Instruction Sheet	Learning Guide #27

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

- Identification, selection and provision of tools, supplies and materials for maintenance onsite according to supervisor's instructions
- Regular operation all check so f machinery and equipment
- Identification and segregation of faulty or unsafe machine/equipment for repair/replacement according to enterprise requirements
- Identification of OHS hazards in the workplace

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 –

- Identify, select and provide tools, supplies and materials required to carry out minor maintenance on site
- Carry out regular operational checks of machinery and equipment and make adjustments according to manufacturer's specifications and/or enterprise procedures
- Identify and segregate faulty or unsafe machinery and equipment for repair or replacement according to enterprise requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the "Information Sheets 1". Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the "Self-check 1" in page 13.

5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Instruction#3.
7. Submit your accomplished Self-check. This will form part of your training portfolio.
8. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2” in page 19.
10. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 2).
11. Read the information written in the “Information Sheets 3&4”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
12. Accomplish the “Self-check 3” in page 43.
13. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
14. If you earned a satisfactory evaluation proceed to Operation Sheets 1 & 2. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Instruction #11.
15. Do the “LAP test” in page 49 & 52 (if you are ready). Request your teacher to evaluate your performance and outputs. Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your

teacher shall advice you on additional work. But if satisfactory you can proceed to Learning Guide #22.

Information Sheet-1	Selection of appropriate tools and equipment required to perform sewing machine maintenance

MAINTENANC OF EQUIPMENTS AND MACHINERY

What is maintenance?

The process of preventing a condition or situation or the state of being prevented, the technical meaning of maintenance involves functional checks, servicing, repairing of necessary devices, equipment, machinery, to the machinery or equipment perform its required functions

Different types of maintenance

- Productive maintenance
- Preventive maintenance
- Predictive maintenance
- Breakdown maintenance
- Corrective maintenance

Productive maintenance

The goal of the pm is program is markedly increase production while, at the same times increasing employee morale and job satisfaction

Preventive maintenance

It is daily maintenance (cleaning, inspection, oiling and re-tightening), design to keep the healthy conditions of equipment and prevent failures through the prevention of deterioration, periodic inspection or equipment condition diagnosis, to measure deterioration,

Just like human life is extended by preventive medicine, the equipment service life can be prolonged by doing preventive maintenance

Predictive maintenance

This is a method in which the service life of important part is predicted based on inspection, in order to use the parts to the limit of their service life. Compared to periodic maintenance, predictive maintenance is condition based maintenance. It

manages trend values, by measuring and analyzing data about deterioration and employs a surveillance system, designed to monitor conditions through an on- line system.

Corrective maintenance

It improves equipment and its components so that preventive maintenances can carried out reliability. Equipment with design weakness must be redesigned to improve reliability or improving maintainability.

Breakdown maintenance

It means that people waits until equipment fails and repair it. Such a thing could be used when the equipment failures does not significantly affect the operation or production or generate any significant loss other than repair cost.

The maintenance function is performed mainly in two ways

1. By prevention of break down successful preventive maintenance can be achieved through two ways routine servicing and scheduled works and periodic scheduled repair
2. By the repair of break down

Maintenance of Hand tool

1.1.1 Screw drivers

Screw driver is a tool, manual or powered, for screwing (installing) and
Un screwed (removing) screws. A typical simple screwdriver has a handle and shaft, ending in tip the user puts Into the screw head before turning the handle handles are typically wood, metal, or plastic and usually hexagonal, square, or oval in cross-section to improve grip and prevent the tool from rolling when set down**.**

A typical screwdriver comprises: an approximately cylindrical handle of a size and shape to be held by a human hand; an axial shaft embedded in, and protruding from, the handle; and a tip found at the end of the shaft, opposite the handle. The handle and shaft allow the screwdriver to be positioned and supported and, by rotating the handle, torque is applied to the tip via the screwdriver's shaft.

1.1.2 Cleaning Brush

A cleaning brush is a tool with bristles wire or other filaments, used for cleaning surface finishing and for many other purposes. It is one of the most basic and versatile tools known to mankind It generally consists of a handle or block to which filaments are affixed either parallel- or perpendicular wise, depending on the way the brush is to be gripped during use. The material of both the block and bristles or filaments is chosen to withstand hazards of its application, such as corrosive chemicals, heat or abrasion.

Many sewing machine problems are often the result of thread and lint build-up in the area between the face plate and the bobbin. A flat artist's paintbrush in 1/2-inch size is useful, and a soft blush or makeup brush with a short, stubby handle is also effective. The long, soft bristles of the makeup brush clean without damage and hold lint well.

How to clean the machine

1. Take a machine apart

   First up plug the machine. Take out the bobbin casing, lower the race cover and remove the hook. Take of the presser foot and throat plate.

2. Grab a brush

   Brush out any lint that built up in the bobbin casing and throat plate .most machines come with a small plastic brush, through any anti static brush or pipe cleaner will work

3. Oil the machine

   A little oil goes a long way and yes, it is totally possible to over oil your machine. If that is happened, run some muslin pr scrap fabric through the machine unit it comes out clean and without oil stains

4. Reassemble the machine

Place the hook, bobbin casing and throat plate back in the their respective places. Change your needle and reattach the presser foot. Replace the bobbin, thread your machine

1.1. 3 Blower

An air blower is a machine used for generating flow of air at substantial pressure and also defined as, a blower is a device designed to blow cool or hot air over wet or damp surface, in order to accelerate the evaporation of water particles and dry the surface.

Air blow can be categorized in the following types on the basis of principle of air flow generation

1. *Centrifugal blower –air enters axially and leaves the blade radial direction*
2. *Axial fans – air enters axially and also leaves the fan blades in axial direction*

1.1.4 Tweezers

Tweezers are small tools used for picking up objects too small to be easily handled with the human hands. They are probably derived from tongs pincers or scissor like pliers used to grab or hold objects. In a scientific or medical context they are normally referred to as forceps.

