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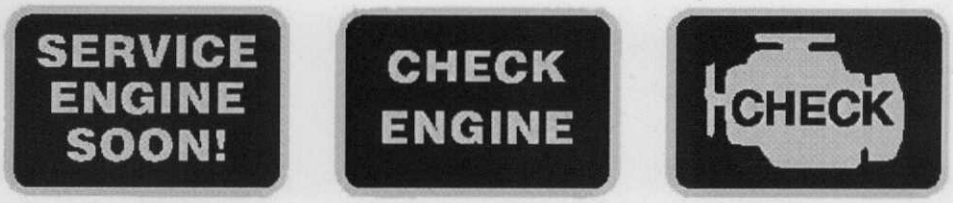

TECHNICIAN'S GUIDE to PASS-THRU ("Flash") REPROGRAMMING

1993-2007 Domestic & Import Cars, Trucks, Vans & SUVs

- **J2534 Pass-Thru Reprogramming Explained**
- **OEM-Specific Reprogramming Procedures**
- **Hardware & Software Required**
- **Sources for Calibration Data**
- **Required Fees**
- **Notes, Warnings & Cautions**
- **Procedures Required after Reprogramming**
- **Pass-Thru Reprogramming Error Codes**
- **Directory of Pass-Thru Tool Manufacturers**
- **What Does the Future of Reprogramming Hold?**

Do you send customers back to the dealer to have ECMs replaced or reprogrammed?
Do you want to keep that business?
Don't turn away repair work, just because an ECM requires reprogramming!

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ABOUT THIS MANUAL. This manual is intended as a quick reference summary for technicians to the requirements, recommendations, procedures, software and hardware necessary to implement J2534 Pass-Thru Reprogramming. The information is current as of the date of publication, but subsequent changes may have been made to vehicle manufacturer's requirements or to tool manufacturer's Pass-Thru devices. Technicians should always consult the vehicle manufacturer's technical information website or the Pass-Thru device manufacturer for the latest information.

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REPROGRAMMING VEHICLE CONTROL MODULES

Pass-Thru Vehicle Reprogramming

As a result of the access-to-information gains made by the independent service industry, reprogramming vehicle electronic control modules (ECMs) is shaping up to be the next big opportunity for independent shops and technicians.

ECMs – also known as electronic control units or ECUs – are the general term for vehicle control modules. ECMs can take the form of a Powertrain Control Module (PCM), a Body Control Module (BCM) or a control module for virtually any other sub-system of the automobile. Modern cars and trucks can have as few as a single control module or as many as 20-40 different control modules.

In 2002, the Environmental Protection Agency (EPA) and California Air Resources Board (CARB) mandated that OEMs meet a Society of Engineers (SAE)-developed standard known as J2534, or Pass-Thru Reprogramming. J2534-1 deals with making ECU reprogramming capabilities for emission-related ECUs available to independent technicians previously only available to dealers. OEMs must make reprogramming available for emissions-related ECMs on all 2004 and later vehicles, and at the option of the OEM, pre-2004 emission-related ECUs as well as control modules for other systems, using a common tool. You can read the entire text of the regulation at:

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2001_register&docid=01-14471-filed.

A J2534 compliant Pass-Thru Reprogramming system is a standard tool for all applicable vehicles, regardless of manufacturer. It consists of a standardized interface module (Pass-Thru device), connected between a PC and the vehicle. The tool comes with an Application Programming Interface (API) developed by the tool manufacturer, software drivers and software to communicate with the vehicle's OBDII system. A Windows®-based reprogramming application and reprogramming files are supplied by the vehicle manufacturer, either downloaded from the OEM website or delivered on CD-ROM or DVD.

"If your favorite tool is a hammer, all of your problems start to look like nails."

- Charlie Gorman, Executive Manager, ETI

The Origins of Reprogramming

Reprogramming was an inevitable result of the use of computers in cars and light trucks. Unfortunately for techs, a basic familiarity with electro-computer babble is a requisite to understanding reprogramming as it applies to cars and light trucks.

PROM Chips

In the early 80s, OEMs introduced the first on-board control and diagnostic systems controlled by a computer. Like a PC, the ECM calibration files needed to be updated from time to time,and the Programmable Read Only Memory (PROM) chips in use could not be reprogrammed.

A PROM is a memory device that contained the operating instructions for the control and diagnostic systems, stored in bits and bytes. Programmable means that the PROM or chip can be programmed with a program (instructions) data or both. Read Only Memory means that the control module (computer) in which the PROM is installed can only retrieve information from the PROM; it cannot insert information into the PROM.

PROMs were small and relatively inexpensive, the disadvantage being that once data was written to a PROM, it was there forever. Inevitably, changes and corrections to the operating instructions of the ECM were required. Making a change or correction to an ECM that used a PROM required that the computer itself be removed and replaced with an ECM containing a PROM chip with new instructions. GM was the only OEM using removable PROMs, but by 1990, technology advanced to allow replacement of only the PROM chip, instead of the entire ECM. While saving considerable saving, it was a delicate operation and not intended to be performed as a normal service operation.

E-PROMs

In the world of computers, there are two basic types of memory chips – those with volatile memory and those with non-volatile memory. Volatile memory forgets the contents of its memory when power is removed

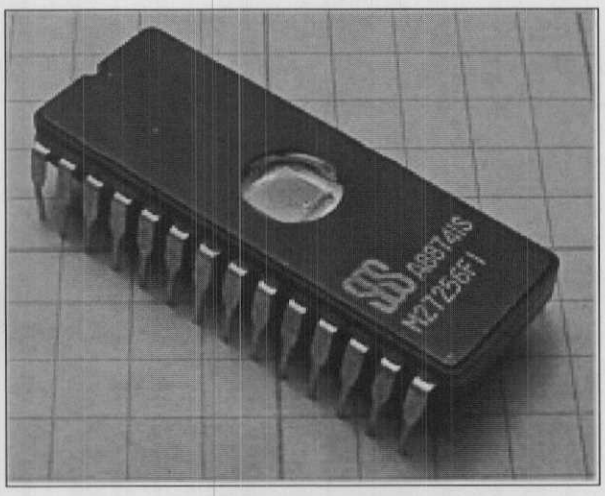


Figure 1 – A typical EPROM chip that could be removed, erased, reprogrammed and replaced

and non-volatile will remembers its contents if power is removed.

EPROMs (Erasable Programmable Read-Only Memory) are non-volatile memory chips. Erasable means that the EPROM can be erased and used again, after being re-programmed with a new program. Once the EPROM is programmed, it cannot be changed unless it erased in an EPROM eraser and reprogrammed.

It isn't necessary for a technician to understand the details of erasing an EPROM. Suffice it to say that it was accomplished using a high intensity ultraviolet light source in a box. It was neither simple, inexpensive nor convenient to erase an EPROM and reprogramming could only be done with a special device called an EPROM Programmer. Despite its limitations, it allowed vehicle manufacturers to make corrections or to update a control module by replacing only the EPROM, instead of the entire control module. This solved the problem of replacing an entire expensive control module and results were more accurate.

EE-PROMs

By 1990, technology was available, in a few vehicles, to reprogram, or "re-flash" an EPROM chip, without replacing it. These chips were known as Electronically Erasable – Programmable Read Only Memory, EE-PROMs, E^2 PROMs or double-E PROMS and the first vehicle application was the 1990 Geo Storm.

In 1993, GM introduced the first true "flash" reprogramming technology. The process of reprogramming these EE-PROMs came to be known as "flash" reprogramming, because many EE-PROMs used a special type of flash memory that allowed erasing and reprogramming in blocks, instead of in single bytes at a time. Vehicle manufacturers now had a way to more or less make changes to the control module's instructions as required and on a vehicle-specific basis, but a dedicated dealership tool was required.

In 1994, Ford introduced its first "flash" reprogrammable vehicle and Chrysler followed suit in 1994, but in both cases, dedicated and expensive dealership tools were required.

By 1996, OBDII was required on all 1996 and later vehicles and flash reprogramming gained popularity as a quick, efficient way to make changes to vehicle control systems, particularly changes involving emissions or driveability. By 1996, virtually all domestic vehicle manufacturers were using ECMs, particularly PCMs, with flash technology. The problem for the independent technician was that tools to affect the changes were expensive and largely unavailable to the independent technician. Many independent technicians sent customer's vehicles with problems requiring reprogramming back to the dealer, resulting in lost revenue.

Each manufacturer had their own method of reprogramming. EPA, with responsibility for controlling air pollution from motor vehicles, realized that vehicle emissions were influenced by ECM calibration and, that access to the equipment to update the calibration files that would improve vehicle emissions was only available at the dealership.

Recognizing the importance of the issue, EPA wanted independent shops, as well as dealerships, to be able to update ECM calibrations. Thus was born the J2534 Pass-Thru reprogramming standard to standardize aftermarket reprogramming among OEMs.

Pass-Thru Reprogramming – A Shop's Advantage

Pass-thru reprogramming is the next step in dealing with EE-PROMs and vehicle control modules and is inextricably linked to On-Board Diagnostics (OBD). OBD allowed the independent technician access to the data and trouble codes generated by the vehicle's on-board control system(s). Pass-Thru reprogramming will give the independent technician the ability to change the control system software when necessary, without going back to the dealer, to effect repairs or corrections, by accessing external databases or products.

Once the independent tech has access to Pass-Thru reprogramming capabilities, the

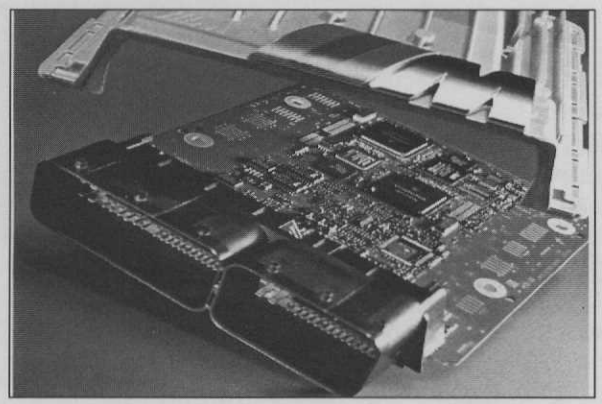


Figure 2 – Inside a modern automotive PCM is a maze of electronics and chips

world of diagnostics and repair will be revolutionized. The key is that Pass-Thru reprogramming allows connection to the internet, or to discrete products on a variety of external media, which will fuel development of guided diagnostics and a host of other products.

Many industry observers see Pass-Thru reprogramming as an opportunity for independent shops. They see Pass-Thru reprogramming as a way for the independent shops to compete with dealerships for the customer's service dollar. But there are learning curves, as well. Technicians are being inexorably drawn into the world of PCs and computer software, a world with which they may not be familiar. But one thing is clear. Pass-Thru reprogramming will present many opportunities in service, diagnostics and customer satisfaction to independent shops. If you're an independent tech, or work for an independent shop, and PCs and software are not part of your diagnostic and repair capabilities, you will be at an increasing disadvantage.

PASS-THRU REPROGRAMMING & OBD

Pass-Thru reprogramming is the next logical extension of OBD, so it's useful to take a quick look at the origins of OBD and see where it goes in the future. Pass-Thru reprogramming is a by-product of OBD II, arguably the most pervasive automotive technology since the Otto cycle and the genesis of many of the on-going technologies technicians face today.

On-Board Diagnostics

OBD was born in California during the early 1950s, when an unknown California research scientist first blamed traffic for the smog-laden skies hovering over southern California. It turned out that automobiles were a major source of pollutants, producing at least half of the carbon monoxide, hydrocarbons and oxides of nitrogen in a typical urban area. Other sources run the gamut from lawn mowers to aerosol propellant to printing establishments to heavy industries burning coal.

However, legislation focused on cars and trucks – collectively part of what is known as mobile sources – to distinguish them from stationary sources. In the intervening 50-odd years, legislation by the United States Congress, the Environmental Protection Agency (EPA) and California Air Resources Board (CARB) have driven the auto industry to implement increasingly complex vehicle control strategies.

The decade of the 70s saw the first serious attempts to control automotive pollutants, though progress was peripatetic and political. The first systems were discrete add-on hardware devices, such as EGR valves. While somewhat effective, performance and driveability suffered. By the mid-80s, vehicle manufacturers (OEMs) were beginning to develop and implement integrated electronic control systems to manage the vehicle's pow-

ertrain and thus, control emissions. By the mid-90s, the typical car had more computing power than the original Apollo spacecraft and computers were well on their way to reducing emissions and improving performance.

California, which had one of the worst air quality problems in the nation, was in the forefront of efforts to reduce vehicle emissions. CARB reasoned that if emission system component failures could be identified and repaired quickly vehicle emissions could be significantly reduced. As vehicles and control systems became more complex, CARB required OEMs to equip vehicles with an on-board diagnostic system to detect emission control malfunctions and indicate the source of the problem via a trouble code stored in the vehicle's engine control module memory. The goal was (1) to identify components that were beginning to fail and cause excessive emissions and (2) to improve the technician's ability to diagnose and repair emission-related malfunctions by providing a clue about what was going wrong. The first part went fairly well. The second part proved more difficult.

OBD I

A few high-end vehicles offered an OBD system as early as 1985, but OBD I applied generally to 1988 through 1993 cars and light trucks. OBD I was a modest effort when compared to its successor, OBD II, monitoring only a small number of components. It stored DTCs but only illuminated the Check Engine light on the dash when a monitored component failed. There was no provision to detect the gradual degradation of a component.

On vehicles with OBD I control systems, technicians used a variety of methods to retrieve stored DTCs. Some vehicles required counting the number and sequence of Morse-code style flashes on a dashboard display. Some systems allowed codes to be retrieved via a scan tool with a digital display, but there was little to no standardization. DTCs and their English translation were largely unique to each OEM, as was the connector (the physical link between the vehicle's control system and the scan tool.) Technicians were forced to buy a scan tool and a variety of adapters that were required to connect the scan tool with each OEM's unique connector. Communication software was unique to each OEM as were the number, identification and the exact meaning of DTCs.

OBD II

In 1990, the failure of 96 urban areas in the U.S. to meet federal air quality targets was largely blamed on increased emissions due to the gradual degradation of vehicle's emission components. This caused the EPA to conclude that more needed to be done to ensure that vehicle emission components were operating properly and paved the way for OBD II.

OBD II, the second generation of On-Board Diagnostic systems, was phased in on 1994 cars and light trucks with new engines. Full implementation on all cars and light trucks was required beginning with the 1996 model year.

OBD II is a much more complex control system than OBD I:

- more systems are monitored;
- closer scrutiny and reporting of engine functions related to emission control systems is required;
- technicians are provided precise feedback via standardization of DTCs among OEMs, and
- the data link connector is standardized on all vehicles.

EPA and CARB turned to SAE, which created a standard, called J1962 that specified the size, shape, location and design of the DLC and another standard, J2012, that standardized the DTCs among OEMs.

With the introduction of OBD II, more computers and more complicated software was being used and computers were talking to each other over increasingly sophisticated on-vehicle networks. Practically all OEMs had begun using EE-PROM chips in their on-board computers to hold the software and operating instructions. The EE-PROM chips

were a significant advance, because they could be "re-flashed" or flash reprogrammed, with new software, corrected software or updated operating instructions applicable to a specific vehicle or even applicable to a specific VIN.

"No Code, No Problem"

OBD II has changed automotive service forever, because it led to the widespread use of generic scan tools. For the first time, independent technicians had access to the same diagnostic data available to technicians working in dealerships using an affordable scan tool and one that was not proprietarily linked to the OEM. OEMs were still able to provide proprietary data that could only be accessed with the manufacturer's scan tool.

Standardized trouble codes ushered in the era of "no code, no problem", a term first coined at GM. No longer were symptoms of a problem an acceptable complaint. Unless a DTC is set illuminating the MIL (pending DTCs will not illuminate the MIL), there really is no problem. OBD II also led directly to the access to service information which independent technicians currently enjoy and to emerging technologies, like reprogramming, guided diagnostics and CAN (Controller Area Network) vehicles.

Controller Area Network (CAN)

Beginning with 2002 vehicles, manufacturers began equipping vehicles with a new high-speed computer controller area network (CAN) to transmit electronic signals and information around the vehicle. CAN is a new communications protocol mandated by EPA as the standard communications protocol by 2008 model year, taking the place of the existing handful of communications protocols currently in use on OBD II vehicles.

CAN was developed for automotive use to reduce weight, reduce the cost of wiring harnesses and add capability. CAN allows the shared use of signals by different control units, fewer wired and plug-in connections, fewer sensors, more centrally-located control units, greater flexibility when expanding or modifying the system, greater reliability and more efficient diagnostics.

CAN operates at data speeds as high as 500Kbits/sec or about 50 times faster than an existing OBD II protocol and in many cases processes information much faster than the scan tool. Information is passed one bit at a time and therefore only one or two wires are needed compared to eight or more wires in existing networks.

CAN messages are broadcast to each ECM, and all messages go through the PCM. The transmission module, for example, can supply the speedometer with the current speed, as well as the radio to change the volume. This information is transmitted over CAN to each ECM. The PCM usually functions as the gateway, but the PCM is also just another ECM, of which there can be many. This makes it easy to add ECMs.

Implementation of generic, high-speed controller area networks will be gradual, but mandatory on 2008 models, and will affect OBD II emission testing as well as problem diagnosis using existing scan tools. A mix of public (required by law in the U.S., Canada and Europe as OBD II) and proprietary information will still be passed over CAN using the standardized J1962 DLC. Diagnostic and vehicle security data not mandated by law will remain proprietary. But, even though the DLC remains the same, CAN vehicles may require new scan tool software and/or hardware to communicate with the scan tool or OBD II emission testing device.

OBD II has evolved into CAN and has technicians asking, "Will there be an OBD III?"

OBDIII?

There really is no formal third generation of OBD. However, OBD II is evolving and morphing into a more complex and more feature-laden system as telematics expand. It has been said that "OBD III is simply OBD II with telematics".

Telematics is the broad term used for integration of computers with telecommunications systems. Lately the term has evolved to refer to automotive systems that combine wireless communications with Global Positioning Satellites (GPS). Included are a wide range of telecommunication systems

that originate or end inside the automobile, transmitting data to and from a vehicle.

The vehicles of the future are much closer than you think. Technicians will be most affected by remote diagnostics, but will need to deal with remote control vehicle systems as well as systems delivering navigation, automated highway information, security and safety services and web-based services integrated with the mobile internet.

Typical of telematics is OnStar Vehicle Diagnostics just introduced by GM's OnStar division. OnStar's Vehicle Diagnostic Service automatically performs hundreds of diagnostic checks on powertrain, ABS, airbag and OnStar systems and reports the results monthly, via email, to the vehicle's owner – no code, no problem. If the customer chooses, the information can be shared with their dealer and the customer has the option to contact the dealer directly from a link on the email.

"OBDIII is just OBDII with telematics"

- Charlie Gorman
Executive Director
ETI

Many industry experts predict that OBD III will simply be the evolution of OBD II combined with telematics and other tools, such as emissions failure notification for fleets or even private motorists.

Take a look behind the curtain to see some of the hidden ways that OBD has changed the technician's life and the shop's business practices. Even if you are not located in an emissions testing state or area, it's a virtual certainty that you will be affected by OBD.

HOW WILL PASS-THRU REPROGRAMMING AFFECT THE TECHNICIAN?

Since OBD was mandated, vehicle manufacturers (OEMs) have relied on software (called firmware, because it's harder to alter than normal software) built into the on-board computers to operate the on-board diagnostic and control systems. Use of reprogrammable memory technology in vehicle ECMs allowed vehicle manufacturers to use a single ECU part in many different vehicles, the only difference being the firmware and operating parameters stored in memory.

Like all software, the firmware is subject to occasional glitches and programming errors that sometimes have an adverse effect on emission controls or on driveability, giving rise to the need to make changes to the firmware or control parameters (called reprogramming or "flash" reprogramming), without replacing the entire computer module. Reprogramming ECMs in the field allowed for relatively easy modification of firmware and complex calibrations without having to replace expensive ECMs.

Dedicated vs Pass-Through Tools

However, the technology came at a cost to the independent technician. Until now, only authorized dealers were able to change or replace the firmware. The reprogramming capabilities were built into each OEM's tools and were dedicated to specific vehicles. Dealerships had a captive market. Independent technicians, who serviced many makes of vehicles, were forced to pay thousands of dollars to purchase each manufacturer's special tools to be able to perform reprogramming.

There will continue to be two ways to reprogram a vehicle. OEM dealers will continue to have a dedicated reprogramming tool for their branded vehicles, and certain tools, to reset security and immobilizer systems, for example, may continue to have restricted access. But independent techs will now have access to a Pass-Thru reprogramming tool that will work on all brands of vehicles with reprogrammable ECUs. The dealership tool is a proprietary tool and offers the advantages of speed (re-programming can take up to an hour or more), efficiency and a stable communication line over the manufacturer's network. They are also bi-directional; the vehicle can communicate with the dealership database and vice versa and are capable of updating the OEM "as-built" database when reprogramming is finished. Disadvantages include high cost and limited availability to independent shops.

Pass-Thru reprogramming devices are more affordable for the independent shop and capable of dealing with most reprogrammable vehicles with a single tool, although adaptors and special cable may be required for 2003 and earlier models. Independent shops can improve customer service and offer better vehicle service. See the "Pass-Thru Tool Manufacturer's Directory" in this manual for an overview of Pass-Thru devices.

As an option, some dealers offer reprogramming from mobile vans and some parts manufacturers offer mail-in reprogramming.

