Vocational Training Program

Automobile Mechanics

5798

Training Sector

10 Motorized Equipment Maintenance

Reach for your Dreams

Québec

Vocational Training Program

5798

Automobile Mechanics

Training Sector

10

Motorized Equipment Maintenance

Formation professionnelle et technique
et formation continue

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et du développement

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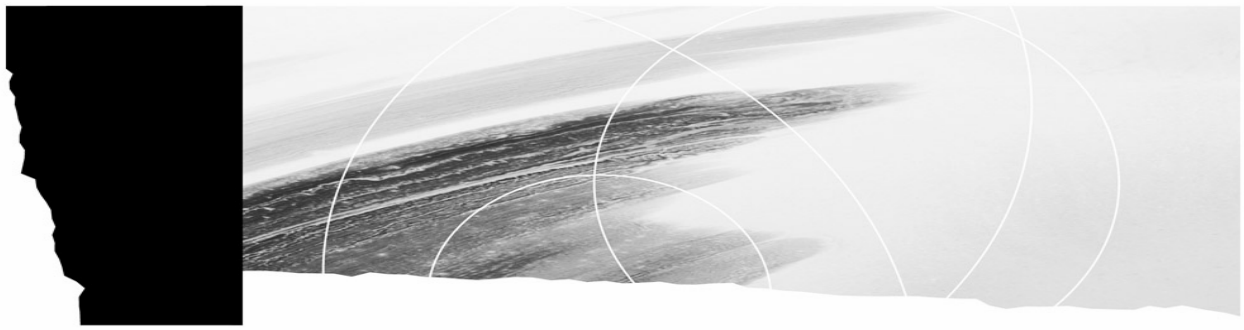


5798 **Automobile Mechanics**

Year of approval: 2005

Certification:	Diploma of Vocational Studies
Number of credits:	120
Number of modules:	29
Total duration:	1 800 hours

To be admitted to the *Automobile Mechanics* program, students must meet the following conditions:

- For students holding a Secondary School Diploma or a recognized equivalent, no additional conditions are required.

OR

- For students who are at least 16 years of age on September 30 of the school year in which they begin the program, the following condition applies: they must have obtained Secondary IV credits in language of instruction, second language and mathematics, or the recognized equivalents.

OR

- For students who are at least 18 years of age, the following condition applies: they must have successfully completed the General Development Test, as well as language of instruction SPR 3, 4, 5, 6 and mathematics MTH 3002-2, or the recognized equivalents.

OR

- For students having obtained Secondary III credits in language of instruction, second language and mathematics in programs established by the Minister, general education is required in conjunction with vocational training in order to obtain the following credits, if applicable: Secondary IV language of instruction, second language and mathematics in programs established by the Minister.

Introduction to the Program

The vocational training curriculum, from which this program of study derives, is the responsibility of both the Ministère de l'Éducation, du Loisir et du Sport, which develops programs and their teaching guides, and the educational institutions, which implement the programs and the evaluation process. Programs of study include compulsory objectives and suggestions for competency-related knowledge, skills, attitudes and perceptions.

Programs of study provide teachers with a frame of reference for planning teaching activities. They define the scope of teaching strategies by identifying the broad educational orientations to be favoured and the objectives to be attained. By successfully completing a program, students acquire not only the entry-level competencies required by the workplace in order to practise a trade or occupation, but also learning that provides them with a certain degree of versatility.

The duration of the program is 1 800 hours, which includes 885 hours spent on the specific competencies required to practise the trade and 915 hours on general work-related competencies. The program of study is divided into 29 modules, which vary in length from 15 to 105 hours. The total hours allocated to the program include time devoted to evaluation for certification purposes and to remedial work.

Title of Module	Code	Module	Hours	Credits
The Trade and the Training Process	843401	1	15	1
Health, Safety and Environmental Protection	843412	2	30	2
Finding Technical Information	843423	3	45	3
Heating, Welding and Cutting	843433	4	45	3
Shop Work	843445	5	75	5
Communicating in the Workplace	843452	6	30	2
Inspecting Internal Combustion Engines	843465	7	75	5
Repairing Internal Combustion Engines	843476	8	90	6
Inspecting Road-Holding Systems	843484	9	60	4
Repairing Road-Holding Systems	843496	10	90	6
Inspecting Electrical and Electronic Systems	843506	11	90	6
Repairing Lighting Systems	843514	12	60	4
Inspecting Basic Computer-Controlled Systems	843524	13	60	4
Inspecting Transmission Systems	843536	14	90	6
Repairing Transmission Systems	843547	15	105	7
Inspecting Starting and Charging Systems and Electromagnetic Accessories	843555	16	75	5

Repairing Starting and Charging Systems and Electromagnetic Accessories	843565	17	75	5
Inspecting Engine and Passenger Compartment Temperature Control Systems	843573	18	45	3
Maintaining and Repairing Engine and Passenger Compartment Temperature Control Systems	843583	19	45	3
Inspecting Active and Passive Safety Systems	843593	20	45	3
Repairing Active and Passive Safety Systems	843604	21	60	4
General Automobile Maintenance	843614	22	60	4
Inspecting Electronic Ignition Systems	843624	23	60	4
Repairing Electronic Ignition Systems	843634	24	60	4
Inspecting Electronic Injection and Antipollution Systems	843644	25	60	4
Maintaining and Repairing Electronic Injection and Antipollution Systems	843655	26	75	5
Inspecting Drive Trains	843665	27	75	5
Job Search	843671	28	15	1
Entering the Work Force	843686	29	90	6

Glossary

Program

A vocational training program is a coherent set of competencies to be acquired. It is formulated in terms of objectives and divided up into modules for administrative purposes. It describes the learning expected of students in accordance with a given performance level. Published as an official pedagogical document, the program leads to the recognition of training qualifying students to practise a trade or occupation.

A vocational training program includes compulsory objectives and content. Although the educational institutions are responsible for learning and evaluation activities, the program presents suggestions for competency-related knowledge, skills, attitudes and perceptions that must be enriched or adapted according to the needs of students, and information regarding the certification of studies.[1]

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 personal and vocational development that have not been explicitly included in the program goals or competencies. They help guide educational institutions in implementing the program.

Competency

A competency is the ability to act successfully and evolve in order to adequately perform work-related tasks or activities, based on an organized body of knowledge and skills from a variety of fields, perceptions, attitudes, etc.

Objectives

Objectives refer to the operational aspect of a competency to be acquired. They are expressed in terms of specific requirements and serve as the practical basis for teaching, learning and evaluation. Objectives are either behavioural or situational.

Objectives also provide indicators for learning, related knowledge, skills, attitudes and perceptions, and associated guidelines. These indicators are grouped according to elements of the competency (in the case of behavioural objectives), and according to phases of the learning context (in the case of situational objectives).

1. Behavioural Objective

A behavioural objective is a relatively closed objective that describes the actions and results expected of the student. Behavioural objectives consist of the following components:

- The *statement of the competency,* which is the result of the job analysis, the general goals of the program and other determinants.
- The *elements of the competency,* which 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 the main components of the competency.

1. Specifications regarding certification complement the program of study, but are presented in another document. Evaluation criteria are prescriptive.

- The *achievement context,* which corresponds to the situation in which the competency is exercised at entry-level on the job market. The achievement context does not specify the context for learning or evaluation.

- The *performance criteria,* which define the requirements by which to judge the attainment of the competency. They may refer to each element of the competency, to several elements or to the competency as a whole. Those associated with a specific element correspond to the requirements for performing a task or activity; those associated with several elements indicate the expected level of performance or the overall quality of a product or service.

Evaluation is based on expected results.

2. Situational Objective

A situational objective is a relatively open-ended objective that outlines the major phases of a learning situation in which a student is placed. It allows for output and results to vary from one student to another. Situational objectives consist of the following components:

- The *statement of the competency,* which is the result of the job analysis, the general goals of the program and other determinants.

- The *elements of the competency,* which outline the essential aspects of the competency and ensure a better understanding of the expected outcome.

- The *learning context,* which provides a broad outline of the learning situation designed to help the students develop the required competency. It is normally divided into three phases of learning: information, participation and synthesis.

- The *instructional guidelines,* which provide guidelines and means 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,* which describe requirements the students must fulfill when participating in the 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 context.

Evaluation is based on the student's participation in the activities suggested in the learning context.

Competency-Related Knowledge, Skills, Attitudes and Perceptions

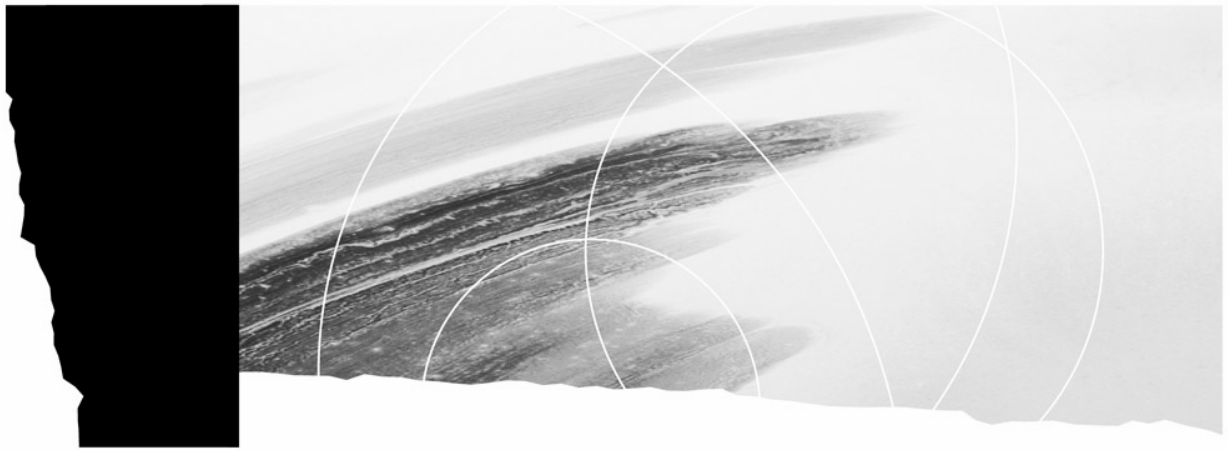
Competency-related knowledge, skills, attitudes and perceptions define the essential and important learning that the student must acquire in order to apply and continue to develop the competency. They correspond to activities in the job market and are accompanied by guidelines that provide information on the field of application, the level of complexity or content related to training. The knowledge, skills, attitudes and perceptions and the related guidelines are not prescriptive.

Module

A module is a component of a program of study comprising a prescriptive objective and suggestions for competency-related knowledge, skills, attitudes and perceptions.

Credit

A credit is a unit used for expressing quantitatively the value of the modules in a program of study. One credit corresponds to 15 hours of training. Students must accumulate a set number of credits to obtain a diploma or attestation.



Part I

Program Goals

Educational Aims

Program Competencies and Grid of Competencies

Harmonization

Program Goals

The *Automobile Mechanics* program prepares students to practise the trade of automobile mechanic.

Automobile mechanics are “generalists” whose work consists in maintaining motor vehicles in perfect working order so that they drive well and are safe and environmentally friendly. Mechanics are therefore required to take preventive and corrective action; inspect vehicles in order to identify defects, their causes and their source; repair, replace and adjust parts; do tests; install optional equipment and accessories; and apply legislation respecting occupational health and safety and environmental protection.

Generally speaking, mechanics work on conventional and computer-controlled motor vehicle components and systems, including the drive train, standard and automatic transmissions, the differential and shafts, hydraulic and air suspensions, the steering system, brakes, carburetors and injectors, electronic ignition systems with and without a distributor, exhaust systems, antipollution devices, the starting and charging systems, and electric and electronic accessories.

The rate of technological development and the wide variety of motor vehicles on the road complicate the mechanic’s job. That is why the ability to find technical information and diagnose problems is crucial. Mechanics must constantly consult manufacturers’ drawings, diagrams, specifications and recommendations. It goes without saying that the ability to communicate with clients is important, both to identify problems with the vehicle and to correctly convey information about the work needed. The ability to think and solve problems, as well as work independently, is an essential quality. Mechanics must be versatile and continue learning throughout their career.

The program goals of the *Automobile Mechanics* program are based on the general goals of vocational training. These goals are:

- To help students develop effectiveness in the practice of a trade or occupation
  - 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
  - to familiarize students with the job market in general and the context surrounding the trade or occupation they have chosen
  - to familiarize students with their rights and responsibilities as workers

- To foster students’ personal development and acquisition of occupational knowledge, skills, perceptions and attitudes
  - to help students develop their autonomy and ability to learn
  - to help students acquire effective work methods and a sense of discipline
  - to help students understand the principles underlying the techniques and the technology used in the trade or occupation
  - 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
  - to help students develop positive attitudes toward technological change and continuing training
  - to help students prepare for a job search
  - to help students develop the means to manage their careers by familiarizing them with entrepreneurship

Educational Aims

The aim of the *Automobile Mechanics* program is to help students develop attitudes and behaviours that are deemed essential to the practice of the trade:

- an awareness of the importance of projecting a positive and professional image of the trade in their attitudes, appearance and language
- an awareness of the impact of their work on road safety and the quality of the environment
- the ability to diagnose and solve problems autonomously
- the ability to think and to establish relationships between cause and effect

Program Competencies and Grid of Competencies

List of Competencies

Determine their suitability for the trade and the training process

Avoid health, safety and environmental hazards

Find technical information about motor vehicles

Perform heating, welding and cutting operations

Do shop work

Establish interpersonal relationships at work

Inspect internal combustion engines

Repair internal combustion engines

Inspect road-holding systems

Repair road-holding systems

Inspect electrical and electronic systems

Repair lighting systems

Inspect basic computer-controlled systems

Inspect transmission systems

Repair transmission systems

Inspect starting and charging systems and electromagnetic accessories

Repair starting and charging systems and electromagnetic accessories

Inspect engine and passenger compartment temperature control systems

Maintain and repair engine and passenger compartment temperature control systems

Inspect active and passive safety systems

Repair active and passive safety systems

Do general maintenance on a motor vehicle

Inspect electronic ignition systems

Repair electronic ignition systems

Inspect electronic injection and antipollution systems

Maintain and repair electronic injection and antipollution systems

Inspect the drive train

Carry out a job search

Enter the work force

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, as well as the major steps in the work process.

The general competencies appear on the horizontal axis and the specific competencies, on the vertical axis. The symbol (△) indicates a correlation between a specific competency and a step in the work process. 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 formulation of objectives related to 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. The modules on the horizontal axis should be taught in relation to those on the vertical axis. This means that some modules are prerequisite to others, while other modules are taught concurrently.

