

TRAINING REGULATIONS



AUTOMOTIVE SERVICING NC I

AUTOMOTIVE SECTOR

**TECHNICAL EDUCATION AND SKILLS DEVELOPMENT
AUTHORITY**

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TRAINING REGULATIONS FOR AUTOMOTIVE SERVICING NC I

SECTION 1 AUTOMOTIVE SERVICING NC I QUALIFICATION

The AUTOMOTIVE SERVICING NC I Qualification consist of competencies that a person must achieve to perform basic engine servicing, removal and installation of vehicle components for both diesel and gasoline-engine powered vehicles

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 NO.	BASIC COMPETENCIES
500311101	Received and respond to workplace communication
500311102	Work with Others
500311103	Demonstrate work values
500311104	Practice basic housekeeping procedures

CODE NO.	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
ALT311204	Perform job estimates
ALT311205	Interpret/ draw technical drawing
ALT723206	Practice health, safety and environment procedures
ALT311207	Inspect technical quality of work
ALT311208	Maintain quality systems
ALT311209	Provide work skill instructions
ALT723210	Identify and select original automotive parts and products

CODE NO.	CORE COMPETENCIES
ALT723301	Perform diesel engine tune up
ALT723302	Perform gas engine tune up
ALT723354	Remove and replace electrical/electronic units/ assemblies
ALT723355	Remove and tag engine system components
ALT723356	Remove and tag automotive steering, suspension and brake system components
ALT723357	Remove and tag transmission system components

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

- Automotive Mechanic Assistant
- Automotive Junior Mechanic

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in AUTOMOTIVE SERVICING NC I.

BASIC COMPETENCIES

UNIT OF COMPETENCY: RECEIVE AND RESPOND TO WORKPLACE COMMUNICATION

UNIT CODE : 500311101

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to receive, respond and act on verbal and written communication.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Follow routine spoken messages	1.1. Required information is gathered by listening attentively and correctly interpreting or understanding information/instructions 1.2. Instructions/information are properly recorded 1.3. Instructions are acted upon immediately in accordance with information received 1.4. Clarification is sought from workplace supervisor on all occasions when any instruction/information is not clear
2. Perform workplace duties following written notices	2.1 Written notices and instructions are read and interpreted correctly in accordance with organizational guidelines 2.2 Routine written instruction are followed in sequence 2.3 Feedback is given to workplace supervisor based on the instructions/information received

RANGE OF VARIABLES

VARIABLE	RANGE
1. Written notices and instructions	It refers to : 1.1. Handwritten and printed material 1.2. Internal memos 1.3. External communications 1.4. Electronic mail 1.5. Briefing notes 1.6. General correspondence 1.7. Marketing materials 1.8. Journal articles
2. Organizational Guidelines	It may include: 2.1. Information documentation procedures 2.2. Company policies and procedures 2.3. Organization manuals 2.4. Service manual

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. Demonstrated knowledge of organizational procedures for handling verbal and written communications 1.2. Received and acted on verbal messages and instructions 1.3. Demonstrated competency in recording instructions/information
<p>2. Underpinning Knowledge and attitude</p>	<ul style="list-style-type: none"> 2.1. Knowledge of organizational policies/guidelines in regard to processing internal/external information 2.2. Ethical work practices in handling communications 2.3. Communication process
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> 3.1. Conciseness in receiving and clarifying messages/information/communication 3.2. Accuracy in recording messages/information
<p>4. Resource implications</p>	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1. Pens 4.2. Note pads
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1. Direct Observation 5.2. Oral interview 5.3. Written Evaluation 5.4. Third Party Report
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> 6.1. Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions

UNIT OF COMPETENCY : WORK WITH OTHERS

UNIT CODE : 500311102

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes required to develop workplace relationship and contribute in workplace activities.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Develop effective workplace relationship	1.1 <i>Duties and responsibilities</i> are done in a positive manner to promote cooperation and good relationship 1.2 Assistance is sought from <i>workgroup</i> when difficulties arise and addressed through discussions 1.3 <i>Feedback</i> provided by others in the team is encouraged, acknowledged and acted upon 1.4 Differences in personal values and beliefs are respected and acknowledged in the development
2. Contribute to work group activities	2.1 <i>Support is provided to team members</i> to ensure workgroup goals are met 2.2 Constructive contributions to workgroup goals and tasks are made according to <i>organizational requirements</i> 2.3 Information relevant to work is shared with team members to ensure designated goals are met

RANGE OF VARIABLES

VARIABLE	RANGE
1. Duties and responsibilities	1.1 Job description and employment arrangements 1.2 Organization's policy relevant to work role 1.3 Organizational structures 1.4 Supervision and accountability requirements including OHS 1.5 Code of conduct
2. Work group	2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Feedback on performance	3.1 Formal/Informal performance appraisal 3.2 Obtaining feedback from supervisors and colleagues and clients 3.3 Personal, reflective behavior strategies 3.4 Routine organizational methods for monitoring service delivery
4. Providing support to team members	4.1 Explaining/clarifying 4.2 Helping colleagues 4.3 Providing encouragement 4.4 Providing feedback to another team member 4.5 Undertaking extra tasks if necessary
5. Organizational requirements	5.1 Goals, objectives, plans, system and processes 5.2 Legal and organization policy/guidelines 5.3 OHS policies, procedures and programs 5.4 Ethical standards 5.5 Defined resources parameters 5.6 Quality and continuous improvement processes and standards

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1. Provided support to team members to ensure goals are met 1.2. Acted on feedback from clients and colleagues 1.3. Accessed learning opportunities to extend own personal work competencies to enhance team goals and outcomes
2. Underpinning Knowledge and attitude	<ol style="list-style-type: none"> 2.1. The relevant legislation that affects operations, especially with regards to safety 2.2. Reasons why cooperation and good relationships are important 2.3. Knowledge of the organization's policies, plans and procedures 2.4. Understanding how to elicit and interpret feedback 2.5. Knowledge of workgroup member's responsibilities and duties 2.6. Importance of demonstrating respect and empathy in dealings with colleagues 2.7. Understanding of how to identify and prioritize personal development opportunities and options
3. Underpinning skills	<ol style="list-style-type: none"> 3.1. Ability to read and understand the organization's policies and work procedures 3.2. Write simple instructions for particular routine tasks 3.3. Interpret information gained from correspondence 3.4. Communication skills to request advice, receive feedback and work with a team 3.5. Planning skills to organized work priorities and arrangement 3.6. Technology skills including the ability to select and use technology appropriate to a task 3.7. Ability to relate to people from a range of social, cultural and ethnic backgrounds.
4. Resource implications	<p>The following resources MUST be provided:</p> <ol 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
5. Method of assessment	<p>Competency may be assessed through:</p> <ol 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
6. Context of assessment	<ol 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: DEMONSTRATE WORK VALUES

UNIT CODE 500311103

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitude in demonstrating proper work values.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Define the purpose of work	1.1 One's unique sense of purpose for working and the why's of work are identified, reflected on and clearly defined for one's development as a person and as a member of society. 1.2 Personal mission is in harmony with company's values
2. Apply work values/ethics	2.1 Work values/ethics/concepts are classified and reaffirmed in accordance with the transparent company ethical standards, policies and guidelines. 2.2 Work practices are undertaken in compliance with industry work ethical standards, organizational policy and guidelines 2.3 Personal behavior and relationships with co-workers and/or clients are conducted in accordance with ethical standards, policy and guidelines. 2.4 Company resources are used in accordance with transparent company ethical standard, policies and guidelines.
3. Deal with ethical problems	3.1 Company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct are accessed and applied in accordance with transparent company ethical standard, policies and guidelines. 3.2 Work incidents/situations are reported and/or resolved in accordance with company protocol/guidelines. 3.3 Resolution and/or referral of ethical problems identified are used as learning opportunities.
4. Maintain integrity of conduct in the workplace	4.1 Personal work practices and values are demonstrated consistently with acceptable ethical conduct and company's core values. 4.2 Instructions to co-workers are provided based on ethical, lawful and reasonable directives. 4.3 Company values/practices are shared with co-workers using appropriate behavior and language.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work values/ethics/concepts	May include but are not limited to: 1.1 Commitment/ Dedication 1.2 Sense of urgency 1.3 Sense of purpose 1.4 Love for work 1.5 High motivation 1.6 Orderliness 1.7 Reliability 1.8 Competence 1.9 Dependability 1.10 Goal-oriented 1.11 Sense of responsibility 1.12 Being knowledgeable 1.13 Loyalty to work/company 1.14 Sensitivity to others 1.15 Compassion/Caring attitude 1.16 Balancing between family and work 1.17 Pakikisama 1.18 Bayanihan spirit/teamwork 1.19 Sense of nationalism
2. Work practices	2.1 Quality of work 2.2 Punctuality 2.3 Efficiency 2.4 Effectiveness 2.5 Productivity 2.6 Resourcefulness 2.7 Innovativeness/Creativity 2.8 Cost consciousness 2.9 5S 2.10 Attention to details
3. Incidents/situations	3.1 Violent/intensed dispute or argument 3.2 Gambling 3.3 Use of prohibited substances 3.4 Pilferages 3.5 Damage to person or property 3.6 Vandalism 3.7 Falsification 3.8 Bribery 3.9 Sexual Harassment 3.10 Blackmail
4. Company resources	4.1 Consumable materials 4.2 Equipment/Machineries 4.3 Human 4.4 Time 4.5 Financial resources
5. Instructions	5.1 Verbal 5.2 Written

