Actual products may differ from images shown

SF-Black Widow EX2 Performance Engine Dynamometer

The SF-Black Widow EX2 is the highest-capacity extreme performance engine dynamometer on the market. Engineered for unmatched versatility, it can be utilized in both dual-absorber and single-absorber setups to accommodate everything from small-block performance engines to Pro Mod engines to large tractor engines.

Unrivaled in its balance of low-speed torque capacity and high-speed power capability, the SF-Black Widow EX2 features special-grade stainless steel absorbers that resist cavitation for exceptional durability and long service life. Automated test sequences streamline operation with intuitive, step-by-step prompts, ensuring consistent, repeatable results every time.

With an absorber speed range up to 12,000 RPM, this versatile water brake dynamometer delivers up to 6,000 hp (4,470 kW) and 5,000 lb-ft (6,780 Nm) of torque. Backed by SuperFlow's engineering excellence, the SF-Black Widow EX2 delivers the precision, consistency, and control that define the next generation of extreme performance testing.

SF-Black Widow EX2

Features and Standard Configuration

Sensor Box

Sensor box is pedestal or wall mounted, keeping it out of the way but still within reach. Optional boom mount available.

Engine Starter System

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

Power Absorber

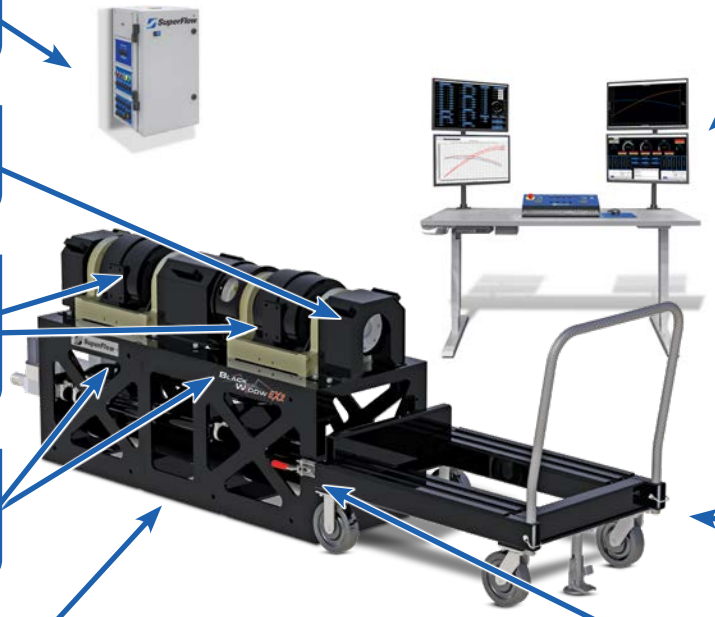
High-capacity dual water brake absorbers with stainless steel construction - incredible combination of low-speed torque capacity and high-speed power absorption capacity.

Load Cell

Twin load cells with temperature compensation for maximum accuracy and repeatability; torque calibration arm and precision weights included.

Base Frame

Industrial-grade, heavy-duty base frame designed for superior rigidity, durability, high torque capacity, and precise torque measurement.



Operator's Workstation

Includes four 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 System

Versatile engine docking cart designed for quick engine exchanges, featuring stainless-steel runners for smooth adjustments. The adaptable design accommodates a wide range of engine types and includes a removable handle. Multiple cart configurations are available.

