

Rebuilding the Black Box: It Would Be Disastrous

by Terry Haller

It is a young industry—the rebuilding of on-board computers and circuits. Maybe it will grow to an enormous size, maybe it will never amount to anything worth worrying about. But right now nobody knows. Some large-scale remanufacturers are involved in the “Black Box” trade. And as we have seen, so are some small-scale operators. But it is still pioneer territory for most readers; though, to be sure, many are talking among themselves and wondering aloud if it’s for them.

In our desire to present all sides and views in what may become the decade’s most controversial rebuilding issue, *RENEWS* has interviewed many different authorities. In a field as new as automotive electronic controls rebuilding it is difficult to find spokespeople who can draw on reams of research data. Instead, most of these authorities must draw on their experience. This can vary from the very profound to the very shallow. But regardless of the profundity and substantiality of the views they are the views that will govern the destiny of this neophyte business segment.

We want to report on one of the more informed judgments. It comes from a rather seasoned automotive veteran, a person who has had careers in both the manufacturing and supplier side and in the service arena. It comes from a man who is now a senior executive in a major firm in the automotive industry—a man who requested anonymity in order to permit total frankness.

His views, though strongly negative, are must-reading for all rebuilders. However, we wish to stress that the ball game is not yet out of its first inning and the final game stats have yet to be assembled...

RENEWS: Our readers rebuild alternators, generators, starters, etc. and their premise could be that if a black box can be rebuilt maybe they

should be taking a serious look at it.

RESPONDENT: That, without trying to take a stand on the issue either way, will be disastrous. That’s something that I’d say the average rebuilder would not be qualified to do.

RENEWS: We are just exploring the subject. At this moment you could say most are not qualified. But we want to explore the terrain and see how difficult it would be to do and what kind of equipment you would have to buy, what kind of problems you are going to face in getting the proper data, manuals, etc.

RESPONDENT: You know this puts me in a very awkward position because some very important OEs strongly discourage tampering with the black box. Please don’t quote me on any of this, but from a marketing perspective we can certainly appreciate why the OEs and their key suppliers would say that.

However, there is another level to this which I’ve since become interested in: Our thinking can go all the way back to the halls of science in Germany where these things were designed and researched. Because I studied many of the original tests I was perfectly attuned to the results of the tests that rejected rebuilt chips.

Back in Germany when they were sourced from rebuilding labs and then sent back for evaluation, the results were most discouraging. For a variety of reasons they didn’t work and it left one open for speculation about why anyone would want to rebuild these if they understood how their quality was so badly rated by the tough tests the OE subjected them to. I’m talking as an engineer now, not as a marketing person.

RENEWS: You are talking about rebuilding the actual on-board computer?

RESPONDENT: Yes. Just dipping into the circuit boards and replacing faulty connectors or chips or whatever it is that made it malfunction. You know, even if the rebuilder had the facility and could source components of comparable quality we’re discussing an issue of extreme cleanliness and extra care. The average rebuilder might find working with these circuit

boards and things of that nature almost impossible. The net outcome could be a low quality product which leaves the motor in a very risky position. I’m not trying to discourage rebuilding but I am really dubious about the aftermarket’s ability to rebuild components which have to be built in an absolutely sterile environment.

RENEWS: What kind of problems would impede the successful rebuilding of these things in your experience?

RESPONDENT: I’m only telling you this on the QT and if you will respect that perhaps I can share my perception with you. I think that the problems that some of the OEs experienced were things like replacement components having poor quality as far as power governance is concerned. That was the number one problem or one of the chief problems.

In the aftermarket it is very difficult to source the electronic components which have the level of quality that today’s complex power plants require. Chips must go through rigorous tests before they are applied to circuit boards, etc. You then need to have a work environment that is hospital-clean with very sterile and ideal conditions which I doubt can be duplicated in the aftermarket.

And then, thirdly, the ability to test the component to see if it meets OE specs is almost impossible in the aftermarket because the testing equipment itself has to be just as elaborate if not more so than the components regulating the computers themselves.

Even in the mechanical realm I have seen examples of diesel fuel injectors that were rewound and relapped and so on that looked just as good as new on the dynamometer but would not perform in the real world. Maybe we had an unsophisticated test run. I don’t know what the answer really is. I am trying to be very honest about that.

RENEWS: I appreciate that.

RESPONDENT: I want to give you some fair perspectives based on my experiences. We found that in the very unsophisticated aftermarket method of testing diesel fuel injectors we could not even begin to appreciate the degree

of sophistication that the injectors were designed to. (I'm only using fuel injectors as an example.) Nor could we find fault with a rebuilt injector because we did not have the test methods to wash out the bugs.

But if emissions and clean air must be maintained by the on-board computer how do we assure that when we can't even always deliver the proper clearance for fluids to flow past in a simple injector? In most rebuilding shops, at least those I am aware of, they are still (I hesitate to use the word) in the "stone age." You know, I went out and visited some of these rebuilders to examine their cleaning programs...

RENEWS: In the electrical segment of our industry?

RESPONDENT: Yes. This is where we separate the men from the boys. They couldn't begin to tackle computers.

RENEWS: How much would it cost to bring them into this arena? Are we talking millions?

RESPONDENT: I just can't answer that without a lot of study. It wouldn't be cheap.

RENEWS: You know there are some large rebuilding companies in the electrical parts area. It may take the large production rebuilding and remanufacturing type of company to do it rather than a smaller operator. Is that what you're thinking?

RESPONDENT: I would certainly agree with that. Unless it is a real mass-production operation you cannot afford to invest in sophisticated equipment.

RENEWS: Let's assume that they do have equipment and they can keep all of the lint, dust and dandruff out of the shop. Then would it be worth doing? What is it in a computer that would go wrong and would need fixing?

RESPONDENT: Interestingly enough, in the majority of the cases where the computers or other components of this type are accused of being faulty, they are not really at fault. Number one, I think the real key to unlocking the riddle is not to automatically condemn the computers and then subject them to rebuilding, but rather to have a sophisticated means of testing them before you do anything else.

RENEWS: We've heard that a lot of them merely have faulty grounds and get drunk on excess electricity. Consequently, the mechanic judges it to be faulty so he throws it out and puts a new one. Hence you get a core that is still viable. The core is really not bad at all. So maybe a rebuilder would only need to buy a bunch of cores and just test them to find the ones that are not screwed up. Then he could put those back on the market and forget about the ones that actually are broken. Is that a far-fetched scenario?

RESPONDENT: I suppose you could do that if you had the means of really testing them.

RENEWS: But your feeling is that it would take something very sophisticated and probably kind of costly to do the testing.

RESPONDENT: That's quite true. Now then it becomes a question of what is the acceptable thing to do. And would you remarket that as a rebuild item when you didn't change it? How do you describe what your service is? And how much do you charge to cover your overhead?

Let's go back to the fuel injection systems again. Your engine has to get an exact amount of fuel. You can appreciate why that is important. But to set your fuel distributor up it takes a machine that is comparable to the one used in the OE's factory. That thing costs tens of thousands of dollars and unless you are a big operation you would not be able to afford to have anything like that. Yet to do that testing or rebuilding operation and be able to guarantee your product you are going to have to buy such equipment.

But that's only the start of your trouble. You also need to have access to the latest data on fuel components that are being built. Then you'd have material sourcing problems. In fuel injectors there is a problem of setting these back up to OE specs (even if you can determine what they are). You've also got to meet the EPA standards. It all becomes very, very costly. From an average rebuilder's point of view I almost think there might be too much risk. The question of product liability scares me. I just think there are places

where it is economical to invest your time and energy and some places where it is not.

RENEWS: Is the premise correct though—that most chips that become cores wouldn't be at fault?

RESPONDENT: By and large the majority of the problems are attributed to loose connections and faulty grounds as opposed to sloppy workmanship within the circuit boards or component failures per se. Now where the component does fail inevitably I think you will find that it is because of the technician's error in grounding something that should not have been grounded or zapping a chip with excess voltage. We see that happen time and time again.

RENEWS: The goal in all rebuilt parts and among the engine rebuilders is to produce remanufactured items that are as good as or, in fact, better than the original product.

RESPONDENT: I think you are right there.

RENEWS: But based on your extensive analysis it sounds like the investment and intensive labor needed to rebuild the automotive black box wouldn't come out with our being able to save the customer any money.

RESPONDENT: Quite honestly, chip technology is advancing too rapidly and most of the components are tuned to what state, country or altitude you are driving in. It's an enormous nightmare matching parts to cars. As a rebuilder your investment may never be realized. Ultimately we are talking about rebuilding components which from an OE point of view probably only cost (or will cost) a few cents to make.

The stocking and distribution cost will drive these things sky high. You could drive your remanufacturing costs down, but you still have all the carrying costs which brings your total cost right back up again. How do you deal with that? We are also getting into a domain that is a mystical kind of a thing. It changes so radically even when you try to keep up. I can tell you from my personal experience we could not keep up to date with the parts and changes. Just to keep track of EPA requirements on these vehicles drove

us nuts. They were making changes so quickly we could not keep track of them any longer. Could anyone supply that data to a rebuilder? I doubt it. And if he could get it how would he find time to absorb it all?

My personal feeling is that they should spend their time and energy trying to do something else besides rebuilding circuit boards. The major industry suppliers are the people who make the circuit boards and things like that. They have a lot of experience and technology behind them so they can profit from rebuilding on-board computers. Who can compete with that?

RENEWS: It sounds like it might be too much for our average electrical rebuilding principals.

RESPONDENT: It reminds me of when I drove to Florida as a college student. On the way home the transmission failed in the car which was an old '62 model. This old guy down in Tennessee took the valve body out of the transmission and cranked it down in the machine by banging on it. I went up to the shop foreman to complain. I was fresh out of trade school. I asked does this guy know what he is doing? I had envisioned myself hitchhiking home with all the bags I had taken to Florida for vacation. The foreman said that old boy had been fixing transmissions before I was born. We got home just before the transmission failed completely. I was scared. But you see, that attitude in that shop was this guy has been around and what do you know. That's a find attitude and I appreciate his ego. But it won't work today. At some point we have to be a little more professional.

(From *RENEWS*, April 1989.)