

# Turbo Charging of Two Stroke S.I Engine

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**Abstract:** Effect, design and installation of turbo charger si engine is available in this paper. Turbo charger in two wheeler which increase efficiency of engine. Supercharger works on engine power while turbo charger works on exhaust gases. We aim to increase to volumetric efficiency of Honda shine bike of 125cc and also emission from engine can be control. Small modification is done on vehicle to improve efficiency and control emission.

**Keywords:** Gasoline Engine, Exhaust Manifold, Intake Manifold, Turbocharger, Nozzle, Flanges, K & N Air Filter, Carburetor, Turbine, Compressor.

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## 1. INTRODUCTION

Turbocharger operates on exhaust gas the measure part in turbocharger in turbine shaft, housing, bearing, etc.

In this project we using the Honda shine cb 125cc bike for installation of turbocharger. CB125cc shine manufactured by Honda in India. This bike launch in market in 2006. The output of exhaust gas given to the blade of turbine so pressurized air is produced.

## 2. METHODOLOGY

What is turbo-charging? Turbo charging is the method of increasing the output of the engine without increasing the size. What the turbo-charger does? It is increases the volumetric efficiency. The objective of a turbocharger is to improve an engine's volumetric efficiency by increasing density of the intake gas. A turbocharger is also used to increase fuel efficiency without increasing power.

### Spark ignition engine:

Two stroke SI engine is an engine that uses gasoline fuel that can be operated on otto cycle. These cycle uses homogeneous air-fuel mixture which is combined in enter into the combustion chamber. Spark plug can be install in cylinder head.

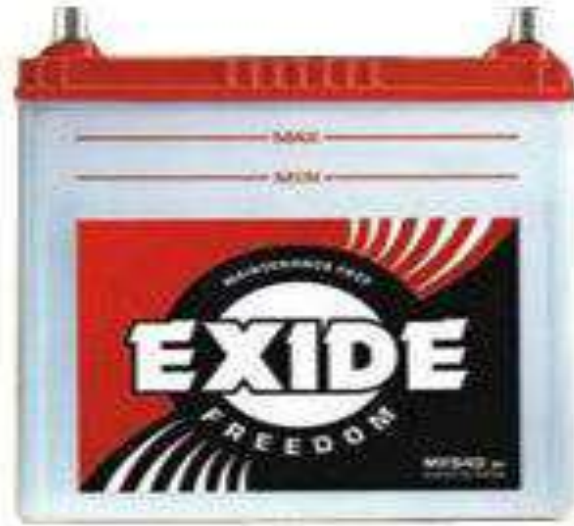
### Air filter:

The basic function of air filter is to filter the air; that is in air remove the dust particle moisture content and cleaned air passing through the carburetor.



**Battery:**

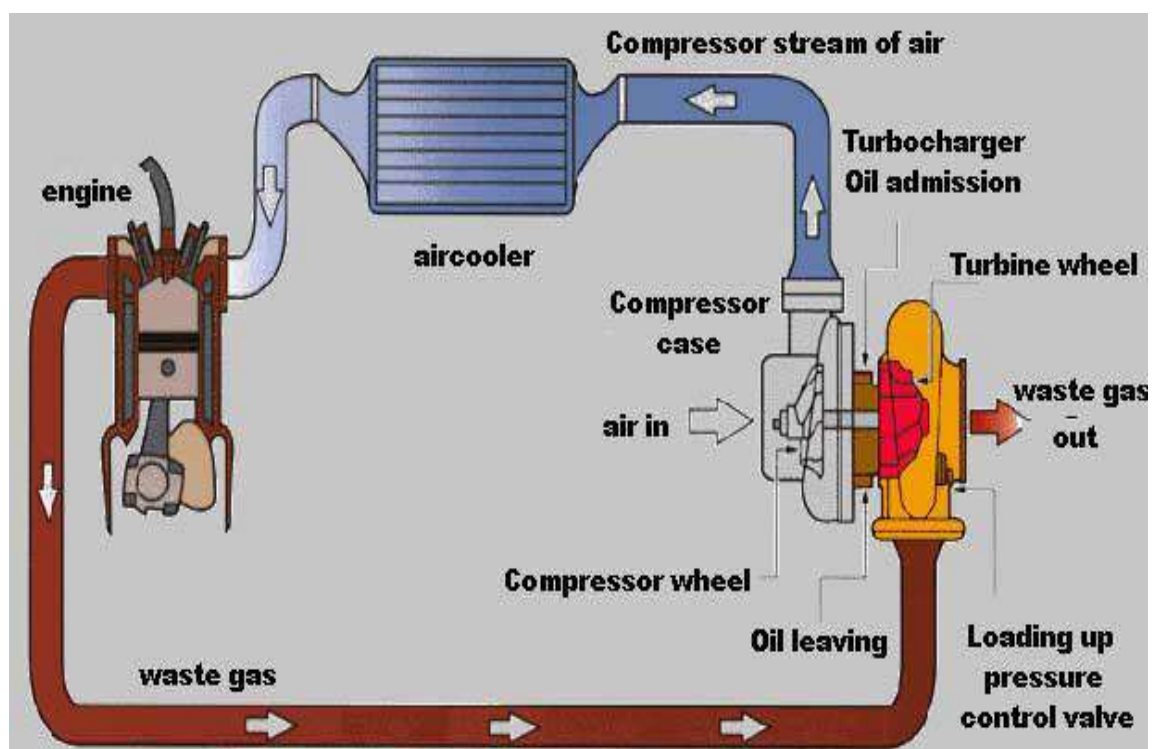
We have to use 12V lead-acid battery for supplying current.

