USE HAND AND POWER TOOLS

LEARNER GUIDE

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1.0 COMPLIANCE DOCUMENTATION

Refer trade basics

1.4.3.1 MATERIALS HANDLING

Materials handling is the movement of materials around a worksite safely and efficiently. It involves a variety of methods and different equipment depending on the type of materials that need to be moved.

Some of the more common types of material handling equipment include:

You need to have a good working knowledge of how to stack and store items as well as how to move them. This is necessary to minimise the risk of falling objects.

Materials handling can also involve landscaping, excavating, or demolition. In these cases, the materials would be things such as dirt, sand, rocks, broken masonry or debris. Trucks, bulldozers and other heavy equipment are used to move these materials.

Ensure that you refer to the relevant Materials Safety Data Sheet (MSDS) for the materials handling methods required for your site and for each task.

1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

Before carrying out any work with hand and power tools it is important to be aware of, and apply, any environmental protection requirements for the worksite.

1.5.1.3 NOISE CONTROL

Noise reduction and control methods may include:

- Restricted hours of operation whenever possible so work does not occur between 10pm and 7am.
- Use of local power sources to reduce the use of generators.
- Noise-deadening materials such as rubber to line the inside of bins.
- Noise barriers, screens or enclosures to reduce the noise from activities.
- Use of personal protective equipment for those on site, such as earmuffs or ear plugs when using power tools.

1.5.1.4 VIBRATION CONTROL

Vibration control techniques may include:

- Use of deep saw-cuts to minimise the transmission of vibrations from pavement-breaking operations to the foundations of nearby structures.
- Use of concrete cutters on pavement surfaces instead of pavement breakers, where practical.
- Use of vibratory rather than impact pile drivers where feasible for the installation of retaining walls and other structural elements.
- Conducting vibration monitoring during highly disruptive construction activities, such as pile driving and drilling, particularly if situated within 30m of a sensitive receptor.

- Scheduling of work to limit night time impacts in residential areas.
- Heightened attention and controls when working in Historic Districts and near historic structures.
- Minimisation of the duration of vibration impacts.

1.5.1.5 CLEAN UP MANAGEMENT

Clean up management will be discussed in a later section. It may include:

- Sorting unused or leftover materials and debris for recycling.
- Collecting and appropriately storing all rubbish until collection.

- Providing bins on site for these materials.

1.5.1.6 DUST MANAGEMENT

Dust control techniques may include:

- All vehicles transporting soil to/from the worksites having their loads covered to minimise spillage and fugitive dust.
- Gravel cover applied to soil (unpaved) surfaces where there is regular traffic on and off the worksite.
- Vehicle wheels cleaned as necessary prior to leaving sites to control tracking.
- Water or a dust/erosion control agent applied as necessary by truck to unpaved surfaces used for trucking during dry weather conditions.
- Dust screens used as feasible.
- All piles of soil and aggregate that could cause dust generation through wind erosion to be covered with a tarp or watered-down regularly.

- Regular clean up of all materials deposited on public roadways and sidewalks from construction-related activities.
- Using labourers and/or street-sweeping equipment where necessary to clean paved surfaces.
- All stockpiles of soils designated for reuse placed on, and covered with, waterproof material until removed for placement elsewhere.

2.1 SELECT HAND TOOLS FOR THE TASK

All hand tools are designed to be used for a particular job. Once you have identified the requirements of the task to be undertaken, you need to select the hand tools most appropriate to that task.

2.1.1 COMMON HAND TOOLS

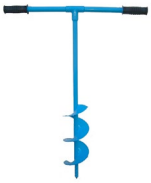
The table below shows some examples of common hand tools:

<table>
<tr><th colspan="4">Cutting Tools</th></tr>
<tr><td> 
Bolt cutters.</td><td> 
Wire cutters.</td><td> 
Axes.</td><td> 
Hacksaws.</td></tr>
<tr><td colspan="2"> 
Handsaws.</td><td colspan="2"> 
Retractable cutters.</td></tr>
</table>

Tightening Tools		
 Adjustable spanners.	 Pliers.	 Wrenches.
 Spanners.	 Screwdrivers.	

