



Industry-Leading Test Solutions

Market Application Case Study:

CYLINDER HEAD LEAK TEST SYSTEM

Market driver:

An engine component manufacturer needs to test cylinder heads to ensure they meet performance specifications. The cylinder heads are aluminum castings that need to be checked for cooling flow and passage leaks. The test system will provide two dedicated stations to independently flow and leak test 'Front' and 'Rear' heads on demand. Testing will be performed on un-machined castings to ensure the parts conform to specifications before machining and additional cost is added to the part.

Test requirements:

Both cylinder head internal water cavities are flow and leak tested. The cycle begins with an air flow test at 2 psig to ensure a minimum flow rate of 220 LPM. Passing this test automatically initiates the leak test cycle. The water cavity is pressurized with air and tested for a maximum leak rate of 5 scc/m at 60 psig. The cylinder heads must pass both tests to meet test specifications or the test will indicate a reject part. The system needs to process approximately 50 parts sets an hour with 90 % uptime.

CTS solution:

The customer requested a two-station semi-automatic test system; one station to test the 'front cylinder head', and the second station to test the 'rear cylinder head.' The Sentinel I28 is the perfect test instrument for this application; featuring an easy to use and compact design, low maintenance, and precision mass flow and pressure decay test capabilities.

The operator manually loads (and unloads) parts onto a sliding tool plate and initiates the test from this position. The system provides part orientation tooling and open access guarding to maximize throughput and minimize test time. Once the test is initiated the part is automatically advanced to the test position, clamped with pneumatic cylinders, passages sealed with pneumatic plugs, and testing begins without operator intervention. Both stations can be operated simultaneously allowing one station to perform testing while the operator unloads and re-loads parts at the second station for continuous testing. The system is equipped with safety interlocks and test pass/fail status lights. Optionally this system can be equipped with an impact marker system and integrated for communication with a PLC or other external process control system.



View of Sentinel I28 Mass Flow and Pressure Decay Leak Test System