



MINI MILLER

MINI MILLER 8/16 | MINI MILLER +C 8/16

OPERATION & SAFETY MANUAL



WARNING

These instructions are for your personal safety. Always ensure that you have read and understood these instructions before using the machinery.
SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

TABLE OF CONTENTS

TOPIC	PAGE
Safety Information	3
Environment, Transport, Storage & Disposal	5
General Information	6
Technical Data	7
Intended Use	7
Available Tooling	7
Voltage & Power Supply	8
Safety Features	8
Noise Levels, Vibrations & Emissions	9
CE Declaration of Conformity	10
Operating Instructions	11
Starting & Using the Machine	11
Attaching Tools, Tightening Set Screws & Sleeve Bearings in DN50/2" bends	12
Rotation Speed Dial	13
Maintenance Programme & Warranty Periods	14
Maintenance	15
Replacing Carbon Brushes	15
Replacing Safety Clutch	18
Inspecting Shaft for Damage	19
Servicing Flexible Shaft	20
Changing Flexible Shaft	20
Shaft Extensions	20
Accessories & Spare Parts	21
Practical Tips & Safety Advice	22
Picote MINI MILLER +C 8/17	24
+C Camera Kit Instructions	25
+C Camera Function Guide	26
+C Technical Data	27
+C Spare Parts	28
Troubleshooting Flowchart	29
Warranty Policy & Procedure	30

To watch practical demonstration videos, take a course, or to download an electronic copy of these Instructions, please visit www.picoteinstitute.com. Please note that videos and courses are not intended as a replacement or alternative to this operating and safety manual, but only as an additional learning tool.

SAFETY INFORMATION

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

WARNING

This section contains important safety information. Failure to comply could result in serious injury.

Safety Symbols

Safety symbols are used throughout this manual to draw attention to potential hazards.



Danger risk of serious injury or death by electrocution, follow instructions.



Danger risk of serious injury, follow instructions.



Danger risk of serious injury from rotating parts, follow instructions.



Danger risk of serious injury from hot parts, follow instructions.



Danger do not touch. Risk of injury, follow instructions.

Personal Protective Equipment (PPE)

Always use Personal Protective Equipment including suitable protective clothing, footwear, plus:



Suitable eye protection to protect against sewage, chemicals or dust from irritating eyes.



Suitable ear protection to protect against hearing loss.



Suitable heat and cut-resistant gloves to help prevent any hand injuries. Any open injuries or skin irritations should always be covered to avoid contact with sewage, chemicals or dust.



Suitable respirator to prevent any dust or fumes being inhaled or consumed, which could cause occupational asthma or dermatitis.

GENERAL MACHINE SAFETY INFORMATION

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

WARNING



This section contains important safety information. Failure to comply could result in serious injury or death.

Always read all safety warnings and instructions. Failure to follow warnings and instructions may result in electric shock, fire and/or serious injury.



1. **Always wear eye and ear protection as well as heat and cut-resistant gloves.**

Other personal protective equipment, such as dust mask, gloves and overalls should be worn when necessary. Dust produced when working can be dangerous to your health, inflammable or explosive. **Always wear appropriate personal protective equipment.**

2. Make sure the pipe has been opened and ventilated to prevent any gases accumulating.
3. Always ensure that the machine is fully turned off and unplugged before inspection, maintenance, or installing any accessories to the machine. Always follow the instructions in the manufacturer's manual.
4. **Before each use** inspect the machine carefully for any potential break or damage. **Change damaged parts immediately.** It is especially important to check the end of the shaft for any signs of wear and tear, and repeat the process for the outer casing.
5. When in use, it is very important that the machine is stable and on an even surface at all times.
6. **Never leave the machine running unattended.** Always hold the cable when operating the machine.
-  7. **Do not touch the Cutter or Grinding Chains immediately after use**, they may be hot and could burn your skin.
8. If the working environment is extremely hot and humid, or badly polluted by conductive dust, use a GFCI-enabled power outlet to ensure the safety of the operator.
9. Make sure that the job location is well ventilated before grinding or drilling. Always use a vacuum extraction system in the pipe to remove dust. The operator must wear a dust mask when using dry grinding to clean pipes.
10. Ensure that the ventilation openings are kept clear when working in dusty conditions. If it should become necessary to clear dust, first unplug the machine. Avoid damaging internal parts.
-  11. **Do not use the machine on any pipes containing asbestos fibres.**
12. **Never touch rotating parts.** Do not stand on the machine.
13. Only use this machine with the accessories and spare parts offered by the Picote Solutions. Accessories and spare parts should only be used in the manner intended and as described by Picote Solutions.
14. Only operate the foot pedal or OPC as instructed. Never place anything on it in place of a foot.
15. **Do not extend the shaft by more than one extension.** Use only Picote Solutions shaft extension and connector.

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

⚠ WARNING This section contains important safety information. Failure to comply could result in serious injury or death

ENVIRONMENTAL

Operational Ambient Temperature Range:	-10 °C to 50 °C (14 °F to 122 °F) frost and condensation free
Storage Ambient Temperature Range:	-20 °C to 60 °C (-4 °F to 140 °F) frost and condensation free
Maximum Altitude:	2000m or 6500 ft. Derate above 1000m or 3280ft: 1% / 100m or 328ft
Maximum Humidity:	95% non-condensing
Camera Maximum Humidity:	90% non-condensing

TRANSPORT

The Mini Miller or Mini Miller +C should be transported in a car or other vehicle and laid down and secured with ratchet straps to prevent any sudden movements or accidents caused by hard braking or accident.

Never transport the machine with tool attached to the shaft. Always retract the camera back to it's housing during transport. If using a pick-up or trailer to transport Picote Millers always suitable cover the unit to protect it from the elements

STORAGE

It is recommended that Picote Millers be stored indoors to protect them from rain and sunlight, and also in a constant ambient temperature. The best way to store the machines is using the same box that the machine has been shipped in.

If the Mini Miller or Mini Miller +C has been stored in an environment colder than +10 °C or 50 °F , the machine should be stood at room temperature for 24 hours before use.

If the Mini Miller or Mini Miller +C has been stored for long periods of time (over 2-3 months), it should be checked and tested according to the maintenance programme before use.

Charge the DVR battery fully before storing for long periods. **Do not leave the DVR unit unattended while it is charging.**

DISPOSAL

Mini Miller motor, control box, electric wires, axle package including slip ring, camera monitoring box, power supply and camera head can be disposed in Europe at Waste Electrical and Electronic Equipment (WEEE) collection points.

The Miller frame, reel, flexible shaft, camera cable reel and name plate can be recycled in metal waste collection points. Outer casing of the shaft and the camera plastic supports can be disposed of as plastic waste.

Always follow local waste handling rules and regulations.

