



Basic apparel production Level-I

Learning Guide-41

Unit of Competence: Perform Industrial Sewing Machine Minor
Service

Module Title: Performing Industrial Sewing Machine Minor
Servicing

LG Code: IND BAP1M13 LO41-LG-41

TTLM Code: IND BAP1 TTLM13 0919v1

LO 1: Assess machine performance and operation



Instruction Sheet

Learning Guide #1

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Starting and stopping machine
- Setting in machine
- Monitoring machine operation
- Identifying and reporting problem

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to:**

- Start and stop **Machine** according to manufacturer requirements.
- Set in Machine accordance with work specifications, manufacturer's instructions and company procedures.
- Machine operation is monitored in accordance with job requirement to ensure required standard of quality are met
- Problem with machine is identified and reported.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4".
4. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 "
6. Do the "LAP test" .



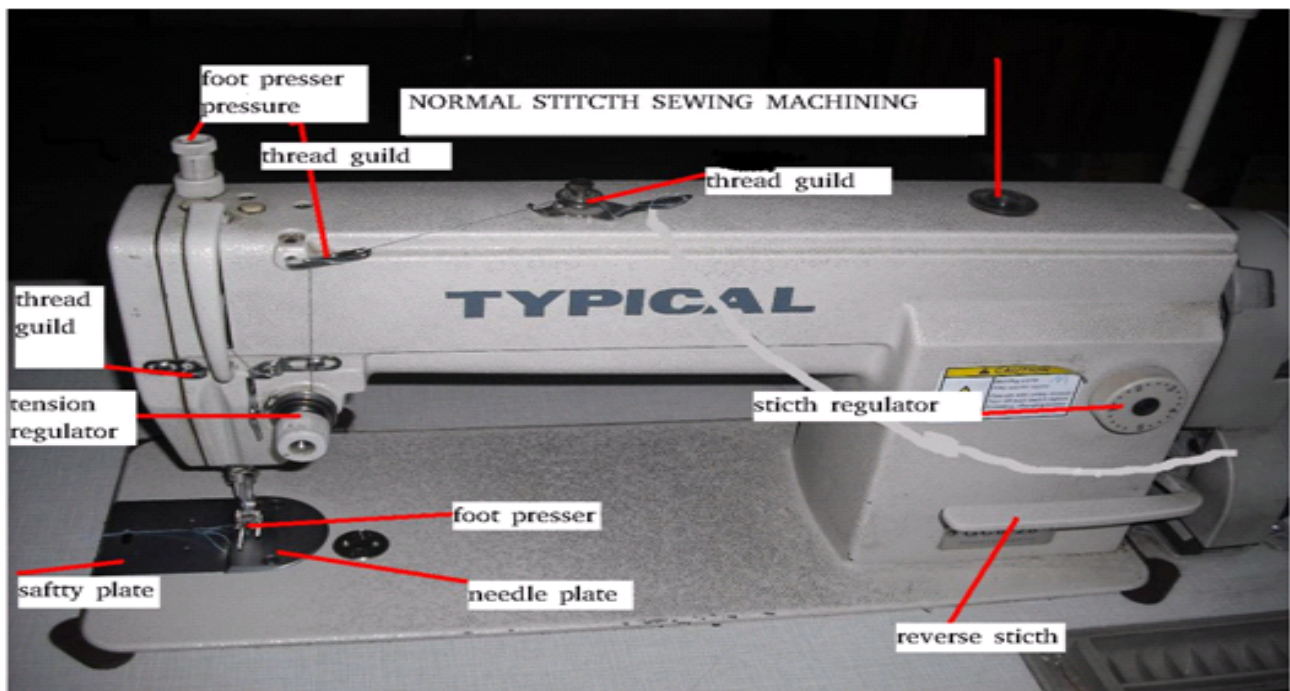
1.1 Starting and stopping Industrial sewing machines

- **Definition:** Maintenance is a set of **organized activities** that are carried out in order to keep an item in its **best operational condition** with minimum cost acquired
- A **sewing machine** is a mechanical (or electromechanical) device that joins fabric using thread. Sewing machines make a stitch, called a *sewing-machine stitch*, usually using two threads although machines exist that stitch using one, three, four or more threads.
- This is the **fastest sewing machine**.
- One needs practice to handle it.
- In an electric machine the balance wheel comes to motion by a belt, which is attached to an electric motor



Sewing Machine Parts

Lockstitch machine





Sewing machine

1. Spool Pin is the thread holder.
2. Thread Guide keeps the thread in position.
3. Thread Take up Lever releases the thread and interlocks with the bobbin thread.
4. Presser bar lifter moves the presser foot high.
5. Tension controls the looseness and tightness of stitches.
6. Needle Bar holds the needle in place.
7. Needle Clamp holds and tightens the needle.
8. Presser Foot holds the fabric in place while sewing.
9. Needle is a slender tool attached in the needle clamp used for sewing.
10. Bobbin Winder controls the bobbin while winding thread.
11. Stitch regulator checks the length of the stitches.
12. Balance Wheel sets the mechanism in motion.
13. Belt connects the balance wheel to the drive wheel.
14. Stop Motion Screw hinders moving when loosened and starts

Parts of Sewing Machine under the Bed

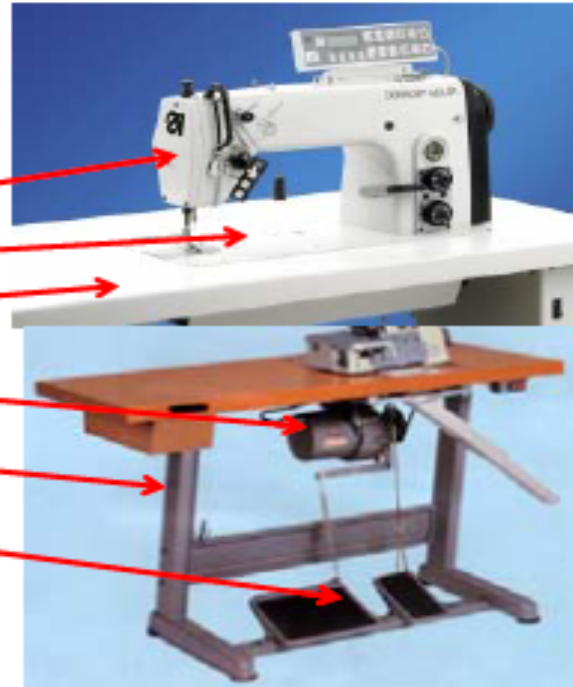
1. Feed Dog - moves the fabric while sewing.
2. Throat plate windows of the feed dog and it are where the bobbin threads come out.
3. Slide plate is a movable plate that covers the shuttle and bobbin case.
4. Shuttle holds the bobbin case while sewing.
5. Bobbin is a metal spool for winding thread.
6. Bobbin Case holds the bobbin.