Impact Tools		
 Hammers.	 Chisels.	 Files.

Measuring Tools	
 Measuring tapes.	 Spirit levels.

Digging/Leverage Tools		
 Crowbars.	 Pinch bars.	 Mattocks.
 Spades.	 Shovels.	 Picks.
 Sledgehammers.	 Rakes.	 Hand augers.

Securing/Clamping Tools	
 Clamps.	 Vices.

In order to select the appropriate hand tools for a particular task, it is important that you have a good understanding of each hand tool and its application.

Understanding a hand tool's application may include being aware of its intended uses, and also how it can be applied to the tasks on your worksite.

If you are unsure about the function of a specific tool you should ask your supervisor or an experienced worker.

2.2 CHECK HAND TOOLS BEFORE USE

Before using any hand tools you need to make sure they are in safe working order.

Check for any obvious signs of damage or wear. For example:

- Check the condition of a hacksaw blade before using it.
- Check for splits or cracks in the wooden handles of sledgehammers, shovels or axes.
- Check the head of the hammer is securely fastened to the handle.
- Check the electrical safety/inspection tag for currency.
- Check for any equipment defect identification.
- Conduct an assessment of conditions and hazards and determination of work requirements.

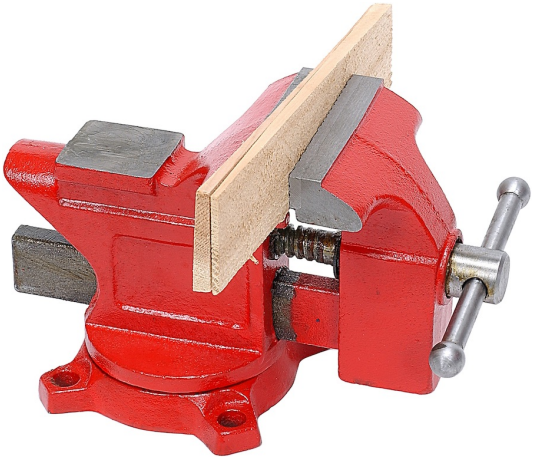
If you find a fault or defect with the tools and equipment, you will need to record and report it in accordance with your worksite requirements.

If you use your own tools you will need to check over them regularly and replace any defective equipment before starting work.

You also need to make sure that using the particular tool you have selected will not cause a hazard because of work conditions. For example, it may not be appropriate to be swinging a sledgehammer where there is somebody working in very close proximity to you.

Where possible you need to isolate your work environment while using any tools for your own safety and the safety of those around you.

2.3 CLAMP OR FIX MATERIALS INTO POSITION



Once you are ready to begin work you may need to clamp or fix the materials you are working with into position.

Materials that commonly require fixing into position include:

- Wood.
- Metal.
- Plastic.

Materials may be secured by way of a clamp, vice or other means as required. When selecting a clamp to secure materials you will need to consider:

- Is the clamp strong enough for the task?
- Will the clamp damage the materials?

It is important to fix materials into position to avoid mishaps while using hand tools and to efficiently complete the task.

Other materials such as rock and concrete may also be commonly used within your industry.

The materials you will be working with may vary depending upon the area of the industry you are working in.

It is important that you ensure you are comfortable working with the materials that are commonly found on your worksite.

2.4 USE HAND TOOLS

Once materials are fixed into position as required you can use the specified hand tools safely and effectively to complete the required task.

All hand tools must be used in accordance with the manufacturer's specifications for the tool. This includes taking note of the technical capabilities and limitations of the tools in use. In other words, the tools need to be used for the tasks they were designed for.

