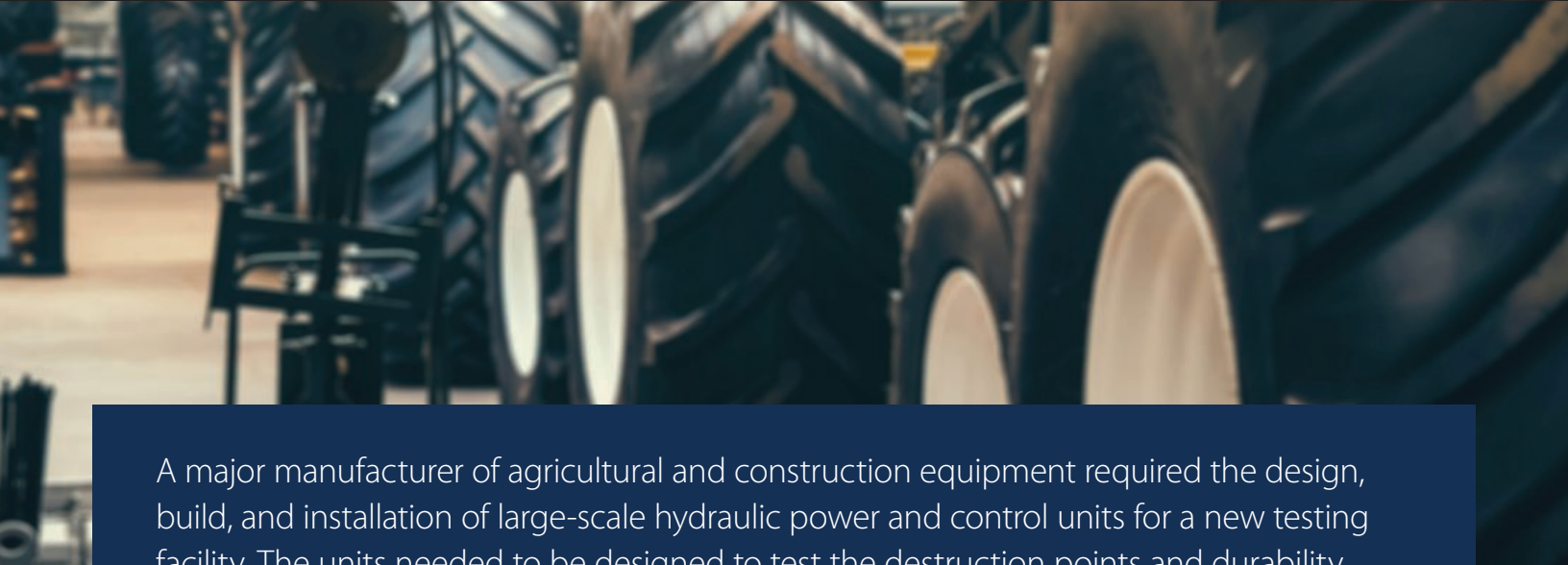


## Off-highway equipment manufacturer enables complex destructive and durability testing of large-scale hydraulic components using Sciometric custom test machines