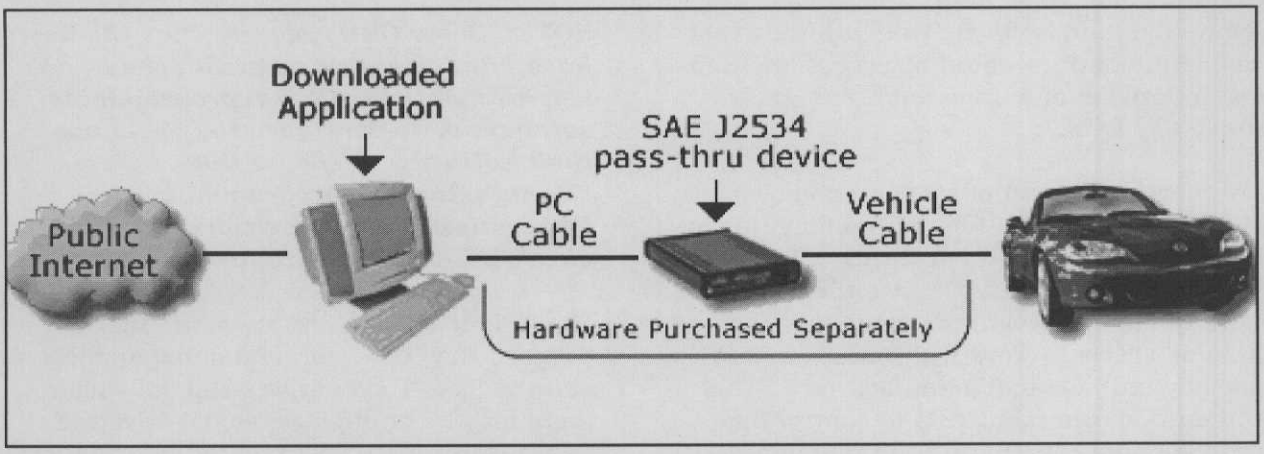
The Tech 2 is one of many scan tools dedicated to an OEM and designed by aftermarket companies. All are capable of reprogramming. (Photo courtesy Vetronix Corporation).

"Flash" Reprogramming

The U.S. EPA realized early on that controlling vehicle emissions required that technicians be able to properly repair vehicles. Amendments to the Clean Air Act mandated that OEMs provide access to the same diagnostic and service information that a dealership received, albeit "at a reasonable price", to independent technicians and consumers.

Reprogramming (referred to as a "reprogramming event") has evolved into one of the favored methods of OEMs for correcting vehicle emission and performance problems, to the point that on the order of 40% of the emission-related recalls in 2004 involved reprogramming. It's quick, inexpensive, and vehicle-specific. That, and the increasing number of vehicles with reprogrammable ECUs or other control modules, forced the EPA to develop a way for independent techs to be able to reprogram a control module.

Flash reprogramming is not only a technician's tool – it's a valuable customer satisfaction tool, too. Give some thought, as part of a "21st Century Tune-Up", to checking the vehicle's calibration files every time a vehicle comes through your shop. Your check of calibration files may not always solve your problem but it can can correct a host of problems on all vehicles, especially problems on those vehicles in the 5-8 year old range. Usually a TSB will advise you a specific problem relating to calibration files, but it's a



Pass-Thru reprogramming requires a PC, a J2534 Pass-Thru device, cables and access to the internet. Note that Pass-Thru reprogramming is a one-way event. Vehicle files maintained by the manufacturer are not updated. (Illustration courtesy Mazda).

good idea to keep calibration files current. Updated calibration files can correct a host of problems, including:

- "false" DTCs (DTCs that set incorrectly),
- enhanced diagnostics,
- driveability problems (rough idle, hesitation, hard starting),
- transmission shift points,
- fuel economy, and
- emission failures.

Many times, reprogramming is the only way to repair the problem.

What Is Included in a J2534 Pass-Thru Tool?

By 1996, virtually all OEMs were using at least some VIN-specific, "flash" reprogrammable ECUs. To complicate matters, replacement ECUs and modules often come with no firmware loaded. They're like a PC with no operating system. New or replacement modules must be reprogrammed with VIN-specific firmware before they are installed in the vehicle. OEM scan tools usually have full reprogramming capabilities built-in, but scan tools generally available to the independent technician had no such capabilities.

CARB and the EPA required the use of standardized reprogramming tools that independent techs could use for all vehicle manufacturers. The purpose was to allow reprogramming of ECUs for all vehicle manufacturers using a single set of hardware. Reprogramming software from multiple vehicle manufacturers would be accessible from a standard set of hardware to reprogram virtually any ECU.

SAE developed a set of standards known as J2534, or Pass-Thru Reprogramming, to satisfy the intent of EPA and CARB. J2534 is a work in progress, but provides the framework to allow reprogramming applications from all OEMs to work with hardware supplied by multiple tool manufacturers. The standard allows each OEM to control the programming content and the reprogramming sequence of the ECU and does not reveal an OEM's proprietary information.

Based on development of the J2534 standard, in 2002, EPA mandated that, as of the 2004 model year, all 2004 and later light duty vehicles must support the J2534 reprogramming standard. Beginning with 2004 vehicles, anyone will be able to reprogram their vehicle's ECU – either on-board or off-board – "at a reasonable cost". Pre-2004 vehicles with reprogrammable ECUs may be reprogrammed using a Pass-Thru device and/or a cable with a proprietary connector.

J2534 Software

Several pieces of software come with a Pass-Thru reprogramming tool, regardless of tool manufacturer. Each tool comes with:

- a Dynamic Link Library (DLL),
- an Application Programming Interface (API), sometimes called firmware or J2534 software,
- a device driver and a
- vehicle interface.

All of the above software is usually preloaded onto the Pass-Thru tool, but there is a provision to change versions of software by adding or deleting files. In addition, you'll need to access and/or download or install the OEM J2534-compliant reprogramming application onto your PC. The OEM reprogramming application and reprogramming files are available from the OEM, usually for a subscription or usage fee. See the Manufacturer pages in this manual for details on sourcing the OEM reprogramming software.

NOTE: ***Some OEMs require that the user have Administrator rights on the PC to use or install the OEM reprogramming software or to configure the PC to use their software. Refer to the "Manufacturer Reprogramming Information" pages for more details or check the OEM website for updates.***

The API, or J2534 software is an interface between the OEM reprogramming application and the Pass-Thru device's DLL (of which there may be multiple versions). See the "Manufacturer Reprogramming Information" pages for OEM requirements. Some version of J2534 software comes with a Pass-Thru

reprogramming device, but there are actually several versions of J2534. There is the original specification, known as J2534 and two other versions, known as J2534-1 and J2534-2. The standard seems clearly defined to allow reprogramming in the field, but both are evolving with multiple versions as changes and refinements are made. However, J2534-1 includes requirements for an interface to reprogram emission-related ECUs as required by EPA and CARB. It's important to know which J2534 software is supported by the OEM reprogramming software. DaimlerChrysler reprogramming software, for example, supports only the J2534-1 software. Other OEMs support the J2534 version. Check the OEM recommendations in the "Manufacturer Reprogramming Information" pages before making a purchasing decision. Different versions of software are available from the Pass-Thru tool manufacturer.

The Vehicle Interface works in conjunction with the API to communicate with various vehicle OBD II communication protocols. J2534 must be able to communicate with KWP 2000, ISO9141, SCI SAE2610, J1850VPW/PWM and CAN, but some Pass-Thru tool manufacturers may be able to communicate with more protocols.

"well over 100 million North American vehicles, 1993 model year and newer, have programmable ECUs, and the number increases by over 10 million every year."

— Source: Standard Motor Products

J2534-2 defines enhanced functionality required to reprogram other non-emission related ECUs (body computers, transmission computers, GM UART ECUs, etc.) not currently mandated by regulations. Aftermarket scan tools have so far concentrated on PCM or engine management reprogramming and are just beginning to address body control and other modules.

In the practical world of repairing vehicles, this means that, for now, the EPA and CARB regulations only require OEMs to supply Pass-Thru "flash" reprogramming capability for emission-related ECUs. If reprogramming a transmission control module would change control pressure to the clutches in an automatic transmission, to avoid transmission failure, but does not affect emissions, the reprogramming may not be available from all OEMs. In practice, however, many OEMs are providing capabilities in excess of what is required by the letter of the law.

J2534 Hardware

Both EPA and CARB proposed similar regulations that required vehicle manufacturers to provide the aftermarket and independent technicians with the capability to reprogram emission-related ECUs.

Required hardware includes:

- a standard PC with a WIN-32 operating system (pur chased separately),
- an OEM-validated "Pass-Thru" device,
- adaptor cable(s) to connect between the PC, the Pass Thru device and the programmable ECU in the vehicle.

Some manufacturers may require the use of special adaptors or security tools for their individual vehicles. Details are available in the "Manufacturer Reprogramming Information" pages or on the OEM website.

The connection between the tool and the PC is not specified. Each tool manufacturer has the flexibility to use RS-232, RS485, USB, Ethernet or other type of connection and is free to choose the hardware interface for their tool, as long as the reprogramming software from any OEM is compatible with the hardware supplied by any tool manufacturer.

J2534 is a work in progress. Several software versions are already in use and you'll need to keep up with changes from the OEMs. Additional requirements for later model years may require more revision, depending on the outcome of legislation regarding medium and heavy-duty trucks, which may use a different DLC than that specified by J1939. Software for an alter-

nate DLC is a possibility, but the basic hardware and procedure is not likely to change.

How Pass-Thru Reprogramming Works

First, you'll need a shop grade PC. In general, any reasonably late model, generic PC (laptop or desktop) running a Win32 (Windows 95, Windows 98/Windows NT/Windows Millennium/Windows 2000/Windows XP, etc.) operating system will do fine. The more powerful the PC, the better. The PC should be capable of connecting to the internet. Many reprogramming applications will assume a high speed internet connection, although not all applications require it.

NOTE: ***Some OEMs or Pass-Thru device manufacturers will specify certain requirements of the PC to be able to reprogram ECUs. The "Manufacturer Reprogramming Information" pages summarize the PC requirements (if any) from the OEM. Also, consult the manufacturer's website for the latest guidance; recommendations are subject to change at any time. The list of OEM website addresses is also printed in this manual.***

Second, you'll need Pass-Thru reprogramming device (or interface) which is available from a number of aftermarket tool manufacturers. The capabilities of the device are specified by J2534, but are implemented in the hardware by the aftermarket tool supplier. You're free to purchase the reprogramming device from the tool manufacturer of your choice, which can also be integrated into a scan tool. However, be careful – not all Pass-Thru reprogramming devices are created equal. While the same device will work for all vehicle manufacturers, not all

SAE J1962 Communication Protocols

The U.S. EPA requires the following OBD II communication protocols to be supported by aftermarket tool manufacturers.

Protocol	Comments
ISO 9141-2	Also known as K-Line and ISO 9141 CARB. Used by some Chrysler, Mazda and European vehicles
ISO 14230-4 KWP 2000 (Keyword Protocol)	Compatible with ISO 9141-2
SAE J1850 PWM (Pulse Width Modulation)	Used by Ford (known as Ford SCP – Standard Corporate Protocol). Operates at 41.6 kbps.
SAE J1850 VPW (Variable Pulse Width)	Used by GM (known as Class 2). Also known as Chrysler PCI.
ISO 11898 CAN 2.0B	CAN 2-wire also known as CAN-C, J1939, J2284 and High Speed CAN. Uses portions of Bosch CAN 2.0 specification. ISO 11519 is low speed version.
ISO 15765-4 CAN	U.S. OBD regulations require CAN serial data communication at 500 kbps. Only the provisions of ISO 15765-4 pertaining to 500 kbps communication are required to be supported to by aftermarket scan tools.

Other Communication Protocols

SCI SAE J2610	(Serial Communications Interface) used by Chrysler vehicles
GM UART	Also known as GM ALDL (Assembly Line Diagnostic Link)
Ford UBP	Based on GM UART
CAN Single Wire	Known as SWC or J2411
KIE	K-Line Inverted Echo

aftermarket tools have been implemented to work with all OEMs or have been validated by all OEMs to work with their vehicles or reprogramming software. Check with your tool supplier to see which years/makes and/or models are supported by individual Pass-Thru devices and check the "Manufacturer Reprogramming Information" pages or the OEM website for Pass-Thru tools that are validated by individual OEMs.

When you purchase the Pass-Thru device, it will come with the necessary cables, although there may be a need for some optional cables or connectors depending on individual OEM. Some optional cables are available from the tool manufacturer, while some OEMs require specific devices available from the OEM. The connection between the PC and the Pass-Thru device is determined by the manufacturer of the Pass-Thru device. It can be an RS-232, RS-485, USB, PCMCIA, Ethernet, IEEE 1394, wireless (Bluetooth) connection or any other future technology.

The cable between the Pass-Thru device and the vehicle must have a J1962 (DLC) connection on the vehicle end and is limited to approximately 15 feet in length. The connection to the Pass-Thru device can be an RS-232, RS-485, USB, PCMCIA, Ethernet, IEEE 1394, wireless (Bluetooth) connection or any other future technology.

The tool manufacturer must also include a device driver as part of the Pass-Thru device so that the actual type of connection and communication protocol is transparent to the API and to the vehicle. The driver invisibly handles communication between the device and the vehicle.

The Pass-Thru tool must also "speak" a number of different languages, including CAN, based on the communications protocols used by individual OEM's vehicles. The major non-CAN protocols are totally incompatible with each other, just as they are incompatible with the two major CAN protocols, which are required to support as many as few as two or as many as 40 or more ECUs. Be sure to check with the manufacturer of the tool you're considering to be sure they support CAN and can be expanded to support future communication protocols.

NOTE: ***Some OEMs have elected to validate their reprogramming software with certain Pass-Thru devices in order to assure that the Pass-Thru device functions with their reprogramming software. The "Manufacturer Reprogramming Information" pages of this manual will list the validated Pass-Thru devices, but also consult the manufacturer's website for the latest guidance, as recommendations are subject to change at any time. The list of OEM website addresses is also printed in this manual.***

The Pass-Thru device alone is not sufficient to reprogram an ECU. You'll also need the Application Programming Interface (API) supplied with the Pass-Thru device. The API is software that controls the communications between the Pass-Thru device and the vehicle, much like a printer drivers all "look" the same to Windows applications, even though the printer hardware may be different. This is what allows you to use the printer of your choice. Similarly, the J2534 API makes all vehicle communications "look" the same to different Pass-Thru reprogramming devices and allows you to use the Pass-Thru reprogramming device of your choice.

Lastly, the OEM – vehicle manufacturer – is responsible for controlling the reprogramming event, including the user interface (what is seen on the screen), selection criteria for downloadable files and downloadable calibration data, the security mechanism to control access to the reprogramming capability and the actual reprogramming steps and sequence required for each individual module.

WHICH VEHICLES CAN BE REPROGRAMMED?

Not all OBD II vehicle computers are capable of being "re-flashed" or reprogrammed. The Manufacturer pages will show you which vehicles use on-board computers that can be reprogrammed, as well as other important data you'll need to know about reprogramming a specific OEM's vehicle(s). But, of those that can be reprogrammed, there are two ways of performing the feat – dedicated

OEM scan tool or aftermarket scan tool. Virtually all dedicated OEM scan tools are capable of reprogramming. The biggest drawback is cost. The dedicated OEM scan tools usually have other proprietary software and are capable of interfacing with the OEM "as built" databases, are expensive and frequently restricted to dealerships. This practice put independent technicians at a competitive disadvantage, and was a detriment to repairing vehicles. To level the playing field, EPA proposed a two-tiered approach to reprogramming.

For 1994 through 2003 OBD-equipped vehicles with reprogramming capability, EPA required that OEMs make available all emissions-related reprogramming information to aftermarket tool and equipment companies, in a manner similar to the way enhanced diagnostic information is made available. This allows aftermarket scan tool companies to replicate the factory scan tool capabilities and to market them to their customers, as an alternative to the factory scan tool.

The situation was different for 2004 and later vehicles with reprogramming capabilities. EPA required OEMs to comply with SAE J2534, for "pass-thru" reprogramming using the standard J1962 DLC, a standard PC with a WIN-32 operating system, an OEM-validated Pass-Thru device and/or an adaptor cable(s).

For these vehicles, OEMs were required to make the necessary reprogramming data, initiation software (the transport method used to transmit the calibrations from the storage media to the Pass-Thru device) available to independent technicians, at a reasonable price, on stand-alone media. Stand-alone media is defined as diskette, CD-ROM, BBS or the internet.

BEFORE YOU GET STARTED – WHAT YOU NEED TO KNOW ABOUT REPROGRAMMING

Reprogramming can be a potential profit center for an independent shop, a customer retention tool and help keep the new car dealerships from stealing your customers. But, before you jump into reprogramming, there are some things you need to know.

1. Some seemingly straightforward reprogramming "events" can turn into a hairball. An assortment of problems can occur. If the reprogramming "event" proves unsatisfactory – and there are a variety of reasons – it may not be able to be undone. You may have created a "brick" (an unusable computer) and be faced with a more expensive repair.

2. Before purchasing a Pass-Thru reprogramming device, check to be sure that the reprogramming can continue from where it left off in the event that the reprogramming connection is temporarily lost.

3. To work with all OEM reprogramming software, the Pass-Thru device must be fully J2534-1 compliant. Also, look for expansion capability for future vehicle protocols, future J2534 uses and other capabilities such as diagnostics and datalogging that can free up your scan tool.

4. You don't want reprogramming to be interrupted, so look for a durable Pass-Thru device with good customer support.

5. If you have a choice, choose a Pass-Thru device with a fast processor. Faster processors will shorten reprogramming time and reduce the risk of dropped data during reprogramming.

6. Reprogramming alone is not always the only answer to a vehicle problem. In addition to reprogramming, you may also need to replace other parts or perform other service procedures, not part of the reprogramming process.

7. In conjunction with the reprogramming software, you may also need to access reflash or other related support files from the vehicle manufacturer.

8. In addition to the charge for the reprogramming event, you may need to reference TSBs. These can be accessed through your normal service information provider or from the vehicle manufacturer's service information website. There is usually at an additional charge to access the OEM service website.

9. Some manufacturers may require you to subscribe to their service information website as a prerequisite for reprogramming. A list of the OEM service information website

addresses can be found at the National Automotive Service Task Force website at www.nastf.org or in this manual.

10. Ambient and/or vehicle operating conditions can affect reprogramming. Depending on vehicle calibrations, low coolant temperature during reprogramming, for instance, can cause a vehicle to go into reduced power mode at start-up. Check with the vehicle manufacturer for any specific conditions that need to be observed during reprogramming.

11. Different OEMs have different requirements, but at a minimum, your basic equipment list will look something like this:

- PC with WIN-32 operating system (each OEM has their own minimum requirements)
- OEM-validated J2534 Pass-Thru device.
- Some manufacturers require a Pass-Thru device adaptor or cable(s) to connect the Pass-Thru device and PC or vehicle DLC. These cables can be equipped with USB connectors or with RS-232 (phone jack) connections.

For software consider the following:

- Many OEMs and information providers require Adobe Acrobat® software to view files with a ".pdf" extension; (Acrobat reader is a free download at www.adobe.com).
- Reprogramming and initialization files can be large, so you'll probably need WinZip to open large, compressed files.
- You may need to access other OEM-specific software.
- Finally, you may need you may need to have Administrator's rights when you log-on to the PC used for reflashing. Some manufacturers may require you to make changes to the PC's configuration and/or browser settings to accept the reprogramming.

12. Many OEMs have tested Pass-Thru devices with specific versions of software and validated those that work on their vehicles. The OEM requirements are listed in the "Manufacturer Reprogramming Information" pages of this manual or you can check the OEM website for the latest information.

13. You'll need a stable, high-speed internet connection, like DSL, cable modem, ISDN line or some comparable broadband internet service to access reprogramming files from the internet. A stable internet connection is important; disconnection during the reprogramming event can damage the control module. DO NOT EVEN ATTEMPT REPROGRAMMING FROM THE INTERNET WITH A STANDARD PHONE GRADE DIAL-UP CONNECTION. As an alternative some (not all) manufacturers offer reprogramming files on CD.

14. At the conclusion of the reprogramming event, you may need to perform other procedures, such as Idle Learn, Crankshaft Position Variation Sensor Learn, PCM initialization or passive anti-theft system (PATS) adaptation as directed by the individual OEM. Don't forget that during the adaptive learning cycle, engine performance and/or transmission shift characteristics will be altered. To avoid customer complaints, customers should be informed that this is a temporary condition.

15. Some manufacturers require that the ECU is properly powered down after a "Learn" procedure, in order to store the learned values.

> Example – If the ECU must be powered down properly to store the values after performing a Crankshaft Position Variation learn procedure on 2004-05 Cadillac SRX, XLR and STS with 4.6-liter V8, a P0315 DTC will be set until the values are stored.

Be sure to inform your customer that their vehicle may perform differently while the vehicle's computer system goes through its adaptive "learning" procedure and that the "learning" procedure may take a few days.

16. Lastly, don't forget that once a reprogramming event takes place, you'll need to set all the readiness monitors to "READY" or "YES" so you'll need the appropriate drive cycles. Drive cycles are specific to individual years/makes/models. The MOTOR OBDII DRIVE CYCLE GUIDE is the most complete, up-to-date and accurate source of drive cycles for all import and domestic vehicles.

PATS, SECURITY & IMMOBILIZER CODES

Many newer vehicles use an immobilizer type

security system. This is the engine computer detection system - not the vehicle's anti-theft system. These systems are known by a variety of marketing names depending on the vehicle manufacturer, but all fall under the Passive Anti-Theft System (PATS) heading. Ford's PATS is called Securilock, for example.

The PATS or immobilizer system disables the vehicle's starter unless a specially programmed key, containing a computer chip, is used to start the vehicle. There are literally billions of possible combinations of codes that can be compared to codes stored on the ECU. Without the key with the proper computer chip, and the proper code on the ECU, you will not be able to start the vehicle, even using a key with the correct cuts. Obtaining a new key(s) for a vehicle, is an entirely different matter.

In some cases, reprogramming a control module will affect the performance of the vehicle's security system. On later model vehicles, with third generation Immobilizer systems, if the starter is disabled, you'll need to contact the vehicle manufacturer with the VIN and other ID numbers and obtain a code to allow a new or reprogrammed ECU to operate in the vehicle.