2.4.1 SAFE AND EFFECTIVE USE OF HAND TOOLS

Using hand tools properly will keep them in good condition and help you to complete the task efficiently and without incident.

Pay attention to what you are doing! It can be very easy to injure yourself by being careless or trying to take shortcuts.

Some other things to consider for the safe and effective use of hand tools include:

- **Think about your body** – Are you in a comfortable position? Are you trying to shift or move loads of materials that are too heavy? Are you stretching or straining to hold materials or tools in the correct position?
- **Think about the task** – Does the job seem too difficult? Have you selected the right type of tools to do it?
- **Take your time** – Don't rush, or you may find yourself rushing to the hospital!

- **Confirm your requirements** – Do you know what you are doing? Could you hurt yourself or damage something by doing the job the wrong way?
- **Get help when you need it** – Asking somebody to lend a hand for a couple of minutes could save you time and help you to get the job done properly.

In some situations you may find yourself trying to take a shortcut by using whatever tool is in your hand instead of making the effort to source the right one. This is a bad habit to get into and may lead to accidental damage to the tool or material, or injury to yourself or others.

The main thing to remember when using hand tools is to use the correct tools that are designed for the task you are completing.

2.5 SAFE TOOL STORAGE

Whenever you are not using a hand tool, it should be placed out of the way in a designated place. This will not only ensure that the tool will not cause a hazard for you or anybody else, but will allow you (and others) to be able to locate the tools when required.

Commonly this would mean putting them back into a toolbox or on a rack or bench where they are normally stored.

3.1 SELECT POWER TOOLS FOR THE TASK

Some tasks require a bit more power and speed than you can achieve with hand tools. In these instances you will need to select the power tools and related equipment most appropriate to the task.

3.1.1 COMMONLY USED POWER TOOLS

Commonly used power tools on a worksite can include:

Power Tools	
 Kanga hammers – used for breaking thin concrete and pavers.	 Drills.
 Cut off saws – used for cutting steel, concrete, rock, ductile cast pipes, and asphalt.	 Screwdrivers.

 Angle grinders – used to cut metal, bricks and concrete.	 Pneumatic wrenches – used where accurate torque is required or difficult nuts must be removed.
 Impact hammers – used to pulverise and crush.	 Scalers – used to remove the surface layer (e.g. paint) of metal objects.
 Circular saws – used to cut timber.	 Rotary hammers/drills – used for drilling and chiselling masonry and concrete.
 Planers – used to take the surface layer off timber.	 Sanders – used for sanding and polishing surfaces.
 Tampers – used for small area soil compaction.	

Equipment Use In Conjunction With Power Tools		
 Power leads.	 Safety switches.	 Air hoses.

Power Tools Could Be Powered By	
 240-volt electricity.	 Compressed air.
 Battery driven.	 Hydraulics.

3.1.2 POWER TOOL SELECTION

It is essential that you select the most appropriate tool for the task and use it safely.

You should read the owners and operator's manual for each tool or piece of equipment to understand the characteristics, limitations and technical capabilities of the tools you are using. This includes looking at what the tool can do, what it is designed for and if it will do the task required of it.

3.2 CHECK POWER TOOLS BEFORE USE

Once you have selected the power tools and related equipment that are best suited to the current task, it is essential that you check them for serviceability and safety.

Any checks made on the tools and equipment must be made in accordance with manufacturer's specifications and worksite policies and procedures.

