Apprenticeship and Industry Training

Apprenticeship Curriculum Guide Companion Document

Automotive Service Technician

lberta Government



Apprenticeship and Industry Training Automotive Service Technician: apprenticeship education program curriculum guide companion document | Advanced Education, May 27, 2025 | ISBN 978-1-4601-6307-8

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Program Guide

Introduction	
The Purpose	02
Outcome Statements	02
Objective Statements	02
Course Content Overview	03
Period One Course Content	15
Period Two Course Content	27
Period Three Course Content	37
Period Four Course Content	

Introduction

Apprenticeship and Industry Training (AIT) utilizes the curriculum guide as a document to guide and direct the developers of training and lesson plans. The curriculum guide is written to reflect and identify competence-based learning through supporting competence statements. Although this model provides more flexibility and responsiveness for the stakeholders, it creates challenges to developers of lesson plans and assessments.

The Purpose

The purpose of this document is to expand on competence and supporting compentence statements by identifying and providing outcome and objective statements that are associated with the supporting competence statement.

Outcome Statements

Outcome statements are an observable major task or work activity that an entry-level journeyperson performs for compensation.

Objective Statements

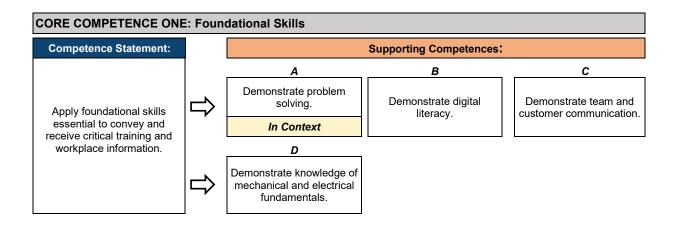
Objective statements are the knowledge or skill an apprentice learns or demonstrates while attending inclassroom instruction. They support achievement of the outcome statement by the apprentice.

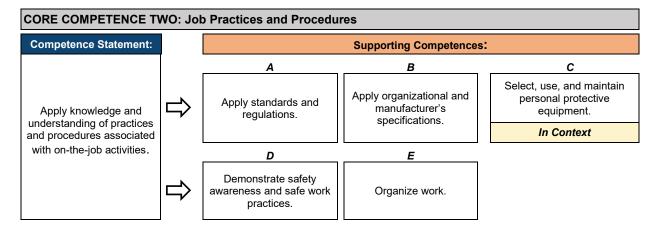
Course Content Overview

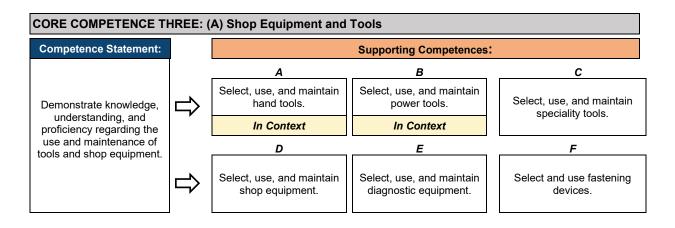


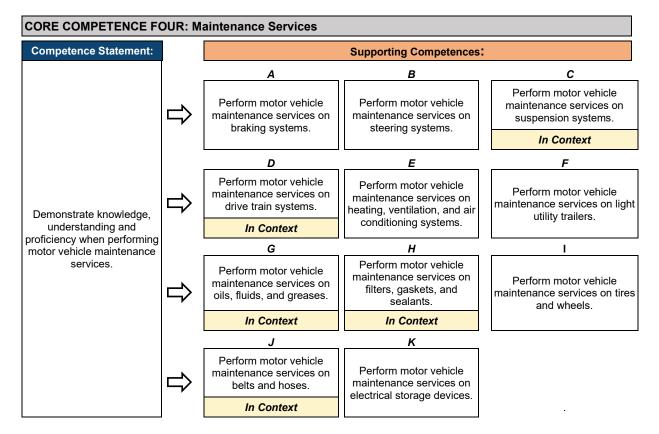
The term "*In Context*" indicates that the supporting competence will become integrated learning and/or utilized as a component of the competence statement. It will not have an assigned weighting and will not be assessed as an examination item.

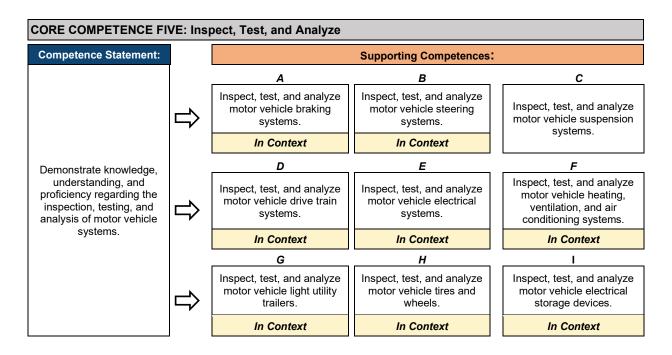
PERIOD ONE COURSE CONTENT

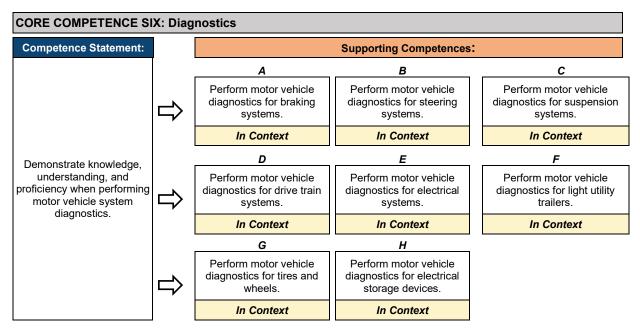


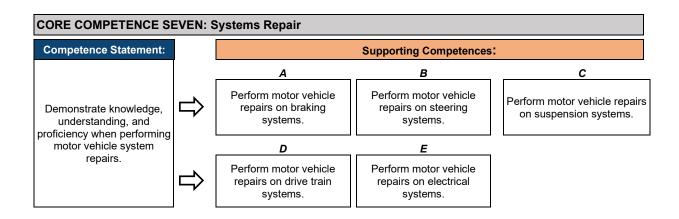




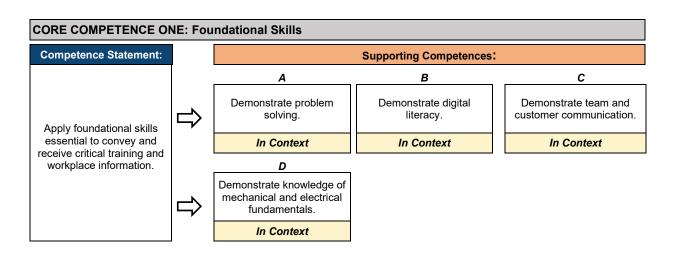


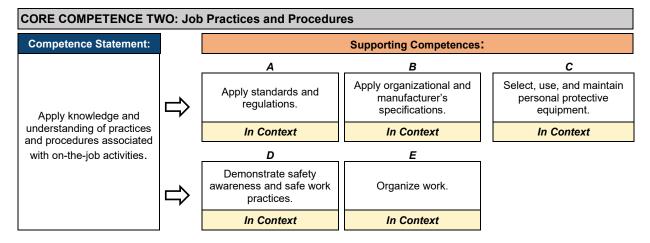


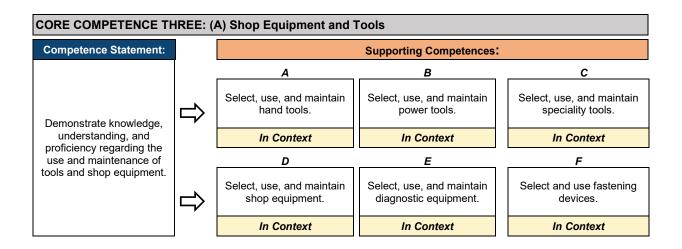




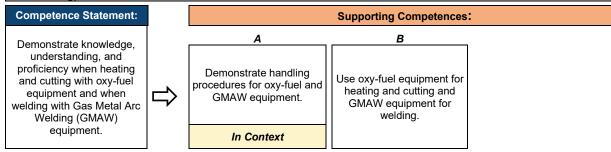
PERIOD TWO COURSE CONTENT

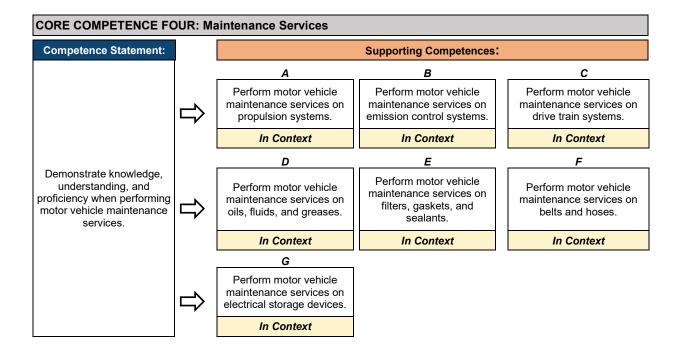


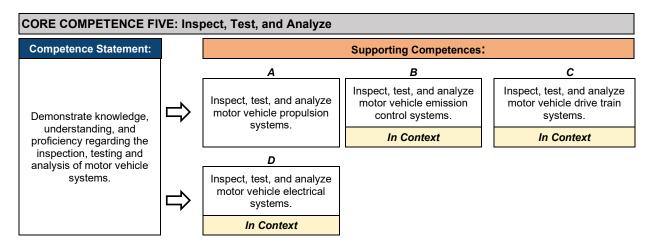


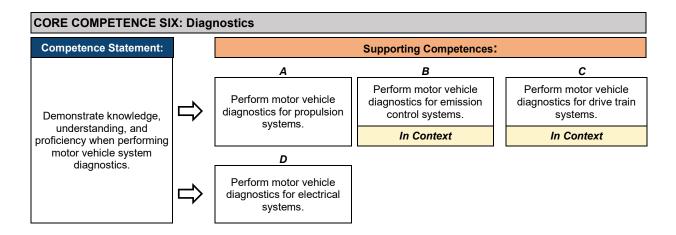


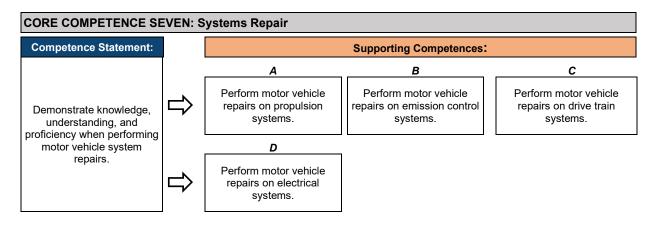
CORE COMPETENCE THREE: (B) Shop Equipment and Tools (Oxy-fuel heating and cutting and gas metal arc welding)



