

# Motor Vehicle Body Repairer (Metal and Paint) Level 1

## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** A1 Orientation I: The Structure & Scope of Trade Learning

**Level:** One

**Duration:** 7 hours

Theory: 7 hours

Practical: 0 hours

### Overview:

Jobsite learning and teaching have long been fundamental to trade-practice, including its safety, health, and environmental implications. The chance to gain maximum benefit from workplace trade learning can be shaped by such complex factors as production schedules and jobsite politics. As adult trade-learners, apprentices at all levels of skill-development are encouraged to use their eyes, ears, prior knowledge, and interpersonal skills to encourage journeypersons to teach as well as to supervise them. This requires understanding the trade's dynamics, including the roles and responsibilities that order jobsite activity. Unit content outlines the trade's skill-requirements and long-term career possibilities. It includes suggestions about trade-related learning styles/strategies. It also introduces the concept of skills stewardship, stressing the obligations that apprentices incur in learning from journeypersons to 'pay it forward' by assisting other newcomers who will follow them into the trade. The unit's purpose is to provide this essential information about learning to learn as a Manitoba apprentice. Elsewhere in Technical Training, senior apprentices explore the importance of learning to teach in trade workplaces – a central function of journeywork.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe the structure and scope of the trade.</b>	<b>20%</b>
a. Historical background, including apprentice experiences	
b. Structure/scope of the trade	
• International and national characteristics	
• Important features of practicing the trade in Manitoba	
• Trade and construction industry organizations	
• Generalists and specialists	
• Lead hands and other immediate supervisors	
• Geographic mobility	
• Job hierarchies and innovations	
<b>2. Describe the Manitoba Apprenticeship Program.</b>	<b>40%</b>
a. Concept and significance of skills stewardship	
• To the trade	
• To apprentices	
• To journeypersons	
• To employers	
b. Practical Training: on-site component of program	
• Roles/responsibilities of employer and journeyperson(s)	
• Roles/responsibilities of Training Coordinator	

- Roles/responsibilities of apprentice, including record-keeping re: job experience
- c. Technical Training: off-site component of program
  - Roles/responsibilities of instructors (including Related'-area faculty)
  - Roles/responsibilities of apprentices
- d. Attendance requirements
- e. Progression requirements
- f. Reporting of grades
- g. Other (as may be specified by instructor)

**3. Describe special opportunities and challenges re: training.**

**40%**

- a. Adapting personal learning goals to program contexts
  - Principles of adult learning (including importance of self-direction)
  - Description/recognition of learning and teaching styles
  - Significance of work culture and interpersonal skills re: trade-learning
  - Integrating Technical Training and Practical Training content
  - Possibilities and perils of peer learning
  - Budgeting and other necessary personal arrangements
  - Identifying sources of support (e.g. upgrading trade-related math skills)
- b. On-site learning challenges and opportunities
  - Significance of jobsite supervision roles and teaching styles (e.g. journey-level skills-coach vs. mentor)
  - Communication with journeypersons and employers
  - Coverage of prescribed tasks/subtasks that define the scope of trade, and the content of the certification exam administered to apprentices who are completing their program
  - Getting help and fixing mistakes
  - Maintaining personal record of trade-learning challenges/achievements (e.g. a learning journal, and/or a personal training plan, if possible, discussed with employers and others supporting the apprenticeship journey to certification)
- c. In-school opportunities/challenges
  - Personal arrangements that support progress in Technical Training
  - "Baggage-handling" – self-assessing potential impacts of previous experiences (favourable/unfavourable) on current learning; availability of supports
  - Techniques for note-taking, record-keeping, and review
  - Relations with instructors (including 'Related'-area faculty)
  - College resources (library, support services, etc.)

