How to Tune Your's Engine

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Abstract— This paper describes the use of some engine tuning products that will helps to increase the power and performance of your engine. In India there is no vast scope in modification, the Indian car maker company built a car, according to Indian standard and costumer demand. India is a country where 80% people want a car having features like high fuel efficiency, economy price range and most importantantly the car should suit for Indian roads. If automaker company wants to hit their car they need these specification, some famous cars that are perfectly made for Indian streets like Maruti Suzuki (800, waganR, Alto etc), Hyundai(Santro, i10 etc), these cars are best on Indian roads. But 20% people are luxury lover, they want high performance engine, tuning equipment's etc, with the help of these features, the cars can have higher power and BHP as compared to original manufactured car. Let's take a look on it, I will help in choosing the best performance upgrades so that your car is a ten-second car, not a ten-minute car. Particularly in this paper a discussion about the air filter, their usability and their working is focused. The discussion emphasis on paper air filter, foam filter, cotton air filter, and some high performance air filter kits like Round straight, cone filter, oval straight, oval tapered. Then a view about the nitrous system is given that help to increase the speed of your car, there are mainly 4 type of nitrous system: Dry type nitrous kits, Direct port nitrous kits, Diesel nitrous system.
In our country the nitrous system is banned, so the installation price of this system is very costly.

Key words: Paper air filter, foam filter, cotton air filter, Round straight, cone filter, oval straight, oval tapered, Dry type nitrous kits, Direct port nitrous kits, Diesel nitrous system

I. INTRODUCTION

Before proceeding lets know why air is needed for engine. Air is needed for combustion of fuel in engine. Air enters the cylinder by the movement of piston during suction stroke. In petrol engines air and fuel mixture enters the cylinder. In some engines air is pushed into the cylinder with the help of turbocharger. This increase the power and fuel efficiency of engine as more air enters the engine. Now I tell you the function of air filter. Air filter is a very important part of the air intake system as the engine breathes through it. It prevent entry of dust and dirt particles into the engine, it locate in intake manifold, air filter suck the dust and dirt particles into it, then it transfer clean air into the engine. Dust and dirt particles are abrasive in nature and cause rapid mechanical wear of engine parts like piston, piston rings, and cylinder walls. Thus the air filter prevents excessive wear of engine parts and increases engine life. Air filter plays an important role in engine performance, the more the air enter in cylinder it help in combustion , and increase the power of the engine. Firstly we discuss about the air filter and it working and then the nitrous oxide. As we have discussed earlier that if we increase the air quantity in cylinder its produce more power. If our car have nitrous oxide system, we can easily boost horsepower in any petrol engine. Let's see how its work, when we heat nitrous oxide to about 300 – 400°C, it splits into oxygen and nitrogen. Its means high amount of oxygen is available during combustion i.e. if we have more oxygen, we can also inject more fuel, and then we can get a more horsepower. When it vaporizes nitrous oxide provides a significant cooling effect on the intake air, when air intake temperature reduces, the air's density is increase and it provides more oxygen inside the cylinder. Well if you want to use this system you have to change your engine parts like piston, connecting rod, engine head, cam shafts etc. because these parts are not use for this porous we have to use high performance engine components. According to my research the installation of nitrous system is banned in approximate all over the country. In India if your car is having a nitrous system and it causes fire due to any reason the insurance company does not provide any claim of your car. This system having a drawback that it catches fire so quickly, nitrous oxide is fairly bulky, and the engine needs a lot of it. A 5-liter engine running at 4,000 rotations per minute (rpm) consumes about 10,000 liters of air every minute (compared to about 0.2 liters of petrol), so it would take a tremendous amount of nitrous oxide to run a car continuously. Therefore, a car normally carries only a few minutes of nitrous oxide, and the driver uses it very selectively by pushing a button.

II. ABOUT

Now we discuss about the types of air filters and nitrous oxide system:

A. Types of air filters

1) Papers filters

Papers filters are used widely for engines, as they are cost-effective, efficient and easy to clean or replace. Generally this type of air filter is used in economy class cars like Maruti, Hyundai etc.

Fig 2.1

2) Foam filters

Foam filters offer minimal restriction of air flow and they have high dust capacity. The foam filters are mostly used in motor sports

Fig 2.2

3) Cotton filters

It has limited use in automobile industry as it is not suited in varying environment. These are the types of air filter that are generally used in cars, now I tell u some high performance filters.

