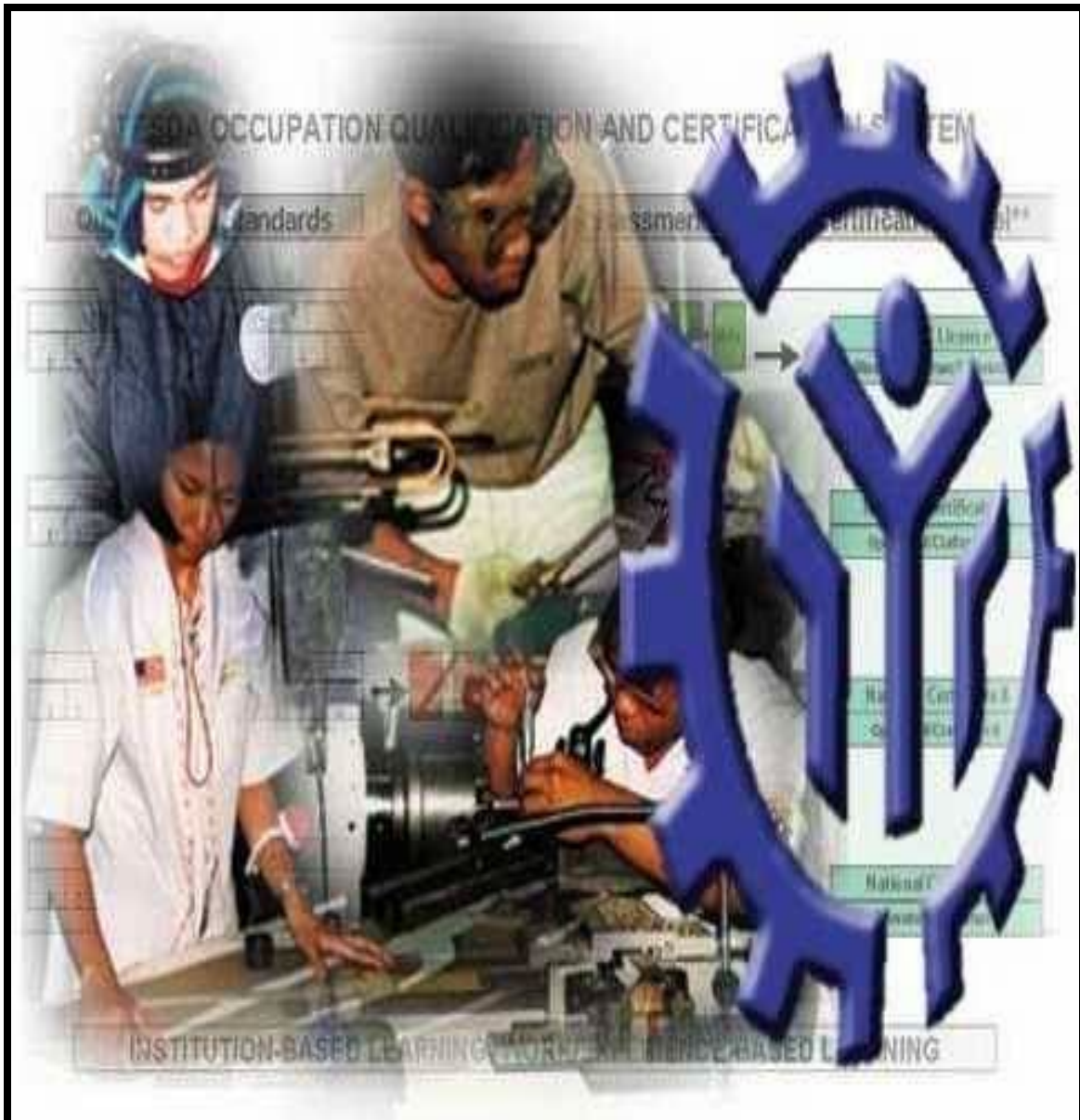


TRAINING REGULATIONS

AUTOMOTIVE BODY PAINTING/FINISHING NC III



AUTOMOTIVE SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

East Service Road, South Superhighway, Taguig City, Philippines

*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, equipment and materials; training facilities; trainer's qualification; and institutional assessment.
- Section 4 National Assessment and Certification Arrangements - describe the policies governing assessment and certification procedure

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TRAINING REGULATIONS FOR AUTOMOTIVE BODY PAINTING/FINISHING NC III

SECTION 1 AUTOMOTIVE BODY PAINTING/FINISHING NC III QUALIFICATIONS

The AUTOMOTIVE BODY PAINTING/FINISHING NC III Qualification consists of competencies that a person must achieve to repair pearl/mica metallic body panels specifically applying the skill in pearl/mica, metallic color matching. It also covers the competency in painting pearl or mica colors.

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	TOOL COMPETENCIES
500311109	Lead Workplace Communication
500311110	Lead Small Teams
500311111	Develop and Practice Negotiation skills
500311112	Solve Problems Related to Work Activities
500311113	Use Mathematical Concepts and Techniques
500311114	Use Relevant Technologies

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 Lubricant/Coolant
ALT723205	Perform Shop Maintenance
ALT311204	Perform Job Estimate
ALT311205	Interpret/Draw Technical Drawing

CODE	CORE COMPETENCIES
ALT714311	Perform Pearl Color Matching
ALT714312	Spray Three-Stage Pearl or Mica Color Paint

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

- Automotive painter (three- stage pearl/mica colors painting)**
- Automotive paint contractor**
- Automotive body paint finisher**

SECTION 2 COMPETENCY STANDARDS

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

BASIC COMPETENCIES

UNIT OF COMPETENCY : **LEAD WORKPLACE COMMUNICATION**

UNIT CODE : **500311109**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Communicate information about workplace processes	1.1 Appropriate <i>communication method</i> is selected 1.2 Multiple operations involving several topics areas are communicated accordingly 1.3 Questions are used to gain extra information 1.4 Correct sources of information are identified 1.5 Information is selected and organized correctly 1.6 Verbal and written reporting is undertaken when required 1.7 Communication skills are maintained in all situations
2. Lead workplace discussions	2.1 Response to workplace issues are sought 2.2 Response to workplace issues are provided immediately 2.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.4 Goals/objectives and action plan undertaken in the workplace are communicated
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise

RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	1.1 Non-verbal gestures 1.2 Verbal 1.3 Face to face 1.4 Two-way radio 1.5 Speaking to groups 1.6 Using telephone 1.7 Written 1.8 Internet

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Dealt with a range of communication/information at one time 1.2 Made constructive contributions in workplace issues 1.3 Sought workplace issues effectively 1.4 Responded to workplace issues promptly 1.5 Presented information clearly and effectively written form 1.6 Used appropriate sources of information 1.7 Asked appropriate questions 1.8 Provided accurate information
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> 2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal communication methods
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> 3.1 Organize information 3.2 Understand and convey intended meaning 3.3 Participate in variety of workplace discussions 3.4 Comply with organization requirements for the use of written and electronic communication methods
<p>4. Resource implications</p>	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Variety of Information 4.2 Communication tools 4.3 Simulated workplace
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Competency in this unit must be assessed through 5.2 Direct Observation 5.3 Interview
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> 6.1 Competency may be assessed in the workplace or in simulated workplace environment

UNIT OF COMPETENCY : **LEAD SMALL TEAMS**

UNIT CODE : **500311110**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes to lead small teams including setting and maintaining team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Provide team leadership	1.1 Work requirements are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3 Team members' queries and concerns are recognized, discussed and dealt with
2. Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team members duties and area of responsibility 3.3 Performance expectations are discussed and disseminated to individual team members
4. Supervised team performance	4.1 Monitoring of performance takes place against defined performance criteria and/or assignment instructions and corrective action taken if required 4.2 Team members are provided with feedback , positive support and advice on strategies to overcome any deficiencies 4.3 Performance issues which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed in accordance with company procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's concerns	2.1 Roster/shift details
3. Monitor performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal process
5. Performance issues	5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2 Assessed and monitored team and individual performance against set criteria 1.3 Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4 Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5 Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> 2.1 Company policies and procedures 2.2 Relevant legal requirements 2.3 How performance expectations are set 2.4 Methods of Monitoring Performance 2.5 Client expectations 2.6 Team member's duties and responsibilities
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> 3.1 Communication skills required for leading teams 3.2 Informal performance counseling skills 3.3 Team building skills 3.4 Negotiating skills
<p>4. Resource implications</p>	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2 Materials relevant to the proposed activity or task
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Direct observations of work activities 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
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> 6.1 Competency assessment may occur in workplace or any appropriately simulated environment 6.2 Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY : **DEVELOP AND PRACTICE NEGOTIATION SKILLS**

UNIT CODE : **500311111**

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes required to collect information in order to negotiate to a desired outcome and participate in the negotiation.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan negotiations	1.1 Information on <i>preparing for negotiation</i> is identified and included in the plan 1.2 Information on creating <i>non verbal environments</i> for positive negotiating is identified and included in the plan 1.3 Information on <i>active listening</i> is identified and included in the plan 1.4 Information on different <i>questioning techniques</i> is identified and included in the plan 1.5 Information is checked to ensure it is correct and up-to- date
2. Participate in negotiations	2.1 Criteria for successful outcome are agreed upon by all parties 2.2 Desired outcome of all parties are considered 2.3 Appropriate language is used throughout the negotiation 2.4 A variety of questioning techniques are used 2.5 The issues and processes are documented and agreed upon by all parties 2.6 Possible solutions are discussed and their viability assessed 2.7 Areas for agreement are confirmed and recorded 2.8 Follow-up action is agreed upon by all parties

RANGE OF VARIABLES

VARIABLE	RANGE
1. Preparing for negotiation	1.1 Background information on other parties to the negotiation 1.2 Good understanding of topic to be negotiated 1.3 Clear understanding of desired outcome/s 1.4 Personal attributes 1.4.1 self awareness 1.4.2 self esteem 1.4.3 objectivity 1.4.4 empathy 1.4.5 respect for others 1.5 Interpersonal skills 1.5.1 listening/reflecting 1.5.2 non verbal communication 1.5.3 assertiveness 1.5.4 behavior labeling 1.5.5 testing understanding 1.5.6 seeking information 1.5.7 self disclosing 1.6 Analytic skills 1.6.1 observing differences between content and process 1.6.2 identifying bargaining information 1.6.3 applying strategies to manage process 1.6.4 applying steps in negotiating process 1.6.5 strategies to manage conflict 1.6.6 steps in negotiating process 1.6.7 options within organization and externally for resolving conflict
2. Non verbal environments	2.1 Friendly reception 2.2 Warm and welcoming room 2.3 Refreshments offered 2.4 Lead in conversation before negotiation begins
3. Active listening	3.1 Attentive 3.2 Don't interrupt 3.3 Good posture 3.4 Maintain eye contact 3.5 Reflective listening
4. Questioning techniques	4.1 Direct 4.2 Indirect 4.3 Open-ended

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome</p> <p>1.2 Participated in negotiation with at least one person to achieve an agreed outcome</p>
2. Underpinning knowledge and attitude	<p>2.1 Codes of practice and guidelines for the organization</p> <p>2.2 Organizations policy and procedures for negotiations</p> <p>2.3 Decision making and conflict resolution strategies procedures</p> <p>2.4 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation</p> <p>2.5 Flexibility</p> <p>2.6 Empathy</p>
3. Underpinning skills	<p>3.1 Interpersonal skills to develop rapport with other parties</p> <p>3.2 Communication skills (verbal and listening)</p> <p>3.3 Observation skills</p> <p>3.1 Negotiation skills</p>
4. Resource implications	<p>The following resources MUST be provided:</p> <p>4.1 Room with facilities necessary for the negotiation process</p> <p>4.2 Human resources (negotiators)</p>
5. Method of assessment	<p>Competency may be assessed through:</p> <p>5.1 Observation/demonstration and questioning</p> <p>5.2 Portfolio assessment</p> <p>5.3 Oral and written questioning</p> <p>5.4 Third party report</p>
6. Context of assessment	<p>6.1 Competency to be assessed in real work environment or in a simulated workplace setting.</p>