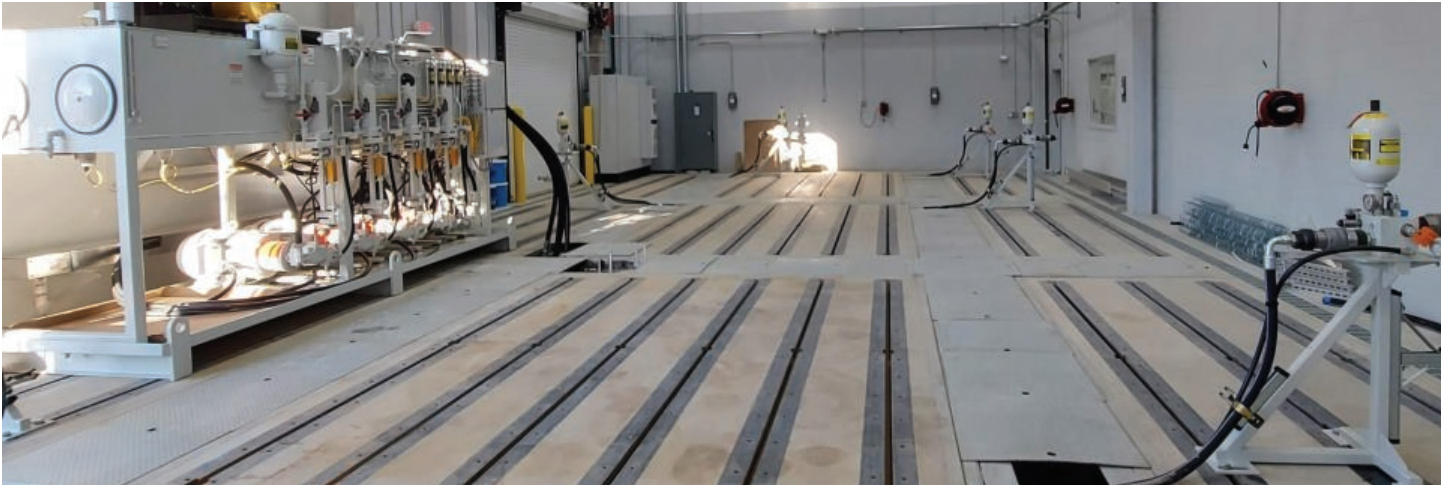


A major manufacturer of agricultural and construction equipment required the design, build, and installation of large-scale hydraulic power and control units for a new testing facility. The units needed to be designed to test the destruction points and durability of large farm and construction equipment, able to accommodate testing numerous large machines in their product line. This project required complex multitasking of hydraulics to ensure controls sequencing and to maintain the right amount of pressure throughout each test cycle, as well as interfacing with a DAQ system.

### Solution

Sciometric's ISD (Integrated Services Division) design-build team was selected to deliver these turnkey testing systems that would make up two large testing rooms in this manufacturer's new state-of-the-art facility. The complexity of these projects required a team of experts in the design and development of hydraulic testing systems, and Sciometric engineers were up to the challenge.

The multitasking of hydraulic systems, accommodating proper control capabilities, as well as size trenches and size specific piping, and the requirement to interface with a DAQ system made this project complex. Sciometric's team worked with the manufacturer's suppliers to ensure seamless project management throughout the process, alleviating the pressure on the manufacturer.



**Learn more about how we designed and built each of these hydraulic power/control units to fulfill the manufacturers' testing needs, below.**

### **Durability Testing System**

Durability testing was also of the utmost importance for this manufacturer, as they needed to determine their machines had suitable wear time in the field. Sciometric was tasked with designing a system that could accommodate thousands of test cycles on numerous machines in their product line. These cycles tested machines' durability in a wide variety of areas, to determine how elements of the machinery deteriorate, and at what pace, testing the durability of various machinery components and safety systems like seat belts and driver cabs.

This system included a hydraulic power unit, pressure head manifolds, and controls. The project specifications required this hydraulic system to be split into two functional parts; the HPU skid and the individual run system, with a custom-built controller. The system featured high pressure hydraulic hoses connecting from the manifolds to 8 separate test fixtures. The system was also designed with a controls console outside the room that would contain a PLC/control software for the hydraulic power unit—rated to NEMA 4 standards, and with room for future expansion.

A variety of sensors were placed on the machine, including accelerometers, pressure transducers, and linear distance transducers, to collect process data during the test operations, to be fed into the DAQ system.

Sciometric worked with the customer's suppliers to ensure the room trench sizing and cover plates were designed to work seamlessly with the new custom test system and ensure a neat and maintainable hydraulic system long-term





## Destructive Testing System

Destructive testing is important for heavy-machinery manufacturers, as it is essential to make sure the machines will operate safely in the field. Sciometric was tasked with designing a system that would find the point of destruction on key parts of agricultural and construction equipment, using force, etc. to test lifting arms, seat belts, and more.

Specifically, this system needed to test for:

- Vertical crush
- Horizontal crush
- Seat belt anchorage and resistance

This system included a hydraulic power unit, service manifold, and controller. A hydraulic panel containing the hydraulic valves with regulators and associated equipment to control pressure to the hydraulic cylinders was located near the test fixture to accommodate for testing.

Pressure sensors were installed on the machine to monitor hydraulic pressure to determine Press, Pull or Crush Force for the different tests. This data was then fed to the DAQ system. A separate controls console was designed to be placed outside the room, containing a PLC/control software for manufacturing operators to run and analyze the tests safely.



## Results

### **Custom hydraulic component testing machines delivered on-time and on-budget**

After months of working closely together with the customer and their suppliers, the ISD team at Sciometric designed, built, and installed two testing systems customized to the manufacturer's unique specifications and needs—on-time and on-budget.

Sciometric's custom system delivered a consistent, reliable, and safe way for the manufacturer to determine the durability and point of destruction of their products. Our engineers were able to harness the complexity of the project, delivering systems that combined the multitasking, controls, and DAQ interfacing that the manufacturer required to begin operations at their new facility with the highest operating accuracy and efficiency.

### **Key Features:**

- One system performing multiple hydraulic functions
- Built to accommodate thousands of test cycles on each machine
- Built to interface with a DAQ system
- Hassle-free project completion for the manufacturer with turnkey system delivered by Sciometric team, from design, to commissioning, and after-sales support

Contact Sciometric to see how our ISD team can help you on your next design-build project, or upgrade/retrofit on the production line.

**Learn more about Sciometric ISD capabilities: [www.sciometric.com/isd](http://www.sciometric.com/isd) or email [inquiries@sciometric.com](mailto:inquiries@sciometric.com)**



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