

**CPC - Construction, Plumbing and Services
Training Package**

CPC20220
Certificate 2 in Construction Pathways



Unit

CPCCCM2005

Use construction tools and equipment

Trainer/Teacher Manual

PASSING

LANE

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STUDENT/TRAINEE DETAILS

Student/Trainee Name

Student/Trainee Email

Teacher / Trainer Name

School / Institution / Training Organisation / Employer

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INTRODUCTION

This manual is developed to provide training content that addresses the specific 'Unit of Competency' as outlined on the following pages.

It provides the teacher and/or trainer with a document that includes all that the student and/or trainee manual content plus guidance notes as well as answers to the learning activities in the student/trainee manual.

This manual can be packaged with various manuals addressing other 'Units of Competency' in order to meet the 'Packaging Rules' of a particular Australian Training Package Qualification.

This resource has been designed to be delivered in a form that is conducive to the learning environment including:

- ☆ Online delivery
- ☆ Classroom delivery
- ☆ On the job training

The documents are designed in a 'landscape' format in order to make reading on a computer screen easier as well as reduces the need to scroll down pages. Documents can be easily printed if the learning environment requires the student or trainee to have hard copies of the learning materials.

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INTRODUCTION—CONT'D

LEARNING ACTIVITIES

The learning activities in the student and/or trainee manuals are 'Form Enabled' so that if the resources delivered online, the activities can be filled in using the computer keyboard.

Each learning activity is identified with the following icon.

**Learning
Activity**

Learning activities come in the following forms.

- ☆ Questions
- ☆ Research
- ☆ Tasks
- ☆ Interviews

Questions

Questions would relate to the information presented on previous pages.

Research

This type of learning activity would require the student or trainee to locate information by using research methods. The information they would be required to locate would be in line and/or support the information that the manual had outlined in previous pages.

INTRODUCTION—CONT'D

Tasks

This learning activity type would require the student/trainee to actually do or undertake something and would be reinforcing the knowledge they have gained from reading the manual's previous pages.

Interviews

This learning activity type would require the student/trainee to interview person(s) in an actual workplace environment or a person(s) who are experienced in the industry sector which the student/trainee is currently undergoing training.

The student/trainee is made aware of the type of learning activity by noting the learning activity type displayed under the learning activity icon.

**Learning
Activity**

Research

SELF ASSESSMENT

At the end of each manual is a series of questions that the student/trainee should review and answer.

This self assessment is to ensure in the student's or trainee's mind that they have reviewed and understood the information that was presented in their manual.

If they are unsure of their understanding in any of the topics reviewed, they are encouraged to go back and review the information again and/or seek the assistance of their teacher or trainer.

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UNIT OF COMPETENCY OVERVIEW

The following pages are extracts from Training.gov.au website and outlines this specific 'Unit of Competency' including the 'Elements' and the 'Performance Criteria'. The content within this manual has been developed to address this unit.

CPCCCM2005 USE CONSTRUCTION TOOLS AND EQUIPMENT

ELEMENT	PERFORMANCE CRITERIA
1. Select and use tools and equipment	<ul style="list-style-type: none">1.1 Review work instructions for a construction task1.2 Select equipment and hand, power and pneumatic tools for the construction task, identify functions and operations, check for serviceability and report any faults1.3 Select and use personal protective equipment (PPE) for each part of the task1.4 Conduct pre-operational checks to manufacturers' specifications1.5 Use equipment and hand, power and pneumatic tools following WHS requirements and manufacturers' specifications
2. Clean up	<ul style="list-style-type: none">2.1 Clean up, meeting all legislative and workplace requirements for safety, waste disposal and materials handling2.2 Check, maintain and/or sharpen, store and secure tools and equipment and report any faults

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Section One

Select and Use Tools and Equipment

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USE CONSTRUCTION TOOLS AND EQUIPMENT

SECTION ONE—SELECT AND USE TOOLS AND EQUIPMENT

INTRODUCTION

Working in the construction industry requires workers need to have access to a wide variety of tools and equipment.

Generally, tools and equipment in the construction industry can be classified as being:

- ☆ Hand tools (including measuring and setting out tools)
- ☆ Powered hand held tools
- ☆ Pneumatic hand held tools
- ☆ Powered (electric and petrol) and pneumatic equipment
- ☆ Heavy equipment

In this training manual we look at the more common hand tools and small construction equipment.

Heavy equipment refers to machinery such as excavator, bulldozers, loaders and so on. We do not go into any detail about these types of machines.

SECTION LEARNING OBJECTIVES

At the completion of this section you will learn information relating to:

- ☆ Reviewing work instructions for a construction task
- ☆ Selecting equipment and hand, power and pneumatic tools for the construction task, identify functions and operations, checking for serviceability and reporting any faults
- ☆ Selecting and using personal protective equipment (PPE) for each part of the task
- ☆ Conducting pre-operational checks to manufacturers' specifications
- ☆ Using equipment and hand, power and pneumatic tools following WHS requirements and manufacturers' specifications



REVIEW WORK INSTRUCTIONS FOR A CONSTRUCTION TASK

In all areas of the construction industry, workers are provided 'work instructions' before the commencement of any job.

These work instructions can be provided in a few ways, which include:

- ☆ **Verbal** - this could be the supervisor providing the work instructions to the workers.
- ☆ **Written** - this can be done using an email, text or handing workers a written overview of the job.

Of course, work instructions could be provided using both verbal and written methods. A supervisor may provide the work instructions and also provide each worker a summary of the job in a written form.

When it comes to 'construction work', majority of the work instructions would be written.

This is because most work instructions will refer to written supporting documentation and other types of information that could include:

- ☆ **Plans** - drawings and layouts that detail the construction and the requirements
- ☆ **Specifications** - this generally includes the materials or parts to be used (this may also include a separate 'materials list')
- ☆ **Quality specifications** - depending on the type and size of the job, there could be a separate quality specification document that workers would refer to ensuring the quality of the work being performed is meeting the expected quality requirements.
- ☆ **Manufacturer's instructions** - in some cases, the job will require tools or equipment where manufacturer's instructions must be followed when using.

Workers would use the work instructions, as well as any supporting documentation to determine what tools and equipment would be needed to complete the job.



UNDERSTANDING AND CONFIRMING WORK INSTRUCTIONS

It is important that all construction workers, both individually and as a team, fully understand what is expected of them on the job site.

As we have learned on the previous pages, construction workers will often receive a significant amount of information relating to the job they are about to commence.

We learned that this information is generally conveyed verbally and supported with written instructions, plans/drawings, specifications and operational information.

A construction job on site that is to be completed efficiently and be of the quality expected, needs to have all construction workers have a clear understanding of the work instructions.

This may require each construction worker to 'clarify' some instructions that may not be fully understood. To clarify information is to ask questions of the person providing the information. This requires two basic communication skills:

- ☆ Questioning skills
- ☆ Listening skills

Examples of clarifying questions could be:

Could you explain that to me again?

Does this instruction refer to....?

Where could I find this information?

Another method of clarifying information is to repeat back to the person providing the information in your own words what you think the instructions or information means to you.

The person can then let you know that you do have an understanding of the instructions/information and where you may not, they can further explain the instructions/information.

'Attentive' listening skills are essential. This means you give the person providing you the instructions/information and clarification your full and undivided attention.

Not listening to the instructions/information and answers provided to your questions will most likely mean you will not perform your work properly.

**Learning
Activity****Question****LEARNING ACTIVITY ONE**

- 1) There are three methods that work instructions could be conveyed. What are they?

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- 2) What were the four examples of supporting documents we mentioned in this Section that would be provided with work instructions?

- 3) What were the two basic communication skills required when clarifying work instructions and other job information?

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TEACHER/TRAINER GUIDANCE NOTES

- 1) Verbal, written and a combination of both.
- 2) Plans, specifications, quality requirements, manufacturer's instructions
- 3) Questioning and listening skills

SAMPLE

SELECT EQUIPMENT AND HAND, POWER AND PNEUMATIC TOOLS FOR THE CONSTRUCTION TASK, IDENTIFY FUNCTIONS AND OPERATIONS, CHECK FOR SERVICEABILITY AND REPORT ANY FAULTS

There is a significant number of different types of construction tools and equipment; many that cross-over to various trades.

This training manual will focus on the basic types of construction tools and equipment.

However we have provided a 'Supplementary Training Manual' called 'Tools and Equipment'.

In this supplementary training manual there is significant detailed information about all types of tools, powered hand tools and small equipment that a worker would encounter in the building and construction industry sectors.

Your teacher or trainer may refer you to portions of this supplementary training manual if they feel there is additional information that you may require to complete this unit of training.



In this training manual we start with 'measuring and setting out tools'.

COMMON MEASURING/MARKING OUT TOOLS

We look at some of the more common measuring tools, as well as marking out tools you would likely see used on construction jobs.

☆ **Tape measure** - steel tapes are made from 2 to about 10 metres in length.

The steel tapes are made with a curved, but rigid thin metal cross section that is flexible enough to be rolled up.

The most common types of steel tapes have a hook at one end to let one person take all the readings.

They have a spring retracting mechanism that pulls the tape back into the casing when unlocked.



For longer measurements, the commonly used tape measure is one made of strong fibreglass cloth.

These go anywhere from 20 metres to 60 metres in length.

These are required to be pulled from their casing and then wound up by hand when measuring has been completed.

- ☆ **Chalk line** - a chalk line is a tool for marking long, straight lines on relatively flat surfaces, much farther than is practical by hand, or with a straightedge.

The string is stored in a box casing full of brightly coloured powdered chalk.

The string is then pulled along the desired line and pulled very tight. The string is then pulled up and snapped, leaving a straight line mark.



- ☆ **String lines** - strong string is used extensively in marking out construction projects. The area is measured out and the string is tied to stakes. Then generally a spray mark line is made.



- ☆ **Steel rules** - these are also called rulers and are essential in any work activity when accuracy matters. Steel rules are inherently more accurate than folding rules because they are made in one piece.