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** A2 Trade Safety Awareness

**Level:** One

**Duration:** 7 hours

Theory: 6 hours

Practical: 1 hour

### Overview:

Safe working procedures and conditions, injury prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers, and employees. It is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to incidents or injury. It is generally recognized that safety-conscious attitudes and work practices contribute to a healthy, safe, and accident-free working environment. It is imperative to apply and be familiar with the Workplace Safety and Health Act and Regulations. As well, it's essential to determine workplace hazards and take measures to protect oneself, co-workers, the public, and the environment. Safety education is an integral part of trade apprenticeship training both in school and on-the-job. Unit content is supplemented throughout Technical Training by trade-specific information about trade safety hazards and precautions presented in the appropriate contexts of discussion and study. **Note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a 'Pass/Fail' grade will be recorded for the unit in its entirety.**

### Objectives and Content:

**Percent of  
Unit Mark (%)**

**1. Identify safety and health requirements.**

n/a

- a. Overview of The Workplace Safety and Health Act ("the Act")
  - Rights and responsibilities of employees under the Act
  - Rights and responsibilities of employers under the Act
  - Rights and responsibilities of supervisors under the Act
- b. Fourteen (14) regulations
- c. Codes of practice
- d. Guidelines
- e. Right to refuse
  - Explanation of right to refuse process
  - Rights and responsibilities of employees
  - Rights and responsibilities of employers
  - Rights and responsibilities of supervisors under the Act

**2. Identify personal protective equipment (PPE) and procedures.**

n/a

- a. Employer and employee responsibilities as related to personal protective equipment.
- b. Standards: Canadian Standards Association (CSA), American National Standards Institute (ANSI) and guidelines
- c. Work protective clothing and danger if it fits poorly.

- d. Gloves – Importance of proper glove selection (when handling chemicals, cold items, slivers, etc.)
  - e. Headwear – appropriate protective headwear when required and the approved type of headwear.
  - f. Eye protection – comparison and distinction of everyday eyeglasses, industrial safety glasses and safety goggles
  - g. Foot protection – when required according to safety standards
  - h. Hearing protection
    - Hazards of various noise levels (hearing protection must be worn)
    - Laws
    - Types of hearing protection
  - i. Respiratory protection – types, overview of proper selection
  - j. Fall protection – Manitoba requirements standards guidelines
    - ANSI (U.S.A. standards), etc.
  - k. Ladders and scaffolding
  - l. Safety principles for working with or around industrial trucks site-specific (forklifts, pallet trucks, etc.)
- 3. Identify electrical safety. n/a**
- a. Effects of electric current on the human body
  - b. Three factors that affect the severity of an electric shock
  - c. The effects of arc and blast on the human body and equipment
  - d. Work with energized equipment
- 4. Identify fire safety. n/a**
- a. Types of fires
  - b. Types of fire fighting equipment
  - c. Classifications of fire extinguishers (A, B and C)
  - d. Location of fire extinguishers and fire exits
  - e. Fire alarms and drills
- 5. Identify ergonomics. n/a**
- a. Definition of ergonomics and conditions that may affect the body
    - Working postures
    - Repetition
    - Force
    - Lifting (simple safety procedures and precautions related to material handling procedures on how to lift carry and put down a load)
    - Tools
    - Identify tool and safety equipment
    - Causes of hand tool accidents
    - Equipment
- 6. Hazard recognition and control. n/a**
- a. Safe work practices
  - b. Basic risk assessment
  - c. Injury prevention and control measures
  - d. Identification of hazards involved in pneumatic tool use and explanation of how to guard against them
- 7. Hazard of confined space entry: n/a**
- a. Identification of a confined space
  - b. Hazards of a confined space

- Physical
- Biological
- c. Working in a confined space
- d. Emergency response plan
- e. Self contained breathing apparatus (SCBA)

**8. Identify First Aid/CPR: n/a**

- a. Overview of First Aid Regulation
- b. Obligations of employers regarding First Aid
  - Who is certified to provide First Aid?
  - What to do while waiting for help?
  - Where is First Aid kit?
- c. Describe basic First Aid requirements and techniques
  - Scope and limits of First Aid intervention
  - Specific interventions (cuts, burns, abrasions, fractures, suffocation, shock, electrical shock, etc.)
  - What is it?
  - Interface with other services and agencies (eg. Workers Compensation claims)
- d. Describe basic Cardiopulmonary Resuscitation (CPR) requirements and techniques
  - How do you get certified?
  - Scope and limits of CPR intervention (include varieties of CPR certification)

