OWNER'S MANUAL

CT133 - MINI MILLING MACHINE

CT133 MINI MILLING MACHINE
INDEX

GENERAL SAFETY INSTRUCTIONS

EXTREME CAUTION SHOULD BE USED IN OPERATING ALL POWER TOOLS. KNOW YOUR POWER TOOL, BE FAMILIAR WITH ITS OPERATION. READ THE OWNER'S MANUAL AND PRACTICE SAFE USAGE PROCEDURES AT ALL TIMES.

- **CONNECT** your machine **ONLY** to the matched and specified power source.
- **WEAR SAFETY GLASSES, RESPIRATORS, HEARING PROTECTION** and **SAFETY SHOES** when operating heavy machinery. **Always wear safety glasses.**
- **DO NOT** wear loose clothing or jewellery when operating machinery.
- **A Safe Environment is important**. Keep the area free of dust, dirt and other debris in the immediate vicinity of the machine.
- **BE ALERT**! Do Not Use prescription or other drugs that may affect your ability or judgement to safely use this machine.
- **DISCONNECT** the power source when changing drill bits or making other adjustments or repairs.
- **NEVER** leave an operating tool unattended.
- **NEVER** reach over the table when the tool is in operation.
- **ALWAYS** keep bits sharp and properly aligned.
- **ALWAYS** keep all safety guards in place and ensure their proper function.
- **ALWAYS** make sure that any tools used for adjustments are removed before operating the machine.
- **ALWAYS** secure your work with the appropriate clamps or vises.
- **ALWAYS** keep bystanders safely away while operating machinery.
- **THINK SAFETY. WORK SAFELY.** Never attempt a procedure if it does not feel safe or comfortable.

SPECIFIC SAFETY INSTRUCTIONS

This machine is designed for drilling, deep milling and face milling of small pieces with a limit size of approx. 12” x 8” x 8”. It is highly recommended that you read this manual carefully before operating this machine.

- Always use the chip guard along with safety glasses to ensure proper safety when milling.

- Before starting any work, make sure the work piece has been properly clamped to the table. **DO NOT** ever hold a work piece in your hand when milling or drilling.

- When selecting an appropriate speed for your work piece, allow the mill to gain full speed before starting.

- **NEVER** reverse the motor direction while the mill is in motion.

- **DO NOT** clear debris & chips by hand. **ALWAYS** use a brush & **DO NOT** clear the table while the mill is running.

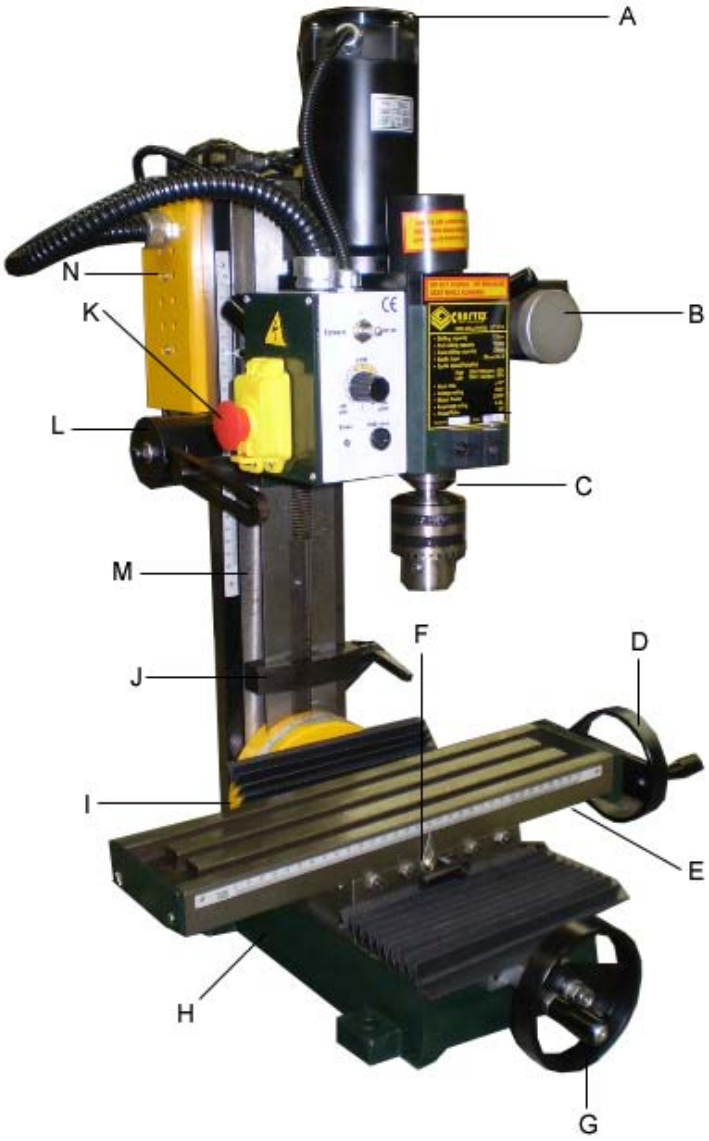
- Operating this machine beyond the design purpose and limit of this machine without sufficient consultation or proper training is not recommended.

- The noise level during operation if 70 – 75db. Hearing protection may not be necessary but is recommended.

- In case of power failure, the machine may start up again once power is restored, be sure to pay close attention in this case and turn the power switch to off as soon as there is a machine interruption.

- Handling – The net weight of this machine is approx. 50kg. When lifting or moving this machine, be sure to get assistance from another person. It is best to use common sense and practice safety at all times when using this machine and other power tools.

