-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

Hanover House
24 Douglas Street
GLASGOW G2 7NQ

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **2140070** **-Session-1990-91**
-Superclass- **WH**

-Title- **MAINTENANCE OF AUTOMATIC CHAINSTITCH SEWING MACHINES - BUTTON SEWING/TACKING ($X^{1}/_{2}$)**

-DESCRIPTION-

Purpose

This module is designed to develop an understanding of and the skills associated with the maintenance requirements of industrial short cycle chainstitch button tacking sewing machinery.

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

84351	Maintenance of Chainstitch Machines: Single and Two Thread (x 1/2)
84356	Maintenance of Chainstitch Sewing Machines: Multi-needle (x 1/2)

Outcomes

The student should:

1. explain the methods of operation and practical applications of short cycle chainstitch button sewing and tacking machines;

2. demonstrate methods of operation of the main stitch forming, clamp control, thread trim and auto start/stop mechanisms on short cycle chainstitch button sewing and tacking machines;

3. service components on automatic short cycle chainstitch button sewing and tacking machines;

4. convert a machine for a given button sewing or tacking operation

5. diagnose and rectify sewing and mechanical faults and test machines for correct operation.

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 SHORT CYCLE CHAINSTITCH BUTTON SEWING AND TACKING MACHINES**

PCs

(a) The identification of the use of each type of chainstitch button sewing and tacking machine is correct for specific operations.
(b) The identification of the materials, fittings and equipment required is correct to perform specified operations.
(c) The outline of the advantages and disadvantages of chainstitch button sewing and tacking machines is correct for specified sewing activities.
(d) The outline of the method of altering the number of stitches is correct for a given operation.

IA Objective Test

The student will be set an exercise consisting of objective questions to test understanding of methods of operation and practical application of short cycle chainstitch button sewing and tacking machine.

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

(a)	sewing operations	3
(b)	materials, fittings, equipment	3
(c)	advantages/disadvantages	3
(d)	stitch regulation	3

Satisfactory achievement of the Outcome will be demonstrated by the student producing at least 2 correct responses to each of (a) - (d) inclusive above.

OUTCOME 2 **DEMONSTRATE THE METHODS OF OPERATION OF THE MAIN STITCH FORMING, CLAMP CONTROL, THREAD TRIM AND AUTO START/STOP MECHANISMS ON SHORT CYCLE CHAINSTITCH BUTTON SEWING AND TACKING MACHINES**

PCs

(a) The identification of the specific areas is correct when related to stitch forming and thread control mechanisms.
(b) The identification of the stop/start systems is correct in terms relating to auto control.
(c) The outline of the difference between mechanised and hand operation is correct in relation to stitch formation and thread control.
(d) Working practices and procedures followed are safe.

IA Assignment

The student will be set an assignment to test understanding of and the skills relating to the operation of specified mechanisms on short cycle chainstitch button sewing and tacking machines.

The assignment will comprise both a practical and written component as follows:

(a) identification of component areas, using actual machines for reference by completion of incomplete handout sheets.

(b) operation and description of:

(i) the rotating action of the looper in relation to the various angled motions of the needle bar;
(ii) the oscillating action of the spreaders in relation to the various motions of the needle bar and rotary looper;
(iii) the vibration action of the work (button) clamp in relation to the reciprocating action of the needle bar;
(iv) the vibrating action of the needle bar in relation to the position of the work (button) clamp for 2 and 4 hole buttons.
(v) examination and comparison of start/stop mechanism of short cycle machines.

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

OUTCOME 3 **SERVICE COMPONENTS ON AUTOMATIC SHORT CYCLE CHAINSTITCH BUTTON SEWING AND TACKING MACHINES**

PCs

(a) The adjustment and setting of components ensure timing relationships and accord to manufacturer's specifications.
(b) The adjustment and replacement of components accords with manufacturer's specifications.
(c) Working practices and procedures followed are safe.

IA Practical Exercise

The student will be presented with a practical exercise set under workshop conditions to test the application of knowledge and skills required to remove and replace specified machine components.

The exercise will involve the student in servicing a machine, making the necessary adjustments where appropriate. The service will include synchronisation of components, adjustment of work/button clamp feeding mechanism and examination of the stitch ratio control system.

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

OUTCOME 4 **CONVERT A MACHINE FOR A GIVEN BUTTON SEWING OR TACKING OPERATION**

PCs

(a) The identification of components to be replaced is correct in terms of name and function.
(b) The identification of substitute components is correct in terms of name and function.
(c) The removal and replacement of component ensure effective and safe operation of new task to be undertaken.
(d) Working practices and procedures followed are safe.

