

ENGINE OVERHEATING PROBLEMS:

An easy solution could spell trouble!

SEVERAL YEARS AGO I wrote a couple of articles for NCRS concerning my experience with an apparent overheating problem in my freshly rebuilt and restored 1960 Corvette. It turned out to be erroneous readings from a new temperature sending unit. Many folks (especially from the hot southwest) called and asked how to solve the problem. I guess I thought the solution was obvious, and that was to go out and find an old original sending unit in the junk yard that read 700 ohms. It turns out several guys thought they had an easy way out and several published their ideas. The article in the December, 1991 *Straight Talk* suggests the same method proposed by several others after I wrote the first article. That is, add resistance in-line between the sending unit and the gauge to get the apparent readings lower to match the actual reading. It is suggested that to determine the extra ohms necessary, place a potentiometer (variable resistor) between the sending unit and temperature gauge. Remove the radiator cap while the engine is cold, start the engine and allow it to idle. Add ohms by adjusting the potentiometer to get the temperature gauge to match a thermometer reading of temperature in the radiator.

Sounds good, and in fact is accurate for that moment. There is a potential problem that may be worse than the erroneous high readings. Take a look at the graph of correct versus bad readings from a new sending unit. First you will notice that it is a non-linear relationship between temperature and ohm readings (i.e., the ohm reading error changes as the temperature changes). In this particular relationship, the error at 120 degrees is 100 ohms. At 160 degrees the error is 60 ohms. At 200 degrees the error is 30 to 40 ohms. I am sorry I could not hold the instruments over the hot water at 210 degrees, however, I believe the error is probably 20 ohms.

DON'T GET STUCK IN TRAFFIC

So what does all this mean? If you add resistance to calibrate while the engine is idling, I believe you will probably calibrate at 150 to 170 degrees. If that is the case, you will have added approximately 60 ohms. Everything will be O.K. until you are either stuck in traffic on a hot summer day or when your radiator hose springs a leak after several years of use. As your actual temperature reaches 220 degrees, the extra ohms you have added will now be too many. By my calculations, the gauge will now be reading about 190 or 195 degrees. Your gauge will not even show the temperature at the first hot mark. The extra ohms in-line to calibrate idle will probably mean your gauge will never register the overheat condition of 220 degrees or higher.

I hope I don't offend those who have worked hard to help our with an easy solution, but in this case, its possible when you need the gauge most, it will be sending the wrong information. The solution is go out there with a good ohm meter and dig around for old manifolds in the junk yard. That's what I'm using and it works just fine. Just remember the quick and easy way to tell if you have a correct old sending unit. If the sending unit is in your car, let it sit overnight to insure all of the heat in the engine compartment is gone. this is very critical. If you have it out leave it on the work bench overnight. Take an ohm reading in the morning when the ambient air temperature is 65 to 80 degrees. It should read 700 ohms. If it reads 600 or less toss it out. Its not worth the agony you will encounter if you use it.

I hope this has reclarified the data I obtained and has prevented the worst of all possibilities and that is ruining an invaluable original engine by causing an overheat seizure, cracked head or worse yet a cracked block. After getting my 60's sending unit correct, I have noticed that in most situations, that old 283 cubic incher runs between 160 and 170 degrees even when the radiator is a little low. At idle while sitting in stop and go traffic at Virginia Beach in the summer at 90 degrees my gauge only goes to 190 degrees, and that's with a four blade standard fan. I continue to believe that many of the stories about hot running engines is just a case of using a newer replacement sending unit. Again, just put on the old work clothes, borrow or buy a good ohm meter and hit the junk yard. Who knows what you may find. Just maybe an old fuel unit that never worked either! Good luck guys.

—D. Farmer, Virginia

Gas Sender

Gas Sender G.M. #5642125, in group.03.107nk unit is available from your dealer that is for a 58-62 Corvette. In issue #1, number 4 on fuel tanks, I mention the different types for each year. This unit can also be used on 56-57, you add the female brass nut, then cut and flare the pipe to fit the gas line and you have a 56-57 unit. If you think you may ever need one then buy this one and store it.

