

Hot Air Chokes vs. Electric Chokes

For this month's issue of *Mustang Times*, we will talk about carburetor choke systems. Chokes are integral parts of your vehicle's carburetor and can be a huge contributor to whether your car starts and runs well or just ok. There are several different types of choke systems that have been used on carbureted vehicles over the years and we will address the pro's and con's of each here.

HOW DO CHOKE SYSTEMS WORK?

If you press the gas pedal all the way to the floor when the engine is cold (at whatever ambient air temperature), you are closing the choke plate on the carburetor. Once that is done, a couple of pumps of the gas pedal will provide the initial charge of fuel for the engine to start. Once the engine starts, a choke unloader will open the choke plate about 1/8-inch. From there, as the engine heats up, the fuel requirements continue to lessen (it can run on a leaner mixture). Heat produced either from a heat riser tube or from an electric choke cap will provide the heat to the bi-metal spring inside the black choke cap. As the spring gets hot, it unwinds and gradually opens the choke plate to a vertical position.

DO I NEED A CHOKE?

We have people from warm climates tell us all the time that they don't need choke systems. I would respectfully disagree and let me tell you why. Even though it may be 80 or 90 degrees outside in the morning, the cylinder walls, pistons, and valves inside your engine are going to be that same temperature or even a little colder. When the engine is at full operating temperature it is approximately 600 degrees. The fuel requirements of a cold engine (90 degrees is cold compared to 600 degrees) are dramatically different than they will be when the engine is at operating temperature. In the first ten seconds of operation the engine needs twice as much fuel than when it is hot. For that reason, we like to use choke assemblies on carburetors. When properly adjusted, an automatic (hot air) choke (especially an Autolite 2100 or 4100) will allow a carbureted vehicle to run almost as well as fuel injection.

WHAT IS AN AUTOMATIC (HOT AIR) CHOKE?

As stated earlier, hot air is provided by the heat riser tube connected to a sealed passage in the exhaust manifold. This is a SEALED passage, therefore there are no exhaust gases traveling through the choke tube. It allows cold air to enter one end of the exhaust manifold, get warmed up, and then pass through the insulated tube to choke cap on the carburetor. Again, the hot air will warm the bi-metal spring, it will unwind and open the choke plate. This process at 40 degrees will take 5-7 minutes, which happens to be about how long it takes your engine to reach operating temperature. We like hot air chokes because the full opening of the choke plate corresponds with the time that it takes for an engine to reach operating temperature.

When we receive requests for anything other than an automatic (hot air) choke, we often ask, "Why?" The answer is usually that the customer has removed the exhaust manifold and installed headers or HiPo exhaust manifolds. That is OK, you can still use an automatic choke. Instead of using the factory pre-bent stainless steel choke tubes that press into the exhaust manifold, we suggest using an extra long, bendable insulated tube that clamps to the outside of the exhaust pipe. The open end of the tube will bring heated air up to the black choke cap in much the same way as the original tubes. You can bend this extra long choke tube to your specifications and it will look neat and factory installed. These tubes are available exclusively through Pony Carburetors.

WHAT IS AN ELECTRIC CHOKE?

Electric choke assemblies differ from hot air chokes by the fact that the heat comes from the cap itself. Inside the black choke cap is a heating element, much like the heating element on your electric stove. It gets red hot and provides heat to the bi-metal spring to make the choke plate open. We do not prefer electric chokes because they go from closed to fully open in about 45 seconds. As stated earlier, it takes an engine 5-7 minutes to reach operating temperature, and in less than a minute the engine is not ready for such lean

air/fuel mixtures that are going to be introduced into the engine. This causes drivability issues which include hesitations, flat spots, surging and dying. Anytime our clients will listen to us we try to discourage the use of electric chokes.

The Ford electric choke caps that were first introduced in 1973 are unique. First, they operate on 7 volts, as opposed to the usual 12 volts. The 7 volts comes off a special terminal on a Ford alternator. In addition, they have ambient air temperature sensors built in and will not work below 60 degrees. Anyone who tries to use the original Ford electric caps alone will find they are pretty much useless. All of the 1973 and newer Ford Motor Company vehicles not only had the electric assist choke cap, but also had the hot air tubes running through the exhaust manifold. The idea was that the electric assist would open the choke cap at warm ambient temperatures when the engine didn't need much help (fully open in about 45 seconds). It was used mainly as an emission device, not a totally electric choke.

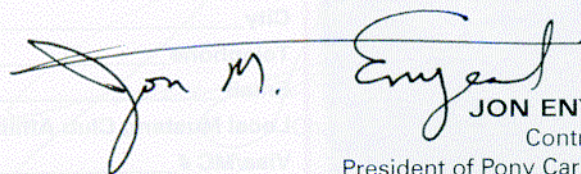
WHAT IS A MANUAL CHOKE?

If you spend enough time around older classic vehicles you will surely be familiar with the manual choke system. They consist of a knob and cable for the driver to be able to open and close the choke plate. These certainly have their place in trucks, farm equipment, lawn mowers, and in some passenger cars. We do not like to see them used unless they were original to the vehicle. There are people that just prefer to be in CONTROL of the choke system and will install a manual choke for that reason alone. Manual choke conversions are really not a good option because of the unavailability of parts that are reliable enough to stay working. We very seldom do these types of conversions for that reason, except on HiPo applications.

As always, I invite your comments about any of the "Good Carbs" columns. Also, if you have questions, please feel free to send them on to me.

You can reach me at Pony Carburetors by phone, fax, or email.

Happy Driving,



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