



DEPARTMENT OF HEAVY EQUIPMENT
THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – WINTER 2021
JANUARY 4 – FEBRUARY 26, 2021
HES 511-VB43 POWER TRAIN II – 3.5 (96 HOURS)

INSTRUCTOR:	Rob Young	PHONE:	780.835.6730
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OFFICE HOURS:	8.00am – 4.30pm		

WINTER 2021 DELIVERY:

Mixed Delivery – Remote and Onsite. This course is delivered remotely with some face-to-face/onsite components at the GPRC Fairview campus.

- For the remote delivery components: students must have a computer with a webcam and reliable internet connection. Technological support is available through helpdesk@gprc.ab.ca.
- For the onsite components: students must supply their own mask [and/or face shield] and follow [GPRC Campus Access Guidelines and Expectations](#).

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

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

Power Train 1.

Unit 2: Couplings

Lesson 2 – Torque Converters and Torque Dividers

Unit 3: Transmissions

Lesson 2 – Power Shift Transmissions

Lesson 3 – Power Shift Transmission Control Systems

Power Train 2

Unit 1: Differentials

Lesson 5 – Differential Steering

Lesson 6 – Steering Clutch and Brake

Unit 3: Undercarriage

Lesson 1 – Undercarriage Components

Lesson 2 – Undercarriage Wear and Operation

Lesson 3 – Track and Shoe Options

Unit 4: Final Drives, Chain Drives, and Tires

Lesson 1 – Final Drives

Lesson 2 – Chain Drives and Tires

Machine Hydraulic Systems

Unit 1: Pilot Operated Hydraulic Systems.

Lesson 2: 950H Pilot Operated Command Control Steering System.

Unit 2: Load Sensing, Pressure Compensated Hydraulic System

Lesson 3: 950H HMU Steering Hydraulic System.

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

190302aA – Wheeled Equipment Steering Fundamentals and Service – Part A

190302aB – Wheeled Equipment Steering Fundamentals and Service – Part B

190302b – Suspension System Fundamentals and Service

190302cA – Off-Road Equipment Accessories and Attachments – Part A

190302cB – Off-Road Equipment Accessories and Attachments – Part A

190303a – Gearing Principles

190303b – Torque Converter Fundamentals and Service

190303c – Powershift and Automatic Transmission Mechanical/Electronic Components

190303d – Powershift and Automatic Transmission Control and Shifting

190303e – Hydraulic Retarder Fundamentals

190303f – Powershift and Automatic Transmission Testing and Service

190303gA – Tracked Equipment Steer Fundamentals and Service – Part A

190303gB – Tracked Equipment Steer Fundamentals and Service – Part B

190303hA – Undercarriage System Fundamentals and Service – Part A

190303hB – Undercarriage System Fundamentals and Service – Part B

190303i – Final Drive Fundamentals and Service (Off-Road)

- 190303jA - Drive Axle and Carrier Fundamentals and Service (Off Road) – Part A
- 190303JB - Drive Axle and Carrier Fundamentals and Service (Off Road) – Part B
- 190303k – Clutch Fundamentals and Service (Off Road).

CALENDAR DESCRIPTION: Power train drives that have a hydraulic component to them will be covered in this course. Torque converters, gearing principles, power shift and automatic transmissions are covered in relation to operation, diagnostics and service procedures. Also included are hydraulic retarders, tracked equipment steering and undercarriage fundamentals and service. Final drive operation and service, differentials as applied to off-road will also be discussed. Wheeled equipment steering and suspension as well as off-road equipment accessories and attachments will be discussed in reference to off-road machines.

Delivery Option: Fairview Campus Only

CREDIT/CONTACT HOURS: Credits: 3.5 / Contact Hours: 96.

DELIVERY MODE: Mixed delivery

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%.**

Power Train II **96 / 240 hours = 40 %
of Semester 4 mark**

Exams Average = _____ **x 45%**

Class Assignments/Quizzes/DPC = _____ **x 30%**

Shop Total _____ **x 25%**

HES 511 VB43 FINAL MARK = _____ **%**

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A⁻	3.7	80 – 84	FIRST CLASS STANDING
B⁺	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B⁻	2.7	70 – 72	
F	0.0	67 – 69	FAIL
F	0.0	63 – 66	
F	0.0	60 – 62	
F	0.0	55 – 59	
F	0.0	50 – 54	
F	0.0	0 – 49	
WF	0.0	0	FAIL, withdrawal after the deadline

STUDENT RESPONSIBILITIES:

This is an adult education environment. Enrolment at Grande Prairie Regional College 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 GPRC College calendar assist us all in maintaining an adult learning environment. Please refer to the Student Rights and Responsibilities policy in the Grande Prairie Regional College Calendar or at www.gprc.ab.ca/downloads/documents/StudentRightsandResponsibilities.pdf.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the GPRC Calendar at <http://www.gprc.ab.ca/programs/calendar/> Pages 44 to 46 or the College Policy on Student Misconduct: Plagiarism and Cheating at <http://www.gprc.ab.ca/about/administration/policies/>. **

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