SuperFlow
A POWER TEST BRAND

SF-Black Widow
Performance Engine Dynamometer

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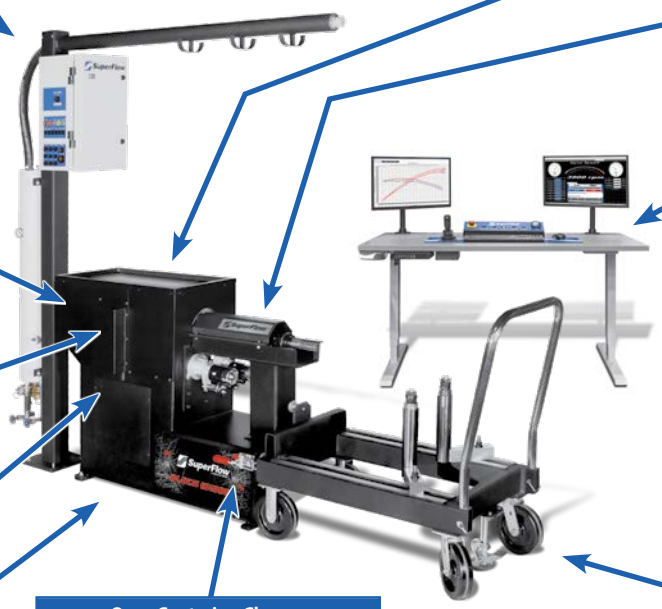
The SF-Black Widow engine dyno from SuperFlow® is unmatched in its combination of low speed torque capacity and high-speed power capacity. This means the SF-Black Widow is equally matched for diesel performance and Pro Mod drag applications. The stainless-steel absorber will last for years due to its high resistance to cavitation. Automated tests make operation simple and repeatable with prompts that guide you from start to finish.

With a speed range from 1,300 rpm all the way to 11,000 rpm (intermittent), the SF-Black Widow handles anything from high-torque performance and marine engines to high-revving drag engines. This versatile water brake dynamometer is rated for 3,000 hp (2,237 kW) and 2,500 lb-ft (3390 Nm) of torque. Our engineers have meticulously implemented measures to ensure the SF-Black Widow possesses the renowned accuracy, consistency, and control characteristic of all SuperFlow dynamometers.

Actual products may differ from images shown

SF-Black Widow

Features and Standard Configuration



Integrated Boom
Routes water from the engine back to the cooling tower and keeps transducer cables organized

Tool and Ignition Storage
Keep necessary items close at hand

Dynamometer Drive Shaft & Guard
High speed dampened drive shaft with constant velocity (CV) joints

Operator's Workstation
Includes two LCD monitors. Control console features a new combined touch encoder, a redesigned throttle with easier manual actuation, and optional auto actuation. Configurable, power-adjustable height ergonomic desk with built-in wire routing and power.

WinDyn 5
Powerful user-configurable data systems with 500+ channels to measure and analyze data. Versatile solution equipped with standardized tests for quick testing. User-customizable test profile editor with pre-loaded profiles and channel editor and data analysis.

Docking Cart
Versatile engine docking cart for quick engine exchanges. Stainless-steel runners for easy adjustments. Design is adaptable to various engine types and has a removal handle

Sensor Box
Sensor box is boom mounted, keeping it out of the way but still within reach

Cooling Tower
Thermostatically controlled engine cooling tower to maintain constant temperatures for continuous testing capabilities and increased repeatability

Starters
Integrated dual high torque starters and ring gear - Start your engines with the dyno

Power Absorber
High capacity water brake absorber with stainless steel construction - incredible combination of low speed torque capacity and high speed power absorption capacity

Load Cell
Load cell is temperature compensated for increased accuracy and repeatability