UNIT OF COMPETENCY : **SOLVE PROBLEMS RELATED TO WORK ACTIVITIES**

UNIT CODE : **500311112**

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause of problems.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify the problem	1.1 Variances are identified from normal operating parameters; and product quality 1.2 Extent, cause and nature are of the problem are defined through observation, investigation and analytical techniques 1.3 Problems are clearly stated and specified
2. Determine fundamental causes of the problem	2.1 Possible causes are identified based on experience and the use of problem solving tools / analytical techniques. 2.2 Possible cause statements are developed based on findings 2.3 Fundamental causes are identified per results of investigation conducted
3. Determine corrective action	3.1 All possible options are considered for resolution of the problem 3.2 Strengths and weaknesses of possible options are considered 3.3 Corrective actions are determined to resolve the problem and possible future causes 3.4 Action plans are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures
4. Provide recommendation/s to manager	4.1 Report on recommendations are prepared 4.2 Recommendations are presented to appropriate personnel. 4.3 Recommendations are followed-up, if required

RANGE OF VARIABLES

VARIABLE	RANGE
1. Analytical techniques	1.1 Brainstorming 1.2 Intuitions/Logic 1.3 Cause and effect diagrams 1.4 Pareto analysis 1.5 SWOT analysis 1.6 Gant chart, Pert CPM and graphs 1.7 Scattergrams
2. Problem	2.1 Non – routine process and quality problems 2.2 Equipment selection, availability and failure 2.3 Teamwork and work allocation problem 2.4 Safety and emergency situations and incidents
3. Action plans	3.1 Priority requirements 3.2 Measurable objectives 3.3 Resource requirements 3.4 Timelines 3.5 Co-ordination and feedback requirements 3.6 Safety requirements 3.7 Risk assessment 3.8 Environmental requirements

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified the problem 1.2 Determined the fundamental causes of the problem 1.3 Determined the correct / preventive action 1.4 Provided recommendation to manager <p>These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.</p>
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> 2.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations 2.2 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations <ul style="list-style-type: none"> 2.2.1 Relevant equipment and operational processes 2.2.2 Enterprise goals, targets and measures 2.2.3 Enterprise quality, OHS and environmental requirement 2.2.4 Principles of decision making strategies and techniques 2.2.5 Enterprise information systems and data collation 2.2.6 Industry codes and standards
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> 3.1 Using range of formal problem solving techniques 3.2 Identifying and clarifying the nature of the problem 3.3 Devising the best solution 3.4 Evaluating the solution 3.5 Implementation of a developed plan to rectify the problem
<p>4. Resource implications</p>	<p>4.1 Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.</p>
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Case studies on solving problems in the workplace 5.2 Observation <p>The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.</p>
<p>6. Context of assessment</p>	<p>6.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.</p>

UNIT OF COMPETENCY : **USE MATHEMATICAL CONCEPTS AND TECHNIQUES**

UNIT CODE : **500311113**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required in the application of mathematical concepts and techniques.

ELEMENT	Performance Criteria <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify mathematical tools and techniques to solve problem	1.1 Problem areas are identified based on given condition 1.2 <i>Mathematical techniques</i> are selected based on the given problem
2. Apply mathematical procedure/solution	2.1 Mathematical techniques are applied based on the problem identified 2.2 Mathematical computations are performed to the level of accuracy required for the problem 2.3 Results of mathematical computation is determined and verified based on job requirements
3. Analyze results	3.1 Result of application is reviewed based on expected and required specifications and outcome 3.2 <i>Appropriate action</i> is applied in case of error

RANGE OF VARIABLES

VARIABLE	RANGE
1. Mathematical techniques	May include but are not limited to: 1.1 Four fundamental operations 1.2 Measurements 1.3 Use/Conversion of units of measurements 1.4 Use of standard formulas
2. Appropriate action	2.1 Review in the use of mathematical techniques (e.g. recalculation, re-modeling) 2.2 Report error to immediate superior for proper action

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified, applied and reviewed the use of mathematical concepts and techniques to workplace problems
2. Underpinning knowledge	2.1 Fundamental operation (addition, subtraction, division, multiplication) 2.2 Measurement system 2.3 Precision and accuracy 2.4 Basic measuring tools/devices
3. Underpinning skills	3.1 Applying mathematical computations 3.2 Using calculator 3.3 Using different measuring tools
4. Resource implications	The following resources MUST be provided: 4.1 Calculator 4.2 Basic measuring tools 4.3 Case Problems
5. Method of assessment	Competency may be assessed through: 5.1 Authenticated portfolio 5.2 Written Test 5.3 Interview/Oral Questioning 5.4 Demonstration
6. Context of assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **USE RELEVANT TECHNOLOGIES**

UNIT CODE : **500311114**

UNIT DESCRIPTOR : This unit of competency covers the knowledge, skills, and attitude required in selecting, sourcing and applying appropriate and affordable technologies in the workplace.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Study/select appropriate technology	1.1 Usage of different technologies is determined based on job requirements 1.2 Appropriate technology is selected as per work specification
2. Apply relevant technology	2.1 Relevant technology is effectively used in carrying out function 2.2 Applicable software and hardware are used as per task requirement 2.3 Management concepts are observed and practiced as per established industry practices
3. Maintain/enhance relevant technology	3.1 Maintenance of technology is applied in accordance with the industry standard operating procedure, manufacturer's operating guidelines and occupational health and safety procedure to ensure its operative ability 3.2 Updating of technology is maintained through continuing education or training in accordance with job requirement 3.3 Technology failure/ defect is immediately reported to the concern/responsible person or section for appropriate action

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technology	May include but are not limited to: 1.1 Office technology 1.2 Industrial technology 1.3 System technology 1.4 Information technology 1.5 Training technology
2. Management concepts	May include but not limited to: 2.1 Real Time Management 2.2 KAIZEN or continuous improvement 2.3 5S 2.4 Total Quality Management 2.5 Other management/productivity tools
3. Industry standard operating procedure	3.1 Written guidelines relative to the usage of office technology/equipment 3.2 Verbal advise/instruction from the co-worker
4. Manufacturer's operating guidelines/ instructions	4.1 Written instruction/manuals of specific technology/ equipment 4.2 General instruction manual 4.3 Verbal advise from manufacturer relative to the operation of equipment
5. Occupational health and safety procedure	5.1 Relevant statutes on OHS 5.2 Company guidelines in using technology/equipment
6. Appropriate action	6.1 Implementing preventive maintenance schedule 6.2 Coordinating with manufacturer's technician

