GM GENERAL MOTORS NORTH AMERICA
Structure & Safety Integration

March 28, 2003

Kathleen C. DeMeter, Director
Office of Defects Investigation
NHTSA Enforcement
Room #5326
400 Seventh Street, S.W.
Washington, D.C. 20590

GM-522B

NVS213
EA02-031

Dear Ms. DeMeter:

This letter is General Motors (GM) response to your information request (IR), dated January 22, 2003, regarding alleged lockup of the steering column in 1997–2001 model year (MY) Chevrolet Corvette vehicles.

Your questions and our corresponding replies are as follows:

1. **State by 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. **Model Year;**
   c. **Transmission Type;**
   d. **Date of manufacture;**
   e. **Date warranty coverage commenced; and**
   f. **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 2000, or a compatible format, entitled "PRODUCTION DATA." See Enclosure 2, EA02-031 Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

   The total number of subject vehicles GM has manufactured for sale or lease in the United States is shown in Table Q1. An electronic summary of the production data is provided on the CD in Attachment 1; refer to the Microsoft Access 2000 file in the folder labeled "Response for Q1." This data was collected from GM Vehicle Profile System on March 17, 2003.

TABLE Q1

CHEVROLET CORVETTES	1997 MY	1998 MY	1999 MY	2000 MY	2001 MY	TOTAL
With Man. Transmission	2,662	6,565	12,818	12,469	14,953	49,467
With Auto. Transmission	6,386	22,126	17,026	18,721	18,255	82,514
Total	9,048	28,691	29,844	31,190	33,208	131,981

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;**

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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 "f ," 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.

Table Q2 summarizes the reports to GM that could relate to the subject condition. These reports are in addition to the reports provided in GM's September 13, 2002 response.

TABLE Q2

REPORT TYPE	COUNT (INCLUDING DUPLICATES)	UNIQUE GM REPORTS	GM REPORTS CORRESPONDING TO NHTSA VOQS	ATTACHMENT CONTAINING REPORTS	NUMBER OF CRASH INCIDENT REPORTS	NUMBER OF REPORTED INJURIES*
Owner Reports), speed ≥ 20 MPH	0	0	0	N/A	0	0
Owner Reports, speed < 20 MPH	1	1	0	2a	0	0
Owner Reports, speed unknown	1	1	0	2a	0	0
Field Reports, speed ≥ 20 MPH	3	3	0	2b	3	2
Field Reports, speed < 20 MPH	4	4	0	2b	1	0
Field Reports, speed unknown	0	0	0	N/A	0	0
Not-In-Suit Claims (any speed)	0	0	0	N/A	0	0
Lawsuits (any speed)	0	0	0	N/A	0	0
Subrogation Claims (any speed)	0	0	0	N/A	0	0
3rd Party Arbitration (any speed)	0	0	0	N/A	0	0
Total (Including Duplicates)	9	9	0	N/A	4	2
Total (Excluding Duplicates)	9	9	0	N/A	4	2

* GM is not aware of any fatalities related to the subject condition.
** N/A – not applicable

GM's response to Item 2 does not include warranty claim data. Refer to question 5 for all warranty claim data. GM has searched the following sources to collect the data for this response: Corporate Central File, Customer Assistance Center, Technical Assistance Center, ESIS, Field Information Network Database, Company Vehicle Evaluation Program, Early Quality Feedback, 24 Hour Concern Detection Process, and Legal. The collection of the reports was completed on March 5, 2003.

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 model year;**
   e. **Vehicle's VIN;**
   f. **Incident date;**
   g. **Report or claim date;**
   h. **Vehicle's mileage at time of incident;**
   i. **Vehicle's speed at time of incident;**
   j. **Whether a crash is alleged;**
   k. **Number of alleged injuries, if any;**
   l. **Number of alleged fatalities, if any;**
   m. **System/component codes; and**
   n. **Summary of the complaint/report.**

   Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER TWO DATA." See Enclosure 2, EA02-031 Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

   An electronic summary of the records included in Item 2 is provided on the CD in Attachment 1; refer to the Microsoft Access 2000 file in the folder labeled "Response for Q3." GM has organized this summary by GM file number within each attachment.