Over-Centering Clamps

Securely connect docking cart and base-frame

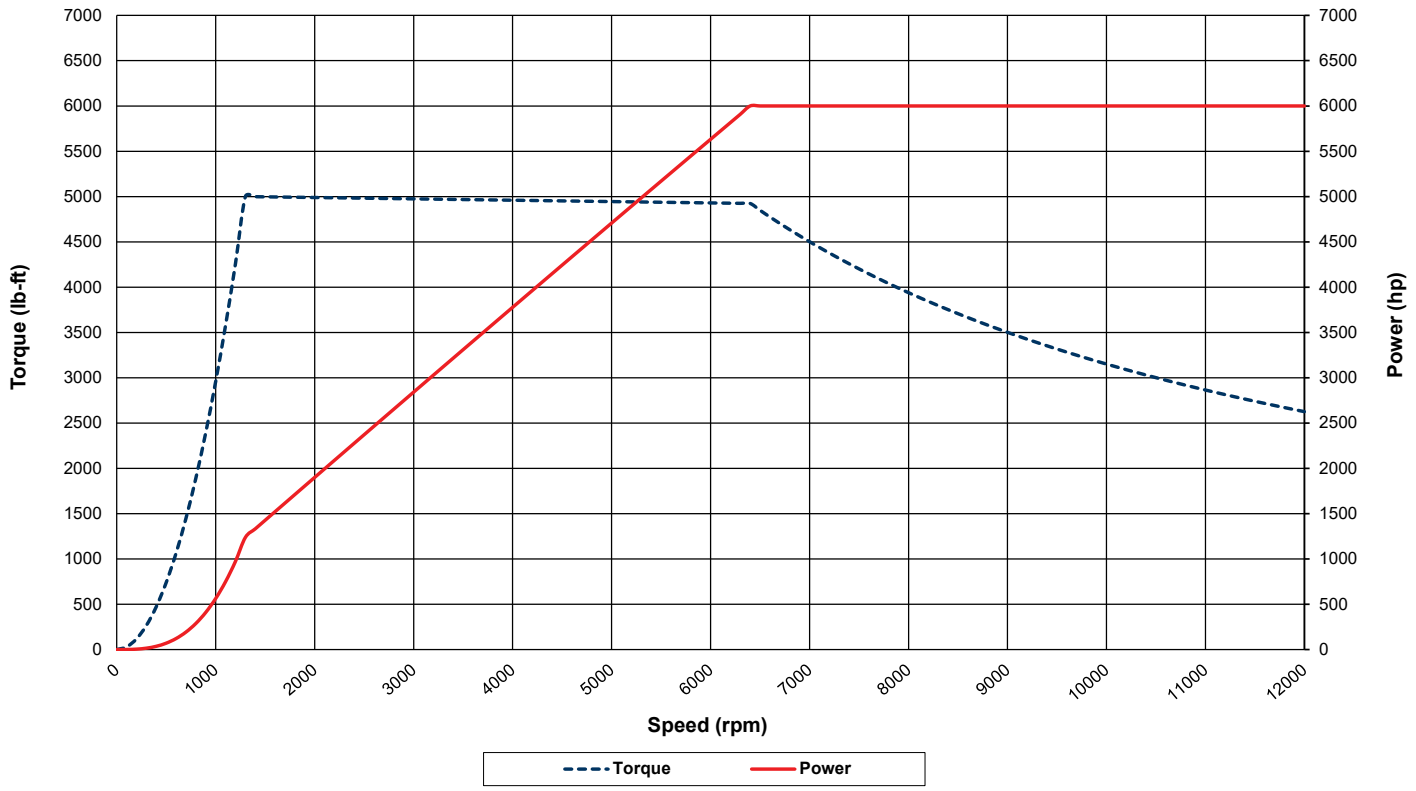
The SF-Black Widow EX2 is built with integrated starters, eliminating the need for a bell housing or engine-mounted starter. Precise control of the water equates to precise closed-loop load and speed control of the engine. SuperFlow designed an exclusive quad water valve strategy for the SF-Black Widow EX2. Each of the four servo valves is designed with two valves per absorber, allowing the water brakes to respond quickly to abrupt load changes—such as a nitrous oxide "hit" or a steep rise in engine volumetric efficiency (VE) from a turbo or supercharger—while increasing overall system torque absorption. Independent valves also allow the dyno to operate as a single or dual absorber setup, and one absorber can be easily disconnected to control large engines with rapid, precise adjustments. Stainless steel absorber inlet and outlet valves with high-speed stepper motors control the water flow in and out of the Black Widow's absorber manifolds, ensuring unmatched responsiveness and performance.

