

Scope

Incumbent eddy current equipment provider was unable to detect small changes in heat treated parts caused by changes in performance of their induction heating coils.

Application

Valve seats are subject to incredibly high percussive contact. They have to be accurately hardened for their own protection and to prevent damage to the valve and its stem. Too hard or too soft won't do.

The Challenge

Valve seats have quite complex geometry which presents a challenge for repetitive, repeatable testing. They are produced in high volume so fast and accurate location of the probe and coils therein is vital.

The Solution/Setup

A special probe was developed by Uson's Component Testing applications group. Using a differential driver / pick up coil protected by a stainless steel cover, the probe features a guide shaft to self center the probe during entry into the valve port.



Using an InSite HT multi-channel multi-frequency tester an eight-frequency test was developed that was capable of detecting the small differences in material structure caused by changes in the output of the induction heating coils.

Test Results

Excellent test results were obtained with a high degree of differentiation.

Implementation

To implement the test and meet cycle time the InSite HT was integrated into an existing automated test stand. The tester's built in industrial I/O was used to communicate the test results to the machine PLC.



To accommodate different sizes of valve seats, or those with a different base material composition, the customer would require different size probes and a menu of different test programs. Using a feature of the tester known as "configuration switching" the PLC can instruct the tester which program to load when each type of valve seat is being produced. This helps to ensure that the correct program is used every time and eliminates false results.

Following the delivery of the InSite HT and necessary probes, the sales support engineer visited the customer to assist with set-up and train the operators and supervisors on the use of the equipment.

Feasibility projects, eddy current and application training, and on-site set up assistance are valuable elements of Uson's solutions and help customers get the most from their investment while providing assurance that the solution will deliver the anticipated benefits.



Benefits

Custom probe design dramatically improves the repeatability and reliability of eddy current testing. Coupled with the capabilities of the InSite tester, attention to the design of the probes produced a far superior test for the customer. Follow up with installation assistance and training ensured that the personnel operating the equipment understand how it functions and how important accurate probe-to-part interface is.

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