

**DEPARTMENT OF TRANSPORTATION**  
**National Highway Traffic Safety Administration**  
**Denial of Motor Vehicle Defect Petition**

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation

**ACTION:** Denial of motor vehicle defect petition.

**SUMMARY:** This document denies a March 2, 2010 petition from Fred and Susan Maynard of Williamsburg, Virginia, requesting that the agency open an investigation into the “air bag systems failure” that they experienced in their model year (MY) 2008 Toyota Corolla. After reviewing the petition and other information, NHTSA has concluded that further investigation of MY 2008 Toyota Corolla vehicles is unlikely to result in a determination that a safety-related defect exists. The agency accordingly denies the petition.

**FOR FURTHER INFORMATION CONTACT:** Mr. Michael Lee, Vehicle Integrity Division, Office of Defects Investigation, NHTSA, 1200 New Jersey Avenue, SE, Washington, DC 20590. Telephone: (202) 366-5236.

**SUPPLEMENTARY INFORMATION:**

**Alleged Problem**

The petitioners allege that the frontal air bags in their Toyota Corolla failed to deploy during a crash into a deer, while the vehicle was traveling at 55 mph. The petitioners believe the vehicle is defective because the air bags did not deploy during the crash. As described by the petitioners, neither the driver nor the front passenger sustained a significant injury in the crash.

It appears that the deer impacted the front left area of the vehicle, causing the hood and left front fender to be displaced rearward.<sup>1</sup> This resulted in deformation to the soft structural material (sheet metal) above the vehicle sub-frame.

### **Air Bag Deployments**

There are a number of important aspects to vehicle design. One is the vehicle structure, including crush zones. Another is the vehicle's air bag system, which by design discriminates between crashes that warrant air bag deployment and those that do not. To do this, current air bag systems sense vehicle deceleration, defined as the change in vehicle speed over a given period of time, then through the use of a microprocessor makes a careful assessment of the deceleration.<sup>2</sup> Overall, the objective of the air bag system is to prevent injuries and deaths in crashes. In a minor crash, an air bag deployment may not be warranted, and in fact, may present an additional hazard to the occupants. Therefore, the system may not initiate air bag deployments in minor crashes.

Due to the very low mass of a deer relative to a Toyota Corolla and the fact that the impact occurred above the vehicle's sub-frame, it appears that in this case, the deer impact did not slow or decelerate the vehicle sufficiently to deploy the air bags. Moreover, neither the driver nor the front passenger was seriously injured. The level of injury reported in this crash is not indicative of the type of crash in which air bag deployment is expected.

---

<sup>1</sup> This is based on an assessment of the vehicle damage shown in a photograph provided by the petitioners.

<sup>2</sup> For each model of light vehicle, the decision of whether or not to deploy the front air bags is based on two deceleration thresholds; a lower threshold below which the air bags must not deploy, and a slightly higher threshold above which the air bags must deploy. This results in a narrow range of deceleration between the lower and upper thresholds where the air bags, by design, may or may not deploy. This range is carefully chosen by the vehicle manufacturer so as to meet all regulatory requirements as well as minimize occupant hazard due to air bag deployment.

## **Subject Vehicle Complaints**

Aside from the petitioners' complaint, the Office of Defects Investigation's (ODI) consumer complaint database contains a handful of other complaints of air bag non-deployment for the subject vehicles. As of March 31, 2011, out of a population of 170,356 vehicles<sup>3</sup>, NHTSA received 9 consumer complaints (including the petitioners' complaint) of air bag non-deployment in crashes involving MY 2008 Toyota Corollas. This translates to a rate of 5.3 reported non-deployments for every 100,000 vehicles. Eight of those were frontal crashes. ODI reviewed and analyzed the 8 crashes. This included an evaluation of the reported travel speed, object impacted, vehicle damage, level of occupant injury, and any other available information that would assist in assessing whether the air bags should have deployed. ODI's review did not uncover any defect trend of non-deployment of the subject vehicles' frontal air bags in moderate to severe frontal crashes.

