Service Training Customer Classes

Electronic Technician (ET)
CC 001

Length: 8 hours (1 day)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price, Marty Cirbo, Jim Hottenroth, William Boorman, Eric Joss, George Guzman, Mike West, Eric Leeman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course provides instruction on the installation, updating procedure, and use of Electronic Technician software and the required communication adapter. Students will receive instruction on ET as a service tool and be able to demonstrate the features of ET software.

Note: Participants must bring their own laptops with the latest version of Electronic Technician, the communication adapter, and cables they currently have available.

Course Objectives:
- Navigate through ET functions of status, diagnostic and event codes, configuration tool, special tests, data logger, real time graphing, and ET preferences
- Connect, use, and perform basic data link troubleshooting using the Caterpillar communication adapter

Introduction to Electronic Technician (ET)
CC 003

Length: 4 hours (.5 day)

Course Format: 75% ILT, 25% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price, Marty Cirbo, Jim Hottenroth, William Boorman, Eric Joss, George Guzman, Mike West, Eric Leeman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is for first time users or those who want to make the best use of this service tool. Students learn how to save screens, use diagnostics, use drop down menus, and other tools in Electronic Technician.

Course Objectives:
- Use Electronic Technician as an effective diagnostic tool
- Navigate through the ET application

Service Information Systems (SIS)
CC 002

Length: 4 hours (.5 day)

Course Format: 25% ILT, 75% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price, Jim Hottenroth, William Boorman, George Guzman, Mike West, Eric Leeman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
SIS is a computer-based program that is compatible with Windows 2000 and XP and is used to access parts books, disassembly and assembly, testing and adjusting, systems operations, and specification information.

Note: Participants must bring their own laptop with the current version of SIS.

Course Objectives:
- Use SIS to access service manual information
- Navigate in SIS

Cat Machine Walk-Around and Maintenance
CC 020

Length: 4 hours (.5 day)
Course Format: 0% ILT, 100% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo, Jim Hottenroth, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Participants learn to locate and explain warning signs and labels, locate and identify switches on the machine, perform a walk-around inspection, and learn basic maintenance procedures for that particular machine.

Course Objectives:
- Identify and locate all filters
- Locate all lubrication points
- Locate all fluid level check points
- Locate and understand all warning labels

ISO Symbols
CC 021

Length: 8 hours (1 day)
Course Format: 80% ILT, 20% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Jim Hottenroth, William Boorman, Eric Leeman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Participants learn to recognize and interpret graphic fluid power symbols. They compare and contrast pictorial diagrams with ISO symbols by converting system pictorial schematics to an ISO diagram.

Course Objectives:
- Read ISO schematics and determine how the component operates
- Trace oil flow through the system
- Learn what the symbols mean

Air Conditioning Theory and Service Procedures
CC 022

Length: 12 hours (1.5 days)
Course Format: 35% ILT, 65% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Eric Leeman, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is for experienced and entry-level technicians that work on mobile air conditioning. Discussed are principles, theory, and operation of the air conditioning system. Also covered are heat transfer, component functions, troubleshooting, and repair of the system. This class consists of both lecture and lab sessions and includes a pre-assessment and a post-assessment.

Course Objectives:
- Identify the type of AC (air conditioning) system
- Describe how the refrigerant travels through the system and state of the refrigerant as it moves through the system
- Understand the principles of heat transfer and what affects AC performance
- Explain gauge readings and expectations for a properly operating system, as well as systems pressures on a broken system
- Demonstrate an efficient way to leak-test and diagnose an air conditioning system prior to making repairs

Air Conditioning 609 Certification
CC 023

Length: 4 hours (.5 day)
Course Format: 100% ILT, 0% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Eric Leeman, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course uses MACS's Training and 609 Certification Program to satisfy the United States EPA Clean Air Act for the proper handling and servicing of all mobile air conditioning refrigerants. Participants passing the MACS examination at the end of the session will be certified to service mobile air conditioning systems.

Course Objectives:
- Understand Federal 609 requirements for servicing air conditioning
- Be authorized to service and repair mobile air conditioning systems

Electronically Controlled Steering and Brake System
CC 030

Length: 8 hours (1 day)
Course Format: 60% Class, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Participants learn to identify, locate, and explain functions and operations of electronically controlled steering and brake systems. Participants learn to identify and explain the steering and brake valve, priority valve, finger tip controls, parking brake switch, service brake sensor, right and left steering sensors, service brake switch, electronic control module, clutch and brake pressure taps, parking brake, secondary brake valve, priority valve pressure tap and adjustment screw, and converter inlet pressure adjustment (D6R and D7R only).

Course Objectives:
- Test and adjust pressures using 8C8195 clicker box and ET
- Trace the flow of oil through the system during a posttest for the following conditions: sharp right turn and service brakes engaged
- Test the priority valve and steering and brake valve pressures
- Diagnose and repair a reported complaint in the steering and brake system

Wheel Loader Walk-Around and Maintenance
CC 031

Length: 4 hours (.5 day)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Participants learn to locate and explain warning signs and labels, locate and identify switches on the machine, determine steering type, perform a walk-around inspection, and identify the alert indicators that are level 1, 2, or 3.

Course Objectives:
- Identify and locate all filters
- Locate all lubrication points
- Locate all fluid level check points
- Identify Level 1,2 and 3 warning categories
- Locate and understand all warning labels

Troubleshooting
CC 039

Length: 8 hours (1 day)
Course Format: 80% ILT, 20% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Marty Cirbo, Eric Leeman, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is designed to develop skill in the area of basic troubleshooting techniques. The class is designed to train the participants to accurately and logically use a troubleshooting process to achieve answers to problems. This process teaches a logical step-by-step process that can be used in any troubleshooting situation.

Course Objectives:
- Distinguish between expert and novice performance
- Describe the troubleshooting process
- Identify and use appropriate service materials
- Work a problem from start to finish

VIMS
CC 045

Length: 24 hours (3 days)
Course Format: 80% ILT, 20% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo, Dan Price
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
VIMS, the Vital Information Management System, is used to monitor all the vitals on machines. Participants learn how to monitor a machine's vital information and use that to make appropriate, timely maintenance decisions. Basic laptop computer skills are required.

Course Objectives:
- Download VIMS information from a machine to a laptop computer
- Merge and review VIMS data
- Take vital snapshots
- Use the data logger to graph information
- Use prognostic information to make maintenance decisions
- Analyze production data

Hose and Coupling Assembly
CC 059

Length: 16 hours (2 days)
Course Format: 45% ILT, 40% Lab, 5% Web
Prerequisite(s): None
Instructor(s): Dan Price
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Anyone interested in becoming a certified hydraulic hose and coupling assembler will benefit from this class. The course covers hose identification, coupling identification, hose assembly identification, hydraulic hose assembly, tooling, contamination control, and use of reference materials.

