

Area of Interest: Transportation

## Motive Power Technician - Diesel Equipment and Truck

Ontario College Diploma

Program Code: 1527X04FWO

42 Weeks

Ottawa Campus

### Our Program

#### **Technical expertise for a career in the repair and service industry.**

The two-year Motive Power Technician - Diesel Equipment and Truck Ontario College Diploma program, delivered in a compressed format over 42 weeks, prepares you to enter a variety of careers in the heavy equipment repair and service industry.

This program gives you a combination of hands-on skills and theoretical knowledge for the diesel equipment and truck repair and service industry.

Algonquin College's Transportation Technology Centre provides you with access to modern equipment, enabling you to learn about advanced technology in today's diesel equipment and truck industries.

Through a series of classroom-based courses and extensive practical labs, you learn skills specific to heavy trucks and diesel equipment, including:

- shop procedures and safety
- vehicle maintenance and repair
- drivelines
- chassis
- operational principles of systems common to most diesel equipment and trucks
- fuel and electrical systems
- internal combustion engines

The curriculum has been designed to align with existing provincial apprenticeship competencies. Upon graduation, you are well-prepared to challenge the Ontario Ministry of Training, Colleges and Universities (MTCU) exemption exams for Commercial Vehicle and Equipment (Level 1 Powered Lift Truck, Farm, Heavy Equipment and Truck Apprenticeships).

Graduates interested in pursuing Red Seal provincial recognition may also choose to further prepare for those examinations.

As a graduate of this program, you may find employment in a number of sectors within this industry, including:

- private and public organizations in the heavy truck and coach industries
- agriculture
- forestry
- mineral harvesting
- construction

- related diesel equipment fields

## **SUCCESS FACTORS**

This program is well-suited for students who:

- Perform well both individually and in a team environment.
- Possess strong problem-solving and analytical skills.
- Are able to effectively handle physically demanding situations.
- Have an appreciation for precise and accurate work.
- Are mechanically inclined.
- Possess good manual dexterity.

## **Employment**

Graduates of this program may find employment as a heavy equipment apprentice, agricultural equipment apprentice, powered lift truck apprentice, truck and coach apprentice, field service person, service advisor/writer or product consultant.

## **Learning Outcomes**

The graduate has reliably demonstrated the ability to:

- Analyze, diagnose, and solve various motive power system problems by using problem-solving and critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships.
- Diagnose and repair climate control systems in compliance with manufacturers` recommendations.
- Diagnose and repair engine systems in compliance with manufacturers` recommendations.
- Diagnose and repair electrical, electronic, personal safety, and emission components and systems in compliance with manufacturers` recommendations.
- Diagnose and repair drive train components and systems in compliance with manufacturers` recommendations.
- Diagnose and repair suspension, steering, and brake components and systems in compliance with manufacturers` recommendations.
- Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.
- Select and use a variety of troubleshooting techniques and test equipment to assess electronic circuits, vehicle systems, and subsystems.
- Apply knowledge of hydraulics and pneumatics to the testing and analysis of motive power systems and subsystems.
- Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.
- Use information technology and computer skills to support work in a motive power environment.
- Prepare, support, maintain, and communicate data from log, record, and documentation systems.
- Apply business practices, project management skills, and communication skills to improve customer service.

- Assist in quality-control and quality-assurance programs and procedures.
- Develop and use personal and professional strategies and plans to improve professional growth, job performance, and work relationships.
- Complete all assigned work in compliance with occupational, health, safety, and environmental law; established policies and procedures; codes and regulations; and in accordance with ethical principles.
- Diagnose and repair diesel equipment and truck operation, components and their interrelationships to ensure optimal performance.
- Apply knowledge of diesel emissions to the analyses of diesel emission system components.
- Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

## Program of Study

Level: 01	Courses	Hours
ENL1813T	Communications I	42.0
GEN0351	Strategies for Learning	42.0
MAT8520	Mathematics and Related Science I	56.0
TRK4100	Chassis Systems and Fluid Power I	84.0
TRK4101	Powertrain Systems I	84.0
TRK4102	Fuel and Electrical Systems I	84.0
TRK4103	Trade Practices	42.0
Level: 02	Courses	Hours
ENL2003	Communications II for Technicians	42.0
MAT8521	Mathematics and Related Science II	56.0
TRK4200	Chassis Systems and Fluid Power II	84.0
TRK4201	Powertrain Systems II	84.0
TRK4202	Fuel and Electrical Systems II	84.0
Choose one from equivalencies:	Courses	Hours
GED1527	General Education Elective	42.0
Level: 03	Courses	Hours
MKT2230	Introduction to Marketing	42.0
TRK4300	Chassis Systems and Fluid Power III	84.0
TRK4302	Fuel and Electrical Systems III	98.0
TRK4401	Powertrain Systems III	84.0
WEL9107	Introduction to Fuel Gas and Electrical Welding	42.0

