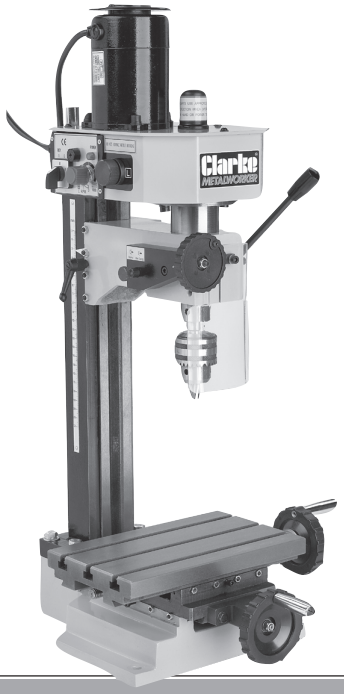
Clarke®

METALWORKER



MICRO MILLING/DRILLING MACHINE

MODEL No. CMD10

Part No. 7610850

OPERATING & MAINTENANCE INSTRUCTIONS

CE

0514

Please read these instructions carefully before operating the tool

Thank you for purchasing this **CLARKE** Micro Milling/Drilling Machine.
Before using the device, please read this manual thoroughly and carefully follow all instructions given. This is for your own safety and that of others around you, and is also to help you achieve a long and trouble free service from your new tool.

CLARKE GUARANTEE

This CLARKE product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended.

Faulty goods should be returned to their place of purchase, no product can be returned to us without prior permission.

This guarantee does not affect your statutory rights.

PARTS & SERVICE TEL: 020 8988 7400

or e-mail as follows:

PARTS: Parts@clarkeinternational.com

SERVICE: Service@clarkeinternational.com

ENVIRONMENTAL RECYCLING POLICY

Through purchase of this product, the customer is taking on the obligation to deal with the WEEE in accordance with the WEEE regulations in relation to the treatment, recycling & recovery and environmentally sound disposal of the WEEE.

In effect, this means that this product must not be disposed of with general household waste. It must be disposed of according to the laws governing Waste Electrical and Electronic Equipment (WEEE) at a recognised disposal facility.

Please note that the details and specifications contained herein are correct at the time of going to print. However CLARKE International reserve the right to change specifications at any time without prior notice. Always consult the machines data plate

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Specifications

Model: CMD10
Part No: 7610850
Voltage: 230vac
Power Rating: 150W
Fuse Rating: 5amp
No Load Speed (H): ..... 100 - 2000rpm
No Load Speed (L): ..... 100 - 1000rpm
Weight 32Kg
Operating Temperature: ..... 0°-40°
Noise: ..... 70 dB (A)
Max Drill Capacity: 10mm
End Mill Capacity: 10mm
Face Mill Capacity: 20mm
Spindle Taper: MT2
Throat 140mm
'T' Slot 8mm
Table Effective Size: ..... 240mm x 145mm
Table Cross Travel: 90mm
Table Longitudal Travel: 180mm

Safety Precautions

WARNING:

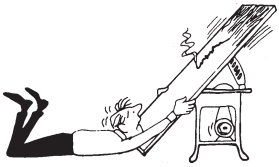
As with all machinery, there are certain hazards involved with their operation and use. Exercising respect and caution will considerably lessen the risk of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator or damage to property, may result.

1. **ALWAYS** Learn the machines' applications, limitations and the specific potential hazards peculiar to it. Read and become familiar with the entire operating manual.

2. **ALWAYS** use a face or dust mask if operation is particularly dusty.
3. **ALWAYS** check for damage. Before using the machine, any damaged part, should be checked to ensure that it will operate properly, and perform its intended function. Check for alignment of moving parts, breakage of parts, mountings, and any other condition that may affect the machines' operation. Any damage should be properly repaired or the part replaced. If in doubt, **DO NOT** use the machine. Consult your local dealer.
4. **ALWAYS** disconnect the tool/machine from the power supply before servicing and when changing accessories.
5. **ALWAYS** wear safety goggles, manufactured to the latest European Safety Standards. Everyday eyeglasses do not have impact resistant lenses, they are not safety glasses.
6. **ALWAYS** keep work area clean. Cluttered areas and benches invite accidents.
7. **ALWAYS** ensure that adequate lighting is available. A minimum intensity of 300 lux should be provided. Ensure that lighting is placed so that you will not be working in your own shadow.

