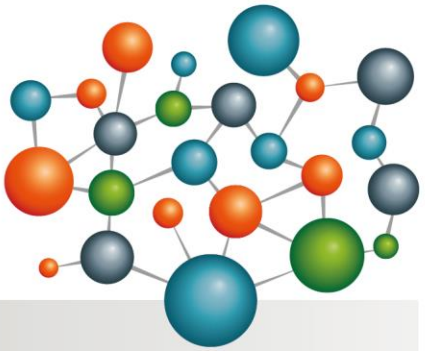
PROGRAM OF STUDY

POWERSPORT VEHICLE AND OUTDOOR POWER EQUIPMENT MECHANICS (DVS 5867)

Training sector
Motorized Equipment Maintenance



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Introduction to the Program

In vocational training, a program of study presents the competencies required to practise a given trade or occupation at entry level on the job market. The training provided allows students to acquire a degree of versatility that will be useful in their career and personal development.

A program is a coherent set of competencies to be developed. It outlines the knowledge and broad orientations to be favoured during training. The competencies correspond to the tasks of the trade or occupation or to activities related to work, vocational or personal life, depending on the case. Learning is acquired in a specific achievement context and targets the ability to act, succeed and evolve.

According to the Education Act,[1] every program "shall include compulsory objectives and contents and may include optional objectives and contents that shall be enriched or adapted according to the needs of students who receive the services." For behavioural competencies, the compulsory components include the statement of the competency, the elements of the competency, the achievement context and the performance criteria; for situational competencies, they include the corresponding components.

For information purposes, programs also provide a grid of competencies, educational aims, a summary of competency-related knowledge and know-how, and guidelines. They also specify the suggested duration of each competency. All optional components of a program may be enriched or adapted according to the needs of the students, the environment and the workplace.

Program Components

Program Goals

Program goals consist of the expected outcome at the end of training as well as a general description of a given trade or occupation. They also include the four general goals of vocational training.

Educational Aims

Educational aims are broad orientations to be favoured during training in order to help students acquire intellectual or motor skills, work habits or attitudes. Educational aims usually address important aspects of career and personal development that have not been explicitly included in the program goals or competencies. They serve to orient appropriate teaching strategies to contextualize students' learning, in keeping with the dimensions underlying the practice of a trade or occupation. They help guide educational institutions in implementing the program.

Competency

A competency is the ability to act, succeed and evolve in order to adequately perform tasks or activities related to one's working or personal life, based on an organized body of knowledge and skills from a variety of fields, perceptions, attitudes, etc.

A competency in vocational training can be defined in terms of a behaviour or a situation, and includes specific practical guidelines and requirements for learning.

[1] *Education Act*, CQLR, c. I-13.3, s. 461

1. Behavioural Competency

A behavioural competency describes the actions and the results expected of the student. It consists of the following features:

- The *statement of the competency* is the result of the job analysis, the orientations and general goals of vocational training and other *determinants*.
- The *elements of the competency* correspond to essential details that are necessary in order to understand the competency *and* are expressed in terms of specific behaviours. They refer to the major steps involved in performing a task or to the main components of the competency.
- The *achievement context* corresponds to the situation in which the competency is exercised at entry-level on the job market. The achievement context attempts to recreate an actual work situation but does not describe a learning or evaluation situation.
- The *performance criteria* define the requirements to be respected. They may refer to elements of the competency or to the competency as a whole. When associated with a specific element, performance criteria are *used* to judge whether a competency has been acquired. When associated with the competency as a whole, the criteria describe the requirements for performing a task or activity and provide information on the expected level of performance or the overall quality of a product or service.

2. Situational Competency

A situational competency describes the situation in which students are placed to acquire learning, and allows for actions and results to vary from one student to another. It consists of the following features:

- The *statement of the competency* is the result of the job analysis, the orientations and general goals of vocational training and other determinants.
- The *elements of the competency* outline the essential aspects of the competency and ensure a better understanding of the competency with respect to the expected outcome. The elements of the competency are fundamental to the implementation of the learning situation.
- The *learning context* provides a broad outline of the learning situation designed to help the students develop the *required* competency. It is normally divided into three key phases of learning: information, participation and synthesis.
- The *instructional guidelines* provide reference points and means for teachers to ensure that learning takes place and that the context in which it occurs is always the same. These guidelines may include general principles or specific procedures.
- The *participation criteria* describe requirements that the students must meet when participating in learning activities. They focus on how the students take part in the activities rather than on the results obtained. Participation criteria *are* normally provided for each phase of the learning situation.

Competency-Related Knowledge and Know-How

Competency-related knowledge and know-how together with related guidelines, are provided for information purposes. Competency-related knowledge and know-how define the essential and meaningful learning that students must acquire in order to apply and continue to develop the competency. They are in keeping with the job market and are accompanied by guidelines that provide information about the field of application, level of complexity and learning content. They generally encompass learning associated with knowledge, skills, strategies, attitudes, perceptions, etc.

Duration

The total duration of the program is compulsory and must be observed. It consists of teaching time, which includes time for the evaluation of learning and for enrichment or remedial activities, depending on the students' needs. The duration indicated for a given competency refers to the amount of time needed to develop the competency.

The amount of teaching time corresponds to the amount of time allotted to training, which is established during program development as the average amount of time needed to acquire a competency and evaluate learning. This duration is helpful in organizing training.

Credit

A credit is a unit used for expressing the quantitative value of each competency. One credit corresponds to 15 hours of training.

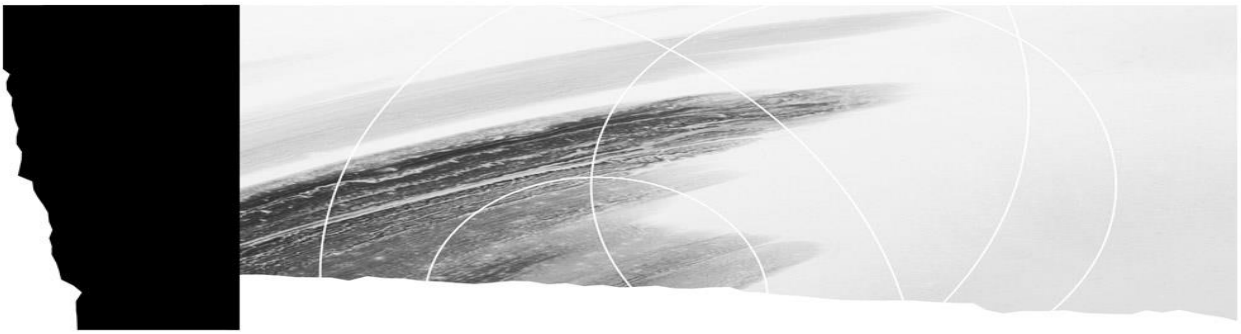
Aspects of Program Implementation

Program-Based Approach

The program-based approach is founded on a comprehensive view of a program of study and its components (e.g. goals, educational aims, competencies). It requires concerted action among all players involved, from the initial stages of program design and development, to program implementation and evaluation. It consists in ensuring that all of the actions and activities proposed are based on the same aims and take into account the same orientations. For students, the program-based approach makes training more meaningful as it presents learning as a coherent whole.

Competency-Based Approach

In vocational training, the competency-based approach is based on a teaching philosophy that is designed to help students mobilize their own individual sets of resources in order to act, succeed and evolve in different contexts, according to established performance levels with all the required knowledge and know-how (e.g. skills, strategies, attitudes, perceptions). The competency-based approach is carried out in situations that are relevant to the students' working life and personal life.



5867 Powersport Vehicle and Outdoor Power Equipment Mechanics

Tear of approval: 2019

Certification:	Diploma of Vocational Studies
Number of credits:	120
Number of competencies:	26
Total duration:	1 800 hours

To be eligible for admission to the *Powersport Vehicle and Outdoor Power Equipment Mechanics* program, candidates must meet one of the following requirements:

- Persons holding a Secondary School Diploma or its recognized equivalent.

OR

- Persons who are at least 16 years of age on September 30 of the school year in which their training is to begin and have earned the Secondary IV credits in language of instruction, second language and mathematics in programs established by the Minister or have been granted recognition of equivalent learning.

OR

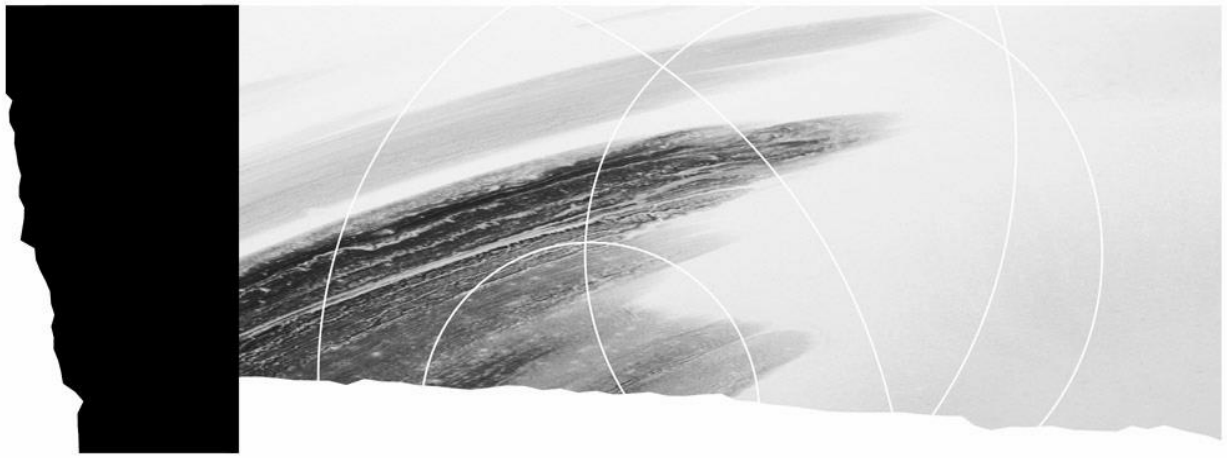
- Persons who are at least 18 years of age upon entry into the program and have the following functional prerequisites: the successful completion of the General Development test and ENG-2102-4 and MTH-2101-3, or recognition of equivalent learning.

OR

- Persons who have obtained Secondary III credits in language of instruction, second language and mathematics in programs established by the Minister are required to pursue general education courses, concurrently with their vocational training, in order to obtain the Secondary IV credits they lack in language of instruction, second language and mathematics in programs established by the Minister.

The duration of the program is 1 800 hours, which includes 1 455 hours spent on the specific competencies required to practise the trade or occupation and 345 hours on general, work-related competencies. The program of study is divided into 26 competencies which vary in length from 15 to 120 hours. The total hours allocated to the program include time devoted to teaching, evaluation of learning and enrichment or remedial activities.

