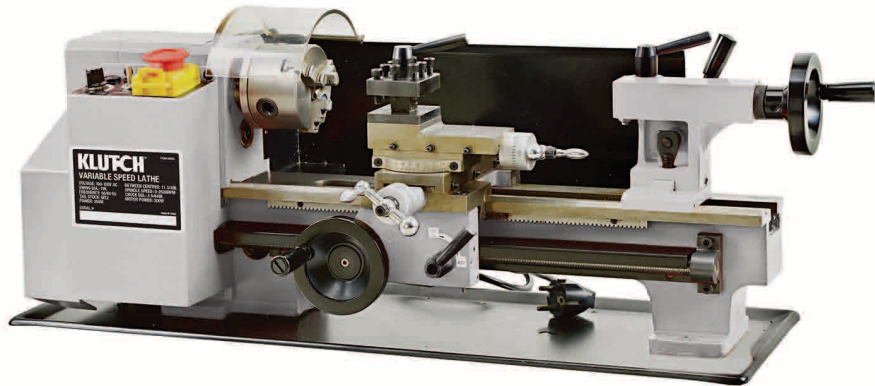




# Mini Metal Lathe 7 x 12

## OWNER'S MANUAL



**⚠ WARNING:**

Read carefully and understand all ASSEMBLY AND OPERATION INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

**Item# 49656**



### Mini Metal Lathe 7 x 12

#### OWNER'S MANUAL

Thank you very much for choosing a Klutch product. For future reference, please complete the owner's record below:  
Serial Number/Lot Date Code: \_\_\_\_\_ Purchase Date: \_\_\_\_\_  
Save the receipt, warranty and these instructions. It is important that you read the entire manual to become familiar with this product before you begin using it.

This mini metal lathe is designed for certain applications only. Northern Tool and Equipment cannot be responsible for issues arising from modification or use of this product in an application for which it was not designed. We strongly recommend that this product not be modified and/or used for any application other than that for which it was designed.

For technical questions please call 1-800-222-5381.

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### Intended Use

This compact 7" x 12" lathe is light-duty multi-purpose machine used for typical turning processes to economically produce small precision parts, threaded parts, fittings, and dies. The lathe features a low and high spindle speed, a change gear set, a wrench set and an oil can.

### Technical Specifications

Property	Specification
Max. swing over bed	7-1/16" (180mm)
Distance between centers (Max. length of workpiece)	11-7/8" (300mm)
Hole through spindle	3/4" (20mm)
Spindle hole taper	MT#3
Tailstock taper	MT#2
Cross slide travel	2-1/2" (65mm)
Compound travel	2-3/16" (55mm)
Range of threads - Metric version	0.5-1.25mm(5 thread pitches)
Imperial version	16-24TPI(5 thread pitches)
Spindle speed-Low range	100-1100RPM
- High range	100-2500 RPM
Motor	3/4 HP
Dimensions	27-1/2 x 11-7/8 x 11-7/8
Shipping Weight	88 lbs.

### Important Safety Information

#### **WARNING:**

- Read and understand all instructions. Failure to follow all instructions may result in serious injury or property damage.
- The warnings, cautions, and instructions in this manual cannot cover all possible conditions or situations that could occur. Exercise common sense and caution when using this tool. Always be aware of the environment and ensure that the tool is used in a safe and responsible manner.
- Do not allow persons to operate or assemble the product until they have read this manual and have developed a thorough understanding of how it works.
- Do not modify this product in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the product. There are specific applications for which the product was designed.
- Use the right tool for the job. DO NOT attempt to force small equipment to do the work of larger industrial equipment. There are certain applications for which this equipment was designed. It will do the job better and more safely at the capacity for which it was intended. DO NOT use this equipment for a purpose for which it was not intended.
- Industrial or commercial applications must follow OSHA requirements.

#### **WARNING:**

- This product may contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.
- Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Some examples of these chemicals are:
  - lead from lead-based paints,
  - crystalline silica from bricks and cement and other masonry products, and
  - arsenic and chromium from chemically-treated lumber.Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well-ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

- Handling power cords on corded products may expose you to lead, a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. Wash your hands after handling.

#### **WARNING:** **WORK AREA SAFETY**

- Inspect the work area before each use. Keep work area clean, dry, free of clutter, and well lit. Cluttered, wet, or dark work areas can result in injury. Using the mini metal lathe in confined work areas may put you dangerously close to other cutting tools and rotating parts.
- Do not use the mini metal lathe where there is a risk of causing a fire or an explosion; e.g., in the presence of flammable liquids, gases, or dust. The product can create sparks, which may ignite the flammable liquids, gases, or dust.
- Do not allow the mini metal lathe to come into contact with an electrical source. The tool is not insulated and contact will cause electrical shock.
- Keep children and bystanders away from the work area while operating the tool. Do not allow children to handle the mini metal lathe.
- Be aware of all power lines, electrical circuits, water pipes, and other mechanical hazards in your work area. Some of these hazards may be hidden from your view and may cause personal injury and/or property damage if contacted.

#### **WARNING:** **PERSONAL SAFETY**

- Stay alert, watch what you are doing, and use common sense when operating the tool. Do not use the tool while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating the tool may result in serious personal injury.
- Dress properly. Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts. Air vents on the tool often cover moving parts and should be avoided.
- Wear the proper personal protective equipment when necessary. Use ANSI Z87.1 compliant safety goggles (not safety glasses) with side shields, or when needed, a face shield. Use a dust mask in dusty work conditions. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate. This applies to all persons in the work area.
- Do not overreach. Keep proper footing and balance at all times.
- Do not use the tool when tired or under the influence of drugs, alcohol or medication.
- Ensure the power switch is off prior to plugging in the tool.
- Remove keys or wrenches before connecting the tool to an air supply, power supply, or turning on the tool. A wrench or key that is left attached to a rotating part of the tool may cause personal injury.
- Secure the work with clamps or a vise instead of your hand when practical. This safety precaution allows for proper tool operation using both hands.

#### **WARNING:** **ELECTRICAL SAFETY**

- Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
- Double insulated tools are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way. Double insulation eliminates the need for the three wire grounded power cord and grounded power supply system.

- Do not allow the product to come into contact with an electrical source. The tool is not insulated and contact will cause electrical shock.
- Avoid body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators. There is an increased risk of electric shock if your body is grounded.
- Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- Do not abuse the power cord. Never use the power cord to carry the tools or pull the plug from an outlet. Keep the power cord away from heat, oil, sharp edges, or moving parts. Replace damaged power cords immediately. Damaged power cords increase the risk of electric shock.
- When operating a power tool outside, use an outdoor extension cords marked "W-A" or "W". These extension cords are rated for outdoor use, and reduce the risk of electric shock.

### CAUTION:

#### MINI METAL LATHE USE AND CARE

- Do not force the product. Products do a better and safer job when used in the manner for which they are designed. Plan your work, and use the correct product for the job.
- Check for damaged parts before each use. Carefully check that the product will operate properly and perform its intended function. Replace damaged or worn parts immediately. Never operate the product with a damaged part.
- Do not use a product with a malfunctioning switch. Any power tool that cannot be controlled with the power switch is dangerous and must be repaired by an authorized service representative before using.
- Disconnect the power/air supply from the product and place the switch in the locked or off position before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.
- Store the product when it is not in use. Store it in a dry, secure place out of the reach of children. Inspect the tool for good working condition prior to storage and before re-use.
- Use only accessories that are recommended by the manufacturer for use with your product. Accessories that may be suitable for one product may create a risk of injury when used with another tool. Never use an accessory that has a lower operating speed or operating pressure than the tool itself.
- Keep guards in place and in working order. Never operate the product without the guards in place.
- Do not leave the tool running unattended.

#### Specific Operation Warnings

### WARNING:

- To prevent serious injury or property damage read owner's manual before operating.
- DO NOT wear loose clothing, jewelry, gloves, or unrestrained hair that may get caught in moving parts of the machine.
- Wear the proper safety gear including ANSI Z87.1 approved eye protection.
- Moving Parts Hazard. Keep hands clear of spindle chuck and work piece.
- Remove keys and adjusting wrenches before starting the machine.
- Feed cutter into work piece against direction of rotation.
- Always secure work piece before machining operation.
- DO NOT operate without guards in place.
- Electric shock hazard. Be sure equipment is properly grounded.
- Turn power OFF before servicing.
- Wait for machine to come to a complete stop before changing gears.
- Not for use by or around children.

#### Grounding

### WARNING:

- This machine must be grounded while in use to protect the operator from electrical shock. This drill press is equipped with an electric cord that has an equipment-grounding conductor and a grounding plug. The plug **MUST** be plugged into a matching receptacle that is properly installed and grounded in accordance with ALL local codes and ordinances.
- DO NOT MODIFY THE PLUG PROVIDED. If it will not fit the receptacle, have the proper receptacle installed by a qualified electrician.
- CHECK with a qualified electrician or service person if you do not completely understand the grounding instructions, or if you are not sure the tool is properly grounded.

