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**NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION****STATEMENT OF STANDARDS****UNIT NUMBER:** 2211143**UNIT TITLE:** SERVICING PLANT AND EQUIPMENT

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

**OUTCOME (ELEMENT OF COMPETENCE)**

1. INTERPRET TECHNICAL INFORMATION FOR SERVICING PLANT AND EQUIPMENT

**PERFORMANCE CRITERIA**

- (a) Technical information derived from given sources relates to parts and components to be replaced and equipment to be installed.
- (b) Oral or written instructions or information given to the candidate are correctly interpreted and implemented.
- (c) Corrective actions are implemented against deviations from technical information.

**RANGE STATEMENT**

Information sources: instruction or operating handbooks; manufacturers' specifications; workshop manuals; parts manuals; technical service bulletins; statutory regulations; oral or written instructions; servicing charts; cross-reference guides; drawings; diagrams; exploded views; symbols.

Corrective actions: specifications, manuals and bulletins amendment procedures.

Calculations: simple multiplication; division; addition; subtraction; percentages.

**EVIDENCE REQUIREMENTS**

Performance evidence of competence under working conditions in:

- (i) extracting:
  - servicing information from servicing charts, operator manuals, workshop manuals, manufacturers' specifications and statutory regulations;
  - procedures for in-service adjustments from manufacturers' specifications;
  - variations from manufacturers' specifications, manuals and bulletins amendment procedures.

- (ii) calculating from given information sources, capacities, volumes, quantities and linear measure.

Oral or written evidence of knowledge and understanding of:

- (i) types and purposes of information sources;
- (ii) methods of checking and reporting inaccuracies in information sources.

All the performance criteria must be met and all items in the range statement covered.

**OUTCOME (ELEMENT OF COMPETENCE)**

- 2. REMOVE WASTE SUBSTANCES, PARTS AND COMPONENTS FROM PLANT AND EQUIPMENT FOR SERVICING**

**PERFORMANCE CRITERIA**

- (a) Oral or written instructions or information given to the candidate are correctly interpreted and implemented.
- (b) The selection of tools and equipment enables the task to be carried out to the specification.
- (c) The removal of substances, parts and components is correct in terms of:
  - (i) conforming with the specification;
  - (ii) being carried out to minimise damage;
  - (iii) being carried out to minimise damage to the environment.
- (d) Work is completed to an agreed time schedule.
- (e) The cleanliness of the work area is maintained.
- (f) Work methods and activities satisfy current legislation.

**RANGE STATEMENT**

Information sources: manufacturers' technical information; instruction or operating handbooks; oral or written instructions; technical service bulletins.

Tools and equipment: hand tools; hand and power specialist servicing tools; drain containers; waste containers.

Parts and components: filters; filter and bearing housings; drive belts; guards; cowling; ducting; retaining hardware; electric cable; wheels, auto-electrical hardware; controls; linkages; rope actuated equipment; pipe network; hoses.

Plant and equipment: static plant; wheeled plant; tracked plant; small plant; attachments.

Preparation processes: removing; dismantling; inspecting.

Waste substances: fuels; lubricants; fluids; coolants; air.

Location: site; workshop.

Safety: personal protective equipment; plant and equipment operation procedures; HASWA (Health and Safety at Work Act); COSHH (Control of Substances Hazardous to Health) Regulations.

## EVIDENCE REQUIREMENTS

Performance evidence of competence under working conditions in:

- (i) removing waste substances in the range from plant and equipment;
- (ii) inspecting substances for contamination;
- (iii) removing parts and components in the range;
- (iv) dismantling parts and components in the range;
- (v) inspecting parts and components in the range.

