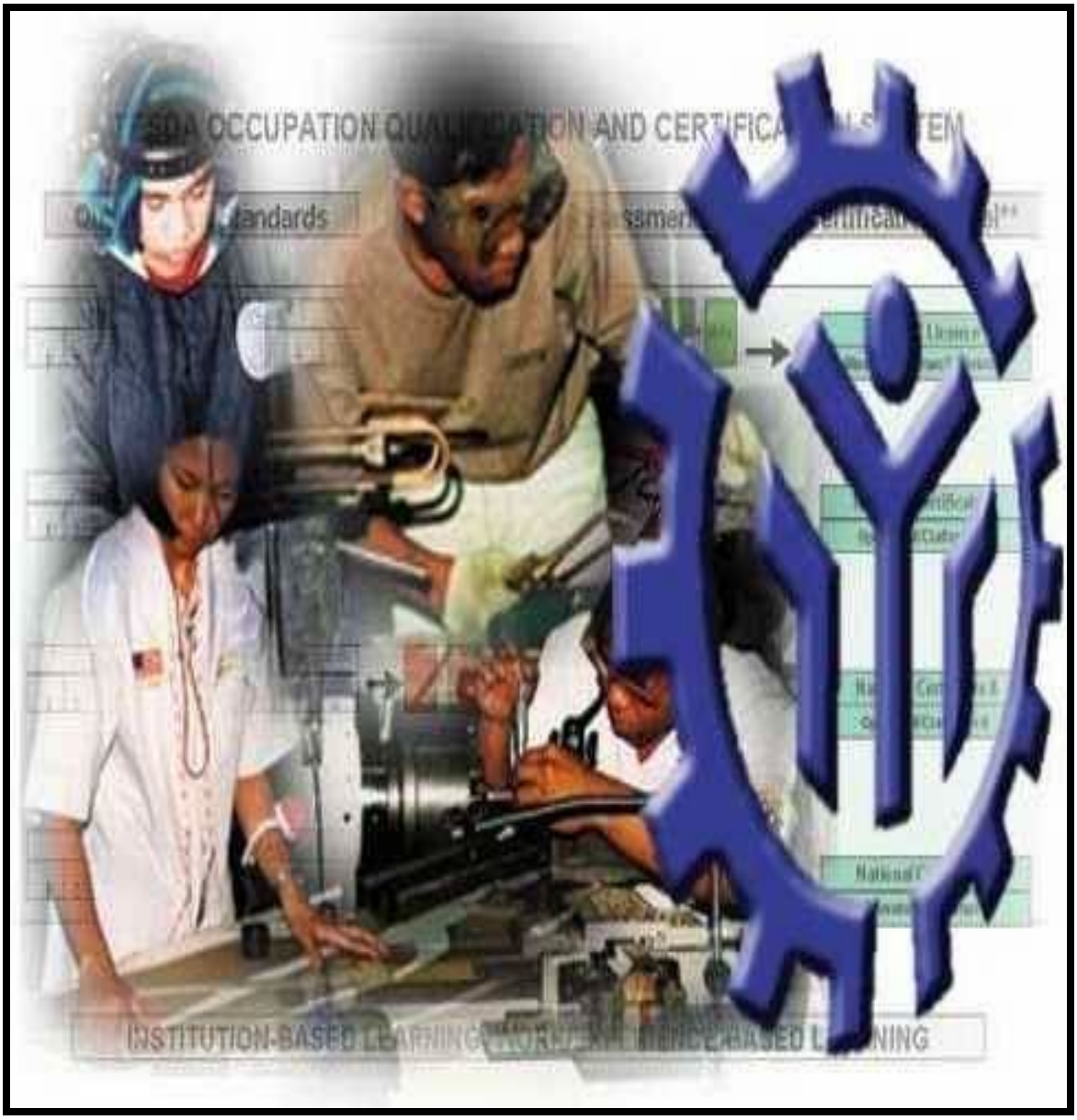
TRAINING REGULATIONS

AUTOMOTIVE BODY PAINTING/FINISHING NC II



AUTOMOTIVE SECTOR

Technical Education and Skills Development Authority
East Service Road, South Superhighway, Taguig, Metro Manila

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serves as basis for the:

1. Competency assessment and certification;
2. Registration and delivery of training programs; and
3. Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 Definition of Qualification - refers to the group of competencies that describes the different functions of the qualification.

Section 2 Competency Standards - gives the specifications of competencies required for effective work performance.

Section 3 Training Standards - contains information and requirements in designing training program for certain Qualification. It includes curriculum design, training delivery; trainee entry requirements; tools and requirements; tools and equipment; training facilities and trainer's qualification.

Section 4 National Assessment and Certification Arrangements - describe the policies governing assessment and certification procedure

TABLE OF CONTENTS
AUTOMOTIVE SECTOR

AUTOMOTIVE BODY PAINTING/FINISHING NC II

TRAINING REGULATIONS FOR
AUTOMOTIVE BODY PAINTING/FINISHING NC II

SECTION 1 AUTOMOTIVE BODY PAINTING/FINISHING NC II QUALIFICATIONS

The AUTOMOTIVE BODY PAINTING/FINISHING NC II Qualification consists of competencies that a person must achieve to restore damaged or change undamaged automotive body or panel paints. Automotive painting includes any land based motor vehicles such as automobiles, trucks, buses vehicle body panels and parts including big bikes or motorcycles that have been repaired or assembled or those vehicles that have lost their luster. It involves putty application, color- matching and paint repair procedures utilizing two-stage paint technology.

This Qualification is packaged from the competency map of the Automotive Industry (Service Sector) as shown in Annex A.

The Units of Competency comprising this Qualification include the following:

CODE	BASIC COMPETENCIES
500311105	Participate in Workplace Communication
500311106	Work in Team Environment
500311107	Practice Career Professionalism
500311108	Practice Occupational Health and Safety Procedures

CODE	COMMON COMPETENCIES
ALT723201	Apply Appropriate Sealant/Adhesive
ALT723202	Move and Position Vehicle
ALT311202	Perform Mensuration and Calculation
ALT723203	Read, Interpret and Apply Specifications and Manuals
ALT723204	Use and Apply Lubricants/Coolants
ALT723205	Perform Shop Maintenance

CODE	CORE COMPETENCIES
ALT714305	Assess Auto Paint Jobs
ALT714301	Prepare Undamaged Surface for Painting
ALT714306	Prepare Damaged Surface for Painting
ALT714302	Apply and Remove Masking
ALT714303	Spray Solid Color Paints
ALT714309	Repair Solid Color Paints
ALT714304	Perform Polishing
ALT714307	Perform Solid/Metallic Color Mixing
ALT714308	Spray Metallic Color Paint
ALT714310	Repair Metallic Color Paints

A person who has achieved this Qualification is competent to be:

- ❑ **Automotive painter (two stage painting)**
- ❑ **Automotive paint refinisher (2-stage painting)**

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in Automotive Body Painting/Finishing NC II.

BASIC COMPETENCIES

UNIT OF COMPETENCY : **PARTICIPATE IN WORKPLACE COMMUNICATION**

UNIT CODE : **500311105**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are tasked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data are recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1 Team members 1.2 Suppliers 1.3 Trade personnel 1.4 Local government 1.5 Industry bodies
2. Medium	2.1 Memorandum 2.2 Circular 2.3 Notice 2.4 Information discussion 2.5 Follow-up or verbal instructions 2.6 Face-to-face communication
3. Storage	3.1 Manual filing system 3.2 Computer-based filing system
4. Forms	4.1 Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1 Face-to-face interactions 5.2 Telephone conversation 5.3 Electronic and two-way radio communication 5.4 Written communication including electronic mail, memos, instruction and forms 5.5 Non-verbal communication including gestures, signals, signs and diagrams
6. Protocols	6.1 Observing meeting 6.2 Compliance with meeting decisions 6.3 Obeying meeting instructions

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared written communication following standard format of the organization 1.2 Accessed information using communication equipment 1.3 Made use of relevant terms as an aid to transfer information effectively 1.4 Conveyed information effectively adopting the formal or informal communication
2. Underpinning knowledge	2.1 Effective communication 2.2 Different modes of communication 2.3 Written communication 2.4 Organizational policies 2.5 Communication procedures and systems 2.6 Technology relevant to the enterprise and the individual's work responsibilities
3. Underpinning skills	3.1 Follow simple spoken language 3.2 Perform routine workplace duties following simple written notices 3.3 Participate in workplace meetings and discussions 3.4 Complete work related documents 3.5 Estimate, calculate and record routine workplace measures 3.6 Basic mathematical processes of addition, subtraction, division and multiplication 3.7 Ability to relate to people of social range in the workplace 3.8 Gather and provide information in response to workplace requirements
4. Resource implications	The following resources **MUST** be provided: 4.1 Fax machine 4.2 Telephone 4.3 Writing materials 4.4 Internet
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Direct Observation 5.2 Oral interview and written test
6. Context of assessment	6.1 Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : **WORK IN TEAM ENVIRONMENT**

UNIT CODE : **500311106**

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The ***role and objective of the team*** is identified from available ***sources of information***
	1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified
	2.2. Roles and responsibility of other team members are identified and recognized
	2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives
	3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and ***workplace context***
	3.3. Observed protocols in reporting using standard operating procedures
	3.4. Contribute to the development of teamwork plans based on an understanding of team's role and objectives and individual competencies of the members.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	1.1 Work activities in a team environment with enterprise or specific sector 1.2 Limited discretion, initiative and judgment may be demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1 Standard operating and/or other workplace procedures 2.2 Job procedures 2.3 Machine/equipment manufacturer's specifications and instructions 2.4 Organizational or external personnel 2.5 Client/supplier instructions 2.6 Quality standards 2.7 Occupational Health and Safety (OHS) and environmental standards
3. Workplace context	3.1 Work procedures and practices 3.2 Conditions of work environments 3.3 Legislation and industrial agreements 3.4 Standard work practice including the storage, safe handling and disposal of chemicals 3.5 Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Operated in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job 1.6 Reported outcomes
2. Underpinning knowledge	2.1 Communication process 2.2 Team structure 2.3 Team roles 2.4 Group planning and decision making
3. Underpinning skills	3.1 Communicate appropriately, consistent with the culture of the workplace
4. Resource implications	The following resources **MUST** be provided: 4.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2. Materials relevant to the proposed activity or tasks
5. Method of assessment	Competency may be assessed through: 5.1 Observation of the individual member in relation to the work activities of the group 5.2 Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 5.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
6. Context of assessment	6.1 Competency may be assessed in workplace or in a simulated workplace setting 6.2 Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : **PRACTICE CAREER PROFESSIONALISM**

UNIT CODE : **500311107**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships ~~is~~ are maintained in the course of managing oneself based on performance ***evaluation*** 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
2. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Underpinning knowledge and attitudes	2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company-operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices
3. Underpinning skills	3.1 Appropriate practice of personal hygiene 3.2 Intra- and Interpersonal skills 3.3 Communication skills
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace or assessment location 4.2 Case studies/scenarios
5. Method of assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Simulation/Role-plays 5.4 Observation 5.5 Third Party Reports 5.6 Exams and Tests
6. Context of assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**

UNIT CODE : **500311108**

UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***Hazards/risks*** in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics • Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles • Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Underpinning knowledge and attitudes	2.1 OHS procedures and practices and regulations 2.2 PPE types and uses 2.3 Personal hygiene practices 2.4 Hazards/risks identification and control 2.5 Threshold Limit Value -TLV 2.6 OHS indicators 2.7 Organization safety and health protocol 2.8 Safety consciousness 2.9 Health consciousness
3. Underpinning skills	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace or assessment location 4.2 OHS personal records 4.3 PPE 4.4 Health records
3. Method of assessment	Competency **MUST** be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
4. Context of assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT OF COMPETENCY : **APPLY APPROPRIATE SEALANT/ADHESIVE**

