

1970 CA Emissions Systems

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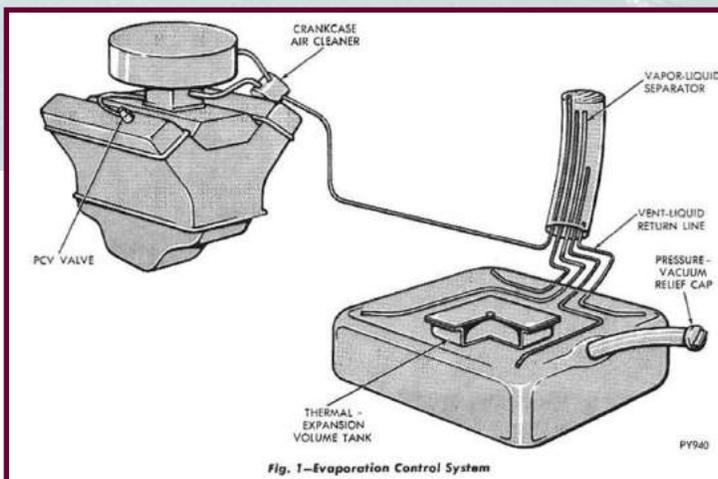


The term “smog” is a combination of the words “smoke” and “fog” or “smoky fog”, and has become a growing problem in urban areas as the use of cars and airplanes and industry grew in the 20th century. Unusually heavy smog can cause various kinds of health problems, difficulty breathing, and even death. One of the most extreme examples of this goes back to 1952 in London when 4000 people died from a week of unusually heavy smog, and then the following year in New York City 200 people died as a direct result of smog. In the United States, California has had a long history of problems with smog because of the climate, geography, expanding number of people. In particular Los Angeles had suffered from heavy smog since the 1940's because of all these reasons. Clearly this was a problem but it wasn't until more research was done that it was determined that cars were a big contributor to this growing situation.

California was the first state in 1965 to impose emission standards on vehicles, and then in 1966 was the first state to test tailpipe emissions. California continued to be the leader in emissions standards so that in 1970 they required that all auto manufacturers have a closed non atmosphere venting fuel system on cars. Those manufacturers that did not comply would be fined. For those wanting to get a better understanding of the California smog issues there is an excellent documentary you can watch called “Clearing California Skies”. <https://www.youtube.com/watch?v=k2Ra8PRtXSU>

This article here will show all the unique pieces of the CA emissions system that was installed on all Mustangs, Cougars and Shelys (regardless of engine size) that were shipped to and sold in California for the 1970 model year.

The basic concept of the system is shown below in Figure 1:



The regulations that California imposed starting in 1970 were designed to simply contain the fuel and the vapors to the car as much as possible and not vent them to the atmosphere. The fuel tank had an area that allowed the fuel to expand into the tanks in the trunk and then back to the fuel tank as it would get hot/cold. Also included in the system was a charcoal canister (not shown in the diagram) that would catch any additional fuel vapors. The last major piece of the system was to have a non vented gas cap that did not allow fuel vapors to escape.

Major System Components

The following pages show the major components of the 1970 CA Emissions systems that are unique to all Mustangs shipped to California that model year. It should be noted in some rare cases a vehicle could have been ordered with this system outside of California, but would need to be documented or verified to be known to be correct and original. Although its not possible to cover every single item that was installed in a 1970 CA emissions system this guide should serve as a tool for the most visible and commonly used items.

Fuel Tank—D0ZZ-9002-B

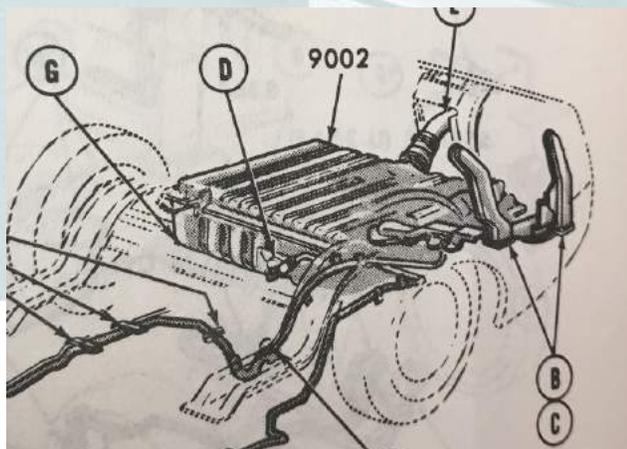
The main, and largest component of the CA Emissions system, is the fuel tank. In 1969 all fuel tanks were a 20 gallon capacity and in 1970 these were all increased to a new 22 gallon capacity. But, because of all the special internal fuel tank components, the CA emission tanks only could carry a 20 gallon capacity.



