

Red Seal Occupational Standard

Auto Body and Collision Technician



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RED SEAL
OCCUPATIONAL
STANDARD
AUTO BODY AND COLLISION
TECHNICIAN



Title: Auto Body and Collision Technician

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FOREWORD

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this Red Seal Occupational Standard (RSOS) as the Red Seal standard for the Auto Body and Collision Technician trade.

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. Employment and Social Development Canada (ESDC) sponsors the Red Seal Program, which, under the guidance of the CCDA, develops a national occupational standard for each of the Red Seal trades.

Standards have the following objectives:

- to describe and group the tasks performed by skilled workers;
- to identify which tasks are performed in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Red Seal Examinations and assessment tools for apprenticeship and certification authorities;
- to develop common tools for apprenticeship on-the-job and technical training in Canada;
- to facilitate the mobility of apprentices and skilled workers in Canada;
- to supply employers, employees, associations, industries, training institutions and governments with occupational standards.

Any questions, comments, or suggestions for changes, corrections, or revisions to this standard or any of its related products may be forwarded to:

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This standard was prepared by the Apprenticeship and Sectoral Initiatives Directorate of ESDC. The coordinating, facilitating and processing of this standard were undertaken by employees of the standards development team of the Trades and Apprenticeship Division and of the Government of British Columbia, the host jurisdiction for this trade.

STRUCTURE OF THE OCCUPATIONAL STANDARD

To facilitate understanding of the occupation, this standard contains the following sections:

Methodology: an overview of the process for development, review, validation and weighting of the standard

Description of the Auto Body and Collision Technician trade: An overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Trends in the Auto Body and Collision Technician trade: Some of the trends identified by industry as being the most important for workers in this trade

Essential Skills Summary: An overview of how each of the 9 essential skills is applied in this trade

Roles and Opportunities for Skilled Trades in a Sustainable Future: an overarching description of how in the context of climate change, skilled trades play a large role in implementing solutions and adjusting to changes in the world. In addition to highlighting the importance of this awareness, the standard may also contain more details on activities, skills and knowledge elements that are specific to the trade

Industry Expected Performance: description of the expectations regarding the level of performance of the tasks, including information related to specific codes, regulations and standards that must be observed

Language Requirements: description of the language requirements for working and studying in this trade in Canada

Pie Chart of Red Seal Examination Weightings: a graph which depicts the national percentages of exam questions assigned to the major work activities

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities

Task: distinct actions that describe the activities within a major work activity

Task Descriptor: a general description of the task

Sub-task: distinct actions that describe the activities within a task

Essential Skills: The most relevant essential skills for this sub-task

Skills:

Performance Criteria: description of the activities that are done as the sub-task is performed

Evidence of Attainment: proof that the activities of the sub-task meet the expected performance of a tradesperson who has reached journeyperson level

Knowledge:

Learning Outcomes: describes what should be learned relating to a sub-task while participating in technical or in-school training

Learning Objectives: topics to be covered during technical or in-school training in order to meet the learning outcomes for the sub-task

Range Variables: elements that provide a more in-depth description of a term used in the performance criteria, evidence of attainment, learning outcomes, or learning objectives

Appendix A – Acronyms: a list of acronyms used in the standard with their full name

Appendix B – Tools and Equipment / Outils et équipement: a non-exhaustive list of tools and equipment used in this trade

Appendix C – Glossary / Glossaire: definitions or explanations of selected technical terms used in the standard

METHODOLOGY

Development of the Standard

A draft standard is developed by a broad group of trade representatives, including tradespeople, instructors and employers at a National Workshop led by a team of facilitators. This draft standard breaks down all the tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in the trade.

Draft Review

The RSOS development team forwards a copy of the standard and its translation to provincial and territorial authorities who consult with industry representatives to review it. Their recommendations are assessed and incorporated into the standard.

Validation and Weighting

Participating provinces and territories also consult with industry to validate and weight the document for the purpose of planning the makeup of the Red Seal Interprovincial Examination for the trade. They validate and weight the major work activities (MWA), tasks and sub-tasks, of the standard as follows:

MWA	Each jurisdiction assigns a percentage of questions to each MWA for an examination that would cover the entire trade.
TASKS	Each jurisdiction assigns a percentage of exam questions to each task within a MWA.
SUB-TASKS	Each jurisdiction indicates, with a YES or NO, whether or not each sub-task is performed by skilled workers within the occupation in its jurisdiction.

The results of this exercise are submitted to the RSOS development team who then analyzes the data and incorporates it into the document. The RSOS provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for MWA and task weighting guide the Interprovincial Red Seal Examination plan for the trade.

The validation of the RSOS is used to identify common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions' industry performs a sub-task, it shall be considered common core. Interprovincial Red Seal Examination questions are limited to the common core sub-tasks identified through this validation process.

Definitions for Validation and Weighting

YES	sub-task performed by qualified workers in the occupation in that province or territory
NO	sub-task not performed by qualified workers in the occupation in that province or territory
NV	standard <u>N</u> ot <u>V</u> alidated by that province or territory
ND	trade <u>N</u> ot <u>D</u> esignated in a province or territory
NOT COMMON CORE (NCC)	sub-task, task or MWA performed less than 70% of responding jurisdictions; these will not be tested by the Interprovincial Red Seal Examination for the trade
NATIONAL AVERAGE %	average percentage of questions assigned to each MWA and task in Interprovincial Red Seal Examination for the trade

Provincial/Territorial Abbreviations

NL	Newfoundland and Labrador
NS	Nova Scotia
PE	Prince Edward Island
NB	New Brunswick
QC	Quebec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
NT	Northwest Territories
YT	Yukon Territory
NU	Nunavut

DESCRIPTION OF THE AUTO BODY AND COLLISION TECHNICIAN TRADE

“Auto Body and Collision Technician” is this trade’s official Red Seal occupational title approved by the CCDA. Prior to October 2018, the trade name was Motor Vehicle Body Repairer (Metal and Paint). This standard covers tasks performed by auto body and collision technicians whose occupational title may vary across provinces and territories of Canada. For official provincial or territorial names, please refer to the [Ellis Chart](#).

Auto body and collision technicians repair and restore damaged motor vehicles. They assess body damage and develop repair estimates and repair plans. Their repair work may range from correcting minor structural damage and cosmetic scratches and dents to fixing extensive structural damage to motor vehicles. Some parts may need to be removed for access or during repairs. Vehicle parts that are damaged beyond repair are replaced. The alignment and replacement of suspension and steering components is also performed in this trade. Restoring interior components of vehicles falls within the scope of the trade. Auto body and collision technicians may work with mechanical and electronic components such as air conditioning (A/C) systems, exhaust systems, drivetrain, engine cooling systems, advanced electronic components (adaptive cruise control and lane departure features), and passenger restraint systems (seat belts and air bags).

In this sector, most auto body and collision technicians work in private enterprises or are self-employed. They may be employed by body repair facilities, auto and truck dealerships, custom repair facilities, and trucking and bus companies. In larger repair facilities or dealerships, there may be a division of responsibilities among the team of repair professionals. Some may work exclusively on collision specialization such as damage repair, frame straightening, refinishing, suspension, detailing, or auto glass installation. Generally in smaller repair facilities, auto body and collision technicians tend to be responsible for a wider range of these duties. While they may work as part of the repair team, which includes other auto body and collision technicians, automotive refinishing technicians, automotive service technicians, and others in the automotive sector, journeypersons tend to work independently.

Auto body and collision technicians require proficiency with a variety of tools and equipment, some of which are technologically advanced. Diagnostic scanning equipment is used for diagnosis and programming electronic and electrical systems. Hand and power tools are used in the repair and replacement of motor vehicle parts. Welding and cutting equipment is also used. Auto body and collision technicians work with a number of materials such as metal, glass, plastic and composites. Surface repairs may require the application of repair materials. In addition, they may prepare surfaces for refinishing and apply a variety of appropriate refinishing products. They have refinishing application and detailing skills.

Working environments vary in this trade. Typically, auto body and collision technicians work indoors in an environment that may be noisy and dusty. However, many repair facilities are well ventilated to reduce health risks from dust and fumes. Health and safety are important issues as these workers are frequently in contact with chemicals (e.g. paints, solvents and fillers) and physical hazards (e.g. lifting heavy objects, frame equipment and sharp metal). Ongoing safety training and safe work practices are important.

Key attributes for people entering this trade are good communication skills, mechanical aptitude, problem solving skills, an eye for detail, computer literacy and a commitment to ongoing training. The work often requires considerable standing, kneeling, lifting, climbing, pulling and reaching.

With experience, auto body and collision technicians may move into supervisory positions, start their own business, or become auto damage appraisers. Some of the skills of this trade may be transferred to other occupations such as sheet metal worker, industrial painter, welder, automotive refinishing technician, truck and transport mechanic, recreation vehicle service technician, glazier or automotive service technician and to other sectors such as manufacturing, aviation and marine.

TRENDS IN THE AUTO BODY AND COLLISION TECHNICIAN TRADE

Removal and repair procedure information is becoming more readily available to the technician as a result of digital technology. This is critical as vehicle design, construction and materials have become more proprietary and complex and changes rapidly to adapt to new government-mandated safety and emission standards. Relevant and up-to-date documentation and training from original equipment manufacturers (OEMs) ensures quality and safe repairs, in a timely manner and according to the OEM and manufacturers' specifications.

Advanced driver-assistance systems (ADAS) (e.g. autonomous vehicles, driver assist technologies, lane departure warning systems) are being introduced. These new systems have increased the need for auto body and collision technicians to continue to update their skills in using advanced diagnostic equipment to diagnose codes and interpret faults. Increased coordination with manufacturers and dealerships may be required due to the use of proprietary technology, including the need for proper manufacturers' reset for electronics.

Repair facilities are streamlining their operations for easier maintenance, better production and cost efficiency. Lean practices are becoming prevalent and affecting the repair process from start to finish by eliminating waste and work duplication.

Health, safety and environmental practices have greatly improved to reduce the risk of workplace health and safety hazards and to comply with legislated environmental practices. More women and people from other equity-seeking groups are being encouraged to enter the trade.

Hybrid, electric vehicles and alternative-fuel vehicles have become, and will continue to be, more prevalent in the marketplace. OEMs have specific recommendations and may have certifications for working on these types of vehicles to prevent vehicle damage and ensure worker safety. This new technology requires auto body and collision technicians to upgrade their skills. The high voltage produced by hybrid and electric vehicles requires increased safety measures. Curing and baking procedures of those vehicles are altered for component longevity and safety.

There is an increase in the use of carbon fibre, plastic and composite type materials, largely because of weight reduction and the resulting fuel economy. Fibre-reinforced plastics and carbon fibre materials are becoming structural components because they are lighter and stronger.

The use of new vehicle construction materials such as magnesium, aluminum and advanced high-strength steels require special training and equipment to perform repairs. Specialized welding equipment and methods are continually being introduced to repair these materials. Aluminum parts and components and all equipment used to repair them must be isolated to avoid cross contamination with ferrous metals.

Auto manufacturers are producing special effect and custom paint finishes such as 3 and 4 stage paint colours, matte finishes and specialty micro flake metallic with specialized preparation and application procedures. Some OEMs are working with paint manufacturers to develop and patent proprietary finishes. New materials and processes for automotive finishing are constantly being researched, developed and introduced.

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

Tools are available online or for order at: <https://www.canada.ca/en/employment-social-development/programs/essential-skills/tools.html>.

The application of these skills may be described throughout this document within the competency statements which support each subtask of the trade. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at: www.red-seal.ca.

READING

Auto body and collision technicians read labels, technical service bulletins and manuals to learn about installation and repair procedures. They read estimates, work orders and memos about damages and details of customers' requests. Auto body and collision technicians read safety-related information and a variety of Acts, bylaws and regulations. They also read trade publications to learn about new technologies, products and materials.

DOCUMENT USE

Auto body and collision technicians observe hazard symbols on product labels. They locate and interpret data on forms, work orders and documents to identify product identification numbers, parts and colours. Auto body and collision technicians read documents to determine product specifications such as vehicle dimensions, and interpret OEM, industry service and repair procedures. They also identify devices and circuits in schematics and technical drawings to identify connectors, switches, and the position and orientation of vehicle parts and assemblies.

WRITING

Auto body and collision technicians write notes and supplements on work orders and forms to describe what work was performed. They may write reports describing workplace incidents.

ORAL COMMUNICATION

Auto body and collision technicians communicate with co-workers, vendors and customers about the scope of work and work completed. They may explain procedures to apprentices. Auto body and collision technicians may exchange technical information with co-workers and technicians when seeking advice on procedures for carrying out tasks.

NUMERACY

Auto body and collision technicians take a variety of measurements, and analyze and compare them to manufacturers' specifications. They may estimate times and materials for projects.

THINKING

Auto body and collision technicians use problem-solving skills to determine severity of damage prior to beginning repairs and to identify hidden damages when dismantling vehicles. They judge the quality of repairs by considering shape, length, depths of bodylines, fit of doors and parts. Auto body and collision technicians decide order and priority of tasks taking into consideration availability of equipment and priority of unfinished work.

DIGITAL TECHNOLOGY

Auto body and collision technicians may use mobile devices to complete numeracy-related tasks. They may use digital cameras to inspect hard to access vehicle components for damages. They use diagnostic equipment. Auto body and collision technicians may use specialized auto body service databases to access job assignments, retrieve and review past service information, and complete estimates and work orders. They may use the internet to access OEM specifications and procedures and training courses or forums to provide advice and learn how to complete repairs.

WORKING WITH OTHERS

Auto body and collision technicians spend most of their time working independently but they may be required to coordinate activities with workers from other departments to ensure vehicle availability when repairing damaged vehicles. They may also work directly with co-workers when moving vehicles and lifting large and heavy parts into place.

CONTINUOUS LEARNING

Auto body and collision technicians are continuously learning to keep up with the changes in the industry. They attend on-site, on-line or classroom training provided by industry associations or manufacturers and suppliers.

Roles and Opportunities for Skilled Trades in a Sustainable Future

Climate change affects all of us. Trades play a large role in implementing solutions and adjusting to changes in the world.

Throughout this standard, there may be specific references to tasks, skills and knowledge that clearly show this trade's role in a more sustainable future. Each trade has different roles to play and contributions to make in their own way.

For example:

- Construction tradespeople need to consider the materials they are using, building methods, and improvements to mechanical and electrical installations. There are important changes to codes and standards to help meet the climate change goals and commitments set for 2030 and 2050. Retrofits and new construction of low-energy buildings provide enormous opportunities for workers in this sector. Concepts, such as energy efficiency and regarding buildings as systems are foundational.
- Automotive and mechanical trades are seeing a shift towards the electrification of vehicles and equipment. As a result, new skills and knowledge will be required for tradespeople working in this sector. There are mandates for sales of new light-duty zero-emission vehicles (ZEV) in Canada, with the goal of achieving 100% ZEV sales by 2035. Due to this mandate, the demand for these vehicles is growing quickly among consumers and fleets. With this escalating demand, the need for skilled workers to maintain and repair these vehicles is also increasing.
- In industrial and resource sectors, there is pressure to move towards increased electrification of industrial processes. Many industrial and commercial facilities are also being upgraded to improve energy efficiency in areas such as lighting systems, and new production processes and technologies. There are also opportunities in carbon capture, utilization and storage (CCUS), as well as the production and export of low-carbon hydrogen.
- Trades in the service sector may also need to be aware of responsible sourcing, as well as efficient use of products and materials. New ways of working better are always a part of the job.

There are fast-moving changes in guidelines, codes, regulations and specifications. Many are being implemented for the purpose of energy efficiency and climate change. Those that affect specific trades may be mentioned within the standard. Examples of these guidelines and legislation include:

- The National Energy Code of Canada for Buildings (NECB).
- The Canadian Net-Zero Emissions Accountability Act (CNZEAA).
- programs that encourage sustainable building design and construction such as Leadership in Energy and Environmental Design (LEED) and the Zero Carbon Building (ZCB) standards.
- the Montreal Protocol for phasing out R22 refrigerants.
- energy efficiency programs such as ENERGY STAR.

- principles of the United Nations Declaration for the Rights of Indigenous Peoples pertaining to energy sector development.

Apprentices and tradespeople need to increase their climate literacy and reinforce their own understanding of energy issues and environmental practices. It is important for them to understand why these changes are happening and their effect on trades' work. While individual tradespeople and apprentices may not be able to choose certain elements like; the architectural design of buildings, building material selection, regulatory requirements, use of electric vehicles and technologies, they must understand the impact of using these elements in their work. Impacts include using environmentally friendly products and following requirements related to the disposal and recycling of materials.

In apprenticeship, as well as in ongoing professional development, employers and instructors should encourage learning about these concepts, why they are important, how they are implemented, and the overarching targets they are aiming to achieve.

All in all, it's about doing the work better and building a better world.

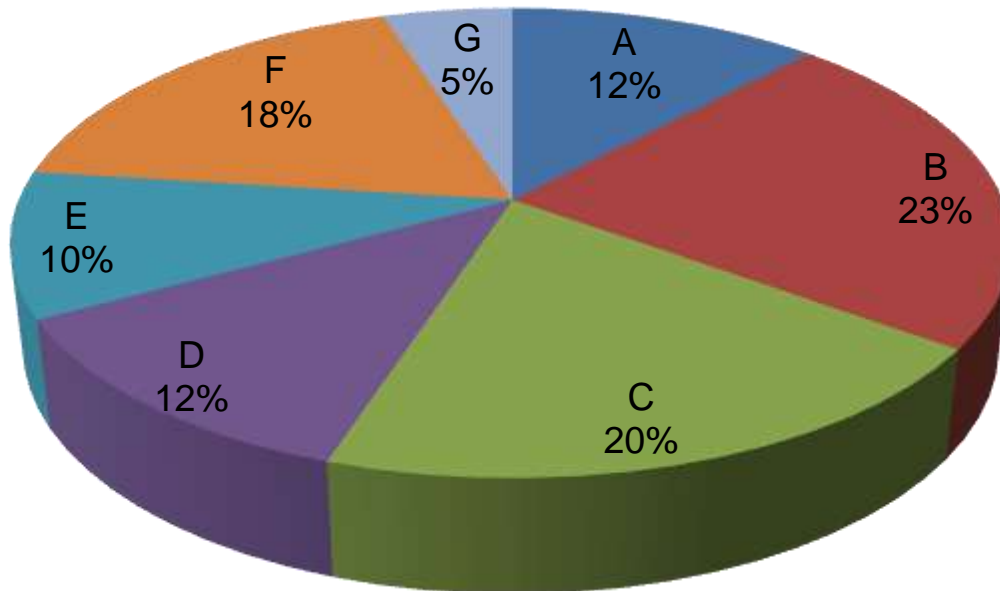
INDUSTRY EXPECTED PERFORMANCE

All tasks must be performed according to the applicable jurisdictional codes and standards. All health and safety standards must be respected and observed. Work should be done efficiently and to a high quality without material waste or environmental damage. All requirements of the manufacturer, client specifications, the Occupational Health and Safety (OH&S) Acts, and Workplace Hazardous Materials Information System (WHMIS) regulations must be met. Auto body and collision technicians should work professionally to meet OEM and industry service specifications, structural integrity and client expectations. At a journeyman level of performance, all tasks must be done with minimal direction and supervision. As a journeyman progresses in their career there is an expectation they continue to upgrade their skills and knowledge to maintain pace with industry and promote continuous learning in their trade through mentoring of apprentices.

LANGUAGE REQUIREMENTS

It is expected that journeypersons are able to understand and communicate in either English or French, which are Canada's official languages. English or French are the common languages of business as well as languages of instruction in apprenticeship programs.

PIE CHART OF RED SEAL EXAMINATION WEIGHTINGS



MWA A	Performs common occupational skills	12%
MWA B	Repairs frame and structural components	23%
MWA C	Repairs non-structural outer body panels and related components	20%
MWA D	Repairs mechanical, electrical and alternative-fuel system components	12%
MWA E	Repairs interior components and services restraint systems	10%
MWA F	Performs refinishing procedures	18%
MWA G	Performs detailing and cleaning	5%

This pie chart represents a breakdown of the interprovincial Red Seal examination. Percentages are based on the collective input from workers from the trade from across Canada. The Task Matrix on the next pages indicates the breakdown of tasks and sub-tasks within each Major Work Activity and the breakdown of questions assigned to the Tasks. The Interprovincial examination for this trade has 120 questions.

AUTO BODY AND COLLISION TECHNICIAN TASK MATRIX

A – Performs common occupational skills

12%

Task A-1 Performs safety-related functions 11%	A-1.01 Maintains safe work environment	A-1.02 Uses personal protective equipment (PPE) and safety equipment	
Task A-2 Uses and maintains tools and equipment 17%	A-2.01 Maintains hand and power tools	A-2.02 Maintains frame and unibody repair and measuring equipment	A-2.03 Uses lifting equipment
Task A-3 Uses and maintains welding equipment 17%	A-2.04 Uses diagnostic equipment	A-2.05 Maintains refinishing tools and equipment	
Task A-4 Organizes work and uses documentation 12%	A-3.01 Uses welding equipment	A-3.02 Maintains welding equipment	A-4.03 Organizes parts, materials and work area
Task A-5 Uses communication and mentoring techniques 8%	A-4.01 Prepares estimates and supplements	A-4.02 Prepares repair plan	
Task A-6 Removes and installs trim and hardware 13%	A-4.04 Uses documentation	A-5.01 Uses communication techniques	A-5.02 Uses mentoring techniques
	A-6.01 Removes trim and hardware	A-6.02 Installs trim and hardware	

Task A-7
Performs final inspections
10%

A-7.01 Performs final operational check

A-7.02 Performs final quality control inspection

Task A-8
Applies corrosion protection and sound deadening materials
12%

A-8.01 Applies corrosion inhibitors and undercoats

A-8.02 Applies seam sealers and sound deadeners

B – Repairs frame and structural components

23%

Task B-9
Prepares for repair and replacement of structural components
38%

B-9.01 Identifies extent of damage

B-9.02 Removes components for access

B-9.03 Performs vehicle setup

Task B-10
Repairs, removes and installs structural components
44%

B-10.01 Repairs structural components

B-10.02 Removes structural components

B-10.03 Installs structural components

Task B-11
Removes, installs and repairs structural and laminated glass
18%

B-11.01 Removes structural glass

B-11.02 Installs structural glass

B-11.03 Repairs laminated glass

C – Repairs non-structural outer body panels and related components

20%

Task C-12
Removes, repairs and installs metal panels and components
46%

C-12.01 Prepares metal panels and components for repair

C-12.02 Removes metal panels and components

C-12.03 Repairs metal panels and components

C-12.04 Installs metal panels and components

Task C-13
Removes, repairs and installs plastic and composite panels and components
37%

C-13.01 Prepares plastic and composite panels and components for repair

C-13.02 Removes plastic and composite panels and components

C-13.03 Repairs plastic and composite panels and components

C-13.04 Installs plastic and composite panels and components

Task-C 14
Removes and installs non-structural glass
17%

C-14.01 Removes non-structural glass

C-14.02 Installs non-structural glass

D – Repairs mechanical, electrical and alternative-fuel system components

12%

<p>Task D-15 Deactivates and reactivates alternative-fuel systems 20%</p>	<p>D-15.01 Deactivates alternative-fuel systems</p>	<p>D-15.02 Reactivates alternative-fuel systems</p>	
<p>Task D-16 Removes and installs mechanical components 48%</p>	<p>D-16.01 Removes mechanical components</p>	<p>D-16.02 Installs mechanical components</p>	
<p>Task D-17 Removes, repairs and installs electrical and electronic components 32%</p>	<p>D-17.01 Removes electrical components</p>	<p>D-17.02 Repairs damaged wires and protective coverings</p>	<p>D-17.03 Installs electrical components</p>
	<p>D-17.04 Services advanced electronic components</p>		

E – Repairs interior components and services restraint systems

10%

<p>Task E-18 Repairs and replaces interior components 39%</p>	<p>E-18.01 Repairs interior components</p>	<p>E-18.02 Replaces interior components</p>
<p>Task E-19 Services supplemental restraint systems (SRS) 61%</p>	<p>E-19.01 Services seat belt restraint systems</p>	<p>E-19.02 Services air bags and related components</p>

F – Performs refinishing procedures

18%

Task F-20 Prepares surface 25%	F-20.01 Performs initial preparation	F-20.02 Masks surface	F-20.03 Strips surface
	F-20.04 Sands surface		
Task F-21 Uses repair materials 13%	F-21.01 Mixes repair materials	F-21.02 Applies repair materials	
Task F-22 Prepares refinishing equipment 13%	F-22.01 Prepares spray booth	F-22.02 Performs spray gun setup	
Task F-23 Prepares refinishing materials 17%	F-23.01 Mixes refinishing materials	F-23.02 Performs colour adjustments	
Task F-24 Applies refinishing materials 23%	F-24.01 Applies sealers	F-24.02 Applies base coat	F-24.03 Applies single-stage paint
	F-24.04 Applies clear coat		
Task F-25 Performs post-refinishing functions 9%	F-25.01 Removes masking materials	F-25.02 Corrects surface imperfections	

G – Performs detailing and cleaning

5%

Task G-26 Details exterior 61%	G-26.01 Removes minor imperfections	G-26.02 Polishes vehicle	G-26.03 Touches up stone chips
Task G-27 Cleans vehicle 39%	G-27.01 Cleans exterior	G-27.02 Cleans interior	

Harmonization of Apprenticeship Training

Provincial and territorial apprenticeship authorities are each responsible for their respective apprenticeship programs. In the spirit of continual improvement, and to facilitate mobility among apprentices in Canada, participating authorities have agreed to work towards harmonizing certain aspects of their programs where possible. After consulting with their stakeholders in the trade, they have reached consensus on the following elements. Note that implementation of these elements may vary from jurisdiction to jurisdiction, depending on their own circumstances. For more information on the implementation in any province and territory, please contact that jurisdiction’s apprenticeship authority.