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Studied and selected appropriate technology consistent with work requirements 1.2 Applied relevant technology 1.3 Maintained and enhanced operative ability of relevant technology
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Awareness on technology and its function 2.2 Repair and maintenance procedure 2.3 Operating instructions 2.4 Applicable software 2.5 Communication techniques 2.6 Health and safety procedure 2.7 Company policy in relation to relevant technology 2.8 Different management concepts 2.9 Technology adaptability
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Relevant technology application/implementation 3.2 Basic communication skills 3.3 Software applications skills 3.4 Basic troubleshooting skills
4. Resource implications	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Relevant technology 4.2 Interview and demonstration questionnaires 4.3 Assessment packages
5. Method of assessment	<p>Competency must be assessed through:</p> <ul style="list-style-type: none"> 5.1 Interview 5.2 Actual demonstration 5.3 Authenticated portfolio (related certificates of training/seminar)
6. Context of assessment	<ul style="list-style-type: none"> 6.1 Competency may be assessed in actual workplace or simulated environment

COMMON COMPETENCIES

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

UNIT CODE : **ALT723201**

UNIT DESCRIPTOR : This unit covers the outcomes required in the selection, use and application of sealant/adhesives.

ELEMENT	PERFORMANCE CRITERIA
	<i>Italicized</i> 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 evenly	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 5.1 Cap/Covers 5.2 Tightly closed 5.3 Concentration

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 implication	<p>The following resources MUST be provided:</p> <ol style="list-style-type: none"> 4.1 Materials relevant to the activity 4.2 Appropriate tools and equipment 4.3 Real or simulated workplace
5. Method of assessment	<p>Competency MUST be assessed through</p> <ol style="list-style-type: none"> 5.1 Observation with questioning 5.2 Interview related to: <ul style="list-style-type: none"> • Safe and correct use of tools and equipment • Application of adhesive/sealant
6. Context of assessment	<ol style="list-style-type: none"> 6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment may be done in a workplace or in a 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 before and after servicing.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Prepare vehicle for driving	1.1 Check-up procedures is 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 implication	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 in a simulated environment.

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

UNIT CODE : **ALT311202**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in measuring and calculating using tools and measuring instruments. It also covers care and handling of measuring instruments.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> 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 to job 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.
4. Maintain measuring instruments	4.1 Measuring instruments are kept free from corrosion 4.2 Measuring instruments are not dropped to avoid damage 4.3 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	Includes calculation of the following: 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 Implication	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 may 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 in a simulated environment

UNIT OF COMPETENCY : **READ, INTERPRET AND APPLY SPECIFICATION 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 <i>Italicized terms</i> 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 2.3 Identification of units of measurements 2.4 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 Implication	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 in 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 and coolants in using and maintaining tools, equipment and vehicles.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify types of lubricants/ coolants	1.1 Correct information on <i>lubrication schedule</i> is accessed and interpreted from appropriate manufacturers specifications <i>manuals</i> 1.2 Type and quantity of <i>lubricants/coolant</i> is identified as per job requirements
2. Use and apply lubricants/coolants	2.1 Correct procedure for change of lubricant is identified following manufacturer's specification or manual 2.1 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 <i>PPE</i> 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 <i>Tools, equipment</i> 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: <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> 2.1 Engine oil: <ul style="list-style-type: none"> • Diesel engine oil • Gasoline engine oil 2.2 Automatic Transmission Fluid <ul style="list-style-type: none"> • Destro II • T4 2.3 Gear oil lubricants: <ul style="list-style-type: none"> • Oil #90 • Oil #140 • Oil #30 • Oil #40 2.4 Grease <ul style="list-style-type: none"> • Special (velocity joint Molybdenum disulfate) • Ordinary • Multi-purpose oil • Contact point lubricant (grease) </td> <td style="vertical-align: top; width: 50%;"> 2.5 Brake/Clutch System <ul style="list-style-type: none"> • Brake fluid • DOT3 2.6 Power Steering Fluid <ul style="list-style-type: none"> • Hydraulic Fluid 2.7 Radiator Coolant <ul style="list-style-type: none"> • Long last coolant 2.8 A/C Compressor Oil <ul style="list-style-type: none"> • PAG oil </td> </tr> </table>	2.1 Engine oil: <ul style="list-style-type: none"> • Diesel engine oil • Gasoline engine oil 2.2 Automatic Transmission Fluid <ul style="list-style-type: none"> • Destro II • T4 2.3 Gear oil lubricants: <ul style="list-style-type: none"> • Oil #90 • Oil #140 • Oil #30 • Oil #40 2.4 Grease <ul style="list-style-type: none"> • Special (velocity joint Molybdenum disulfate) • Ordinary • Multi-purpose oil • Contact point lubricant (grease) 	2.5 Brake/Clutch System <ul style="list-style-type: none"> • Brake fluid • DOT3 2.6 Power Steering Fluid <ul style="list-style-type: none"> • Hydraulic Fluid 2.7 Radiator Coolant <ul style="list-style-type: none"> • Long last coolant 2.8 A/C Compressor Oil <ul style="list-style-type: none"> • PAG oil
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3. Lubricant schedule	Schedule for changing oil: <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> 3.1 Kilometers traveled used 3.2 No. of Hours used 3.3 Monthly </td> <td style="width: 50%;"></td> </tr> </table>	3.1 Kilometers traveled used 3.2 No. of Hours used 3.3 Monthly	
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4. Tool and equipment	Tools used includes: <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> 4.1 Hand tools 4.2 Oiler 4.3 Oil Dispenser 4.4 Grease gun </td> <td style="width: 50%;"></td> </tr> </table>	4.1 Hand tools 4.2 Oiler 4.3 Oil Dispenser 4.4 Grease gun	
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5. Personal protective equipment (PPE)	PPE include: <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> 5.1 Apron 5.2 Gloves 5.3 Goggles 5.4 Safety shoes </td> <td style="width: 50%;"></td> </tr> </table>	5.1 Apron 5.2 Gloves 5.3 Goggles 5.4 Safety shoes	
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EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified types of lubricants and lubrication schedule. 1.2 Used and applied lubricants. 1.3 Performed housekeeping
2. Underpinning knowledge	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 3.1 Handling of oils (Gear, oil, engine oil) 3.2 Familiarization/Classification of Lubricants 3.3 Lubrication Procedure
4. Resource implication	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace: Real or simulated work area 4.2 Appropriate tools and equipment 4.3 Materials relevant to activity
5. Method of assessment	<p>Competency MUST be assessed through</p> <ul style="list-style-type: none"> 5.1 Demonstration with questioning 5.2 Written/Oral examination
6. Context of assessment	<ul style="list-style-type: none"> 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 : **ALT723205**

