CAT Defense

CATERPILLAR DEFENSE

# TRAINING CATALOG

RESPONSE SUBMITTED ON BEHALF OF CATERPILLAR DEFENSE/ CATERPILLAR INC.

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While most training programs stop at basic tasks and capabilities, Caterpillar Defense Training supports mission readiness. Our curriculum, instructors, and methods focus on the proficiency of operators and technicians, ensuring they are prepared to perform with maximum efficiency and reliability in critical environments.

Caterpillar Defense partners with Equipment Training Solutions (ETS), international Global Dealer Learning Centers (GDLC), and accredited Caterpillar Regional Dealer Learning Centers (RDLC). RDLCs operate as an extension of Caterpillar's Learning Center, maintaining rigorous standards that are reevaluated every two years. This guarantees that every participant receives world-class instruction with cutting-edge training aids and resources.

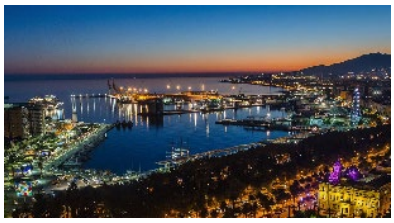
These specialized programs are designed to help defense teams reduce operational costs, minimize downtime, and improve safety while optimizing the performance of Caterpillar equipment in demanding conditions. Training options include secure online modules, on-site sessions at our dedicated facilities, or deployment to your operational location.

If your requirements go beyond standard offerings, Cat Defense Training provides custom solutions tailored to mission-specific applications, platforms, and environments. Our expert instructors will collaborate with you to develop training programs that align with your objectives and operational goals.

**Reach out to** Cat_Defense_Training@cat.com **for more information.**

## Global Learning Centers

**Caterpillar Learning Center – Dubai**
Get empowered with our skilled instructors and experience all Dubai has to offer.



**Malaga**
Malaga, in Spain, is where you'll find our European Learning Center – and it's a great place to learn, develop, and experience.

**Melbourne**
Our instructors Down Under – at the Learning Center in Melbourne, Australia, we will take you above and beyond your peers in learning.

**Miami**
Professional training with skilled instructors in beautiful surroundings. Welcome to the Miami Lakes Learning Center.

**Peoria**
Just south of Chicago in Peoria, Illinois you'll find another great Learning Center staffed by ace instructors.

**Tinaja Hills**
Caterpillar's massive demonstration and Learning Center out in the Arizona desert.

## Class Schedules

Upon request, Caterpillar Defense will assist each customer in scheduling their requested classes.

# Caterpillar GDL Instructor Lead General Information

| GENERAL INFORMATION | |
|---|---|
| **Introduction** | This catalog contains course descriptions, prerequisites, and schedules for GDL training within our Core & Specialty, Electric Power and Oil & Gas segments. |
| **Docebo/DPC** | This system is designed for learners to enroll into posted course Instructor Led Trainings (ILT) and Virtual Instructor Led Training (VLT) for learning development. Participants can enroll in available offerings using this dealership link – catdealer.com/dpc |
| **Learning Plan** | A learning plan is a plan that a learner can enroll into for a specific course to fulfill all the required course to be certified for that specific course offering. |
| **Wait List Policy** | The wait listed functionality in Docebo/DPC is designed for tracking demand purposes only at this time. If a learner is enrolled as wait listed, they will need to drop that wait list to enroll into any future offerings for that specific course that may come available. The wait listed function is not automated, so if a seat opens the dealer admin will still need to approve that learner to secure a seat in the training. |
| **Safety** | Safety is our top priority. Please make sure that all learners are reviewing the require PPE for each specific course before attending the training. |
| **Cancellation Policy** | Cancellation policies vary by Learning Center. Please be sure to reference the Cancellation policy within Docebo for that specific course, the confirmation letter emails sent out by the Learning Center Event Coordinator or through the CAT Visitor App. |
| **Transcript Updates** | All transcript update requests must be sent to the Global Dealer Learning Support team through a “Need Something” service ticket by clicking on the link in Docebo |
| **Prerequisite Requirements** | Confirmation letters are sent out at least 30 days before a schedule course start date to the learners that are enrolled into that course in Docebo. The dealer admins are copied on the confirmation letters for all course trainings. |
| **Confirmation Letters** | The CAT Visitor App is another way that learners can download all the necessary information needed for their visit at a specific Learning Center during their training. |

## CORE AND SPECIALTY LEARNING

# Applied Failure Analysis (AFA) I

**COURSE DESCRIPTION:**

AFA-I focuses on the basic principles of metallurgy, wear and fractures, and on managing the failure analysis process to arrive at the most probable root cause of failure. Engine parts are generally lower in hardness than drivetrain components so their facts ('road signs") are easier to see ("read"). The course consists of classroom instruction and laboratory exercises and concludes with case studies of failures that have occurred in the field.

**LEARNING OBJECTIVES:**

After instruction in these basics, students then learn to apply the fundamentals to the major engine components: Bearings, Crankshafts, Valves, Pistons, Rings, Liners, Connecting Rods, and Threaded Fasteners**.**

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:**

This course has one or more prerequisites that need to be completed and passed before a participant will be allowed to be enrolled in the course. The following web-based classes are available in DPC.