1. Trade name

The official Red Seal name for this trade is Auto Body and Collision Technician.

2. Number of Levels of Apprenticeship

The number of levels of technical training recommended for this trade is 4 (four).

3. Total Training Hours During Apprenticeship Training

The total hours of training, including both on-the-job and in-school training for this trade is 7200.

4. Sequencing Topics and Related Sub-tasks

The topic titles in the table below are placed in a column for each apprenticeship level for technical training. Each topic is accompanied by the sub-tasks and their reference number. The topics in the grey shaded cells represent those that are covered “in context” with other training in the subsequent years.

Level 1	Level 2	Level 3	Level 4
	Context	Context	Context
	Safety-Related Functions	Safety-Related Functions	Safety-Related Functions
	Communication	Communication	
		Refinishing Materials (Prepares)	Refinishing Materials (Prepares)
		Structural and Laminated Glass (Removes, Installs and Repairs)	
		Non-Structural Glass (Removes and Installs)	

Safety-Related Functions
1.01 Maintains safe work environment.
1.02 Uses personal protective equipment (PPE) and safety equipment

Level 1	Level 2	Level 3	Level 4
Tools and Equipment 2.01 Maintains hand and power tools. 2.03 Uses lifting equipment. 2.05 Maintains refinishing tools and equipment.	Tools and Equipment 2.03 Uses lifting equipment. 2.05 Maintains refinishing tools and equipment	Tools and Equipment 2.02 Maintains frame and unibody repair and measuring equipment. 2.04 Uses diagnostic equipment	Tools and Equipment 2.02 Maintains frame and unibody repair and measuring equipment. 2.04 Uses diagnostic equipment
Welding Equipment (Basic/Introduction) 3.01 Uses welding equipment. 3.02 Maintains welding equipment	Welding Equipment 3.01 Uses welding equipment. 3.02 Maintains welding equipment	Welding Equipment 3.01 Uses welding equipment. 3.02 Maintains welding equipment	Welding Equipment 3.01 Uses welding equipment. 3.02 Maintains welding equipment
Work Organization and Document Use 4.03 Organizes parts, materials and work area. 4.04 Uses documentation	Work Organization and Document Use 4.02 Prepares repair plan. 4.03 Organizes parts, materials and work area. 4.04 Uses documentation	Work Organization and Document Use 4.01 Prepares estimates and supplements. 4.04 Uses documentation	Work Organization and Document Use 4.01 Prepares estimates and supplements. 4.04 Uses documentation
Communication 5.01 Uses communication techniques			Mentoring 5.02 Uses mentoring techniques
Trim and Hardware 6.01 Removes trim and hardware. 6.02 Installs trim and hardware			
		Final Inspections 7.01 Performs final operational check	Final Inspections 7.02 Performs final quality control inspection.
	Corrosion Protection and Sound Deadening Materials 8.01 Applies corrosion inhibitors and undercoats. 8.02 Applies seam sealers and sound deadeners		
		Structural Components (Prepares) 9.01 Identifies extent of damage. 9.02 Removes components for access. 9.03 Performs vehicle set-up	Structural Components (Prepares) 9.01 Identifies extent of damage. 9.02 Removes components for access. 9.03 Performs vehicle set-up

Level 1	Level 2	Level 3	Level 4
		<p>Structural Components (Removes, Repairs and Installs) 10.01 Repairs structural components. 10.02 Removes structural components. 10.03 Installs structural components</p>	<p>Structural Components (Removes, Repairs and Installs) 10.01 Repairs structural components. 10.02 Removes structural components. 10.03 Installs structural components</p>
	<p>Structural and Laminated Glass (Removes, Installs and Repairs) 11.01 Removes structural glass. 11.02 Installs structural glass. 11.03 Repairs laminated glass</p>		
<p>Metal Panels and Components (Removes, Repairs and Installs) 12.01 Prepares metal panels and components for repair. 12.02 Removes metal panels and components. 12.03 Repairs metal panels and components. 12.04 Installs metal panels and components</p>	<p>Metal Panels and Components (Removes, Repairs and Installs) 12.03 Repairs metal panels and components</p>		
<p>Plastic and Composite Panels and Components (Removes, Repairs and Installs) 13.01 Prepares plastic and composite panels and components for repair. (Introduction) 13.02 Removes plastic and composite panels and components. (Introduction) 13.03 Repairs plastic and composite panels and components. (Introduction) 13.04 Installs plastic and composite panels and components. (Introduction)</p>	<p>Plastic and Composite Panels and Components (Removes, Repairs and Installs) 13.01 Prepares plastic and composite panels and components for repair. 13.02 Removes plastic and composite panels and components. 13.03 Repairs plastic and composite panels and components. 13.04 Installs plastic and composite panels and components.</p>		
	<p>Non-Structural Glass (Removes and Installs) 14.01 Removes non-structural glass. 14.02 Installs non-structural glass</p>		

Level 1	Level 2	Level 3	Level 4
		Alternate Fuel Systems (Deactivates and Reactivates) 15.01 Deactivates alternate-fuel systems. 15.02 Reactivates alternate-fuel systems	
		Mechanical Components (Removes and Installs) 16.01 Removes mechanical components. 16.02 Installs mechanical components	Mechanical Components (Removes and Installs) 16.01 Removes mechanical components. 16.02 Installs mechanical components
		Electrical and Electronic Components (Removes, Repairs and Installs) 17.01 Removes electrical components. 17.02 Repairs damaged wires and protective coverings. 17.03 Installs electrical components. 17.04 Services advanced electronic components	Electrical and Electronic Components (Removes, Repairs and Installs) 17.04 Services advanced electronic components
	Interior Components (Repairs and Replaces) 18.01 Repairs interior components. 18.02 Replaces interior components		
		Supplemental Restraint Systems (SRS) 19.01 Services seat belt restraint systems. 19.02 Services air bags and related components	
Surface Preparation 20.01 Performs initial preparation. 20.02 Masks surface. 20.03 Strips surface. 20.04 Sands surface			
Repair Materials 21.01 Mixes repair materials. 21.02 Applies repair materials			
Refinishing Equipment Preparation 22.01 Prepares spray booth. 22.02 Performs spray gun setup	Refinishing Equipment Preparation 22.01 Prepares spray booth. 22.02 Performs spray gun setup		

Level 1	Level 2	Level 3	Level 4
Refinishing Materials (Prepares) 23.01 Mixes refinishing materials. (Introduction)	Refinishing Materials (Prepares) 23.01 Mixes refinishing materials. 23.02 Performs colour adjustments		
Refinishing Materials (Applies) ¹ 24.01 Applies sealers. (Introduction) 24.02 Applies base coat. (Introduction) 24.03 Applies single-stage paint. (Introduction) 24.04 Applies clear coat. (Introduction)	Refinishing Materials (Applies) 24.01 Applies sealers. 24.02 Applies base coat. 24.03 Applies single-stage paint. 24.04 Applies clear coat		
Post-Refinishing Functions 25.01 Removes masking materials	Post-Refinishing Functions 25.02 Corrects surface imperfections		
Exterior Detailing 26.01 Removes minor imperfections. 26.02 Polishes vehicle. 26.03 Touches up stone chips			
Cleans vehicle 27.01 Cleans exterior 27.02 Cleans interior			

¹ Alberta will stand as an exception and deliver training solely in Level 2.

MAJOR WORK ACTIVITY A

Performs common occupational skills

TASK A-1 Performs safety-related functions

TASK DESCRIPTOR

Auto body and collision technicians are responsible for using personal protective equipment (PPE) and maintaining a safe work environment to protect themselves, others and the environment.

A-1.01 Maintains safe work environment

Essential Skills Working with Others, Document Use, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-1.01.01P	maintain clean and organized work station and repair facility	work station and repair facility are clean and organized according to company policies and jurisdictional regulations
A-1.01.02P	recognize and eliminate potential fire hazards	fire hazards are recognized and eliminated according to workplace safety, health and fire regulations
A-1.01.03P	perform job hazard assessment (JHA)	potential hazardous conditions are recognized and eliminated by applying safe work practices according to jurisdictional safety regulations
A-1.01.04P	handle, remove, dispose of and recycle hazardous products and waste	hazardous products and waste are handled, removed, disposed of and recycled according to jurisdictional workplace safety, health and environmental regulations
A-1.01.05P	apply jurisdictional workplace safety and health regulations	jurisdictional workplace safety and health regulations are located, identified and executed
A-1.01.06P	recognize and eliminate personal injury welding hazards	personal injury welding hazards are recognized and eliminated by following safety practices

A-1.01.07P	tag and lock out damaged tools, equipment and vehicles	damaged tools, equipment and vehicles are tagged and locked out according to company policies and jurisdictional regulations, if applicable
A-1.01.08P	maintain clear path to emergency exits and designated emergency meeting area	clear path to emergency exits and designated emergency meeting area is maintained
A-1.01.09P	document, complete and maintain safety-related documentation	safety-related documentation is completed according to workplace policies and jurisdictional regulations

RANGE OF VARIABLES

fire hazards include: contaminated rags, build-up of vapours, flammable materials, sparks, open flames

workplace safety and health regulations include: Workplace Hazardous Materials Information System (WHMIS), Occupational Health and Safety (OH&S)

hazardous conditions include: fumes, lack of grounding, static electricity

hazardous products and waste include: solvents, paint products, oils

personal injury welding hazards include: sparks, heat, protruding objects, wet floors, ultraviolet (UV) rays, sharp objects, electrical connections, defective equipment

safety-related documentation includes: spill procedure sheets, product labelling, incident reports, safety data sheets (SDS), equipment maintenance schedules

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-1.01.01L	demonstrate knowledge of safe work practices	identify hazardous conditions and describe safe work practices
		identify fire hazards and describe safe work practices
		describe procedures used to store, use, dispose of and recycle hazardous products and waste
		identify personal injury welding hazards and describe safe work practices
		identify potential hazards and describe safe work practices for hybrid/alternative fuel vehicles
		identify potential hazards from metal debris and describe safe work practices
A-1.01.02L	demonstrate knowledge of regulatory requirements pertaining to safety	identify and describe workplace safety and health regulations

		describe regulatory requirements used for the disposal of hazardous products and waste
A-1.01.03L	demonstrate knowledge of safety-related documentation and its use	identify types and location of safety-related documentation and describe their purpose, applications and procedures for use

RANGE OF VARIABLES

hazardous conditions include: fumes, lack of grounding, static electricity

fire hazards include: contaminated rags, build-up of vapours, flammable materials, sparks, open flames

hazardous products and waste include: solvents, paint products, oils

personal injury welding hazards include: sparks, heat, protruding objects, wet floors, ultraviolet (UV) rays, sharp objects, electrical connections, defective equipment

metal debris includes: aluminum, magnesium dust

workplace safety and health regulations include: Workplace Hazardous Materials Information System (WHMIS), Occupational Health and Safety (OH&S)

safety-related documentation includes: spill procedure sheets, product labelling, incident reports, safety data sheets (SDS), equipment maintenance schedules

A-1.02 Uses personal protective equipment (PPE) and safety equipment

Essential Skills Document Use, Thinking, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-1.02.02P	select and wear personal protective equipment (PPE)	PPE is selected and worn according to task, job requirements and OH&S regulations
A-1.02.02P	select and use safety equipment	safety equipment is selected and used according to OH&S regulations and company policies
A-1.02.03P	inspect and maintain PPE and safety equipment	PPE and safety equipment are inspected and maintained to ensure proper fit and operation prior to use
A-1.02.04P	store PPE and safety equipment	PPE and safety equipment are stored in designated locations and packaging
A-1.02.05P	dispose of expired, damaged and used PPE and safety equipment	expired, damaged and used PPE and safety equipment are disposed of according to manufacturers' specifications and jurisdictional regulations

RANGE OF VARIABLES

PPE includes: hearing protection, task-specific respirators, safety gloves, welding jackets, eye and face protection, coveralls, safety footwear, automotive paint suit

safety equipment includes: welding curtains and blankets, smoke and dust extractors, eye wash stations, fire extinguishers, first aid kits, defibrillators, safety stands

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
A-1.02.01L	demonstrate knowledge of PPE and safety equipment , their applications, maintenance, storage and procedures for use	identify types of PPE and safety equipment and describe their applications and limitations
		describe PPE and safety equipment operations
		describe the procedures used to inspect, maintain, care for, store and fit PPE and safety equipment
		identify PPE and safety equipment and describe safe work practices for hybrid/alternative fuel vehicles
A-1.02.02L	demonstrate knowledge of regulatory requirements pertaining to PPE and safety equipment	identify and interpret the regulatory requirements and responsibilities
		identify and describe workplace safety and health regulations pertaining to the use of PPE and safety equipment

RANGE OF VARIABLES

PPE includes: hearing protection, task-specific respirators, safety gloves, welding jackets, eye and face protection, coveralls, safety footwear, automotive paint suit

safety equipment includes: welding curtains and blankets, smoke and dust extractors, eye wash stations, fire extinguishers, first aid kits, defibrillators, safety stands

safe work practices for hybrid/alternative fuel vehicles include using: insulated gloves, insulated tools, pylons, digital volt-ohm meter (DVOM); removing components

TASK A-2 Uses and maintains tools and equipment

TASK DESCRIPTOR

The proper use and maintenance of tools and equipment is important for safety and efficiency.

A-2.01 Maintains hand and power tools

Essential Skills Thinking, Document Use, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-2.01.01P	clean hand and power tools	hand and power tools are cleaned to ensure proper operation and to prevent transfer of contaminants to vehicle
A-2.01.02P	lubricate hand and power tools	hand and power tools are lubricated according to manufacturers' specifications
A-2.01.03P	identify, remove, repair or replace defective or unsafe hand and power tools	defective or unsafe hand and power tools are identified, tagged and removed from use, repaired or replaced according to condition of tool
A-2.01.04P	drain compressed air system of water	compressed air system is drained of water daily to prevent premature failure of tools and contamination of work surface
A-2.01.05P	organize and store hand and power tools	hand and power tools are organized and stored according to company policies and safety considerations

RANGE OF VARIABLES

hand tools include: see Appendix B

power tools include: see Appendix B

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-2.01.01L	demonstrate knowledge of hand and power tools , their applications and procedures for use	identify types of hand and power tools , their applications, limitations and procedures for use
		describe the procedures used to inspect hand and power tools
		identify potential hazards related to hand and power tools

A-2.01.02L	demonstrate knowledge of the maintenance and storage of hand and power tools	describe the procedures used to store and maintain hand and power tools
		describe the procedures used to repair defective hand and power tools
A-2.01.03L	demonstrate knowledge of cutting tools and equipment , their applications and procedures for use	identify cutting tools and equipment used to cut components
		identify hazards and describe safe work practices pertaining to cutting
		identify cutting processes and describe their applications
		describe the procedures to set up and shut down plasma arc cutting equipment
		describe the procedures used to cut with plasma arc cutting equipment
		describe the procedures to maintain plasma arc cutting equipment
		describe the procedures to set up and shut down oxy-fuel equipment
		describe the procedures used to cut with oxy-fuel equipment
		describe the procedures to maintain oxy-fuel equipment

RANGE OF VARIABLES

hand tools include: see Appendix B

power tools include: see Appendix B

cutting tools and equipment include: cut-off wheels, plasma cutters, saws (manual, air, electric), oxy-fuel

A-2.02 Maintains frame and unibody repair and measuring equipment

Essential Skills

Numeracy, Document Use, Working with Others

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-2.02.01P	check frame and unibody repair equipment components	frame and unibody repair equipment components are checked for damage, wear and missing parts
A-2.02.02P	check level of hydraulic fluids in frame and unibody repair equipment	level of hydraulic fluids is checked according to manufacturers' specifications to ensure full extension and capability
A-2.02.03P	confirm air pressure in frame and unibody repair equipment	air pressure is confirmed according to manufacturers' specifications to avoid premature damage to equipment
A-2.02.04P	clean frame and unibody repair equipment	frame and unibody repair equipment is cleaned according to manufacturers' procedures to ensure smooth operation
A-2.02.05P	lubricate frame and unibody repair equipment	frame and unibody repair equipment is lubricated according to manufacturers' specifications
A-2.02.06P	calibrate measuring equipment	measuring equipment is calibrated according to manufacturers' specifications to ensure accurate measurements
A-2.02.07P	identify, remove, repair or replace defective measuring equipment	defective measuring equipment is identified and removed, repaired or replaced to ensure accurate measurements
A-2.02.08P	update measuring equipment software	measuring equipment software is updated to current specifications on electronic measuring systems
A-2.02.09P	clean and store measuring equipment	measuring equipment is cleaned and stored to prevent damage while not in use

RANGE OF VARIABLES

frame and unibody repair equipment components include: See Appendix B

frame and unibody repair equipment includes: See Appendix B

measuring equipment includes: See Appendix B

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-2.02.01L	demonstrate knowledge of frame and unibody repair equipment and components , their applications and procedures for use	identify types of frame and unibody repair equipment and components , their applications, limitations and procedures for use
		identify correct air pressures and level of hydraulic fluids
		describe the procedures used to inspect frame and unibody repair equipment and components
A-2.02.02L	demonstrate knowledge of the maintenance and storage of frame and unibody repair equipment	describe the procedures used to store and maintain frame and unibody repair equipment
A-2.02.03L	demonstrate knowledge of measuring equipment , their applications and procedures for use	identify types of measuring equipment , their applications, limitations and procedures for use
		describe the procedures used to inspect measuring equipment
A-2.02.04L	demonstrate knowledge of the maintenance and storage of measuring equipment	describe the procedures used to store and maintain measuring equipment

RANGE OF VARIABLES

frame and unibody repair equipment includes: See Appendix B

frame and unibody repair equipment components include: See Appendix B

measuring equipment includes: See Appendix B

A-2.03 Uses lifting equipment

Essential Skills

Document Use, Working with Others, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-2.03.01P	identify lifting points of vehicle	lifting points of vehicle are identified to avoid damage to hoist, vehicle and surroundings
A-2.03.02P	select lifting equipment	lifting equipment is selected according to vehicle and required repair

A-2.03.03P	operate lifting equipment within operating limitations	lifting equipment is operated within operating limitations according to manufacturers' specifications
A-2.03.04P	check lifting equipment	lifting equipment is checked to ensure that certification and servicing are kept current and documented according to jurisdictional regulations
A-2.03.05P	check lifting equipment components and safety backups	lifting equipment components and safety backups are checked for proper operation

RANGE OF VARIABLES

lifting equipment includes: hoists, floor jacks, door jacks, engine lifts, frame racks

lifting equipment components include: pads, levers, cables, arm locks

safety backups include: hoist locks, safety tabs, height limiter switches, safety stands

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
A-2.03.01L	demonstrate knowledge of vehicle lifting points	identify vehicle lifting points
A-2.03.02L	demonstrate knowledge of lifting equipment , their applications and procedures for use	identify types of lifting equipment , their applications, limitations and procedures for use describe the procedures used to inspect lifting equipment , including checking safety backups and lifting equipment components
A-2.03.03L	demonstrate knowledge of jurisdictional regulatory requirements pertaining to lifting equipment	identify and interpret the jurisdictional regulatory requirements pertaining to lifting equipment

RANGE OF VARIABLES

lifting equipment includes: hoists, floor jacks, door jacks, engine lifts, frame racks

safety backups include: hoist locks, safety tabs, height limiter switches, safety stands

lifting equipment components include: pads, levers, cables, arm locks

jurisdictional regulatory requirements include: inspection frequency, documentation, maintenance

A-2.04 Uses diagnostic equipment

Essential Skills

Digital Technology, Continuous Learning, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
A-2.04.01P	check function of diagnostic equipment	functional errors are identified
A-2.04.02P	calibrate diagnostic equipment	diagnostic equipment is calibrated according to manufacturers' specifications to ensure accurate diagnosis
A-2.04.03P	clean and store diagnostic equipment	diagnostic equipment is cleaned and stored in its case to prevent damage
A-2.04.04P	update diagnostic equipment software	diagnostic equipment software is updated to current manufacturers' specifications
A-2.04.05P	perform pre-scan of vehicle to identify faults	pre-scan of vehicle is performed to identify faults using diagnostic equipment according to OEM or industry service specifications and manufacturers' procedures
A-2.04.06P	perform post-scan of vehicle to confirm repairs	post-scan of vehicle is performed to confirm repairs using diagnostic equipment according to OEM or industry service specifications and manufacturers' procedures

RANGE OF VARIABLES

diagnostic equipment include: scan tools, DVOM, laptop, tablets

KNOWLEDGE

Learning Outcomes		Learning Objectives
A-2.04.01L	demonstrate knowledge of diagnostic equipment , their applications and procedures for use	identify types of diagnostic equipment , their applications, limitations and procedures for use
		describe the procedures used to inspect diagnostic equipment
		describe the procedures used to calibrate diagnostic equipment

		describe the procedures used to diagnose advanced safety system and advanced driver-assistance system (ADAS) codes
A-2.04.02L	demonstrate knowledge of the maintenance and storage of diagnostic equipment	describe the procedures used to store and maintain diagnostic equipment

RANGE OF VARIABLES

diagnostic equipment include: scan tools, DVOM, laptop, tablets

A-2.05 Maintains refinishing tools and equipment

Essential Skills Thinking, Document Use, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-2.05.01P	clean and maintain spray booths and preparation stations	spray booths and preparation stations are cleaned and maintained according to manufacturers' specifications
A-2.05.02P	clean spray guns	spray guns are cleaned after every application according to manufacturers' procedures
A-2.05.03P	lubricate spray gun components	spray gun components are lubricated with paint-compatible lubricant according to manufacturers' procedures
A-2.05.04P	maintain air dryers and filters	air dryers and filters are maintained to remove contamination and moisture
A-2.05.05P	calibrate refinishing material mixing scales	refinishing material mixing scales are calibrated according to manufacturers' specifications
A-2.05.06P	maintain mixing equipment and paint mixing room	mixing equipment and paint mixing room are maintained according to health and safety regulations and company policies
A-2.05.07P	maintain spray gun cleaners and recycling equipment	spray gun cleaners and recycling equipment are maintained according to manufacturers' specifications

A-2.05.08P	check spray gun equipment for malfunctions	spray gun equipment is checked for malfunctions and corrected
A-2.05.09P	maintain service and maintenance records	service and maintenance records are maintained according to manufacturers' recommendations and jurisdictional regulations

KNOWLEDGE

Learning Outcomes		Learning Objectives
A-2.05.01L	demonstrate knowledge of types of refinishing tools and equipment , their components and applications	identify types of refinishing tools and equipment , their components and applications
		describe the procedures used to inspect and make adjustments to refinishing tools and equipment and their components
A-2.05.02L	demonstrate knowledge of refinishing tools and equipment maintenance and storage	describe the procedures used to maintain and store refinishing tools and equipment and their components
		identify types of cleaning products and equipment used to clean spray guns
		describe procedures used to clean and store spray equipment
		identify types of lubricants and their purpose and application

RANGE OF VARIABLES

refinishing tools and equipment include: spray booths, spray guns, drying equipment, mixing tools, paint scales, paint application equipment, paint mixing machines, gun wash stations, solvent recyclers, preparation stations

TASK A-3 Uses and maintains welding equipment

TASK DESCRIPTOR

The ability to weld competently is an important skill for auto body and collision technicians as it is used in many aspects of the trade.

