-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION

GENERAL INFORMATION

-Module Number- **2211063** **-Session-1993-94**

-Superclass- **VG**

-Title- **SERVICING AND REPAIRING PLANT AND EQUIPMENT (GENERAL SERVICING)**

-DESCRIPTION-

GENERAL COMPETENCE FOR UNIT: Interpreting instructions and adopting safe working practices in the removal and cleaning of parts and components and in selecting and repairing parts and components. Removing, replenishing and replacing materials and substances, carrying out in-service adjustments and commissioning plant and equipment for safe use.

OUTCOMES (Elements of Competence)

1. interpret technical information for servicing plant, machinery and equipment;

2. remove waste materials and substances;

3. remove parts and components for servicing;

4. select materials, substances, parts and components for servicing;

5. prepare parts and components for servicing;

6. position and secure parts and components in the service and repair of plant and equipment;

7. apply materials and substances to plant and equipment;

8. commission plant and equipment.

This unit incorporates the standards of the CITB Lead Body.

CREDIT VALUE: 1 NC Credit

ACCESS STATEMENT: This module forms part of the level II SVQ in Plant Maintenance, details of which are given in the Support Notes, under Progression. There is no access statement for this module but it is designed to complement the other units in the SVQ and candidates would normally be expected to be receiving complementary industrial experience in a related field.

For further information contact: Committee and Administration Unit, SQA, Hanover House, 24 Douglas Street, Glasgow G2 7NQ.

This specification is distributed free to all approved centres. Additional copies may be purchased from SQA (Sales and Despatch section) at a cost of £1.50 (minimum order £5).

NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION

STATEMENT OF STANDARDS

UNIT NUMBER: 2211063

UNIT TITLE: SERVICING AND REPAIRING PLANT AND EQUIPMENT (GENERAL SERVICING)

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, MACHINERY AND EQUIPMENT

PERFORMANCE CRITERIA

(a) Accurate and relevant selection and interpretation is made of technical information from given sources in relation to the task.
(b) Instructions given to the candidate are correctly interpreted and implemented.
(c) Instructions and information relayed to others are clear and concise.
(d) Corrective actions are implemented against deviations from technical information.

RANGE STATEMENT

Information sources: drawings; diagrams; manufacturers' specifications; workshop manuals; operator or instruction manual; technical services bulletins; parts lists; servicing charts; oral or written instructions.

Corrective actions: specifications; manuals; bulletins; amendment procedures.

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

EVIDENCE REQUIREMENTS

Performance evidence of competence under working conditions in:

(i) extracting servicing information from service charts, operators' manuals, workshop manuals and manufacturers' specifications;
(ii) carrying out procedures for in-service adjustments from manufacturers' specifications;
(iii) complying with variations from manufacturers' specifications, manuals, bulletins and amendment procedures;
(iv) calculating, from given information sources, capacities, quantities, volumes and linear measurement.

Oral or written evidence of knowledge and understanding of:

(i) types and purpose 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 MATERIALS AND SUBSTANCES

PERFORMANCE CRITERIA

(a) Instructions given to the candidate are correctly interpreted and implemented.
(b) Instructions and information relayed to others are clear and concise.
(c) Removal of components is carried out to minimise damage.
(d) The selection of tools and equipment is appropriate to the work.
(e) Work is completed to an agreed time schedule.
(f) The cleanliness of the work area is maintained.
(g) Work methods and activities are correct in terms of:

  (i) minimising damage to the built environment;
  (ii) optimising the use of available materials and manpower;
  (iii) satisfying current legislation.

(h) Removal of waste materials and substances conforms with safe working practices.

RANGE STATEMENT

Information sources: workshop manuals; operator or instruction manuals; manufacturers' specifications; technical service bulletins.

Materials and substances: fuels; lubricants; coolants; fluids.

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

Parts and components: power units; power trains; hydraulic and pneumatic systems; pipe network; retaining hardware; brakes; bearing housings; auxiliary equipment.

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

Preparation processes: removing, draining; disassembling; disposing; replacing; inspecting; securing.

Location: site; workshop.

Safety: personal protection legislation; 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) removing waste materials and substances from machinery and equipment:

- fuels;
- lubricants;
- fluids;
- coolants;
- air.

(ii) disposing of waste materials and substances.

