

Valve seat testing in the automotive industry



Application note A056-GP03-0716B



◆ Engine valves

Valve manufacturers check any metal to metal valve seats using pressure degradation methods. Since the new generation car engines are running on higher pressures the manufacturers are in need of new methods for leak testing to keep up with customer needs.

Bronkhorst has been developing innovative solutions throughout the years (hardware and software) to meet the top quality industrial manufacturer's high standards. Recently Bronkhorst has been successfully involved with manufacturers of valves and valve seat testing machines to implement low flow measurement as the alternative method for a better performance.



Valve seats

Application requirements

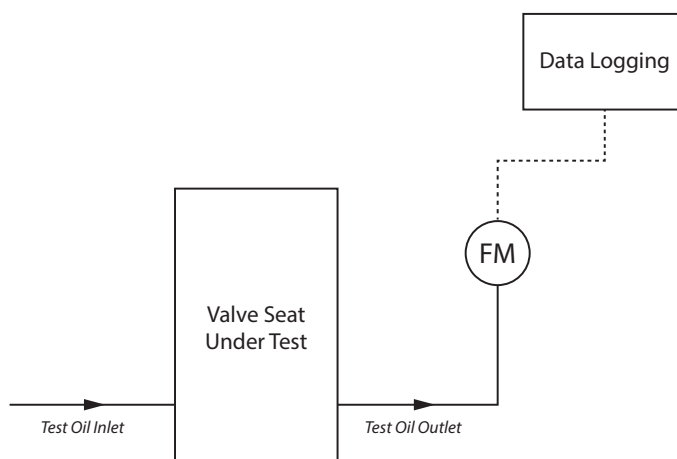
Valve manufacturers use pressure degradation to meet international leakage standards. However logging the pressure reduction over a time period is difficult to administer and can be very labour intensive.

Instead the manufacturers are looking to measure the flow across the valve seats under test. This method has to reduce testing time, improve the accuracy of the overall valve seat leak integrity and make the outputs accessible for data logging.

Important topics

- ◆ High accuracy
- ◆ Reduced testing time
- ◆ Data logging

Process solution



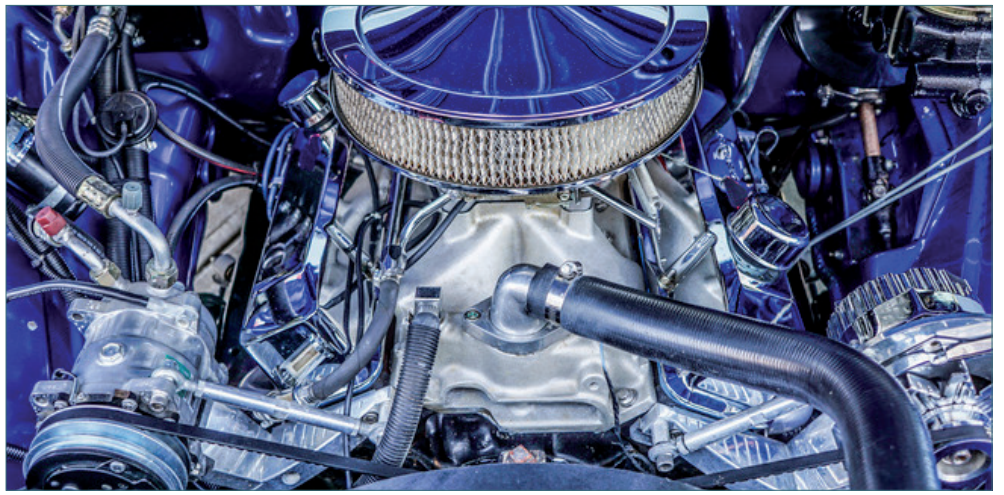
Flow scheme

Bronkhorst used the mini CORI-FLOW ML120 series in collaboration with the manufacturers to allow a measure of the very low flow leak rates. Flow rates as low as 50 milligrams per hour have easily been achieved within these very compact physical units.

The implementation of the Coriolis instruments has given the operators an instant reading for a pass or a fail, reducing production time and increasing productivity.

Moreover the valve seats quality is improved by using the very accurate (+/- 0.2% reading) ultra low-flow meters / controllers in the testing process of the manufacturers.

With the low flow measurement technology in the system the manufacturers can now use the outputs for data logging the flow profiles and the direct performance of each valve seat. This not only enables management to improve their manufacturing process continuous. It also gives them a valuable tool for reporting data to their customers and reaching a new level of confidence. ■



Recommended Products



mini CORI-FLOW Series ML120
The new Bronkhorst ML120 Coriolis Mass Flow Meters and Controllers offer highest performance at the world's lowest flow rates for both liquids and gases lowest range 50...5000 mg/h up to highest range 2...200 g/h The Coriolis sensor of the ML120 shows little to no variance over a long period of operation, thus reducing the system downtime.

- ◆ Direct mass flow measurement
- ◆ Fast response time
- ◆ High accuracy (0,2% Rd for liquids, 0,5% Rd for gases)
- ◆ Additional density and temperature outputs
- ◆ Compact design with very small internal volume
- ◆ Easy to install (low risk of gas bubble inclusion)
- ◆ Multi-range: easy on-site re-ranging via digital interface (span 1:4000)



EL-PRESS
The EL-PRESS series digital electronic pressure transducers and controllers for gases and liquids have a well-proven compact thru-flow design. The instruments include a diaphragm type piezo-resistive pressure sensor for pressure measurement/control from: lowest ranges 2 ... 100 mbar absolute, gauge or differential up to highest ranges 8 ... 400 bar absolute / gauge or 0,3 ... 15 bar dif.

- ◆ Thru-flow design
- ◆ Compact arrangement
- ◆ Stable control, even at varying process volumes
- ◆ High pressure capability up to 400 bar
- ◆ Metal sealed and/or down-ported versions available
- ◆ High accuracy and repeatability



E-8000
Bronkhorst offers Power Supply / Readout and Control Modules for use with digital Mass Flow Meters / Controllers, Pressure Meters/ Controllers and other transmitters and transducers with RS-232 communication. The E-8000 Series have one or two colour TFT displays per module for indication of measured/totalised values and a push button menu.

- ◆ Bright, wide angle, 1.8" display (TFT technology)
- ◆ User friendly operation
- ◆ Programmable alarm functions
- ◆ Fluid selection (up to 8 fluids/curves)
- ◆ Indication/operation/configuration of measured value, setpoint, totalised flow, fluid/tag number, control characteristics, fieldbus settings

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GP: General Purpose
03: Automotive