CT133 - FEATURES



A – MOTOR

B – FINE FEEDING WHEEL

C – HEADSTOCK & SPINDLE

D – LOGINTUDINAL FEED HAND WHEEL

E – WORKING TABLE

F – SADDLE

G – CROSS FEED WHEEL

H – BASE

I – CONNECTING STRUT

J – LIMIT BLOCK

K – EMERGENCY STOP SWITCH

L – BALANCE MECHANISM

M – COLUMN

N – ELECTRICAL BOX

CT133 - MACHINE SPECIFICATIONS

As part of the growing line of Craftex metalworking equipment, we are proud to offer the CT133 Mini Milling Machine. The Craftex name guarantees Craft Excellence. By following the instructions and procedures laid out in this owner's manual, you will receive years of excellent service and satisfaction. The CT133 is a professional tool and like all power tools, proper care and safety procedures should be adhered to. The CT133 Mini Milling Machine has multiple functions on either face milling or drilling and there are various sizes and kinds or cutters that can be used with this machine.

Table Size ……16" x 4"
T-Slot Size …… M10
Maximum Table Travel …….. 8 ½"
Maximum Cross Slide ……..…4"
Maximum Spindle Travel ……..7"
Head Tilt……(-45° ~ +45°)
Spindle Speed ..……Low: 0 ~ 1100 RPM
High: 0 ~ 2500 RPM
Spindle Taper …… MT3
Drilling Capacity ……1/2"
End Milling Capacity ……5/8"
Face Milling Capacity ……..1 1/8"
Machine Weight ……Gross Weight – 68 kg
Net Weight – 50 kg

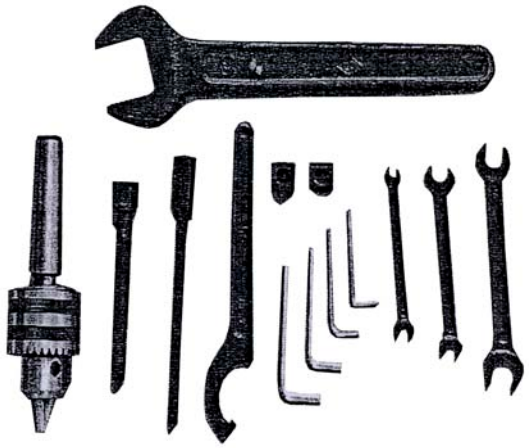
Motor…… 350 Watts
Voltage…… 110V
AMP……4.5
Cycle/RPM…… 6000RPM
Switch Type ……Variable Speed Reversible
Power Transfer…… Gears

FEATURES

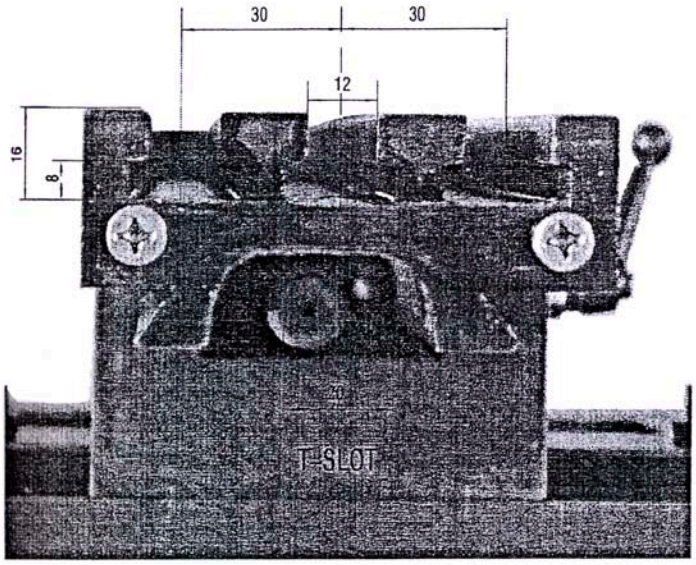
Dial Graduation are in Metric
Fine Feed Head Control
Two Speed ranges
Spring Head Return
Zero Setting Dials
Cast Iron Construction

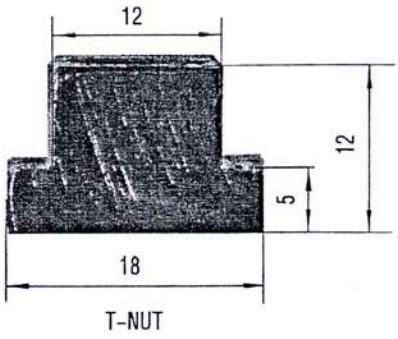
CT113 – STANDARD ACCESSORIES

Description	**QTY**
Large Wrench S: 36	1
Drill Chuck & Taper Shank	1
Oil Can	1
Fixing Pin	1
L Hex. Wrench S: 3, 4, 5,	4
Socket Head Wrench D: 45 – 52	1
Double End Wrench 8-10, 14-17, 17-19	3
Drill Chuck Holder	1
Handle	2
T-Nut	2
Fuse 4.5A(110V)	1
Draw Bar	1



T-SLOT SPECIFICATION (mm)





CT133 - POWER CONNECTION/DISCONNECT & OPEARTION

The connection, disconnection and grounding is carried out through the plug on the machine. For safety reasons do not change this plug in any situation. For the protection control device, we recommend that the operator should supply a fuse with current ratings and the total length between the fuse and connection terminal should coincide with the following " Extension lead Chart"

Amperage Rating	3A	6A	10A	13A
Extension Cable Length	Wire Size mm ^{2}			
7.5m	0.75	0.75	1.0	1.25
15m	0.75	0.75	1.0	1.5
22.5m	0.75	0.75	1.0	1.5
30m	0.75	0.75	1.0	1.5
45.5m	0.75	1.25	1.5	2.5

