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October 8, 2004

VIA FEDERAL EXPRESS

Kathleen C. DeMeter, Director
Office of Defects Investigation
Enforcement
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

RECEIVED
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Re: Engineering Analysis (EA04-020)
2001 Kia Rio Wheel Fracture

Dear Ms. DeMeter:

This letter is submitted in response to your letter of August 23, 2004 sent to Hyundai America Technical Center, Inc. ("HATCI") (Reference NVS-213kmb/EA04-020). That letter raised certain issues and requested information regarding the performance of MY 2001 Kia Rio vehicles in relation to allegations of steel wheel fracture. Although HATCI is an organization independent of both Kia Motors Corp. ("KMC") and Kia Motors America, Inc. ("KMA"), it has been designated by those organizations to act as their communication liaison with the National Highway Traffic Safety Administration ("NHTSA"). This response is submitted to NHTSA by HATCI in that limited role.

REQUEST NO. 1:

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 alleged defect in the subject vehicles:

- a. Consumer complaints, including those from fleet operators;
- b. Field reports, including dealer field reports;
- c. Reports involving a crash, injury, or fatality, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;
- d. Property damage claims; and

- 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 "d," 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" through "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. 1:

The table below provides a comprehensive summary of information previously and currently submitted. The consumer COMPLAINT DATA submitted with Kia's response to PE04-030 on June 4, 2004 was obtained on April 23, 2004. The consumer COMPLAINT DATA submitted with this response was obtained on September 10, 2004.

CATEGORY	PE04-030 06/04/04	EA04-020 10/08/04	TOTAL
Consumer Complaints	27	6	33
Field Reports	12	0	12
Crash Reports	0	0	0
Property Damage Claims	5	0	5
Third Party Arbitration	0	0	0
Lawsuits	0	0	0

REQUEST NO. 2:

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), 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; and
- l. Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "COMPLAINT DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

RESPONSE TO REQUEST NO. 2:

A listing of the consumer communications is provided on a Data Collection Disc under the category "COMPLAINT DATA".

REQUEST NO. 3:

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.

RESPONSE TO REQUEST NO. 3:

Copies of the documents identified in response to Request No. 2 are submitted with this letter. See Tab 1. They are organized by the following categories:

- Consumer Affairs Department files from KMA's department database, along with Warranty History Inquiry reports for each such file (6).

- In addition, KMA interviewed the mother of Violet Bailey, whose daughter submitted a customer complaint identified in response to the June 4th PE response. The description of that interview is attached. See Tab 2.

Per the instructions in you letter, documents responsive to this request in PE04-030 were provided with the response letter dated June 4, 2004 and were attached under Tab 2.

REQUEST NO. 4:

State, by model and model year, a total count for all of the following categories of claims, collectively, that have been paid by Kia to date that relate to, or may relate to, the alleged defect in the subject 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. Kia's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) 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;
- h. Nature code;
- i. Cause code;
- j. Replacement part number(s) and description(s);
- k. Concern stated by customer; and
- l. Comment, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "WARRANTY DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

RESPONSE TO REQUEST NO. 4:

A listing of the responsive warranty claims is provided on a Data Collection Disc under the category "WARRANTY DATA". This claim data was obtained on September 10, 2004.

REQUEST NO. 5

Describe in detail the search criteria used by Kia to identify the claims identified in response to Request No. 5, including the labor operations, problem 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 applicable to the alleged defect in the subject vehicles. State, by make and model year, the terms of the new vehicle warranty coverage offered by Kia 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 Kia 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.

RESPONSE TO REQUEST NO. 5:

The same search criteria identified in response to Request No. 6 of PE04-030 was used.

REQUEST NO. 6:

Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Kia 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 Kia is planning to issue within the next 120 days.

RESPONSE TO REQUEST NO. 6:

There are no documents responsive to this request. However, it is Kia's desire to issue communications which would fall within this category, and it identified its desire to do so after its meeting with ODI on July 20th. However, it is Kia's understanding that communications regarding a matter under investigation by ODI must be cleared with ODI before such communications are sent.

REQUEST NO. 7:

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. A brief summary of the findings and/or conclusions resulting from the action.

