Beginning in August 2019, Mercedes-Benz AG (MBAG) reviewed with NHTSA a number of customer VOQs that reported one or both of the rear wheel speed sensors had been replaced in platform 906 Sprinter 3500 vehicles. Customers reported a variety of different symptoms including illuminated warning lamps for ABS/ESC, irregular transmission shifting, loss of power/limp mode and allegations of uncommanded vehicle surging. MBAG provided an initial update to NHTSA in September 2019, and at the time and based on the wide variety of vehicle behavior being reported, MBAG could not definitively connect the performance of the vehicle to a faulty rear wheel speed sensor. However, MBAG was able to confirm that as general matter a fault in a one or both rear wheel speed sensors would not affect braking or steering performance although in the case of two simultaneous faults, the brake distribution could be affected. At the time, all of the customer VOQs that involved platform 906 Sprinter 3500 vehicles had been upfitted into camper vans and MBAG's investigation began to focus on a possible connection between the rear wheel speed sensor and these vehicles. MBAG also advised NHTSA that in conjunction with its supplier, MBAG had upgraded the original rear wheel speed sensor in 2014, after finding that the original wheel speed sensor part was prone to moisture intrusion which allowed for the formation of crystals or dendrites. The upgraded part was intended to be more robust and resilient to moisture intrusion.

As the investigation progressed, MBAG continued to regularly provide updates to NHTSA throughout the remainder of 2019 and into 2020. As part of MBAG's investigation, it issued a specialized questionnaire to Sprinter dealers in September 2019 that was aimed at collecting information about the customer experience at the time of the malfunction including the length of time the vehicle is typically not in-use, geographic location and error memory and stored DTCs. The responses to the questionnaires indicated a concentration of vehicles in hot/humid states with a large number of camper vans seeking service for the rear wheel speed sensor.

MBAG also initiated a parts return program from the United States to its supplier in Europe. In October 2019, the supplier began to analyze the first sets of rear wheel speed sensors returned from the field and this analysis included, among other things, multiple rounds of electric load testing and a simulation of how the components heat up when installed near the brakes in real world driving conditions. The supplier also conducted a manual disassembly and microscopic analysis. MBAG received the initial results of the parts analysis in early 2020, which indicated which indicated that many of the returned

parts experienced moisture intrusion in the sensor housing and this was causing a short circuit in the RWSS, leading the ESP control unit to receive an implausible signal from the sensor and the in-vehicle warning messages to appear.

MBAG's analysis found that in the event of a rear wheel speed sensor fault, the ESP control unit was responding as intended so that, when the ESP control unit detects an implausible signal due to a fault in the sensor, the ESP control unit ignores the wheel speed information, enters a failsafe mode, and provides in-vehicle warnings to the driver. The system returns to normal operation if the moisture dries out and the wheel speed sensor resumes full functionality at the next ignition cycle.

In February 2020, MBAG provided a further update to NHTSA after receiving a video of a customer's Sprinter allegedly experiencing uncommanded acceleration. MBAG installed a data logger in the customer's vehicle for several months through July 2020. Analysis of the data logger indicated that the vehicle had experienced a "pre-phase" which occurred when there is a fault in the wheel speed sensor, but before it fails. During the pre-phase, the engine drag torque function sends pulses to the driven axle and upon failure recognition, the ESP control unit deactivates as a protective failsafe measure. Through simulations and in-vehicle testing in the second half of 2020. MBAG continued to analyze the impact of an affected sensor during the pre-phase and if moisture in the sensor progressed to the point of causing the part to fail. Analysis of field data and DTCs indicated that in the majority of cases, customers particularly camper van drivers, were responding to the in vehicle warnings and taking their vehicles to a workshop for repair before the fault progressed to a permanent failure.

Additional VOQs alleged that the vehicle surged beyond the set speed when cruise control was activated and NHTSA opened its Preliminary Evaluation (PE) 20-014 on September 21, 2020. In the fourth quarter of 2020, MBAG's investigation of the engine drag torque function showed that the repeated sensation of quick torque pulses plus the RPM changes and engine acoustics can mimic the feeling of the vehicle accelerating, as some customers had alleged. However, the torque pulses did not affect vehicle control, stability or braking. With respect to the cruise control function, MBAG found that if the RWSS sends a deviating signal while the driver has activated cruise control,

there is a possibility for the vehicle speed to exceed the set speed, but the acceleration is gradual, is technically limited to a maximum speed, and cruise control could always be immediately deactivated through the service brakes or turning off the function.

MBAG's review of the VOQs found that more than ninety percent relate to campers and all of them to the platform 906 Sprinter 3500 and found the same distinction in vehicle experience in its internal data. Nevertheless, in November 2020, MBAG decided to extend the warranty for the rear wheel speed sensor for both the platform 906 Sprinter 2500 and 3500 and regardless of whether the vehicle had been upfitted to a camper. Later that month, MBAG provided its initial response to the PE Information Request and provided supplemental information in December 2020.

MBAG received feedback from NHTSA in January 2021, following the agency's review of the response to the Information Request wherein NHTSA primarily expressed concern about the deactivation of the ESP during a fault or failure of the rear wheel speed sensor, but also noted a distinct difference in the field experience between the platform 906 Sprinter 3500 vehicles upfitted into campers and other Sprinter variants. On January 27, 2021, and consistent with the agency's view concerning vehicle scope, MBAG decided that a potential safety risk could not be ruled out for the platform 906 Sprinter 3500 (5-ton) vehicles upfitted into campers and a recall was decided for these vehicles.