

Course Description:

Advanced Electric Drive Vehicle Technician Training **Get "hands-on" experience from extensive shop activities**

Electric drive vehicles, including Hybrid-Electric Vehicles (HEVs), Battery-Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), Fuel Cell Electric Vehicles (FCEVs), and Extended Range Electric Vehicles (EREVs) are appearing on America's highways in ever increasing numbers. As a consequence, the need for qualified technicians to service and maintain these vehicles is growing rapidly. This five-day hands-on course is designed for the professional technician or automotive student and will teach you safety, service procedures, computer diagnostics, vehicle systems, battery technologies, and the nature of electricity as an automotive fuel source.

Why Electric Drive Training?

The Advanced Electric Drive Automotive Technician Education courses offers training for automotive technicians to gain a better understanding of advanced electric drive vehicles. The course will cover the fundamentals, system design, diagnostic considerations and special service topics of HEVs, BEVs, PHEVs, FCEVs, and EREVs.

The course also explains appropriate safety measures in maintaining advanced electric drive vehicles and describes electric propulsion systems including the construction, operation, control strategies, service tools, scan tool data, and basic diagnostic fundamentals. Course objectives include coverage of required fundamentals, system design and operation, *diagnostics*, service and repair of HEVs, BEVs, PHEVs and FCEVs. Adhering to appropriate and necessary safety measures for each type of vehicle will be emphasized. The electric propulsion systems will be described including construction, operation, control strategies, service tools, scan tool data, and basic diagnostic fundamentals. Auxiliary systems required by these alternative power trains, such as (but not limited to) electric power steering and electric air conditioning compressors, will be explained. The course has a heavy incorporation and concentration on hands-on shop time and lab activities.

The number of electric drive vehicles is growing every year. Mandates such as the Federal Energy Policy Act require most large fleets to include alternative fuel vehicles (AFVs) in ever-growing numbers. In addition, many consumers have chosen to buy and drive electric drive passenger vehicles for both economic and environmental reasons.

All of this means that the demand for AFV technicians is increasing dramatically. The AFV technician needs to know everything that is currently applicable to servicing automobiles, along with new electric vehicle technology. This course meets the needs of the technician, the employer, the fleet operator, and the training institution.

Course Objectives

Taught by certified **NAFTC** instructors, this five-day course contains an equal mix of classroom lecture and shop activities, exercises, diagnostics and repair, including major component removal and refit, battery removal and reinstallation, along with hands-on motor-generator (MG) disassembly and diagnostics. After the course, the technician will be able to:

- List personnel and shop safety procedures on high voltage and electric drive vehicles
- Describe the different Advanced Electric Drive (AED) vehicle configurations
- Explain the procedures for start-up, operation, and shut-down of AED vehicles
- List the tools necessary for effective and safe AED vehicle diagnostic and repair, including OEM computer scan tools
- Describe the various battery technologies and charging schemas for electric drive vehicles
- Demonstrate the ability to remove and reinstall major hybrid vehicle components
- List the major electric vehicle components and explain their operation

- Describe the operation and components in a hydrogen fuel cell
- Explain the common maintenance procedures necessary for AED vehicles
- Demonstrate a working knowledge and diagnostic capabilities in relation to AED transaxles and transmissions
- Describe electric motors and their relationship with regenerative braking

Course Materials Provided to the Participant:

- Participant Manual - including review questions and learning activities*
- Program certificate

Course Materials Provided to NAFTC Members participating in Train-the-Trainer session:

- Instructor Manual - including course agenda and planning notes
- Participant Manual - including review questions and learning activities
- Lesson plans
- Case studies
- Extensive shop activities
- Training aids (PowerPoint presentation, Flash animations, etc.)
- Exam question pool (pre- and post-test)
- Original Equipment Manufacturer (OEM) specific information
- Lesson plans
- Workshop curricula
- Practical exercises
- Surveys
- List of suggested hands-on training aids for shop tasks

Please contact info@ev-institute.com for additional details and class pricing.

**Each module of the Participant's Manual contains text, illustrations, explanatory figures and tables, module review questions, and a list of key terms and abbreviations.*