U.S. Department of Transportation

National Highway Traffic Safety Administration

ODI RESUME

Investigation: PE 18-016
Date Opened: 12/17/2018 **Date Closed:** 12/12/2019
Investigator: Joseph Oxenham **Reviewer:** Scott Yon
Approver: Stephen Ridella
Subject: Steering loss due to linkage separation

MANUFACTURER & PRODUCT INFORMATION

Manufacturer: Chrysler (FCA US LLC)
Products: MY 2013 -2018 Ram 2500/3500 PU Truck w/4x4 Style Steering
Population: 795,575

Problem Description: The steering linkage (drag link) that connects the steering box to the front wheels may separate at the adjustment device resulting in loss of steering.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	4	48	50**
Crashes/Fires:	1	13	13**
Injury Incidents:	1	1	1**
Number of Injuries:	1	1	1**
Fatality Incidents:	0	0	0

** Total eliminates duplicates received by ODI and manufacturer.

ACTION / SUMMARY INFORMATION

Action: Close this Preliminary Evaluation, see NHTSA Recall 19V-021. Also PE18-016 has been upgraded to an Engineering Analysis, EA19-004, to further evaluate the 4x2 style steering system.

Summary:

On December 17, 2018, NHTSA's Office of Defects Investigation (ODI) opened Preliminary Evaluation (PE) 18-016 to investigate the steering system on model year (MY) 2015 and 2016 Ram 2500 manufactured by FCA US, LLC (FCA). Four complaints were received alleging separation of the drag link, a steering linkage that connects between the right front steering knuckle and the pitman arm on the steering box output shaft. The failures were found to be at a threaded coupler within the drag link used for adjusting the length of the linkage during routine maintenance (alignment) of the steering system. Once separation occurs, turning the steering wheel has no effect, and there is no way for the driver to control or maintain the direction of the vehicle.

During the investigation, it was determined that the same threaded coupler was used on two different drag link designs FCA manufactured on MY 2013-2018 Ram 2500 and 3500 pickups. FCA refers to the designs as either 4x2 or 4x4 style. In both designs, the coupler is prevented from turning on the drag link via two jam nuts that are tightened against the coupler. In its response to NHTSA's March 15, 2019, Information Request (IR) letter, FCA identified 48 incidents alleging separation of the steering linkage at the coupler resulting in a loss of steering control. Of those, 13 involved a crash, one of which resulted in an injury. All of the separations involved the 4x4 style drag link. Additionally, FCA's IR response refers to over 300 4x4 style equipped vehicles that experienced, or may have experienced loosening of one or more coupler jam nuts.

On January 25, 2019, FCA submitted a Defect Information Report (DIR) initiating NHTSA Recall No. 19V-021. In its DIR, FCA stated that the outboard jam nut in certain MY 2013-2018 Ram 2500 and 3500 could loosen potentially resulting in damage to the coupler and/or drag link threading allowing one end of the drag link to separate. The DIR notes that drag link separation results in loss of steering control, which in turn can cause a crash without warning.

FCA's DIR did not identify a root cause for the defect, however it posits that an improperly torqued outboard jam nut could loosen, and with long-term vehicle use, cause damage to the outer link bar and/or coupler threads due to relative motion between the two components. The scope of Recall 19V-021 included vehicles with the 4x4 style drag link only. Also discussed in its IR response, FCA noted that the 4x2 style drag link contains a design difference (the outboard portion of the drag link is straight while the 4x4 style contains a bend) which it suggests may result in differences in the mechanical (bending) loads presented at the coupler and jam nut interface. Moreover, the DIR states that "While root cause of the 4x4 style defect has not been established, FCA US believes that bending loads on the drag link is, at least, a causal contributing factor." FCA notes it did not identify any reports alleging 4x2 style separation as well as only three reports of loosening of jam nuts, two of which resulted in loosening that provided obvious warning to the vehicle operator, indicating a different failure mode.

NHTSA is upgrading this investigation to Engineering Analysis (EA) 19-004 in order to continue to monitor the subject 4x2 style vehicles for evidence of field failures. Additionally, in conjunction with NHTSA's Vehicle Research and Test Center, ODI intends to more thoroughly study potential root cause(s) of the 4x4 style defect mechanism, and if identified, will seek to determine if the 4x2 drag link is susceptible to the same mechanism(s). NHTSA will also evaluate the long-term suitability of the recall remedy FCA implemented for Recall 19V-021.

The ODI reports cited above can be viewed at NHTSA.gov under the following NHTSA ID numbers: 10936579, 11064516, 11083519, and 11204993.