Oral or written evidence of knowledge and understanding of:

(i) types and purposes of information sources;
(ii) periodic servicing methods and procedures for the removal of waste materials and substances in the range (hourly, weekly, monthly); mileage;
(iii) purpose of selecting correct tools and equipment to remove waste materials and substances;
(iv) precautions to be observed when working with and handling fuels, lubricants, greases, coolants and fluids;
(v) procedures for disposing of waste materials and substances
(vi) purpose of inspecting removed fuels, lubricants and coolants for contamination;

(vii) reasons for flushing fuel, lubrication and cooling systems;
(viii) responsibilities regarding statutory legislation.

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

OUTCOME (ELEMENT OF COMPETENCE)

3. REMOVE PARTS AND COMPONENTS FOR SERVICING

PERFORMANCE CRITERIA

(a) Instructions given to the candidate are correctly interpreted and implemented.
(b) Instructions and information relayed to others are clear and concise.
(c) Waste materials and substances are removed to conform with safe working practices and effective operation.
(d) The selection of tools and equipment is appropriate to the work.
(e) The cleanliness of the work area is maintained.
(f) The removal of parts and components conforms with the specification.
(g) Work is completed to an agreed time schedule.
(h) Work methods and activities are correct in terms of satisfying current legislation.

RANGE STATEMENT

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

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

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

Machinery and equipment: wheeled plant; tracked plant; static plant; small plant; attachments; auxiliary equipment.

Preparation processes: removing; dismantling; inspecting.

Location: site; workshop.

Safety: personal protection legislation; machine 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) removing parts and components in the range;
(ii) dismantling parts and components in the range;
(iii) inspecting parts and components in the range.

Oral or written evidence of knowledge and understanding of:

(i) types and purposes of information sources in the range;
(ii) periodic servicing methods and procedures (hourly, weekly, monthly, annual, mileage) applicable to machinery and equipment in the range;
(iii) purpose of inspecting parts and components when dismantling;
(iv) applications and limitations of hand tools, power tools and specialist tools;
(v) reasons for using lifting equipment or aids to remove parts and components;
(vi) handling and storage of parts and components;
(vii) responsibilities regarding statutory regulations.

OUTCOME (ELEMENT OF COMPETENCE)

4. SELECT MATERIALS, SUBSTANCES, PARTS AND COMPONENTS FOR SERVICING

PERFORMANCE CRITERIA

(a) Parts and components are correctly identified for use.
(b) The selection of parts, components, materials and substances complies with the specification in terms of quantity, quality and types.
(c) Corrective actions are implemented to establish utility of parts, components, materials and substances.
(d) Instructions given to the candidate are correctly interpreted and implemented.
(e) Instructions and information relayed to others are clear and concise.

RANGE STATEMENT

Information sources: manufacturers' technical information; operator's or instruction handbooks; manufacturers' specifications; oral or written instructions; parts lists or handbooks; capacities charts; lubricant and fuel maintenance charts.

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

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

Materials and substances: lubricants; fluids; fuels; coolants; jointing and sealing compounds and adhesives; protective coatings.

Locations: site; workshop.

Safety: personal protection legislation; 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) selecting parts and components;
(ii) selecting materials and substances.

Oral or written evidence of knowledge and understanding of:

(i) types and purpose of information sources in the range;
(ii) types and purpose of parts, components, materials and substances in the range;
(iii) replacement procedures for selecting parts, components, materials and substances in the range;
(iv) methods of inspecting faulty parts, components and materials;
(v) storing parts, components, materials and substances;
(vi) procedures for reporting defects in parts, components, materials and substances;
(vii) manual and non-manual stock record systems;
(viii) responsibilities regarding statutory regulations.

OUTCOME (ELEMENT OF COMPETENCE)

5. PREPARE PARTS AND COMPONENTS FOR SERVICING

PERFORMANCE CRITERIA

(a) Instructions given to the candidate are correctly interpreted and implemented.
(b) Instructions and information relayed to others is clear and concise.
(c) Preparation of parts and components is complete and conforms with manufacturers' specifications.
(d) The selection of tools and equipment is appropriate to the work.
(e) The cleanliness of the work area is maintained.
(f) Work is completed to an agreed time schedule.

RANGE STATEMENT

Information sources: manufacturers' technical information; oral or written instructions; operator's or instruction manuals; technical service bulletins.