- Intro to AFA Principles of Wear
- Intro to AFA Principles of Fractures
- Intro to AFA Management
- Intro to AFA Visual Examination
- Intro to AFA Metallurgy

**COURSE DURATION:** 4.5 days; 36 hours

# Applied Failure Analysis (AFA) II

**COURSE DESCRIPTION:**

This course begins with a review of the basic principles covered in AFA I. Students apply those principles to gears, anti-friction bearings, hydraulic pumps & motors, lubrication, welds, and shafts. Communicating failure analysis is more strongly emphasized by including a section of taking good digital pictures. The course wraps up with case studies from the field.

**LEARNING OBJECTIVES:**

Review Principles of Management, Review of Fractures, Review of Wear, then apply to them to Lubrication Gears, Anti-friction Bearings, Hydraulic Pumps & Motors, Shafts, Welds, and Case Studies.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Applied Failure Analysis (AFA) I

**COURSE DURATION:** 4.5 days; 36 hours

# Cat Electronic Technician & SIS 2.0 Overview

**CLASS DESCRIPTION:**

This course is designed to introduce the technician to the working principles & capabilities of the Caterpillar Electronic Technician Diagnostic Software. This course also includes an Overview, Familiarization, and Working Capabilities of the NEW SIS 2.0 (Service Information System).

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Understand the capabilities of the Cat engine ECU and ET
- Successfully connect to an engine ECU using Cat ET
- View active & logged diagnostic codes within the ET program
- View and change parameters in the ECU Monitoring System & Configuration Screens
- Successfully downloading a Product Status Report & ECU replacement file from an ECU
- Understand and use the Data Logging & Real Time Graphing functions within ET
- Understand the benefits of SIS 2.0 to customers compared to the previous old SIS (SIS Web)
- Complete hands-on exercises using Cat ET and SIS 2.0

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 1 day; 8 hours

**** CLASS SCHEDULED BY REQUEST ONLY**

# Undercarriage Repair Process Service Training

**COURSE DESCRIPTION:**

This three-day class discusses in detail the service procedures for undercarriage manufactured by Caterpillar Inc. Service procedures presented during this class include standard track service, Cat Abrasion undercarriage service, idler rebuild, and resources for UC service information. The class provides the engineering basis for each of the service procedures. The student will gain understanding of how the undercarriage components wear.

The course will cover the proper tooling setup and service procedures necessary to maximize undercarriage life. A review of available resources for undercarriage such as service literature will be provided.

**LEARNING OBJECTIVES:**

After completing this course, the learner will be able to:

- Explain the differences of Cat Undercarriage and competitor's undercarriage.
- Utilization of the Cat Track Press to safely and efficiently do a pin and bushing turn on undercarriages.
- Utilization of Cat Undercarriage tools
- Hands on use of the shop track press
- Coverage of the Cat Test and Fill Machine
- Explain the process of disassembly/assembly of Cat  Undercarriages
- Repair of SystemOne track
- Disassembly/Assembly of idlers with conventional duo-cone seals

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# Hose and Coupling Assembler Training

**COURSE DESCRIPTION:**

This course provides thorough training on Cat Hose and Coupling Assembly. The lesson will begin with the basics of hose and coupling identification and standards for both Cat and non-Cat, operator safety, and hands-on training for all Cat Hose Assembly machines. The hands-on will include assembly and disassembly techniques of reusable couplings as well as crimping of permanent couplings.

**LEARNING OBJECTIVES:**

The learner will be trained in all new products and reference resources including H.I.S. The session will wrap up with instruction on quality inspection processes and contamination control techniques. The attendee will be designated a Cat Hose and Coupling Assembler after passing the exam at the end of the **3.5** days.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 3.5 days; 28 hours

# Electronics Troubleshooting (ET)

**COURSE DESCRIPTION:**

This course is a redesigned version of Electronics Troubleshooting 1 that offers a higher ratio of hands-on labs for skills development. This new version provides the learner with various fault scenarios for analyzing proper component operation and system response under different failure mode conditions. With an emphasis on the troubleshooting procedures, the most critical FMI codes will be reviewed and discussed, -3, -4, -5, -6, -8, -9, and -14. Given this course is heavily on hands-on skills development, the participants should have working knowledge of basic circuits, circuit faults, multi-meter use, electrical schematics interpretation, basic Cat ET, and servicing connectors prior to attending this course.

**LEARNING OBJECTIVES:**

At the completion of this course, the participants should be able to demonstrate the following knowledge:

- Troubleshoot ECU's
- Troubleshoot CAN and CDL datalinks using volts and resistance
- Troubleshoot fault codes related to input circuits
- Troubleshoot fault codes related to output circuits to access and gather technical information resources.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Electronics Fundamentals

**COURSE DURATION:** 4.5 days; 36 hours

# Powertrain Systems Troubleshooting Part I (VILT)

**COURSE DESCRIPTION:**

This is a Virtual Instructor Led (VILT) Courses course that offers the knowledge required to perform testing, adjusting, and performance analysis of powertrain systems.