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 <i>Italicized terms</i> are elaborated in the Range of Variables
1. Inspect/clean tools and work area	1.1 Cleaning solvent used as per workshop/tools <i>cleaning requirement</i> 1.2 <i>Work area</i> 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 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 has 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: <ul style="list-style-type: none"> • 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 Mop 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	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 2.1 5 S or 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	<ul style="list-style-type: none"> 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	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	<p>Competency MUST be assessed through:</p> <ul style="list-style-type: none"> 5.1 Written/Oral Questioning 5.2 Demonstration
6. Context of assessment	<ul style="list-style-type: none"> 6.1 Competency must be assessed on the job or in a simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

UNIT OF COMPETENCY : **PREPARE JOB ESTIMATE/COSTING**

UNIT CODE : **ALT311204**

UNIT DESCRIPTOR : This competency unit covers the knowledge, skills and attitude in estimating/costing automotive repair.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify nature/scope of work	1.1 Effective communication skills are applied to determine the nature and scope of work to be undertaken 1.2 Extent of service to be rendered is determined and documented in line with standard operating procedures (SOP)
2. Prepare and present estimate	2.1 Type and quantity of supplies, materials and labor required to perform work are identified in line with job requirements 2.2 Cost of supplies, materials are obtained from suppliers 2.3 Total cost of required services is calculated in line with SOP 2.4 Estimate is presented to customer in line with SOP.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Communication	Communication includes: 1.1 Listening to customer 1.2 Speaking with suppliers, customers and co-workers 1.3 Questioning
2. Suppliers	Suppliers includes: 2.2 Distributors 2.3 Managers 2.4 Proprietors
3. Cost	Costs include: 3.1 Materials 3.2 Labor 3.3 Overhead

EVIDENCE GUIDE

1. Critical aspect of competency	<p>Assessment requires evidence that the candidate</p> <p>1.1 Identified nature/scope of work</p> <p>1.2 Prepared and presented estimate</p>
2. Underpinning knowledge	<p>2.1 Consumer mathematics</p> <p>2.2 Replaceable/Fabricated Materials or Spare parts in a vehicle</p> <p>2.3 Automotive Repair Procedures and Techniques</p> <p>2.4 Job estimates</p>
3. Underpinning skills	<p>3.1 Computing using the Four Mathematical Operations</p> <p>3.2 Estimating repair works and activities</p>
4. Resource implication	<p>The following resources MUST be provided:</p> <p>4.1 Appropriate tools such as calculator, paper, pen, and other measuring instruments relevant to activity</p>
5. Method of assessment	<p>Competency MUST be assessed through:</p> <p>5.1 Observation with questioning</p> <p>5.2 Presentation of Finished drawing</p>
6. Context of assessment	<p>6.1 Must be assessed in a room or in any simulated places</p> <p>6.2 Assessment must be given according to industry standard</p>

UNIT OF COMPETENCY : **INTERPRET/DRAW TECHNICAL DRAWING**

UNIT CODE : **ALT723206**

UNIT DESCRIPTOR : This unit identifies the competencies required to draw/interpret basic trade drawing

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Interpret technical drawing	1.1 Components, assemblies or objects recognized as required 1.2 Dimensions identified as appropriate to the field of employment 1.3 Instructions identified and followed as required 1.4 Material and other consumable requirements identified as required 1.5 Symbols recognized as appropriate in drawing
2. Select correct technical drawing	2.1 Drawing checked and validated against job requirements or equipment 2.2 Drawing version checked and validated according to the Manual
3. Apply freehand sketching	3.1 Correct freehand sketching is produced using the necessary tools and materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Drawing	1.1 Drawing symbols 1.2 Alphabet of lines 1.3 Orthographic views 1.3.1 Front view 1.3.2 Right side view/left side view 1.3.3 Top view 1.3.4 Pictorial 1.4 Schematic diagram
2. Manual	2.1 technical drawing manual 2.2 manufacturers schematic diagram
3. Consumables	3.1 drawing plate 3.2 pencil and eraser 3.3 scotch tape
4. Tools and materials	4.1 compass 4.2 divider 4.3 rulers 4.4 triangles 4.5 drawing tables 4.6 computer

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Interpreted technical drawing 1.2 Selected correct technical drawing 1.3 Applied freehand sketching
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Drawing standard symbols 2.2 Safe handling of tools and consumables 2.3 Identification of types of drawing
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Draw/interpret orthographic drawing 3.2 Handling of drawing instruments
5. Resource implication	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Drawing room 4.2 Appropriate tools 4.3 Materials relevant to activity
6. Method of assessment	<p>Competency MUST be assessed through:</p> <ul style="list-style-type: none"> 5.1 Observation with questioning 5.2 Written/Oral examination 5.3 Presentation of Finished drawing
6. Context of assessment	<ul style="list-style-type: none"> 6.1 Must be assessed in a drawing room or in any simulated places 6.2 Assessment must be given according to industry standard

CORE COMPETENCIES

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

UNIT OF COMPETENCY: **PERFORM PEARL COLOR MATCHING**

UNIT CODE: **ALT714311**

UNIT DESCRIPTOR: This unit covers the competency in performing pearl color matching for automotive body panel painting. This also covers the competency in performing three-stage color application.

ELEMENT	PERFORMANCE CRITERIA
	<i>Italicized terms</i> are elaborated in the Range of Variables
1. Determine special color formula	1.1 Correct information of car/vehicle is checked from V.I.N (vehicle ID numbers). 1.2 Vehicle special color code is matched with paint manufacturer color code.
2. Compute volume of paint needed	2.1 Amount of special paint per panel required is consulted from paint manufacturer specification 2.2 Computation performed accurately and as per paint manufacturer specifications
3. Mix paint	3.1 3-stage colors selected as per paint manufacturer's formula 3.2 Weighing scale is calibrated 3.3 Ground coat or Base Color, Pearl-base, Mica, and clear coat are weighed accurately as per procedure and according to formula 3.4 Special colors are mixed as per procedure 3.5 Paint container edges are thoroughly scraped and paint is mixed properly and without spillage.