4. **Produce copies of all documents related to each item within the scope of Request No 2 excluding those submitted in GM's September 13, 2002 response to PE02-054. 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 Q2. GM has organized the records by the GM file number within each attachment.

5. **State, by 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 this information in Microsoft Access 2000, or a compatible format, entitled "WARRANTY DATA." See Enclosure 2, EA02-031 Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

A summary of warranty claims that may relate to the subject condition on vehicles for sale or lease in the U.S. is provided on the CD in Attachment 1; refer to the Microsoft Access 2000 file in the folder labeled "Response for Q5." The summary includes claims provided in GM's previous submissions on September 13, 2002 and October 23, 2002. GM searched its Claims Analysis Retrieval Database (warranty database) on February 14, 2003.

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 fields labeled "Customer Code", "Customer Code Description" and "Verbatim Text" in response to request 5j and 5k. The verbatim text is an optional field, not required to be completed for every warranty claim. It is for the dealer to enter any additional comments that may be applicable to the 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.**

The warranty data was collected by searching for the labor codes listed in Table Q6. A list of warranty trouble codes and trouble code descriptions associated with the labor operations are provided on the CD in Attachment 1; refer to the Microsoft Excel 2000 file in the folder labeled "Response for Q6." Some of these trouble codes do not seem appropriate for a description of the alleged defect. Labor code E7501 is used for the replacement of the steering column locking parts for any reason.

TABLE Q6

LABOR CODE	DESCRIPTION
E7501	Locking Parts, Steering Column – Replace
V0743*	ECL Relay Harness Replace

* Labor code did cease to perform high pressure service grs 01044 and 01444.

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 do 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.

7. State, by 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) related to the alleged defect that GM offered for the subject vehicles and state by option and model year, the number of vehicles that are covered under each such extended warranty.

The subject vehicles are covered by a bumper-to-bumper new vehicle warranty for three years or 36,000 miles, whichever occurs first. Many 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 warranty system does not contain information on the number of vehicles that have extended warranty coverage

8. Provide a chart showing electronic column lock warranty incidents per thousand vehicles by build month and by time in service. Provide all charts in full color, or in an electronic format that contains full color.

The requested charts are provided on the CD in Attachment 1; refer to the Microsoft Excel 2000 file in the folder labeled "Response for Q8." These charts were completed on March 24, 2003 by GM Product Investigations Department using the information provided for Item 1 and Item 5 of this response.

9. 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 vehicle owners, dealers, regional or zone offices, field offices, fleet purchasers, or other entities, other than those identified in GM's September 13, 2002 response to PE02-054. 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 supplied communications to the dealers related to the subject investigation as part of its September 13, 2002 response. Attachment 9 contains a copy of the communication to the dealers related to the subject investigation since September 13, 2003. This data was supplied by GM Service and Parts Operation on March 21, 2003

General Motors is not planning to issue any additional service, warranty or other technical document or communication to its dealers, regional offices, zone offices or other entities regarding the subject condition.

10. 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, other than those identified in GM's September 13, 2002 response to PE02-054. 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 and for each document provided, state the source of the document and the date the action was or will be completed.

The Table Q10-A summarizes the actions conducted by or on behalf of GM. The documents are provided on the CD in Attachment 1; refer to the Microsoft Excel 2000 and Microsoft Word 2000 files in the folder labeled "Response for Q10."

TABLE Q10-A

IDENTIFIER	START	END	SUMMARY OF TEST	GROUP	RESULT SUMMARY
C-5 ECL Actuator Rebound Evaluation Over Life Cycle	3/31/03	4/17/03 (estimate)	The objective is to determine if the lock pin can ever protrude, due to rebound, and contact the lock ring, while the micro switch continues to indicate an unlocked column. It is planned to run the test to 50,000 cycles (durability requirement of ignition switch).	Warren Electrical Test Development & Validation	To Be Determined
Analysis of Warranty Claims	1/07/03	On going, no set end date	Review recent warranty claims to determine if any may have happened while driving & identify vehicles that may exhibit alleged condition for further review.	GM Service & Parts Operation	Only one claim was identified that may exhibit condition – VIN 1G1YY22G0W5123464. Vehicle analyzed (see analysis below).
Evaluation of Customer Vehicle – VIN: 1G1YY22G0W5123464	3/13/03	4/15/03 (estimate)	Review vehicle to determine validity of complaint & likely cause. Vehicle was reviewed in MD. Column was removed for further analysis by Delphi & Honeywell	GM Engineering – Electrical, Steering Column Representatives, Delphi Automotive, Honeywell.	No cause identified that could result in column locking while vehicle is driven. Complaint does not appear to be valid. Further investigation is being done on the column.