This course offers the knowledge required to carry out testing, adjusting, and performance analysis on torque converters, powershift transmissions, differential steering, differentials, final drive, and driveline fitted to heavy equipment power train systems.

**LEARNING OBJECTIVES:**

At the completion of this course, the participants should be able to demonstrate the following knowledge:

- Explain the method to access and gather technical information resources.
- Explain the method to list and use the diagnostic tooling to perform testing and adjusting of the powertrain system.
- Identify the components of torque converters.
- Explain the system operation of torque converters.
- Identify the components of a countershaft-type powershift transmission.
- Explain the system operation of a countershaft-type powershift transmission.
- Identify the components of a planetary-type automatic transmission.
- Explain the system operation of a planetary-type automatic transmission.
- Identify the components of Track Type Tractor steering systems.
- Explain the system operation of Track Type Tractor steering systems.
- Identify the components of differential assemblies and the final drive.
- Explain the system operation of the differential assemblies and the final drive.
- Identify components and explain the operation of driveline assemblies.
- Explain the system operation of driveline assemblies.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION**: 3.5 days; 30 hours

# Powertrain Systems Troubleshooting Part II

**COURSE DESCRIPTION:**

The course offers the knowledge and skills required to perform testing, adjusting, troubleshooting, and performance analysis on Cat machine powertrain systems.

**LEARNING OBJECTIVES:**

At the completion of this course, the participants should be able to demonstrate the following knowledge and skills:

- Explain the Cat troubleshooting process.
- Access and gather technical information resources required for the Powertrain Systems testing. adjusting and troubleshooting processes.
- List and use the diagnostic tooling to perform testing, adjusting, and troubleshooting of the powertrain system.
- Explain the testing, adjusting, and troubleshooting procedures of the torque converter.
- Perform testing, adjusting, and troubleshooting procedures of the torque converter.
- Explain the testing, adjusting, and troubleshooting procedures of a countershaft-type powershift transmission.
- Perform testing, adjusting, and troubleshooting procedures of a countershaft-type powershift transmission.
- Explain the testing, adjusting, and troubleshooting procedures of a planetary-type automatic transmission.
- Perform testing, adjusting, and troubleshooting procedures of a planetary-type automatic transmission.
- Explain the testing, adjusting, and troubleshooting procedures of Track Type Tractor steering systems.
- Perform testing, adjusting, and troubleshooting procedures of Track Type Tractor steering systems.
- Explain the testing, adjusting, and troubleshooting procedures of differential assemblies and final drives.
- Perform testing, adjusting, and troubleshooting procedures of differential assemblies and final drives.
- Explain the testing, adjusting, and troubleshooting procedures of driveline assemblies.
- Perform testing, adjusting, and troubleshooting procedures of driveline assemblies.
- Explain the powertrain systems performance analysis (TA2) procedures.
- Perform powertrain systems performance analysis (TA2).

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Powertrain Systems Troubleshooting Part I – VILT

**COURSE DURATION:** 4.5 days; 36 hours

## INSTRUCTOR-LED OPERATOR TRAINING

# Competent Operator Training Level I

**COURSE DESCRIPTION:**

Level I Competent Operator Training is the first of three levels in the Caterpillar Operator Training Program.

**LEARNING OBJECTIVES:**

This program is designed for entry-level operators with less than 3 years operating experience. It provides a foundation for development of skills for safe and proficient operation. Each Level I course is focused on one machine family. Individuals complete this training with the knowledge and documentation (Certificate of Completion) of their skill levels as measured against task competency standards.

**Included product families:**

Articulated Trucks, Backhoe Loaders, Coal Stockpile, Dozers, Electric Rope Shovels, Excavators, Forestry Wheel Loaders Millyard, Hydraulic Mining Shovels, Material Handlers, Motor Graders, Multi Terrain/Compact Track Loaders, Off-Highway Trucks, Skid Steer Loaders, Underground Articulated Trucks, Underground Loaders, Waste Industry, Wheel Dozers, Wheel Excavators, Wheel Loaders, Wheel Tractor-Scraper.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# Professional Operator Training Level II

**COURSE DESCIPTION:**

Level II Professional Operator Training is the second of three levels in the Cat Operator Training Program.

This program is intended to improve the operating and application efficiency (productivity) of operators with 3 or more years operating experience on a machine family. It provides a review of safety and operational fundamentals, an evaluation of individual operating skills, recommendations to improve skills and operation time under supervision of instructors. Individuals complete this training with the knowledge and documentation (Certificate of Completion) of their skill levels as measured against task competency standards.

**Applicants are expected to have at least three years operating experience working on similar machines prior to registration.**

Included product families:

Articulated Trucks, Backhoe Loaders, Coal Stockpile, Dozers, Electric Rope Shovels, Excavators, Forestry Wheel Loaders Millyard, Hydraulic Mining Shovels, Material Handlers, Motor Graders, Multi Terrain/Compact Track Loaders, Off-Highway Trucks, Skid Steer Loaders, Underground Articulated Trucks, Underground Loaders, Waste Industry, Wheel Dozers, Wheel Excavators, Wheel Loaders, Wheel Tractor-Scraper

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# Professional Operator Certification Level 3

**COURSE DESCRIPTION:**

Level III Professional Operator Certification is the final of the three levels in the Cat Operator Training Program.

