

OEM cuts warranty claims with dramatic improvement to leak test Gage R

For one international manufacturer of agricultural machinery, it took a head-to-head trial to prove it made good business sense to replace an unreliable third-party leak testing platform that its quality team couldn't trust.

Leak testing is one of the most common, and frustrating, assembly line tests for many manufacturers. Conventional leak testing methods often miss leaks, create bottlenecks on the production line and can't easily compensate for environmental variables that can skew results.

This was certainly the case for one manufacturer of agricultural machinery. It markets a premium brand that offers a no-nonsense warranty – if a farmer has a problem with a tractor, it goes back to the dealership in exchange for another, right off the lot. That faulty machine comes back to the plant for repair.

In the manufacturer's transmission plant, operators and quality engineers had lost all trust in the existing third-party leak testing system. The system suffered from poor repeatability or Gage R. The same part could fail a leak test, then pass on another run.

As these were large parts with large internal volumes, internal temperature variation was a constant variable that the existing system simply could not reliably address. It lacked the necessary accuracy in pressure regulation and sensor sensitivity.

Dismal Gage R led test results to be ignored

With a Gage R of about 40 per cent, operators tried various tricks to get a pass, such as pressurizing the part faster during the fill phase, running the test repeatedly, or just ignoring fail results altogether.

But this only served to drive up the number of warranty claims from the field. With a tractor model running between US \$150,000 and \$350,000 per unit, the costs of warranty claims were adding up fast, as well as threatening to harm the manufacturer's brand reputation.

This third-party leak test system was also a data black hole, unable to collect reliable data and provide trend reporting for insight to improve the leak test. When those warranty claims did come back from the field, there was no archive of reliable data to draw on for root cause analysis and to determine how many other machines might be at risk of the same leak problem and should be recalled.

The solution

The manufacturer agreed to a head-to-head trial between its existing system and the Sentinel 3520. The results soon spoke for themselves. A Gage R of 40 per cent was slashed to only five per cent.

How? The 3520 has the digital pressure regulation to measure down to one-millionth of a PSI, as well as the sensor sensitivity to compensate for ambient and internal temperature

Sentinel 3520 Application Note

variations that can compromise test results, no matter how large the part. The manufacturer proceeded to replace the leak test systems in its transmission plant with our technology.

The 3520 paid for itself in a matter of weeks – the first time a leak was caught that the old system would have missed.

Visibility that drives performance

The 3520 collects the full waveform, or digital process signature, from each leak test cycle. This provides a full “instant replay” of what happens through every millisecond of the test cycle, to highlight trends or anomalies for reliable pass/fail determinations in production real-time.

All this data can then be uploaded for quick visual reporting to Sciometric’s QualityWorX data management and manufacturing analytics platform. Reports and data can be shared and used to monitor the performance of the leak tester itself, optimize its performance and dial-in new leak testers, faster. When warranty claims do come through the door, historic data can be reviewed for quick root cause analysis and process improvement, to limit the scope of recalls and prevent the same issue from reoccurring.

Raising the standard for leak globally

Two years after that first head-to-head trial, the Sentinel 3520 has been deployed in eight of this manufacturer’s plants, in Mexico, Argentina, the U.S. and France. With data insight and trend reporting now available, the manufacturer has more control to optimize processes, address the upstream issues that contribute to downstream leak problems and set new test limits fast.

The result is higher first-time yields and overall quality.



Restoring trust in leak testing

40% Gage R down to 5%

- Improved confidence in leak test
- Precise control of test variables
- Reliable in-depth reporting
- Test performance optimized

Reduced warranty issues

- Quick return on investment
- Rapid root cause analysis/resolution
- Higher yields, improved quality
- Market reputation maintained

