

Impulse testing is one of the key predictions of hose life. Impulse testing involves the pressurizing or cycling of hose pressure, often times up to 140% of working pressure, at rates up to 1 to 2 cycle per second while the hose is held in either a 90° or 180° configuration. An impulse testing is a very good indicator of assembly robustness.

Controlling pressure is common in testing applications. These applications require the added value pressure control, which is much more sophisticated than what can be provided by the usual pressure relief valve or pressure regulator. The major challenge in this application is pressure cycling, where the pressure and its ramp rate needs to be controlled in a desired manner. As the oil pressure will have more dynamics where pressure spikes and hunting likely to happen, it is essential that the control system design and its component like closed loop motion controller, pressure sensor

Customer: Under NDA

Year of Commissioning of system: May 2010

Pressure rating: 700 bar

Frequency: 2 Hz

and servo valve etc. to have high response which will help in controlling the pressure in desired manner.

Closed loop control methods are now commonly used to control the pressure accurately by compensating of oil viscosity changes. Field proven PID algorithms are much more sophisticated than the limited proportional control that mechanical devices with springs can provide.

The test system consists of high pressure Hydraulic pump driven by an electric motor which supplies necessary flow of Hydraulic oil at required pressure. The output of Hydraulic pump is fed to high response precision Servo valve which modulates the input pressure and feeds it to test hose. The pressure developed in the hose is sensed by means of pressure transducer installed near to the hose pressure inlet line. The pressure sensor acts as a feedback mechanism and sends the pressure information to Delta RMC70 motion controller.

The Man Machine interface software loaded into the PC allows the user to set the desired pressure patterns and acquires the system data from various sensors for user display, plotting and report generation. The pressure pattern or command set through the Man Machine interface software will be loaded into the RMC70 motion controller for the execution.

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APPLICATION NOTE

Motion Controller in Hydraulic Hose Impulse Testing Application

The RMC70 motion controller performs closed-loop control, monitoring the data from the pressure sensor up to 2000 times per second and then operating the Servo valve which modulates the pressure and feeds it to test hose so as to match the target pressure. A servo valve is used so that small changes in valve position can instigate very precise hydraulic pressure.

The RMC70 Closed Loop Motion controller offers online tuning facility where the system gains can be changed while the system is working. In addition with pressure PID gains the RMC70 motion controller offers pressure and pressure rate feed forward gains which will help to increase the system dynamics. Online graphing and event log provides easy set up and trouble shooting of the system.

Scope of Supply

- ◆ Delta Closed loop motion controller
- ◆ High precision servo valve
- ◆ High response pressure sensor
- ◆ Data Acquisition system
- ◆ Hydraulic power pack
- ◆ Electrical Control cabinet
- ◆ Accumulators



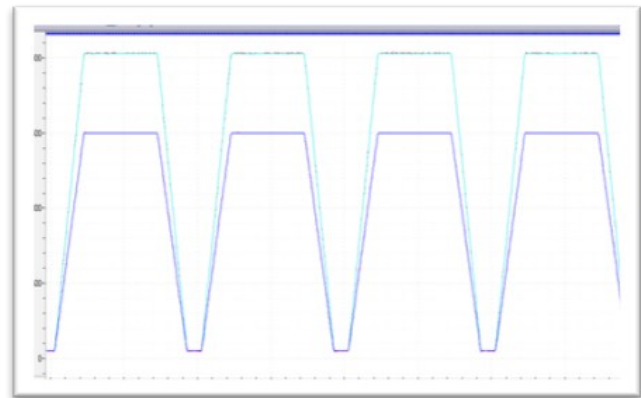
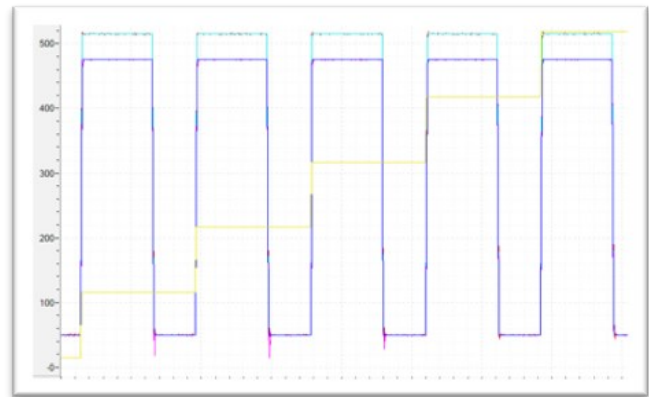
Delta RMC70 Motion Controller



Pressure Sensor



Servo Valve



Test plots captured during testing

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