#### Grounded Tools: Tools with 3-Prong Plugs

Tools marked with Grounding Required have a 3-wire cord and 3-prong grounding plug. The plug must be connected to a properly grounded outlet. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user, reducing the risk of electric shock. (See Figure A.)

The grounding prong in the plug is connected through the green wire inside the cord to the grounding system in the tool. The green wire in the cord must be the only wire connected to the tool's grounding system and must never be attached to an electrically live terminal.

Your tool must be plugged into an appropriate outlet, properly installed and grounded in accordance with all codes and ordinances. The plug and outlet should look like those in the following illustration.

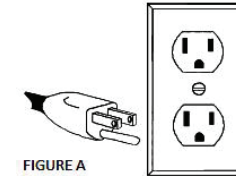


FIGURE A

#### Double Insulated Tools: Tools with Two-Prong Plugs

Tools marked Double Insulated do not require grounding. They have a special double insulation system which satisfies OSHA requirements and complies with the applicable standards of Underwriters Laboratories, Inc., the Canadian Standard Association, and the National Electrical Code. (See Figure B.)

Double insulated tools may be used in either of the 120 volt outlets shown in the following illustration.

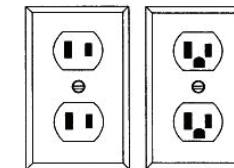


FIGURE B

#### Extension Cords

### WARNING:

- USE A PROPER EXTENSION CORD. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage, resulting in loss of power and cause overheating.

- Be sure your extension cord is properly wired and in good condition. Always replace a damaged extension cord or have it repaired by a qualified person before using it. Protect your extension cords from sharp objects, excessive heat and damp or wet areas.
- Grounded tools require a 3-wire extension cord. Double Insulated tools can use either a 2- or 3-wire extension cord.
- As the distance from the supply outlet increases, you must use a heavier gauge extension cord. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible tool damage.
- The smaller the gauge number of the wire, the greater the capacity of the cord. For example, a 14-gauge cord can carry a higher current than a 16-gauge cord. Minimum extension cord wire size is shown in the following table:

Minimum Wire Size Of Extension Cords				
Nameplate AMPS	Cord Length			
	25'	50'	100'	150'
0-6	18 AWG	16 AWG	16 AWG	14 AWG
6-10	18 AWG	16 AWG	14 AWG	12 AWG
10-12	16 AWG	16 AWG	14 AWG	12 AWG
12-16	14 AWG	12 AWG	NOT RECOMMENDED	

- When using more than one extension cord to make up the total length, make sure each cord contains at least the minimum wire size required.
- If you are using one extension cord for more than one tool, add the nameplate amperes and use the sum to determine the required minimum cord size.
- If you are using an extension cord outdoors, make sure it is marked with the suffix W-A (W in Canada) to indicate it is acceptable for outdoor use.
- Make sure your extension cord is properly wired and in good electrical condition. Always replace a damaged extension cord or have it repaired by a qualified electrician before using it.
- Protect your extension cords from sharp objects, excessive heat, and damp or wet areas.

### Assembly

When unpacking the milling machine, check the shipping crate contents to ensure all parts are present. If any pieces are missing, call the distributor at the number in the Replacement Parts section of this manual.

### UNPACKING

When unpacking the lathe, check that all items are present:

Part No.	Description	Q'ty	Part No.	Description	Q'ty
1	Lathe	1	7	Bakelite straight handle	2
2	Spindle center, MT#3	1	8	Double end wrench 8*10	1
3	Tailstock, MT #2	1	9	Socket head wrench:3	1
4	External jaws	3	10	Plastic oil can	1
5	Key for chuck	1	11	Fuse	1
6	Change gear:30, 35, 40, 50, 60	1	12	Instruction manual (this manual)	1

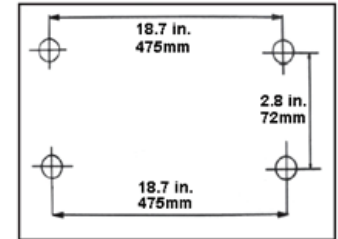
If any parts are missing, call the distributor at the number in the Replacement Parts section of this manual.

### MOUNTING THE MACHINE

Consider the weight of the lathe (88 lbs.) and, with assistance, place it onto a good solid surface or workbench. Ensure the location is adequately lit and that you will not be working in your own shadow.

Remove all traces of the factory preservative coating with paraffin or a good quality solvent then spread a thin layer of oil on all machined surfaces.

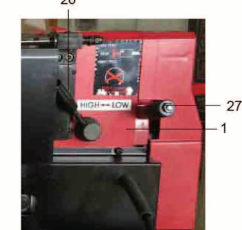
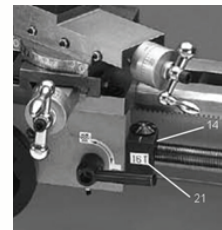
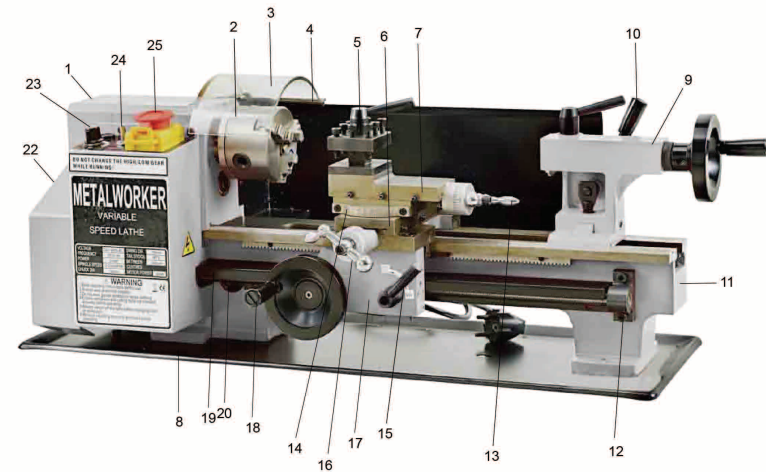
Mount the machine to a workbench, of sufficient height so that you do not need to bend your back to perform normal operations. We strongly recommend bolting the machine to a workbench using the tapped holes used to secure the feet to the machine. This provides added stability and safety. To do this, first drill four M6 clearance holes in a worktop, at the dimensions shown in the diagram opposite, and with appropriate length M6 bolts, or screws, with flat washers (not included).



The saddle, cross-slide, and compound slide adjustments are all factory set to ensure smooth movement in both directions. If however the adjustments have drifted in transit, as indicated by stiff or erratic movement, refer to the Settings and Adjustments subsection in the Operating Instructions section for adjustment procedures.

All hex keys and wrenches for necessary adjustments are supplied, together with a chuck key for the 3-jaw chuck and a spare fuse. The fuse holder is located on the main control panel.

### Main Parts





REF	Description	Part No.	Description
1	Headstock	15	Automatic feed lever
2	Spindle flange	16	Cross-slide feed handle
3	Chuck guard	17	Apron
4	3-Jaw chuck	18	Manual(saddle)feed handle
5	Tool post	19	Leadscrew
6	Cross slide (saddle)	20	Motor brush cap
7	Compound slide	21	Thread dial indicator table(optional accessory)
8	Chip tray	22	Running gear cover
9	Tailstock	23	Variable speed control knob
10	Quick lock	24	Forward/off/reverse switch
11	Bed	25	Emergency speed range lever
12	Leadscrew support	26	High/Low speed range lever
13	Compound slide feed handle	27	Lead screw Fwd/Neutral/Rvrse lever
14	Thread dial indicator(Optional accessory)		

### THE HEADSTOCK

The motor provides a direct drive to the spindle via an internal tooth type belt. Spindle speed is variable, and is regulated by the Speed Control Knob (23) on the main control panel. The spindle is provided with an internal No.3 Morse taper to accommodate a center for use with a face plate or turning clamp. The 3-jaw self-centering chuck(4) is mounted on the spindle flange. To remove the chuck, simply remove the three securing nuts on the rear of the flange then pull it out together with the three mounting studs.

**Note:** The chuck has a protection cover. Opening the cover turns off the main power of the lathe, so keep the cover closed during operation.

### THE RUNNING GEAR

The Running Gear is protected by a cover (22). Open the cover of the gear box on the left side of the machine, and select the gear of the correct size according to the desired feeding rate or pitch size (refer to 'The Gear Box' in the Operating Instruction/Settings and Adjustments section). Install the appropriate gear into the gearbox and connect it to the leadscrew. (Refer to the "changing gear label" on the machine.)

Automatic feeding (forward or reverse) is enabled or disabled by the control clutch toggle switch (24) on the main panel. Turn the switch to the center position for manual feeding or to the forward or reverse position for automatic feeding.