GRID OF COMPETENCIES

AUTOMOBILE MECHANICS

SPECIFIC COMPETENCIES

	Competency Number	Type of Objective	Duration (in hours)	Determine their suitability for the trade and the training process	Avoid health, safety and environmental hazards	Find technical information about motor vehicles	Perform heating, welding and cutting operations	Do shop work	Establish interpersonal relationships at work	Inspect internal combustion engines	Inspect road-holding systems	Inspect electrical and electronic systems	Inspect basic computer-controlled systems	Inspect transmission systems	Inspect starting and charging systems and electromagnetic accessories	Inspect engine and passenger compartment temperature control systems	Inspect active and passive safety systems	Inspect electronic ignition systems	Inspect electronic injection and antipollution systems	Carry out a job search	Gather information	Diagnose the problem	Do the work	Inspect the work	Tidy up the work area
				GENERAL COMPETENCIES																	**WORK PROCESS**				
Competency Number				1	2	3	4	5	6	7	9	11	13	14	16	18	20	23	25	28					
Type of Objective				S	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	S					
Duration (in hours)				15	30	45	45	75	30	75	60	90	60	90	75	45	45	60	60	15					
Repair internal combustion engines	8	B	90	○	●	●	○	●	●	●		○	○	○	○	○		○	○		▲	▲	▲	▲	▲
Repair road-holding systems	10	B	90	○	●	●	●	●	●		●	○	○	○	○		○				▲	▲	▲	▲	▲
Repair lighting systems	12	B	60	○	●	●		●	●		○	●	○		○	○	○				▲	▲	▲	▲	▲
Repair transmission systems	15	B	105	○	●	●	○	●	●	○	○	○	○	●	○	○	○	○	○		▲	▲	▲	▲	▲
Repair starting and charging systems and electromagnetic accessories	17	B	75	○	●	●		●	●	○		●	●	○	●	○	○	○	○		▲	▲	▲	▲	▲
Maintain and repair engine and passenger compartment temperature control systems	19	B	45	○	●	●		●	●	○		●	○	○	○	●			○		▲	▲	▲	▲	▲
Repair active and passive safety systems	21	B	60	○	●	●		●	●		○	●	●	●	○		●		○		▲	▲	▲	▲	▲
Do general maintenance on a motor vehicle	22	B	60	○	●	●	●	●	●	●	●	●	○	●	●	●	●	○	○		▲	▲	▲	▲	▲
Repair electronic ignition systems	24	B	60	○	●	●		●	●	●		●	●		○	○		●	○		▲	▲	▲	▲	▲
Maintain and repair electronic injection and antipollution systems	26	B	75	○	●	●		●	●	●		●	●	○	●	○		○	●		▲	▲	▲	▲	▲
Inspect the drive train	27	B	75	○	●	●		●	●	●		●	●	●	●	●	●	●	●		▲	▲			
Enter the work force	29	S	90	●	●	○	○	○	●	○	○	○	○	○	○	○	○	○	○	●	△	△	△	△	△

Harmonization

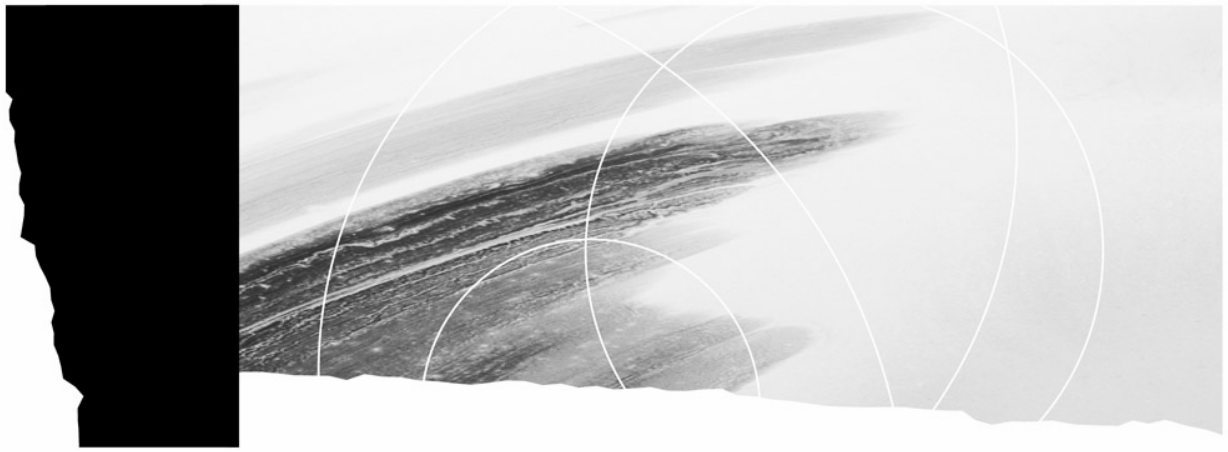
The Ministère de l'Éducation, du Loisir et du Sport harmonizes its vocational and technical programs by establishing similarities and continuity between secondary- and college-level programs within a particular sector or between sectors in order to avoid overlap in program offerings, to recognize prior 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 *Automobile Mechanics* program does not share any competencies with other programs at this time.



Part II

Objectives

The Trade and the Training Process	Code:	843401

Module 1 Duration 15 hours

Situational Objective

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.
- Be familiar with the effects of technological developments on the practice of the trade.
- Understand the program of study.
- Confirm their career choice.

Learning Context

Information Phase

- Learning about the job market in automobile mechanics.
- Learning about the nature, conditions and requirements of the job.
- Learning about professional ethics.
- Learning about different aspects of technological development and their impact on an automobile mechanic's work.
- Learning about the possibility of starting their own business.
- Participating in a group discussion about the advantages and requirements of the trade.

Participation Phase

- Learning about the program of study and the training process.
- Drawing parallels between the training offered and the job.
- Sharing their first impressions of the trade and the training process.
- Discussing possibilities of acquiring the versatility required to evolve in the trade or in related fields.
- Learning about continuing training.

Synthesis Phase

- Writing a report in which they:
  - assess their career choice by comparing the different aspects and demands of the trade with their own preferences, aptitudes and interests
  - describe their career objectives and expectations

The Trade and the Training Process	Code:	843401

Instructional Guidelines

- Create a pleasant atmosphere conducive to vocational integration.
- Encourage students to engage in discussions and express their opinions.
- Encourage students to participate actively in the suggested activities.
- Provide students with the means to assess their career choice honestly and objectively.
- Organize field trips to companies that are representative of the automotive trade or arrange meetings with trade specialists.
- Foster the desire to excel and develop.
- Encourage students to adopt attitudes and behaviours consistent with professional ethics.
- Make suitable reference material available to the students.
- Provide students with an outline of a report and help them write their own.

Participation Criteria

Information Phase

- Gather information on most of the topics to be covered.
- Express their impression of the trade, based on the information they have gathered.

Participation Phase

- Examine the reference material provided.
- Show an interest in the suggested activities.
- Express their impression of the program of study.

Synthesis Phase

- Write a report that:
  - explains their career choice, explicitly comparing the different aspects of the trade with their preferences, aptitudes and interests
  - addresses the potential of the trade to meet their expectations

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the learning context, the elements of the competency related to each phase as well as the instructional guidelines.

Information Phase

• Situate the competency in the training program.	Purpose of the competency Lesson plan Links with other competencies
• Follow the main rules governing group discussion.	Participation Observance of the topic and others' right to speak Attention to others Acceptance of diverging points of view
• Learn about the job market in automobile mechanics.	Types of companies, job prospects, remuneration, potential for advancement and transfer, hiring criteria

• Learn about the nature and requirements of the job.	Tasks and operations Skills, knowledge, attitudes and behaviours Professional ethics Rights and responsibilities of the parties involved
• Learn about the aspects of technological development that affect the practice of the trade.	New technologies, regulations, materials, etc.
• Give their opinion of the aspects of the trade revealed during a field trip to a company or a discussion with a trade specialist.	Perception of positive or negative aspects Emphasis on aspects of particular interest
Participation Phase	
• Study the training plan.	Program of study: competency-based approach, objectives, links between the modules Evaluation methods and the certification of studies
• Learn about technological watch.	Potential of continuing training Seminars; training offered by dealers, associations or other groups; etc.
• Explore related trades and occupations.	Specialties Heavy road vehicle or heavy equipment mechanics, agricultural mechanics, diesel and electronic control mechanics, customer support, parts sales, etc.
• Share their impressions of the trade, the program and its requirements.	Links between actual work activities and program competencies
Synthesis Phase	
• Write a report explaining their career choice.	Report outline provided by the teacher Determination of personal objectives Brief description of their preferences, aptitudes and interests Brief description of the requirements for practising the trade Brief conclusion

Health, Safety and Environmental Protection	Code:	843412

Module 2 Duration 30 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Avoid health, safety and environmental hazards.	• Working in a mechanical workshop • 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 the working environment • Determination of the appropriate means of controlling: – the way the shop is set up – work methods – tasks performed on the different systems of a vehicle – the use of electric and air tools and equipment – the handling of loads – the handling of products – the maintenance and storage of tools and equipment and the tidiness of the work area – the use of personal safety 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 their limitations • Determination of an effective method of communicating with: – emergency services – resource persons on site
	For the competency as a whole: • Adoption of safe behaviour at all times • Use of the appropriate terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Consult legislation respecting occupational health and safety in mechanics.	Act respecting industrial accidents and occupational diseases Manufacturing laws Method of consulting documents
• Establish the rights and responsibilities of the parties with respect to health and safety in a mechanical workshop.	Identification of those responsible and their roles Rights and responsibilities of the employer Rights and responsibilities of employees
• Learn about the possible effects of incidents or accidents on their physical and psychological safety.	Inhalation of toxic substances, burns, injuries, chilblains and occupational diseases Possible effects on mental health
• Understand the importance of maintaining a clean and orderly mechanical workshop.	Prevention of falling, stumbling, overturning equipment, dropping tools, spilling hazardous products, etc.
• Adopt safe behaviour when working on a vehicle.	Preventive measures related to: – the effects of chemicals on health and safety – using compressed air – using electric and air tools – using lifting and handling equipment – welding, cutting and heating – maintaining batteries – all other tasks
• Locate the safety devices in the mechanical workshop.	Location of emergency exits Location of first-aid kits, fire extinguishers, fire protection equipment, sources of water (emergency showers, eye douches, etc.), ventilation system controls, etc.
• Select the appropriate safety equipment for the job.	Collective safety equipment Personal protective clothing and accessories
• Consult legislation respecting environmental protection in mechanics.	Federal laws and regulations respecting environmental protection Provincial laws and regulations respecting volatile organic compounds (VOCs), halocarbons (substances detrimental to the ozone layer), alternative refrigerants, global warming, smog, etc. The Kyoto and Montréal protocols, etc.

• Adopt behaviour respectful of the quality of the environment when working on a vehicle.	Types of pollution produced by motor vehicles (direct and secondary) Effects of chemicals on the environment Basic principles for avoiding pollution Use, storage and disposal of greases, oils and solvents Use of halocarbons, fuels, oxidizing agents and gases Presence of exhaust fumes, etc.
• Consult WHMIS data sheets.	Pictograms Text
• Record emergency information.	Resources: medical personnel, ambulance technicians, firefighters, police officers, community organizations, etc.

Finding Technical Information	Code:	843423

Module 3 Duration 45 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Find technical information about motor vehicles.	• Using technical documentation in printed or electronic format • Using a computer and peripherals • In English and French

Elements of the Competency	Performance Criteria
1. Select reference materials.	• Determination of: – the purpose of the information search – the type of information required – the limits of the search • Determination of the appropriate information sources given the type of vehicle
2. Gather information in technical manuals.	• Efficient location of information • Appropriate interpretation of information • Determination of useful information
3. Gather technical information in electronic format.	• Observance of the method for importing files • Appropriate interpretation of information • Effective use of specialized software • Appropriate selection of information • Observance of the method for printing and transferring information
4. Search the Internet.	• Proper use of search engine • Efficient browsing • Appropriate selection of information • Observance of methods for saving and transferring data • Proper use of e-mail program • Creation of a brief list of useful sites
5. Identify in documentation the general characteristics of a motor vehicle.	• Accurate identification of the vehicle • Recognition of the main parts and systems • Accurate location of information about parts, systems and jacking points

For the competency as a whole:

- Appropriate use of research method
- Proper use of computer and hard copy
- Methodical recording of information
- Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• List different sources of technical documentation.	Documentation in printed or electronic format Manuals, guides and data sheets, catalogues, etc.
• Use a research method.	Identification of the context and scope of the search Planning Collection of information or data Analysis and selection of information Recording of essential information
• Use a computer, software and peripherals.	Methods of importing, saving, printing and archiving data, etc. Rules of ergonomics
• Locate information in reference documents.	Table of contents Categories of parts, materials, etc. Alphabetical and numerical order Special sections
• Understand the general meaning of technical texts in French.	English and French technical terminology Key words and the general meaning of sentences
• Identify motor vehicles.	Make, model and serial number Main characteristics
• Demonstrate professional conscience.	Observance of copyrights Precautions to preserve materials

Heating, Welding and Cutting	Code:	843433

Module 4 Duration 45 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Perform heating, welding and cutting operations.	• Working in a mechanical workshop • Working on materials used in automobile mechanics • Using tools and equipment • Using the necessary materials • Using technical documentation • Using personal and collective safety equipment

Elements of the Competency	**Performance Criteria**
1. Prepare the work.	• Appropriate preparation of welding station • Correct assembly of oxyacetylene welding station • Leaktightness of oxyacetylene welding station • Proper choice of: – welding tips – preventive measures • Appropriate adjustment of welding equipment • Complete disconnection of vehicle and accessory power supplies • Appropriate preparation of surfaces
2. Heat parts.	• Appropriate identification of metal • Proper application of heating techniques • Uniform heating
3. Weld metals.	• Appropriate choice of the type of weld based on: – the nature of the repair – the metals to be assembled – the forces exerted on the part • Proper preparation of the part • Proper application of welding techniques in the following positions: – horizontal – vertical – flat • Uniformity and resistance of the weld bead • Adequate penetration of the filler metal • Reasonable resistance of the weld bead
4. Cut metals.	• Appropriate application of cutting techniques • Regularity of drag lines • Clean cut