<p>4. Apply paint to test panel</p>	<p>4.1 Spray gun is assured clean and without contamination and set to the required condition.</p> <ul style="list-style-type: none"> a. Special color is applied using spray gun following and observing the factors in paint application b. Sample paint mixture is prepared according to company procedure and mixed with thinner as per paint manufacturer specifications. c. Sample paint mixture is transferred to the spray gun without spillage. d. Paint sample mixture is applied on test panel using spray gun according to paint manufacturer specification e. Drying time/Flash-off time is observed as per manufacturer specifications f. Special colors are applied as per procedure for 3-stage solid color mixing/matching. g. Painting sequence is applied following manufacturer specifications.
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5. Check Spray Out Result	<p>5.1 Test Panel is put adjacent to original panel for color comparison using direct sunlight or color matching light at varying light intensity.</p> <p>a. Missing color is determined and mixed to sample paint as per procedure within company standard time.</p>
6. Adjust and prepare final color mixture	<p>6.1 Re-computation for missing color is performed accurately.</p> <p>6.2 Color mixing is performed as per procedure</p> <p>6.3 Final test panel application is performed as per procedure</p> <p>6.4 Final approval is obtained as per company standard operating procedures</p> <p>6.5 All works are performed as per company standard operating procedure/occupational health and safety practices using the <i>required personal protective equipment</i></p>
7. Clean the spray gun	<p>7.1 Paint cup is cleaned with thinner before and after use</p> <p>7.2 Paint passage is cleaned with back-flush technique</p> <p>7.3 Nozzle cap is removed and fluid tip is cleaned</p> <p>7.4 Thinner is ensured clear after repetitive back-flush cleaning method</p>

RANGE OF VARIABLES

VARIABLES	RANGES
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. Factors in Paint Application	Factors in paint application includes: 1.1 Pressure – 2-3 kg. 2.2 Distance – 100-200mm 2.3 Pattern – fully open 2.4 Discharge amount – normally 3 full turns of discharge adjustment screw
3. Special Color	Vehicle special color characteristic include: 3.1 Color variation at different angle 3.2 Color applied using 3-stage process 3.3 May contain metallic pigments
4. Computation	Different computation includes solving for: 4.1 Volume 4.2 Area 4.3 By weight 4.4 By percentage 4.5 By cumulative
5. Equipment, Tools, Supplies and materials	Equipment used includes: 5.1 Spray gun Tools include: 5.2 Paint stirrer 5.3 Test panel Supplies and Materials 5.4 Paint materials 5.5 Rags
6. Personal Protective Equipment	Personal protective clothing and safety devices may include: 6.1 Gloves -cotton and solvent resistant 6.2 Safety shoes or boots 6.3 Dust mask, gas mask or respirator, particle mask 6.4 Shop uniform 6.5 Apron 6.6 Painting suit used during actual painting spraying
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
8. Painting sequence	Painting sequence include the application of the following: 8.1 Ground paint or base coat 8.2 Pearl or mica base 8.3 Clear coat

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Determined special color formula. 1.2 Computed volume of paint needed 1.3 Mixed paint 1.4 Applied paint to test panel 1.5 Checked spray out results 1.6 Adjusted and prepared final color mixture
2. Underpinning knowledge and attitudes	<ul style="list-style-type: none"> 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 Personal safety requirements 2.8 Mathematical Computation of volume, area, ratio and proportion, percentages and decimals 2.9 Types of Paint Materials 2.10 Principle of Color Wheels 2.11 Principle of Applying Paint Coats 2.12 Different Paint Properties and Defects 2.13 Procedure in three Stage Paint Application 2.14 Patience, Honesty, Sense of Quality in Work, Dedication to Work, Thoroughness, Trainable to New procedures.
3. Underpinning skills	<ul style="list-style-type: none"> 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 customer, superiors and peers
4. Resource implications	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Demonstration and Questioning 5.2 Observation in the workplace with questioning 5.3 Portfolio 5.4 Written examination
6. Context of assessment	<ul style="list-style-type: none"> 6.1 Competency elements must be assessed on the job or in a 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 PEARL OR MICA COLOR PAINT

UNIT CODE: ALT714312

UNIT DESCRIPTOR: This unit covers the competency in spraying pearl or mica color paints for automotive body panels painting. This also includes ability to perform three-stage paint application.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> 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. 1.1 Panel/Vehicle to be painted is positioned as per painting requirements 1.2 Cleaning of panel/vehicle is performed using pressurized air with air dryer to remove sanded particles 1.3 Degreasing of panel/vehicle is performed as per standard operating procedure 1.4 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 medium 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.
3. Apply Ground coat	3.1 Ground coat is applied using spray gun following and observing the factors in paint application : 3.2 Appropriate personal protective devices are used during painting 3.3 Flash-off time is observed as per paint manufacturer's specification 3.4 Drying time is observed as per manufacturer's specification.
4. Apply pearl or mica coat	4.1 Pearl or mica coat 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/Baking time is observed as per manufacturer's specification.

5. Apply clear coat	<p>5.1 Tack cloth is used to wipe off remaining particles</p> <p>5.2 Clear coat is applied using spray gun following and observing the factors in paint application:</p> <p>5.3 Appropriate personal protective devices are used during painting</p> <p>5.4 Flash-off time is observed as per paint manufacturer's specification</p> <p>5.5 Drying time is observed as per manufacturer's specification.</p> <p>5.6 All works are performed following workshop/company standard operating procedures and occupational health and safety (OHS) practices</p>
6. Clean the spray gun	<p>6.1 Paint cup is cleaned with thinner before and after use</p> <p>6.2 Paint passage is cleaned with back-flush technique</p> <p>6.3 Nozzle cap is removed and fluid tip is cleaned</p> <p>6.4 Thinner is ensured clear after repetitive back-flush cleaning method</p>

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, Safety shoes or boots, Dust mask, gas mask or respirator, particle mask 2.2 Shop uniform 2.3 Apron 2.4 Painting suit 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. Workshop/ company standard operating procedures	Workshop or company standard operating procedures include but not limited to: 4.1 Job order 4.2 Materials, tools and equipment requisition slip 4.1 Use of personal protective equipment and devices

