GENERAL MOTORS NORTH AMERICA
Structure & Safety Integration

Inter-Organization

Date: November 11, 2004

GM-666 (PE04-064)

On The Cover:

GM Assigned IR Number
NHTSA Assigned Evaluation Number
Number of Books
Allegation Title, Model Year and Make
Date Received from NHTSA
GM Reply Date

Book 1:

Tab (1).....GM Response Letter to NHTSA
Tab (2)..... NHTSA Letter
Tab (3)..... [redacted]
Tab (4)..... Attachment 2C with supplemental photos and video for case number 419601 on (1) CD

GM GENERAL MOTORS NORTH AMERICA
Structure & Safety Integration

November 11, 2004

GM-666

Thomas Z. Cooper, Chief
Vehicle Integrity Division
Office of Defects Investigation
NHTSA Safety Assurance
Room #5326
400 Seventh Street, S.W.
Washington, D.C. 20590

NVS-212pco
PE04-064

Dear Mr. Cooper:

This letter is General Motors (GM) response to your information request (IR), dated September 17, 2004, regarding allegations of wrist or lower arm injuries from entrapment between the Power Sliding Door (PSD) interior handle and the second row seat back during the powered door opening sequence. The subject vehicles for this investigation are Model Year (MY) 1996 through 2004 GM U-Vans (Chevrolet Venture, Pontiac Montana, and Oldsmobile Silhouette) equipped with a left, right, and dual PSD option. As requested, information regarding 1997 U-Vans is also provided.

Your questions and our corresponding replies are as follows:

1. **State, by model and model year, the 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. **Vehicle identification number (VIN);**
   b. **Make;**
   c. **Model;**
   d. **Model Year;**
   e. **Date of manufacture;**
   f. **Middle-row seat configuration;**
   g. **Number of middle-row seats;**
   h. **Equipped passenger-side PSD;**
   i. **Equipped driver-side PSD;**
   j. **"Auto-reverse" feature in PSD;**
   k. **Date warranty coverage commenced; and**
   l. **The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).Identify in the file the vehicle's middle-row seat configuration (i.e. Bench; 60/40 Bench; Captain's Chair; Bucket Seats or none).**

   General Motors is providing the number of subject vehicles produced for sale or lease in the United States by model and model year in Table 1 below:

MODEL	1997 MY	1998 MY	1999 MY	2000 MY	2001 MY	2002 MY	2003 MY	2004 MY	TOTAL
Chevrolet Venture	26,572	38,691	46,709	61,955	52,035	44,125	58,721	52,854	377,662
Pontiac Montana	22,904	30,696	38,594	40,869	40,447	22,748	23,103	15,247	232,747
Oldsmobile Silhouette	16,325	30,236	34,164	38,435	33,377	22,137	17,301	9,125	201,100
TOTAL	65,801	99,622	117,467	141,259	125,859	89,010	97,125	76,926	811,509

TABLE 1 VEHICLE PRODUCTION
VEHICLE PRODUCTION DATED OCTOBER 8, 2004.
INCLUDES SUBJECT VEHICLES MANUFACTURED WITH A LEFT, RIGHT OR DUAL PSD.

Product Investigations
Mail Code: 480-106-304 • 30500 Mound Road • Warren, MI 48090-9055
Phone: (586) 986-8029 • Fax: (586) 947-2318

The production information requested in 1a-1l is provided on the CD in Attachment 1, in the folder labeled Response to Q1; refer to the Microsoft Access 2000 file labeled "PRODUCTION DATA". All of the subject vehicles are equipped with PSD.

The production information requested in 1a-1l is provided on the CD labeled Response to Q1; refer to the Microsoft Access 2000 file. The GM database that contains Vehicle Identification Number (VIN) information does not include information on the state where an individual vehicle was sold. GM is providing the state where the vehicle was shipped in response to request 1i. 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:

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;
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.

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

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 "a" through "d," 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.

Table 2-1 below summarizes records that could relate to the subject condition. GM has organized the records by the GM file number within each attachment.