5. Disassemble the welding station.	• Careful handling of pressure valves and welding tips • Proper installation of caps on cylinder valves • Safe storage of tools and equipment • Clean tools and neat work area *For the competency as a whole:* • Observance of occupational health and safety rules and environmental protection measures • Appropriate use of welding equipment and tools • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Determine the job to be done given the type of material.	Characteristics of ferrous and nonferrous metals Characteristics of alloys Identification of materials to be welded, cut or heated Action of heat on metal Filler metals Cleaners and antioxidants
• Protect the vehicle and accessories.	Disconnection of battery, accessories, etc. Identification of danger points Alternative protective measures
• Assess the danger involved.	Dangers associated with the use of compressed gases, oxygen, acetylene and electricity Characteristics of oxidants and fuels Handling and storage of bottles Ventilation of the work area General characteristics of the work area Use of safety shields to protect the work area Use of personal safety equipment
• Use heating equipment.	Characteristics of equipment Choice of equipment Use of equipment Work techniques Health and safety rules

Heating, Welding and Cutting	Code:	843433

• Use welding stations.	Characteristics of equipment Selection of welding station (soldering, oxyacetylene welding, semi-automatic welding) Use of equipment Work techniques Health and safety rules
• Use cutting equipment.	Characteristics of equipment Selection of equipment (oxyacetylene cutting, plasma cutting) Use of equipment Work techniques Health and safety rules
• Maintain equipment.	Handling and storage of bottles Inspection of hoses and tips Storage of pressure valves Cleaning and replacement of tips Inspection of cart and accessories Minor repairs to hoses, electric cables and connectors

Shop Work	Code:	843445

Module 5 Duration 75 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Do shop work.	• Working in a mechanical workshop • Given instructions • Using the necessary tools, measuring instruments and equipment • Using materials and products • Using personal safety equipment
Elements of the Competency	**Performance Criteria**
1. Disassemble and reassemble a simple mechanical assembly.	• Proper choice of hand, electric and air tools • Proper choice of fasteners • Proper installation of fasteners • Quality of assemblies • Observance of sequence of operations
2. Take measurements in the imperial and metric systems of measurement.	• Appropriate choice of instruments • Careful handling of instruments • Accurate adjustment of instruments • Proper use of instruments • Accurate readings • Precise measurements • Accurate interpretation of measurements
3. Perform operations on ferrous and nonferrous metals at the workbench.	• Observance of cutting, drilling, filing, threading and tapping techniques • Quality of cuts • Successful extraction of a broken screw • Appropriate installation of threaded inserts
4. Use mechanical workshop equipment.	• Observance of work methods • Observance of capacity of equipment • Appropriate maintenance of equipment • Safe replacement of a grinding wheel
	For the competency as a whole: • Observance of occupational health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Accurate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Select work tools.	Names of the tools in a mechanic's toolbox and in a mechanical workshop, manual cutting tools, and measuring and control instruments Function of tools and instruments Applications with respect to the job
• Prepare the tools.	Inspection of tools and measuring and control instruments Adjustment and calibration, lubrication, sharpening, cleaning and minor repairs Attachment of accessories
• Select fasteners.	Identification, classification and coding of threaded and unthreaded fasteners Applications with respect to the job
• Use an effective disassembly and reassembly technique.	Visualization of the initial assembly Handling and cleaning of parts Organized arrangement of disassembled parts and fasteners Application of the sequence in reverse Torque and adjustments
• Use hand tools and measuring instruments.	Hand, electric and air tools Dial gauges, micrometer, vernier callipers, gauges (telescope, screw-pitch, feeler, etc.), rules, protractors, compass, etc. Capacities and limitations of tools and instruments Directions for use and work methods Precautions After-use maintenance and storage
• Select and use cutting tools.	Drill bits, blades, files, taps, dies, milling machines and reamers Characteristics, properties and rating Applications with respect to the job Capacities and limitations of tools Directions for use and work methods Precautions, after-use maintenance and storage
• Select and use extraction tools.	Identification of extractors Characteristics and properties Applications with respect to the job Capacities and limitations of tools Directions for use, work methods and sequence of operations Precautions, after-use maintenance and storage

Shop Work	Code:	843445

• Select and use mechanical workshop equipment.	Cleaning of equipment, hydraulic presses, vises and bench grinders Characteristics and properties Applications with respect to the job Capacities and limitations of equipment Preparation of equipment Directions for use Precautions and maintenance, including resurfacing of grinding wheels and storage of equipment
• Select and use lifting and handling equipment.	Automotive lift, floor jacks, stands, hoist, slings, supports, tools used to move batteries, etc. Characteristics and properties Applications with respect to the job Capacities and limitations of equipment Preparation of equipment Directions for use
• Maintain a compressed air distribution system.	Elements of a compressed air system Draining of tank and lines Inspection of filters, lubricators, oil level, leaktightness, hoses and connectors Control of supply pressure Corrective measures
• Adopt safe behaviour.	Use of personal safety equipment Safe work methods Use of products and solvents Recycling and storage of products Startup of an exhaust system

Communicating in the Workplace	Code:	843452

Module 6 Duration 30 hours

Situational Objective

Statement of the Competency

Establish interpersonal relationships at work.

Elements of the Competency

- Be familiar with the principles of communication.
- Communicate in a context related to the field of automobile mechanics.
- Establish cooperative relationships in a work team.
- Learn about their strengths and weaknesses with respect to their ability to communicate.

Learning Context

Information Phase

- Learning about the elements involved in the communication process.
- Listing communication difficulties and the factors that make effective communication possible.
- Learning about ways of working in a team.

Participation Phase

- Participating in learning contexts enabling them to apply the different communication techniques used in a mechanical workshop.
- Participating in learning contexts enabling them to adopt the appropriate attitudes and behaviours for dealing with different people.
- Participating in learning contexts enabling them to communicate by telephone with people in the field of mechanics.
- Participating in learning contexts enabling them to adopt the attitudes and behaviours needed to contribute effectively to a work team.

Synthesis Phase

- Learning about their strengths and weaknesses with respect to communication and teamwork.
- Writing a report on improvements to be made throughout the learning process.

Instructional Guidelines

- Provide the necessary documentation.
- Facilitate group discussion.
- Encourage students to express themselves and help students who have difficulty communicating.
- Provide the necessary support during activities.
- Foster the use of communication techniques within the group.
- Develop learning contexts representative of the workplace.
- Explain the importance of proper attire, cleanliness and general appearance.
- Provide an outline of a report and help the students write their own.

Participation Criteria

Information Phase

- Consult sources of information made available to them.

Participation Phase

- Participate actively in the different activities.
- Use strategies appropriate for communicating with people who work in automobile mechanics.
- Adopt attitudes and behaviours that foster cooperation in a work team.

Synthesis Phase

- Write a report on:
  - their strengths and weaknesses with respect to communication and teamwork
  - means of improving their weaknesses

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the learning context, the elements of the competency related to each phase as well as the instructional guidelines.

Information Phase

• Identify the elements involved in the communication process.	From the transmitter's point of view: language levels, message, construction, meaning and codes From the receiver's point of view: decoding of message, perception and interpretation of codes, feedback
• Identify the factors that influence communication.	Verbal and nonverbal language Perception and interpretation of message Positive behaviours: self-confidence, attentiveness, clarity, self-control, openness and responsiveness Negative behaviours: lack of attention, respect or tact; preconceived ideas; aggressiveness; confrontation; defensiveness; inappropriate language; etc.
• Identify the factors that influence teamwork.	Shared goals and objectives Concerted action and collaboration Positive behaviours: spirit of cooperation, attentiveness, openness, altruism, respect, active participation, etc. Negative behaviours: competitiveness, self-sufficiency, prejudice, subjectivity, confrontation, etc.

Participation Phase

• Deal with different types of people.	Clients, suppliers and subcontractors, colleagues, supervisors, etc. Personality types

• Take down information concerning a complaint.	Greeting technique Types of questions and reformulation Active listening Atmosphere of trust, politeness and tact
• Transmit technical information.	Answers to questions: explanation and justification of work done or needed, information and practical advice upon delivery of a vehicle, etc. Understandable, concise information Reassurance of client
• Deal with contingencies.	Reactions to pressure and irritants Handling of complaints, reactions to specific requests or demands, problem-solving, etc. Self-control, assurance, acceptance of diverging opinions and criticism, openness, etc.
• Communicate over the telephone.	Telephone etiquette: tone, pronunciation, concision and accuracy of information
• Communicate in a work team.	Types of questions used to obtain information Reformulation of points of agreement and disagreement in a discussion Reformulation of a message Constructive feedback Expression of their point of view Ways of dealing with emotional behaviour, etc.
Synthesis Phase	
• Evaluate their communication and teamwork abilities.	Honesty Positive criticism Self-acceptance

Inspecting Internal Combustion Engines	Code:	843465

Module 7 Duration 75 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Inspect internal combustion engines.	• Working in a mechanical workshop • Given a work order • Working on vehicles representative of those currently on the road • Using technical documentation • Using conventional and specialized tools • Using measuring and control instruments and equipment • Using products • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the technical information needed to inspect the engine.	• Selection of the appropriate information given the type of vehicle • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Do the inspection.	• Appropriate choice of control instruments and equipment • Thorough visual inspection • Accurate measurement of – compression – vacuum – oil pressure – cylinder leaks, etc. • Methodical recording of measurements on the work order
3. Make observations.	• Measurements checked against manufacturer's specifications • Appropriateness of observations: – engine in good condition – problems requiring maintenance or repair
4. Explain the results of the inspection.	• Clear information recorded on the work order • Appropriate explanation of observations • Proposal of solutions to the problems identified

For the competency as a whole:

- Use of logical diagnostic procedure
- Observance of health and safety rules and environmental protection measures
- Appropriate use of tools and instruments
- Methodical work
- Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of an internal combustion engine.	Types of internal combustion engines Work cycles of internal combustion engines Operating principles of lubrication, cooling and drive systems Main components of internal combustion engines and their characteristics, functions and interaction Composition and function of lubricants
• Consult different sources of technical information about internal combustion engines.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle and engine Location on the engine of the components and systems indicated in diagrams and technical drawings
• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection
• Select and use measuring instruments, equipment and control products.	Various gauges, leak detectors, pressure regulator, stethoscope, markers, ultraviolet light, etc. Calibration, adjustment and directions for use Precautions and maintenance
• Detect malfunctions using their senses.	Visual, auditory, olfactory and tactile acuity Observation of fluids Detection of leaks and signs of wear Detection of unusual sounds, etc.

• Report on their inspection.	Consultation of tables of symptoms Identification of nonconformities Conclusions Explanation of observations
• Issue a work order.	Recording and compilation of information throughout the process Essential elements Formatting and handwriting Reporting of final information Bilingual technical vocabulary
• Persevere in their research.	
• Adopt safe and environmentally friendly behaviour.	Consultation of occupational health and safety rules and environmental protection measures Dangers inherent in working on an engine Preventive measures

Repairing Internal Combustion Engines	Code:	843476

Module 8 Duration 90 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Repair internal combustion engines.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Using conventional and specialized tools • Using instruments and control equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Plan the work.	• Appropriate handling of the complaint • Determination of the action to take based on the nature of the repair • Identification of appropriate methods and specifications in technical documentation • Appropriate choice of tools and equipment
2. Disassemble an internal combustion engine.	• Observance of manufacturer's recommendations concerning the removal and disassembly of components • Proper cleaning of parts • Accurate identification of parts based on their position • Organized arrangement of parts
3. Inspect the components of the cylinder block and head.	• Thorough visual inspection of each part • Observance of the recommended inspection methods for each component • Appropriate choice of instruments and control equipment • Accurate measurement of each component • Accurate interpretation of the values obtained with respect to the manufacturer's specifications • Determination of the nature of the repair

4. Repair and replace components of the cylinder block and head.	• Proper application of manufacturer's recommendations • Finish of repaired surfaces in conformity with requirements • Conformity with specifications • Conformity of the valve face and leaktightness with requirements
5. Reassemble the internal combustion engine.	• Observance of manufacturer's recommendations and specifications concerning: – torque value and sequence – allowances and adjustments • Integrity of assemblies • Proper choice of sealants • Proper application of sealants • Proper installation of seals and rings
6. Inspect the engine after reassembly.	• Proper application of manufacturer's recommendations concerning: – fluid levels – the condition of external components and accessories – external leaks, etc. • Application of the appropriate corrective measures
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Appropriate adjustment of instruments • Careful handling of components • Clear report of work done • Clean, neat and thorough work • Well-developed sense of observation • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather the necessary information.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Identification of the characteristics of the type of engine
• Memorize the initial position of the disassembled components.	Codes Engraving or punching of reference points Location and position of components
• Recognize the importance of finding and observing the different manufacturers' recommended inspection sequences.	Identification and selection of information Visualization of the inspection process Development of professional integrity and autonomy
• Find the source and causes of the malfunctions identified.	Deductive method of identifying malfunctions: plausible hypotheses, investigation, cause and effect, and observations
• Transmit information about the engine.	Nature of the problems detected Type and scope of repairs Consequences Potential cost Explanation and justification of repairs Advice
• Use machining tools and equipment.	Valve, valve guide and valve seat refacing Cylinder reconditioning Installation and adjustment of the part on the machine Directions for use Inspection after machining Corrective measures
• Select and use tools.	Depending on the type of repair, vehicle and engine and the manufacturer's instructions Conventional and specialized tools Directions for use, adjustment and maintenance

• Select products.	Cleaners, sealants and lubricants Compatibility of products Possible chemical reactions Manufacturer's recommendations Replacement products Technological development
• Recognize the importance of quality.	Thoroughness, precision and cleanliness
• Adopt safe and environmentally friendly behaviour.	Work methods, handling of loads and use of products Organization of the work area Wearing of safety gear, etc.