Features:

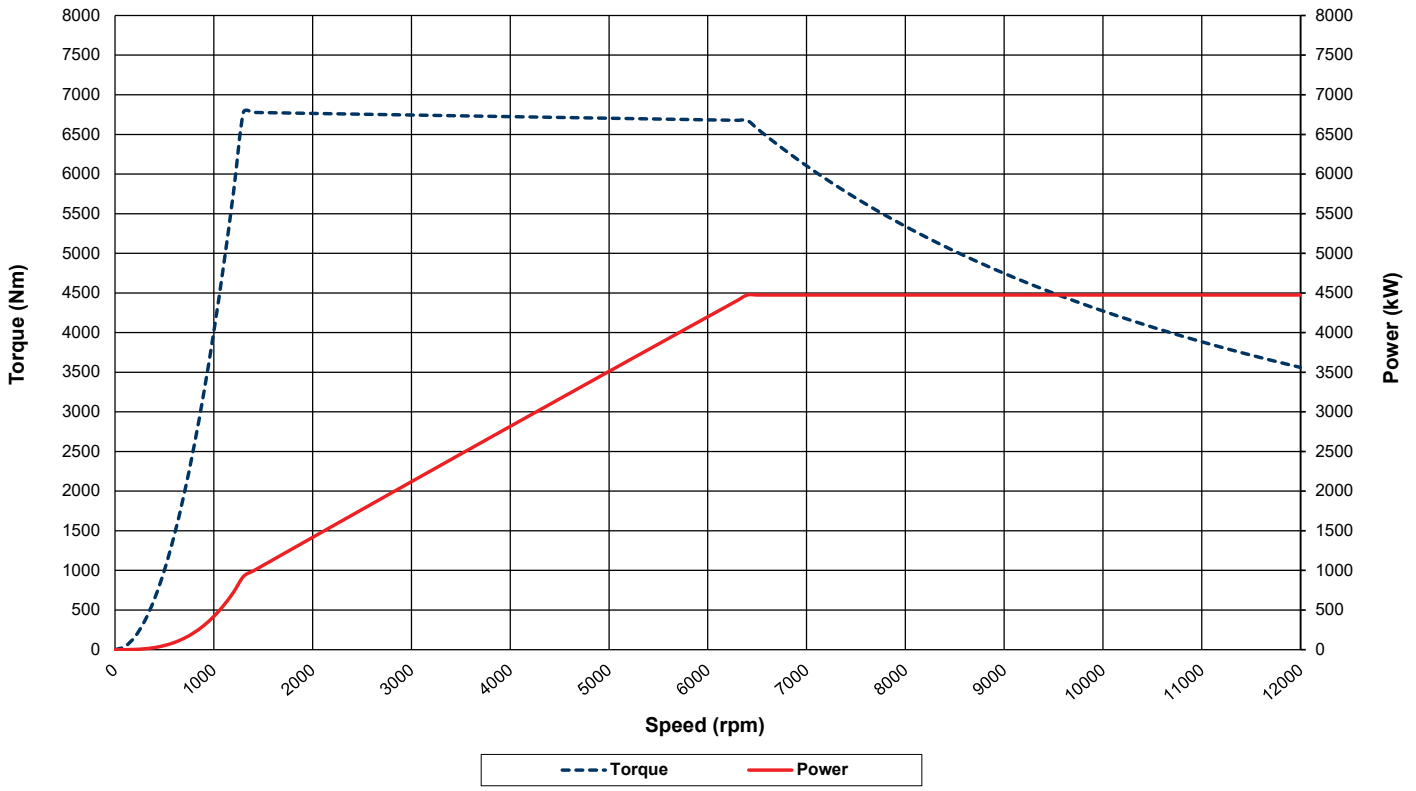
- Innovative dual/single absorber design – Industry leading configuration that allows operation in both dual-absorber and single-absorber setups, accommodating everything from from small-block performance engines to Pro Mod engines to large tractor engines, with the flexibility to decouple the second absorber for smaller engine testing.
- Gearbox options are available for increased torque capacity at lower speeds.
- Durable industrial grade construction and components for reliable trouble-free operation
- Automated tests for simple operation and extreme repeatability
- Optional 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

Absorber Capacity

SF-Black Widow EX2 (US Customary)



SF-Black Widow EX2 (S.I.)



Specifications

Power and Torque

- Absorber Type: Water brake, uni-directional
- Maximum Speed: 12,000 rpm *intermittent
- Horsepower Capacity: 6,000+ hp (4,470 kW)
- Torque Capacity: 5,000+ lb-ft (6,780 Nm)

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)

WinDyn5 Data Acquisition System

SuperFlow's advanced WinDyn5 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.

Water Circuit

Overview

The SF-Black Widow EX2 water circuit is a high-performance water system designed to support black widow absorbers applications. This system utilizes dual supply and dual sump pumps to ensure continuous water flow, with variable frequency drives (VFDs) for precision control.