Course Objectives:
- Explain the basics of hose and coupling identifications and standards
- Demonstrate assembly and disassembly techniques of reusable couplings
- Crimp permanent couplings
- Explain and demonstrate quality inspection processes and contamination techniques

Applied Failure Analysis I
CC 077

Length: 40 hours (5 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price
Student Maximum: 10
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is designed to instruct service personnel on the techniques and procedures required to correctly identify probable causes of failure. Students gain knowledge and develop skills by utilizing the basics of metallurgy, characteristics of wear, fracture identification, and proper visual examination of failed components. After instruction in these basics, students then learn to apply the fundamentals to major components of diesel engines.

Course Objectives:
- Use the eight steps of failure analysis
- Define specific wear and fracture patterns
- Perform report functions to include correct terminology
- Use visual examination aids
- Apply knowledge to a series of failed components

Foundational Preventative Maintenance
CC 101

Length: 8 hours (1 day)
Course Format: 20% ILT, 75% Lab, 5% Web
Prerequisite(s): None
Instructor(s): Dan Price, Eric Leeman, William Boorman
Student Maximum: 10
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This workshop is a foundational level, instructor-led laboratory course to instruct Preventative Maintenance Technicians on conducting and documenting PM4 Maintenance Interval Schedules (MIS) and TA1 Technical Analysis Walk-Around Inspections.

Course Objectives:
- Demonstrate competency in performing a PM4 Maintenance Interval Schedule using best-practice techniques
- Demonstrate competency in performing a TA1 Technical Analysis Walk-Around Inspection using best-practice techniques
- Use checklists to document and guide the work

Contamination Control
CC 103

Length: 4 hours (.5 day)
Course Format: 100% ILT, 0% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Marty Cirbo, Jim Hottenroth, Eric Leeman, William Boorman, Shawn Brown
Student Maximum: 15
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class provides participants with the skills and knowledge required to effectively implement contamination control and review a contamination control self-review.

Course Objectives:
- Define contamination
- Determine responsibility for contamination control
- Define micron rating
- Identify sources of contamination
- Take a proper oil sample

Undercarriage Fundamentals
CC 111

Length: 4 hours (.5 day)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price, Jim Hottenroth, William Boorman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This unit discusses undercarriage components, operation, maintenance, and options of track type machines.

Course Objectives:
- Identify the components of the undercarriage
- Demonstrate an understanding of wear and undercarriage operation
- Demonstrate an understanding of required maintenance
- Demonstrate an understanding of application choices

Standby Generator and Emergency Power Systems
CC 199

Length: 16 hours (2 days)

Course Format: 80% ILT, 20% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Marty Cirbo, George Guzman

Student Maximum: 25

Student Minimum: 15

Course Cost: $595.00

Course Description:
In the field of emergency power generation; the ability to understand, maintain, test, and troubleshoot standby equipment is an absolute must. It is no longer acceptable to have equipment installed with the assumption that it works. More and more frequently; engineers, maintenance technicians, and facility managers are becoming aware of the critical role proper electrical energy planning plays in the survival of their facility in the event of a power outage. This course is designed to take the mystery out of onsite power generation and provide the peace of mind knowing that the facility is ready for anything.

This seminar begins with an introduction to the basics of generators and prime movers including a review of basic electrical fundamentals and the different generator types. Next, students are taken through typical generator and engine control systems. Recommended maintenance and testing activities are also covered during this discussion.

Course Objectives:
- Understand the basics of parallel operation, stand-alone systems, and load sharing
- Adjust KVAR's to control the power factors
- Understand basic troubleshooting and proper applications of various generators
- Troubleshoot
- Go back to their workplace and immediately apply what they have learned

NPI - Tier 4 Interim
CC 027

Course Length: 4 hours (.5 day)
Course Format:100% ILT, 0% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Dan Price, Shawn Brown
Student Maximum: 20
Student Minimum: 4
Course Cost(s): Please refer to Pricing Policy on page 5

Course Description:
This course is an introduction to the Tier 4 Interim emissions changes to Caterpillar machine engines.

Course Objectives:
- Describe the Cat solutions for Tier 4 Interim NOX reduction and PM reduction
- Outline the air flow through the intake, exhaust, and after treatment systems
- Identify and explain the role of each component in the following emissions systems: NOX reduction system, clean emissions module, asymmetric turbo and balance valve, and crankcase ventilation

3400 Hydraulic Electronic Unit Injected Engine (HEUI)
CC 028

Length: 16 hours (2 days)
Course Format: 55% ILT, 45% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo, Dan Price, Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course covers component identification, location, function, and service. Learn to trace oil flow, fuel flow, and current flow through the 3400 HEUI engine. Students learn about analog and PWM sensors. Lab will consist of the use of ET and basic troubleshooting tests.

Course Objectives:
- Identify the major components of a 3400 HEUI engine
- Understand HEUI function
- Trace oil circuit of a 3400 HEUI
- Trace the fuel circuit of a 3400 HEUI

1.1 Liter Engine Injector Synchronization
CC 032

Length: 12 hours (1.5 days)

Course Format: 25% ILT, 75% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Marty Cirbo, Dan Price, Jim Hottenroth, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course provides classroom instruction, as well as lab practice to cover injector synchronization, fuel settings, and timing on 3114, 3116, and 3126 MUI engines using the 223-2454 Caterpillar tool group. Students participate in a four hour lab exercise to remove, install, and ream injector coppers on the last day of the class using the 143-2099 and 173-1530 Caterpillar tool groups.

Course Objectives:
- Find top dead center on the above engines
- Use Caterpillar method and tooling for injector synchronization, fuel setting, timing, and overhead on the above engines
- Properly remove and install injector coppers
- Know when to ream or not ream injector coppers
- Properly ream injector coppers

3126/C7/C9 Engines
CC 040

Length: 32 hours (4 days)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): CC 53

Instructor(s): Dan Price, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course provides technicians with the knowledge and skills required to diagnose and repair 3126, C7, and C9 HEUI (hydraulic electronic unit injected) truck engines using systems operation, testing, adjusting, troubleshooting, and service training material. Students are also introduced to Caterpillar common rail fuel system used on 2007 C7 and C9 ACERT engines. This course is a mix of classroom lecture and hands-on lab sessions.

