STUDY ON ENGINE

An engine is something that produces some effect from a given input. The origin of engineering was the working of engines. There is an overlap in English language [[1]] between two meanings of the word "engineer": 'those who operate engines' and 'those who design and construct new items'.

Usage of the term

In original usage, an engine was any sort of mechanical device. The term "gin" in cotton gin is a short form of this usage. Practically every device from the industrial revolution [[2]] was referred to as an engine, and this is where the steam engine gained its name. This form of the term has recently come into use once again incomputer science, where terms like search engine, "3-D graphics game engine [[3]]" and "speech synthesis engine [[4]]" are common. The earliest mechanical computing device was called the difference engine [[5]]; Military devices such as catapults [[6]] are referred to as siege engines [[7]].

In more recent usage, the term is typically used to describe devices that perform mechanical work, follow-ons to the original steam engine. In most cases the work is supplied by exerting a torque, which is used to operate other machinery, generate electricity, pump water or compress gas.

In the context of propulsion systems, an air breathing engine is one that uses atmospheric air to oxidise the fuel carried, rather than carrying an oxidiser, as in a rocket. Theoretically, this should result in a better specific impulse than for rocket engines.

History of engines

Antiquity

While chemical and electrical engines of enormous power dominate the modern world, engines themselves are not new. Engines using human power, animal power, water power, wind power and even steam powerdate back to antiquity.

For more information see History of engines at [[8]]

Modern

English inventor Sir Samuel Morland allegedly used gunpowder [[9]] to drive water pumps in the 17th century. For more conventional, reciprocating internal combustion engines the fundamental theory for two-stroke engines was established by Sadi Carnot, France [[10]], 1824, whilst the American Samuel Morey received a patent on April 1, 1826.

Automotive production down the ages has required a wide range of energy-conversion systems. These include electric, steam, solar, turbine, rotary, and different types of piston-type internal combustion engines.

The gasoline internal combustion engine, operating on a four-stroke Otto cycle, has traditionally been the most successful for automobiles, while diesel engines are widely used for trucks and buses. However, in the twenty first century the diesel engine has been increasing in popularity with automobile owners. This is partially due to the improvement of engine control systems (computers) and forced induction (turbos and superchargers), giving modern diesel engines the same power characteristics as gasoline engines. This is especially evident with the popularity of diesel engines in Europe.

The internal combustion engine was originally selected for the automobile due to its flexibility over a wide range of speeds. Also, the power developed for a given weight engine was reasonable; it could be produced by economical mass-production methods; and it used a readily available, moderately priced fuel--gasoline.

In today's world, there has been a growing emphasis on the pollution producing features of automotive power systems. This has created new interest in alternate power sources and internal-combustion engine refinements that were not economically feasible in prior years. Although a few limited-production battery-powered electric vehicles have appeared from time to time, they have not proved to be competitive owing to costs and operating characteristics. However, the gasoline engine, with its new emission-control devices to improve emission performance, has not yet been challenged significantly.

The first half of the twentieth century saw a trend to increase engine power, particularly in the American models. Design changes incorporated all known methods of raising engine capacity, including increasing the pressure in the cylinders to improve efficiency, increasing the size of the engine, and increasing the speed at which power is generated. The higher forces and pressures created by these changes created engine vibration and size problems that led to stiffer, more compact engines with V and opposed cylinder layouts replacing longer straight-line arrangements. In passenger cars, V-8 layouts were adopted for all piston displacements greater than 250 cubic inches (4 litres).

Smaller cars brought about a return a to smaller engines, the four- and six-cylinder designs rated as low as 80 horsepower (60 kW), compared with the standard-size V-8 of large cylinder bore and relatively short piston stroke with power ratings in the range from 250 to 350 hp (190 to 260 kW).

The automobile motor from Europe [[11]] had a bigger range, varying from 1to12 cylinders with corresponding differences in overall size, weight, piston displacement, and cylinder bores. Four cylinders and power ratings from 19 to 120 hp (14 to 90 kW) were followed in a majority of the models. Several three-cylinder, two-stroke-cycle models were built while most engines had straight or in-line cylinders. There were several V-type models and horizontally opposed two- and four-cylinder makes too. Overhead camshafts were frequently employed. The smaller engines were commonly air-cooled and located at the rear of the vehicle; compression ratios were relatively low. The 1970s and '80s saw an increased interest in improved fuel economy which brought in a return to smaller V-6 and four-cylinder layouts, with as many as five valves per cylinder to improve efficiency.

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