A-3.01 Uses welding equipment

Essential Skills

Thinking, Digital Technology, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
A-3.01.01P	determine base material to be welded	base material is determined according to OEM documentation and physical test results
A-3.01.02P	select and use welding equipment	welding equipment is selected and used according to base material to be welded and OEM procedures
A-3.01.03P	protect vehicle	vehicle is protected with welding blankets, disconnecting battery, and ensuring any electronic components are isolated
A-3.01.04P	select position for continuity clamp (work clamp)	position of continuity clamp (work clamp) is selected as close as possible to repair area
A-3.01.05P	ensure a safe working environment	a safe working environment is ensured
A-3.01.06P	prepare and clean work piece	work piece is prepared and cleaned using methods
A-3.01.07P	secure, clamp and brace work piece	work piece is secured, clamped and braced according to OEM specifications and procedures
A-3.01.08P	set welding equipment and shielding gas	welding equipment and shielding gas are adjusted according to job requirements, OEM and manufacturers' specifications, and performing test welds on the same material
A-3.01.09P	perform destructive test	destructive test is performed to ensure proper and safe weld according to OEM specifications and procedures
A-3.01.10P	control heat while welding	heat is controlled while welding using heat-sink materials to prevent warping

A-3.01.11P	maintain appropriate angle, speed of travel and distance from work piece	appropriate angle, speed of travel and distance from work piece are maintained to ensure a proper and safe weld
A-3.01.12P	maintain appropriate position of electrode tips on work piece	appropriate position of electrode tips on squeeze type welders are controlled according to OEM and manufacturers' specifications
A-3.01.13P	install components	components are installed with number and types of welds according to OEM specifications and procedures
A-3.01.14P	return vehicle integrity	vehicle integrity is returned by using sectioning procedures according to available OEM specifications and procedures

RANGE OF VARIABLES

physical tests include: ferrous metal test, grinding test, magnet test

welding equipment includes: GMAW (metal active gas MAG, metal inert gas MIG), STRSW, GTAW (tungsten inert gas TIG)

safe includes: dry, ventilated, clean, well-lit, isolated

methods include: grinding, media blasting, using a pre-cleaner, drilling, punching, applying corrosion resistant materials, sanding

components include: sheet metal, structural components, repair panels

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-3.01.01L	demonstrate knowledge of base materials	identify types of base materials and describe their characteristics
A-3.01.02L	demonstrate knowledge of welding equipment	identify types of welding equipment and describe their applications and procedures for use
		identify types of welding equipment accessories and describe their applications and procedures for use
		describe the procedures to set up and shut down different types of welding equipment
		describe the procedures used to perform troubleshooting of welding equipment
A-3.01.03L	demonstrate knowledge of welding procedures	define terminology associated with welding
		identify hazards and describe safe work practices pertaining to welding
		describe the procedures to use welding equipment
		describe squeeze-type resistance spot welding (STRSW) and its applications

	describe gas metal arc welding (GMAW) and its applications
	describe gas tungsten arc welding (GTAW) and its applications
	identify types of welds, their characteristics and applications
	describe the procedures to perform destructive test
	describe the procedures to perform test welds
	identify types of joint assembly and describe their characteristics and applications
	identify types of weld defects , their causes and the procedures to prevent and correct them

RANGE OF VARIABLES

welding equipment includes: GMAW (metal active gas MAG, metal inert gas MIG), STRSW, GTAW (tungsten inert gas TIG)

welding equipment accessories include: gauges, tips, coolants, nozzles, regulators, welding wires, shielding gases, hoses

hazards include: personal, equipment, vehicle, repair facility

joint assembly include: lap joint, butt joint, backing, open butt joint, plug welding

weld defects include: porosity, burn through, overlap, excess weld spatter, cracking, undercut

A-3.02 Maintains welding equipment

Essential Skills Thinking, Continuous Learning, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-3.02.01P	check welding equipment	welding equipment is checked for calibration, damage, wear and missing parts
A-3.02.02P	ensure cylinders are secured	cylinders are secured to prevent them from damage according to jurisdictional regulations
A-3.02.03P	check tension on drive rollers	tension on drive rollers is checked to ensure that wire is fed correctly according to manufacturers' procedures

A-3.02.04P	check wire liner	wire liner is checked for wear and contamination according to manufacturers' procedures
A-3.02.05P	clean out interior of GMAW equipment	interior of GMAW equipment is cleaned out according to manufacturers' procedures
A-3.02.06P	conduct systems check of STRSW equipment	STRSW equipment is checked to ensure tips are dressed, coolant level, cables, casings and cords are maintained according to manufacturers' specifications
A-3.02.07P	perform leak test	leaks are identified using leak test solution

RANGE OF VARIABLES

welding equipment includes: GMAW (metal active gas MAG, metal inert gas MIG), STRSW, GTAW (tungsten inert gas TIG)

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
A-3.02.01L	demonstrate knowledge of procedures to maintain welding equipment	identify types of welding equipment and describe their maintenance procedures
		identify types of welding equipment accessories used for different types of repairs and describe their maintenance procedures
		describe inspection procedures
		identify documentation associated with welding equipment maintenance
		list safety and hazards associated with the maintenance of welding equipment

RANGE OF VARIABLES

welding equipment includes: GMAW (metal active gas MAG, metal inert gas MIG), STRSW, GTAW (tungsten inert gas TIG)

welding equipment accessories include: gauges, tips, coolants, nozzles, regulators, flowmeters, welding wire, shielding gases, hoses

hazards include: unsecured and leaking cylinders, fire, explosion, electrical shock, contamination

TASK A-4 Organizes work and uses documentation

TASK DESCRIPTOR

Upon the receipt of vehicle, auto body and collision technicians prepare estimates and supplements to establish their repair plans and procedures. In some jurisdictions, technicians contribute to the preparation of estimates and supplements but are not solely responsible for preparing them.

In order for the work to be more efficient, they organize parts, materials and work areas. They use a variety of documents to plan and document their work.

A-4.01 Prepares estimates and supplements

Essential Skills Document Use, Digital Technology, Writing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-4.01.01P	discuss collision details with customer	collision details are gathered from customer
A-4.01.02P	document information on estimate	information is documented on estimate
A-4.01.03P	interpret vehicle identification number (VIN) and vehicle build labels information	VIN and vehicle build labels information are interpreted
A-4.01.04P	visually assess damage to vehicle	damage to vehicle is visually assessed to document repair required
A-4.01.05P	perform and document pre-scan of vehicle	pre-scan of vehicle is performed and documented to identify diagnostic trouble codes (DTC)
A-4.01.06P	perform initial measurements	initial measurements are performed according to OEM and manufacturers' specifications to determine structural damage
A-4.01.07P	photograph vehicle	vehicle is photographed to document damage
A-4.01.08P	dismantle vehicle to access and assess hidden damage	vehicle is dismantled to access and assess hidden damage after obtaining permission from customer
A-4.01.09P	document any previous or pre-existing damage on vehicle	previous or pre-existing damage on vehicle is documented
A-4.01.10P	document estimate of damage	estimate of damage is documented by listing parts, materials and labour required for repair

A-4.01.11P	review estimate with customer	estimate is reviewed with customer and authorization is obtained
A-4.01.12P	prepare supplement, if required	supplement is prepared, if required

RANGE OF VARIABLES

collision details include: vehicle stopped or moving, speed of vehicle during collision, number of passengers in vehicle, traffic accident report, difference in driveability of car since the incident, direction of impact

information includes: mileage, customer information, VIN, make and model, production date, paint codes, plate number, OEM specifications

VIN and vehicle build labels information include: paint codes, trim levels and colours, OEM-relevant information, production date, make and model

customers include: vehicle owner, insurance company, leasing company

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
A-4.01.01L	demonstrate knowledge of trade-related documentation and its use	describe the importance of effective communication with people relating to preparing estimates
		define terminology associated with damage analysis and estimate documentation
A-4.01.02L	demonstrate knowledge of vehicle construction	define terminology associated with vehicle construction
		identify types of vehicle construction and describe their characteristics
		identify types of complex materials and describe their characteristics
		identify body sections and describe their components
		identify body construction methods
A-4.01.03L	demonstrate knowledge of the procedures used to prepare estimate and supplement documentation	identify the sources of information used in the preparation of estimates and supplements
		describe the procedures used to prepare estimate and supplement documentation
		identify software used to prepare estimates and supplements
		identify sections of an estimate
A-4.01.04L	demonstrate knowledge of the procedures used to perform a visual inspection	identify the procedures used to perform a visual inspection of the vehicle
A-4.01.05L	demonstrate knowledge of vehicle component operation	describe the procedures used to perform vehicle component operational checks
A-4.01.06L	demonstrate knowledge of the procedures used to perform damage analysis	describe the procedures used to perform damage analysis

RANGE OF VARIABLES

people include: customers, co-workers, appraisers, estimators, insurance adjusters

terminology associated with damage analysis and estimate documentation includes: depreciation, sublet, supplement, included and not-included operations, betterment

types of vehicle construction include: conventional frames, unitized bodies, semi-unitized bodies, space frame, monocoque

complex materials include: aluminum, carbon fibre, magnesium, high-strength steels (HSS), ultra-high-strength steels (UHSS)

information includes: mileage, customer information, VIN, make and model, production date, paint codes, plate number, OEM specifications

sections of an estimate include: customer information, vehicle information, estimate detail lines (damage assessment), estimate sub-totals, final totals, customer responsibility (betterment, deductible)

A-4.02 Prepares repair plan

Essential Skills

Thinking, Document Use, Working with Others

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-4.02.01P	review work order and estimate	work order and estimate are reviewed to identify repairs required
A-4.02.02P	perform and document pre-scan of vehicle, if required	pre-scan of vehicle is performed and documented to identify DTCs, if required
A-4.02.03P	review OEM repair procedures and specifications	OEM repair procedures and specifications are reviewed
A-4.02.04P	verify parts are available	parts are available with supplier
A-4.02.05P	inspect ordered parts	ordered parts are inspected to confirm quality and suitability for vehicle repair
A-4.02.06P	determine sequence of repair procedure	sequence of repair procedure is determined according to repair facility schedule
A-4.02.07P	determine tasks to be completed	tasks to be completed are determined

RANGE OF VARIABLES

parts include: OEM, after-market, recycled

tasks include: diagnostic, frame, body, refinishing, electrical, mechanical, glass

KNOWLEDGE

Learning Outcomes		Learning Objectives
A-4.02.01L	demonstrate knowledge of vehicle construction	define terminology associated with vehicle construction
		identify types of vehicle construction and describe their characteristics and applications
		identify body sections and describe their components
		identify types of materials used in vehicle construction and describe their characteristics and applications
		identify body construction methods
A-4.02.02L	demonstrate knowledge of vehicle components	identify structural and non-structural components and describe their characteristics and applications
A-4.02.03L	demonstrate knowledge of work orders (repair orders) and estimates	identify types of repair-related documentation and describe their purpose, applications and procedures for use
		describe procedures for verifying ordered parts
		describe components of work orders (repair orders) and estimates
A-4.02.04L	demonstrate knowledge of preparing and interpreting repair plans	describe the procedures to prepare repair plan
		describe procedures used to determine repair sequence

RANGE OF VARIABLES

types of vehicle construction include: conventional frames, unitized bodies, semi-unitized bodies, space frame, monocoque

materials used in vehicle construction include: mild steel, composites, plastics, aluminum, carbon fibre, magnesium, HSS, UHSS

structural components include: frame rails, strut tower/apron, rocker panels, reinforcements, pillars, rad supports, stationary glass, bumper reinforcements, intrusion beams

non-structural components include: moveable glass, doors, bolt-on body panels

documentation includes: pre-scan print-out, vehicle dimension print-out, items to be sublet, wheel alignment check

parts include: OEM, after-market, recycled

A-4.03 Organizes parts, materials and work area

Essential Skills

Oral Communication, Working with Others, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-4.03.01P	verify that necessary parts and consumables are available for task	necessary parts and consumables are available according to job requirements
A-4.03.02P	notify supervisor of missing, damaged and incorrect parts	supervisor is notified of missing, damaged and incorrect parts
A-4.03.03P	store parts	parts are stored to ensure they are not lost or damaged
A-4.03.04P	inspect and prepare parts	parts are inspected and prepared prior to installation
A-4.03.05P	store electronic components in sealed packaging	electronic components are stored in sealed packaging to protect from dust, moisture and static electricity
A-4.03.06P	label parts and electronic components	parts and electronic components are labelled for traceability
A-4.03.07P	arrange and sort work area	work area is arranged and sorted in order to facilitate and complete job requirements

RANGE OF VARIABLES

electronic components include: sensors, modules, computers, entertainment systems, on-board cameras

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-4.03.01L	demonstrate knowledge of organizing parts, materials and work area	describe procedures for organizing and storing replacement parts and materials
		describe procedures to verify that parts and materials are available for task
		describe procedures to inspect and prepare parts prior to installation
		describe procedures for labelling parts and components
		describe procedures to keep work area organized

A-4.04 Uses documentation

Essential Skills Digital Technology, Document Use, Writing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-4.04.01P	interpret information in technical manuals/data sheets and bulletins	information in technical manuals/data sheets and bulletins is interpreted to aid in repair operations
A-4.04.02P	interpret trade terminology and information on work orders (repair orders) and estimates	trade terminology and information on work orders (repair orders) and estimates are interpreted to carry out repair procedures
A-4.04.03P	maintain service records and maintenance logs	service records and maintenance logs are maintained according to manufacturers' scheduled maintenance
A-4.04.04P	document payable and actual hours	payable and actual hours are documented to measure accuracy and efficiency
A-4.04.05P	interpret and complete safety documentation	safety documentation is interpreted and completed

RANGE OF VARIABLES

information in technical manuals/data sheets and bulletins includes: paint codes, product information, OEM-relevant information

safety documentation includes: SDS, incident reports, spill logs, workplace labels

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-4.04.01L	demonstrate knowledge of trade-related documentation and its use	identify and interpret sources of vehicle-related information
		identify types of trade-related documentation and describe their purpose, applications and procedures for use
		identify and interpret types of technical manuals/data sheets and bulletins
		identify, interpret and complete types of safety documentation

identify information required for service records and maintenance logs

identify types of **written reports** and describe their purpose and applications

RANGE OF VARIABLES

trade-related documentation includes: OEM and manufacturers' specifications, work orders (repair orders), equipment maintenance schedules, equipment maintenance records, safety manuals and bulletins

information in technical manuals/data sheets and bulletins includes: paint codes, product information, OEM-relevant information

safety documentation includes: SDS, incident reports, spill logs, workplace labels

written reports include: time and material records, apprentice training logs, estimates

TASK A-5 Uses communication and mentoring techniques

TASK DESCRIPTOR

Learning in the trades is done primarily in the workplace with tradespeople passing on their skills and knowledge to apprentices, as well as sharing knowledge among themselves. Apprenticeship is, and always has been about mentoring – learning workplace skills and passing them on. Because of the importance of this to the trade, this task covers the activities related to communication in the workplace and mentoring skills.

A-5.01 Uses communication techniques

Essential Skills

Working with Others, Oral Communication, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-5.01.01P	demonstrate communication practices with individuals or in a group	instructions and messages are understood by all parties involved in communication
A-5.01.02P	listen using active listening practices	active listening practices are utilized
A-5.01.03P	receive and respond to feedback on work	response to feedback indicates understanding and corrective measures are taken
A-5.01.04P	explain and provide feedback	explanation and feedback is provided and task is carried out as directed

A-5.01.05P	use questioning to improve communication	questions enhance understanding, on-the-job training and goal setting
A-5.01.06P	participate in safety and information meetings	meetings are attended, information is relayed to the workforce, and is understood and applied

RANGE OF VARIABLES

active listening includes: hearing, interpreting, reflecting, responding, paraphrasing

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
A-5.01.01L	demonstrate knowledge of trade terminology	define terminology used in the trade
A-5.01.02L	demonstrate knowledge of effective communication practices	describe the importance of using effective verbal and non-verbal communication with people in the workplace
		identify sources of information to effectively communicate
		identify communication and learning styles
		describe effective listening and speaking skills
		identify personal responsibilities and attitudes that contribute to on-the-job success
		identify the value of diversity in the workplace
		identify communication that constitutes harassment and discrimination

RANGE OF VARIABLES

people in the workplace include: other tradespeople, co-workers, apprentices, supervisors, clients, authorities having jurisdiction (AHJ), manufacturers

sources of information include: regulations, codes, occupational health and safety requirements, AHJ requirements, prints, drawings, specifications, company and client documentation

learning styles include: seeing it, hearing it, applying it

personal responsibilities and attitudes include: asking questions, working safely, accepting constructive feedback, time management and punctuality, respect for authority, good stewardship of materials, tools and property, efficient work practice

harassment includes: objectionable conduct, comment or display made either on a one-time or continuous basis that demeans, belittles, or causes personal humiliation or embarrassment to the recipient

discrimination is prohibited based on: race, national or ethnic origin, colour, religion, age, sex, sexual orientation, gender identity or expression, marital status, family status, disability, genetic characteristics, pardoned conviction

A-5.02 Uses mentoring techniques

Essential Skills

Working with Others, Oral Communication, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-5.02.01P	identify and communicate learning objective and point of lesson	apprentice or learner can explain the objective and point of the lesson
A-5.02.02P	link lesson to other lessons and the job	lesson order and unplanned learning opportunities are defined
A-5.02.03P	demonstrate performance of a skill to an apprentice or learner	steps required to demonstrate a skill are performed
A-5.02.04P	set up conditions required for an apprentice or learner to practice a skill	practice conditions are set up so that the skill can be practiced safely by the apprentice or learner
A-5.02.05P	assess apprentice or learner's ability to perform tasks with increasing independence	performance of apprentice or learner improves with practice to a point where skill can be done with little supervision
A-5.02.06P	give supportive and corrective feedback	apprentice or learner adopts best practice after having been given supportive or corrective feedback
A-5.02.07P	support apprentice or learner in pursuing technical training opportunities	technical training is completed within timeframe prescribed by apprenticeship authority
A-5.02.08P	support anti-harassment in the workplace	workplace is harassment and discrimination-free
A-5.02.09P	assess apprentice or learner suitability to the trade	apprentice or learner is given feedback that helps them identify their own strengths and weaknesses and suitability for the trade

RANGE OF VARIABLES

steps required to demonstrate a skill include: understanding the who, what, where, when, why, and how, explaining, showing, giving encouragement, following up to ensure skill is performed correctly

practice conditions means: guided, limited independence, full independence

KNOWLEDGE

Learning Outcomes	Learning Objectives	
A-5.02.01L	demonstrate knowledge of strategies for learning skills in the workplace	describe the importance of individual experience
		describe the shared responsibilities for workplace learning
		determine one's own learning preferences and explain how these relate to learning new skills
		describe the importance of different types of skills in the workplace
		describe the importance of essential skills in the workplace
		identify different learning styles
		identify different learning needs and strategies to meet them
		identify strategies to assist in learning a skill
A-5.02.02L	demonstrate knowledge of strategies for teaching workplace skills	identify different roles played by a workplace mentor
		describe teaching skills
		explain the importance of identifying the point of a lesson
		identify how to choose a good time to present a lesson
		explain the importance of linking the lessons
		identify the components of the skill (the context)
		describe considerations in setting up opportunities for skill practice
		explain the importance of providing feedback
		identify techniques for giving effective feedback
		describe a skills assessment
		identify methods of assessing progress
	explain how to adjust a lesson to different situations	

RANGE OF VARIABLES

essential skills are: reading, document use, writing, oral communication, numeracy, thinking, working with others, digital technology, continuous learning

learning styles include: seeing it, hearing it, applying it

learning needs include: learning disabilities, learning preferences, language proficiency

strategies to assist in learning a skill include: understanding the basic principles of instruction, developing coaching skills, being mature and patient, providing feedback

strategies for teaching include: different methods for teaching skills

teaching skills include: identifying the point of the lesson, linking the lesson, demonstrating the skill, providing practice, giving feedback, assessing skills and progress

TASK A-6 Removes and installs trim and hardware

TASK DESCRIPTOR

Auto body and collision technicians remove trim and hardware to facilitate repairs and refinish on panels. They install trim and hardware on vehicles to obtain proper fit and finish.

A-6.01 Removes trim and hardware

Essential Skills Thinking, Working with Others, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-6.01.01P	determine material composition of trim , hardware and substrate	material composition is determined to avoid damage during removal process
A-6.01.02P	identify how trim and hardware is attached	attachment method for trim and hardware is identified in order to determine removal method according to available OEM procedures
A-6.01.03P	select and use tools and equipment	tools and equipment are selected and used according to job requirements
A-6.01.04P	document position of trim for reinstallation	position of trim is documented for reinstallation
A-6.01.05P	remove trim and hardware and identify one-time use parts	trim and hardware are removed and one-time use parts are identified
A-6.01.06P	remove adhesive tapes and residue	adhesive tapes and residue are removed using eraser wheels, plastic scrapers, heat and solvents

RANGE OF VARIABLES

trim includes: mouldings, roof rack, weatherstrip, interior trim, decals, pin stripes, stone chip protective film, emblems, information labels

hardware includes: window regulators, door handles, side mirrors, door latches

tools and equipment include: plastic blades, utility knives, clip removers, heat guns, eraser wheels, razor blades, stripe cutters, metal picks

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
A-6.01.01L	demonstrate knowledge of types of trim and hardware , their applications and characteristics	define terminology associated with trim and hardware
		identify interior trim and hardware and describe their characteristics
		identify exterior trim and hardware and describe their characteristics
		describe fasteners and adhesives relating to trim and hardware
		identify hazards and describe safe work practices pertaining to trim and hardware
A-6.01.02L	demonstrate knowledge of procedures to repair and replace trim and hardware	describe the procedures used to repair or replace interior trim and hardware

RANGE OF VARIABLES

trim includes: mouldings, roof rack, weatherstrip, interior trim, decals, pin stripes, stone chip protective film, emblems, information labels

hardware includes: window regulators, door handles, side mirrors, door latches

A-6.02 Installs trim and hardware

Essential Skills Thinking, Working with Others, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS		
	Performance Criteria	Evidence of Attainment
A-6.02.01P	clean panel and verify that substrate has proper temperature for adhesion	panel is cleaned and substrate temperature is verified for proper temperature to ensure adhesion
A-6.02.02P	determine application method	application method is determined according to job requirements

A-6.02.03P	select and use tools	tools are selected and used according to job requirements
A-6.02.04P	install mechanical fasteners	mechanical fasteners are installed according to OEM procedures
A-6.02.05P	select and apply adhesion promoters and adhesives to trim	adhesion promoters and adhesives are applied to trim
A-6.02.06P	align and install trim and hardware	trim and hardware are aligned and installed to ensure correct placement and proper seal
A-6.02.07P	verify for fit and finish and take corrective action	fit and finish are verified and corrective action is taken if necessary
A-6.02.08P	inspect for leaks and noises and take corrective action	leaks and noises are inspected and corrective action is taken if necessary

RANGE OF VARIABLES

application methods include: soapy water, heat, self-adhesive

mechanical fasteners include: retainers, screws, clips, rivets

adhesion promoters include: wipes, brush-on, spray-on

adhesives include: double-sided tape, sprays, emblem adhesive

trim includes: mouldings, roof rack, weatherstrips, interior trim, decals, pin stripes, stone chip protective film, emblems, information labels

hardware includes: window regulators, door handles, side mirrors, door latches

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-6.02.01L	demonstrate knowledge of types of trim and hardware , their applications and characteristics	define terminology associated with trim and hardware
		identify interior trim and hardware and describe their characteristics
		identify exterior trim and hardware and describe their characteristics
A-6.02.02L	demonstrate knowledge of procedures to install trim and hardware	describe fasteners and adhesives relating to trim and hardware
		identify hazards and describe safe work practices pertaining to trim and hardware
A-6.02.03L	demonstrate knowledge of procedures to detect and repair noises and leaks attributed to trim and hardware	describe the procedures used to inspect interior trim and hardware for noises and leaks

RANGE OF VARIABLES

trim includes: mouldings, roof rack, weatherstrips, interior trim, decals, pin stripes, stone chip protective film, emblems, information labels

hardware includes: window regulators, door handles, side mirrors, door latches

TASK A-7 Performs final inspections

TASK DESCRIPTOR

Auto body and collision technicians perform final operational checks and quality control inspections prior to delivery of vehicle to the customer.

A-7.01 Performs final operational check

Essential Skills Document Use, Digital Technology, Writing

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
A-7.01.01P	check affected fluid levels	fluid levels are checked to ensure that they are at correct operational capacity according to OEM specifications
A-7.01.02P	check operation of components that were repaired, replaced and calibrated	components that were repaired, replaced and calibrated are operational according to OEM specifications
A-7.01.03P	perform post-scan of vehicle	post-scan of vehicle is performed and documented, DTCs are cleared, and components are reprogrammed and calibrated according to OEM procedures and specifications
A-7.01.04P	check tire pressure and wheel torque	tire pressure and wheel torque is checked prior to road test according to OEM specifications
A-7.01.05P	perform road test	road test is performed to ensure that vehicle is returned to pre-incident condition
A-7.01.06P	reset clocks and radio codes	clocks and radio codes are reset

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-7.01.01L	demonstrate knowledge of procedures to perform final quality operational checks	identify work order (repair order) details to determine completeness of work
		describe final operational checklist to verify quality of work
		describe the procedures used to perform vehicle component operational checks
		identify the purpose and procedures for conducting a vehicle road test

RANGE OF VARIABLES

final operational checklist includes: fluid levels, operation of components, post-scan of vehicle, tire pressure, road test, re-enter pre-sets, wheel torque specifications

A-7.02 Performs final quality control inspection

Essential Skills Document Use, Writing, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-7.02.01P	inspect vehicle	vehicle is inspected according to pre-delivery checklist
A-7.02.02P	check panel gaps, panel alignment and functionality of latches, catches and locks	panel gaps, panel alignment and functionality of latches, catches and locks are checked for operation according to OEM specifications
A-7.02.03P	check alignment of trims, headlights, grilles and bumpers	alignment of trims, headlights, grilles and bumpers are checked for operation according to OEM specifications

RANGE OF VARIABLES

pre-delivery checklist includes: colour match, blend areas, polish residue, overspray, paint imperfections, tape residue, vehicle cleanliness, lights, mirrors, customer courtesies, sublets, brake pedal hold

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-7.02.01L	demonstrate knowledge of procedures to perform quality control inspections	describe procedures to determine completeness of work based on repair order (work order)
		describe procedure to verify quality of work following <i>pre-delivery checklist</i>
		describe procedures used to visually inspect repaired vehicle or component

RANGE OF VARIABLES

pre-delivery checklist includes: colour match, blend areas, polish residue, overspray, paint imperfections, tape residue, vehicle cleanliness, lights, mirrors, customer courtesies, sublets, brake pedal hold

TASK A-8 Applies corrosion protection and sound deadening materials

TASK DESCRIPTOR

Auto body and collision technicians apply corrosion protection to impede corrosion infiltration and ensure structural soundness of vehicle. They also apply sound deadening materials to minimize noise and panel vibration.

