



## MODEL CX814

# 14" X 20" HEAVY DUTY VS WOOD LATHE USER MANUAL



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Version: 2.0 2024

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**Specifications:**

**Model Number CX814 Product Dimensions:**

Net Weight..... 50KG  
Width (side-to-side) x Depth (front-to-back) x Height..... 41-1/2X22X19

**Shipping Dimensions:**

Gross Weight.....52.5KG  
Length x Width x Height.....970\*530\*300mm  
Must Ship Upright.....Yes

**Electrical:**

Power Requirement.....120V 60HZ 1PH  
Power Cord Length.....2.3M  
Plug Included.....Yes Included  
Switch Type.....Paddle Switch ON/OFF

**Motors:**

Horsepower.....750W  
Amps.....6A  
Type.....Universal Brush-Type  
Motor Power.....Variable frequency motor  
Transfer Belt.....Drive Belt

**Operation Information**

Swing Over Bed.....14 inch  
Swing Over Tool Rest Base.....10 inch  
Distance Between Centers.....20 inch  
Max. Distance Tool Rest to Spindle Center.....5 inch  
No of Spindle Speeds.....Variable  
Spindle Speed Range.....250-720 RPM, 600-1700 RPM, and 1200-3550  
Spindle Taper.....MT2  
Spindle Thread Size.....1" x 8TPI  
Spindle Bore.....0.40 inch  
Type of Included Spindle.....Center Spur  
Indexed Spindle Increments.....15 deg.  
No of Indexes.....24

**Tool Rest Information-**

Tool Rest Width.....8 inch  
Tool Rest Post Diameter.....1 inch  
Tool Rest Post Length.....3-1/2 inch  
Tool Rest Base Height.....2 inch

**Tailstock Information**

Tailstock Taper.....MT2  
Type of Included Tailstock Center.....Live  
Tailstock quill travel.....90mm

**Other Related Information**

Bed Width.....5-1/8 inch  
Faceplate Size.....4inch

## Assembly

The wood turning lathe is delivered pre-assembled. After unpacking, the lathe should be mounted to a solid stand or work surface.

Transport the wood turning lathe in its packing crate to a place near its final installation site before unpacking it. If the packaging shows signs of possible transport damage, take the necessary precautions to not to damage the machine when unpacking. If any damage is discovered, the carrier and/or shipper must be notified of this fact immediately to establish any claim which might arise.

## Needed for Setup

The following items are needed, but not included, for the setup/assembly of this machine.

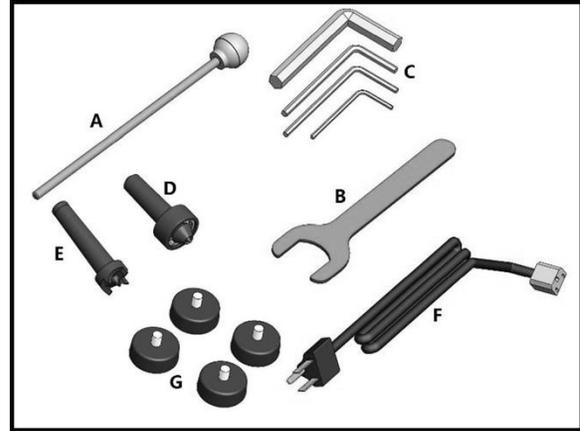
Description	Qty
Additional People.....	1
Safety Glasses.....	1
Cleaner/Degreaser.....	As Needed
Disposable Shop Rags...	As Needed

This machine is heavy. DO NOT over exert yourself while unpacking or moving machine get assistance!!

## Unpacking the machine

Inspect the machine completely and carefully, making sure that all materials, such as shipping documents, instructions and accessories supplied with the machine have been received.

The following is a list of items shipped with your machine. Before beginning setup, lay these items out and inventory them.



A. Knockout Rod.....	1
B. Open-End Wrench 32mm.....	1
C. Hex Wrenches 3, 4, 5, 12mm.....	1
D. Live Center MT#2.....	1
E. Spur Center MT#2.....	1
F. Power Cord (installed).....	1
G. Rubber Feet M8-1.25 x 15.....	4
H. Faceplate (mounted).....	1

### NOTE

If you cannot find an item on this list, please carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.

## Cleanup

The unpainted surfaces of the machine are coated with a heavy-duty rust preventative that prevents corrosion during shipment and storage.

This rust preventative works extremely well, but it will take a little effort to clean.

Be patient and do a thorough job cleaning your machine. The time you spend doing this now will give you a better appreciation for the proper care of your machine's unpainted surfaces.

### Basic steps for removing rust preventative:

- 1.) Put on safety glasses.
- 2.) Coat the rust preventative with a liberal amount of cleaner/degreaser, and then let it soak for 5–10 minutes.
- 3.) Wipe off the surfaces. If your cleaner/degreaser is effective, the rust preventative will wipe off easily. If you have a plastic paint scraper, scrape off as much as you can first, and then wipe off the rest with the rag.
- 4.) Repeat **Steps 2–3** as necessary until clean, then coat all unpainted surfaces with a quality metal protectant to prevent rust.

<b>CAUTION</b>
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Avoid chlorine-based solvents, such as acetone or brake parts cleaner, that may damage painted surfaces.
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## Placement location

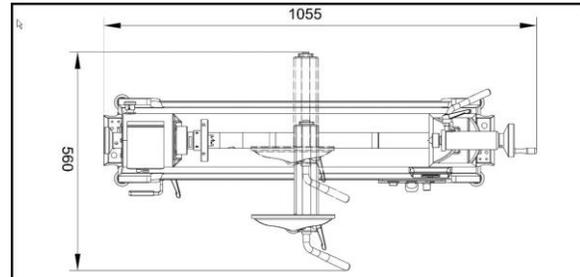
### Workbench Load

Refer to the Machine Data Sheet for the weight and footprint specifications of your machine. Some workbenches may require additional reinforcement to support the weight of the machine and workpiece materials.

### Placement

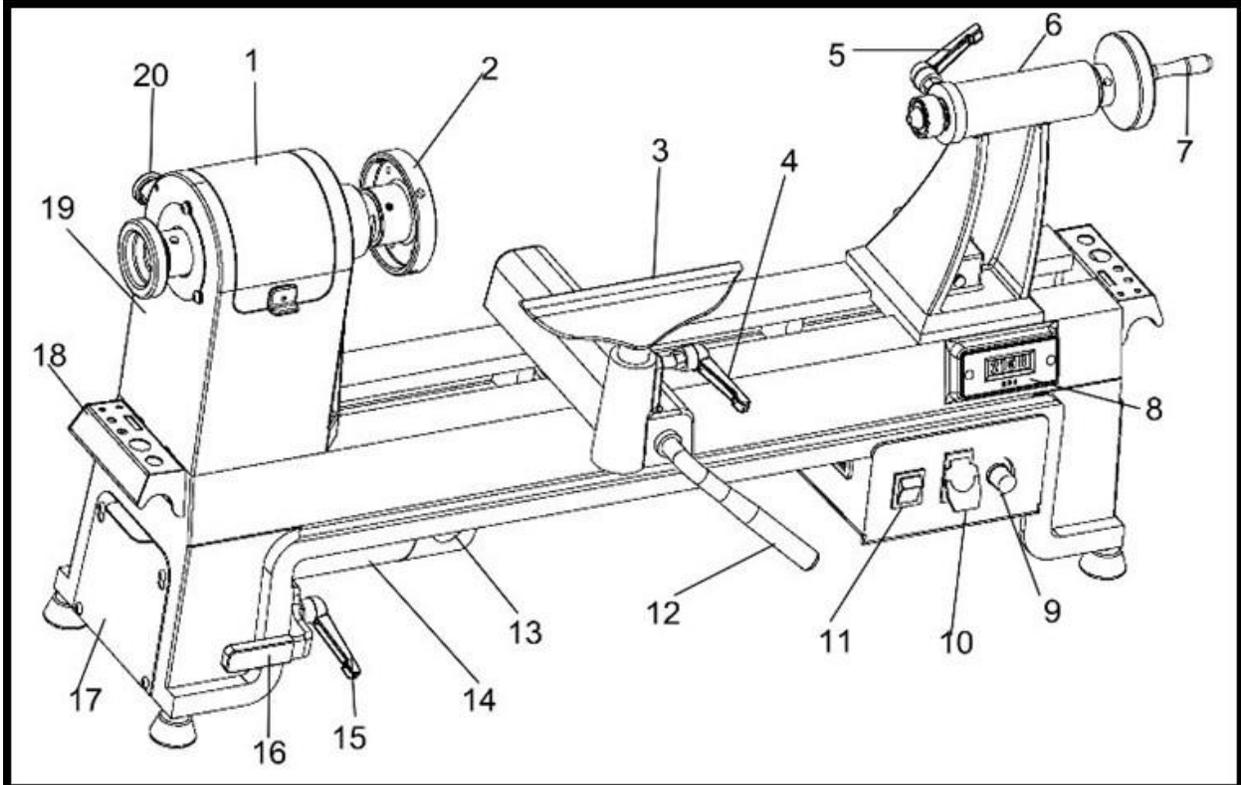
Consider anticipated workpiece sizes and additional space needed for

auxiliary stands, worktables, or other machinery when establishing a location for this machine in the shop. Below is the minimum amount of space needed for the machine.



## Assembly

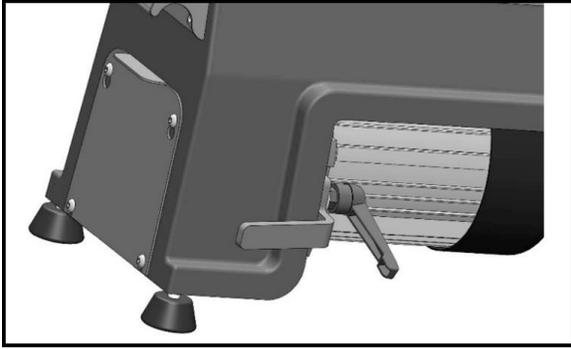
The machine must be fully assembled before it can be operated. Before beginning the assembly process, refer to **Needed for Setup** and gather all listed items. To ensure the assembly process goes smoothly, first clean any parts that are covered or coated in heavy-duty rust preventative.



- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. Belt Drive Access Panel        | 15. Belt Tension Locking Handle   |
| 2. Face Plate                     | 16. Motor Plate Tensioning Handle |
| 3. Tool Rest                      | 17. Lower Belt Drive Access Plate |
| 4. Tool Rest Locking Handle       | 18. Accessory Holder              |
| 5. Quill Locking Handle           | 19. Headstock                     |
| 6. Tailstock                      | 20. Spindle Lock (Backside)       |
| 7. Tailstock Handle               |                                   |
| 8. Digital RPM Readout            |                                   |
| 9. Speed Adjustment Knob          |                                   |
| 10. ON/OFF Switch                 |                                   |
| 11. Forward/Reverse Switch        |                                   |
| 12. Tool rest Base Locking Handle |                                   |
| 13. Carbon Brush Cap              |                                   |
| 14. Motor                         |                                   |

## To assemble machine

1. Install (4) rubber feet into holes in bottom of legs and adjust feet so lathe sits level without rocking.



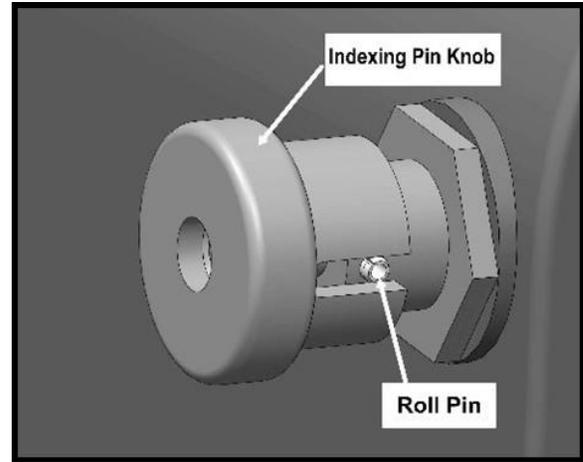
## Initial Running

Once assembly is complete, test run the machine to ensure it is properly connected to power and safety components are functioning correctly. If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The Troubleshooting table in the SERVICE section of this manual can help. The test run consists of verifying the motor powers up and runs correctly.

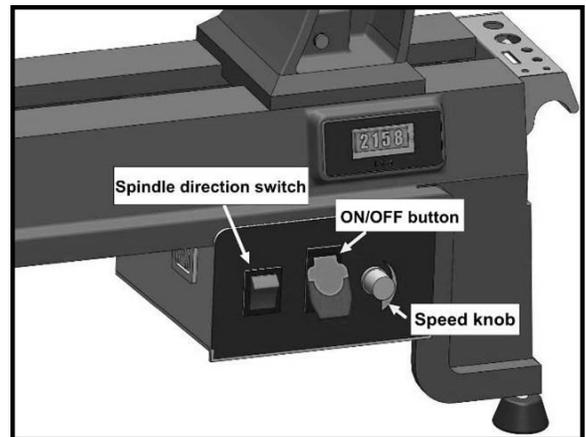
### To test run machine:

1. Clear all setup tools away from machine.
2. Pull out the indexing pin knob and rotate so detent is seated on roll

pin. This disengages the indexing pin.



3. Set the spindle direction switch to forward and turn spindle speed knob all the way counter clockwise.
4. Connect the machine to power supply.



5. Verify machine is operating correctly by setting spindle direction switch in forward (down) position, pressing ON button, then

slowly turning spindle speed dial clockwise. The digital readout should illuminate, and spindle should rotate down toward front of lathe.

6. Turn the spindle speed dial all the way counterclockwise.
7. Press the OFF button.
8. Set the spindle direction switch to reverse (up) position, press the ON button, then slowly turn the spindle speed dial clockwise.
9. When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises. Spindle should rotate up toward rear of lathe.
10. Press OFF button.

## Adjustment

### Tool rest adjustment

You can adjust the position, height and angle of the tool rest assembly to suit the task at hand.

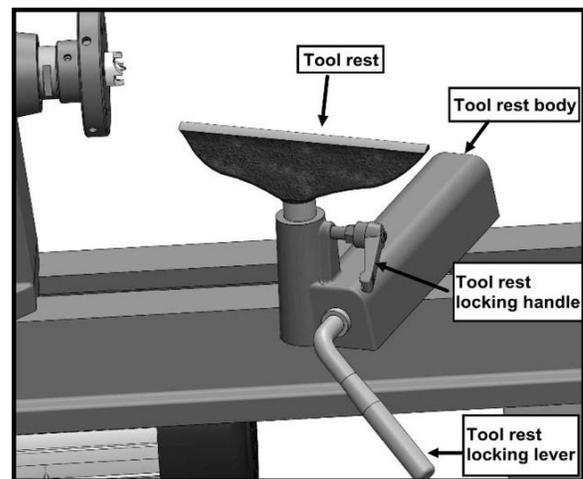
1. The tool rest locking lever (locks the tool rest body) in position. Loosen the lever to slide the tool rest body along the lathe bed. Tighten the lever

firmly when the tool rest body is properly positioned.

#### NOTE:

There is a nut on the underside of tool rest body that needs to be tightened periodically to enable the tool rest body locking lever to tighten properly.

2. The tool rest locking handle locks the tool rest in place. Loosen the handle to position the tool rest at the specific angle or height. Tighten the handle firmly when the tool rest is properly positioned.



### Setting up the face plate

#### NOTE:

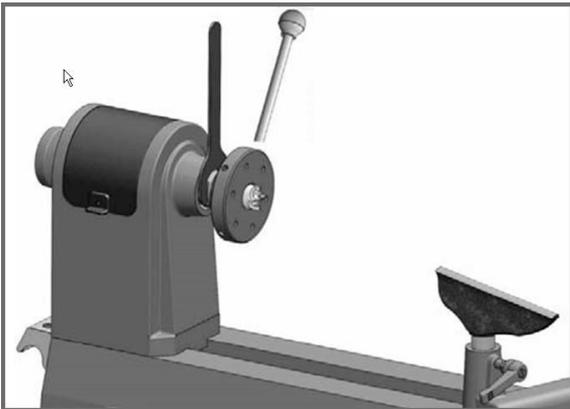
When installing the face plate for turning bowls and plates, mount the workpiece onto the face plate prior to installing the face plate on the headstock.

### To install the face plate:

1. Thread the face plate onto the headstock spindle by turning it clockwise as far as it will go, and then tighten the two set screws with a hex wrench.
2. Lock the spindle lock by engaging the knob in the deep groove. Insert the knockout rod into a hole on the side of the face plate and use the wrench to fully tighten the face plate.

### To remove the face plate:

1. Loosen the two face plate set screws.
2. Lock the spindle lock and insert the knockout rod into the face plate side hole. Use the wrench to unscrew the face plate by turning it towards the operator.



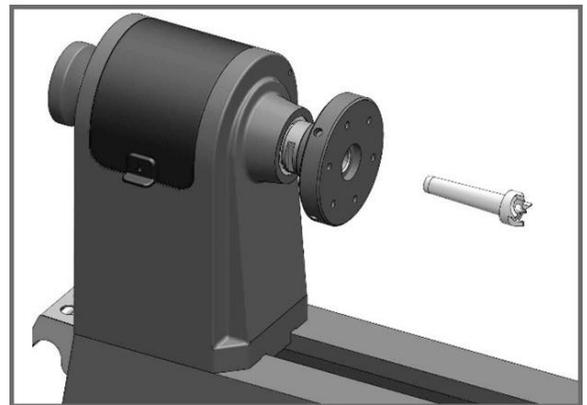
### Setting up the headstock spur center

#### To install the spur center:

1. Make sure the mating surfaces of both the spur center and the headstock spindle are clean. You can use an acetone-moistened cloth to remove any debris, oil, etc.
2. Drive the spur center into the workpiece, using a rubber mallet or a piece of scrap wood.

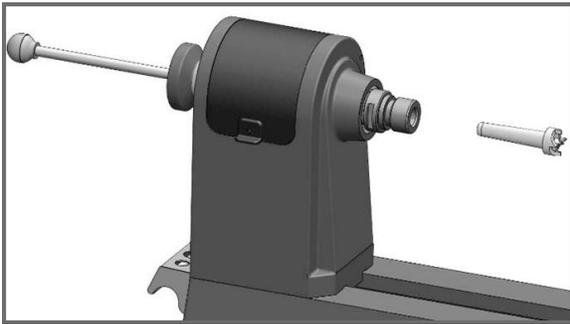
CAUTION
Never drive the workpiece into the spur center while the spur center is in the headstock.

3. Push the spur center through the face plate into the headstock spindle.



## To remove the spur center:

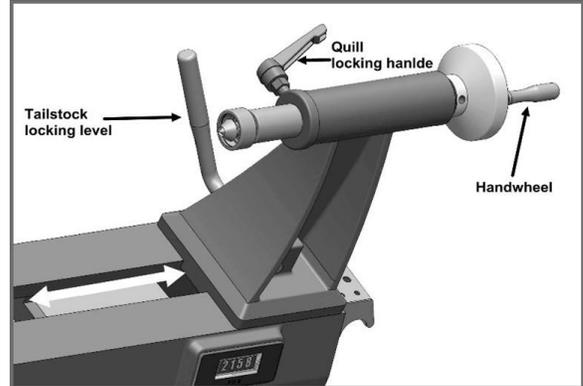
1. Hold the spur center to prevent it from falling. Use a rag to protect your hand from the sharp edges.
2. Insert the knockout rod through the spindle hole to tap out the spur center.



## Tailstock adjustment

Loosen the tailstock locking lever and slide the tailstock along the lathe bed into the desired position. Retighten the locking lever.

Loosen the quill locking handle just enough to unlock the tailstock quill. Turn the hand wheel clockwise to advance the quill and counter clockwise to retract the quill. Retighten the quill locking handle.



