HAINBUCH

Operating instructions

[incl. installation manual]

Force compensating module

EN

Translation of the original operating instructions

Contents

Directory of tables

1 General

1.1 Information about this manual

This manual enables you to work safely and efficiently with the product.

This manual is part of the product and must be kept in a location directly beside the product that is accessible to the personnel at all times. The personnel must have read this manual carefully and understood its contents before starting any work. The basic requirement for safe work is compliance with all stipulated safety notices and work-related instructions in this manual.

If the product is passed onto a third party, this manual must accompany it.

Illustrations in this manual are there to facilitate a basic understanding, and may differ from the actual design configuration of the product.

WARNING

Serious injuries caused by individual products or by inappropriate combinations of them!

- Read and pay attention to all operating instructions for individual products and combinations of them.

1.2 Key to symbols

Safety instructions in this manual are designated by symbols. The safety notices are invoked by signal words that express the level of hazard involved.

Always comply with safety notices and exercise caution to avoid accidents, injury to people and damage to materials.

Safety notices

DANGER

… indicates an immediate and hazardous situation that can lead to death or serious injury if not avoided.

WARNING

… indicates a potentially hazardous situation that can lead to death or serious injury if not avoided.

CAUTION

… indicates a potentially hazardous situation that can lead to moderate or slight injuries if not avoided.

NOTE

… indicates a potentially hazardous situation that can lead to damage to materials if not avoided.

Tips and recommendations

INFORMATION
… highlights useful tips and recommendations as well as information for efficient and problem-free operation.

… refers to other documents relating to personal and general safety.

Warning symbols may appear on the product or its components.

Always pay attention to warning symbols, and exercise caution to avoid accidents, injury to people and damage to materials.

… warns of stored energy [for example involving springs].

… warns of hand injuries.

… draws attention to the fact that the operating instructions of the product must be read.

1.3 Definition of terms

1.3.1 Release setting

Release setting means that the clamping device is released. If the clamping device is released, this also releases the workpiece.

1.3.2 Complete clamping reserve

Complete clamping reserve means that the clamping device is clamped without a workpiece. The complete stroke has been used up, which means that the clamping device is therefore at the limit position for clamping reserve.

1.4 Limitation of liability

All details and notices in this manual were compiled with due reference to applicable standards and specifications, state-of-the-art technology and our many years of expertise and experience.

The manufacturer accepts no liability for damage arising from any of the following:

- Non-compliance with this manual
- Unintended use
- Use of untrained personnel
- Autonomous conversion work
- Technical modifications
- Use of non-approved spare parts
- Use of non-approved accessories

Subject to any commitments agreed to in the supplier contract, the General Terms & Conditions of Business and the delivery terms of the manufacturer and all legislative stipulations valid at the time of conclusion of this contract.

1.5 Copyright

This manual is protected by copyright, and are only intended for internal use.

The dissemination of this manual to third parties, reproductions in any shape or form - even in part - as well as commercial use and/or communication of their contents are prohibited for anything other than internal use, except with the written consent of the manufacturer.

Infringements oblige the offending party to pay compensation. Without restriction on further claims.

1.6 Scope of delivery

The scope of delivery of this product includes:

- Force compensating module
- The operating instructions

Additionally needed and included as optional items in the scope of delivery:

- Clamping device

1.7 Spare parts and accessories

WARNING

Serious injuries can be caused by incorrect or defective spare parts!

- Always use genuine spare parts made by the original manufacturer.

WARNING

Serious injuries can be caused by incorrect or missing clamping devices!

- Only use genuine clamping devices from the manufacturer.

NOTE

Damage, malfunctions or total failure of the product or the machine tool caused by an incorrect or defective spare parts!

- Always use genuine spare parts made by the original manufacturer.

NOTE

Damage, malfunctions or total failure of the product or machine tool caused by incorrect or missing clamping devices!

- Only use genuine clamping devices from the manufacturer.

Spare parts and accessories can be sourced from contract dealers or directly from the manufacturer [see »Contact« chapter].

Without exception, wearing parts and components in contact with the workpiece are not covered by warranty.

1.8 Warranty terms

The warranty terms are included in the manufacturer's General Terms & Conditions of Business.

2 Safety

This section provides an overview of all the important safety aspects for optimum protection of personnel, and for safe and problem-free operation.

2.1 Responsibility of the operator

The product is used in the industrial sector. The operator of the product is therefore governed by the provisions of Health & Safety at Work legislation.

As well as the safety notices in this manual, the area of use of the product must also comply with locally applicable safety, accident prevention and environmental protection specifications as well as those in the manual for the machine tool.

No modifications must be made to the product. The operator is wholly and solely responsible for any resultant personal injury and/or damage to materials.

DANGER

Serious injuries caused by parts being ejected centrifugally due to a drop in actuating force / supply pressure!

- On the machine, ensure that the actuating force / the supply pressure do not drop while the product is in use.
- If no precautions have been taken on the machine to maintain the actuating force / the supply pressure, it is prohibited to use this product on the machine.
- Pay attention to the operating instructions for the machine tool.

In particular, note that end-stop requests by the machine tool must be set on the product involved.

DANGER

Serious injuries caused by parts being ejected centrifugally after defective setting of the machine!

- Set up the end-stop requests by the machine tool on the product involved.
- On a regular basis, check the end-stop requests of the machine tool [see »Maintenance schedule« chapter].
- If the limit stops are not reached, the product must not be used any more.

2.2 Personnel requirements

WARNING

Serious injuries caused by incorrect handling of the product by insufficiently skilled or trained personnel!

- All activities must be performed by skilled staff from the relevant specialist field.

WARNING

Serious injuries caused by unauthorized presence of unauthorized personnel in the working area!

- Keep unauthorized people away from the working area.
- If in doubt, speak to people and direct them to leave the working area.
- Interrupt work until unauthorized people have left the working area.

NOTE

Serious damage to materials caused by incorrect handling of the product by insufficiently skilled or trained personnel!

- All activities must be performed by skilled staff from the relevant specialist field.

This manual name the following skills sets required for various different areas of activity:

Skilled specialist
Skilled specialists, due to their professional training, knowledge and experience and awareness of applicable provisions, are capable of carrying out the work entrusted to them and independently to identify and avoid potential hazards.

Hydraulics specialist
Hydraulics specialists are trained in the specific task profile for which they are employed, and are familiar with the relevant standards and legislative provisions.

Due to their vocational training and experience, hydraulics specialists can work on hydraulic systems and can independently identify and avoid potential hazards.

Pneumatics specialist
Pneumatics specialists are trained in the specific task profile for which they are employed, and are familiar with the relevant standards and legislative provisions.

Due to their vocational training and experience, pneumatics specialists can work on pneumatic systems and can independently identify and avoid potential hazards.

Electricians
Electricians are trained in the specific task profile for which they are employed, and are familiar with the relevant standards and legislative provisions.

Due to their vocational training and experience, electricians can work on electrical systems and can independently identify and avoid potential hazards.