This program is intended to evaluate the operating and application efficiency (productivity) of individuals that have existing operating experience on a machine family as measured against our competency standards. Students will be assessed on their proficiency during the certification process. Scoring includes the ability to conduct a thorough walk-around inspection, pass a safety quiz with a score of 100% and a written knowledge assessment with a minimum score of 80%.

**This is NOT intended for inexperienced operators and DOES NOT include training. At least five years operating applicable heavy equipment is required. Those wanting to attempt certification must successfully complete the machine Level II course prior.**

Upon successful completion of the course, each graduate will receive:

- Graduation verification number assigned and entered into the Caterpillar data registry
- Caterpillar certificate and belt buckle with graduate's name and number (Attendees who do NOT meet the expected requirements will receive a Certificate of Participation)

Included product families:

Articulated Trucks, Backhoe Loaders, Coal Stockpile, Dozers, Electric Rope Shovels, Excavators, Forestry Wheel Loaders Millyard, Material Handlers, Motor Graders, Multi Terrain/Compact Track Loaders, Off-Highway Trucks, Skid Steer Loaders, Underground Articulated Trucks, Underground Loaders, Waste Industry, Wheel Dozers, Wheel Excavators, Wheel Loaders, Wheel Tractor-Scraper

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Level II Professional Operator Training

**COURSE DURATION:** 5 days; 40 hours

## ELECTRIC POWER

# Cat Electric Power (CEP) II

**COURSE DESCRIPTION:**

This course provides in-depth study and hands-on activity in maintaining, troubleshooting, and repairing current and legacy production Cat Generator Sets operating as single units.

The participants will successfully perform key tasks selected from topics presented in the course to include but not limited to re-strapping generator output, electrical tests for maintenance and troubleshooting, voltage regulator installation and setup, control panel navigation, basic operation, and programing, general circuit breaker features and function.

**LEARNING OBJECTIVES:**

After completion, the participant will be able to:

- Properly recognize the generator's real and apparent power under load.
- State the effects of power factor and reactive/resistive loading on the engine and generator.
- Properly recognize different generator-mounted control panels, their features, and basic screen navigation (EMCP 4 and ECS100.)
- Perform voltage regulation and response adjustments. (VR6, CDVR, IVR and R series)
- Perform proper planned maintenance and make diagnostic measurements on generators. Recognize different circuit breaker types.

At the completion of the courses, the participants should be able to demonstrate the following knowledge and skills:

- Identify, discuss and navigate the Caterpillar online information resources.
- Discuss generator fundamentals including construction, generation theory, generator operational limits, and re-strapping.
- Perform procedures for maintenance and diagnostic testing with proper specifications and proper tooling.
- Properly recognize generators' actual and apparent power loading. Understand the effects of power factor and reactive loading on the engine and generator.
- Identify and diagnose electrical common electrical components on voltage regulators, control panels, and control systems. Specify, test, and adjust voltage regulators per customer requirements.

- Properly utilize electrical drawings for system troubleshooting and safety. Discuss EMCP II+, EMCP 3, and EMCP 4 I/O and programming.
- Discuss controls strategies for generators with EUI and MUI engines. Identify circuit breakers and other single unit protective devices.
- Explain the differences between integral and remote circuit breaker trip functions. Identify Cat ATS models. Overview ATS control strategies.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Level II Professional Operator Training

**COURSE DURATION:** 4.5 days; 36 hours

# Cat Electric Power (CEP) III

**COURSE DESCRIPTION:**

This course provides an in-depth study and hands-on activity in verifying, maintaining, troubleshooting, and repairing concepts which can be applied to current and legacy production Cat generator sets operating in parallel. Equipment found in legacy Cat Switchgear is used to instruct and learn the fundamentals of a paralleled generator system which can then be applied to all other paralleling controllers. The participants will successfully perform key tasks selected from the topics presented in the course, including but not limited to verification of phase rotation, verification and adjustment of synchronization, set-up and adjustments to share kW load, verification of the principals of modern automatic load sharing, set-up and adjustments to share the reactive load and manual breaker closure to parallel generators.

**LEARNING OBJECTIVES:**

At the completion of the courses, the participants should be able to demonstrate the following knowledge and skills:

- Determine the differences between resistive and reactive load and their respective effects on the generator.
- Verify proper phase rotation
- Verify synchronization
- Adjust fuel control for proper droop or isochronous operation to share kW load
- Adjust the voltage regulator for proper reactive load sharing
- Manually parallel generators
- Identify protective devices and what may cause them to trip, document settings and reset trips of a multifunction relay
- Recognize components found in Switchgear and their wiring requirements.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Cat Electric Power (CEP) II

**COURSE DURATION:** 4.5 days; 36 hours

# Cat Switchgear Level I (Powerlynx)

**COURSE DESCRIPTION:**

This course provides insight for a technician to operate, install, maintain, and troubleshoot the M1 and M1E PLC-based EGP and XLM Cat Switchgear. The participants will successfully perform hands-on tasks selected from the topics covered in the course including modes of operation, print reading, commissioning, and troubleshooting. *This class was formerly called Cat Switchgear Level 1 Training (Powerlynx).*