UNIT CODE : **ALT723201**

UNIT DESCRIPTOR : This competency unit covers the selection and application of sealant/adhesives.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Identify appropriate sealant/adhesive	1.1 ***Sealant/adhesive*** selected in line with job requirements and manufacturer's specification 1.1 ***Sealant/adhesive checking*** is performed to ensure that product is fit for use.
2. Prepare surface for sealant/adhesive	2.1 Surface materials are identified as per construction 2.2 Surface is cleaned and free of moisture, dust and other foreign matters to ensure maximum adhesion or seal.
3. Apply sealant/ adhesive	3.1 Sealant/adhesive is applied evenly on the surface in line with manufacturer's specification 3.2 Excess sealant/adhesive is removed by sanding or scrapping 3.3 ***Tools and equipment*** used to apply sealant/adhesive are appropriate to job requirements 3.1 ***Safety*** are observed and PPE are worn in accordance with industry SOP 3.2 ***Hazards*** associated with the use of sealant and adhesives are identified.
4. Store/Dispose of sealant/adhesive	4.1 Sealant/adhesive are stored as per prescribed procedure 4.2 Waste are disposed as per workshop SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Sealant/Adhesive	Sealant/adhesive includes: 1.1 Form in Place Gasket (FIPG) 1.2 Ribbon Sealer 1.3 Hametite 1.4 Silicon Body sealer 1.5 Prestite for Auto and Auto Aircon
2. Tools and equipment	Tools and equipment include: 2.1 Putty knife 2.2 Scraper 2.3 Compressor 2.4 Steel brush 2.5 Paint brush 2.6 Rubber hammer 2.7 Hand tools Personal protective equipment include: 2.8 Gloves 2.9 Apron 2.10 Safety shoes 2.11 Goggles 2.12 Gas mask
3. Safety	Safety includes: 3.1 Ventilation 3.2 Handling of Flammable/Irritating substances 3.3 Use of Personal Protective Equipment
4. Hazards	Hazard includes: 4.1 Fumes 4.2 Skin irritation 4.3 Burns
5. Adhesive/Sealant checking	Adhesive/Sealant checking includes: 5.1 Expiry date 5.2 Free of contamination 5.3 Cap/Covers 5.4 Tightly closed 5.5 Concentration

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified appropriate sealant/adhesives 1.2 Prepared surface for sealant/adhesive 1.3 Applied sealant/adhesive 1.4 Stored unused or dispose of used sealant/adhesive
2. Underpinning knowledge	2.1 OH & S regulations 2.2 Safe handling of sealant/adhesive 2.3 Industry code of practice 2.2 Procedures in sealant/adhesive application 2.3 Procedures in interpreting manuals
3. Underpinning skills	3.1 Handling sealant/adhesive 3.2 Applying sealant/adhesive 3.3 Sanding the surface 3.4 Use of tools, equipment 3.5 Mixing of body filler and epoxy base and hardener
4. Resource implications	The following resources **MUST** be provided: 4.1 Materials relevant to the activity 4.2 Appropriate tools and equipment 4.3 Real or simulated workplace
5. Method of assessment	Competency **MUST** be assessed through 5.1 Observation with questioning 5.2 Interview related to: • Safe and correct use of tools and equipment • Application of adhesive/sealant
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment may be done in a workplace or simulated environment

UNIT OF COMPETENCY : **MOVE AND POSITION VEHICLE**

UNIT CODE : **ALT723202**

UNIT DESCRIPTOR : This competency unit covers the knowledge, skills and attitude needed to move and position vehicle in a workshop.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Prepare vehicle for driving	1.2 Correct ***check-up procedures*** performed based on vehicle manufacturer standard
2. Move and position vehicle	2.1 Select vehicle to be moved or re-position. *2.2* Drive the vehicle to appropriate location 2.3 Park vehicle following ***parking safety techniques*** and procedure
3. Check the vehicle	3.1 ***Vehicle*** position is checked as per required 3.2 Vehicle is checked for external damages

RANGE OF VARIABLE

VARIABLE	RANGE
1. Check up procedure	Check up procedures include the following: 1.1 Oil level 1.2 Brake fluid 1.3 Clutch fluid 1.4 Coolant level 1.5 Battery (electrolyte) 1.6 Tire pressure 1.7 Position of driving gear 1.8 Lighting and warning devices
2. Vehicles	2.1 Vehicles with automatic transmission 2.2 Vehicles with manual transmission
3. Parking safety techniques	3.1 Engaging of Park brake 3.2 Vehicle parking position 3.3 Front wheel position

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared vehicle for driving. 1.2 Moved and positioned vehicle 1.3 Checked the vehicle.
2. Underpinning knowledge	2.1 Driver's Code of conduct 2.2 Workshop signs and symbols 2.3 Driving skills 2.4 Vehicle accessories for safe driving and parking
3. Underpinning skills	3.1 Ability to handle vehicle/maneuver vehicle the easiest way 3.2 Immediate response to accident 3.3 Preparing vehicle for driving 3.4 Parking Downhill, Uphill, Parallel 3.5 Shifting Gears 3.6 Maneuvering
2. Resource implications	The following resources **MUST** be provided: 4.1 Driving range/area 4.2 Appropriate vehicle for driving 4.3 Vehicle accessories
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination
6. Context of assessment	6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment of practical skills must be done in a workplace or simulated environment.

UNIT OF COMPETENCY : **PERFORM MENSURATION AND CALCULATION**

UNIT CODE : **ALT311202**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in identifying caring, handling and using measuring instruments.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Select measuring instruments	1.1 Object or component to be measured is identified 1.2 Correct specifications are obtained from relevant source 1.3 Appropriate ***measuring instrument*** is selected according to job requirements
2. Carry out measurements and calculation	2.1 Measuring tools are selected in line with job requirements 2.2 Accurate measurements are obtained in accordance with job requirements. 2.3 ***Calculation*** needed to complete work tasks are performed using the four fundamental operation of addition (+), subtraction (-), multiplication (x) and division (/). 2.4 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks. 2.5 Numerical computation is self-checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool.
3. Maintain measuring instruments	3.1 Measuring instruments are kept free from corrosion 3.2 Measuring instruments are not dropped to avoid damage 3.3 Measuring instruments are cleaned before and after using.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring instruments	Measuring instruments includes: 1.1 Multitester 1.2 Micrometer (In-out, depth) 1.3 Vernier caliper (Out, inside) 1.4 Dial Gauge with Mag. Std. 1.5 Plastigauge 1.6 Straight Edge 1.7 Thickness gauge 1.8 Torque Gauge 1.9 Small Hole gauge 1.10 Telescopic Gauge 1.11 Try square 1.12 Protractor 1.13 Combination gauge 1.14 Steel rule
2. Calculation	Kinds of part mensuration include: 2.1 Volume 2.2 Area 2.3 Displacement 2.4 Inside diameter 2.5 Circumference 2.6 Length 2.7 Thickness 2.8 Outside diameter 2.9 Taper 2.10 Out of roundness 2.11 Oil clearance 2.12 End play/thrust clearance

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Selected measuring instruments 1.2 Carried-out measurements and calculations. 1.3 Maintained measuring instruments
2. Underpinning knowledge	2.1 Types of Measuring instruments and its uses 2.2 Safe handling procedures in using measuring instruments 2.3 Four fundamental operation of mathematics 2.4 Formula for Volume, Area, Perimeter and other geometric figures
3. Underpinning skills	3.1 Caring and Handling measuring instruments 3.2 Calibrating and using measuring instruments 3.1 Performing calculation by Addition, Subtraction, Multiplication and Division 3.2 Visualizing objects and shapes 3.3 Interpreting formula for volume, area, perimeter and other geometric figures
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace location 4.2 Measuring instrument appropriate to servicing processes 4.3 Instructional materials relevant to the propose activity
5. Method of assessment	Competency must be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination 5.3 Interview 5.4 Demonstration with questioning
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment may be conducted in a workplace or simulated environment

UNIT OF COMPETENCY : **READ, INTERPRET AND APPLY SPECIFICATIONS AND MANUALS**.

UNIT CODE : **ALT723203**

UNIT DESCRIPTOR : This unit deals with identifying, interpreting and applying service specification manuals, maintenance procedure manuals and periodic maintenance manual.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Identify and access manual/ specification	1.1 Appropriate ***manuals*** are identified and accessed as per job requirements. 1.2 Version and date of manual is checked to ensure correct specification and procedure are identified.
2. Interpret manuals	2.1 Relevant sections, chapters of manuals/specifications are located in relations to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance to industry practices
3. Apply information in manual	3.1 Manual is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer specification 3.3 Manual data is applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications
4. Store manuals	4.1 Manual or specification are stored appropriately to ensure prevention of damage, ready access and updating of information when required in accordance with company requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Manuals	Kinds of manuals: 1.1 Manufacturer's specification manual 1.2 Repair manual 1.3 Maintenance Procedure Manual 1.4 Periodic Maintenance Manual

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified and accessed manual/specification 1.2 Interpreted manuals 1.3 Applied information in manuals 1.4 Stored manuals
2. Underpinning knowledge	2.1 Types of manuals used in automotive industry 2.2 Identification of symbols used in the manuals 3.1 Identification of units of measurements 3.2 Unit conversion
3. Underpinning skills	3.1 Reading and comprehension skills required to identify and interpret automotive manuals and specifications 3.2 Accessing information and data
4. Resource Implications	The following resources **MUST** be provided: 4.1 All manuals/catalogues relative to Automotive 4.2 Job order, requisitions 4.3 Actual vehicle or simulator
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Observation with questioning 5.2 Interview
6. Context of assessment	6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment may be conducted in the workplace or a simulated environment.

UNIT OF COMPETENCY : **USE AND APPLY LUBRICANTS/COOLANTS**

UNIT CODE : **ALT723204**

UNIT DESCRIPTOR : This unit covers the outcomes required to select and apply different types of lubricants.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Identify types of lubricants/ coolant	1.1 Correct information on ***lubrication schedule*** is accessed and interpreted from appropriate manufacturers specifications ***manuals*** 1.2 Type and quantity of ***lubricants/coolant*** is identified as per job requirements
2. Use and apply lubricants/coolant	2.1 Correct procedure for change of lubricant is identified following manufacturer's specification or manual 2.2 Correct tools and equipment are selected and used in line with job requirements 2.3 Existing lubricants is removed and replaced with specified types and quantity of new materials in line with manufacturer's specification 2.4 Safe procedure and use of ***PPE*** is observed when removing or replacing lubricant 2.5 Used lubricants are disposed in accordance with environmental guidelines 2. 6 Work is checked in line with company SOP.
3. Perform housekeeping activities	*3.1* ***Tools, equipment*** and materials are properly stored as per company SOP 3.2 Workplace is free from waste materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Manuals	1.1 Manufacturer's specification manual 1.2 Periodic Maintenance manual 1.3 Service Manual
2. Lubricants/ Coolant	Kinds of lubricants include: 2.1 Engine oil: • Diesel engine oil • Gasoline engine oil 2.2 Automatic Transmission Fluid • Destro II • T4 2.3 Gear oil lubricants: • Oil #90 • Oil #140 • Oil #30 • Oil #40 2.4 Grease • Special (velocity joint) Molybdenum disulfate) • Ordinary • Multi-purpose oil • Contact point lubricant (grease) 2.5 Brake/Clutch System • Brake fluid • DOT3 2.6 Power Steering Fluid • Hydraulic Fluid 2.7 Radiator Coolant • Long last coolant 2.8 A/C Compressor Oil • Pag oil
3. Lubricant schedule	Schedule for changing oil: 3.1 Kilometers traveled used 3.2 No. of Hours used 3.3 Monthly
4. Tool and equipment	Tools used include: 4.2 Hand tools 4.3 Oiler 4.4 Oil Dispenser 4.5 Grease gun
5. Personal protective equipment (PPE)	PPE include: 5.1 Apron 5.2 Gloves 5.3 Goggles 5.4 Safety shoes

