

AUTO BODY AND COLLISION TECHNICIAN

Version: 2021

Revised: N/A

PLAN OF TRAINING

Atlantic Apprenticeship Curriculum Standard

Auto Body and Collision Technician

April 2022



Government of Newfoundland and Labrador
Department of Immigration, Population Growth and Skills
Apprenticeship and Trades Certification Division

Approved by:



Chairperson, Provincial Apprenticeship and Certification Board

Date: April 6, 2022

Atlantic Apprenticeship Curriculum Standard

Auto Body and Collision Technician

Preface

This Atlantic Apprenticeship Curriculum Standard (AAHP) is intended to assist instructional staff in the design and delivery of technical, in-class training in support of the Auto Body and Collision Technician program.

This document contains all the technical training elements required to complete the Auto Body and Collision Technician apprenticeship program and has been developed based on the 2019 Red Seal Occupational Standard (RSOS). The RSOS can be found on the Red Seal website (www.red-seal.ca).

Implementation of this Atlantic Apprenticeship Curriculum Standard (AACS) for Apprenticeship training is outlined in the following table.

Level	Implementation Effective
Level 1	2022-2023
Level 2	2023-2024
Level 3	2024-2025
Level 4	2025-2026

**** The above implementation schedule identifies the training season where implementation is required to be complete in all Atlantic jurisdictions. Please confirm with Apprenticeship Staff in your jurisdiction for more specific implementation dates for your jurisdiction prior to commencing training.**

Granting of credit or permission to challenge level examinations for pre-employment or pre-apprenticeship training for the Auto Body and Collision Technician trade will be based on the content outlined in this standard. Training providers must contact their provincial apprenticeship authority for more information on the process and requirements for determining eligibility for credit towards an apprenticeship program. Programs which have been deemed acceptable by the jurisdictional apprenticeship authority will be identified in transfer credit matrix developed through the Atlantic Apprenticeship Harmonization Project.

Acknowledgements

The development of the Atlantic Apprenticeship Curriculum Standard (AACS) is an initiative of the Atlantic Apprenticeship Council's Atlantic Apprenticeship Harmonization Project (AAHP) through the Atlantic Workforce Partnership and Employment and Social Development Canada.

The Atlantic Apprenticeship Council wishes to acknowledge the contributions of the following industry and instructional representatives on the Atlantic Trade Advisory Committee (ATAC) who participated in the development of this document in November, 2020.

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Logan Redfurn	Nova Scotia
Nicole Hamilton	Nova Scotia
Mark MacEachern	Nova Scotia
David Kember	Prince Edward Island
Chris Dalziel	Prince Edward Island

Advisory committees, industry representatives, instructors and apprenticeship staff provided valuable input to the development of this document. Without their dedication to quality apprenticeship training, this document could not have been produced.

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User Guide

Atlantic Apprenticeship Curriculum Standards (AACS) are developed based on Red Seal Occupational Standards (RSOS), National Occupational Analyses (NOA), Interprovincial Program Guides (IPG) (if available) and extensive industry consultation. This document represents the minimum content to be delivered as part of the harmonized Atlantic program for the Auto Body and Collision Technician trade.

The AACS is deliberately constructed for ease of use and flexibility of structure in order to adapt to all delivery requirements. They detail units of training, unit outcomes and objectives. They do not impose a delivery model or teaching format.

Jurisdictions and/or training providers will select and develop delivery materials and techniques that accommodate a variety of learning styles and delivery patterns. The AACS does not dictate study materials, textbooks or learning activities to be used in delivery.

The document includes a level structure to facilitate mobility for apprentices moving from one jurisdiction to another.

Structure

The content of the AACS is divided into units. Unit codes are used as a means of identification and are not intended to convey the order of delivery. It is at the discretion of the training provider to deliver the content in the required logical sequence of delivery within the level. Jurisdictions are free to deliver units one at a time or concurrently within a level, provided all outcomes are met.

The Learning Outcomes describe what the apprentice should know or be able to do at the end of training. Wording of the Learning Outcomes, “Demonstrate knowledge of...” acknowledges the broad spectrum of ways in which knowledge can be assessed (i.e. practical projects, multiple choice testing, presentations, etc.) by instructional staff within the training.

Summative evaluation will be through a multiple-choice Level Examination administered through the jurisdictional Apprenticeship Authority.

User Guide (continued)

The 2019 Red Seal Occupational Standard References (RSOS) to AACS Comparison chart outlines the relation between each RSOS sub-task and the AACS units. RSOS References have also been detailed in each unit to highlight the direct link between the unit and relevant sub-tasks in the RSOS.

In the Level Structure section, the document identifies suggested hours in order to provide an indication of the time it should take to cover the material in the unit and is intended as a guide only. Adjustments to the suggested hours for each unit may be required to account for rate of apprentice learning, statutory holidays, storm days, registration and examinations. These suggested hours detailed for each unit will represent both theory and practical training (if relevant) and for consistency will be based on a standard of 30 hours per week of training. The actual length of time required to deliver an outcome successfully will depend upon the learning activities and teaching methods used.

There are two types of objectives found in the AACS document: theoretical and practical.

The theoretical objectives represent the material that is to be covered during the technical training in order to convey the required knowledge to the apprentice.

The practical objectives represent the tasks or skills that have been deemed by the Atlantic Trade Advisory Committee as critical for the apprentices to receive exposure to while attending technical training. For example, exposure could be done through instructor demonstration or individual or group performance of the skill or task. Training providers are encouraged to use practical demonstration and opportunities for hands-on learning whenever possible. Practical objectives are not intended to replace the on-the-job training component of the apprentice's program or to mirror or replace the logbook skills that are to be taught and evaluated in the workplace.

Detailed content for each objective has not been developed. Where detail is required for clarity, content has been provided.

Glossary of Terms

These definitions are intended as a guide to how language is used in the document.

Adjust	To put in good working order; regulate; bring to a proper state or position.
Application	The use to which something is put and/or the circumstance in which an individual would use it.
Characteristics	A feature that helps to identify, tell apart or describe recognizably; a distinguishing mark or trait.
Component	A part that can be separated from or attached to a system; a segment or unit.
Define	To state the meaning of (a word, phrase, etc.).
Describe	To give a verbal account of; tell about in detail.
Explain	To make plain or clear; illustrate; rationalize.
Identify	To point out or name objectives or types.
Interpret	To translate information from observation, charts, tables, graphs and written material.
Maintain	To keep in a condition of good repair or efficiency.
Method	A means or manner of doing something that has procedures attached to it.
Operate	How an object works; to control or direct the functioning of.
Procedure	A prescribed series of steps taken to accomplish an end.
Purpose	The reason for which something exists or is done, made or used.

Glossary of Terms (continued)

Service	<p>Routine inspection and replacement of worn or deteriorating parts.</p> <p>An act or business function provided to a customer in the course of an individual's profession (e.g., haircut).</p>
Technique	<p>Within a procedure, the manner in which technical skills are applied.</p>
Test	<p>v. To subject to a procedure that ascertains effectiveness, value, proper function or other quality.</p> <p>n. A way of examining something to determine its characteristics or properties, or to determine whether or not it is working correctly.</p>

Essential Skills Profiles

Through extensive research, the Government of Canada and other national and international agencies have identified and validated key essential skills for the workplace. These skills are used in nearly every job and at different levels of complexity. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Essential Skills Profiles describe how workers in various occupations use each of the key essential skills. They include:

- a brief description of the occupation;
- examples of tasks that illustrate how each essential skill is applied; and,
- complexity ratings that indicate the level of difficulty of the example tasks.

Essential Skills profiles can be found on the Employment and Social Development Canada (ESDC) website at www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml.

The development and improvement of these Essential Skills is inherent throughout the apprenticeship training program as apprentices work towards achieving journeyperson status.

Level Structure

Level 1 – 7 Weeks

Unit Code	Unit Title	Hours	Page Number
ABT-100	Safety	12	19
ABT-105	Hand and Portable Power Tools	9	21
ABT-110	Plasma and Oxy Fuel Cutting	9	22
ABT-115	Lifting Equipment	6	24
ABT-120	Refinishing Tools	9	26
ABT-125	Welding	36	28
ABT-130	Trade Documentation	9	30
ABT-135	Communications	3	32
ABT-140	Trim and Hardware	12	34
ABT-145	Metal Panels and Components (Introduction)	18	36
ABT-150	Plastic and Composite Panels and Components I	12	39
ABT-155	Surface Preparation	27	42
ABT-160	Repair Materials	15	45
ABT-165	Refinishing I	15	47
ABT-170	Exterior Detailing	9	49
ABT-175	Vehicle Cleaning	6	51
ABT-180	Workplace Mentoring I	3	53

Level 2 – 7 Weeks

Unit Code	Unit Title	Hours	Page Number
ABT-200	Aluminum Welding	12	56
ABT-205	Vehicle Construction	18	58
ABT-210	Corrosion Protection and Sound Deadening	15	60
ABT-215	Structural and Laminated Glass	15	63
ABT-220	Metal Panels and Components Repair	30	65
ABT-225	Plastic and Composite Panels and Components II	18	67
ABT-230	Non-Structural Glass	12	69
ABT-235	Interior Components	12	71
ABT-240	Refinishing II	36	73
ABT-245	Colour Adjustments	30	75
ABT-250	GMAW Silicon Bronze Welding	12	77

Level Structure (continued)

Level 3 - 6 Weeks

Unit Code	Unit Title	Hours	Page Number
ABT-300	Frame and Unibody Repair and Measuring	18	81
ABT-305	Final Operational Checks	6	82
ABT-310	Structural Component Preparation	21	83
ABT-315	Structural Component Repair	42	86
ABT-320	Mechanical Components I (Steering, Suspension and Brakes)	36	89
ABT-325	Electrical Components	21	91
ABT-330	Restraint Systems	18	95
ABT-335	Alternative Fuel Systems	18	97

Level 4 - 5 Weeks

Unit Code	Unit Title	Hours	Page Number
ABT-400	Estimates and Supplements	15	101
ABT-405	Quality Control Inspections	6	104
ABT-410	Structural Component Removal	21	105
ABT-415	Structural Component Installation	24	107
ABT-420	Mechanical Components II (Powertrain, HVAC and Exhaust)	33	108
ABT-425	Electronic Components	15	110
ABT-430	Workplace Mentoring II	6	111
ABT-435	Program Review	30	113

2019 RSOS Sub-Task to AACS Unit Comparison

RSOS Sub-Task		AACS Unit	
Task A-1 - Performs safety-related functions.			
1.01	Maintains safe work environment.	ABT-100	Safety
1.02	Uses personal protective equipment (PPE) and safety equipment.	ABT-100	Safety
Task A-2 - Uses and maintains tools and equipment.			
2.01	Maintains hand and power tools.	ABT-105	Hand and Portable Power Tools
		ABT-110	Plasma and Oxy Fuel Cutting
2.02	Maintains frame and unibody repair and measuring equipment.	ABT-300	Frame and Unibody Repair and Measuring
2.03	Uses lifting equipment.	ABT-115	Lifting Equipment
2.04	Uses diagnostic equipment.	ABT-300	Frame and Unibody Repair and Measuring
2.05	Maintains refinishing tools and equipment.	ABT-120	Refinishing Tools
		ABT-240	Refinishing II
Task A-3 – Uses and maintains welding equipment.			
3.01	Uses welding equipment.	ABT-125	Welding
		ABT-200	Aluminum Welding
		ABT-250	GMAW Silicon Bronze Welding
		ABT-315	Structural Component Repair
3.02	Maintains welding equipment.	ABT-125	Welding
		ABT-200	Aluminum Welding
		ABT-250	GMAW Silicon Bronze Welding
Task A-4 – Organized work and uses documentation.			
4.01	Prepares estimates and supplements.	ABT-400	Estimates and Supplements
4.02	Prepares repair plan.	ABT-205	Vehicle Component and Construction Repair Plan
4.03	Organizes parts, materials and work area.	ABT-130	Trade Documentation
4.04	Uses documentation.	ABT-130	Trade Documentation
		ABT-205	Vehicle Component and Construction Repair Plan
		ABT-400	Estimates and Supplements
Task A-5 – Uses communication and mentoring techniques.			
5.01	Uses communication techniques.	ABT-135	Communications
		ABT-180	Workplace Mentoring I
5.02	Uses mentoring techniques.	ABT-180	Workplace Mentoring I