Course Objectives:
- Explain the basic design features of the 3126, C7, and C9 engines
- Understand electronic, fuel, lube, air, and cooling systems on 3126, C7, and C9 engines
- Use ET to perform basic troubleshooting for 3126, C7, and C9 engines

Cooling Systems
CC 046

Length: 24 hours (3 days)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Marty Cirbo, Dan Price, Jim Hottenroth, Eric Leeman, William Boorman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class covers cooling systems and troubleshooting guidelines. It is designed to help both experienced and less experienced technicians improve cooling system understanding and diagnosis. Course content is acceptable for both truck and machine technicians. Those attending should understand basic engine and system operation. Topics include coolant and your engine, know your cooling system, machine and truck engine fluid recommendations, general rule of thumb, and useful formulas and tolerances.

Course Objectives:
- Understand cooling system operation and design
- Understand cooling system maintenance
- Diagnose cooling system problems using pressure and Delta T Methods

OPT Overhaul
CC 048

Length: 32 hours

Course Format: 20% ILT, 80% Lab, 0% Web

Prerequisite(s): CC 53

Instructor(s): Dan Price

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is part of the Heavy Duty Truck Technician Certification training modules and covers basic engine principles, inspection, and reuse of components per OPT (Overhaul Protection Plan for Trucks) guidelines. In the class, students discuss OPT procedures and perform lab exercises including D & A of a 3406E or C15 engine. Lab includes cylinder head removal and installation, camshaft removal and installation, and cylinder pack removal and installation. Students also check liner protrusion, perform cam idler gear backlash adjustments, perform overhead adjustments, inspect and cut liner counterbore, and perform engine reassembly.

Course Objectives:
- Understand diesel engine operation and design
- Know the proper use and operation of hand tools, torques, fasteners, seals and gaskets, and bearings
- Properly disassemble and assemble an engine for overhaul according to OPT guidelines

Medium Engine Fuel Systems
CC 049

Length: 32 hours (4 days)

Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): CC 53
Instructor(s): Dan Price, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
The intent of this class is to familiarize technicians with current Caterpillar medium engine fuel systems. This class covers diesel fuels and improving fuel system durability. Also covered are current scroll, new scroll, and EUI fuel systems and timing graphs. Reusability guidelines are discussed. Labs include 3406B injection pumps R & I, governor D & A, and fuel settings.

Course Objectives:
- Understand diesel engine fuels and maintenance
- Medium engine fuel system operation
- Governor operation
- Disassembly and assembly of new scroll governor
- Fuel setting for 3306 and 3406 new scroll
- Disassembly, assembly, and adjustment of automatic timing advance

Engine Diagnostics
CC 050

Length: 32 hours (4 days)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): CC 53, CC 48 (or one year experience on Caterpillar engine overhaul), CC 49, CC 51, CC 71

Instructor(s): Dan Price, Eric Leeman, William Boorman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is the final part of the Heavy Duty Truck Technician Certification training modules. The intent of this class is to familiarize technicians with engine diagnostics including the mechanical segment of Caterpillar engines. Diagnostics of the cooling system, intake and exhaust system, lube system, and fuel system are covered as well as how these systems effect performance and work together for total engine performance. Participants conduct lab exercises in fuel settings, timing, and troubleshooting. The main lab in this class will be conducted on a chassis dynamometer, if possible, and tie all previous training together.

Course Objectives:
- Understand mechanical systems on Caterpillar engines
- Troubleshoot fuel systems, air systems, lube systems, and cooling systems
- Understand the effects these systems will have on engine performance and durability

Truck Engine Sensors and Control Logic
CC 051

Length: 32 hours (4 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): CC 53
Instructor(s): Dan Price, Eric Leerman
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is part of the Heavy Duty Truck Technician Certification training modules. The intent of this course is to bring technicians up to date with the electronics used in Caterpillar on-highway engines. System operation, testing, and troubleshooting procedures will be covered. Also covered are electronics, from PEEC to current Caterpillar ACERT engines.

Course Objectives:
- Understand on-highway electronic engine controls
- Understand the effects of electronics on engine operation
- Gain practical knowledge by troubleshooting electronic engines
- Understand and be able to use test ECM mode
- Have practical experience using ET (Electronic Technician)

Truck Engine Service Information
CC 053

Length: 16 hours (2 days)
Course Format: 20% ILT, 80% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is a prerequisite for most of the TEPS engine training courses offered. Students may test out of this class by passing a 40 question exam with at least 70% efficiency. This course establishes a foundation for accessing service information data as well as some basics for using Caterpillar electronic service tools. The intent of this course is to familiarize technicians with the Caterpillar service literature that is available on the Web and how to find and access information using truck.cat.com, TMI web, and SIS. This is a hands-on class where students spend two full days on the computer learning the Caterpillar web literature system. Specifics include looking up and downloading of flash and trim code files.

Note: Everyone attending this class needs to have or be set up with a CWS log in ID (please contact your TEPS Program Manager if you need assistance with this).

Course Objectives:
- Use SIS Web and other Caterpillar information sites
- Find materials necessary to work on Caterpillar product
- Use ET or Workbench to access component based troubleshooting
- Locate and download flash and trim files

New Scroll Fuel System
CC 056

Length: 8 hours (1 day)

Course Format: 20% ILT, 80% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Marty Cirbo, Dan Price, Jim Hottenroth, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Students learn to identify component location of the new scroll fuel system and explain the function of those components. Students learn to trace fuel and oil flow through the injection pump and governor and make governor adjustments using Caterpillar specifications.

Course Objectives:
- Disassemble and assemble Caterpillar new scroll pump and governor
- Make governor adjustments
- Make FLS and FTS adjustments
- Set AFRC linkage and dynamic adjustments

C7 HEUI Introduction and Troubleshooting
CC 062

Length: 8 hours (1 day)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price, Eric Leeman, William Boorman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is designed for customer level technicians. It is an introduction to system operation and electronic troubleshooting for the C7 truck engine. The class includes both classroom instruction as well as lab time using ET (Electronic Technician).

Course Objectives:
- Understand basic overview of the C7 engine
- Understand the use of ET on the C7 engine

Caterpillar C15 On-Highway ACERT Engine
CC 066

Length: 16 hours (2 days)

Course Format: 50% ILT, 50% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is an overview of the Caterpillar C15 ACERT Engine. Instruction covers system operation, new troubleshooting codes and diagnostics, basics of ET, and overhead adjustment. Included are lab sessions on using ET and running the overhead.

Course Objectives:
- Understand basic operation of the C15 ACERT engine
- Perform ET related checks on C15 ACERT
- Perform overhead adjustments on C15 ACERT

Truck Engine Parameters
CC 071

Length: 32 hours (4 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): CC 53, CC 51
Instructor(s): Dan Price
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is an in-depth study of on-highway truck engine parameters and their operational effects on engines and vehicles. The class is a balance of classroom lecture and hands-on lab. The lecture covers most early electronics as well as current electronic engines. Emphasis is placed on labs and lab discussion.

