7. ABSTRACT OF THE INVENTION

This innovation is a new product called Helical Blade Swirler. It is an innovative device which helps to improve the fuel economy in automobiles. The device while fitted at the inlet manifold of the engine increases the turbulence of the air entering through the engine inlet. By using this technique, homogeneity of Air/Fuel mixture gets better, thus it helps in complete burning of Air/Fuel mixture inside the combustion chamber by creating additional air swirling motion in the inlet manifold itself. Experimental results showed that, Presence of Helical Blade Swirler at the inlet manifold reduces the fuel consumption and the carbon based emissions while increasing the engine performance. The design of the helical blade swirler is arrived through repeated trails of testing the engine fitted with the swirler in a dynamometer test facility.

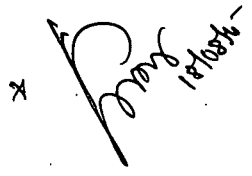
6. CLAIMS

1. The proposed system is invented to reduce the fuel consumption of an internal combustion engine by changing the turbulent characteristics of the incoming air as it passes through the engine inlet manifold, for that purpose an Helical Blade Swirler device is fitted at the manifold with its exit side facing the engine inlet port, the swirler device is designed with Tapered helical blades with holes in its lateral surface, the blade area is covered with an outer bulged portion which acts as an reservoir of excess air as well aids in attracting from more from outside than from the engine side due to creation of a void area at its centre.
2. The System as claimed in Claim 1above design of the Helical Blade Swirler is first of its kind to improve the fuel economy of vehicles while decreasing the carbon based emissions.
3. The System as Claimed in Claim 1 , the central bulged portion aids in covering the helical blade portion as well serves as an air accumulator, it is designed in such a way that it attracts more amount air from the inlet side than the engine side and hence the volumetric

efficiency will increase with better performance and lesser fuel consumption and lesser engine emissions.

4. The System as claimed in Claim 1 the taper side will be positioned on Engine side so that there will be less restriction just before the engine intake, the second benefit is for accumulating the air just before the engine intake so that the engine get higher density of air.

5. The System as claimed in Claim 1 the bulged portion will make voids which will cause vacuum at that portion which in turn helps to suck the air current from outside and hence it helps to reserve the air for second suction.



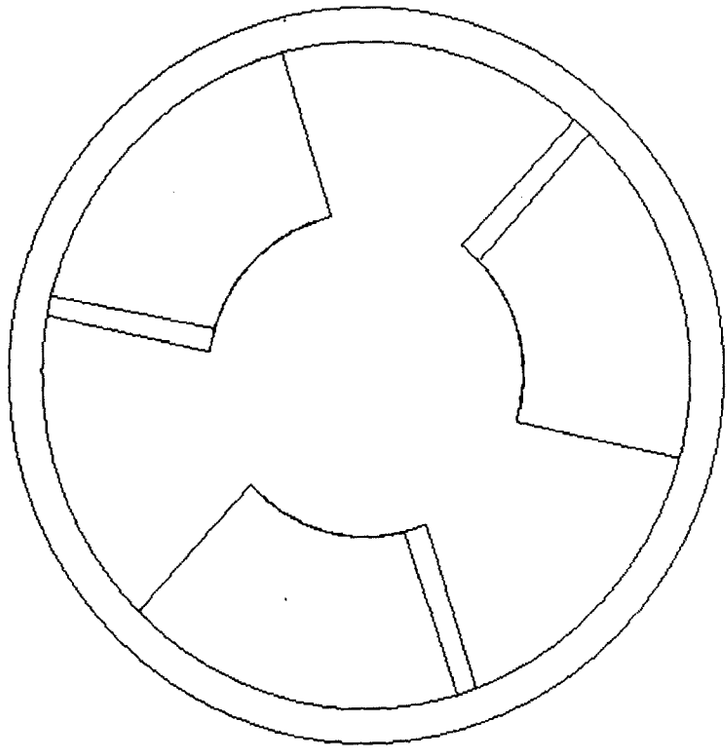


Figure 1. Shows the top view of the solid CAD model of the Helical blade Swirler device

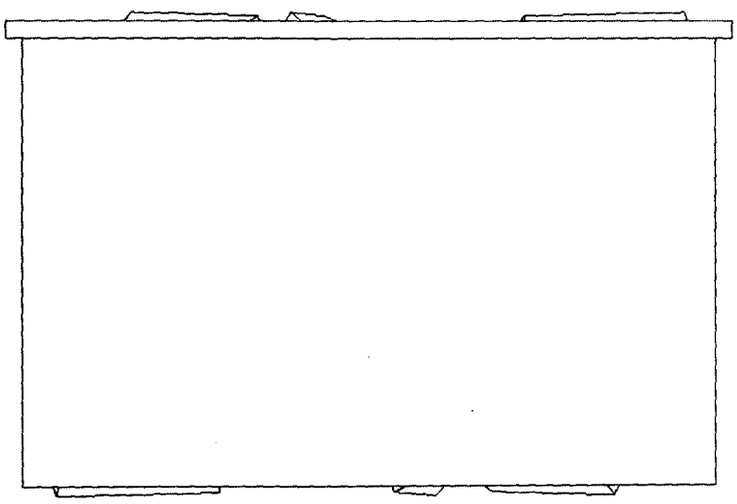


Figure 2. Shows the front view of the solid CAD model of the Helical blade Swirler device