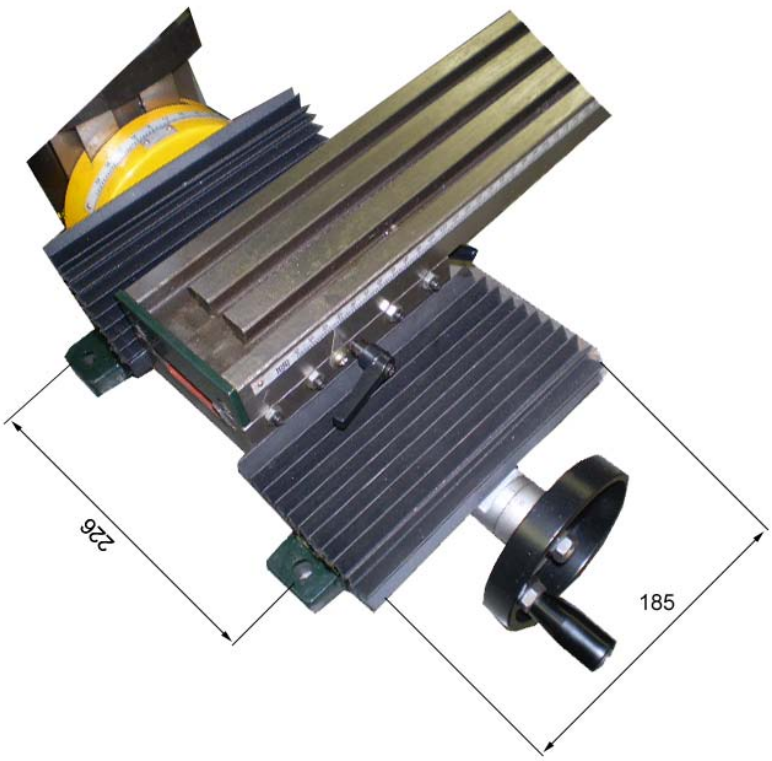
The power source for this machine is 110V. Make sure that the Emergency stop switch is in the off position before plugging the cord in. Disconnect the machine from the power source with the plug before servicing and when changing accessories.

CT133 – MACHINE INSTALLATION

MACHINE LOCATION & SET UP

The machine should be fixed on the working table with four hexagon holts. Please install it to an appropriate location in order to meet with the precision requirements of the machine. Before setting your machine up, clean off any anti-rust protector and grease that was used for shipping purposes. You can use a clean cloth and appropriate solvents.

(1) When selecting a location make sure that your worktable has a flat surface.
(2) Avoid placing in a location with exposure to direct sunlight, heavy moisture and excessive dust.
(3) When you have found your desired location, drill 4 locating holes on the worktable, the dimensions should be the same as the machine base.
(4) Pay close attention when selecting your spot to ensure that there is enough room around the machine for the cross feed & longitudinal hand wheel can be extended during future use.
(5) Adjust the machine accordingly and affix to the worktable with 4 M10 bolts & nuts.



CT133 – MACHINE INSTALLATION

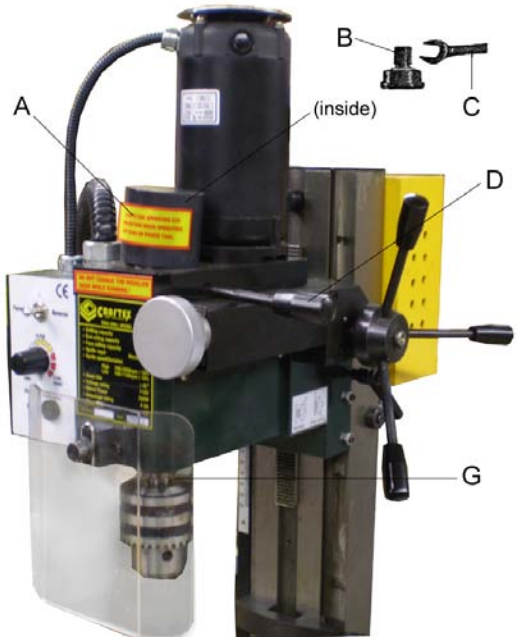
CHECK THE FOLLOWING BEFORE SWITCHING YOUR MACHINE ON

(1) Remove all fixtures that were used while initial set up of your machine took place.
(2) Check whether the power voltage is suited for your machine
(3) Remove all obstacles which are around your machine and might come in the way
(4) Check the angle of the pillar and adjust the bolts to see if they are tight enough.
(5) Check the chuck, chuck holder and fixing pin on the spindle to make sure that they are unloaded.
(6) Check the high-low speed o n the spindle to see if it is set on the right speed.

CT133 – MECHANISM ADJUSTMENT

INSTALATION OF THE TAPER SHANK

(1) Turn the main power off before replacing the cutter.
(2) Pull out the protective cover (a)
(3) Wipe the spindle sleeve and the taper shank from any debris or dirt.
(4) Put the taper shank (g) into the spindle sleeve. The cutter should be matted with an oilcloth to keep your fingers safe.
(5) Insert the fixing pin (d) right on the spindle
(6) Use a #14 open end wrench (c) to tighten(clockwise) the spindle draw bar (b)
(7) Pull out the fixing pin
(8) Install the protective cover



REMOVAL OF THE TAPER SHANK

(1) Turn off the main power before you replace the cutter
(2) Pull out the protective cover (a)
(3) Insert the fixing pin (d) right on the spindle sleeve
(4) Use a #14 open end wrench (c) to loosen (counter clockwise) the spindle draw bar (b)
(5) Knock the taper shank (g) gently with a plastic or deadblow hammer to loosen it into the spindle sleeve. Then take off the taper shank (g)
(6) The cutter should be again handles with an oilcloth to protect your fingers.
(7) Install the protective cover (a)

*** When installing or removing the taper shank, make sure that the machine is unplugged**.

CT133 – CONTROL PANEL

Review the following diagram to familiarize yourself with the CT133 Control Panel.