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 Defined one's unique sense of purpose for working 1.2 Clarified and affirmed work values/ethics/concepts consistently in the workplace 1.3 Demonstrated work practices satisfactorily and consistently in compliance with industry work ethical standards, organizational policy and guidelines 1.4 Demonstrated personal behavior and relationships with co-workers and/or clients consistent with ethical standards, policy and guidelines 1.5 Used company resources in accordance with company ethical standard, policies and guidelines. 1.6 Followed company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct/behavior
<p>2. Underpinning Knowledge and attitude</p>	<ul style="list-style-type: none"> 2.1 Occupational health and safety 2.2 Work values and ethics 2.3 Company performance and ethical standards 2.4 Company policies and guidelines 2.5 Fundamental rights at work including gender sensitivity 2.6 Work responsibilities/job functions 2.7 Corporate social responsibilities 2.8 Company code of conduct/values 2.9 Balancing work and family responsibilities
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> 3.1 Interpersonal skills 3.2 Communication skills 3.3 Self awareness, understanding and acceptance 3.4 Application of good manners and right conduct
<p>4. Resource implications</p>	<p>The following resources MUST be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace or assessment location 4.2 Case studies/Scenarios
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Portfolio Assessment 5.2 Interview 5.3 Third Party Reports
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> 6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY: PRACTICE HOUSEKEEPING PROCEDURES**UNIT CODE : 500311104****UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to apply the basic housekeeping procedures.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Sort and remove unnecessary items	1.1 Reusable, recyclable materials are sorted in accordance with company/office procedures 1.2 Unnecessary items are removed and disposed of in accordance with company or office procedures
2. Arrange items	2.1 Items are arranged in accordance with company/office housekeeping procedures 2.2 Work area is arranged according to job requirements 2.3 Activities are prioritized based on instructions. 2.4 Items are provided with clear and visible identification marks based on procedure 2.5 Safety equipment and evacuation passages are kept clear and accessible based on instructions
3. Maintain work area, tools and equipment	3.1 Cleanliness and orderliness of work area is maintained in accordance with company/office procedures 3.2 Tools and equipment are cleaned in accordance with manufacturer's instructions/manual 3.3 Minor repairs are performed on tools and equipment in accordance with manufacturer's instruction/manual 3.4 Defective tools and equipment are reported to immediate supervisor
4. Follow standardized work process and procedures	4.1 Materials for common use are maintained in designated area based on procedures 4.2 Work is performed according to standard work procedures 4.3 Abnormal incidents are reported to immediate supervisor
5. Perform work spontaneously	5.1 Work is performed as per instruction 5.2 Company and office decorum are followed and complied with 5.3 Work is performed in accordance with occupational health and safety (OHS) requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Unnecessary items	May include but are not limited to: 1.1 Non-recyclable materials 1.2 Unserviceable tools and equipment 1.3 Pictures, posters and other materials not related to work activity 1.4 Waste materials
2. Identification marks	2.1 Labels 2.2 Tags 2.3 Color coding
3. Decorum	3.1 Company/ office rules and regulations 3.2 Company/ office uniform 3.3 Behavior
4. Minor repair	Minor repair include but not limited to: 4.1 Replacement of parts 4.2 Application of lubricants 4.3 Sharpening of tools 4.4 Tightening of nuts, bolts and screws

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Practiced the basic procedures of 5S
2. Underpinning Knowledge and attitude	2.1 Principles of 5S 2.2 Work process and procedures 2.3 Safety signs and symbols 2.4 General OH&S principles and legislation 2.5 Environmental requirements relative to work safety 2.6 Accident/Hazard reporting procedures
3. Underpinning skills	3.1 Basic communication skills 3.2 Interpersonal skills 3.3 Reading skills required to interpret instructions 3.4 Reporting/recording accidents and potential hazards
4. Resource implications	The following resources MUST be provided: 4.1 Facilities, materials tools and equipment necessary for the activity
5. Methods of assessment	Competency must be assessed through: 5.1 Third party report 5.2 Interview 5.3 Demonstration with questioning
6. 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 knowledge, skills and attitude required in the selection and application of sealant/adhesives.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify appropriate Sealant/adhesive	1.1 Sealant/adhesive are selected in line with job requirements and manufacturer's specification 1.1 Sealant/adhesive checking is performed to ensure that the 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 standard operating procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Sealant/Adhesive	May include: 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	May 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	May include: 3.1 Ventilation 3.2 Handling of Flammable/Irritating substances 3.3 Use of Personal Protective Equipment
4. Hazards	May include: 4.1 Fumes 4.2 Skin irritation 4.3 Burns
5. Adhesive/Sealant checking	May include: 5.1 Expiry date 5.2 Free of contamination 5.1 Cap/Covers 5.2 Tightly closed 5.3 Concentration

EVIDENCE GUIDE

1. Critical aspect 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. Required 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. Required 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 implication	The following resources should 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 in this unit may be assessed through: 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	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 unit covers the knowledge, skills and attitude needed to move and position vehicle in a workshop.

ELEMENT	PERFORMANCE CRITERIA
1. Prepare vehicle for driving	1.1 Correct check-up procedures performed based on vehicle manufacturer's 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 requirement 3.2 Vehicle is checked for external damages

RANGE OF VARIABLE

VARIABLE	RANGE
1. Check up procedure	May include: 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	May include: 2.1 Vehicles with automatic transmission 2.2 Vehicles with manual transmission
3. Parking safety techniques	May include: 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. Required 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. Required skills	3.1 Ability to handle/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
4. Resource implication	The following resources should be provided: 4.1 Driving range/area 4.2 Appropriate vehicle for driving 4.3 Vehicle accessories
5. Method of assessment	Competency in this unit may be assessed through: 5.4 Observation with questioning 5.5 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 sing of measuring instrument.

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 in accordance with the job requirements 2.3 Calculation needed to complete work tasks are performed using the four fundamental operations 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	May include: 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	May 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. Required Knowledge	2.1 Types of Measuring instruments and their 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. Required skills	3.1 Caring and Handling measuring instruments 3.2 Calibrating and using measuring instruments 3.3 Performing calculation by Addition, Subtraction, Multiplication and Division 3.4 Visualizing objects and shapes 3.5 Interpreting formula for volume, area, perimeter and other geometric figures
4. Resource implication	The following resources should 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 in this unit may 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 simulated environment

UNIT TITLE: 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 are checked to ensure correct specification and procedure are identified.
2. Interpret manuals	2.1 Relevant sections, chapters of manuals/specifications are located in relation to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance with 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 are 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	May include: 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. Required 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. Required 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 should 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 in this unit may 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 knowledge, skills and attitudes required in selecting and applying different types of lubricants.

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/coolants</i> are 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 are 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> are 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	May include: 1.1 Manufacturer's specification manual 1.2 Periodic Maintenance manual 1.3 Service Manual	
2. Lubricants/ Coolant	May include: 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
3. Lubricant Schedule	May include: 3.1 Kilometers traveled used 3.2 No. of Hours used 3.3 Monthly	
4. Tool and equipment	May include: 4.1 Hand tools 4.2 Oiler 4.3 Oil Dispenser 4.4 Grease gun	
5. Personal Protective Equipment (PPE)	May 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. Required 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. Required skills	3.1 Handling of oils (Gear, oil, engine oil) 3.2 Familiarization/Classification of Lubricants 3.3 Lubrication Procedure
4. Resource implication	The following resources should 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 in this unit may be assessed through: 5.1 Demonstration with questioning 5.2 Written/Oral examination
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 6.2 Assessment of Underpinning Knowledge and attitude 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 of tools and 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 cleaning requirement 1.2 Work 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 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	May 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	May include: 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	May include: 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	May 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. Required Knowledge	2.1 5S 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. Required 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 should 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 in this unit may be assessed through: 5.1 Written/Oral Questioning 5.2 Demonstration
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: PREPARE JOB ESTIMATE/COSTING

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

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate 1.1 Identified nature/scope of work 1.2 Prepared and presented estimate
2. Required Knowledge	2.1 Consumer mathematics 2.2 Replaceable/Fabricated Materials or Spare parts in a vehicle 2.3 Automotive Repair Procedures and Techniques 2.4 Job estimates 2.5 Honesty, Perseverance, Patience, Attention to Details
3. Required skills	3.1 Computing using the Four Mathematical Operations 3.2 Estimating repair works and activities
4. Resource implications	The following resources should be provided: 4.1 Appropriate tools such as calculator, paper, pen, and other measuring instruments relevant to activity
5. Method of assessment	Competency in this unit may be assessed through: 5.1 Observation with questioning 5.2 Presentation of Finished drawing
6. Context of assessment	6.1 Competency must be assessed in a room or any simulated places 6.2 Assessment must be given according to industry standard

UNIT OF COMPETENCY: INTERPRET/DRAW TECHNICAL DRAWING

CODE: ALT311205

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
Interpret technical drawing	1.1 Components, assemblies or objects are recognized as required 1.2 Dimensions are identified as appropriate to the field of employment 1.3 Instructions are identified and followed as required 1.4 Material and other consumable requirements are identified as required 1.5 Symbols are recognized as appropriate in drawing
2. Select correct technical drawing	2.1 Drawing is checked and validated against job requirements or equipment 2.2 Drawing version is checked and validated according to the Manual
3. Apply freehand sketching	5.5 Correct freehand sketching is produced using the necessary tools and materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Drawing	May include: 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	May include: 2.1 technical drawing manual 2.2 manufacturers schematic diagram
3. Consumables	May include: 3.1 drawing plate 3.2 pencil and eraser 3.3 scotch tape
6. Tools and materials	May include: 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	Assessment requires evidence that the candidate: 1.1 Interpreted technical drawing 1.2 Selected correct technical drawing 1.3 Applied freehand sketching
2. Required Knowledge	2.1 Drawing standard symbols 2.2 Safe handling of tools and consumables 2.3 Identification of types of drawing 2.4 Patience, Perseverance, Attention to Details
3. Required skills	3.1 Draw/interpret orthographic drawing 3.2 Handling of drawing instruments
7. Resource implications	The following resources should be provided: 4.1 Drawing room 4.2 Appropriate tools 4.3 Materials relevant to activity
8. Method of assessment	Competency in this unit may be assessed through: 5.1 Observation with questioning 5.2 Written/Oral examination 5.3 Presentation of Finished drawing
6. Context of assessment	6.1 Must be assessed in a drawing room or in any simulated places 6.2 Assessment must be given according to industry standard

UNIT OF MPETENCY: PRACTICE HEALTH, SAFETY AND ENVIRONMENT PROCEDURES

UNIT CODE : ALT723206

UNIT DESCRIPTOR : This unit of competency incorporates the work safe regional guidelines and encompasses competencies necessary to apply basic safety and emergency procedures to maintain a safe workplace for staff, customers and others.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Apply basic safety procedures	1.1. <i>Policies and procedures</i> to achieve a safe working environment are followed and maintained in line with <i>occupational health and safety (OHS) procedures</i> and according to worksite policy 1.2. All unsafe situations are recognized and reported according to worksite policy 1.3. All breakdowns in relation to machinery and equipment are reported to supervisor or nominated persons 1.4. Fire and safety <i>hazards</i> are identified and precautions are taken or reported according to worksite policy and procedures 1.5. Dangerous goods and substances are identified, handled and stored according to worksite policy and procedures and OHS requirements 1.6. Worksite policy regarding manual handling practice is followed 1.7. Participation in consultative arrangements established by company for OHS is exercised
2. Apply emergency procedures	2.1. Worksite policies and emergency procedures regarding illness or accidents are identified and applied 2.2. Safety alarms are identified 2.3. Qualified persons are contacted in the event of accident or sickness of customers or staff and accident details are documented according to worksite accident/ injury procedures 2.4. Worksite evacuation procedures are identified and applied

