

Installation manual

capteX D machine adapter

EN

Table of contents

1	General.....	4
1.1	Information about this manual.....	4
1.2	Explanation of symbols.....	4
1.3	Limitations of liability.....	5
1.4	Max. RPM.....	6
1.5	Copyright.....	6
1.6	Scope of delivery.....	7
1.7	Spare parts.....	7
1.8	Warranty terms.....	7
1.9	CFK.....	7
2	Safety.....	8
2.1	Responsibility of the customer.....	8
2.2	Personnel requirements.....	9
2.3	Intended use.....	10
2.4	Personal protective equipment.....	12
2.5	Special dangers.....	13
2.6	Further warnings.....	15
2.7	Clamping force.....	17
2.8	Screws.....	18
2.9	Functionality.....	18
2.10	Environmental protection.....	19
3	Technical data.....	20
3.1	General information.....	20
3.2	Operating conditions.....	21
3.3	Power specifications.....	21
3.4	Dimensional sheet.....	21
3.5	Type designation.....	21
4	Structure and function.....	22
4.1	Overview and brief description.....	22
4.2	Optional Accessories.....	23
4.2.1	Clamping head.....	23
4.2.2	Changing fixture.....	24
4.2.3	Grease.....	24
4.2.4	Grease gun.....	24
5	Transporting, packaging, storing.....	25
5.1	Safety instructions for transporting.....	25
5.2	Symbols on the packaging.....	25
5.3	Transport inspection.....	25
5.4	Unpacking and inner-company transportation.....	26
5.5	Packaging.....	27
5.6	Storing.....	28

6 Assembly.....	29
6.1 Pre-consideration.....	29
6.2 Preparation of the capteX D machine adapter.....	30
6.3 Installation.....	31
6.3.1 Assembly of the capteX D machine adapter.....	33
6.3.2 Assembly of a clamping device to the clamping device adapter.....	37
6.3.3 Assembly of the clamping device to the capteX D machine adapter.....	39
6.3.4 Clamping head.....	42
6.4 Work piece.....	42
6.5 Inspections.....	43
6.6 Control of the stroke position.....	44
6.7 Activities after production is concluded.....	44
7 Disassembly, subsequent storage, disposal.....	45
7.1 Safety.....	45
7.2 Disassembly of the clamping device from the capteX D machine adapter....	46
7.3 Disassembly of the clamping device adapter.....	48
7.4 Disassembly of the capteX D machine adapter.....	49
7.5 Subsequent storage of the clamping device.....	52
7.6 Disposal.....	53
8 Maintenance.....	54
8.1 General.....	54
8.2 Cleaning.....	56
8.3 Preservation.....	56
8.4 Use of lubricant.....	57
8.5 Maintenance schedule.....	57
8.6 Bolt torque.....	59
9 Trouble shooting.....	60
9.1 Safety.....	60
9.2 Trouble shooting table.....	61
9.3 Start-up after corrected fault.....	61
10 Appendix.....	62
10.1 Service Hotline.....	62
10.2 Representatives.....	62
10.2.1 Europe.....	62
10.2.2 America.....	65
10.2.3 Asia.....	65
10.2.4 Australia.....	66
10.2.5 Africa.....	66
11 Index.....	67

»Translation of original installation manual«

1 General

1.1 Information about this manual

This manual enables safe and efficient handling of the clamping device.

The manual is a component of the clamping device and must be kept in the immediate vicinity of the clamping device 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 clamping device.

It is assumed that the reader is familiar with standard procedures, such as cleaning the mounting surfaces.

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 strictly 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.

**CAUTION!**

Our clamping devices are balanced with balance quality $G = 4$, in one level $n = 1$.

The data on the rotation balance refers to rotationally symmetrical work pieces.

The clamping of not rotationally symmetrical work pieces may not be clamped and/or only be clamped after consultation with the manufacturer.

Balancing bolts and balancing weights at the clamping devices may not be removed / disassembled!

1.4 Max. RPM

**CAUTION!**

The maximum permissible speed is marked on the product.

By the combination of a clamping device and an add on clamping element a reduction of the maximum permissible speed may be necessary.

- Of all RPMs of the groups specified, the **lowest given RPM** must always be used.

Note that the clamping force is influenced by the centrifugal force of the clamping elements.

- If necessary, adjust the machining force!

1.5 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.

1.6 Scope of delivery



All tools and accessories that are not included in the scope of delivery are marked as optional.

In scope of delivery of the machine adapter:

- 1 machine adapter
- 1 pentagon key

1.7 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.

1.8 Warranty terms

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

1.9 CFK



In case of visible damage or visible wear of the carbon parts:

- Further processing only after consultation with HAINBUCH.

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 device is used in industrial applications. Consequently the owner of the device is subject to legal industrial safety obligations.

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

Note in particular that the status scans of the machine must be adjusted to the respective clamping device.



DANGER!

Risk of injury due to thrown out parts!

Incorrect machine settings may lead to the throwing out of parts.

- The status scans the machine must be set to the respective clamping device.
- Regularly check the status scans of the machine, see chapter »Maintenance Schedule«. If the end position can not be reached the jaw module may no longer be used.
- Observe the operating instructions of the machine.



WARNING!

Risk of injury!

An incorrect media supply [hydraulic, pneumatic], e.g. by damaged or missing seals or pipes, can cause serious personal injury.

- Hydraulic and / or pneumatic tubes must be secured by the machine by check valves and a permanent pressure monitoring!

**WARNING!****Risk of injury!**

Declining operating force, for example by declining energy supply, may cause serious personal injury.

- The product may be used only on machines where it is ensured, that during use, the operating force does not drop.

**NOTE!****Malfunction of the safety device by incorrect machine setting!**

By a missing or incorrect setting of the machine-side limit switch the clamping control can become invalid.

- In interfaces where no constructive idle stroke is taken into consideration, it must be ensured that the machine-side limit switch control is adjusted to the stroke of the clamping device.

2.2 Personnel requirements

**WARNING!****Danger of injury due to insufficient qualification!**

Improper handling of the clamping device 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 who 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 his own.

- **Electric specialist**

The electric 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 electric specialist can perform tasks on electric equipment and recognize and avoid possible dangers on his 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 clamping device is designed for installation in a machine tool according to CE compliant. Within the machine tool the clamping device is designed exclusively as a through-bore chuck for bar work and / or as an end-stop chuck for chuck work.

The clamping device should only be mounted, operated, maintained, and cleaned by instructed, specialized personnel.

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

The clamping device is to be used for the case of application contractually agreed between the producer/deliverer and the user, as well as such cases of application described in the product description which are also in accordance with the technical values.

The safe function of the clamping device is, as far as it can be foreseen, guaranteed when it is used for the intended purpose in accordance with the appropriate safety regulations.

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

**WARNING!****Danger due to misuse!**

Misuse of the clamping device can cause dangerous situations.

Particularly refrain from the following uses of the clamping device:

- Use in machines other than machine tools.
- Use in machine tools with technical data other than that specified on the clamping device.

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

Unintended and improper use of the Power Chuck is for example

- If workpieces are not clamped properly
- If safety regulations are disregarded and persons are working at the clamping device without additional protective devices e.g. for machining.
- If the clamping device is used for machines or tools for which it is not intended.

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 clamping device 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.

Horizontal / lying parts



WARNING!

Danger of injury due to horizontal parts!

Before transporting the clamping device in horizontal condition:

- Put the clamping device on a non-slip pad
- Screw in the eye bolts

Suspended loads



WARNING!

Life-threatening danger due to suspended loads!

Some clamping devices must be lifted with a crane. When lifting the clamping device there is a life-threatening hazard due to falling parts or parts swinging out of control.

- Never step under suspended loads.
- Comply with the instructions concerning the intended attachment points. Ensure that the sling gear is securely seated!
- Do not attach lifting gear in projecting components.
- Only use approved hoists and sling gear with sufficient bearing capacity.
- Do not use rope and belts that are torn or frayed.

Moving parts



WARNING!

Danger of injury due to moving parts!

Rotating parts of the clamping device can cause serious injuries.

- Do not reach into moving parts or handle moving parts during operation.
- Note the gap dimensions 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.

Wrong clamping of the work piece



WARNING!

Danger of injury due to incorrect clamping of the work piece!

Incorrect work piece clamping may lead to the ejection of the work piece and result in serious injuries.

Under dimensioned (tolerance) parts can lead to incorrect clamping!

- Check the unmachined work pieces at random on dimensional accuracy.

Too low supply pressure can lead to the reduction of clamping force!

Too high supply pressure can lead to damage of the components of the clamping device!

- Check and adjust, if necessary, the supply pressure regularly.
- Do random checks of the unmachined work pieces on dimensional accuracy.

Missing changing parts



WARNING!

Danger of injury due to missing changing parts!

When operating the clamping device without changing parts [segmented clamping bushing, clamping heads, work piece end-stops] there is a higher danger of crushing injuries due to the stroke of movable components of the clamping device.

- The clamping process may not be initiated without assembled segmented clamping bushing and/or work piece end-stop.

Parts with sharp edges



WARNING!

Risk of injury!

When screwing in individual components such as for example work piece end-stops, threaded adapters and similar devices that are equipped with an external thread or wear caused by burrs, there is risk of cutting.

- The operation must be done only by qualified personnel.
- Wearing of gloves / [PSA] is required!



CAUTION!

Risk of injury!

A special use-dependent or job-based design can result in variations in the clamping strokes and thus the clamping force.

- The notes on the associated clamping situations or product drawing must always be observed

2.6 Further warnings



WARNING!

Risk of injury!

Never start rotating the clamping device without a clamped work piece.

- For operation any available clamping position must be clamped with a suitable work piece.

**WARNING!****Risk of injury!**

Never reach for the clamping device while the spindle is rotating. Before starting to work on the mandrel, make sure the machine spindle cannot be put in motion.

**WARNING!****Risk of injury!**

Falling down of the clamping device or its parts can cause severe bruises and fractures.

The dead weight of the clamping device or its parts can lead to high physical stress.

**WARNING!****Risk of injury!**

By repeated reworking or wear and tear of the clamping surfaces sharp edges and burrs may appear and lead to severe cutting damages.

**WARNING!****Risk of injury!****Missing o-rings or seals may cause severe injuries!**

Due to missing / fallen out O-rings and seals compressed air or hydraulic fluids which are under high pressure may expel!