Base Frame
Industrial grade, heavy-duty base frame for extreme durability

Over-Centering Clamps
Securely connect docking cart and base-frame

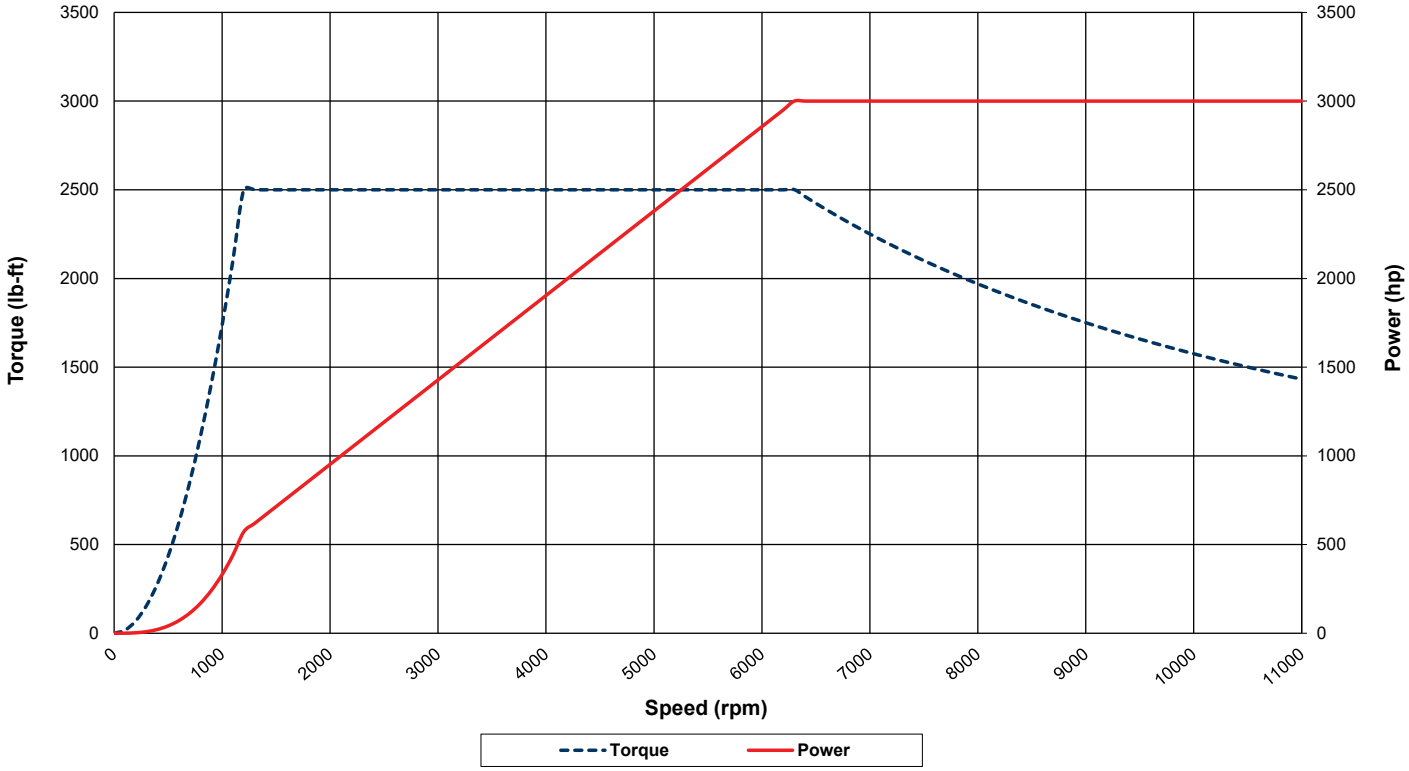
The SF-Black Widow is built with integrated starters which eliminate the need for bell housing or engine mounted starter. A special compliant driveshaft that absorbs the torsional vibrations of the engine allows for coupling to the dynamometer directly to the engine's crankshaft or flywheel. The driveshaft's 4.5 in (114 mm) constant velocity (CV) joints ensure smooth power transfer.

Precise control of the water equates to precise closed-loop load and speed control of the engine. SuperFlow designed an exclusive dual water valve strategy for the SF-Black Widow. Stainless steel absorber inlet and outlet valves with high speed stepper motors control the water flow in and out the Black Widow's absorber manifolds. The dual valve control allows the water brake to respond quickly to abrupt load changes such as nitrous oxide "hit" or steep rise in engine volumetric efficiency (VE) from a turbo or supercharger and it increases overall system torque absorbing capacity.

