-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **2140100** **-Session-1990-91**
-Superclass- **WH**

-Title- **MAINTENANCE AND FABRICATION OF SEWING MACHINE ATTACHMENTS AND WORK AIDS**

-DESCRIPTION-

Purpose

This module is designed to develop an understanding of and the skills associated with the design, fabrication, modification and maintenance of industrial attachments and work aids used on industrial sewing machinery.

It is intended that this module is taught in conjunction with other related modules and forms part of a course 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)
84351 Maintenance of Chainstitch Machines - Single and Two Thread (x 1/2)
84553 Engineering Systems: Pneumatics (x 1/2)
74741 Metal Joining Skills: Thermal
74759 Introductory Fabrication Skills
74743 Thermal Joining Processes (x 1/2)

Outcomes

The student should:

1. outline the reasons for using work aids and attachments in garment production;

2. outline the basic design principles of attachments and work aids and the types of engineering materials that may be used to construct them;

3. construct a selection of specified attachments and work aids to be fitted to selected sewing machines and test for correct operation;

4. diagnose and rectify faults directly attributed to attachments and work aids.

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 OUTLINE THE REASONS FOR USING WORK AIDS AND ATTACHMENTS IN GARMENT PRODUCTION

PCs

(a) The identification of attachments and work aids that may simplify or eliminate a sewing operation is correct.
(b) The identification of the objectives of attachments and work aids is correct in relation to their ability for improvement of quality, simplifying training and increase of output.
(c) The identification of the advantages and disadvantages of selected work aids is correct.

IA Restricted Response Questions

The student will be set an exercise consisting of restricted response questions to test understanding of the reasons for using work aids and attachments.

The exercise will consist of 12 questions covering different work aids and different attachments.

The questions will be allocated as follows:

(a)	identification	4
(b)	objectives	4
(c)	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 at least 3 correct responses to each of (a), (b) and (c).

OUTCOME 2 **EXPLAIN THE BASIC DESIGN PRINCIPLES OF ATTACHMENTS AND WORK AIDS AND THE TYPES OF ENGINEERING MATERIALS THAT MAY BE USED TO CONSTRUCT THEM**

PCs

(a) The classification attachment and work aid groups is correct.
(b) The description of the attachments used to assist the operative to maintain position when sewing garment parts is correct.
(c) The listing of types of folders, guides and hemmers is appropriate to their category.
(d) The identification of the limitations of attachments and work aids is accurate in relation to their application as sewing operations.

IA Objective Test

The student will be set an exercise consisting of objective items to test knowledge relating to the basic design principles and materials used when manufacturing work aids.

The exercise will consist of 12 questions allocated as follows:

(a)	classification	3
(b)	descriptions	3
(c)	types of folders, guides, hemmers	3
(d)	limitations	3

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

OUTCOME 3 **CONSTRUCT A SELECTION OF SPECIFIED ATTACHMENTS AND WORK AIDS TO BE FITTED TO SELECTED SEWING MACHINES AND TEST FOR CORRECT OPERATION**

PCs

(a) The working drawing of selected attachments produced is clear and in accordance with British Standards specifications.
(b) The selection of materials to be used in the fabrication of the selected attachments is appropriate.
(c) The prototype of the selected attachments produced is appropriate for a given use and operates effectively.
(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 applications of knowledge and skills required to fabricate selected attachments to demonstrate the difference in specific applications.

The exercise will involve the student fabricating 4 selected attachments from the following categories:

binders; folders; hemmers; guides; corders; tapers.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met for at least 3 of the 4 attachments.

OUTCOME 4 **DIAGNOSE AND RECTIFY FAULTS DIRECTLY ATTRIBUTED TO ATTACHMENTS AND WORK AIDS**

PCs

(a) The procedures adopted for fault diagnosis ensure:

(i) correct interpretation of manufacturer's information;
(ii) correct inspection of attachment;
(iii) safe working practices are followed.

(b) The procedures adopted for fault rectification ensure:

(i) appropriate methods are used;
(ii) effective operation of attachment or work aid;
(iii) safe working practices are followed.

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 diagnose and rectify faults directly attributed to attachments and work aids.

The exercise will consist of 2 tasks as follows:

(i) 1 fault on an attachment;
(ii) 1 fault on a work aid.

Satisfactory achievement of the Outcome will be demonstrated by all Performance Criteria being met for both tasks.

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 operation and the effects produced in relation to the actual sewing performance of the selected machine types.