- Make sure that all O-rings / seals for the hydraulic / pneumatic connections are available and undamaged!
- If necessary lubricate them before assembly and/or during service.

**WARNING!****Damage of clamping device!**

The clamping device may be released exclusively in the standing condition!

**Risk of injury!**

Leaking [sprayed out] hydraulic oil can cause serious injury.

- Make sure that all O-rings / seals for the hydraulic and/or pneumatic connections are available and undamaged

**WARNING!****Risk of injury!**

The operating screw may be turned out and/or thrown off!

- Never put the machine adapter into rotation if the operating system is not tightened with the given tightening torque!

2.7 Clamping force

The achieved clamping force can vary due to the maintenance condition of the clamping device [state of lubrication and degree of contamination] [see chapter »Maintenance«].

The clamping force must be checked at regular intervals. This requires the use of static clamping force measuring devices.

**CAUTION!****Damages due to excessive draw and compressive force!**

An excessive draw force and/or compressive force may damage the clamping device.

- The max. draw force and compressive force may not be exceeded.

2.8 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 product can be accelerated out of the device and cause severe injuries.

- At the product radially mounted screws and stud screws which were loosened for assembly and maintenance must be re-tightened with the correct tightening torque!
The tightening torque is given at the product itself, near the screw or threaded pin, and/or given in chapter »Bolt torque«.
- All screws or stud screws that are not marked with a tightening torque specification are tightened with the prescribed tightening torque and locked [medium-strength bonding] in the factory and should only be unscrewed after consultation with the manufacturer. If in doubt you must contact the manufacturer immediately do determine the subsequent procedure.

2.9 Functionality



NOTICE!

With high contamination of the clamping device the functionality is no longer guaranteed.

- The cleaning and maintenance intervals must be observed.

2.10 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 clamping device only use HAINBUCH lubricants. See the appendix for reference addresses.

3 Technical data

3.1 General information

The adapter capteX D is available in different sizes and variants.

Information about e.g.

- dimensions
- weight
- max. RPM
- max. clamping force

you will find on the corresponding drawing that you can order at HAINBUCH.



WARNING!

Risk of injury!

Using false technical data can lead to serious personal injury and property damage.

- The technical data [label on the product, assembly drawing] must be observed and may not be modified by the operator!

3.2 Operating conditions

Environment	Specification	Value	Unit
	Temperature range	15 - 65	°C

Mechanical actuating In each possible operating condition the maximum draw force and compressive force may not be exceeded!

3.3 Power specifications



NOTE!

Material damage if the power specifications do not agree!

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

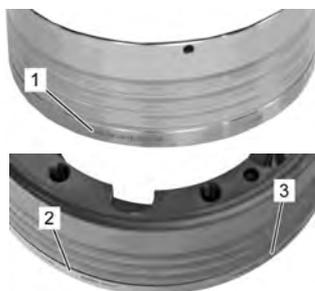
- Only operate clamping devices and adapters in machines with the same power specifications.

Information on maximum clamping force and draw tube force is provided on the clamping device and the adapter.

3.4 Dimensional sheet

Dimension sheets for the respective product can be requested from HAINBUCH.

3.5 Type designation



The type designation is on the product and includes the following information:

- 1 ID no. [marked with the # symbol]
- 2 Maximum speed [rpm]
- 3 Maximum clamping force [kN]

Fig. 1

4 Structure and function

4.1 Overview and brief description

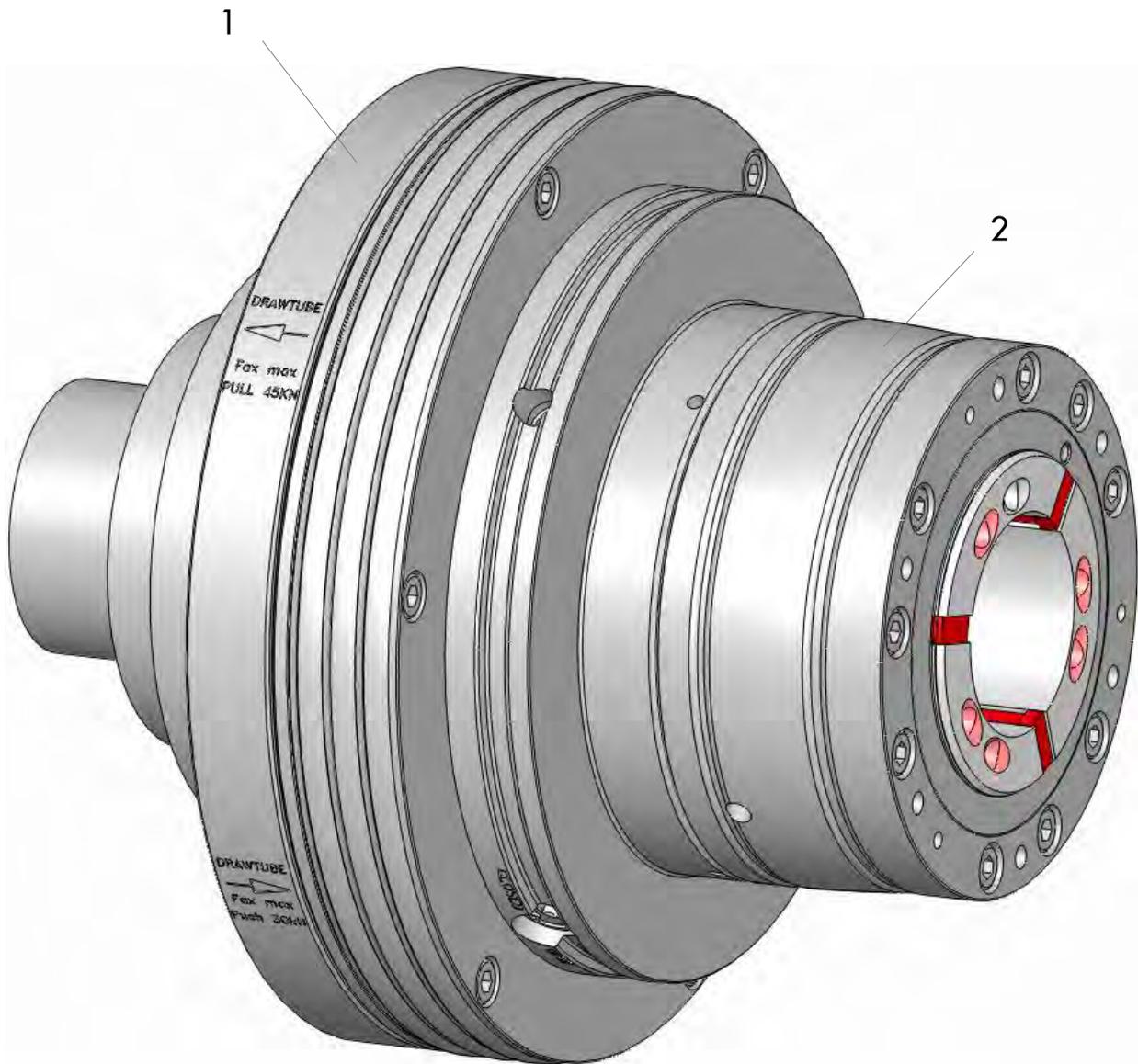


Fig. 2

1. capteX D machine adapter
2. clamping device with capteX D interface

1 View is exemplary

Brief description

Higher quality, flexibility, and productivity, shorter throughput times, above all delivery reliability – this is what you achieve with capteX. In seconds you have changed the complete clamping device. With a jaw quick-change-over system, in just a few seconds you change only the jaws – without machining to size.

Here capteX is significantly more efficient. With capteX you can always use the optimal clamping device on the optimal machine. Moreover you save time and money. And your customers will be pleased.

The highlights:

- Greater productivity and flexibility
- Change clamping devices in seconds
- Change-over accuracy < 0.002 mm
- Same rigidity as a screwed connection

4.2 Optional Accessories

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

Specially developed segmented clamping bushings match to the respective maximum RPM are available for each clamping device. Trouble-free and precise function of HAINBUCH clamping devices is only ensured when using original HAINBUCH segmented clamping bushings.

Lubricating grease and grease gun are required for cleaning and preservation of the clamping device. The lubricating grease is also specially matched for protection of the vulcanized segments of the segmented clamping bushings and increase their service life and elasticity by a significant factor.

4.2.1 Clamping head



Fig. 3

The clamping heads are used to accommodate the work piece that will be machined. They consist of hard steel and rubber segments that are connected via a vulcanizing process.

Depending on the requirements of the work piece there are clamping heads in different sizes and with different profiles and bores.

4.2.2 Changing fixture



Fig. 4

Manual changing fixture

The pins of the changing fixture are inserted in the matching holes in the clamping head. The changing fixture is tensioned via hand force. The clamping head is firmly clamped in the changing fixture and can be inserted into the mounted clamping device with the aid of the changing fixture.



Fig. 5

Pneumatic changing fixture

The pins of the changing fixture are inserted in the matching holes in the clamping head. The changing fixture is tensioned via compressed air. The clamping head is firmly clamped in the changing fixture and can be inserted into the mounted clamping device with the aid of the changing fixture.

4.2.3 Grease



Fig. 6

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

4.2.4 Grease gun



Fig. 7

The grease gun is filled with universal grease, which is pressed into the clamping device. The grease gun has a pointed mouthpiece. The order number for the grease gun is 2086/0004; it can be ordered from HAINBUCH.

5 Transporting, packaging, storing

5.1 Safety instructions for transporting

Unbalanced package



WARNING!

Danger of falling due to an unbalanced package

Packed goods can have an unbalanced package. If attached incorrectly the package can tip and cause life-threatening injuries.

- Note the markings on the packages.
- Attach the crane hook in such a manner that it is located above the center of gravity.
- Carefully lift and see if the load tilts. If necessary change the attachment.



Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

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 Transport 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 extend of transport damage on the transport documents or on the transport company's delivery ticket.
- 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 Unpacking and inner-company transportation



The adapter is packed vertically and has threaded holes.

Lifting eye bolts can be screwed into these threaded holes.

To safely lift the adapter out of the package it must be hooked into a crane depending on the weight.

For transporting with transport trolley the adapter must be positioned in standing condition. Make sure that a non-slip pad has been laid.

All tools and accessories which are not in scope of delivery are marked as optional in the operating instructions.

