

# 2018 TECHNICAL TRAINING CATALOG



**TRAINING MAKES THE DIFFERENCE**

**866-843-7440**

**Louisiana** 



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## **Staff**

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Training Coordinator

## Training Facilities

Louisiana Cat  
6111 Port Road  
New Iberia, LA 70560  
(337) 374-1901 - Tel  
(337) 374-1914 - Fax

Louisiana Cat  
9592 Highway 182 East  
Morgan City, LA 70380  
(985) 631-0561 - Tel  
(985) 631-0567 - 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 2018 Technician Training Schedule.

## Registration/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

## Course Fees

Course 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.

## 2018 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](mailto: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 steel toe 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 credentials. No reimbursement will be given for class costs.

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## Dealer Performance Center (DPC)

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**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 **\$300 per individual per year**
- Individual subscriptions are valid for one year from the date of activation, and does not renew automatically
- A DPC Subscription gives the learner access to a number of web-based courses

### In order to fully process a DPC request, we will need:

- Student Name
- Company Name
- Company Physical Address
- Company Mailing Address
- Company Phone Number
- Company Parish/County
  - Please note that for new subscriptions, it takes approximately 7-10 business days to successfully activate. Once activated, you will receive notification from the Louisiana Cat DPC Administrator that the accounts have been activated, the login information for each account, and a helpful user guide for each individual.

Currently, Louisiana Cat offers some Instructor-Led Courses that require DPC access as a prerequisite. Those courses are as follows: **AFA I, AFA II, D3600 Engine Master Mechanic, G3600 Natural Gas Engine Master Mechanic, and Electronics Troubleshooting I**. Please note that for **AFA I** and **Electronics Troubleshooting I**, there are online courses that need to be completed as well within DPC prior to attending the class.

## Electronics Troubleshooting I\*

**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

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## 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



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## Fuel Systems Troubleshooting

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**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

**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:** 40809

**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 Engine Master Mechanic\*

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**COURSE NUMBER:** 26244

**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**

## Performance Based Gas Engine Training\*

**COURSE NUMBER:** 51957

**CLASS DESCRIPTION:**

This course is geared towards dealer and customer technicians with two years of experience working with gaseous-fueled engines. The technician must be competent in:

- Interpreting and making recommendations based on fuel sample analysis
- Navigating through the various Information Resource Systems (i.e., GERP, TMI, SISWeb, Cat ET)
- Describing the operating principles of Caterpillar Gas Engine Systems
- Troubleshooting basic electrical power supply

The course will cover topics such as:

- Air/Fuel Ratio
- Regulators
- Carburetors
- Air Inlet & Exhaust Systems
- SCAC
- Tuning and Startup
- Ignition System
- Startup/Tune-up Procedures
- Wiring Schematics

To enhance the learner experience during this training, we highly request the participant to complete the recommended web-based training listed below.

An 85% or above score is required to successfully complete this Instructor-Led Training

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

- Perform the initial set up of G3500 A3 carbureted engines
- Test and adjust natural gas engine components
- Troubleshoot general gas engine performance issues (i.e., low power, poor performance, etc.)
- Setup and check engine pressures and temperatures
- Read schematics for carbureted engines
- Troubleshoot electrical related problems

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

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

### Gas Engines Systems Overview

- Introduction to Gas Engines
- Natural Gas Engines Operation and Service Part 1
- Natural Gas Engines Operation and Service Part 2



- Natural Gas Engine Tool Usage and Purpose Part 1
- Natural Gas Engine Tool Usage and Purpose Part 2
- Natural Gas Engine Symptoms and System Relationships
- Fuel System Components and Functions
- The Air Intake System of the Natural Gas Engine
- The Exhaust System of the Natural Gas Engine
- Basic Gas Technician Tasks of the Natural Gas Engine: Air/Fuel System
- Tuning the Air/Fuel Ratio of the Low Emission Natural Gas Engine with Air/Fuel Ratio Control
- Basic Troubleshooting of the Air/Fuel System of the Natural Gas Engine
- Natural Gas Engine Basic Diagnostics: Locating Malfunctions at the System Level
- Gas Engine Rating Pro (GERP)

### **Electrical Systems**

- ELE CO1 – Key Features of Electricity
- Introduction to Wiring Schematics
- The Ignition System of the Natural Gas Engine
- General Maintenance of the Ignition System of the Natural Gas Engine
- Troubleshooting the G3500 A3 Ignition System
- Troubleshooting the Repair of the Ignition System of the Natural Gas Engine: Comprehensive Review and Practice
- The Control Systems of the Natural Gas Engine