A-8.01 Applies corrosion inhibitors and undercoats

Essential Skills Thinking, Document Use, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-8.01.01P	identify <i>areas subject to corrosion</i>	<i>areas subject to corrosion</i> are identified
A-8.01.02P	protect surrounding areas and components from inhibitors	surrounding areas and components are protected from inhibitors
A-8.01.03P	apply inhibitors to required areas and components	inhibitors are applied to required areas and components to return them to a pre-accident or OEM condition
A-8.01.04P	remove excess inhibitors from surrounding area	excess inhibitors are removed from surrounding area after application

A-8.01.05P	identify usage and location of replacement product	usage and location of replacement product is identified by checking OEM and manufacturers' specifications if available
A-8.01.06P	prepare surface	surface is prepared before applying weld-through primer between adjoining surfaces
A-8.01.07P	apply weld-through primer	weld-through primer is applied according to OEM specifications before panels are welded together

RANGE OF VARIABLES

areas subject to corrosion include: limited access panels, rocker panels, frame rails, repair areas, wheel wells

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-8.01.01L	demonstrate knowledge of corrosion, its causes and effects	define terminology associated with corrosion
		identify the types of corrosion and describe their causes
		identify the areas subject to corrosion
		identify environmental and atmospheric conditions that influence the rate of corrosion
A-8.01.02L	demonstrate knowledge of types of corrosion protection , their characteristics and applications	identify hazards and describe safe work practices pertaining to corrosion and corrosion protection
		identify types of corrosion protection and describe their characteristics and applications
		interpret documentation pertaining to corrosion protection
		describe the procedures used to inspect for corrosion related damage
A-8.01.03L	demonstrate knowledge of the procedures to restore corrosion protection	identify the tools and equipment relating to corrosion protection and describe their applications and procedures for use
		describe the procedures used to restore corrosion protection to OEM specifications
A-8.01.04L	demonstrate knowledge of undercoats, their applications, and procedures for use	define terminology associated with undercoats
		identify hazards and describe safe work practices pertaining to undercoats
		interpret jurisdictional regulations pertaining to the use of undercoats

		identify types of undercoats, and describe their characteristics and applications
		identify tools and equipment relating to undercoats and describe their applications and procedures for use
		identify undercoat application techniques
		describe the procedures used to apply undercoats
		identify undercoat defects and describe their causes and the procedures used to prevent or correct them
		describe the procedures used to prepare undercoats for topcoat
A-8.01.05L	demonstrate knowledge of undercoat materials, their characteristics and mixing procedures	describe the procedures used to prepare substrate prior to applying undercoats
		describe the procedures used for mixing undercoats

RANGE OF VARIABLES

types of corrosion include: oxidation, galvanic

areas subject to corrosion include: limited access panels, rocker panels, frame rails, repair areas, wheel wells

types of corrosion protection include: OEM applications, undercoats (primers), topcoats, anti-corrosion compounds, cavity waxes

documentation includes: OEM specifications, manufacturers' specifications

A-8.02 Applies seam sealers and sound deadeners

Essential Skills

Thinking, Document Use, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
A-8.02.01P	identify and replace original seam sealers and sound deadening materials	original seam sealers and sound deadening materials are identified and replaced
A-8.02.02P	protect surrounding areas and components from excess material	surrounding areas and components are protected from excess material
A-8.02.03P	prepare surface prior to application of seam sealers and sound deadening materials	surface is prepared by priming or scuffing, according to manufacturers' specifications

A-8.02.04P	apply seam sealers	seam sealers are applied according to manufacturers' specifications using methods to replicate original appearance
A-8.02.05P	apply sound deadening materials	sound deadening materials are applied according to manufacturers' specifications to replicate original appearance
A-8.02.06P	apply sound deadening and structural foam	sound deadening and structural foam is applied according to manufacturers' specifications
A-8.02.07P	remove residual material from surrounding area after application of seam sealers and sound deadening materials	residual material from surrounding area is removed after application

RANGE OF VARIABLES

seam sealers include: sprayables, brushables, self-leveling, direct-to-metal, solid (seam sealer tape)

sound deadening materials include: pads, foams, sprayables

methods include: masking, spraying, brushing

KNOWLEDGE

	Learning Outcomes	Learning Objectives
A-8.02.01L	demonstrate knowledge of seam sealers and sound deadening materials	identify types of seam sealers and sound deadening materials and describe their characteristics and applications
		identify hazards and describe safe work practices pertaining to seam sealers and sound deadening materials
A-8.02.02L	demonstrate knowledge of procedures to apply seam sealers and sound deadening materials	identify procedures to apply seam sealers and sound deadening materials

RANGE OF VARIABLES

seam sealers include: sprayables, brushables, self-leveling, direct-to-metal, solid (seam sealer tape)

sound deadening materials include: pads, foams, sprayables

MAJOR WORK ACTIVITY B

Repairs frame and structural components

TASK B-9 Prepares for repair and replacement of structural components

TASK DESCRIPTOR

The frame and structural components, on which all other components of the vehicle are installed, provide vehicles with strength and structural integrity. The vehicle must be anchored securely and dimensions restored. In order to repair or replace these components to OEM tolerances and specifications, some parts may need to be removed for access.

B-9.01 Identifies extent of damage

Essential Skills Thinking, Document Use, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-9.01.01P	visually inspect components	components are visually inspected to identify signs of damage
B-9.01.02P	identify hidden damage	hidden damage is identified by using methods
B-9.01.03P	compare measurements against OEM or industry service specifications	measurements are compared against OEM or industry service specifications to determine extent of damage and to help develop a repair plan using methods

RANGE OF VARIABLES

damage includes: fender gaps, cracked paint, stressed spot welds, broken seam sealers, striker misalignment, cab to body misalignment (full-frame), sway, sag, mash, diamond, twist

methods include: comparison measuring, cross measuring of structural components, 3-D measuring systems, dedicated fixture measuring system

KNOWLEDGE

	Learning Outcomes	Learning Objectives
B-9.01.01L	demonstrate knowledge of vehicle construction and structural components	define terminology relating to vehicle construction
		identify types of vehicle construction and structural components, and describe their characteristics
		identify energy management zones in vehicle construction
B-9.01.02L	demonstrate knowledge of procedures to analyze damage	define terminology associated with damage analysis
		identify visual inspection techniques
		identify types of damage and determine the appropriate repair procedures
		identify hazards and describe safe work practices pertaining to damage analysis
		describe the methods used for analyzing damage to vehicles
		describe the procedures and considerations used for analyzing damage to vehicles
		describe measuring theory
		identify types of measuring equipment and describe their applications and procedures for use
		describe mechanical universal measuring systems
		describe 3-D computerized measuring systems
		describe dedicated fixture measuring systems

RANGE OF VARIABLES

vehicle construction includes: unibody, conventional, space frame, monocoque

damage includes: fender gaps, cracked paint, stressed spot welds, broken seam sealers, striker misalignment, cab to body misalignment (full-frame), sway, sag, mash, diamond, twist

methods include: comparison measuring, cross measuring of structural components, 3-D measuring systems, dedicated fixture measuring system

considerations include: OEM procedures, industry service specifications, repair vs. replace, part availability

B-9.02 Removes components for access

Essential Skills Thinking, Writing, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-9.02.01P	identify components that need to be removed	components that need to be removed are identified
B-9.02.02P	remove body, mechanical and electrical components	body, mechanical and electrical components are removed using hand and power tools according to OEM procedures if available
B-9.02.03P	inspect removed components	components are inspected for physical and operational damage
B-9.02.04P	store, clean and dispose of components	components are stored, cleaned and disposed of according to environmental and jurisdictional regulations
B-9.02.05P	label, organize and store removed components	removed components are labelled, organized and stored for reassembly according to job requirements

RANGE OF VARIABLES

components include: outer body panels, suspension components, wiring harnesses, refrigerant, cooling system, electronic modules

damage includes: cracks, deformations, kinks, bends, flaking, missing parts, wear and tear

KNOWLEDGE

	Learning Outcomes	Learning Objectives
B-9.02.01L	demonstrate knowledge of procedures to remove components	describe the procedures to remove components
		identify tools and equipment used for removing components
		identify procedures to disarm and disable components
B-9.02.02L	demonstrate knowledge of procedures to inspect for physical damage	assess physical appearance and operation of components for damage using inspection methods
B-9.02.03L	demonstrate knowledge of labelling, organizing and storage of removed components	identify labelling, organizing and storing procedures

identify storage, clean-up and disposal methods

identify protection and isolation procedures for related **components**

RANGE OF VARIABLES

components include: outer body panels, suspension components, wiring harnesses, refrigerant, cooling system, electronic modules

damage includes: cracks, deformations, kinks, bends, flaking, missing parts, wear and tear

B-9.03 Performs vehicle setup

Essential Skills

Reading, Document Use, Digital Technology

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria

Evidence of Attainment

B-9.03.01P	identify anchoring points for clamps and fixtures	anchoring points are identified for clamps and fixtures to secure vehicle prior to repair, according to vehicle type , damage condition and OEM or industry repair specifications
B-9.03.02P	prepare anchoring locations	anchoring locations are prepared
B-9.03.03P	anchor vehicle to structural repair system	vehicle is anchored to structural repair system to secure vehicle for realignment according to OEM-approved anchoring methods or industry repair specifications

RANGE OF VARIABLES

vehicle types include: unibody, full-frame, space frame, monocoque

prepare includes: remove undercoating, remove vehicle components, remove paint, anchoring equipment maintenance

KNOWLEDGE

Learning Outcomes

Learning Objectives

B-9.03.01L	demonstrate knowledge of procedures to set up vehicle	identify anchoring and pulling techniques used for vehicle structural repair and describe their applications and procedures for use
		identify anchoring location

TASK B-10 Repairs, removes and installs structural components

TASK DESCRIPTOR

Auto body and collision technicians return the frame and structural components of a vehicle to original tolerances and specifications. Repairing involves straightening and stress relieving with or without the application of controlled heat. Damaged components may need to be removed using drilling, cutting and grinding procedures. Replacement components are then installed using welding, fastening and adhesive bonding techniques.

B-10.01 Repairs structural components

Essential Skills Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-10.01.01P	identify composition of structural components using methods	composition of structural components is identified using methods
B-10.01.02P	fasten straightening equipment to the vehicle	straightening equipment is fastened to the vehicle
B-10.01.03P	isolate damaged area	damaged area is isolated according to measurements
B-10.01.04P	apply corrective force to damaged areas	corrective force is applied to damaged areas to realign frame and structural components
B-10.01.05P	adjust repair plan	repair plan is adjusted by evaluating corrective forces and measurements while ensuring a safe work environment
B-10.01.06P	use stress relief techniques while pulling	stress relief techniques are used while pulling to achieve OEM or industry repair specifications
B-10.01.07P	take three-dimensional measurements and test fit related components	three-dimensional measurements are taken to monitor repair and related components are test fitted

RANGE OF VARIABLES

composition of structural components includes: aluminum, magnesium, fibre-reinforced composite, HSS, UHSS

methods include: OEM specifications, magnetism, scratch testing, electronic mil gauge

straightening equipment includes: clamps, pullers, hooks, dedicated bench systems, chains

safe work environment includes: safety straps, monitoring forces, checking chains

KNOWLEDGE

Learning Outcomes	Learning Objectives
B-10.01.01L demonstrate knowledge of metals and their characteristics	define terminology associated with metallurgy
	identify types of metals and describe their characteristics
B-10.01.02L demonstrate knowledge of metallurgic principles and their applications to control expansion, contraction and distortion	identify procedures associated with working metals and describe their applications
	describe the effects metal working has on metallurgic properties
	describe the procedures to prevent or correct problems that occur when working metals
	identify hazards and describe safe work practices pertaining to working metals
B-10.01.03L demonstrate knowledge of structural components	describe methods for identifying construction material
	define terminology associated with structural components
B-10.01.04L demonstrate knowledge of procedures and techniques used to repair structural components	identify structural components and describe their characteristics
	identify damaged frame conditions
B-10.01.05L demonstrate knowledge of procedures and techniques used to adjust and align structural components	describe repair procedures
	identify measuring techniques
	identify measuring equipment and describe their applications and procedures for use
	describe the procedures to test fit components
	explain technician liability and responsibility for repair
	identify hazards and describe safe work practices pertaining to straightening, repairing and aligning structural components
B-10.01.05L demonstrate knowledge of procedures and techniques used to adjust and align structural components	identify straightening equipment and describe their applications and procedures for use
	describe anchoring equipment and describe their applications and procedures for use

RANGE OF VARIABLES

procedures associated with working metals include: forming, shearing, punching, drilling, cutting, welding, heating, shrinking, stretching

effects metal working has on metallurgic properties include: stress, contraction, expansion, distortion, work hardening, shrinking, stretching

methods include: OEM specifications, magnetism, scratch testing, electronic mil gauge

damaged frame conditions include: sway, sag, mash, diamond, twist

repair procedures include: pulling, stress relieving (hammer on/hammer off dolly), applying controlled heat

measuring techniques include: cross, length, datum line, width

measuring equipment includes: tram gauge, centering gauge, 3-D measuring systems

straightening equipment includes: clamps, pullers, hooks, dedicated bench systems, chains

anchoring equipment includes: clamps, fixtures, jigs, chains, hooks, cables, straps

B-10.02 Removes structural components

Essential Skills

Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-10.02.01P	identify areas for sectioning	areas for sectioning are identified according to OEM or industry repair specifications
B-10.02.02P	remove fasteners	fasteners are removed by using hand and power tools, and applying heat
B-10.02.03P	remove spot welds in pre-determined areas	spot welds in pre-determined areas are removed by drilling or grinding
B-10.02.04P	cut and remove components using cutting tools and equipment	components are cut and removed using cutting tools and equipment
B-10.02.05P	remove noise, vibration and harshness (NVH) materials and structural foams	NVH materials and structural foams are removed according to type and location

RANGE OF VARIABLES

fasteners include: self-piercing rivets (SPR), blind rivets, adhesive bonding, laser welds, one-time fasteners, bolts

cutting tools and equipment include: cut-off wheels, plasma cutters, saws (manual, air, electric), oxy-fuel

KNOWLEDGE

Learning Outcomes	Learning Objectives
B-10.02.01L demonstrate knowledge of procedures to remove structural components	describe the procedures used to section vehicle structural components
	identify the procedures to remove fasteners
	identify techniques for removing welds
	identify structural component removal procedures
B-10.02.02L demonstrate knowledge of cutting tools and equipment , their applications and procedures for use	identify cutting tools and equipment used to cut components
	identify hazards and describe safe work practices pertaining to cutting
	identify cutting processes and describe their applications
	describe the procedures to set up and shut down plasma arc cutting equipment
	describe the procedures used to cut with plasma arc cutting equipment
	describe the procedures to maintain plasma arc cutting equipment
	describe the procedures to set up and shut down oxy-fuel equipment
	describe the procedures used to cut with oxy-fuel equipment
describe the procedures to maintain oxy-fuel equipment	

RANGE OF VARIABLES

vehicle includes: unibody, full-frame, space frame, monocoque

fasteners include: self-piercing rivets (SPR), blind rivets, adhesive bonding, laser welds, one-time fasteners, bolts

techniques for removing welds include: drilling, grinding, cutting

structural component removal procedures include: grinding, drilling, cutting, releasing of mechanical fasteners

cutting tools and equipment include: cut-off wheels, plasma cutters, saws (manual, air, electric), oxy-fuel

B-10.03 Installs structural components

Essential Skills

Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-10.03.01P	prepare structural components	structural components are prepared according to OEM or industry repair procedures
B-10.03.02P	perform initial fastening of components	initial fastening of components is performed to verify alignment and fit using methods
B-10.03.03P	take ongoing measurements and test fit related components	related components are test fitted and measurements are confirmed according to OEM or industry repair procedures
B-10.03.04P	perform final fastening of components	final fastening of components is performed using fastening methods
B-10.03.05P	clean and dress repair areas	repair areas are cleaned and dressed according to job requirements and OEM or industry repair procedures
B-10.03.06P	install NVH materials and structural foams	NVH materials and structural foams are installed according to OEM or industry repair procedures
B-10.03.07P	inspect fastening methods	fastening methods are confirmed according to OEM or industry repair procedures

RANGE OF VARIABLES

methods include: tack welding, bolting, screwing, clamping, dedicated fixtures and jigs

fastening methods include: welding, bolting, using adhesive bonding, riveting, following OEM procedures

repair areas include: welded, bonded, riveted, rivet-bonding, resistance spot welding

KNOWLEDGE

	Learning Outcomes	Learning Objectives
B-10.03.01L	demonstrate knowledge of procedures to install structural components	describe the <i>procedures used to prepare structural components for installation</i>
		describe the procedures and techniques used to protect electrical and electronic systems and components during installation
		identify <i>measuring techniques</i>
		identify the procedures to test fit components to ensure structural alignment
		describe <i>fastening methods</i> used to install structural components

RANGE OF VARIABLES

procedures used to prepare structural components for installation include: cleaning, grinding, drilling holes for plug welds

measuring techniques include: cross, length, datum line, width

fastening methods include: welding, bolting, using adhesive bonding, riveting, following OEM procedures

TASK B-11 Removes, installs and repairs structural and laminated glass

TASK DESCRIPTOR

Auto body and collision technicians remove structural glass such as windshields and back glass in order to facilitate access to spot welds and repair areas on structural body panels, or for replacement of damaged glass. They also repair stone chips on laminated structural glass.

B-11.01 Removes structural glass

Essential Skills Document Use, Working with Others, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-11.01.01P	remove trim, moulding, non-structural and electrical components	trim, moulding, non-structural and electrical components are removed to access bonding material
B-11.01.02P	release urethane seal	urethane seal is released using cutting tools or induction heaters to facilitate removal of structural glass without causing damage to surrounding body, glass or paint
B-11.01.03P	remove glass from opening	glass is removed from opening manually or by using lifting devices

RANGE OF VARIABLES

lifting devices include: suction cups, ergonomic lift assists

KNOWLEDGE

	Learning Outcomes	Learning Objectives
B-11.01.01L	demonstrate knowledge of structural glass, its characteristics and importance to vehicle structure	define terminology associated with structural glass
		identify hazards and describe safe work practices pertaining to structural glass and removal tools
		explain the importance of structural glass to the vehicle structural integrity
		identify types of structural glass and describe their characteristics

		identify structural glass components and accessories and describe their purpose and applications
		identify structural glass electrical components and procedures
		describe the procedures used to determine if structural glass can be repaired or if replacement is necessary
B-11.01.02L	demonstrate knowledge of the procedures to remove structural glass	describe the procedures used to remove structural glass and its related components
		identify lifting devices used to remove glass

RANGE OF VARIABLES

lifting devices include: suction cups, ergonomic lift assists

B-11.02 Installs structural glass

Essential Skills

Document Use, Working with Others, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
B-11.02.01P	test fit glass in opening and check for defects in glass and mounting surfaces	glass is test fitted in opening and mounting surfaces are checked for defects
B-11.02.02P	prepare mounting surfaces	mounting surfaces are prepared by trimming old urethane and cleaning
B-11.02.03P	prepare mating areas using primers	mating areas are prepared according to OEM specifications and manufacturers' procedures using primers to promote adhesion and prevent corrosion
B-11.02.04P	apply recommended urethane to opening and replace spacer blocks	recommended urethane is applied to opening and spacer blocks are replaced to achieve required glass height
B-11.02.05P	set glass in opening manually or using lifting devices , and verify uniformity of gaps	glass is set in opening manually or by using lifting devices , and uniformity of gaps are verified

B-11.02.06P	secure glass in place to avoid movement until urethane is set	glass is secured in place to avoid movement until urethane is set according to OEM specifications and manufacturers' procedures
B-11.02.07P	perform leak test	leak test is performed according to manufacturers' procedures
B-11.02.08P	install electrical and non-structural components and trim	electrical and non-structural components and trim are installed
B-11.02.09P	calibrate electrical components	electrical components are calibrated according to OEM procedures
B-11.02.10P	complete post-repair documentation	post-repair documentation is completed according to job requirements

RANGE OF VARIABLES

mounting surfaces include: pinch welds, cowls, package trays

primers include: bonding, pinch weld, windshield, corrosion

lifting devices include: suction cups, ergonomic lift assists

KNOWLEDGE

	Learning Outcomes	Learning Objectives
B-11.02.01L	demonstrate knowledge of the procedures to install structural glass	identify tools and equipment used to install structural glass and describe their applications and procedures for use
		identify procedures to test fit glass
		identify materials used for structural glass replacement and describe their characteristics and procedures for use
		identify the types of leaks associated with structural glass and describe the procedures used to detect and repair them
		describe procedures to install structural glass
		identify fastening methods for structural glass and their associated components
		identify lifting devices used to install glass
		identify electrical components and their calibration requirements

RANGE OF VARIABLES

types of leaks include: wind, water

fastening methods include: mechanical, bonded

lifting devices include: suction cups, ergonomic lift assists

B-11.03 Repairs laminated glass

Essential Skills Reading, Document Use, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
B-11.03.01P	inspect glass to determine repair process	glass is inspected to determine repair process according to jurisdictional regulations and OEM specifications
B-11.03.02P	clean glass to remove contaminants	glass is cleaned to remove contaminants
B-11.03.03P	check that glass is dry and at required temperature for resin flow	glass is checked for dryness and is at required temperature for resin flow according to manufacturers' procedures
B-11.03.04P	clean out chipped area of laminated glass	chipped area of laminated glass is cleaned out by drilling outer layer with rotary cutting tools and air pressure
B-11.03.05P	mount resin injection tool onto repair area	resin injection tool is mounted onto repair area
B-11.03.06P	inject resin into damaged area	resin is injected into damaged area with or without vacuum pressure according to manufacturers' specifications
B-11.03.07P	cure resin	resin is cured according to manufacturers' specifications
B-11.03.08P	remove excess resin	excess resin is removed with razor blade
B-11.03.09P	polish glass	glass is polished to remove scratches and minimize the appearance of resin

RANGE OF VARIABLES

contaminants include: water repellents, dirt, broken glass, bugs

KNOWLEDGE

Learning Outcomes	Learning Objectives
B-11.03.01L	demonstrate knowledge of procedures to repair laminated glass
	describe the procedures used to determine if laminated glass can be repaired or if replacement is necessary
	describe procedures used to repair laminated glass

MAJOR WORK ACTIVITY C

Repairs non-structural outer body panels and related components

TASK C-12 Removes, repairs and installs metal panels and components

TASK DESCRIPTOR

Non-structural outer body panels are cosmetic panels that contribute very little to the structural integrity of the vehicle and are generally mechanically affixed to the vehicle structure. Auto body and collision technicians are required to repair or replace damaged panels and components to pre-damaged condition. This task covers the removal, repair and installation of non-structural outer body panels and components made from metals such as aluminum and steel.