Competency	Code	Number	Hours	Credits
The Trade and the Training process	719631	1	15	1
Health, Safety and Environmental protection	719641	2	15	1
Finding technical information	719652	3	30	2
Shop Work	719664	4	60	4
Heating, Cutting and Welding	719673	5	45	3
Repairing traction systems on powersport vehicles and outdoor power equipment	719683	6	45	3
Inspecting electrical and electronic systems	719696	7	90	6
Repairing electrical and electronic systems	719706	8	90	6
Inspecting hydraulic systems	719712	9	30	2
Repairing and maintaining conventional braking systems	719725	10	75	5
Repairing and maintaining four-stroke engines and their systems	719738	11	120	8
Repairing two-stroke engines and lubrication systems	719746	12	90	6
Repairing ignition systems	719753	13	45	3
Repairing and maintaining carburetors	719766	14	90	6
Repairing and maintaining clutch systems and transmissions	719776	15	90	6
Repairing and maintaining work and cutting devices	719784	16	60	4
Repairing and maintaining steering and propulsion systems of recreational watercraft	719797	17	105	7
Inspecting electronic control systems	719804	18	60	4
Repairing steering systems on land-based powersport vehicles and outdoor power equipment	719814	19	60	4
Repairing and maintaining suspensions	719825	20	75	5
Repairing and maintaining drivetrains and differentials	719835	21	75	5
Repairing and maintaining air intake, fuel and exhaust systems	719845	22	75	5
Repairing and maintaining the sequential transmission and clutch systems of the powertrain	719857	23	105	7
Repairing driving assistance and alternative drive systems	719865	24	75	5
Performing periodic and seasonal maintenance	719876	25	90	6
Entering the workforce	719886	26	90	6



Part I

Program Goals

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Grid of Competencies

Harmonization

Program Goals

The *Powersport Vehicle and Outdoor Power Equipment Mechanics* program prepares students to practise the trade or occupation of land-based powersport vehicle, recreational watercraft and outdoor power equipment mechanic.

Land-based powersport vehicle, recreational watercraft and outdoor power equipment mechanics work for dealerships, retailers, companies that specialize in repair and maintenance, rental centres or municipalities, among others.

In the fields of land-based powersport vehicles and recreational watercraft, they repair and maintain motorcycles, three-wheeled motorcycles, scooters, all-terrain vehicles (including side-by-sides), snowmobiles, personal watercraft and boats powered by one or more outboard or inboard/outboard motors.

In the field of outdoor power equipment, they repair and maintain outdoor power machinery such as lawn mowers, snow blowers, small tractors, chainsaws, generators and trimmers.

These mechanics also do seasonal maintenance and tune-ups of land-based powersport vehicles, personal watercraft and outdoor power equipment.

The repair and maintenance work is carried out on a wide variety of systems: gasoline engines, electrical and electronic systems, carburetors, ignition systems, fuel, exhaust and antipollution systems, braking systems, hydraulic systems, suspensions, steering, transmissions, differentials, clutch systems, drivetrain, traction systems, propulsion systems and electronic power steering systems.

These mechanics often work on their own and are usually supervised by service managers. As part of their job, they are often called upon to meet with technical advisers, parts clerks and parts managers.

To do their work, these mechanics use hand, electric and pneumatic tools, measuring instruments, electronic diagnostic tools, lifting equipment and welding equipment.

Land-based powersport vehicle, recreational watercraft and outdoor power equipment mechanics must be very versatile and have a well-developed capacity to adapt, given the diversity of the work they do.

The program goals of the *Powersport Vehicle and Outdoor Power Equipment Mechanics* program are based on the general goals of vocational training. These goals are as follows:

- To help students develop effectiveness in the practice of a trade or occupation, that is:
  - to teach students to perform roles, functions, tasks and activities associated with the trade or occupation upon entry into the job market
  - to prepare students to progress satisfactorily on the job (which implies having the technical and technological knowledge and skills in such areas as communication, problem solving, decision making, ethics, health and safety)
- To help students integrate into the work force, that is:
  - to familiarize students with the job market in general, and with the specific context of their chosen trade or occupation
  - to familiarize students with their rights and responsibilities as workers
- To foster students' personal development and acquisition of occupational knowledge, skills, perceptions and attitudes, that is:
  - to help students develop their autonomy and ability to learn, and acquire effective work methods

  - to help students understand the principles underlying the techniques and the technology used in the trade or occupation
  - to help students develop self-expression, creativity, initiative and entrepreneurial spirit
  - to help students adopt the attitudes required to successfully practise the trade or occupation, and instill in them a sense of responsibility and a concern for excellence
- To promote job mobility, that is:
  - to help students develop positive attitudes toward change
  - to help students develop the means to manage their careers by familiarizing them with entrepreneurship

Educational Aims

The aim of the *Powersport Vehicle and Outdoor Power Equipment Mechanics* program is to help students develop attitudes and behaviours that representatives from education and the field deem essential to the practice of the trade or occupation:

- awareness of the importance of a job well done
- development of their autonomy and their teamwork skills
- openness to technological change
- development of their problem-solving skills

Statements of the Competencies

List of Competencies

- Determine their suitability for the trade and the training process.
- Prevent threats to health, occupational safety and the environment.
- Find technical information on powersport vehicles and outdoor power equipment.
- Perform shop work.
- Perform heating, cutting and welding work.
- Repair traction systems on powersport vehicles and outdoor power equipment.
- Inspect electrical and electronic systems.
- Repair electrical and electronic systems.
- Check the operation of hydraulic systems.
- Repair and maintain conventional braking systems.
- Repair and maintain four-stroke gasoline engines and their systems.
- Repair two-stroke engines and lubrication systems.
- Repair ignition systems.
- Repair and maintain carburetors.
- Repair and maintain clutch systems and transmissions.
- Repair and maintain work and cutting devices.
- Repair and maintain steering and propulsion systems of recreational watercraft.
- Inspect the functioning of electronic control systems.
- Repair steering systems on land-based powersport vehicles and outdoor power equipment.
- Repair and maintain suspensions.
- Repair and maintain drivetrains and differentials.
- Repair and maintain air intake, fuel and exhaust systems.
- Repair and maintain the sequential transmission and clutch systems of the powertrain.
- Repair driving assistance and alternative drive systems.
- Perform periodic and seasonal maintenance of powersport vehicles, recreational watercraft and outdoor power equipment.
- Enter the workforce.

Grid of Competencies

The grid of competencies shows the relationship between general competencies, which correspond to work-related activities, and specific competencies, which are required to practise the particular trade or occupation.

The general competencies appear on the horizontal axis and the specific competencies, on the vertical axis. The symbol (○) indicates a correlation between a general and a specific competency. Shaded symbols indicate that these relationships have been taken into account in the acquisition of specific competencies. The logic used in constructing the grid influences the course sequence. Generally speaking, this sequence follows a logical progression in terms of the complexity of the learning involved and the development of the students' autonomy. The vertical axis presents the specific competencies in the order in which they should be acquired and serves as a point of departure for determining how all of the competencies will be taught.

GRID OF COMPETENCIES													
				GENERAL COMPETENCIES								TOTAL
POWERSPORT VEHICLE AND OUTDOOR POWER EQUIPMENT MECHANICS				Determine their suitability for the trade and the training process	Prevent threats to health, occupational safety and the environment	Find technical information on powersport vehicles and outdoor power equipment	Perform shop work	Perform heating, cutting and welding work	Inspect electrical and electronic systems	Check the operation of hydraulic systems	Inspect the functioning of electronic control systems	
SPECIFIC COMPETENCIES	**Competency Number**	**Type of competency**	**Duration (in hours)**									
Competency Number				1	2	3	4	5	7	9	18	
Type of Objective				S	B	B	B	B	B	B	B	
Duration (in hours)				15	15	30	60	45	90	30	60	345
Repair traction systems on powersport vehicles and outdoor power equipment	6	B	45	○	●	●	●	○	○	○		
Repair electrical and electronic systems	8	B	90	○	●	●	●		●		○	
Repair and maintain conventional braking systems	10	B	75	○	●	●	●	○	●	●		
Repair and maintain four-stroke gasoline engines and their systems	11	B	120	○	●	●	●	○	●	●		
Repair two-stroke engines and lubrication systems	12	B	90	○	●	●	●	○	●	●	○	
Repair ignition systems	13	B	45	○	●	●	●		●		○	
Repair and maintain carburetors	14	B	90	○	●	●	●		●		○	
Repair and maintain clutch systems and transmissions	15	B	90	○	●	●	●	○	●	●	○	
Repair and maintain work and cutting devices	16	B	60	○	●	●	●	●	●	●		
Repair and maintain steering and propulsion systems of recreational watercraft	17	B	105	○	●	●	●	○	●	●	○	
Repair steering systems on land-based powersport vehicles and outdoor power equipment	19	B	60	○	●	●	●	○	●		●	
Repair and maintain suspensions	20	B	75	○	●	●	●	○	●	●	●	
Repair and maintain drivetrains and differentials	21	B	75	○	●	●	●	○	●	●	●	
Repair and maintain air intake, fuel and exhaust systems	22	B	75	○	●	●	●	○	●	●	●	
Repair and maintain the sequential transmission and clutch systems of the powertrain	23	B	105	○	●	●	●	○	●	●	●	
Repair driving assistance and alternative drive systems	24	B	75	○	●	●	●		●	●	●	
Perform periodic and seasonal maintenance of powersport vehicles, recreational watercraft and outdoor power equipment	25	B	90	○	●	●	●		●	●	●	
Enter the workforce	26	S	90	●	●	○	○	○	○	○	○	
Duration of the training			1455									1800

Links between the general competencies and the specific competencies

○: Existence of a link

●: Application of a link

Harmonization

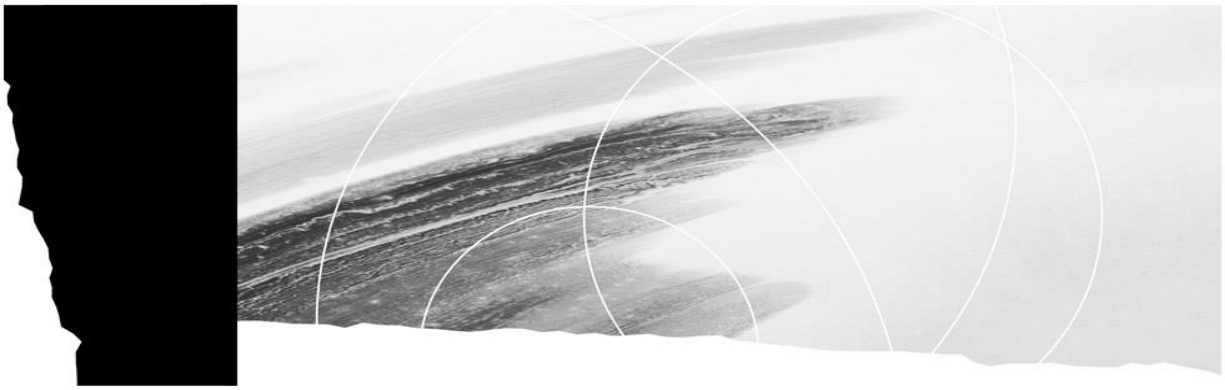
The Ministère de l'Éducation harmonizes its vocational and technical programs by establishing similarities and continuity between secondary- and college-level programs within a particular sector or between sectors in order to avoid overlap in program offerings, to recognize prior learning and to optimize the students' progress.