System Components

Supply Pumps

- Quantity: (2) Two (Parallel Operation)
- Flow Rate: 300 gpm (1,136 lpm) each
- Pressure Requirement: Variable 35-50 psi (2.4 - 3.44 bar)
- Motor Rating: 15 hp (11.2 kW) 460V/230V 60Hz 3-Phase)
- Pump Type: End-suction centrifugal pump (or equivalent, rated for continuous-duty service) 3 in. Flanged Connections
- Drive Control: Each supply pump is equipped with a Variable Frequency Drive (VFD) for:
  - Precise flow and pressure control
  - Energy efficiency
  - Soft start/stop to reduce mechanical wear

Sump Pumps

- Quantity: (2) Two
- Flow Rate: 350 gpm (1,325 lpm) each
- Motor Rating: 7.5 hp (5.6 kW) (460V/230V 60Hz 3-Phase)
- Pump Type: Submersible or vertical sump pump (as application dictates) 3 in. NPTF
- Control: Basic float switch operation with optional VFDs for throttling and efficiency

Sump Tank

- Minimum Capacity: 150 gal (568 l)
- Minimum Height: 36 inches (91.44 cm)
- Material: Corrosion-resistant (e.g., polyethylene, fiberglass, or stainless steel depending on fluid compatibility)