In addition to the above documents, Delphi Automotive (Delphi) has provided information relating to the testing listed in Table Q10-B and analysis of the returned warranty parts. This information is provided in "Attachment-Delphi."

TABLE Q10-B

IDENTIFIER	START	END	SUMMARY OF TEST	GROUP	RESULT SUMMARY
Rebound Test	9/27/02	9/30/02	Evaluation of 26050960 & 26089807 w/o dynamic braking	Fasco Invensys/ Honeywell	See Report Provided in Attachment-Delphi
Evaluation of Original 1997.2 MY System	4/03 (estimate)	5/03 (estimate)	Evaluation of Dynamic Braking	Honeywell & Delphi	To Be Determined

The preceding information was collected from GM Engineering, GM Service and Parts Operation, and Delphi Automotive. The data collection was completed on March 27, 2003.

11. State by model year and transmission type all modification(s), component(s), or kit(s) that would be required to retrofit the MY 2001 ECL assembly onto MY 1997-2000 subject vehicles, including all modifications required in the Passenger Zone Module (PZM). For each component or kit required, state the part number(s), the component or kit application, and the modifications made to the component or kit from the earlier vehicle. State whether any new or additional service or maintenance processes are required to retrofit or maintain the component(s) or kit(s) on earlier vehicles.

Table Q11 indicates the changes that would likely be necessary to retrofit MY 1997-2000 subject vehicles to make them similar to 2001 MY vehicles. GM cannot currently retrofit the 1997-2000 MY vehicles to make them the same as 2001 MY vehicles because production of the 2001 ECL has ceased.

Table Q11

VEHICLE – TRANSMISSION TYPE	1997 MY	EARLY 1998 MY	LATE 1998 MY	1999 MY	2000 MY
Automatic Option 1	1. New '97 PZM 2. New wiring kit to add SPDT ECL relay. 3. Latest ECL p/n 26089807*. 4. Steering wheel nut p/n 26056108.	1. New '98 PZM 2. New wiring kit to add SPDT ECL relay. 3. Latest ECL p/n 26089807*. 4. Steering wheel nut p/n 26056108.	1. Service Kit 88952428. 2. Latest ECL p/n 26089807*. 3. Steering wheel nut p/n 26056108.	1. Service Kit 88952428. 2. Latest ECL p/n 26089807*. 3. Steering wheel nut p/n 26056108.	1. Service Kit 88952428. 2. Latest ECL p/n 26089807*. 3. Steering wheel nut p/n 26056108.
Automatic Option 2	1. Service Kit 88952427 to disable ECL using procedure in Customer Satisfaction Campaign #01044A. 2. Steering wheel nut p/n 26056108.	1. Service Kit 88952427 to disable ECL using procedure in Customer Satisfaction Campaign #01044A. 2. Steering wheel nut p/n 26056108.	1. Service Kit 88952427 to disable ECL using procedure in Customer Satisfaction Campaign #01044A. 2. Steering wheel nut p/n 26056108.	1. Service Kit 88952427 to disable ECL using procedure in Customer Satisfaction Campaign #01044A. 2. Steering wheel nut p/n 26056108.	1. Service Kit 88952427 to disable ECL using procedure in Customer Satisfaction Campaign #01044A. 2. Steering wheel nut p/n 26056108.
Manual	1. New '97 PZM 2. New wiring kit to add SPDT ECL relay. 3. Latest ECL p/n 26089807*. 4. Steering wheel nut p/n 26056108.	1. New '98 PZM 2. New wiring kit to add SPDT ECL relay. 3. Latest ECL p/n 26089807*. 4. Steering wheel nut p/n 26056108.	1. Service Kit 88952428. 2. Latest ECL p/n 26089807*. 3. Steering wheel nut p/n 26056108.	1. Service Kit 88952428. 2. Latest ECL p/n 26089807*. 3. Steering wheel nut p/n 26056108.	1. Service Kit 88952428. 2. Latest ECL p/n 26089807*. 3. Steering wheel nut p/n 26056108.

