

# LMCS – Safe Work Procedure

## PEDESTAL DRILL



**DO NOT use this equipment unless you have been instructed in its safe use and operation and have passed the safety accreditation**

### PERSONAL PROTECTIVE EQUIPMENT

- Safety glasses must be worn at all times in work areas.
- Long and loose hair must be contained.
- Hearing protection must be worn.
- Sturdy footwear must be worn at all times in work areas.
- Close fitting/protective clothing must be worn.
- Rings and jewellery must not be worn.

### PRE-OPERATIONAL SAFETY CHECKS

- ✓ Locate and ensure you are familiar with all machine operations and controls and emergency stops.
- ✓ Ensure the machine, power cords etc. are in safe working condition.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present and that no one will be harmed by you operating the machine.
- ✓ Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- ✓ Ensure table and work area is clear of all tools, off-cut timber and sawdust.
- ✓ Start the dust extraction unit before using the machine.

### OPERATIONAL SAFETY CHECKS

- ✓ Plug in the machine.
- ✓ Allow the blade to obtain maximum speed before making a cut.
- ✓ Before making adjustments or before cleaning swarf accumulations, switch off and bring the machine to a complete standstill.
- ✓ Use a safe working posture.
- ✓ Feed downwards at a sufficient rate to keep the drill cutting.
- ✓ Select and adjust drill to optimal speed.
- ✓ Drill must be isolated from power source when being cleaned, adjusted, maintained or repaired.

### ENDING OPERATIONS AND CLEANING UP

- ✓ Switch off the machine when work completed.
- ✓ Reset all guards to a fully closed position after use.
- ✓ Leave the machine in a safe, clean and tidy state.

### POTENTIAL HAZARDS AND INJURIES

- Kickback: drill bit may catch or jam and work piece be rotated violently.
- Airborne dust.
- Eye and hearing injuries.
- Contact with blade at point of operation, potentially severe injuries.

### DON'Ts

- ✗ Do not use operate equipment without wearing appropriate PPE.
- ✗ Do not use faulty equipment. Immediately report suspect equipment.
- ✗ Do not cut pieces with shattered ends.
- ✗ Never leave the machine running unattended.
- ✗ Do not hold the item being drilled with your hands. Use a clamp.
- ✗ Do not use heavy pressure to a point the machine slows down audibly at a starkly reduced pitch.

**This SWP does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with other references. It is designed as a guide to be used to compliment training and as a reminder to users prior to equipment use.**

*This information is modified from Frontline Safety [www.frontline.edu.au](http://www.frontline.edu.au)*

| Issued     | Issued For                | Prepared               | Checked            | Approved | Rev. |
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| 08.05.2022 | Endorsement by Safety Com | A Oldham<br>C de Groot | Safety Com pending | Approved | 0.2  |

## Safe Operating Procedures – Pedestal Drill

### BACKGROUND INFORMATION & READING

These videos will assist you in following safe work practices, especially the second video:

<https://www.youtube.com/watch?v=Nu9tYcld7ck>

<https://www.youtube.com/watch?v=yPRFW2MHigE>

<https://www.youtube.com/watch?v=aTpgXOCk3il>

### FITNESS TO OPERATE THE PEDESTAL DRILL

Members are expected to refrain from working on these power tools and machines if they acknowledge their own level of physical ability inhibits them from doing so safely.

However, if assessors determine that a member has some level of physical impairment that makes it unsafe to use machines, they will have no option other than to assess the member as not having the capacity to do so safely.

You can still do your projects, just mark the timber and ask another shed member to cut/machine the timber for you. You are not compelled to cut the timber yourself and in this environment, you will easily find others that are more than able and willing to do the cutting for you.

### GENERAL RULES & TIPS

As your drill bit breaks through the underside ease up on the pressure to help prevent it grabbing.

A countersink or larger diameter bit can be carefully used to remove burrs from drilled holes.

No lubrication required for wood

For guidance on drilling speeds for different bit sizes, see charts below.

### COMMON OPERATIONS ON PEDESTAL



Figure 1 Adjust belt speed, typical

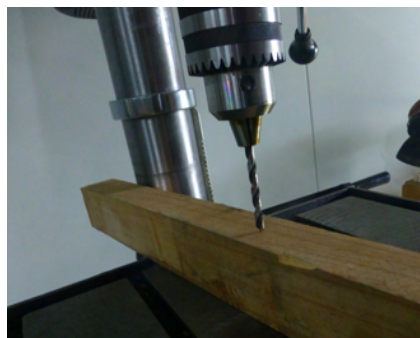


Figure 2 Item to swing against column

Refer also to the Nova Viking Manual



This drill press is located in the woodworking area. It is direct drive and therefore does not require changing of the position of belts to change the spindle speed. Instead, the machine has variable speed and must not be used for steel. The depth can be set electronically and instead of the depth being mechanically limited, this machine just stops spinning when the programmed depth has been reached.

The pedestal drill in the metal working area is the traditional belt driven type with a mechanical depth stop.

