WARRANTY DATA." See Enclosure, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

The 350 regular warranty claims for the subject vehicles that may be responsive to this request are summarized in Table 5-1 below. The 12 regular warranty claims for the peer vehicles that may be responsive to this request are summarized in Table 5-2 below. A summary of these warranty claims is provided in Attachment 1 Disk; refer to the folder labeled, "Response to Q5." There were no MIC or UWC extended warranty claims found.

Regular Warranty Claims that may relate to excessive brake pedal effort after cold engine start (Labor Codes H2508 and H9726).

MAKE	MODEL	2008
Pontiac	Solstice	150
Saturn	Sky	200
	Total	350

TABLE 5-1: REGULAR WARRANTY CLAIMS - SUBJECT VEHICLES

MAKE	MODEL	2007	2008	TOTAL
Pontiac	Solstice	1	0	1
Saturn	Sky	11	0	11
	Total	12	0	12

TABLE 5-2: REGULAR WARRANTY CLAIMS - PEER VEHICLES

GM searched the GM Global Analysis and Reporting Tool (GART-regular warranty), the Motors Insurance Corporation (MIC–extended warranty), and the Universal Warranty Corporation (UWC–extended warranty) databases to collect the warranty data for this response. The warranty data was last gathered on May 6, 2008.

GM's warranty database does not contain the following information: vehicle owner's name or telephone number, replacement part number description, or customer concern statement. GM is providing a field labeled "Verbatim Text" in response to request 5K (dealer/technician comment). 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 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.

A summary of warranty claims that may relate to the subject condition is provided on the Attachment 1 Disk, in the folder labeled "Response to Q5;" refer to the Microsoft Access 2000 file labeled "REQUEST NUMBER FIVE - WARRANTY DATA."

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 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.**

The regular warranty data from the GM GART Database was collected by searching the labor codes listed in Table 6-1. The complaint codes associated with claims that may be related to the alleged condition are summarized in Table 6-2.

LABOR CODE	DESCRIPTION:
H2508	ELECTRONIC BRAKE AND/OR TRACTION CONTROL MODULE REPROGRAMM
H9726	BRAKE RETROFIT (ADD VACUUM PUMP TO SYSTEM)

TABLE 6-1 LABOR CODES USED IN WARRANTY SEARCH

COMPLAINT CODE	COMPLAINT DESCRIPTION
0-0000	00=Not Detected by Customer-Not Detected by Customer
0-0090	No Customer Complaint - Other issues
0-0121	Drivability - Responsiveness
0-0122	Drivability - Handling
0-0123	Drivability - Steering
0-0124	Drivability - Brakes
0-0126	Drivability - Noise
0-0190	Drivability - Other issues
0-0621	Features/Controls/Displays - Gauges/Warning Lights
0-0890	Interior - Other issues
1-AV	UNUSUAL GAGE READING
1-MH	TECH BULLETIN
1-NG	GRIND
1-O2	SPONGY
1-O7	WON'T MAINTAIN ADJUST
1-OF	ENGAGE/DISENGAGE
1-OG	EXCESS EFFORT
1-OH	EXCESSIVE PLAY
1-OJ	INOPERATIVE
1-OL	INTERMITTENT
1-OM	LOCKS/LOCKING UP
1-OO	LOW PEDAL
1-OY	SHUDDERS

TABLE 6-2 COMPLAINT CODES USED IN WARRANTY SEARCH

The subject vehicles are covered by a bumper-to-bumper new vehicle warranty for three years or 36,000 miles whichever occurs first. Many different extended warranty options are available through GM 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 GM's warranty system does not contain information on the number of vehicles that have extended warranty coverage. The number of extended warranty coverage contracts on the subject vehicles that have been sold by MIC regardless of status (in-force, expired, cancelled) as of May 2, 2008 is contained in Table 6-3.

