

# Lectron Technical Information

Total air flow through an engine determines its maximum BHP. So to increase engine output, either the airflow capacity must be increased or the fuel/air charge burned more effectively.

The primary obstacles to getting maximum airflow into an engine are the carburetor, intake manifold and port. We will deal here with the air/fuel charge and how the Lectron Carburetor can enhance this.

In an engine a rapid repeating sequence of controlled explosions in the combustion chamber creates the power. The carburetor must mix the air and fuel in the correct proportions to obtain an optimum air to fuel ratio. The carburetor creates this air/fuel ration by responding to the vacuum created inside the manifold of the engine.

The design of the Lectron® is focused on two primary principles:

“AMPLIFY” the fuel pick up signal.

“UTILIZE” the amplified fuel pick-up signal to create a more efficient burnable mixture.

The bore of the Lectron® carb is not straight, but incorporates a taper to increase the air velocity. Maximum air velocity is obtained at the point where the patented metering rod vaporizes the fuel with the passing air. The bore then increases to allow the vaporized air/fuel mixture to flow freely to the engine intake ports.

## **The Patented Metering Rod**

The metering rod, which vaporizes the fuel, is located behind the air cut-off slide; therefore it is directly exposed to the manifold pressure of the engine. In most other carburetors the needle is in the center of a round slide or on the end of a flat slide, therefore keeping it out of the manifold pressure.

The increased air velocity in the venturi aids in creating a stronger fuel pick up signal at the fuel-metering rod. The air flow moves more rapidly past the needle in this taper bore design, more so than in a conventional straight bore carburetor.

The metering rod serves three important functions:

1. A fuel signal generating device.
2. A fuel delivery metering device.
3. An air volume density sensor.

## **Fuel Signal Generating Device**

The shape of the metering needle in itself is a fuel signal-generating device. The flat side of the needle in a High Velocity Chamber, enhances the fuel pick up signal. The metering rod accomplishes this by creating divergence. This divergence is similar to the low-pressure area created by an air craft wing, which utilizes low pressure to create lift. The Lectron carburetor uses divergence to create “Fuel-Lift”.

## **Fuel Delivery Metering Device**

The shape and contour of the ground surface of the metering rod controls how much fuel is allowed to be drawn up in response to the extremely strong fuel pick-up signal. The various numbers of the metering rod relate to the depth of the grind at various throttle positions. The depth of the grind determines the amount of fuel delivered.

The metering rod is one smooth continuous profile that eliminates “Flat Spots” often found on conventional carburetors with multiple overlapping fuel circuits. The metering rod does not contain transitions from idle to mid-range and wide-open power, but rather provides for a smooth consistent throttle response.

The fuel pick-up signal at the base of the metering rod is twice as strong as found on conventional carburetors. This extremely high fuel pick up signal relates to instantaneous acceleration, created by a fuel surge when the throttle is snapped open.

The shape of the metering rod compliments and enhances the fuel vaporization process by carrying the fuel signal and fuel vapors all the way up the length of the metering rod. In this manner fuel vapors are spread over the entire distance of the carburetor bore. The contoured side of the metering rod creates a fuel vacuum “wick” whereby the fuel vapors diverge from the metering rod starting at the base and continuing to the top of the rod. This allows a more efficient burnable mix to be created with all the air entering the intake manifold.

The contoured side of the metering rod creates an extremely low-pressure area at this point, which results in the fuel being broken down into a very fine vapor. Most other carburetors lack such a device to create this. These extremely fine vapors are easily dispersed up through the bore of the carb. The finer the vapor the more efficient the burnable mix. A more efficient burnable mix will result in more horsepower and better fuel economy.

## **Air Volume (Density) Sensor**

The combined affect of the metering rod acting as a fuel signal generating device and a fuel delivery metering device allows the metering rod to also act as an air volume (density) sensor.

The ability of the metering rod to “sense” the air volume and density of the air flowing past it enables the metering rod to mix the proper amount of fuel with the air at a wider range of temperatures and elevations.

Both air temperature and elevation affect airflow volume by weight. As temperatures decrease air becomes more dense and heavier. The denser, heavier air will pick up more fuel when passing the metering rod due to the signal generated at the rod and the shape of the rod. Conversely, as elevation increases less dense or thinner, the lighter air will automatically pick up less fuel by weight while still maintaining the optimum air/fuel ratio.

## **THE SIMPLICITY**

The beauty of the Lectron Fuel Management System is its ability to “read” the fuel requirements based on air flow volume (density) and temperature to automatically provide the proper fuel/air mixture.

Naturally there are limitations with any designed metering system. The Lectron carbs are able to operate in a much wider range of applications, temperature, and elevation due to their fuel vaporization efficiencies. Changes to operate beyond the wide range are simple and easy to make with a screwdriver and adjusting the metering rod. Changes do not require the removal of the float bowl. Depending on access to the carbs, the carbs do not have to be removed from the engine. All adjustments are made from the top side of the carb.

Thank you for taking the time to understand the Lectron carburetor.

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