RSOS Sub-Task		AACS Unit	
		ABT-430	Workplace Mentoring II
Task A-6 – Removes and installs trim and hardware.			
6.01	Removes trim and hardware.	ABT-140	Trim and Hardware
6.02	Installs trim and hardware.	ABT-140	Trim and Hardware
Task A-7 - Performs final inspections.			
7.01	Performs final operational check.	ABT-305	Final Operational Checks
7.02	Performs final quality control inspection.	ABT-405	Quality Control Inspections
Task A-8 – Applies corrosion protection and sound deadening materials.			
8.01	Applies corrosion inhibitors and undercoats.	ABT-210	Corrosion Protection and Sound Deadening
8.02	Applies seam sealers and sound deadeners.	ABT-210	Corrosion Protection and Sound Deadening
Task B-9 – Prepares for repair and replacement of structural components.			
9.01	Identifies extent of damage.	ABT-310	Structural Component Preparation
9.02	Removes components for access.	ABT-310	Structural Component Preparation
9.03	Performs vehicle setup.	ABT-310	Structural Component Preparation
Task B-10 – Repairs, removes and installs structural components.			
10.01	Repairs structural components.	ABT-315	Structural Component Repair
10.02	Removes structural components.	ABT-410	Structural Component Removal
10.03	Installs structural components.	ABT-415	Structural Component Installation
Task B-11 – Removes, installs and repairs structural and laminated glass.			
11.01	Removes structural glass.	ABT-215	Structural and Laminated Glass
11.02	Installs structural glass.	ABT-215	Structural and Laminated Glass
11.03	Repairs laminated glass.	ABT-215	Structural and Laminated Glass
Task C-12 – Removes, repairs and installs metal panels and components.			
12.01	Prepares metal panels and components for repair.	ABT-145	Metal Panels and Components (Introduction)
12.02	Removes metal panels and components.	ABT-145	Metal Panels and Components (Introduction)
12.03	Repairs metal panels and components.	ABT-145	Metal Panels and Components (Introduction)
		ABT-220	Metal Panels and Components Repair
12.04	Installs metal panels and components.	ABT-145	Metal Panels and Components (Introduction)
Task C-13 – Removes, repairs and installs plastic and composite panels and components.			
13.01	Prepares plastic and composite panels and components for repair.	ABT-150	Plastic and Composite Panels and Components I

RSOS Sub-Task		AACS Unit	
		ABT-225	Plastic and Composite Panels and Components II
13.02	Removes plastic and composite panels and components.	ABT-150	Plastic and Composite Panels and Components I
		ABT-225	Plastic and Composite Panels and Components II
13.03	Repairs plastic and composite panels and components.	ABT-150	Plastic and Composite Panels and Components I
		ABT-225	Plastic and Composite Panels and Components II
13.04	Installs plastic and composite panels and components.	ABT-150	Plastic and Composite Panels and Components I
		ABT-225	Plastic and Composite Panels and Components II
Task C-14 – Removes and installs non-structural glass.			
14.01	Removes non-structural glass.	ABT-230	Non-Structural Glass
14.02	Installs non-structural glass.	ABT-230	Non-Structural Glass
Task D-15 – Deactivates and reactivates alternative-fuel systems.			
15.01	Deactivates alternative-fuel systems.	ABT-335	Alternative Fuel Systems
15.02	Reactivates alternative-fuel systems.	ABT-335	Alternative Fuel Systems
Task D-16 – Removes and installs mechanical components.			
16.01	Removes mechanical components.	ABT-320	Mechanical Components I (Steering, Suspension and Brakes)
		ABT-420	Mechanical Components II (Powertrain, HVAC and Exhaust)
16.02	Installs mechanical components.	ABT-320	Mechanical Components I (Steering, Suspension and Brakes)
		ABT-420	Mechanical Components II (Powertrain, HVAC and Exhaust)
Task D-17 – Removes, repairs and installs electrical and electronic components.			
17.01	Removes electrical components.	ABT-325	Electrical Components
17.02	Repairs damaged wires and protective coverings.	ABT-325	Electrical Components
17.03	Installs electrical components.	ABT-325	Electrical Components
17.04	Services advanced electronic components.	ABT-425	Electronic Components
Task E-18 – Repairs and replaces interior components.			
18.01	Repairs interior components.	ABT-235	Interior Components
18.02	Replaces interior components.	ABT-235	Interior Components

RSOS Sub-Task		AACS Unit	
Task E-19 - Services supplemental restraint systems (SRS).			
19.01	Services seat belt restraint systems.	ABT-330	Supplemental Restraint Systems
19.02	Services air bags and related components.	ABT-330	Supplemental Restraint Systems
Task F-20 – Prepares surface.			
20.01	Performs initial preparation.	ABT-155	Surface Preparation
20.02	Masks surface.	ABT-165	Refinishing I
20.03	Strips surface.	ABT-155	Surface Preparation
20.04	Sands surface.	ABT-155	Surface Preparation
Task F-21 – Uses repair materials.			
21.01	Mixes repair materials.	ABT-160	Repair Materials
21.02	Applies repair materials.	ABT-160	Repair Materials
Task F-22 – Prepares refinishing equipment.			
22.01	Prepares spray booth.	ABT-165	Refinishing I
		ABT-240	Refinishing II
22.02	Performs spray gun setup.	ABT-165	Refinishing I
		ABT-240	Refinishing II
Task F-23 – Prepares refinishing materials.			
23.01	Mixes refinishing materials.	ABT-165	Refinishing I
23.02	Performs colour adjustments.	ABT-245	Colour Adjustments
Task F-24 - Applies refinishing materials.			
24.01	Applies sealers.	ABT-165	Refinishing I
		ABT-240	Refinishing II
24.02	Applies base coat.	ABT-165	Refinishing I
		ABT-240	Refinishing II
24.03	Applies single-stage paint.	ABT-165	Refinishing I
		ABT-240	Refinishing II
24.04	Applies clear coat.	ABT-165	Refinishing I
		ABT-240	Refinishing II
Task F-25 – Performs post-refinishing functions.			
25.01	Removes masking materials.	ABT-165	Refinishing I
25.02	Corrects surface imperfections.	ABT-240	Refinishing II
Task G-26 – Details exterior.			
26.01	Removes minor imperfections.	ABT-170	Exterior Detailing
26.02	Polishes vehicle.	ABT-170	Exterior Detailing
26.03	Touches up stone chips.	ABT-170	Exterior Detailing

RSOS Sub-Task		AACS Unit	
Task G-27 – Cleans vehicle.			
27.01	Cleans exterior.	ABT-175	Vehicle Cleaning
27.02	Cleans interior.	ABT-175	Vehicle Cleaning

Level 1

Unit Code	Title	Suggested Hours	Page
ABT-100	Safety	12	19
ABT-105	Hand and Portable Power Tools	9	21
ABT-110	Plasma and Oxy Fuel Cutting	9	22
ABT-115	Lifting Equipment	6	24
ABT-120	Refinishing Tools	9	26
ABT-125	Welding	36	28
ABT-130	Trade Documentation	9	30
ABT-135	Communications	3	32
ABT-140	Trim and Hardware	12	34
ABT-145	Metal Panels and Components (Introduction)	18	36
ABT-150	Plastic and Composite Panels and Components I	12	39
ABT-155	Surface Preparation	27	42
ABT-160	Repair Materials	15	45
ABT-165	Refinishing I	15	47
ABT-170	Exterior Detailing	9	49
ABT-175	Vehicle Cleaning	6	51
ABT-180	Workplace Mentoring I	3	53

ABT-100

Safety

Learning Outcomes:

- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of regulatory requirements pertaining to safety.
- Demonstrate knowledge of safety-related documentation and its use.
- Demonstrate knowledge of PPE and safety equipment, regulations, applications, maintenance, storage and procedures for use.

2019 Red Seal Occupational Standard Reference:

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

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with safety in the worksite.
2. Identify and describe workplace safety and health regulations.
3. Identify hazardous conditions and describe safe work practices.
 - i) lack of grounding
 - ii) static electricity
 - iii) airborne particulates
 - aluminum dust
 - fumes
4. Identify fire hazards and describe safe work practices.
 - i) contaminated rags
 - ii) build-up of vapours
 - iii) flammable materials
 - iv) sparks
 - v) open flames
5. Identify personal injury welding hazards and describe safe work practices.
 - i) sparks
 - ii) heat
 - iii) protruding objects
 - iv) wet floors

- v) ultraviolet (UV) rays
 - vi) sharp objects
 - vii) electrical connections
 - viii) defective equipment
6. Identify potential hazards from metal debris and describe safe work practices.
 7. Identify types of PPE and safety equipment and describe their applications, limitations and operations.
 8. Identify types and location of safety-related documentation and describe their purpose, applications and procedures for use.
 9. Explain technician liability and responsibility for repair.
 10. Describe regulatory requirements used for the disposal of hazardous products and waste.
 11. Describe the procedures used to inspect, maintain, care for, store and fit PPE and safety equipment.
 12. Describe the procedures used to store, use, dispose of and recycle hazardous products and waste.

Practical Objectives:

1. Clean and store respirator equipment.

ABT-105 Hand and Portable Power Tools

Learning Outcomes:

- Demonstrate knowledge of hand and power tools, their applications and procedures for use.
- Demonstrate knowledge of the maintenance and storage of hand and power tools.

2019 Red Seal Occupational Standard Reference:

2.01 Maintains hand and power tools.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with hand and portable power tools.
2. Identify hazardous conditions and describe safe work practices.
3. Identify types of hand, measuring and power tools, and describe their applications, limitations and procedures for use.
4. Identify types and location of safety-related documentation and describe their purpose, applications and procedures for use.
5. Describe the procedures used to inspect hand and power tools.
6. Describe the procedures used to store and maintain hand and power tools.
7. Describe the procedures used to repair or replace defective hand and power tools.

Practical Objectives

1. Use a tram gauge for under hood measurement.

ABT-110

Plasma and Oxy-Fuel Cutting

Learning Outcomes:

- Demonstrate knowledge of cutting tools and equipment, their applications, maintenance and procedures for use.

2019 Red Seal Occupational Standard Reference:

2.01 Maintains hand and power tools.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with plasma and oxy-fuel cutting equipment.
2. Identify hazardous conditions and describe safe work practices pertaining to cutting.
 - i) ferrous metals
 - ii) non ferrous metals
3. Identify tools and equipment used to cut components and describe their applications.
4. Identify cutting processes and describe their applications.
5. Describe the procedures used to set up and shut down plasma arc cutting equipment.
6. Describe the procedures used to cut with plasma arc cutting equipment.
7. Describe the procedures used to maintain plasma arc cutting equipment.
8. Describe the procedures used to set up and shut down oxy-fuel equipment.
9. Describe the procedures used to cut with oxy-fuel equipment.
10. Describe the procedures used to maintain oxy-fuel equipment.

Practical Objectives:

1. Set up and shut down oxy-fuel cutting equipment.
2. Set up and shut down plasma arc cutting equipment.

ABT-115

Lifting Equipment

Learning Outcomes:

- Demonstrate knowledge of vehicle lifting points.
- Demonstrate knowledge of lifting equipment, their applications and procedures for use.
- Demonstrate knowledge of jurisdictional regulatory requirements pertaining to lifting equipment.
- Demonstrate knowledge of procedures used to inspect lifting equipment.