### **Basic Engine Systems**

- ER C10 – Diesel Engine Cooling System and Radiator
- ER C11 – Diesel Engine Cooling System Components
- ER C12 – Cat Diesel Engine Lubrication System

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

**COURSE COST:** \$2,400.00 USD per participant

\* **DPC Subscription Required**

## Advanced Performance Based Gas Engine Training\*

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**COURSE NUMBER:** 51958

**CLASS DESCRIPTION:**

Following completion of this course the technician will have the working knowledge and ability to troubleshoot, identify and complete repairs on mechanical and electrical faults on a G3500 A3 Lean Burn Natural Gas Engine. Additionally will perform calculations on a loaded engine during all ranges of operation, determine effects on turbochargers, aftercoolers, exhaust bypass at any altitude & temperature. Calculate minimum gas pressure on a loaded engine with and without a transient load. Given a fuel sample, input into GERP and perform initial setup based on timing changes required, emissions data tuning, and exhaust bypass final adjustments at full load. Calculate the Brake Specific Fuel consumption of a given fuel.

- Operate Emission Analyzer to adjust and tune engine at 50%, 75% and 100% load.
- Navigate proficiently through the various Information Resources Systems (i.e. GERP, TMI, SISWeb, Cat ET) to accurately identify root causes of G3500 A3 engine issues, and perform timely repairs.
- Use Electronic Technician to modify engine parameters, request factory passwords, perform calibrations, etc.
- Troubleshooting Engine Status Control Module, Electronic Control Unit, Air/Fuel Ratio Module
- Utilize Engine / Wiring Schematics to locate issues in control systems, relays, and starting circuits.
- Perform diagnostics test on a static and loaded natural gas engine.

The course will cover topics such as:

- Air/Fuel Ratio Tuning
- Main Gas & Engine Regulator Adjustments
- Carburetors Repairs and Adjustments
- Air Inlet & Exhaust Systems Pressure & Temperature measurements
- SCAC and Heat Exchanger faults
- Tuning and Startup of a loaded G3500 A3
- Ignition System Troubleshooting and Repairs
- Startup / Tune up Procedures Assessment using Service Information System
- Wiring Schematics to identify active and logged faults

To enhance the learner experience during this training, we request the participant to review the recommended web-based training listed below.

An 80% or above score is required to successfully complete this Instructor-Led Assessment.

**LEARNING OBJECTIVES:**

Upon completion of this course the participants will be able to:

- Perform the initial setup of G3500 A3 carbureted engines
- Test and adjust natural gas engine components
- Troubleshoot general & advance gas engine performance issues (i.e. low power, poor performance, timing, Btu, etc.)
- Setup and check engine pressures and temperatures of an engine loaded @ 50%, 75% and 100%

- Research and locate engine specific information related to electronic, mechanical and control components
- Read schematics a G3500 A3 carbureted engine
- Troubleshoot electrical related problems.

**REQUIRED PREREQUISITES:**

**Gas Engines Courses**

1. Performance Based Gas Engines ILT - 41450

**Gas Engines Systems Overview**

1. Introduction to Natural Gas Engines
2. Natural Gas Engines Operation and Service Part 1
3. Natural Gas Engines Operation and Service, Part 2
4. Natural Gas Engine Tool Usage and Purpose Part 1
5. Natural Gas Engine Tool Usage and Purpose, Part 2
6. Natural Gas Engine Symptoms and System Relationships
7. Fuel System Components and Functions
8. The Air Intake System of the Natural Gas Engine
9. The Exhaust System of the Natural Gas Engine
10. Basic Gas Technician Tasks of the Natural Gas Engine: Air/Fuel System
11. Tuning the Air/Fuel Ratio of the Low Emission Natural Gas Engine with Air/Fuel Ratio Control
12. Basic Troubleshooting of the Air/Fuel System of the Natural Gas Engine
13. Natural Gas Engine Basic Diagnostics: Locating Malfunctions at the System Level
14. Gas Engine Rating Pro (GERP)

**Electrical Systems**

15. ELE C01 - Key Features of Electricity
16. Introduction to Wiring Schematics
17. The Ignition System of the Natural Gas Engine
18. General Maintenance of the Ignition System of the Natural Gas Engine
19. Troubleshooting the G3500 A3 Ignition System
20. Troubleshooting and Repair of the Ignition System of the Natural Gas Engine: Comprehensive Review and Practice
21. The Control Systems of the Natural Gas Engine