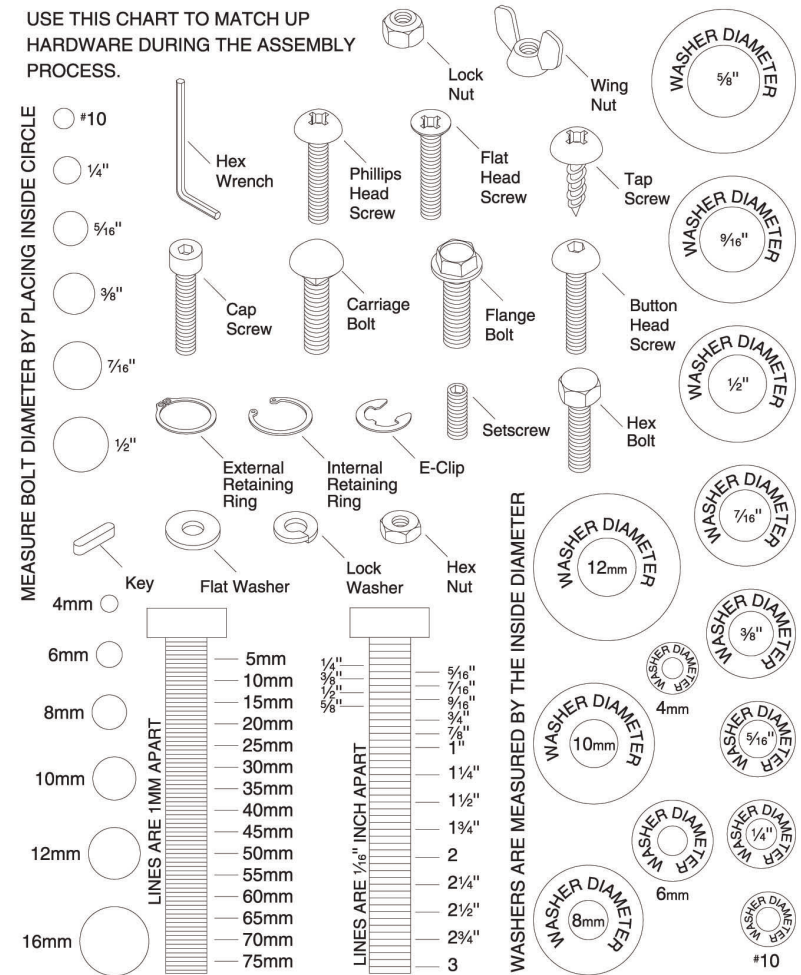
### THE TAILSTOCK

The Tailstock Casting (9) may be moved along the bed to any desired position and secured in position by two screws on the front of the tailstock to lock the tailstock wedge. The tailstock spindle includes an internal No. 2 Morse taper for use with the Center provided.

### THE SADDLE AND THE CROSS-SLIDE

The saddle carries the Compound Slide (7), on which is mounted the Tool Post (5) allowing intricate and delicate operations to be performed. It is driven by a leadscrew via a Drive Nut, to provide automatic feed when the Clutch (24) is positioned for forward or reverse feeding.

### Bolt Chart



### Before Each Use

- Check for damaged parts before each use. Replace damaged or worn parts immediately. Never operate the lathe with a damaged part.
- Check the lathe for correct function before starting operation. Ensure that the lathe is clean to perform its function correctly and that all the parts of the machine are present and in place.

See the Maintenance section for repair of machined surfaces.

### Operating Instructions

#### ⚠ WARNING:

- Only trained and properly supervised personnel should operate the lathe. Make sure operation instructions are clearly understood.
- Many machines will eject a workpiece toward the operator. Know and avoid conditions that cause the workpiece to “kickback”.
- Do not use the lathe with a malfunctioning switch. Any power tool that cannot be controlled with the power switch is dangerous and must be repaired by an authorized service representative before use.
- Always lock mobile bases (if used) before operating the lathe.
- Put the switch in the locked or off position before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.
- Do not force the lathe. Tools do a better and safer job when used in the manner for which they are designed. Plan your work, and use the correct tool for the job.
- Keep guards in place and in working order. Never operate the tool without the guards in place.
- Do not leave the lathe running unattended.

### Settings and Adjustments

Occasionally, it may be necessary to readjust various components in order to maintain optimum performance. The adjustments that may be performed are as follows:

#### TAILSTOCK ADJUSTMENTS

The tailstock (9) is locked by two lock screws at the front of the tailstock. When the lock screws are loose, the tailstock can moved to the left or right; when the lock screws are tight, the tailstock can be fixed any position on the bed (11).

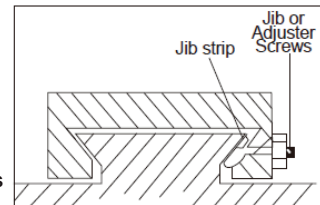
#### CROSS-SLIDE ADJUSTMENTS

The cross-slide (6) is mounted on a dovetail slide, as shown below. Between the sloping surfaces on one side of the dovetail, a “jib strip” “is inserted, which may be tightened against the dovetail by three adjuster, or “jib” screws mounted along its length. The jib screws are found on the right-hand side of the slide, directly beneath the compound slide handle. In time, wear will occur on the mating surfaces resulting in a “sloppiness” of action.

**NOTE:** It is important that the cross-slide and compound slide adjustments are correctly set and that there is no “sloppiness” of action. Any sloppiness will seriously effect on the quality of the work. It is vital that there is as little movement as possible.

Adjust the jib strip to account for wear and ensure the slide moves evenly and smoothly as follows:

1. Loosen then tighten the lock nuts and screws on the jib evenly, i.e. use the same torque for each screw. The slide should be held firmly. Test by trying to turn the handle, but do not force it.
2. Screw out each jib screw by one quarter of a turn only, and snug up the lock nuts.
3. Test again, by turning the handle, the movement should be even and smooth along its complete length.
4. If the movement is too slack, screw all adjusters “in” by one eighth of a turn, and re-try. Similarly, if the movement is too stiff, screw “out” the adjusters by one eighth of a turn until the correct adjustment is attained.



5. Tighten all lock nuts taking care to ensure you do not move the jib screws while doing so.
6. When completed, retract the slide fully and apply oil to all mating surfaces and the feed screw thread, then wind the slid back to its normal position.

### CROSS-SLIDE FEED HANDLE

The cross-slide (6) feed should run smoothly, and the scale must rotate with the handle. If any stiffness occurs, it is probably the result of shavings lodged between the mating surfaces. Undo the screw securing the handwheel. Remove the handwheel and pull off the collar with the scale taking great care to retain the small spring plate which sits in a groove beneath the collar. Clean the assembly and reassemble it in reverse order. It is necessary to hold the spring plate in place with a small screw driver, or similar tool, and pushing down on it to allow the collar to be correctly located on to the shaft.

### THE GEAR BOX

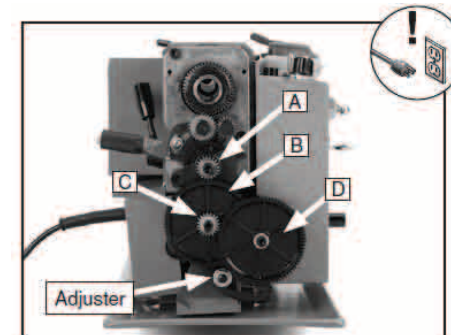
#### Gear Charts

Change Gear Box	mm	Change Gear				CHANGE GEAR BOX	A	B	C	D	THREAD PER INCH	CHANGE GEAR BOX				THREAD PER INCH	CHANGE GEAR BOX						
		A	B	C	D							A	B	C	D		A	B	C	D			
		0.4	20	50	40							60	12	40	65		30	26	40	60	85	12	40
0.5	20	50	/	60	13	40	65	60	30	28	20	65	35	13	40	65	60	30	28	20	65	35	
0.6	40	50	30	60	14	40	65	/	35	32	20	65	40	14	40	65	/	35	32	20	65	40	
0.7	40	50	35	60	16	40	65	/	40	36	20	65	45	16	40	65	/	40	36	20	65	45	
0.8	40	50	40	60	18	40	65	/	45	38	20	50	60	18	40	65	/	45	38	20	50	60	57
1.0	20	60	/	30	19	40	50	60	57	40	20	65	50	19	40	50	60	57	40	20	65	50	
1.25	50	40	/	60	20	40	65	/	50	44	20	65	55	20	40	65	/	50	44	20	65	55	
1.5	40	60	/	40	22	40	65	/	55	48	20	65	60	22	40	65	/	55	48	20	65	60	
1.75	35	60	/	30	24	40	65	/	60	52	20	60	85	24	40	65	/	60	52	20	60	85	
2.0	40	60	/	30																			

#### Change Gears

The following is an example to cut a 0.5mm thread on a piece of round stock:

1. Turn off the power switch and unplug the lathe!
2. Remove the gear cover.
3. Loosen the adjuster to disengage the gears from each other.
4. Remove the gears in place and replace with the A=20, B=50, and D=60 gears in the positions shown below.
5. Reposition the adjuster to mesh the gears.



### Operation

#### SIMPLE TURNING

Before starting the machine, as described above, it is imperative that the setup for the type of work to be carried out is fully checked.

