

AutoDyn

Chassis Dynamometer for High Performance 2WD and AWD Vehicles

*Run acceleration, steady speed, ECM calibration and track lap tests.
Capacities to 1,500 hp (1118 kW) and 200 mph (320 kph).*

- Control all aspects of the test from the front seat of the test vehicle with SuperFlow's handheld Commander.
- Precisely map fuel injection curves, troubleshoot driveability issues and target drivetrain frictional losses by testing with computer controlled load.
- Test rapidly and easily with built-in tests in SuperFlow's WinDyn software. Easily customize tests or create your own sophisticated test cycles.
- Count on extreme accuracy due to built-in compensation for bearing and aerodynamic losses.
- Enjoy years of trouble-free testing because virtually all SuperFlow electronics are inside the Sensor Box, separate from the personal computer. Your data is safe in the sensor box if the personal computer happens to crash.



SuperFlow

Computerized Engine and Vehicle Test Systems

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Website **www.superflow.com**

Test Confidently and Accurately with an AutoDyn



Rugged modular design.

SuperFlow's all-wheel-drive AutoDyn chassis dyno is the most complete, robust, feature-rich chassis dyno on the market. This top-of-the-line

model adjusts for wheelbases from 92 to 150 inches. AutoDyn all-wheel-drive models synchronize the wheel speeds with a driveshaft that connects the front and rear rollsets. This feature allows you to test ECU-equipped vehicles that go into limp mode if all four wheels aren't turning at the same speed. Each rollset has its own torque-measuring system so you can measure the torque and power split for each axle.

AutoDyNs are designed to last for years, requiring very little maintenance. All models can be upgraded incrementally so you can upgrade them as your needs grow. All AutoDyn's are available with several different roll width and spacing configurations to support either wide track widths or narrow shop installations and almost anything in between.

Measure engine speed!

SuperFlow data acquisition systems are available with five different types of Engine Speed sensing methods. Inductive Pickups work well, but there are conditions where inductive pickups work poorly, if at all.

By offering these five methods, SuperFlow ensures that your results are accurate, repeatable and trustworthy:

- Inductive with adjustable Gain
- Direct coil
- Low Voltage
- Infrared optical
- Calculated method



Direct coil



Infrared optical



Inductive with adjustable gain



Tachometer wire

Perform Inertia or Loaded Tests

SuperFlow AutoDyNs are available as an inertia testing unit, or with eddy-current power absorbers, and with many optional data-gathering electronics and sensors. Choose either inertia or absorber-equipped versions of AutoDyn. Each has its own optimum application. Let a SuperFlow sales engineer help you choose the right one for your testing needs.

Inertia Testing... Quick and accurate

- Lower cost
- Quick tests
- Full-throttle acceleration testing only
- Highly accurate and repeatable

An inertia acceleration test is a simple way to evaluate a vehicle's power and torque characteristics under wide-open-throttle conditions. To start the test, the vehicle is brought up to an initial test speed. The throttle is opened all the way and the engine accelerates against the roll inertia to the end test speed. You can perform inertia dynamometer tests on all AutoDyn models.

SuperFlow's inertia dynamometers provide accurate power and torque numbers, because each dynamometer's inertial mass is precisely measured before it

leaves the factory. SuperFlow also measures parasitics; losses caused by bearing friction and windage, and uses this data in the calculations. The inertial mass and the parasitic values are key factors in the equation SuperFlow uses to calculate torque and power.



SuperFlow technicians measure inertia, aerodynamic and friction losses on AWD AutoDyn.

Loaded Testing... A more comprehensive look at performance

- Performs variable-rate acceleration, step, and steady-speed testing at all throttle settings.
- Precise load control at all speeds.
- More meaningful sensor data.
- Performs track and road simulation test cycles.

The AutoDyn measures torque based on the signal from a strain gauge. The temperature-compensating strain gauge is precisely calibrated and provides very accurate and repeatable results. The power absorber and strain gauge allow you to test vehicles under operator or computer-controlled load. You can even measure the torque split between front and rear axles on AWD models.

