

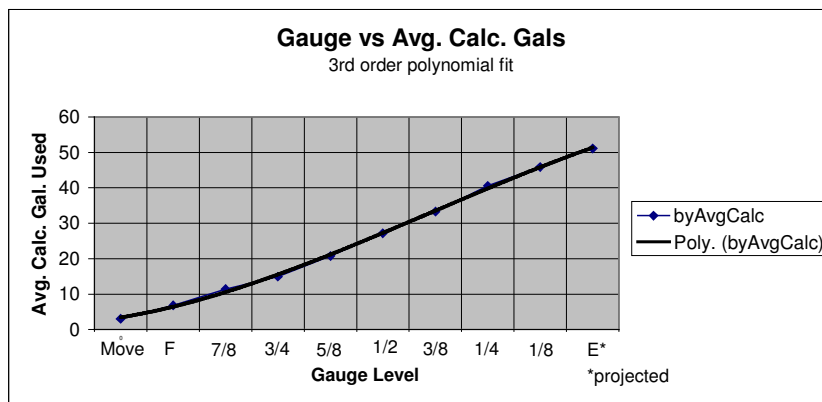
## Ford E-450 Gas Gauge on Phoenix Cruiser

*How much gas has been used according to the indications on the gauge?*

Here are my results from 21 fill-ups... along with guidelines for estimating mpg.

<u>Gauge</u>	<u>Used</u>	<u>at 9mpg</u>	<u>at 10mpg</u>	<u>at 11mpg</u>
Full	6.8 Gal.	61 miles	68 miles	75 miles
Three-Quarters	14.7 Gal.	132 miles	147 miles	162 miles
One-Half	27.0 Gal.	216 miles	270 miles	297 miles
One-Quarter	40.7 Gal.	366 miles	407 miles	448 miles
Warning light	47.9 Gal.	431 miles	479 miles	527 miles

Clearly the Full mark does not mean full and the gauge indications are not linear. A more detailed plot shows a shallow S-shape that is linear only around the half way mark.



### Discussion

The capacity rating of a gas tank starts when the sender unit in the tank begins to read. For Ford trucks that point is set at 55 gallons and the readings on the gas gauge will then start to go down.

Before the 55 gallon point there is fuel over the sender unit and up into the fill pipe on the cab chassis. The Ford engineers cannot know the fill pipe capacities of the various models using the gauge so they allow some leeway before reaching the "F" mark. In our case leeway is 4 gallons from the point where the needle starts to move and when it reaches the "F" mark.

Ford engineers also cannot know the capacity of a fill pipe added during manufacture of a motor-home, ambulance, bus, etc. In the case of the Phoenix Cruiser, the fill pipe holds 2.8 gallons before the gas gauge needle starts to move. Adding this to the 4 gallons above, means we burn 6.8 gallons to reach the "F" mark... or go 68 miles at 10mpg.

Nearing empty a warning light comes on. I only ran this low four times and was not sure that I recorded accurately when the light came on so my 47.9 gallon average has a spread of 1.8 gallons. Be wary. Anyhow, the difference from 55 gallons means there probably is 6 to 7 gallons reserve left when the light goes on.

Finally, one wonders how much gas is in the tank when the gauge reads "E". It is tempting to drive to that point and immediately fill up to see how much gas it takes... came close but didn't risk it.

Instead I projected using the difference between 1/4th and 1/8th of a tank and came up with an average value of 50.8 gallons at the "E" mark. That being the case, you aren't out of gas when the gauge reads empty. There are maybe 4 gallons left and hopefully a gas station near by.

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