

IRM 2500 – Rotation plate for oval rings (operating manual)

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Machine designation

This product is manufactured and marketed by the company Laban-Produkttechnik. The 'Rotation plate for oval rings' (IRM 2500) is labelled as follows.



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1 Introduction / information for the user







1.1 Purpose of this operating manual

This operating manual contains descriptions of the 'IRM 2500 – rotation plate for oval rings' fixture for the IRM 3 inner ring grinding and polishing machine. In-depth knowledge about the rotation plate and strict compliance with this operating manual are essential for satisfactory and problem-free machine / machine component operations. This document will not achieve its purpose if it does not reach the hands of the people entrusted with operating and monitoring the machine. The manual must be read to ensure perfect commissioning.

This manual contains important safety information as well as all the information users need regarding:

- **disassembly / assembly of the fixture**
- **description of the fixture's function**
- **setting up and tooling the fixture**
- **commissioning / operating the fixture**
- **maintaining the fixture**

1.2 Pictograms / explanation of pictograms

Pictogram	Explanation of pictogram
	<u>Danger</u> Non-compliance with this information will result in the risk of very serious injury to the user. This information must be observed in order to protect the user from serious injury and harm and / or to prevent damage to the machine or machine parts.
	<u>Warning</u> This information must be observed in order to protect the user from injury and harm and / or to prevent damage to the machine or machine parts.
	<u>Caution</u> This information must be observed in order to protect the user from possible harm and to prevent damage to the machine or machine parts.
	<u>Information</u> This note contains general and / or additional information that should be observed in order to prevent damage to the machine or machine parts. The safety of the user and perfect machine functions can only be ensured if this information is observed.
	<u>Announcement of request for action / order of steps</u> This note indicates one or more requests for action on the part of the user and specifies the order in which individual sequences should be undertaken.
	<u>Request for action</u> This note requests that the user carry out an action which is essential for subsequent assembly / operating steps.

1.3 Important safety information

Read the following information through carefully before starting up the 'rotation plate for oval rings'. This will protect you and prevent damage to the device / machine / machine components.



⚡ HIGH VOLTAGE CURRENT – RISK OF DEATH

High voltage current – risk of fatal electric shock

Safety measures

- ☒ NEVER touch electric cables / electric control units
- ☒ NEVER carry out any maintenance work or repairs on the electrics, control unit, motors or lifting magnets. Instead always notify a qualified service technician of the work required
- ☒ Only open the control housing / switch cabinet when the machine is SWITCHED OFF



WARNING – RISK OF INJURY

Rotating parts – risk of injury

Safety measures

- ☒ NEVER reach into rotating / turning machine parts
- ☒ NEVER touch a running belt drive / grinding belt
- ☒ Only use machine elements / components for their intended purpose



CAUTION

- ☒ Never carry out any maintenance work or repairs. Instead always notify a qualified service technician of the work needed



Please note that only one 'rotation plate for oval rings' can ever be attached to the machine at any one time.



You will find more safety information and precautionary measures at appropriate points in the text and/or in the machine circuit diagrams provided (see switch cabinet).



Keep this document in a place where it can be accessed at all times. Careful reading of this manual is essential for problem-free commissioning of the 'rotation plate for oval rings'.

1.4 Intended use



The only sure way to avoid risk to user and machine is through observance of the safety measures illustrated and listed in this operating manual, using the machine and machine parts / components for their intended purpose and observance of the information relating to risks, caution and safety.

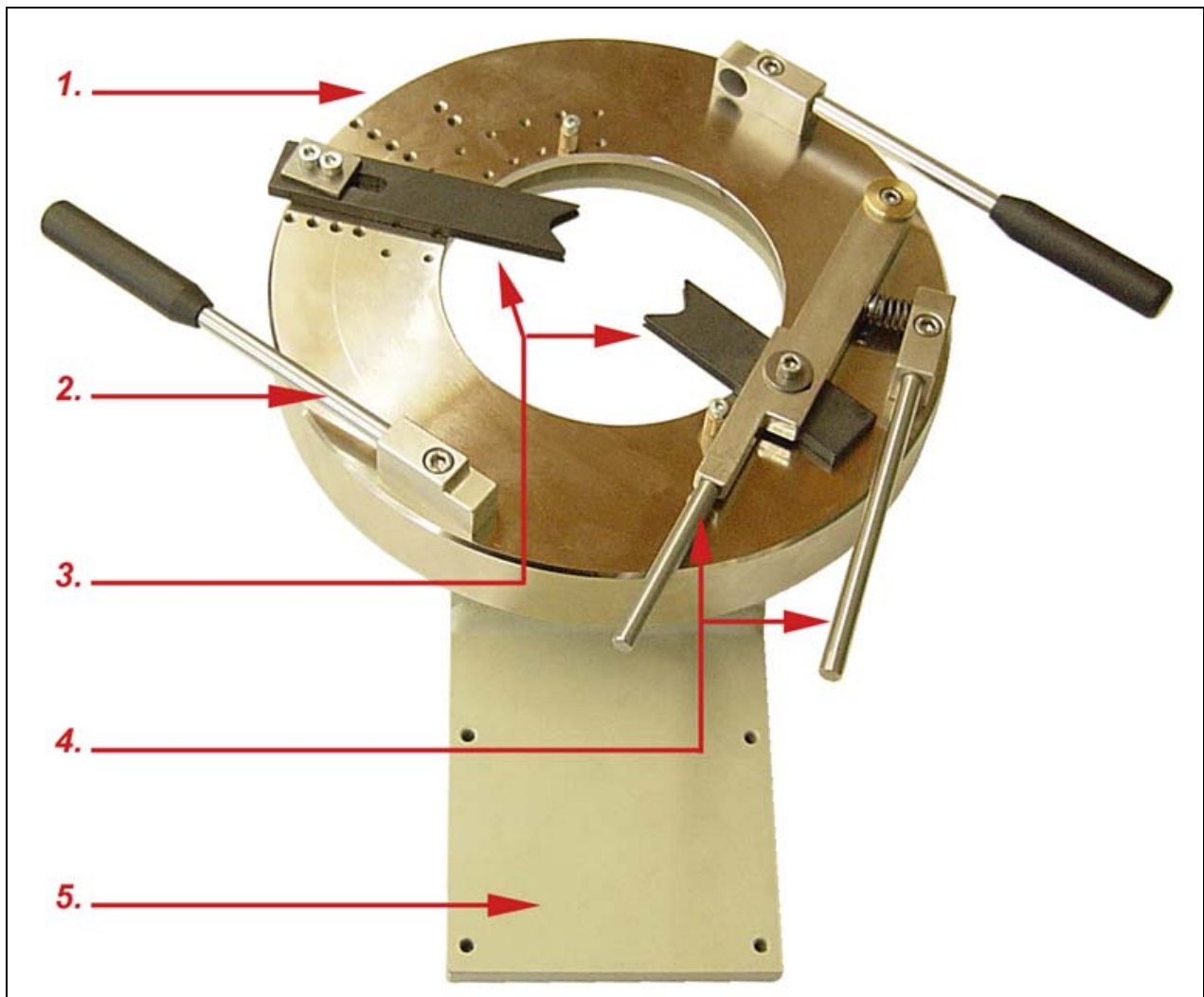
1.5 Reference to the rotation plate for oval rings