AutoDyn and WinDyn software make it easy to test at varying rates of acceleration, deceleration, steady speeds, and part- or full-throttle through multiple gears. You can simulate circle track, road course, and high-performance street applications. You can reproduce real-world driving conditions. Test at many different controlled rates of acceleration, and get great resolution in your test data. Perform steady-state and drive cycle tests at full- or part-throttle.

Loaded testing lets you perform tests over a longer period of time and thus produces more meaningful data. This ensures that vehicle and engine components are up-to-temperature and gives the sensors time to stabilize to produce usable readings. It is difficult to get much meaningful sensor data (fuel consumption, temperatures, pressures, emissions, etc.) from a rapid inertia acceleration test due to the short duration.

You can perform a step test to precisely measure power at different engine speeds or roll (vehicle) speeds. During a step test, the engine is held at each speed, then allowed to change to the next step. This eliminates the power needed for acceleration and reflects a steady-state power. You get a more stable look at air



AutoDyn torque link with strain gauge.

Run tests with a power absorber and you can...

- Evaluate exhaust systems, lubricants, performance coatings, pinion angle alignment, axle bearings, rear ends, and u-joints.
- Quantify tire, clutch, or torque converter slip. Study the effects these components have on power and torque without expensive and time-consuming track testing.
- Perform short-term durability tests on engine and driveline components.
- Simulate hills of varying grades, constant or variable speeds, and around town stoplight-to-stoplight driving. Ensure that the vehicle is driveable at various throttle settings, in a variety of circumstances.
- Locate and troubleshoot engine and driveline problems.
- Run track lap simulations.

and fuel flows, lambda, exhaust temperatures, various pressures, and many other characteristics of the vehicle under test. You can even simulate an entire race with lap cycles and pit stops.

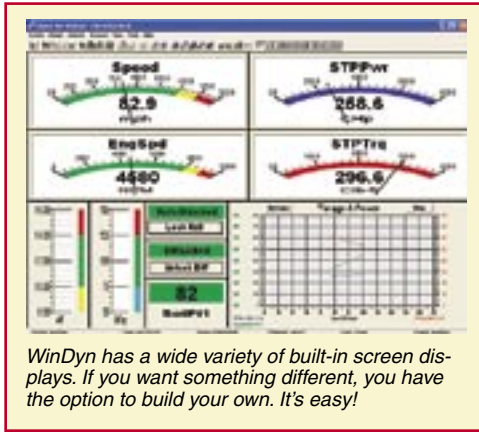
WinDyn Software is Easy to Use

Each AutoDyn model includes WinDyn™ dynamometer software. WinDyn is your interface to the AutoDyn. It automates the dyno testing process by including predefined testing sequences and screen layouts. Whether you wish to check your carburetor jetting or test the transient response of an exhaust system, the AutoDyn has a built-in test mode to do the job. WinDyn simplifies AutoDyn's data acquisition and calculation. You can view real-time, or post-test data displays and graphs of torque, power, and any other sensor data your AutoDyn is equipped to sample. As you become familiar with WinDyn, you can customize its features, and modify it to fit your needs. WinDyn even allows you to create your own tests, and to send data disks home with your customer.

See SuperFlow's WinDyn brochure for more information on the industry's finest dynamometer test program



WinDyn helps you configure, execute, and analyze your AutoDyn tests. Sensor box shown with optional equipment.

