

### **Chronology of Defect/Noncompliance Determination**

In the end of November 2018, DAG received a single field report describing an instance of a malfunctioning electric power supply to the engine coolant pump due to chafing on the engine fan. This report was considered to be an isolated event, however, DAG initiated an investigation to understand why the electric power supply had come into contact with the engine fan.

Although the investigation did not reveal broader concerns relating to the routing of the wiring harness, an additional fixation clip on the wiring harness was implemented in January 2019 as a measure of continuous improvement.

After a second field report was received from a vehicle produced before the introduction of the additional clip, further investigations were initiated in March 2019, as the report for this vehicle also indicated that the electric power supply to the engine coolant pump had made contact with the engine fan.

From April to May 2019, DAG considered the manner in which the wiring harness for the electric power supply was routed in the vehicles as well as the potential consequences if this wiring harness was not installed according to specification.

Based on findings from further field reports, from June 2019 onwards, possible consequences of damage to the wiring harness were analyzed.

The investigation concluded that due to tolerances in the length and routing of the wiring harness, under certain circumstances it could potentially come into contact with the engine fan.

The investigation also found that if the insulation of the wiring harness were damaged by the engine fan, the 48V on-board electrical system might be deactivated, subsequently leading to an engine stall in connection with the ECO start/stop and "Glide mode" functions, while a risk of fire due to short circuit could be ruled out.

Furthermore, it was determined that an interruption of the wiring harness would lead to a malfunction of the coolant pump, which could lead to engine overheating and a potential engine stall.

On August 9, 2019, DAG determined that a potential safety risk cannot be ruled out. After a second field report was received from a vehicle produced before the introduction of the additional clip, further investigations were initiated in March 2019, as the report for this vehicle also indicated that the electric power supply line to the engine coolant pump had made contact with the engine fan.

From April to May 2019, DAG considered the manner in which the wiring harness for the electric power supply line was being routed in the vehicles as well as the potential consequences if this wiring harness was not installed according to specification.

Based on findings from further field reports, from June 2019 onwards possible consequences of damaged isolations of the wiring harness were analyzed.

The investigation concluded that due to tolerances in the length and routing of the wiring harness, it could potentially come into contact with the engine fan.

The investigation also found that if the insulation of the wiring harness were damaged by the engine fan, the 48V on-board electrical system might be deactivated, subsequently leading to an engine stall in connection with the ECO start/stop and "glide mode" functions, while a risk of fire due to short circuit could be ruled out.

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Furthermore, it was determined that an interruption of the wiring harness would lead to a malfunction of the coolant pump, which could lead to engine overheating and a potential engine stall.

On August 9, 2019, DAG determined that a potential safety risk cannot be ruled out. In the beginning of August 2019, DAG determined that a potential safety risk cannot be ruled out.