

The PSI logo is rendered in a bold, italicized, sans-serif font. The letters are white with a subtle gradient and are set against a dark green rectangular background that has a slight 3D effect with a shadow on the right side.

PSI

**POWER SOLUTIONS
INTERNATIONAL**

PSI Alt Fuels Technology
January 21st, 2018



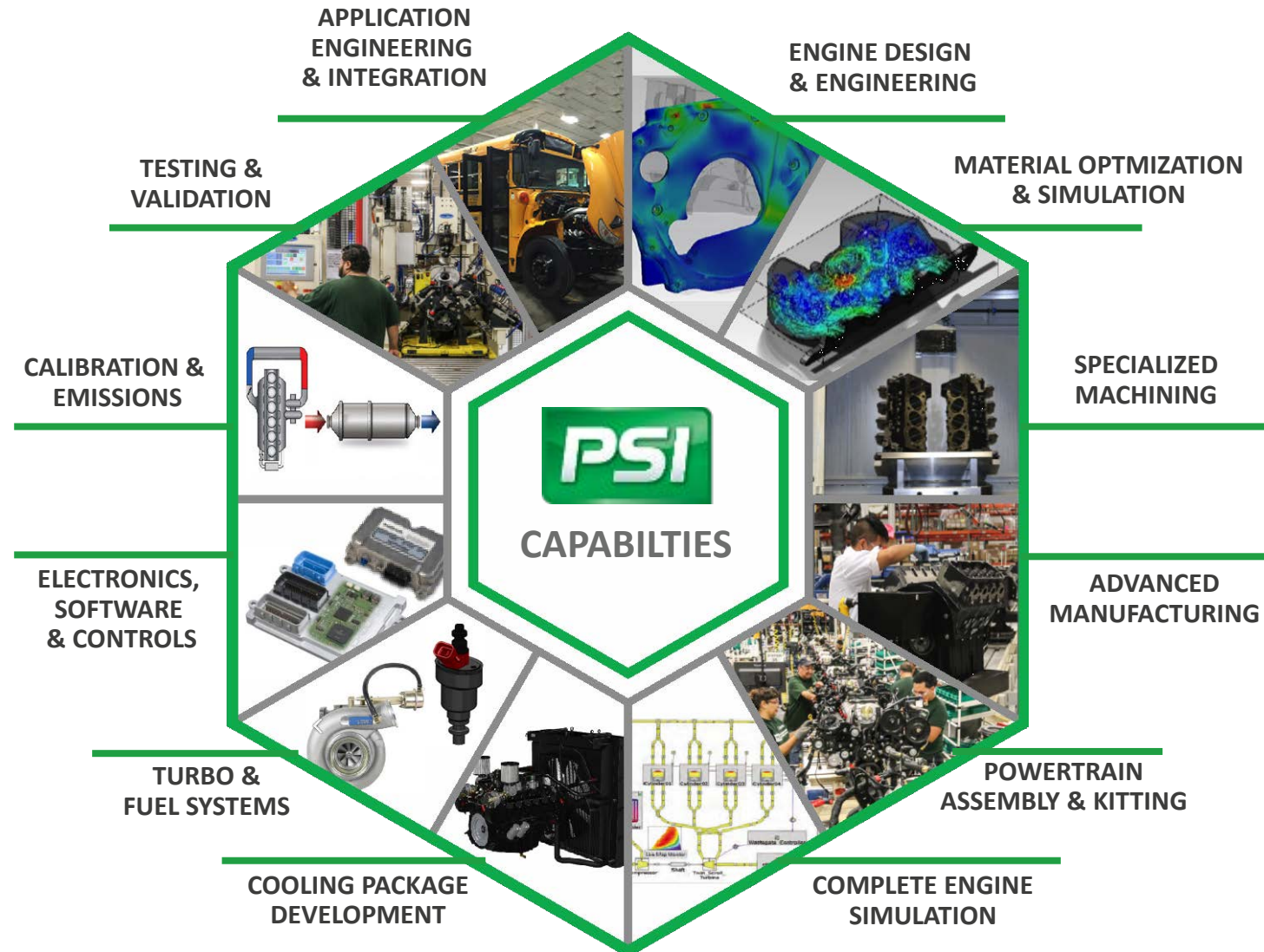
- PSI Introduction
- OEM Engine Business
 - Fuel Agnostic Strategy
 - Strategic Controls
- Specialty Vehicle Manufacturer (SVM) Business
 - Fuel Agnostic Strategy
 - Strategic Controls
- Technology Summary