* ECL part number 26089807 has superceded ECL part number 26050960 used in MY 2001 vehicles.

Please note that some of these changes have not been validated and other changes may be necessary. In addition the following are likely:

Automatic Option 1 and Manual Notes

- New Passenger Zone Modules are required to add the software to control the external Electric Column Lock Relay, using an existing spare low side driver. The software changes would drive new GM part numbers. The new Passenger Zone Modules would be used by both auto and manual transmission vehicles for a given model year.

- New wiring kit would be needed for 1997 to Early 1998 model year vehicles to add SPDT relay to ECL subsystem.

- The latest ECL part number 26089807 would be needed to update the steering column. It could be released with the new wiring kit in item 2 above.

- Service Kit 88952428 converts an existing SPST ECL relay to a SPDT ECL relay. The kit contains a new SPDT ECL relay and a wiring jumper. In addition, the latest ECL p/n 26089807 and steering wheel nut p/n 2605608 are needed.

Automatic Option 2 Notes

- Service Kit 88952427 is used to disable the ECL using procedure provided in Customer Satisfaction Campaign #01044A. The steering column lock/cam orientation plate is replaced with a new cam orientation plate. A new jumper wire and relay harness (from the kit) is used to replicate the function of the ECL. The ECL actuator remains operational to counteract oxide growth on the ECL relays in the Passenger Zone Module. The ECL lock bolt will no longer lock the column because the steering column lock/cam orientation plate has been replaced with a new cam orientation plate.

12. **Provide a chronological description of all modifications or changes, other than those identified in GM's September 13, 2002 response to PE02-054, 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 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. **Disposition of unused pre-modified parts;**
    h. **When the modified component was made available as a service component; and,**
    i. **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 not aware of any changes made to the subject component that were not provided in its previous response. There is a planned change to change the Positive Temperature Coefficient (PTC - thermal circuit breaker Part number 26089807) in June of 2003 because the manufacturer (Raychem) is incorporating a material change that will obsolete the current PTC. There should be

no effect on the performance of the Electric Column Lock (ECL). The new PTC (part number has not been determined) is planned to be interchangeable with the current part number. It is intended that current stock will be used. The date the new part will be available in service has not been determined.

13. Furnish each of the following:

a. Field return samples of the subject component exhibiting each subject failure mode GM has identified, including subject components exhibiting the following:

I. Failure of actuator;
II. Short circuiting of ECL;
III. Binding of worm/worm gear;
IV. Excessive lock bolt rebound; and
V. Any other failure mode.

b. One assembled steering column (without steering wheel) per Enclosure 3, General Motor's 1998 Chevrolet Corvette Service Manual - Steering Column – Disassembled View; and

c. Two exemplar samples of the Shaft Lock Shield Assembly.

To respond to 13a, GM requested parts returned to its Warranty Return Center. As of March 21, GM had not identified any parts responsive to 13a. If any parts are returned that are responsive to 13a, GM will forward them to NHTSA.

Delphi Automotive will supply the parts requested in 13b and 13c. Delphi will send them to VRTC as NHTSA requested in the e-mail note from Ms. Cheryl Tuosto dated March 14, 2003.

14. Produce GM's design specifications and testing requirements for the subject component used on the subject vehicle, including:

a. The original GM specification;
b. A chronological listing of all specification modifications or additions, including the date the change was incorporated into the production of the subject vehicle and the reason for the change;
c. The original testing requirements and a description of how each testing process was conducted, including the name and description of each type of testing and measurement equipment;
d. The test results used to validate how the subject component met the design specifications for each testing requirement;
e. A chronological listing of any testing requirement modification or addition, including a description of the modified or additional testing procedure, if applicable, the date the change was incorporated into the production of the subject vehicle, and the reason the change was made; and
f. The test results used to validate how the subject component met the design specifications for each modified testing requirement.;

a. Attachment 14 contains the GM specification, 26087216 - revision 001. GM is seeking confidentiality on this information. The Delphi specification is 26052015 - revision 025. Delphi is seeking confidentiality on this specification. The Delphi specification and the request for confidentiality are provided in Attachment-Delphi.

b. The specification change history is included as the last page of each specification. There have been no changes to the GM specification since its release.

c. The testing requirements are listed in the specifications. A description of the testing process is contained in the specification instructions.

d. Test results are provided in the Attachment-Delphi, Appendix A.

e. No changes or additions were made to the testing requirements.

f. Not applicable. There were no modified testing requirements.