## Setting up the tailstock live center

### To install the live center:

1. Rotate the tailstock hand wheel clockwise a few times to advance the quill forward.
2. Make sure the mating surfaces are clean. Push the live center into the quill.

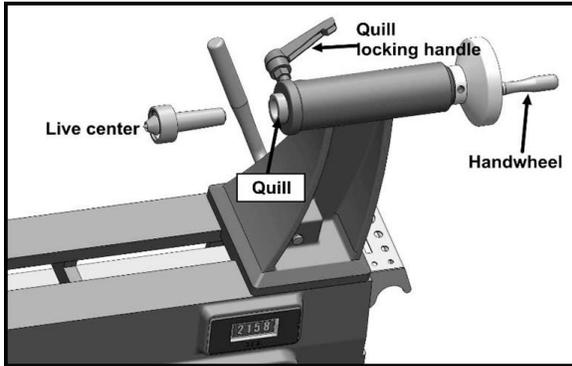
### **NOTE:**

If the tailstock quill gets fully retracted when the live center is mounted, it will dismount the live center. This is normal. Remount the live center by extending the tailstock quill approximately 0.5 inch and pushing the live center in place.

### To remove the live center:

1. Hold the live center to prevent it from falling. Use a rag to protect your hand from the sharp edges.

2. Rotate the hand wheel counter clockwise to retract the quill until the live center is released from the quill.



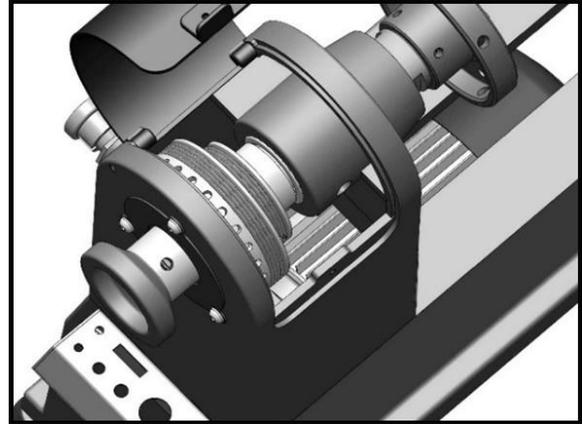
## Indexing/Spindle lock

Indexing is used to create evenly spaced features around the circumference of the workpiece while keeping the spindle locked. There are 24 index positions in the spindle pulley, each 15° apart, to help you rotate the workpiece evenly for accurately spaced features.

Place the spindle lock in the locked position to help maintain the certain index point.

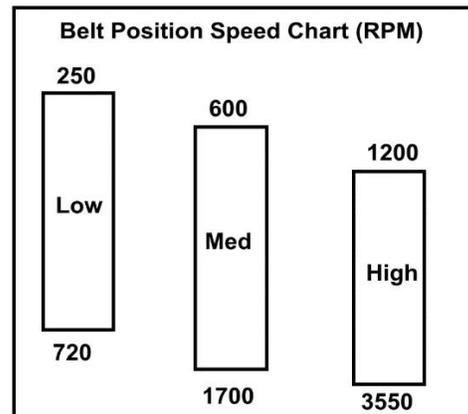
### CAUTION:

Make sure to DISENGAGE the spindle lock before starting the lathe again. Never start the lathe with the index pin engaged in the spindle pulley!!



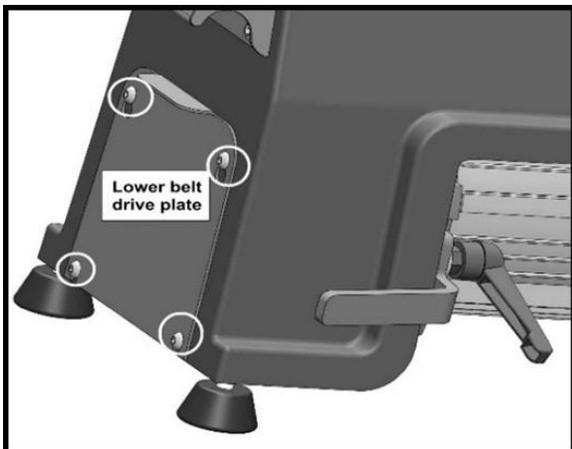
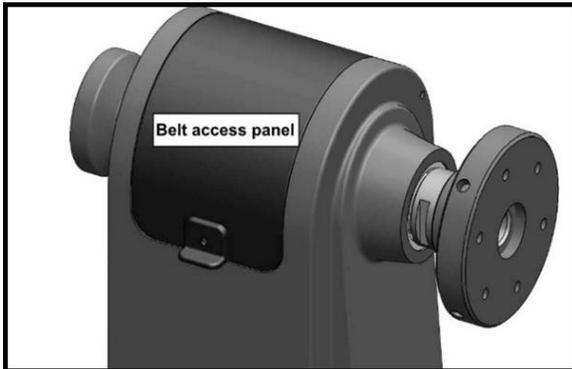
## Adjusting the speed

CX814: Three speed ranges: 250-720 RPM, 600-1700 RPM, and 1200-3550 RPM.



Always start at slower speeds for rough cuts and larger workpieces. Use faster speeds for refined cuts and detailed work. Set a suitable speed range for your operation by adjusting the belt position. Change the speed within a speed range using the speed adjustment knob. The speed will be displayed on the digital RPM readout on the front panel.

1. When changing speed, make sure to turn off and disconnect the lathe.
2. Loosen the knob on the top front of the headstock and open the belt drive access panel.
3. Loosen (but do not remove) the four screws holding the lower belt drive plate onto the left side of the headstock. Lift and remove the lower belt drive plate.

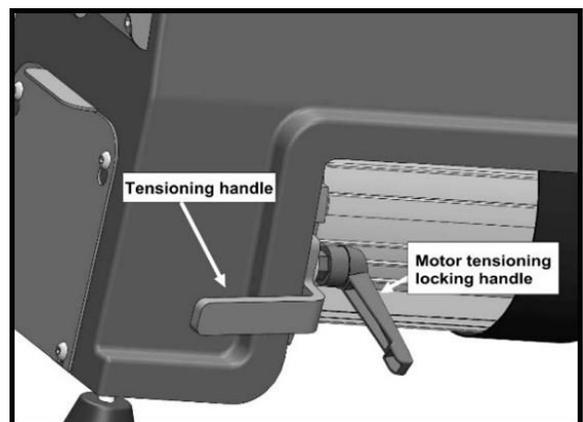


4. Loosen the motor tensioning locking handle.

**NOTE:**

The screw at the center of the locking handle can be loosened to rotate the locking handle to an optimal position.

5. Pull upwards on the tensioning handle to relieve tension on the belt. It may help to wedge a piece of wood or other support under the tensioning handle to keep it in place while you adjust the belt position.
6. Adjust the belt's position on both the upper and lower drive pulleys to the desired speed range setting. Make sure the belt is vertically aligned on the upper and lower pulleys.
7. Lower the tensioning handle back to its original position, allowing the weight of the motor to place the belt under tension. Tighten the locking handle.



8. Replace the lower belt drive plate and tighten the screws. Lower the upper belt drive access panel and tighten the belt drive access panel knob.
9. Use the speed adjustment knob on the front panel to set the speed within your selected speed range. Use the forward/reverse switch to set the rotational direction.

### Speed recommendations

High range is best when turning a workpiece where a clean finish is required, and only light cuts are made. Mid-range is a compromise between high and low ranges. Low range, which has more torque, is best when turning a workpiece where a lot of material must be removed, and a rough finish does not matter. Use the speed dial to adjust spindle speed within each range.

Diameter of Work-piece	Roughing RPM	General Cutting RPM	Finishing RPM
Under 2"	1520	3000	3000
2-4"	760	1600	2480
4-6"	510	1080	1650
6-8"	380	810	1240
8-10"	300	650	1000
10-12"	255	540	830
12-14"	220	460	710

## Operation

The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation. It will also make the machine controls/components discussed later in this manual easier to understand. Due to the generic nature of this overview, it is not intended to be an instructional guide. To learn more about specific operations, read this entire manual, seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.

### CAUTION

If you are not experienced with this type of machine, **WE STRONGLY RECOMMEND** that you seek out additional training outside of this manual. Read books/magazines or get formal training before beginning any projects.

**To complete a typical operation, the operator does the following:**

1. Make sure the workpiece is suitable for turning. No extreme bows, knots, or cracks should exist.
2. Prepare and trim workpiece with a bandsaw or table saw to make it roughly concentric.

3. Install workpiece between centers or attach it to a faceplate or a chuck.
4. Adjust tool rest according to type of operation and set minimum clearance between workpiece and lip of tool rest to a 1/4" gap.
5. Rotate workpiece by hand to verify spindle and workpiece rotate freely throughout full range of motion.
6. Verify pulley speed range is set for type of wood and size of workpiece installed.
7. Verify spindle speed dial is turned all the way counterclockwise, so spindle won't start in high speed.
8. Put on safety glasses, face shield, and respirator.
9. Set spindle direction switch to forward or reverse, start spindle, adjust spindle speed, and carefully begin turning operation, keeping chisel against tool rest the entire time it is cutting.
10. Turn spindle **OFF** when cutting operation is complete.

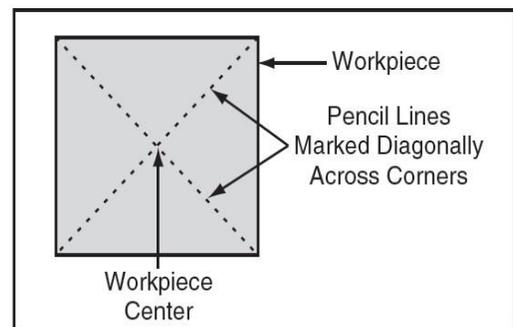
<b>WARNING</b>
TURN OFF MACHINE BEFORE CHANGING ROTATIONAL DIRECTION.

## Spindle turning

Spindle turning is the operation performed when a workpiece is mounted between centers. Table legs, tool handles, and candlesticks are typical projects where this operation is used.

