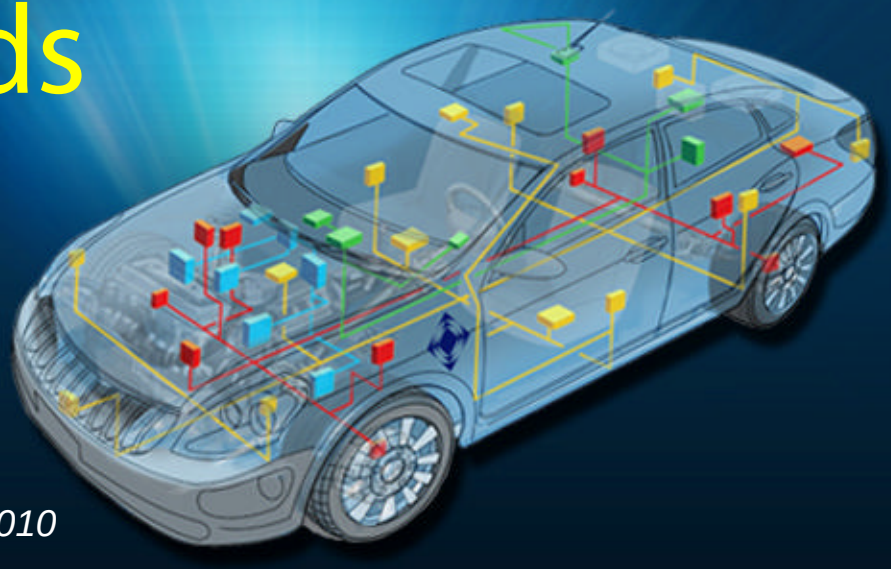
DREW TECHNOLOGIES

Global Diagnostics using SAE Standards



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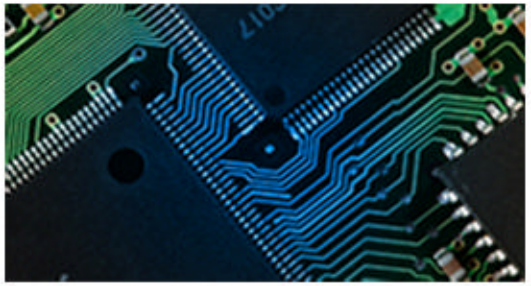
Repairing a broken business model

Presentation for SAE World Congress April 13, 2010

OEM



Standard and custom electronics for engineering and factory programs

Technician

Service tools for J2534 reflashing and diagnostics

Enthusiast

Displays for monitoring, logging, and analyzing vehicle performance

DREW TECHNOLOGIES

Today's Presentation

- Current State of the Industry
- J2534 – A Proven Standard
- Vision and Use Case
- Benefits

Factory Diagnostics Today

Development

OEM Contracts a vendor to develop the Bespoke Factory Diagnostics hardware

- May require ground-up development
- Will need a proprietary communications spec

Development takes place

- Factory Diagnostics Program
- J2534 Regulatory Application

Factory Diagnostics Today

Launch and Support

The Factory Diagnostics tool is released to dealers

J2534 application is released to the aftermarket, subscriptions are sold from the website

Eventually the Factory Diagnostics tool is offered to the aftermarket thru OEM or the Tier1.

Both Dealer Program and J2534 Application are supported thru the lifecycle

At the end of life, the hardware is discarded and the cycle begins again

Driving Change

Motivating Factor = Cost

A more affordable solution benefits EVERYONE

OEMS

- decrease development and program cost
- increase diagnostics revenue

Dealers/Repair Shops

- Lower investment in hardware allows access to needed tools
- Re-using the same hardware for longer time periods on more OEMs

Customer

- The customer can take their car ANYWHERE
- Find technicians with the right tools ensures timely, efficient repair
- Both good and bad experiences will affect brand loyalty

This concept isn't new, the one thing missing has been a proven standard to leverage.

Why hasn't the Industry Standardized Yet?

