



U.S. Department
of Transportation
**National
Highway
Traffic Safety
Administration**

ODI RESUME

OFFICE OF DEFECTS INVESTIGATION

Investigation: PE24012

Prompted By: SGO Incident Reports

Date Opened: 04/25/2024

Date 01/17/2025

Closed:

Investigator: Joseph Teitelman

Reviewer: Peter Kivett

Approver: Tanya Topka

Subject: Collisions Involving Ford BlueCruise

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: Ford Motor Company

Products: 2021-2024 Ford Mustang Mach-E vehicles equipped with Co-Pilot360
Active 2.0 (BlueCruise)

Population: 129,222

Problem Description: Subject vehicle collisions with in-road stationary vehicles

FAILURE REPORT SUMMARY

	ODI	Manufacturer	EWR D&I	Other	Total	EWR Field Reports
All Incidents:	0	3	2	4	4*	0
Crashes/Fires:	0	3	2	4	4*	0
Injury Incidents:	0	2	2	2	2*	0
Number of Injuries:	0	2	2	2	2*	0
Fatality Incidents:	0	2	2	2	2*	0
Number of Fatalities:	0	3	3	3	3*	0

Description of Other:

Crashes reported under SGO 2021-01. Note: All crashes listed under Manufacturer and EWR D&I categories were also reported through the SGO.

*Total eliminates duplicates received by the manufacturer

ACTION/SUMMARY INFORMATION

Action: This Preliminary Evaluation (PE) has been upgraded to an Engineering Analysis.

Summary:

On April 25, 2024, NHTSA's Office of Defects Investigation (ODI) opened a Preliminary Evaluation (PE24012) to assess BlueCruise, a partial driving automation system available on certain vehicles manufactured by Ford Motor Company (Ford). NHTSA opened the investigation after the agency received notice of two fatal collisions involving BlueCruise-equipped Ford Mustang Mach-E vehicles. Based on the incidents, NHTSA scoped the investigation to 2021-2024 Mustang Mach-E vehicles equipped with BlueCruise. In June 2024, ODI sent an Information Request (IR) letter to Ford requiring that it provide certain information pertaining to crashes, non-crash reports, and technical specifications that relate to BlueCruise, as well as other Ford partial driving automation systems that offer lane and speed maintenance.

In its response to ODI's IR, Ford stated that there are 2,539,962 Ford and Lincoln vehicles (including subject and peer vehicles) equipped with a partial driving automation system within the scope of the request. The majority of these vehicles are equipped with a system that Ford calls Lane Centering Assist (LCA), which is a hands-on partial driving automation system that combines longitudinal control authority governed by Adaptive Cruise Control (ACC) and lateral control authority governed by a steerable path. LCA is offered on a wide range of Ford and Lincoln models beginning in model year 2019. Vehicles that are equipped with BlueCruise, the focus of this investigation, have LCA capability and additionally offer hands-free partial driving automation when certain conditions are met. Hands-free BlueCruise operation is only offered on certain roadways and system availability is geofenced using vehicle GPS. BlueCruise-equipped vehicles employ a camera-based driver monitoring system to determine driver attentiveness to the roadway. BlueCruise was introduced in model year 2021 and is currently available in a select range of Ford and Lincoln vehicles.

For BlueCruise- and LCA-equipped vehicles, both ACC and Pre-Collision Assist (PCA) features use a combination of camera and radar sensing technologies to detect and classify objects. ACC is specifically designed to detect vehicles (including cars, trucks, and motorcycles) and bicycles in front of the subject vehicle which are either stationary or moving in the same direction as the subject vehicle. Through this investigation, limitations in the detection of stationary vehicles in certain conditions have been identified. Specifically, due to the potential for false detection of stationary objects at long distances, Ford designed ACC to inhibit any response to reported stationary objects when the subject vehicle's approach speed is at or above 62 mph. Additionally, system performance may be limited when there is poor visibility due to insufficient illumination.

In addition to reviewing Ford's response to ODI's IR, the agency conducted a review of crash and non-crash reports identified collectively through Ford's IR response, incident reporting through Standing General Order 2021-01 (SGO), and NHTSA vehicle owner questionnaires. In total, 32 crashes and 2,004 non-crash reports on subject and peer Ford vehicles were identified across manufacturer and ODI data sources. A detailed analysis of each crash was conducted including the review of any available police reports, photographs, data recovered from in-vehicle event data recorders, connected vehicle data, and/or other information.

In both fatal collisions referenced in the PE24012 opening resume, the subject Ford Mustang Mach-E vehicle was traveling over 70 mph on a controlled-access highway during nighttime lighting conditions with hands-free BlueCruise engaged when it collided with a stationary vehicle. Analysis of data imaged from the vehicles' event data recorders demonstrates that in each incident, the driver did not apply the brakes or take evasive steering action, and no deceleration was initiated by either the BlueCruise system or PCA prior to impact. Through the agency's crash analysis, four additional frontal collisions were identified where the subject Ford impacted a stopped or slow-moving lead vehicle or another stationary object located in the travel lane. Two of these four incidents involved BlueCruise-equipped Ford Mustang Mach-E vehicles (included in the failure report summary along with the fatal collisions discussed above), while the other two involved other Ford models equipped with the LCA system. Additionally, a trend was identified through analysis of the non-crash reports relating to allegations that ACC (the longitudinal component of both BlueCruise and LCA) failed to detect and/or respond to a stopped or slow-moving lead vehicle. In these reports, consumers often describe that the absence of deceleration initiated by ACC was unexpected and required harsh manual braking or intervention from the PCA to avoid a frontal collision with the lead vehicle.

Based on NHTSA's analysis, system limitations relating to the detection of stationary vehicles while traveling at highway speeds and in nighttime lighting conditions appear to be factors in collisions under investigation and several apparently similar near-miss, non-crash reports. This Preliminary Evaluation is being upgraded to an Engineering Analysis (EA25001) to further investigate these system limitations and to evaluate drivers' ability to respond to scenarios that exceed system limitations. During the EA, the agency expects to, among other things, perform vehicle evaluations, review additional technical information, and perform additional analysis of related crashes and non-crash reports. The crashes included in the failure report summary can be found at [NHTSA.gov](https://www.nhtsa.gov) under the following SGO report identification numbers: 502-7268, 502-7426, 502-6852, 502-8738.