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June 14, 2024

Sophie Shulman
Acting Administrator
National Highway Traffic Safety Administration
West Building, Ground Floor, Rm. W12-140
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590
Via: www.regulations.gov

Re: Tesla's Comments in Response to Notice of Proposed Rulemaking (NPRM), 89 Fed. Reg. 26704 (April 15, 2024); Docket No. NHTSA-2024-0012,
Federal Motor Vehicle Safety Standards; FMVSS No. 305a Electric-Powered Vehicles: Electric Powertrain Integrity Global Technical Regulation No. 20, Incorporation by Reference.

Dear Acting Administrator Shulman:

Tesla, Inc. ("Tesla" or the "Company"), is pleased to submit written comments to the National Highway Traffic Safety Administration ("NHTSA" or the "Agency") in response to the Agency's April 15, 2024, "Proposed Rule on Federal Motor Vehicle Safety Standards; FMVSS No. 305a Electric-Powered Vehicles: Electric Powertrain Integrity Global Technical Regulation No. 20, Incorporation by Reference."

We would like to commend NHTSA for its proactive efforts in enhancing the safety of electric-powered vehicles through the proposed rulemaking for Federal Motor Vehicle Safety Standards (FMVSS) No. 305a. As the automotive industry continues to innovate and transition towards sustainable electric powertrains, it is crucial to ensure that safety standards keep pace with technological advancements. The comprehensive approach taken by NHTSA in addressing potential risks associated with electric powertrains underscores its commitment to public safety and the protection of vehicle occupants and emergency responders. By establishing stringent guidelines and performance criteria for electric-powered vehicles, NHTSA is not only fostering a safer driving environment, but also reinforcing consumer confidence in the adoption of electric vehicles. We applaud NHTSA's dedication to advancing vehicle safety standards and look forward to the positive impact these regulations will have on the industry and society.

I. Background

Tesla's mission is to accelerate the world's transition to sustainable energy. To accomplish its mission, Tesla designs, develops, manufactures, and sells high-performance fully electric vehicles and energy generation and storage systems, installs, and maintains such systems, and sells solar electricity.[1] To that end, Tesla is the world's leading manufacturer of fully electric vehicles ("EVs").[2] In the United States, the Company maintains primary research, development, and manufacturing facilities in Austin, Texas, Palo Alto and Fremont, California, and Sparks, Nevada. Tesla has been instrumental in reviving consumer interest in EVs with the introduction of Roadster in 2008, Model S in 2012, Model X in 2015, Model 3 in 2017, Model Y in 2020 and Cybertruck in 2023. Additionally, in December 2022, Tesla initiated delivery of its Tesla Semi Class 8, day cab truck.[3] With each model, we proved that modern EVs can deliver performance, range, technology, safety, and style, all in a completely emissions-free package.

Safety is our highest priority. We design our vehicles to ensure that an all-electric architecture and powertrain design will enhance passengers' safety in the event of a crash. We believe the unique combination of passive safety, active safety, and automated driver assistance is crucial for keeping not just Tesla drivers and passengers safe, but all drivers on the road. It's this notion that grounds every decision we make – from the design of our cars to the software we introduce, to the features we offer every Tesla owner. As a testament to our commitment to safety, Tesla vehicles since our first Model S introduction have received NCAP 5-star, Euro NCAP 5-star, Australasian NCAP 5-star, and IIHS Top Safety Pick+ ratings. In addition, we have been bestowed with top honors in the Euro NCAP Best-in-Class Cars. Tesla continues to improve vehicle safety through our fleet data collection and safety feature refinements. Finally, we design our vehicles to allow for continual improvements to the fleet via remote, over-the-air ("OTA") software updates. We use OTA updates to provide customers with safety and convenience features as quickly as we develop and validate them.