In the Past	Today
few similarities in the VCI from OEM to OEM	CAN is widespread and Tier1's provide the same ECU systems to multiple OEMs
Bespoke "handheld" diagnostics tools were very popular	Using a PC, Laptop, or Netbook is very popular
no proven standards for the vehicle communications interface	there is a proven standard that exists, SAE J2534

This concept isn't new, the one thing missing has been a proven standard to leverage.

A Standard Already Exists…

SAE's Standard – J2534

Vehicle Communications API for Reprogramming

SAE J2534 – first written in 2002

Three parts to the SAE J2534 Standard

- J2534-1: standard set of requirements for emissions reprogramming
- J2534-2: Optional set of manufacturer-specific standards
- J2534-3: Compliance test of for J2534-1 requirements

Every Major OEM selling cars in the US has J2534-compliant software

In the past 8 years, the standard has matured and has been proven over and over again

The Aftermarket has been successful using SAEJ2534 for reprogramming for 8 years, and it's demand has been growing significantly over the past 3 years.

Required in EURO5/6 for module reprogramming in the aftermarket.

SAE's Standard – J2534

Vehicle Communications API for Diagnostics

J2534 was designed to be a re-programming specification, but is capable of performing diagnostics

With factory diagnostics, the technician can use their own interface to perform factory diagnostics

This allows OEMS to use the same software stream used for diagnostics can fulfill the EPA/EURO J2534 requirements. This not only meets the requirements now, but pre-empts future regulatory requirements

Innovators:

BMW - First OEM to offer some factory diagnostics to the aftermarket with J2534.

Toyota – First OEM to offer full factory diagnostics to the dealership and aftermarket with J2534

Standardizing OEM Proprietary Requirements

Vehicle Communications API for Diagnostics

J2534-1 may be complete enough to meet the full diagnostics requirements without the use for J2534-2

J2534-2 was created as an open standard for OEMs to define special vehicle communications when needed

J2534-2 is not regulated, OEMs have expanded it to support diagnostics, security keys, and non-emissions module programming

Some recent examples:

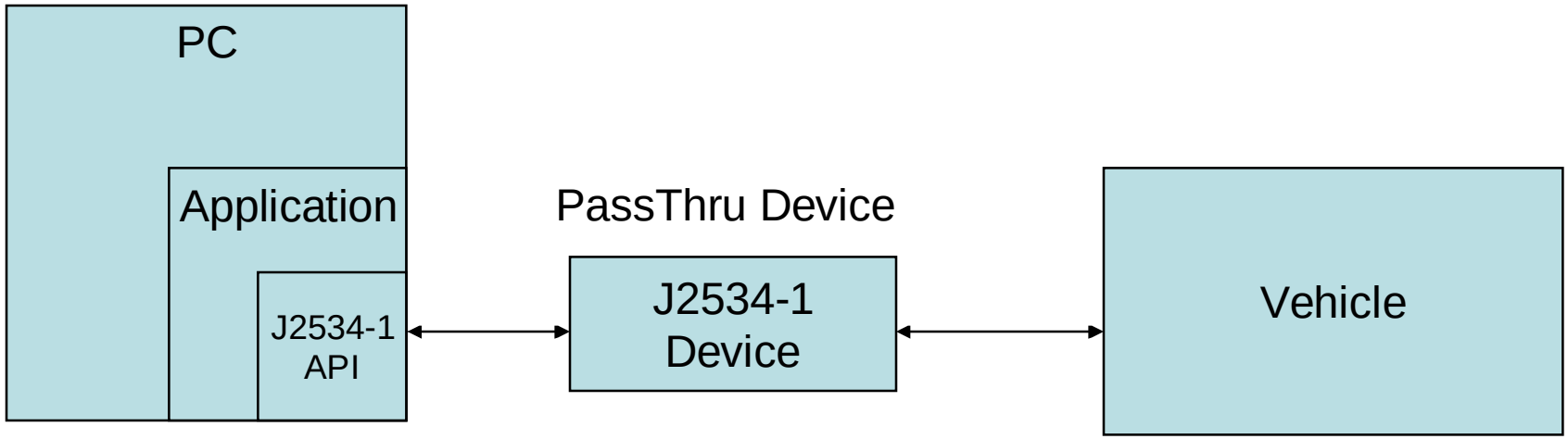
- Honda added Diag-H
- GM added UART and Single-wire CAN
- VW added TP2.0

This standard gives OEMs a mechanism to standardize and support new diagnostics protocols as technology advances.