Type of Report	Count (Including Duplicates)	GM Reports	GM Reports Corresponding to NHTSA Reports	Location of Reports (Attachment)	Number of Property Damage	Number of Reported Injuries*	Crashes
Owner Reports	18	18	0	2A	0	19	0
Field Reports and Technical Assistance System Reports	25	21	4	2B	0	27	0
Not-In-Suit Claims	59	49	10	2C	0	62	0
Subrogation Claims	3	3	0	2D	0	3	0
Third Party Arbitration Proceedings	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Product Liability Lawsuits	4	3	1	2E	0	4	0
Total (Including Duplicates)	109	94	15	N/A	0	115	0
Total (Excluding Duplicates)	87	75	12	N/A	0	91	0

Table 2-1: Report Breakdown 1997 - 2004 MY U-Van
* GM is not aware of any fatalities reported to the subject condition

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

Source System	Last Date Gathered
Corporate Central File	October 4, 2004
Customer Assistance Center	October 11, 2004
Technical Assistance Center	October 14, 2004
Company Vehicle Evaluation Program (CVEP)	September 28, 2004
Legal / Employee Self Insured Services (ESIS)	October 21,2004

Table 2-2: 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 a crash is alleged;
j. Whether property damage is alleged;
k. Number of alleged injuries, if any; and
l. Number of alleged fatalities, if any.

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

The requested information is provided on the CD in Attachment 1, in a folder labeled Response to Q3; refer to the Microsoft Access 2000 file in the labeled, "REQUEST NUMBER TWO DATA."

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 identified in item 2 are provided in the attachments listed in Table 2-1. 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: 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;
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 the table in Microsoft Access 2000, or a compatible format, entitled "WARRANTY DATA."

GM searched the regular and extended warranty databases for claims on vehicles where incidents were reported in Questions 2 through 4. For the eighty-seven incidents reported, GM found six regular warranty and no extended warranty claims related to PSD system repairs. Only one warranty repair of the six regular warranty claims was performed after the incident occurred. This is consistent with GM's understanding that the subject condition occurs with PSD systems that are operating as designed and is not related to a malfunction. The information is summarized in Table 5.

U-Van Regular Warranty Claims

Model	1997 MY	1998 MY	1999 MY	2000 MY	2001 MY	2002 MY	2003 MY	2004 MY	Warranty Total
Chevrolet Venture	0	0	4	1	0	0	0	0	5
Pontiac Montana	0	0	0	0	1	0	0	0	1
Oldsmobile Silhouette	0	0	0	0	0	0	0	0	0
WARRANTY TOTAL	0	0	4	1	1	0	0	0	6

Table 5

Information related to the six warranty claims is provided on the CD in Attachment 1, in the folder labeled Response to Q5; refer to the Microsoft Access 2000 file labeled "REQUEST NUMBER FIVE - WARRANTY DATA." The warranty data was last gathered on 10/6/2004.

GM has received warranty claims for PSD system malfunctions, such as failed PSD motors, clutch assemblies, and controllers. To our knowledge, these are not related to the subject condition, but GM will provide them if you wish.

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.

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 labor code (N4872) listed in Table 6-1 was the single labor code used by GM dealers for the six claims reported in response to Question 5. Table 6-2 lists the trouble codes associated with the warranty data.

LABOR CODE	DESCRIPTION:
N4872	Module, Control (Power Sliding Door) - Replace

TABLE 6-1 LABOR CODES RETURNED IN REGULAR WARRANTY SEARCH

TROUBLE CODE	DESCRIPTION
3A	MISADJUSTED/MISALIGNED
3L	OUT OF CALIBRATION
6C	COMPONENT-INOPERATIVE
6D	COMPONENT-INTERMITTENT

TABLE 6-2 TROUBLE CODES RETURNED IN REGULAR WARRANTY SEARCH

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 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 General Motor's warranty system does not contain information on the number of vehicles that have extended warranty coverage.

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 is not aware of any past service or warranty documents, that relate to the subject condition that GM has issued to dealers, regional or zone offices, field offices, fleet purchasers or other entities.

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

The preceding information was collected from GM Service Operations. The data collection was completed on October 13, 2004.

8. **Describe all the operation and safety features of the PSD during opening operation. Highlight any changes/upgrades in these features from inception to MY 2004 vehicles. They should include the following detailed information:**

a. **Component description;**
b. **Component location/diagram;**
c. **Distance from the interior door handle pivot to the front of the middle-row seat back at the forward most and rearward most (fore/aft) seat position;**
d. **Lateral distance from the interior door handle (center line) to the edge of the right hand middle-row seat/seat arm rest (center line) for each seat configuration on the passenger-side position;**
e. **Lateral distance from the interior door handle (center line) to the edge of the left hand middle-row seat/seat arm rest (center line) for each seat configuration on the driver-side position;**
f. **Pictorial diagram showing the relative locations of the interior door handle and the various available seat configurations;**
g. **Description of the door's "auto-reverse" feature during opening operation and maximum forces at various door opening points (from fully-closed to fully-opened) in two inch increments;**
h. **The PSD "stall" force during opening operation.**

➢ In Response to Question 8a and 8g:

GM has installed three generations of PSD Systems on the subject vehicles from the 1997 through 2004 Model Years. The GEN I and GEN II Right Hand (RH) PSD Systems are installed on the subject vehicles as summarized in Table 8-1. The B2 PSD System is installed on subject vehicles with a Left Hand (LH) PSD option.