2019 Red Seal Occupational Standard Reference:

2.03 Uses lifting equipment.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with lifting equipment.
2. Identify hazards and describe safe work practices pertaining to lifting equipment.
3. Identify and interpret the jurisdictional regulatory requirements pertaining to lifting equipment.
 - i) inspection frequency
 - ii) documentation
 - iii) maintenance
4. Identify types of lifting equipment, their applications, limitations and procedures for use.
 - i) hoists
 - ii) floor jacks
 - iii) door jacks
 - iv) engine lifts
 - v) frame racks
5. Identify vehicle lifting points.
6. Describe the procedures used to inspect lifting equipment, including checking safety backups and lifting equipment components.
 - i) pads

- ii) levers
- iii) cables
- iv) arm locks

Practical Objectives:

1. Inspect lifting equipment.
2. Lift a vehicle.

ABT-120

Refinishing Tools

Learning Outcomes:

- Demonstrate knowledge of refinishing tools and equipment, their components, applications, maintenance and procedures for use.

2019 Red Seal Occupational Standard Reference:

2.05 Maintains refinishing tools and equipment.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with refinishing tools and equipment.
2. Identify hazards and describe safe work practices pertaining to refinishing tools and equipment.
3. Identify types of refinishing tools and equipment, and describe their components and applications.
 - i) spray booths
 - ii) spray guns
 - iii) drying equipment
 - iv) mixing tools
 - v) paint scales
 - vi) paint application equipment
 - vii) paint mixing machines
 - viii) gun wash stations
 - ix) solvent recyclers
 - x) preparation stations
4. Identify types of cleaning products and equipment used to clean spray guns.
5. Identify types of lubricants and describe their purpose and application.
6. Describe the procedures used to inspect and adjust refinishing tools and equipment and their components.

7. Describe the procedures used to maintain and store refinishing tools and equipment and their components.
8. Describe the procedures used to clean and store spray equipment.

Practical Objectives:

N/A

ABT-125

Welding

Learning Outcomes:

- Demonstrate knowledge of base materials and their characteristics.
- Demonstrate knowledge of welding equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of welding procedures.
- Demonstrate knowledge of procedures to maintain welding equipment.

2019 Red Seal Occupational Standard Reference:

- 3.01 Uses welding equipment.
- 3.02 Maintains welding equipment.

Suggested Hours:

36 Hours

Theoretical Objectives:

1. Define terminology associated with welding equipment.
2. Identify hazards and describe safe work practices pertaining to welding equipment operation and maintenance.
3. Identify types of welding equipment and describe their applications and procedures for use.
 - i) Gas Metal Arc Welding (GMAW)
 - ii) Squeeze Type Resistance Spot Welding (STRSW)
 - iii) Gas Tungsten Arc Welding (GTAW)
4. Identify types of welding equipment accessories and describe their applications and procedures for operation and maintenance.
5. Identify types of base materials and describe their characteristics and applications.
6. Identify welding positions and describe their applications.
 - i) horizontal
 - ii) vertical
 - ii) flat
 - iv) overhead

7. Identify types of weld defects, their causes and the procedures used to prevent and correct them.
8. Identify types of joint assembly and describe their characteristics and applications.
 - i) overlap
 - ii) butt
 - iii) butt with insert
 - iv) plug weld
9. Describe the procedures used to set up and shut down welding equipment.
10. Describe the procedures used to perform troubleshooting of welding equipment.
11. Describe the procedures to use welding equipment.
 - i) Gas Metal Arc Welding (GMAW)
 - ii) Squeeze Type Resistance Spot Welding (STRSW)
 - iii) Gas Tungsten Arc Welding (GTAW)
12. Describe the procedures used to perform a destructive test.
13. Describe the procedures used to perform test welds.
14. Describe the inspection procedures used for welding equipment.
15. Describe the procedures used to perform maintenance of welding equipment.

Practical Objectives:

1. Set up and shut down welding equipment.
2. Complete a coupon test weld and assess for defects.

ABT-130 Trade Documentation

Learning Outcomes:

- Demonstrate knowledge of organizing parts, materials and work area.
- Demonstrate knowledge of trade documentation and its use.

2019 Red Seal Occupational Standard Reference:

- 4.03 Organizes parts, materials and work area.
- 4.04 Uses documentation.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with trade documentation.
2. Identify and interpret sources of vehicle-related information.
3. Identify types of trade-related documentation and describe their purpose, applications and procedures for use.
 - i) technical manuals/data sheets and bulletins
 - ii) safety documentation
 - iii) service records
 - iv) maintenance logs
4. Identify types of written reports and describe their purpose and applications.
5. Describe the components of work orders (repair orders) and estimates.
6. Describe the procedures used for organizing and storing replacement parts and materials.
7. Describe the procedures used to verify that parts and materials are available for work tasks.
8. Describe the procedures used to inspect and prepare parts prior to installation.
9. Describe the procedures used to label parts and components.
 - i) replacement

- ii) disassembly/reassembly
10. Describe the procedures used to keep work area organized.
 11. Describe the procedures used to verify ordered parts.
 - i) OEM
 - ii) after-market
 - iii) recycled
 12. Describe the procedures used to prepare repair plan.
 13. Describe the procedures used to determine repair sequence.

Practical Objectives:

1. Review an estimate/work order on a damaged vehicle.
2. Retrieve a repair procedure.

ABT-135 Communications

Learning Outcomes:

- Demonstrate knowledge of effective communication practices.

2019 Red Seal Occupational Standard Reference:

5.01 Uses communications techniques.

Suggested Hours:

3 Hours

Theoretical Objectives:

1. Describe the importance of using effective verbal and non-verbal communication with people in the workplace.
 - i) other tradespeople
 - ii) co-workers
 - iii) apprentices
 - iv) supervisors
 - v) clients
 - vi) authorities having jurisdiction (AHJ)
 - vii) manufacturers

2. Identify sources of information to effectively communicate.
 - i) regulations
 - ii) codes
 - iii) occupational health and safety requirements
 - iv) AHJ requirements
 - v) prints, drawings and specifications
 - vi) company and client documentation

3. Identify communication and learning styles.
 - i) seeing it
 - ii) hearing it
 - iii) applying it

4. Describe effective listening and speaking skills.

5. Identify personal responsibilities and attitudes that contribute to on-the-job success.
 - i) asking questions

- ii) working safely
 - iii) accepting constructive feedback
 - iv) time management and punctuality
 - v) respect for authority
 - vi) good stewardship of materials, tools and property
 - vii) efficient work practices
6. Identify the value of diversity in the workplace.
7. Identify communication that constitutes harassment and discrimination.
- i) objectionable conduct
 - ii) comments or displays made either on a one-time or continuous basis that demeans, belittles, or causes personal humiliation or embarrassment to the recipient
 - iii) discrimination prohibitions
 - race
 - national or ethnic origin
 - colour
 - religion
 - age
 - sex
 - sexual orientation
 - gender identity or expression
 - marital status
 - family status
 - disability
 - genetic characteristics
 - pardoned conviction

Practical Objectives:

N/A

ABT-140

Trim and Hardware

Learning Outcomes:

- Demonstrate knowledge of types of trim and hardware, their applications and characteristics.
- Demonstrate knowledge of procedures to replace trim and hardware.
- Demonstrate knowledge of procedures to install trim and hardware.
- Demonstrate knowledge of procedures to detect and repair noises and leaks attributed to trim and hardware.

2019 Red Seal Occupational Standard Reference:

- 6.01 Removes trim and hardware.
- 6.02 Installs trim and hardware.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with trim and hardware.
2. Identify hazards and describe safe work practices pertaining to trim and hardware.
3. Identify interior trim and hardware and describe their characteristics.
 - i) mouldings
 - ii) weather striping
 - iii) information labels
 - iv) window regulators
 - v) door handles
 - vi) panels
4. Identify exterior trim and hardware and describe their characteristics.
 - i) roof racks
 - ii) weather striping
 - iii) decals
 - iv) pin stripes
 - v) stone chip protective film
 - vi) emblems
 - vii) side mirrors
 - viii) door latches

- ix) body side mouldings
 - x) cladding
 - xi) cameras
5. Describe fasteners and adhesives relating to trim and hardware.
 6. Describe the procedures used to replace interior trim and hardware.
 7. Describe the procedures used to replace exterior trim and hardware.
 8. Describe the procedures used to inspect interior trim and hardware for noises and leaks.

Practical Objectives:

1. Remove and re-install a trim panel.

ABT-145

Metal Panels and Components (Introduction)

Learning Outcomes:

- Demonstrate knowledge of metal panels and components, and their characteristics.
- Demonstrate knowledge of procedures to prepare metal panels for repair.
- Demonstrate knowledge of procedures to remove metal panels and components.
- Demonstrate knowledge of procedures to align and adjust metal panels.
- Demonstrate knowledge of procedures to install metal panels and components.

2019 Red Seal Occupational Standard Reference:

- 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.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with metal panels and components.
2. Identify hazards and describe safe work practices pertaining to preparing, removing, repairing, and installing metal panels and components.
3. Identify types of tools and equipment used to remove components and large and heavy panels.
 - i) clip tools
 - ii) wrenches
 - iii) hook tools
 - iv) blades
 - v) lifting equipment
 - vi) hand tools
4. Identify types of metal panels, their characteristics, application and handling procedures.
 - i) door skins
 - ii) repair panels
 - iii) doors
 - iv) fenders
 - v) side panels

- vi) deck lid
 - vii) hood
5. Identify types of components.
 - i) door handles
 - ii) mirrors
 - iii) body side mouldings
 - iv) trim
 - v) emblems
 - vi) brackets
 - vii) door stays
 6. Identify types of metals, their properties, application and handling procedures.
 - i) steel
 - ii) aluminum alloys
 7. Identify types of fillers used to repair metal panels and components.
 8. Identify products and cleaners used to clean panel.
 - i) soapy water
 - ii) degreasers
 - iii) solvents
 9. Identify fasteners used to attach panels and components.
 - i) clips
 - ii) bolts
 - iii) adhesives
 - iv) spot welds
 - v) rivets
 10. Describe the procedures used to identify extent of damage.
 - i) intrusion beam
 - ii) reinforcements
 11. Describe the procedures used to disconnect and reconnect electrical systems, electronic systems and accessories.
 12. Identify alignment sequence and describe its importance in the repair of metal panels and components.
 13. Describe the procedures used to prepare metal panels for repair.
 14. Describe the procedures used to remove metal panels and components.

15. Describe the procedures used to rough out and align damaged metal panels.
16. Describe the procedures used to adjust and align metal panels and components.

Practical Objectives:

1. Remove and re-install a front end panel.

ABT-150

Plastic and Composite Panels and Components I

Learning Outcomes:

- Demonstrate knowledge of plastic and composite panels and components, and their characteristics.
- Demonstrate knowledge of procedures to remove plastic and composite panels and components.
- Demonstrate knowledge of procedures to prepare plastic and composite panels and components for repair.
- Demonstrate knowledge of procedures to repair plastic and composite panels and components.
- Demonstrate knowledge of procedures to prepare panels for refinishing.
- Demonstrate knowledge of procedures to install plastic and composite panels and components.

