

# FLOWING FREELY

*How a Fresh Air Filter Helps Your Car Breathe Easier—and “Feel” Better*

**If you have seasonal allergies, then you are probably familiar with waking up in the morning and barely being able to breathe.**

You feel as if something has invaded your body and completely blocked your airways. But if you're one of those people who has been fed up with that feeling, you've likely visited your doctor about the problem. Then, she gave you a magical prescription to help you breathe easily.

Believe it or not, your vehicle can have the same problem. Albeit your Ford isn't allergic to pollen, but sometimes it may find itself unable to breathe. That's when you—or your automotive technician—get to step in and play doctor with a magic cure. What's the cure? A fresh air filter.

The air filter is one of the most critical maintenance items on your vehicle. A clogged air filter can reduce horsepower and fuel economy.

Even worse is a damaged air filter that allows particulate matter into the engine, as those tiny particles of dirt and other material can speed up engine wear and even cause premature engine failure.

When you think of it, your car's engine is essentially one big air pump. Air is forced (i.e. inducted) into the engine, where it is compressed, mixed with fuel and ignited. The power from that miniature “explosion” (what mechanics call combustion) is what turns the engine in a process that occurs dozens or even hundreds of times per second and thousands of times per minute. Once combusted, the

air is forced out of the vehicle through its tailpipe. With all that rapid motion going on inside your engine—camshafts rotating, valves opening and closing, pistons sliding up and down, etc.—it's amazing and just a little bit scary to think about what can happen if just one tiny particle gets thrown into all that mechanical chaos. Imagine a very, very tiny grain of sand getting stuck between the cylinder lining and piston ring of your engine and grinding, grinding, grinding away at the metal surface until a tiny groove has been etched, allowing oil to leak through. Now multiply that times several thousand or more and you can see just how quickly particulate matter can harm an engine.

But when it comes to particle size, how tiny is tiny? Most dust particles range in size from one to 100 microns, and the ones that tend to do the most damage are around 20 microns in diameter—basically because they're small enough to fit between the metal components of today's high-tolerance engines. (For anyone who slept through science class, a micron is one-millionth of a meter; 25 microns equals 0.001 inch. Want to do a quick science experiment? Pluck a hair from your head and look at it. What you're seeing is generally 50 to 70 microns in diameter!)

Fortunately, modern engine air filters do a fantastic job of grabbing these particles, usually trapping up to 98 percent of particulate matter down to 20 microns in size. Some premium engine air filters can even boast that much efficiency with particles as small as 10 microns.

Engine air filters work by keeping a layer

of cloth or paper, called media, between the outside air and your engine. The filter media traps particles that are in the air, but allows the air itself to pass into the engine. Like many other filters on your vehicle, however, the engine air filter eventually becomes dirty as the media collects more and more particulate matter. This can reduce the flow of air through the filter, starving your engine of the precious air flow it needs, which not only robs you of horsepower, it also cuts into your fuel mileage. (Remember how you felt when you awoke unable to breathe thanks to your nasty allergies. Well, that's how your car feels right about now.)

That's why automakers generally recommend replacing your engine air filter every 15,000 to 30,000 miles, or more frequently if you drive in dirty, dusty conditions. (And doesn't all urban driving qualify? Just rub your hand along your car's body the next time it's been a couple of weeks since you washed it. Now imagine all that dirt trying to get into your engine.) In fact, the Car Care Council recommends that your car's air filter be visually inspected at every oil change and replaced at least annually in order to provide maximum protection and fuel efficiency.

Although air filters usually don't need to be replaced as often as oil filters, they are an important part of your maintenance routine that keeps your engine operating at peak efficiency and helps extend its life.

Air filters keep the air flowing freely to your engine allowing it to breath easily, so be sure to ask your service technician if your air filter needs to be replaced. +

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