Trainees
Trainees can only work on the machine under the supervision and direction of staff skilled in the relevant specialist field.

The only people admitted as personnel are those who can reasonably be expected to carry out their work to a reliable standard. People whose response capabilities are impaired, for example by drugs, alcohol or medication, are prohibited.

For the selection of personnel, pay attention to the stipulations applicable at the place of work governing age and specific vocational requirements.

2.3 Intended use

The product is only intended for installation in a CE-compliant machine tool with a separating set of guards.

The product is only intended for the type of use described in this manual [see »Use« chapter]. Furthermore, an extended form of use can be agreed contractually between manufacturer and operator.

Only skilled staff from the appropriate specialist fields may install, operate, maintain and clean the product [see »Personnel requirements« chapter].

Never exceed the technical values stipulated for the product [see »General information« and »Operating conditions« chapters].

Maintain the product at regular intervals [see »Maintenance schedule« chapter].

When used for its intended purpose, the operational safety of the product is assured, subject to compliance with relevant safety stipulations, to the full extent foreseeable.

Intended use also includes compliance with all stipulations in this manual.

Any form of use beyond the scope of intended use, or other forms of use of the product, is considered as misuse, and can lead to dangerous situations.

DANGER

Serious injuries caused by misuse of the product!

- Only use in CE-compliant machine tool with a separating guard.
- Only use for the disclosed purpose [see »Use« chapter].
- Product only to be used by trained specialists in the relevant field [see »Personnel requirements« chapter].
- Never exceed the technical data indicated on the product [see »General details« and »Operating conditions« chapters].
- The product requires regular maintenance [see the »Maintenance schedule« chapter].
- Only use with approved attachments.

NOTE

Material damage caused by misuse of the product!

- Only use in CE-compliant machine tool with a separating guard.
- Only use for the disclosed purpose [see »Use« chapter].
- Product only to be used by trained specialists in the relevant field [see »Personnel requirements« chapter].
- Never exceed the technical data indicated on the product [see »General details« and »Operating conditions« chapters].
- The product requires regular maintenance [see the »Maintenance schedule« chapter].
- Only use with approved attachments.

Claims of all kinds will be rejected that are due to unintended use.

Here are some examples of unintended use of the product

- If people fail to observe the safety stipulations when working on the product, by failing to use additional protective equipment.
- if the product is used on non-intended machines and/or clamping devices.

2.4 Personal protective equipment

During work, it is essential to wear personal protective equipment to minimize the health hazards.

Always wear the required personal protective equipment when working on any given job.

Always pay attention to any notices about personal protective equipment displayed in the working area.

Always wear

When working, always wear the following items:

Workplace clothing

Workplace clothing should be close-fitting, with low tear-resistance, narrow cuffs and no protruding parts. It serves primarily to protect the wearer from coming into contact with moving machine parts. Do not wear rings, chains or other jewelry.

Safety footwear

To protect the wearer from any heavy items that may fall, and from losing their footing on slippery ground.

Protective goggles

To protect the eyes from projectile parts and liquid splashes.

Hair net

To protect long hair from getting snagged in rotating parts on the machine tool.

Additional personal protective equipment

When carrying out certain work, additional personal protective equipment is required. Separate reference is made to this in the individual chapters of this manual. The following section explains these additional items of personal protective equipment:

Protective gloves

To protect the hands from friction, chafing, stabbing or deeper injuries and from contact with hot surfaces.

Hard hat

To protect against falling and projectile parts and materials.

2.5 Particular hazards

The following section names residual risks resulting from the installation of the product in a machine tool. In all cases, the residual risks detected during a risk assessment of the machine tool need to be named by the operator.

Pay attention to the safety instructions named here, as well as the warning notices in other chapters of these operating instructions to reduce the risk of health hazards and to prevent dangerous situations.

Moving parts

WARNING

Serious injuries caused by touching rotating and/or moving parts!

- Do not open guards while the system is operating.
- During operation, do not reach for rotating and/or moving parts.
- Pay attention to the gap dimensions of moving parts.
- Before opening the guards, ensure that none of the parts are moving any more.

Sharp-edged parts

WARNING

Serious cut injuries caused by sharp-edged parts and burrs!

- All installation of individual parts must be performed by skilled staff from the relevant specialist field.
- Also wear the following items of personal protective equipment, in addition to the basic equipment:

2.6 Other safety instructions

WARNING

Serious injuries caused by the release of stored energy!

- When unfastening the relevant screws, these must be actuated crosswise in alternating fashion to reduce clamping action to a minimum.
- Do not open the screws secured with sealing lacquer.

WARNING

Serious head injuries caused by bending into the working area of the machine!

- Only ever bend into the working area of the machine if there are no cutting tools or sharp objects in it, or if these are covered.
- Never move body parts under parts in the working area of the machine with the potential to drop down.

WARNING

Serious injuries caused by snagging body parts on the rotating machine spindle!

- Never reach into the product while the machine spindle is still rotating.
- Before working on the product, ensure that the machine spindle is unable to start up.

WARNING

Serious injuries caused by reaching into slots and bores!

- Never reach into slots or bores.

WARNING

Serious injuries caused by the use of damaged products or by their components and accessories!

- Check products or their components and accessories on a regular basis for visible signs of damage [see »Inspections« and »Cleaning« chapters].
- Use of damaged products, their damaged components and/or their damaged accessories is prohibited.
- Report damage to the operator immediately.
- Damaged components / accessories must be replaced with genuine spare parts / accessories made by the manufacturer.

CAUTION

Cut injuries caused by sharp edges and burrs resulting from wear and/or repeated rework!

- Remove sharp edges and burrs.
- If necessary, replace worn components with genuine parts made by the manufacturer.

NOTE

Damage to materials caused by untightening the wrong screws!

- Do not open the screws secured with sealing lacquer.

2.7 Screws

WARNING

Serious injuries caused by radially installed screws being ejected centrifugally if installed incorrectly / poor handling!

- Do not open the screws secured with sealing lacquer.
- Screws and threaded pins fitted radially to the product that were bonded with adhesive need to be secured again using a standard, medium-strength screw adhesive and tightened to the specified tightening torque [see nomenclature or the »Screw tightening torques« chapter]. Before reinstallation, clean and degrease the screw and internal thread.
- Radially mounted screws and threaded pins that were not bonded with sealing lacquer or an adhesive need to tightened back down to the specified tightening torque [see nomenclature or the »Screw tightening torques« chapter].
- If in doubt, contact the manufacturer immediately to determine how best to proceed.

2.8 Functionality

WARNING

Serious injuries caused by severe contamination of the product!

- Always comply with the cleaning instructions and intervals [see »Cleaning« chapter].

2.9 Environmental protection

NOTE

Substantial damage to the environment can result from non-compliant handling or incorrect disposal of environmentally hazardous substances!

- If environmentally hazardous substances enter the environment accidentally, take immediate remedial action.
- If in doubt, notify the relevant municipal authorities about the incident.