Steel rules come in rigid and flexible versions. While their primary purpose is accurate measurement, they can also be used as guides for laying out lines (called straight edges). The thinner, more flexible rules can also be used to measure rounded or cambered work.



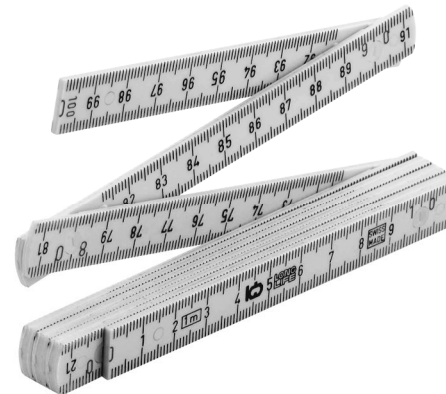
A narrow rule is used to measure the depth of narrow slots and small diameter holes where the standard rule is too wide to be used.



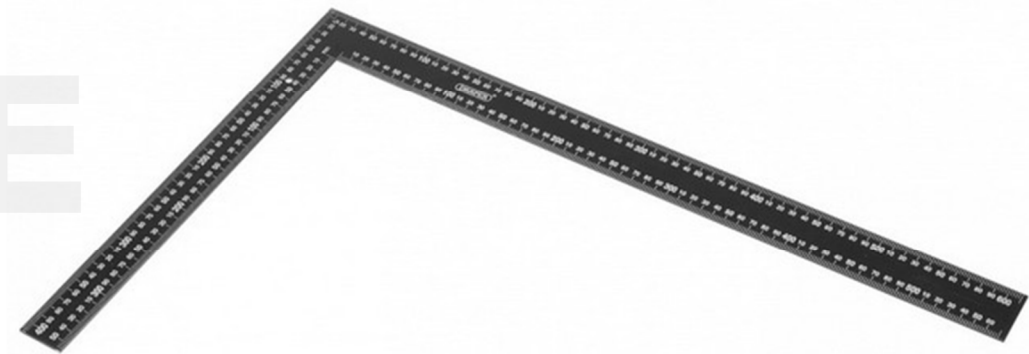
Most rules are made by cutting the required length from a roll of band spring steel, with etched graduations. Rules made by this method are adequate for most applications and reasonably priced.

Higher-priced rules are cut, not stamped, from plate steel and the edges are ground. Graduations are machined, much deeper than etched graduations, longer-lasting and easier to read in poor light.

- ☆ **Folding rules** - sometimes called zig-zag rules or jointed rules, are a series of two or more smaller rule strips joined with hinges.



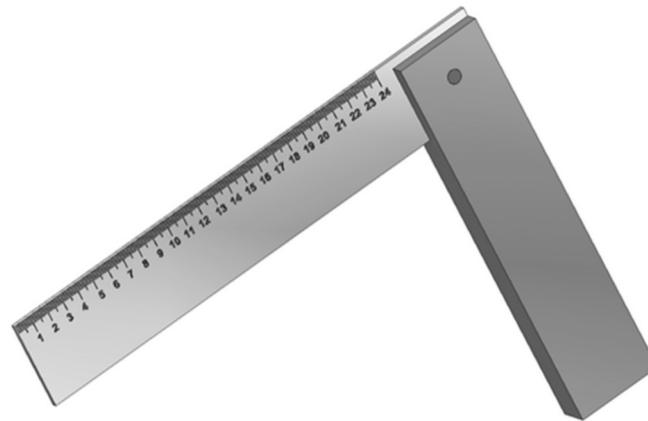
- ☆ **Carpenter's square** - this is a larger square used for a number of tasks. The short part of the square is called the 'tongue' and the longer edge is called the 'blade'.



- ☆ **Engineer's try squares** - a try square is used for marking, measuring and checking the accuracy of right angles (90 degrees). It has a metal ruler set at right angles to another straight piece.

A traditional try square has a broad blade of steel or brass riveted to the face of a wooden handle called the stock. This is added to the stock to ensure a straight edge.

Engineer's try squares are also known as an engineer's square, or a machinist square.



- ☆ **Bevel squares** - this tool is also known as a sliding bevel, angle bevel, bevel square, sliding T-bevel, or adjustable try square. Tongues range from 150 mm upward, sometimes to 450 mm. Whatever the length of the blade, the stock is always shorter.

The tongue of the bevel gauge fits into a groove cut into the head of the stock. In most models, a slot cut into the tongue allows further adjustments of the position of tongue and stock.

The tongue is usually made of thin steel and the stock of wood, plastic, or metal. The bevel square is a marking out tool used to transfer a known angle to the material. It is adjustable from 0 to 180 degrees.



- ☆ **Combination square** - a combination square is part of a combination set. It consists of a square and a rule and can be used to check components for square or marking lines when marking out.

One edge is at 45 degrees; the other is at 90 degrees. The rule is also useful for measuring and checking depths.



- ☆ **Spirit levels** - are rules fitted with glass bubble-tubes so that work can be checked in the horizontal and vertical planes for level and plumb.



- ☆ **Plumb lines** - a piece of string with a weight attached to one end, used to test if something is vertical.



HAND TOOLS USED FOR CONSTRUCTION TYPE WORK

There are numerous hand tools used to perform construction tasks and building repairs and maintenance. On the following pages we look at those generally used to perform basic construction job tasks.

- ☆ **Screwdrivers** - screwdrivers are available in many different shapes, sizes, and materials. Screwdrivers are used for driving or removing screws or bolts with slotted, recessed, or special heads.

There are three main kinds of screwdriver:

- ◆ Slotted head
- ◆ Phillips head
- ◆ Robertson square head

'Slotted Head' screwdrivers have a flat tip for slot-headed screws/bolts. 'Phillips Head' screwdrivers have a cross-shaped tip. 'Robertson' screwdrivers are used where the screw or small bolt has a square recess.



The common screwdriver has a round steel blade with a wood or plastic handle, usually fluted for a good grip. Screwdrivers are also used in construction type work.

- ☆ **Claw/carpenter's hammer** - the claw hammer is used for driving or pulling nails, tapping wood chisels and so on.

The handles are generally wooden, however there are brands that have fibreglass handles. There are two types of claws; the curved claw and the straight (rip) claw. The most commonly used is the curved claw.



- ☆ **Sledge hammer** - the sledge hammer is used for striking bolsters, for breaking stones or concrete and for setting timbers. These hammers give the user the advantage of a heavier head and a longer handle.

There are a wide range of sledge hammers available.

A double face sledge hammer has similar faces on both sides of the head. They range from long handles and heavy heads, to short handles and lighter heads.



- ☆ **Mason's hammer** - the mason's hammer has a flat striking face on one end of the head and a tapered chisel on the other end.

The hand is generally wooden. There are various styles available. It is used for setting and cutting bricks and flat stones.



- ☆ **Mallets** - the most commonly used mallet would be the rubber mallet, used to pound pavers into place, position stone pieces and used to hit other materials without the fear of chipping or breaking the material.

The head is made of hard dense rubber and the handle is generally wooden, although some have steel handles with rubber hand grips. The size is based on the weight of the head, the most common being 450grams.



SAMPLE

- ☆ **Hand saw** - also known as the carpenter's saw is the most common saw used in construction for cutting timber components for planters, frames for retaining walls, concrete forms and the list goes on. The average blade lengths are between 600 to 700mm long.



- ☆ **Backsaw** - the backsaw has a straight blade and parallel top and bottom, with a heavy strip of steel, or brass wrapped along the back to provide rigidity.

The handle is of similar shape to other handsaws, except it is usually mounted higher. Backsaws are used for general bench work, such as cutting joints and smaller sections of timber to length. Sizes vary, depending on design and nature of work.



- ☆ **Hacksaw** - the hacksaw is designed to cut almost any size or shape of metal object.

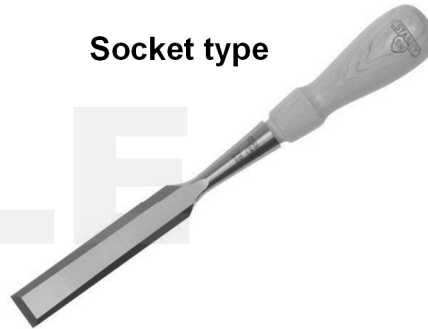
The blade is held to the saw frame by pins that fit into small holes at each end of the blade. A screw and wing nut assembly at either the nose or the handle end of the frame adjusts blade tension.



- ☆ **Chisels** - there are two types of woodworker's chisels.

The socket type has a blade and socket handle forged of high carbon steel in a single casting.

Socket type



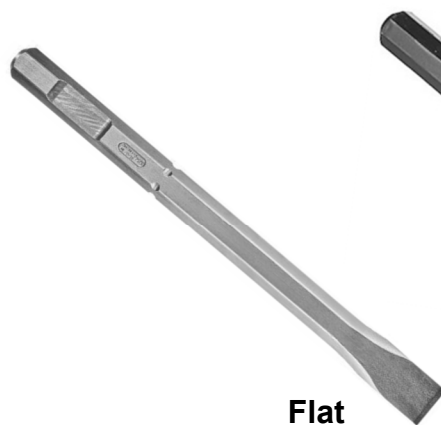
Tang type



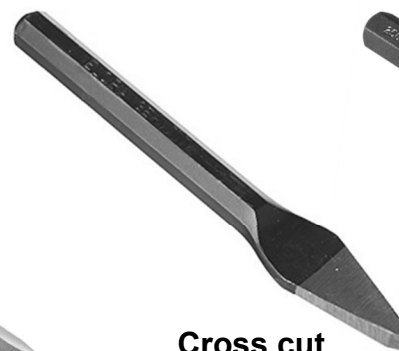
The tang-type chisel is forged in a single casting. The handle is drilled and inserted over the tang and reinforced with a metal band.

