



January 27, 2021

VIA EMAIL ONLY

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: NHTSA Engineering Analysis 20-003 – Response to Recall Request Letter (NEF-104aa)

Dear Dr. Ridella:

Tesla, Inc., is in receipt of your January 13, 2021, letter, wherein the National Highway Traffic Safety Administration (“NHTSA”) requests that the company conduct a recall and provide a remedy for the wear-out of the 8G eMMC NAND flash memory device embedded in the NVIDIA Tegra 3 processor that results in failure of the media control unit (“MCU”) in certain model year (“MY”) 2012 through 2018 Tesla Model S and MY 2016 through 2018 Tesla Model X vehicles (the “subject vehicles”). After carefully reviewing the agency’s tentative conclusions, and the information it has offered in support thereof, Tesla respectfully disagrees that the eMMC wear-out condition constitutes a defect in the subject vehicles. Nevertheless, as is explained in further detail below, in the spirit of cooperation and to administratively conclude this investigation, as well as inquiries pending in other markets, and to provide a better experience for the customer, the company will conduct a voluntary recall and provide a free hardware remedy in addition to the over-the-air (“OTA”) firmware updates we have already implemented.

NHTSA’s recall authority is limited to non-compliances with motor vehicle safety standards and defects that present an unreasonable risk to safety. See 49 U.S.C. § 30118(a). However, NHTSA’s tentative conclusion identifies certain safety impacts, without clear support for finding they have been caused by a defect. Further, Tesla disagrees with NHTSA’s tentative conclusion that these concerns, even if they do occur, are an unreasonable risk because drivers are still able to safely operate the vehicle.

While the Safety Act’s definition of “defect” may be a bit circular<sup>1</sup>, it is well-established that it does not require manufacturers to design vehicles and components that never fail. See *United States v. General Motors Corp. (Wheels)*, 518 F.2d 420, 435 (D.C. Cir. 1975). To that end, components and systems (even those that impact safety, e.g. brakes, lights, tires) are not deemed defective if they fail due to age and

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<sup>1</sup> See 49 U.S.C. § 30102 (a)(3) (A “defect” includes any defect in performance, construction, a component, or material of a motor vehicle or motor vehicle equipment.”).

wear. *Id.* at 436. If, on the other hand, a component or system is designed to function without replacement or repair for the life of the vehicle, then NHTSA may be able to make a prima facie case of defect simply by showing a significant number of failures in normal operation. *Id.* at 438. Here, however, the eMMC flash memory is not so designed – it is inherently subject to wear, has a finite life (as NHTSA itself acknowledges), and may need replacement during the useful life of the vehicle.

Tesla recognizes that even when a component is not designed to last the life of the vehicle, a defect may still be found if it wears prematurely. However, that is not the case here. During the Preliminary Evaluation phase of NHTSA's investigation, and as NHTSA acknowledged in its letter, Tesla presented the agency with evidence that the eMMC flash memory device is rated for 3,000 Program/Erase ("P/E") cycles, which is an industry standard. While the wear rate is heavily influenced by the active use of the center display system, even more so when the vehicle is in drive or charging, given a reasonable average daily use of 1.4 cycles, the expected life would be 5-6 years. NHTSA has not presented any evidence to suggest that this expected life is outside industry norms or that the eMMC flash memory device itself does not comport with that average lifetime estimate.

Instead, NHTSA has asserted that the component should last at least the useful life of the vehicle, essentially double its expected lifespan. Tesla has significant concerns with the impact of this tentative conclusion. First, it disregards the capabilities of the device and the then-existing state of the art. Second, electronic components are becoming increasingly more complex while, at the same time, the expected useful life of vehicles has grown substantially. It is economically, if not technologically, infeasible to expect that such components can or should be designed to last the vehicle's entire useful life. See *Wheels*, 518 F.2d at 436. To improve the experience, Tesla has implemented an alert to notify customers when the eMMC is nearing the end of its life and that service is necessary before performance is degraded.

There have been zero accidents or injuries associated with any of the conditions described if the eMMC fails. Tesla does not dispute that some of the consequences of eMMC wear-out may be related to safety, but disputes that every safety risk is caused by a defect and that every defect creates an unreasonable risk to safety, especially when the condition does not surprise the driver while driving and the vehicle can continue to be safely operated. In its letter, NHTSA cites as precedent a number of recalls conducted by manufacturers other than Tesla; however, in each of those cases, there was an underlying noncompliance<sup>2</sup> or defect,<sup>3</sup> unlike the case here. Nevertheless, to mitigate any potential risk (no matter

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<sup>2</sup> Tesla does not consider the noncompliance recalls particularly relevant to NHTSA's investigation. While the company agrees that the existence of a standard may be indicia of a system's relevance to safety, the subject vehicles complied with all such standards at the time of first delivery consistent with 49 U.S.C. §§ 30112(a)(1) and 30115(a). Moreover, the noncompliances in the list of recalls cited by NHTSA involved software errors, broken parts, or design flaws distinguishable from the wear-out condition present here.

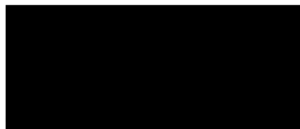
<sup>3</sup> The safety recalls cited by NHTSA identified defects that can be broadly categorized as follows: an identified software error (19V-603, 19V-540, 17V-132, 16V-839, 15V-366, 10V-514, 09V-158, 07V-563, 06V-494); inadequate contact or lost connections (19V-403, 18V-139, 04V-547, 04V-524); and manufacturing problems (15V-233). Only three of the cited recalls involved premature wear, although they are distinguishable in that they each pointed to damage or degradation outside of the expected life: 14V-294

how remote), Tesla released a series of over-the-air (OTA) firmware updates last year that addressed each of the consequences identified in NHTSA's letter and improved the expected life of the eMMC device. Because these updates did not address a safety defect, a recall filing for these OTA firmware updates would have been inappropriate. More so, over 88% of all affected vehicles have already installed the OTA firmware updates described. NHTSA's anachronistic regulations are unfit for situations where there is no safety defect, but nevertheless the manufacturer immediately can improve vehicle performance, including safety performance, without the cumbersome need for physical repair.

Having fully considered NHTSA's request, and in the interests of efficiently resolving this matter and providing a better experience for the customer, Tesla has decided to file the requested Part 573 report for the OTA firmware updates, even though we have not decided that a defect exists. In addition, while Tesla recently launched a warranty adjustment program to repair or replace the 8GB eMMC device, Tesla has decided to make that hardware repair part of the free recall remedy. As you know, parts constraints mean that we are planning to launch the hardware portion of the remedy program in phases, to be prioritized by each vehicle's currently available eMMC flash memory so that repairs are prioritized before failure occurs, which is unique to Tesla because our vehicles log and alert Tesla to the rate of wear for the eMMC. We also recognize that some customers will prefer to upgrade to the newer Intel car computer, rather than receive the remedy repair, because the newer car computer offers enhanced features and performance. To meet the preference of those customers, we have significantly reduced the price of the Intel upgrade and will make it available as an alternative customer-pay remedy. We expect to submit the requested Part 573 report through the recall portal by the end of this week.

Our customers' safety and satisfaction will always be Tesla's top priority. If you have any questions or wish to discuss either our response or forthcoming Part 573 report, please feel free to contact me at [aprescott@tesla.com](mailto:aprescott@tesla.com).

Sincerely,



Al Prescott  
Vice President, Legal

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(corrosion caused by water ingress); 06V-263 (vibration causing bulb to burn out prematurely); and 04V584 (hazard switch may degrade because of distortion and material transfer of certain relay contacts).