Check for any obvious signs of damage or wear. For example:

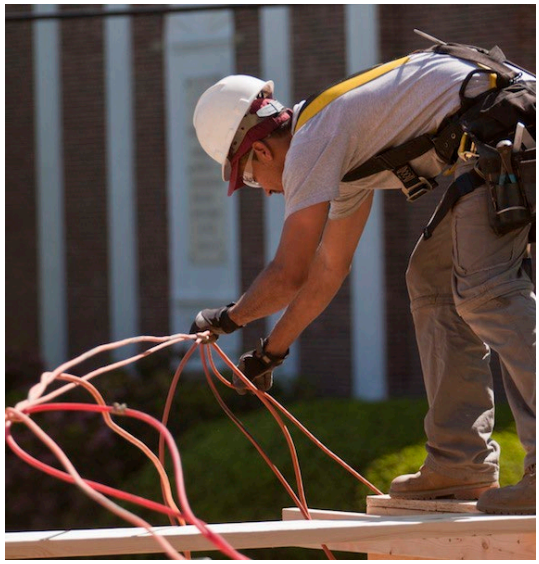
- Missing saw blade teeth.
- Defective or damaged guards, switches, triggers and controls.
- Electrical safety/inspection tag for currency.

If you use your own tools you will need to check over them regularly and replace any defective equipment before starting work.

3.2.1 CHECKING POWER LEADS AND HOSES

It is essential that all power leads, hoses and safety switches are checked for serviceability and safety in accordance with the site safety plan.

Checks of electrical equipment should be done visually, and should include checking that:



- Equipment casing is not damaged.
- Flexible power cords are appropriately fixed to the equipment.
- Power cords are not damaged.
- Controls are in good working order.
- Safety guards are present and appropriately fixed to equipment.
- Electric power cords are not in contact with liquids, materials and in environments that would constitute a hazard according to the manufacturer's specifications.

Any faults, damage or other safety concern identified will need to be recorded and reported in accordance with your worksite requirements.

Where necessary, equipment should be tagged out or locked out to ensure other people do not use it until it has been repaired or replaced.

3.3 CLEAR ROUTE FOR LEADS AND HOSES

Trips and falls are the most common types of workplace accidents. A worksite that is clear from materials, tools and untended equipment is less likely to cause accident or injury.

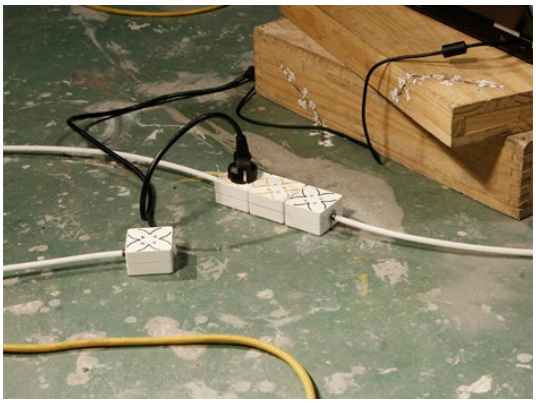
A proactive approach to safety requires workers to anticipate risks and act to minimise them.

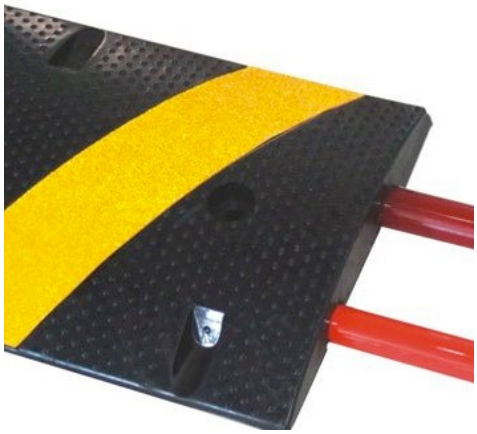
3.3.1 LEAD AND HOSE PLACEMENT

Leads and hoses that are poorly placed or inadequately sign-posted or covered pose a hazard to others.

They could cause someone to trip or may result in a power tool being pulled out of the operator's hands.

This could cause damage to materials and raises the risk of accident or injury.