## Drilling Techniques and Speed Charts

Once you have marked where you need the hole you will need to centre punch it. This will provide a start for the drill bit, preventing it from slipping or skating and ensuring accuracy. Line up the point of the tool with your mark, then hit the punch with a hammer to create a small round indentation. Be careful doing this on thin metal, you may need something behind to prevent it denting a larger area. When drilling metal you should always wear safety goggles. Be aware that the drill could jam in the hole as it breaks through the underside of a larger hole. Keep a good grip on it at all times. Also be aware of any sharp edges or burrs that the holes may have. Burrs can easily be removed using a file.

Set the machine speed according to the hole you are drilling, ensure you are not drilling in the bed and routinely secure the item in the vice. In any case ensure that the item will swing against the column and position

yourself such you are outside the arc of the anticipated movement.

To start the hole you will need a pilot hole. A bit around 3 or 4mm is ideal for a pilot hole. Once the pilot hole is drilled, then change up to a larger bit. If you require a hole of around 12mm, it is sometimes easier to use an intermediate size, like an 8mm, especially if your power drill isn't particularly powerful. It is essential to keep the bit as sharp as possible or there is a chance it will wander or overheat. Overheating a drill bit will damage it beyond repair.

Lubrication may well be required especially if you are drilling something thicker than the diameter of the bit, and always on stainless steel. Speed is another key factor for drilling metal. Take a look at the chart below for a guide. If your power drill does not have a variable speed control a good way is to intermittently pull the trigger on and off. This will give it a chance to slow and reach an optimum speed.

If you are drilling a deep hole of into thick material you will need to remove the bit from the hole occasionally to allow any swarf to be removed from the hole.

## Drilling Speeds

| Diameter of Drill Bit | Steel   | Aluminium/Wood |
|-----------------------|---------|----------------|
| 3mm                   | 1820    | 2580 rpm       |
| 5mm                   | 1290    | 2580 rpm       |
| 7mm                   | 830 rpm | 2580 rpm       |
| 9mm                   | 500 rpm | 1820 rpm       |
| 13mm                  | 420 rpm | 1350 rpm       |
| 15mm                  | 320 rpm | 1290 rpm       |

Use these as a basic guideline for twist drills. Your power drills handbook should have the settings for speeds listed assuming it is variable speed.

For Stainless steel use a slower speed than recommended for steel.

It is essential not to run a drill too fast on stainless steel as it will heat up easily and become hard, making it very difficult to drill.

## Technique- Hole saws, Step drills & Countersinks

### Hole saws

- When using a hole saw it will be essential to lubricate it.

# LAKE MONGER COMMUNITY SHED



- Select the required size cutter and screw onto the arbour. The pilot drill should not extend past the teeth of the saw more than the thickness of what you are cutting. If necessary, clamp a piece of waste material to the back. This will also help reduce burring.
- Centre punch the drilling position, and begin drilling. The hole saw arbour will be fitted with its own pilot drill. Carefully drill the hole at around 970rpm. Slow the drill down as the teeth are about to come into contact. Hold perpendicular as possible so the teeth cut evenly. Keep going until you are through, don't be tempted to increase to a higher speed, this will stop it cutting, and simply wear the teeth out.

## Cone & Step drills

- Again, it is essential to keep these well lubricated.
- Depending on the tool you have you may or may not require a pilot drill. Some have them built into the ends.
- Centre punch and drill a pilot hole if required.
- Begin drilling at the necessary speed (check chart below) the larger diameter step you are using you will need to decrease the speed slightly.
- Drill with a firm pressure. As you approach the size you require be careful not to go too far, resulting in an oversized hole.

## Countersinks

- Lubricating a countersink is necessary on metal. Once you have drilled the required diameter hole use a countersink to produce a chamfer for a countersunk screw or bolt head to sit into.
- Check the size of the countersink you have made to the screw frequently. Woodworkers' carbon steel countersink bits are not suitable for metal. You will require a HSS countersink bit, usually with three flutes. These are prone to slipping in chucks, therefore hexagonal shanks are preferred.

| Diameter | Steel   | Stainless Steel | Aluminium/Wood |
|----------|---------|-----------------|----------------|
| 16mm     | 530 rpm | 275 rpm         | 900 rpm        |
| 20mm     | 460 rpm | 230 rpm         | 690 rpm        |
| 25mm     | 350 rpm | 175 rpm         | 525 rpm        |
| 30mm     | 285 rpm | 145 rpm         | 425 rpm        |
| 35mm     | 250 rpm | 125 rpm         | 375 rpm        |
| 40mm     | 220 rpm | 110 rpm         | 330 rpm        |
| 50mm     | 170 rpm | 85 rpm          | 255 rpm        |
| 75mm     | 115 rpm | 55 rpm          | 165 rpm        |
| 100mm    | 85 rpm  | 40 rpm          | 125 rpm        |

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For hole saws, cone drills and step drills use this chart as a guide.

## Trouble Shooting

| Symptom   | Solution   |
|---|--|
| Drill produces a very high pitch squeal<br>Drill Bit becomes very hot | Drill is running too fast  |
| Drill bit dulls very quickly<br>Drill bit becomes very hot            | Lubrication is required  |
| Drill bit Wobbles   | Damaged Drill bit<br>Ensure the Bit is correctly positioned in the chuck |
| Drill Bit skates across the metal surface                             | Centre punch is too small<br>Smaller pilot hole is needed                |
| Drill Bit grabs as it breaks through                                  | Too much Pressure<br>Drill is running too fast                           |