Figure 5 – Hickok makes the PATS Immobilizer initialization tool for Ford vehicles.

Because they are the key to the Passive Anti-Theft System, these codes are carefully guarded by the vehicle manufacturer and can be very difficult to acquire. Some OEMs limit their distribution to registered locksmiths; other OEMs make them available from a special location on their service information website and usually charge a fee for the code. Still others require that the vehicle be returned to a dealer. The ECU on vehicles with older (second generation) Immobilizer systems can usually be adapted by logging into the engine diagnostics with the recommended equipment and following the factory procedure.

There are aftermarket tools available to ease the problem of matching the Immobilizer key to the codes stored in the ECU. Searching the web, will produce a list of aftermarket companies who market tools for some or all OEMs or some OEMs will lease the tools. Like OEMs, some aftermarket companies restrict the sale of these aftermarket tools to registered locksmiths.

NASTF is working to develop standards to ease access to OEM vehicle service information affecting vehicle security, PATS and other new security systems. However, due to the sensitivity to the information, it may not be immediately available from all OEMs.

REPROGRAMMING PRECAUTIONS

Almost all manufacturers have specific cautions, instructions and warnings for reprogramming their vehicles, which should be followed to the letter, to avoid serious consequences or damage to the vehicle. Be sure to consult the OEM reprogramming information before initiating a reprogramming event. That said, here's a list of general precautions of which you should be aware.

1. Do not try to reprogram a non-US emission spec vehicle.

2. Since reprogramming is done with the ignition key ON, vehicle systems are operating on battery power. Be sure the battery is fully charged before beginning to reprogram. Minimum battery voltage will be specified by the manufacturer, usually 11-12.5V, and fluctuations in battery voltage can damage the control module and/or cause faulty programming, which may not be able to be reversed.

3. One of the primary requirements for

successful reprogramming is stable battery voltage. Voltage drops and spikes are an unwanted occurrence during any reprogramming. Check the vehicle manufacturer's recommendations in the "Manufacturer's Recommendations" pages of this manual to see if battery chargers or regulated power supplies are required. Some manufacturers absolutely forbid their use during reprogramming for the following reasons, any of which can terminate or suspend the control module reprogramming event and/or damage the control module:

- battery chargers can cause fluctuation in the vehicle system voltage,
- modules being programmed can shut down if they sense a voltage spike, or
- other modules may be drawn into unwanted conversations on the data line.

Other OEMs require the use of a regulated power supply during reprogramming, but usually require an approved battery charger/external power source that can be programmed to automatically monitor and adjust itself in power supply mode. When the battery is charged, the charger should act as a regulated power supply to sustain loads and offset parasitic drain.

4. The other primary requirement for successful reprogramming is "clean" DC current. The battery charger may put out unrectified AC as interference. External power supplies have a greater supply of clean DC current for reprogramming.

5. Most Pass-Thru devices are powered through the DLC. Be sure there is a good connection between the PC, Pass-Thru device and ground.

6. Turn OFF all accessories and electrical loads such as A/C and headlights.

7. Unplug any devices from the vehicle's on-board power outlets. They can consume power, thereby reducing system voltage and/or emit interference which can disrupt the reprogramming process.

8. Do not start the engine during the reprogramming process, unless instructed to do so. Follow the instructions of the reprogramming process to turn the ignition switch ON or OFF.

9. While reprogramming is taking place, do not handle the cables or reprogramming equipment.

10. Turn off any nearby appliances that generate high levels of electromagnetic radiation, such as cell phones or fax machines.

11. Be sure that the equipment is on a stable surface with plenty of room to connect the cables. Connect the cables surely and do not allow them to become disconnected while reprogramming is underway. If the cables are disconnected during the reprogramming process, the reprogramming may fail or the control module could be damaged.

WARRANTIES – AND OTHER IMPLICATIONS

In addition to the vehicle manufacturer's bumper-to-bumper warranty, control modules and reprogramming are usually covered under the Federal emission warranty, either "Eight-and-Eighty" (8 years or 80,000 miles) for 2000 and later model years or "Five and Fifty" (5 years or 50,000 miles) for 1996-99 model year vehicles.

Vehicle manufacturers spend $14-15 billion, give or take a half a billion or so, each year in warranty costs. Not surprisingly, OEMs are sensitive to warranty costs, as are independent technicians. Longer warranties tend to drive service business back to the dealership and away from independent shops.

Now comes word that even longer emission warranties are showing up on new vehicles. For an excellent and detailed discussion of the longer warranties, which is summarized below, get a copy of Vince Mow's six-part series on Super Warranties, beginning in the January, 2006 issue of *Automotive Journal.*

OBD II took effect on 1996 model vehicles and had the intended consequence of cleaning up the emissions of the nation's vehicle fleet. The "Check Engine" or MIL light became the universal symbol of increased emissions and keeping it off became the holy grail of emissions engineers. If vehicle technology could be prodded along by OEMs

wanting to prevent illumination of the MIL during the warranty period, how much better, the feds wondered,would technology get if the warranty were longer.

Like emissions itself, longer warranties were born in California. In the 1990s California required OEMs to produce Zero Emission Vehicles (ZEVs) equal to ten percent of the fleet in 2005 through 2008. Basically, a ZEV meant an electric vehicle, which required no warranty, since their were no pollutants. When the public rebelled at electric vehicles and it was realized that the impact on the infrastructure was worse than the pollution from gasoline engines, a deal was struck. CARB amended their ZEV regulation in 2003 to allow a Partial Zero Emission Vehicle (PZEV). Five PSEVs could count for one ZEV.

OEMs, in order to be sure of meeting the emissions targets, started turning their best-selling models into PSEVs or into its close cousin, the Advanced Technology PSEV (AT-PSEV). The catch was that in stead of ZEVs accounting for ten percent of production, PSEVs now accounted for 50 percent of production. California now estimates that nearly 60 percent of new passenger cars will be PSEVs (including hybrids) by 2010 and over 70 percent will be PSEVs by 2020.

So why should an independent shop worry? There are two reasons, but it may depend on which state your business is located.

First, in the trade-off to allow PSEVs to take the place of ZEVs, California required a 15-year/150,000 mile, so-called Super Warranty on PSEVs, apparently feeling that the way to ensure clean air was to make the OEM responsible for emission failures during the useful life of the vehicle. Longer warranties have long been opposed by the aftermarket, because they have the effect of diverting emission-related service work, as well as other related work, to the dealer network. Without longer warranties, most of this work would be performed by independent shops.

The saying is that as California goes, so goes the nation, and states began adopting the California Low Emission Vehicle (CA-LEV) standard and its promise of reduced emissions. Each state has the option to adopt the National Low Emission Vehicle (NLEV) standard with its 24 month/24,000 mile performance warranty and the "Eight and Eighty" emissions warranty of key components or to adopt the tougher CA-LEV standards with its much longer warranty.

So far, Connecticut, New York, New Hampshire, New Jersey, Massachusetts, Rhode Island and Vermont have joined California - the so-called Clean Vehicle states - in adopting the CA-LEV standards including the 15 year/150,000 mile warranty on

2005 PSEV MODELS

OEM	Model	Engine
BMW	325i, 325Ci	2.5
Chrysler	Sebring	2.4
Dodge	Stratus	2.4
Ford	Escape Hybrid	2.3
Honda	Accord EX coupe	2.4
	Accord EX sedan	2.4
	Accord LX coupe	2.4
	Accord LZ sedan	2.4
	Civic Hybrid	1.3
	Civic GX	1.7
	FCX Fuel Cell	NA
Hyundai	Elantra	2.0
Kia	Spectra	2.0
Mazda	Mazda 3	2.3
	Mazda 6	2.3
Mitsubishi	Galant	2.4
Nissan	Altima	2.5
	Sentra	1.8
Subaru	Legacy, Outback	2.5
Toyota	Camry	2.4
	Prius Hybrid	2.4
Volvo	S40, S60	2.4
	V50 FWD	2.5
	V70 FWD	2.5
VW	Jetta	2.0
	Jetta	2.5

emission components. Oregon and neighboring Washington state, adopted the CA-LEV standards but abandoned the Super Warranty provisions. The federal "Eight and Eighty" warranty is still in effect on key emission components.

Second, California has recently proposed an extended warranty as an alternative to a recall. Currently, if an emissions-related part failure i more than four per cent, California may order the OEM to issue a recall to correct the problem. Since recalls are expensive, there's a good deal of negotiation before a recall is issued. Under the recent proposal, CARB is offering the OEM an alternative to a recall. In place of a recall, the OEM may elect to extend the warranty on the emissions-related part fore the remaining useful life of the vehicle, usually 15 years or 150,000 miles. This will have the effect of driving more business toward the dealer network.

As a shop owner or technician, regardless of your state, you would be well served to keep abreast of this and related issues through your local association, national organizations, or by contacting your local or state representatives. Depending on an individual states' or localities politics, it has the power to impact your business significantly. Some forecasters expect that, in states or areas that adopt CA-LEV, some 50 percent of all cars produced by 2009 and maybe as many as 75 percent of all cars produced by 2015 will be PSEVs with the Super Warranty. But PSEVs are also sold in other areas, and it is unclear whether the Super Warranty applies to those vehicles.

It turns out that the law of unintended consequences may have an effect on your service business. Actions of legislators in crafting Clean Air programs could have a startling and unintended impact on your business.

You may not even be aware of any PSEVs coming through your shop, but the list of PSEV manufacturers is long and getting longer. Although PSEV certification is attached to engine families, the following 2005 models are all PSEV certified. PSEVs and AT-PSEVs will clearly grow in numbers over the coming model years, not only in the Clean Vehicle states, but nationwide as well, by the 2009 model year. As a shop owner or technician, you'll have to keep abreast of developments with this issue, because it can have an impact of your ability to reprogram vehicles and on your service business as well.

"Off-Road" (Performance) Modifications

You should also be aware of any "off-road" modifications (performance enhancements or changes that cause the vehicle to perform outside the normal parameters and specifications as certified by the vehicle manufacturer) that may have been made to the vehicle's control module. Pass-thru vehicle programming can wipe out any aftermarket "off-road" programs and any parts damaged by the "off-road" programming, including adverse emission consequences, may not be covered by the vehicle manufacturer's warranty. Always check first, and if necessary obtain the customer's written consent to the reprogramming procedure. Some OEMs even have written consent forms for reprogramming control modules in such circumstances, requiring the owner to accept responsibility for the consequences of reprogramming.

Off-Board Reprogramming

Reprogramming can be done with the ECM on the vehicle (on-board reprogramming) or removed from the vehicle (off-board reprogramming).

If you think that reprogramming in your shop is a little too "hands-on" for you, there are alternatives. Some parts manufacturers offer a reprogramming service. You can remove the ECM and send it to a central location where it can be reprogrammed and returned to you. You'll still have to reinstall and perform any necessary re-learn procedures or other required services. Note too, that like manufacturers of J2534 pass-thru devices, not all services are capable of reprogramming all vehicles at this time.

Specialists are also starting to spring up, possibly in your neighborhood, who specialize in reprogramming for local shops. If you

don't think it's for you, explore your options. Ask around, check with your local association and check on the web.

FUTURE USES FOR J2534

Two trends are driving future uses of J2534. First, as dealership profits erode, dealers are trying to direct more service work from the independent shop to the dealership service bay. Longer warranties, sophisticated diagnostic tools, wireless PCs connected to the vehicle and dealership call centers to keep in touch with customers are all a factor.

Second, use of sophisticated electronics systems on cars and trucks is being driven by systems designed to improve safety and emissions control. Growth in automotive electronics is projected to increase at a 7.5 percent annual clip through 2009.

GM's OnStar now has a diagnostic component which monitors various automotive systems on the vehicle and produces a monthly report, delivered to the owner via email. On receipt of the report, the owner may even choose to schedule an appointment, right from their PC.

The next step in OnStar development will, in all probability, include the ability to constantly monitor virtually every vehicle service system via OBD II. This will inevitably lead to instant communications with the vehicle owner as he or she drives down the highway. The system can warn of a potential problem, briefly define the problem and prioritize the urgency to take corrective action.

OnStar is standard equipment on 2006 and later Cadillac, Buick, Hummer and Saturn models and GM expects to increase their current 500,000 subscribers to the diagnostic service to 2,000,000 by the end of '06.

BMW has a similar system on today's cars. BMW's Teleservice is standard equipment on 2004 and later 5 and 6-series models. Teleservice allows the driver to contact his/her preferred service center at the touch of a button or automatically.

Operating in a wireless mode, Teleservice transmits data stored on a chip in the ignition key, which can be received and read out by any authorized BMW service center through its key reader.

Both OnStar and BMW are pushing diagnostics and there is little doubt that, when combined with J2534, guided diagnostics will be come as reality. BMW, Volvo and VW are known to be developing systems that will utilize step-by-step repair, using the J2534 platform, including wiring diagrams, TSBs, electronic manuals and diagnostics. In fact, it won't be long before some OEMs will base service on the results of guided diagnostics on a specific vehicle, rather than a specific model range.

The future uses of 2534 may be a factor in whether you want to get involved in reprogramming. If you plan to stay in business and service 21st Century vehicles, it's a decision worth some thought.

None of the future uses of J2534 will eliminate the need for independent technicians. But shop owners and technicians alike will need to face the need for a much greater degree of technological sophistication, particularly in the area of diagnostics.

21st Century vehicles cannot be serviced with technician skills and shop equipment of the early 90s. Automotive service today is a moving target, advancing quickly as new systems appear on vehicles brought to you for diagnosis and service. Pass-Thru reprogramming is just the beginning, but is one of the keys to customer satisfaction.

Acronyms

Acronym	Definition
ALDL	Assembly Line Diagnostic Link
AT-PZEV	Advanced Technology - Partial Zero Emission Vehicle
API	Application Programming Interface
ASCII	American Standard for Character Information Interchange
BCM	Body Control Module
CA	California
CA-LEV	California - Low Emission Vehicle
CAN	Controller Area Network
CRC	Cyclic Redundancy Check
DLL	Dynamic Link Library
ECM	Electronic Control Module
ECU	Electronic Control Unit
EPA	Environmental Protection Agency
ETI	Equipment & Tool Institute
IFR	In Frame Response
IOCTL	Input Output Control
ISO	International Standards Organization
KOEO	Key On Engine Off
KOER	Key On Engine Running
KWP	Key Word Protocol
NASTF	National Automotive Service Information Task Force
OBD	On-Board Diagnostics
OEM	Original Equipment Manufactured
PATS	Passive Anti-Theft System
PC	Personal Computer
PCM	Powertrain Control Module
PZEV	Partial Zero Emission Vehicle
PWM	Pulse Width Modulation
SAE	Society of Automotive Engineers
SCI	Serial Communications Interface
SCP	Standard Corporate Protocol
USB	Universal Serial Bus
VPW	Variable Pulse Width

OEM Website Addresses

Auto manufacturers are required to make available emission-related service information. Service information for each OEM can be found at the following website addresses and a listing is compiled and updated by National Automotive Service Task Force at www.nastf.org.

Vehicle Manufacturer	Technical Information Website Address
Acura	http://www.ServiceExpress.Honda.com
Aston-Martin	http://www.astonmartintechinfo.com
Audi	http://www.ebahn.com
Bentley	http://www.bentleytechinfo.com
BMW	http://www.bmwtechinfo.com
Buick	http://www.gmtechinfo.com
Cadillac	http://www.gmtechinfo.com
Chevrolet	http://www.gmtechinfo.com
Chrysler	http://www.techauthority.com
Dodge	http://www.techauthority.com
Eagle	http://www.techauthority.com
Ferrari	http://www.ferraritechinfo.com
Ford	http://www.motorcraft.com
GMC	http://www.gmtechinfo.com
Geo	http://www.gmtechinfo.com
Honda	http://www.ServiceExpress.Honda.com
Hummer	http://www.gmtechinfo.com
Hyundai	http://hmaservice.com
Infiniti	http://www.infinititechinfo.com
Isuzu	http://www.isuzutechinfo.com
Jaguar	http://www.jaguartechinfo.com
Jeep	http://www.techauthority.com
Kia	http://www.kiatechinfo.com
Land-Rover	http://www.landrovertechinfo.com
Lexus	http://techinfo.lexus.com
Lincoln	http://www.motorcraft.com
Maserati	http://www.maseratiusa.com contact service@maseratiusa.com
Mazda	http://www.mazdatechinfo.com
Mercedes-Benz	http://www.startekinfo.com
Mercury	http://www.motorcraft.com
Mini	http://www.minitechinfo.com
Mitsubishi	http://www.mitsubishitechinfo.com
Nissan	http://www.nissantechinfo.com
Oldsmobile	http://www.gmtechinfo.com
Plymouth	http://www.techauthority.com
Pontiac	http://www.gmtechinfo.com
Porsche	http://www.techinfo.porsche.com
Saab	http://www.saabtechinfo.com
Saturn	http://www.gmtechinfo.com
Scion	http://techinfo.toyota.com
Subaru	http://techinfo.subaru.com
Suzuki	http://www.suzukitechinfo.com
Toyota	http://techinfo.toyota.com
Volkswagen	http://www.ebahn.com
Volvo	http://www.volvotechinfo.com

Pass-Thru Reprogramming API Error Codes

Any of the following error codes can be returned by a J2534 Pass-Thru Reprogramming API. Following are the plain English descriptions of the error codes for technicians who experience problems using pass-thru reprogramming devices. J2534 error codes are prepared by the Pass-Thru Programming J2534 Task Force of the SAE Vehicle E/E Systems Diagnostics Standards committee and can be found in SAE On-Board Diagnostics for Light and Medium Duty Vehicles Standards Manual, 2003 Edition, copyright 2003 SAE International.

Value	Error Message (Plain English Description)
0x00 STATUS_NOERROR	Function call completed successfully
0x01 ERR_NOT_SUPPORTED	Function option is not supported
0x02 ERR_INVALID_CHANNEL_ID	Channel identifier not recognized
0x03 ERR_INVALID_PROTOCOL_ID	Protocol identifier not recognized
0x04 ERR_NULL_PARAMETER	Invalid pointer supplied. A valid pointer is required. NULL is an invalid pointer.
0x05 ERR_INVALI_IOCTL_VALUE	OCTL parameter is invalid (not recognized)
I0x06 ERR_INVALID_FLAGS	Invalid flag values. Flag(s) field(s) contain invalid value
0x07 ERR_FAILED	Unspecified error. Get description of error (text string) using PassThruGetLastError
0x08 ERR_DEVICE_NOT_CONNECTED	Pass-Through reprogramming device not connected to PC
0x09 ERR_TIMEOUT	Timeout violation. No message available or pass-through reprogramming device unable to read specified number of messages returned from vehicle. Actual number of messages read is in NumMsgs.
0x0A ERR_INVALID_MSG	Invalid message structure. ExtraData support or J1850PWM source address conflict violation.
0x0B ERR_INVALID_TIME_INTERVAL	Time interval value outside specified range
0x0C ERR_EXCEEDED_LIMIT	The limit of 10 messages or allocated space for the protocol associated with communications channel was exceeded.
0x0D ERR_INVALID_MSG_ID	Message identifier not recognized
0x0E ERR_INVALID_ERROR_ID	Error identifier not returned by any of API functions
0x0F ERR_INVALID_IOCTL_ID	IOCTL identifier not recognized
0x10 ERR_BUFFER_EMPTY	Pass-through reprogramming device could not read any messages from vehicle.
0x11 ERR_BUFFER_FULL	Pass-through reprogramming device could not read any more transmit messages for the vehicle
0x12 ERR_BUFFER_OVERFLOW	Buffer in pass-through device overflowed and received messages were lost
0x13 ERR_PIN_INVALID	Invalid pin number on the J1962 connector
0x14 ERR_CHANNEL_IN_USE	Existing communications channel using specified network protocol
0x15 ERR_MSG_PROTOCOL_ID	Protocol type within message does not match protocol associated with communications channel

ACURA

OEM WEBSITE ADDRESS: WWW.SERVICEEXPRESS.HONDA.COM

REPROGRAMMABLE MODELS/MODULES:

Depending on exact drivetrain configuration, emission-related PCMs on Acura models beginning in 2001 are reprogrammable with a J2534 Pass-Thru device.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

An annual reprogramming subscription covering all applicable Acura vehicles is required. Subscription includes one year's access to downloadable Acura J2534 software, plus PC updates.

Fee: $300/year

Website Subscription Required: Yes. You must be an active subscriber to the ServiceExpress website to purchase J2534 software and to access the latest reprogramming software documentation. Pricing details are on the website, but currently are $20 - 3 days; $50 - 30-days; $250 - 365 days

HARDWARE/SOFTWARE RECOMMENDATIONS

Shop grade PC or laptop.

CPU: None specified.
Operating System: Windows 2000 or later
Monitor: None specified
Ram: None specified
Free Disc Space: None specified
Other: High speed internet connection recommended

J2534 PASS-THRU DEVICE

Acura does not recommend and has not validated any specific J2534 Pass-Thru devices. Follow the instructions of the manufacturer of the J2534 Pass-Thru device. If you experience problems, Acura recommends contacting the J2534 device manufacturer. Do not contact Acura, Acura dealers or American

NOTES

1. Always refer to the OEM website for the latest information.
2. Reprogramming should only be performed as directed by an Acura TSB.
3. Reprogramming software is delivered via an internet connection. If a high-speed connection is not available, the software can be supplied on a CD.
4. Acura's J2534 software will automatically check for the latest vehicle calibration. If you do not have Acura's latest J2534 software, or if you are not sure if the vehicle has the latest software calibration , contact Helm, Inc. at 949-330-7152 or www.helminc.com.
5. A Honda Interface Module (HIM) non-J2534 tool is available to update the control module on any Acura vehicle with a reprogrammable chip. New cost is approximately $800; refurbished cost is approximately $650 or the tool can be rented for $155 for 3-days. The HIM also allows you to initialize replacement control modules with Immobilizer. Hardware and software requirements, purchase and rental details are available at the above website. Click on "Control Module Initialization and Reprogramming" and print the material. An active subscription to the above website is required to rent the tool.