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified types of lubricants and lubrication schedule. 1.2 Used and applied lubricants. 1.3 Performed housekeeping
2. Underpinning knowledge	2.1 Types/Classification of Lubricants 2.2 Identifying lubrication schedule 2.3 Cause and Effects of Gear Oil Dilution 2.4 Purpose of Lubrication (Problem and effects) 2.5 Hazard associated with lubrication
3. Underpinning skills	3.1 Handling of oils (Gear, oil, engine oil) 3.2 Familiarization/Classification of Lubricants 3.3 Lubrication Procedure
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate tools and equipment 4.3 Materials relevant to activity
5. Method of assessment	Competency **MUST** be assessed through 5.1 Demonstration with questioning 5.2 Written/Oral examination The assessment of practical skill must only take place in a period of supervised practice and repetitive experience.
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment must be undertaken in accordance with the endorsed industry assessment guidelines 6.3 Assessment of underpinning knowledge and skills may be assessed on or off the job

UNIT OF COMPETENCY : **PERFORM SHOP MAINTENANCE**

UNIT CODE : **ALT723307**

UNIT DESCRIPTOR : This unit deals with inspecting and cleaning of work area including tools, equipment and facilities. Storage and checking of tools/ equipment and disposal of used materials are also incorporated in this competency.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Inspect/clean tools and work area	1.1 Cleaning solvent used as per workshop/tools ***cleaning requirement***
	1.2 **W*ork area*** is checked and cleaned
	1.3 Wet surface/spot in work area is wiped and dried
2. Store/arrange tools and shop equipment	2.1 Tools/equipment are checked and stored in their respective shelves/location
	2.2 Corresponding labels are posted and visible
	2.3 Tools are safely secured and logged in the records
3. Dispose of wastes/used lubricants	3.1 Containers for used lubricants are visibly labeled
	3.2 Wastes/used lubricants are disposed as per workshop SOP
4. Report damaged tools/equipment	4.1 Complete inventory of tools/equipment is maintained
	4.2 Damaged tools/equipment/facilities are identified and repair recommendation is given
	4.3 Reports prepared have no error/discrepancy

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work Area	Work areas include: 1.1 Workshop areas for servicing/repairing light and/or heavy vehicle and/or plant transmissions and/or outdoor power equipment 1.2 Open workshop/garage and enclosed, ventilated office area 1.3 Other variables may include workshop with: • Mess hall • Wash room • Comfort room
2. Cleaning requirement	2.1 Cleaning solvent 2.2 Inventory of supplies, tools, equipment, facilities 2.3 List of mechanics/technicians 2.4 Rags 2.5 Broom 2.6 Map 2.7 Pail 2.8 Used oil container 2.9 Oiler 2.10 Dust/waste bin
3. Manuals	3.1 Vehicle/plant manufacturer specifications 3.2 Company operating procedures 3.3 Industry/Workplace Codes of Practice 3.4 Product manufacturer specifications 3.5 Customer requirements 3.6 Industry Occupational Health &Safety
4. Company standard operating procedure	Wearing of personal protective equipment include: 4.1 Gloves 4.2 Apron 4.3 Goggles 4.4 Safety shoes

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned workshop tools/facilities 1.2 Maintained equipment, tools and facilities 1.3 Disposed wastes and used lubricants/fluid as per required procedure
2. Underpinning knowledge and attitudes	2.1 5 S or Total Quality Management (TQM) 2.2 Service procedures 2.3 Relevant technical information 2.4 Safe handling of Equipment and tools 2.5 Vehicle safety requirements 2.6 Workshop policies 2.7 Personal safety procedures 2.8 Fire Extinguishers and prevention 2.9 Storage/Disposal of Hazardous/flammable materials 2.10 Positive Work Values (Perseverance, Honesty, Patience, Attention to Details)
3. Underpinning skills	3.1 Handling/Storing of tools/equipment/supplies and material 3.2 Cleaning grease/lubricants 3.3 Disposing of wastes and fluid 3.4 Preparing inventory of s/m and tools and equipment 3.5 Monitoring of s/m and tools/equipment
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Written/Oral Questioning 5.2 Demonstration Assessment of underpinning knowledge and practical skills may be combined.
6. Context of assessment	6.1 Competency must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

CORE COMPETENCIES

This section gives the details of the contents of the core units of competency required in AUTOMOTIVE BODY PAINTING/FINISHING NC II.

UNIT OF COMPETENCY : **ASSESS AUTO PAINTING JOBS**

UNIT CODE : **ALT714305**

UNIT DESCRIPTOR : This unit covers the competency in assessing automotive painting jobs for metal, plastic and fiberglass auto body and accessories.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Evaluate painting works	1.1 Damaged ***surface*** area is assessed using the ***3 methods*** of assessing surface area. 1.2 Visual method is used for no damaged panel painting 1.3 Paint thickness gauge is used as per job requirements 1.4 Solvent test is performed as per procedures 1.5 ***Type of paint*** to be used is determined through the use of solvent tests.
2. Determine paint defects	2.1 ***Paint defects*** are determined visually as per symptoms
3. Recommend corrective measure	3.1 Appropriate ***corrective measures*** are identified based on defects 3.2 ***Supplies and materials*** are determined as per company standard operating procedures 3.3 ***Checklist Forms***/estimate reports of job requirements are completely accomplished and signed accordingly 3.4 Amount of time or man-hour requirement for the work to be done is accurately determined

RANGE OF VARIABLES

VARIABLE	RANGE
1. Surfaces	Types of automotive body/panel surfaces include: 1.1 Metal 1.2 Plastic 1.3 Fiberglass
2. 3 Methods of assessing surface	Methods of assessing surface for painting 2.1 Visual Inspection 2.2 By Touch of Hand 2.3 Using Gauges (Paint Thickness gauge, Straight edge or Paint texture gauge)
3. Types of paints	Types of paints include: 3.1 Acrylic-based 3.2 Urethane based 3.3 Acrylics urethane 2.4 Polyurethane
4. Paint defects	Some known paint defects include the following: 4.1 Dirt inclusion (seeds) 4.2 Fish-eye (Cratering) 4.3 Mottling 4.4 Sags and Run 4.5 Orange Peel 4.6 Blushing (Whitening/Hazing) 4.7 Lifting (Shrinking/Floating) 4.8 Putty marks/edge mapping 4.9 Sanding marks 4.10 Bleeding 4.11 Pin holing Water spot and Stains 4.12 Blistering (Popping/Bubbling) 4.13 Peeling and adhesion loss 4.14 Fading and yellowing (Discoloration) 4.15 Chalking 4.16 Cracking 4.17 Gloss Reduction or matting 4.18 Polishing marks 4.19 Striping/Brading
4. Corrective measures	4.1 Retouch 4.2 Repair 4.3 Repaint 4.4 Scrape to metal
5. Supplies and materials	5.1 Gloves 5.2 Thinner 5.3 Rags 5.4 Polishing compound
6. Checklist forms	Checklist forms include information on: 6.1 Vehicle data 6.2 Interior/Exterior contents of the vehicle 6.3 Layout of the vehicle 6.4 Remarks

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Evaluated painting works 1.2 Determined paint defects 1.3 Recommended corrective measures 1.4 Determined current vehicle data (color)
2. Underpinning Knowledge and attitudes	2.1 Types of paints 2.2 Kinds of paint defects 2.3 Corrective measure for paint defects 2.4 Surface defect assessment methods 2.5 Company industry standard operating procedures 2.6 Kinds of Painting supplies and materials 2.7 Auto Body Panels and Accessories 2.8 Procedures in Using Paint Thickness Gauges 2.9 Auto Body Repair 2.10 Paint Mixing 2.11 Classification of Sprayed Paint by Stages 2.12 Honesty and Fairness 2.13 Courtesy and Politeness
3. Underpinning skills	3.1 Communication skills in dealing with customers, superiors and peers 3.2 Calculation skills 3.3 Evaluating skills (Touching by hands, Visual inspection and Using gauges) 3.4 Fundamental Mathematical skills such as Addition, Subtraction, Multiplication, Division 3.5 Computing using percentages, by weight, ratio and proportion
4. Resource Implication	The following resources **MUST** be provided: 4.1 Materials relevant to the activity specifically Color Book /Color Swatch or Microfische/Color Data Materials 4.2 Appropriate tools, supplies and materials 4.3 Real or simulated workplace
5. Method of assessment	Competency may be assessed through: 5.1 Observation with questioning 5.2 Demonstration with questioning 5.3 Written test 5.4 Portfolio assessment
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment of underpinning knowledge and skills may be done on or off the job

UNIT OF COMPETENCY : **PREPARE UNDAMAGED SURFACE FOR PAINTING**

UNIT CODE : **ALT714301**

UNIT DESCRIPTOR : This unit identifies the competence required to remove surface rust/scale and prepare application of primers, sealers and sealant for painting and refinishing.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Remove body accessories	1.1 All detachable parts from panel/**surface** to be repainted are removed as per procedure and without damage ***using required tools, equipment, supplies and materials*** 1.2 All detachable parts are placed on secured containers with complete label and identification.
2. Sand surface	2.1 Adjacent panels or areas not to be sanded are applied with masking materials. 2.2 Sanding is performed as per procedure. 2.3 Sanded area is assessed using visual, touch, gauges assessment methods 2.4 Dual action or orbital sander is used as per manufacturer operation instruction
3. Clean the spray gun	3.1 Paint cup is cleaned with thinner before and after use 3.2 Paint passage is cleaned with back-flush technique 3.3 Nozzle cap is removed and fluid tip is cleaned 3.4 Thinner is ensured clear after repetitive back-flush cleaning method
4. Apply primers for strip to metal painting job	4.1 Cleaning of panel is performed using pressurized air with air dryer to remove sanded particles and ***waste materials*** 4.2 Degreasing performed as per standard operating procedure 4.3 Tack cloth is used to wipe off remaining particles 4.4 ***Primers*** mixed according to paint manufacturer specifications 4.5 Spraying air pressure is maintained as per paint manufacturer specification 4.6 Spraying distance maintained as per manufacturer specification 4.7 Flash off time is observed as per paint manufacturer specifications 4.8 Drying time is observed as per paint manufacturer specifications. 4.9 ***Personal protective equipment*** and devices appropriate to the application processes are worn and used as per specification
5. Apply sealant when replacing with new panel	5.1 Cleaning and degreasing is performed on the area to be applied with sealant 5.2 Sealant applicator nozzle is trimmed/cut according to application necessity/requirements 5.3 Sealant is applied as per procedure 5.4 Applied sealant is checked and excess sealant is removed and cleaned properly

RANGE OF VARIABLES

VARIABLE	RANGE
1. Equipment, tools, supplies and materials	Equipment used includes: For removing paints/Feather edging 1.1 Sander single action with dust extractor 1.2 Sander Dual action or Orbital with dust extractor For applying surfacer 1.3 Air compressor 1.4 Spray gun 1.5 Air lines and accessories 1.6 Air dryer/filter Tools include: 1.7 Scraper 1.8 Basic handtools Supplies and Materials 1.9 Sand paper 1.10 Paint remover 1.11 Degreaser 1.12 Primer 1.13 Thinner 1.14 Surfacer 1.15 Sealant 1.16 Masking materials
2. Surfaces	Types of surfaces include: 2.1 Metal 2.2 Plastic 2.3 Fiberglass
3. Protective clothing and equipment	Personal protective clothing and safety devices may include: 3.1 Gloves – cotton and solvent resistant 3.2 Safety shoes or boots 3.3 Dust mask, gas mask or respirator or particle mask 3.4 Shop uniform 3.5 Apron 3.6 Eye spectacle or goggles
4. Primer	Kinds of primers may include: 4.1 Wash primer 4.2 Epoxy primer 4.3 Urethane primer 4.4 Acrylic primer
5. Waste materials	Waste may include: 5.1 Used water 5.2 Paint scrapings 5.3 Used or leftover consumables 5.4 Paint containers 5.5 Used thinner/cleaning thinner 5.5 Leftover paint

