MEFE
MITCHELL ENGINEERING
FOOD EQUIPMENT PTY LTD

Instruction Manual

Power Knife Sharpener

100mm CMB Coated Wheel

CAT 139100

Revision 2

1. MACHINE OVERVIEW

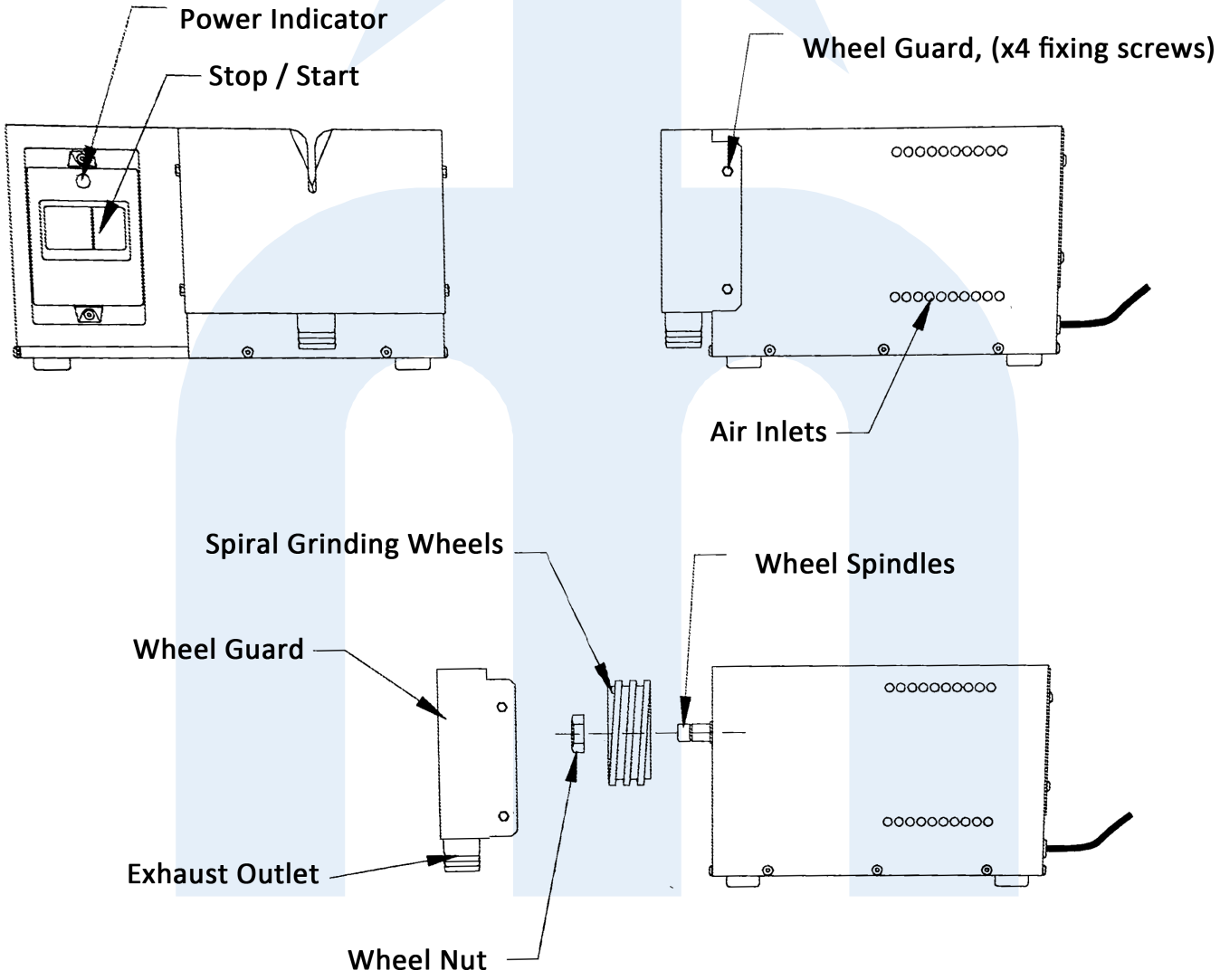
This manual refers to the Model CAT 139 100 Knife Sharpener Machine, with belt drive technology. A view of the machine and its component terminology can be seen below

This machine is supplied with spiral abrasive wheels which are suitable for sharpening (and re-sharpening in service environments) a wide range of hand held designs (whether a handle is fitted or not). This is in the main a dry operation.

The standard wheels supplied on the machine have a small front radius, which is a big help to the operator when blades have a concave shape or a small radius at the choil, *e.g. a boner.* These will also sharpen the vast majority of straight or convex forms blades. Straight form wheels are recommended in applications where it is required to sharpen the blade right up into the choil, *e.g pocket and pen knifes.* If many short blades are sharpened then disproportionate wear on the abrasive coating may occur at the front of the wheels. In such cases we can supply wheels with a centre hub adaptor, which allows the wheels to be reversed.

All personnel should read this document before installing or using the machine.

Figure 1.1



1.1 Service Contacts

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Figure 1.2

1.2 Equipment

The following schedule of parts is supplied as standard:

QTY	Description
1	Sharpening Machine (fully stainless cover and flying lead)
1 pair	Spiral Interlocking Abrasive Wheels 100mm dia (4 ins)
1	30mm A/F Box Spanner with "T" Bar
1	8mm AF Open Ended Spanner
1	Safety Glasses
1	Instruction Manual

1.3 Specification

Height	200mm
Width	360mm
Length	350mm
IP Rating	54 Overall
Weight	20kg

	UK & Europe			USA
MOTOR				
Voltage	220/240V AC 1ph 50Hz		110V AC 1ph 50Hz	110V AC 1ph 60Hz
	I100 / S	I100 / F	I100 / F	
Power	0.18 Kw	0.24 Kw	0.25 Kw	0.25 Kw
RPM	1370	2850	2790	3420
Current	1.6 A	2. A	4 A	4.7 A
Wheel spindle Speed	1340	2870	2790	3420
WHEEL SURFACE SPEED				
30	1324 sfpm	2836 sfpm	2776 sfpm	3404 sfpm
40	1362 sfpm	2916 sfpm	2854 sfpm	3499 sfpm
50	1413 sfpm	3026 sfpm	2962 sfpm	3631 sfpm
60	1481 sfpm	3172 sfpm	3105 sfpm	3806 sfpm

Note: The wheel spindle speed is correct for the type of wheels fitted to this machine and should not be altered except in consultation with MEFE

Wheels

⇒ Nominally 4" dia 1 1/2" wide spirally interlocking, ***see section 3.3***

⇒ 1/2" Pitch

⇒ CBN Coated—125 and 76 grit standard

1.4 Installation

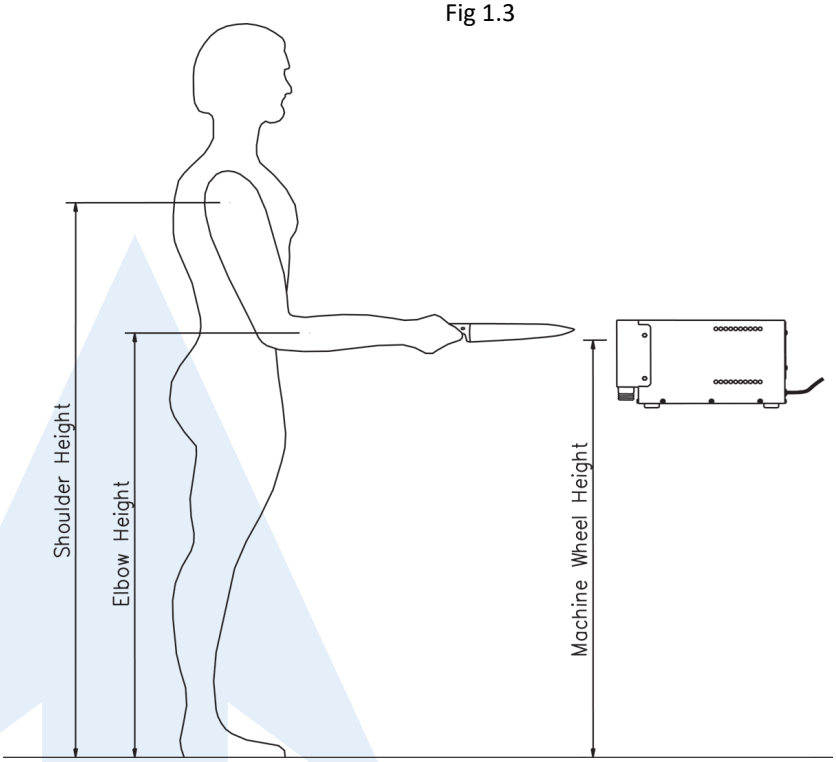
Check and identify the equipment supplied against the schedule above and inspect for any defects occurring in transit before preparing the machine for use.

Site the machine on a firm level bench convenient for connection and electrical supply and extraction equipment.

The machine should be set at a height such that is relatively tall person meets the arrangement shown in **Fig 1.3.** Adjust the position for shorter operators use of a board / Plinth in order to achieve an elbow heigh slightly above the wheel level.

