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December 2, 2021

**VIA ELECTRONIC SUBMISSION**

Gregory Magno, Chief
Vehicle Defects Division – D
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: **Preliminary Evaluation (PE21-020)**
**Investigation of Crashes Involving First Responder Scenes/Vehicles by Tesla, Inc.**

Dear Mr. Magno:

Pursuant to the extension you previously granted, this letter contains Kia's supplemental responses to various requests identified in your letter dated September 13, 2021 (PE21-020/NEF-0104).

**REQUEST NO. 1:**

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

a. Vehicle identification number (VIN);
b. Model;
c. Model Year;
d. Subject component trade / trim name, part number and design version installed as original equipment; including:
   i) Software version;
   ii) Firmware version;
   iii) Hardware version;
e. Date of manufacture;
f. Date warranty coverage commenced;
g. The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease);

h. Latest known vehicle mileage and commensurate date;
i. Cumulative mileage covered with the subject system engaged; and
j. Date and identities of the most recent software, firmware, and hardware updates.

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

**RESPONSE TO REQUEST NO. 1:**

A chart summarizing the total number of subject vehicles broken down by model and model year is provided. **TAB 1.** A list of these vehicles is provided in Microsoft Access with the title "PRODUCTION DATA" and is submitted with this response. The information requested in 1(d)i-iii will be submitted on December 3, 2021.

The source of information submitted in response to this request is both Kia America, Inc. and Kia Corporation.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 1:**

The production data containing the information requested in (d) i-iii is submitted in Microsoft Access with the title "PRODUCTION DATA_UPDATED".

**REQUEST NO. 2:**

State 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 subject system in the subject vehicles:

a. Consumer Complaints;
b. Field Reports;
c. Reports involving a subject crash, injury or fatality;
d. Property damage claims;
e. Third-party arbitration proceedings where KIA is or was a party to the arbitration; and
f. Lawsuits, both pending and closed, in which KIA is or was a defendant or codefendant.

For subparts "a" through "f" state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle are to be counted separately. Multiple reports of the same incident are also to be counted separately (i.e., a

consumer complaint and a field report involving the same incident in which a crash occurred are to be counted as a crash report, a field report and a consumer complaint).

In addition, for items "e" and "f", 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 "e" and "f," identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

**RESPONSE TO REQUEST NO. 2:**

A chart summarizing the total of each of the items requested in 2(a) through (f) is submitted with this response. **TAB 2.**

The source of the information submitted in response to this request is Kia America, Inc.

**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 model and model year;
f. Vehicle's mileage at time of incident;
g. Software, firmware, and hardware versions in place at the time of the incident, along with vehicle and mileage and date of installation;
h. Incident date;
i. Report or claim date;
j. Whether a crash is alleged;
k. Description of the crash including:
    i) Time of day and local time zone;
    ii) Crash site coordinates (latitude and longitude);
    iii) Listing of involved vehicles, objects and persons;

iv) Speed and direction of the subject vehicle;
v) Documented subject vehicle driver impairment;
vi) Location / orientation of the subject vehicle in relation to other involved vehicles, objects, persons at the time of impact;
vii) Timing of subject system engagement / disengagement over the 30 second period leading to the subject crash and, if not:
(1) Description and timing of driver control inputs that may have overridden the subject system;
viii) Description of the intervention of:
(1) crash warning or avoidance systems (e.g., AEB, FCW)
(2) subject system logic intended to detect first responder vehicles / scenes on or off the roadway;

l. Description and timing of the last driver engagement warning prior to the subject crash;
m. Duration (minutes) and distance (miles) of the drive cycle that led to the subject crash;
n. Whether property damage is alleged;
o. Number of alleged injuries, if any; and
p. Number of alleged fatalities, if any.

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

**RESPONSE TO REQUEST NO. 3:**

A list of communications responsive to this request is provided in Microsoft Access with the title "REQUEST NUMBER TWO DATA" and is submitted with this response.

