

DEPARTMENT OF INDUSTRY PARTNER TRAINING
THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – SPRING 2026
HES562 VB53 – ON HIGHWAY MACHINE SYSTEM DIAGNOSTICS/REPAIR
1.5 CREDIT (1-0-5) 48 HOURS FOR 8 WEEKS

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land, and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR: Richard McGrail

OFFICE: FPS 112

OFFICE HOURS: 8.30 AM to 4.30 PM.

PHONE: 780-835-6778

E-MAIL: rmcgrail@nwpolytech.ca

CALENDAR DESCRIPTION: Primarily a lab-based course where the student's knowledge will be challenged and troubleshooting skills developed. Students will be required to successfully diagnose and repair On Highway machine systems in a real-world setting.

Delivery Option: Fairview Campus Only

PREREQUISITE(S)

COREQUISITE:

RESOURCE MATERIALS:

Alberta Apprenticeship and Industry Training Individual Learning Modules Heavy Equipment Technician (HET)

190403cA – Air Conditioning Testing and Service – Part A

190403cB – Air Conditioning Testing and Service – Part B

190401a – Clutch Fundamentals and Service (On-Road)

190401b – Driveline Fundamentals and Service

190401dA – Transmission Fundamentals – Part A

190401dB – Transmission Fundamentals – Part B

190401e – Transmission Shifting

Caterpillar Material

Machine Diagnostics:

Unit 4: Electrical Systems Diagnostics.

Lesson 1 – Electrical Systems Diagnostic Principles.

Air Conditioning Fundamentals:

Unit 1: Fundamentals of AC

Lesson 2 – Machine AC System Operation

Unit 3: Service Procedures

Lesson 1 – Machine AC Service

Unit 4: Troubleshooting

Lesson 1 – Machine AC Troubleshooting

Lesson 2 – AC Repair

Power Train I:

Unit 2: Couplings

Lesson 1 – Flywheel Clutch

Unit 3: Transmissions

Lesson 1 – Manual Shift Transmissions

Machine Specific:

As per available units.

DELIVERY MODE(S):

In person delivery. Primarily lab based.

Note: NWP reserves the right to change the course delivery.

LEARNING OUTCOMES:

TRANSFERABILITY:

None.

GRADING CRITERIA:

Students must complete all required courses with no failing (F) grades. A passing grade in this course is a **minimum of 70%**. Grades for this course will be assigned as a percentage. Failure to achieve a minimum grade of 70% will result in withdrawal from the Think BIG program.

EVALUATIONS:

On Highway Machine Systems Diagnostics and Repair

48 hours

Exams Average = _____ $\times 20\%$

Class Assignments / Quizzes = _____ $\times 5\%$

Shop Total _____ $\times 75\%$

FINAL MARK = _____ %

COURSE SCHEDULE/TENTATIVE TIMELINE:

Will be posted in the classroom.

STUDENT RESPONSIBILITIES: This is an adult education environment. Enrolment at Northwestern Polytechnic assumes that the student will become a responsible citizen of NWP. As such, each student will display a positive work ethic, take pride in, and assist in the maintenance and preservation of Institute property, and assume responsibility for his/her education by researching academic requirements and policies, demonstrating courtesy and respect toward others; and respecting instructor expectations concerning attendance, classroom and shop rules, safety, assignments, deadlines and appointments. Students are learning skills to prepare them for the work environment. Non-academic misconduct, including the possession, use, or distribution of intoxicants, will be addressed through the

Student Rights and Responsibilities policy.

Students are expected to attend all class and shop hours. Students who miss more than 21 hours or 3 days of classes may be removed from the course.

Absences will be monitored and recorded by the instructors.

- Upon reaching 7 hours missed time in a single semester the student will be required to meet with the program instructor.
- Upon reaching 14 hours missed time in a single semester the student will be required to meet with the instructor and program Chair.
- Upon reaching 21 hours missed time in a single semester the student will be required to meet with the instructor, program chair and the Dean to evaluate the students' ability successfully continue in the Think BIG program.

Following the guidelines in “Student Rights and Responsibilities” in the NWP College calendar assist us all in maintaining an adult learning environment. Please refer to the Student Rights and Responsibilities policy in the Northwestern Polytechnic Calendar or at www.nwpolytech.ca/downloads/documents/StudentRightsandResponsibilities.pdf.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at <https://www.nwpolytech.ca/about/administration/policies/index.html>

****Note:** all Academic and Administrative policies are available on the same page.