C-12.01 Prepares metal panels and components for repair

Essential Skills Reading, Thinking, Digital Technology

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-12.01.01P	identify procedures for removal, repair and installation	procedures are identified by researching available OEM procedures
C-12.01.02P	clean metal panel with products and cleaners	metal panel is cleaned with products and cleaners according to manufacturers' specifications to remove contamination
C-12.01.03P	inspect panel	panel is inspected visually and by touch to identify extent of damage
C-12.01.04P	protect surrounding area and unrelated components from further damage	surrounding area and unrelated components are protected from further damage
C-12.01.05P	remove components attached or adjacent to panel to access damaged area	components are removed using tools and equipment to access damaged area

RANGE OF VARIABLES

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

products and cleaners include: soapy water, degreasers, solvents

damage includes: paint damage, metal damage, stretches, buckles, tears

components include: door handles, mirrors, body side mouldings, trims, emblems, brackets and door stays

further damage includes: sparks, grinding marks, overspray

tools and equipment include: clip tools, wrenches, hook tools, blades

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
C-12.01.01L	demonstrate knowledge of metal panels and components , and their characteristics	define terminology associated with metal panels and components
		identify types of metal panels , their characteristics, application and handling procedures
		identify types of components
		identify types of metals , their properties, application and handling procedures
C-12.01.02L	demonstrate knowledge of procedures to prepare metal panel for repair	describe the procedures used to prepare metal panel for repair
		identify products and cleaners used to clean panel
		identify procedures to identify extent of damage
		identify types of tools and equipment used to remove components

RANGE OF VARIABLES

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

components include: door handles, mirrors, body side mouldings, trims, emblems, brackets and door stays

metals include: steel, aluminum alloys

products and cleaners include: soapy water, degreasers, solvents

damage includes: paint damage, metal damage, stretches, buckles, tears

tools and equipment include: clip tools, wrenches, hook tools, blades

C-12.02 Removes metal panels and components

Essential Skills

Working with Others, Thinking, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
C-12.02.01P	identify fasteners	fasteners are identified to determine method of removal
C-12.02.02P	remove and label fasteners	fasteners are removed and labeled to identify original location
C-12.02.03P	disconnect electrical components	electrical components are disconnected
C-12.02.04P	protect surrounding area from incidental contact and damage during removal of metal panels and components	surrounding area is protected from incidental contact and damage during removal of metal panels and components
C-12.02.05P	select and use tools and equipment	tools and equipment are selected and used according to job requirements

RANGE OF VARIABLES

fasteners include: clips, bolts, adhesives, spot welds, rivets

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

components include: door handles, mirrors, body side mouldings, trims, emblems, brackets and door stays

tools and equipment include: lifting equipment, hand tools

KNOWLEDGE

Learning Outcomes	Learning Objectives
C-12.02.01L demonstrate knowledge of procedures to remove metal panels and components	describe the procedures used to remove metal panels and components
	identify fasteners used to attach panels and components
	identify procedures used to disconnect electrical systems, electronic systems and accessories
	identify tools and equipment used to remove large and heavy panels

RANGE OF VARIABLES

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

components include: door handles, mirrors, body side mouldings, trims, emblems, brackets and door stays

fasteners include: clips, bolts, adhesives, spot welds, rivets

tools and equipment include: lifting equipment, hand tools

C-12.03 Repairs metal panels and components

Essential Skills

Thinking, Continuous Learning, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-12.03.01P	identify metal	metal is identified to determine repair procedure
C-12.03.02P	obtain perimeter alignment	perimeter alignment is obtained using strategies and tools and equipment
C-12.03.03P	remove existing coatings from damaged area	existing coatings are removed from damaged area with grinders and sanders
C-12.03.04P	rough out damaged area	damaged area is roughed out using tools and equipment
C-12.03.05P	return metal to shape	metal is returned to shape within tolerances using methods
C-12.03.06P	featheredge repaired area	repaired area is featheredged according to job requirements
C-12.03.07P	apply filler to repair area	filler is applied to repair area using repair tools according to application
C-12.03.08P	sand filler to contour	filler is sanded to contour by guide coating and block sanding using the cross hatch method
C-12.03.09P	identify surface imperfections	imperfections are identified visually and by touch
C-12.03.10P	determine corrective actions	corrective actions are determined according to imperfection

RANGE OF VARIABLES

metal includes: aluminum, steel

repair procedures include: quarantining, using dedicated tools and materials for aluminum to avoid contamination from steel

strategies include: pulling, pushing, stress relieving

tools and equipment include: hammers, dollies, friction jacks, pry bars, stud welder, suction cups, glue pulling equipment

existing coatings include: paints, primers, undercoats, fillers

methods include: shrinking, jacking, hammer on and off dolly

repair tools include: spreaders, squeegees, fill boards

imperfections include: pin holes, sand scratches, low/high spots

corrective actions include: re-application, block sanding

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
C-12.03.01L	demonstrate knowledge of procedures to repair metal panels and components	describe procedures used to repair metal panels and components
		identify types of metals and describe their associated repair procedures
		identify vehicle construction considerations and requirements for performing metal work on panels
		describe the procedures used to shrink metal
		describe the procedures used to reshape metal
		identify hazards and describe safe work practices pertaining to repairing metal panels
		identify tools and equipment relating to metal panels and describe their applications
		describe metallurgic principles
		describe the procedures and techniques used to protect electrical and electronic systems and components during repair
		identify types of repair materials
C-12.03.02L	demonstrate knowledge of procedures used to align and adjust metal panels	describe procedures used to apply repair materials
		identify the alignment sequence and describe its importance in the repair of metal panels and components
		describe the procedures used to rough out and align damaged metal panels

C-12.03.03L	demonstrate knowledge of procedures to prepare panels for refinishing	describe the procedures used to prepare panels for refinishing
		identify types of imperfections
		identify the corrective action to remedy various surface imperfections

RANGE OF VARIABLES

metal includes: aluminum, steel

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

components include: door handles, mirrors, body side mouldings, trims, emblems, brackets and door stays

repair procedures include: quarantining, using dedicated tools and materials for aluminum to avoid contamination from steel

vehicle construction considerations include: metal types, structures

procedures used to reshape metal include: heating, cold repair, pushing, pulling

tools and equipment include: hammers, dollies, friction jacks, pry bars, stud welder, suction cups, glue pulling equipment

metallurgic principles include: tempering, annealing, shrinking, stretching, work hardening

repair materials include: fibre reinforced filler, body fillers, advanced repair compounds, panel bond, aluminum filler

C-12.04 Installs metal panels and components

Essential Skills

Working with Others, Thinking, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-12.04.01P	protect surrounding area from incidental contact and damage during installation	surrounding area is protected from incidental contact and damage during installation
C-12.04.02P	select and use lifting equipment	lifting equipment is selected and used according to job requirements
C-12.04.03P	reconnect electrical components	electrical components are reconnected
C-12.04.04P	align panel	panel is aligned visually and by touch to achieve uniform spacing and positioning relative to adjacent panels using gap gauges according to OEM specifications

C-12.04.05P	secure panel	panel is secured using fasteners at their original location according to OEM specifications if available
C-12.04.06P	verify fit and operation	fit and operation are verified

RANGE OF VARIABLES

lifting equipment includes: hoists, jack stands, floor jacks, door jacks

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

fasteners include: clips, bolts, adhesives, spot welds, rivets, GMAW welds

KNOWLEDGE

	Learning Outcomes	Learning Objectives
C-12.04.01L	demonstrate knowledge of procedures to install metal panels and components	<p>identify types of lifting equipment used to reposition large or heavy panels</p> <p>identify procedures used to connect electrical systems, electronic systems and accessories</p> <p>identify types of fasteners and describe their applications</p>
C-12.04.02L	demonstrate knowledge of procedures used to align and adjust metal panels	<p>identify the alignment sequence and describe its importance in the installation</p> <p>describe the procedures used to adjust and align metal panels and components</p>

RANGE OF VARIABLES

lifting equipment includes: hoists, jack stands, floor jacks, door jacks

panels include: door skins, repair panels, doors, fenders, side panels, deck lid

fasteners include: clips, bolts, adhesives, spot welds, rivets, GMAW welds

components include: door handles, regulators, latches, mirrors, body side mouldings, trims, emblems, brackets and door stays

TASK C-13 Removes, repairs and installs plastic and composite panels and components

TASK DESCRIPTOR

This task covers the removal, repair and installation of non-structural outer body panels and components made from plastics and composites. Plastic and composite materials are popular because they are often lighter, more durable and safer for vehicle occupants and pedestrians than traditional base materials.

C-13.01 Prepares plastic and composite panels and components for repair

Essential Skills Reading, Working with Others, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-13.01.01P	clean plastic and composite panel	plastic and composite panel is cleaned according to manufacturers' specifications to remove contaminants using products and cleaners
C-13.01.02P	inspect panel	panel is inspected visually and by touch to identify the extent of damage
C-13.01.03P	protect surrounding area and unrelated components from damage	surrounding area and unrelated components are protected from damage
C-13.01.04P	remove plastic and composite components attached or adjacent to panel to access damaged area	plastic and composite components are removed using tools and equipment to access damaged area

RANGE OF VARIABLES

plastic and composite panels include: doors, hoods, fenders, deck lids

products and cleaners include: soap and water, alcohol-based cleaners, anti-static degreasers

damage (to panels) includes: paint damage, damage to base material

damage (to surrounding areas) includes: grinding marks, overspray

plastic and composite components include: door handles, mirrors, body side mouldings, trims, emblems, brackets, door stays, radiator supports, bumpers

tools and equipment include: clip tools, wrenches, hook tools, blades

KNOWLEDGE

	Learning Outcomes	Learning Objectives
C-13.01.01L	demonstrate knowledge of <i>plastic and composite panels</i> and <i>components</i> , and their characteristics	define terminology associated with <i>plastic and composite panels</i> and <i>components</i>
		identify types of <i>plastics and composites</i> , their characteristics, application and handling procedures
		identify types of <i>plastic and composite panels</i>
		identify types of <i>plastic and composite components</i>
C-13.01.02L	demonstrate knowledge of procedures to prepare <i>plastic and composite panels</i> and <i>components</i> for repair	describe the procedures used to prepare <i>plastic and composite panels</i> and <i>components</i> for repair
		identify <i>products and cleaners</i> used to clean panels
		identify procedures to identify extent of <i>damage</i>
		identify types of <i>tools and equipment</i> used to remove <i>components</i>

RANGE OF VARIABLES

plastic and composite panels include: doors, hoods, fenders, deck lids

plastic and composite components include: door handles, mirrors, body side mouldings, trims, emblems, brackets, door stays, radiator supports, bumpers

plastics and composites include: poly-olefins, fibre-reinforced polymers, urethane

products and cleaners include: soap and water, alcohol-based cleaners, anti-static degreasers

damage (to panels) includes: paint damage, damage to base material

damage (to surrounding areas) includes: grinding marks, overspray

tools and equipment include: clip tools, wrenches, hook tools, blades

C-13.02 Removes plastic and composite panels and components

Essential Skills

Document Use, Working with Others, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-13.02.01P	identify fasteners	fasteners are identified to determine method of removal
C-13.02.02P	disconnect electrical components	electrical components are disconnected
C-13.02.03P	select and use tools and equipment	tools and equipment are selected and used according to job requirements
C-13.02.04P	protect surrounding area from incidental contact and damage during removal	surrounding area is protected from incidental contact and damage during removal
C-13.02.05P	remove and label fasteners	fasteners are removed and labelled to identify original location

RANGE OF VARIABLES

fasteners include: clips, bolts, adhesives

tools and equipment include: lifting equipment, hand tools, power tools

KNOWLEDGE

	Learning Outcomes	Learning Objectives
C-13.02.01L	demonstrate knowledge of procedures to remove plastic and composite panels and components	describe the procedures used to remove plastic and composite panels and components
		identify fasteners used to attach plastic and composite panels and components
		identify procedures used to disconnect electrical systems, electronic systems and accessories
		identify tools and equipment used to remove plastic and composite panels and components

RANGE OF VARIABLES

plastic and composite panels include: doors, hoods, fenders, deck lids

plastic and composite components include: door handles, mirrors, body side mouldings, trims, emblems, brackets, door stays, radiator supports, bumpers

fasteners include: clips, bolts, adhesives

tools and equipment include: lifting equipment, hand tools, power tools

C-13.03 Repairs plastic and composite panels and components

Essential Skills

Document Use, Thinking, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-13.03.01P	identify material	material is identified to determine if it can be repaired or should be replaced according to OEM specifications if available
C-13.03.02P	obtain perimeter alignment	perimeter alignment is obtained using strategies and tools and equipment to return material to its pre-damage condition
C-13.03.03P	remove coatings from damaged area	coatings are removed from damaged area using grinders and sanders
C-13.03.04P	remove imperfections from damaged area	imperfections are removed according to job requirements
C-13.03.05P	perform repair	repair is performed by welding, bonding and heating according to manufacturers' and OEM specifications
C-13.03.06P	featheredge repaired area	repaired area is featheredged according to job requirements, manufacturers' and OEM specifications to achieve a smooth transition from repaired area to existing finish
C-13.03.07P	apply adhesion promoters	adhesion promoters are applied according to manufacturers' specifications
C-13.03.08P	apply repair material to repair area	repair material is applied to repair area using repair tools according to job requirements
C-13.03.09P	sand repair material	repair material is block sanded to achieve its original contour

C-13.03.10P	identify surface imperfections	imperfections are identified visually and by touch
C-13.03.11P	determine corrective actions	corrective actions are determined according to imperfection

RANGE OF VARIABLES

materials include: poly-olefins, fibre-reinforced polymers, urethane, carbon fibres

strategies include: heating, reshaping

tools and equipment include: ovens, heat lamps, heat guns, plastic welders

coatings include: paints, primers

imperfections include: cracks, deep scratches, low/high spots, dents, deformations

repair tools include: spreaders, squeegees, mixing board, static mixer

corrective actions include: re-application, sanding

KNOWLEDGE

	Learning Outcomes	Learning Objectives
C-13.03.01L	demonstrate knowledge of procedures to repair plastic and composite panels and components	describe procedures used to repair plastic and composite panels and components
		identify the alignment sequence and describe its importance in the repair of plastic and composite panels and components
		describe the procedures used to rough out and align damaged plastic and composite panels
		describe ISO code used for identifying types of plastic
		identify types of material and describe their associated repair procedures
		identify products and materials used in repair of plastic and composite panels and components
		identify hazards and describe safe work practices pertaining to repair of plastic and composite panels and components
C-13.03.02L	demonstrate knowledge of procedures to prepare panels for refinishing	describe the procedures used to prepare panels for refinishing
		identify types of imperfections
		identify the corrective action to remedy surface imperfections

RANGE OF VARIABLES

plastic and composite panels include: doors, hoods, fenders, deck lids

plastic and composite components include: door handles, mirrors, body side mouldings, trims, emblems, brackets, door stays, radiator supports, bumpers

materials include: poly-olefins, fibre-reinforced polymers, urethane, carbon fibres

products and materials include: adhesives, reinforcement mesh, back pad, plastic adhesion promoters

imperfections include: cracks, deep scratches, low/high spots, dents, deformations

corrective actions include: re-application, sanding

C-13.04 Installs plastic and composite panels and components

Essential Skills

Working with Others, Thinking, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-13.04.01P	select and use lifting equipment	lifting equipment is selected and used according to job requirements
C-13.04.02P	protect surrounding area from incidental contact and damage during installation	surrounding area is protected from incidental contact and damage during installation
C-13.04.03P	connect electrical components	electrical components are connected
C-13.04.04P	align panel	panel is aligned visually and by touch to achieve uniform spacing and positioning relative to adjacent panels using gap gauges according to OEM specifications
C-13.04.05P	secure panel	panel is secured using fasteners at their original location and according to OEM specifications
C-13.04.06P	verify fit and operation	fit and operation are verified using methods

RANGE OF VARIABLES

lifting equipment includes: hoists, floor jacks, door jacks

fasteners include: clips, bolts, adhesives, rivets

methods include: visual, mechanical, digital calibration

KNOWLEDGE

	Learning Outcomes	Learning Objectives
C-13.04.01L	demonstrate knowledge of procedures to install plastic and composite panels and components	identify types of lifting equipment used to reposition large or heavy panels
		identify procedures used to connect electrical systems, electronic systems and accessories
		identify the alignment sequence and describe its importance in the installation
		identify types of fasteners and describe their applications

RANGE OF VARIABLES

plastic and composite panels include: doors, hoods, fenders, deck lids

plastic and composite components include: door handles, mirrors, body side mouldings, trims, emblems, brackets, door stays, radiator supports, bumpers

lifting equipment includes: hoists, floor jacks, door jacks

fasteners include: clips, bolts, adhesives, rivets

TASK C-14 Removes and installs non-structural glass

TASK DESCRIPTOR

Non-structural glass is usually located in doors and side panels. It may be movable or fixed. Cracked, chipped or broken non-structural glass usually needs to be replaced. In some applications, glass needs to be removed and reinstalled to facilitate repair of surrounding components.

C-14.01 Removes non-structural glass

Essential Skills	Document Use, Thinking, Working with Others
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NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-14.01.01P	remove trim	trim is removed to expose fasteners
C-14.01.02P	position glass	glass is positioned to access fasteners
C-14.01.03P	identify and remove fasteners	fasteners are identified and removed

C-14.01.04P	extract glass from vehicle	glass is extracted from vehicle using glass removal tools
C-14.01.05P	label, store or dispose of glass	glass is labeled, stored or disposed of according to job requirements
C-14.01.06P	remove broken glass	broken glass is removed by vacuuming and cleaning areas
C-14.01.07P	inspect vehicle for damage	vehicle is inspected for damage

RANGE OF VARIABLES

trim includes: interior panels, reveal mouldings

fasteners include: pressure clips, mechanical clips, rivets, bolts, urethane, butyl

glass removal tools include: suction cups, cutting tools, heating tools, hand tools, power tools

areas include: seats, seat belt retractors, window regulators, run channels, heating and cooling vents, door panels

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
C-14.01.01L	demonstrate knowledge of non-structural glass and hardware components , and their characteristics	identify types of non-structural glass and describe their characteristics
		identify types of hardware components and describe their applications
		define terminology associated with non-structural glass
		identify types of fasteners used with non-structural glass
C-14.01.02L	demonstrate knowledge of procedures to remove non-structural glass , and its associated hardware components and attachments	identify hazards and safe work practices pertaining to non-structural glass
		describe procedures used to remove non-structural glass
		describe procedures used to remove broken glass

RANGE OF VARIABLES

non-structural glass includes: door glass, sun roofs, quarter glass, vent glass, T-tops

hardware components include: regulators, window guides, channel guides, latches

fasteners include: pressure clips, mechanical clips, rivets, bolts, urethane, butyl

C-14.02 Installs non-structural glass

Essential Skills Document Use, Thinking, Working with Others

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
C-14.02.01P	select and use tools, equipment, hardware and fasteners	tools, equipment, hardware and fasteners are selected and used according to manufacturers' specifications
C-14.02.02P	inspect glass for defects	glass is inspected for defects
C-14.02.03P	insert glass in opening and attach with hardware and fasteners	glass is inserted and attached with hardware and fasteners
C-14.02.04P	verify fit and operation of glass	fit and operation of glass is verified using tests
C-14.02.05P	install and reprogram components	components are installed and reprogrammed according to OEM specifications and procedures

RANGE OF VARIABLES

fasteners include: pressure clips, mechanical clips, rivets, bolts, urethane, butyl

defects include: scratches, chipped edges, pitting, warps

tests include: air, water, operational

components include: trim, modules, vapour barriers, wiring, latches, regulators

KNOWLEDGE

	Learning Outcomes	Learning Objectives
C-14.02.01L	demonstrate knowledge of procedures to install non-structural glass, and its associated hardware and attachments	identify types of tools and equipment used to install non-structural glass and its associated hardware and attachments
		describe the procedures for inspecting non-structural glass and its associated hardware
		identify types of defects in non-structural glass
		describe the procedures used to install non-structural glass and its associated hardware

describe the procedures used to install and reprogram **components**

identify **glass classifications and grades** and describe their characteristics and applications

RANGE OF VARIABLES

defects include: scratches, chipped edges, pitting, warps

components include: trim, modules, vapour barriers, wiring, latches, regulators

glass classifications and grades include: AS1, AS2, AS3, tints

MAJOR WORK ACTIVITY D

Repairs mechanical, electrical and alternative-fuel system components

TASK D-15 Deactivates and reactivates alternative-fuel systems

TASK DESCRIPTOR

The deactivation and reactivation of alternative-fuel system power sources is critical for the safety of auto body and collision technicians and protection of the vehicle. As well, safety must be considered when handling and storing these units and components.

D-15.01 Deactivates alternative-fuel systems

Essential Skills Document Use, Numeracy, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-15.01.01P	identify type of alternative-fuel system	alternative-fuel system is identified according to OEM and manufacturers' specifications
D-15.01.02P	inspect low-voltage and high-voltage batteries	low-voltage and high-voltage batteries are inspected for damage and leaks according to OEM and manufacturers' specifications
D-15.01.03P	test electrolyte for pH level	electrolyte is tested and neutralized according to OEM and manufacturers' specifications
D-15.01.04P	ensure zero energy	zero energy is achieved by using methods
D-15.01.05P	disconnect low-voltage battery for 12V power systems	low-voltage battery for 12V power systems is disconnected according to OEM procedures
D-15.01.06P	disable high-voltage system	high-voltage system is disabled by using disabling methods according to OEM procedures

D-15.01.07P	remove battery pack	battery pack is removed when performing repairs in proximity according to OEM procedures
D-15.01.08P	close alternative-fuel supply valves	alternative-fuel supply valves are closed according to OEM specifications
D-15.01.09P	remove alternative-fuel cells	alternative-fuel cells are removed when performing repairs in proximity according to manufacturers' procedures

RANGE OF VARIABLES

alternative-fuel systems include: propane, compressed natural gas (CNG), hybrid gas-electric, hybrid diesel-electric, full electric

methods include: turning ignition off, removing keys and separating from vehicle, removing the ignition circuit relay or high-voltage fuse, placing vehicle on wheel dollies, testing with DVOM

disabling methods include: removing service plug or locking tab, deactivating the master shut-off switch, disabling 12V power system

KNOWLEDGE

	Learning Outcomes	Learning Objectives
D-15.01.01L	demonstrate knowledge of alternative-fuel systems	identify types of alternative-fuel systems
		define terminology associated with alternative-fuel systems
D-15.01.02L	demonstrate knowledge of procedures to deactivate alternative-fuel systems	identify the dangers associated with the deactivation of electric and fuel/electric hybrids
		identify the dangers associated with the deactivation of compressed fuels
		identify the dangers associated with battery electrolytes
		explain capacitor discharge times
		describe the procedures used to remove batteries
		identify the considerations relating to the removal and replacement of battery packs in hybrid/alternative-fuel vehicles
		describe handling and storage considerations and procedures of low-voltage and high-voltage batteries
		explain residual power after deactivation of power supply
		describe colour coding of high current wiring

RANGE OF VARIABLES

alternative-fuel systems include: propane, compressed natural gas (CNG), hybrid gas-electric, hybrid diesel-electric, full electric

handling and storage considerations include: cool, dry, well-ventilated location and away from sources of ignition, use of PPE

D-15.02 Reactivates alternative-fuel systems

Essential Skills Document Use, Numeracy, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-15.02.01P	install battery pack	battery pack is installed when repairs have been completed
D-15.02.02P	enable high-voltage system	high-voltage system is enabled by using reactivation methods according to OEM specifications
D-15.02.03P	open alternative-fuel supply valves	alternative-fuel supply valves are opened according to OEM specifications
D-15.02.04P	connect low-voltage battery for 12V power systems	low-voltage battery for 12V power systems is connected according to OEM procedures
D-15.02.05P	charge low-voltage battery	low-voltage battery is charged according to OEM procedures

RANGE OF VARIABLES

reactivation methods include: re-installing service plug or locking tab, reactivating the master shut-off switch, returning the key to the vehicle, re-installing the ignition circuit relay or high-voltage fuse, removing vehicle from wheel dollies, opening the alternative-fuel supply valves

KNOWLEDGE

	Learning Outcomes	Learning Objectives
D-15.02.01L	demonstrate knowledge of procedures to reactivate alternative-fuel systems	identify the dangers associated with the reactivation of electric and fuel/electric hybrids
		identify types of PPE and safety equipment used to work on alternative-fuel systems
		describe the procedures used to install batteries

identify the considerations relating to the installation of battery packs in hybrid/alternative-fuel vehicles

describe **handling and storage considerations** and procedures of low-voltage and high-voltage batteries

describe colour coding of high current wiring

RANGE OF VARIABLES

alternative-fuel systems include: propane, CNG, hybrid gas-electric, hybrid diesel-electric, full electric

PPE and safety equipment includes: safety goggles, insulated gloves, face shield, insulated hand tools, insulated footwear, pylons, safety hook

handling and storage considerations include: cool, dry, well-ventilated location and away from sources of ignition, use of PPE

TASK D-16 Removes and installs mechanical components

TASK DESCRIPTOR

Auto body and collision technicians require the knowledge of the operation and purpose of mechanical components to fully remove, and install them safely and to OEM specifications and procedures.

D-16.01 Removes mechanical components

Essential Skills

Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-16.01.01P	select and use specialized tools and equipment	specialized tools and equipment are selected and used according to job requirements and manufacturers' specifications
D-16.01.02P	determine removal procedure of mechanical components	removal procedure of mechanical components are determined according to extent of damage
D-16.01.03P	identify type of refrigerant and coolant	type of refrigerant and coolant is identified

D-16.01.04P	recover air conditioning (A/C) refrigerant	A/C refrigerant is recovered according to jurisdictional and environmental regulations
D-16.01.05P	drain coolant system	coolant system is drained according to jurisdictional and environmental regulations
D-16.01.06P	disconnect lines and hoses for mechanical systems	mechanical system lines and hoses are disconnected according to OEM procedures
D-16.01.07P	disconnect electrical connections from mechanical systems	electrical connections are disconnected from mechanical systems according to OEM procedures
D-16.01.08P	remove mechanical fasteners from components	mechanical fasteners from components are removed using hand and power tools
D-16.01.09P	remove mechanical systems and components	mechanical systems and components are removed according to OEM procedures and specifications

RANGE OF VARIABLES

specialized tools and equipment include: A/C recovering/recycling machine, wheel alignment machine, fuel line and A/C line release tools, suspension spring compressors, pneumatic tools

mechanical components include: A/C condensers, radiators, fan cooling assemblies, control arms, leaf springs, drive shafts, exhaust pipes, ball joints, gas tanks, fuel lines, coil springs, struts

refrigerants include: R134a, 1234yf

mechanical systems include: heating, ventilation and air conditioning (HVAC), cooling, power steering, braking, sensors, fuel, suspension

mechanical fasteners include: bolts, rivets, retaining clips, clamps, screws

KNOWLEDGE

	Learning Outcomes	Learning Objectives
D-16.01.01L	demonstrate knowledge of mechanical systems and components	define terminology associated with mechanical systems and components identify types of mechanical systems and components identify types of mechanical fasteners used with components
D-16.01.02L	demonstrate knowledge of procedures to remove mechanical systems and components	describe the procedures used to inspect mechanical systems and components for collision-related damage describe the procedures used to identify damaged mechanical systems and components describe the procedures used to remove mechanical systems and components

identify types of **specialized tools and equipment** used

identify **hazards** and describe safe work practices pertaining to **mechanical systems** and **components**

RANGE OF VARIABLES

mechanical systems include: heating, ventilation and air conditioning (HVAC), cooling, power steering, braking, sensors, fuel, suspension

mechanical components include: A/C condensers, radiators, fan cooling assemblies, control arms, leaf springs, drive shafts, exhaust pipes, ball joints, gas tanks, fuel lines, coil springs, struts

mechanical fasteners include: bolts, rivets, retaining clips, clamps, screws

specialized tools and equipment include: A/C recovering/recycling machine, wheel alignment machine, fuel line and A/C line release tools, suspension spring compressors, pneumatic tools

hazards include: explosive fumes, vapours, spills, forces (tension, weight)

D-16.02 Installs mechanical components

Essential Skills

Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-16.02.01P	determine installation procedure	installation procedure is determined according to OEM specifications
D-16.02.02P	lubricate mechanical components	mechanical components are lubricated if required according to OEM specifications
D-16.02.03P	preassemble mechanical components	mechanical components are preassembled according to application and efficiency requirements
D-16.02.04P	torque mechanical components to specified tolerances	mechanical components are torqued to specified tolerances according to OEM specifications
D-16.02.05P	connect hoses and lines, and fasten clamps to mechanical components	hoses and lines are connected, and clamps are fastened to mechanical components according to OEM specifications
D-16.02.06P	refill systems with fluids	systems are refilled with fluids according to OEM specifications and procedures to ensure proper fluid levels and avoid air locks

D-16.02.07P	connect electrical connections to mechanical systems and reprogram	electrical connections are connected to mechanical systems and reprogrammed according to OEM procedures
D-16.02.08P	recharge A/C system	A/C system is recharged using A/C recovering/recycling machine according to manufacturers' procedures, OEM specifications and jurisdictional regulations
D-16.02.09P	verify mechanical systems operation	mechanical systems are operational

RANGE OF VARIABLES

mechanical components include: A/C condensers, radiators, fan cooling assemblies, control arms, leaf springs, drive shafts, exhaust pipes, ball joints, gas tanks, fuel lines

mechanical systems include: HVAC, cooling, power steering, braking, sensors, suspension

KNOWLEDGE

	Learning Outcomes	Learning Objectives
D-16.02.01L	demonstrate knowledge of procedures to install mechanical systems and components	describe the procedures used to install mechanical systems and components
		identify regulations and documentation relating to installing mechanical systems and components
		identify hazards and describe safe work practices pertaining to installing mechanical systems and components
		describe procedures and considerations used when installing fasteners
		define terminology associated with the alignment process
		identify the alignment process and describe its importance in the repair of steering and suspension system components
		describe the procedures used to perform operational check of mechanical systems and components

RANGE OF VARIABLES

mechanical systems include: HVAC, cooling, power steering, braking, sensors, suspension

mechanical components include: A/C condensers, radiators, fan cooling assemblies, control arms, leaf springs, drive shafts, exhaust pipes, ball joints, gas tanks, fuel lines

considerations used when installing fasteners include: identifying one-time-use fasteners, identifying the requirement for anti-seize and thread-locker materials, torque specifications

TASK D-17 Removes, repairs and installs electrical and electronic components

TASK DESCRIPTOR

Auto body and collision technicians require the knowledge of the operation and purpose of electrical and electronic components to fully remove, repair and replace them safely and to OEM and manufacturers' specifications.

