

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	0084362	-Session-1988-89
-Superclass-	WH	
-Title-	MAINTENANCE OF AUTOMATIC SHORT CYCLE LOCKSTITCH SEWING MACHINES - BARTACKING/BUTTON SEWING (x¹/₂)	
-DESCRIPTION-		
Purpose	<p>This module is designed to develop essential skills and an in depth understanding of maintenance requirements of industrial short cycle lockstitch bartacking/button sewing machinery producing BS stitch types 301 and 304.</p> <p>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.</p> <p>It is aimed at those following a career in clothing machine engineering.</p>	
Preferred Entry Level	84350 Maintenance of Lockstitch Machines 84352 Stitchology and Thread Control 84354 Fabric Feeding Mechanisms	
Learning Outcomes	<p>The student should:</p> <ol style="list-style-type: none">1. explain the methods of operation and practical applications of short cycle lockstitch bartacking/button sewing machines;2. explain the methods of operation of the main stitch forming, clamp control, thread trim and auto start/stop mechanisms on short cycle lockstitch bartacking/button sewing machines;3. carry out service procedures in accordance with manufacturers' specifications on automatic short cycle lockstitch bartacking/button sewing machines;	

4. identify the components, fittings and mechanism settings required for machine conversion for a given sewing application on short cycle lockstitch bartacking/button sewing machines;
5. diagnose and rectify sewing and mechanical faults and test the machine for correct sewing operation.

Content/
Context

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

Corresponding to Learning Outcomes 1-5:

1. Recognition and selection of appropriate machine type from the various machine types for given sewing applications:
 - (a) Menswear
 - (i) trousers - fly, side and waist band buttons
 - (ii) jeans - belt loops - label sewing
 - (iii) jackets - buttonhole tacking
 - (b) Ladieswear
 - (i) foundation garments - hook and eye clips
 - (ii) skirts - adjustable darts
 - (iii) slacks - pocket stress areas
 - (c) Childrenswear
 - (i) trousers - strap tacking
 - (ii) dresses - decorative tacks
 - (iii) playsuits - bib and brack tacking/metal buttons
 - (d) Knitwear - wool, cotton and synthetic
 - (i) cardigans - light, medium and heavy knit, underarm tacking
 - (ii) casual shirts - cuff tacking
 - (iii) jackets - hang tags

- (e) Articles and Workwear
 - (i) bags - straps
 - (ii) car seat belts
 - (iii) shoes - decorative tacking
 - (iv) coveralls (boilersuits etc) - fixed tie belts
 - (v) parachute harness
- (f) Efficiency rating
 - (i) shape of tack required by operation
 - (ii) number of stitches required by tack
 - (iii) handling time of operation
 - (iv) quality of materials to be used
 - (v) arrangement of work
 - (vi) skill of operative
 - (vii) speed of machine
- 2. A Recognition of the component assemblies and their function in relation to controlling and handling the thread during the sewing cycle.
 - (a) the needle and spool thread control systems - one and two thread
 - (i) reciprocating link take-up lever
 - (ii) tension assemblies: passive and active controls
 - (iii) thread guides and eyelets
 - (iv) pre-tension controls
 - (v) auxiliary thread control - nipper device
 - (b) the stitch forming implements:
 - (i) oscillating shuttle
 - (ii) rotating hook (a) horizontal - removable spool, (b) specialised - enclosed spool
 - (c) needle bar drive motions: rotating shaft - crank and linkage - straight reciprocating motion
 - (d) thread trimming devices:
 - (i) thread cutting - stationary and moving knives - cam control - vertical axis - horizontal axis (ii) thread wiper (iii) thread puller finger

- B Recognition of the mechanisms and component assemblies and their function in relation to their control of automatic start/stop drive and work control during the total sewing cycle.
- (a) start/stop drive mechanism:
 - (i) direct drive (dual pulley)
 - (ii) clutch drive (single pulley)
 - (iii) manual start control - pedal
 - (iv) auto start control - electro-pneumatic
 - (v) automatic stop - cam control
 - (vi) emergency stop - (a) manual
 - (b) sensor
 - (vii) braking systems - (a) cam and link
 - (b) disk and drum
 - (b) work holding devices:
 - (i) tacking clamps
 - (ii) button clamps
 - (iii) feed plates
 - (c) vibrating work/button clamp motions and controls
 - (i) internal vertical axis cams -
 - (a) fixed pivot feed plate motion
 - (b) co-ordinated feed plate motion
 - (ii) external horizontal axis cams -
 - (a) floating pivot feed plate motion
 - (iii) cam followers
 - (a) knife edge or point
 - (b) roller
 - (c) flat
 - (d) spherical
 - (iv) cam types - motions and characteristics