**9. Identify the safety requirements as they apply to WHMIS with emphasis on: n/a**

- a. WHMIS is a system
- b. Provincial Regulation under The Workplace Safety and Health Act
  - Each province has a WHMIS regulation
- c. Federal Hazardous Products Act
- d. WHMIS generic training:
  - WHMIS defined and the format used to convey information about hazardous materials in the workplace
  - Information found on supplier and workplace labeling using WHMIS
  - Hazardous materials in accordance with WHMIS
  - Compliance with government safety standards and regulations
- e. Description of WHMIS (include varieties of WHMIS Certification)
  - Typology of WHMIS labels, symbols, and classifications
  - Scope and use of Materials Safety Data Sheets (MSDS)

**10. Identifying and controlling hazards: n/a**

- a. Basic control measures (injury prevention)
- b. Safe work procedures
- c. Explanation on the importance of industrial housekeeping
- d. Employer responsibilities
- e. How and where to store materials
- f. Safety measures related to walkways, stairs and floor openings
- g. Explanation of how to protect the worker and others when working in traffic paths

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** A3 Communication

**Level:** One

**Duration:** 7 hours

Theory: 6 hours

Practical: 1 hour

### Overview:

This unit is designed to provide the trade apprentice with the knowledge about the communication skills required when working in the industry. Beginning with communication practices, the unit also covers aspects of customer relations and resume writing.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe importance of effective communication practices.</b> a. Customers b. Co-workers c. Appraisers d. Suppliers	<b>49%</b>
<b>2. Identify the types of communication equipment and describe their operating procedures.</b>	<b>21%</b>
<b>3. Role-play how to deal with challenging situations. Practice empathetic listening and response.</b>	<b>6%</b>
<b>4. Practice listening skills with customers.</b>	<b>9%</b>
<b>5. Perform resume writing, practice selling yourself.</b>	<b>15%</b>

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** A4 Tools and Equipment

**Level:** One

**Duration:** 6 hours

Theory: 3 hours

Practical: 3 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for using and maintaining tools. Topics will include: safely using and maintaining hand tools, measuring equipment, and specialized measuring equipment, testing equipment, using power tools, shop equipment, electric welding and gas cutting equipment, straightening equipment, and refinishing and detailing tools.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. <b>Identify types of hand tools and describe their applications and procedures for use.</b>	<b>16%</b>
a. Basic	
b. Trade specific	
2. <b>Identify types of basic measuring equipment and describe their applications and procedures for use.</b>	<b>4%</b>
3. <b>Identify types of specialized measuring equipment and describe their applications.</b>	<b>4%</b>
4. <b>Identify types of testing/diagnostic equipment and describe their applications.</b>	<b>4%</b>
5. <b>Identify types of power tools and describe their applications and procedures for use.</b>	<b>16%</b>
a. Electric	
b. Pneumatic	
c. Hydraulic	
6. <b>Identify types of shop equipment and describe their applications.</b>	<b>7%</b>
a. Cleaning	
b. Lifting	
7. <b>Identify types of electric welding and gas cutting equipment and describe their applications.</b>	<b>7%</b>
8. <b>Identify types of straightening equipment and describe their applications.</b>	<b>4%</b>
9. <b>Identify types of refinishing and detailing tools and equipment and describe their applications.</b>	<b>4%</b>



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|---|-----------|
| <b>10. Identify and describe care and maintenance procedures relating to tools and equipment.</b> | <b>4%</b> |
| <b>11. Demonstrate the use of various hand tools.</b>   | <b>7%</b> |
| <b>12. Demonstrate the use of various measuring equipment.</b>                                    | <b>2%</b> |
| <b>13. Demonstrate the use of various testing/diagnostic equipment.</b>                           | <b>2%</b> |
| <b>14. Demonstrate the use of various power tools their applications and procedures for use:</b>  | <b>7%</b> |
| a. Electric   |           |
| b. Pneumatic  |           |
| c. Hydraulic  |           |
| <b>15. Demonstrate the use of shop equipment.</b>   | <b>6%</b> |
| <b>16. Demonstrate the use of straightening equipment.</b>  | <b>2%</b> |
| <b>17. Demonstrate care and maintenance of tools and equipment.</b>                               | <b>4%</b> |

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** A5 Trade Related Documents