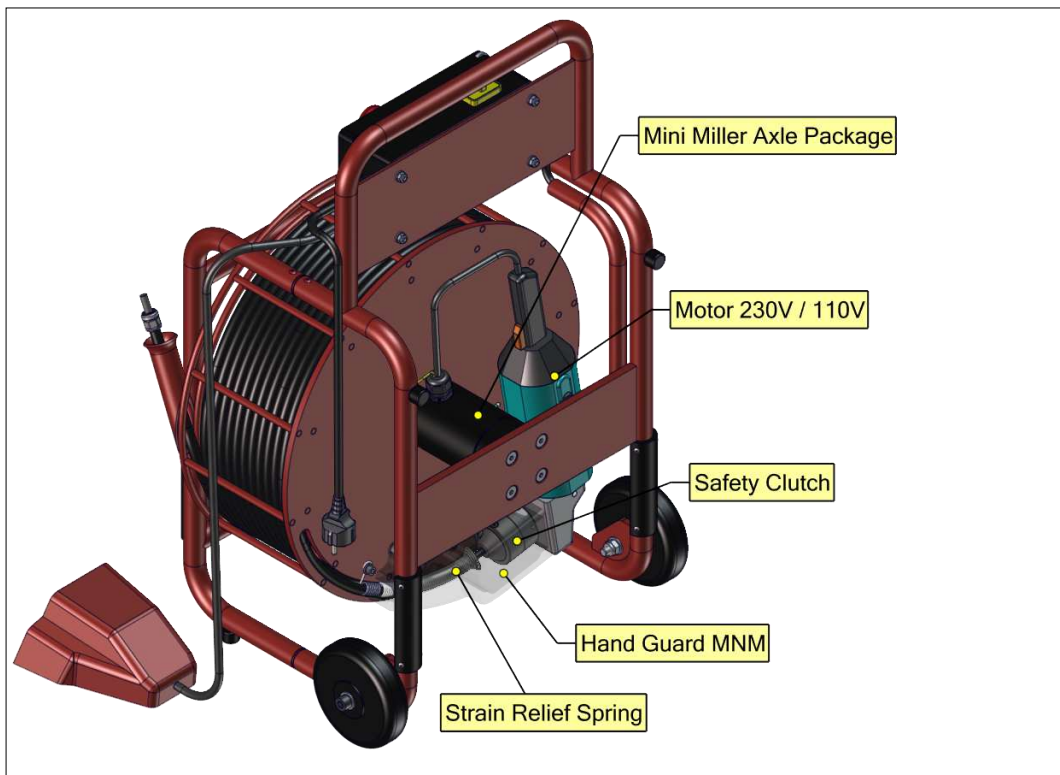
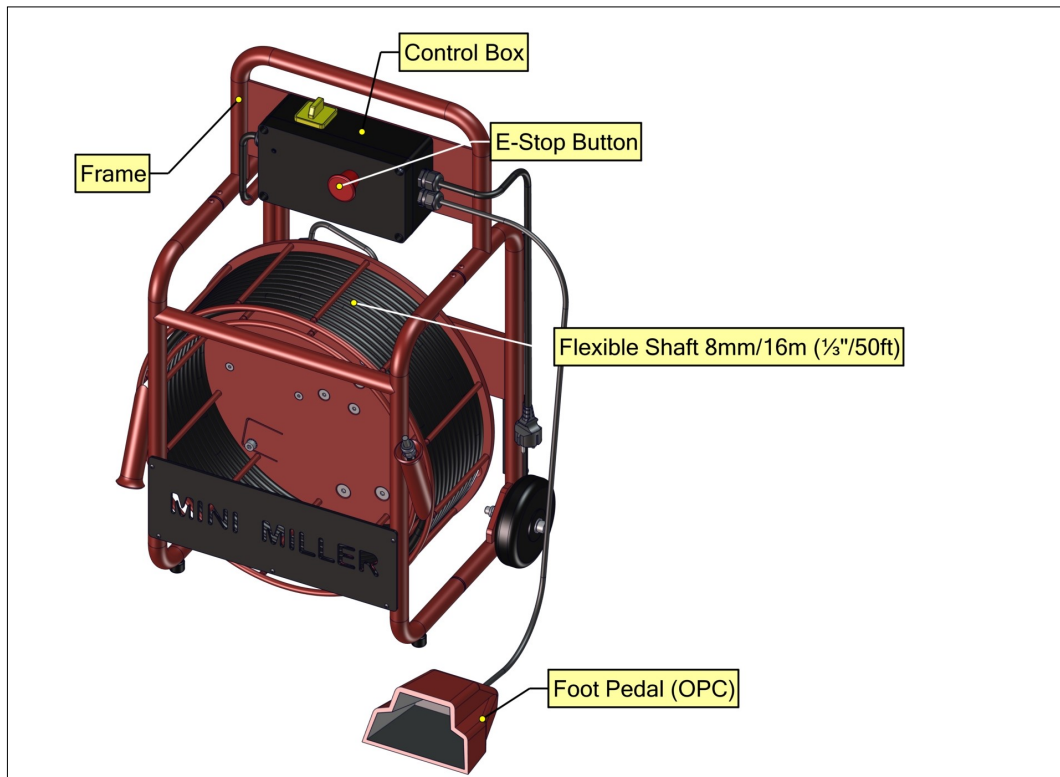


The +C camera monitoring box includes a Li-ion battery.

Li-ion

GENERAL INFORMATION

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CAUTION When in use always lay the machine down horizontally on the floor. When not in use some non-hazardous Picote Flexible Shaft Lubricant might leak from the hand guard.

TECHNICAL DATA

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Size (mm/inches)	Shaft (mm/	Range (m/ft)	Drain Diameter (mm/inches)	Rotating Speed (rpm)	Output (W)	Power Source	Weight (kg/lbs)
740x519x404 29"x20"x16"	8 / 1/3"	16 / 50	DN50-DN100 / 2"-4" DN50-DN150 / 2"-6" for cleaning pipes	500-2900	110V:1100 230V:1200	Electric Motor	27 / 60

INTENDED USE

This machine is intended for the following uses;

1. Cleaning and unblocking pipes, drains and sewers by grinding.
2. Descaling pipes.
3. Opening lateral connections.
4. Internal pipe coating using the Picote Brush Coating™ System and the Mini Coating Pump.

AVAILABLE TOOLING

Always follow the Picote Solutions instructions when installing and using the machine with accessories.

Original Chains	Cyclone Chains	3D Chains
Smart Cutter™	Nylon Cleaning / Coating Brush	Mini Sweeper
Special Drill Head	Wire Brush	Twister Mini
Tiger Bore	Tiger Drill Chains	

Please check Picote Solutions Quick Guides and Tool Manuals for more detailed information:

www.picoteinstitute.com

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Ensure that the supply voltage is correct. The voltage of the power source must match the value given on the nameplate of the machine within the tolerances of $\pm 10\%$. Machines with a 230V plate can be used in 220V mains and 110V machines in the 120V grid.

The machine has been double sealed according to European standards. The power source has to be grounded.

Camera power supply can operate with Input: 110VAC ~ 240 VAC, Output: 12V DC 1200mA. The DVR unit has in-built 5200 mAh Li-ion battery (7.4 V).

Power plugs

For safety purposes, use only grounded outlets. If the plug does not fit securely or match the outlet, do not force it — contact an electrician to determine required power supply. Never alter the plug in any way. Use the plug with an extension cord only if it can be fully inserted into the receptacle. Use the Mini Miller with a heavy duty extension cord only.

If a power generator is used as power source, ensure that the power rating is sufficient.

220-230V: EU Schuko 230V 16A. Power cable lead minimum thickness 1.5mm^2 .

110-125V: The Mini Miller is equipped with a 15 amp (125V) NEMA 5-15 plug. Power cable lead minimum thickness 2.5mm^2 / 14 AWG. The Mini Miller must be supplied with sufficient power and proper current rating. A minimum of 15 amps are needed to operate it safely and efficiently. When used with an extension cord, the plug must be a 3 prong, 15amp (125V). If a power generator is used, a minimum 3 kW required. Adapters may be necessary for generator connections. Contact your reseller or Picote technical support for more information.

AUSTRALIA/UK: Mini Millers in these regions have special plugs.

Australia: CEE 16A 230V colour blue. Power cable minimum lead thickness 2.5mm^2 .

UK: UK Plug BSEN 60309 16A 110V colour yellow. Power cable lead minimum thickness 2.5mm^2 . Mini Miller requires a transformer to comply with the site power regulations and safe usage in UK.

NOTE: If working with a generator always use the 110 V transformer. Do not plug directly in to the generator.

SAFETY FEATURES



The machine is equipped with an Emergency Switch Off Button. The power supply to the motor is cut off when the Emergency Switch Off Button is pushed. Always make sure the Emergency Switch Off Button is pressed or completely unplug the machine when the machine accessories (e.g. Cutter or Grinding Chains) are not inside a pipe. Always unplug the machine from the power source when performing any maintenance or repairs to the machine.

The machine is operated by foot pedal (Operator Presence Control or 'OPC'). When the control is not held down, the machine stops. Never place any kind of object on the pedal in place of a foot (such as a brick).

NOISE LEVELS, VIBRATIONS & EMISSIONS

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This section contains important safety information. Failure to comply could result in serious injury or loss of hearing.

