

**-SQA-SCOTTISH QUALIFICATIONS AUTHORITY**

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**NATIONAL CERTIFICATE MODULE DESCRIPTOR**

**-Module Number- 0084350 -Session-1988-89**

**-Superclass- WH**

**-Title- MAINTENANCE OF LOCKSTITCH MACHINES (x 1<sup>1</sup>/<sub>2</sub>)**

**-DESCRIPTION-**

**Purpose** This module is designed to provide students with skills in, and an in-depth understanding of the maintenance and operating procedures of lockstitch sewing machines producing BS stitch types 301 and 304.

It is intended that this module is taught in conjunction with other related modules to form part of a programme of study which should include complementary industrial experience.

It is aimed at those following a career in clothing machine engineering.

**Preferred Entry Level** Standard Grade in Mathematics at 3;  
Standard Grade in Science at 3;  
Standard Grade in English at 3.

**Learning Outcomes** The student should:

1. outline the methods of operation and practical applications of basic and high speed lockstitch sewing machines;
2. Explain the methods of operation and interaction of the main stitch forming components of basic and high speed lockstitch sewing machines;
3. carry out service procedures on lockstitch sewing machines;
4. diagnose and rectify faults in single needle lockstitch machines and test for correct stitch formation and sewing performance;

5. compare the technical specifications of a variety of high speed lockstitch sewing machines.

Content/  
Context

Safety and safe working practices should form an integral part of the module activities during investigation of practical machine adjustments and the effects produced in relation to the actual sewing performance of the selected lockstitch machines.

Corresponding to Learning Outcomes 1-5:

1. Recognition and selection of appropriate machine type from the various flat bed, drop and compound feed lockstitch machines for a given sewing application, such as superimposed, bound, flat and lapped seam types.

Recognition of the mechanisms for controlling and handling the thread during stitch formation in a lockstitch machine.

The function of the following component parts in relation to thread handling:

- (a) the thread take up systems on the sewing machines;
  - (i) ink type;
  - (ii) sleeve;
  - (iii) rotary
- (b) thread tensions (i) disc type; (ii) rotary; (iii) check springs passive and active;
- (c) the stitch forming implements:
  - (i) oscillating shuttle;
  - (ii) horizontal axis rotating hook;
  - (iii) vertical axis rotating hook;
  - (iv) horizontal axis transverse rotating hook.

2. Interaction and timing relationships of different stitch forming and feeding mechanisms. Use of manufacturers' tools and gauges.

3. Timing and position of the stitch forming, thread handling and feeding components of each of the four selected lockstitch machines. The use of manufacturers' gauge and marks to set up machines.

Examination of machine lubricating, bearing and gearing systems. Different machine lubricant requirements eg. types and grades of oils and greases. Selection of appropriate lubricant for eg. dissipation of heat.

4. Identification of faults, adjustment and setting of the relative position of the components and the stitch forming mechanism. Testing of machines producing stitch types BS 301, 304.

Determination of the correct thread for a selection of materials, sewing operations, machines and production situations, in order to demonstrate technique of safe operation with the ability to control stitch size and thread tension adjustment for producing test samples with a balanced stitch.

5. Technical report to evaluate the following factors in different machines: machine design, needle bar motions, internal motion drive systems, stitch forming mechanisms, thread handling controls, feeding mechanisms and stitch length regulation; lubrication, bearing and gearing systems.

Suggested  
Learning and  
Teaching  
Approaches

This module should be presented in the sewing room/workshop where the tutor would carefully explain and demonstrate the various techniques using a programme of exercises related to a theme or vocational bias which will interest the student.

The student would follow an activity-based learning approach to become familiar with the machines in question. Students could work singly or in pairs.

In the initial stages the tutor would fully explain and demonstrate each tool, operation or process. Terminology and principles should be introduced in the context of the exercises.

Student activities would be essentially centred on practical exercise assignments and the student should follow precise briefs for each assignment exercise.

A set of completed exercises should be available for the students to relate and compare standards.

Information charts and posters relating to machines, threads and fabrics should be displayed to assist the students with the exercises.

Safety and safe working practices should form an integral part of all instruction. It should be stressed throughout the module that the needs for good housekeeping, tidy layout of workplaces, materials and tools is imperative.

Assessment  
Procedures

Acceptable performance in the module will be satisfactory achievement of all 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 OUTLINE THE METHODS OF OPERATION AND PRACTICAL APPLICATIONS OF BASIC AND HIGH SPEED LOCKSTITCH SEWING MACHINES

PC The student:

- (a) identifies the lockstitch BS stitch types of the 301 and 304 stitch types from prepared samples of sewing;
- (b) lists sewing operations for which each highspeed lockstitch machine type is used;
- (c) states the basic operation principles of lockstitch machinery;
- (d) lists the advantages and disadvantages of the specialised high speed lockstitch for given operations;
- (e) identifies specified components of lockstitch machinery;
- (f) states the function of the main components.