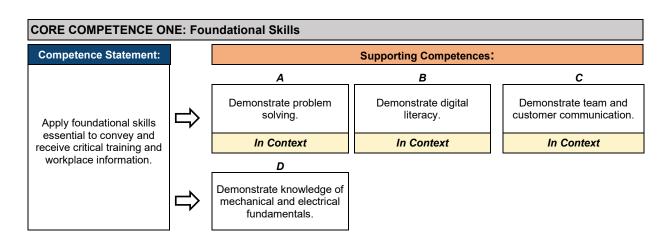


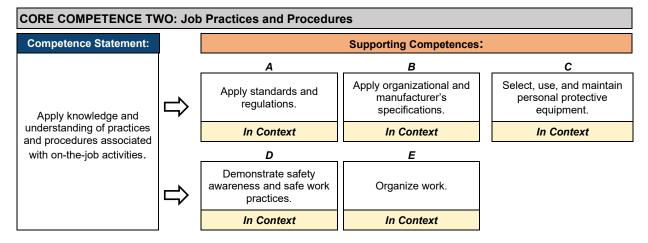


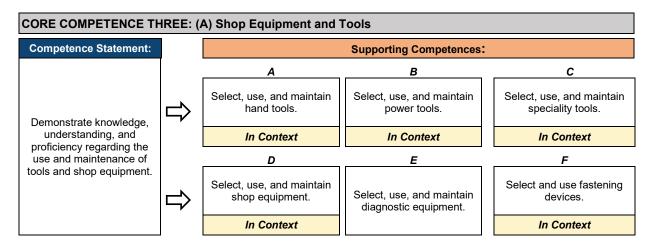


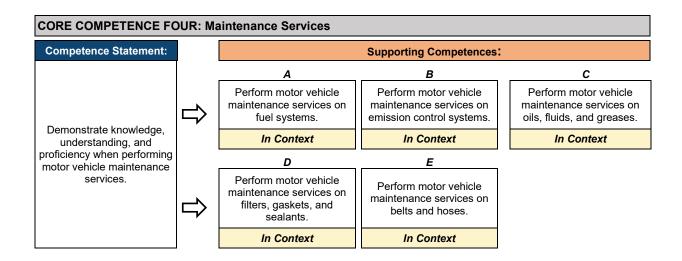


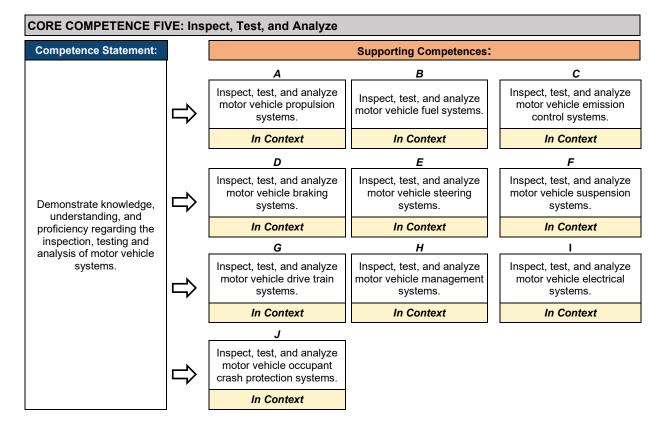
PERIOD THREE COURSE CONTENT

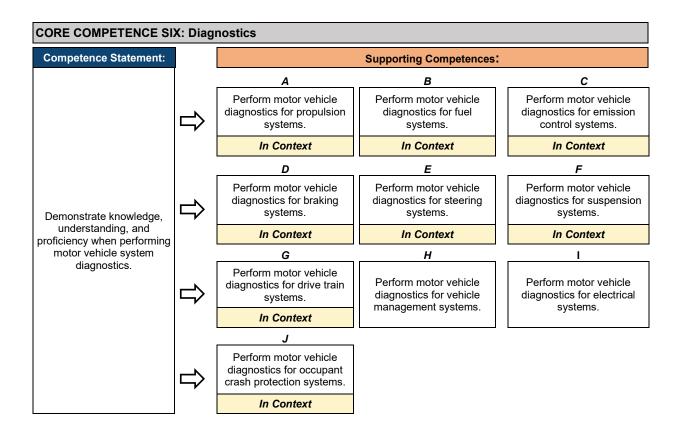


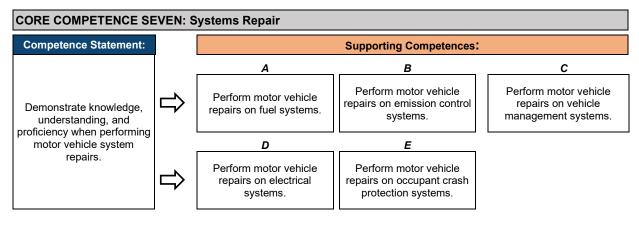




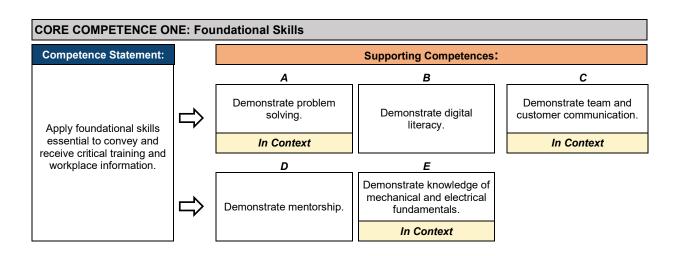


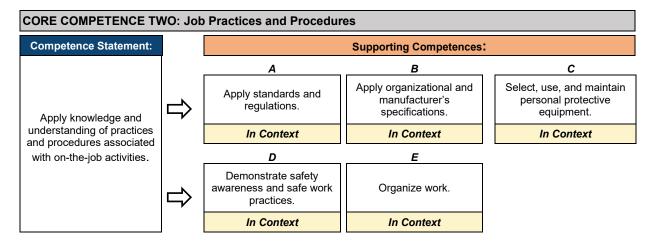


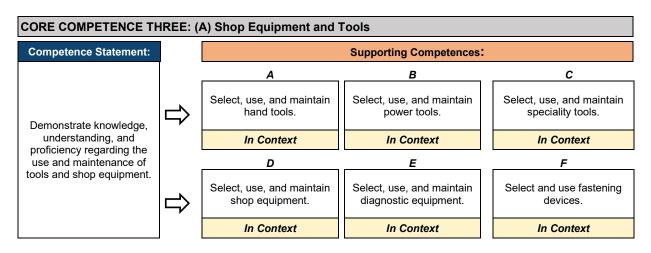


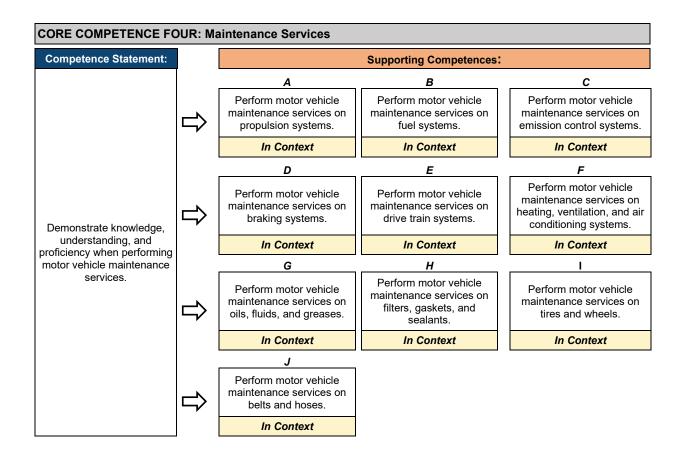


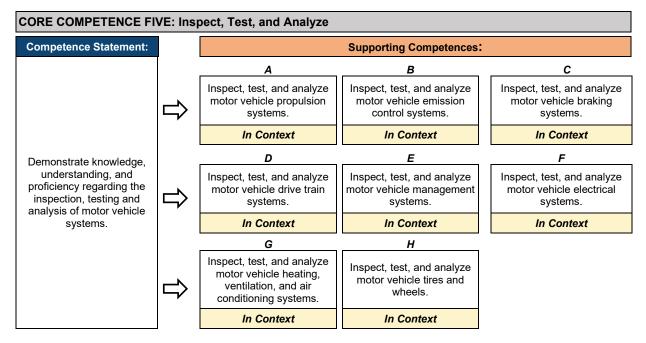
PERIOD FOUR COURSE CONTENT

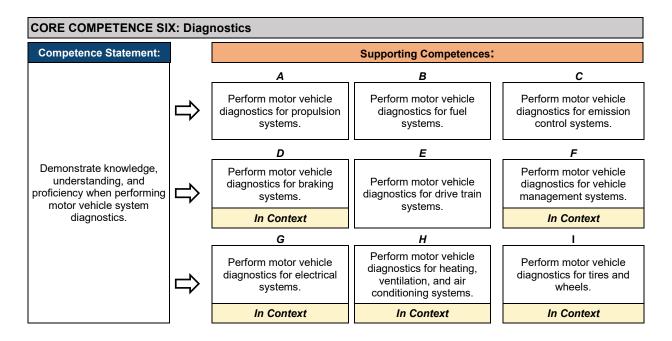


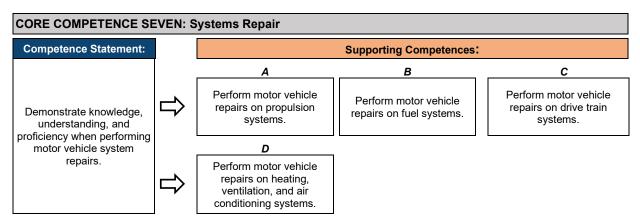












Period One Course Content

(9 weeks - 270 hours)

Period One Core Competences	Weighting
Foundational Skills	12%
Job Practices and Procedures	8%
Shop Equipment and Tools (A)	10%
Maintenance Services	28%
Inspect, Test, and Analyze	2%
Diagnostics	In Context
Systems Repair	40%

Core Competence 1: Foundational Skills Weighting – 12%

Automotive Service Technicians utilize a variety of foundational skills that enable them to understand and perform their job responsibilities. They form the basis upon which more specialized knowledge, skills, and abilities are developed. These skills are developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and are essential components to a successful career in the trade.

The automotive service technician first period will provide instruction on the following skills: digital literacy, team and customer communication, and mechanical and electrical fundamentals.



Apply foundational skills essential to convey and receive critical training and workplace information.

Core Competence 1: Foundational Skills

Sup	porting Competence	Taxonomy	Weighting
1A.	Demonstrate problem solving		In Context
1B.	 Demonstrate digital literacy Outcomes for this supporting competence include: <i>Use electronic service information</i> Access vehicle repair forums for diagnostic purposes. Use electronic service information to repair vehicles. 	II, III	9%
1C.	 Demonstrate team and customer communication Outcomes for this supporting competence include: <i>Apply communication techniques</i> Identify standard terms related to the trade. Demonstrate effective communication of trade related information. Demonstrate effective written documentation. Develop a concern, cause, and correction report. 	I, II, III	9%
1D.	 Demonstrate knowledge of mechanical and electrical fundamentals Outcomes for this supporting competence include: <i>Measure electrical circuits</i> Identify circuit types and their electrical properties. Describe electrical units of measure. Describe physical qualities of electrical components. Explain power requirements in circuit design. Calculate circuit yalues using Ohm's Law. Calculate circuit power. Interpret electrical symbols and wiring diagrams. <i>Magnetism principals</i> Describe magnetism principles. Describe how magnetism can change electrical energy into kinetic energy. 	1, 11	82%

Core Competence 2: Job Practices and Procedures Weighting – 8%

Automotive Service Technicians utilize a variety of on-the-job practices and procedures that enable them to perform their work in a safe, accurate, and efficient manner that meets criteria established by both manufacturers and regulatory agencies. These job practices and procedures are utilized and refined through explicit and implicit instruction extensively throughout the entire apprenticeship education program and are essential components to a successful career in the trade and beyond.

The automotive service technician first period will provide instruction on the following job practices and procedures: apply standards and regulations, apply organizational and manufacturer's specifications, demonstrate safety awareness and safe work practices, and organize work.



Apply knowledge and understanding of practices and procedures associated with onthe-job activities.

Core Competence 2: Job Practices and Procedures

Sup	porting Competence	Taxonomy	Weighting
2A.	Apply standards and regulations	I, II	9%
	Outcomes for this supporting competence include:		
	 Apply legislation, regulations, and practices ensuring safe work Describe the employer's and employee's role with Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations and related advisory bodies and agencies. Describe industry practices for hazard assessment and control procedures. Describe the responsibilities of employees and employers to apply emergency procedures. Describe tradesperson attitudes with respect to housekeeping, personal protective equipment, and emergency procedures. Describe the roles and responsibilities of employers and employees with the selection and use of personal protective equipment (PPE). Maintain required PPE for tasks. Demonstrate the application of the Occupational Health and Safety Act, Regulation and Code. 		

Core Competence 2: Job Practices and Procedures

Supp	porting Competence	Taxonomy	Weighting