The following environmentally hazardous substances are used:

Lubricants, auxiliary materials and operating fluids

Lubricants such as grease and oil can contain toxic substances. These must not enter the environment.

Dispose of environmentally hazardous substances properly [see »Disposal« chapter].

3 Technical data

3.1 General information

Axial release stroke [mm]	Axial clamping reserve [mm]	Weight [kg]	Dimensions [ø x length] [mm]	Maximum speed [min^{-1}]	Axial clamping force $F_{ax\,max.}$ [kN]	Reduction of clamping force in clamped position $F_{red.}$ [kN]	Balancing quality G in n planes
2.2	2	4.3	Ø131 x 95	6000	16	8	4/1

Table 1: Technical data

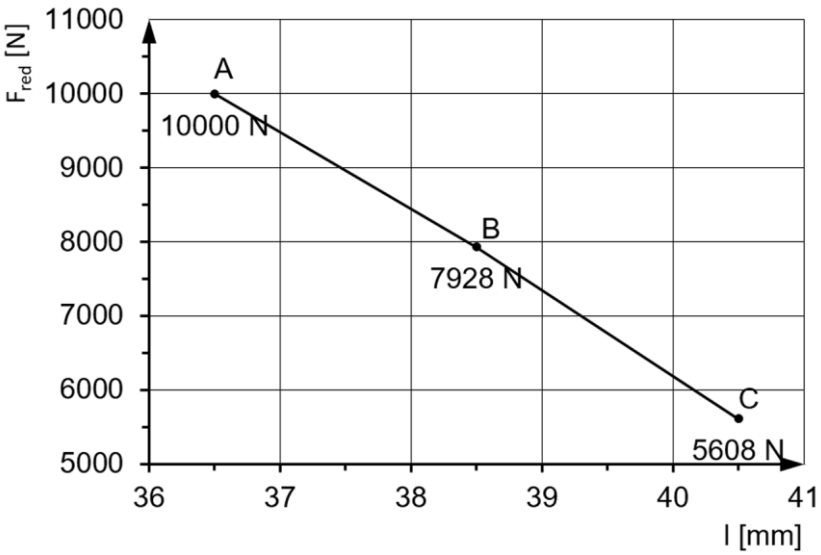
3.1.1 Reduction in clamping force

The installed clamping force reducer reduces the force introduced through the clamping cylinder as a function of the stroke position of the product.

The following diagram shows the force of the clamping force reducer as a function of the stroke position of the product.

Sample scan:

In clamping position, the spring length l measures 38.5 mm and the reduction in clamping force $F_{red.}$ measures 7928 N.



A Clamping reserve
B Clamping position
C Release setting

3.2 Performance values

NOTE

Material damage to the products use and/or to the machine tool caused by exceeding the maximum performance values!

- Do not exceed the maximum performance values [see »General information« chapter].
- On all products used, do not exceed the lowest of the maximum performance values.
- Only use product in machine tools with the same performance values.

INFORMATION

Details of maximum performance values can be found on each product.

If, due to abrasive wear, those performance values are no long legible, refer to the operating instructions.

The achievable actuation forces may vary as a result of the maintenance status [lubrication status and level of contamination] of the product [see »Maintenance schedule« chapter].

3.3 Balancing quality

The product is balanced before leaving the factory [balancing quality - see »General information« chapter].

DANGER

Serious injuries caused by parts being ejected centrifugally if products are not balanced correctly!

- Never remove balancing screws and weights attached to the product.

NOTE

Material damage caused by machining with incorrectly balanced products!

- Never remove balancing screws and weights attached to the product.

3.4 Speed

The product is authorized for rotational operation.

The maximum speed is written on the product [maximum speed, see »General information« chapter].

DANGER

Serious injuries caused by parts being ejected centrifugally due to a non-compliant combination of several products!

- From all of the maximum speeds indicated for the combined products, always remain at the lowest of those maximum speeds.

3.5 Operating conditions

Indication	Value	Unit
Ambient temperature range	15 - 65	°C
Humidity	≤ 80	%

Table 2: Operating conditions

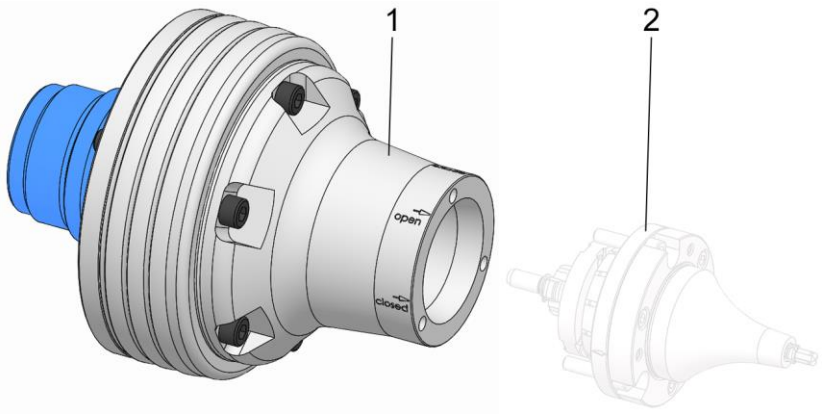
3.6 Type designation

The type designation is on the product and it includes the following indications:

- Manufacturer
- Product designation
- ID number [marked with a # symbol]
- Build year
- Maximum speed n $[min^{-1}]$
- Maximum actuating force $F_{ax\ max}$ $[kN]$

4 Layout and function

4.1 Overview and brief description



1 Force compensating module
2 Clamping device

The force compensating module provides a support for clamping devices.

The spindle flange is mounted on the machine spindle.

The force compensating module is screwed to the spindle flange.

The bayonet drawtube adapter of the force compensating module is screwed to the machine drawtube.

The clamping device is mounted to the force compensating module and it clamps the workpiece to be machined.

4.2 Accessories required

4.2.1 Clamping devices

The clamping device is secured to the product to adapt it to the machine tool.

5 Use

The product is there solely to support HAINBUCH clamping devices on chip-cutting machine tools.

The product can only be used in conjunction with a suitable clamping device from HAINBUCH.

As well as for its general field of application, this product was designed and developed for use, when necessary, in a specific and documented application [see clamping situation drawing or order confirmation].

Any other fields of application require the explicit approval of the manufacturer.

6 Transport, packaging, storage

6.1 Safety, transport, packaging, storage

WARNING

High level of physical strain due to the weight of the product or of its components if not transported properly!

- From a weight of 10 kg, use appropriate transport equipment, lifting gear and lifting tackle.

WARNING

Serious crushing injuries and breakages caused by falling parts if transported incorrectly!

- Ensure that the product cannot roll away or fall.
- Place on a non-slip surface.
- When using lifting gear, use appropriate load-bearing equipment and lifting tackle.

WARNING

Serious injuries caused by transporting off-center equipment!

- Pay attention to marks on the packaging items.
- Attach the crane hook directly above the center of gravity.
- Raise carefully and correct the lifting points if necessary.

WARNING

Serious injuries caused by incorrect transport with lifting gear!