The 'rotation plate for oval rings' is usually referred to as the fixture throughout the operating manual. Please note that the following designations have the same meaning / describe the same product:

- **IRM 2500**
- **rotation plate for oval rings**
- **attachment for oval rings**
- **fixture**
- **attachment**

2 Discription of fixture

2.1 Detailed view / basic setting



Item	Description
1	Rotation plate
2	Grab handles (belt guidance)
3	Clamping jaws
4	Clamping lever system
5	Support

2.2 Description of function (general)



Please note that only one 'rotation plate for oval rings' can ever be attached to the machine at any one time

Description of fixture's function

As an accessory for the IRM 3 inner ring grinding and polishing machine, the semi-automatic IRM 2500 attachment (*rotation plate for oval rings*) allows for the even and simple grinding and polishing of oval ring instruments, pincers and clamps.

Work loads are greatly reduced when compared with those of manual grinding and polishing of oval rings. Productivity is also improved by the low-force machining process.

One major advantage offered by the 'rotation plate for oval rings' is its clean and uniform grinding pattern. When compared with manual machining, the attachment achieves a considerably better grinding pattern.

"Consistent ring machining satisfies the quality requirements of our customers"

2.3 Technical data

Materials used:

Nickel-plated steel St1203

Size of rotation plate:

Outer diameter: 258 mm

Inner diameter: 130 mm

Height: 35 mm

Size of support:

Length: 153 mm

Width: 120 mm

Weight:

Net 7.5 kg

3 Assembly / commissioning

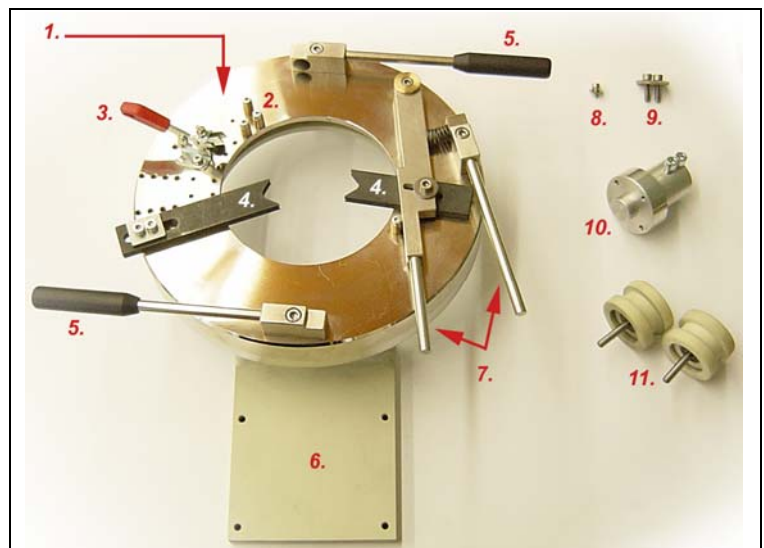
3.1 Scope of supply



Before assembling the fixture, ensure that all the components needed can be found in the packaging. If any parts are missing or damaged, get in touch with us right away (*Address -> Section 6*).

Content of packaging

The following parts can be found in the packaging:



Item	Description	Quantity
1.	Rotation plate	1
2.	Stop bolt	3
3.	Clamping lever	1
4.	Clamping jaws	2
5.	Grab handles (for belt guidance)	2
6.	Support (rotation plate for oval rings)	1
7.	Clamping lever system (clamp for clamping jaws)	1
8.	Spare screw (M4)	1
9.	Small base plate / screws (M5)	2 each
10.	Flange (for contact disc)	1
11.	Belt release reels (for oval rings)	2

3.2 Disassembling the standard fixture – IRM 1700



Before you can fit the new 'IRM 2500' fixture for oval rings, you will have to disassemble the 'IRM 1700' standard fixture. You should comply strictly with the steps listed here in the assembly instructions for your own safety and to protect the machine / machine components.