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

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

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

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

Location - site, workshop.

Safety: personal protection legislation; 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 parts and components in the range.

Oral or written evidence and components in the range:

(i) types and purpose of information sources in the range;
(ii) reasons for different types of preparation processes for parts and components in the range;
(iii) application and limitations of tools and equipment for preparation purposes on parts and components in the range;
(iv) purpose of inspecting parts components and materials prior to assembly and fitting;
(v) reasons for storing parts, components and materials prior to assembly and fitting;
(vi) reasons for reclaiming parts and components;
(vii) responsibilities regarding statutory regulations.

OUTCOME (ELEMENT OF COMPETENCE)

6. POSITION AND SECURE PARTS AND COMPONENTS IN THE SERVICE AND REPAIR OF PLANT AND EQUIPMENT

PERFORMANCE CRITERIA

(a) Instructions given to the candidate are correctly interpreted and implemented.
(b) Instructions and information relayed to others is clear and concise.
(c) Parts and components are positioned to conform with the specification.
(d) Parts and components are secured to conform with the specification.
(e) The selection of tools and equipment is appropriate to the work.
(f) The cleanliness of the work area is maintained.
(g) Work methods and activities satisfy current legislation.
(h) Work is completed to an agreed time schedule.

RANGE STATEMENT

Information sources: manufacturer's technical information; oral or written instructions; operator's or instruction manual; technical service bulletins; workshop manuals.

Records: company required forms.

Machinery and equipment: static plant; wheeled plant; tracked plant; small plant; attachments; auxiliary equipment.

Parts and components: filters; housings; drive belts; hoses; pipes; guards; cowelling; ducting; retaining hardware; wheels; linkages; attachments; controls; rope actuated equipment.

Tools and equipment: hand tools; hand and power specialist servicing tools.

Preparation processes: securing; positioning; adjusting; assembling.

Location: site; workshop.

Safety: personal protection legislation; manual handling regulations; HASWA (Health and Safety at Work Act); COSHH (Control and 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.

Oral or written evidence of knowledge and understanding of:

(i) types and purpose of information sources in the range;
(ii) purpose of assembling parts and components in accordance with the manufacturers' specifications;
(iii) purpose of positioning and securing parts and components in accordance with the manufacturers' specification;
(iv) purpose of making adjustments to parts and components in accordance with the manufacturers' specifications;
(v) methods of recording servicing and maintenance tasks;
(vi) responsibilities regarding statutory regulations.

OUTCOME (ELEMENT OF COMPETENCE)

7. APPLY MATERIALS AND SUBSTANCES TO PLANT AND EQUIPMENT

PERFORMANCE CRITERIA

(a) Instructions given to the candidate are correctly interpreted and implemented.
(b) Instructions and information relayed to others are clear and concise.
(c) Methods of application provide the specified finish.
(d) The selection of tools and equipment is appropriate to the work.
(e) The cleanliness of the work area is maintained.
(f) Work is completed to an agreed time schedule.
(g) Work methods and activities satisfy current legislation.

RANGE STATEMENT

Information sources: manufacturers' technical information; oral or written instructions; operator or instruction manuals; technical service bulletins; lubrication; coolant and capacities charts; symbols and abbreviations.

Machinery and equipment: static plant; wheeled plant; tracked plant; small plant; attachments; auxiliary equipment.

Parts/components: power units, power trains, hydraulic and pneumatic systems, chassis, steering, tracks, wheels, ropes, brakes, batteries, linkages, controls, pins, bushes, retaining hardware, bearing houses.

Tools and equipment: hand tools; hand and power specialist servicing tools; fluid and coolant measures and containers; grease guns.

Materials and substances: fuels; lubricants; coolants; fluids.

Preparation processes: applying; replenishing; measuring; mixing; securing.

Location: site; workshop.

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

EVIDENCE REQUIREMENTS

Performance of competences under working conditions in:

(i) applying materials and substances to machinery and equipment in the range;
(ii) carrying out visual checks for fluid leaks after replenishment and replacement.