15. The following questions refer to the summary table provided on Bates pages GM622 Att. 10 16 through 18 in Attachment "10" of GM's September 13, 2002 response to PE02-054.

a. State the source and date of the document.

b. Produce copies of all reference documents cited, including:

i. Reference Document B-2;
ii. Reference Document C-1;
iii. Reference Document D-1;
iv. Reference Document E-4;
v. Chart: Appendix B;
vi. Reference Documents J-1, J-3, and J-4;
vii. Reference Document N; and
viii. Reference Document K-1.

c. Explain the terminology "PPAP", "Interim A", "Interim D", and "engineering permit", as it applies to the subject component.

d. Explain the PPAP approval process and requirement specifications for the steering column as it relates to the subject component in the subject vehicle.

e. Explain the requirements and testing procedures necessary to validate the ECL actuator and provide the test results used to substantiate its validation prior to the start of production of the subject vehicles.

f. Explain the ECL durability requirements and the specific durability requirements referenced in the 12/18/96 modification description, which Fasco (Invensus) could not meet.

g. Explain each action that Fasco (Invensus) has taken to meet the specific durability requirements that it could not meet in question 14f.

h. Describe failure mode referenced in the 04/1998 modification description and the vehicle mechanism GM changed to address this failure mode.

i. Describe the purpose and requirement specifications of the relay referenced in the 04/1998-12/1999 modification description, which GM added in April 1999.

j. Produce all documents and drawings that relate to, or may relate to, the relay referenced in question 14i.

k. Provide GM's detailed opinion of how and why the relay referenced in question 14h adversely affected the performance of the ECL.

l. Describe the "out of print" condition experienced with the stainless steel actuator referenced in the 12/18/96 modification description and the procedure used to rectify this issue in the subject vehicles containing the subject component.

a. Delphi Automotive provided the chart on pages 16-18 of Attachment 10 in GM's previous response. Delphi has not been able to confirm the author or date of the chart. There are some inaccuracies in the chart. For example, the chart indicates that GM identified early warranty concerns in the fall of 1996; however, the 1997 MY was a late introduction and was not introduced to commerce until early 1997 calendar year. Therefore, there could not be any

warranty in the fall of 1996. It is more likely that the chart refers to a concern that surfaced during validation or durability testing.

b. The referenced documents are provided by Delphi in Attachment-Delphi.

c. The following terms: "PPAP", "Interim A", "Interim D", and "engineering permit" are explained in the PPAP process booklet provided in Attachment-Delphi.

d. The PPAP approval process is defined in the PPAP process booklet provided in Attachment-Delphi.

e. This is explained in Attachment-Delphi, response to 15.

f. This is explained in Attachment-Delphi, response to 15.

g. This is explained in Attachment-Delphi, response to 15.

h. This question was answered in GM's September 13, 2002 response to PE02-054. Please the response to question 17c.

i. The purpose of the SPST relay was described in GM's September 13, 2002 response 17c to PE02-054.

j. The requested drawings are provided on the CD in Attachment 1; refer to the files in the folder labeled "Response for Q15l."

k. Prior to the addition of the relay, the ECL actuator, when commanded to unlock, had an inadvertent 350,000 ohms resistive load across the ECL motor when the circuit was de-energized. This resistive load may cause some dynamic braking of the ECL motor, and may help the ECL motor to slow. The addition of the relay eliminates the resistive load.

GM does not believe that the 350,000 ohm resistive load contributes any significant dynamic braking of the ECL motor. The analysis, found in Attachment 1, Response to Q15k, indicates that the load resistance needs to be less than 13 ohm for dynamic braking to occur. Therefore, the addition of the relay does not adversely affect the ECL function. GM and Delphi intend to conduct testing to provide additional information on this issue, refer to the planned testing listed in response to Item 10.

l. This is explained in Attachment-Delphi, response to 15.

