DELPHI

Product Investigation and Safety Affairs

Gary R. Greib, Manager

April 11, 2014

Jennifer Timian
Chief, Recall Management Division
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE
Washington, DC 20590

RE: March 26, 2014 Ignition Switch Questions

Dear Ms. Timian:

This letter is Delphi's response to your email dated March 26, 2014. Your inquiries are listed below, followed by Delphi's response. Delphi began to research this matter as soon as it learned of the GM recall in February 2014. Because of the long period of time that the relevant ignition switches have been in circulation and because of intervening changes in our company, our research into this matter is at an early stage. The answers below reflect Delphi's understanding based on our review to date.

1. Did Delphi manufacture or supply ignition switch parts or assemblies that are identical or substantially similar to those it supplied to GM, and that are now part of the GM recall, to any aftermarket or third party component suppliers or vehicle manufacturers? If so, please identify each aftermarket or third party component supplier or vehicle manufacturer, together with any contact information, and for each supplier or manufacturer so identified, identify by respective part number and/or other helpful identifying information those parts or assemblies Delphi supplied. If Delphi has information as to which vehicles these parts or assemblies were intended for use, whether as production or replacement/service equipment, please identify those vehicles by make, model, and model year.

Response: Based on our review to date, the answer is no, Delphi did not supply the ignition switches that are part of GM's recall (or substantially similar switches)[1] to anyone other than GM and its tier suppliers.

2. As to the ignition switches covered by GM's recall action 14V-047, is there a way to distinguish the parts or assemblies intended for production use from those intended for service or aftermarket use? If so, please explain how that distinction can be made and supply copies of any pictures, design specifications, drawings, or any other materials that depict the distinction.

[1] We understand "substantially similar" to mean a detent plunger design and resistive torque level similar to the recalled GM ignition switches built prior to the "April 26, 2006 detent plunger change" (referenced in the GM chronology for 14V-04 7).

Response: Based on our review to date, it is not possible to distinguish the ignition switches intended for production use from those intended for service or aftermarket use.

3. Identify all vehicle manufacturers to whom Delphi supplied ignition switch parts or assemblies from calendar year 1999 to present. For each manufacturer identified, please also identify by make, model, and model year, the vehicles for which those parts or assemblies were designed and, if known, whether the design was for production or service use or both.

Response: Based on our review to date, the vehicle manufacturers and aftermarket or third party component suppliers to whom Delphi has supplied ignition switches from calendar year 1999 to present are shown in the attached table (Bates Number: NHTSA-IGN-000001). All of the ignition switches were supplied to either GM directly, a tier supplier of GM, or a Delphi division that supplied the ignition switch to GM as part of a larger sub-assembly.

4. Identify all aftermarket or third party component suppliers to whom Delphi supplied ignition switch parts or assemblies from calendar year 1999 to present. For each supplier identified, please also identify by make, model, and model year, the vehicles for which those parts or assemblies were designed.

Response: See response to question 3.

5. Did GM or any other vehicle manufacturer or aftermarket or third party supplier ask Delphi to review, study, assess, and/or analyze Delphi supplied ignition switches or parts for low torque or detent force conditions that can cause an ignition switch to inadvertently turn from a "Run" position to "AccOff" position? If so, identify the manufacturer or supplier and identify when that request was made and identify the switch or parts about which the request was made.

Response: Based on our review to date, we have identified one instance where GM asked Delphi to review, study, assess, and/or analyze Delphi supplied ignition switches or parts for low torque or detent force conditions that can cause an ignition switch to inadvertently turn from a "Run" position to "Acc/Off" position. To date, we have no information of any other company making such a request. GM's request appears to have been received by Delphi in approximately June 2005. The request appears to have related to the switch used in the Cobalt.

6. Has Delphi ever modified an ignition switch to increase position retention torque or detent force, whether at the request of a vehicle manufacturer or aftermarket or third party supplier or not? If so, identify the switch or parts that were modified.

Response: Based on our review to date, there are two instances where Delphi modified an ignition switch to increase position retention torque or detent force.