- ☆ **Cold chisels** - cold chisels are chisels normally designed to be used on non-heat treated metals which are softer than themselves, but they are often used when working with stone, brick and concrete as well.

They come in a variety of different shapes. The flat chisel, cross cut chisel, the half round and the diamond point chisels are the most common types.



Flat



Cross cut



Half round



Diamond point

- ☆ **Hand metal shears** - shears are used for cutting sheet metal and steel of various thicknesses and shapes. Shears come in a variety of styles and sizes. Hand shears are made with straight or curved cutting blades. Straight-bladed shears are used to cut straight lines, or to cut curves in locations that are easily reached.



Shears with curved blades such as the hawk bill and the curved blade hand shears are made especially for cutting short straight lines or curves. They are also used for cutting out small intricate designs in locations where it is necessary to keep the handles and handle-operating hand away from the metal stock.



- ☆ **Utility knife** - the utility knife (also known as a trimming knife) is used to cut wallboard, paper, cardboard, linoleum, canvas, and upholstery materials. Most utility knives have an aluminium handle and have storage space for five interchangeable blades in the handle.



- ☆ **Clamps** - the most common clamp is the C-clamp. C-clamps are used to hold work which cannot be held in a vice, or which has to be held for extended periods of time. They are available in a variety of sizes.



There is the hand screw clamp that is made up of two hardwood or high impact plastic jaws and two hand-operated screws which hold the clamp together. The hand screw clamp is used for holding wood while gluing. They are available in a variety of sizes.



There are also 'clutch' style clamps used where components to be clamped are longer in lengths.



Bars are steel tools used to lift and move heavy objects and to pry where leverage is needed. They can also be used to remove nails and spikes.

The most commonly used types of bars are the wrecking bar, crowbar and pry bar. These bars range from 300mm to 1.5 metres in length, depending upon their design and the purpose for which they are used.

- ☆ **Wrecking bar** - the wrecking bar is used to pull large nails or spikes, to open heavy crates and to do wrecking work.



- ☆ **Crowbar** - the crowbar is used for heavy prying and for moving heavy timbers and other large objects.

In moving heavy objects or prying, it should be used in a position where the weight of the user's body is exerted downward on the long section of the lever. When possible, use a block or other object as a fulcrum behind the bar, near the spot where the bar's point is wedged under the object to be moved.



- ☆ **Pry bar** - the pry bar is used for light ripping and prying jobs. It is the smallest of the bars used.



☆ **Mattock** - the mattock is designed for digging and cutting operations.

The mattock generally has two bevelled blades.



A mattock can be combined with other digging tools to perform a variety of functions. For example, the 'pick-mattock' is a combination of the single-bevelled mattock and pick.



- ☆ **Wheelbarrow** – the wheelbarrow is one of the most common tools on a construction site and is used for multiple tasks; carting tools and materials around.



- ☆ **Shovel/spade** – Used for digging and moving materials.



COMMON POWERED HAND TOOLS

Over the next few pages we look at the more common powered hand tools including electric, cordless and pneumatic.

- ☆ **Powered hand drill** - arguably the most popular and used powered hand tool is the cordless drill. It comes with rechargeable batteries, a charger and a storage case.



**Cordless
hand drill**

The other types of powered hand drills are the electric drill and the pneumatic drill. The electric hand drill uses a cord that is connected to 'mains' power. A pneumatic hand drill uses compressed air through a hose from an air compressor.



**Electric
hand drill**



**Pneumatic
hand drill**

Power cord

**Compressed
air hose**

Powered hand drills, especially cordless are used for tasks far beyond just drilling holes.

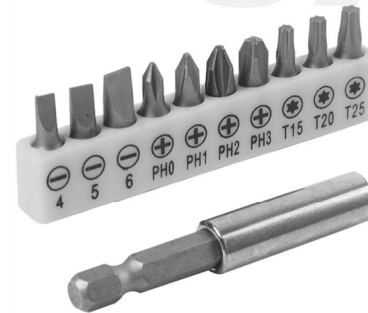
Below are some of the accessories used by a drill for different tasks.



Hole saw



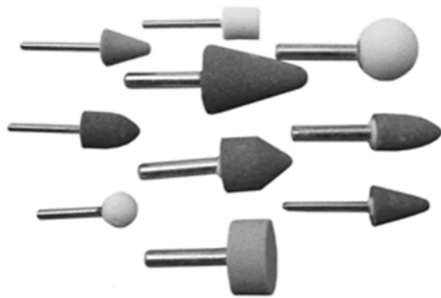
Hole spade bits



Screwdriver bits



Socket sets



Grinding stones



Wire brushes



**Polishing and
buffing wheels**



**Abrasive cut off
wheels**

Electric hand drills and pneumatic hand drills are generally used in a workshop environment, whereas cordless hand drills can be used 'in the field'.

- ☆ **Hammer drills** - the hammer drill is a drill used to drill into masonry material, such as brick or blocks.



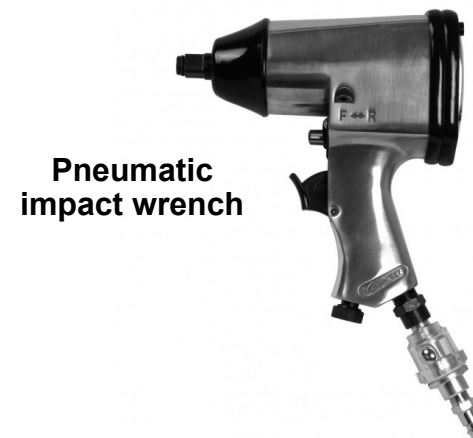
- ☆ **Electric and pneumatic impact wrench** - the impact wrench consists of a pistol-grip on a metal housing which contains a motor that energises the driving-anvil inside the muzzle of the housing.

The portable impact wrench with its accompanying attachments is primarily intended for applying and removing nuts, bolts and large screws.

It may also be used to drill and tap wood, metal, plastics, etc. and to drive and remove a socket head or self-tapping screws. Comes in both electric and pneumatic models.



**Electric
impact wrench**



**Pneumatic
impact wrench**

- ☆ **Portable electric circular saw** - a wide range of circular saws are on the market and it is worth knowing the basic options.

They come in various sizes and are generally electrically powered, although there has been an increased availability of battery powered circular saws.



Electrically operated saw



Cordless saw

There are many applications for this tool.

Typical uses would be cutting studding to length, cutting off end boards, preparing trim, or ripping boards and planks. These are common tasks on building jobs.

Most circular saws have the same set of features; what varies is how the manufacturer has incorporated them into the saw and how easily they can be used.

SAMPLE

- ☆ **Jigsaws** - handheld jigsaws are useful for precision-cutting, intricate curves and patterns in thin stock. They have thin blades that move rapidly up and down.

The blade is held in upper and lower chucks that pull it tight and keep it from bending.



The main consideration when using a jigsaw is the blade choice.

To start with, you need to know what type of material will be cut (wood, metal, plastic, etc.) and what kind of cuts will be made — rough cuts, tight, scrolling cuts, or both.

Wood cutting blade



Metal cutting blade

☆ **Reciprocating saw** - these saws are available in electric, cordless and pneumatic models.

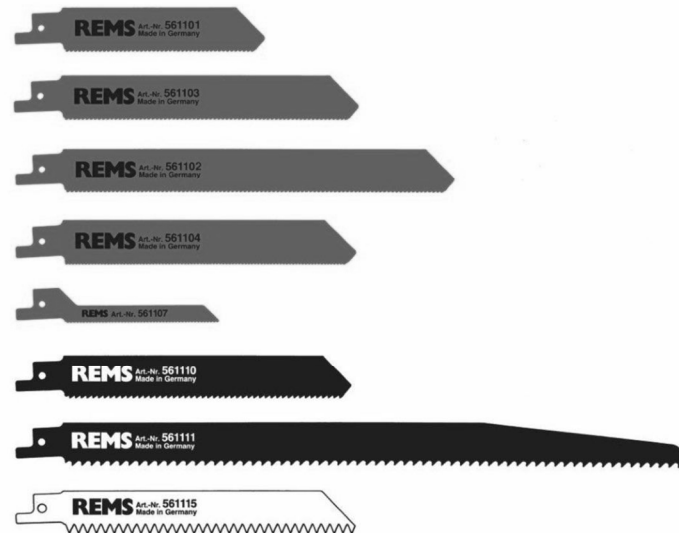
A reciprocating saw is a type of powered saw in which the cutting action is achieved through a push-and-pull (reciprocating) motion of the blade.

It is used to cut pipe, nails, openings for windows, metal, plasterboard, cement and bricks and so on.

The reciprocating saw is similar to a 'jigsaw' but is bigger and used in more heavier duty sawing tasks.



The blades are designed to cut various materials from the fine tooth blade for metal cutting, to medium tooth blades for wood and heavy tooth blades for materials such as cement and other masonry materials.



☆ **Nail gun** - these tools are available in electric, cordless and pneumatic models.



There are three common type of 'nailers' - framing, finishing and bradders, or brad.

A framing nail gun is used for large wood projects, such as framing and deck building. It uses nails that are usually 50-75mm long.



Finishing nail guns are fairly versatile in the number of things that they can do.

Generally they are used for trim, moulding, door jams, cabinetry, and plenty of other light duty wood work. Cabinet making is a prime candidate for finish nailers.

It uses nails that are usually 25-50mm long and far thinner in diameter than a framing nail.



Brad nailers are used for fine woodworking, such as delicate trim work and simple repairs.

It uses nails that are usually 12-25mm long and thinner in diameter than both a framing and a finishing nail.



- ☆ **Angle grinders** - the portable electric angle grinder is an electrically driven tool with a spindle at the front end for holding circular attachments.

Various types of attachments can be fastened to the end of the projecting spindle.

The rear end of the tool housing tapers to form a guiding handle and the switch is located on this handle.

To provide additional control, a second handle is attached to the side of the housing. Smaller hand held units do not usually have the side handle.



