

Installation manual

Jaw adapter

SE

RD

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»Translation of the original installation manual«

1 General

1.1 Information about this manual

This manual enables safe and efficient handling of the jaw adapter.

The manual is a component of the jaw adapter and must be kept in the immediate vicinity of the jaw adapter where it is accessible for personnel at all times. Personnel must have carefully read and understood this manual prior to starting all tasks. The basic prerequisite for safe work is compliance with all the safety instructions and handling instructions in this manual.

Illustrations in this manual are provided for a basic understanding and may deviate from the actual model of the jaw adapter.

1.2 Explanation of symbols

Safety instructions Safety instructions are indicated by symbols in this operating manual. The safety instructions are introduced by signal words that express the scope of the hazard.

The safety instructions must be adhered to, you must act prudently to prevent accidents, personal injury, and material damage.



DANGER!

... indicates an imminent dangerous situation that can result in death or serious injury if it is not avoided.



WARNING!

... indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.



CAUTION!

...indicates a possible dangerous situation that can result in minor or light injury if it is not avoided.

! **NOTE!**

...indicates a possible dangerous situation that can result in material damage if it is not avoided.

Tips and recommendations

... indicates useful tips and recommendations, as well as information for efficient and trouble-free operation.

1.3 Limitations of liability

All information and instructions in this operating manual have been provided under due consideration of applicable standards and regulations, the current state of technology, as well as our many years of experience.

The manufacturer assumes no liability for damage due to:

- Failure to follow the instructions in the manual
- Non-intended use
- Deployment of untrained personnel
- Unauthorized conversions
- Technical changes
- Use of non-approved spare parts

The actual scope of delivery can vary from the explanations and graphic representations provided in this manual in the case of special versions, if supplemental order options are desired, or on the basis of the latest technical changes.

The agreed obligations in the delivery contract, the general terms and conditions, as well as delivery conditions of the manufacturer, and the statutory regulations valid at the time the contract was concluded, apply.

1.4 Copyright

This manual is protected by copyright and is provided exclusively for internal purposes.

Delivery of the operating manual to third parties, duplication in any form – including excerpts – as well as exploitation and/or communication of the content, are not permitted

[except for internal use] without written approval from the manufacturer.

Actions to the contrary make damage compensation mandatory. We reserve the right to enforce additional claims.

1.5 Scope of delivery

1.5.1 Jaw adapter SE and RD

- Jaw adapter
- Auxiliary handle
- Pre-load bushing
- Storage case
- Sealing screw

1.5.2 Optional accessories

- Centering
- Jaws

1.6 Spare parts



WARNING!

Safety risk if the wrong spare parts are used!

Incorrect or defective spare parts can cause damage, malfunction, or total failure; they can also impair safety.

- Only use manufacturer's original spare parts.

Only purchase spare parts from authorized dealers or direct from the manufacturer. Addresses are in the appendix.

1.7 Warranty terms

The warranty terms are included in the manufacturer's terms and conditions.

1.8 Clamping force

The specified maximum radial clamping force can vary due to lubrication condition and the degree of contamination.

2 Safety

This section provides an overview of all the important safety aspects for optimal protection of personnel, as well as for safe and trouble-free operation.

2.1 Responsibility of the customer

The jaw adapter is used in industrial applications. Therefore the owner of the jaw adapter is subject to legal industrial safety obligations.

In addition to the safety instructions in this manual, generally valid safety and accident protection guidelines, and environmental protection guidelines must be adhered to and complied with for the area of implementation of the device.

2.2 Personnel requirements



WARNING!

Danger of injury due to insufficient qualification!

Improper handling of the jaw adapter can cause serious injury or material damage.

- Only have activities performed by personnel who are qualified to perform these activities.

The following qualifications are cited in the operating manual for the various activity areas.

- **Specialized personnel**
are personnel that due to their specialized training, skills, and experience, as well as knowledge of the applicable regulations, are capable of executing the tasks assigned to them and of recognizing and avoiding possible hazards on their own.
- **Hydraulic specialist**
The hydraulic specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations.
Due to his specialized training and experience the hydraulic specialist can perform tasks on hydraulic

equipment and recognize and avoid possible dangers on their own.