Inspecting Road-Holding Systems	Code:	843484

Module 9 Duration 60 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Inspect road-holding systems.	• Working in a mechanical workshop • Given a work order • Working on vehicles representative of those currently on the road • Working on braking systems excluding antilock brakes • Working on different types of suspension and steering systems excluding computer-controlled systems • Using conventional and specialized tools • Using instruments and control equipment • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the technical information needed to inspect braking, suspension and steering systems.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Inspect brakes.	• Determination of inspections to be done based on: – the braking system – the manufacturer's recommendations • Thorough visual inspection of the system • Appropriate choice of instruments and control equipment • Accurate measurement of: – brake fluid level and quality – the travel of the brake pedal and the parking brake lever – the thickness, parallelism and warp of the rotors – the diameter of the brake drums – the thickness and condition of the brake linings • Appropriate verification of the related electrical circuits

3. Inspect suspension and steering systems.	• Determination of inspections to be done based on: – the suspension or steering system – the manufacturer's recommendations • Thorough visual inspection of systems • Appropriate choice of instruments and control equipment • Accurate measurement of: – the ground clearance of the vehicle – the wear on suspension and steering components • Appropriate verification of the related electrical circuits
4. Make observations.	• Measurements checked against manufacturer's specifications • Appropriateness of observations: – systems in good condition – problems requiring maintenance or repair
5. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Proper use of instruments and control equipment • Methodical recording of results on the work order • Concern for passenger safety • Clean work area • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of a conventional braking system.	Laws of physics related to friction, heat dissipation, masses in motion and inertia Types of brakes and their operating principles Components of brakes and their characteristics, functions and interaction Composition and function of brake fluids and lubricants Materials used in braking systems Kinematic chain and its effect on other systems
• Visualize the operation of a suspension system.	Laws of physics related to suspension systems Types of suspensions and their operating principles Main components and their characteristics, functions and interaction Visualization of suspension and steering angles and their movements Composition and function of lubricants Kinematic chain and its effect on other systems
• Visualize the operation of a steering system.	Laws of physics related to steering systems Types of steering systems and their operating principles Main components and their characteristics, functions and interaction Visualization of suspension and steering angles and their movements Understeering and oversteering Composition and function of power steering oils and lubricants Kinematic chain and its effect on other systems
• Consult different sources of technical information about braking, suspension and steering systems.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Identification of braking, suspension and steering systems and their components and controls Location on the vehicle of the components and systems indicated in diagrams and technical drawings

• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection
• Check system fluids.	Physical characteristics and properties of brake and power steering fluids Principles of hydraulics related to the systems Deductive search for the source and effects of contaminated fluids
• Select and use the appropriate measuring and control instruments for each system.	Appropriate measuring instruments for each system Control instruments for checking the suspension, the steering system and their angles Devices for cleaning, bleeding and inspecting brake fluids, hydraulic systems, etc. Calibration, adjustment and directions for use Precautions and maintenance
• Detect malfunctions using their senses.	Visual, auditory, olfactory and tactile acuity Observation of fluids Detection of leaks and signs of wear Special attention to brake dust Detection of unusual sounds Allowance for hidden defects, etc.
• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusions Explanation of observations
• Fill out the work sheets.	Inspection records and work orders Compilation of essential elements Formatting and handwriting Bilingual technical vocabulary and codes
• Bear in mind their responsibility with respect to the safety of people on the road.	Potential hazards as a result of poorly executed or omitted operations Normal and extreme driving conditions Quality requirements Compliance with standards Professional conscience

Repairing Road-Holding Systems	Code:	843496

Module 10 Duration 90 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Repair road-holding systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Working on braking systems excluding antilock brakes • Working on different types of suspension and steering systems excluding computer-controlled systems • Using conventional and specialized tools • Using instruments and control equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the information needed to make a diagnosis.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs
2. Locate the problem on the vehicle.	• Precise location of the systems involved in the complaint • Thorough visual inspection of the systems • Appropriate choice of instruments and control equipment • Accurate measurements • Comparison of the results of the inspection with tables of symptoms and diagnostic tables • Determination of the problem
3. Plan the repair.	• Determination of the appropriate actions • Clear explanation of the job • Appropriate choice of tools, instruments, equipment and products • Appropriate preparation of materials • Appropriate sequence of operations

4. Perform maintenance and repair operations on suspension, steering and braking systems.	• Proper application of methods for bleeding brakes and the power steering system • Appropriate use of methods for leakproofing components and lines • Proper adjustment of: – each system – wheel bearings • Appropriate lubrication of each system • Precise machining of braking system components • Appropriate cleaning of braking system
5. Replace components of the different systems.	• Proper application of manufacturer-recommended removal and reinstallation methods • Adjustments in conformity with requirements • Appropriate lubrication
6. Repair components.	• Proper application of manufacturer-recommended disassembly and reassembly methods • Appropriate cleaning of parts • Observance of inspection methods • Identification of defective parts • Appropriate replacement of defective parts • Accurate adjustments • Observance of torques
7. Inspect the system.	• Appropriate testing of systems • Quality control
8. Tidy up the work area.	• Appropriate storage of tools, equipment and products • Clean work area • Appropriate handling of products to be recycled
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, equipment and instruments • Clear explanation of work done on the work order • Clean, neat and thorough work • Appropriate use of English and French terminology • Repaired system in good working order

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a problem in a road-holding system.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Consideration of the characteristics of the system
• Identify on the vehicle the system involved in the complaint.	Identification of the type of vehicle and system Use of information gathered Application of information in diagrams and technical drawings to real-life situations Location on the vehicle of the system's main components
• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of inspection sequences to the system in question and its mechanical, electrical and electronic components Autonomous approach
• Find the source and causes of the malfunctions.	Tables of symptoms and algorithms Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations Logical deduction of hidden defects based on visible leads
• Transmit information about the defective systems.	Nature of the problems detected Type and scope of repairs Consequences Potential cost Explanation and justification of repairs Advice Information conveyed in understandable terms

• Select and use tools and equipment to repair braking, suspension and steering systems.	Devices for bleeding brakes Machine tools for turning rotors and brake drums Tools for flaring lines and controlling steering and suspension angles Oxyacetylene welding station Hydraulic and air instruments used to take measurements in the systems in question Conventional tools Directions for use and adjustments
• Select products.	Lubricants, brake fluids, power steering fluids and cleaners Characteristics, applications and directions for use
• Take the necessary precautions when working on braking, suspension and steering systems.	Brake dust, metal particles and broken springs Use of stands and supports
• Remove and reinstall components of suspension, steering and conventional braking systems.	Recommended sequences Diagrams Initial position of components Torque and adjustments Identification of possible contaminants
• Disassemble and reassemble system components.	Recommended sequences Diagrams Initial position of parts Torque and adjustments Identification of possible contaminants
• Keep the work area clean.	Precautions related to dust, grease, fluids, etc.
• Be aware of the impact of their actions on the use of the vehicle.	Passenger safety, driving pleasure, performance and lifespan of vehicle

Inspecting Electrical and Electronic Systems	Code:	843506

Module 11 Duration 90 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Inspect electrical and electronic systems.	• Working in a mechanical workshop • Given a work order • Working on vehicles representative of those currently on the road • Working on lighting, rear defrost, warning and heating systems and subsystems, excluding computer-controlled systems • Using measuring and control instruments and equipment • Using conventional tools • Using technical documentation • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the technical information needed to inspect electrical and electronic systems.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Do the inspection.	• Observance of the manufacturer-recommended inspection process • Thorough visual inspection of wiring harnesses, wires and connectors • Appropriate choice of control instruments and equipment • Proper use of tools, instruments and control devices • Observance of position and integrity of wiring harnesses and connectors • Methodical recording of results on the work order
3. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – systems in good condition – problems requiring maintenance or repair
4. Explain the results of the inspection.	• Clear information on the work order • Accurate explanation of observations • Appropriate solutions suggested

	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Respect for the vehicle's integrity • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the phenomena associated with the electrical and electronic systems of a motor vehicle.	Structure of matter Conductors, semiconductors and insulators Sources of electricity Nature and speed of electricity Ohm's law, laws related to power, magnetism and electromagnetism Applications of electricity in automobile mechanics
• Visualize the operation of the electrical and electronic circuits in a motor vehicle.	Direct current, series circuits, parallel circuits and series-parallel circuits Components, their characteristics and functions, and related phenomena Transformation of electrical energy into thermal energy Relationships between the gauge of a wire, the intensity of the current and the heat of the conductor
• Consult different sources of technical information about electrical and electronic circuits.	Methods of finding information in a variety of sources Manufacturer's manuals, diagrams or graphs Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Interpret electrical drawings and diagrams.	Path of current in a circuit Instructions for consulting and interpreting drawings and diagrams Symbols and codes Representation of electrical and electronic components Application of information in drawings and diagrams to real circuits Allowance for potential defects
• Establish an inspection sequence.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection

Inspecting Electrical and Electronic Systems	Code:	843506

• Locate the control points on the vehicle.	Use of drawings, diagrams, graphs Observance of inspection sequence Location of components, wiring harnesses, etc.
• Select and use tools, instruments and control devices.	Types of circuits and inspection Multimeter, ammeter, ohmmeter, signal lamp, jumper wires, etc. Analogue and digital devices Calibration, adjustment and directions for use Precautions and maintenance
• Do inspections using a voltage drop.	Measurement of a circuit's static and dynamic resistance Application to feeder circuits and grounds Gauge and code of conductor
• Detect malfunctions using their senses.	Visual and olfactory acuity Position and condition of wiring harnesses, connections and connectors; wear; etc.
• Validate the information gathered.	Consultation of manufacturer's recommendations Identification of nonconformities Conclusions Explanation of observations
• Issue a work order.	Recording and compilation of information Essential elements Formatting and handwriting Reporting of final information Bilingual technical vocabulary
• Demonstrate a concern for efficiency.	Curiosity and foresight Visualization of abstract phenomena

Repairing Lighting Systems	Code:	843514

Module 12 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Repair lighting systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Using conventional and specialized tools • Using control instruments and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to make a diagnosis.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs
2. Locate the problem on the vehicle.	• Accurate location of the circuit or component involved in the complaint • Observance of manufacturer-recommended inspection methods • Thorough visual inspection of the lighting system and components • Appropriate choice of control instruments and equipment • Accurate measurements • Appropriate inspection of the related electrical and electronic circuits • Accurate identification of the problem
3. Plan the repair.	• Determination of the appropriate actions • Clear explanation of the job • Appropriate choice of equipment, instruments, tools and materials • Appropriate sequence of operations

4. Replace lighting system components.	• Proper application of manufacturer-recommended removal and reinstallation methods • Respect for the system's and the vehicle's integrity
5. Repair wiring harnesses, cables and their components.	• Proper application of repair techniques • Proper use of specialized tools • Appropriate cleaning of contacts
6. Inspect the system.	• Appropriate testing of system • Appropriate verification of alignment of headlights • Appropriate corrective measures
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Clear explanation of work done on the work order • Well-developed sense of observation • Appropriate use of English and French terminology • Lighting system in good working order

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a problem in a lighting system.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Identification of the characteristics of the different types of lighting systems
• Identify on the vehicle the lighting circuit involved in the complaint.	Identification of the type of vehicle Interpretation of information gathered Application of information in electrical drawings and diagrams to a real-life situation Location on the vehicle of the main components of the circuit

• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Visualization of the inspection process Visualization of the operation of the system in question and its mechanical, electrical and electronic components Autonomous approach
• Transmit information about the defective circuit.	Clients and co-workers Nature of the problems detected Type and scope of repairs Explanation and justification of repairs
• Select and use tools and instruments.	Conventional and specialized tools Device used to check the adjustment of headlights and light meter Directions for use, adjustments and maintenance
• Remove and reinstall components of electrical circuits.	Recommended sequences Diagrams Initial position of components Adjustments and torque Handling of components
• Repair wiring harnesses and cables.	Splicing and soldering techniques Methods for insulating splices Installation of protective sleeves Crimping technique
• Show concern for quality.	Cleanliness, thoroughness, patience and perseverance

Inspecting Basic Computer-Controlled Systems	Code:	843524

Module 13 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Inspect basic computer-controlled systems.	• Working in a mechanical workshop • Given a work order • Working on vehicles representative of those currently on the road • Using tools • Using control instruments, devices and equipment including new technologies • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to inspect the systems.	• Selection of appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Plan the inspection.	• Determination of inspections to be done on: – the system and its sensors – the electrical and electronic circuits – the computers – the actuators • Appropriate choice of control and communications tools and instruments
3. Inspect sensors.	• Appropriate location of sensors • Thorough visual inspection of the system • Accurate measurement of: – voltages and resistances – allowances and spacing – the types of signals generated – signal signatures
4. Inspect electrical and electronic circuits.	• Accurate identification of type of circuit • Accurate location of circuit and its components • Accurate measurement of: – voltages and voltage drops – resistance – continuity

5. Inspect the vehicle's computers.	• Accurate location of computer to be inspected and its circuits • Accurate identification of malfunction codes • Methodical verification of input and output parameters
6. Inspect actuators.	• Accurate location of the system and its actuators • Thorough visual inspection of the system • Accurate measurement of: – voltages and voltage drops – resistance – continuity – the types of signals generated – signal signatures
7. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – circuits and components in good condition – problems requiring maintenance or repair
8. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, equipment and instruments • Observance of safety measures for working on computer-controlled systems • Appropriate use of tables of symptoms and diagnostic tables • Methodical recording of results on the work order • Appropriate use of English and French terminology • Cleanliness of work area

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of sensors.	Types of sensors, their operating principles and the related phenomena Components and their characteristics, functions and interaction Sensor materials Characteristics of the signals and waveforms generated
• Visualize the operation of computers.	Components of computers and their characteristics and functions (microprocessor, analogue-to-digital converters, different types of memory, internal clock, etc.) Data-processing principles and methods Means of communication Malfunction codes
• Visualize the operation of actuators.	Types of actuators, their operating principles and the related phenomena Actuators and their components, and their characteristics and functions Actuator materials Characteristics of the signals and waveforms that power them
• Recognize the types of circuits in a computer-controlled system.	Classification of types of circuits by function Gauge of wires, terminals, connectors and microconnectors Position of wiring harnesses
• Consult different sources of information about basic computer-controlled systems.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of type of vehicle Identification of elements of basic computer-controlled systems Location on vehicle of the different elements
• Plan their approach.	Inspection sequence Minor adaptations as a result of constraints Limits of the inspection

• Select and use tools, measuring instruments and control devices for computer-controlled systems.	Multimeters Communications and diagnostic devices Analogue and digital oscilloscope Calibration, adjustment and directions for use Connections Precautions and maintenance
• Detect malfunctions in components of computer-controlled systems.	Operating parameters Signal signature Condition of circuits and contacts, etc.
• Fill out the work sheet.	Essential elements Formatting and handwriting Bilingual technical vocabulary and codes
• Demonstrate professional conscience.	Impact of diagnosis on actions Atmosphere of trust Concern for detail