**Basic Engine Systems**

22. ER C10 – Diesel Engine Cooling System and Radiator
23. ER C11 - Diesel Engine Cooling System Components
24. ER C12 - Cat Diesel Engine Lubrication System

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

**COURSE COST:** \$2,400.00 USD per participant

**\* DPC Subscription Required**

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## G3600 Master Mechanic\*

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**COURSE NUMBER:** 26242

**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**

- Performance Based Gas Engines - 51957
- Advanced Performance Based Gas Engines - 51958

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

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

\* **DPC Subscription Required**



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## C175 Engine Electrical, Operation & Maintenance

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**COURSE NUMBER:** 408115

**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 USD per participant

## C32 Engine Electrical Operation & Maintenance

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**COURSE NUMBER:** 41641

**CLASS 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 Caterpillar ET program
- Read and decipher electronic codes
- Basic electronics of a C32

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

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

## Marine Engine Systems\*

**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.

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

**COURSE COST:** \$1000.00 USD per participant

\* **DPC Subscription Required**

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

**COURSE DURATION:** 4 Days; 32 Hours

**ENVIRONMENT:** Classroom and Lab

**LEARNING 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 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.

**TRAINING DEPARTMENT**

(985) 536-0494 Tel

(985) 536-0947 Fax



www.LouisianaCat.com

**REQUIRED EQUIPMENT:**

Laptop computer

Access to Technical Marketing Information (TMI)

Texas Instruments 30XA Scientific Calculators (TI-30XA)

Flash Drive

Participant Guide

Binder with Reference materials

Marine Analyst Service Handbook (MASH) LEBV4830-09

**ASSESSMENT:**

Given all reference material, 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. Student may not consult with others during the post-test.

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

\* **DPC Subscription Required**

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## Applied Failure Analysis (AFA) I\*

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**COURSE NUMBER:** 26213 ILT

**DESCRIPTION:**

AFA I focuses on the basic principles of metallurgy, wear and fractures, and on managing the failure analysis process itself 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.

**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.

**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 – 33402 AICC
- Intro to AFA Principles of Fractures – 33403 AICC
- Intro to AFA Management – 33400 AICC
- Intro to AFA Visual Examination – 33401 AICC
- Intro to AFA Metallurgy – 33407 AICC

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

**COURSE COST:** \$2,150.00 USD per participant

\* **DPC Subscription Required**

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## Applied Failure Analysis (AFA) II\*

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**COURSE NUMBER:** 26214 ILT

**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 a 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.

**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.

**PREREQUISITES:**

- AFA I – 26213 ILT

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

**COURSE COST:** \$2,150.00 USD per participant

\* **DPC Subscription Required**



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## Component Reuse Training\*

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**COURSE NUMBER:** 41658

**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 a 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.

**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.

**PREREQUISITES:**

This course has one or more prerequisites that need to be completed before any participant will be allowed to be enrolled in this course.

- AFA I must be successfully completed prior to be allowed to register for this course
- Review the appropriate Guidelines for reusable parts and salvage operations
- Applied Failure Analysis I - 26213
- Component Reuse: General Procedures - 44380
- Component Reuse: Hydraulic Pump Components – 44591
- Component Reuse: Hydraulic Pump Group - 44592
- Component Reuse: Drivetrain Discs and Plates - 44891
- Component Reuse: Drivetrain Gears Repair - 44893
- Component Reuse: Drivetrain Planetary Final Drive - 44895
- Component Reuse: Engine Camshaft - 44588
- Component Reuse: Engine Crankshaft - 44589
- Component Reuse: Engine Pistons - 44590
- Reusability Guidelines for Engine Liners - 52894
- Reusability Guidelines for Rocker Arms - 52896
- Reusability Guidelines for Turbochargers – 52895
- Review the appropriate Guidelines for reusable parts and salvage operations

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

**COURSE COST:** \$1,875.00

**\* DPC Subscription Required**

## NEW IBERIA / LAFAYETTE AREA HOTELS

Lodging and transportation are not included in course fees.