The following notes are guidelines as to how to set up the lathe in order to carry out a simple turning operation.

1. ALWAYS plan your work. Have drawings or a plan on hand together with any measuring instruments you may require, such as micrometers, calipers, etc.
2. Select a cutting tool that will produce the desired cut and mount it, with as little over-hang as possible, securing it using three hex socket head screws. (Ideally, the over-hang should be approx., 6mm but not more than 8mm for a straight tool).
3. It is IMPORTANT to ensure that the tip of the cutting tool is on the center line of the work, or very slightly below it. The tip should never be above the center line.

Where necessary shims should be used beneath the tool in order to achieve the correct height, or, if the tip is too high, the only recourse is to select another tool or grind down the tip.

To check that the tip is at the correct height, position the tool so that the tip is almost touching the point of the tailstock center. They should coincide. If necessary make adjustments using shims grind down the cutting tip or select another tool.

4. When satisfied, mount the work, either in the chuck or on a faceplate, and if necessary, use the tailstock (9) center for additional support (if the work cannot be adequately secured by the chuck, or if it is a long piece, or of small diameter). Additionally, a 'steady rest' may be used.

If the tailstock will not be used, you may remove it completely by loosening off the securing nut at its base, and sliding it free of the bed.

5. Mark the surface of the work at the point where the cut is to end, i.e. the shoulder, using a scribe or similar means, and move the cross-slide (6) so that the cutting tool is directly opposite the mark, then wind in the cross-slide so that the tool touches the surface of the work.

6. While carrying out these maneuvers, rotate the chuck by hand to ensure that nothing will come into contact with it when turning takes place, i.e. there is adequate clearance between the cross-slide, tool post, or cutting tool, and the chuck.

7. When satisfied, retract the cutting tool and wind the cross-slide (6) away from the headstock (1), then wind the cutting tool up to the work, somewhere along the length to be cut, whilst rotating the work by hand, using the chuck.

Continue to advance the cutting tool slowly, until it just touches the surface. Record this position by zeroing the scale on the cross-slide, i.e. turn the moveable scale until the tool is a short distance from the right hand edge of the work. Wind in the cross-slide again one full until the zero marks again coincide.

**IMPORTANT:** If you go past the zero mark, back off again at least one half of a turn, then slowly bring the marks back together.

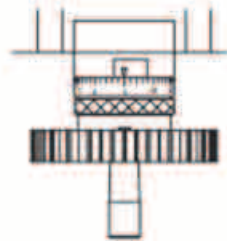
Whenever you use the scale as an indicator, to advance the cross-slide or compound slide, ALWAYS use this procedure to align the marks. This is to take into account backlash and other clearances in the gearing, slides, etc.

8. Continue to turn the handle (18) an amount equivalent to your desired depth of cut.

**NOTE:** We recommend that for rough cutting, you do not exceed 0.010" (0.25mm) as your depth of cut.

9. The setup is now complete to begin your cutting operation, but before starting, check that the position of the Clutch (24) is Off.

10. Switch the machine on and slowly feed the cutting tool into the work using the manual feed handle. Proceed until you reach the previously marked line on the work, and then retract the tool one or two complete turns on the Cross-slide feed handle (16).



11. Wind the cross-slide back to the beginning then wind the tool the same number of turns "in", plus the depth of desired cut, and proceed to cut once more.

**NOTE:** This procedure describes general, rough cutting. For other types of cuts-finishing, cutting shoulders etc., consult a suitable handbook.

#### SIMPLE TURNING WITH POWER FEED

Simple turning with power feed has the same basic setup as described above, except that, before starting, the Leadscrew F/N/R lever (27) is set to the 'Forward' position and the Automatic feed lever (15) is operated in order to drive the cross-slide.

As mentioned previously, the rotational speed of the leadscrew, and hence the rate of feed of the tool, is dependent upon the gear configuration of the gear train.

- The feed rate for simple turning is considerably less than that used for screw cutting.
- The lathe is factory configured for simple turning, however if you have been screw cutting, always remember to reset the gear configuration to that for simple turning.
- Please refer to the chart on a previous page that shows the gear configuration, and the explanation of how to change the gears.

1. Taking all precautions previously mentioned, position the cutting tool a short distance to the right of the workpiece with the appropriate depth of cut set on the cross-slide.
2. Ensure the leadscrew F/N/R lever (27) is set to 'Forward' and select 'Forward' on the Forward/Off/Reverse switch (24) on the main control panel.
3. Switch on the lathe.
4. Turn the variable speed control knob (23) to achieve the desired spindle speed with your right hand and push down on the automatic feed lever (15) until the nut becomes firmly engaged with the leadscrew.

**IMPORTANT:** Your left hand should always be free in order to hit the emergency stop (25) should it become necessary.

5. Carefully observe the movement of the tool and as it approaches the mark on the surface, denoting the end of cut, pull the automatic feed lever (15) UP sharply and ensure it stays UP. If a degree of accuracy is required, it is recommended that you finish the cut by hand.

**NOTE:** If you require a shoulder with perfectly clean corners, then you need to use an appropriately shaped tool.

6. Retract the tool one or two complete turns on the cross-slide feed (6), then wind it so that the tool is at the start point once again. Advance the tool the same number of turns, plus the depth of cut, and when read, push down the automatic feed lever (15) and proceed to take another cut.

#### BEVEL CUTTING

Bevel cutting involves the use of the compound slide (7), which is mounted on the cross-slide (6) and set at right angles to it for all normal cutting operations. This is indicated by the zero mark, on the scale, (B, Fig. 8), lining up with the mark etched on the body of the cross-slide.

To set the compound slide so that the cutting tool will cut a bevel, first retract the slide, until the two hex, socket head screws (A) are revealed as shown in Fig. 9.





Loosen the screws sufficiently to allow the compound slide to be turned to the desired angle, as indicated on the scale, and secure the slide in this position by retightening the socket head screws.

The taper, or bevel, is cut by setting the cross-slide appropriately then using the compound slide feed handle to advance the cutting tool in the direction of the arrow as shown in Fig. 9.

### SCREWCUTTING

This operation requires a degree of skill and accuracy, and should not be attempted unless you are completely familiar with all aspects of the lathe.

Essentially, the cross-slide (6) will move towards the headstock (1) under power, the same as cutting using auto feed, except the rate of feed is faster, as determined by the gear configuration. The cutting tool therefore, is moving ever closer to the rotating chuck.

**WARNING:** Great care and concentration must be exercised to ensure that the two do not meet when the machine is operating, as the possible damage caused could be disastrous.

The lathe is supplied with a leadscrew that will produce Imperial Treads in a range from 12 to 52 threads per inch, or metric threads in a range from 0.4-2.0mm pitch. It is important to remember that the type of thread you need to cut, i.e. UNF, BA, BSP, BSW etc., will be totally dependent upon the cutting tool profile, as profiles differ from thread to thread.

For detailed information regarding screwcutting techniques, cutting tools etc., you should consult a suitable handbook or obtain advice from a qualified person.

The general procedure for screwcutting is as follows:

1. Try to get as much distance from the chuck to the end of the proposed screw thread as possible, and if your design allows, cut a 'run-off' into the workpiece which is of a smaller diameter than the root diameter of the proposed screw thread.  
**Note:** for long threads it may be necessary to use a separate 'steady rest' (not included).
2. Install the appropriate gears for the thread required, and correctly mount the cutting tool.
3. Set the required depth of cut, and position the tool ready to begin cutting.  
**Note:** The depth of cut is vitally important and may be calculated or obtained from an appropriate reference manual.
4. Take all necessary precautions previously stated, and start the lathe with automatic feed lever (15) in the disengaged position (UP).
5. Push the automatic feed lever down sharply and turn the Forward/Off/Reverse switch (24) to 'FORWARD'.
6. As the tool approaches the end of the desired thread, turn the Forward/Off/Reverse switch to 'OFF' but do not disengage the auto-feed lever.
7. Retract the tool, using the cross-slide feed handle (18), noting the exact position on the scale and the exact number of turns (this will be used in step 9).
8. Turn the Forward/Off/Reverse switch to 'REVERSE'. The cross-slide will wind back to the beginning then turn switch to 'OFF'.
9. Reset the lathe by winding the cross-slide IN the exact number of turns previously wound OUT (step 7) then continue to wind IN to the desired depth of cut.
10. Repeat steps 5 – 7 until the thread is completed.

### After Each Use

Remove all metal shavings from the lathe and thoroughly clean all surfaces. If coolant was used, ensure it has completely drained from the tray.

### Storage

Store the lathe when it is not in use. Store it in a dry, secure place out of the reach of children. Inspect the lathe for good working condition prior to storage and again before re-use. Components should be dry, and all machined surfaces should be lightly oiled. Always remove cutting tools before storage store them separately. Put the switch in the locked or off position before storing the lathe. Such preventive safety measures reduce the risk of starting the lathe accidentally when used next.