RANGE OF VARIABLES

VARIABLE	RANGE
1. Policies and procedures	May include: <ul style="list-style-type: none"> 1.1. Hazard policies and procedures 1.2. Emergency, fire and accident procedures 1.3. Personal safety procedures 1.4. Procedures for the use of personal protective clothing and equipment 1.5. Use of motor vehicles 1.6. Resolution procedures 1.7. Job procedures 1.8. Work instructions
2. OHS procedures	May include: <ul style="list-style-type: none"> 2.1. Safe manual handling and lifting customers, staff, equipment/tooling, premises and stock
3. Hazards	May include: <ul style="list-style-type: none"> 3.1. Sharp cutting tooling and instruments 3.2. Electricity and water 3.3. Toxic substances 3.4. Damaged packing material or containers 3.5. Broken or damaged equipment 3.6. Flammable materials and fire hazards 3.7. Lifting practices 3.8. Spillages, waste and debris especially on floors, ladders, trolleys and glue guns/burns
4. Emergency procedures	May include: <ul style="list-style-type: none"> 4.1. Sickness 4.2. Accident 4.3. Fire or store evacuation involving staff or customers

EVIDENCE GUIDE

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate has:</p> <ul style="list-style-type: none"> 1.1 Communicated effectively with others involved in or affected by the work 1.2 Identified and assessed hazardous situations and rectified, or reported to the relevant persons 1.3 Operated fire-fighting equipment 1.4 Handled safely and stored dangerous and/or hazardous goods and substances 1.5 Applied safe manual handling practices 1.6 Operated safely and effectively equipment and utilized materials over the full range of functions 1.7 Followed worksite evacuation procedures.
2. Required Knowledge	<p>General knowledge of:</p> <ul style="list-style-type: none"> 2.1 The implications of OHS on efficiency, morale and customer relations 2.2 Common automotive terminology 2.3 OHS regulations/requirements, equipment, material and personal safety requirements 2.4 Safe manual handling theories and practices 2.5 The selection and application of fire-fighting equipment 2.6 Dangerous goods and hazardous chemicals handling processes 2.7 Worksite reporting procedures
3. Required Skills	<ul style="list-style-type: none"> 3.1. Collect, organize and understand information related to recognizing and reporting situations 3.2. Communicate ideas and information to reporting procedures (verbal and written) 3.3. Plan and organize activities which implement and follow standard procedures 3.4. Work with others and in a team by assisting and cooperating with team members 3.5. Use mathematical ideas and techniques to document and report numbers for emergency procedures 3.6. Establish diagnostic processes which recommend improvements for OHS issues 3.7. Use workplace technology related to the use of technology to assist with safe work practices
4. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 4.1. A workplace or simulated workplace 4.2. Situations requiring safe working practices 4.3. Worksite or equivalent instructions on safe working practice 4.4. Hazardous chemicals and/or dangerous goods information 4.5. Materials, tooling and equipment 4.6. Firefighting appliances and fire test facilities
5. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
6. Context for Assessment	<ul style="list-style-type: none"> 6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY: INSPECT TECHNICAL QUALITY OF WORK**UNIT CODE : ALT311207****UNIT DESCRIPTOR :** This unit covers the competence to inspect work done by other staff, apply quality standards to work, and protect customer property and interests.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Gather information to carry out inspection	1.1 OH&S requirements , including company regulatory requirements and personal protection needs are observed throughout the work 1.2 Pertinent information are sourced 1.3 Different methods are analyzed and those most appropriate to the circumstances are selected and prepared 1.4 Technical and/or calibration requirements for inspection are sourced and needed equipment is identified and prepared
2. Inspect and apply quality standards to work	2.1 Work is identified and confirmed for inspection in accordance with company quality procedures 2.2 Quality Inspections are conducted throughout the course of the work to ensure quality standards are maintained 2.3 Quality standards are applied during work completion to ensure the treatment of customer property meets industry and / or company standards 2.4 Activities are coordinated throughout the workplace in accordance with company procedures 2.5 Documents of work quality are maintained according to company requirements
3. Achieve quality work outcomes	3.1 Damage to customer property is avoided through ensuring staff adherence to quality procedures and use of protective materials at all stages of the repair or service 3.2 Communication pertaining to quality improvements and recommendations are to be done in accordance with company requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S Requirements	May include: <ul style="list-style-type: none"> 1.1 Safety equipment 1.2 Personal protective equipment and clothing 1.3 First aid equipment 1.4 Hazard and risk control 1.5 Elimination of hazardous materials and substances manual handling, including shifting, lifting and carrying 1.6 Emergency procedures 1.7 Road rules and safe driving policy
2. Information	May include: <ul style="list-style-type: none"> 2.1 Manufacturer / component supplier specifications 2.2 Company operating procedures 2.3 Supplier directories 2.4 Parts catalogues 2.5 Customer orders 2.6 Service manual 2.7 Material safety data sheets
3. Quality Procedures	May include: <ul style="list-style-type: none"> 3.1 Worksite quality system documentation 3.2 Work instructions 3.3 Safe work procedures 3.4 Product specifications 3.5 Equipment maintenance schedules 3.6 Technical procedures 3.7 Adopted or specifically prepared standards
4. Quality Inspections	May include: <ul style="list-style-type: none"> 4.1 Periodic inspection during the job or observation at completion of the job to ensure all ordered parts have been fitted, components used meet manufacturer / component supplier specifications, invoicing complies with service / repair / parts order and contains sufficient details of labor and / or components used 4.2 Reported and diagnosed problems have been confirmed as rectified thru test procedures and presentation of the vehicle or equipment after service / repair meets manufacturer and Company standards
5. Communication	May include: <ul style="list-style-type: none"> 5.1 Verbal 5.2 Written 5.3 Telephone or Electronic means

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 Observed safety procedures and requirements 1.2 Communicated effectively with others involved in or affected by the work 1.3 Applied OH&S policies and procedures 1.4 Identified quality procedures 1.5 Inspected work undertaken by others 1.5 Applied quality standards to work
<p>2. Required Knowledge</p>	<p>A working knowledge of:</p> <ul style="list-style-type: none"> 2.1 Quality systems in a workplace 2.2 Common automotive terminology 2.3 Vehicle safety requirements 2.4 Work planning processes 2.5 OH&S regulations/requirements, equipment, material and personal safety requirements 2.6 Company quality systems and procedures 2.7 Worksite environmental control measures 2.8 Worksite reporting procedures
<p>3. Required skills</p>	<ul style="list-style-type: none"> 3.1 Communicating ideas and information 3.2 Collecting, analyzing and organizing information 3.3 Planning and organizing activities 3.4 Working with others and in a team 3.5 Using mathematical ideas and techniques 3.6 Solving problems 3.7 Using technology
<p>4. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 4.1 A workplace or simulated workplace 4.2 Situations requiring inspections of technical quality 4.3 Computer hardware and software, access to electronic communication
<p>5. Method of assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Direct Observation 5.2 Oral interview 5.3 Written Evaluation 5.4 Third Party Report
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> 6.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions

UNIT OF COMPETENCY: MAINTAIN QUALITY SYSTEMS

UNIT CODE : ALT311208

UNIT DESCRIPTOR : This unit of competency covers the competence to conduct the final quality check on completed work or orders, report on the quality of processes and work outcomes, and implement improvements to work processes.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Conduct final quality check on completed work / orders	1.1. Completed work / orders are checked for compliance with supplier, company or customer specifications 1.2. Level of inspection conducted is appropriate to the size and importance of the job 1.3. Documentation is authorized in accordance with company requirements 1.4. Feedback is provided to staff on the quality of their work with equal emphasis on strengths and weaknesses and opportunities for development
2. Report on the quality of processes and work outcomes	2.1. Documents are kept according to company quality procedures on outcomes of quality checks 2.2. Quality problems are identified according to company performance indicators 2.3. Information relating to the quality of processes and work outcomes is provided to appropriate persons on a regular basis
3. Implement improvements to work processes	3.1. Staff input is encouraged to generate possible solutions to quality problems 3.2. Options for solving quality problems are generated and the costs and benefits of each option are evaluated 3.3. Recommended solutions to quality problems are discussed with management 3.4. Improvements to work processes are implemented according to company policies and procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Quality procedures	May include: <ul style="list-style-type: none"> 1.1 Company quality system documentation 1.2 Work instructions 1.3 Safe work procedures 1.4 Product specifications 1.5 Equipment maintenance schedules 1.6 Technical procedures and adopted or specifically prepared standards
2. Performance indicators	May include: <ul style="list-style-type: none"> <input type="checkbox"/> account for issues of time, quantity, quality and cost factors and may include establishing time targets for own work, identifying reasonable criteria for evaluating own work outcomes, identifying measures to avoid wastage, identifying reasonable criteria to judge internal and/or external customer satisfaction
3. Quality problems	May include: <ul style="list-style-type: none"> 3.1 Misdiagnosed faults 3.2 Jobs requiring rework 3.3 Jobs which do not meet customer requirements 3.4 Repairs which do not fix the problem within the allocated timeframe
4. Communication	May include: <ul style="list-style-type: none"> 4.1 Verbal 4.2 Written 4.3 Telephone or other means
5. Information/documents	May include: <ul style="list-style-type: none"> 5.1 Vehicle manufacturer practices 5.2 Company operating procedures 5.3 Supplier directories 5.4 Parts catalogues 5.5 Customer orders and industry/workplace codes of practice 5.6 Material safety data sheets (MSDS)