CAUTIONS

1. It is possible to damage the vehicle's electronic control modules during the reprogramming process. Once the reprogramming process has started, the process must not be interrupted until it is complete.

OEM WEBSITE ADDRESS: WWW.ASTONMARTINTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee:

Website Subscription Required:

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU:
Operating System:
Monitor:
Ram:
Free Disc Space:
Other:

J2534 PASS-THRU DEVICE

Manufacturer:
Model:
Cost:
Contact:

NOTES

CAUTIONS

AUDI

OEM WEBSITE ADDRESS: WWW.EBAHN.COM

REPROGRAMMABLE MODELS/MODULES:

Audi supports Pass-Thru reprogramming for emission-related PCMs on most 2004 and later vehicles.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee:

Website Subscription Required: Yes. You can look at the availability of Pass-Thru information on Audi's website by selecting a vehicle and clicking on "Pass-Thru". Separate applications are listed as Pass-Thru bulletins. Accessing the TSB or the ECM update requires a subscription to the Audi website. Subscriptions can be had for one model ($19.95/3 days, $49.95/30 days or $79.95/365 days) or multiple models ($49.95/3 days, $199.95/30 days or $999.95/365 days).

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium III, 500 MHz or more
Operating System: Windows 98SE, Windows 2000, Windows NT 4.0 (SP6) or Windows XP
Windows XP SP2 is recommended
Monitor: None specified
Ram: At least 128 Mb
Free Disc Space: At least 50 Mb
Other: Internet Explorer 6.0 SP2; Un-interrupted internet link

J2534 PASS-THRU DEVICE

Audi recommends one of the following Pass-Thru devices. Currently, Audi supports J2534 version 2.02 only. Be sure you have the appropriate version installed on your pass-thru device.

Manufacturer:	Drew Technologies, Inc.	Actia Corporation
Model:	CarDAQ2534	I+ME Pass-Thru+XS
Cost:	$1595.00	$1595.00
Contact:	www.drewtech.com 810-231-3171	www.infocar.us 877-560-3030

NOTES

1. Always refer to the above website for the latest information on reprogramming for Audi vehicles.
2. The Pass-Thru reprogramming process can over-write any "Tuned" ECM programming (an ECM that has been altered to perform outside the normal parameters approved and/or certified by the manufacturer). Advise the customer, in writing, that any damage caused by tuning the ECM (including adverse emission consequences) will not be covered by Audi's warranty.

CAUTIONS

1. Reprogramming should only be done if a TSB directs you to do so.
2. Battery must have a minimum of 12.5 no-load voltage and must be maintained with an approved battery charger/maintainer.
3. Turn OFF any devices with high electromagnetic radiation (i.e., cell phones, etc.).
4. Erase any stored DTCs.
5. Do not disconnect any connections while the reprogramming is under way.

OEM WEBSITE ADDRESS: WWW.BENTLEYTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Bentley does not support J2534 Pass-Thru reprogramming. Any requirements for reprogramming of ECUs in the field are handled by replacement of the module.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee:

Website Subscription Required:

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU:
Operating System:
Monitor:
Ram:
Free Disc Space:
Other:

J2534 PASS-THRU DEVICE

Manufacturer:
Model:
Cost:
Contact:

J2534 Pass-Thru Reprogramming is Not Supported

NOTES

CAUTIONS

BMW

OEM WEBSITE ADDRESS: WWW.BMWTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

All OBD II-equipped BMWs are designed to be programmed and coded electronically. Reprogramming on 1996 and later BMWs , with certain exceptions, is supported by the GT1, BMW SSS service tools or via pass-thru reprogramming. 1996-99 318i, 1996-97 840Ci and 1996-98 Z3 Roadster 1.9 models can not be reprogrammed via Pass-Thru reprogramming. Other models require a 7-8 pin or BMW-specific 20-pin adaptor. The 20-pin adaptor is part of the BMW starter kit from Actia.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

The instructions and settings for reprogramming are contained in "Vehicle Reprogramming, Coding and Diagnosis for BMW & Mini via Internet".

Fee:

Website Subscription Required: Yes

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium III or higher (at least 500 MHz)
Operating System: Windows 98, Windows 2000, Windows XP Pro
Monitor: At least 1024 x 768; at least 256 colors
Ram: At least 128 Mb
Free Disc Space: At least 5 Gb
Other: Netscape 4.7 or higher; Internet Explorer 5.0 or higher; administrator rights
Microsoft Java Virtual Machine (available at www.bmwtechinfo.com)

J2534 PASS-THRU DEVICE

BMW has validated J2534 Pass-Thru reprogramming tools from the following manufacturers. A BMW specific driver is necessary and can be downloaded from www.bmwtechinfo.com. Be sure driver version is greater than 0048.

Manufacturer:	Snap-On	Actia Corporation
Model:	Pass-Thru Pro	I+ME Pass-Thru + XS
Driver Version:	Original J2534 installation greater than v1.08. Do not use J2534-1 driver less than v2.0	
Cost:	$1595.00	$1595.00
Contact:	www.snapon.com/j2534	www.infocar.us
Phone:	877-762-7664	877-560-3025

NOTES

1. Engine must be OFF and transmission oil <80 degrees F.
2. All electrical devices must be OFF and all ECUs installed and functioning.
3. Do not route cables through open windows. Car must not be disturbed during reprogramming (doors, windows, etc.).
4. Park vehicle where it will be unobstructed (reprogramming can take several hours).
5. Windshield wipers must be unobstructed (they will operate during reprogramming).
6. Approved battery charger (see TSB 04 11 02) must be connected and ON. Specs are in the TSB or in the document in #8. 745i, 750i, 760i and newer models cannot be reprogrammed without the power supply.
7. Identify and correct and problems and clear all DTCs.
8. Access "Vehicle Reprogramming, Coding and Diagnosis for BMW & Mini via Internet" document under Minimum System Requirements at website above. Print the document.

CAUTIONS

1. Check the website above frequently for updates to Pass-Thru reprogramming.
2. On 745i, 750i and 760i models, the fuel tank must be full or F73 fuse in trunk must be disconnected. (programming with insufficient fuel can damage the fuel pump).

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Buick vehicles are reprogrammable. ECMs on 1996 and later Buicks can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Buick models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Buick vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.

Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Buick TSB or to update to a newer calibration file

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

CADILLAC

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Cadillac vehicles, except Catera, are reprogrammable. ECMs on 1996 and later Cadillac vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Cadillac models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Cadillac vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.

Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J-2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Buick TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

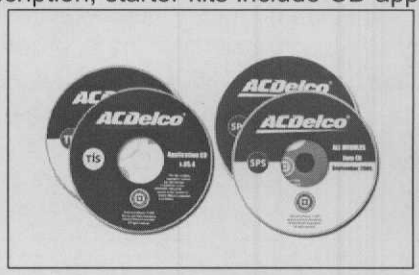
OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Chevrolet vehicles are reprogrammable. ECMs on 1996 and later Chevrolet vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Chevrolet models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".



Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Chevrolet vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.

Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J-2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Buick TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

CHRYSLER

OEM WEBSITE ADDRESS: WWW.TECHAUTHORITY.COM

REPROGRAMMABLE MODELS/MODULES:

Chrysler supports J2534 Pass-Thru reprogramming of 1996 and later Chrysler powertrain and transmission control modules. A Reprogramming Matrix is available at the website above, without subscribing. Click on "J2534 Flash Availability" at the left side. Adobe Acrobat reader is required to view the file. The matrix shows calibration ID, module type, part numbers, TSB reference and recall reference.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Access to the J2534 Pass-Thru reprogramming application is through the website above. An account and current subscription is required. After subscribing, click on "FLASH" in the header bar and print out the instructions and follow them exactly. The application is not backward compatible. You'll need to uninstall any previous versions of the application before installing an updated version.

Fee: Included with website subscription

Website Subscription Required: Yes. Subscriptions are:

24 Hours	$20.00
72 Hours	$50.00
30 Days	$300.00
1 Year	$2500.00

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified

Operating System: Windows 2000 Professional or later

Monitor: 1024 x 768 resolution

Ram: *256 Mb*

Free Disc Space: 1 Gb

Other: Internet Explorer 5.5 or higher with Service Pack 2; Adobe Acrobat Reader 5.0 or higher
You may need to download the latest version of Java Run-Time Environment (JRE) from a link on the FLASH section of the website above.

J2534 PASS-THRU DEVICE

Your J2534 Pass-Thru device must support Chrysler's SCI communication protocol. Chrysler has validated devices from these device manufacturers, which support DaimlerChrysler's SCI communication protocol. Your Pass-Thru device drivers must be J2534-1 compliant, which are available from the device manufacturer. Uninstall any J2534 compliant drivers and install the J2534-1 compliant drivers.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Actia Corp	PassThru +XS	See above	See above	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	See above	See above	Call	www.bsecorp.com

NOTES

1. After 2 hours of inactivity or 8 hours on the website, you will be logged off.
2. You must "Accept" the User's Agreement to subscribe to the website. Be sure to read the FLASH section of the User's Agreement, before clicking "Accept".
3. Be sure you have the latest version of the DaimlerChrysler J2534-1 application and be sure it is installed in the proper directory (see "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview."
4. Follow the instructions for installation and use of the application exactly.
5. Read the section at the end of the "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview" regarding the need for harness adaptors on certain vehicles.

CAUTIONS

1. Check the website above frequently for J2534 updates as they relate to Pass-Thru reprogramming of Chrysler vehicles.

OEM WEBSITE ADDRESS: WWW.TECHAUTHORITY.COM

REPROGRAMMABLE MODELS/MODULES:
Dodge supports J2534 Pass-Thru reprogramming of 1996 and later Dodge powertrain and transmission control modules. A Reprogramming Matrix is available at the website above, without subscribing. Click on "J2534 Flash Availability" at the left side. Adobe Acrobat reader is required to view the file. The matrix shows calibration ID, module type, part numbers, TSB reference and recall reference.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS
Access to the J2534 Pass-Thru reprogramming application is through the website above. An account and current subscription is required. After subscribing, click on "FLASH" in the header bar and print out the instructions and follow them exactly. The application is not backward compatible. You'll need to uninstall any previous versions of the application before installing an updated version.

Fee: Included with website subscription

Website Subscription Required: Yes. Subscriptions are:

24 Hours	$20.00
72 Hours	$50.00
30 Days	$300.00
1 Year	$2500.00

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified
Operating System: Windows 2000 Professional or later
Monitor: 1024 x 768 resolution
Ram: *256 Mb*
Free Disc Space: 1 Gb
Other: Internet Explorer 5.5 or higher with Service Pack 2; Adobe Acrobat Reader 5.0 or higher
You may need to download the latest version of Java Run-Time Environment (JRE) from a link on the FLASH section of the website above.

J2534 PASS-THRU DEVICE
Your J2534 Pass-Thru device must support Chrysler's SCI communication protocol. Dodge has validated devices from these device manufacturers, which support DaimlerChrysler's SCI communication protocol. Your Pass-Thru device drivers must be J2534-1 compliant, which are available from the device manufacturer. Uninstall any J2534 compliant drivers and install the J2534-1 compliant drivers.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Actia Corp	PassThru +XS	See above	See above	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	See above	See above	Call	www.bsecorp.com

NOTES
1. After 2 hours of inactivity or 8 hours on the website, you will be logged off.
2. You must "Accept" the User's Agreement to subscribe to the website. Be sure to read the FLASH section of the User's Agreement, before clicking "Accept".
3. Be sure you have the latest version of the DaimlerChrysler J2534-1 application and be sure it is installed in the proper directory (see "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview."
4. Follow the instructions for installation and use of the application exactly.
5. Read the section at the end of the "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview" regarding the need for harness adaptors on certain vehicles.

CAUTIONS
1. Check the website above frequently for J2534 updates as they relate to Pass-Thru reprogramming of Dodge vehicles.

EAGLE

OEM WEBSITE ADDRESS: WWW.TECHAUTHORITY.COM

REPROGRAMMABLE MODELS/MODULES:
Eagle supports J2534 Pass-Thru reprogramming of 1996 and later Eagle powertrain and transmission control modules. A Reprogramming Matrix is available at the website above, without subscribing. Click on "J2534 Flash Availability" at the left side. Adobe Acrobat reader is required to view the file. The matrix shows calibration ID, module type, part numbers, TSB reference and recall reference.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS
Access to the J2534 Pass-Thru reprogramming application is through the website above. An account and current subscription is required. After subscribing, click on "FLASH" in the header bar and print out the instructions and follow them exactly. The application is not backward compatible. You'll need to uninstall any previous versions of the application before installing an updated version.

Fee: Included with website subscription

Website Subscription Required: Yes. Subscriptions are:

24 Hours	$20.00
72 Hours	$50.00
30 Days	$300.00
1 Year	$2500.00

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified
Operating System: Windows 2000 Professional or later
Monitor: 1024 x 768 resolution
Ram: 256 Mb
Free Disc Space: 1 Gb
Other: Internet Explorer 5.5 or higher with Service Pack 2; Adobe Acrobat Reader 5.0 or higher
You may need to download the latest version of Java Run-Time Environment (JRE) from a link on the FLASH section of the website above.

J2534 PASS-THRU DEVICE
Your J2534 Pass-Thru device must support DaimlerChrysler's SCI communication protocol. Eagle has validated devices from these device manufacturers, which support DaimlerChrysler's SCI communication protocol. Your Pass-Thru device drivers must be J2534-1 compliant, which are available from the device manufacturer. Uninstall any J2534 compliant drivers and install the J2534-1 compliant drivers.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Actia Corp	PassThru +XS	See above	See above	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	See above	See above	Call	www.bsecorp.com

NOTES
1. After 2 hours of inactivity or 8 hours on the website, you will be logged off.
2. You must "Accept" the User's Agreement to subscribe to the website. Be sure to read the FLASH section of the User's Agreement, before clicking "Accept".
3. Be sure you have the latest version of the DaimlerChrysler J2534-1 application and be sure it is installed in the proper directory (see "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview."
4. Follow the instructions for installation and use of the application exactly.
5. Read the section at the end of the "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview" regarding the need for harness adaptors on certain vehicles.

CAUTIONS
1. Check the website above frequently for J2534 updates as they relate to Pass-Thru reprogramming of Eagle vehicles.

OEM WEBSITE ADDRESS: WWW.FERRARITECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee:

Website Subscription Required:

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU:

Operating System:

Monitor:

Ram:

Free Disc Space:

Other:

J2534 PASS-THRU DEVICE

Manufacturer:

Model:

Cost:

Contact:

NOTES

CAUTIONS

FORD

OEM WEBSITE ADDRESS: WWW.MOTORCRAFT.COM

REPROGRAMMABLE MODELS/MODULES:

Electronic modules can be reprogrammed on the the following Ford vehicles:

- vehicles built in the U.S.
- Emission-related OBD II modules on some 1995 vehicles and all 1996 and later vehicles
- Non-emission related modules on all vehicles so equipped (including PATS functions and PCM parameter resets)

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

The API is available at the website above. Click on "Technical Resources" then click on "Reprogramming and Initialization". Ford supports v4.04 of the J2534 API.

Fee: Short term (day) -$24.95; 1-month - $59.95; 1-Year - $599.95

The reprogramming fee is separate from the technical information website usage fee.

Website Subscription Required: You may be required to access TSBs. A TSB subscription is not included in the reprogramming fee.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: 500 MHz (minimum)
Operating System: Windows 2000, XP or later
Monitor: None specified
Ram: 128 Mb
Free Disc Space: 200 Mb
Other: 800 x 600 resolution, 16-bit color
Internet Explorer v5.5 or later, Adobe Acrobat v5.0 or later
High speed internet connection

J2534 PASS-THRU DEVICE

Ford has validated the following J2534 Pass-Thru devices:

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQ2534	5.52	5.52	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	2.05c	2.05c	$1595.00	www.infocar.us
EEPod LLC	McS1	1.4	1.4	$475.00	www.eepod.com
Blue Streak Electronics	2534 Global Programmer	2.24	1.19	Call	www.bsecorp.com

NOTES

1. Always refer to the OEM website for the latest information.
2. Access and print out the "Reprogramming and Initialization" information.
3. Reprogramming subscription includes:
   - Downloadable API to be installed on PC.
   - Access to As Built database (Module Build Data) - may be required for reprogramming
   - Access to latest calibration data for emission-related modules.
   - Access to PATS information
4. After purchasing a reprogramming subscription, download the application and install it on your PC. Connect the J2534 pass-thru device, power it up and run the application. The application will determine if a new calibration file is available. If you choose to use the new file, the module will be reprogrammed.

CAUTIONS

1. Consult the website for the latest updates.

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later GMC vehicles are reprogrammable. ECMs on 1996 and later GMC vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for GMC models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

HARDWARE/SOFTWARE RECOMMENDATIONS

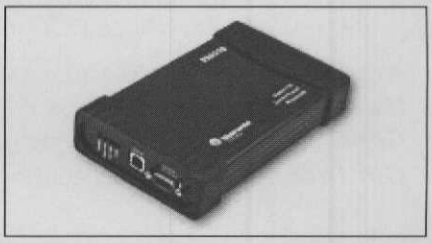
Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on GMC vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.

Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com



NOTES

1. Refer to the GM technical information website above for the latest J-2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a GMC TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

GEO

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Geo vehicles are reprogrammable. ECMs on 1996 and later Geo vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Geo models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

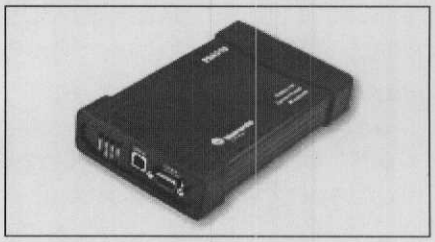
HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Geo vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.



Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J-2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Geo TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

OEM WEBSITE ADDRESS: WWW.SERVICEEXPRESS.HONDA.COM

REPROGRAMMABLE MODELS/MODULES:

Depending on exact drivetrain configuration, emission-related PCMs on Honda models beginning in 2001 are reprogrammable with a J2534 Pass-Thru device.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

An annual reprogramming subscription covering all applicable Honda vehicles is required. Subscription includes one year's access to downloadable Acura J2534 software, plus PC updates.

Fee: $300/year

Website Subscription Required: Yes. You must be an active subscriber to the ServiceExpress website to purchase J2534 software and to access the latest reprogramming software documentation. Pricing details are on the website, but currently are $20 - 3 days; $50 - 30-days; $250 - 365 days

HARDWARE/SOFTWARE RECOMMENDATIONS

Shop grade PC or laptop.

CPU: None specified.

Operating System: Windows 2000 or later

Monitor: None specified

Ram: None specified

Free Disc Space: None specified

Other: High speed internet connection recommended

J2534 PASS-THRU DEVICE

Honda does not recommend and has not validated any specific J2534 Pass-Thru devices. Follow the instructions of the manufacturer of the J2534 Pass-Thru device. If you experience problems, Honda recommends contacting the J2534 device manufacturer. Do not contact a Honda dealer or American Honda.

NOTES

1. Always refer to the OEM website for the latest information.
2. Reprogramming should only be performed as directed by an Honda TSB.
3. Reprogramming software is delivered via an internet connection. If a high-speed connection is not available, the software can be supplied on a CD.
4. Acura's J2534 software will automatically check for the latest vehicle calibration. If you do not have Honda's latest J2534 software, or if you are not sure if the vehicle has the latest software calibration , contact Helm, Inc. at 949-330-7152 or www.helminc.com.
5. A Honda Interface Module (HIM) non-J2534 tool is available to update the control module on any Honda vehicle with a reprogrammable chip. New cost is approximately $800; refurbished cost is approximately $650 or the tool can be rented for $155 for 3-days. The HIM also allows you to initialize replacement control modules with Immobilizer. Hardware and software requirements, purchase and rental details are available at the above website. Click on "Control Module Initialization and Reprogramming" and print the material. An active subscription to the above website is required to rent the tool.

CAUTIONS

1. It is possible to damage the vehicle's electronic control modules during the reprogramming process. Once the reprogramming process has started, the process must not be interrupted until it is complete.

HUMMER

OEM WEBSITE ADDRESS: **WWW.GMTECHINFO.COM**

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Hummer vehicles are reprogrammable. ECMs on 1996 and later Hummer vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Hummer models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

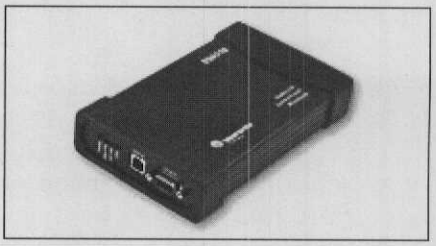
HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Hummer vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.



Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J-2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Hummer TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

OEM WEBSITE ADDRESS: WWW.HMASERVICE.COM

REPROGRAMMABLE MODELS/MODULES:

Hyundai is currently developing support for J2534 Pass-Thru reprogramming, but has not yet released details. Refer to the above website, for the latest information on J2534 Pass-Thru reprogramming for Hyundai vehicles. There are references to certain Hyundai vehicles on the Kia website. Refer to the Kia page in this manual.

Details of reprogramming Hyundai vehicles using the Hi-Scan dealership tool, as well as details on how to purchase the tool, are available on the Hyundai website

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee:

Website Subscription Required: There is no charge to access the Hyundai website.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU:
Operating System:
Monitor:
Ram:
Free Disc Space:
Other:

J2534 PASS-THRU DEVICE

Manufacturer:
Model:
Cost:
Contact:

J2534 Support is Under Development and Not Yet Available

NOTES

1. Refer to the Hyundai technical service information website above for the latest information on J2534 Pass-Thru reprogramming relating to Hyundai vehicles.