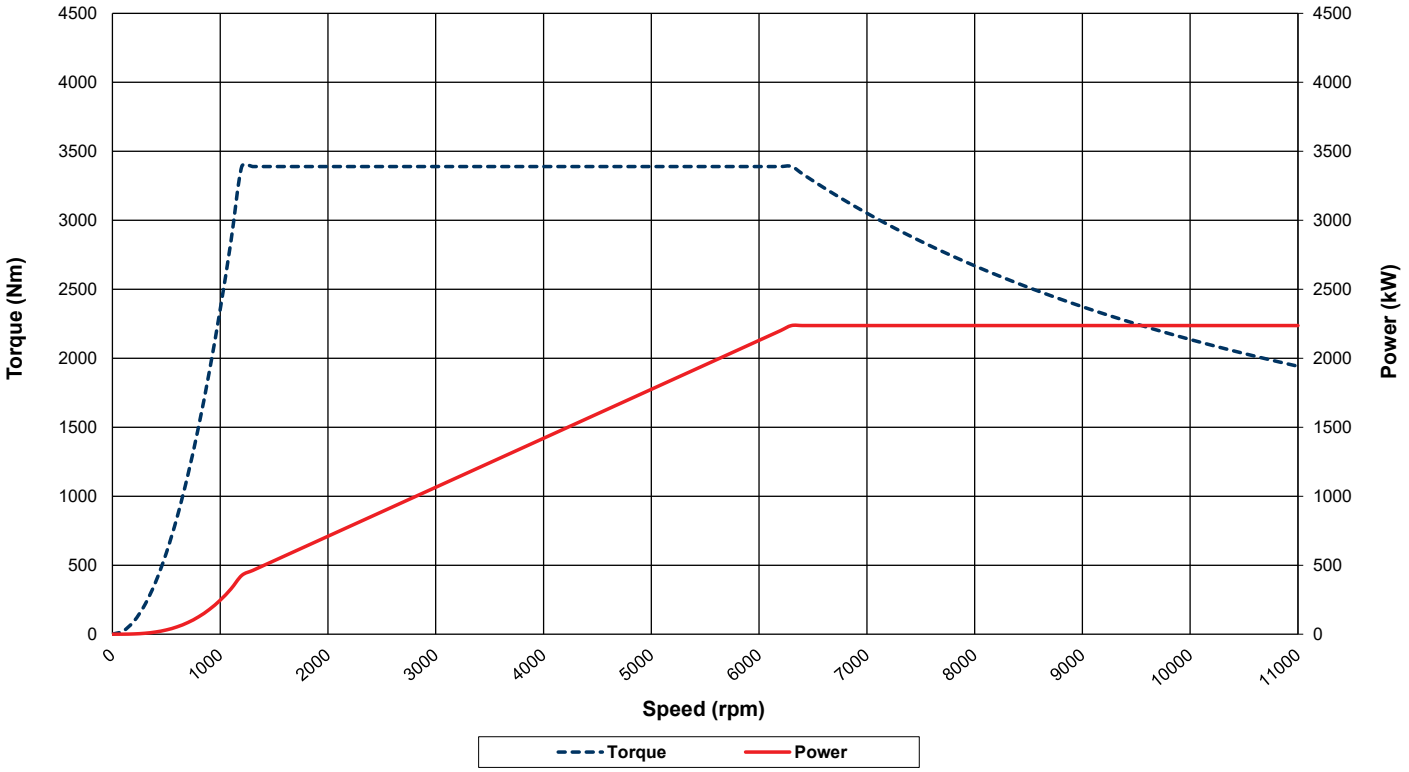
Features:

- Complete engine testing system includes dynamometer stand, engine docking cart, operator station & console, throttle control, thermostatically controlled engine cooling column, WinDyn data acquisition and software, Dynamometer PC, multiple monitors and color printer
- Durable industrial grade construction and components for reliable trouble-free operation
- Test stand located large tool tray also convenient area to mount ECM/ignition systems
- Automated tests for simple operation and extreme repeatability
- Uni-directional operation - with unique cross vented rotor design for equal capacity in either direction
- Boom system to mount sensor box, manage sensor cables, weather station and mount the cooling column neatly in the test cell
- 500 data acquisition channels – user configurable to meet any application
- Pre-scripted standard tests like acceleration sweeps, step and steady state tests, and engine break-in test cycles
- Modular sensor box with expansion panel system to easily add sensors as testing needs change over the life of the dyno

SF-Black Widow (US Customary)



SF-Black Widow (S.I.)