Choose one from equivalencies: Courses		Hours
GED1527	General Education Elective	42.0

## Fees for the 2023/2024 Academic Year

Tuition and related ancillary fees for this program can be viewed by using the Tuition and Fees Estimator tool at <https://www.algonquincollege.com/fee-estimator> .

Further information on fees can be found by visiting the Registrar's Office website at <https://www.algonquincollege.com/ro> .

Fees are subject to change.

Additional program related expenses include:

- Books and supplies cost approximately \$1,000 for the program duration and can be purchased in the campus bookstore.
- In addition, students are required to supply their own protective equipment as required at a cost of approximately \$160, including safety footwear and safety glasses.

## Admission Requirements for the 2024/2025 Academic Year

### College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent. Applicants with an OSSD showing senior English and/or Mathematics courses at the Basic Level, or with Workplace or Open courses, will be tested to determine their eligibility for admission; OR
- Academic and Career Entrance (ACE) certificate; OR
- General Educational Development (GED) certificate; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program). Eligibility may be determined by academic achievement testing for which a fee of \$50 (subject to change) will be charged.

### Program Eligibility

- English, Grade 12 (ENG4C or equivalent).
- Mathematics, Grade 12 (MAP4C or equivalent).
- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).
- IELTS-International English Language Testing Service (Academic) Overall band of 6.0 with a minimum of 5.5 in each band; OR TOEFL-Internet-based (iBT) Overall 80, with a minimum of 20 in each component: Reading 20; Listening 20; Speaking 20; Writing 20; OR Duolingo English Test (DET) Overall 110, minimum of 110 in Literacy and no score below 95.

Not sure if you meet all of the requirements? Academic Upgrading may be able to help with that: <https://www.algonquincollege.com/access/> .

Should the number of qualified applicants exceed the number of available places, applicants will be selected on the basis of their proficiency in English and mathematics.

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### Application Information

#### **MOTIVE POWER TECHNICIAN - DIESEL EQUIPMENT AND TRUCK** **Program Code 1527X04FWO**

Applications to full-time day programs must be submitted with official transcripts showing completion of the academic admission requirements through:

ontariocolleges.ca  
60 Corporate Court  
Guelph, Ontario N1G 5J3  
1-888-892-2228

Students currently enrolled in an Ontario secondary school should notify their Guidance Office prior to their online application at <http://www.ontariocolleges.ca/>.

Applications for Fall Term and Winter Term admission received by February 1 will be given equal consideration. Applications received after February 1 will be processed on a first-come, first-served basis as long as places are available.

International applicants please visit this link for application process information: <https://algonquincollege.force.com/myACint/>.

For further information on the admissions process, contact:

Registrar's Office  
Algonquin College  
1385 Woodroffe Ave  
Ottawa, ON K2G 1V8  
Telephone: 613-727-0002  
Toll-free: 1-800-565-4723  
TTY: 613-727-7766  
Fax: 613-727-7632  
Contact: <https://www.algonquincollege.com/ro>

### Additional Information

Students are required to achieve a minimum passing grade of 60% in all core, vocational program courses to move to the next program level for the Motive Power Technician - Diesel Equipment and

Truck program. The 60% passing grade aligns with the passing requirements set for the Apprenticeship Training Standards that exist in the four trades that this program supports. Additionally, students will need to perform these skills at a higher level for industry, because liability is extremely high in the diesel equipment and truck industry.

Following the completion of the program, students have the opportunity to challenge the Ontario Ministry of Training Colleges and Universities exemption exams for Commercial Vehicle and Equipment (Level 1 Powered Lift Truck, Farm, Heavy Equipment and Truck Apprenticeships). For a fee, each challenge exam can Algonquin College upon successful completion of the program. Additional information is available at: <http://www.collegeoftrades.ca/resources/exam-process>.

