

Drill Press



Machine:	Drill Press
Make/Model:	Grizzly G7947
Revised:	3 / 10 / 2023
Author:	Trevor Marks
Location:	Engr. II, rm 2226
Department:	Mechanical Engineering

DO NOT use this machine unless you have been trained in its safe use and operation!

Personal Protective Equipment



Safety Glasses
Required



Protective
Clothing



Entanglement
Hazard



Contain
Long Hair



Do Not Wear
Gloves



Do Not Wear
Jewelry

Potential Hazards

- Eye injury from flying chips or broken bits
- Cuts from contact with cutting tools or pointed end of center
- Entanglement in rotation machine parts
- Pinch from moving machine parts
- Burns from hot tools or hot work pieces
- Metal Splinters
- Falls due to poor housekeeping around the machine

Typical Operations

- Drill (through and blind holes)
- Bore and counter sink
 - Speeds for counter sink operations are approximately $\frac{1}{2}$ speed for similar sized drill bit
- Ream
 - Speeds for counter sink operations are approximately $\frac{1}{2}$ to $\frac{2}{3}$ speed for similar sized drill bit

Procedure Checklist

PRE-Operation:

- Identify ON/OFF switch.
- Keep overhangs as small as possible and check that the work piece is securely clamped either in a drill press vise or to the table. Use V-blocks for round parts.
- Ensure chip shield is safely positioned and secured.
- Check to ensure the cutting tool is clear of the work.
- Remove all tools and parts from the drill press table.
- Ensure cutting tool is clear of work and can turn freely.
- Ensure the correct speed for the drill bit is selected.

Operation:

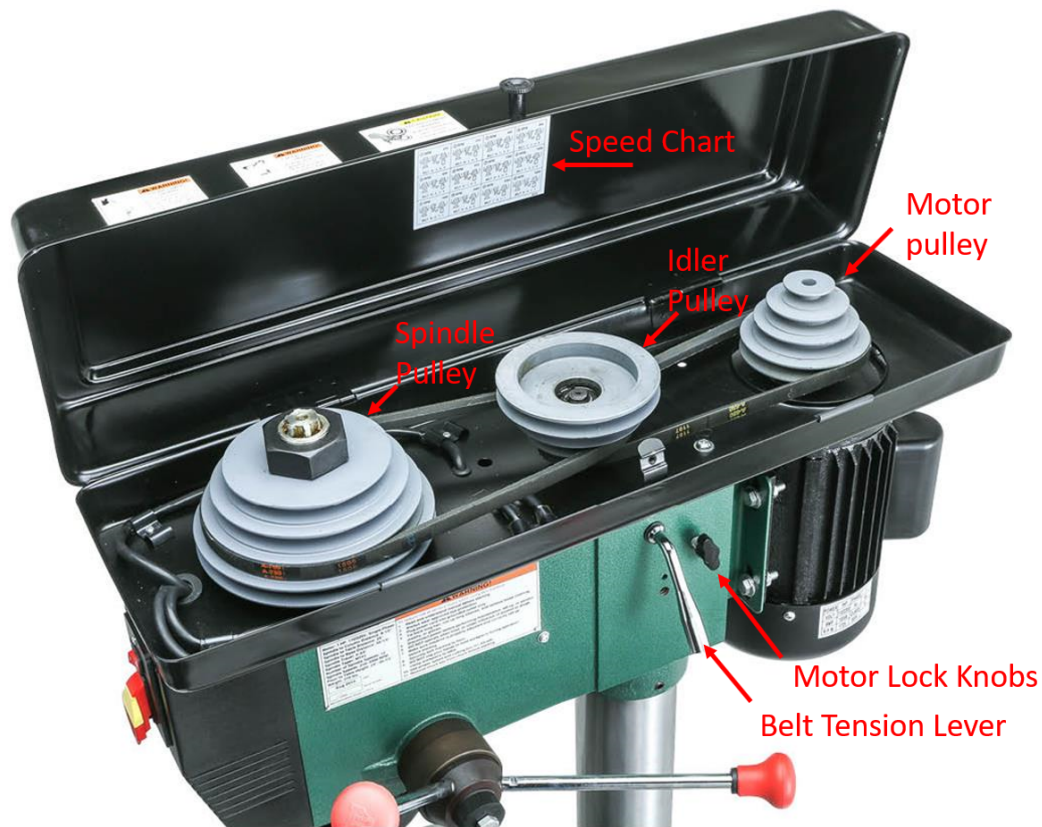
- Turn on power.
 - ◇ Never leave the drill press running unattended.
- *Peck drill* – remove material in increments of 0.05 inches – to start holes.
- Apply even pressure on the feed; listen for “chattering”, “squeaking”, or over heating bits.
- Use a brush — never a rag — to remove chips.
 - ◇ Never use your hand to remove chips (even if the machine is stopped)
- Apply cutting fluid as needed.
- Power down machine when finished with task(s).
 - ◇ Do not attempt to slow/stop the chuck or spindle by hand.

