

# 2017 TECHNICAL TRAINING CATALOG



**TRAINING MAKES THE DIFFERENCE**

**866-843-7440**

**Louisiana** **CAT**

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## STAFF

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*Corporate Safety & Training Manager*

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*Marine Engine Instructor*

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*Large Bore Engine Instructor*

Randy Hendrickson  
*Electronics and Large Bore Engine Instructor*

Julius Persons  
*Electronics and Machine Instructor*

Glen Stafford  
*Electronics and Natural Gas Instructor*

Lacey Volion Peckhaus  
*Training Coordinator/DPC Administrator*

## TRAINING FACILITIES

Louisiana Cat  
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New Iberia, LA 70560  
(337) 374-1901 Tel  
(337) 374-1914 Fax

Louisiana Cat  
9592 Hwy 182 East  
Morgan City, LA 70380  
(985) 631-0561 Tel  
(985) 631-0567 Fax

## CORPORATE OFFICE

Louisiana Cat  
3799 W. Airline Hwy.  
Reserve, LA 70084  
(985) 536-1121 Tel  
(985) 536-4549 Fax

## **REGISTRATION**

[training@LouisianaCat.com](mailto:training@LouisianaCat.com)

(985) 536-0494 Tel  
(985) 536-0947 Fax

## **CLASS SCHEDULES**

Upon request, Louisiana Cat will assist each customer in scheduling their requested classes. The current class schedule is posted on our company website at [www.louisianacat.com](http://www.louisianacat.com). Training information can be found under the heading Parts and Services or click on the training solutions icon. Then, go to Technician Training to find the 2017 Technician Training Schedule.

## **ENROLLMENT**

A completed Training Enrollment Form is required per participant. The enrollment form can be found on our company website as well as on page 5 of this catalog. The completed enrollment form should be sent to:

**Training@LouisianaCat.com**

(985) 536-0494 Tel  
(985) 536-0947 Fax

## **FEES**

Class fees are listed next to each course under the available classes section. The fees include the course, handouts, course material on flash drive, and lunch each day with the exception of the last day that classes are held.

A cancellation fee applies if notification is not provided in advance of one week prior to the scheduled class date. This late cancellation fee is \$450.00 per participant. If the participant fails to provide advance notification (via email) of enrollment cancellation, the full class fee is due at this time. If Louisiana Cat cancels the class for any reason, no fee will be charged.

## 2017 TRAINING ENROLLMENT FORM

\*Technician Name: \_\_\_\_\_

\*Technician Email Address: \_\_\_\_\_

\*Course Title: \_\_\_\_\_

\*Course Date: \_\_\_\_\_

\*Company: \_\_\_\_\_

\*Contact Name: \_\_\_\_\_

\*Contact Phone Number/Email: \_\_\_\_\_

\*Purchase Order Number: \_\_\_\_\_

\*Authorized Signature: \_\_\_\_\_

*\*Required for confirmation of enrollment*

### Forward all training enrollments to:

training@louisianacat.com  
(985) 536-0494 Tel  
(985) 536-0947 Fax

- Lodging and transportation are not included.
- Lunch will be provided except on the last day of classes if the last day is a ½ day.
- Louisiana Cat reserves the right to cancel any class at their discretion if fewer than four (4) participants are enrolled.

### Cancellation Fee Policy

A cancellation fee applies if notification is not provided in advance of one week prior to the scheduled class date. This late cancellation fee is \$450.00 per participant. If the participant fails to provide advance notification of enrollment cancellation, the full class fee is due at this time. If Louisiana Cat cancels the class for any reason, no fee will be charged.

### Safety Equipment/Proper Attire

Participants must bring approved safety glasses with side shields and wear safety shoes. Classes involve hands-on lab activities, and suitable attire is required; short pants, sleeveless shirts and canvas tennis shoes are not allowed. Participants dressed inappropriately will not be able to participate in exercises, and will not receive qualification stickers. No reimbursement will be given for class costs.

