AMERICAN BONANZA SOCIETY

V35A CHT Solution

ABS member shares the benefit of his experience

After purchasing my 1969 V35A Bonanza in 1987 I noticed that the CHT only read 200 F. This was my first Bonanza. However, I knew the CHT should read between 300 to 400 F. Removing the CHT probe and placing it in an oil bath confirmed the erroneous readings. At 300 F the CHT gauge had stopped at 200 F. Replacing the CHT probe with a variable resistor (1K, 10 turn) confirmed that the CHT gauge was all right.

A new CHT probe was ordered from Beech which took over three months for delivery. At this time Beech was changing suppliers from A.C. to Rochester since A.C. no longer made the CHT probes. With the new CHT probe installed, the engine was started and to my surprise, the CHT pegged beyond 500 F in less than three minutes of running the engine. A call to Beech summarized that the new probe must be bad so another new CHT probe was ordered under warranty replacement parts at no cost. The second new probe arrived several weeks later and was installed. Again, the CHT probe pegged beyond 500 F after about three minutes of running the engine. Now I was really worried. Do I have a bad cylinder or what?

The oil bath was used again and the new probe heated. This time, however, the CHT probe was heated out of the circuit and the resistance was measured with a digital ohmmeter. The resistance versus temperature table that was plotted from these measurements is enclosed. Using the 10 turn variable resistor to control the CHT gauge in place of the CHT probe showed that the CHT gauge was reading correctly. At 200 ohms the CHT gauge showed 350 F. This showed the current passing through the probe was heating the probe enough to change the resistance of the probe or putting an offset in the readings.

Now I knew the new probe was the problem. Once again I called Beech engineering and told them of the test I had run and the results. I must mention at this point that Beech Engineering was very helpful and promptly returned any calls. Beech said they had not heard of any complaints or problems with CHT probes (mid '87). I told Beech that the probe supplied was not rated for the current used by the CHT gauge. Beech did check into the Problem and got back to me in November '87. Here is what I was told by Beech:

The original CHT probe was made by A.C. which has stopped making the probes. Also, the CHT gauge in the instrument panel was made by A.C. The new replacement probes are made by Rochester and are not compatible with the A.C. gauge. Rochester makes a CHT gauge, but it is not a direct replacement for the CHT gauge in the panel and would have to be mounted somewhere else in the instrument panel. This was the only solution offered at that time (Nov. '87). This meant ordering both a new CHT gauge and CHT probe and abandoning the old A.C. gauge.

This upset me as I don't like the idea of having a gauge in my panel that doesn't work. With a little experimenting, I soon found that a 82 ohm, two watt resistor installed in series with the CHT probe would limit the current enough to allow the probe to be used and yet it did not affect the accuracy to any large degree. The 82 ohm resistor must be a two watt flameproof resistor. The one I used was made by Phillips ECG. Inc., 1025 Westminster Drive, P.O. Box 3277, Williamsport, PA. 17701, and purchased locally at an electronics store.