- Two people are required for this task.
- Special tools required:
 - Crane from weight 15 kg
 - Lifting eye bolts
- 1. Screw lifting eye bolt into the thread of the adapter.
- 2. Hook the load-handling equipment into the lifting eye bolt.
- 3. Use a crane to carefully lift the adapter out of the transport packaging and put it down on a stable, level substrate.

5.5 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 weight 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.

5.6 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 bis 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 clamping device Only re-store the clamping device under the following conditions:

- Thoroughly clean the clamping device prior to subsequent storage [see section »Cleaning«]
- Thoroughly oil and grease the clamping device. [see section »Cleaning«]
- Store the clamping device in airtight foil
- The clamping device must be stored securely in position. If this is not guaranteed, use a suitable container for the clamping device or equip the shelf with a circumferential securing edge.

6 Assembly



WARNING!

During the initial installation of the clamping device severe injuries may occur.

- The initial installation must be done only by qualified personnel.
- All screws remaining in the clamping must be tightened firmly.
- All tools and keys must be removed after installation.

6.1 Pre-consideration

- Screws are tightened according to the size of the screw and the general torque.
To avoid axis-parallel warpage under load and to get stiffness turn in the screws evenly.
- To avoid precision error clean the screw joint surfaces and also the mating surfaces, see »Maintenance«.
The ex works wetting of the plate surfaces and the clamping element is only corrosion protection. It's not functionally lubricated.
- The insertion of lubricant is provided only on the mechanical surfaces. Pay attention to the instructions for lubricants in the chapter »Maintenance«.
- Avoid too much lubricant on the bearing surface, as this can cause face runout.
- Seal rings (e.g. o-ring, quad-ring seal) and sealing surfaces must be lubricated.
Note the information in the chapter »Maintenance«.
- Note that the function surfaces (plate surface, mating surface, cone surface and seal surface) may not be damaged.



CAUTION!

Wear safety shoes during the assembly and maintenance work.

Make sure that the starting of the spindle is impossible.

6.2 Preparation of the capteX D machine adapter

Two people are required for this task.

Special tools required:

- Allen wrench
- Crane and eye bolts

! Transport!

For transporting the capteX D machine adapter always use a suitable clamping means / crane and the eye bolts [in scope of delivery].

Make sure that a moving / falling of the capteX D machine adapter is not possible!

The capteX D machine adapter is delivered in assembled condition.

For the assembly of the capteX D machine adapter to the machine it must be separated into parts.

Follow these steps:

! NOTE!

The draw tube adapter [A] is locked against turning in the capteX D machine adapter by a feather key [B].

- The feather key [B] may not be damaged!
- Keep the feather key [B] ready for assembly!

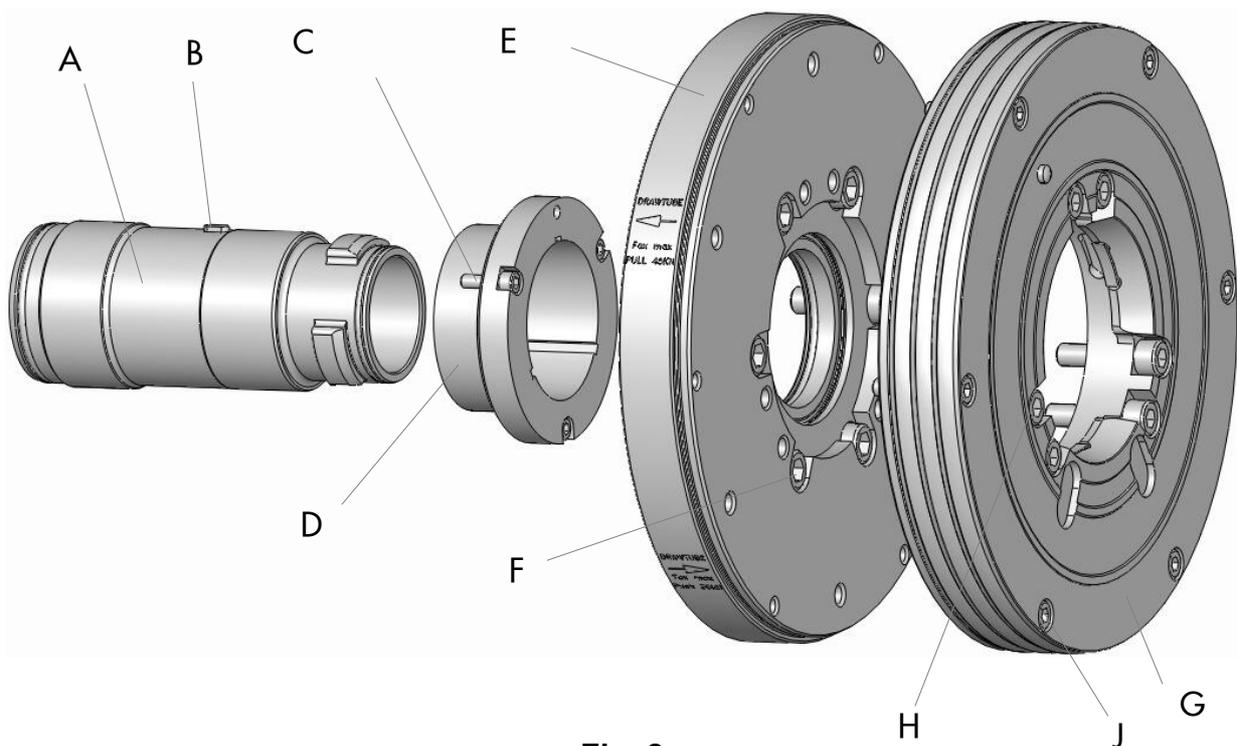


Fig. 8

1. Pull the drawtube adapter [A] carefully backwards out of the capteX D machine adapter.
2. Remove the plate [C] from the flange [E].
3. Loosen and remove the cylindrical screws [H] and remove the actuating unit [G] from the flange [H].

The capteX D machine adapter is ready for assembly.

6.3 Installation



WARNING!

Danger of injury due to unintentional 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 eye bolts from the clamping device and remove them from the interior of the machine.
- Only run the machine in set-up mode or jog mode.
- Always remove immediately all the tools and wrenches from the clamping device after use.



WARNING!

Risk of injury!

By operating the clamping device without changing parts [clamping head, segmented clamping bushing, work piece end-stops ...] there is an increased risk of crushing injuries by the stroke of the moving components of the clamping device.

By uncontrolled discharge of the clamping process [e.g. by incorrect installation of the energy supply or faulty programming] there is an increased danger.



WARNING!

Risk of injury!

Bending in the working area of the machine can cause severe head injuries!



CAUTION!

Risk of injury!

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

- Make sure that the system is pressure-free and that a restart of the machine can be excluded!



Risk of injury!

Contamination of the mechanism can influence/reduce the stroke, thus the clamping force is reduced and thus, the work piece is not properly tightened and can be thrown out.

- Clean the product regularly [see chapter »Maintenance and service«].



Risk of injury!

If the clamping pressure is too low clamped work piece may be thrown out.

If the clamping pressure is too high severe damages of the components of the clamping device may occur the throwing out of the work piece.

- Before operation set the operation pressure back to operation level.
- The operating pressure should be checked and adjusted regularly!
- The dimension of the work pieces should be checked regularly [clamping- \emptyset]!



Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

**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.

6.3.1 Assembly of the capteX D machine adapter

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane and eye bolts

For the assembly of the capteX D machine adapter to the machine the following steps are to be done:

**WARNING!****Risk of crushing due to machine movement!**

Due to the design of the draw tube it can not always be avoided, that during the assembly of the draw tube adapter and the clamping unit there will be a gap between machine and clamping device.

By this gap there is a high risk of crushing which can lead to serious injuries.

- Never reach into the gap between machine / spindle flange and clamping device.

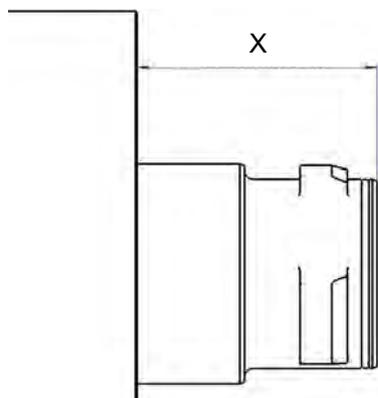


Fig. 9

1. Move the drawtube into front end position.
The setting dimension describes the axial distance of the front face of the drawtube adapter to the flange in the front drawtube position and it is indicated on the corresponding drawing.
2. Screw the drawtube adapter [A] on the machine spindle till end-stop.
3. Turn back the draw tube adapter [A] till the adjusting dimension [X] is reached.

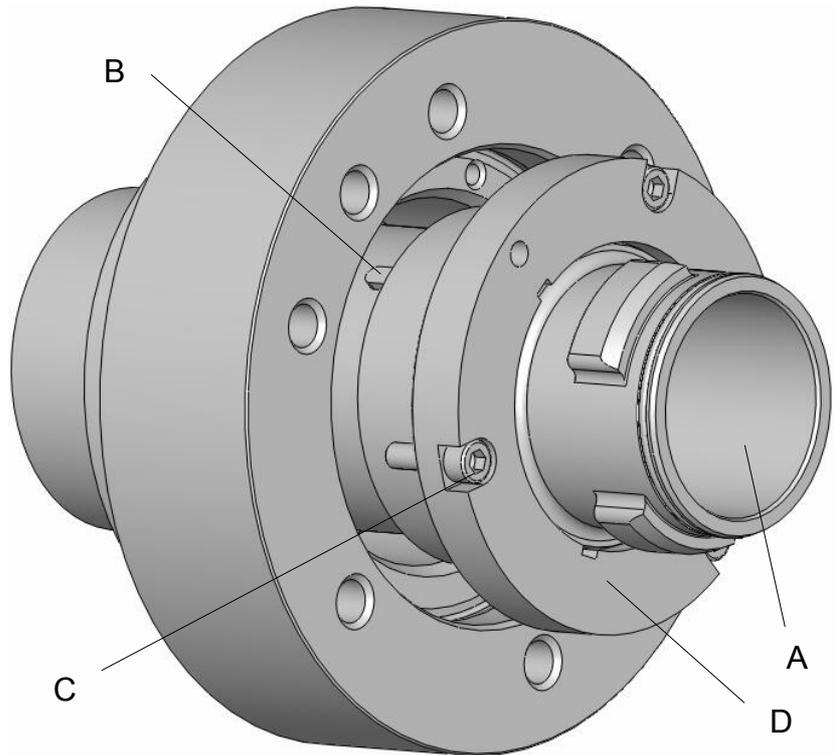


Fig. 10

4. Put the plate [D] on the machine spindle.
5. Screw in the cylindrical screws [C] and tighten them firmly with the correct tightening torque.

