



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

ODI RESUME

Investigation: EA 09-003
 Prompted By: PE 08-053
 Date Opened: 01/15/2009
 Principal Investigator: Peter Kivett
 Subject: Drag Link Failure

Manufacturer: Volvo Trucks North America
 Products: Model Year 1998 - 2005 Volvo VNL and VN Trucks
 Population: 193,000 (Estimated)

Problem Description: Drag-link failure resulting in a loss of steering control.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	1	75	76
Crashes/Fires:	3	9	12
Injury Incidents:	0	2	2
# Injuries:	0	12	12
Fatality Incidents:	0	0	0
# Fatalities:	0	0	0
Other*:	0	0	0

*Description of Other: Of the 75 complaints, 16 are US Fleets, 43 are Canadian Fleets and 15 are unknown.

Action: This Engineering Analysis is opened

Engineer: Peter Kivett

Date: 01/15/2009

Div. Chief: Richard Boyd *RB*

Date: 01/15/2009

Office Dir.: Kathleen C. DeMeter

Date: 01/15/2009

Summary: This investigation pertains to certain Volvo Trucks built with "Sealed" TRW drag links that allegedly fail without warning, resulting in a steering loss. These drag links were used in the VN Model from 1996 through MY 2005. Sealed links are not greaseable (no lubrication required) and they are standard on these trucks. Greaseable links are offered as an option. Per Volvo, the "Sealed" links require a quarterly inspection. That inspection requires checking for looseness in the steering wheel and checking for axial movement at the ball sockets by pushing and pulling the socket. Any movement requires replacement. Volvo believes that the drag-links are not defective, rather they believe that the quarterly inspections are not being performed. See attached report for more details.

The Office of Defects Investigation (ODI) opened this Preliminary Evaluation (PE) on September 12, 2008. This PE was based on two reports received by the Federal Motor Carrier Safety Administration (FMCSA) alleging two separate crashes, both involving model year 2005 Volvo VNL and VN trucks. The crashes were allegedly caused by a separation of the steering drag-link. This type of failure results in a total loss of steering control. The subject vehicles' drag links are "maintenance free," designed without provisions to lubricate the steering joint. They are commonly referred to as "sealed" drag links.

Upon receiving the response to ODI's PE Information Request letter from Volvo, ODI learned that the drag links used in the subject vehicles go back to model year 1996. Volvo claims that they are aware of 57 field reports, 16 consumer complaints, and 2 lawsuits. These incidents include 12 reports involving a crash or injury and 9 claims of property damage going back to MY 1998. Of the 75 "incidents," ODI notes that 43 occurred on Canadian fleet trucks. These failures all involve the "sealed" drag link. Due to the type and severity of incidents ODI feels that it is prudent to expand the scope of this investigation to incorporate 1998 through 2005 VNL and VN model vehicles into this Engineering Analysis (EA).

An ODI investigator contacted the fleets identified by FMCSA and visited several others identified from Volvo's warranty and complaint submission received November 7, 2008. An ODI investigator also visited two trucking fleets alleging a drag link failure resulting in a vehicle crash and took possession of several worn out drag links. ODI has also received reports from State Police as well as a crash reconstruction company, both of whom responded onsite to a crash, and each alleging independently of one another that the drag link failed causing a loss of all steering.

ODI theorizes that moisture can penetrate into the ball and socket assembly of the drag link ball joint (Figure 1), which at some point will compromise the joint integrity.

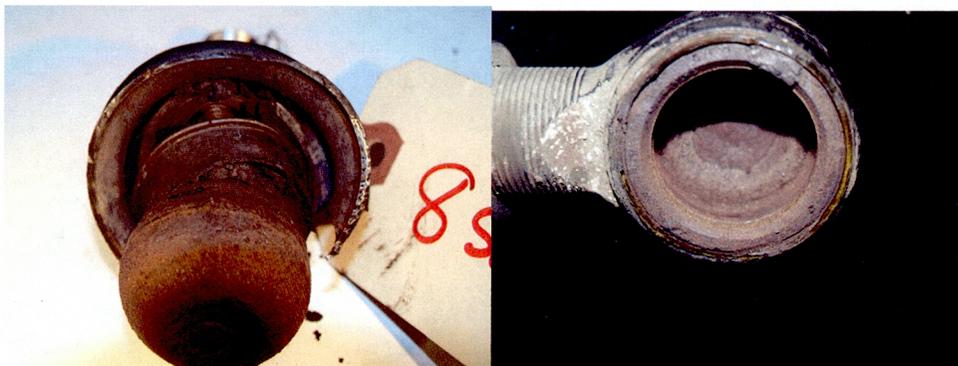


Figure 1: Drag link steering ends recovered from the field with extensive corrosion

Since there is no "Zerk" fitting (Figure 2) to flush the ball joint free of foreign contaminants, ODI theorizes that ultimately corrosion causes the ball and socket to wear. Eventually, due to the heavy loads and constant road vibration, this wear causes the ball to detach from the socket resulting in a catastrophic failure of the drag link.

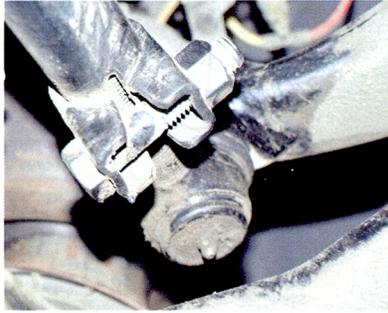


Figure 2: Photo of a peer vehicle that uses a “Zerk” fitting

ODI was notified by Volvo that the supplying manufacture of the drag link was changed from “TRW” Fahrwerkssysteme GMBH & CO.KG *part # 8079525* to Lemforder Corporation *part # 20371221* for the 2006 model year vehicles. ODI is also aware that the Lemforder drag link steering joint increased in size. The ball and stud outer dimension increased from 35mm to 40mm.

Volvo’s position is that this is a “wear-out” part, that is to be inspected with all front suspension and steering components. Volvo also has published a Service Bulletin explaining how to manually check for looseness, by testing for axial movement along the axis of the ball stud (Service Bulletin #LKN-105). Furthermore, Volvo claims there are warnings to the operator; loose feeling in the steering “play” and possible noise “popping” within the steering.

In summary, ODI has reports of total drag link separations. Volvo has certain maintenance requirements which they believe would allow the inspector to detect the loose ball socket in the drag link long before a total failure would ever occur.

In order to fully understand whether a defect exists, ODI is upgrading this investigation to an EA. During this stage ODI will conduct component analysis and review the information provided by Volvo.