There are electrical powered units, as well as rechargeable battery units. The angle grinder is a common tool used on building and construction projects.



The portable electric angle grinder with its many attachments can be used for a variety of tasks.

Heavy-duty sanding, grinding, wire brushing, buffing and planing are some of the possible applications.

☆ ***Pedestal and bench grinders*** - these are workshop machines used by workers mainly for sharpening tools



Pedestal



Bench

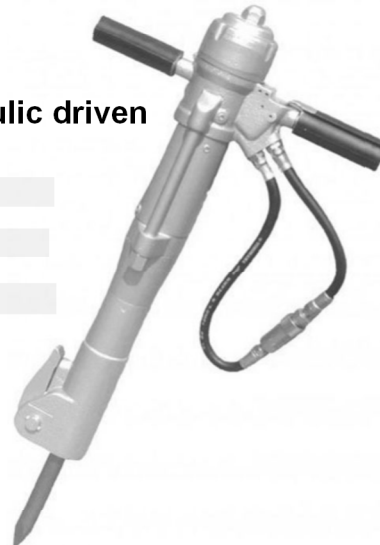
SAMPLE

SMALL CONSTRUCTION EQUIPMENT

- ☆ **Demolition/jack hammers** - demolition hammers (also known as Jack Hammers) deliver a powerful hammering action that allows more efficient means of demolishing concrete and masonry.

The heavy duty models are generally hydraulic driven or pneumatic powered.

Hydraulic driven



Pneumatic powered



- ☆ **Portable hydraulic power packs** - many types of construction equipment use hydraulic pumps to power the equipment such as the one shown above. These portable power pack units have high pressure hydraulic pumps driven by either petrol, or diesel engines.



☆ **Portable air compressor** - many jobsites will have pneumatic tools. This means an air compressor is required.

There are several types of portable air compressors based on the tank capacity and how it is powered. The larger the tank size, the less work the compressor unit needs to work.

So for heavy usage, a larger compressor tank size would be required.

Portable air compressors can be powered with petrol engines, or electrically powered using mains power, or a generator.

Petrol powered



Electrically powered



☆ **Portable generator** - used on job site where there is no 'mains' electric connection.



MISCELLANEOUS TOOLS

- ☆ **Extension leads** - power tools and equipment used on site require not only a power source, but also a method of connecting the tools to the power source. This is commonly done using extension leads.

There are strict guidelines and regulations as to the design of electrical power leads. This includes the plug which must resist moisture entering into the plug which can cause shortening out.



Moisture proof plug

- ☆ **Portable residual current device (RCD)** - an important safety measure is to have the tools connected to a 'residual-current device' or an RCD. These devices sit between the mains power connection and the electrically powered tool or equipment.

Also known as 'safety switches', these devices break the electrical current when it detects an unnormal leakage of electrical current; preventing electric shock or serious electrocution.



- ☆ **Air hoses** - pneumatic tools require compressed air. This is supplied by an air compressor, however the tool requires air hoses to connect the tool to the air compressor.

There are specially designed and manufactured air hoses that are capable to withstand high air pressures.

There is also the need to have special connectors. There are the standard 'male' connectors that connect the hose to the compressor and then there is the 'quick connector' that connects the hose to the tool.





CHECKING FOR SERVICEABILITY

The safety and the quality of any construction jobs not only depend on the skills and experience of the worker, but also the tools and equipment the worker uses.

If the tools or equipment are not designed to do the job, the tools or equipment may be damaged, the user/operator may be injured and the quality of the work jeopardised.

This means that the tools and equipment chosen to do the job must be aligned with the capabilities of the tool or equipment, as well as what the job specifications are.

Simply, use equipment for jobs they were designed to be used for.

Also, there are a number of equipment that require the user or operator to have been trained in its use. This is not only from a safety point of view, but also the need to ensure quality work outcome is achieved.

Equipment in particular, are prone to accidental damage due to the tough and harsh working conditions associated with construction, or building work sites.

Powered hand tools and equipment that require power leads need to be checked on a regular basis.

Plugs can get bent and the leads sustain tears in the insulation covering, bare wires showing and so on and if not identified early can cause serious electric shock.

Any electric equipment and leads that have been checked and shown damage would need to be tagged 'DO NOT USE' and set aside and then reported to the supervisor.

Some tools and equipment have safety guards installed when manufactured. As one would expect, this is to ensure the user is kept safe when using the equipment.

As part of any safety procedure, workers are generally required to check the tool and equipment safety features and ensure they are working properly.

DEALING WITH DAMAGE, FAULTS OR PERFORMANCE ISSUES

During pre-use checks on electric powered equipment, while the equipment is being used or routine servicing and maintenance, faults, performance issues or damage may be revealed.

Because electric powered equipment are mechanical equipment, you would need to seriously think about the level of your mechanical and/or electrical knowledge, skills and capabilities before attempting to repair or rectify any faults, performance issues or damage.

It is most likely you would need to report the faults, performance issues or damage to your supervisor.

If the equipment turns out to be unsafe to use or totally unusable, it would be necessary to tag the equipment as “DO NOT USE” and set aside for either repair, or replacement.

Some minor faults or performance issues can sometimes be resolved easily and quickly by going to the owner’s or operational manuals and taking a look in the ‘troubleshooting’ section.

However again, you would need to seriously think about the level of your mechanical and/or electrical knowledge, skills and capabilities before attempting to repair or rectify any faults or performance issues, even if they seem to be easily resolved or fixed.

SAMPLE



**Learning
Activity****Task****LEARNING ACTIVITY TWO**

Tell us the name of the tools as depicted below.

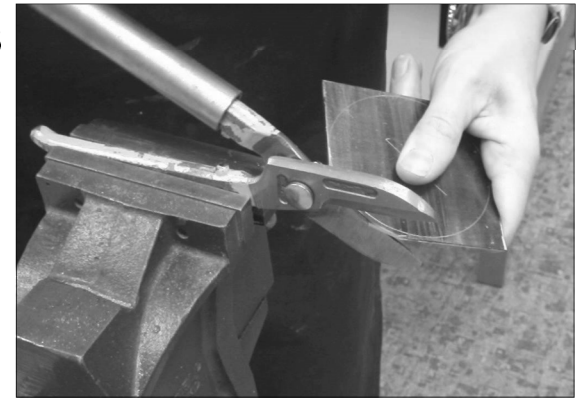
1



2



3



4



5



6



TEACHER / TRAINER GUIDANCE NOTES

- 1—Electric hammer drill
- 2—Angle grinder
- 3—Tin snips
- 4—Drill with hole cutter
- 5—Combination square
- 6—C-clamps

SAMPLE

**Learning
Activity****Task****LEARNING ACTIVITY THREE**

In this activity we want you to list all the types of measuring and marking out tools we mentioned in this Section. (Hint—there were eleven types)

TEACHER/TRAINER GUIDANCE NOTES

- 1) Tape measures
- 2) Chalk lines
- 3) String lines
- 4) Steel rules
- 5) Folding rules
- 6) Carpenter's square
- 7) Engineer's square
- 8) Bevel square
- 9) Combination square
- 10) Spirit levels
- 11) Plumb lines

SAMPLE

**Learning
Activity****Task****LEARNING ACTIVITY FOUR**

To successfully complete this unit of training, you are required to demonstrate your ability to use a selection of hand tools, powered hand tools and some basic construction equipment while doing three different construction tasks.

The tools you will be required to use and be assessed on include:

☆ Hand tools:

- ◆ retractable tape measure
- ◆ builders square
- ◆ string line
- ◆ hand saw
- ◆ hammer
- ◆ chisel
- ◆ trimming knife
- ◆ clamps
- ◆ spirit level
- ◆ tin snips
- ◆ shovel/spade
- ◆ mattock
- ◆ crow bar/fencing bar

☆ Powered hand tools (including pneumatic) and equipment:

- ◆ circular saw
- ◆ reciprocating saw
- ◆ angle grinder
- ◆ drill/driver drill
- ◆ nail gun
- ◆ bench grinder
- ◆ jack hammer
- ◆ extension lead
- ◆ portable residual current device
- ◆ air compressor

In this activity you are to learn and organise three construction tasks you will be given that would require the above mentioned tools and equipment.

Ideally the assessment tasks and activities will be undertaken at work (if you are employed). If this is the case, then your teacher or trainer will provide you with the necessary assessment forms and instructions to give to your employer to fill in and sign as part of your performance assessment evidence.

If the assessment tasks and activities will be undertaken at a training facility, then your teacher or trainer will provide you those three different construction tasks that would require the above mentioned tools and equipment.

TEACHER/TRAINER GUIDANCE NOTES

The assessment requirements for this Unit of Competency states:

Performance Evidence

To demonstrate competency in this unit, a candidate must complete three different construction tasks. Over the course of these three tasks, they must satisfy all the elements, performance criteria and foundation skills of this unit by safely and effectively using and maintaining and/or sharpening each of the following at least once:

☆ Hand tools:

- ♦ retractable tape measure
- ♦ builders square
- ♦ string line
- ♦ hand saw
- ♦ hammer
- ♦ chisel
- ♦ trimming knife
- ♦ clamps
- ♦ spirit level
- ♦ tin snips
- ♦ shovel/spade
- ♦ mattock
- ♦ crow bar/fencing bar

☆ Powered hand tools (including pneumatic) and equipment:

- ♦ circular saw
- ♦ reciprocating saw
- ♦ angle grinder
- ♦ drill/driver drill
- ♦ nail gun
- ♦ bench grinder
- ♦ jack hammer
- ♦ extension lead
- ♦ portable residual current device
- ♦ air compressor

SAMPLE

SELECT AND USE PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR EACH PART OF THE TASK

The handling of construction materials and the use of construction tools and equipment can be hazardous and this would require certain types of 'personal protection equipment', or PPE.

Common PPE used by construction workers could include:

- ☆ **Work gloves** - many construction materials can cause cuts and splinters to the hands, so work gloves are essential when handling construction materials and using some tools and equipment.



