



Caterpillar Dealer Service Technician



Student Information Guide
2019-2020

Butler 

Sponsored By:

Butler Machinery Company
&
Lake Area Technical Institute

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Caterpillar ThinkBIG Program Overview

PROGRAM OBJECTIVE

The Caterpillar ThinkBIG Program is a cooperative two-year college level Student Technician education program that leads to an Associate of Applied Science degree with a major in Caterpillar Service Technology. The diesel division and LATI work in close relationship with the sponsoring CAT dealers, to administer the program activities. The program is exclusively by and for the sponsoring CAT dealerships. **It should be understood that the students selected for this program may have the opportunity for full time employment with the dealership upon successful completion of the program.**

PROGRAM PURPOSE

America's workplace is changing. Current technology and emerging technological advances constantly increase innovation, productivity and competitiveness in a truly global economy. To meet the new challenges of advancing technology in the workplace, LATI is partnering with Caterpillar and its dealerships to produce high-performance technicians ready to fill productive roles in both business and society, today and into the future. The purpose of the program is to upgrade the technical competency and professional level of incoming CAT dealership service technicians. It will train CAT Dealer students to analytically diagnose service and maintain Caterpillar products using recommended procedures, special tools and service information. It will provide course content that will enable successful graduates to advance in position after additional experience, and to understand new systems and components as they are introduced.

PROGRAM STRUCTURE

The two-year, five semester program incorporates approximately one half of the time designated for technical/academic education at Lake Area Technical Institute. The remaining time is allocated for on-the job experience at sponsoring CAT dealerships. Each block of technical education and general education course work is followed by an immediate dealership work experience time period that reinforces the technical education. These time periods are approximately eight weeks in length each. It is essential for the success of the program that the student's education at LATI and dealership work experiences are closely aligned for maximum student learning and retention. Since considerable time is spent at the dealership it is a requirement of the program that students have a sponsoring CAT dealership prior to enrollment. The primary responsibility for the dealership is to provide training-related employment for the students during their dealership learning/work experience, internship. All tuition, fees, textbooks, travel expenses and housing costs are the responsibility of the student. In addition to these costs, the students are required to purchase a specified tool set if they do not already have one.

PROGRAM CURRICULUM

Technical training on Caterpillar equipment and components includes the latest developments in Engine Repair, Hydraulic Systems, Electrical and Electronic Systems, Test Procedures and Diagnostic Tools. In addition to the technical curriculum, courses will be offered in select Communications, Social Sciences, Mathematics, and Psychology courses to provide students with the background necessary for effective communication and the development of interpersonal skills.

PURPOSE OF THE INTERNSHIP

The internship allows students to apply, in a real world setting, what they have learned during the previous classroom/lab sessions. In addition, students become familiar with the dealership environment, its organizational structure, and the competencies that are expected of a professional service technician.

Student Qualifications:

Prospective students must be:

1. Eighteen years of age (or older) by the time of the first internship.
2. High School graduate or equivalent.
3. Able to meet LATI and CAT Dealership admission and academic requirements.
4. Sponsored by a CAT dealership.
5. Possess a valid driver's license and maintain an employable driving record.
6. Willing to take a drug test if requested by dealership sponsor. (Note: for many dealerships this is a requirement for employment)
7. Sincere about becoming the best service technician he/she can be.

Responsibilities of Participants

LATI

1. Provide faculty dedicated solely to the CAT "ThinkBIG" Program
2. Provide necessary time to initially train and update the faculty
3. Provide facility dedicated solely to the CAT "ThinkBIG" program: classrooms, labs, etc.
4. Appoint a CAT "ThinkBIG" program coordinator.
5. Provide advisement for CAT "ThinkBIG" students.
6. Maintain up-to-date tools and equipment.
7. Grant the Associate of Applied Science degree in Caterpillar Service Technology to graduates.
8. Inform sponsoring dealers of student progress.
9. Assist dealerships with student selection and recruitment.
10. Work with the dealership coordinator to assure involvement in internships.
11. Conduct student visitations during internships.
12. Establish a CAT dealer prep advisory committee.
13. Schedule advisory committee meetings.