Specifications

Power and Torque

- Absorber Type: Water brake, uni-directional
- Maximum Speed: 11,000 rpm *intermittent
- Horsepower Capacity: 3,000+ hp (2,237+ kW)
- Torque Capacity: 2,500+ lb-ft (3,390+ Nm)

Water Requirements

- 10 gallons per minute (gpm) for each 100 hp (75.5 kW) produced by the engine at a minimum pressure of 35* psi (2.4 bar)

  *application specific

Typical Shipping Dimensions and Weights:

- 64 x 87 x 62 in (163 x 221 x 157 cm)
- 2,280 lb (1,034 kg)

Stand Sensor Compliment Includes:

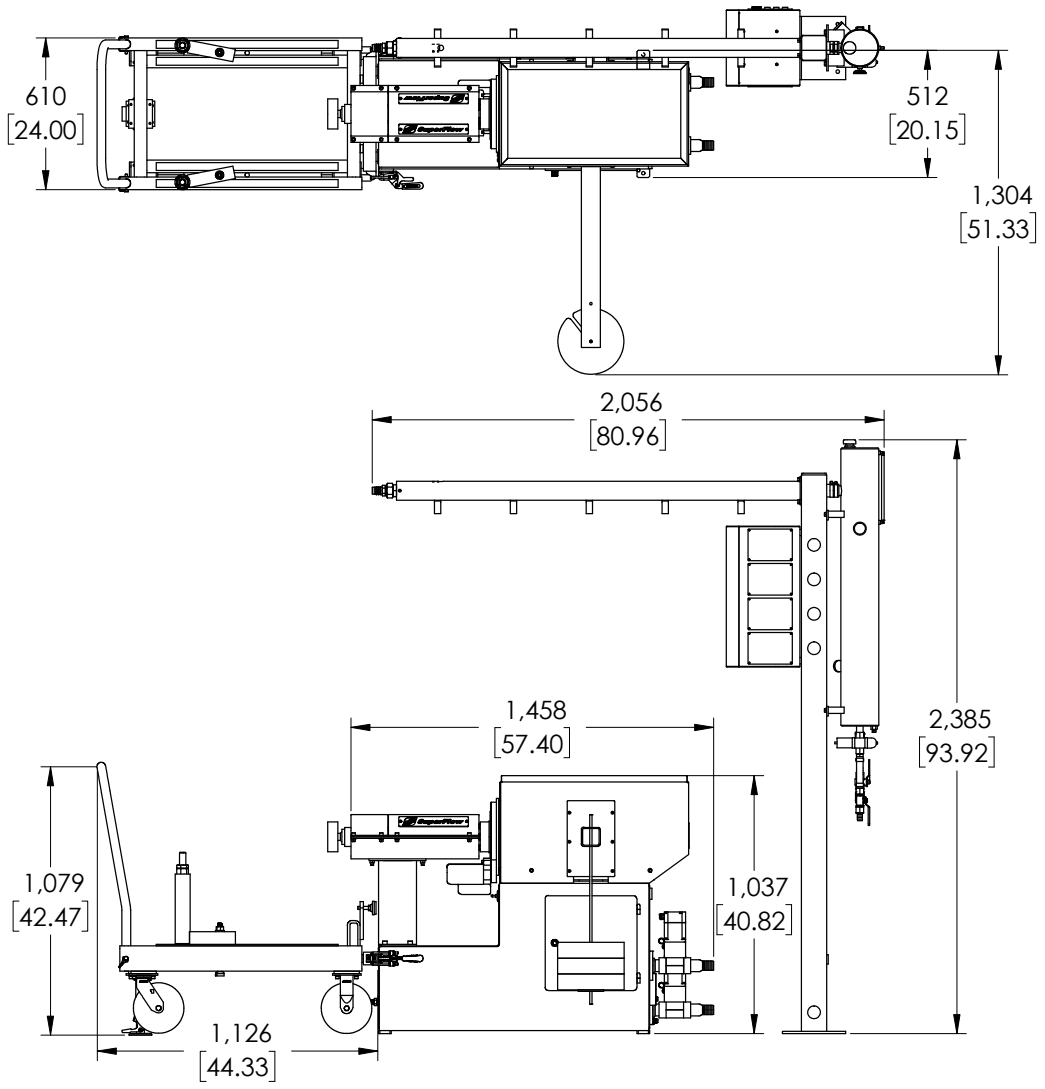
- **Temperature:**
  - (1) One: (16) Sixteen-channel thermocouple panel
  - (12) Twelve: Closed tip thermocouples, .125 in (.3175 cm) diameter x 4 in (101 mm) long probe with 5 ft. (152 cm) lead, 0° to 2,000°F (-17.8° - 1,093°C)
  - (12) Twelve: Swagelock fittings
  - (12) Twelve: 10 ft (3.048 m) extension cables
- **Pressure:**
  - (1) One: (10) Ten-Channel pressure panel
  - (3) Three: Transducers included standard (-15 to 150 psi, 1-10 bar)
- **Air / Fuel:**
  - (2) Two: Pre-configured analog inputs (Lambda/ AFR)
- **Fuel Flow:**
  - (2) Two: Fuel flow measurement turbines 2-80 gallons (7.5- 302 l) per hour (Gasoline) each

