



## X-Series Engine Dynamometers

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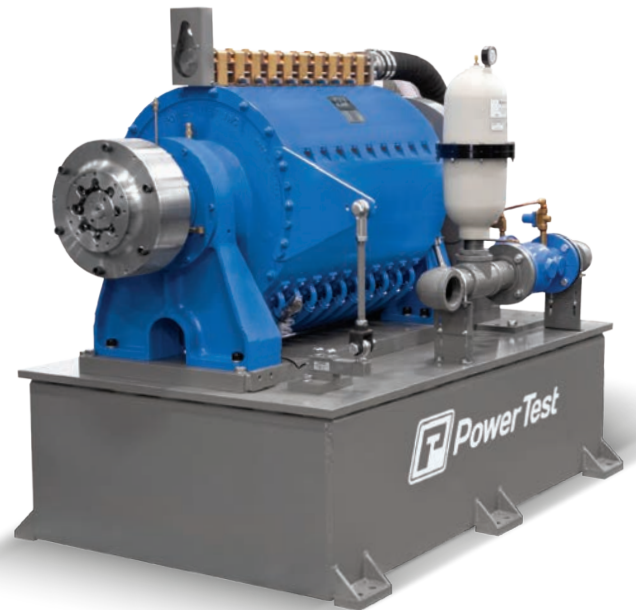
# X-Series Engine Dynamometers

Power Test's X-Series water brake dynamometers excel at testing wide ranges of power inputs with one dynamometer. Each of these fixed base dynamometers may be used for continuous duty endurance testing, as well as for transient tests. Proven durability and performance assure the dynamometer you purchase today will faithfully perform the tests of tomorrow.

The 45X, 35X and 50X Series of dynamometers are modeled after each other in design, sharing common operation and construction principles, but differing in size, capacities, operating speeds, materials, and inertia.

Each X-Series dynamometer features a trunnion-mounted, fixed base design. These dynamometers provide equal load capability in either direction of rotation. Power Test dynamometers are constructed of multiple absorption sections offering the flexibility to test prime movers of widely varying outputs with the same dynamometer. By closing off selected sections, the absorption characteristics are able to be closely matched to the engine or motor's capability.

The through shaft design allows either end of the dynamometer to be driven and for dynamometer mounted starting systems to be attached and used. Although supplied to provide long term service, internationally available bearings and seals are used in every X-Series dynamometer and are located in easy-to-access cartridges to allow field service without the need for dynamometer removal or specialty tools.



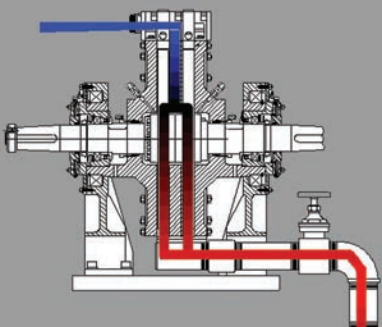
45X10 4,500 HP Dynamometer



50X02 1,000 HP Dynamometer

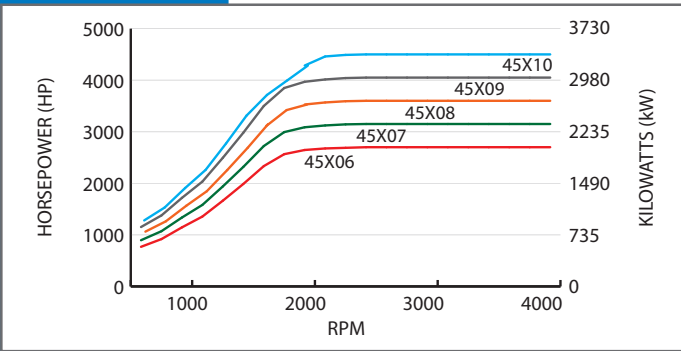
Each of the X-Series dynamometers may be operated for extended periods of time without water flow. This feature ensures that this dynamometer can perform flawlessly even on the warmest of days without fear of damaging the absorber. Power Test dynamometers do not rely upon thermal or pressure sensors to provide dynamometer protection.

Inlet control allows for very low, minimal loads to be applied for high speed, low torque testing. This method of control also minimizes the amount of water consumed as compared to other styles of dynamometers.



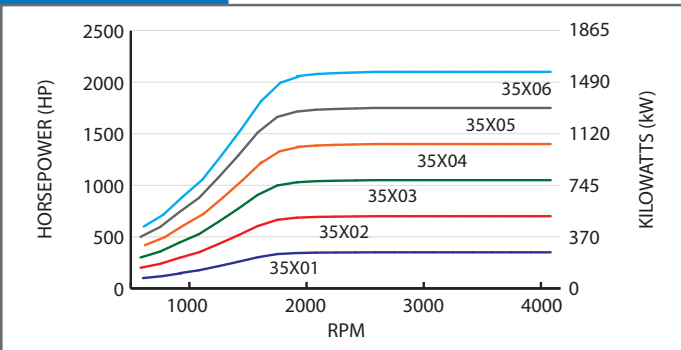
## How A Water Brake Dynamometer Works

In the Power Test water brake dynamometer, water flow proportional to desired applied load is used to create resistance to the engine or motor. A controlled flow of water through the inlet manifold is directed at the center of the rotor in each absorption section. This water is then expelled towards the outside of the dynamometer body by centrifugal force. As it is directed outward, the water is accelerated into pockets on the stationary stator plates where it is decelerated. The continual acceleration and deceleration causes the applied load to the input device. Through this transfer of energy, the water is heated and discharged.