CAT Dealerships

1. Agree to act as a sponsoring dealership.
2. Appoint an in-dealership coordinator.
3. Recruit, interview and select prospective student (s).
4. Provide dealership coordinated internship experience in accordance with the program schedule for the duration of the curriculum
5. Provide related work/learning experiences that supplement the students' most recent instruction.
6. Agree to pay the student during periods of dealership internship.
7. Provide work uniforms for student consistent with dealership while at the dealership.
8. Provide any other benefits in a manner consistent with other dealership employees.
9. Assist in obtaining equipment and training aids.
10. Participate in the advisory committee meetings.

STUDENT

1. Obtain and maintain a CAT dealer sponsor throughout the program.
2. Provide sponsoring CAT dealership with responsible and productive work effort
3. Participate in all learning activities at scheduled times.
4. Maintain academic standards and adhere to academic policies (minimum 3.0) according to LATI policy
5. Maintain dealership attendance standards
6. Be responsible for program costs: tuition, fees, books, tools, housing, etc.
7. Wear work uniforms, safety glasses and recommended personal safety equipment during campus class/labs and dealership internship experiences.

Student Selection Procedures

1. Students who wish to become a member of the Caterpillar "ThinkBIG" program should apply early in the fall semester (October-December) if possible. This will allow time for processing financial aid packages, identification of preparatory class needs, sponsorship acquisition, etc. The application process includes the following:
 - A) Complete LATI application for admission
 - B) Comply with LATI admission policies
 - C) Complete the CAT dealer employment application
 - D) Submit a current official driving record
2. Students who successfully complete the admission process are eligible to interview and test with the CAT dealership of their choice. The interview should take place at the dealership and participant's goals should be discussed. All students must have a dealer sponsor before enrollment can be completed.

Should the interview prove successful, the CAT dealer coordinator will notify the LATI CAT Dealer ThinkBIG coordinator of the agreement to sponsor the individual.

Note: Should the CAT ThinkBIG Program have more applicants than openings, (16 maximum), the faculty and participant CAT dealerships will use the criteria listed above in the selection process.

FINANCIAL ASSISTANCE

Students deciding to be part of the CAT dealer ThinkBIG program may have a need for financial assistance. Students involved in the program have the opportunity to earn while they learn during the dealership internship portion of the program. These earnings may be applied to program costs. Additional financial aid, through loans or grants, for tuition, books, tools, on-campus room and board, etc. may be available through various financial assistance programs. Students needing financial assistance are encouraged to complete the applications for financial aid as early as possible. Following application submittal, allow an 8-10 week period for processing. Early application assures availability of funds, if qualified, and allows the Financial Aid office to prepare a realistic financial aid package.

Financial Aid information may be obtained by calling the LATI Student Financial Aid office at 605-882-5284.

Note: Tools required for the CAT "ThinkBIG" program are considered an educational expense and should be included in education costs when applying for student financial aid.

DIESEL TECHNOLOGY



AAS –Caterpillar Dealer Service Program

CATERPILLAR DEALER SERVICE TECHNOLOGY PROGRAM DESCRIPTION

The Caterpillar Dealer Service Technology Program is designed to develop technically competent entry level service technicians for Caterpillar Dealerships regionally and throughout the world. Caterpillar Company, Peoria, Ill. endorses the program and participating dealers sponsor students enrolled at LATI.

Students receive up to date technical training on Caterpillar equipment and systems through a combination of classroom instruction, hands on laboratory instruction and an internship at the participating Caterpillar dealer. Work experience at the dealership is structured to relate to the most recent classroom/lab subjects covered at LATI. Upon completion of the program, graduates earn an Associate of Applied Science degree (AAS).

The Caterpillar Service Technology Program takes 5 semesters to complete. The 5 semesters are divided into 9 terms, each approximately 9 weeks in length. Students complete the 1st, 3rd, 5th, 7th and 9th terms on campus at LATI. They complete the 2nd, 4th, 6th and 8th terms at their participating dealership.

If interested, students should complete the LATI Admissions application. Candidate applications will then be screened by Caterpillar Dealerships for program selection. Each student selected will be sponsored by a participating Caterpillar Dealer.

