

-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 2140060 -Session-1990-91
-Superclass- WH

**-Title- MAINTENANCE OF HIGH ARM LOCKSTITCH
BLINDSTITCH MACHINES (X¹/₂)**

-DESCRIPTION-

Purpose This module is designed to develop an understanding of and the skills associated with the maintenance requirements and operating procedures of industrial, high arm lockstitch blindstitch sewing machines producing BS stitch types of the 300 series.

It is intended that this module is taught in conjunction with other related modules and forms 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	84350	Maintenance of Lockstitch Machines (x 1.1/2)
	84355	Maintenance of Low Arm Blindstitch Machines (x 1/2)
	2140050	Needle Positioning Devices (x 1/2)

Outcomes The student should:

1. explain the methods of operation and practical applications of high arm lockstitch blindstitch sewing machines;
2. explain the methods of operation and interaction of the main stitch forming components of high arm lockstitch blindstitch machines;
3. carry out service procedures on high arm lockstitch blindstitch sewing machines in accordance with manufacturer's specifications;

4. diagnose and rectify faults in the selected machine type and test for correct sewing performance.

Assessment
Procedures

Acceptable performance in this module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

The following abbreviations are used below:

PC Performance Criteria
IA Instrument of Assessment

Note: The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

OUTCOME 1

EXPLAIN THE METHODS OF OPERATION AND PRACTICAL APPLICATIONS OF HIGH ARM LOCKSTITCH BLINDSTITCH SEWING MACHINES

PCs

- (a) The identification of lockstitch blindstitch BS stitch types of the 300 series is correct.
- (b) The identification of sewing operations is correct for a range of high arm lockstitch blindstitch machine types.
- (c) The outline of the operational principles of blindstitch machinery is correct.
- (d) The outline of the advantages and disadvantages of the specialised high arm lockstitch blindstitch is correct for given operations.

IA Objective Items

The student will be set an exercise consisting of objective items to test the recall of knowledge relating to the methods of operation and practical applications of basic and high arm lockstitch blindstitch machines.

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

The exercise will consist of 12 questions allocated as follows:

- (a) identification of stitch types 2
- (b) sewing operations 4
- (c) basic operational principles 2
- (d) advantages and disadvantages 4

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing 8 correct responses overall with at least one correct response to each of (a) and (c) and 2 correct responses to each of (b) and (d).

OUTCOME 2 EXPLAIN THE METHODS OF OPERATION AND INTERACTION OF THE MAIN STITCH FORMING COMPONENTS OF LOCKSTITCH BLINDSTITCH MACHINES

- PCs
- (a) The identification of the specific areas is correct for different types of lockstitch blindstitch machines.
 - (b) The explanation of the rotating action of the hook and oscillating action of automatic opener is correct in relation to the various angled motions of the needle carrier.
 - (c) The explanation of the reciprocating action of the spreaders is correct in relation to the various angled motions of the needle carrier.
 - (d) The description of the thread control and stitch forming action of the rotating hook and spreaders is accurate.
 - (e) The description of thread control by the thread tension assembly and the take-up lever system is correct.
 - (f) The explanation of the action of the automatic plunger is correct in relation to needle depth penetration and skip/non skip stitch (catch) control.

IA Restricted Response Questions

The student will be set an exercise consisting of restricted response questions to test understanding relating to the methods of operation and interaction of the thread control, rotating hook, automatic plunger, spreaders, take-up lever and needle carrier of lockstitch blindstitch machines.

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

The exercise will consist of 12 questions based on the Performance Criteria and allocated as follows:

- (a) identification of specific areas 2
- (b) rotating action of hook 2
- (c) reciprocating action of spreader 2
- (d) stitch forming action 2
- (e) thread control 2
- (f) needle penetration depth control 2

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing 9 correct responses overall with at least one correct answer from each of sections (a) - (f) inclusive above.

OUTCOME 3 CARRY OUT SERVICE PROCEDURES ON LOCKSTITCH BLINDSTITCH SEWING MACHINES

- PCs
- (a) The adjustment and replacement of components ensure correct sewing and feeding action to permit machines to feed and sew fabric.
 - (b) The adjustment and setting of components are correct in terms of timing relationships and accord to manufacturer's specifications.
 - (c) Working practices and procedures followed are safe.

IA Practical Exercise

The student will be set a practical exercise set under workshop conditions to assess the application of knowledge and skills required to carry out service procedures on lockstitch blindstitch high arm sewing machines.