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## **Dealer Performance Center (DPC)**

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DPC is our online training website that allows you to experience easy to use engaging videos and interactive training, all with the click of a mouse. Thousands of online courses are available 24 hours a day, 7 days a week and are also available in various languages. We suggest you take our prerequisite classes online 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 Cat 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 the 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
- Individual subscriptions are valid for one year from the date of purchase
- The DPC Administrator has the capability to grant subscriptions to dealer employees and customers
- The DPC Administrator is also responsible for providing dealer learners access to DPC campuses, which gives the learner access to a number of web-based courses
- Contact our DPC Administrator for questions regarding pricing & gaining access to DPC

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## Electronics Troubleshooting I\*

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**COURSE NUMBER:** 26679 ILT

**CLASS DESCRIPTION:**

This is a foundational course to aid mechanical technicians in transition to electrical and electronic systems repair. This course teaches participants the procedures for maximizing battery life and reducing operational costs while reducing the environmental impact in disposing of spent batteries. Each participant is provided hands-on experience with electrical tools used to diagnose circuit faults and understand the effects of open and shorted conductors. It also includes hands-on testing of various charging and starting systems in the lab facility.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Identify safety concerns related to electrical energy for the prevention of accidental exposure, equipment damage and injury
- Identify types of electrical circuits: series, parallel and series/parallel
- Review and use the information within Ugly's electrical handbook
- Utilize Ohm's Law, measure and calculate I, E and R in electrical circuits
- Repair wiring harness utilizing Caterpillar wiring and terminal repair kits
- Identify the effects of opens and/or unwanted path to ground within a circuit
- Identify operation and maintenance concerns that shorten battery life and perform maintenance procedures that do not shorten battery life
- Explain the importance of proper electrolyte concentrations
- Measure a battery's level of charge and properly recharge the battery without shortening its operational life
- Explain the sign wave signal produced within the alternator and how the signal is transformed into DC voltage
- Measure current draw at various starting system circuits and compare to specification for diagnosing system faults
- Assemble electrical circuits on a training aid & measure electrical circuits using DMM
- Identify basic components & apply Ohm's Law to solve unknown circuit values
- Diagnose basic circuit faults
- Identify inputs and outputs and measure their signals
- Navigate and interpret schematics
- Use service resources to correctly diagnose battery, starter & alternator faults
- Successfully flash an ECM using ET

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

**PREREQUISITES:**

**Suggested Self Study - Web based classes available in DPC**

- ELE C01 - Key features of Electricity - 40113
- ELE C02 - Electrical Schematics -40114
- ELE C03 - Measuring Electrical Circuits - 40115
- ELE C04 - Electrical Circuit Types - 40018
- ELE C05 - Electrical Circuit Faults - 40017
- ELE C06 - Wire Connectors - 40016
- ELE C07 - Wire Types, Terminals and Harnesses - 40015
- ELE C08 - Circuit Devices - 40013
- ELE C09 - Circuit Protection Devices - 40014
- ELE C10 - Electrical Motors - 40028
- ELE C11 - Semi-Conductors - 40012
- ELE C12.1 - Electrical Circuit Inputs: Switches - 40019
- ELE C12.2 - Position Sensors - 40029
- ELE C12.3 - Electrical Circuit Inputs: Temp.& Pressure Sensors - 40042
- ELE C12.4 - Electrical Circuit Inputs: Speed/Timing Sensors - 40030
- ELE C13 - Circuit Processors - 40031
- ELE C14 - Circuit Outputs: Components – 40027
- ELE C15 - Battery System – 40026
- ELE C16 - Starting System – 40041
- ELE C17 - Charging System - 40062

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$2,175.00 USD per participant