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Removed body accessories 1.2 Sanded surfaces 1.3 Mixed primer according to manufacturer's specifications 1.4 Applied sealant when replacing with new panel
2. Underpinning knowledge and attitudes	2.1 Necessary cleaning and degreasing agents 2.2 Surface preparation procedures for primers/sealers (including minor dents/surface blemish repair) 2.3 Relevant technical information 2.4 Workplace safety procedures 2.5 Vehicle safety requirements 2.6 Equipment safety requirements 2.7 Wet sanding procedure preparation for refinishing 2.8 Primer/sealed surface preparation for refinishing 2.9 Correct operating procedures of relevant equipment for surface preparation 2.10 Personal safety requirements 2.10 Dedication to work 2.11 Patience and perseverance
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Use relevant tools and equipment 3.3 Cleaning bare metal, plastic, fiberglass surfaces for primer application 3.4 Performing surfaces for surfacer application 3.5 Applying primers/sealers and surfacer
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Demonstration and Questioning 5.2 Written examination 5.3 Portfolio
6. Context of assessment	6.1 Competency elements must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience. 6.3 The required outcome must be able to be achieved without direct supervision

UNIT OF COMPETENCY : **PREPARE DAMAGED SURFACE FOR PAINTING**

UNIT CODE : **ALT714306**

UNIT DESCRIPTOR : This unit identifies the competence required to remove surface rust/scale and prepare application of primers, sealers and sealant for refinishing. It also includes the competency in applying putty on flat and complex surfaces.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Remove body accessories	1.1 All detachable parts from panel/***surface*** to be repainted are removed as per procedure and without damage. 1.2 All detachable parts are placed on secured containers with complete label and identification.
2. Remove paint	2.1 Surface treatment is performed as per company standard operating procedure ***using required tools, equipment, supplies and materials*** 2.2 Paint removed bare to metal from damaged panel 2.3 Equipment, tools and materials used as per instruction and recommended procedures 2.4 Feather edging is performed as per company standard operating procedures 2.5 Waste materials are disposed off in accordance with company requirements 2.6 Surface preparation activities and testing is carried out according to industry guidelines, OHS, legislation and company standard operating procedures 2.7 Work is completed without causing damage to any component or system.
3. Clean the spray gun	3.1 Paint cup is cleaned with thinner before and after use 3.2 Paint passage is cleaned with back-flush technique 3.3 Nozzle cap is removed and fluid tip is cleaned 3.4 Thinner is ensured clear after repetitive back-flush cleaning method
4. Apply primers	4.1 Cleaning is performed using pressurized air with air dryer to remove sanded particles and ***waste materials*** 4.2 Degreasing performed as per standard operating procedure 4.3 Tack cloth is used to wipe off remaining particles 4.4 ***Primers*** mixed according to paint manufacturer specifications 4.5 Spraying air pressure is maintained as per paint manufacturer specification 4.6 Spraying distance maintained as per manufacturer specification 4.7 Flash off time is observed as per paint manufacturer specifications 4.8 Drying time is observed as per paint manufacturer specifications. 4.9 ***Personal protective equipment*** and devices appropriate to the application processes are worn and used as per specification

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
5. Apply putty on flat surfaces	5.1 ***Putty*** is mixed according to paint manufacturer specifications and ***company standard operating procedures*** 5.2 Equipment, tools are used as per instruction manual specification 5.3 Putty is applied on surfaces gradually to fill in dents and damages 5.4 Putty is dried as per manufacturer specifications 5.5 Sanding of repaired area is performed as per procedures 5.6 Sanded area is assessed using ***3 methods*** of assessing surfaces.
6. Apply putty on complex surface	6.1 Recommended technique in applying putty on complex surfaces to restored complex to original form 6.2 Sanding technique is applied to restore complex surface to original form
7. Apply surfacer	7.1 Cleaning is performed using pressurized air with air dryer to remove sanded particles 7.2 Degreasing performed as per company standard operating procedure 7.3 Tack cloth is used to wipe off remaining particles 7.4 Surfacer mixed according to paint manufacturer specification 7.5 Spraying air pressure is maintained as per manufacturer specification 7.6 Spraying distance maintained as per manufacturer's specification 7.7 Flash off time is observed as per paint manufacturer specification 7.8 Drying time is observed as per paint manufacturer specification 7.9 Sanded area is assessed using visual, touch, gauges assessment methods 7.10 Dual action or orbital sander is used as per manufacturer operation instruction

RANGE OF VARIABLES

VARIABLE	RANGE
1. Equipment, tools, supplies and materials	Equipment used includes: For removing paints/Feather edging 1.1 Sander single action with vacuum pump For applying surfacer 1.2 Sander Dual action or Orbital 1.3 Air compressor 1.4 Spray gun 1.5 Air lines and and accessories 1.6 Air dryer/filter 1.7 Putty equipment Tools include: 1.8 Scraper 1.9 Basic handtools 1.10 Spatula 1.11 Putty knife Supplies and Materials 1.12 Sand paper 1.13 Paint remover 1.14 Degreaser 1.15 Primer 1.16 Thinner 1.17 Surfacer 1.18 Sealant 1.19 Masking materials
2. Surface	Types of surfaces include: 2.1 Metal 2.2 Plastic 2.3 Fiberglass
3. Protective clothing and equipment	Personal protective clothing and safety devices may include: 2.1 Gloves –cotton and solvent resistant 3.2 Safety shoes or boots 3.3 Dust mask, gas mask or respirator, particle mask 2.4 Shop uniform 2.5 Apron
4. Primer	Kinds of primers may include: 4.1 Wash Primer 4.2 Epoxy Primer 4.3 Urethane Primer 4.4 Acrylic Primer
5. Waste materials	Waste may include: 5.1 Used water 5.2 Paint scrapings 5.3 Used consumables 5.3 Paint Containers

VARIABLE	RANGE
6. Putty	Types of putty 6.1 Acrylic putty or touch up putty 62 Epoxy putty 6.3 Polyester putty 6.4 Polyurethane
7. Company standard operating procedures	Company standard operating procedures may include but not limited to: 7.1 Job order 7.2 Equipment and Materials request slip 7.3 Use of Personal Protective Equipment (PPE) such as gas • Gloves • Gas mask • Apron • Safety shoes • Eye spectacle or Goggles 7.4 Observance of Occupational Health and Safety
8. Methods of assessing surfaces	3-Methods of assessing surface for putty application include: 8.1 Visual inspection 8.2 By touch of hand 8.3 Using gauges (Paint thickness, straight edge or paint texture gauge)

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Removed body accessories 1.2 Removed paint 1.3 Mixed primer as per procedure 1.4 Applied primers 1.5 Mixed surfacer as per procedure 1.6 Applied surfacer 1.7 Applied putty on flat and complex surfaces 1.8 Sanded the putty to conform to the original shape 1.9 Used tack cloth for wiping 1.10 Avoided touching surface after degreasing and wiping of tack cloth 1.11 Used proper grit number of sand paper
2. Underpinning knowledge and attitudes	1.1 Necessary cleaning and degreasing agents 1.2 Surface preparation procedures for primers/sealers (including minor dents/surface blemish repair) for metal, plastic and fiberglass 1.3 Relevant technical information of paint materials 1.4 Workplace safety procedures 1.5 Vehicle safety requirements 1.6 Equipment safety requirements 1.7 Wet sanding procedure after surfacer 2.8 Types of Putty 2.9 Tools and Equipment used in putty application 2.10 Procedures in applying putty filler 2.11 Kinds of body paint defects 2.12 Kinds of auto body panels 2.13 Procedure in mixing putty filler 2.14 Characteristics of putty fillers 2.15 Kinds of surface areas in auto body panel 2.16 Primer/sealed surface preparation for refinishing 2.17 Correct operating procedures of relevant equipment for surface preparation 2.18 Personal safety requirements 2.19 Dedication to work 2.20 Patience and perseverance
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using relevant tools, equipment and consumable materials 3.3 Cleaning bare metal, plastic, fiberglass surfaces for primer application 3.4 Performing surfaces for surfacer application 3.5 Applying primers/sealers and surfacer 3.6 Familiarization of paint defects 3.7 Familiarization of auto body surface area and panel surfaces. 3.8 Applying putty filler to a variety of surfaces 3.9 Mixing putty 3.10 Estimating volume quantity of putty to be used and area for putty application 3.11 Communication skills in dealing with customers, superiors or peers 3.12 Cleaning work area, tools and equipment and disposing waste materials and other residues

4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Demonstration and Questioning 5.2 Written examination 5.3 Portfolio
6. Context of assessment	6.1 Competency elements must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience. 6.3 The required outcome must be able to be achieved without direct supervision

UNIT OF COMPETENCY : **APPLY AND REMOVE MASKING**

UNIT CODE : **ALT714302**

UNIT DESCRIPTOR : This unit covers the competency required in applying and removing materials in preparation for spray painting.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Remove detachable parts for panel to be painted	1.1 All ***detachable parts*** from panel to be repainted are removed as per procedure and without damage. 1.2 All detachable parts are placed on secured containers with complete label and identification.
2. Clean and degrease panel for masking	2.1 Cleaning is performed using pressurized air with air dryer to remove dust particles. 2.2 Panel is washed with car shampoo and water 2.3 Degreasing is performed as per company standard operating procedure
3. Apply masking materials	3.1 Type of ***masking materials*** to be used is accurately determined based on the panel to be repainted 3.2 Masking materials is applied as per ***masking procedures*** depending on the panel to be repainted 3.3 Improperly applied or loose ends Masking materials are re-checked and corrected upon applying pressurized air as per company standard operating procedure.
4. Remove masking materials	4.1 Remove masking materials as per paint job requirements 4.2 Masking materials removed as per sequence of layers 4.3 Masking materials are disposed as per company standard operating procedures.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Detachable parts	Example of detachable parts of automotive body include but not limited to: 1.1 Mouldings 1.2 Door handles 1.3 Clearance lights 1.4 Logo, emblem or stickers
2. Masking materials	Masking materials may include but not limited to: 2.1 Masking paper/plastics 2.2 Masking tapes for auto use 2.3 Mouldings tapes 2.4 Fine line tapes 2.5 Spray –type masking
3. Masking procedures	Masking procedures may include the following: 3.1 Reverse masking 3.2 Masking non-removable parts 3.3 Masking curved or complex areas or surfaces 3.4 Masking for block or whole panel painting 3.5 Masking for spot repairs

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Removed detachable parts for panel to be painted 1.2 Cleaned and degreased panel for masking 1.3 Applied masking materials 1.4 Removed masking materials 1.5 Ensured proper masking to prevent over spray.
2. Underpinning knowledge and attitudes	2.1 Necessary cleaning and degreasing agents 2.2 Workplace safety procedures 2.3 Vehicle safety requirements 2.4 Equipment safety requirements 2.6 Personal safety requirements 2.5 Masking Procedures 2.6 Kinds of Masking materials 2.7 Detachable Parts of automotive vehicle body 2.8 Proper use of masking materials 2.9 Procedure in removing detachable auto body parts and accessories 2.10 Open-mindedness, Trainable to new procedures, Dedication to work, Patience, Initiative, Orderliness and Cleanliness
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using tools and equipment 3.3 Cleaning bare metal surfaces, plastic and fiberglass 3.4 Degreasing panel to be repainted 3.5 Applying and removing masking materials 3.6 Removing and Replacing auto body parts and accessories 3.7 Securing/storing of auto body parts and accessories
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Demonstration with Questioning 5.2 Portfolio
6. Context of assessment	6.1 Competency elements must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience. 6.3 The required outcome must be able to be achieved without direct supervision

