



September 13, 2021

**SENT VIA E-MAIL**

Brian Latouf  
C/O Cole Stutz  
Engineering and Design Analysis  
Hyundai Motor America  
10550 Talbert Avenue  
Fountain Valley, CA 92708

NEF-104  
PE21-020

Dear Mr. Latouf,

This letter is to inform you that the Office of Defects Investigation (ODI) of the National Highway Traffic Safety Administration (NHTSA) has opened a Preliminary Evaluation (PE21-020) to investigate crashes involving first responder scenes and vehicles manufactured by Tesla, Inc. (Tesla) that were operating in either Autopilot or Traffic Aware Cruise Control leading up to the incident, and to request certain information. A copy of the PE21-020 opening resume is enclosed for your information.

This information request is being sent to Hyundai Motor America (Hyundai) to gather information in support of ODI's comparative analysis amongst production vehicles equipped with the ability to control both steering and braking/accelerating simultaneously under some circumstances.

Unless otherwise stated in the text, the following definitions apply to these information requests:<sup>1</sup>

- **Level 2 ADAS**: a driver support feature (Advanced Driver Assistance System) on the vehicle that can control both steering and braking/accelerating simultaneously under some circumstances. The human driver must remain fully and continuously engaged in the (Level 2) driving task.<sup>2</sup>

---

<sup>1</sup> Unless otherwise specified herein, any terms in these information requests that relate to an Advanced Driver Assistance System (ADAS), including the SAE International levels of driving automation, should be construed to have the same meaning as any overlapping term defined in NHTSA First Amended Standing General Order 2021-01, which is located at [https://www.nhtsa.gov/sites/nhtsa.gov/files/2021-08/First\\_Amended\\_SGO\\_2021\\_01\\_Final.pdf](https://www.nhtsa.gov/sites/nhtsa.gov/files/2021-08/First_Amended_SGO_2021_01_Final.pdf)

<sup>2</sup> "Level 2" means the same as and is coterminous with the definition of "Level or Category 2 - Partial Driving Automation" in SAE J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles § 5.3 (April 2021).

- **ODD**: Operational Design Domain or operating conditions under which a given driving automation system or feature thereof is specifically designed to function, including, but not limited to, environmental, geographical, and time-of-day restrictions, and/or the requisite presence or absence of certain traffic or roadway characteristics.<sup>3</sup>
- **DDT**: Dynamic Driving Task or all of the real-time operational (lateral and longitudinal movement of vehicle) and tactical (planning component) functions required to operate a vehicle in on-road traffic, excluding the strategic functions such as trip scheduling and selection of destinations and waypoints, and including without limitation:
  - Lateral vehicle motion control via steering (operational);
  - Longitudinal vehicle motion control via acceleration and deceleration (operational);
  - Monitoring the driving environment via object and event detection, recognition, classification, and response preparation (operational and tactical);
  - Object and event response execution (operational and tactical);
  - Maneuver planning (tactical); and
  - Enhancing conspicuity via lighting, signaling and gesturing, etc. (tactical).<sup>4</sup>
- **OEDR**: Object and event detection and response or the subtasks of the DDT that include monitoring the driving environment (detecting, recognizing, and classifying objects and events and preparing to respond as needed) and executing an appropriate response to such objects and events (i.e., as needed to complete the DDT and/or DDT fallback).<sup>5</sup>
- **Subject System**: Suite of software, hardware, data, and any other related systems on or off the vehicle that contributes to the conferral of any Level 2 capabilities on any HYUNDAI vehicle, including but not limited to the various Highway Driving Assist packages.
- **Subject Vehicles**: All HYUNDAI vehicles, equipped with the subject system at any time, and manufactured for sale or lease in the United States, including, but not limited to, the District of Columbia, and current U.S. territories and possessions.
- **Subject Crashes**: Incidents in which any subject vehicle experiences a crash in the United States (including any of its territories) with the subject system engaged at any time during the period beginning 30 seconds immediately prior to the commencement of the crash.

---

<sup>3</sup> “ODD” means the same as and is coterminous with the definition of “Operational Design Domain” in SAE J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles § 3.22 (April 2021).

<sup>4</sup> “DDT” means the same as and is coterminous with the definition of “Dynamic Driving Task” in SAE J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles § 3.13 (April 2021).

<sup>5</sup> “OEDR” means the same as and is coterminous with the definition of “Object and Event Detection and Response” in SAE J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles § 3.20 (April 2021).