Only persons from whom it can be expected that they reliably execute their work are considered as personnel. Persons whose capability to react is impaired, for instance through drugs, alcohol, or medication, are not approved.

- Comply with age-specific and job-specific regulations that are applicable at the installation site when selecting personnel.

2.3 Intended use

The jaw adapter is designed for installation in a machine tool. Within the machine tool the jaw adapter is used exclusively as an attachment for the existing clamping device for quickly extending the maximum clamping diameter.

The jaw adapter only be mounted, operated, maintained, and cleaned by instructed personnel.

Intended use also includes compliance with all the instructions in this manual.

Any use that extends beyond the intended use, or any other use of the jaw adapter is considered to be misuse and can cause dangerous situations.



WARNING!

Danger due to misuse!

Misuse of the jaw adapter can cause dangerous situations.

Particularly refrain from the following uses of the jaw adapter:

- Adaptation of the jaw adapter on clamping devices other than SPANNTOP nova, TOPlus, TOROK, MANOK plus, and HYDROK.
- Use in machines other than machine tools.
- Use in machine tools with technical data other than that specified on the jaw adapter.

Claims of any type due to damage arising from non-intended use are excluded.

2.4 Personal protective equipment

Wearing of personal protective equipment is required to minimize health hazards when working with the device.

- Always wear the protective equipment necessary for the respective task when working with the device.
- Follow the instructions that have been posted in the work area.

Always wear



For all tasks always wear:

Protective work clothing

is tight-fitting work clothing with low resistance to tearing, with tight sleeves, and without projecting parts. It is primarily used to protect against entanglement by moving machine parts.

Do not wear rings, chains, or other jewelry.



Safety footwear

for protection against heavy falling parts and slipping on slippery substrates.

For special tasks wear

Special protective equipment is required when executing special tasks. Separate reference is made to this equipment in the specific sections of this manual. This special protective equipment is explained below:



Hard hat

to protect against falling and flying parts and materials.



Protective goggles

to protect eyes from flying parts and liquid splashes.



Protective gloves

to protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.

2.5 Special dangers

In the following section residual risks are cited that occur due to installation of the jaw adapter in a machine tool. In each case the residual risks that have been determined based on a risk analysis of the machine must be specified by the customer.

- Follow the safety instructions listed here and the warnings in the other sections of this manual to reduce health hazards and to avoid dangerous situations.

Moving parts



WARNING!

Danger of injury due to moving parts!

Rotating parts of the jaw adapter can cause serious injuries.

- Do not reach into moving parts or handle moving parts during operation.
- Pay attention to the clearance of moving parts.
- Do not open covers when the device is in operation.
- Be aware of afterrun time:
Prior to opening the covers ensure that all parts have come to a standstill.
- Wear tight-fitting protective work clothing in the danger zone.

2.6 Clamping force

The specified maximum radial clamping force can vary due to lubrication condition and the degree of contamination.

2.7 Screws

Moving parts



WARNING!

Danger of injury due to screws and stud screws being accelerated out of the device!

Screws and stud screws radially attached to the jaw adapter can be accelerated out of the device and cause severe injuries.

- After assembly and maintenance tasks, always retighten all screws and stud screws radially attached on the jaw adapter with the prescribed tightening torque.
- All screws or stud screws that are not marked with a tightening torque specification are tightened with the prescribed tightening torque in the factory and should only be unscrewed after consultation with the manufacturer.



The tightening torque is shown in the assembly drawing of the jaw adapter or it is engraved on the device itself in the direct vicinity of the screw or stud screw.

2.8 Environmental protection

! **NOTE!**
Environmental hazard due to incorrect handling!

Incorrect handling of environmentally hazardous substances, particularly improper disposal, can cause significant environmental damage.