2B.	 Apply organizational and manufacturer's specifications Outcomes for this supporting competence include: <i>Perform scheduled maintenance</i> Identify oils used in automotive applications. Describe the characteristics of oils used in automotive applications. Describe handling practices for all vehicle fluids. Describe the characteristics of engine coolants. Explain maintenance schedules. Identify an appropriate preventative maintenance schedule. Inspect vehicle fluids. Replace accessory drive belts. 	I, II	57%
2C.	Select, use, and maintain personal protective equipment		In Context
2D.	 Demonstrate safety awareness and safe work practices Outcomes for this supporting competence include: <i>Apply industry standard practices for hazardous materials and fire protection</i> Describe roles, responsibilities, features, and practices related to the Workplace Hazardous Materials Information System (WHMIS) program. Describe four key elements of WHMIS. Describe handling, storing, and transporting procedures for hazardous materials. Describe venting procedures when working with hazardous materials. Describe hazards, classes, procedures, and equipment related to fire protection. <i>Mapply hybrid and electric vehicle safety procedures</i> Identify hybrid and electric vehicles. 	Ι, ΙΙ	24%
2E.	 Organize work Outcomes for this supporting competence include: <i>Manage an apprenticeship to earn a journeyperson certificate</i> Describe the contractual responsibilities of the apprentice, employer and Alberta Apprenticeship and Industry Training. Describe the purpose of the apprentice record book. Describe the procedure for changing employers during an active apprenticeship. Describe the procedure for progressing through an apprenticeship. Describe the procedure for progressing through an apprenticeship. 	I, II	10%

Core Competence 3: Shop Equipment and Tools Weighting – 10%

Automotive Service Technicians utilize various types of shop equipment and tools to perform their work. Completing tasks safely, efficiently, and effectively requires knowledge and experience to select, use, and maintain the appropriate tools for the specific task. Skill in this area will be developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and is an essential component to a successful career in the trade.

The automotive service technician first period will provide instruction on selecting, using, and maintaining the following: specialty tools, shop equipment, diagnostic equipment, and fastening devices.



Demonstrate knowledge, understanding and proficiency regarding the use and maintenance of tools and shop equipment.

Core Competence 3A: Shop Equipment and Tools

Sup	porting Competence	Taxonomy	Weighting
3A.	Select, use, and maintain hand tools		In Context
3B.	Select, use, and maintain power tools		In Context
3C.	 Select, use, and maintain speciality tools Outcomes for this supporting competence include: <i>Use specialty hand tools</i> Use thread-forming tools. Perform thread repair. Perform broken fastener removal. Perform tube flaring. <i>Use measuring tools</i> Identify measuring tools. Maintain measuring tools. Perform linear measurements. Perform torque measurements. 	I, II	54%
3D.	 Select, use, and maintain shop equipment Outcomes for this supporting competence include: <i>Use industry standard practices for lifting, rigging, and hoisting</i> Describe manual lifting procedures. Describe the characteristics and applications of vehicle hoists and shop lifting equipment. Identify type and capacity of hoisting and lifting equipment required for vehicle or item to be lifted. Identify vehicle lifting points and required adapters and extensions. Perform pre-operational safety checks on vehicle hoists and shop lifting equipment. Operate vehicle hoists and shop lifting equipment. 	I, II	12%

Core Competence 3A: Shop Equipment and Tools

Sup	porting Competence	Taxonomy	Weighting
3E.	Select, use, and maintain diagnostic equipment		19%
	Outcomes for this supporting competence include:		
	 Use scan tools Use scan tools to retrieve diagnostic data. Use scan tools to perform function tests. 		
3F.	Select and use fastening devices	I, II	15%
	Outcomes for this supporting competence include:		
	 Use fastening devices Describe plastic trim fastener usage. Describe special retaining devices. Explain sealer usage. Explain adhesive usage. Perform torquing procedures using threaded fasteners. 		

Core Competence 4: Maintenance Services Weighting – 28%

Automotive Service Technicians assess the need for and perform regular upkeep and servicing on vehicle systems and components to ensure their safe and efficient operation over time. Proficiency in carrying out these tasks and procedures helps prevent breakdowns, extends vehicle lifespan, and maintains optimal vehicle performance.

The automotive service technician first period will provide instruction on how to perform maintenance services on braking systems, steering systems, heating, ventilation and air conditioning systems, light utility trailers, tires and wheels, and electrical storage devices.



Demonstrate knowledge, understanding and proficiency when conducting motor vehicle maintenance services.

