

**CVG01 HEAVY-DUTY TRUCK SYSTEMS (4 DAYS)**

Technicians will learn the operation, troubleshooting, and repair of many main mechanical systems on heavy-duty vehicles. Systems covered include: main and cab air suspension systems and adjustment, clutch and linkage operation and adjustment, power steering systems, wheel ends, air supply and delivery systems, and air brake systems.

**CVG02 DTNA INFORMATION RESOURCES (1 DAY)**

This course is the foundation of the Service Training Academy vehicle training curriculum. In this course, technicians will learn to access and use the DTNA and vendor service literature that underpins all troubleshooting and repair efforts. By learning the correct way to approach vehicle maintenance, technicians can avoid common pitfalls that cost the technicians and dealerships time and money.

**CVE05 ELECTRONIC SYSTEMS (4 DAYS)**

Technicians will learn how state-of-the-art electronic control systems on today's medium and heavy-duty trucks generally work including how ECUs monitor a variety of sensors, determine appropriate actions, and control outputs. They will learn specifically how sensors work and how to confirm proper operation of various sensors including speed sensors, temp sensors, position sensors, pressure sensors, Hall effect sensors. Technicians gain an in-depth understanding of each system including location of system components, how the system and components communicate, essential troubleshooting skills, electrical diagnostics, and the use of MID's, SID's, PID's, and FMI's for diagnostic purposes. Course objectives include: inputs, outputs, and controls, J1708/1587, 1939, multiplexing, CAN networks, DiagnosticLink operation and interpretation, ABS systems troubleshooting, vendor and OEM circuits, and understanding the 7-step troubleshooting process.

**CVE06 CEEA+ COMMON ELECTRICAL AND ELECTRONIC ARCHITECTURE (3 DAYS)**

This professional level course will provide the technician with an in depth understanding of Common Electrical and Electronic Systems on the DTNA vehicles that utilize it. The CEEA class covers the Single SAM system that is used on the New Cascadia and new Western Star trucks. The class covers the power distribution thru the truck, the electronics, new datalinks, and goes thru the understanding of the wall charts.

**CVE12 ELECTRICAL TROUBLESHOOTING (4 DAYS)**

Designed to guide technicians through a step-by-step process to understand and analyze electrical circuitry, this course prepares technicians to understand schematic circuitry diagrams and wiring harness drawings, learn best test points, and perform hands-on diagnosis and testing of DTNA vehicles. Technicians will review electrical fundamentals as they apply to DC circuits. They will build series, parallel, and series parallel circuits as well as multiple circuits with relays and multiple controls for the purpose of understanding electrical circuit operation and problem conditions. They will learn when, how, and why to use the various modes of a digital multimeter to isolate problems circuits plus additional resources including Parts Pro, Excelerator, EZWiring, and other DTNA resources.

**CVH02 HVAC DIAGNOSTICS (4 DAYS)**

Technicians will learn the components, operation, control, and diagnostics of the HVAC system. They will learn fundamental laws of heat energy and heat transfer as related to HVAC systems and will use this knowledge to better understand refrigerant system operation, performance testing, and gauge-driven diagnostics as well as related service procedures, recovery, evacuation, and charging. Technicians will learn where to find maintenance information through various resources as well as techniques on how to service the HVAC system. Course objectives include: overview of heating and A/C systems, auxiliary system, service and diagnostic procedures, system electrical fundamentals, blend air, performance testing, ParkSmart and BPHS system operation, recycling, and safety procedures.

This course is not a supplement for, nor does it meet the EPA Section 609 regulations from the Clean Air Act Amendments of 1990. Please visit the EPA site ([www.epa.gov](http://www.epa.gov)) for more information on this certification program.

**CVL02 BUSINESS CLASS M2 (4 DAYS)**

This expert-level course will provide the technician with an in-depth understanding of the Business Class M2's multiplexed electrical system. Technicians will learn the functions, operation, and troubleshooting techniques for electronically controlled systems to include lighting, instrumentation, HVAC, body builder interface, air management system, and the multiplexed electrical system. Technicians will use all available resources such as, DiagnosticLink, Vehicle Info, PartsPro, Excelerator, and EZWiring to isolate and repair problems in all vehicle systems. Technicians will use DiagnosticLink to monitor vehicle systems operation, change/add parameters, and flash vehicle ECUs.

**CVL05 CASCADIA - ALL MODELS (4 DAYS)**

This expert level course builds upon skills learned in the CVE06 - Common Architecture course and applies them to Cascadia vehicles. Students will learn power distribution, ECU communication, and troubleshooting issues specific to Cascadia vehicles. Technicians will learn the functions, operation, and troubleshooting techniques for electronically controlled systems to include lighting, instrumentation, HVAC, and the multiplexed electrical system including information about vehicle data links. Technicians will use all available resources such as DiagnosticLink, Vehicle Info, PartsPro, Excelerator, and EZWiring to isolate and repair problems in all vehicle systems. They will use DiagnosticLink to monitor vehicle systems operation, change/add parameters, flash vehicle ECUs, and have hands-on troubleshooting opportunities after the classroom instruction portion of the class.

**CVL06 WESTERN STAR (4 DAYS)**

This expert-level course is designed to provide experienced technicians with an in-depth understanding of Western Star's electrical system. Technicians will learn the functions, operation, and troubleshooting techniques for all electronically controlled systems including lighting, instrumentation, HVAC, and multiplexed electrical systems. Additional topics include: the air system, suspension, and steering options to familiarize them with the brand. Various resources including Vehicle Info, PartsPro, Excelerator, Western Star Legacy Information (StarNet), and EZWiring will be utilized to help isolate and repair problems.

