Mercedes-Benz Part 573 Submission
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Chronology-Only section

Chronology of Defect/Noncompliance Determination

In April 2015, DAG launched initial investigations based on two individual field reports outside the USA describing an instance in which a customer allegedly experienced an inadvertent deployment of the driver airbag. The parts were requested for analysis. A systematic root cause could not be identified after analysis of these parts. Both reports were classified as individual incidents without a connection.

In late-2016, a third field report was brought to DAG's attention. Renewed investigations were initiated and parts of the affected vehicle were requested for further analysis. Within the course of these investigations two additional incidents with a similar customer complaint were identified in connection with this issue.

Those analyses indicated, that the affected vehicles had an issue within the steering column module but could not determine a root cause for the inadvertent deployment of the driver airbag.

In January 2017, a taskforce including a blackbelt investigation was initiated. First hypotheses included a short circuit of the broken clock spring and electromagnetic compatibility as potential root causes for the inadvertent deployment of the driver airbag and additional tests were initiated. These tests occurred in in March 2017, but did not identify a possible root cause. Further investigations led to the development of additional hypotheses for a potential root cause. These included the hypothesis of a potential electrostatic discharge initiating an inadvertent deployment of the driver airbag.

In April 2017, laboratory tests were launched with steering column modules simulating broken clock springs to reproduce an electrostatic discharge on open wirings of the driver airbag.

In June 2017, the test results identified a possible impact of an electrostatic discharge to a broken steering column module clock spring, leading to a potential inadvertent deployment of the driver airbag. Subsequently the different grounding scenarios of the steering components of different vehicle types were analyzed to identify possible causes of an electrostatic charge-up.

In July 2017, DAG determined grounding scenarios on different vehicle types where the steering components do not have a grounding to the vehicle chassis. An insufficient grounding of the steering components might lead to an electrostatic charge-buildup and, in the event of a broken steering column module clock spring could result in an electrostatic discharge and subsequently to an inadvertent deployment of the driver airbag. An electromagnetic compatibility induced inadvertent deployment of the driver airbag could be ruled out.

In August 2017, the range of potentially affected vehicles equipped with a suspect steering column module and insufficient grounding of the steering components was determined.

In September 2017, DAG determined that a short circuit within a broken steering column module clock spring can be ruled out due to the constructive design of the clock spring. Additionally a possible electrostatic discharge in combination with a broken steering column module clock spring and an insufficient grounding of the steering components was identified as the root cause of an inadvertent deployment of the driver airbag in such an event. DAG therefore determined that a potential safety risk cannot be ruled out.