

# Induction sheet

## Colchester Lathe

Inductee \_\_\_\_\_

Equipment (equipment specific sheets?)

Inductor \_\_\_\_\_

Date \_\_\_\_\_

### Safety

- Sensible clothing (nothing too loose or with dangly bits inc. hoodie strings), sensible shoes (swarf hurts, basically only closed toe shoes, ones with toe caps if you have them), also safety glasses are required.
- Emergency Stops: Main switch on the headstock, and footbrake (shown in photos)
- Don't spin anything that is not firmly secured - failing to do so can result in heavy, flying objects, this list includes:
  - The workpiece - this should be tightly held within the chuck
  - 3 and 4 Jaw Chucks:
    - Don't spin an empty chuck without tightening the jaws
    - Don't leave the chuck key in the chuck
  - Collet chuck:
    - Make sure the drawbar is installed and tightened securely
    - Ensure the grub screw for the spindle cap is tightened
    - Do not leave the spindle cap installed without the drawbar
    - Don't leave the draw bar spanner on the draw bar
- Similarly, ensure any tools are firmly secured within their holder, the holders within the toolpost, and that the toolpost itself is tightened.
- Keep spindle speed to a sensible speed for your work - going too fast could cause damage to your job, the machine or you!
- If machine seems to not be working correctly, please contact head of the metal working team, Steve Maggs or a Director.