Core Competence 4: Maintenance Services

Sup	oportir	g Competence	Taxonomy	Weighting
4A.	Perform motor vehicle maintenance services on braking systems		I, II, III	16%
	Out	comes for this supporting competence include:		
	I.	 Service brake systems Describe bleeding procedure for brake systems. Perform bleeding procedures on brake systems. Diagnose problems related to brake systems. 		

Core Competence 4: Maintenance Services

Supp	orting Competence	Taxonomy	Weighting
4B.	 Perform motor vehicle maintenance services on steering systems Outcomes for this supporting competence include: <i>Perform a wheel alignment</i> Describe the effects of steering angles on vehicle operation. Describe the measurement procedures for each steering angle. Describe the adjustment procedures for each steering angle. Describe a road test procedure. Select the appropriate alignment settings. Perform a wheel alignment. 	I, II, III	39%
4C.	Perform motor vehicle maintenance services on suspension systems		In Context
4D.	Perform motor vehicle maintenance services on drive train systems		In Context
4E.	 Perform motor vehicle maintenance services on heating, ventilation, and air conditioning systems Outcomes for this supporting competence include: <i>I. Service air conditioning systems</i> Identify refrigerants. Identify air conditioning components. Explain refrigerant handling. Explain refrigerant regulations. Perform refrigerant recovery. Perform air conditioning system recharge. 	I, II	15%
4F.	 Perform motor vehicle maintenance services on light utility trailers Outcomes for this supporting competence include: <i>Service light utility trailers</i> Describe trailer brake operation. Perform trailer brake service. Perform light utility trailer service. 	I, II	8%
4G.	Perform motor vehicle maintenance services on oils, fluids, and greases		In Context
4H.	Perform motor vehicle maintenance services on filters, gaskets, and sealants		In Context
41.	 Perform motor vehicle maintenance services on tires and wheels Outcomes for this supporting competence include: <i>I.</i> Service wheel assemblies Describe wheel design. Describe tire design. Describe Tire Pressure Monitoring System (TPMS) operation. Diagnose wheel assemblies. Service wheels. Service tires. Service TPMS systems. 	I, II, III	13%

Core Competence 4: Maintenance Services

Supp	porting	Competence	Taxonomy	Weighting
4J.				In Context
4K.	Perform motor vehicle maintenance services on belts and hoses Perform motor vehicle maintenance services on electrical storage devices Outcomes for this supporting competence include: I. Service batteries 1. Describe battery operation. 2. Describe types and ratings of batteries. 3. Diagnose problems related to batteries. 4. Perform battery service. 5. Perform battery charging. 6. Perform battery boosting.		I, II, III	9%

Core Competence 5: Inspect, Test, and Analyze

Weighting – 2%



CS

Automotive Service Technicians utilize a systematic approach to assess and understand the condition of the systems and components they are tasked with working on. Proficiency in this approach is a necessary step in addressing customer concerns in an efficient and effective manner.

The automotive service technician first period will provide instruction on how to inspect, test and analyze suspension systems.

Demonstrate knowledge, understanding and proficiency regarding the inspection, testing and analysis of motor vehicle systems.

Core Competence 5: Inspect, Test, and Analyze

Supp	pporting Competence		Taxonomy	Weighting
5A.	Ins	pect, test, and analyze motor vehicle braking systems		In Context
5B.	Ins	pect, test, and analyze motor vehicle steering systems		In Context
5C.		 bect, test, and analyze motor vehicle suspension systems comes for this supporting competence include: <i>Inspect vehicle frame and structure</i> 1. Identify frame and structure damage. 2. Describe frame and structure inspection. 3. Identify hitches. 4. Describe hitch damage. 	I, II	100%

Core Competence 5: Inspect, Test, and Analyze

Supp	Supporting Competence Taxonomy		Weighting
5D.	Inspect, test, and analyze motor vehicle drive train systems		In Context
5E.	Inspect, test, and analyze motor vehicle electrical systems		In Context
5F.	Inspect, test, and analyze motor vehicle heating, ventilation, and air conditioning systems		In Context
5G.	Inspect, test, and analyze motor vehicle light utility trailers		In Context
5H.	Inspect, test, and analyze motor vehicle tires and wheels		In Context
51.	Inspect, test, and analyze motor vehicle electrical storage devices		In Context

Core Competence 6: Diagnostics

Weighting – In Context

Automotive Service Technicians utilize a variety of diagnostic tools and techniques to assess and understand the underlying reasons for observed faults, defects or performance issues on the systems and components they are tasked with working on. Proficiency in this area is a necessary step in addressing customer concerns in an efficient and effective manner.

All instruction for diagnostics in the first period will be provided in the context of instruction in systems repair.



Demonstrate knowledge, understanding and proficiency when performing motor vehicle system diagnostics.

Core Competence 6: Diagnostics

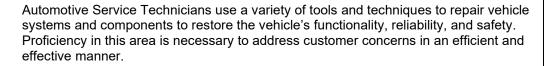
Supp	Supporting Competence		Weighting
6A.	Perform motor vehicle diagnostics for braking systems		In Context
6B.	Perform motor vehicle diagnostics for steering systems		In Context
6C.	Perform motor vehicle diagnostics for suspension systems		In Context
6D.	Perform motor vehicle diagnostics for drive train systems		In Context

Core Competence 6: Diagnostics

Supp	Supporting Competence		Weighting
6E.	Perform motor vehicle diagnostics for electrical systems		In Context
6F.	Perform motor vehicle diagnostics for light utility trailers		In Context
6G.	Perform motor vehicle diagnostics for tires and wheels		In Context
6H.	Perform motor vehicle diagnostics for electrical storage devices		In Context

Core Competence 7: Systems Repair

Weighting – 40%



The automotive service technician first period will provide instruction on how to perform repairs on the following systems: braking, steering, suspension, drive train, and electrical.



Demonstrate knowledge, understanding, and proficiency when performing motor vehicle system repairs.

Supporting Competence		Taxonomy	Weighting	
7A.		form motor vehicle repairs on braking systems omes for this supporting competence include:	I, II, III	33%
	I.	 Repair hydraulic brake systems 1. Describe the operating principles of brake systems. 2. Identify brake fluids. 3. Explain Pascal's Law and its implications for brake systems. 4. Describe the design features of brake hydraulic systems. 5. Describe the operation of the hydraulic components when used as a system. 6. Repair hydraulic brake components. 		
	II.	 Repair drum brake systems Describe drum brake system operation. Describe drum brake system components. Describe drum park brake operation. Repair drum brake systems. 		

Supp	orting	J Competence	Taxonomy	Weighting
	 III. Repair disc brake systems 1. Describe disc brake system operation. 2. Describe disc brake system components. 3. Describe disc park brake operation. 4. Describe electric park brakes. 5. Repair disc brake systems. 			
	IV.	 Repair power assisted brake systems Describe power assisted brake operation. Describe hybrid vehicle braking system service precautions. Demonstrate the procedures for testing a power assisted brake unit. Diagnose power assisted brake units. 		
7B.	Perf	orm motor vehicle repairs on steering systems	I, II, III	34%
	Outc	omes for this supporting competence include:		
	I.	 Repair steering systems Describe design features of steering systems. Describe operating principles of steering systems. Diagnose steering systems. Repair steering systems. 		
	<i>II.</i>	 Repair electrically assisted steering systems Describe electrically assisted steering system operation. Repair mechanical problems related to electrically assisted steering gears. 		
	<i>III.</i>	 Repair hydraulically assisted steering systems 1. Identify hydraulic assist pumps. 2. Describe the operation of hydraulically assisted steering systems. 3. Diagnose hydraulically assisted steering problems. 		
	IV.	 Repair steering columns 1. Describe steering column operation. 2. Describe steering column replacement. 3. Diagnose steering column problems. 		
7C.		orm motor vehicle repairs on suspension systems	I, II, III	16%
	I.	Repair suspension systems 1. Describe suspension systems. 2. Describe operating principles of suspension systems. 3. Diagnose suspension systems. 4. Repair suspension systems.		
	II.	 Repair wheel bearings 1. Describe wheel bearing construction. 2. Diagnose problems related to wheel bearings. 3. Service wheel bearings. 		
7D.	Perf	orm motor vehicle repairs on drive train systems	I, II, III	9%
	Outc	omes for this supporting competence include:		
	I.	 <i>Repair drive shafts</i> 1. Describe drive shaft operation. 2. Describe drive shaft components. 3. Repair drive shaft assemblies. 		

Supporting Competence		Taxonomy	Weighting	
7E.		orm motor vehicle repairs on electrical systems	I, II, III	8%
	I.	 <i>Repair electrical circuits</i> Describe hazards of electrostatic discharge (ESD). Perform circuit tests. Identify types of circuit faults. Perform circuit repairs. 		

Period Two Course Content

(9 weeks - 270 hours)

Period Two Core Competences	Weighting
Foundational Skills	In Context
Job Practices and Procedures	In Context
Shop Equipment and Tools (A)	In Context
Shop Equipment and Tools (B) Oxy Fuel Heating and Cutting and GMAW Welding	7%
Maintenance Services	In Context
Inspect, Test, and Analyze	5%
Diagnostics	15%
Systems Repair	73%

Core Competence 1: Foundational Skills

Weighting – In Context

Automotive Service Technicians utilize a variety of foundational skills that enable them to understand and perform their job responsibilities. They form the basis upon which more specialized knowledge, skills, and abilities are developed. These skills are developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and are essential components to a successful career in the trade.

All instruction for foundational skills in the second period will be provided in the context of instruction in the other core competences.