## Contact Information

### Program Coordinator(s)

- Tony Vander Byl, <mailto:vandert@algonquincollege.com>, 613-727-4723, ext. 6530

## Course Descriptions

### ENL1813T Communications I

Communication remains an essential skill sought by employers, regardless of discipline or field of study. Using a practical, vocation-oriented approach, students focus on meeting the requirements of effective communication. Through a combination of lectures, exercises, and independent learning, students practise writing, speaking, reading, listening, locating and documenting information and using technology to communicate professionally. Students develop and strengthen communication skills that contribute to success in both educational and workplace environments.

Prerequisite(s): none  
Corerequisite(s):none

### ENL2003 Communications II for Technicians

Communicating effectively in the workplace is a key component of career advancement and essential skills development. The ability to read, understand, reframe and deliver technical information to varied audiences is critical in a competitive marketplace. Students are exposed to a variety of common communication challenges related to working in their field of study. To meet these challenges, students are required to do basic research and data gathering, to summarize and reframe written, oral and visual information and to present their findings to a defined audience in an appropriate medium or media.

Prerequisite(s): ENL1813T  
Corerequisite(s):none

### GED1527 General Education Elective

Students choose one course, from a group of general education electives, which meets one of the following five theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

Prerequisite(s): none  
Corerequisite(s):none

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Students choose one course, from a group of general education electives, which meets one of the following five theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

Prerequisite(s): none  
Corerequisite(s):none

### GEN0351 Strategies for Learning

Self-Regulated Learning is important not only for academic success but also in the development of lifelong learning skills, and can be defined as an active constructive process whereby learners monitor, regulate, and control their cognition, motivation, and behaviour. Through a variety of assignments and in class activities, students learn how to transform their mental abilities into academic skills by investigating notetaking, time management, goal setting and feedback. Case studies allow students to consider how to employ SRL in their own learning. Students explore effective learning techniques and move toward implementing these techniques to improve their study habits.

Prerequisite(s): none  
Corerequisite(s):none

### **MAT8520 Mathematics and Related Science I**

Diagnosis and repair in the automotive trade requires familiarity with mathematical concepts and calculations. Students solve problems using basic operations with integers, decimals, and fractions. They carry out conversions within and between the SI and US Customary systems. Learners investigate geometric figures and angles. They use percent, ratio, proportion, and interest calculations to prepare repair estimates. Through analysis and execution students prepare to utilize mathematics in the automotive industry.

Prerequisite(s): none  
Corerequisite(s):none

### **MAT8521 Mathematics and Related Science II**

The automotive trade has a long and rich history based on many scientific principles. Students develop the skills to calculate engine and transmission measurements and specifications. They use equations to determine force and pressure in hydraulic systems. Learners solve basic problems related to circuits, kinematics, and dynamics. Through analysis, application, and discussion students become familiar with the relevance of science in the automotive industry.

Prerequisite(s): MAT8520  
Corerequisite(s):none

### **MKT2230 Introduction to Marketing**

Students gain basic marketing skills and concepts. While an overview of the entire marketing process is provided, emphasis is on the consumer market. The acquisition of skills and attitudes essential to promoting customer satisfaction through positive perspectives is also emphasized.

Prerequisite(s): none  
Corerequisite(s):none

### **TRK4100 Chassis Systems and Fluid Power I**

Both safety and performance are essential parts of all vehicles. Students explore fluid power systems pertaining to various commercial vehicles and equipment trades. Through a combination of theory and hands-on practice, students examine fluid power fundamentals, theories, components and the principles of operation. With a focus on wheel ends, students perform adjustment and repair procedures on wheel end assemblies, as well as study the operating principles and construction features of brake systems pertaining to the various commercial vehicles and equipment trades. A major focus is on the purpose, fundamentals, principles of operation, maintenance, and the servicing of hydraulic and pneumatic brake systems.

Prerequisite(s): none  
Corerequisite(s):none

### **TRK4101 Powertrain Systems I**

The powertrain consists of the main components that generate power and contribute to vehicle mobility. Students examine the components, operating principles, testing and servicing of diesel combustion engine assemblies, cylinder heads and valve trains, lubrication systems, cooling

systems, intake and exhaust systems. Student also develop basic knowledge of the components, operating principles, testing and servicing of power train clutch assemblies, drive shafts, PTOs and single drive axle assemblies.

