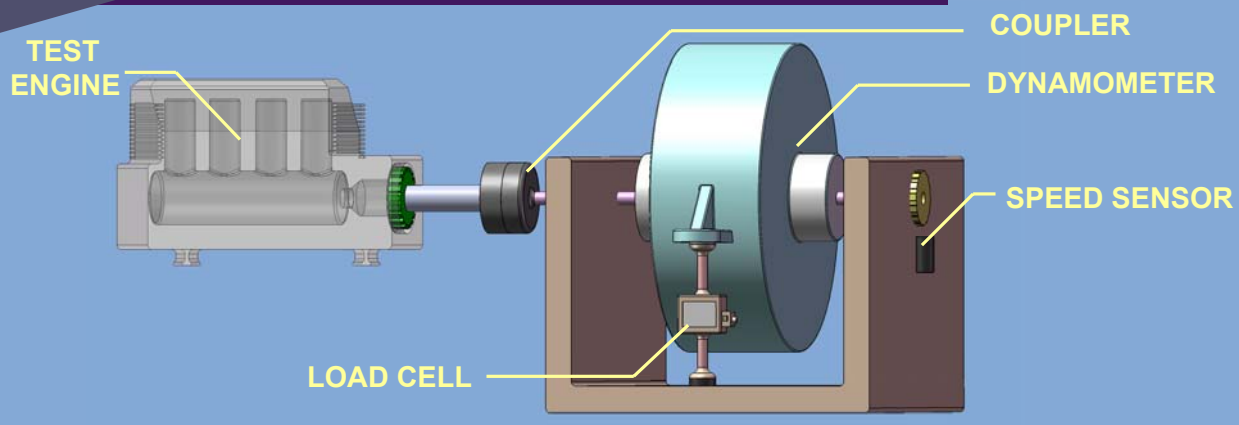
USM ENGINES LAB

ENGINE TESTING - DYNAMOMETRY



The test engine is coupled to a load device called a **dynamometer.** The dynamometer applies a load to the engine & absorbs energy. The speed and the torque of the engine are measured by sensors on the dynamometer. Generally a controller is used to control the load.

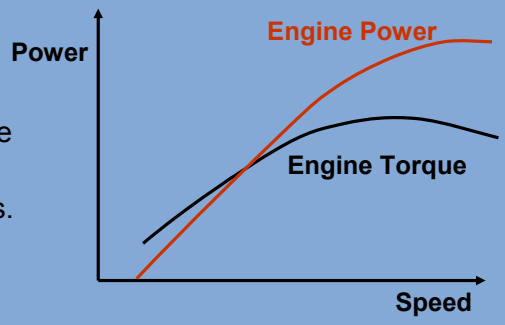
ENGINE POWER OUTPUT (Break Power)

Break Power — Torque — Speed

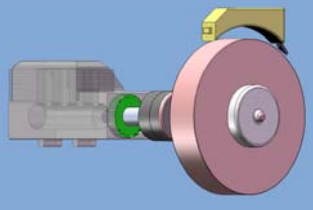
$$P = \tau\ \omega$$

Typically the engine is instrumented with sensors to measure fuel consumption, temperatures, pressures, emissions and etc. This information is used in tuning and designing engines.

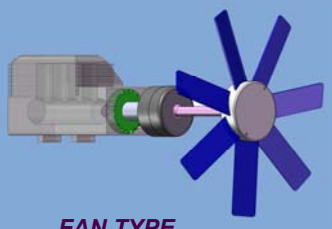
Generally the engine speed and power used in a test are similar to that experienced by a vehicle in real-world use.



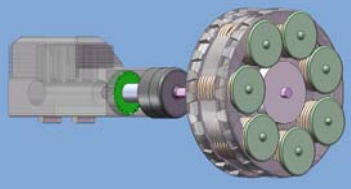
COMMON TYPES OF DYNAMOMETERS



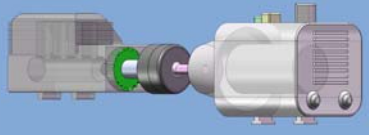
FRICTIONAL - BREAK
A break applies resistance to a rotating drum or disk



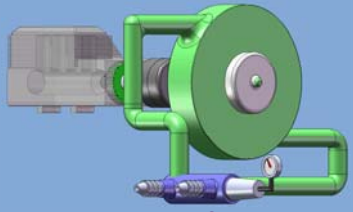
FAN TYPE
Aerodynamic drag applies resistance to a rotating fan



EDDY CURRENT
Coils induce electromagnetic drag on a spinning disk



ELECTRIC
A generator applies electromagnetic resistance to the rotor



HYDRAULIC
Hydraulic fluid applies resistance to a pump's impeller

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