CAUTIONS

INFINITI

OEM WEBSITE ADDRESS: WWW.INFINITITECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

J2534 Pass-Thru reprogramming is supported for the PCM or TCM on 2004 and later Infiniti vehicles. The 1999 Q45 and all 2000 and later Infiniti vehicles have reprogrammable ECMs.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: There is no charge for the J2534 Program file (API). It can be downloaded from the website above by clicking on "ECM Program Data" from the drop down menu box. Scroll down and double click on "Download J2534 Program (9.0MB) - No Cost". Install this file on your PC before downloading any ECM data.
Website Subscription Required: Yes. You must set up an account, and be logged in, to purchase ECM or TCM calibration files. The charge for ECM or TCM calibration data is $19.95 per ECM/TCM # (same price as daily subscription to website). Purchase of ECM or TCM calibration data allows download access for 24 hours, so download the file immediately following purchase.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified
Operating System: None specified
Monitor: None specified
Ram: None specified
Free Disc Space: None specified

J2534 PASS-THRU DEVICE

Infiniti has not validated any J2534 Pass-Thru devices.

NOTES

1. Do not reprogram unless instructed to do so by a TSB. In order to locate the proper ECM or TCM file, you'll need to look up the applicable TSB. The TSB will advise of the newest ECM or TCM calibration file for the vehicle in question. TSBs can be accessed through the Infiniti website for a fee or accessed from outside sources.
2. Always refer to the Infiniti website for the latest reprogramming information.

CAUTIONS

1. Always refer to the Infiniti website for the latest reprogramming information.
2. Before reprogramming, the vehicle battery should be fully charged, if less than 11 volts.
3. All electrical loads should be turned OFF.
4. Do not disturb the connections during reprogramming.

OEM WEBSITE ADDRESS: WWW.ISUZUTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Emission-related electronic control modules on 1996 and later Isuzu vehicles can be reprogrammed using a J2534 Pass-Thru device.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: Yes. Contact www.IsuzuSource.com. Isuzu's TIS 2000 reprogramming software package includes:

- Software updates on CD or DVD for 12 months (approximately 4 updates per year)
- Hardware lock, RS-232 cable and adapter

Website Subscription Required: No. Access to TSBs may be required, for a separate fee.

HARDWARE/SOFTWARE RECOMMENDATIONS

These are the minimum PC specifications to support J2534 Pass-Thru reprogramming on Isuzu vehicles.

CPU: 2.4 GHz or greater
Operating System: Windows 2000 or Windows XP
Monitor: None specified
Ram: 256 Mb
Free Disc Space: 2 GB
Other: One free COM port, One free USB port, 16X DVD ROM Drive

J2534 PASS-THRU DEVICE

1. Isuzu recommends only using Isuzu-validated J2534 Pass-Thru devices. Isuzu has validated the following Pass-Thru devices with their software.
2. Check with the J2534 device manufacturer for the most current firmware version before reprogramming.
3. J2534 Pass-Thru devices must support API v4.04.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQ2534	N/A	N/A	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	N/A	N/A	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	N/A	N/A	Call	www.bsecorp.com

NOTES

1. Isuzu will reprogram a replacement PCM for $55.00 per PCM. Visit www.isuzutechinfo.com for details. Look for "J2534 Reprogramming Info" under "Service Information" on the Isuzu website for the latest information. There is no fee to access this information.
2. Check for CAL ID and CVN at http://tis2web.service.gm.com/tis2web. You'll need a valid VIN.
3. Reprogramming should only be performed when instructed by an Isuzu TSB.
4. Due to the large number of PC configurations available, the hardware lock may not be configured for your PC. Use the "Contact" portion of www.IsuzuSource.com for more information.

CAUTIONS

1. Use of a PC that does not comply with the above specifications may cause a failure when installing or operating the J2534 software.
2. All charging system concerns must be addressed before reprogramming a module.
3. Battery must be charged. Battery voltage between 12-16 volts. Reprogramming failure or ECM damage can result if the system voltage is incorrect or if voltage fluctuation occurs.
4. Do not connect a battery charger. Turn OFF any system that may put a load on the battery with ignition switch ON.
5. Follow instructions for ignition switch position. Do not change the switch position during reprogramming, unless instructed to do so.
6. Make sure all connections are secure and do not disturb connections while reprogramming. Reprogramming failure or ECM damage can result if the reprogramming procedure is interrupted,
7. Do not turn the ignition OFF is the reprogramming procedure was interrupted or unsuccessful. Be sure the software is up-to-date and try to reprogram again.

JAGUAR

OEM WEBSITE ADDRESS: WWW.JAGUARTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Jaguar supports J2534 reprogramming on PCMs and TCMs on the following models. A more specific list can be seen at the above website. After logging on, click on J2534 Reprogramming Information".

- 1997-02 XK8
- 2003 and later XK range
- 1998 and later XJ Series
- 1999 and later S-Type
- 2001 and later X-Type

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

After selecting a type of information (Diagnostics), a model and a year, you can verify that a reprogramming event is available by clicking on "Re-Programming Information". Subscribing to the website will allow Jaguar's Web Flash application to be downloaded from the website above and allow access to the J2534 Reprogramming Cautions. Subscriptions range from:

- 1 Model/1 Year - $12 (day), $59/Month, $236/Year
- 1 Model/All Years - $20/day, $98/Month, $482/Year
- All Models/All Years - $39/day, $236/Month, $1377/Year

The Web Flash application will check for software version on the PCM and install the new version.

Website Subscription Required: Yes, to access the Web Flash application.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium III, 800 MHz or more

Operating System: Windows 2000 Professional (SP2, Windows XP Pro
(Correct functionality on other operating systems is not guaranteed).

Monitor: Resolution of 1024 x 768 or greater with 16-bit color

Ram: None specified

Free Disc Space: None specified

Other: 10/100Mbit Ethernet card if J2534 interface box uses Ethernet connection

J2534 PASS-THRU DEVICE

Jaguar has not validated and does not recommend any J2534 Pass-Thru device.

NOTES

1. Do not re-flash a PCM or TCM unless directed to do so by a TSB.
2. You must have administrator privileges on your PC to install the Jaguar Flash application.
3. Install the driver software for the J2534 Pass-Thru device, before downloading and installing the Jaguar Flash application.
4. Once the Jaguar Flash application is downloaded:
   - double-click the file to start the installation
   - follow the on-screen prompts
   - When asked to install the XML Parser, click "Yes"
   - When the XML Parser finishes installing, shut down the PC and follow instructions to connect to a vehicle.
5. To connect to a vehicle:
   - Connections must be made in the following order to ensure proper initialization.
   - Connect the J2534 Pass-Thru device to the vehicle DLC. Confirm that the Pass-Thru device is receiving power.
   - Connect the J2534 Pass-Thru device to the Ethernet, USB or RS-232 port on the computer.
   - Start the PC and start the Jaguar Flash application.

CAUTIONS

1. Always refer to the website above for the latest reprogramming information for Jaguar vehicles.

OEM WEBSITE ADDRESS: **WWW.TECHAUTHORITY.COM**

REPROGRAMMABLE MODELS/MODULES:

Jeep supports J2534 Pass-Thru reprogramming of 1996 and later Jeep powertrain and transmission control modules. A Reprogramming Matrix is available at the website above, without subscribing. Click on "J2534 Flash Availability" at the left side. Adobe Acrobat reader is required to view the file. The matrix shows calibration ID, module type, part numbers, TSB reference and recall reference.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Access to the J2534 Pass-Thru reprogramming application is through the website above. An account and current subscription is required. After subscribing, click on "FLASH" in the header bar and print out the instructions and follow them exactly. The application is not backward compatible. You'll need to uninstall any previous versions of the application before installing an updated version.

Fee: Included with website subscription

Website Subscription Required: Yes. Subscriptions are:

24 Hours	$20.00
72 Hours	$50.00
30 Days	$300.00
1 Year	$2500.00

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified

Operating System: Windows 2000 Professional or later

Monitor: 1024 x 768 resolution

Ram: ***256 Mb***

Free Disc Space: 1 Gb

Other: Internet Explorer 5.5 or higher with Service Pack 2; Adobe Acrobat Reader 5.0 or higher
You may need to download the latest version of Java Run-Time Environment (JRE) from a link on the FLASH section of the website above.

J2534 PASS-THRU DEVICE

Your J2534 Pass-Thru device must support Chrysler's SCI communication protocol. Jeep has validated devices from these device manufacturers, which support DaimlerChrysler's SCI communication protocol. Your Pass-Thru device drivers must be J2534-1 compliant, which are available from the device manufacturer. Uninstall any J2534 compliant drivers and install the J2534-1 compliant drivers.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Actia Corp	PassThru +XS	See above	See above	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	See above	See above	Call	www.bsecorp.com

NOTES

1. After 2 hours of inactivity or 8 hours on the website, you will be logged off.
2. You must "Accept" the User's Agreement to subscribe to the website. Be sure to read the FLASH section of the User's Agreement, before clicking "Accept".
3. Be sure you have the latest version of the DaimlerChrysler J2534-1 application and be sure it is installed in the proper directory (see "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview."
4. Follow the instructions for installation and use of the application exactly.
5. Read the section at the end of the "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview" regarding the need for harness adaptors on certain vehicles.

CAUTIONS

1. Check the website above frequently for J2534 updates as they relate to Pass-Thru reprogramming of Jeep vehicles.

OEM WEBSITE ADDRESS: WWW.KIATECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

2004 and later Kia models support J-2534 Pass-Thru reprogramming.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Go to the Kia website (above) and click on "J-2534" under "Community". Adhere to the following Notes and Cautions, as well as any others that may have been added to the website. After reading the information, click "Next". You must supply the "old" calibration ID. After the online application validates the need for reprogramming, you can choose to reprogram or not and follow the on-screen instructions.

Fee: Access to the Kia website is free. You'll need to set up an account.
Website Subscription Required: Yes

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified
Operating System: None specified
Monitor: None specified
Ram: None specified
Free Disc Space: None specified
Other: None specified

J2534 PASS-THRU DEVICE

Kia has not validated any J2534 Pass-Thru reprogramming devices and does not recommend and specific J2534 Pass-Thru reprogramming devices.

Manufacturer: None specified
Model: None specified
Cost: None specified
Contact: None specified

NOTES

1. Check to be sure that the vehicle is compatible with J2534 Pass-Thru reprogramming.
2. Connect the Pass-Thru device and check that the API is installed.
3. Maintain a stable internet connection during reprogramming.
4. Maintain a stable power supply.
5. Some vehicles (Optima w/2.4L and Sedona/Sorento w/3.5L) require an additional power supply using an adaptor.

CAUTIONS

1. Always check the website above, for the latest J2534 reprogramming information.
2. Do not interrupt the reprogramming process after it starts. The ECU could be damaged.

OEM WEBSITE ADDRESS: WWW.LANDROVERTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Land-Rover supports J2534 Pass-Thru Reprogramming on PCMs and TCMs on 2004 Discovery II, 2005 and later LR3, 2004 and later New Range Rover, 2006 and later Range Rover Sport and 2004-05 Freelander. A more specific list can be seen at the above website. After logging on, click on 'J2534 Reprogramming Information".

1996-99 Discovery I, 1999-03 Discovery II, 1997 Defender 90, 1995-02 Range Rover, 2003 New Range Rover and 2002-03 Freelander are reprogrammable, but covered by leasing the Land-Rover T4 Mobile+ system ($100 plus shipping for 7 day lease) from Omitec, Inc., 29777 Telegraph Road, Suite 1637, Onyx Plaza, Southfield, MI 48034 (248-799-2000 or sales@omitecinterro.com).

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

After selecting a type of information (Diagnostics), a model and a year, you can verify that a reprogramming event is available by clicking on "Re-Programming Information". Subscribing to the website will allow Land-Rover's Webflash or Proflash application to be downloaded from the website above and allow access to the J2534 Reprogramming Cautions. Subscriptions range from:

- 1 Model/1 Year - $12 (day), $59/Month, $236/Year
- 1 Model/All Years - $20/day, $98/Month, $482/Year
- All Models/All Years - $39/day, $236/Month, $1377/Year

Webflash/ Proflash will check software version on the ECM and install the new version. An interface dongle (DTC4220A) is required to program a new ECM. New Range Rover and Freelander models require a DTC4217A adaptor temporarily inserted between DLC and Pass-Thru device. Adaptor (right) is available from Land-Rover North America (201-818-8500) or stuck12@ford.com).

Website Subscription Required: Yes, to access the Web Flash appli-

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium III, 800 MHz or more

Operating System: Windows 2000 Professional (SP2, Windows XP Pro (SP1 and SP2) (Correct functionality on other operating systems is not guaranteed).

Monitor: Resolution of 1024 x 768 or greater with 16-bit color

Ram: 256 Mb

Other: 10/100Mbit Ethernet card if J2534 interface box uses Ethernet connection; Microsoft Explorer

J2534 PASS-THRU DEVICE

Land-Rover has not validated and does not recommend any J2534 Pass-Thru device.

NOTES

1. Do not re-flash a PCM or TCM unless directed to do so by a TSB.
2. You must have administrator privileges on your PC to install and use Webflash or Proflash.
3. Access and Land-Rover Webflash Application Help Information and print it for reference.
4. Install the driver software for the J2534 Pass-Thru device (supplied with Pass-Thru device), before downloading and installing the Webflash or Proflash application.
5. Once the Webflash or Proflash application is downloaded, double-click the file to start the installation and follow the on-screen prompts.
6. If using a Drewtech CarDAQ2534, Pass-Thru device, to connect to a vehicle, the connections must be made in the following order to ensure proper initialization.
   - Connect J2534 Pass-Thru device to vehicle DLC. Confirm that Pass-Thru device is receiving power.
   - Connect the J2534 Pass-Thru device to the Ethernet, USB or RS-232 port on the computer.
   - Start the PC and start the Webflash or Proflash application.
7. If using any other Pass-Thru device, follow the device manufacturer's instructions.

CAUTIONS

1. Always refer to the website above for the latest reprogramming information for Land-Rover vehicles.

LEXUS

OEM WEBSITE ADDRESS: WWW.TECHINFO.LEXUS.COM

REPROGRAMMABLE MODELS/MODULES:

The PCM on the following models can be reprogrammed with a J2534 Pass-Thru device.

- 2001 and later GS 300, GS 430, IS 300, LS 430, LX 470
- 2002 and later SC430
- 2003 and later all Lexus vehicles

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: The Calibration CD is compatible with the validated scan tools and is updated quarterly. Each update is $55.00 + shipping/handling. The calibration CD contains the most current calibration files, applicable TSBs, a Calibration Update Wizard application for a Windows PC and instructions. Calibration CDs are available from Toyota Material Distribution Center (800-622-2033). Order P/N 00456-REPRG-001.

Website Subscription Required: No

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified

Operating System: Windows 2000 SP2 or later, Windows XP Pro SP1 or later

Monitor: None specified

Ram: None specified

Free Disc Space: None specified

Other: None Specified

J2534 PASS-THRU DEVICE

1. Lexus has validated the following devices to work with Lexus vehicles. Lexus does not recommend use of any J2534 device, firmware, DLL or API not listed here. In some cases, changes made to J2534 devices or software can negatively impact reprogramming performance. Check Lexus' website for the latest information.
2. Lexus supports v4.04 of the API.
3. Original validated versions of firmware or DLL may be superceded by the device manufacturer. Contact the device manufacturer if you are unable to find the versions listed below.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQPlus	01.08.06	01.08.06	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	02.01	02.01	$1595.00	www.infocar.us
Vetronix Corporation	ES6510 Flasher	04.23	06.12	$1595.00	www.vetronix.com
Blue Streak Electronics	2534 Global Programmer	02.27	01.21	Call	www.bsecorp.com
Ease Diagnostics	Universal Reprogrammer	1.3.0.13	JPI1_11b	$1150.00	www.obd2.com
Snap-On	Pass Thru Pro	02.01	02.01	$1700.00	www.snapon.com

NOTES

1. Always refer to Lexus' website for the latest information on reprogramming.
2. Report J2534 reprogramming problems to the J2534 device manufacturer.
3. Reprogramming should only be performed when a TSB or service campaign provides direction to do so.

CAUTIONS

1. Once started do not interrupt the reprogramming process. Do not disconnect J2534 devices or PCs.
2. Do not allow PCs to go into Stand-By, Hibernation or similar power management modes.

OEM WEBSITE ADDRESS: WWW.MOTORCRAFT.COM

REPROGRAMMABLE MODELS/MODULES:

Electronic modules can be reprogrammed on the the following Lincoln vehicles:

- Vehicles built in the U.S.
- Emission-related OBD II modules on some 1995 vehicles and all 1996 and later vehicles
- Non-emission related modules on all vehicles so equipped (including PATS functions and PCM parameter resets)

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

The API is available at the website above. Click on "Technical Resources" then click on "Reprogramming and Initialization". Lincoln supports v4.04 of the J2534 API.

Fee: Short term (day) -$24.95; 1-month - $59.95; 1-Year - $599.95
The reprogramming fee is separate from the technical information website usage fee

Website Subscription Required: You may be required to access TSBs. A TSB subscription is not included in the reprogramming fee.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: 500 MHz (minimum)
Operating System: Windows 2000, XP or later
Monitor: None specified
Ram: 128 Mb
Free Disc Space: 200 Mb
Other: 800 x 600 resolution, 16-bit color
Internet Explorer v5.5 or later, Adobe Acrobat v5.0 or later
High speed internet connection

J2534 PASS-THRU DEVICE

Lincoln has validated the following J2534 Pass-Thru devices:

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQ2534	5.52	5.52	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	2.05c	2.05c	$1595.00	www.infocar.us
EEPod LLC	McS1	1.4	1.4	$475.00	www.eepod.com
Blue Streak Electronics	2534 Global Programmer	2.24	1.19	Call	www.bsecorp.com

NOTES

1. Always refer to the OEM website for the latest information.
2. Access and print out the "Reprogramming and Initialization" information.
3. Reprogramming subscription includes:
   - Downloadable API to be installed on PC.
   - Access to As Built database (Module Build Data) - may be required for reprogramming
   - Access to latest calibration data for emission-related modules.
   - Access to PATS information
4. After purchasing a reprogramming subscription, download the application and install it on your PC. Connect the J2534 Pass-Thru device, power it up and run the application. The application will deter mine if a new calibration file is available. If you choose to use the new file, the module will be reprogrammed.

CAUTIONS

1. Consult the website for the latest updates.

MASERATI

OEM WEBSITE ADDRESS: WWW.MASERATITECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee:

Website Subscription Required:

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU:

Operating System:

Monitor:

Ram:

Free Disc Space:

Other:

J2534 PASS-THRU DEVICE

Manufacturer:

Model:

Cost:

Contact:

NOTES

CAUTIONS

OEM WEBSITE ADDRESS: WWW.MAZDATECHINFO.COM

REPROGRAMMABLE MODELS/MODULES: Depending on exact model/drivetrain configuration, the PCM is reprogrammable on the following U.S. models: 1997-00 626, 1995 and later B-Series trucks, 2003 and later Mazda 3, 2003 and later Mazda 6, 1999 and later MPV, 1999-01 Protege, 2003 and later RX-8, 2001and later Tribute. Refer to the application chart on the Mazda technical information website for the latest information. (There is no charge for the list, and it is included with the API).

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

The API is available at the website above. Choose "PCM Reprogramming Codes" under the "Mazda Reprogramming " bar at the tip of the page.

API Fee: 24-Hour subscription - $29.95; 30-day subscription - $59.95; 1-Year subscription $599.95
The reprogramming fee is separate from the technical information website usage fee

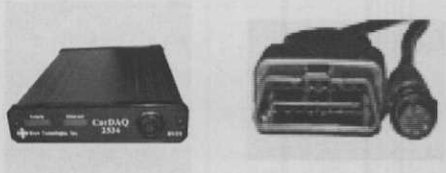
Website Subscription Required: Access to TSBs may be required and is not included in the fee

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: 500 Mhz
Operating System: Windows 98, 2000, XP or later
Monitor: None recommended
RAM: 128 Mb
Free Disc Space: 200 Mb
Other: 800 x 600 resolution, 16-bit color
Internet Explorer v5.5 or later, Adobe Acrobat v5.0 or later

J2534 PASS-THRU DEVICE

Only one J2534 Pass-Thru device has been validated by Mazda.
Manufacturer: Drew Technologies, Inc.
Model: CarDAQ2534
Cable (extreme right) between the CarDAQ (right) and vehicle (CD2534-J1962-FEPS) is required and sold separately.
Cost: $1595 (CarDAQ2534); $85 (cable)
Contact: www.drewtech.com



NOTES

1. Always refer to the OEM website for the latest information.
2. CarDAQ2534 unit includes RS232 and ethernet cables to connect CarDAQ2534 to PC.
3. After purchasing a reprogramming subscription, download the application and install it on your PC. Connect the J2534 Pass-Thru device, power it up and run the application. The application will determine if a new calibration file is available. If you choose to use the new file, the module will be reprogrammed.
5. If online subscription access to PATS or Immobilizer codes is required, additional subscriptions for 24 hours ($19.95), 30 days ($199.95), 6 month ($900.00) or 1 year ($1,500.00) are required. You will need to provide, business, business license number, VIN, immobilizer serial number and contact information to obtain Immobilizer or PATS codes.

CAUTIONS

1. Consult the website for the latest updates.
2. Because the API checks for the version of calibration file and installs the new version, you'll need to download a new application each time you want to reprogram a different vehicle.