### Maintenance

#### ⚠ WARNING:

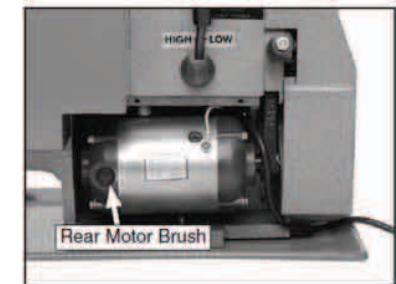
- Always disconnect the lathe from power before servicing it. Make sure the switch is in OFF position before reconnecting.

Maintain the Lathe by adopting a program of conscientious repair and maintenance in accordance with the following recommended procedures. It is recommended that the general condition of any tool be examined before it is used. Keep your tool in good repair. Keep all cutting tools sharp and clean. Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control. Keep handles dry, clean, and free from oil and grease. The following chart is based on a normal operation schedule.

USE LUBRICATING OIL	Maintenance Point
Daily maintenance	<ul style="list-style-type: none"> <li>Check loose mounting bolts.</li> <li>Check damaged parts.</li> <li>Check poorly adjusted parts.</li> <li>Check worn or damaged wires.</li> <li>Check any other unsafe condition.</li> <li>Clean tooling and storage.</li> <li>Cleaning the machine is relatively easy. Remove all chips at the end of the day. Wipe up any coolant used that settled in the bottom of the chip tray or has settled on any other part of the lathe. Dry off entire machine with a clean, dry towel. do not use compressed air to clean your lathe.</li> </ul>
Monthly maintenance	<ul style="list-style-type: none"> <li>Check gear damage, wear, rust, sludge, or chip build-up inside gearbox and off motor.</li> <li>Clean and lube as necessary.</li> </ul>

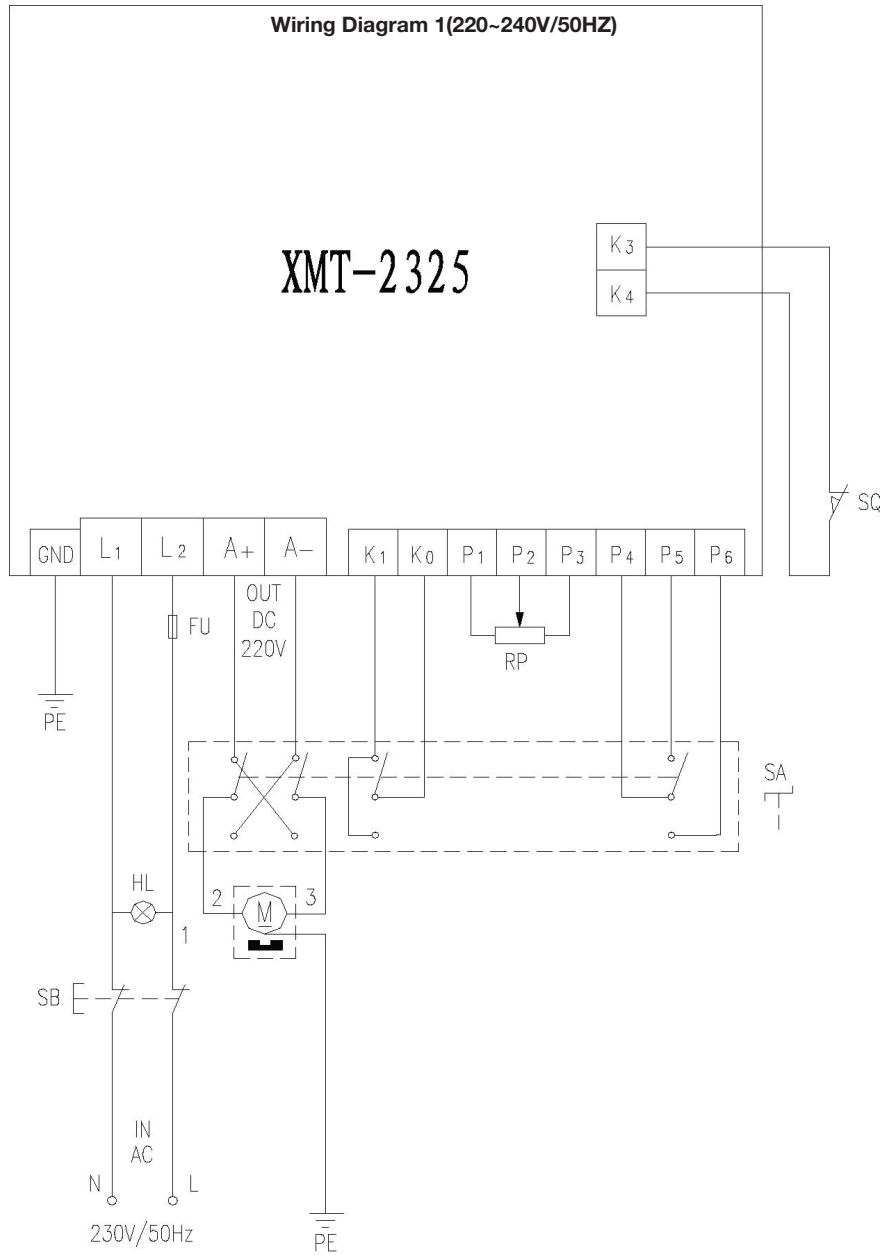
### MOTOR BRUSHES

The motor brushes may be changed by unscrewing the caps, on the upper side of the motor, beneath the headstock..