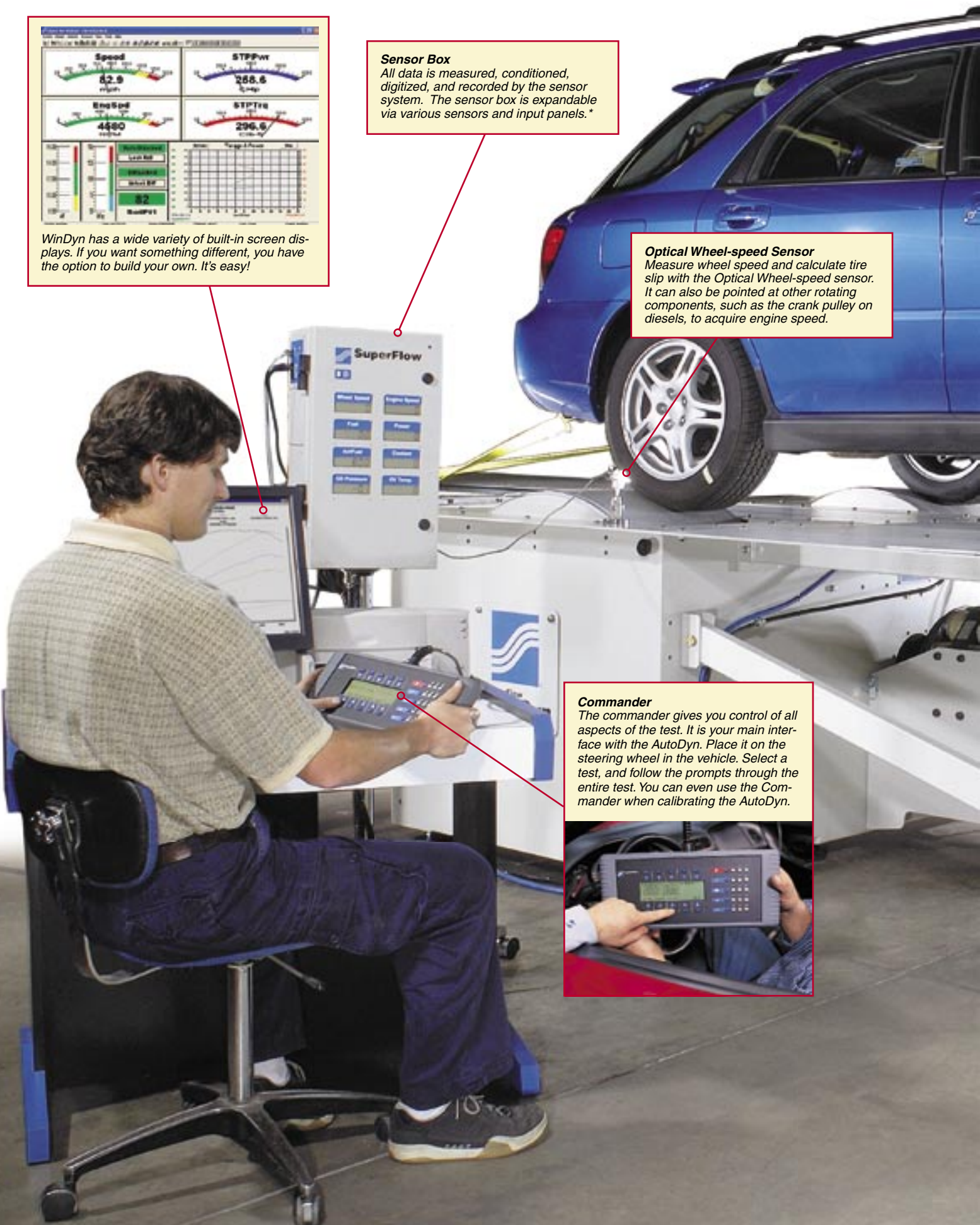


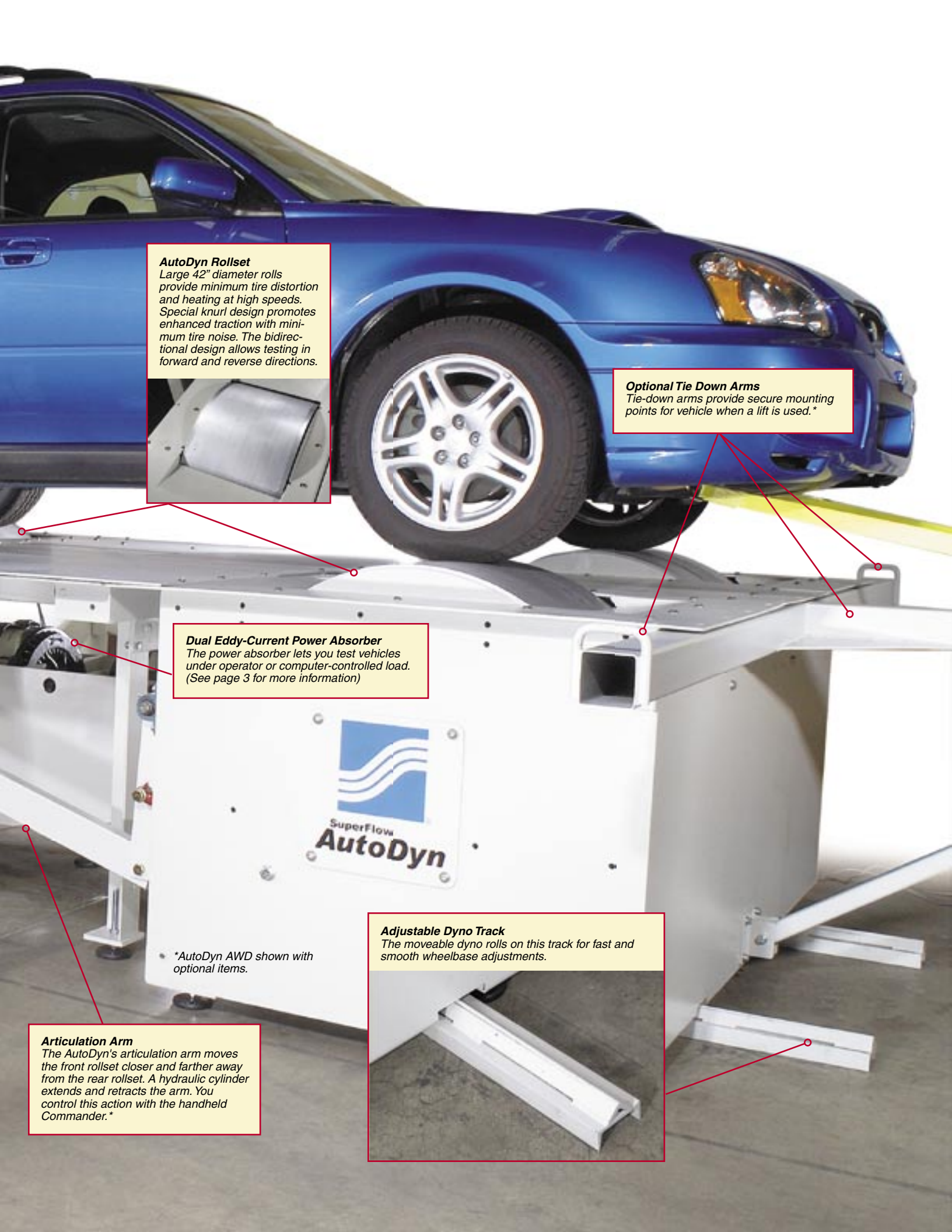
WinDyn has a wide variety of built-in screen displays. If you want something different, you have the option to build your own. It's easy!

Sensor Box
 All data is measured, conditioned, digitized, and recorded by the sensor system. The sensor box is expandable via various sensors and input panels.*

Optical Wheel-speed Sensor
 Measure wheel speed and calculate tire slip with the Optical Wheel-speed sensor. It can also be pointed at other rotating components, such as the crank pulley on diesels, to acquire engine speed.

Commander
 The commander gives you control of all aspects of the test. It is your main interface with the AutoDyn. Place it on the steering wheel in the vehicle. Select a test, and follow the prompts through the entire test. You can even use the Commander when calibrating the AutoDyn.





AutoDyn Rollset

Large 42" diameter rolls provide minimum tire distortion and heating at high speeds. Special knurl design promotes enhanced traction with minimum tire noise. The bidirectional design allows testing in forward and reverse directions.



