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HOW TO GET YOUR CAR STARTED ON ITS ORIGINAL 6-VOLT SYSTEM

Technical Tips from PI Member Jim Woolsey

The 6-volt system was for many decades the common automotive starting circuit. Starting in the 1950's there was a gradual transition to the 12-volt system. Unfortunately with age, lack of care and deterioration, many of the older cars now have difficulty starting on the original 6-volt system. Rather than address the underlying cause, there are varied makeshift alternatives, such as the 8-volt battery. There is nothing wrong with the concept of the 6-volt system, it is just that the remedy is to carefully check, service and maintain each of the components of the 6-volt starting circuit and be sure each is functioning as originally designed.

THE BATTERY

First: the obvious thing to do is to examine the battery itself to be sure it is equal or larger in capacity than the specified original battery. One is frequently surprised to see a small replacement battery being used to turn a 400 plus cubic inch twelve. The surprising thing is that sometimes they work in spite of the deviation from original specification. One can expect so much more from complying with the original design.

It is important to remember that voltage is only part of the equation. Cranking amperes are another very important consideration. Modern 6-volt batteries have ratings of 750 to 1000 cold cranking amps, and even more. Our classics have large engines, and larger starter motors, just because they need the energy to turn the engine, and still have the voltage to fire the spark.

Second: Be sure to check the water level in your lead-acid battery. If low, add distilled water, to be sure the fluid covers the lead plates. If it is an older battery, it may have had regular water added and internal chemistry may be much deteriorated. A hydrometer will soon tell you the quality of the electrolyte. After adding distilled water, it may be necessary to charge the battery for a while. It is always best to use a trickle charger, such as a Battery Tender, to be sure the battery is charged slowly, and not overcharged. This is no place to hurry. If in a hurry, simply replace the old battery with a fully charged new one.

Test: To test the voltage of the battery you will need a voltmeter that will read as low as 0.1 volts. A digital voltmeter will be much easier to read, and more accurate, since it eliminates your estimate of where the needle stops swinging. Connect the voltmeter to the battery itself: the red lead to the positive post, and black lead to the negative post. The reading should be 6.4 volts or better. If lower, continue your

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c) Next measure the voltage drop across the solenoid or starter switch. The typical design is a thick copper bar that is pushed mechanically across two large copper bolt heads. Over time these will burn or corrode. They can usually be dressed and cleaned so that full current passes through to the starter. Some types of solenoid-starter switches can still be purchased. Remember that even though the copper buss does not care if it is carrying 6 or 12 volts, the actual coil of the solenoid is specific to 6 volt, or 12 volt. If you have to buy one, see if you can obtain the type with a push button on the solenoid which allows you to rotate the starter motor and thereby turn the engine while working in the engine compartment - a real convenience when adjusting valves.

Retest, from battery to starter motor, using the same procedure described above, and if the reading on the voltmeter is below 0.2 volts, you have solved the problem of the battery - cable system.

THE GROUND SYSTEM

It is also important to verify that the ground system works as well. It is desirable to improve the ground by installing a new cable of full size from the engine to the ground post on the battery. Be sure that the paint has been removed from the contact point on the block, and solid ground with a star washer has been established.

Repeat the testing only this time on the ground cable to the ground post on the battery. Crank the engine, and read the voltmeter at the same time. If the reading is more than 0.2 perform the following:

- 1) Put one lead on the ground post, and one on the ground post clamp, crank the engine, and verify the reading is 0.2 or less.

- 2) Place one end of voltmeter lead from battery cable to frame. Crank engine and read the voltmeter. If reading is too high clean and reset cable. If reading is below 0.2 go to next step

- 3) Place one end of volt meter on frame, and one on engine, crank engine and read volt meter. If reading is too high clean ground and try again.

- 4) Place one end of voltmeter lead on the starter housing, and one end on the bell housing. Crank engine and read voltmeter. If reading is high, remove starter and clean starter housing, bell housing, and the bolts. Use sandpaper but carefully clean all grit. It frequently happens that these surfaces are painted in restoration, and the paint must be removed for a good electrical contact.

THE STARTER

If after all of this the engine cranks too slowly, have the starter motor rebuilt.

THE DISTRIBUTOR

If now the engine cranks well, but spark is weak, check distributor, coils, and carburetor, but that is another article.