Applicants not selected for sponsorship into the Caterpillar Dealer Service Technology Program are encouraged to enroll in the Diesel Technology Program at LATI.

What are the responsibilities of a participating dealership?

1. Recruit, interview and select prospective student
2. Assign an in-dealership coordinator who will monitor the student during the internship.
3. Provide dealership coordinated educational work/learning experiences in areas of technical education that were conducted at LATI.
4. Pay wages to the student during periods of internship at the dealership.
5. Provide uniforms for the student, consistent with dealership policy.
6. Complete student evaluation forms during each internship.
7. Advise school of concerns or changes in student status with dealership.

CAT DEALER SERVICE TECHNICIAN COURSES DESCRIPTIONS

DCAT 110 CATERPILLAR ENGINE FUNDAMENTALS

A theory and lab course covering engine operating principles, cylinder and piston service, valve service, crankshaft and bearing service, lubrication systems, rebuilding procedures and measurement fundamentals on Caterpillar Engines. Caterpillar engines are used for lab disassembly and assembly.

DCAT 111 INTRODUCTION TO CAT SERVICE

This course introduces the student to the Caterpillar organization history and the different parts of the company. Instruction and lab experiences in the shop include safety, shop operation and a major emphasis on how to obtain information using CAT Specific Software Systems.

DCAT 150 INTERNSHIP I

This supervised experience is required of students enrolled in the Caterpillar Dealer Service Technology curriculum. Placement experience is obtained through the cooperation of a CAT Dealer. Students needs and objectives determine major emphasis.

DCAT 112 FUNDAMENTALS OF HYDRAULICS

A theory and lab course designed to teach the basic hydraulic fundamentals. Identification and function of the various components used in Caterpillar Hydraulic Systems will include: vane pumps, gear pumps and piston pumps. ISO hydraulic symbol identification and tracing oil flows used in Caterpillar Hydraulic Systems. Lab exercises include disassembly and assembly of Caterpillar Hydraulic Components.

DCAT 113 CATERPILLAR FUEL SYSTEMS

A lab lecture course introducing the student to fuel systems used on Caterpillar Engines. Combustion chamber design, injectors and injection pumps are covered in this class. Also covered are diagnosing faults in fuel injection and combustion systems. Lab exercises include disassembly and assembly of fuel components used in Caterpillar Fuel Systems.

DCAT 114 FUNDAMENTALS OF ELECTRICITY

A lecture/lab course that introduces the student to basic electrical and electronic fundamentals needed by a technician to properly diagnose and repair the complex electrical systems installed on Caterpillar Machines. Included is the study of Ohm's law, series and parallel circuits, test instruments and various components found on Caterpillar Equipment. The course does not teach specific machine systems.

DCAT 151 INTERNSHIP II

This supervised experience is required of students enrolled in the Caterpillar Dealer Service Technology curriculum. Placement experience is obtained through the cooperation of a CAT Dealer. Students needs and objectives determine major emphasis.

DCAT 115 FUNDAMENTALS OF AIR CONDITIONING

A lecture, discussion and lab-type course covering the basic theory and operating principles of air-conditioning systems as they relate to Caterpillar equipment. Lab exercises consist of leak detecting, evacuation, reclaiming, charging, component repair and use of test equipment to diagnose and repair malfunctions.

DCAT 116 FUNDAMENTALS OF TRANSMISSION & TORQUE CONVERTORS

A lecture/lab course that covers the various transmissions, torque converters and differentials used in Caterpillar Equipment. This course also covers: constant mesh, sliding gear, hydrostatic synchromesh, and power shift transmissions involving planetary. At the completion of this course, the student will have working knowledge of basic power train theory.

DCAT 200 UNDERCARRIAGE/FINAL DRIVES

A lecture/lab course that introduces the student to undercarriage and drive systems used on the many different types of Caterpillar track machines. Also covered are final drives and braking systems used in Caterpillar Track and Wheel Equipment. This course is a continuation of DCAT 116 Fundamentals of transmissions and torque converters.