Optional Tie Down Arms

Tie-down arms provide secure mounting points for vehicle when a lift is used.*

Dual Eddy-Current Power Absorber

The power absorber lets you test vehicles under operator or computer-controlled load. (See page 3 for more information)



Adjustable Dyno Track

The moveable dyno rolls on this track for fast and smooth wheelbase adjustments.



Articulation Arm

The AutoDyn's articulation arm moves the front rollset closer and farther away from the rear rollset. A hydraulic cylinder extends and retracts the arm. You control this action with the handheld Commander.*

*AutoDyn AWD shown with optional items.

Choose Your Dynamometer Configuration

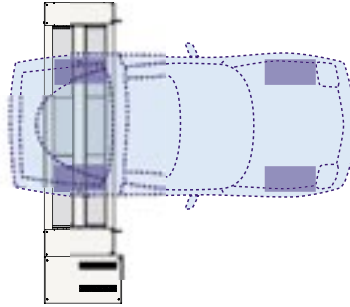
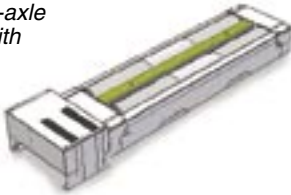
SuperFlow's AutoDyn is available in several different configurations. There is a low-cost, low-profile Cradle-roll dyno and a high-performance Large-roll model. You can choose Inertia and single or double eddy-current power absorber module. You have your choice of two-wheel or all-wheel drive. All-wheel

drive units can have fixed or adjustable wheelbase. You can choose three different roll widths and two different roll spacings.

All AutoDyNs can be operated in either direction. If you need more features, SuperFlow can quote additional custom applications.

Cradle Roll

Low-profile, single-axle Cradle-roll dyno with eddy-current power absorber.

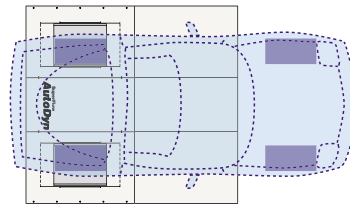
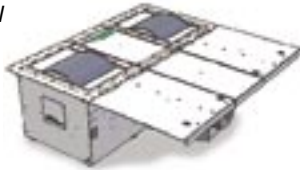


Notes

1. Least amount of floor modification required for installation.
2. Low cost.
3. Small roll diameter = small tire contact patch = more tire distortion and limited traction. Therefore limited power can be transferred to the tire patch without increasing down force by strapping. See diagram below.

2WD Large Roll

Single-axle, large-roll dyno. Available in inertia-only, single and double eddy-current power absorber models.

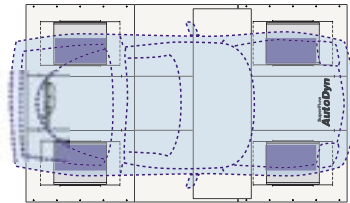
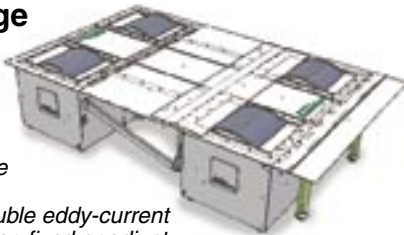


Notes:

1. Large roll diameter = less tire distortion, better contact, more traction, more power to the rolls.
2. Measures reaction torque, so variable bearing and aerodynamic losses are accounted for in measurements for more accurate test data.
3. Requires 42" deep pit or lift.

AWD Large Roll

Double-axle, large-roll dyno. Available in inertia-only, single and double eddy-current power absorber, fixed or adjustable wheelbase models.