**Level:** One

**Duration:** 4 hours

Theory: 2 hours

Practical: 2 hours

### Overview:

This unit is designed to provide the motor vehicle body repair apprentice with an overview of trade related documents required in the trade and practice, presenting information in written form. Topics will include: interpreting information found on vehicles, preparing documentation, ordering, organizing, and storing parts and materials.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Identify sources of related information.</b>	<b>17%</b>
<b>2. Identify and interpret information found on the vehicle.</b>	<b>17%</b>
a. Vehicle Identification Number (VIN)	
b. Paint code	
c. Production date	
<b>3. Identify types of documents and describe the procedures used to interpret them.</b>	<b>14%</b>
a. Manuals and bulletins	
b. Work orders	
c. Estimates	
<b>4. Describe the procedures used to prepare documentation.</b>	<b>7%</b>
<b>5. Describe procedures for ordering parts and materials.</b>	<b>10%</b>
<b>6. Describe procedures for organizing/storing parts and materials.</b>	<b>5%</b>
<b>7. Retrieve vehicle identification number and all other necessary information as specified by the instructor for a specific job.</b>	<b>15%</b>
<b>8. Retrieve trade related documents from the computer.</b>	<b>15%</b>

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** B1 Trade Formulations I & Trade Related Science

**Level:** One

**Duration:** 12 hours

Theory: 10 hours

Practical: 2 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for performing trade math and science. Topics will include: metal properties, heat and its effects on metals, application of high strength steel (HSS), simple machines and pulleys and hydraulic concepts.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<b>1. Describe metal properties.</b>	<b>26%</b>
a. Metal properties	
• Tensile strength	
• Hardness	
• Ductility	
• Elasticity	
b. Steel alloy numbering system	
c. Testing metals	
<b>2. Describe heat and its effect on metals.</b>	<b>17%</b>
a. Heat laws and formulae	
b. Celsius to Fahrenheit conversions ( & vice versa)	
c. Expansion (linear, thermal, area)	
d. Effects of heat on metals	
<b>3. Describe high strength steel (HSS) and its applications.</b>	<b>17%</b>
a. HSS metallurgy	
• Properties	
• Welding capabilities	
• Terminology	
• Elements	
• Heat treatment	
• Grain size	
b. HSS types	
• Classification	
• Numbering	
• Production method	

- c. Welding of HSS
    - Metal Inert Gas (MIG) welding
    - Shielding gases
    - Filler wire/electrodes
    - Start-up procedure
- 4. Describe simple machines and pulleys. 4%**
- a. Levers
    - Type
    - Mechanical advantage, inclined plane
    - Lever problems
  - b. Simple machines
    - Mechanical advantage
    - Simple machines
    - Pulleys
    - Principles as applied to shop equipment
- 5. Describe hydraulic concepts. 4%**
- a. Force and pressure
  - b. Pascal's principle
  - c. Calculations
    - Forces
    - Pressure
    - Piston movement
  - d. Hydraulic and brake fluid properties
- 6. Perform basic arithmetic. 20%**
- a. Whole numbers
    - Operations and sequence
    - Addition
    - Subtraction
    - Division
  - b. Rules of brackets
  - c. Dimensioning and shop related applications
  - d. Fractions and decimals
    - Types of fractions
    - Terminology
      - Numerator/denominator
      - Lowest common denominator
      - Least common multiple
      - Reciprocal fractions
    - Decimals
      - Decimal fractions; mixed decimals
    - Manipulation of common and decimal fractions
    - Fraction to decimal and decimal to fraction conversions
    - Dimensioning and shop related applications
  - e. Metric measurement
    - Units of metric measure
    - Shop related practical applications
  - f. Imperial measurement
    - Units of Imperial measure
    - Imperial and metric conversions

- Shop-related practical applications: calculating and mixing by percentage and parts/volume
- g. Percent: practical applications
  - Payroll calculations
  - Purchasing parts & paints
- h. Ratio
  - Writing comparisons as ratios
  - Stating and interpreting ratios
  - Equality within ratios
- i. Proportion
  - Direct proportions: gear ratios, tapers
  - Inverse proportions: gear and pulley systems
  - Solving trade-related proportion problems
- j. Geometry concept applications: shapes and measurement
  - Perimeter, area, volume

**7. Perform basic algebra.**

**12%**

- a. Signed numbers: comparison of signed numbers
- b. Basic equations
  - Algebraic operations: addition, subtraction, multiplication, division, powers, roots
  - Solving equations using principles of equality and transportation
  - Solving equations using combined operations
  - Shop related applications
- c. Formulas
  - Formula manipulation
  - Solve cutting speed, revolutions per minute (rpm) and cutting time formulas
  - Solve production time problems

