QualityWorX CTS DataHub Case Study

Automotive OEM uses data analysis and visualization to eliminate bottleneck and improve FTT in hours

One of the world's largest automotive OEM's transmission assembly line was experiencing a bottleneck at its end-of-line leak test stations. Test cycle time had to speed up to meet production targets – but just as important, the First Time Through (FTT) rates at these stations were well below acceptable percentages. Without real-time data and detailed visibility into the leak tests, the manufacturer struggled to address these issues.

Digital signatures provide insight

The QualityWorX CTS DataHub was connected to the CTS Sentinel I28 leak test instrument resident at one of the test stations to upload live production test data. After 100 parts moved through production and leak tests were conducted on each, data was ready for analysis in Sciemetric Studio, the advanced analytics software provided as part of the QualityWorX CTS DataHub solution. Analysis of the collected pressure waveforms pointed to a condition where a valve within the transmission assembly may not have been opening, causing a slower pressurization of the Torque Converter cavity. This added to cycle time while also compromising test reliability.

Data delivers immediate improvements

11.5%
increase in FTT

21%
reduction in cycle time

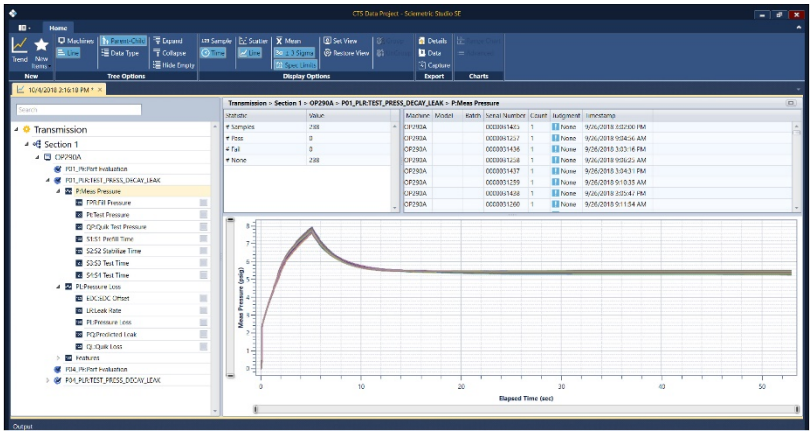

Figure 1: Overlaying the measured pressure values provides a comprehensive visualization of the stability of the pressure curve across the entire test cycle.

Corrective actions yield results

Armed with insight derived directly from the pressure waveforms, the team adjusted the fill pressure and fill time to sufficiently pressurize the entire transmission to a state of equilibrium. The higher pressure fill and added fill time helped to mitigate the impact of the air interacting with the transmission fluid which was creating additional variability in the leak test results. Two hundred more parts were run with the optimized program. The resulting digital process signatures clearly indicated that the combination of the higher pressure fill and extended fill time provided a much more stable and reliable process.

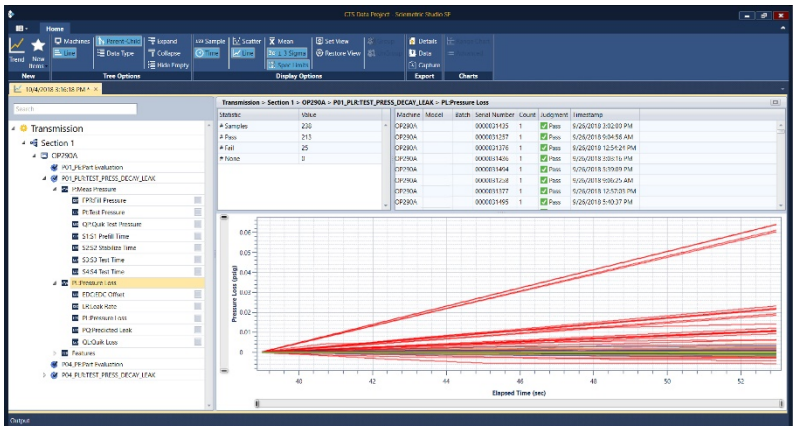

Figure 2: Simple visualization of pressure loss values highlights those measurements that are outside the normal population of results. In this case, the data shows substantial variation in the measured pressure loss values across a population of test results.

Just the beginning: Manufacturer sees opportunity for continuous improvement

The waveform data allowed the manufacturer to fully visualize the entire pressure curve, providing unique insight into the leak test in a very short period of time. Before the process changes were implemented, the cycle time was 67 seconds. After implementing the changes, cycle time was reduced by 14 seconds, and FTT increased by 11.5% as compared to the other station that had not been modified. The Sciemetric Studio software provided a visualization tool that brought to light the process changes necessary to reduce cycle time and improve FTT.

The analysis also highlighted additional opportunities for improvement, not only at these end-of-line stations but across the line where other CTS Sentinel leak test instruments are utilized. Together with Sciemetric and CTS, the OEM is applying these tools and using data to identify other potential root causes and improve quality and productivity.