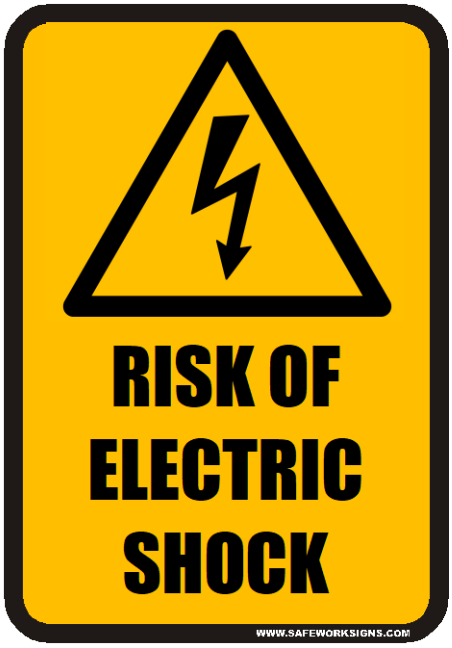


To ensure safe placement of leads and hoses they must be:

- Covered and provided with appropriate signs warning of a potential tripping hazard if placed on the ground.
- Clear of obstructions such as other equipment and identified hazards.
- Not under the feet of other workers.
- Not placed across a walkway.
- Raised above head-height so that they don't constitute a tripping hazard.
- Marked and mapped so that everyone on the worksite is aware of their placement.

Ensuring safe placement will reduce the chance of power leads being damaged, and reduce the risk of electric shock or other injury to personnel/workers on the worksite.

3.3.2 CONNECTING TO THE ELECTRICITY SUPPLY



Always take care when connecting and disconnecting a tool from the power supply.

When a power tool is connected to the electricity supply the tool is said to be 'live'. This means that electricity is running to the power tool.

Caution is required because:

- The tool could be activated accidentally.
- There is a risk of electric shock from the tool and/or the power supply.

When connecting electrical appliances:

- Always make sure that the tool is turned off when connecting the tool's power lead to the power supply.
- Never make contact with the metal pins on the power lead.
- Only use power boards with a built-in Residual Current Device (RCD).
- Never use double adaptors on a power board.
- Never connect two power boards to increase the number of power points.

3.3.2.1 CONNECTING AIR HOSES TO POWER TOOLS

The compressed air that powers your tool is prevented from flowing out of the compressor tank by the discharge coupler. The coupler is screwed on to the end of the compressor's discharge pipe.

The coupler is 'checked', i.e. the pressurised air in the air compressor will not be released until an appropriate connector is inserted into the coupler.

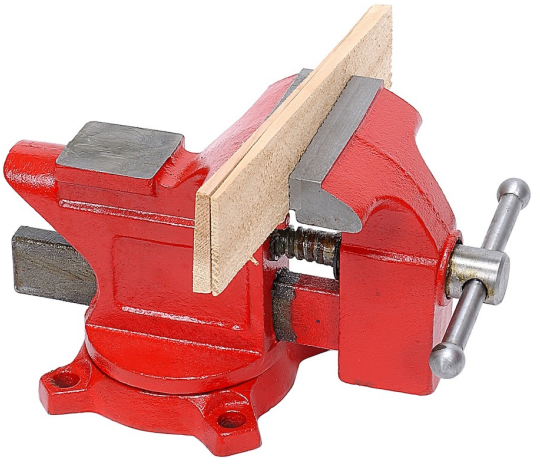
In most industrial settings a connector will be attached to the supply port of every tool.

To connect your power tool to the air compressor:

1. Insert the connector into the coupler.
2. Slide the knurled ring on the coupler back so that the coupler can click into place.
3. Release the ring so that the connector is locked into place.

Make sure that the connector is secured properly. If it is not, it will blow out of the air compressor as soon as the air is released.

3.4 FIX MATERIALS INTO POSITION



slipping or becoming stuck.

Often prior to using power tools you will need to clamp or fix materials into place. Clamps are used when working on materials that are not fixed in place.