Oral or written evidence of knowledge and understanding of:

- (i) types and purposes of information sources;
- (ii) hourly, weekly, monthly, annual and mileage periodic servicing methods and procedures applicable to plant and equipment in the range;
- (iii) basic lubrication and cooling systems (engines, power trains);
- (iv) purpose of inspecting parts and components when removing and dismantling;
- (v) purpose of selecting correct tools and equipment to carry out servicing tasks;
- (vi) applications and limitations of hand tools, power tools and specialist tools;
- (vii) precautions to be observed when working with and handling fuels, lubricants, greases, coolants and fluids;
- (viii) purpose of using lifting equipment or aids to remove parts and components;
- (ix) procedures for disposing waste substances and components;
- (x) purpose of inspecting removed fuels, lubricants, fluids and coolants for contamination;
- (xi) handling and storage of parts and components;
- (xii) responsibilities with regard to safety.

All the performance criteria must be met and all items in the range statement covered.

## OUTCOME (ELEMENT OF COMPETENCE)

### 3. PREPARE PARTS AND COMPONENTS FOR SERVICING

## PERFORMANCE CRITERIA

- (a) Oral or written instructions or information given to the candidate are correctly interpreted and implemented.

- (b) The selection of tools and equipment enables the task to be carried out to the specification.
- (c) The preparation of parts and components is complete and conforms with manufacturers' instructions or specifications.
- (d) Work is completed to an agreed time schedule.
- (e) The cleanliness of the work area is maintained.
- (f) Work methods and activities satisfy current legislation.

### **RANGE STATEMENT**

Information sources: instruction or operating handbooks; technical service bulletins; oral or written instructions; manufacturers' technical information; capacities charts; cross-reference guides; lubricant, fuel and coolant maintenance charts.

Tools and equipment: hand tools; hand and power specialist servicing tools; cleaning tanks and containers.

Parts and components: filter housings; mating surfaces; reservoirs; pipe network; hoses; linkages; wheels; tyres; wire ropes; cowling; ducting.

Materials and substances; cleaning agents; solvents; lubricants; emery cloth; emery paper; jointing and sealing compounds.

Preparation processes: cleaning; scraping; dressing; lubricating; inspecting; assembling; adjusting; flushing; applying.

Location: site; workshop.

Safety: personal protective equipment; machinery operating procedures; HASWA (Health and Safety at Work Act); COSHH (Control of Substances Hazardous to Health) Regulations.

### **EVIDENCE REQUIREMENTS**

Performance evidence of competence under working conditions in:

- (i) preparing parts and components in the range;
- (ii) reclaiming and salvaging parts and components in the range.

Oral or written evidence of knowledge and understanding of:

- (i) types and purpose of information sources;
- (ii) reasons for different types of preparation processes for parts and components;
- (iii) application and limitations of tools and equipment for preparation purposes on parts and components;
- (iv) construction and principal design features of parts and components;
- (v) purpose of inspecting parts, components and materials prior to assembly and fitting;
- (vi) methods and procedures for salvaging and reclaiming parts and components;
- (vii) reasons for storing parts, components and materials prior to assembly and fitting;
- (viii) reasons for reclaiming parts and components;
- (ix) reasons for meeting set time schedules;
- (x) responsibilities with regard to safety.

All the performance criteria must be met and all items in the range statement covered.

**OUTCOME (ELEMENT OF COMPETENCE)**

- 4. SELECT PARTS, COMPONENTS AND SUBSTANCES FOR SERVICING**

**PERFORMANCE CRITERIA**

- (a) The quantity, quality and types of parts, components and substances complies with the specification.
- (b) Corrective actions are implemented to establish utility of parts, components and substances.
- (c) Oral or written instructions or information given to the candidate are correctly interpreted and implemented.

**RANGE STATEMENT**

Information sources: capacities charts; workshop manuals; manufacturers' specifications; operating handbooks and instruction books; parts lists; lubricant and fuel, maintenance charts.

Corrective actions: defective, non-match, substandard parts and components, materials and substances replacement procedures.

Parts and components: drive belts; filters; hoses; pipes; seals; auto-electrical hardware; retaining hardware; gaskets.

Substances: fuels; lubricants; coolants; fluids; joint and sealing compounds; protective coatings.