DCAT 201 CAT MACHINE ELECTRONIC SYSTEMS

A lecture/lab course that covers the electronic systems used on Caterpillar Equipment. This course provides the background needed to diagnose and repair the electronics and computerized circuits found on Caterpillar Equipment and Engines. Basic electronic concepts, component function and system operation are covered. Caterpillar's procedures are taught to identify malfunctions and to test the system properly.

DCAT 210 MACHINE HYDRAULIC SYSTEMS

A lecture/lab course designed for inspecting, testing, servicing and diagnosing Caterpillar Hydraulic Systems and components. Students will conduct testing and adjusting procedures on Caterpillar Equipment, utilizing Caterpillar Service Procedures and Test Equipment.

DCAT 235 APPLIED FAILURE ANALYSIS

This course teaches students to think in a consequential and organized manner so that they learn to work in a consequential and organized manner. Failure Analysis is the thoughtful review of product and environment facts which leads to identification of root causes of failures.

DCAT 250 INTERNSHIP III

This supervised experience is required of students enrolled in the Caterpillar Dealer Service Technology curriculum. Placement experience is obtained through the cooperation of a CAT Dealer. Students needs and objectives determine major emphasis.

DCAT 202 ENGINE PERFORMANCE

A lecture/lab course that teaches the skills necessary to make CAT Engines run at peak performance. The student will be provided with a thorough understanding of the necessary diagnostic skills required for trouble shooting Caterpillar Engines and Fuel Systems. Emphasis will be placed upon knowledge and skills necessary to assure product reliability and performance.

DCAT 203 DIAGNOSTIC TESTING

A lecture/lab course that studies the practical use of diagnosing Caterpillar Products using the proper test equipment. System testing on the various Caterpillar Equipment will cover such areas as Engines, Hydraulics, Transmissions, Electro-Hydraulics and Implement System Control. The student will utilize ET and Data View systems for diagnostic testing.

DCAT 204 MACHINE SPECIFIC SYSTEMS

This course is designed to expose the student to different types of specialty equipment used for various operations, utilizing CAT equipment. Testing and adjustment of this equipment will also be covered as per Caterpillar Service procedures.

DCAT 206 AED CERTIFICATION TESTING

At the completion of this course, the student will successfully complete their AED certification testing in the areas of diesel engines, hydraulics, electrical, powertrains, HVAC and safety.

DCAT 251 INTERNSHIP IV

This supervised experience is required of students enrolled in the Caterpillar Dealer Service Technology curriculum. Placement experience is obtained through the cooperation of a CAT dealer. Students needs and objectives determine major emphasis.

ThinkBIG Tool List

The following is a generic list of the tools **required** for the LATI-Diesel Technology ThinkBIG program. It is important that students begin their professional diesel technician career by purchasing **professional, mechanic grade tools**. Questions regarding the suitability of specific tools should be directed to the diesel technology staff.

OSHA approved safety glasses or OSHA approved prescription glasses with side shields (Z-87)
Ear plugs
Tool Box-roll around cabinet (5 to 12 drawer)
Wrench set – combination ($\frac{1}{4}$ " – $1\frac{1}{4}$ ")
Wrench set – flare nut ($\frac{3}{8}$ " – $\frac{3}{4}$ ")
Wrench set – metric combination 12 pt (10-19 mm)
12" Adjustable wrench
1 $\frac{1}{16}$ " combination wrench
1 $\frac{3}{16}$ " combination wrench
Torx driver set $\frac{1}{4}$ and $\frac{3}{8}$ drive T8-T55
Socket set – $\frac{1}{4}$ " dr., with ratchet and extensions ($\frac{3}{16}$ " – $\frac{1}{2}$ ") including metric (4 – 13mm), shallow 12 pt
Socket set – $\frac{3}{8}$ " dr. ($\frac{3}{8}$ " – $\frac{3}{4}$ ") shallow 12 pt and deep, with ratchet and extensions
Socket set – $\frac{1}{2}$ " dr. ($\frac{7}{16}$ " – $1\frac{1}{4}$ ") shallow 12 pt, with long ratchet, breaker bar and extension
Socket set – metric, $\frac{3}{8}$ " dr., (8-19 mm), shallow and deep 12 pt
Socket set 12 pt – metric, $\frac{1}{2}$ dr., (12-22 mm)
Socket set 12 pt – standard deep socket, $\frac{1}{2}$ dr., $\frac{3}{4}$ - $1\frac{1}{4}$ "
Sockets – $\frac{1}{2}$ " dr. shallow impact 6 pt. $\frac{3}{8}$ "- $1\frac{1}{4}$ "
Socket adapter set $\frac{1}{4}$ - $\frac{3}{8}$, $\frac{3}{8}$ – $1\frac{1}{2}$
 $\frac{3}{4}$ " deep well socket 12 pt
 $\frac{1}{2}$ " – $\frac{3}{4}$ " male square adaptor socket
Hammer – ball peen (16 oz.)
Hammer – cross peen (32 oz)
Hammer – dead blow (24 oz)
Pliers – standard Pliers
– needle nose Pliers – diagonal cutter
Pliers – wire stripper, crimper
Pliers – retaining ring, fixed tip, convertible .070 tip 5 pc set including 90 degree pliers
Vise Grip – 7" curved jaw Vise Grip
- 10" curved jaw Screwdriver set (straight & phillips)
Hex key set with ball-end (.050" – $\frac{3}{8}$ ")
Hex key set with ball-end (1.5mm to 10 mm)
Gasket scraper
Rolling head pry bar
Punch & chisel set (including center punch)
Pliers – 14" lock ring