Clamps provide benefits such as:

- Preventing the movement of materials.
- Enabling safer operation of power tools.
- Minimising the risk of accident or injury due to materials and/or power tool

When selecting a clamp to secure materials you will need to consider:

- Is the clamp strong enough for the job?
- Will the clamp damage the materials?

Ensure that you are familiar with the requirements of the current task so that you can determine whether the materials you are using must be fixed into position.

3.5 COMPETENTLY USE POWER TOOLS

Once you have checked your tools and equipment, placed and connected your leads and hoses, and fixed the materials into position, you are ready to use the power tools to complete the task.

Power tools need to be treated with respect at all times – a live tool has the potential to cause serious injury. All equipment must be used in accordance with the manufacturer's instructions and site safety requirements.

3.5.1 SAFE POWER TOOL OPERATION

Safe operation depends on your knowledge of the power tool. You need to know its capabilities and limitations so that you don't expect the tool to do more than it was designed for.

Forcing a tool to work outside the manufacturer's specifications will:

- Damage the tool.
- Produce unsatisfactory work quality.
- Increase the risk of accident or injury to the operator and others on the worksite.

If you are unsure how to use a tool safely and effectively check the manufacturer's instructions.

3.5.1.1 SAFE OPERATING PROCEDURES

You need to take personal responsibility for the safe operation of power tools. This involves knowing and following safe operating procedures.

Safe operating procedures involve:

- Wearing appropriate Personal Protective Equipment (PPE), e.g. safety glasses, gloves and hearing protection.
- Not wearing loose clothing or jewellery that may get caught in the machine or materials.
- Making sure that all guards and safety devices are properly installed and operational before use.

- Knowing emergency procedures on the worksite, e.g. who should be contacted if an accident occurs.
- Only using a power tool for the manufacturer's intended purpose.
- Recognising dangerous environments and changes in the environment that would make it dangerous to continue using the tool.

The site safety plan will outline safety and emergency procedures. This safety plan may also provide information on:

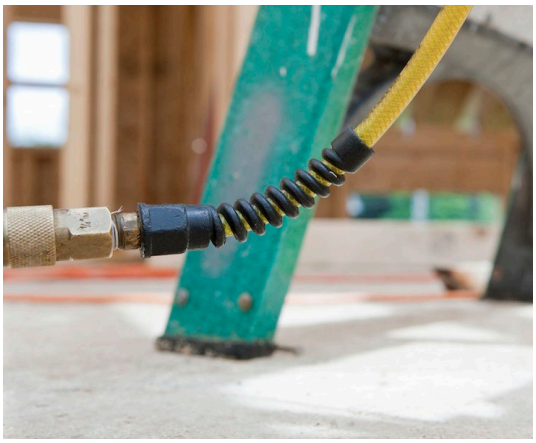
- Sirens and alarms warning of an emergency situation.
- A buddy system – pairing two members of staff together so that there is always someone available to report an accident or injury.

- Location of first aid equipment and staff with first aid training.

3.5.1.2 WORKING SAFELY WITH COMPRESSED AIR

Powering tools with compressed air offers a significant advantage over electricity, as the tool does not get hot, therefore reducing the risk of fire and burns.

However, working with compressed air is not without risk. For example, air hoses can whip dangerously if they are not connected properly. The pressurised air is also dangerous if it is directed at skin or clothing.



To operate the air compressor safely:

- **Do not** install a shut-off valve between the compressor and compressor oil sump.
- **Do not** disconnect or bypass the safety circuit system.
- **Do not** install safety devices other than authorised replacement devices.
- Close all openings and replace all covers and guards before operating the compressor unit.

- Tools, rags, or loose parts must not be left on the compressor or drive parts.
- Do not use flammable solvents for cleaning parts.
- Keep combustibles out of and away from the compressor.
- Never use compressed air to blow dust from work clothes.
- When using the air compressor to clear dust from power tools always use the lowest setting needed to do the job safely.