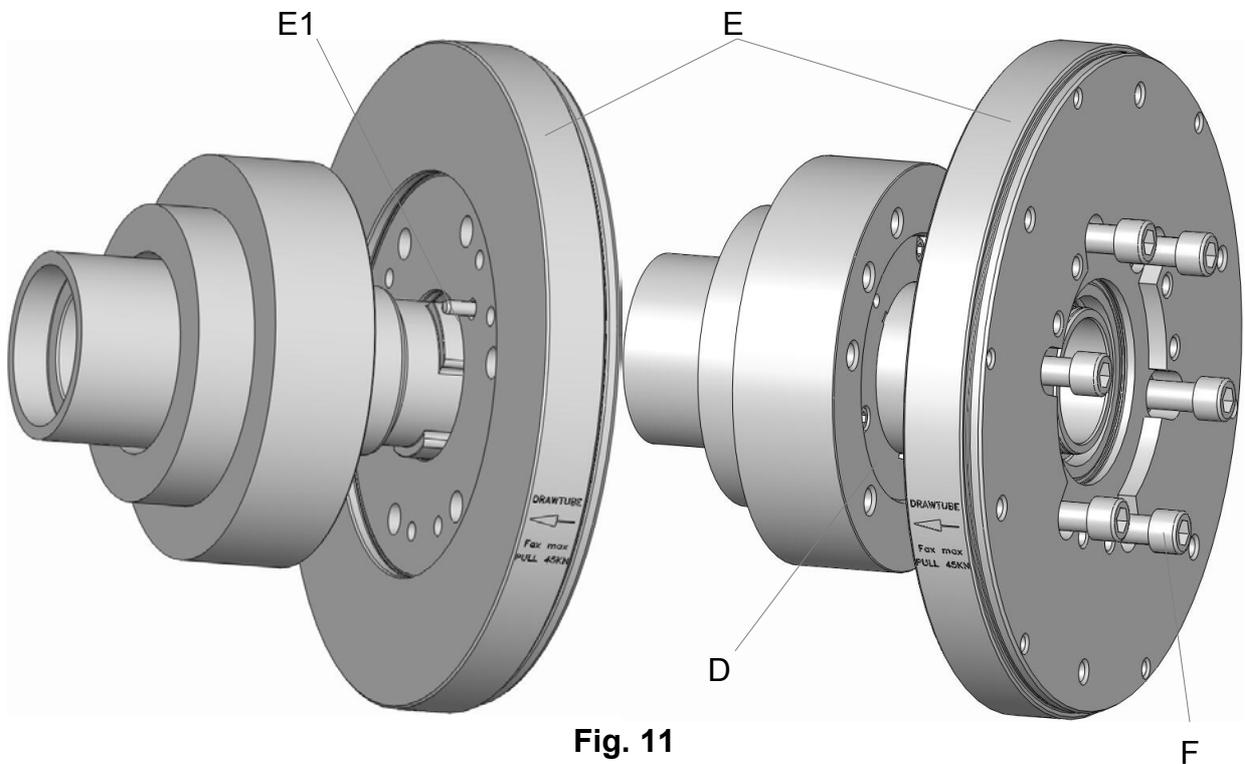
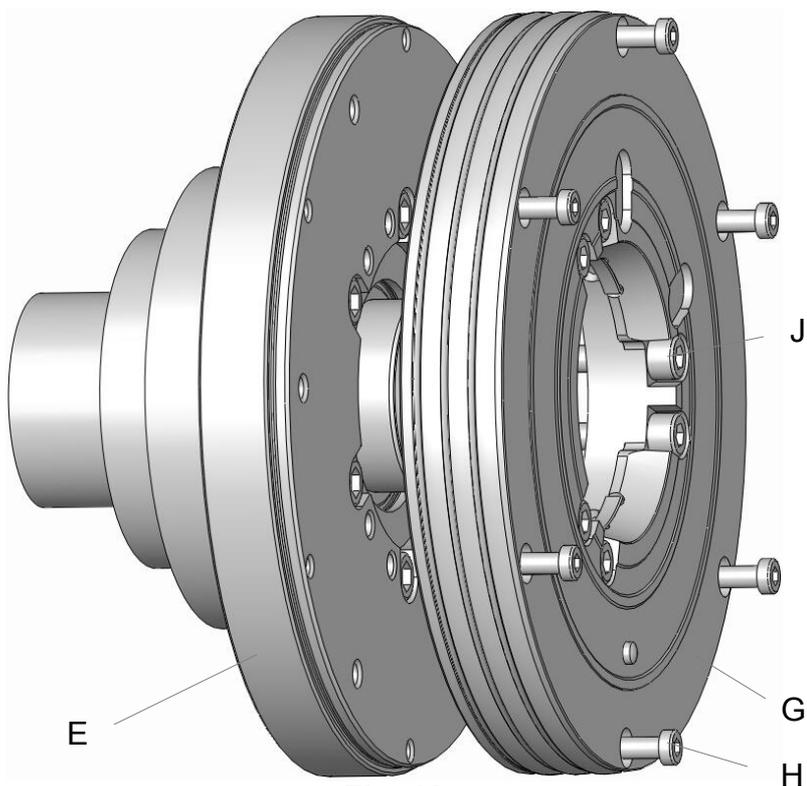


Fig. 11

! **NOTE!**

Position the flange [E] on the plate [D] by the positioning pin [E1] at the flange [E]

6. Put the flange [E] on the machine.
7. Screw in the cylindrical screws [F] through the flange [E] into the machine and tighten them firmly with the correct tightening torque.

**Fig. 12**

8. Put the actuating unit [G] on the flange [E].
9. Screw in the cylindrical screws [H] and tighten them only finger-tight.
10. Screw in the cylindrical screws [J] and tighten them only finger-tight.

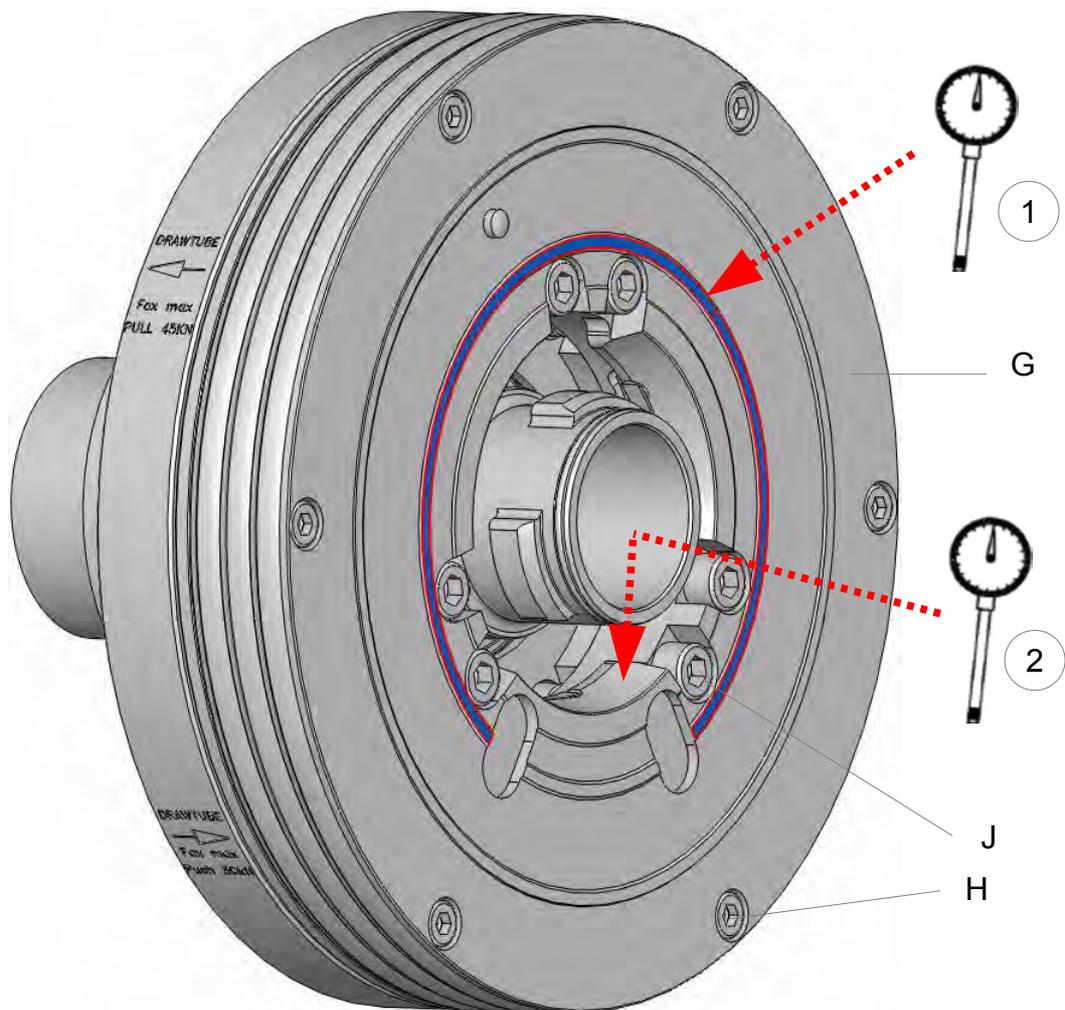


Fig. 13

11. Check the concentricity at the inner taper [2] of the actuating unit [G] [max. 0.003 mm], correct if necessary carefully with a plastic hammer.

! **NOTE!**

The tightening torque must be strictly adhered to.

Make sure that the tightening torque is not too low or too high.

- Use a torque wrench!

12. Tighten the cylindrical screws [J] by using a torque wrench in the marked order [#1 ... #6] with the allowed tightening torque of **50 Nm**.
13. Tighten the cylindrical screws [H] with the correct tightening torque.
14. Remove the transport eye bolts.
The machine adapter is assembled and ready for the assembly of the clamping device.

6.3.2 Assembly of a clamping device to the clamping device adapter

The clamping device adapter is delivered in assembled condition.

In exceptional cases it may be necessary to adapt a clamping device to a suitable clamping device adapter at the site.

For this, the operating instructions of the clamping device must also be consulted!