UNIT OF COMPETENCY : **SPRAY SOLID COLOR PAINT**

UNIT CODE : **ALT714303**

UNIT DESCRIPTOR : This unit covers the competency required in spraying solid color paint to metal, plastic and direct gloss fiberglass surfaces. It also involves single stage paint spraying.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Clean and degrease panel/vehicle to be repainted	1.1 Work area is properly cleaned as per recommended paint manufacturer and company standard. 1.2 Panel/Vehicle to be painted is positioned as per painting requirements 1.3 Cleaning of panel/vehicle is performed using pressurized air with air dryer to remove sanded particles 1.4 Degreasing of panel/vehicle is performed as per company standard operating procedure 1.5 Tack cloth is used to wipe off remaining particles
2. Prepare paint mixture and spray gun	2.1 ***Spray gun*** is set-up as per paint manufacturer specifications 2.2 ***Paint mixture*** is strained using fine paint strainer while transferring mixture to spray gun without spillage 2.3 Paint mixture is transferred to spray gun at least 70% of paint cup capacity and without spillage. 2.4 Spray pattern is checked by spray testing on separate test panel 2.5 Pattern, discharge, volume, air pressure of spray gun is adjusted as per job requirements.
3. Apply solid color paint by spraying	3.1 ***Solid color*** is applied using spray gun following and observing the ***factors in paint application***: 3.4 Appropriate ***personal protective devices*** are used during painting 3.5 Flash-off time is observed as per paint manufacturer's specification 3.6 Drying time is observed as per manufacturer's specification.
4. Clean the spray gun	4.1 Paint cup is cleaned with thinner before and after use 4.2 Paint passage is cleaned with back-flush technique 4.3 Nozzle cap is removed and fluid tip is cleaned 4.4 Thinner is ensured clear after repetitive back-flush cleaning method

RANGE OF VARIABLES

VARIABLE	RANGE
1. Spray gun	Types of spray gun: According to performance 1.1 Conventional type 1.2 HVLP (Hi volume low pressure) type According to construction 1.3 Gravity fed type 1.4 Suction type
2. Protective clothing and equipment	Personal protective clothing and safety devices may include: 2.1 Gloves -cotton and solvent resistant 2.2 Safety shoes or boots 2.3 Dust mask, gas mask or respirator, particle mask 2.4 Shop uniform 2.4 Apron 2.5 Separate clothing for actual painting application 2.6 Eye spectacles or goggles
3. Factors in paint application	Factors in paint application/handling techniques 3.1 Distance, normally 100-200 mm 3.2 Angle – Spray gun perpendicular to the panel 90 degrees 3.3 Speed – normally 800-1000 mm/sec. 3.4 Spray pattern overlap
4. Paint mixture	Paint mixture includes substance such as: 4.1 Paint 4.2 Thinner 4.3 Hardener 4.4 Additives
5. Solid color paint	Types of solid color paint are: 5.1 Single stage or direct gloss 5.2 Two stage base over clear

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned the work area before and after use. 1.2 Cleaned and degreased panel or vehicle to be repainted 1.3 Prepared paint mixture and spray gun 1.4 Applied solid color paint by spraying 1.5 Used tack cloth to wipe off remaining particles 1.6 Avoided touching surfaces after degreasing and after wiping of tack cloth 1.7 Disposed off left over paint as per company standard operating procedure. 1.8 Cleaned the spray gun before and after use
2. Underpinning knowledge and attitudes	2.1 Necessary cleaning and degreasing agents 2.2 Workplace safety procedures 2.3 Vehicle safety requirements 2.4 Equipment safety requirements 2.5 Procedure in spraying solid color paint 2.6 Personal safety requirements 2.7 Color mixing and matching 2.8 Masking Procedures 2.9 Polishing procedures 2.10 Procedure in removing detachable auto body parts and accessories 2.11 Honesty, Sense of Quality in Work, Patience, Thoroughness, Dedication to Work and Trainable to New Procedures.
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using relevant tools and equipment 3.3 Cleaning bare metal, plastic and fiberglass surfaces 3.4 Preparing surfaces for application of primers 3.5 Communication skills specifically in dealing with customers, superior or peers 3.6 Reading and writing 3.7 Computation skills for volume, area, length, ratio and proportion 3.8 Preparing paint mixtures 3.9 Disposal of wastes and other residue materials
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Demonstration and Questioning 5.2 Written examination 5.3 Portfolio
6. Context of assessment	6.1 Competency must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

UNIT OF COMPETENCY : **REPAIR SOLID COLOR PAINTS**

UNIT CODE : **ALT714309**

UNIT DESCRIPTOR : This unit covers the competency in repairing solid color paints for automotive body paint refinishing. This also involves the task in performing single stage paint coating.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Clean and degrease panel/vehicle for paint repair	1.1 Work area is properly cleaned as per recommended paint manufacturer and company standard. 1.2 Panel/Vehicle for paint repair is positioned as per painting requirements 1.3 Cleaning of panel/vehicle is performed using pressurized air with air dryer to remove sanded particles 1.4 Degreasing of panel/vehicle is performed as per standard operating procedure 1.5 Tack cloth is used to wipe off remaining particles
2. Prepare paint mixture and spray gun	2.4 ***Spray gun*** is set-according to paint manufacturer specification or recommendation 2.5 ***Paint mixture*** is strained using fine paint strainer while transferring mixture to spray gun without spillage 2.6 Paint mixture is transferred to spray gun at least 70% of paint cap capacity and without spillage. 2.7 Spray pattern is checked by spray testing on separate test panel 2.8 Pattern, discharge, volume, air pressure of spray gun is adjusted as necessary. 2.9 Shading agent is prepared as per paint manufacturer specification
3. Apply paint	3.1 Shading agent is applied using spray gun following and observing the paint manufacturer specification and ***factors in paint application*** 3.2 Appropriate ***personal protective devices*** are used during painting 3.3 Paint is applied as per spot paint Repair procedure 3.4 Flash-off time is observed as per paint manufacturer's specification 3.5 Drying time is observed as per manufacturer's specification.
4. Clean the spray gun	4.1 Paint cup is cleaned with thinner before and after use 4.2 Paint passage is cleaned with back-flush technique 4.3 Nozzle cap is removed and fluid tip is cleaned 4.4 Thinner is ensured clear after repetitive back-flush cleaning method

RANGE OF VARIABLES

VARIABLE	RANGE
1. Spray gun	Types of spray gun : According to performance 1.1 Conventional type 1.2 HVLP (Hi volume low pressure) type According to construction 1.3 Gravity fed type 1.4 Suction type
2. Protective clothing and equipment	Personal protective clothing and safety devices may include: 2.1 Gloves -cotton and solvent resistant 2.2 Safety shoes or boots 2.3 Dust mask, gas mask or respirator, particle mask 2.4 Shop uniform 2.4 Apron 2.5 Separate clothing for actual painting application
3. Factors in paint application	Factors in paint application/handling techniques 3.1 Distance, normally 100-200 mm 3.2 Angle – Spray gun perpendicular to the panel 90 degrees 3.3 Speed – normally 800-1000 mm/sec. 3.4 Spray pattern overlap
4. Paint mixture	Paint mixture includes substances such as: 4.1 Paint 4.2 Thinner 4.3 Hardener 4.4 Additives

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned and degreased panel/vehicle for paint Repair 1.2 Prepared paint mixture and spray gun 1.3 Applied paint 1.4 Repainted shaded/faded area is unnoticed
2. Underpinning knowledge and attitudes	2.1 Necessary cleaning and degreasing agents 2.2 Workplace safety procedures 2.3 Vehicle safety requirements 2.4 Equipment safety requirements 2.5 Correct operating procedures of relevant equipment for surface preparation 2.7 Personal safety requirements 2.6 Mathematical computation in volume, area, ratio and proportion, percentage and decimals. 2.7 Principle of Color wheels 2.8 Types of paint 2.9 Procedure in Paint Repair for Solid colors 2.10 Different Paint defects and properties 2.11 Patience, Sense of Quality in Work, Dedication to Work, Trainable to New procedures
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using relevant tools and equipment 3.3 Cleaning bare metal, plastic and fiberglass surfaces 3.4 Using and Handling Spray Gun 3.5 Color comparison and Matching 3.6 Computation Skills 3.7 Mixing and Transferring Paint and Mixtures 3.8 Communication skills in dealing with Customers, Superiors and Peers.
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency may be assessed through: 5.1 Demonstration with Questioning 5.2 Observation in the workplace and questioning 5.3 Portfolio 5.4 Written examination
6. Context of assessment	6.1 Competency must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

UNIT OF COMPETENCY : **PERFORM POLISHING**

UNIT CODE : **ALT714304**

UNIT DESCRIPTOR : This unit covers the competency in performing polishing for automotive body painting. It also involves skills in applying masking materials and handling of polishing equipment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Assess painted surface	1.1 Adequate ***lighting system*** is used in assessing painted surface 1.2 Appropriate ***polishing procedure*** is accurately determined 1.3 Appropriate polishing procedure are selected as per selected repair procedure
2. Prepare surface for polishing	2.1 Workplace is properly cleaned as per polishing compound manufacturer specification 2.2 ***Masking materials*** are applied on necessary areas as per appropriate ***masking procedure*** 2.3 Panel/surface to polished is positioned as per company polishing requirements
3. Polish painted surface	3.1 Manual hand polishing is applied on surface as per job requirements 3.2 Sanding is applied on surface as per job requirements 3.3 ***Handling of polishing equipment***, tools and materials is done as per procedures 3.4 Polishing is performed as per procedure 3.5 ***Polishing compound*** are applied as per polishing compound manufacturer standard 3.6 No over-polish or thin paint results
4. Clean the polished surface	4.1 Adequate tap water for washing and cleaning is used 4.2 Soft fine cloth or flannel cloth is used for wiping. 4.3 Surface is wiped-dried and cleaned
5. Install body accessories	5.1 Safety requirements are observed in installing automotive body parts and accessories 5.2 All body accessories are installed and are free from dirt 5.3 Final polished area is assessed before and after installation of body parts and accessories.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Lighting system	Lighting sources include illumination of 1.1 800-1000 lux 1.2 Natural sunlight
2. Repair procedure	Polishing procedures include: 2.1 Sanding and repainting clear coat 2.2 A) Sanding coarse B) Repainting clear coat C) Fine sanding D) Fine Polishing
3. Polishing pads	Polishing pads include: 3.1 Wool 3.2 Foam
4. Polishing compounds	Polishing compounds can be liquid or paste and include: 4.1 Fine 4.2 Medium 4.3 Coarse
5. Masking materials	Masking materials may include but not limited to; 5.1 Masking paper/plastics 5.2 Masking tapes for auto use 5.3 Moulding tapes 5.4 Fine line tapes 5.5 Spray –type masking
6. Masking procedures	Masking procedures may include the following: 6.1 Reverse masking 6.2 Masking non-removable parts 6.3 Masking curved or complex areas or surfaces 6.4 Masking for block painting 6.5 Masking for spot repairs
7. Handling of polisher	Handling of polisher must consider the following: 7.1 Angle of polishing 7.2 Direction of rotation 7.3 Strokes in polishing

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Assessed painted surface 1.2 Prepared surface for polishing 1.3 Polished painted surface 1.4 Cleaned the polished surface 1.5 Installed body accessories
2. Underpinning knowledge and attitudes	2.1 Types of polishing compounds 2.2 Procedure in using polisher 2.3 Procedure in polishing 2.4 Procedure in masking 2.5 Types of masking materials 2.6 Types of lighting sources 2.7 Kinds of Paint Repair procedures 2.8 Procedure in cleaning polished surface 2.9 Procedure in removing and installing automotive body parts and accessories 2.10 Kinds of polishing defects 2.11 Patience, Honesty, Sense of Quality in Work, Thoroughness, Dedication to Work, Attentive to details
3. Underpinning skills	3.1 Performing polishing 3.2 Applying different masking materials and techniques 3.3 Cleaning the polished surface. 3.4 Installing body parts and accessories 3.5 Using and Handling Polishing equipment and tools facilities 3.6 Using Polishing materials 3.7 Communication skills in dealing with customers, superiors and peers
4. Resource implication	The following resources **MUST** be provided: 4.1 Materials relevant to the activity 4.2 Appropriate tools, supplies and materials 4.3 Real or simulated workplace
5. Method of assessment	Competency may be assessed through: 5.1 Observation in the workplace with questioning 5.2 Demonstration with questioning 5.3 Portfolio assessment 5.4 Written examination
6. Context of assessment	6.1 Competency must be assessed in a safe working environment 6.2 Assessment of underpinning knowledge and skills may be assessed on or off the job