Inspecting Transmission Systems	Code:	843536

Module 14 Duration 90 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Inspect transmission systems.	• Working in a mechanical workshop • Given a work order • Working on vehicles representative of those currently on the road • Working on conventional clutches, manual and automatic gearboxes, differentials, transfer cases and drive shafts • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the information needed to inspect transmission assemblies.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Inspect: – clutch systems – manual gearboxes – differentials – transfer cases – drive shafts	• Determination of inspections to be done based on the type of transmission part • Thorough visual inspection of assemblies • Appropriate choice of tools and control instruments • Accurate measurements • Appropriate use of tables of symptoms and diagnostic tables • Appropriate inspection of related electrical, electronic, hydraulic and pneumatic circuits
3. Inspect automatic gearboxes.	• Determination of inspections to be done based on the type of automatic gearbox • Accurate identification of malfunction codes • Thorough visual inspection of the gearbox
4. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – parts in good condition – problems requiring maintenance or repair

5. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed *For the competency as a whole:* • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Appropriate use of tables of symptoms and diagnostic tables for each of the systems • Methodical recording of results on the work order • Appropriate use of English and French terminology • Clean work area

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of a clutch system.	Laws of physics related to inertia, torque, shear, friction, heat, centrifugal force and levers Operating principles of clutch systems and their controls Components of clutch systems and their characteristics, functions and interaction Kinematic chain of energy transmitted and foreseeable malfunctions Characteristics of fluids Contamination of components
• Visualize the operation of manual gearboxes.	Laws of physics related to torque, radial loads, axial loads, gear ratios and the force generated by work Types of manual gearboxes Operating principles of manual gearboxes and their controls Components and their characteristics, functions and interaction Shifting, synchronization and downshifting Classification, characteristics and functions of lubricants Kinematic chain of energy transmitted and foreseeable malfunctions

• Visualize the operation of automatic gearboxes and their assemblies.	Types of automatic gearboxes Operating principles of automatic gearboxes and their controls Components and their characteristics, functions and interaction Classification, characteristics and functions of fluids Kinematic chain of energy transmitted and foreseeable malfunctions Related hydraulic principles
• Visualize the operation of transfer cases.	Types of transfer cases Operating principles of transfer cases and their controls Components and their characteristics, functions and interaction Classification, characteristics and functions of fluids Kinematic chain of energy transmitted and foreseeable malfunctions
• Visualize the operation of drive shafts.	Types of drive shafts Operating principles of drive shafts Components and their characteristics, functions and interaction Classification, characteristics and functions of lubricants Kinematic chain of energy transmitted through the different types of drive shafts and its impact on other systems Effects of suspension and steering travel on the working angle of drive shafts and joints
• Consult different sources of information about transmission systems.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Identification of transmission parts, components and controls Location on the vehicle of parts and components indicated in diagrams and drawings
• Plan their approach.	Inspection sequence Minor adaptations as a result of constraints Limits of the inspection

Inspecting Transmission Systems	Code:	843536

• Check fluids.	Fluid composition and codes Characteristics, properties and functions Contamination of fluids Types and classification of lubricants and additives Deductive search for the source and effects of fluid contamination
• Select and use tools, measuring instruments and control equipment for the different systems.	Multimeter Control instruments for driveshaft angles, hydraulic pressure, etc. Diagnostic device Calibration, adjustment and directions for use Precautions and maintenance
• Detect malfunctions using their senses.	Olfactory, visual, auditory and tactile acuity Observation of fluids (level, contamination, odours) and the condition of electrical, hydraulic and vacuum circuits Detection of leaks, signs of wear and breakage Detection of unusual sounds Allowance for hidden defects, etc.
• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusion Explanation of observations
• Fill out the work sheets.	Inspection records and work order Compilation of essential elements Formatting and handwriting Bilingual technical vocabulary and codes
• Demonstrate professional conscience.	Sense of responsibility with respect to the high cost of repairs

Repairing Transmission Systems	Code:	843547

Module 15 Duration 105 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Repair transmission systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Working on conventional clutches • Working on manual and automatic gearboxes, transfer cases, differentials and drive shafts • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using recycling and recovery equipment • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to make a diagnosis.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs
2. Locate the problem in: – the clutch – the manual gearbox – the transfer case – the differential – the driveshaft	• Accurate location of the assemblies involved in the complaint • Thorough visual inspection of the assemblies and their control devices • Appropriate choice of control instruments and equipment • Accurate measurements • Results checked against tables of symptoms and diagnostic tables • Accurate identification of problem(s)
3. Plan the repair.	• Determination of the appropriate actions • Clear explanation of the job • Appropriate choice of tools, instruments, equipment and products • Appropriate preparation of materials • Appropriate sequence of operations

4. Replace components of different transmission systems.	• Proper application of manufacturer-recommended methods for removing and reinstalling components • Appropriate and accurate adjustment • Appropriate lubrication
5. Disassemble components.	• Observance of manufacturer-recommended disassembly methods • Appropriate cleaning of parts • Organized arrangement of parts • Observance of inspection methods • Detection of defective part
6. Perform maintenance and repair operations.	• Proper application of method for bleeding a hydraulic clutch • Appropriate use of methods for leakproofing components and lines • Appropriate adjustment of assemblies • Appropriate lubrication of assemblies • Proper replacement of parts or assemblies
7. Reassemble the components.	• Observance of manufacturer-recommended reassembly methods • Accurate adjustment • Appropriate lubrication
8. Work on an automatic gearbox.	• Appropriate inspection of oil for contaminants • Observance of removal and reinstallation methods • Leaktightness of gearbox and lines • Proper installation of gearbox • Accurate adjustment of external controls
9. Inspect the systems.	• Appropriate testing of assemblies • Quality control
10. Tidy up the work area.	• Appropriate storage of tools, equipment and products • Clean work area • Appropriate handling of products to be recycled

For the competency as a whole:

- Observance of health and safety rules and environmental protection measures
- Proper use of tools, instruments and equipment
- Observance of torque
- Well-developed sense of observation
- Clean, neat and thorough work
- Clear explanation of work done on the work order
- Appropriate explanation of the job
- Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a problem in a transmission assembly.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Identification of the defective system and its characteristics
• Identify on the vehicle the system or assembly involved in the complaint.	Identification of the type of vehicle, system or transmission assembly Application of information in diagrams and technical drawings to real-life situations Location of major parts on the vehicle and transmission system
• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of the sequence to the operation of the system in question and its mechanical, electrical and electronic components
• Find the source and causes of the malfunctions.	Tables of symptoms and algorithms Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations Logical deduction of hidden defects based on visible leads

• Transmit information about the defective system or assemblies.	Nature of the problems detected Type and scope of repairs Consequences Potential cost Explanation and justification of repairs Advice Information conveyed in understandable terms
• Select and use tools, instruments and equipment to repair and maintain transmission systems and assemblies.	Specialized tools Electrical, electronic and mechanical measuring instruments Devices for recycling, recovering or replacing fluids Conventional tools Directions for use and adjustments Capacity of extractors and hydraulic press
• Select products.	Lubricants, additives, cleaners and sealants Characteristics and uses of products
• Remove and reinstall transmission components or assemblies.	Recommended sequences Appropriate work methods Initial position of components Torque and adjustments Identification of possible contaminants
• Recognize the importance of quality.	Thoroughness, precision and cleanliness
• Adopt safe and environmentally friendly behaviour.	Work methods, handling of loads, use of products, organization of work area, use of safety equipment, etc.

Inspecting Starting and Charging Systems and Electromagnetic Accessories	Code:	843555

Module 16 Duration 75 hours

Behavioural Objective

Statement of the Competency

Inspect starting and charging systems and electromagnetic accessories.

Achievement Context

- Working in a mechanical workshop
- Given a work order
- Working on vehicles representative of those currently on the road
- Working on starting and charging systems including computer-controlled systems and batteries
- Working on conventional and computer-controlled electromagnetic accessories such as:
  - windshield wipers
  - electric windows and door locks
  - dashboard indicators
  - warning signals
  - rear defrost
- Using conventional and specialized tools
- Using control instruments and devices including new technologies
- Using materials and products
- Using technical documentation
- Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to inspect starting and charging systems and electromagnetic accessories.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs

2. Do the inspection.	• Determination of inspections to be done based on: – the systems or accessories – their controls – the manufacturer's recommendations • Appropriate use of tables of symptoms and diagnostic tables • Thorough visual inspection of systems and electromagnetic accessories • Appropriate choice of tools, instruments and control equipment • Appropriate control of electrical circuits and the related components • Accurate measurement of: – resistance – intensity – voltage – voltage drops – current drains • Methodical recording of measurements on the work order
3. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – circuits, systems and components in good condition – problems requiring maintenance or repair
4. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole: • Use of logical diagnostic procedure • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Methodical and organized work • Appropriate use of English and French terminology • Cleanliness of work area

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of a starting system.	Laws of physics related to magnetism and electromagnetism Principles of electricity and chemistry associated with batteries Operating principles of the system Main components of a battery, starter, solenoids and coils, and their characteristics, functions and interaction Component materials Circuits, connections and safety devices in a starting system Current drains
• Visualize the operation of a charging system.	Principles of induction, electromagnetism, alternating current and continuous rectification Main components of an alternator and their interaction Charging and control circuits and their characteristics, functions and operating principles
• Visualize the operation of electromagnetic accessories.	Principles of induction, electromagnetism, magnetism, thermal resistance, etc. Operating principles of analogue and digital dashboard instruments, transmitters, light indicators, dial gauges, buzzers, etc. Electrical and mechanical operating principles of actuators, motors and mechanisms related to the different electromagnetic accessories Electrical circuits and computer-controlled parameters
• Consult different sources of technical documentation about starting and charging systems and electromagnetic accessories.	Methods of finding information in a variety of sources Parts catalogues, manufacturer's manuals, technical guides, diagrams or technical drawings Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Identification of starting systems, charging systems or electromagnetic accessories Conformity of the battery with standards and codes Location on the vehicle of electrical components, systems and circuits in the documentation

• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection
• Select and use tools, measuring instruments and control equipment for starting and charging systems and electromagnetic accessories.	Tools, instruments and control equipment to verify the condition and charging capacity of the battery, systems and electromagnetic accessories Test benches to verify the performance of starters and alternators Calibration, adjustment and directions for use Precautions and maintenance
• Adopt safe behaviour.	Preventive and safety measures for working on vehicles and batteries
• Select products.	Cleaners for batteries and terminals
• Detect malfunctions using their senses.	Visual and auditory acuity Detection of unusual sounds Observation of the electrolyte Allowance for hidden defects
• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusions Explanation of observations
• Fill out the work sheets.	Inspection records and work order Compilation of essential elements Formatting and handwriting Bilingual technical vocabulary and codes

Repairing Starting and Charging Systems and Electromagnetic Accessories	Code:	843565

Module 17 Duration 75 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Repair starting and charging systems and electromagnetic accessories.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Working on starting and charging systems including computer-controlled systems • Working on conventional and computer-controlled electromagnetic accessories such as: – windshield wipers – electric windows and door locks – dashboard indicators – warning signals – rear defrost • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to inspect systems and accessories.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs
2. Locate the problem on the vehicle or in the assembly.	• Accurate identification of the system or assembly involved in the complaint • Thorough visual inspection of the components and circuits • Appropriate choice of measuring instruments and control devices • Accurate measurements • Appropriate inspection of the related electrical and electronic circuits • Comparison of the results of the inspection with tables of symptoms and diagnostic tables • Determination of the problem

3. Plan the repair.	• Determination of appropriate actions • Clear explanation of the job • Appropriate choice of tools, equipment and products • Appropriate preparation of materials • Appropriate sequence of operations
4. Replace components.	• Proper application of manufacturer-recommended methods for removing and installing components • Adjustments in conformity with requirements
5. Perform repair operations on: – systems – system components – electromagnetic accessories	• Proper application of manufacturer-recommended disassembly and reassembly methods • Observance of manufacturer-recommended repair methods • Precise application of techniques for repairing wiring harnesses, cables and terminals • Adjustments and torques in conformity with manufacturer's recommendations • Proper positioning of wiring harnesses and terminals • Proper replacement of component parts
6. Inspect the systems after repair.	• Appropriate testing of system • Quality control
7. Tidy up the work area.	• Appropriate storage of tools, equipment and products • Clean work area • Appropriate handling of products to be recycled
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Proper use of tools, instruments and equipment • Well-developed sense of observation • Clean, thorough and organized work • Clear explanation of work done on the work order • Accurate use of English and French terminology • Repaired system in good working order

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a problem in a starting or charging system or an electromagnetic accessory.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Identification of the characteristics of the systems and components involved in the complaint
• Locate on the vehicle the system or assembly involved in the complaint.	Identification of the type of vehicle and system involved in the complaint Application of information in diagrams and technical drawings to real-life situations Location of each major component on the vehicle and in the different systems
• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of inspection sequence to the system in question and its mechanical, electrical and electronic components
• Find the malfunction in the system, accessory or component.	Tables of symptoms and algorithms Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations
• Transmit information about the defective system, accessory or component.	Nature of the problems detected Type and scope of repairs Consequences Explanation and justification of repairs Advice Information conveyed in understandable terms
• Select and use the tools, instruments and equipment to repair and maintain systems.	Conventional tools and tools specific to the types of vehicles in question Scan tool and electrical, electronic and mechanical measuring instruments Adjustments and directions for use
• Remove and reinstall components.	Recommended sequences Appropriate work methods Initial position of components Torque and adjustments

• Disassemble and reassemble system and accessory components.	Recommended sequences Appropriate work methods Initial position of components Torque and adjustments Identification of possible contaminants
• Recognize the importance of quality.	Thoroughness, precision and cleanliness

Inspecting Engine and Passenger Compartment Temperature Control Systems	Code:	843573

Module 18 Duration 45 hours

Behavioural Objective

Statement of the Competency

Inspect engine and passenger compartment temperature control systems.

