

Chronology of Defect/Noncompliance Determination

Beginning in mid-2016, DAG began to receive sporadic reports related to the performance of the carbon-fiber drive shaft in its AMG GT vehicles. The reports were received from various global markets and included varying descriptions of the issue, ranging from accounts of excessive noise to statements that the level of power when the accelerator pedal was depressed did not meet the customer's expectations. DAG made attempts to obtain the parts from various field locations in order to conduct further inspection and analysis in combination with the drive shaft supplier.

DAG considered whether this set of reports had any relationship to a previous product investigation also involving the performance of carbon-fiber drive shafts for which DAG submitted a Defect Information Report (16V-308) in May 2016, involving a total of 136 MY16 AMG vehicles. In this recall (16V-308), the supplier had not properly cleaned the surfaces connecting the carbon fiber drive shaft to the engine or transmission flange in certain batches of parts. In that instance, if the anti-corrosive residue was not thoroughly cleaned from the end of the drive shaft, it could affect the adhesive bonding between the two surfaces and could cause the drive shaft to separate. Following an improvement to the cleaning process at the supplier, all drive shafts produced after the improvement process were believed to be performing according to specification. DAG's review found the more recent reports were not related to the same concern which led to the May 2016 recall.

DAG received additional reports related to the carbon-fiber drive shaft still on an intermittent basis into early 2017. These reports related to vehicles outside the range of affected vehicles from Recall (16V-308). In early 2017, DAG working with the supplier, began to consider other reasons for these reports. Because producing the carbon-fiber drive shaft is a largely manual process, it was considered whether the reports were the result of manufacturing error.

In May 2017, a number of carbon-fiber shafts retrieved from the field were analyzed at a supplier. The samples indicated the presence of silicone residues on the surfaces between the carbon drive shaft and the flange connection although having been properly cleaned according to valid production specification.

DAG continued to receive sporadic sets of reports from the field from mid-2017 and into 2018. DAG and its supplier continued the investigation into early 2018, where testing indicated some additional units returned from the field also suffered from silicone contamination.

Through the Spring and Summer 2018, DAG conducted a detailed evaluation of the vehicles from which the drive shafts were returned. The parts came from markets from around the world and from vehicles driven varying distances at the time of the event (ranging from 1,000 km to 50,000 km) and did not appear to meet any fixed pattern.

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As a theory, DAG and the supplier began to investigate the impact of certain types of protective paper on the drive shaft. After the flanges of carbon-fiber drive shafts are produced at the supplier, they rest for a period of time before they are bonded to driveshaft. During this period, the flanges are wrapped in the protective paper to avoid corrosion. It was eventually found that depending on the type of protective paper used, silicone particles on the paper could be transferred to the flanges during the rest period and lead to contamination.

Through the Summer and Fall 2018, DAG then undertook the process of mapping the delivery of batches of drive shafts to its vehicle production facilities back to production batches from the supplier. Following the conclusion of this mapping process and after accumulating sufficient additional field returns, in January – April 2019, DAG and the supplier conducted testing of individual drive shafts to identify potential suspect batches and which batches included drive shafts without any contamination. The testing results confirmed that tested parts from the suspect batches indicated levels of silicone contamination while those in other production batches did not indicate any such issues. On June 7, 2019, DAG decided to conduct a recall of vehicles equipped with drive shafts sourced from the affected production batches.

In the end of June 2019, DAG learned that there were field complaints potentially related to the performance of the drive shafts from vehicles manufactured outside the determined recall-range. Analyses were initiated immediately to confirm whether the recently received reports in fact related to the same issue and why they were not identified initially.

In July 2019, these analyses initially showed, that the additional vehicles had been equipped with drive shafts from the affected production batches as identified by the supplier.

Further analyses were performed to understand why the vehicles were not included in the scope of the recall. The analyses showed, that the production cycle time of the AMG GT had not been considered correctly for the specific production period from 2016. This resulted in an incorrect estimation of potentially affected vehicles. Subsequently, the previous production cycle and production period was corrected and the updated range of potentially affected additional vehicles was determined. On August 30, 2019, DAG decided to include the additional vehicles from the corrected production period in the already initiated recall.