



**Kia Motors America, Inc.**

**Corporate Headquarters**

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August 30, 2019

**VIA FEDERAL EXPRESS**

Stephen Ridella, Ph.D., Director  
Office of Defects Investigation  
U.S. Department of Transportation  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue, S.E.  
Washington D.C. 20590

Re: **Engineering Analysis (EA19-001); ZF-TRW Airbag Control Units (ACUs)**

Dear Dr. Ridella:

This letter is submitted in response to your letter received by Kia Motors America, Inc. ("KMA") on July 16, 2019 (Reference NEF-103no/EA19-001). That letter identified the opening of EA19-001 to investigate and request information regarding allegations of failure of the airbag control units (ACUs) supplied by ZF-TRW (ZF) involving model year (MY) 2013 Kia Forte/Forte Koup, 2013-2019 Optima, 2012-2016 Optima Hybrid and 2014 Sedona vehicles.

**REQUEST NO. 1:**

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

- a. Make;
- b. Model;
- c. Model Year;
- d. Supplier of the subject component (ZF or Alternate Supplier); and
- e. The part number(s) (service and engineering) of the subject component.

Provide the table in Microsoft Access 2010, or a compatible format, entitled "PRODUCTION DATA."

**RESPONSE TO REQUEST NO. 1:**

A summary of the information requested is provided under the category “PRODUCTION DATA” and is submitted contemporaneously with this response.

**REQUEST NO. 2:**

State, by model and model year the number of each of the following, received by Kia, or of which Kia is otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles:

- a. Consumer complaints, including those from fleet operators;
- b. Field reports, including dealer field reports;
- c. Reports for ACUs returned from the field or from test vehicles;
- d. Reports involving a crash, injury or fatality;
- e. Property damage claims;
- f. Third-party arbitration proceedings where Kia is or was a party to the arbitration; and
- g. Lawsuits, both pending and closed, in which Kia is or was a defendant or codefendant.

For subparts “a” through “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 “d” through “g” provide a summary description of the alleged problem and causal and contributing factors and Kia’s assessment of the problem, with a summary of the significant underlying facts and evidence. For items “f and “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.

**RESPONSE TO REQUEST NO. 2:**

- a. Consumer Complaints—0
- b. Field reports—0  
Technical Assistance Reports—0
- c. Reports for ACUs returned from the field or from test vehicles—0
- d. Reports involving a crash, injury or fatality—0
- e. Property Damage Claims—0
- f. Third-Party Arbitration—0
- g. Lawsuits—0

**REQUEST NO. 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. Kia'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 property damage is alleged;
- k. Number of alleged injuries, if any;
  - i) The AIS score of the injuries; and
  - ii) Description of injury and location.
- l. Number of alleged fatalities, if any;
- m. Supplier of the Subject Component; and
- n. All applicable indicators for the Alleged Defect (items A through H, as identified above).

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

**RESPONSE TO REQUEST NO. 3:**

Not applicable.

**REQUEST NO. 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 Kia used for organizing the documents. Describe in detail the search methods and search criteria used by Kia to identify the items in response to Request No. 2.

**RESPONSE TO REQUEST NO. 4:**

There are no documents. See response to Request No. 2. KMA's search included all CA's, Field Reports, Techlines, Lawsuit Complaints, Claims and Arbitrations received through June 30, 2019 which included the words "crash" and "air\_bag", "crash" and "airbag", "collision" and "air\_bag", "collision" and "airbag", "accident" and "air\_bag", and "accident" and "airbag" for

the subject vehicles. The results were then reviewed to identify any reports which related, or may relate to the Alleged Defect as described in your letter. No responsive information was identified.

**REQUEST NO. 5:**

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, Kia. 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. 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.