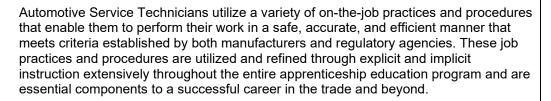
Apply foundational skills essential to convey and receive critical training and workplace information.

Core Competence 1: Foundational Skills

Sup	Supporting Competence Taxonomy		Weighting
1A.	Demonstrate problem solving		In Context
1B.	Demonstrate digital literacy		In Context
1C.	Demonstrate team and customer communication		In Context
1D.	Demonstrate knowledge of mechanical and electrical fundamentals		In Context

Core Competence 2: Job Practices and Procedures

Weighting – In Context



All instruction for job practices and procedures in the second period will be provided in the context of instruction in the other core competences.



Apply knowledge and understanding of practices and procedures associated with onthe-job activities.

Core Competence 2: Job Practices and Procedures

Supporting Competence Taxonor		Taxonomy	Weighting
2A.	Apply standards and regulations		In Context
2B.	Apply organizational and manufacture's specifications		In Context
2C.	Select, use, and maintain personal protective equipment		In Context
2D.	Demonstrate safety awareness and safe work practices		In Context
2E.	Organize work		In Context

Core Competence 3: Shop Equipment and Tools

Automotive Service Technicians utilize various types of shop equipment and tools to perform their work. Completing tasks safely, efficiently, and effectively requires knowledge and experience to select, use, and maintain the appropriate tools for the specific task. Skill in this area will be developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and is an essential component to a successful career in the trade.

The automotive service technician second period will provide instruction on the use of oxy-fuel equipment for heating and cutting and Gas Metal Arc Welding (GMAW) equipment for welding.

Core Competence 3A: Shop Equipment and Tools Weighting – In Context

CS

Demonstrate knowledge, understanding and proficiency regarding the use and maintenance of tools and shop equipment.

Core Competence 3A: Shop Equipment and Tools

Suppo	orting Competence	Taxonomy	Weighting
3aA.	Select, use, and maintain hand tools		In Context
3aB.	Select, use, and maintain power tools		In Context
3aC.	Select, use, and maintain specialty tools		In Context
3aD.	Select, use, and maintain shop equipment		In Context
3aE.	Select, use, and maintain diagnostic equipment		In Context
3aF.	Select and use fastening devices		In Context

Core Competence 3B: Oxy Fuel Heating and Cutting and GMAW Welding Weighting – 7%



Demonstrate knowledge, understanding and proficiency when heating and cutting with oxy-fuel equipment and when welding with GMAW equipment.

Suppo	Supporting Competence		Weighting
3bA.	Demonstrate handling procedures for oxy-fuel and GMAW equipment		In Context
3bB.	Use oxy-fuel equipment for heating and cutting and GMAW equipment for welding	I, II	100%
	Outcomes for this supporting competence include:		
	 Use oxy-fuel and gas metal arc welding (GMAW) equipment Describe characteristics of welding equipment. Describe handling procedures for using welding equipment. Describe oxy-fuel and GMAW equipment. Use PPE when using oxy-fuel and GMAW equipment. Demonstrate handling procedures for oxy-fuel and GMAW equipment. Demonstrate the use of oxy-fuel and GMAW equipment. Perform cutting operations. Perform GMAW procedures. 		

Core Competence 3B: Oxy Fuel Heating and Cutting and GMAW Welding

Core Competence 4: Maintenance Services

Weighting – In Context



Automotive Service Technicians assess the need for and perform regular upkeep and servicing on vehicle systems and components to ensure their safe and efficient operation over time. Proficiency in carrying out these tasks and procedures helps prevent breakdowns, extends vehicle lifespan, and maintains optimal vehicle performance.

All instruction for maintenance services in the second period will be provided in the context of instruction in the other core competences.



Demonstrate knowledge, understanding and proficiency when conducting motor vehicle maintenance services.

Core Competence 4: Maintenance Services

Sup	Supporting Competence		Weighting
4A.	Perform motor vehicle maintenance services on propulsion systems		In Context
4B.	Perform motor vehicle maintenance services on emission control systems		In Context
4C.	Perform motor vehicle maintenance services on drive train systems	-	In Context
4D.	Perform motor vehicle maintenance services on oils, fluids, and greases		In Context

Core Competence 4: Maintenance Services

Supporting Competence		Taxonomy	Weighting
4E.	Perform motor vehicle maintenance services on filters, gaskets, and sealants		In Context
4F.	Perform motor vehicle maintenance services on belts and hoses		In Context
4G.	Perform motor vehicle maintenance services on electrical storage devices		In Context

Core Competence 5: Inspect, Test, and Analyze Weighting – 5%

weighting – 57

Automotive Service Technicians utilize a systematic approach to assess and understand the condition of the systems and components they are tasked with working on. Proficiency in this approach is a necessary step in addressing customer concerns in an efficient and effective manner.

The automotive service technician second period will provide instruction on how to inspect, test and analyze propulsion systems.



Demonstrate knowledge, understanding and proficiency regarding the inspection, testing and analysis of motor vehicle systems.

Core Competence 5: Inspect, Test, and Analyze

Supp	orting Competence	Taxonomy	Weighting
5A.	 Inspect, test, and analyze motor vehicle propulsion systems Outcomes for this supporting competence include: <i>Inspect internal engine components</i> Describe design features of crankshaft components. Describe service options to repair damaged crankshaft components. Describe the design features of piston assemblies. Describe piston assembly fitting procedure. Describe engine balance. Describe service options for piston assemblies. Inspect piston assemblies. Inspect piston assemblies. 	I, II	100%
5B.	Inspect, test, and analyze motor vehicle emission control systems		In Context
5C.	Inspect, test, and analyze motor vehicle drive train system		In Context

Core Competence 5: Inspect, Test, and Analyze

Supp	orting Competence	Taxonomy	Weighting
5D.	Inspect, test, and analyze motor vehicle electrical systems		In Context

Core Competence 6: Diagnostics

Weighting – 15%



Automotive Service Technicians utilize a variety of diagnostic tools and techniques to assess and understand the underlying reasons for observed faults, defects or performance issues on the systems and components they are tasked with working on. Proficiency in this area is a necessary step in addressing customer concerns in an efficient and effective manner.

The automotive service technician second period will provide instruction on how to perform diagnostics on the following systems: propulsion and electrical.



Demonstrate knowledge, understanding and proficiency when performing motor vehicle system diagnostics.

Core Competence 6: Diagnostics

Sup	Supporting Competence		Weighting
6A.	 Perform motor vehicle diagnostics for propulsion systems Outcomes for this supporting competence include: <i>Diagnose engine mechanical problems</i> Diagnose engine mechanical problems using physical senses. Diagnose engine mechanical problems using engine test equipment. 	I, II, III	40%
6B.	Perform motor vehicle diagnostics for emission control systems	In Context	
6C.	Perform motor vehicle diagnostics for drive train systems		In Context
6D.	 Perform motor vehicle diagnostics for electrical systems Outcomes for this supporting competence include: <i>Diagnose electrical systems</i> Interpret electrical circuit diagrams. Connect scan tools to vehicles and monitor scan data on applicable second period automotive systems. Use diagnostic strategies to locate circuit faults. Diagnose circuit faults. 	I, II, III	60%

Core Competence 7: Systems Repair Weighting – 73%

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Automotive Service Technicians use a variety of tools and techniques to repair vehicle systems and components to restore the vehicle's functionality, reliability, and safety. Proficiency in this area is necessary to address customer concerns in an efficient and effective manner.

The automotive service technician second period will provide instruction on how to perform repairs on the following systems: propulsion, emission control, drive train, and electrical.



Demonstrate knowledge, understanding, and proficiency when performing motor vehicle system repairs.

Supporting Competence		Taxonomy	Weighting	
7A.	Perform motor vehicle repairs on propulsion systems Outcomes for this supporting competence include:		I, II, III	35%
	<i>I. R</i> (1. 2. 3. 4. 5. 6. 7.	Describe the principles of engine operation. Describe design features of automotive engines. Describe service options for damaged engine components. Inspect engine block. Disassemble an engine.		
	<i>II. R</i> (1. 2. 3. 4.	Describe cylinder head design. Describe valve design.		
	1. 2. 3. 4. 5. 6. 7. 8. 9.	Describe valve train operation. Describe valve train lubrication. Describe valve train drive mechanisms. Describe variable valve timing mechanisms. Describe cylinder deactivation. Inspect camshafts and lifters. Inspect valve train drive mechanisms.		

Supporting Competence		Taxonomy	Weighting	
	IV.	 Repair air induction systems 1. Identify the types of induction systems. 2. Describe intake manifolds design. 3. Describe the construction of forced air induction systems. 4. Describe forced air induction system maintenance and repair. 5. Diagnose forced air induction systems. 		
	V.	 Repair lubrication systems 1. Describe lubrication systems. 2. Describe lubrication system components. 3. Describe positive crankcase ventilation (PCV) operation. 4. Diagnose PCV systems. 5. Service PCV systems. 6. Repair lubrication systems. 		
	VI.	 Repair Cooling Systems 1. Describe heat transfer. 2. Describe cooling system operation. 3. Describe cooling system components. 4. Diagnose cooling systems. 		
7B.	Perfo	rm motor vehicle repairs on emission control systems	I, II, III	2%
	Outcor	nes for this supporting competence include:		
	Ι.	Repair exhaust systems		
		 Describe exhaust components. Describe exhaust system diagnostics. 		
		 Describe exhaust system diagnostics. Describe exhaust component replacement. 		
7C.		rm motor vehicle repairs on drive train systems	I, II, III	46%
	Outcomes for this supporting competence include:			
	Ι.	Repair manual transmissions and transaxles		
		 Identify gear designs. Identify types of bearings and seals in manual transmissions and 		
		transaxles.		
		3. Identify the path of power through a manual transmission and transaxle.		
		4. Describe operating principles of a manual transmission and transaxle.		
		5. Describe manual transmission and transaxle lubrication		
		requirements.Describe shift mechanism operation.		
		7. Describe synchromesh operation.		
		8. Describe the adjustment of manual transaxle linkages.		
		 Describe internal manual transmission component lubrication. Diagnose manual transmissions. 		
		11. Diagnose manual transaxles.		
		12. Disassemble a manual transmission.		
		 Assemble a manual transmission. Disassemble a manual transaxle. 		
		15. Assemble a manual transaxle.		