**Oil line and oil pump:**

Oil line and oil pump require smooth operation of turbocharger. we are using 10W80 mineral based oil.

**3. HOW TURBO CHARGER WORK**

Turbochargers consist of single stage radial flow compressor which is driven by turbine instead of driven by crank shaft. Turbine get transmit the energy from high temperature exist gas flow and supply power to f drive the turbine. It slite increases the pumping losses.



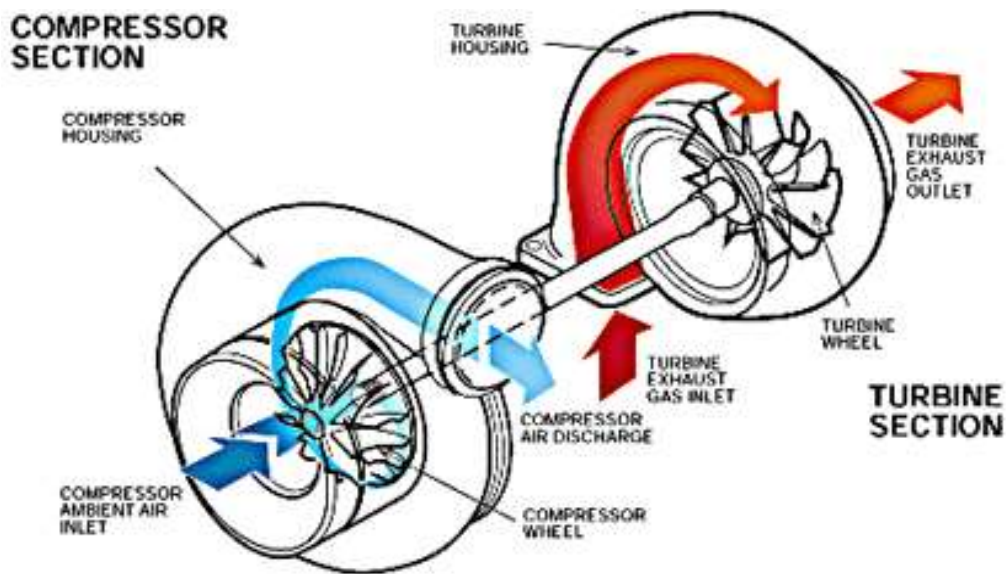


Figure: Turbocharger Working

#### 4. PROCESS OF INSTALLATION OF TURBOCHARGER IN SI ENGINE

Connect turbocharger inlet with an engine exhaust with the help of nut bolt and welding. The turbine shaft is connected to compressor of vehicle which draw combustion air compressed it and supply to engine. Connect the turbocharger inlet with hose pipe with air cleaner now connect air filter with turbocharger compression section. Connect carburetor and air cleaner with engine. silencer is connected outlet of the engine where the exhaust gases flow.