Wood Dale, IL Assembly Plant





- Nasdaq: PSIX
 - Founded in 1985
 - Public listing in 2011
- Approximately 1000 employees
- Largest worldwide manufacturer of natural gas, propane, gasoline and other diesel-alternative engines
 - Produced over 60,000 engines last year
 - Wide range of engines: .99L to 29L
 - Over 800k sq. ft. manufacturing footprint, with headquarters in Wood Dale, IL
- Partnered with Weichai Power in 2017



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OEM Engine Products

INDUSTRIAL



.99L



2.0L/2.4L



3.4L



4.3L



5.0L/5.7L



8.8L

ON-ROAD



4.8L



6.0L



8.0L



8.8L



Hybrid



Transmissions

HEAVY DUTY



8.1L



11.1L



14.6L



18.3L



21.9L



29.2L

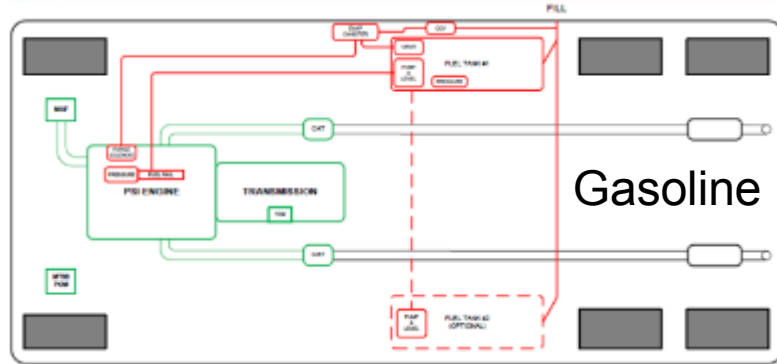
OEM Spark Ignited OBD-HD Controls

- ◆ PSI has partnered with Delphi Powertrain to develop an exclusive OBD-HD capable engine control system Exclusively for PSI V8 engines
- ◆ Derived from Delphi Certified OBD-II Core Software
- ◆ Common Controls Strategy:
 - Same controller for all PSI engines
 - Works on all fuels – gasoline, LPG, CNG/LNG
- ◆ Full Torque-based Controls
- ◆ CAN Communications Support
 - J1939 for HD applications
 - J1979 for LD / MD applications
 - Fuel Sense 2.0 support for Allison Transmissions
 - GM-LAN for 6L90E Transmissions
- ◆ **PSI can make application specific software customizations as necessary to satisfy requirements and/or to differentiate customer's products within the marketplace**



PSI'S MT88 CONTROLLER

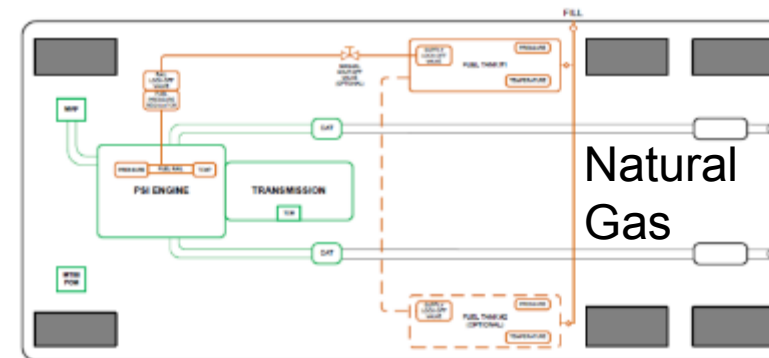
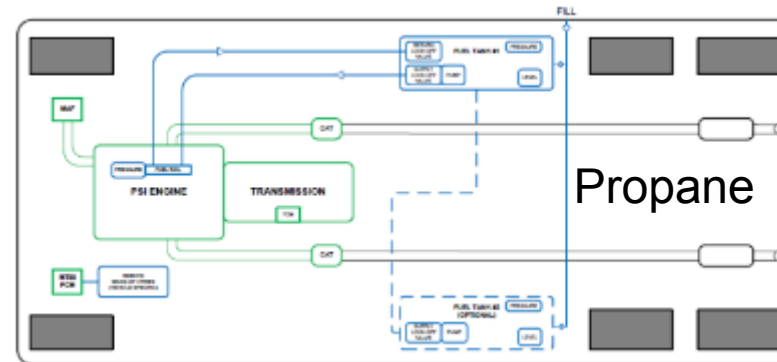
PSI Fuel Agnostic Strategy



- Common Architecture
- Common Controls
- Common Harness
- Support of 1 or 2 tanks
- Easy for Customers

Summary

- \$10M Investment to date
- Partnership with Delphi
- Launched in 2015
- OBD-HD certified
- Customized for HD OEM's
- Class 3 – 8 support



