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July 12, 2012

David Strickland  
Administrator  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue, SE  
Washington, DC 20590

Dear Mr. Strickland:

In February 2011, the National Highway Traffic Safety Administration (NHTSA) released its Technical Assessment of Toyota Electronic Throttle Control Systems (ETCS) containing its conclusions on the Unintended Acceleration (UA) of Toyota vehicles.<sup>1</sup> Through a request by NHTSA, National Aeronautics and Space Administration (NASA) engineers conducted tests on Toyota vehicles, focusing on the vulnerabilities in the Toyota ETCS.<sup>2</sup>

Recently, whistleblowers have provided my office with information, supported by documentation, which raises concerns that the scope of the NHTSA and NASA investigations may have been too narrow. The NASA report even advised, “Because proof that the ETCS[] caused the reported UAs was not found does not mean it could not occur.”<sup>3</sup>

The phenomenon known as “tin whiskers,” within accelerator pedal assembly and possibly other vehicle electronics, may be a cause for concern. The NASA report defines “tin whiskers” as “electronically conductive, crystalline structures of tin that sometimes grow from surfaces where tin (especially electroplated tin) is used as a final finish.”<sup>4</sup> Furthermore, the report detailed a notable finding:

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<sup>1</sup> National Highway Traffic Safety Administration Report, “Technical Assessment of Toyota Electronic Throttle Control Systems,” February 8, 2011 (April 15, 2011 revision), *available at* [http://www.nhtsa.gov/staticfiles/nvs/pdf/NHTSA-UA\\_report.pdf](http://www.nhtsa.gov/staticfiles/nvs/pdf/NHTSA-UA_report.pdf).

<sup>2</sup> National Aeronautics and Space Administration Report, “Technical Support to the National Highway Traffic Safety Administration on the Reported Toyota Motor Corporation Unintended Acceleration Investigation,” January 18, 2011, *available at* [http://www.nhtsa.gov/staticfiles/nvs/pdf/NASA-UA\\_report.pdf](http://www.nhtsa.gov/staticfiles/nvs/pdf/NASA-UA_report.pdf).

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

Destructive physical analysis of this pedal assembly found tin whiskers, one of which had formed the resistive partial short circuit between the pedal signal outputs. A second tin whisker of similar length was also found in this pedal assembly that had not caused an electrical short. If a resistive short between the potentiometer accelerator pedal signal outputs exists, the system may be vulnerable to a specific second fault condition that could theoretically lead to UA.<sup>5</sup>

In a separate UA vehicle study of a 2003 Toyota Camry conducted last fall, NASA expert Henning Leidecker examined an accelerator pedal assembly from a malfunctioning vehicle in Albuquerque, finding two “tin whiskers” inside. This finding contributed to his conclusion that, “[a]lthough the vehicle would operate, we would not consider it to be drivable.”<sup>6</sup>

In its February 2011 UA report, NHTSA appears to have summarized the finding of the presence of “tin whiskers”:

NASA also identified certain apparently rare conditions that could lead to a fail safe mode that may involve small, irregular throttle openings in vehicles equipped with potentiometer pedal sensors that experience a particular kind of resistive short circuit. However, in these very rare events, simply releasing the accelerator pedal closes the throttle and the brakes are fully operational. NHTSA does not find these minor, controllable conditions to constitute significant safety risks.<sup>7</sup>

In an April 12, 2012, Notice of Proposed Rulemaking (NPRM), NHTSA proposed new federal motor vehicle safety standards related to accelerator control systems, including stricter testing requirements and a provision for a brake-throttle override system:

First, we propose to amend the Standard to address more fully the failure modes of electronic throttle control (ETC) systems and also to include test procedures for hybrid vehicles and certain other vehicles. This part of today’s proposal is related to an NPRM that NHTSA published in 2002. Second, we propose to add a new provision for a brake-throttle override (BTO) system, which would require that input to the brake pedal in a vehicle must have the capability of overriding input to the accelerator pedal.<sup>8</sup>

This is a serious issue. From 2000 to 2010, NASA concluded there were 9,698 identified UA customer complaints and NHTSA concedes that this is likely only a fraction of the actual

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<sup>5</sup> *Id.* (internal citations omitted).

<sup>6</sup> Sharon Silke Carty, “Toyota’s Sudden Acceleration Problem May Have Been Triggered By Tin Whiskers,” *HuffingtonPost*, January 21, 2012, *available at* [http://www.huffingtonpost.com/2012/01/21/toyota-sudden-acceleration-tin-whiskers\\_n\\_1221076.html](http://www.huffingtonpost.com/2012/01/21/toyota-sudden-acceleration-tin-whiskers_n_1221076.html).

<sup>7</sup> National Highway Traffic Safety Administration Report, “Technical Assessment of Toyota Electronic Throttle Control Systems,” February 2011, *available at* [http://www.nhtsa.gov/staticfiles/nvs/pdf/NHTSA-UA\\_report.pdf](http://www.nhtsa.gov/staticfiles/nvs/pdf/NHTSA-UA_report.pdf).

<sup>8</sup> National Highway Traffic Safety Administration, Notice of Proposed Rulemaking, Docket No. NHTSA-2012-0038, *available at* [http://www.nhtsa.gov/staticfiles/rulemaking/pdf/FMVSS\\_124\\_BTO\\_NPRM\\_Final.pdf](http://www.nhtsa.gov/staticfiles/rulemaking/pdf/FMVSS_124_BTO_NPRM_Final.pdf).

incidents of UA: “NHTSA assumes that not all incidents are reported and that, accordingly, each complaint represents a greater number of unreported real-world failures.”<sup>9</sup>

Based on these findings, the information provided to my office, and the examples of incidents described in the NPRM, key questions about the cause of unintended acceleration remain unanswered. In order to gain further insight into NHTSA’s investigation of this problem, please answer the following questions and provide in electronic format, if possible, all related documents no later than July 26, 2012:

1. Why did NHTSA rely on NASA engineers to investigate UA in vehicles?
2. How often does NHTSA utilize other agencies to perform tests and investigations and why?
3. Do NHTSA personnel lack the sufficient expertise to conduct such investigations and why?
4. Did NHTSA provide direction to the NASA investigation team? Please describe and provide documentation for any direction given, including but not limited to: initial theories for investigation, required completion timelines, any testing methodologies, identified units for test, and any hardware provided for analysis.
5. What factors contributed to the April 12, 2012 NPRM?
6. What is the NHTSA position on “tin whiskers” as a potential cause of UA? What is the basis of this position? Please provide all information related to “tin whiskers” arising from testing.
7. Of the 9,698 suspected UA complaints, how many vehicles were inspected for the presence of “tin whiskers?” What, if any, other components of the ETCS were inspected for the presence of “tin whiskers”?
8. Last year, NHTSA asked the National Academy of Sciences (NAS) to study broader questions related to UA. Did the NAS evaluate the impact of “tin whiskers” on UA? Please provide the entire report, findings, and suggestions.

Thank you for your cooperation and attention in this matter. If you have any questions, please do not hesitate to contact Chris Lucas or Rob Donovan for the Committee on the Judiciary at (202) 224-5225.

Sincerely,



Charles E. Grassley  
Ranking Member  
Committee on the Judiciary

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<sup>9</sup> National Highway Traffic Safety Administration Report, “Technical Assessment of Toyota Electronic Throttle Control Systems,” February 2011, *available at* [http://www.nhtsa.gov/staticfiles/nvs/pdf/NHTSA-UA\\_report.pdf](http://www.nhtsa.gov/staticfiles/nvs/pdf/NHTSA-UA_report.pdf).