STEP 1



WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

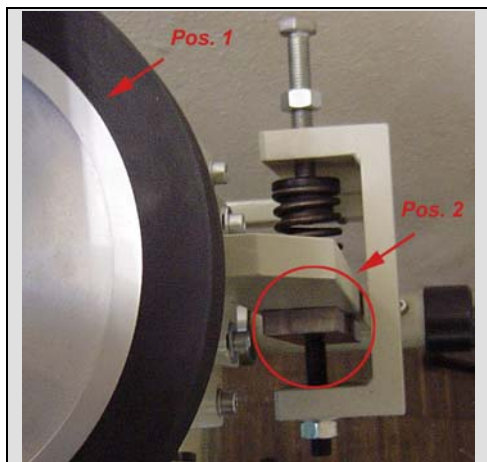
☑ Ensure that the machine is SWITCHED OFF



☑ Switch off the machine.



☑ Disconnect the high voltage cable from the socket.



STEP 2



☑ Press the bracket for the contact disc drive motor backwards towards the spring. *(Photo on left)*



☑ Place a wedge / spacer piece underneath. *(Item 2)*



In order to be able to change the rotation plate fitted, the distance between the fitted contact disc (*item 1*) and the rotation plate must be at least 3 cm.



STEP 3



☑ Ensure that you have sufficient space between the rotation plate and contact discs. *(Photo on left)*



In order to be able to change the rotation plate fitted, the distance between the fitted contact disc (*item 1*) and the rotation plate must be at least 3 cm.



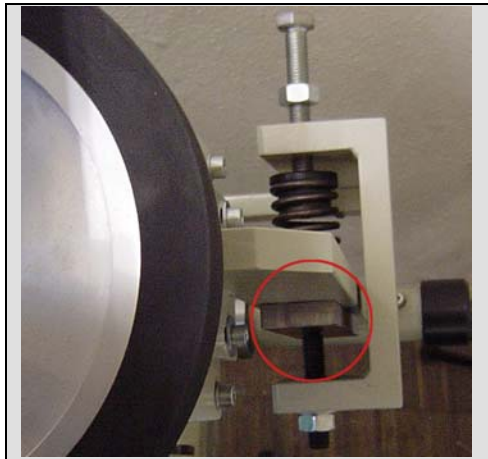
STEP 4



Caution

- ☑ 2 people must always be involved in removing the rotation plate
- ☑ Secure the rotation plate to prevent it from falling
- ☑ 2 people must be involved in transporting the rotation plate

- ☑ Have a second person secure the rotation plate to prevent it from falling.
- ☑ Loosen the 4 screws from the rear / base of the fitted 'IRM 1700' standard rotation plate. (*Photo on left*)
- ☑ Engage the assistance of a second person to lift the rotation plate out of the bracket.



STEP 5

- ☑ Press the bracket for the contact disc drive motor backwards towards the spring.
- ☑ Remove the wedge / spacer piece from the rotation plate drive motor's bracket.

3.3 Assembling rotation plate for oval rings – IRM 2500



Before you can fit the new IRM 2500 fixture 'attachment for oval rings', you will have to disassemble the IRM 1700 standard fixture (Section 3.2). You should comply strictly with the steps listed here in the assembly instructions for your own safety and to protect the machine / machine parts.

➡ STEP 1

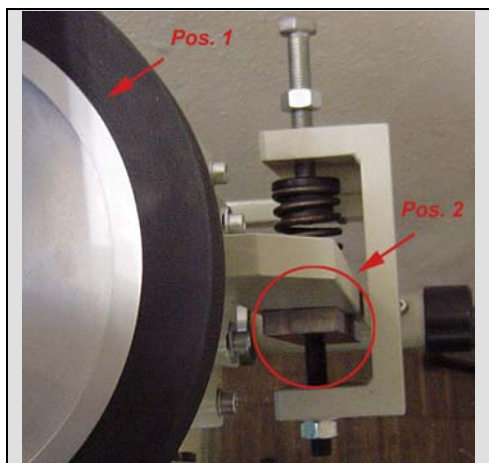


WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

☑ Ensure that the machine is SWITCHED OFF

- ☑ Switch off the machine.
- ☑ Disconnect the high voltage cable from the socket.



➡ STEP 2

- ☑ Press the bracket for the contact disc drive motor backwards towards the spring. (Photo on left)
- ☑ Place a wedge / spacer piece underneath. (Item 2)



In order to be able to change the rotation plate fitted, the distance between the fitted contact disc (item 1) and the rotation plate must be at least 3 cm.



➡ STEP 3



CAUTION

- ☑ 2 people must always be involved in fitting the rotation plate
- ☑ Secure the rotation plate to prevent it from falling
- ☑ 2 people must be involved in transporting the rotation plate

- ☑ Place the pre-assembled 'rotation plate for oval rings' (IRM 2500) and support on the rotation plate bracket intended for this purpose.
- ☑ Insert screws on the underside of the rotation plate bracket to secure the plate.
- ☑ Tighten the screws.



➡ **STEP 4**

The contact disc's flange must be replaced to ensure that the rotation plate functions perfectly.

- ☑ Loosen the screws for the standard flange on the contact disc.
- ☑ Pull out the contact disc along with the flange.