\* **DPC Subscription Required**

## Electronic Sensors & Control Logics

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**COURSE NUMBER:** 40807

**CLASS DESCRIPTION:**

This course is an in depth study of effective techniques utilized for troubleshooting Caterpillar electronic engine control systems. The course will cover electronic components and their functions for all electronic systems. It will teach the use of the diagnostic tooling required to troubleshoot and repair electronic engine systems, basic troubleshooting techniques, and basic control logics. Engines covered will include 3116, 3126 HEUI, 3176/3176B, C-10, C-12, C-15 and 3406 B/C/E.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Recognize engine components and understand their functions
- Recognize and use service and diagnostic tooling (Service Technician Workbench, ET, Flash)
- Obtain factory passwords
- Establish program parameters
- Calibrate and adjust electronic engine components
- Troubleshoot electronic systems, differentiating electrical hardware and harness problems from electronics
- Describe the troubleshooting process
- Troubleshoot and repair electronic engine control systems.
- Diagnose and repair intermittent problems
- Isolate mechanical, OEM and perceived problems
- Demonstrate a working knowledge of:
  - Service Information System (SIS)
  - Electronic Technician (ET)
  - Flash procedures
- Use Cat Tooling to repair any harness problems

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

**PREREQUISITES:**

**Instructor Led Course**

- Electronics Troubleshooting I - 26679 ILT

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$2,475.00 USD per participant

## Hydraulics Troubleshooting

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**COURSE NUMBER:** 40810

**CLASS DESCRIPTION:**

This course is designed to familiarize the participant with basic hydraulics tests and inspection techniques required to demonstrate diagnostic procedures with hydraulic concerns.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Outline the safety procedures to follow when working or checking high-pressure hydraulics
- Identify hydraulic symbols relating to Cat products
- Explain how to use a hydraulic schematic, to understand graphic symbols and how they are used in the make-up of a hydraulic schematic
- Explain the fundamental principles of pressure and flow, describe the operation of basic hydraulic components and explain how these components are combined to do their many jobs

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

**PREREQUISITES:**

**Suggested Self Study - Web based classes available in DPC**

- Hydraulic System Fundamentals - 20323

**Instructor Led Courses**

- Electronics Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807

**CLASS DURATION:** 4.5 Days; 36 Hours

**CLASS COST:** \$1,625.00 USD per participant

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## Powertrain Troubleshooting

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**COURSE NUMBER:** 40811

**CLASS DESCRIPTION:**

This course covers basic powertrain theory, studying the various components used in Caterpillar equipment. The topics include, but are not limited to, the transmissions and differentials, torque converters, final drives and axles.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Identify powertrain components
- Discuss system operations and component functions
- Locate pressure testing ports and specifications
- Demonstrate safety procedures for working on or checking powertrain systems included

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

**PREREQUISITES:**

**Instructor Led Courses**

- Electronics Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807
- Hydraulics Troubleshooting - 40810

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$1,625.00 USD per participant

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## Air Conditioning Troubleshooting

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**COURSE NUMBER:** 40806 ILT

**CLASS DESCRIPTION:**

This course is designed to introduce the technician to the basic principles and theories of air conditioning in relation to Caterpillar equipment.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Understand basic fundamentals of AC systems, identification of system components and component functions
- Utilize tooling to inspect and test operating air conditioner system on various Caterpillar machines
- Understand governmental laws, safety and handling concerns of air conditioning refrigerant
- Perform the efficient process for refrigerant recovery and charging of an air conditioner system
- Effectively execute charging and recharging of the air conditioning system

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

**PREREQUISITES:** None

**COURSE DURATION:** 3 Days; 24 Hours

**COURSE COST:** \$1,575.00 USD per participant

## Fuel Systems Troubleshooting

**COURSE NUMBER:** 40808

**CLASS DESCRIPTION:**

This course is an in-depth study of Caterpillar fuel systems for 3114, 3116, 3126, C7 & C9 series engines and the C10/C12, C15 and 3400 series engines. Participants learn fuel system disassembly and assembly procedures. Participants study Caterpillar pumps, governors, timing advance units, unit injectors and nozzles.