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** B2 Metallurgy/Batteries

**Level:** One

**Duration:** 12 hours

Theory: 10 hours

Practical: 2 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for metallurgy and the use of batteries. Topics will include: metallurgy terminology, types and properties of metals, the properties of metals, working with metals, the effects of metal working on metallurgic properties, preventing and correcting problems in metal working, types, purpose, location, construction, operation and ratings of batteries, safety precautions, testing, charging, removing, and replacing batteries.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. Define and explain terms associated with metallurgy.	10%
2. Identify types of metals used in vehicle construction	12%
3. Describe the properties of metals.	12%
4. Demonstrate trade-related calculations as specified by instructor.	4%
a. Forming	
b. Shearing	
c. Punching	
d. Drilling	
e. Cutting	
f. Welding	
g. Heating	
5. Describe the effects metal working has on metallurgic properties.	4%
a. Stress	
b. Contraction	
c. Expansion	
d. Distortion	
e. Work hardening	
6. Describe the procedures to prevent or correct problems that occur when working metals.	4%

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| <b>7. Identify types of batteries and describe their purpose, location, construction, operation and ratings.</b> | <b>10%</b> |
| a. Lead acid   |            |
| b. Hybrid  |            |
| <b>8. Identify safety precautions relating to batteries.</b>   | <b>4%</b>  |
| a. Handling  |            |
| b. Storage   |            |
| c. Disposal and recycling  |            |
| <b>9. Describe the procedures used to test batteries.</b>  | <b>4%</b>  |
| <b>10. Describe the procedures used to charge batteries.</b>   | <b>3%</b>  |
| <b>11. Describe the procedures used to remove and replace batteries.</b>   | <b>3%</b>  |
| <b>12. Remove and re-install batteries while maintaining memory.</b>   | <b>6%</b>  |
| <b>13. Load test an automotive battery.</b>  | <b>6%</b>  |
| <b>14. Charge an automotive battery.</b>   | <b>6%</b>  |
| a. Slow charge   |            |
| b. Fast charge   |            |
| <b>15. Disconnect and connect batteries.</b>   | <b>6%</b>  |
| <b>16. Demonstrate boosting requirements.</b>  | <b>6%</b>  |

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** C1 Cutting and Heating

**Level:** One

**Duration:** 7 hours

Theory: 2 hours

Practical: 5 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for the application, maintenance and procedures for cutting and heating equipment. Topics will include: safety precautions, cutting and heating processes and application, cutting and heating equipment, components and accessories, the set up, maintenance, shut down, and cutting procedures of oxy-acetylene and plasma arc equipment, cutting with oxy-acetylene and plasma arc equipment and heating with oxy-acetylene equipment.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. <b>Describe safety considerations when using cutting and heating equipment.</b> a. Personal and others b. Shop/facility c. Equipment d. Vehicle	7%
2. <b>Identify cutting and heating processes and describe their application.</b>	7%
3. <b>Identify and describe equipment, components and accessories used in cutting and heating processes.</b> a. Oxy-acetylene b. Plasma arc c. Induction heaters	14%
4. <b>Describe the procedures to set-up, maintain, and shut-down oxy-acetylene equipment.</b>	17%
5. <b>Describe the procedures to set-up, maintain, and shut-down plasma arc cutting equipment.</b>	7%
6. <b>Describe the procedures used to cut with oxy-acetylene equipment.</b>	7%
7. <b>Describe the procedures used to cut with plasma arc cutting equipment.</b>	4%
8. <b>Describe the procedures used to heat with oxy-acetylene equipment.</b>	7%
9. <b>Set-up and shut down oxy-acetylene equipment.</b>	15%



**10. Perform heating and cutting procedures with plasma arc equipment.**

**15%**

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** C2 Gas Metal Arc Welding (GMAW [MIG])