The servicing will be carried out on one sewing machine and should include examination and synchronisation of stitch forming components and adjustment of feeding and plunger mechanism.

Satisfactory achievement of the Outcome will be demonstrated by the student meeting all Performance Criteria.

OUTCOME 4 DIAGNOSE AND RECTIFY FAULTS IN THE MACHINE AND TEST FOR CORRECT SEWING PERFORMANCE

- PCs
- (a) The diagnosis of faults relating to sewing fabric is correct.
 - (b) The rectification of the diagnosed fault ensures effective and safe operation of the machine.
 - (c) The setting up of the specified machine is correct for a range of stitch types.
 - (d) Working practices and procedures followed are safe.

IA Practical Exercise

The student will be set a practical exercise set under workshop conditions to assess the application of knowledge and skills required to diagnose and rectify faults in the machine and test for correct stitch operation. The exercise will be carried out on one machine containing 6 previously inserted faults.

The candidate will set up the machine for testing and produce samples of stitch types and will select and fit the appropriate needle into each machine type, select the correct thread for a selection of materials and thread the machine correctly.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met.

**The following sections of the descriptor are offered as guidance.
They are not mandatory.**

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 machines.

Corresponding to Outcomes 1-4:

Diagnose faults including slipping stitches, incorrect feed, malformed stitches, damage to fabric, needle deflection, incorrect depth of penetration.

1. Recognition and selection of appropriate lockstitch blindstitch machinery head angles for given sewing applications:
 - (i) 15 head angle:
 - (ii) 25 head angle:
 - (iii) 45 head angle:
 - (iv) 90 head angle: operating principles of machines related to lockstitch blindstitch seaming operations.

Recognition of the mechanisms for handling and controlling the fabric and stitch depth during the lockstitch blindstitch seaming operations.

Recognition of the mechanisms for controlling and handling the thread during stitch formation in lockstitch blindstitch machines.

The function of the following components in relation to thread handling:

- (a) The thread take-up systems in the blindstitch sewing machines:
 - (i) reciprocating sleeve types take-up lever;
 - (ii) thread tensions - passive and active controls.
- (b) The stitch forming implements:
 - (i) needle carriers with:
 - (a) rightward travel - penetration angles of 15 , 25 , 45 , and 90 to line feed.
 - (b) leftward travel - penetration angle 15 to line feed.
 - (c) parallel travel - penetration angle parallel to line of feed.
 - (ii) horizontal rotating hook incorporating an automatic opener.
 - (iii) reciprocating spreaders.

2. Interaction and timing relationship of the stitch forming and thread controlling mechanisms within the machine head:

- (i) needle carrier crank;
- (ii) hook drive gearing;
- (iii) spreader cranks and gearing;
- (iv) sleeve take-up linkage.

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

- (i) main presser foot;
- (ii) platten feed plate;
- (iii) elevating feed dog;
- (iv) plunger - standard and automatic;
- (v) cloth retainers, work plates and guides.

Interaction and timing relationship of the fabric handling components within the cylinder arm, mechanisms. Practice in removal and replacement of the components and the use of manufacturers' gauges and marks to set up machines by making adjustment to the relative position of the components.

3. Examination of machine lubricating system.
4. Diagnosis of faults with particular reference to machines with a head angle of 15 , 25 , 45 , and 90 , and to machines with and without spreaders and machines with and without automatic plungers and with skip stitch/non skip stitch (catch). Setting, adjustment and testing of machines for producing test samples with balanced BS 300 series stitch types eg. BS 306.

Determination of the correct thread for a selection of materials, sewing operations, machines and production situation, in order to demonstrate technique of safe operation with the ability to control: stitch length; depth of needle penetration; thread tension; skip stitch (catch).

SUGGESTED LEARNING AND TEACHING APPROACHES

Safety, safe working practices and care and use of sewing equipment should be an integral part of all module activities.

This module should be presented in the sewing room/workshop where the tutor should 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 should 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 should fully explain and demonstrate each tool, operation or process. Terminology and principles should be introduced in the context of the exercises.

Information charts, posters and mechanic's manuals relating to high and blindstitch machines, threads and fabrics should be displayed to assist the students with the exercises.

Student activities should be essentially centred on practical exercise assignments and the tutor should be expected to prepare precise briefs for each assignments exercise.

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

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