UNIT OF COMPETENCY : **PERFORM SOLID AND METALLIC COLOR MIXING**

UNIT CODE : **ALT714307**

UNIT DESCRIPTOR : This unit covers the competency in performing solid and metallic color mixing and matching for automotive body painting.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Determine solid color formula	1.1 Correct ***information of car/vehicle*** is checked from V.I.N (vehicle ID numbers). 1.2 Vehicle ***color*** code is matched with paint manufacturer color code.
2. Compute volume of paint needed	2.10 Consult amount of paint per panel as per paint manufacturer specification 2.11 ***Computation*** performed accurately and as per paint manufacturer specifications
3. Mix paint	3.1 Tinting colors selected as per paint manufacturer's formula 3.2 Weighing scale is calibrated 3.3 Tinting color/clear coat are weighed accurately as per procedure and according to formula 3.4 Tinting color/clear coat is mixed as per procedure 3.5 Mixing is performed considering ***paint properties*** 3.6 Paint container edges are thoroughly scraped and mixed.
4. Clean the spray gun	4.1 Paint cup is cleaned with thinner before and after use 4.2 Paint passage is cleaned with back-flush technique 4.3 Nozzle cap is removed and fluid tip is cleaned 4.4 Thinner is ensured clear after repetitive back-flush cleaning method
5. Apply paint to test panel	5. 1 Spray gun is assured clean and without contamination 5.2 Paint is applied using required ***tools, equipment, supplies and materials*** following and observing the factors in paint application 5.3 Sample paint mixture is prepared according to company procedures and mixed with thinner as per paint manufacturer specifications 6.1 Sample paint mixture is transferred to the spray gun without spillage. 6.2 Paint sample mixture is applied on test panel using spray gun according to paint manufacturer specification 6.3 Drying time/Flash-off time is observed as per manufacturer specifications 5.4 Clear coating is applied as per procedure for 2-stage solid color mixing/matching.
6. Check spray out result	6.1 Test Panel is put adjacent to original panel for color comparison using ***required light source*** 6.2 Missing color is determined and mixed to sample paint as per procedure within company standard
7. Adjust and prepare final color mixture	7.1 Re-computation for missing color is performed accurately. 7.2 Color mixing is performed as per procedure 7.3 Final test panel application is performed as per procedure 7.4 Final approval is obtained as per company standard operating procedures 7.5 All works are performed as per company standard operating procedure/occupational health and safety practices using the required ***personal protective equipment***

RANGE OF VARIABLES

VARIABLE	RANGE
1. Car/Vehicle information	Car/Vehicle information from V.I. N. include but not limited to the following: 1.1 Plate number 1.2 Model and maker of vehicle 1.3 Engine Number 1.4 Name of Owner 1.5 Vehicle body color 1.6 Vehicle trim color
2. Color	Kinds of vehicle color include: 2.1 Solid color – plain, no special effects, no metallic pigments 2.2 Metallic color – metallic sparkle effect at high lights but solid color at low lights 2.3 Pearl Mica color -
3. Computation	Different computation includes solving for: 3.1 Volume 3.2 Area 3.3 Total weight 3.3.1 By individual weight method 3.3.2 By percentage method 3.3.3 By cumulative method
4. Equipment, tools, supplies and materials	Equipment used includes: 4.1 Spray gun Tools include: 4.2 Paint stirrer/agitator 4.3 Test panel/sample panels Supplies and Materials 4.4 Paint materials 4.5 Rags
5. Paint properties	Paint properties include: 5.1 Gelation 5.2 Precipitation (Caking/Settlement) 5.3 Skinning 5.4 Separation
6. Personal protective equipment	Personal protective clothing and safety devices may include: 6.1 Gloves –cotton and solvent resistant 6.1 Safety shoes or boots 6.2 Dust mask, gas mask or respirator, particle mask 6.4 Shop uniform 6.5 Apron 6.6 Eye spectacle or goggles
7. Required light source	Required light source include: For Solid color: 7.1 Color matching light 7.2 Direct sunlight – usually at 8-10am and at 3-5 pm normal weather condition 7.3 Indoor light –2 meters from window sunlight For Metallic color: 7.4 Sunlight at 10am –3pm 7.5 Color matching light at 800-1,000 lux 7.6 Indoor light – 1 meter from window sunlight

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Determined the correct color name or description code of the vehicle 1.2 Determined solid color formula 1.3 Computed volume of paint needed 1.4 Mixed and matched paint 1.5 Applied paint to test panel by spraying 1.6 Checked Spray out Result 1.7 Adjusted and Prepared final color mixture
2. Underpinning knowledge and attitudes	2.1 Necessary cleaning and degreasing agents 2.2 Workplace safety procedures 2.3 Vehicle safety requirements 2.4 Equipment safety requirements 2.5 Correct operating procedures of Spray Gun 2.7 Personal safety requirements 2.6 Principle of Color Wheels 2.7 Types of Paint Materials 2.8 Principle of Applying Paint Coat 2.9 Different Paint Properties 2.10 Patience, Honesty, Sense of quality in Work, Dedication to Work, Thoroughness, Trainable to New Procedures
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using tools and equipment 3.3 Using and Handling Spray Gun 3.4 Mixing and transferring paint 3.5 Color comparison and matching 3.6 Computation skills 3.7 Communication skills in dealing with customer, superiors and peers
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency may be assessed through: 5.1 Demonstration with Questioning 5.2 Observation with questioning 5.3 Portfolio 5.4 Written examination
6. Context of assessment	6.1 Competency elements must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

UNIT OF COMPETENCY : **SPRAY METALLIC COLOR PAINT**

UNIT CODE : **ALT714308**

UNIT DESCRIPTOR : This unit covers the competency in spraying metallic color paint to automotive body panels. This unit also includes performance of two-stage paint application.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Clean and degrease panel/vehicle body for repainting	1.1 Work area is properly cleaned as per recommended paint manufacturer standard. 1.2 Panel/Vehicle to be painted is positioned as per painting requirements 1.3 Cleaning of panel/vehicle is performed using pressurized air with air dryer to remove sanded particles 1.4 Degreasing of panel/vehicle is performed as per standard operating procedure 1.5 Tack cloth is used to wipe off remaining particles
2. Prepare paint mixture and spray gun	2.1 Spray gun is assured clean and without contamination and set to the required condition. 2.2 Sample paint mixture is prepared according to company procedure and mixed with thinner as per paint manufacturer specifications. 2.3 ***Paint mixture*** is strained using fine paint strainer while transferring mixture to spray gun without spillage 2.4 Paint mixture is transferred to spray gun at least 70% of paint cap capacity and without spillage. 2.5 Spray pattern is checked by spray testing on separate test panel 2.6 Pattern, discharge, volume, air pressure of spray gun is adjusted as necessary.
3. Apply base color	3.1 Metallic color is applied using spray gun following and observing the ***factors in paint application*** Appropriate ***personal protective devices*** are used during painting 3.2 Flash-off time is observed as per paint manufacturer's specification 3.3 Drying time is observed as per manufacturer's specification.
4. Apply clear coat	4.1 Tack cloth is used to wipe off remaining particles 4.2 Clear coat paint is applied using spray gun following and observing the factors in paint application: 4.2 Appropriate personal protective devices are used during painting 4.3 Flash-off time is observed as per paint manufacturer's specification 4.4 Drying time is observed as per manufacturer's specification.
5. Clean the spray gun	5.1 Paint cup is cleaned with thinner before and after use 5.2 Paint passage is cleaned with back-flush technique 5.3 Nozzle cap is removed and fluid tip is cleaned 5.4 Thinner is ensured clear after repetitive back-flush cleaning method

RANGE OF VARIABLES

VARIABLE	RANGE
1. Paint mixture	Paint mixture include but not limited to: 1.1 Paint 1.2 Thinner 1.3 Hardener 1.4 Additives
2. Protective clothing and equipment	Personal protective clothing and safety devices may include: 2.1 Gloves –cotton and solvent resistant 2.2 Safety shoes or boots 2.3 Dust mask, gas mask or respirator, particle mask 2.4 Shop uniform 2.5 Apron 2.7 Separate clothing for actual painting application 2.8 Eye Protector
3. Factors in paint application	Factors in paint application/handling techniques 3.1 Distance, normally 100-200 mm 3.2 Angle – Spray gun perpendicular to the panel 90 degrees 3.3 Speed – normally 800-1000 mm/sec. 3.4 Spray pattern overlap

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned work area 1.2 Cleaned and degreased panel/vehicle body for repainting. 1.3 Prepared paint mixture and spray gun. 1.4 Applied base color 1.5 Applied clear coat.
2 Underpinning knowledge and attitude	2.1 Necessary cleaning and degreasing agents 2.2 Workplace safety procedures 2.3 Vehicle safety requirements 2.4 Equipment safety requirements 2.6 Personal safety requirements 2.5 Mathematical computation in volume, area, ratio and proportion, percentage and decimals. 2.6 Principle of Color wheels 2.7 Types of Paints 2.8 Principle of Applying Paint Coat 2.9 Procedure in Applying Metallic Paint and Performing Two Stage Paint Coal 2.10 Different Paint Defects and Properties 2.11 Patience, Sense of Quality in Work, Dedication to Work, Trainable to New Procedures
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using relevant tools and equipment 3.3 Using and Handling Spray Gun 3.4 Mixing and Transferring Paint 3.5 Color comparison and Matching 3.6 Computation Skills 3.7 Communication skills in dealing with Customers, Superiors and Peers.
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency may be assessed through: 5.1 Demonstration and Questioning 5.2 Observation in the workplace and questioning 5.3 Portfolio 5.4 Written examination
6. Context of assessment	6.1 Competency must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

UNIT OF COMPETENCY : **REPAIR METALLIC COLOR PAINTS**

UNIT CODE : **ALT714310**

UNIT DESCRIPTOR : This unit covers the competency in repairing metallic or special color paints for automotive body painting. It also involves the ability to perform three stage painting application.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Clean and degrease panel/vehicle for paint repair	1.1 Work area is properly cleaned as per recommended paint manufacturer and company standard. 1.2 Panel/Vehicle for paint repair is positioned as per painting requirements 1.3 Cleaning of panel/vehicle is performed using pressurized air with air dryer to remove sanded particles 1.4 Degreasing of panel/vehicle is performed as per standard operating procedure 1.5 Tack cloth is used to wipe off remaining particles
2. Prepare paint mixture and spray gun	2.1 ***Spray gun*** is set-up to the required condition 2.2 ***Paint mixture*** is strained using fine paint strainer while transferring mixture to spray gun without spillage 2.3 Paint mixture is transferred to spray gun at least 70% of paint cap capacity and without spillage. 2.4 Spray pattern is checked by spray testing on separate test panel 2.5 Pattern, discharge, volume, air pressure of spray gun is adjusted as necessary. 2.6 Shading thinner or shading clear is prepared as per paint manufacturer specification
3. Apply paint	3.1 Shading thinner or shading clear is applied using spray gun following and observing paint manufacturer specification 3.2 Appropriate ***personal protective devices*** are used during painting 3.3 Paint is applied as per spot paint repair procedure and ***factors in paint application*** 3.4 Flash-off time is observed as per paint manufacturer's specification 3.5 Drying time is observed as per manufacturer's specification.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Spray gun	Types of spray gun : According to performance 1.1 Conventional type 1.2 HVLP (Hi volume low pressure) type According to construction 1.3 Gravity fed type 1.4 Suction type
2. Protective clothing and equipment	Personal protective clothing and safety devices may include: 2.1 Gloves -cotton and solvent resistant 2.2 Safety shoes or boots 2.3 Dust mask, gas mask or respirator, particle mask 2.4 Shop uniform 2.5 Apron 2.6 Separate clothing for actual painting application
3. Factors in paint application	Factors in paint application/handling techniques 3.1 Distance, normally 100-200 mm 3.2 Angle – Spray gun perpendicular to the panel 90 degrees 3.3 Speed – normally 800-1000 mm/sec. 3.4 Spray pattern overlap

