

**June 8, 2020**

**Ford Motor Company (Ford) Recall No. 20S31 – Certain 2014-2017 model year Ford F-150 vehicles equipped with 3.5L Ecoboost engines brake cylinder leak into booster**

**Chronology**

In May 2016, Ford issued FSA 16S24 (16V345) for vehicles produced between August 1, 2013 and August 31, 2014 to address brake master cylinder fluid leakage into the booster caused by the rolling of the rearmost cup seal in the master cylinder. This could result in loss of brake fluid in the front brake circuit, which can translate to reduced or eventual loss of brake function to the front wheels. Ford continued to monitor vehicles built after the recall population for reports of brake master cylinder fluid leakage into the brake booster.

In September 2016, NHTSA opened a recall query (RQ16-001) to evaluate the scope and effectiveness of safety recall 16S24. Specifically, NHTSA's investigation focused on the Model Year 2015-2016 F-150 vehicles not subject to FSA 16S24. Ford responded to the agency's request for information in December 2016. Ford continued its investigations into the field performance of vehicles built after the recall population. Ford and the agency have continued to share data and analyses throughout these investigations.

To better understand the nature of complaints for vehicles outside the recall population, Ford initiated an in-depth investigation into complaint parts from the field. Prior analysis of parts returned from vehicles included in FSA 16S24 found that they had principally exhibited a rolled cup seal, which could result in more rapid fluid depletion from the front brake circuit into the booster. While analysis of parts from vehicles built after the recall found that some exhibited rolled cup seals, an equal number were found to have exhibited fluid leakage caused by fluid contamination that could interfere with rear cup seal function.

Ford then conducted component-level testing to better understand any differences between a rolled cup and a contamination failure. Even with significant contamination interference with the rear cup seal, component testing demonstrated that the rate-of-loss of brake fluid caused by contamination is 3x slower than for leaks resulting from a rolled cup seal. Fluid leak caused by contamination would likely result in a prolonged period of time before fluid depletion from the front brake circuit, including an extended period of both visual and audible warnings of low brake fluid. In the event that a loss of brake fluid occurs, the driver will receive an audible chime, a full screen message center alert, and a red brake warning indicator in the instrument cluster; all indicating that brake system service is required. These indicators are activated when the brake fluid in the reservoir is depleted to a pre-determined level. Braking ability would still be unchanged at that time. If a vehicle continues to be operated and additional fluid is depleted, the driver may begin to experience a change in brake pedal travel and feel. If a loss of brake fluid is substantial enough to reduce brake function to the front wheels, full braking function

would remain in the rear wheel circuit. However, the driver may experience longer pedal travel, increased pedal effort, and extended stopping distance.

Ford's analysis found the comparative rate of reports for vehicles built after the recall population to be significantly lower than the rate of reports for the recall population. A full useful life projection forecasted the rate of reports for vehicles built after the recall population to be 7x lower (or 15% of) the lifetime rate of reports for the recalled vehicles. As of March 20, 2020, Ford had received 3,332 reports potentially related to this concern. As of March 27, 2020, NHTSA had provided Ford with 246 VOQ's potentially related to this concern.

Throughout this period, Ford and the agency have continued to communicate regarding this subject and the agency's open investigation. In late 2019 and early 2020, Ford and the agency discussed how best to address future customer concerns. Ford communicated its perspective that both the rate and nature of reports associated with this population of vehicles was notably different and less severe than in the previously recalled population. To address concerns with customer's vehicles, Ford proposed conducting a Customer Satisfaction campaign to repair master cylinders if and when they fail and to continue monitoring the population of non-recalled vehicles. NHTSA encouraged Ford to conduct this campaign as a safety recall.

On June 1, 2020, Ford's Field Review committee reviewed the concern and approved a safety recall field action.

Ford is aware of 7 low speed/low impact accident allegations with 2 injuries.