This response was prepared from data supplied by GM Engineering, GM Supplier Quality and Delphi on March 21, 2003.

16. Provide the following product validation and quality assurance (SQA) data relating to the subject component in the subject vehicles:
a. All Invensys product validation data;
b. All Delphi product validation data;
c. All GM product validation data;
d. All Invensys quality assurance (SQA) data;
e. All Delphi quality assurance (SQA) data; and
f. All GM quality assurance data.

Include all documents relating to this data. For each document provided, state the source of the document, identify any testing performed, the entity that performed the tests, and the date each test was performed, state the testing procedure for each test, and state the results of the tests. Identify any problems, non-conformance to technical requirements, or other exceptions contained within this data and describe the corrective action taken.

a. The Invensys product validation data available at Delphi is provided in Attachment-Delphi, Appendix A.

b. Delphi product validation data is provided in Attachment-Delphi, Appendix A.

c. GM does not validate the column assembly as a system. It relies on the component testing conducted by the suppliers

d. GM does not have this information. Honeywell Corporation has indicated that this data will be submitted as part of its response to the IR that it received.

e. The Delphi quality assurance data is provided in Attachment-Delphi, Appendix D

f. GM does not conduct SQA testing on the ECL system. As part of the a general system check at the end of the assembly line the key is removed to verify the column property locks; however, there are no records kept of this check. If a vehicle were to fail this check, it would be repaired prior to leaving the assembly plant.

This data was supplied by Delphi on March 21, 2003.

17. **Provide copies of all communications between GM and the first and second tier suppliers relating to the subject component. If any communications were oral or were conducted electronically, provide a written transcript or summary of each such communication, and include a statement that identifies the participants and the date of the communication.**

As part of this response and its September 13, 2003, GM supplied testing data and reports that it received from Delphi Automotive. Additional documents that GM has found responsive to this request are provided on the CD in Attachment 1; refer to the Microsoft Access 2000 file in the folder labeled "Response for Q5. Delphi has also supplied document that is has found. They are provided in Attachment-Delphi, Appendix E.

The GM information was supplied on March 25, 2003. The Delphi information was supplied on March 28, 2003.

18. **Identify, by make, model and model year, all other vehicles manufactured by GM which contain the subject component used in the subject vehicles. For each vehicle, state the following:**
   a. Make;
   b. Model;
   c. Model year;
   d. The GM part number of the subject component;
   e. The manufacturer part number of the subject component;
   f. The number of vehicles sold; and
   g. The electrical schematic and/or wiring diagram detailing the ECL circuit in the vehicle.

There are no other GM products that use the ECL system found on the subject vehicles.

19. **Furnish GM's assessment of the alleged defect in the subject vehicle, including:**
    a. **The causal or contributory factor(s);**
    b. **The failure mechanism(s);**
    c. **The failure mode(s);**
    d. **The risk to motor vehicle safety that it poses;**
    e. **What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and**
    f. **The reports included with this inquiry.**

GM has continued to monitor the alleged condition in the field and has not been able to substantiate any factor that could lead to a column locking while a vehicle is driving down the road. Most of the known reports of locked steering columns are consistent with a single point failure that results in a failure of the column to unlock. In that circumstance, the vehicle can be started and put in gear, but the column does not unlock. If the customer attempts to move the vehicle, the engine will stop when the vehicle reaches approximately 1 MPH. GM does not believe that this poses a safety risk. Specific responses to Question 19 follow:

a. GM has not been able to substantiate any factors that causes a steering column to lock while the vehicle is in motion.

b. GM has not been able to substantiate any failure mechanism that causes a steering column to lock while the vehicle is in motion. In January 2003, GM requested dealers and technicians call whenever there is an alleged complaint of a vehicle locking while in motion. GM has received several calls (see chart provided in Attachment 10) and has followed-up on each. In every case the complaint is consistent with a failure to unlock; and does not appear to have happened while the vehicle was in motion.

c. GM has not been able to substantiate any failure mode that causes a steering column to lock while the vehicle is in motion.

d. GM will continue to monitor this situation. However, for the following reasons GM believes that there is not a safety defect:

- GM has not found any evidence of a failure in the field that could cause the steering column to lock while the vehicle is being driven down the road.
- GM only received 9 new reports since its September 13 response, and most of these are consistent with a failure to unlock. This suggests that the rate of field complaints for the alleged condition is declining.
- There are a low number of reports (20) that indicate the customer was driving at speeds above 20 MPH. As indicated in GM's previous response Attachment 8A, GM has investigated many of these allegations, but in none of the cases did GM find any failures that could lead to a column locking while driving down the road.
- There are a low number of crashes (10 above 20 MPH).
- There are a low number of injuries (10, all minor).

