

MEMORANDUM

**Subject:** Unwanted Acceleration Investigations on Toyota Vehicles

**Abstract:** Over the past five years, NHTSA investigations into Toyota products for allegations of safety-related defects have been increasingly focused on reports of unwanted acceleration. Following the TREAD Act requirements and increasing complaint activity on internet user groups, NHTSA has evaluated petitions from the public and opened several inquiries. In many of the cases, pedal misapplication/driver error has been the cause. However, in some of the cases, unsecured floor mats have been found to entrap the accelerator pedal. Also, recently, there has been at least one report of a plastic floor cover in the early-production 2004 Sienna potentially interfering with the accelerator pedal.

Therefore, my request is that TMC evaluate the feasibility of using the Electronic Throttle Control (ETC) system to identify these pedal entrapments (by identifying dual-pedal application by the driver) and reduce throttle opening/engine power. I believe pedal entrapment events are distinguishable from normal driving events because both pedals may be simultaneously applied by the driver during the event (WOT and brake "on") for a prolonged period, and should be easily detectable by the engine ECU.

**Overview:** The need for such a feasibility study is evidenced by the increasing scrutiny by NHTSA's Office of Defects Investigation (ODI) on Toyota products. Beginning in 2004, NHTSA granted a petition from a member of the public to investigate the Camry for reports of unwanted acceleration. ODI believed that an investigation was warranted due to reports of unexpected surge/acceleration for brief periods and sought to learn more about Toyota's ETC system. This investigation was closed after a lengthy investigation (and good TMC support), but NHTSA later opened formal investigations into the ES350, Tacoma, and later, the Sienna.

In the ES350 investigation, NHTSA demanded that Toyota conduct a recall on the all-weather floor mats. On the Sienna, they are now demanding that Toyota recall the "floor carpet cover," an interior trim panel located next to the accelerator pedal that, if not clipped in place, can interfere with the accelerator pedal causing a near wide open throttle (WOT) event. The Tacoma petition was denied, after a detailed and prolonged investigation (and excellent TMC and TMS support), but NHTSA strongly considered "unsecured floor mats" as the root cause. In lieu of an investigation into the Tacoma, they opened an investigation into MacNeil Corporation, a manufacturer of rubber floor mats. As part of this investigation into MacNeil, NHTSA plans on measuring the accelerator pedal position relative to the vehicle floor on as many vehicles as they can procure. This is important, as this activity could result in findings that a manufacturer's vehicle could stand out from peers based on the accelerator pedal design.

In meetings with NHTSA, TMA was told that some German manufacturers utilize the ETC system to limit throttle opening if the brake pedal is applied for a certain time period. For example, if there is a large throttle input, and the brake pedal is simultaneously being applied, the ETC system apparently recognizes this and closes the throttle, enters a "limp home" mode, and illuminates a "Check Engine" lamp. NHTSA ODI is very enthusiastic about this feature, as it believes it could eliminate reports of unwanted acceleration due to pedal entrapment. It should be noted that this feature would not eliminate reports of unwanted acceleration due to pedal misapplication, where the driver applies the accelerator instead of the brake pedal.