Harmonization establishes consistency between training programs and is especially important in ensuring that the tasks of a trade or occupation are clearly identified and described. Harmonization makes it possible to identify tasks requiring competencies that are common to more than one program. Even if there are no common competencies, training programs are still harmonized.

Harmonization is said to be "inter-level" when it focuses on training programs at different levels, "intra-level" when it focuses on programs within the same educational level, and "inter-sector" when carried out between programs in various sectors.

An important aspect of harmonization is that it allows the common features of competencies to be identified and updated as needed. Common competencies are those that are shared by more than one program; once acquired in one program, they can be recognized as having been acquired in another. Competencies with exactly the same statement and elements are said to be identical. Common competencies that are not identical but have enough similarities to be of equal value are said to be equivalent.

The *Powersport Vehicle and Outdoor Equipment Mechanics* program does not share any competencies with other programs as this time.



Part II

Program Competencies

Glossary

The Trade and the Training Process	Code: 719631

Competency 1 Duration 15 h Credit 1

Situational Competency

Statement of the Competency

Determine their suitability for the trade and the training process.

Elements of the Competency

- Be familiar with the nature of the trade.
- Understand the training program.
- Evaluate their career choice.

Learning Context

Information Phase

- Learning about the job market in the powersport vehicle and outdoor power equipment sector.
- Learning about the nature and requirements of the trade.
- Learning about the training process.
- Sharing their first impressions of the trade and the training process.

Participation Phase

- Presenting information gathered during meetings with trade specialists and discussing their perceptions of the trade: advantages, disadvantages, requirements.
- Identifying the characteristics of the training program (competencies, evaluation methods, certification of studies).
- Discussing the program vis-à-vis the trade.

Synthesis Phase

- Writing a report that contains:
  - a presentation of their aptitudes and interests
  - an assessment of their career choice in which they compare the aspects and requirements of the trade with their own preferences, aptitudes and interests

Instructional Guidelines

- Encourage an atmosphere in which each person can express themselves freely.
- Provide relevant documentation.
- Organize a meeting with trade specialists.
- Motivate students to carry out the proposed activities.
- Provide students with tools to help them assess their career choice objectively.

Participation Criteria

Information Phase

- Gather information on most of the topics to be covered.
- Present their perception of the trade, making connections with the information gathered.

Participation Phase

- Participate actively in the organized activities.
- Properly express their impression of the program of study.
- Express their views on some of the requirements that must be met in order to practise the trade.

Synthesis Phase

- Write a report that contains:
  - a summary of their aptitudes and interests
  - explanations regarding their career choice, making explicit the connections required

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each phase of the learning context, along with their attendant guidelines.

Information Phase

- Characteristics of the job market: job prospects, working conditions, hiring criteria and remuneration, possibilities for advancement and transfer, etc.
- Nature and requirements of the trade: types of tasks, responsibilities, professional ethics, standards and regulations, etc.

Participation Phase

- Characteristics and requirements of the training: program of study, evaluation, certification of studies, amount of personal work, regulations, student services, timetable, etc.
- Connections between the program competencies and the tasks, functions, knowledge and skills associated with the trade.

Synthesis Phase

- Importance of assessing their career choice.
- Characteristics and qualities of a report confirming their career choice.

Health, Safety and Environmental Protection	Code: 719641

Competency 2 Duration 15 h Credit 1

Behavioural Competency

Statement of the Competency	**Achievement Context**
Prevent threats to health, occupational safety and the environment.	• With respect to land-based powersport vehicles, recreational watercraft and outdoor power equipment • Using the necessary documentation

Elements of the Competency	**Performance Criteria**
1. Take precautions to protect their own health and safety and those of others.	• Recognition of hazardous situations in their work environment • Determination of the appropriate means of controlling: – the way the shop is set up – the work methods – the tasks performed on the different systems – the use of electric and pneumatic tools and equipment – the handling of products – the maintenance and storage of equipment, tools and the tidiness of the work area – the wearing of personal protection equipment • Determination of the appropriate measures to prevent fires
2. Take precautions to preserve the quality of the environment.	• Recognition of potentially hazardous situations • Determination of the appropriate means of controlling: – the use of toxic and hazardous products – the way the shop is set up – the use of tools and equipment – the storage, disposal and recycling of hazardous materials – the maintenance of air quality in the shop
3. Take action in the event of an accident or an emergency.	• Recognition of the limits as to their intervention • Relevant determination of an effective method of communicating with: – emergency services – resource persons

For the competency as a whole:

- Adoption of safe behaviour in all circumstances
- Use of the appropriate terminology

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Take precautions to protect their own health and safety and those of others.
    - Rights and responsibilities of the employer and employees
    - Wearing of personal protection equipment: safety shoes, safety glasses, hearing protection, clothing, etc.
    - Importance of maintaining a clean and orderly workshop
    - Prevention of falling, stumbling over obstacles, overturning equipment, dropping tools, spilling hazardous products, etc.
    - Preventive measures related to the use of electric and pneumatic tools and equipment
    - Preventive measures related to the handling of hazardous products: Workplace Hazardous Materials Information System (WHMIS), overall ventilation and that of the area, availability of emergency equipment (extinguishers, emergency showers, etc.)
    - Work methods

2. Take precautions to preserve the quality of the environment.
    - Types of pollution created
    - Effects of chemicals on the environment
    - Basic principles for avoiding pollution of the environment
    - Use, storage and disposal of greases, oils and solvents
    - Use of fuels, combustion agents and gases
    - Presence of exhaust fumes
    - Oil collectors, cleaning tank, etc.

3. Take action in the event of an accident or an emergency.
    - Location of first-aid kits, fire extinguishers, fire protection equipment, sources of water (decontamination showers, eye washing stations, etc.), ventilation system control panel, etc.
    - Resources: medical personnel, ambulance technicians, firefighters, police officers

Finding technical information	Code: 719652

Competency 3 Duration 30 h Credits 2

Behavioural Competency

Statement of the Competency	**Achievement Context**
Find technical information on powersport vehicles and outdoor power equipment.	• With respect to land-based powersport vehicles, recreational watercraft and outdoor power equipment • Using technical documentation in printed or electronic format • In English and French

Elements of the Competency	**Performance Criteria**
1. Select sources of reference materials to consult.	• Exact identification of the type of land-based powersport vehicle, recreational watercraft and outdoor power equipment • Accurate determination of: – the purpose of the information search – the type of information required – the limits of the search • Determination of relevant sources of information
2. Search for technical information.	• Appropriate use of search methods • Proper use of reference sources. • Efficient location of the information sought
3. Identify, in the documentation, the general characteristics of land-based powersport vehicles, recreational watercraft and outdoor power equipment.	• Accurate identification of the main systems and components • Methodical recording of information to be kept
	For the competency as a whole: • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Select sources of reference materials to consult.
   - Land-based powersport vehicles: motorcycles, trikes, scooters, all-terrain vehicles (ATVs) including side-by-sides (UTVs) and snowmobiles
   - Recreational watercraft: personal watercraft (PWCs) and boats powered by one or more outboard or inboard/outboard motors

- Outdoor power equipment: power equipment such as lawn mowers, snow blowers, small tractors, chainsaws, generators, trimmers, and other motorized work tools
- Delimitation and scope of the search
- Print documents: parts, workshop and operator manuals
- Documents in electronic format: main websites of manufacturers and suppliers, DVDs, etc.

2. Search for technical information.
   - Location of information in print format: table of contents, sections and subsections, alphabetical and numerical order, special sections
   - Location of information in electronic format: use of search engines, search by keywords

3. Identify, in the documentation, the general characteristics of land-based powersport vehicles, recreational watercraft and outdoor power equipment.
   - Information specific to different systems and parts
   - English and French technical terminology and keywords

Shop Work	Code: 719664

Competency 4 Duration 60 h Credits 4

Behavioural Competency

Statement of the Competency	**Achievement Context**
Perform shop work.	• Using hand, electric, air and hydraulic tools • Using measuring instruments: micrometer, vernier, dial gauge, ruler, measuring tape, thickness gauge, etc. • Using lifting equipment: jack stands, jacks, hoists, platform lifts, etc. • Using cleaning, lubrication and assembly products • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Lift and move loads.	• Appropriate choice of lifting equipment • Proper use of fasteners • Proper use of lifting equipment
2. Disassemble and reassemble simple mechanical assemblies.	• Proper use of an extractor and a workshop press • Correct disassembly of components and fasteners • Correct cleaning of components • Correct assembly of components and fasteners
3. Measure lengths, thicknesses and diameters of mechanical components.	• Appropriate choice of measuring instruments • Appropriate verification and adjustment of measuring instruments • Proper use of measuring instruments • Correct conversion of units of measure • Accurate interpretation of measurements
4. Perform manual machining work.	• Appropriate use of cutting, drilling, grinding, filing, threading and tapping techniques • Successful extraction of a broken screw • Correct installation of threaded inserts
5. Complete the work.	• Correct cleaning of tools • Correct storage of tools and products • Correct maintenance of tools • Correct disposal of toxic and hazardous products • Cleanliness and tidiness of premises

For the competency as a whole:

- Appropriate choice and use of hand, electric, air and hydraulic tools
- Appropriate use and choice of cleaning, lubrication and assembly products
- Observance of occupational health and safety rules
- Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Lift and move loads.
    - Estimate of the load's weight and centre of gravity
    - Location of appropriate jacking points in accordance with the type of vehicle or equipment
    - Safe movement of vehicles or equipment: motorcycles, ATVs, tractors, etc.
    - Fastening of vehicles or equipment using retaining straps
    - Safe use of jack stands, jacks, lift platforms and wheel chocks

2. Disassemble and reassemble simple mechanical assemblies.
    - Simple mechanical assemblies: drive shaft with bearings or gears, housing cover, etc.
    - Types of extractors: straight, tapered, claw, etc.
    - Use of extractors: safety devices, position and configuration of extractors
    - Use of a shop press: safety devices, position of the bench, the component and the extractor
    - Hand, electric, pneumatic and hydraulic tools: wrenches, socket sets, files, hammers, tools for assembling and disassembling bushings, oil seals, pliers, punches, screwdrivers, impact wrenches, pneumatic ratchets, pneumatic hammers, shop presses, etc.
    - Choice of cleaning products. Cleaning method. Use of a parts washing tank and pressure washer
    - Fasteners: pins, snap rings, bolts, screws, etc.