- Always comply with the instructions cited below.
- If environmentally harmful substances should inadvertently get into the environment, initiate suitable measures immediately. If in doubt notify the responsible municipal authority about the damage.

The following environmentally harmful substances are used:

Lubricants

Lubricants like greases and oils can contain toxic substances. Ensure that they do not get into the environment. The device must be disposed of by a specialized disposal company.

To achieve trouble-free operational performance of the jaw adapter only use HAINBUCH lubricants. See the appendix for reference addresses.

3 Technical data

3.1 General information

Product line	Adaptation size	Clamping range	Dimensions [∅ x length in mm]	Max. speed [rpm]	Weight - add-on clamping device [kg]	Max. draw force F _{ax} [kN]	Max. clamping force F _{rad} [kN]
SE	65	25-120	149 x 166	5000	3	30	54
	100	25-160	192 x 176	3000	5		
RD	65	25-120	149 x 167.5	5000	3	35	
	80	25-133	162 x 167.5		4		
	100	25-160	192 x 176	3000	5		

3.2 Operating conditions

Environment

Specification	Value	Unit
Temperature range	15 – 70	°C

3.3 Power specifications

! NOTE!

Material damage if the power specifications do not agree!

If the power specifications of jaw adapter and machine do not agree, severe damage extending to total damage can occur to the jaw adapter and machine.

- Only install jaw adapters in machines with the same power specifications.



Information on maximum clamping force and drawtube force is provided on the jaw adapter.

3.4 Dimensional Sheet



Dimensional sheets for the respective jaw adapter can be requested from HAINBUCH.

3.5 Type designation



The type designation is on the jaw adapter device and includes the following information:

- 1 Ident.-Nr.
- 2 Maximum speed [rpm]

Fig. 1

4 Structure and function

4.1 Overview – jaw adapter SE/RD

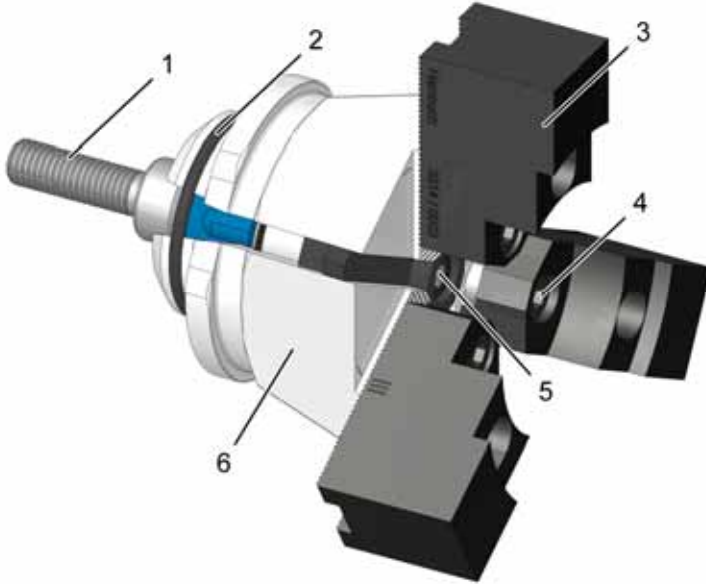


Fig. 2

- | | | | |
|---|--------------|---|---------------|
| 1 | Support bolt | 4 | Allen screws |
| 2 | O-ring | 5 | Sealing screw |
| 3 | Jaws | 6 | Jaw adapter |

4.2 Brief description – jaw adapter SE/RD

The jaw adapter makes it possible to accomplish radial machining in-between the chuck jaws, for which a second clamping setup would otherwise be necessary. In addition the clamping range can be significantly extended with the jaw adapter. The clamping diameter of the standard clamping head for size 65, for example is maximum 65 mm. When using the jaw adapter the clamping diameter extends to maximum 120 mm.

For use of the jaw adapter the base plate of the basic clamping device must be removed and replaced with a centering for jaw adapters. Then the jaw adapter must be properly mounted. The jaw adapter can be used with the following clamping devices:

- SPANNTOP nova
- TOPlus
- TOROK
- MANOK plus
- HYDROK

4.3 Optional accessories

The accessories described here are not included in the scope of delivery.