PSD Series	Model Year	Wheel Base	Location
GEN I	1997– 1998	Extended Wheel Base	Right Hand
GEN II	1998– 2004	Regular Wheel Base	Right Hand
GEN II	1998– 2004	Extended Wheel Base	Right Hand
B2	Mid Year 2001 - 2004	Extended Wheel Base	Left Hand

TABLE 8-1 1997 – 2004 MY U-VAN PSD CONTROLLER EVOLUTION

The PSD is operated using interior switches, the door mounted interior or exterior handles, or a remote keyless entry device. The opening sequence of the PSD occurs when the PSD motor/controller module receives an input from an interior PSD switch or remote keyless entry device. Upon receiving the open door command, the PSD is unlatched, the PSD motor mounted in the rear body structure near the rear wheel-well begins to turn a drum and wind a cable that is attached to the door. The PSD first moves outboard approximately 145 mm to clear the vehicle body and then begins to move rearward at a constant nominal speed of 160 mm/s. The PSD travels 885 mm until reaching the hold-open device. At that time, the hold-open device is engaged and the PSD door open sequence is complete. The time required for the PSD door opening sequence to occur is nominally five seconds.

The PSD system on the subject vehicles has several safety features:

The PSD includes an integrated obstacle detection feature to enhance safety during the opening and closing sequence. Obstacle detection is accomplished as the PSD controller monitors a moving average of four position counts and compares the change in PSD velocity to calibration values stored in the controller. When the change in average frequency is large enough, an obstacle is detected and the PSD reverses direction. The PSD controller does not use motor current or opening and closing forces for the obstacle detection algorithm.

An input from any of the PSD switches (located on the B-Pillar or the Overhead Console) or PSD button on the remote keyless entry transmitter will reverse the direction of the door when not in the override mode. The interior overhead console mounted PSD override switches allow the PSD to be disabled or placed in a manual operation mode. During the manual (PSD override) mode, passengers can open and close the PSD like a manual sliding door, using the interior and exterior handles.

In addition to the obstacle detection system, there are other design features that minimize the possibility of injuries with the PSD. The PSD Security Lock (Child Safety Lock), described in the Owner's Manual, adds an additional level of PSD control for the driver and passengers. The PSD Security Lock is located on the forward inside edge of the PSD. When enabled, the lock prevents passengers from opening the PSD via the interior door handle. To open the PSD, the driver or passengers can depress any of the interior PSD switches or pull the exterior door handle. The driver can use this method when the passengers, including children and others, may not understand the operation of the PSD.

Additional PSD Safety Features include:

- The Power Sliding Door is disabled when the vehicle is not in park, disabling all switches and key fobs.
- PSD will only operate if the vehicles transaxle is in PARK (P).
- PSD must be unlocked before it can be operated manually or in the powered mode.
- PSD Override switch will stop the door immediately while opening or closing.
- Alarm will sound if vehicle is placed in Drive with the PSD open.

Operation of the PSD is explained in the Owner's Manual and cautions are provided. The cautions include:

- Do not operate the PSD while the vehicle is on a steep grade.
- Do not allow unattended children to operate the PSD.
- Push the PSD override switch to help avoid accidental operation of the PSD.
- Make sure the PSD is fully closed before moving the transaxle out of PARK (P).
- Before closing the PSD, verify the door path is clear.

GM is providing photos of the PSD switches on the overhead console, remote keyless entry, sliding door security lock and door pillar switches in response to Question 8a. They are included in the Attachment 1 CD, Response to Q8, folder 8a

➢ In Response to Question 8b:

GM is providing drawings and photos of the left and right hand PSD systems and locations in response to Question 8b. They are included in the Attachment 1 CD, Response to Q8, folder 8b.

➢ In Response to Question 8c – 8f:

The interior measurements and pictorial diagrams detailing the relative locations of the interior door handle and second row seat configurations are included in the Attachment 1 CD, Response to Q8 folder 8c-8f, in the file: U-Van Seat and Door Handle Measurements.xls.

➢ In Response to Question 8g:

The PSD controller opens the PSD at a constant velocity based on the applied voltage. The peak opening forces were measured while the door was moving on the straight portion of the PSD track with a force transducer mounted in series with a 10 N/mm spring. The peak forces are listed in Table 8-2 below. The PSD controller initially exerts higher torque on the PSD to open doors that may be frozen or have higher friction in the track and glide mechanism and at the hold-open position until the hold-open solenoid engages.

