

**MODULE MEC2130: DRIVE TRAINS****Level:** Intermediate**Theme:** Guidance and Control Systems**Prerequisite:** MEC1130 Mechanical Systems**Module Description:** Students identify the purpose, describe the operation and perform the servicing of a vehicle drive train.**Module Parameters:** Access to drive train units, hand tools, specialized drive train tools and related resources.**Curriculum and Assessment Standards**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• demonstrate safe work practices when working with vehicle drive trains</li> <li>• identify purpose and describe function of the major drive train components</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• observed performance related to:               <ul style="list-style-type: none"> <li>– safe practices using equipment, tools and materials</li> <li>– safe procedures when working with vehicle drive train parts and components</li> <li>– following proper lifting and handling procedures.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Drive Trains, Part 1, MEC2130–1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p>	<p>10</p>
	<ul style="list-style-type: none"> <li>• measured performance related to:               <ul style="list-style-type: none"> <li>– identification of major drive train components and their purpose</li> <li>– explanation of the inter-relationship between major components</li> <li>– developing a service schedule for drive train components.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Drive Trains, Part 2, MEC2130–1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p>	

**MODULE MEC2130: DRIVE TRAINS** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>execute inspection, diagnostic, service and repair procedures on specific drive train components</li> <li>identify career opportunities related to drive train repairs</li> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observed performance related to:                             <ul style="list-style-type: none"> <li>inspection and diagnosis of drive train components (clutch, manual transmission, automatic transmission drive axles/shaft, and differential)</li> <li>service of drive train components</li> <li>removal/replacement of drive train components.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Drive Trains, Part 3, MEC2130-1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p>	50
	<ul style="list-style-type: none"> <li>observed performance related to:                             <ul style="list-style-type: none"> <li>reporting up-to-date information concerning opportunities in the drive train area.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Guide: Career Profile, MECCPR</i></p> <p><i>Standard</i>  <i>Performance rating of at least 2 on each criteria</i></p>	20
	<ul style="list-style-type: none"> <li>observations of individual effort and interpersonal exploration during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Health/Safety Hazards	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>demonstrate knowledge of and follow lab safety procedures</li> <li>identify potential back problems associated with lifting heavy objects.</li> </ul>	
Identification/Function	<ul style="list-style-type: none"> <li>state the overall purpose of the power transmission system in a vehicle</li> <li>list and describe the function of component assemblies in a drive train</li> </ul>	

**MODULE MEC2130: DRIVE TRAINS** (continued)

Concept	Specific Learner Expectations	Notes
<p>Identification/ Function (continued)</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• differentiate between the following drive trains:               <ul style="list-style-type: none"> <li>– front wheel drive</li> <li>– rear wheel drive</li> <li>– four wheel drive:                   <ul style="list-style-type: none"> <li>• front–rear</li> <li>• rear–front</li> </ul> </li> <li>– all wheel drive.</li> </ul> </li> </ul>	
<p>Inspect/Service and Repair</p>	<ul style="list-style-type: none"> <li>• create a service schedule for each drive train component to include fluid change interval and type</li> <li>• demonstrate how to:               <ul style="list-style-type: none"> <li>– check fluid levels</li> <li>– remove and install drive train components</li> <li>– assess clutch serviceability</li> <li>– check and adjust clutch linkage for correct free play or check operation of automatic adjuster if so equipped</li> <li>– check manual transmission fluid level and replenish or replace as necessary, considering the service requirement characteristics of the vehicle</li> <li>– check manual transmission for leaks and replace the required seal(s) if possible, or recommend the repair requirement</li> <li>– adjust transmission shifting linkages</li> <li>– service an automatic transmission by replacing the fluid, filter and oil pan gasket</li> <li>– check automatic transmission assembly for leakage and replace the required seal(s) if possible, or recommend the repair requirement</li> <li>– inspect drive shaft or drive axle components such as:                   <ul style="list-style-type: none"> <li>• joints</li> <li>• straps</li> </ul> </li> </ul> </li> </ul>	

**MODULE MEC2130: DRIVE TRAINS** (continued)

Concept	Specific Learner Expectations	Notes
<p>Inspect/Service and Repair (continued)</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>– repair the coupling joint or shaft as required to return it to serviceability according to manufacturer’s specifications</li> <li>– inspect transfer case fluid level and replenish or replace as required by service schedule</li> <li>– check transfer case linkage operation and adjust or repair as required to ensure serviceability</li> <li>– assess transfer case operation of the assembly and repair, or recommend repair requirement</li> <li>– inspect the transfer case assembly for leaks and replace the required seal(s), or recommend the repair requirement</li> <li>– locate and inspect viscous clutch if the vehicle is so equipped and repair or recommend the required repair</li> <li>– check differential fluid and either replenish or replace as necessary, considering the vehicle’s operating conditions and service interval scheduling specifications</li> <li>– remove a differential cover and identify the parts enclosed, or if not an integral type of differential, remove the carrier assembly identifying the parts</li> <li>– inspect differential housing for filings and inspect gears and bearings for wear and repair needs</li> <li>– calculate differential gear ratio between the crown and pinion gears and determine the torque multiplication that results</li> <li>– reassemble differential and check assembly for leaks, replacing the required seals or recommending repair required</li> <li>– inspect the drive train components for alignment, wear and looseness</li> <li>– using a mechanics stethoscope, test the assemblies for noise at bearing locations while the system is being operated</li> </ul>	

**MODULE MEC2130: DRIVE TRAINS** (continued)

Concept	Specific Learner Expectations	Notes
Inspect/Service and Repair (continued)	<i>The student should:</i> <ul style="list-style-type: none"><li>– identify the cause of noise or vibration and repair or recommend required repair</li><li>– inspect isolation mounts and bushings at the drive train assemblies to assess capability of noise or vibration transference.</li></ul>	
Careers	<ul style="list-style-type: none"><li>• identify local businesses specializing in drive train repairs, and determine the working conditions and career opportunities.</li></ul>	