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 Communicated effectively with others involved in or affected by the work 1.2 Identified quality system procedures and needs 1.3 Identified performance indicators 1.4 Conducted final quality checks on completed work orders 1.5 Reported on the quality of processes and work outcomes 1.6 Monitored and adjusted performance indicators to meet changing circumstances 1.7 Processed and implemented recommendations for change
<p>2. Required Knowledge</p>	<p>Competency includes sufficient knowledge to:</p> <p>Knowledge of:</p> <ul style="list-style-type: none"> <input type="checkbox"/> quality systems and application techniques in a work environment <input type="checkbox"/> typical loss and damage control systems <input type="checkbox"/> work planning and organization processes <input type="checkbox"/> occupational health and safety (OHS) regulations/requirements, equipment, material and personal safety requirements at the worksite <input type="checkbox"/> enterprise quality systems and procedures <input type="checkbox"/> worksite information management systems
<p>3. Required skills</p>	<p>Required skills include the ability to:</p> <ul style="list-style-type: none"> 3.1 Research and interpretive skills to locate, interpret and apply quality audit policies and procedures 3.2 Investigative and analytical skills required for identification and analysis of quality breaches, incidents or risks, and identification of quality related training needs 3.3 English literacy and communication skills in relation to dealing with customers and team members on worksite quality audit issues 3.4 Questioning and active listening skills 3.5 Written communication skills sufficient to prepare reports, document investigations and maintain worksite quality documents 3.6 Plan and organize activities for leadership skills required in organizing, implementing and promoting worksite quality systems and measures

	<p>3.7 Work with others and in a team by seeking advice and assistance from team members</p> <p>3.8 Use mathematical ideas and techniques to document quantities and company sampling procedures</p> <p>3.9 Establish diagnostic processes which analyze problems and recommend solutions</p> <p>3.10 Use the workplace technology related to document and analyze quality problems</p>
4. Resource implications	<p>The following resources should be provided:</p> <p>4.1 A workplace or simulated workplace</p> <p>4.2 Situations requiring worksite quality systems maintenance</p> <p>4.3 Worksite quality policies and procedures</p> <p>4.4 Worksite quality documents system</p> <p>4.5 Materials, tooling and equipment</p>
5. Method of assessment	<p>Competency in this unit may be assessed through:</p> <p>5.1 Direct Observation</p> <p>5.2 Oral interview</p> <p>5.3 Written Evaluation</p> <p>5.4 Third Party Report</p>
6. Context of assessment	<p>6.2 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

UNIT OF COMPETENCY: PROVIDE WORK SKILL INSTRUCTIONS**UNIT CODE : ALT311209**

UNIT DESCRIPTOR : This unit describes the performance outcomes, skills and knowledge required to conduct individual and group instruction and demonstrate work skills, using existing learning resources in a safe and comfortable learning environment. The unit also covers the skills and knowledge required to determine the success of both the training provided and one's own personal training performance. It emphasizes the training as being driven by the work process and context.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Organize instruction and demonstration	1.1 Gather information about learner characteristics and learning needs 1.2 Confirm a safe learning environment 1.3 Gather and check instruction and demonstration objectives and seek assistance if required 1.4 Access and review relevant learning resources and learning materials for suitability and relevance, and seek assistance to interpret the contextual application 1.5 Organize access to necessary equipment or physical resources required for instruction and demonstration 1.6. Notify learners of details regarding the implementation of the learning program and/or delivery plan
2. Conduct instruction and demonstration	2.1 Use interpersonal skills with learners to establish a safe and comfortable learning environment 2.2 Follow the learning program and/or delivery plan to cover all learning objectives 2.3 Brief learners on any OHS procedures and requirements prior to and during training 2.4 Use delivery techniques to structure, pace and enhance learning 2.5 Apply coaching techniques to assist learning 2.6 Use communication skills to provide information, instruct learners and demonstrate relevant work skills 2.7 Provide opportunities for practice during instruction and through work activities 2.8 Provide and discuss feedback on learner performance to support learning
3. Check training performance	3.1 Use measures to ensure learners are acquiring and can use new technical and generic skills and knowledge 3.2 Monitor learner progress and outcomes in consultation with learner 3.3 Review relationship between the trainer/coach and the learner and adjust to suit learner needs
4. Review personal training performance and finalize documentation	4.1 Reflect upon personal performance in providing instruction and demonstration, and document strategies for improvement 4.2 Maintain, store and secure learner records according to organizational and legal requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Learner Characteristics	May include: 1.1 Language, literacy and numeracy levels 1.2 Learning styles 1.3 Past learning and work experiences 1.4 Specific needs 1.5 Workplace culture
2. Safe Learning Environment	May include: 2.1 Exit requirements 2.2 Personal protective equipment 2.3 Safe access 2.4 Safe use of equipment
3. Instruction and demonstration objectives	May include: 3.1 Competencies to be achieved 3.2 Generic and technical skills, which may be provided by the organization, developed by a colleague and individual or group objectives 3.3 Learning outcomes.
4. Learning resources	May include: 4.1 Learner and user guides 4.2 Trainer and Facilitator guides 4.3 Example training programs 4.4 Specific case studies 4.5 Professional development materials 4.6 Assessment materials 4.7 A variety of formats produced locally or acquired from other sources
5. Learning materials	May include: 5.1 Handouts for learners 5.2 Materials sourced from the workplace, like workplace documentation, operating procedures, and specifications
6. Details	May include: 6.1 Location and time 6.2 Outcomes of instruction or demonstration 6.3 Reason for instruction or demonstration 6.4 Who will be attending instruction session

VARIABLE	RANGE
7. OHS procedures	May include: 7.1 Emergency procedures 7.2 Hazards and their means of control 7.3 Incident reporting 7.4 Use of personal protective equipment 7.5 Safe work practices 7.6 Safety briefings 7.7 Site-specific safety rules
8. Delivery techniques	May include: 8.1 Coaching 8.2 Demonstration 8.3 Explanation 8.4 Group or pair work providing opportunities to practice skills and solve problems 8.5 Questions and answers
9. Coaching	May include: 9.1 Learning arrangements requiring immediate interaction and feedback 9.2 On-the-job instruction and 'buddy' systems 9.3 Relationships targeting enhanced performance 9.4 Short-term learning arrangements 9.5 Working on a one-to-one basis.
10. Measures	May include: 10.1 Informal review or discussion 10.2 Learner survey 10.3 On-the-job observation 10.4 Review of peer coaching arrangements.

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>1.1 Carried out a minimum of three training sessions, involving demonstrating and instructing particular work skills for different groups; with each session addressing:</p> <p>1.1.1 Different learning objectives</p> <p>1.1.2 A range of techniques and effective communication skills appropriate to the audience</p>
<p>2. Required Knowledge</p>	<p>2.1 Learner characteristics and needs</p> <p>2.2 Content and requirements of the relevant learning program and/or delivery plan</p> <p>2.3 Sources and availability of relevant learning resources and learning materials</p> <p>2.4 Content of learning resources and learning materials</p> <p>2.5 Training techniques that enhance learning and when to use them</p> <p>2.6 Introductory knowledge of learning principles and learning styles</p> <p>2.7 Key OHS issues in the learning environment, including:</p> <ul style="list-style-type: none"> • roles and responsibilities of key personnel • responsibilities of learners • relevant policies and procedures, including hazard identification, risk assessment, reporting requirements, safe use of equipment and emergency procedures • risk controls for the specific learning environment
<p>3. Required skills</p>	<p>3.1 Non-verbal communication techniques, such as:</p> <ul style="list-style-type: none"> • asking relevant and appropriate questions • providing explanations • demonstrating • using listening skills • providing information clearly <p>3.2 Safety skills to implement OHS requirements, by acting and responding safely in order to:</p> <ul style="list-style-type: none"> • identify hazards • conduct prestart-up checks if required • observe and interpret learner behaviour that may put people at risk <p>3.3 Time-management, skills to:</p> <ul style="list-style-type: none"> • ensure all learning objectives are covered • pace learning <p>3.4 Reflection skills in order to:</p> <ul style="list-style-type: none"> • identify areas for improvement • maintain personal skill development <p>3.5 Literacy skills to:</p> <ul style="list-style-type: none"> • complete and maintain documentation • read and follow learning programs and plans • read and analyze learner information

	<p>3.6 Technology skills to operate audio-visual and technical equipment</p> <p>3.7 Interpersonal skills to:</p> <ul style="list-style-type: none"> • engage, motivate and connect with learners • provide constructive feedback • maintain appropriate relationships • establish trust • use appropriate body language • maintain humor • demonstrate tolerance • manage a group • recognize and be sensitive to individual difference and diversity <p>3.8 Observation skills to:</p> <ul style="list-style-type: none"> • monitor learner acquisition of new skills, knowledge and competency requirements • assess learner communication and skills in interacting with others • identify learner concerns • recognize learner readiness to take on new skills and tasks
<p>4. Resource implications</p>	<p>The following resources should be provided: Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided</p>
<p>5. Method of assessment</p>	<p>Competency in this unit may be assessed through:</p> <p>5.1 Direct Observation</p> <p>5.2 Oral interview</p> <p>5.3 Written Evaluation</p> <p>5.4 Third Party Report</p>
<p>6. Context of assessment</p>	<p>6.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

UNIT OF COMPETENCY: IDENTIFY AND SELECT ORIGINAL AUTOMOTIVE PARTS AND PRODUCTS

UNIT CODE : ALT723210

UNIT DESCRIPTOR : This unit of competency covers the competence required to identify original automotive parts and products based on evidence from customers and/or other sources which may include catalogue numbers or samples of parts/products or their purpose.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Identify the part/product and its end use	1.1 Available part/product information is gathered, documented and confirmed with customer 1.2 Information gathering techniques is established for proper identification of part/product 1.3 End user or host for the part/product, i.e. vehicle/unit assembly or vehicle/unit assembly options, is established from an analysis of available information
2. Identify details of the part/product	2.1 The parts/product cataloguing system is identified and accessed 2.2 Part/product is matched accurately with cataloguing information by accessing and using the catalogue system 2.3 Details of identity of the part/product are documented and processed
3. Part/product is supplied or ordered for customer	3.1 Customer accepts process used 3.2 Part/product is supplied or ordered if not available 3.3 Customer records are updated

RANGE OF VARIABLES

VARIABLE	RANGE
1. Part/product information	May include: 1.1 Manufacturer/component supplier specifications and technical documentation 1.2 Company procedures and documentation 1.3 Company or industry specifications, diagrams, sketches 1.4 Verbal descriptions and physical and visual evidence
2. Information gathering techniques	Customer may require active assistance and questioning to fully describe requirement in terms of: 2.1 Common vehicle/unit model 2.2 Date of manufacture 2.3 Purpose and appearance of product and other tracking information
3. Parts/products cataloguing systems	May include: 3.1 Hard-copy (book-fast, loose-leaf) 3.2 Stand-alone computer or networked/online computer-supported services