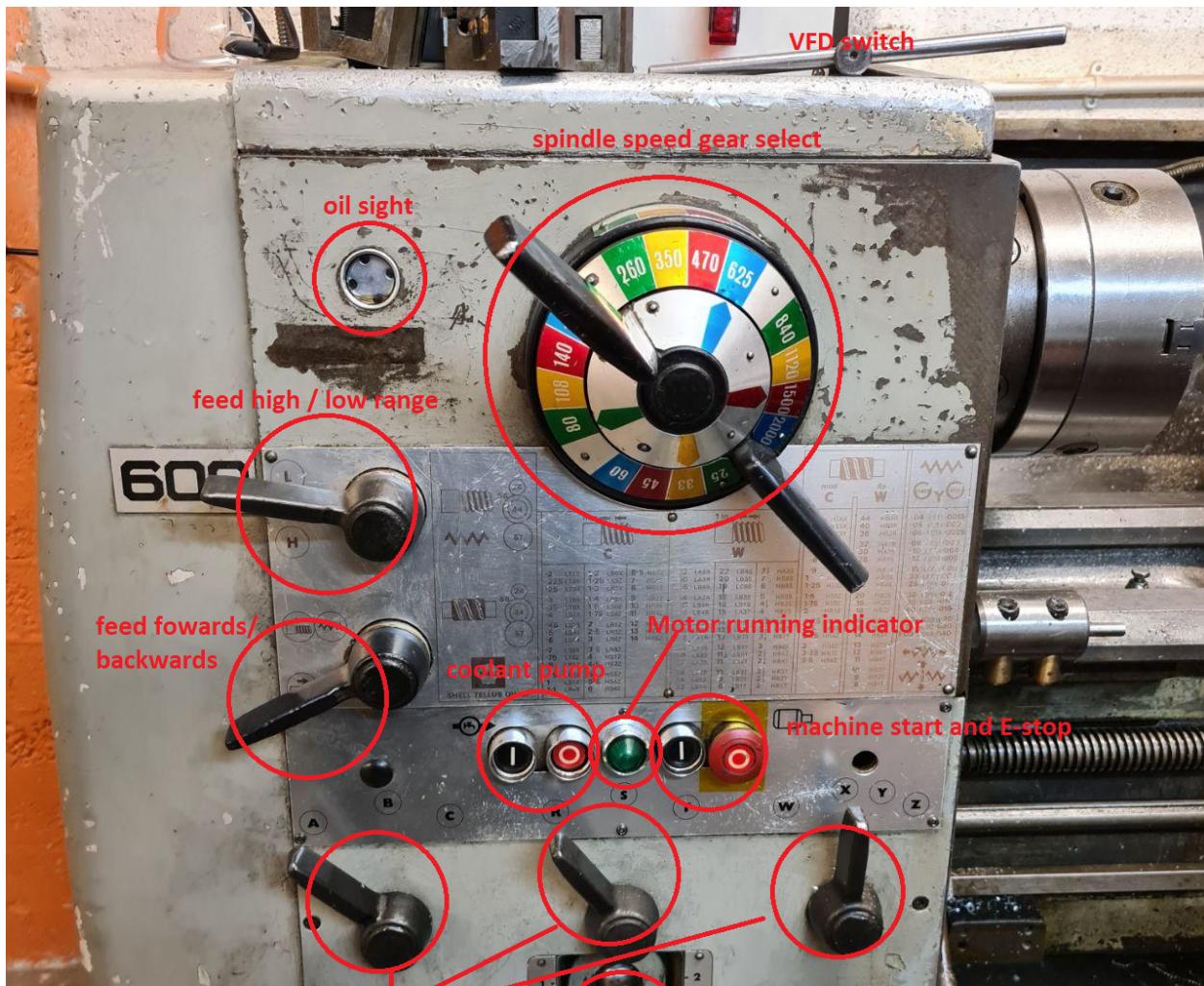
## Start up

- Make sure the clutch is open (use foot brake)
- Switch on isolator on the wall
- Switch on main motor control (main switch on headstock)
- (long pause as VFD starts)
- Make sure the clutch definitely is open (use foot brake)
