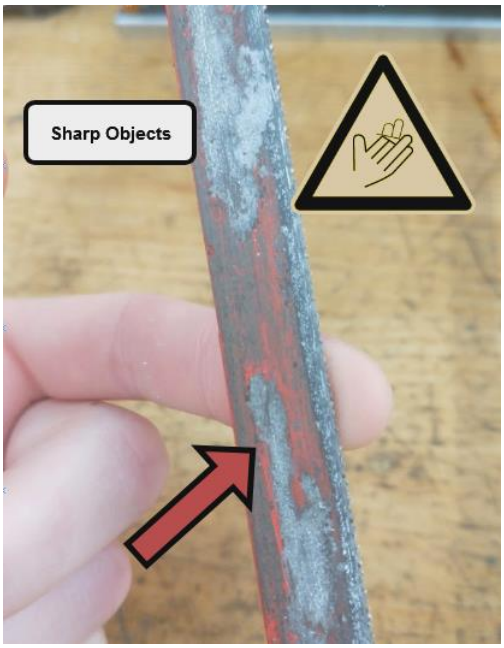
Hand Tools Standard Operating Procedure

LIMITATIONS

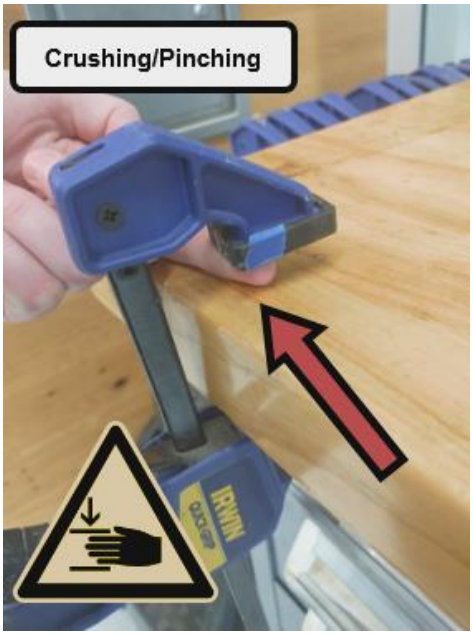
- ❑ This document only refers to hand tools in the BIDC 103 shop, covering the metal shop and the woodworking shop
- ❑ Only considers non-powered tools, with the exception of hand drills and impact drivers
- ❑ Only considers tools not specific to any machine (i.e. torque wrench for the CNC mills, and any tooling specific to any powered machine is not included here)
- ❑ This document provides instructions on the most commonly used tools in the shop, but is not an exhaustive list of all hand tools available