**LEARNING OBJECTIVES:** Upon completion, the participant will be able to:

- Explain the operating principals of the 3116, 3126, C-7, C-9 unit injector, Hydraulically Actuated Electronically Controlled Unit Injection (HEUI), and ACERT technology
- Explain the operation of current and new scroll fuel systems 3406, 3400-V
- Explain the operation of the C/10/12, 3406E, C15, 3400-V High performance, and 3400 HEUI fuel systems and ACERT technology
- Demonstrate the operation and adjustment of 3116, 3126, C7 & C9 fuel systems
- Correctly determine API fuel density
- Inspect 3116 unit injectors for damage
- Check and adjust 3116 and HEUI fuel settings
- Check and adjust 1.1 unit injector synchronization, rack setting and timing
- Evaluate how API fuel density affects performance
- Demonstrate the operation and adjustments of C15 and 3400-V fuel Systems.
- Check and adjust set point and low idle
- Check and adjust fuel settings
- Check injection tinting
- Test unit injectors and nozzles

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

**PREREQUISITES:**

**Suggested Self Study - Web based classes available in DPC**

- 7 Step Diagnostic Process Course - 26917
- C15 ACERT Engine Performance Course - 26915
- Engine Performance Diagnostic Exercise 21 - 25946
- C-9 Engine Performance Course - 26916
- Engine Performance Diagnostic Exercise 18B - 25906
- Cat 3116 Engine Performance Course - 26848
- Cat 3406 and 3054 Engine Performance Course - 26949

**Instructor Led Courses**

- Electronics Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807

**CLASS DURATION:** 4.5 Days; 36 Hours

**CLASS COST:** \$1,750.00 USD per participant

## Engine Diagnostics

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**COURSE NUMBER:** 40921

**CLASS DESCRIPTION:**

This course is an in-depth study of engine diagnostic and repair techniques. The majority of the class time is spent with hands-on activities, diagnosing and correcting engine problems.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Explain the operating principals of the 3116, 3126; C-7, C-9 unit injector, and HEUI fuel systems
- Demonstrate the operation and adjustment of 3116, 3126, C-7 & C-9 fuel systems
- Explain the use of diagnostic tools to perform basic troubleshooting on engine systems
- Measure and evaluate temperature and pressures of an operating engine
- Measure and evaluate inlet and exhaust manifold pressures and temperatures
- Determine the effects on the engine set point and engine performance by changing fuel settings, high idle, and timing

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

**PREREQUISITES:** Suggested Self Study - Web based classes available in DPC

- C15 ACERT Engine Performance Course - 26915
- Engine Repair Diagnostic Exercise 17 - 26266
- Engine Performance Diagnostic Exercise 20 - 26920
- Engine Performance Diagnostic Exercise 21 - 25946
- C-9 Engine Performance Course - 26916
- Engine Performance Diagnostic Exercise 18B - 25906
- Cat 3116 Engine Performance Course - 26848
- Cat 3406 and 3054 Engine Performance Course - 26949
- Engine Performance Diagnostic Exercise 21 - 25946
- ER C01 - Cat Diesel Engines - 41134
- ER C06 - Diesel Engine Crankshaft - 40436
- ER C07 - Diesel Engine Front Gear Train - 41300
- ER C09 - Diesel Engine Connecting Rod Assembly - 41301
- ER C12 - Cat Diesel Engine Lubrication System - 41304
- ER C13 - Cat Diesel Engine Oil Pumps - 41305

**Instructor Led Courses**

- Electronics Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807
- Fuel Systems Troubleshooting - 40808

**CLASS DURATION:** 4.5 Days; 36 Hours

**CLASS COST:** \$1,750.00 USD per participant

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## D3500 A/B/C Engine Electrical, Operation & Maintenance

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**COURSE NUMBER:** 41875

**CLASS DESCRIPTION:**

This course covers air, lubrication, cooling and fuel engine systems. Lab activities include the Caterpillar software program, Electronic Technician, on the D3500 Series I, II, and III 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:**

**Instructor Led Courses**

- Electronics Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807
- Engine Diagnostics - 40921

**COURSE DURATION:** 2.5 Days; 20 Hours

**COURSE COST:** \$1,575.00 USD per participant

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## D3500 A/B/C, Tier III Engine Master Mechanic

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**COURSE NUMBER:** 41899

**CLASS DESCRIPTION:**

The primary focus of this course is the planned maintenance and repairs for the Caterpillar 3500 A, B, C, and Tier III 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 Tier III Series engines
- Accurately check and set the bridges, valves, injector heights and injector synchronization
- Disassemble and assemble the heads and pistons
- 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
- Troubleshoot engine related iron problems.