Course Objectives:
- Recognize the various on-highway truck engine parameters and their contact headings
- Identify and properly program on-highway truck engine parameters for a variety of vehicle applications
- Effectively diagnose probable causes of improperly programmed parameters
- Effectively use Caterpillar Electronic Technician (ET), Service Technician Workbench (STW), Engine Performance Estimator (EPE), and Caterpillar Design Pro
- Have a basic understanding of the flash software process

Electronic Engine Controls
CC 078

Length: 24 hours (3 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Jim Hottenroth, Eric Leeman, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course reviews use of electronic engine service tools. Students learn about the electronic controls of Caterpillar engines and how they affect engine function and performance. Lab times vary according to the electronic engines that are available and the location of the training.

Course Objectives:
- Identify electronic engine components and understand their functions
- Identify and use service and diagnostic tooling (STW, ET, Flash, SIS)
- Establish and program parameters
- Calibrate and adjust electronic engine components
- Troubleshoot electronic system, differentiating electrical hardware, and harness problems from electronics
- Describe the troubleshooting process

2007 On-Highway ACERT Engines
CC 079

Length: 16 hours (2 days)
Course Format: 70% ILT, 30% Lab, 0% Web
Prerequisite(s): CC 53
Instructor(s): Dan Price
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
The intent of this training is to provide technicians with a basic understanding of the 2007 Caterpillar on-highway truck engine product. It is highly recommended that all people attending this training be current with WebEx training, as well as Tech Tips training and online tests. Air system, fuel system, electronics, and after treatment for 2007 product are discussed. This class has limited hands-on training.

Course Objectives:
- Understand 2007 air systems operation
- Understand 2007 fuel systems operation
- Understand 2007 emission devises
- Understand 2007 electronics and how it all ties together

CAT EPA 07 Update
CC 087

Length: 16 hours (2 days)
Course Format: 50% ILT, 40% Lab, 10% Web
Prerequisite(s): CC 53
Instructor(s): Dan Price, Mike Clark
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course trains technicians on specific troubleshooting techniques for EPA ‘07 engines. At course completion, students are able to identify and follow the proper troubleshooting techniques for both symptoms and codes outlined within the Troubleshooting Guide for components and systems of the EPA ‘07 on-highway truck engines.

This course also prepares students to take Caterpillar’s online EPA ‘07 Assessment (#20230). This assessment is designed to measure the service technician’s ability to troubleshoot and repair EPA ‘07 on-highway truck engines. In addition to general knowledge, specific topics tested include: the Caterpillar Regeneration System (CRS), Clean Gas Induction (CGI), Medium Duty (MD) Engines, Heavy Duty (HD) Engines, the ET datalog, and the Diesel Particulate Filter (DPF).

Course Objectives:
- Understand systems operation of related emissions components
- Apply best practices concerning troubleshooting EPA ‘07 on-highway truck engines
- Understand available service information and current service procedures
- Understand ET datalog operations, including but not limited to: preferred file naming, sample rate, duration, channels, scaling, and interpretation of results

Basic Engine Care and Engine Set-Up
CC 097

Length: 40 hours (5 days)
Course Format: 65% ILT, 35% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Eric Leeman
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Basic Engine Care and Engine Set-Up is a course designed to provide students with the procedure for connecting to ET and navigating through SIS to determine corrective action required. Students learn how gas engines are tuned to ensure that the engine is emissions compliant. Students also learn the adverse affects when the engine is not compliant. Also covered is how these adjustments impact engine performance and engine life if the settings are altered.

Course Objectives:
- Navigate through ET functions of status, diagnostic and event codes, configuration tool, special tests, data logger, real time graphing, and ET preferences
- Connect, use, and perform basic data link troubleshooting using the Caterpillar communication adapter
- Navigate through SIS to access service manual information
- Perform component identification on a gas engine
- Identify the proper media and procedures for preventive maintenance practices and schedules
- Understand operation, define correct settings, and adjust an engine pressure regulator
- Correctly set up an exhaust-free oxygen analyzer

Engine Diagnostic Tools
CC 136

Length: 24 hours (3 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, William Boorman
Class Max: 8
Class Minimum: 4
Course Cost(s): Please refer to Pricing Policy on page 5

Course Description:
This class and lab session provides technicians with the information and tools necessary to properly use tooling for engine diagnostics. Tools and processes are covered. A working knowledge of engines and use of Caterpillar ET is required before attending this class.

Course Objectives:
- Check air intake systems for leaks at joints and ATAAC core for leaks
- Measure fuel and AFRC settings
- Check fuel-specific gravity and condition
- Test fuel nozzles and injectors
- Correct valve lash settings on current CAT engines
- Decipher fuel sight glass readings
- Use a multitach, set point indicator, blow by meter, and timing indicator

C6.6/C4.4 Engines with ACERT
CC 205

Length: 16 hours (2 days)

Course Format: 60% ILT, 40% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Dan Price, William Boorman, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class provides information on the Tier 3, C6.6/C4.4 engine with ACERT Technology in the Caterpillar 3000 series engine range. The common rail fuel system is explained along with the safety issues while working on this fuel system.

Course Objectives:
- Identify C6.6/C4.4 engines with ACERT technology features
- Explain mechanical system functionally and operation
- Describe fuel system function
- Define limits of serviceability for the C6.6/C4.4 engine with ACERT

Hydraulic Fundamentals
CC 107

Length: 32 hours (4 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo, Eric Leeman, William Boorman, Shawn Brown, Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is designed to help students understand hydraulic principles and how they are used in the operation of hydraulic system components. Participants learn to identify the function of the various valves used in hydraulic systems and to identify the function of vane pumps, gear pumps, and piston pumps. Students learn ISO hydraulic symbols, how to trace the oil flow, and state the operation of various hydraulic systems including load sensing/pressure compensating (LSPC) hydraulic systems used in Caterpillar Machines.

Course Objectives:
- Explain basic hydraulic fundamental principles (pressure x area = force)
- Explain the effects of flow through an orifice
- Explain the operation of the gear, vane, and piston pumps
- Identify the components and explain the operation of the simple relief valve, the pilot-operated relief valve, the flow control valve, the pressure reducing valve, the pressure differential valve, the check valve, the make-up valve, the sequence valve and the directional control valve
- Identify the components and explain the operation of single acting cylinders and double acting cylinders
- Identify and explain ISO hydraulic symbols
- Trace oil flow through ISO hydraulic schematics and explain operation of the pilot-operated implement system
- Identify and explain LSPC hydraulic systems

Load Sensing/Pressure Compensating Hydraulic Systems (LSPC)


CC 115

Length: 8 hours (1 day)
Course Format: 75% ILT, 25% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Class Max: 8
Class Minimum: 4
Course Cost(s): Please refer to Pricing Policy on page 5

Course Description:
This class is an introduction to Load Sensing/Pressure Compensating hydraulic systems. Students dentify the basic components and the benefits of LSPC. Hands-on testing of LSPC system is included.

