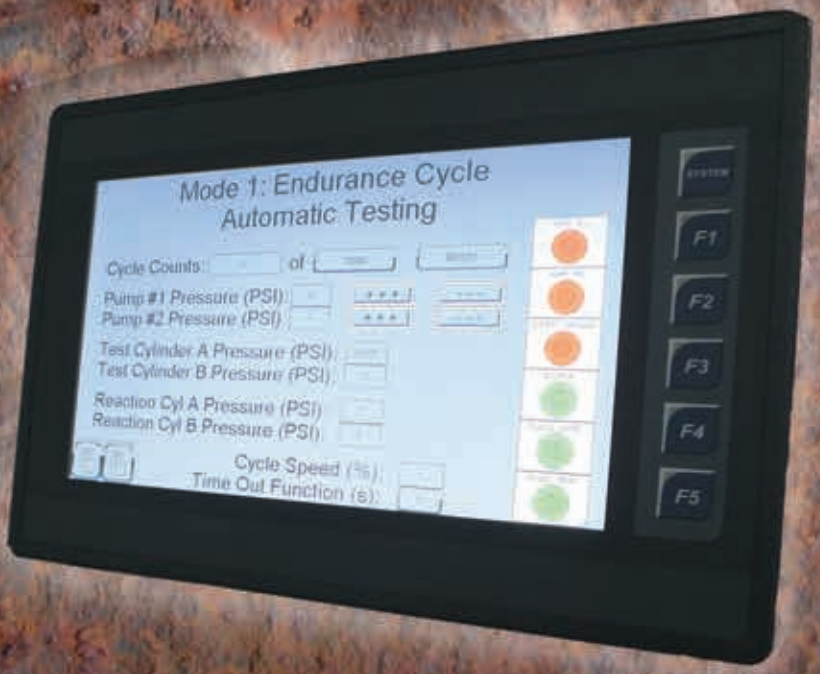
RAM
INDUSTRIES INC.

HYDRAULIC TESTING SERVICES



EXPERIENCE • EXPERTISE • QUALITY • SERVICE

HYDRAULIC TESTING SERVICES

RAM Industries recognizes that hydraulic cylinders perform a critical function in the effective and efficient operation of OEM equipment. As your partner and expert in hydraulic cylinder design and manufacturing, RAM offers sophisticated testing services to assist companies in verifying their cylinder design and performance specifications.

Testing services are made available through RAM's state-of-the-art onsite cylinder testing equipment – capable of evaluating your R&D or prototype cylinders, as well as current production run cylinder models. Buckling, friction, endurance (cycle and impulse), drift and hydraulic proof pressure tests can be performed on a wide range of cylinder designs and sizes based on specific customer test parameters. Tests can also be conducted using SAE Standard testing methodologies (as specified in J1334, J1335, J1336).

RAM's knowledgeable engineering team will work directly with your company to ensure cylinder test setup, monitoring and reporting is based on your custom testing requirements.

FULLY CUSTOMIZED TESTING PARAMETERS

- Various testing pressures (min/max, operating)
- Wide range of mechanical loads
- Oil temperature specification
- Partial or full stroke endurance testing
- Drift tests at various stages of testing

CYLINDER TYPES

- **Cylinder Designs:** Welded, tie rod, wirelock, NFPA
- **All Applications:** Agriculture, industrial, mining, mobile equipment, forestry, material handling, transportation, oil & gas, construction, etc.
- **Cylinder Mounts:** Any cylinder mount is accepted; RAM provides custom fixturing for testing
- **Shafts:** Chrome, nitro, stainless, hollow

MAXIMUM TECHNICAL RANGE OF TEST CAPABILITIES

- **Testing Flow Capacity:** 60 gpm (227 lpm)
- **Hydraulic Testing Pressure:** 5,000 psi (345 bar)
- **Mechanical Load Capability:** 100,000 lbs (45,360 kg)
- **Cylinder Stroke:** up to 48" (122 cm)
- **Bore Diameter:** up to 9"
- **Oil Temperature Range:** 122–230 °F (50–110 °C)

TESTING SERVICES INCLUDE:

- Hydraulic cylinder testing and reporting service
- Test setup, including cylinder fixturing and sample test run data collection if requested
- Test monitoring including visual, photographs (at setup, check points, and final inspection)
- Customized test parameters and test schematic
- 24/7 endurance testing for time-sensitive requirements

Column Load (Buckling) Test

This test evaluates the column load capacity of a hydraulic cylinder. The test is conducted with the cylinder base side blocked and a column load applied to the fully extended cylinder. The cylinder must be able to withstand the specified loads as applied incrementally and gradually to the cylinder, while measuring radial deflection.

Cylinder Friction Test

The cylinder friction test evaluates the internal cylinder friction. This simple test measures the minimum pressure required to move the cylinder at mid-stroke. This test allows you to compare frictional forces of different seal configurations and diametrical clearances to evaluate the cylinder performance.

Cycle (Endurance) Test

This test is the most demanding test for the cylinder evaluation. Its purpose is to evaluate durability by simulating the life cycle of the cylinder. This test can be defined as continuing until the total number of cycles is reached or can run until a malfunction occurs. It is conducted by stroking the cylinder at partial or full stroke under specified pressure to simulate cylinder application. Test parameters include: velocity, pressure, stroke length, number of cycles, cycle rate, partial or full stroke, and oil temperature range.

Impulse Endurance Test

The impulse endurance test primarily evaluates the static seal performance of the cylinder. It also provides fatigue testing of the body and other mechanical components. The impulse endurance testing is conducted by fixing the cylinder into position and pressure cycling each side alternately at a minimum frequency of 1 Hz. This test is conducted at specified pressure, up to 5000 psi, until the specified number of cycles has been reached or a malfunction occurs.

Drift Test

The drift test evaluates the cylinder for internal and external leakage. It can be completed between the stages of the Cycle (Endurance) Test or Impulse Endurance Test, or at any time specified by the customer. The condition of the seals and internal cylinder components are evaluated with this test.

Hydraulic Proof Pressure Test

This test confirms the integrity of the internal and external components of the cylinder. The cylinder is checked for internal and external leakage at the end of the stroke in both the extended and retracted position at a specified proof pressure and for a specified period of time. This test is normally conducted at a specified pressure of 120% to 200% above the working pressure. RAM Industries has the capability to test up to a maximum of 10,000 PSI.

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