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Supp	Supporting Competence		Taxonomy	Weighting
	II.	 Repair automotive clutches 1. Describe clutch operation. 2. Describe clutches. 3. Describe clutch service. 4. Diagnose a clutch assembly. 		
	<i>III.</i>	 Repair Four Wheel Drive (4WD) Systems 1. Describe transfer case operation. 2. Describe 4WD hubs and axle operation. 3. Diagnose transfer cases. 4. Diagnose 4WD hubs and axles. 		
	IV.	 Repair All Wheel Drive (AWD) Systems Describe AWD system operation. Diagnose AWD systems. 		
	V.	 Repair axle shafts and bearings 1. Identify axle shaft types. 2. Describe drive axle assembly components. 3. Describe bearing maintenance. 4. Diagnose axle shafts. 5. Diagnose axle bearings. 		
	VI.	 Repair drive axle assembly Identify differential types. Describe the operation of differentials. Describe the lubrication requirements for differentials. Describe the procedure to test a traction-enhancing differential. Identify the path of power from the drive pinion gear to the axle. Describe the operation of final drive gear sets. Describe how the final drive gear set support bearings are lubricated. Describe final drive gear sets. Demonstrate the effect of gear position on contact pattern. Diagnose Drive Axle Assembly. Perform final drive gear set reassembly. 		
7D.	Perfo	rm motor vehicle repairs on electrical systems	I, II, III	17%
	Outco	mes for this supporting competence include:		
	I.	 Repair charging systems Describe generator operating principles. Describe charging system operation. Describe charging system-warning indicator operation. Describe computer-controlled charging systems. Describe dual generator systems. Perform charging system diagnostics. 		
	<i>II.</i>	 Repair starting systems Describe the operating principles of Direct Current (DC) motors. Describe starting system operation. Describe electronically controlled starting systems. Perform starter system diagnostics. 		

Period Three Course Content

(9 weeks - 270 hours)

Period Three Core Competences	Weighting
Foundational Skills	6%
Job Practices and Procedures	In Context
Shop Equipment and Tools (A)	6%
Maintenance Services	In Context
Inspect, Test, and Analyze	In Context
Diagnostics	16%
Systems Repair	72%

Core Competence 1: Foundational Skills Weighting – 6%

Automotive Service Technicians utilize a variety of foundational skills that enable them to understand and perform their job responsibilities. They form the basis upon which more specialized knowledge, skills, and abilities are developed. These skills are developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and are essential components to a successful career in the trade.

The automotive service technician third period will provide instruction on mechanical and electrical fundamentals.



Apply foundational skills essential to convey and receive critical training and workplace information.

Core Competence 1: Foundational Skills

Sup	Supporting Competence		Taxonomy	Weighting
1A.	Demonst	trate problem solving		In Context
1B.	Demonst	trate digital literacy		In Context
1C.	Demons	trate team and customer communication		In Context
1D.	Demonstrate knowledge of mechanical and electrical fundamentals Outcomes for this supporting competence include:		I, II, III	100%
	<i>I. Ev</i> 1. 2.	aluate system operation Use wiring diagrams and service information to verify system operation. Use wiring diagrams and test procedures to isolate system faults.		
	<i>II. An</i> 1. 2. 3. 4.	alyze the combustion process Describe fuel properties. Describe the combustion process. Describe combustion emission gases. Describe the effect of engine management and design on exhaust emissions.		

Core Competence 2: Job Practices and Procedures

Weighting – In Context

Automotive Service Technicians utilize a variety of on-the-job practices and procedures that enable them to perform their work in a safe, accurate, and efficient manner that meets criteria established by both manufacturers and regulatory agencies. These job practices and procedures are utilized and refined through explicit and implicit instruction extensively throughout the entire apprenticeship education program and are essential components to a successful career in the trade and beyond.

All instruction for job practices and procedures in the third period will be provided in the context of instruction in the other core competences.



Apply knowledge and understanding of practices and procedures associated with onthe-job activities.

Core Competence 2: Job Practices and Procedures

Supp	Supporting Competence		Weighting
2A.	Apply standards and regulations		In Context
2B.	Apply organizational and manufacture's specifications		In Context
2C.	Select, use, and maintain personal protective equipment		In Context
2D.	Demonstrate safety awareness and safe work practices		In Context
2E.	Organize work		In Context

Core Competence 3: Shop Equipment and Tools

Weighting – 6%

Automotive Service Technicians utilize various types of shop equipment and tools to perform their work. Completing tasks safely, efficiently, and effectively requires knowledge and experience to select, use, and maintain the appropriate tools for the specific task. Skill in this area will be developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and is an essential component to a successful career in the trade.

The automotive service technician third period will provide instruction on selecting, using, and maintaining diagnostic equipment.



Demonstrate knowledge, understanding and proficiency regarding the use and maintenance of tools and shop equipment.

Core Competence 3A: Shop Equipment and Tools

Suppo	Supporting Competence		Weighting
3aA.	Select, use, and maintain hand tools		In Context
3aB.	Select, use, and maintain power tools		In Context
3aC.	Select, use, and maintain specialty tools	-	In Context
3aD.	Select, use, and maintain shop equipment		In Context

Core Competence 3A: Shop Equipment and Tools

Supp	orting Competence	Taxonomy	Weighting
3aE.	 Select, use, and maintain diagnostic equipment Outcomes for this supporting competence include: <i>Diagnose component faults using a lab scope</i> Describe lab scope function. Describe vibration analysis. Perform vibration analysis. Perform current ramping test. Perform pressure transducer diagnosis. 	I, II, III	100%
3aF.	Select and use fastening devices		In Context

Core Competence 4: Maintenance Services

Weighting – In Context

Automotive Service Technicians assess the need for and perform regular upkeep and servicing on vehicle systems and components to ensure their safe and efficient operation over time. Proficiency in carrying out these tasks and procedures helps prevent breakdowns, extends vehicle lifespan, and maintains optimal vehicle performance.

All instruction for maintenance services in the third period will be provided in the context of instruction in the other core competences.



Demonstrate knowledge, understanding and proficiency when conducting motor vehicle maintenance services.

Core Competence 4: Maintenance Services

Sup	Supporting Competence		Weighting
4A.	Perform motor vehicle maintenance services on fuel systems		In Context
4B.	Perform motor vehicle maintenance services on emission control systems		In Context
4C.	Perform motor vehicle maintenance services on oils, fluids, and greases		In Context
4D.	Perform motor vehicle maintenance services on filters, gaskets, and sealants		In Context
4E.	Perform motor vehicle maintenance services on belts and hoses		In Context

Core Competence 5: Inspect, Test, and Analyze Weighting – In Context



Automotive Service Technicians utilize a systematic approach to assess and understand the condition of the systems and components they are tasked with working on. Proficiency in this approach is a necessary step in addressing customer concerns in an efficient and effective manner.

All instruction for inspecting, testing, and analyzing systems in the third period will be provided in the context of instruction in the other core competences.



Demonstrate knowledge, understanding and proficiency regarding the inspection, testing and analysis of motor vehicle systems.

Core Competence 5: Inspect, Test, and Analyze

Sup	porting Competence	Taxonomy	Weighting
5A.	Inspect, test, and analyze motor vehicle propulsion systems		In Context
5B.	Inspect, test, and analyze motor vehicle fuel systems		In Context
5C.	Inspect, test, and analyze motor vehicle emission control systems		In Context
5D.	Inspect, test, and analyze motor vehicle braking systems		In Context
5E.	Inspect, test, and analyze motor vehicle steering systems		In Context
5F.	Inspect, test, and analyze motor vehicle suspension systems		In Context
5G.	Inspect, test, and analyze motor vehicle drive train systems		In Context
5H.	Inspect, test, and analyze motor vehicle management systems		In Context
5I.	Inspect, test, and analyze motor vehicle electrical systems		In Context
5J.	Inspect, test, and analyze motor vehicle occupant crash protection systems		In Context

Core Competence 6: Diagnostics Weighting – 16%

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Automotive Service Technicians utilize a variety of diagnostic tools and techniques to assess and understand the underlying reasons for observed faults, defects or performance issues on the systems and components they are tasked with working on. Proficiency in this area is a necessary step in addressing customer concerns in an efficient and effective manner.

The automotive service technician third period will provide instruction on how to perform diagnostics on the following systems: vehicle management and electrical.



Demonstrate knowledge, understanding and proficiency when performing motor vehicle system diagnostics.