- Never raise loads above people.
- Never step under suspended loads.
- Pay attention to information about the intended lifting points. Ensure that the lifting gear is mounted on a secure base.
- Only use authorized and undamaged lifting gear, load-bearing equipment and lifting tackle.
- Never exceed the maximum load-bearing capacity of lifting gear, load-bearing equipment and lifting tackle.

NOTE

Damage to materials caused by falling parts if transported incorrectly!

- Ensure that the product cannot roll away or fall.
- Place on a non-slip surface.
- When using lifting gear, use appropriate load-bearing equipment and lifting tackle.

6.2 Symbols on the packaging

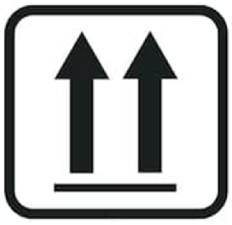
Fragile

Designates packaging items with fragile or breakable contents.

Handle the packaging item with care. Do not drop it and protect it against collision impacts.

Keep it dry

Keep packaging items dry and protect them from the ingress of water.



Position designation

Points to the correct upright position of the packaging item.

6.3 Transport inspection

Check the delivery on receipt immediately to ensure it is complete and has not been damaged in transit.

Proceed as follows if you find any externally visible signs of damage while in transit:

- Refuse to accept the delivery, or only subject to later approval
- Make a note of the extent of damage on the transportation documents or on the delivery note of the transportation company
- Initiate a complaint

INFORMATION

Raise a complaint for every defect as soon as it is discovered. Compensation claims can only be enforced during the applicable complaint periods.

6.4 Unpacking and internal transportation

The total weight of the product depends on its size.

Depending on the weight involved, it may be necessary to use lifting gear to lift the product or its components out of the packaging safely, to transport them and to position and install them in the machine tool or on the machine table.

1. The product is packaged in a stable position, and it has threads / bores for transportation.
2. Lifting tackle can be installed in these transportation threads / bores. To lift the product out of its packaging, the front-end functional threads can if necessary be used to attach lifting tackle to upright packaged products.
3. Attach load-bearing equipment to the lifting tackle.
4. Subject to weight, use lifting gear to lift the product out of its packaging safely, and place it down on a stable, flat surface.
5. Secure the product to prevent it from rolling away.
6. When transporting on a trolley or car, ensure that the product is securely mounted on a non-slip surface before starting to move it.

6.5 Packaging

The individual packaging items are packaged in an appropriate manner for the type of transportation involved. Always use environmentally compatible materials for packaging purposes.

Packaging should protect individual components from damage in transit, corrosion and other forms of damage, up until installation. For this reason, do not destroy the packaging, and do not remove it until shortly before installation.

INFORMATION

The packaging units are packaged, wrapped in air-tight film and placed in cardboard boxes. On the individual weights of each of the sizes [see »General information« chapter].

Dispose of packaging material in accordance with applicable legislative provisions and local regulations.

NOTE

Damage to the environment caused by improper disposal of packaging materials!

- Dispose of packaging materials in an environmentally responsible manner.
- Pay attention to local disposal regulations and, if necessary, appoint a specialist waste disposal company with this work.

6.6 Storage

INFORMATION

The packaged items may display information relating to storage and readmission to storage that extend beyond the scope of these requirements. Pay attention to these notices.

Store packaged items under the following conditions:

- Safe for storage.
- Do not store outdoors.
- Store in a dry, dust-free place.
- Avoid exposure to aggressive media.
- Protect against direct sunlight.
- Avoid mechanical vibration.
- Storage temperature: 15 to 35°C.
- Relative humidity: Maximum 60%.
- In the event of storage for more than 3 months:
  - On a regular basis, check the general condition of all parts and packaging.
  - If necessary, refresh the preservation or replace it.

6.7 Preservation

1. Clean and lubricate the product [see »Cleaning« and »Lubricating the product« chapters].
2. Apply a light coating of preserving oil to the inner and outer faces of the product. Wipe away surplus preserving oil with a sort, lint-free, tear-resistant cloth.
3. Pack product air-tight in foil.
4. Return product to storage [see »Return to storage« chapter].

6.8 Return to storage

Return product to storage under the following conditions:

1. Preserve the product [see »Preservation« chapter].
2. The product must be stored in a safe condition. Use an appropriate container for the product, on a non-slip surface, or fit the floor of the shelving unit with an all-round safety border.
3. For storage conditions, see the »Storage« chapter.

7 Installation

7.1 Installation safety

WARNING

Serious injuries caused by unskilled staff during installation / removal!

- Installation and removal must be performed by skilled staff from the relevant specialist field.

WARNING

Serious injuries can be caused if the machine tool starts up accidentally!

- Set the machine tool into set-up mode.
- Remove all tools, auxiliary equipment and items of test equipment immediately from the working area of the machine.
- Remove all lifting gear from the product and from the working area of the machine.

WARNING

Serious injuries caused by the escape of media under high pressure!

- Shut down media delivery during installation and removal.
- Relieve any pressure trapped in the system.
- Shut down the system.

WARNING

Serious crushing injuries and breakages caused by falling parts during incorrect installation or removal!

- Ensure that the product cannot roll away or fall.
- If necessary, use an appropriate mounting aid for installation or removal on a vertically suspended machine spindle.

WARNING

Serious crushing injuries caused by improper machine movement during installation or removal!

- Machine movements are only permitted in set-up mode during installation and removal.
- Never reach into a gap.
- Pay attention to the gap dimensions of moving parts.

WARNING

Serious head injuries caused by bending into the working area of the machine!

- Only ever bend into the working area of the machine if there are no cutting tools or sharp objects in it, or if these are covered.
- Never move body parts under parts in the working area of the machine with the potential to drop down.
- Depending on weight, use an appropriate mounting aid for installation or installing on a vertically suspended machine spindle.

WARNING

High level of physical strain due to the weight of the product or of its components if not transported properly!

- From a weight of 10 kg, use appropriate transport equipment, lifting gear and lifting tackle.

NOTE

Damage to materials caused by lifting gear left in the product!

- Always remove lifting gear immediately after installing the product.

NOTE [only for aluminum components]

Damage to materials can be caused by incorrect screw tightening torques on aluminum components!

- Pay attention to the reduced screw tightening torques for aluminum components [see »Screw tightening torques« chapter].

7.2 Preliminary remarks

- In accordance with their thread size and strength class, screws must be tightened crosswise to the specified tightening torque [see »Screw tightening torques« chapter]. When tightening the screws, do so evenly to prevent any distortion under load.
- To avoid precision errors, clean all screw-fitting points and mating surfaces [Notes on cleaning, see »Cleaning« chapter]. Factory wetting of flat surfaces and, where necessary of clamping elements, only serves as a corrosion inhibitor. This is not functionally related lubrication.