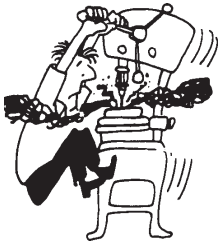
8. **ALWAYS** keep children away. All visitors should be kept a safe distance from the work area, especially whilst operating the machine.
9. **ALWAYS** maintain machine in top condition. Keep tools/machines clean for the best and safest performance. Follow maintenance instructions.

10. **ALWAYS** handle with extreme care do not carry the tool/machine by its' electric cable, or yank the cable to disconnect it from the power supply .
11. **ALWAYS** ensure the switch is off before plugging in to mains. Avoid accidental starting.
12. **ALWAYS** concentrate on the job in hand, no matter how trivial it may seem. Be aware that accidents are caused by carelessness due to familiarity.
13. **ALWAYS** keep your proper footing and balance at all times don't overreach. For best footing, wear rubber soled footwear. keep floor clear of oil, scrap wood, etc.



14. **ALWAYS** wear proper apparel. loose clothing or jewellery may get caught in moving parts. wear protective hair covering to contain long hair.
15. **ALWAYS** use recommended accessories. the use of improper accessories could be hazardous.
16. **ALWAYS** remove plug from electrical outlet when adjusting, changing parts, or working on the machine.

17. **NEVER** operate machine while under the influence of drugs, alcohol or any medication.
18. **NEVER** leave machine running unattended. turn power off. Do not leave the machine until it comes to a complete stop.
19. **NEVER** force the machine. it will do a better and safer job at the rate for which it was designed.
20. **NEVER** use power tools in damp or wet locations or expose them to rain. Keep your work area well illuminated. do not use in explosive atmosphere (around paint, flammable liquids etc.). Avoid dangerous environment.



Additional Precautions For Power Tools

1. **ALWAYS** wear ear protectors/defenders as the noise level of this machine can exceed 70dB (A).
2. **ALWAYS use** the appropriate cutter for the material being cut.
3. **DO NOT** use the machine if the electric cable, plug or motor is in poor condition.
4. **DO NOT** allow the ventilation slots in the machine to become blocked.
5. **DO NOT** touch the cutter immediately after use, allow time for it to cool.
6. Replacement cutters are available from your CLARKE dealer.
7. Ensure the cutter is fully tightened before use.
8. Switch the machine OFF immediately the task is completed.
9. **NEVER** leave chuck keys in situ, always remove and store safely when finished tightenining or loosening the chuck.
10. **NEVER** Change from high to low speed and vice versa whilst the machine is still running, always ensure the machine has come to a complete stop before doing so.
11. **NEVER** change from forward to reverse and vice versa whilst the machine is still running, always ensure the machine has come to a full stop before doing so.

Additionally, please keep these instructions in a safe place for future reference.

Electrical Connections

This product is provided with a standard 13 amp, 230 volt (50Hz), BS 1363 plug, for connection to a standard, domestic electrical supply. Should the plug need changing at any time, ensure that a plug of identical specification is used.

WARNING ! THIS APPLIANCE MUST BE EARTHED

This machine must be wired up in accordance with the following colour code:

BLUE	-	***NEUTRAL***
BROWN	-	***LIVE***
GREEN/YELLOW	-	***EARTH***

- Connect the BLUE coloured cord to the plug terminal marked "N"
- Connect the BROWN coloured cord to the plug terminal marked "L"
- Connect the GREEN/YELLOW coloured cord to the plug terminal marked "E"

If this appliance is fitted with a plug which is moulded on to the electric cable (i.e. non-rewireable) please note:

1. The plug must be thrown away if it is cut from the electric cable. There is a danger of electric shock if it is subsequently inserted into a socket outlet.
2. Never use the plug without the fuse cover fitted.
3. Should you wish to replace a detachable fuse carrier, ensure that the correct replacement is used (as indicated by marking or colour code).
4. Replacement fuse covers can be obtained from your local dealer or most electrical stockists.

Fuse Rating

The fuse in the plug must be replaced with one of the same rating **(5 amps)** and this replacement must be ASTA approved to BS1362.

If in doubt, consult a qualified electrician. Do not attempt any electrical repairs yourself.