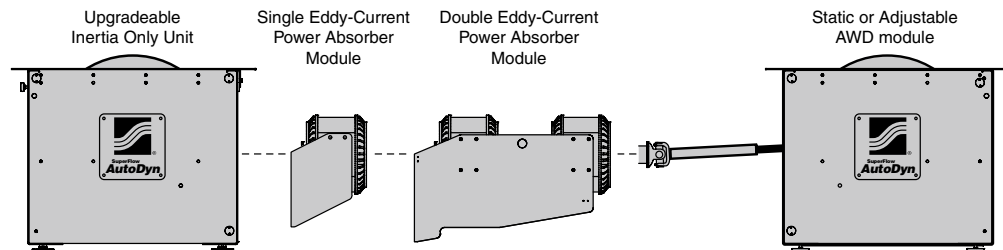


Notes:

1. Same as 2WD, plus...
2. Only way to test AWD, 4WD and vehicles with traction control that cannot be disabled.
3. Measures rolling losses on all wheels, so road load can be simulated more accurately.

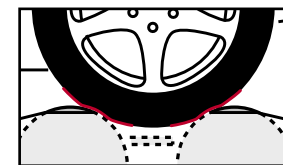
Large Roll Upgrade Path

SuperFlow's Large-roll dynamometers can be purchased as an Inertia-only unit for a low initial cost. Later when needs change, the unit can be upgraded with single or double eddy-current power absorber. You can also add AWD capability.

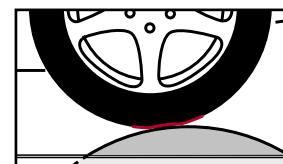


All AutoDyNs can be pit or surface mounted. Ask your Sales Engineer for details.

Cradle Roll vs. Single Roll



12.6" diameter Cradle Roll



42" diameter Large Roll

Choose your Sensor System

All SuperFlow dynamometers come with precise Data Acquisition and Control systems, WinDyn dynamometer software, and one or more days of training (labor only). The Data Acquisition and Control systems include a built-in weather station and Commander remote control. The sensor box is mounted on a rolling stand, on a boom or wall. Data displays show power, torque, wheel speed, engine speed, or any selected channel you wish to see. It's easy to choose the displayed data with WinDyn software.

The sensor boxes have sensor expansion panels for optional thermocouples, pressures, analog inputs, lambda sensors and four/five-gas analyzers. Barometric pressure transducer, air temperature and humidity sensor are all used to measure atmospheric conditions during the test. Optional sensors are also available for wheel slip, air flow, and fuel flow. PID (Proportional, Integral, Derivative) control signals are generated by the sensor system.

All data is measured, conditioned, digitized, and recorded by the 32-bit microprocessor sensor system. Data is broadcast over an Ethernet network for display on WinDyn-equipped computers, or for use by other components of the sensor system. Up to 32,000 lines of data can be stored in the Sensor

Box, even with the personal computer turned off. With optional equipment, you can even control room lighting, fans, pumps, etc.

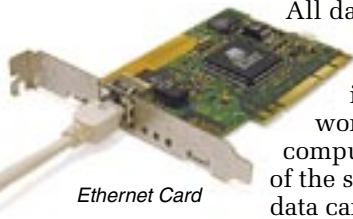


Optical tachometer
SuperFlow includes an optical tach with each AutoDyn. You can use it to get a speed channel from anything that will accept a piece of reflective tape. WinDyn allows you to apply calculations to the signal to provide easy-to-read data. Use it to acquire wheel slip, clutch slip, engine speed, etc.



Sensor Box
Includes advanced electronics and up to eight data displays.

Shown with optional data displays and sensor expansion panels.



Ethernet Card



Lambda Sensor
Optional Lambda Sensors allow you to keep an eye on Air-Fuel mixtures and can assist with fuel-injection mapping.



Each sensor box has a built-in weather station with barometric transducer and temp/humidity probe.

Pressure Input Panel
The optional Pressure Input Panel accepts injector pressure, fuel supply, manifold, oil return, crankcase, coolant, oil, boost, inlet, exhaust, etc.

Analog Voltage Input Panel
The optional Analog Voltage Input Panel accepts 0-10V inputs for sensors such as Lambda.

Type-K Thermocouple Input Panel
The optional Thermocouple Input Panel accepts Type-K inputs so you can view exhaust gas temps, air intake, fuel, coolant, oil etc.