➡ **STEP 5**

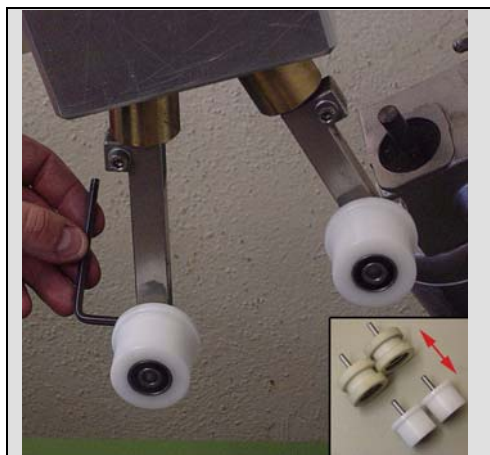
Replace the standard flange with the flange supplied. (*Scope of supply -> Section 3.1*)

- ☑ Loosen the 4 screws on the top of the contact disc.
- ☑ Pull out the standard flange and replace it with the flange supplied.
- ☑ Use the existing screws to fit the flange.
- ☑ Tighten the screws.



➡ **STEP 6**

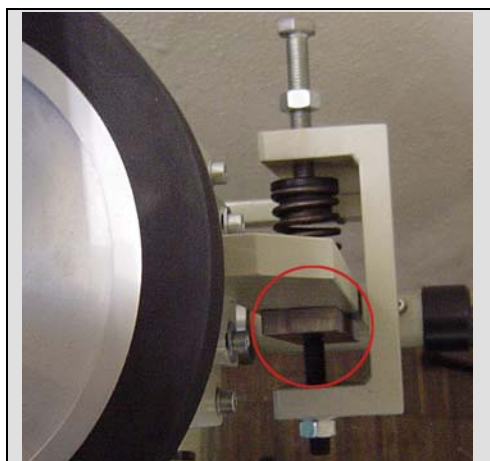
- ☑ Refit the contact disc along with flange in the position intended for this purpose.
- ☑ Tighten the screws.



➡ STEP 7

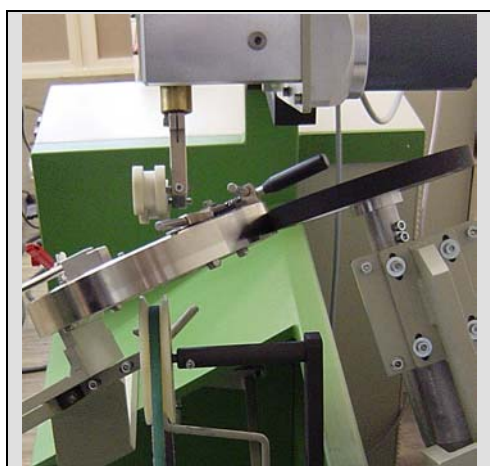
Replace the standard reels with the reels supplied.
(See scope of supply -> Section 3.1)

- ☑ Disassemble the standard reels and fit the belt release reels supplied for oval rings. (Small photo on left)



➡ STEP 8

- ☑ Press the bracket for the contact disc drive motor backwards towards the spring.
- ☑ Remove the wedge / spacer piece from the rotation plate drive motor's bracket.



➡ STEP 9

- ☑ Check that the contact disc is touching the 'rotation plate for oval rings'.
- ☑ If you have followed all the steps correctly, the 'rotation plate for oval rings' should be fitted as shown in the photo on the left.



To ensure that the attachment works perfectly, the contact disc must make contact with the 'rotation plate for oval rings'.

3.4 Disassembling rotation plate for oval rings – IRM 2500



Disassembly of the 'rotation plate for oval rings' is the same as disassembly of the IRM 1700 standard fixture..

Please disassemble the fixture following the instructions provided in Section 3.2.

4 Controls

The controls of the 'IRM 3 inner ring grinding and polishing machine' at a glance:



Item	Description
1.	Operating display / operating message
2.	Machine ON operating switch
3.	Belt release ON operating display
4.	Belt release selection switch (belt release ON / OFF)
5.	Fault display / fault message
6.	Machine OFF operating switch
7.	Belt tension ON operating display
8.	Belt tension selection switch (increased belt tension ON / OFF)
9.	Rotation plate speed control
10.	Emergency stop
11.	Grinding belt speed control
12.	Machining time setting (length of polishing / grinding)

5 Operations / operating the fixture



CAUTION

- ☑ Ensure that only trained staff instructed and trained in accordance with this operating manual operate the machine, machine components and 'rotation plate for oval rings'

5.1 Residual risks during commissioning



CAUTION

- ☑ Problem-free fixture operations can only be ensured if the 'rotation plate for oval rings' is fitted correctly and perfectly.

5.2 Switching the machine on and off

5.2.1 Switching the machine on



➡ STEP 1

- ☑ Turn the master switch to the right and into the ON position.



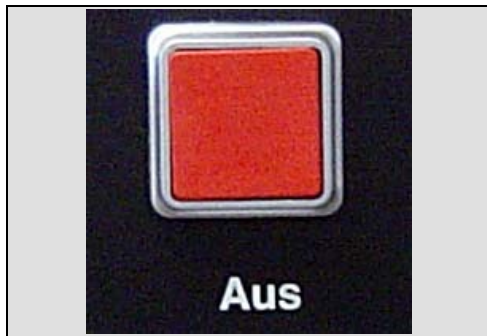
➡ STEP 2.

- ☑ Press the ON button.



The machine is now switched on and ready for operation.
The green operating display lights up.

5.2.2 Switching the machine off



STEP 1



Press the OFF button.



The machine is NO LONGER ready for operation.
The green operating display NO LONGER lights up.



STEP 2



Turn the master switch to the left and into the OFF position.

5.3 Emergency stop switch



The emergency stop switch is in the bottom right of the control panel.



In an emergency, press the emergency stop switch as quickly as possible.

Do not use the emergency stop switch to switch off the machine.

5.4 Tooling the rotation plate (retractor / narrow rings)



This section describes how to tool the rotation plate for various retractors, narrow rings and other similar instruments. You should comply strictly with the steps listed here in the assembly instructions for your own safety and to protect the machine / machine parts.