IA Objective Questions

The student should be set a test of objective questions to test the recall of knowledge relating to the methods of operation and practical applications of basic and high speed lockstitch machines.

Samples, diagrams and photographs may be used in the test.

The test will consist of 12 questions allocated as follows:

- (a) identification of stitch types 2 questions
- (b) sewing operations 2 questions
- (c) basic operation principles 2 questions
- (d) advantages and disadvantages 2 questions
- (e) identification of components 2 questions of machinery
- (f) functions of main components 2 questions

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing 12 correct responses to the set questions.

LO2 EXPLAIN THE METHODS OF OPERATION AND INTERACTION OF THE MAIN STITCH FORMING COMPONENTS OF BASIC AND HIGH SPEED LOCKSTITCH SEWING MACHINES

PC The student:

- (a) identifies the specific areas related to thread control and stitch forming action of different types of lockstitch machines;
- (b) explains the rotating action of the hook or oscillating shuttle in relation to the needle bar motion;
- (c) describes stitch forming action and thread control of the hook and shuttle;
- (d) explains the action of feed in relation to motion of the needle mechanism.

IA ,Restricted Response Questions

The student should be set questions to test the understanding of the methods of operation and interaction of the thread control, hook, shuttle.

Samples, diagrams and photographs may be used in the test.

The test will consist of 8 questions allocated as follows:

- (a) identification of specific areas                      2 questions
- (b) rotating action of hook or shuttle 2 questions
- (c) stitch forming action    2 questions
- (d) feed mechanism action              2 questions

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing six correct responses, including one from (a), (b), (c), and (d)

LO3 CARRY OUT SERVICE PROCEDURES ON LOCKSTITCH SEWING MACHINES

PC The student:

- (a) adjusts and sets components in correct timing relationships according to manufacturer's specifications;
- (b) adjusts and replaces components to produce correct feeding action to permit machines to feed fabric;
- (c) checks that the lubricating system functions during machine operation;
- (d) carries out test exercises on machine to produce correctly                      formed                      stitch;

- (e) works in a safe manner and wears appropriate safety clothing and equipment relative to the task.

#### IA Practical Exercise

The student should be presented with a practical exercise set under workshop conditions to test the application of knowledge and skills required to carry out service procedures on lockstitch sewing machines.

The servicing will be carried out on one sewing machine and should include synchronisation of components, adjustment of feeding mechanism, examination of lubricating, bearing and gearing system and operation for correct stitch formation.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student meeting all performance criteria.

#### LO4 DIAGNOSE AND RECTIFY FAULTS IN SINGLE NEEDLE LOCKSTITCH MACHINES AND TEST FOR CORRECT STITCH FORMATION AND SEWING PERFORMANCE

PC The student:

- (a) diagnoses faults related to sewing fabric including slipping stitches, incorrect feed, malformed stitches, damage to fabric, needle deflection and to stitch forming implement.
- (b) rectifies the diagnosed faults;
- (c) sets up machine for testing and producing samples of stitch types;
  - (i) selects and fits the appropriate needle into each machine type;
  - (ii) selects the correct thread for a selection of materials;
  - (iii) threads the machine correctly;
  - (iv) operates the machine correctly.
- (d) works in a safe manner and wears safety clothing and equipment appropriate to the task.

#### IA Practical Exercise

The student should be presented with a practical exercise set under workshop conditions to test the application of knowledge and skills required to diagnose and rectify faults in the machine and test for correct stitch operation and sewing performance.

The exercise will be carried out on one machine containing a maximum of 8 previously inserted faults.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student meeting all performance criteria.

LO5 COMPARE THE TECHNICAL SPECIFICATIONS OF A VARIETY OF HIGH SPEED LOCKSTITCH SEWING MACHINES

PC The student:

- (a) lists the technical specifications of high speed and ultra high speed lockstitch machines;
- (b) distinguishes between lubrication, bearing and gearing systems, thread control systems, stitch forming mechanisms, fabric feeding mechanisms and machine fittings;
- (c) evaluates a selected machine for a given operation.

IA Extended Response Question

The student should be set an extended response question to test knowledge and understanding of the technical factors related to a variety of selected high speed lockstitch machines.

The question will require the student to produce a written report of approximately 500 words which contains an evaluation of the technical specifications of the selected high speed and ultra high speed lockstitch sewing machines.

Satisfactory achievement will be demonstrated by the student achieving all the performance criteria.