A description of the PSD obstacle detection feature is included in the response to Question 8a.

PSD System	Force (N)	Force (lbs)
Gen I	176.5	40.1
Gen II	567.5	129.0
B2	292.0	66.4

TABLE 8-2 PEAK FORCES (DURING OPENING) FOR U-VAN PSD

Measurement Specifications:
PSD Supply Voltage = 12.8 V
Incline = Level Ground
Ambient Temperature = 23°C
Force gauge in series with 10 N/mm spring
Straight section of PSD track

➢ In Response to Question 8h:

As stated above, the PSD controller does not use motor current or force measurement during obstacle detection. Table 8-3 includes the stall torque for the PSD motors. The torque values listed do not take into account the mechanical advantage of the different PSD systems nor the associated software. Additional PSD motor torque information is provided in the Attachment 1 CD, Response to Q8 folder 8h, in the file: PSD Motor Specifications.xls

PSD System	Stall Torque (Nm)	Stall Torque (ft lbs)
Gen I	38.0	28.0
Gen II	60.0	44.3
B2	44.0	32.5

TABLE 8-3 PSD MOTOR MAXIMUM STALL TORQUE

Measurement Specifications:
PSD Supply Voltage = 14.0 V
Ambient Temperature = 24°C

9. 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 9-1 below is a summary of actions performed by GM regarding the subject condition on the 1997 through 2004 Model Year GM U-Vans. Documents and additional supporting information are included in the Attachment 1 CD, Response to Q9.

Action: Power Sliding Door Manual Opening Efforts Study **Start Date:** September 14, 2000 **End Date:** September 14, 2000 **Engineering Group:** GM **Response to Q9 – 9A** **Description:** MS Word Document **Summary of Action:** PSD Action items collected for further review.
Action: U-Van Power Sliding Door Presentation **Start Date:** 11/13/2000 **End Date:** 11/13/2000 **Engineering Group:** GM **Response to Q9 – 9B** **Description:** Presentation regarding PSD background, operation, safety features and injuries related to the U-Van Power Sliding Door **Summary of Action:** List of possible modifications to U-Van PSD system.
Action: Power Sliding Door Force Measurements **Start Date:** April 4, 2001 **End Date:** June 14,2001 **Engineering Group:** Delphi Automotive **Response to Q9 – 9C** **Description:** Delphi Test results of the three PSD systems opening force at various ambient conditions **Summary of Action:** Data matrix of test results from force measurements of the PSD systems at various ambient conditions when using various obstruction forces and software changes.
Action: Power Sliding Door reduce open force project plan **Start Date:** December 4, 2000 **End Date:** June 19, 2001 **Engineering Group:** GM and Delphi **Response to Q9 –9D** **Description:** MS Project file with summary of actions items **Summary of Action:** Project plan to test and validate potential changes to Gen II PSD System. While attempting to improve the obstacle detection algorithm in the U-Van PSD controller, it was determined that issues such as false reversals and operational quality and durability issues made the change ineffective. The ineffectiveness of the software changes caused the project to be cancelled.
Action: U-Van (GMT 200) PSD Inner Handle System Modifications **Start Date:** June 11, 2002 **End Date:** June 14, 2004 **Engineering Group:** GM Engineering **Response to Q9 – 9E** **Description:** Presentations and meeting minutes regarding potential changes to U-Van PSD inner handle system **Summary of Action:** Changes to U-Van PSD inner handle were not implemented because of supplier and quality issues.

TABLE 9-1 ASSESSMENTS, TESTS AND ACTIONS FOR GM PSD SYSTEMS

10. **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 component, from the start of production to date, which relate to, or may relate to, the alleged defect (including interior door handle, door panel, middle-row seat designs and configurations) 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 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.

    The modification information responsive to items 10 a-h is summarized on the Attachment 1 CD; refer to the folder labeled "Response to Q10".

    GM is not aware of any other modification or change with the subject components that may be incorporated into vehicle production within the next 120 days.

11. **State the number of component related to the door's "auto-reverse" feature 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:**
    a. **Sensor that senses obstruction during opening; and**
    b. **Electronic module that controls the PSD operation when opening.**

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

    A summary table of the requested service part information for the subject component is provided in Attachment 1 CD GM; folder labeled "Response to Q11."