- ☆ **Safety boots** - generally work boots are required for all types of building and construction activities. Safety boots with steel toes prevent injuries to the foot from falling tools and materials when handling.



- ☆ **Eye protection** - this would include safety glasses, face shields and sunglasses.

Safety glasses clear



Safety glasses tinted



Face shield



- ☆ **Hearing protection** - required when using many types of construction equipment.

Ear plugs



Ear muffs



- ☆ **Dust masks and respirators** - protect from the dust caused when excavations, sawing or drilling. For prolonged exposure to fumes and dust, respirators are recommended.

Dust mask



Dust respirator



- ☆ **Workwear** - every worker on a building and construction site would need to wear clothing that protects them from all types of hazards.



SAMPLE

- ☆ **Hard hats** - many worksites require the use of hard hats, especially where there is unloading of materials, as well as work being undertaken overhead.



Hard hat with
sun brim and
neck protection

SELECTING AND WEARING PERSONAL PROTECTION EQUIPMENT

When selecting PPE it is very important that:

- ☆ The right type of PPE is selected for the job
- ☆ PPE fits properly and is comfortable under working conditions
- ☆ Be adequately trained in the need for PPE and how to use and maintain it
- ☆ Wear and/or use PPE in accordance with instructions received
- ☆ PPE is stored in a clean and fully operational condition. Store PPE in areas where the equipment will not become damaged or contaminated with dust or chemicals

Selection processes should include:

- ☆ Detailed evaluation of the risk and performance requirements for the PPE
- ☆ Consultation with your supervisor
- ☆ Ensuring compatibility of PPE items where more than one type of PPE is required (e.g.. ear muffs with a face shield)
- ☆ Consideration of workers' medical conditions and fitting requirements
- ☆ Using PPE that complies with the relevant Australian Standard or similar international standard

SAMPLE

**Learning
Activity**

Question

LEARNING ACTIVITY FIVE

1) What were the ten examples of PPE types we mentioned in this Section?

SAMPLE

2) In this section we mentioned the six important points about selecting PPE. What were they?

SAMPLE

TEACHER/TRAINER GUIDANCE NOTES

1)

1. Gloves
2. Safety glasses
3. Face shield
4. Ear plugs
5. Ear muffs
6. Dust mask
7. Dust respirator
8. Safety boots
9. Hard hats
10. Workwear

2)

1. The right type of PPE is selected for the job
2. PPE fits properly and is comfortable under working conditions
3. Be adequately trained in the need for PPE and how to use and maintain it
4. Wear and/or use PPE in accordance with instructions received
5. PPE is stored in a clean and fully operational condition.
6. Store PPE in areas where it will not become damaged or contaminated

SAMPLE



CONDUCT PRE-OPERATIONAL CHECKS TO MANUFACTURERS' SPECIFICATIONS AND USE EQUIPMENT AND HAND, POWER AND PNEUMATIC TOOLS FOLLOWING WHS REQUIREMENTS AND MANUFACTURERS' SPECIFICATIONS

(Over the next few pages we cover two 'Performance Criteria' points at the same time to avoid repetition)

All manufacturers of tools and construction equipment, especially powered hand tools and equipment provide user/owner manuals.

These manuals will provide information on the proper use of the tool and the equipment, how the tool and/or equipment should be maintained, cleaned and stored.

Details in these manuals could include:

- ☆ Pre-use and post-use checks
- ☆ Safety information
- ☆ Accessory maintenance such as blade sharpening, bit sharpening and so on
- ☆ Lubrication (if required)

Of most importance is the manufacturer's information on the correct use of the tools or equipment.

As we have mentioned on a number of occasions, all tools and equipment used by any trade are designed to do a specific task.

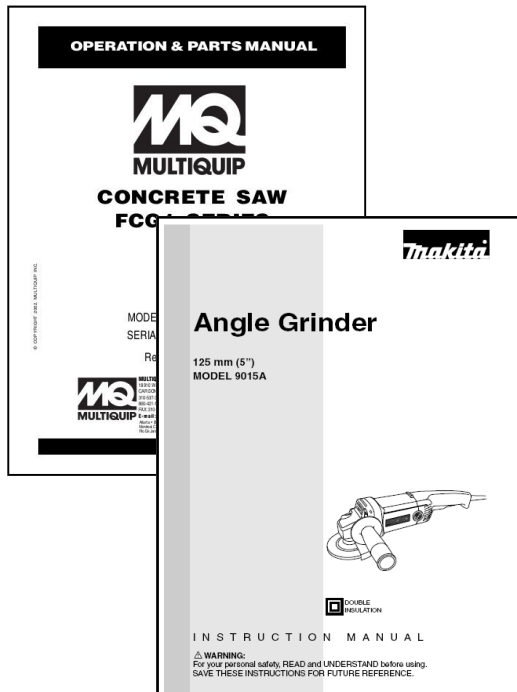
Not using the tool or equipment as they were designed to be used could cause damage to the tool or machine or materials, resulting in low quality job outcomes and even injuries to the users.

An obvious initial task is to ensure that the tool is actually operating and in good condition. This includes the attachments such as guards, blades, disks and drill bits.

These need to be in good condition, sharp and firmly attached.

Any initial inspections of the tool, equipment or attachments may reveal issues and faults.

If this was the case, then the tool should be set aside, tagged 'DO NOT USE' and reported to the most appropriate person using the organisational procedures.



PRE-OPERATIONAL CHECKS

Many tool and construction equipment manufacturers recommend that each user go through a series of checks and inspections before using the tool or the equipment.

These checks ensure that the tool or equipment is not damaged or has any safety issues and that fuel, water and lubrication are at the recommended levels.

This includes any attachments such as blades, discs, drill bits and chisels. These would need to be checked and assured that the blades, chisels and bits are sharp and any grinding discs are not cracked and are tightly attached.

Handles on hand tools would be checked to ensure they are tightly attached and not damaged.

Equipment with tyres would need to be checked for proper inflation and other items, such as wheel bearing condition.

All electrical cords and plugs are checked and ensured that there are no frays, cuts or other damage.

Guards and other safety devices are checked to ensure they are fully operational.

Fasteners such as nuts and bolts are checked and tightened if required and all belts, chains and gears are checked and adjustments made as per the manufacturer's recommendations.

If recommended by the manufacturer, the tools or equipment may require lubrication. Lubrication points and the type of lubrication would be outlined in the manufacturer's user/operators manuals.

Air hoses and compressed air connections would need to be checked. Air compressor's air filter and other filters would need to be checked, cleaned or replaced and the tank drained of water.

SAMPLE



FUEL POWERED EQUIPMENT GENERIC CHECKLIST

As you will be aware some equipment used in construction jobs are powered by petrol engines

These could include:

- ☆ Portable generators
- ☆ Air compressors
- ☆ Concreting equipment
- ☆ Material handling equipment

Depending on the size and type of the equipment, a standard pre-operational checklist will generally include:

- ☆ **Engine oil** – check levels and top up if required
- ☆ **Fuel** - check levels and top up if required
- ☆ **Fuel system** – look for leaks, check filters
- ☆ **Drive chain** – check for wear, freeplay and alignment. This includes chains and belts.
- ☆ **Throttle** - ensure operational, check cables and adjustments
- ☆ **Air intake** – check air filters, clean or replace if necessary
- ☆ **Spark plugs** – check, clean or replace if necessary
- ☆ **Battery** – check levels, terminals and cable conditions
- ☆ **Wheels** – check rim condition, check spoke condition
- ☆ **Tyres** – check pressures, tyre wear or damage
- ☆ **Exhaust system** – check for leaks, sparks, debris
- ☆ **Fitting and accessories** – ensure secure, tighten pins, nuts and bolts, etc.
- ☆ **Guards**—ensure they are installed, tightened and not damaged

Any problems that make a piece of equipment or machinery unusable or unsafe, should not be used and tagged 'DO NOT USE'.

The issues or problems would need to be reported to the supervisor and they would need to determine whether the equipment is to be repaired, or replaced.

Never attempt to repair fuel powered equipment without a significant amount of mechanical training or expertise.



SHARPENING AND MAINTAINING TOOLS

Construction tools and equipment all need to be maintained if they are to remain in good and safe condition.

Every powered hand held tool requires some level of maintenance as does construction equipment.

The proper operation and life span of any tool and/or equipment relies heavily on the ongoing servicing and maintenance of the tool.

Servicing and maintenance of powered hand held tools and equipment can be categorised in two ways:

- 1) Routine
- 2) Scheduled

☆ **Scheduled** - Scheduled servicing and maintenance is a set time period or hours of usage where the manufacturer suggests certain tasks be performed on the powered hand held tool or equipment. The schedule could be based on:

- ◆ Hours of operation
- ◆ Calendar scheduling such as once a month, every six months, or yearly

This type of servicing can either be performed by the owner (if they have the mechanical skills to do so), or by a trained service technician. Scheduled servicing and maintenance is more thorough and sees several parts or components completely replaced.

☆ **Routine** - Routine servicing and maintenance is less thorough and is generally performed after each day's use at random periods when work is slow.

Routine servicing generally involves looking a critical parts such as guards, nuts and bolts, cables, blades and attachments, as well as the lubrication.

Some routine servicing or maintenance can be required while actually using the tool or equipment. This need could be a result of the tool/equipment not performing properly, or has sustained minor damage.



CLEANING

Power tools and equipment generally are used to remove materials while sawing, drilling or sanding.

Dust, dirt, flakes and/or chips can possibly be lodged into the tools and parts of equipment.

This can clog the cooling vents to cause the tool or machine to overheat and interfere with the electrical contacts and/or brushes in the electric motor as a result causing the motor to lose power, or even cease operating.

Air filters and oil filters need to be checked as well for dust and dirt collection and cleaned, or replaced.

Regular cleaning while performing the tasks, definitely after use and before storing is important.