If the grinding wheels are not fitted, inspect them for any damage. Fit the wheels following the procedure in **Section 4.4**. Correct rotation is facilitated by the capacitor start motor. On start up there should be no ringing noise including wheel interference.

Fig 1.3



Connecting To A Power Supply

This machine should be connected to a suitable single phase electrical supply of the rating according to the factory site specified by the customer.

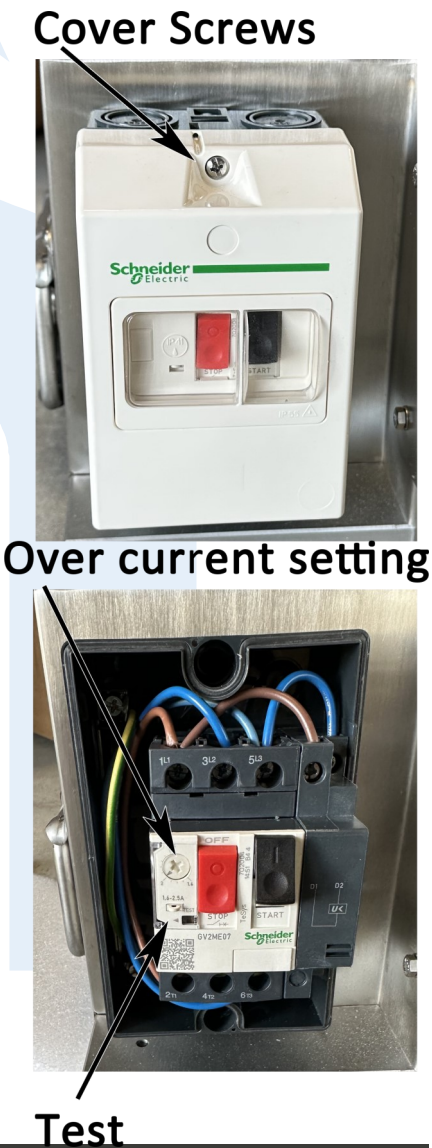
When supplied to Australia the electrical lead has a moulded standard 3 pin 13 A Plug for single phase (220/240 V 50Hz) operation and a 5 amp fuse.

Wiring Convention

Live	-	Brown
Neutral	-	Blue
Earth	-	Green/Yellow

The starter on the machine provides both no-volt release and overcurrent circuit protection functions by thermal magnetic sensing. It is recommended that the machine be connected to the supply via fused outlet with a means of isolation.

The circuit breaker can be tested and adjusted by gaining access to the front of the device. Remove the two screws in front of the starter enclosure and put aside being careful not to strain the wires to the indicator lamp.



NB Isolate the machine from supply before accessing any electrical connections.

1.5 Dust Extraction

There is very little wheel wear (i.e. loss) using the CBN abrasive wheels. However, the main by-product of sharpening will be particles of steel dust produced by grinding. This can be removed locally from the machine using a suitable extraction system.

The wheel guard of this machine has been fitted with an extraction outlet ready to be connected to a suitable system. The outlet (32 mm) should be covered when not in use, using the cap provided, (see **Fig 1.1)**.

In some circumstances, it may be useful to have an additional dust extraction point over the top of the grinding area, as shown in **Fig 1.5.** This can be designed un the shape of a hood, which does not obstruct the operators' vision or access to the knife blade. The portion of blade over the back of the wheels may actually enter this hood.

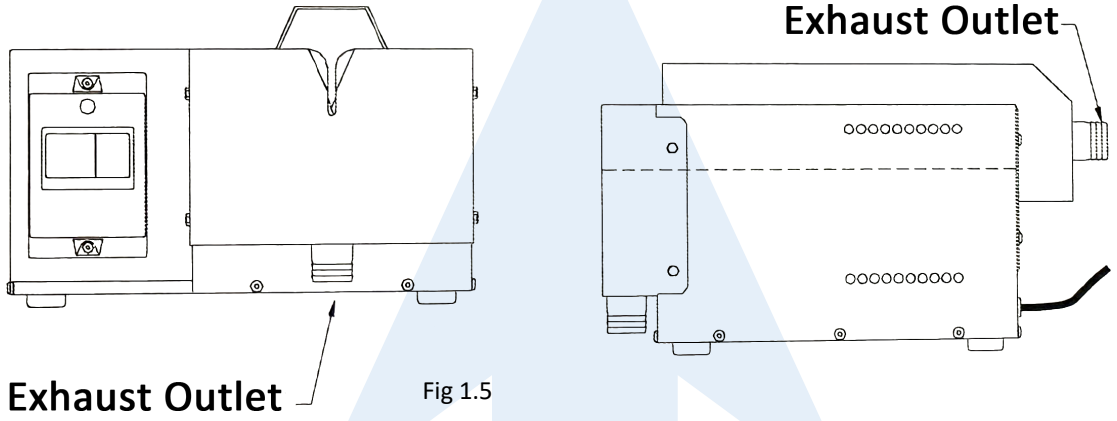


Fig 1.5

2. SAFETY

As in any grinding machine, there is an element of risk to the user of either trapping or physical abrasion to parts of the body. However, the design of the MEFE machine incorporates several features to reduce the chance of accidental injury,

- ⇒ All mechanical moving parts are fully enclosed in solid guarding.
- ⇒ Only the minimal "V" shaped aperture in the wheel cover is available for application of the component to wheel and is of a size small enough to prevent the insertion of a finger
- ⇒ The risk of grinding wheel bursting (as with conventional wheels) is negligible due to the solid steel construction of the wheels.
- ⇒ The surface speed of the abrasive wheels is considerably less than that for conventional wheels.
- ⇒ The interlocking principle of the wheels and their upwards direction of rotation presents a positive location and makes it easier for the operator to present the component to the wheels than in any other similar off-hand grinding operation.

DO NOT	Use the machine without all the guards in place
DO NOT	Start the machine with the grinding wheel loose or badly adjusted for clearance
DO NOT	Start the machine with anything obstructing the wheels
DO NOT	Apply anything other than knife blades to the wheels, this could invalidate our guarantee
DO NOT	Grind anything with a hardness less than 50Rc, this could invalidate our guarantee
DO	Wear safety glasses or a face shield at all times whilst using the machine
DO	Isolate the machine from the electrical supply while fitting wheels, carrying out routine maintenance or any other activity where moving parts of the machine are exposed
DO	Employ dust controls and/or protective measures appropriate to the materials being ground
DO	Give appropriate training to operators in the use of the machine and the techniques of grinding components. MEFE can provide training and/or video instructions by agreement.

3. OPERATING THE MACHINE

Run the machine only when the wheels are secured and set up correctly, (refer to ***section 4).*** Ensure that all the guards are fitted securely.

Start and **stop** the machine using the buttons on the starter enclosure at the front of the machine. Allow a few seconds on start up for the wheels to get to speed and proceed only if the wheels are in good order and running satisfactorily.

3.1 Principle of Sharpening

The design and arrangement of the interlocking wheels on the machine means that there is a fixed angle in the "valley" at the intersection of the wheels. This angle is determined by the diameter and the centres of the wheels, (see **Section 3.3**). When the wheels are rotating in the normal direction, an abrasive surface is "generated" capable of grinding simultaneously on both sides, an included angle on a knife blade, which is made to pass through the intersection point.

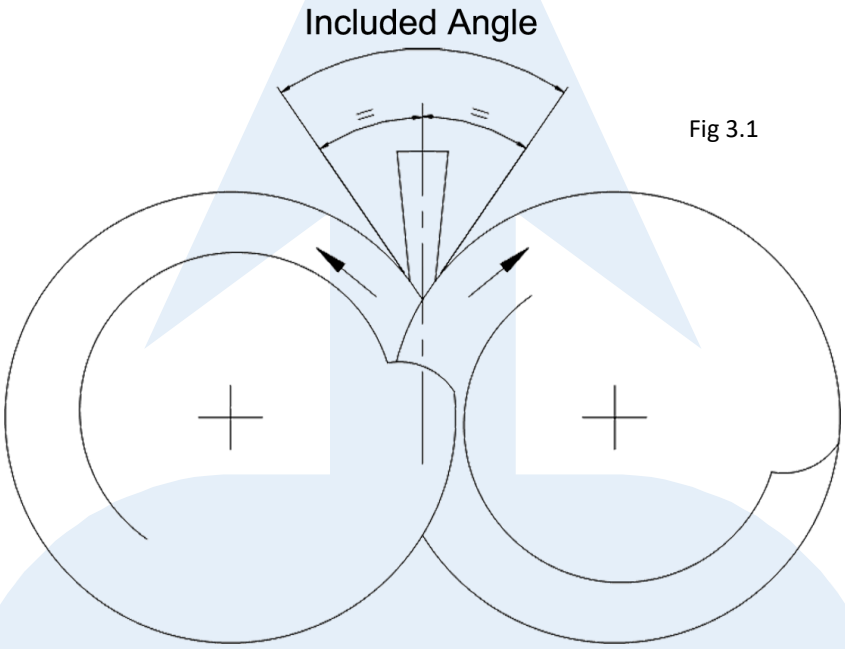


Fig 3.1

The knife should be held by its handle in the operator's hand and offered into the intersection of the wheels, applying light downwards pressure making the edge of the blade contact in the very bottom of the "v"