- There are no fatalities.
- The Customer Satisfaction Campaigns appear to be addressing the customer's concerns.

e. Not applicable. GM cannot verify any warning related to the alleged condition.

f. Ninety-four percent of the 161 reports that NHTSA provided indicate the involved vehicle was not in motion; no speed was reported; or the speed was below 10 MPH. This is consistent with the steering column failing to unlock. In that circumstance, it would be possible for the vehicle to be moved a small amount, until a speed of 1 MPH is reached; at which time the engine is stopped. GM does not believe that this poses a safety risk.

* * *

General Motors requests that the document stamped "GM Confidential" included in Attachment 14 afforded confidential treatment by the NHTSA. This information is not customarily made public by General Motors and contains trade secrets and commercial information which is privileged or confidential under 5 U.S.C. Section 552(b)(4), 49 CFR Part 512 and 49 U.S.C. Section 30167(a).

Attachment 14 contains an engineering Subsystem Technical Specifications. These specifications have commercial value that can only be obtained independently at considerable cost. This information can be used by competitors to identify quality and performance requirements, thereby enabling them to improve their own products, without the expenditures associated with the development of these specifications, all at the expense of General Motors. Attachment 14 contains commercial information the disclosure of which would likely result in substantial competitive harm.

General Motors treats the above material as confidential proprietary information available only to authorized General Motors or supplier personnel, and not otherwise available to the public. The document is maintained under a record-keeping system which is intended to control dissemination of this material within General Motors, and to assure that it is not disseminated outside the Corporation, except as described in the attached certification made pursuant to 49 CFR Part 512.4(e).

To the best of our knowledge, no prior determinations of the confidentiality of this document has been made by the NHTSA, other Federal Agencies, or the Federal Courts. Document such as the one contained in Attachment 14, however, have, to the best of our knowledge, normally been granted confidential treatment by the NHTSA in the past. The document in Attachment 14 is of a type for which a class determination of confidentiality has been made under 49 CFR Part 512, Appendix B.

The document subject to this request for confidentiality has been clearly stamped "GM CONFIDENTIAL". If a request for disclosure of any or all of this information is received by the NHTSA, General Motors requests notification of receipt of each such request and, if necessary, an opportunity to further explain the reasons why such material is trade secret and commercial information which should not be disclosed under the applicable statutes and regulations.

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, 1994, 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,

Lyndon R. Lie
Director
Product Investigations

attachments

CERTIFICATE IN SUPPORT OF REQUEST FOR CONFIDENTIALITY

I, Lyndon R. Lie, pursuant to the provisions of 49 CFR Part 512 state as follows:

(1) I am the Director of Product Investigations, and I am authorized by General Motors Corporation (GM) to execute documents on its behalf;

(2) The information stamped "GM Confidential" contained in Attachment 14 to this document is confidential and proprietary data and is being submitted with the claim that it is entitled to confidential treatment of 5 USC s552(b)(4), 49 U.S.C. Section 30167(a) and implemented in 49 CFR Part 512;

(3) I, or members of my staff, have personally inquired of the responsible GM personnel who have authority in the normal course of business to release the information for which a claim of confidentiality has been made to ascertain whether such information has ever been released outside GM;

(4) Based upon such inquiries to the best of my knowledge, information and belief, the information for which GM has claimed confidential treatment has never been released or become available outside GM or authorized supplier personnel, except as hereinafter specified: None.

(5) I make no representations beyond those contained in this certificate and in particular, I make no representations as to whether this information may become available outside GM because of unauthorized or inadvertent disclosure except as stated in Paragraph 4; and,

(6) I certify under penalty of perjury that the foregoing is true and correct. Executed on this the 28 day of March 2003.

Lyndon R. Lie
Director
Product Investigations