

Course Length: 2-days

HEV / PHEV / EV Battery Testing, Conditioning, and Rebuilding Course:

As Hybrid Electric Vehicle (HEV) population continues to grow in the service market, Plug-In Hybrid Electric Vehicle (PHEV) and Electric Vehicles (EV) begin to emerge into the service market there are more opportunities than ever for servicing the rechargeable energy storage (battery pack) system. There are tremendous opportunities for not only the education/training arena but, there are equally or more opportunities in service related businesses. The HEV / PHEV / EV Battery Testing, Conditioning, and Rebuilding course is designed to provide attendees the education and training on how to properly test, condition, and/or rebuild battery pack systems. Whether the battery pack system is from a Ford, GM, Honda, Lexus, Toyota – or other OEM – testing conditioning and/or rebuilding is an option for a service provider or for an automotive instructor to teach students about servicing advanced automotive propulsion energy systems. Currently, OEM service strategies do not include detailed testing or conditioning of battery pack systems. Conditioning or rebuilding of a battery pack system is a cost effective method of providing customers with a battery pack service when compared to the cost of a new or used battery pack – or a complete battery pack module replacement. This is a 70% hands-on course concentration. Participants will be disassembling, testing, conditioning, and rebuilding battery packs in this course. Some of the areas of where the elements of this course can be used in the college classroom and/or in the field of HEV/PHEV/EV repair:

- ❖ Customers with "out-of-warranty" vehicles can receive inexpensive analysis and repair on their battery pack system
- ❖ Analyze all battery pack modules to determine if any battery modules need to be replaced or, if the battery pack needs to be conditioned by using empirical (statistical) data that removes subjectivity from the analysis
 - Results are documented and graphed to visually illustrate the condition of the battery pack
- ❖ Partner with aftermarket service providers, used car businesses, or specialty service businesses to provide battery pack analysis and rebuilding services as a sublet service
- ❖ Educational institutions can offer their automotive technology students enhanced skills in analyzing and rebuilding battery pack systems as part of their curriculum

Course Objectives:

At the completion of this course attendees will be able to perform and/or complete the following analysis tasks:

- ✓ Interrogate the vehicle for battery pack system for diagnostic codes
- ✓ Determine the battery sub-systems that can, and cannot, be rebuilt/serviced
- ✓ Inspect the battery pack for corrosion, battery module venting, and overall mechanical integrity
- ✓ Perform High Voltage battery module analysis by performing Power, Energy, and Temperature testing
- ✓ Analyze battery data to determine whether the battery pack needs module replacements or conditioning
- ✓ Perform High Voltage battery charging
- ✓ Create a detailed specification sheet for each battery pack that is tested, conditioned, or rebuilt

Tools and Equipment that will be used in this course:

- High Voltage Battery Charger
- Battery Discharge Unit (BDU) – *AR&D Proprietary microprocessor controlled BDU system*
- Infrared Thermometer
- Laptop Computer (to analyze data from AR&D BDU software)
- Serial Data (scan) tool
- DVOM
- Electrical Safety Gloves

Participant Course Materials (included):

- Participant Workbook/Manual
- Instructor PowerPoint