Cable Extension

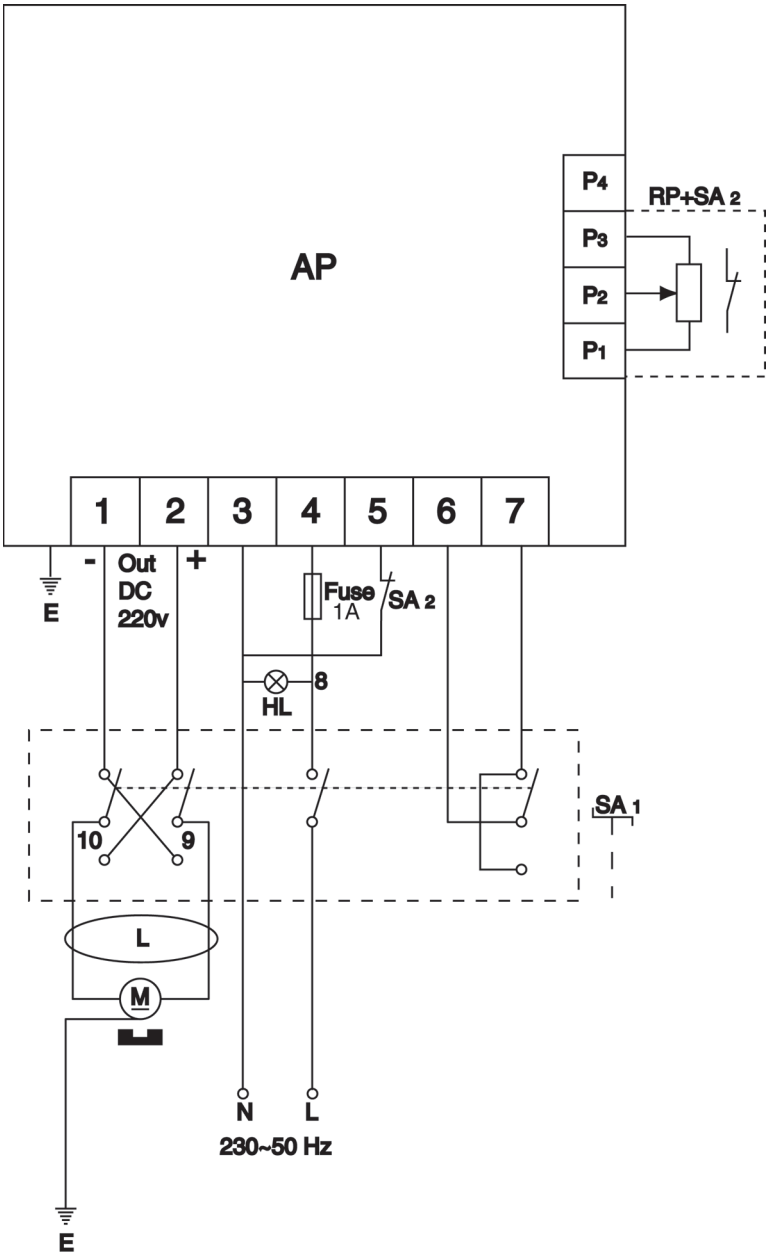
Always use an approved cable extension suitable for the power rating of this tool (see specifications), the conductor size should also be at least the same size as that on the machine, or larger. When using a cable reel, always unwind the cable completely.

IMPORTANT:

If a cable extension is needed, it is essential to comply with the following data.

Voltage	Extension length	Cable section
230v	Up to 20m	2.5mm^2
230v	From 20 to 50m	4mm^2

Electrical Circuit Diagram 230v 50Hz



Unpacking

Unpack machine and accessories, lay out neatly on work surface or similar.

1. Open case top, remove loose items from top of packing.
2. Fold Flaps back and carefully turn case upside down onto its top, take care when doing so as machine is heavy (32Kg).
3. Carefully slide cover off.
4. Turn unit back over onto the plywood base.
5. Remove polystyrene packing.
6. Loosen and remove three nuts securing machine onto plywood base.
7. Carefully lift machine off base, with assistance if necessary. Return all packing to carton and store safely for re-use in the event the machine needs to be returned for repair etc.

Check contents and advise immediately of any shortages.

Checklist

1. Micro milling machine.
2. Operating and Instruction Manual.
3. Allen Keys_3mm & 6mm.
4. Spanners_5.5mm-7mm & 8mm-10mm.
5. Oil Can.
6. Drill Chuck & Key.
7. Handle Assy_3OFF.
8. 'T' Nut, 4 Off.
9. Chuck Guard, (Perspex).
10. Handle.
11. Tommy bar with handle/locking pin.

Installation and Assembly (Figures in brackets refer to parts diag page 13)

IMPORTANT: Careful consideration is required when choosing the location for the machine, special attention should be paid to the operation, i.e. the X & Y-axis, powerpoint etc, also the workbench where the machine is to be installed should be firm flat and level. Avoid installing in direct sunshine, damp or very dusty location.

