

In April 2020, MBAG started to receive customer complaints alleging frozen images on the rear view camera display.

MBAG commenced an investigation to evaluate the complaints and to determine whether they could be related.

MBAG sought out and retrieved available parts that workshops had removed from vehicles that reported the rearview camera screen freezing, and provided those to the component supplier for further analysis.

In parallel, MBAG tested other vehicles of the same model, trying to produce the reported failure for examination and analysis.

For several months, the engineering team was unable to produce the reported failure. In October 2020, following extensive testing on the test stand and the plant premises, MBAG was able to observe the failure in a vehicle for the first time. However, it remained unclear what triggered the frozen screen, and the engineering team was unable to intentionally produce the phenomenon. Based on MBAG's testing and field reports, the occurrence of a frozen screen appears to be both random and rare. This supported MBAG's determination that the probability of the occurrence was very low.

During the same period, the supplier conducted its own analysis. It was able to generate and observe the failure for the first time in January 2021.

Further analyses by MBAG and the supplier in the following months determined that frozen images were likely caused by a defect in a camera memory chip. A faulty signal from the chip could cause the processor to crash, resulting in a frozen screen, however at this point it was still unclear how and when this failure would occur.

This determination allowed MBAG investigators to recreate the failure more frequently, in order to determine what factors and conditions might lead to the failure in vehicles in the field.

After additional testing conducted by the supplier and MBAG, the supplier determined that two failure paths could potentially lead to a frozen image. In approximately 80 % of cases, the failure occurs during the camera calibration process during vehicle operation (background operation of rearview camera during forward travel at the rate of 3 to 19 mph). In the remaining 20 % of cases, the

failure occurs, when the camera is switched on while the vehicle remains stationary or speed is below 3 mph.

In the course of that additional testing and analysis, MBAG further determined that the probability of screen freeze is higher in colder outdoor temperatures.

In parallel over the course of several months during 2021, MBAG and the supplier worked to design, develop, and test potential solutions. After extensive additional testing and analysis, a specific software update solution was developed and successfully tested.

In case of the failure path involving online calibration (80% of failure cases), the software would prevent the failure from occurring and the camera would work as intended. In case of the other failure path that occurs when the vehicle is stationary (remaining 20 % of failure cases), the software would automatically switch off the camera if the failure is detected, preventing a frozen image.

On February 16, 2022, MBAG determined that it could not rule out a safety risk associated with rear view camera screens installed in certain VS20 Platform 447 Metris vehicles.

Accordingly, MBAG will initiate a recall for all affected VS20 Metris vehicles.