Cold rolled drift ($\frac{3}{4}$ " x 18" long)
Brass drift ($\frac{3}{4}$ " x 18" long)
File – 6" single cut
File – 10" double cut
File – 10" round, bastard cut
Hacksaw – with 12" x 24T blades
Wire brush, full size
Wire brush, small stainless steel
Blow gun (heavy duty)
Feeler gauge (.0015" - .035") offset
O-ring pick
Lock ring tool 18"-20" (Ken-tool T-27)
Magnetic pickup tool
Tape measure – 12'
Inspection mirror
Air hose – $\frac{3}{8}$ " x 50' ($\frac{1}{4}$ " NPT) with universal female coupler
Radiator hose pick
Dual foot air chuck
Trouble light – fluorescent, non-metallic
Mechanic's creeper
Tire tester – 120 psi capacity
Circuit tester 9-12-24 volt
Fluke 875 multi-meter
Penlight (2 AAA cell pocket flashlight) Stylus
Battery terminal cleaner
Lock out tag
Ear plugs on a band
Electric engraving tool
Creeper hanger
Soldiering gun
Grease gun
Quart of oil
Pry bar set 6"
dial caliper
5-75 ft lbs. torque wrench
50-250 ft lbs. torque wrench
Welding gloves
Welding goggles
Lifting brackets

Revision 6/19

Complete diesel technician tool sets **may be** purchased from the LATI bookstore. Tools may also be purchased individually from many other sources. You are encouraged to shop around. Visit with area diesel technicians for additional information regarding tool selection.

REMEMBER – A career as a diesel technician starts with a set of *professional grade* tools. *Hobby grade* tools are NOT satisfactory for this occupation. Buying tools is a career long process necessitated by changing technology and the desire to do a job better and/or faster. As a tool set moves from basic to more complete, personal preferences regarding such things as brand, size, shape, and design play an increasingly important role in tool selection.

Questions regarding the purchase of a basic tool set through LATI may be directed to the LATI-Bookstore. Phone (605) 882-5284 Ext. 336.

Note: The composition of tool sets available from the various tool suppliers typically vary somewhat. A particular tool set may include “extra” tools, while a similar set may be “lacking” some tools listed on the LATI Diesel Technology tool list. Generally, the various tool sets will all provide satisfactory service to diesel technology students. If you have questions regarding the suitability of a particular tool set, contact the LATI Diesel Technology department (605) 882-5284 ext. 211.

Additional tools may be purchased throughout the year to “personalize” a tool set. For more diesel technology tools information, visit www.lakeareatech.edu.

APPLICATION FOR INTERNSHIP

CATERPILLAR DIESEL SERVICE TECHNOLOGY PROGRAM

All applicants must apply on-line at:

<https://www.butlermachinery.com/careers/thinkbig/>

If you have any questions, please contact:

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Butler Machinery Store Locations:

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