Location: site, workshop.

**EVIDENCE REQUIREMENTS**

Performance evidence of competence under working conditions in selecting substances, parts and components.

Oral or written evidence of knowledge and understanding of:

- (i) types and purposes of information sources;
- (ii) types and purposes of substances, parts and components;
- (iii) procedures for locating and identifying spare parts and components;
- (iv) replacement procedures for selecting substances, parts and components for periodic servicing;
- (v) ordering procedures for spare parts and components;
- (vi) methods of inspecting faulty parts, components and materials;
- (vii) storing parts and components;
- (viii) storing fuels, lubricants and anti-freeze;
- (ix) procedures for reporting defects in substances, parts and components;
- (x) manual and non-manual stock record systems;
- (xi) responsibilities with regard to safety.

All the performance criteria must be met and all items in the range statement covered.

**OUTCOME (ELEMENT OF COMPETENCE)**

5. POSITION AND SECURE PARTS AND COMPONENTS ON PLANT AND EQUIPMENT

**PERFORMANCE CRITERIA**

- (a) Oral or written instructions or information given to the candidate are correctly interpreted and implemented.
- (b) Parts and components are positioned and secured to conform with specification.
- (c) The selection of tools and equipment enables the task to be carried out to the specification.
- (d) Work is completed to an agreed time schedule.
- (e) The cleanliness of the work area is maintained.
- (f) Work methods and activities satisfy current legislation.

**RANGE STATEMENT**

Manufacturers' technical information; oral or written instructions; workshop manuals; technical service bulletins; operating or instruction handbooks.

Records: company required forms.

Tools: hand tools; specialist servicing tools (hand and power).



Substances: fuels; lubricants; fluids; coolants.

Parts and components: filters; housings; drive belts; hoses; pipes; guards; cowling; ducting; retaining hardware; electric cable; auto-electrical hardware; wheels; linkages; attachments; controls; rope actuated equipment.

Plant and equipment: static plant; wheeled plant; tracked plant; small plant; attachments.

Preparation processes: positioning; securing; assembling; adjusting; replenishing; applying; replacing; applying.

Location: site; workshop.

Safety: personal protective equipment; manual handling; HASWA (Health and Safety and Work Act); COSHH (Control of Substances Hazardous to Health) Regulations.

## **EVIDENCE REQUIREMENTS**

Performance evidence of competence under working conditions in;

- (i) positioning and securing parts and components;
- (ii) making adjustments on parts, components, plant and equipment to manufacturers' specifications;
- (iii) applying fuels and lubricants.

Oral or written evidence of knowledge and understanding of:

- (i) types and purpose of information sources;
- (ii) purpose of assembling parts and components in accordance with manufacturers' specifications;
- (iii) purpose of positioning and securing parts and components in accordance with manufacturers' specifications;
- (iv) purpose of making adjustments to parts and components in accordance with manufacturers' specifications;
- (v) correct methods of replenishing and replacing lubricants, fluids and coolants on plant and equipment in the range;
- (vi) reasons for meeting set time schedules;
- (vii) responsibility with regard to safety.

All the performance criteria must be met and all items in the range statement covered.

**OUTCOME (ELEMENT OF COMPETENCE)**

- 6. OPERATE PLANT AND EQUIPMENT TO EVALUATE PERFORMANCE OF SERVICED SYSTEMS**

**PERFORMANCE CRITERIA**

- (a) Oral or written instructions or information given to the candidate are correctly interpreted and implemented.
- (b) Plant and equipment is operated to conform with industry procedures.
- (c) The selection of tools and equipment enables the task to be carried out to the specification.
- (d) Plant and equipment is serviced and maintained to conform with manufacturers' technical information.
- (e) Defects and faults are identified and recorded.
- (f) Work is completed to an agreed time schedule.
- (g) Work methods and activities satisfy current legislation.