The source of information submitted in response to this request is Kia America, Inc. and Kia Corporation.

**REQUEST NO. 4:**

Produce copies of all documents, telematics reports / data, and data logs 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.

In addition, provide a full copy of any expert report that has been produced by KIA or received from another party in a lawsuit, arbitration, or a pre-suit claim regarding the incidents identified in Request Number 2. This includes any reports produced or exchanged for experts designated by any party in such litigation, including KIA, plaintiff(s), or co-defendants. This does not include reports that KIA has never produced to another party, to the extent KIA claims a privilege exists for such a report.

**RESPONSE TO REQUEST NO. 4:**

Copies of the documents responsive to Request No. 2 for the subject vehicles are organized electronically in the folders titled "Consumer Assistance Case Center Reports (CA's)", "Technical Assistance Center Case Reports," "Field Reports," and "Lawsuits & Arbitrations".

Based on Kia's interpretation of the definition of "subject system", the applicable ADAS's for purposes of responding to this IR letter include Highway Driving Assist (HDA), Lane Following Assist (LFA) and Smart Cruise Control with Stop & Go (SCC). KUS's search included all CA's, Field Reports and Techline Reports generated through September 13, 2021 and all lawsuits and arbitrations of which KUS received notice of on or before September 13, 2021 using the search words "lane following" or "lane_follow" or "lfa"; "lane keeping" or "lane keep" or "lka" or "lkas"; "lane centering" or "lane center"; "lane departure" or "ldw"; "lane steering"; "lane assist"; "smart cruise control" or "scc" or "cruise control" or "auto cruise" or "speed control" or "radar cruise" or "adaptive cruise" or "auto pilot" or "autopilot"; highway driveway assist" or "highway drive assist" or "had" or "highway driving feature" or "highway drive feature" or "highway drive system" or "highway driving system". KUS took a very broad approach in its search terms to account for interchangeability of terms and understanding by customers in describing the system. Those cases were then reviewed for responsiveness regarding any "issues that relate or may relate to the subject system" based on KUS's interpretation of "subject system" as indicated above. With respect to CA reports, KUS is not always able to extract the incident date information in an automated manner from the source system and thus will include the incident date if available.

The source of information submitted in response to this request is Kia America, Inc.

**REQUEST NO. 5:**

For each trade name / trim level of the subject system available in the subject vehicles, state its name and designation including:

a. Describe the ODD specified to the customer by KIA for the intended use of the system, including but not limited to:
   i) Types of roads, road marking, weather conditions, etc. the system is intended to be used on and the types of roads on which the system should not be used;
   ii) List the methods and technologies used to prevent subject system usage outside the ODD specified to the customer by KIA; and
   iii) If the subject system can be engaged (or remain engaged) outside of the ODD specified to the customer by KIA, state the reasons for this capability and describe any performance restrictions or modifications to the subject system's operational characteristics in such an environment (e.g. slower maximum speeds or control authority, additional driver warnings, adjustments to the driver engagement system).

b. Describe the subject system's maximum control authority over steering (steering angle (degrees), rate (degrees / sec), lateral acceleration (g)), braking (g), and acceleration (g) functions during routine and crash-imminent operations. Separately include any additional conditions and control authority values that KIA deems appropriate.

c. List and describe the information, system status, alerts, warnings, and graphics communicated by the subject vehicle to its driver during the DDT (e.g., warning lights, instrument panel animations, aural warnings, haptic warnings) during the following subject system operational conditions:
   i) Routine subject system operation;
   ii) Scenarios where the vehicle requires driver intervention (e.g., driver engagement needed, imminent ODD exit, system fault); and
   iii) When the subject vehicle detects that a crash is imminent.