(A) Emergency Stop Switch
(B) Electrical Control Box
(C) Variable Speed Control Knob
(D) Fuse Socket

Note – After using the Emergency Stop control, it will be necessary to reset the spindle ON and RPM control knob, and the spindle rotation toggle switch

CT133 – MECHANISM ADJUSTMENT

TEST RUN & SPINDLE BREAK IN

The CT133 has two spindle speeds: Low – 0 ~ 1100 & High – 0 ~ 2500 RPM. It is important to break the machine in properly before consistently using your machine. This will ensure better overall performance. Once you have read this entire manual and have familiarized yourself with the machine, you can begin the process.

To begin, take the following steps
(1) Make sure the machine is properly lubricated (see page20)
(2) Make sure the machine is free from obstruction or debris. Remove the drawbar if there is no arbor or collet in the spindle.
(3) With the spindle at a complete stop, change the speed range lever into the low range. (If the lever will not change at first, rotate the spindle by hand while holding light pressure on the lever. When the gear engages, the lever will fall into place)
(4) Turn the machine ON and let the machine run for at least 10 minutes on low speed. The machine should run smooth with minimal vibration and minimal noise. If the mill is not running smoothly, turn the machine OFF right away before proceeding.

DO NOT change speed ranges with the machine is ON. This may damage your machine.

(5) Slowly increase the RPM to a medium range and allow the machine to run another 10 minutes in this range.
(6) Slowly increase the RPM to the highest range and allow the machine to run another 10 minutes in this range.
(7) Turn the machine OFF and change to HIGH speed. **Repeat steps 4 – 6.**

CT133 – MECHANISM ADJUSTMENT

TRAVEL ADJUSTMENT

Using the limit block you can control the traveling of the spindle box.
(1) Loosen the handle (a) beside the limit block
(2) Adjust the limit block in position
(3) Tighten the handle
(4) The travel position can be referred to the measurement guide of the column

ADJUST THE ANGLE OF THE COLUMN

(1) Turn the main power off before making this adjustment
(2) Hold the column with your hands in order to prevent the column from free fall once it is loose.
(3) Loosen the locked nut (a) with a large wrench (b)
(4) Adjust the column angle as desired. (45° is the Max. for both left & right)
(5) Tighten.

MITER WEDGE ADJUSTMENT

After long term use & contact motion to the machine function, errors may occur due to relative surface motion. The miter wedge acts as an interface on each slide face. In order to eliminate this error, make use of the adjusting screw by keeping pressure between two machine parts (example – Spindle box & column) Adjust and keep the contact pressure to maintain its mechanical precision.

In order to maintain precision, the pressure between the two elements needs to be adjusted appropriately because of the abrasion that is produced from the contact motion (This adjustment can be made once a year if necessary)

In order to make this adjustment take the following steps.

(1) Loosen the locked nuts
(2) Adjust the foremost pressure of the miter wedge by the locked nut. If necessary, loosen all the adjusting screws
(3) Tighten and loosen the adjusting screws and keep in mind that the pressure of each adjusting screw should be the same.
(4) Tighten the lock nuts uniformly
(5) Use a #3 hexagonal wrench to fix the adjusting screws from rotating to cause the unbalanced pressure
(6) Adjust the middle portion first and then go towards the interior from two sides uniformly while you are adjusting the screw in order to ensure a uniform pressure.

CT133 – OPERATIONS & TECHNIQUES

METHOD OF OPERATION – DRILLING & DEEP MILLING

(1) Install the appropriate tool and tighten & make sure your adjustments are firm.
(Make sure the power is turned to OFF at this time)
(2) Select an appropriate speed level.
WHEN THE SPINDLE IS RUNNING, DO NOT CHANGE THE SPEED BETWEEN HIGH & LOW
(3) Set your work piece on the worktable & secure it.
(4) Adjust the working table (Longitudinal Axis Y) and saddle seat (Cross Axis X) in position.
(5) Loosen the limit block handle and adjust the blocks in position. At this point do not let the tool meet the work piece.
(6) Remove all obstacles and unnecessary items from around the machine.
(7) Turn on the main power.
(8) Refer to the measurement ruler on the column to obtain your desired drilling or milling depth.
(9) After you have finished your work, turn the power off and take the spindle back to its original position.
(10) Clean the machine of debris or dirt.

FACE MILLING

(1) Install the appropriate tool and tighten & make sure your adjustments are firm.
(Make sure the power is turned to OFF at this time)
(2) Select an appropriate speed level.
WHEN THE SPINDLE IS RUNNING, DO NOT CHANGE THE SPEED BETWEEN HIGH & LOW
(3) Set your work piece on the worktable & secure it.
(4) Adjust the working table (Longitudinal Axis Y) and the saddle seat (Cross Axis X) in position.
(5) Release the limit block on the column and adjust the depth of cut.
(6) Turn the hand wheel of the working table (Y-axis) and the saddle seat (X- axis) to perform face milling.
(7) After you have finished your work, turn the power off and take the spindle back to its original position.
(8) Clean the machine of debris or dirt.

CT133 – OPERATIONS & TECHNIQUES

INSPECTION DURING OPERATION

During operation it is important to be aware at all times not only of your work piece and machine but of your surroundings. The machine will not perform to the best of its abilities under the following conditions.

(1) The depth of cut is too deep
(2) The feeding speed is too fast for the material being worked on
(3) The rotation speed is too fast
(4) The machine is not fixed properly to the bench or worktable.
(5) The vise and work piece is not properly and firmly fixed.