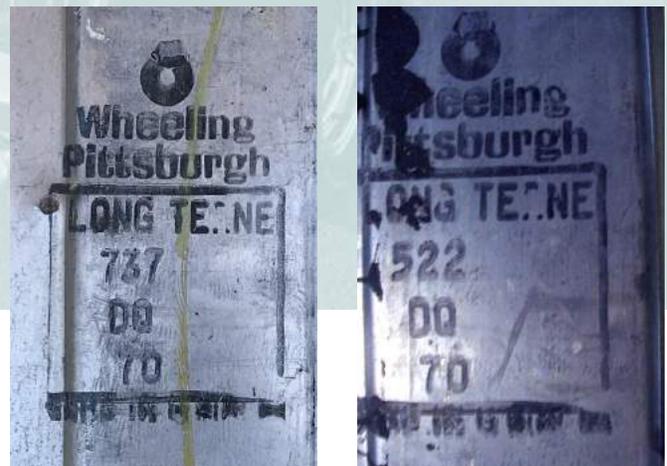
Shown here is the special CA fuel tank completely split open to show the internals showing the top half view. Note the extra tubing that is used to recover the fuel vapors. It is because of all these extra parts its impossible to clean out and reseal one of these tanks.



It appears that almost all of the CA emission fuel tanks were manufactured by Wheeling Pittsburgh as indicated by the stamps that are seen on surviving cars and fuel tanks. Note also the grey sealer used to hold the anti rattle board in place on top of the tank.



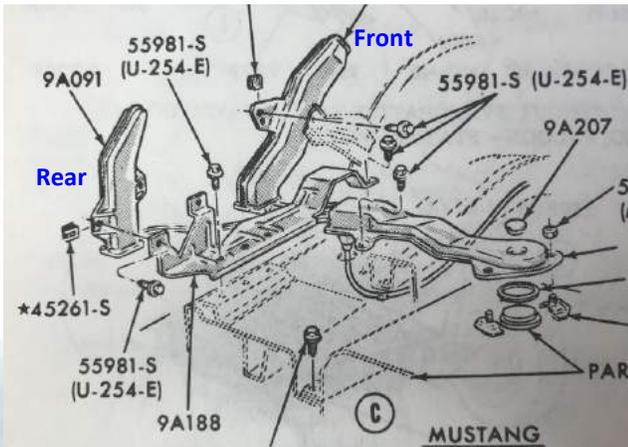
Shown here illustration of the fuel tank assembly and related parts that were installed.



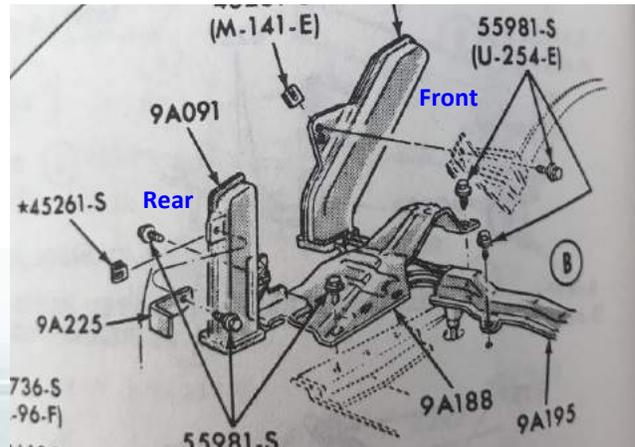
Original ink stampings from Wheeling Pittsburgh that were typically on these style 1970 fuel tanks.

Fuel Tank Vent Expansion Tank Assemblies

These expansion tanks are what is seen inside the trunk on the drivers side. The purpose of these tanks is to contain any fuel or vapors that would expand as the temperatures increase inside the fuel tank. Mustangs and Cougars do not have the same tanks and should be noted as they are not technically interchangeable. There is also a front and rear tank assembly inside the trunk.



MUSTANG

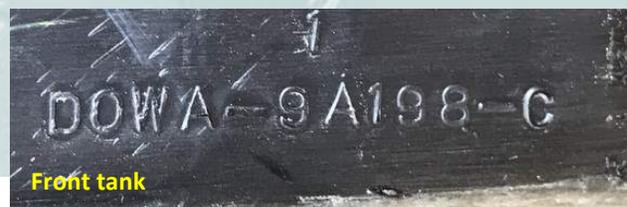


COUGAR



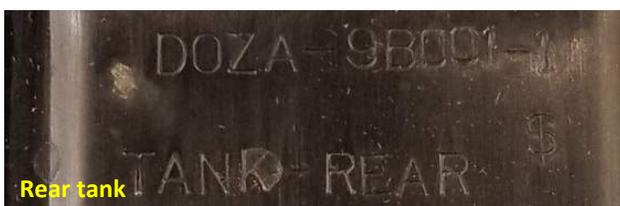
Front tank

Mustang tanks



Front tank

Cougar tanks



Rear tank



Rear tank

Continued—Fuel Tank Vent Expansion Tank Assemblies

Shown here are original tanks with the ink stamped date codes, which is normally in yellow and visible when looking in the trunk of the car. Decoding of the stampings as shown. PB = manufacturer stamp



Oct 30 1969

Oct 22 1969

Feb 23 1970

Emissions Sticker: All systems carried an emissions sticker warning that was placed on the front tank and shown here. It seems that usually there is a slash mark or inspection mark that the sticker was placed over.