D-17.01 Removes electrical components

Essential Skills Document Use, Thinking, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-17.01.01P	disconnect and isolate 12V battery	12V battery is disconnected and isolated, and time is allowed for residual charge to dissipate according to OEM procedures
D-17.01.02P	disconnect electrical components	electrical components are disconnected according to OEM and manufacturers' procedures and specifications
D-17.01.03P	remove electrical components	electrical components are removed by releasing fasteners
D-17.01.04P	dispose of damaged electrical components	damaged electrical components are disposed of according to jurisdictional and environmental regulations

RANGE OF VARIABLES

electrical components include: fuses and fuse boxes, relays, fan motors, power accessories, batteries

fasteners include: clips, bolts, nuts

KNOWLEDGE

Learning Outcomes		Learning Objectives
D-17.01.01L	demonstrate knowledge of electrical theory and its applications	explain basic electrical theory
		define terminology associated with electrical and electronic components
		identify hazards and describe safe work practices pertaining to electrical and electronic components
D-17.01.02L	demonstrate knowledge of electrical schematics, their applications and interpretation	identify basic electrical and electronic components and describe their applications and operation
		identify electrical schematics and describe their purpose and applications
		describe the procedures used to interpret electrical schematics in the repair of electrical and electronic components
D-17.01.03L	demonstrate knowledge of procedures to remove 12V batteries	identify DTCs
		identify hazards and describe safe work practices pertaining to 12V batteries
		describe the procedures used to remove batteries
D-17.01.04L	demonstrate knowledge of procedures to remove electrical components	describe the procedures used to disconnect and remove electrical components
		interpret jurisdictional and environmental regulations pertaining to the disposal of damaged electrical components

RANGE OF VARIABLES

terminology includes: resistors, switches, circuits, path, input

electrical components include: fuses and fuse boxes, relays, fan motors, power accessories, batteries

electronic components include: sensors, modules, computers, entertainment systems, on-board cameras

D-17.02 Repairs damaged wires and protective coverings

Essential Skills

Document Use, Thinking, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-17.02.01P	remove components and protective coverings	components and protective coverings are removed to access damaged wiring connectors according to OEM and manufacturers' procedures
D-17.02.02P	determine necessary repairs	repairs are determined according to visual inspection, result of diagnostic testing, and OEM and manufacturers' specifications
D-17.02.03P	perform repairs using methods	repairs are performed using methods according to OEM and manufacturers' specifications
D-17.02.04P	identify and remove corrosion from connections and apply corrosion protection	corrosion from connections is identified and removed and corrosion protection is applied according to OEM and manufacturers' specifications
D-17.02.05P	identify areas requiring protection	areas requiring protection are identified
D-17.02.06P	verify operation of electrical and related components	electrical and related components are operational
D-17.02.07P	complete repair	repair is completed by routing wires in original locations

RANGE OF VARIABLES

methods include: soldering, crimping, shrink tubing, reattaching connectors

corrosion protection includes: dielectric grease, shrink tubing, electrical tape, weather-pack connections (rubber seals)

areas requiring protection include: grounding, connectors, splices

KNOWLEDGE

	Learning Outcomes	Learning Objectives
D-17.02.01L	demonstrate knowledge of procedures to determine damage to electrical and electronic systems and components	identify testing equipment used to test electrical and electronic circuits and components and describe their applications and procedures for use
		describe the procedures used to test electrical and electronic circuits and components

D-17.02.02L	demonstrate knowledge of procedures for diagnosing electrical and electronic systems and components	describe the procedures used to diagnose electrical or electronic systems and their associated components
		describe the procedures used to identify signs of corrosion
		identify DTCs
D-17.02.03L	demonstrate knowledge of procedures to repair damaged wires and protective coverings	describe the removal procedures for component and protective coverings
		identify types of wiring and protective coverings
		identify considerations when handling wiring and components
		identify types of repair tools
		identify types of corrosion protection
		describe the procedures used to restore corrosion protection to electrical components
		identify types of connectors
		describe methods used to repair damaged wires and protective coverings
		describe procedures used to verify operation of electrical and related components
		describe the procedures used to protect electrical and electronic systems during repairs
D-17.02.04L	demonstrate knowledge of types of corrosion protection for electrical components, their characteristics and applications	describe electrical and electronic damage associated with collisions
		describe the procedures used to inspect for corrosion to electrical component related damage
		identify types of corrosion protection for electrical components and describe their characteristics and applications
		identify hazards and describe safe work practices pertaining to corrosion and corrosion protection for electrical components
		identify environmental and atmospheric conditions that influence the rate of corrosion to electrical components

RANGE OF VARIABLES

testing equipment includes: DVOM, test lights, diagnostic scanners

protective coverings include: insulated plastic coatings, wire looms, shrink tubing

removal procedures include: cutting, dismantling, disconnecting

repair tools include: soldering equipment, wire strippers, crimpers, side cutters, terminal release tools, heat guns

corrosion protection includes: dielectric grease, shrink tubing, electrical tape, weather-pack connections (rubber seals)

connectors include: locking tabs, screw-type fastening blocks, locking pins, loom connectors, spade-type connectors

methods include: soldering, crimping, shrink tubing, reattaching connectors

D-17.03 Installs electrical components

Essential Skills

Document Use, Thinking, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-17.03.01P	preassemble electrical components prior to final installation	electrical components are preassembled prior to final installation according to application
D-17.03.02P	install fasteners	fasteners are installed according to OEM specifications to secure electrical components in place
D-17.03.03P	connect electrical components	electrical components are connected according to OEM and manufacturers' procedures and specifications
D-17.03.04P	connect battery and check operation of electrical components	battery is connected and operation of electrical components is checked
D-17.03.05P	scan vehicle for codes	vehicle is scanned for active related codes and codes are cleared or reprogrammed if required

RANGE OF VARIABLES

electrical components include: fuses and fuse boxes, relays, sensors, fan motors, entertainment systems, power accessories, computers

KNOWLEDGE

	Learning Outcomes	Learning Objectives
D-17.03.01L	demonstrate knowledge of procedures to install electrical components	describe procedures used to install electrical components
		identify clips and fasteners used in the installation of electrical components
		describe procedures used to connect electrical components
		describe procedures used to connect 12V battery
		describe procedures used to verify operation of electrical components

RANGE OF VARIABLES

electrical components include: fuses and fuse boxes, relays, sensors, fan motors, entertainment systems, power accessories, computers

D-17.04 Services advanced electronic components

Essential Skills Document Use, Digital Technology, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
D-17.04.01P	identify type of advanced electronic component	advanced electronic component is identified according to visual inspection
D-17.04.02P	perform pre-scan of vehicle	pre-scan of vehicle is performed to identify DTCs and system operation
D-17.04.03P	repair or replace damaged component	damaged component is repaired or replaced according to OEM procedures and specifications
D-17.04.04P	perform or arrange recalibration of system	recalibration of system is performed or arranged according to OEM procedures and specifications
D-17.04.05P	perform road test	road test is performed to verify operation of advanced electronic components
D-17.04.06P	perform post-scan	post-scan is performed to verify operation of advanced electronic components and to ensure no DTCs relating to system are present

RANGE OF VARIABLES

advanced electronic components include: lane departure, adaptive cruise control, adaptive and auto-levelling headlights, traction control, rain sensing, auto-dimming mirrors, blind-spot monitoring, lane-keep assist, driver attention systems, accident avoidance systems, back-up cameras

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
D-17.04.01L	demonstrate knowledge of procedures to service advanced electronic components	identify types of advanced electronic components , their applications and characteristics
		describe procedures used to service advanced electronic components
		define terminology associated with advanced electronic components
		identify considerations when handling advanced electronic components

RANGE OF VARIABLES

advanced electronic components include: lane departure, adaptive cruise control, adaptive and auto-levelling headlights, traction control, rain sensing, auto-dimming mirrors, blind-spot monitoring, lane-keep assist, driver attention systems, accident avoidance systems, back-up cameras

considerations include: recycling, disposal, core charges

MAJOR WORK ACTIVITY E

Repairs interior components and services restraint systems

TASK E-18 Repairs and replaces interior components

TASK DESCRIPTOR

Auto body and collision technicians replace and repair interior components such as trim panels to bring the interior of the vehicle back to its pre-damage condition.

E-18.01 Repairs interior components

Essential Skills Continuous Learning, Document Use, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
E-18.01.01P	handle and store interior components with care during repair	interior components are handled and stored with care during repair to avoid damage
E-18.01.02P	clean components	components are cleaned using appropriate cleaners to determine extent of damage and to facilitate repair
E-18.01.03P	select and use tools and equipment for repair	tools and equipment for repair are selected and used according to manufacturers' specifications
E-18.01.04P	select and use repair materials	repair materials are selected based on type of damage and substrate according to manufacturers' specifications
E-18.01.05P	re-attach mounting points for clips	mounting points for clips are re-attached
E-18.01.06P	repair plastics	plastics are repaired using heat, plastic welder, panel bonders and epoxy

E-18.01.07P	install in original location with original type fasteners	original type fasteners are installed in original location to ensure it remains a serviceable piece, after confirming there is no secondary damage to mounting locations
E-18.01.08P	complete installation	installation is completed by verifying fit, finish and operation

RANGE OF VARIABLES

interior components include: trim panels, seats, head liners, door panels, center consoles

damage includes: scratches, staining, cracks, tears, bruising

appropriate cleaners include: soap and water, damp cloths

tools and equipment for repair include: plastic welding equipment, heat guns, spray guns (adhesives)

repair materials include: epoxies, adhesives, welding rods

plastics include: thermoplastics, thermoset, rigid, flexible

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
E-18.01.01L	demonstrate knowledge of procedures to repair interior components	identify types of interior components
		define terminology associated with interior components
		identify types of substrates
		describe fasteners and adhesives relating to interior components
		identify types of tools and equipment for repair
		identify types of repair materials
		describe procedures used to establish removal and installation sequence
		identify types of tools and equipment for removal and installation
		describe procedures used to repair interior components
		describe procedures used to verify fit, finish and operation of interior components

RANGE OF VARIABLES

interior components include: trim panels, seats, head liners, door panels, center consoles

substrates include: steel, plastic, aluminum, composites, cloth

tools and equipment for repair include: plastic welding equipment, heat guns, spray guns (adhesives)

repair materials include: epoxies, adhesives, welding rods

tools and equipment for removal and installation include: various hand tools, flashlights

E-18.02 Replaces interior components

Essential Skills

Thinking, Document Use, Reading

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
E-18.02.01P	disconnect and isolate battery when replacing trim and interior components	battery is disconnected and isolated when replacing trim and interior components according to OEM procedures
E-18.02.02P	verify replacement interior component matches damaged component	replacement interior component is verified that it matches damaged component
E-18.02.03P	identify types and locations of fasteners	types and locations of fasteners are identified
E-18.02.04P	remove interior components	interior components are removed using tools and equipment
E-18.02.05P	transfer fasteners, clips and retainers from removed component to replacement component	fasteners, clips and retainers from removed component are transferred to replacement component in the event they are not provided
E-18.02.06P	install new component into its original location with OEM-type fasteners	new component is installed into its original location with OEM-type fasteners to ensure it remains a serviceable piece, after confirming there is no secondary damage to mounting locations
E-18.02.07P	secure interior components	interior components are secured using fasteners according to OEM specifications
E-18.02.08P	connect electrical components and reconnect battery	electrical components are connected and battery is reconnected
E-18.02.09P	complete installation	installation is completed by re-initializing electrical components and verifying operation according to OEM procedures

RANGE OF VARIABLES

interior components include: trim panels, seats, head liners, door panels, center consoles, dash

matches include: colours, features, textures

tools and equipment include: steering wheel pullers, screwdrivers, clip removers, various hand and power tools

electrical components include: power-assisted features, control switches, handles, convenience systems

KNOWLEDGE

	Learning Outcomes	Learning Objectives
E-18.02.01L	demonstrate knowledge of procedures to replace <i>interior components</i>	identify types of <i>interior components</i>
		define terminology associated with <i>interior components</i>
		describe fasteners and adhesives relating to <i>interior components</i>
		identify types of <i>tools and equipment</i>
		describe procedures used to replace <i>interior components</i>
		describe procedures used to disconnect, isolate and reconnect battery
		describe procedures used to verify fit, finish and operation of <i>interior components</i>
E-18.02.02L	demonstrate knowledge of procedures to install <i>electrical components</i>	describe procedures used to connect <i>electrical components</i>
		describe procedures to verify operation

RANGE OF VARIABLES

interior components include: trim panels, seats, head liners, door panels, center consoles, dash

tools and equipment include: steering wheel pullers, screwdrivers, clip removers, various hand and power tools

electrical components include: power-assisted features, control switches, handles, convenience systems

TASK E-19 Services supplemental restraint systems (SRS)

TASK DESCRIPTOR

Auto body and collision technicians service restraint systems such as air bags and seat belts in a safe and systematic way in order to return the system to its original condition.

E-19.01 Services seat belt restraint systems

Essential Skills

Document Use, Digital Technology, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
E-19.01.01P	perform diagnostic pre-scan	diagnostic pre-scan is performed to identify failed components
E-19.01.02P	disconnect battery and allow residual charge to dissipate	battery is disconnected and residual charge is dissipated according to OEM specifications and procedures to prevent unintentional activation
E-19.01.03P	identify type of seat belt restraint system and safe handling procedures	type of seat belt restraint system is identified and handled according to OEM specifications
E-19.01.04P	identify failed seat belt component indicators	failed seat belt component indicators are identified
E-19.01.05P	remove components in sequence	components are removed in sequence according to OEM specifications
E-19.01.06P	inspect for secondary damage to surrounding components	secondary damage to surrounding components is identified
E-19.01.07P	install seat belt components	seat belt components are installed ensuring fasteners are torqued according to OEM specifications and procedures
E-19.01.08P	verify seat belt installation and operation	tests are performed to ensure seat belts are operational according to OEM specifications
E-19.01.09P	reconnect battery	system is energized after complete supplemental restraint system (SRS) has been serviced
E-19.01.10P	allow vehicle to complete a self-diagnostic check	vehicle has completed a self-diagnostic check
E-19.01.11P	perform diagnostic post-scan	diagnostic post-scan is performed to ensure that codes are cleared

RANGE OF VARIABLES

seat belt restraint systems include: passive, active

failed seat belt component indicators include: visible damage, DTCs, deployed seat belt retractor

secondary damage includes: seat belt mounting locations, seat structure, interior trim damage

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
E-19.01.01L	demonstrate knowledge of electrical theory and its relationship with seat belt restraint systems	define role of batteries in seat belt restraint systems
		describe the procedures used to disconnect, isolate and reconnect batteries
E-19.01.02L	demonstrate knowledge of seat belt restraint systems , their location, components, operation and failed seat belt component indicators	identify types of seat belt restraint systems and describe their location, components and operation
		define terminology associated with seat belt restraint systems
		identify hazards and describe safe work practices pertaining to seat belt restraint systems
E-19.01.03L	demonstrate knowledge of procedures to service seat belt restraint systems and their related components	interpret and follow documentation pertaining to seat belt restraint systems
		describe the procedures used to service seat belt restraint systems and their related components
		describe the procedures used to perform operational check of seat belt restraint systems

RANGE OF VARIABLES

seat belt restraint systems include: passive, active

failed seat belt component indicators include: visible damage, DTCs, deployed seat belt retractor

documentation includes: service manuals, OEM specifications

E-19.02 Services air bags and related components

Essential Skills

Digital Technology, Document Use, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
E-19.02.01P	perform diagnostic pre-scan	diagnostic pre-scan is performed to identify failed components
E-19.02.02P	disconnect battery and allow residual charge to dissipate	battery is disconnected and residual charge is dissipated according to OEM specifications and procedures to prevent unintentional activation or deployment
E-19.02.03P	identify type of air bag system	type of air bag system is identified
E-19.02.04P	take precautionary measures during air bag removal, handling, storage and disposal	precautionary measures are taken during air bag removal, handling, storage and disposal to avoid damage and personal injury
E-19.02.05P	remove components in sequence	components are removed in sequence according to OEM specifications
E-19.02.06P	inspect for secondary damage to surrounding components	secondary damage to surrounding components is identified
E-19.02.07P	verify components for installation	components for installation are verified according to OEM specifications
E-19.02.08P	install components	components are installed ensuring fasteners are torqued according to OEM specifications and procedures
E-19.02.09P	verify installation, fit and alignment of air bag system and components	installation, fit and alignment of air bag system and components are verified
E-19.02.10P	reconnect battery	system is energized after complete SRS has been repaired
E-19.02.11P	allow vehicle to complete a self-diagnostic check	vehicle has completed a self-diagnostic check
E-19.02.12P	perform diagnostic post-scan	diagnostic post-scan is performed to ensure that codes are cleared

RANGE OF VARIABLES

air bag systems include: passive, active

components include: sensors, air bags, modules, seats, pop-up roll bars, clock springs

secondary damage includes: air bag mounting locations, seat structure, interior trim damage, windshield

KNOWLEDGE

Learning Outcomes	Learning Objectives
E-19.02.01L demonstrate knowledge of electrical theory and its relationship with air bag systems and related components	define role of batteries in air bag systems and related components
	describe the procedures used to disconnect, isolate and reconnect batteries
E-19.02.02L demonstrate knowledge of air bag systems , their components , operation and safety	identify types of air bag systems and describe their location, components , operation and safe precautions
	define terminology associated with air bag systems
	identify hazards and describe safe work practices pertaining to air bag systems
E-19.02.03L demonstrate knowledge of procedures to service air bag systems and their related components	interpret and follow documentation pertaining to air bag systems
	describe the procedures used to service air bag systems and their related components
	describe the procedures used to perform a diagnostic check of air bag systems
	describe the procedures used to clear codes from vehicle

RANGE OF VARIABLES

air bag systems include: passive, active

components include: sensors, air bags, modules, seats, pop-up roll bars, clock springs

documentation includes: warning labels, OEM specifications and procedures

MAJOR WORK ACTIVITY F

Performs refinishing procedures

TASK F-20 Prepares surfaces

TASK DESCRIPTOR

Auto body and collision technicians must prepare substrates and existing surfaces for the application of undercoats and topcoats. Using proper tools, materials and techniques are important to achieve a smooth transition from repaired area to existing finish.

F-20.01 Performs initial preparation

Essential Skills Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-20.01.01P	remove residual two-way tape and decal adhesive	residual two-way tape and decal adhesive is removed using tools, products and cleaners according to job requirements and manufacturers' specifications
F-20.01.02P	clean substrate with products and cleaners , and dry surface	substrate is cleaned with products and cleaners and surface is dried using methods to ensure a finish free of surface contamination
F-20.01.03P	apply a pre-wash cleaner based on substrate and refinish material to be applied	pre-wash cleaner is applied using the wipe-on wipe-off method, to improve adhesion and to avoid static charged flash fires
F-20.01.04P	inspect substrate	substrate is inspected for surface imperfections and surface evaluation is performed

RANGE OF VARIABLES

tools include: heat guns/lamps, rotary tool (eraser wheel), razor blades

products and cleaners include: soapy water, degreasers, solvents, fallout remover

methods include: using chamois or cloths, compressed air

surface contamination includes: tar, tree sap, bugs, waxes, paint sealants

pre-wash cleaners include: water-based, alcohol-based, solvent-based, anti-static plastic cleaners

surface imperfections include: stone chips, corrosion, peeling, oxidization, cracking, scratches, checking, environmental damage

surface evaluation includes: paint thickness, chemical compatibility, adhesion

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-20.01.01L	demonstrate knowledge of performing initial preparation of substrates and surfaces	define terminology associated with surface preparation
		describe the procedures used to remove dust, loose debris and moisture
		describe the procedures used to remove residual two-way tape and decal adhesive
		identify tools, products and cleaners used to remove residual two-way tape and decal adhesive
		identify types of products and cleaners and describe their applications and procedures for use
		identify types of pre-wash cleaners and describe their applications and procedures for use
		describe cleaning techniques
		identify hazards and describe safe work practices pertaining to surface preparation
		identify types of surface imperfections

RANGE OF VARIABLES

tools include: heat guns/lamps, rotary tool (eraser wheel), razor blades

products and cleaners include: soapy water, degreasers, solvents, fallout remover

pre-wash cleaners include: water-based, alcohol-based, solvent-based, anti-static plastic cleaners

surface imperfections include: stone chips, corrosion, peeling, oxidization, cracking, scratches, checking, environmental damage

F-20.02 Masks surface

Essential Skills

Thinking, Continuous Learning, Working with Others

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
F-20.02.01P	apply soft edge tape to panels	soft edge tape is applied to panels to protect against overspray and to leave a soft edge
F-20.02.02P	apply masking tape and paper	masking tape and paper are applied to protect against damage during preparation, avoiding over and under masking
F-20.02.03P	apply spray mask (liquid mask)	spray mask (liquid mask) is applied using equipment to protect areas not to be refinished from overspray
F-20.02.04P	apply plastic sheeting	plastic sheeting is applied according to manufacturers' specifications to cover vehicle and secure edges, to protect from overspray
F-20.02.05P	apply edging tape behind flexible moulding	edging tape is used behind flexible moulding to prevent problems
F-20.02.06P	apply final masking materials before refinishing	final masking materials are applied using methods to avoid hard edges
F-20.02.07P	apply vinyl tape (fine edge)	vinyl tape (fine edge) is applied according to job requirements

RANGE OF VARIABLES

problems include: bridging, peeling, overspray

masking materials include: masking tape, paper, plastic sheeting, liquid mask, soft edge tape, fine edge tape

methods include: back masking, reverse masking

KNOWLEDGE

Learning Outcomes		Learning Objectives
F-20.02.01L	demonstrate knowledge of masking materials , their applications and procedures for use	describe the procedures and methods used to mask surfaces
		describe masking uses

identify types of **masking materials** and describe their applications and compatibilities

describe potential **problems** if masking is not done properly

RANGE OF VARIABLES

masking materials include: masking tape, paper, plastic sheeting, liquid mask, soft edge tape, fine edge tape

methods include: back masking, reverse masking

masking uses include: for protection (sanding, stripping), for primer, for paint

problems include: bridging, peeling, overspray

F-20.03 Strips surface

Essential Skills

Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-20.03.01P	protect surrounding area	surrounding area is protected with materials
F-20.03.02P	apply chemical stripper to work area using tools	chemical stripper is applied to work area according to manufacturers' specifications using tools
F-20.03.03P	neutralize and remove chemical residue	chemical residue is neutralized and removed according to manufacturers' specifications
F-20.03.04P	mechanically strip work area using tools	work area is mechanically stripped using tools according to job requirements and manufacturers' specifications
F-20.03.05P	media blast work area using media	work area is media blasted using media according to substrate and environmental regulations
F-20.03.06P	remove dust and residue from work area after mechanical or media stripping	dust and residue is removed from work area after mechanical or media stripping according to manufacturers' specifications and jurisdictional regulations

RANGE OF VARIABLES

materials include: duct tape, cardboard, masking

tools (for chemical stripping) include: brushes, aerosol sprays, scrapers, wire brushes, plastic sheeting

tools (for mechanical stripping) include: dual action sanders, stripping wheels, scrapers, razor blades, putty knives, rotary tools, compressed air blower, pressure washer

media includes: glass, sand, soda, plastic beads

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-20.03.01L	demonstrate knowledge of stripping equipment and products, their applications, safety precautions and procedures for use	identify methods used to strip topcoats and undercoats and describe their applications and associated safety or environmental considerations
		identify the tools used to mechanically strip topcoats and undercoats
		describe the effect of chemical stripping, mechanical stripping and media blasting on substrates
		describe the procedures used to remove dust and residue from work area after chemical, mechanical or media stripping
		identify types of media blasting
		identify hazards and describe safe work practices pertaining to surface preparation

RANGE OF VARIABLES

methods include: chemical strippers, media blasting, mechanical

tools (for chemical stripping) include: brushes, aerosol sprays, scrapers, wire brushes, plastic sheeting

tools (for mechanical stripping) include: dual action sanders, stripping wheels, scrapers, razor blades, putty knives, rotary tools, compressed air blower, pressure washer

media includes: glass, sand, soda, plastic beads

substrates are: aluminum, steel, composites, plastic

F-20.04 Sands surface

Essential Skills

Document Use, Thinking, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
F-20.04.01P	prepare blend area	blend area is prepared by using methods to achieve a uniform surface according to paint manufacturers' specifications
F-20.04.02P	featheredge repaired area	repaired area is featheredged according to job requirements and manufacturers' specifications to achieve a smooth transition from repaired area to existing finish
F-20.04.03P	back sand repaired area	repaired area is back sanded according to job requirements and manufacturers' specifications
F-20.04.04P	scuff sand repaired area	repaired area is scuff sanded according to job requirements and manufacturers' specifications to prepare for the application of undercoats
F-20.04.05P	level surface by removing excess primer surfacer and filler material	excess primer surfacer and filler material are removed by guide coating and block sanding using the cross hatch method to achieve a level surface

RANGE OF VARIABLES

methods include: using wet or dry sandpaper, scuff pads and scuff paste; guide coating; machine sanding; manual sanding

KNOWLEDGE

	Learning Outcomes	Learning Objectives
F-20.04.01L	demonstrate knowledge of sanding equipment and materials , their applications, safety precautions and procedures for use	identify sanding equipment and materials , their applications and procedures for use
		identify methods used to sand surfaces and describe their applications and associated safety and environmental considerations
		identify hazards and describe safe work practices pertaining to surface preparation

RANGE OF VARIABLES

sanding equipment includes: power sanders, sanding blocks

materials include: scuff paste, wet or dry sandpaper, scuff pads, guide coat

methods include: using wet or dry sandpaper, scuff pads and scuff paste; guide coating; machine sanding; manual sanding

TASK F-21 Uses repair materials

TASK DESCRIPTOR

Auto body and collision technicians use repair materials such as two-part putties, primers, primer surfacers and gravel guards. The proper use and application of these products is important to set the foundation for the refinishing process.

