Electronic Ignition VS. Point Ignition System

By Bill Hancock, Assistant Editor

Many of us have engines which were originally powered by point type ignition systems. Before we delve into the comparison, let's spend a minute to understand how the internal combustion engine ignition system works.

In order for an engine to run, a spark must be created at just the right time and introduced into the combustion chamber where it initiates the burn. Contrary to popular belief, there is no series of explosions inside the engine, unless it is improperly tuned. The burn starts when the compressed charge consisting of a roughly 12.7 parts of air combined with 1 part of fuel by weight is ignited by the spark. The spark and resulting burn is initiated anywhere from 10-30 degrees before the piston reaches the top of its travel at Top Dead Center, TDC. The spark produces what is known in combustion research circles as the Kernel. Think of it as a small ball of fire which grows as it spreads through the combustion chamber. As the kernel grows and gets larger it fully ignites the charge which causes it to rapidly expand. By now, the piston has passed TDC and is on its way down the bore, aided by this rapidly expanding gas which is now pushing on top of the piston. At 2500 RPM the aforementioned sequence of events takes place in about a tenth of a second!

It suddenly becomes very clear that in order for the engine to run correctly, everything must be very precisely timed. If the spark is weak or missing, it throws everything off and the engine does not run properly. So now that we understand the effect of the spark, let's talk about how we generate it. In most traditional battery powered boat engine ignition systems, the spark is generated by a coil which produces a spark. This coil which produces a short burst of very high voltage sufficient to create a spark capable of jumping the gap of the spark plug. When the spark occurs in the tightly packed atmosphere of the combustion chamber, it ignites the charge or mixture of gasoline and air and starts the burn.

The coil must be switched on and off each time a spark is needed. By breaking the current flow to the coil, the magnetic field in the coil collapses and the spark is created. Over the years from 1920-1960, this switching task was handled by a mechanical switching device called contact points. Think of a crude little mechanical switch that is literally opened and closed 10,000 times a minute when the RPM is 2500 in a V8 engine. Soon you realize that the points wear out and tend to become less than accurate. Transferring the current, tends to erode the contact surface, and over time the clearance changes which affects the overall timing, so a solution was needed to handle this switching duty.

Along came the transistorized ignition system which handles the switching electronically. There were no mechanical parts to wear, hence engines stayed in tune much longer. Cylinders fired with more consistency and therefore power was much more reliable.

Today, there are firms such as Pertronix™ which make electronic conversion kits that allow you to convert a traditional point type ignition system to electronic. By doing this you make a much more reliable ignition system. Best of all, it is not noticeable unless you remove the distributor cap. The systems are easily installed and they are virtually maintenance free. As a result, spark plugs tend to last much longer and the engine runs much better. Fuel economy and power usually improves because the spark is much more reliable.

There are specialty firms that can convert older less well known distributors into electronic versions for those of you who have unique or rare engines.

Happy Boating!

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