

ADVANCEMENT IN INTERNAL COMBUSTION ENGINES.

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Abstract

over the years, there have been continuous advancements in the design of internal combustion engine. in specially, the motive behind this was the increase in efficiency of the engine and decrease the pollution, the main area of advancements in design, fuel injection and material selection. just because of recent advancements, the current engine are more efficient.

Keywords: *supercharger: increase the density of air, turbocharger: provides extra air to the combustion chamber.*

Introduction

As we know, the technology has been at most advancements, with the time technology have been advanced day by day, in each particular field of science. the system being developed mainly for increase in efficiency and effectiveness.

for instant, material science has been developed through combination of design to come up with the systems more effectively. and there are lots of thing came with the development of design like decrease in fuel consumption ratio,

less economic, less maintenance needed etc.

there have been advancements in internal combustion engines that have not only made easily to move from one position to other position. but also ensured that the journey is more efficient. internal combustion engine are one of the oldest

technology, still prevailing for nearly about 200 years. this milestone is possible just because of continuous development of technologies applied to them.

Advancement:

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these are the following advancements

Turbocharger (TDI-turbocharged Direct Injection):

there are nothing but turbines which are operated by engines exhaust gases for produce power for compressor which in turn used to increase the mass flow rate of air. which is sucked inside the stroke during the

intake stroke. this method increase the power and performance of IC engine.

Gasoline direct injection(GDI):

This method is often used in Gasoline engines. As the name indicates, it involves the direct injection of Gasoline into the combustion chamber of an engine by means of electrically controlled actuators and sensors. This method helps in metering the quantity of the fuel injected, based on our requirements thereby reducing fuel consumption.

Variable valve timing(VVI):

This method involves the electronic control of valves, thereby adjusting the valve opening and closing mechanism based on our needs. This technology also improves fuel efficiency and performance.

Start- stop technology:

This method is used to stop the vehicle when it is idle for a long period of time. i.e during traffic. This helps in reducing fuel consumption. Now, to start the vehicle, it is enough to hold the clutch. This method also reduces emissions.

Catalytic Converters:

Today, due to the stringent emission norms, after treatment devices are necessary to bring down the emissions in an IC engine. Catalytic converters are one of the devices which

reduces the emissions from IC engines, thereby making them to comply with the emission standards.

Energy analysis:

Although this is a commonly used engine in vehicles today, it does not mean that it is the most efficient. Combustion inefficiency measures the portion of energy that is not utilized from fuel. It is found that coolant heat loss and exhaust energy heat loss are the biggest sources of thermal loss, which contributes to the lack of energy turnover. It is constantly stated that the Second Law of Thermodynamics limits all engines from reaching maximum thermal efficiency, yet it does not mean we cannot improve the conversion rate of energy. Constant innovation and redesign of the internal combustion engine have allowed for better energy conversion of fuel.

Conclusion:

Knowing how the internal combustion engine works and where its inefficiencies lie, proper technology and design of the internal combustion engine will allow us to better utilize the energy within fuel. Although gas prices have been constantly fluctuating, the most likely trend in the future will be increasing gas prices, which will only make the movement to develop highly gas-efficient cars stronger. It is even possible with the ongoing dialogue about divestment from fossil fuels and effects of climate change, that, alongside our current technology boom.

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