BASIC SEWING MACHINE UNIT

In general, a sewing machine consists of:

- ❖ sewing head
- ❖ machine bed
- ❖ work-top;
- ❖ drive motor;
- ❖ machine stand;
- ❖ treadle.



TREADLE SEWING MACHINE

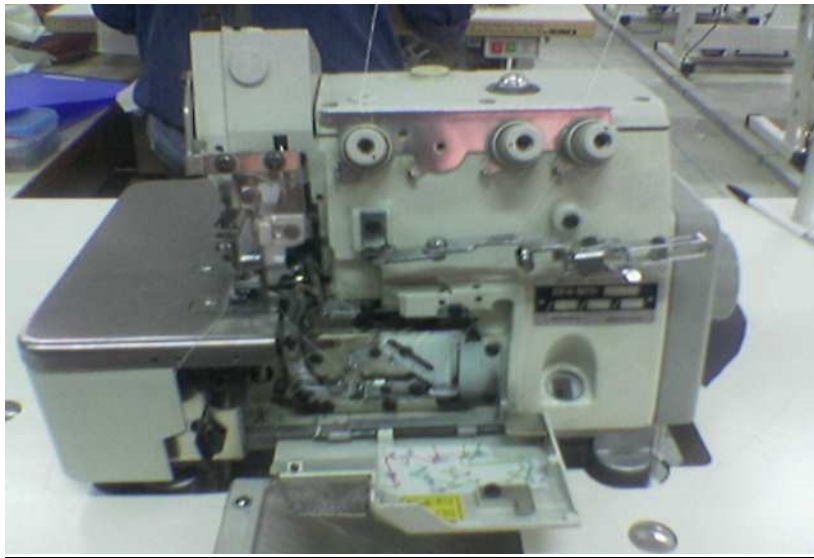
- Exactly like the hand sewing machine but it is operated by foot using an additional stand.
- The balance wheel is operated by a belt with the help of lower stand, which is driven by feet.
- Operates faster than that of the hand-operated machine.
- Is suitable where there is no power supply.
- When handling this machine both the hands are free to handle the fabric, speeding up the work.
- Even some of the heavy-duty machines are operated by this method.





OVERLOCK MACHINE

- Overlock machine is a special purpose machine used for finishing edges and sometimes for seaming. It falls under the class 500.
- Stitch types in this class are formed with one or more groups of threads and have general characteristics that loops from at-least one group of threads pass around the edge of the material.





Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Describe Electrical single lock stitch Sewing machine? .(4points)
2. What is the use of overlock machine? (4 points)

Short answer questions

1. Write List out the Parts Sewing Machine? (4 points)

Note: Satisfactory rating - and 6 points

Unsatisfactory - below and 6 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information Sheet- 2	Setting in machine
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1.2 Setting in machine

- Many work aids have been developed to facilitate the use of basic equipment and make it more adaptable to specific operations.
- Carefully selected work aids can often produce significant savings.
- Work aids can be purchased, created by research and development departments, or developed by engineers, mechanics, and technicians on the production floor.
- Work aids may be used in all types of operations including cutting, sewing, and finishing, but they are most widely used in the sewing room because of the accuracy and labour intensity required.

1.2.1 working specifications

- The work aids that are used during sewing operations can be categorized in a number of different ways and they vary in the aspects of their overall purpose that they emphasize.
- Some offer greatly increased speed of working in a
 - ▶ Situation where quality is already satisfactory.
- Others give very little improvement in productivity but great accuracy of sewing.



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Describe step of setting sewing machine? (5 point)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information Sheet-3	Monitoring machine operation
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1.3. Monitoring machine operation

The monitoring and diagnosis of machinery is a well-established discipline, but much progress remains to be made in automating diagnosis as well as developing low-cost reliable technologies which can be applied cost-effectively in the majority of production environment.

Condition monitoring can be carried out when the equipment is in operation, which known as on-line, or when it is off-line, which means when it is down and not in the operation. While on-line, the critical parameters that are possible to monitor are speed, temperature, vibration, and sound. These may be continuously monitored or may be done periodically. Off-line monitoring is carried out when the machine is down for whatever reason.

Machine condition monitoring (MCM) is a vital component of preventive and predictive maintenance programs that seek to reduce cost and avoid unplanned downtime.

It includes, but is not limited to, technologies such as **visual inspection**, **vibration measurement** and analysis, **temperature monitoring**, **acoustic emission analysis**, **noise analysis**, **oil analysis**, **wear debris analysis**, **motor current signature analysis**, and nondestructive testing.

- 1. Visual Inspection:** - visual monitoring can sometimes provide a direct indication of the machine's condition without the need for further analysis. The available techniques can range from using a simple magnifying glass or low-power microscope. Other forms of visual monitoring include the use of dye penetrates to provide a clear definition of any cracks occurring on the machine surface, and the use of heat-sensitive or thermo graphic paints.
- 2. Vibration Analysis:** - Modern condition monitoring techniques encompass many different themes; one of the most important and informative is the vibration analysis of rotating machinery. Using vibration analysis, the state of a machine can be constantly monitored and detailed analysis may be made concerning the health of the machine and any faults which may arise or have already arisen.
- 3. Temperature Monitoring:** - Temperature monitoring consists of measuring of the operational temperature and the temperature of component surfaces.

Monitoring operational temperature can be considered as a subset of the operational variables for performance monitoring. The monitoring of component temperature has been found to relate to wear occurring in machine elements,



particularly in journal bearings, where lubrication is either inadequate or absent. The techniques for monitoring temperature of machine components can include the use of optical pyrometers, thermocouples, thermo graphy, and resistance thermometers.

4. Noise Analysis: - Noise signals are utilized for condition monitoring because noise signals measured at regions in proximity to the external surface of machines can contain vital information about the internal processes, and can provide valuable information about a machine's running condition. When machines are in a good condition, their noise frequency spectra have characteristic shapes. As faults begin to develop, the frequency spectra change. Each component in the frequency spectrum can be related to a specific source within the machine. This is the fundamental basis for using noise measurement and analysis in condition monitoring.

Key Benefits of Machine Monitoring during operation

- Improved manufacturing efficiency
- Reduced production wastes for increased profits
- Improved operator engagement and overall company communication
- Automated data collection and analysis
- Custom reporting
- Increased overall machinery efficiency

**Self-Check -3****Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Say True or False

1. ----- Machine condition monitoring (MCM) is a vital component of preventive and predictive maintenance programs.(2 point)
2. ----- Monitoring and diagnosis of machinery is not a well-established discipline in maintenance.(2 point)

Short answer question

3. Write at least 3 key benefits of monitoring machine operations? (3 point)
4. Explain the methods of monitoring machine condition? (4 point)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information Sheet-4	Identifying and reporting problem
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1.4 Identifying and reporting problem

Needle breakage

Incorrect class and variety needle being--- Use correct class and variety used. Needle.