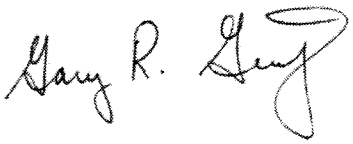
The first instance relates to the ignition switches involved in GM Recall 14V-047. A Delphi engineering change request document dated January 15, 2006 indicates GM requested a change to the detent plunger to increase the ignition switch torque to specification. A copy of

the January 15, 2006 change request is attached (Bates Number: NHTSA-IGN-000002 thru 000004). The change was approved by GM engineer Ray DeGiorgio in a GM form titled General Motors Commodity Validation Sign-Off dated April 26, 2006 (see attached, Bates Numbers: NHTSA-IGN-000005 thru 000007).

The second instance involves a pre-production change to the 2007-2009 SRX (GMT265) ignition switch design. A Delphi problem resolution document dated February 17, 2006 describes a lab test incident that occurred as a result of a change to a stronger detent plunger. The document indicates that the change to the stronger detent plunger was requested by GM as a result of complaints by test drivers turning off the car with their knees while driving competitively. A copy of the February 17, 2006 problem resolution document is attached (Bates Numbers: NHTSA-ING-000008 thru 000009).

Please call if you have any questions.

Sincerely,



Gary R. Greib
Manager, Product Investigations
Delphi Automotive Systems, LLC
5725 Delphi Dr.
Troy MI 48098-2815
248-813-3362
gary.r.greib@delphi.com

Attachments

LISTING OF VEHICLE MANUFACTURERS AND THIRD PARTIES WHO WERE SUPPLIED IGNITION SWITCHES FROM 1999 TO PRESENT

OEM/Third Party Invoice	Notes	Vehicle Make	Vehicle Model	Model Years
Koyo Steering Systems USA[1]	Production	Saturn	Ion	2003-2004
GM	Service			
Koyo Steering Systems USA[1]	Production	Chevrolet	Cobalt	2005-2007
			HHR	2006-2007
JTEKT North America[1]		Pontiac	G5	2007
			Solstice	2006-2007
GM	Service	Saturn	Sky	2007
			Ion	2005-2007
JTEKT North America[1]	Production	Chevrolet	Cobalt	2008-2010
			HHR	2008-2011
		Pontiac	G5	2008-2009
GM	Service		Solstice	2008-2009
		Saturn	Sky	2008-2009
Delphi Saginaw[2]	Production	Cadillac	CTS	2003-2007
GM	Service		SRX	2004-2006
Delphi Saginaw[2]/Nexteer[1]	Production	Cadillac	SRX	2007-2009
GM	Service			
IAC[1]/Lear Huron[1]	Production	Saab	9-7x	2005-2009
GM	Service			
Delphi Safety & Interior[2]	Production	Chevrolet	Malibu	2004
GM	Service			
Delphi Safety & Interior[2]	Production	Pontiac	G6	2005-2006
GM	Service	Chevrolet	Malibu	2005-2006
Delphi Safety & Interior[2]	Production	Pontiac	G6	2007-2010
Delphi Thermal[2]		Chevrolet	Malibu	2007-2010
Inteva[1]		Saturn	Aura	2007-2010
GM	Service			
Inteva[1]	Production	Chevrolet	Malibu	2011-2012
GM	Service			

[1]Tier supplier to GM that supplied sub-assemblies that included the ignition switch.
[2]Delphi division that supplied sub-assemblies that included the ignition switch.