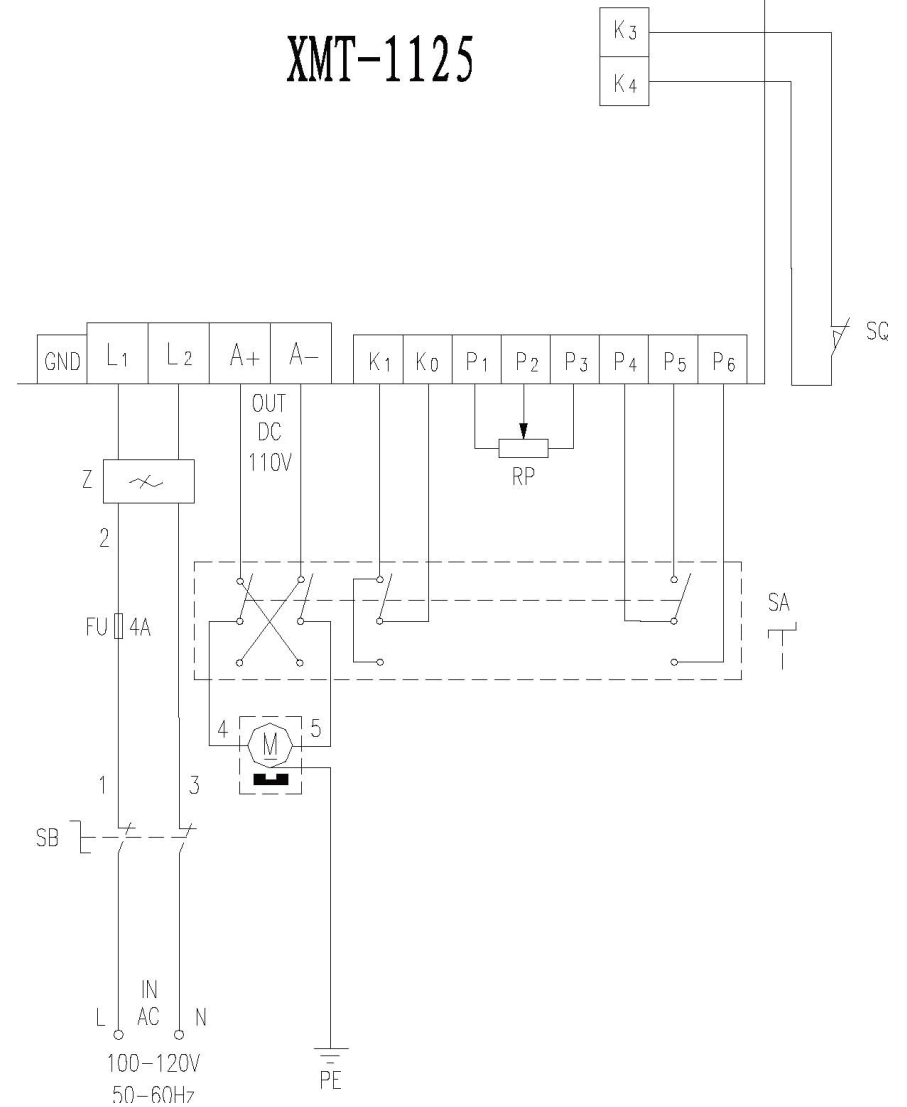




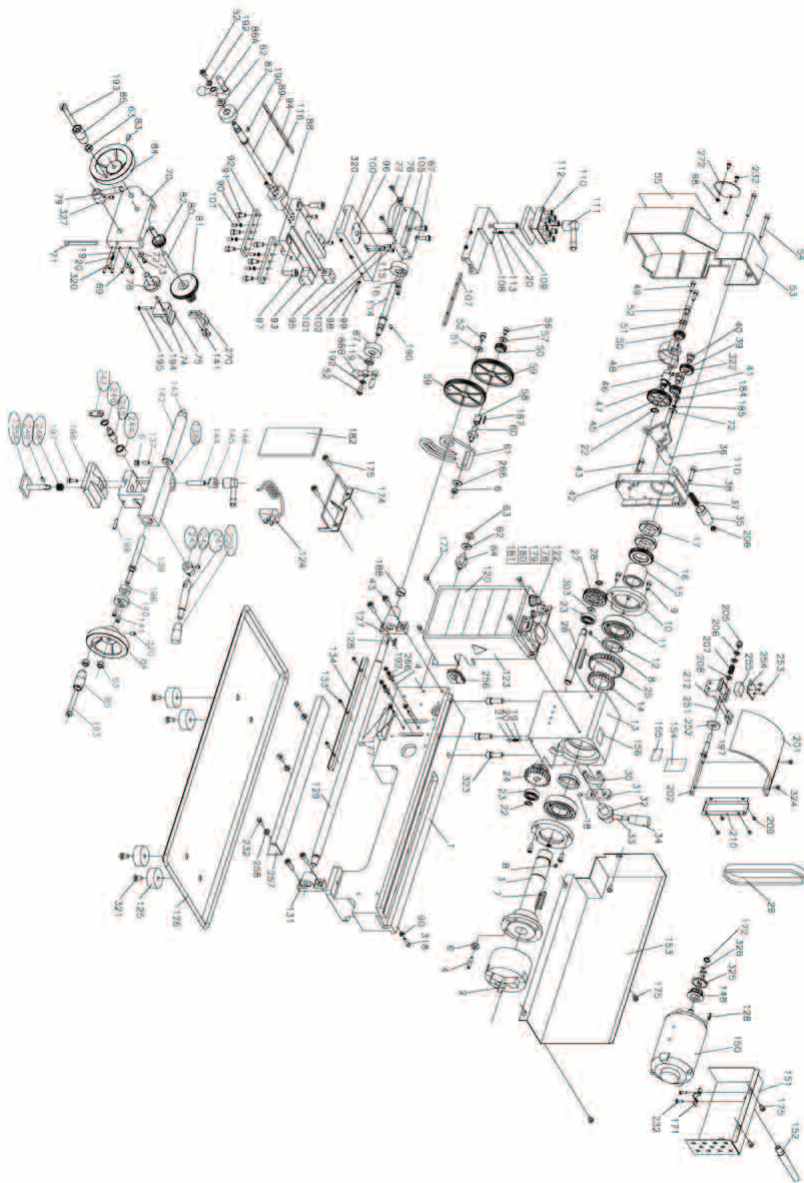
Parts Diagram



Wiring Diagram 2 (100-120V/60HZ)



### Parts Diagram



### Parts List

No	ERP No	Description	Qty.	#	Part No.	Description	Qty.
1	LC2A0101	Bed Way	1	45	LC2A0812	Gear 45T	1
2	LCH001	3 Jaws Chuck	1	46	LC2A0805	Shaft	1
3	LC2A0202	Spindle	1	47	GB1096-79	LC3X8 Parallel Key 4 x 8	1
4	GB77-85 M6x25	Set screw M6 x 25	5	48	LC2A0802	Mount	1
6	GB6170-85 M6	Nut M6	10	49	GB70-85 M5X18	Cap screw M5 x 18	2
7	GB1096-79 5x50	Key M5 x 40	1	50	LC2A0816	Pinion 20T	2
8	GB1096-79 4x8	Key M4 x 8	2	51	LC2A0810	Washer M6	2
9	GB70-85 M5x12	Cap screw M5 x 12	6	52	GB70-85 M6X8	Cap screw M6 x 8	4
10	LC2A0203	Cover	2	53	LC2A0828	Cover	1
11	YD01201018	Ball Bearing	2	54	GB70-85 M5X45	Cap screw M5 x 45	2
12	LC2A0206	Spacer	2	55	DC22514	Threads Cutting Chart	1
13	LC2A0201	Head Stock Casting	1	56	GB70-85 M5X8	Cap screw M5 x 8	1
14	LC2A0207	H/L Gear 21/29T	1	57	GB96-85 5	Washer M5	1
15	LC2A0205	Spacer	1	58	LC2A0813	Bush W/Key	1
16	LC2A0208	Spur Gear 45T	1	59	LC2A0826	Gear 80T	2
17	GB810-88 M27x1.5	Nut M27x1.5	2	60	LC2A0804	Shaft	1
18	GB78-85 M5x8	Screw M5x8	1	61	LC2A0801	Support Plate	1
19	YD004004	Steel Ball	2	62	GB97.1-85 8	Washer M8	2
20	YD00302013	Fixed Spring	3	63	GB6170-86 M8	Nut M8	4
21	GB78-85 M6x6	Screw M6x6	1	64	LC2A0827	Shaft	1
22	GB894.1-86 12	Retaining Ring M12	2	67	GB70-85 M6x16	Cap screw M5x16	2
23	YD01201005	Ball Bearings	2	69	GB71-85 M4x10	Screw M4x10	3
24	LC2A0204 H/L	Gear 12T/20T	1	70	LC2A0601	Carrige	1
25	GB1096-79 4x45	Parallel Key M4 x 45	1	71	LC2A0606	Gib Strip	1
26	LC2A0210	H/L Gear Shaft	1	72	GB96-85 5*12	Washer	3
27	LC2A0209A	Pulley	1	73	GB818-85 M4x8	Phillips Head Screw M4 x 8	2
28	GB894.1-86 10	Retaining Ring M10	1	74	GB119-86 A5x12	Shaft	2
29	YD00803001	Timing Belt	1	75	LC2A0602B	Half Nut Base	2
30	LC2A0211A	Shifting Fork	1	76	LC2A0413	Angle Block	1
31	LC2A0212	Shifting Arm	1	77	GB819-85 M4x10	Screw M4x10	2
32	LC2A0214	Shifting Knob	1	78	LC2A0609	Groove Cam	1
33	GB953-88 M8x70	Shifting Lever	1	79	LC2A0613	Handle	1
34	YD011001	Shifting Grip	1	80	LC2A0604	Shaft	1
35	LC2A0808	Handle	1	81	LC2A0607	Feeding Gear (A) 11T/54T	1
36	LC2A083000	Handle Mount	1	82	LC2A0603	Feeding Gear (B) 24T	1
37	YD00302028	Compressive Spring	1	83	GB78-85 M6x12	Screw M6 x 10	1
38	LC2A0807	Indicator	1	84	LC2A030200	Wheel	2
39	LC2A0814	Pinion 25T	1	85	LC2A0307	Knob+ Screw M8 x 55 +Nut M8	2
40	LC2A0811	Support Screw	2	87	LC2A0508	Dial	2
41	LC2A0815	Pinion 20T	1	88	LC2A0509	Bracket	1
42	LC2A0803	Fixed Cover	1	*88A	RS180501	The plate guide	1
43	GB70-85 M6X20	Cap screw M6x20	5	89	LC2A0503	Feeding Screw	1



