

A chassis dyno, or dynamometer, to be precise is an automotive tool designed to simulate a road in which an automobile is driven. Its main purpose is to provide a means in which an automobile can be accelerated, cruised, and generally driven while remaining stationary in the confines and safety of a shop floor. A chassis dynamometer is used in this manner to achieve several objectives ranging from performance tuning to diagnostics. The chassis dynamometer employs a simple design consisting of a roller mass specifically weighed to simulate identical physics of a car being driven on a road. A vehicle is then driven on this roller mass much like it would be driven on a road and measurements are taken through sensors attached to the roller and the vehicle to evaluate performance. Loads are placed on the rotating mass by a brake mechanism to simulate loads placed on a vehicle such as those when the vehicle climbs a grade or when the vehicle is weighed down. The reasons why an automotive performance technician or enthusiast would use a chassis dyno are as follows:

- **Safety** - A technician can safely test and tune a car repetitively without having to drive the car at unsafe and illegal speeds. Many automotive performance tests consist of running the vehicle at wide open throttle and at high speeds. Even if a technician has access to a test track and professional test driver, the issue of safety still exists. Not to mention the wear on the vehicles tires, brakes and suspension. Chassis dyno testing however does not replace track testing of high performance vehicles such as race cars. This is because many more variables exist when a vehicle is driven around a track that simply cannot be replicated in a chassis dynamometer. Chassis dyno testing and tuning complements track testing.
- **Efficiency and accuracy** - A chassis dyno provides an automotive technician a platform in which to repetitively test, evaluate and tune a vehicle in a relatively short amount of time. Using the dyno's load functions, a technician can tune a vehicle across the engines' entire operating range and performance envelope. Modern chassis dynamometers operate with cutting edge software technology to provide accurate, efficient and repeatable testing. A dyno used in conjunction with current electronic engine management systems and tuning software provides a technician or enthusiast a complete toolkit to evaluate, adjust, re-evaluate and perfect a vehicles tuning parameters.
- **Baseline and successive testing** - An automotive enthusiast wishing to improve vehicle performance can use a chassis dyno to determine the vehicles baseline performance before any modifications are made. After each stage of modifications are performed, successive dyno tests are conducted to evaluate and determine the effectiveness of the modifications. A performance aftermarket vendor involved in developing performance products should use a chassis dyno to help test the products design and effectiveness in improving performance.
- **Diagnosis** - Certain symptoms of vehicular problems are many times exhibited only when the vehicle is driven and only during specific speeds, RPM, gear, etc. A chassis dyno can aid a repair technician by simulating the same conditions in which the symptoms are exhibited while the vehicle is driven on the street without the safety and legal issues.