STEP 1



WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

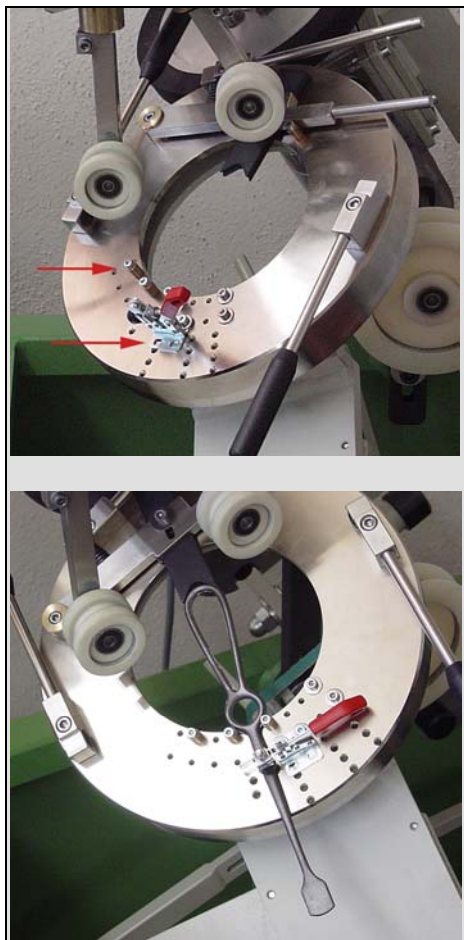
☑ Ensure that the machine is SWITCHED OFF



Switch off the machine.



Disconnect the high voltage cable from the socket.



STEP 2 - positioning the workpieces

Before you can actually tool the rotation plate for retractors and other similar instruments, the stop bolt and clamping lever must first be positioned on the rotation plate to match the workpieces and instruments to be machined.



Move the stop bolt and clamping lever such that the inner ring to be machined (the workpiece) is as close to the centre of the rotation plate as possible once inserted. (*Photo, top left*)



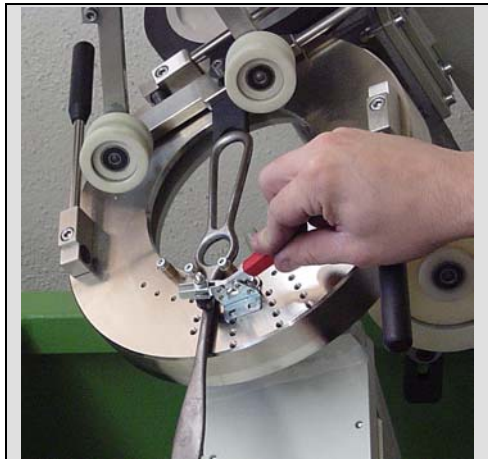
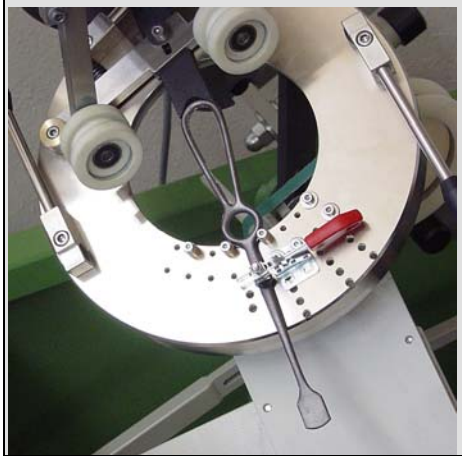
Position the stop bolt provided such that your workpiece or instrument is securely positioned in the rotation plate and cannot slide during grinding or polishing. (*Photo, bottom left*)



Note that you can use the clamping lever to easily tension / press down the workpiece. (*Photo, bottom left*)



To work as effectively and cleanly as possible, you should position your workpiece as close to the centre of the rotation plate as possible.



STEP 3 - inserting the workpieces



WARNING – RISK OF INJURY – risk of crushing

Risk of injury from rotating / moving machine parts

Risk of crushing (clamping lever / workpiece)

- ☑ Ensure that the machine is SWITCHED OFF
- ☑ Ensure that the workpiece is firmly clamped in
- ☑ Ensure that the clamping lever is NOT touching anywhere



Press the clamping lever system together. *(Photo, top left)*



Insert / position your workpiece or instrument such that the inner ring to be machined (*the workpiece*) is as close to the centre of the fixture as possible. *(Photo, bottom left)*



Clamp your workpiece or instrument by releasing the clamping lever system again. *(Photo, top left)*



STEP 4 - clamping the workpieces



WARNING – RISK OF INJURY – risk of crushing

Risk of crushing (clamping lever / workpiece)

Risk of injury from rotating / moving machine parts

- ☑ Ensure that the workpiece is firmly clamped in
- ☑ Ensure that the clamping lever is NOT touching anywhere



Secure your workpiece or instrument by pressing down the clamping lever!



Turn the 'rotation plate for oval rings' through 360° to ensure that the tooled fixture CANNOT touch or remain suspended at any point!

5.5 Tooling the rotation plate (oval rings /standard rings)



This section describes how to tool the rotation plate for oval rings, standard rings and other similar instruments. You should comply strictly with the steps listed here in the assembly instructions for your own safety and to protect the machine / machine components.