The typical A-weighted noise level determined according to EN60745:



WEAR EAR PROTECTION

Sound pressure level (LpA): 90 dB (A)

Sound power level (LWA): 103 dB (A)

Emissions during actual use of the machine can differ from declared values depending on the ways that the machine is used. Safety measures to protect the operator should be determined by actual conditions, taking into account all aspects of the operating cycle (such as when the machine is switched off and when it is running idle).

Due to continuing product development, the specifications herein are subject to change without notice.

VIBRATION

Hand vibration levels depend on the distance from the tool head to the user and working conditions. The vibration levels below have been measured during normal lining activities at Picote worksites in Finland. Vibration has been determined according to ISO-5349 and EU-directive 2002/44/EG. The table below details the safe daily exposure time for the user depending on tool used.

Safe daily exposure time for user:

Exposure Action Value (EAV) 2,5 m/s²

Exposure Limit Value (ELV) 5,0 m/s²

Tooling	Working Distance m/ft	EAV	ELV
Mini Twister DN50 / 2"	2m / 6.6ft	10h 14min	Over 24h
Mini Twister DN50 / 2"	10m / 32.8ft	Over 24h	Over 24h
Original Cleaning Chain DN50 / 2"	0-2m / 0-6.6ft	9h 42min	Over 24h
Original Cleaning Chain DN50 / 2"	0-15m / 0-49.2ft	16h 42min	Over 24h

CE DECLARATION OF CONFORMITY

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We Picote Solutions Oy Ltd as the responsible manufacturer, declare that the following Picote Solutions Oy Ltd drain cleaning machine:

Mini Miller

Model No: 8/16

and

Mini Miller +C

Model No: 8/16

are of series production and

Conform to the following EU Directive:

2006/42/EY

And is manufactured in accordance with the following standards or standardised documents:

EN62841-1

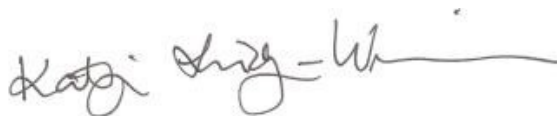
EN62841-13

ISO-5349-1:2001

The technical documentation is kept by our authorised representative in Europe who is:

Picote Solutions Oy Ltd, Pienteollisuustie 24
06450 Porvoo, Finland

31st July 2020



Katja Lindy-Wilkinson

C.E.O.

Picote Solutions Oy Ltd

Pienteollisuustie 24, 06450 Porvoo, Finland

OPERATING INSTRUCTIONS

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Before operation:



- Before installing Picote tools, always make sure that the machine is fully turned off and unplugged.



- Always round off the sharp edges of the shaft to avoid cuts and to make it easier to insert the shaft into the tool or for a leader to be used.
- Check that there is the correct length of flexible shaft (without its plastic casing) at the end of the flexible shaft and that all screws have been loosened so that the shaft can be easily inserted inside the tool. Position the shaft inside the tool, as far as it will go, and tighten the screws. **Consult accessory manuals (cutters & grinding chains) for detailed information.**

While in operation:

- Always lay the machine down horizontally on the floor. During drilling, grinding and cutting processes, always use a separate vacuum extraction system or run water in the drain to remove dust.

STARTING & USING THE MACHINE



This section contains important safety information. Failure to comply could result in serious injury.

1. The machine has an operator presence control or 'OPC'. When the control is not held down, the machine stops. The machine can also be stopped by pushing the Emergency Stop Button down, rotating the power gear to "O" or unplugging the machine.
2. Check the rotational speed of the shaft before powering up. The rotational speed control is located on the motor. The rotational speed can be set at speed levels from 1 to 6.
3. Place the tool inside the pipe.
4. Turn on the power switch.
5. Release the Red Emergency Switch Off Button.
6. The machine starts when the OPC foot pedal is pressed down. Always hold the flexible shaft with both hands firmly while operating the machine.
7. Rotating the tool slowly makes it easier to move the tool forward inside the pipe.
8. The lifespan of the shaft outer casing can be prolonged by using a Sleeve Bearing designed for the outer casing.

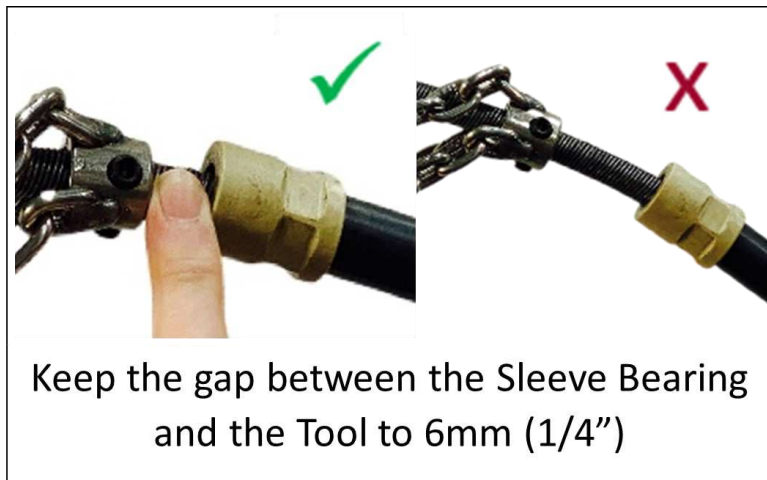
There is a mechanical safety clutch installed in the Mini Miller. If the machine is overloaded the safety clutch separates the shaft from the motor. The user will hear a loud noise when this happens. Release the foot pedal, pull the shaft back a little bit and continue working. If the safety clutch is released constantly the silicone spring inside of it may have worn down. Brief changing instructions can be found in this manual pages 17-18.

Avoid overloading the motor.

OPERATING INSTRUCTIONS

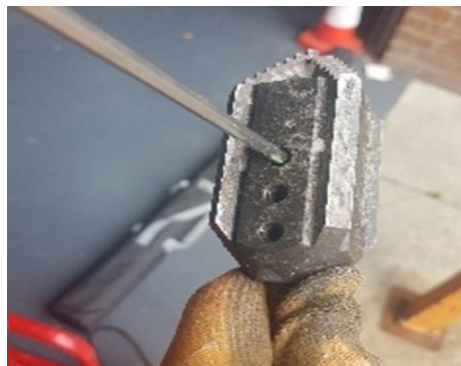
SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

ATTACHING TOOLS



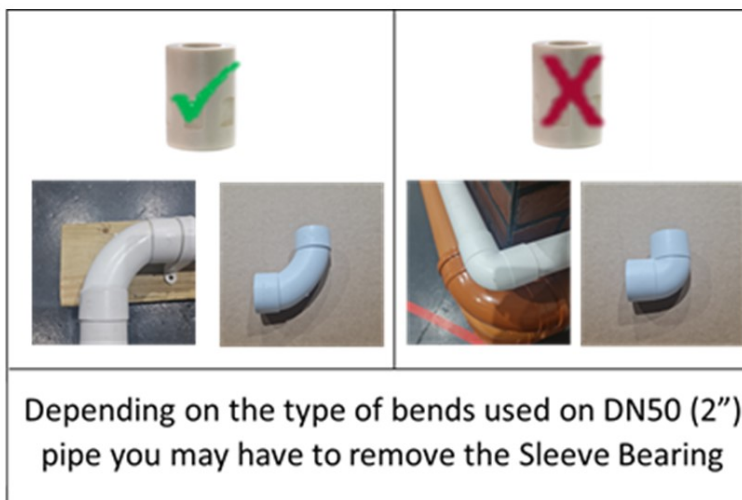
TIGHTENING THE SET SCREWS

When you add a tool always tighten the screws starting from the screw furthest away from the end of the flexible shaft (where applicable).



SLEEVE BEARING IN DN50 / 2" BENDS

Depending on the type of bend you may not be able to easily navigate a DN50 / 2" bend unless you first remove the Sleeve Bearing. This is usually the case for tight bends (see examples to the right).



