



Carpentry

Level-II

Learning Guide-25

Unit of Competence: use carpentry hand and power tools

Module Title: using carpentry hand and power tools

LG Code: EIS CRP2 M06 LO4-LG-25

TTLM Code: EIS CRP2 M06 TTLM 0919v1

LO4: Identify, select and use plant and equipment.

Instruction Sheet		Learning Guide #1	
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Selecting and using Plant and equipment
- Checking Lubricants, hydraulic fluid and water
- Maintaining Plant and equipment

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:**

- 4.1. Plant and equipment are selected and used consistent with OHS requirements and the needs of the job.
- 4.2. Lubricants, hydraulic fluid and water are checked according to manufacturer recommendations.
- 4.3. Plant and equipment are maintained in accordance with manufacturer recommendations and standard work practices.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, and Sheet 3
4. Accomplish the “Self-check 1, up to Self-check 3” after each information sheet respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheets
6. Do the “LAP test” (if you are ready).

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4.1. Selecting and using of plant and equipments

- **OHS requirements**

As a carpenter you'll be required to work with a range of tools, plant and equipment. These tools will vary in type, purpose, make and model but you must consider WHS requirements for every tool you use. Safety is the most important consideration when you're selecting and using any tools, plant or equipment. If you choose the wrong tools or use them in an unsafe manner, it can result in an injury or accident.

Power tools are particularly dangerous, because they run at high speeds and/or pressure and can cause very serious injuries. Before you get to the power tools section of this guide, you'll be looking at safe working practices and how to implement them to ensure your own safety and that of other workers. Your lecturer will also take you through some safety training in the workshop

- **Working with power tools**

The following are some important tips for you when you're working with power tools.

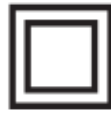
- ✓ If you don't know how to operate a tool safely, don't use it. Power tools in particular should be used only by fully trained operators.
- ✓ Choose the correct tool for the job and identify its limitations before you start any task.
- ✓ When using power tools, it's important that you're alert at all times. Never use a tool if you're tired, unwell or under the influence of drugs or alcohol.
- ✓ Be aware of your surroundings, the limitations of your work area and the presence of other people.
- ✓ Never disturb anyone who is using a power tool. Wait for them to finish what they're doing before trying to attract their attention.
- ✓ Keep the working environment clean and tidy, and make sure there is adequate lighting.
- ✓ Always wear the correct PPE when using any tools, plant or equipment.

- **Electrical safety**

Although there are other power sources available for carpentry tools, eg batteries and compressed air, electricity is still the most commonly used power source within the construction industry. Electricity is extremely dangerous and can cause serious injury or



death, not just to the operator but to others working nearby. When you're working with electricity, you must choose tools with appropriate safety features. You must maintain their condition and use safe work practices at all times. Most modern power tools are 'double insulated'. This means that they have two layers of insulating material (usually plastic) between the live components and the operator. These tools do not require an earthing wire (used to divert electricity away from the operator and into the earth), so they're fitted with a two pin plug or a plug that has a third unconnected pin to help hold the plug in the power point. Double insulated tools are identified by this symbol.



Note: You should avoid older power tools (made before 1980) as they do not have the required safety features. Many were made with metal housings and may not have proper earthing. If you're not sure, ask a qualified electrician to check the tool for you

- **Extension leads, plugs and sockets**

All power tools have cables which need to be plugged into a 240 volt power supply.

Extension leads are often used to allow tools to be operated at various locations around a work area. You must take particular care to protect these cables and leads from being damaged or becoming a hazard to others working nearby. Keep the following important tips in mind when you're working with cables and extension leads.

- ✓ Always keep the extension lead of a power tool over your shoulder so that it's well away from cutters, blades or other equipment.
- ✓ Never carry or lower a power tool by its cable, and never disconnect a power tool by pulling on the power cable. Always disconnect by removing the plug.
- ✓ Don't use extension leads while they're coiled up, as they can get very hot if they're tightly coiled when current is running through them.
- ✓ Don't try to repair damaged extension leads yourself. Repairs should be carried out by a licensed electrician only.
- ✓ Electric tools and extension leads must have clear or moulded plugs and sockets so that any damaged connections can be seen. Sockets on extension leads must also have an extended rim or shroud to prevent anything getting into the gap between the plug and socket and touching the live pins.
- ✓ Never allow traffic such as wheelbarrows or vehicles to run over power cables or extension leads. Protect cables and leads with timber or suspend them overhead.

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- ✓ Make sure power cables and extension leads are not a trip hazard.

- **Battery powered tools**

Battery powered tools (often referred to as cordless tools) are becoming more popular with a wide range of tools now available. Although these tools are relatively safe to use, you should consider the following safety issues.

- ✓ Lithium batteries are deemed hazardous, because they can overheat and ignite under certain conditions.
- ✓ Always store batteries in cool, dry conditions. They should never be allowed to become too hot or to freeze.
- ✓ Batteries should only be recharged with a compatible battery charger. Allow discharged batteries to cool down before recharging.
- ✓ Battery chargers are plugged into a 240 volt power source and should therefore be tested and tagged by a qualified electrician.
- ✓ Rechargeable batteries contain hazardous materials and should not be placed in the rubbish bin. They should always be disposed of at a recycling centre.

- **Uses plant and equipments**

These days, power tools have largely replaced hand tools, because they allow site carpenters and bench joiners to work with increased speed, more efficiency and greater accuracy.

Power tools are available with a variety of power sources including mains power, battery and compressed air.

Carpenters use a range of power tools to cut, shape and install timber in building construction and fit out. There are several categories of power tools, each designed to carry out specific functions. They're usually available in a range of shapes and sizes.

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Self-Check -1	Written Test
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Directions: Say True for the correct and False for the incorrect for all the questions listed below. Use the Answer sheet provided in the next page:

1. Power tools are run at low speed /pressure so that mach they are not dangerous
2. Batteries and compressed air can be source of power for carpentry work
3. Most modern power tools are single insulated
4. All power tools have cables which need to be plugged in to a 240volt power
5. Battery powered tools are relatively safe to use

Note: Satisfactory rating - 3 and 5 points

Unsatisfactory - below 3 and 5 points

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



Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

True or False Questions

1. -----
2. -----
3. -----
4. -----
5. -----



4.2. Checking Lubricants hydraulic fluid and water

To keep tools and equipment operating smoothly and to prevent jamming, you must lubricate them to reduce wear on their moving parts. You can do this by using one of the following procedures.

- **In-line lubrication:** - This system has a reservoir of oil in the air line between the receiver and the tool. As the air passes across the reservoir, a mist of oil is drawn into the air stream and passes through the tool as it's used.
- **Manual lubrication:-** This is done by simply dropping a few drops of oil into the inlet end of the tool. Use only approved oil that comes with the tool or is recommended in the manufacturer's guide

- ✓ **Fluids:-** particularly diesel fuel, diesel exhaust fluid (DEF), engine and transmission oil, hydraulic fluid and coolant are machine's lifeblood.

These fluids require exceptional care, especially as equipment continues to be manufactured with sophisticated technologies.

- **Manufacturer recommendations in using of lubricants and fluids**

1. Read the Manual

When it comes to maintaining and selecting equipment fluids, follows the manufacturer's Operation & Maintenance Manual. The manual explains in detail the machine's maintenance points and lists suggested fluid intervals and recommended original equipment manufacturer (OEM) fluids.

Make sure your operators also follow instructional decals and safety measures outlined in the manual. Some manufacturers strategically place decals with the recommended service intervals on heavy construction equipment. Ideally, you and your operators should request proper maintenance training from your local equipment dealer, and familiarize yourself with decals and key maintenance points on machines.

2. Follow Storage Procedures

When storing diesel fuel, oils, coolants and hydraulic fluids, the last thing you want is water, dust and debris in your storage tanks. These contaminants can degrade a fluid's chemical structures and lead to pump, filter and injector problems. All machine fluids should be handled in a dedicated fluid containment area and stored in a manner that maintains a maximum level of cleanliness.

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When handling fuel, oils and fluids, make sure to follow these general best practices.

- Any fluid entering a storage tank should pass through a dispensing filter.
- Keep fluids tightly closed in a dry, well-ventilated place.
- Carefully reseal open containers and keep them upright to prevent leakage.
- Always observe label precautions and follow safe handling procedures.
- Wear protective equipment to reduce the oils and fluids that are absorbed into skin and to keep components clean.

Be cautious when storing DEF to help reduce contaminants such as dirt and dust when working in earthmoving applications.

Try to fill the DEF tank directly from the DEF container. If you are using a funnel or intermediate containers, make sure they're clean and only used for DEF. Contamination can damage the catalyst in your selective catalytic reduction system and cause you to use more DEF than is needed. Purity is critical, so work with a local dealer to better understand how to store and handle DEF. Every 6 months, you or a professional diesel fuel cleaning and inspection service should test supply tanks for contaminants. If significant amounts of water or sludge are found, the entire tank should be drained and cleaned. To help monitor your supply tank, maintain a preventive maintenance log that includes maintenance history, filter changes and particle counts.

3. Evaluate Delivery Methods

Getting equipment serviced in the field using clean, contaminant-free fluids is critical to avoid damaging machine parts and critical system components, resulting in machine downtime and shortened component life.

Fortunately, fluid distributors and mobile lubrication vehicles can provide you with a choice of efficient fluid delivery methods. They offer a clean, dirt-free environment that can successfully reduce contaminants that might otherwise be introduced into machine components. Depending on what fluids are needed, the distributor or dealer will determine which type of mobile lube vehicle best fits your operation.

4. Develop a Proactive System

To best identify minor issues before they become major repairs, develop a proactive maintenance program executed by trained service technicians. Addressing issues during regular maintenance helps to avoid the domino effect—triggered by a machine breakdown—that forces downtime and results in rush-rate repairs.

One of the biggest advantages to utilizing dealership service teams is having trained technicians with access to the latest information, resources and tools. They can complete calibrations and check diagnostics with tools and software that are typically not available to customers. Machines equipped with telematics allow your dealership to monitor machine

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activity and location, and they provide visibility to machine hours, so you can properly schedule maintenance.

5. Consider Fluid Analysis

Finally, protect your equipment with a fluid analysis program. Some manufacturers offer a program that will test small samples of engine oil, transmission oil and coolant to identify the overall condition of the fluids as well as any contaminants. The report can give you a heads-up on machine condition.

By following these simple steps, you can prolong component life, reduce maintenance costs and keep your equipment running successfully on the jobsite.

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

Column A

1. A reservoir of oil in the air line b/n the receiver and the tools
2. Done by a simply dropping in a few drops of oil in to the inlet end of the tool
3. Machine life blood
4. Dust and debris in storage tank

Column B

- A. Fluid
- B. Coolant
- C. In line lubrication
- D. Manual lubrication
- E. Contaminants

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: _____

Matching Questions

1. -----
2. -----
3. -----
4. -----



4.3. Maintaining Plant and equipment

- **Maintaining equipments**

- ✓ **Care and maintenance Power drills**

- Never cover the air vents in a drill casing as they keep the motor cool by allowing air to circulate.
 - Never lay a drill (or any other power tool) in sand. This can cause damage to the motor and sand to be blown into the operator's face.
 - Remove the drill bit from the hole occasionally and clear any build-up of dust. This helps to prevent the drill bit from overheating or jamming.

- ✓ **Care and maintenance – Power saws**

- Always refer to the manufacturer's data label found on the power saw for make and model information when ordering replacement parts.
 - When fitting a new blade to the saw, make sure the teeth below the base plate
 - Point forward. Before you make any adjustments, you must ensure that the saw is disconnected from the power source (unplugged).
 - Keep saw blades dry to avoid rust.
 - Clean the blade with an oily rag and remove any build-up of adhesive or sap to avoid drag.
 - Never cover the air vents in the casing as they keep the motor cool by allowing air to circulate.

- ✓ **Care and maintenance Drop saw**

- When fitting a new blade to the saw, make sure the blade is compatible with the saw and that the saw teeth face in the correct direction.
 - Always isolate the drop saw from its power source (unplug it) before you attempt to change the blade or carry out any maintenance.
 - Regularly lubricate moving parts to ease operation.

- ✓ **Care and maintenance – jig saws**

- Always refer to the manufacturer's data label for make and model information when ordering replacement parts.
 - When fitting a new blade to the saw, make sure that the teeth point forward.
 - Never cover the air vents in the casing as they keep the motor cool by allowing air to circulate.

Care and maintenance – Power sanders

- Empty the dust bag regularly. If it gets more than half full, it won't collect the dust properly.
 - Always refer to the manufacturer's data label found on the sander for make and model information when ordering replacement parts.

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- Never cover the air vents in the casing as they keep the motor cool by allowing air to circulate.

Care and maintenance – Power planes

- When you're replacing blades in a plane, it's important that the cutting edge of the blades line up with the rear base plate. Proper alignment is usually made easier by using the attachment supplied with the plane.
- When buying replacement blades, make sure you get the correct type. The cutters shown here are from two different manufacturers and obviously differ from each other. You must take care to ensure that replacement parts are suitable for the make and model of the plane.

Care and maintenance – Routers and trimmers

- If you're using a dust extraction system, check the dust bag and empty it regularly.
- If it gets more than half full, it won't collect the dust properly.
- Always refer to the manufacturer's data label found on the router for make and model information when ordering replacement parts.
- Whenever you make any alterations to or carry out maintenance on the router, avoid bending the power cable as this can cause the wires inside the cable to break. Allow the cable to pass down the side of the workbench.
- Never cover the air vents in the casing as they keep the motor cool by allowing air to circulate.

✓ **Care and maintenance – Portable electricity generators**

- Maintain the generator according to the manufacturer's maintenance guide to ensure best performance and safety.
- Always refer to the manufacturer's data label for make and model information when ordering replacement parts.
- Make sure the equipment is cleaned after use and before storage. Remove any fuel by using the drainage valve or by using a siphon.
- Clean and replace the air filter regularly.
- If a generator is stored for a long time, start it up and run it occasionally.

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Self-Check -3	Written Test
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Directions: Say True or False for all the questions listed below. Use the Answer sheet provided in the next page:

1. When fitting a new blade to a jig saw the teeth point should be backward
2. Manufacturer recommendation can be the guide to maintain equipments
3. When maintenance is applied to the power tools the cable should be disconnected
4. During maintenance bending of the power cable can cause the wire inside the cable can break

Note: Satisfactory rating – 3 and 4 points

Unsatisfactory - below 3 and 4 points

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



Answer Sheet

Name: _____

Date: _____

Score = _____

Rating: _____



Operation Sheet 1

Procedures for using drilling power tools

The Procedures for using drilling power tools are;

Step 1 – Pre check

- Identify and put on the appropriate PPE.
- Check the power drill and extension lead for any visible signs of damage.
- Check the tag on the power drill and extension lead for the last inspection date.
- Select and fit the correct drill bit for the task and material, eg timber, metal, plastic or masonry.
- Set the drill to the correct speed and torque for the size of your drill bit. Remember: Big drill bit – slower speed; smaller bit – faster speed.
- Turn on the ‘hammer’ action (if required).
- Check that chuck/drill bit is tightened.
- Ensure the material to be drilled is held securely.

Step 2: Set the drill to the correct speed for the material being drilled. The harder the material, the slower the speed.

Step 3: Drill a pilot hole or use a centre punch to help guide larger drill bits.

Step 4: Hold the drill firmly and begin drilling, removing the bit on a regular basis to clear the dust and avoid overheating.

Step 5 Reduce the pressure on the drill when nearing the end of the operation, to avoid ‘snatching’ or ‘grabbing’.



Operation Sheet 2

Procedures for using power saw tools

Procedures for using power saw tools are:

Step 1 – Pre check

- Identify and put on the appropriate PPE.
- Check the power cord (and extension lead, if used) for any visible signs of damage.
- Check the tag on the power saw and extension lead for the last inspection date.
- Select and fit the correct saw blade for the task, ie ripping, cross-cutting, combination or tungsten carbide tipped.
- Adjust the saw blade to the required depth of cut.
- Check that the retractable blade guard is working correctly and isn't damaged.
- Adjust the base plate to set the saw to the required angle.
- Set the fence to the required width.
- Check all adjustment devices are tight.
- Make sure you hold securely the timber to be cut. The best way to do this is to clamp it to saw stools or a workbench.
- Ensure dust extraction system is fitted (if required).

Step 2: Rest the front of the base plate on the timber before starting a cut. Position the power cable over your shoulder (away from the blade).

Step 3: Hold the saw in both hands and pull the trigger to start the saw. Allow the saw to reach full speed before you start to cut the timber.

Step 4: Feed the saw blade into the timber slowly. Allow the saw blade to do the work – do not force the cut. The blade guard should automatically retract as you move the saw along the timber.

Step 5: At the end of the saw cut, allow the blade to complete the cut before you release the trigger. The blade guard should spring back into place (covering the saw blade). Let the saw blade come to a complete standstill before you rest the saw on the ground.



Operation Sheet 3

Techniques of cutting timber by using jig saw

Techniques for cutting timber by using jig saw are:

Step 1 – Pre check

- Identify and put on the appropriate PPE.
- Check the power cord and extension lead for any visible signs of damage.
- Check the tag on the reciprocating saw and extension lead for the last inspection date.
- Select and fit the correct saw blade for the required task, ie cutting timber, metal or plastic.
- Select the correct speed for the required task.
- Set the base plate to the required bevel (if required).
- Check all adjustment devices are tight.
- Check that the work piece is securely clamped to avoid unwanted movement during cutting.

Step 2: Place the front of the base plate on the material with the motor off before you start the cut. Ensure adequate clearance under or behind the work piece for the blade to move up and down.

Step 3: Grip the handle firmly, pull the trigger and allow the saw blade to reach full speed before you start to cut the timber.

Step 4: When cutting, allow the blade to do the work. Do not force the cut, especially on curves as cutting too quickly may cause the blade to wander or break.

Step 5: At the end of the cut, release the trigger and allow the blade to stop moving before you lift it from the work piece.



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 8-12 hours.

Task 1: Fix the blade in to jig saw

Task 2: Fix the blade in to portable saw

Task 3: Select the proper power tools and perform cuts in difference angle

Task 4: Select the proper power tools and perform curved cuts

Task 5: select the proper tools and make small holes in difference dimension



Table of Answer keys for the self checks provided on each information sheets

UNIT OF COMPETENCY: use carpentry hand and power tools							
LO: 4 LG: 25 Identify, select and use plant and equipment.							
Self check: 1		Self check:2		Self check:3		Self check:4	
True or False		Matching		True or False			
1	False	1	C	1	False	1	
2	True	2	D	2	True	2	
3	False	3	A	3	True	3	
4	True	4	E	4	True	4	
5	True	5		5		5	



List of Reference Materials

References

- USE CARPENTRY TOOLS AND EQUIPMENT CERTIFICATE II IN BUILDING AND CONSTRUCTION CERTIFICATE II IN BUILDING AND CONSTRUCTION (PATHWAY – TRADES) CPCCCA2002B
- Construction Health and Safety Manual
- [MONITOR%20WORK%20OPERATIONS.pdf%20_%20Competence%20\(Human%20Resources\)%20_%20Goal.html](#)
- Best practice guide to improving waste management on construction sites
- Interpreting and Applying Equipment Specifications I
Speaker/Author: Suzanne
- Waste management at the construction site By Joseph Laquatra and Mark Pierce
- Manage workplace operations Trainee Manual William Angliss Institute of TAFE

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