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

**PREREQUISITES:**

**Instructor Led Course**

- D3500 A/B/C Engine Electrical, Operation & Maintenance - 41875

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$2,475.00 USD per participant

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## C280 Engine Electrical, Operation & Maintenance

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**COURSE NUMBER:** 41895 ILT

**CLASS DESCRIPTION:**

The C280 Engine Electrical and Operation and Maintenance course provides an in-depth study and hands-on activities for installation, start-up, tuning, maintenance, and troubleshooting of the MMS II/GMS II controls on a C280 engine.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Perform upload and download programming utilizing a PC and memory card
- Setup the parameters in the MMS II/GMS II to match the engine and generator
- Identify the capabilities and functionality of the MMS II/GMS II
- Perform peripheral module programming associated with the MMS II/GMS II (these modules may include the Annunciator, Discrete I/O module, Thermocouple Module, and RTD Module)
- Understand the different components of the panels, such as Flex, PLC, Speed Switch, and the Panel View 1000 and their operation
- Understand the troubleshooting process for the panel and sensors
- Exhibit an understanding of the different communication protocols on the MMS II/GMS II

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

**PREREQUISITES:**

**Instructor Led Courses**

- Electronic Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807

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

**COURSE COST:** \$1,475.00 USD per participant

## C280 Engine Master Mechanic

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**COURSE NUMBER:** 40609

**CLASS DESCRIPTION:**

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.

**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:**

**Instructor Led Courses**

- Electronic Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807
- Engine Diagnostics - 40921

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

**COURSE COST:** \$2,300.00 USD per participant

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## D3600 Diesel Engine Master Mechanic\*

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**COURSE NUMBER:** 41904

**CLASS 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:**

**Instructor Led Courses**

- Electronic Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807
- Engine Diagnostics - 40921

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$2,300.00 USD per participant

\* **DPC Subscription Required**

## Natural Gas Engines I

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**COURSE NUMBER:** 41710

**CLASS DESCRIPTION:**

This course focuses on the basic operating principles of gaseous fueled engines. Emphasis is on fuel systems, horsepower calculations, maintenance, intake and exhaust systems, and the timing and ignition system.

**LEARNING OBJECTIVES:** Upon completion, the participant will be able to:

- Explain the operating principles of basic gaseous fueled engines
- Review the definitions of some common gas engine terms
- Perform cooling system, lubrication system, and fuel system maintenance
- Adjust and set the operating pressure of the adjustable waste gate
- Assess reusability of a diaphragm
- Perform a startup procedure

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

**PREREQUISITES:** Suggested Self Study - Web based classes available in DPC

- C15 ACERT Engine Performance Course - 26915
- Engine Repair Diagnostic Exercise 17 - 26266
- Engine Performance Diagnostic Exercise 20 - 26920
- Engine Performance Diagnostic Exercise 21 - 25946
- C-9 Engine Performance Course - 26916
- Engine Performance Diagnostic Exercise 18B - 25906
- Cat 3116 Engine Performance Course - 26848
- Cat 3406 and 3054 Engine Performance Course - 26949
- Engine Performance Diagnostic Exercise 21 - 25946
- ER C01 - Cat Diesel Engines - 41134
- ER C02 - Diesel Engine Cylinder Block - 41135
- ER C03 - Diesel Engine Cylinder Head Assembly - 41136
- ER C04 - Diesel Engine Valve Train - 40434
- ER C05 - Diesel Engine Camshaft - 40435
- ER C06 - Diesel Engine Crankshaft - 40436
- ER C07 - Diesel Engine Front Gear Train - 41300
- ER C08 - Diesel Engine Piston Assembly - 40437
- ER C09 - Diesel Engine Connecting Rod Assembly - 41301
- ER C10 - Diesel Engine Cooling System and Radiator - 41302
- ER C11 - Diesel Engine Cooling system Components - 41303
- ER C12 - Cat Diesel Engine Lubrication System - 41304
- ER C13 - Cat Diesel Engine Oil Pumps - 41305