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 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 ground coat 1.5 Applied pearl or mica coat 1.6 Applied clear coat.
2. Underpinning knowledge and attitude	<ul style="list-style-type: none"> 2.1 Necessary cleaning and degreasing agents 2.2 Relevant technical information 2.3 Workplace safety procedures 2.4 Vehicle safety requirements 2.5 Equipment safety requirements 2.6 Personal safety requirements 2.7 Health Awareness on Effects of Paint Particles and Fumes 2.8 Principle of Color Wheels 2.9 Types of Different Paint materials 2.10 Kinds of Paint Defects 2.11 Types of Paints Used for 3 Stage Coating 2.12 Workshop Maintenance and Housekeeping 2.13 Proper Disposal of Waste Materials
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Accessing, interpreting and applying technical information 3.2 Use and setting up of relevant tools and equipment 3.3 Handling and Using of Spray Gun 3.4 Cleaning and Degreasing the Panel/Vehicle body 3.5 Applying 3 Stage Coating 3.6 Wearing of Personal Protective Clothing and Devices 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	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5 Method of assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Demonstration with Questioning 5.2 Observation with questioning 5.3 Portfolio 5.4 Written examination
6 Context of assessment	<ul style="list-style-type: none"> 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

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 III**

Nominal Training Duration: **183** 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 specialized competencies such as: Repair two-stage metallic color paints, Perform pearl color matching, Spray pearl or mica color paint.

BASIC COMPETENCIES

(20 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Lead workplace communication	1.1 Communicate information about workplace processes. 1.2 Lead workplace discussions. 1.3 Identify and communicate issues arising in the workplace	<ul style="list-style-type: none"> • Group discussion • Role Play • Brainstorming 	<ul style="list-style-type: none"> • Observation • Interviews
2. Lead small teams	2.1 Provide team leadership. 2.2 Assign responsibilities among members. 2.3 Set performance expectation for team members. 2.4 Supervise team performance	<ul style="list-style-type: none"> • Lecture • Demonstration • Self-paced (modular) 	<ul style="list-style-type: none"> • Demonstration • Case studies
3. Develop and practice negotiation skills	3.1 Identify relevant information in planning negotiations 3.2 Participate in negotiations 3.3 Document areas for agreement	<ul style="list-style-type: none"> • Direct observation • Simulation/role playing • Case studies 	<ul style="list-style-type: none"> • Written test • Practical/ performance test
4. Solve workplace problem related to work activities	4.1 Explain the analytical techniques. 4.2 Identify the problem. 4.3 Determine the possible cause/s of the problem.	<ul style="list-style-type: none"> • Direct observation • Simulation/role playing • Case studies 	<ul style="list-style-type: none"> • Written test • Practical/ performance test
5. Use mathematical concepts and techniques	5.1 Identify mathematical tools and techniques to solve problem 5.2 Apply mathematical procedures/solution 5.3 Analyze results	<ul style="list-style-type: none"> • Direct observation • Simulation/role playing • Case studies 	<ul style="list-style-type: none"> • Written test • Practical/ performance test

6. Use relevant technologies	6.1 Identify appropriate technology 6.2 Apply relevant technology 6.3 Maintain/enhance relevant technology	<ul style="list-style-type: none"> • Direct observation • Simulation/role playing • Case studies 	<ul style="list-style-type: none"> • Written test • Practical/performance test
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COMMON COMPETENCIES

(43 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	<ul style="list-style-type: none"> • Lecture/Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview
2. Move and position vehicle	2.1 Prepare vehicle for driving 2.2 Move and position vehicle 2.3 Check the vehicle	<ul style="list-style-type: none"> • Lecture/Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview
3. Perform mensuration and calculation	3.4 Select measuring instrument and carry out measurement and calculations 3.5 Maintain measuring instruments	<ul style="list-style-type: none"> • Lecture/Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview
4. Read, interpret and apply specifications and manual	4.1 Identify/access manuals and interpret data and specification 4.2 Apply information accessed in manual 4.3 Store manual	<ul style="list-style-type: none"> • Lecture/Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview
5. Use and apply lubricants/coolants	5.1 Identify type of lubricants/coolants 5.2 Use and apply lubricants	<ul style="list-style-type: none"> • Lecture/Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview
6. Perform shop maintenance	6.1 Inspect/clean tools and work area	<ul style="list-style-type: none"> • Lecture/Demonstration 	<ul style="list-style-type: none"> • Written test

	6.2 Store/arrange tools and shop equipment 6.3 Dispose waste/used lubricants 6.4 Report damaged tools/equipment	<ul style="list-style-type: none"> • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Oral questioning • Direct observation • Interview
7. Interpret/Draw technical drawing	7.1 Interpret technical drawing 7.2 Select correct technical drawing 7.3 Apply freehand sketching	<ul style="list-style-type: none"> • Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview
8. Prepare job estimates	8.1 Identify nature/scope of work 8.2 Prepare and present estimates	<ul style="list-style-type: none"> • Lecture/ Demonstration • Dual training • Self-paced (modular) • Distance learning 	<ul style="list-style-type: none"> • Written test • Oral questioning • Direct observation • Interview

CORE COMPETENCIES
(120 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform pearl color matching	1.1 Determine special color formula 1.2 Compute volume of paint needed 1.3 Mix Paint 1.4 Apply paint to test panel 1.5 Check Spray Out Result 1.6 Adjust and prepare final color mixture 1.7 Clean the spray gun	<ul style="list-style-type: none"> • Discussion • Demonstration • Practical application 	<ul style="list-style-type: none"> • Demonstration of practical skills • Interview
2. Spray pearl or mica color paint	2.1 Clean and degrease panel/vehicle body for repainting 2.2 Prepare paint mixture and spray gun	<ul style="list-style-type: none"> • Discussion • Demonstration • Practical application 	<ul style="list-style-type: none"> • Demonstration of practical skills • Interview
3. Perform polishing	3.6 Assess painted surface 3.7 Prepare surface for polishing 3.8 Polish painted surface 3.9 Clean the polish surface 3.10 Install body accessories	<ul style="list-style-type: none"> • Discussion • Demonstration • Practical application 	<ul style="list-style-type: none"> • Demonstration of practical skills • Interview

2.4 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.

