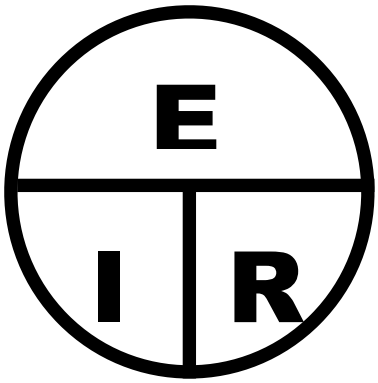
The Cure for Hard Starting 6 Volt Cars



Ever wonder why these old cars crank over so slow compared to their 12 Volt counterparts? It all has do with a fellow named Watt and his famous Law. He stated that the amount of power you could generate was equal to the Current multiplied by the Voltage. Using that formula you can easily see that a system using 6 Volts will simply develop half the starting power of a similar 12 Volt system. So unless you are able to some how hop up or modify the starting motor you will be cranking at a slower speed.

Do not be discouraged or begin your plan to upgrade to a 12 Volt system since it is simply not necessary. These old cars were designed to run and start on 6 Volts and that just means that there is little room for error or faulty components in your primary starting circuit.

Your primary starting circuit is that circuit that contains the heavy wiring. This is the cause of the great majority of starting issues. When you have a Primary Starting circuit you have a source (Battery), a load (the Starting Motor), some sort of switch (Mechanical or Solenoid) and a return (the Ground). Current in that circuit is the same at any point in that circuit so if you have a starting motor that draws 100 Amps, that current will be felt at any point in the circuit. That is very important since that same large amount of current is across every connection and ground in that circuit. That funny little circle above is the gouge for another applicable law called Ohms Law. Ohms Law will explain why the Primary Circuit is so critical. As you look at the wheel above note that E above the line represents voltage. The Voltage drop (E) at any point or connection is equal to the current (I) times the resistance (R).

Since most starters typically draw between 70 and 150 amps, it is easy to see why that circuit is so critical and the source of a the majority of starting issues.

Let's take a look at the critical elements and make sure that they are in good shape.

Battery - You don’t really need an expensive Optima Battery, just one that is healthy and tests well under a load. Clean terminals and tight connections are a must. The standard thumb screw battery shut off will work as long as the connection is kept clean.

Cables - The good folks at Sound Starter tell me that installing the wrong cable is a very common cause of the problem. If you go to the parts store and ask for a battery cable they will most likely hand you a 12 Volt Battery Cable. They are not the same as their 6 Volt counterparts! 6 Volt cables are larger in diameter and have less resistance per foot than those designed for 12 Volt circuits! Installing the wrong cable in any segment of the Primary Circuit will reduce your cranking power!

Starter - Just because it rotates when power is applied does not mean that it is good! A Starter that is dragging due to poor bearings or a bad winding will not develop enough torque to properly start the engine, while reducing the available voltage to the coil. This is a double gotcha! Have it tested by someone who knows what he is doing!

The Switch - Whether you have a starting solenoid or a mechanical switch that same large starting current is across that device. Therefore it and its connections are also critical.

Ground - Often forgotten or neglected, the ground is the other half of the circuit. That same high starting current is also at the ground point and cabling to that ground is also critical. We assume the Starter will have a good ground since it is bolted directly to the engine however that may not be the case. Maybe when the vehicle was new that was the case, but the years have a way of compromising that vital connection. Running a heavy ground wire directly from the starter (using one of the starters mounting bolts) to the frame of the vehicle may work wonders!

A note on cables

Good cables are vitally important in starting circuits. So important that I have been building my own and this has paid great dividends.

I recently went to the Welding Supply store and purchased some of there small lengths of welding cable. It's not cheap (at around 2 to 3 dollars a running foot) but the cable is very flexible and has a large amount of Copper.

My next stop was a trip to amazon.com for some copper lugs. As luck would have it I got a great deal on a kit that contained a number of lugs and pre cut pieces of heat shrink (Black and Red). Obviously intended for just this purpose.

You will need a pair of Marine Style Battery terminals (they have a bolt stud for attaching the cable).

Now you will need something to crimp the lugs to the cable. I have a small tool designed for that. It has a grove the lug sits in and a punch that you drive into the lug with a hammer. I think that you may be able to get away with a set of Vice Grips, the style with the V grove, used for removing nuts.

A drill with a 3/16 bit and a propane torch, some rosin core solder and a head gun and I believe you are ready to go.

- Drill a 3/16 hole on the back side of the lug (this is where you will be adding solder).
- Strip cable and test fit to assure you have enough to fill the lug.
- Crimp the lug to the cable
- With the cable in a vise, heat the lug and apply solder into the hole, until filled.
- Install heat shrink (Red for Positive)

Article courtesy of the folks at cruisinkitsap.com