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$2,300.00 USD per participant

## Natural Gas Engines II

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**COURSE NUMBER:** 41711

**CLASS DESCRIPTION:**

This course covers electrical systems and special considerations necessitated by low emissions gas engines – specifically the G3500 engine families. One day is spent reviewing stoichiometric principles. The remainder of the class is spent discussing principles of rich burn engines, the advanced wiring associated with the accompanying control systems, and doing tests and adjustments on a running G3508 Natural Gas engine. The effective use of Caterpillar service literature is practiced.

**LEARNING OBJECTIVES:**

Upon completion, the participant will be able to:

- Explain the effects of turbochargers, aftercoolers and exhaust bypass valve on engine performance
- Calculate the effects that altitude and temperature changes have on engine performance
- Calculate the minimum gas supply pressure requirement for gas engines with or without transient loads
- Calculate the Brake Specific Fuel Consumption (BSFC) for a given BTU fuel
- Understand the use of an exhaust free-oxygen emission analyzer to set exhaust oxygen/emissions
- Connect and properly use a computer with “Cat ET” to check and record the Customer Preferred Parameters and calibrate timing
- Explain the operation of the Engine Status Control Module (SCM) and its role in engine protection
- Explain the Caterpillar Electronic Ignition System (EIS) and how to troubleshoot it
- Explain how to do a self-test of the EIS using the proper testing harness

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

**PREREQUISITES:**

**Instructor Led Course**

- Natural Gas Engines I - 41710

**COURSE DURATION:** 4.5 Days; 36 Hours

**COURSE COST:** \$2,300.00 USD per participant

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## **G3600 Natural Gas Master Mechanic\***

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**COURSE NUMBER:** 41905

**CLASS 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.
- Understand a turbocharger and its housings for installation on a Vee engine.
- 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:**

**Instructor Led Courses**

- Natural Gas Engines I - 41710
- Natural Gas Engines II - 41711

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

**COURSE COST:** \$2,300.00 USD per participant

\* **DPC Subscription Required**

## **Louisiana Cat ADEM III – G3500 & G3600 Electronic Engine Controls\***

**COURSE NUMBER:** 44682

**CLASS DESCRIPTION:**

This course will address the operating strategies of Caterpillar's G3500B, and also advanced instruction for the G3600 Gas Engine Control/Systems operation and set up.

The G3500 petroleum engine portion of this course is customized to meet the needs of the gas compression industry for Caterpillar ADEM III Control Systems. This course will introduce the students to Caterpillar Electronic Technician (CAT ET) and its operation. Instruction will include time spent on an operating G3500 ADEM III engine using ET. Hands on training will include: fundamental engine troubleshooting using CAT ET, engine set up, evaluation and adjustment of engine emissions, and lab exercises using CAT ET data logger.

Covering the G3600 Gas Engine Control Systems, this course will provide education for:

- A3 and A4 ECM's and new control systems as they are introduced into production
- Service and troubleshooting procedures unique to these advanced control systems
- Configuration of ECM parameters
- Calibration of the Combustion Feedback System
- Engine Maintenance
- Various Engine Systems Operation
- Ignition System Components
- Hydrax hydraulic system and service

Reviewing of the troubleshooting guide, sensors, and Combustion and Temperature Sensors System (ITSM/ISM) will be conducted through this portion of the course. Course will also include discussions for available tooling and software for product support and the effective use of CAT service literature with this tooling. The remainder of the class will be spent discussing advanced wiring and schematics associated with the engine control system to include performing tests and adjustments to an operational G3600 A3 lab engine. Students will utilize the CAT ET service tool, SIS, GERP, TMI, and service manuals throughout this course.

**LEARNING OBJECTIVES:**

The purpose of this course is to train technicians on the proper set-up and operation of the G3500 petroleum engine and G3600 A3 ECM controlled engine.