➡ STEP 1

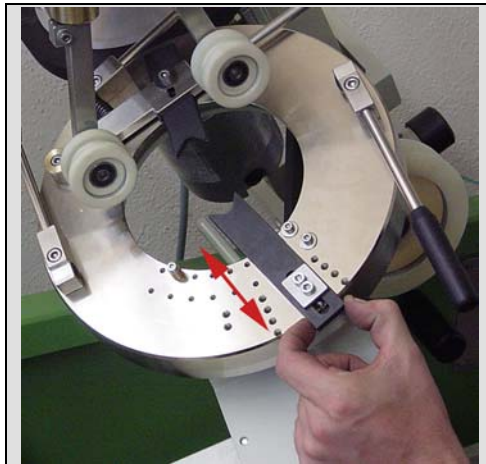


WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

☑ Ensure that the machine is SWITCHED OFF

- ☑ Switch off the machine.
- ☑ Disconnect the high voltage cable from the socket.



➡ STEP 2 - positioning the workpieces

Before actually tooling the rotation plate for oval rings and other similar instruments, the clamping jaws must be positioned on the rotation plate to match your instruments / workpieces.

- ☑ Move the clamping jaws such that the inner ring to be machined (the workpiece) is as close to the centre of the rotation plate as possible once inserted. (*Photo on left*)
- ☑ Firmly screw on the clamping jaws.



To work as effectively and cleanly as possible, you should position your workpiece as close to the centre of the rotation plate as possible.



➡ STEP 3 - positioning the workpieces

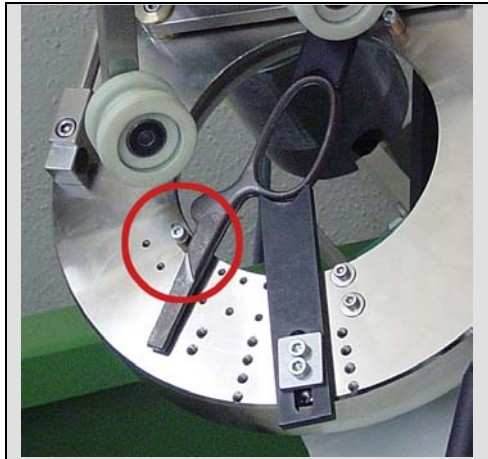


WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

☑ Ensure that the machine is SWITCHED OFF

- ☑ Position the stop bolt (*see scope of supply -> Section 3.1*) provided such that your workpiece or instrument is securely positioned in the rotation plate and cannot slide during grinding or polishing.



STEP 4 - inserting the workpieces



WARNING – RISK OF INJURY – risk of crushing

Risk of crushing (clamping lever / workpiece)

Risk of injury from rotating / moving machine parts

- ☑ Ensure that the workpiece is firmly clamped in
- ☑ Ensure that the clamping lever is NOT touching anywhere

- ☑ Press the clamping lever system together. (*Photo on left*)
- ☑ Insert / position your workpiece or instrument such that the inner ring to be machined (*the workpiece*) is as close to the centre of the fixture as possible.
- ☑ Clamp your workpiece or instrument by releasing the clamping lever again. (*See photo on left*)

6 Operating the fixture

6.1 Before operating

You should comply strictly with the handling instructions listed here and all information relating to risks, caution and safety to ensure your own safety and to protect the machine / machine components



Even a simple and self-explanatory step can result in the user being injured or the machine / machine components being damaged if the procedure is carried out carelessly or the operating manual is not observed.



WARNING – RISK OF INJURY

Rotating parts – risk of injury

Safety measures

- ☒ NEVER reach into rotating / turning machine parts
- ☒ NEVER touch a running belt drive / grinding belt
- ☒ Only use machine elements for their intended purpose



CAUTION

- ☒ Before operating the fixture for the first time, familiarise yourself with all the steps listed in this section. Read this section through carefully and in full before operating the fixture for the first time.



Keep this document in a place where it can be accessed at all times. Careful reading of this manual is essential for problem-free commissioning of the 'rotation plate for oval rings'.

6.2 Procedure / operating steps



STEP 1 - switching on master switch.



Turn the switch to the right and into the ON position.



STEP 2 - switching on machine



Press the ON button.



The machine is now switched on and ready for operation.
The green operating display lights up.



STEP 3 - switching off belt release.



Turn the switch to the left and into the OFF position.



The belt release is not needed when using the rotation plate for oval rings.



STEP 4 - setting the machining time



Turn the switch to the right / left depending on the machining time you want.



Set as long a machining time as possible. The machining time should be between 15 and 25 sec.

You will find the timer setting in the machine's electrical documentation -> switch cabinet.

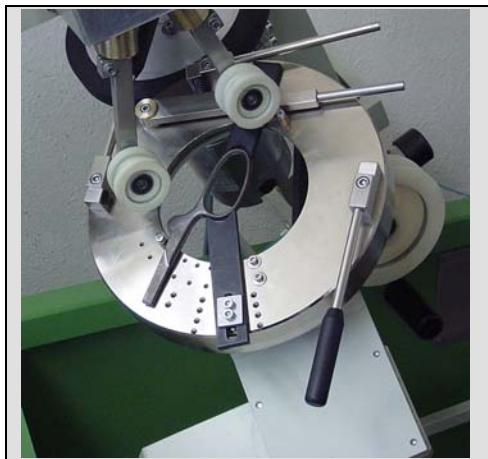


➡ STEP 5 – grinding belt speed

- ☑ Turn the switch to position 0 / 1 / 2 depending on the grinding belt speed you want
 - Position 0 = grinding belt switched off
 - Position 1 = normal grinding belt speed (**RECOMMENDED**)
 - Position 2 = fast grinding belt speed



If the 'drive grinding belt' switch is in the 0 position, the grinding belt does NOT run when the machine is operated



