

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 0084356 -Session-1988-89
-Superclass- WH

**-Title- MAINTENANCE OF CHAINSTITCH MACHINES -
MULTI-NEEDLE (x¹/₂)**

-DESCRIPTION-

Purpose

This module is designed to provide students with essential skills and an in-depth understanding of the maintenance requirements and operating procedures of industrial multi-needle chainstitch sewing machines producing BS stitch types 400 and 600.

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**

84351 Maintenance of Chainstitch Machines -
Single and Two Thread.

**Learning
Outcomes**

The student should:

1. explain the methods of operation and practical applications of multi-needle chainstitch sewing machines;
2. explain the methods of operation and interaction of the main stitch forming and fabric trimming components of multi-needle chainstitch sewing machines;
3. carry out service procedures on multi-needle chainstitch sewing machines;
4. diagnose and rectify faults in selected machine types and test for correct stitch formation and sewing performance.

Content/
Context

Safety and safe working practice 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 multi-needle chainstitch machines.

Corresponding to Learning Outcomes 1-4:

1. Recognition and selection of appropriate machine type from the various raised bed, cylinder arm and feed-off-arm multi-needle chainstitch machines for given sewing applications:
 - (a) lap seaming - jeans and jackets;
 - (b) edge pare and cover - side seams;
 - (c) raw edge cover - underwear;
 - (d) elasticating - sportswear;
 - (e) butt edging - wet suits;
 - (f) top and bottom fabric trim - nightwear;
 - (g) ornamental seaming - babywear;
 - (h) special sewing - belt loops;
 - (l) collar, cuff and waistband seaming - knitwear;
 - (j) pintucking - permanent seams.

Recognition of the mechanisms for handling and controlling the fabric during the multi- needle seaming operations as listed above.

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

- (a) presser feet - compensating, tractor etc;
- (b) feed dogs - tandem and differential;
- (c) throat plates - varying gauges;
- (d) puller feeds - incorporated and independent;
- (e) special attachments - tape metering;
- (f) fabric trim mechanisms - incorporated and independent.

Recognition of the mechanisms for controlling and handling the thread during stitch formation in multi-needle chainstitch. The effects of feed reverse mechanisms on stitch identity, stitch structure and fabric behaviour during sewing.

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

- (a) needle thread pull-off systems:
 - (i) head controls - reciprocating;
 - (ii) horizontal arm - rotary.

- (b) looper thread pull-off systems:
 - (i) vertical arm controls - rotary - reciprocating;
 - (ii) bed and lower arm controls - rotary - oscillating.
 - (c) thread tension assemblies:
 - (i) passive and active controls;
 - (ii) thread wires and eyelets.
 - (d) stitch forming implements:
 - (i) oscillating loopers - transverse and in-line, with avoid and non avoid motions;
 - (ii) spreaders - top and bottom.
 - (iii) half shaft - synchronisation control.
 - (e) auxiliary thread controls:
 - (i) back-latching devices;
 - (ii) needle guards.
 - (f) thread trimming devices:
 - (i) underbed trimming;
 - (ii) chain cutting.
 - (g) stitch condensing controls:
 - (i) variable feed control - lever actuated;
 - (ii) adjustable eccentric - push button.
2. Interaction and timing relationships of different stitch forming component assemblies, fabric feeding and trimming mechanisms; practice in removal and replacement of the components and the use of manufacturers' gauges and marks; use of jigs to sharpen knives; making adjustment to the synchronisation and relative position of the components required to produce BS 400 and 600 series stitch types.
 3. Examination of machine lubricating, bearing and gearing system covering feed and filter return. Different machine lubricant requirements e.g. types and grades of oils and greases. Selection of appropriate lubricant for eg. dissipation of heat.
 4. Diagnosis of sewing, feeding and trimming faults. Setting, adjustment and testing of machines producing stitch types BS 400 and 600 series.

Determination of the correct thread for a selection of materials, seam types, 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 balanced stitches.

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 context of the exercises.

Information charts, posters and mechanic's manuals relating to 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 would 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.

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 EXPLAIN THE METHODS OF OPERATION AND PRACTICAL APPLICATIONS OF MULTI-NEEDLE CHAINSTITCH SEWING MACHINES

PC The student:

- (a) identifies the chainstitch BS stitch types 400 and 600 from prepared samples of sewing;
- (b) lists sewing operations for which each chainstitch type is used;
- (c) explains the basic operating principles of chainstitch machinery;
- (d) lists the advantages and disadvantages of the specialised chainstitch for given operations;
- (e) identifies specified components of chainstitch 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 multi-needle chainstitch sewing 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 of machinery | 2 questions |
| (f) functions of main components | 2 questions |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing 9 correct responses including one from (a) - (f).

LO2 EXPLAIN THE METHODS OF OPERATION AND INTERACTION OF THE MAIN STITCH FORMING AND FABRIC TRIMMING COMPONENTS OF MULTI-NEEDLE CHAINSTITCH SEWING MACHINES

PC The student:

- (a) identifies the specific areas related to thread control and stitch forming action of the multi-needle chainstitch machines;

- (b) explains the oscillating action of the looper/s in relation to the motion of the needle bar.
- (c) explains the reciprocating action of the top spreader in relation to the motion of the needles;
- (d) describes stitch forming action and thread control of the loopers and spreader;
- (e) explains the action of the feed mechanism.

IA Restricted Response Questions

The student should be set questions to test the understanding of knowledge relating to the methods of operation and interaction of the thread control, looper(s), spreaders, needle bar of multi-needle chainstitch machines.

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

The test will consist of 10 questions allocated as follows:

- | | |
|--|-------------|
| (a) identification of specific areas | 2 |
| questions | |
| (b) oscillating action of looper(s) | 2 questions |
| (c) reciprocating action of top spreader | 2 questions |
| (d) stitch forming action | 2 questions |
| (e) feed mechanism | 2 questions |

Satisfactory achievement of the Learning Outcome will be demonstrated by the student producing 8 correct responses including one from (a), (b), (c), (d), and (e).

LO3 CARRY OUT SERVICE PROCEDURES ON MULTI-NEEDLE CHAINSTITCH SEWING MACHINERY

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) 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 chainstitch sewing machines.

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

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

LO4 DIAGNOSE AND RECTIFY FAULTS IN SELECTED MACHINE TYPES 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, incorrect depth of penetration;
- (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;
- (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.

The exercise will be carried out on one machine containing 6 previously inserted faults.

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