How does a dyno work?

A dynamometer, or dyno for short, is a tool used to measure the amount of power being generated by an engine. The physics behind a dyno is what enables the measurement to be taken. It begins with the equation that states that force is equal to mass times acceleration. This means that the amount of force can be calculated by finding the weight of an object being moved and then multiplying that by the rate at which it is accelerated. With this number it is then possible to calculate how much work is being done and then how much power is being generated. These equations are integral to all dynos and make it possible for engine power to be measured. There are two main types of dynos that are used by car enthusiasts today.

The Chassis/Inertia Dyno: in this type of dynamometer, a car is driven up onto a platform until its wheels are on a set of large metal cylinders. The car is then strapped in and a computer is connected to the car's ignition system through a spark plug wire, in order to monitor RPMs. The test will begin and the car will be driven through its full RPM range, from idle to redline (the maximum Revolutions Per Minute that the engine is designed to safely operate at). Once this is done, and the test is complete, the computer will use the speed of the spinning cylinders to calculate the acceleration, and then use this number, along with the weight of the cylinders which it already knows, to get an answer to the force equation.

The Brake/Engine Dyno: in this type of dynamometer, the engine has to be removed from the car and directly connected to the testing mechanism. The testing mechanism then uses either hydraulic fluid or water to create resistance to the engine's spinning force. This resistance is continued until the engine's maximum turning force is measured at every RPM, giving the tester an accurate reading of the engine's torque. A computer or the tester can then use the same equations to derive a horsepower number for the engine.

(Taken from http://www.ehow.com/how-does_5183355_ dyno-work_.html)

EXCERCISES

1 True or false?

a. A dyno is a tool used to measure the amount of power being generated by an engine. T F

b. When you use a Chassis you have to remove the engine from the car. T F

c. The Brake testing method uses hydraulic fluid or water to create resistance. T F

d. Force is equal to mass times acceleration. T F

2 Complete.

A dyno is a ..... tool. It is used to measure the ..... of an engine. The ..... works on the basis of an ..... that states that ..... is equal to mass times ..... This equation means that if you have the ..... of a moving object and you ..... it by the rate of its ..... you can calculate the force generated by the ..... There are two main ..... of dynos that are used today: the ..... and the Brake.

force • multiply • Chassis • engine • acceleration • power • measuring • dyno • acceleration • weight • equation • types

3 Match questions and answers.

QUESTIONS		ANSWERS	
A	How can you calculate the amount of force of an engine?	1	The computer uses this information to calculate the acceleration and then it uses the acceleration and the weight of the cylinders to get an answer to the force equation.
B	What is the difference between a Chassis and a Brake dynamometer?	2	You have to find the weight of an object being moved and then multiply that by the rate at which it is accelerated.
C	How does the computer of a Chassis use the information about the speed of the spinning cylinders?	3	When you use the first type of dyno a car is driven up onto a platform until its wheels are on a set of large metal cylinders, when you use the second type the engine has to be removed from the car and directly connected to the testing mechanism.

A	B	C .....