**Level:** One

**Duration:** 40 hours

Theory: 11 hours

Practical: 29 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for gas metal arc welding. Topics include: GMAW terminology and applications, safety precautions, and related GMAW equipment and accessories. The unit focuses on techniques and procedures from set-up, operation and shut-down to various types of welds and joint assembly.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. Define and describe GMAW welding, terminology and its applications.	6%
2. Identify safety precautions relating to gas metal arc welding.	4%
a. Personal	
b. Equipment	
c. Vehicle	
3. Identify and describe gas metal arc welding equipment and accessories.	4%
4. Identify the types of welds performed using gas metal arc welding equipment.	14%
a. Plug	
b. Fillet (continuous)	
c. Stitch	
d. Tack	
5. Describe the procedures used to GMAW weld various substrates.	7%
a. Steel	
b. Aluminum	
6. Identify weld defects, their causes and the procedures to prevent and correct them.	7%
7. Operate, troubleshoot and maintain GMAW welding equipment.	30%
8. Describe and perform various types of welds, lap, butt, flat, plug, recessed, tack, stitch, and continuous in various positions overhead, horizontal, and vertical.	28%

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** D1 Vehicle Construction

**Level:** One

**Duration:** 7 hours

Theory: 3 hours

Practical: 4 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for vehicle construction. Topics will include: types of vehicle construction, body sections, structural and non-structural components and the types of materials used in vehicle construction.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. <b>Identify types of vehicle construction and describe their characteristics.</b> a. Conventional frames b. Unitized bodies c. Space frames	17%
2. <b>Identify body sections and describe their components.</b>	18%
3. <b>Identify and describe structural and non-structural components.</b>	17%
4. <b>Identify and describe the types of materials used in vehicle construction.</b>	18%
5. <b>Demonstrate sheet metal panel adjustments.</b>	30%

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** D2 Fasteners and Adhesives

**Level:** One

**Duration:** 2 hours

Theory: 1 hour

Practical: 1 hour

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills of using fasteners and adhesives. Topics will include: applications of fasteners and adhesives and removing and installing fasteners and adhesives.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. <b>Identify and describe safety considerations and procedures relating to fasteners and adhesives.</b> a. Personal b. Vehicle	14%
2. <b>Identify types of fasteners and describe their applications.</b>	14%
3. <b>Describe the procedures to remove and install fasteners.</b>	14%
4. <b>Identify types of adhesives and describe their applications.</b>	14%
5. <b>Identify the considerations when applying and removing adhesives.</b>	14%
6. <b>Demonstrate removal of mechanical fasteners and adhesives.</b>	30%

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** F1 Metal Working I (Sheet Metal)

**Level:** One

**Duration:** 49 hours

Theory: 11 hours

Practical: 38 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for metal working 1 (sheet metal). Topics will include: describing types of sheet metal and types of damage, performing metal work on sheet metal, panels and repair procedures, paintless dent repair, detecting surface irregularities, rough out and alignment of damaged mild sheet metal, preparing sheet metal for application of fillers and correcting rust perforation.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. Identify the types of automotive sheet metal.	4%
2. Identify and describe types of damage to sheet metal.	7%
a. Direct	
b. Indirect	
3. Identify considerations when performing metal work on sheet metal.	10%
a. Tool selection	
b. Repair sequence	
c. Protection of adjacent panels	
d. Panel preparation	
e. Corrosion protection	
4. Identify the types of panels and their associated repair procedures.	7%
a. Accessibility	
• Hammer and dolly	
• Shrinking (hot or cold)	
b. Limited accessibility	
• Prybar	
• Pick	
• Dent puller	
• Uni-spotter	
5. Describe the repair procedures associated with paintless dent repair.	4%
6. Describe the methods used to detect surface irregularities.	7%

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|---|------------|
| <b>7. Describe the procedures used to rough out and align damaged sheet metal.</b>                  | <b>14%</b> |
| <b>8. Describe the procedures used to prepare sheet metal for application of fillers.</b>           | <b>7%</b>  |
| <b>9. Describe the procedure for correcting rust perforation.</b>                                   | <b>10%</b> |
| <b>10. Demonstrate unlocking and reshaping metal, dent removal, shrinking and stress relieving.</b> | <b>12%</b> |
| <b>11. Determine primary and secondary damage.</b>  | <b>6%</b>  |
| <b>12. Perform fabrication for rust repair patches.</b>   | <b>12%</b> |

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit: F2 Body Fillers and Abrasives**

