STUDY ON KINETIC ENERGY

Kinetic energy is energy that a body has as a result of its speed or energy of motion.

Definition

It is formally defined as work needed to accelerate a body from rest to a velocity v. Having gained this energy during its acceleration, the body maintains this kinetic energy unless its speed changes. The same amount of work would also be required to return the body to a state of rest from that velocity.

Simple explanation

Energy can exist in many forms, for example chemical energy, heat, electromagnetic radiation, potential energy (both gravitational and elastic), nuclear energy, and kinetic energy.

These forms of energy can often be converted to other forms. One good example is the conversion of enrgy in Power generating stations.

Kinetic energy can be best understood by examples that demonstrate how it is transformed from other forms of energy and to the other forms. For example a cyclist will use chemical energy that was provided by food to accelerate a bicycle to a chosen velocity. This velocity can be maintained without further work, except to overcome air-resistance and friction. The energy has been converted into the energy of motion, known askinetic energy but the process is not completely efficient and heat is also produced within the cyclist.

The kinetic energy in the moving bicycle and the cyclist can be converted to other forms. For example, the cyclist could encounter a hill just high enough to coast up, so that the bicycle comes to a complete halt at the top. The kinetic energy has now largely been converted to gravitational potential energy that can be released by freewheeling down the other side of the hill. (There are some frictional losses so that the bicycle will never quite regain all the original speed.) Alternatively the cyclist could connect a dynamo to one of the wheels and also generate some electrical energy on the descent. The bicycle would be travelling more slowly at the bottom of the hill because some of the energy has been diverted into making electrical power. Another possibility would be for the cyclist to apply the brakes, in which case the kinetic energy would be dissipated as heat energy.

See also energy conversion.

Simple calculation

The kinetic energy of a body = $\frac{1}{2}mv^2$ where m is the mass and v is the velocity of the body.

Note that the kinetic energy increases with the square of the velocity. This means for example that if you are traveling twice as fast, you need to lose four times as much energy to stop. The braking distance of a car at 100 km/h is therefore four times as far as the braking distance at 50 km/h.

Flywheels are being developed as a method of energy storage (see article flywheel energy storage). This illustrates that kinetic energy can also be rotational.

Source : http://engineering.wikia.com/wiki/Kinetic_energy