



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: PE 13-003
Date Opened: 02/21/2013
Investigator: Kareem Habib
Approver: Frank Borris
Subject: Electronic Throttle Body Malfunction

Date Closed: 02/28/2014
Reviewer: Jeff Quandt

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: Ford Motor Company
Products: MY 2009-2013 Escape/Mariner/Fusion/Milan w/2.5L/3.0L engines
Population: 1,593,452 (Estimated)

Problem Description: Electronic throttle body failure may result in sudden reduction of engine power while driving.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	1,147	10,999	11960**
Crashes/Fires:	0	0	0
Injury Incidents:	0	1	1
Fatality Incidents:	0	0	0
Other*:	4	8	11**

*Description of Other: Low speed minor impacts. See attached for details.

** Total eliminates duplicates received by ODI and manufacturer.

ACTION / SUMMARY INFORMATION

Action: This Preliminary Evaluation is closed.

Summary:

On February 21, 2013, the Office of Defects Investigations (ODI) opened Preliminary Evaluation PE13-003 to investigate allegations of electronic throttle body (ETB) failures resulting in sudden reduction of engine power in model year (MY) 2009-2013 Ford Escape, Fusion, Mariner and Milan vehicles. During this investigation, Ford identified a condition in subject vehicles equipped with 2.5L and 3.0L engines that may result in a sudden reduction of engine power. According to Ford, the ETB internal motor contacts may develop a high resistance material buildup condition on the commutator, resulting in intermittent electrical connectivity and reduced engine power. When this condition occurs, the Malfunction Indicator Lamp (MIL) or Wrench light will illuminate and the vehicle may enter a limited limp home mode. Ford's trade name for the feature is Failure Mode Effects Management (FMEM) mode. In this mode, engine power and vehicle speed are reduced, while full function of the power steering, power braking, lighting, and climate control systems are maintained.

ODI's complaint analysis indicate that the predominant failure mode involved reduced motive power associated with the limited limp home mode with engine speeds limited to approximately 900 RPM. Analysis of warranty claims provided by Ford identified 59,807 claims related to ETB replacements and approximately 50 percent of claims are associated with diagnostic trouble codes (DTC) P2111, "Throttle Body Stuck Open", and P2112, "Throttle Body Stuck Closed". Ford described several factors where the ETB motor may fail resulting in DTCs P2111 or P2112 but the failure is not an existing stuck open or closed ETB valve position. According to Ford, the ETB control strategy provides the driver with three FMEM modes that allow varying degrees of vehicle mobility depending on the severity of the fault detected. DTCs associated with stuck open or closed throttle valves are designated the highest failure severity resulting in engine speeds limited to high idle corresponding to the limited limp home mode. Vehicles are not

likely to unexpectedly stall as a result of this condition, but drivers may characterize the reduced functionality as a stall, even though their vehicle may still has motive capability. Other FMEM limp modes may result in reduced engine performance but will maintain vehicle speed above 20mph.

During this investigation, Ford and its suppliers, Delphi and Igarashi, updated the powertrain control module (PCM) software to include a throttle body motor cleaning cycle during key-on and modified the ETB internal motor components design, surface finish and material composition to improve durability. Additionally, Ford developed a remedy procedure and issued a special Customer Satisfaction Program (CSP) 13N03 extending the ETB warranty coverage and instructing dealers to update the powertrain calibration to improve vehicle performance in the event that intermittent electrical connectivity of the throttle body motor contacts occurs. The program extends the coverage for up to 10 years of service or 150,000 miles from the warranty start date of the vehicle, all vehicles are eligible for the program through January 31, 2015 regardless of mileage. Owners of the affected vehicles will be contacted by mail to take their vehicle to a Ford dealer who will reprogram the PCM to the latest calibration. The bulletin was sent to dealers on January 17, 2014 and the owner letter mailing began on January 27, 2014. See the investigative file for copies of Ford's bulletin and owner letter.

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 complete closing resume in the document file for PE13-003.