SAE Standard – J2534

How it Works

Standard API for vehicle communications



- Commands and data sent from the Application to the J2534-1 device which passes them through to the vehicle
- Each J2534-1 device vendor supplies a Windows DLL for their device
- Devices from different suppliers all work with the same software

Intellectual Property Shift

Keeping Secrets inside the PC application

- Using SAE J2534 shifts OEM proprietary diagnostics and reprogramming secrets back into the PC application
- By moving the complexity into the application, it allows the hardware to be standardized and removes cost.
- This also allows the OEM to re-use more existing IP with each new next generation tool because the hardware is interchangeable

Vision for the Future

Use of an SAE J2534 interface in the Factory Diagnostics Program

- OEMS have a single software stream for both dealers and the aftermarket
- software subscription fee charged to technicians from the OEM
- Shop can use one tool on multiple OEMs
- Competition for SAE J2534 hardware can drive down cost

Aftermarket Use Case

Toyota Techstream J2534

Use Case

1. Car's service indicator comes on while driving

2. Customer brings car to their local independent repair shop

3. Repair shop logs onto Toyota's website and purchases short term diagnostics subscription

4. OEM diagnostics subscription is downloaded to technicians PC and connected to the vehicle using an SAE J2534 tool

5. Repair shop has the correct tools and information and successfully repairs car

Benefits of Standardizing

- Use the same application for factory diagnostics and emissions requirements
  - Simplify product support through vehicle lifecycle
  - Reduce service engineering costs – support everyone with single software stream
  - Mitigate regulatory risk by pre-empting them
- Support Dealerships and aftermarket technicians with factory diagnostics
  - Increase revenue by selling subscriptions to the aftermarket
  - Ensure swift, accurate and cost-effective repair – anywhere
  - Enhance brand image – increase likelihood of brand purchase
  - Increase market share – and dealer new & used car, parts sales
- Develop Next-Generation Diagnostics Systems Faster
  - Increase productivity by programming at a higher level
  - Insulate programmers from low level protocol details
  - Protect your software investment by separating the hardware vendor and software vendor
  - Reduce risk by removing dependency on one device supplier
  - Gain Large selection of devices each with their own price/performance tradeoff

Misconceptions about J2534

Misconception	Truth
J2534 is only a reprogramming standard, and is not suitable for diagnostics	While true that it's original intent was for reprogramming, J2534 has proven successful for diagnostics
Won't work with certain vehicles	All 2004-present vehicles must support J2534 reprogramming by EPA Regulation
Doesn't support the specific protocol our OEM needs	If the OEM's requirements aren't fully satisfied with J2534-1, the OEM can have proprietary protocols added to the J2534-2 standard
No modular or expandable	J2534 is just a hardware communications standard, it does not prevent vendors for making expandable hardware.
Too complicated or expensive to implement	Every OEM that sells car in the USA already has experience implementing J2534. While it is true that switching to J2534 will incur development cost, pairing that activity with the next generation diagnostics system could actually save cost
Standard is not clear enough to implement 2 devices from 2 different vendors	This has proven successful over the last 8 years. There are over a dozen J2534 devices in the market
J2534 is not popular or used in the aftermarket	J2534, like any other standard, took some time to develop and mature. Over the past 3 years J2534 has seen significant growth

Next Steps

- Attend SAE J2534 Programming class: C0733
- Attend SAE J2534 meetings, talk to participants
- Send RFI to J2534 vendors to get a feature/cost information on current products available


Questions?