Needle loose in clamp. --- Tighten needle clamp screw.

Needle too small for fabric. ---Use larger needle.

Operator pulling on the material. ---Allow machine to feed material.

Needle thread breakage

Thread too heavy for needle. ---Use larger needle or smaller thread.

Right twist threads being used. ---Use left twist thread.

Damp or defective thread being used. ---Use only dry smooth thread.

Machine incorrectly threaded. ---Check machine for proper threading.

Needle incorrectly set. ---Set needle with long groove to the left.

Needle threads tension too tight. ---Loosen needle thread tension.

Thread take-up spring out of adjustment. ---Adjust thread take-up spring.

Burr on bobbin case, --- Shuttle point or Smooth with emery cloth. tension disks.

Thread rubbing against presser foot. ---Adjust presser foot.

Needle has burr on eye or point, blunted ---Replace needle. or bent.

Bobbin thread breakage

Bobbin tension too tight. ---Adjust bobbin tension.

Bobbin incorrectly threaded. ---Thread bobbin to revolve clock- wise.

Bobbin wound too full to revolve freely. ---Remove some of the bobbin thread.

Rounds of bobbin thread lapped over one another. --- Insure bobbin thread is straight when winding bobbin.

Bobbin case is dirty. --- Clean and lubricate bobbin case.



Skipped stitches

Machine out of time. ---Time needle to shuttle.

Thread controller spring out of ---Adjust thread controller spring. Adjustment.

Drawing of seam

Needle and bobbin tension too tight. --- Loosen needle and bobbin tension.

stitches piled up

Stitch regulator out of adjustment. ---Adjust stitch regulator.

Pressure on presser foot too tight. ---Loosen presser foot adjustment screw.

Feed dog striking throat plate

Feed dog set too high. --- Lower feed dog to correct height.

Adjusting the Feed Dog

The height at which the feed dog should beset depends on the weight and number of plies of the material being sewn. If the feed dog is set too low, the material does not feed through the machine; if it is set too high, it may cut or fray the material. The recommended height of the feed dog for sewing lightweight canopy material is slightly less than one tooth above the throat plate.

If you are sewing heavier material, raise the feed dog to a height that ensures positive feeding of the material.

After you have decided on the correct height for the project you are working on, adjust the feed dog accordingly, by loosening and then tightening the screw.

You must remember that each time the height of the feed dog is changed, the feeding mechanism may be out of time. For this reason, set the feed dog first, and then make the necessary adjustment on the feeding mechanism.

Since most of your canopy repairs involve material of approximately the same weight, one-time adjustment of the feed dog is usually sufficient. Repeated changing of its height is not necessary.

Adjusting the Thread Take - up spring



To adjust correctly the take-up spring in the tension assembly, you should first understand its normal operation.

The thread take- up lever pulls the thread take-up spring down about even with the slack thread regulator while the needle is going up.

While the take-up lever is coming down with the needle, the thread take- up spring pulls the slack out of the thread and keeps it from getting under the needle. If you do not have this adjusted properly, a loop can form

Tension assembly.

Over the needle hole in the throat plate and the needle can split the thread as it enters the needle hole. You should set the spring about 1/4 inches above the slack thread regulator.

The thread take- up spring should be set so that the spring will have completed its downward motion and be resting on the stop when the needle, on its down stroke, reaches the fabric.

To put more tension on the spring, you turn the assembly clockwise; to put less tension on the spring, you turn the assembly counterclockwise.

It may be necessary for you to replace the thread take-up spring because it can bend and become weak. Loosen the setscrew and insert a screwdriver into the slot of the tension screw stud.

Turn the stud to the left until it is screwed out of the thread take-up spring regulator. Remove thumb nut, the tension

Spring and tension discs.

The take-up spring is now free for removal. After replacing the old spring with a new one, assemble the parts in reverse procedure.

Replacing the Needle

It is very important that the proper needle be used to ensure good machine operation. The selection of needles by class, variety, and size for different machines and materials is necessary to:-

- Eliminate thread breakage
- Needle breakage



- Skipped stitches and
- Fraying of the thread.

Sewing machine needle

Machine needles have along groove on one side, and either a short groove or a scarf on the opposite side.

The purpose of the grooves is to allow the thread to fall back into the needle when it enters the material to prevent the thread from breaking or fraying; therefore, it is important that the long groove be placed in the machine properly.

Needles are sized by the diameter or gauge of the needle and the needle eye. The selection of the correct size needle is determined by the size and type of thread and material used.

The thread must pass freely through the eye of the needle to prevent thread fraying or breaking. The needle size number increases with the diameter of the needle; therefore size 18 needles are used for lighter weight materials than size 22.

Listed below are some of the needle sizes you will be working with and their uses:

- ✚ Size 18. For sewing two to four plies of thin material, such as silk, nylon, or rayon, with size E thread. Size 20. For sewing five or more plies.
- ✚ Size 21. For sewing two to four plies of medium weight materials, such as aircraft cloth, 12-ounce duck, light leather, and artificial leather.
- ✚ Size 22. For sewing two to four plies of medium weight material, such as heavy duck, lightweight and medium weight web- binges, and russet leather.
- ✚ Size 24. For sewing elastic or rubberized — materials.

You should check the condition of the needle's point before you start to sew. A dull or rough round needle acts the same as a cutting needle. It cuts or pulls threads and may weaken the seam.

The condition of a needle maybe checked by sliding the fingernail over the point. If it scratches or catches the nail, the needle should be replaced with a new one.

Having selected the proper needle:-



- ✚ Turn the balance wheel toward you until the needle bar moves to its highest point.
- ✚ Loosen the needle clamp screw and put the shank of the needle up into the groove as far as it will go.
- ✚ Turn the long groove so that it faces to the left and is directly in line with the arm of the machine.
- ✚ Then tighten the clamp screw, and check to see that the needle does not turn or slip.

Threading the Machine:-Threading a machine is a very simple job. The procedure may vary slightly with different models; but after working with the various machines in the loft, the task becomes automatic.

- Pass the thread from the thread stand to the thread post on top of the machine, right to left through the bottom hole, and then right to left through the top hole.
- Pass the thread from right to left through the top hole in the thread retainer
- Pass the thread from left to right through the middle hole in the thread retainer
- Pass the thread from right to left through the bottom hole in the thread retainer
- The thread is then passed down and under from right to left between the tension disks
- Draw the thread up into the thread take-up spring drawing the thread up and beyond the spring end so that it comes out in the center of the spring.
- The thread is then placed under the tension thread guard Pass the thread up and from right to left through the hole in the thread take-up lever. The thread is now drawn down through three thread guides

Removing the Bobbin Case

Before attempting to remove the bobbin case, turn the balance wheel toward you until the needle moves upward to its highest position.

