



DEPARTMENT OF TRANSPORTATION TRADES
THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – WINTER 2024
JANUARY 8 – MARCH 1, 2024
HES410 VB42 MACHINE HYDRAULIC SYSTEMS - 3.5 (96 HOURS)

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:	Jeremy Parker	PHONE:	780.835.6795
OFFICE:	FPS 112	E-MAIL:	jparker@nwpolytech.ca
OFFICE HOURS:	8 AM to 4:30 PM		

CALENDAR DESCRIPTION: This course is designed to teach the system operations and the testing and adjusting procedures for the pilot operated hydraulic system, the load sensing, pressure compensated (LSPC) hydraulic system, the electro-hydraulic system, and the hydrostatic system. Students will identify the system components, state the component function and trace the oil flow through the component. This section will be covered on different types of machines.

PREREQUISITE(S)/COREQUISITE: Successful completion of Blocks 1 through 3.
Please read all modules before they are presented in class

REQUIRED TEXT/RESOURCE MATERIALS:

Caterpillar Material

Hydraulic Fundamentals

Unit 3: Hydraulic System Components

- Lesson 3 – Hydraulic Pumps and Motors
- Lesson 4 – Pressure Control Valves
- Lesson 5 – Direction Control Valves
- Lesson 6 – Flow Control Valves.

Unit 4: Pilot Operated Hydraulic System

Lesson 1 – Pilot Operated Implement Hydraulic System

Machine Hydraulic Systems

Unit 1: Pilot Operated Hydraulic Systems

Lesson 1 – 950G Pilot Operated Implement Hydraulic System

Unit 2: Load Sensing, Pressure Compensated Hydraulic Systems

Lesson 1 – Basic LS/PC Hydraulic Systems

Lesson 2 – LS/PC Hydraulic Pumps and NFC Hydraulic Systems

Machine Hydraulic Systems *continued* . . .

Unit 3: Proportional, Priority, Pressure Compensated Hydraulic Systems

Lesson 1 – PPPC Hydraulic System

Unit 4: Hydrostatic Systems

Lesson 1 – Basic Hydrostatic Systems

Lesson 2 – Hydrostatic System Controls

Lesson 4 – C Series Skid Steer Loader Hydrostatic Drive System.

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

190301a – Hydraulic Principles

190301b – Hydraulic Pump Fundamentals

190301c – Hydraulic Pump Service

190301d – Hydraulic Actuator Fundamentals

190301e – Hydraulic Actuator Service

190301fA – Hydraulic Valve II – Part A

190301fB – Hydraulic Valve II – Part B

190301g – Hydraulic System Types

190301h – Hydraulic System Testing and Service

190301i – Electrohydraulic

650401a – Alberta's Industry Network.

650401b – Workplace Coaching Skills.

650401c – Interprovincial Standards Red Seal Program.

DELIVERY MODE(S): In person delivery.

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

LEARNING OUTCOMES:

TRANSFERABILITY: None.

GRADING CRITERIA:

Students must complete all required courses with a grade point average of no less than 2.7 and no failing (F) grades. A passing grade in this course is a **minimum of 70%**.

Machine Hydraulic Systems 96 / 240 hours = 40 %
of Semester 4 mark

Exams Average = _____ x 45%

Class Assignments/Quizzes/DPC = _____ x 30%

Shop Total _____ x 25%

HES410 VB42 FINAL MARK = _____ %

Grades for this course will be assigned as a percentage.

COURSE SCHEDULE/TENTATIVE TIMELINE:

STUDENT RESPONSIBILITIES: This is an adult education environment. Enrolment at Northwestern Polytechnic assumes that the student will become a responsible citizen of the College. 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.

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 PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the Northwestern Polytechnic Calendar at <https://www.nwpolytech.ca/programs/calendar/> or the Student Rights and Responsibilities policy which can be found at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

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