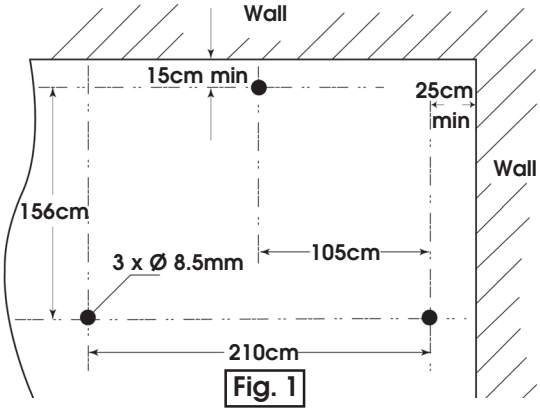


Fig. 1

1. Choose suitable location, taking into consideration the operation, i.e. the X & Y-axis, allow sufficient clearance especially on the right hand side of the machine to enable unhindered use of the machine to enable unhindered use of the handwheel etc.
2. Drill three 8.5mm in workbench where machine is to be installed, (see Fig.1).

NOTE; before drilling, observe the min distances from the walls, anything less could impair the maximum use of the machine.

3. Using suitable 8mm dia bolts, (not supplied), bolt machine firmly in position.
4. Fit three handles, (97,98,99), to handwheels, (see Fig. 2 `A').
5. Fit handle, (87), (see Fig.2 `B').
6. Your machine has been coated with rust protection to protect it in shipping, all traces of this must be removed before attempting to use the machine. Commercial degreaser, kerosene or similar solvent may be used to remove this protection, care must be taken to avoid getting solvent into the motor and electrical parts i.e. switches etc, also observe the cleaner manufactures instructions.
7. After cleaning, lightly coat all bright (non painted) surfaces, with a light machine oil, lightly lubricate all moving parts, i.e. handwheel threads etc.
8. Remove drill chuck/taper shank if fitted, to do this, pull out the protective cover on the top of the mill head (see Fig. 2), insert the tommy bar into the hole in the spindle

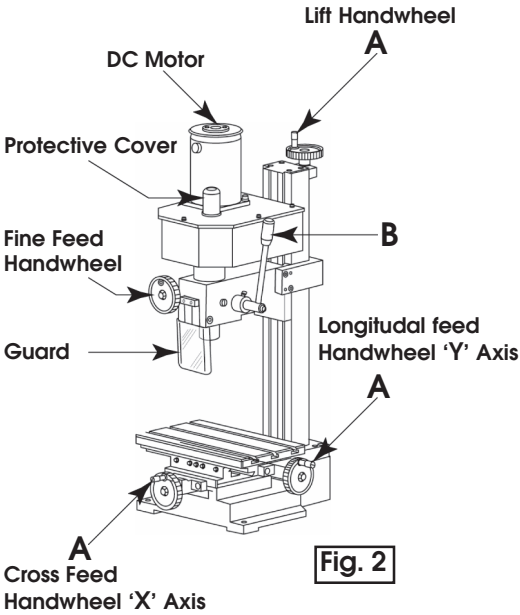


Fig. 2

(see Fig. 3), whilst holding spindle with tommy bar, loosen the spindle draw bar using 8mm spanner (see Fig. 4). Remove tommy bar, and store safely. Unscrew the draw bar approx three full turns, whilst supporting the drill chuck with one hand, gently, using a plastic mallet or similar, DO NOT USE HAMMER, apply a swift blow to the top of the draw bar, this should cause the chuck to fall, if not repeat with plastic hammer applying a little more force. Once the chuck is free, continue to support with one hand and unscrew the draw bar completely until the chuck can be removed, store removed parts safely.

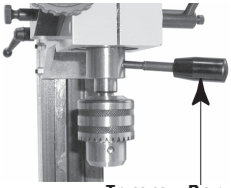


Fig. 3

NOTE: If removing taper shank with cutting tool inserted, use protection such as industrial work gloves or a wad of cloth etc to protect your hands.

Fig. 4

9. Your Machine is now ready for testing.

IMPORTANT: before plugging in and switching ON, ensure all items such as chuck keys tommy bars etc are removed. Set the machine HIGH/LOW range knob (see Fig. 5), to LOW, Set forward reverse switch to forward.