ODI also analyzed Early Warning Reporting (EWR) data. Manufacturers are required to provide the agency with quarterly submissions of EWR data, which includes reports on incidents involving death(s) or injury(ies) identified in a claim or notice alleging the death or injury was caused by a possible defect in the vehicle. As of March 31, 2011, ODI received one injury report on a subject vehicle in Toyota's EWR data. This report states that the frontal air bags did not deploy during a pole impact. The report also indicates that the passenger compartment was not deformed and the occupant injuries were minor in nature. Based on the available information, while NHTSA has not reached a definitive conclusion, this does not appear to be the type of crash that necessarily warrants air bag deployment.

---

<sup>3</sup> From NHTSA Early Warning Reporting data: number of vehicles sold in the U.S.

## **Peer Vehicle Complaints**

The Toyota Corolla is not the only vehicle that is the subject of allegations regarding air bag non-deployments. The ODI database contains many reports alleging air bag non-deployment in other compact vehicles. ODI reviewed and analyzed consumer complaints of air bag non-deployment in comparable MY 2008 compact vehicles: the Chevrolet Cobalt, Ford Focus, Honda Civic, and Hyundai Elantra vehicles. In doing so, we were cognizant that historically there have been assertions that in specific crashes an air bag should have deployed, which were not always well-founded, or based on any technical analysis. There were 5 reports of non-deployment in a population of 176,471<sup>4</sup> Chevrolet Cobalt vehicles, translating to a rate of 2.8 non-deployments for every 100,000 vehicles. There were 6 reports of non-deployment in a population of 180,724 Ford Focus vehicles, translating to a rate of 3.3 non-deployments for every 100,000 vehicles. There were 6 reports of non-deployment in a population of 355,611 Honda Civic vehicles, translating to a rate of 1.7 non-deployments for every 100,000 vehicles. There were 6 reports of non-deployment in a population of 110,355 Hyundai Elantra vehicles, translating to a rate of 5.4 non-deployments for every 100,000 vehicles. Thus, air bag non-deployment complaints for the MY 2008 Toyota Corolla are not substantive when compared against peer vehicles and do not indicate a significant trend of non-deployment.

## **Crash Data**

NHTSA's review of crash data indicates that the air bag in the MY 2008 Toyota Corolla generally deploys in moderate, severe, and fatal crashes.

---

<sup>4</sup> All vehicle population counts in this section are taken from NHTSA Early Warning Reporting data: number of vehicles sold in the U.S.

*FARS*

NHTSA's Fatality Analysis Reporting System (FARS) tracks all fatal crashes involving motor vehicles in the United States. An analysis of fatal crashes of 4-door compact vehicles, where the vehicle did not roll over, and the occupants wore their seat belts, generally indicates that air bags in MY 2008 Toyota Corollas deploy in fatal crashes. Specifically, ODI reviewed fatalities of belted drivers in the MY 2008 Toyota Corolla, Ford Focus, Honda Civic, Chevrolet Cobalt, and Hyundai Elantra. Among these vehicles, the Corolla had the least number of fatal crashes when compared against other compact vehicles. The FARS database contains one report of a driver fatality in which the driver air bag did not deploy in each of a MY 2008 Corolla, Civic, and Focus. The Elantra and Cobalt reported no driver fatalities in situations where the air bag did not deploy. However, these two vehicles have the smallest populations among the peer compact vehicles compared.

*NASS*

NHTSA's National Automotive Sampling System (NASS) has records of a sampling of crashes and an analysis that may include, among other things, a computation of the change in velocity of the vehicle during the crash impact. A review of this data shows no trend of non-deployment of the frontal air bags in MY 2008 Toyota Corolla vehicles. The NASS records contain 26 reports on the subject vehicles. Of the 26 cases, 15 were involved in frontal impact crashes. The remaining cases were corner, side, or rear impact crashes. Of the 15 frontal crashes, the frontal air bags deployed in 9 crashes, did not deploy in 5, and in one crash, information on air bag deployment was not available. In the 5 cases of non-deployment, the

change in velocity<sup>5</sup> did not appear to be great enough to deploy the air bag, and there were no known moderate or serious injuries.<sup>6</sup>

## Crash Testing

NHTSA's crash tests of the subject vehicles resulted in air bag deployment in all of the tests.