Course Objectives:
- Check system pressures and adjust them
- Perform cycle tests
- Understand how the hydraulic system works

Proportional, Priority, Pressure Compensated Hydraulic System (PPPC)
CC 118

Length: 8 hours (1 day)
Course Format: 70% ILT, 30% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
The information learned in this class allows students to understand the principles of the PPPC hydraulic system used on many Caterpillar machines including motor graders, telehandlers, and 365/385 excavators.

Course Objectives:
- Identify the basic components of the PPPC system
- Demonstrate an understanding of the PPPC hydraulic system

Off Highway Truck, Scraper, and ADT Transmissions
CC 013

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo, Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Purpose, function, and use of electronic controls, identifying input/output components, reading/interpretting diagnostic displays, clearing diagnostics, resetting operational parameters, adjusting shift lever, body raising, body up switching, and the TOS sensor are covered. Students learn to diagnose and repair a reported operator complaint.

Course Objectives:
- Perform and interpret transmission performance tests
- Explain oil flow through the ICM transmission and describe the functions of the transmission control valves
- Explain operation of electrical control system for the transmission and identify troubleshooting techniques
- Test and adjust hydraulic and electrical systems of ICM transmission

Electronic Transmission Control
CC 029

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo, Jim Hottenroth, William Boorman
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course introduces participants to the electronically controlled transmission system for track type tractors. Topics include component identification and function, electronic and hydraulic systems operations, and testing and adjusting procedures.

Course Objectives:
- Locate and identify the following components: power train ECM, power train pump group, transmission oil filter, transmission control group manifold, system relief valve, transmission modulating valves, engine speed sensor, torque converter output speed sensor, transmission intermediate speed sensors, transmission output speed sensors, transmission oil temperature sensor, and the power train oil reservoir
- Test the operation of the Finger Tip Control or Tiller Control
- Access each service and calibration mode
- Explain the function of the following components during a posttest: transmission modulating valve solenoid, pilot valve, reducing spool and orifice
- Explain the transmission clutch modulation cycle during a posttest

Wheel Loader Electronics
CC 024

Length: 8 hours (1 day)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Dan Price, Marty Cirbo, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course introduces participants to the computerized Caterpillar Monitoring System and the Electronic Transmission Control. Emphasis is placed on the components' controls and associated diagnostics such as MIDs (Module Identifiers), CIDs (Component Identifiers), and FMIs (Fault Mode Identifiers).

Course Objectives:
- Describe each electronic component and its operation
- Identify components on a machine and locate them on an electrical schematic
- Retrieve information from both types of monitoring systems using the operator switch, 4C8195 clicker box, and Electronic Technician

Machine Electrical
CC 043

Length: 24 hours (3 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Dan Price, Jim Hottenroth, Eric Leeman, William Boorman, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Participants learn basic principles, Ohm's Law, voltage resistance, amperage, electrical/hydraulic comparison, terms, AC, DC, PWM, analog, input/control/output, wire maintenance, connectors tooling, electrical schematics, and troubleshooting.

Note: Students are encouraged to bring a digital multimeter and calculator to class.

Course Objectives:
- Demonstrate Ohm's Law
- Demonstrate DMM competencies
- Identify input and output devices and electronic controls
- Explain component function and operation
- Perform basic troubleshooting

D7G Transmission Rebuild
CC 004

Length: 32 hours (4 days)
Course Format: 10% ILT, 90% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This is a hands-on class in which students disassemble, inspect, and assemble a D7G transmission provided by the customer. Proper reconditioning guidelines are taught.

Course Objectives:
- Disassemble the transmission
- Inspect the transmission parts and determine re-usability
- Properly assemble the transmission

H-Series Motor Graders
CC 005

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course covers H-Series Motor Graders including implement hydraulics, the steering system, and countershaft transmission.

Course Objectives:
- Demonstrate proficiency in locating and identifying major system components within the implement hydraulic and steering system
- Demonstrate proficiency in using the hydraulic schematic to trace oil flow through the implement hydraulic and steering systems
- Demonstrate proficiency in checking system pressure on the implement hydraulic and steering systems
- Demonstrate proficiency in locating and identifying major system components within the countershaft transmission and power train
- Demonstrate proficiency in using the hydraulic schematic to trace oil flow through the countershaft transmission and power train
- Demonstrate proficiency in checking system pressures of the countershaft transmission and power train

980G Wheel Loader
CC 006

Length: 36 hours (4.5 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course covers all machine systems of the 980G Series II Loader. Classroom work includes systems operation and testing and adjusting of the engine, power train, hydraulic, steering, brake, and electrical systems. Lab work includes testing and adjusting of all systems.

Course Objectives:
- Locate machine components and understand their operation
- Understand the oil flow schematics for all systems
- Test and adjust the engine, transmission, and the hydraulic, braking, and steering systems

D8R Track Type Tractors
CC 007

Length: 40 hours (5 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course provides information on all major systems of the D8R Track Type Tractor to include the engine, power train, undercarriage, and the steering, brake, and hydraulic systems.

Course Objectives:
- Locate components for all systems
- Understand the operation of the components
- Troubleshoot all control systems
- Understand D8R maintenance practices

D10R/D11R Track Type Tractors
CC 008

Length: 40 hours (5 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is designed to give a broad understanding of machine systems and components in large track type tractors. Upon completion of this course, participants have knowledge and skill in understanding the function and operation of the implement hydraulic system, steering, brakes, powertrain, and electrical system of the D10R and D11R Track Type Tractors.

Course Objectives:
- Locate the power train, steering, and electrical control components
- Explain the function of the Power Train Electronic Control Module
- Trace oil flow in the electro-hydraulic system
- Test and adjust the electronic clutch and brake valve
- Test and calibrate the blade and ripper solenoids and lever controls
- Demonstrate using VIDS and other service tools to diagnose faults

12G/130G/140G/160G Transmission Rebuild
CC 010

Length: 32 hours (4 days)
Course Format: 10% ILT, 90% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This is a hands-on class in which students disassemble, inspect, and assemble a 12G, 130G, 140G, or 160G transmission provided by the customer. Proper reconditioning guidelines are taught.

Course Objectives:
- Disassemble the transmission
- Inspect the transmission parts and determine re-usability
- Properly assemble the transmission

24M Motor Grader Electrical/ Electronic Troubleshooting
CC 017

Length: 16 hours (2 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course offers instruction in the operation and troubleshooting of the 24M Motor Grader electrical system.