Special accessories are available for each jaw adapter. Trouble-free and precise function of HAINBUCH jaw adapters is only ensured when using original HAINBUCH accessories.

Lubricating grease is required for cleaning and preservation of the jaw adapter. The lubricating grease is also specially matched for protection of the vulcanized segments of the jaw adapter and increases their service life and elasticity by a significant factor.

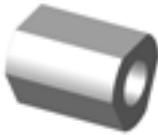
4.3.1 Centering



The centering replaces the base end-stop in the clamping device and is used to mount and center the jaw adapter.

Fig. 3

4.3.2 Pre-load bushing



The pre-load bushing is required for assembly of the jaw adapter, and for machining the jaws to size. The jaw adapter reaches its clamping position through the pre-load bushing.

Fig. 4

4.3.3 Auxiliary handle



The auxiliary handle is an assembly aid measuring device to accommodate the initial tension bushing through a thread. With it the initial tension bushing is held in the jaw adapter when clamping.

Fig. 5

4.3.4 Lubricating grease



The universal grease for chuck lubrication is supplied in a 1000 g can. The order number for the universal grease is 2085/0003; it can be ordered from HAINBUCH.

Fig. 6

5 Transporting, packaging, and storing

5.1 Instructions for transporting

Improper transportation



NOTE!

Material damage due to improper transportation!

If the jaw adapter is transported improperly, material damage extending to total failure of the jaw adapter can occur.

- Always transport the jaw adapter with the utmost caution.
- Do not let the jaw adapter fall or expose it to other strong vibration.

5.2 Symbols on the packaging



Fragile

Identifies packages with fragile or sensitive contents.

Handle the packed goods with care; do not allow them to fall, and do not subject them to impact.



Protect from moisture

Keep packed goods dry and protected against moisture.

5.3 Transporting inspection

Check delivery immediately upon receipt to ensure that delivery is complete, and to identify any transport damage.

Proceed as follows if there is apparent external damage:

- Do not accept the delivery, or only accept it with reservation.
- Note the scope of transportation damages on the shipping documents or on the freight forwarders delivery papers.
- Submit a complaint.



Report any defect as soon as it is detected. Claims for damage compensation can only be enforced during the applicable periods for giving notice of lack of conformity.

5.4 Packaging

About the packaging

Individual packages are packed according to the expected transport conditions. Environmentally-friendly materials have been used exclusively for the packaging.

Packaging should protect the specific components from transport damage, corrosion, and other damage until installation. Therefore do not destroy the packaging; remove it just before installation.



The packed goods are sealed in foil airtight and packed in cartons. See the »Technical data« section for the specific weights of the respective sizes.

Handling packaging materials

Dispose of packaging materials in accordance with the respectively valid statutory regulations and local guidelines.



NOTE!

Improper disposal causes environmental damage!

Packaging materials are valuable raw materials and in many cases they can be reused, or they can be effectively treated and recycled.

- Dispose of packaging materials in an environmentally responsible manner.
- Comply with locally applicable disposal guidelines. If necessary commission a specialized company to dispose of packaging.

5.5 Storing



Under certain circumstances, instructions for storage and subsequent storage are affixed to the packages that extend beyond the requirements cited here. Comply with these instructions accordingly.

Storage of packages Only store packages under the following conditions:

- Do not store outdoors
- Store in a dry and dust-free location
- Do not expose to aggressive media
- Protect from direct sunlight
- Avoid mechanical vibration
- Storage temperature: 15 to 35°C
- Relative humidity: max. 60%
- For storage periods longer than 3 months:
 - Check the general condition of all parts and the packaging at regular intervals
 - Touch up or re-apply anti-corrosion agents as needed

Subsequent storage of the jaw adapter Only re-store the jaw adapter under the following conditions:

- Thoroughly clean the jaw adapter prior to subsequent storage [see section »Cleaning«]
- Thoroughly oil and grease jaw adapter [see section »Cleaning«]
- Store jaw adapter in airtight foil

6 Installation

6.1 Preparations

The total weight of the jaw adapter depends on the size and can be as much as 5 kg.