Achievement Context

- Working in a mechanical workshop
- Given a work order
- Working on vehicles representative of those currently on the road
- Working on manually controlled cooling, heating and air conditioning systems and subsystems
- Using conventional and specialized tools
- Using control instruments, devices and equipment including new technologies
- Using materials and products
- Using technical documentation
- Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the technical information needed to inspect cooling, heating and air conditioning systems.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs • Appropriate consultation of the data sheet for the refrigerant used
2. Do the inspection.	• Determination of inspections to be done based on: – the system – the manufacturer's recommendations • Appropriate choice of instruments and control equipment • Thorough visual inspection of systems • Accurate measurement of: – the operation of the thermostat – the density and condition of the antifreeze – the cooling temperatures – pressures – leaks • Accurate identification of type of refrigerant • Methodical inspection of engine and passenger compartment temperature controls • Methodical recording of measurements on the work order

3. Make observations.	• Measurements checked against manufacturer's specifications • Accurate evaluation of performance of systems • Appropriate observations: – systems in good condition – problems requiring maintenance or repair
4. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole: • Use of logical diagnostic procedure • Observance of health and safety rules and environmental protection measures • Appropriate use of instruments and control equipment • Methodical and organized work • Perseverance in their research • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of an air conditioning system.	Vaporization, evaporation and liquefaction processes Effect of pressurization on the temperature of a liquid or gas Main components and their characteristics, functions, interaction and component materials System controls
• Visualize the operation of cooling and heating systems.	Physical principles related to the motion of hot and cold fluids Methods of transferring engine heat to the cooling system Air, conventional and inverted systems Operating principles of the systems Main components and their characteristics, functions, interaction and component materials System controls

• Consult different sources of technical documentation about air conditioning, cooling and heating systems.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Identification of air conditioning, heating and cooling systems and their components and controls Location on the vehicle of components and systems indicated in diagrams and technical drawings
• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection
• Check antifreeze.	Acidic solutions and electrolytic corrosion Formation of scale and oxidation Types of antifreeze and their density controls Contaminants Recovery and recycling of antifreeze Explanation of observations
• Select and use the measuring instruments and equipment needed to diagnose the problem.	Devices used to identify refrigerants, recycle antifreeze and refrigerants, and detect leaks Diagnostic tools Calibration, adjustment and directions for use Precautions and maintenance
• Consult legislation respecting halocarbons.	Objectives of regulations and codes Physicochemical properties of R-12 and R-134 halocarbons Hazards for people and the environment Contaminants Recovery and recycling of gases Standards Refrigerant control register
• Select lubricants for the air conditioning system.	Types of lubricants Characteristics, properties and classification Compatibility Hygroscopicity of lubricants
• Detect malfunctions using their senses.	Visual, auditory and olfactory acuity Observation of fluids Detection of leaks and signs of wear Detection of unusual sounds, etc.

• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusions Explanation of observations
• Issue a work order.	Recording and compilation of information throughout the process Essential elements Formatting and handwriting Reporting of final information Bilingual technical vocabulary
• Understand the importance of working methodically.	Planning, work methods and sequence of operations Manufacturer's recommendations
• Demonstrate a concern for respecting the quality of the environment.	HFCs and other refrigerants Antifreeze

Maintaining and Repairing Engine and Passenger Compartment Temperature Control Systems	Code:	843583

Module 19 Duration 45 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Maintain and repair engine and passenger compartment temperature control systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Working on cooling and heating systems and subsystems • Activities limited to preventing and repairing leaks in an air conditioning system • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to make a diagnosis.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs
2. Locate the problem on the vehicle.	• Accurate identification of the systems involved in the complaint • Thorough visual inspection of the systems • Appropriate choice of control instruments and equipment • Accurate measurements • Appropriate inspection of the related electrical and electronic circuits • Comparison of the results of the inspection with tables of symptoms and diagnostic tables • Accurate identification of the problem

3. Plan the maintenance and repairs.	• Determination of appropriate actions • Clear explanation of the job • Appropriate choice of tools, equipment and products • Appropriate preparation of materials and products • Appropriate sequence of operations
4. Repair cooling and heating systems.	• Observance of manufacturer-recommended methods for replacing components • Proper application of repair techniques • Observance of tolerances • Quality assemblies • Proper application of methods for repairing leaks • Proper use of tools
5. Maintain cooling and heating systems.	• Belt adjustments in conformity with specifications • Observance of proportions of water and antifreeze • Proper use of cleaning and recycling devices
6. Repair leaks in an air conditioning system.	• Detection of refrigerant leaks • Proper use of devices for repairing air conditioning systems • Observance of manufacturer-recommended methods for recovering and recycling refrigerants • Appropriate replacement of parts • Leaktightness of system • Observance of manufacturer-recommended methods for draining and filling the air conditioning system
7. Inspect the systems after repair.	• Appropriate testing • Quality control
8. Tidy up the work area.	• Appropriate storage of tools, equipment and products • Clean work area • Appropriate handling of products to be recycled

For the competency as a whole:

- Observance of health and safety rules and environmental protection measures
- Appropriate use of tools, instruments and equipment
- Observance of torque
- Clear explanation of work done on the work order
- Careful handling of vehicle and equipment
- Well-developed sense of observation
- Appropriate use of English and French terminology
- Repaired system in good working order

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about problems in cooling, heating and air conditioning systems.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Identification of the characteristics of the type of system
• Locate on the vehicle the system involved in the complaint.	Identification of the type of vehicle and system Interpretation of the information gathered Application of information in diagrams and technical drawings to real-life situations Location of major parts on the vehicle
• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of inspection sequence to the system in question and its mechanical, electrical and electronic components Autonomous approach
• Find the source and causes of the malfunctions.	Tables of symptoms and algorithms Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations Logical deduction of hidden defects based on visible leads

• Transmit information about the defective system.	Nature of the problems detected Type and scope of repairs Consequences Potential cost Explanation and justification of repairs Advice
• Select and use tools and equipment for air conditioning, cooling and heating systems.	Tools for checking the density and acidity of antifreeze and the leaktightness of systems Tools for checking the performance of the cooling and heating systems Device used to identify refrigerants Measuring instruments for mechanical, electrical and electronic components Equipment used to drain, recover, recycle and top up coolants and refrigerants Conventional repair tools Directions for use and adjustments Precautions and maintenance
• Select products.	Cleaners, lubricants, antifreeze and sealants Characteristics and applications of products Directions for use
• Consult current legislation.	Regulations respecting halocarbons and volatile organic compounds (VOCs) Keeping of a halocarbons register
• Remove and reinstall components of cooling and heating systems.	Recommended sequences Initial position of components Torque and adjustments Identification of possible contaminants
• Show concern for quality.	Cleanliness, methodical work and precision Integrity of vehicle after the job
• Adopt safe and environmentally friendly behaviour	Integration of safety and environmental protection measures into their work methods and habits

Inspecting Active and Passive Safety Systems	Code:	843593

Module 20 Duration 45 hours

Behavioural Objective

Statement of the Competency

Inspect active and passive safety systems.

Achievement Context

- Working in a mechanical workshop
- Given a work order
- Working on vehicles representative of those currently on the road
- Working on active and passive safety systems limited to:
  - antilock brakes and dynamic stability and traction control systems
  - energy-absorbing steering columns
  - air bags and seat belts
  - dealer antitheft systems and vehicle immobilizers
- Using conventional and specialized tools
- Using control instruments, devices and equipment including new technologies
- Using materials and products
- Using technical documentation
- Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to inspect active and passive safety systems.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs

2. Do the inspection.	• Determination of inspections to be done based on: – the system – the manufacturer's recommendations • Location of components, connectors and wiring harnesses on the vehicle • Thorough visual inspection of systems • Appropriate choice of tools, instruments and control equipment • Measurements of the following in conformity with manufacturer's recommendations: – system components – wiring harnesses • Accurate identification of information provided by the scan tool • Methodical recording of measurements on the work order
3. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – system components in good condition – problems requiring maintenance or repair
4. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question and on other systems • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole: • Use of logical diagnostic procedure • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Strict observance of the manufacturer's instructions regarding air bags • Methodical and organized work • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of antilock brakes and traction control.	Application of knowledge and know-how related to the operation of the braking system Principles related to inertia, kinetic energy and friction on different road surfaces Antilock, stability and traction control, and dynamic stability and traction control systems and their operating principles Understeering and oversteering Components and their characteristics, functions and interaction Computer control and strategies Integrated or aftermarket systems Categories of active and passive systems Indicators and controls
• Visualize the operation of air bags and seat belts.	Power, steering, speed, point and speed of impact Main components and their materials, characteristics, functions, operating principles and interaction Categories, location and deployment of air bags Design, construction and position of steering column parts Anchor points, retractors, antilock or tension mechanisms, loops and electric or electronic circuits Indicators and controls
• Visualize the overall operation of an antitheft system or vehicle immobilizer.	Main components and their characteristics, functions, operating principles and interaction Design of antitheft systems and vehicle immobilizers and position of components Indicators, controls, circuits and computer control
• Consult different sources of technical documentation.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings, etc. Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle and safety systems and their components and controls Location on the vehicle of the different components and systems indicated in diagrams and technical drawings

• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection
• Take the necessary preventive measures for working on active and passive safety systems.	Disarming of systems, depressurization of high pressure accumulators, precautions against electrostatic discharges, etc.
• Select and use the tools, devices and measuring and control instruments for the different systems.	Multimeter Specialized tools including control instruments for air bag or seat belt simulators and hydraulic pressure gauges New diagnostic technology Calibration, adjustment and directions for use Precautions and maintenance
• Do tests.	Safety belts, antilock braking systems, traction control, antitheft systems and vehicle immobilizers
• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusions Explanation of observations
• Issue a work order.	Recording and compilation of information throughout the process Essential elements Formatting and handwriting Reporting of final information Bilingual technical vocabulary
• Demonstrate professional conscience.	Marked concern for passenger safety

Repairing Active and Passive Safety Systems	Code:	843604

Module 21 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Repair active and passive safety systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Working on active and passive safety systems limited to: – antilock brakes and dynamic stability and traction control systems – energy-absorbing steering columns – air bags and seat belts – dealer antitheft systems and vehicle immobilizers • Using conventional and specialized tools • Using measuring and control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to make a diagnosis.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs

2. Locate the problem on the vehicle.	• Precise location of the systems involved in the complaint • Thorough visual inspection of the components or systems in question • Appropriate choice of control instruments and equipment • Inspection of the system and its components in conformity with manufacturer's recommendations: – malfunction codes – parameters – measurements • Appropriate inspection of the related electrical and electronic circuits • Accurate identification of problems
3. Plan the repair.	• Determination of appropriate actions • Clear explanation of the job • Appropriate choice of tools, equipment and products • Appropriate preparation of materials • Appropriate sequence of operations
4. Replace components of different systems.	• Observance of methods for disarming air bags and depressurizing accumulators • Proper application of manufacturer-recommended methods for removing, reinstalling and bleeding components • Adjustments in conformity with requirements • Careful handling of components
5. Repair circuits.	• Observance of manufacturer-recommended repair methods • Appropriate cleaning of electrical contacts
6. Inspect the system after repair.	• Appropriate testing of systems • Quality control
7. Tidy up the work area.	• Appropriate storage of tools, instruments, equipment and products • Proper handling of parts posing a risk in terms of their: – storage – return – disposal • Clean work area

For the competency as a whole:

- Observance of health and safety rules and environmental protection measures
- Proper use of tools, instruments and equipment
- Methodical and organized work
- Clear explanation of work done on the work order
- Accurate use of English and French terminology
- Repaired system in good working order

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a problem in an active or passive safety system.	Strategies for communicating with clients and the work team Consultation of the work order Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consultation of the different sources of technical information Identification of the characteristics of the system in question
• Locate on the vehicle the system involved in the complaint.	Identification of the type of vehicle and system Application of information in diagrams and technical drawings to real-life situations Location of the system's major components and wiring harnesses on the vehicle
• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of inspection sequence to the system in question and its mechanical, electrical and electronic components Symptoms and malfunction codes
• Find the source and causes of the malfunctions.	Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations Logical deduction of hidden defects based on visible leads
• Transmit information about the defective systems.	Nature of the problems Type and scope of repairs Consequences Explanation and justification of repairs Advice Information conveyed in understandable terms

• Select and use the tools and equipment to repair active and passive safety systems.	Specialized tools, torque wrenches, hydraulic pressure gauges and tools for working on electrical components Scan tool, oscilloscopes, terminal boards, multimeters, etc. Wrist straps or antistatic mats Adjustments and directions for use Precautions and maintenance
• Remove and reinstall components on active and passive safety systems.	Diagrams Recommended sequences Initial position of components Torque, adjustments, alignment, bleeding, etc. Identification of possible contaminants
• Realize the impact of their actions on the use of the vehicle.	Mechanic's responsibility with respect to the work done Consultation of standards and regulations issued by the Ministère des transports and other sources

General Automobile Maintenance	Code:	843614

Module 22 Duration 60 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Do general maintenance on a motor vehicle.	• Working in a mechanical workshop • Given an inspection record or a work order • Working on vehicles representative of those currently on the road • Inspecting all of the vehicle's systems • Working on the exhaust system, battery, tires, belts, fluids and body parts • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the information needed to do maintenance on the vehicle.	• Selection of the appropriate information given the type of vehicle • Accurate location of manufacturer-recommended maintenance procedures • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs • Accurate interpretation of information in safety pictograms
2. Plan the work.	• Determination of the sequence of operations • Clear explanation of the job • Appropriate choice of tools, instruments, equipment and products
3. Prepare the vehicle.	• Accurate location of jacking points • Proper installation of the vehicle on the lift • Appropriate draining of fluids • Appropriate removal of contaminated components • Safe recovery of fluids and contaminated components

4. Detect malfunctions while doing the general maintenance.	• Thorough visual inspection of the vehicle • Accurate reading of measurements • Clear communication of the results of the inspection to the client • Appropriate recommendations concerning the work needed
5. Perform lubrication operations.	• Proper application of draining methods • Appropriate replacement of oil filters • Precise topping up of fluids • Appropriate lubrication of body parts • Minor repairs to stop lubricant leaks
6. Do maintenance work on the entire vehicle.	• Proper replacement and adjustment of belts • Proper replacement of exhaust system components • Accurate adjustment of body parts • Appropriate cleaning of battery terminals, posts and unit • Appropriate verification of state of charge • Proper application of boosting method • Replacement of battery in conformity with manufacturer's recommendations
7. Do maintenance work on the wheels.	• Proper replacement of wheels on rims and mag wheels • Proper repair of air leaks • Tire rotation in conformity with recommendations • Precise balancing of wheels • Proper installation of wheels on vehicle
8. Fill out the maintenance records.	• Maintenance sticker filled out and affixed to the vehicle • Clear and accurate communication of the results of the inspection and the maintenance work done • Appropriate recommendations concerning follow-up
9. Tidy up the work area.	• Storage of all tools, equipment and products • Appropriate recovery of products to be recycled

For the competency as a whole:

- Observance of health and safety rules and environmental protection measures
- Appropriate use of tools, instruments and equipment
- Proper performance of maintenance operations
- Appropriate tests
- Appropriate use of English and French terminology
- Observance of professional ethics