Ensure that you are familiar with the procedures to work safely with and around compressed air. If you are not confident, speak with your supervisor or other experienced personnel/workers.

3.5.1.3 RECOGNISING PROBLEMS

You need to be able to recognise an unsafe power tool. Use your senses to identify the early signs of a problem. Indications of an unsafe tool may include:

- Sound – is there an unusual noise? This may indicate something is loose or incorrectly calibrated.
- Smell – a burning smell may indicate an electrical or mechanical problem.
- Vibration – excessive vibration may indicate a motor under stress or loose parts.

If you have any doubts at all about the safety of your power tool, contact your site supervisor immediately. Take the tool with you to avoid someone else using it while you are reporting the defective equipment.

3.5.1.4 ADAPTING TO CHANGING WORK CONDITIONS

It is important to understand that your work conditions may change during operation of the equipment. This may be due to the activities being conducted, personnel/workers and equipment movement on site, variations required to achieve the desired results and specifications, or environmental changes such as weather and lighting.

You must remain aware of these changes, and show initiative in adapting to the changed conditions if they occur.

This may include stopping operations and speaking with your supervisor or changing your

operating techniques. Always ensure that you are working within the specified tolerances, and within your policies and plans.

3.5.2 WORKING IN TEAMS

Operation of power tools will often require you to work alongside, and with other personnel/workers.

Working effectively in teams requires you to possess a number of skills, abilities and attributes. These include:

It is essential that you can work effectively and communicate with those around you to ensure safe and efficient work practices.

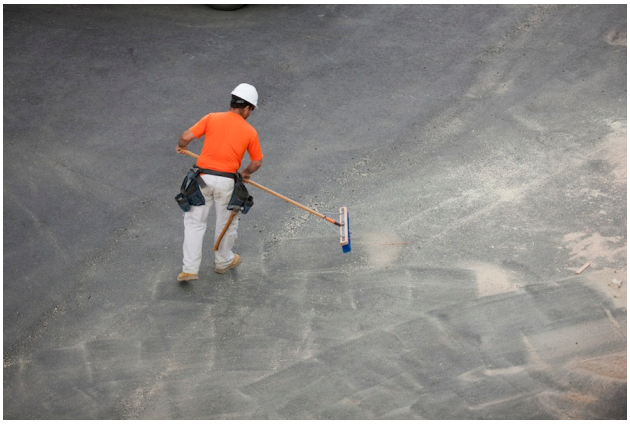
3.6 STORE POWER TOOLS WHEN NOT IN USE

Whenever you are not using a power tool, it should be placed out of the way in a designated safe place where it cannot accidentally be switched on, knocked over or trip someone.

This will not only ensure that the tool will not cause a hazard for you or anybody else, but will allow you (and others) to be able to locate the tools when required.

Portable power tools are best placed back in their case.

3.7 CLEAN AND CLEAR THE WORK AREA



It is important to maintain a clear work area. The worksite and work area need to be kept clear of obstructions and hazards. It is good working practice to clean up as you go.

Materials should be cleaned up according to the environmental management plan and the safety management plan.

Allow time to clear the work area at the end of the job. Make sure all rubbish is collected and disposed of correctly. Dispose of any debris properly without impacting negatively on the environment.

Divide up recycling and other waste materials for correct removal and processing in accordance with the environmental management plan for the worksite.

3.8 MAINTAIN TOOLS AND EQUIPMENT AFTER USE

Once you have finished operations you will need to maintain the tools and equipment that were used.

The maintenance tasks that you conduct may vary depending upon the type of power tool or equipment used.

Maintenance tasks must be conducted in accordance with the manufacturer's specifications and standard work practices. If you are unsure about any maintenance tasks ensure that you speak with your supervisor.

Common maintenance tasks you might be required to conduct include:

- Cleaning tools and equipment.
- Inspecting tools and equipment, and recording and reporting faults.
- Conducting authorised servicing (within your level of training).
- Conducting authorised minor replacements (within your level of training).
- Storing tools and equipment.