A)

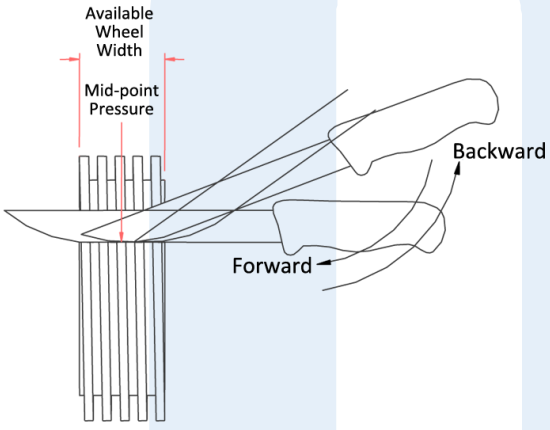
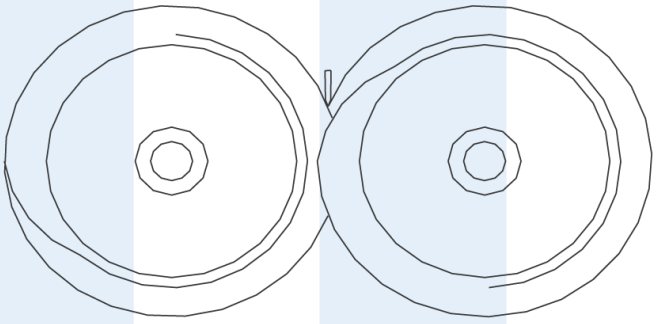
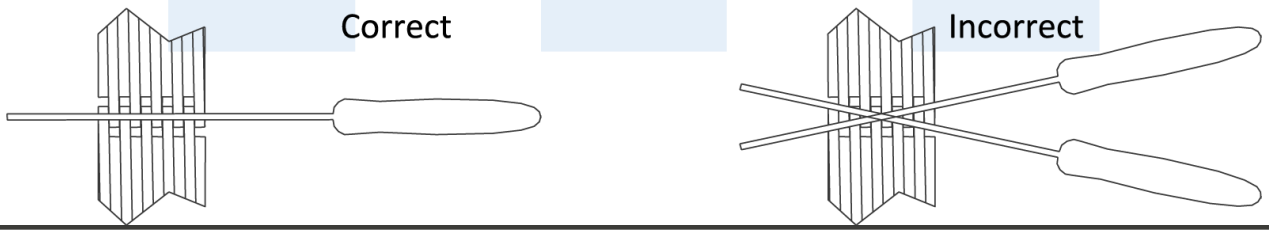


Fig 3.2



B)

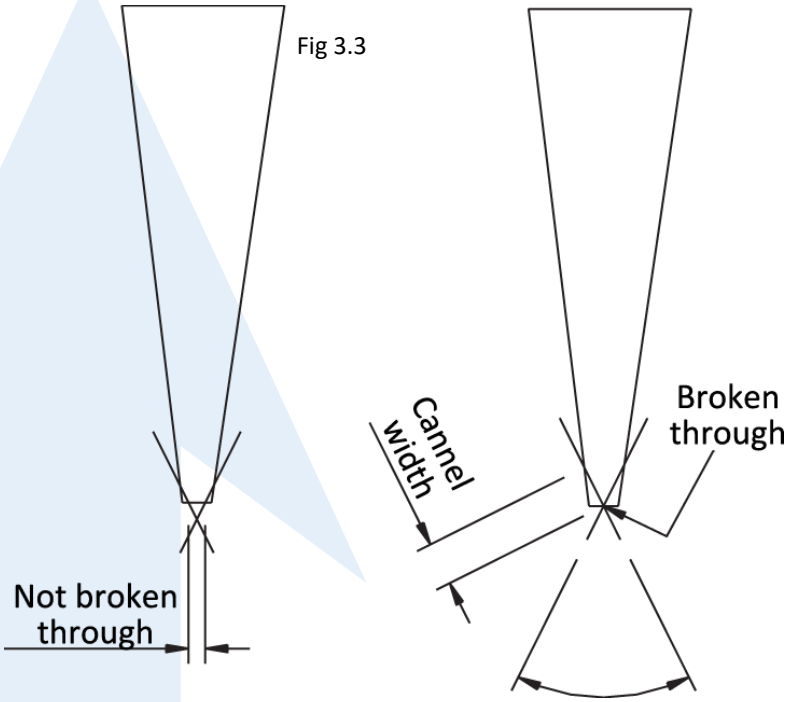


Whilst maintaining the attitude of the blade vertical **(Fig 3.1)** and parallel **(Fig 3.2B)** to the intersection of the wheels, the blade should be traversed in a motion, which maintains the profile of the edge in contact with the wheels and the line of the "V" form normal to the curvature of the blade **(as in Fig 3.2A)**.

Depending upon the blade edge thickness, a combination of several passes through the wheels with regulation of the applied pressure is required to ensure that a sharp edge is produced, Ensure that sharpening has fully taken place with the sides of the blade coming to a sharp point. This can be achieved by looking vertically on to the blade edge, under a bright light. If the blade is not completely sharpened, a shiny reflection will be seen.

The component should be kept constantly moving in the forward and backward motion to ensure an even grind over the length of the blade edge and reduce the risk of overheating. Blades should be first applied to and removed from the wheels in the middle of the width available **(Fig 3.2A)**

Fig 3.3



3.2 Useful Hints

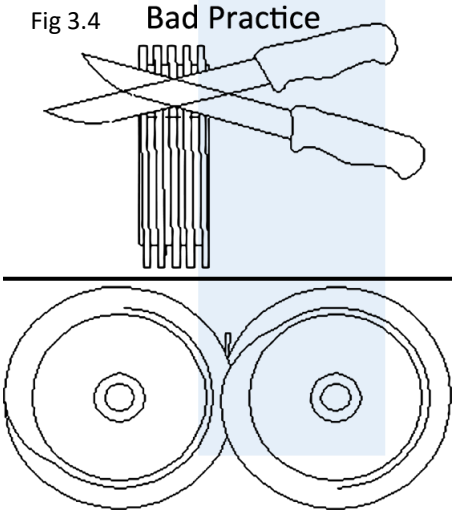
3.2.1. Do not hold the component with too rigid a grip. Adopt a comfortable and relaxed attitude at the wrist and fingers which will allow the blade to self align itself in the intersection of the wheels. Using the fore-finger on the back of the blade helps to control the pressure.

3.2.2 Avoid excessive use or over pressure on the front of the wheels where the spiral form runout is rising as this causes chatter and damage to the wheels.

3.2.3 Avoid passing the blade over the front and back edges of the wheels at an incorrect attitude as this causes indentations in the ground edge and damage to the wheels.

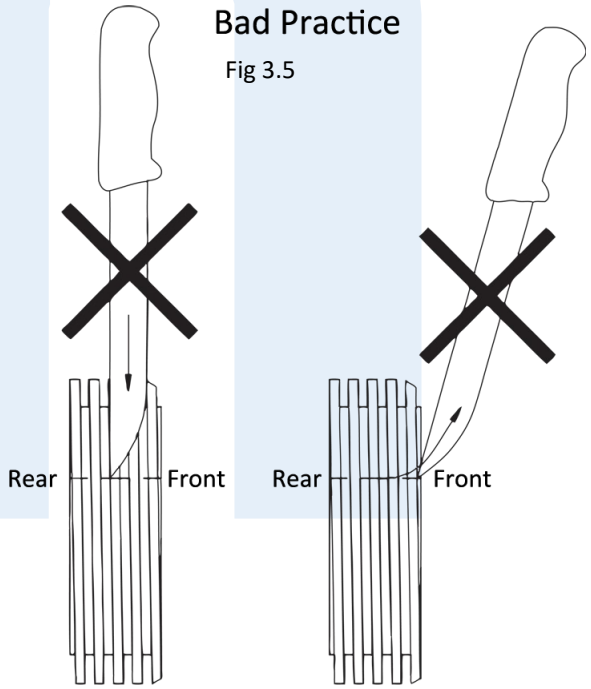
3.2.4 Avoid starting to sharpen by placing the blade point first down in to the wheels or withdrawing the blade point over the front edge as both these will cause the blade to receive a kick.

Fig 3.4 Bad Practice



Bad Practice

Fig 3.5



3.2.5 Special non-standard wheels can be manufactured to cater for blades which may have a concave shape on the cutting edge. Contact MEFE for further details.

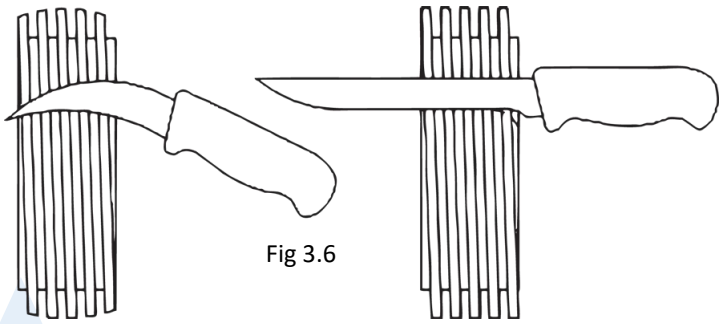


Fig 3.6

3.2.6 Where it is particularly important to sharpen the blade right up to a point very close to the handle, then it is very useful to fit a stop either to contact the point of the blade or the front of the handle whichever is the most suitable. This will give the operator confidence to enter the blade with the handle as close up to the front of the wheel as possible.