MAKE	MODEL	2007	2008	TOTAL
Pontiac	Solstice	3,961	682	4,643
Saturn	Sky	7,340	1,826	9,166
	Total	11,301	2,508	13,809

TABLE 6-3: MIC EXTENDED WARRANTY 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, 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 found 3 Technical Service Bulletins and 2 Preliminary Information documents that relate to the subject condition that have been issued to dealers, regional or zone offices, field offices, fleet purchasers or other entities.

GM is not aware of any documents or communications to dealers regarding the subject condition that may be incorporated into vehicle production within the next 120 days.

The bulletins are included in the Attachment 1 Disk, "Response to Q7." The data collection was completed on May 14, 2008. The preceding information was collected from GM Service Operations.

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.

Action 8-1: Validation **Start Date:** August 2006 **End Date:** August 2007 **Engineering Group:** **Attachments:** Attachment 2 Disk GM Confidential Disk in the Response to Questions 8 - Validation folder. **Description:** GMs testing, validation, and presentations of the Optimized Hydraulic Brake (OHB) braking system for the subject vehicles. **Summary:** The brake system for the subject vehicles passed all validation tests.
Action 8-2: Continuous Improvement **Start Date:** July 2007 **End Date:** 4/2008 **Engineering Group:** GM Engineering **Attachment:** Attachment 2 Disk GM Confidential Disk in the Response to Questions 8 - Continuous Improvement folder. **Description:** GMs engineering changes and continuous improvement of the OHB brake system on the subject vehicles. **Summary:** GM released information and engineering changes to address customer concerns regarding the functionality and operation of the OHB system.

Action 8-3: GM Investigation **Start Date:** February 2008 **End Date:** May 2008 **Engineering Group:** GM Engineering **Attachment:** Attachment 2 Disk GM Confidential Disk in the Response to Questions 8 - GM Investigation folder. **Description:** Management reviews of the OHB brake system and continuous improvements.
Action 8-4: 2008 MY Solstice/Sky OHB Vehicle Drive Demonstration **Start Date:** 5/13/2008 **End Date:** 5/13/2008 **Engineering Group:** GM Engineering **Attachment:** See GM previous voluntary submission dated 5/20/2008 **Description:** GM Technical presentation of the Optimized Hydraulic Brake System (OHB) and Drive demonstration to NHTSA ODI personnel. Several subject and peer vehicles were driven in parking lot maneuvers to demonstrate the operation of the vehicle brake system after cold start.

9. **Describe all modifications or changes made by, or on behalf of, GM in the design, material composition, manufacture, quality control, supply, or installation of the subject system, 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;**
   b. **A detailed description of the modification or change;**
   c. **The reason(s) for the modification or change;**
   d. **The part number(s) (service and engineering) of the original component;**
   e. **The part number(s) (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 table of the changes and associated Engineering Work Orders (EWOs) that occurred to the subject vehicles OHB system in the Attachment 1 Disk, in a folder labeled: "Response to Q9." The EWOs are included in the ATT_2_GM_CONF Disk, in a folder labeled: "Response to Q8/Continuous Improvement/Engineering Work Orders."

   GM is not planning to incorporate any modifications or changes into production of the subject vehicles that relate to the alleged defect within the next 120 days.

10. **Provide the following information regarding the braking performance of the subject vehicles and the peer vehicles. For the subject vehicles, provide the information for all modes of operation (i.e., low vacuum mode and normal mode):**

    a. **Provide detailed descriptions of the control logic used in the production release calibration of the OHB system of the subject vehicles and after any changes in the**

control algorithm - include all sensor inputs and all set points for changing modes of operation;

b. **Provide graphs showing (1) brake line pressure as a function of brake pedal force; (2) brake pedal travel as a function of pedal force; and (3) vehicle deceleration as a function of brake line pressure;**
c. **For each of the graphs provided in the responses to 10.b provide GM's assessment of the typical range of operation for braking events at low-speeds (≤ 10 mph), such as in driveways or parking lots. Provide this information for flat, level surfaces and for inclined surfaces (e.g., a driveway with a 15% grade or any and all other grades for which GM has this or other information);**
d. **Provide graphs plotting brake line hydraulic pressure as a function of pedal effort for (1) the subject vehicles with and without OHB functioning and (2) for the peer vehicles;**
e. **The range in times after engine shut-off required for brake booster vacuum to drop below the level at which the OHB mode is activated; and**
f. **GM's assessment of the time required, for the subject vehicles just after engine start-up to achieve full vacuum level.**

GM is providing the information responsive to Questions 10a through 10d in the ATT_2_GM_CONF Disk, in a folder labeled: "Response to Q10 in the files: OHB operation 10a.doc and 2008 GMX020 OHB Response_10b-c.doc.