## Mini Metal Lathe 7 x 12 OWNER'S MANUAL

No	ERP No	Description	Qty.	#	Part No.	Description	Qty.
*89A	RS180502	Feeding Screw	1	*135A	LC2A03A0100B	Clamp Plate	1
90	GB6172-86 M5	Nut M5	1	136	GB97.1-85 10	Flat Washer M10	1
91	GB70-85 M6x12	Cap Screw M6x12	5	137	GB79-85 M6x14	Cap Screw M5 x 16	1
92	LC2A0505	Slide Plate	6	138	LC2A0301	Tailstock Casting	1
93	LC2A0501	Saddle	2	*138A	LC2A0301B	Tailstock Casting	1
94	LC2A0507	Gib Strip	1	139	LC2A0304	Tailstock Screw	1
95	LC2A0504	Feeding Nut	1	140	LC2A0305	Bracket	1
96	LC2A0506	Swivel Disk	1	*141	GB70-85 M4x10	Cap Screw M4 x 10	4
97	GB70-85 M8x20	Cap Screw M8 x 20	1	142	LC2A0303D	Tailstock Quilt	1
*98	GB6172-86 M4	Nut M4	2	143	LC2A2001	Center	1
99	GB79-85 M4x16	Cap Screw M4 x 16	8	144	GB77-85 M8x40	Stud M8 x 40	1
100	LC2A0502	Cross Slide	3	145	LC2A0308	Clamp	1
101	GB77-86 M5x10	Set Screw M5 x 10	1	146	LC2A0309	Handle	1
102	GB70-85 M4x8	Cap Screw M4 x 8	5	148	LC2A1501	Pulley	1
105	LC2A0401	Compound Rest	2	150	YE00101009	Motor	1
106	GB79-85 M4x14	Cap Screw M4 x 14	1	151	LC2A1802	Motor Cover	1
107	LC2A0403	Gib Strip	3	152	YE013007	Power cord Guard	1
108	LC3D0402	Compound Rest (A)	1	153	LC2A230100	Rear Splash Guard	1
109	LC2A0407	Positioning Pin	1	154	DC22508	H/L Label	1
110	GB70-85 M6x25	Cap Screw M6 x 25	1	155	DC22507	H/L Label	1
111	LC2A0409	Clamping Lever	9	156	DC22502	Warning Label	1
112	LC2A0405	Tool Rest	1	157	LC2A0817	Gear 30T	1
113	GB77-85 M10x65	Stud M10 x 65	1	158	LC2A0818	Gear 35T	1
114	LC2A0406	Cross Feeding Screw	1	159	LC2A0819	Gear 40T	2
*114A	RS180407	Cross Feeding Screw	1	160	LC2A0812	Gear 45T	1
115	LC2A0404	Bracket		161	LC2A0821	Gear 50T	1
*115A	RS180406	Small slide guide	1	162	LC2A0822	Gear 55T	1
116	GB70-85 M4x12	Cap Screw M4 x 12	1	163	LC2A0823	Gear 57T	1
119	LC2A0415	Nut M18	4	164	LC2A0825	Gear 60T	1
120	DC2A2503A	Model Label	1	165	LC2A0824	Gear 65T	1
122	DC22511A	Indicator Table Label	1	166	N/A	Cover	1
123	LC2A180101	Electric Cover	1	167	N/A	Key	1
124	YE012009	Plug	1	171	LX21806	Clamp Block	1
125	LC2A01001	Rubber Foot	4	172	GB894.1-86 8	Check Ring φ9	1
126	LC2A0107A	Chip Tray	1	173	GB819-85 M5x8	Flat Head Screw M5 x 10	4
127	LC2A0104	Bracket	1	174	LC2A1806	Protector	1
128	GB1096-79 3x16	Key	2	175	GB818-2000 M5x8	Phillips Head Screw M5 x 10	7
129	LC2A0103B	Lead Screw	1	177	GB77-85 M6x20	Screw M6 x 25	2
131	LC2A0105	Bracket	1	178	YE00503008	Emergency Stop Switch	1
133	GB70-85 M3x10	Cap Screw M3x10	3	179	YE010004A	Fuse Box	1
134	LC2A0102	Rack	1	180	YE008001	Variable Speed Control Knob	1
135	LC2A030100	Clamp Plate	1	181	YE00501006	Toggle Switch	1



## Mini Metal Lathe 7 x 12 OWNER'S MANUAL

No	ERP No	Description	Qty.	#	Part No.	Description	Qty.
182	1YE00201011	PC Board	1	*247	GB894.1-86	Link block	1
184	GB818-85 M5X10	Phillips Head Screw M5 x 10	1	*248	LC2A03A13B	Common cylindrical	1
185	GB93-87 5	Spring washer 5	1	*249	GB2089-80	Belt thread pin shaft	1
187	LC2A0806	Key 3*16	1	*250	LC2A03A14	Long sleeve knob	1
188	LC2A0106	Small spacer	1	251	GB4141.14A-84 M8x40	Cylinder Pin	1
190	YD00304004	Spring	2	253	GB119-86 3x8	Tap Screw	3
192	GB93-87 6	Washer 8	4	254	GB845-85 ST2.9x4.5	Cover	1
193	GB65-85 M8x55	Screw M8*55	2	255	LC2A2308A	Micro switch	1
194	GB77-85 M4x38	Set Screw M4*38	1	256	YE00502003	Dust sheet	1
195	GB6170-86 M4	Nut M4	1	257	LC2A1820	Lead Screw Cover	1
196	LC2A0302	Plate of tailstock	1	*258	LC2A0110	Washer 4	3
197	GB70-85 M5x16	Cap Screw M5*16	3	*260	GB97.1-86 4	Drive briquetting	2
198	LC2A0306	Panel set of tailstock	1	*261	RS180402	Carved film before	2
199	GB75-85 M5x25	Screw M5*25	1	*262	RS182501	Screw M4x25	6
201	LC2A2302C	Chuck guard	1	*263	GB70-85 M4x25	Let grid scale	2
202	LC2A2304A	Shaft	1	*264	YE018014	Screw M3x4	2
205	GB923-88 M6	Screw M6	1	266	GB71-85 M3x4	Washer 6	3
206	GB6172-86 M6	Nut M6	2	268	GB96-85 6	Screw 10	1
207	YD00302022	Compression Spring	1	*270	GB6170-86 M10	Support Pin	1
208	GB97.1-85 6	Washer 6	2	*272	LC2A0614	Protective Cover	1
209	GB818-85 M3x4	Phillips Head Screw M3*4	4 *	303	LC2A0829	Washer	1
210	LC2A2305	Switch Cover	1	318	GB848-85 10	Cap Screw M5*20	1
212	LC2A2303D	Block	1	319	GB70-85 M5x20	Washer	1
*232	GB818-85 M4x6	Phillips Head Screw M4x16	7	320	GB97.1-85 5	Set Screw M6x10	4
*235	LC3D0401	Clamp Cover	1	No.	GB77-85 M6x10	Description	Qty.
*236	LC3D0403	Screw	1	321	GB818-85 M6x16	Phillips Head Screw M6x16	4
*237	YD00302027	Compression Spring	1	322	GB1096-79 LC3X6	Key	1
*238	GB65-85 M6x30	Screw M6x30	1	323	GB70-85 M8x25	Cap Screw M8x25	3
*239	GB848-85 6	Washer	1	324	GB819-85 M4x8	Flat Head Screw M4x8	2
*241	LC2A03A09	Brake tight handle shaft	1	325	LC2A1502	Flange	1
*242	GB78-85 M6x8	Screw M6x8	1	326	GB846-85 ST2.9x9.5LC	Screw	2
*243	LC2A03A10	Brake lever	1	327	GB79-85 M6x8	Cap Screw M6x8	1
*244	LC2A03A12	Shaft sleeve	1	86A	LC2A0511	Three Ball Handle	1
*245	LC2A03A11	Eocentric brake tight shaft	1	86B	LC2A0411	Three Ball Handle	1
*246	GB894.1-86	12 Shaft with elastic ring 12	1				

**Troubleshooting**

Motor & Electrical		
Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	<ol style="list-style-type: none"> <li>1. Fuse has blown.</li> <li>2. Emergency stop push-button is engaged/ faulty.</li> <li>3. Plug/receptacle is at fault or wired incorrectly.</li> <li>4. Computer board is at fault.</li> <li>5. Power supply is at fault/switched OFF.</li> <li>6. Motor on button or on /OFF switch is at fault.</li> <li>7. Spindle rotation switch is at fault.</li> <li>8. Wiring is open/has high resistance.</li> <li>9. Motor is at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Correct short/replace fuse on control panel.</li> <li>2. Rotate clockwise slightly until it pops out/replace it.</li> <li>3. Test for good contacts; correct the wiring.</li> <li>4. Inspect computer board; replace if faulty.</li> <li>5. Ensure hot lines have correct voltage on all legs and main power supply is switched on.</li> <li>6. Replace faulty on button or on /OFF switch.</li> <li>7. Turn switch to FWD/REV; replace bad switch.</li> <li>8. Check for broken wires or disconnected/corroded connections, and repair/replace as necessary.</li> <li>9. Test/repair/replace.</li> </ol>
Machine stalls or is underpowered.	<ol style="list-style-type: none"> <li>1. Wrong workpiece material (metal).</li> <li>2. Computer board is at fault.</li> <li>3. Motor speed rheostat is at fault.</li> <li>4. Motor brushes are at fault.</li> <li>5. Pulley/sprocket slipping on shaft.</li> <li>6. Motor bearings are at fault.</li> <li>7. Machine is undersized for the task.</li> <li>8. Spindle rotation switch at fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use metal with correct properties for your type of machining.</li> <li>2. Inspect and replace if faulty.</li> <li>3. Test and replace if faulty.</li> <li>4. Remove brushes and clean/replace.</li> <li>5. Replace loose pulley/shaft.</li> <li>6. Test by rotating shaft; rotational grinding /loose shaft requires bearing replacement.</li> <li>7. Use sharp lathe bits/chisels at correct angle; reduce feed rate/depth of cut; use cutting fluid if possible.</li> <li>8. Turn switch to FWD/OFF/REV; replace bad switch.</li> </ol>
Loud, repetitious noise coming from machine near the motor.	<ol style="list-style-type: none"> <li>1. Pulley setscrews or keys are missing or loose.</li> <li>2. Motor fan is hitting the cover.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect keys and setscrews. Replace or tighten if necessary.</li> <li>2. Tighten fan or shim cover, or replace items.</li> </ol>
Motor overheats.	<ol style="list-style-type: none"> <li>1. Motor overloaded.</li> <li>2. Air circulation through the motor restricted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce load on motor.</li> <li>2. Clean out motor to provide normal air circulation.</li> </ol>
Motor is loud when cutting. Overheats or bogs down in the cut.	<ol style="list-style-type: none"> <li>1. Excessive depth of cut or feed rate.</li> <li>2. RPM or feed rate wrong for cutting operation.</li> <li>3. Cutting tool is dull.</li> <li>4. Gear setup is too tight, causing them to bind.</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease depth of cut or feed rate.</li> <li>2. Refer to RPM feed rate chart for appropriate rates.</li> <li>3. Sharpen or replace the cutting tool.</li> <li>4. Readjust the gear setup with a small amount of backlash so the gears move freely and smoothly when the chuck is rotated by hand.</li> </ol>

