-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **0084471** **-Session-1988-89**
-Superclass- **XS**

-Title- **MOBILE PLANT TRANSMISSION 4: SPECIALISED TRANSMISSION**

-DESCRIPTION-

Purpose

This module is designed to develop the specialised knowledge and skills required for repairing and servicing specialised transmission systems. It is suitable for those with experience in conventional transmissions who wish to extend the range of their skills. It is appropriate for those following a career associated with agricultural, light and heavy vehicle and construction plant operations.

Preferred Entry Level

74439 Mobile Plant Transmission Systems 1
74440 Mobile Plant Transmission 2: Light Vehicle

Learning Outcomes

1. know the principles of operation of a specialised transmission system and its components;

2. use service procedures to remove, dismantle, examine, assemble, and refit a specialised transmission system;

3. use service procedures to carry out service tests, repairs and adjustments on a specialised transmission system.

Content/ Context

Safety regulations and safe working practices and procedures should be observed at all times.

<u>Corresponding to Learning Outcomes 1-3:</u>

The transmission system dealt with should suit the student group requirements and may be chosen from automatic transmission, semi-automatic transmission, tractor transmission and heavy vehicle specialised transmission.

1. Transmission components and their function. Power flow through the system: converter/coupling, gear trains, clutches, hydraulic circuit. Method of gear selection for appropriate transmission. Automatic operation. Load sensing. Speed sensing. Power take-off auxiliary drives.

2. Transmission unit removal procedures. Dismantling and assembling procedures. Condition and assessment of: fluid, converter/coupling, governor, clutches, servos, brake bands/friction locks, gear trains, gear sets, mechanical controls, pumps and valves. Refitting procedures for unit.

3. Appreciation of manufacturers' test procedures. Stall test, fluid level, cable and linkage adjustments.

Awareness of the dangers associated with vehicles fitted with specialised transmission and the need to take adequate safety precautions before and during workshop tests.

Suggested Learning and Teaching Approaches

The major part of this module should be undertaken in a service workshop with facilities for instruction, demonstration and practical work on specialised transmission systems. The type of transmission system used for practical exercises should reflect the student group requirements. A general approach should be used rather than specialised detailed instruction on a specific make and model of transmission. Students should have full access to relevant service publications, special tools and test equipment. The necessary theory, testing and diagnostics should be integrated with the teaching of maintenance and repair. The use of visual aids and audio visual material is highly recommended. Continuous formative assessment is essential with the large content of practical activity in the module. Students should not undertake any workshop tests of transmission systems before adequate instruction has been given on safety.

Assessment Procedures

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each Learning Outcome.

The following abbreviations are used below:

LO Learning Outcome
IA Instrument of Assessment
PC Performance Criteria

LO1 KNOW THE PRINCIPLES OF OPERATION OF A SPECIALISED TRANSMISSION SYSTEM AND ITS COMPONENTS.

PC The student:

(a) correctly identifies the main transmission components and their function;
(b) correctly identifies the power flow through the transmission system including unit engagement combinations for all power paths;
(c) correctly describes the methods of gear selection and engagement within the unit.

IA Structured Questions

The student will be presented with questions which test recall of knowledge and comprehension of the working principles and operation of one specialised transmission system. The system should reflect the student group requirements.

The test will consist of 24 questions allocated as follows:

(a)	identification and function of components	10
(b)	power flow	6
(c)	gear selection and engagement	8

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing the following correct responses:

7 from (a);
5 from (b); and
6 from (c)

LO2 USE SERVICE PROCEDURES TO REMOVE, DISMANTLE, EXAMINE, ASSEMBLE AND REFIT A SPECIALISED TRANSMISSION SYSTEM.

PC The student:

(a) disconnects and safely removes complete specialised transmission system from operational unit;
(b) follows service procedures to remove transmission components and dismantle sub assemblies undamaged;
(c) examines, identifies faults and reports on condition of components;
(d) follows service procedures to assemble transmission system;
(e) follows service procedures to refit transmission system;
(f) follows all safety requirements.

IA Practical Exercise

The student will complete a practical exercise set under workshop conditions to demonstrate the application of knowledge and skills required to remove, dismantle, examine, assemble and refit a specialised transmission system.

The practical exercise will be carried out from given instructions using manufacturers' service procedures, specialist tools and equipment and supported by the use of a checklist to specify the required skills and record the student's performance.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student gaining all 8 essential items (E) plus at least 1 desirable item (D) from the following checklist.

CHECKLIST

Removal

1.	Removes transmission system	E
2.	Uses tools correctly	D

Dismantles System

3.	Dismantles transmission system	E
4.	Cleans components	D

Inspection

5.	Reports on serviceability of components	E

Assembles System

6.	Lubricates components	E
7.	Assembles system	E
8.	Observes cleanliness	D
9.	Tests unit	D

Refit

10.	Refits transmission system	E

Safety Requirements

11.	Observes safety procedures associated with the repair of specialised transmission systems	E
12.	Observes statutory regulations	E

LO3 USE SERVICE PROCEDURES TO CARRY OUT SERVICE TESTS, REPAIRS AND ADJUSTMENTS ON A SPECIALISED TRANSMISSION SYSTEM

PC The student:

(a) accurately identifies test and adjustment specifications from service information for a given transmission;

(b) carries out correct procedure to check transmission fluid level;
(c) carries out two service adjustments to manufacturers' specifications;
(d) carries out workshop tests;
(e) follows safe working practices relevant to the task.

IA Practical Exercise

The student will complete a practical exercise set under workshop conditions to demonstrate the application of knowledge and skills required to carry out service tests, repairs and adjustments on a specialised transmission system.

The practical exercise will be carried out from given instructions using manufacturers' service procedures, specialist tools and equipment and supported by the use of a checklist to specify the required skills and record the student's performance.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student gaining all 6 essential items (E) plus 1 desirable item (D) from the following checklist.

CHECKLIST

Interprets Service Information

1.	Interprets and records test and adjustment specifications	E

Transmission Fluid

2.	Follows procedure for fluid content check	E
3.	Observes cleanliness with fluid	D

Service Adjustments

4.	Carries out two service adjustments	E
5.	Uses tools correctly	D

Workshop Tests

6.	Connects equipment logically	D
7.	Assesses condition	E

Safety Requirements

8.	Observes safety procedures associated with the testing of specialised transmission systems	E
9.	Observes statutory regulations	E