2019 Red Seal Occupational Standard Reference:

- 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.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with plastic and composite panels and components.
2. Identify hazards and describe safe work practices pertaining to preparing, removing, repairing and installing plastic and composite panels and components.
3. Identify tools and equipment used to remove and repair plastic and composite panels and components.
4. Identify products and cleaners used to clean panels.
 - i) soap and water
 - ii) alcohol-based cleaners
 - iii) anti-static degreasers
5. Identify plastic panels.
 - i) doors

- ii) hoods
 - iii) fenders
 - iv) deck lids
6. Identify types of plastics and composites, their characteristics, application and handling procedures.
- i) thermoplastics
 - ii) thermosetting plastics
 - iii) sheet-molded compounds (SMC)
7. Identify types of imperfections.
- i) cracks
 - ii) deep scratches
 - iii) low/high spots
 - iv) dents
 - v) deformations
8. Identify plastic and composite components.
- i) door handles
 - ii) mirrors
 - iii) body side mouldings
 - iv) trim
 - v) emblems
 - vi) brackets
 - vii) door stays
 - viii) radiator supports
 - ix) bumpers
9. Identify fasteners used to attach plastic and composite panels and components.
10. Identify corrective action to remedy surface imperfections.
- i) re-application
 - ii) sanding
11. Describe ISO code used for identifying types of plastic.
12. Describe the procedures used to prepare plastic and composite panels and components for repair.
13. Describe the procedures used to remove plastic and composite panels and components.
14. Describe the procedures used to repair plastic and composite panels and components.
- i) minor dents
 - ii) minor cuts and cracks

15. Describe the procedures used to replace and align plastic and composite panels.
16. Describe the procedures used to prepare panels for refinishing.

Practical Objectives:

1. Repair a minor abrasion on a plastic panel.

ABT-155 Surface Preparation

Learning Outcomes:

- Demonstrate knowledge of performing initial preparation of substrates and surfaces.
- Demonstrate knowledge of masking materials, their applications and procedures for use.
- Demonstrate knowledge of stripping equipment and products, their applications, safety precautions and procedures for use.
- Demonstrate knowledge of sanding equipment and materials, their applications, safety precautions and procedures for use.

2019 Red Seal Occupational Standard Reference:

- 20.01 Performs initial preparation.
- 20.03 Strips surface.
- 20.04 Sands surface.

Suggested Hours:

27 Hours

Theoretical Objectives:

1. Define terminology associated with surface preparation.
2. Identify hazards and describe safe work practices pertaining to surface preparation.
3. Identify tools, products and cleaners used in surface preparation.
 - i) heat guns/lamps
 - ii) rotary tool (eraser wheel)
 - iii) razor blades
 - iv) soapy water
 - v) degreasers
 - vi) solvents
 - vii) fallout remover
4. Identify tools used to mechanically strip topcoats and undercoats.
5. Identify sanding equipment and materials, their applications and procedures for use.
 - i) power sanders
 - ii) sanding blocks

- iii) scuff paste
 - iv) wet or dry sandpaper
 - v) scuff pads
 - vi) guide coat
6. Identify types of pre-wash cleaners and describe their applications and procedures for use.
- i) water-based
 - ii) alcohol-based
 - iii) solvent-based
 - iv) anti-static plastic cleaners
7. Identify types of surface imperfections.
- i) stone chips
 - ii) corrosion
 - iii) peeling
 - iv) oxidization
 - v) cracking
 - vi) scratches
 - vii) checking
 - viii) environmental damage
8. Identify types of media blasting.
- i) glass
 - ii) sand
 - iii) soda
 - iv) plastic beads
9. Identify methods used to strip topcoats and undercoats and describe their applications and associated safety or environmental considerations.
10. Identify methods used to sand surfaces and describe their applications and associated safety and environmental considerations.
- i) using wet or dry sandpaper
 - ii) scuff pads and scuff paste
 - iii) guide coating
 - iv) machine sanding
 - v) manual sanding
11. Describe cleaning techniques.
12. Describe the effect of chemical stripping, mechanical stripping and media blasting on substrates.

13. Describe the procedures used to remove surface materials during preparation.
 - i) dust
 - ii) loose debris
 - iii) moisture
 - iv) residual two-way tape
 - v) decal adhesive
 - vi) enhanced coating
 - ceramic
 - wax

14. Describe the procedures used to remove dust and residue from work area after chemical, mechanical or media stripping.

Practical Objectives:

1. Clean and prepare a panel for repair.

ABT-160

Repair Materials

Learning Outcomes:

- Demonstrate knowledge of repair materials, their applications and procedures for use.
- Demonstrate knowledge of procedures to apply repair materials.

2019 Red Seal Occupational Standard Reference:

- 21.01 Mixes repair materials.
- 21.02 Applies repair materials.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with repair materials.
2. Identify hazards and describe safe work practices pertaining to repair materials.
 - i) health and safety considerations
3. Identify types of tools used to apply repair materials and describe their characteristics and applications.
 - i) putty knives
 - ii) plastic spreaders
 - iii) spray guns
4. Identify types of repair materials and describe their characteristics and applications.
 - i) putties
 - ii) primers
 - iii) primer surfacers
 - iv) gravel guard/chip resistant coatings
5. Identify types of additives and describe their uses, characteristics and applications.
 - i) flex additives
 - ii) accelerators
 - iii) retarders
 - iv) adhesion promoters
6. Identify considerations used when selecting repair materials that maintain characteristics of existing substrate.

7. Describe the role of environmental conditions on working and curing times.
8. Describe the limitations of repair materials.
9. Describe the procedures used to mix repair materials.
10. Describe application techniques.
 - i) spraying
 - ii) rolling
 - iii) spreading
11. Describe the procedures and techniques used for applying repair materials.

Practical Objectives:

1. Spray primer and clean gun.

ABT-165 Refinishing I

Learning Outcomes:

- Demonstrate knowledge of refinishing materials and their characteristics.
- Demonstrate knowledge of refinishing equipment, its applications, maintenance and procedures for use.

2019 Red Seal Occupational Standard Reference:

- 20.02 Masks surface.
- 22.01 Prepares spray booth.
- 22.02 Performs spray gun setup.
- 23.01 Mixes refinishing materials.
- 24.01 Applies Sealers.
- 24.02 Applies base coat.
- 24.03 Applies single stage coat.
- 24.04 Applies clear coat.
- 25.01 Removes masking materials.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with refinishing.
2. Identify types of refinishing equipment and describe their applications and procedures for use.
3. Identify types of topcoat finishes and describe their characteristics.
 - i) single-stage
 - ii) multistage
 - solvent
 - water
 - iii) clear
4. Identify types of masking materials and describe their applications and compatibilities.
 - i) masking tape
 - ii) paper
 - iii) plastic sheeting
 - iv) liquid mask

- v) soft edge tape
 - vi) fine edge tape
5. Identify paint codes.
 6. Describe masking uses.
 - i) for protection (sanding, stripping)
 - ii) for primer
 - iii) for paint
 7. Describe the safety considerations relating to refinishing.
 - i) personal
 - ii) shop/facility
 - iii) environment
 8. Describe the surface preparation procedures used for refinishing.
 9. Describe potential problems if masking is not done properly.
 - i) bridging
 - ii) peeling
 - iii) overspray
 10. Describe the procedures used to set-up, operate, adjust, and maintain refinishing equipment.
 11. Describe the procedures and methods used to mask surfaces.
 - i) back masking
 - ii) reverse masking

Practical Objectives:

N/A

ABT-170

Exterior Detailing

Learning Outcomes:

- Demonstrate knowledge of polishing materials and their characteristics.
- Demonstrate knowledge of polishing equipment, its applications and procedures for use.
- Demonstrate knowledge of procedures to remove overspray and minor imperfections.
- Demonstrate knowledge of procedures used to polish vehicles.
- Demonstrate knowledge of procedures to repair stone chips.

2019 Red Seal Occupational Standard Reference:

26.01 Removes minor imperfections.

26.02 Polishes vehicle.

26.03 Touches up stone chips.

Suggested Hours:

9 Hours

Theoretical Objectives:

1. Define terminology associated with exterior detailing.
2. Identify hazards and describe safe work practices pertaining to exterior detailing.
3. Identify exterior detailing tools and materials and describe their set up, operation, adjustment and procedures for use.
 - i) remove overspray and minor imperfections
 - razor blades
 - polishers
 - clay bars
 - rubbing compounds
 - chemicals
 - de-nib files
 - ii) polish
 - mil thickness gauge
 - variable speed buffers
 - polishing cloths and pads
 - iii) touch up stone chips
 - touch-up pen
 - paint brush

- tape
 - toothpicks
4. Identify products used in vehicle polishing and describe their related safety considerations.
 5. Identify types of topcoat defects and describe their characteristics.
 6. Identify types of minor imperfections.
 7. Identify limitations of repair based on topcoat type.
 8. Identify causes of minor imperfections.
 - i) contamination
 - ii) poor spray technique
 - iii) improper mixing procedures
 - iv) inter-mixing of products
 - v) expired product
 - vi) poor equipment
 - vii) poor booth conditions
 - viii) incorrect prepping procedures
 - ix) environmental effects
 9. Identify the corrective action to remedy various minor imperfections.
 - i) wet sanding
 - ii) dry sanding
 - iii) compounding
 - iv) reapplication
 - v) polishing
 - vi) use of blades
 10. Describe the procedures used to remove overspray.
 11. Describe the surface preparation procedures used for polishing.
 12. Describe the characteristics of stone chips and identify methods of repair.
 13. Describe the procedure used to prepare area and apply touch-up paint.

Practical Objectives:

1. Polish a panel with defects.

ABT-175

Vehicle Cleaning

Learning Outcomes:

- Demonstrate knowledge of vehicle exterior and interior cleaning tools and equipment.
- Demonstrate knowledge of vehicle exterior and interior cleaning materials.
- Demonstrate knowledge of practices and procedures to clean vehicle exterior and interior.

2019 Red Seal Occupational Standard Reference:

27.01 Cleans exterior.

27.02 Cleans interior.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with vehicle cleaning.
2. Identify hazards and describe safe work practices pertaining to vehicle cleaning and disinfecting.
 - i) biohazards
 - blood
 - fecal matter
 - needles
 - ii) weapons
 - iii) sharp edges
 - iv) broken glass
 - v) airbag residue
 - vi) PPE
 - gloves
 - goggles
 - visor
3. Identify materials used to clean vehicle exterior.
 - i) tire and glass cleaners
 - ii) car wash soap (silicone free)
 - iii) tire dressing (silicone free)
 - iv) degreasers
 - v) dish soap

- vi) cleaning solvents
4. Identify materials used to clean vehicle interior.
 - i) lint-free rags
 - ii) glass cleaners
 - iii) paper products
 - iv) interior shampoo
 - v) leather conditioners
 5. Identify types of vehicle exterior cleaning tools and equipment and describe their applications.
 - i) pressure washers
 - ii) hoses
 - iii) brushes
 - iv) wash mitts
 - v) sponges
 - vi) steel wool
 6. Identify types of vehicle interior cleaning tools and equipment and describe their applications.
 - i) vacuum
 - ii) steam cleaner
 - iii) brushes
 7. Describe the procedures used to clean vehicle exterior.
 8. Describe the procedures used to clean un-painted plastic exterior components.
 9. Describe situations where caution should be observed.
 10. Describe the practices and procedures used to clean vehicle interior surfaces.

Practical Objectives:

N/A

ABT-180

Workplace Mentoring I

Learning Outcomes:

- Demonstrate knowledge of strategies to assist in learning skills in the workplace.

Red Seal Occupational reference:

- 5.01 Uses communications techniques.
- 5.02 Uses mentoring techniques.

Suggested Hours

3 Hours

Theoretical Objectives:

1. Describe the importance of your own experiences.
2. Identify partners involved in apprenticeship.
3. Describe the shared responsibilities for workplace learning.
4. Determine your own learning preferences and explain how these relate to learning new skills.
5. Describe the importance of different types of skills in the workplace.
6. Describe the importance of essential skills in the trade.
7. Identify different ways of learning.
8. Identify learning preferences.
9. Identify different learning needs and strategies to meet learning goals.
10. Identify techniques for effective communication.
11. Identify strategies to assist in learning a skill.

