



9035

SURFACE PREPARATION AND
REFINISHING (12C)

40S/40E/40M

A Collision Repair and Refinishing Technology Course

9035: SURFACE PREPARATION AND REFINISHING (12C) 40S/40E/40M

Course Description

In this course, students will learn to prepare vehicles for spot repairs, panel repairs, blending, and complete refinishing. Students will mix and prepare paints for spraying. They will refinish, reassemble, and clean vehicles for delivery, and follow paint shop health and safety practices.

Goal 1: Describe and apply appropriate **health and safety** practices.

GLO 1.1: Describe and apply appropriate **health and safety** practices.

- SLO 12C.1.1.1: Identify safety and health requirements. (A2.1)
- SLO 12C.1.1.2: Describe the importance of using personal protective equipment (PPE), and identify PPE and procedures. (A2.2) (TSA 16)
- SLO 12C.1.1.3: Identify electrical safety, and outline the safety principles for working on and around electrical equipment. (A2.3) (TSA 18)
- SLO 12C.1.1.4: Identify fire safety, and outline workplace fire safety principles. (A2.4) (TSA 19)
- SLO 12C.1.1.5: Recognize and control hazards. (A2.6)
- SLO 12C.1.1.6: Demonstrate awareness of the hazards of confined space entry, and identify the hazards in confined spaces and the preparation needed to work in a confined space. (A2.7) (TSA 20)
- SLO 12C.1.1.7: Describe basic first aid and cardiopulmonary resuscitation (CPR) requirements and techniques. (A2.8)
- SLO 12C.1.1.8: Explain the Workplace Hazardous Material Information System (WHMIS), and identify the WHMIS safety requirements. (A2.9) (TSA 13)
- SLO 12C.1.1.9: Identify and control hazards. (A2.10)
- SLO 12C.1.1.10: Identify safety precautions related to gas metal arc welding. (C2.2)
- SLO 12C.1.1.11: Identify and describe safety considerations and procedures related to fasteners and adhesives. (D2.1)
- SLO 12C.1.1.12: Practise safety precautions related to batteries. (B2.8)

- SLO 12C.1.1.13: Identify safety considerations when working with body fillers and abrasives. (F2.4)
 - SLO 12C.1.1.14: Create and maintain a safe and organized working environment.
 - SLO 12C.1.1.15: Follow guidelines listed in the Safe Work Procedure for specific tasks.
 - SLO 12C.1.1.16: Describe the safety considerations of products used in vehicle detailing. (H2.3)
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GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

- SLO 12C.1.2.1: Explain the importance of trade safety and health in reducing injuries and fatalities to young employees in Manitoba. (TSA 1)
- SLO 12C.1.2.2: Describe the rights and responsibilities of employees, employers, and supervisors under *The Workplace Safety and Health Act*. (TSA 2)
- SLO 12C.1.2.3: Describe the steps to use in the Right to Refuse process. (TSA 3)
- SLO 12C.1.2.4: Explain how and where to find information on workplace safety and health. (TSA 4)
- SLO 12C.1.2.5: Demonstrate how to handle a potentially dangerous work situation. (TSA 5)
- SLO 12C.1.2.6: Explain the S.A.F.E. acronym. (TSA 6)
- SLO 12C.1.2.7: Define workplace safety and health hazards. (TSA 7)
- SLO 12C.1.2.8: Give examples of trade-specific (collision repair and refinishing technology) workplace safety and health hazards. (TSA 8)
- SLO 12C.1.2.9: Give examples of five types of safety and health hazards. (TSA 9)
- SLO 12C.1.2.10: Define workplace safety and health risks. (TSA 10)
- SLO 12C.1.2.11: Give examples of trade-specific (collision repair and refinishing technology) workplace safety and health risks. (TSA 11)
- SLO 12C.1.2.12: Explain the principles of hazard recognition and control as they apply to collision repair and refinishing technology. (TSA 12)
- SLO 12C.1.2.13: Match the WHMIS hazardous materials symbols and their meanings. (TSA 14)
- SLO 12C.1.2.14: Describe the importance of the Material Safety Data Sheets (MSDS). (TSA 15)

SLO 12C.1.2.15: Demonstrate proper selection and use of a variety of personal protective equipment and fall protection systems. (TSA 17)

Goal 2: Select, use, and manage tools and equipment.

GLO 2.1: Select and manage tools and equipment.

SLO 12C.2.1.1: Select and manage tools and equipment used in surface preparation and refinishing.