➡ STEP 6 - positioning the workpieces

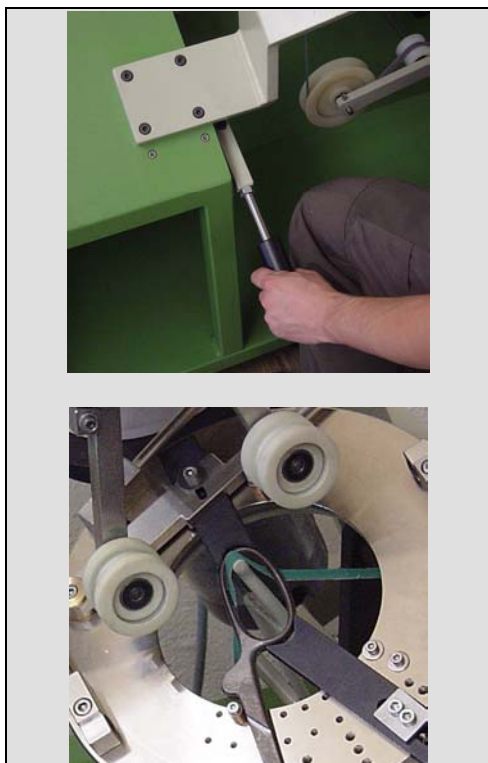


WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

- ☑ Ensure that the machine is SWITCHED OFF

- ☑ Position your workpiece or instrument such that the inner ring to be machined (*the workpiece*) is as close to the centre of the fixture as possible. (See tooling -> Section 5)



➡ STEP 7 - mounting the grinding belt



CAUTION

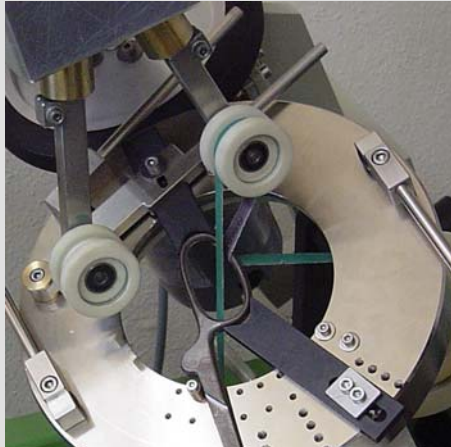
- ☑ After use ensure that the belt lifting lever is always returned to its initial setting / position.

- ☑ Press down the belt lifting lever.
(Photo, top left)
- ☑ Lead the grinding or polishing belt through the inner ring / workpiece to be machined by pressing the belt lifting lever all the way down.

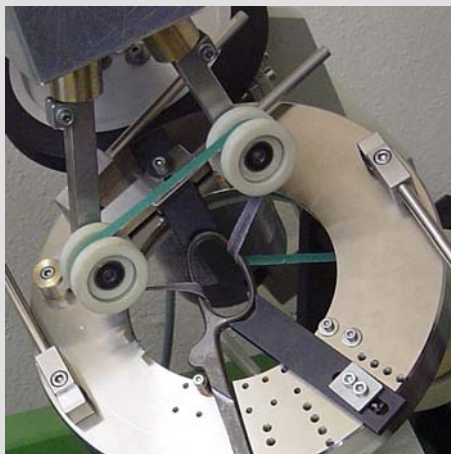


If you have placed your workpiece in a central position, the grinding belt is easily led through the workpiece. (Photo, bottom left)

Variant A:



Variant B:



STEP 8 - threading the grinding belt

There are two possible ways of threading the grinding or polishing belt:

Variant A

- ☒ Pull the grinding or polishing belt over the right-hand reel. *(Photo, top left)*

Variant B

- ☒ Pull the grinding or polishing belt over both reels. *(Photo, bottom left)*



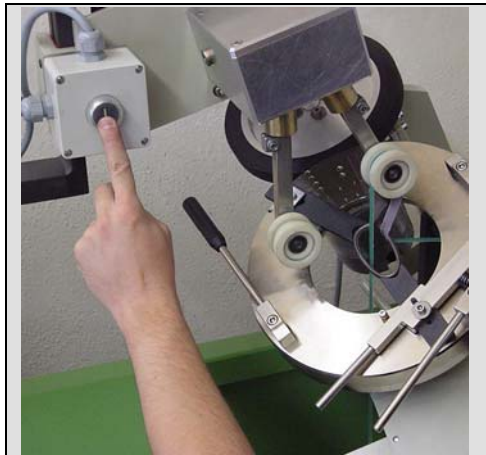
The way in which the grinding or polishing belt is threaded will affect the grinding pattern.

Variant A is the more common of the two methods



STEP 9

- ☒ Secure the rotation plate for oval rings to one of the pre-assembled handles.



STEP 10 - starting a grinding or polishing process



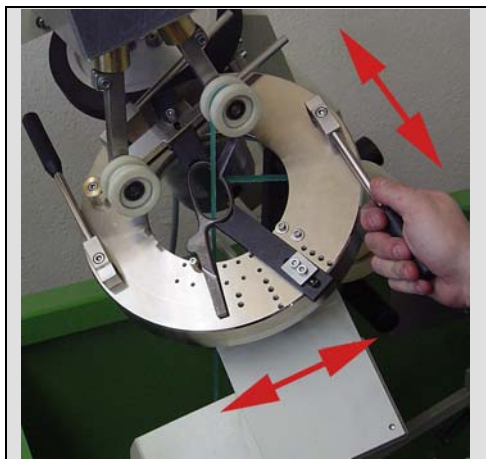
WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

- ☑ NEVER reach into rotating / turning machine parts
- ☑ NEVER touch a running belt drive / grinding belt
- ☑ READ through all steps before starting.



Press the start switch. (*Photo on left*)



STEP 11 – monitoring the grinding process



WARNING – RISK OF INJURY

Risk of injury from rotating / moving machine parts

- ☑ To monitor the machining process, only ever use the two pre-assembled handles.
- ☑ NEVER reach into rotating / turning machine parts



Use the two pre-assembled handles to monitor the grinding and polishing process.



