

■ Verification of Cup Plug Insertion: Multi-Ram Press Monitoring System

Overview:

Incorrect insertion of cup plugs will result in coolant system leakage, and in some cases will cause an engine to overheat. Warranty claims to repair coolant system failures are costly and can be easily avoided if cup plugs are inserted correctly. Press monitoring systems that can detect even the smallest anomaly with cup plug insertion will help manufacturers achieve better quality. The Sciometric Multi-Ram Press Monitoring System is designed to identify even the most subtle cup plug defects and to ensure proper insertion depth.

Benefits:

- Reduced warranty costs
- Immediate quality improvements
- Minimized false accepts of engine with defective cup plugs



Challenge

A major engine manufacturer was experiencing numerous warranty claims as a result of coolant system failure. Upon investigation of the problem, the primary cause was determined to be leaking cup plugs. When a cup plug is inserted into the casting with marginal interference, it may pass leak tests further in the assembly process but will ultimately come loose in the field, causing premature engine failure. The resulting negative customer satisfaction and costly warranty repairs were damaging the reputation and bottom line for this manufacturer.

Solution

The manufacturer required a press monitoring system that would catch even the most subtle cup plug defects. Upon evaluating options the manufacturer decided to implement Sciometric's Multi-Ram Press Monitoring System. They chose this system based on its advanced defect detection capability. The core technology uses algorithms designed specifically for cup plug press applications. The system evaluates the entire force-distance test waveform to identify anomalies of features unique to press applications. The system provides consistent and reliable detection of cup plug defects such as: missing, damaged or unseated plugs, plugs inserted to the incorrect final depth and under/oversized holes. Based on the flexibility of the system and its embedded cup plug intelligence, the manufacturer was able to detect even the smallest cup plug defects.

Achievement

Although it was apparent that better testing was needed, the manufacturer could not sacrifice cycle time and was concerned that a new system would be complex, expensive to implement and would result in production bottlenecks. Each concern was quickly addressed as the Sciometric Multi-Ram Press Monitoring System comes ready "out-of-the-box" with embedded press algorithms. Its compatibility with the existing manufacturing process in conjunction with its flexibility allowed the manufacturer to install the system quickly and to experience an immediate quality improvement. The system is designed for high volume press environments, providing multi-ram asynchronous testing capability. As a result, cycle time was not impacted. The manufacturer was able to integrate the system onto an existing Sciometric test stand saving both upfront costs and ongoing maintenance fees and effort. As a result of implementing the system, the manufacturer's quality improved and the warranty costs associated with coolant system failure decreased.

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www.sciometric.com

email: inquiries@sciometric.com

Tel: 1-877-931-9200 in North America;

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