Methods available to increase the power output of an automobile engine

Engineering

The paper " Methods Available to Increase the Power Output of an Automobile Engine" is a great example of coursework on engineering and construction. Over the last decade, technological advancements have been engineered all for one purpose; to generate more power output that is more reliable and requires reduced maintenance attention. Improvements have been made in engine design, construction methods, and materials so that the modern automobile can achieve this goal, Judge (1931). To increase the power output of an automobile engine, the following methods can be used;

(1) Changing the displaced volume

This can be achieved by reboring the engine. By doing so the power of any engine is increased by increasing its capacity. This is a slightly complex step since it involves the calculations of the ratio of compression against the overall engine capacity to avoid engine knock. Reporting will involve the drilling the cylinder blocks usually made of cast iron or aluminum to a wider dimension so as to increase the cylinder capacity. This will later be matched with a larger diameter piston. The engine capacity can also be increased by using a stroker kit which allows a much longer stroke in the engine. The benefit of this method is that it is fuel economy and lowers carbon dioxide emissions.

(2) Supplying compressed air

This is the principal most supercharged and turbocharged vehicles work on. By increasing the amount of air an engine takes in the cleaner the combustion becomes and the maximum the power output of the engine is derived. This is achieved by supplying with highly compressed air which will occupy lesser volume. The advantage of using this method in deriving

optimum power output of an engine is that the engine mechanical noises and losses are reduced and overall fuel consumption is attained. The engine’s life expectancy is also prolonged coupled will lower carbon dioxide emissions.

(3) Variable valve timing

The valves within the engine are used to control the rate of flow of intake and exhaust gases in and out of the combustion chamber. A variation in the timing, lift, and duration of these valves result in a significant increase in the power output on the engine. The benefit of using this method in optimizing the power output of an automobile engine is that it reduces emissions and increases the fuel efficiency of the engine in question.

(4) Alternate fuels and gases

Over the years, concerns have been raised over the use of fossil fuels in powering automobile engines and their dwindling supplies. This has led towards the discovery and development of alternative automobile fuel propulsion system. The advantages of this system are the use of an environmentally safer and more economical fuel. The development of the Wankel rotary engine not only improved the performance of the automobile in terms of power it also increased the life expectancy of the engine and reliability.

(5) Alternative engine operating cycles

Both the Atkinson and Miller cycle engines are variations on the traditional four-stroke spark-ignition engines that are used to power automobiles. To increase the power output of the engine these alternative engine operating cycles extend the stroke and expansion ratios of the combustion chambers.

Together with valve timing variations, these two operating cycles increase engine efficiency. The benefits of using such a method to increase power output include the elimination of the unnecessary drag in the engine and they allow construction of lightweight engine parts which reduce friction in comparison to the conventional engines.

The Range Rover Evoque is the lightest and most fuel-efficient Range Rover to be produced yet. With a full time intelligent all-wheel drive that is controlled by Haldex center coupling, the vehicle has a 240 horsepower engine that is turbocharged with a direct four-cylinder two-liter engine capacity. The coupling of the engine with a twin variable timing system enables the automobile to deliver 0-100 km in 7. 3 seconds. The vehicle’s engine is constructed using aluminum alloy and it has twin balancer shafts which enable the automobile to give optimum power output with excellent fuel efficiency and driveability. The new engine design of 2000 cc in comparison with larger capacity engines that deliver the same power output enables the vehicle to reduce its carbon dioxide emissions by a maximum of 20%. This engine also achieves a 7. 1L / 100 km highway and 11. 4 L / 100 km city fuel economy which is significantly lower when compared to automobiles with the same power output, Canadian Media Information (2011).