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 role of the "auto-reverse" feature;**
    d. **The failure mode(s);**

e. **The risk to motor vehicle safety that it poses;**
f. **What notes and warnings is available in the owners manual or to the middle-row occupants when opening the PSD when occupant's arm is resting on the interior door handle/arm rest;**
g. **What warnings (visual or audible), if any, the operator and the other persons inside the vehicle would have that the alleged defect (or the PSD is in its opening sequence) was occurring; and**
h. **The reports included with this inquiry.**

➢ In Response to Question 12a - 12d:

The right-hand PSD has been available as an option in GM vehicles since the 1993 Model Year. The PSD has become so widely accepted as a convenience item that it has been included as an option on U-Vans with a left-hand sliding door. As shown in Table 12-1, 66.1 percent of the 2004 Model Year U-Vans sold by GM, include a PSD.

MY	% Population w/PSD
1997	47.0
1998	53.6
1999	63.9
2000	69.1
2001	73.1
2002	58.0
2003	59.9
2004	66.1

TABLE 12-1 VEHICLES PRODUCED WITH PSD

The PSD system offers drivers the convenience of opening the sliding door(s) with a remote keyless entry system, interior switches, and manual operation. Remote interior switches and additional safety features allow the driver greater PSD control. The driver has the ability to choose how the PSD is operated.

The PSD allows drivers to place personal items and children directly in the vehicle without fumbling for keys to unlock the door and then opening it manually. It also allows drivers to open and close the doors remotely without leaving the driver's seat. The driver also has the ability to select whether the door is opened electronically or manually using the override switch located on the overhead console. Also, as with other vehicle doors, the PSD must be unlocked manually or remotely before the door can be opened manually or electronically.

An input from any of the PSD switches (located on the B-Pillar or the overhead console) or PSD button on the remote keyless entry transmitter will reverse the direction of the door. The interior overhead console mounted PSD override switches allow the PSD electrical operation to be disabled, allowing the PSD to only be operated manually.

The PSD Security Lock (Child Safety Lock) is an additional safety feature, located on the forward inside edge of the PSD. The PSD Security Lock prevents passengers from opening the door by using the interior door handle. To open the PSD while using the security lock, the driver or passengers can depress any of the interior PSD switches or pull the exterior door handle.

The PSD includes an integrated obstacle detection feature to help enhance safety during the opening and closing sequence. The purpose of the "auto-reverse" feature is to reverse the direction of the door when contact with an obstacle is detected. The same technology is used in competitive vehicles.

The design of the interior door handle allows people to operate the door with a thumbs-up or thumbs-down grip orientation. Depending on the second row seating option (bucket seats, captain's chairs or 40/60 split bench seat), and seat trac position, the PSD interior door handle is 429 – 667 mm from the rear seat backs.

The obstacle detection feature of the PSD is calibrated to help prevent injuries and damage to personal property while maintaining proper operation of the door in a range of environmental conditions. PSD operation requirements include the ability to operate the PSD when the door is frozen to the seal and when the vehicle is parked on an incline or decline. As the PSD is performing the opening sequence, if an occupant is gripping the door handle and his or her elbow contacts the seatback, the door velocity may not be reduced below the calibration values because of the padding of the seatback and flexing of the occupant's wrist. Because the deceleration rate is less than the obstacle detection calibration values, the PSD controller continues to open the door at a constant velocity until the hold-open position is reached.

These rare injuries should be assessed in context. There is a risk of injury with every vehicle door. Vehicle occupants and users can injure themselves while opening and closing doors that are entirely manual in their operation. Indeed, a manually-operated door can be slammed shut or opened with as much speed and force as someone chooses to apply.

These PSDs offer several advantages over manual doors. The motor and controller work to maintain a controlled opening and closing rate, making the operation of the door predictable. They incorporate obstacle detection and reversing to help reduce the potential for injury and damage. A driver can set the door so that only the driver can operate it. The driver can open and close the door while it is in view from the driver's seat, making it unnecessary for the driver to leave the vehicle and providing access for a child or an adult who might not be capable of operating a manual door safely. If a driver is unfamiliar with the operation of the power sliding door, he or she should review the owner's manual before operating it or allowing others to do so.

- In Response to Question 12f:

  The Owner's Manual describes the operation of the PSD and includes a caution about the risk of injury if a person is in the path of the moving door. The caution does not address specific portions of the body.

➢ In Response to Question 12g:

Occupants can hear the PSD lock unlatch and hear the PSD separate from the door seal. They can also feel the door move outboard and hear noise from the door glides and motor as the PSD moves in the track. There is no additional audible alarm during door opening.