The exterior of the tool or machine should be cleaned of dirt, grease and grime, especially the grips and handles. Greasy handles are a safety hazard.

For major cleaning and maintenance tasks, such as motor or engine parts, it is advisable that a trained technician or mechanic does this.



LUBRICATION

The owner's manual usually tells the operator when and where to lubricate a powered hand tool and any moving parts of construction equipment.

Lubrication is important and also equally as important, is using the proper lubrication.

The lubrication of air powered tools needs to be performed regularly.

This ensures that the moving parts of the tool can move freely. They contain air seals and gaskets that need to be kept pliable with lubricants. There are specially developed air tool oils available.

The owner's manual must again be referred to as to when and how to lubricate the tool, as well as what type of lubricant to use.

Owner's manuals will also show lubrication points on construction equipment, as well as when they should be done. It is very important that the instructions of the manufacturer are followed when lubricating machines.

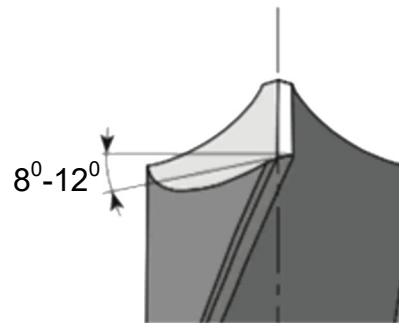


SHARPENING DRILL BITS

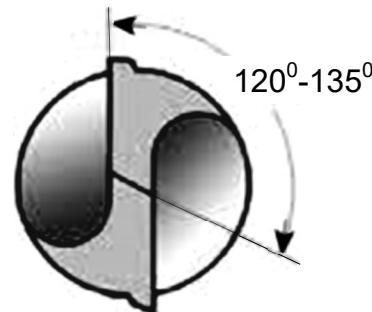
Three factors must be considered when sharpening a drill bit:

The first is the 'lip' clearance. The two cutting edges, or lips are comparable to chisels.

To cut effectively, you must relieve the heel or that part of the point back to the cutting edge. Without this clearance, it would be impossible for the lips to cut. If there is too much clearance, the cutting edges are weakened.



Too little clearance results in the drill point merely rubbing against the material without penetration. Gradually increase lip clearance toward the centre until the line across dead centre stands at an angle of 120 to 135 degrees with the cutting edge.

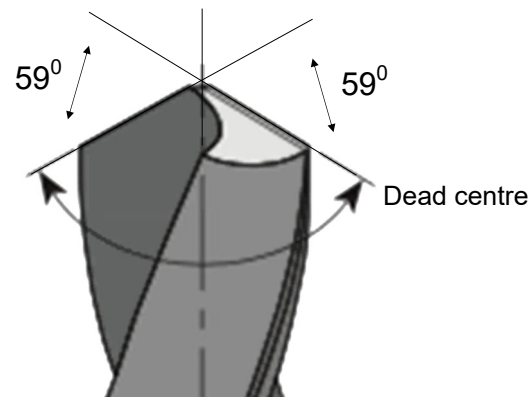


Second is the length and angle of the lips.

Fifty-nine degrees is the most common for most drilling needs. The angles, in relation to the axis, must be the same. If the angles are unequal, only one lip will cut and the hole will be oversize.

The third factor is the proper location of dead centre.

Equal angles with lips of different lengths will result in oversize holes and will cause 'wobbling' that places tremendous pressures on the drill spindle and bearings.



A combination of both wrong angles and an off centre drill point can result in a broken drill bit and if the drill bit is very large, permanent damage to the tool. The hole produced will be oversized and often out-of-round.

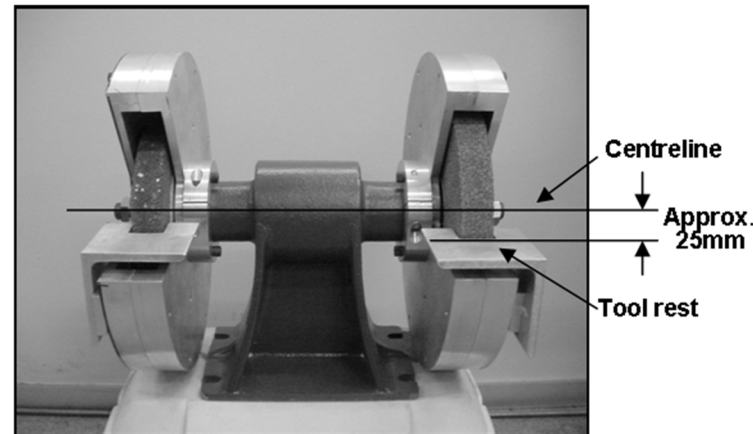
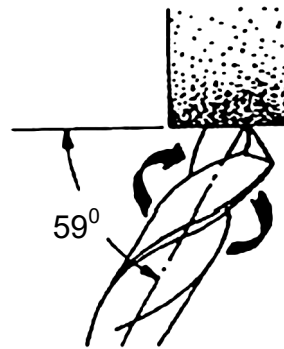
SAMPLE

The drill steps start with a coarse grinding wheel for roughing out the drill point if much metal must be ground away.

Then the sharpening is completed using a fine grinding wheel.

Many hand sharpening techniques have been developed. The following are recommended:

1. Grasp the drill shank with the right hand and the rest of the drill bit with the left hand.
2. Place the fingers of the left hand that are supporting the drill bit on the grinder tool rest. The tool rest should be slightly below centre of the wheel.



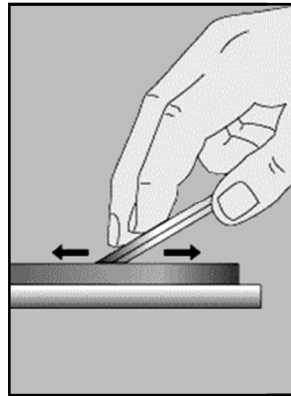
3. Stand so the centreline of the drill bit will be at a 59-degree angle with relation to the centreline of the wheel and lightly touch the drill lip to the wheel in approximately a horizontal position.
4. Use the left hand as a pivot point and slowly lower the shank with the right hand. Increase the pressure as the heel of the lip (back of the lip) is ground to ensure proper clearance.
5. Repeat the operation on each lip until the drill bit is sharpened.
6. Check the drill tip frequently with the drill point gauge to assure a correctly sharpened drill bit.

SHARPENING CHISELS

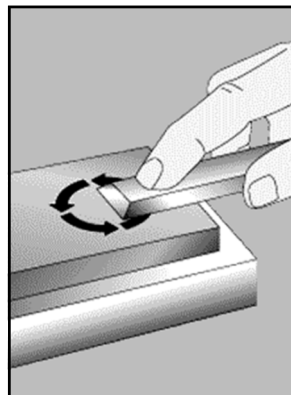
The sharpening of chisels is a skill that takes practice. Many times these tools are taken to a professional sharpening business. However with practice, sharpening these tools can be done by the worker.

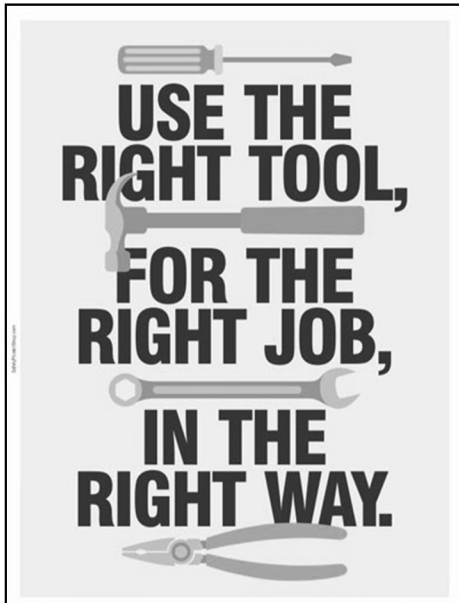
Sharpening involves two steps -- grinding and honing. Grinding, shapes the tool by removing metal back from the edge. Honing removes metal right at the edge.

One simple technique to sharpen a chisel is to drip a pool of oil on a whetstone. Brace the whetstone firmly on a flat surface. Hold the chisel bevel-face-down, at an angle slightly steeper than the bevel, so you are not grinding the entire bevelled face. Grind by pressing gently and moving back and forth.



Turn the chisel over and lay its flat side on the whetstone. Add more oil if the stone is dry, or if a thick paste has built up. Hone the flat side by pressing gently, moving the chisel with a circular motion. You don't want to grind a new cutting edge on this side; only remove the burrs created after grinding the bevelled face.





USING HAND TOOLS SAFELY

Although there are laws and regulations relating to workplace health and safety, safety is a state of mind.

A person should consider the following general safety guidelines when using any type of hand tools:

- ☆ Is the tool in good condition?
- ☆ Is it the right size for the job?
- ☆ Is it in the proper working condition?
- ☆ Every tool was designed to do a certain job. Use it for its intended purpose.
- ☆ Keep your tools in good condition: sharp, clean, oiled, dressed and not abused.
- ☆ Worn tools are dangerous. For example hammer heads can fly off loose handles.
- ☆ Tools subject to impact (chisels, punches, hammer heads, etc.) tend to 'mushroom'. Keep them dressed (sharpened) to avoid flying spalls. Use tool holders.
- ☆ Do not force tools beyond their capacity.
- ☆ Chisels, screwdrivers or other pointed tools should never be carried in clothing pockets. Use tool belts designed for carrying tools.
- ☆ Hammers should have heads ground properly. Should not have broken claws or handles. Check for loose handles. Always use the proper size and weight for the job.
- ☆ Cutting tools should be kept sharp to ensure good smooth cutting. Always use proper handles.
- ☆ Always wear the personal protection equipment (PPE) required for the job. Protect your eyes, hands, ears and other body parts. Keep clothing out of your work.

SAMPLE

POWERED HAND TOOL SAFETY

Failing to properly use and maintain electric-powered tools causes thousands of cuts, punctures, pinches, amputations and electrocutions each year. Tools can seriously injure or kill the user if not properly maintained or used.