3. Measure lengths, thicknesses and diameters of mechanical components.
    - Types of measuring instruments: micrometer, caliper, dial gauge, ruler, measuring tape, thickness gauge, etc.
    - Choice of instrument in accordance with the type of measurement
    - Verification and adjustment of measuring instruments: resetting, use of measurement standards, setting to zero, etc.
    - Use of measuring instruments: taking of precautions and measurement points
    - Meaning of measurements and conversion of metric and imperial systems

4. Perform manual machining work.
    - Verification of tools and safety devices
    - Preparation of tools: adjustment of guards, changing of grinding wheels, cutting disks, metal brushes, etc.
    - Choice of drill bits

- Work at the workbench and use of clamps, files, saws, grinding wheels, files, taps, drills, metal cutters, etc.
- Types of extractors (conical, straight or spiral fluted, tap wrench) and their use (positioning and centering of the drilled hole in the bolt at the centre)
- Threaded inserts: proper choice of thread and material of insert, installation equipment and installation technique in accordance with the type of thread and thread extraction technique

5. Complete the work.
   - Cleaning of tools
   - Maintenance of tools: inspection, lubrication, sharpening, etc.
   - Cleanliness and tidiness of the premises: cleaning of work area, storage of bulky objects, etc.

Heating, Cutting and Welding	Code: 719673

Competency 5 Duration 45 h Credits 3

Behavioural Competency

Statement of the Competency	**Achievement Context**
Perform heating, cutting and welding work.	• Using heating, cutting and welding stations • Using metallic materials • Using electrodes, tips, hammers, etc. • Using the required protection equipment
Elements of the Competency	**Performance Criteria**
1. Prepare the work.	• Appropriate choice of procedure • Correct preparation of the station • Correct set-up of the protection equipment needed • Correct set-up of metals and protection equipment.
2. Heat parts.	• Proper application of heating techniques • Uniform heating
3. Cut metals.	• Proper application of cutting techniques • Clean cut
4. Weld.	• Uniformity and resistance of the weld bead • Adequate penetration of the filler metal • Compliance with the welding procedure
5. Complete the work.	• Proper disassembly of the station • Proper storage of equipment and tools • Clean and tidy premises
	For the competency as a whole: • Proper identification of metal • Proper preparation of surfaces • Proper use of equipment and tools • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Prepare the work.
   - Preparation of station: installation of tanks, types of tips, types of pressure valves, wire size, etc.
   - Adjustment of the equipment in accordance with the work to be done
   - Installation and maintenance of metals
   - Protection equipment, ventilation of the work area, safety shields, gloves, glasses, etc.
   - Application of measures to protect electronic components and use of a surge protector

2. Heat parts.
   - Characteristics of oxyacetylene welding (OAW process) equipment
   - Method of using equipment and choice of work techniques in accordance with the type of metal and components to be dislodged or disassembled

3. Cut metals.
   - Characteristics of the equipment (OAW or plasma)
   - Method of using equipment and choice of work techniques in accordance with the type of metal to cut

4. Weld.
   - Characteristics of the equipment for shielded metal arc welding (SMAW process), semi-automatic with full wire feed (GMAW process), or homogeneous or heterogeneous oxyacetylene welding (OAW process)
   - Method of using equipment and work techniques in accordance with the type of metal, welding process, nature of the repair and the forces exerted on the part
   - Difficulties and characteristics of welding positions
   - Importance of the uniformity of the weld bead and the penetration of the filler metal

5. Complete the work.
   - Handling and storage of tanks
   - Inspection of hoses and tips
   - Storage of pressure valves
   - Inspection of cart and accessories

Repairing traction systems on powersport vehicles and outdoor power equipment	Code:	719683

Competency 6 Duration 45 h Credits 3

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair traction systems on powersport vehicles and outdoor power equipment.	• Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be done • Appropriate inspection of the functioning of the mechanical components • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace or repair defective components of the traction system.	• Correct disassembly of the traction system and its related systems • Appropriate choice of replacement mechanical components • Replacement or precise repair of defective traction system components • Correct reassembly of the traction system and its related systems • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences
4. Perform tests and make final adjustments.	• Correct application of start-up and test procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the traction system

5. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises *For the competency as a whole:* • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the powersport vehicle or outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of traction systems: two-, three-, four- or more wheeled vehicles, ATV and outdoor power equipment caterpillar tracks, etc.
   - Characteristics of tires: ordinary tires, studded or special tires, material used, radial, bias-belted, height, profile, width, plies, etc.
   - Technical terms: adherence, load and speed indexes for motorcycles, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Types of problems: flats, abnormal wear, vibrations, cracking in the caterpillar track, etc.

3 Replace or repair defective components of the traction control system.
   - Disassembly of the traction system and its related systems: cleaning of components, identification of components based on their location, and the way the parts are laid out
   - Defective mechanical components of a traction control system: caterpillar tracks, tubes, rims, tires, wheels, etc.

4. Perform tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: tire pressure, caterpillar track tension and alignment, wheel balancing, etc.

5. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Inspecting electrical and electronic systems	Code: 719696

Competency 7 Duration 90 h Credits 6

Behavioural Competency

Statement of the Competency	**Achievement Context**
Inspect electrical and electronic systems.	• For powersport vehicles and outdoor power equipment • Given a work order • Using tools, devices and measuring instruments • Using technical documentation • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Gather the technical information on electrical and electronic systems.	• Selection of the relevant information • Correct interpretation of plans and diagrams, and the annotations, symbols and codes that appear on them • Correct interpretation of the manufacturer's specifications and recommendations
2. Plan the inspections.	• Accurate location of components • Logical determination of the measures to be taken • Logical determination of a work sequence • Appropriate choice of devices and measuring instruments
3. Carry out control tests on electrical and electronic systems.	• Thorough visual inspection of circuits and components • Appropriate choice of measuring devices and instruments • Precise amperage, voltage and resistance measurements
4. Diagnose the condition of the electrical and electronic systems.	• Thorough verification of measurements taken in comparison to the specifications • Relevance of the conclusions drawn
5. Explain the diagnosis.	• Clear information recorded on the work order • Appropriate justification of the conclusions drawn • Appropriate solutions suggested with regard to the problems detected

For the competency as a whole:

- Observance of the manufacturer's recommended diagnostic procedure
- Proper use of tools
- Appropriate use of English and French terminology
- Respect for the integrity of the powersport vehicles and outdoor power equipment
- Observance of occupational health and safety rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Gather the technical information on electrical and electronic systems.
   - Nature and sources of electricity, and risks associated with batteries exploding
   - Series circuits, parallel circuits and series-parallel circuits
   - Direct and alternating currents
   - Conductors, semiconductors and insulators
   - Ohm's law
   - Electrical plans and diagrams: methods for finding information, annotations, symbols and codes
   - Components of a circuit: source, surge protection device, electrical load component, conductors, switch, etc.
   - Status of the circuit: open circuit, closed circuit, short circuit, etc.
   - Conventional meaning of current, positive and negative, power supply and ground
   - Relationships between the gauge of a conductor and the intensity of the current

2. Plan the inspections.
   - Choice of the measurements to be taken in accordance with the characteristics of the circuit and the problem detected
   - Manufacturer's recommended inspection sequence
   - Types of measuring devices and instruments: multimeter, induction clamp, signal lamp, etc.
   - Choice of measuring device or instrument in accordance with the type of measurement to be taken, the electrical circuit and the component

3 Carry out control tests on electrical and electronic systems.
   - Search for corrosion (verdigris and rust), pinched or stripped wires, damaged sheaths, etc.
   - Operation of measuring devices and instruments, safety instructions, etc.
   - Use of jumper wires
   - Choice of units of measure
   - Procedure to follow, steps to complete and measurement points
   - Connection procedures based on the types of measurements to be taken

4. Diagnose the condition of the electrical and electronic systems.
    - Comparison of values obtained against the manufacturer's specifications
    - Diagnostics: proper functioning, open circuit, short circuit, parasitic resistance, defective electrical or electronic components

5. Explain the diagnosis.
    - Recording and compilation of information
    - Essential elements that must be included
    - Findings and solutions
    - English and French technical vocabulary

Repairing electrical and electronic systems	Code: 719706

Competency 8 Duration 90 h Credits 6

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair electrical and electronic systems.	• For powersport vehicles and outdoor power equipment • For essential electrical systems: charging, starting, lighting and safety • For electrical systems for rider comfort: radio, heating systems, auxiliary jack, windshield washer motor, generators, etc. • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment
Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be done • Appropriate inspection of the condition of components • Appropriate verification of the functioning of electrical and electronic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace or repair defective components of the essential electrical and electronic systems and of the electrical systems related to rider comfort.	• Correct disassembly of the electrical and electronic systems and their related systems • Appropriate choice of replacement electrical and electronic components • Replacement or precise repair of defective components of the electrical systems • Correct reassembly of essential and rider comfort electrical systems and related systems • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences

4. Perform operational tests.	• Correct application of test procedures • Thorough visual inspection of the work • Relevance of corrective work • Proper functioning of the essential and rider comfort electrical systems
5. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the vehicles and equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of essential electrical systems: charging, starting, lighting and safety
   - Main electrical rider comfort systems: heated seats, heated handlebars, radio, generators, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the components
   - Inspection of electrical and electronic systems (see Competency 7)
   - Types of problems: dead battery, inoperative component, lack of lighting, lack of heating, charging indicator light on, starter turns over too slowly, etc.

3. Replace or repair defective components of the electrical and electronic systems and of the electrical systems related to rider comfort.
   - Disassembly of the electrical and its related systems: cleaning of components, identification of components based on their location, and the way the parts are laid out
   - Defective components of essential electrical systems: bulbs, battery, charge coil, conductors, starter, fuses, electrical harnesses, switches, relays, etc.
   - Defective components of electrical passenger comfort systems: heating elements, fuses, electrical harnesses, switches, relays, etc.