SLO 12C.2.1.2: Identify types of refinishing and detailing tools and equipment, and describe their applications. (A4.9)

SLO 12C.2.1.3: Identify and describe procedures used to set up, adjust, care for, and maintain refinishing equipment. (H4.4)

GLO 2.2: Use tools and equipment.

SLO 12C.2.2.1: Use tools and equipment applicable to surface preparation and refinishing.

SLO 12C.2.2.2: Identify and describe procedures used to operate refinishing equipment. (H4.4)

Goal 3: Demonstrate vehicle damage analysis and repair estimation.

GLO 3.1: Demonstrate vehicle damage analysis.

SLO 12C.3.1.1: Evaluate condition of substrate while performing repairs.

SLO 12C.3.1.2: Determine extent of damage to paint in order to plan refinishing repairs.

GLO 3.2: Demonstrate vehicle repair estimation.

SLO 12C.3.2.1: Estimate time and materials required to complete repairs.

SLO 12C.3.2.2: Create repair estimates.

Goal 4: Demonstrate welding procedures.

GLO 4.1: Demonstrate welding procedures.

SLO 12C.4.1.1: Restore corrosion protection.

Goal 5: Demonstrate **structural repair**.

GLO 5.1: Demonstrate an understanding of **vehicle construction**.

No applicable SLOs.

GLO 5.2: Demonstrate **measuring and gauging**.

SLO 12C.5.2.1: Measure paint film thickness.

GLO 5.3: Perform **structural repairs**.

SLO 12C.5.3.1: Discuss the effects of corrosion on structural components.

Goal 6: Demonstrate **sheet metal repair**.

GLO 6.1: Demonstrate an understanding of the **properties** of metal.

No applicable SLOs.

GLO 6.2: Repair sheet metal.

No applicable SLOs.

Goal 7: Select, use, and manage **seam sealers, fillers, and adhesives**.

GLO 7.1: Select, use, and manage **seam sealers** and **adhesives**.

SLO 12C.7.1.1: Demonstrate surface preparation for the topcoating of seam sealers and adhesives.

Goal 8: Select, use, and manage **fasteners**.

GLO 8.1: Select, use, and manage **fasteners**.

No applicable SLOs.

Goal 9: Demonstrate **glass repair and replacement**.

GLO 9.1: Demonstrate **glass repair and replacement**.

No applicable SLOs.

Goal 10: Demonstrate repair and replacement of **upholstery, trim, and hardware**.

GLO 10.1: Repair and replace **upholstery**.

No applicable SLOs.

GLO 10.2: Repair and replace **trim and hardware**.

No applicable SLOs.

Goal 11: Demonstrate **surface preparation**.

GLO 11.1: Select, use, and manage **materials other than abrasives** used in surface preparation.

No applicable SLOs.

GLO 11.2: Select, use, and manage **abrasives** used in surface preparation.

SLO 12C.11.2.1: Select, use, and manage abrasives.

GLO 11.3: Prepare substrates.

SLO 12C.11.3.1: Identify and demonstrate surface preparation and related techniques when working with waterborne refinishing materials. (H4.2)

Goal 12: Demonstrate **refinishing**.

GLO 12.1: Demonstrate **refinishing** processes.

SLO 12C.12.1.1: Define and describe waterborne refinishing material, including its technical characteristics and applications for use. (H4.1)

SLO 12C.12.1.2: Describe and demonstrate types of topcoat. (H4.3)

SLO 12C.12.1.3: Perform the application of topcoats.

SLO 12C.12.1.4: Describe and demonstrate types of basecoat/clearcoat finishes. (H4.5)

SLO 12C.12.1.5: Perform the application of basecoat/ clearcoat finishes.

SLO 12C.12.1.6: Describe and demonstrate single-stage finishes. (H4.6)

SLO 12C.12.1.7: Perform the application of single-stage finishes.

Goal 13: Demonstrate **cleaning and detailing.****GLO 13.1: Demonstrate **cleaning and detailing**.**

- SLO 12C.13.1.1: Demonstrate ability to detail vehicle exterior. (H2.1)
- SLO 12C.13.1.2: Demonstrate ability to detail vehicle interior. (H2.2)
- SLO 12C.13.1.3: Demonstrate ability to correct topcoat defects. (H2.4)
- SLO 12C.13.1.4: Demonstrate ability to remove overspray. (H2.5)
- SLO 12C.13.1.5: Demonstrate ability to polish vehicle exterior. (H2.6)
- SLO 12C.13.1.6: Demonstrate ability to clean vehicle interior. (H2.7)
- SLO 12C.13.1.7: Demonstrate ability to wash vehicle exterior. (H2.8)
- SLO 12C.13.1.8: Perform final cleanup for customer delivery. (H2.9)
- SLO 12C.13.1.9: Demonstrate ability to apply decals and pinstriping. (H2.10)

Goal 14: Describe **vehicle systems.****GLO 14.1: Describe **vehicle systems**.**

No applicable SLOs.

