

## BODY LEAKAGE TEST STAND - 4TH GENERATION VEHICLE CABIN AIR LEAKAGE TEST SYSTEM

An Automobile Manufacturer required a portable tester to measure the airflow leakage through a vehicle cabin in order to improve quality and reduce warranty expenses on wind, road and power-train noise complaints.

- Provides Pressure, Suction or Mass Flow Control within the Vehicle Under Test
- Highly Repeatable Results
- Multiple Models with Unique Specifications
- User-friendly Controller Software for Automated Testing



## HVAC TEST MODEL

- Vehicle HVAC Zero Pressure Test
  - Set Vehicle HVAC Blower Voltage, Control to Zero Cabin Pressure and Measure Blower Current, RPM, and Airflow
- Vehicle HVAC Blower Voltage Sweep Test
  - Configurable Test Schedule to Perform Automated Voltage Output Sweep with Current, RPM, and Airflow Measurements



## MAFS TEST SYSTEM

### CHALLENGE:

OEM's, their suppliers and aftermarket performance shops require accurate repeatable and robust solutions for setting and measuring the mass flow rate of air through the Mass Air Flow Sensors (MAFS) and other induction components.

### SOLUTION:

FLOW SYSTEMS offers three levels of systems, each utilizing state-of-the-art Sonic Nozzle technology for flow measurement. Uncertainty, automation and software functionality have been optimized for best economy at each level.

### FEATURES:

- Scalable Expansion for both Mass Flow and Uncertainty:
  - +/- 0.25% of reading
  - +/- 0.17% of reading
- Windows™ - based Software with Sophisticated Data Management and Analysis Capabilities



## THROTTLE CHAMBER AIR FLOW TEST SYSTEM

An automotive OEM parts supplier required an automated end-of-line production test system to provide an accurate metered airflow supply through a new generation of automotive engine throttle chambers. This workstation provides the final quality control checkpoint for 100 % of all manufactured units, so accuracy, repeatability, throughput and availability were critical elements in the design of the test system.



## COLD FLOW EXHAUST BACK PRESSURE TEST SYSTEM

The Cold Flow test system is an automated, Sonic Nozzle based test system that is used to test back pressure generated by automotive exhaust systems including single, dual, 2 into 1 and 1 into 2 designs. Up to 16 back pressure measurements and 4 system temperature measurements are standard.

Standard flow range is 0.25 - 200 gps (using a single path) or 0.5 to 400 gps (dual path). Custom ranges available.

### SYSTEM UNCERTAINTIES

- Flow - +/-0.25% of reading
- Back pressure - +/- 0.04% full scale (0-35 kPa)
- Temperature - +/- 0.28 deg C of reading

Windows based software with preloaded or customizable exhaust system maps for extra flexibility and detailed data management.



## AUTOMOTIVE MASS AIR FLOW SENSOR PRODUCTION

An Automotive OEM Parts Supplier required a flexible, automated, in-line production test system to provide an accurate metered airflow supply through a new generation of automotive engine Mass Air Flow Sensors. The workstation would need to power, communicate and perform final programming of the Unit-Under- Test (UUT) while concurrently setting mass flow points. Additionally, this workstation had to be fully integrated into a production line that was being simultaneously designed and installed.



## INTAKE / EXHAUST VALVE & MANIFOLD

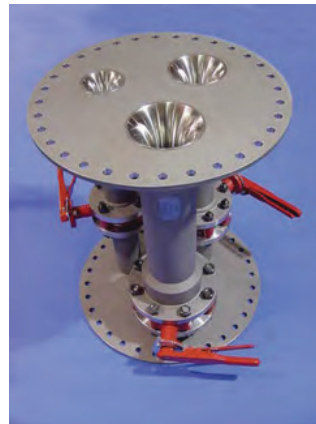
An automotive client required an airflow test stand to aid in improving engine design. Accurate air flow measurements through cylinder heads, intake and exhaust manifolds, intake air cleaner boxes, throttle bodies, exhaust piping systems, mufflers, and catalytic converters would be used to develop more efficient engines and improve computer engine models. Speed and ease in setup and use must be maintained for rapid prototyping.



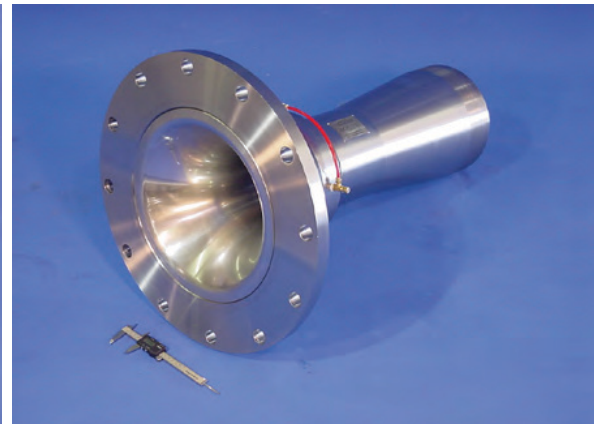
## EMISSIONS AIRFLOW METERING



Sub-Sonic Venturis



Sonic Nozzles



Sub-Sonic Venturi