In response to Question 10e, GM believes that it would take a minimum of 4 hours to get the brake booster vacuum to a level to activate the OHB function.

In response to Question 10f, the time for the subject vehicle to achieve full vacuum level ranges from 0 – 90 seconds depending primarily on the following conditions: the coolant temperature at ignition "on", the time since the engine was last run and the idle speed. If the vehicle is driven during this time (the first 0 - 90 seconds) and then returned to idle, the time to reach full vacuum level would also be reduced.

11. **Describe all human factors, or other types of, studies or analyses related to the effects of changing the brake pedal force required to achieve a given vehicle deceleration during different modes of brake system operation - especially on initial brake applications immediately after starting the vehicle. Include the following factors in the description and provide copies of all documents related to all such studies or analyses:**

a. **Amount of increased effort required to initiate braking (i.e., produce hydraulic pressure at the wheels) for the subject vehicles in normal braking mode (with sufficient booster vacuum) and in OHB mode (state answer for all calibrations of the OHB system);**
b. **Whether all drivers will perceive and respond to the change in system response in the same way (e.g., by pressing harder on the brake pedal);**
c. **The range in reaction times for drivers to recognize the differences in system response and achieve the necessary pedal force; and**
d. **The effects of all of the above on stopping distances, particularly during low-speed driveway and parking lot type braking maneuvers.**

To date, GM has not performed any of the above mentioned human factors studies or analyses related to the subject condition in the subject vehicles. During vehicle design and validation

process, the subject vehicles' braking system had been evaluated using both qualitative and quantitative methods. Refer to the information provided in response to Question 8-1.

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

a. Differences in field experience, measured by complaint rates, between subject vehicles with automatic and manual transmissions
b. An explanation for the differences described in 12.a;
c. Differences in field experience, measure by complaint rates adjusted for exposure, between subject vehicles produced with the original OHB calibration and with any recalibrations;
d. The safety consequences associated with the factors discussed in request 11; and
e. The reports included with this inquiry, including the crash alleged in VOQ 10208536.

The 2008 MY Pontiac Solstice GXP and Saturn Sky Redline vehicles equipped with 2.0L turbo-charged engine (start of production to April 28, 2008) include the Optimized Hydraulic Brake (OHB) supplemental hydraulic assist system.

The OHB system may be active for up to 90 seconds after vehicle startup, during preheating of the catalytic converter, which improves vehicle emissions performance during cold starts. Catalytic heating involves retarding spark and opening the throttle to maintain idle, which has the effect of depleting engine vacuum.

The OHB function is active during conditions of low brake booster vacuum. This can occur after the vehicle has been sitting for at least 4 hours. To maintain brake power assist (which is supplied by engine vacuum when the vehicle is warm), the subject vehicles employ OHB supplemental hydraulic assist during catalytic heating. This supplemental hydraulic assist is achieved by increasing brake pressure through the electronic stability control pump.

As stated in response to Question 11, throughout the design and validation process, the performance of the OHB system was evaluated and approved by GM engineering. It also meets the FMVSS 135 requirements for unassisted braking.

In May 2008, NHTSA personnel drove both the subject and peer vehicles to compare the brake system performance characteristics by performing low speed parking lot maneuvers during cold start conditions. GM demonstrated that the driver may feel some pedal feedback (pulsation) and also some non-linear brake gain; i.e., higher pedal effort to achieve a given deceleration during the initial vehicle warm-up. While these small differences in performance displease some customers, GM's evaluation is that they do not degrade the performance of the brake system.