NOTE!

Material damage due to the jaw adapter falling!

During assembly, the jaw adapter can fall and be damaged, or cause material damage to the machine tool.

- Two people may be required for this task.
- Always handle the jaw adapter with care.
- Always wear safety footwear.

6.1.1 Preparing the machine tool for assembly



Prior to assembling the jaw adapter the base end-stop of the clamping device must be disassembled.

- Required tools:
 - Allen wrench
 - Changing fixture

1. Remove the existing clamping head [Fig. 7/1] with changing fixture [Fig. 7/2].



Fig. 7



Fig. 8

2. Loosen three clamping screws for the base end-stop [Fig. 8/2] of the clamping screw with the Allen wrench [Fig. 8/1].



Fig. 9

3. Take off the base end-stop [Fig. 9/1].

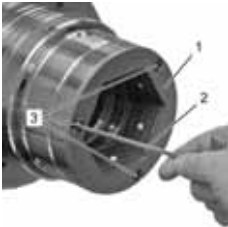


Fig. 10

4. Loosen the countersunk screws [Fig. 10/3] on the sheet metal [Fig. 10/1] with the Allen wrench [Fig. 10/2].
5. Take off the sheet metal [Fig. 10/1].

6.1.2 Preparing the jaw adapter

- Required tools:
 - Allen wrench AF6



Fig. 11

1. Remove six Allen screws [Fig. 11/1] with a suitable Allen wrench.



Fig. 12

2. Fit profile jaws [Fig. 12/1] on the gearing on the basic body [Fig. 12/2]. We recommend that you place this as far as possible to the outside. For easier radial adjustment there are 3 marks on the jaws [Fig. 12/3].



Fig. 13

3. Insert Allen wrench [Fig. 13/1] and tighten.



Fig. 14

4. Screw the auxiliary handle [Fig. 14/1] into the jaw adapter centering [Fig. 14/2] hand tight.

6.2 Assembling the adaptation clamping device



WARNING!

Danger of injury due to unexpected startup of the tool spindle!

Unexpected start up of the tool spindle can cause severe injury.

- Prior to switching on automatic mode close all protective doors or hoods that are present on the machine tool.
- Unscrew all ring nuts from the jaw adapter and remove them from the interior of the machine.
- Only run the machine tool in set-up mode or jog mode.

6.2.1 Assembling the jaw adapter



WARNING!

Danger of injury due to vertical suspended spindle!

Bending into the machine work area when assembling overhead can cause severe head injuries.

- Secure components prior to overhead assembly.
 - For assembly on a vertically suspended spindle always use a suitable mounting aid.
-
- Special tools required:
 - Allen wrench AF8
 - Allen wrench AF4



Fig. 15

1. Put the machine tool in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine tool on the lowest setting.
4. Move the drawtube of the machine tool into the front stop position.



Fig. 16

5. Insert the jaw adapter centering [Fig. 16/2] in the clamping device [Fig. 16/1]. In this process, ensure that the pin [Fig. 15/2] on the side of the centering is flush with the groove in the clamping device [Fig. 15/1] and that it engages in this groove.



Fig. 17

6. With the three threaded pins on the side [Fig. 17/1] tighten the jaw adapter centering.
7. Unscrew the auxiliary handle out of the jaw adapter centering.



Fig. 18

8. Insert the jaw adapter [Fig. 18/2] in the clamping device [Fig. 18/1].



Fig. 19

9. Tighten the jaw adapter with the Allen wrench [Fig. 19/2] via the middle opening [Fig. 19/1] until the segments tangibly and audibly lock in place.



Fig. 20

10. Screw the pre-load bushing [Fig. 20/2] onto the auxiliary handle [Fig. 20/3] and introduce it into the middle clamping bore [Fig. 20/1].

! NOTE!

