

Vehicle Electrification Summer Workshop

5-Day GM Product Technical Training Chevrolet Volt (Gen 1 and 2), Bolt, and Spark



Training By



Hosted By



**Portland
Community
College**

Sponsored By



Advanced Vehicle Training Group Northwest

Dates: June 24-28, 2019 (8:30AM – 4:30PM)

Location: Portland Community College – Sylvania Campus
12000 SW 49th Ave, Portland OR, 97219

Price: \$1,995 (AVTGNW Members receive 15% discount – Contact for details)

For further details and to register:

<https://www.futuretechauto.com/store/p80/SW2019>

For Additional assistance please contact us:

- Phone: 702.570.3140
- Email: service@futuretechauto.com

This hands-on and lecture technical training will provide an overview of components, operation, and core system functions of the Gen 1 and Gen 2 Chevrolet Volt, Bolt, and Spark EV. Participants can expect to learn certain diagnostic strategies, differences between model years, and product-specific information. This course is approximately 35 hours in length and lunch, snacks, and beverages will be provided daily.

About the instructor:

Alan is a certified Vehicle Electrification professional who has delivered over 30,000 hours of technical training over 28 years. For the past 12 years he has focused on development and delivery of training in Vehicle Electrification service and repair.



Alan Nagel, CVEP

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Chevrolet Volt Gen 1 and Gen 2 Course Outline:

- Introduction to EREV and Theory of Operation, Power and Energy Systems & Specifications, Primary Modes of Operation (Charge Depletion vs. Charge Sustaining Modes) Special Drive Modes (Normal, Hold, Mountain and Sport modes) GEN1 vs. GEN2
- Major EREV Systems and Components Overview, Component Locations, High Voltage Cabling, Manual Service Disconnect (MSD) and High Voltage System Disabling (Safeing) , High Voltage Interlock System, GEN1 vs. GEN2
- Detailed Lithium Ion Battery Pack- Cell Chemistry, Pack Construction, Cells and Cell Groups, Pack Power vs. Capacity, Battery Disconnect Unit (BDU) and High Voltage Contactors, Battery Management System (BMS), Lithium Ion Battery Charging System Levels 1 & 2 GEN1 vs. GEN2
- Electric Drive Units (4ET50 vs. 5ET50), Traction Power Inverter Module (TPIM), Motor Generator Units, 4 vs. 5 Modes of Operation, L-Position, Electric Drive Unit Cooling GEN1 vs. GEN2
- Internal Combustion Engine (ICE) and GenSet Features, Engine Maintenance Modes, Long Term Fuel Storage Considerations and EVAP system, Refueling System, Fuel Maintenance Mode, GEN1 vs. GEN2
- Thermal Management Systems (Battery Pack cooling and heating, Electronics cooling, Engine cooling and cabin heating/cooling (HVAC) DC-DC Converter/14V Power Module/ Auxiliary Power Module GEN1 vs. GEN2
- Electro-Hydraulic Regenerative Braking System, TRW Slip Control Boost EV Braking System vs. Bosch ESP-hev with iBooster & REGEN On-Demand GEN1 vs. GEN2
- System Diagnostic Strategy and Available Scan Tool Data-streams (OEM and Aftermarket), Loss of Isolation Diagnosis (passive and active) and available LOI data-streams, Special Scan Tool Functions (Battery capacity, statistical data resets, Lifetime mpg, Braking system reset) Clearing "Secured" High Voltage Data, Special Emission I/M Flag Function and potential issues) Module Reprogramming Strategy via SPS GEN1 vs. GEN2



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Chevrolet Bolt Course Outline:

- Introduction to Chevrolet BOLT EV, Theory of Operation, Power and Energy Systems & Specifications, Special Drive Modes (Enhanced REGEN and Sport modes)
- Major BEV Systems and Components Overview, Component Locations, High Voltage Cabling, Manual Service Disconnect (MSD) and High Voltage System Disabling (Scan Tool Method) , High Voltage Interlock Systems
- Detailed Lithium Ion Battery Pack- Cell Chemistry, Pack Construction, Cells and Cell Groups, Pack Power vs. Capacity, Battery Disconnect Unit (BDU) and High Voltage Contactors, Battery Management System (BMS),
- Lithium Ion Battery AC Charging System (Levels 1 & 2) as well as optional DC Fast Charging (DCFC) System with Enhanced Charging Status Indicators, Location Based Charging and Hill-Top Mode.
- 1ET25 Electric Drive Unit , Traction Power Inverter Module (TPIM), Motor Generator Unit, Electric Drive Unit Cooling , Precision Electronic Shifter with “annoying” Neutral and Car Wash Mode) Hidden L-Mode, Dexron HP
- Thermal Management Systems (Battery Pack cooling and heating, Electronics cooling, as well as cabin heating/cooling (HVAC) DC-DC Conversion for 12V system functionality, 14V Power Module/ Auxiliary Power Module
- Bosch ESP-hev II braking system, Regen On-Demand, 1-pedal driving and FULL-STOP regenerative braking. Front Pedestrian Braking System (optional)
- Advanced User Configurable Instrumentation with “Confidence” Gauge, Real-Time Efficiency Gauge and Energy Statistical Displays as well as discussion on using these displays as diagnostic data parameters, Passive Pedestrian Alert
- System Diagnostic Strategy and Available Scan Tool Data-streams (OEM and Aftermarket), Special Scan Tool Functions (Battery capacity, Batt ID, statistical data resets) Underhood “Service Layers” , Parts Restriction Bulletins, Remote FOB and Module Reprogramming Peculiarities , Special Service Tools vs. Essential Service Tools, Battery Smoke Testing
- Known BOLT EV Conditions & Failure Modes, Service Bulletins, Special Service Considerations (e.g. R1234yf)
- “Reduced propulsion power” and/or “Service high voltage charging system” messages due to non-factor scan tools or DLC devices, Michelin Self Sealing Tire repairs, BCM Programming Power Mode requirement, ECM/HPCM/PLCM Programming Glitches



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Chevrolet Spark Course Outline:

- Introduction to Chevrolet Spark BEV, Theory of Operation, Power and Energy Systems & Specifications, Special Drive Modes (Enhanced REGEN and Sport modes)
- Major BEV Systems and Components Overview, Component Locations, High Voltage Cabling, Manual Service Disconnect (MSD) and High Voltage System Disabling (Safeing) , High Voltage Interlock System
- Detailed Lithium Ion Battery Pack- Cell Chemistry, Pack Construction, Cells and Cell Groups, Pack Power vs. Capacity, Battery Junction Block & Relay Assembly, Battery Management System (BMS),
- NOTE* These details must be covered for BOTH Gen1 w/ A123 pack (2013-2014) and Gen2 w/LG CHEM pack (2014-2016) Lithium Ion Battery AC Charging System (Levels 1 & 2) as well as optional DC Fast Charging (DCFC) System
- 1ET35 Electric Drive Unit , Traction Power Inverter Module (TPIM), Motor Generator Unit, L-Position, Electric Drive Unit Cooling
- Thermal Management Systems (Battery Pack cooling and heating, Electronics cooling, as well as cabin heating/cooling (HVAC) DC-DC Conversion for 12V system functionality, 14V Power Module/ Auxiliary Power Module
- Electro-Hydraulic Regenerative and Blended Braking System Strategy, TRW SCB with Hydraulic Emergency Braking, L-Mode Regen
- Advanced User Configurable Instrumentation with "Confidence" Gauge, Real-Time Efficiency Gauge and Energy Info Displays as well as using these displays as diagnostic data parameters
- System Diagnostic Strategy and Available Scan Tool Data-streams (OEM and Aftermarket), Loss , Special Scan Tool Functions (Battery capacity, statistical data resets, Active and heater Isolation Tests) Underhood "Service Layers" , Remote FOB and Module Reprogramming Peculiarities , Automatic Pedestrian Alert
- Known Conditions, Failure Modes, Service Bulletins, Special Service Considerations (e.g. R1234yf)

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