ROTATION SPEED DIAL

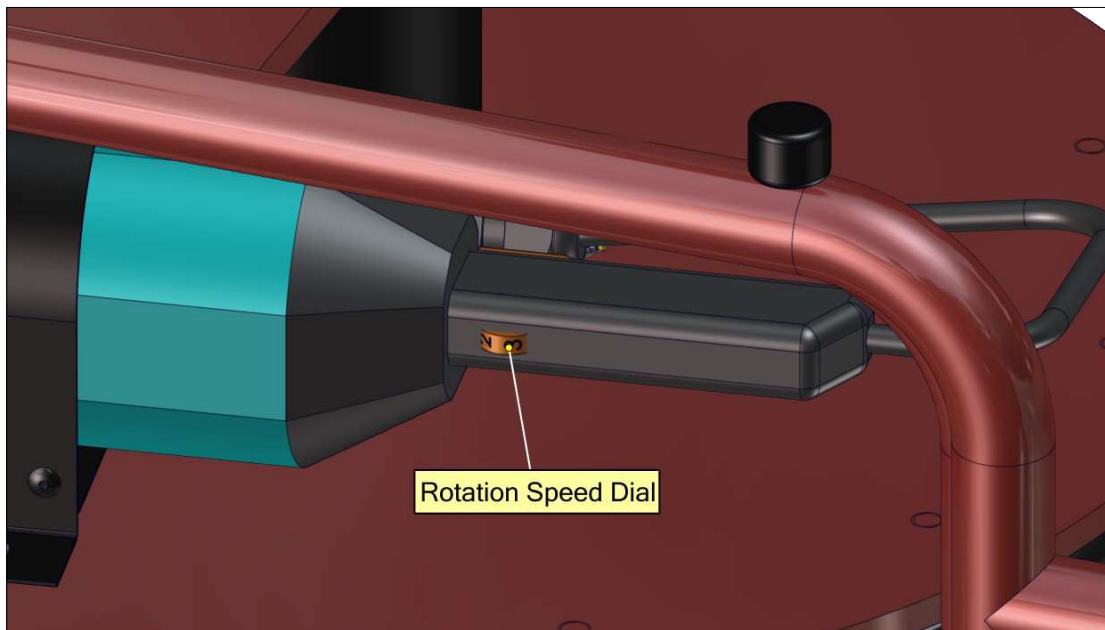
SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

WARNING

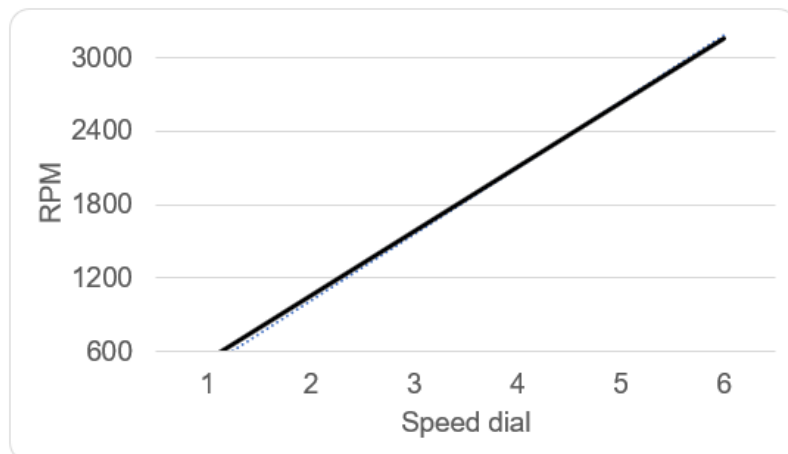
This section contains important safety information. Failure to comply could result in serious injury.

Optimal rotation speed of the Mini Miller is dependent on work load. Minimum rotation speed is normally best when moving the tool around tight bends. When beginning to work, adjust the speed up to the level which seems to work the best.

The speed dial can be found on the motor itself (see below image). Set the speed by rotating the button. Check the corresponding rotation speed from table below.



Rotation Speed	Speed dial					
3200						X
2700				X		
2100			X			
1500		X				
900	X					
600	X					
	1	2	3	4	5	6



MAINTENANCE PROGRAMME & WARRANTY PERIODS

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Maintenance task	Months			
	3	6	12	24
Change motor carbon brushes			I	R
Tightness of motor fixing			I	I
Alignment of motor			I	I
Condition of frame			I	I
Condition of wheels & rubber bushes			I	I
Condition of control box			I	I
Condition of electric cables	I	I	I	I
Condition of electrical connections	I	I	I	I
Lubricate Shaft	P	P	P	P
Operation of E-Stop	I	I	I	I
Safety clutch silicone ring	I	I	I	I
Operation of safety clutch	I	I	I	I

I: Inspect, fix or replace if needed.

P: Perform, replace if needed.

R: Replace

WARRANTY PERIODS

Picote Solutions grants limited warranty for certain machines, equipment & components. Read more detailed information on page 29 (Picote Warranty Policy and Procedure).

Service Period	3 months	6 months	1 year
A			
B			
C			

A Milling machine & spare parts, except:

B Electric motors

C Service Centre repair work

WARNING



1. Before performing any maintenance always check that the machine is fully turned off and unplugged.
2. Always inspect the flexible shaft before each use. If there are potential weak points, or the shaft is damaged, cut off the damaged length using a band saw or replace the entire shaft as needed.
3. For safety and efficiency, always keep the machine and its motor, drive unit, ventilation and cooling slots clean.
4. Remove handguard and check that the screws for the shaft socket are securely tightened (weekly).
5. Check that all the bolts and screws on the machine are securely tightened.
6. It is recommended that the oil in the bevel gear should be changed about every 12 months. Only use regular oil developed for gearboxes.

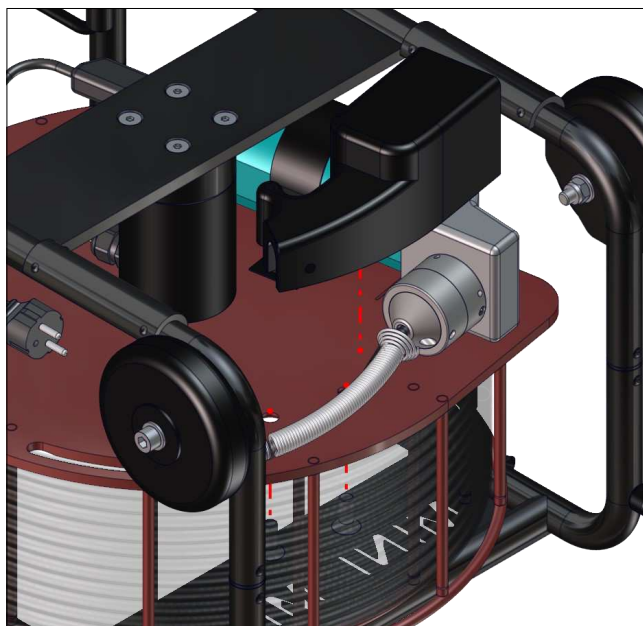
REPLACING CARBON BRUSHES

Remove and check carbon brushes regularly and replace when worn down to the limit mark. See page 13 for maintenance intervals. Keep the carbon brushes clean and free to slip in the holders. Both carbon brushes should be replaced at the same time. Use only identical carbon brushes.

New Mini Millers have a maintenance hole for carbon brush changing. Skip to step 4. For older versions the complete motor needs to be removed in order to change both of the carbon brushes. Follow the steps shown below.

Use a screwdriver to remove the brush holder caps. Take out the worn carbon brushes, insert the new ones and secure the brush holder caps.