System Design Considerations

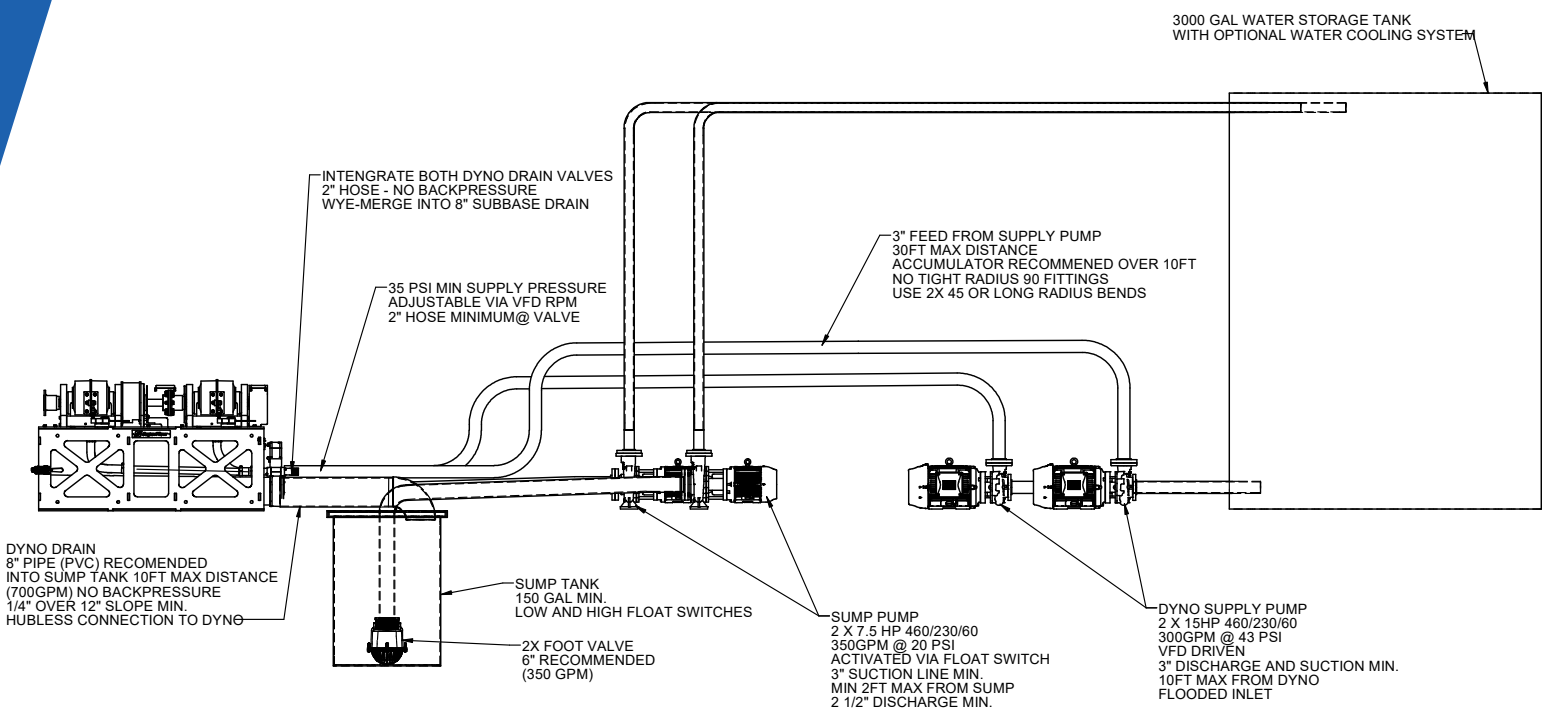
Piping & Plumbing

- Material: PVC, CPVC, stainless steel, or other pressure-rated materials suitable for system fluid
- Pressure Rating: All plumbing must be rated for at least 60 psi (4 bar) to accommodate pump output and surge
- Pipe Sizing:
  - » Sized for 300 gpm (1,136 lpm) flow with velocity kept within 5-10 fps (1.5-3 mps) to minimize pressure drop
  - » Properly supported and anchored to reduce vibration
  - » Pipe runs should be kept as short and as straight as possible
- Valves:
  - » Isolation valves on all pumps for maintenance
  - » Check valves to prevent backflow
  - » Pressure relief valves where necessary

Electrical & Controls

- Power Requirements:
  - » (2) Two - 15 hp (11.3kW) supply pumps 460V 20amp per motor (two 30amp breakers) OR 230V 40amp per motor (two 50amp breakers)
  - » (2) Two - 7.5 hp (5.6kW) sump pumps 460V 10amp per motor (two 15amp breakers) OR 230V 20amp per motor (two 30amp breakers)
- Control Panel:
  - » Integrated motor starters or VFDs
  - » HMI or local interface for manual control and status display
  - » Alarm indications for pump fault, high/low level, and overpressure

Water Circuit



Control Console Table

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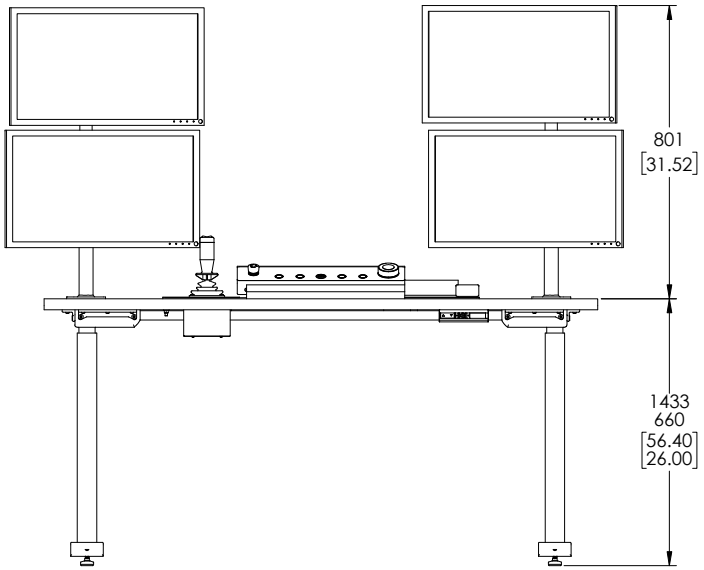