Tweezers makes use of two third class levers connected at one fixed end with the pincers at the others

1.1.5 Oiling can

A can that stores oil to be used in a sewing machine for various purposes. Oilcan is used to lubricate various leather goods tools, equipments and machines with suitable machine oils.

1.1.6 Cleaning cloth

Different types of cloth are available for cleaning parts of a sewing machine. Anything, which is dry, is used for cleaning sewing machine and its parts.

1.1.7 .Pliers:

Three types of pliers' viz. nose pliers, diagonal cutting pliers and lineman's pliers are very useful in a leather products manufacturing workshop for cutting and bending, pulling small fittings and holding metal fittings that are to be filed or hammered. Nose pliers are used for cutting and bending thin wires and small fittings. Diagonal cutting pliers are sometimes called as wire cutters. It has scooped jaws, which make them ideal for extracting small nails, or damaged fittings. Lineman's pliers are sometimes called engineer's pliers. They are very useful for bending, gripping and manipulating sheet, metal and wire. Their wide, heavy, checked jaws and long handles provide leverage and nonslip hold necessary to turn thzwe head of a bolt, the nut or stubborn screw whose slot is too chewed up to be removed with a screwdriver. These pliers are used in fabricating leather goods, repair works and maintenance of machinery.

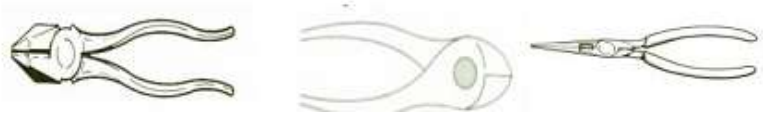


Fig: Linesman's pliers Diagonal cutting pliers Nose pliers

5. Pincer:

Pincer pulls out nails that a claw hammer cannot (for example a wire nail without head). It is used for short pulls. The fine claw at the end of pincer handles slips well into the well-driven nails or rivets.

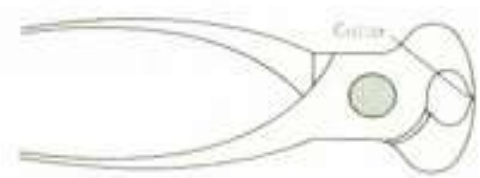


Fig: Pincer

1.1.8. Bench grinder

Bench grinder has two grinding wheels. One is coarse and the other is fine. The grinding wheels are provided with guards and tool rest. The tool rest must be 3mm away from the wheel at the required angle. This prevents the tool from being dragged into the wheel. A bowl of cold water is kept by the side of the machine so that cooling of the work can be done periodically. Bench grinder is used to sharpen clicking and skiving knives. While sharpening the knife, the following steps are to be followed:

i. Adjust the angle of the knife to be ground,
ii. Use the hand to hold the knife steady while moving it across the grinding wheel from side to side and
iii. Keep the surface being ground as cool as possible by dipping the knife in water bath. When the bevel has been removed, the knife is reading for whetting.

Fig: Bench grinder

Needle Theaters and Small Flashlights

In order to repair a sewing machine, you will need to thread the needle and check the stitching. Save time by keeping a few needle traders on hand, along with some miniature flashlights. The electric sewing machines often have to be unplugged to work on internal parts for safety, so the lighting provided by the machine is not available. Have easy lighting available, even if it is a key chain flashlight.

Other Useful Tools

Long-handled tweezers are handy for working on a sewing machine, and the ones with the angled pinchers are best. A flat magnet is good for holding or retrieving tiny pieces and parts when working on the sewing machine. Scissors are helpful for the sewing machines that do not have a built-in thread cutter (or if you don't know where it is). The instruction book for the model you are working on is an essential tool, and some of these are available online.

Personal Protective Equipment (PPE)

- PPE is defined in the Personal Protective Equipment at Work Regulations as: 'All equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work which protects them against one or more risks to their health and safety'.
- PPE includes equipment such as safety footwear, hard hats, high visibility waistcoats, goggles, life jackets, respirators and safety harnesses.
- Waterproof, weatherproof, or insulated clothing is subject to the Regulations only if its use is necessary to protect employees against adverse climatic conditions that could otherwise affect their health and safety.

Grease gun

A **grease gun** is a common workshop and garage tool used for lubrication. The purpose of the grease gun is to apply lubricant through an aperture to a specific point, usually on a grease fitting. The channels behind the grease nipple lead to where the lubrication is needed. The aperture may be of a type that fits closely with a

receiving aperture on any number of mechanical devices. The close fitting of the apertures ensures that lubricant is applied only where needed.

There are three types of grease gun:

1. **Hand-powered**, where the grease is forced from the aperture by back-pressure built up by hand cranking the trigger mechanism of the gun, which applies pressure to a spring mechanism behind the lubricant, thus forcing grease through the aperture.

2. Hand-powered, where there is no trigger mechanism, and the grease is forced through the aperture by the back-pressure built up by pushing on the butt of the grease gun, which slides a piston through the body of the tool, pumping grease out of the aperture.
3. Air-powered (pneumatic), where compressed air is directed to the gun by hoses, the air pressure serving to force the grease through the aperture. Russell Gray, inventor of the air-powered grease gun, founded Graco based on this invention.

The grease gun is charged or loaded with any of the various types of lubricants, but usually a thicker heavier type of grease is used.

Self-Check 1	Written Test

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

1 What is the use grease gun? (3 point)

2 List down the tools required to perform maintenance. (5 points)

3 What are tweezers? (3 points)

4 What is the use of oilcan? (2 points)

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15points**
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

_____

_____

_____

2. _____

_____

_____

_____

3. _____

_____

_____

4. _____

_____

_____

Information Sheet 2	**Ensuring work area to be safe for working and complying with safety measures**

1. What is work area inspection?

Workplace inspections are a thorough and critical examination of the workplace for the purpose of identifying & recording hazards and implementing proper safety methods.