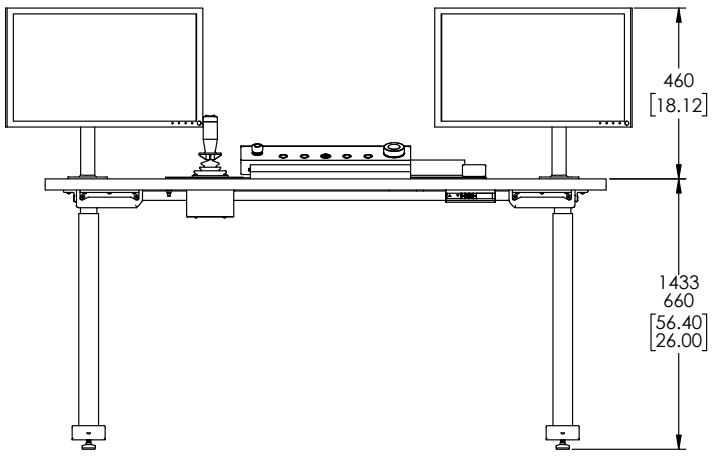
WinDyn® 5 Data Acquisition System

SuperFlow's advanced WinDyn 5 Data Acquisition System provides a wealth of pre-defined tests along with a user-friendly test editor to easily write custom tests. Standard tests can be performed and at part or wide open throttle. These include: controlled acceleration, controlled deceleration, step, steady-state, and track lap, break-in and mapping.

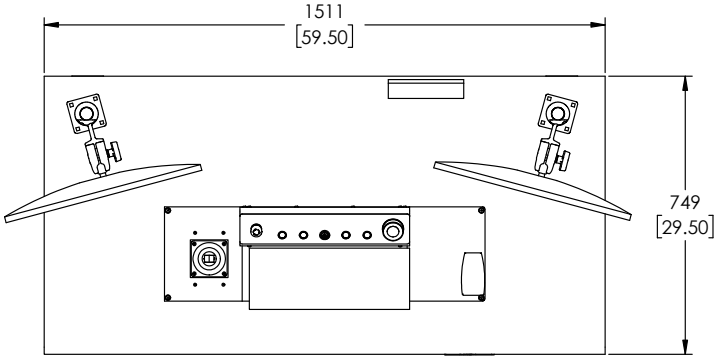
SF-Black Widow - Tower - Engine Cart

mm
[in]





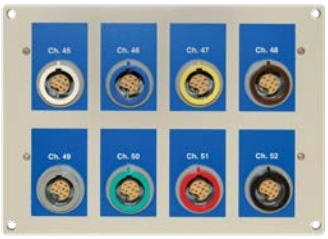
Control Console Table



Typical Product Options

Air Flow Measurement Turbine

Volumetric air flow measurement device in 4,6,9 in (10, 15, 23 cm) models available. Ceiling mount kit available (shown above).