- Only apply lubricant to the mechanical mating surfaces. Pay attention to notes about lubricants [see »Use of lubricants« chapter].
- Avoid too much lubricant on the locating face because this can cause face run-out errors.
- Apply grease to the sealing elements [for example O-rings, rectangular rings] and sealing surfaces. Pay attention to notes about greases [see »Use of lubricants« chapter].
- Do not damage the functional surfaces [flat, mating, tapered and sealing surfaces].

7.3 Screw tightening torques

The tables show the specified values.

Knowledge of the applicable guidelines and design criteria is essential.

NOTE

Damage to materials caused by defective screw tightening torques!

- To secure the product to the machine, pay attention to the values specified by HAINBUCH and by the machine manufacturer for screw tightening torques. If the machine manufacturer stipulates different values, you must consult HAINBUCH.

Metric control threads

The following table contains the guide values in Nm for screw tightening torques for achieving the highest permitted preload for metric control threads.

- Total friction coefficient $\mu_{ges} = 0.12$

Thread designation	Tightening torque at screw quality [Nm]	
	10.9	12.9
M4	4	5
M5	7	9
M6	12	15
M8	25	38
M10	50	70
M12	100	130
M16	220	300

Thread designation	Tightening torque at screw quality [Nm]	
	10.9	12.9
M20	400	550
M24	600	800

Table 3: Screw tightening torques, metric control threads

Aluminum components

The following table contains the reduced screw tightening torques for securing aluminum components.

Thread designation	Tightening torque [Nm]	Minimum screw depth [mm]
M6	10	12
M8	23	16
M10	46	20

Table 4: Screw tightening torques for aluminum components

7.4 Preparation of the machine for installation

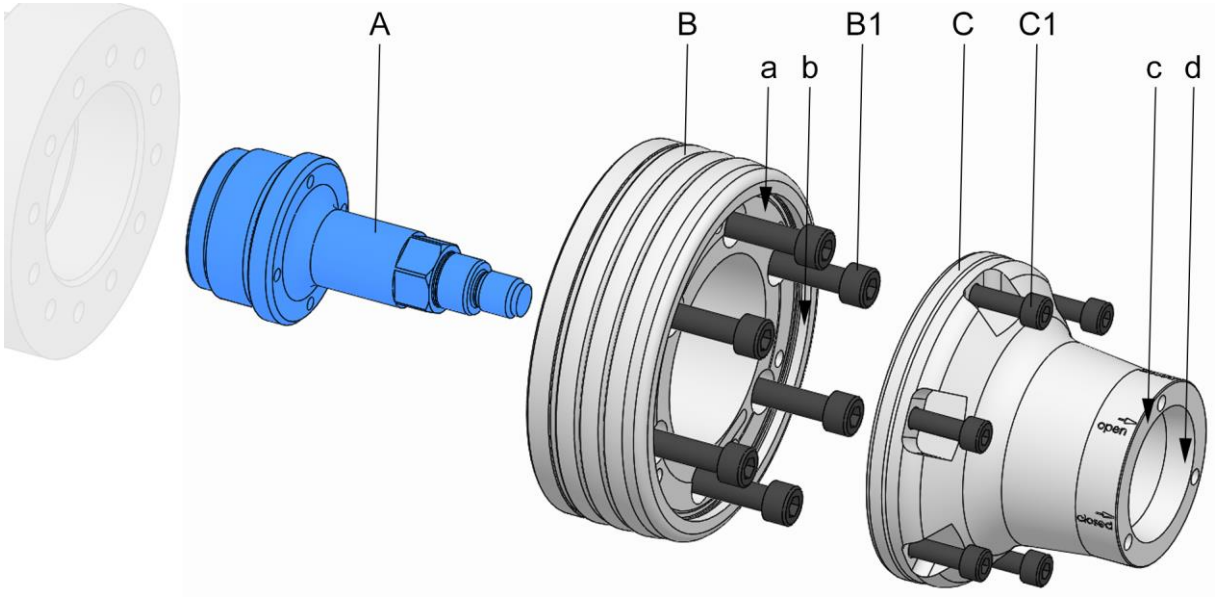
1. Set the machine into set-up mode.

INFORMATION

The minimum operating pressure is reached when the drawtube can still just be moved without triggering an error message.

2. Reduce the operating pressure to a minimum.
3. Remove cutting tools and/or sharp objects from the working area of the machine, or cover them.

7.5 Installation of the product



A	Drawtube adapter
B	Spindle flange
B1	Fixing screws, spindle flange
C	Force compensating module
C1	Fixing screws, force compensating module
a	Test surface, face run-out, spindle flange
b	Test surface, axial run-out, spindle flange
c	Test surface, face run-out, force compensating module
d	Test surface, axial run-out, force compensating module

1. As described in the »Preparation of the machine for installation« chapter, prepare for the following steps.

7.5.1 Compatibility check

Check the compatibility of the product and the connection point of the machine.

For this, check that the connection point and the product share the same adaptation geometry. Also check if the actuating element / coupling element is suitable.

It may be necessary to install an adapter between the actuating element on the machine and the product.

7.5.2 Preparation of the product

The product is supplied in assembled condition.

The following preparatory steps are needed to install the product.

If the spindle flange and / or the drawtube adapter is included in the scope of delivery, no preparatory steps are needed to install the product.

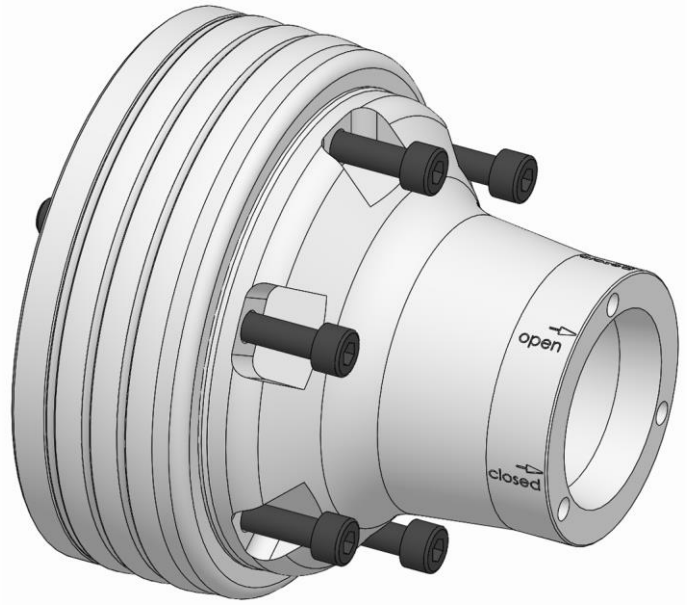
If the spindle flange and / or the drawtube adapter is installed on the clamping device, the following preparatory steps are needed to install the product.