As an example the installation of a mandrel is shown:

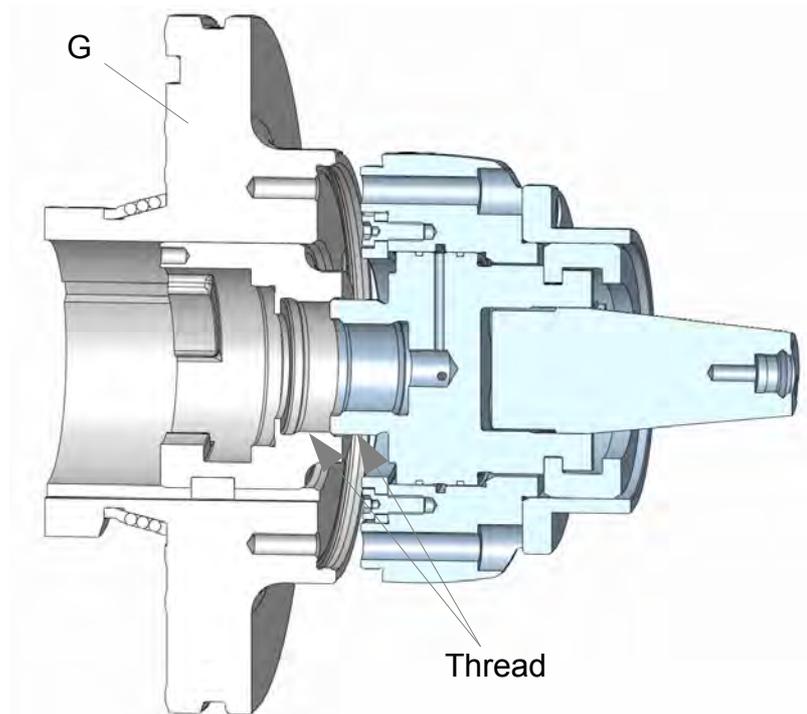


Fig. 14

1. Put the clamping device [K] on the corresponding clamping device adapter [G] [possibly a partly disassembly of the clamping device is required, e.g. to reach the mounting screws of the flange].
2. Screw the clamping device on the thread of the bayonet adapter till end stop.

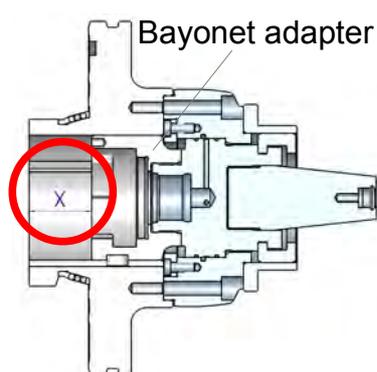


Fig. 15

3. Push the mounted bayonet adapter into front end position.
4. Check the given dimension [X].



NOTE!

With each clamping device that is designed for this adapter the dimension [X] is given in the corresponding manual and/or in the assembly drawing.

- The dimension – measured in step 4 – must fit to the given dimension!

5. If the dimension doesn't fit, the clamping device must be loosened from the bayonet adapters' thread and unscrewed until the dimension [X] is reached.

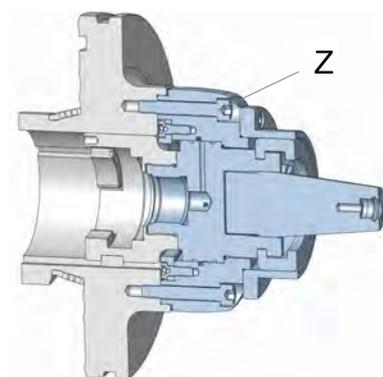


Fig. 16

6. Screw back the bayonet adapter until the bolt hole circles of clamping device and clamping device adapter fit.
7. Screw in the cylindrical screws [Z].
8. Tighten the cylindrical screws [Z] with the required tightening torque, see chapter »Maintenance«.

The clamping device is assembled to the clamping device adapter.

9. Assemble the new group [clamping device and clamping device adapter] on the capteX machine adapter, see chapter »Assembly of the clamping device to the captex machine adapter«.
10. Check the concentricity of the clamping device, correct if necessary.
Information about adjusting the concentricity is given in the corresponding manual to the clamping device.

6.3.3 Assembly of the clamping device to the capteX D machine adapter

The clamping device is delivered in assembled condition.

! Transport!

- For transport always use a suitable clamping means / crane and the eye bolts.
- Make sure that a rolling / falling of the clamping device is not possible.

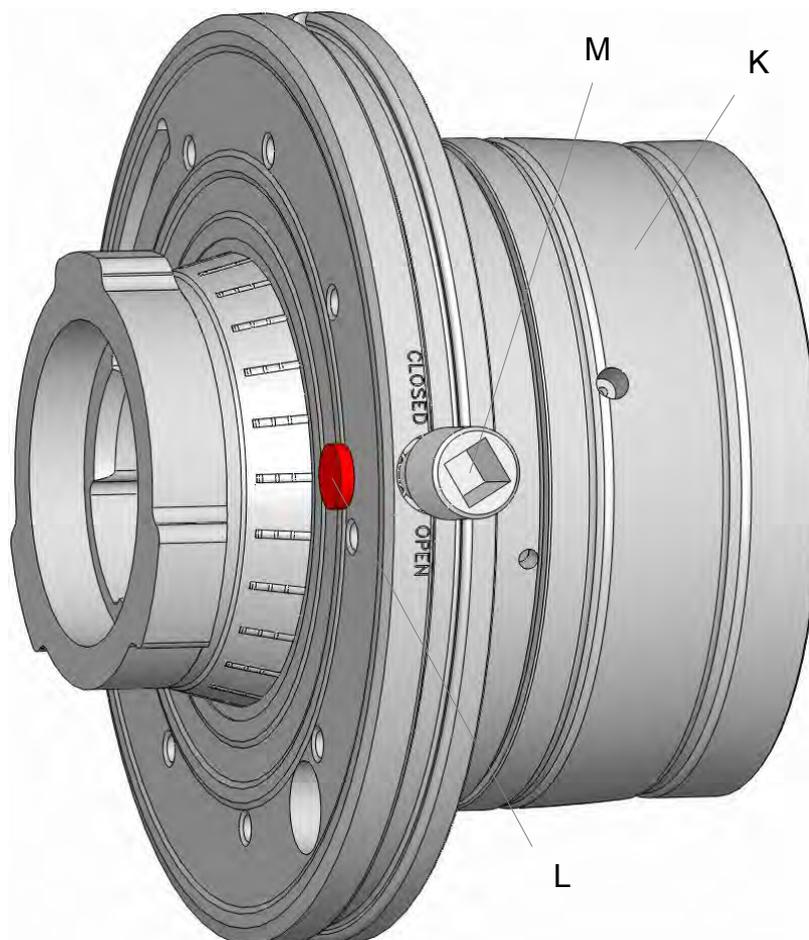


Fig. 17

For the assembly of the clamping device to the machine adapter the following steps are to be done:

1. Move the draw tube into front end position.
2. Reduce the clamping pressure to minimum.
3. Screw in the transport eye bolts.

! NOTE!

Make sure that the locking pin [L] is turned in before assembly!

4. Insert the delivered special assembly key [M] into the actuating of the clamping device [K]. Turn the key to »OPEN« to turn in the locking pin [L].
5. Put the clamping device on the actuating unit [G], use a transport aid.
6. Lock the clamping device by the bayonet.
7. Turn the delivered special assembly key to »CLOSED« to turn out the locking pin [L] and lock the clamping device [K].
8. Remove the delivered special assembly key [M] from the actuating of the clamping device [K].

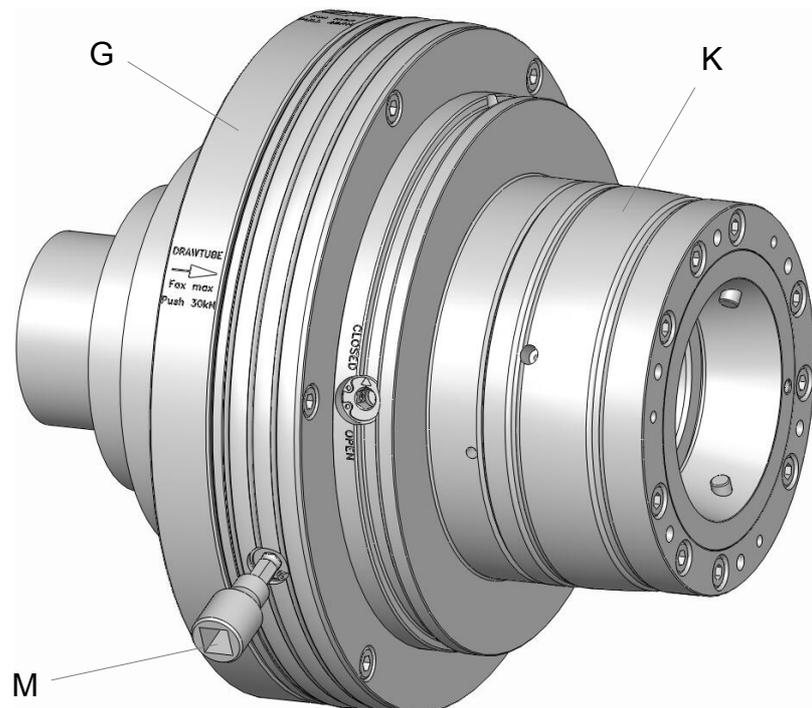


Fig. 18

9. Insert the delivered special assembly key [M] into the actuating unit of the machine adapter [G].
10. Put a torque wrench on the special assembly key [M], if necessary use an adapter.

! **NOTE!**

Always use a torque wrench to tighten the actuating unit in the machine adapter. Always tighten the actuating unit by **max. 30 Nm!**
 Make sure that the tightening torque of 30 Nm will not be exceeded!

11. Tighten the actuating unit with the delivered special assembly key [M]. Always use a torque wrench!
12. Remove the torque wrench from the special assembly nut [M].
13. Remove the special assembly key [M] from the actuating unit.
14. Remove the transport eye bolts.

The clamping device is assembled and locked.

**WARNING!****Risk of injury!**

Tools and gages that are thrown out of the machine can cause injury.

- Remove all tools and gages from the working area of the machine before the machine is started up.

**Risk of injury!**

If the clamping pressure is too low clamped work piece may be thrown out.

