

Pressure Control Valve Test
(Manufacturing Industry)



Client Background

Client is world's leading manufacturer of a braking systems for rail and commercial vehicles. Known for expertise in braking systems for trucks, buses, trailers and agricultural machinery.

Pressure-control valves are found in every hydraulic system in maintaining system pressures safely below a desired limit. Modern vehicle provides Anti-lock braking systems (ABS) helps drivers retain steering control by preventing wheels from locking up. Pressure control valve is one of the main components used in braking system. The pressure control valve consists of inlet port, outlet port, exhaust port and two solenoid valves. The pressure is applied at the inlet port and the two solenoid valves are operated simultaneously to control the pressure at the outlet port.



Challenge

Client requires an automated test system to verify the Pressure Control valve. In real scenario, the ECU operates the solenoid valves when brake is applied. The solenoid valves control the pressure at the outlet and ensures smooth braking without wheels locking up.

The objective of the test system is to perform

- a) Crank Pressure Test
- b) Residual Pressure Test
- c) Response Test
- d) Leakage Test

Engagement Journey

Started With



Extended To



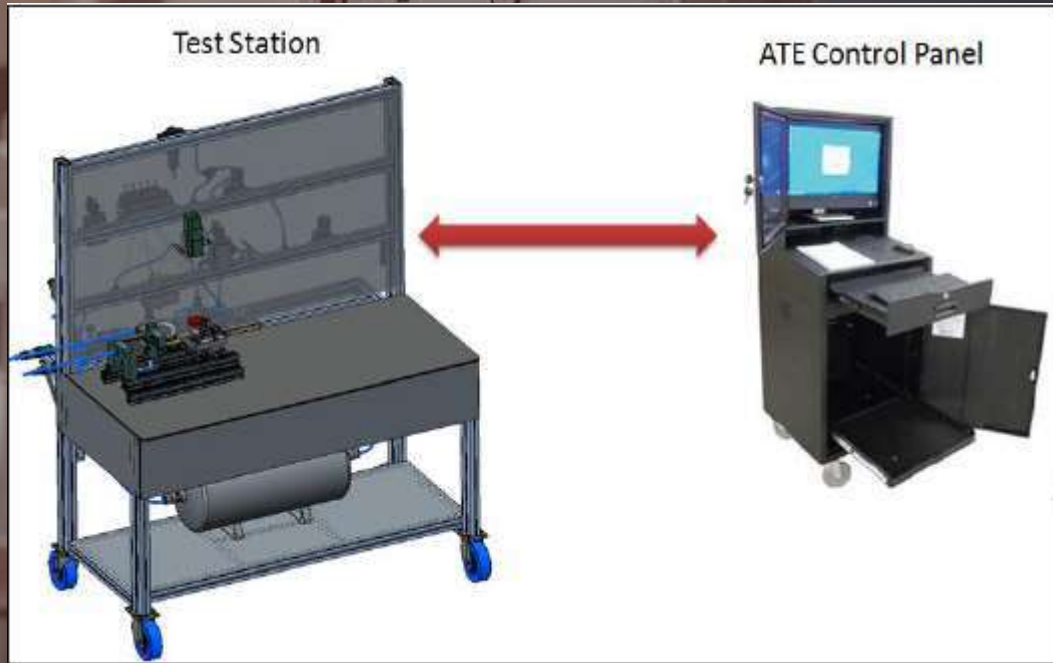
Ongoing Support



Solution

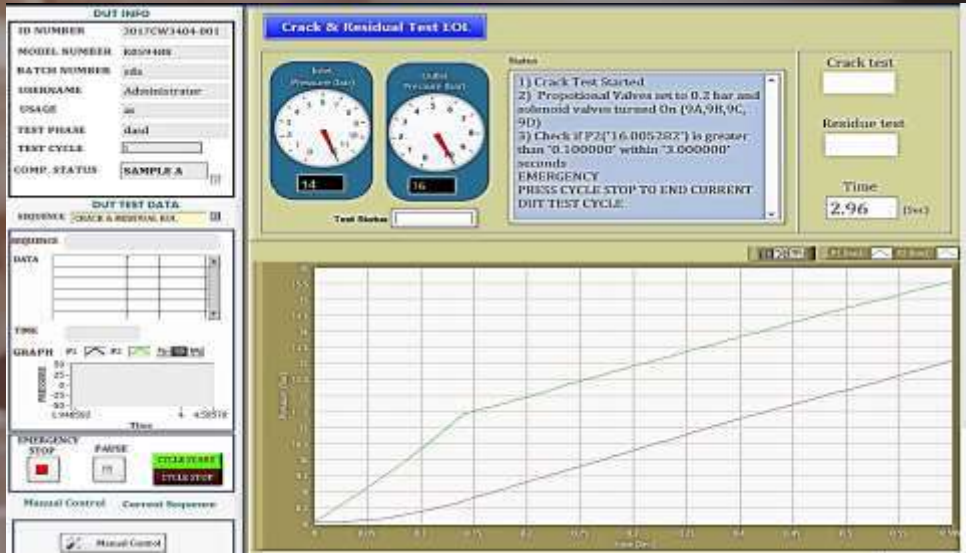
Design of data acquisition system to test and verify Pressure control valve. The data acquisition system acquires pressure sensor data at the inlet & outlet port and controls the solenoid valves. The test system is designed to operate PCV valves at either 12V or 24V through the Programmable power supply. The solenoid valve is operated by data acquisition system instead of ECU with user defined ABS test cycle.