PROPER RPM SETTINGS

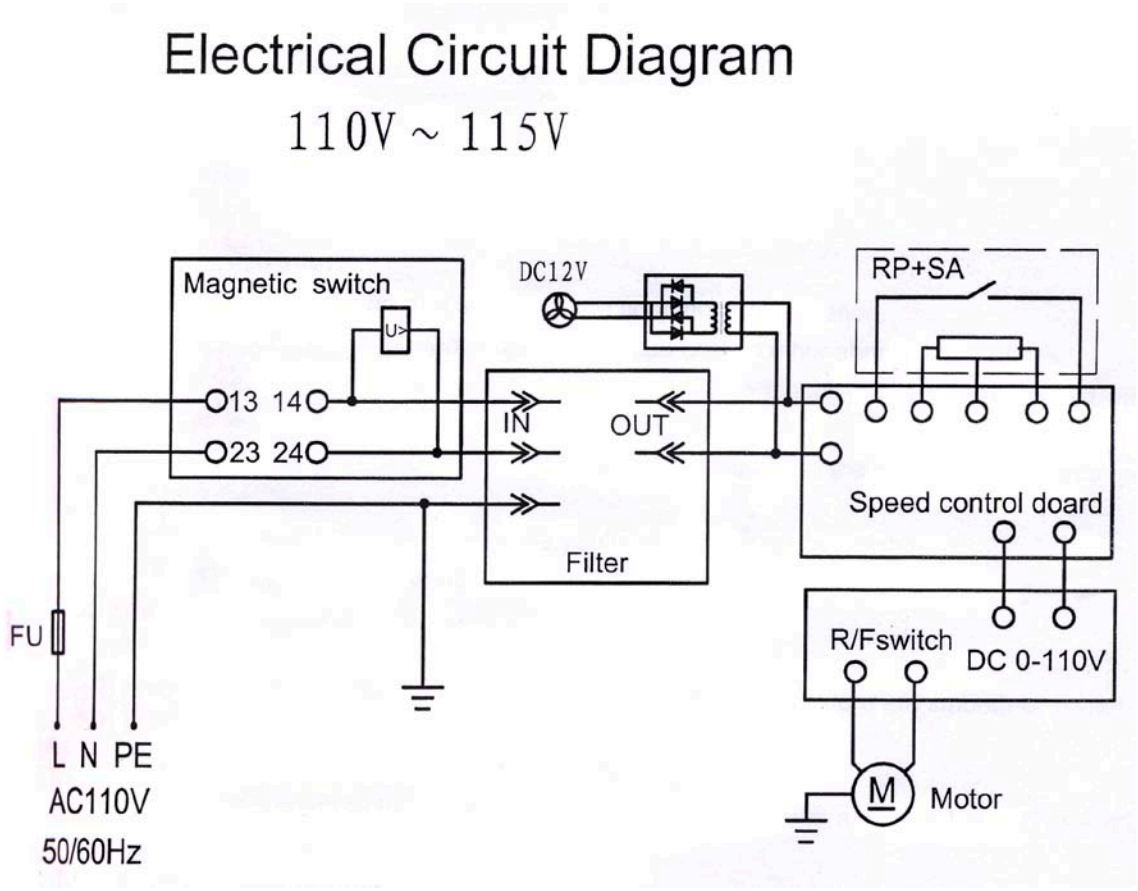
It is important the follow correct RPM settings when working with different materials. Before you start any work, you should determine the best RPM setting for your work piece. Failure to select the correct RPM may result in the operator's bodily harm as the machine may eject certain materials or work piece if the incorrect RPM is selected. Failure to choose the correct RPM will also put excess strain on the machine and shorten the tool life. The following formula may also be helpful in determining the correct RPM.

(Cutting Speed x 4) / Diameter of cutting tool = RPM

Refer to the following table below before you begin milling/drilling.

CUTTING SPEEDS FOR HSS CUTTING TOOLS	
MATERIAL	**CUTTING SPEED (SFM)**
STAINLESS STEEL	**60**
TOOL STEEL	**50**
CAST STEEL	**80**
CAST IRON, HARD	**50**
CAST IRON, SOFT	**80**
COPPER	**100**
ALLOY STEEL, HARD	**40**
TITANIUM	**50**
ALUMINUM & ALLOYS	**300**
BRASS & BRONZE	**150**
WOOD	**300-500**
PLASTICS	**300-800**

CT133 – ELECTRICAL CIRCUIT DIAGRAM



CT133 – MAINTENANCE

LUBRICATION

In order to ensure precision and maintenance of your machine, you must keep your machine properly lubricated.
Part of your standard accessories there is an oil-can; you can use this to lubricate your machine.

It is recommended that you use two to three drops on all contact points shown in the diagram below with ISO 68 or SAE 20W oil or similar lubricant.

(A) Cross slide & saddle seat ways
(B) Column Pivot point
(C) Column ways

It is recommended that you use lightweight lithium grease directly on the following points once a month to ensure accuracy and longer tool life.

(D) Longitudinal Leadscrew
(E) Cross Feed Leadscrew
(F) Column Gear Rack

CT133 – MAINTENANCE

To get the most out of your machine, it is imperative that you maintain it. Daily, weekly, monthly and yearly maintenance is highly recommended and keeping a log of your maintenance is also recommended.

DAILY MAINTENANCE

(1) Inspect each operation part to ensure the condition of lubrication.
(2) Ensure that the mounting bolts are secure.
(3) Double check that all wires are not worn or damaged.
(4) Clean any debris or dirt from in and around the machine.
(5) Ensure that the mill is completely powered down at the end of each use. If The machine is left on, the cooling fan will continue to run and could cause excess wear.

WEEKLY MAINTENANCE

(1) Clean and grease down the shaft.
(2) Check all nuts & bolts to ensure they are tight and in place.
(3) Check your lubrication levels and ensure your machine is properly lubricated.
(4) Examine the overall circuit, contact point conductor, plugs and switches to ensure everything is normal.