Oral or written evidence of knowledge and understanding of:

(i) types and purposes of information sources in the range;
(ii) characteristics, uses and limitations of the materials and substances in the range;
(iii) types and purpose of parts and components on machinery and equipment in the range;
(iv) types of application processes for fuels, lubricants and coolants;
(v) procedures for oil replenishment and replacement on machinery and equipment in the range;
(vi) procedures for reporting defects in materials and substances in the range;
(vii) assessment of leak seriousness on machinery and equipment in the range;
(viii) reasons for recording servicing and maintenance of tools;
(ix) responsibilities regarding statutory regulations.

OUTCOME (ELEMENT OF COMPETENCE)

8. COMMISSION PLANT AND EQUIPMENT

PERFORMANCE CRITERIA

(a) Instructions given to the candidate are correctly interpreted and implemented.
(b) Instructions and information relayed to others are clear and concise.
(c) Commissioning of plant and equipment conforms with prescribed procedures in terms of:

  (i) safe working practices;
  (ii) effective operation;
  (iii) technical information.

(d) Records are complete, accurate, clear and accessible.
(e) Work methods and activities satisfy current legislation.

RANGE STATEMENT

Information sources: manufacturers' technical information; manufacturers' specifications; oral or written instructions; operator or instruction manuals; technical service bulletins.

Records: company required forms; statutory regulation forms.

Machinery and equipment: static plant; wheeled plant; tracked plant; small plant; auxiliary equipment; attachments.

Tools and equipment: hand tools; specialist servicing tools; monitoring and diagnostic equipment.

Commissioning processes: systems operation of machinery and equipment following servicing; carrying out 'in-service' adjustments to the specification; visual checking for malfunctions in machinery and equipment in the range; monitoring of machinery and equipment throughout the operating range; visual checks for fluid, gas and air leaks on machinery and equipment.

Location: site; workshop.

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

EVIDENCE REQUIREMENTS

Performance of competences under working conditions in:

(i) commissioning plant and equipment;
(ii) monitoring plant and equipment;
(iii) making adjustments to the specification.

Oral or written evidence of knowledge and understanding of:

(i) types and purpose of information sources in the range;
(ii) methods of identifying the need for adjustment;
(iii) purpose of carrying out 'in-service' adjustments in accordance with the manufacturers' specifications;
(iv) application and suitability of tools and equipment for servicing and making adjustments;
(v) purpose of visual, sensory and routine checks on plant and equipment;
(vi) procedures for reporting malfunctions and defects on plant and equipment in the range;
(vii) purpose of evaluating performance of serviced plant and equipment;
(viii) reasons for recording and maintaining information for servicing plant and equipment;
(ix) responsibilities regarding statutory regulations.

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.

NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION

SUPPORT NOTES

UNIT NUMBER 2211063

UNIT TITLE SERVICING AND REPAIRING PLANT AND EQUIPMENT (GENERAL SERVICING)

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 design to enable the candidate to develop skills and knowledge in the general servicing of a range of plant and equipment used in the construction industry and is suitable for operatives working in the construction industry or a services or installation 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 skills and knowledge necessary to service and repair a range of plant and equipment used in the construction industry. You will learn how to remove parts, components and substances and replace them in compliance with manufacturers' specifications and relevant statutory safety regulations.

CONTENT/CONTEXT The candidate successfully completing this module will require underpinning knowledge and skills relating to the interpretation of technical information, selection, removal and replacement of parts, components and substances for the general servicing and repair of a range of construction plant and equipment.

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 the general servicing and repair of construction plant and equipment and is complemented by units dealing with related aspects of work in construction plant maintenance.

It should be delivered as part of a structured programme of training and originated 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 should 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 endorsements; 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 II 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 modules:

2211063 Servicing and Repairing Plant and Equipment (General Servicing)

2211073 Repairing and Maintaining Plant and Equipment (Thermal Joining and Cutting) (x 1.5)

2211083 Repairing and Maintaining Plant and Equipment (Plant Electrical Systems and Components) (x 1.5)

2211093 Repairing and Maintaining Plant and Equipment (Power Units)

2211103 Repairing and Maintaining Plant and Equipment (Power Trains-Mechanical)

2211113 Repairing and Maintaining Plant and Equipment (Hydraulic Systems and Components)

2211123 Repairing and Maintaining Plant and Equipment (Pneumatic Systems and Components)

2211133 Repairing and Maintaining Plant and Equipment (Auxiliary Systems and Components) (x 1.5)

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. (Replacement for 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'.