**RANGE STATEMENT**

Information sources: manufacturers' technical information; company regulations; manufacturers' operating instructions; workshop manuals; oral or written instructions; technical service bulletins; company regulations; statutory regulations.

Plant and equipment: static plant; wheeled plant; tracked plant; small plant; attachments.

Tools and equipment: hand tools; specialist servicing tools.

Processes: starting; stopping; manoeuvring; testing; monitoring; checking; adjusting; recording.

Safety: personal safety; personal protective equipment; operation of plant and equipment; HASWA (Health and Safety at Work Act); COSHH (Control of Substances Hazardous to Health) Regulations.

**EVIDENCE REQUIREMENTS**

Performance evidence of competence under working conditions in:

- (i) starting, manoeuvring and stopping plant and equipment;
- (ii) carrying out pre-operating, functional and monitoring checks on plant and equipment;
- (iii) carrying out 'in-service' adjustments to specification.

Oral or written evidence of knowledge and understanding of:

- (i) types and purpose of information sources;
- (ii) methods and procedures for carrying out pre-operating checks on plant and equipment;

- (iii) methods and procedures for carrying out functional tests, on plant and equipment;
- (iv) methods and procedures for carrying out monitoring checks on plant and equipment;
- (v) purpose of evaluating performance of serviced plant and equipment;
- (vi) procedures for reporting malfunctions and defects in plant and equipment;
- (vii) reasons for carrying out 'in-service' adjustments in accordance with manufacturers' specifications;
- (viii) application and suitability of tools and equipment for servicing and carrying out adjustments;
- (ix) reasons for meeting set time schedules;
- (x) methods of securing and isolating plant and equipment;
- (XI) responsibilities with regard to safety.

All the performance criteria must be met and all items in the range statement covered.

**OUTCOME (ELEMENT OF COMPETENCE)**

**7. RECORD AND MAINTAIN SERVICING INFORMATION**

**PERFORMANCE CRITERIA**

- (a) Work methods and activities satisfy current legislation.
- (b) Records are complete, accurate, clear and accessible.
- (c) Co-ordinating directions and communications are clear, concise and effective.
- (d) Working methods are designed to ensure that organisational objectives are achieved.

**RANGE STATEMENT**

Information sources: manufacturers' operating instructions; company record requirements; company instructions; parts lists or manuals; cross-reference guides.

Documentation: company records.

Location: site; depot.

Safety: relevant codes of practice; HASWA (Health and Safety at Work Act); COSHH (Control of Substances Hazardous to Health) Regulations.

**EVIDENCE REQUIREMENTS**

Performance evidence of competence under working conditions in:

- (i) recording and collating;
- (ii) processing information;
- (iii) report writing.

Oral or written evidence of knowledge and understanding of:

- (i) types and purpose of information sources;
- (ii) reasons for planned servicing and the need to keep records;
- (iii) methods of maintaining records of plant servicing;
- (iv) methods and procedures for report writing and report compilation;
- (v) methods of maintaining parts and components records;
- (vi) reasons and methods for reporting construction plant and equipment for safety and serviceability requirements;
- (vii) purpose of planning and control procedures;
- (viii) common types of servicing and maintenance record-keeping systems, their applications, uses and limitations;
- (ix) responsibilities with regard to statutory regulations.

All the performance criteria must be met and all items in the range statement covered.

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### **ASSESSMENT RECORDS**

In order to achieve this unit, candidates are required to present sufficient evidence that they have met all the performance criteria for each outcome within the range specified. Details of these requirements are given for each outcome. The assessment instruments used should follow the general guidance offered by the SQA assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of assessment instruments used showing how evidence is generated for each outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

### **SPECIAL NEEDS**

In certain cases, modified outcomes and range statements can be proposed for certification. See references at end of Support Notes.

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**NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION****SUPPORT NOTES****UNIT NUMBER** 2211143**UNIT TITLE** SERVICING PLANT AND EQUIPMENT

**SUPPORT NOTES:** This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

**NOTIONAL DESIGN LENGTH:** SQA allocates a notional design length to a unit on the basis of time estimated for achievement of the stated standards by a candidate whose starting point is as described in the access statement. The notional design length for this unit is 40 hours. The use of notional design length for programme design and timetabling is advisory only.