**LEARNING OBJECTIVES:**

After completion, the participant will be able to:

- Identify the difference between the EPG and XLM systems
- Gain a familiarity with the Schneider M1 and M1E PLC Hardware
- Perform preliminary and pre-start up inspection
- Perform Level 1 commissioning
- Terminate interconnect wiring and configure devices to interface switchgear and generator sets
- Set the generator system voltages and frequency
- Test alarm and shutdown faults and resets on the system
- Diagnose faults and verify proper system operation using electrical drawings
- Troubleshoot and repair communications problems

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Cat Electric Power (CEP) II / Cat Electric Power (CEP) III

**COURSE DURATION:** 4.5 days; 36 hours

# EMCP 4.1 / 4.2 Controls Training

**COURSE DESCRIPTION:**

The EMCP 4.1 / 4.2 Control provides an in-depth study and hands-on activities for installation, start-up, and maintenance of the EMCP 4.1 and EMCP 4.2 control. The class will also focus on the application and programming of the EMCP 4.1 and EMCP 4.2 and peripheral modules.

**LEARNING OBJECTIVES:**

At the completion of the courses, the participants should be able to demonstrate the following knowledge and skills:

- Panel Display and Navigation
- Wiring and programming of Digital I/O
- Wiring and programming of Analog I/O
- Usage of CAN annunciators, CAN I/O modules, CAN thermocouple and RTD modules.
- 5Usage of the EMCP 4 remote monitoring software.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Cat Electric Power (CEP) II

**COURSE DURATION:** 3 days; 24 hours

# EMCP 4.3 / 4.4 Controls Training

**COURSE DESCRIPTION:**

The EMCP 4.3 / 4.4 Controls Class provides an in-depth study and hands on activities for installation, start-up, tuning, maintenance, and troubleshooting of the EMCP 4.3 and EMCP 4.4 controls.

**LEARNING OBJECTIVES:**

At the completion of the courses, the participants should be able to demonstrate the following knowledge and skills:

- Identify key features of the EMCP 4.3 and EMCP 4.4
- Perform input and output programming utilizing ET and the front panel of the EMCP 4.3 and EMCP 4.4 Controls
- Install interface wiring between parallel generators
- Perform a startup of the EMCP 4.4
- Demonstrate tuning of the EMCP 4.4 parallel controls
- Implement installation of Multi Genset Data Link (MGDL) and Implement MGDL set up
- Perform system troubleshooting of parallel generators

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** EMCP 4.1 / 4.2 Controls Training

**COURSE DURATION:** 4.5 days;  36 hours

# Cat ECS 100 Genset Controls – Single Unit

**COURSE DESCRIPTION:**

This training is designed to prepare technicians to commission, diagnose, and repair Cat Energy Control System (ECS) 100 genset controls. The technician will work with running units to navigate the controls interface, verify functions, customize inputs and outputs to meet customer needs, and examine expanded features and remote connectivity capabilities.

**LEARNING OBJECTIVES:**

On successful completion of this course, participants should be able to:

- State the capabilities of the A6L3 control module in a Cat ECS 100 control system.
- Navigate and customize the Human Machine Interface (HMI).
- Customize Inputs and Outputs to meet customer needs.
- Set up and test expanded features.
- Test the functional safety system.
- List the remote connectivity capabilities of Cat ECS 100

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Cat Electric Power (CEP) II

**COURSE DURATION:** 3 days; 24 hours

# Cat ECS 200 Genset Controls – Parallel Operation

**COURSE DESCRIPTION:**

This training is designed to prepare technicians to commission, diagnose, and repair Cat Energy Control System (ECS) 200 genset controls used for genset paralleling applications. Participants will become familiar with the Cat ECS 200 controls system hardware. The following topics will be explored: Dead-Bus Arbitration, Paralleling circuit breaker control, Synchronization tuning, Load Share tuning, Load Sense-Load Demand function, Failsafe Mode operation.

**LEARNING OBJECTIVES:**

On successful completion of this course, participants should be able to:

- Verify voltage and frequency control.
- Verify circuit breaker control.
- Perform synchronization tuning.
- Perform real and reactive load share tuning.
- Identify key features of Cat ECS 200 controls.
- Perform input and output programming to meet customer needs.
- Install interface wiring between parallel generators.
- Perform a startup of the Cat ECS 200 paralleling system.
- Perform system troubleshooting of parallel generators

**ASSESSMENT:**

Learning outcomes will be assessed using both formative and summative assessments such as quizzes, oral questioning, written assessments and practical tasks. For a course participant to be assessed as competent at the end of this course, the participant must be able to demonstrate competence at both the:

- Knowledge level by means of oral or written questions; and
- Practical or task level by demonstrating and completing specific tasks.

All participants must complete all lab exercises and questionnaires with 80% accuracy.