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Mechatronics Change Request Form

CR #: 6115
CN #: 57128
Assigned CN# Date:

Request Information

Requester: DG. J. Coniff/G.Lin Change Owner: Eduardo Rodriguez Pequeño CO Phone: 956-554-5857 Request Date: 1/15/06

Change Request Title: New PCB design and Catera Spring/Plunger for production in Delta Ignition Sw

Customer: GM Program, Product Type & Model Year: GMX357, Delta Ignition Sw 2007

PTS / AR #: 972251 Design Center: DG Manufacturing Sites Affected: Condura

What is the impact of this change?	Change Driven by:	Change Category:	Ref. Info.(DAR, Customer Authorizattion, PRR, etc)
☐ Process ☐ Purchased Components	☑ Customer	☐ Warranty	
☑ Final Product ☐ In-House Fab Components	☑ D-MS	☐ Cost Savings	
	☐ Supplier	☑ Product Design	
		☐ Process/Quality	

Change Reason: New PCB has vias enlarge and via holes removed from traces. Cater Spring/Plunger is a Customer request to be in specification according the GM spec for the torque forces.

Change Flow:	Risk Assesment:	Change Type:	Request Type:	Program Phase:
☐ Fast Track	☐ Low	☐ Documentation	☐ Experimental	☐ Program Launch ☐ Production Approval
☑ Production	☐ Med	☑ Running	☑ Permanent	☐ Concept Direction ☐ Close Out/Transfer
	☑ High	☐ Mandatory Date:	☐ Advanced	☐ Concept Approval ☑ Present Product
				☐ Final Approval

Technical Analysis

☑ Theorical Analysis ☑ DOE ☑ Spec. Review ☑ Drawings Review ☑ Prod. Validation ☑ Where's Used (BPCS)
☑ Tolerance Stack UP ☑ Mock Up ☑ Dim.Studies ☑ 3D Analysis ☑ DFMEA Review ☑ Special Testing

Detailed Description of Change (Use CN Details formats if additional space is required to explain better the change):
1. PCB change is because the fall-out problems in the EOLT and the Catera spring/plunger is because the torque forces.
PCB 12861211 Rev 5 Release in CN57064

Change Verification (Special Testing) Summary:
* 3 lifes of durability perform without problems
* Torque and angle test perform for forces and displacements of make/brakes.

CIB - Multifunctional Team

MINIMUM REQUIRED NOTIFICATION

Function	Notified	Responded	Name
Change Owner	☑	☑	Eduardo Rodriguez
Purchasing:	☑	☑	Carlos Lara
SQA:	☑	☑	Marco Lemus
PC&L - Procurement	☑	☑	Aldo Gonzalez
PC&L - Cust Service:	☑	☑	D.Cardenas/Barbarella G
PC&L - Planning	☑	☑	Israel Leon
Manufacturing Eng:	☑	☑	Jorge MontesdeOca
Process Engineer:	☑	☑	Jorge MontesdeOca
Quality Engineer	☑	☑	Jose Luis Rivera
Industrial Engineer	☑	☑	Ernesto Castellanos
Packaging Engineer:	☑	☑	

Note: Minimum required, but not limited to this.

NOTIFICATION TO THESE POSITIONS UP TO CIB DECISION:

Function	Notified	Responded	Name
Production Line Supervisor	☑	☑	Carlos Zarate
Software Engineer:	☑	☑	N/A
Systems Engineer:	☑	☑	N/A
Component Engineer:	☑	☑	N/A
Validation Engineer:	☑	☑	Aldo Calvillo/Luis Delgado
Sales:	☑	☑	Larry Allen
Finance:	☑	☑	Gabriel Ayala
Test Engineer:	☑	☑	Edgar Zambrano
Tool Engineer:	☑	☑	N/A
ECAD	☑	☑	N/A
MCAD	☑	☑	Gerardo Cuevas
Other:	☐	☐	
Other:	☐	☐	

Note: Follow next steps to find Condura Contact List to verify CIB names.
(Delphi Mechatronics Systems- Sharepoint Home / Condura Engineering Document Control / Cond Contact List for Engineering Changes)

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Mechatronics Change Request Form

CR #:	6115
CN #:	57128
Assigned CN# Date:	

Financial Feasibility Review

IMPORTANT:
Previous to fill out this section, please type Cost, and leadtimes into Checklist/IAP format.
Once leadtimes have been received, target dates can be set up in all required tasks into Checklist/IAP format also.