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Locate information on the vehicle and in the documentation.	Identification of the type of vehicle Pictograms related to safety measures and warnings Manufacturer's recommended inspection sequences Manufacturer recommendations for the topping up of fluids, lubrication and adjustments, etc.
• Apply safety measures when doing general maintenance on a vehicle.	Lifting and handling Working on air bags, antilock brakes, air conditioning systems, catalytic converters, batteries, etc. Handling, removal and installation of tires Balancing of wheels Use of hazardous and toxic products
• Use handling equipment.	Lift, floor jacks, stands, supports, tool used to move batteries, etc.
• Detect problems with the vehicle using their senses.	Visual, auditory, olfactory and tactile acuity Leaks; breakage; wear; dryness; condition and level of the different fluids; operating problems in the suspension, steering, braking, exhaust, cooling, transmission and lighting systems; condition of the battery, cables and terminals; etc.
• Observe the different manufacturers' recommended inspection sequences.	Inspection records Visualization of the inspection processes Measurements and readings for the different systems and components of the vehicle
• Select replacement parts.	Exhaust parts, battery and filters, and their characteristics and codes

General Automobile Maintenance	Code:	843614

• Select products.	Classification of oils and greases Characteristics, codes and compatibility of lubricants
• Select tires.	Characteristics and classification of tires
• Perform lubrication operations.	Quantities Technique for applying each type of lubricant Directions for using lubricating, draining and recycling equipment
• Transmit information about the results of the inspection.	Nature of the problems detected Type and scope of repairs or maintenance Potential cost Explanation and justification of diagnosis Prevention of eventual problems Advice
• Replace defective components.	Types of wheels and belts, system parts and battery Initial position of components Disassembly and reassembly sequences Cleaning Torque and adjustments Oxyacetylene welding operations
• Make minor adjustments to the body.	Hood, doors, windows, trunk, tailgate, wipers, etc.
• Select and use the equipment needed to maintain wheels.	Equipment used to remove, install and rotate tires; torque bolts in the proper order and balance wheels Repair of flats Characteristics of weights Products used to ensure leaktightness
• Realize the impact of their actions on the use of the vehicle.	Passenger safety, driving pleasure, performance and lifespan of the vehicle
• Demonstrate a sense of responsibility.	Efficiency, autonomy, concern for a job well done Cleanliness of vehicle upon delivery
• Observe professional ethics.	Language, appearance, communication with clients, professionalism, honesty, etc.

Inspecting Electronic Ignition Systems	Code:	843624

Module 23 Duration 60 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Inspect electronic ignition systems.	• Working in a mechanical workshop • Given a work order • Working on vehicles representative of those currently on the road • Using conventional and specialized tools • Using instruments and measuring and control equipment for ignition systems • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the technical information needed to inspect electronic ignition systems.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Inspect electronic ignition systems.	• Determination of inspections to be done based on: – the system and its controls – the manufacturer's recommendations • Thorough visual inspection of the systems • Appropriate choice of tools, instruments and control devices • Accurate measurement of: – supply and reference voltages – component resistances – sensor signatures – spark duration and voltage – electrode allowances on the spark plugs – timing • Accurate inspection of: – conformity of parts with specifications – ignition timing • Accurate recording of measurements on the work order
3. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – system in good working order – problems requiring maintenance or repair

4. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the engine • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole:
	• Use of logical diagnostic procedure • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and devices • Methodical and organized work • Clean work area • Appropriate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize combustion in a gas engine.	Composition of fuels on the market and their influence on combustion Characteristics of additives and reconstituted gasoline Fuel/oxidant ratio Fire points Kinematic chain of combustion Impact of compressing the mixture in a cylinder Types of combustion (autoignition, preignition, detonation, etc.)
• Visualize the operation of ignition systems.	Ignition systems: conventional, electronic with or without a distributor, with spark plug coils Primary and secondary circuits and their operating principles Control circuits, mechanical and electronic components, and their characteristics, functions, operating principles and interaction Timing, initial timing and ignition advance Spark plugs: characteristics, codes and heat range Potential defects
• Consult different sources of documentation about ignition systems.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings, etc. Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text

Inspecting Electronic Ignition Systems	Code:	843624

• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Identification of ignition systems and their components and controls Location on the vehicle of the different components and systems in the documentation
• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Limits of the inspection
• Detect malfunctions using their senses.	Visual and auditory acuity Observation of spark plugs, voltage leaks, electrical circuits and vacuum Detection of unusual noises Allowance for hidden defects, etc.
• Select and use the tools, measuring instruments and control devices for ignition systems.	Multimeter, timing lights, spark plug tester, portable digital and automotive oscilloscopes, specialized tools, scanner, etc. New technology diagnostic devices Calibration, adjustment and directions for use Precautions and maintenance
• Take preventive measures when working on ignition systems.	Prevention of electric shock and fire Prevention of component damage
• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusion Explanation of observations
• Fill out the work sheets.	Essential elements Formatting and handwriting Reporting of final information Bilingual technical vocabulary and codes
• Demonstrate perseverance in their search for defects.	

Repairing Electronic Ignition Systems	Code:	843634

Module 24 Duration 60 hours

Behavioural Objective

Statement of the Competency	**Achievement Context**
Repair electronic ignition systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	**Performance Criteria**
1. Gather the information needed to make a diagnosis.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of methods and specifications recommended by the manufacturer • Accurate interpretation of diagrams
2. Locate the problem on the vehicle.	• Accurate location of the components involved in the complaint • Thorough visual inspection of the ignition system controls, circuits and components • Appropriate choice of control instruments and equipment • Inspection of the system and its components in conformity with manufacturer's recommendations: – malfunction codes – parameters – measurements • Accurate identification of problems
3. Plan the repair.	• Determination of appropriate actions • Clear explanation of the job • Appropriate choice of tools, equipment and products • Appropriate preparation of materials • Appropriate sequence of operations

4. Repair the defective system.	• Proper application of repair techniques: – replacement of components and cables – repair of wiring harnesses and cables • Appropriate and accurate adjustments • Accurate timing of distributor, if applicable
5. Inspect the systems after repair.	• Appropriate testing of systems • Quality control
6. Tidy up the work area.	• Proper storage of tools, instruments, equipment and products • Clean work area
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Proper use of tools, instruments and equipment • Methodical and organized work • Clear explanation of work done on the work order • Accurate use of English and French terminology

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a given problem in an ignition system.	Strategies for communicating with clients and the work team Consultation of the work order Consultation of the different sources of technical information Determination of scenarios concerning possible defects Search for information based on the scenarios selected Identification of the characteristics of the systems and components involved
• Identify on the vehicle the system involved in the complaint.	Identification of the type of vehicle and ignition system Application of information in electrical drawings and diagrams to real-life situations Location of the system components and wiring harnesses on the vehicle

• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of inspection sequence to the system involved and its mechanical, electrical and electronic components Inspection methods by symptom and by malfunction code
• Find the source and the cause of malfunctions.	Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations Logical deduction of hidden defects based on visible leads
• Transmit information about the defective systems.	Nature of the problems Type and scope of repairs Consequences Explanation and justification of repairs Information conveyed in understandable terms
• Select and use the tools and equipment to repair ignition systems.	Appropriate tools Scan tool, oscilloscopes, terminal boards, multimeters, timing lights, etc. Tools for working on wires and terminals Adjustments and directions for use Precautions and maintenance
• Remove and reinstall components and cables on electronic ignition systems.	Diagrams Recommended sequences Initial position of components Torque and adjustments Timing, etc.

Inspecting Electronic Injection and Antipollution Systems	Code:	843644

Module 25 Duration 60 hours

Behavioural Objective

Statement of the Competency

Inspect electronic injection and antipollution systems.

Achievement Context

- Working in a mechanical workshop
- Given a work order
- Working on vehicles representative of those currently on the road
- Using conventional and specialized tools
- Using instruments, measuring and control devices and equipment including new technologies
- Using materials and products
- Using technical documentation
- Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to inspect electronic injection and antipollution systems.	• Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – drawings, diagrams and graphs
2. Do the inspection.	• Determination of inspections to be done based on: – the systems and their controls – the manufacturer's recommendations • Thorough visual inspection of the systems • Appropriate use of tables of symptoms and diagnostic tables • Appropriate choice of instruments and control equipment • Appropriate inspection of electrical circuits and the related components • Accurate measurement of: – resistance – intensity – voltage and voltage drops – fuel flow and pressure • Accurate reading of information provided by the scanner and oscilloscope • Methodical recording of measurements on the work order

3. Make observations.	• Measurements checked against manufacturer's specifications • Appropriate observations: – systems in good working order – problems requiring repair
4. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole: • Application of a logical diagnostic method • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, instruments and equipment • Methodical and organized work • Appropriate use of English and French terminology • Clean area

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of an engine's fuel systems.	Air and fuel supply systems Principles of physics related to gases and air in the atmosphere, fluids, and the atomization and vaporization of gasoline Supercharging System components and their characteristics, functions, operating principles and interaction Component materials
• Visualize the operation of the systems' electronic controls.	Application of knowledge and know-how to the operation of basic computer-controlled systems Control of injection and antipollution systems Electronic circuits, controls and sensors, and their characteristics, functions, operating principles and interaction Basic computer strategies in the different control modes

Inspecting Electronic Injection and Antipollution Systems	Code:	843644

• Visualize the operation of antipollution systems or their subsystems.	Constituents of exhaust and crankcase gases, and gases produced by fuel vapours Recovery of fuel and crankcase vapours and the recirculation of exhaust gases Processing of postcombustion gases Principles of physics related to the back pressure, pressure and velocity of exhaust gases Components and their characteristics, functions, operating principles and interaction
• Consult current legislation.	Identification and sources of pollutants Effects of pollutants on the quality of the atmosphere Regulations, standards and laws respecting motor vehicle emissions Means of control
• Consult different sources of technical documentation about electronic injection and antipollution systems.	Methods of finding information in a variety of sources Manufacturer's manuals, technical guides, diagrams or technical drawings, etc. Hard copy or electronic files Bilingual technical vocabulary, key words and general meaning of the text
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Identification of the type of injection and antipollution systems on the vehicle, and their components and controls Location on the vehicle of the different components and systems indicated in diagrams and technical drawings
• Plan their approach.	Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints
• Detect malfunctions using their senses.	Visual, auditory and olfactory acuity Detection of leaks and signs of wear Detection of unusual sounds Visualization of abstract manifestations of the related physical, mechanical, electronic and chemical phenomena Allowance for potential defects

• Select and use tools, instruments and control equipment for electronic injection and antipollution systems.	Device for checking fuel flow and pressure, specialized tools for inspecting injectors, scanner for reading parameters and malfunction codes in computer-controlled systems, oscilloscopes, multimeters, vacuum gauges, back pressure gauges, water pressure gauge, exhaust gas analyzer, infrared temperature gauges, etc. Maintenance, calibration, adjustments and directions for use Precautions and maintenance
• Take preventive measures when working on electronic injection and antipollution systems.	Prevention of fire, explosion and burns Measures for working with volatile organic compounds (VOCs)
• Consider the results of the inspection.	Analysis and synthesis of the information gathered Links with physical and chemical phenomena
• Validate the information gathered.	Consultation of tables of symptoms and diagnostic tables Identification of nonconformities Conclusions Explanation of observations
• Issue a work order.	Recording and compilation of information throughout the process Essential elements Formatting and handwriting Reporting of final information Bilingual technical vocabulary and codes

Maintaining and Repairing Electronic Injection and Antipollution Systems	Code:	843655

Module 26 Duration 75 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Maintain and repair electronic injection and antipollution systems.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Working on electronic injection systems • Working on antipollution systems related to: – the recovery of fuel vapours – the recirculation of crankcase gases – the recirculation of exhaust gases – postcombustion • Using conventional and specialized tools • Using control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to maintain and repair electronic injection and antipollution systems.	• Appropriate handling of the complaint • Determination of the information needed based on the complaint • Identification of the methods and specifications recommended by the manufacturer • Accurate interpretation of drawings, diagrams and graphs
2. Locate the problem on the vehicle.	• Accurate location of the systems involved in the complaint • Thorough visual inspection of the components and their controls • Appropriate choice of control instruments and equipment • Verification of conformity of the component or system with manufacturer's recommendations: – malfunction codes – parameters – measurements • Appropriate inspection of the related electrical and electronic circuits • Accurate identification of problems

3. Plan the work.	• Determination of appropriate actions • Clear explanation of the job • Appropriate choice of tools, equipment and products • Appropriate preparation of materials • Appropriate sequence of operations
4. Make repairs.	• Proper application of repair techniques: – replacement of components and cables – repair of wiring harnesses and cables • Adjustments and torque in conformity with manufacturer's requirements • Leaktightness of systems and lines • Proper positioning of components after reassembly
5. Perform maintenance operations.	• Proper replacement of parts and filters • Appropriate cleaning of injection and air systems • Leaktightness of systems and lines
6. Inspect the systems after repair.	• Appropriate testing • Quality control
7. Tidy up the work area.	• Appropriate storage of tools, instruments, equipment and products • Clean work area
	For the competency as a whole: • Observance of health and safety rules and environmental protection measures • Proper use of tools, equipment and instruments • Careful handling of the vehicle and equipment • Methodical and organized work • Well-developed sense of observation • Clear explanation of work done on the work order • Accurate use of English and French vocabulary • Repaired system in good working order

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Gather information about a given problem in an electronic injection or antipollution system.	Strategies for communicating with clients Consultation of the work order Consultation of the different sources of technical information Determination of scenarios concerning possible defects Search for information based on the scenarios selected Consideration of the system characteristics
• Identify on the vehicle the system or component involved in the complaint.	Identification of the type of vehicle and system Interpretation of the information gathered Application of information in diagrams and technical drawings to real-life situations Location on the vehicle of each of the circuits and components
• Observe the different manufacturers' recommended inspection sequences.	Identification and selection of technical information Application of the inspection sequence to the system in question and its mechanical, electrical and electronic components Inspection methods by symptom and by malfunction code
• Find the source and causes of the malfunctions.	Deductive method of finding defects: plausible hypotheses, investigation, cause and effect, and observations Logical deduction of hidden defects based on engine behaviour
• Transmit information about the defective system.	Nature of the problems detected Type and scope of repairs Consequences Potential cost Explanation and justification of diagnosis Advice Information conveyed in understandable terms