Material damage due to excessive clamping force!
Excessive clamping force can damage the pre-load bushing.

- Do not exceed the permissible draw force of 20 kN.
- Only clamp pre-load bushing in the basic body to $\varnothing 20$ mm.
- Ensure that the pre-load bushing is not clamped by the clamping jaws.



Fig. 21

11. Switch the machine tool to jog mode and initiate the clamping.
12. Unscrew and remove the auxiliary handle from the pre-load bushing.



The pre-load bushing [Fig. 21/1] remains clamped in the jaw adapter. The jaw adapter does not clamp on the sleeve of the pre-load bushing, because this is clamped in deeper.



Fig. 22

- 13.** With an Allen wrench AF3 [Fig. 22/1] tighten the securing element in the interior.
- 14.** Machine the jaws to the desired clamping diameter.
- 15.** Screw the auxiliary handle back into the pre-load bushing.
- 16.** Move the clamping device in jog mode to unclamped position.
- 17.** Take out the auxiliary handle with pre-load bushing.
- 18.** Clamp in the work pieces.

6.2.2 Offsetting the jaws retroactively

- Required tools:
 - Allen wrench AF6



With the aid of the gearing and the line marks the jaws can also be retroactively offset. However the maximum adjustment should not exceed 2 teeth, otherwise the machining result can be influenced.



Fig. 23

- 1.** Loosen Allen screws with Allen wrench and remove them.
- 2.** Offset the jaws.



All three jaws must be uniformly offset radially.

- 3.** Reinsert the Allen screws and retighten with the Allen wrench.

6.3 Inspections

! NOTE!

Material damage due to damaged jaw adapter!

A damaged, incomplete, or unbalanced jaw adapter can significantly damage or even destroy the machine tool and the work piece.

- Only use complete and properly assembled jaw adapters.
- If in doubt contact the manufacturer.

Ensure the following points prior to each installation and start-up of the jaw adapter:

- The jaw adapter must be undamaged.
- All Allen screws of the jaw adapter must be present and tightened with the proper tightening torque.
- The set RPM of the machine tool should not exceed the maximum permissible speed of the jaw adapter.
- The maximum drawtube force specified on the perimeter of the jaw adapter must not be exceeded.
- The clamping pressure of the machine must be sufficiently high.
- All assembly tools must be removed from the interior of the machine.
- Jaw adapter and work piece must be compatible.
- The work piece must be clamped into the jaw adapter with sufficient work piece tension.

6.4 Executing a stroke position check



WARNING!

Danger of injury due to moving parts!

Danger of crushing exists due to moving parts during the stroke position check, or at the gaps that occur in this process.

- Only execute a stroke position check with the changing parts mounted.
- Only run the machine tool in set-up mode or jog mode for the stroke position check.

6.5 Activities after production is concluded

1. Move the clamping device into unclamped position.
2. Switch off the machine tool and safeguard it from being switched on again.
3. Open the protective door or hood.
4. Clean the jaw adapter of chips and production residues with a soft, lint-free cloth.
5. If necessary, remove the jaw adapter from the clamping device again.
6. Close the protective door or hood.

7 Disassembly, subsequent storage, and disposal

If there is break in production that lasts longer than 3 days, or if the machine will be changed over for other work pieces, the jaw adapter must be disassembled and properly stored in accordance with the manufacturer's specifications [see the section, »Transportation, packaging, storage«].

Prior to disassembling:

- Put the machine in set up mode.
- Remove fuels and auxiliary materials, as well as residual processing materials and dispose of these items in an environmentally-responsible manner.

7.1 Safety

Safeguarding against restart



DANGER!

Life-threatening danger if restarted without authorization!

When disassembling there is danger of the energy supply being switched on inadvertently. This poses a life-threatening hazard for persons in the danger zone.

- Prior to starting the tasks switch off all energy supplies and safeguard them from being switched on again.

7.2 Disassembling the jaw adapter



WARNING!

Danger of injury due to vertical suspended spindle!

Bending into the machine work area when disassembling overhead can cause severe head injuries.

