

Trouble Shooter



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The 16-pin J1962 diagnostic connector has been providing access to OBD II-compliant engine management systems for 20 years.

Has that convenience made it an easy target for misuse or abuse?

You CAN, But Should You?

A customer of ours is contemplating enrollment in his insurance company's vehicle monitoring program. In exchange for installation of a logging device at his vehicle's OBD II connector, the company has promised a reduction in his insurance costs. It seems like a good deal, but our customer has concerns about if or how the device may affect the operation of his vehicle. We've heard stories about some of these devices and aren't sure whether we should recommend installing one to our customer.

*Mark Jacobs
Chicago, IL*

The convenient J1962 connector wasn't always there, so it might be helpful to look back at how it came to be located beneath the dash on most of the vehicles you're likely to see in your shop these days. Prior to the implementation of OBD II standards in 1996, many manufacturers had installed proprietary connectors on their vehicles, either under the hood or under the dash. These connectors were originally intended for "end of line testing" as a final check of engine management system operation as finished vehicles came off the assembly line.

The value of these connectors was next exploited by tool manufacturers, who constructed dedicated test equipment for each vehicle manufacturer, which was typically distributed to those manufacturers' dealership technicians. Aftermarket tool manufacturers soon followed, producing their own test equipment that utilized these proprietary connectors.

If you've been around since the early days of aftermarket scan tools, you probably remember that the rather large box that held the tool was only partially filled by the tool itself. Most of the room was consumed by the seemingly endless variety of dedicated connectors and harnesses that were needed to connect a single scan tool to the full range of domestic and import vehicles. As each new model year rolled around, and more vehicle manufacturers and models entered the market, the number of required harnesses seemed to grow larger, rather than smaller.

Things took a positive turn in 1996, when the OBD II standard was fully implemented. One of the requirements of OBD II was the introduction of a standardized diagnostic connector. The size, shape, location and pin configuration were all specified in the SAE J1962 standard. Some manufacturers seemed to have difficulty understanding what SAE meant in its description of the connector's location, which led to Easter egg hunts on some early OBD II vehicles, but those problems were ironed out long ago. Today, it shouldn't take more than a minute to find the location of the J1962, or OBD II, connector, even on an unfamiliar vehicle.

The standardized OBD II connector shape and pin configuration made all of those dedicated, vehicle-specific harnesses and connectors obsolete, almost overnight. SAE assigned pin locations for several specific functions, like PCM power and ground, but left many of the remaining 16 pins open for manufacturers to assign at their discretion. That's why you still need to tell your scan tool what kind of a vehicle you're plugging it into, because some of those dedicated pins might be used for one thing on a Ford and something quite different on a vehicle from another manufacturer.



Photo: courtesy Pico Technology

If you're going to use the J1962 connector for diagnostic purposes, consider investing in a breakout or test box. It will save wear and tear on the connector's 16 pins, while allowing you to conveniently check power and ground. You can also connect a scope's leads directly to the box to monitor CAN bus High and Low signals, plus signal quality.

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A few years later, pass-thru PCM reprogramming (J2534) was added to the list of possible and permitted uses of the OBD II connector. Rather than serving as a one-way portal for delivering information from the vehicle to a diagnostic tool, J2534 outlined the standards for two-way communication between vehicle and diagnostic or reprogramming equipment. A vehicle's entire personality could now be remapped, all through those same 16 pins in the humble OBD II connector. Refer to Bob Chabot's article, beginning on page 20, for news on developments that could affect J2534 in the months and years ahead.

More recently, other players have recognized the value of the information that could be harvested via a vehicle's OBD II connector. Fleet managers could keep track of when and how their vehicles were being used by their drivers. Parents could keep track of how their children were driving when they couldn't be there with them. Technicians could use data loggers to gather information on elusive intermittent problems. And certainly not least of all, insurance companies could use the OBD II port to monitor how, when and (possibly) where their customers were driving the vehicles the companies insured.

All of these later uses of the OBD II port have at least one thing in common: They were not originally envisioned by vehicle manufacturers or the original framers of the SAE regulations. Vehicle manufacturers are supposed to design their vehicles to comply with all applicable rules and regulations, and if those regulations specify the installation of an OBD II port, then one is provided. As specified in the regulations, that port is to be used for diagnostic purposes in an automotive service facility. Any other use for the port probably wasn't planned for, which means that unintended consequences may result.

In researching this column, I came across several news accounts of vehicle owners who had experienced difficulties

after installation of an insurance monitoring device. Complaints have numbered in the thousands, with many resulting in cash payments to owners, to compensate them for damages they believe were caused by these devices. It's not hard to understand why. You know how complicated it is for one scan tool manufacturer to make a scan tool that will interface reliably with a wide range of vehicle makes and models. Similar problems are certain to be encountered when a single insurance "snapshot" device must be designed and manufactured for installation on any vehicle with an OBD II port.

I recently learned that some owners of Volkswagen diesels have encountered problems after installation of insurance monitoring devices. The owners have claimed a loss of engine performance and fuel economy when the devices were installed, with everything returning to normal when the devices were removed. As has since been revealed, installing a monitoring device on these vehicles is believed to have triggered the vehicles' "defeat" software. The engine management system mistakenly believed it was about to be tested, which caused it to operate in a different mode. This is the strategy Volkswagen has now been accused of employing to get its diesel vehicles to pass emissions tests both in this country and elsewhere, while maintaining higher engine performance and fuel economy the rest of the time.

Your customer's insurance company should be able to tell him whether they intend to permanently or temporarily install a monitoring device. If they only want to temporarily install the device to monitor his driving habits for a finite period to set a baseline, then it's probably okay. Make sure he understands that the operation of his vehicle may or may not be affected by the device while it's installed. The OBD II connector is intended for occasional use by professionals only, and only as directed. It's in his best interest to keep that connector unencumbered when he's not visiting your shop. 