Operation and Work Results		
Symptom	Possible Cause	Possible Solution
Entire machine vibrates successively upon start up and while running.	<ol style="list-style-type: none"> <li>1. Workpiece is unbalanced.</li> <li>2. Loose or damaged belt(s).</li> <li>3. V-belt pulleys are not properly aligned.</li> <li>4. Worn or broken gear present.</li> <li>5. Chuck or faceplate has become unbalanced.</li> <li>6. Spindle bearings badly worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reinstall workpiece so it is as centered with the spindle bore as possible.</li> <li>2. Tighten/replace the belt as necessary.</li> <li>3. Align the V-belt pulleys.</li> <li>4. Inspect gears and replace if necessary.</li> <li>5. Rebalance chuck or faceplate; contact a local machine shop for help.</li> <li>6. Replace spindle bearings.</li> </ol>
Bad surface finish.	<ol style="list-style-type: none"> <li>1. Wrong rpm or feed rate.</li> <li>2. Dull tooling or poor tool selection.</li> <li>3. Too much play in the gibs.</li> <li>4. Tool too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust for appropriate RPM and feed rate.</li> <li>2. Sharpen tooling or select a better tool for the intended operation.</li> <li>3. Tighten the gibs.</li> <li>4. Lower the tool position.</li> </ol>
Can't remove tapered tool from tailstock quill.	<ol style="list-style-type: none"> <li>1. Quill had not retracted all the way back into the tailstock.</li> <li>2. Debris was not removed from taper before inserting into quill.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the quill handwheel until it forces taper out of quill.</li> <li>2. Always make sure that taper surfaces are clean.</li> </ol>
Cross slide, compound slide, or carriage feed has sloppy operation.	<ol style="list-style-type: none"> <li>1. Gibs are out of adjustment.</li> <li>2. Handwheel is loose.</li> <li>3. Lead screw mechanism worn or out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust gib screw(s) (see Page 35).</li> <li>2. Tighten handwheel fasteners.</li> <li>3. Tighten any loose fasteners on lead screw mechanism.</li> </ol>
Cross slide, compound slide, or carriage feed handwheel is hard to move.	<ol style="list-style-type: none"> <li>1. Gibs are loaded up with shavings, dust, or grime.</li> <li>2. Gib screws are too tight.</li> <li>3. Backlash setting too tight (cross slide only).</li> <li>4. Bedways are dry.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove gibs, clean ways/dovetails, lubricate, and readjust gibs.</li> <li>2. Loosen gib screw(s) slightly, and lubricate bedways.</li> <li>3. Slightly loosen backlash setting by loosening the locking screw and adjusting the spanner ring at the end of the handle.</li> <li>4. Lubricate bedways and handles.</li> </ol>
Cutting tool or machine components vibrate excessively during cutting.	<ol style="list-style-type: none"> <li>1. Tool holder not tight enough.</li> <li>2. Cutting tool sticks too far out of tool holder; lack of support.</li> <li>3. Gibs are out of adjustment.</li> <li>4. Dull cutting tool.</li> <li>5. Incorrect spindle speed or feed rate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for debris, clean, and retighten.</li> <li>2. Reinstall cutting tool so no more than 1/3 of the total length is sticking out of tool holder.</li> <li>3. Tighten gib screws at affected component.</li> <li>4. Replace or re-sharpen cutting tool.</li> <li>5. Use the recommended spindle speed.</li> </ol>
Inaccurate turning results all along the workpiece.	<ol style="list-style-type: none"> <li>1. Headstock and tailstock are not properly aligned with each other.</li> </ol>	<ol style="list-style-type: none"> <li>1. Realign the tailstock to the headstock spindle bore center line.</li> </ol>
Chuck jaws won't move or don't move easily.	<ol style="list-style-type: none"> <li>1. Chips lodged in the jaws.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove jaws, clean and lubricate chuck threads, and replace jaws.</li> </ol>
Carriage won't feed.	<ol style="list-style-type: none"> <li>1. Gears are not all engaged.</li> <li>2. Gears are broken.</li> <li>3. Loose screw on the feed handle.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust gear positions.</li> <li>2. Replace.</li> <li>3. Tighten.</li> </ol>



Operation and Work Results		
Symptom	Possible Cause	Possible Solution
Carriage hard to move.	<ol style="list-style-type: none"> <li>1. Carriage lock is tightened down.</li> <li>2. Chips have loaded up on bedways.</li> <li>3. Bedways are dry and in need of lubrication.</li> <li>4. Longitudinal stops are interfering.</li> <li>5. Gibs are too tight.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check to make sure table locks are fully released.</li> <li>2. Frequently clean away chips that load up during turning operations.</li> <li>3. Lubricate bedways and handles.</li> <li>4. Check to make sure that stops are floating and not hitting the center stop.</li> <li>5. Loosen gib screw(s) slightly.</li> </ol>
Gear change levers will not shift into position.	<ol style="list-style-type: none"> <li>1. Gears not aligned in headstock.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rotate spindle by hand until gear falls into place.</li> </ol>
Loud, repetitious noise coming from machine.	<ol style="list-style-type: none"> <li>1. Gears not aligned in headstock or no backlash.</li> <li>2. Broken gear or bad bearing.</li> <li>3. Workpiece is hitting stationary object.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust gears and establish backlash.</li> <li>2. Replace broken gear or bearing.</li> <li>3. Stop lathe immediately and correct interference problem.</li> </ol>
Tailstock quill will not feed out of tailstock.	<ol style="list-style-type: none"> <li>1. Quill lock knob is tightened down.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn knob counterclockwise.</li> </ol>

### Replacement Parts

- For replacement parts and technical questions, please call Customer Service at 1-800-222-5381.
- Not all product components are available for replacement. The illustrations provided are a convenient reference to the location and position of parts in the assembly sequence.
- When ordering parts, the following will be required: Model Number, Serial Number/Lot Date Code, and Description.
- The distributor reserves the rights to make design changes and or improvements to product lines and manuals without notice.

### Limited Warranty

Northern Tool and Equipment Company, Inc. ("We" or "Us") warrants to the original purchaser only ("You" or "Your") that the Ironton Air Tool product purchased will be free from material defects in both materials and workmanship, normal wear and tear excepted, for a period of one year from date of purchase. The foregoing warranty is valid only if the installation and use of the product is strictly in accordance with product instructions. There are no other warranties, express or implied, including the warranty of merchantability or fitness for a particular purpose. If the product does not comply with this limited warranty, Your sole and exclusive remedy is that We will, at our sole option and within a commercially reasonable time, either replace the product without charge to You or refund the purchase price (less shipping). This limited warranty is not transferable.

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This limited warranty does not cover: (a) normal wear and tear; (b) accessories both consumable and durable; (c) damage through abuse, neglect, misuse, or as a result of any accident or in any other manner; (d) damage from misapplication, overloading, or improper installation; (e) improper maintenance and repair; and (f) product alteration in any manner by anyone other than Us, with the sole exception of alterations made pursuant to product instructions and in a workmanlike manner.

### Obligations of Purchaser

You must retain Your product purchase receipt to verify date of purchase and that You are the original purchaser. To make a warranty claim, contact Us at 1-800-222-5381, identify the product by make and model number, and follow the claim instructions that will be provided. The product and the purchase receipt must be provided to Us in order to process Your warranty claim. Any returned product that is replaced or refunded by Us becomes our property. You will be responsible for return shipping costs or costs related to Your return visit to a retail store.

### Remedy Limits

Product replacement or a refund of the purchase price is Your sole remedy under this limited warranty or any other warranty related to the product. We shall not be liable for: service or labor charges or damage to Your property incurred in removing or replacing the product; any damages, including, without limitation, damages to tangible personal property or personal injury, related to Your improper use, installation, or maintenance of the product; or any indirect, incidental or consequential damages of any kind for any reason.

### Assumption of Risk

You acknowledge and agree that any use of the product for any purpose other than the specified use(s) stated in the product instructions is at Your own risk.

### Governing Law

This limited warranty gives You specific legal rights, and You also may have other rights which vary from state to state. Some states do not allow limitations or exclusions on implied warranties or incidental or consequential damages, so the above limitations may not apply to You. This limited warranty is governed by the laws of the State of Minnesota, without regard to rules pertaining to conflicts of law. The state courts located in Dakota County, Minnesota shall have exclusive jurisdiction for any disputes relating to this warranty.



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