For each action identified, provide copies of all documents not previously submitted to ODI 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. 7:¹

An additional assessment not previously submitted was conducted relating to the alleged defect in the subject vehicles. The assessment was prepared as a result of two incidents which occurred in the country of Oman. A copy of the report is attached. See Tab 3.

- a. Rio Road Wheel (Steel) Crack Analysis Report
- b. Approximately the month or so before the completion date.
- c. January 15, 2002
- d. To analyze the metallurgical and tensile properties of steel wheels which had cracked, as well as the shape and notch characteristics of the cracked wheel compared to other wheels.
- e. Yoon, Kyung II of Metal Element Research Team
- f. The cracked wheel was designated as a warranty-return part and other production wheels were designated as normal parts. (1) The wheels were found to be

¹ This request was previously identified in PE04-030 as Request No. 8. On pages 10, 11 and 13 of our response dated June 4, 2004, the group responsible for the Rio Wheel Crack Analysis Report Parts I & II was listed as the KMA Quality Assurance Team 1. It is actually a KMC team.

chemically the same, with similar hardness readings and thus tensile strength. (2) The crack initiated in the R-area around the vent hole/disc rib and moved towards the vent hole and hub hole. (3) An Electron Microscope was used to perform a notch analysis to confirm the crack initiation point and progression. (4) A comparison of the shapes of the warranty-return part and the normal parts revealed that they came from different molds. The key difference was in the notch radius in the R-area. (5) The smaller radius in the R-area of the warranty-return part reduced the fatigue strength in that area. Reference was made to a notch-sensitivity chart in the Metals Handbook, but no determination was made as to the specific effect of the reduced radius in the warranty-return wheel.

REQUEST NO. 8:

Provide the following information concerning Kia's analysis of subject wheels returned from service that exhibit the alleged defect:

- a. A complete tabulation of subject components that have been examined by Kia with the following information: VIN; mileage; wheel position; wheel date of manufacture; crack size - in both millimeters and degrees (0-360°); and a short summary of how the crack was detected, if known;
- b. Photographs of each wheel listed in 8.a;
- c. Copies of all documents relating to Kia's analysis of wheels returned from service with cracks.

RESPONSE TO REQUEST NO. 8:

KMC's Quality Assurance Team I Rio Steel Wheel Warranty-Return Part Analysis dated March 25, 2002 is attached. See Tab 4. The photographs provided in this analysis are worst-case wheel conditions. None of the wheels examined, including the ones provided in the report reached complete or failure level cracking. Further identifying information regarding vehicles and mileage are included. A search has been conducted for further source material, including photographs, regarding the wheels covered by this evaluation and none have been located. Similarly, no further material was located as backup for the March 21, 2002 report submitted with the June 4th PE response.

REQUEST NO. 9:

Furnish Kia's current 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.

RESPONSE TO REQUEST NO. 9:

Introduction: The key analytical elements of this Rio steel wheel situation distinguish it from other wheel cracking investigations in critical ways. These are:

- The vehicles involved are not used in high speed and high stress situations, such as in police vehicles, which have been a significant focus of cracked wheel recalls over the modern history of ODI.
- No loss of air pressure, and thus no blowout effects or other high speed loss of control situations, have occurred or will occur as a result of wheel cracking in the Rio.
- No welding issues are involved which can lead to sudden wheel collapse due to weld failure.
- There have been no incidents of wheel failure under side force loading during driving on curves, either on local roads or on highways. This is consistent with the previously reported Exponent testing.
- The results of this investigation are unique compared to prior investigations in demonstrating a clear, consistent history of a progressive increase in noise and vibration before wheel failure might occur. Kia specifically conducted both internal and external testing to confirm this sequence of events before determining that there was no unreasonable risk to highway safety in the condition.
- Customers are given consistent and increasing notice of a developing problem, in the form of both vibration and/or noise. This allows drivers commensurate time to perceive the issue and recognize that something is wrong and respond by taking the vehicle to a qualified mechanic, as they would as their brakes lost their braking ability and moved towards failure. The reported separation incidents do not fit within the relevant trend analysis and instead reflect impact damage, a severe lug nut overtightening incident, and mechanic error.