	TOTAL	Paid By: Supplier%	Customer%	Delphi%
Investment $	$240	0%	0%	100%
	TOTAL Hrs-Qty	TOTAL Hrs-Cost$	Paid By: Customer%	Delphi%
Development Engineering Hours	210	$21,000	0%	100%

Investment paid by Delphi:

	Dept# / Account#	Dept Name	%
Charge to Dept :	3171	SMT department	100%
Charge to Dept :			
Charge to Dept :			
Charge to Dept :			
Charge to Dept :			

Total Change Lead Time : 24 wks Planned Obsolescence $ $0.00 Piece Part Cost $ Change From: - To: -

CR Approval

Title	Name	Signature	Date	Title	Name	Signature	Date
Change Owner:	Eduardo Rodriguez		4/12/06	Plant Mgr:	Mauro Gonzalez	N/A	4/13/06
CAL:	Juan Carlos Gonzalez		4/12/06	PC&L Mgr (Proc).:	Orlando Salinas		4/13/06
Mech. Prod. Eng. Mgr.:	Paul Verdream		4/12/06	PC&L Mgr (C.S.).:	Rocio Barron/R. Ramirez		4/12/06
Elec. Prod. Eng. Mgr.	N/A			Purchasing Mgr.:	Eugenia Acosta		4/13/06
Program Mgr.:	Jesus Chavez		ABR-13-06	Production Mgr:	J. Olvera		4/12/06
Account Mgr.:	N/A			Prod. Line Mgr.:	Carlos Zarate		4/13/06
Mfg. Eng. Mgr.	Armando Lozano		4/18/06	Quality Mgr.:	Saul Hernandez		4/13/06
Process Mgr.:	Hector Hernandez		13 ABR 06	Lab Mgr.:	Francisco Mendoza		4/13/06

Form No: D-MSNAW3.8F1 (Rev. 3) Change Request Form

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Mechatronics Change Notice Form

Page 1

CR #:	6115
CN #:	57128
Assigned CN# Date:	4/13/06

Change Notice Information

Requester: OG. J. Coniff/G.Li Change Owner: Eduardo Rodriguez Pequeño CO Phone: 956-554-5857 Request Date: 1/15/06

Change Title: New PCB design and Catera Spring/Plunger for production in Delta Ignition Sw

Customer: GM Program, Product Type & Model Year: GMX357, Delta Ignition Sw 2007

Affected Documents Information

			From this:					To this:			
Where Used P/N	Affected Doc Description	Type	Current Doc	Rev	Ver	Disp	Action	Disp	New Document	Rev	Ver	Doc. Owner
741-76307	Assy Ignition Sw	DR	741-76307	B	1	P	R	P	741-76307	C	1	
741-76307	Part List Ignition sw	PL	pl-741-76307	B	1	P	R	P	pl-741-76307	C	1	
741-76307	Dfmea Ignition Sw	DF	df-741-76307	C	1	P	R	P	df-741-76307	D	1	
			OBSOLETE P/N:						OBSOLETE P/N:			
	Detent Spring Plunger	DR	741-75316	A	1	P	R	O	741-75316	-	-	
	Assy Base-PCB	DR	741-79845-T	B	1	P	R	O	741-79845-T	-	-	
	Assy PCB	DR	741-79846-T	A	1	P	R	O	741-79846-T	-	-	
	Assy PCB in process	DR	741-79847-T	A	1	P	R	O	741-79847-T	-	-	
	Printed Circuit Board	DR	12962193	2	1	P	R	O	12962193	-	-	
	Assy Ignition Sw	DR	741-79896	A	1	P	R	O	741-79896	-	-	
	Part List Ignition sw	PL	pl-741-79896	A	1	P	R	O	pl-741-79896	-	-	
	Dfmea Ignition Sw	DF	df-741-79896	A	1	P	R	O	df-741-79896	-	-	
	Data doc support	DS		-	-	-	N	-	57128dat.doc	-	-	

Type: DRW-Drawing; PL-Part List; SW-Software; DF-DFMEA; DS-Data Support. Disposition: P-Production; S-Service; O-Obsolete. Action: R-Replace; N-New.