If the clamping pressure is too high severe damages of the components of the clamping device may occur the throwing out of the work piece.

- Before operation set the operation pressure back to operation level.
- The operating pressure should be checked and adjusted regularly!

**WARNING!****Slipping danger due to escaping hydraulic fluid!**

Escaping (sprayed out) hydraulic oil can cause serious injuries.

- Make sure that all o-rings/seals for the hydraulic / pneumatic interfaces are available and in undamaged condition.
- Make sure that the clamping device is empty and leakage of hydraulic fluid is avoided.

6.3.4 Clamping head

Inserting the clamping head

For the inserting of the clamping head into the clamping device the following steps are to be done:

1. Move the drawtube into front end position and reduce the clamping pressure to minimum.
2. Put the changing fixture [in scope of delivery] to the clamping head.
3. Put the clamping head into the clamping device by using the changing fixture.
4. Remove the changing fixture from the clamping head.

The clamping head is inserted.

Removing the clamping head

For the removing of the clamping head out of the clamping device the following steps are to be done:

1. Move the drawtube into front end position and reduce the clamping pressure to minimum.
2. Put the changing fixture [in scope of delivery] to the clamping head.
3. Take the clamping head out of the clamping device by using the changing fixture.
4. Remove the changing fixture from the clamping head.

The clamping head is removed.

6.4 Work piece



WARNING!

Risk of injury due to thrown out parts!

During clamping of the work piece and the processing parts can be thrown and cause severe injuries and property damage.

- Check the clamping diameter of the work piece.
- Tighten only work pieces that meet the dimensional requirements.
- For clamping very long work pieces use in addition a tailstock / a steady rest for support.
- Do not exceed the maximum permissible clamping force.
- Make sure that the applied clamping force is set correctly [neither too high nor too low].

**CAUTION****Risk of injury!**

When placing the work piece:

- Make sure that the hands / fingers may not be clamped between the flange and the work piece!

6.5 Inspections

NOTE!**Material damage due to damaged clamping devices!**

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

- Only install undamaged, complete, and precisely balanced clamping devices.
- If in doubt contact the manufacturer.

Ensure the following points prior to each installation and start-up of the clamping device:

- All cylindrical screws of the clamping device must be present and tightened with the proper tightening torque.
- The balance screws of the clamping device must all be present and undamaged.

All rubber segments must be intact; this means that they are neither torn, nor are they porous at any point.

- All edges and bearing surfaces are intact; this means that they are neither broken nor do they show any signs of wear.
- The set speed of the machine tool should not exceed the maximum permissible speed of the clamping device.
- The maximum draw tube force specified on the perimeter of the clamping device must not be exceeded.
- The clamping pressure of the machine must be sufficiently high.

- All mounting tools must be removed from the interior of the machine.
- Clamping device and work piece must be compatible –check the clamping diameter regularly.
- The work piece must be clamped into the clamping device with sufficient work piece tension.
- Do a pressure loss test and a measurement of clamping force.

6.6 Control of the stroke position



WARNING!

Crushing danger from moving parts!

Crushing danger from moving parts during controlling the stroke position!

Gaps, caused while controlling the stroke position, can cause severe injury.

- Only do the controlling of the stroke position with assembled changing parts.
- Only run the machine in set-up mode or jog mode.
- Do not reach into moving parts or handle moving parts during operation.
- Note the gap dimensions of moving parts.
- Wearing of gloves / [PSA] is required!

6.7 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 clamping device and a possibly mounted adaptation clamping device and adapter of chips and production residues using a soft, lint-free cloth and oil them lightly.
5. Close the protective door or hood.

7 Disassembly, subsequent storage, disposal

If there is break in production that lasts longer than 3 days, the clamping device must be disassembled and properly stored in accordance with the manufacturer's specifications [see section »Transport, 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.



WARNING!

Danger of injury due to falling components!

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.



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.

7.2 Disassembly of the clamping device from the capteX D machine adapter

For the disassembly of the clamping device from the machine adapter the following steps are to be done:

1. Move the draw tube of the machine into front end position.
2. Reduce the clamping pressure to minimum.

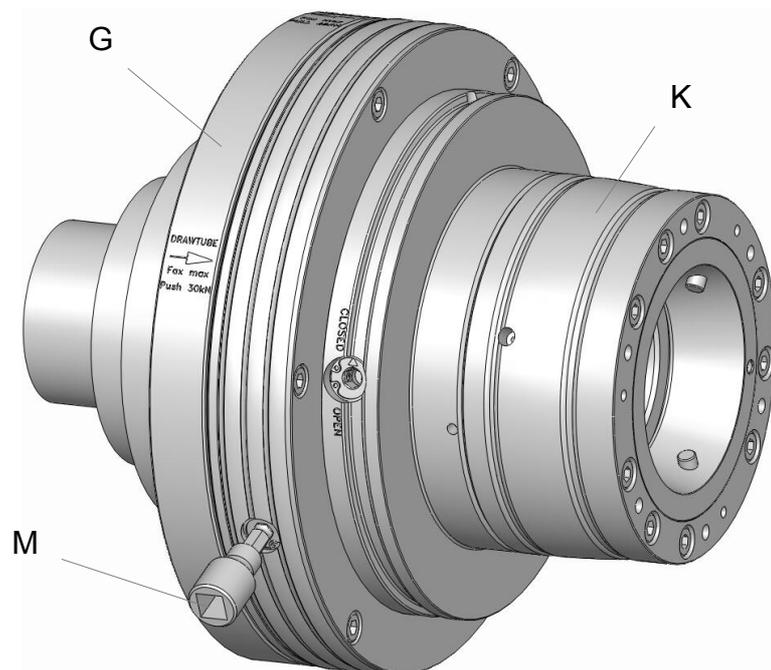


Fig. 19

3. Insert the delivered special assembly key [M] into the actuating unit of the machine adapter [G].
4. Put a torque wrench on the special assembly key [M], if necessary use an adapter.
5. Loosen the actuating unit by using the delivered special mounting nut. Always use a torque wrench

and remove it immediately after using!

6. Remove the delivered special assembly key [M] from the actuating of the clamping device [K].

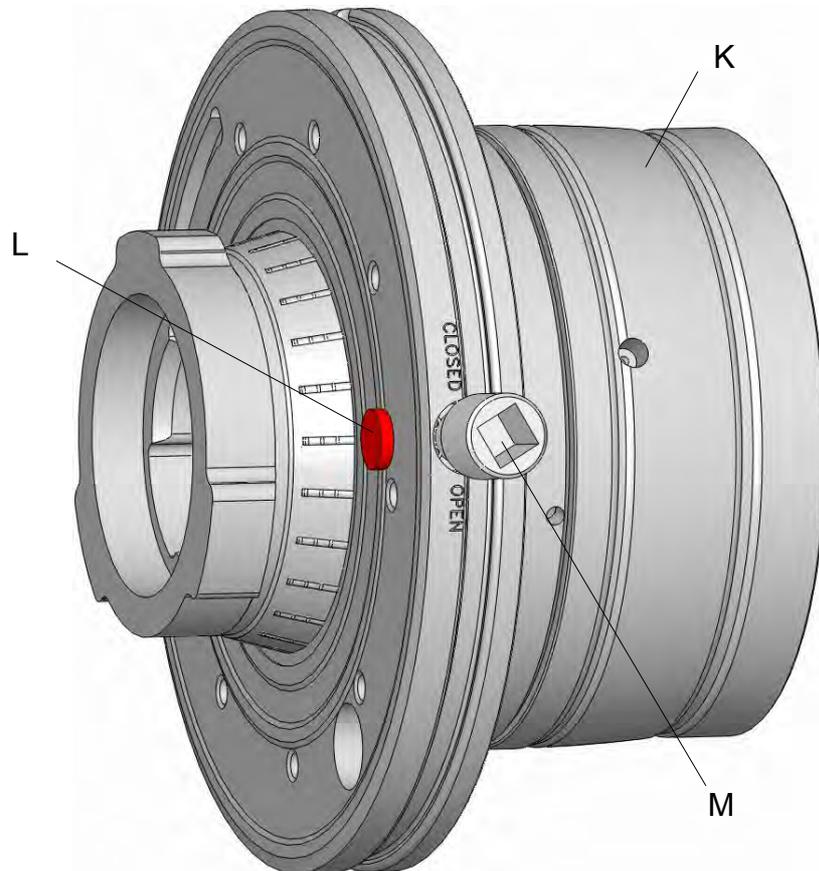


Fig. 20



CAUTION!

Risk of injury!

Before disassembling secure the clamping device with the transport eye bolts and a crane.

7. Insert the delivered special assembly key [M] into the actuating of the clamping device [K]. Turn the key to »OPEN« to turn in the locking pin [L].
8. Unlock the clamping device by the bayonet.
9. Remove the clamping device from the machine adapter.
10. Turn the key to »CLOSED« to turn out the locking pin [L].
11. Remove the delivered special assembly key [M] from the actuating unit.

The clamping device is disassembled.