Bracket—Fuel Tank Vent Expansion Tank



Both Mustangs and Cougars use the same exact bracket to hold the front and rear fuel tank vent expansion units. Part number for this was a D0ZZ-9A188-A and would be painted black and installed after the car was painted so it should not have any body color on it to be correct. Self tapping screws were used to hold the bracket in place (usually zinc dichromate).



Fuel Tank Filler—Pipe Assembly

More commonly just called the fuel filler neck, these were specially modified units for the CA fuel tank and system. Note the difference in overall size as compared to a regular fuel filler neck. Also since these were used with non vented gas caps they had a double wall that allowed fuel and vapors to flow back to the gas tank.



Shown here an NOS Mustang filler neck marked with the DOZZ-9034-B part number. Note different design when compared to the normal filler necks and the correct tin lead finish which does not corrode to fuel.



Yellow paint dab on the NOS filler neck possibly used as an ID mark.



The unique end of the filler neck on these units when compared to a vented system.

Fuel Tank Filler Neck Hose

The unique fuel filler neck hose has never been reproduced and is matched to the unique fuel filler neck in its shape (note the size). The original part number was a DODZ-9047-A. Note the orientation of the two clamps for the hose when installed which is always pointed away from the trunk compartment- a detail often overlooked.



Additional items—fuel filler neck grommets

The fuel filler neck hose to tank connection had two additional grommets shown here that were installed with the tank to keep fuel and vapors from escaping. Like so many other items these had the FoMoCo logo molded in them but with no engineering numbers.



Fuel Tank Filler—Cap Assembly

Cars equipped with the 1970 CA Emissions package all had a unique gas cap to work with the fuel filler neck. Shown here are the different versions that were used depending on the exact model and version.



D0ZZ-9030-A version GAS cap—NOS



Note the longer extended neck of the cap



All original caps have the AUTOLITE logo on the back.



D0ZZ-9030-D pop off style cap that was used with the 1970 Mach 1 package also had the longer neck to accommodate the CA emissions package.



D0AZ-9030-A style cap non vented, used on Cougars. Note the S stamped in the center rivet which is the manufacturer stamp for Stant.



Inside of the D0AZ-9030-A cap showing the longer neck.

Fuel Vapor Storage—Canister Assembly

Most commonly called the charcoal canister this is mounted in the front of the car under the engine compartment and can only be seen from underneath the car. Original part number was a DOAZ-9D653-C and is a 1 year only unique part that was then replaced by a 1971 version which was a D1AZ-9D653-A.



Continued—Fuel Vapor Storage—Canister Assembly

In a side by side comparison, note the size of the 1970 DOAZ version that is much larger and also has the distinct dimple on the bottom of the canister that the 71-73 version does not have.



DOAZ Version



D1AZ Version

Fuel Vapor Storage Canister—Bracket and Strap Assembly

The charcoal canister had a separate strap and bracket assembly shown here that held it in place under the front of the car. Part number for this assembly was a D0ZZ-9D664-A and it was keyed so it could only be installed one way.



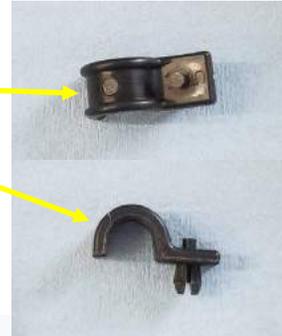
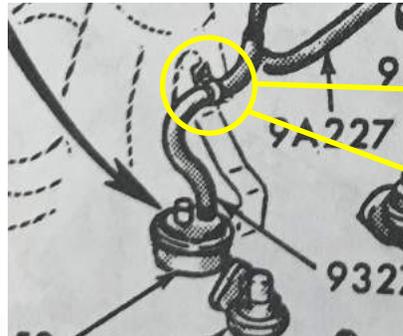
Fuel Tank Vent—Valve Assembly

This vent was mounted on the frame under the car near the rear axle and was also called the three way valve. Original part number was a D0DZ-9A153-C and these were all date coded according to a Julian calendar and year (example below 267 9 = 267th day of 1969). The shield that covered it was painted black and had a part number of D0OZ-9B022-A.



Fuel Return Hose

The fuel return hose was cut to length and ran from the charcoal canister to the return fuel line. Note the correct fuel hose ink stampings, and the special unique clip that held the fuel line to the shock tower. This clip has never been serviced and is a rare find today.



Fuel Vapor Storage Canister—Purge Tube

This paper and aluminum tube was routed from the air cleaner to the charcoal canister. It was held in place by a #7 Wittek clamp at the canister (typically galvanized) and no clamp at the air cleaner assembly. Also shown here is the special air cleaner adapter that was used to connect the hose.



Miscellaneous—Trunk pinch weld area

Another unique change on these cars is in the trunk pinch weld area. It appears most cars had a small strip of windlace that was used to cover that area instead of the normal protector, and in some cases an additional clip as well for the fuel sender wire shown here:



Special thanks to those who contributed here: Mike Bauman, Scott Taylor, Jeff Speegle, John Murphy, Scott Behncke, and Michael Banks.

**A N G H E L
R E S T O R A T I O N S**

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