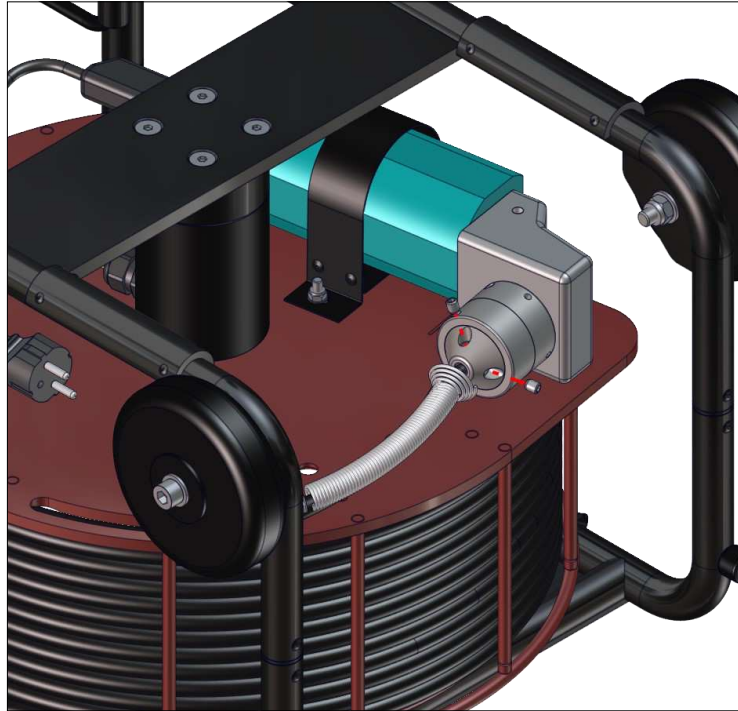
Step 1. Open Allen Bolts and remove the hand guard.



MAINTENANCE

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

Step 2. Open Set Screws and detach the shaft from the Safety Clutch.



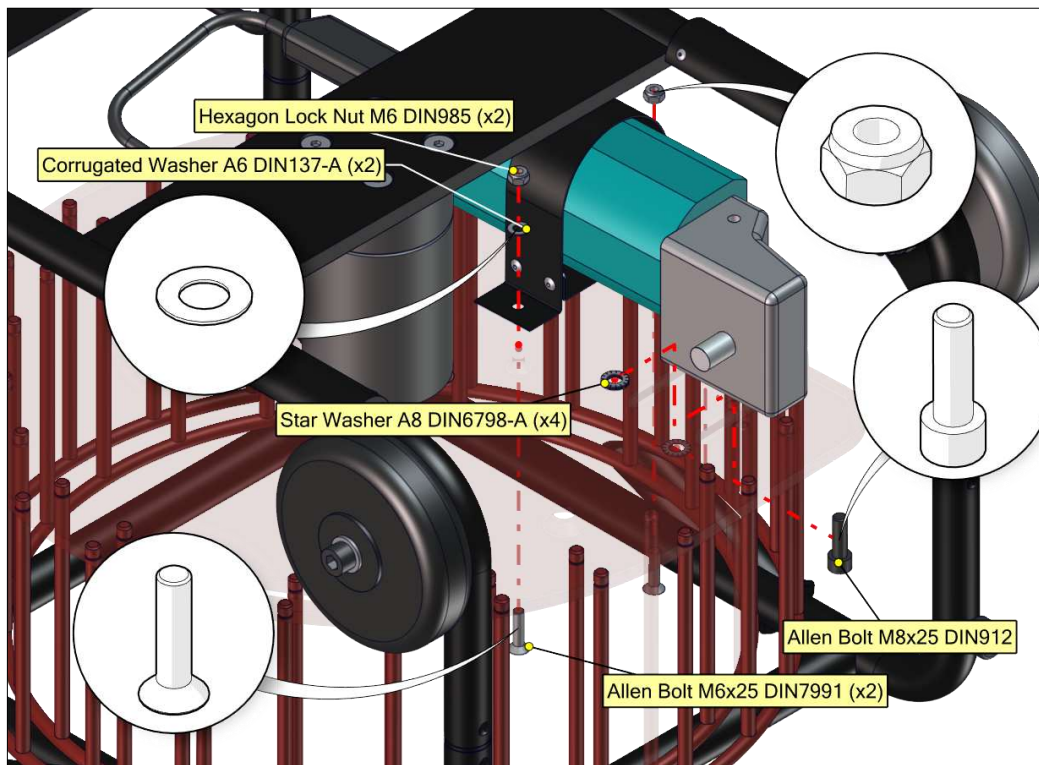
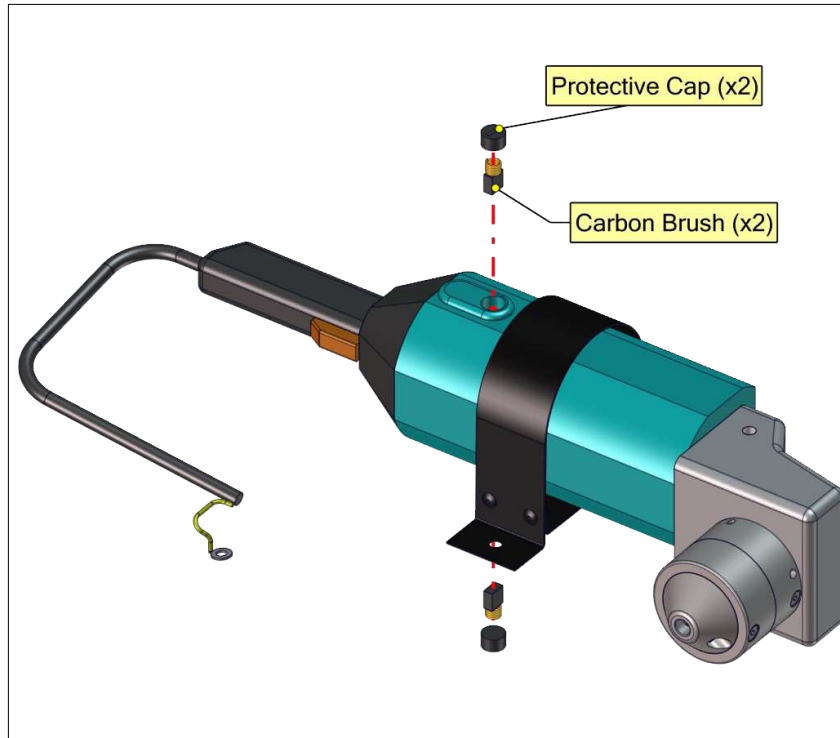
Step 3. Open the Allen Bolts which attach the motor to the reel.



MAINTENANCE

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

Step 4. Open the protective caps with a screwdriver and replace both of the carbon brushes. Repeat the steps in reverse order to reassemble. Tighten the Allen Bolt which attaches the motor to the reel with torque of 12 Nm. **Recommended use of Loctite 542.**

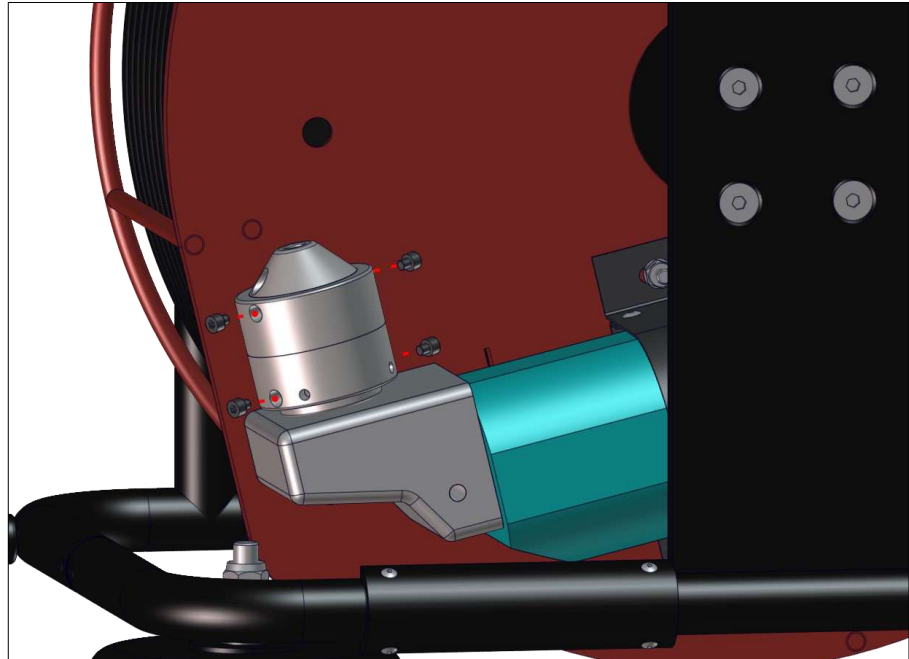


REPLACING SAFETY CLUTCH SPRING

Remove and check the silicone spring of the Safety Clutch regularly and replace when worn down. When safety clutch begins to release constantly the spring should be changed.