2. The involved person in workplace Inspection

Workplace inspections should involve a representative from the Health & Safety Unit.

3. Plan your inspections

Planning is essential for an effective inspection. The planning should be in such a way that the inspections should examine who, what, where, when and how. Particular attention should be made to items most likely to develop unsafe or unhealthy work conditions.

4. Determine the elements of the workplace you are going to inspect

Look at all workplace elements - the environment, equipment and the process.

The environment includes such hazards as noise, vibration, lighting, temperature, and ventilation. Equipment includes materials, tools and apparatus for producing a product or a service operation.

Methods for Identifying Hazards

The first step in control of a hazard is to identify and list them. There are many methods which are useful for identifying hazards, including

• Injury and illness records - investigating workplace incidents and near hits' reports in some cases there may be more than one hazard contributing to an incident

• Checking of new work practices or equipment introduced into the workplace in line with legislative requirements

• Doing safety audits in the workplace to evaluate the organizations health and safety system

• Considering the conclusion of OHS when analyzing work processes

• Getting feedback from employees can often provide valuable information about hazards, because they have hands-on experience in their work are.

• To predict the types of injuries or illnesses from work

• Identify the way of dealing the work in the workplace

• The introduction of new work processes

• Identify the skill and experience level of employees

• Personal characteristics of employees exposed to the risk (colour blindness or hearing impairment)

• Existing control measures in place such as the use of clothing and personal protective equipment.

Classes of Hazard and the Materials that Causes Hazards

Hazards are classified into five different types. They are

• **Physical** - includes floors, stairs, work platforms, steps, ladders, fire, falling objects, slippery surfaces, manual handling (lifting, pushing, pulling), excessively loud and prolonged noise, vibration, heat and cold, radiation, poor lighting, ventilation, air quality.

• **Mechanical and/or electrical** - includes electricity, machinery, equipment, pressure vessels, dangerous goods, forklifts, cranes, hoists.

• **Chemical**- includes chemical substances such as acids or poisons and those that could lead to fire or explosion, cleaning agents, dusts and fumes from various processes such as welding.

• **Biological** - includes bacteria, viruses, mould, mildew, insects, vermin, and animals.

• **Psychosocial environment** - includes workplace stressors arising from a variety of sources.

Note that some physical and chemical hazards can lead to fire, explosion and other safety hazards.

Self-Check 2	Written Test

Instructions*:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

Test: Short Answer Questions

1. Define work area instruction (1 point)
2. List down the different classes of hazards. (5 points)
3. List down Methods of Identifying Hazards(5points)
4. Explain work place elements (3points)
5. Planning is essential for an effective inspection T/F (1point)

Note: **Satisfactory rating - 8 points** **Unsatisfactory - below 8 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

   _____

2. _____

   _____

3. _____

   _____

4. _____

   _____

5. _____

   _____

Information Sheet3	Identification and report of OHS hazards in the workplace to the supervisor

1. How to prevent hazards?

To prevent hazards, we need safe practices. Ensuring workplace housekeeping is maintained and flooring is in good condition helps to maintain a safe working environment.

Practices to Prevent Hazards

• Don't leave items on the floor that cause disturbance in the workplace.

• Clean up spills and wet areas immediately.

• Mop or sweep floors regularly.

• Strengthen mats, rugs or carpets to the floor so they don't cause a trip hazard.

• Don't leave cabinets, drawers or cupboards open.

• Ensure all safety equipment is in proper working condition.

• Replace batteries in smoke and carbon monoxide detectors regularly.

• Keep staircases well-lit and free from clutter.

• Use only step-ladders, stools and ladders for reaching high places (do not stand on chairs, boxes or crates.)

• Clean air vents and filters on a regular basis.

• Ensure all exits are free from obstructions.

• Always "lock-out" machinery before and during cleaning procedures.

2. **Methods of control**

A. Elimination

Elimination of a specific hazard or hazardous work process, or preventing it from entering the workplace, is the most effective method of control.

B. Substitution

If a particularly dangerous chemical or work process cannot be completely eliminated, then try to replace it with a safer **substitute**.

It is not easy to find “safer” chemical substitutes (in fact, no chemical should be considered completely safe). It is important to review every year or so current reports on the chemicals used in your workplace because chemicals considered being “safer” substitutes today may not be considered safer in the future. When you look for safer substitutes, try to choose a less **volatile** (volatile liquids vaporize, or evaporate easily) instead of a highly volatile one, choose a solid instead of a liquid, etc.

C. Engineering Controls

There are a number of common control measures which are called “engineering controls”. These include enclosure, isolation and ventilation.

1. Enclosure

If a hazardous substance or work process cannot be eliminated or substituted, then enclosing it so workers are not exposed to the hazard is the next method of control. Many accidents can be controlled by partially or enclosing the work process.

I. **Enclosure guards:** prevent you from coming into contact with the dangerous moving parts of a machine by enclosing them. This type of guard also prevents broken and flying machine parts from hitting you.

II. **Interlocking guards:** prevent you from operating the machine if the guard is not in place, or automatically stop the machine if part of your body enters a dangerous area..

III. **Automatic guards:** actually pull or push your hands, arms, or body away from the danger zone as the work is being done.

IV. **Remote control, feeding, placement or ejecting guards:** the works are done by controlling from the remote. These control methods protect you from dangerous points of operation.

2. Isolation

Isolation can be an effective method of control if a **hazardous job** can be moved to a part of the workplace where fewer people will be exposed, or if a job can be changed to

a shift when fewer people are exposed (such as a weekend or midnight shift). It is also important to limit the length of **time** and the **amount** of a substance(s) to which workers are exposed if they must work in the hazardous area.