➢ In Response to Questions 12e and 12h:

GM has reviewed the 23 ODI complaints and finds they fall into three categories:

- Seventeen of the ODI records involved passengers of rental vehicles or children. These passengers may have been unfamiliar with the operation of the power sliding door. The drivers failed to assist or supervise the passengers effectively or may themselves have been unfamiliar with the operation of the door.
- Four of the ODI records involve incidents where no inspection of the vehicle was performed. GM found no warranty records on the PSD system or additional details. Therefore, GM is unable to assess those incidents.
- Two of the ODI records have insufficient VIN and vehicle details and, therefore, GM is unable to assess the details regarding the subject condition.

Over the past seven years, GM has produced 811,509 vehicles with the left, right or dual PSD. As shown in Figure 12-1 below, most of the incidents occur when the subject vehicle has been in service for less than one year.

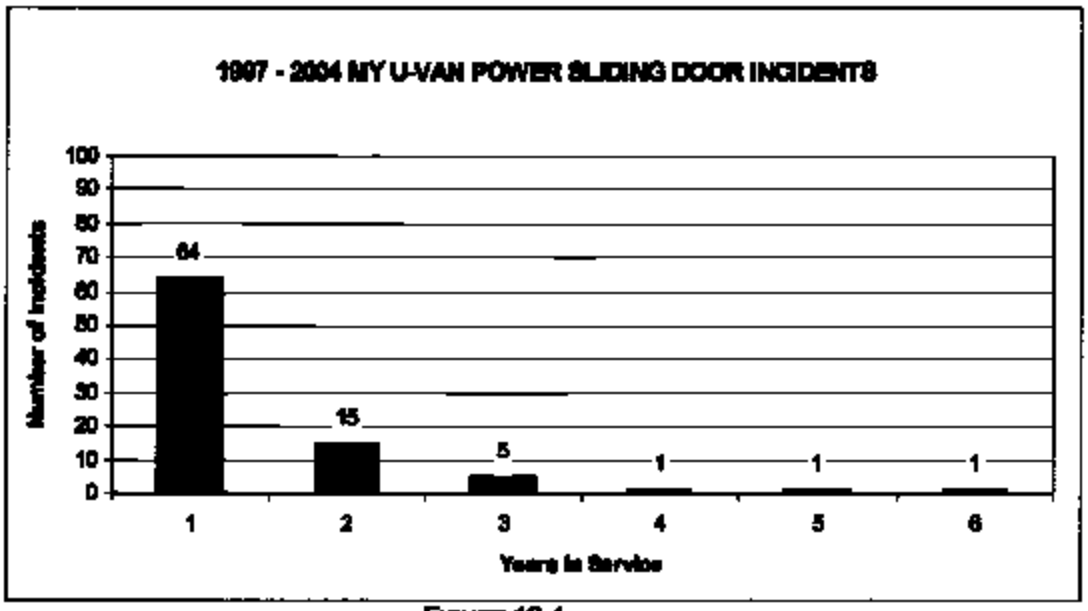

FIGURE 12-1

The incident rate of the subject condition is low. As less than ten percent of the vehicles now have less than a year in service, it can be expected that there will be a declining number of incidents in future years. For the reasons stated above, the subject condition does not present an unreasonable risk to motor vehicle safety.

* * *

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, "including 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 September 1, 1995, 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
2 CDs
2 DVDs

GM 666

U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

SEP 24 2004

Original
w/VOQs
Received
9-30-04

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

NVS-212.pco
PE04-064

Ms. Gay P. Kent
GM Product Investigations
Mail Code 480-111-E18
Engineering Building
30200 Mound Road
Warren, MI 48090-9010

Dear Ms. Kent:

This letter is to inform you that the Office of Defects Investigation (ODI) of the National Highway Traffic Safety Administration (NHTSA) has opened a Preliminary Evaluation (PE04-064) to investigate allegations of wrist or lower arm injury from entrapment between the power sliding door interior handle and the middle-row seat back during powered door opening sequence in MY 1998 through MY 2004 GM U-Vans (Chevrolet Venture, Oldsmobile Silhouette and Pontiac Transport/Montana minivans) manufactured by General Motors Corporation, and to request certain information.

This office has received 21 reports of which 19 of the 21 reports alleged the occupant's wrist or lower arm were injured from entrapment of their arm between the power sliding door interior handle and the middle-row seat back during powered door opening. Of the 19 injury reports, 13 alleged a broken bone related injury (broken wrist/arm). A copy of each of the reports is enclosed for your information.

Unless otherwise stated in the text, the following definitions apply to these information requests:

- **Subject vehicles:** all MY 1998 through MY 2004 GM U-Vans manufactured for sale or lease in the United States. In addition, MY 1997 GM U-Vans shall also be included.