**NOTES:**

This Course Description is subject to change due to product design changes and individual attendee needs and experience.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Cat Electric Power (CEP) III

**COURSE DURATION:** 4.5 days; 36 hours

# MARINE

## Marine Installation & Diagnostics (MID)

**COURSE DESCRIPTION:**

This training is designed to prepare technicians to properly review and troubleshoot marine engine installations within a given vessel. The technician will be given instruction on the following: engine mounting & alignment, engine room design, cooling systems, ventilation systems, air intake systems, exhaust systems, marine engine commissioning & Computer-Aided Marine Performance Analysis Report (CAMPAR). Throughout the course the technician will address installation issues using a running propulsion engine. Participants will be required to fix and/or make recommendations for fixing each engine installation issue. Each participant will learn how to properly conduct and interpret a sea trial using Caterpillar approved tooling and software. The completion of this course is one of the requirements to become a Certified Marine Analyst.

**LEARNING OBJECTIVES:**

On successful completion of this course, participants should be able to:

- Determine possible engine room installation issues after reviewing CAMPAR sea trial reports.
- Perform full CAMPAR sea trial on running propulsion engine.
- Diagnose marine engine installation faults using proper tooling and provide solutions to resolve issues.
- Describe marine engine commissioning procedure.
- Calculate engine room ventilation requirements for a given engine.
- Calculate engine cooling system requirements for a given engine.
- Analyze TMI data for a given marine propulsion engine.
- Interpret CAMPAR reports and communicate data to instructor.
- Illustrate process for uploading sea trial reports, general information files, and build sheets to Marine Service Interlink.
- Break down engine room design to determine quality of design and make recommendations to improve the design.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Cat Electric Power (CEP) III

**COURSE DURATION:** 4.5 days; 36 hours

# Marine Engine Systems Troubleshooting (MEST)

**COURSE DESCRIPTION:**

This training is designed to prepare technicians to properly diagnose and troubleshoot marine engines and engine systems. The technician will be given instruction on the following marine engine systems; lube oil, diesel fuel, cooling, marine engine ratings and performance, hull types and propeller topology, ventilation/exhaust design parameters, and basic alignment/vibration procedures. Throughout the course the technician will troubleshoot various marine engine systems on a running marine engine. The completion of this course is one of the requirements to become a Certified Marine Analyst.

**LEARNING OBJECTIVES:**

On successful completion of this course, participants should be able to:

- Given a customer complaint, test and troubleshoot marine lube system using proper diagnostic tooling.
- Determine possible engine failures after review of S.O.S reports and provide corrective actions.
- Given a customer complaint, test and troubleshoot marine fuel system using proper diagnostic tooling.
- Given a customer complaint, test and troubleshoot marine cooling systems.
- Describe the differences between marine engine ratings.
- Conduct performance analysis of marine engines based on 900 series numbers using proper diagnostic tooling.
- Describe the function of different types of marine propulsion systems.
- Given a customer complaint, test and troubleshoot proper ventilation and exhaust requirements for a given engine.
- Diagnose marine engine faults using proper tooling and provide a solution to resolve the issue.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 5 days; 40 hours

# Marine Control Systems (MCS) Combined Controls

**COURSE DESCRIPTION:**

The Marine Control Systems (MCS) Combined Controls course is intended for Cat Dealer Service Technicians, Service Training Instructors, Technical Communicators and Customer Technicians. This course addresses both Cat MCS (Auto Maskin based) and Cat MCS (WMPC/Deif based) systems. The aim of this course is to allow Technicians to identify, operate, program, and troubleshoot Cat Marine Control Systems (MCS). This will cover the LEGP II and III, LECP II and III, MECP II and III B, MGCP III B control panels.

**LEARNING OBJECTIVES:**

On completion of this course, participants should be able to:

- Demonstrate the purpose and function of all MCS components
- Locate the MCS components as they are located on a vessel.
- Locate and discuss how modules connect to the DCU
- Demonstrate and discuss wiring locations on the DCU
- Demonstrate Initial Setup – Environment, Marine Society Compliance
- Demonstrate Installation Considerations - System Review, Component
- Locations
- Demonstrate configuration remotely – over Ethernet
- Explain how to add modules on the MCS System.
- Display ability to add a Remote Panel on the MCS System.
- Display ability to effectively troubleshoot and Repair the MCS System
- Demonstrate purpose and function of all MCS components
- Demonstrate and (troubleshoot) wiring locations on the DCU
- Demonstrate Installation Considerations
- Explain and Utilize Ethernet, Connect to PC and Web Server utilities

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 5 days; 40 hours

# C280 Engine Master Mechanic

**COURSE DESCRIPTION:**

Students will use the special tooling, Electronic Technician, to view and troubleshoot minor electrical problems with engine components. Understand basic operating principles of the C280 diesel engine systems. Remove and install a cylinder head, piston, connecting rod and cylinder liner. Remove and install a main bearing. Remove and install a camshaft segment and time the camshaft(s) to the crankshaft. Adjust valves, valve bridges, and the unit injectors. Have a basic understanding of the operation of Unit Injectors. Explain the internal and external flow of engine coolant and lube oil. Service the main and centrifugal oil filters.

**LEARNING OBJECTIVES:**

This course will cover systems operation and teach service procedures unique to the C280 diesel engine. Students will use the special tooling, Electronic Technician, to view and troubleshoot minor electrical problems with engine components.