a. **Causal or contributory factors for cracking:** The reduced radius in the R-area of the supplier's spare ring die reduced the fatigue strength. Environmental factors unrelated to the reduced radius could induce damage in the wheels, leading to unique failure sequences not related to the ring die shape issue.

b. **The failure mechanism for such cracking:** Kia's assessment of the failure mechanism has not changed since its PE04-030 submission dated June 4, 2004. See response to Request No. 13 (b).

c. **The failure mode for such cracking:** Kia's assessment of the failure mode has not changed since its PE04-030 submission dated June 4, 2004. See response to Request No. 13 (c).

d. **Possible risk motor vehicle safety posed by such cracking:** The following comments supplement Kia's prior evaluation contained in response 13(d) to your PE.

This steel wheel investigation provides a unique case. As compared to prior and current steel wheel investigations, the testing and consumer information about the Rio steel wheels are consistent in showing a long period of progressive and increasing information coming from the wheels to the customer to identify that maintenance and/or repair was required for those wheels. This is the same experience that a customer has as their brakes wear down, with sound, vibration and performance information all being received to let the customer know that maintenance and/or repair is required. Although customers can and do have different levels of response and reaction time to such information about their brakes, as they did about the wheels, they eventually respond to such information and obtained servicing. That is exactly what occurred with Kia owners in this case.

In fact, the relatively high number of customer complaints and warranty claims compared to other investigations demonstrates that this is not a matter of guesswork as to how the crack develops and functions, and the noise, vibration and performance messages it provides, as well as the timely responsiveness of customers to those inputs. That is, although Kia is not pleased with the quality issue which is present here, there is an extraordinarily high level of evidence from real world experience that Kia's analysis that this does not present an unreasonable risk to highway safety is correct.

In light of the information which Kia has learned from this investigation and its meeting with ODI, however, Kia continues to focus on the quality issues present and also continues to believe in the benefit of taking action to communicate with customers and dealers regarding this issue.

e. **The warnings received by the operator and the other persons both inside and outside the vehicle as to the presence and growth of such cracking:** Kia's assessment of the detailed and progressive information received by the customer as information and warning when wheel cracking occurs is consistent with its prior submission. Kia has adjusted its assessment to take into account the further supporting information it has derived from the new VOQ discussed below, and the review of other wheel cracking investigations, which establishes that the history of the Rio steel wheel cracking is unique in the slowness of the development of the issue and the degree to which customers are given continuous and increasing information of the need to obtain servicing.

f. **The VOQ reports included with this inquiry:** The VOQ reports are consistent with KMA's CA files and previously submitted field reports in establishing that consumers receive consistent, substantial feedback of the cracking due to noise and vibration. Kia has previously analyzed all but one of the VOQ's attached to your letter. The VOQ's previously addressed in response to Request No. 13 (f) of PE04-030 include: 8006477, 8023149, 10016604, 10021287, 10040164, 10053443 and 10058598.

- **VOQ No. 10087188; 08/04/04; (VIN: KNADC12316????)**

"While driving it felt like the vehicle was off balance. This occurred because the right front rim busted. This occurred twice two years ago because consumer overloaded the vehicle. The same rim busted against without the vehicle being overloaded."

The customer was given substantial warning (i.e. felt like vehicle was off balance) that something was wrong. Due to the lack of information with this VOQ, Kia has been unable to contact this person or review their repair records. However, based on all other information, we believe that the customer would also have heard noise and felt vibration in addition to feeling "off balance".

After the additional evaluation prompted by the instant EA letter, Kia believes more strongly that the testing, evaluation and consumer records are all consistent in showing the absence of a safety related defect which creates an unreasonable risk to highway safety. However, Kia recognizes the additional information which it has learned from the current investigation and it has a continuing and overriding interest in satisfying its customers and providing better service. It is therefore interested in quickly moving to conduct customer and dealer notifications consistent with its July 20th statements.

Sincerely yours,



Alfred Gloddeck
Sr. Manager—Corporate Affairs