

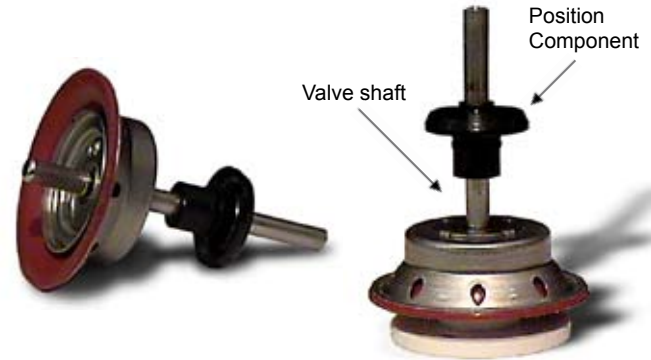
■ Idle Speed Control Valve Assembly: Press Force Monitoring Using Signature Analysis

Highlights:

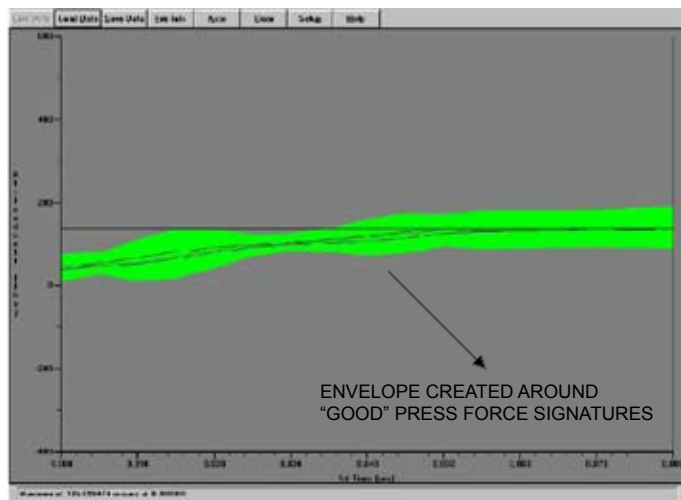
- Defect detection:
 - Improper shaft size
 - Shaft misalignment
 - Shaft burring
 - Incorrect press depth
 - High or low press force
- Automatic PASS/FAIL analysis and display to operator
- Easy to use menus and graphic interface

The assembly of a part to a shaft, such as an idle speed control valve assembly, requires detailed testing to ensure that it will be secure over the life of the vehicle. Monitoring only the peak force at the press indicates the general quality of fit, but it cannot predict the likelihood of failure or even detect all defective parts.

The SigMETER® monitors and verifies the entire assembly process and solves the problem. It digitizes the signal from a load cell and a distance-measuring device, and displays force versus incremental distance. It compares this "signature" with results from representative samples of known, good assemblies, producing a reliable PASS/FAIL result.



The operation assembles the position component at a particular height over the idle speed control valve shaft. Improper force or position during assembly may cause the valve to malfunction. The SigMETER® analyzes each significant section of the signature and performs a series of PASS/FAIL analyses. The sample curve below shows that the initial travel requires minimal force until the ram contacts the position component. This distance can be used to evaluate the press height, and to indicate a tapered or bowed hole. The shape of the first section depends on the alignment and condition of the parts. The tightness of fit determines the force at the ram and controls the slope of the second section. A burred shaft could open the hole, so that a higher than normal initial force would be required, but the slope would be shallower. The correct final position is indicated when the press bottoms out. Each variation has its own signature. The operator receives a definite PASS/FAIL indication, the QA personnel can observe trends and provide 100% quality assurance, and the engineering staff can correct incipient problems. The company as a whole benefits from lower production costs, higher reliability ratings and fewer warranty call-backs.



Screen showing Signature Waveform Produced from Pressing the Position Component onto the Valve Shaft.

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