- **HYUNDAI:** Hyundai Motor America all of its past and present officers and employees, whether assigned to its principal offices or any of its field or other locations, including all of its divisions, subsidiaries (whether or not incorporated) and affiliated enterprises and all of their headquarters, regional, zone and other offices and their employees, and all agents, contractors, consultants, attorneys and law firms and other persons engaged directly or indirectly (e.g., employee of a consultant) by or under the control of HYUNDAI (including all business units and persons previously referred to), who are or, in or after January 1st, 2011 were involved in any way with any of the following related to the subject system in the subject vehicles:
  - a. Design, engineering, analysis, modification or production (e.g. quality control);
  - b. Testing, assessment or evaluation;
  - c. Consideration, or recognition of potential or actual defects, reporting, record-keeping and information management, (e.g., complaints, field reports, warranty information, part sales), analysis, claims, or lawsuits; or
  - d. Communication to, from or intended for zone representatives, fleets, dealers, or other field locations, including but not limited to people who have the capacity to obtain information from dealers.
  
- **Document:** “Document(s)” is used in the broadest sense of the word and shall mean all original written, printed, typed, recorded, or graphic matter whatsoever, however produced or reproduced, of every kind, nature, and description, and all non-identical copies of both sides thereof, including, but not limited to, papers, letters, memoranda, correspondence, communications, electronic mail (e-mail) messages (existing in hard copy and/or in electronic storage), faxes, mailgrams, telegrams, cables, telex messages, notes, annotations, working papers, drafts, minutes, records, audio and video recordings, data, databases, other information bases, summaries, charts, tables, graphics, other visual displays, photographs, statements, interviews, opinions, reports, newspaper articles, studies, analyses, evaluations, interpretations, contracts, agreements, jottings, agendas, bulletins, notices, announcements, instructions, blueprints, drawings, as-builts, changes, manuals, publications, work schedules, journals, statistical data, desk, portable and computer calendars, appointment books, diaries, travel reports, lists, tabulations, computer printouts, data processing program libraries, data processing inputs and outputs, microfilms, microfiches, statements for services, resolutions, financial statements, governmental records, business records, personnel records, work orders, pleadings, discovery in any form, affidavits, motions, responses to discovery, all transcripts, administrative filings and all mechanical, magnetic, photographic and electronic records or recordings of any kind, including any storage media associated with computers, including, but not limited to, information on hard drives, floppy disks, backup tapes, and zip drives, electronic communications, including but not limited to, the Internet and shall include any drafts or revisions pertaining to any of the foregoing, all other things similar to any of the foregoing, however denominated by HYUNDAI, any other data compilations from which information can be obtained, translated if necessary, into a usable form and any other documents. For purposes of this request, any document which contains any note, comment, addition, deletion, insertion, annotation, or otherwise comprises a non-identical copy of another document shall be treated as a separate document subject to production. In all cases where original and any non-identical copies

are not available, “document(s)” also means any identical copies of the original and all non-identical copies thereof. Any document, record, graph, chart, film or photograph originally produced in color must be provided in color. Furnish all documents whether verified by HYUNDAI or not. If a document is not in the English language, provide both the original document and an English translation of the document.

- **Other Terms:** To the extent that they are used in these information requests, the terms “claim,” “consumer complaint,” “dealer field report,” “field report,” “fire,” “fleet,” “good will,” “make,” “model,” “model year,” “notice,” “property damage,” “property damage claim,” “rollover,” “type,” “warranty,” “warranty adjustment,” and “warranty claim,” whether used in singular or in plural form, have the same meaning as found in 49 CFR 579.4.

In order for my staff to evaluate the subject system and subject crashes, certain information is required. Pursuant to 49 U.S.C. § 30166, please provide numbered responses to the following information requests. Insofar as HYUNDAI has previously provided a document to ODI, HYUNDAI may produce it again or identify the document, the document submission to ODI in which it was included and the precise location in that submission where the document is located. When documents are produced, the documents shall be produced in an identified, organized manner that corresponds with the organization of this information request letter (including all individual requests and subparts). When documents are produced and the documents would not, standing alone, be self-explanatory, the production of documents shall be supplemented and accompanied by explanation.

Please repeat the applicable request verbatim above each response. After HYUNDAI’s response to each request, identify the source of the information and indicate the last date the information was gathered.

1. State, by model and model year, the number of subject vehicles HYUNDAI has manufactured for sale or lease or operation in the United States. Separately, for each subject vehicle manufactured to date by HYUNDAI, 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.”

2. State the number of each of the following, received by HYUNDAI, or of which HYUNDAI 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 HYUNDAI is or was a party to the arbitration; and
  - f. Lawsuits, both pending and closed, in which HYUNDAI 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 HYUNDAI’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.

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. HYUNDAI’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."

