



## COURSE OUTLINE: TCT716 - DRIVE TRAIN

Prepared: Sylvain Belanger

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	TCT716: DRIVE TRAIN
<b>Program Number: Name</b>	6081: T/C TECHN LEVEL II
<b>Department:</b>	MOTIVE POWER APPRENTICESHIP
<b>Semesters/Terms:</b>	20F
<b>Course Description:</b>	<p><b>I. COURSE DESCRIPTION:</b></p> <p>The Level Two Drive Trains course deals with the power-train systems and components starting from the Engine Flywheel to the Drive wheels of the vehicles. Students will be taught about Heavy Duty pull type clutch assemblies, Drive line arrangements, Multiple Countershaft Standard Transmissions, Electronically Automated Standard Transmissions, Double Reduction and Inter-Axle Differential Assemblies. Students will be taught the power-flow associated with the Transfer of power from the engine through each of these individual system components and the relationship to gearing and gear ratios to produce the multiple speeds and torque output required for Commercial Vehicle Industry applications. The students will also be taught the proper service and maintenance procedures as well as the repair and over-haul procedures. Proper diagnosis and testing procedures will be demonstrated and taught to the students to enable them to learn these skills.</p>
<b>Total Credits:</b>	5
<b>Hours/Week:</b>	0
<b>Total Hours:</b>	40
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Essential Employability Skills (EES) addressed in this course:</b>	<p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p>
<b>General Education Themes:</b>	Science and Technology
<b>Course Evaluation:</b>	<p>Passing Grade: 50%, D</p> <p>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.</p>
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>Assignments related to theory and appropriate application skills.</p> <p>Proctored final exam.</p> <p>Periodic quizzes.</p>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



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Grade  
Definition Grade Point Equivalent

A+ 90 - 100% 4.00

A 80 - 89%

B 70 - 79% 3.00

C 60 - 69% 2.00

D 50 - 59% 1.00

F (Fail) 49% and below 0.00

CR (Credit) Credit for diploma requirements has been awarded.

S Satisfactory achievement in field /clinical placement or non-graded subject area.

U Unsatisfactory achievement in field/clinical placement or non-graded subject area.

X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.

NR Grade not reported to Registrar's office.

W Student has withdrawn from the course without academic penalty.

**Books and Required Resources:**

Heavy Duty truck systems by Sean Bennett

Publisher: cengage Edition: 6

**Course Outcomes and Learning Objectives:**

Course Outcome 1	Learning Objectives for Course Outcome 1
Pull Type Clutches and Flywheel Assemblies 6.1 Upon successful completion, the apprentice is able to understand the principles of operation, diagnose and repair pull-type clutches and flywheels.	6.1.1 Explain the purpose and fundamentals of pull type clutches and flywheel assemblies. 6.1.2 Identify the function, construction, composition, types, styles, and application of pull type clutches and flywheel assemblies. 6.1.3 Describe the principle(s) of operation of pull type clutches and flywheel assemblies. 6.1.4 Perform inspection, testing and diagnostic procedures on pull type clutches and flywheel assemblies. 6.1.5 Recommend reconditioning or repairs following manufacturers' procedures on pull type clutches and flywheel assemblies.
Course Outcome 2	Learning Objectives for Course Outcome 2
6.2 Multiple Countershaft Transmission and Auxiliary Sections Upon successful completion, the apprentice is able to understand the principles of operation, diagnose and repair countershaft manual transmission and auxiliary sections.	6.2.1 Explain the purpose and fundamentals of multiple countershaft manual transmission and auxiliary sections. 6.2.2 Identify the functions, construction, composition, types, styles and application of multiple countershaft manual transmission and auxiliary sections. 6.2.3 Describe the principle (s) of operation of multiple countershaft manual transmission and auxiliary sections. 6.2.4 Perform inspection, testing and diagnostic procedures on multiple countershaft manual transmission and auxiliary sections. 6.2.5 Recommend reconditioning or repairs following manufacturers' procedures on multiple countershaft manual transmission and auxiliary sections.
Course Outcome 3	Learning Objectives for Course Outcome 3

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	Multiple Speed and Double Reduction Drive Axle Assemblies. 6.3 Upon successful completion, the apprentice is able to understand the principles of operation, diagnose and repair multiple speed and double reduction drive axle assemblies.	6.3.1 Explain the purpose and fundamentals of multiple speed and double reduction drive axle assemblies. 6.3.2 Identify the functions, construction, composition, types, styles and application of multiple speed and double reduction drive axle assemblies. 6.3.3 Describe the principle(s) of operation of multiple speed and double reduction drive axle assemblies. 6.3.4 Perform disassembly, inspection, testing, diagnostic and reassembly procedures on multiple speed and double reduction drive axle assemblies. 6.3.5 Recommend reconditioning or repairs following manufactures` procedures on multiple speed and double reduction drive axle assemblies.						
	<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>						
	Power Divided Tandem Drive Assemblies 6.4 Upon successful completion, the apprentice is able to understand the principles of operation, diagnose and repair power divided tandem drive assemblies.	6.4.1 Explain the purpose and fundamentals of power divider tandem drive assemblies. 6.4.2 Identify the function, construction, composition, types, styles and application of power divided tandem drive assemblies. 6.4.3 Describe the principle(s) of operation of power divided tandem drive assemblies. 6.4.4 Perform inspection, testing and diagnostic procedures on power divided tandem drive assemblies. 6.4.5 Recommend reconditioning or repairs following manufacturers` procedures on power divided tandem drive assemblies.						
	<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>						
	Electronically Automated Standard Transmissions 6.5 Upon successful completion, the apprentice is able to understand the principles of operation, diagnose and repair electronically automated standard transmissions.	6.5.1 Explain the purpose and fundamentals of electronically controlled standard transmissions. 6.5.2 Identify the function, construction, composition, types, styles and application of electronically controlled standard transmissions. 6.5.3 Describe the principle(s) of operation of electronically controlled standard transmissions. 6.5.4 Perform inspection, testing and diagnostic procedures on electronically controlled standard transmissions. 6.5.5 Recommend reconditioning or repairs following manufacturers` procedures and perform assigned operations on electronically controlled standard transmissions.						
<b>Evaluation Process and Grading System:</b>	<table><tr><th>Evaluation Type</th><th>Evaluation Weight</th></tr><tr><td>practical application testing</td><td>30%</td></tr><tr><td>Theory testing 70</td><td>70%</td></tr></table>		Evaluation Type	Evaluation Weight	practical application testing	30%	Theory testing 70	70%
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practical application testing	30%							
Theory testing 70	70%							
<b>Date:</b>	October 6, 2020							
<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.							

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