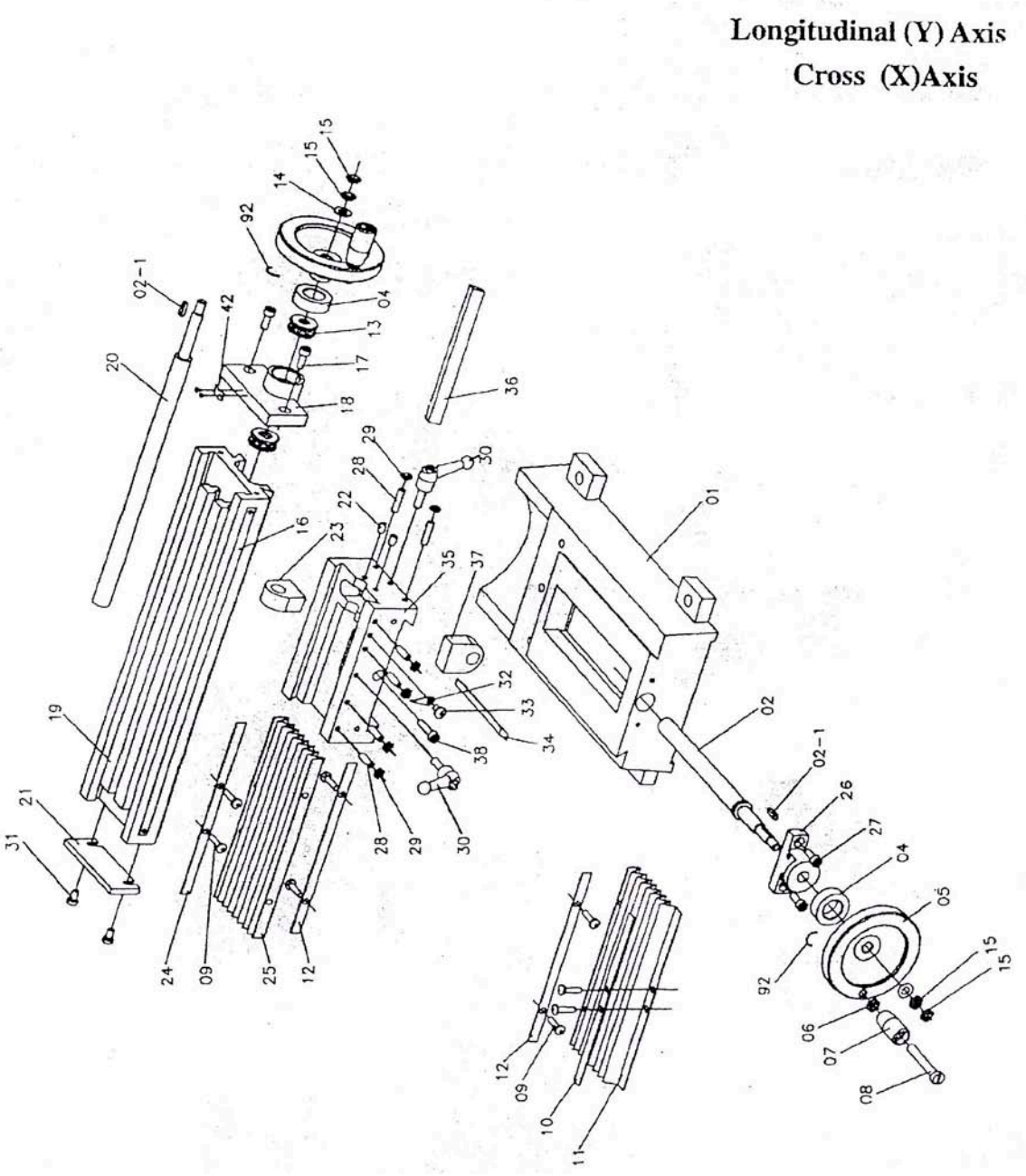
MONTHLY MAINTENANCE

(1) Check all plugs and switches are in working order.
(2) Check the cooling fan to ensure everything is in order.
(3) Check lubrication levels.

SEASONAL MAINTENANCE

(1) Go over your maintenance logs to ensure that you have not come across any problems.
(2) Check that all parts are in working order
(3) Check that electrical components are OK and do not need replacement.

