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TURBO RESEARCH
&
INSTALLATION

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PREFACE

The basic idea of turbocharging, providing some form of forced induction system, is nearly as old as the interval combustion engine itself. In 1905, the Swiss engineer Buchi was granted the first patent for a practical turbocharger. In recent decades the application of the turbocharger to heavy trucks has gradually increased, until suddenly in the 1980s turbocharged automobiles appeared everywhere. Now 'turbo' has become a generally used adjective associated with anything fast or powerful with its own image completely separate from the automotive industry.

Turbocharger is a device for increasing the pressure in an internal combustion engine. By increasing the density of air drawn in, turbocharging an internal combustion engine allows more fuel to be burned. This in turn means a greater power output from a given size of engine, or conversely allows a smaller and lighter engine to be used for the same power requirement. There can also be some engine efficiency improvements which can reduced fuel consumption. These benefits naturally focused early attention on the maximum power requirement application such as racing cars and military use in aircraft.

Most people look at the word 'turbo' as something that gives power. Turbocharging gives the power for passing, power for acceleration, power for top speed, power for climbing hills, and power for pulling heavy loads. The doddering and crawling that clog our back road s into slow trains of traffic make frequent full throttle passes a necessity, if we want to maintain a reasonable speed. These slow trains of traffic are created by drivers who lack an enthusiasm for passing. Yet all but the dullest deadbeats must occasionally think they would like to blow those roadhogging slow poke off the road. Most people just don't have the guts to do it. That's partly because they also don't have the horsepower. The average cars takes 16 second to get from 0 to 60 miles per hour. Some takes more than 21 seconds. This kind of leisurely speed increased just don't allow safe backroad passes. It takes sub - 10 second 0 to 60 to pull of those acts of aggression.

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Throughout the development of this project paper, the authors have found that no matter what the need or problem is, there is always someone willing to lend a hand. Since this project paper would not be what it is today without this invaluable help, the authors would like to take this opportunity to thank all those who deserve it.

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The authors hope that the project paper would assist and guide future turbo studies with much ease.

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INTRODUCTION

The basic idea of supercharging, providing some form of forced induction system, is nearly as old as the internal combustion engine itself. In 1896 Rudolf Diesel introduced his supercharger design, only 18 years after the first successful Otto engine. The idea of using exhaust energy to provide the supercharging was not far behind, and in 1905, the Swiss engineer Buchi was granted the first patent for a practical turbocharger.

Despite this early appearance, supercharging remained for a long time something of relevance only to motor racing fanatics, aero engine designers and a few other specialist users. In recent decades the application of the turbocharger to heavy trucks has gradually increased until suddenly in the 1980s turbocharged automobiles appeared everywhere.

Now 'turbo' has become a generally used adjective associated with anything fast or powerful with its own image completely separate from the automotive industry. A brief check revealed a 'turbo' candy bar, an insulating house brick, a men's aftershave cosmetic, and a logo on a pair of pyjamas! This does not include the more obvious connections such a domestic fan heater and a vacuum cleaner and automotive shock absorbers and cam shafts.

This fashionable use of the word clearly has followed from the general appearance of turbocharged automobiles on the road, which has brought the public into contact with the concept of supercharging.

According to the dictionary, a supercharger is a device for increasing the pressure in an internal combustion engine. However, in many automotive discussions the word is used loosely to mean a traditional, mechanically driven compressor as distinct from an exhaust driven turbine or centrifugal compressor combination.