



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: PE 16-003
Date Opened: 02/29/2016
Investigator: Joseph Oxenham
Approver: Stephen Ridella
Subject: Master Cylinder External Leak
Date Closed: 07/26/2016
Reviewer: Jeff Quandt

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: Ford Motor Company
Products: 2013-2014 Ford F-150 with 3.5L engine
Population: 419,151

Problem Description: The master cylinder rear cup seal may roll, resulting in brake fluid leakage from the primary reservoir into the brake booster. Loss of brake fluid from the primary reservoir may result in a complete loss of front brake function, increasing the risk of a crash.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	82	314	380**
Crashes/Fires:	5	8	12**
Injury Incidents:	0	1	1
Number of Injuries:	0	1	1
Fatality Incidents:	0	0	0

** Total eliminates duplicates received by ODI and manufacturer.

ACTION / SUMMARY INFORMATION

Action: This Preliminary Evaluation is closed. Recall 16V-345

Summary:

On May 23, 2016, Ford Motor Company (Ford) submitted a Defect Information Report (DIR) to NHTSA regarding a master cylinder defect that could result in loss of the front brake circuit in approximately 225,012 model year 2013 through 2014 Ford F-150 vehicles equipped with 3.5-liter GTDI engines and built at the Dearborn Truck Plant from August 1, 2013 through August 22, 2014; and the Kansas City Assembly Plant from August 1, 2013 through August 31, 2014 (NHTSA Recall #16V-345, Ford Recall #16S24). Ford indicated that the rearmost cup seal in the brake master cylinder may roll, resulting in leakage from the brake fluid reservoir to the brake booster.

According to Ford's DIR, "Depending on the amount of brake fluid loss from the brake master cylinder into the brake booster, the driver will experience an audible chime, message center alert, red brake warning light in the instrument cluster and may begin to experience a change in brake pedal travel and feel. In the event that a loss of brake fluid is substantial enough to reduce brake function to the front wheels, the driver may experience longer pedal travel, increased pedal effort, and extended stopping distance, increasing the risk of a crash. Full braking function would remain in the rear wheel brake circuit." Ford's recall will replace the master cylinder and, if the master cylinder is leaking, also replace the brake booster.

Seventy-three (73) of the complaints received by ODI contained vehicle identification number (VIN) information required to determine date of build and recall applicability. ODI's analysis found that 66 complaints to ODI and 278 complaints to Ford involving vehicles built in the range covered by 16V-345, resulting in an overall complaint rate of 152.9 incidents per 100,000 vehicles. Twelve (12) crash incidents were reported, including 11 with VIN information. All 11 crash incidents with VIN information reported involve vehicles covered by Ford's recall.

ODI's analysis identified 7 ODI complaints and 36 Ford complaints in the 194,139 subject vehicles built outside of the build range for 16V-345, resulting in a complaint rate of 22.1 incidents per 100,000 vehicles. Ford indicated that warranty return analyses identified issues with minor internal leakage between circuits due to internal contamination caused by supplier assembly plant cleanliness concerns in these vehicles. Ford assessed the internal leak condition as an early-life condition with minimal safety risk that does not result in loss of fluid or circuit failure. ODI will continue to monitor complaints in subject vehicles not included in 16V-345. No complaints have been identified in MY 2013 through 2014 Ford F-150 vehicles equipped with other engine options.

The recall action initiated by the manufacturer appears to address the safety risks identified by this investigation. This preliminary evaluation is closed.

The ODI reports cited above can be reviewed at <http://www-odi.nhtsa.dot.gov/owners/SearchSafetyIssues> under the following identification numbers: 10870768, 10870747, 10870511, 10870395, 10870055, 10869981, 10865843, 10865521, 10865342, 10865043, 10864862, 10864714, 10864360, 10863982, 10863527, 10862333, 10862047, 10861735, 10861190, 10860378, 10860118, 10855381, 10855356, 10854785, 10853751, 10853295, 10853012, 10852349, 10852134, 10852037, 10851317, 10851268, 10851109, 10850015, 10849862, 10846488, 10846335, 10846193, 10846006, 10840414, 10840377, 10839994, 10839985, 10839981, 10839833, 10839825, 10839816, 10838782, 10838510, 10818273, 10817706, 10809601, 10788886, 10788369, 10785526, 10779854, 10776834, 10766291, 10762034, 10761412, 10760663, 10758997, 10750065, 10749886, 10748122, 10747875, 10747531, 10746143, 10745511, 10744847, 10743344, 10733196, 10733023, 10731327, 10725476, 10725096, 10725046, 10724169, 10715103, 10692723, 10662564, and 10632103.