CT133 ASSEMBLY DIAGRAM



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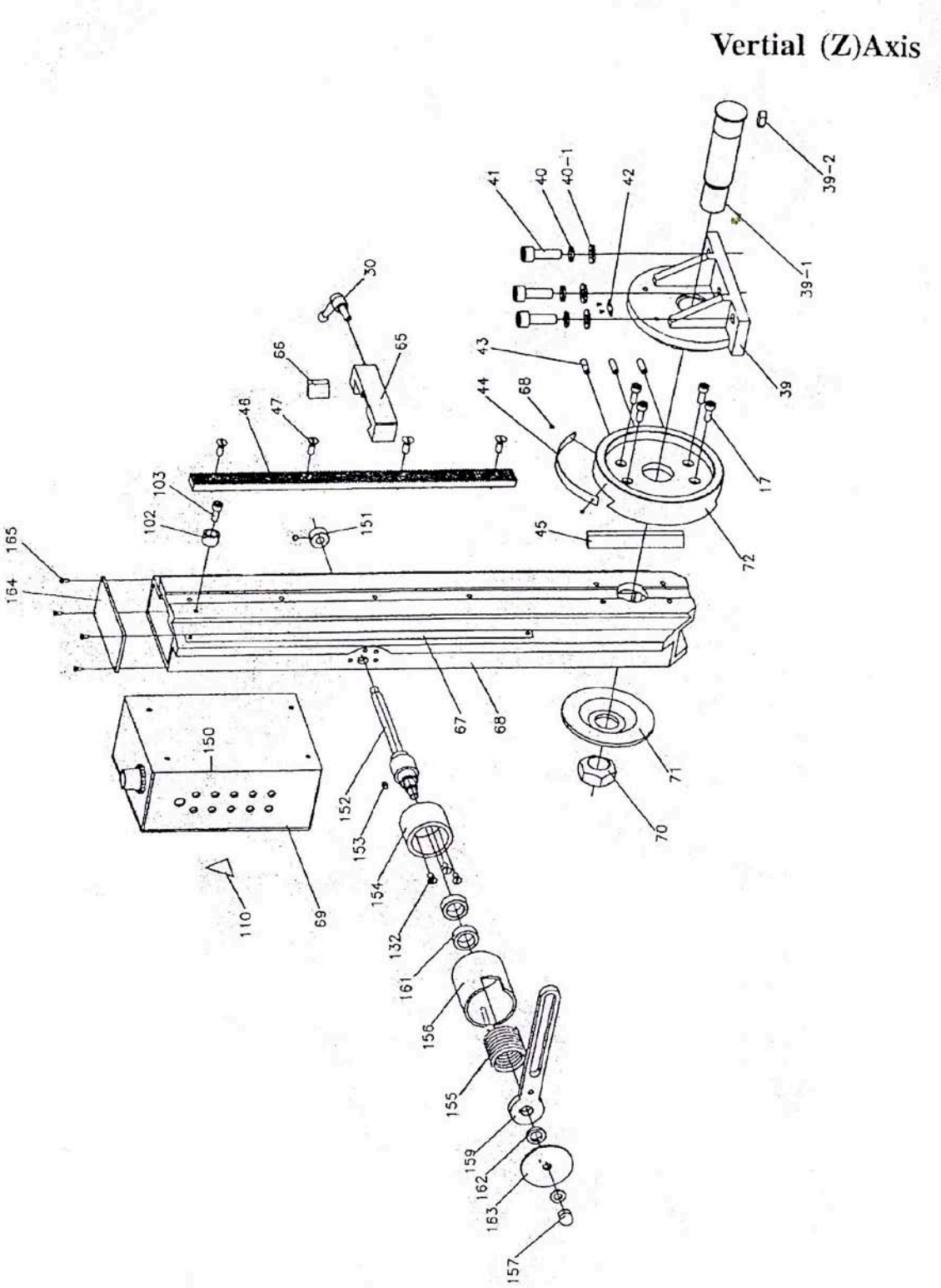
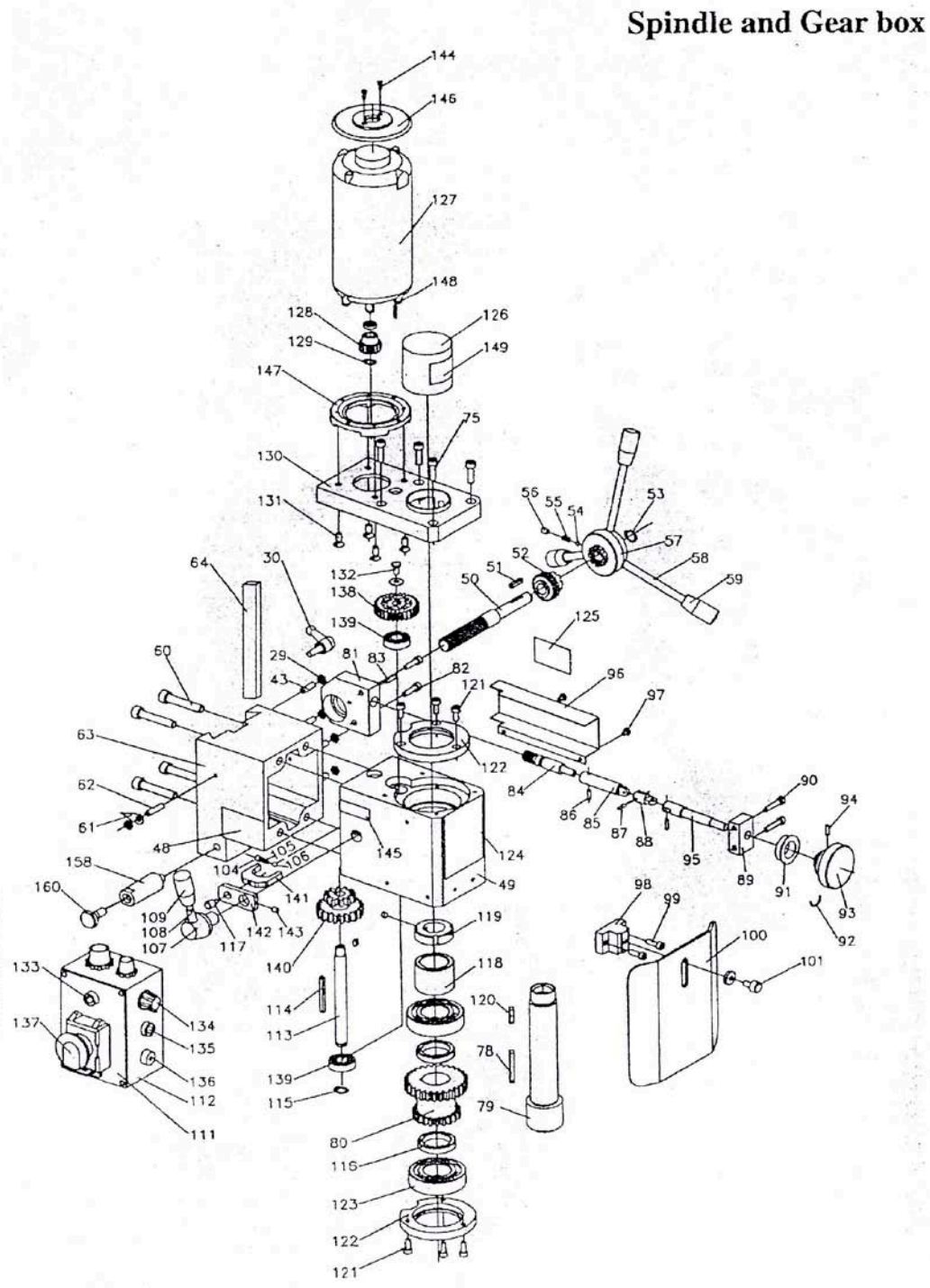