- Switch on VFD switch
- (motor will start)
- Check oil sight has filled up

## Shutdown

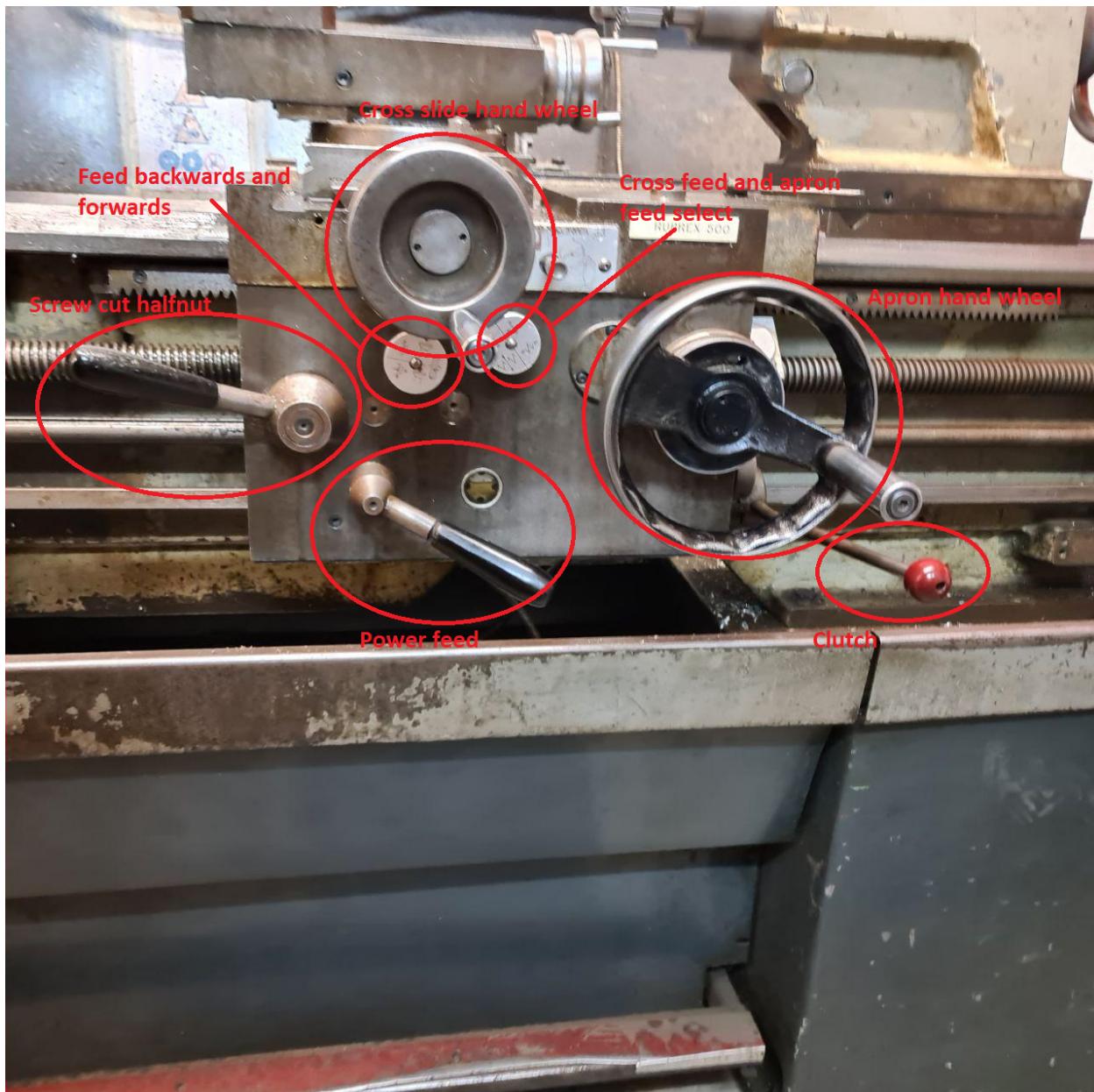
- Make sure the clutch is open (use foot brake)
- Switch off VFD
- Switch off head stock
- Switch off isolator
- Tidy up area

