

As the gas level in the tank rises, the distance between the dispenser nozzle and the fuel grows smaller. A small pipe called a *venturi* runs alongside the gas nozzle. When the end of the venturi pipe becomes submerged in the rising gas, it chokes off the air pressure that holds the nozzle handle open and shuts down the flow of gas.

Unfortunately, this shutdown can sometimes happen before the tank is full as the rapidly flowing gas backs up on its way into the tank. This can cause the gas handle to spring open before pumping is complete, leaving the annoyed customer to squeeze the handle again and risk the possibility of overflow. Pausing briefly will allow the gas to continue into the tank and the pump nozzle to start pouring gas again.

Should I Top Off My Tank?

Gasoline vapors are bad to breathe. When you smell gas, that means some highly toxic substances are in the air. Topping off your tank damages the *vapor recovery system* that's designed to minimize the amount of vapors released into the air and protect your health.



Did you know— Spilling just a “shot glass” (one ounce) of gasoline produces the same volatile organic compound emissions as a car driving 56 miles?

A cartoon illustration of a blue car with a large, billowing white cloud of gas coming out of the rear, symbolizing emissions.

Provided as a public service by
The Bucks County Commissioners

HOW GAS PUMPS WORK

Fueling Up for Dummies!



*Bucks County
Department of
Consumer Protection/
Weights and Measures*

1260 Almshouse Rd., 4th Fl.
Doylestown, PA 18901

1-800-942-2669

215-348-6060

www.buckscounty.org



During all those trips to the pump, have you ever stopped to wonder where the gas in the service station dispenser comes from or how it gets from the dispenser to your car's gas tank?

Pumping gas may seem like a simple matter of lifting a pump, pushing some buttons and sometimes swiping a credit card through a reader or waving a credit wand at a detector.

What goes on inside the gas dispenser itself, however, is a bit more complicated than that.

The Check Valve

The route that the gas takes from the tanks to the above-ground dispenser isn't terribly complicated, though it may take a few minor twists and turns.

When pumping is complete and the pump motor is turned off, the gas inside the pump doesn't simply fall back into the tank. Instead, it's held inside the pipe by a *check valve*.

- The check valve, which is located above the gas inside the pipe, creates an airtight seal above the fluid.
- Although the bottom of the pipe remains open, the vacuum pressure

created by the check valve holds the gas in place. This is a process known as *keeping the prime*.

- The power that drives the pumps usually comes from the same electric grid that powers the lights and appliances in your home, though a few states require that service stations maintain a backup power supply in case of power failure.

Now that the gas is on its way to the car and it's time for the customer to start pumping, *how does the dispenser know just how much gas the customer has pumped?*

The Flow Meter

As a driver, your primary objective at the pump is to get your tank filled so that you can get your car back on the road.

The goal of the service station owner and the company that supplies the gas, however, is to know just how much gas you've pumped so they can properly charge for it. That's where the flow meter comes in.



As the gasoline travels upward into the dispenser, it passes through a *flow control valve* that regulates the gasoline's flow speed.



It does this via a plastic diaphragm that gets squeezed more and more tightly into the pipe as the flow of gas increases, always leaving

just enough room for the proper amount of gasoline to get through.

If you've set a predetermined amount of gas to be pumped, the flow of gas will slow down as you approach the limit.

When the customer removes the pump handle from its place on the side of the dispenser, this action activates a switch that starts the dispenser operation.

The Automatic Shut-off

Stopping the flow of gas is just as simple—the customer need only release the lever to cut off the stream of fuel.

But what if the tank fills unexpectedly to the brim and the gasoline threatens to overflow? As anyone who has ever operated a gas pump knows, the pump will switch off automatically. But how does the pump know when to stop pumping?