3.8.1 CLEANING TOOLS AND EQUIPMENT

After use, clean the power tools and equipment so that no foreign materials are attached and the equipment is free from oil, grease and other materials that may interfere with its effective operation.

Keeping the tools or equipment as clean as practical for a worksite will assist you to find leaks, damage or faults and can also help to prevent damage and faults.

3.8.2 TOOL AND EQUIPMENT INSPECTION

You will need to perform an inspection of your tools after use. This is to ensure that any damage that has occurred will be identified as early as possible.

Checking tools after use may include looking for:

- Loose handles, bolts and screws.
- Worn or damaged power leads and attachments.
- Cracks in the tool's external casing.
- Blunt or damaged blades and contact surfaces.

If damage or faults are found, you will need to record and report them in accordance with your worksite procedures.

3.8.3 GENERAL MAINTENANCE FOR HAND AND POWER TOOLS

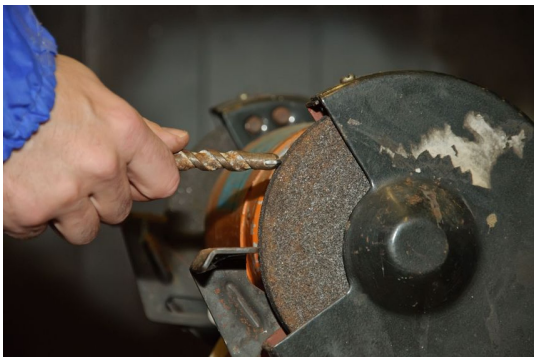
The following are some procedures that you may need to complete on your worksite to carry out general maintenance on:

- Hand tools.
- Power tools.
- Air compressors.

3.8.3.1 HAND TOOL MAINTENANCE

When maintaining hand tools you may need to:

- Sharpen cutting tools or drilling bits.
- Oil or sand down handles.
- Tighten or replace screws and bolts.



3.8.3.2 POWER TOOL MAINTENANCE

Power tools need to be serviced by authorised personnel/workers. A record of the last service will be entered on a tag attached to the power tool.

Be aware of the due date for the next service and take appropriate steps to ensure that this is done on time and according to procedures.

3.8.3.3 AIR COMPRESSOR MAINTENANCE

When using air compressors:

- Regularly check for leaks in all piping, joints, drains, valves, flexible hoses, fittings, filters and lubricator units.
- Bleed (release) the air from the air compressor after use.
- Ensure that any damaged or malfunctioning equipment is put in for repair immediately.

3.8.4 REGULAR SERVICING

Regular servicing is an important part of tool maintenance. This applies to hand tools, power tools and air compressors.

You need to know the process for organising regular maintenance. You also need to know how to order replacement parts and accessories, such as blades, sandpaper etc.

Always refer to the manufacturer's instructions for specific advice on how to maintain tools and equipment.

3.8.5 STORING TOOLS AND EQUIPMENT

Make sure all equipment and materials are stored properly and safely in accordance with manufacturers' specifications and site requirements. For example:

- Small hand tools may be located on a pegboard or in tool kits.
- Larger tools may be off the ground, hanging from tool racks.
- Power tools may be located on shelves or benches away from traffic areas.

Stack materials neatly so that they don't fall out on the next person who tries to get to them.

Tools should never be stacked in front of a doorway or an electric power point. Stacked tools should never obstruct emergency equipment or emergency exits.

Make sure that you know the appropriate storage location for power tools and equipment. Always return tools and equipment to their designated location when not in use.

Maintaining a reliable system for storing hand and power tools means that there is:

- Less uncontrolled movement of staff and equipment across the worksite.
- Reliable access to tools and equipment.
- Effective tracking of the use and location of tools and equipment.

This will help to protect staff from accidents and prolong the life and effectiveness of the tools.