



National Unit specification: general information

Unit title: Tractor Operations and Attachments (SCQF level 5)

Unit code: H28R 11

Superclass: SK

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Summary

This Unit develops the knowledge and practical skills necessary to operate and maintain a tractor with a range of implements and attachments. Candidates will also develop awareness of how to maximise the efficiency of tractors through careful adherence to operation, maintenance and driving techniques. This is a mandatory Unit within the National Certificate in Agriculture at SCQF level 6, but may also be taken as a free-standing Unit. This Unit is suitable for candidates who have basic knowledge and skills in driving a tractor.

Outcomes

- 1 Identify and describe the main controls of a tractor.
- 2 Describe the main systems of a tractor.
- 3 Drive and operate a tractor safely with a range of attachments.
- 4 Carry out basic maintenance and servicing tasks on a tractor.
- 5 Describe how the operator can influence the efficiency of a tractor.

Recommended entry

While entry is at the discretion of the centre, it would be beneficial for candidates to have basic tractor driving experience which may be evidenced by the attainment of the following Unit or equivalent:

H28B 10 Tractor Driving (SCQF level 4)

General information (cont)

Unit title: Tractor Operations and Attachments (SCQF level 5)

Credit points and level

1 National Unit credit at SCQF level 5: (6 SCQF credit points at SCQF level 5*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes of this Unit specification.

There is no automatic certification of Core Skills or Core Skill component in this Unit.

National Unit specification: statement of standards

Unit title: Tractor Operations and Attachments (SCQF level 5)

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

Outcome 1

Identify and describe the main controls of a tractor.

Performance Criteria

- (a) Identify the positions of the main controls of a tractor.
- (b) Describe the functions of the main controls of a tractor.

Outcome 2

Describe the main systems of a tractor.

Performance Criteria

- (a) Identify the main systems of a tractor.
- (b) Describe the function of the main systems of a tractor.
- (c) Describe the basic operating principles of the main systems of a tractor.

Outcome 3

Drive and operate a tractor safely with a range of attachments.

Performance Criteria

- (a) Carry out the attachment and operation of trailed implements safely and correctly.
- (b) Carry out the attachment and operation of 3 point linkage implements safely and correctly.

Outcome 4

Carry out basic maintenance and servicing tasks on a tractor.

Performance Criteria

- (a) Carry out fluid level checks on a tractor.
- (b) Carry out wheel and tyre checks on a tractor.
- (c) Participate in an oil and filter change on a tractor.
- (d) Participate in lubricating a tractor.
- (e) Participate in making adjustments on a tractor.

National Unit specification: statement of standards

Unit title: Tractor Operations and Attachments (SCQF level 5)

Outcome 5

Describe how the operator can influence the efficiency of a tractor.

Performance Criteria

- (a) Describe how tyre systems and conditions affect the efficiency of tractor operation.
- (b) Describe how routine servicing and maintenance affect the efficient operation of a tractor.
- (c) Describe how driving technique affects the efficient operation of a tractor.

National Unit specification: statement of standards (cont)

Unit title: Tractor Operations and Attachments (SCQF level 5)

Evidence Requirements for this Unit

Performance and written and/or oral evidence is required to demonstrate that candidates have achieved all of the Outcomes and Performance Criteria. Evidence will be obtained under open book, supervised conditions at appropriate points throughout the Unit, and can be generated holistically or Outcome by Outcome.

In Outcome 1, written and/or oral evidence is required to show that candidates can:

- ◆ identify the main controls of a tractor, to include, engine start and stop controls, independent brakes, park brake, clutch, gear selection, power take off, throttles, three point linkage, pickup hitch, hydraulic services, differential lock and four wheel drive.
- ◆ describe the function of the main controls of a tractor, to include, engine start and stop controls, independent brakes, park brake, clutch, gear selection, power take off, throttles, three point linkage, pickup hitch, hydraulic services, differential lock and four wheel drive.

In Outcome 2, written and/or oral evidence is required to show that candidates can:

- ◆ identify the main systems of a tractor to include, fuel system, cooling system, lubrication system, electrical system, hydraulic system, transmission and braking system.
- ◆ describe the function and basic operating principles of the main systems of a tractor to include, fuel system, cooling system, lubrication system, electrical system, hydraulic system, transmission and braking system.

In Outcome 3, performance evidence, generated under supervised conditions, is required to show that candidates can safely and correctly carry out the attachment and operation of

- ◆ a minimum of one Power Take Off (PTO) driven and one hydraulically operated trailed implement.
- ◆ a minimum of one PTO driven and one hydraulically operated three point linkage implement.

In Outcome 4, performance evidence, generated under supervised conditions, is required to show that candidates can carry out all basic maintenance and servicing tasks as given in the Performance Criteria, in accordance with the relevant operator's manual.