Course Objectives:
- Use the Messenger Display to view machine component status and diagnostic codes
- Use Electronic Technician to troubleshoot systems and view faults and events
- Locate electronic control modules and engine, power train, and hydraulic system sensors
- Perform pressure tests of the engine, power train, implement, steering, and brake systems

D11R TTT Electrical/Electronic Troubleshooting
CC 018

Length: 16 hours (2 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course offers instruction in the operation and troubleshooting of the D11R Track Type Tractor electrical system.

Course Objectives:
- Use the VIDS display (if equipped) to view faults and events, to perform hydraulic tests and calibrations, and to view the status of machine components
- Use Electronic Technician to troubleshoot systems and view faults and events
- Locate electronic control modules and engine, power train, and hydraulic system sensors
- Perform pressure tests of the engine, power train, and implement systems

R1700G LHD Introduction
CC 019

Length: 8 hours (1 day)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is an overview of the R1700G Loader. The course provides a brief study of the various machine systems: engine components, power train components, steering and braking system components, and hydraulic system components.

Course Objectives:
- Identify and describe the operation of the engine components
- Identify and describe the operation of the power train components
- Identify and describe the operation of the steering and braking system components
- Identify and describe the operation of the hydraulic system components

H-Series Motor Grader Electronics
CC 025

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class reviews the Electronic Monitoring System as it pertains to the motor grader with emphasis on the electronic transmission and AWD controls. MIDs (Module Identifiers), CIDs (Component Identifiers), and FMIs (Fault Mode Identifiers) are discussed.

Course Objectives:
- Locate and identify the major machine components
- Locate the all wheel drive system components
- Trace the oil flow through the all wheel drive system in low speed, high speed, and freewheel
- List the logged and active faults in the AWD ECM
- Perform the following instrument tests: charge and purge relief pressures, maximum system pressure, charge system solenoid, drive solenoid, and displacement solenoid
- Identify the system components and from a list, identify the cause and/or effect of a component or system malfunction

R1700G LHD Hydraulic System
CC 026

Length: 20 hours (2 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is a study of the steering, braking, and implement hydraulic systems of the R1700G Loader. Participants learn the location and functions of each system. In addition, they learn to use the hydraulic schematic to trace oil flow and perform hydraulic system testing and adjusting procedures.

Course Objectives:
- Locate steering components and describe their functions
- Locate braking components and describe their functions
- Locate implement hydraulic components and describe their functions
- Use the hydraulic schematic to trace oil flow in the different systems
- Perform basic hydraulic system testing and adjusting procedures

G-Series Wheel Loader Electro-Hydraulic Implements and CCS
CC 033

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course focuses on electro-hydraulic implements and command control steering. Participants learn the systems operation, testing, and procedures for adjusting the hydraulic and steering systems on G-Series loaders.

Course Objectives:
- Explain the operation of hydraulic and steering system pressures
- Learn to test electronic sensors and calibrate electronic systems
- Troubleshoot hydraulic and steering system problems

789B Truck


CC 034

Length: 16 hours (2 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course serves as an introduction to the 789B Off Highway Truck. Basic maintenance information, as well as systems operation of the engine, power train, steering, hoist, and braking systems are covered.

Course Objectives:
- Locate and identify major components of the engine, power train, steering, hoist, and braking systems
- Explain the operation of the components of the various systems
- Locate regular maintenance points

Introduction to the 930H Wheel Loader

NEW!

CC 035

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is an entry level service training class for the 930H Wheel Loader. Basic operation of the power train, steering, braking, and hydraulic systems are covered; as well as preparing the machine for service.

Course Objectives:
- Explain basic operation of the power train, steering, braking, and hydraulic systems
- Prepare the machine for service by releasing all stored energy
- Properly prime the engine fuel system
- Check stall speed and transmission pump pressure
- Check steering time and steering system pressure
- Check implement cycle times and hydraulic pump pressure
- Test the brakes for proper operation

966G/972G Wheel Loader Power Train

CC 036

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class prepares technicians to explain system operation and functioning and to perform testing and adjusting on the 966/972G Wheel Loader power train.

Course Objectives:
- Explain power train component location and operation
- Explain power train hydraulic system operation
- Test and adjust a power train
- Calibrate transmissions

966G/972G Wheel Loader Command Control Steering

CC 037

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class provides technicians with specific information on command control steering.

Course Objectives:
- Explain steering system components location and operation
- Trace oil flow through the steering system
- Check steering system pressures and perform other testing and adjusting procedures

966G Wheel Loader
CC 038

Length: 40 hours (5 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course covers all machine systems on the 966G Wheel Loader. Classroom work covers systems operation and testing to include adjusting of the engine, power train, implement hydraulic, steering, braking, and electrical systems. Lab work involves hands-on testing and adjusting of all of these systems.

Course Objectives:
- Locate machine components and understand their operation
- Understand fluid flows for all systems
- Test and adjust the engine and transmission
- Test and adjust the hydraulic, braking, and steering systems

R1700 LHD Fuel
CC 042

Length: 16 hours (2 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is an in-depth study of the electronically controlled fuel systems of the 3176C engines and the C11 engines, which are used in the R1700G load haul dumps. The engine model used is dependent on the model year of the machine.

Course Objectives:
- Trace fuel flow and identify fuel system components on a 3176C engine in a R1700G LHD
- Trace fuel flow and identify fuel system components on a C11 engine in a R1700G LHD
- Adjust the injector timing height of the 3176C and C11 engine
- Explain basic testing and adjusting procedures for the unit injector fuel systems
- Explain the importance of fuel system cleanliness and using good quality fuel
- Describe safety concerns of the mechanical electronic fuel systems

854G 2000-Hour Service
CC 054

Length: 16 hours (2 days)
Course Format: 20% ILT, 80% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
In this class, participants are shown the correct procedures for performing the 2000-hour preventative maintenance on a Caterpillar 854G Wheel Dozer.

Course Objectives:
- Describe some of the benefits of contamination control practices
- Demonstrate proper completion of PM1, PM2, PM3, and PM4 on an 854G Wheel Dozer

988G Power Train
CC 068

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class introduces the major features, component locations, and systems operation for the power train on the 988G Wheel Loader.

Course Objectives:
- Identify and locate major features and components of the power train and how they operate
- Calibrate the power train electronics
- Trace the power train system oil flow

988G Wheel Loader
CC 070

Length: 36 hours (4.5 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
The 3456 engine fuel system, basic component location, and derates specific to the 988G are covered in this class. Students perform testing and adjusting procedures on the engine, power train, implement hydraulic, engine coolant fan, steering, brakes, and electrical systems.