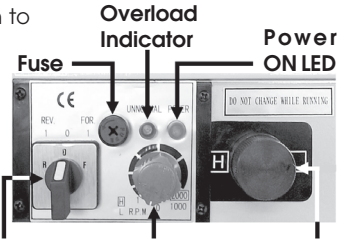


Fig. 5

10. Plug machine into main electrical supply and switch ON, ensuring the correct supply is available.

11. Switch the machine on by turning the speed control knob slowly clockwise. A click will be heard as the power is turned ON, continue to slowly turn the Knob until the spindle starts turning, run the machine at a slow speed for 5 minutes, at the end of that period, providing there are no apparent problems i.e. adverse noises etc, rotate the speed control knob slowly clockwise until maximum speed is reached, continue to run at this speed for a further 2 minutes. when 2 minutes has elapsed, slowly turn the speed control knob anticlockwise until a click is heard and the power is turned OFF, turn forward, reverse switch to the centre position 'OFF'.

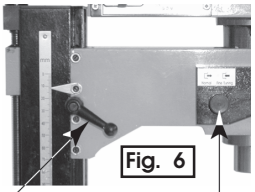


Fig. 6

12. Before using the machine for the first time, test all functions: refer to Fig.2.

a. Test vertical travel of the milling head by turning the lift handwheel in both directions, apply the vertical lock, (see Fig. 6), attempt to turn the lift handwheel, head should not move, DO NOT FORCE.

b. Test longitudal travel of the bed by turning the longitudal handwheel in both directions.

c. Test cross feed travel by turning cross feed handwheel in both directions.

NOTE: Both longitudal and cross travel can be locked, with respective allen screws, (see Fig. 7)

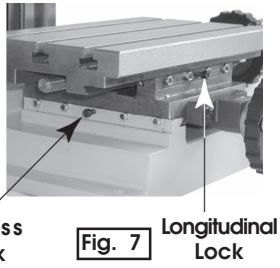


Fig. 7

Operating Instructions

NOTE: these instructions are not definitive, they are to be used for guide purposes only and are not intended to teach you all there is to know about milling and drilling.

Always keep the work area clean and tidy, especially in the close proximity of the machine.

Plan work carefully before starting.

- Secure workpiece onto the woktable, using the appropriate method, e.g, 'T' bolts and clamps or vice etc.
- Insert the cutter to be used, into the milling chuck or collet and tighten securely. Only use good quality cutters with the correct form and sharpness etc.
- Ensure the chuck guard is in place and securely fixed.
- For added accuracy, if you are only, for instance using the cross feed when cutting, ensure all other axis are locked, (vertical and horizontal).
- Select the correct cutting speed for the size of cutter and the material being machined. A good rule of thumb is, the smaller the hole or depth of cut, and the softer the material to be machined etc, the faster the speed.
- Select the direction of rotation, either forward or reverse.
- Ensure the cutter is not making contact with the workpiece, turn machine ON.
- Slowly bring the cutter into contact with the workpiece and start machining.
- **DO NOT** attempt to make too bigger cuts than the cutter and machine are capable of, it is much better and safer to make several small passes.
- Use an appropriate cutting/cooling fluid whilst machining, which can be applied with a small brush etc.
- **DO NOT** allow swarf to build up in the cutting area. Stop the machine and remove using a suitable implement, (brush etc).
- When finished turn the machine OFF, return the cutter to the uppermost position and allow it to come to a complete stop before attempting to remove the workpiece or tool etc, also to prevent accidental starting, isolate the machine from the power supply by turning OFF at the wall socket and removing the plug from the socket.

Motor Overload

Should the motor be overloaded for any reason....too great a depth of cut etc., a trip will operate, thereby shutting off the motor. Should this occur, shut down in the normal manner before trying to restart. Investigate the cause and rectify.

Maintenance (Figures in brackets refer to parts diag page 11)

The amount of maintenance depends on the amount of use the machine gets, however it is important to carry out routine maintenance to prevent premature wear and shortening the life of the machine.

1. Inspect and clean all non painted surfaces, lubricate using a light machine oil, **Do Not** over lubricate, oil can be applied to the worktable and column etc, using a soft oil soaked cloth.
2. Inspect and clean all moving parts, Lubricate using machine oil, check for smooth operation.
3. Inspect the machine for signs of wear or damage, any faults should be rectified before continuing.
4. Occasionally remove and inspect the motor brushes for even wear etc. Brushes should wear evenly and not show signs of burning or grooves etc. Consider replacing both brushes when one brush is 50% worn, (new brush = 15mm in length).
5. Check all supporting bolts etc are tight.

   With use, play may develop between the following components.

   a. Column (102) - Spindle Box (24).

   b. Base (74) - Saddle (114).

   c. Saddle (114) - Worktable (105).