7.3 Disassembly of the clamping device adapter

For the disassembly of the clamping device adapter [K] from the machine adapter [G] the following steps are to be done:

1. Move the drawtube into front end position and reduce the clamping pressure to minimum.

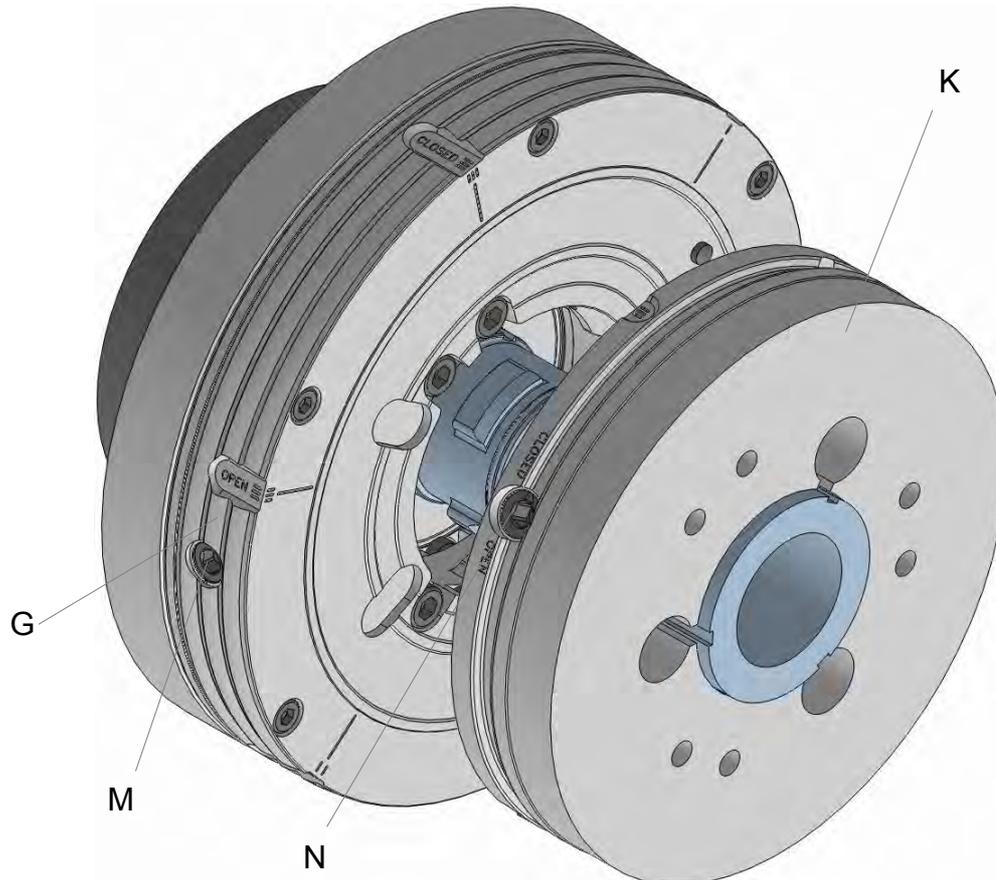


Fig. 21

2. Insert the delivered special assembly key [M] into the actuating unit of the machine adapter [G].
3. Put a torque wrench to the special assembly key [M], if necessary use an adapter.
4. Loosen the actuating unit with the delivered special assembly key [M]. If necessary use a torque wrench and remove the torque wrench immediately after using.
5. Remove the special assembly key [M] from the actuating.



Fig. 22

**CAUTION!****Risk of injury!**

Screw in ring nuts into the clamping device and secure the clamping device with a transport crane!

6. Insert the delivered special assembly key [M] into the actuating of the clamping device [K]. Turn the nut to »OPEN« to turn in the locking pin [L].
7. Unlock the clamping device by the bayonet.
8. Remove the clamping device adapter from the machine adapter.
9. Turn the nut to »CLOSED« to turn out the locking pin [L].
10. Remove the delivered special assembly key [M] out of the actuating of the clamping device adapter [K].

The clamping device adapter is disassembled.

7.4 Disassembly of the capteX D machine adapter

For the disassembly of the capteX D machine adapter from the machine the following steps are to be done:

1. Move the drawtube into front end position.
2. Reduce the clamping pressure to minimum.

**CAUTION!****Risk of injury!**

Before disassembly screw in ring nuts into the actuating unit of the capteX D machine adapter.

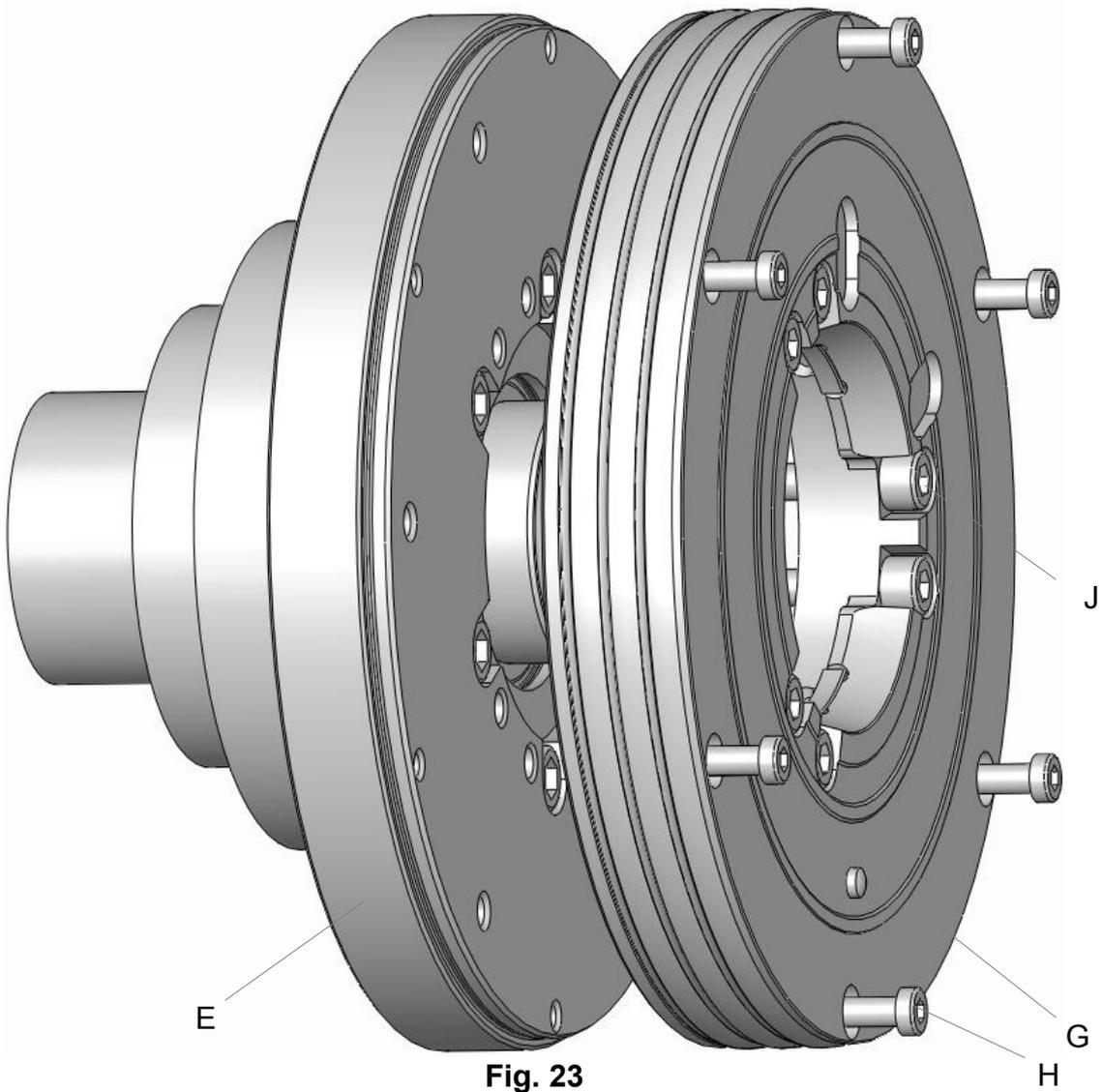


Fig. 23

3. Loosen and remove the cylindrical screws [J].
4. Loosen and remove the cylindrical screws [H].
5. Remove the actuating unit [G] from the flange [E].