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 Elicited sufficient information from the customer and/or other sources to enable a confirmed identification of vehicle or unit the part/product intended 1.2 Accessed the parts/products catalogue systems associated with required vehicle/unit 1.3 Used both manual and computer-based parts/products catalogues and equivalent documentation to trace and identify common specific brand parts/products 1.4 Communicated effectively with others involved in or affected by the work.
<p>2. Required Knowledge</p>	<p>Competency includes sufficient knowledge to:</p> <ul style="list-style-type: none"> 2.1 Structural of computer workstations 2.2 Common automotive terminology 2.3 Main automotive systems and assemblies and their functions 2.4 Parts/product catalogue systems, both brand-specific and general options 2.5 Legal issues associated with the supply and use of non-conforming parts/components/accessories 2.6 Company quality system 2.7 Work organization and planning processes
<p>3. Required skills</p>	<p>Required skills include the ability to:</p> <ul style="list-style-type: none"> 3.1 Apply research and interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures 3.2 Apply analytical skills required for identification and analysis of technical information 3.3 Apply plain English literacy and communication skills in relation to dealing with customer and team members 3.4 Apply questioning and active listening skills 3.5 Apply oral communication skills sufficient to convey information and concepts to customers 3.6 Apply planning and organizing skills to own work activities, including making good use of time and resources, sorting out priorities and monitoring own performance 3.7 Use mathematical ideas and techniques to correctly calculate material requirements, estimate and calculate costs and establish quality checks 3.8 Use workplace technology related to customer services, including use of measuring equipment, computerized technology, use of communication devices and reporting/ documenting of results

<p>4 Resource implications</p>	<p>The following resources should be provided:</p> <p>4.1 Workplace location or simulated workplace</p> <p>4.2 Information and material identifying and selecting automotive parts and products</p> <p>4.3 Equipment identifying and selecting automotive parts and products</p> <p>4.4 Activities covering task requirements</p> <p>4.5 Specifications and work instructions.</p>
<p>5 Method of assessment</p>	<p>Competency in this unit may be assessed through:</p> <p>5.2 Direct Observation</p> <p>5.3 Oral interview</p> <p>5.4 Written Evaluation</p> <p>5.5 Third Party Report</p>
<p>6 Context of assessment</p>	<p>6.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

CORE COMPETENCIES

UNIT OF COMPETENCY: PERFORM DIESEL ENGINE TUNE UP

UNIT CODE: ALT723301

UNIT DESCRIPTOR: This competency unit covers the ability to carry out engine maintenance in order to keep the vehicle in good running condition and maintain optimum engine performance and prevent serious engine trouble.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables (NOTE: All standard of performance for Performing Diesel Engine Tune Up is in accordance with company standard operating procedure and manufacturer's specification manuals using specified tools and equipment)
1. Set injection timing	<p>1.1 Engine injection parts required in setting injection timing is positioned as per manufacturer's manual</p> <p>1.2 No error in detecting/reading injection timing setting</p> <p>1.3 Injection timing setting is re-checked following instructional manual</p>
2 Install injection pump to engine	<p>2.1 Timing marks, torque and injection pump moving parts motion is re-checked before installation</p> <p>2.2 Injection pump requirement in installing Injection pump per manual instruction is set-up</p> <p>2.3 Mounting bolts are tightened following torque sequence, pattern and specification in the manual</p>
3 Inspect injection Timing	<p>3.1 Injection re-checking timing device is used without error</p> <p>3.2 An interpreted result is without error.</p> <p>3.3 Timing advance operation checked</p>
4 Bleeding injection system components	<p>4.1 Fuel level, line leakage and fuel strainer/filter are checked</p> <p>4.2 Air lock free fuel system is determined without error</p> <p>4.3 Bleed screw and primer pumps is identified without error.</p>
5. Conduct compression testing	<p>5.1 Engine requirements in compression testing is set up</p> <p>5.2 Specific compression test result is read and interpreted</p> <p>5.3 Corresponding recommendation/prescription is given based on the test result.</p>

RANGE OF VARIABLES

VARIABLE	RANGE
1. Injection System Components	May include: 1.1 Governor 1.2 Delivery valve
2.Manuals	May include: 2.1 Manufacturer specification manual 2.2 Maintenance procedure manual 2.3 Periodic maintenance manual 2.4 Service manual 2.5 Parts Checklist
3.Tools and equipment	May include: 3.1 Common and special service hand tools 3.2 Cleaning tools
4.Company standard operating procedure	May include: 4.1 Job order 4.2 Requisition slip 4.3 Wearing of personal protective equipment such as <ul style="list-style-type: none"> • Apron, gloves, gas mask, goggles

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Performed diesel engine tune up
2 Required knowledge	2.1 Compression testing procedure and precaution 2.2 Engine parts 2.3 Engine parts failure 2.4 Effects of low compression pressure to diesel fuel injection system 2.5 Cleaning parts procedures 2.6 Types/classification of gasket and sealant application/use 2.7 Engine fuel injection marks, use and location 2.8 Procedure in setting fuel injection timing. 2.9 Timing mark interpretation, use/application and meaning 2.10 Special tools in setting injection timing care, use/application and maintenance 2.11 Procedure in installing injection pump to engine 2.12 Procedure in re-checking injection timing 2.13 Positive Work values (Perseverance, Honesty, Attention to details) 2.14 Quality procedures, e.g., 5S 2.15 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle)
3 Required skills	3.1 Installing injection pump to engine 3.2 Interpreting results from compression testing 3.1 Handling of parts, cleaning tools and chemicals, sealant and gaskets 3.2 Handling equipment such as tester and pressurized gases 3.5 Use of compression testing equipment 3.6 Bleeding diesel fuel injection system
4 Resource implications	The following resources should be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity 4.4 Manufacturer's repair manual or related reference materials
5 Method of assessment	Competency in this unit may be assessed through: 5.1 Direct observation while the tasks are being performed 5.2 Written/Oral test
6 Context of assessment	6.1 Competency may 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 GAS ENGINE TUNE UP

UNIT CODE: ALT723302

UNIT DESCRIPTOR: This competency unit covers the ability to carry out gas engine maintenance in order to keep the vehicle in good running condition and maintain optimum engine performance and prevent serious engine trouble.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables (NOTE: All standard of performance for Perform Gas Engine Tune Up is in accordance with company standard operating procedure and Manufacturer's Specification manuals using specified tools and equipment .)
1. Inspect/test spark plug	1.1 Spark plug clearance is adjusted 1.2 Spark plug is tested 1.3 Spark plug test result analyzed and appropriate recommendations are prescribed.
2. Check/replace fuel filter and air cleaner	2.1 Fuel filter and air cleaner are replaced 2.2 Fuel filter is free of sediments and impurities
3. Inspect/replace contact point condenser	3.1 Contact point gap is inspected 3.2 Condenser tested and replaced
4. Test /adjust dwell angle and ignition setting	4.1 Dwell angle is adjusted 4.2 Ignition timing is set
5. Adjust engine idle speed and mixture	5.1 Engine speed (rpm) is checked
6. Check advance mechanism and adjust ignition timing	6.1 Ignition timing is adjusted 6.2 Safety is observed in using equipment 6.3 Advanced timing is checked
7. Conduct compression test	7.1 Compression test is conducted 7.2 Test conducted without damage or injury to person or property 7.3 Compression Test result is interpreted and appropriate recommendations is prescribed.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Tune Up	May include: 1.1 Ignition system 1.2 Fuel system 1.3 Engine system 1.4
2. Manual	May include: 2.1 Maintenance Procedure Manual 2.2 Periodic Maintenance Data 2.3 Service Manual 2.4 Parts Checklist
3. Company Standard Operating Procedure	May include: 3.1 Job Order 3.2 Requisition slip 3.3 Wearing of Personal Protective Equipment such as <ul style="list-style-type: none"> • Goggles, gloves, apron, safety shoes
4. Tools and equipment	May include: 4.1 Hand tools, power tools, 4.2 Special equipment, measuring equipment, lifting equipment, testing equipment, cleaning equipment 4.3 Parts washers, chemical cleaning equipment, crack testing equipment, pressure testing equipment

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Performed gas engine tune up
2. Required Knowledge	2.1 Types of lubricants and fluids 2.2 Automotive systems 2.3 Equipment safety requirements 2.4 Relevant company policies 2.5 Personal safety requirements 2.6 Manual handling techniques 2.7 Cleaning methods and materials 2.8 Principle of Engine operation 2.9 Servicing inspection checklist 2.10 Positive Work Values (Honesty, Perseverance, Attention to Details) 2.11 Quality procedures, e.g., 5S 2.12 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle)
3. Required skills	3.1 Accessing, interpreting and applying technical information 3.2 Using relevant tools and equipment safely 3.3 Maintaining customer records 3.4 Applying maintenance procedures 3.5 Following servicing/inspection job order 3.6 Speaking and listening skills 3.7 Reading and writing skills 3.8 Using and interpreting measurements
4. Resource implications	The following resources should be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity 4.4 Repair manuals and related reference materials
5. Method of assessment	Competency in this unit may be assessed through: 5.1 Direct observation 5.2 Questions/Interview related to the Underpinning skills
6. Context of assessment	6.1 Competency may 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: REMOVE AND REPLACE ELECTRICAL/ELECTRONICS UNITS/ASSEMBLIES