Layout of Turbocharger Installation in Honda Stunner 125cc

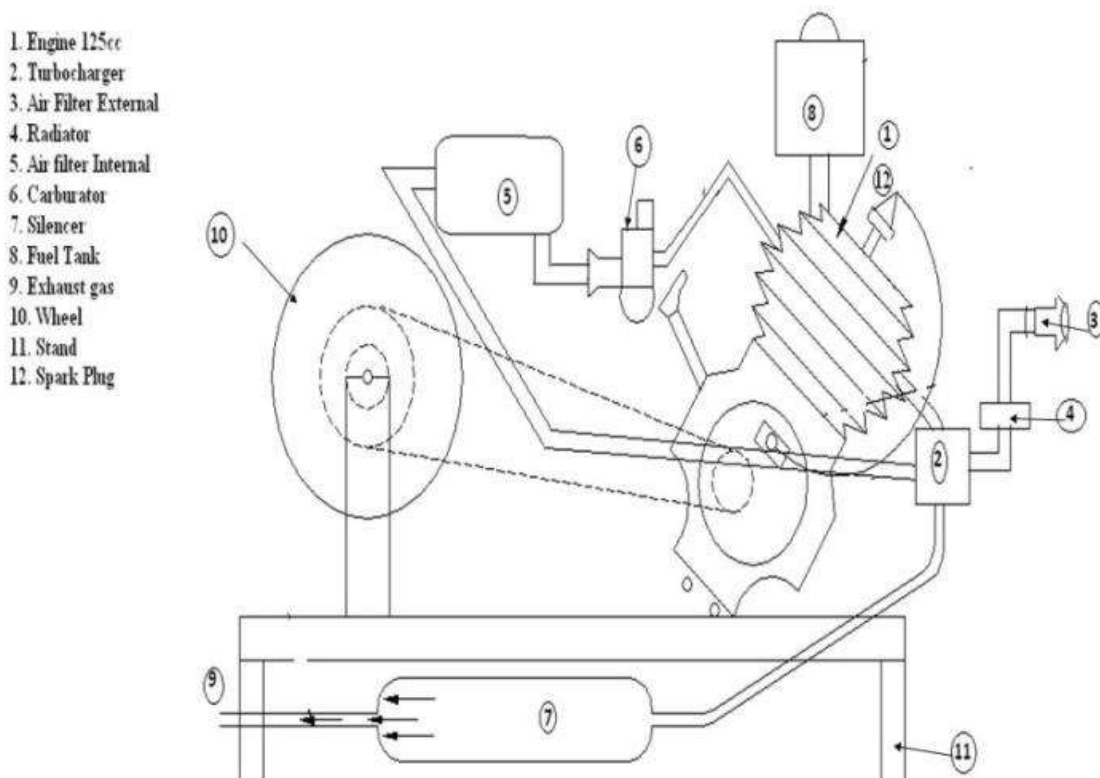


Figure: Turbocharger layout

## 5. WORKING PRINCIPLE

Turbocharger consist of two parts first is turbine and second is compressor. Turbine converts heat into rotational force which is used to drive the compressor. compressor function is draw ambient air and pump into the intake manifold at higher pressure. The mass of air enter in air increases on each stroke. Pressurize air is produced at output of engine and input of turbine blade.

We design the prototype turbocharger on two wheeler from these we developed the method of increase the efficiency of engine and control the emission. These types of engine more efficient than existing one.



Figure: Installed Turbocharger

### Features scope:

- \* Efficiency of engine can be increased.
- \* Engine emission can be control.
- \* Experimental analysis of IC engine with turbocharger and supercharger.
- \* Altitude competition.

## 6. CONCLUSION

We have to conclude that installation of turbocharger on two stroke S.I engine; to improve the efficiency of the engine and control the emission.

The installation of turbocharger weight of vehicle is more. Also installation of turbocharger increase the speed and better average can be obtained. Power can be enhanced.

## 7. ADVANTAGES

- More power compared to the same size naturally aspirated engine.
- Better thermal efficiency over naturally aspirated engine and super charged engine, because the engine exhaust is being used to do the useful work which otherwise would have been wasted.
- Better Fuel Economy by the way of more power and torque from the same sized engine. A century of development and refinement—for the last century the SI engine has been developed and used widely in automobiles.
- Continual development of this technology has produced an engine that easily meets emissions and fuel economy standards. With current computer controls and reformulated gasoline, today's engines are much more efficient and less polluting than those built 20 years ago.
- Low cost—The SI engine is the lowest cost engine because of the huge volume currently produced.
- High Thermal efficiency.
- Better Volumetric efficiency.
- High speed obtained.
- Better average obtained.

## 8. DISADVANTAGES

- \* Bike cost will increase.
- \* Engine weight will increase.
- \* If there will be improper maintenance then there will be problem in turbo such as turbo lag.

## REFERENCES

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