[1] See, Tesla, Impact Report Highlights 2023 (May 23, 2024) available at https://www.tesla.com/ns_videos/2023-tesla-impact-report-highlights.pdf

[2] See, ICCT, The Global Automaker Rating 2022: Who Is Leading the Transition to Electric Vehicles? (May 31, 2023) available at https://theicct.org/publication/the-global-automaker-rating-2022-may23/

[3] See, Tesla, Tesla Semi Delivery Event (Dec. 1, 2022) available at https://www.youtube.com/watch?v=LtOqU2o81iI; See generally, Tesla, Semi: The Future of Trucking available at https://www.tesla.com/semi

II. Comments

Tesla appreciates this opportunity to share our comments in response to the NPRM. Please see our comments in full below.

1. Mechanical Integrity Test and Mechanical Shock Test

Tesla does not believe this test will be representative of the full vehicle environment, especially if the storage battery system must be removed from the vehicle. Test conditions representing the full vehicle system (like GTR-20) and parameters must be accurately represented to fully appreciate and understand the process. For each battery mounting system, the point of contact varies significantly and thus defining a generic mounting system will not be truly representative of the full vehicle setups.

2. General Specifications Relating to Crash Testing

a. Low Energy Option for Capacitors

Tesla agrees this is a positive initiative from NHTSA and Tesla supports expanding the 0.2 Joules requirement for all high voltage components. Tesla's understanding is that if the electrical energy is below 0.2 Joules, then the system is determined to be below a safe energy limit, and there is no need to fully discharge all the capacitors; NHTSA correctly points out that discharging all capacitors are challenging in automotive systems.

b. Assessing Fire or Explosion in Vehicle Post-Crash Test

Tesla agrees with the proposal from NHTSA; however, we recommend that NHTSA provide additional guidance and an explicit procedure to evaluate this criterion within FMVSS No. 305a.

c. Assessing Post-Crash Voltage Measurements.

Tesla agrees with the rationale of extending the measurement times to be made between 10-60 seconds post impact to ensure that the systems are at static rest. Tesla requests that NHTSA reconsider the value of the static rollover test post-crash in line with GTR-20, given the current state of EV battery architecture versus older lead-acid batteries.

d. Electrolyte Spillage Versus Leakage

Tesla agrees with the proposed changes in verbiage from electrolyte spillage to electrolyte leakage. The 5-liter amount of electrolyte quantity to be assessed is not fully relevant to newer EV battery technologies. Physical characteristics of the coolant and/or electrolyte (manufacturer specific) can be used to discern between electrolyte leakage versus coolant leakage. Further, if there is a coolant leakage it will be evident from system parameters of the REESS based on the quantity of the leakage.

3. Warning Requirements for REESS Operations

a. Thermal Event Warning

Tesla recommends that the warnings be focused on the potential hazardous scenarios and not necessarily focused on a single cell thermal runaway. The proposed ignition methods related to single cell thermal runaway do not necessarily create a hazard. Instead, Tesla recommends that the 3-minute warning timing begin after the start of a propagating runaway event and not necessarily the initiation of a single cell thermal runaway.

Tesla has always designed its batteries in a way that minimizes the chance of propagating thermal runaway. Our battery packs are industry leading because they are designed to stop a cell runaway event from spreading to a fire. [4, 5.]

b. Warning in the Event of Operational Failure of REESS Vehicle Controls

Tesla supports including the requirements in FMVSS No. 305a as this applies to all REESS irrespective of crash conditions.

c. REESS Venting

Tesla agrees with the Agency that more research needs to be conducted to fully understand the scope and to appropriately define the venting gas parameters that would be considered a safety risk to vehicle occupants.