4. Perform operational tests.
    - Start-up, testing and visual inspection of the work
5. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Inspecting hydraulic systems	Code: 719712

Competency 9 Duration 30 h Credits 2

Behavioural Competency

Statement of the Competency	**Achievement Context**
Check the operation of hydraulic systems.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • For open and closed circuits • Given a work order • Using tools and measuring instruments • Using technical documentation • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Gather technical information on hydraulic systems.	• Selection of the relevant information • Correct interpretation of plans and diagrams, and the annotations, symbols and codes that appear on them • Correct interpretation of the manufacturer's specifications and recommendations
2. Plan the inspections.	• Accurate location of components • Logical determination of the measures to be taken • Logical determination of a work sequence • Appropriate choice of devices and measuring instruments
3. Carry out control tests on the hydraulic systems.	• Thorough visual inspection of circuits and their components • Appropriate use of the pressure gauge and a flow sensor • Precise taking of pressure and flow measurements
4. Diagnose the condition of the hydraulic systems.	• Thorough check of the readings against the specifications • Relevance of the conclusions drawn
5. Explain the diagnosis.	• Clear information recorded on the work order • Appropriate justification of the conclusions drawn • Appropriate solutions suggested with regard to the problems detected

For the competency as a whole:

- Observance of the manufacturer's recommended diagnostic procedure
- Proper use of tools
- Appropriate use of English and French terminology
- Respect for the integrity of the vehicles and equipment
- Observance of occupational health and safety rules
- Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Gather technical information on hydraulic systems.
   - Laws that govern hydraulics
   - Flow rate
   - Risks of bursting and contamination
   - Hydraulic plans and diagrams: methods for finding information, annotations, symbols and codes
   - Characteristics of open and closed hydraulic circuits
   - Relationships between the gauge of the hose and the pressure
   - Hydraulic fluids, characteristics and classification

2. Plan the inspections.
   - Choice of the measurements to be taken in accordance with the characteristics of the circuit and the problem detected
   - Manufacturer's recommended inspection sequence
   - Types of measuring devices and instruments: pressure gauge, pressure indicator, flow indicator
   - Choice of measuring device or instrument in accordance with the type of measurement to be taken, the circuit and the component

3. Carry out control tests on the hydraulic systems.
   - Search for leaks, cracked hoses, damaged cylinders, blockages, debris, etc.
   - Operation of measuring devices and instruments, safety instructions, etc.
   - Choice of units of measure
   - Procedure to follow, steps to complete and measurement points
   - Connection procedures based on the types of measurements to be taken

4. Diagnose the condition of the hydraulic systems.
   - Comparison of values obtained against the manufacturer's specifications
   - Diagnostics: proper functioning, lack of pressure, lack of feed, contamination, defective components

5. Explain the diagnosis.
    - Recording and compilation of information
    - Essential elements that must be included
    - Findings and solutions
    - English and French technical vocabulary

Repairing and maintaining conventional braking systems	Code: 719725

Competency 10 Duration 75 h Credits 5

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain conventional braking systems.	• For land-based powersport vehicles and outdoor power equipment • For mechanical, electrical and hydraulic braking systems • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication and assembly products • Using replacement components • Using the required protection equipment
Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be done • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace or repair defective components of the braking system.	• Correct disassembly of the braking system and its related systems • Appropriate choice of replacement mechanical, electrical or hydraulic components • Replacement or precise repair of defective braking system components • Correct reassembly of braking system and its related systems • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences

4. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
5. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the braking system
6. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the vehicles and equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of conventional braking systems: mechanical, electrical, hydraulic, drum, disc and parking brakes
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical and hydraulic systems (see Competencies 7 and 9)
   - Types of problems: noises, uneven or premature wear, vibrations, malfunctioning parking brake, etc.

3. Replace or repair defective components of the braking system.
   - Disassembly of the braking system and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective mechanical, electrical or hydraulic components of the braking system: cables, discs, hoses, calipers, levers, pads, drums, electromagnets, etc.

4. Apply the maintenance procedure.
   - Maintenance procedures: cleaning, lubrication, changing fluids, purge, etc.

5. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: adjustment of brake shoes, cables, parking brake tension, brake switch, etc.

6. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining four-stroke engines and their systems	Code: 719738

Competency 11 Duration 120 h Credits 8

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain four-stroke gasoline engines and their systems.	• For land-based powersport vehicles, pleasure craft or outdoor power equipment • For splash and pressure lubrication systems • For air and liquid cooling systems • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a preliminary diagnosis.	• Logical choice of inspections to be done • Appropriate inspection of the condition of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Formulation of realistic hypotheses as to the cause of the breakdown
3. Disassemble the engine and its systems and make the final diagnosis.	• Correct disassembly of the systems and engine • Meticulous and complete inspection of inner components • Precise measurement of parts and clearances • Accurate determination of the nature of the work to be done
4. Replace the engine or its defective components.	• Appropriate choice of: – replacement engine – replacement mechanical components • Precise replacement of the engine or its defective components • Correct reassembly of the engine and its related systems

5. Replace the lubrication system or its defective components.	• Appropriate choice of: – replacement lubrication system – replacement mechanical, electrical, electronic or hydraulic components • Precise replacement of the lubrication system or its defective components • Correct reassembly of the lubrication system and its related systems
6. Replace the defective components of the cooling system.	• Appropriate choice of replacement mechanical, electrical or electronic components • Precise replacement of the defective components of the cooling system • Correct reassembly of the cooling system and its related systems
7. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
8. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the engine as well as the lubrication and cooling systems
9. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Oil and coolant fluid levels meet requirements • Respect for the integrity of the land-based powersport vehicles and outdoor power equipment • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics and configuration of four-stroke engines: inline engine, V engine, number of cylinders, position (in front, behind or in the centre), etc.
   - Characteristics of splash and pressure lubrication systems
   - Characteristics of air, forced air, oil and liquid air cooling systems
   - Technical terms: torque, power, compression rate, viscosity, recovery, expansion, pressure, density, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a preliminary diagnosis.
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7 and 9)
   - Tests for cylinder leaks, compression tests, oil pressure tests, radiator cap release pressure, liquid coolant density, etc.

3. Disassemble the engine and its systems and make the final diagnosis.
   - Disassembly engine and cooling systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Measurements: cylinder diameter (bore), cylinder ovality and taper, piston diameter, piston ring end cap allowance, valve guide, play of the rotor in the pump casing, etc.
   - Types of problems related to engines: seized engine, lack of power, unusual noises, vibrations, consuming too much oil, etc.
   - Types of problems related to the lubrication system: incorrect oil pressure, unusual noises, warning light on, wrong oil type
   - Types of problems related to the cooling system: leaking fluids, overheating, low operating temperature, etc.

4. Replace the engine or its defective components.
   - Replacement of the engine
   - Defective mechanical engine components: camshafts, connecting rods, cylinders, pistons, valves, crankshaft, etc.

5. Replace the lubrication system or its defective components.
   - Replacement of the lubrication system
   - Defective lubrication system mechanical, electrical, electronic or hydraulic components: oil pressure sensor, oil temperature sensor, hose, pump, pressure regulator, tank, etc.

6. Replace the defective components of the cooling system.
   - Defective mechanical, electrical or electronic cooling system components: fluid temperature sensor, hose, pump, radiator, thermostat, fan, etc.

7. Apply the maintenance procedure.
    - Maintenance procedures: cleaning, oil and filter changes, topping up or changing coolant fluid, etc.

8. Perform operational tests and make final adjustments.
    - Start-up, testing and visual inspection of the work
    - Adjustments: adjustment of valves, preliminary adjustment of governor, play of the accelerator cable, etc.

9. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing two-stroke engines and lubrication systems	Code: 719746

Competency 12 Duration 90 h Credits 6

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair two-stroke engines and lubrication systems.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • For oil-gasoline mix and oil injection lubrication systems • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment
Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a preliminary diagnosis.	• Logical choice of inspections to be done • Appropriate inspection of the condition of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Formulation of realistic hypotheses as to the cause of the breakdown
3. Disassemble the engine and lubrication system and make the final diagnosis.	• Correct disassembly of the engine and its systems • Meticulous and complete inspection of inner components • Precise measurement of parts and clearances • Accurate determination of the nature of the work to be done

4. Replace the engine or its defective components.	• Appropriate choice of: – replacement engine – replacement mechanical components • Precise replacement of the engine or its defective components • Correct reassembly of the engine and related systems
5. Replace defective lubrication system components.	• Appropriate choice of replacement mechanical, electrical, electronic or hydraulic components • Replacement of defective lubrication system components • Correct reassembly of the lubrication system and its related systems
6. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the engine and the lubrication system
7. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Oil and coolant liquid levels meet requirements • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Respect for the integrity of the land-based powersport vehicles and outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics and configuration of two-stroke engines: inline engine, V engine, number of cylinders, position (in front, behind or centered), etc.
   - Characteristics of oil-gasoline and oil injection lubrication systems
   - Technical terms: torque, power, compression rate, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a preliminary diagnosis.
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7 and 9)
   - Compression tests, leak-down tests engine, verification of oil flow, etc.

3. Disassemble the engine and lubrication system and make the final diagnosis.
   - Disassembly of the engine and cooling systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Measurements: cylinder diameter (bore), cylinder ovality and taper, piston diameter, piston ring end cap allowance, straightness of the crankshaft, etc.
   - Types of problems related to engines: seized engine, lack of power, unusual noises, vibrations, etc.
   - Types of problems related to the lubrication system: poor oil flow, unusual noises, warning light on, etc.

4. Replace the engine or its defective components.
   - Replacement of the engine
   - Defective mechanical engine components: connecting rod, cylinders, pistons, crankshaft, etc.

5. Replace defective lubrication system components.
   - Defective mechanical, electrical, electronic or hydraulic lubrication system components: oil level sensor, hose, electric pump, unidirectional valves, etc.

6. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: oil pump outflow, exhaust pipe, etc.

7. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing ignition systems	Code: 719753

Competency 13 Duration 45 h Credits 3

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair ignition systems.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • For ignition systems: capacitor discharge, transistorized, etc. • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment
Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be done • Appropriate inspection of the condition of the components • Appropriate inspection of the functioning of the electrical and electronic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace the defective ignition system components.	• Correct disassembly of the ignition system and its related systems • Appropriate choice of replacement electrical and electronic components • Precise replacement of defective ignition system components • Correct reassembly of the ignition system and its related systems • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences

4. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the ignition system
5. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the land-based powersport vehicles and outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of ignition systems: capacitor discharge, transistorized, etc.
   - Characteristics of a work order
   - Technical terms: ignition, ignition advance or delay, peak voltage, gap, etc.
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Visual inspection and verification of the functioning of the components
   - Inspection of electrical and electronic systems (see Competency 7)
   - Types of problems: detonation, irregular functioning, incorrect ignition timing, engine not turning off, etc.

3. Replace the defective ignition system components.
   - Disassembly of ignition systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective ignition system components: coils, spark plug, wiring harness, ignition plate, engine flywheel, electronic modules, etc.

4. Perform operational tests and make final adjustments.
    - Start-up, testing and visual inspection of the work
    - Adjustments: adjustment of the air gap of the ignition coil or module, engine flywheel brake, ground, etc.

5. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining carburetors	Code: 719766

Competency 14 Duration 90 h Credits 6

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain carburetors.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, and sealing products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace the carburetor or its defective components.	• Correct disassembly of the carburetor and its related systems • Appropriate choice of the: – replacement carburetor – replacement mechanical or electrical components • Precise replacement of the carburetor or its defective components • Correct reassembly of the carburetor and its related systems • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences

4. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
5. Perform operational tests and make final adjustments.	• Correct use of start-up and testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Optimal functioning of the carburetor
6. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the land-based powersport vehicles and outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of carburetors: float-type, diaphragm, vacuum, slider, etc.
   - Characteristics of a work order
   - Technical terms: flashpoint, pressure, vacuum, Venturi effect, etc.
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical and electronic systems (see Competency 7)
   - Types of problems: flooding, contaminated gasoline, incorrect adjustment of the air-fuel mixture, ventilation of the gasoline tank, unsatisfactory idle speed, poor acceleration, etc.