**PURPOSE** This unit is designed to enable the candidate to develop skills and knowledge related to servicing plant and equipment. It is suitable for operatives working in the construction industry or a service industry related to construction.

SQA publishes summaries of NC units for easy reference, publicity purposes, centre handbooks, etc. The summary statement for this unit is as follows:

This module will help you to acquire the skills and knowledge necessary to prepare, select, position and secure parts and components for the servicing of plant and equipment. You will also acquire skills in the operation of plant and equipment to enable an evaluation of the performance of serviced systems to be made. On completion of the module you will have a working knowledge of relevant safety procedures and legislation.

**CONTENT/CONTEXT** The candidate successfully completing this module will require underpinning knowledge and skills relating to the processes and techniques required to service plant and equipment and to record and maintain service information.

The unit would be offered to candidates from the construction and related services industries. The skills are transferable within different working environments but the unit is primarily aimed at candidates whose normal place of work would be a site or similar environment.

The range statement is applicable to all areas of construction and other related or similarly structured industries. The competences and underpinning knowledge gained in successfully completing this unit would be transferable across a range of disciplines within the built environment.

The unit deals with servicing plant and equipment and is complemented by units dealing with related aspects of work in plant maintenance.

It should be delivered as part of a structured programme of training and orientated to the context of the candidate's work and area of responsibility.

**APPROACHES TO GENERATING EVIDENCE** The achievement of the underpinning knowledge required for this unit would be assisted by the use of slides and videos, and hands-on experience.

Tutors/trainers should demonstrate practical elements step by step until the candidate feels confident enough to attempt them on his/her own, and the safety factors should be thoroughly emphasised.

Supervisors and employers could also play an important part in assisting candidates to generate evidence.

**ASSESSMENT PROCEDURES** Candidates will be able to provide evidence of performance using a variety of methods. These will include:

- Performance at work (recorded in Candidate's Assessment and Evidence Record or other methods).
- Performance in training (recorded in Candidate's Assessment and Evidence Record or other methods).
- Simulated exercises (skills/progress test results).
- Past achievement/experiences e.g. letters of endorsement; past certificates.

Evidence gathering from the workplace will be the preferred method; however there may be situations where this is inappropriate or the evidence is insufficient. Supplementary evidence will also be required to demonstrate the underpinning knowledge related to the competences in the unit.

For detailed guidance on assessment, reference should be made to the publications listed at the end of the Support Notes and to the Assessment Guidance Notes available for the delivery of the Scottish Vocational Qualification of which this module is a component.

**PROGRESSION** This unit forms part of the level III SVQ in Plant Maintenance.

Each module is a separate unit and the modules are not necessarily taken in a prescribed order, although there is a logical sequence to the acquisition of the skills and knowledge concerned.

To gain the award, the candidate must successfully complete all of the following units:

Construction: Plant Maintenance (level III)

2211143	Servicing Plant and Equipment
2211153	Inspecting Plant and Equipment to Identify Defects
2211163	Repairing and Overhauling Plant and Equipment

2211173	Commissioning Plant and Equipment
4120723	Contributing to the Planning, Organisation, Monitoring, Control and Evaluation of Operational Activities
4120733	Maintaining Working Conditions and Operational Activities to Meet Quality Standards (x 0.5)

**RECOGNITION** Many SQA NC units are recognised for entry/recruitment purposes. For up-to-date information see the SQA guide 'Recognised and Recommended Groupings'.

## REFERENCES

1. Guidelines for Module Writers.
2. SQA's National Standards for Assessment and Verification.
3. For a fuller discussion on assessment issues, please refer to SQA's Guide to Assessment.
4. Procedures for special needs statements are set out in SQA's guide 'Students with Special Needs'.

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