INFORMATION

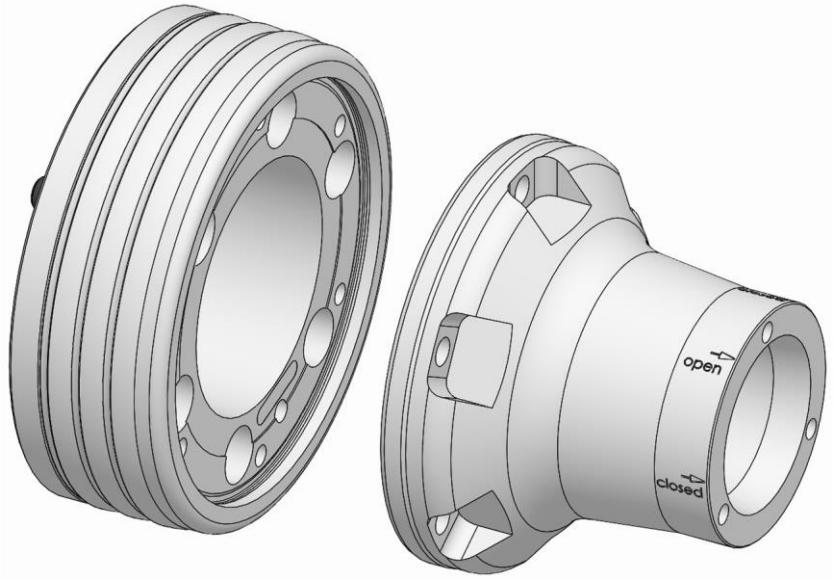
The drawtube adapter can already be installed in the product.

Depending on the geometry of the drawtube adapter, it may be necessary to remove the drawtube adapter to be able to remove the force compensating module from the spindle flange.

1. If necessary, unscrew and remove the drawtube adapter from the product.



2. Unfasten and remove the fixing screws on the force compensating module.

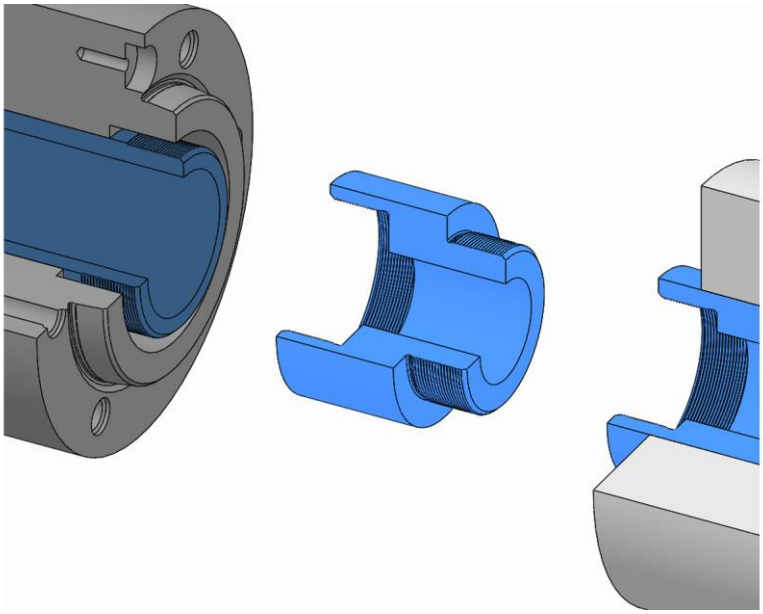


3. Remove the force compensating module from the spindle flange.

7.5.3 Installation of the drawtube adapter

INFORMATION

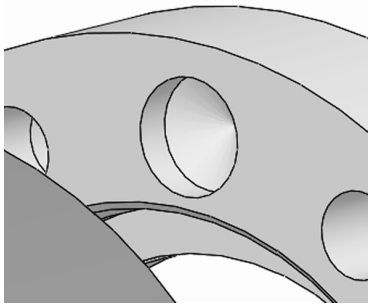
Depending on the geometry of the drawtube adapter, it must be installed either on the machine drawtube or in the force compensating module.

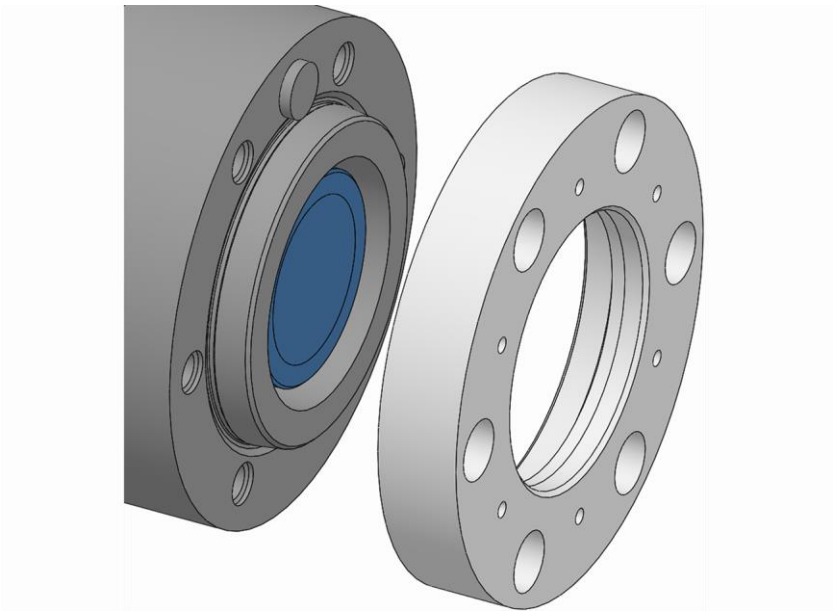


1. Screw the drawtube adapter into the force compensating module using its thread or screw it to the machine drawtube and tighten it down.

7.5.4 Installation of a spindle flange that cannot be aligned

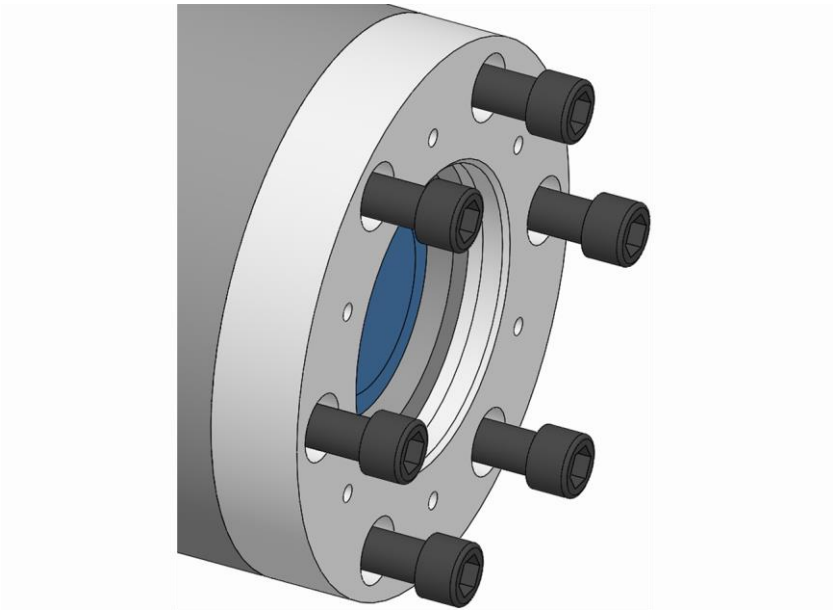
1. Attach any lifting gear that may be required.
2. If necessary, fit the mounting aid onto a vertically suspended spindle.