UNIT CODE : ALT723354

UNIT DESCRIPTOR : This unit covers competence to remove and replace units/assemblies, such as headlights, tail-lights, electrical components, and computer control units to facilitate body repair activities.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Prepare for work	1.1 Work instructions are used to determine job requirements, including method, material and equipment 1.2 Job specifications are read and interpreted 1.3 OHS requirements are observed throughout the work 1.4 Material for work is selected appropriate to application 1.5 Equipment and tooling are identified and checked for safe and effective operation 1.6 Procedures are determined to minimize waste material and to maximize energy efficiency.
2. Remove electrical / electronic units / assemblies	2.1 Correct information is accessed and interpreted from manufacturer/component supplier specifications 2.2 Electrical / electronic units / assemblies are removed using approved methods, tooling and equipment 2.3 Assistance from a licensed person must be sought in relation to air conditioning and LPG/NGV system/ components removal 2.4 Removal is completed without causing damage to component or system 2.5 Removal activities are carried out according to company procedures/policies 2.6 Units/assemblies are handled and stored in accordance with manufacturer/component supplier requirements
3. Replace electrical / electronic units / assemblies	3.1 Electrical units/assemblies are replaced using approved methods, tooling and equipment 3.2 Assistance from a licensed person must be sought in relation to air conditioning and LPG/NGV system/ components replacement 3.3 Replacement is completed without causing damage to component or system 3.4 Replacement activities are carried out in accordance with company procedures/policies
4. Clean up work area and maintain equipment	4.1 Material that can be reused is collected and stored 4.2 Waste and scrap is removed following workplace and environmental procedures 4.3 Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures 4.4 Unserviceable equipment is tagged and faults identified in accordance with workplace requirements 4.5 Operator maintenance is completed in accordance with manufacturer/component supplier specifications and site procedures 4.6 Tooling is maintained in accordance with workplace procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work instruction / information	May include: 1.1 Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams and sketches 1.2 Safe work procedures related to removal and replacement of electrical/electronic units/assemblies 1.3 Engineer's design specifications and instructions 1.4 Instructions issued by authorized company or external persons
2. OH&S Requirements	May include: 2.1 Protective clothing and equipment 2.2 Use of tooling and equipment 2.3 Workplace environment and safety 2.4 Handling of material 2.5 Use of fire-fighting equipment 2.6 Company first aid, hazard control and hazardous materials and substances 1.7 Dust and fume collection & breathing apparatus
3. Materials	May include: 3.1 Minor spare parts 3.2 Cleaning materials
4. Equipment and Tooling	May include: 4.1 Hand tooling 4.2 Jacking 4.3 Support and lifting equipment 4.4 Special equipment for removal and replacement
5. Procedures	May include: 5.1 Internal company quality policy 5.2 Company operating procedures
6. Electrical/electronic units / assemblies	May include: 6.1 Headlights 6.2 Tail-lights 6.3 Electrical components 6.4 Computer control units

EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1 Observed safety procedures and requirements 1.2 Communicated effectively with others involved in or affected by the work 1.3 selected methods and techniques appropriate to the circumstances 1.4 Completed preparatory activity in a systematic manner 1.5 Removed and replaced a minimum of four units/assemblies to workplace and manufacturer/component supplier requirements, including: <ul style="list-style-type: none"> • one Supplementary Restraint System • one body electronic module • one engine module 1.6 Completed final functional test to specification
<p>2. Required knowledge</p>	<p>A working knowledge of:</p> <ol style="list-style-type: none"> 2.1 OH&S regulations/requirements, equipment, material and personal safety requirements 2.2 Types, applications and external specifications of electrical/electronic units/assemblies 2.3 Sealant selection and application 2.4 Removal and replacement procedures for electrical/electronic units/assemblies 2.5 Use of tooling and equipment 2.6 Work organization and planning processes 2.7 Company quality processes 2.8 Quality procedures, e.g., 5S 2.9 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle)

3. Required skills	<p>3.1 Collect, organize and understand information related to work orders, plans and safety procedures for removing and replacing electrical/electronic units/assemblies</p> <p>3.2 Communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with site supervisor, other workers and customers, and reporting of work outcomes and problems</p> <p>3.3 Plan and organize activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking, workflow interruptions or wastage</p> <p>3.4 Work with others and in a team by recognizing dependencies and using cooperative approaches to optimize workflow and productivity</p> <p>3.5 Use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks</p>
4. Resource implications	<p>The following resources should be provided:</p> <p>4.1 Workplace location or simulated workplace</p> <p>4.2 Material relevant to removal and replacement of electrical and electronic units/assemblies</p> <p>4.3 Equipment, hand and power tooling appropriate to removal and replacement of electrical / electronic units / assemblies</p> <p>4.4 Specifications and work instructions</p>
5. Method of assessment	<p>Competency in this unit may be assessed through:</p> <p>5.1 Direct Observation</p> <p>5.2 Oral interview</p> <p>5.3 Written Evaluation</p> <p>5.4 Third Party Report</p>
6 Context of assessment	<p>6.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

UNIT OF COMPETENCY: REMOVE AND TAG ENGINE SYSTEM COMPONENTS

UNIT CODE : ALT723355

UNIT DESCRIPTOR : This unit covers the competence to remove and tag engine system components

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Prepare to remove and tag engine system components	1.1 Nature and scope of work requirements are identified and confirmed 1.2 OH&S requirements , including individual National / Local / Territory regulatory requirements and personal protection needs are observed throughout the work 1.3 Procedures and information such as workshop manuals and specifications, and required tools and equipment , are sourced 1.4 Method options are analyzed and those most appropriate to the circumstances are selected and prepared 1.5 Dangers associated working with the removal and tagging of engine components are observed
2. Remove engine system components	2.1 Engine system components for removal are identified 2.2 Methods for the removal and tagging are implemented in accordance with manufacturer / component supplier specifications 2.3 Components are removed without damage 2.4 Inspection of components is carried out 2.5 Report is processed in accordance with workplace procedures on communication
3. Tag engine system components	3.1 Tagging procedures are identified 3.2 Material requirements for tagging are identified and support equipment is identified and prepared 3.3 Components are tagged without damage

RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S Requirements	May include: 1.1 Protective clothing and equipment 1.2 Use of tooling and equipment 1.3 Workplace environment and safety 1.4 Handling of material 1.5 Use of fire-fighting equipment 1.6 Company first aid, hazard control and hazardous materials and substances
2. Personal protective equipment	May include: Personal protective equipment includes items prescribed under legislation/regulations/codes of practice and workplace policies and practices
3. Procedures	May include: Internal company quality policy and standards company operations and procedures
4. Material Requirements	May include: 4.1 Tags 4.2 Cleaning materials
5. Tools and equipment	May include: 5.1 Set of Hand Tools 5.2 Hand-held Power Tools
6. Engine system	May include: 6.1 Engine systems from light vehicles, heavy vehicles road transport, heavy vehicles mobile plant.
7. Communications	May include: 7.1 Site specific instructions 7.2 Written instructions 7.3 Plans or instructions related to job/task
8. Information/documents	May include: 8.1 Company operating procedures 8.2 Workshop manuals 8.3 Supplier data sheets 8.4 Parts catalogues 8.5 Customer orders and industry/workplace codes of practice, 8.6 Material safety data sheets 8.7 Safe work procedures related to removing and tagging engine system components

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 Observed safety procedures and requirements 1.2 Communicated effectively with others involved in or affected by the work 1.3 Selected methods and techniques appropriate to the circumstances 1.4 Completed preparatory activity in a systematic manner 1.5 Identified, removed and tagged a range of components by their title and application 1.6 Conducted removal and tagged without damage to components or tooling and equipment
<p>2. Required knowledge</p>	<p>Competency includes sufficient knowledge to:</p> <ul style="list-style-type: none"> 2.1 OH&S regulations/requirements, equipment, material and personal safety requirements 2.2 Engine system terminology and function of each component 2.3 Relationship of components to each other 2.4 Application of components 2.5 Removal procedures 2.6 Tagging procedures 2.7 Quality procedures, e.g., 5S 2.8 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle)
<p>3. Required skills</p>	<p>Required skills include the ability to:</p> <ul style="list-style-type: none"> 3.1 Research and interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures 3.2 Analytical skills required for identification and analysis of technical information 3.3 Plain English literacy and communication skills in relation to dealing with customers and team members 3.4 Questioning and active listening skills 3.5 Oral communication skills sufficient to convey information and concepts to customers 3.6 Planning and organizing skills to own work activities 3.7 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage 3.8 Use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks 3.9 Use workplace technology related to removing and tagging engine system components, including use of measuring equipment and communication devices and the reporting/documenting of results

4. Resource implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace location or simulated workplace 4.2 Material relevant to removing and tagging engine system components 4.3 Equipment, hand and power tooling appropriate to removing and tagging engine system components 4.4 Specifications and work instructions
5. Method of assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 6.3 Direct Observation 6.4 Oral interview 6.5 Written Evaluation 6.6 Third Party Report
6. Context of assessment	<p>6.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

UNIT OF COMPETENCY: REMOVE AND TAG STEERING, SUSPENSION AND BRAKE SYSTEM COMPONENTS

UNIT CODE : ALT723356

UNIT DESCRIPTOR : This unit covers the competence to remove and tag steering, suspension and brake system components

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Prepare to remove and tag steering, suspension and brake system components	1.1 Nature and scope of work requirements are identified and confirmed 1.2 OH&S requirements , including individual National / Local / Territory regulatory requirements and personal protection needs are observed throughout the work 1.3 Procedures and information such as workshop manuals and specifications, and required tools and equipment , are sourced 1.4 Method options are analyzed and those most appropriate to the circumstances are selected and prepared 1.5 Dangers associated working with the removal and tagging of steering, suspension and brake system components are observed
2. Remove steering, suspension and brake system components	2.1 Steering, suspension and brake system components for removal are identified 2.2 Methods for the removal and tagging are implemented in accordance with manufacturer / component supplier specifications 2.3 Components are removed without damage 2.4 Inspection of components is carried out 2.5 Report is processed in accordance with workplace procedures on communication
3. Tag steering, suspension and brake system components	3.1 Tagging procedures are identified 3.2 Material requirements for tagging are identified and support equipment is identified and prepared 3.3 Components are tagged without damage

RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S Requirements	May include: 1.1 Protective clothing and equipment 1.2 Use of tooling and equipment 1.3 Workplace environment and safety 1.4 Handling of material 1.5 Use of fire-fighting equipment 1.6 Company first aid, hazard control and hazardous materials and substances
2. Personal protective equipment	May include: Personal protective equipment includes items prescribed under legislation/regulations/codes of practice and workplace policies and practices
3. Procedures	May include: Internal company quality policy and standards company operations and procedures
4. Material Requirements	May include: 4.1 Tags 4.2 Cleaning materials
5. Tools and equipment	May include: 5.1 Set of Hand Tools 5.2 Hand-held Power Tools
6. Steering, suspension and brake system components	May include: 6.1 Power steering 6.2 Mac-pherson, double-wisbon type of suspension
7. Communications	May include: 7.1 Site specific instructions 7.2 Written instructions 7.3 Plans or instructions related to job/task
8. Information/documents	May include: 8.1 Company operating procedures 8.2 Workshop manuals 8.3 Supplier data sheets 8.4 Parts catalogues 8.5 Customer orders and industry/workplace codes of practice, 8.6 Material safety data sheets 8.7 Safe work procedures related to removing and tagging engine system components