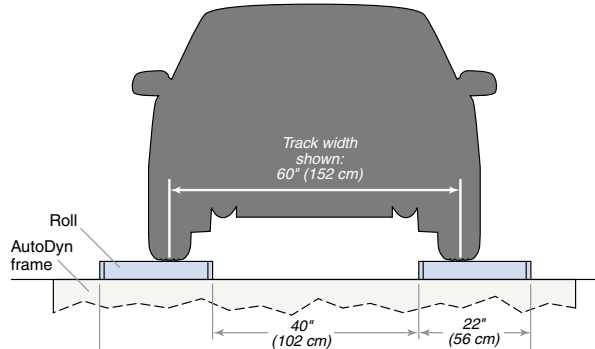
Four types of thermocouples



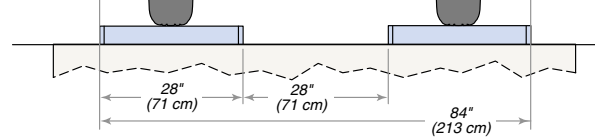
AutoDyn Chassis Dynamometer

Track Dimensions

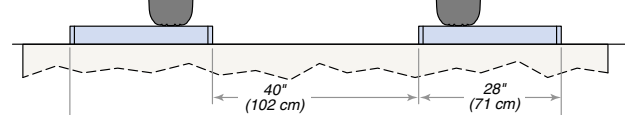
22-84 — Standard configuration. Works with most passenger vehicles.



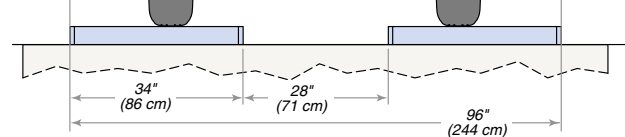
28-84 — Ideal for most passenger cars and drag racing vehicles.



28-96 — Good for large trucks and passenger vehicles.



34-96 — Great for almost all vehicles.



Specifications

Speed Rating up to 200 MPH (320 km/h)

Maximum Wheel Power

Inertia test, Large-roll models 1,500 hp (1118 kW)

Peak power absorption

Single eddy current 700 hp (521 kW)

Large-roll dual eddy current 1,400 hp (1043 kW)

At 10 minutes duration (temperature dependent)

Single eddy current 350 hp (261 kW)

Large-roll dual eddy current 700 hp (521 kW)

Control Accuracy ± 0.1 mph (0,2 km/h)

Maximum Axle Load

Cradle-roll model 7,000 lb (3500 kg)

Large-roll models 10,000 lb (4535 kg)

Power requirements

All models 110–250 VAC, 15–8 amps

Single eddy current 208–250 VAC, 20 amps

Dual eddy current 208–250 VAC, 40 amps

Shipping Weights (approximate)

2WD Upgradeable inertia 6,300 lbs (2865 kg)

2WD Single eddy current 7,000 lbs (3180 kg)

2WD Dual eddy current 7,600 lbs (3455 kg)

AWD Upgradeable inertia 12,600 lbs (5715 kg)

AWD Single eddy current 13,300 lbs (6033 kg)

AWD Dual eddy current 13,900 lbs (6304 kg)

Dual Power Absorber Detail



SuperFlow's dual eddy-current power absorbers are coupled with durable, low-maintenance driveshafts.

The AutoDyn can measure:

Roll speed, torque, acceleration, fuel flows, air flows, lambdas, liquid flows, air temperatures, exhaust gas temperatures, liquid temperatures, oil pressure, manifold pressure, barometric pressure, humidity, analog voltages and more.

The AutoDyn can calculate: Power, corrected power, air-fuel ratio, brake specific fuel consumption, brake specific air consumption, volumetric efficiency, mechanical efficiency, drive-train loss via coast-down test, and more.

Limited Warranty

SuperFlow warrants that this SuperFlow product will perform as described in this brochure for a period of one year from the ship date. To request a copy of the limited warranty statement, email us or call SuperFlow, 8am–5pm (Mountain Time) at 719 471-1746.



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