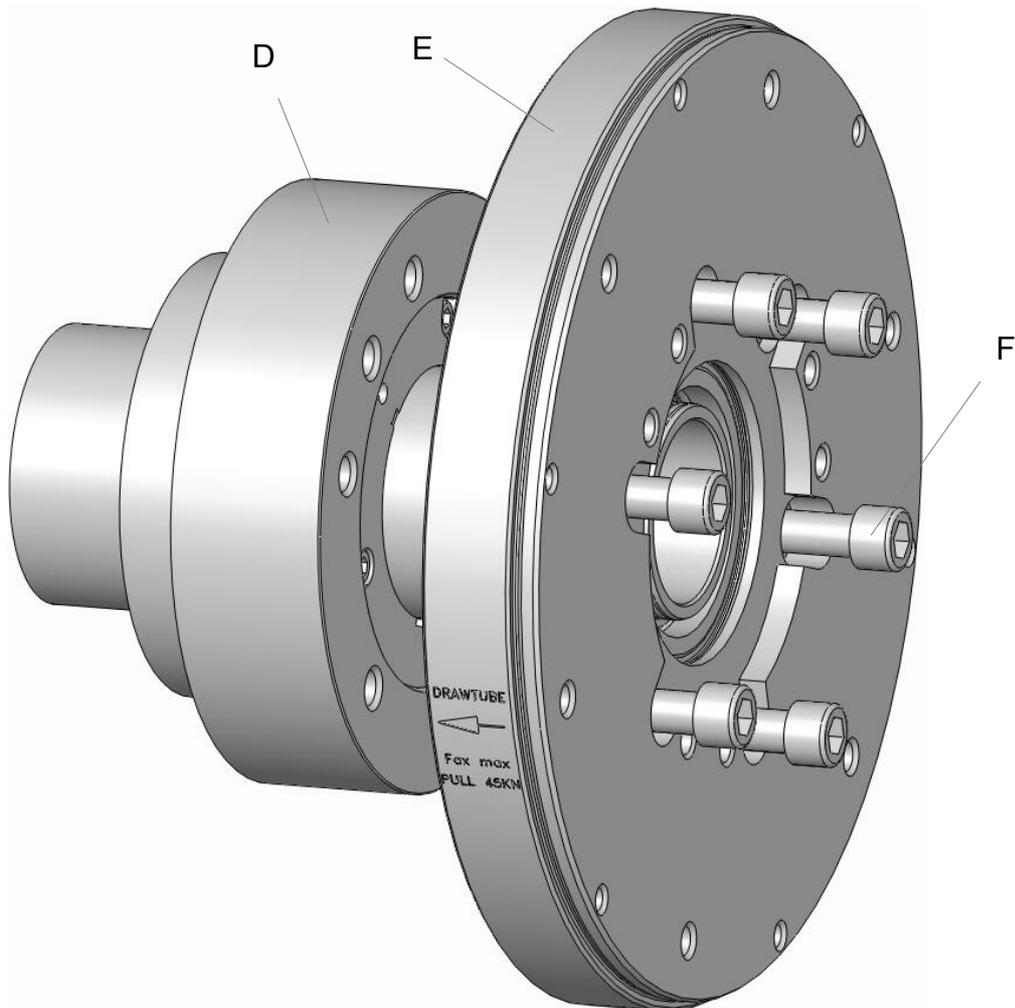


Fig. 24

6. Loosen and remove the cylindrical screws [F] and remove the flange [E] from the machine spindle.

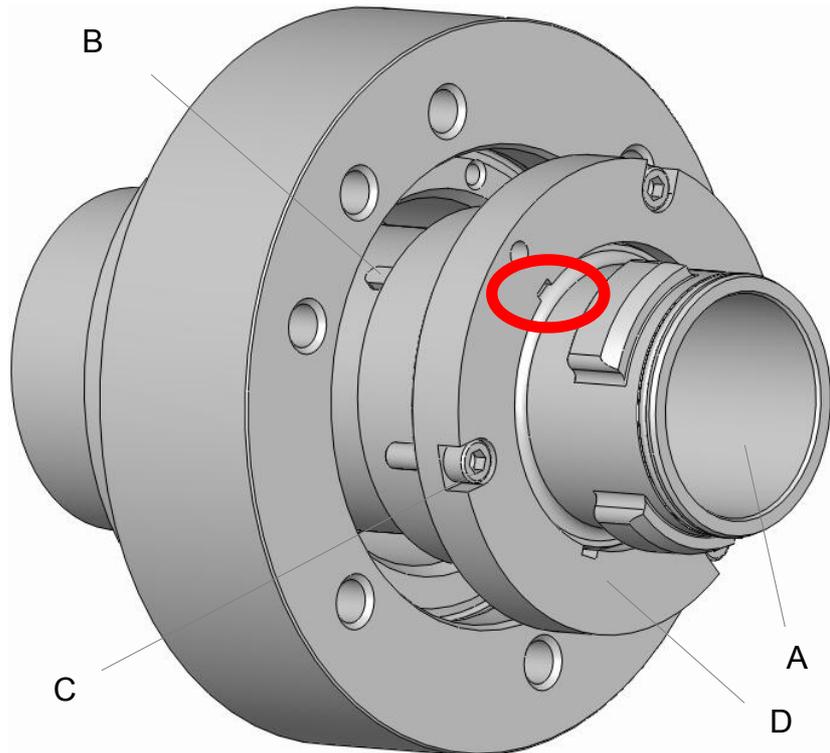


Fig. 25



NOTE!

The draw tube adapter [A] is locked against rotation in the capteX D machine adapter by a feather key.

The feather key [B] may not be damaged!

Hold the feather key [B] ready for the assembly!

7. Loosen and remove the cylindrical screws [C].
8. Remove the plate [D] from the machine.
9. Unscrew the draw tube adapter [A] from the machine spindle.

The machine adapter is disassembled.

7.5 Subsequent storage of the clamping device

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



NOTE!

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

7.6 Disposal

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



CAUTION!

Risk of injury due to leaking fluids!

Hydraulically or pneumatically operated clamping devices may contain residues of liquids. Uncontrolled leakage of fluids can lead to severe injuries.

- Open the pressure relief screw and drain remaining liquid.
- Discard the liquid.



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!



NOTE!

Composite materials!

For disposal clamping devices which include composite materials [mineral cast, CFK] must be returned at HAINBUCH!

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 General

Cleanliness of the appropriate end-stop as well as the guidance diameters are conditions for reaching the concentricity and perpendicularity tolerances. Clean these surfaces with an appropriate cleaner.



CAUTION

Danger of injury due to improper handling of cleaners!

Improper handling of cleaners can cause health impairments.

- Always comply with the safety data sheets and guidelines provided by the manufacturer of the cleaning agent for handling/using the cleaners.



NOTE!

Material damage due to use of the wrong cleaning agent/cleaner!

Seals and clamping elements can be damaged due to use of the wrong seals and clamping elements.

- Do not use any solvents that contain ester or polar solvents for cleaning purposes.

**CAUTION****Danger of injury due to loss of clamping force!**

Fouling of the adapter can cause the adapter to lose considerable clamping force.

- Always comply with the maintenance and cleaning intervals specified in this manual.

**Risk of injury!**

Slipping while lubricating with a grease gun can lead to severe cuts!

**WARNING****Risk of injury due to stored energy!**

The clamping device can be designed with disc springs. These disc springs are under permanent tension! The release of the stored energy can cause injuries!

- By loosening the corresponding screws they have to be operated continuously alternately to reduce the clamping pressure to a minimum!
- Particularly cautious approach is required!
- For cleaning and maintenance disassemble the clamping device from the machine!
- Always wear personal protective equipment!

8.2 Cleaning



NOTE!

Material damage if cleaned with compressed air!

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

- Never clean the clamping device with compressed air!



Fig. 26

- Auxiliary material required:
 - Ester-free, non-polar cleaning agent
 - Soft, lint-free cloth
- 1. Disassemble the adapter [see section »Disassembling the adapter«].
- 2. Clean all components listed below with cleaning agent and a cloth; remove all oil and grease residues:
 - Flange
 - Actuating unit
 - Actuating screw
 - Mounting screw

8.3 Preservation

- Special tools required:
 - Universal grease 2085/0003
 - Grease gun
 - Oil stone
 - Soft, lint-free cloth
- 1. Disassemble the adapter [see section »Disassembling the adapter«].
- 2. Hone all the bearing surfaces of the adapter with an oil stone.
- 3. Lightly grease all cylindrical screws. Remove excess grease with a cloth.
- 4. Remount the adapter.
- 5. Screw all cylindrical screws into the adapter again and tighten them finger-tight.

! For subsequent storage tightening the cylindrical screws finger-tight suffices. This facilitates re-commissioning and protect the cylindrical screws.

6. Lightly grease all interior and outer surfaces of the adapter. Remove excess grease with a cloth.
7. Pack the adapter airtight in foil. Place it on a level, impact-free storage location and safeguard it from falling.

8.4 Use of lubricant

With the usage of lubricant you may only use grease that corresponds to the requirements concerning bond, pressure-stability and solubility in lubricating coolant. In addition no dirt particles may be in the grease; they cause run errors if they come in in-between two mating surfaces.

We recommend for this the following lubricant:

HAINBUCH grease

see product information

Alternatives:

Lubricant	Manufacturer	Product
Universal grease	MicroGleit	GP 355
	Klüber	QNB 50
	Zeller & Gmelin	DIVINOL SD24440
	Bremer & Leguill	RIVOLTA W.A.P.
Special grease	Klüber	MICROLUBE GL 261

8.5 Maintenance schedule

Maintenance tasks are described in the sections above 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«]
Every 36 hours of operation	Clean the adapter [see section »Cleaning«] Grease the adapter [see section »Preservation«]
Every 6 months and/or with heavy contamination	Completely disassemble and clean the adapter [see section »Cleaning«]. If necessary send the adapter back to HAINBUCH for special cleaning.
<p>! For proper operation of the coolant feed a pre-filtering with duplex filter (mesh size 100 µm, PI 3754) is necessary. The duplex filter is mounted on the coolant cleaning system.</p>	

By using the clamping device in the 3-shift operating it should be maintained as follows:

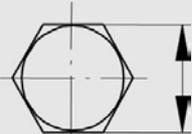
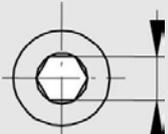
- After **22 operation hours each**, the clamping element is to be taken from the clamping device and cone, coupling and clamping element (clamping element, segmented clamping bushing) are to be cleaned.
Special attention applies for the coupling area.
- A general **visual inspection**, particularly at the clamping area and the end-stop face, is to be done to ascertain early damages at the clamping device and at the rubber of the clamping element.
- During maintenance also the seals of the segmented clamping bushing must be checked for any damage, if necessary they must be replaced.
- Depending on contamination a complete cleaning of all mobile parts should be accomplished.
- Approx. **2 times annually** the clamping device is must be divided and cleaned completely.
- With storage the clamping device must be cleaned in principle by lubricating coolant and be protected from rust with preservative at the surface.
- **Daily and additional when needed** the coupling area must be cleaned.

8.6 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 $\mu_{\text{tot}} = 0,12$

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 prescribed values.

Knowledge of the applicable guidelines and configuration criteria are the prerequisites.

9 Trouble shooting

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

If faults occur more frequently, the maintenance intervals must be shortened to correspond to the actual system load.

Contact the manufacturer if there are faults that cannot be corrected by following the instructions below; see the service address on the back of this operating instruction.

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 of the machine.
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.



The trouble shooting table provided below lists personnel who are authorized to correct the fault.

6. If there is a fault that was not caused by the clamping device 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

Fault	Possible cause	Fault correction	Corrected by
Clamping device does not open	Fouling at the thread of the actuating screw	Loosen the actuating screw with much power, if necessary get in contact with HAINBUCH	
	Contamination at the actuation	Get in contact with HAINBUCH	Specialist
Dimensional deviation on the work piece	Contaminated centroteX reception	Disassemble the clamping device from the centroteX adapter, clean the cone and the reception [see section »Cleaning«].	Specialist
Clamping device doesn't fit correctly to the adapter	Screws may have loosened	Get in contact with HAINBUCH	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 device
2. Acknowledge the fault on the machine tool controller
3. Ensure 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 7144. 907-333

Schedule Hotline

Current status of your order? Just call:
+49 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 7144. 907-444

10.2 Representatives

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

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11 Index

A

Accessories.....	
optional.....	23
Assembly.....	
Preparation capteX D machine adapter.....	30
Work piece.....	42

B

Bolt torque.....	59
Brief description.....	22

C

Carbon / CFK.....	7
Changing fixture.....	
Manual.....	24
pneumatic.....	24
Clamping head.....	23
Cleaning.....	56
Control of the stroke position.....	44

D

Dimensional sheet.....	21
Disposal.....	53

E

Environmental protection.....	19
-------------------------------	----

G

Grease.....	24
Grease gun.....	24

I

Intended use.....	10
-------------------	----

M

Maintenance schedule.....	57
---------------------------	----

O

Operating conditions.....	21
Overview.....	22

P

Packaging.....	27
Personal protective equipment.....	
Hard hat.....	12
Protective gloves.....	12
Protective goggles.....	12
Protective work clothing.....	12
Safety footwear.....	12
Personnel requirements.....	9
Power specifications.....	21
Preservation.....	56

R

Representatives.....	
Africa.....	66
America.....	65
Asia.....	65
Australia.....	66
Europe.....	62

S

Scope of delivery.....	7
Spare parts.....	7
Special dangers.....	13
Storing.....	28
Structure.....	22
Subsequent storage.....	45
Symbols on the packaging.....	25

T

Transport inspection.....	25
Transport, inner company.....	26
Trouble shooting.....	60
Trouble shooting table.....	61
Type designation.....	21

U

Unpacking.....	26
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