Everyone who uses tools must learn to recognise the hazards associated with the different types of tools and the safety precautions necessary to prevent those hazards.

Following the guidelines below, along with using your own good judgment will help keep you safe.

Before you use a tool:

- ☆ Know the application, limitation, and potential hazards of the tool. Operate according to the manufacturer's instructions.
- ☆ Inspect the cord for the proper type. Electric-powered tools must either have a three-wire cord with ground, or be double insulated. Never use a plug that has its ground prong removed.
- ☆ Inspect the tool for frayed cords, loose or broken switches, and other obvious problems. Tools that fail this inspection must not be used. These must be removed from service and labelled 'Do Not Use' until repairs are made.
- ☆ Never modify a tool to use for a job it's not intended to do.

When using the tool:

- ☆ Do not use electric-powered tools in damp or wet locations.
- ☆ Keep guards in place, in working order, and properly adjusted. Safety guards must never be removed when the tool is being used.
- ☆ Avoid accidental starting. Do not hold a finger on the switch button while carrying a plugged-in tool.
- ☆ Safety switches must be kept in working order and must not be modified. If you feel it necessary to modify a safety switch for a job you're doing, use another tool.
- ☆ Work areas should have adequate lighting and be free of clutter.
- ☆ Observers should remain a safe distance away from the work area.
- ☆ Be sure to keep good footing and maintain good balance.
- ☆ Do not wear loose clothing, ties, or jewellery when operating tools.
- ☆ Wear appropriate gloves and footwear while using tools.



EQUIPMENT SAFETY

As with all other types of tools used in the building and construction industries, the use of tiling equipment requires no less an awareness of safety. In this section we looked at various types of powered equipment. The following points are a safety summary relating to the use of such equipment:

- ☆ Only qualified operators should use any tiling equipment
- ☆ The equipment should only be used for purposes in which it was designed for
- ☆ The owners and operators manuals should be read and fully understood before operating any type of equipment
- ☆ All pre-operational checks must be done to ensure proper and safe use
- ☆ All equipment must be maintained and repaired according to the manufacturer's recommendations
- ☆ Any equipment that is damaged, in disrepair, or malfunctioning must not be used and this equipment tagged as being unusable
- ☆ No equipment should be repaired by any unqualified person
- ☆ All repairs including parts must be in line with the manufacturer's recommendations
- ☆ All operators are required to wear suitable personal protection equipment including eyes, hearing, feet and body protection
- ☆ All equipment must be operated with the safety of the other workers and the safety of the general public in mind
- ☆ Proper safety signs and barricades must be erected whenever possible
- ☆ Safe re-fuelling practices must be adhered to including outdoors or ventilated area re-fuelling, no smoking and proper spillage clean up
- ☆ All equipment must be cleaned and stored safely when not in use

SAMPLE

**Learning
Activity****Question****LEARNING ACTIVITY SIX**

Depending on the size and type of the fuel powered equipment, a standard pre-operational checklist will generally include thirteen items. What are they?

TEACHER / TRAINER GUIDANCE NOTES

- 1) Engine oil
- 2) Fuel
- 3) Fuel system
- 4) Drive chain
- 5) Throttle
- 6) Air intake
- 7) Spark plugs
- 8) Battery
- 9) Wheels
- 10) Tyres
- 11) Exhaust system
- 12) Fitting and accessories
- 13) Guards

**Learning
Activity****Task**

SAMPLE

LEARNING ACTIVITY SEVEN

In Activity Four, you were informed of the assessment requirement of this training unit, specifically the use of a number of different types of tools and tiling equipment.

In this activity we want you to pick two 'powered' tools or types of equipment (could be one of each) and locate the manufacturer's user manual for each.

The choice is yours and once you have located the manuals, either download the manuals and save them or print them out and keep on file in some manner, such as a training filing portfolio.

Then inform your teacher that you have obtain these manuals. The teacher or trainer will decide on how you will provide evidence of having the manuals.

In the space below tell us what the name of the tool or equipment is, as well as the brand and model.

1) Tool/equipment name _____

Brand and model _____

2) Tool/equipment name _____

Brand and model _____

TEACHER/TRAINER GUIDANCE NOTES

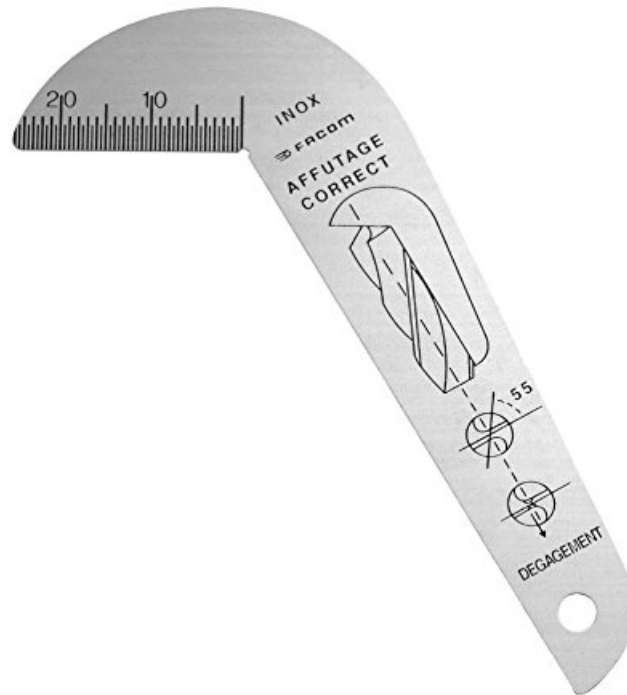
The assessment requirements for this unit of training states:

Performance Evidence

- ☆ Use of all tools must be to the standard required in the workplace and use must comply with work health and safety (WHS) requirements and manufacturers' specifications.

**Learning
Activity****Question****LEARNING ACTIVITY EIGHT**

What is the item pictured below called?

**TEACHER / TRAINER GUIDANCE NOTES**

It is a drill gauge.

**Learning
Activity****Task****LEARNING ACTIVITY NINE**

To successfully complete this unit of training, you are required to demonstrate your ability to grind, sharpen and hone a chisel.

Ideally the assessment tasks and activities will be undertaken at work (if you are employed). If this is the case, then your teacher or trainer will provide you with the necessary assessment forms and instructions to your employer to fill in and sign as part of your performance assessment evidence.

If the assessment tasks and activities will be undertaken at a training facility, then your teacher or trainer will provide you those three different construction tasks that would require the above mentioned tools and equipment.

TEACHER/TRAINER GUIDANCE NOTES

The assessment requirements for this Unit of Competency states:

Performance Evidence

- ☆ Over the course of these three tasks, they must satisfy all the elements, performance criteria and foundation skills of this unit by safely and effectively using and maintaining and/or sharpening...

SAMPLE

**Learning
Activity****Question****LEARNING ACTIVITY TEN**

What were the nine safety tips outlined in this Section that related to the safe use of powered hand tools?

TEACHER / TRAINER GUIDANCE NOTES

- 1) Do not use electric-powered tools in damp or wet locations
- 2) Keep guards in place, in working order and properly adjusted.
- 3) Avoid accidental starting
- 4) Safety switches must be kept in working order and must not be modified
- 5) Work areas should have adequate lighting and be free of clutter
- 6) Observers should remain a safe distance away from the work area
- 7) Be sure to keep good footing and maintain good balance
- 8) Do not wear loose clothing, ties, or jewellery when operating tools
- 9) Wear appropriate gloves and footwear while using tools

SAMPLE

**Learning
Activity****Question****LEARNING ACTIVITY ELEVEN**

What were the thirteen basic safety rules of operating equipment we reviewed in this Section?

TEACHER/TRAINER GUIDANCE NOTES

- 1) Only qualified operators should use any tiling equipment
- 2) The equipment should only be used for purposes in which it was designed for
- 3) The owners and operators manuals should be read and fully understood
- 4) All pre-operational checks must be done to ensure proper and safe use
- 5) All equipment must be maintained and repaired according to the manufacturer's recommendations
- 6) Any equipment is damaged, in disrepair or malfunctioning must not be used and tagged as being unusable
- 7) No equipment should be repaired by any unqualified person
- 8) All repairs including parts must be in line with the manufacturer's recommendations
- 9) All operators are required to wear suitable personal protection equipment
- 10) All equipment must be operated with the safety of the other workers and the general public
- 11) Proper safety signs and barricades must be erected whenever possible
- 12) Safe re-fuelling practices must be adhered
- 13) All equipment must be cleaned and stored safely when not in use

**Learning
Activity****Task****LEARNING ACTIVITY TWELVE**

As you know, to successfully complete this unit of training, you are required to demonstrate your ability to use a selection of hand tools, powered hand tools and some basic carpentry equipment while doing three different construction tasks.

In Activity Four we listed the tools and equipment you are to use while doing those three different construction tasks.

In this activity you are to start those construction tasks and start using tools and equipment so as you are able to be assessed in your abilities in using those tools and equipment.

Ideally the assessment tasks and activities will be undertaken at work (if you are employed). If this is the case then your teacher or trainer will provide you with the necessary assessment forms and instructions to give to your employer to fill in and sign as part of your performance assessment evidence.

If the assessment tasks and activities will be undertaken at a training facility, then your teacher or trainer will provide you those three different construction tasks that would require the tools and equipment as outlined earlier.