ODI analyzed complaints related to electronic throttle body (ETB) malfunctions that were provided by Ford or submitted to ODI from consumers. In total, there were 11,960 unique reports, and the predominant failure mode identified involved reduced motive power associated with the limited limp home mode (FMEM) with engine speeds limited to approximately 900 RPM. The complaint counts shown in this resume include incidents in which enough detail was available to verify the symptoms were related to the defect condition identified by Ford. Eleven (11) reports alleged minor vehicle impacts related to throttle body malfunctions with either stationary objects or very low speed rear-end type collisions mostly at traffic lights or during cornering maneuvers. One complaint reported very minor vehicle damage from a low speed rear-end collision after safely pulling onto a paved shoulder to exit the flow of traffic. Complaints alleging loss of vehicle control are inconsistent with vehicle operation in an FMEM mode.

Additionally, ODI evaluated one complaint provided by Ford in which a low speed, rear-end collision in interstate traffic was alleged to have resulted in an injury to the driver. The complaint alleged head, neck and shoulder injury due to a stall event in a MY 2010 Ford Fusion. Drivers alleging a stall were most likely unaware that the engine was still running and characterized the reduced functionality as a stall even though their vehicle may have still had limited motive capability. Ford's electronic throttle control strategy allows the engine to operate and provides the driver with vehicle mobility to maneuver their vehicle to a safe location, even in the most severe FMEM mode. Engine operation is maintained providing full power steering assist, brake assist, and electrical functions. Additionally, drivers are alerted that a fault has been detected by the illumination of a wrench light or MIL.

The ODI reports cited above can be viewed at "<http://www-odi.nhtsa.dot.gov/owners/SearchNHTSAID?targetCategory=C>" under the following identification numbers (ODI Nos.):

10303756, 10317487, 10332233, 10346209, 10369908, 10402592, 10405277, 10424384, 10426879, 10427644, 10432795, 10437318, 10438114, 10439118, 10449203, 10452984, 10456609, 10456833, 10457089, 10457958, 10458639, 10459681, 10459847, 10460429, 10460520, 10460553, 10461260, 10461301, 10461382, 10461708, 10463400, 10463645, 10464040, 10464141, 10464556, 10464678, 10464696, 10464839, 10465073, 10465378, 10465654, 10465918, 10466537, 10466753, 10467849, 10467994, 10468445, 10468979, 10469600, 10469929, 10469933, 10470221, 10470371, 10470730, 10470846, 10471210, 10471600, 10471815, 10472734, 10473625, 10473674, 10474037, 10474044, 10474507, 10474518, 10475123, 10475894, 10477023, 10478386, 10478838, 10479399, 10479854, 10479860, 10480196, 10481089, 10481098, 10481301, 10482069, 10482602, 10482730, 10482785, 10483126, 10483931, 10483989, 10485035, 10485843, 10486647, 10486668, 10487542, 10487698, 10487928, 10488954, 10489106, 10489221, 10489270, 10490704, 10490737, 10490851, 10491430, 10491633, 10491794, 10491950, 10492281, 10494655, 10494708, 10495282, 10496021, 10496116, 10496540, 10496657, 10498297, 10499247, 10499438, 10499525, 10499541, 10499923, 10499938, 10499970, 10499987, 10500003, 10500044, 10500046, 10500054, 10500076, 10500091, 10500107, 10500122, 10500155, 10500168, 10500179, 10500483, 10500522, 10500590, 10500608, 10500665, 10500672, 10500677, 10500774, 10501049, 10501131, 10501204, 10501311, 10501425, 10501827, 10501952, 10502682, 10503123, 10503155, 10503177, 10503484, 10503744, 10504084, 10504197, 10504229, 10505610, 10505649, 10505998, 10506008, 10506044, 10507062, 10507438, 10507502, 10507542, 10507548, 10508060, 10508166, 10508167, 10508783, 10508988, 10509130, 10509164, 10509491, 10509636, 10509708, 10509883, 10509920, 10509991, 10510047, 10510049, 10510164, 10510228, 10510245, 10510280, 10510296, 10510318, 10510330, 10510410, 10510543, 10510751, 10510767, 10510804, 10510895, 10510940, 10511008, 10511149, 10511204, 10511442, 10511648, 10511715, 10511850, 10512100, 10512144, 10512174, 10512262, 10512350, 10512491, 10512494,

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