Goal 15: Describe and demonstrate transferable **cross-curricular knowledge and skills.****GLO 15.1: **Read, interpret, and communicate** information.**

- SLO 12C.15.1.1: Read, interpret, and communicate information from technical service bulletins.
- SLO 12C.15.1.2: Read, interpret, and communicate information from supplier labels.

GLO 15.2: Apply knowledge and skills from **mathematics.**

- SLO 12C.15.2.1: Demonstrate the mathematical skills required to create vehicle repair estimates.
- SLO 12C.15.2.2: Demonstrate the correct use of ratios and proportions in the mixing of products.

GLO 15.3: Apply knowledge and skills from **information and communication technology.**

No applicable SLOs.

GLO 15.4: Apply knowledge and skills from the **sciences**.

SLO 12C.15.4.1: Discuss the chemistry associated with refinishing products.

SLO 12C.15.4.2: Discuss the effects of overcatalyzing finishes.

Goal 16: Understand **career opportunities** and the **working environment**.

GLO 16.1: Describe **education, career opportunities, professional organizations, and working environments** related to collision repair and refinishing technology and associated fields.

SLO 12C.16.1.1: Describe apprenticeship, education, and career opportunities, and professional organizations related to refinishing.

SLO 12C.16.1.2: Describe working environments related to refinishing.

Goal 17: Demonstrate an awareness of **sustainability**.

GLO 17.1: Describe the effects of collision repair and refinishing technology on **human health and well-being**, including on tradespersons working in the field and those who use their services.

SLO 12C.17.1.1: Discuss long-term health concerns related to surface preparation and refinishing.

SLO 12C.17.1.2: Demonstrate the use of dust collection systems.

GLO 17.2: Describe collision repair and refinishing technology's **sustainability practices** and **impact on the environment**.

SLO 12C.17.2.1: Practise recycling materials.

SLO 12C.17.2.2: Discuss the effects of VOCs (volatile organic compounds) on the environment.

GLO 17.3: Describe **sustainable business practices** within collision repair and refinishing technology.

SLO 12C.17.3.1: Discuss practices that will keep a collision repair and refinishing technology facility competitive.

Goal 18: Demonstrate an awareness of **ethical and legal standards** as they pertain to collision repair and refinishing technology.

GLO 18.1: Practise **ethical and legal standards** as they pertain to collision repair and refinishing technology.

SLO 12C.18.1.1: Discuss legislation related to VOCs (volatile organic compounds).

Goal 19: Demonstrate **employability skills**.

GLO 19.1: Demonstrate fundamental **employability skills**.

SLO 12C.19.1.1: Demonstrate regular and punctual attendance.

SLO 12C.19.1.2: Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.

SLO 12C.19.1.3: Demonstrate accountability by taking responsibility for own actions.

SLO 12C.19.1.4: Demonstrate adaptability, initiative, and effort.

SLO 12C.19.1.5: Demonstrate teamwork skills.

SLO 12C.19.1.6: Demonstrate the ability to stay on task and use time effectively in class and work environments.

SLO 12C.19.1.7: Demonstrate the responsible use of wireless communication devices.

GLO 19.2: Demonstrate an awareness of **cultural proficiency** and its importance in the workplace.

SLO 12C.19.2.1: Demonstrate respect for cultural differences.

GLO 19.3: Demonstrate an understanding of the **business operation** of a collision repair and refinishing technology facility.

SLO 12C.19.3.1: Organize/store parts and materials. (A5.6)

GLO 19.4: Demonstrate **critical thinking skills** in planning, procedures, analysis, and diagnosis.

SLO 12C.19.4.1: Demonstrate critical thinking skills.

SLO 12C.19.4.2: Use a variety of strategies in order to diagnose and solve problems.

Goal 20: Demonstrate an understanding of the **evolution** of collision repair and refinishing technology, including its **technological progression and emerging trends**.

GLO 20.1: Describe the **evolution** of collision repair and refinishing technology, including its **technological progression and emerging trends**.

SLO 12C.20.1.1: Discuss the evolution of surface preparation and refinishing, including technological progression and emerging trends.