MACHINE SPECIFIC HAZARDS

- ❑ Sharp Objects: i.e. saws, shears, deburr tools



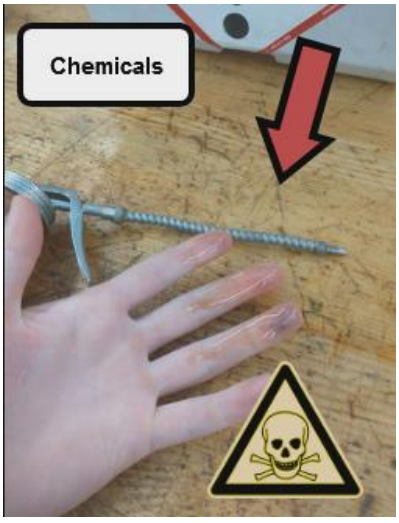
- Crushing/Pinching: i.e. vise jaws



- Heavy Items: i.e. Hammers

- ❑ Rotating Machinery: i.e. hand drills

- ❑ Chemicals: i.e. glue, coolant, vac2 oil, tapping fluid

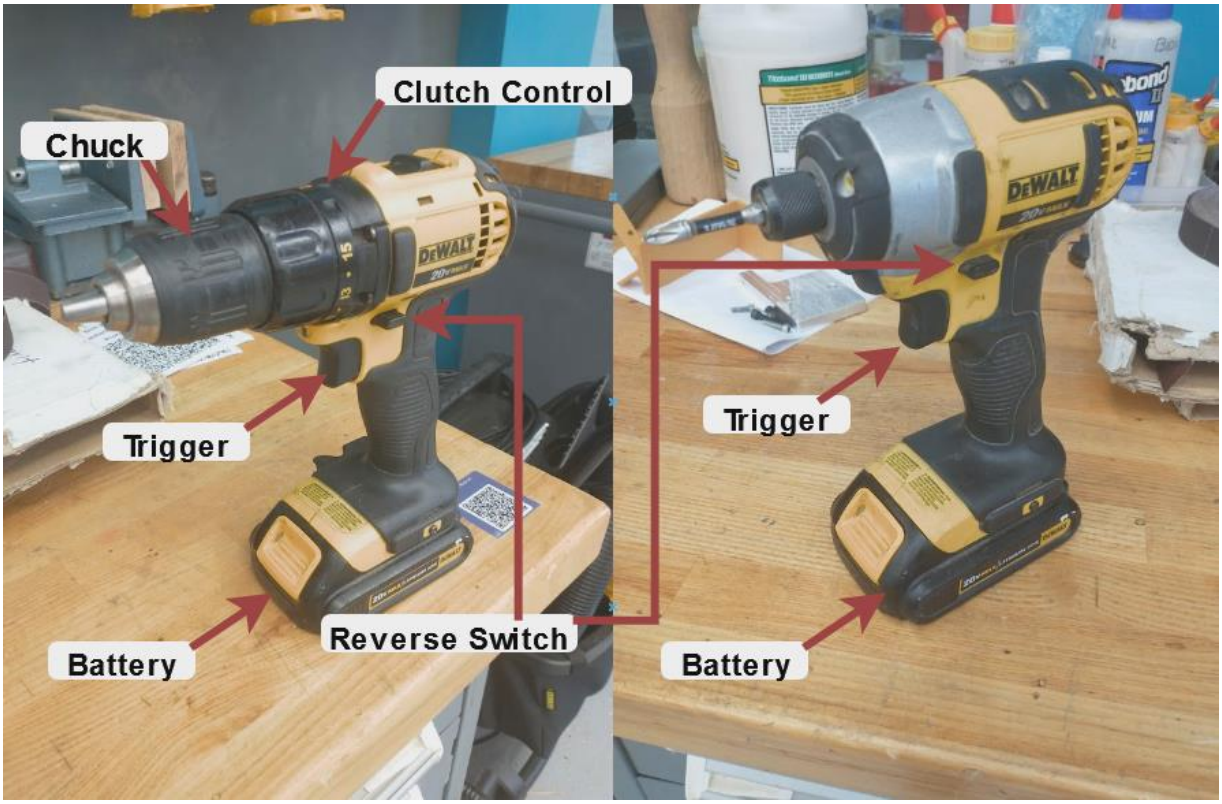


PRE-FLIGHT

- ❑ Locate all the tools you will need for your task
- ❑ Assemble them at a workstation, such as a free bench out of the way of other members