Numerous engine systems and/or functions will be taught during this course and will include:

- Proper engine Start Up procedure including validation of correct engine operation
- The role of the ICSM (Integrated Combustion Sensors Module) in the engine control strategy
- Calibration of the Air/Fuel Pressure Module
- Understanding the role of entering correct ECM Configuration parameters using CAT ET
- Understanding how to modify the Programmable Monitoring System Values, if required.
- Proper setting of Combustion Cylinder Burn Times to produce correct operation emissions levels.

After completion, the student should be able to:

- Understand the operating principles of the Caterpillar ADEM III Gas Engine Controls
- Understand the uses of CAT ET on the G3500 engine
- Perform a data log

- Understand wiring schematics and how to use them
- Understand the importance of the power valve and its proper setting
- Understand the proper use of the emission analyzer

Students will utilize service manuals, GERP, SIS, and various other forms of media to properly troubleshoot and diagnose engine and control fault codes. Students will use classroom powered ECM's to view and configure the Configuration Parameters and to set the Programmable Monitoring System values of the ECM. Running engine labs will be conducted and students will utilize the CAT ET service tool to create, log, and troubleshoot engine anomalies using data logger methods. Students will receive education in the use of electrical schematics associated with the ADEM 3 ECM control systems and perform test and adjustment procedures on a G3600 ADEM III engine. A final exam will be administered to confirm student success upon completion of this course.

**REQUIRED EQUIPMENT:** Laptop with CAT ET downloaded is required for this course. Safety glasses with side shields, safety footwear, and long pants.

**PREREQUISITES:****Suggested Self Study – Web based classes available in DPC**

- Natural Gas Engine Tool Usage and Purpose, Part 2 – 20608 AICC
- Basic Troubleshooting of the Air/Fuel System of the Natural Gas Engine – 33275 AICC
- Natural Gas Engines Operation and Service Course Part 2 – 20389 AICC
- Caterpillar Electronic Technician (CAT ET) Overview - 40258

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

**COURSE COST:** \$2480.00 per participant

\* **DPC Subscription Required**

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## C175 Engine Electrical, Operation and Maintenance

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**COURSE NUMBER:** 40815

**CLASS 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 engine electronic 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**

- Electronic Troubleshooting I - 26679 ILT
- Electronic Sensors and Control Logics - 40807
- Engine Diagnostics - 40921

**COURSE DURATION:** 2.5 Days, 20 Hours

**COURSE COST:** \$1,675.00 per participant

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## Marine Engine Systems

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**COURSE NUMBER:** 40431

**AUDIENCE:**

Dealer technicians and/or dealer application engineers working on the service or installation of marine engines.

**OBJECTIVES:**

Upon completion of the course students will be able to:

- Determine the proper oil selection for Cat marine engines
- Explain the SOS test process
- Explain the requirements of Lube Oil
- Determine the API of diesel fuel
- Determine the A and I guide requirements for marine fuel systems
- Describe the marine engine rating system
- Navigate TMI to retrieve information about a marine engines
- Describe the three basic hull types
- Describe how marine propellers work
- Describe the various types of marine engine cooling systems
- Explain requirements for marine engine coolant
- Describe basic principles for proper ventilation and exhaust system design
- Describe basic principles of marine engine alignment and vibration
- Identify basic types of engine mounting systems

**PREREQUISITES:**

Participants should have a training session on using the Technical Marketing Information (TMI) on-line system prior to attending this module.

**COURSE DURATION:** 2.5 Days; 20 Hours

**PARTICIPANT RESOURCES:**

Participants should bring his or her Laptop computer; Have access to Caterpillar Technical Marketing Information (TMI)

**ASSESSMENT:**

Given all reference materials, class notes, and the post-test, the participant will be able to answer the questions with 100% accuracy. Student may refer to their module materials and class notes when taking the post-test, however no student collaboration or consulting with other participants will be allowed during the post-test.

