Interro PST500 OBD-II Personal Scan Tool

Diagnostic scan tools have been with us for many years and have become an integral part of nearly every technician's diagnostic tool arsenal. It's easy to forget how far these tools and their underlying technology have come, until you take a moment to look back. Early scan tools gave the user the ability to retrieve a limited (and small) number of diagnostic trouble codes (DTC's), but that seemed like a pretty big deal at the time. As the sophistication of powertrain management systems on vehicles increased, scan tools added serial data monitoring as well. This provided us with even more information on the inner workings of the powertrain management system. On many vehicles, this was followed by two-way communications between the scan tool and the powertrain management system.

As no unifying standard for vehicle self-diagnostic systems was in place, powertrain management systems from different manufacturers had different strategies, provided different diagnostic capabilities and required different scan tool interface hardware and software. The number of diagnostic scan tools multiplied, and their carrying cases got bigger and heavier as their manufacturers added the cables, connectors and software necessary to communicate with a growing number of vehicles and vehicle systems. Unless you were a compulsively orderly person, carefully sorting which set of cables and adapters you needed for each vehicle, finding the right set in the clutter of a busy shop had major-hassle potential.

A single connection to the vehicle provides the PST500 with power and vehicle communications. Each time the PST500 is connected to a vehicle, it conducts a power-on self-test routine. All tool functions are handled by a 10-key silicone rubber keypad (shown).

Right: *A 10-line, 20-character LCD display with adjustable contrast controls provides adequate visibility under most shop lighting conditions. In the Monitor Current Powertrain Data mode, up to eight emission-related data values can display. Scrolling up or down allows you to see the remaining data. If more than one control module (CM) replies for a given data value, scrolling left or right expands the detail. Each data value is displayed in a <Name> <CM> <Data> format.*

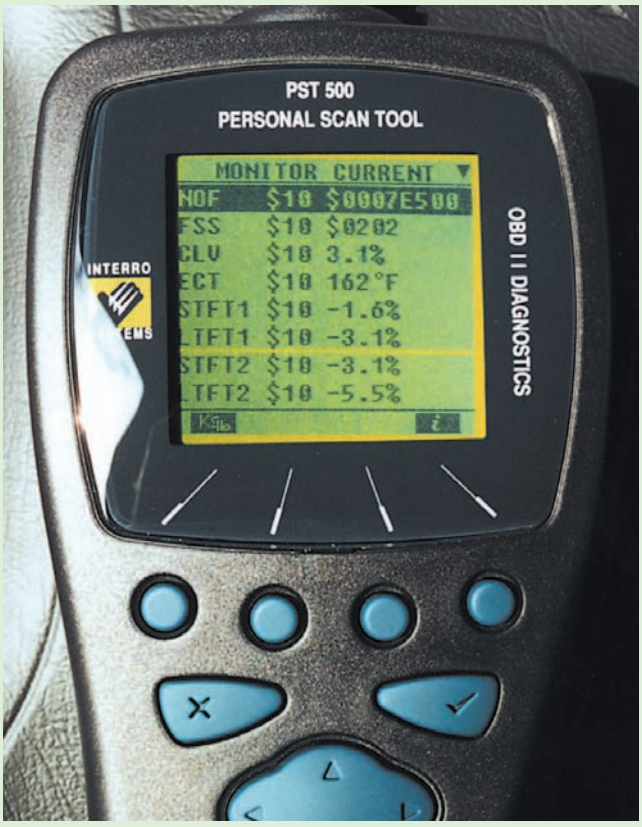
Bottom Right: *This vehicle had no driveability or emissions problems, so I temporarily tricked its control module by disconnecting the MAP sensor harness connector. The control module immediately illuminated the MIL and stored a P0107 DTC, which I then retrieved using the PST500. The DTC is initially displayed without explanation. If you're not familiar with the DTC-numbering system, context sensitive help is available by touching the 'soft key' below the "i" symbol on the screen.*

Then along came OBD-II. OBD-II promised to 'level the playing field' by mandating a common set of standards all manufacturers would have to abide by. Although manufacturers could continue to go their own way with their vehicle self-diagnostic and repair systems, OBD-II required all manufacturers also to provide a specific range of data in a standard form through a standard connector in a standard location.

Rather than maintain two discrete communications, monitoring and self-diagnostic systems on the same vehicle, some manufacturers abandoned their proprietary diagnostic interface and adopted the OBD-II standard connector as their main interface between the technician and the vehicle. Other manufacturers chose to continue with side-by-side powertrain diagnostic systems and diagnostic connectors.

Regardless of the manufacturer's approach, this much is certain: all vehicles sold in the United States beginning with the 1996 model year had to comply with most guidelines of the OBD-II regulations. All had to use the OBD-II interface connector in a designated location and provide access to their powertrain self-diagnostic data using a standard diagnostic protocol. That tangle of vehicle-specific harnesses, connectors and software was no longer necessary. One scan tool with the right software and harness connector could wring all the available data out of any OBD-II compliant vehicle, or at least all the data relative to exhaust emissions.

The first *OBD-II only* diagnostic scan tool we've had a chance to use is the PST500 Personal Scan Tool manufactured by Interro. Interro describes the PST500 as "a dedicated, totally generic OBD-II scan tool, designed for the individual mechanic." The useful life of this tool should be quite long, as newer OBD-II compliant vehicles are just beginning to supplant older vehicles on the road, and the new vehicles are compatible with the tool's capacities.



When the control unit stores a DTC, it also takes a freeze-frame snapshot of the emission-related data values at the moment the DTC was detected. The PST500 displays this freeze-frame information, which can prove useful when diagnosing the original cause of the DTC. After you've found and fixed the cause of the DTC, erase all DTC and freeze frame data before returning the vehicle to the customer.

OBD-II Protocols And Diagnostic Interface

Although OBD-II was supposed to mandate a universal protocol for communication between the vehicle and a scan tool, there are actually several protocols in use. The PST500 can communicate with an OBD-II compliant vehicle via SAE J1850 PWM, SAE J1850, VPW, ISO 9141-2 and ISO 14230-4 communications protocols. The PST500 automatically detects and selects the relevant communications protocol.

When a component or subsystem on an OBD-II vehicle exceeds allowable emissions thresholds or operates outside defined tolerances, the computer sets a diagnostic trouble code (DTC) and turns on the Malfunction Indicator Lamp (MIL). System monitors in the vehicle ECU's are used to control both DTC storage and MIL status. For OBD-II, these are:

- Exhaust Gas Recirculation (EGR) system
- Heated Oxygen Sensor (HO_2S)
- Catalytic Converter Efficiency
- Misfire Detection
- Fuel System
- Comprehensive Component Monitors
- Secondary Air System
- Evaporative System
- A/C System Refrigerant

The PST500 interfaces with the vehicle ECU's via the standard J1962 OBD-II connector and performs the following operations:

- Monitor current powertrain data (Mode 1)
- Monitor freeze frame data (Mode 2)
- Request emission trouble codes (Mode 3)
- Clear trouble codes (Mode 4)
- Request O_2 sensor test (Mode 5)
- Monitor on-board test results (Modes 6 and 7)

That's enough specs and J-numbers for now. The first thing we noticed is that the PST500 shares its carrying case with just one thing: an instruction manual. A permanently attached three-meter (9.75 ft) cable with molded connector is the tool's only 'interface attachment.' Software is provided by a plug-in program cartridge that may be replaced depending on future requirements. Refer to the photographs to see how the PST500 actually works, and **Circle Number 121** on the Reader Service Card if you would like to receive additional information about the PST500. ■

—By Karl Seyfert