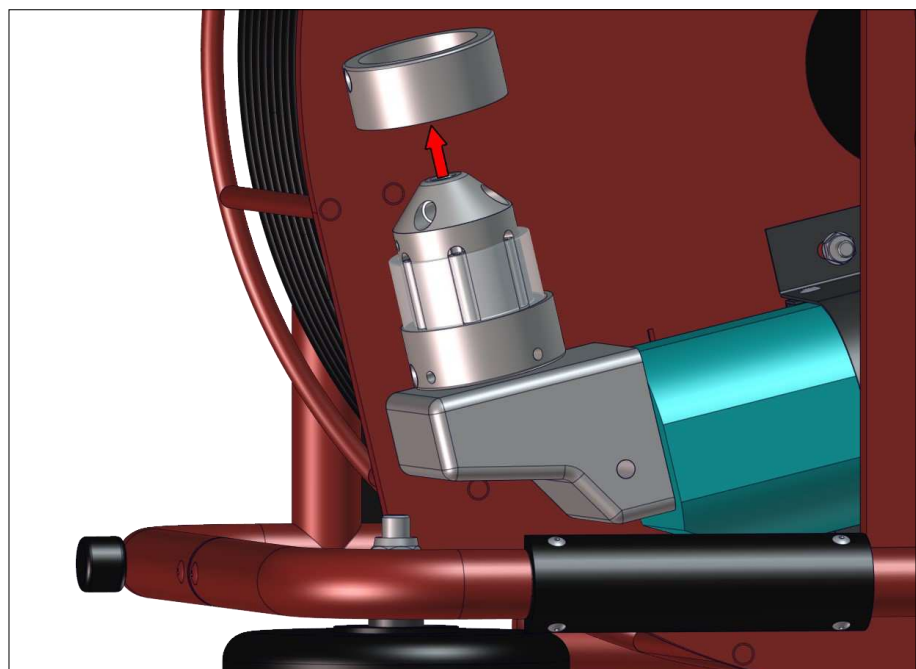
The silicone spring can be easily changed even in field conditions.

Step 1. Remove the hand guard and detach the flexible shaft from the Safety Clutch. Open and remove four screws from the Safety Clutch Covers.

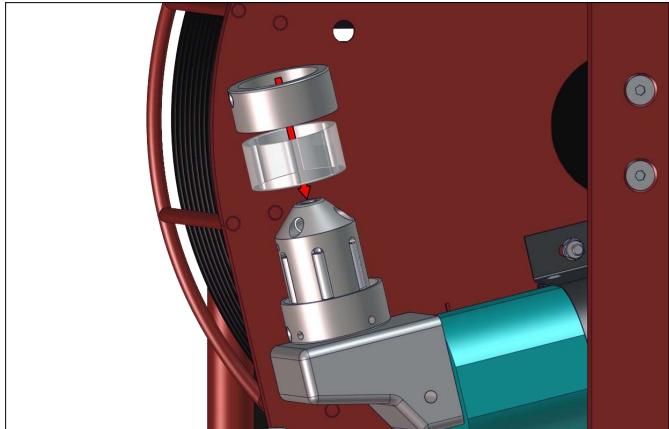


Step 2. Remove the Upper Cover and push the Lower Cover down.

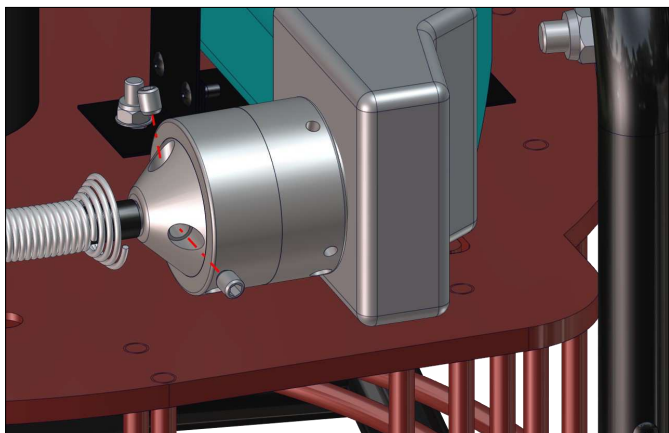
NOTE: The silicone ring for the Mini Miller and Mini Miller +C is WHITE.



Step 3. Remove the old Silicone Spring and replace it with a new one. Be careful not to drop axles from the heart of the clutch. Repeat the steps in **reverse order**.



Step 4. The correct way to install shaft into the safety clutch is shown below. There should only be 3mm or 1/8" between the outer casing and safety clutch. Push the shaft all the way to the end of the safety clutch. **Recommended : use Loctite 542.**



INSPECTING FLEXIBLE SHAFT FOR DAMAGE

Carefully inspect the flexible shaft and its casing on a regular basis to ensure that there are no signs of wear and tear. Change the flexible shaft and casing as and when required. Damaged shaft needs to be trimmed back before attaching tools (see examples to right).



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SERVICING THE FLEXIBLE SHAFT & ITS OUTER CASING

The flexible shaft is pre-treated with Picote Flexible Shaft Lubricant and the casing replaced prior to shipping. Always inspect the condition of the shaft and its outer casing regularly. Also, inspect at least once a week that the shaft is well attached under the hand guard at the machine end. If the shaft appears to have gaps between the windings from the beginning to the end, the entire shaft will need to be replaced.

Lubricant can be added between the flexible shaft and its outer casing when the shaft is attached to the machine. To add lubricant the shaft has to be disconnected from the clutch and removed from the reel. Around 1 -1.5m (3-5ft) of shaft should be removed from the outer casing, with the lubricant applied to the inside of the casing. No more than **20ml/20g/1oz** will be required for the entire shaft. Too much lubricant can cause a strain on the shaft. After the lubricant has been poured, the free shaft end should be pushed through the outer casing. The shaft will push the lubricant evenly inside the outer casing. Connect the shaft to the machine and rotate on a low rotation speed so that the shaft will push excess lubricant to the outside. Use a mat to protect the work area under the machine to prevent damage to floors.

Keeping the shaft well lubricated will prolong its lifespan and decrease the friction caused by the shaft while it turns round. Lower friction will decrease the burden caused to the motor.

If preferred, the shaft can be taken out of its outer casing for lubrication.

Appropriate oil to use: Picote Flexible Shaft Lubricant (available from your reseller)

CHANGING THE FLEXIBLE SHAFT

Only use the shaft and its special outer casing specified by Picote Solutions. Order the replacement shaft from your reseller. The flexible shaft is pre-treated with Picote Flexible Shaft Lubricant and the casing replaced prior to shipping.

1. Loosen the bolts holding the hand guard and remove the hand guard.
2. Open bolt which is holding strain relief spring.
3. Loosen the screws in the safety clutch that hold the shaft. Pull strain relief spring away from the shaft. Pull the old shaft out of the machine.
4. Insert new shaft. Before inserting the shaft inside the safety clutch, add strain relief spring and tighten it. Verify that the shaft goes all the way to the end. Tighten the screws.
5. Mount the hand guard. Tighten the bolts.

FLEXIBLE SHAFT EXTENSION



Flexible shafts extensions are available for the Mini Miller and Mini Miller +C in lengths of 10 metres (33ft). **Do not** extend the shaft by more than **one** extension and only use a Picote shaft extension and connector.

Before attaching or removing the shaft extension always make sure that the machine is fully turned off and unplugged.

1. Machine as far as possible with the flexible shaft before fitting the extension.
2. Remove the flexible shaft from the pipe.
3. Push the extension down the pipe and then connect onto the existing flexible shaft using a shaft connector.

Note: for vertical pipes connect the extension onto the existing flexible shaft before pushing the extension down the pipe.

ACCESSORIES & SPARE PARTS

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

▲WARNING

You must use only the Picote Solutions accessories and attachments with the machine described in this operations manual. The use of other accessories or attachments could present a risk of injury or death. The accessories or attachments should only be used in the proper and intended manner, and always follow Picote Solutions instructions.