**CEP42 DD HEAVY-DUTY - BASIC DIAGNOSTICS ILT  
(4 DAYS)**

In this course, technicians will be introduced to all the core competencies required of DD engine diagnostics. Key sections include how to gather important service information stored on the DTNA network, relating concepts of basic electricity to the DD engine sensor system, detailed usage of the DiagnosticLink electronic service tool, how to program engine controller using DiagnosticLink professional, and an overview of using DDEC Reports.

**CEP43 DD HEAVY-DUTY - MAJOR REPAIR ILT (5 DAYS)**

This course covers DD heavy-duty major repair with an emphasis on the systems of the engine (air, coolant, lube, fuel). As the technicians disassemble and reassemble the engine, they will learn how to properly use Technical Literature for tasks including how to set the gear train and gear lash, set valve lash, and engine brake lash. The course will cover component differences that the technician will see between the different releases of DD engines (EPA07, EPA10, GHG14, GHG 17, and Gen V engines) as well as basic failure analysis of key components.

**CEP70 DD MEDIUM-DUTY DIAGNOSTIC/MAJOR REPAIR  
(4 DAYS)**

This course is split into two sections. One section is the Major Repair on the DD5 engine, and the other is the diagnostic on the DD8 engine. This class is 95% hands on learning. Part one covers the major repair of the engine with emphasis on the systems of the engine (air, coolant, lube, and fuel). As the technicians disassemble and reassemble the engine, they will learn how to properly use Technical Literature for tasks including how to set the gear train, gear lash, set the valve lash, and engine brake lash. The course will cover component differences the technician will see between the Heavy-Duty DD and the Medium-Duty engine. Part two covers the live troubleshooting of various possible engine failures and tooling to repair them, including the usage of the DiagnosticLink electronic service tool panels.

**CEA01 DD HEAVY-DUTY - AIR & ATS DIAGNOSTICS ILT  
(3 DAYS)**

This advanced course is focused on the components, operation, and diagnostics of the DD engine's air and after treatment system. On the air system side of the course, we will look at the evolution of the turbocharger and EGR system components over the different DD engine releases. Technicians will learn the proper operation and diagnostics of air system components (both electronic faults and symptom-based issues). The ATS system will include a detailed study of the DOC and DPF filters, their related sensors, and all aspects of the regeneration process. The SCR system will be covered by examining the major components of both the air-assisted system (EPA10) the liquid-only system (GHG14, GHG17), and the Gen V Global Aftertreatment System 2.0. Technicians will study ATS diagnostic procedures via both fault code and symptom-based issues with a combination of log file analysis and hands-on exercises.

**CEA02 DD HEAVY-DUTY - FUEL SYSTEM DIAGNOSTICS ILT  
(4 DAYS)**

This advanced course will provide an in-depth look at how all the components of the fuel system from the fuel tank to the injector work together on a properly running engine. Based on that knowledge, technicians will learn how to use the latest electronic service routines and troubleshooting to diagnose fault codes or symptom based failures on the fuel system. The course will cover the evolution of the DD engine fuel system from its initial EPA07 release through the latest Gen V version.

**CVG18 DT12 TRANSMISSION (3 DAYS)**

In this specialized course, technicians will cover the component identification, basic mechanical transmission operation, using special transmission tools for key service procedures, using the special transmission service routines in DiagnosticLink, transmission diagnostics with an emphasis on log file analysis, and basic parameter management.

**CVD13 VIBRATION ANALYSIS (2 DAYS)**

This two-day instructor-led course is intended to provide technicians with the knowledge and skills necessary to diagnose and troubleshoot vehicle vibration-related concerns. The course introduces the basics of vibration theory, the use of vibration software, and other vibration-related tools to properly diagnose and correct the root cause issue.

**CVX01 FCCC SERVICE AND MAINTENANCE (2 DAYS)**

Freightliner Custom Chassis Corporation (FCCC) vehicles are covered in this class. Students will become familiar with FCCC Manuals and Maintenance procedures on Motor homes, School Bus, Walk-in Van and shuttle Buses. Component location and access will be stressed as well as Freightliner responsibilities. Students will also learn the differences in FCCC product drawings and schematics.

**CVX02 FCCC ALL INSTRUMENT PANELS (1 DAY)**

In this course the technician will gain a working knowledge about electrical components, system problems and diagnostics of System III, MMDC, Ametek, Optiview, Drivetech dashes used in the MT chassis, shuttle bus, XC Motor Home. They will use schematics to trace circuits and diagnose problems. This class will also include the new Standard Wiring Harness and Schematic Locations on Excelsior and E-Z Wiring. (System III and MMDC is only used on older XC Motor Home, XB Shuttle Bus products and briefly covered.)

**CVX03 FCCC 6.0L AND 6.6L GASOLINE TRAINING WALK  
IN VAN CHASSIS (1 DAY)**

The Techs will be shown Diagnostics & Drivability and code retrieval. The Freightliner techs will be shown how to retrieve active and non-active codes. They will be given instructions on how to use a generic code reader for E78 controllers. They will also be taught the importance of the gateway module and how it interacts with the J1939 data line. Then will be shown how to use and retrieve codes with Detroit Diagnostic Link 8, on the new MT88 Controller. The techs will be given information on the NEW 6.6L ENGINE. THE OVERVIEW, FUEL SYSTEM, DIRECT INJECTION, OIL SYSTEM. Will be shown diagnostic manuals and procedures for all engines.