Practical Objectives:

N/A

Level 2

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ABT-200 Aluminum Welding

Learning Outcomes:

- Demonstrate knowledge of the procedures used to prepare aluminum alloy base metals and joints for gas metal arc welding (GMAW) welds.
- Demonstrate knowledge of the procedures used to weld aluminum alloys in all positions using the GMAW process.

2019 Red Seal Occupational Standard Reference:

- 3.01 Uses welding equipment.
- 3.02 Maintains welding equipment.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with GMAW welding equipment.
2. Identify hazardous conditions and describe safe work practices pertaining to GMAW welding equipment operation and maintenance.
3. Identify GMAW welding equipment and describe its application and procedures for use when welding aluminum alloys.
4. Identify types of aluminum alloys and describe their characteristics and applications.
5. Identify the considerations when selecting consumables and determining equipment set-up for performing GMAW welds on aluminum alloys in all positions.
 - i) specification requirements
 - ii) base metal
 - composition
 - thickness
 - iii) shielding gas selection
 - iv) power source
 - push/pull
 - spool gun
 - v) welding position
 - vi) joint type and design

6. Describe the procedures used to prepare aluminum base metals and joints for GMAW welds.
7. Describe the procedures used to perform welds on aluminum alloys in all positions using the GMAW process.
8. Describe the procedures used to perform visual quality inspection of welds.
9. Describe the procedures used to prevent and correct weld faults.

Practical Objectives:

1. Set up and shut down welding equipment.
2. Complete a coupon test weld and assess for defects.

ABT-205 Vehicle Construction

Learning Outcomes:

- Demonstrate knowledge of vehicle construction.
- Demonstrate knowledge of vehicle components.
- Demonstrate knowledge of work orders (repair orders) and estimates.
- Demonstrate knowledge of preparing and interpreting repair plans.

2019 Red Seal Occupational Standard Reference:

- 4.02 Prepares repair plan.
- 4.04 Uses documentation.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with vehicle construction.
2. Identify body sections and describe their components.
3. Identify types of vehicle construction and describe their characteristics and applications.
 - i) conventional frames
 - ii) unitized bodies
 - iii) semi-unitized bodies
 - iv) space frame
 - v) monocoque
4. Identify types of materials used in vehicle construction and describe their characteristics and applications.
 - i) mild steel
 - ii) composites
 - iii) plastics
 - iv) aluminum
 - v) carbon fibre
 - vi) magnesium
 - vii) High Strength Steel (HSS)
 - viii) Ultra High Strength Steel (UHSS)

5. Identify types of repair-related documentation and describe their purpose, applications and procedures for use.
 - i) pre-scan print-out
 - ii) vehicle dimension print-out
 - iii) items to be sublet
 - iv) wheel alignment check

6. Describe the procedures used to prepare a repair plan.

7. Identify structural and non-structural components and describe their characteristics and applications.
 - i) frame rails
 - ii) strut tower/apron
 - iii) rocker panels
 - iv) reinforcements
 - v) pillars
 - vi) rad supports
 - vii) stationary glass
 - viii) bumper reinforcements
 - ix) intrusion beams
 - x) moveable glass
 - xi) doors
 - xii) bolt-on body panels

8. Identify body construction methods.

Practical Objectives:

N/A

ABT-210

Corrosion Protection and Sound Deadening

Learning Outcomes:

- Demonstrate knowledge of corrosion, its causes and effects.
- Demonstrate knowledge of corrosion protection, their characteristics and applications.
- Demonstrate knowledge of the procedures to restore corrosion protection.
- Demonstrate knowledge of undercoats, their applications, and procedures for use.
- Demonstrate knowledge of seam sealers and sound deadening materials.
- Demonstrate knowledge of procedures to apply seam sealers and sound deadening materials.

2019 Red Seal Occupational Standard Reference:

- 8.01 Applies corrosion inhibitors and undercoats.
- 8.02 Applies seam sealers and sound deadeners.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with corrosion protection and sound deadening.
2. Identify hazards and describe safe work practices.
 - i) corrosion
 - ii) corrosion protection
 - iii) undercoats
 - iv) seam sealers and sound deadening materials
3. Interpret regulations pertaining to the use of undercoats.
 - i) environmental
 - ii) jurisdictional
4. Interpret documentation pertaining to corrosion protection.
 - i) OEM specifications
 - ii) manufacturers' specifications
5. Identify tools and equipment relating to undercoats and corrosion protection and describe their applications and procedures for use.
6. Identify the areas subject to corrosion.

- i) limited access panels
 - ii) closed panels
 - iii) frame rails
 - iv) repair areas
 - v) wheel wells
7. Identify the types of corrosion and describe their causes.
- i) oxidation
 - ii) galvanic
8. Identify types of corrosion protection and describe their characteristics and applications.
- i) OEM applications
 - ii) undercoats (primers)
 - iii) topcoats
 - iv) anti-corrosion compounds
 - v) cavity waxes
9. Identify types of undercoats and describe their characteristics and applications.
10. Identify types of seam sealers and sound deadening materials and describe their characteristics and applications.
11. Identify environmental and atmospheric conditions that influence the rate of corrosion.
12. Identify undercoat application techniques.
13. Identify undercoat defects and describe their causes and the procedures used to prevent or correct them.
14. Describe the procedures related to corrosion and undercoating.
- i) inspecting for corrosion related damage
 - ii) restoring corrosion protection to OEM specifications
 - iii) preparing substrate prior to applying undercoats
 - iv) mixing undercoats
 - v) applying undercoats
 - vi) preparing undercoats for topcoat
15. Describe the procedures to apply seam sealers and sound deadening materials.
- i) sound deadening pads
 - ii) reinforcement pads
 - door handles
 - door skins

Practical Objectives:

1. Apply seam sealer.
2. Apply an anti-corrosion compound.

ABT-215 Structural and Laminated Glass

Learning Outcomes:

- Demonstrate knowledge of structural glass, its characteristics and importance to vehicle structure.
- Demonstrate knowledge of the procedures to remove and install structural glass.
- Demonstrate knowledge of procedures to repair laminated glass.

2019 Red Seal Occupational Standard Reference:

- 11.01 Removes structural glass.
- 11.02 Installs structural glass.
- 11.03 Repairs laminated glass.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with structural and laminated glass.
2. Identify hazards and describe safe work practices pertaining to structural and laminated glass.
3. Explain the importance of structural glass to a vehicle's structural integrity.
4. Identify tools and equipment used to remove and install structural glass and describe their applications and procedures for use.
5. Identify lifting devices used to remove and install glass.
 - i) suction cups
 - ii) ergonomic lift assists
6. Identify materials used for structural glass replacement and describe their characteristics and procedures for use.
7. Identify types of structural glass and describe their characteristics.
8. Identify the types of leaks associated with structural glass and describe the procedures used to detect and repair them.

- i) wind
 - ii) water
9. Identify structural glass components and accessories and describe their purpose and applications.
10. Identify structural glass electrical components.
- i) procedures for removal and installation
 - ii) calibration requirements
11. Identify fastening methods for structural glass and components and describe their associated procedures.
- i) mechanical
 - ii) bonded
12. Describe the procedures used to test-fit glass.
13. Describe the procedures used to determine if structural glass can be repaired or requires replacement.
14. Describe the procedures used to remove and install structural glass and its related components.
15. Describe the procedures used to determine if laminated glass can be repaired or requires replacement.
16. Describe the procedures used to repair laminated glass.

Practical Objectives:

1. Remove and install structural glass.

ABT-220

Metal Panels and Components Repair

Learning Outcomes:

- Demonstrate knowledge of metal panels and components, and their characteristics.
- Demonstrate knowledge of procedures to repair metal panels and components.
- Demonstrate knowledge of procedures used to align and adjust metal panels.

2019 Red Seal Occupational Standard Reference:

12.03 Repairs metal panels and components.

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with metal panels and components.
2. Identify hazards and describe safe work practices pertaining to repairing metal panels and components.
3. Identify tools and equipment relating to metal panels and describe their applications.
4. Identify types of metals and describe their associated repair procedures.
 - i) aluminum
 - ii) steel
 - iii) quarantining
5. Identify types of imperfections.
 - i) pin holes
 - ii) sand scratches
 - iii) low/high spots
6. Identify types of repair materials and describe their applications.
 - i) fibre reinforced filler
 - ii) body fillers
 - iii) advanced repair compounds
 - iv) panel bond
 - v) aluminum filler

7. Identify vehicle construction considerations and requirements for performing metal work on panels.
 - i) metal types
 - ii) structures
8. Identify the alignment sequence and describe its importance in the repair of metal panels and components.
9. Identify the corrective action to remedy various surface imperfections.
 - i) re-application
 - ii) block sanding
10. Describe metallurgic principles.
11. Describe the procedures used to repair metal panels and components.
12. Describe the procedures used to shrink metal.
13. Describe the procedures used to reshape metal.
 - i) heating
 - ii) cold repair
 - iii) pushing
 - iv) pulling
14. Describe the procedures and techniques used to protect electrical and electronic systems and components during repair.
15. Describe procedures used to apply repair materials.
16. Describe the procedures used to rough out and align damaged metal panels.
17. Describe the procedures used to prepare panels for refinishing.

Practical Objectives:

1. Repair a damaged body panel.
 - analyze damage
 - rough out panel
 - metal shrinking
 - apply fillers
 - sand fillers

ABT-225

Plastic and Composite Panels and Components II

Learning Outcomes:

- Demonstrate knowledge of plastic and composite panels and components, and their characteristics.
- Demonstrate knowledge of procedures to remove plastic and composite panels and components.
- Demonstrate knowledge of procedures to prepare plastic and composite panels and components for repair.
- Demonstrate knowledge of procedures to repair plastic and composite panels and components.
- Demonstrate knowledge of procedures to prepare panels for refinishing.
- Demonstrate knowledge of procedures to install plastic and composite panels and components.

2019 Red Seal Occupational Standard Reference:

- 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.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Identify hazards and describe safe work practices pertaining to preparing, removing, repairing and installing plastic and composite panels and components.
2. Identify equipment, products and materials used in the repair of plastic and composite panels and components.
 - i) plastic welders
 - ii) adhesives
 - iii) reinforcement mesh
 - iv) back pad
 - v) plastic fillers
 - vi) plastic adhesion promoters
3. Identify types of plastics and composites, their characteristics, application and handling procedures.

- i) fibre-reinforced plastic
 - ii) reinforced injection molded polyurethane
 - iii) composite/hybrid plastics
 - iv) fiberglass
 - v) carbon-fibre
4. Identify types of damage and describe the procedures used to align and repair plastic and composite panels and components.
- i) gouges
 - ii) tears
 - iii) punctures
 - iv) deformations
5. Describe the procedures used to clean, prepare, remove and reinstall plastic and composite panels and components.

Practical Objectives:

1. Perform a two-sided repair with a backing.

ABT-230 Non-Structural Glass

Learning Outcomes:

- Demonstrate knowledge of non-structural glass and hardware components, and their characteristics.
- Demonstrate knowledge of procedures to remove non-structural glass, and its associated hardware components and attachments.
- Demonstrate knowledge of procedures to install non-structural glass, and its associated hardware and attachments.

2019 Red Seal Occupational Standard Reference:

- 14.01 Removes non-structural glass.
- 14.02 Installs non-structural glass.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with non-structural glass.
2. Identify hazards and describe safe work practices pertaining to non-structural glass.
3. Identify glass classifications and grades and describe their characteristics and applications.
 - i) AS1
 - ii) AS2
 - iii) AS3
 - iv) tints
4. Identify types of tools and equipment used to install non-structural glass and its associated hardware and attachments.
5. Identify types of non-structural glass and describe their characteristics.
6. Identify types of hardware components and describe their applications.
7. Identify types of fasteners used with non-structural glass.