4. DESCRIPTION

FIELD OF THE INVENTION

The Present invention is related to **"HELICAL BLADE SWIRLER FOR AUTOMOBILE APPLICATIONS".** It is an innovative device which helps to improve the fuel economy in automobiles. The device while fitted at the inlet manifold of the engine increases the turbulence of the air entering through the engine inlet and hence better performance and better fuel economy are achieved.

BACKGROUND OF INVENTION

Several researchers are working on improving the performance of IC Engines and reducing its fuel consumption. Since both these parameters rely on the quality of combustion process taking place inside the cylinder. In spite of several years of research in this direction, IC Engines are performing only at an efficiency level of 35-40%. Hence there is a real necessity to maximize the performance of existing engines using simple techniques without affecting its performance characteristics. Hence through several experimental trials, the Helical Blade Swirler device is designed to improve the performance of automobile engines. By introducing this device in the inlet manifold, homogeneity of Air/Fuel mixture gets better, thus it helps in complete burning of Air/Fuel mixture inside the combustion chamber by creating additional air swirling and turbulent motion in the inlet manifold itself.

PRIOR ART

Many swirler devices are used in turbine applications to improve its efficiency. However the Helical Blade Swirler designed with tapered helical blades with holes and central bulged portion is a new combination of design to achieve turbulence in the incoming air as it enters the engine inlet. Similarly many have worked in achieving turbulence at the air inlet; however most of the techniques were related to the re-design of the inlet port itself. This helical blade swirler device technique proposed here can be adopted to any engine without modifying its present port design.

SUMMARY OF THE INVENTION

The principle objective of this invention is to reduce the fuel consumption of an internal combustion engine by making its combustion process better and more efficient by allowing the incoming air to pass through an innovative Helical Blade Swirler device kept at the engine inlet manifold and rush

turbulent and high density air entering the combustion chamber. The design of the helical blade swirler is arrived through repeated trails of testing the engine fitted with the swirler in a dynamometer test facility. It is a new innovative design which is not available in the present market. It would add value to our nations' economy indirectly as it saves the fuel consumption used by automobile vehicle users. It is a low cost, simple & easy to install device for improving fuel efficiency of automobiles and reducing the emissions of HC, CO and CO_2. The swirler geometries such as number of blades, blade length, blade angle, diameter to length ratio are optimized through several experimental trials for achieving the maximum benefits in terms of fuel efficiency.

BRIEF DESCRIPTION OF THE FIGURES

Fig: 1 explains the Helical Blade Swirler Device

Fig: 2 explains Profile of the tapered swirler blade

Fig: 3 explains Air flow pattern in the bulged area of the swirler

DETAILED DESCRIPTION OF THE FIGURES

Fig: 1 shows the Helical Blade Swirler Device explains (a) top view of the helical blade swirler device (b) side view of the helical blade swirler device and (c) front view of the helical blade swirler device

Fig: 2 shows profile of the tapered swirler blade explains that the taper side will be positioned on Engine side so that there will be less restriction just before the engine intake, the second benefit is for accumulating the air just before the engine intake so that the engine get higher density of air.

Fig: 3 shows air flow pattern in the bulged area of the swirler explains that the bulged portion will make voids which will cause vacuum at that portion which in turn helps to suck the air current from outside and hence it helps to reserve the air for second suction.

DETAILED DESCRIPTION

As described, the invention is to reduce the fuel consumption of an internal combustion engine by changing the turbulent characteristics of the incoming air as it passes through the engine inlet manifold. For that purpose a Helical Blade Swirler device is fitted at the manifold with its exit side facing the engine inlet port. The swirler device is designed with Tapered helical blades with holes in its lateral surface. The blade area is covered with an outer bulged portion which acts as a reservoir of excess air as well aids in attracting from more from outside than from the engine side due to creation

of a void area at its centre. Experimental results showed that, Presence of Helical Blade Swirler at the inlet manifold reduces the fuel consumption and the carbon based emissions while increasing the engine performance.

5. DATE AND SIGNATURE

VELTECH Dr.RR &Dr.SR TECHNICAL UNIVERSITY