



DEPARTMENT OF HEAVY EQUIPMENT
THINKBIG SERVICE TECHNICIAN COURSE OUTLINE – FALL 2017
OCTOBER 23 – DECEMBER 15, 2017
HES 511-VA42 POWER TRAIN II – 3.5 (96 HOURS)

INSTRUCTOR: Rudy Hrynkiw **PHONE:** 780.835.6757
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OFFICE HOURS: By Appointment

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(S): Lecture and lab.

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 5 mark**

Exams Average = _____ x 45%

Class Assignments/Quizzes/DPC = _____ x 30%

Shop Total _____ x 25%

HES511 VA42 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.