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 Observed safety procedures and requirements 1.2 Communicated effectively with others involved in or affected by the work 1.3 Selected methods and techniques appropriate to the circumstances 1.4 Completed preparatory activity in a systematic manner 1.5 Identified, removed and tagged a range of components by their title and application 1.6 Conducted removal and tagged without damage to components or tooling and equipment
<p>2. Required knowledge</p>	<p>Competency includes sufficient knowledge to:</p> <ul style="list-style-type: none"> 2.1 OH&S regulations/requirements, equipment, material and personal safety requirements 2.2 Engine system terminology and function of each component 2.3 Relationship of components to each other 2.4 Application of components 2.5 Removal procedures 2.6 Tagging procedures 2.7 Quality procedures, e.g., 5S 2.8 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle)
<p>3. Required skills</p>	<p>Required skills include the ability to:</p> <ul style="list-style-type: none"> 3.1 Research and interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures 3.2 Analytical skills required for identification and analysis of technical information 3.3 Plain English literacy and communication skills in relation to dealing with customers and team members 3.4 Questioning and active listening skills 3.5 Oral communication skills sufficient to convey information and concepts to customers 3.6 Planning and organizing skills to own work activities 3.7 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage 3.8 Use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks 3.9 Use workplace technology related to removing and tagging engine system components, including use of measuring equipment and communication devices and the reporting/documenting of results

<p>4. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 4.1 Workplace location or simulated workplace 4.2 Material relevant to removing and tagging engine system components 4.3 Equipment, hand and power tooling appropriate to removing and tagging steering, suspension and brake system components 4.4 Specifications and work instructions
<p>5. Method of assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 5.1 Direct Observation 5.2 Oral interview 5.3 Written Evaluation 5.4 Third Party Report
<p>6. Context of assessment</p>	<p>6.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

UNIT OF COMPETENCY: REMOVE AND TAG TRANSMISSION SYSTEM COMPONENTS

UNIT CODE : ALT723357

UNIT DESCRIPTOR : This unit covers the competence to remove and tag transmission components

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Prepare to remove and tag transmission components	1.1 Nature and scope of work requirements are identified and confirmed 1.2 OH&S requirements , including individual National / Local / Territory regulatory requirements and personal protection needs are observed throughout the work 1.3 Procedures and information such as workshop manuals and specifications, and required tools and equipment , are sourced 1.4 Method options are analyzed and those most appropriate to the circumstances are selected and prepared 1.5 Dangers associated working with the removal and tagging of transmission components are observed
2. Remove transmission system components	2.1 Transmission components for removal are identified 2.2 Methods for the removal and tagging are implemented in accordance with manufacturer / component supplier specifications 2.3 Components are removed without damage 2.4 Inspection of components is carried out 2.5 Report is processed in accordance with workplace procedures on communication
3. Tag transmission components	3.1 Tagging procedures are identified 3.2 Material requirements for tagging are identified and support equipment is identified and prepared 3.3 Components are tagged without damage

RANGE OF VARIABLES

VARIABLE	RANGE
1. OH&S Requirements	May include: 1.1 Protective clothing and equipment 1.2 Use of tooling and equipment 1.3 Workplace environment and safety 1.4 Handling of material 1.5 Use of fire-fighting equipment 1.6 Company first aid, hazard control and hazardous materials and substances
2. Personal protective equipment	May include: Personal protective equipment includes items prescribed under legislation/regulations/codes of practice and workplace policies and practices
3. Procedures	May include: Internal company quality policy and standards company operations and procedures
4. Material Requirements	May include: 4.1 Tags 4.2 Cleaning materials
5. Tools and equipment	May include: 5.1 Set of Hand Tools 5.2 Hand-held Power Tools
6. Transmission system	May include: 6.1 Manual and/or automatic and/or semi automatic and/or power shift transmissions 6.2 Driveline components 6.3 Rear axle/final drive assemblies and multiple speed and overdrive transmissions
7. Communications	May include: 7.1 Site specific instructions 7.2 Written instructions 7.3 Plans or instructions related to job/task
8. Information/documents	May include: 8.1 Company operating procedures 8.2 Workshop manuals 8.3 Supplier data sheets 8.4 Parts catalogues 8.5 Customer orders and industry/workplace codes of practice, 8.6 Material safety data sheets 8.7 Safe work procedures related to removing and tagging engine system components

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 Observed safety procedures and requirements 1.2 Communicated effectively with others involved in or affected by the work 1.3 Selected methods and techniques appropriate to the circumstances 1.4 Completed preparatory activity in a systematic manner 1.5 Identified, removed and tagged a range of components by their title and application 1.6 Conducted removal and tagged without damage to components or tooling and equipment
<p>2. Required knowledge</p>	<p>Competency includes sufficient knowledge to:</p> <ul style="list-style-type: none"> 2.1 OH&S regulations/requirements, equipment, material and personal safety requirements 2.2 Transmission terminology and function of each component 2.3 Relationship of components to each other 2.4 Application of components 2.5 Removal procedures 2.6 Tagging procedures 2.7 Quality procedures 2.8 Quality procedures, e.g., 5S 2.9 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle)
<p>3. Required skills</p>	<p>Required skills include the ability to:</p> <ul style="list-style-type: none"> 3.1 Research and interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures 3.2 Analytical skills required for identification and analysis of technical information 3.3 Plain English literacy and communication skills in relation to dealing with customers and team members 3.4 Questioning and active listening skills 3.5 Oral communication skills sufficient to convey information and concepts to customers 3.6 Planning and organizing skills to own work activities 3.7 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage 3.8 Use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks 3.9 Use workplace technology related to removing and tagging engine system components, including use of measuring equipment and communication devices and the reporting/documenting of results

<p>7. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 7.1 Workplace location or simulated workplace 7.2 Material relevant to removing and tagging transmission system components 7.3 Equipment, hand and power tooling appropriate to removing and tagging transmission system components 7.4 Specifications and work instructions
<p>8. Method of assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 8.1 Direct Observation 8.2 Oral interview 8.3 Written Evaluation 8.4 Third Party Report
<p>9. Context of assessment</p>	<p>9.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</p>

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 Servicing NC I.

3.1 CURRICULUM DESIGN

Course Title: **AUTOMOTIVE SERVICING**

NC Level **NC I**

Nominal Training Duration: **28 Hours** (Basic Competencies)
40 Hours (Common Competencies)
88 Hours (Core Competencies)
 156 Hours

Course Description:

This course is designed to enhance the knowledge, skills and attitudes of an individual in the field of automotive servicing in accordance with industry standards. It covers core competencies such as; performance of basic engine servicing through removal and reinstallation of components for gas and diesel engines.

This course is also designed to enhance the basic and common knowledge, skills and attitudes of an individual in the field of automotive servicing.

To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Receive and respond to workplace communication	1.1 Explain routinary speaking & messages in a workplace 1.2 Follow routinary speaking & message 1.3 Perform work duties following written notices	Group discussion Interaction	<ul style="list-style-type: none"> • Interviews/questioning • Observation
2. Work with others	2.1 Develop effective workplace relationship 2.2 Contribute to work group activities	Group discussion Interaction	<ul style="list-style-type: none"> • Interviews/questioning • Demonstration • Observation
3. Demonstrate work values	3.1 Define the purpose of work 3.2 Apply work values/ethics 3.3 Deal with ethical problems 3.4 Maintain integrity of conduct in the workplace	Group discussion Interaction	<ul style="list-style-type: none"> • Demonstration • Observation • Interviews/questioning
4. Practice housekeeping procedures	4.1 Sort and remove unnecessary items 4.2 Arrange items 4.3 Maintain work areas, tools and equipment 4.4 Follow standardize work process and procedures 4.5 Perform work spontaneously	Group discussion Interaction	<ul style="list-style-type: none"> • Demonstration • Observation • Interviews/questioning

COMMON COMPETENCIES

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 • 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	<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 • Project method • Interview
3. Perform Mensuration and Calculation	3.1. Select measuring instrument and carry out measurement and calculations. 3.2. 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 • Project method • Interview
4. Read, Interpret and Apply Specifications and Manual	4.1. Identify/accessed 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 • Project method • 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 • Project method • Interview
6. Perform Shop Maintenance	6.1. Inspect/clean tools and work area 6.2. Store/arrange tools and shop equipment 6.3. Dispose wastes/used lubricants 6.4. Report damaged tools/equipment	<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 • Project method • Interview

7.Prepare job estimates	7.1 Identify nature/scope of work 7.2 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 • Project method • Interview
8. Interpret/Draw technical drawing	8.1 Interpret technical drawing 8.2 Select correct technical drawing 8.3 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 • Project method • Interview
9.Practice health, safety and environment procedures	9.1 Apply basic safety procedures 9.2 Apply emergency procedures	<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 • Project method • Interview
10.Inspect technical quality of work	10.1 Gather information to carry out inspection 10.2 Inspect and apply quality standards to work 10.3 Achieve quality work outcomes	<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 • Project method • Interview
11.Maintain quality systems	11.1 Conduct final quality check on completed work/ orders 11.2 Report on the quality of processes and work outcomes 11.3 Implement improvements to work processes	<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 • Project method • Interview
12.Provide work skill instructions	12.1 Organize instruction and demonstration 12.2 Conduct instruction and demonstration 12.3 Check training performance 12.4 Review personal training performance and finalize documentation	<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 • Project method • Interview
13.Identify and select original automotive parts and products	13.1 Identify the part/ product and its end use 13.2 Identify details of the part/ product 13.3 part/ product is supplied or ordered for customer	<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 • Project method • Interview