MINI MILLER

3540000817	Mini Miller G8/16	3540001817	Mini Miller +C 8/16 EU
3540000817US	Mini Miller G8/16 110V US	3540001817US	Mini Miller +C 8/16 US
3540000817UK	Mini Miller G8/16 110V UK	3540001817UK	Mini Miller +C 8/16 AU

MINI COATING PUMP

2220100001	Mini Coating Pump EU, AUS 230v (Now includes 3 hose connectors and 2 brush stoppers)
2220100002	Mini Coating Pump U.S., UK 110v (Now includes 3 hose connectors and 2 brush stoppers)

SPARE PARTS

1312030085017	Mini Miller / 8mm Shaft Thick Casing / 17.5 metres (57.4ft)
1312030085010	Flexible Shaft 8mm Thick Casing / 10 metres (33ft)
9123050001	Shaft Connector 8mm/8mm
93212321085	Sleeve bearing 8mm
9530000134	Strain Relief Micro/Mini 9/13mm casing
9530000134-1	Strain Relief Spring Micro/Mini for Safety Clutch
9530000041	Safety Clutch Upgrade Kit for Micro and Mini Millers
900000856	Micro/Mini Miller Safety Clutch
900000920	Silicone Spring 5pcs, spare parts (WHITE)
1350000020	Picote Flexible Shaft Lubricant 0.5 liters
1350000021	Picote Flexible Shaft Lubricant Package, includes 6 bottles

ADDITIONAL TOOLS

1350000005	Pliers	1350000012	Cutter for Side Grinding Panels
1350000018	Shaft Rounder	1350000008	Hex Key 4mm
1350000006	Sheath Cutter 1	1350000009	Hex Key 3mm
1350000011	Sheath Cutter 2 (Shaft inside outer casing)	1350000010	Hex Key 2.5mm
1350000013	Combo Hex Key 1-6mm		

Here are some useful tips on how to get the most out of your Picote system. Always use the recommended tools for maintenance to avoid personal injury.



CUTTING THE FLEXIBLE SHAFT



Always inspect the flexible shaft before each use. Run the machine briefly in clockwise direction to allow the shaft to return to its resting position. If there are potential weak points or the shaft is damaged, cut off the damaged length using a band saw. For most tools, the shaft should extend ~40mm (1 ½") past the casing. Hubs and Original chains without a leader require more exposed shaft.

CUTTING THE OUTER CASING



Always inspect the outer casing before each use. The easiest and safest way to shorten the outer casing to the correct length is using a sheath cutter. Only the necessary amount of bare shaft should be exposed at any time.



SHAFT ROUNDER



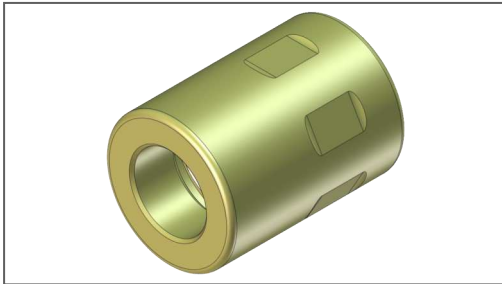
The Shaft Rounder is used to smooth the end of the flexible shaft, preventing the user from being cut by the otherwise sharp metal edge .



Here are some useful tips on how to get the most out of your Picote system.
Always use the recommended tools for maintenance to avoid personal injury.

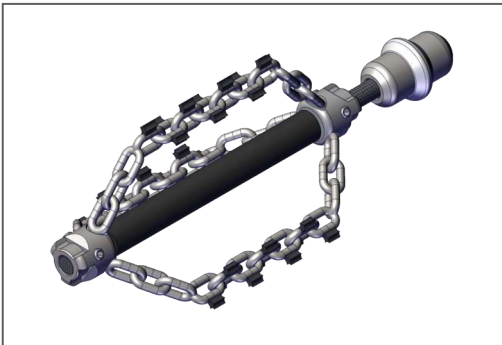


SLEEVE BEARING



Always use a Sleeve Bearing when working with the Mini Miller or Mini Miller +C. It prolongs the lifetime of the flexible shaft and prevents the outer casing from melting in the tool end. Sleeve bearings can be reused when outer casing is shortened.

CREATING LEADERS



You can extend the life of the flexible shaft and increase productivity on site by making individual leaders for the most commonly used tools. This way you can easily and quickly switch between tools. **Leaders should always be used if the situation permits it.**



ADDING A VISUAL MARKER FOR SAFETY



If not using a “leader” attach a visual marker (tape) on the outer casing of the flexible shaft. Place it around 500mm (20”) from the end of the shaft. The marker will indicate the tools location and help prevent possible injury from the rotating parts by alerting you when the tool is about to exit the pipe.



MINI MILLER +C 8/16

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE



This machine is intended for the following uses;

1. Tool for inspecting pipes before, during and after work (Navigates through DN50 (2") bends)
2. Working inside pipes; the CCTV is fitted with an integrated Sonde (512hz)

Always follow the Picote Solutions instructions when installing and using the machine with accessories.

MINI MILLER +C | CAMERA KIT INSTRUCTIONS

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

CAUTION This section contains operating instructions only for Mini Miller +C camera kit

BEFORE OPERATION:

1. Before using the +C camera kit, install an SD card to SD card slot.
2. Connect DVR to camera reel with included cable




STARTING & USING THE MACHINE


DVR Icons:


1. SD Card
2. Battery level
3. Image Reverse
4. Image Reverse & Mirror
5. Image Mirror
6. Timestamp
7. LED Brightness
8. Record
9. Meter Counter




1. Live video

Press  to turn on/off the DVR


Press  to start/stop recording

Press  to mirror or/and reverse the image


Press  to adjust the brightness of the camera LEDs


Press  to take a picture

2. Video settings menu


Press  to enter settings menu

Use  and  to navigate in the menu


Press  to confirm the selection

Press  to exit to exit the settings menu

3. Playback menu


Press  to enter playback mode

Use  and  to browse through the files


Press  to confirm the selection and preview media files

Use  and  to preview previous/next file

Press  to playback video

Press  to enter the play settings


4. Playing video

Press  to play/pause the video



Press  to stop playing the video

Press  to rewind

Press  to forward

Press  to change rewind/forward speed

5. DVR settings menu

Press  to enter video settings,
then press  to enter DVR settings

MINI MILLER +C | CAMERA TECHNICAL DATA

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

	ITEM	PARAMETER
General	Unit Weight	14 Kg or 31 lbs
Camera	Camera Size	Φ23mm×45mm (Main body)
	Video Resolution	PAL 720×576 25FPS Max. NTSC 720×488 30FPS Max
	Front Lens	Sapphire
	Shell Material	304# Stainless Steel
	Lighting	Built-in 12xLED (White)
	Water-Proof	20 m or 65 ft Water
	Power Consumption	70 mA (LED OFF), 140 mA (LED ON)
	DVR	Screen
Screen Resolution		800x480 RGB
Features		Sonde, self-levelling, image mirror, image flip
External Memory		SD Memory Card up to 32GB
Cable Length		30 m or 100 ft
Meter Counter		Yes
Single Charge Work Time		6 Hours
Charging time		8 Hours
Language		English, German, French, Spanish, Italian, Chinese, Japanese, Russian, Portuguese
Tool Box	Size	380x260x150 mm (15x10x6 in.)(L x W x H)