Any play can be removed by adjusting the offending part i.e., if excessive play is found between the base and saddle, proceed as follows;

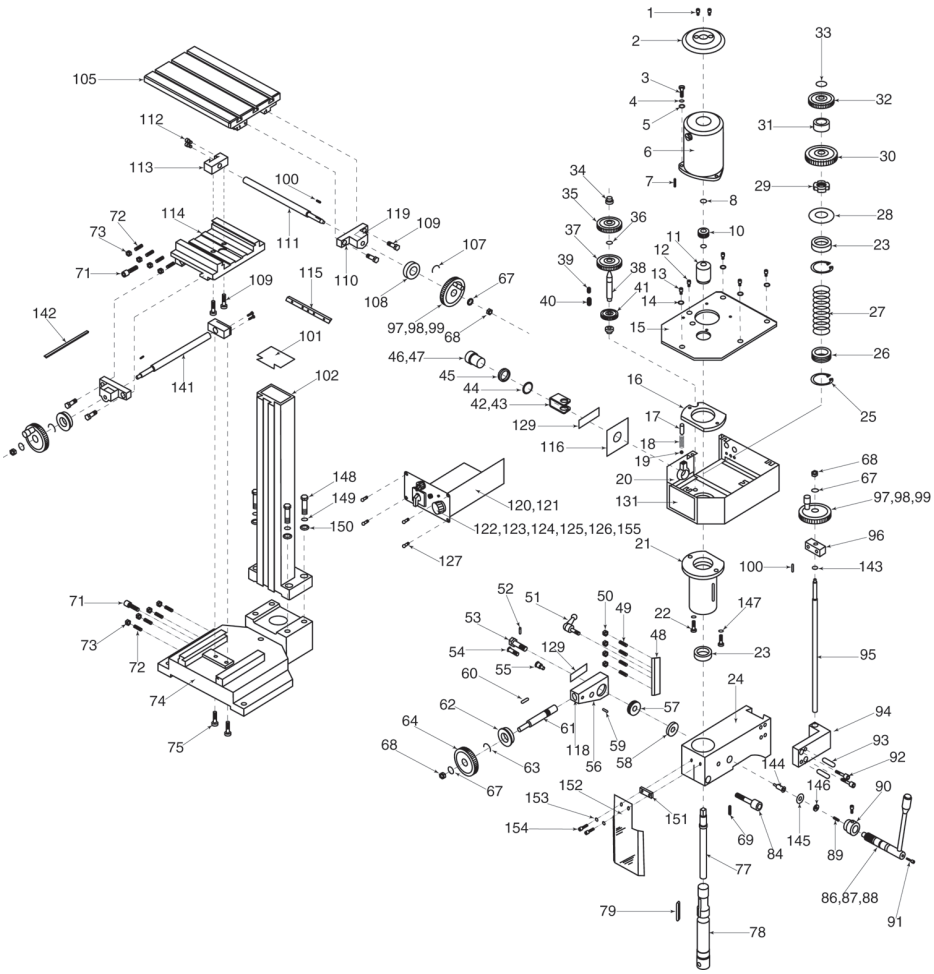
Tools required = 7mm spanner and small flat bladed screwdriver and 3mm allen key.

1. Loosen locking screw (71), using 3mm allen key.
2. Loosen 4 locknuts (73), using 8mm spanner.
3. Using flat bladed screwdriver back off all four adjusting screws (72), approximately one full turn.
4. The saddle can now be removed from the base to enable cleaning of the friction surfaces before adjustment, to do this, turn the crossfeed handwheel anticlockwise until the saddle comes off the end of the leadscrew. Carefully slide the saddle assembly off the base, taking care not to drop it.
5. Clean all friction surfaces of all oil and dirt etc using a commercial degreaser and soft cloth, observing the manufacturers recommendations at all times.
6. Lightly lubricate all friction surfaces and reassemble in reverse order.
7. Position the saddle in the centre of the base.
8. Turn the crossfeed handwheel backwards and forwards, at the same time using small flat bladed screwdriver, gently, starting on one of the centre adjusting screws, tighten until resistance is felt on the handwheel, turn adjusting screw back one ¼ turn, handwheel should move freely again, holding the screw with screwdriver, gently nip the locknut.

   Repeat procedure for the other centre screw, when finished re-check adjustment for previously adjusted screw, if any further adjustment of that screw is required, it will be necessary to re-check the second adjusting screw again. Once both centre adjusting screws are OK and the locknuts are secured, the same procedure can the be applied to the end screws in turn. When finished adjusting, check the full travel of the saddle ensuring there is no play, if any play is found, then further adjustment must be carried out until handle turns freely with no play between the saddle and base.