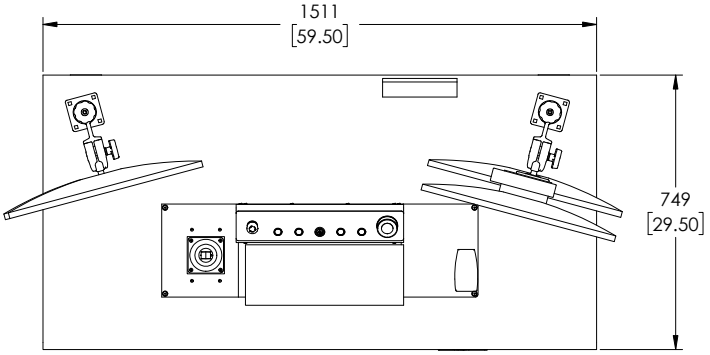

SF-Black Widow EX2 - Tower - Engine Cart

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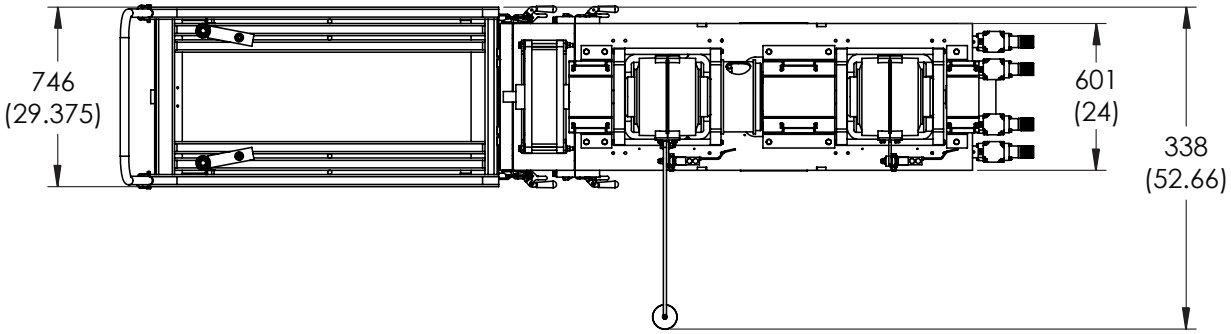
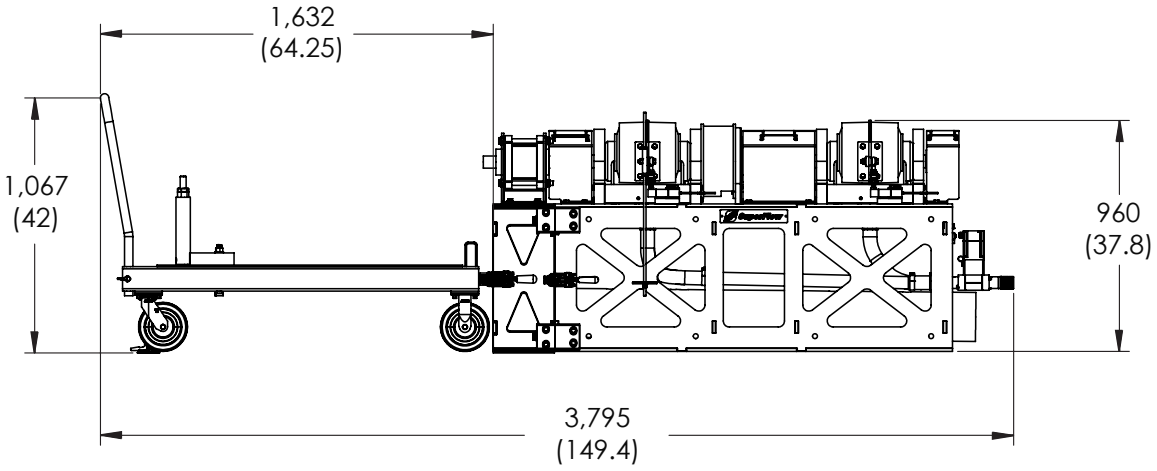




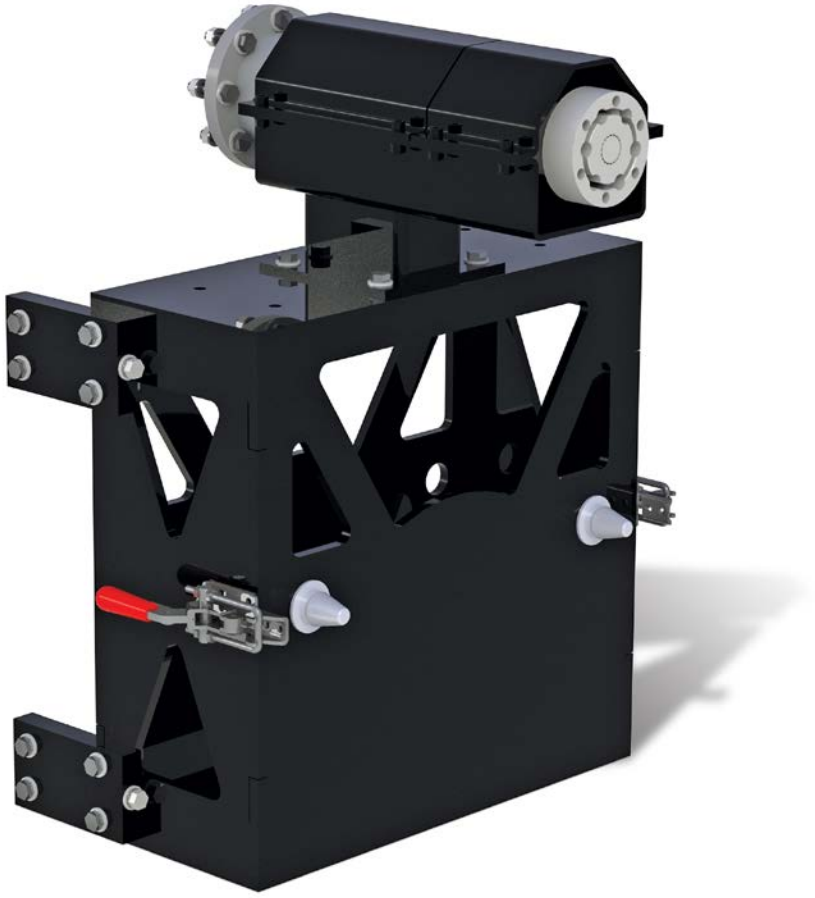
NOTE: Shown With Cart and Gearbox Options