### To set up a spindle turning operation:

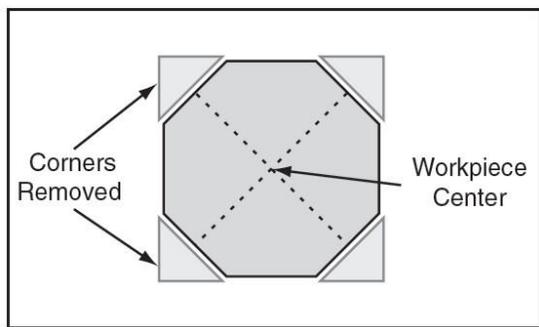
1. Find center point of both ends of your workpiece by drawing diagonal lines from corner to corner across end of workpiece.
2. Make a center mark by using a wood mallet, tapping the point of the spur center into center of workpiece on both ends.



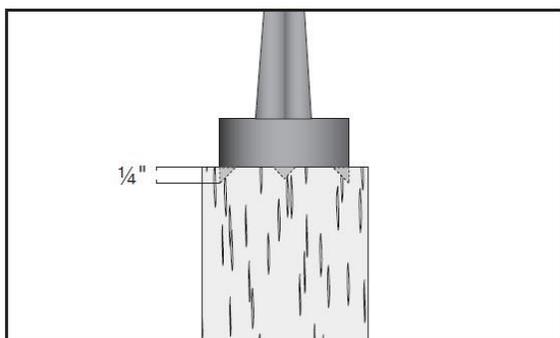
3. Using a 1/4" drill bit, drill a 1/4" deep hole on the center mark on end of the workpiece to be mounted on headstock spur center.

4. To help embed spur center into workpiece, cut 1/8" deep saw kerfs in headstock end of workpiece along diagonal lines marked in **Step 1**.

5. If your workpiece is over 2" x 2", cut corners off workpiece lengthwise to make turning safer and easier.



6. Drive spur center into end center mark of workpiece with a wood mallet to embed it at least 1/4" into workpiece.



7. With workpiece still attached, insert spur center into headstock spindle.

### Note:

Use tool rest to support opposite end of workpiece so that workpiece and spur center do not separate during installation.

8. Install live center into tailstock quill and tighten quill-lock handle to lock quill in position.

9. Slide tailstock toward workpiece until point of live center touches workpiece center mark, then lock tailstock in this position.

10. Loosen quill-lock handle and rotate tailstock hand wheel to push live center into workpiece at least 1/4".

11. Properly adjust tool rest to workpiece.

12. Before beginning lathe operation, rotate workpiece by hand to ensure there is safe clearance on all sides.

### Spindle turning tips

- When turning the lathe **ON**, stand away from the path of the spinning workpiece until the spindle reaches full speed and you can verify that the workpiece will not come loose.
- Use the slowest speed when starting or stopping the lathe.

- Select the right speed for the size of workpiece that you are turning.
- Keep the turning tool on the tool rest the ENTIRE time that it is in contact with the workpiece.
- Learn the correct techniques for each tool you will use. If you are unsure about how to use the lathe tools, read books or magazines about lathe techniques, and seek training from experienced and knowledgeable lathe users.

The following operation instructions serve as a beginning point for some common lathe operations. Practice on scrap material to become familiarized with the operation process and make the necessary adjustments before working on your workpiece.

### **Roughing out cut**

Roughing out is the first step of the lathe operation, which uses the large roughing gouge tool to smooth out sharp corners to make the workpiece cylindrical. When roughing out a workpiece, run the lathe at low speed and always cut downhill, from the large diameter side of the workpiece to the small diameter side.

1. Make sure the lathe is turned off and disconnected. The first cut will start about 2 inches from the tailstock end of the workpiece. Adjust the tool

rest to the suitable position and set the lathe to a slow speed.

2. Plug in and turn on the lathe. Wait for the motor to reach full speed. Place the roughing gouge on the tool rest about 2 inches from the tailstock end of the workpiece. Slowly and gently raise the tool handle until the cutting edge comes into contact with the workpiece.

<b>NOTE:</b>
Make sure that the tool is being held well on the work, with the bevel or grind tangent to the revolving surface of the workpiece. This position will generate a clean shearing cut. Do not push the tool straight into the work.

3. To make the first pass, roll the flute of the tool (the hollowed-out portion) towards the end of the tailstock.

4. Make the second pass, starting at about 2 or 3 inches to the left of the first cut. Again, advance the tool towards the tailstock, and merge with the previous cut.

5. As your cuts get close to the headstock live center end of the workpiece, roll the gouge in the opposite direction to carry the final cut off the live center end of the workpiece.

<b>NOTE</b>
-------------

Always work towards the end of the workpiece; NEVER start a cut at the end.
---

6. Make long sweeping cuts in a continuous motion to turn the workpiece to a cylinder. Keep as much of the bevel of the tool in contact with the workpiece as possible to ensure control and avoid catches. The roughing cut is continued until the work approaches about 1/8 inch to the required cylinder diameter.

7. Once the workpiece is roughed down to a cylinder, smooth it with a large skew chisel tool. The turning speed can be increased. Keep the skew handle perpendicular to the spindle and use only the center third of the cutting edge for a long smoothing cut (touching one of the points of the skew to the spinning workpiece may cause a catch and ruin the workpiece).

<b>NOTE:</b>
--------------

Constantly remember to move the tool rest inward towards the workpiece to keep a safe distance between the tool and your workpiece.
---

## Creating Beads

Making a parting cut for the desired depth and location of your bead.

1. Place the parting tool on the tool rest and move the tool forward to make the full bevel of the tool come into contact with the workpiece. Gently raise the handle to make cuts of the appropriate depth. Repeat for the other side of the bead.

2. Using a small skew or spindle gouge, start in the center between the two cuts and cut down each side to form the bead. Roll the tool in the direction of the cut.

## Creating coves

Using a spindle gouge to create a cove.

1. With the flute of the tool at 90 degrees to the workpiece, touch the point of the tool to the workpiece and roll in towards the bottom of the cove. Stop at the bottom, as attempting to go up the opposite side may cause the tool to catch.

2. Move the tool over the desired width of the cove. With the flute facing the opposite direction, repeat the step for the other side of the cove. Stop at the bottom of the cut.

## Creating V-grooves

Using the point of the skew to create a V-groove in the workpiece.

1. Lightly mark the center of the V with the top of the skew. Move the point of the skew to the right half of the desired width of your cut.
2. With the bevel parallel to the right side of the cut, raise the handle and push the tool in to the desired depth. Repeat from the left side.

**NOTE:**

The two cuts should meet at the bottom and leave a clean V-groove. Additional cuts may be taken to add to either the depth or the width of the cut.

**Sanding the workpiece**

Adjust the lathe to a slower speed for sanding and finishing. High speed can build friction while sanding and cause burns in some woods. The cleaner the cuts, the less sanding will be required - try to make the cuts as refined as you can before moving to the sanding process.

1. Use sandpaper finer than 120 grit, as coarse sandpaper may scratch the workpiece. Folding the sandpaper into a pad will allow easier and safer sanding. Do not wrap the sandpaper around your fingers or the workpiece.
2. Apply light pressure to the workpiece during sanding. Use power-sanding techniques to avoid concentric sanding marks around your finished piece.

3. Progress through finer grits of sandpaper until the desired surface is achieved. Finish sanding with 220 grit sandpaper.

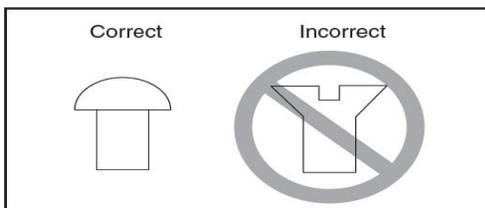
**Bowl turning****Mounting the workpiece onto the face plate**

When turning bowls or plates with a large diameter, mounting it to the face plate to give the maximum amount of support. While face plates are the most reliable method for holding a larger block of wood for turning, a lathe chuck can also be used. A chuck is handy when working on more than one piece at a time, allowing you to open the chuck and change workpieces instead of having to remove the mounting screws.

1. Select a stock that is at least .2 inches (5 mm) larger than each dimension of the finished workpiece.
2. Remove any bark from the top of the wood stock (that will be later attached onto a face plate or in a chuck).
3. True one of the surfaces of the workpiece for mounting against the face plate. Using the face plate as a template, mark the location of the

mounting holes on the workpiece and drill pilot holes of the appropriate size.

If the mounting screws on the face plate will interfere with the workpiece, a waste block can be used. Shape the waste block so that it is of the same diameter as the face plate. Flatten the mating surfaces of the waste block and the workpiece. Use a high-quality glue suitable for the particular workpiece to prevent the workpiece from falling off during operation. Glue the waste block to the workpiece securely. If you plan to use a chuck, turn the waste block into a tenon of the appropriate length and diameter to fit your chuck.



### To shape the inside of a bowl or plate

- Turn off the lathe and move the tailstock out of the way.
- Mount the workpiece onto the face plate and install the face plate on to the headstock.
- Adjust the tool rest in front of the workpiece to be just below the centerline and at the right angle to the lathe's turning axis.

- Rotate the workpiece by hand to check for proper seating and clearance.
- Begin shaping by lightly shearing across the top of the bowl from rim to center. Place a bowl gouge tool on the tool rest at the center of the workpiece with the flute facing the top of the bowl.
- The tool handle should be level and pointed toward the four o'clock position.
- Control the cutting edge of the gouge with the left hand, while swinging the tool handle around towards your body with the right hand. The flute should start out facing the top of the workpiece, rotating it upwards as it moves deeper into the bowl to maintain a clean and even curve. As the tool goes deeper into the bowl, progressively work outwards towards the rim of the bowl. It may be necessary to turn the tool rest into the piece as you get deeper into the bowl.

