



Superchargers Vs. Turbochargers



Research By: Fadi Abas Christina Pope Wayne Gyorgak

Intro

Since the creation of the internal combustion engine people have searched how to make it better. The most common idea was to force as much air and fuel into the given space as possible to create more power. From this thought two different approaches emerged: the turbocharger and the supercharger.

We shall try to give those who are curious the knowledge on the difference between the two forms of charging and how they work. Then with research we intend, if possible, to name a superior of the two methods.

What's the Difference?

The turbocharger compresses the air intake by using exhaust gases to spin the internal turbine, while the supercharger uses a belt driven pulley to spin the turbine to compress the air.

Pros Vs Cons

Turbo Pros

- more power for the size and space taken up by the turbo
- more efficient: uses power source that is usually wasted in normally aspirated engines
- better fuel economy in smaller engines

Turbo Cons

- "turbo lag": refers to the time it takes for a turbo to spool up before it provides boost
- turbos generally have a range of rpms that they work for
- turbos need to tap into the engines oil supply where a supercharger doesn't need to
- turbochargers generally surge power

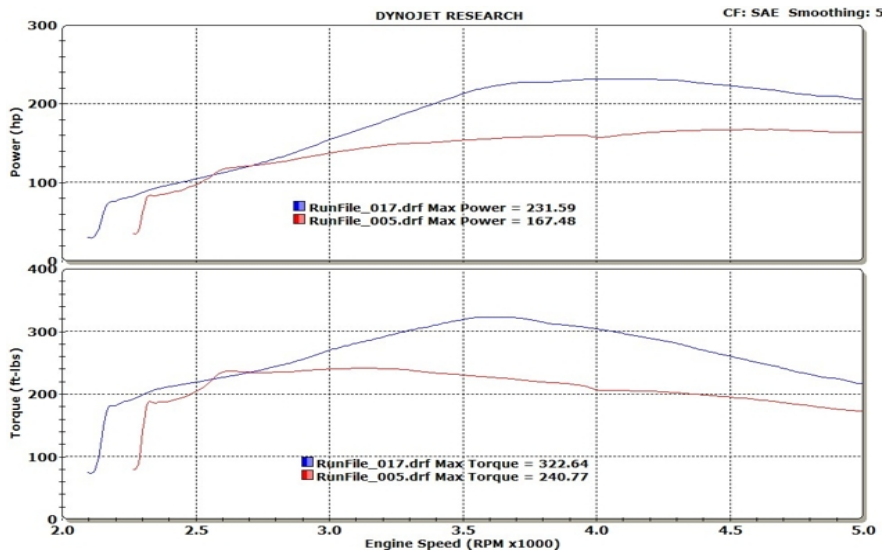
Supercharger Pros

- Instant power: no lag and easy to set up
- work at all engine rpms
- cheaper than turbos

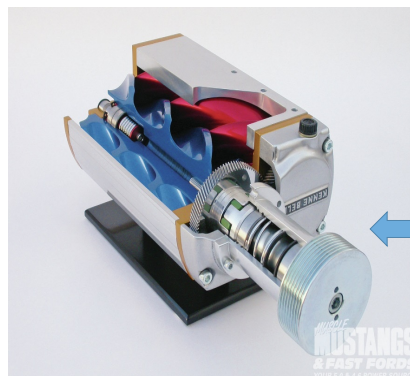
Supercharger Cons:

- takes power from engine to make more power

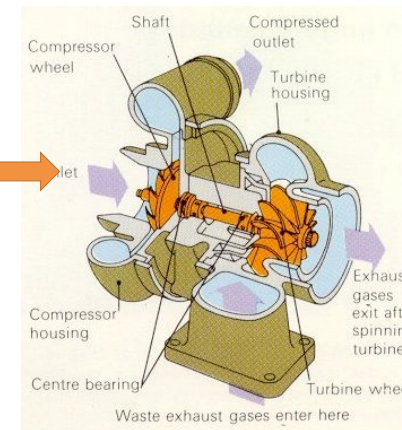
Thank you to our many online sources.



This is a comparison of a turbo and a supercharger on a '93 truck. The red lines are the supercharger and the blue is the turbocharger.



Turbocharger
Supercharger



Conclusion

So after seeing the data we can verify that a turbo creates more power over time than a supercharger. But if the cost of the turbo is worth the performance boost is all dependent of the vehicle at hand.

Faculty Advisor: Dr. Michael Adams