### *FMVSS 208*

All new passenger cars and lights trucks must comply with Federal Motor Vehicle Safety Standard (FMVSS) 208, "Occupant Crash Protection." 49 C.F.R. § 571.208. This standard specifies minimum occupant protection performance levels for the restraint systems in vehicles. In 2005, NHTSA conducted FMVSS 208 compliance tests on five MY 2005 Toyota Corolla vehicles, which are of the same generation as MY 2008 Corolla vehicles, and contain the same air bag system design.<sup>7</sup> These were full frontal crash tests conducted with test vehicles carrying unbelted test dummies. The vehicles impacted a fixed barrier at 25 mph. The frontal air bags deployed in a similar time and in a similar way in all five tests.<sup>8</sup>

---

<sup>5</sup> In the NASS database, change in velocity is calculated using an algorithm that takes into account vehicle crush measurements, weights, vehicle stiffness and other parameters. If crush and/or overlapping vehicle damage prevents accurate inputs to the automated program, change in velocity is estimated based on collision deformation classification (CDC) inputs into the algorithm. In cases where no change in velocity figure was available in NASS, NHTSA based its analysis on a visual inspection of photographs of the vehicle.

<sup>6</sup> Injuries in vehicle crashes are commonly characterized on the Abbreviated Injury Scale (AIS). For example, an "AIS 1" injury is specified as a minor injury, "AIS 2" as a moderate injury, "AIS 3" as a serious injury, etc.

<sup>7</sup> For purposes of evaluating occupant protection, the results of crash tests of MY 2005-2008 Toyota Corolla vehicles are representative for any included model year Corolla.

<sup>8</sup> FMVSS 208 uses instrumented test dummies and calculates the values of certain injury criteria. The injury criteria NHTSA measures for the upper body include "Head Injury Criterion" ("HIC"), chest acceleration, chest deflection, and several neck related performance requirements. In the first test of the MY 2005 Corolla by NHTSA, there were test procedural issues that raised issues whether certain MY 2005 Corollas manufactured at a specific assembly plant in Japan might have been in marginal compliance with FMVSS 208. However, after the test procedural issues were resolved, all four subsequent test vehicles complied with all FMVSS 208 requirements.

## *NCAP*

NHTSA conducts the frontal New Car Assessment Program (NCAP) to provide consumers with information on the crash performance of vehicles. The test dummies in NCAP tests are restrained with seat belts and the vehicles crash into a barrier at 35 mph. There are no specific criteria which must be met in connection with NCAP tests. Rather, vehicles are given a safety rating of up to 5 stars in a frontal crash, side crash, and rollover. The driver's side and passenger's side are evaluated separately in each of those crashes. In a frontal crash, the MY 2005-2008 Toyota Corolla received 5-star safety ratings on both the driver's and passenger's side, which is the highest rating given for frontal impact crashes.

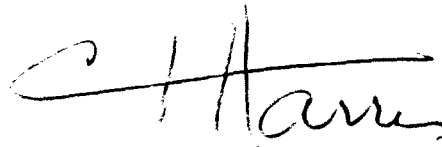
## **Conclusion**

Based on the information available at the present time, NHTSA does not believe that a safety-related defect currently exists for air bag non-deployment in the model year 2008 Toyota Corolla vehicles. Therefore, in view of the need to allocate and prioritize NHTSA's limited resources to best accomplish the agency's safety mission, the petition is denied. However, the agency will continue to monitor this event and will take further action if warranted by changing future circumstances.

Authority: 49 U.S.C. 30162(d); delegations of authority at CFR 1.50 and 501.8.

Issued on:

**AUG 12** 2011



---

Claude H. Harris  
Acting Associate Administrator for Enforcement

Billing Code: 4910-59-P