**NOTE:**

**Try to make one light continuous movement from the rim to the bottom of the bowl to ensure a clean, sweeping curve through the piece. Should there be a few small ridges left, a light cut with a large domed scraper can even out the surface.**

Develop the preferred wall thickness at the rim and maintain it as you work deeper into the bowl (once the piece is thin toward the bottom, you cannot make it thinner at the rim). When the interior is finished, move the tool rest back to the exterior to re-define the bottom of the bowl. Work the tight area around the face plate or the chuck with a bowl gouge. Begin the separation with a parting tool, but do not cut all the way through.

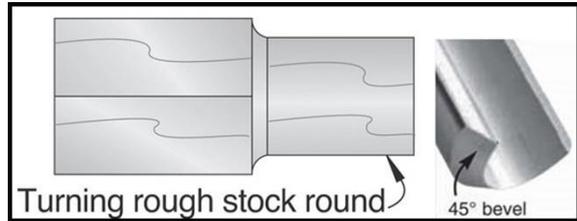
### Turning tools

Lathe tools come in a variety of shapes and sizes, and usually fall into five major categories.

**WARNING:**  
Select the right tool for your task at hand. Make sure all tools, chisels and accessories are sharp before using them. DO NOT use dull or damaged tools!!

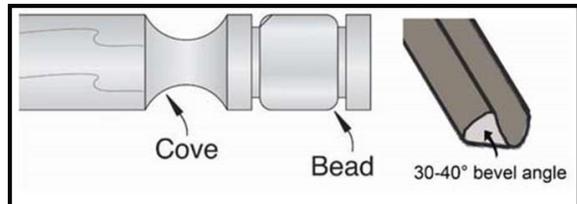
### Roughing gouge

Mainly used for rough cutting, detail cutting, and cove profiles. The rough gouge is a hollow, double-ground tool with a round nose, and the detail gouge is a hollow, double-ground tool with either a round or pointed nose.



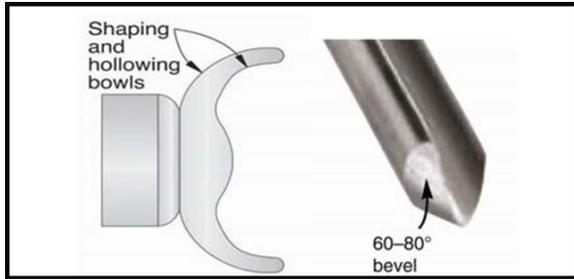
### Spindle gouge

The spindle gouge cuts coves, beads and freeform contours. It can also be used for producing shallow hollows on faceplate turnings.



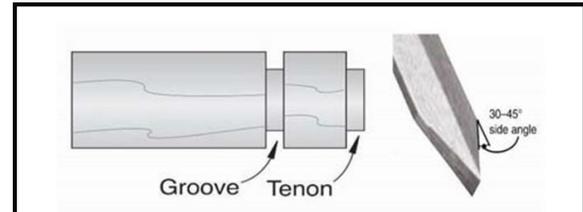
### Bowl gouge

The bowl gouge cuts external and internal profiles on faceplate-mounted stock, such as bowls and platters. It can also be used for creating ultra-smooth cuts on bowls and spindles by using it as a shearing scraper.



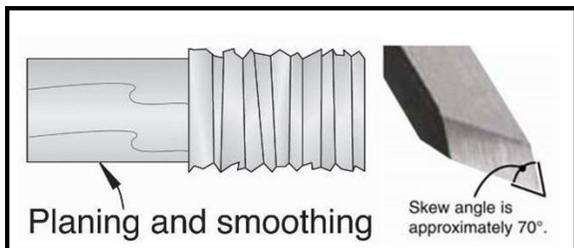
## Parting tool

Use the parting tool to form grooves and tenons and to remove stock. It can also be used for rolling small beads.



## Skew Chisel

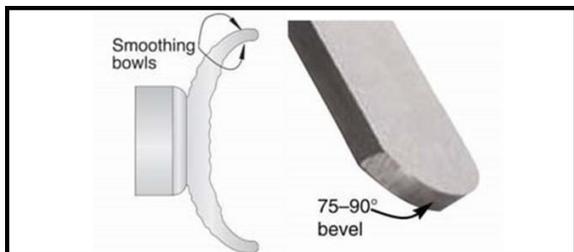
A very versatile tool that can be used for planing, squaring, V-cutting, beading, and parting off. The skew chisel is flat, double-ground with one side higher than the other (usually at an angle of 20°–40°).



If possible, select only quality high-speed steel turning tools. High-speed steel tools hold an edge and last longer than ordinary carbon steel. As one becomes proficient in turning, a variety of specialty tools for specific applications can be acquired. The following tools provide the basics for most woodturning projects

## Round nose scraper

Typically used where access for other tools is limited, such as hollowing operations. This is a flat, double-ground tool that comes in a variety of profiles (round nose, spear point, square nose, etc.) to match many different contours.



## Maintenance

This chapter contains important information about:

- Inspection
- Maintenance

### ATTENTION!

Please note that properly performed regular maintenance is an essential prerequisite for operational safety, failure-free operation, a long service life of the wood lathe, and the quality of the products in which you manufacture. Any installations and/or equipment from other manufacturers must also be in good condition.

## Schedule

For optimum performance from this machine, this maintenance schedule must be strictly followed.

## Ongoing Check

To maintain a low risk of injury and proper machine operation, if you ever observe any of the items below, shut down the machine immediately and fix the problem before continuing operations:

- Loose faceplate or mounting bolts.
- Damaged center or tooling.
- Worn or damaged wires.
- Loose machine components.
- Any other unsafe condition.

## Daily Check

- Clean off dust build-up.
- Clean and lubricate lathe bed, spindle, and quill.

## Monthly Check

- Belt tension, damage, or wear.

## Cleaning

Cleaning this lathe is relatively easy. Vacuum excess wood chips and sawdust and wipe off the remaining dust with a dry cloth. If any resin has built up, use a resin-dissolving cleaner to remove it. Protect the unpainted cast-iron surfaces by wiping them clean after every use—this ensures moisture from wood dust does not remain on bare metal surfaces.

## Lubrication

All bearings on this lathe are lubricated and sealed at the factory, and do not need additional lubrication.

Using a lightly oiled shop rag wipe the outside of the headstock spindle. DO NOT allow any oil to get on the inside mating surfaces of the spindle.

Use the tailstock hand wheel to extend the quill out to the furthest position and apply a thin coat of white lithium grease to the outside of the quill.

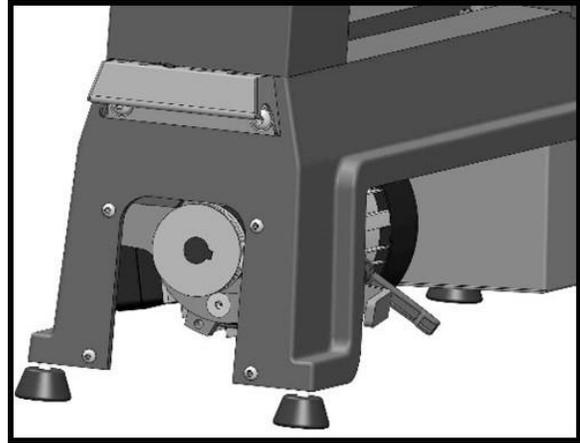
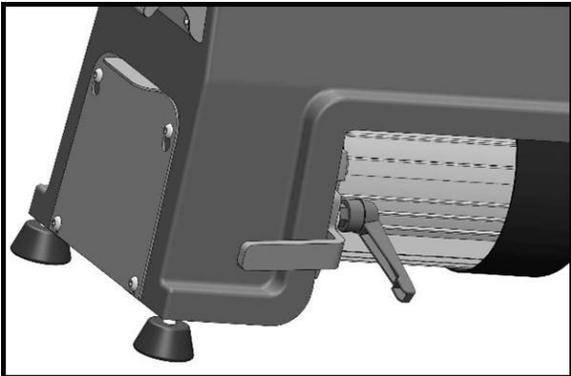
DO NOT allow any oil or grease to get on the inside mating surfaces of the quill.

## Tensioning and replacing belt

Most of the stretching will occur during the first 16 hours but may continue with further use. If the lathe loses power while making a cut, the belt may be slipping and need tensioning. If the belt shows signs of excessive wear, or damage, replace it.

### Tensioning belt

1. Disconnect machine from power!
2. Remove side access cover, open front access cover, and loosen belt-tension lock handle
3. Lift belt-tension lever, then tighten belt-tension lock handle.

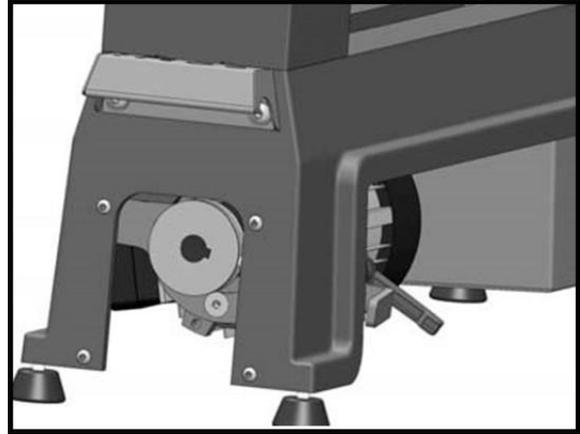


4. Press belt with moderate pressure in center to check tension. Belt is correctly tensioned when there is approximately 1/2" deflection.
5. Re-install side access cover and close front access cover.

### Replacing belt

1. Disconnect machine from power!
2. Remove side access cover and open front access cover.
3. Loosen belt-tension lock handle, release belt tension, tighten lock handle, then remove belt from motor pulley.
4. Unthread and remove spindle handwheel, then remove (3) Phillips head screws from spindle end cover and remove cover.

5. Move belt around pulley and spindle, then remove belt through upper opening.
6. Insert new belt through lower opening, and pull it around end of spindle onto pulley
7. Re-install end cover and headstock spindle handwheel.
8. Loosely install belt on inner or outermost motor pulley position.
9. Loosen belt-tension lock handle, move belt-tension lever down to tension belt, then tighten belt-tension lock handle.
10. Follow Step 4 in the Tensioning Belt procedure to set belt tension.
11. Re-install side access cover and close front access cover.



