

Document Provided in Native Format

File Name: [REDACTED]

10944228 1G1R6E40CU	[REDACTED]	The 2012 Volt seat was replaced (by the 2012 Volt owner) with a seat off of a 2013 Volt from a car yard
11031440 1G1RA5E41CU	[REDACTED]	included in case
11061616 1G1RD6E40CU	[REDACTED]	included in case
11084962 1G1RD6E4XC	[REDACTED]	
10582973 1G1RH6E41D	[REDACTED]	included in case
11022955 1G1RH6E49D	[REDACTED]	included in case
11061403 1G1RA6E45D	[REDACTED]	included in case
11063754 1G1RD6E42D	[REDACTED]	
11090377 1G1NR6E46D	[REDACTED]	
11019602 1G1RD6E49E	[REDACTED]	included in case
[REDACTED]	[REDACTED]	included in case
[REDACTED]	[REDACTED]	included in case
[REDACTED]	[REDACTED]	included in case
[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	included in case

Document Provided in Native Format

File Name:

[REDACTED]

Document Provided in Native Format

File Name:

[REDACTED]

[REDACTED]

[REDACTED]

Document Provided in Native Format

File Name:

[REDACTED]

Document Provided in Native Format

File Name:

[REDACTED]

[REDACTED]

[REDACTED]

Document Provided in Native Format

File Name: MICROSOFT_EXCEL_WORKSHEET5.XLSX

Message

From: Renee Jurkiw [/O=GM/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=22B8EF157FFB4190B2DF966E9E4C9CD9-GZT682]
Sent: 9/10/2018 2:17:41 PM
To: John R Dolan [/o=GM/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5f0ab62e3b944cf5a57088e0048115ba-LZDSCD]
Subject: FW: Questions with regards to the Chevrolet Volt's Passenger Sensing System for Passenger Airbags
Attachments: Questions to GM-071118.docx

John,

Here is the list of questions NHTSA posed to us that we will discuss with NHTSA on Friday.

Thank you,

Renee Jurkiw

Lead External Investigation Engineer
Global Vehicle Safety
586-907-1696

From: LAWRENCE C MAUGH
Sent: Wednesday, July 11, 2018 10:16 AM
To: Renee Jurkiw <renee.jurkiw@gm.com>
Cc: Brett Gibson <brett.gibson@gm.com>
Subject: FW: Questions with regards to the Chevrolet Volt's Passenger Sensing System for Passenger Airbags

Hi Renee,

Jisan put together an extremely detailed list of questions. Take a look at the attachment and we can discuss this afternoon or tomorrow.

Thanks,
Larry

Lawrence Maugh
Senior Manager
External Investigations
Global Vehicle Safety
(586) 291-3136

From: Xue, Jisan (NHTSA) [mailto:jisan.xue@dot.gov]
Sent: Wednesday, July 11, 2018 9:59 AM
To: LAWRENCE C MAUGH <lawrence.c.maugh@gm.com>
Cc: Magno, Gregory (NHTSA) <Gregory.Magno@dot.gov>; Lash, Chris (NHTSA) <Chris.Lash@dot.gov>
Subject: [EXTERNAL] Questions with regards to the Chevrolet Volt's Passenger Sensing System for Passenger Airbags

Hi Larry,
Attached are questions we have relevant to our case for the 2012-2013 Volt OCS issues for your review.
We can discuss these questions together at an appropriate time.

Thanks,

1. **17 VOQs:** What are your analysis and observation after reviewing 17 VOQs with 10 disclosed VINs?
2. **Method of Operation of the Airbag System** (Based on 2013 Chevrolet Volt): The contents in the table are what we understand of the method of operation of the airbag system for Chevrolet Volt. Please confirm or correct the Method of Operation shown in the table.

Operation Status	SERVICE AIRBAG Message	Airbag System - Airbag Readiness Light	PSS - Passenger Airbag Status Indicator
Normal Operation	Off	Off while driving	Stay <u>On</u> or <u>Off</u> while driving
If there is an issue, it can be: (labeled as Issue X)	On		
If there is an issue, it can be: (labeled as Issue Y)		No Light after car is started. Come-On or Stay-On while driving.	
If there is an issue, it can be: (labeled as Issue Z)			<u>Off</u> is on if seat is occupied by adult <u>On</u> is on if seat is unoccupied, or taking him/her weight off for a while, or infant is present
Or an issue that can be:	Any combination of issue X, Y, Z		

3. **To understand the passenger sensing system (PSS) and its components:** Please describe the technology and the sensing method to detect the objects in the front passenger seat for the passenger frontal/knee airbags. If there is a change/difference (technology or method), please describe the change/difference.
 - a. Please describe what components or sub-systems the passenger sensing system consists of for the frontal passenger airbags.
 - b. Please clarify, and then explain the terminology of the components described in i. and ii., which have been seen to be used in various places such as GM documents, repair receipts, owner manual, or relevant technical articles etc.
 - i. Passenger presence sensor (PPS)

When a problem is identified as a PPS issue, what do parts/components mean to be included?