In Outcome 5, written and/or oral evidence is required which shows that candidates can describe how the following affect the efficiency of a tractor:

- ◆ tyre systems and conditions, to include reference to four wheel drive, adding ballast, tyre pressure and tyre wear.
- ◆ servicing and maintenance, to include reference to frequency and adherence to maintenance schedules.
- ◆ driving techniques, to include reference to use of gears and speed.

National Unit specification: support notes

Unit title: Tractor Operations and Attachments (SCQF level 5)

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This Unit is a mandatory Unit within the National Certificate in Agriculture at SCQF level 6 but may also be taken as a free-standing Unit. Delivery of this Unit could be integrated with the Units *Tractor Driving* (SCQF level 4) and *Crop Production Equipment* (SCQF level 6).

In this Unit, candidates will become familiar with tractor controls and systems. They will learn how a tractor functions in conjunction with attached equipment, develop skills in operating tractors with a range of attachments and carry out routine maintenance and servicing tasks.

In Outcomes 1 to 4, a selection of tractor models and their respective operator manuals should be available to reflect those that candidates are likely to encounter in the workplace. For example, these should vary in size, type, age and complexity. Models with a front loader and fitted passenger seats would be desirable to aid instruction.

In Outcome 3, the implements used with the tractors should reflect those that candidates are likely to encounter in the workplace, eg livestock, grassland or arable equipment.

In Outcome 4, maintenance and servicing could be conducted in groups so as to avoid unnecessary replication of tasks such as oil and filter changes, if tractor availability is limited.

With regard to specific tasks:

- ◆ fluid level checks should include coolant, engine oil, transmission and hydraulic oil levels.
- ◆ wheel and tyre checks should include wheel nut torque, tyre pressure (with regards to loading and speed), tyre tread and tyre condition.
- ◆ filter change could be an engine, transmission or hydraulic oil and filter change.
- ◆ lubrication should relate to grease points.
- ◆ adjustments could include clutch, brake, tracking and/or track width.

Outcome 5 could involve field observations of compaction and wheel slip on tractors with:

- ◆ 4 wheel drive engaged or disengaged.
- ◆ varying tyre size, pressure and tread.
- ◆ varying ballast.

Consideration of servicing and maintenance should concentrate on tractor reliability, longevity and likely cost of operation.

Driving technique is concerned primarily with engine speed, gear selection, brake operation, work rate and likely fuel efficiency.

National Unit specification: support notes (cont)

Unit title: Tractor Operations and Attachments (SCQF level 5)

This Unit is aligned to elements of the following National Occupational Standards (NOS) from Lantra:

CU11	Prepare and operate a tractor with attachments
CU28	Prepare for and maintain equipment and machines

Guidance on learning and teaching approaches for this Unit

For Outcomes 1 and 2 candidates would benefit from:

- ◆ going on trips to shows, demonstrations, farms and engineering premises.
- ◆ working individually to review manufacturers' literature and websites.
- ◆ reviewing tractor use using pictures, diagrams and videos.

For Outcomes 3 and 4 candidates would benefit from:

- ◆ working with equipment relevant to potential future workplaces.
- ◆ working in small groups with access to tools and equipment in a workshop.
- ◆ working on farms for field or yard operation of equipment.
- ◆ completing worksheets to report on tractor condition and operation.

By adopting the above learning and teaching approaches and/or through the Outcomes and corresponding Evidence Requirements, this Unit should provide candidates with an opportunity to develop the following essential skills for life, learning and work:

- ◆ Employability — through developing practical skills in line with good farm practice and working on time limited tasks.
- ◆ Sustainability — through recognising how to maximise resource efficiency in tractor operations.
- ◆ Technical skills — in operating and maintaining tractors and machinery.
- ◆ Organisational skills — in terms of personal management, equipment use and maintenance record keeping, etc.
- ◆ Interpersonal skills — through contact with employers and in working in class teams.

Guidance on approaches to assessment for this Unit

A holistic approach to assessment of Outcomes is encouraged, and the following approaches to assessment suggested.

Outcomes 1 and 2:	Restricted response questions.
Outcomes 3 and 4:	A practical assessment with an assessor observation checklist.
Outcome 5:	Restricted response questions.

National Unit specification: support notes (cont)

Unit title: Tractor Operations and Attachments (SCQF level 5)

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

Opportunities for developing Core Skills

In this Unit candidates will learn about tractor controls and systems and how a tractor functions in conjunction with attached equipment. They will develop skills in operating tractors with a range of attachments and carry out routine maintenance and servicing tasks.

Candidates will:

- ◆ identify and describe controls, and systems.
- ◆ operate tractors with a range of attachments.
- ◆ make judgements in relation to space and vehicle manoeuvrability.
- ◆ carry out tasks safely.
- ◆ interpret and use operator manuals.
- ◆ measure fluid levels and tyre pressures.
- ◆ participate with others in maintenance tasks.
- ◆ assess the impact of a variety of factors on efficiency.

This means that as they are doing this Unit candidates may develop aspects of the Core Skills of *Communication, Numeracy, Problem Solving* and *Working with Others*.

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

Version	Description of change	Date

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