- (a) disc or radial - edge profile
- (b) plate or face - sunken track - raised track
- (c) cylindrical - sunken track
- (d) uniform velocity
- (e) simple harmonic
- (f) uniform acceleration
- (g) cycloidal motion

- (v) lateral feed
- (vi) longitudinal feed
- (vii) clamp lift: manual, automatic

3. Interaction and timing relationship of the component assemblies relating to:

- (i) stitch formation
- (ii) clamp control
- (iii) thread trimming, knives control
- (iv) start-stop mechanism

Practice in removal and replacement of component assemblies and the use of gauges, marks and fittings; making adjustment to the synchronisation and relative position of the components to achieve a given sewing application.

4. Recognition and selection of appropriate components and fittings to demonstrate the ability to convert the machine for selected sewing operations or production situations:

- (i) operations: e.g.
 - (a) tacking - standard and special
 - (b) buttonhole closing
 - (c) stress areas - garments
 - (d) label sewing
 - (e) straps and belts
 - (f) embroidery designs
 - (g) buttons, clips and buckles stitch patterns:

- (i) pattern
- (ii) pattern
- (iii) pattern

(ii) components and data:

(a) pattern cam

- (i) tack track shape
- (ii) number of stitches - 1, 2, 3 or 4 stop trip/segments
- (iii) nipper segments
- (iv) knife control

- (v) follower gauge and type
 - (b) clamp - feet
 - (c) feed plate
 - (d) needle hole insert
 - (e) gearing stitch ration
 - (f) knife cam
 - (g) knives
 - (h) automatic clamp lift
 - (i) automatic work feed: labels, belt loops, hang tags
 - (j) special fittings - mechatron etc
5. Diagnosis and rectification of faults with particular reference to machines with vibrating clamp, adjustable oscillating shuttle, rotating hook on cylinder arm and flatbed machines.

Setting, adjustment and testing machines for producing test samples, for sewing operations and production situations in order to demonstrate techniques of safe operation.

Suggested
Learning and
Teaching
Approaches

Safety, safe working practices, 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 bartacking machines in question. Students could work singly or in pairs. In the initial stages the tutor should fully explain and demonstrate each tool gauge operation or process. Terminology and principles relating to lockstitch bartacking machines should be introduced in the content of the exercise. Information charts, posters and mechanic's manuals relating to short cycle bartacking/button sewing lockstitch machines, needles, buttons, thread 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 would be expected to prepare precise briefs for each assignments exercise. A set of completed exercise should be available for the students to relate and compare standards.

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 EXPLAIN THE METHODS OF OPERATION AND PRACTICAL APPLICATIONS OF SHORT CYCLE LOCKSTITCH BARTACKING/BUTTON SEWING MACHINES

PC The student:

- (a) lists sewing operations for which each type of lockstitch bartacking/button sewing machine is used;
- (b) states all of the materials and fittings and equipment required to perform specified operations on (i) menswear, (ii) ladieswear, (iii) childrenswear, (iv) knitwear and (v) workwear;
- (c) compiles a list of advantages and disadvantages of lockstitch bartacking/button sewing machines;
- (d) states how the number of stitches may be altered to suit the given operation.

IA Short Answer Questions.

The student should be set questions to test the understanding of methods of operation and practical operations of short cycle lockstitch bartacking/button sewing machines.

The test will consist of 10 questions allocated as follows:

- | | |
|------------------------------------|-------------|
| (a) sewing operations | 2 questions |
| (b) materials, fittings, equipment | 3 questions |
| (c) advantages, disadvantages | 2 questions |
| (d) stitch regulation - questions | 3 questions |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing 6 correct responses including one from (a), (b), (c) and (d).