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 HYUNDAI used for organizing the documents. Describe in detail the search methods and search criteria used by HYUNDAI 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 HYUNDAI 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 HYUNDAI, plaintiff(s), or co-defendants. This does not include reports that HYUNDAI has never produced to another party, to the extent HYUNDAI claims a privilege exists for such a report.

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 HYUNDAI 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 HYUNDAI; and
    - iii) If the subject system can be engaged (or remain engaged) outside of the ODD specified to the customer by HYUNDAI, 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 HYUNDAI 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 HYUNDAI'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 to 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 HYUNDAI. 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.
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 HYUNDAI 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 HYUNDAI is planning to issue within the next 120 days.
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, HYUNDAI 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 HYUNDAI is aware of which may be incorporated into vehicle production or pushed to subject vehicles in the field within the next 120 days.

8. Describe HYUNDAI’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).
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.
10. Describe HYUNDAI’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 HYUNDAI;
    - 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.
11. Furnish HYUNDAI’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.

### **Legal Authority for This Request**

This letter is being sent to HYUNDAI pursuant to 49 U.S.C. § 30166, which authorizes NHTSA to conduct any investigation that may be necessary to enforce Chapter 301 of Title 49 and to request reports and the production of things. It constitutes a new request for information.

### **Civil Penalties**

HYUNDAI's failure to respond promptly and fully to this letter could subject HYUNDAI to civil penalties pursuant to 49 U.S.C. § 30165 or lead to an action for injunctive relief pursuant to 49 U.S.C. § 30163. (Other remedies and sanctions are available as well.) The Vehicle Safety Act, as amended, 49 U.S.C. § 30165(a)(3), provides for civil penalties of up to \$22,992 per violation per day, with a maximum of \$114,954,525 for a related series of daily violations, for failing or refusing to perform an act required under 49 U.S.C. § 30166. *See* 49 CFR 578.6 (as amended by Fixing America's Surface Transportation Act (the "FAST Act"), Pub. L. 114-94, § 24110(a)(2), 129 Stat. 1312 (Dec. 4, 2015)). This includes failing to respond completely, accurately, and in a timely manner to ODI information requests.

If HYUNDAI cannot respond to any specific request or subpart(s) thereof, please state the reason why it is unable to do so. If on the basis of attorney-client, attorney work product, or other privilege, HYUNDAI does not submit one or more requested documents or items of information in response to this information request, HYUNDAI must provide a privilege log identifying each document or item withheld, and stating the date, subject or title, the name and position of the person(s) from, and the person(s) to whom it was sent, and the name and position of any other recipient (to include all carbon copies or blind carbon copies), the nature of that information or material, and the basis for the claim of privilege and why that privilege applies.

### **Confidential Business Information**

**All business confidential information must be submitted directly to the Office of Chief Counsel as described in the following paragraph and should not be sent to this office.** In addition, do not submit any business confidential information in the body of the letter submitted to this office. Please refer to PE21-020 in HYUNDAI's response to this letter and in any confidentiality request submitted to the Office of Chief Counsel.

If HYUNDAI claims that any of the information or documents provided in response to this information request constitute confidential commercial material within the meaning of 5 U.S.C. § 552(b)(4), or are protected from disclosure pursuant to 18 U.S.C. § 1905, HYUNDAI must submit supporting information together with the materials that are the subject of the confidentiality request, in accordance with 49 CFR Part 512. Additional information can be found here: <https://www.nhtsa.gov/coronavirus/submission-confidential-business-information>.

If you have any questions regarding submission of a request for confidential treatment, contact Daniel Rabinovitz, Trial Attorney, Office of Chief Counsel at [daniel.rabinovitz@dot.gov](mailto:daniel.rabinovitz@dot.gov) or (202) 366-8534.

**Due Date**

HYUNDAI's response to this letter, in duplicate, together with a copy of any confidentiality request, must be submitted to this office by **November 17th, 2021**. HYUNDAI's response must include all non-confidential attachments and a redacted version of all documents that contain confidential information. If HYUNDAI finds that it is unable to provide all of the information requested within the time allotted, HYUNDAI must request an extension from me at (202) 366-5226 no later than five business days before the response due date. If HYUNDAI is unable to provide all of the information requested by the original deadline, it must submit a partial response by the original deadline with whatever information HYUNDAI then has available, even if an extension has been granted.

Please send email notification to Steven Posada at STEVEN.POSADA@DOT.GOV and to ODI\_IRresponse@dot.gov when HYUNDAI sends its response to this office and indicate whether there is confidential information as part of HYUNDAI's response.

If you have any technical questions concerning this matter, please call Steven Posada of my staff at (202) 366-9402.

Sincerely,



Gregory Magno, Chief  
Vehicle Defects Division - D  
Office of Defects Investigation

Enclosure: PE21-020 Opening Resume