The PCV valve unit to be tested is mounted in fixture. The application software facilitates test operator to perform any kind of the test. GUI of Host Application software are designed to provide user with the features that will improve the control and ease of operation of the test facility.



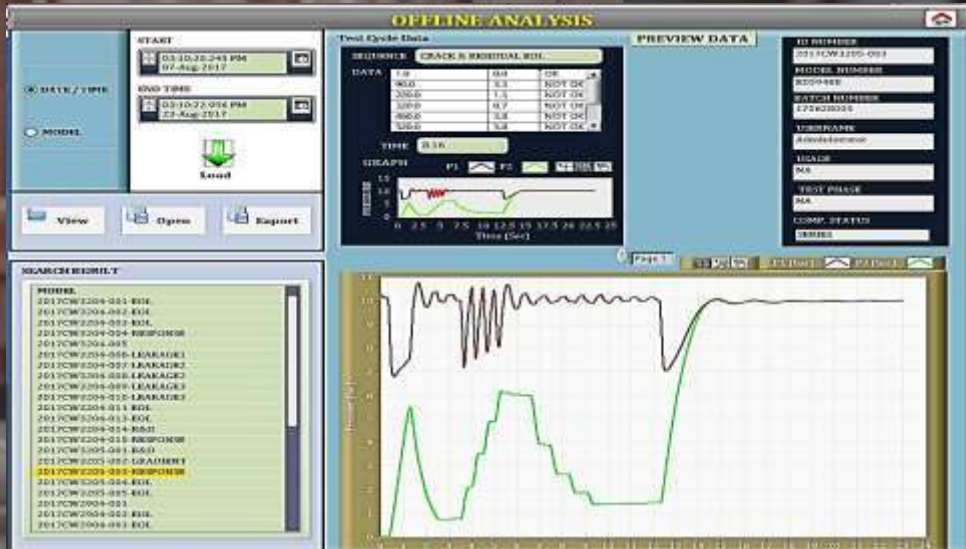
Solution

The software should allow the user to run the application in configure limits, set-points and acquisition parameters, control the system by monitoring the process parameters and alarms, Check the runtime status and operating parameters of the various signals and subsystems continuously, monitor the character/behaviour of the various analog channels on a graph, Conduct the experiments in an easy and safe automated manner, and do post experiment analysis.



Benefits

- Significantly reduces human efforts during testing
- Test data stored in memory
- Post reports can be regenerated
- Alarms Indication
- Cost and time saving solution
- Precise motion
- Accurate measurement
- Fully automated system
- Helps user to validate design





Benefits against alternatives

Implementing a fully automated data acquisition system for testing and verifying pressure control valves offers significant benefits over traditional and semi-automated methods. This system dramatically reduces human effort, minimizing the potential for human error and ensuring more precise and accurate measurements. The automated solution not only saves time and reduces costs but also enhances the overall efficiency and reliability of the testing process. By storing test data in memory and enabling post-test report generation, the system facilitates thorough analysis and validation of design, which is not as easily achievable with manual testing methods. Additionally, the integrated alarms and real-time monitoring improve safety and control, providing immediate feedback to operators. Overall, this automated system offers a comprehensive, cost-effective, and accurate solution compared to alternative testing approaches.



Value Proposition

Optimized Solutions delivers a comprehensive solution for testing pressure control valves, offering both the data acquisition system and the application software tailored to the end user's needs. This integrated solution enhances the efficiency and accuracy of the testing process, ensuring reliable data collection and precise control. By leveraging our expertise, we provide a fully automated system that not only simplifies operations but also significantly reduces testing time and costs, ultimately adding substantial value to the end user's testing capabilities.