Remember: Isolating the work process or the worker does not eliminate the hazard, which means workers can still be exposed.

3. Ventilation

Ventilation, which is generally used for keeping the workplace comfortable, is one of the least effective methods of controlling hazards but one of the most commonly used. The purpose of any general ventilation system is to remove contaminated air and replace it with “fresh” air.

Ventilation in the workplace can be used for two reasons:

(1) To prevent the work environment from being too hot, cold, dry or humid;

(2) To prevent contaminants in the air from getting into the area where workers breathe.

D. Administrative Controls

Administrative controls limiting the amount of time workers spend at a hazardous job can be **used together with other methods of control** to reduce exposure to hazards. Some examples of administrative controls include:

• Changing work schedules (for example, two people may be able to work for four hours each at a job instead of one person working for eight hours at that job);

• Giving workers longer rest periods or shorter work shifts to reduce exposure time;

• Moving a hazardous work process to an area where fewer people will be exposed;

• Changing a work process to a shift when fewer people are working.

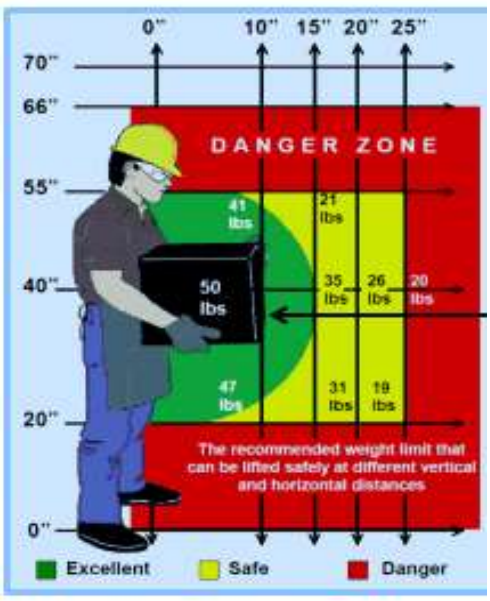
What is occupational health and safety?

Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs.

1.3.1Safe lifting, carrying and manual handling

Safe lifting techniques should be stressed by all workplaces, but are commonly overlooked. Most people just want to finish the job quickly, even if that means moving heavy objects in safe ways. In doing so, workers can become injured and have to miss work for extended periods of time.

Proper Lifting Techniques



Lifting Do's and Don'ts

DO…

- Know or test the object weight.
- Use ergonomic lift assists when possible.
- Plan the lift and clear your path.
- Get help for heavy or awkward loads.
- Keep the object in the power zone.
- Use a wide stance for balance.
- see your legs to lift.
- Pivot your feet to avoid twisting.

DON'T…

- don't hold your breath.
- don't bend or twist at the waist.
- don't use a partial grip (1-2 fingers).
- don't obstruct your vision when carrying.
- don't jerk or lift quickly.
- don't pinch you fingers or toes.
- don't pull a load if you can push it.

 don’t forget to wear proper PPE.

Safe Lifting and Carrying Techniques

Proper methods of lifting and handling protect against injury. Proper lifting makes work easier. You need to “think” about what you are going to do before bending to pick up an object. Overtime, safe lifting technique should become a habit.

Following are the basic steps of safe lifting and handling:

1. Size up the load and check overall conditions. Don’t attempt the lift by yourself if the load appears to be too heavy or awkward. Check that there is enough space for movement, and that they footing is good. “Good housekeeping” ensures that you won’t trip or stumble over an obstacle.
2. Make certain that your balance is good. Feet should be shoulder width apart, with one foot beside the other and the other foot behind the object that is to be lifted.
3. Bend (the knees; don’t stoop). Keep the back straight, but not vertical. (There is a difference. Tucking in the chin straightens the back).
4. Grip the load with the palms of your hands and your fingers. The palm grip is much more secure. Tuck in the chin again to make certain your back is straight before starting to lift.
5. Use your body weight to start the load moving, and then lift by pushing up with the legs. This makes full use of the strongest set of muscles.
6. Keep the arms and elbows close to the body while lifting.
7. Carry the load close to the body. Don’t twist your body while carrying the load. To change direction, shift your foot position and turn your whole body.
8. Watch where you are going!
9. To lower the object, bend the knees. Don’t stop. To deposit the load on a bench or shelf, place it on the edge and push it into position. Make sure your hands and feet are clear when placing the load.

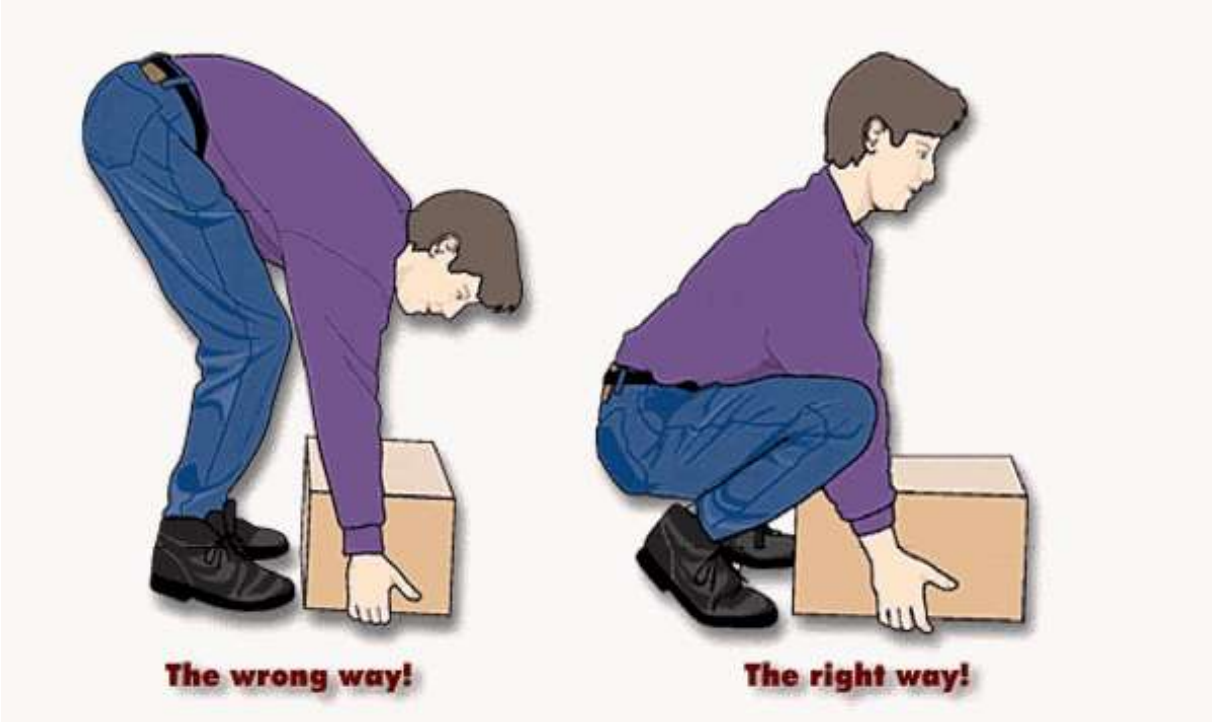
Make it a habit to follow the above steps when lifting anything-even a relatively light object.

Team lifting must be coordinated

1. If the weight, shape, or size of an object makes the job too much for one person, ask for help.
2. Ideally, workers should be of approximately the same size for team lifting.
3. one individual needs to be responsible for control of the action to ensure proper coordination. If one worker lifts too soon, shifts the load, or lowers it improperly, either they or the person working with them may be injured.
4. Walk out of step

Lifting heavy objects

1. Safe lifting of heavy items requires training and practice. For example, we've probably all seen a small person move heavy feed sacks with apparent ease.
2. The secret lies in taking the proper stance and grip
3. •When equipment is available, it should be used to lift and carry heavy objects.
4. Loaders, forklifts, hoists, etc. are made for this purpose.



Do	Don't
Tuck in the chin to keep the back as straight as possible while lifting.	Use your back muscles to do lifting.
Lift with the strong leg muscles.	Try to lift an item that is too heavy or awkward.
Ask for help with the heavy, awkward items.	Twist your body while carrying an object.
When possible, use mechanical equipment to move heavy items.	Attempt team lifting without proper coordination.

Safe Manual Lifting and Carrying Overview

Steps	Techniques
Planning 	• Size up the load and check overall conditions • Check route for clearances and obstacles • Use a handcart or dollie, etc. when possible • Break down large and heavy loads • Know your limits • Seek help if necessary • Take extra care with awkward tasks
Lifting 	Remember to use the "5" L's of Back Safety • Load • Lungs • Lever • Legs • Lordosis – keep your back straight
Carrying 	• Hold the load close to your body • Look where you are walking • Take extra care carrying up and down stairs • Don't twist your body, move your feet to turn
Lowering 	• Bend your knees to lower the load • Don't trap your fingers and toes • Pull it down first, then slide it into place • Don't over-reach or stretch

1.3.2 Appropriate use, maintenance and storage of personal protective equipment

Personal protective equipment should only be used for its intended purpose and not for any task that has not been approved by the manufacturer. If there is any doubt about the suitability of the PPE for a task, the Work Environment Group, should be consulted.

PPE means precisely what it says; it is personal protective equipment or clothing that is intended for an individual's use. Wherever practicable, PPE should be issued on a personal basis, and adequately marked so that each user can readily identify their own equipment. In most cases, the individual can then be the one primarily responsible for the day-to-day use, handling, storage, care and maintenance of their equipment.

Storage of PPE

Personal protective equipment should be stored in its original packaging prior to use. Apart from keeping the items clean, this may extend the life of the item. For example, plastic wrapping around some respirator cartridges can prevent cartridge from being activated prematurely. This will also ensure an economical, in-service life span of the item. Atmospheric contaminants such as dust or organic vapors may considerably reduce the life span of some items. When not in use, PPE should be stored in accordance with the manufacturer's recommendations. Generally this means that the PPE should be:

- cleaned;
- checked for faults;
- Otherwise maintained;
- placed in an appropriate, clean container; and
- Stored in a convenient, uncontaminated environment.

PPE should never be left in the work area where it is worn, as it may be exposed to workplace contaminants such as dust, chemicals and insects. This can severely reduce the effectiveness and lifetime of the equipment.

Maintenance of PPE

PPE needs to be maintained and cared for according to the manufacturer’s instructions. This includes cleaning and storage of PPE, and replacement of components when

recommended (e.g. cartridges in respirators). If usage is high, consideration should be given to keeping a supply of replacement parts, or replacement units of PPE, to minimize delays in obtaining components.

The budget unit should ensure appropriate maintenance of PPE is being conducted. Where maintenance is required, a responsible person should be designated to coordinate a maintenance program, provide advice and training, and keep records of all maintenance that is conducted Care should be taken to avoid actions that may, albeit unintentionally, alter the effectiveness of the PPE. For example, the use of incompatible cleaning agents can reduce the effectiveness of some PPE

Specify the right PPE

Personal protective equipment (PPE) needs to be provided for eyes, hands, body and feet as highlighted from your risk assessment. Users are far more likely to use the PPE properly if they help to select it. Once provided, its use needs to be properly supervised if injuries are to be prevented. Never allow exemptions for those jobs which take “just a few minutes”. All PPE comes in a variety of sizes and the range of sizes needed by the workforce should be provided at the outset (with spares available as replacements). Care should be taken in selecting the right size for each individual, particularly with gloves where people are less likely to be familiar with the size ranges available.

The risks of working in confined space

Every year, a number of people are killed and others seriously injured working in confined spaces across a wide range of industries in the UK, from those involving complex plant to simple storage vessels. Those killed include not only people working in confined spaces but those who try to rescue them without proper training and equipment.

Dangers can arise in confined spaces because of:

- lack of oxygen
- poisonous gas, fume or vapor
- liquids and solids suddenly filling the confined space, or releasing gases into it when disturbed
- fire and explosions
- residues left behind which can give off gas, fume or vapor
- dust
- Hot working conditions.

Reducing risks from working in confined space

The Confined Spaces Regulations 1997 contain the following key duties:

1. Avoid entry to confined spaces

Ask yourself if the work is really necessary, or if it can be done in some other way that avoids the need to enter the confined space?

2. If entry to a confined space is unavoidable, follow a safe system of work

The results of your risk assessment should help to identify the necessary precautions to reduce the risk of injury, depending on the type of confined space, the associated risk and the work involved. The safe system of work should be implemented and everyone involved should be trained and instructed.

3. Put in place adequate emergency arrangements before the work starts

The preparation of suitable and sufficient measures to be taken to ensure the safe rescue of a person in an emergency are required before a person enters a confined

space. These arrangements should also consider the safety of rescuers, procedures and liaison with emergency services.

1.3.3 Protection of people in the workplace

The health of workers is essential prerequisites for household income, productivity, and economic development. Therefore, restoring and maintaining working capacity is an important function of the health services.

Health risks at the work places, such as heat, noise, dust, hazardous chemicals, unsafe machines, and psychological stress, cause occupation and the position in the workplace hierarchy also after health. People working under stress or with precarious employment conditions are likely to smoke more, exercise less and have an unhealthy diet.

In addition to general health care, all workers and particularly those in high risk occupations need health services to assess and reduce exposure to occupational risks, as well as medical surveillance for early detection of occupational and work related disease and injuries.

1.3.4 Proper use of tools and equipment for maintenance of machinery and equipment

Hand tools such as screwdriver wrench, hammers, pliers, levels and wire cutters are examples of common household tools that are often left out in places such as

basement, garages and tool sheds. Tools are tough, but they are not indestructible and exposure to the elements can take its toll.

Make it a habit to clean tool after each use before return them to storage, and be sure they are free of dust, graces, and debris before put them in to their proper places. This is also opportunity to look handles for splinters, breaks and cracks. Also make sure that metal parts show no sign of corrosions or rest. Replace any tools that show.

Proper use of tools

Using tools properly helps prevent accident and damage to equipment and people. For every job there is the right tool. Make sure that you are familiar with the correct use of each tool and that tool is used for the current task. Skilled use of tools make the job less difficult and prevent the machine from damage

1.3.5 Workplace environment and handling of material safely

Work place environment is the location where a task is completed when pertaining to a place of employment, the work environment involves the physical geographical location as well as the immediate surroundings of the work place such as manufacturing site construction or office building. Typically involves other factors relating to the place of employment, such as the quality of the air, noise level, and additional parks.

Occupational hazards danger to health, limb, or life that is inherent in, or is associated with a particular occupations, industry, or work environment. Occupational hazards include risk of accident and of contracting occupational diseases

Handling of material safely

The efficient handling and storing of materials are vital to industry. In addition to raw materials, these operations provide a continuous flow of parts and assembles through the workplace accident involving the moving, handling and storing of materials often result in costly injuries.

Applying general safety principles such as proper work practice, equipment controls can help reduce work place accident involving the moving, handling, and storing of materials. Whether the moving of materials manually or mechanically the employment should know and understand the potential hazards associated with the task at hand and how to control their work places to minimize the danger.

1.3.6 Follow OHS procedures designated for the task

Hazard: a situation at the workplace capable of causing harm (ie capable of causing personal injury, occupationally related disease or death). A hazard is a source or potential source of human injury, ill health or disease. Anything which might cause injury or ill health to anyone at or near a workplace is a hazard. While some hazards are fairly obvious and easy to identify, others are not - for example exposure to noise, chemicals or radiation.

Risk: the chance of a hazard actually causing injury or disease. It is measured in terms of consequences and likelihood.

Risk Management he overall process of risk identification, risk analysis, control of risks and risk evaluation.

Risk Control: that part of risk management which involves the implementation of policies, standards, procedures and physical changes to eliminate or minimize adverse risks.

Identify and reporting hazards

Hazard identification

The first step in reducing the likelihood of an accident is hazard identification. Hazard identification is identifying all situations or events that could cause injury or illness. Eliminating or minimizing workplace hazards needs a systematic approach. It is essential to try and anticipate all possible hazards at the workplace - known as the 'what if?' approach.

Classes of hazard

Hazards are classified into five different types. They are:

- physical - includes floors, stairs, work platforms, steps, ladders, fire, falling objects, slippery surfaces, manual handling (lifting, pushing, pulling), excessively loud and prolonged noise, vibration, heat and cold, radiation, poor lighting, ventilation, air quality
- Mechanical and/or electrical - includes electricity, machinery, equipment, pressure vessels, dangerous goods, forklifts, cranes, hoists
- chemical - includes chemical substances such as acids or poisons and those that could lead to fire or explosion, cleaning agents, dusts and fumes from various processes such as welding
- Biological - includes bacteria, viruses, mould, mildew, insects, vermin, animals
- Psychosocial environment - includes workplace stressors arising from a variety of sources.

Note that some physical and chemical hazards can lead to fire, explosion and other safety hazards.

Methods for identifying hazards

The first step in control of a hazard is to identify and list them. There are many methods which are useful for identifying hazards, including

- Injury and illness records - review your workers' compensation data and check the incidence, mechanism and agency of injury, and the cost to the organization. These statistics can be analyzed to alert the organization to the presence of hazards
- staying informed on trends and developments in workplace health and safety, for example via the internet or OHS publications
- reviewing the potential impact of new work practices or equipment introduced into the workplace in line with legislative requirements
- doing walk-through surveys, inspections or safety audits in the workplace to evaluate the organization's health and safety system
- considering OHS implications when analyzing work processes
- investigating workplace incidents and 'near hits' reports - in some cases there may be more than one hazard contributing to an incident
- getting feedback from employees can often provide valuable information about hazards, because they have hands-on experience in their work area
- consulting with employees, health and safety representatives and OHS Committee members
- Benchmarking against or liaising with similar workplaces.

Hazard Reporting

All identified hazards that have not caused personal injury must be reported to the ASM / Town-based Line Manager using the WHS Hazard Report Form. If a hazard results in an injury or incident, the RHB Incident Reporting Form must be completed, as appropriate. See Incident Reporting for further information.

The risks of manual handling

More than a third of all reportable injuries of over three days involve manual handling, and around 10% of major injuries are linked to manual handling. It has a major impact on all workplaces, and costs the economy hundreds of millions of pounds every year.

In the UK, 1.1m people reported that they suffered from musculoskeletal disorders (MSDs) caused, or made worse, by work. It is estimated 12.3m working days are lost annually due to work-related MSDs.

Anyone involved in the moving and handling of goods and people could be at risk. Injuries and suffering can be linked to any work involving handling of loads. There are risks in handling even light loads if a repetitive task is being carried out in poor conditions. Poor ergonomics and workplace layout are a factor in many hazardous manual handling tasks.

Risks can be found in all work sectors, but healthcare, agriculture and construction are recognized as high-risk industries due to the number and nature of the manual handling activities.

Legal duties and obligations around manual handling

The Manual Handling Operations Regulations

These Regulations state that employers should adopt a hierarchy of control measures:

1) to avoid hazardous Manual Handling Operations so far as is reasonably practicable
2) to assess any hazardous Manual Handling Operation that cannot be avoided
3) to reduce the risk of injury so far as is reasonably practicable.

Assessing manual handling risks

One way to assess manual handling activities is to look at four specific areas – Task, Individual, Load and Environment (easily remembered by the acronym TILE).As with any assessment, the workforce should be involved in the process, and use should be made of any relevant guidance available for particular industries.

Key factors to consider in each element are:

1. The Task

Does the activity involve twisting, stooping, bending, excessive travel, pushing, pulling or precise positioning of the load, sudden movement, inadequate rest or recovery periods, team handling or seated work?

2. The Individual

Does the individual require unusual strength or height for the activity, are they pregnant, disabled or suffering from a health problem. Is specialist knowledge or training required?

3. The Load

Is the load heavy, unwieldy, difficult to grasp, sharp, hot, cold, difficult to grip, are the contents likely to move or shift?

4. The Environment

Are there space constraints, uneven, slippery or unstable floors, variations in floor levels, extremely hot, cold or humid conditions, poor lighting, poor ventilation, gusty winds, clothing or Personal Protective Equipment that restricts movement?

Controlling risk from manual handling

As with any other risk, if you can eliminate or avoid the risks from manual handling, this is by far the best option. You should try to remove as many of the constraints as possible to reduce the risks to as low a level as reasonably practicable.

An ergonomic approach is recommended – look at how the task can be fitted to the individual. Consider whether mechanical handling aids could be used, this could range from a simple trolley or sack truck to more sophisticated aids such as conveyors or fork lift trucks. If you cannot eliminate or mechanize the manual handling tasks, you must carry out a risk assessment where the task could present a risk of injury. You need to look at ways to reduce the risks to as low a level as reasonably practicable.

Basic principle of manual handling

There are some basic principles that everyone should observe prior to carrying out a manual handling operation:

- ensure that the object is light enough to lift, is stable and unlikely to shift or move
- heavy or awkward loads should be moved using a handling aid
- make sure the route is clear of obstructions
- make sure there is somewhere to put the load down wherever it is to be moved to
- stand as close to the load as possible, and spread your feet to shoulder width
- bend your knees and try and keep the back's natural, upright posture
- grasp the load firmly as close to the body as you can
- use the legs to lift the load in a smooth motion as this offers more leverage reducing the strain on your back
- carry the load close to the body with the elbows tucked into the body
- avoid twisting the body as much as possible by turning your feet to position yourself with the load. Attempt team lifting without proper coordination.

1.4 Maintaining and using suitable personal protective equipment

Different types of Personal Protective Equipment which can be used during maintenance

Eye protection Hand There is a possibility of dust or rust material from the sewing machine while performing maintenance. Hence, safety glasses or safety goggles are needed to be worn during the maintenance.

Hand protection During maintenance, there is a possibility of cuts due to improper usage of tools. Hence, it is suggested to wear hand gloves during maintenance operation.

Body and foot protection Use protective clothing such as apron or cover jackets or boots is required to safeguard the body against broken blades or knives during maintenance.

Protective Goggles

Cut resistant Gloves

Mask to protect from dust

Safety apron

1.4.2 Working in confined spaces

Definitions of confined space

Confined spaces are the one which is both enclosed, or largely enclosed, and which also has a reasonable risk to workers of fire, explosion, loss of consciousness, asphyxiation or drawing.

A confined space is a place that is substantially (although not always entirely) enclosed where there is a risk of death or serious injury from hazardous substances or dangerous conditions (e.g. lack of oxygen).

Very often, injuries and deaths occur as a result of work being carried out such as welding, painting, flame cutting, use of chemicals.

Self-Check 3	Written Test

Instructions: Perform the following tasks. Write your answers in the answer sheet provided:

1. What are the risks of working in confined space? (5 points)
2. What is the methods for identifying hazards (5 points)
3. What are basic principles of manual handling?(5 points)
4. What is controlling risk from manual handling? (2 points)
5. Write at least three types of hazard? (3 points)

Note: **Satisfactory rating - 11 points** **Unsatisfactory - below 11 points**
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

   _____

2. _____

   _____

3. _____

   _____

4. _____

   _____

5. _____

Operation Sheet 1	Fixing needle

PURPOSE: To show how to fix needle

Procedure of needle inserting/fixing/

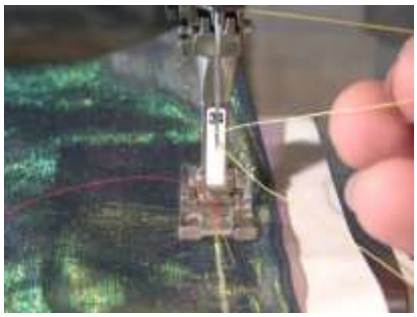
CONDITIONS OR SITUTATIONS FOR THE OPERATION: Trainees should know the different types of tools that help to fix needls

EQUIPMENT, TOOLS AND MATERIALS screw driver, needle

PROCEDURES:

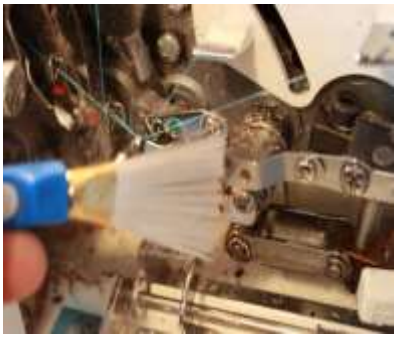
Steps

1. Move the power foot control away to prevent accidently pressing it while changing the needle. Turn the hand wheel that is located on the upper right side of the sewing machine. Watch the needle while you are turning the wheel and stop when the needle is as high as it can go. If the thread is still inserted into the needle ,pull it out

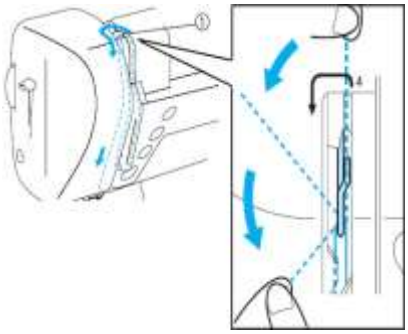


2. Remove bobbin case from hook assembly

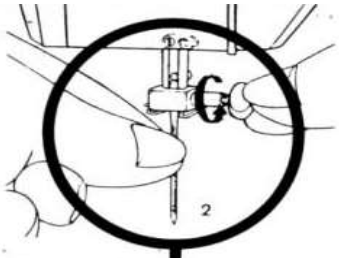
3. Using cleaning brush, clean any thread debris or lint from hook area



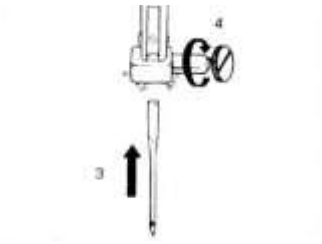
4. While standing in front of training sewing head, rotate gangs hat until take-up levers Are in up position, this is called color change position



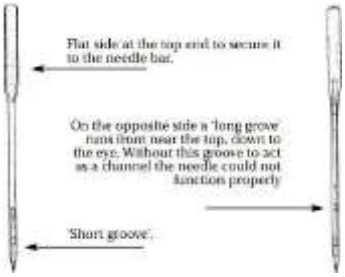
5. Using needle screwdriver, loosen needle set screw.



6. Remove and discard old needle.



7. Insert new needle correctly. (Groove facing front and scarfz)



PRECAUTIONS:

- Use the right drawing tools when required

.

QUALITY CRITERIA:

1) All steps were completed in the correct sequence,
2) The needle should be fix in the right position

LAP Test 1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, workshop, tools and materials you are required to perform the following tasks within 3 hours.

Task 1: Insert sewing needle according to the procedures.

Operation Sheet 2	Inserting bobbin in to shuttle

PURPOSE: To show how to insert bobbin in the shuttle

CONDITIONS OR SITUTATIONS FOR THE OPERATION: Trainees should know the different tools to insert bobbin in shuttle and their usage

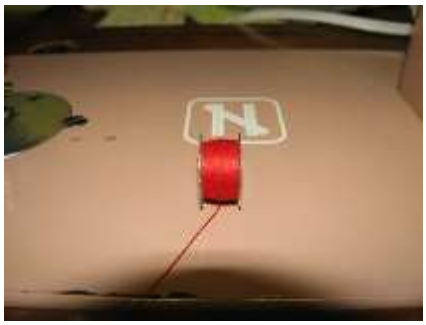
EQUIPMENT, TOOLS AND MATERIALS: bobbin**,**

PROCEDURES:

Steps

Procedure to insert bobbin in to shuttle

1. Hold the bobbin between the thumb and fore finger of your right hand and pull off about 15cm (6 inches of thread.



2. Hold the bobbin case in your left hand as shown and place the filled bobbin inside

3. Pull the thread in to the slot in the edge of the bobbin case

4. Now pull the thread under the tension spring and in to the thread eyelet

To insert the bobbin case in the bobbin

5. Insure that about 15(6 inches) of thread extends out of bobbin. Hold the bobbin case so that long finger on case points up. Open the latch of bobbin case. Slip the bobbin case over the center pin of hook and press in place until long finger of the bobbin case inters notch. Release latch and press down

PRECAUTIONS:

- Use the right tools when required

QUALITY CRITERIA:

3) All steps were completed in the correct sequence
4) The bobbins should insert properly ,

LAP Test 2	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, workshop, tools and materials you are required to perform the following tasks within 3 hours.

Task 1: wind the bobbin according to the procedures.

List of Reference Materials

1. Sewing Machine Maintenance, Susan Wright & Jewel M. Liniacher
2. http://www.topinnovations.com/
3. http://www. Handquilter.com