F-21.01 Mixes repair materials

Essential Skills Document Use, Digital Technology, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-21.01.01P	mix polyester putties	polyester putties are mixed with hardener on a non-porous mixing board according to manufacturers' specifications
F-21.01.02P	measure and stir quantities of primers and primer surfacers	quantities of primers and primer surfacers are measured and stirred according to job size and manufacturers' specifications

F-21.01.03P	agitate aerosol-type repair materials	aerosol-type repair materials are agitated according to manufacturers' specifications
F-21.01.04P	incorporate additives while mixing repair material	additives are incorporated while mixing repair material according to substrate and manufacturers' specifications

RANGE OF VARIABLES

aerosol-type repair materials include: etch primers, adhesion promoters, gravel guards

repair materials include: putties, primers, primer surfacers, gravel guards

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-21.01.01L	demonstrate knowledge of repair materials , their applications and procedures for use	define terminology associated with repair materials
		identify types of repair materials and describe their characteristics and applications
		describe the procedures used to mix repair materials
		describe application techniques
		describe the considerations taken for selecting repair materials that will maintain characteristics of existing substrate
		identify types of additives and describe their uses, characteristics and applications
		describe role of environmental conditions on working and curing times
		describe the limitations of repair materials

RANGE OF VARIABLES

repair materials include: putties, primers, primer surfacers, gravel guards

application techniques include: spraying, rolling, spreading

additives include: flex additives, accelerators, retarders, adhesion promoters

F-21.02 Applies repair materials

Essential Skills Document Use, Numeracy, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-21.02.01P	spread two-part putties firmly and evenly over imperfections	two-part putty is spread firmly and evenly over imperfections using tools according to manufacturers' specifications
F-21.02.02P	select and use spray gun with recommended fluid tip size	spray gun with recommended fluid tip size is selected and used according to technical data sheet (TDS)
F-21.02.03P	adjust spray gun pattern, fluid delivery and air pressure	spray gun pattern, fluid delivery and air pressure are adjusted according to manufacturers' specifications
F-21.02.04P	apply primers and primer surfacer	primers and primer surfacer are applied according to TDS

RANGE OF VARIABLES

tools include: putty knives, plastic spreaders, spray guns

KNOWLEDGE

	Learning Outcomes	Learning Objectives
F-21.02.01L	demonstrate knowledge of applying repair materials	describe the procedures and techniques used for applying repair materials
		identify types of repair materials and describe their characteristics and applications
		identify types of tools used for applying repair materials and describe their characteristics and applications
		identify health and safety considerations when working with repair materials
		explain limitations of types of repair materials

RANGE OF VARIABLES

repair materials include: two-part putties, primers, primer surfacer, gravel guards

tools include: putty knives, plastic spreaders, spray guns

TASK F-22 Prepares refinishing equipment

TASK DESCRIPTOR

Spray guns and spray booths need to be set up properly to ensure quality refinish results. Auto body and collision technicians identify and correct problems with refinishing equipment.

F-22.01 Prepares spray booth

Essential Skills

Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
F-22.01.01P	clean spray booth	spray booth is cleaned to ensure a dust-free environment prior to vehicle or part setup
F-22.01.02P	adjust spray booth pressure	spray booth pressure is adjusted according to equipment manufacturers' specifications
F-22.01.03P	adjust spray booth temperature	spray booth temperature is adjusted according to paint and equipment manufacturers' specifications
F-22.01.04P	utilize spray booth space to accommodate work to be completed	spray booth space is utilized according to work to be completed
F-22.01.05P	position air movers	air movers are positioned for optimal coverage and to decrease flash times
F-22.01.06P	tack off equipment	equipment is tacked off to be free of dust
F-22.01.07P	identify spray booth problems	spray booth problems are identified
F-22.01.08P	correct spray booth problems	spray booth problems are corrected or reported

RANGE OF VARIABLES

spray booths include: down draft, cross draft, semi-down draft

equipment includes: hoses, stands, blowers, benches, hangers, PPE, spray equipment

KNOWLEDGE

	Learning Outcomes	Learning Objectives
F-22.01.01L	demonstrate knowledge of spray booths , their function and preparation procedures	describe types of spray booths and their functions
		describe the cycles of spray booths
		describe the procedures to adjust spray booth pressure
		describe the procedures to adjust spray booth temperature
		describe the procedures to adjust air movers
F-22.01.02L	demonstrate knowledge of spray booth problems and troubleshooting methods	explain utilization of spray booth space, and operating temperatures, air flow, and humidity and their effects on topcoat quality
		explain the effect of positive and negative spray booth pressures on topcoat quality
		describe corrective actions for spray booth problems

RANGE OF VARIABLES

spray booths include: down draft, cross draft, semi-down draft

cycles of spray booths include: spray, purge, ramp-up time, bake, cool down

F-22.02 Performs spray gun setup

Essential Skills Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-22.02.01P	select spray gun, fluid tip, needle and air cap	spray gun, fluid tip, needle and air cap are selected according to equipment and product manufacturers' specifications
F-22.02.02P	install fluid tip, needle and air cap	fluid tip, needle and air cap are installed using tools supplied by manufacturer
F-22.02.03P	attach paint cup to the spray gun	product is supplied to the spray gun according to equipment manufacturers' specifications

F-22.02.04P	attach spray gun to hose/coupler	spray gun is attached to hose/coupler according to equipment manufacturers' specifications
F-22.02.05P	adjust air pressure, fluid delivery and fan width	air pressure, fluid delivery and fan width are adjusted according to manufacturers' specifications and application requirements
F-22.02.06P	verify spray pattern	spray pattern is verified to match job requirements by performing spray pattern test
F-22.02.07P	identify spray pattern problems	spray pattern problems are identified visually by performing a flood test
F-22.02.08P	correct spray pattern problems	spray pattern problems are corrected

RANGE OF VARIABLES

spray pattern problems include: heavy on top or bottom, hourglass, heavy in the middle, crescent shape, sputter

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-22.02.01L	demonstrate knowledge of spray guns, their applications and setup	describe spray gun components
		describe manufacturers' specifications in the selection and assembly of spray guns
		describe adjustment of spray gun air pressure, air volume and fluid delivery
F-22.02.02L	demonstrate knowledge of spray pattern problems and correction methods	describe factors affecting spray patterns
		describe corrective actions for spray pattern problems

RANGE OF VARIABLES

spray gun components include: fluid tips, needles, springs, seals, baffles, air caps, gun body, trigger, paint cup, pressure gauge

spray pattern problems include: heavy on top or bottom, hourglass, heavy in the middle, crescent shape, sputter

TASK F-23 Prepares refinishing materials

TASK DESCRIPTOR

Auto body and collision technicians must accurately mix refinishing materials and adjust colour in order to achieve desired colour and finish on the vehicle.

F-23.01 Mixes refinishing materials

Essential Skills

Digital Technology, Document Use, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-23.01.01P	agitate or shake toners	toners are agitated or shaken according to manufacturers' specifications
F-23.01.02P	clean mixing equipment before mixing	mixing equipment is cleaned before mixing
F-23.01.03P	determine required quantity of refinishing materials	quantity of refinishing materials required is determined according to factors
F-23.01.04P	place mixing cup and tare (zero) the scale	mixing cup is placed and scale is tared (zeroed)
F-23.01.05P	select mixing ratio and mixing equipment	mixing ratio and mixing equipment are selected according to manufacturers' specifications and factors
F-23.01.06P	select products , reducers, additives and activators	products , reducers, additives and activators are selected according to ambient conditions , job size and manufacturers' specifications
F-23.01.07P	pour products , reducers, additives and activators	products , reducers, additives and activators are poured according to manufacturers' specifications, by weight or by volume
F-23.01.08P	mix ready-to-spray product	ready-to-spray product is mixed according to manufacturers' specifications
F-23.01.09P	strain paint	paint is strained according to manufacturers' specifications

RANGE OF VARIABLES

toners include: metallic, pearls, micas, pigments, dyes

refinishing materials include: water-borne, solvent-based

factors include: size of job, coverage required, paint reduction

products include: toners, clearcoats, sealers

additives include: flattening agents, blending agents, accelerators, retarders, solvents, hardeners, adhesion promoters, flex agent

ambient conditions include: humidity, temperature

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-23.01.01L	demonstrate knowledge of refinishing materials and their applications	identify types of refinishing materials and their applications
		identify types of refinishing material components and their applications
		identify types of sealers and their applications
		identify types of toners and their applications
		identify types of additives and their applications
		identify types of topcoats and their applications
		identify types of clear coats and their applications
		identify refinishing material characteristics
F-23.01.02L	demonstrate knowledge of procedures used to mix refinishing materials	describe procedures to use refinishing material manufacturer software
		identify paint codes
		identify factors to consider when choosing quantity of refinishing material
		calculate required quantity of refinishing material

RANGE OF VARIABLES

refinishing materials include: water-borne, solvent-based

refinishing material components include: binders, pigments, solvents, additives

sealers include: tintable, non-tintable, plastic, transparent, epoxy, polyester, urethane

toners include: metallic, pearls, micas, pigments, dyes

additives include: flattening agents, blending agents, accelerators, retarders, solvents, hardeners, adhesion promoters, flex agent

topcoats include: single-stage, two-stage, multi-coat

clear coats include: nano-technology, scratch-resistant, ceramic, urethane

refinishing material characteristics include: durability, colour, adhesion, gloss, dry time, evaporation rate, viscosity, curing, water-resistance, chemical resistance

factors include: size of job, coverage required, paint reduction

F-23.02 Performs colour adjustments

Essential Skills

Digital Technology, Continuous Learning, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	no	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
F-23.02.01P	select variant	variant is selected according to vehicle and job requirements
F-23.02.02P	spray spray-out card	spray-out card is sprayed using spray gun that has been set up to spray vehicle to verify coverage, value, hue and chroma
F-23.02.03P	spray a let-down panel	let-down panel is sprayed to determine number of mid-coats required
F-23.02.04P	visually compare test card against an adjacent polished panel	test card is visually compared against an adjacent polished panel in natural light or using colour-corrective lighting
F-23.02.05P	adjust colour formula	colour formula is adjusted for value, hue and chroma to achieve necessary colour in natural light or using colour-corrective lighting
F-23.02.06P	adjust spray gun or spraying technique	spray gun or spraying technique is adjusted as needed to achieve desired result
F-23.02.07P	seek technical support for challenging and non-existent colour formulas	technical support is sought for challenging and non-existent colour formulas

RANGE OF VARIABLES

technical support includes: OEM, paint manufacturer

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-23.02.01L	demonstrate knowledge of performing colour matching	describe <i>elements of colour theory</i>
		describe spray gun techniques and procedures for their setup
		explain procedures for use of spectrophotometer (colour camera)
		explain procedures for use of colour corrective lighting
		describe procedures used to obtain colour formulas
		describe procedures used to adjust colour formulas
		describe procedure to create a spray-out card and let-down panel

RANGE OF VARIABLES

elements of colour theory include: value, hue, chroma, colour spectrum, primary and secondary colours, metamerism (role of light in colour perception), face, pitch, flop, metallic, pearls

TASK F-24 Applies refinishing materials

TASK DESCRIPTOR

Auto body and collision technicians must apply refinishing materials to achieve desired colour and finish on vehicle.

F-24.01 Applies sealers

Essential Skills

Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	no	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
F-24.01.01P	check for undercoat defects	undercoat defects are identified
F-24.01.02P	correct undercoat defects	undercoat defects are corrected
F-24.01.03P	select and use cleaning materials	cleaning materials are selected and used according to manufacturers' specifications
F-24.01.04P	tack surface	surface is tacked according to job requirements
F-24.01.05P	spray sealer	sealer is sprayed according to manufacturers' specifications and job requirements
F-24.01.06P	blend sealer	sealer is blended to avoid halos and dry edges according to manufacturers' specifications
F-24.01.07P	verify coverage of sealer	coverage of sealer is verified using visual inspection
F-24.01.08P	verify sealer is flashed prior to subsequent application	sealer is verified to ensure it is flashed prior to subsequent application and according to manufacturers' specifications

RANGE OF VARIABLES

defects include: fish-eyes, dry spray, contaminants, runs, scratches, pin holes, orange peel, unsanded surfaces

cleaning materials include: tack cloths, low-static solvents, water-borne cleaners, solvent-borne cleaners, low-lint wipes

KNOWLEDGE

	Learning Outcomes	Learning Objectives
F-24.01.01L	demonstrate knowledge of applying sealers	identify types of cleaning materials
		describe topcoat application factors as they apply to sealers
		describe the role of sealers in the refinishing process
		describe spray techniques
		describe blending techniques
		identify types of defects
		explain the effect of contaminants and methods of removal
		explain flash-off times
		explain forced drying and forced curing
		explain drying times of materials in relation to defect correction

RANGE OF VARIABLES

cleaning materials include: tack cloths, low-static solvents, water-borne cleaners, solvent-borne cleaners, low-lint wipes

topcoat application factors include: spray techniques, spray sequence, tacking between coats, blending

spray techniques include: distance, overlap, gun speed, trigger control, angle

blending techniques include: reverse blending, arcing, trigger control, melting in, blending agents

defects include: fish-eyes, dry spray, contaminants, runs, scratches, pin holes, orange peel, unsanded surfaces

F-24.02 Applies base coat

Essential Skills

Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	no	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-24.02.01P	correct undercoat and top coat defects	undercoat and top coat defects are corrected
F-24.02.02P	spray base coat	base coat is sprayed according to manufacturers' specifications and job requirements

F-24.02.03P	blend base coat	base coat is blended to avoid dry edges and to ensure a uniform transition according to job requirements and manufacturers' specifications
F-24.02.04P	apply drop/orientation coat on metallic and pearl/mica	drop/orientation coat on metallic and pearl/mica is applied according to manufacturers' specifications
F-24.02.05P	spray mid-coat	mid-coat is sprayed according to let-down panel and manufacturers' specifications
F-24.02.06P	tack or anti-static treat surface prior to first base coat and between subsequent coats	surface is tacked or treated with anti-static prior to base coat and between subsequent coats according to manufacturers' specifications
F-24.02.07P	verify base coat is flashed prior to subsequent application	base coat is verified to ensure it is flashed prior to subsequent application and according to manufacturers' specifications
F-24.02.08P	verify coverage of base coat	coverage of base coat is verified using visual inspection

RANGE OF VARIABLES

defects include: fish-eyes, dry spray, contaminants, runs, orange peel, mottling, halo, striping, poor colour match, poor coverage

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-24.02.01L	demonstrate knowledge of applying base coats	describe topcoat application factors as they apply to base coats
		describe the role of base coats in the refinishing process
		describe spray techniques
		describe blending techniques
		describe drop/orientation coat techniques
		identify types of defects
		explain the effect of contaminants and methods of removal
		explain flash-off times
		explain forced drying and forced curing
		explain drying times of materials in relation to defect correction

RANGE OF VARIABLES

topcoat application factors include: spray techniques, spray sequence, tacking between coats, blending

spray techniques include: distance, overlap, gun speed, gun adjustments, trigger control, angle

blending techniques include: reverse blending, arcing, trigger control, melting in, blending agents

drop/orientation coat techniques include: arcing, trigger control, speed, temperature, cross patterns, reverse blending, air pressure, spray gun distance

defects include: fish-eyes, dry spray, contaminants, runs, orange peel, mottling, halo, striping, poor colour match, poor coverage

F-24.03 Applies single-stage paint

Essential Skills

Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	no	NV	NV	NV

SKILLS

Performance Criteria

Evidence of Attainment

F-24.03.01P	ensure undercoat defects are corrected	undercoat defects are corrected
F-24.03.02P	select and use cleaning materials	cleaning materials are selected and used according to manufacturers' specifications
F-24.03.03P	spray single-stage paint	single-stage paint is sprayed according to manufacturers' specifications and job requirements
F-24.03.04P	blend single-stage paint	single-stage paint is blended to avoid dry edges and ensure a uniform transition according to job requirements and manufacturers' specifications
F-24.03.05P	verify single-stage paint is flashed prior to subsequent application	single-stage paint is verified to ensure it is flashed prior to subsequent application and according to manufacturers' specifications

RANGE OF VARIABLES

defects include: fish-eyes, dry spray, contaminants, runs, orange peel, mottling, halo, striping, poor colour match, poor coverage

cleaning materials include: tack cloths, low-static solvents, water-borne cleaners, solvent-borne cleaners, low-lint wipes

KNOWLEDGE

	Learning Outcomes	Learning Objectives
F-24.03.01L	demonstrate knowledge of applying single-stage paint	identify types of cleaning materials
		describe topcoat application factors as they apply to single-stage paint
		describe the role of single-stage paint in the refinishing process
		describe spray techniques
		describe blending techniques
		identify types of defects
		explain flash-off times
		explain forced drying and forced curing
		explain the effect of contaminants
		identify applications of clear coat over single-stage paint

RANGE OF VARIABLES

cleaning materials include: tack cloths, low-static solvents, water-borne cleaners, solvent-borne cleaners, low-lint wipes

topcoat application factors include: spray techniques, spray sequence, blending

spray techniques include: distance, overlap, gun speed, trigger control, angle

blending techniques include: reverse blending, arcing, trigger control, melting in, blending agents

defects include: fish-eyes, dry spray, contaminants, runs, orange peel, mottling, halo, striping, poor colour match, poor coverage

F-24.04 Applies clear coat

Essential Skills Document Use, Thinking, Numeracy

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	no	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-24.04.01P	ensure topcoat defects are corrected	topcoat defects are corrected
F-24.04.02P	spray clear coat	clear coat is sprayed according to manufacturers' specifications and job requirements
F-24.04.03P	blend clear coat	clear coat is blended to a uniform texture according to manufacturers' specifications

F-24.04.04P	verify clear coat is flashed prior to subsequent application	clear coat is verified to ensure it is flashed prior to subsequent application and according to manufacturers' specifications
F-24.04.05P	correct defects	defects are corrected

RANGE OF VARIABLES

defects include: fish-eyes, dry spray, contaminants (hair, bugs, dirt, water), runs, orange peel, solvent popping

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
F-24.04.01L	demonstrate knowledge of applying clear coat	describe topcoat application factors as they apply to clear coat
		describe the role of clear coats in the refinishing process
		describe spray techniques
		describe blending techniques
		identify types of defects
		explain the effect of contaminants
		explain flash-off times
		explain forced drying and forced curing
		explain drying times of materials in relation to defect correction

RANGE OF VARIABLES

topcoat application factors include: spray techniques, spray sequence, blending

spray techniques include: distance, overlap, gun speed, trigger control, angle, air pressure

blending techniques include: arcing, trigger control, melting in, blending agents

defects include: fish-eyes, dry spray, contaminants (hair, bugs, dirt, water), runs, orange peel, solvent popping

TASK F-25 Performs post-refinishing functions

TASK DESCRIPTOR

Auto body and collision technicians inspect vehicles after the refinishing process. They are responsible for removing all masking materials, correcting imperfections, and verifying the quality and completion of the refinish work.

F-25.01 Removes masking materials

Essential Skills

Thinking, Working with Others, Oral Communication

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

Performance Criteria		Evidence of Attainment
F-25.01.01P	select removal procedures	removal procedures are selected according to masking products and masking technique
F-25.01.02P	remove masking plastic, paper and tape	masking plastic, paper and tape are removed according to job requirements to prevent damaging refinished and existing surfaces
F-25.01.03P	remove spray mask	spray mask is removed by washing with water
F-25.01.04P	inspect for masking issues	masking issues are identified visually and corrective actions are determined

RANGE OF VARIABLES

removal procedures include: timing of removal, removal tools

masking products include: tapes, paper, plastics, trim mask, foam tape, spray mask, foam earplugs, tin foil

masking techniques include: perimeter masking, back masking, reverse masking, tunnel masking, two-tone masking

masking issues include: bridging, under-masking, over-masking, over spray, adhesive residue

corrective actions include: re-application, polishing, use of solvents, use of glass cleaner, use of blades, application of detail products

KNOWLEDGE

	Learning Outcomes	Learning Objectives
F-25.01.01L	demonstrate knowledge of removing masking products	identify types of masking products and describe their applications
		describe procedures used to remove masking products
F-25.01.02L	demonstrate knowledge of masking issues	identify masking issues and their corresponding corrective actions

RANGE OF VARIABLES

masking products include: tapes, paper, plastics, trim mask, foam tape, spray mask, foam earplugs, tin foil

masking issues include: bridging, under-masking, over-masking, over spray, adhesive residue

corrective actions include: re-application, polishing, use of solvents, use of glass cleaner, use of blades, application of detail products

F-25.02 Corrects surface imperfections

Essential Skills

Document Use, Thinking, Working with Others

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	no	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
F-25.02.01P	identify surface imperfections	surface imperfections are identified visually and by touch
F-25.02.02P	determine corrective actions	corrective actions are determined according to surface imperfection
F-25.02.03P	sand or de-nib refinish area	refinish area is sanded or de-nibbed according to surface imperfection
F-25.02.04P	compound refinish area	refinish area is compounded according to surface imperfection
F-25.02.05P	polish refinish area	refinish area is polished to restore lustre and to match existing finish

RANGE OF VARIABLES

imperfections include: sags, fish-eyes, solvent popping, runs, orange peel, dust nibs, dry spray, dieback, sinking, top-coat bridging, contour mapping, bleeding, colour mismatch, mottling, transparency, gloss mismatch, texture mismatch

corrective actions include: re-application, polishing, use of blades, sanding, nib/run filing

KNOWLEDGE

Learning Outcomes	Learning Objectives
F-25.02.01L	demonstrate knowledge of surface imperfections
	identify types of surface imperfections
F-25.02.02L	demonstrate knowledge of the corrective action of various surface imperfections
	identify the corrective action to remedy various surface imperfections
	identify limitations of repair based on coating type
	describe procedures used to sand when correcting surface imperfections
	describe procedures used to compound when correcting surface imperfections
	describe procedures used to polish when correcting surface imperfections
F-25.02.03L	demonstrate knowledge of the causes of various surface imperfections
	identify the causes of various surface imperfections

RANGE OF VARIABLES

imperfections include: sags, fish-eyes, solvent popping, runs, orange peel, dust nibs, dry spray, dieback, sinking, top-coat bridging, contour mapping, bleeding, colour mismatch, mottling, transparency, gloss mismatch, texture mismatch

corrective actions include: re-application, polishing, use of blades, sanding, nib/run filing

causes include: contamination, poor spray technique, improper mixing procedures, inter-mixing of products, expired product, poor equipment, poor booth conditions, incorrect prepping procedures, environmental effects

MAJOR WORK ACTIVITY G

Performs detailing and cleaning

TASK G-26 Details exterior

TASK DESCRIPTOR

Auto body and collision technicians detail the exterior of vehicles to re-enhance their finish. This includes cleaning and polishing, and touching up stone chips.