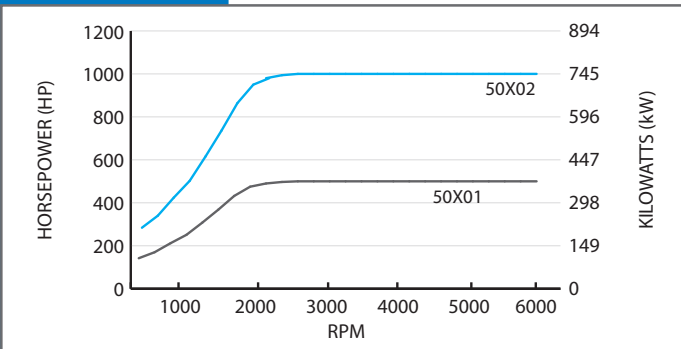
### 45X Series

- For testing on-highway, off-highway, and marine applications.
- Power ranges from 200-4,500 HP.
- Speeds to 4,000 rpm.
- May be used in tandem applications.



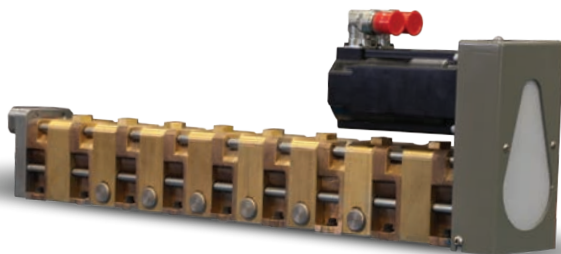
### 35X Series

- For testing the majority of diesel engines.
- Power ranges from 100-2,100 HP.
- Speeds to 4,000 rpm.



### 50X Series

- For testing electric motors, gasoline, and higher speed diesel applications.
- Power ranges from 50-1000 HP.
- Speeds to 6,000 rpm.
- Alloy construction for reduced inertia.



Inlet Manifold

## High Performance or Basic Controls

Each X-Series water brake dynamometer can be produced in two configurations.

For demanding test applications and automation, a servo operated inlet manifold is incorporated into the dynamometer to facilitate rapid load change. The servo inlet manifold is designed for direct interface into our PowerNet data acquisition and control package, but may also be adapted to a wide range of available control devices.

For less demanding applications, a water supply control valve may be used with our standard inlet manifold.

## PowerNet - The Future of Engine Testing

The PowerNet system sets new benchmarks for dynamometer control by incorporating the features that were exclusive to electric dynamometers, while providing the reduced inertia, enhanced stability, cost effectiveness, and durability found in traditional Power Test water brake designs.

PowerNet is a two computer system incorporating the latest in data acquisition technology. The system is comprised of the Commander Computer, a modified desktop PC, and the WorkStation, a touch-screen operated unit housed in a rugged industrial enclosure. Both systems communicate to each other through an Ethernet cable, providing rapid data transfer speeds, wiring simplicity, and LAN connections.

PowerNet instrumentation is designed specifically for your engine dynamometer. It uses a Windows®-based software package to provide consistent, automated test results. PowerNet allows either manually or automatically controlled operation, warm-up, break-in, and power tests.

PowerNet's ability to run automatically at predetermined speeds and loads allows the operator to step effortlessly through all testing operations. Automatic mode gives the operator a choice between running a pre-configured test pattern or entering direct numeric setpoints for speed, torque, or power. Manual control is achieved through the use of slider bars. This system gives the operator a quick, effective, and accurate means of controlling test conditions, while providing rapid feedback in an easy-to-comprehend visual format. Accurate test results can be obtained regardless of the operator's skill level.

### ***Designed for the Future of Engine Testing***

PowerNet virtually eliminates instrumentation failures by starting with a standard computer platform and ensuring that the technology offered is easily understood, serviced, and updated. Many of the components used in our systems can be sourced from major computer outlets both domestically and internationally.

Designed with the future of testing in mind, Power Test's staff of engineers, programmers, and electronics technicians are dedicated to making sure that our system is on the cutting edge of technology as engines and test requirements change.

## A Complete Testing Solution

Power Test provides a full range of test cell support equipment and accessories, including engine carts, air start systems, drive shafts, resilient couplings, engine adapters, water recirculation and cooling systems, fuel measurement systems, smoke opacity meters, additional temperature and pressure sensors, and analog input channels. Whether you are dealing with new installation or looking to repair, upgrade, or replace an existing dynamometer, Power Test has a solution.



## Power Test, Your Full Service Dynamometer Manufacturer

Power Test can provide facility design and installation of every dynamometer we sell. We also offer a complete line of support equipment, including ventilation systems, exhaust systems, auxiliary cooling systems, and water recirculation systems.

Contact your Power Test representative or visit our web site at [www.pwrtst.com](http://www.pwrtst.com) for more information.

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