Remove the slide in the bed of the machine so you can see what you are doing.

Reach under the table with your left hand, and, using your thumb and forefinger, open the bobbin case latch and lift out the bobbin case. While the latch is held open, the bobbin is retained in the bobbin case.



Replacing the Bobbin Case

Hold the latch open on the threaded bobbin case with the thumb and forefinger of the left hand, with the latch in a horizontal position. Place the bobbin case on the center stud of the shuttle body. Release the latch and press the bobbin case back until the latch catches the groove near the end of the stud. Preparing for Sewing With the left hand, hold the end of the needle thread, leaving it slack from the hand to the needle. Turn the balance wheel toward you until the needle moves down and catches the bobbin thread. Continue to turn the balance wheel forward until the needle comes up and brings the bobbin thread up with the needle thread.

Regulating the Tension

The tension on the needle thread should be regulated only when the presser foot is down. If the tension of the machine thread is not correct, it should be adjusted by turning the tension adjusting nut,

To INCREASE THE TENSION, turn the nut clockwise; to DECREASE THE TENSION, turn the nut counterclockwise.

The tension on the bobbin thread is regulated by the small screw in the bobbin case tension spring. To increase the tension, turn the screw clockwise; to decrease the tension, turn the screw counterclockwise.



Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Describe Sewing machine stitch problem? .(5 points)
2. How to sewing machine Needle breakage solve problem? .(5 points)

Short answer questions

3. . Write the methods of machine problem identifications? (4 point

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____



Basic apparel production

Level-I

Learning Guide-42

Unit of Competence: Perform Industrial Sewing Machine Minor
Service

Module Title: Performing Industrial Sewing Machine Minor
Servicing

LG Code: IND BAP1M13 LO42-LG-42

TTLM Code: IND BAP1 TTLM13 0919v1

LO 2: Rectify minor machine fault



Instruction Sheet

Learning Guide #42

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Checking machine operation's
- Identifying, reporting and addressing minor machine faults and associate
- Identifying and reporting major machine faults
- Recording machine maintenance and completing other documentation

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to:**

- checked operation Machine ensure correct
- Machine Minor and associated equipment and tool faults are identified, reported and addressed where necessary to meet specified requirements.
- identified Machine Major Faults and reported to appropriate personnel.
- Maintenance Machine and records documentation are accurately completed.

Learning Instructions:

7. Read the specific objectives of this Learning Guide.
8. Follow the instructions described below 3 to 6.
9. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4".
10. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4" **in page -6, 9, 12 and 14** respectively.
11. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 " **in page -15.**
12. Do the "LAP test" **in page – 16** (if you are ready).



Information sheet 1

Checking machine operation's

2.1 checking machine operations

- ▶ Check to see if the machines are being kept clean
- ▶ Machines should be blown off every day to remove lint and trash
- ▶ Check to see that the machines are being lubricated regularly
- ▶ Oil levels should be checked daily and additional oil added if necessary
- ▶ Randomly check the oil levels in the machines
- ▶ A high quality white machine oil should be used that will not stain
- ▶ Check availability of proper machine oil in the workshop
- ▶ Check to make sure the oil is not contaminated
- ▶ Check to see that oil reservoir pump filters are cleaned regularly
- ▶ If compressed air is used, make sure the air system is regulated properly and has humidity
- ▶ Dryers, filters and lubricator in the air lines.
- ▶ Check for rusted areas due to excessive moisture in production area
- ▶ Check Machines for wear on critical moving parts
- ▶ Check for shake in needle bar due to worn needle bar bushings
- ▶ Check for excessive movement in stitch forming devices, etc.
- ▶ Check condition of critical screws
- ▶ Check for missing screws
- ▶ Check for defective screws that are difficult to tighten properly
- ▶ Check condition of mechanics tools to see their condition properly

**Self-Check -4****Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Describe Sewing machine operations? .(5 points)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet 2	Identifying, reporting and addressing minor machine faults and associate
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2.2 Identifying, reporting and addressing minor machine faults and associate

Sewing machine, like any other machine, requires regular maintenance in order to operate properly. By following these simple steps after every 8 to 10 hours of machine use, you will help ensure your machine's longevity and will be able to better enjoy your sewing experience.

No	Sequence of task	Potential Hazards
1	Turn on the power switch	<ul style="list-style-type: none"> i. Injury – due to contact with machine parts set in motion immediately after power switch is ON ii. Electric shock – unexpected flow of current and contact with conducting parts of the machine body
2	Know proper operation of sewing machine	<ul style="list-style-type: none"> i. Injury – due to improper handling of machine, electrical shocks, electric burns and heat burns ii. Illness to health – inhalation of cotton fibers, eye strain and hearing problem iii. Ergonomics problem due to repeated work and awkward postures
3	Connect machine to energy source	<ul style="list-style-type: none"> i. Electric shock –using the damaged cords, damaged switches and using wet hands and poor earthing
4	Perform the sewing operation	<ul style="list-style-type: none"> i. Injury – finger contact with needle, revolving parts(V belt ,motor) operating at high speed ii. Loose clothing, Untied hair and Jewellery caught in between the moving parts of the machine iii. Broken needle hitting the worker(eyes, face, body parts) iv. Electric shock – leakage of current to the metal parts of the machine
5	Turn off power to stop machine	<ul style="list-style-type: none"> i. Electric Shock – damaged switches, using wet hands ii. Electric Spark - in case of poor earthing iii. Injury – contact with moving parts of machine(body parts or cloth) and elevated parts of machine
7	Special Cases: i. Threading needle, adjusting thread, thread guide, replacing	<ul style="list-style-type: none"> i. Injury – finger contact with needle, revolving parts, hitting to the projected parts, sharp edges of the machine ii. Cut injury by threads iii. Accidental start of the machine



	<p>bobbin ii. Replacing needles, presser feet, needle plates, feed dogs, needle guards, horns, cloth guides</p>	
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Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List out sewing machine faults? (10 point)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet 3	Identifying and reporting major machine faults
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2.3 Identifying and reporting major machine faults

The machine Problem: Thread is bunching under the fabric.

THE SOLUTION:

You can have a perfectly straight stitch on the top, but a "bird's nest" forming on the bottom. So why the inconsistency? People tend to think that the bobbin is to blame; in fact, this couldn't be farther from the truth. The thread is snarling -- usually, under the fabric -- because there is no tension on the upper thread.

What to do: First, raise the presser foot lifter and rethread the machine. This opens up the tension mechanism to receive the thread. Second, you will need to raise the take-up lever and needle to the highest position according to your machine's manual. This should help to confirm you have the right tension.

The Problem: Stitches are coming out uneven or skipping entirely.