SAMPLE

TEACHER/TRAINER GUIDANCE NOTES

The assessment requirements for this Unit of Competency states:

Performance Evidence

To demonstrate competency in this unit, a candidate must complete three different construction tasks. Over the course of these three tasks, they must satisfy all the elements, performance criteria and foundation skills of this unit by safely and effectively using and maintaining and/or sharpening each of the following at least once:

☆ Hand tools:

- ♦ retractable tape measure
- ♦ builders square
- ♦ string line
- ♦ hand saw
- ♦ hammer
- ♦ chisel
- ♦ trimming knife
- ♦ clamps
- ♦ spirit level
- ♦ tin snips
- ♦ shovel/spade
- ♦ mattock
- ♦ crow bar/fencing bar

☆ Powered hand tools (including pneumatic) and equipment:

- ♦ circular saw
- ♦ reciprocating saw
- ♦ angle grinder
- ♦ drill/driver drill
- ♦ nail gun
- ♦ bench grinder
- ♦ jack hammer
- ♦ extension lead
- ♦ portable residual current device
- ♦ air compressor

SAMPLE

Section Two

Clean up

SAMPLE

USE CONSTRUCTION TOOLS AND EQUIPMENT

SECTION TWO—CLEAN UP

INTRODUCTION

Any construction job is not complete until the work area is cleaned up and all the tools and equipment cleaned and stored away.

In this final section we look at these two topics.

SECTION LEARNING OBJECTIVES

At the completion of this section you will learn information relating to:

- ☆ Cleaning up, meeting all legislative and workplace requirements for safety, waste disposal and materials handling
- ☆ Checking, maintaining and/or sharpening, storing and securing tools and equipment and reporting any faults

SAMPLE

CLEAN UP, MEETING ALL LEGISLATIVE AND WORKPLACE REQUIREMENTS FOR SAFETY, WASTE DISPOSAL AND MATERIALS HANDLING

As part of a construction project, the contractor and their workers are required to clear the work area of any materials left over, including building materials waste.

Most worksites will use building material waste bins (known also as skips). These would be regularly picked up and dumped at approved landfill sites.

Some construction materials at the end of a job are not always considered waste.

Many contractors have an arrangement with the supplier in place to take back any new materials that were not used on the job.

If the materials are commonly used by the contractor, the excess materials would generally be transported to a storage location or to another job site for use.

To avoid having to do this, initial care in estimating the quantities of materials for the job will assist in the minimisation of waste.

Some worksites may have specific bins where recyclable materials are separated into.

Packaging material will often be placed in the waste bin on site. Some contractors now insist that pallets are only strapped and not shrink wrapped. This significantly cuts down on the amount of plastic packaging to dispose of.

The site supervisor will inform the workers on what is required when clearing their work area and how to deal with any waste materials.

WASTE MANAGEMENT AND MINIMISATION PLANS

A Waste Management and Minimisation Plan is a plan prepared by building contractors:

- ☆ To encourage waste avoidance, source separation, reuse and recycling
- ☆ To ensure appropriate storage and collection of waste and recyclable material in order to reduce waste to landfill

Most, if not all, local government or councils require a plan before a development or construction permit or approvals are given.

A Waste Management and Minimisation Plan provides details of the following:

- ☆ The volume and type of waste to be generated
- ☆ How waste is to be stored and treated onsite
- ☆ How residual is to be disposed of
- ☆ How ongoing waste management will operate

This plan will assist site managers and workers in planning necessary waste management procedures. It has also shown that the time spent planning waste minimisation and management is a cost-saving measure for the contractors.

All Waste Management and Minimisation Plan are based on the 'Hierarchy of Waste'.

It starts with the most desirable outcome being 'Avoid or Prevent' waste altogether...zero waste. If this is not possible then you would work toward 'Reusing' or at least try and 'Recycle/Reprocess' waste. The least desirable outcome would be 'Disposal'.

Hierarchy of Waste

Avoid/Prevent

Reuse

Recycle/
Reprocess

Disposal

**Learning
Activity****Research****LEARNING ACTIVITY ONE**

In this Section we mentioned 'Waste Management and Minimisation Plans'. We also mentioned that most if not all local government councils require contractors to develop a 'Waste Management and Minimisation Plan' before being granted development permits or approvals.

In this activity we want you to do some research and locate documentation about 'Waste Management and Minimisation Plans' in your own local area.

If there is no such documentation available in your local council or local government, then research another council until you find some documentation about 'Waste Management and Minimisation Plans'.

Once you have found the documentation, print a copy out and present this to your teacher or trainer for review and discussion.

TEACHER/TRAINER GUIDANCE NOTES

This activity will provide the student or trainee some insight into 'Waste Management and Minimisation Plans' and how the local government councils require builders/contractors/developers to develop a 'Waste Management and Minimisation Plan'.

SAMPLE



CHECK, MAINTAIN AND/OR SHARPEN, STORE AND SECURE TOOLS AND EQUIPMENT AND REPORT ANY FAULTS

After a construction project has been completed, as part of clearing out of the work area is the handling of the tools and equipment.

Equipment, such as those mentioned in the previous section would need to be cleaned and checked as per the owners/operating manuals. Checking would likely include:

- ☆ Any damage from use
- ☆ Electrical cords and plugs
- ☆ Hoses and connections
- ☆ Tightness of belts, nuts and other fasteners

Any damage should be noted down and reported to the site supervisor. If the damage is enough to require repairs, the piece of equipment should be tagged 'DO NOT USE'.

With some equipment, the manuals may recommend lubrication before being placed into storage. Storing equipment would also be done as per the recommendations outlined in the owners/operating manuals.

Powered hand tools such as saws, drills or angle grinders would need to be cleaned and checked for damage. Cleaned powered hand tools should be placed in a tool case for safe transport.

Hand tools such as hammers, hand saws, chisels and so on would also need to be cleaned and checked especially the handles. Wooden handles would need to be tightly fixed, and without any splinters.

Any hand and powered hand tools that are damaged would need to be tagged and set aside for repair or replacement.

Any tools and equipment found to be faulty or damaged and set aside, need to be reported as per the organisational reporting procedures.

In Section One we learned that some hand tools and drills need sharpening. This can be done before the tools are placed in storage.

**Learning
Activity****Research****LEARNING ACTIVITY TWO**

In this activity we want you to do some research and locate copies of owners/operating manuals for the following equipment:

- ☆ Petrol driven generator
- ☆ Onsite air compressor

Once you have located each, print out the page(s) that outline what should be done after use and storage recommendations.

Once you have this information, present the pages to your teacher or trainer for review and discussion.

TEACHER/TRAINER GUIDANCE NOTES

This activity will show how owners/operating manuals present maintenance and storage recommendations for basic construction equipment.

SAMPLE

**Learning
Activity****Task**

SAMPLE

LEARNING ACTIVITY THREE

Below is a list of some hand tools. Each has a space provided where we want you to summarise what the tool's storage recommendations are. This may take some research.

Wheelbarrow**Chisels****Power leads****Retractable steel measuring tape**

TEACHER/TRAINER GUIDANCE NOTES

This activity will assist the student or trainee satisfy the assessment requirements for a specific 'Performance Criteria' being:

'Check, maintain and/or sharpen, store and secure tools and equipment and report any faults'

SAMPLE

**Learning
Activity****Task****LEARNING ACTIVITY FOUR**

As we have learned, faulty and damaged tools and equipment need to be set aside and tagged 'DO NOT USE'.

We also learned that tool issues need to be reported. The reporting procedures are often done following organisational procedures.

In this activity we want you to summarise what reporting procedures are in place at your place of employment or training facility for tools and/or equipment issues.

Summary**TEACHER/TRAINER GUIDANCE NOTES**

This activity will assist the student or trainee satisfy the assessment requirements for a specific 'Performance Criteria' being:

'Check, maintain and/or sharpen, store and secure tools and equipment and report any faults'

SELF ASSESSMENT

Self assessment is where you ask yourself certain questions to ensure you have understood what you have learned while reading this manual and completing the learning activities.

This unit requires you the student or trainee at the completion of your training to have a certain level of 'Required Knowledge' in which you would need to have acquired and in which you will be assessed on. This self assessment section reviews this required knowledge by way of questions and if you are able to say YES to all of them you can be confident your assessment will be satisfactory.

- ☆ This training unit had two sections each focussing on areas relating to the of construction tools and equipment.
- ☆ After reviewing the information in Section One, are you confident that you understand and could:
 - 1) Review work instructions for a construction task?
 - 2) Select equipment and hand, power and pneumatic tools for the construction task, identify functions and operations, check for serviceability and report any faults?
 - 3) Select and use personal protective equipment (PPE) for each part of the task?
 - 4) Conduct pre-operational checks to manufacturers' specifications?
 - 5) Use equipment and hand, power and pneumatic tools following WHS requirements and manufacturers' specifications?
- ☆ After reviewing the information in Section Two, are you confident that you understand and could:
 - 1) Clean up, meeting all legislative and workplace requirements for safety, waste disposal and materials handling?
 - 2) Check, maintain and/or sharpen, store and secure tools and equipment and report any faults?

If there were any questions that you were unable to confidently say YES to, we encourage you to review the information again in this manual and if needed seek the assistance of your teacher or trainer.

SAMPLE

POWERPOINT SLIDE PRESENTATION MAPPING

This training manual is accompanied with a PowerPoint slide presentation, titled the same as this training manual.

The following listing is a 'mapping cross-reference' between the Slide Number and the corresponding page number in the 'Student Manual'.

<i>Slide Numbers</i>	<i>Student Manual Page Number</i>	<i>Slide Numbers</i>	<i>Student Manual Page Number</i>
Slide Number 4	Page 11	Slide Number 16	Page 58
Slide Number 5	Page 12	Slide Number 17	Page 59
Slide Number 6	Page 15-20	Slide Number 18	Page 59
Slide Number 7	Page 21-30	Slide Number 19	Page 60-62
Slide Number 8	Page 31-39	Slide Number 20	Page 60-62
Slide Number 9	Page 40-43	Slide Number 21	Page 63
Slide Number 10	Page 44	Slide Number 22	Page 64
Slide Number 11	Page 45	Slide Number 23	Page 65
Slide Number 12	Page 49-51	Slide Number 24	Page 66
Slide Number 13	Page 52	Slide Number 26	Page 77
Slide Number 14	Page 55-56	Slide Number 27	Page 78
Slide Number 15	Page 57	Slide Number 28	Page 79