   The above procedure applies to all three moving assemblies equally, other than perhaps a different size spanner may be required.

Parts Diagram



PARTS & SERVICE TEL: 020 8988 7400

or e-mail as follows:

PARTS: Parts@clarkeinternational.com

SERVICE: Service@clarkeinternational.com

Accessories

A wide range of accessories is available from your nearest CLARKE dealer, for further information, contact your nearest dealer, or telephone CLARKE International Sales department on 01992 565300.

Parts List

Item	Part No	Description	Qty
1	SG10001	Screw M4 x 12	2
2	SG10002	Protect Cover for Motor	1
3	SG10003	Screw M6 x 12	3
4	SG10004	Spring Washer 6	3
5	SG10005	Washer 6	3
6	SG10006	Motor	1
7	SG10007	Round Key 3 x 16	1
8	SG10008	Circlip	2
10	SG10010	Motor Gear	1
11	SG10011	Safety Cover	1
12	SG10012	Screw M4 x 6	1
13	SG10013	Screw M4 x 8	4
14	SG10014	Washer 4	4
15	SG10015	Up Cover	1
16	SG10016	Sleeve Support Table	1
17	SG10017	Screw M6 x 5	1
18	SG10018	Compression Spring	1
19	SG10019	Steel ball 5	1
20	SG10020	Gear Box	1
21	SG10021	Spindle Sleeve	1
22	SG10022	Screw M6 x 14	2
23	SG10023	Bearing 61905-2Z	2
24	SG10024	Spindle Box	1
25	SG10025	Circlip	2
26	SG10026	Spring Seat Ring	1
27	SG10027	Compression Ring	1
28	SG10028	Round Nut Stop Gasket	1
29	SG10029	Round Nut M24 x 1.5	1
30	SG10030	Spindle Gear	1
31	SG10031	Spacer	1
32	SG10032	Spindle Gear	1
33	SG10033	Circlip	1
34	SG10034	Powder Bearing	2
35	SG10035	Gear	1
36	SG10036	Circlip	1
37	SG10037	Change Gear	1
38	SG10038	Shift Shaft	1
39	SG10039	Key 4 x 8	1
40	SG10040	Key 4 x 12	1
41	SG10041	Change Gear	1
42	SG10042	Dila Fork	1
43	SG10043	Flange Lining	2
44	SG10044	Circlip	1
45	SG10045	Spacer	1
46	SG10046	High/Low Speed Knob	1
47	SG10047	Spring Pin 2 x 12	1
48	SG10048	Wedge	1
49	SG10049	Screw	4
50	SG10050	Nut M5	4

Item	Part No	Description	Qty
51	SG10051	Handle	1
52	SG10052	Pin 3 x 12	1
53	SG10053	Joint Shaft	1
54	SG10054	Screw M5 x 18	1
55	SG10055	Joint Screw	1
56	SG10056	Worm Base	1
57	SG10057	Helical Gear	1
58	SG10058	Spacer	1
59	SG10059	Pin 3 x 18	1
60	SG10060	Key 2 x 18	1
61	SG10061	Worm Shaft	1
62	SG10062	Dial	1
63	SG10063	Damp Spring	1
64	SG10064	Hand Wheel	1
67	SG10067	Washer	4
68	SG10068	Top Nut M6	4
69	SG10069	Screw M6 x 20	1
71	SG10071	Screw M4 x 20	2
72	SG10072	Screw M4 x 18	8
73	SG10073	Nut M4	8
74	SG10074	Base	1
75	SG10075	Screw M6 x 26	2
77	SG10077	Draw Bar	1
78	SG10078	Spindle	1
79	SG10079	Key 4 x 28	1
84	SG10084	Screw M8 x 50	1
86	SG10086	Gear Shaft	1
87	SG10087	Handle Shaft	1
88	SG10088	Long Handle Sleeve	1
89	SG10089	Spring Pin 3 x 12	2
90	SG10090	Mark Shoe Sleeve	1
91	SG10091	Screw M5 x 8	2
92	SG10092	Screw M6 x 20	4
93	SG10093	Pin 6 x 26	2
94	SG10094	Nut Block	1
95	SG10095	Lifting Screw	1
96	SG10096	Screw Support	1
97	SG10097	Hand Wheel	3
98	SG10098	Handle Bolt	3
99	SG10099	Handle Sleeve	3
100	SG10100	Pin 3 x10	3
101	SG10101	Cover Board	1
102	SG10102	Column	1
105	SG10105	Worktable	1
107	SG10107	Damp Spring	2
108	SG10108	Dial	2
109	SG10109	Screw M6 x 16	4
110	SG10110	Screw Base	2
111	SG10111	Lengthways Screw	1
112	SG10112	Screw M4 x 8	4
113	SG10113	Screw Nut	2

