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Low Tension Coil

A low tension coil is an electrical device used to create a spark across the points of an ignitor on early 1900s gasoline engines, generally flywheel engines, hit and miss engines, and other engines of that era. In modern electronic terms, a low tension coil is simply a large inductor, an electrical device that stores energy for brief periods. The term “low tension” was the terminology of the day used to differentiate it from the term “high tension,” and generally meant “low voltage” (tension) as opposed to “high voltage”(tension). High tension coils produce high voltages, generally meant to produce a spark across a spark plug.

Construction

A typical low tension coil used in the ignition system of an ignitor fired engine consists of an iron core that has wire wrapped around it. The size of the iron core, the number of turns of wire, and the size of the wire determine the electrical properties of the coil. Terminals are provided to connect the coil into the ignition circuit. The wood ends are provided for mechanical stability, to provide for the terminal placement and to hold the wire on the coil over time. A cloth or tape covering is provided to protect the windings.

Use

A low tension coil for engine ignition is used in conjunction with a battery and an ignitor. The ignitor is no more than a set of contacts that reside inside the combustion chamber of the engine. A series circuit is made between the three components: battery connects to coil, second terminal on the coil connects to the ignitor, second terminal on the ignitor (usually connected electrically and mechanically to the engine itself) connects to the second terminal of the battery.

Theory of Operation

An inductor attempts to maintain a constant current flow through it. If the current in the circuit in which the inductor is connected goes down for some reason, the voltage developed across the inductor will go up in an attempt to try to maintain the constant current. When used with an ignitor ignition system in an engine, there is current flow when the ignitor contacts are closed. When the ignitor contacts are opened by the mechanical parts of the engine, current flow is interrupted. Because the low tension coil wants to maintain that current flow, the voltage across the coil rapidly goes up (usually to several hundred volts). When the voltage rises high enough, the voltage will jump the still very small gap of the ignitor contacts and create a spark which ignites the fuel mixture in the engine. Since there is a finite among of energy stored in the coil, as soon as the spark jumps the gap the voltage across the coil collapses. As soon as the engine rotates and the ignitor contacts again close, current starts to flow through the coil and it again stores energy for the next cycle.

Connection

Polarity doesn’t matter. Just make good solid connections with a heavy gauge wire. Fahnstock clips make for fast and clean looking electrical connections. Follow the diagram below. Make sure to turn the coil off when ever the engine isn’t running to prevent burning up the coil.