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned and degreased panel/vehicle for paint repair 1.2 Prepared paint mixture and spray gun 1.3 Applied paints 1.4 Used of Tack cloth to wipe off remaining particles 1.5 Repainted shaded/faded area must be unnoticed.
2. Underpinning knowledge and attitudes	2.1 Necessary cleaning and degreasing agents 2.2 Workplace safety procedures 2.3 Vehicle safety requirements 2.4 Equipment safety requirements 2.5 Correct operating procedures of relevant equipment for surface preparation 2.6 Personal safety requirements 2.7 Procedure in Repairing Metallic or Special Color Paints 2.8 Different Paint Defects and Its Properties 2.9 Types of Different Paint Materials 2.10 Principle of Color Wheels 2.11 Procedure in Performing Three-Stage Paint Application 2.12 Health Awareness on Effect of paint Particles and Fumes 2.13 Workshop Maintenance and Housekeeping 2.14 Proper Disposal of Waste Materials 2.15 Positive Work Values (Patience, Honesty, Perseverance, Attention to Details)
3. Underpinning skills	3.1 Accessing, interpreting and applying technical information 3.2 Using relevant tools and equipment 3.3 Cleaning bare metal, plastic, and fiberglass surfaces 3.4 Cleaning and Degreasing Panel 3.5 Applying three-stage Coating/painting 3.6 Wearing Personal Protective Clothing and Equipment 3.7 Handling and Transferring Paint Materials 3.8 Computation Skills 3.9 Communication skills in dealing with customers, superiors and peers
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Demonstration or Observation with Questioning 5.2 Portfolio assessment 5.3 Written examination
6. Context of assessment	6.1 Competency elements must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

SECTION 3 TRAINING STANDARDS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for Automotive Body Painting/Finishing NCII.

3.1 CURRICULUM DESIGN

Course Title: **AUTOMOTIVE BODY PAINTING/ FINISHING** NC Level **NC II**

Nominal Training Duration: **158 Hours**

Course Description:

This course is designed to enhance the knowledge, skills and attitudes of an individual in the field of automotive body paint refinishing in accordance with industry standards. It covers core competencies such as: assess automotive painting jobs; prepare undamaged and damaged surface for painting, apply masking, perform solid and metallic color mixing; spray solid color paint, spray metallic color paint; and repair solid color paints, and perform polishing.

BASIC COMPETENCIES
(18 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Participate in workplace communication	1.1 Obtain and convey workplace information 1.2 Complete relevant work related documents 1.3 Participate in workplace meeting and discussion	• Group discussion • Interaction	• Written test • Practical/ performance test • Interview
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team. 2.2 Describe work as a team member.	• Group discussion • Interaction	• Observation • Simulation • Role playing
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals 3.2 Set and meet work problems 3.3 Maintain professional growth and development	• Group discussion • Interaction	• Demonstration • Observation • Interviews/ questioning
4. Practice occupational health and safety	4.1 Evaluate hazards and risks 4.2 Control hazards and risks 4.3 Maintain occupational health and safety awareness	• Group Discussion • Plant tour • Symposium	• Observation • Interviews

COMMON COMPETENCIES
(20 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Apply appropriate sealant/ adhesive	1.1 Identify appropriate sealant/ adhesive 1.2 Prepare surface for sealant / adhesive application 1.3 Store unused and dispose used sealant/adhesive	• Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning	• Written test • Oral questioning • Direct observation • Project method • Interview
2. Move and position vehicle	2.1 Prepare vehicle for driving 2.2 Move and position vehicle 2.3 Check the vehicle	• Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning	• Written test • Oral questioning • Direct observation • Project method • Interview
3. Perform mensuration and calculation	3.1 Select measuring instrument and carry out measurement and calculations 3.2 Maintain measuring instruments	• Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning	• Written test • Oral questioning • Direct observation • Project method • Interview
4. Read, interpret and apply specifications and manual	6.1 Identify/access manuals and interpret data and specification 6.2 Apply information accessed in manual 6.3 Store manual	• Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning	• Written test • Oral questioning • Direct observation • Project method • Interview
5. Use and apply lubricants/ coolants	7.1 Identify type of lubricants/ coolants 7.2 Use and apply lubricants	• Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning	• Written test • Oral questioning • Direct observation • Project method • Interview
6. Perform shop maintenance	8.1 Inspect/clean tools and work area 8.2 Store/arrange tools and shop equipment 8.3 Dispose waste/used lubricants 8.4 Report damaged tools/equipment	• Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning	• Written test • Oral questioning • Direct observation • Project method • Interview

CORE COMPETENCIES
(120 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Assess auto paint jobs	1.1 Identify different types of paints 1.2 Determine different types of paint defects 1.3 Evaluate painting works 1.4 Recommend corrective measure	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Written examination • Interview
2. Prepare undamaged surface for painting	2.1 Remove body accessories 2.2 Prepare surface 2.3 Apply primer paint 2.4 Apply sealant to new panel	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview
3. Prepare damaged surface for painting	3.1 Remove body accessories 3.2 Remove paint 3.3 Clean the spray gun 3.4 Apply primers 3.5 Apply putty on flat surfaces 3.6 Apply putty on complex surfaces 3.7 Apply surfacer	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview
4. Apply and remove masking	4.1 Clean panel and apply masking 4.2 Remove masking	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview
5. Perform solid and metallic color mixing	5.1 Determine solid color formula 5.2 Compute volume of paint needed 5.3 Mix paint 5.4 Clean the spray gun 5.5 Apply paint to test panel 5.6 Check spray out result 5.7 Adjust and prepare final color mixture	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Written examination • Interview
6. Spray solid color paints	6.1 Clean and degrease panel/vehicle for paint repair 6.2 Prepare paint mixture and spray gun 6.3 Apply paint 6.4 Clean the spray gun	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview
7. Spray metallic color paint	7.1 Clean and degrease panel/vehicle body for repainting 7.2 Prepare paint mixture and spray gun 7.3 Apply base color 7.4 Clean the spray gun	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview
8. Repair solid color	8.1 Clean panel for paint repair	• Discussion	• Demonstration

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
paints	8.2 Prepare paint materials, tools/equipment 8.3 Apply paint	• Demonstration • Practical application	of practical skills • Interview
9. Repair metallic color paints	9.1 Clean panel for paint repair 9.2 Prepare paint materials, tools/equipment 9.3 Apply paint	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview
10. Perform polishing	10.1 Assess and prepare surface for polishing 10.2 Polish painted surface 10.3 Clean polished surface 10.4 Install body accessories	• Discussion • Demonstration • Practical application	• Demonstration of practical skills • Interview

3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET.

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is individualized and self-paced;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off-the-job components;
- Allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Approved training programs are nationally accredited.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Practical application System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.

3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students should possess the following requirements:

- can communicate both oral and written;
- physically and mentally fit;
- with good moral character; and
- can perform basic mathematical computation.

This list does not include specific institutional requirements such as educational attainment, appropriate work experience, and others that may be required of the trainees by the school or training center delivering the TVET program.

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS AUTOMOTIVE BODY PAINTING/FINISHING – NC II

Recommended list of tools, equipment and materials for the training of 25 trainees for Automotive Body Painting/ Finishing – NC II

TOOLS		EQUIPMENT		MATERIALS	
QTY		QTY		QTY	
6 pairs	• Putty knife	1 unit	• Sander (single action) w/ vacuum pump	25 pcs.	• Sandpaper #120
4 pcs.	• Scraper			25 pcs.	• Sandpaper #180
2 pcs.	• Spatula	1 unit	• Sander (dual action) or orbital sander	25 ltrs.	• Paint remover
2 sets	• Screw driver			10 ltrs.	• Degreaser
2 sets	• Wrench (socket)	1 unit	• Air compressor	10 ltrs.	• Thinner
2 sets	• Wrench (combination)	1 unit	• Spray gun (complete accessories)	10 ltrs.	• Surfacer
				10 ltrs.	• Sealant
1 pc.	• Impact wrench			10 sets	• Masking materials
2 sets	• Mechanic's hammer			10 ltrs.	• Wash primer
25 pcs.	• Goggle			10 ltrs.	• Epoxy primer
25 pairs	• Glove			10 ltrs.	• Urethane primer
25 pcs.	• Dust mask			10 ltrs.	• Acrylic primer
2 pcs.	• Gas mask			1 liter	• Penetrating oil
25 pairs	• Safety shoes				
25 pcs.	• Shop uniform				
2 sets	• S.S.T.				

3.5 TRAINING FACILITIES
AUTOMOTIVE BODY PAINTING/FINISHING – NC II

The workshop must be made of reinforced concrete or steel structure. The size must be suited on the requirements of the competencies. The facility should accommodate a minimum of 25 students/trainees.

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
Workshop Component Areas			
• Laboratory/Workshop Area	-	-	100.00
• Lecture Room	5.00 x 5.00	25.00	25.00
• Tool, Supply & Storage Room	3.00 X 3.00	9.00	9.00
• Learning Resource Center	2.00 x 5.00	10.00	10.00
• Wash Room and Toilet	2.00 X 5.00	10.00	10.00
		Total (Workshop Component)	154.00
• Circulation Area (30% of Workshop Component Space)			40.00
Grand Total (Building Space)			**194.00**

Note: The entries in the size in meters column are recommendations only. The grand total (building space) is the minimum space requirement for registration.

3.6 TRAINERS' QUALIFICATION
AUTOMOTIVE/LAND TRANSPORT SECTOR

AUTOMOTIVE BODY PAINTING/FINISHING – NC II

TRAINER QUALIFICATION (TQ II)

- Must be a holder of Automotive Body Painting/ Finishing NC III
- Must have undergone training on Training Methodology II (TM II)
- Must be computer literate
- Must be physically and mentally fit
- *Must have at least 2 years job/industry experience
- Must be a civil service eligible (for government position or appropriate professional license issued by the Professional Regulatory Commission)

* Optional. Only when required by the hiring institution.

Reference: TESDA Board Resolution No. 2004 03

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

SECTION 4 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1 To attain the National Qualification of Automotive Body Painting/Finishing NC II, the candidate must demonstrate competence in all the units of competency listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4.2 Individual aspiring to be awarded the qualification of Automotive Body Painting/Finishing NC II must acquire Certificate of Competency in all the following core units of the qualification. Candidates may apply for assessment in any accredited assessment center.

4.2.1 Apply Solid Color Paints
- Prepare Undamaged Surface for Painting
- Apply and Remove Masking
- Spray Solid Color Paints
- Perform Polishing

4.2.2 Apply Metallic Color Paints
- Assess Auto Paint Jobs
- Prepare Damaged Surface for Painting
- Apply and Remove Masking
- Perform Solid/Metallic Color Mixing
- Spray Metallic Color Paint
- Perform Polishing

4.2.3 Repair Solid Color Paints
- Assess Auto Paint Jobs
- Prepare Damaged Surface for Painting
- Apply and Removed Masking
- Perform Solid/Metallic Color Mixing
- Repair Solid Color Paint
- Perform Polishing

Successful candidates shall be awarded Certificates of Competency (COC).

4.3 Accumulation and submission of all COCs acquired for the relevant units of competency comprising a qualification, an individual shall be issued the corresponding National Certificate.

4.4 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

4.5 The following are qualified to apply for assessment and certification:

4.5.1 Graduates of formal, non-formal and informal including enterprise-based training programs.

4.5.2 Experienced workers (wage employed or self employed)

4.6 The guidelines on assessment and certification are discussed in detail in the “Procedures Manual on Assessment and Certification” and “Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTOQCS)”..

