In principle, hydraulic dynamometer construction is similar to that of a fluid flywheel.

Hydraulic dynamometer consists of an impeller or inner rotating member coupled to the output shaft of the engine.

The impeller in this dynamometer rotates in a casing filled with a fluid.

Due to the centrifugal force developed in the outer casing, tends to revolve with the impeller, but is resisted by a torque arm supporting the balance weight.

The frictional forces generated between the impeller and the fluid are measured by the spring balance fitted on the casing.

The heat developed due to the dissipation of power in Hydraulic dynamometer is carried away by a continuous supply of the working fluid.

The output power can be controlled by regulating the sluice gates which can be moved in and out to partially or wholly obstruct the flow of water between the casing and the impeller.

Absorption Dynamometers:

Transmission dynamometers are also called torque meters. They mostly consist of a set of strain-gauges fixed on the rotating shaft and the torque is measured by the angular deformation of the shaft which is indicated as the strain the of the strain gauge. A four arm bridge is used to reduce the effect of temperature, and the gauges are arranged in pairs such that the effect of axial or transverse load on the strain gauges is avoided.

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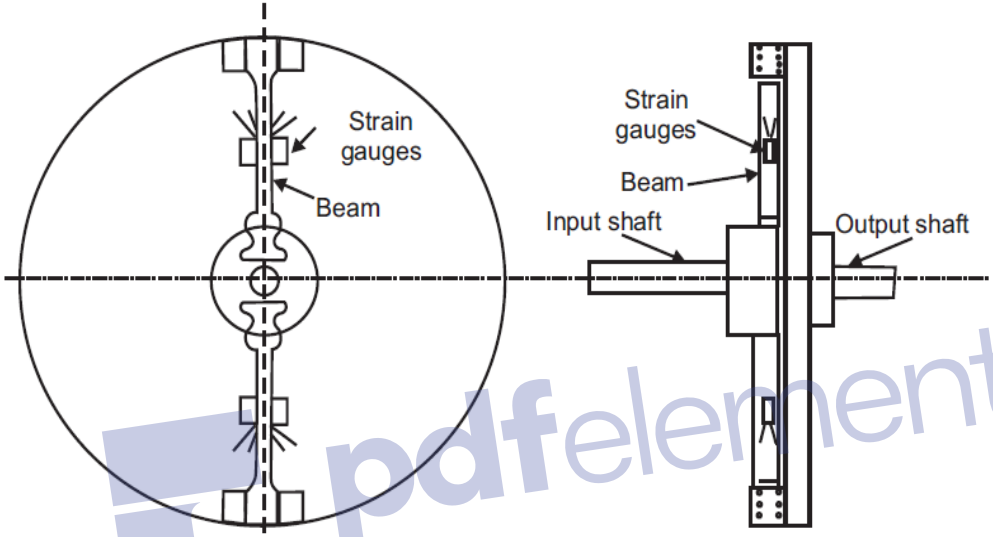

Above figure shows the transmission dynamometer which employs beams and strain gauges for a sensing torque. Transmission dynamometers measure brake power very accurately and are used where continuous transmission of the load is necessary. These are mainly used in automatic units.

Classification of Transmission Dynamometers

The following types of transmission dynamometers are important from the subject point ofview :

1. Epicyclic-train dynamometer,
2. Belt transmission dynamometer, and
3. Torsion dynamometer.

1. Epicyclic-train dynamometer,