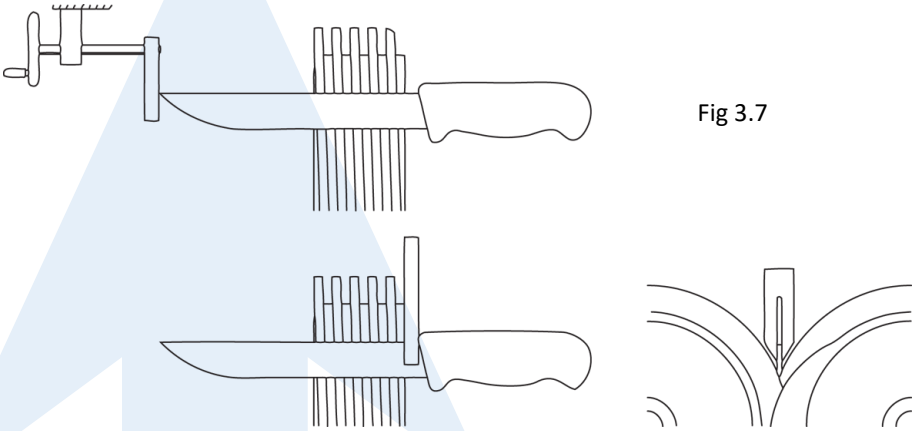


Fig 3.7

3.2.7 As no two knife designs have the same blade edge profile, the blade motions for each pattern through the wheels should be designed to optimise the number of passes required (thus shorten the process time) and also utilisation of the abrasive surface of the wheels.

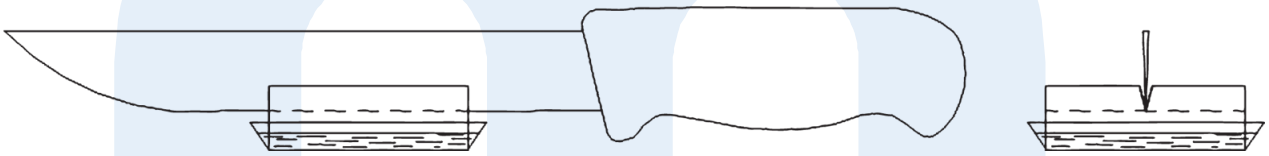
3.2.8 Although CBN has a high thermal stability, a coolant / lubricant should be used wherever practical. It has a good dry performance when used for sharpening operations by hand however the use of a lubricant will increase wheel life by as much as 50% over a dry operation provided that the recommended coolant is used.

Inferior wheel life results from using water based coolants and therefore these should not be used.

The use of straight sulphurated mineral oils is recommended, however, problems of oil mist which requires the use of air filtering systems arises when copious amounts are used.

When sharpening knives, a much simpler technique can be used without these problems occurring. Simpler technique can be used without these problems occurring. Simply wipe the edge of the knife to be sharpened over the surface of a felt pad standing in a dish of oil. A small amount of oil will be transferred locally to the blade without and undue excess.

Fig 3.8



3.3 Selecting the Grind Angle

The model CAT 139 100 Knife Sharpening Machine has fixe wheel centres and therefore has no angle adjustment feature. However, it is possible to select a grinding angle from one of four standard options by fitting wheels of different diameters.

Knife Type	Wheel Dia (mm)	Grinding Angle (inclusive)
Table blades	107.24 103.70	60° 54°
Kitchen / Professional Knives	95.86	30°
Professional / Special Knives	94.83	25°°

- It is, therefore, necessary for the user to carry In stock pairs of wheels that suit the angles to be ground
- It is impractical for the machine to sharpen below 25 included angle.
- Change the wheels as described in **Section 4.3 & 4.4**

4. ABRASIVE WHEELS

The Grinding wheels fitted into this machine are of special design. The are made of steel and supplied in matching pairs with one each left and right handed threaded form—termed “spiral”.

The standard wheels range from 94.8—107 mm diameter with a thin uniform electroplated coating of CBN abrasive on the periphery of the form. Standard abrasives are CBN 126 and 76 grit although other grades are available on request.

Due to this special construction, no reduction in wheel diameter in the conventional sense. Is experienced in the grinding process. This means than any form of compensation for wheel wear or methods of maintaining a consistent grind angle are not required. In addition, CBN used at the designed speeds produces a relatively cool grind in most cases and be used dry.

CBN has been found to be particularly suitable for applications such as knife sharpening where a small depth of cut per pass is required. It is a very cool cutting abrasive, and as such does not normally overheat martensitic stainless steels used for knives even when used in the dry condition, except in cases where heavy metal removal is required or excessive pressure used. Such excessive pressure may reduce wheel life and also effect the corrosion resistance of the stainless steel blade and may under certain circumstances lead to cracking.

4.1 Care of Wheels

The spiral whetting wheel should be handled carefully at all times, both on and off the machine. Extra care should be taken not to damage either the CBN coating or the bores and boss faces.

If damage has occurred due to chattering, usually on he lead in of the spiral form, this can be rectified by removing the wheels from the machine and smoothing in the damage with an engineer’s file to produce a burr free leading angle again.

If the wheels are incorrectly interlocked damage will occur to the edges of the abrasive coating and to the grooves in the wheels. A distinctive ringing noise will signify this problem. To correct this the clearance of the wheels must be re-set as described in **Section 4.4**.

In extreme cases of incorrect interlock serious damage may occur if an attempt to use the machine is made.

Damage resulting in unnecessary loss of wheel life will be caused if grinding is continued when the coating becomes excessively worn, in whole or part, resulting in the steel surface of the wheel being exposed.

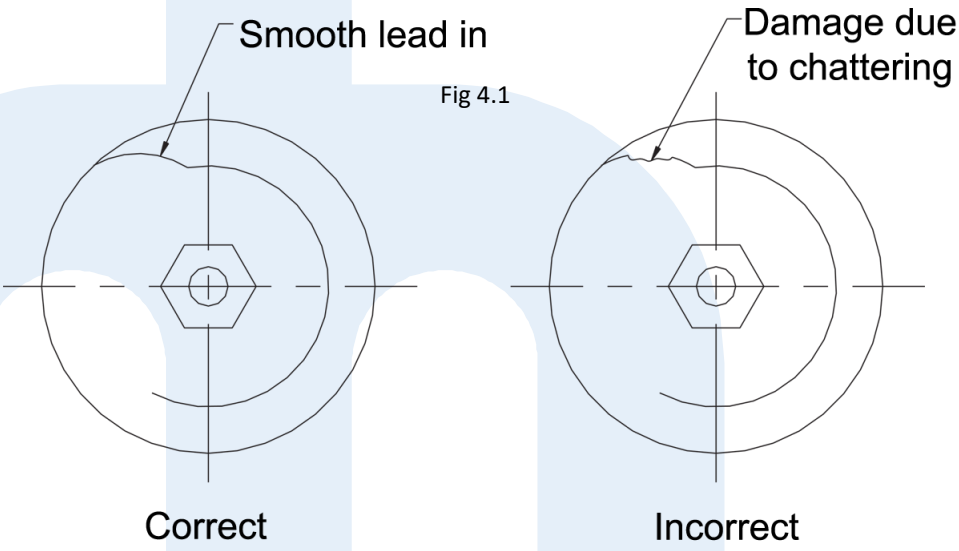


Fig 4.1

4.2 Abrasive Recoating

With increased use the single layer abrasive becomes worn and loses its bite without loss of wheel size.

Normally, wheels can be chemically stripped of the electroplate and any CBN recovered, and if the form has not been damaged, then recoated. This process can be repeated a number of times, but if however, the form is damaged, then it will need to be re-machined to the original profile before replating. Depending on the application, obviously there will be a limit to the number of times this can be done before a new wheel is required. (see also Section 3.3).

4.3 Removing and Fitting Wheel Guard

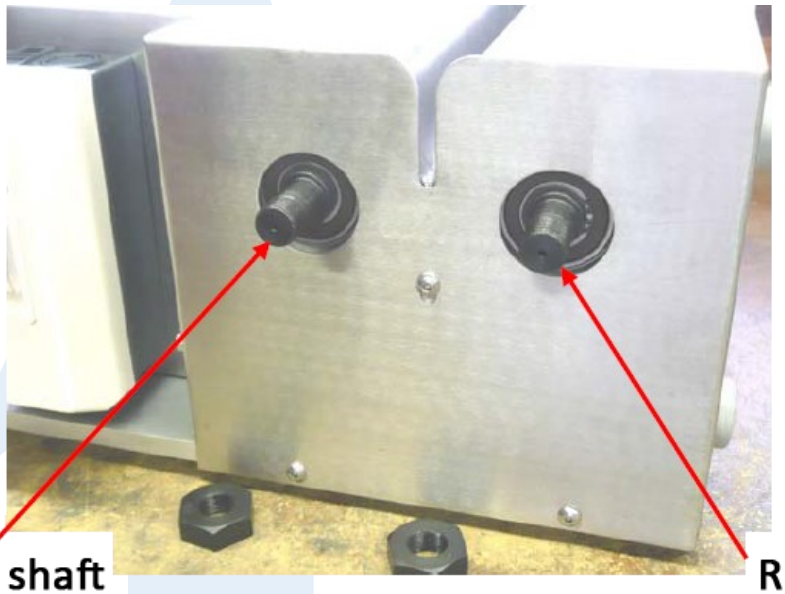
Access to change or inspect the abrasive wheels is gained by removing the wheel cover **(see Fig 1.1)**.