Engine Connection Options

Drive Shaft

High-speed dynamometer drive shaft assembly featuring constant velocity (CV) joints and a driveshaft safety guard.

- Precision-balanced and dampened shaft designed for smooth, high-speed operation.
- Ideal for testing high-performance U.S. domestic V8 engines when using the SF-Black Widow EX2 in a single-brake configuration.
- Enables use of standard SuperFlow engine docking carts, engine mounts, flywheel and crankshaft adapters for straightforward integration.



Spline Coupling

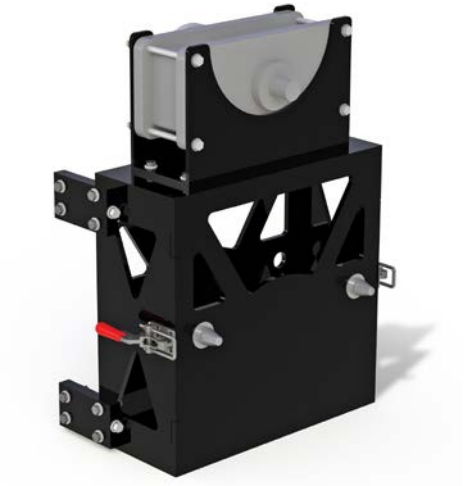
Straight-shaft splined engine coupling to the SF Black Widow EX2 dynamometer system. Designed for extreme horsepower, high-speed applications.

- Ideal for Pro Mod, Top Alcohol, and other forced-induction, high-output racing engines.
- 2 in (5 cm) 4340 case-hardened splined shaft.
- Standard crank adapters for Big Block Chevrolet and MOPAR Hemi engines; other applications quoted by request.

Gear Box

Boosts torque handling at low RPMs with a high-strength speed-increasing gearbox. Perfect for Pro Stock diesel and pulling tractor engine testing.

- Heavy-duty gearbox with dyno connection and mounting brackets.
- Engine connection supplied by customer.



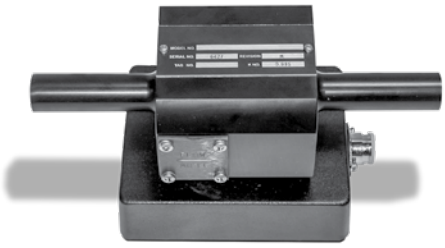
Typical Product Options

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).

Turbo Speed Sensor

Turbo speed sensor kit adds Turbo speed measurement to WinDyn includes input cable.



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

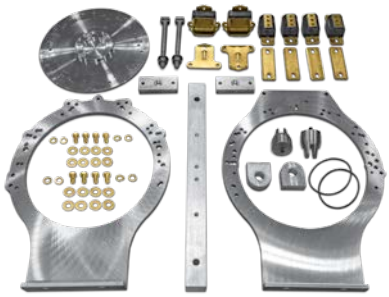
High Performance fuel pump - 1,200 lb/hr (545 kg/hr) /filter combo with two high flow fuel pressure regulators, accumulator tank, pressure bypass and vibration isolated mounting bracket.

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.