Core Competence 6: Diagnostics

Supp	oorting Competence	Taxonomy	Weighting
6A.	Perform motor vehicle diagnostics for propulsion systems		In Context
6B.	Perform motor vehicle diagnostics for fuel systems		In Context
6C.	Perform motor vehicle diagnostics for emission control systems		In Context
6D.	Perform motor vehicle diagnostics for braking systems		In Context
6E.	Perform motor vehicle diagnostics for steering systems		In Context
6F.	Perform motor vehicle diagnostics for suspension systems		In Context
6G.	Perform motor vehicle diagnostics for drive train systems		In Context
6H.	Perform motor vehicle diagnostics for vehicle management systems	I, II, III	77%
	 Outcomes for this supporting competence include: <i>Diagnose input devices</i> Identify sensor classifications. Describe input switch operation. Describe operation and application of sensors. Describe a feedback loop system. Perform input sensor and switch diagnosis. <i>Diagnose output devices</i> Describe operation and application of output devices. Describe strategy of output controls. Perform output device diagnosis. 		

Core	Competence	6:	Diagnostics	
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Sup	Supporting Competence		Taxonomy	Weighting
	<i>III.</i>	 Diagnose control modules Describe microprocessor function. Describe control module interactions. Describe solid-state device operation. Perform control module diagnosis. 		
61.		form motor vehicle diagnostics for electrical systems.	II, III	23%
	I.	 Perform electrical test procedures Interpret electrical circuit diagrams. Use electrical test equipment for circuit diagnosis. Diagnose Parasitic Draw. 		
6J.		orm motor vehicle diagnostics for occupant crash ection systems.		In Context

Core Competence 7: Systems Repair Weighting – 72%



Automotive Service Technicians use a variety of tools and techniques to repair vehicle systems and components to restore the vehicle's functionality, reliability, and safety. Proficiency in this area is necessary to address customer concerns in an efficient and effective manner.

The automotive service technician third period will provide instruction on how to perform repairs on the following systems: fuel, emission control, vehicle management, electrical, and occupant crash protection.



Demonstrate knowledge, understanding, and proficiency when performing motor vehicle system repairs.

Sup	Supporting Competence		Taxonomy	Weighting
7A.		 Form motor vehicle repairs on fuel systems comes for this supporting competence include: Repair fuel supply systems 1. Describe fuel supply system operation. 2. Describe fuel system components. 3. Describe the safety devices in fuel supply systems. 4. Describe fuel pump operation. 5. Perform fuel supply system diagnosis. 6. Repair fuel supply systems. 	I, II, III	29%

Sup	portin	g Competence	Taxonomy	Weighting
	И.	 Repair fuel injection systems 1. Identify fuel injection system components. 2. Describe air measurement. 3. Describe fuel injector operation. 4. Describe idle speed control methods. 5. Describe fuel metering. 6. Describe the operation of alternate fuel systems. 7. Explain a fuel injection system operation. 8. Demonstrate practices for working with pressurized fuel systems. 9. Diagnose fuel injection system problems. 		
7B.	Perf	orm motor vehicle repairs on emission control systems	I, II, III	8%
	Outco	omes for this supporting competence include:		
	I.	 <i>Repair exhaust gas recirculation systems</i> Describe exhaust gas recirculation system operation. Perform exhaust gas recirculation system diagnosis. 		
	II.	<i>Repair air injection systems</i>1. Describe air injection system operation.		
	<i>III.</i>	 <i>Repair exhaust after treatment systems</i> Describe exhaust aftertreatment system operation. Perform exhaust aftertreatment system diagnosis. 		
	IV.	 Repair evaporative emission control systems Describe evaporative emissions. Describe evaporative emission control system operation. Perform evaporative emission control system diagnosis. 		
7C.		orm motor vehicle repairs on vehicle management systems	I, II, III	34%
	<i>I.</i>	 <i>Repair vehicle networks</i> 1. Describe the purpose of the data stream. 2. Describe multiplexing functions. 3. Describe data buses in a network. 4. Diagnose network faults. 5. Describe vehicle software update. 6. Repair network faults. 		
	II.	 Repair ignition systems Identify the inputs and outputs of an ignition system. Describe ignition systems. Describe the function of an ignition system. Interpret ignition system waveforms. Perform ignition system diagnosis. 		
	<i>III.</i>	 <i>Repair vehicle speed control systems</i> Describe vehicle speed control systems. Perform vehicle speed control system diagnosis. 		
	IV.	 Repair Advanced Driver Assistance Systems (ADAS) Identify the levels of autonomy. Describe Advanced Driver Assistance System. Identify ADAS components. Describe ADAS component characteristics and applications. Describe operating principals of ADAS Components Diagnose ADAS components. Calibrate ADAS components. Repair ADAS components. 		

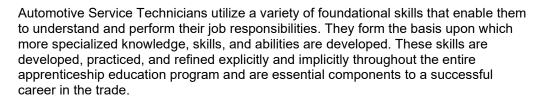
Sup	Supporting Competence		Taxonomy	Weighting
	V.	 Repair anti-lock brake (ABS) and Stability Control systems Describe ABS and Stability Control systems. Perform ABS and Stability Control system diagnosis. 		
7D.	Perf	orm motor vehicle repairs on electrical systems	I, II, III	24%
	Outc	omes for this supporting competence include:		
	I.	 Repair instrument panel and warning systems Describe instrument panel gauge operation. Describe warning device operation. Perform visual warning device diagnosis. Perform audible warning device diagnosis. 		
	Ш.	 Repair vehicle lighting systems 1. Identify lighting systems. 2. Describe vehicle lighting system operation. 3. Perform vehicle lighting system diagnosis. 4. Perform headlamp alignment. 		
	<i>III.</i>	 <i>Repair wiper and washer systems</i> Describe wiper and washer systems. Perform wiper and washer system diagnosis. 		
	IV.	 Repair power accessories Identify emerging technologies. Perform power accessory fault diagnosis. Repair power accessories faults. Perform electric motors with feedback system diagnosis. Perform actuator system diagnosis. Perform solenoid system diagnosis. Perform electric heating and cooling system diagnosis. Perform auxiliary power supply system diagnosis. 		
	V.	 Repair information and entertainment systems 1. Describe information system operation. 2. Describe entertainment system operation. 3. Perform information system diagnosis. 4. Perform entertainment system diagnosis. 		
	VI.	 <i>Repair factory-installed security systems</i> Perform anti-theft and alarm system diagnosis. Perform remote system diagnosis. 		
7E.		form motor vehicle system repairs on occupant crash ection systems	I, II	5%
	Outc	omes for this supporting competence include:		
	I.	 Repair occupant crash protection systems Identify types of occupant crash protection systems and their components. Describe characteristics and applications of occupant crash protection systems and components. Perform occupant crash protection system diagnosis. 		

Period Four Course Content

(9 weeks - 270 hours)

Period One Core Competences	Weighting
Foundational Skills	4%
Job Practices and Procedures	In Context
Shop Equipment and Tools (A)	In Context
Maintenance Services	In Context
Inspect, Test, and Analyze	In Context
Diagnostics	45%
Systems Repair	51%

Core Competence 1: Foundational Skills Weighting – 4%



The automotive service technician fourth period will provide instruction on the following skills: digital literacy and mentorship.



Apply foundational skills essential to convey and receive critical training and workplace information.

Core Competence 1: Foundational Skills

Supp	orting Competence	Taxonomy	Weighting
1A.	Demonstrate problem solving		In Context
1B.	 Demonstrate digital literacy Outcomes for this supporting competence include: <i>Use Red Seal resources to prepare for an interprovincial examination</i> 1. Identify Red Seal resources used to develop interprovincial examinations. 2. Use Red Seal resources to prepare for an interprovincial examination. 	Ι, ΙΙ	75%
1C.	Demonstrate team and customer communication		In Context
1D.	 Demonstrate mentorship Outcomes for this supporting competence include: <i>I. Use coaching skills when training an apprentice</i> 1. Describe the process for coaching apprentices. 	II	25%
1E.	Demonstrate knowledge of mechanical and electrical fundamentals		In Context

Core Competence 2: Job Practices and Procedures

Weighting – In Context

Automotive Service Technicians utilize a variety of on-the-job practices and procedures that enable them to perform their work in a safe, accurate, and efficient manner that meets criteria established by both manufacturers and regulatory agencies. These job practices and procedures are utilized and refined through explicit and implicit instruction extensively throughout the entire apprenticeship education program and are essential components to a successful career in the trade and beyond.

All instruction for job practices and procedures in the fourth period will be provided in the context of instruction in the other core competences.

CS

Apply knowledge and understanding of practices and procedures associated with on-the-job activities.

Core Competence 2: Job Practices and Procedures

Supp	Supporting Competence		Weighting
2A.	Apply standards and regulations		In Context
2B.	Apply organizational and manufacture's specifications		In Context
2C.	Select, use, and maintain personal protective equipment		In Context
2D.	Demonstrate safety awareness and safe work practices		In Context
2E.	Organize work		In Context

Core Competence 3: Shop Equipment and Tools

Weighting – In Context

Automotive Service Technicians utilize various types of shop equipment and tools to perform their work. Completing tasks safely, efficiently, and effectively requires knowledge and experience to select, use, and maintain the appropriate tools for the specific task. Skill in this area will be developed, practiced, and refined explicitly and implicitly throughout the entire apprenticeship education program and is an essential component to a successful career in the trade.

All instruction for shop equipment and tools in the fourth period will be provided in the context of instruction in the other core competences.

CS

Demonstrate knowledge, understanding and proficiency regarding the use and maintenance of tools and shop equipment.