1) Isolate the machine from the electrical supply
2) Disconnect any extraction pipes / hoods which may be connected to the outlet or guard opening.
3) Remove the four side screws.
4) Refitting is the reverse of the above, When offering the guard back onto the machine line up the sides.
5) **NEVER** run the machine without fixing the guard securely

4.4 Removing and Fitting Wheels

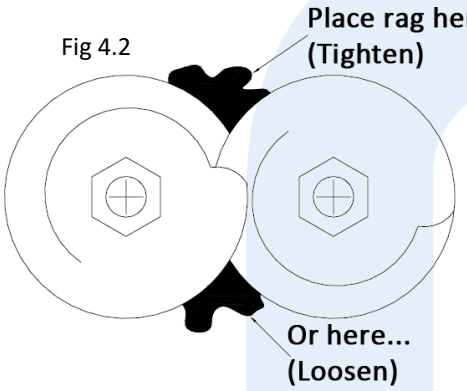
Isolate the machine and remove the wheel cover as in **Section 4.3**

Each wheel locates on a plain shaft up to a shoulder with a locking nut, Viewed from the front of the machine the thread direction for tightening these nuts on each shaft is as shown:-



From the end of 2011 wheels may be supplied with drilled holes to assist wheel alignment. A pin tool should also be available when these wheels are supplied.

Fig 4.2



Undo the locking nuts (earlier method—no pin tool)

To loosen the lock nuts, push a thick cloth or rag between the wheels on the underside and turn the nuts with the box spanner provided. This action should secure the cloth in intersection of the wheels and prevent their rotation.

Undo the locking nuts (pin tool method)

Turn the wheels by hand until the drilled holes line up vertical as shown. Note that the holed in the left and wheel have smaller centres than those on the right hand wheel. Identify the correct attitude for the pin tool and offer it up to the wheels, If necessary turn each wheel slightly to enable the pins to locate. Push the tool firmly flush to the face of the wheels.

Hold the tool in place and use the box spanner to loosen each nut, as shown. When the nuts are loose the tool can be put aside and the nuts completely removed.

The wheels can be removed from the shafts by either:-

1. Lightly pull one wheel, whilst rotating the other (in the direction to unscrew the wheels from each other) until the one wheel can be removed from its spindle. Remove the other wheel.

2. It is also possible to pull both wheels at once whilst remaining interlocked.

NB Do not hammer the wheels or apply unequal leverage at the periphery of the wheels with tools which may cause bruising or damage to the wheels

If there is a difficulty in removing wheels then there is some other underlying problem ***eg wheels jammed or binding or bruising on shafts caused by undue care.***

Before refitting a pair of wheels make sure that both shafts, threads and shoulders are clean and free from dirt, rust and physical damage. Clean the bores of the wheels intended to use and smear a small amount of oil on them.

Identify the appropriate wheels and nuts. Wheels are labelled RH and LH with mark side facing the operator.

The wheels can be refitted to the shafts by either:-

1. Place one of the wheels, with its markings facing outwards onto its relevant shaft, when whilst slowly rotating that wheel place the other onto its shaft and slowly "screw" it on, keeping it square to the shafts at all times. Do not hammer or try to push the wheels on, they can only be fitted as described.
2. It is also possible to fit the wheels as the interlocked pair. Hold each wheel in the interlocked position then push both wheels on to the shafts at the same time. Each wheel should be held as square as possible to the shafts. Maintain clearance between the wheel forms and apply a small angular motion, clockwise and anticlockwise, with respect of the shafts whilst still pushing backwards to the shaft abutments.

When each wheel is fitted and firmly against the shoulder on the shaft fit the appropriate nuts but only tighten lightly. Because there is no key drive (location) for the wheels, clearance can be set freely and must be set properly for the wheels to run.

Tighten locking nuts (earlier method — no pin tool)

Tighten only one locknut by placing a cloth or rag in the top intersection of the wheels **(see Fig 4.2)** and use the box spanner supplied. When one wheel is secured remove the cloth and check the clearance between the screw-cut form on each wheel. This can be viewed from above the wheels and is aided by holding a piece of white card or paper below the wheels. Turn the free wheel on its shaft to adjust the clearance as necessary until the clearance is equal between the sides of the form.

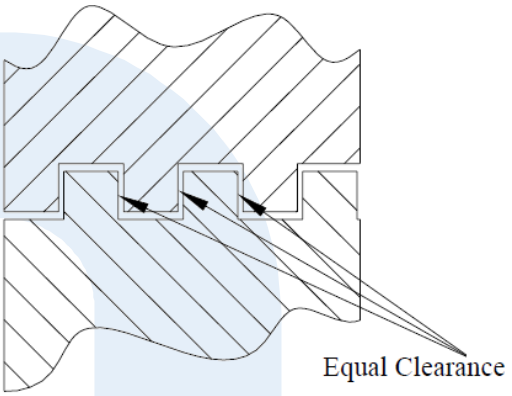


Fig. 4.3 Scrap view of interlocked wheels

When satisfied tighten the second wheel (using a cloth again) being careful not to alter the wheel's position on the shafts. Recheck the clearance over a full revolution of the wheels by turning by hand and again viewing from above. If the wheels are not free to rotate clearly then readjust as described.

Tighten locking nuts (pin tool)

Using the pin tool with pre-drilled wheels mean that the running clearance is automatically set which removes any necessary judgement required by the operator. Align the drilled holes and fit the pin tool as per removal method. Hold the tool in place and run up each nut lightly and then finally tighten using the box spanner.

When the wheels will spin freely by turning the whole drive system over by hand then replace the wheel cover.

NOTE: *If at any time it is thought the wheels may be interfering with each other then the machine must be stopped immediately and the clearance checked as above.*

A distinct ringing sound will be heard from wheels which are touching

5 MAINTENANCE

The sharpening machine will need very little user maintenance throughout its lifetime. However, a few simple guidelines should be followed in order that the best performance is obtained from the machine.

◊ The machine external covers are made of a grade of stainless steel which will maintain a good appearance and is easily cleaned. Covers can be cleaned. Covers can be cleaned using proprietary degreasing agents or hot soapy water. Use a wet cloth and dry the surfaces afterwards.

◊ The machine has an overall IP 54 rating.

◊ All internal bearings are sealed and greased for life and other parts suitably lubricated on assembly. There are no user adjustments required on the internal drive assembly.

5.1 However, if the machine is used in a heavy duty application and the user has qualified engineering staff at the plant then an internal inspection and clean would be beneficial , in the long term, at say 160-200 hours intervals.

◊ Ensure that the electrical supply is disconnected before removing the screws which hold the two rear cover plates.

◊ Periodically check the condition of the drive belt and its tension.
If tensioning is necessary this can be done by slackening the four motor bracket screws and sliding the bracket on its slots. Correct tension is when the longest free length of belt can just be twisted through 90 using finger and thumb.

5.2 Regulations require that this portable unit is electrically tested on a regular basis or whenever a fault is detected and rectified. This includes

- ◊ Inspection of external cable for damage (eg abrasion) and security
- ◊ Correct fuse fitted to plug and functionality of strain relief mechanism
- ◊ Continuity Test
- ◊ Earth bonding test (do not clip onto wheels / spindles for test)
- ◊ Insulation test

NOTE that whenever the main cover of the machine is removed then it will be necessary to repeat part of this test procedure when the cover is refitted. All units leave MEFE production having satisfactorily completed these tests.