- Secure components prior to overhead disassembly.
- For disassembly on a vertically suspended spindle always use a suitable mounting aid.

- Special tools required:
 - Allen wrench AF8
 - Allen wrench AF4



Fig. 24

1. Move the machine tool into unclamped position.
2. With an Allen wrench [Fig. 24/1] loosen the securing element in the interior.

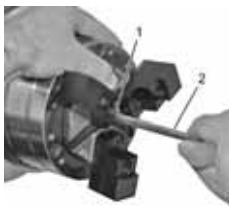


Fig. 25

3. Loosen the jaw adapter with Allen wrench [Fig. 25/2] via the center opening [Fig. 25/1].



Fig. 26

4. Take the jaw adapter [Fig. 26/2] out of the clamping device [Fig. 26/1].
5. Screw the auxiliary handle into the jaw adapter centering.



Fig. 27

6. Loosen the three threaded pins on the side [Fig. 27/1] in order to take out the jaw adapter centering again.



Fig. 28

7. Take the jaw adapter centering [Fig. 28/2] out of the clamping device [Fig. 28/1].

7.3 Subsequent storage of the jaw adapter

The jaw adapter must be cleaned and treated with corrosion protection for subsequent storage [see section »Cleaning«].



The storage conditions are specified in the section »Transport, packing, and storing«.

7.4 Disposal

If a return or disposal agreement has not been concluded, then recycle disassembled components.



NOTE!

Improper disposal causes environmental damage!

Lubricants and other auxiliary materials are subject to treatment as special waste, and should only be disposed of by approved specialist companies!

Local municipal authorities or specialized disposal companies provide information on environmentally-responsible disposal.

8 Maintenance

Environmental protection

Comply with the following instructions for environmental protection when performing maintenance work:

- At all lubricating points where lubricant is applied by hand, remove escaping, used, or excess grease, and dispose of it in accordance with applicable local regulations.
- Collect used oil in suitable containers and dispose of it in accordance with applicable local regulations.

8.1 Cleaning

! NOTE!

Material damage if cleaned with compressed air!

Cleaning the jaw adapter with compressed air can force metal chips into thread and grooves. This can damage or even destroy the jaw adapter.

- Never clean the jaw with compressed air.

- Auxiliary material required:
 - Ester-free, non-polar cleaning agent
 - Soft, lint-free cloth
 - Lubricant

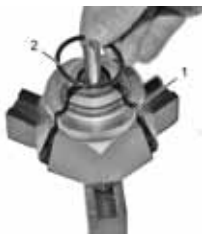


Fig. 29

1. Unscrew jaw adapter and place it on the jaws [Fig. 29/1].
2. Carefully pull of the o-ring [Fig. 29/2].



Fig. 30

3. Take off the support bolt [Fig. 30/1].



Fig. 31

4. Lubricate the ring on the support bolt [Fig. 31/1].



Fig. 32

5. Insert the support bolt [Fig. 32/1] in the basic body. In this process, ensure that the guiding elements [Fig. 31/2] on the support bolt are located in the gaps between the segments.

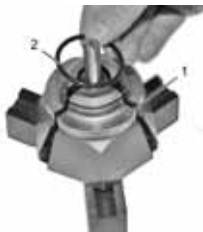


Fig. 33

6. Press the segments of the basic body together [Fig. 33/1] and reattach o-ring [Fig. 33/2] in accordance with the former position. Ensure that the support bolt can be turned within the guide ring after the o-ring is attached.
7. Clean all the components listed below with cleaning agent and a cloth; remove all oil and grease residues.

8.2 Maintenance schedule

Maintenance tasks are described in the sections below that are required for optimal and trouble-free operation.

If increased wear is detected during regular inspections, then reduce the required maintenance intervals according to the actual indications of wear.

Contact the manufacturer, [see the service address on the back] if you have questions concerning maintenance tasks and intervals.