Core Competence 3A: Shop Equipment and Tools

Supporting Competence		Taxonomy	Weighting
3aA.	Select, use, and maintain hand tools		In Context
3aB.	Select, use, and maintain power tools		In Context
3aC.	Select, use, and maintain specialty tools		In Context
3aD.	Select, use, and maintain shop equipment		In Context

Core Competence 3A: Shop Equipment and Tools

Supporting Competence		Taxonomy	Weighting
3aE.	Select, use, and maintain diagnostic equipment		In Context
3aF.	Select and use fastening devices		In Context

Core Competence 4: Maintenance Services Weighting – In Context



Automotive Service Technicians assess the need for and perform regular upkeep and servicing on vehicle systems and components to ensure their safe and efficient operation over time. Proficiency in carrying out these tasks and procedures helps prevent breakdowns, extends vehicle lifespan, and maintains optimal vehicle performance.

All instruction for maintenance services in the fourth period will be provided in the context of instruction in the other core competences

CS

Demonstrate knowledge, understanding and proficiency when conducting motor vehicle maintenance services.

Core Competence 4: Maintenance Services

Supp	Supporting Competence T		Weighting
4A.	Perform motor vehicle maintenance services on propulsion systems		In Context
4B.	Perform motor vehicle maintenance services on fuel systems		In Context
4C.	Perform motor vehicle maintenance services on emission control systems		In Context
4D.	Perform motor vehicle maintenance services on braking systems		In Context
4E.	Perform motor vehicle maintenance services on drive train systems		In Context
4F.	Perform motor vehicle maintenance services on heating, ventilation, and air conditioning systems		In Context
4G.	Perform motor vehicle maintenance services on oils, fluids, and greases		In Context
4H.	Perform motor vehicle maintenance services on filters, gaskets, and sealants		In Context

Core Competence 4: Maintenance Services

Supporting Competence Ta		Taxonomy	Weighting
41.	Perform motor vehicle maintenance services on tires and wheels		In Context
4J.	Perform motor vehicle maintenance services on belts and hoses		In Context

Core Competence 5: Inspect, Test, and Analyze Weighting – In Context



Automotive Service Technicians utilize a systematic approach to assess and understand the condition of the systems and components they are tasked with working on. Proficiency in this approach is a necessary step in addressing customer concerns in an efficient and effective manner.

All instruction for inspecting, testing, and analyzing systems in the fourth period will be provided in the context of instruction in the other core competences.



Demonstrate knowledge, understanding and proficiency regarding the inspection, testing and analysis of motor vehicle systems.

Core Competence 5: Inspect, Test, and Analyze

Supp	Supporting Competence Taxonomy		Weighting
5A.	Inspect, test, and analyze motor vehicle propulsion systems		In Context
5B.	Inspect, test, and analyze motor vehicle emission control systems		In Context
5C.	Inspect, test, and analyze motor vehicle braking systems		In Context
5D.	Inspect, test, and analyze motor vehicle drive train systems		In Context
5E.	Inspect, test, and analyze motor vehicle management systems		In Context
5F.	Inspect, test, and analyze motor vehicle electrical systems		In Context
5G.	Inspect, test, and analyze motor vehicle heating, ventilation, and air conditioning systems		In Context
5H.	Inspect, test, and analyze motor vehicle tires and wheels		In Context

Core Competence 6: Diagnostics

Weighting – 45%

Automotive Service Technicians utilize a variety of diagnostic tools and techniques to assess and understand the underlying reasons for observed faults, defects or performance issues on the systems and components they are tasked with working on. Proficiency in this area is a necessary step in addressing customer concerns in an efficient and effective manner.

The automotive service technician fourth period will provide instruction on how to perform diagnostics on the following systems: propulsion, fuel, emission control, and drive train.

CS

Demonstrate knowledge, understanding and proficiency when performing motor vehicle system diagnostics.

Core Competence 6: Diagnostics

Supp	porting Competence	Taxonomy	Weighting
6A.	 Perform motor vehicle diagnostics for propulsion systems Outcomes for this supporting competence include: <i>Diagnose diesel engine performance</i> Diagnose diesel engine performance. 	I, II, III	13%
6B.	 Perform motor vehicle diagnostics for fuel systems Outcomes for this supporting competence include: <i>Diagnose diesel fuel storage and supply systems</i> Describe diesel fuel properties. Describe low pressure supply system operation. Diagnose low pressure supply system. Perform fuel sample testing. 	I, II, III	7%
6C.	 Perform motor vehicle diagnostics for emission control systems Outcomes for this supporting competence include: <i>Diagnose diesel emission systems</i> Explain diesel emission systems. Explain crankcase ventilation systems. Describe emissions systems service. Perform diesel exhaust fluid system diagnosis. Perform regeneration procedures. 	I, II, III	12%
6D.	Perform motor vehicle diagnostics for braking systems		In Context

Core Competence 6: Diagnostics

Supp	orting Competence	Taxonomy	Weighting
6E.	Perform motor vehicle diagnostics for drive train systems	I, II, III	68%
	Outcomes for this supporting competence include:		
	 Diagnose planetary gear sets Describe single planetary gear set operation. Describe compound planetary gear set operation. Diagnose planetary gear set failures. 		
	 Diagnose torque converters Describe torque converter operation. Describe torque converter control circuit operation. Diagnose torque converter systems. 		
	 <i>Diagnose transmission controls</i> Describe manual valve operation. Describe the operation of transmission shifting controls. Describe pressure controls. 		
	 <i>Diagnose hydraulic circuits in an automatic transmission</i> 1. Explain hydraulic circuit diagrams. 2. Diagnose hydraulic circuits. 		
	 V. Diagnose automatic transmissions and transaxles 1. Diagnose automatic transmissions. 2. Diagnose automatic transaxles. 3. Perform control circuit tests. 		
	 VI. Diagnose auto-shifting manual transmissions 1. Describe auto-shifting manual transmission operation. 2. Describe auto-shifting manual transmission service procedures. 3. Diagnose auto-shifting manual transmissions. 		
	 VII. Diagnose Continuously Variable Transmissions (CVTs) 1. Describe CVT operation. 2. Describe CVT service procedures. 3. Diagnose CVTs. 		
6F.	Perform motor vehicle diagnostics for vehicle management systems		In Context
6G.	Perform motor vehicle diagnostics for electrical systems		In Context
6H.	Perform motor vehicle diagnostics for heating, ventilation, and air conditioning systems		In Context
61.	Perform motor vehicle diagnostics for tires and wheels		In Context

Core Competence 7: Systems Repair Weighting – 51%

Automotive Service Technicians use a variety of tools and techniques to repair vehicle systems and components to restore the vehicle's functionality, reliability, and safety. Proficiency in this area is necessary to address customer concerns in an efficient and effective manner.

The automotive service technician fourth period will provide instruction on how to perform repairs on the following systems: propulsion, fuel, drive train, and heating, ventilation, and air conditioning.

CS

Demonstrate knowledge, understanding, and proficiency when performing motor vehicle system repairs.

Sup	porting Competence	Taxonomy	Weighting
7A.	Perform motor vehicle repairs on propulsion systems	I, II, III	35%
	Outcomes for this supporting competence include:		
	 Repair induction systems Describe positive air shut-off. Explain pre-heater systems. Explain forced induction systems. Perform pre-heater system test. Perform induction system diagnosis. 		
	 Repair hybrid electric and electric vehicles Identify hybrid vehicle systems and components. Identify electric vehicle systems and components. Describe hybrid vehicle operation. Describe hybrid and electric vehicle cooling and heating systems. Describe high voltage charging systems. Perform high voltage system diagnosis. Perform hybrid and electric vehicle control system diagnosis. 		
7B.	Perform motor vehicle repairs on fuel systems	I, II, III	10%
	Outcomes for this supporting competence include:		
	 Repair diesel injection systems Explain injection system types. Explain high pressure pumps. Explain injector operation. Explain electronic controls. Perform injector testing. 		
7C.	Perform motor vehicle repairs on drive train systems Outcomes for this supporting competence include:	I, II, III	27%
	 <i>Repair oil pumps</i> Describe automatic transmission oil pump operation. Diagnose automatic transmission oil pumps. Disassemble an automatic transmission oil pump. Assemble an automatic transmission oil pump. 		

Supp	oortin	g Competence	Taxonomy	Weighting
	<i>II.</i>	 Repair automatic transmission clutches and bands 1. Describe clutch assembly operation. 2. Describe band and servo assembly operation. 3. Diagnose clutch assemblies. 4. Diagnose band and servo assemblies. 		
	III.	 Repair automatic transmissions and transaxles Describe emerging transmission technologies. Explain operating principles of an automatic transmission and transaxle. Explain transmission fluid flush procedures. Disassemble an automatic transmission or transaxle. Assemble an automatic transmission or transaxle. Perform fluid check. Perform adaptive shift strategy relearn. Perform automatic transmission or transaxle operation test. 		
7D.		form motor vehicle repairs on heating, ventilation, and air ditioning systems	I, II, III	28%
	Outc	omes for this supporting competence include:		
	I.	 Repair the operation of refrigerant systems 1. Describe the principles of heat. 2. Describe refrigerant properties. 3. Describe refrigerant oil properties. 4. Describe refrigerant system operation. 5. Describe the function of refrigeration system components. 6. Explain cooling fan operation. 7. Diagnose refrigerant system. 		
	II.	 Repair climate control systems 1. Explain climate control system operation. 2. Explain climate control system components. 3. Explain climate control integration with vehicle systems. 4. Perform climate control systems diagnosis. 		



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