d. Furnish an overview of KIA's approach to the enforcement of driver engagement / attentiveness during the subject system's operation in the subject vehicles. Include a description of all means of detecting (both through direct measurement and inference) / monitoring driver engagement / attentiveness including:
   i) The technological means and related logic (including direct measurement or inference) used a sense driver engagement / attentiveness;
   ii) Minimum contact or detected engagement duration and time between contact / detected engagement required to satisfy the driver engagement / attentiveness logic including changes based on variations in driving conditions such as vehicle speed or presence of a lead vehicle;
   iii) Describe any warning strategies or messaging and timing associated with each system identified above in subpart (ii) (include pictures/videos of all audible & visual warnings/alerts); and

iv) Describe any escalation or lockout strategies used to address either unresponsive drivers or repeated engagement warnings in any given drive cycle.

e. Describe subject system responses to driver control inputs that could cancel or override one or more of its Level 2 functions. For each driver input, include:
   i) Driver input description and minimum threshold (e.g., minimum steering angle or rate);
   ii) List the Level 2 functions disabled and permitted to continue operation following a driver override;
   iii) Describe / illustrate warnings and messages to the driver concerning the system status following a driver override; and
   iv) Explain which, if any, of the disabled Level 2 functions resume operation on their own after the override input and under what conditions.

f. List the conditions / events / alerts that may prompt an operating subject system to require a "take-over" by the driver. For each such condition, list:
   i) Sequence of events and timing for each; and
   ii) Intended vehicle behavior in the instance where a driver take-over is not detected.

g. Describe the subject system OEDR capabilities within the ODD specified to the customer by KIA. List the objects and events that the system is designed to detect (e.g., particular vehicle aspects, pedestrians, road signs, drivable space limitations, environmental (weather / road surface / lighting) conditions, path predictions, object classifications). For each item, list:
   i) Subject system behavior
   ii) Limitations on detection; and
   iii) Subject system interaction with crash avoidance technologies.

**RESPONSE TO REQUEST NO. 5:**

Pursuant to the extension granted by Gregory Magno on November 9, 2021, the response to this Request will be provided on December 3, 2021.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 5:**

A chart containing the requested information is submitted with this response. **TABS A and B.**

The source of information submitted in response to this request is Kia Corporation, Kia America, Inc., and Hyundai America Technical Center, Inc.

**REQUEST NO. 6:**

Produce copies of all instructional, service, warranty, marketing, and other documents that relate to, or may relate to, the operation of each trade name / trim level of the subject system in the subject vehicles, that KIA has issued to any customers, 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, digital messages on a subject vehicle display, or other documents or communications, with the exception of standard shop manuals. Also, include the latest draft copy of any communication that KIA is planning to issue within the next 120 days.

**RESPONSE TO REQUEST NO. 6:**

Copies of the documents responsive to this request are provided. **TABS 3-135.**

The source of information submitted in response to this request is Kia America, Inc.

**REQUEST NO. 7:**

For each trade name / trim level of the subject system available in the subject vehicles, describe all modifications or changes made by, or on behalf of, KIA in the design, material composition, manufacture, quality control, supply, function, or installation of the subject system, from the start of production to date, which relate to, or may relate to driver engagement / attentiveness and OEDR by the subject system 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 hardware, firmware, and software names and numbers of the original version;
e. The hardware, firmware, and software names and numbers of the modified version;
f. Primary distribution method of related firmware and software updates (over the air or in-person service); and
g. When the modified version / update was made available as a service component.

Also, provide the above information for any modification or change that KIA is aware of which

may be incorporated into vehicle production or pushed to subject vehicles in the field within the next 120 days.

**RESPONSE TO REQUEST NO. 7:**

Pursuant to the extension granted by Gregory Magno on November 9, 2021, the response to this Request will be provided on December 3, 2021.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 7:**

A chart identifying the information responsive to this request is submitted with this response. **TAB C.**

The source of information submitted in response to this request is Kia Corporation.

**REQUEST NO. 8:**

Describe KIA's strategies for detecting and responding to the presence of first responder / law enforcement vehicles and incident scene management tactics whether in or out of the roadway during subject system operation in the subject vehicles. Include:

a. Incident scene detection (particularly flashing lights, road flares, cones / barrels, reflectorized vests on personnel, vehicles parked at an angle "fend-off" position");
b. Explain the effects of low light conditions on these strategies; and
c. List subject system behaviors (e.g., driver warnings, control interventions).