Is the passenger seat/cushion embedded with sensors/wires a part of PPS?
 - ii. Passenger presence module. Passenger presence sensor module. Passenger presence control module.

When a problem is identified as a module issue, what does this part include, only the control module?

c. For the airbag system, when a fault is identified, for example, the fault is lost communication with the airbag system, will the fault almost always mean either a sensor(s) failure or a module failure?

4. **To understand TSB 12-09-41-002D:** In GM TSB 12-09-41-002D (issued on 2/28/2017, to address PPS may command seat belt reminder chime and passenger airbag indicator on), affected models included Chevrolet Volt 2014-2016MY.

a. Why did the model years of 2014-2016 stand out from other model years of Volt? Please describe the basis for the scope.

(GM 12-09-41-002D states that "Because this vehicle is equipped with low risk passenger airbags, the PPS system is designed to turn the airbag on for most front seat occupants and turn the airbag off for small children in child seats. The system works by detecting the capacitance of the object on the seat, not the objects weight; and certain conductive objects will enable the airbag")

5. **To understand GM EI Analytics Log#389:** Page 1

#389 Page 1 - Frequency:

Warranty: As of 2016-12-20, 15.25 IPTV (219 total claims over population)

Total RPTV: As of 2016-12-20: RPTV of 15.42 (219 relevant claims + 2 unique trend over population)

#389 Page 1 - Effect of the Condition:

When fault is active, the Passenger Frontal Airbag and Passenger Knee Airbag are suppressed. The Service Airbag System telltale is illuminated, the Service Airbag System message is displayed on DIC, and front Passenger Airbag Status indicator will display OFF.

a. Please explain the paragraph of Effect of the Condition. What did the fault here (passenger frontal/knee airbags are suppressed) include, for instance, a lost communication or a PPS failure? Would the 3 types of warning lights described in this paragraph almost always react to the fault (passenger airbags are suppressed) in this way?

b. What was the percentage of 219 IPTV claims that was directly correlated to what were described in "Effect of the Condition"?

c. What was the percentage of 219 RPIV for the replacement of PPS that was directly correlated to what were described in "Effect of the Condition"?

6. **To understand GM EI Analytics Log#389:** Page 1

#389 Page 1 - Condition:



The RPTV for the replacement of the PPS is higher than other models for 2013MY as a whole and relative to 2014MY Volt forward. The Relevant IPTV is especially elevated for vehicles built in 2012-10 up to 2013-04.

#389 Page 1 - Root Cause:

Multiple causes have been identified through previous analysis of returned parts. However, no definite cause has been identified for the elevated relevant IPTV for vehicles built in 2012-10 up to 2014-4.

- a. Did the design (change) subsequently described in #389 only apply to 2013MY vehicles built in 10/2012-4/2013?
- b. Please explain the connection(s) between *RPTV is higher for 2013MY...*, and, *Relevant IPTV is especially elevated for vehicles built in 10/2012-4/2013* (described in "Condition") and *no definite cause has been identified for IPTV for vehicles built in 10/2012-4/2013* (described in 'Root Cause').
- c. What was the percentage of the RPTV from the vehicles built in 10/2012-4/2013?

7. To understand GM EI Analytics Log#389

#389 - Page 6: Supplier Analysis of Returned parts

#389 - Pages 8 and 9: Passenger Presence Sensor and Alignment of PPS on Seat Foam

#389 - Pages 10 and 11: DTC and IPTV breakdown by Build Month for 2013MY

- a. To Page 6: Please explain the time axis in the chart (by build date, by warranty date etc.?)
- b. To Pages 8-9: Please clarify the period and MYs the described design in pages 8-9 was applied to.
- c. To Pages 10-11: In page 1 Root Cause, it stated that no definite cause has been identified for the elevated relevant IPTV for vehicles built in 2012-10 up to 2014-4.
 - i. Please explain how this statement can be associated with the data and comments shown in pages 10-11.
 - ii. Or, had the design change been identified as the factor to B0074-00, B0074-0D etc. errors?
- d. To pages 10-11: In page 1 Effect of the Condition, it described that when fault is active, the Service Airbag System telltale is illuminated, the Service Airbag System message is displayed on DIC, and front Passenger Airbag Status indicator will display OFF.
 - i. Please explain how this description can be associated with the data, DTCs and comments shown in pages 10-11.
- e. Was it possible that other factors such as seat's durability performance may also lead to a DTC code(s) or PPS failure?

f. What is the durability performance requirement of the passenger seat relevant to the passenger presence sensor performance?

Document Provided in Native Format

File Name: [REDACTED] 2011-16 VOLT AIRBAG VOQ
19SEP2018.XLSM

[REDACTED]

Document Provided in Native Format

File Name: COPY OF N18-217296 VOLT 2012 2013 WITH ALO
SFI VEH POPULATION 9-25-2018.XLSX