COMPETENCY MAP- AUTOMOTIVE SECTOR

Legend:
Automotive Body Paint Finishing NC II

CORE COMPETENCIES

Performs Gas Engine Tune up	Perform Diesel Engine Tune Up	Service Automotive Battery	Service Ignition System	Test & Repair Wiring/Lighting System	Perform Under-chassis Preventive Maintenance	Service Starting System	Service Suspension System
Service Charging System	Service Engine Mechanical System	Service Clutch System	Service Differential & Front/Rear Axle	Service Steering System	Overhaul Manual Transmission	Service Brake System	Service Electronics Body Management System
Test & Repair Electrical Security System/Components	Service Electronic Engine Management	Service Automatic Transmission	Overhaul Engines & Associated Components	Perform Maintenance Service Check up & Repair to AC	Install Auto AC System	Service Aircon Compressor & Associated Comp	Carry Out Pre-Repair Operation on Engine Components
Service Electronic Drive Management System	Service Diesel Engine Management System & Component	Service Diesel Fuel Injection System Components	Service Emission Control System	Interpret Technical Manual Specification of Engine Components	Disassemble Engine Block and Sub-Assemblies, Check Tolerances and Components	Disassemble Engine Sub-Assemblies /Cylinder Head and Check Components	Inspect Engine Components and Determined Preferred Action
Carry Out Machining Operations	Set, Operate and Monitor Specialized Machine	Use and Maintain Measuring Instrument	Assemble Engine Block and Sub-Assemblies, Check Tolerances and Components	Assemble Engine Sub-Assemblies /Cylinder Head and Check Components	Perform Special Color Matching	Assess Auto Painting Jobs	Prepare Undamaged Surface for Painting
Prepare Damaged Surface for Painting	Apply Masking	Spray Solid Color Paints	Repair Solid Color Paints	Perform Polishing	Perform Solid/Metallic Color Mixing	Spray Metallic Color Paint	Repair Metallic or Special Color Paint
Spray Pearl or Mica Color Paint					Prepare Vehicle Body for Repair	Repair Body Panel	Replace Damaged Panel/Parts with Pre-Fabricated Panel

COMMON COMPETENCIES

Interpret/draw technical drawing	Perform mensuration and calculation	Move and position vehicle	Apply appropriate sealant/ adhesive	Use and apply lubricant/ coolant	Perform Shop Maintenance	Read, interpret and apply specifications and manuals	Prepare job estimate/costing

BASIC COMPETENCIES

Receive and respond to workplace communication	Work with others	Demonstrate work values	Practice basic housekeeping procedures	Lead in workplace communication	Develop and practice negotiation skills	Use relevant technologies	Solve problems related to work activities	Plan and organize work
Participate in workplace communication	Work in team environment	Practice career professionalism	Practice occupational health and safety procedures	Lead small team	Use mathematical concepts and techniques	Develop team and individual	Apply problem solving techniques in the workplace	Utilize specialized communication skills
Promote environmental protection	Collect, analyze and organize information							

DEFINITION OF TERMS

1.	**Basecoat**	The foundation paint layer of the basecoat / clearcoat automotive finish. Specifically the layer of densely pigmented paint (color) applied over the primer coat.
2.	**D.A. Polisher/ Sander**	Dual Action rotates with a double elliptical movement
3.	**Degreasing**	The removal from the substrate of contaminants which would otherwise give rise to surface defects and performance failures. e.g. poor adhesion
4.	**Drying**	The process of change of a coating from the liquid to the solid state by evaporation of solvent, chemical reaction of the binding medium, or a combination of these processes. When drying takes place during exposure to air at normal temperatures, it is called 'air-drying'; if it can be accelerated by the application of a moderate degree of heat it is called 'Force-drying' (or *Low-bake*), as distinct from High-bake. Alternate Term(s): Binder, Air-drying, Force-drying, Stoving, Low-bake, High-bake
5.	**Fish Eye**	Complications which occur during repainting when paint is repelled from a spot due to the presence of grease, oil or silicone on the paint surface
6.	**Flash-off Time**	Dwell time for solvent to evaporate from the paint surface
7.	**Masking**	Temporary covering of areas not to be painted
8.	**Metallic Paint**	A type of automotive finish which contains metallic flakes that produce a glittery appearance A term used for finishes incorporating fine metallic particles, usually aluminum, in the paint.
9.	**Mica**	A naturally occurring mineral, based on silica, which after treatment, is used as an effect pigment in coatings. Their special property is that light falling on a mica particle, depending on the angle of illumination, reflects the light with a change in colour. Because of this they are sometimes referred to as *pearls*. Alternate Term(s): Pearl
10.	**Mottling**	Paint color appears streaked, with light and dark areas. Cause, heavier film thickness in some areas that in others. Excessive wetting of some areas when painted. Uneven disbursement of the metallic in the paint.
11.	**Orange Peel**	The nubby rough appearance of paint; looks much like the texture of an orange skin, surface lacks clarity or reflected image. Caused by paint applied too dry, resulting in poor flow-out.

12. Overspray	Substance such as paint mist that settles out of the air onto automobile surface appearing as tiny specks.
13. Paint Film Thickness	Measure of the amount of paint on the vehicle. Also known as film builds, and is measured in millimeters or thousandths of an inch.
14. Polishing	Term is often used to describe the action of using a machine to buffer wheel a vehicle.
15. Primers	Material applied to the surface to seal, fill scratches and improve adhesion of paint.
16. Putty	A plastic material with a high mineral filler content – used for filling deep holes or wide gaps.
17. Sanding	An abrasive process used to level a coated surface prior to the application of a further coat. Alternate Term(s): Flatting
18. Sealer/Sealant	A protective product applied by hand or machine to an automotive paint, which coats, seals and protects the surface. Normally contains silicones to maximize durability.
19. Skinning	The formation of a thin tough film on the surface of a liquid paints film. Usually due to reaction with the air or to rapid solvent loss.
20. Solid Color	A coating, which contains colored pigments only, i.e., does not contain pigments such as aluminum and micas.
21. Spray Gun	A typical painter will use a high-pressure spray gun to apply coatings. High-pressure guns are powered by compressed air. The purpose of the gun is to turn the liquid paint into a mist (atomize) and propel the paint toward the surface to be painted. When the wet mist contacts the surface, some of it sticks and some of it bounces off of the surface. Under ideal conditions, only about 30% of the paint sprayed stick or is transferred to the surface using a high pressure spray gun. This is termed transfer efficiency; high-pressure spray guns have a maximum transfer efficiency of 30%. This means that if a gallon of paint can coat 300 square feet, it will only coat 90 square feet if applied with a high-pressure spray gun.
22. Tack cloth	Cotton fabric, such as cheesecloth, lightly impregnated with a resin, used to remove dust from a surface after rubbing down and prior to further painting. Tack rags should be stored in an airtight container to conserve their tackiness.

23. Thinner	A blend of volatile organic solvents added to the paint to reduce it to the correct viscosity for application
24. Three-Stage Color	A topcoat colour, which consists of 3, parts, a basecoat, a midcoat and a clear. Alternate Term(s): Tri-coat
25. VIN (Vehicle Identification Number)	Acronym for Vehicle Identification Number. This is a unique number that identifies your vehicle. Although its primary purpose is to identify your vehicle, it often contains important information concerning the equipment and options that were installed on your vehicle at the factory. This information allows the Repair Center to order the correct parts for your vehicle. Any professional estimate or Repair Order will have this number on it
26. Wet Sanding	A procedure of simultaneously sanding and rinsing an automotive finish to remove imperfections. Regarded as complicated and should only be attempted by professionals.

ACKNOWLEDGEMENTS

The Technical Education and Skills Development Authority (TESDA) wishes to extend thanks and appreciation to the many representatives of business, industry, academe and government agencies who donated their time and expertise to the development and validation of this Training Regulation.

THE TESDA ADVISORY PANEL (TAP)

MR. ALLEN RAYMUND A. RUFO
TAP Chairman – Automotive Sector
TOYOTA Motors Philippines, Corp.
Parañaque City
Automotive Industry Board Foundation, Inc. (AIBFI)
Suite 1206, 12 th flr. Jollibee Center
San Miguel Avenue, Pasig City

MS. MA. CLARISSA V. FUNESTO
TAP Alternate Chairperson – Automotive Sector
HONDA Phils. Inc.
Parañaque City
Automotive Industry Board Foundation , Inc. (AIBFI)
Suite 1206, 12 th flr. Jollibee Center
San Miguel Avenue, Pasig City

MR. SIXTO D. CAYPUNO
TAP Member – Academe
Samson Technical College
Cubao, Quezon City

MR. BENITO S. FELIX
TAP Member – Academe
Technological University of the Philippines
Tagig.MM.

MR. ANGEL Y. DIMALANTA
TAP Member – Labor
TOYOTA Motors Philippines Corporation
Supervisory Union
Automotive Industry Workers Alliance
Km.15 So. Superhighway Parañaque City MM.

MR. ALLAN V. MERCADO
Member – Labor
Automotive Service Association
TESDA Region VII Compound
Mandaue City

THE TECHNICAL AND INDUSTRY EXPERT PANEL

AUTOMOTIVE BODY PAINTER/FINISHER

RAYMOND CECILIO A. CABAUATAN
BENIGNO L. AQUINO
NESTOR PARAYNO
APOLINAR R. RAMPOLA
GILBERT BLANES
Toyota Motors Phils, Corporation
Brgy. Pulong, Sta. Rosa, Laguna

RICHARD O. ALMUDIN
NISSAN Core Automotive Resources
Pasong Tamo Makati City

ENRIQUE M. SARMIENTO
Mantrade Devt. Corp.
Pasong Tamo Extension, Makati City

RUDOLFO B. VELASCO
RBV Auto Management and Consultancy, New Manjila, Quezon City

The PARTICIPANTS in the National Validation of this Training Regulation		
MUSSOLINI C. BARILLO **ASAI, Cebu City**	**MABINI P. CALINAWAN** Filipinas Shell Bajada, Davao City	**DIEGO L. DRECE** Llarenas Motor Works Diit, Tacloban City
LORIMER V. GARCIA The Wheels, Auto Repair Shop Cebu City	**ALFREDO V. PANUELA JR.** TESDA Davao	**EMMANUEL M. GARCIA** TESDA RTC Tacloban City
REYNALDO B. BALLETEROS TESDA PTC-Kabangkalan Bacolod		
Members of the TESDA Board		
The MANAGEMENT and STAFF of the TESDA Secretariat		
TESDA EXCOM		
• **SDCO**	• **OFTVET**	• **TESDA Regional/Provincial Offices** (Regions VI, VII, VIII, and XI)

List of Published Training Regulations

- ❑ Animal Production NC II
- ❑ Aquaculture NC II
- ❑ **Automotive Body Painting/Finishing NC II**
- ❑ Automotive Body Repair NC II
- ❑ Auto Engine Rebuilding NC II
- ❑ Automotive Servicing NC II
- ❑ Bartending NC II
- ❑ Building Wiring Installation NC II
- ❑ Carpentry NC II
- ❑ Commercial Cooking NC II
- ❑ Computer Hardware Servicing NC II
- ❑ Deck Seafaring NC II
- ❑ Dressmaking NC II
- ❑ Driving NC II
- ❑ Engine Seafaring NC II
- ❑ Food and Beverage Services NC II
- ❑ Footwear Making NC II
- ❑ Heavy Equipment Operation NC II
- ❑ Horticulture NC II
- ❑ Household Services NC II
- ❑ Housekeeping NC II
- ❑ Machining NC II
- ❑ Masonry NC II
- ❑ Motorcycle and Small Engine Servicing NC II
- ❑ Plumbing NC II
- ❑ Pyrotechnics NC II
- ❑ RAC Servicing NC I
- ❑ RAC Servicing NC II
- ❑ Security Services NC II
- ❑ Tailoring NC II
- ❑ Tour Guiding Services NC II
- ❑ Transport RAC Servicing NC II
- ❑ Travel Services NC II
- ❑ Welding NC II

These materials are available in both printed and electronic copies. For more information please contact:

Technical Education and Skills Development Authority (TESDA)
Telephone Nos.: 893-8303, 893-2139; 817-4076 to 82 loc. 615 to 617
or visit our website: www.tesda.gov.ph