8. Identify types of defects in non-structural glass.
 - i) scratches
 - ii) chipped edges
 - iii) pitting
9. Describe the procedures used to remove glass.
 - i) non-structural
 - ii) broken
10. Describe the procedures used for inspecting non-structural glass and its associated hardware.
11. Describe the procedures used to install non-structural glass and its associated hardware.
12. Describe the procedures used to install and reprogram components.

Practical Objectives:

1. Remove and install non-structural glass and its components.

ABT-235 Interior Components

Learning Outcomes:

- Demonstrate knowledge of procedures to repair and replace interior components.
- Demonstrate knowledge of procedures to install electrical components.

2019 Red Seal Occupational Standard Reference:

18.01 Repairs interior components.

18.02 Replaces interior components.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Define terminology associated with interior components.
2. Identify hazards and describe safe work practices pertaining to interior components.
3. Identify types of tools and equipment for removal, repair, and installation.
 - i) plastic welding equipment
 - ii) heat guns
 - iii) spray guns (adhesives)
 - iv) steering wheel pullers
 - v) screwdrivers
 - vi) clip removers
 - vii) flashlights
4. Identify types of interior components.
 - i) trim panels
 - ii) seats
 - iii) head liners
 - iv) door panels
 - v) center consoles
5. Identify types of substrates.
 - i) steel
 - ii) plastic
 - iii) aluminum
 - iv) composites

- v) cloth
6. Identify types of repair materials and describe their applications.
 - i) epoxies
 - ii) adhesives
 - iii) welding rods
 7. Describe fasteners and adhesives relating to interior components.
 8. Describe the procedures used to establish removal, storage and installation sequence.
 9. Describe the procedures used to repair interior components.
 10. Describe the procedures used to verify fit, finish and operation of interior components.
 11. Describe the procedures used to replace interior components.
 12. Describe the procedures used to disconnect, isolate and reconnect battery.
 13. Describe the procedures used to connect electrical components and verify operation.

Practical Objectives:

1. Remove and re-install interior components.

ABT-240

Refinishing II

Learning Outcomes:

- Demonstrate knowledge of refinishing materials, their characteristics and mixing procedures.

2019 Red Seal Occupational Standard Reference:

- 2.05 Maintains refinishing tools and equipment.
- 22.01 Prepares spray booth.
- 22.02 Performs spray gun setup.
- 24.01 Applies Sealers.
- 24.02 Applies base coat.
- 24.03 Applies single stage coat.
- 24.04 Applies clear coat.
- 25.02 Corrects surface imperfections.

Suggested Hours:

36 Hours

Theoretical Objectives:

1. Define terminology associated with vehicle top coats.
2. Identify hazardous conditions and describe safe work practices pertaining to refinishing tools and equipment.
3. Identify types of trade related documentation pertaining to refinishing.
4. Identify topcoat defects that occur during application and describe the procedures used to prevent or correct them.
5. Identify the considerations and requirements for determining curing cycles for alternate fuel and electric vehicles.
6. Describe colour theory.
7. Describe the procedures used to inspect, make adjustments, maintain and store refinishing tools and equipment and their components.
8. Describe the procedures used for colour matching.

9. Describe the procedures used for mixing and applying single stage finishes.
 - i) spot
 - ii) panel
 - iii) complete

10. Describe the procedures used for mixing and applying basecoat/clearcoat, tri-coat and four-stage finishes.
 - i) spot
 - ii) panel
 - iii) complete

11. Describe the application and curing procedures for waterborne based finishes.
 - i) surface preparation
 - ii) color matching
 - iii) wet beds
 - iv) blending

12. Describe the procedures used to refinish plastic parts.
 - i) interior
 - ii) exterior

13. Describe the procedures used to blend top coats.
 - i) single-stage
 - ii) multi-stage

Practical Objectives:

1. Apply a top coat.

ABT-245 Colour Adjustments

Learning Outcomes:

- Demonstrate knowledge of performing colour matching.

2019 Red Seal Occupational Standard Reference:

23.02 Performs colour adjustments.

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with colour adjustments.
2. Identify hazards and describe safe work practices pertaining to performing colour adjustments.
3. Identify types of refinishing materials and their applications.
 - i) single stage
 - ii) water-borne
 - iii) solvent-based clear coat
4. Identify types of refinishing material components and their applications.
 - i) binders
 - ii) pigments
 - iii) solvents
 - iv) additives
5. Describe the elements of colour theory.
 - i) value
 - ii) hue
 - iii) chroma
 - iv) colour spectrum
 - v) primary and secondary colours
 - vi) metamerism (role of light in colour perception)
 - vii) face
 - viii) pitch
 - ix) flop
 - x) metallic

xi) pearls

6. Describe spray gun techniques and procedures used for their setup.
7. Describe the procedures used to obtain colour formulas.
8. Describe the procedures used to adjust colour formulas.
9. Describe the procedure used to create a spray-out card and let-down panel.
10. Describe the procedures for use of spectrophotometer (colour camera).
11. Describe the procedures for use of colour corrective lighting.

Practical Objectives:

1. Create a spray-out card and let-down panel.

ABT-250

GMAW Silicon Bronze Welding

Learning Outcomes:

- Demonstrate knowledge of the procedures used to perform Gas Metal Arc Welding (GMAW) using silicon bronze.

2019 Red Seal Occupational Standard Reference:

- 3.01 Uses welding equipment.
- 3.02 Maintains welding equipment.

Suggested Hours:

12 Hours

Theoretical Objectives:

1. Identify hazardous conditions and describe safe work practices pertaining to GMAW equipment operation and maintenance.
2. Identify GMAW equipment and describe its application and procedures for use.
3. Identify welding filler materials and describe their characteristics and applications.
4. Identify the considerations when selecting consumables and determining equipment set-up for performing silicon bronze welding using GMAW.
 - i) specification requirements
 - ii) base metal
 - composition
 - thickness
 - iii) shielding gas selection
 - iv) power source
 - push/pull
 - v) welding position
 - vi) joint type and design
5. Describe the procedures used to perform GMAW using silicon bronze.
6. Describe the procedures used to perform visual quality inspection of welds.
7. Describe the procedures used to prevent and correct weld faults.

Practical Objectives:

1. Set up and shut down welding equipment.
2. Complete a coupon test weld and assess for defects.

Level 3

Unit Code	Title	Suggested Hours	Page
ABT-300	Frame and Unibody Repair and Measuring	18	81
ABT-305	Final Operational Checks	6	82
ABT-310	Structural Component Preparation	21	83
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ABT-320	Mechanical Components I (Steering, Suspension and Brakes)	36	89
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ABT-300

Frame and Unibody Repair and Measuring

Learning Outcomes:

- Demonstrate knowledge of frame and unibody repair, measuring and diagnostic equipment and components, their applications and procedures for use.
- Demonstrate knowledge of the maintenance and storage of frame and unibody repair, measuring and diagnostic equipment.

2019 Red Seal Occupational Standard Reference:

- 2.02 Maintains frame and unibody repair and measuring equipment.
- 2.04 Uses diagnostic equipment.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with frame and unibody repair equipment.
2. Identify hazardous conditions and describe safe work practices related to frame and unibody repair equipment.
3. Identify types of frame and unibody repair, measuring and diagnostic equipment and describe their components, applications, limitations and procedures for use.
4. Describe the procedures used to inspect, maintain and store frame and unibody repair, measuring and diagnostic equipment and components.
5. Describe the procedures used to calibrate diagnostic equipment.

Practical Objectives:

1. Set up a vehicle on frame straightening equipment and perform measurement.

ABT-305 Final Operational Checks

Learning Outcomes:

- Demonstrate knowledge of procedures to perform final operational checks.

2019 Red Seal Occupational Standard Reference:

7.01 Performs final operational check.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with final operational check.
2. Identify hazardous conditions and describe safe work practices related to final operational check.
3. Identify work order (repair order) details to determine completeness of work.
4. Identify the purpose and procedures for conducting a vehicle road test.
5. Describe final operational checklist to verify quality of work.
 - i) fluid levels
 - ii) operation of components
 - iii) post-scan of vehicle
 - iv) tire pressure
 - v) road test
 - vi) re-enter pre-sets
 - vii) wheel torque specifications
 - viii) pre-existing safety concerns
6. Describe the procedures used to perform vehicle component operational checks.

Practical Objectives:

N/A

ABT-310 Structural Component Preparation

Learning Outcomes:

- Demonstrate knowledge of vehicle construction and structural components.
- Demonstrate knowledge of procedures to analyze damage.
- Demonstrate knowledge of procedures to remove components.
- Demonstrate knowledge of procedures to inspect for physical damage.
- Demonstrate knowledge of labelling, organizing and storage of removed components.
- Demonstrate knowledge of procedures to set up vehicle.

2019 Red Seal Occupational Standard Reference:

- 9.01 Identifies extent of damage.
- 9.02 Removes components for access.
- 9.03 Performs vehicle set-up.

Suggested Hours:

21 Hours

Theoretical Objectives:

1. Define terminology relating to vehicle construction.
 - i) unibody
 - ii) conventional
 - iii) space frame
 - iv) monocoque
2. Define terminology associated with damage analysis.
3. Identify hazards and describe safe work practices pertaining to damage analysis.
4. Identify tools and equipment and describe their applications and procedures for use.
 - i) measuring equipment
 - ii) component removal
5. Identify energy management zones in vehicle construction.
 - i) structural foam
 - ii) NVH foam
6. Identify visual inspection techniques.

7. Identify types of vehicle construction and structural components, and describe their characteristics.
8. Identify types of damage and determine the appropriate repair procedures.
 - i) fender gaps
 - ii) cracked paint
 - iii) stressed spot welds
 - iv) broken seam sealers
 - v) striker misalignment
 - vi) cab to body misalignment (full-frame)
 - vii) sway
 - viii) sag
 - ix) mash
 - x) diamond
 - xi) twist
9. Describe the procedures used to disarm and disable components.
10. Describe the procedures used to label, organize and store removed components.
11. Identify labelling, organizing and storing procedures.
12. Identify storage, clean-up and disposal methods.
13. Describe the procedures used to protect and isolate related components.
14. Identify anchoring locations.
15. Identify anchoring and pulling techniques used for vehicle structural repair and describe their associated procedures.
16. Describe methods used for analyzing damage to vehicles.
 - i) comparison measuring
 - ii) cross measuring of structural components
 - iii) 3-D measuring systems
 - iv) dedicated fixture measuring system
17. Describe the procedures and considerations used for analyzing damage to vehicles.
 - i) OEM procedures
 - ii) industry service specifications

- iii) repair vs. replace
 - iv) part availability
18. Describe measuring theory and measuring systems.
- i) mechanical universal
 - ii) 3-D computerized
 - iii) dedicated fixture
19. Describe the procedures used to assess physical appearance and operation of components for damage using inspection methods.
- i) outer body panels
 - ii) suspension components
 - iii) wiring harnesses
 - iv) refrigerant
 - v) cooling system
 - vi) electronic modules

Practical Objectives:

N/A

ABT-315

Structural Component Repair

Learning Outcomes:

- Demonstrate knowledge of metals and their characteristics.
- Demonstrate knowledge of metallurgic principles and their applications to control expansion, contraction and distortion.
- Demonstrate knowledge of structural components.
- Demonstrate knowledge of procedures and techniques used to repair structural components.
- Demonstrate knowledge of procedures and techniques used to adjust and align structural components.

2019 Red Seal Occupational Standard Reference:

- 10.01 Repairs structural components.
- 3.01 Uses welding equipment.