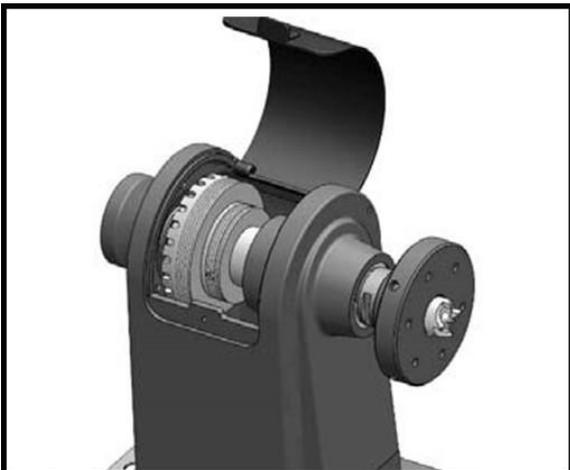
## Replacing Brushes

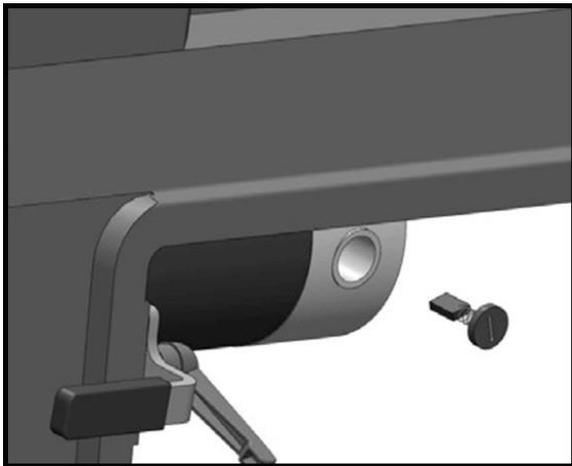
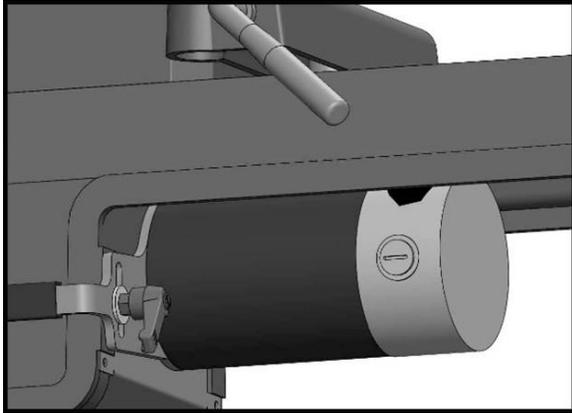
This machine is equipped with a universal motor that uses a pair of carbon brushes to transmit power. These brushes are considered to be regular "wear items" or "consumables" that will eventually need to be replaced. The frequency of this replacement is directly related to how much the motor is used and how hard it is pushed. These brushes are not covered under warranty.

Replace both brushes at the same time if the motor no longer reaches full power, operates inconsistently, or when the brushes measure less than 1/4" long (new brushes are 5/8" long).

### To replace motor brushes:

1. Disconnect machine from power!
2. Unscrew and remove brush caps on front and rear of motor.





4. Use a ruler to measure wear of each carbon brush. If either brush is worn to less than 1/4" in length, replace both brushes.
5. Insert new brush assemblies, positioning them to slide into slots in motor sockets. Individually, press each brush cap against its spring, pushing it into motor socket and turning each brush cap to lock it into motor housing.
6. Test run machine.

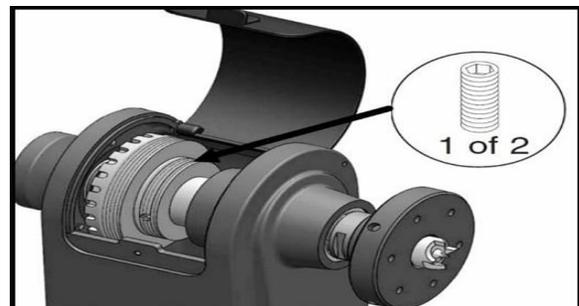
## Aligning Pulleys

The motor and spindle pulleys are aligned at the factory and should not require any adjustment. If they become misaligned over time, it is important that they be re-aligned in order to extend belt life and maximize the transfer of power from the motor to the spindle.

1. Disconnect machine from power!
2. Open front access cover.
3. Loosen (2) set screws on spindle pulley.
4. Slide spindle pulley into alignment with motor pulley.

<b>Note:</b>
When pulleys are properly aligned, there should be no unusual or pulsing sounds coming from the belt.

5. Tighten set screws.



## Troubleshooting Motor& Electrical

DRO ERROR CODE LIST		
ERROR CODE	DESCRIPTION	SOLUTION
<b>F1</b>	low voltage protection (20% lower than standard)	check voltage, restart lathe
<b>F2</b>	high voltage protection (20% higher than standard)	check voltage, restart lathe
<b>F3</b>	incorrect operation of reverse	turn off main switch, restart lathe after the speed display showing "zero"

Symptom	Possible Cause	Possible Solution
<b>Machine does not start, or power supply fuse/breaker trips immediately after start -up.</b>	<ol style="list-style-type: none"> <li>1. OFF button not pressed before toggling spindle direction switch.</li> <li>2. Motor brushes worn or at fault.</li> <li>3. Blown fuse.</li> <li>4. Power supply circuit breaker tripped, or fuse blown.</li> <li>5. Motor wires connected incorrectly.</li> <li>6. Wiring open/has high resistance.</li> <li>7. ON/OFF switch at fault.</li> <li>8. Circuit board at fault.</li> <li>9. Variable-speed potentiometer at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press OFF button before toggling spindle direction switch.</li> <li>2. Remove/replace brushes.</li> <li>3. Replace fuse/ensure no shorts.</li> <li>4. Ensure circuit is sized correctly and free of shorts. Reset circuit breaker or replace fuse.</li> <li>5. Correct motor wiring connections.</li> <li>6. Check/fix broken, disconnected, or corroded wires.</li> <li>7. Replace switch/circuit breaker.</li> <li>8. Inspect/replace if at fault.</li> <li>9. Test/replace if at fault.</li> </ol>

<p><b>Machine stalls or is underpowered.</b></p>	<ol style="list-style-type: none"> <li>1. Machine undersized for task.</li> <li>2. Workpiece material not suitable for machine.</li> <li>3. Feed rate/cutting speed too fast.</li> <li>4. Variable-speed potentiometer at fault.</li> <li>5. Belt slipping.</li> <li>6. Motor brushes worn or at fault.</li> <li>7. Circuit board at fault.</li> <li>8. Pulley slipping on shaft.</li> <li>9. Motor at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use sharp chisels; reduce feed rate/depth of cut.</li> <li>2. Only cut wood and ensure moisture is below 20%.</li> <li>3. Decrease feed rate/cutting speed.</li> <li>4. Test/replace if at fault.</li> <li>5. Tension/replace belt; ensure pulleys are aligned, belts are clean and not damaged.</li> <li>6. Remove/replace brushes.</li> <li>7. Inspect/replace if at fault.</li> <li>8. Tighten/replace loose pulley/shaft.</li> <li>9. Test/repair/replace.</li> </ol>
<p><b>Machine has vibration or noisy operation.</b></p>	<ol style="list-style-type: none"> <li>1. Motor or component loose.</li> <li>2. Machine sits unevenly on workbench.</li> <li>3. V-belt worn, loose, or misaligned.</li> <li>4. Pulley loose.</li> <li>5. Motor fan rubbing on fan cover.</li> <li>6. Workpiece/faceplate at fault.</li> <li>7. Motor mount loose/broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect/replace damaged bolts/nuts and retighten with thread-locking fluid.</li> <li>2. Adjust feet.</li> <li>3. Inspect/replace belt. Re-align pulleys if necessary</li> <li>4. Re-align/replace shaft, pulley, set screw, and key.</li> <li>5. Fix/replace fan cover; replace damaged fan.</li> <li>6. Center workpiece in chuck/faceplate; reduce RPM; replace defective chuck.</li> <li>7. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.</li> </ol>

## Wood Lathe Operations

Symptom	Possible Cause	Possible Solution
<b>Bad surface finish.</b>	<ol style="list-style-type: none"> <li>1. Dull tooling or wrong tool used for task.</li> <li>2. Tool height is not 1/8" above spindle centerline.</li> <li>2. Spindle speed is wrong.</li> <li>3. Excessive vibration.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sharpen tooling, select correct tool for operation.</li> <li>2. Adjust tool rest so tool is 1/8" above spindle centerline.</li> <li>3. Adjust for appropriate spindle speed</li> <li>4. Troubleshoot possible causes/solutions in this table.</li> </ol>
<b>Excessive vibration upon start-up (when workpiece is installed).</b>	<ol style="list-style-type: none"> <li>1. Workpiece is mounted incorrectly.</li> <li>2. Workpiece warped, out of round, or flawed.</li> <li>3. Lathe is resting on an uneven surface.</li> <li>4. Spindle speed too fast for workpiece.</li> <li>5. Workpiece hitting stationary object.</li> <li>6. Tailstock or tool rest not securely clamped to lathe bed.</li> <li>7. Belt pulleys are not properly aligned.</li> <li>8. Motor mount bolts are loose.</li> <li>9. Belt is worn or damaged.</li> <li>10. Spindle bearings are worn or damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remount workpiece, making sure that centers are embedded in true center of workpiece.</li> <li>2. Cut workpiece to be concentric or use a different workpiece.</li> <li>3. Adjust feet to eliminate wobble.</li> <li>4. Reduce spindle speed.</li> <li>5. Stop lathe and fix interference problem.</li> <li>6. Check lock levers and tighten if necessary.</li> <li>7. Align belt pulleys.</li> <li>8. Tighten motor mount bolts.</li> <li>9. Replace belt.</li> <li>10. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.</li> </ol>
<b>Chisel grabs or digs into workpiece</b>	<ol style="list-style-type: none"> <li>1. Wrong chisel/tool being used.</li> <li>2. Chisel/tool too dull.</li> <li>3. Tool rest height not set correctly.</li> <li>4. Tool rest is set too far from workpiece.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use correct chisel/tool.</li> <li>2. Sharpen or replace chisel/tool.</li> <li>3. Correct tool rest height.</li> <li>4. Move tool rest closer to workpiece.</li> </ol>

