RFF Verification: Laser Scanning of Cylinder Heads to Check Roller Finger Followers

Highlights:

- Laser scanning of finger followers
- Defects detectable:
  - Missing RFF
  - Angled RFF
  - Off location RFF
- Signature software displays entire laser scanned waveform
- Software extracts each RFF profile and compares to correct profile
- Supports multiple head recipes
- Fieldbus compatible
- PASS/FAIL output for host PLC
- Data logging of parts processed

Off-location RFF's (Roller Finger Followers) are a major problem for many automobile engine manufacturers. A verification system using an off-the-shelf standard profiling laser and a Sciemetric Signature Analysis System offers a reliable and economical solution to this problem.

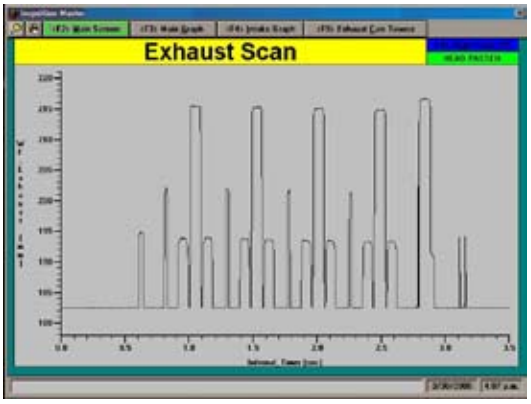
Lasers are used to scan the profile of the cylinder head on the head assembly line. Two lasers may be required depending on the head geometry: one for the exhaust, and another for the intake followers. The verification can be performed in a lift and locate station using a pneumatic or motor driven slide, or on some lines it may be possible to scan the head as it passes by naturally on the assembly line.

The laser output is measured by the Signature Analysis system for the entire length of the cylinder head, and when viewed with the Sciemetric software, it forms a waveform for the entire profile. The InspeXion® Test and Analysis software then extracts smaller segments from this main waveform, one for each valve stem. The extracted waveforms are then analyzed using an algorithm to compare each stem profile with that of a correct profile.

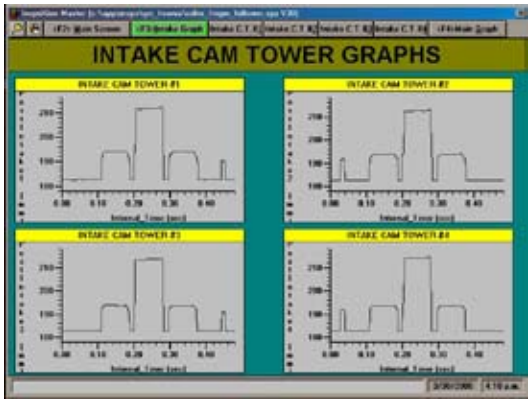
OFF LOCATION

PASS/FAIL results are graphically displayed for the operator on the display screen and can be transmitted to a host PLC with discrete relays or via optional fieldbus connections (Interbus, DeviceNet, Profibus). The impact of this test on cycle time is negligible since testing is performed in seconds (depends on the line speed).

This is just one example of the many innovative in-process-test solutions Sciemetric has developed for powertrain manufacturing.



InspeXion Screen showing a Profile Scan Waveform of the Entire Cylinder Head



InspeXion Screen showing Profile Scan Waveforms for Four Valve Sterns

AN170

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