

DynoLab On-Board Dyno™

**Now You Can Know Your Engine's Horsepower
When It's Installed In The Car**



By Michael Ferrara

The DynoLab On-Board Dyno™ is an in-car dyno that allows measurement of horsepower, acceleration, speed, frictional drag, and aerodynamic drag. The LED display can display real-time horsepower, acceleration (G-force) and vehicle speed. Peak values of horsepower, acceleration, and speed can easily be displayed with a touch of a button. The analog gauge can also be monitored to optimize shift points. Recently, we've been using a DynoLab unit to tune our twin-turbo, 5.0-liter Mustang. In the first week of use, we've been able to tailor fuel and timing curves to unleash 60 more horsepower at the same boost level!

Is The DynoLab Unit Similar To A Vericom?

No, the Vericom is designed to be a performance analyzer which uses an accelerometer and microprocessor to estimate 1/4-mile e.t., 0-60 times, braking distance and other useful information. As a performance timing tool, our Vericom units have proven to be invaluable. Although the Vericom can estimate the horsepower per thousand pounds of a vehicle, since the Vericom has no tire speed input, factors such as wheel-spin and hard shifting can often give inaccurate horsepower results. Careful set-up and calibration can reduce the error, but there is always some error present.

The DynoLab On-Board Dyno™, however, uses a high-accuracy

accelerometer, a wheel speed input and a high-speed microprocessor to calculate actual flywheel horsepower. This allows for high-accuracy horsepower readings even when wheel-spin is present. To enhance data analysis, the DynoLab allows P.C. owners to set up a datalog of the vehicle's horsepower, speed and acceleration. This makes the unit a valuable tool for anyone doing performance tuning.

How The On-Board Dyno™ Works

Instead of using torque and rpm to calculate horsepower, the On-Board Dyno™ measures speed, acceleration, and then it calculates horsepower based on vehicle weight. The On-Board Dyno™ uses a rigid-mounted accelerometer to measure the acceleration (in Gs) of a vehicle. The rigid-mounting and pre-run calibration procedure ensures accurate accelerometer readings. As with any accelerometer, testing on a straight and level road will give the best results. Also providing an input signal to the On-Board Dyno™ is a vehicle speed signal. On cars equipped with an electronic speedometer or ABS, no adapter is needed and the speed signal is tapped off a factory harness. For other vehicles, speed transducers can be installed between the speedometer cable and transmission. Race vehicles without a speedometer can use a photo/magnetic transducer which can be fitted to monitor drive-shaft or brake rotor speed.

After installation, the unit needs to be calibrated. First, the DynoLab unit will need to know the vehicle's weight (including driver). A quick drive to the scales of a moving company revealed that our '89 Convertible Mustang tips the scales at 3640 pounds (excluding driver). Adding our weight to this figure, we fed in the two-ton figure into the unit. Next, we set out on a test drive to calibrate the speed sensor. We found a section of highway with mile markers

and had the DynoLab unit calculate the number of speed transducer pulses per mile and the major calibrations were done. Two coast-down tests later (which calibrated the vehicle's frictional and aerodynamic drag), we were ready to hit the road and start monitoring our real-time horsepower.

Conclusions

Anyone serious about vehicle performance can definitely benefit from the data provided by DynoLab's On-Board Dyno™. The unit proved itself to have very repeatable results—as long as the weather didn't change peak horsepower was the same day to day. The unit has a claimed accuracy of one-percent when calibrated correctly. The On-Board Dyno™ is available in a range of models from 150 to 2000 horsepower. Since no direct connections to the engine are required, the unit can be moved from vehicle to vehicle. The On-Board Dyno™ retails for \$1495, which might seem expensive until you compare it to the cost of an engine or chassis dynamometer. For additional information on the units, contact DynoLab.

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The high-quality accelerometer uses military-spec connectors and a rigid mount that rotates for level alignment of the unit. DynoLab units are available for any application from 150 to 2000 maximum horsepower.