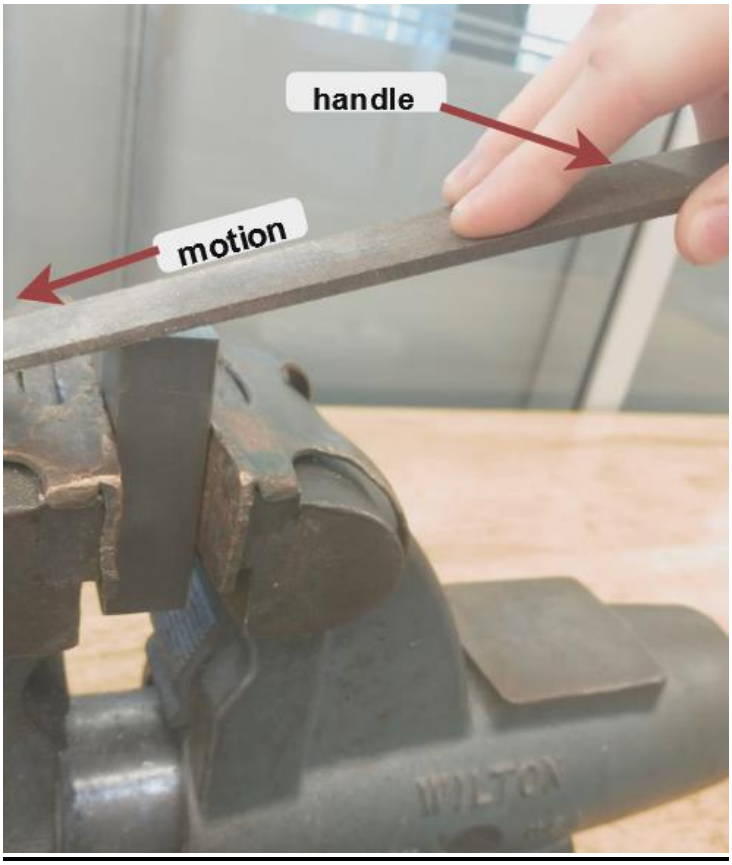
MACHINE CONTROLS

<u>Hand Drills and Impact Drivers</u>

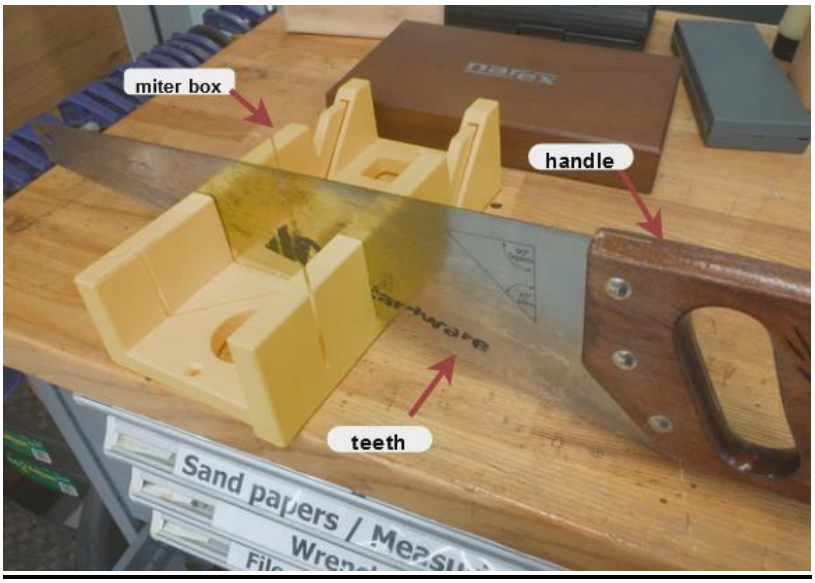


Drivers

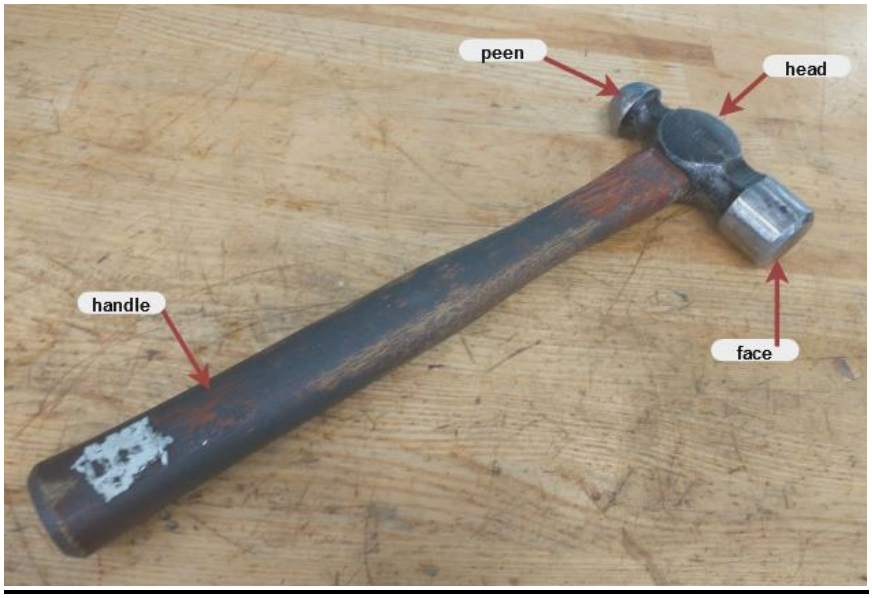
Abrasives



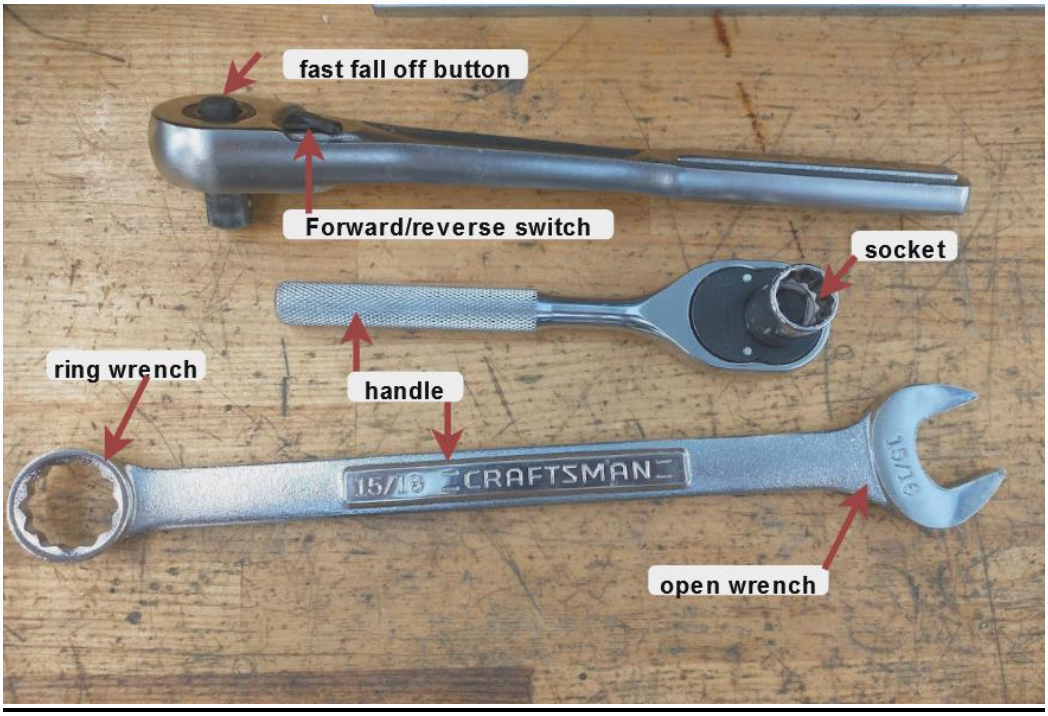
Saws



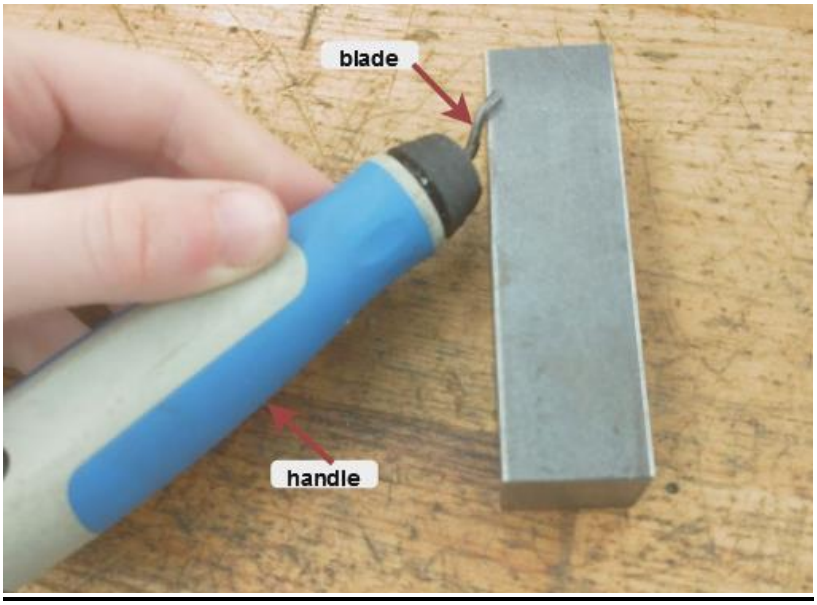
Hammers



Wrenches and Sockets



Deburr Tools



OPERATION

Hand Drills and Impact Drivers

- ❑ Install charged battery
- ❑ Twist chuck to attach drill bit (ONLY HSS drills may be used, no carbide)
- ❑ For hand drills, use torque dial to switch between clutch, driver and hammer mode
- ❑ Speed control with the trigger
- ❑ Directional control with the reverse switch
- ❑ Remove battery and set to charge once done

Drivers (torx, allen keys, hex nut, Phillips head and flathead screwdrivers)

- ❑ Determine which type of fastenser you need to loosen/tighten (is it metric/imperial? What shape is it? How big?)
- ❑ Find the correct driver for that size and shape of fastener, do NOT mix imperial and metric, this will damage the tool and fastener
- ❑ Insert and twist using the handle. For allen keys, this can be either the short or long side

- ❑ Do NOT use flathead screwdrivers as pry bars

Abrasives (files & sandpaper)

- ❑ Rougher is lower grit, finer is higher grit
