

## **Chronology of Principle Events**

### April, 2017

Suzuki Motor Corporation (SMC) received a Field Technical Information Report (FTIR) from its Japanese distributor concerning a GSX250R motorcycle headlamp that was not working. SMC found that the low-beam filament was broken and deformed. SMC judged that this likely occurred as a result of an impact applied to the vehicle with the low beam illuminated.

### July, 2017

SMC received information from the Japanese distributor that the headlamp bulb retaining spring of a new motorcycle had become dislodged when a Japanese dealer replaced the original headlamp bulb with an aftermarket bulb at the customer's request. As result of their investigation, SMC found that when the bulb retention spring is unhooked, the spring can drop down so that it is not properly retained between the retention washer and housing. SMC developed a design change to the headlamp assembly as a countermeasure to prevent the bulb retention spring from becoming dislodged from its original position during bulb replacement.

### September, 2017

SMC received a third FTIR about headlight bulbs with broken filaments from the Japanese distributor.

### October to November, 2017

As a result of investigation of the collected bulb from the motorcycle that was the subject of the third FTIR from the Japanese distributor, SMC found that the headlamp filament was broken, and melted spherical ends were found at the broken point of the filament. This failure was determined to be consistent with breakage due to excessive voltage. The cause of the excessive voltage could not be identified by only examining the returned bulb.

### January, 2018

SMC received the first FTIR from Suzuki Motor of America, Inc. (SMAI), indicating that the low beam did not turn on in a GSX250R motorcycle. SMC determined during investigation of the failed headlamp bulb that it was an aftermarket bulb.

SMC received an FTIR from the United Kingdom distributor that indicated that a single motorcycle had experienced two headlamp bulb failures. The bulb that broke the second time was an aftermarket bulb. SMC also found that the low beam filament was broken, and that the bulb retaining spring was worn and installed out of alignment with the headlamp bulb.

### May, 2018

SMC received a fifth FTIR from SMAI and was told that a field investigation was possible.

### June, 2018

An on-site vehicle inspection of the affected motorcycle described above was performed, and SMC learned from user comments that the motorcycle was used for commuting to Mexico and was ridden over several speed bumps near the border. SMC confirmed through testing that operation with impacts

caused by riding over speed bumps would not cause bulb failure in such a short period of time as seen in the market.

#### August, 2018

SMC received nine FTIR's from SMAI, four of which involved headlamps with aftermarket bulbs. SMC conducted comparison durability testing with aftermarket bulbs and genuine Suzuki bulbs. The result of the comparison durability testing showed that aftermarket bulbs had filament breakage earlier than genuine Suzuki bulbs. In three of the nine cases, SMC was unable to collect or investigate the actual parts, so SMC does not know if these cases involved aftermarket bulbs.

#### September, 2018

SMC had become aware of more than 20 cases of similar failures in the world markets. Based on FTIRs received, SMC understood that the similar failures involved the bulb spring becoming displaced when the bulb spring hook is removed, and that this may not be noticed by the individual performing the bulb replacement due to inability to visually confirm that the reassembly work was done correctly. Based on the assumption that a replaced bulb may not be properly fixed and will rattle if the spring is displaced, it was judged that this may create the possibility of filament breakage due to vibration. SMC decided to prepare countermeasure parts to prevent the bulb retention spring from becoming dislodged from its proper position when the bulb is replaced.

#### November, 2018

SMC continued analysis of FTIRs. During this analysis, questions arose about the causal relationship between the bulb retention spring coming off and filament breakage, so a retest was conducted. It was found that detachment of the bulb retaining spring is not a factor in bulb failure. Instead, it was determined that if the rubber cap behind the bulb was not installed correctly, the vibration would be amplified and the filament may break in the high speed range near the engine speed limiter.

#### January, 2019

SMC decided to issue a Service Bulletin to distributors, providing tips for headlamp bulb replacement that would reduce the chance that the bulb retention spring would be displaced during bulb replacement.

#### April, 2020

SMC received a Preliminary Evaluation (PE) information request from NHTSA. It was decided to repurchase two motorcycles from the U.S. market which experienced headlamp failure, to restart the investigation into the cause of the problem.

#### May-July, 2020

SMC responded to the PE information request in three submissions covering information about the failures, Suzuki's actions and views, and the results of the repurchased vehicle survey.

#### August, 2020

As of August 2020, SMC was aware of 37 vehicles in the United States with headlamp bulb failures out of 2,040 vehicles mass-produced prior to the change in the retention structure of the spring.

#### September, 24, 2020

On September 24, 2020, SMC decided to make a defect determination and file a Part 573 report. The cause of the bulb breakage is still being investigated and recall corrective action has not yet been determined.

#### October-November, 2020

An interim customer notification letter using SMAI sales records was sent to customers on October 9, 2020 informing that a safety defect had been determined for certain GSX250R motorcycles. A supplemental mailing was issued on November 16, 2020 using DMV registration records to customers not identified in the initial interim mailing.

SMC continued to conduct testing at headlamp bulb filament-resonant engine speeds using a headlamp assembly equipped with the original-design spring retention structure. SMC confirmed filament breakage as a result of this extended running distance testing. The broken filament inspected from this testing had similar appearance to the broken filaments of bulbs collected from customer-owned motorcycles.

SMC conducted additional testing by subjecting headlamp bulbs to the same vibration directly as had been measured during vehicle vibration tests. This testing confirmed that the bulb filaments could be broken by vibration in a relatively short amount of time, however the amount of time for a filament to break was inconsistent.

SMC conducted additional testing using a headlamp assembly equipped with the revised spring retention structure and determined that the amount of bulb filament vibration was lower than with a headlamp assembly with the original-design spring retention structure when subjected to the same test conditions.

#### December, 2020

SMC has not yet determined the reason why bulb filament vibration is different between the original-design and revised-design spring retention structure. This is still under investigation.

#### January, 2021

SMC determined that the revised spring retention structure by itself increased the spring tension that is applied to the headlamp bulb, and that this increased spring tension reduced the amplitude of the headlamp bulb filament movement compared to the original headlamp spring retention structure design. The degree of filament movement measured in the revised headlamp assembly was consistent with filament movement other model Suzuki motorcycles that do not exhibit premature headlamp filament breakage.

#### February, 2021

SMC conducted testing of a countermeasure headlamp bulb that contained an additional filament support for a period of 100 hours while subjected to vibration equivalent to a worst-case riding condition of 7,700~8,100RPM (260~290Hz) without a bulb filament failure.

SMC determined that maximum filament vibration of the countermeasure bulb, when installed in an original 2018 model year design headlamp housing, was less than the filament vibration exhibited by other model Suzuki motorcycles that do not exhibit premature headlamp filament breakage.

February 24, 2021

SMC determined after further review of parts shipment information that all 2018 GSX250R production received headlamp assemblies of the original design that preceded the change in the headlamp bulb spring retention structure that was applied to 2019 model year GSX250R production. As a result, the affected recall population increases by 60 vehicles to 2,100.

February 26, 2021

SMC decided to conduct a recall to replace the headlamp bulbs of affected vehicles with the countermeasure bulb.