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## Marine Control Systems

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**COURSE NUMBER:** 41564

**AUDIENCE:**

Level I & II: This module is designed for field service personnel, resident mechanics, technical communicators, marine, shop, & power system technicians. All students should have a working knowledge of basic electrical and electronic systems used within Caterpillar products.

**OBJECTIVES:**

This course is designed to prepare the technician to identify the components and explain the systems operation on the Cat MCS (formerly Auto-Maskin) Alarm and Protection System, Cat MSCS, Multi -Station Control System, and the PL1000E & PL1000T Communication ECM. Level II.

**PREREQUISITES:** Suggested Self Study – Web based classes available in DPC

- Basic Electricity – 21468
- Electrical Circuit Components – 21464
- Electrical/Electronic Components – 26670
- Measuring Electrical Circuits – 40115

**COURSE DURATION:** 3.5 to 4 Days; 25 Hours

**ENVIRONMENT:** Classroom and Lab

**PARTICIPANT RESOURCES:**

- Participants should bring laptop with ET and SIS installed
- Communication Adapter

**LAFAYETTE AREA HOTELS** – 30 minutes from training facility; 5 minutes from LFT airport - (Lodging & transportation are not included in course fees)

**Homewood Suites by Hilton**

201 Kaliste Saloom Road  
Lafayette, LA 70508  
Direct Hotel Line: (337) 264-6044

- Complimentary breakfast
- Complimentary dinner, Monday through Thursday; 5 to 7 pm
- Louisiana Cat Corporate via

<http://homewoodsuites.hilton.com/en/hw/reservations/index.jhtml?hotel=LFTKSHW&corporateCode=0560053070>



**Wingate by Wyndham**

702 East Kaliste Saloom Road  
Lafayette, LA 70508  
Direct Hotel Line: (337) 234-3700



**NEW IBERIA AREA HOTELS** – 10 minutes from training facility; 30 minutes from LFT airport

**Holiday Inn Express**

318 West Highway 90 Frontage Road  
New Iberia, LA 70560  
Hotel Direct Phone: (337) 408-2700



**Hampton Inn**

400 Spanish Town Blvd.  
New Iberia, LA 70560  
Direct Hotel Phone: (337) 321-6700



## LAFAYETTE / NEW IBERIA AIRPORT INFORMATION

### Lafayette Regional Airport (LFT)

American Eagle, connecting to Dallas Ft. Worth (DFW)

Delta Connection, connecting to Atlanta Hartsfield International (ATL)

United Express, connecting to Houston Bush Intercontinental (IAH)

## LAFAYETTE / NEW IBERIA CAR RENTAL

Alamo  
Hertz

Avis  
National

Budget  
Enterprise

## NEW IBERIA MAP



## MORGAN CITY AREA HOTELS

(Lodging and transportation are not included in course fees)

**Clarion Inn** (formally Holiday Inn)  
520 Roderick St.  
Morgan City, LA 70380  
Direct Hotel Phone: (985) 385-2200

- Complimentary Breakfast



**Hampton Inn**  
6365 Highway 182 East  
Morgan City, LA 70380  
Direct Hotel Phone: (985) 221-4421

- Complimentary Continental Breakfast



## **Holiday Inn Express & Suites**

704 Dr. Martin Luther King Dr.  
Morgan City, LA 70380  
Direct Hotel Phone: (985) 300-5300

- Complimentary Breakfast



## **MORGAN CITY AIR TRAVEL (Serviced through New Orleans)**

### **NEW ORLEANS LOUIS ARMSTRONG INTERNATIONAL (MSY) – 75 Miles Away**

Air Canada  
Alaska Airlines  
Allegiant Airlines  
American Airlines/American Eagle  
Branson Air Express  
Condor Airlines  
Copa Airlines  
Delta Airlines/Delta Connection  
Frontier Airlines  
GLO Airlines  
JetBlue Airways  
Southwest Airlines  
Spirit Airlines  
United Airlines/United Express

## MORGAN CITY CAR RENTAL (Serviced at New Orleans Int'l Airport)

Alamo	Avis	Budget
Hertz	National	Enterprise

## MORGAN CITY STORE LOCATION