MERCEDES-BENZ (INCLUDING MAYBACH)

OEM WEBSITE ADDRESS: WWW.STARTEKINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Mercedes-Benz supports J2534 Pass-Thru reprogramming on engine and transmission control modules for 2004 and later Mercedes-Benz and Maybach models.The Mercedes-Benz J2534 Pass-Thru Reprogramming software will validate whether calibration updates are available.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

You must fill out a paper order form and attach a signed License Agreement to purchase the Mercedes-Benz J2534 Pass-Thru Software. Both forms are available at the above website. Click on "J2534" under "MB Workshop Resources". You may receive a call from Mercedes-Benz after requesting to purchase software. The software is delivered on DVD and is a self-running application. You will receive monthly updates on DVD as long as you have a valid subscription. If your subscription expires, the existing DVDs will still work, but you will no longer receive the latest updates.

Fee: $925.00 plus sales tax for annual subscription. Annual renewals are $925.00 plus sales tax

Website Subscription Required: No, but you may need to access TSBs.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium II at least 450 Mhz
Operating System: Not specified
Monitor: Not specified
Ram: at least 128 Mb
Free Disc Space: 30 Mb
Other: Internet Explorer 5.0 or higher, Netscape 7.1 or higher
4 Mb video card
Adobe Acrobat required

J2534 PASS-THRU DEVICE

Any J2534-spec Pass-Thru device should work, but Mercedes-Benz has validated two J2534 Pass-Thru devices listed below. The software will ask you to specify which Pass-Thru device you are using.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQ2534	Not Specified	Not Specified	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	Not Specified	Not Specified	$1595.00	www.infocar.us

NOTES

1. A battery charger is required to use the J2534 Pass-Thru Reprogramming software.
2. Access the "User Manual for J2534". Click on "J2534" under "MB Workshop Resources". Print out the user manual for reference.
3. The License Agreement must be executed prior to purchasing the software. Read the License Agreement carefully. You may wish to consult with your attorney before signing the License Agreement..
4. A calibration update does not automatically mean it will fix the problem you are experiencing. You may need to consult a TSB for the intended use of the updated calibration.

CAUTIONS

1. Check the above website frequently for the latest information regarding Pass-Thru reprogramming of Mercedes-Benz vehicles.
2. Follow the on-screen instructions in the Mercedes-Benz J2534 Pass-Thru software user manual.
3. Read the file of safety notes included in the J2534 Pass-Thru software.

OEM WEBSITE ADDRESS: WWW.MOTORCRAFT.COM

REPROGRAMMABLE MODELS/MODULES:

Electronic modules can be reprogrammed on the the following Mercury vehicles:

- Vehicles built in the U.S.
- Emission-related OBD II modules on some 1995 vehicles and all 1996 and later vehicles
- Non-emission related modules on all vehicles so equipped (including PATS functions and PCM parameter resets)

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

The API is available at the website above. Click on "Technical Resources" then click on "Reprogramming and Initialization". Mercury supports v4.04 of the J2534 API.

Fee: Short term (day) -$24.95; 1-month - $59.95; 1-Year - $599.95

The reprogramming fee is separate from the technical information website usage fee.

Website Subscription Required: You may be required to access TSBs. A TSB subscription is not included in the reprogramming fee.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: 500 MHz (minimum)
Operating System: Windows 2000, XP or later
Monitor: None specified
Ram: 128 Mb
Free Disc Space: 200 Mb
Other: 800 x 600 resolution, 16-bit color
Internet Explorer v5.5 or later, Adobe Acrobat v5.0 or later
High speed internet connection

J2534 PASS-THRU DEVICE

Mercury has validated the following J2534 Pass-Thru devices:

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQ2534	5.52	5.52	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	2.05c	2.05c	$1595.00	www.infocar.us
EEPod LLC	McS1	1.4	1.4	$475.00	www.eepod.com
Blue Streak Electronics	2534 Global Programmer	2.24	1.19	Call	www.bsecorp.com

NOTES

1. Always refer to the OEM website for the latest information.
2. Access and print out the "Reprogramming and Initialization" information.
3. Reprogramming subscription includes:
   - Downloadable API to be installed on PC.
   - Access to As Built database (Module Build Data) - may be required for reprogramming
   - Access to latest calibration data for emission-related modules.
   - Access to PATS information
4. After purchasing a reprogramming subscription, download the application and install it on your PC. Connect the J2534 pass-thru device, power it up and run the application. The application will determine if a new calibration file is available. If you choose to use the new file, the module will be reprogrammed.

CAUTIONS

1. Consult the website for the latest updates.

MINI

OEM WEBSITE ADDRESS: WWW.MINITECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:
All OBD II-equipped Minis are designed to be programmed and coded electronically. Reprogramming on 1996 and later Minis, with certain exceptions, is supported by the GT1, BMW SSS service tools or via Pass-Thru reprogramming.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS
The instructions and settings for reprogramming are contained in "Vehicle Reprogramming, Coding and Diagnosis for BMW & Mini via Internet".

Fee:
Website Subscription Required: Yes

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium III or higher (at least 500 MHz)
Operating System: Windows 98, Windows 2000, Windows XP Pro
Monitor: At least 1024 x 768; at least 256 colors
Ram: At least 128 Mb
Free Disc Space: At least 5 Gb
Other: Netscape 4.7 or higher; Internet Explorer 5.0 or higher; administrator rights
Microsoft Java Virtual Machine (available at www.bmwtechinfo.com)

J2534 PASS-THRU DEVICE

Mini has validated J2534 Pass-Thru reprogramming tools from the following manufacturers. A Mini-specific driver is necessary and can be downloaded from www.bmwtechinfo.com. Be sure driver version is greater than 0048.

Manufacturer:	Snap-On	Actia Corporation
Model:	Pass-Thru Pro	I+ME Pass-Thru + XS
Driver Version:	Original J2534 installation greater than v1.08. Do not use J2534-1 driver less than v2.0	
Cost:	$1595.00	$1595.00
Contact:	www.snapon.com/j2534	www.infocar.us
Phone:	877-762-7664	877-560-3030

NOTES
1. Engine must be OFF and transmission oil <80 degrees F.
2. All electrical devices must be OFF and all ECUs installed and functioning.
3. Do not route cables through open windows. Car must not be disturbed during reprogramming (doors, windows, etc.).
4. Park vehicle where it will be unobstructed (reprogramming can take several hours).
5. Windshield wipers must be unobstructed (they will operate during reprogramming).
6. Approved battery charger (see TSB 04 11 02) must be connected and ON. Specs are in the TSB or in the document in #8.
7. Identify and correct and problems and clear all DTCs.
8. Access "Vehicle Reprogramming, Coding and Diagnosis for BMW & Mini via Internet" document under Minimum System Requirements at website above. Print the document.

CAUTIONS
1. Check the website above frequently for updates to Pass-Thru reprogramming.

MITSUBISHI (EXCEPT 2006-LATER ECLIPSE, GALANT, RAIDER)

OEM WEBSITE ADDRESS: WWW.MITSUBISHITECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Mitsubishi vehicles use reflashable PCMs beginning with the 1998 model year and support J2534 Pass-Thru reprogramming. Note that special procedures are required for the 2006-later Eclipse, Galant and Raider.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: The Update Manager is in 2 parts - A and B. There is no charge for Update Manager A, which determines the current calibration level, or ROM-ID and is downloaded once.

Website Subscription Required: Yes. A paid subscription to the Mitsubishi website above is required to download Update Manager B. Subscriptions are $19.95 /day, $99.95/week, $249.99/month, $999.99/6-months and $1,499.95/year. Update manager B actually re-flashes the PCM with new files downloaded from the website.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified
Operating System: Windows 98, ME, 2000 or Windows XP
Monitor: None specified
Ram: 256 Mb
Free Disc Space: 10 Mb
Other: Available serial port or USB connection; internet connection; Acrobat Reader

J2534 PASS-THRU DEVICE

Mitsubishi only recommends Pass-Thru devices that they have tested and validated. To date, only one J2534 Pass-Thru device is validated.

Manufacturer: Actia
Model: Actia Pass Thru + XS
Cost: $1595.00
Contact: www.infocar.us 877-560-3030
Other: The current firmware version is 1.09 and enables Mitsubishi Update Manager A and B to recognize Pass-Thru devices. Install firmware before using Update Manager A or B.
Some Mitsubishi vehicles require a special Y-cable adaptor which can be purchased from SPX (part no. MIT47295). Refer to the "Adaptor Cable Chart" available under "J2534 Reflash" to determine which vehicles require the adaptor cable.

NOTES

1. A Mitsubishi TSB indicating the need for reprogramming is required. Reprogramming a PCM without direction from a TSB may result in unsatisfactory performance.
2. TSBs are available on the Mitsubishi website (fee) or from outside sources.
3. Access the Mitsubishi document regarding J2534 on the website above and print it for reference, including the links in the document. The document can be found by clicking on "J2534 Reflash" at the top of the home page.
4. Always refer to the website above for the latest information on reprogramming Mitsubishi vehicles.
5. Before reprogramming, check the "PCM Software Updates" chart on the website to see if there is a TSB and new software. If so, do the following. The first 4 steps are free and allow you to determine if it is worthwhile to proceed.
   - Download and install Update Manager A,
   - Connect the J2534 device and turn ignition ON; run Update Manager A
   - Compare PCM data with the data in the "PCM Software Updates" chart
   - If there is a software update, find the TSB (Mitsubishi website or other source)
   - Download Update Manager B and search for re-flash files
   - Activate Update Manager B and re-flash the PCM.

CAUTIONS

1. There are no specific cautions on the Mitsubishi website, but follow the instructions exactly.

MITSUBISHI (2006-LATER ECLIPSE & GALANT)

OEM WEBSITE ADDRESS: **WWW.MITSUBISHITECHINFO.COM**

REPROGRAMMABLE MODELS/MODULES:

Mitsubishi supports J2534 Pass-Thru reprogramming on 2006 and later Eclipse and Galant models, but they use a new and different powertrain control module than previous models.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

The application to re-flash ECMs used in these vehicles is currently available from Mitsubishi only on CD-ROM. You must have an active subscription to the above website to obtain the CD-ROM. There is no additional charge for the CD-ROM, but you must request the CD-ROM from Mitsubishi by contacting the webmaster by email, using the contact link on the above website. You must specify the following in your email:

- vehicle model (2006 Eclipse or Galant)
- TSB number indicating a re-flash is necessary
- subscriber user name (Mitsubishi will validate your active subscription)

You will also need to download Update Manager B to your PC before using the CD-ROM application. A valid subscription to above website is required to download Update Manager B. Update manager B is not actually used to re-flash a 2006-later Eclipse or Galant, but the application uses some components of Update Manager B.

Fee: No additional fee for CD-ROM

Website Subscription Required: Yes. A paid subscription to the Mitsubishi website above is required to obtain the re-flash CD-ROM or to download Update Manager B. Subscriptions are $19.95 /day, $99.95/week, $249.99/month, $999.99/6-months and $1,499.95/year. If you allow your website subscription to expire, the application will no longer function.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified

Operating System: Windows 2000 or Windows XP

Monitor: None specified

Ram: 256 Mb

Free Disc Space: 10 Mb

Other: Available serial port or USB connection; internet connection; Acrobat Reader

J2534 PASS-THRU DEVICE

Mitsubishi only recommends Pass-Thru devices that they have tested and validated. To date, only one J2534 Pass-Thru device is validated.

Manufacturer: Actia

Model: Actia Pass Thru + XS

Cost: $1595

Contact: www.infocar.us (877-560-3030)

Other: The current firmware version is 1.09 and enables Update Manager B and the CD application for these models to function properly. Install firmware before using any re-flash software.

NOTES

1. A Mitsubishi TSB (Mitsubishi website or outside source) indicating the need for re-flash is required.
2. Access the Mitsubishi document regarding J2534 on the website above and print it for reference, including the links in the document. The document can be found by clicking on "J2534 Reflash" at the top of the home page.
3. Always refer to the website above for the latest information on reprogramming Mitsubishi vehicles.
4. Install the application from the CD-ROM on your PC.
5. You need to validate your software with an internet connection. After the re-flash application starts up, you will be prompted for your www.mitsubishitechinfo.com User ID and password.
6. When your website subscription is validated online, you can use the application 3 times, disconnected from the internet before validation is required again (see Update Manager B explanation).

CAUTIONS

1. There are no specific cautions on the Mitsubishi website, but follow the instructions exactly.

OEM WEBSITE ADDRESS: WWW.MITSUBISHITECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

Mitsubishi supports J2534 Pass-Thru reprogramming on 2006 and later Raider models, but Raider uses a new technology powertrain control module which it shares with the 2006 Dodge Dakota. J2534 Pass-Thru reprogramming support is provided at the DaimlerChrysler technical information website at www.techauthority.com. Before subscribing to www.techauthority. com, determine if access to it is necessary. Checking for a re-flash related TSB for Raider on the free portion of the Mitsubishi website. Access the "TSB Update and Adapter Cable Chart" in the "Supporting Documents" box under J2534. If there is no re-flash related TSB for Raider, go no further. A re-flash for a Mitsubishi vehicle must be authorized by a TSB. If there is a re-flash TSB, note the corresponding Chrysler TSB number.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Access to the J2534 Pass-Thru reprogramming application is through the DaimlerChrysler website. A n account and current subscription is required. After subscribing, click on "FLASH" in the header bar and read and print out the instructions applicable to Raider and follow them exactly. Pay attention to the prerequisites for the 2006 Raider. The application is not backward compatible. You'll need to uninstall any previous versions of the Dodge or Mitsubishi applications before using the Raider re-flash application.

Fee: Included with website subscription

Website Subscription Required: Yes. Subscriptions are: 24 Hours $20.00; 72 Hours $50.00; 30 Days $300.00; 1 Year $2500.00

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified

Operating System: Windows 2000 Professional or later

Monitor: 1024 x 768 resolution

Ram: 256 Mb

Free Disc Space: 1 Gb

Other: Internet Explorer 5.5 or higher with Service Pack 2; Adobe Acrobat Reader 5.0 or higher
You may need to download the latest version of Java Run-Time Environment (JRE) from a link on the FLASH section of www.techauthority.com.

J2534 PASS-THRU DEVICE

Your J2534 Pass-Thru device must support Chrysler's SCI communication protocol. Dodge has validated devices from these device manufacturers, which support DaimlerChrysler's SCI communication protocol. Your Pass-Thru device drivers must be J2534-1 compliant, which are available from the tool manufacturer.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Actia Corp	PassThru +XS	See above	See above	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	See above	See above	Call	www.bsecorp.com

NOTES

1. After 2 hours of inactivity or 8 hours on the DaimlerChrysler website, you will be logged off.
2. You must "Accept" the User's Agreement to subscribe to the website. Be sure to read the FLASH section of the User's Agreement, before clicking "Accept".
3. Be sure you have the latest version of the DaimlerChrysler J2534-1 application and be sure it is installed in the proper directory (see "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview."
4. Follow the instructions for installation and use of the application exactly.
5. Read the section at the end of the "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview" regarding the need for harness adaptors on certain vehicles.

CAUTIONS

1. Check the Mitsubishi website above and www.techauthority.com frequently for J2534 updates as they relate to Pass-Thru reprogramming of Mitsubishi Raider.
2. See the Special Notes for PCM Replacement on 2006 Mitsubishi Raider at the end of this publication.

NISSAN

OEM WEBSITE ADDRESS: WWW.NISSANTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

J2534 Pass-Thru reprogramming is supported for the PCM or TCM on 2004 and later Nissan vehicles. The 1999 Frontier, 1999 Quest, 1999.5 Pathfinder and all 2000 and later Nissan vehicles have reprogrammable ECMs.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: There is no charge for the J2534 Program file (API). It can be downloaded from the website above by clicking on "ECM Program Data" from the drop down menu box. Scroll down and double click on "Download J2534 Program (9.0MB) - No Cost". Install this file on your PC before downloading any ECM data.

Website Subscription Required: Yes. You must set up an account, and be logged in, to purchase ECM or TCM calibration files. The charge for ECM or TCM calibration data is $19.95 per ECM/TCM # (same price as daily subscription to website). Purchase of ECM or TCM calibration data allows download access for 24 hours, so download the file immediately following purchase.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified
Operating System: None specified
Monitor: None specified
Ram: None specified
Free Disc Space: None specified
Other: None specified

J2534 PASS-THRU DEVICE

Nissan has not validated any J2534 Pass-Thru devices.

NOTES

1. Do not reprogram unless instructed to do so by a TSB. In order to locate the proper ECM or TCM file, you'll need to look up the applicable TSB. The TSB will advise of the newest ECM or TCM calibration file for the vehicle in question. TSBs can be accessed through the Nissan website for a fee or accessed from outside sources.
2. Always refer to the Nissan website for the latest reprogramming information.

CAUTIONS

1. Always refer to the Nissan website for the latest reprogramming information.
2. Before reprogramming, the vehicle battery should be fully charged, if less than 11 volts.
3. All electrical loads should be turned OFF.
4. Do not disturb the connections during reprogramming.

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Oldsmobile vehicles are reprogrammable. ECMs on 1996 and later Oldsmobile vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Oldsmobile models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Oldsmobile vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.

Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Oldsmobile TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

OEM WEBSITE ADDRESS: WWW.TECHAUTHORITY.COM

REPROGRAMMABLE MODELS/MODULES:
Plymouth supports J2534 Pass-Thru reprogramming of 1996 and later Plymouth powertrain and transmission control modules. A Reprogramming Matrix is available at the website above, without subscribing. Click on "J2534 Flash Availability" at the left side. Adobe Acrobat reader is required to view the file. The matrix shows calibration ID, module type, part numbers, TSB reference and recall reference.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS
Access to the J2534 Pass-Thru reprogramming application is through the website above. An account and current subscription is required. After subscribing, click on "FLASH" in the header bar and print out the instructions and follow them exactly. The application is not backward compatible. You'll need to uninstall any previous versions of the application before installing an updated version.

Fee: Included with website subscription

Website Subscription Required: Yes. Subscriptions are:

24 Hours	$20.00
72 Hours	$50.00
30 Days	$300.00
1 Year	$2500.00

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Not specified
Operating System: Windows 2000 Professional or later
Monitor: 1024 x 768 resolution
Ram: *256 Mb*
Free Disc Space: 1 Gb
Other: Internet Explorer 5.5 or higher with Service Pack 2; Adobe Acrobat Reader 5.0 or higher
You may need to download the latest version of Java Run-Time Environment (JRE) from a link on the FLASH section of the website above.

J2534 PASS-THRU DEVICE
Your J2534 Pass-Thru device must support Chrysler's SCI communication protocol. Chrysler has validated devices from these device manufacturers, which support DaimlerChrysler's SCI communication protocol. Your Pass-Thru device drivers must be J2534-1 compliant, which are available from the device manufacturer. Uninstall any J2534 compliant drivers and install the J2534-1 compliant drivers.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Actia Corp	PassThru +XS	See above	See above	$1595.00	www.infocar.us
Blue Streak Electronics	2534 Global Programmer	See above	See above	Call	www.bsecorp.com

NOTES
1. After 2 hours of inactivity or 8 hours on the website, you will be logged off.
2. You must "Accept" the User's Agreement to subscribe to the website. Be sure to read the FLASH section of the User's Agreement, before clicking "Accept".
3. Be sure you have the latest version of the DaimlerChrysler J2534-1 application and be sure it is installed in the proper directory (see "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview."
4. Follow the instructions for installation and use of the application exactly.
5. Read the section at the end of the "DaimlerChrysler J2534-1 Flash Reprogramming Process Overview" regarding the need for harness adaptors on certain vehicles.

CAUTIONS
1. Check the website above frequently for J2534 updates as they relate to Pass-Thru reprogramming of Chrysler vehicles.

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Pontiac vehicles are reprogrammable. ECMs on 1996 and later Pontiac vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Pontiac models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Pontiac vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.

Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J-2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Pontiac TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

PORSCHE

OEM WEBSITE ADDRESS: WWW.TECHINFO.PORSCHE.COM

REPROGRAMMABLE MODELS/MODULES:

Porsche supports J2534 Pass-Thru Reprogramming on 2004 and later models with Digital Motor Electronic (DME). The PCM on 1996 and later models is capable of reprogramming by the factory and dealerships, using dedicated Porsche diagnostic equipment.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

A Pass-Thru DME Check is available at the Porsche website above and verifies vehicle compliance with air pollution control regulations. It is free of charge and requires no log-in or password. The Pass-Thru Update DME will check and update the DME, for which there is a charge.

Fee: There is a charge of $100/data record (update). Data records can be accessed independently of the website, but you must set up an account. see the website for details.

Website Subscription Required: No

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: 400 MHz or faster

Operating System: WINDOWS XP

Monitor: 17 IN. , 1024 x 768

Ram: 128 Mb or more

Free Disc Space: No recommendation

Web Browser: Microsoft INternet Explorer 6.0 (or higher); Netscape 6.2

Other: Use appropriate USB driver when using USB connection in place of RS232 connection. Java, Javascript, CSS and cookies enabled. Pop-up blocker disabled. Java run-time environment JSE v1.4.2_xx JRE (Java Plug-in) can be downloaded from SUN. Adobe Acrobat Reader required. High speed internet connection (1000 kBit/s). Virus scanning software and PC firewall.

J2534 PASS-THRU DEVICE

Manufacturer:	Snap-On	Actia Corporation
Model:	Pass-Thru Pro	I+ME Pass-Thru + XS
Driver Version:		Version 1.09 up to 1.xx based on SAE J2534 Feb. 2002.
Cost:	$1595.00	$1595.00
Contact:	www.snapon.com/j2534	www.infocar.us
Phone:	877-762-7664	877-560-3030

NOTES

1. Refer to the Porsche website for the latest Pass-Thru Reprogramming details as they are released.
2. Installation of Actia software requires administrator rrihts on your PC
3. Read all of the material regarding Pass-Thru on the Porsche website, before proceeeding.
4. Your PC must have a stable power supply.
5. The engine must be at operating temperature to reprogram.
6. Turn the engiine OFF before connecting the PC..
7. Use a constant voltage supply to keep battery up to specification.
8. You must have access to the VIN.
9. Follow the on-screen instructions. Complete instructions, including re-initialization, for updating the DME are on the Porsche website. Click on "Pass-Thru Update DME."