**Level:** One

**Duration:** 6 hours

Theory: 2 hours

Practical: 4 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for using body fillers and abrasives. Topics will include: describing characteristics and applications of abrasives, techniques for using abrasives, types of abrasives and body fillers, safety considerations, applying body fillers and shaping and finishing body fillers.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. Identify the types of abrasives and describe their characteristics and applications.	7%
2. Describe the procedures and techniques for using abrasives.	14%
3. Identify the types of body fillers and describe their characteristics and applications.	10%
4. Identify safety considerations when working with body fillers and abrasives.	4%
5. Describe the techniques and procedures used to apply body fillers.	14%
a. Tools	
b. Surface preparation	
c. Mixing	
d. Application techniques	
6. Describe the procedures and techniques for shaping and finishing body fillers.	21%
a. Grit selection	
b. Tool selection	
c. Sanding techniques	
d. Detect surface irregularities	
e. Visual	
f. Guide coat	
g. Tactile (touch)	
7. Demonstrate proper surface preparations for application of body fillers.	6%
8. Demonstrate mixing and applying fillers.	6%

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|---|------------|
| <b>9. Demonstrate procedures and methods for detecting high and low spots.</b>          | <b>3%</b>  |
| <b>10. Demonstrate the procedures and techniques for shaping and finishing fillers.</b> | <b>10%</b> |
| <b>11. Perform procedures used to detect surface irregularities.</b>                    | <b>5%</b>  |

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** H1 Surface Preparation and Application of Undercoats and Topcoats

**Level:** One

**Duration:** 44 hours

Theory: 14 hours

Practical: 30 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for surface preparation and application of undercoats and topcoats (cleaning, stripping and masking). Topics will include: describing working conditions for surface preparation, products, application and procedures for cleaning surfaces, evaluating types of substrate, evaluating and stripping topcoats and undercoats, stripping paint, using abrasives to prepare surfaces, and techniques for masking and removing masking.

<b>Objectives and Content:</b>	<b>Percent of Unit Mark (%)</b>
<p><b>1. Describe ideal working conditions for surface preparation.</b></p> <ul style="list-style-type: none"> <li>a. Personal</li> <li>b. Shop/facility</li> <li>c. Equipment</li> <li>d. Environmental</li> </ul>	<b>4%</b>
<p><b>2. Identify products used to clean surfaces, their applications and procedures for use.</b></p> <ul style="list-style-type: none"> <li>a. Remove grease and dirt from surfaces to be painted.</li> </ul>	<b>7%</b>
<p><b>3. Identify substrate types and describe the procedures and considerations for evaluating their condition.</b></p>	<b>7%</b>
<p><b>4. Identify topcoats and undercoats and describe the procedures and considerations for evaluating their condition.</b></p>	<b>7%</b>
<p><b>5. Identify and describe the methods involved in stripping topcoats, undercoats and paint.</b></p> <ul style="list-style-type: none"> <li>a. Safety considerations</li> <li>b. Environmental considerations</li> <li>c. Applications</li> <li>d. Chemical strippers</li> <li>e. Media blasting</li> <li>f. Mechanical</li> </ul>	<b>9%</b>

- 6. Describe and demonstrate surface preparation of substrates. 25%**
  - a. Feather edging
  - b. Back sanding
  - c. Final sanding
  - d. Prepping for blend areas
  
- 7. Describe and demonstrate masking and unmasking techniques. 10%**
  
- 8. Demonstrate ability to apply primers. 11%**
  - a. Duplicate corrosion factory protection
  - b. Corrosion protection (epoxy, self-etching primer, direct-to-metal, metal conditioning)
  - c. Apply primer surfacers and guidecoat
  - d. Artificially dry or bake products.
  
- 9. Demonstrate ability to use proper spray gun technique and equipment maintenance. 20%**
  - a. Prepare paint booth (clean & drain air line system)

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** H2 Cleaning and Detailing

**Level:** One

**Duration:** 8 hours

Theory: 4 hours

Practical: 4 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for cleaning and detailing equipment and products. Topics will include: equipment for detailing vehicle interiors and exteriors, products used in detailing and safety precautions, correcting topcoat defects cleaning, removing overspray washing, polishing and washing vehicle exteriors and cleaning vehicle interiors.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. Identify equipment used in detailing vehicle exterior.	7%
2. Identify equipment used in detailing vehicle interior.	7%
3. Identify products used in vehicle detailing and describe their related safety considerations.	7%
4. Describe techniques for correcting topcoat defects.	21%
5. Describe the procedures used to remove overspray.	7%
6. Describe the procedures used to polish vehicle exterior.	7%
7. Describe the procedures used to clean vehicle interior.	7%
8. Describe the procedures used to wash vehicle exterior.	7%
9. Perform final clean-up for customer delivery:	21%
a. Remove overspray	
b. Wash & polish vehicle exterior	
c. Clean vehicle interior	
d. Demonstrate ability to remove imperfections	
10. Demonstrate ability to apply decals and pin stripping.	9%