THE SOLUTION:

Odds are, the secret culprit here is a needle that is broken, bent, or otherwise damaged

The Problem: The needle keeps breaking.

STILL HAVING ISSUES? THIS THREE-STEP CHECKLIST CAN EASILY SOLVE MOST MACHINE MISHAPS.

1. Clean it out: When was the last time you did a thorough top-to-bottom wipe-down of your machine? Dust and lint can quietly and quickly accumulate in the bobbin area and tension assembly, so have your machine professionally serviced regularly. If you use it daily, a weekly cleaning is needed. For weekly use only, clean it once a month. And for occasional monthly use, clean it every three months.

2. Rethread your machine: Yes, even the slightest bump can affect your stitching. Check your bobbin, needle, and thread to make sure everything is in the right place.

3. Check your needle and thread: As we already mentioned, using the right size and type of needle is imperative. Additionally, you should use high-quality thread -- it will have a nice, smooth filament and not be "fuzzy" or uneven in thickness. Thread does have a shelf-life -- although different types age differently -- so keep your collection of spools in rotation and stored properly (out of humidity and direct sunlight).



1. Sewing Defect:

- Different types of needle damage such as breakage of yarn in fabric, yarn fraying, hole formation in fabric etc.
- Skipped stitch that is improper successive binding of upper and lower thread.
- Thread breakage
- Seam pucker
- Wrong stitch density
- Uneven stitch
- Staggered stitch
- Improper formed stitch
- Oil spot or stain on garments

2. Seaming Defect:

- Wrong or improper seam line.
- Unsecured stitch due t lack of back stitches.
- Twisting.
- Wrong matching of checks and stripes.
- Not matching of seam.
- Trapping of undesirable materials in seam.
- Sewing without co-ordination of fabric face and back side.
- Using of wrong stitch type or seam type.
- Mismatching of sewing thread shade with fabric.





Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Describe sewing machine faults **(5 points)**
2. Briefly describe sewing defect? **(5 points)**
3. Describe Seaming defect? **(5 points)**

Note: Satisfactory rating – 3 and 4 points

Unsatisfactory - below 3 and 4 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____



Information sheet 4	Recording machine maintenance and completing other documentation
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2.4 Recording machine maintenance and completing other documentation

Define Maintenance record

A type of paper records a list of the necessary and vital maintenance that is required to be completed by a maintenance person, the status of the task and the closure of the task when it is completed.

A maintenance record is a helpful tool to assign tasks to a maintenance person and update other members of a team in relation to any type of maintenance that has been recorded and track the status of the record until it is completed.

What should be recorded?

- The details of repair work done on each machine (including cause/suspected cause, and who carried out the repair)
- The spare parts and materials used
- The date equipment has broken down, and the date it is repaired.
- The causes of any delay.

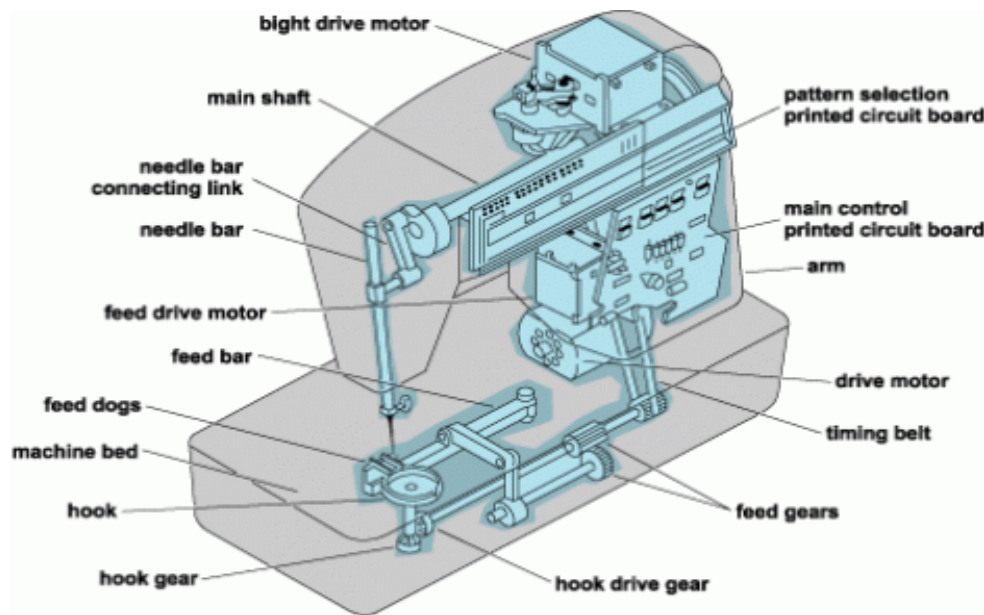
6 Advantages of keeping an equipment maintenance record

- *Prevent expensive repair works from happening*
- *Helps you create specialized maintenance programs*
- *Prevent problems regarding warranty claim*
- *It increases the safety of operators*
- *Helps you track who is accountable for a piece of equipment*
- *It increases the resale value of the equipment*



Introduce the maintenance checklist

		daily	weekly	monthly
1	Check to see if the machines are being kept clean!	✓		
2	Machines should be blown off every day to remove lint and trash	✓		
3	on lockstitch machines, the hook should be blown off regularly during the day to prevent lint or dirt from building up in the oil ports in the race of the hook	✓		
4	Check to see that the machines are being lubricated regularly	✓		
5	Oil levels should be checked daily and additional oil added if necessary	✓		
6	Randomly check the oil levels in the machines	✓		
7	A high quality white machine oil should be used that will not stain			✓
8	Check availability of proper machine oil in the workshop			✓
9	Check to make sure the oil is not contaminated			✓
10	Check to see that oil reservoir pump filters are cleaned regularly properly and has humidity dryers, filters and lubricator in the air lines.	✓		
11	Check for rusted areas due to excessive moisture in production area		✓	
12	Check Machines for wear on critical moving parts			✓
13	Check for shake in needle bar due to worn needle bar bushings		✓	
14	Check for excessive movement in stitch forming devices, etc.		✓	
15	Check condition of critical screws		✓	
16	Check for missing screws		✓	
17	Check for defective screws that are difficult to tighten properly	✓		
18	Check condition of mechanics tools to see their condition properly		✓	



How to teach Maintenance of sewing machines?

