



FUEL TANK DURABILITY TEST STAND

PRINCIPLE OF OPERATION

The APS Fuel Tank Durability Test Stand (Pressure Vacuum System or PVS) simulates pressure and vacuum variations that develop within vehicle fuel tank systems during vehicle operations. Typically, these variations develop due to fuel motion, tank wall motion, engine vacuum changes, and vapor pressure changes. The PVS determines the fatigue life of the fuel tank by alternately applying internal pressure and vacuum to the tank at a given rate.

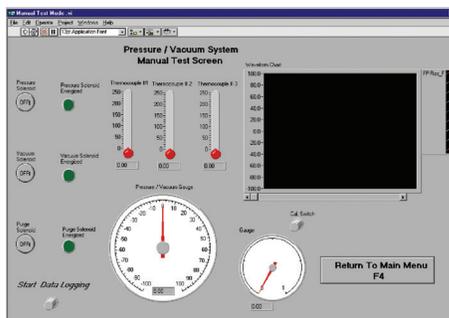
Each cycle, comprised of one pressure and one vacuum run, executes four times per minute until the total number of cycles is completed. Typical specifications are 60 inches of water pressure and 28 inches of water vacuum.

A leak test performed between cycles is completed in user-selectable intervals. This consists of pulling a vacuum to -25 inches of water column and holding it for 60 seconds. Within that time period, the vacuum decay experienced should not exceed the user-defined setting to pass.

The PVS offers both automatic and manual modes of operation. The automatic mode uses predefined settings to complete all test procedures, while the manual mode allows independent control of pressure, vacuum, purge, and leak check settings. Additionally, three thermocouple connections allow the operator to measure temperature in user-selectable areas.

USER-FRIENDLY INTERFACE

The PVS uses an industrial PC-based control system and operator interface. The software is a custom data acquisition package developed using B&R Industrial Automation Studio 4.0 for control and monitoring of all system perimeters. Running on Windows 7 Pro®, this system provides user-friendly, intuitive screen graphics for ease of system operation. The Industrial PC interfaces with B&R's X20 I/O via Ethernet Powerlink for fast read rate and response of all sensors.



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CUSTOMIZABLE VARIABLES

| | |
|------------------------------|---|
| NUMBER OF TEST CYCLES | Each test cycle is a combination of one pressure and one vacuum cycle. The total number of test cycles the PVS must go through before completing the test is adjustable. |
| PEAK PRESSURE SETTING | The peak pressure that the tank is exposed to is adjustable in inches of water column. In automatic mode, once the peak pressure is reached, the pressure solenoid is automatically de-energized and the vacuum or purge solenoid is energized. |
| PEAK VACUUM SETTING | The peak vacuum that the tank is exposed to is adjustable in inches of water column. In automatic mode, once the peak vacuum is reached, the vacuum solenoid is automatically de-energized and the pressure or purge solenoid is energized. |
| DATA LOGGING RATES | The data logging rate for all sample points is adjustable. This includes a pressure transducer reading, three thermocouple readings, and a time and date stamp. |
| PURGE TO VACUUM | The pressure level triggers a switch from purge mode to vacuum mode and is adjustable to reduce cycle times. |
| LEAK CHECK TEST | The leak check test allows you to adjust how often the leak test procedure is repeated, the vacuum level in the tank, the hold time, and the maximum allowable vacuum decay. |

GENERAL SPECIFICATIONS

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|-------------------------------------|------------------------------|
| MAXIMUM PRESSURE // | 100" H ₂ O |
| MAXIMUM VACUUM // | -100" H ₂ O |
| COMPRESSED AIR CONNECTION // | 3/8" Quick Connect |
| VACUUM CONNECTION // | 1/2" Swage Type Tube Fitting |
| FUEL TANK CONNECTION // | 1/2" Swage Type Tube Fitting |
| ENCLOSURE DIMENSIONS // | 66"H x 24"W x 24"D |
| POWER REQUIREMENTS // | 120VAC, 60 Hz , Single Phase |