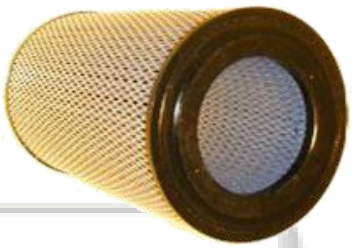

Fig 2.3

1) Round straight

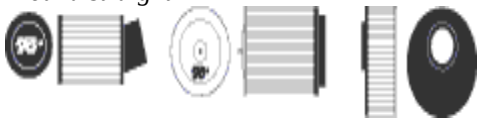

Fig 2.4

2) Round Tapered (Cone Filter)

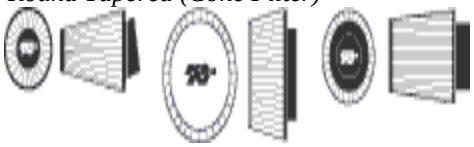

Fig 2.5

3) Oval Straight

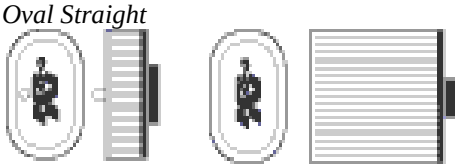

Fig 2.6

Well these types of air filters are used for engine tuning, according to my personal opinion use K&N air filters, they give best class quality product, and their filters can easily installed in car. K&N air filter life is for 100000 km and generally they are made by foam filter and they are washable. If we talking about normal air filter that are company fitted their life is for 6 month and 10000 km life, they are not washable. Now we talk about the nitrous kit, so let's take a look.

Fig 2.6

1) Dry type nitrous kits

In dry nitrous system the nitrous is in dry form, nitrous oxide passes through mass airflow sensor (MAF), and this system work by single type nozzle that only sprays nitrous through it, not nitrous and fuel. Some features are

- Injects Nitrous To Intake Tract, Produce 75 Extra Horsepower, And Excellent Mixture Atomization.

2) Direct port nitrous kits

In direct port nitrous kit, use in MPFI system 4, 6, 8 cylinder & Rotary engines cars where nitrous is injected by injectors so that our car gain extra HP, this may cause increase engine performance. Power levels are adjustable by changing nitrous and fuel Jets in each NOS injector. All Sportsman Fogger Systems include a 25 kg capacity nitrous bottle, Power shot nitrous and fuel solenoids, Fogger injectors, aircraft quality steel braided hose, and all other necessary electrical and mounting hardware for a complete installation.

3) Diesel nitrous system

If you think the torque of that monster diesel is something to brag about then you should feel it with the extra power of NOS. This kit works with stock and modified applications. Vehicles with computer upgrades will benefit even more as nitrous will aid in a clean combustion. Comes complete with 25kg bottle, Bottle brackets, nitrous feed line, large nitrous solenoid, electrical wiring and complete instructions

III. FEATURES

- Adjustable HP settings
- Gains up to 75HP on STOCK applications

– Higher HP gains with computer modifications

Nitrous oxide injection systems for automobiles are illegal for road use in many countries. For example, in New South Wales, Australia, the Roads and Traffic Authority Code of Practice for Light Vehicle Modifications (in use since 1994) states in clause 3.1.5.7.3 that the use or fitment of nitrous oxide injection systems is not permitted. Nitrous is legal in street driven automobiles, only if the feed line from the bottle is disconnected or if the bottle is dry (empty) or simply closed. In Great Britain, there are no restrictions on use of N2O in but the modification does have to be declared to the insurance company, which will undoubtedly require a higher premium for Motor Vehicle insurance or could refuse to insure. Regulations in Australia vary by State, but are banned in New South Wales.

In Germany, despite its strict TÜV rules, a nitrous system could be installed and used legally in a street driven car. The requirements for the technical standard of the system are similar to those of aftermarket natural gas conversions, especially for the gas bottles. Since the car still has to meet its emission standards, which depend on the cars year of construction, it's easier for older cars.

IV. Conclusion

Well this research paper helps us for choosing best performance upgrades which play a very important role in Engine tuning. In India the modification is not popular because these equipment's are very costly and some equipment's are ban in India like nitrous oxide system. But these systems are install in India illegally. Our government banned on these system because our Roads are not good as compared to other developed country. But there is vast future scope in India because India is developing country, today era roads are built properly, many car maker company gives company fitted turbocharger and other features of engine tuning. In India there is traffic problem, so that our cars does not suitable for these types of system. On my next research paper I tell u about some other engine tuning equipment's. Speed thrills but kills, So drive safely and obey the traffic rules, but remember Install the engine tuning equipment's like Turbocharger, intercooler, weight reduction kits, intakes and exhaust kits, spoiler etc.

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