Analog Panel

8 channel analog panel to integrate exhaust analyzers, lambda sensors and other devices with analog outputs. Select 0-1V, 0-5V, 0-10V, 0-20V or 0-30V

Blow-By-Sensor

Measures the volumetric flow of crankcase blow-by. Two sizes available: 0.4 to 16 ACFM and .25 to 10 ACFM. Select either analog or frequency output.

Optional Short Engine Mounts

Additional Docking Cart

Extra docking cart to save time between engine tests by pre-staging engines. Includes removable handle and two adjustable front engine supports. Engine mounts sold separately. Standard size is shown. Long version and HD Industrial engine size carts also available.

Additional CV Joints

Allows splined slip CV joint to stay with extra cart and/or flywheel and crank adaptors for faster unit under test changes.

AFR/LAMDA Sensor Kit

AFR/LAMDA sensor kits available. Kits available in 2-16 channels. Bosch LSU 4.2, 4.9 and OEM grade NTK type sensors available.

Flywheel and Crankshaft Adaptors

Adapts engine flywheel or crankshaft to dynamometer driveshaft CV joint. Universal flywheel adaptor with patterns to fit most domestic flywheel patterns. GM "Prostock" inertia crank adaptor and direct to crank buttons available in early Chevy, small ford and blank versions.

Engine Oil Cooler

Designed for oil cooling during endurance tests. Multi-pass water to oil heat exchanger with adjustable temperature control. Plumbing water and oil hoses not included.

Sensor Expansion Panels

The modular sensor box allows for additional sensor expansion panels. Pressure, analog and temperature panels are available. Extra pressure transducers are sold separately.

Fuel Canister

Designed to measure fuel consumption of fuel injected engines. Mid-flow unit available in 20 – 720 lb/hr (9 - 327 kg/hr). High-flow unit available in 30 -1070 lb/hr (14 - 485 kg/hr). Available for gas and alcohol.

Throttle Actuator

Electric throttle control provides automated testing from dynamometer control system. Upgrade from standard cable operated throttle. Linear actuator with push button span adjustment. High-speed rotary actuator also available.

2,000 hp (1,491 kW) Gasoline Fuel System

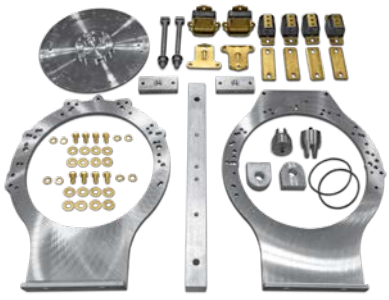
High Performance fuel pump - 1,200 lb/hr (545 kg/hr) /filter combo with two high flow fuel pressure regulators, accumulator tank, pressure bypass and vibration isolated mounting bracket.

Throttle Box Joystick Control

Provides joystick control of throttle actuator switchable from manual and automated control.

Pressurized Cooling Columns

CT-700 Pressurized Cooling Column integrates seamlessly with boom assembly. Standard temperature range from 160° F - 230° F (71° C - 110° C). Rated for continuous duty testing up to 700 HP (522 kW). CT-300 hp (223.7 kW) version available for small engine testing.



Complete US Domestic V8 Engine Mount Kit

Includes multi-fit rear engine mounts, polyurethane engine and vibration mounts, and a universal flywheel adaptor. Kit components available individually and some may be used universally with other engines.

SuperFlow®, a Power Test®, LLC brand, is an industry leader in the design, manufacture and sales of dynamometers, specialized test systems, and related data acquisition and control systems. Power Test, LLC, offers a comprehensive portfolio of brands including SuperFlow®, Axiline® Precision Products, Hicklin® Engineering, Stuska® Dynamometer, Torque Converter Rebuilding Systems (TCRS™), Power Test, Taylor Dyno™, and Dyne Systems™ that have long been the standard bearer for quality in the testing industry. As your equipment testing partner for innovative products and comprehensive life-cycle services and support, we are dedicated to delivering an exceptional experience by offering specialized solutions to Make Your Testing Easy.