INFORMATION
The positioning block on the machine spindle and the positioning bore in the spindle flange can be used for positioning.

3. Fit the spindle flange on the machine spindle. If necessary, position the spindle flange over the machine spindle using its bore.



4. Screw in the changing part fixing screws on the spindle flange and tighten to the specified tightening torque [see »Screw tightening torques« chapter].

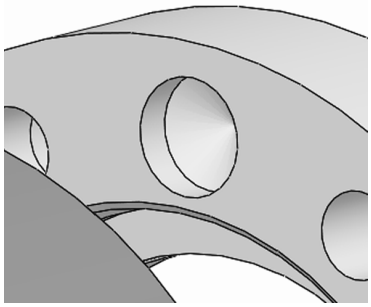
5. Unfasten and remove any lifting gear that may have been required.
6. Remove the mounting aid on a vertically suspended spindle if one was used.
7. Check face run-out on the test surface of the spindle flange [ideally ≤ 0.005 mm].
8. Check axial run-out on the test surface of the spindle flange [ideally ≤ 0.005 mm].

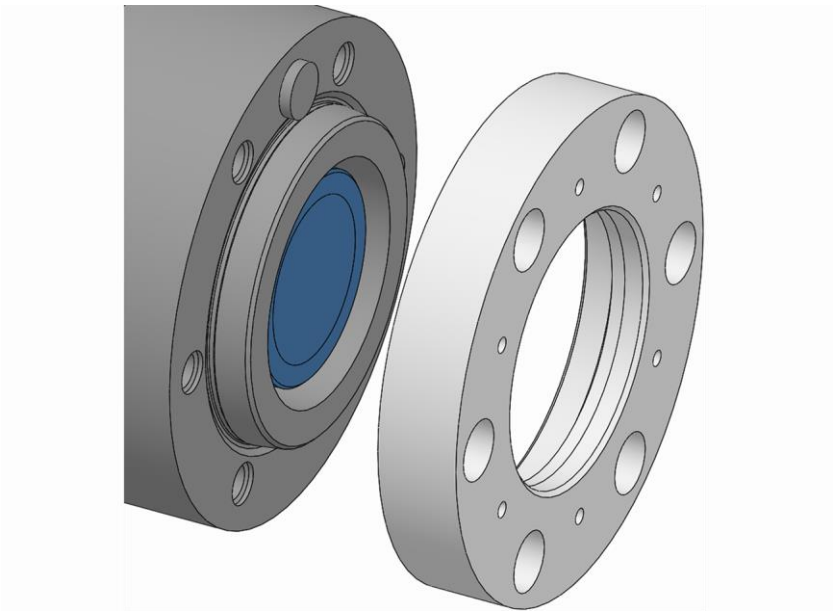
Whenever the face run-out and/or the axial run-out is greater than the maximum permitted value:

9. Remove the spindle flange.
10. Clean the locating face and the mating faces of the machine spindle and the spindle flange.
11. If there is a burr or slight damage, rub down the locating face of the spindle flange and the machine spindle gently with an oil stone.
12. Reinstall the spindle flange.
13. Repeat the face run-out test.
14. Repeat the axial run-out test.

7.5.5 Installation of a spindle flange that can be aligned

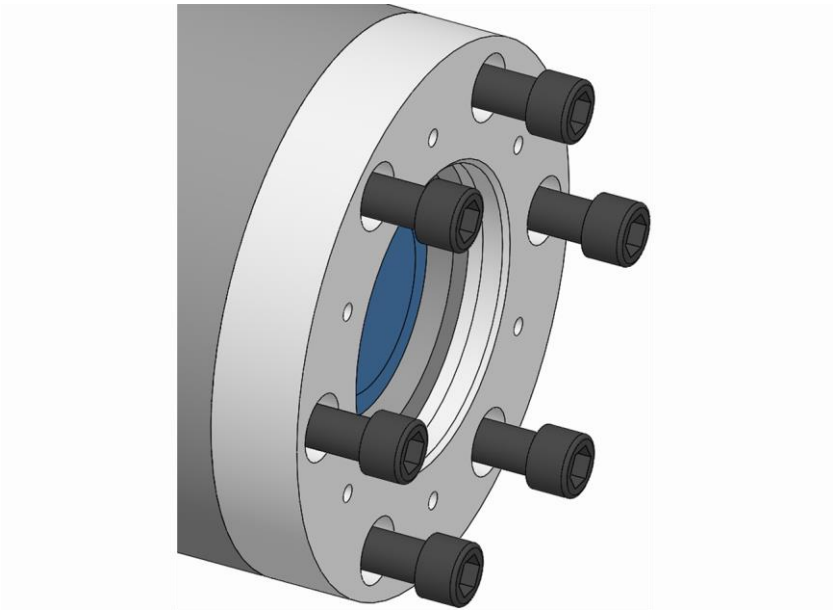
1. Attach any lifting gear that may be required.
2. If necessary, fit the mounting aid onto a vertically suspended spindle.





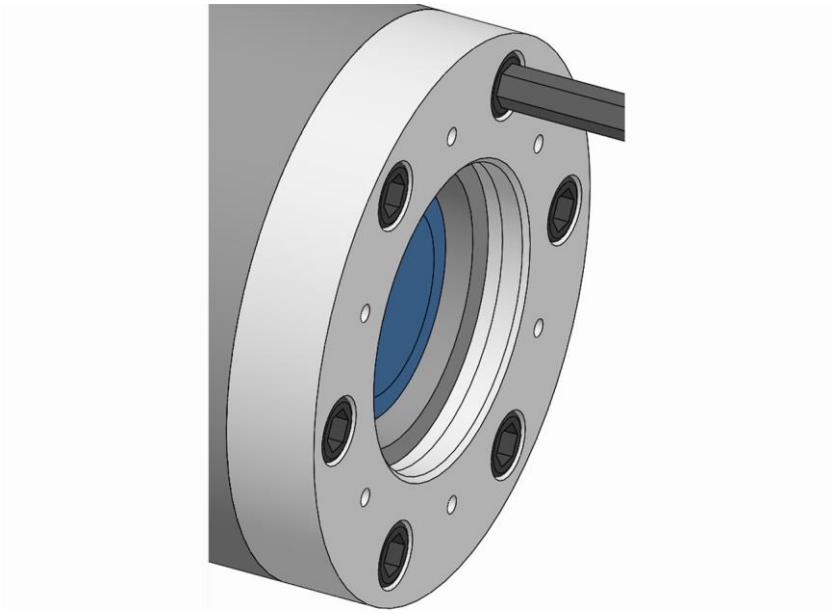
INFORMATION
The positioning block on the machine spindle and the positioning bore in the spindle flange can be used for positioning.

3. Fit the spindle flange on the machine spindle. If necessary, position the spindle flange over the machine spindle using its bore.