- ❑ Use back and forth motion to buff surfaces, debur metal pieces, or smooth out features
- ❑ Brush or knock metal or wood particles off file when done, sandpaper that is heavily used and no longer abrasive may be thrown out

Saws

- ❑ Use clamps and/or a miter box to secure part
- ❑ Check direction of saw teeth, this is the direction that will remove material
- ❑ Move saw back and forth to cut piece of metal or wood

Hammers

- ❑ Hold the handle of the hammer by the base of the handle for hard hitting and near the head for soft hitting

Wrenches and Sockets

- ❑ Wrenches are useful for loosening and tightening nuts and bolts
- ❑ Socket wrenches have a ratchet allowing them to make many turns
- ❑ Choose correct wrenches for the size of fastener, do NOT mix metric and imperial
- ❑ Change the ratcheting direction on the socket wrenches with the lever
- ❑ Change sockets on the socket wrenches by pushing the fast fall off button

Deburr Tools

- ❑ Hold the deburr tool at an angle to the metal and pull towards you, like peeling an apple
- ❑ A thin metal chip should smoothly flow off the blade

POST FLIGHT

- ❑ Clean tools and work area
- ❑ Return all tools to where they belong, ask a peer mentor for help if needed
- ❑ Perform a 5 minute shop job before you leave