CN Approval

Validation Test was successfully completed? ☑ Yes ☐ No ☐ N/A Validation Ref. Number: C005-177

Has customer approval or concurrence been received for this change? ☑ Yes ☐ No ☐ N/A Customer Approval Ref. No: See 57128dat for GM3660

Detailed Implementation Action Plan defined & Agrees with CIB: ☑ Yes ☐ No ☐ N/A CIL Identified: ☑ Yes ☐ No

CIL's Name:	Alicia Salazar	Signature:	Date: 4/21/06
Engineering Manager Name:	Paul Verdream	Signature:	Date: 4/21/06
CAL's Name:	Juan Carlos Gonzalez	Signature:	Date: 4/21/06
Program Mgr Name:	Jesus Chavez	Signature:	Date: ABR-21-06

Document Control Usage Only

CN Number: 57128 Release Date: 04/27/06 D.C.Name & Signature: Jose Luis Alpuche

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Engineering Change Support Information Cover Page

File Number:	57128dat.doc

Main information about Technical Evaluation:	This information support the implementation on New PCB 12861211 Rev 5 and the New Detent Plunger 741-79378. Durability 3 times life test was perform according GM specification in Lab Test # C005-177. Torque and Angle test was perform in DG with Work Request 06-0871 Ray DeGiorgio (GM RDE) agree to implement change without changing GM p/n. He provides his approval with GM3660 to implement both changes. *PCB price is increasing and being in negotiations with Viasystems to get a better price, according Managers and PDT meeting we can not wait to get the correct price because the big fall-out registered in the production line closed to 30%

Attached Document	Explain how this document supported change
GM3660	Approval from GM to implement change

Date: 5/27/06

DELPHI MECHATRONIC SYSTEMS

GM 3660 approval to implement New PCB and Detent plunger.

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DELPHI MECHATRONIC SYSTEMS

04/25/2006 14:51 5864924548 PAGE 01/02

FAX: 956-554-566666 5666

EDWARDO RODRIGUEZ

GENERAL MOTORS COMMODITY VALIDATION SIGN-OFF

pg. 1 of 2

Buyer's concurrence on the Seller's completion of validation shall not limit, impair, or otherwise modify Buyer's right to assert any legal or equitable remedy, or relieve Seller of its responsibility to provide conforming goods.

Part Name* GMX 357 Delta Ignition Switch | Part Number* 10392423 | Suffix/ Release Level* 001

Shown on Drawing No.* 10392423 / 22673957 | Engineering Design Record Change Level* N/A | Dated* 27AP04

Procuring Division* NAO | Application/Program* GMX 357 | Purchase Order No.*

GM Lead Engineer* Ray DeGiorgio | GM Validation Engineer*

SUPPLIER MANUFACTURING INFORMATION

Supplier Name* Delphi Mechatronic | DUNS Number* 812502961

Street Address* Norte 4, Poniente 7 No. 6 H. Matamoros, Tam, Mexico

REASON FOR SUBMISSION*

[ ] Initial Submission [x] Resubmission due to Engineering Change(s) [ ] Resubmission to correct problems in initial submission

COMMODITY VALIDATION SIGN-OFF REQUIREMENTS*

Specified by Procuring Division in SOR or in separate written request. Page 2 lists more information about the required documentation.