## Head stock



- Oil Sight - Indicates that the oil pump is circulating oil
- VFD switch - Switched on VFD which enables machine to spin
- Spindle Speed gear select - select spindle RPM
- Feed high/low range - changes whether its in a high or low gear range
- Feed Forwards/Backwards - Changes the direction of the feed gearbox
- Feed gear select - From the chart on the headstock you can select feed per revolution, or thread pitches
- Coolant pump - These were originally used to control the coolant pump - this has been replaced with an independent coolant system **PLEASE DON'T USE - IT COULD RESULT IN DAMAGE TO THE MACHINE**
- Motor running indicator - Lit when the VFD is on
- Machine start/Emergency stop - black button = go, red button = emergency stop.

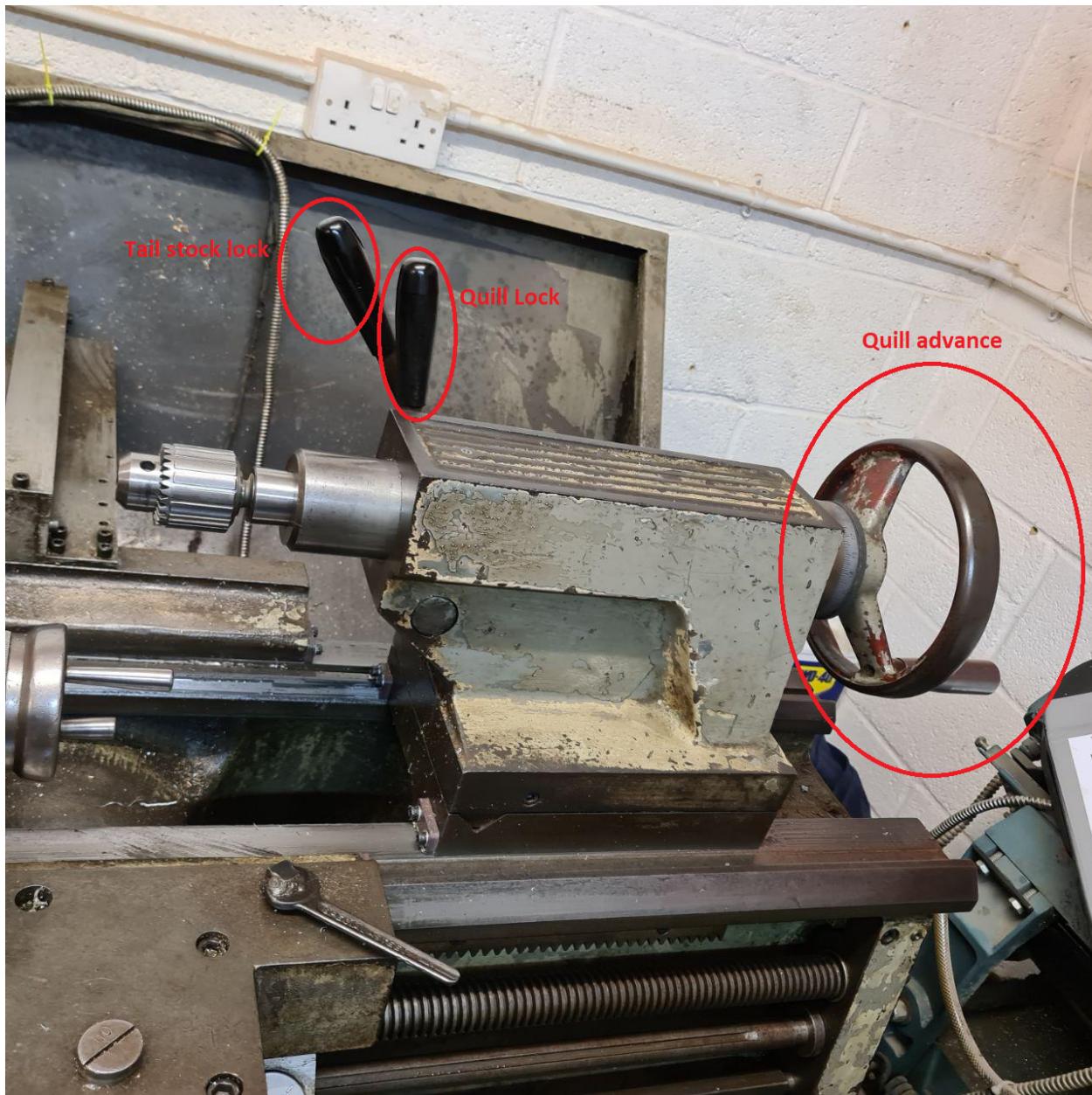
### Apron controls



- Cross slide handwheel - advances the tool across the work from outwards towards the centre
- Cross feed and apron feed select - Selects whether the cross feed or the apron is driven by the machine
- Feed backwards and forwards - Selects which direction the power feed will run
- Screw cut half nut - it engages the half nut for screw cutting. Currently, this lever is not installed, but it can be found in the cupboard. **WARNING IF ENGAGED THE APRON WILL MOVE QUICKLY**
- Power feed - Makes the apron or cross feed move
- Clutch - Connects the spindle to motor causing the spindle to spin - up is forwards, down is backwards
- Apron handwheel - Used to manually move the apron

## Tail stock

The tail stock is used to support work whilst using the lathe.