**RESPONSE TO REQUEST NO. 8:**

Pursuant to the extension granted by Gregory Magno on November 9, 2021, the response to this Request will be provided on December 3, 2021.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 8:**

The subject vehicles are not equipped with any systems that have the ability to detect and respond to the presence of first responder / law enforcement vehicles during subject system operation.

The source of information submitted in response to this request is Kia Corporation.

**REQUEST NO. 9:**

Describe any processes, procedures, or policies governing the extent of testing and validation required prior to the release of the subject system or an in-field update to the subject system, including hardware and software components of such systems, identifying, in particular:

a. The extent of field testing or vehicle validation miles required prior to the release of such a system or feature;
b. The extent of any computer simulations or training data sets required to be conducted prior to the release of such a system or feature and the degree to which any such simulations are relied upon for testing and validation in lieu of field testing;
c. The extent to which the processes, procedures, or policies for the testing and validation identified above differ, if at all, for updates to a subject system or feature (e.g. software updates) compared to the first release of the system or feature;
d. The length of time that the processes, procedures, or policies for the testing and validation identified above have been in place; and
e. Any processes, procedures, or policies in place to compare the performance of a subject system or feature in the field after a release with the design intent for the system or feature.

**RESPONSE TO REQUEST NO. 9:**

Pursuant to the extension granted by Gregory Magno on November 9, 2021, the response to this Request will be provided on December 3, 2021.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 9:**

The requested information is submitted with this response. **TAB D.**

The source of information submitted in response to this request is Kia Corporation.

**REQUEST NO. 10:**

Describe KIA's processes for identifying and investigating subject crashes in the subject vehicles with the subject system in operation including:
a. Vehicle's Data collection/logging capabilities including vehicle's ability to wirelessly transmit data including:

i) The conditions in which a vehicle may send wireless data that may relate to a subject crash;
ii) The methods by which the data are sent (type of wireless system and location of involved components on the subject vehicles);
iii) A description of the data sent and related alerting within KIA;
iv) Any limitations on such transmittal (e.g. poor wireless connectivity, etc.);
v) Countermeasures / alternate retrieval options when transmittal limitations apply;

b. Procedures for investigating customer concerns or safety incidents; and
c. Metrics used to assess safety performance.

**RESPONSE TO REQUEST NO. 10:**

Pursuant to the extension granted by Gregory Magno on November 9, 2021, the response to this Request will be provided on December 3, 2021.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 10:**

The procedures and processes for the identification and investigation of the subject system in subject crashes is the same as those for identifying and investigating/evaluating any product issue that may potentially relate to motor vehicle safety. For a summary of this process see **TAB E**. Currently, Kia vehicles are not equipped with the capability of wirelessly transmitting data to alert Kia of a subject crash involving the subject system. Kia instead relies on various field data related sources to identify such issues as described in Tab E. Investigation of subject crashes can include a review of EDR data, an evaluation of the incident location and inspection of the vehicle and vehicle records for any pre-existing damage that may have interfered with the subject system. An assessment of vehicle performance and the existence of any potential safety risk is conducted based on all information received and analyzed.

The source of information submitted in response to this request is Kia America, Inc.

**REQUEST NO. 11:**

Furnish KIA's assessment of the impact of the subject system on the crashes furnished in response to Request 2, 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 they pose.

**RESPONSE TO REQUEST NO. 11:**

Pursuant to the extension granted by Gregory Magno on November 9, 2021, the response to this Request will be provided on December 3, 2021.

**SUPPLEMENTAL RESPONSE TO REQUEST NO. 11:**

Kia assessment is submitted with this response. **TAB F**.

The source of information submitted in response to this request is Kia America, Inc.

Sincerely,

[redacted]

J.S. (Jurassic) Park
Vice President, Chief Safety Officer