Prerequisite(s): none  
Corerequisite(s):none

### **TRK4102 Fuel and Electrical Systems I**

Possessing knowledge of electrical, fuels and fuel systems fundamentals is essential to understanding the operation of vehicles. Building on principles of basic electrical circuitry and components, students develop skills to recognize the use of electricity within a vehicle. Within a shop environment, students build and test circuits using industry-standard tools. Diesel, alternate fuels and fuels systems are discussed in relation to engine operations. Through hands on experience in the lab environment, students explore fuel supply and injection systems.

Prerequisite(s): none  
Corerequisite(s):none

### **TRK4103 Trade Practices**

It is important to have a knowledge and understanding of common and specialty tools and their safe use in the shop environment. Through discussion and hands-on experience, students learn the correct use and care of a variety of provided tools to ensure safety in the shop environment. Students examine a variety of safety protocols over a wide range of everyday shop procedures. The topics are delivered with both theoretical and practical explanations to reinforce the importance of this subject.

Prerequisite(s): none  
Corerequisite(s):none

### **TRK4200 Chassis Systems and Fluid Power II**

A comprehensive knowledge of hydraulics and pneumatics allows for a more thorough understanding of many types of diesel equipment and vehicle systems. Students build upon previous knowledge by working with hydraulic and pneumatic components, schematics and perform circuit calculations. Emphasis is on air brake components and system operation. Hands on practical sessions involve the use of hydraulic components, trainers and systems along with air-brake equipped vehicles. Inspection, servicing, testing and repair procedures are also performed.

Prerequisite(s): TRK4100  
Corerequisite(s):none

### **TRK4201 Powertrain Systems II**

Technicians working in the field work on a variety of components including gasoline powered equipment. Students define the differences in operation and servicing of gasoline engines compared to diesel engines. Students also examine single countershaft transmission fundamentals and drive axles. Other topics include transmission construction, operation, gear theory and ratios. Through hands-on experience in the shop environment, students discover inspection, servicing, testing, disassembly, reassembly and diagnostic procedures of gasoline engines and single countershaft manual transmissions.

Prerequisite(s): TRK4101  
Corerequisite(s):none

### **TRK4202 Fuel and Electrical Systems II**

Today's vehicles depend heavily on both electrical and complex fuel systems to run efficiently and cleanly. Students examine the operation and proper repair processes of both these systems and how they work together in today's heavy duty vehicles. Through manufacturer recommended service and testing procedures, students follow these procedures to diagnose system and component faults



Prerequisite(s): TRK4102  
Corerequisite(s):none

### **TRK4300 Chassis Systems and Fluid Power III**

Service technicians must have a solid understanding of vehicle suspension, steering, and frame components, which require regular maintenance and inspection. Students develop a more in-depth understanding of, and ability in, working with hydraulics and brake systems. Students examine the laws regarding weight restrictions and vehicle limits and also learn about the various styles of hitching systems used on highway vehicles. Through the use of shop vehicles which can be disassembled and reassembled for inspection, students develop the skills in working with these components. Other topics and activities include ABS fundamentals, system inspection and servicing.

Prerequisite(s): TRK4200  
Corerequisite(s):none

### **TRK4302 Fuel and Electrical Systems III**

Today's diesel engines have high electrical demands for electronically controlled fuel injection systems. Students develop an understanding about where electrical power is generated for vehicle systems and explore the various electronic fuel injection systems. Through hands-on experience in a shop environment, students perform routine jobs relating to both vehicle charging systems and fuel injection systems.

Prerequisite(s): TRK4202  
Corerequisite(s):none

### **TRK4401 Powertrain Systems III**

The powertrain provides vehicles with the ability to move through force. Students develop more in-depth knowledge of diesel engines, sophisticated manual and automated transmissions, as well as common driveline components. Students examine the construction, operation and service procedures of diesel cylinder heads and valve train mechanisms. Students examine single and tandem drive axle assemblies, as well as manual transmission theory including twin countershaft manual transmissions and electronically automated standard transmissions. Through hands-on experience in the shop environment, students practice inspection, servicing, testing, disassembly, reassembly and diagnostic procedures on all of these components.

Prerequisite(s): TRK4201  
Corerequisite(s):none

### **WEL9107 Introduction to Fuel Gas and Electrical Welding**

Welding is a skill essential to a variety of professions. Students develop competent welding skills at a basic level using oxyacetylene equipment, Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding, (GMAW) and Gas Tungsten Arc Welding (GTAW). Students are provided with instructions on the safety, proper setup and operation of equipment. Students learn basic principles of flame types and temperatures, metal preparation, gas selection and electrode classification.

Prerequisite(s): none  
Corerequisite(s):none