3. Replace the carburetor or its defective components.
    - Disassembly of the carburetor and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
    - Replacement of the carburetor
    - Defective mechanical or electrical carburetor components: inlet hose, heating element, float, jets, jet needle, needle valve, diaphragm pump, electric pump, tank, needle valve seat, etc.

4. Apply the maintenance procedure.
    - Maintenance procedures: emptying the tank, cleaning the carburetor, etc.

5. Perform operational tests and make final adjustments.
    - Start-up, testing and visual inspection of the work
    - Adjustments: air-fuel mixture, governor, idle speed, accelerator cable play, synchronization of the carburetors, etc.

6. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining clutch systems and transmissions	Code: 719776

Competency 15 Duration 90 h Credits 6

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain clutch systems and transmissions.	• For land-based powersport and outdoor power equipment • For pulley-driven, magnetic and dry centrifugal clutch systems • For mechanical and hydrostatic transmissions • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment
Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a preliminary diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Formulation of realistic hypotheses as to the cause of the breakdown
3. Disassemble the clutch system and transmission, and make the final diagnosis.	• Accurate disassembly of the transmission and its systems • Meticulous and thorough inspection of inner components • Precise measurement of parts and clearances • Accurate determination of the nature of the work to be done

Repairing and maintaining clutch systems and transmissions	Code: 719776
4. Replace the clutch system or its defective components.	• Appropriate choice of: – replacement clutch system – replacement mechanical, electrical or electronic components • Precise replacement of the clutch system or its defective components • Correct reassembly of the clutch system and its related systems
5. Replace the transmission or its defective components.	• Appropriate choice of: – replacement transmission – replacement mechanical, electrical or hydraulic components • Precise replacement of the transmission or its defective components • Correct reassembly of the transmission system and its related systems
6. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
7. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the clutch system and transmission
8. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Hydrostatic oil level meets requirements • Respect for the integrity of the land-based powersport vehicles and outdoor power equipment

- Observance of manufacturer's procedures and specifications for:
  - clearances and adjustments
  - torque and tightening sequences
- Observance of occupational health and safety rules
- Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of pulley-driven, magnetic and centrifugal dry clutch systems
   - Characteristics of mechanical transmissions: belt and pulley, chain drive, disk and friction wheel, variable pulley, gear, flexible shaft, etc.
   - Characteristics of hydrostatic transmissions
   - Technical terms: ratio, overdrive, reduction, torque, coupling, friction, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a preliminary diagnosis.
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7 and 9)

3. Disassemble the clutch system and transmission, and make the final diagnosis.
   - Disassembly of the clutch and transmission systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Measurements: thickness of the friction lining, friction wheel material, length and thickness of the belt, weight of the rollers, quantity of oil, straightness of the shafts, etc.
   - Types of problems associated with the clutch system: slipping, grinding, noises, no electrical feed, etc.
   - Types of problems associated with the transmission: fluid leaks, wear, noises, intermittent functioning, etc.

4. Replace the clutch system or its defective components.
   - Replacement of the clutch system
   - Defective mechanical, electrical or electronic clutch system components: belts, disk and friction wheel, electromagnetic clutch system, pulleys, variable pulleys, relays, springs, rollers, shoes, belt tensioners, etc.

5. Replace the transmission or its defective components.
   - Replacement of the transmission
   - Defective mechanical, electrical or hydraulic transmission components: chain, shafts, belts, disk and friction wheel, gears, switches, pumps, pulleys, springs, rollers, etc.

6. Apply the maintenance procedure.
   - Maintenance procedures: cleaning, changing lubricant, filter, etc.

7. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: alignment of pulleys, positioning of neutral, belt tension, clutch pedal or lever pressure, clutch friction point, etc.

8. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining work and cutting devices	Code: 719784

Competency 16 Duration 60 h Credits 4

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain work and cutting devices.	• For outdoor power equipment • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning and lubrication products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace the work or cutting device or their components.	• Appropriate choice of: – replacement work or cutting device – replacement mechanical, electrical, electronic or hydraulic components • Correct replacement of the work or cutting device or their defective components
4. Repair parts.	• Satisfactory recovery of parts • Quality of welds • Proper use of machining tools
5. Lubricate work or cutting devices.	• Proper adjustment of oil levels • Proper cleaning of the lubrication system • Observance of lubrication procedures
6. Sharpen cutting devices.	• Proper position of cutting devices • Application of sharpening techniques in conformity with the manufacturer's specifications • Proper balancing of blades

7. Perform operational tests and make final adjustments.	• Correct use of start-up and testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the work or cutting device
8. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Correct disassembly and reassembly of work or cutting devices • Respect for the integrity of the outdoor power equipment • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of work or cutting devices: chains, knives, chain guides, cutting discs, shears, trimmer cutting heads, lawn mower and branch chipper blades, rototillers, winches, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Verification of the electrical, electronic and hydraulic systems (see Competencies 7 and 9)
   - Types of problems: uneven cuts, overheating, broken chain, unusual vibrations, etc.

3. Replace the work or cutting device or their components.
    - Disassembly: cleaning of components, identification of components based on their location, and the ways the parts are laid out
    - Defective devices or mechanical, electric, electronic or hydraulic components: safety fasteners, chain guards, chains, shears, blades, cylinders, cutting discs, tips or teeth, hoses, chain brakes, chain guides, blades, filaments, switches, relays, antivibration pads, augers, etc.

4. Repair parts.
    - Disassembly: cleaning of components, identification of components based on their location, and the ways the parts are laid out
    - Repair of parts using tools: mallets, anvils, heating tools, etc.
    - Welding of parts: casing, rollers, cutter apron, etc.

5. Lubricate work or cutting devices.
    - Oil levels and flow
    - Cleaning and lubrication of the chain guide, bearings, etc.

6. Sharpen cutting devices.
    - Disassembly: cleaning of components, identification of components based on their location, and the ways the parts are laid out
    - Manual or mechanical sharpening of blades, cutting discs, etc.
    - Sharpening of chainsaw chains: manufacturer's specifications, adjustment of the chain tension, manual or mechanical sharpening of teeth (start with the most worn tooth) and filing of depth guides using a calibrated gauge

7. Perform operational tests and make final adjustments.
    - Start-up, testing and visual inspection of the work
    - Adjustments in accordance with the type of device: synchronisation of blades, cutting chain tension, etc.

8. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining steering and propulsion systems of recreational watercraft	Code: 719797

Competency 17 Duration 105 h Credits 7

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain steering and propulsion systems of recreational watercraft.	• Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace defective steering components.	• Correct disassembly of the steering system and its related systems • Appropriate choice of replacement mechanical, electrical or hydraulic components • Precise replacement of defective steering components • Correct reassembly of the steering system and its related systems
4. Replace the propulsion system or its defective components.	• Correct disassembly of the propulsion system • Appropriate choice of the: – replacement propulsion system – replacement mechanical, electrical or electronic components • Precise replacement of the propulsion system or its defective components • Correct reassembly of the propulsion system

5. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
6. Perform operational tests and make final adjustments.	• Correct use of start-up and testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the steering and propulsion system
7. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Oil level meets requirements • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Respect for the integrity of the recreational watercraft • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of rack-and-pinion and cable steering systems
   - Characteristics of propeller and turbine steering and propulsion systems
   - Characteristics of a work order
   - Technical terms: cavitation, propeller pitch, port, starboard, planing, etc.
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7 and 9)
   - Types of problems: alignment, hard steering, lack of power, oil leak in the planing system, noises, insufficient cooling, vibrations, etc.

3. Replace defective steering components.
   - Disassembly of the steering system and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective mechanical, electrical or hydraulic steering components: cable, rack and pinion, cylinders, joints, hydraulic or electrohydraulic unit, bellows, etc.

4. Replace the propulsion system or its defective components.
   - Disassembly of the propulsion system and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective mechanical, electrical or electronic propulsion system components: wear ring, drive shaft, gearbox, sensors, propeller, trim gauge, bow thruster, bellows, components of the water cooling system, turbine, etc.

5. Apply the maintenance procedure.
   - Maintenance procedures: lubricant change for the motor stem or turbine cleaning, inspection of anode wear, inspection of gearbox leaks, etc.

6. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: alignment of the baseplate or turbine, stem lift, alignment of the handlebars or steering wheel, etc.

7. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Inspecting electronic control systems	Code: 719804

Competency 18 Duration 60 h Credits 4

Behavioural Competency

Statement of the Competency	**Achievement Context**
Inspect the functioning of electronic control systems.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • Given a work order • Using tools • Using verification and communication devices and instruments: multimeter, oscilloscope, diagnostic tools, computers, etc. • Using technical documentation • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Gather the information required for inspecting the systems.	• Selection of relevant information • Correct interpretation of: – the manufacturer's recommendations – plans, diagrams and graphs
2. Plan the inspections.	• Logical determination of the inspections to be done on: – sensors – electrical and electronic circuits – electronic modules – actuators • Logical choice of verification and communication devices and instruments
3. Inspect sensors.	• Accurate location of the sensors • Accurate measurement of: – voltages and resistances – clearances and spacing – types of signals generated – signal signatures
4. Inspect electrical and electronic circuits.	• Accurate identification of the type of circuit • Accurate location of the circuit to be inspected and its components • Accurate measurement of: – voltages – amperages – resistance

Inspecting electronic control systems	Code: 719804
5. Inspect electronic modules.	• Accurate location of the module to be inspected and its circuits • Correct reading of diagnostic codes • Methodical checking of input and output parameters
6. Inspect actuators.	• Accurate location of the system and its actuators • Accurate measurement of: – voltages – amperage – resistance – types of signals generated – signal signatures
7. Make the diagnosis.	• Thorough check of the results against the manufacturer's specifications • Relevance of the conclusions drawn
8. Explain the diagnosis.	• Clear information recorded on the work order • Appropriate justification of the conclusions drawn • Appropriate solutions suggested with regard to the problems detected
	For the competency as a whole: • Thorough visual inspection of systems • Proper use of tools • Proper use of verification and communication devices and instruments • Correct application of protective measures related to work on systems • Appropriate use of tables of symptoms and diagnostic tables • Cleanliness and tidiness of premises and the work area • Respect for the integrity of the land-based powersport vehicles or outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Gather the information required for inspecting the systems.
   - Plans, diagrams and graphs: methods for finding information, annotations, symbols and codes
   - Components of an electronic control circuit
   - Specific characteristics of the signals and waveforms

2. Plan the inspections.
   - Choice of the measurements to be taken in accordance with the characteristics of the circuit
   - Manufacturer's recommended inspection sequence
   - Choice of measuring device or instrument in accordance with the type of measurement to be taken, the electrical circuit and the electronic component: multimeter, oscilloscope, diagnostic tools, etc.