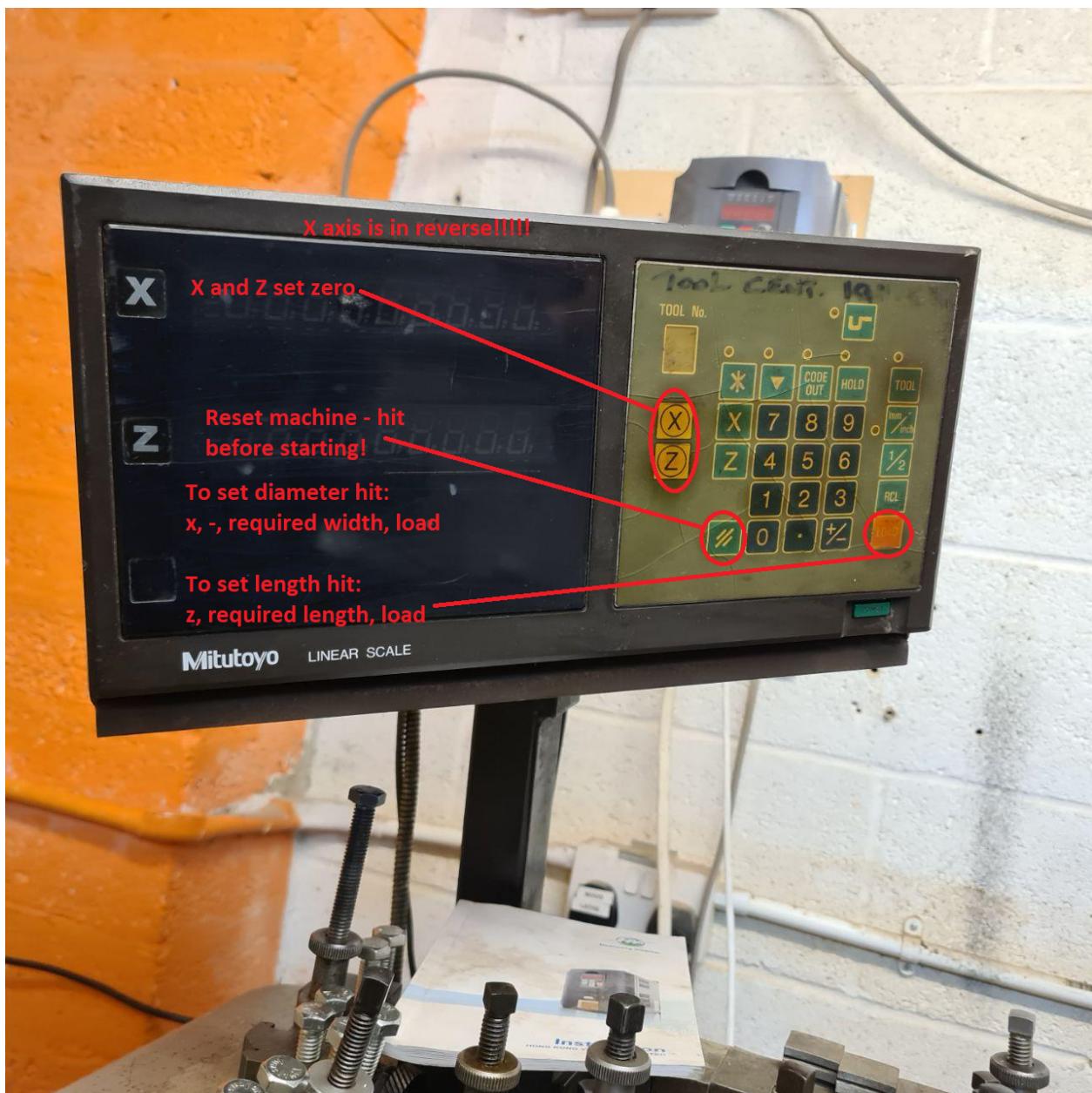


- Tailstock lock - used to lock the tail stock in place when supporting work
- Quill lock - used to lock the quill in place when in use
- Quill advance - used to advance or retract the quill to help in supporting work

## DRO

Digital read out is used to indicate the position of the tool relative to the work

**Important to note that the x axis is reversed**



- X and Z set zero - buttons used to set the X and Z values to zero
- Reset machine - resets the DRO start the unit properly
- Diameter and length settings - used to set the width of the work, and the length of the work.

## Collet Chuck

Below is the equipment available for setting up a collet chuck, or for turning between centres. Only the sleeve, dead centre and lathe dog attachment is needed for between centre work - it does not require a drawbar. *The collet chuck must be used with the drawbar.*



## Installing

**Step 1:** Remove the 3 jaw chuck that is usually attached to the lathe. It is heavy. Use the wooden "chuck-o-matic" to protect the ways, and to limit the amount of lifting that is necessary.



To undo the chuck you need to align the | markers, this position is between the furthest clockwise or anticlockwise positions. It can be quite hard to see the marker on the rotating part. In addition, the chuck may require a tap from the dead weight hammer to release it.

**Step 2:** Screw the collet chuck onto the threaded bar, and insert into the MT4 sleeve.



**Step 3:** Insert the assembly into the spindle. The drawbar should protrude from the back. Make sure the threads are clean ;)



**Step 4:** Install the cap, washer and nut. Tighten the nut with a 24mm spanner, and tighten the grub screw. You can tighten the collet and drawbar simultaneously by using the ER32 spanner on the chuck and the 24mm spanner on the nut simultaneously.



## Removing

Basically, reverse the steps above. However, removing the parts may be difficult and there are some gotchas.

- Don't use the drawbar to tap out the MT4 sleeve unless you enjoy fixing threads. The way the drawbar rests in the spindle combined with the shape of the sleeve means that the thread will be compressed when attempting to tap it out.
- The collet chuck fits very snuggly, and because the draw bar is very long, it is hard to give a sharp enough tap from the dead weight hammer. A harder hammer might be necessary. Do this with caution.
- Make sure that the precision surfaces are clear of swarf before reinstalling the chuck, or it will run out, perhaps permanently.

## Basic how to use guide

- Adjustments
- Repairs
- Inductor demonstration
- Inductee demonstration
- Shut down / tidy up

Actually make something

To add work holding best workholding best practice