Upon completion, the participant will be able to:

- Understand basic operating principles of the C280 diesel engine systems.
- Remove and install a cylinder head, piston, connecting rod and cylinder liner.
- Remove and install a main bearing.
- Remove and install a camshaft segment and time the camshaft(s) to the crankshaft.
- Adjust valves, valve bridges, and the unit injectors.
- Have a basic understanding of the operation of Unit Injectors.
- Explain the internal and external flow of engine coolant and lube oil.
- Service the main and centrifugal oil filters.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# D3600 Engine Master Mechanic

**COURSE DESCRIPTION:**

This course covers system operation and teaches service procedures unique to 3606, 3608, 3612, and 3616/C280 Engines. Special tooling is used, which includes hydraulic tensioning equipment, to disassemble, assemble and adjust various engine components.

**LEARNING OBJECTIVES:**

After completion, the participant will be able to:

- Understand the basic operating principles of the D3600/C280 Engine and Components.
- Understand use of the Service Manual.
- Remove and install a cylinder head. Remove and install a piston, connecting rod and cylinder liner. Remove and install a main bearing.
- Remove and install a camshaft segment and time the camshaft(s) to the crankshaft.
- Adjust the valves and valve bridges.
- Synchronize and time the unit injectors.
- Understand the operating principles of the MUI and EUI fuel system.
- Check the rack stop setting and synchronize the governor or actuator to the engine.
- Understand the internal and external flow of engine coolant and lube oil.
- Service the main and centrifugal oil filters.
- Understand maintenance procedures and when to perform.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# Product Link Technology

**COURSE DESCRIPTION:**

The course will cover knowledge and skills regarding the product link radios, network managers, and Bluetooth modules that are studied to perform a proper installation and configuration to have the system ready to report data. A general overview will focus the participant to identify a Locator, Basic, Pro and Elite system. Electrical installation, and configuration for Pro and Elite systems are studied and set on practices. Modules are set to report to Remote Fleet Vision, Cat RAM, and Vision Link. Remote Services to perform a remote flash and remote troubleshooting Advanced features on Network managers are studied to configure them to acquire Modbus data or send data through Modbus.

**COURSE OBJECTIVES:**

Upon successful completion of this course, the technician will be able to demonstrate their ability to:

- Identify the different types of Product Link devices used across the industries (Machine, Marine, Oil & Gas, Electric Power)
- Identify features of current radios and network managers.
- Navigate the different resources with updated Information related to the Product Link technology
- Locate the appropriate firmware and configuration file for an application.
- Perform the network manager configuration using the Product Link Configuration Tool.
- Register, subscribe, and onboard Product Link assets.
- Identify the functionality of the VisionLink User Interfaces
- Install and configure a Pro System
- Install and configure an Elite System
- Explain remote services: Remote flash and Remote troubleshooting
- Perform remote services: Remote flash and Remote troubleshooting
- Configure a Network Manager to report by a LAN connection
- Configure a Network Manager to acquire data through Modbus RTU and/or Modbus TCP IP
- Configure a Network Manager to send data through Modbus RTU and/or Modbus TCP/IP

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** Compact Energy Storage Systems

**COURSE DURATION:** 4 days; 32 hours

## OIL & GAS

# D3500 Engine Operation, Maintenance & Electrical

**COURSE DESCRIPTION:**

This course covers air, lubrication, cooling and fuel engine systems. Lab activities include Electronic Technician on the D3500 Electronic engines. Hands-on troubleshooting of fully functioning D3512C and D3508B engines.

**LEARNING OBJECTIVES:**

Upon completion, the participant will understand:

- Engine systems
- Basic maintenance and troubleshooting on D3500 electronic engine
- Be able to set valves and injectors on a D3500 engine
- Use the electronic instrument panel
- Use the Caterpillar ET program
- Read and decipher electronic codes
- Basic D3500 electronics

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 3.5 days; 28 hours

# D3500 Engine Master Mechanic

**COURSE DESCRIPTION:**

The primary focus of this course is the planned maintenance and repairs for the Cat 3500 A, B, C, and E diesel engines. It involves hands-on iron activities covering troubleshooting techniques, operations and adjustments.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Understand the operation principles and flow of 3500 engine systems for lubrication, cooling, fuel and air intake/exhaust
- Identify the differences between the 3500 A, B, C, and E Series engines
- Accurately check and set the bridges, valves, injector heights and injector synchronization
- Disassemble and assemble the heads, cylinder packs
- Demonstrate the ability to perform fuel quality (API) correction factors to determine the actual horsepower being produced by an engine
- Remove and install an after cooler, camshaft, and a turbocharger cartridge assembly and replace main bearings
- Troubleshoot engine related iron problems
- Remove, install and perform settings on a 3161 governor

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# D3500E Tier 4 Operation & Maintenance

**COURSE DESCRIPTION:**

This course is designed to familiarize the participant with the basic maintenance & operation on a D3500E Tier 4 engine, and all the engine systems consisting of the cooling, oil, fuel, and intake & exhaust with after treatment. Navigation of the Cat Marine Engine Control Panel III and Color Marine Power Display Panels. Understanding the basic operation and maintenance of the Cat Marine air assist after treatment system.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Identify basic engine systems (cooling, oil, fuel, air and exhaust systems with after treatment)
- Apply basic maintenance and operation on a D3500E electronic engine
- Navigate the Cat Marine Engine Control Panel III and Color Marine Power Display Panels

