Today’s modern age many kinds of sensors are used in cars. Sensors used in automobiles monitor the performance of the entire vehicle. Different sensors are used to control and process oil, temperature, emission level, coolant level, etc. In vehicle engine oil is pumped under high-pressure throughout the engine system to lubricate the engine parts that are in constant friction. By doing so, it also transfers away heat from these engine parts. As the oil travels around the motor, large amount of heat keeps being absorbed and transferred. It eventually reaches engine sump where it is cooled using a coolant, and then again recirculated through the engine. In this process, overheating of this oil can greatly affect its viscosity and reduce its efficiency, eventually causing performance issue of the engine. To prevent overheating, temperature oil sensors are used, that continuously send data to the Electronic Control Unit (ECU) then subsequently ECU adjusts and regulates the fuel quantity and ignition timing.

The temperature oil sensors usually consists of three parts: brass body, thermistor unit and a coupler unit. For continuous temperature monitoring, the brass body is continuously in contact with the engine oil that are based on sulphates and ammoniate, under high pressure and elevated temperature. In present study we observed leakage failure in the brass body of and conducted root cause failure analysis. The basic objective of failure analysis is to identify the overall damage mode like: mechanical overload, environmental degradation / corrosion, fatigue etc. and its type and root-cause leading to the failure and its understanding help to mitigate similar failures in near future.

In the present work, the failed / cracked brass body material was analysed by using Scanning Electron Microscopy assisted with Energy Dispersive Spectroscopy for identifying mechanisms of corrosion failures in Temperature oil sensor brass body components is highlighted. Failure analysis of cracked brass body showed the Stress Corrosion Cracking (SCC) failure which is further confirmed by multiple crack branching and Inter-Granular (IG) fracture.