Course Objectives:
- Locate and explain the components of the engine, power train, implement hydraulic, steering, engine coolant fan, brakes, and electrical systems
- Trace the oil flow and explain the operation of the implement hydraulic, steering, and brake systems
- Test and adjust the engine, power train, implement hydraulic, steering, engine coolant fan, brakes, and Caterpillar monitoring systems

R1700G LHD
CC 076

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is designed to introduce students to the R1700G LHD. The course provides a general knowledge of the systems within the R1700G LHD and familiarizes technicians with them.

Course Objectives:
- Identify 3176C or C11 engine components
- Identify power train components
- Identify Stic Steering System components and use system schematic
- Identify hydraulic system components and use system schematic
- Identify braking system components and use system schematic
- Identify electrical system components and use system schematic
- Identify Caterpillar Monitoring System components

D10R/D11R Implement Hydraulic Systems
CC 080

Length: 32 hours (4 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is designed to give a broad understanding of machine systems and components in large track type tractors. Upon completion of this course, participants have knowledge and skill in understanding the function and operation of the implement hydraulic system, steering, brakes, power train, and electrical system of the D10R and D11R Track Type Tractor.

Course Objectives:
- Locate the power train, steering, and electrical control components
- Explain the function of the Power Train Electronic Control Module
- Trace oil flow in the electro-hydraulic system
- Test and adjust the electronic clutch and brake valve
- Test and calibrate the blade and ripper solenoids and lever controls
- Demonstrate using VIDS and other service tools to diagnose faults

785C Off Highway Truck Hydraulic System
CC 081

Length: 16 hours (2 days)
Course Format: 70% ILT, 30% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Upon completion of this course, students will understand the operation of the hydraulic system for the 785B-785D.

Course Objectives:
- Identify hoist system components
- Adjust the hoist lever linkage and verify that the hoist lever switch neutralizer operation is correct
- Test the hydraulic control valve relief valve setting(s), the diverter valve relief valve setting, and the oil cooler relief valve operation
- Perform a hoist system cycle test
- Perform a hoist cylinder drift test
- Trace the flow of oil through the hoist system

R1700G LHD Maintenance
CC 082

Length: 8 hours (1 day)
Course Format: 70% ILT, 30% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course teaches the procedures to perform scheduled maintenance on R1700G Load Haul Dump underground mining machines at all maintenance intervals.

Course Objectives:
- Locate the maintenance schedule
- Identify the locations of all machine maintenance points
- Understand the maintenance procedures as stated in the Operation and Maintenance Manual

793D Off Highway Trucks
CC 083

Length: 24 hours (3 days)
Course Format: 70% ILT, 30% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
Participants learn to identify, locate, and explain components and their functions. Maintenance, basic troubleshooting, hydraulics, and the electrical system are covered.

Course Objectives:
- Describe the hydraulic and electrical systems
- Utilize service tools to view electrical system
- Perform minor troubleshooting on the electrical system
- Describe recommended maintenance for the equipment

966H Wheel Loader
CC 084

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class studies the operation and maintenance of the power train and hydraulic system on the 966H Wheel Loader.

Course Objectives:
- Perform power train and hydraulic system maintenance procedures
- Explain the power flow through the power train
- Trace oil flow through the hydraulic system
- Connect ET to the machine and use it to read and clear fault codes

980H Wheel Loader
CC 085

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class studies the operation and maintenance of the power train and hydraulic system on the 980H Wheel Loader.

Course Objectives:
- Perform power train and hydraulic system maintenance procedures
- Explain the power flow through the power train
- Trace oil flow through the hydraulic system
- Connect ET to the machine and use it to read and clear fault codes

740 Articulated Dump Truck Power Train
CC 086

Length: 24 hours (3 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course offers service information for the engine, transmission, transfer gears, axles, steering, and braking systems of the 740 Articulated Dump Truck. The course is designed for customers who do not need information on the implement hydraulic system, such as those with a 740 Articulated Dump Truck equipped with a water tank.

Course Objectives:
- Locate engine components and sensors
- Correctly adjust engine valves and injectors
- Explain power flow through the power train
- Test power train components using pressure gauges
- Perform basic machine preventive maintenance
- Use Caterpillar ET to troubleshoot machine systems

Introduction to the Small K-Series Wheel Loaders
NEW!
CC 102

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is an entry level service training class for the 924K, 930K, and 938K Small Wheel Loaders. Systems operation is covered, as well as maintenance points and basic systems checks.

Course Objectives:
- Locate maintenance points on the loader
- Describe the operation of the engine and power train
- Describe the operation of the steering, implement, and braking systems
- Explain the functions of the cab controls and switches, including the soft touch panel

950G/962G/IT62G Power Train
CC 108

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is designed to prepare service technicians to explain the power train system operation and perform testing and adjusting procedures on the power train for the 950G and 962G Wheel Loaders.

Course Objectives:
- Locate all components of the power train system
- Using ET, perform forward high speed lockout select, reverse high speed lockout select, ride control configuration, shift input select, secondary steering select, transmission clutch engagement, and clutch fill calibration
- Perform torque converter stall test, modulating solenoid valve test, lubrication pressure test, torque converter outlet pressure test, and transmission pump test

950G/962G/IT62G Steering and Brake Systems
CC 109

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is designed to provide service technicians with specific information for the steering and brake system on the 950G/962G/IT62G Wheel Loaders. This class covers component identification and function, systems operation, and testing and adjusting.

Course Objectives:
- Perform steering system pressure tests
- Perform a pump low pressure standby
- Perform pump margin pressure tests
- Perform steering cylinder crossover relief valve test
- Perform steering cycle time and check and adjust the neutralizer valve
- Test and charge brake accumulator
- Test service brake system pressure
- Check service brakes for wear and perform parking brake test
- Perform fan dive system pressure tests

950G/962G/IT62G Pilot-Operated Implement Systems
CC 110

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class covers identifying components and functions, explaining system operation, and performing testing and adjusting procedures of the Pilot-Operated Implement System.

Course Objectives:
- Identify and locate all components of the Pilot -Operated Implement System
- Lift and tilt cylinder drift tests
- Lift and tilt cylinder speed tests
- Pilot system pressure test with the engine on
- Pilot system pressure test with the engine off
- Tilt cylinder rod end and head end line relief valve test
- Test main relief valve
- Charge the ride control accumulator

950G Wheel Loader
CC 112

Length: 40 hours (5 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class provides an in-depth study of the 950G Wheel Loader and highlights the differences between the original 950G and the 950G Series II. Both the mechanically governed 3126 and the electronic 3126B engines are studied. Also covered are the complete power train, steering system, implement hydraulics, brake system, and electrical system.