**RESPONSE TO REQUEST NO. 5:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

**REQUEST NO. 6:**

Testing by multiple parties indicates that negative voltage transients, with respect to chassis ground, on the satellite sensor signal wires are capable of producing the EOS damage to the DS84 ASIC which leads to resets and/or shutdown of the ACU during crash events. Separately from Response 5, 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 which evaluates performance of the Subject Component ACU designs and/or peer ACU designs, from any ACU supplier including ZF, for transient voltage susceptibility on the satellite crash sensor, battery power, or ground wires, that have been conducted, are being conducted, are planned, or are being planned by, or for, Kia. For each such action, provide the following information:

- a. Action title or identifier (can be cross referenced to actions provided in Response 5);

- 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;
- f. Copies of all procedures used to conduct the tests, along with a list of test equipment utilized for the tests; and
- g. A 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.

**RESPONSE TO REQUEST NO. 6:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

**REQUEST NO. 7:**

For every Subject Component ACU design which shares a similar satellite sensor protection design (i.e. equivalent circuit protection devices providing similar levels of negative transient protection), and for each ACU design or modified design (including intermediated harnesses) used as a remedy repair for vehicles previously recalled for the Alleged Defect, provide the following:

- i) A simplified ACU circuit showing the protection devices for each satellite sensor line along with any current limiting devices incorporated into the ACU power circuitry separate from the satellite sensor communications lines. Additionally, the data sheet for each device shown in the circuit diagram shall be included with this submission.
- ii) The level of negative transient protection specified, in both voltage level and duration at that voltage level. If available, include a voltage versus duration curve (i.e. the envelope) depicting the protection capability. If the negative transient protection has been evaluated using a different electrical measurement/metric (i.e. current, power, or other parameter), provide a detailed explanation of the parameter used and provide duration and parameter versus duration information as requested for voltage.
- iii) All actions identified in Response 6(a) which apply to each particular ACU design.

**RESPONSE TO REQUEST NO. 7:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

**REQUEST NO. 8:**

Provide the following information for each unique part number identified in response 1(e):

- a. Original design specification sent to supplier;
- b. All modifications or changes made by, or on behalf of, Kia 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;
- c. The date or approximate date on which the modification or change was incorporated into vehicle production;
- d. A detailed description of the modification or change;
- e. Whether the modified component can be interchanged with earlier production components; and
- f. The applicable simplified circuit identified in Response 7.

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

**RESPONSE TO REQUEST NO. 8:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

**REQUEST NO. 9:**

For the subject vehicles, provide for each model and model year, a list of all possible fault codes and/or diagnostic trouble codes stored in the ACU or other modules located anywhere on the vehicle which could be associated with the alleged defect. For each fault code provide:

- a. The identifier for the code;
- b. The module or other hardware which contains the code;
- c. A description of the code;
- d. The conditions which result in the code being set; and
- e. The tools, software, and procedures required to download the code.

**RESPONSE TO REQUEST NO. 9:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

**REQUEST NO. 10:**

Produce engineering drawings, photos, and/or documents for each unique design version of the Subject Vehicles related to the electrical wiring configurations forward of the firewall:

- a. Original design specification;
- b. Modified design specification;
- c. Location(s) of the front impact sensors;
- d. Description of every unique bundle cross-section including:
  - i) Descriptions of each wire in the bundle cross-section;
  - ii) Indicate whether the wire is connected to the ACU and whether the wire also connects to a DS84 ASIC
  - iii) The voltage and current load specifications for each wire; and
  - iv) Description of any electrical shielding techniques applied to a wire or a sub-group of wires (twisted pair, foil shielding, etc.)

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

**RESPONSE TO REQUEST NO. 10:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

**REQUEST NO. 11:**

Furnish Kia'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. Any prior safety recalls Kia has conducted to address EOS related failures of the subject ACU, the remedy that was utilized in that recall action, and how, in Kia's assessment, that action addresses any residual risk of an EOS failure of the DS84 ASIC;
- e. The risk to motor vehicle safety that it poses; and
- f. 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.

Stephen Ridella, Ph.D., Director  
Office of Defects Investigation  
August 30, 2019  
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**RESPONSE TO REQUEST NO. 11:**

Pursuant to the extension granted by Paul Simmons on August 23, 2019, the response to this Request will be produced on September 16, 2019.

Sincerely,



J.S. (Jurassic) Park  
Vice President, Product Litigation &  
Regulatory Compliance  
Kia Motors America, Inc.