Item	Part No	Description	Qty
114	SG10114	Saddle	1
115	SG10115	Wedge	1
116	SG10116	Speed Change Label	1
117	SG10117	Joint Label	1
118	SG10118	'0' position Label	2
119	SG10119	Dial Label	1
120	SG10120	Electricity Box	1
121	SG10121	PC Board	1
122	SG10122	Variable Speed Knob	1
123	SG10123	Fuse Box	1
124	SG10124	Power Indicating Lamp	1
125	SG10125	Forward/Reverse Switch	1
126	SG10126	Electricity Label	1
127	SG10127	Screw ST2.9 x 6.5	4
128	SG10128	Power Cord & Plug	1
129	SG10129	Caution Label	1
131	SG10131	Technical Data Label	1
132	SG10132	Chuck	1
133	SG10133	Allen Wrench S:3, 6	1 ea
134	SG10134	Spanner 5.5 x 7, 8 x 10mm	1 ea
135	SG10135	Socket Head Wrench D38-42	1
136	SG10136	Oil Can	1
137	SG10137	Fuse	1
138	SG10138	Taper Shank	1
139	SG10139	Chuck Key	1
140	SG10140	T - Nut	4
141	SG10141	Leadscrew	1
142	SG10142	Wedge	1
143	SG10143	Spacer	1
144	SG10144	Adjusting Screw	1
145	SG10145	Flat Washer 10	1
146	SG10146	Thin Nut M10	1
147	SG10147	Spring Washer M6	2
148	SG10148	Bolt M8 x 30	4
149	SG10149	Spring Washer M8	4
150	SG10150	Flat Washer 8	4
151	SG10151	Block	1
152	SG10152	Chuck Guard	1
153	SG10153	Flat Washer 4	2
154	SG10154	Screw M4 x 14	2
155	SG10155	Lamp	1

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IMPORTANT:

The use of parts other than CLARKE replacement parts may result in safety hazards, decreased tool performance and may invalidate your warranty.

Accessories

1. Mill Chuck Set

Part Number: 7601853

A set of 6 collets with chuck with sizes:

- **3mm**
- **4mm**
- **5mm**
- **6mm**
- **8mm**
- **10mm**

1. Insert the shank of the chuck into the Mill Head Spindle and screw on to the end of the draw bolt, shown in Fig 7, page 18. Tighten the draw bolt, holding the spindle steady by hand or by using a tommy bar (not provided) in the hole provided in the spindle.
2. Unscrew and remove the end collar 'A', insert the appropriate collet and reattach the end collar.
3. Insert the respective end mill into the collet and tighten using the 'C' spanner.

To remove the chuck, undo the draw bolt a turn or two, then tap its' head using a mallet to break the seal.

2. HSS End Mill (2-Fluted)

Part Number: 7601852

A set of 6 End Mills, of the following sizes, for use with the Mill Chuck or Collet Set

- **3mm**
- **4mm**
- **5mm**
- **6mm**
- **8mm**
- **10mm**

3. Collet Set (MT2)

Part Number: 7601851

A set of 6 Collets for use with the HSS End Mills:

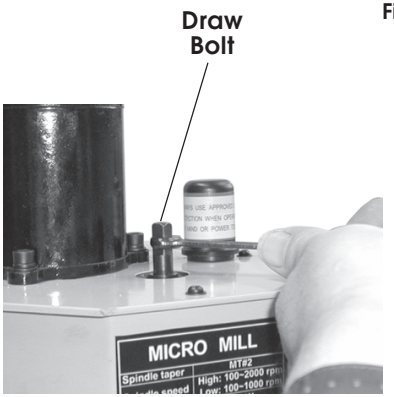
Insert the appropriate Collet into the spindle.

Insert the the draw bolt, provided, into the spindle, from the top and screw on to the Collet a few turns.

Insert the appropriate Mill into the jaws of the Collet, and tighten the draw bolt.

To remove the Collet, unscrew the draw bolt a few turns and tap its head with a mallet to break the seal between the Collet and spindle.

Fig. 7



NOTE: A hole in the Spindle allows a tommy bar (not provided) to be inserted so that the spindle may be held whilst tightening/ loosening is carried out.

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