1.	The Supplier has submitted the required proof of validation completion as specified in SOR Appendix G, Section 4 (i.e., GP-11 ADV or executive letter certifying that commodity is validated).	Yes [x]	No [ ]		
2.	All issues that are the responsibility of the Supplier have been classified as "closed" and the resolution of each issue has been confirmed by successful validation. This includes those issues that were identified during development, design validation, or product validation, whether those issues are tracked by GM or by the Supplier.	Yes [x]	No [ ]		
3.	All Corrective Action Plans (CAP) that are the responsibility of the Supplier have been classified as "closed."	Yes [x]	No [ ]		
4.	The information in the Supplier's issue tracking system has been updated and is consistent with the final resolution of all supplier issues and CAPs.	Yes [x]	No [ ]		
5.	The Supplier has completed its final ADV P&R (GM 1829-2) summarizing ADV execution status.	Yes [x]	No [ ]		
6.	Supplier's ADV Plan(s) and all specified ADV activities have been completed, including activities required to resolve issues identified during development and validation.	Yes [x]	No [ ]		
7.	Supplier has obtained GM approval of the detailed validation results for those requirements for which GM approval was specified in the "Other Validation Requirements" column of the Final VCRI.	Yes [ ]	No [ ]	Not required by SOR	[x]
8.	Supplier evaluation reports have been completed for all regulatory requirements for which the Supplier conducted ADV activities to confirm compliance of the commodity.	Yes [ ]	No [ ]	Not required by SOR	[x]
9.	Supplier evaluation reports have been completed for those non-regulatory requirements or procedures that were identified in SOR Appendix G, in the Final VCRI, or in writing by the program.	Yes [ ]	No [ ]	Not required by SOR	[x]
10.	The Supplier has submitted the commodity models, etc. required for the Virtual Archive.	Yes [ ]	No [ ]	Not required by SOR	[x]
11.	Other:	Yes [ ]	No [ ]		
12.	Other:	Yes [ ]	No [ ]		

Explanation of "NO" answer or comment here:

Note that the during cycling, 1 amp was applied on the Delta Ignition Sw. This validation was submitted with New PCB correct timings adjusts as Customer required, also New detent plunger (Catera spring/Plunger) was implemented to increase torque force in the switch.

Supplier Name (please print)* Eduardo Rodriguez | Title* Present Product Eng | Phone No.* 956-554-5857

Supplier Authorized Signature* Eduardo Rdz P. | Dated:* 4/24/06

GM DECISION: Rejected (see comments below) [ ] Re-submit (see comments below) [ ] Sign-Off Complete [X]

GM Name (please print) Ray DeGiorgio | Phone No. 586-947-3555

GM Authorized Signature | Code: C284 | Dated: APRIL 26, 2006

Comment:

* Asterisk (*) denotes required field/information.

General Motors Corp. pg. 1 DRAFT for PPAP June 28, 2002 GM 3860

PQC : 051033 / 9 (Opened)

Program Name	GMT265 Ignition Switch
Customer	DELPHI T

Open	17 Feb 2006
Closed	
Duration	136 d

Detection Origin	Internal
Test Report ID	C006-008

	Originator	Responsible	Resolver	Validator
Name	Jorge Morales	George Lin	John Coniff	David Kozerski
Location	Matamoros Tamps	Downersgrove, IL	Downersgrove, IL	Downersgrove, IL
Phone	956 554 5822	(630)795-4802	6307954785	(630)795-4803

Problem Description	Root Cause / Proposal Solutions
Update: 3/17/06: Removing Detent Loss issue found in DUT# 32 Sample from DG cycling samples. Issue to be considered on a separate PQC. Date: 2/17/06 Lab Job: C006-008. Post 1x Life cycling. Devices: DUT# 23 Group 1 Condura During Post Parametric Measurements, device presented the following issue on Function Check at 85C: Position detents on device are not detected during manual actuation (Detent Loss). Rattling condition is present on the switch. Device is electrically functional.	The Catera detent plunger was used in this switch. The assembly has more spring force that the Delta plunger assembly used in the begining of the program. This change was requested by the customer because of complaints from some test drivers turning the car off with their knees when driving competatively. Because of the extra force, the wall of the plunger barrel in the housing broke allowing the plunger assembly to move out of place. A flange was added to the wall for support.
Corrective Action (07 Apr 2006)	**Preventive Action**
Added a flange on the wall to support the	

added force.	
	Verification of Effectiveness
	The switches are being retested with the flange molded in the housing.

Topic(s)
• Design • Noise / Geräusche

Severity	Medium
Test Type	Temp / Humidity Soak
Failure Type	Other
Root Cause Category	Mechanical
Root Cause	Other
Prog./Test. Stage	**PV (Product Validation)**