Interval	Maintenance task
Daily	Visual inspection and complete cleaning in case of heavy contamination [see section »Cleaning«]
Weekly	Clean the jaw adapter [see section »Cleaning«]

8.3 Bolt torque

Metric ISO thread

The guide values for bolt tightening torque for achieving the highest permissible pre-tension for metric ISO thread are specified in Nm in the table.

- Total friction coefficient $\mu_{\text{tot}} = 0.12$
- 90% utilization of the apparent limit of elasticity

Diameter	 [mm]	 [mm]	Torque for screw quality 10.9 [Nm]
M 4	7	3	4
M 5	8	4	7
M 6	10	5	12
M 8	13	6	25
M 10	17	8	50
M 12	19	10	100
M 16	24	14	220
M 20	30	17	400
M 24	36	19	600

The table shows the maximum permissible values and does not include any other safety factors. Knowledge of the applicable guidelines and configuration criteria are the prerequisites.

9 Troubleshooting

Possible fault causes and the tasks to correct these faults are described in the following section.

If there are faults that cannot be corrected through the instructions below, contact the manufacturer, see service address on the back of this operating manual

9.1 Safety

Trouble shooting

The following always applies:

- 1.** For faults that pose a direct danger for personnel and or property immediately execute the emergency-stop function.
- 2.** Determine the cause of the fault.
- 3.** If correction of the fault requires work in the danger zone, put the machine in set-up mode.
- 4.** Immediately inform the responsible parties at the installation site of the fault.
- 5.** Depending on the type of fault, either have authorized specialized personnel correct the fault, or correct it yourself.
- 6.** If there is a fault that was not caused by the jaw adapter the cause of the fault may be in the machine area. See the operating manual for the machine in this regard.

9.2 Trouble shooting table



The faults and causes described in the fault table are based both on the clamping device as well as the adapted jaw adapter.

Fault	Possible cause	Fault correction	Corrected by
Clamping force is too low	Work piece is underdimensioned	Check the position of the jaws/insert a suitable work piece.	Specialist
	Insufficient hydraulic pressure on the clamping cylinder	Check the machine-side hydraulic unit.	Hydraulic specialist
	Defective clamping cylinder or blocked drawtube	Contact the machine manufacturer.	Machine manufacturer
Eccentric dimensional deviation on the work piece	Concentricity error of the clamping device.	Check the concentricity on the clamping taper and correct if necessary.	Specialist
Dimensional deviation on the work piece	Contaminated clamping taper	Take out the jaw adapter and clean the clamping taper of the clamping device	Specialist
Formal defect on the work piece	Elastic deformation of feedstock that is subject to formal defects. After machining, the work piece returns to its original form.	Use feedstock with fewer formal defects.	Specialist

9.3 Start-up after corrected fault

After correcting the fault execute the following steps to start up again:

- 1.** Reset the emergency-stop devices.
- 2.** Acknowledge the fault on the machine tool controller.
- 3.** Ensure that that no one is in the danger zone.
- 4.** Start the machine tool.

10 Appendix

10.1 Service Hotline

Order Hotline

Quickly ordered and delivered. A call is all it takes:
+49 [0]7144. 907-333

Schedule Hotline

Current status of your order? Just call:
+49 [0]7144. 907-222

24h emergency call

Has there been a crash or other technical emergency?
Our experts are at your service around the clock:
+49 [0]7144. 907-444

10.2 Representatives in Germany and Europe

The sales partners and service employees listed below are available for further consultation or support.

Overview of German postal codes:

J 010 – 049	B 370 – 399	N 600 – 659	H 800 – 839	N 970 – 989
M 060 – 089	C 400 – 479	E 660 – 699	G 840 – 851	O 979
J 090 – 189	A 480 – 499	L 700 – 709	H 852 – 866	M 980 – 999
I 190 – 289	C 500 – 509	O 710 – 719	L 867	
B 290 – 319	F 510 – 549	D 720 – 729	H 868 – 879	
A 320 – 339	N 550 – 559	L 730 – 739	D 880 – 899	
B 340 – 349	F 560 – 569	O 740 – 749	L 900 – 919	
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