GENERAL MOTORS LLC
Global Vehicle Safety

August 7, 2020

Greg Magno, Chief
Vehicle Defects Division – A
Office of Defects Investigation
National Highway Traffic Safety Administration
1200 New Jersey Ave., SE
Room W48-334
Washington, DC 20590

VIA EMAIL
G230773

NEF-101cnl
PE20-009

Re: General Motors LLC's Responses to NHTSA's June 16, 2020 Information Request in Investigation PE20-009

Dear Mr. Magno:

This letter contains General Motors LLC's ("**GM**") responses (the "**Responses**") to the information requests in your June 16, 2020 letter (the "**Requests**") relating to National Highway Traffic Safety Administration ("**NHTSA**") Preliminary Evaluation 20-009, which is a NHTSA investigation of "allegations related to Bulletin No. 14232, 'Special Coverage Adjustment – Power Steering Stick-Slip' in certain model year (MY) 2010-2012 Chevrolet Equinox and GMC Terrain vehicles manufactured by General Motors (GM)." Unless otherwise defined herein, GM's Responses rely on the defined terms in the Requests. GM will provide a supplemental response to Request 8 that will include documents relating to a recent investigation into the effectiveness of GM's special coverage No. 14232 that only recently concluded on July 30, 2020. This investigation is identified in response to Question 8 and has been labeled below as "Action 8D."

PRELIMINARY STATEMENT

GM prepared its Responses by: (i) identifying, in consultation with the appropriate GM business personnel, the primary electronic databases and document repositories in GM's custody and control that store potentially responsive documents and information in the ordinary course of business, as more fully identified in the Responses below; and (ii) conducting a reasonable search, as appropriate, of these databases and document repositories for responsive documents and information. GM objects to the definitions of "document" and "GM" in the Requests as overbroad, unreasonably burdensome, and not reasonably tailored to records that might be expected to bear relevant and responsive information. GM's document production does not contain: (i) attorney-client privileged information or information protected as attorney-work product; and (ii) documents generated or archived in these locations after the dates that GM conducted its final searches. GM construes the Information Request as pertaining to vehicles manufactured for sale in the United States and its territories.

GM's document production is contained on the folder titled G230773_1_GM and will be transferred electronically via P2P. Certain portions of these documents are exempt from public disclosure under the Freedom of Information Act (5 U.S.C. § 552(b)(4)) ("**FOIA**") and 49 CFR part 512 and have been redacted in the copy contained in the folder. GM has submitted the

unredacted nonpublic copy of its document production (in the folder titled G230773_2_GM_CONF) to the NHTSA Office of Chief Counsel under 49 C.F.R. part 512.

Some of the documents in GM's production contain personally identifiable information ("**PII**") (e.g., vehicle registration information or VIN, employee names, and customer/employee contact information). GM today submits documents with unredacted PII with the understanding that NHTSA (or GM, if NHTSA prefers) will redact any PII before disclosing these documents to the public.

REQUESTS AND RESPONSES

REQUEST 1:

State, by model and model year, the number of subject and peer vehicles GM has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by GM, state the following:

a. Vehicle identification number (VIN);

b. Make;

c. Model;

d. Model Year;

e. Subject component part number(s) and design version(s) installed as original equipment;

f. Date of manufacture;

g. Date warranty coverage commenced; and

h. 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 2010, or a compatible format, entitled "PRODUCTION DATA."

GM RESPONSE:

In response to your request that GM "[s]tate, by model and model year, the number of subject and peer vehicles GM has manufactured for sale or lease in the United States," GM provides the following tables:

		MODEL YEAR			
MAKE	**MODEL**	**2010**	**2011**	**2012**	**TOTAL**
Chevrolet	Equinox	111,088	161,612	179,356	452,056
GMC	Terrain	31,144	61,953	72,013	165,110
	TOTAL	142,232	223,565	251,369	617,166

TABLE 1-1: SUBJECT VEHICLES

		MODEL YEAR				
MAKE	**MODEL**	**2011**	**2012**	**2013**	**2014**	**TOTAL**
Buick	Verano	N/A	32,640	50,560	12,915	96,115
Chevrolet	Cruze	177,404	270,698	207,659	108,134	763,895
Chevrolet	Volt	4,369	18,362	27,505	4,615	54,851
Chevrolet	Malibu	N/A	N/A	211,357	42,545	253,902
Chevrolet	Equinox	*See Table 1-1*	*See Table 1-1*	237,352	53,329	290,681
GMC	Terrain	*See Table 1-1*	*See Table 1-1*	82,607	17,675	100,282
	TOTAL	181,773	321,700	817,040	239,213	1,559,726

TABLE 1-2: PEER VEHICLES[1]

GM has produced the information requested in subparts (a) through (h) in the G230773_1_GM folder in the subfolder labeled "Q_01". Refer to the Microsoft Access 2010 files labeled "Q_01_PRODUCTION_DATA_Subject" and "Q_01_PRODUCTION_DATA_Peer." The tables include the population of vehicles that were included in the Subject Bulletin. The Subject Component is an assembly which includes the steering gear, the motor kit, and the steering control module. In response to request (e), the Subject Component part-number change-history can be viewed in response to Request 9.