Acquire basic knowledge of simple single needle lock stitch machine

- 1 Introduce a sewing machine and start labeling the single parts of the machine (sticker)
- 2 Lists the main parts of simple Sewing machine (Horizontal arm, vertical arm needle bed)
- 3 Demonstrate parts of simple sewing machine.
- 4 Explain function of above mentioned parts

Understand the method of oiling

- 1 name the method to oiling,
- 2 Explain the methods of oiling (Direct oiling. reserve oiling and centrifugal pump)
- 3 Define lubrication and its necessity of machine

Know the elementary maintenance and equipment used during sewing

- 1 Define the skip stitches
- 2 Explain the formation of loops
- 3 Name equipment used during sewing (at least min 10)
- 4 Demonstrate uses for equipment during sewing

Understanding various types of stitches (functional) and decorative and needles used in simple sewing machine

- 1 Enlist the types of machine stitches
- 2 Explain all types of machine stitches (functional)
- 3 Explain all types of machine stitches (decorative)
- 4 State the classification of needles
- 5 Sketch of needle and define its parts
- 6 State the function of each needle
- 7 Explain about needle strokes

Know terms used in sewing



- 1 Name terms used in sewing (at least -10)
- 2 Define terms used in sewing (at least -10)

Understand causes thread breaking of needle and bobbin and its remedies

- 1 Explain causes of thread breaking of needle
- 2 Explain causes of thread breaking of bobbin
- 3 Detect the causes of needle thread break
- 4 Detect the causes bobbin thread break



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List the instruction of OHS Practices? 5 point
2. How do you give your Personal protective equipment? 5 point
3. How do you to use the machine safely? 5 point

Note: Satisfactory rating – 3 and 4 points

Unsatisfactory - below 3 and 4 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____



Basic apparel production

Level-I

Learning Guide-43

Unit of Competence: Perform Industrial Sewing Machine Minor
Service

Module Title: Performing Industrial Sewing Machine Minor
Servicing

LG Code: IND BAP1M13 LO43-LG-43

TTLM Code: IND BAP1 TTLM13 0919v1

LO3: Clean and lubricate machine

LO3. Clean and lubricate machine



Instruction Sheet

Learning Guide #43

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- OHS practices
- Cleaning machine
- Lubricating machine
- Observing procedures and measures

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to:**

- Cleaned Machine according to **OHS practices** and schedules, and manufacturer cleaning instructions
- lubricated Machine according to workplace requirements and schedules, and manufacturer lubricating instructions.
- Observed **OHS practices** procedures and measures throughout the application of this unit.

Learning Instructions:

13. Read the specific objectives of this Learning Guide.
14. Follow the instructions described below 3 to 6.
15. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
16. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” respectively.
17. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ”
18. Do the “LAP test” (if you are ready).



Information Sheet-1	OHS practices
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3.1 OHS practices

OHS Practices: You should apply safety and health regulations in the shop. Safety and health regulations in the shop, if properly observed and followed, will ensure added efficiency in the operation especially when orderliness in a small shop is maintained.

- 1) The “NO SMOKING” sign in the shop should be strictly enforced and the proper notice must be noticed.
- 2) Wear correct work clothes for comfort and protection.
- 3) Use non-flammable cleaning solutions such as a degreaser.
- 4) Use work table when servicing machines, do not work on the shop floor to avoid accident and loss of parts.
- 5) Close attention should be given when testing dangerous parts like needle to avoid finger piercing.
- 6) Avoid eating inside the workshop to prevent food contamination. Factory (work shop) would have canteen for eating.
- 7) Check the machine belt guard when operating the machine for breakage protection.
- 8) The throat plate should be unobstructed when testing to avoid needle damage.
- 9) Switch off the machine when not in use. To prevent accidental tripping on.
- 10) Place dismantled parts in order for easy access when assembling.
- 11) Clean the table after every servicing done on the machine parts.
- 12) Spare parts and machine records should be correctly stored.
- 13) The work shop should be separated from the clerical section for proper accounting of spare parts and tools.
- 14) Idle machine for serving should be kept orderly.
- 15) Wash your hands after every servicing job done.



3.1.1 Hazard identification and control

Hazard is any substance or agent that can cause potential health effect and it can be biological, chemical, physical substances.

- **Hazard identification** – is the process of finding, listing, and characterizing hazards.
- The work environment in the textile mills is dominantly harmful or dangerous due to noise, dust and heat. Floor are usually dirty, the pre spinning stage extremely dust and the finishing stage toxic with highly concentrated odors.
- During textile processing the worker are exposed to various hazards and risks.

Types of Hazards

A. physical Hazards: - Physical hazards can be any factors within the environment that can harm the body without necessarily touching it. for example heat, dust, noise, physical characteristics of material.

B. Chemical Hazards: - Are present when a worker is exposed to any chemical preparation in the workplace in any form (solid, liquid or gas). Some are safer than others, but to some workers who are more sensitive to chemicals, even common solutions can cause illness, skin irritation, or breathing problems. For example chemical used in fabric processing. E.g. sulphuric acid, caustic soda, and any other toxic chemicals

C. Ergonomics: - for example increased repetitious, seated for long period of time, poor arrangement of machine, lifting large load.

D. Psychosocial factor: - include boring, stress, low pay, lack of recognition, production pressure and repetitious task.

3.1.3.1 standard operating procedures

A standard operating procedure is a set of step-by-step instructions compiled by an organization to help workers carry out complex routine operations.






It is aimed to achieve efficiency, quality output and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations. Different templates may be used to develop SOP.



3.1.3.2 Personal protective equipment

Personal protecting equipment's are any materials that are used to cover body parts to protect the worker from different disease causing organisms, direct sun radiation and any other physical damages. This equipment's may be provided by purchasing from markets or by making from local materials.

The following are some of personal protecting materials

No	Materials	Description
1		Body safety cloth (tuta): - This cloth is a type of cloth which covers all the body part except the head and the fingers. It is used to protect the body from dirty.
2		Sun hat:- is the material, that is used to protect head from direct sun radiation
3		Eye protecting device: - it is used to protect the eye from different damages
4		Safety shoe:- it is used to protect foots from hazard chemicals damaging
5		Hand glove: - which is made of leather or strong flexible plastic rubber, it used to cover fingers to protect from sharpen materials, greases, and oils Mouse cape:- it is used to protect mouth from any dirty



3.1.3.3 Safe materials handling

Material handling can be defined as: art and science of conveying, elevating, positioning, transporting, packaging and storing of materials Starting from the time, the raw material (such as fibers for spinning unit or yarns for weaving/ knitting unit and fabrics for wet processing or garmenting units) enters the mill gate and goes out of the mill gate in the form of finished products; it is handled at all stages within mill boundaries such as within and between raw material stores, various section of production department, machine to machine and finished product stores.

Material handling involves the **movement of materials**, manually or mechanically in batches or one item at a time within the plant. The movement may be horizontal, vertical or the combination of these two. A material may be handled even 50 times or more before it changes to finished product.