IA Assignment

The student will be presented with an assignment to test the application of knowledge and skills required for converting a button/tacking sewing machine for a given sewing application.

The assignment will be based on the Performance Criteria and sub-divided as follows:

(a) identification of parts to be replaced;
(b) identification of substitute parts to effect new operation.

For Performance Criteria (c) and (d) the student will be set a practical exercise comprising the removing and replacing specified components (eg. work clamp assembly) from the machines.

The exercise should be carried out in a workshop situation.

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

OUTCOME 5 **DIAGNOSE AND RECTIFY SEWING AND MECHANICAL FAULTS AND TEST MACHINES FOR CORRECT OPERATION**

PCs

(a) The diagnosis of faults relating to sewing fabric is correct.
(b) The rectification of faults ensures effective and safe operation of the machine.
(c) The setting up and threading of the machine enables samples of button/tacking operations to be produced.
(d) Working practices and procedures followed are safe.

IA Practical Exercise

The student will be presented with a practical exercise set under workshop conditions to test the application of skills required to diagnose and rectify mechanical faults in a short cycle automatic chainstitch sewing machine including slipping/malformed stitches, incorrect feed, damage to fabric, buttons and needles.

The exercise will involve the student examining a machine containing 6 previously inserted faults in order to locate and rectify the given faults.

Satisfactory achievement of the Outcome will be demonstrated by the student meeting all the Performance Criteria. This will be demonstrated by the student producing test samples which show elimination of the above stated faults.

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

CONTENT/CONTEXT

Corresponding to Outcomes 1-5:

1. Recognition and selection of appropriate machine type from the various machine types for given sewing applications:

   (a) Menswear: pyjamas; shirts; jackets.
   (b) Ladieswear: foundation wear; dresses; shirts.
   (c) Childrenswear: coats; sleepsuits; playsuits.
   (d) Knitwear - wool, cotton and synthetic: cardigans - light, medium and heavy knit; casual shirts; jackets and skirts.
   (e) Articles and workwear: bags; umbrellas; shoes; coveralls (dustcoats etc).

2. Recognition of the component assemblies and their function in relation to controlling and handling the thread, button and fabric during the sewing cycle.

   (a) the needle thread tension assemblies: passive and active controls; thread guides and eyelets - stationary and moving; pre-tension controls;
   (b) auxilliary thread control pull-off systems: head controls - reciprocating lever slack thread regulators; needle guards; nipper device;
   (c) the stitch forming implements: primary looper - (spreader); spreaders - single and dual function;
   (d) work holding devices: button clamps; tacking clamps; feed/needle plates; sew slack devices;
   (e) thread trimming devices: thread cutting - incorporated and independent; thread wiper.

   Recognition of the mechanisms and component assemblies and their function in relation to their control of automatic start/stop, stitch formation 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 - manual; sensor;
      (vii) braking systems - rebound plunger; cam and link; disc and drum; spring and bumper.

(b) needle bar drive motions:

(i) oscillating shaft - parallel eccentric, con-rod and crank;
(ii) rocking lever - transverse eccentric, con-rod and link;
(iii) rotating shaft - crank and linkage;
(iv) straight reciprocating motion;
(v) vibrating motion - vertical and horizontal axis cam control.

(c) stitch forming mechanism:

(i) rotating looper (spreader); direct drive - main shaft; indirect drive; parallel shafts; transverse shafts; intersecting shafts; constant rotary motion - helical gearing - continuous shaft; variable rotary motion - spur gearing - continuous shaft; variable rotary motion - horizontal split shaft - drag link assembly; variable and vibrating motion - bevel gearing - vertical split shaft drag link assembly; oscillating spreader: eccentric control; non avoid motion; avoiding motion.

(d) button/fabric clamp control: vertical axis cams; horizontal axis cams; lateral feed - vibrating clamp; longitudinal feed - vibrating clamp; 2-4 hole clamp setting; dubbil stay effect; clamp lift - manual; automatic.

3. Interaction and timing relationship of the component assemblies relating to: stitch formation; clamp control; 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: 2, 3 and 4 hole buttons - flat and dished with various lines; stay button operations; shank and spherical buttons - leather, plastic and metal; snap fastner; buckles and clips; joker ticket tacking; blind stitching.

Stitch patterns: (five different patterns); label tacking - dot and single line, automated button feed - hoppers; automatic clamp lift; automatic thread trim.

5. Diagnosis and rectification of faults with particular reference to machines with vibrating clamp and to machines with vibrating needle bar with and without variable vibrating looper motion.

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 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 should be introduced in the content of the exercise.

Information charts, posters and mechanic's manuals relating to short cycle button sewing/tacking chain stitch 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.

09/02/98 JH/SH