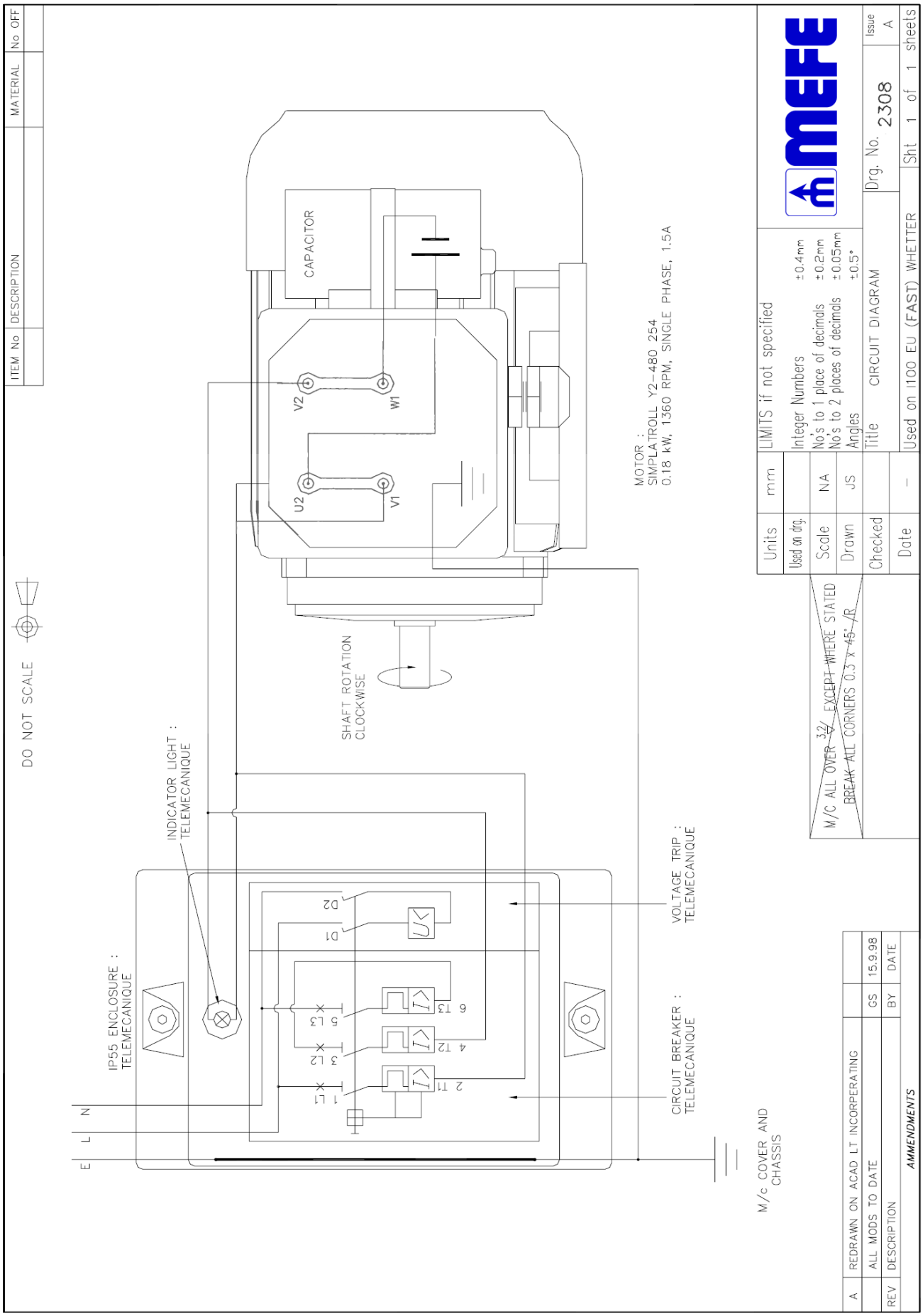
MEFE can offer the checking service at (5.1) and/or (5.2) above or give further advice on request.

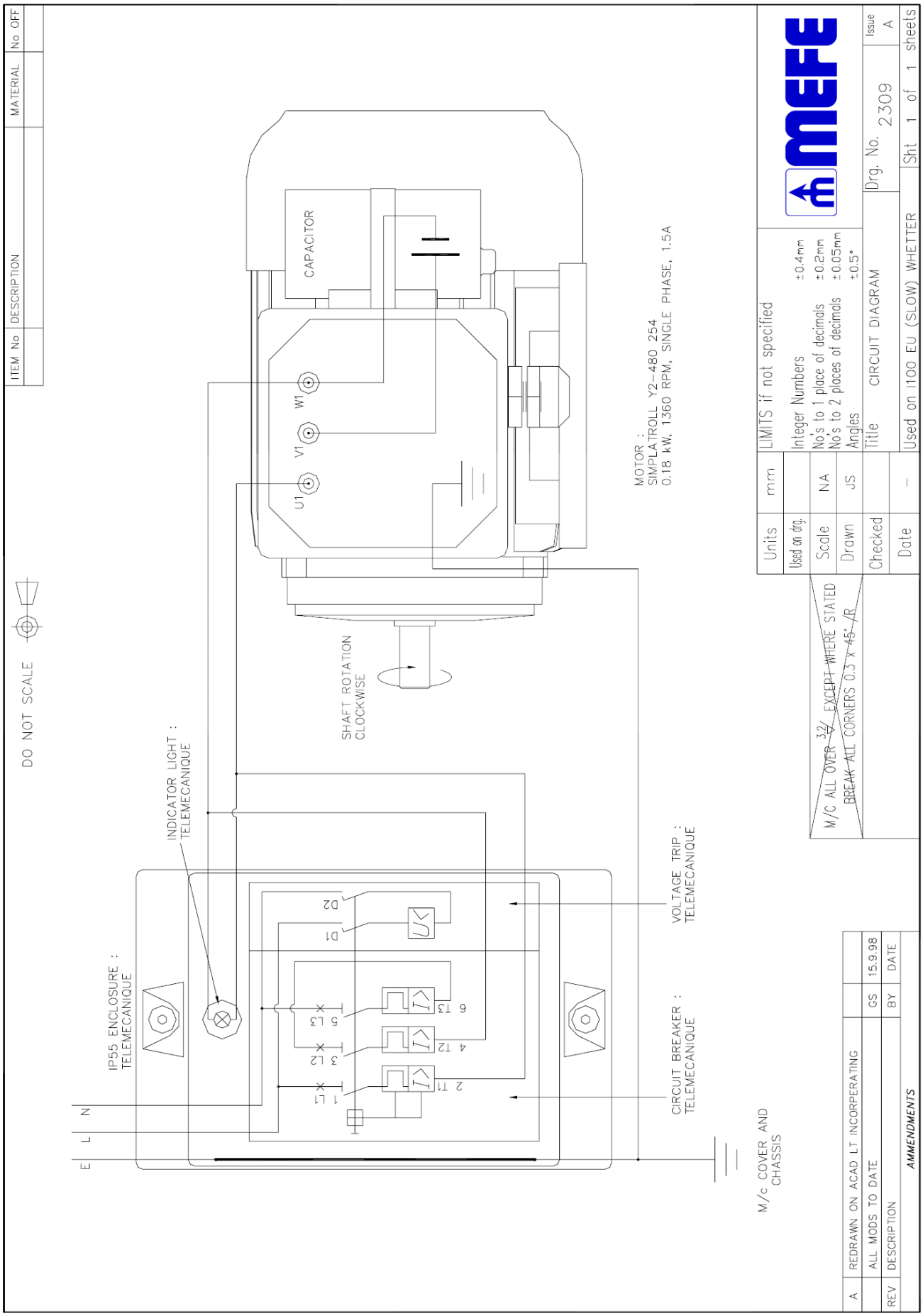
Bad practise in setting up/ changing the grinding wheels may result in damage to the spindles or the drive system and it should be avoided. Also running the machine with an obvious fault condition or with unexplained noise coming from the motor / drive housing may result in damage requiring costly repairs and may invalidate the guarantee. Always switch off and investigate any suspected problems.

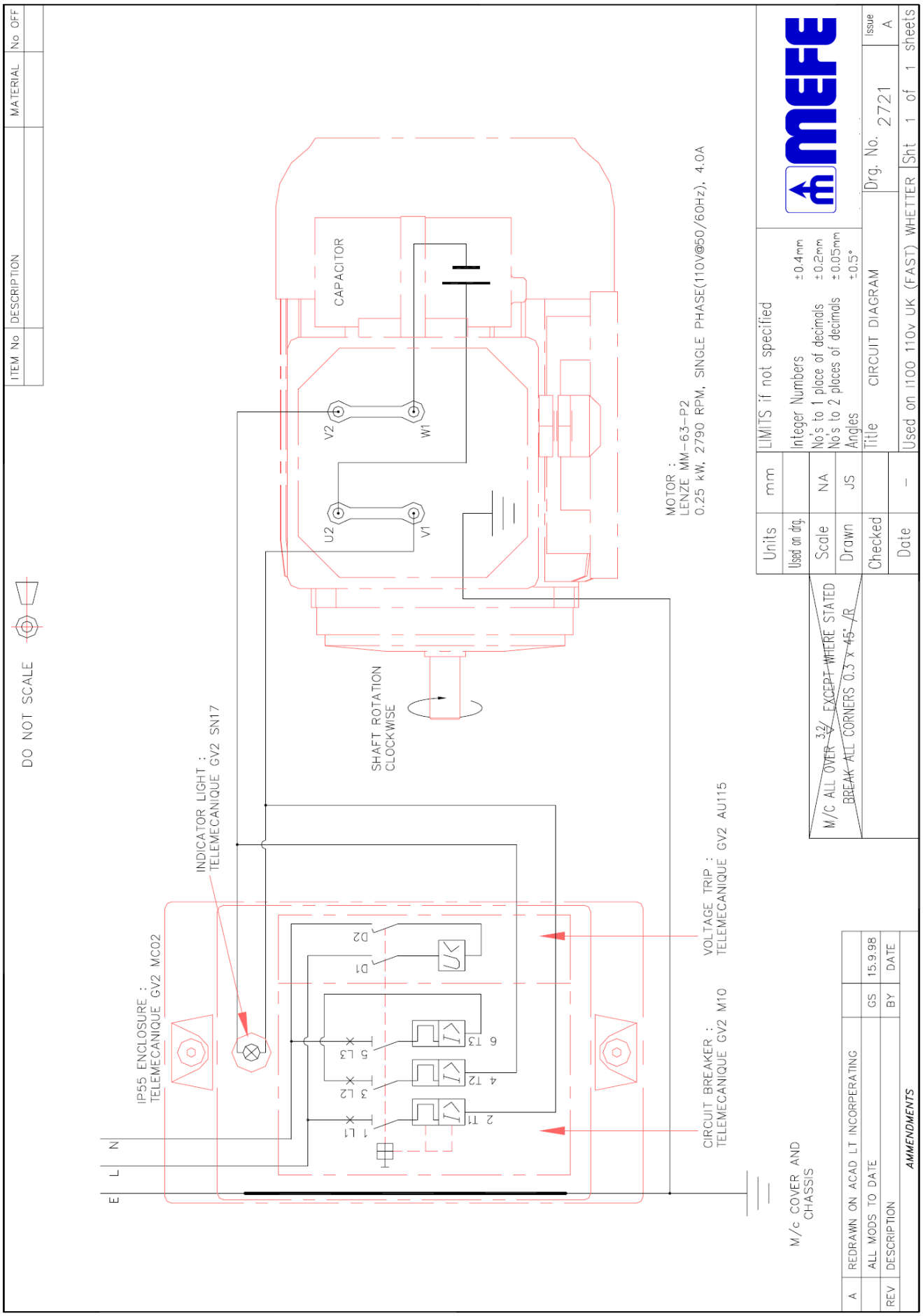
In the event of unexpected problems with the machine please contact MEFE.

