

5 Ways to Add Horsepower & Torque to Your Car

Sports car drivers are obviously not just interested in the outward appearance of their ride, they also want maximum power at their disposal. They want to be a second faster in getting from 0 to 100 as soon as the red light turns green; because in this game, a second is equivalent to a lifetime.

In the automobile world, to achieve this objective of having more power, two key metrics, known as horsepower and torque, come into play. Both these terms have specific definitions that can be explored on any credible online forum. However, there is heavy consensus amongst auto experts on the following five ways of adding horsepower and torque to a vehicle. While most of these upgrades are pocket friendly, some may leave a heavy dent.

1. Install a Cold-Air Intake

One of the most popular manners of increasing horsepower and torque in a car is through a cold-air intake. Before delving into how installing a cold-air intake would increase horsepower, it is integral to understand what cold-air intake is.

In layman's terms, a car engine should be considered as a large air pump with a sequence of planned combustions that throws as much air in and out as possible. If someone wants to increase the horsepower and torque of a vehicle, they need to ensure that the maximum amount of air goes in and out of the engine.

It is a common fact that colder air is denser and has more oxygen. Hence, in a certain volume, if the air is cold, more of it would be present. This rationale also comes into play when the air pressure in your car tires plummets during winter. If we take this rationale a step further, it would mean that the denser the air that goes into your engine, the more molecules will go through your engine to mix with fuel and generate power. Furthermore, more oxygen improves the combustion process also and creates more horsepower from the engine. This is achieved using a cold-air intake. Due to their large surface area, an aftermarket cold-air intake can be up to three times larger than factory fitted air intakes.

A cold-air intake can cost between \$150 and \$500 depending upon the make and model of your car. For instance, a [cold-air intake system for Porsche 911 Turbo](#) costs \$295 and results in an increase of 21 horsepower and 14 ft/lbs in torque. It is not a heavy outlay as it can result in savings because of better performance.

2. Replace to a High-Performance Air Filter

Another economical way to increase horsepower and torque is by opting for a high-performance air-filter as opposed to a stock air filter installed by the auto manufacturer. Factory fitted air filters may be

good at stopping dust particles from going into the engine, but they are not optimized to allow a free flow of air into the engine as opposed to a high-performance air filter. This creates a hindrance in the optimum performance of the engine.

Aftermarket high-performance air filters have done a stellar job at overcoming this limitation. They provide multiple layers of cotton to allow better flow of air as compared to paper-based air filters. Thus resulting in improved performance in the form of more horsepower and torque.

Installing a high-performance air filter is an economical way of increasing horsepower and torque. For instance, a [high-performance air filter for BMW M3 & M4](#) is available for \$195 only. It provides a 40% increase in airflow than paper-based air filters.

3. Go for a Cat-back Exhaust

Before exploring the impact of cat-back exhaust system on the horsepower and torque of a car, it is pertinent to understand what a cat-back exhaust is. After the process of combustion, the remaining harmful fumes are sent to the catalytic converter, following which carbon dioxide, nitrogen oxide, and water is produced, and go through the exhaust system.

The cat-back exhaust comes into play when these fumes reach the exhaust. Stock mufflers do not allow these fumes to depart quickly, undermining the optimum performance of the engine. The installation of a cat-back exhaust straightens the pipes from the catalytic converter to the muffler. Furthermore, it has a bigger diameter than the stock system, which allows more fumes to pass through quickly and helps the engine perform better. It also reduces weight on the ride of the car that makes the lighter and thus faster.

The fact that the [cat-back exhaust system for Porsche 911 GT3 and GT3 RS](#) is available for \$1,595 only, also indicates how pocket-friendly this mod is. Additionally, not only does it improve the horsepower and torque of the car, it also reduces more than 54lbs (24kg) weight from the rear side of the vehicle, which results in improved handling and acceleration, and a roaring sound at low RPMs.

4. Get a Supercharger or Turbocharger

As previously, the concept of cold-air intake is based upon colder and denser air going through the engine to increase its performance. Meanwhile, for turbochargers and superchargers, the concept of forced induction comes into play. Forced induction compresses the air flowing into the engine and can result in an increase in horsepower by 30% to 50%. The increase in air results in more combustion, which, in turn, increases the horsepower and torque of a car.

A turbocharger also works on the principle of forced induction. However, there are couple of significant differences between a turbocharger and a supercharger. Firstly, a turbocharger is not directly connected to the engine as opposed to a supercharger. Secondly, a turbocharger has smog altering equipment that reduces the carbon emission, while a supercharger does not have a waste gate. Finally, the supercharger

drives power from the crankshaft of the engine and the turbocharger uses the exhaust stream to generate its own power.

5. Opt for a Re-flash

The engine control unit (ECU) of modern cars can be reprogrammed for optimal output. This can result in a significant increase in horsepower and torque. The re-flash of the ECU makes alterations to factors like low RPM power restrictions, fuel-air mixture, ignition timing advance, turbo boosting, and a combination of other options. However, a re-flash only works if the car is supercharged or turbocharged.

Considering the fact that the [ECU tune for Ferrari 430](#) and [Lamborghini Huracan](#) costs just under \$2,000, it shouldn't be much of an issue. The process requires the car owner to send their ECU to a car performance specialist, who can re-flash it and send it back to them. A re-flash for the Ferrari 430 increases its horsepower from 490 to 516. Meanwhile, the torque increases from 343 ft/lbs to 363 ft/lbs. Normally, most auto specialists save the default settings of the ECU, if it needs to be restored later.

A re-flash is a recommended solution for those who have performance parts installed in their cars, especially a supercharger or turbocharger. However, there is a con of higher costs due to decreased service intervals and the requirement of higher quality fuel following the re-flash.

For car owners, getting the most out of their vehicle in terms of speed and performance is very important. An increase in the horsepower and torque of their machine gives them an edge over fellow racers and enthusiasts on the track. Additionally, bragging rights for having the fastest car on the track is a bonus!