Proper material handling offers benefits for:

- Improving productivity
- Increasing the handling capacity
- Reducing man-power
- Increasing the speed of material movement
- Reducing materials wastage
- Promoting easier and cleaner handling
- Eliminating idle time of machines, equipment and workers
- Reduce fatigue incurred by the workers
- Increasing safety and minimizing accidents
- Locate and stock material better and in less space
- Minimizing production cost, etc

3.1.3.4 Reporting accidents and incidents

Accidents and unexpected incidents at work are something you try to avoid. But they can happen. This all starts, with reporting. Employees should report all accidents and incidents to their employer by filling to the accident book. Employers should investigate all reports and notify their insurance company.

Accident reports can be used to:

- ❖ Gather information
- ❖ Identify problems
- ❖ Prevent it from happening again
- ❖ Provide training



- ❖ Improve management skills
- ❖ Comply with legal requirements and etc.

In any case, it's best to report and investigate accidents quickly. You can get more information while the incident is fresh in everyone's minds. And, the quicker you act to fix any problems found, the less risk of it happening again.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List the instruction of OHS Practices? 5 point
2. How do you give your Personal protective equipment? 5 point
3. How do you to use the machine safely? 5 point

Note: Satisfactory rating – 3 and 4 points

Unsatisfactory - below 3 and 4 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____



Information Sheet-2

Cleaning machine

3.2. Cleaning machine

Cleaning is the process of removing unwanted physical substances such as dirt, infections agents and other impurities from an object or any machine or environment.

Sewing machine, like any other machine, requires regular maintenance in order to operate properly. By following these simple steps after every 8 to 10 hours of machine use, you will help ensure your machine's longevity and will be able to better enjoy your sewing experience.

Benefits of cleaning machine and equipment

- Improve machine and equipment performance
- Increase the life span of the machine
- Increase machine reliability
- Reduce service downtime

Unplug your sewing machine and remove needle, thread spool and bobbin.

Remove lint from the exterior of your machine by gently wiping the machine casing and exposed parts with a soft, lint-free cloth. Remove stubborn dirt stains with a dampened cloth and mild soap.

Use a small lint brush and/or canned, compressed air to remove lint from thread guides and other tight areas.

Move the slide plate toward you as far as it will go and remove throat plate as per instructions found in your owner's manual. Some throat plates can be snapped out of position, others must be unscrewed.

Remove lint from area in and around bobbin case with canned air and/or lint brush.



Remove excess lint from in and around bobbin case by removing bobbin case as per owner's manual instructions and using tweezers to extract lint that has been packed under or around bobbin case.



**Self-Check -2****Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Short answer questions

1. Write the benefit of machine and equipment cleaning? (4 point)
2. Explain at least 3 types of machine cleaning equipment? (3 point)
3. What is cleaning? (2 point)

Note: Satisfactory rating – 4.5&above points

**Unsatisfactory -
below 4.5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Operation Sheet-1

Machine cleaning

Procedure of sewing machine cleaning OHS practice

Step 1- understand the standard sewing machine cleaning

Step 2- identify hazards and risks during cleaning

Step 3- wear personal protective equipment for cleaning

Step 4- store the cleaning equipment safely

Step 5- use proper cleaning material handling techniques



LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within -2-4 hour.

Task 1- apply OHS practice



List of Reference Materials

1. <https://www.osha.gov/shpguidelines/hazard-prevention.html>
2. http://www.worksafeforlife.ca/Portals/worksafeforlife/CareerColleges/WCBNS_https://w
3. www.westernsydney.edu.au/__data/assets/pdf_file/0020/12917/12917_Hazard_Identification,_Risk_Assessment_and_control_Procedure.pdf
4. <https://www.bing.com/search?q=personal+protective+equipment&form>
5. <https://www.gov.uk/rest-breaks-work>
6. <https://www.haspod.com/blog/management/reporting-accidents-incidents-at-work>
7. <https://www.haspod.com/blog/management/reporting-accidents-incidents-at-work>



Information Sheet-3

Lubricating machine

3.2 Lubricating machine

A lubricant is a substance that reduces friction between two surfaces in relative motion. Lubricant works by separating two surfaces that are in relative motion & reducing the friction between them.

This **prevents the stronger surface** from removing particles from the weaker surface.

The basic purposes of lubrication are to:

- Reduce friction
- Reduce wear
- Dampen shock
- Cool moving elements
- Prevent corrosion
- Seal out dirt

The Types of Lubrication

Lubrication can be divided into three types:

1. Oil
2. Grease
3. Solid lubrication

Lubricate machine according to workplace

➤ Machine type 1:- SNLS industrial Sewing machine Maintenance

○ *Specification*

- ☞ Application:- light to medium weight fabric
- ☞ Needle type:- DBx1 or DAx1 #9-18
- ☞ Lubricating oil:- white oil # 10 or azola 32

○ *Preparation*

- ☞ Lubrication
- ☞ Setting the bobbin in to the bobbin case
- ☞ Threading the machine head
- ☞ Adjusting stitch length
- ☞ Thread tension



- ☞ Use of hand lifter and knee lifter
 - *Maintenance*
- ☞ Needle-to-Hook relationship
- ☞ Hand lifter and knee lifter maintenance
- ☞ Presser bar regulating bolt adjustment
- ☞ Hook cleaning and changing
- ☞ Hand wheel adjustment
- ☞ Filter and Impeller cleaning and assembling
- ☞ Positioning finger mounting
- ☞ Height and angle of presser foot adjustment
- ☞ Pedal angle adjustment
- ☞ Feed dog height adjustment

➤ Machine type 2:-3/4/5 thread over lock sewing machine

No.	Machine type	No. of Needle	No. of loopier	No. of thread	Stitch diagram	Used mostly for
1	Over lock m/c (edge neatening)	1	2	3		For edge neatening of any fabric
2	Serged seam (4-thread o/l)	1	2	4		Four shoulder and side seam of knit wear
3	Safety stitch m/c (5-thread o/l)	2	3	5		For shoulder, side seam and inseam (in trouser) of garment made from, mostly, heavy duty fabric

- *Specification*
- ☞ Application:- light to medium weight fabric
- ☞ Needle type:- DCx1 #9-18
- ☞ Lubricating oil:- white oil # 10 or azola 32
- *Preparation of the machine:*
- ☞ Lubrication and drainage
- ☞ Checking the direction of rotation
- ☞ Attaching the needles
- ☞ Threading the machine
- ☞ Adjusting the pressure of presser foot and moving the presser foot
- ☞ Adjusting stitch length
- ☞ Differential feed mechanism
- *Maintenance*
- ☞ Knives and over edge width
- ☞ Cleaning the machine head



- ☞ Cleaning the filter

➤ Machine type 3:- Straight Button holing machine

- *Specification*

- ☞ Application: button holing for ordinary cloth, knit etc
- ☞ Button hole length:-1/4 -1 1/4"
- ☞ Bar tack width: 2.5-4.0 mm
- ☞ Needles: DPx5 #11-14 but you can use DBx1 #14-18
- ☞ Lubricating oil: oil #10 or azola 32