REQUEST 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 and peer vehicles:

a. Consumer complaints, including those from fleet operators;

b. Field reports, including dealer field reports;

[1] NHTSA defined both "Peer Vehicles" and "Subject Vehicles" as including the 2010-2012 GMC Terrain vehicles. For purposes of this response and to avoid redundancy or confusion, the data/information for the 2010-2012 Terrain vehicles will be provided with the "Subject Vehicles." With respect to the GMC Terrain vehicles, "Peer Vehicles" will therefore be limited to model-year 2013 and 2014 Terrains. In addition, for purposes of this response, "Peer Vehicles" does not include vehicles built after November 4, 2013, which is consistent with the vehicles subject to Special Coverage 14232. Vehicles built after this date had changes to the Subject-Component supplier manufacturing process that addressed the stick-slip issue, discussed in response to Request 9, and are not included in this population.

c. Reports involving a crash, injury or fatality;

d. Reports involving a fire;

e. Property damage claims;

f. Third-party arbitration proceedings where GM is or was a party to the arbitration; and

g. Lawsuits, both pending and closed, in which GM is or was a defendant or codefendant.

For subparts "a" through "f, / g" 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, / g" 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/f" and "f, / g" 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.

GM RESPONSE:

In response to subparts (a) through (g) for the Subject and Peer Vehicles, GM provides the following tables, which GM prepared by conducting a reasonable keyword search for potentially responsive claims in several databases.[2] In determining the responsiveness of a claim, GM erred on the side of coding the claim as responsive, even if the evidence in GM's possession linking the claim to the Alleged Defect was implausible, inconclusive, or circumstantial.[3] Accordingly, the claim totals in Tables 2-1 and 2-2 are conservative.

[2] These databases include: Customer Assistance Center (CAC), Product Assistance Center (PAC), Business Resource Center (BRC), Technical Assistance Center (TAC), Field Information Network Database (FIND), Company Vehicle Evaluation Program (CVEP), Captured Testing Fleet (CTF), COMPASS, Early Quality Feedback (EQF), Problem Resolution Tracking System (PRTS), Field Product Report Database (FPRD), Global Incident Management System (GIMS), and GM Legal records.

[3] Some claims did not reference the Subject Component or the speed at which the condition occurred, but merely referenced a stick-slip related condition. These claims were included as responsive, but they may not be related to the Alleged Defect or the Subject Component. For example, binding or increased steering effort at highway speed may be related, but at low speeds, any increased steering effort would likely be related to a different issue such as loss of power steering assist, which is an electrical issue as opposed to the stick-slip issue which relates to a mechanical (internal gear) issue.

A. Subject Vehicles

		Subcategories				
Type of Report	GM Reports	Corresponding to NHTSA Reports (VOQ)	Number with Property Damage	Number with Crash	Number with Fire	Number with Injuries/ Fatalities
Owner Reports	*154*	*8*	*0*	*0*	*0*	*0/0*
Field Reports	*435*	*9*	*0*	*0*	*0*	*0/0*
Not-In-Suit Claims	*0*	*0*	*0*	*0*	*0*	*0/0*
Third Party Arbitration Proceedings	*0*	*0*	*0*	*0*	*0*	*0/0*
Product Liability Lawsuits	*0*	*0*	*0*	*0*	*0*	*0/0*
Total Reports (Including Duplicates)	*589*	*17*	*0*	*0*	*0*	*0/0*
Total Vehicles with Reports (Unique VIN)	***572***	***14***	***0***	***0***	***0***	*0/0*

TABLE 2-1: SUMMARY OF CLAIMS RESPONSIVE TO REQUEST 2A-2G FOR THE SUBJECT VEHICLES

As summarized in Table 2-1 above, GM is aware of 572 unique claims involving the Subject Vehicles that may be responsive to Request 2. The number of claims in Table 2-1 includes claims made both before and after the launch of the Subject Bulletin. There were only 26 unique claims that alleged a repeat occurrence of the Alleged Defect after the remedy in the Subject Bulletin was performed.

In response to subparts "c," "d" and "e" for the Subject Vehicles, GM is not aware of any relevant incidents involving a crash, injury, fatality, fire or property damage claims. With respect to subparts "f" and "g" for the Subject Vehicles, GM is not aware of any third-party arbitration proceedings or lawsuits related to the Alleged Defect in the Subject Vehicles.

B. Peer Vehicles

		Subcategories				
Type of Report	GM Reports	Corresponding to NHTSA Reports (VOQ)	Number with Property Damage	Number with Crash	Number with Fire	Number with Injuries/ Fatalities
Owner Reports	*519*	*17*	*0*	*4*	*0*	*1/0*
Field Reports	*1508*	*16*	*0*	*0*	*0*	*0/0*
Not-In-Suit Claims	*1*	*0*	*0*	*1*	*0*	*1/0*
Third Party Arbitration Proceedings	*0*	*0*	*0*	*0*	*0*	*0/0*
Product Liability Lawsuits	*1*	*0*	*0*	*0*	*0*	*0/0*
Total Reports (Including Duplicates)	*2029*	*33*	*0*	*5*	*0*	*2/0*
Total Vehicles with Reports (Unique VIN)	***1892***	***26***	***0***	***4***	***0***	***1/0***

TABLE 2-2: SUMMARY OF CLAIMS RESPONSIVE TO REQUEST 2A-2G FOR THE PEER VEHICLES

As summarized in Table 2-2 above, GM is aware of 1892 unique claims involving the Peer Vehicles that may be responsive to Request 2. The number of claims in Table 2-2 includes

claims made both before and after the launch of the Subject Bulletin. There were only 44 unique claims that alleged a repeat occurrence of the Alleged Defect after the remedy in the Subject Bulletin was completed.

As indicated in Table 2-2, GM is aware of four minor accident claims and one minor injury claim (associated with 1 of the 4 accident claims) that may be related to the Alleged Defect in the Peer Vehicles. GM characterizes these claims as potentially related to the Alleged Defect because, in each of these cases, GM could not conclusively tie the accident (or the injury) to the Alleged Defect or the Subject Component. None of the vehicles associated with the accident claims were serviced under the Subject Bulletin prior to the alleged accident. See **Appendix A – Summary of Alleged Accidents** for a summary of each alleged accident and GM's assessment of the claim.

In response to subparts "c," "d," "e" and "f" for the Peer Vehicles, GM is not aware of any relevant incidents involving a fatality, fire, property damage claims or third-party arbitration proceedings. In response to subpart "g" for the Peer Vehicles, GM is producing the responsive, nonprivileged litigation records relating to the litigation cases listed above in Table 2-2. These records contain the requested information regarding 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.

Additional information about the claims in Tables 2-1 and 2-2 are available in the document production that GM is providing in response to Request 4 and in GM's assessment of the Alleged Defect provided in Response to Request 11.

REQUEST 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), street address, email 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 a fire is alleged;

k. Whether property damage is alleged;

l. Number of alleged injuries, if any; and

m. Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2010, or a compatible format, entitled "REQUEST NUMBER TWO DATA."

GM RESPONSE:

GM has produced the requested information for the Subject and Peer Vehicles in the G230773_1_GM folder in the subfolder labeled "Q_03". Refer to the Microsoft Access 2010 file labeled "Q_03_REQUEST NUMBER TWO DATA."

REQUEST 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. Describe in detail the search methods and search criteria used by GM to identify the items in response to Request No. 2.

GM RESPONSE:

With respect to Request 4, GM CAC, PAC, and Legal records are GM's primary repositories of potentially responsive documents stored in the ordinary course of business. GM identified responsive documents by conducting a keyword search of these records for potentially responsive claims and reviewed the associated claim file to confirm the responsiveness of the claim. GM is producing the responsive, nonprivileged documents associated with responsive claims listed in Table 2-1 and 2-2 in the Microsoft Access file labeled "Q_03_REQUEST NUMBER TWO DATA" in the subfolder labeled "Q_03" in the G230773_1_GM folder. GM has organized the records by the GM file number.

Additionally, this response was compiled and prepared upon review of documents produced by various GM locations. This response does not include documents generated or received at those GM locations after the searches were completed.

REQUEST 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 and peer vehicles: warranty claims; extended warranty claims; claims for good will

services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin 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), street address, email address 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(s);

h. Problem code(s);

i. Diagnostic trouble code(s);

j. Replacement part number(s) and description(s);

k. Concern stated by customer;

l. Cause as stated on the repair order;

m. Correction as stated on the repair order; and

n. Additional comments, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2010, or a compatible format, entitled "WARRANTY DATA."

GM RESPONSE

To collect warranty data responsive to this request, GM conducted a reasonable keyword search of the GM Global Analysis and Reporting Tool ("**GART**"), GM's primary repository of potentially responsive warranty claim information stored in the ordinary course of business. In determining the responsiveness of a claim, GM erred on the side of coding the claim as responsive, even if the evidence in GM's possession linking the claim to the Alleged Defect was implausible, inconclusive, or circumstantial.[4]

[4] Some claims did not reference the Subject Component or the speed at which the condition occurred, but merely referenced a stick-slip related condition. These claims were included as responsive, but they may not be related to the Alleged Defect or the Subject Component. For example, binding or increased steering effort at highway speed may be related, but at low speeds, any increased steering effort would likely be related to a different issue such as loss of power steering assist, which is an electrical issue as opposed to the stick-slip issue which relates to a mechanical (internal gear) issue.

Table 5-1, below, summarizes the warranty claims for the Subject Vehicles that may relate to the Alleged Defect.[5] There are a total of 49,543 warranty claims (47,788 unique VINs) that were categorized as responsive.[6] This total includes: (i) 43,477 claims repaired under the Subject Bulletin; (ii) 2,427 claims that were also reported as a field report in Response 2; and (iii) 675 claims that required a secondary repair after the service described in the Subject Bulletin was performed.

The take rate for the entire population of vehicles covered under the Subject Bulletin is low at 2.0%, as shown in Table 5-2. Once repairs were performed under the Subject Bulletin, a low number of vehicles returned for a second repair, resulting in a high, 98.4% effectiveness rate for the Subject Bulletin.

MY	Make	Model	Total Claims	Claims After 11/19/14[7]	Secondary Repair[8]	Secondary Repair %	Remedy Effectiveness
2010-2012	Chevrolet/GMC	Equinox/ Terrain	14,896	12,607	268	2.1%	97.9%
2013-2014	Chevrolet/GMC	Equinox/ Terrain	5,087	4,637	55	1.2%	98.8%
2011-2014	Chevrolet	Cruze	17,298	15,352	243	1.6%	98.4%
2013-2014	Chevrolet	Malibu	8,614	7,692	75	1.0%	99.0%
2011-2014	Chevrolet	Volt	1,453	1,274	7	0.5%	99.5%
2012-2014	Buick	Verano	2,195	1,915	27	1.4%	98.6%
		Total	**49,543**	**43,477**	**675**	**1.6%**	**98.4%**

TABLE 5-1: SUMMARY OF SUBJECT AND PEER VEHICLE WARRANTY CLAIMS

[5] GART does not contain the vehicle owner's name or telephone number. Additionally, some replacement part numbers, part descriptions, and customer concern code descriptions are not included in the GM warranty database. In response to subpart (j), the diagnostic trouble code (DTC) is not captured separately and, if available, is included in one of the verbatim fields.

[6] GM identified responsive records based on the information supplied to GM by the servicing dealerships, which can contain material errors and omissions. Warranty records, for example, do not always accurately or completely describe the condition of the allegedly defective part at the time of the warranty correction, and service personnel may not consistently classify warranty repairs using the correct labor and trouble codes.

[7] This is the date the Subject Bulletin launched. These claims reflect those that were serviced under the Subject Bulletin.

[8] "Secondary repairs" are those vehicles that, based on the available service records, received the repair a first time under the Subject Bulletin and then returned a second time for another repair related to the Alleged Defect.

MY	Make	Model	SC Repairs	Population	SC Take Rate
2010-2012	Chevrolet/GMC	Equinox/ Terrain	12,607	617,166	2.0%
2013-2014	Chevrolet/GMC	Equinox/ Terrain	4,637	390,963	1.2%
2011-2014	Chevrolet	Cruze	15,352	763,895	2.0%
2013-2014	Chevrolet	Malibu	7,692	253,902	3.0%
2011-2014	Chevrolet	Volt	1,274	54,851	2.3%
2012-2014	Buick	Verano	1,915	96,115	2.0%
		Total	**43,477**	**2,176,892**	**2.0%**

TABLE 5-2: TAKE RATE FOR SPECIAL COVERAGE

GM has produced the requested information in subparts (a) through (n) in the G230773_1_GM folder in the subfolder labeled "Q_05". Refer to the Microsoft Access 2010 file labeled "Q_05_WARRANTY DATA." In response to subparts (l) and (m), GM has included in these records all available dealer-provided "verbatim text" in the GART database relating to the responsive claims that are currently in GM's possession[9].

REQUEST 6

Describe in detail the search methods and search criteria used by GM to identify the claims in response to Request No. 5, including the labor operations, problem codes, diagnostic trouble 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, diagnostic trouble codes and diagnostic trouble code descriptions applicable to the alleged defect in the subject and peer vehicles. State whether the diagnostic trouble codes are automatically reported to the warranty database electronically or manually entered into the warranty database by a claims administrator.

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

[9] The verbatim text is provided to GM by the dealer that serviced the warranty claim and reflects both dealer- and customer-provided comments relating to the claim. Before the 2010 model year, GM did not require the dealer to populate this field in the warranty system; for this reason, GM may not be in possession of this information for every responsive warranty claim.

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.

GM RESPONSE:

The labor codes that GM used to search for and identify potentially related warranty claims in GM's GART warranty database are summarized in Table 6-1 below.[10] Each warranty record may have up to five verbatim fields. GM analyzed all verbatim claim fields and determined a claim to be responsive if the verbatim indicated that the claim may have been related to the Alleged Defect in the Subject Component. Not all claims listed under the Subject Bulletin labor code were related to the Alleged Defect as dealers do not always select the correct labor code. There are no diagnostic trouble codes that are relevant to the Alleged Defect.[11]

LABOR CODE	LABOR CODE DESCRIPTION
2810625	Power Steering Control Module Reprogramming with SPS
7420270 (E8434)	Power Steering Assist Motor Replacement
7421740 (E9740)	Steering Gear Replacement
7421770	Electric Belt Drive Rack and Pinion Steering Gear Replacement
7429949 (E9994)	Steering - Customer Concern Not Duplicated (CCND)
7449949	Steering - Customer Concern Not Duplicated (CCND)
990064[12]	Reprogram Power Steering Control Module with SPS (2013-2014 MY)
990065[12]	Replace Steering Gear (2010-2012 MY) (inc. alignment)
990066[12]	Customer Reimbursement Approved

TABLE 6-1: LABOR CODES USED IN GART WARRANTY SEARCH

Table 6-2 summarizes the terms of GM's new-vehicle warranty coverage on the Subject and Peer Vehicles:

MODEL YEAR	MAKE	WARRANTY TYPE	WARRANTY TERMS
2012-2014	Buick	Limited Bumper-To-Bumper	4 years, 50,000 miles
2010-2014	Chevrolet	Limited Bumper-To-Bumper	3 years, 36,000 miles
2010-2014	GMC	Limited Bumper-To-Bumper	3 years, 36,000 miles

TABLE 6-2: GM'S NEW-VEHICLE WARRANTY COVERAGE ON SUBJECT AND PEER VEHICLES

Many different optional extended warranty plans were available for the Subject and Peer Vehicles through GM dealerships. These plans were offered at different prices and for varying lengths of time based on a customer's preference.

[10] The Subject Bulletin includes both regular warranty labor codes and unique labor codes depending on whether the vehicle was still covered under warranty.
[11] Because there are no DTCs associated with the Alleged Defect (stick-slip does not trigger a DTC), claims that had a steering-related DTC were deemed to be related to a loss of power steering assist and therefore not relevant to the Alleged Defect.
[12] This labor code is for the Subject Bulletin.

REQUEST 7

Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject and peer 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 RESPONSE:

The documents that are responsive to Request 7 are in the G230773_1_GM folder in the subfolder labeled "Q_07".

REQUEST 8

Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject and peer 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.

GM RESPONSE:

GM identified responsive product investigations by conducting a reasonable search in GM's Global Vehicle Safety-Case Observation Review and Evaluation ("**GVS-CORE**") database, which is the primary electronic records database for GM's Safety and Field Investigations organization. GM is aware of the following product investigations conducted by GM or at GM's direction that relate to the Alleged Defect:

Action 8A: GM Internal Investigation N14-167649 (N-140232)	
Start/End Dates	May 15, 2014 – August 13, 2014
Involved Engineering Groups	GM Global Safety and Field Investigations, GM Global Engineering
Description	GM investigated claims of the Alleged Defect due to an alleged malfunction of the Subject Component in the Subject and Peer Vehicles.
Outcome	On August 13, 2014, upon review of the collected data, GM's Safety Field Action Decision Authority (SFADA) decided to provide an extended warranty on the Subject Component for the Alleged Defect for 10 years or 150,000 miles. This decision resulted in the Subject Bulletin.
Associated Documents	Information and documents contained in GVS-CORE related to investigation N14-167649. The files are in the G230773_1_GM and G230773_2_GM_CONF folders labeled as 8A-167649 in the index file.
Action 8B: GM Engineering Studies	
Start/End Dates	September 2010 – May 2018
Involved Engineering Groups	GM Global Safety and Field Investigations, GM Global Engineering
Description	Investigation activities involved root cause analysis of the Alleged Defect, testing and remedy development and PRTS documents
Outcome	The conclusions are consistent with GM's Response to Request 11 as it relates to causal or contributory factors, failure mechanisms, and failure modes.
Associated Documents	GM Engineering information, documents, PRTS' and emails related to the Alleged Defect in the Subject and Peer Vehicles. The files are in the G230773_1_GM and G230773_2_GM_CONF folders labeled as 8B-GM-ENG in the index file.
Action 8C: Bosch Engineering Information	
Start/End Dates	March 2010 – May 2018
Involved Engineering Groups	Robert Bosch Automotive Steering LLC ("**Bosch**"), (the supplier who assumed the business of the Subject Component in the Subject Vehicles). The original supplier for the Subject Component was ZF Lenksysteme GmbH ("**ZFLS**"), a partnership between ZF Group and Bosch. ZF Group sold their stake in ZFLS to Bosch and Bosch now owns the design and manufacturing of the Subject Component.

Description	Bosch provided information on the Subject Component design and manufacturing process.
Outcome	Bosch's conclusions were consistent with GM's Response to Request 11 as it relates to causal or contributory factors, failure mechanisms, and failure modes.
Associated Documents	Bosch documents that GM has in its possession, custody, or control presented during GM meetings and reviews related to the Alleged Defect in the Subject and Peer Vehicles. The files are in the G230773_2_GM_CONF folder labeled with a X in the Supplier CBI column in the index file.
Action 8D: GM Internal Investigation N20-230774	
Start/End Dates	June 2, 2020 – July 30, 2020
Involved Engineering Groups	GM Global Safety and Field Investigations, GM Global Engineering
Description	GM investigated claims of the Alleged Defect due to an alleged malfunction of the Subject Component in the Subject and Peer Vehicles after completion of the Subject Bulletin remedy.
Outcome	On July 30, 2020 upon review of the collected data, GM's SFADA decided to close the investigation.
Associated Documents	Information and documents contained in GVS-CORE related to investigation N20-230774. The files related to this investigation will be provided in GM's supplemental response by August 31, 2020.

TABLE 8-1: GM INVESTIGATIONS OF THE ALLEGED DEFECT IN THE SUBJECT VEHICLES

GM is producing the nonprivileged documents that are responsive to Request 8 in the G230773_1_GM and G230773_2_GM_CONF folders in the subfolder labeled "Q_08". The index file, PE20-009 Q8 Index_NHTSA, provided is a directory of the files with the original file names and is labeled as listed in Table 8-1.

REQUEST 9

Describe all modifications or changes made by, or on behalf of, GM in the design, material composition, manufacture, quality control, supply, or installation of the subject 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 number(s) (service and engineering) of the original component;

e. The part number(s) (service and engineering) of the modified component;

f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;

g. When the modified component was made available as a service component; and

h. Whether the modified component can be interchanged with earlier production components.

Also, provide the above information for any modification or change that GM is aware of which may be incorporated into vehicle production within the next 120 days.

GM RESPONSE:

A spreadsheet summary of GM engineering work order history on the Subject Component in the Subject and Peer Vehicles is provided in the G230773_2_GM_CONF folder; subfolder labeled "Q_9".

REQUEST 10:

State the number of each of the following 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 (including the cut-off date for sales if applicable):

a. Subject component; and

b. Any kits that have been released, or developed, by GM for use in service repairs to the subject component/assembly.

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 or production or service usage.

GM RESPONSE:

The requested sales information for the Subject Component in both production and service versions is provided in the G230773_1_GM folder; subfolder labeled "Q_10." There are two files, one for dealer repair orders and one for customer paid repairs. The dealer RO file summarizes the sales volume by make, model and model year and date of sale. The make, model and model year are not provided in the customer paid PT file because VIN information is not available.

This data has limited analytical value in analyzing the field performance of a motor vehicle component because the records do not contain sufficient information to establish the reason for the part sale or, in the case of a dealer sale, whether the part was actually used to repair a customer vehicle or is being held as dealer stock. The Subject Component may also be replaced for noise, loss of power steering assist, malfunctions of the torque sensor or steering angle sensor inside the gear, or other steering conditions not related to the Alleged Defect. It could also be replaced due to accident damage. NHTSA acknowledges that there are "multiple potential failure modes" for steering-related concerns in the second opening paragraph of the Information Request. Therefore, it is difficult to draw any conclusions regarding the performance of the Subject Component, or malfunctions thereof, from this data.

REQUEST 11:

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.

Separately, for a. through f. for question 11, furnish GM's assessment of the alleged defect in the peer vehicles if different from the subject response.

GM RESPONSE:

GM's Assessment of the Alleged Defect in the Subject and Peer Vehicles:

a. Customers driving at highway speeds in the Subject and Peer Vehicles may experience, in rare circumstances, a slight feeling of increased friction or resistance when turning the steering wheel from the straight-ahead position. This friction is easily overcome by a slightly increased steering effort and it does not interfere with the driver's ability to steer the vehicle. For this condition to occur, customers would need to be driving long distances on a straight highway at a high sustained speed and with significant distance driven without turning or adjusting the steering wheel. As soon as the customer applies the slight increased steering effort required to move the steering wheel from the straight-ahead position, this condition is immediately eliminated, and the steering response and effort required returns to normal.

b. The steering gear contains a servo unit that includes a worm gear with a worm and a worm wheel. The primary contributor to the stick-slip condition is the supplier's inconsistent application of grease in the interface between the worm and the worm wheel. The grease may have been applied in a location on the worm wheel that didn't interface with the worm, depriving the worm gear of proper lubrication.
c. This condition can require, in rare circumstances (described in Response 11a above), an increased effort to turn the steering wheel because increased effort may be needed to overcome the increased friction caused by inconsistent grease application in the worm gear.
    i. GM's internal testing, relative to advanced safety features,[13] shows that customers can safely manage up to 3.0 Nm steering wheel torque to override these advanced safety features and safely take control of the vehicle. Even when this stick-slip condition is present, the torque required to turn the steering wheel is well below the 3.0 Nm. The overall wheel torque measured on the Subject and Peer Vehicles was less than 1.5 Nm, with an average of 0.5 Nm attributed to the Alleged Defect.
    ii. GM has provided a remedy for this issue for vehicles in the field through the Subject Bulletin. For model-year 2010-2012 Subject and Peer vehicles, the remedy was a replacement steering gear with an improved greasing process to the internal worm gear.[14] For model-year 2013-2014 Peer Vehicles, the issue was addressed through a software reprogramming to the steering gear control module ("**the new software**"). The new software has an anti-stick feature which senses and reduces the friction between the worm and the worm wheel by oscillating the worm gear. The 2010-2012MY Subject and Peer Vehicle steering gears were not able to be reprogrammed with the new software.[15]
d. GM does not believe this condition poses an unreasonable risk to motor vehicle safety for at least the following reasons:
    i. The slight amount of increase in steering effort, in the rare chance that this condition occurs, is not significant enough to cause a driver to lose the ability to safely steer the vehicle.
    ii. There are no accidents, injuries, fatalities or fires attributed to the Alleged Defect in the Subject Vehicles.
    iii. There were, however, 4 reported minor accident allegations and 1 minor injury allegation in the Peer Vehicles, but there is not enough information about these allegations to conclusively attribute them to the Alleged Defect or the Subject Component.
        i. None of the vehicles associated with these four accident claims were serviced under the Subject Bulletin prior to the alleged accident.

[13] Super Cruise, Lane Keep Assist, Lane Centering, Automatic Park Assist etc.
[14] See GM's response to Request 9 for the details of this change.
[15] The steering gear control module was updated to a new version for 2013-2014 Peer Vehicles. The software in the new control module was incompatible with the older version of the control module on the 2010-2012 Subject and Peer Vehicles.

iv. The stick-slip condition is not an issue where customers lose power steering assist—power steering assist remains active. Rather, there can be, in rare circumstances, a slight feeling of increased friction in the steering mechanism that customers can easily overcome with slight additional steering effort—e.g., on average, the increased effort is on the order of 0.5 Nm. This condition does not affect the driver's ability to control the vehicle. The stick-slip condition is immediately eliminated once the steering wheel is turned and normal steering effort is restored. See GM's Response to 11a above.

v. The remedy in the Subject Bulletin is 98.4% effective; only 1.6% of the vehicles came back for the same condition after the Subject Bulletin was performed.

e. The operator is alerted to the malfunction, and the malfunction is detectable by the slightly increased steering effort to turn or adjust the steering wheel.