Suggested Hours:

42 Hours

Theoretical Objectives:

1. Define terminology relating to metallurgy.
2. Define terminology associated with structural components.
3. Identify hazards and describe safe work practices pertaining to working and cutting metals.
4. Identify measuring equipment and describe their applications and procedures for use.
 - i) tram gauge
 - ii) centering gauge
 - iii) 3-D measuring systems
5. Identify straightening equipment and describe their applications and procedures for use.
 - i) clamps
 - ii) pullers
 - iii) hooks
 - iv) dedicated bench systems
 - v) chains

6. Identify types of metals and describe their characteristics.
7. Identify structural components and describe their characteristics.
8. Describe damaged frame conditions.
 - i) sway
 - ii) sag
 - iii) mash
 - iv) diamond
 - v) twist
9. Identify measuring techniques and describe their associated procedures.
10. Identify procedures associated with working metals and describe their applications.
 - i) forming
 - ii) shearing
 - iii) punching
 - iv) drilling
 - v) cutting
 - vi) welding
 - vii) heating
 - viii) shrinking
 - ix) stretching
11. Describe the procedures used to remove fasteners.
12. Describe the effects metal working has on metallurgic properties.
 - i) stress
 - ii) contraction
 - iii) expansion
 - iv) distortion
 - v) work hardening
 - vi) shrinking
 - vii) stretching
13. Identify anchoring equipment and describe their applications and procedures for use.
 - i) clamps
 - ii) fixtures
 - iii) jigs
 - iv) chains

- v) hooks
 - vi) cables
 - vii) straps
14. Describe the procedures used to prevent or correct problems that occur when working metals.
15. Describe methods used for identifying construction material.
- i) OEM specifications
 - ii) magnetism
 - iii) scratch testing
 - iv) electronic mil gauge
16. Describe the procedures used to repair structural components.
- i) pulling
 - ii) stress relieving
 - hammer on dolly
 - hammer off dolly
 - iii) applying controlled heat
17. Describe the procedures used to test fit components.
18. Describe the procedures used to replace vehicle structural components.
- i) full replacement
 - ii) sectioning
 - iii) adjust and align

Practical Objectives:

1. Repair and re-align a frame rail.

ABT-320

Mechanical Components I (Steering, Suspension and Brakes)

Learning Outcomes:

- Demonstrate knowledge of mechanical systems and components.
- Demonstrate knowledge of procedures to remove mechanical systems and components.
- Demonstrate knowledge of procedures to install mechanical systems and components.

2019 Red Seal Occupational Standard Reference:

16.01 Removes mechanical components.

16.02 Installs mechanical components.

Suggested Hours:

36 Hours

Theoretical Objectives:

1. Define terminology associated with mechanical systems and components.
2. Identify hazards and describe safe work practices pertaining to mechanical systems and components.
3. Identify regulations and documentation relating to installing mechanical systems and components.
4. Identify types of specialized tools and equipment and describe their applications and procedures for use.
5. Identify types of mechanical systems and describe their components and fluids.
 - i) steering
 - ii) suspension
 - iii) brakes
6. Identify types of mechanical fasteners used with components and describe their applications.
7. Describe the procedures used to inspect mechanical systems and components for wear and collision-related damage.
8. Describe the procedures and considerations used when installing fasteners.

- i) identifying one-time-use fasteners
 - ii) identifying the requirement for anti-seize and thread-locker materials
 - iii) torque specifications
9. Describe the procedures used to remove mechanical systems and components.
 10. Describe the procedures used to install mechanical systems and components
 11. Describe the alignment process used in the repair of steering and suspension system components.
 12. Describe the procedures used to perform operational check of mechanical systems and components.

Practical Objectives:

N/A

ABT-325 Electrical Components

Learning Outcomes:

- Demonstrate knowledge of electrical theory and its applications.
- Demonstrate knowledge of electrical schematics, their applications and interpretation.
- Demonstrate knowledge of procedures to remove 12V batteries.
- Demonstrate knowledge of procedures to remove and install electrical components.
- Demonstrate knowledge of procedures to diagnose and determine damage to electrical and electronic systems and components.
- Demonstrate knowledge of procedures to repair damaged wires and protective coverings.
- Demonstrate knowledge of corrosion protection for electrical components, its characteristics and applications.

2019 Red Seal Occupational Standard Reference:

- 17.01 Removes electrical components.
- 17.02 Repairs damaged wires and protective coverings.
- 17.03 Installs electrical components.

Suggested Hours:

21 Hours

Theoretical Objectives:

1. Define terminology associated with electrical and electronic components.
 - i) resistors
 - ii) switches
 - iii) circuits
 - iv) path
 - v) input
2. Identify hazards and describe safe work practices pertaining to electrical and electronic components.
 - i) 12V batteries
 - ii) corrosion and corrosion protection
3. Interpret jurisdictional and environmental regulations pertaining to the disposal of damaged electrical components.
4. Explain basic electrical theory.

5. Identify testing equipment used to test electrical and electronic circuits and components and describe their applications and procedures for use.
 - i) DVOM
 - ii) test lights
 - iii) diagnostic scanners

6. Identify basic electrical and electronic components and describe their applications and operation.
 - i) fuses and fuse boxes
 - ii) relays
 - iii) fan motors
 - iv) power accessories
 - v) batteries

7. Identify types of advanced electronic components and describe their applications and characteristics.

8. Identify types of wiring and protective coverings.
 - i) insulated plastic coatings
 - ii) wire looms
 - iii) shrink tubing

9. Identify types of repair tools and describe their applications and procedures for use.
 - i) soldering equipment
 - ii) wire strippers
 - iii) crimpers
 - iv) side cutters
 - v) terminal release tools
 - vi) heat guns

10. Identify types of connectors and describe their applications.
 - i) locking tabs
 - ii) screw-type fastening blocks
 - iii) locking pins
 - iv) loom connectors
 - v) spade-type connectors
 - vi) clips and fasteners

11. Identify types of corrosion protection for electrical components and describe their characteristics and applications.

- i) dielectric grease
 - ii) shrink tubing
 - iii) electrical tape
 - iv) weather-pack connections (rubber seals)
12. Identify electrical schematics and describe their purpose and applications.
 13. Identify a diagnostic trouble code (DTC).
 14. Identify considerations when handling wiring and components.
 15. Identify environmental and atmospheric conditions that influence the rate of corrosion to electrical components.
 16. Describe electrical and electronic damage associated with collisions.
 17. Describe the procedures used to remove and reconnect batteries.
 18. Describe the procedures used to disconnect, remove and reconnect electrical components.
 19. Describe the procedures used to interpret electrical schematics in the repair of electrical and electronic components.
 20. Describe the procedures used to test and diagnose electrical and electronic circuits and components.
 21. Describe the procedures related to electrical and electronic systems, wires and protective coverings.
 - i) removal of component and protective coverings
 - cutting
 - dismantling
 - disconnecting
 - ii) identify signs of corrosion
 - iii) inspect for corrosion
 - iv) protect during repairs
 - v) restore corrosion protection
 - vi) repair damaged wires and protective coverings
 - soldering
 - crimping
 - shrink tubing

- reattaching connectors
- vii) install and verify operation

Practical Objectives:

1. Perform a multi-wire repair.

ABT-330

Restraint Systems

Learning Outcomes:

- Demonstrate knowledge of electrical theory and its relationship with restraint systems.
- Demonstrate knowledge of restraint systems, their location, components, operation and failed component indicators.
- Demonstrate knowledge of procedures to service restraint systems and their related components.

2019 Red Seal Occupational Standard Reference:

19.01 Services seat belt restraint systems.

19.02 Services air bags and related components.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with restraint systems.
 - i) seat belts
 - ii) air bags - Supplemental Restraint Systems (SRS)
 - iii) sensors
 - iv) modules
 - v) clock springs
 - vi) pre-tensioner
2. Identify hazards and describe safe work practices pertaining to seat belt and air bag restraint systems.
3. Interpret documentation and OEM specifications pertaining to seat belt and air bag restraint systems.
4. Describe the role of batteries in restraint systems.
 - i) seat belts
 - ii) air bags - Supplemental Restraint Systems (SRS)
5. Identify types of seat belt restraint systems and describe their location, components and operation.
 - i) passive

- ii) active
6. Identify types of air bag systems and describe their location, components and operation.
 7. Describe the procedures used to disconnect, isolate and reconnect batteries.
 8. Describe the procedures used to service seat belt restraint systems.
 9. Describe the procedures used to perform operational check of seat belt restraint systems.
 - i) visible damage
 - ii) DTCs
 10. Describe the procedures used to service and repair air bag.
 11. Describe the procedures used to perform a diagnostic check of restraint systems.
 - i) deployed seat belt pre-tensioner
 - ii) air bags
 12. Describe the procedures used to identify and clear restraint system codes from vehicle.

Practical Objectives:

1. Remove and install a restraint system component.
2. Check for a DTC code.

ABT-335

Alternative Fuel Systems

Learning Outcomes:

- Demonstrate knowledge of alternative-fuel systems.
- Demonstrate knowledge of procedures to deactivate alternative-fuel systems.
- Demonstrate knowledge of procedures to reactivate alternative-fuel systems.

2019 Red Seal Occupational Standard Reference:

- 15.01 Deactivates alternative-fuel systems.
- 15.02 Reactivates alternative-fuel systems.

Suggested Hours:

18 Hours

Theoretical Objectives:

1. Define terminology associated with alternative fuel systems.
2. Identify hazards and describe safe work practices pertaining to electric and fuel/electric hybrids.
 - i) deactivation of compressed fuels
 - ii) battery electrolytes
 - iii) reactivation of electric and fuel/electric hybrids
 - iv) moving and towing practices
 - v) vehicle and key isolation
 - vi) verifying zero energy state
3. Identify types of PPE and safety equipment used to work on alternative-fuel systems.
4. Identify types of alternative-fuel systems.
 - i) propane
 - ii) compressed natural gas
 - iii) hybrid gas electric
 - iv) hybrid diesel electric
 - v) full electric
5. Explain capacitor discharge times.
6. Explain residual power after deactivation of power supply.

7. Identify the considerations relating to the removal and replacement of battery packs in alternative-fuel vehicles.
8. Identify the considerations relating to the installation of battery packs in alternative-fuel vehicles.
9. Describe the handling and storage considerations and procedures of low-voltage and high-voltage batteries.
10. Describe colour coding of high current wiring.
11. Describe the procedures used to remove batteries.
12. Describe the procedures used to install batteries.

Practical Objectives:

1. De-activate and re-activate high voltage battery pack.

Level 4

Unit Code	Title	Suggested Hours	Page
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ABT-420	Mechanical Components II (Powertrain, HVAC and Exhaust)	33	108
ABT-425	Electronic Components	15	110
ABT-430	Workplace Mentoring II	6	111
ABT-435	Program Review	30	113

ABT-400

Estimates and Supplements

Learning Outcomes:

- Demonstrate knowledge of trade-related documentation and its use.
- Demonstrate knowledge of vehicle construction.
- Demonstrate knowledge of the procedures used to prepare estimate and supplement documentation.
- Demonstrate knowledge of the procedures used to perform a visual inspection.
- Demonstrate knowledge of vehicle component operation.
- Demonstrate knowledge of the procedures used to perform damage analysis.

