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When to Upgrade Your EcoBoost F-150's Intercooler

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Whether you're building up your EcoBoost for tougher work or building a track truck, upgrading from your stock intercooler can increase torque as well as reliability. While

not an obvious horsepower grade, aftermarket intercoolers help keep engine intake temperatures under control, reducing the risk of future issues.

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No matter whether you have a 2.7L or 3.5L EcoBoost F-150, an intercooler is an integral part of your truck's performance and a necessary modification when adding more power. This guide will go over how your EcoBoost F-150's intercooler functions and when you need to upgrade it.

What Does An F-150 EcoBoost Intercooler Do?

- - Intercoolers cool down the intake air

- - Keep performance consistent

- - Add power

- - Make the air going into your intake denser with oxygen

- - Optimize your EcoBoost turbocharger's output

The EcoBoost F-150 intercooler cools down your intake air coming from the turbocharger, allowing your EcoBoost engine to take in denser air. Intercoolers are a common component on supercharged and turbocharged vehicles, as they are needed to cool down the air supplied to your engine.

As the air gets compressed by the turbocharger it builds up a lot of heat. Hot air is less dense than cool air, effectively lowering the oxygen levels and reducing the air-fuel ratio. The intercooler combats this by cooling that air down, allowing it to be very dense and oxygen rich, giving you an optimal air-fuel ratio and more consistent performance.

Through their design and function, intercoolers allows your engine to burn more fuel, improving the combustion of your EcoBoost F-150 engine and giving it more power in the process, effectively optimizing the output of the turbocharger. Intercoolers allow your Ford truck to have more consistent performance because of the more regulated air going into your intake, keeping the air temperature at a steady level, and regulating the air-fuel ratio as well.

Types of EcoBoost F-150 Intercoolers

There are two types of F-150 intercoolers:

- - Air-to-air intercoolers

- - Air-to-water intercoolers

Air-to-air is what is found on the F-150 in stock form and is the popular upgrade in the aftermarket. Air-to-water intercoolers are heavier, but typically take up less space than air-to-air intercoolers.

Air-to-Air F-150 EcoBoost Intercoolers

Air-to-air F-150 EcoBoost intercoolers function by funneling hot compressed air from the turbocharger through an array of cooling fins before feeding it into the engine. The outside air

hitting the intercooler removes the heat from the cooling fins, allowing the temperature of the compressed air to stay low.

Air-to-air intercooler systems are typically simple in design, low in cost, and lighter in weight (when compared to air-to-water). The only downside is they can take up extra space as they need a large "core" for the air to flow through and need extra room for the piping. Air-to-air intercoolers are generally the recommended upgrade for F-150 owners as they can and will serve all of your needs in a build.

Air-to-Water EcoBoost F-150 Intercoolers

Air-to-water F-150 Ecoboost intercoolers function by taking the compressed air and channeling it through a system of veins of water that absorb the heat from the air into the water. That water is then flushed through another circuit (usually a radiator) while the cool compressed air is sucked into the engine. These types of intercoolers are often referred to as heat exchangers as they exchange the coolness of the water for the heat from the air.

Air-to-water intercoolers are more efficient at exchanging the heat out of the compressed air while capable of handling a wider-range of heat. Air-to-Water intercoolers don't take up much space, however, they are usually heavier and more expensive than air-to-air intercoolers. Air-to-Water is also more complicated to install. With an air-to-water setup you will need to add:

- - A radiator unit

- - A pump

- - Water

- - Transfer lines

While you can upgrade your stock EcoBoost F-150 intercooler to an air-to-water unit, it is often more hassle than it is worth. If you're planning on upgrading to a massive turbo setup, then an air-to-water setup is within reason for your build.

When Do I Need to Upgrade My EcoBoost F-150's Intercooler?

You will want to upgrade your EcoBoost F-150's intercooler after you have begun modding it a good bit, especially after tuning it. When you start upping the boost on your F-150 EcoBoost's turbo, you'll want to improve the cooling capabilities of your truck by swapping out the stock system for an aftermarket one. Once you have done, exhaust, intake, and a tune, it is really time to start thinking about upgrading the intercooler. If you upgrade the turbo system, you will almost definitely have to upgrade the intercooler.

Even if you are stock you may want to consider upgrading your intercooler to an aftermarket unit to get more consistent performance out of it. Upgrading your EcoBoost F-150's intercooler while stock will slightly increase the horsepower and torque while helping to keep engine temperatures down.

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Meet Our Team

[John, '10 F-150 Lariat](#) Fulfillment & Production

I decided to buy my first F-150 years ago after I wrecked my Grand AM, and I've owned nothing but F-150s ever since. I've owned a total of four F-150s in my lifetime, and I first laid eyes on my current Lariat in 2012 when I drove by a dealership and saw it on the lot. I knew at that moment I need...