f. The following information is provided in the G230773_2_GM_CONF folder in the subfolder labeled "Q_11:"

i. Diagrams of the Subject Component

ii. Pictures of the worm gear greasing

iii. Stick-slip test results

GM's Assessment of Petition CL-10919921-3617:

The Petitioner claims the Alleged Defect can recur and even get worse after the repairs from the Subject Bulletin are completed. He also claims the remedy was not sufficient because both the steering gear and the control module need to be replaced. The facts, however, demonstrate that the Petitioner unfortunately had two separate and distinct issues with his steering gear—the first issue was the Alleged Defect which GM corrected free of charge pursuant to the Subject Bulletin by replacing the entire steering gear assembly (which includes a motor kit), and the second issue was a loss of power steering assist related to a torque sensor failure where the dealer initially replaced the wrong component on the customer's second visit for service.

To be clear, GM always puts the safety its customers first and it strives to ensure all customers are satisfied with the quality and safety of its products. In this case, the customer brought his vehicle to the dealer for the Alleged Defect on February 26, 2015. As a result, GM replaced the customer's entire steering gear assembly free of charge on March 31, 2015 under the Subject Bulletin. This remedy was sufficient and addressed the Alleged Defect because the steering gear assembly replacement included a steering gear with an improved greasing process to the internal worm gear.

The customer returned to the dealer on November 16, 2016 with another issue that the dealer diagnosed as an intermittent loss of power steering assist based on a DTC C0545—it was not an issue related the Alleged Defect. This DTC would have illuminated a "Service Power Steering" message on the dash providing warning to the customer. To correct a loss of power steering assist, which was caused by an issue with the steering torque sensor, the dealer should have ordered and installed a new *steering gear assembly* because that is where the steering

torque sensor is located. Instead, and unfortunately for the customer, the dealer ordered and installed a new steering *motor kit*, which is only one component of the steering gear assembly (not the entire steering gear assembly) and did not include a new torque sensor. In other words, replacing the steering motor kit did not correct the torque sensor issue. The dealer continued to diagnose the vehicle by calling TAC which recommended a replacement of the entire steering gear assembly. The dealer subsequently ordered a new steering gear assembly and replaced it on the customer's vehicle. The customer has not returned for any other steering-related concerns to date.

The Petitioner also references two VOQs as evidence that the repair in the Subject Bulletin was not effective. The first VOQ is the Petitioner's case, and contrary to the Petitioner's assertion, the repair under the Subject Bulletin did effectively address the Alleged Defect as explained above. For the second VOQ (VOQ 10689932) relating to a 2012 Chevrolet Equinox (VIN 2GNALDEK6C[redacted]), the Petitioner claims it also shows that the Subject Bulletin repair was ineffective. The facts, however, suggest otherwise. This VOQ lists an incident date of February 1, 2013, more than a year before GM issued the Subject Bulletin, and states "after 36K miles, the car steering would stick and slip." The VOQ further claims his vehicle was repaired under extended warranty due to a technical bulletin. The VOQ then claims, "the problem went away and came back after 36K more miles on the new steering rack."

GM has no warranty or dealer-repair record showing that the vehicle was repaired near the claimed incident date (February 1, 2013) or mileage (36,000 miles). However, there is a TAC case for this vehicle that was opened on December 7, 2012. In that case, the technician says the customer complained of the steering wheel slipping and "feels like the vehicle is hydroplaning, but it is dry out." This description does not sound consistent with the Alleged Defect. The technician stated that they could not duplicate the problem. The TAC advisor recommended that the dealer replace the Subject Component. Without a dealer repair order for the original repair, GM is unable to determine whether this vehicle experienced the Alleged Defect or whether the Alleged Component was replaced the first time. Either way, the vehicle was not serviced under the Subject Bulletin the first time, because it did not launch until November 2014. Therefore, this first claim is not relevant to the effectiveness of the Subject Bulletin remedy.

Then, years later, on February 23, 2015, the date VOQ 10689932 was submitted, there is a warranty claim showing that this vehicle was repaired under the Subject Bulletin. The customer verbatim from this claim says "cust states sometimes the steering gets stiff and then suddenly feels loose like sticks and then slips." Therefore, based on GM's warranty repair records, this vehicle was repaired only one time free of charge for the Alleged Defect on February 23, 2015. This VOQ does not support the Petitioner's claim that the Subject Bulletin repair was not effective. If anything, it shows that it was.

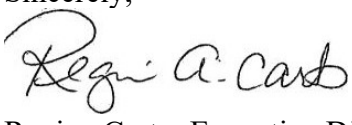
This is undoubtedly an unfortunate situation for the Petitioner, which was exacerbated by the dealer initially failing to order the correct part on the second visit. But this is not a situation where the original remedy failed and the Petitioner experienced a repeat occurrence of the Alleged Defect; the Alleged Defect was properly remedied the first time free of charge with a new steering gear under the Subject Bulletin.

CONCLUSION

While GM will continue to monitor the performance of the Subject Component in the Subject and Peer Vehicles in the field, GM believes, based on current data, that the Subject Component in the Subject and Peer Vehicles does not contain a safety-related defect. GM's Responses are based upon its investigation to date and reflect its current information and belief. GM reserves the right to supplement or amend its Responses as appropriate.