- *Preparation*

- ☞ Lubrication and drainage
- ☞ Inserting the needle
- ☞ Winding the bobbin
- ☞ Inserting/removing of bobbin case
- ☞ Threading the needle thread
- ☞ Reduction of sewing speed and emergency stop
- ☞ Manual feed handle
- ☞ How to hold the descending knife
- ☞ Thread tension
- ☞ Adjusting the button hole length
- ☞ Replacing the knife
- ☞ Changing the number of stitches
- ☞ Adjusting the presser bar pressure
- ☞ Attaching and removing the different belts

- *Maintenance*

- ☞ Adjusting the button hole width (i.e. stitch width and bar tack width) and button hole reference position
- ☞ Adjusting the machine if the stop motion mechanism fails to stop in the correct position
- ☞ Adjusting the bobbin thread winder if it fails to wind
- ☞ Cleaning the shuttle and trimmer area

**Self-Check -3****Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Define lubricant
2. Write the types of lubrication? (3 point)
3. Explain the basic purpose of lubrication? (5 point)
4. What is friction? (2 point)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Operation sheet 3

lubricating machine

PURPOSE: -after performing this operation the trainee's should be able to perform lubricate machine.

Conditions: -

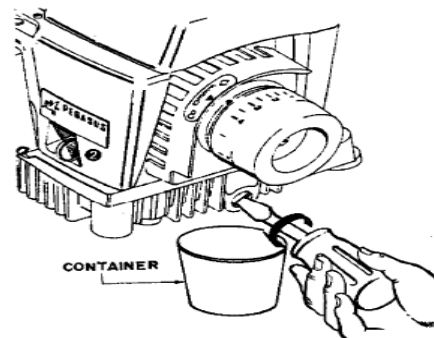
- **EQUIPMENT AND TOOLS:** - Screwdriver, fabric

MATERIALS

- Sewing machine
- Sewing machine oil

PROCEDURE:

1. Drain machine oil by placing an empty container below the oil port then loosen the screw using a screwdriver.

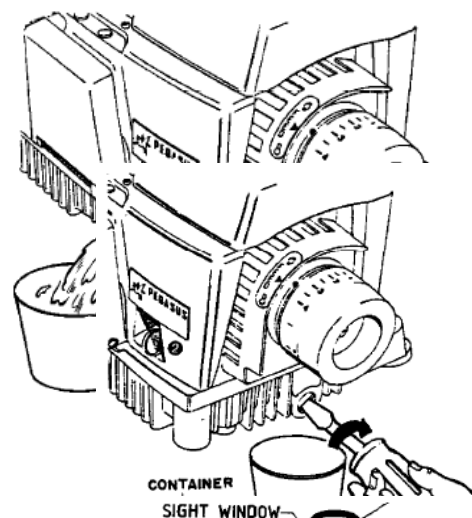


2. Remove the screw slowly to drain the

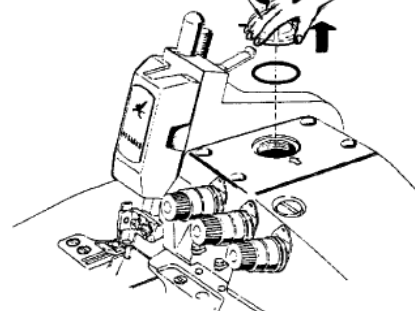
oil.

3. Replace the plug and tighten the screw

Note: Change oil entirely every 6 months



4. Loosen and take out oil sight window manually

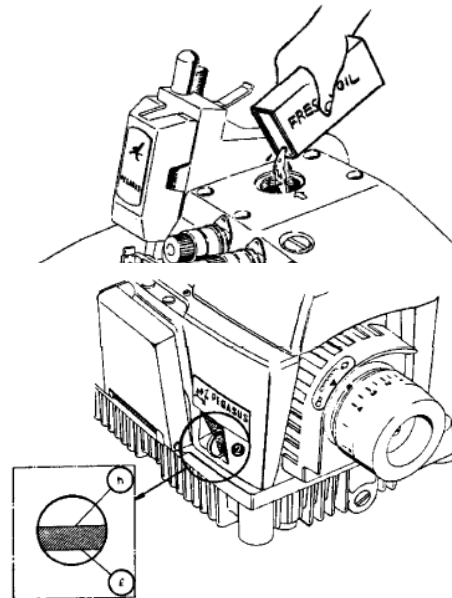
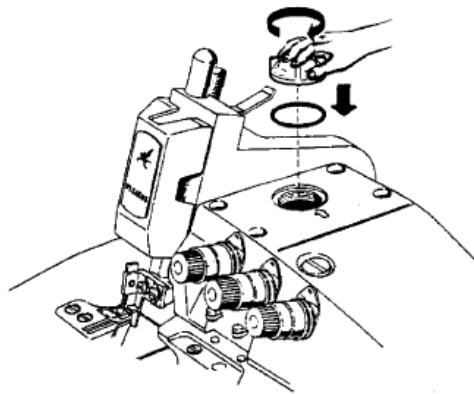




5. Pour fresh oil into the reservoir. Use oil specified by the manufacturer.

Note: Be sure that oil reaches the upper line “H” of the oil sight window

6. Replace oil sight window manually.



PRECAUTIONS: - During operation, keep oil level between the high and low gauge

QUALITY CRITERIA: - the trainee's should be able to perform accurate machine lubricate.



LAP Test	Practical Demonstration
----------	-------------------------

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within -2-4 hour.

Task 1- perform machine lubrication



Information Sheet-4

Observing procedures and measures

3.3 Observing procedures and measures

Step 1 removing fluff and dust

The first thing to do is to remove all dust and fluff wherever you can find it.

Between the needles the feed dogs is a favorite place for it to collect.

Step 2 checking the bobbin

In a vintage machine the bobbin id often accessed by sliding away a plate next to the needle plate

Step 3 lubrication

This is easy on a vintage machine. The bottom mechanism is accessed by tipping it on its side as in the previous step and the top mechanism can generally be accessed be by removing a couple of screws retaining the top cover

Step 4 checking the tension

It is important to check the bobbin tension as you will get poor results and possible broken or snagging thread if it is wrong. Fit a bobbin of thread to the bobbin case and thread it under the tension spring

Step 5 checking the bobbin winder

Try winding a bobbin. The thread tension should be sufficient to produce a neat and tight but not excessively tight pile.

Step 6 checking the electrics

Before touching any of the electrics double check the your machine isn't still plugged in.

Step 5 checking the timing

If you are getting unexplained Brocken threads it could be that the timing needs adjustment

**Self-Check -3****Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write the type of observing procedures and measures sewing machine? (5 point)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions