

LACK OF TACH

I have a digital tachometer that I used successfully for years on an older car where it was connected to the ignition system's distributor points. I now own a 1985 Chevy with an electronic ignition system that I know nothing about. How can I pick up a suitable signal to use the tach, and do I have to modify the digital input?—T. Ulijasz, Brookfield, WI

A friend of mine had a similar problem a few years ago when he traded in his old car and got a new one. I had built a digital tach for him and he'd been using it on his old car for years. When we went to put it on his new car I opened the hood and discovered that he'd bought a diesel. And you think you have a problem!

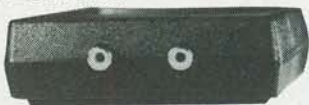
I can't speak with authority on every car there is—I'll take them as they come. Since your car, unlike my friend's, has a "real" ignition system, there's always someplace to pick up an input for the tach.

Although you haven't mentioned it in your letter, I'm assuming that the electronic ignition in your Chevy is factory-installed. If that's the case, there are loads of books (like the Chilton manuals) that tell you everything you could want to know about the inner workings of your car. You might even be able to get information about the system from GM. What you really need is the schematic for the car's electrical system.

If it turns out to be absolutely impossible for you to find out how things are wired up in your car, you can always take the signal from the most obvious place of all: right off the spark plugs. Since you didn't tell me exactly how the tach was working in your old car, I'll have to do a bit of guessing.

The input conditioning you have should be good no matter where you pick up the signal in your car. You may have to change the value of the current-limiting resistor depending on the voltages you find in the car but that's about it. The digital tach I've been using in my car for about five

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years takes its input from one of the plugs with no problems at all. I use a 1K resistor as a current limiter but you may find that you have to change that in your car.

It's always possible to pick up an input signal for your tach right from a spark plug. It can be done inductively by wrapping a few turns of wire around the ignition cable or by running a lead into the cap of the spark plug. Try an inductive pickup first because it's the safest way to go. You may have to experiment with the number of turns but, since such a huge spike is generated when the plug fires, you shouldn't have any trouble getting a pulse that can be fed to your tachometer.

If, for some reason, inductive coupling is impossible, you can get the pulse from the cap of the plug but you have to be careful when you do this. Don't, under any circumstances, cut into the ignition wire leading to the plug. The cables are designed to properly isolate the high voltages and messing with the insulation can

cause problems from moisture or arcing and lead to misfiring or a substantial decrease in engine efficiency. And be sure to use cable that can safely handle the high voltage at the plugs. If you have problems with arcing, get yourself a good supply of RTV putty to insulate the cable.

You may also have to make some changes to the logic in your tach because the number of sparks per second at the plug may be different than the number you were getting from the distributor. Remember that you're getting one spark for each two revolutions of the engine.

MULTILAYER WOES

The keyboard connector on my AT motherboard broke so I unsoldered it from the board and replaced it with a new one. The problem I have now is that the board is a multilayer one and I think one of the traces in a middle layer has broken. Do you know of any way to repair a trace on an inner layer of a multilayer board?—V. Deesh, New York, NY

You've got a big problem. I've been faced with shorts on inner layers and the only way I've been able to repair the board was to lift all the legs that sat on the trace and connect them to a totem-pole wire that I ran above the board.

If, as you suggested, you've broken a trace on one of the middle layers of the board, the only way I know to repair it is to make the connections with new wire on top of the board. I've never found a way to do anything to the copper buried inside the board.

That technique may not sound too difficult but it presupposes that you know which trace is broken, and which pins on which components are supposed to be connected together—You need the schematic.

If you don't have the schematic, I don't know if a repair is even possible. The internal copper is buried in the board and you can't usually hold to board up to the light and follow the traces.

I'm sorry to tell you that I think your chances of making a repair to a buried trace on an undocumented mother board are only slightly better than your chances of getting a quick answer from a government official. It's theoretically possible but I wouldn't count on it.

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