



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: PE 14-010
Date Opened: 04/15/2014
Investigator: Kareem Habib
Approver: Frank Borris
Subject: Active Safety System Malfunction
Date Closed: 11/21/2014
Reviewer: Jeff Quandt

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: General Motors LLC
Products: MY 2014 Chevrolet Impala
Population: 105,765

Problem Description: Consumers allege incidents of inappropriate autonomous braking while driving, resulting in unexpected sudden and rapid deceleration in traffic.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	0	0	0
Crashes/Fires:	0	0	0
Injury Incidents:	0	0	0
Fatality Incidents:	0	0	0
Other*:	1	1	2

*Description of Other: Crash reports related to inadvertent actuation of the electric park brake switch.

ACTION / SUMMARY INFORMATION

Action: This preliminary evaluation is closed.

Summary:

On April 15, 2014, the Office of Defects Investigations (ODI) opened Preliminary Evaluation PE14-010 based on two complaints alleging incidents of sudden/severe uncommanded braking resulting in rear impact collisions in model year (MY) 2014 Chevrolet Impala vehicles. ODI analyzed all complaints related to allegations of unwanted brake activations while driving that were provided by GM or submitted to ODI from consumers and has not identified any additional incidents involving sudden, extended (greater than 1 second) autonomous braking. The two crash complaints that were the basis of PE14-010 involved rental vehicles equipped with an Electric Park Brake (EPB) system. Neither vehicle was equipped with Full Speed Range Adaptive Cruise Control (FSRACC) or Forward Collision Alert (FCA) systems.

According to GM, brake lights will be illuminated if the service brakes are applied or the EPB system is activated while the vehicle is moving (dynamic EPB brake apply). In a dynamic EPB brake apply, the Electric Brake Control Module (EBCM) initiates a controlled deceleration while activating a chime and a telltale light. If the service brake is applied at any time during dynamic EPB brake apply, the system provides a substantially greater deceleration. Witness statements and analysis of crash data from the two incidents are consistent with inadvertent dynamic EPB brake applications. Both reports alleged beeping noise immediately before the accidents and one pre-crash data report shows a moderate initial vehicle deceleration followed by an increase in deceleration to approximately 0.6g just prior to the vehicle stopping and being struck from the rear.

During this investigation, General Motors LLC (GM) inspected the two crash incident vehicles and examined each of the EPB switches to assess potential mechanical and electrical fault conditions. The testing and part examination did not find any evidence of mechanical or electrical failure of the EPB switches and GM did not identify any faults in the subject components or systems that could have caused or contributed to autonomous brake applications in the

incident vehicles. According to GM, the evidence indicates the events were caused by inadvertent driver actuation of the EPB switch.

Additionally, during this investigation, GM identified a defect condition in the EPB software in approximately 132,921 model year (MY) 2014 through 2015 Chevrolet Impala and MY 2013 through 2015 Cadillac XTS vehicles (Recall No. 14V-541) that could result in failure of the EPB to release after vehicle start-up. In this condition, the electronic parking brake piston actuation arm may not fully retract when the driver disengages the EPB, which may cause the brake pads to stay partially engaged with the rotor. According to GM, the parking brake indicator may not illuminate when the EPB is engaged and the driver may experience poor vehicle acceleration, undesired deceleration during idle coast-down, excessive brake heat, and premature wear to some brake components. If the vehicle is operated for an extended period of time in this condition, there is a potential for the rear brakes to generate significant heat, smoke, and sparks. GM and its supplier, Mando Pyeongtaek, upgraded the EPB software to address brake drag conditions and issued a recall bulletin on September 4, 2014 instructing dealers to reprogram the electronic parking brake control module on all affected vehicles.

This preliminary evaluation is closed. The closing of this investigation does not constitute a finding that a safety-related defect does not exist. For additional information regarding this investigation, see Attachment A to this closing resume.

Attachment A

PE14-010

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ODI analyzed all complaints related to allegations of unwanted brake activations while driving that were provided by GM or submitted to ODI from consumers. In total, there were twenty (20) unique reports that alleged either undesired momentary brake interventions or excessive brake drag conditions resulting from the rear brakes partial engagement with the rotors. Eleven (11) reports involved an Electric Park Brake (EPB) drag condition causing the vehicle not to move when trying to accelerate, undesired deceleration during idle coast-down and excessive brake heat. Reports alleging smoke appear to be related to rear brake components premature wear and damage resulting from excessive heat. According to GM, there is a potential for the rear brakes to generate significant heat, smoke, and sparks if the vehicle is operated for an extended period of time while the rear brake pads are partially engaged. Complaints alleging open flames are inconsistent with an EPB malfunction condition.

Nine (9) reports involved nuisance incidents in vehicles equipped with active safety technologies such as Full Speed Range Adaptive Cruise Control (FSRACC) or Forward Collision Alert (FCA). All 9 incidents reported false forward sensing surveillance resulting in either light momentary decelerations or driver perception of braking events resulting from cruise control automatic disengagements around certain bridges. According to GM, certain active safety calibrations may report some objects such as overpasses as moving or objects in the adjacent lanes as in-path resulting in the cruise control dropping out or momentary light deceleration events. Five (5) incident reports associated with vehicles equipped with only FCA systems are consistent with cruise control dropouts due to FCA false activations. All five drivers perceived vehicle deceleration resulting from cruise control automatic disengagements as braking events.

Additionally, ODI evaluated four (4) allegations of unwanted braking in vehicles equipped with Full Speed Range Adaptive Cruise Control (FSRACC). All four (4) incidents resulted in momentary light deceleration events and the driver in one report was able to override the unexpected braking incident by applying the accelerator pedal. Vehicle Global Diagnostic Systems (GDS) and active safety EDR downloads indicated no evidence of system malfunction. FSRACC brake interventions related to technology limitations in the Long Range Radar (LRR) sensor typically last 500 milliseconds (ms), which are long enough to be perceptible to the driver but do not result in significant changes in vehicle speed.

The condition that is causing the majority of unwanted sudden braking incidents occurs in vehicles equipped with FSRACC for an extremely brief duration with maximum target deceleration limited to 0.3g and allows the driver to override any autonomous braking activation through steering, braking or acceleration which will cancel any autonomous braking. This preliminary evaluation is closed.

The following VOQ numbers are associated with the issues discussed in this closing resume:

10630218, 10622353, 10615854, 10610041, 10593681, 10592222, 10585185, 10584485,
10574799