GM has made continuous improvements to the OHB operation and provided educational information about the OHB system to customers and dealers.

- In June 2007 (2008 MY SOP), GM included a description of the OHB operation in the owner's manual and released an informational service bulletin to dealers that described OHB system operation.

- In October 2007, GM included a glove box hang tag that described the OHB operation and characteristics.

- From July through October 2007, GM reviewed customer reports regarding concerns of OHB operation and the brake pedal feel. In November 2007, GM released an OHB service calibration. This improved the brake pedal feel.

  Of the 228 complaints received by GM regarding the alleged condition, 218 complaints were received prior to releasing the OHB service calibration. After the service calibration was released GM received 10 reports. At the same time, GM continued to seek additional system refinements to improve the customer acceptance.

- In April 2008, GM released an ECM calibration service bulletin which made brake pedal effort and travel, in a cold start vehicle, closer to that of a warmed-up vehicle.

GM believes that this is a customer pleasibility issue and that actual brake system performance is not adversely affected when operating in OHB mode versus power assist from engine vacuum.

GM's response to Question 12a - e are:

a) GM found 207 GM reports for subject vehicles with automatic transmissions (29 IPTV). GM also found 5 reports for subject vehicles with manual transmissions (an IPTV of less than 1.0).

b) The reasons for this difference are:

   a. First, drivers of manual transmission vehicles typically increase engine speed (depress the accelerator pedal) momentarily while releasing the clutch pedal to move the vehicle. Release of the accelerator pedal after the increase in engine rpm elevates the vacuum in the brake booster. Since automatic transmissions do not require the same apply and release motion of the accelerator pedal, there is no additional vacuum stored in the booster during an idle drive condition.
   b. Second, during most low speed braking maneuvers, the clutch is depressed. This disengages the drive torque from the wheels, which in turn reduces the amount of brake line pressure needed to stop the vehicle. On automatic transmission vehicles, the drive torque is being applied to the wheels as long as the vehicle is in gear, this additional drive torque needs to be overcome by the brake system.

c) Based on the month of vehicle build, GM saw a decline in the rate of reports associated with the OHB system from October 2007 through January 2008. Since the OHB service cal was not released for vehicle production, this change may be attributed to greater customer awareness of OHB functionality (possibly due to the addition of the glove box hang tag).

d) Although some customers have complained about the feedback from the OHB system, the data and driving evaluations show that its performance is comparable to the system in the peer vehicles. The field reports do not suggest there is a safety defect.

e) GM reviewed the VOQs and believes they may be related to customer concerns about the brake pedal feel/effort (OHB operation) in the subject vehicles. Regarding VOQ 10208536, GM searched its field reports and warranty claims and did not find any brake system related claims or accident claims related to this vehicle.

* * *

GM claims that certain information, in documents that are part of lawsuit and claims files maintained by the GM Legal Staff, is attorney work product and/or privileged. That information includes notes, memos, reports, photographs, and evaluations by attorneys (and by consultants, claims analysts, investigators, and engineers working at the request of attorneys). GM is producing responsive documents from claims files that are neither attorney work product nor privileged, and withholding those that are attorney work product and/or privileged.

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 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 1,2005, 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,

FOR

Gay P. Kent
Director
Product Investigations

Attachments

N080111
PE08-016

GM CONFIDENTIALITY LETTER

GM CONFIDENTIALITY LETTER
HAS BEEN REMOVED FROM THIS
ATTACHMENT AND SUPPLIED TO
THE OFFICE OF THE CHIEF COUNSEL

N080111
PE08-016

ATTACHMENT "1"

GM NON-CONFIDENTIAL MATERIAL

N080111
PE08-016

ATTACHMENT "2"

GM CONFIDENTIAL MATERIAL

GM CONFIDENTIAL MATERIAL HAS BEEN REMOVED FROM THIS ATTACHMENT AND SUPPLIED TO THE OFFICE OF THE CHIEF COUNSEL