<b>Tailstock moves under load.</b>	<ol style="list-style-type: none"> <li>1. Tailstock mounting bolt/hex nut is loose.</li> <li>2. Bed or clamping surface is excessively oily or greasy.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten mounting bolt/hex nut.</li> <li>2. Clean bed or clamping surface to remove excess oil/grease.</li> </ol>
<b>Spindle lacks turning power or starts up slowly.</b>	<ol style="list-style-type: none"> <li>1. Belt is slipping.</li> <li>2. Pulleys loose.</li> <li>3. Workpiece too heavy for spindle.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten/adjust belt.</li> <li>2. Tighten pulley set screw; re-align/replace shaft, pulley set screw, and key.</li> <li>3. Remove excess material before remounting; use lighter workpiece.</li> </ol>
<b>Quill will not move forward when handwheel is turned</b>	<ol style="list-style-type: none"> <li>1. Keyway is not aligned with quill lock lever.</li> </ol>	<ol style="list-style-type: none"> <li>1. Align quill keyway and quill lock lever and slightly tighten lever to engage keyway.</li> </ol>
<b>DRO doesn't give reading; reading incorrect.</b>	<ol style="list-style-type: none"> <li>1. Shorted/disconnected wiring/plugs.</li> <li>2. Variable-speed potentiometer at fault.</li> <li>3. DRO speed sensor at fault. Circuit board at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect wiring connections on circuit boards, sensors, and plugs. Replace/repair as necessary.</li> <li>2. Test/replace if at fault.</li> <li>3. Test/replace if at fault. Inspect/replace if at fault.</li> </ol>

## Optional accessories

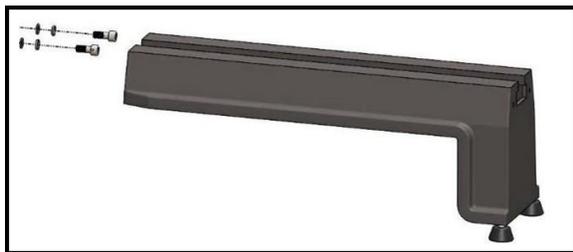
Installing after market accessories may cause machine to malfunction, resulting in serious personal injury or machine damage. To reduce this risk, only install accessories recommended for this machine.

### Extension bed

For lengthening the working capacity of the wood lathe, the extension bed is attached. Made of heavy cast iron, it bolts to the right end of the lathe to extend the lathe's working spindle length capacity to 44".

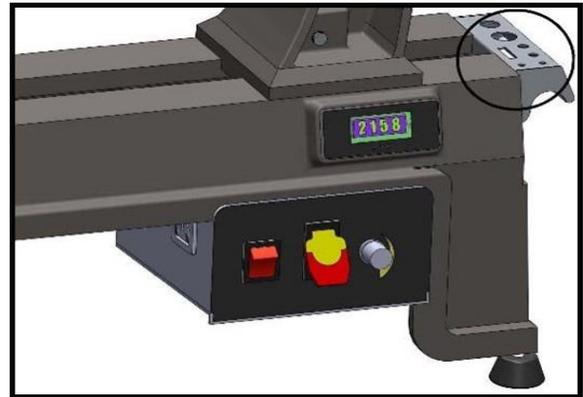
### Assemble the extension bed

The extension bed is packed in one separate carton, including the following items. Please check carefully when you receive.

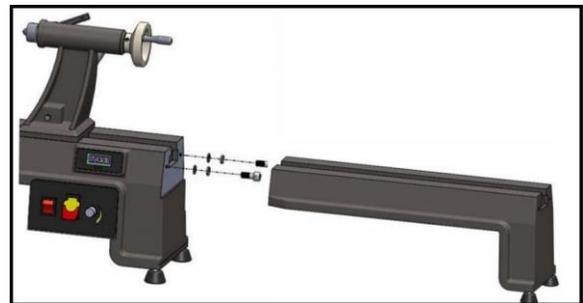


Description	Qty
Extension bed.....	1
Hexagon socket cap screws.....	2
Flat washer.....	2
Spring washer.....	2
Feet.....	2

1. Install (2) rubber feet into holes in bottom of the extension bed and adjust feet so lathe sits level without rocking.
2. Remove the accessory holder at the end of the lathe bed.



3. Fasten the extension bed to the lathe bed with the hexagon socket cap screw, flat washer and spring washer.



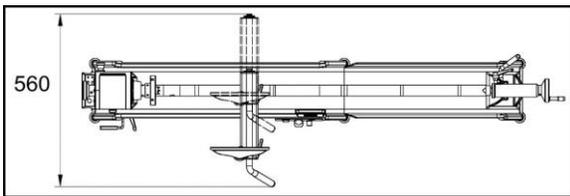
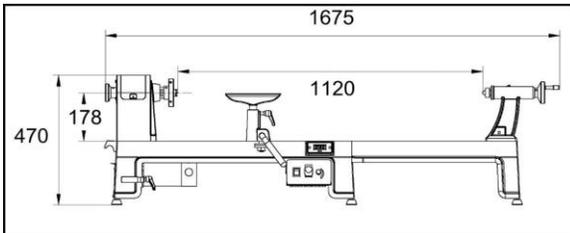
4. Adjust the feet's height to make the extension bed at the same level with the lathe bed.

- The assembly work is finished. The working spindle length capacity is extended to 44”.