2019 Red Seal Occupational Standard Reference:

- 4.01 Prepares estimates and supplements.
- 4.04 Uses documentation.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with damage analysis and estimate documentation.
 - i) depreciation
 - ii) sublet
 - iii) supplement
 - iv) included and not-included operations
 - v) betterment
2. Define terminology associated with vehicle construction.
3. Identify types of vehicle construction and describe their characteristics.
 - i) conventional frames
 - ii) unitized bodies
 - iii) semi-unitized bodies
 - iv) space frame
 - v) monocoque
4. Identify types of complex materials and describe their characteristics.
 - i) aluminum
 - ii) carbon fibre
 - iii) magnesium

- iv) high-strength steels (HSS)
 - v) ultra-high-strength steels (UHSS)
5. Identify body sections and describe their components.
 6. Identify body construction methods.
 7. Identify sources of information used to prepare estimates and supplements.
 - i) mileage
 - ii) customer information
 - iii) VIN
 - iv) make and model
 - v) production date
 - vi) paint codes
 - vii) plate number
 - viii) OEM specifications
 8. Identify software used to prepare estimates and supplements.
 9. Identify sections of an estimate.
 - i) customer information
 - ii) vehicle information
 - iii) estimate detail lines (damage assessment)
 - iv) estimate sub-totals
 - v) final totals
 - vi) customer responsibility
 - betterment
 - deductible
 10. Describe the procedures used to perform a visual inspection of the vehicle.
 11. Describe the importance of effective communication with people relating to preparing estimates.
 - i) co-workers
 - ii) appraisers
 - iii) estimators
 - iv) insurance adjusters
 - v) part suppliers
 - vi) customer
 12. Describe the procedures used to prepare estimate and supplement documentation.
 13. Describe the procedures used to perform vehicle component operational checks.

14. Describe the procedures used to perform damage analysis.
15. Describe the procedures used to document any previous or pre-existing damage on vehicle.

Practical Objectives:

1. Perform damage analysis and prepare estimate documentation.

ABT-405 Quality Control Inspections

Learning Outcomes:

- Demonstrate knowledge of procedures to perform final quality control inspections.

2019 Red Seal Occupational Standard Reference:

7.02 Performs final quality control inspection.

Suggested Hours:

6 Hours

Theoretical Objectives:

1. Define terminology associated with final quality control inspections.
2. Describe the procedures used to determine completeness of work based on repair order (work order).
3. Describe the procedure used to verify quality of work following pre-delivery checklist.
4. Describe the procedures used to visually and manually inspect repaired vehicle and component.
 - i) panel gaps
 - ii) panel alignment
 - iii) functionality of latches, catches and locks
 - iv) operation according to OEM specifications

Practical Objectives:

1. Perform a pre-delivery check.

ABT-410 Structural Component Removal

Learning Outcomes:

- Demonstrate knowledge of procedures to remove structural components.
- Demonstrate knowledge of cutting tools and equipment, their applications and procedures for use.

2019 Red Seal Occupational Standard Reference:

10.02 Removes structural components.

Suggested Hours:

21 Hours

Theoretical Objectives:

1. Define terminology associated with cutting tools and equipment.
2. Identify hazardous conditions and describe safe work practices related to cutting tools and equipment.
3. Identify cutting tools and equipment used to cut components.
 - i) plasma arc
 - ii) oxy fuel
 - iii) pneumatic
 - iv) electric
4. Identify techniques for removing welds.
5. Identify structural component removal procedures.
6. Identify measuring techniques and describe their associated procedures.
7. Identify cutting processes and describe their applications.
 - i) plasma arc
 - ii) oxy fuel
8. Describe the procedures used to cut with plasma arc cutting equipment.
9. Describe the procedures used to cut with oxy-fuel equipment.

Practical Objectives:

1. Remove a structural component.

ABT-415 Structural Component Installation

Learning Outcomes:

- Demonstrate knowledge of procedures to install structural components.

2019 Red Seal Occupational Standard Reference:

10.03 Installs structural components.

Suggested Hours:

24 Hours

Theoretical Objectives:

1. Define terminology relating to metallurgy.
2. Identify hazards and describe safe work practices pertaining to working and cutting metals.
3. Identify measuring techniques.
4. Identify the procedures used to test fit components to ensure structural alignment.
5. Describe fastening methods used to install structural components.
 - i) fasteners
 - ii) adhesives
 - iii) welding
 - GMAW
 - STRSW
6. Describe the procedures used to prepare structural components for installation.
7. Describe the procedures and techniques used to protect electrical and electronic systems and components during installation.

Practical Objectives:

1. Install a structural component.

ABT-420

Mechanical Components II (Powertrain, HVAC and Exhaust)

Learning Outcomes:

- Demonstrate knowledge of mechanical systems and components.
- Demonstrate knowledge of procedures to remove mechanical systems and components.
- Demonstrate knowledge of procedures to install mechanical systems and components.

2019 Red Seal Occupational Standard Reference:

16.01 Removes mechanical components.

16.02 Installs mechanical components.

Suggested Hours:

33 Hours

Theoretical Objectives:

1. Define terminology associated with mechanical systems and components.
2. Identify hazards and describe safe work practices pertaining to mechanical systems and components.
3. Identify regulations and documentation relating to installing mechanical systems and components.
4. Identify types of specialized tools and equipment used and describe their applications and procedures for use.
5. Identify types of mechanical systems and describe their components and fluids.
 - i) powertrain
 - ii) HVAC
 - R134A
 - 1234YF
 - iii) cooling systems
 - iv) exhaust
 - v) fuel systems
6. Identify types of mechanical fasteners used with components and describe their applications.

7. Describe the procedures used to inspect mechanical systems and components for wear and collision-related damage.
8. Describe the procedures and considerations used when installing fasteners.
 - i) identifying one-time-use fasteners
 - ii) identifying the requirement for anti-seize and thread-locker materials
 - iii) torque specifications
9. Describe the procedures used to remove mechanical systems and components.
10. Describe the procedures used to install mechanical systems and components.
11. Describe the procedures used to perform operational check of mechanical systems and components.

Practical Objectives:

N/A

ABT-425 Electronic Components

Learning Outcomes:

- Demonstrate knowledge of procedures to service advanced electronic components.

2019 Red Seal Occupational Standard Reference:

17.04 Services advanced electronic components.

Suggested Hours:

15 Hours

Theoretical Objectives:

1. Define terminology associated with advanced electronic components.
2. Identify hazards and describe safe work practices pertaining to servicing electronic components.
3. Identify types of advanced electronic components and describe their applications and characteristics.
4. Identify types of tools used to check and protect electronic components and describe their applications and procedures for use.
 - i) diagnostic
 - ii) surge protector
5. Identify considerations when handling advanced electronic components.
6. Describe the procedures used to service advanced electronic components.
7. Describe the procedures used to check and protect electronic components during inspection, service and repair.
8. Describe the procedures used to diagnose advanced safety system and advanced driver-assistance system (ADAS) codes.

Practical Objectives:

N/A

ABT-430 Workplace Mentoring II

Learning Outcomes:

- Demonstrate knowledge of strategies for teaching workplace skills.

2019 Red Seal Occupational Standard reference:

5.02 Uses Mentoring Techniques.

Suggested Hours

6 Hours

Theoretical Objectives:

1. Describe the importance of individual experience.
2. Describe the shared responsibilities for workplace learning.
3. Determine one's own learning preferences and explain how these relate to learning new skills.
4. Describe the importance of different types of skills in the workplace.
5. Describe the importance of essential skills in the workplace.
 - i) reading
 - ii) writing
 - iii) document use
 - iv) oral communication
 - v) numeracy
 - vi) thinking
 - vii) working with others
 - viii) digital technology
 - ix) continuous learning
6. Identify different learning styles.
 - i) seeing it
 - ii) hearing it
 - iii) trying it
7. Identify different learning needs and strategies to meet learning needs.
 - i) learning disabilities

- ii) learning preferences
 - iii) language proficiency
8. Identify strategies to assist in learning a skill.
 - i) understanding the principles of instruction
 - ii) developing coaching skills
 - iii) being mature and patient
 - iv) providing feedback
 9. Identify different roles played by a workplace mentor.
 10. Describe teaching skills.
 11. Explain the importance of identifying the point of a lesson.
 12. Identify how to choose a good time to present a lesson.
 13. Explain the importance of linking the lessons.
 14. Identify the components of the skill (context).
 15. Describe considerations in setting up opportunities for skill practice.
 16. Explain the importance of providing feedback.
 17. Identify techniques for giving effective feedback.
 18. Describe a skills assessment.
 19. Identify methods of assessing progress.
 20. Explain how to adjust a lesson to different situations.

Practical Objectives:

N/A

ABT-435

Program Review

Learning Outcomes:

- Demonstrate knowledge of the Red Seal Occupational Standard (RSOS) and its relationship to the Interprovincial Examination.
- Demonstrate knowledge of overall comprehension of the trade in preparation for the Interprovincial Examination.

Entire Red Seal Occupational Standard (RSOS)

Suggested Hours:

30 Hours

Theoretical Objectives:

1. Define terminology associated with a Red Seal Occupational Standard (RSOS).
 - i) levels
 - ii) tasks
 - iii) sub-tasks
2. Explain how an RSOS is developed and the link it has with the Interprovincial Red Seal Examination.
 - i) development
 - ii) validation
 - iii) level and task weighting
 - iv) examination breakdown (pie-chart)
3. Identify Red Seal products and describe their use when preparing for the Interprovincial Red Seal Examination.
 - i) Red Seal website
 - ii) examination preparation guide
 - iii) sample questions
 - iv) examination counselling sheets
4. Explain the relationship between the RSOS and the Atlantic Apprenticeship Curriculum and Standards (AACS).
5. Review common occupational skills for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) safety-related functions
 - ii) tools and equipment

- iii) welding equipment
 - iv) work organization and document use
 - v) communication and mentoring
 - vi) trim and hardware removal and installation
 - vii) final inspections
 - viii) corrosion protection and sound deadening material
6. Review process to repair frame and structural components for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) prepare for repair and replacement of structural components
 - ii) repair, remove and install structural components
 - iii) remove, install and repair structural and laminated glass
 7. Review process to repair non-structural outer body panels and related components for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) remove, repair and install metal panels and components
 - ii) remove, repair and install plastic and composite panels and components
 - iii) remove and install non-structural glass
 8. Review process to repair mechanical, electrical and alternate fuel system components for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) deactivate and reactivate alternative fuel systems
 - ii) remove and install mechanical components
 - iii) remove, repair and install electrical and electronic components
 9. Review process to repair interior components and service restraint systems for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) repair and replace interior components
 - ii) service supplemental restraint systems
 10. Review process to perform refinishing procedures for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) prepare surfaces
 - ii) use repair materials
 - iii) prepare refinishing equipment
 - iv) prepare refinishing materials
 - v) apply refinishing materials
 - vi) perform post-refinishing functions
 11. Review process to perform detailing and cleaning for the Auto Body and Collision Technician trade as identified in the RSOS.
 - i) detail exterior
 - ii) clean vehicle

Practical Objectives:

N/A

Feedback and Revisions

This AACCS will be amended periodically; comments or suggestions for improvements should be directed to:

New Brunswick:

Apprenticeship and Occupational
Certification
Post-Secondary Education, Training and
Labour
470 York St., Rm. 110, PO Box 6000
Fredericton, NB E3B 5H1
Tel: 506-453-2260
Toll Free in NB: 1-855-453-2260
www.gnb.ca

Prince Edward Island:

Apprenticeship, Training and Certification
Atlantic Technology Centre
212-176 Great George St., PO Box 2000
Charlottetown, PE C1A 7N8
Tel: 902-368-4460
www.apprenticeship.pe.ca

Newfoundland and Labrador:

Apprenticeship and Trades Certification
Immigration, Population Growth and Skills
Confederation Bldg., West Block
Prince Philip Dr., PO Box 8700
St. John's, NL A1B 4J6
Toll Free: 1-877-771-3737
www.gov.nl.ca/atcd

Nova Scotia:

Nova Scotia Apprenticeship Agency
1256 Barrington St.
Halifax, NS B3J 1Y6
Tel: 902-424-5651
Toll Free in NS: 1-800-494-5651
www.nsapprenticeship.ca

Any comments or suggestions received will be reviewed and considered to determine the course of action required. If the changes are deemed to be minor, they will be held for implementation during the next review cycle. If immediate change is deemed appropriate and approved by the Atlantic Trade Advisory Committee, it will result in a revision to this version of the AACCS and will be detailed in the following section.

Version Changes

Revision Date	Section	Description of Change