

Chronology of Defect / Noncompliance Determination

Provide the chronology of events leading up to the defect decision or test data for the noncompliance:

October 2, 2017 – Subaru received the first technical report from a foreign market alleging that a vehicle had a loss of motive power and the engine could not be immediately restarted. Subaru collected the engine for further evaluation. From the joint investigation conducted with the supplier, it was estimated that the loss of motive power was due to a damaged ignition coil. The investigation of the ignition coil did not identify the cause of the damage. Subaru requested additional part collection for any similar claims.

February 14, 2018 – Subaru received the first technical report from the U.S. market alleging loss of motive power. Subaru opened a joint investigation with the ECM, ignition coil, and engine harness supplier. From the investigation of the collected engine, it was again estimated that the loss of power was due to a damaged ignition coil. A short circuit in the igniter was one possible cause of the damage to the ignition coil, however, the investigation could not identify the cause of the short circuit.

May 2018 – Subaru, the supplier, and a third party conducted FTA analysis into the possible cause of an igniter short circuit. The results of the analysis were inconclusive.

August 2018 – Simulation tests, such as CAE analysis of thermal effect and temperature cycle testing, were conducted to determine if potential voids in the solder could be a contributing factor. As a result, soldering was ruled out as a potential cause.

October 29, 2018 – As a preventative measure, a thermal resistance inspection for the ignition coil was implemented on the production line.

January 19, 2019 – Destructive testing was conducted using long periods of conduction in an attempt to induce an igniter short circuit. Damage observed on one of the field return parts and damage observed after testing appeared to be similar.

June 19, 2019 – At the supplier, the continuing investigation results appeared to show that the ECM programming may be the cause of ignition coil energization for longer than expected periods of time after the engine is shut off. Since the previous preventative countermeasure did not completely resolve the condition, as an additional preventative measure, and updated ECM program was implemented on the production line.

October 10, 2019 – Based on the results of the investigation, Subaru believes that the ignition coil may be energized longer than designed after the engine is OFF. The occurrence rate appears to increase with the number of engine OFF cycles. In certain foreign markets, the subject vehicle population is equipped with an automatic start/stop feature. Field data in these markets serves as an early warning indicator for markets that do not offer an automatic start/stop feature, such as the U.S. market. For the entire

population of potentially affected vehicles, Subaru has received 32 field reports and 8 VOQs in the U.S. market. Out of an abundance of caution, Subaru decided to conduct a voluntary safety recall.