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[4] See, Tesla, Vehicle Safety Report available at https://www.tesla.com/VehicleSafetyReport

[5] See, Tesla, Impact Report 2023 (May 23, 2024) available at https://www.tesla.com/ns_videos/2023-tesla-impact-report.pdf

4. Vehicle Controls for Safe REESS Operation

a. Overcharge Protection

Tesla agrees with the test procedure and does not have any concerns with the proposed methodology, which aligns with GTR-20 requirements.

b. Over-Discharge Protection

Tesla agrees with the test procedure and does not have any concerns with the proposed methodology, which aligns with GTR-20 requirements.

c. Overcurrent Protection

Tesla agrees with the test procedure and does not have any concerns with the proposed methodology, which aligns with GTR-20 requirements.

d. Over-Temperature Protection

Tesla understands the proposed methodology of generating temperature profiles using a chassis dynamometer but believes it would be difficult to characterize real-world driving temperature profiles fully and accurately due to variable drive states. Thus, we propose having an option of a component level testing (instead of a vehicle level) of the REESS systems that can replicate real-world driving temperatures.

e. External Short-Circuit Protection

Tesla agrees with the test procedure and does not have any concerns with the proposed methodology, which aligns with GTR-20 requirements.

f. Low-Temperature Protection

Tesla agrees with the inclusion of documentation for the low-temperature protection, per GTR-20 requirements, in FMVSS No. 305a.

5. Mitigating Risk of Thermal Propagation Due to Internal Short Within a Single Cell in the REESS

a. GTR No. 20 Phase 1 Requirements

Tesla supports the documentation process as proposed in the Phase I requirements of GTR-20 and suggests that NHTSA extend this process to accommodate Phase II as well.

b. GTR No. 20 Phase 2 Test Procedure

i. Thermal Event Warning

Tesla feels that a single standard test for a thermal event warning is not appropriate across all battery packs and cell types. Successful initiation methods will differ across cell types and the response to thermal runaway initiation will vary. The manufacturer of each system should be involved in determining a test that results in propagating thermal runaway and documenting that their specific warning system is successful.

A heater can be a successful method of initiating a cell runaway, but the specific parameters required will vary with cell and battery pack design.

ii. Warning in the Event of Operational Failure of REESS Vehicle Controls

Tesla supports including the requirements in the general section under FMVSS No. 305a as this applies to all REESS irrespective of crash conditions.

6. GTR No. 20 Requirements

a. Vehicle Washing Test

Tesla supports NHTSA's inclusion of requirements to wash the underside of the REESS system as per the proposed methodology. Tesla recommends to not include saline water (but freshwater per GTR-20) in the washing test.

b. Driving Through Standing Water Test

Tesla agrees with the test methodology of changing GTR-20's maximum time outside the wade pool from 10 minutes to 5 minutes. We also suggest keeping the long rectangular pool for this test as it is clearer to define driving and test evaluation methodologies.

c. NHTSA's Consideration of Submersions

Tesla recommends that NHTSA conduct additional research on defining the parameters for salinity, as there is very little conclusive research on these limits currently defined in the literature.

7. Emergency Response Information to Assist First and Second Responders

Tesla agrees with the proposed list of documentation for Emergency Response Information to assist first and second responders.

8. Placing the Emergency Response Information and Documentation Requirements in a Regulation Rather than in FMVSS No. 305a

Tesla supports including the requirements in the general section under FMVSS No. 305a as this applies to all REESS irrespective of crash conditions.

III. Conclusion

Tesla appreciates this opportunity to share our comments in response to the NPRM and would welcome the opportunity to further discuss battery safety standards and testing procedures to help assist towards optimized solutions.

Tesla applauds and supports the Agency's efforts to update the existing FMVSS No. 305 leading to improved safety. Overall, Tesla believes that NHTSA's proposals and descriptions of potential updates are sound. However, as discussed in more detail above, Tesla believes the Agency's proposal can be revised in a manner that would make a major impact on its clarity, effectiveness, and practicality. Additionally, Tesla believes that additional research and analysis should be considered regarding certain aspects of the FMVSS No. 305a updates before they are implemented as proposed.

If you have any questions or comments on our submission, please contact me at abelwadi@tesla.com.
Sincerely,

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