Corresponding to Outcomes 1-4:

1. Reasons for using attachments and/or work aids including performing automatically certain manipulations of materials that would be too difficult or laborious to do by hand. Reasons relate to the specific objectives of: simplifying sewing operations; reducing training; reducing operative fatigue; improving consistency; increasing output; standardising quality; lowering costs.

   Recognition of the appropriate attachment and work aid components, their use in re-engineering the garment, the principles of specific operations and the use of attachments and work aids in relation to handling and controlling fabric during sewing and on completion of operations.

   (a) Division of sewing methods:

   pick-up, present and position to the needle;
   fold base or additional material for sewing;
   trim threads or fabric;
   dispose of sewn work.

   (b) Attachment and work aid groups:

   replacing presser foot;
   fixed to machine bed;
   fixed to machine head;
   alongside machine.

   (c) Classification of attachments and work aids:

   (i) Position in machine: before the needle; behind the needle; under the needle; above the needle.

   (ii) Relating to fabric feed: before sewing; during sewing; after sewing.

   (iii) Relating to machine function: pneumatic; electronic; mechanical; electro-mechanical; electro-pneumatic.

2. Determination of the correct selection of materials, tools, techniques and service requirements for an attachment/work aid for a given sewing application.

   (a) Practical planning factors: accuracy requirements; operative skill; machine type; type of materials (fabric); scrap removal; number to be produced; safety.

   (b) Attachment/work aid function: fabric folding; fabric guiding; fabric trimming; fabric handling; presentation; disposal.

   (c) Combination Fittings: interchangeability of parts; head fittings; bed fittings; unit fittings.

   (d) Design considerations: drafting; drawing; ultimate form; sequence of assembly; production methods; working life.

   (e) Engineering materials: brass, copper, tin plate, stainless steel and plastic; service requirements - strength, fatigue, abrasive, and wearing properties. Farbication requirements - material costs, availability; properties - malleability, plasticity, ductility.

   (f) Fabrication techniques: tools and machines special pliers, snips, bending bars, formers; marking, cutting, drilling; bending, rolling, wiring, hemming, allowances and tolerances; joining, joint design, soldering, brazing, pop riveting; polishing and finishing - by hand and machine; fixing methods, screws, bolts, brackets.

3. Recognition of a category of attachments/work aids to accomplish a specific application of a sewing operation.
   Selection of appropriate materials in order to demonstrate the ability to fabricate an attachment from each selected category to demonstrate the difference in specific sewing applications: binders; folders; hemmers; guides; corders; tapers.

   Recognition of the objectives and limitations of attachments/work aids and fittings and the factors that govern their selection:

   (i) interpret garment designers needs;
   (ii) relate to production personnel:

   type of operation;
   pre-determined motion times;
   improvement of methods;
   intrinsic savings

   (iii) availability of sewing equipment;
   (iv) range of alternatives;
   (v) modification of sewing process.

Responsibility of maintenance technicians for the procurement, innovation, modification, adaption and requirements for maintenance of all attachments/work aids with particular reference to:

(i) specific task result;
(ii) job analysis techniques;
(iii) size and complexity of device;
(iv) tolerance limits;
(v) facilities and skill available.

Determination of the correct choice from a selection of basic attachments/work aids and fittings which would assist the operative to maintain position, demonstrate safe technique and proficiency in accomplishing a specific task from given materials, seam types, sewing operations, machines and production situations.

Determination of the correct choice from a selection of suitable components to design and construct a pneumatic/electro mechanical/electro pneumatic work aid to be fitted to a designated machine. the device may be: clamp or foot lifter; fabric or thread trimmer; garment stacker; metering mechanism.

4. Diagnostic and remedial procedures relating to the basic principles of the practical use of attachment/work aids and fittings used in the production of BS seam types covering:

effects of maladjusted work aids;
interference by attachment with machine performance;
interference of work flow by attachment;
incorrect selection of work aid or attachment; garment damage due to work aid or attachment.

SUGGESTED LEARNING AND TEACHING APPROACHES

This module should be presented in the sewing room/workshop where the tutor should carefully explain and demonstrate the various techniques using 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 technology and machines in question.

Students could work singly, in pairs or as a group.

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

Information charts, posters and mechanics manuals relating to machines, attachments, work aids and fittings should be displayed to assist the students with the exercises. Student activities would be essentially centred on practical exercise assignments and the tutor would be expected to prepare precise briefs for each assignment exercise. A set of completed attachment/work aid exercises should be available for the students to relate and compare standards and to develop initiative and work independently. Safety, safe working practices, care and use of soldering, brazing and welding equipment, bending and cutting machines, tools and sewing equipment should be an integral part of all module activities.

09/02/98 JH/SH