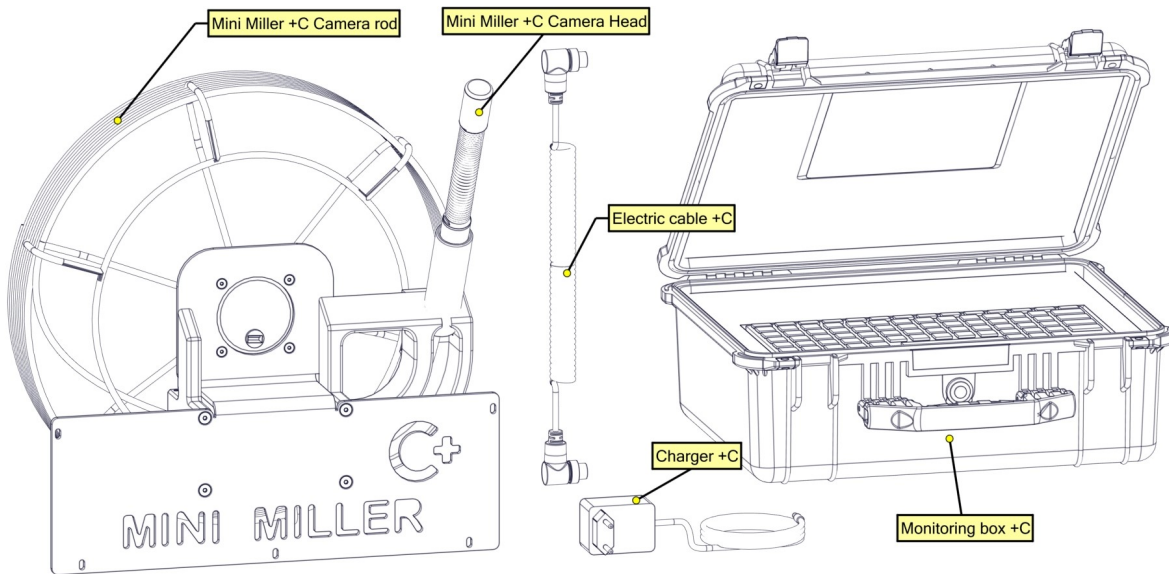
SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

MINI MILLER +C update kit

3540001000EU	Mini Miller +C EU
3540001000US	Mini Miller +C US
3540001000UK	Mini Miller +C UK
3540001000AU	Mini Miller +C AU

SPARE PARTS

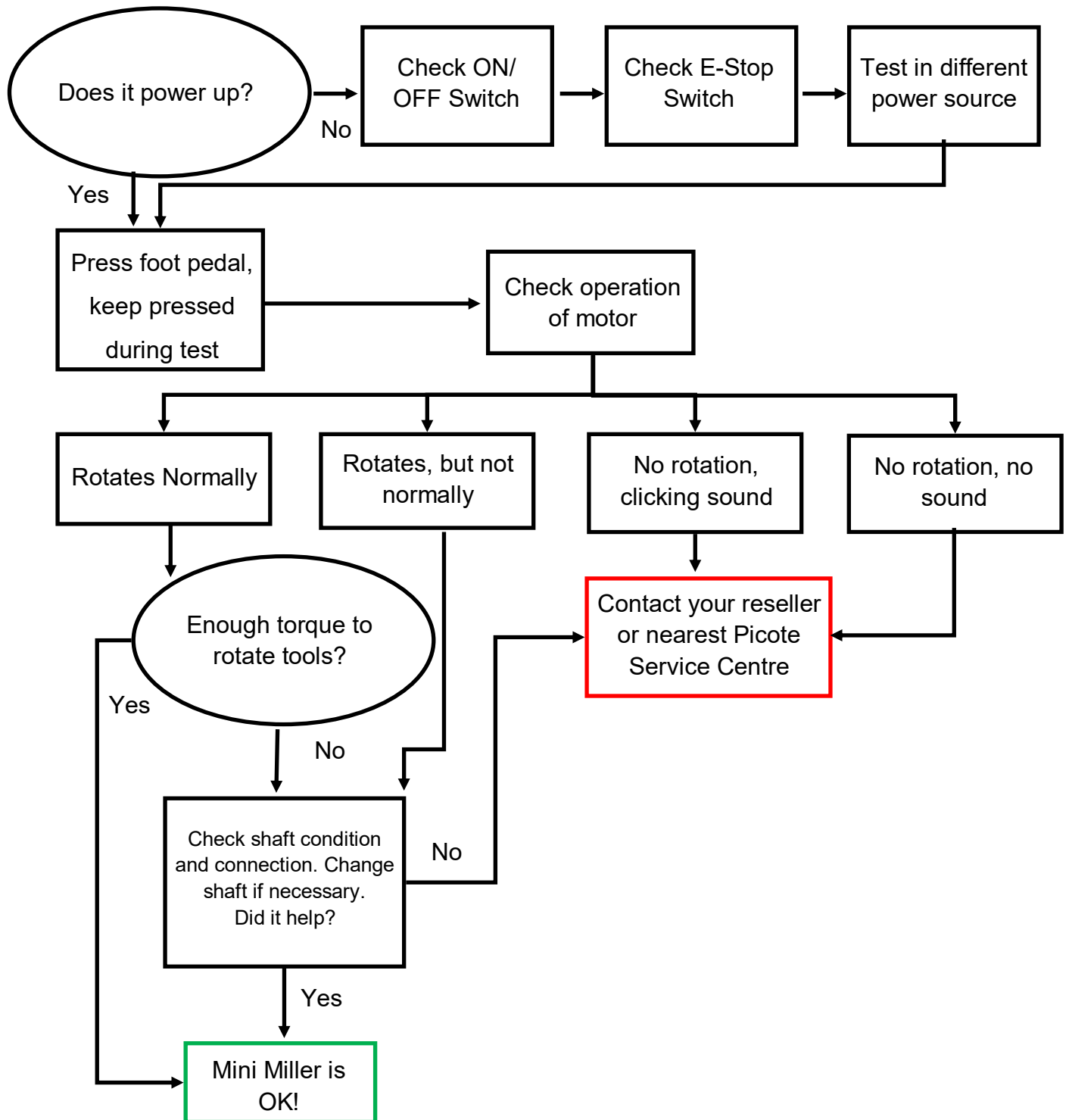
900001754	Mini Miller +C Camera Head
900001688	+C Charger EU
900001691	+C Charger US
900001689	+C Charger UK
900001804	Mini Miller +C Camera Rod
900001758	Electric cable +C
900001755	Monitoring Box +C



Number (config)	Description (config)	Qty
900001758	Electric cable +C	1
900001804	Mini Miller +C Camera rod	1
900001688 (EU), 900001691 (US), 900001689 (UK)	Charger +C	1
900001754	Mini Miller +C Camera Head	1
900001755	Monitoring box +C	1

TROUBLESHOOTING FLOWCHART

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE



If there is problem that you cannot resolve with this manual, please consult your Picote Reseller or Picote Solutions at claims@picotesolutions.fi.

WARRANTY POLICY & PROCEDURE

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

Limited Warranty:

Picote warrants to the original End User that the Product purchased by such End User will operate in accordance with, and substantially conform to their published specifications when shipped or otherwise delivered to the End User and for a period of one (1) year, except electric motors for which the warranty period shall be six (6) months, provided, however, that Picote does not warrant any claim or damage under this Warranty if such claim or damage results from:

1. Consumable parts or normal wear and tear resulting from use of the Products,
2. Product overload or overheated motor,
3. Regular periodic maintenance of Products,
4. Misuse, neglect, or improper installation or maintenance of the Products, or use of Products not for their intended purpose,
5. Products that have been altered, modified, repaired, opened or tampered with by anyone other than Picote or an authorized Picote Service Centre, or unsuitable or unauthorized spare parts, accessories or third party products when using the Products or;
6. the use of the Products not in compliance with their respective Documentation, user manuals, safety and maintenance instructions, and any usage restrictions contained therein, or
7. accident, fire, power failure, power surge, or other hazard.

Otherwise, the Products are sold AS IS. End User is responsible for using the Products within their specifications and instructions as contained in the Documentation.

EXCEPT AS SPECIFIED IN THIS WARRANTY, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON INFRINGEMENT, SATISFACTORY QUALITY OR ARISING FROM A COURSE OF DEALING, LAW, USAGE, OR TRADE PRACTICE, ARE HEREBY EXCLUDED TO THE EXTENT ALLOWED BY APPLICABLE LAW. TO THE EXTENT AN IMPLIED WARRANTY CANNOT BE EXCLUDED, SUCH WARRANTY IS LIMITED IN DURATION TO THE WARRANTY PERIOD. BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, THE ABOVE LIMITATION MAY NOT APPLY. This disclaimer and exclusion shall apply even if the express warranty set forth above fails of its essential purpose.

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