Please contact me if you require further information about this response or the nature or scope of our searches.

Sincerely,



Regina Carto, Executive Director
Global Safety and Field Investigations

cc: Mr. Chris Lash
ODI_IRresponse@dot.gov

Enclosures
Appendix A – Summary of Alleged Accidents
G230773_1_GM – Public copy of GM's document production

Appendix A – Summary of Alleged Accidents

A summary of each alleged accident listed in Table 2-2 is below. Additional information about the claims is available in the document production that GM is providing in response to Request 4, and GM's assessment of the Alleged Defect is provided in its Response to Request 11. GM characterizes these accident claims as inconclusive because GM could not conclusively tie the accident (or the injury) to the Subject Component or the Alleged Defect. None of the vehicles associated with these four accident claims were serviced under the Subject Bulletin prior to the alleged accident.

1. 2013 Chevrolet Malibu – VIN 1G11B5SA7DU[redacted]

The claimant alleged that he took his vehicle to the dealer for a concern with the steering locking up on January 3, 2014, and the dealer ordered a steering gear. The repair order states, "steering binds while driving." The vehicle was not repaired during this visit since the dealer had to order the part. The claimant then alleges that he had an accident on January 20, 2014 because of the steering wheel. He says he was driving over a bridge and the road veered to the right and when he tried to turn the steering locked up and he hit a wall with the right side of the vehicle. The claimant did not state how fast he was going or whether he had been driving straight for a long distance. He claims minor soft tissue injury from the accident. The accident report lists injury as O, no indication of injury. The vehicle had the steering gear replaced after the accident on May 12, 2014.

An inspection of the vehicle was completed on February 2, 2014. The steering system appeared to be working properly at the time of the inspection. The claimant's description of his steering issue prior to and during the crash does not include the speed he was traveling or how long he was traveling before he experienced the alleged binding. Although the repair order lists the complaint as binding, the warranty claim lists the cause of the binding as "noisy." There were no events recovered from the Event Data Recorder, so we do not know how fast the claimant was traveling prior to the incident. The posted speed limit is also blank on the accident report. The accident report narrative states "he took the exit toward Rt. 3 and while he was traveling on the exit ramp his steering wheel locked up and he was unable to turn his vehicle." This narrative suggests the claimant was able to steer his vehicle into the exit lane without any steering issue just prior to it "locking up" around the curve, which is inconsistent with the Alleged Defect. However, there is no diagram in the accident report to confirm. It is possible that the claimant steered into the exit lane and was going too fast to negotiate the curve. Due to the limited details, conflicting information and the fact that there was no defect found at the time of the inspection, GM does not have enough evidence to directly tie the Alleged Defect to the accident and the claimant's allegations may be wholly without merit. GM has included this claim as relevant only because the Subject Component was replaced post accident. Please refer to the documents in SR 71-1266520491 and legal file 775036.

2. 2014 Chevrolet Cruze – VIN 1G1PA5SH7E7[redacted]

The claimant alleged that on January 6, 2015, while driving down a 2-lane highway, his steering became stuck and he couldn't turn and ran into a curb at 50mph. There are no alleged

injuries. He seeks assistance with his tire repair. The dealer repaired the accident damage and performed the software reprogramming according to the Subject Bulletin on February 14, 2015.

The dealer performed an inspection and said the customer needed special coverage repairs. However, no inspection report is included in the file to directly tie the Alleged Defect to the accident. The associated repair order only states the customer complaint and does not report any findings. There is no accident report to confirm the customer's allegations. Therefore, this claim is inconclusive and may be wholly without merit. Please refer to the documents in SR 71-1420762200.

3. 2012 Chevrolet Volt – VIN 1G1RD6E49CU[redacted]

The claimant alleged that on January 15, 2015 he was travelling on the turnpike when he approached a bend in the road. He tried to maneuver the bend when the steering got tight which he claims caused him to go off the highway into a berm. He claims he traveled about 30 miles before he approached the bend. There is no injury claim. The Subject Component was replaced on January 15, 2015.

The dealer performed an inspection and stated that the technician drove the vehicle 8 miles and there were no drivability issues with the vehicle. The vehicle was noted to have poor tire maintenance and improper inflation which can cause more friction and stress on steering, which could result in control issues. There was no concrete evidence of the Alleged Defect being the cause of the accident, but as a goodwill gesture, GM offered to repair the minor damage and perform the remedy from the Subject Bulletin. Therefore, this claim in inconclusive and may be wholly without merit. Please refer to the documents in SR 71-1425090487.

4. 2012 Chevrolet Cruze – VIN 1G1PE5SCXC7[redacted]

The claimant called CAC on May 12, 2017 and alleged that almost a year earlier, on August 15, 2016, her steering wheel locked up while driving and she hit a guard rail causing damage to her vehicle. There is no claim of injury. The vehicle's accident damage was already repaired at the time of the allegation. The Subject Component was not replaced under the Subject Bulletin at the time of the accident, but over a year later on June 9, 2017.

There is almost a year between the date of the incident and the claim. PAC denied the claim because the vehicle had already been repaired and any evidence would have been removed. Because the vehicle could not be inspected, there is no evidence that the Alleged Defect caused or contributed to the accident. Therefore, this claim in inconclusive and may be wholly without merit. Please refer to the documents in SR 8-2954481349.

[redacted]