3. Inspect sensors.
   - Types of sensors: pressure, temperature, rotation, position, etc.
   - Location of sensors on land-based powersport vehicles, recreational watercraft or outdoor power equipment
   - Visual inspection: damaged sensor, moisture present, damaged connectors, etc.
   - Use of the measuring device or instrument
   - Voltage, amperage, resistance, clearances, spacing, etc.
   - Types of signals generated and signal signatures

4. Inspect electrical and electronic circuits.
   - Classification of types of circuits
   - Wires, terminals and connectors
   - Location of circuits and wiring harnesses on land-based powersport vehicles, recreational watercraft or outdoor power equipment
   - Visual inspection: search for corrosion, pinched or stripped wires, damaged sheaths, etc.
   - Use of the measuring device or instrument
   - Voltage, voltage drops, resistance and continuity

5. Inspect electronic modules.
   - Main components of the computer and how they are functioning
   - Means of communication
   - Location of electronic modules on land-based powersport vehicles, recreational watercraft or outdoor power equipment
   - Types of malfunction codes: by system, type of problem, etc.
   - Use of the measuring device or instrument
   - Input and output parameters

6. Inspect actuators.
    - Types of actuators: engines, electrovalves, solenoids, etc.
    - Location of actuators on land-based powersport vehicles, recreational watercraft or outdoor power equipment
    - Visual inspection: damaged actuators, moisture present, damaged connectors, etc.
    - Use of the measuring device or instrument
    - Voltage, voltage drops, resistance, continuity, etc.
    - Types of signals and signal signatures

7. Make the diagnosis.
    - Comparison of values obtained against the manufacturer's specifications
    - Diagnostics: proper functioning, short circuit, open circuit, parasitic resistance, defective components

8. Explain the diagnosis.
    - Recording and compilation of information
    - Essential elements that must be included
    - Findings and solutions
    - English and French technical terminology

Repairing steering systems on land-based powersport vehicles and outdoor power equipment	Code:	719814

Competency 19 Duration 60 h Credits 4

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair steering systems on land-based powersport vehicles and outdoor power equipment.	• For mechanical and power steering systems • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical and electronic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace defective steering components.	• Correct disassembly of the steering and its related systems • Appropriate choice of replacement electrical, electronic or hydraulic components • Precise replacement of defective steering components • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences
4. Perform operational tests and make final adjustments	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Correct calibration of the power steering • Proper functioning of the steering system

5. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the land-based powersport vehicle or outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of mechanical and power steering systems
   - Characteristics of a work order
   - Technical terms: radius, wheelbase, convergence, divergence, caster angle, etc.
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of the electrical and electronic systems (see Competencies 7 and 18)
   - Types of problems: noises, vibrations, poor road-holding, hard steering, etc.

3. Replace defective steering components.
   - Disassembly of the steering and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective mechanical, electrical or electronic steering components: tie-rods, sensors, conductors, bearings, tie-rod ends, steering bearings, wheel bearings, power steering unit, etc.

4. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: clearance between the wheels or skis, wheelbase angle, etc.
   - Calibration of the power steering using a diagnostic tool

5. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining suspensions	Code: 719825

Competency 20 Duration 75 h Credits 5

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain suspensions.	• For land-based powersport vehicles • For spring, hydraulic and air suspensions • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace or repair defective suspension components.	• Correct disassembly of related systems and the suspension • Appropriate choice of replacement mechanical, electrical, electronic or hydraulic components • Precise replacement or repair of defective suspension components • Correct reassembly of the suspension and related systems • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences
4. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure

5. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the suspension
6. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Oil level meets requirements • Respect for the integrity of the land-based powersport vehicle • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of spring, hydraulic and air suspensions
   - Characteristics of a work order
   - Technical terms: compression, rebound, torsion, etc.
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7, 9 and 18)
   - Types of problems: poor road-holding, oil leak, vibrations, noises, etc.

3. Replace or repair defective suspension components.
   - Disassembly of the suspension and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective mechanical, electrical, electronic or hydraulic suspension components: shock absorbers, rings, air springs, sensors, compressor, snowmobile caterpillar track, joints, rails, springs, etc.

4. Apply the maintenance procedure.
   - Maintenance procedures: cleaning, lubrication, oil change, etc.

5. Perform operational tests and make final adjustments.
    - Start-up, testing and visual inspection of the work
    - Adjustments: preloading of the springs in accordance with the driver's weight and the type of driving, adjustment of the limiter strap, adjustment of the air pressure in the shock absorbers, tension of the caterpillar track, etc.

6. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining drivetrains and differentials	Code : 719835

Competency 21 Duration 75 h Credits 5

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain drivetrains and differentials.	• For land leisure vehicles • For drivetrains: chain, toothed belt, rigid drive shaft, cardan drive shaft, homokinetic, bell crank, etc. • For differentials: limited slip, manual or electrical locking, viscous automatic locking, rollers, etc. • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace or repair defective drivetrain components.	• Correct disassembly of related systems and the drivetrain • Appropriate choice of replacement mechanical components • Precise replacement of repair of defective drivetrain components • Correct reassembly of the drive and related systems

4. Replace the differential or its defective components.	• Correct disassembly of the differential and its related systems • Appropriate choice of: – replacement differential – replacement mechanical, electrical, electronic or hydraulic components • Precise replacement of the differential or its defective components • Correct reassembly of the differential and its related systems
5. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
6. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Proper functioning of the drivetrain and the differential
7. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Oil level meets requirements • Respect for the integrity of the land-based powersport vehicle • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of chain, toothed belt, rigid drive shaft, cardan drive shaft, homokinetic, bell crank, etc. drivetrains
   - Characteristics of limited slip, manual or electrical locking, viscous automatic locking, rollers, etc. differentials
   - Technical terms: torque, coupling, viscous coupling, limited slip, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7, 9 and 18)
   - Types of problems: noises, oil leak, loss of traction, skidding, intermittent functioning, etc.

3. Replace or repair defective drivetrain components.
   - Disassembly of the drivetrain and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective drivetrain mechanical components: shafts, chain, belt, constant velocity (CV) joint, universal joints, etc.

4. Replace the differential or its defective components.
   - Disassembly of the differential and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Replacement of the differential
   - Defective mechanical, electrical, electronic or hydraulic drivetrain components: spool, sensors, crown wheel, friction disks, electronic module, electrical motor, pinion, rollers, viscous coupling, etc.

5. Apply the maintenance procedure.
   - Maintenance procedures: cleaning, greasing, oil change**,** etc.

6. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments: adjustment of the differential’s engagement cables, alignment of couplings, etc.

7. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining air intake, fuel and exhaust systems	Code: 719845

Competency 22 Duration 75 h Credits 5

Behavioural Competency

Statement of the Competency	Achievement Context
Repair and maintain air intake, fuel and exhaust systems.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	Performance Criteria
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace defective air intake and fuel system components.	• Correct disassembly of related systems as well as air intake and fuel systems • Appropriate choice of replacement mechanical, electrical, electronic or hydraulic components • Precise replacement of defective components of the air intake and fuel systems • Correct reassembly of air intake, fuel and related systems

4. Replace or repair defective exhaust system components.	• Correct disassembly of the exhaust system and its related systems • Appropriate choice of replacement mechanical, electrical or electronic components • Precise replacement or repair of defective exhaust system components • Correct reassembly of exhaust and related systems
5. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
6. Perform operational tests and make final adjustments.	• Correct use of start-up and testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Correct calibration of air intake, fuel and exhaust systems • Optimal functioning of air intake, fuel and exhaust systems
7. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the land-based powersport leisure vehicles or outdoor power equipment • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of the systems: air intake, supercharging, electronic injection, variable exhaust, fuel vapour recovery system, etc.
   - Technical terms: volume, flow, temperature, air-fuel mixture, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of the electrical, electronic and hydraulic systems (see Competencies 7, 9 and 18)
   - Fuel pressure, exhaust pressure, injector flow, tests, etc.
   - Types of problems: loss of power, difficulty starting, fuel leak, malfunction indicator on, air intake system leak, etc.

3. Replace defective air intake and fuel system components.
   - Disassembly of air intake and fuel systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective mechanical, electrical, electronic or hydraulic components of air intake and fuel systems: ignition coils, spark plugs, sensors, volumetric compressor, conductors, conduits, hose, heat exchanger, fuses, injectors, electronic module, fuel pump, pipes, turbocharger, etc.

4. Replace or repair defective exhaust system components.
   - Disassembly of the exhaust system and its related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Defective exhaust system mechanical, electrical or electronic components: sensors, catalytic converter, electric motor, electronic module, muffler, valves, pipes, etc.

5. Apply the maintenance procedure.
   - Maintenance procedures: cleaning, lubrication, gas filter change, etc.

6. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustment of the opening of the exhaust valves, idle speed, etc.
   - Calibration of the butterfly (throttle) position sensor, the variable exhaust, etc., using a diagnostic tool

7. Complete the work.
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing and maintaining the sequential transmission and clutch systems of the powertrain	Code: 719857

Competency 23 Duration 105 h Credits 7

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair and maintain the sequential transmission and clutch systems of the powertrain.	• For land-based powersport vehicles • For sequential transmissions, multidisc clutch and wet centrifugal clutch systems • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a preliminary diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the functioning of the mechanical components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Formulation of realistic hypotheses as to the cause of the breakdown
3. Disassemble the clutch and transmission systems and make the final diagnosis.	• Correct disassembly of the clutch and transmission systems • Meticulous and thorough visual inspection of inner components • Precise measurement of parts and clearances • Accurate determination of the nature of the work to be done
4. Replace the clutch system or its defective components.	• Appropriate choice of: – replacement clutch system – replacement mechanical, electrical, electronic or hydraulic components • Precise replacement of the clutch system or its defective components • Correct reassembly of the clutch and related systems

Repairing and maintaining the sequential transmission and clutch systems of the powertrain	Code: 719857
5. Replace the defective transmission components.	• Appropriate choice of replacement mechanical, electrical, electronic or hydraulic components • Precise replacement of defective transmission components • Correct reassembly of the transmission and related systems
6. Apply the maintenance procedure.	• Choice of products based on the type of maintenance to be performed • Observance of the maintenance procedure
7. Perform operational tests and make final adjustments.	• Correct use of testing procedures • Thorough visual inspection of the work • Relevance and accuracy of adjustments • Correct adjustment of the clutch system • Proper functioning of the clutch system and the transmission
8. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole: • Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Oil and coolant levels meet requirements • Respect for the integrity of the land-based powersport vehicles • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of gear type sequential transmissions, inside an engine crankcase or a gearbox; mechanical, electronic or electrohydraulic gear shift
   - Characteristics of multidisc clutch and wet centrifugal clutch systems
   - Technical terms: ratio, overdrive, underdrive, torque, coupling, friction, etc.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a preliminary diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and verification of the functioning of the mechanical components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7, 9 and 18)

3. Disassemble the clutch and the transmission systems and make the final diagnosis.
   - Disassembly of the clutch and transmission systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
   - Types of clutch system problems: slipping, grinding, noises, no electrical supply, no neutral gear, etc.
   - Types of transmission problems: loss of transmission fluid, wear, noises, intermittent functioning, etc.