CAUTIONS

1. Be careful of electric vehicle fans that can start running automatically..
2. Once started, do not interrupt the update process.
3. Do not use the Back, Forward or Reload buttons of your browser while update is in progress.
4. Do not close the Pass-Thru window while update is in progress.
5. Check the Porsche website under Pass-Thru Update DME for the latest precautions.

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

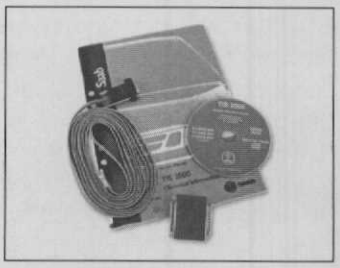
Specific 2003 and earlier models with reprogrammable ECUs are not listed on the SAAB website. 2004 and later models are required by law to be reprogrammable with J-2534 Pass-Thru reprogramming tools.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

SAAB uses the (Technical Information System) 2000 software kit to update the SAAB Tech 2 flash kit for the aftermarket. The software starter kit is a 12-month subscription, including a CD-ROM and an RS232 cable. The software kit (SAAB-3622-02) updates the 32 Mb PCMCIA card in the Tech 2 Flash tool and can be ordered from SPX Dealer Equipment and Services at 1-800-336-6687.

Fee: $1,495.00 plus shipping and handling

Website Subscription Required: Useful, but not required.



HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified
Operating System: None specified
Monitor: None specified
Ram: None specified
Free Disc Space: None specified
Other: None specified

J2534 PASS-THRU DEVICE

SAAB has not yet validated a J-2534 Pass-Thru reprogramming tool, so SAAB advertises the Tech 2 Basic Flash Kit for the aftermarket to perform flash reprogramming on SAAB vehicles. The TECH 2 is dedicated to SAAB vehicles and also performs diagnostics.

Manufacturer: SPX
Model: SAAB-3622
Cost: $5,499.00 plus shipping and handling
Contact: SPX Dealer Equipment & Services 1-800-336-6687

NOTES

1. Refer to the SAAB technical information website above for the latest J2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a SAAB TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the SAAB service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

SATURN

OEM WEBSITE ADDRESS: WWW.GMTECHINFO.COM

REPROGRAMMABLE MODELS/MODULES:

ECMs, PCMs and TCMs on 1996 and later Saturn vehicles are reprogrammable. ECMs on 1996 and later Saturn vehicles can be reprogrammed using J2534-1 Pass-Thru compliant hardware.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Two versions of reprogramming software for Saturn models are distributed by AC-Delco through Vetronix Corp. The TIS (Technical Information System) includes all ECU calibration files, North American software updates for the Tech 2 GM dealer scan tool, *PC View* and *Tech 2 Snapshot* programs. SPS Pro includes ECU calibration files only and is recommended for J2534-only applications. Both products are delivered monthly on CD-ROM. Initial purchase price includes a one-year subscription; starter kits include CD applications, API and PC security device. SPS Pro and TIS are available from Vetronix e-store (www.vetronix.com) or from the local Vetronix field sales force (contact info at www.vetronix.com under "Sales and Support".

Fee: Current list price for SPS Pro is $1195. Annual renewals are $995). Discounts are available for members of AC-Delco's TSS (Total Service Support) program.

Website Subscription Required: No.

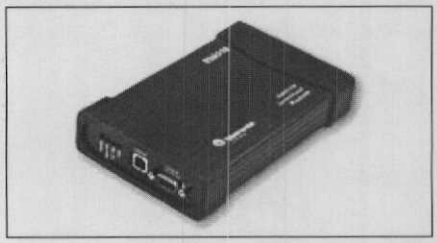
HARDWARE/SOFTWARE RECOMMENDATIONS

Windows XP Pro is required by Vetronix. In general, follow the hardware recommendations for using the GM service information website.

CPU: None Specified
Operating System: Windows XP Professional
Monitor: None specified
Ram: 64 Mb
Free Disc Space: 8 Gb
Other: None specified

J2534 PASS-THRU DEVICE

The Vetronix Pass-Thru tool has been validated on the ECMs on Saturn vehicles and is capable of reprogramming all J2534-compliant ECUs. A special cable adaptor ($46) may be required for 1996-03 vehicles. The ES6510 unit provides 5-20 V DC output for vehicles requiring changes in voltage to initiate ECU reprogramming.



Manufacturer: Vetronix Corp.
Model: Vetronix ES6510 J2534 Flasher
Cost: $1595 (Discounts are available for AC-Delco TSS members)
Contact: www.vetronix.com

NOTES

1. Refer to the GM technical information website above for the latest J2534 reprogramming information.
2. Calibration information is also available by clicking on "Reprogramming" and "Reprogramming Calibration Information" under "GM Tech Info" on the AC-Delco website above. A valid VIN is required to obtain the latest calibration ID.
3. Access to TSBs is required. Do not reprogram a vehicle unless directed to do so by a Saturn TSB or to update to a newer calibration file.

CAUTIONS

1. Consult the GM service information website, AC-Delco TechConnect newsletter, AC-Delco TechLink publications or the Pass-Thru tool manufacturer for the latest cautions.

OEM WEBSITE ADDRESS: WWW.TECHINFO.TOYOTA.COM

REPROGRAMMABLE MODELS/MODULES:

The PCM on the following models can be reprogrammed with a J2534 Pass-Thru device.

- 2004 and later Scion models

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: The Calibration CD is compatible with the validated scan tools and is updated quarterly. Each update is $55.00 + shipping/handling. The calibration CD contains the most current calibration files, applicable TSBs, a Calibration Update Wizard application for a Windows PC and instructions. Calibration CDs are available from Toyota Material Distribution Center (800-622-2033). Order P/N 00456-REPRG-001.

Website Subscription Required: No

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified

Operating System: Windows 2000 SP2 or later, Windows XP Pro SP1 or later

Monitor: Non specified

Ram: None specified

Free Disc Space: None specified

Other: None Specified

J2534 PASS-THRU DEVICE

1. Scion has validated the following devices to work with Scion vehicles. Toyota does not recommend use of any J2534 device, firmware, DLL or API not listed here. In some cases, changes made to J2534 devices or software can negatively impact reprogramming performance. Check Scion's website for the latest information.
2. Scion supports v4.04 of the API.
3. Original validated versions of firmware or DLL may be superceded by the device manufacturer. Contact the device manufacturer if you are unable to find the versions listed below.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQPlus	01.08.06	01.08.06	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	02.01	02.01	$1595.00	www.infocar.us
Vetronix Corporation	ES6510 Flasher	04.23	06.12	$1595.00	www.vetronix.com
Blue Streak Electronics	2534 Global Programmer	02.27	01.21	Call	www.bsecorp.com
Ease Diagnostics	Universal Reprogrammer	1.3.0.13	JPI1_11b	$1150.00	www.obd2.com
Snap-On	Pass Thru Pro	02.01	02.01	$1700.00	www.snapon.com

NOTES

1. Always refer to Scion's website for the latest information on reprogramming.
2. Report J2534 reprogramming problems to the J2534 device manufacturer.
3. Reprogramming should only be performed when a TSB or service campaign provides direction to do so.
4. Some 2004 vehicles that have been flash reprogrammed may contain 2005 MY OBD II logic, which requires VIN entry into the PCM following reprogramming.

CAUTIONS

1. Once started do not interrupt the reprogramming process. Do not disconnect J2534 devices or PCs.
2. Do not allow PCs to go into Stand-By, Hibernation or similar power management modes.

SUBARU

OEM WEBSITE ADDRESS: HTTP://TECHINFO.SUBARU.COM

REPROGRAMMABLE MODELS/MODULES:

Subaru uses the Select Monitor III in dealerships toreprogram ECU modules (1996-06)and to perform ECU re-initialization. The SSMIII is available through Kent-Moore Corporation, 28635 Mound Road, Warren, MI 48092-3499 (800-345-2233 or http://subaru.spx.com). A generic diagnostic tool and software, the HDS-3000 (Hitachi Diagnostic System) is available through Blue Streak Electronics (contact info below). Subaru uses an engine immobilizer on some 2005 and later models and some earlier models may have an alarm system. The HDS aftermarket tool will perform the sam re-initialization functions as the SSMIII.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Access to the Subaru technical information website is not required for reprogramming.

Fee: 72 hours - $34.95; 30 days - $299.95; 365 days $2499.95

Website Subscription Required: No. Diagnostic software and tool firmware is available from Blue Streak Electronics at a price of $1100.00/year. Software ius uypdated annually.

HARDWARE/SOFTWARE RECOMMENDATIONS

No recommendations for PC hardware or software are specified. Contact Subaru or Blue Streak Electronics for specific recommendations.

CPU: None specified
Operating System: None specified
Monitor: None specified
Ram: None specified
Free Disc Space: None specified
Other: None specified

J2534 PASS-THRU DEVICE

Manufacturer: Blue Streak Electronics
45 Basaltic Road
Concord, Ontario L4K 1G5
Canada

Model: HDS-3000

Cost: $2,000.00

Contact: 905-669-4812
www.bsecorp.com/hds.php (website)
info@bsecorp.com (email)

Other: The diagnostic tool includes:
- an interface box (no software),
- diagnostic cable,
- USB cable,
- CF card,
- carrying case and
- instructions.

NOTES

1. Check the Subaru STIS website for updates.

CAUTIONS

1. Check the Subaru STIS website and the Blue Steak Electronics website for cautions.

OEM WEBSITE ADDRESS: **WWW.SUZUKIPITSTOP.COM**

REPROGRAMMABLE MODELS/MODULES:
Only certain Suzuki models are capable of accepting reprogramming.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS
Suzuki makes no reference on their website to J2534. However, Suzuki does make available a proprietary Pass-Thru Reprogramming tool, which is available directly from Suzuki.

Fee: An annual subscription to Suzuki Pass-Thru Reprogramming software is required. The annual fee for the subscription is $499.95 and includes one year access to Pass-Thru software and updates, access to the ECU calibration files database and online operator's manual. After subscribing, a serial number and additional information is provided by mail.

Website Subscription Required: No additional website subscription is required, but you must set up an account on the Suzuki website.

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium 200MHz or greater
Operating System: Windows 98, Windows ME, Windows 2000, Windows XP
(There are different installation instructions depending on operating system)
Monitor: SVGA (800-600) or more, 256 colors or more
Ram: 32 Mb or more
Free Disc Space: 32 Mb or more
Other: USB 1.1 (or more) port

J2534 PASS-THRU DEVICE
Suzuki makes no reference on their website to J2534. However, Suzuki does make available a proprietary Pass-Thru Reprogramming tool, which is available directly from Suzuki. The SDS Tool Kit (SKU 09910-06520) includes the Suzuki Diagnosis Interface Box, USB cable and DLC cable. The kit is required to reprogram control modules in certain Suzuki vehicles.

Manufacturer: Suzuki
Model: SKU 09910-06520
Cost: $702.35
Contact: www.suzukipitstop.com

NOTES

1. Always consult the Suzuki website for the latest reprogramming information.
2. Access the Suzuki Pass-Thru reprogramming Tool Operator's Manual and print it for reference.
3. Do not reprogram a Suzuki vehicle unless directed to do so by a Suzuki TSB.
4. Follow the instructions in the Operator's Manual carefully.
5. ECU initialization is part of the reprogramming process.

CAUTIONS

1. Be sure battery is fully charged (11 volts or more).
2. Do not start engine during the reprogramming process.
3. Do not reprogram with battery charger connected to the vehicle.
4. Turn OFF all electrical loads (lights, A/C, etc.).
5. Follow instructions to turn ON or OFF ignition switch.
6. Be sure all equipment is stable and securely connected. Do not disconnect cables during reprogramming.
7. ECU temperature should be between 32-104 degrees F.for reprogramming.
8. Eliminate any outside electrical interference from motors, cellphones, fax machines, etc. Do not start another vehicle near the reprogramming or turn ON any lights in the vehicle.

TOYOTA

OEM WEBSITE ADDRESS: WWW.TECHINFO.TOYOTA.COM

REPROGRAMMABLE MODELS/MODULES:

The PCM on the following models can be reprogrammed with a J2534 Pass-Thru device.

- 2001 and later 4Runner,Highlander,Land Cruiser, RAV4, Sequoia, Tundra
- 2002 and later Camry, Solara, Tacoma
- 2003 and later Corolla, Matrix
- 2004 and later all models except Celica, MR2 Spyder, Avalon, Tacoma (3RZ-FE engine)
- 2007 and later all models

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: The Calibration CD is compatible with the validated scan tools and is updated quarterly. Each update is $55.00 + shipping/handling. The calibration CD contains the most current calibration files, applicable TSBs, a Calibration Update Wizard application for a Windows PC and instructions. Calibration CDs are available from Toyota Material Distribution Center (800-622-2033). Order P/N 00456-REPRG-001.

Website Subscription Required: No

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: None specified
Operating System: Windows 2000 SP2 or later, Windows XP Pro SP1 or later
Monitor: Non specified
Ram: None specified
Free Disc Space: None specified
Other: None Specified

J2534 PASS-THRU DEVICE

1. Toyota has validated the following devices to work with Toyota vehicles. Toyota does not recommend use of any J2534 device, firmware, DLL or API not listed here. In some cases, changes made to J2534 devices or software can negatively impact reprogramming performance. Check Toyota's website for the latest information.
2. Toyota supports v4.04 of the API.
3. Original validated versions of firmware or DLL may be superceded by the device manufacturer. Contact the device manufacturer if you are unable to find the versions listed below.

Manufacturer	Device Name	DLL Version	Firmware Version	Approx. Price	Contact
Drew Technologies	CarDAQPlus	01.08.06	01.08.06	$1595.00	www.drewtech.com
Actia Corp	PassThru +XS	02.01	02.01	$1595.00	www.infocar.us
Vetronix Corporation	ES6510 Flasher	04.23	06.12	$1595.00	www.vetronix.com
Blue Streak Electronics	2534 Global Programmer	02.27	01.21	Call	www.bsecorp.com
Ease Diagnostics	Universal Reprogrammer	1.3.0.13	JPI1_11b	$1150.00	www.obd2.com
Snap-On	Pass Thru Pro	02.01	02.01	$1700.00	www.snapon.com

NOTES

1. Always refer to Toyota's website for the latest information on reprogramming.
2. Report J2534 reprogramming problems to the J2534 device manufacturer.
3. Reprogramming should only be performed when a TSB or service campaign provides direction to do so.

CAUTIONS

1. Once started do not interrupt the reprogramming process. Do not disconnect J2534 devices or PCs.
2. Do not allow PCs to go into Stand-By, Hibernation or similar power management modes.

OEM WEBSITE ADDRESS: WWW.EBAHN.COM

REPROGRAMMABLE MODELS/MODULES:

VW supports Pass-Thru reprogramming for emission-related PCMs on most 2004 and later vehicles.

OEM REPROGRAMMING SOFTWARE & CALIBRATIONS

Fee: See below

Website Subscription Required: Yes. You can look at the availability of Pass-Thru information on VW's website by selecting a vehicle and clicking on "Pass-Thru". Separate applications are listed as Pass-Thru bulletins. Accessing the TSB or the ECM update requires a subscription to the VW website. Subscriptions can be had for one model ($19.95/3 days, $49.95/30 days or $79.95/365 days) or multiple models ($49.95/3 days, $199.95/30 days or $999.95/365 days).

HARDWARE/SOFTWARE RECOMMENDATIONS

CPU: Pentium III, 500 MHz or more
Operating System: Windows 98SE, Windows 2000, Windows NT 4.0 (SP6) or Windows XP
Windows XP SP2 is recommended
Monitor: None specified
Ram: At least 128 Mb
Free Disc Space: At least 50 Mb
Other: Internet Explorer 6.0 SP2; Un-interrupted internet link

J2534 PASS-THRU DEVICE

VW recommends one of the following Pass-Thru devices. Currently, VW supports J2534 version 2.02 only. Be sure you have the appropriate version installed on your Pass-Thru device.

Manufacturer:	Drew Technologies, Inc.	Actia Corporation
Model:	CarDAQ2534	I+ME Pass-Thru+XS
Cost:	$1595.00	$1595.00
Contact:	www.drewtech.com 810-231-3171	www.infocar.us 877-560-3030

NOTES

1. Always refer to the above website for the latest information on reprogramming for VW vehicles.
2. The Pass-Thru reprogramming process can over-write any "Tuned" ECM programming (an ECM that has been altered to perform outside the normal parameters approved and/or certified by the manufacturer). Advise the customer, in writing, that any damage caused by tuning the ECM (including adverse emission consequences) will not be covered by VW's warranty.

CAUTIONS

1. Reprogramming should only be done if a TSB directs you to do so.
2. Battery must have a minimum of 12.5 no-load voltage and must be maintained with an approved battery charger/maintainer.
3. Turn OFF any devices with high electromagnetic radiation (i.e., cell phones, etc.).
4. Erase any stored DTCs.
5. Do not disconnect any connections while the reprogramming is under way.

SPECIAL NOTES FOR PCM REPLACEMENT ON 2006 MITSUBISHI RAIDER

NOTES & CAUTIONS

These notes are available at www.mitsubishitechinfo.com. Check to be sure that you have the latest version and print them out.

PCM replacement procedure are available at www.mitsubishitechinfo.com and at www.techauthority.com. Using the 2006 Dakota PCM replacement procedure at www.techauthority.com will require a subscription only to the techauthority website. Using the PCM replacement procedure at www.mitsubishitechinfo.com will require a subscription to both websites.

Replacement PCMs for the 2006 Mitsubishi Raider are delivered with no programming and must be flashed with the latest calibration before the vehicle will run. The latest calibrations are available at www.techauthority.com, but you must search by powertrain instead of by TSB number.

To search:

1. log onto www.techauthority.com.
2. Click on the "FLASH" link.
3. A new page entitled "FLASH" will appear in a separate window.
4. Scroll to "Year/Model & Powertrain"
5. Enter 2006 Dodge Dakota.
6. Select the correct powertrain for 2006 Mitsubishi Raider. 2006 Mitsubishi Raider uses the following powertrains:
    - 3.7 liter with automatic transmission
    - 3.7 liter with manual transmission
    - 4.7 liter with automatic transmission 2WD
    - 4.7 liter with automatic transmission part time 4WD (Raider option code DHT or DH5)
    - 4.7 liter with automatic transmission full time AWD (Raider option code DHTV)
    - 4.7 liter with manual transmission
    - Other powertrains are available for 2006 Dakota that do not apply to Mitsubishi Raider. Do not select an option not available on the Raider.
7. Be certain that you are selecting the correct flash file for the powertrain listed. Flashing a new PCM with the wrong file can irreparably damage the new PCM .
8. After making the correct selections, download the files and follow all instructions for using the Chrysler J2534 re-flash application. See the summary of the Manufacturer's Reprogramming Information in the pages in this manual or at the manufacturer's technical information websites above.

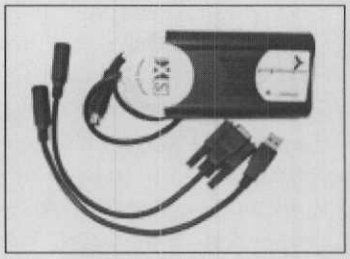
PASS-THRU TOOL MANUFACTURER'S DIRECTORY

The companies listed in this section are manufacturers and/or distributors of Pass-Thru reprogramming devices. The list is as complete as possible at the time of publication. However, new manufacturers are continuously introducing new Pass-Thru tools and manufacturers of existing tools are upgrading their products. Consult the Pass-Thru tool manufacturer's website for the latest product introductions and upgrades. Refer to the OEM websites, or to the Pass-Thru tool manufacturer's website for the latest changes and specifications applicable to individual vehicles.

- Some manufacturers, automotive rebuilders, parts retailers, and/or jobbers may offer a private label version of one or more of the tools listed in this directory.
- Some parts manufacturers, such as CARDONE Industries, Inc. (1-800-777-4780 or www.cardone.com), offer off-board reprogramming services, Service Reminder Indicator resetting, VIN reprogramming, and PATS reprogramming with overnight shipping and 48-hour turnaround. CARDONE also distributes the FLASH^2 All-Makes Reprogrammer to do flash reprogramming at your facility.
- Vehicle calibration data is not usually included with the Pass-Thru reprogramming tool. Calibration data for specific vehicles is available from the OEM at additional cost. Refer to the Vehicle Manufacturer pages in the preceding section for purchase details.
- Some OEMs may require adaptors or special cabling to be able to use their calibration data. Check the Manufacturer pages in the preceding section for specific requirements.
- Some Pass-Thru tool manufacturers may have the ability to deliver OEM calibration data for certain OEMs at an additional cost.
- Check the Manufacturer pages in the preceding section for the exact Pass-Thru tool software or firmware versions required by specific OEMs. The Pass-Thru tool manufacturer should be able to supply the necessary version of software.
- Refer to the section on "Before You Get Started – What You Need to Know About Reprogramming" in this manual before purchasing a Pass-Thru reprogramming tool.

ACTIA, INC.

CONTACT: Infocar.us
3424 Westmound Road
Joliet, IL 60436
1-877-560-3030
www.infocar.us



Passthru+ XS

PASS-THRU DEVICE

Product: Passthru+ XS
Part No.: Same as Product Name
Price:: $1595.00
Validated By: Audi, BMW, DaimlerChrysler, Ford, GM, Honda, Jaguar, Kia, Land Rover, Mercedes-Benz, Mini, Mitsubishi, Porsche, SAAB, Toyota, VW, Volvo
Features: Pass-thru reprogramming device exceeding J2534 and J2534-1 specs. Compatible with all major OBDII vehicle comm protocols. On-board data processing and memory, programmable power supply, additional I/Os for specific OEMs. Wireless connectivity with Bluetooth model.
VEHICLE/SYSTEM COVERAGE:: All J2534-compliant vehicles.
HARDWARE/SOFTWARE INCLUDED: Pass-Thru device (hard-wired or wireless), API, R/S 232 connector cable, USB connector cable, OBDII cable, user guide on CD.