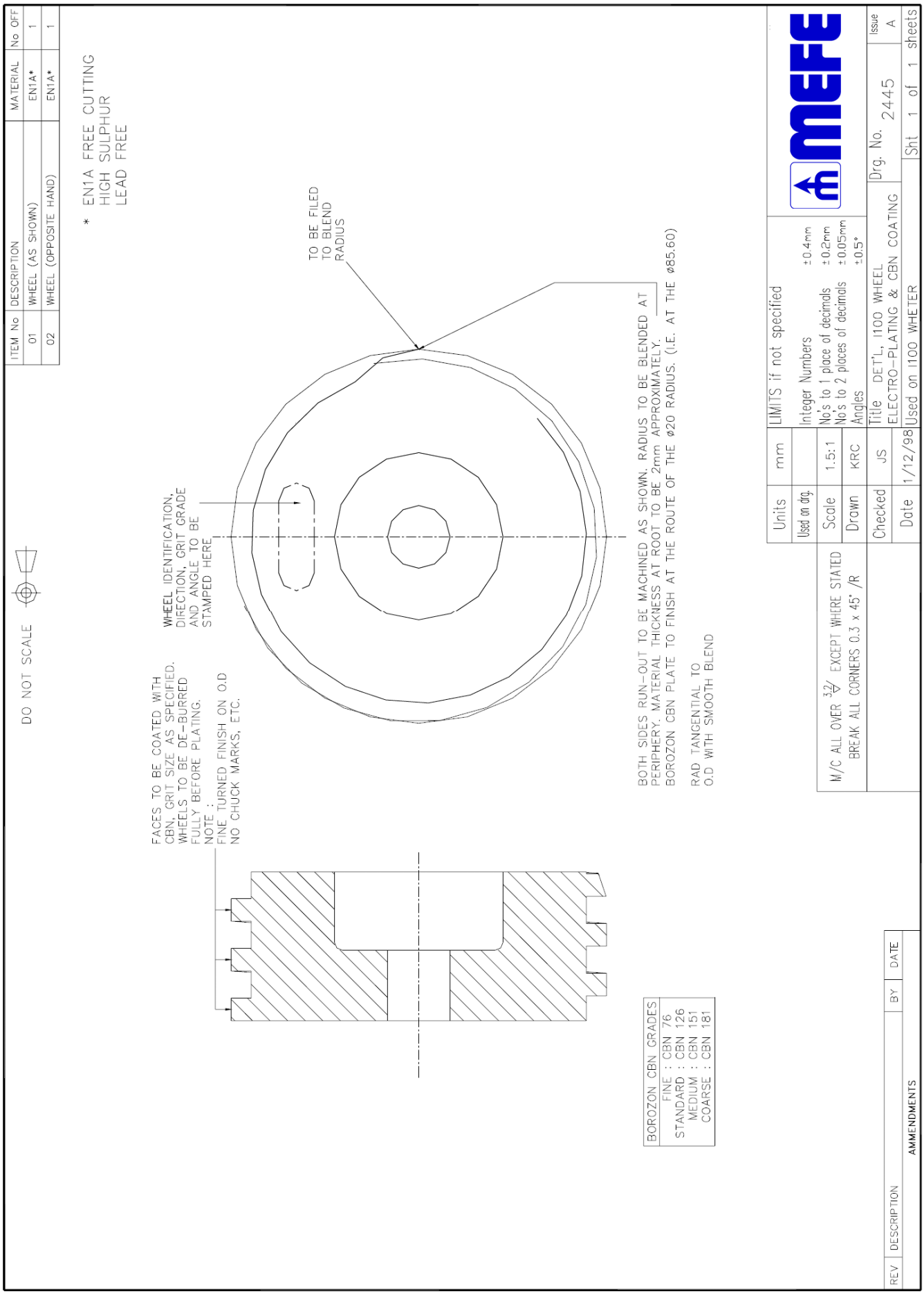
Waste Electrical & Electronic Equipment

Please refer to your local waste management policies on disposal of waste for this product.


ITEM No
DESCRIPTION
MATERIAL
No OFF
DO NOT SCALE
CAPACITOR
V2
W1
U2
V1
MOTOR :
SIMPLATROLL Y2-480 254
0.18 kW, 1360 RPM, SINGLE PHASE, 1.5A
SHAFT ROTATION
CLOCKWISE
INDICATOR LIGHT :
TELEMECANIQUE
IP55 ENCLOSURE :
TELEMECANIQUE
VOLTAGE TRIP :
TELEMECANIQUE
CIRCUIT BREAKER :
TELEMECANIQUE
M/c COVER AND
CHASSIS
E
L
N
D2
D1
U<
1 L1
2 T1
3 L2
4 T2
5 L3
6 T3
M/C ALL OVER 32
EXCEPT WHERE STATED
BREAK ALL CORNERS 0.3 x 45° /R
Units
mm
Used on drg.
Scale
NA
Drawn
JS
Checked
Date
LIMITS if not specified
Integer Numbers ±0.4mm
No's to 1 place of decimals ±0.2mm
No's to 2 places of decimals ±0.05mm
Angles ±0.5°
Title
CIRCUIT DIAGRAM
Drg. No. 2308
Issue A
Used on I100 EU (FAST) WHETTER
Sht 1 of 1 sheets
A
REDRAWN ON ACAD LT INCORPERATING
GS
15.9.98
ALL MODS TO DATE
REV
DESCRIPTION
BY
DATE
AMMENDMENTS


ITEM No
DESCRIPTION
MATERIAL
No OFF
DO NOT SCALE
CAPACITOR
W1
V1
U1
MOTOR :
SIMPLATROLL Y2-480 254
0.18 kW, 1360 RPM, SINGLE PHASE, 1.5A
SHAFT ROTATION
CLOCKWISE
INDICATOR LIGHT :
TELEMECANIQUE
IP55 ENCLOSURE :
TELEMECANIQUE
VOLTAGE TRIP :
TELEMECANIQUE
CIRCUIT BREAKER :
TELEMECANIQUE
M/c COVER AND
CHASSIS
E
L
N
D2
D1
U<
1 L1
3 L2
5 L3
2 T1
4 T2
6 T3
M/C ALL OVER 32
EXCEPT WHERE STATED
BREAK ALL CORNERS 0.3 x 45° /R
Units
mm
Used on drg.
Scale
NA
Drawn
JS
Checked
Date
LIMITS if not specified
Integer Numbers ±0.4mm
No's to 1 place of decimals ±0.2mm
No's to 2 places of decimals ±0.05mm
Angles ±0.5°
Title
CIRCUIT DIAGRAM
Drg. No. 2309
Issue A
Used on I100 EU (SLOW) WHETTER
Sht 1 of 1 sheets
A
REDRAWN ON ACAD LT INCORPERATING
GS
15.9.98
ALL MODS TO DATE
REV
DESCRIPTION
BY
DATE
AMMENDMENTS