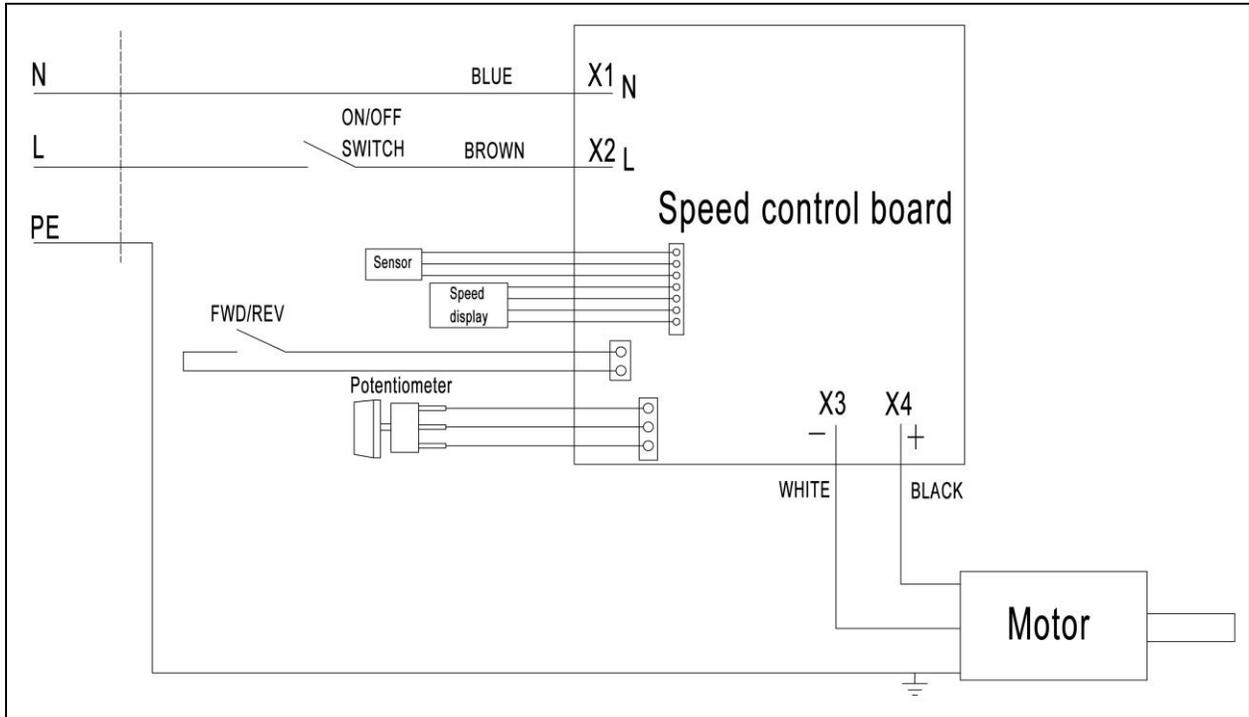


## Dimensions

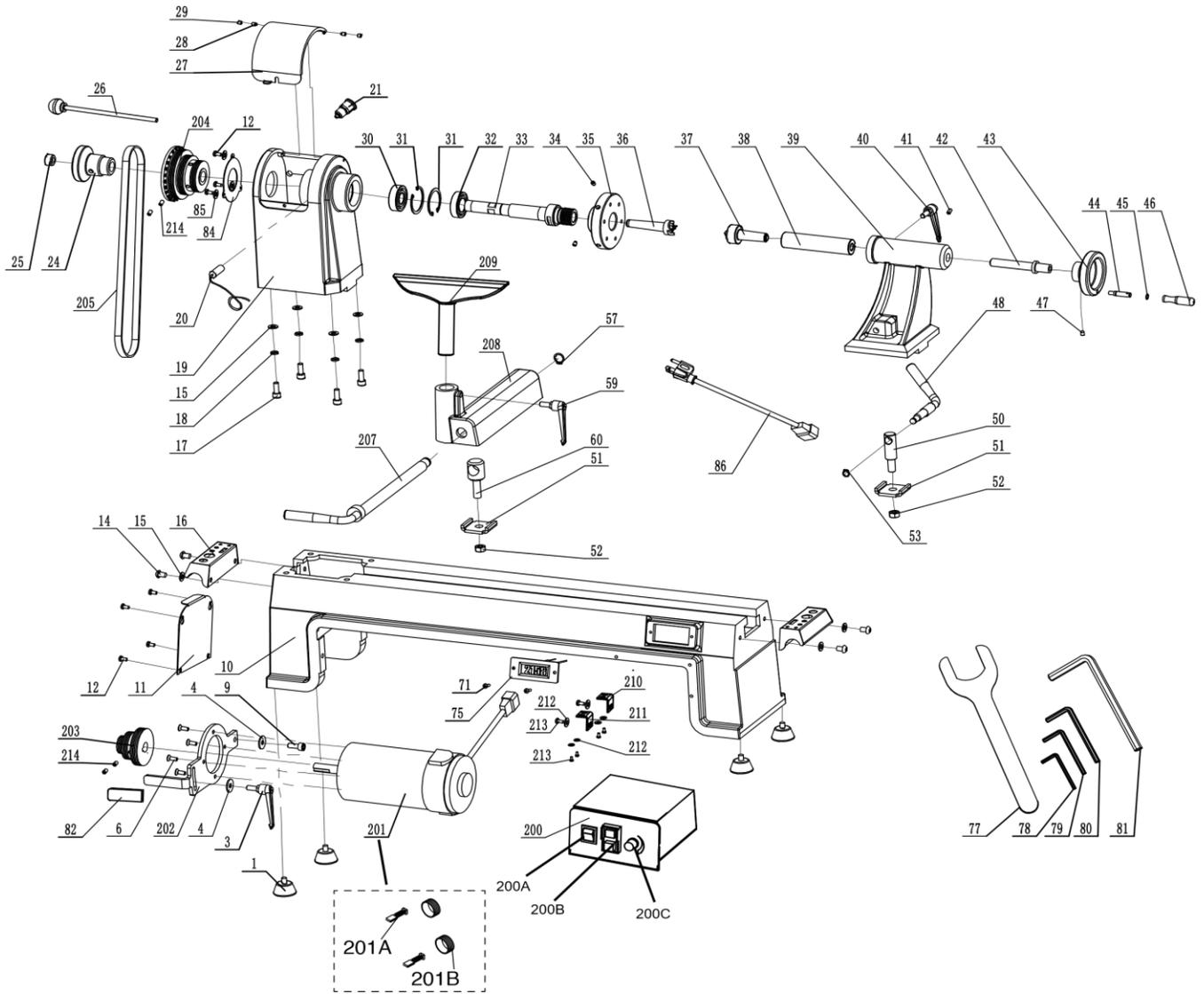
Consider anticipated workpiece sizes and additional space needed for auxiliary stands, worktables, or other machinery when establishing a location for this machine in the shop. Below is the minimum amount of space needed for the machine with extension bed.



# CX814 Wiring Diagram



# Diagram for CX814



## CX814 Parts List

Key	Part Number	Description	QTY
1	PCX81401	FOOT M8-1.25 X 18	4
3	PCX81403	BELT TENSION LOCK LEVER	1
4	PCX81404	WASHER - FLAT 8mm	2
6	PCX81406	SCREW- HEX HD CAP M6-1.0 X 16	4
9	PCX81409	SCREW- HEX HD CAP M8-1.25 X 16	1
10	PCX81410	BED	1
11	PCX81411	BELT ACCESS DOOR	1
12	PCX81412	SCREW - PH. HD M5-0.8 X 10	7
14	PCX81414	SCREW - PH. HD M8-1.25 X 12	4
15	PCX81415	WASHER - FLAT 8MM	8
16	PCX81416	HANDLE - TOOL STORAGE	2
17	PCX81417	SCREW - CAP SOC HD M8-1.25 X 20	4
18	PCX81418	WASHER - SPRING 8MM	4
19	PCX81419	HEADSTOCK	1
20	PCX81420	DIGITAL READ OUT SENSOR	1
21	PCX81421	LOCATION PIN ASSEMBLY	1
24	PCX81424	SPINDLE HANDWHEEL	1
25	PCX81425	LOCKING NUT M20-2.5 X 12	1
26	PCX81426	KNOCKOUT ROD ASSEMBLY	1
27	PCX81427	COVER FOR MOTOER PULLER	1
28	PCX81428	SCREW - CAP M5-0.8 X 10	2
29	PCX81429	SCREW - SET M5-0.8 X 6	2
30	PCX81430	BEARING 6204ZZ	1
31	PCX81431	INT RETAINING RING 47MM	2
32	PCX81432	BEARING 6005ZZ	1
33	PCX81433	SPINDLE	1
34	PCX81434	SCREW SET HEX SOC M6-1.0 X 8 (CYLINDRICAL END)	2
35	PCX81435	FACE PLATE 4"	1
36	PCX81436	SPUR CENTER MT2	1

37	PCX81437	LIVE CENTER MT2	1
38	PCX81438	QUILL	1
39	PCX81439	TAILSTOCK	1
40	PCX81440	QUILL LOCK LEVER M10-1.5 X 17	1
41	PCX81441	BOLT - HEX HD M8-1.25 X 10	1
42	PCX81442	LEADSCREW	1
43	PCX81443	TAILSTOCK HANDWHEEL	1
44	PCX81444	HANDWHEEL HANDLE BOLT	1
45	PCX81445	C-RING $\phi$ 8X0.8	1
46	PCX81446	HANDWHEEL HANDLE	1
47	PCX81447	SCREW - SET M8-1.25 X 10	1
48	PCX81448	TAILSTOCK LOCK LEVER	1
50	PCX81450	TAILSTOCK CLAMP BOLT	1
51	PCX81451	TAILSTOCK CLAMP	2
52	PCX81452	NUT M12	2
53	PCX81453	C-RING 10MM	1
57	PCX81457	C-RING 16MM	2
59	PCX81459	TOOLPOST LOCKING HANDLE	1
60	PCX81460	TOOL REST CLAMP BOLT	1
71	PCX81471	SCREW - PH HD M4-0.7 X 8	2
75	PCX81475	DIGITAL READOUT	1
77	PCX81477	WRENCH 32MM	1
78	PCX81478	HEX WRENCH 3MM	1
79	PCX81479	HEX WRENCH 4MM	1
80	PCX81480	HEX WRENCH 5MM	1
81	PCX81481	HEX WRENCH 12MM	1
82	PCX81482	RUBBER HANDLE SLEEVE	1
84	PCX81484	HEADSTOCK REAR PLATE	1
85	PCX81485	WASHER - FLAT	1
86	PCX81486	PLUG	1
200	PCX814200	DRIVE ASSEMBLY	1
200A	PCX814200A	FORWARD REVERSE SWITCH	1
200B	PCX814200B	ON OFF SWITCH	1

200C	PCX814200C	Speed Control Switch	1
201	CX814MOT	MOTOR 1HP 110VDC	1
201A	PCX814201A	Motor Brushes	2
201B	PCX814201B	Motor Brush Cap	2
202	PCX814202	MOTOR CONNECT PLATE	1
203	PCX814203	MOTOR PULLEY	1
204	PCX814204	SPINDLE PULLEY	1
205	PCX814205	POLY v Belt 787J5(31") (12X787MM)	1
207	PCX814207	LOCKING BAR FOR TOOL REST	1
208	PCX814208	TOOL REST BASE	1
209	PCX814209	8" TOOL REST	1
210	PCX814210	MOUNTING BRACKET	1
211	PCX814211	MOUNTING BRACKET	1
212	PCX814212	WASHER	6
213	PCX814213	SCREW - SET SOC HD M5-0.8 X 10	6
214	PCX814214	SCREW - SET SOC HD M8--1.25 X 10	4



## WARRANTY

Craftex warrants every product to be free from defects in materials and agrees to correct such defects where applicable. This warranty covers **three years** for parts and 90 days for labour (unless specified otherwise), to the original purchaser from the date of purchase but does not apply to malfunctions arising directly or indirectly from misuse, abuse, improper installation or assembly, negligence, accidents, repairs or alterations or lack of maintenance.

*Proof of purchase is necessary.*

All warranty claims are subject to inspection of such products or part thereof and Craftex reserves the right to inspect any returned item before a refund or replacement may be issued. Return authorization may take up to 72 hours for inspection and approval.

This warranty shall not apply to consumable products such as blades, bits, belts, cutters, chisels, punches etceteras.

Craftex shall in no event be liable for injuries, accidental or otherwise, death to persons or damage to property or for incidental contingent, special or consequential damages arising from the use of our products.

## RETURNS, REPAIRS AND REPLACEMENTS

To return, repair, or replace a Craftex product, you must visit the appropriate Busy Bee Tools showroom or call 1-800-461-BUSY. Craftex is a brand of equipment that is exclusive to Busy Bee Tools. For replacement parts directly from Busy Bee Tools, for this machine, please call 1-800-461-BUSY (2879), and have your credit card and part number handy.

- All returned merchandise will be subject to a minimum charge of 15% for re-stocking and handling with the following qualifications.
- Returns must be pre-authorized by us in writing.
- We do not accept *collect* shipments.
- Items returned for warranty purposes must be insured and shipped pre-paid to the nearest warehouse
- Returns must be accompanied with a copy of your original invoice as proof of purchase. Returns must be in an un-used condition and shipped in their original packaging a letter explaining your reason for the return. Incurred shipping and handling charges are not refundable.
- Busy Bee will repair or replace the item at our discretion and subject to our inspection.
- Repaired or replaced items will be returned to you pre-paid by our choice of carriers.
- Busy Bee reserves the right to refuse reimbursement or repairs or replacement if a third party without our prior authorization has carried out repairs to the item.
- Repairs made by Busy Bee are warranted for 30 days on parts and labour.
- Any unforeseen repair charges will be reported to you for acceptance prior to making the repairs.
- The Busy Bee Parts & Service Departments are fully equipped to do repairs on all products purchased from us with the exception of some products that require the return to their authorized repair depots. A Busy Bee representative will provide you with the necessary information to have this done.