POST-Operation:

- Use a brush or rag to clean machine.
- Remove any custom fixtures used.
- Deburr holes.
- Ensure the space and floor around the drill press is clear of chips, debris, and oil.
- Leave the machine and work area in a safe, clean state.

Changing Speed

1. **DISCONNECT MACHINE FROM POWER!**
2. Loosen *motor lock knobs* (one on each side).
3. Rotate *belt tension lever* to take tension off V-belts.
4. Locate desired speed on *speed chart* and move V-belts to corresponding V-grooves on the *motor, idler, and spindle pulleys*.
5. Rotate *belt tension lever* until belts are tight; tighten both *motor lock knobs*.
6. Close cover before plugging in machine.



Do's and Don'ts

Do's:

- Read the user manual: [GitHub LINK]
- Approved materials for this machine: some steel, aluminum, brass, plastic, and wood.
- Consult with lab manager or Machinery's Handbook for cutting fluid choices.
(typically WD40 for aluminum and brass and dry for plastics)
- Work from a drawing and a project plan (ask the lab manager for templates).
- Take the time to properly layout your work.
- Use the light on the drill press to help illuminate work area.
- When drilling large diameter holes first drill a pilot hole. The pilot hole should be as large, or slightly larger than, the width of the large drill bit's dead center.
- Ensure you will not drill into the table when drilling through holes.
- Use care when removing a drill bit from the chuck — always support the tool with one hand when removing.
- Use sharp drill bits. . . ask the lab manager where the sharpener is (yes, we have one!)

Don'ts:

- Do not use the drill press without approval!
- Do not use end mills in the drill press.
- Do not use Dremel bits in the drill press.
- Do not use custom fixture without approval.
- Do not hold the workpiece being drilling with your hand(s).
- Do not use your bare hand to wipe away chips.
- Do not use compressed air to clean any part of the drill press.
- Do not power the machine in an attempt to tighten or loosen the chuck.

Speed Recommendations

The speeds shown here are intended as a starting point only. The optimum speed will always depend on various factors, including: tool diameter, drilling pressure, material hardness, material quality, and desired finish.

Table 1: **Speed** recommendations in RPM.

Drill Bit	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
1/16" — 3/16"	3300	2350	2350	2350	3300	2350
13/64" — 3/8"	2350	2050	2050	1260	2350	1260
25/64" — 5/8"	1650	1260	1650	1260	1650	670
11/16" — 1"	1260	630	1260	440	1260	400

Forstner Bit	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
1/4" — 1/2"	2050	1650	—	—	—	—
9/16" — 1"	1650	1260	—	—	—	—
1-1/8" — 1-7/8"	1260	670	—	—	—	—
2" — 3"	630	400	—	—	—	—

Hole Saw	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
1/2" — 7/8"	630	630	670	—	—	—
1" — 1-7/8"	440	440	630	—	—	—
2" — 2-7/8"	310	310	400	—	—	—
3" — 3-7/8"	210	210	310	—	—	—
4" — 5"	210	210	210	—	—	—

Note:

- Running a tool too slow will only decrease productivity; however, running a tool too fast with regard to speed or feed rate will result in accelerated tool wear or outright failure. . . So err on the side of running too slow.
- A feed that is too light will cause the drill to *chatter* and rapidly dull. A feed that is too great can cause chipped cutting edges, drill breakage, or excess heat — avoid too great a feed.