PC REQUIREMENTS (MINIMUM)

CPU: None specified. Contact Infocar.us for more details.
Operating System: None specified. Contact Infocar.us for more details.
Monitor: None specified. Contact Infocar.us for more details.
Ram: None specified. Contact Infocar.us for more details.
Free Disc Space: None specified. Contact Infocar.us for more details.
Other: Internet Explorer, Netscape or other internet browser, internet connectivity (high speed preferable), access to OEM calibration data.

AES (AUTOMOTIVE ELECTRONICS SERVICES)

CONTACT: AES, Inc.
3849 N. Fine Avenue, #102
Fresno, CA 93727
1-559-292-7851
www.aeswave.com

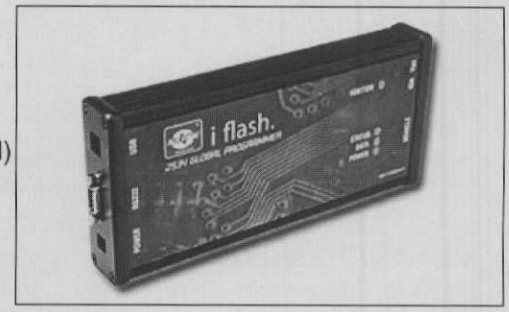
PASS-THRU DEVICE

Product: i-Flash 2534 Global Programmer On-Board Solution
Part No.: BDM-BXBD35721
Price:: $1,299.00
Validated By: None Specified
Features: AES distributes the Blue Streak i-flash 2534 Global Programmer. See listing for Blue Streak Electronics

VEHICLE/SYSTEM COVERAGE:: See listing for Blue Streak Electronics
HARDWARE/SOFTWARE INCLUDED: See listing for Blue Streak Electronics
PC REQUIREMENTS (MINIMUM)
CPU: See listing for Blue Streak Electronics
Operating System: See listing for Blue Streak Electronics
Monitor: See listing for Blue Streak Electronics
Ram: See listing for Blue Streak Electronics
Free Disc Space: See listing for Blue Streak Electronics
Other: See listing for Blue Streak Electronics

BLUE STREAK ELECTRONICS, INC.

CONTACT: Blue Streak America, Inc.
1197 South Rogers Circle
Boca Raton, FL 33487
1-877-916-8324 (Customer Service)
www.bsecorp.com



PASS-THRU DEVICE

Product: i-Flash 2534 Global Programmer (On-Board)
Part No.: BXBD35721
Price:: $1,400.00
Validated By: None Specified
Features: Pass-Thru reprogramming device that supports J2534-1 and non-J2534 reprogramming and diagnostic applications. Programmable voltage output and status LEDs. Supports all major vehicle comm protocols and is available in on-car and off-car models. Off-car Pass-Thru reprogrammer available at additional cost.
NOTE: Firmware updates are available on the Blue Streak website. The latest firmware version is v5.0, which allows reprogramming of 1996 & later DaimlerChrysler models.

VEHICLE/SYSTEM COVERAGE::

- All 2534-1 compliant manufacturers and controllers
- 1993 & later GM models using TIS2000 Expertec or Expertec Pro software
- 1996 & later Ford and Chrysler models (including insertion of VIN and mileage in Chrysler)
- All models Honda/Acura, Isuzu, Audi/VW; 1996 & later Mazda, 1999 & later Toyota/Lexus

HARDWARE/SOFTWARE INCLUDED: Pass-Thru device, AC/DC power supply, RS-232 cable, USB cable, main vehicle cable, OBDII adaptor, i-flash PC software, user guide.

PC REQUIREMENTS (MINIMUM)
CPU: Contact Blue Streak for specifics
Operating System: Windows 2000 or later
Monitor: Contact Blue Streak for specifics
Ram: Contact Blue Streak for specifics
Free Disc Space: Contact Blue Streak for specifics
Other: Internet connection (high-speed preferable), 2 USB ports, access to OEM calibration data.

DREW TECHNOLOGIES

CONTACT: Drew Technologies
7012 E. M-36, Suite 3B
Whitmore Lake, MI 48189
1-810-231-3171
www.drewtech.com

PASS-THRU DEVICE

Product: CarDAQ-Plus
Part No.: CarDAQ-Plus
Price:: $1,595.00 (vehicle interface cable - $85.00)
Validated By: GM, Ford, DaimlerChrysler, VW, Volvo
Features: Pass-Thru reprogramming device that supports J2534 and non-J2534 reprogramming and diagnostic applications. 200MHz processor, with wireless capability and Compact Flash expansion slot. Supports all major comm protocols.

VEHICLE/SYSTEM COVERAGE:: Supports all 2534-compliant manufacturers and controllers.
HARDWARE/SOFTWARE INCLUDED: Pass-Thru device, Ethernet cables, Pass-Thru device (J2534) driver.
PC REQUIREMENTS (MINIMUM) Contact Drew Technologies for specifics regarding CPU, Operating system, Monitor, RAM and free disc space.
Other: Internet connection (high-speed preferable), access to OEM calibration data.

CARDONE INDUSTRIES, INC.

CONTACT: CARDONE Industries, Inc.
5501 Whitaker Avenue
Philadelphia, PA 19121-1799
1-800-777-4780 (Customer Service)
www.cardone.com

PASS-THRU DEVICE

Product: FLASH^2 All-Makes Reprogrammer
Part No.: 70-1100
Price:: Approx. $1,200.00
Validated By: None specified
Features: Pass-Thru reprogramming device that supports GM, Ford and Chrysler reprogramming, DG Technology manufactures reprogramming device for CARDONE industries.

VEHICLE/SYSTEM COVERAGE:: Currently supports 1996 and later GM, Ford, Chrysler. Other J2534-compliant manufacturers and controllers will be supported as developed.
HARDWARE/SOFTWARE INCLUDED: Reprogramming device, cables, user manual, access to online library.
PC REQUIREMENTS (MINIMUM): In general PC running XP Pro. Contact CARDONE Industries for specifics regarding CPU, Monitor, RAM and free disc space. Internet connection (high-speed preferable), access to OEM calibration data required.

DELPHI CORPORATION

CONTACT: Delphi North American Regional Headquarters
1441 Long Lake Road
Troy, MI 48098-5090
1-877-411-ECM-1
http://go.delphi.com

PASS-THRU DEVICE

Product: J2534 Universal Reprogrammer. Delphi distributes the EASE Diagnostics J2534 device.
Part No.: J2534 Universal Reprogrammer
Price:: Not available at time of publication
Validated By: See listing under EASE Diagnostics
Features: See features under listing for EASE Diagnostics.

VEHICLE SYSTEM COVERAGE: See listing under EASE Diagnostics.
HARDWARE/SOFTWARE INCLUDED: See listing under EASE Diagnostics.
PC REQUIREMENTS (MINIMUM): See listing under EASE Diagnostics.

DG (DEARBORN GROUP) TECHNOLOGY

CONTACT: DG Headquarters
27007 Hills Tech Court
Farmington Hills, MI 48331
1-800-248-2080
www.dgtech.com

PASS-THRU DEVICE

Product: Python (DPA - Dearborn Protoccol Adaptor)
Part No.: PDG-Python-USB
Price:: $850.00 (USB connection); $1500.00 (wireless)
Validated By: None specified.
Features: J2534-compliant pass-thru reprogramming device. Supports all major J1962 vehicle comm protocols.

VEHICLE/SYSTEM COVERAGE:: J2534-compliant vehicles. See www.dgtech.com for updates.
HARDWARE/SOFTWARE INCLUDED: Python, cables, API. See www.dgtech.com for req'd firmware versions.

PC REQUIREMENTS (MINIMUM)

CPU: Pentium III. Contact DG Tech for more details.
Operating System: Windows XP Pro. Contact DG Tech for more details.
Monitor: None specified. Contact DG Tech for more details.
Ram: None specified. Contact DG Tech for more details.
Free Disc Space: None specified. Contact DG Tech for more details.
Other: Internet Explorer, high-speed internet connection, access to OEM calibration data.

EASE DIAGNOSTICS

CONTACT: Ease Diagnostics
RR1 Box 285
Olyphant, PA 18447
1-888-366-EASE (3273)
www.obd2.com

PASS-THRU DEVICE

Product: J2534 Universal Reprogrammer
Part No.: J2534-ON-KIT
Price:: $1,150.00
Validated By: Toyota, Lexus, Scion
Features: Pass-Thru reprogramming device that supports J2534 and non-J2534 on-board reprogramming and diagnostic applications. Off-board reprogramming capability and optional wireless capability. Cables for off-board reprogramming are additional cost. Can be used as a scan tool with optional software upgrades. Supports all major vehicle comm protocols.

VEHICLE/SYSTEM COVERAGE::

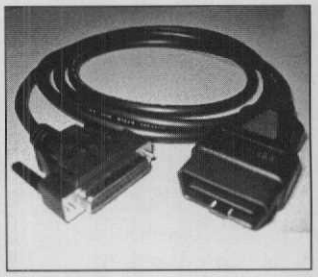
- 1993 & later GM/Saturn Powertrain, Body, Chassis controllers (on-board)
- 1993 & later GM/Saturn Powertrain controllers (off-board)
- 1996 & later Ford/Lincoln/Mercury Powertrain, Body, Chassis controllers (on-board)
- 1996 & later Ford/Lincoln/Mercury Powertrain controllers (off-board)
- 1996 & later Chrysler Powertrain controllers (on-board and off-board)
- 2001 & later Toyota/Lexus/Scion Powertrain controllers (on-board and off-board)

HARDWARE/SOFTWARE INCLUDED: Pass-Thru device, power supply, OBDII/GM OBDI cables (on-board), USB cable, cigarette plug power cable, case, Ease Flash Wizard software (with relearn procedures).

PC REQUIREMENTS (MINIMUM)

CPU: Pentium III 600MHz processor
Operating System: Windows 2000 or XP
Monitor: 1024 x 768 256 color graphics card
Ram: 256 Mb
Free Disc Space: 20 GB
Other: 16X CD-ROM drive, 2 unused USB ports, Internet connection (high-speed preferable), e-mail account, access to OEM calibration data.

EEPOD (EMBEDDED ELECTRONIC PRODUCTS OR DESIGN), LLC.



CONTACT: EEPod, LLC.
8609 Parshallville Road
Fenton, MI 48430
1-810-813-6625
www.eepod.com

PASS-THRU DEVICE

Product: McS1 Vehicle Diagnostic Interface
Part No.: McS1
Price:: $475.00 (OBDII J1962 cable – $55.00)
Validated By: Ford, Lincoln, Mercury, Mazda
Features: Pass-Thru reprogramming tool for on-board reprogramming of J2534-compliant vehicles. Supports all major J1962 comm protocols, except Chrysler SCI. Unit features USB connection to PC, variable voltage analog output channel.

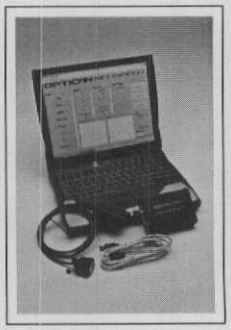
VEHICLE/SYSTEM COVERAGE:: 1996 & later Ford, Lincoln, Mercury and Mazda and all J2534-compliant vehicles. Check ww.eepod.com for updates.

HARDWARE/SOFTWARE INCLUDED: Kit includes vehicle network interface (tool), USB cable from tool to PC, carrying case, software and CD-ROM. Operating instructions and software are on the CD.

PC REQUIREMENTS (MINIMUM)

CPU: None specified.
Operating System: None specified.
Monitor: None specified.
Ram: None specified.
Free Disc Space: None specified.
Other: Internet connection (high-speed preferable), access to OEM calibration data.

NEUSPEED (AUTOMOTIVE PERFORMANCE SYSTEMS)



CONTACT: Neuspeed Headquarters
3300 Corte Malpaso
Camarillo, CA 93012
1-800-423-3623
www.neuspeed.com

PASS-THRU DEVICE

Product: OptiCan Neuspeed
Part No.: 64.00.00
Price:: $3000.00
Validated By: None specified
Features: Flash reprogrammer for on-board reprogramming of selected vehicles. Requires regulated voltage supply.

VEHICLE/SYSTEM COVERAGE:: 1999 & later "drive-by-wire" models of VW, Audi, Porsche, Bentley. BMW, Mercedes-Benz, Volvo coming soon. Check website at www.neuspeed.com.

HARDWARE/SOFTWARE INCLUDED: Kit includes OptiCan flash reprogramming device, software drivers, USB cable from PC to OptiCan, serial connection from OptiCan to OBDII connector. System comes with $1200 in credits to download calibration data from website.

PC REQUIREMENTS (MINIMUM)

CPU: Pentium III
Operating System: Windows XP Pro
Monitor: None specified. Contact Neuspeed.
Ram: None specified. Contact Neuspeed.
Free Disc Space: None specified. Contact Neuspeed.
Other: Internet Explorer required.

SNAP-ON (SUN)

CONTACT: Snap-On
P.O. Box 1410
Kenosha, WI 53141-1410
1-877-762-7664
www.snapon.com/j2534

PASS-THRU DEVICE

Product: Pass Thru Pro
Part No.: EETA113A
Price:: $1,700.00 (Snap-On dealers set their own prices).
Validated By: None specified
Features: Certified Pass-Thru reprogramming device that supports J2534 on-board reprogramming applications. Meets or exceeds J2534 specification. Supports all J1962 vehicle comm protocols. Features on-board memory and data processing. Includes status indicator light.

VEHICLE/SYSTEM COVERAGE:: All J2534-compliant vehicles. For the latest information on OEM applications and vehicles/system coverage, visit www.snapon.com.

HARDWARE/SOFTWARE INCLUDED: Pass-Thru device, OBDII connector to vehicle, RS-232 connector to PC, USB connector to the PC, SUN Pass-Thru API PC interface software driver, installation guide.

PC REQUIREMENTS (MINIMUM)

CPU: IBM compatible PC with 233 MHz or better.
Operating System: Windows 95, 98 (SE), ME, NT4 (service pack 6), 2000 (service pack 3), XP.
Monitor: None specified. Contact Snap-On.
Ram: 32 Mb (Windows 95b and 98) or 64 Mb (all other Windows versions)
Free Disc Space: 2 Mb
Other: Internet connection (high-speed preferable), access to OEM calibration data required.

SPX/OTC

CONTACT: SPX/OTC Service Solutions
655 Eisenhower Drive
Owatonna, MN 55060
1-800-533-6127
www.otctools.com

PASS-THRU DEVICE

Product: Genisys 2.0
Part No.: 3653
Price:: $3,799.95 (Suggested list price).
Validated By: GM
Features: Generic scan tool/diagnostic tool that supports on-board reprogramming for GM models and diagnostics for domestic, European and Asian vehicles. Requires GM-ACDelco SPS Reprogramming Kit 12-month subscription to Powertrain controller calibration data) or GM-ACDelco All Modules Reprogramming Starter Kit (12 month subscription to powertrain, body and chassis controller calibration data - $1615.95).

VEHICLE/SYSTEM COVERAGE:: 1993 & later GM vehicles.

HARDWARE/SOFTWARE INCLUDED: Genisys tool, OBDI and OBDII cables, card reader, Smart cards, 14 adaptors.

PC REQUIREMENTS (MINIMUM)

NOTE: *Visit http://service.gm.com (select techline) for the latest minimum or recommended PC specs.*
CPU: Intel Pentium III 1 GHz
Operating System: Windows 2000 Pro or Windows XP Pro
Monitor: None specified.
Ram: 128 Mb SDRAM, 16 MB DRAM (video)
Free Disc Space: 20 GB
Other: 40X/16X CD/DVD combo drive, 1 parallel port, 1 serial port, 1 USB port, current version of commercially available virus protection.

VETRONIX

CONTACT: Vetronix Corp.
2030 Alameda Padre Sierra
Santa Barbara, CA 93103
1-805-966-2000
www.vetronix.com

PASS-THRU DEVICE

Product: Flasher E6510 Vehicle Programming Module
Part No.: 0 100 286 3
Price:: $1,595.00
Validated By: None specified
Features: Certified Pass-Thru reprogramming device that supports J2534 on-board reprogramming and other non-J2534 applications. Supports all J1962 vehicle comm protocols. Features variable voltage output for vehicles requiring a change in voltage to initiate reprogramming events and expansion capability for future vehicle protocols such as J2534-2. Contains auxiliary pin for external DC power output status LEDs. Powered by 12 VDC from vehicle DLC. Vetronix also makes available GM software calibration updates for 1993 & later GM powertrain, chassis and body controllers on an annual subscription. Includes theft deterrent reprogramming and new module initialization.
VEHICLE/SYSTEM COVERAGE:: All J2534-compliant vehicles and many 1996-2003 vehicles (may require proprietary connector or special cable adaptor). For the latest information on OEM applications and vehicles/system coverage, visit www.vetronix.com.
HARDWARE/SOFTWARE INCLUDED: ES6510 Pass-Thru device, OBDII connector to vehicle DLC, USB connector to the PC, API, PC software installation guide and quick start guide. RS-232 connector to PC is optional.

PC REQUIREMENTS (MINIMUM)

CPU: None specified. Contact Vetronix sales rep.
Operating System: None specified. Contact Vetronix sales rep.
Monitor: None specified. Contact Vetronix sales rep.
Ram: None specified. Contact Vetronix sales rep.
Free Disc Space: None specified. Contact Vetronix sales rep.
Other: Contact Vetronix sales rep. Internet connection (high-speed preferable), access to OEM calibration data required.

FAQS

1. WHAT IS "FLASHING"?

Flashing is the same as reprogramming. Much like the operating system of your PC, the calibration files of an ECU need to be updated or corrected from time to time. Flashing means the technician can update the ECU's calibration files with the ECU either on or off the vehicle.

2. WHAT DOES J2534 REQUIRE OEMS TO DO?

USEPA requires all OEMs to comply with the J2534 Pass-Thru reprogramming standard allowing reprogramming of ECUs without the need for an OEM-specific tool by June, 2005. OEMs must also make their ECU calibration files available to the aftermarket. If the OEM uses special cables or hardware, they are required to make available to tool and equipment companies, any information needed to develop an aftermarket version of the OEM-specific hardware or software.

3. WHICH VEHICLES ARE SUBJECT TO J2534?

The J2534 Pass-Thru reprogramming standard applies to reprogrammable, emission-related ECUs on model year 2004 and later vehicles, without the use of OEM-specific cables, hardware or software. J2534 also allows OEMs to use the J2534 reprogramming standard to reprogram ECUs on model year 1996 through 2003 vehicles. However, if special cables or hardware are used, OEMs must make the additional hardware available to the aftermarket.

4. DOES J2534 APPLY TO ALL VEHICLE MANUFACTURERS?

J2534 applies to all OEMs that sell vehicles in North America and support reprogrammable calibration files for emission-related ECUs.

5. WHY ARE THERE DIFFERENT VERSIONS OF J2534?

SAE J2534-1 specifies requirements for a common software interface that can be used to reprogram emission-related Electronic Control Units (ECUs) as required by USEPA regulations. SAE J2534-2 defines enhanced functionality required to reprogram additional ECUs not currently required by USEPA regulations.

6. ARE ALL J2534 PASS-THRU TOOLS THE SAME?

No. Although all Pass-Thru devices must conform to the same standard, like your scan tool, they all have different features. In addition to price differences, you'll find differences in processor speed, construction, wireless capability, optional parts, vehicle compatibility, PC requirements, cable connectors and software availability, among other differences.

7. WHERE CAN I GET UP-TO-DATE ECU CALIBRATIONS?

The USEPA requires OEMs to make their ECU calibrations available. Most OEMs make them available for download on their technical information website, but a few offer the calibration files on CD, which can be ordered from their technical information website. It is the responsibility of the OEM to keep calibration files current.

8. HOW MUCH DO I HAVE TO PAY FOR CALIBRATION FILES?

Fees vary among OEMs, but USEPA specifies that OEMs may charge a "reasonable fee" for calibration files or for the use of their technical information website. Usage of either one is usually on a daily, monthly or annual basis.

FAQS (CONTINUED)

9. DO I NEED HIGH-SPEED INTERNET ACCESS?

High-speed internet access is not usually a requirement, but it is strongly recommended. Calibration files can be large, so faster downloads mean less reprogramming time and fewer errors.

10. HOW LONG DOES IT TAKE TO REPROGRAM AN ECU?

The time varies, but a reprogramming event can take from 15 minutes to 2 hours, depending mainly on the speed of internet access and the size of the calibration file.

11. IS THE PASS-THRU DEVICE ALL I NEED TO REPROGRAM AN ECU?

No. In addition to the Pass-Thru device and cabling, you will also need a Windows-based personal computer (PC) preferably with a with a high speed internet connection. Some OEMs and/or pass-thru tool manufacturers specify minimum requirements for a PC used for Pass-Thru reprogramming. Some OEMs also specify the need for a programmable power supply or a battery charger. The Manufacturer Reprogramming Information pages in this manual spell out the require ments.

12. DO I HAVE TO BUY A NEW PC TO USE A PASS-THRU REPROGRAMMING DEVICE?

You don't necessarily have to buy a new PC. In general, late model shop-grade PCs are sufficient for Pass-Thru reprogramming. However, there are if you are in doubt, check the Manufacturer Reprogramming Information pages in this manual or visit the manufacturer's technical information website.

13. DO I NEED MY SCAN TOOL TO REPROGRAM A VEHICLE'S ECU?

Your scan tool is not required to reprogram an ECU. The Pass-Thru device is a stand-alone tool, although a few scan tools have reprogramming capability built-in.

14. DO I STILL NEED MY SCAN TOOL?

Yes, you'll still need your scan tool. Many functions, especially diagnostic (reading and clearing DTCs, Mode 6 data) and bi-directional control functions are not currently part of the J2534 pass-thru reprogramming standard.