Carburetors explained

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-In the simplest terms, car engines work by converting the energy stored in gasoline to mechanical force. This is accomplished via combustion (hence the "internal combustion engine" name), which requires the mixing of gasoline with air.

Before the rise of fuel injection systems, almost all car engines performed this task with a device called a carburetor, but given the relative scarcity of the older technology, you might be prompted to first ask: What is a carburetor?

A carburetor''s task is to mix the right amount of gasoline and air together. Despite what you might have assumed, gasoline, when in its liquid form, isn''t actually flammable. In fact, it''s the fumes that ignite.

Of course, the air fuel mixture has to be just right. A well-performing engine needs the Goldilocks-like calibration of the carburetor. If there is not enough fuel mixed with the air, the engine "runs lean" and either will not ignite, or potentially damage the engine.

---Even in the era of electronic fuel injection, many small-engine machines still use carburetors (aka carbs). Since the carburetor on a chain saw is simpler than most carbs, it''s a good place to demonstrate the basics. It really has only three situations that it has to cover:

-No one operating a chain saw is really interested in any gradations between idle and full throttle, so incremental performance between these two extremes is not very important. In a car, the many gradations are important; this is why a car''s carb is a lot more complex.

-T-he carb is operating "normally" at full throttle. In this case the throttle plate is parallel to the length of the tube, allowing maximum air to flow through the carb. The air flow creates a vacuum in the venturi, and this vacuum draws in a metered amount of fuel through the jet.

You can see a pair of screws on the right top of the carb in photo 1. One of these screws (labeled "Hi" in the case of the chain saw) controls how much fuel flows into the venturi at full throttle.

When the engine is idling, the throttle plate is nearly closed (the position of the throttle plate in the photos is the idle position). There is not really enough air flowing through the venturi to create a vacuum.

If a tiny hole is drilled into the side of the carb''s tube just behind the throttle plate, more fuel can be drawn into the tube by the throttle vacuum. This tiny hole is called the idle jet. The other screw of the pair seen in photo 1 is labeled "Lo" and it controls the amount of fuel that flows through the idle jet.

Both the Hi and Lo screws are simply needle valves. By turning them you allow more or less fuel to flow past the needle. When you adjust them you are directly controlling how much fuel flows through the idle jet and the main jet.

Usually this very rich mixture will allow the engine to fire once or twice, or to run very slowly. If you then open the choke plate the engine will start running normally.

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