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 1 day; 8 hours

**** CLASS SCHEDULED BY REQUEST ONLY**

# G3600 Master Mechanic*

**COURSE DESCRIPTION:**

This course covers mechanical service procedures unique to the G3600 gas engine. Special tooling, which includes hydraulic tensioning equipment, is used to disassemble, assemble, and adjust various components. The disassembly and assembly part of this course is similar to the 3600 Diesel Engine Master Mechanic Course (2820). However, the service and adjustment procedures apply only to the gas engines.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Remove and install a cylinder head.
- Remove and install a piston, connecting rod, and cylinder liner.
- Remove and install a main bearing.
- Remove and install a camshaft segment and time the camshaft to the crankshaft.
- Adjust engine valve bridges, engine valves, and gas admission valves.
- Understand adjustments to the fuel control valve, waste gate, and choke valve linkages.
- Explain the internal and external flow of engine coolant and lube oil and explain
- temperature control of each system.

This course is designed for those who have a good theoretical and practical understanding of gas fueled engines and correct mechanical procedures.

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 4.5 days; 36 hours

# C32 Engine Operation, Maintenance & Electrical

**COURSE DESCRIPTION:**

This course covers product information, air, lubrication, cooling, fuel, engine electronics and monitoring systems, as well as Electronic Technician (ET) software and hardware. Lab activities include the removal and installation of injectors, the installation of injector flash files, and valve and injector adjustments. This course also involves hands-on troubleshooting of a fully functioning C32 engine.

**LEARNING OBJECTIVES:**

After completion, participants will understand:

- Engine systems
- Basic operation, maintenance and troubleshooting on a C32
- Remove and install C32 unit injectors
- Be able to set valves and injectors on a C32
- Use monitoring systems and control panels
- Use Cat ET program
- Read and decipher electronic codes
- Basic electronics of a C32

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:** None

**COURSE DURATION:** 2.5 days; 20 hours

# C175 Engine Electrical, Operation & Maintenance

**COURSE DESCRIPTION:**

This course will teach the Cat C175 Diesel Engine electronic systems, related wiring harness, component hardware and the use of Electronic Technician (ET) on the engine electronic control systems. The emphasis of this course will be to provide the participant with hands on diagnostic troubleshooting of all major systems of a running C175 Diesel Engine.

**LEARNING OBJECTIVES:**

Learning objectives for this course include:

- Recognize electronic engine components and their functions
- Describe C175 Software features and configurations
- Use Electronic Technician (ET) to diagnose problems, configure engine parameters, monitor
- system and make data logging
- Calibrate and adjust electronic engine components
- Troubleshoot electronic system, differentiating electrical hardware and harness problems from
- electronic problems
- Diagnose and ratify intermittent electrical problems

**REQUIRED EQUIPMENT:** Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:**

**Instructor Led Courses:**

- Electronics Fundamentals
- Electronics Troubleshooting ILT
- Electronic Sensors and Control Logics
- Engine Diagnostics

**COURSE DURATION:** 2.5 days, 20 hours

# Dealer Performance Center (DPC)

Dealer Performance Center (or DPC) is our online training website. Using our online training website, you will experience easy to use engaging videos and interactive training, all with the click of a mouse. By taking our suggested learning classes online, you will increase the value of your training. Our online courses are available 24 hours a day, 7 days a week, and are also available in various languages. We suggest that you take our "Suggested Self-Study" classes online prior to attending our Instructor-Led courses to increase the value of your training.

DPC is a best-in-class solution for all training and development needs. The goal is to offer Caterpillar dealers and customers a one-source solution for learning and development. All tools necessary to organize and launch an effective learning plan can be found in DPC while keeping track of all course transcript details in one place. Flexibility and ease of use are just some of the benefits.

**How It Works:**

- A subscription is required to access DPC
- Subscriptions can be purchased per individual user at a cost of $450 per individual per year
- Individual subscriptions are valid for one year from the date of activation, and do not renew automatically
- A DPC Subscription gives the learner access to several web-based courses

**To fully process a DPC request, we will need:**

- Student Name
- Company Name
- Physical Address
- Mailing Address
- Phone Number
- Parish/County

Please note that for new subscriptions, it takes approximately 3-5 business days to successfully activate. Once activated, you will receive notification from the Cat DPC Administrator that the accounts have been activated, the login information for each account, and a helpful user guide for everyone.

Currently, Global Dealer Learning offers some Instructor-Led Courses that require DPC access as a prerequisite. Those courses are as follows: **AFA I, AFA II, D3500 Master Mechanic, D3600 Master Mechanic, G3600 Master Mechanic, Electronics Troubleshooting ILT**. Please note that for **AFA I, Electronics Troubleshooting ILT,** there are online courses that need to be completed prior to attending the class.

The following classes have suggested online courses that DPC access is needed: **Electronics Fundamentals, Fuel Systems Troubleshooting, Engine Diagnostics, Emission Systems Troubleshooting and Performance Based Gas Engines**

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