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GM Collaboration for CNG and LPG



SILVERADO & SIERRA
2500/3500 HD Pickups



EXPRESS & SAVANA
2500/3500 Vans
3500/4500 Cutaways



LOW CAB FORWARD
3500/4500 HD Trucks

4 PRIMARY MARKET SEGMENTS TARGETED



GM DEALERS



FLEETS



BODY BUILDERS



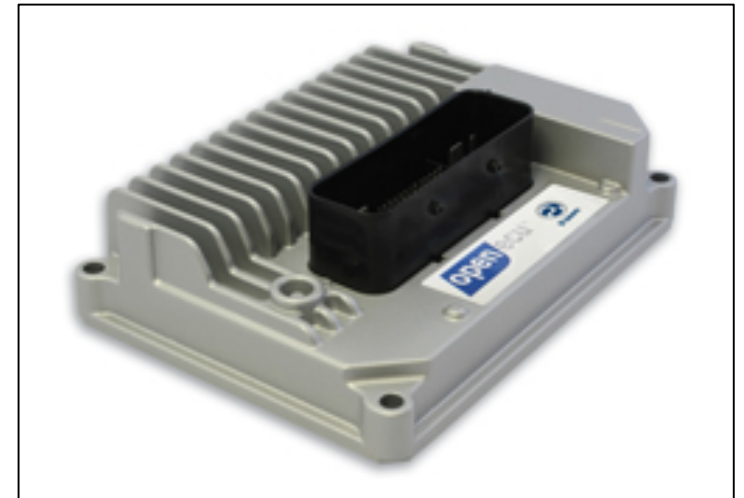
OEMS

- Agreement on 11/21/16 authorizes PSI to perform alt fuel conversions including natural gas and propane on a range of GM specialty vehicles.
- GM customers can seamlessly order and take delivery from GM dealerships.
- GM will supply vehicles equipped with a specialized version of 6.0L V-8 engine to PSI, which in turn will install the fuel system and other hardware.
- **All PSI-modified vehicles are covered by Chevrolet and GMC's five-year/60,000-mile limited powertrain warranty, a considerable value that no other aftermarket provider can offer.**

- **Technology**
 - Development collaboration with Delphi
 - Port Injected Alt Fuel (CNG or LPG)
 - Capable of Bi-Fuel or Monofuel
 - DI Injectors are thermally protected
 - Advanced Safety & Diagnostic Capabilities
 - “Plug in” Installation, No cutting or splicing
- **CANIM (CAN Interface Module)**
 - Hardware developed and validated by Pi-Innovo
 - Short circuit protection for sensor inputs
 - Firmware developed using Matlab Simulink modeling
 - 2 High Speed CAN 2.0 Channels
 - Responds to scan tool requests
 - Separate OBDII monitors for alt fuel system performance
 - Monitors system health
 - Capable of further integration with Cluster (if applicable)



5.3L manifold & PFI Fuel Rails







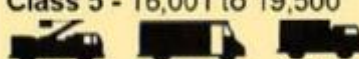

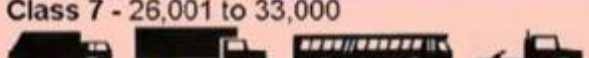

CANIM

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PSI and GM – Covering all the Spark-Ignited Bases

		Certification Type	Vehicle Network	On-Board Diagnostics	Diagnostic CAN	Diagnostic Connector	Engine Controls	
GM Focus Area	Class 1 - 6,000 & Less 	Light Duty Chassis Cert	GM-LAN	OBD-II	SAE J1979	J1962 16-PIN	GM ECM	PSI ECM MD
	Class 2 - 6,001 to 10,000 							
SVM Focus Area	Class 3 - 10,001 to 14,000 	Medium Duty Chassis Cert	Vehicle Specific (mixed)	OBD-II	SAE J1979	SAE J1962 16-PIN and SAE J1939 9-PIN		
	Class 4 - 14,001 to 16,000 							
	Class 5 - 16,001 to 19,500 							
PSI OEM Focus Area	Class 6 - 19,501 to 26,000 	Heavy Duty Engine Dyno Cert	SAE J1939 (typical)	OBD-HD	SAE J1939	J1939 9-PIN	ALT FUELS	PSI ECM HD
	Class 7 - 26,001 to 33,000 							
	Class 8 - 33,001 & Over 							

OEM Involvement for Light Duty NGV's

- Both Ford and GM take an arms length approach to participating in the conversion process.

Certification Timing

- Obtainment of ARB certification typically does not align with the OEM Model year. This causes a reduction in the market window.



PSI

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Thank you,

Jeff Hall

V.P. of Specialty Vehicle Sales

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