CT133 ASSEMBLY DIAGRAM



CT133 PARTS LISTING

☐Parts List

Item No	Part Name	Q'ty	Item No	Part Name	Q'ty
1	Base	1	40	Spring washer 10	3
2	X-axis feeding screw	1	40-1	Washer 10	3
2-1	Key 4×16	2	41	Cap screw M10×30	3
4	Dial	2	42	Guide finger	2
5	Hand wheel	2	43	Set screw M6×22	7
6	Nut M8	2	44	Ruler	1
7	Knob	2	45	Wedge	1
8	Screw M8×55	2	46	Gear rack	1
9	Cap screw M6×8	8	47	Cap screw M6×12	4
10	Holding Plate (1)	1	48	Name plate	1
11	Dust guard cover	1	49	Spindle box	1
12	Holding plate (2)	2	50	Pinion	1
13	Ball bearing 8200	2	51	Key 4×25	1
14	Washer	2	52	Bevel gear	1
15	Nut M8	4	53	Retaining ring 12	1
16	Y-axis ruler	1	54	Ball ϕ5.0	1
17	Cap screw M6×16	4	55	Spring 0.8×0.8×10	1
18	Y-axis bearing seat	1	56	Screw M6×8	1
19	Working table	1	57	Handle stock	1
20	Y-axis feeding screw	1	58	Operating lever	3
21	End cover	1	59	Lever cap	3
22	Screw M6×10	2	60	Cap screw M8×25	4
23	Y-axis screw nut	1	61	Guide finger	1
24	Holding plate (3)	1	62	Cap screw M6×25	1
25	Dust guard cover	1	63	Spindle box seat	1
26	Screw seat	1	64	Wedge	1
27	Cap screw M6×16	2	65	Limit block	1
28	Set screw M6×22	6	66	Wedge	1
29	Nut M6	13	67	Ruler	1
30	Handle	3	68	Fuselage	1
31	Screw M6×10	2	69	Electric box	1
32	Guide finger	1	70	Lock nut M24	1
33	Screw M6×8	1	71	Big washer	1
34	X-axis wedge	1	72	Connecting strut	1
35	Saddle	1	78	Key 5×5×40	1
36	Y-axis wedge	1	79	Spindle	1
37	X-axis screw nut	1	80	Transmission gear	1
38	Cap screw M6×25	2	81	Support block	1
39	Fuselage seat	1	82	Screw M5×20	2
39-1	Shaft	1	83	Pin 4×15	1
39-2	Key 8×12	1	84	Worm	1

CT133 PARTS LISTING

Item No	Part Name	Q'ty	Item No	Part Name	Q'ty
85	Sleeve	1	126	Protecting cover	1
86	Pin 3×12	1	127	Motor	1
87	Pin 3×12	2	128	Motor gear	1
88	Adjustable union	1	129	Intering ring 9.0	1
89	Bracket	1	130	Motor seat	1
90	Screw M5×25	1	131	Flat screw M6×12	4
91	Dial	1	132	Round screw M5×8	4
92	Spring steel 1.0	3	133	Yellow lamp	1
93	Small hand wheel	1	134	Speed control knob	1
94	Screw M5×16	1	135	Green lamp	1
95	Small shaft	1	136	Fuse box	1
96	Cover	1	137	Emergency stop switch	1
97	Screw M4×6	2	138	Gear	1
98	Support of dust cover	1	139	Ball bearing 80101	2
99	Screw M5×16	2	140	Transmission gear	1
100	Dust guard	1	41	Bar	1
101	Clamp bolt M6×12	1	142	Linking board	1
102	Upper end washer	1	143	Set screw M5×8	1
103	Upper end screw M6×16	1	144	Self-tapping Screw ST2.9×8	2
104	Set screw M6×6	1	145	H/L label	1
105	Spring 0.8×4.8×10	1	146	Motor cover	1
106	Ball φ5.0	1	147	Motor connecting flange	1
107	Handle seat	1	148	Screw M6×10	4
108	Double head bolt M8×70	1	149	Warming lable	1
109	Knob	1	150	PC board	1
110	Warning label	1	151	Lock sleeve	1
111	Controller	1	152	Rotor shaft	1
112	Label on controller	1	153	Key 4×6	1
113	Shaft (1)	1	154	Spring support	1
114	Double round head key 4×4×45	1	155	Torsion spring	1
115	Internal ring φ12	1	156	Cover	1
116	Spacing ring	2	157	Nut	1
117	Small shaft	1	158	Prop	1
118	Spacing ring	1	159	Supporting shank	1
119	Spindle nut	1	160	Screw	1
120	Double round head key 5×5×30	1	161	Washer	2
121	Cap screw M5×8	6	162	Internal ring 12	1
122	Bearing cover	2	163	Cover	1
123	Ball bearing 80206	2	164	Top Cover	1
124	Name plate	1	165	Screw M3×6	4
125	Fine feeding label	1			

WARRANTY

CRAFTEX 2 YEAR LIMITED WARRANTY

Craftex warrants every product to be free from defects in materials and agrees to correct such defects where applicable. This warranty covers **two 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.
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.
- For faster service it is advisable to contact the nearest Busy Bee location for parts availability prior to bringing your product in for repairs.