You will only get a clean, uniform grinding pattern after a long run-in time.



STEP 12 – removing the workpieces



WARNING – RISK OF INJURY

Risk of burning from hot workpieces

- ☑ Use pliers to remove the workpieces.



Pull the grinding or polishing belt off the reels.



Allow it to fall through the inner ring / workpiece.



Use pliers to remove the workpiece.

7 Retractor / narrow rings (spezial operations)

7.1 Before starting operations

You should comply strictly with the handling instructions listed here and all information relating to risks, caution and safety to ensure your own safety and to protect the machine / machine components.



Even a simple and self-explanatory step can result in the user being injured or the machine / machine components being damaged if the procedure is carried out carelessly or the operating manual is not observed.



WARNING – RISK OF INJURY

Rotating parts – risk of injury

Safety measures

- ☒ NEVER reach into rotating / turning machine parts
- ☒ NEVER touch a running belt drive / grinding belt
- ☒ Only use machine elements for their intended purpose



CAUTION

- ☒ for the first time, you must be familiar with all the steps for machining retractors and narrow rings. Read this section through carefully and in full before operating the fixture for the first time



Keep this document in a place where it can be accessed at all times. Careful reading of this manual is essential for problem-free commissioning of the 'rotation plate for oval rings'.

7.2 Polishing and grinding retractors

Special machining

Grinding and polishing retractors and narrow ring instruments is a particular challenge.

The peculiar shape of retractors may mean that different / special machining is needed. Manual machining may first have to be undertaken on these instruments.

If standard machining (*as described in Section 6.2 of these instructions*) does *not* produce a clean grinding pattern, please follow the procedure described in this section.

7.2.1 Procedure / basic operating steps

Tooling the rotation plate

The rotation plate is tooled as described in Section 5.4 of these instructions.

Operating the fixture

The fixture is operated as described in Sections 6.1 and 6.2 of these instructions.

Different steps

The peculiar shape of retractors may mean that different / special machining is needed. If the standard machining process does NOT provide a clean grinding pattern, please follow the procedure described in this section under point 7.3.



Note the 'Different steps' listed in point 7.3. This point details the differences in fixture operations. When compared with machining oval or standard rings, the process for retractors and narrow ring instruments requires a different operation / different machining.

7.2.2 Safety measures

Special instrument shapes require more care. The number of potential sources of risk to the fixture's user increases as a result of the shape and size of these instruments.



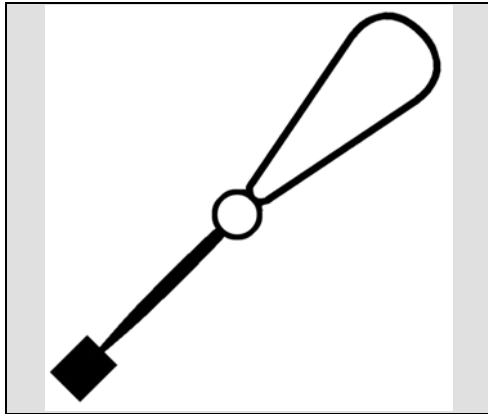
IT IS ESSENTIAL THAT THE FOLLOWING SAFETY INFORMATION IS OBSERVED:

- **Safety information for tooling / Section 5 ff**
- **Safety information for operations / Section 6 ff**
- **Safety information for special operations / Section 7 ff**

7.3 Different steps

Machining in 3 steps

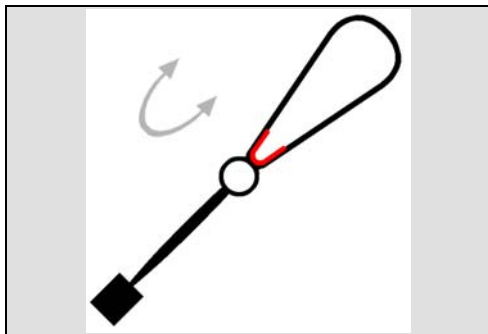
Retractors should always be machined in three steps. Operations for retractors differ from normal fixture operations in these three "extra / different steps".



➡ STEP 1 - initial grinding

The special shape of the retractor and many narrow ring instruments may mean that conventional initial grinding is needed on grinding blocks or other grinding units. Moreover, it is important that no burr is on the inner ring.

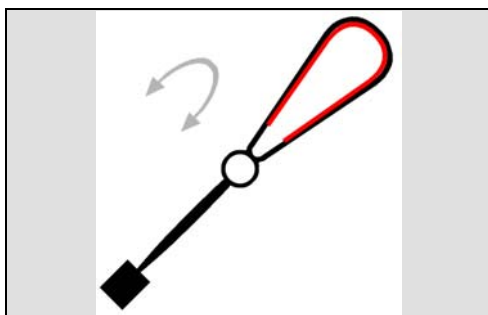
- ☒ If necessary, the inner ring should be roughly initially ground before further machining.
- ☒ If necessary, remove the burr in the inner-ring



➡ STEP 2 - small radius

In the second step, the smaller radius of your instrument should be machined first. A narrower grinding and polishing belt should be used for this purpose.

- ☒ Change the grinding and polishing belt.
RECOMMENDATION (width: 5 mm)
- ☒ Machine the small radius of your instrument **ONLY**.



➡ STEP 3 - large radius

The last step involves machining the large radius. Change back to a 'normal width' grinding or polishing belt for this step.

- ☒ Change the grinding and polishing belt.
RECOMMENDATION (standard size: 8 - 10 mm)
- ☒ Machine the large radius of your instrument.