- **Subject component:** Power Sliding Door (PSD) "auto-reverse" feature during door opening sequence on the subject vehicles.

- **GM:** General Motors Corporation, all of its past and present officers and employees, whether assigned to its principal offices or any of its field or other locations, including 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 September 1, 1995, 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.

- **Alleged defect:** PSD opening force causing wrist or lower arm injury from entrapment of occupant arm between the power sliding door interior handle and the middle-row seat back during powered door opening sequence.

- **Document:** "Document(s)" is used in the broadest sense of the word and shall mean all original written, printed, typed, recorded, or graphic matter whatsoever, however produced or reproduced, of every kind, nature, and description, and all non-identical copies of both sides thereof, including, but not limited to, papers, letters, memoranda, correspondence, communications, electronic mail (e-mail) messages (existing in hard copy and/or in electronic storage), faxes, mailgrams, telegrams, cables, telex messages, notes, annotations, working papers, drafts, minutes, records, audio and video recordings, data, databases, other information bases, summaries, charts, tables, graphics, other visual displays, photographs, statements, interviews, opinions, reports, newspaper articles, studies, analyses, evaluations, interpretations, contracts, agreements, jottings, agendas, bulletins, notices, announcements, instructions, blueprints, drawings, as-builts, changes, manuals, publications, work schedules, journals, statistical data, desk, portable and computer calendars, appointment books, diaries, travel reports, lists, tabulations, computer printouts, data processing program libraries, data processing inputs and outputs, microfilms, microfiches, statements for services, resolutions, financial statements, governmental records, business records, personnel records, work orders, pleadings, discovery in any form, affidavits, motions, responses to discovery, all transcripts, administrative filings and all mechanical, magnetic, photographic and electronic records or recordings of any kind, including any storage media associated with computers, including, but not limited to, information on hard drives, floppy disks, backup tapes, and zip drives, electronic communications, including but not limited to, the Internet and shall include any drafts or revisions pertaining to any of the foregoing, all other things similar to any of the foregoing, however denominated by GM, any other data compilations from which information can be obtained, translated if necessary, into a usable form and any other documents. For purposes of this request, any document which contains any note, comment, addition, deletion, insertion, annotation, or otherwise comprises a non-identical copy of another document shall be treated as a separate document subject to production. In all cases where original and any non-identical copies are not available, "document(s)"also means any identical copies of the original and all non-identical copies

thereof. Any document, record, graph, chart, film or photograph originally produced in color must be provided in color. Furnish all documents whether verified by GM or not. If a document is not in the English language, provide both the original document and an English translation of the document.

- **Other Terms:** To the extent that they are used in these information requests, the terms "claim," "consumer complaint," "dealer field report," "field report," "fire," "fleet," "good will," "make," "model," "model year," "notice," "property damage," "property damage claim," "rollover," "type," "warranty," "warranty adjustment," and "warranty claim," whether used in singular or in plural form, have the same meaning as found in 49 CFR 579.4.

In order for my staff to evaluate the alleged defect, certain information is required. Pursuant to 49 U.S.C. § 30166, please provide numbered responses to the following information requests. Insofar as GM has previously provided a document to ODI, GM may produce it again or identify the document, the document submission to ODI in which it was included and the precise location in that submission where the document is located. When documents are produced, the documents shall be produced in an identified, organized manner that corresponds with the organization of this information request letter (including all individual requests and subparts). When documents are produced and the documents would not, standing alone, be self-explanatory, the production of documents shall be supplemented and accompanied by explanation.

Please repeat the applicable request verbatim above each response. After GM's response to each request, identify the source of the information and indicate the last date the information was gathered.

1. State, by model and model year, the 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. Vehicle identification number (VIN);
   b. Make;
   c. Model;
   d. Model Year;
   e. Date of manufacture;
   f. Middle-row seat configuration;
   g. Number of middle-row seats;
   h. Equipped passenger-side PSD;
   i. Equipped driver-side PSD;
   j. "Auto-reverse" feature in PSD;
   k. Date warranty coverage commenced; and
   l. The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

   Identify in the file the vehicle's middle-row seat configuration (i.e. Bench; 60/40 Bench; Captain's Chair; Bucket Seats or none).

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:

   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;
   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.

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

   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 "d," 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.

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 a crash is alleged;
   j. Whether property damage is alleged;
   k. Number of alleged injuries, if any; and
   l. Number of alleged fatalities, if any.

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

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.

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: 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;
   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 the table in Microsoft Access 2000, or a compatible format, entitled "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.

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.