Course Objectives:
- Explain the operation of the engine and machine systems
- Perform troubleshooting procedures on the engine, power train, and hydraulic components
- Use Electronic Technician to diagnose electrical faults and view machine status
- Explain the machine preventive maintenance procedures

Introduction to the F-Series Backhoes

NEW!

CC 113

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is an entry level service training class for the 416F, 420F, and 430F Backhoe Loaders. Systems operation is covered, as well as maintenance points and basic systems checks.

Course Objectives:
- Locate maintenance points on the backhoe
- Describe the operation of the engine and power train
- Explain the operation of the Clean Emissions Module
- Describe the operation of the steering, implement, and braking systems
- Explain the functions of the cab controls and switches

Introduction to the 950K/962K Wheel Loader

NEW!

CC 114

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is an entry level service training class for the 950K and 962K Wheel Loaders. Systems operation is covered, as well as maintenance points and basic systems checks.

Course Objectives:
- Locate maintenance points on the loader
- Describe the operation of the engine and power train
- Explain the operation of the Clean Emissions Module
- Describe the operation of the steering, implement, and braking systems
- Explain the functions of the cab controls and switches

793F Off Highway Truck Introduction

NEW!

CC 131

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course serves as an introduction to the 793F Off Highway Truck. Basic machine maintenance is covered, as well as systems operation of the engine, power train, steering system, brake system, hoist system, and monitoring system.

Course Objectives:
- Locate and identify major components of the engine, power train, steering, hoist, and braking systems
- Explain the operation of the components of the various systems
- Locate regular maintenance points

Introduction to the 140M/160M

NEW!

CC 154

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class is an entry level service training class for the 140M and 160M Motor Graders. Systems operation is covered, as well as maintenance points and basic systems checks.

Course Objectives:
- Locate maintenance points on the motor grader
- Describe the operation of the engine and power train
- Describe the operation of the steering, implement, and braking systems
- Use the Messenger panel to view machine parameters and service codes
- Perform basic checks of the various systems using Messenger and pressure gauges
- Explain the functions of the cab controls and switches

M-Series Motor Grader Power Train
CC 155

Length: 8 hours (1 day)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course is a short study of the engine and power train of the M-Series Motor Grader. The 140M or 160M machine is covered, unless the customer requests a different M-Series model. Participants gain knowledge of the engine, transmission, drive axle, and their control systems. If desired, the all-wheel drive system can also be studied.

Course Objectives:
- Locate engine and power train components and explain their function
- Trace the oil flow through the power train hydraulic system
- Perform testing and adjusting procedures on the engine and transmission using ET and other diagnostic tooling
- Perform troubleshooting procedures on the engine and power train

M-Series Motor Graders
CC 156

Length: 32 hours (4 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course provides an overview of the machine systems in the M-Series Motor Grader. Participants gain knowledge and skills related to the function and operation of the implement hydraulic, steering, power train, and electrical systems of the M-Series Motor Grader.

Course Objectives:
- Locate the components of the power train, implement hydraulic system, steering, and electrical controls
- Trace oil flow through the hydraulic system
- Test and adjust the steering and brake systems
- Demonstrate knowledge in troubleshooting the M-Series Motor Grader

M-Series Motor Grader Engine/ Transmission
CC 157

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course focuses on the engine and power train of the M-Series Motor Grader. The 140M or 160M machine is studied, unless the customer requests a different M-Series model. Participants gain knowledge of the engine, transmission, drive axle, and their control systems. If desired, the all-wheel drive system can also be studied.

Course Objectives:
- Locate engine and power train components and explain their function
- Trace the oil flow through the power train hydraulic system
- Perform testing and adjusting procedures on the engine and transmission using ET and other diagnostic tooling
- Perform troubleshooting procedures on the engine and power train

M-Series Motor Grader Hydraulics, Brakes, and Steering
CC 158

Length: 16 hours (2 days)
Course Format: 60% ILT, 40% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Jim Hottenroth, Shawn Brown
Student Maximum: 8
Student Minimum: 4
Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course focuses on the M-Series Motor Grader implement hydraulic, steering, and braking systems. The 140M or 160M machine is studied unless the customer requests a different M-Series model.

Course Objectives:
- Locate implement hydraulic components and explain their function
- Locate steering and braking components and explain their function
- Describe the oil flow through the implement, steering, and brake systems
- Test and adjust the implement, steering, and brake systems using ET and other diagnostic tooling
- Perform troubleshooting procedures on the implement, steering, and brake systems

924G/928G/930G Power Train Electrical
CC 200

Length: 8 hours (1 day)

Course Format: 70% ILT, 30% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Jim Hottenroth, Marty Cirbo, Shawn Brown

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This course explains the 3056E engine electrical system and the transmission electrical system on the G-Series Small Wheel Loaders with electronically controlled engines.

Course Objectives:
- Use ET or the instrument panel to access fault codes
- Troubleshoot the engine electrical system
- Troubleshoot the transmission control system
- Effectively read an electrical schematic

Level I: Basic Motor Grader Operation
OP 001

Length: 24 hours (3 days)
Course Format: 50% ILT, 50% Lab, 0% Web
Prerequisite(s): None
Instructor(s): Marty Cirbo
Student Maximum: 4
Student Minimum: 2
Course Cost: $1,495.00

Course Description:
Participants learn machine and job site safety, proper machine maintenance, location and function of all components of the operator's compartment, and proper start-up and shutdown procedures. Participants learn motor grader operation at the entry level with a focus on safely moving the machine from one point to another while following all safety requirements.

NOTE: Running the machine at a production level will not be taught in this class.

Course Objectives:
- Identify machine safety and job site safety requirements
- Perform a machine walk-around inspection
- Locate, identify, and describe major engine and machine components
- Identify operator controls, gauges, indicators, and monitoring system functions
- Perform pre-operational start-up and shutdown procedures
- Efficiently operate a motor grader at the entry level (move the machine from one point to another without moving any dirt)

Challenger MT800C Tractors
CA 008

Length: 40 hours (5 days)

Course Format: 60% ILT, 40% Lab, 0% Web

Prerequisite(s): None

Instructor(s): Jim Hottenroth

Student Maximum: 8

Student Minimum: 4

Course Cost: Please refer to Pricing Policy on page 5

Course Description:
This class provides an in-depth study of MT835C, MT845C, MT855C, MT865C, and MT875C tractors. Participants learn maintenance procedures, systems operation, and testing and adjusting procedures for all machine systems.

Course Objectives:
- Demonstrate basic maintenance procedures for MT800 tractors
- Describe how the engine, power train, implement, steering, braking, and electrical systems operate
- Troubleshoot the different tractor systems
- Use ET and EDT for component diagnosis