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** H3 Upholstery, Trim and Hardware

**Level:** One

**Duration:** 5 hours

Theory: 2 hours

Practical: 3 hours

### Overview:

This unit is designed to provide the apprentice with the knowledge and skills for repairing and replacing upholstery, trim and hardware. Topics will include: describing exterior and interior trim and hardware, the use of fasteners and adhesives in the installation of upholstery, repairing or replacing interior and exterior trim, removing and installing pin stripes and decals, inspecting upholstery, trim, and hardware for collision damage and detecting and repairing leaks and noises for trim and hardware.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
1. Identify and describe exterior trim and hardware.	7%
2. Identify and describe interior upholstery, trim and hardware.	7%
3. Describe fasteners and adhesives used in the installation of upholstery, trim and hardware.	7%
4. Describe the procedures used to repair or replace exterior trim.	7%
5. Describe the procedures used to remove and install pin stripes and decals.	7%
6. Describe the procedures used to inspect interior upholstery, trim and hardware for collision related damage.	7%
7. Describe the procedures used to repair or replace interior trim.	7%
a. Considerations	
b. Component availability	
8. Describe the procedure used to repair or replace upholstery.	7%
a. Considerations	
b. Component availability	
9. Describe the procedures used to locate/detect and repair leaks and noises related to trim and hardware.	14%
10. Repair and replace exterior trim.	6%

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|---|-----------|
| <b>11. Remove and install pin stripes and decals.</b>                           | <b>5%</b> |
| <b>12. Inspect interior upholstery, trim and hardware for collision damage.</b> | <b>3%</b> |
| <b>13. Repair and replace interior trim.</b>                                    | <b>5%</b> |
| <b>14. Repair and replace upholstery.</b>                                       | <b>3%</b> |
| <b>15. Repair leaks related to interior and exterior trim and hardware.</b>     | <b>4%</b> |
| <b>16. Repair noises related to interior and exterior trim and hardware.</b>    | <b>4%</b> |

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## Motor Vehicle Body Repairer (Metal and Paint)

**Unit:** H4 Refinishing I

**Level:** One

**Duration:** 22 hours

Theory: 7 hours

Practical: 15 hours

### Overview:

This unit is designed to introduce the apprentice to refinishing techniques and procedures for waterborne refinishing material, and its characteristics and applications for use. The unit places particular emphasis on topcoats and types of basecoats/clearcoats.

<b>Objectives and Content:</b>	<b><u>Percent of Unit Mark (%)</u></b>
<p><b>1. Define and describe waterborne refinish material, including its technical characteristics and applications for use.</b></p> <ul style="list-style-type: none"> <li>a. Difference compared to solvent-borne refinish material</li> <li>b. Clearcoat recommendations</li> <li>c. Storage temperatures and conditions</li> </ul>	<b>10%</b>
<p><b>2. Identify and demonstrate surface preparation and related techniques when working with waterborne refinish materials.</b></p> <ul style="list-style-type: none"> <li>a. Consumable products</li> <li>b. Temperature and humidity effects</li> <li>c. Spray gun requirements</li> <li>d. Proper mixing and application techniques</li> <li>e. Air movement equipment</li> </ul>	<b>5%</b>
<p><b>3. Describe and demonstrate types of topcoat.</b></p> <ul style="list-style-type: none"> <li>a. Sealer</li> <li>b. Basecoat</li> <li>c. Direct glass</li> <li>d. Clearcoat</li> </ul>	<b>50%</b>
<p><b>4. Identify and describe procedures used to set-up, operate, adjust, care for and maintain refinishing equipment.</b></p>	<b>5%</b>
<p><b>5. Describe and demonstrate types of basecoat/clearcoat finishes.</b></p>	<b>25%</b>
<p><b>6. Describe and demonstrate single-stage finishes.</b></p>	<b>5%</b>