G-26.01 Removes minor imperfections

Essential Skills Document Use, Oral Communication, Continuous Learning

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
G-26.01.01P	identify <i>minor imperfections</i>	<i>minor imperfections</i> are identified
G-26.01.02P	determine <i>corrective actions</i>	<i>corrective actions</i> are determined according to <i>minor imperfection</i>
G-26.01.03P	wet sand, de-nib and shave required area	required area is wet sanded, de-nibbed and shaved according to <i>minor imperfection</i>
G-26.01.04P	remove overspray	overspray is removed from paint surface and glass using <i>tools and materials</i>

RANGE OF VARIABLES

minor imperfections include: sags, fish-eyes, solvent popping, runs, orange peel, dust nibs, dry spray, dieback, scratches, top-coat bridging, oxidization, brake dust, gloss mismatch, texture mismatch

corrective actions include: re-application, polishing, use of blades, sanding

tools and materials include: razor blades, polishers, clay bar, rubbing compounds, chemicals, de-nib files

KNOWLEDGE

	Learning Outcomes	Learning Objectives
G-26.01.01L	demonstrate knowledge of procedures to remove overspray and minor imperfections	identify types of topcoat defects and describe their characteristics
		identify types of minor imperfections
		describe the procedures used to remove overspray
		identify tools and materials used to remove overspray and minor imperfections and describe their applications and procedures for use
		identify hazards and describe safe work practices pertaining to removing overspray and minor imperfections
		define terminology associated with removing overspray and minor imperfections
		identify the corrective action to remedy various minor imperfections
		identify limitations of repair based on top coat type
		describe procedures used to sand when correcting minor imperfections
		describe procedures used to compound when correcting minor imperfections
		describe procedures used to polish when correcting minor imperfections
G-26.01.02L	demonstrate knowledge of the causes of minor imperfections	identify the causes of minor imperfections

RANGE OF VARIABLES

minor imperfections include: sags, fish-eyes, solvent popping, runs, orange peel, dust nibs, dry spray, dieback, scratches, top-coat bridging, oxidization, brake dust, gloss mismatch, texture mismatch

tools and materials include: razor blades, polishers, clay bar, rubbing compounds, chemicals, de-nib files

corrective actions include: re-application, polishing, use of blades, sanding

causes include: contamination, poor spray technique, improper mixing procedures, inter-mixing of products, expired product, poor equipment, poor booth conditions, incorrect prepping procedures, environmental effects

G-26.02 Polishes vehicle

Essential Skills

Working with Others, Document Use, Thinking

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
G-26.02.01P	evaluate paint finish	paint finish is evaluated
G-26.02.02P	determine polishing procedure	polishing procedure is determined according to paint finish evaluation
G-26.02.03P	protect surrounding areas	surrounding areas are protected
G-26.02.04P	select and use tools, equipment and materials	tools, equipment and materials are selected and used according to job requirements
G-26.02.05P	polish surfaces	surfaces are polished to restore lustre and to remove micro-scratches from compounding
G-26.02.06P	wet sand and polish headlights	headlights are polished to restore clarity
G-26.02.07P	control speed, pressure and angle of polisher	speed, pressure and angle of polisher are controlled to avoid damage to surface

RANGE OF VARIABLES

areas include: plastic mouldings, tires, soft surfaces

tools, equipment and materials include: mil thickness gauge, variable speed buffers, polishing cloths and pads

damage includes: burning through the finish, scratching, dulling the finish

KNOWLEDGE

	Learning Outcomes	Learning Objectives
G-26.02.01L	demonstrate knowledge of procedures used to polish vehicle	identify terminology associated with polishing describe the surface preparation procedures used for polishing
G-26.02.02L	demonstrate knowledge of polishing materials and their characteristics	identify types of topcoat finishes and describe their characteristics identify products used in vehicle polishing and describe their related safety considerations
G-26.02.03L	demonstrate knowledge of polishing equipment, its applications and procedures for use	identify hazards and describe safe work practices pertaining to polishing

identify polishing tools and equipment and describe their applications

describe the procedures used to set up, operate and adjust polishing equipment

RANGE OF VARIABLES

topcoat finishes include: single-stage, multi-stage

G-26.03 Touches up stone chips

Essential Skills

Thinking, Working with Others, Oral Communication

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	no	yes	yes	NV	NV	NV

SKILLS

Performance Criteria

Evidence of Attainment

G-26.03.01P	identify severity of stone chip damage	severity of stone chip damage is identified
G-26.03.02P	determine vehicle colour	vehicle colour is determined using vehicle paint codes
G-26.03.03P	prepare damaged area and apply touch-up paint	damaged area is prepared and touch-up paint is applied using tools and materials

RANGE OF VARIABLES

severity includes: depth of chip, presence of corrosion

tools and materials include: touch-up pen, paint brush, tape, toothpicks

KNOWLEDGE

Learning Outcomes

Learning Objectives

G-26.03.01L	demonstrate knowledge of stone chips, their characteristics and repair procedures	describe the characteristics of stone chips
		identify method of repair
		identify tools and materials used to touch up stone chips
		identify paint codes
		describe procedure to prepare area and apply touch-up paint

RANGE OF VARIABLES

tools and materials include: touch-up pen, paint brush, tape, toothpicks

TASK G-27 Cleans vehicle

TASK DESCRIPTOR

Auto body and collision technicians must clean vehicles prior to repair and prior to delivery.

G-27.01 Cleans exterior

Essential Skills Oral Communication, Working with Others, Document Use

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
G-27.01.01P	select and use tools and equipment	tools and equipment are selected and used according to job requirements
G-27.01.02P	select materials	materials are selected according to job requirements
G-27.01.03P	follow washing sequence	washing sequence is followed with caution
G-27.01.04P	dry vehicle	vehicle is dried using drying techniques
G-27.01.05P	clean and dry glass	glass is cleaned and dried to ensure it is spot and streak free

RANGE OF VARIABLES

tools and equipment include: pressure washers, hoses, brushes, wash mitts, sponges, steel wool

materials include: tire and glass cleaners, car wash soap (silicone free), tire dressing (silicone free), degreasers, dish soap, exterior cleaning solvents

washing sequence includes: using pressure washer, pre-soaking vehicle, washing, rinsing, top to bottom

caution includes: biohazards (blood, fecal matter), sharp edges, using PPE (gloves, goggles)

drying techniques include using: chamois, squeegees, air blowers

KNOWLEDGE

	Learning Outcomes	Learning Objectives
G-27.01.01L	demonstrate knowledge of vehicle exterior cleaning tools and equipment	identify types of vehicle exterior cleaning tools and equipment and describe their applications
G-27.01.02L	demonstrate knowledge of vehicle exterior cleaning materials	identify materials used to clean vehicle exterior
G-27.01.03L	demonstrate knowledge of practices and procedures to clean vehicle exterior	describe the procedures used to clean vehicle exterior
		describe the procedures used to clean unpainted plastic exterior components
		describe situations where caution should be observed

RANGE OF VARIABLES

tools and equipment include: pressure washers, hoses, brushes, wash mitts, sponges, steel wool

materials include: tire and glass cleaners, car wash soap (silicone free), tire dressing (silicone free), degreasers, dish soap, exterior cleaning solvents

caution includes: biohazards (blood, fecal matter), sharp edges, using PPE (gloves, goggles)

G-27.02 Cleans interior

Essential Skills

Document Use, Thinking, Oral Communication

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	NV	NV	NV	yes	NV	yes	yes	yes	NV	NV	NV

SKILLS

	Performance Criteria	Evidence of Attainment
G-27.02.01P	remove items from interior	items are removed from interior with caution and held for customer
G-27.02.02P	vacuum interior	interior is vacuumed to remove debris
G-27.02.03P	shampoo upholstery	upholstery is shampooed to remove stains and other contaminants
G-27.02.04P	deodorize interior	interior is deodorized
G-27.02.05P	apply silicone-free surface conditioners, cleaners and dressings to surfaces	silicone-free surface conditioners, cleaners and dressings are applied to surfaces according to manufacturers' specifications
G-27.02.06P	clean interior of glass	interior of glass is cleaned with glass cleaning materials

RANGE OF VARIABLES

surfaces include: dashes, consoles, door panels, head liners, seats, floor mats, steering wheel

materials include: lint-free rags, glass cleaners, paper products, interior shampoo, leather conditioners

KNOWLEDGE		
	Learning Outcomes	Learning Objectives
G-27.02.01L	demonstrate knowledge of vehicle interior cleaning tools and equipment	identify types of vehicle interior cleaning tools and equipment and describe their applications
G-27.02.02L	demonstrate knowledge of vehicle interior cleaning materials	identify materials used to clean vehicle interior
G-27.02.03L	demonstrate knowledge of practices and procedures to clean vehicle interior	describe the practices and procedures used to clean vehicle interior surfaces describe situations where caution should be observed

RANGE OF VARIABLES

tools and equipment include: vacuum, steam cleaner, brushes

materials include: lint-free rags, glass cleaners, paper products, interior shampoo, leather conditioners

caution includes: biohazards (blood, fecal matter, needles), weapons, sharp edges, using PPE (gloves, goggles)

APPENDIX A

ACRONYMS

A/C	air conditioning
ADAS	advanced driver-assistance system
AHJ	authorities having jurisdiction
CNG	compressed natural gas
DTC	diagnostic trouble code
DVOM	digital volt-ohm meter
GMAW	gas metal arc welding
GTAW	gas tungsten arc welding
HSS	high-strength steel
ISO	International Standards Organization
JHA	job hazard assessment
MAG	metal active gas
MIG	metal inert gas
NVH	noise, vibration and harshness
OEM	original equipment manufacturer
OH&S	Occupational Health and Safety
PPE	personal protective equipment
SDS	safety data sheet
SPR	self-piercing rivets
SRS	supplemental restraint systems
STRSW	squeeze-type resistance spot welder
TDS	technical data sheet
TIG	tungsten inert gas
UHSS	ultra-high-strength steel
UV	ultraviolet
VIN	vehicle identification number
WHMIS	Workplace Hazardous Materials Information System

APPENDIX B

TOOLS AND EQUIPMENT / OUTILS ET ÉQUIPEMENT

Hand Tools / Outils à main

adjustable hood props	béquilles de capot réglables
adjustable locking pliers	pincés-étaux réglables
air blow guns	soufflettes
aluminum-dedicated tools	outils dédiés à la réparation d'aluminium
ball joint removers	extracteurs de joint à rotule
body fill spreaders	spatules à mastic pour carrosserie
body spoons	cuillères à débosser
brushes	brosses
caulking guns	pistolets à calfeutrer
chisels	burins
clamps	serre-joints
clip release tools	pincés à enlèvement de clip et garniture
crimping tools	outils de sertissage
cut-out tools (windshield)	outils à tronçonner (pare-brise)
dollies	tas
files	limes
flange tools	outils de brides
hack saws	scies à métaux
hammers	marteaux
hex keys	clés hexagonales
levels	niveaux
leverage type door adjusters	leviers d'ajustement de portières
magnets	aimants
marking tools	outils de marquage
measuring tapes	rubans de mesure
paintless dent repair tools	outils de débosselage sans peinture
picks	pics
plastic pry tools	barres-leviers en plastique
pliers	pincés
pry bars	leviers
pullers	extracteurs
punches	poinçons
putty knives and scrapers	couteaux à mastic et grattoirs
quick-connect joint release tools (A/C lines, fuel lines)	clips pour déconnecter les tuyaux (conduits de climatiseur, conduits de carburant)
ratchets	clés à rochet
razor blades and holders	lames de rasoir et porte-lames
resin injection tools (windshield repair tools)	outils d'injection de résine (outils de réparation de pare-brise)
rivet guns	pistolets à rivets
roller applicators	appliqueurs à rouleau
rubber mallets	maillets en caoutchouc
sanding blocks	blocs de ponçage
screwdrivers	tournevis
slide hammers	marteaux à inertie

sockets, extensions and swivels
soldering tools
specialty bits
spring compressor (door hinge)
squeegees
stands
steering wheel pulling kits
straight edges
suction cups
tie rod removal tool
tin snips
torque wrenches
trim clip removal tools
utility knives
vices
windshield removal wires
wire cutters
wire stripping tools
wire wheel brushes
wiring terminal release tools
wrenches

douilles, rallonges et pivots
fers à souder
mèches spécialisées
compresseur de ressort (charnière de portière)
raclettes
supports
extracteurs de volant
règles droites
ventouses
outils d'extraction de biellette de direction
cisailles de ferblantier
clés dynamométriques
outils d'extraction d'attaches de garniture
couteaux universels
étaux
fils à piano
coupe-fils
pinces à dénuder
brosses métalliques circulaires
outils de desserrage de borne de raccordement
clés

Power Tools / Outils mécaniques

A/C tools and equipment
air compressors
air drills
air hoses
aluminum dust extractor
applicator guns
battery chargers
battery jump packs
bench grinders
circular fans
computer and software
computerized diagnostic equipment
corrosion protection applicator

curing light
cut-off tools
cut-out knives (pneumatic, electric)

dent pullers
digital cameras
door flange tool
door jacks
drill and drill bits
frame flange tools
frame gauging equipment
fuel storage unit
grinders (belt, angle, die)
heat guns
heating equipment
impact guns
induction heaters
metal saws

outils et équipement pour les climatiseurs
compresseurs d'air
perceuses pneumatiques
tuyaux d'air
extracteur de poussière d'aluminium
pistolets applicateurs
chargeurs de batterie
blocs d'alimentation pour démarrage de secours
meuleuses d'établi
ventilateurs circulaires
ordinateur et logiciels
matériel de diagnostic informatisé
applicateur d'enduit de protection contre la corrosion
lampe de séchage
outils à tronçonner
couteaux de découpage (pneumatiques, électriques)
extracteurs de bosses
caméras numériques
outil à emboutir pour portière
vérins de portière
perceuses et forets
outils pour les brides de cadre
équipement de calibrage de cadres
réservoir d'entreposage du carburant
meuleuses (à ruban, d'angle, à matrice)
pistolets thermiques
équipement de chauffage
pistolets cloueurs
appareils chauffants à induction
scies à métaux

plastic repair equipment
pneumatic air chisels
pneumatic hole punches
pneumatic moulding removers
rivet guns (pneumatic)
sand blasters (spot, conventional)

sanders (belt, orbital, dual-action)
seam sealer applicators
trouble lights (electric and portable)

matériel pour réparer les matières plastiques
burins pneumatiques
emporte-pièces pneumatiques
enlève-moules pneumatiques
pistolets à rivets (pneumatiques)
sableuses au jet (pour sablage par points et sablage conventionnel)
ponceuses (à courroie, orbitale, à double action)
applicateurs de produits d'étanchéité pour joints
lampe baladeuse

Welding and Cutting Equipment and Consumables / Équipement de soudage et de coupage et consommables

calipers
consumables (anti-spatter material, oxygen, acetylene, welding rods/wires)
flow meter
oxy-fuel equipment (cutting and heating)
plasma cutters
plastic welders
propane torches
regulator
shielding gas
shunting clamps
squeeze-type resistance spot welder (STRSW)
stud/pin welders
tip cleaners
welders (GMAW, GTAW, pulse)
welding blankets
welding carts
welding clamps
welding coveralls/aprons
welding curtains
welding fume extractors
welding gauges and hoses
welding gloves
welding jackets
welding respirators
welding shields
welding tips
welding/cutting glasses and helmets

compas d'épaisseur
consommables (matériel anti-éclaboussures, oxygène, acétylène, baguettes et fils de soudage)
débitmètre
équipement de soudage à l'oxygaz
coupeuses au plasma
soudeuses à plastique
chalumeaux au gaz propane
régulateur
gaz de protection
pinces de shuntage
soudeuses STRSW
soudeuses de goujons
cure-buses
soudeuses (GMAW, GTAW, par impulsion)
toiles de protection
chariots de soudage
pinces à souder
combinaisons de soudeur et tabliers
écrans de soudeur
extracteurs de fumée de soudage
calibres et tuyaux de soudage
gants de soudeur
manteaux de soudage
respirateurs pour le soudage
masques de soudage
becs de soudage
lunettes et casques de soudage et de coupage

Frame and Unibody Repair Equipment / Équipement de redressage de cadres

chains
clamps and fixtures
come-alongs (ratcheting winches)
electric winches
friction jacks
frame benches
hook tools
hydraulic jacking equipment
leverage bars

chaînes
pinces et raccords
palans manuels à leviers
treuils électriques
vérins à friction
appareils à redresser les cadres
outils à crochets
équipement de levage hydraulique
leviers de tirage

portable hydraulic pulling towers and related equipment
pulling straps
safety straps
structural straightening equipment

tours de tirage hydraulique portatifs et équipement connexe
sangles de traction
sangles de sécurité
équipement de redressement structural

Lifting Equipment / Équipement de levage

air bag jack
door lifts
engine lifts
hoists
jacks and jack stands
portable truck box racks
transmission lifts
vehicle lifts
wheel alignment racks
wheel dollies

vérins à ballons
dispositifs de levage de portière
dispositifs de levage de moteur
palans de levage
crics de levage et chandelles
racks portatif pour les caisses de camion
dispositifs de levage de transmission
ponts élévateurs
bancs d'alignement
charriots à roues

Measuring and Testing Equipment / Équipement de mesure et d'essai

body dimensional measuring equipment

computerized 3D measuring equipment
centering gauges
diagnostic/testing equipment
digital volt-ohm meter (DVOM)
heat crayons
lasers
mechanical measuring system
mil thickness gauge (ferrous and non-ferrous)

tape measures
test cards
test lights
thermometers
tram gauges
ultrasonic equipment

équipement de mesure de la dimension de la carrosserie
système de mesure en 3D
jauges autocentreuses
équipement de diagnostic et équipement d'essai
multimètres numériques
crayons indicateurs de chaleur
lasers
système de mesure mécanique
jauges d'épaisseur du feuillet (métaux ferreux et non ferreux)
rubans à mesurer
gabarit
lampes témoins
thermomètres
piges de contrôle
équipement à ultrasons

Refinishing and Detailing Equipment / Équipement de finition et d'esthétique

agitators (shakers)
air blower nozzles
blow guns
brushes
chamois
colour corrective lighting
colour identification cameras
computerized mixing systems
drying equipment (curing light)
exhaust fans
gun wash stations
hazardous materials disposal containers

masking equipment
mixing tools

agitateurs
bouches de soufflage d'air
soufflettes
brosses
peau de chamois
éclairage correcteur de couleur
caméras pour l'identification des couleurs
systèmes de mélange informatisé
équipement de séchage (lampe de séchage)
ventilateurs d'extraction
postes de lavage pour pistolets à peinture
contenants pour l'élimination des matières dangereuses
matériel de masquage
outils à mélanger

paint application equipment
paint booths
paint database
paint measuring sticks
paint mixing machines
paint rollers
paint scales
paint suits
power polishers
preparation stations
pressure washers
primer application equipment
sanding equipment
shampoos
solvent recyclers
solvent resistant gloves
spray guns
spray out cards and let down panels

strainers
stripe/adhesive removal wheel
tack cloths
tweezers
ultraviolet light gun
vacuum cleaners (wet and dry)
venturi blowers
wash mitts
water hoses

équipement d'application de peinture
cabines de peinture
base de données sur la peinture
doseurs de peinture
mélangeurs de peinture
rouleaux à peinture
échelles de peinture
combinaisons de peintre
polisseuses électriques
postes de préparation
laveuses à pression
équipement d'application d'apprêt
équipement de ponçage
laveuses à tapis
recycleurs de solvant
gants à l'épreuve des solvants
pistolets pulvérisateurs
cartes de pulvérisation et panneaux de comparaison
tamis
roue pour enlever les adhésifs
chiffons à dépoussiérer
pinces à cils
pistolet à peinture UV
aspirateurs (pour déchets secs et humides)
ventilateurs à effet Venturi
gants de lavage
tuyaux d'arrosage

Personal Protective Equipment (PPE) and Safety Equipment / Équipement de protection individuelle et de sécurité (EPI)

automotive paint suit
coveralls
creepers
dust masks
eye wash stations
face shields
fire blankets
fire extinguishers
fire hoses
first aid kit
fresh air respirator
gloves (high-voltage, rubber, impact, welding, solvent-proof)

goggles
hearing protection (ear plugs, ear muffs)

knee pads
respirator (particulate and organic vapour)

safety footwear

combinaison de peintre automobile
combinaison
sommiers roulants
masques antipoussières
douches oculaires
écrans faciaux
couvertures ignifuges
extincteurs
tuyaux d'incendie
trousse de premiers soins
respirateur à adduction d'air
gants (gants de protection contre la haute tension, gants en caoutchouc, gants résistants aux chocs, gants de soudeur, gants résistants aux solvants)
lunettes de protection
protecteurs auditifs (bouchons d'oreilles, protège-oreilles)
genouillères
respirateur (antiparticules et anti-vapeurs organiques)
chaussures de sécurité

safety glasses
showers
storage containers for used oils and fuels

lunettes de sécurité
douches
conteneurs d'entreposage pour les huiles et les
carburants usagés

APPENDIX C

GLOSSARY / GLOSSAIRE

active restraint system is a system you need to physically enable such as seat belts, passenger side airbag

advanced electronic components components that enhance occupants safety such as advanced warning, lane departure, adaptive cruise control, collision mitigation

advanced driver-assistance systems systems which automate, adapt and enhance vehicle systems for safety and better driving

air bags refers to inflatable restraints located in steering wheels, dashes, seats, doors, pillars, roof rails, and headliners

air bag matrix manufacturers' specifications for components that need to be replaced or checked in the event of a deployment

detailing all activities performed for final preparation for delivery to the customer; detailing includes but is not limited to installation of trim and accessories, cleaning and polishing

systèmes de retenue actifs système qu'il faut activer physiquement comme les ceintures de sécurité et le coussin gonflable passager

composants électroniques avancés composants qui améliorent la sécurité des occupants du véhicule, comme les systèmes évolués d'assistance au conducteur, l'avertisseur de sortie de voie, le régulateur de vitesse adaptatif et le système anti-collision

système avancé d'aide à la conduite système qui automatise, régule et améliore les systèmes du véhicule pour faciliter sa conduite et la rendre plus sûre

coussins de sécurité gonflables dispositifs de retenue gonflables insérés dans le volant, le tableau de bord, les sièges, les portières, les montants, les longerons de toit et les garnitures de toit

matrice de coussins gonflables spécifications du fabricant pour les composants à remplacer ou à vérifier après un déploiement

vérification de l'esthétique toutes les activités effectuées dans le cadre de la préparation finale du véhicule en vue de la livraison au client, y compris l'installation des garnitures et des accessoires, le nettoyage et le polissage

frame and structural components	provide the vehicle with strength and structural integrity	cadre et composants structuraux	renforcent la résistance et l'intégrité structurale du véhicule
glass	a hard transparent substance that is laminated or tempered and sometimes tinted. Motor vehicle glass can be fixed as in windshields and rear windows or moveable as in side windows	vitre	substance transparente dure laminée ou trempée et parfois teintée; les vitres d'un véhicule peuvent être fixes (pare-brise et lunettes arrière) ou mobiles (vitres latérales)
glass hardware	glass hardware consists of moveable and adjustable parts and components that ensure the operation of moveable glass and consists of but is not limited to tracks, glass run channels, plastic guides, stops and regulators	éléments de fixation des vitres	pièces et composants mobiles et réglables garantissant le fonctionnement des vitres mobiles et comprenant entre autres les glissières, les coulisses, les guides en plastique, les butées et les lève-vitres
interior components	interior components consist of trim, upholstery and panels within the vehicle	composants de l'habitacle	garnitures, revêtements et panneaux à l'intérieur du véhicule
mechanical and electrical components	mechanical components consist of the moving parts that produce motion or a state of balance including suspension systems (steering and suspension), cooling systems, air conditioning systems, brake systems, fuel systems, the power train and the exhaust system. Electrical components are designed to perform a specific function (e.g. radio, defrost, cruise control) or to generate, store and distribute electricity (e.g. battery, charging system, relays)	composants mécaniques et électriques	<p>composants mécaniques : pièces mobiles produisant un mouvement ou un balancement et comprenant le système de suspension (direction et suspension), le système de refroidissement, le système de conditionnement d'air, le système de freinage, le système d'alimentation en carburant, le groupe motopropulseur et le système d'échappement</p> <p>composants électriques : conçus pour des fonctions spécifiques (par exemple la radio, le dégivreur et le régulateur de vitesse) ou pour la génération, l'entreposage et la distribution de l'électricité aux composants électriques (par exemple la batterie, le système de charge et les relais)</p>

outer body panels	portions of a motor vehicle that are attached to the frame or structural components of the vehicle by welding, bonding or by mechanical attachments	panneaux de carrosserie	parties d'un véhicule automobile attachées au cadre ou aux composants structuraux par soudage, collage ou par des moyens mécaniques
passive restraint systems	passive restraint systems include components such as dash, pads, head rest, collapsible steering columns and knee bolsters, motorized seat belts, air bags	systèmes de retenue passifs	dispositifs comprenant les composants comme le tableau de bord, les coussins, les appuie-têtes, les colonnes de direction télescopiques, les appuie-genoux, les ceintures de sécurité motorisées et les coussins de sécurité gonflables
refinishing	provides a smooth and level surface upon which paint will adhere, by sanding, filling, cleaning and priming the surface prior to, and including, the application of a final colour coat	 finition	assure un fini lisse et uniforme auquel la peinture doit adhérer en ponçant, en remplissant, en nettoyant et en apprêtant la surface avant l'application de la dernière couche de couleur
restraint systems (also see definition for active and passive restraint systems)	restraint systems consist of passive or active safety components which provide occupants with injury protection in the event of a collision	systèmes de retenue (voir aussi les définitions des systèmes de retenue actifs et passifs)	dispositifs comportant des composants de sécurité actifs ou passifs protégeant les occupants dans l'éventualité d'une collision
structural components	any primary-stress-bearing portion of the body structure that affects its over-the-road performance or crash-worthiness	composants structuraux	toute surface primaire de la carrosserie supportant les contraintes qui a un effet sur le comportement routier ou sur la capacité de résistance aux chocs du véhicule
structural glass	a specific type of glass with a special design and installation process that adds to the structural integrity of the vehicle	verre structurel	type de verre dont la conception et l'installation particulières améliorent l'intégrité structurale du véhicule
unibody motor vehicle	vehicle design in which parts of the body structure serve as support for overall vehicle	véhicule automobile monocoque	véhicule conçu de façon à ce que sa structure serve de support à l'ensemble du véhicule