8. Describe all the operation and safety features of the PSD during opening operation. Highlight any changes/upgrades in these features from inception to MY 2004 vehicles. They should include the following detailed information:

   a. Component description;
   b. Component location/diagram;
   c. Distance from the interior door handle pivot to the front of the middle-row seat back at the forward most and rearward most (fore/aft) seat position;
   d. Lateral distance from the interior door handle (center line) to the edge of the right hand middle-row seat/seat arm rest (center line) for each seat configuration on the passenger-side position;
   e. Lateral distance from the interior door handle (center line) to the edge of the left hand middle-row seat/seat arm rest (center line) for each seat configuration on the driver-side position;
   f. Pictorial diagram showing the relative locations of the interior door handle and the various available seat configurations;
   g. Description of the door's "auto-reverse" feature during opening operation and maximum forces at various door opening points (from fully-closed to fully-opened) in two inch increments;
   h. The PSD "stall" force during opening operation.

9. 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.

10. 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 component, from the start of production to date, which relate to, or may relate to, the alleged defect (including interior door handle, door panel, middle-row seat designs and configurations) 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 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.

11. State the number of component related to the door's "auto-reverse" feature 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:
    a. Sensor that senses obstruction during opening; and
    b. Electronic module that controls the PSD operation when opening.

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

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 role of the "auto-reverse" feature;
    d. The failure mode(s);
    e. The risk to motor vehicle safety that it poses;
    f. What notes and warnings is available in the owners manual or to the middle-row occupants when opening the PSD when occupant's arm is resting on the interior door handle/arm rest;
    g. What warnings (visual or audible), if any, the operator and the other persons inside the vehicle would have that the alleged defect (or the PSD is in its opening sequence) was occurring; and
    h. The reports included with this inquiry.

This letter is being sent to GM pursuant to 49 U.S.C. § 30166, which authorizes NHTSA to conduct any investigation that may be necessary to enforce Chapter 301 of Title 49 and to request reports and the production of things. It constitutes a new request for information. GM's failure to respond promptly and fully to this letter could subject GM to civil penalties pursuant to

49 U.S.C. § 30165 or lead to an action for injunctive relief pursuant to 49 U.S.C. § 30163. (Other remedies and sanctions are available as well.) Please note that maximum civil penalties under 49 U.S.C. § 30165 have increased as a result of the recent enactment of the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act, Public Law No. 106-414 (signed November 1, 2000). Section 5(a) of the TREAD Act, codified at 49 U.S.C. § 30165(b), provides for civil penalties of up to $5,000 per day, with a maximum of $15 million for a related series of violations, for failing or refusing to perform an act required under 49 U.S.C. § 30166. This includes failing to respond to ODI information requests.

If GM cannot respond to any specific request or subpart(s) thereof, please state the reason why it is unable to do so. If on the basis of attorney-client, attorney work product, or other privilege, GM does not submit one or more requested documents or items of information in response to this information request, GM must provide a privilege log identifying each document or item withheld, and stating the date, subject or title, the name and position of the person(s) from, and the person(s) to whom it was sent, and the name and position of any other recipient (to include all carbon copies or blind carbon copies), the nature of that information or material, and the basis for the claim of privilege and why that privilege applies.

GM's response to this letter, in duplicate, together with a copy of any confidentiality request, must be submitted to this office by November 5, 2004. Please refer to PE04-064 in GM's response to this letter. If GM finds that it is unable to provide all of the information requested within the time allotted, GM must request an extension from me at (202) 366-5218 no later than five business days before the response due date. If GM is unable to provide all of the information requested by the original deadline, it must submit a partial response by the original deadline with whatever information GM then has available, even if an extension has been granted.

If GM claims that any of the information or documents provided in response to this information request constitute confidential commercial material within the meaning of 5 U.S.C. § 552(b)(4), or are protected from disclosure pursuant to 18 U.S.C. § 1905, GM must submit supporting information together with the materials that are the subject of the confidentiality request, in accordance with 49 CFR Part 512, as amended (69 Fed. Reg. 21409 et seq; April 21, 2004), to the Office of Chief Counsel (NCC-113), National Highway Traffic Safety Administration, Room 5219, 400 Seventh Street, S.W., Washington, D.C. 20590. GM is required to submit two copies of the documents containing allegedly confidential information (except only one copy of blueprints) and one copy of the documents from which information claimed to be confidential has been deleted.

If you have any technical questions concerning this matter, please call Peter Ong of my staff at (202) 366-0583.

Sincerely,

Thomas Z. Cooper, Chief
Vehicle Integrity Division
Office of Defects Investigation

GM666
PE04-064

ATTACHMENT "1"

GM666
PE04-064

ATTACHMENT "2C"