➤ **Homewood Suites by Hilton**

201 Kaliste Saloom Rd.

Lafayette, LA 70508

Phone: (337) 264-6044



\* Complimentary breakfast

\* Complimentary dinner, Monday through Thursday

\* Swimming pool, fitness center, basketball court

\* **Louisiana Cat Corporate Rate** via

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

➤ **Wingate by Wyndham**

702 East Kaliste Saloom Rd.

Lafayette, LA 70508

Phone: (337) 234-3700

Reservations Line: (866) 434-0298

➤ **Hampton Inn**

400 Spanish Town Blvd.

New Iberia, LA 70560

Phone: (337) 321-6700

➤ **Holiday Inn Express**

318 West Highway 90 Frontage Road

New Iberia, LA 70560

Phone: (337) 408-2700

## LAFAYETTE / NEW IBERIA AIRPORT INFORMATION

### Lafayette Regional Airport (LFT)

American Airlines, connecting to/from Dallas Ft. Worth (**DFW**)

Delta Airlines, connecting to/from Atlanta Hartsfield International (**ATL**)

United Airlines, connecting to/from Houston Bush Intercontinental (**IAH**)

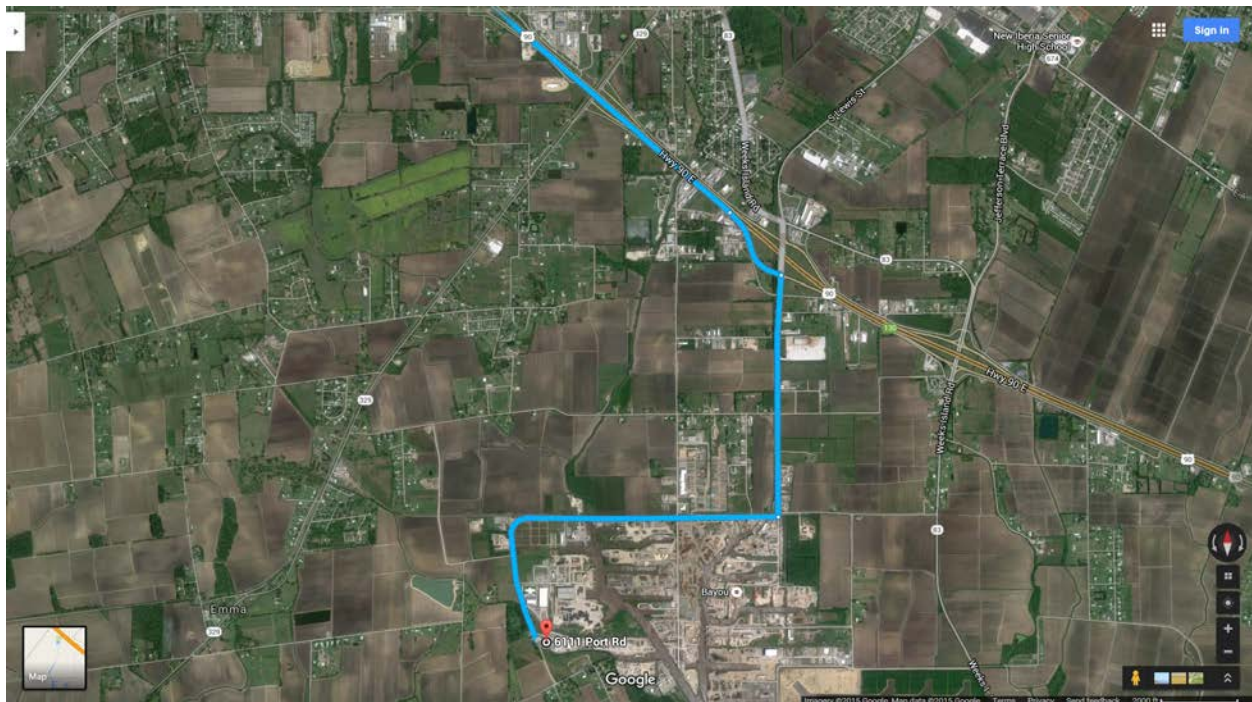
## LAFAYETTE / NEW IBERIA CAR RENTAL

Alamo  
Hertz

Avis  
National

Budget  
Enterprise

## NEW IBERIA MAP



## **MORGAN CITY AREA HOTELS**

Lodging and transportation are not included in course fees.

### **Clarion Inn**

520 Roderick St.

Morgan City, LA 70380

Phone: (985) 385-2200

Reservations: (888) 465-4329

<https://goo.gl/dHBPrH>



- \* Complimentary breakfast
- \* Full Service Restaurant and Cocktail Bar

### **La Quinta Inn & Suites**

2018 Allison St.

Morgan City, LA 70380

Phone: (985) 300-0200

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

### **NEW ORLEANS LOUIS ARMSTRONG INTERNATIONAL (MSY)**

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 AREA MAP