2.5 TRAINEE ENTRY REQUIREMENTS

Trainees or students should possess the following requirements:

- can communicate both oral and written;
- 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 III

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

TOOLS		EQUIPMENT		MATERIALS	
QTY		QTY		QTY	
25 pairs	• Putty knife	1 unit	• Sander (single action) w/ vacuum pump	75 pcs.	• Sandpaper #120
4 pcs.	• Scraper			75 pcs.	• Sandpaper #180
2 pcs.	• Spatula	1 unit	• Sander (dual action) or orbital sander	25 ltrs.	• Paint remover
2 sets	• Screw driver assorted type 6pcs.			10 ltrs.	• Degreaser
2 sets	• Wrench Socket 24 pcs. per set 6mm-24mm	1 unit	• Air compressor	100 ltrs.	• Thinner
2 sets	• Wrench Combination 24 pcs. per set 6mm-32mm.	2 unit	• Spray gun (complete accessories) Suction type	10 ltrs.	• Surfacer
				10 ltrs.	• Sealant
1 pc.	• Impact wrench	1 unit	• Pressurized car wash machine	25 rolls	• Masking materials
2 pcs.	• Mechanic's hammer	1 unit	• Paint Mixing Machine	10 ltrs.	• Wash primer
25 pcs.	• Goggle	1 unit	• Electronic Weighing Machine	10 ltrs.	• Epoxy primer
2 sets	• Box wrench 32pcs. per set 6mm-32mm			10 ltrs.	• Special paint
25 pairs	• Gloves	25 pcs.	• Rubber sanding block	10 ltrs.	• Urethane primer
25 pcs.	• Dust mask	1 set	• Paint sanding file	10 ltrs.	• Acrylic primer
2 pcs.	• Gas mask	2 units	• Spray gun gravity type	1 liter	• Penetrating oil
25 pairs	• Safety shoes	2 units	• Touch-up spray gun	100 pcs	• Painting cloth

TOOLS		EQUIPMENT		MATERIALS	
25 pcs.	• Painting uniform	2 unit	• Compressed air regulator with complete accessories.	5 sets	• Spray gun cleaning kit
2 sets	• S.S.T.			10 pcs.	• Wire buffing
5 pcs.	• Vice grip			10 ltrs.	• Degreasing chemical
2 sets	• Spray gun cleaning kit	1 unit	• Painting booth with infra-red bul	100 pcs	• Tack cloth
2 sets	• Loose panel support	2 pcs	• Paint wire buffer attachment	100 pcs.	• Paint Strainer
10 pcs.	• Hose couplings and fittings	2 unit	• Vacuum paint strainer	25 pcs.	• Shading materials
25 pcs.	• Rubberized Buffing pad			25 pcs.	• Manufacturer materials
2 sets	• Painting brushes 7pcs per set one of each kind			25 pcs.	• Respirator
				25 pcs.	• Particle mask
2 units	• Compressed air gun nozzle			25 pcs.	• Apron

3.5 TRAINING FACILITIES AUTOMOTIVE BODY PAINTING/FINISHING – NC III

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 III

TRAINER QUALIFICATION (TQ II)

- Must be a holder of Automotive Body Painting/ Finishing NC IV or equivalent qualification
- Must have undergone training on Training Methodology II (TM II) or equivalent in training/experience
- Must be computer literate
- *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 III, the candidate must demonstrate competence through project-type assessment covering 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 III** must acquire Certificates of Competency in all the following core units of the Qualification. Candidates may apply for assessment in any accredited assessment center.
- 4.2.1.1 Apply Solid Color Paints
 - Prepare Undamaged Surface for Painting
 - Apply and Remove Masking
 - Spray Solid Color Paints
 - Perform Polishing
 - 4.2.1.2 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
 - 4.2.1.3 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
 - 4.2.1.4 Perform Repair on Metallic Color Paints
 - Repair Two-Stage Metallic Color Paints
 - 4.2.1.5 Apply Pearl or Mica Color Paints
 - Perform Pearl Color Matching
 - Spray Pearl or Mica Color Paints

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

C O R E	Performs gas engine tune up	Service ignition system	Test & repair wiring/lighting system	Perform under-chassis preventive maintenance	Service starting system	Service suspension system
	Service charging system	Service differential & front/rear axle	Service steering system	Overhaul manual transmission	Service brake system	Service electronics body management system
	Test & repair electrical system/components	Overhaul engines & associated components	Perform maintenance service check up & repair to AC	Install auto AC system	Service AC compressor & associated component	Service electronic drive management system
	Service diesel engine management system	Carry out pre-repair operation on engine components	Interpret technical manual specification of engine components	Disassemble engine block & sub-assemblies, check tolerances & components	Disassemble engine sub-assemblies/ cylinder head & check components	Inspect engine components & determined preferred action
	Service engine mechanical system	Assemble engine block & sub-assemblies, check tolerances & components	Assemble engine sub-assemblies/ cylinder heads and check components	Perform pearl color matching	Assess auto paint jobs	Prepare undamaged surface for painting
	Service electronic engine management system	Repair solid color paints	Perform Polishing	Perform solid/metallic color mixing	Spray metallic color paint	Repair two-stage metallic color paint
	Service diesel fuel components injection system	Replace damaged panel/parts with pre-fabricated panel				
	Set, operate & monitor specialized machine					
	Apply and remove masking					
	Prepare vehicle body for repair					
C O M M O N	Perform mensuration and calculation	Use and apply lubricant/ coolant	Perform shop maintenance	Read, interpret and apply specification and manuals	Interpret/draw technical drawing	Prepare job estimate/ costing
	Move and position vehicle	Apply appropriate sealant/adhesive				
	Work with Other	Demonstrate work values				
B A S I C	Receive and respond workplace communication	Practice basic housekeeping procedures	Lead in workplace communication	Develop and practice negotiation skills	Use relevant technologies	Solve problems related to work activities
	Participate in workplace communication	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
	Plan and organize work	Promote environmental protection	Collect, analyze and organize information			

Legend:

Automotive Body Painting/Finishing NC III

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 than 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.

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List of Published Training Regulations

- Animal Production NC III
- Aquaculture NC III
- Automotive Body Painting/Finishing NC III**
- Automotive Body Repairing NC III
- Automotive Engine Rebuilding NC III
- Automotive Servicing NC III
- Driving NC III
- Footwear Making NC III
- Heavy Equipment Operation NC III
- Horticulture NC III
- RAC Servicing NC III
- Security Services NC III
- Small Engine Servicing NC III
- Welding NC III

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