LO2 EXPLAIN THE METHODS OF OPERATION OF THE MAIN STITCH FORMING, CLAMP CONTROL, THREAD TRIM AND AUTO START/STOP MECHANISMS ON SHORT CYCLE LOCKSTITCH BARTACKING/BUTTON SEWING MACHINES

PC The student:

- (a) identifies the specific areas related to thread control and stitch forming action of different types of lockstitch bartacking/button sewing machines;
- (b) turns machine over by hand to demonstrate and describe the action of stitch formation thread control by the rotating hook and oscillating shuttle;
- (c) operates the machines by hand;
- (d) identifies the differences between the start/stop systems.

IA Practical Exercises.

The student should be set practical exercises to test understanding of the principles of operation of the main mechanisms on short cycle lockstitch bartacking/button sewing machines.

The exercises will comprise as follows:

- (a) identification of 5 component areas of two different types of machines and completion of incomplete handout sheets, using bartacking machines as a point of reference;
- (b) operation and oral description of the oscillating or rotating action of the stitch forming implement in relation to the motion of the needle bar in:
 - (i) two thread lockstitch machine;
 - (ii) single thread lockstitch machine.

Satisfactory achievement of the Learning Outcome will be demonstrated by the student providing 4 correct answers to (a) and correctly operating the machinery by hand for (b) to provide accurate descriptions of a total of 4 specified component units.

LO3 CARRY OUT SERVICE PROCEDURES IN ACCORDANCE WITH MANUFACTURERS' SPECIFICATIONS ON AUTOMATIC SHORTCYCLE LOCKSTITCH BARTACKING/BUTTON SEWING MACHINES

PC The student:

- (a) adjusts and sets components in correct timing relationships according to manufacturer's specifications;
- (b) adjusts or replaces components to produce correct feeding action to permit machines to feed fabric;
- (c) works in a safe manner and wears appropriate safety clothing and equipment.

IA Practical Exercise.

The student should be presented with a practical exercise set under workshop conditions to test ability to carry out service procedures in accordance with manufacturers' specifications, making the necessary adjustments where appropriate.

The exercise will involve the student in servicing one sewing machine making the necessary adjustments where appropriate.

The service should include synchronisation of components, adjustment of feeding mechanism and examination of lubrication bearing and gearing system.

Satisfactory achievement of the Learning Outcome will be based on the student meeting all the performance criteria.

LO4 IDENTIFY THE COMPONENTS, FITTINGS AND MECHANISM SETTINGS REQUIRED FOR MACHINE CONVERSION FOR A GIVEN SEWING APPLICATION ON SHORT CYCLE LOCKSTITCH BARTACKING/BUTTON SEWING MACHINES

PC The student correctly:

- (a) identifies and removes specified component;
- (b) states the function of the removed component;
- (c) lists the components to be changed in order to accomplish an alternative operation;
- (d) replaces the component with alternative component stating its function;
- (e) works in a safe manner and wears appropriate safety clothing and equipment.

IA Practical Exercise.

The student should be presented with a practical exercise set under workshop conditions to test the application of knowledge required for converting a sewing machine for a given sewing application.

The exercise will involve the student in removing and replacing four specified component units from the machines in order to identify the purpose of the component in relation to machine conversion for a given sewing application.

Satisfactory achievement of the Learning Outcome will be based on the student meeting all the performance criteria.

LO5 DIAGNOSE AND RECTIFY SEWING AND MECHANICAL FAULTS AND TEST THE MACHINE FOR CORRECT SEWING OPERATION

PC The student:

- (a) diagnoses faults related to sewing fabric including slipping stitches, incorrect feed, malformed stitches, damage to fabric, buttons and, needle deflection;
- (b) rectifies the diagnosed faults;
- (c) sets up and threads machine correctly for testing and producing samples of stitch type BS.301, 304;
- (d) produces test samples which show elimination of fault;
- (e) works in a safe manner and wears appropriate safety clothing and equipment.

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 sewing and mechanical faults on an automatic lockstitch short cycle sewing machine.

The exercise will be carried out on one machine containing 5 previously inserted faults.

Satisfactory achievement of the Learning Outcome will be based on the student meeting all the performance criteria.