• Select and use the tools and equipment for injection and antipollution systems or subsystems.	Conventional and specialized tools Device for checking fuel flow and pressure Specialized tools for inspecting injectors, etc. Devices used to clean injectors and air systems and to control fuel vapour recovery systems Scanner for reading parameters and malfunction codes in computer-controlled systems Oscilloscopes, multimeters, vacuum gauges, back pressure gauges, water pressure gauge, etc. Gas analyzer and infrared temperature gauges Calibration, adjustment and directions for use Precautions and maintenance
• Select products.	Cleaners for injection systems Fuel additives, etc. Characteristics, applications and directions for use
• Consult current legislation.	Regulations respecting volatile organic compounds (VOCs) and emissions of greenhouse gases and other air pollutants Current antipollution standards
• Remove and reinstall components on injection and antipollution systems.	Recommended sequences and methods Initial position of components Torque and adjustments Identification of possible contaminants
• Take preventive measures when working on an injection system.	Measures to avoid the risk of fire or explosion Use of products in conformity with standards
• Apply themselves in their search for defects and in their actions.	Concern for detail and its impact on the system's performance

Inspecting Drive Trains	Code:	843665

Module 27 Duration 75 hours

Behavioural Objective

Statement of the Competency	Achievement Context
Inspect the drive train.	• Working in a mechanical workshop • Given a complaint and a work order • Working on vehicles representative of those currently on the road • Using conventional and specialized tools • Using measuring and control instruments, devices and equipment including new technologies • Using materials and products • Using technical documentation • Using personal safety equipment

Elements of the Competency	Performance Criteria
1. Gather the information needed to inspect drive train systems.	• Appropriate handling of the complaint • Selection of the appropriate information given the type of vehicle and system • Realistic interpretation of: – the manufacturer's recommendations – electrical diagrams and drawings and graphs
2. Do the inspection.	• Determination of inspections to be done based on: – the complaint – the type of problem – the system to be inspected – the manufacturer's recommendations • Thorough visual inspection of systems • Appropriate choice of tools, instruments and control devices • Appropriate inspection of: – electrical and electronic circuits – components of the related systems • Comparison of the results of the inspection with: – tables of symptoms and diagnostic tables – operating parameters
3. Measure the gas emission rate.	• Proper application of the inspection method • Realistic interpretation of results • Appropriate verification of the efficiency of the catalytic converter

4. Make observations.	• Results checked against the manufacturer's recommendations • Appropriate observations
5. Explain the results of the inspection.	• Clear explanation of the nature of the problems • Realistic deduction of possible repercussions on the operation of the systems in question • Appropriate explanation of observations • Appropriate solutions proposed
	For the competency as a whole:
	• Proper application of diagnostic procedure • Observance of health and safety rules and environmental protection measures • Appropriate use of tools, equipment and instruments • Methodical and organized work • Full report of work done on the work order • Appropriate use of English and French terminology • Perseverance in their research

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the elements of the competency, the main components of these elements and the performance criteria related to the competency.

• Visualize the operation of the drive train.	Drive train systems, subsystems and components, and their interaction Application of knowledge and know-how to the operation of drive train systems
• Visualize the operation of the integrated electronic control system on a motor vehicle.	Functions of sensors and actuators Functions of the drive train computer: communication with vehicle system computers; information processing; changes, corrections and adjustments to control parameters Links between the central computer and vehicle system controls

• Gather information about a problem in an integrated drive train system.	Strategies for communicating with clients Consultation of the work order Consultation of the different sources of technical information Determination of scenarios concerning possible defects Search for information based on the scenarios selected Identification of the characteristics of the system in question
• Apply information gathered in documentation to real-life situations.	Identification of the type of vehicle Location on the vehicle of the different components and systems indicated in diagrams and technical drawings Location of pins, wires and circuits involved in the operation of the drive train
• Plan their approach.	Confirmation of the complaint Manufacturer-recommended inspection sequence Minor adaptations as a result of constraints Impact of defects identified on the operation of the engine and its related systems
• Select and use the measuring instruments needed to inspect drive train systems and subsystems.	Multimeters, gauges, pressure gauges, oscilloscopes, timing lights, spark plug tester, device for checking fuel flow and pressure, etc. Specialized tools for inspecting injectors, scanner for reading parameters and malfunction codes, gas analyzer, dynamometer, etc. Maintenance, calibration, adjustment and directions for use Precautions and maintenance
• Detect malfunctions using their senses.	Visual, auditory and olfactory acuity Detection of leaks and signs of wear Detection of unusual sounds, etc. Visualization of manifestations of the physical, mechanical, electronic and chemical phenomena related to drive train components
• Consult current legislation.	Regulations respecting volatile organic compounds (VOCs) and greenhouse gas emissions Antipollution standards
• Validate the information gathered.	Consultation of tables of symptoms, diagnostic tables and current programming Identification of nonconformities Conclusions Explanation of observations

• Consider the results of the inspection.	Analysis and synthesis of the information gathered Links with physical and chemical phenomena
• Transmit information about the defective systems.	Nature of the problems Type and scope of repairs Consequences Explanation and justification of repairs Information conveyed in understandable terms
• Maintain a relationship of trust with clients.	Observance of confidentiality

Job Search	Code:	843671

Module 28 Duration 15 hours

Situational Objective

Statement of the Competency

Carry out a job search.

Elements of the Competency

- Plan a job search.
- Prepare the necessary documents.
- Contact employers.

Learning Context

Information Phase

- Consulting sources of information.
- Identifying employers likely to meet their needs and expectations.
- Taking the necessary steps to find a job.

Participation Phase

- Writing a résumé and a cover letter.
- Contacting potential employers.
- Participating in a simulated hiring interview.
- Following up.

Synthesis Phase

- Presenting a report on the steps taken.
- Observing their strengths and weaknesses in each step of the job search.

Instructional Guidelines

- Provide students with the material resources and samples they need.
- Explain how to use reference sources.
- Direct students to resource people who can help them.
- Make sure students are well-equipped.
- Organize simulations and provide support.
- Foster discussion and collaboration among students.

Participation Criteria

Information Phase

- Consult the available sources of information.
- Develop a job search plan.

Participation Phase

- Write a résumé and a cover letter.
- Contact the employer.

Synthesis Phase

- Assess their approach and their strengths and weaknesses.

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the learning context, the elements of the competency related to each phase as well as the instructional guidelines.

Information Phase

• Find sources of information.	Sample résumés and cover letters Documentation from employment agencies or employment centres Internet Newspapers and other publications Resource people
• Define their needs and expectations with respect to a job.	Personal and occupational objectives Job market potential Criteria for selecting a company and a type of job Conformity of criteria with expectations

Participation Phase

• Learn about different types of résumés.	Various samples provided by the teacher Essential information Formatting Qualities of a résumé, etc.
• Recognize the behaviours to adopt with a potential employer.	Verbal and nonverbal language Dress and appearance Positive attitude and interest in the job Politeness, punctuality, etc.
• Determine the behaviour to adopt when following up.	Methods of following up with employers Recommended attitudes, such as perseverance, tact, interest in the job, etc.

Synthesis Phase

• Evaluate their approach.	Awareness of internal or external factors resulting in a positive or negative outcome Identification of means of improving their chances of success

Entering the Work Force	Code:	843686

Module 29 Duration 90 hours

Situational Objective

Statement of the Competency

Enter the work force.

Elements of the Competency

- Find a practicum position.
- Observe and perform activities in the workplace.
- Communicate with the work team.
- Compare their training with the reality of the workplace.

Learning Context

Information Phase

- Learning about the terms and conditions of the practicum.
- Defining their needs and expectations with regard to the practicum.
- Identifying companies likely to meet their needs and expectations.
- Taking steps to obtain a practicum position.

Participation Phase

- Observing mechanics at work.
- Performing or helping perform different occupational tasks.
- Communicating with colleagues and practicum supervisors.
- Following practicum and company rules.
- Writing a report on the tasks and operations performed during the practicum.

Synthesis Phase

- Discussing their experience and the tasks and operations they performed during the practicum with other students.
- Evaluating the usefulness of what they learned with respect to workplace requirements.

Instructional Guidelines

- Provide students with the necessary means and assistance during their practicum search.
- Maintain close cooperation between the school and the company.
- Make sure students are constantly supervised by a responsible person in the company.
- Prepare students to take on responsibility and meet workplace requirements.
- Ensure regular support and supervision and intervene in case of difficulties.
- Make sure the company respects conditions allowing students to achieve the objectives of the practicum.
- Foster discussions among students.
- Provide an outline of a report.

Participation Criteria

Information Phase

- List companies meeting their criteria in order of priority.
- Look for a practicum position.

Participation Phase

- Follow company rules regarding activities, work schedules and professional ethics.
- Write a practicum report on the activities performed.
- Show sustained interest throughout the practicum.

Synthesis Phase

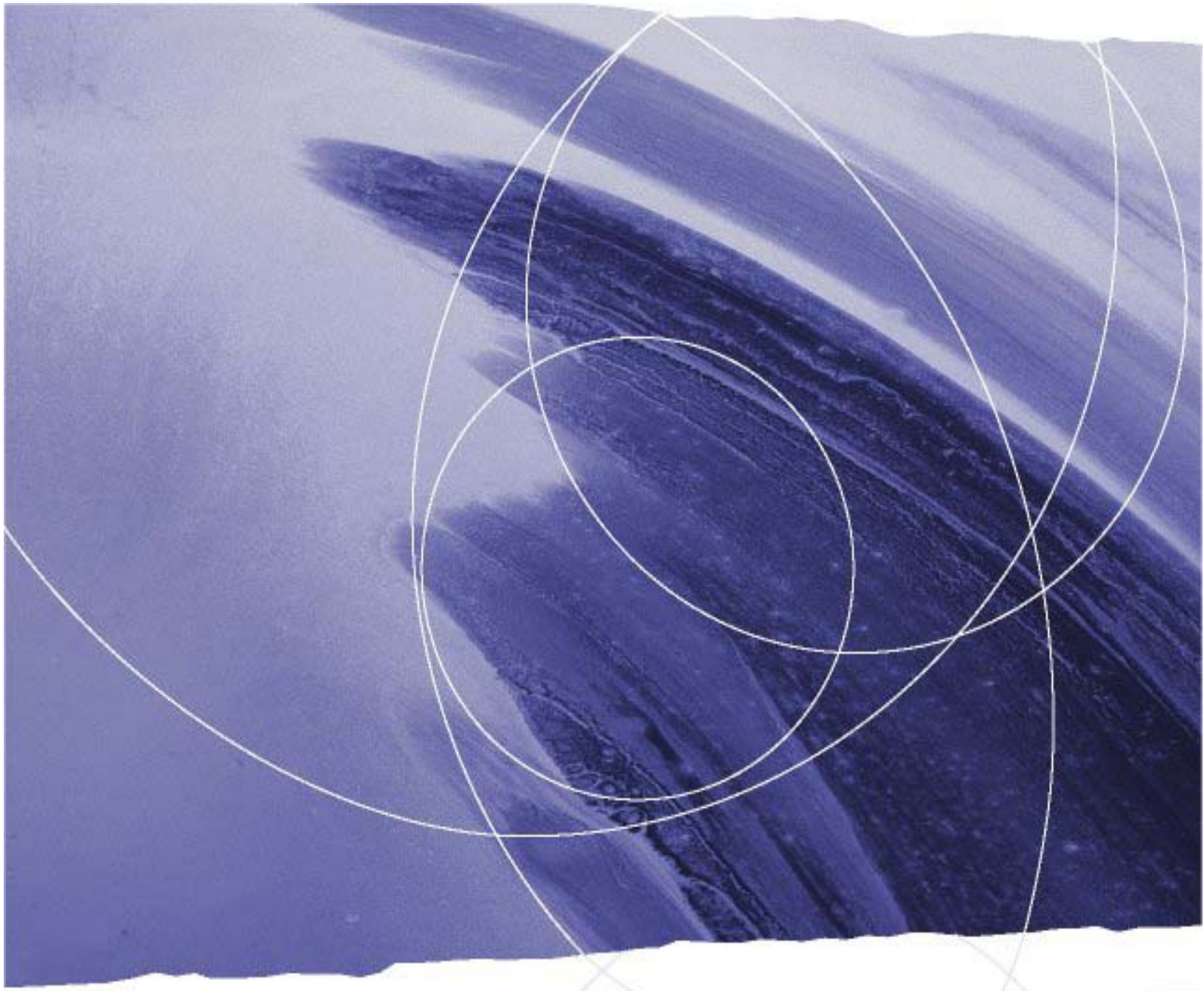
- Participate in discussions about their experience and the tasks and operations performed during the practicum.
- Emphasize the strengths and weaknesses of their training.

Suggestions for Competency-Related Knowledge, Skills, Attitudes and Perceptions

The following suggestions take into account the learning context, the elements of the competency related to each phase as well as the instructional guidelines.

Information Phase	
• Learn about the terms and conditions of the practicum.	Practicum objectives, duration, instructional guidelines, requirements, participation criteria and company rules
• Identify companies likely to meet their needs and expectations.	Consultation of various sources Identification of companies that have taken in trainees in the past and examination of their history Assistance from the teacher
• Take steps to obtain a practicum position.	Contact with employer and agreement on terms and conditions Presentation to employer of a list of tasks required for the practicum Confirmation of practicum Possession of documents needed for the practicum
Participation Phase	
• Join a work team.	Observation of ways of doing business Observance of work schedule
• Adopt attitudes and behaviours conducive to a successful practicum.	Qualities appreciated by employers Attitudes conducive to obtaining the maximum benefit from the experience Application of professional ethics

• Record information during the practicum.	Production of a log Useful and meaningful elements of a report on the experience
• Observe tasks.	Observation of work context, tasks, the application of current legislation and professional ethics, etc. Introduction to new work techniques or procedures Recording of observations in the log
• Perform tasks.	Active participation in the practicum Full or partial performance of tasks Participation in the development of original projects Occupational health and safety rules Company rules and regulations Recording of tasks in the log
• Communicate with the people around them.	Work meetings, informal meetings, teamwork Search for and transmission of information Acceptance of advice and comments Feedback Verification of practicum supervisors' satisfaction
• List the activities performed during the practicum.	Typical content of a practicum report List of daily activities performed and observed Procedures tried out, technological innovations, new learning, problems encountered and solutions found, etc. Comments received about their performance Use of log
Synthesis Phase	
• Consider whether they achieved their objectives.	Self-evaluation
• Discuss their experience with other trainees after the practicum.	Report on their experience Mention of positive elements and their level of satisfaction Mention of problems encountered and solutions found Perception of the trade before and after the practicum Use of a practicum report
• Compare what they learned in their courses with the activities observed or performed in the workplace.	Identification of aspects of the trade learned about in school that correspond to or differ from the workplace, occupational practices, job requirements, etc.



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