4. Replace the clutch system or its defective components.
   - Replacement of the clutch system
   - Defective mechanical, electrical, electronic or hydraulic clutch system components: sensors, clutch housing, switch housing, clutch friction discs, metal plates, electronic module, pistons, pump, relays, rollers, shoes, solenoids, etc.

5. Replace the defective transmission components.
   - Defective mechanical, electrical, electronic or hydraulic transmission components: shafts, cylinder, sensors, switch housing, gears, forks, electronic module, electric motor, relays, rollers, solenoids, etc.

6. Apply the maintenance procedure.
   - Maintenance procedures for changing motor oil, filters and the clutch lever

7. Perform operational tests and make final adjustments.
   - Start-up, testing and visual inspection of the work
   - Adjustments of the clutch cable and friction point
   - Calibration of the clutch using a diagnostic tool

8. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Repairing driving assistance and alternative drive systems	Code: 719865

Competency 24 Duration 75 h Credits 5

Behavioural Competency

Statement of the Competency	**Achievement Context**
Repair driving assistance and alternative drive systems.	• For land-based powersport vehicles, recreational watercraft or outdoor power equipment • For electronic driving assistance systems: anti-lock braking system (ABS), traction control system, stability control system, tire pressure monitoring system (TPMS), etc. • Given a work order • Using technical documentation • Using equipment, tools, lifting equipment and measuring instruments • Using cleaning, lubrication, sealing and assembly products • Using replacement components • Using the required protection equipment

Elements of the Competency	**Performance Criteria**
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Make a diagnosis.	• Logical choice of inspections to be made • Appropriate inspection of the condition of the components • Appropriate inspection of the functioning of the electrical, electronic and hydraulic systems • Appropriate use of a diagnostic method • Accurate determination of the nature of the work to be done
3. Replace the defective components of the driving assistance or alternative drive systems.	• Correct disassembly of the driving assistance or alternative drive systems and their related systems • Appropriate choice of replacement hydraulic, electrical or electronic components • Precise replacement of defective driving assistance or alternative drive system components • Oil level meets requirements • Correct reassembly of driving assistance or alternative drive systems and their related systems

	• Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences
4. Perform operational tests and calibrate systems.	• Correct use of start-up and testing procedures • Thorough visual inspection of the work • Relevance and accuracy of calibrations • Proper functioning of the systems
5. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Respect for the integrity of the land-based powersport vehicles or outdoor power equipment • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Types of electronic driving assistance systems: anti-lock braking system (ABS), traction control system, stability control system, tire pressure monitoring system (TPMS), etc.
   - Alternative electric or other drive systems
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Make a diagnosis.
   - Types of inspections to be performed based on the work order
   - Visual inspection and testing the functioning of components
   - Inspection of electrical, electronic and hydraulic systems (see Competencies 7, 9 and 18)
   - Types of problems: defective braking, poor traction management, lack of power, abnormal energy consumption, malfunction indicator on, etc.

3. Replace the defective components of the driving assistance or alternative drive systems.
    - Disassembly of driving assistance or alternative drive systems and their related systems: cleaning of components, identification of components based on their location, and the ways the parts are laid out
    - Defective system components: batteries, sensors, conductors, controls, fuses, brake pressure modulator, electronic modules, electric motors, potentiometer, etc.

4. Perform operational tests and calibrate systems.
    - Start-up, testing and visual inspection of the work
    - Use of a diagnostic tool, bleeding of the anti-lock braking system (ABS), calibration of sensors and tire pressure monitoring system (TPMS), etc.

5. Complete the work.
    - Information: work performed, length of time, problems encountered, decisions made, etc.
    - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Performing periodic and seasonal maintenance	Code: 719876

Competency 25 Duration 90 h Credits 6

Behavioural Competency

Statement of the Competency

Perform periodic and seasonal maintenance of powersport vehicles and outdoor power equipment.

Achievement Context

- For powersport vehicles and outdoor power equipment
- Given a work order
- Using technical documentation
- Using equipment, tools, lifting equipment and measuring instruments
- Using cleaning and lubrication products as well as protective fluids and oils
- Using protective devices
- Using the required protection equipment

Elements of the Competency	Performance Criteria
1. Determine the work to be done.	• Correct interpretation of the work order • Appropriate collection of technical information
2. Start the vehicle or piece of outdoor power equipment.	• Correct installation of components removed for storage • Complete visual inspection of the condition of the systems and mechanical components before starting the vehicle or equipment
3. Perform operational tests and the tune-up.	• Proper inspection of the functioning of the mechanical, electrical, electronic and hydraulic systems • Relevance and accuracy of adjustments and calibrations • Observance of manufacturer's methods and specifications for: – clearances and adjustments – torque and tightening sequences
4. Store the vehicle or equipment.	• Complete visual inspection of the vehicle and equipment to be stored • Appropriate use of protective fluids and oils • Correct and complete removal of components to be protected • Correct installation of tarpaulins or correct storage of the vehicle or equipment

5. Complete the work.	• Clear and thorough notes on the work done • Correct storage of equipment, tools, lifting equipment, measuring instruments and products • Clean and tidy premises
	For the competency as a whole:
	• Appropriate choice and use of equipment, tools, lifting equipment, measuring instruments and products • Fluid and oil levels meet requirements • Respect for the integrity of the vehicle or equipment • Compliance with start-up procedures • Compliance with company policies • Adherence to schedules • Observance of occupational health and safety rules • Observance of environmental protection rules

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

1. Determine the work to be done.
   - Characteristics of a work order
   - Gathering of technical information (see Competency 3)

2. Start the vehicle or piece of outdoor power equipment.
   - Installation and connection of components: batteries, pumps, pipes, etc.
   - Importance of the visual inspection of the condition of the systems and the mechanical components for the start-up

3. Perform operational tests and the tune-up.
   - Testing of the functioning of the mechanical, electrical, electronic and hydraulic systems (see Competencies 7, 9 and 18)
   - Adjustment and calibrations according to the type of vehicle or equipment

4. Store the vehicle or equipment.
   - Importance of the visual inspection of the vehicle or equipment to be stored
   - Use of protective fluids and oils: anti-fog, antifreeze, fuel stabilizer, etc.
   - Removal of components to be protected: batteries, pumps, pipes, etc.
   - Installation of tarpaulins and implementation of storage procedures

5. Complete the work
   - Information: work performed, length of time, problems encountered, decisions made, etc.
   - Importance of clean and tidy premises and properly stored equipment, tools, lifting equipment, measuring instruments and products

Entering the workforce	Code: 719886

Competency 26 Duration 90 h Credits 6

Situational Competency

Statement of the Competency

Enter the workforce.

Elements of the Competency

- Familiarize themselves with exercising the trade in a company.
- Integrate the knowledge, skills, attitudes and habits acquired during their training.
- Be aware of the changes in point of view that result from doing a practicum in a workplace.

Learning Context

Information Phase

- Familiarizing themselves with the terms, conditions and information related to the practicum.
- Setting selection criteria for the choice of workplace.
- Gathering information about the various companies likely to take interns: location of the company, size of the company, type of work, etc.
- Taking steps to obtain a practicum position.

Participation Phase

- Observing the work environment.
- Performing or helping with different occupational tasks.
- Writing a journal stating their observations about the work environment and the tasks performed in the company.

Synthesis Phase

- Identifying the aspects of the occupation that correspond to the training received and those that do not.
- Discussing the influence of the practicum on their choice of future employment in terms of aptitudes and areas of interest.

Instructional Guidelines

- Maintain close collaboration between the school/training centre and the company.
- Provide the documentation required for students to prepare for the practicum and write the journal.
- Make it possible for students to carry out occupational tasks.
- Provide students with regular support throughout their practicum.
- Make sure the students are supervised by a practicum supervisor in the company.
- Intervene if difficulties or problems arise.

Participation Criteria

Information Phase

- List the practicum settings that meet their predetermined selection criteria.
- Meet with the practicum supervisor in the company with the goal of being accepted as an intern.

Participation Phase

- Comply with company policies regarding the tasks that can be performed by interns, work schedules, occupational health and safety rules and rules of professional ethics.
- Record information on the work environment and the tasks performed.

Synthesis Phase

- Write a practicum report:
  - comparing the aspects of the practicum setting with the training received
  - emphasizing their strengths and areas for improvement with regard to the chosen trade
  - presenting a self-assessment of their practicum in the workplace and their involvement

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each phase of the learning context, along with their attendant guidelines.

Information Phase

- Consultation of documentation about practicum positions.
- Search for a practicum position, updating of resumé and writing of a letter of introduction.
- Type of company: dealership, repair centre, rental centre, etc.
- Company staff: service manager, technical adviser, parts clerk, staff member responsible for cleaning and aesthetics, sales staff member, office staff member, etc.
- Work schedules and service structure.
- Agreement on the terms and conditions of the practicum.

Participation Phase

- Occupational health and safety (see Competency 2).
- Professional attitude and teamwork.
- Information on the workplace practicum: schedule, difficulties encountered, activities carried out, etc.

Synthesis Phase

- Content of the practicum report: portrait of the company and their first impression, their observations, specific situations experienced and their reactions.
- Aptitudes and areas of interest (see Competency 1).

Glossary

The program has a glossary to facilitate understanding of the terms used.

Powersport vehicles

Powersport vehicles: land-based powersport vehicles and personal watercraft.

Land-based powersport vehicles

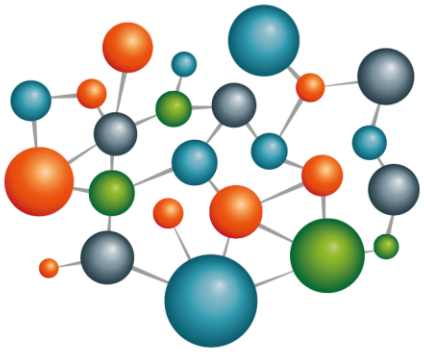
Land-based powersport vehicles: three-wheeled motorcycles (trikes), scooters, all-terrain vehicles (ATVs) including side-by-sides (UTVs) and snowmobiles.

Recreational watercraft

Recreational watercraft: personal watercraft and boats powered by one or more outboard or inboard/outboard motors.

Outdoor power equipment

Outdoor power equipment: power equipment such as lawn mowers, snow blowers, small tractors, chainsaws, generators, trimmers, etc.



Éducation
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