ITEM No
DESCRIPTION
MATERIAL
No OFF
DO NOT SCALE
CAPACITOR
V2
W1
U2
V1
MOTOR :
LENZE MM-63-P2
0.25 kW, 2790 RPM, SINGLE PHASE(110V@50/60Hz), 4.0A
SHAFT ROTATION
CLOCKWISE
INDICATOR LIGHT :
TELEMECANIQUE GV2 SN17
IP55 ENCLOSURE :
TELEMECANIQUE GV2 MC02
VOLTAGE TRIP :
TELEMECANIQUE GV2 AU115
CIRCUIT BREAKER :
TELEMECANIQUE GV2 M10
M/c COVER AND
CHASSIS
E
L
N
D2
D1
U<
1 L1
3 L2
5 L3
2 T1
4 T2
6 T3
LIMITS if not specified
Integer Numbers ±0.4mm
No's to 1 place of decimals ±0.2mm
No's to 2 places of decimals ±0.05mm
Angles ±0.5°
Units mm
Used on drg.
Scale NA
Drawn JS
Checked
Date –
Title CIRCUIT DIAGRAM
Drg. No. 2721
Issue A
Sht 1 of 1 sheets
Used on 1100 110v UK (FAST) WHETTER
M/C ALL OVER 3.2 EXCEPT WHERE STATED
BREAK ALL CORNERS 0.3 x 45° /R
A REDRAWN ON ACAD LT INCORPERATING GS 15.9.98
ALL MODS TO DATE BY DATE
REV DESCRIPTION
AMMENDMENTS


ITEM No | DESCRIPTION | MATERIAL | No OFF
01 | WHEEL (AS SHOWN) | EN1A* | 1
02 | WHEEL (OPPOSITE HAND) | EN1A* | 1
* EN1A FREE CUTTING HIGH SULPHUR LEAD FREE
DO NOT SCALE
TO BE FILED TO BLEND RADIUS
WHEEL IDENTIFICATION, DIRECTION, GRIT GRADE AND ANGLE TO BE STAMPED HERE
FACES TO BE COATED WITH CBN, GRIT SIZE AS SPECIFIED. WHEELS TO BE DE-BURRED FULLY BEFORE PLATING.
NOTE :
FINE TURNED FINISH ON O.D NO CHUCK MARKS, ETC.
BOTH SIDES RUN-OUT TO BE MACHINED AS SHOWN. RADIUS TO BE BLENDED AT PERIPHERY. MATERIAL THICKNESS AT ROOT TO BE 2mm APPROXIMATELY. BOROZON CBN PLATE TO FINISH AT THE ROUTE OF THE ø20 RADIUS. (I.E. AT THE ø85.60)
RAD TANGENTIAL TO O.D WITH SMOOTH BLEND
BOROZON CBN GRADES
FINE : CBN 76
STANDARD : CBN 126
MEDIUM : CBN 151
COARSE : CBN 181
M/C ALL OVER 3.2/ EXCEPT WHERE STATED
BREAK ALL CORNERS 0.3 x 45° /R
Units mm
Used on drg.
Scale 1.5:1
Drawn KRC
Checked JS
Date 1/12/98
LIMITS if not specified
Integer Numbers ±0.4mm
No's to 1 place of decimals ±0.2mm
No's to 2 places of decimals ±0.05mm
Angles ±0.5°
Title DET'L, 1100 WHEEL ELECTRO-PLATING & CBN COATING
Drg. No. 2445
Issue A
Sht 1 of 1 sheets
Used on 1100 WHETER
REV | DESCRIPTION | BY | DATE
AMMENDMENTS

Appendix III - Health and Safety Product Data Sheet

CBN Abrasive Coating Grinding Wheels

Product

Grinding Wheels normally supplied as a steel core with selected peripheral surfaces coated with a single layer of CBN grit using the electroplated bond system.

Use

For sharpening and other form grinding operations on hardened cutlery and / or other tool types.

Physical Data

These wheels will usually take the form of our standard spiral interlocking wheels (pairs) or bespoke profiled wheels for form grinding to special design.

Core Steel Specification BS970 : Pt1 1983 070M20 (Lead Free)

Dimensions

8" (200mm) Spiral Wheels	Ø203mm x 63.5mmW	6kg each
5.5" (140mm) Spiral Wheels	Ø140mm x 38mmW	2.1kg each
4" (100mm) Spiral Wheels	Ø96mm x 38mmW	1.7kg each
Typical Serrating Wheel	Ø178mm x 25mmW	2kg each

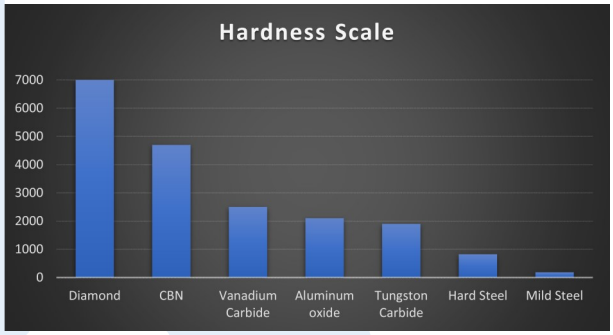
Surface Speeds:

10 - 20m/s Dry

10 - 50m/s With Adequate Lubrication

Abrasive

Cubic Boron Nitride (CBN) is the second hardest known material (2nd only to diamond). It is crystalline material, which is synthesised under conditions of extreme pressure and temperature and the crystals are blocky and regular in shape with very good cutting edge presentation. In the key characteristics of an abrasive i.e. high hardness, abrasion resistance, strength and resistance to thermal and chemical attack CBN exceeds the performance of conventional abrasives such as silicon carbide and aluminium oxide. Its good thermal stability is better than diamond for grinding ferrous materials.



Grits

There are two main manufacturers of this material and the general purpose grit supplied for use on these type of wheels is an uncoated grade and is black in colour. The more commonly available grit sizes are shown in the following Table:

FEPA Standard Grit Size		US Standard Grit Sizes Mesh
D 213	B 213	70 / 80
D 181	B 181	80 / 100
D 151	B 151	100 / 120
D 126	B 124	120 / 140
D 107	B 107	140 / 170
D 91	B 91	170 / 200
D 76	B 76	200 / 230
D 64	B 64	230 / 270
D 54	B 54	270 / 325
D 46	B 46	325 / 400
Diamond	CBN	

Bond Systems

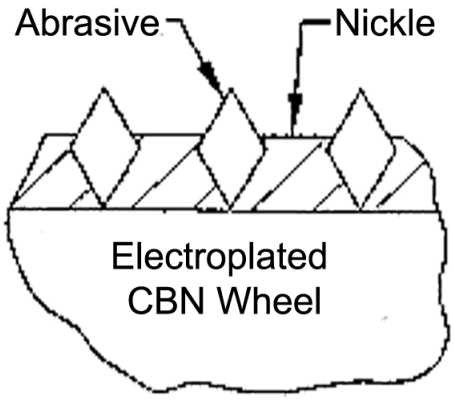
These electroplated wheels consist of a single layer of super abrasive particles bonded to the steel wheel surface by a nickel matrix. This bonding process has the advantage that wheels can be manufactured reasonably economically with various forms and contours.

As the nickel is deposited onto the core it entraps the CBN particles in a strong mechanical grip. This type of bond system is impractical to dress and thus this puts more importance on the wheel alignment on the machine and accuracy of manufacture of the initial core shape.

This system does not rely on fresh grits being presented by breakdown of the bond. In normal grinding the chips wear by shearing along cleavage planes. The disadvantage is that the single layer coating has a finite life. On the other hand wheels can normally be recoated thus making it a cost effective route.

General Safety

Care should be taken when handling these wheels. In some cases the weight of a single wheel or hub assembly may be significant. Whilst normally all sharp edges are removed during manufacture the abrasive surface can offer a small risk of abrasion during handling.



Prepare in advance and consult individual machine manuals for instructions regarding removal and fitting of wheels.

Employ good housekeeping in the work area and wear suitable overalls, gloves and safety footwear. Good personal hygiene in conjunction with suitable barrier creams is also recommended.

The method of storage and packaging for transportation should be carefully considered. Strong and stable wooden racking is recommended with individual wheels protected by 1" polystyrene separation.

Particular importance should be given to prevention of damage to the CBN coated surfaces, bores and boss faces.

Do not pack wheels in multiples, without layers of separating materials, or where the cumulative weight is outside the range of the available manual or mechanical lifting equipment.

Hazards & Precautions:

When handled and used for their intended purpose the constituents of these wheels are considered unlikely to present a health hazard.

Nickel may be a mild irritant to sensitive skin in prolonged continuous contact. The use of barrier creams and gloves when handling wheels is recommended.

The main area of concern when using these products is in the grinding operation, which can give rise to airborne dust. This will take the form of particles / chippings of the material being ground. Provided that the grinding wheel is not abused then particles of grit produced will be insignificant compared to those of the product being ground.

The user should take appropriate action to reduce the degree of exposure to and risk of inhalation of this nuisance material. This should include provision of adequate and efficient local exhaust, the wearing of suitable eye protection and other appropriate safety apparel.

Disposal / Recycling

One of the advantages of this type of wheel is that when the single layer abrasive is completely dulled it can be recoated. With good operator training and back up wheels in place it should be possible to release a dull wheel from production before any of the grit / bond has been damaged. The normal procedure is then to send the wheel back to MEFE where the coating can be reclaimed and replaced by our contractor.

If a wheel is badly used or has reduced in size so as not to be reusable by reforming and recoating, then the core blank should be recycled in the normal way with ferrous materials via the local metals dealer.