CORE COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform diesel engine tune - up	1.1 Measure/Adjust valve tappet clearance 1.2 Test fuel injector and glow plug 1.1 Check/Replace fuel and air filter 1.2 Check /Adjust injection timing 1.3 Check and adjust injection pump setting 1.4 Perform diesel fuel injection bleeding 1.5 Perform compression testing	<ul style="list-style-type: none"> • Demonstration • Discussion • Dual training • Distance learning 	<ul style="list-style-type: none"> • Demonstration of practical skills • Direct observation • Interview
2. Perform Gas Engine Tune Up	2.1 Measure/Adjust valve tappet clearance 2.2 Test spark plug 2.3 Check/Replace fuel and air filter 2.4 Test and replace ignition breaker 2.5 Check and adjust distributor setting 2.6 Set fuel mixture and idle rpm 2.7 Perform compression testing	<ul style="list-style-type: none"> • Demonstration • Discussion • Dual training • Distance learning 	<ul style="list-style-type: none"> • Demonstration of practical skills • Direct observation • Interview
3.Remove and replace electrical/electronics unit/assemblies	3.1 Prepare for work 3.2 Remove electrical / electronic units / assemblies 3.3 Replace electrical / electronic units / assemblies 3.4 Clean up work area and maintain equipment	<ul style="list-style-type: none"> • Demonstration • Discussion • Dual training • Distance learning 	<ul style="list-style-type: none"> • Demonstration of practical skills • Direct observation • Interview
4.Remove and tag engine system components	4.1 Prepare to remove and tag engine system components 4.2 Remove engine system components 4.3 Tag engine system components	<ul style="list-style-type: none"> • Demonstration • Discussion • Dual training • Distance learning 	<ul style="list-style-type: none"> • Demonstration of practical skills • Direct observation • Interview
5.Remove and tag steering, suspension and brake system components	5.1 Prepare to remove and tag steering, suspension and brake system components 5.2 Remove steering, suspension and brake system components 5.3 Tag steering, suspension and brake system components	<ul style="list-style-type: none"> • Demonstration • Discussion • Dual training • Distance learning 	<ul style="list-style-type: none"> • Demonstration of practical skills • Direct observation • Interview
6.Remove and tag transmission system components	6.1 Prepare to remove and tag transmission components 6.2 Remove transmission system components 6.3 Tag transmission components	<ul style="list-style-type: none"> • Demonstration • Discussion • Dual training • Distance learning 	<ul style="list-style-type: none"> • Demonstration of practical skills • Direct observation • 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 Dual Training 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; 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 TOOLS, EQUIPMENT AND MATERIALS AUTOMOTIVE SERVICING – NC

Recommended list of tools, equipment and materials for the training of 20 trainees for Automotive Servicing – NC I

TOOLS		EQUIPMENT		MATERIALS	
QTY		QTY		QTY	
2 sets	Box wrench of 28 pcs, 4mm-32mm	2 units	Motor Vehicle	20 ltrs.	Engine oil
2 sets	Open end wrench of 28 pcs, 4mm-32mm	2 units	Engine	10 kg	Grease
2 sets	Socket wrench	2 units	Hydraulic jack/lift	10 tube	Sealant /adhesive
2 pcs	Pliers	2 units	Ignition timing light for diesel engine	20 ltrs.	Hydraulic oils/gear oil
6 pcs	Screw driver, one of each kind	2 units	Ignition timing light for gasoline engine	20 ltrs.	Automatic transmission fluid
4 sets	Wire strippers	4 units	Tachometer	10 pcs.	Wheel wedges
4 pcs	Mechanic's hammer	4 units	Differential and front axle	10 pcs.	Test lamp
25 pcs.	Apron	4 units	Multimeter	2 sets	Overhauling gasket (per engine model)
2 pcs	Impact wrench	4 units	Diesel fuel injector assembly	25 pcs.	Goggles
4 units	Soldering gun/iron			25 pcs.	Gloves
2 sets	Carburetor tool set, 8 pcs				
2 units	Oil pressure tester				
1 unit	Injection nozzle tester				
4 sets	Torque wrench				
4 sets	Feeler gauge				
4 units	Cell tester				
4 sets	Hydrometer				
2 units	Dial gauge				
2 sets	Bore gauge				
4 sets	Caliper, 25mm to 100mm				

3.5 TRAINING FACILITIES

AUTOMOTIVE SERVICING – NC I

The automotive workshop must be made of reinforced concrete or steel structure. The size must be suited on the requirements of the competencies. The class size of 25 students/trainees is reserved for the lecture room and the practical demonstration area for carrying out servicing of minor automotive parts. Most of the learning activities such as on-vehicle servicing are performed in the workshop.

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
Workshop/Laboratory area		6 per student	150
Lecture Room		28.00	28.00
Learning Resource Center		20.00	20.00
Wash/Comfort room		10	10
Storage/Tool room		20	20
Circulation Area			60
Total Area			288

3.6 TRAINERS' QUALIFICATION

- Holder of National TVET Trainers Certificate (NTTC) Level 1 in Automotive Servicing NC I
- Must be computer literate
- *Must have at least 2 years job/industry experience

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 Servicing NC I, the candidate must demonstrate competence through project-type assessment covering all the units 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 Servicing NC I 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 Perform Diesel Engine Tune Up
 - 4.2.2 Perform Gas Engine Tune Up
 - 4.2.3 Perform Removal and Reinstallation of Diesel Engine components
 - 4.2.4 Perform Removal and Reinstallation of Gas Engine components

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 SERVICING NC I

CORE COMPETENCIES

Perform diesel engine tune up	Perform gas engine tune up	Remove and replace electrical/electronic units/assemblies	Remove and tag engine system components	Remove and tag steering, Suspension and brake system components	Remove and tag transmission system components
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COMMON COMPETENCIES

Practice health safety and environment procedures	Inspect technical quality of work	Maintain quality systems	Provide work skill instructions	Identify and select original automotive parts and products	
Perform mensuration and calculation	Move and position vehicle	Apply appropriate sealant/adhesive	Use and apply lubricant/coolant	Perform shop maintenance	Read, interpret and apply specification and manuals
					Interpret/draw technical drawing
					Prepare job estimate/costing

BASIC COMPETENCIES

Receive and respond workplace communication	Work with Other	Demonstrate work values	Practice basic housekeeping procedures	Lead in workplace communication	Develop and practice negotiation skills	Solve problem related to work activities
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	
Plan and organize work	Utilize specialist Communication skills	Promote environmental Protection	Develop team and individual	Apply problem solving techniques in the workplace	Collect, analyze and organize work	

DEFINITION OF TERMS

1. **Light Duty Vehicles** These are motor vehicles whose gross vehicle weight is equal or less than 3,500 kgs. Powered by a gas or diesel engine.
2. **Automotive Service Technician** Refers to an all around auto serviceman that can perform both mechanical and electrical as well as auto electronics maintenance checking and inspection of motor vehicle. Assesses vehicle problems, perform all necessary diagnostic test or installation of accessories and competently repairs or replaces faulty parts.
3. **Adhesives** Substance used to hold gasket in place during assembly. It also maintains a tight seal by filling in small irregularities on a surface and prevents gasket from shifting due to vibration.
4. **Anti-Lock Braking System** System that automatically controls wheel slip or prevents sustained wheel locking on braking
5. **Automatic Transmission** A transmission in which gear or ratio changes are self-activated, eliminating the necessity of hand shifting gears
6. **Backlash** The amount of clearance or play between two meshed gears
7. **Catalytic Converter** Emission The control device fitted in the exhaust system of an internal combustion engine. The converter reduces the toxicity of products of combustion by catalytic re-combination
8. **Charcoal Canister** Trap containing charcoal granules to store fuel evaporating from a fuel system and prevent its loss to atmosphere, particularly from a carburetor and fuel tank.
9. **Electronics** Electrical assemblies, circuit and system that use electronic devices such as transistors and diodes.
10. **Emissions** Any air contaminant, pollutant, gas stream from a known source which is introduced into the atmosphere.
11. **Final Drive** The end of the drive train before power is transmitted to the wheels.
12. **Fuel Injection** An electronic system that increases the performance and fuel economy because it monitors engine conditions and provides the correct air/fuel mixture based on the engine's demand. It injects fuel directly into the cylinder head enabling more precise control over the quantity used.
13. **Governor** A speed sensing device that employs centrifugal force and spring tension to govern engine speed.
14. **Hotchkiss Drive** The type of rear suspension in which leaf springs absorb the rear axle housing torque.
15. **Intake Manifold** Tubing attached to the engine through which the air/fuel mixture reaches the cylinder.

- 16. Ignition System** Electrical system devised to produce timed sparks from engine spark plug. Consisting of a battery, induction coil, capacitor, distributor, spark plugs and relevant switches and wiring.
- 17. Master Cylinder** The liquid-filled cylinder in the hydraulic brake system or clutch, where hydraulic pressure is developed when depresses a foot pedal.
- 18. Periodic Maintenance Service** The regular servicing prescribed by manufacturer to maintain the vehicle's top performance.
- 19. Positive Crank Ventilation** Emission control system that prevents crank case gases from entering the atmosphere, usually by drawing the gases from the crank case and feeding them into the engine's induction system.
- 20. Power Steering** Steering that has been designed to make the wheel move more easily than in a manual steering system. Hydraulic assists the process utilizing hydraulic fluid. The fluid increases pressure in the power steering pump and aids in the movement of the steering mechanism. This fluid, called power steering fluid, is what is replaced at regular intervals to keep steering soft and comfortable.
- 21. Super Charged Engine** An engine that is similar to a turbo-charged engine which uses a series of belts or chains from the crankshaft to turn the turbines that forces the air/fuel mixture into the cylinder heads under pressure creating a bigger explosion which generates more power. A turbocharger uses the exhaust gases to turn the turbines to create the same effect.
- 22. Transaxle** Type of construction in which the transmission and differential are combined in one unit.
- 23. Thermostat** A device for automatic regulation of temperature
- 24. Turbo Charged Engine** A performance-increasing turbine positioned in the exhaust system. Expanding exhaust gases spin an impeller (very small fan-type blades) at speeds up to 25 thousand rpm, driving a similar compressing impeller. Compressed air from the driven impeller is forced into the induction system, which squeezes more air/fuel mixture into the combustion chambers. With the greater charge of air and fuel, a more powerful combustion burn results, thus more power. The big advantage of the turbo over directly driven superchargers is the increased efficiency, although there is a slight lag before the turbine spins up and increases the power output. Originally turbo were developed to enable aircraft to fly at high altitudes, then they found use in diesel trucks and train engines to increase their torque.
- 25. U-joint** A four-joint cross-connected to two U-shaped yokes that serve as a flexible coupling between shafts.

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