4. Screw in the spindle flange fixing screws and tighten them gently.

5. Unfasten and remove any lifting gear that may have been required.
6. Remove the mounting aid on a vertically suspended spindle if one was used.
7. Check the face run-out on the test surface of the spindle flange [ideally ≤ 0.005 mm] and, if necessary, correct carefully with a plastic hammer.



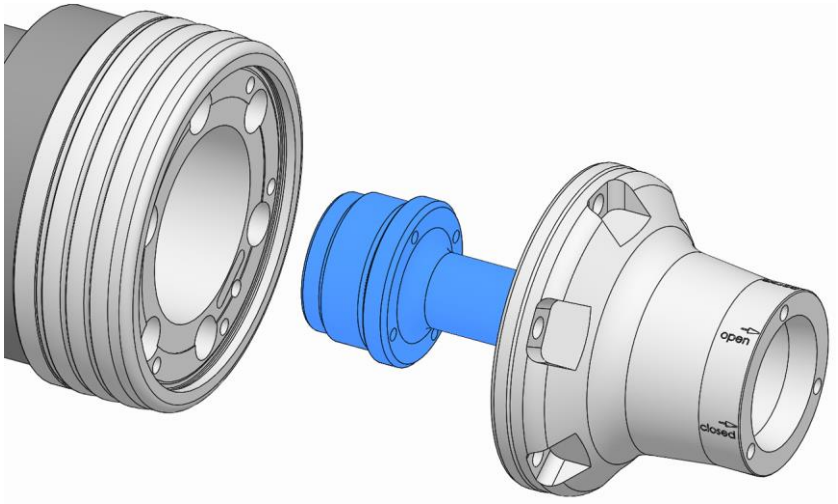
8. Screw in the drift body fixing screws on the spindle flange and tighten to the specified tightening torque [see »Screw tightening torques« chapter].
9. Check face run-out on the test surface of the spindle flange [ideally ≤ 0.005 mm].

Whenever the face run-out is greater than the maximum permitted value:

10. Remove the spindle flange.
11. Clean the locating face and the mating faces of the machine spindle and the spindle flange.
12. If there is a burr or slight damage, rub down the locating face of the spindle flange and the machine spindle gently with an oil stone.
13. Reinstall the spindle flange.
14. Repeat the alignment process.
15. Repeat the face run-out test.

7.5.6 Installation of the force compensating module

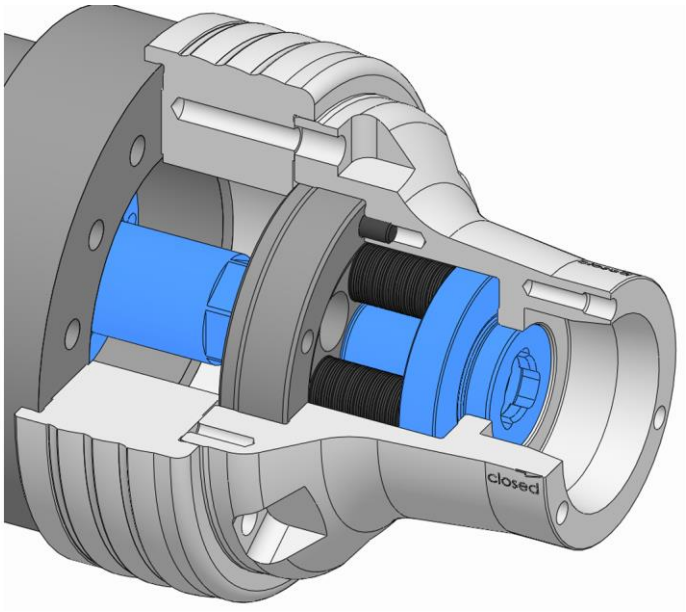
1. Attach any lifting gear that may be required.
2. If necessary, fit the mounting aid onto a vertically suspended spindle.
3. Move the machine drawtube to the front limit stop.



INFORMATION

If lifting gear needs to be used, rotate the spindle flange and machine spindle manually to tighten / untighten the force compensating module.

4. Screw the force compensating module firmly home on the machine drawtube.



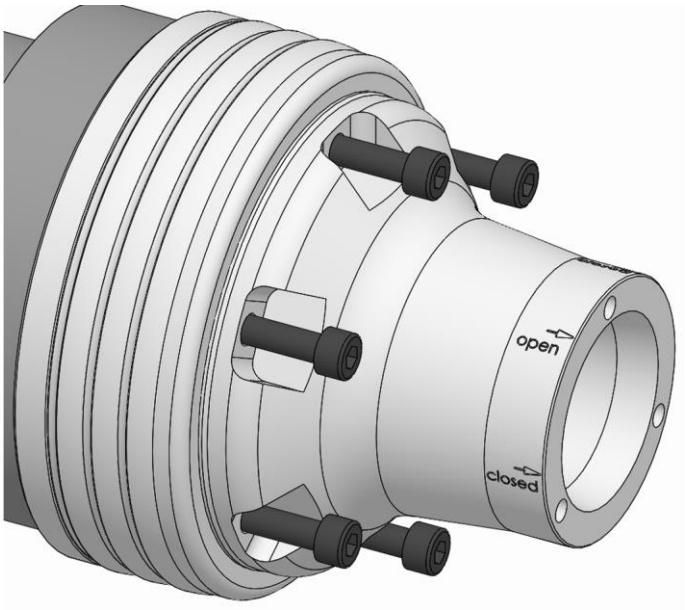
5. Turn back the force compensating module until the hole patterns on the spindle flange and force compensating module are aligned.

WARNING

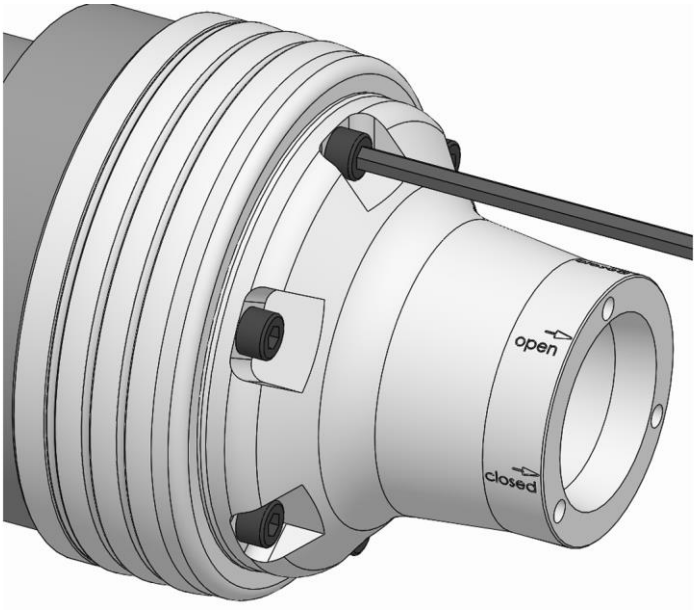
Serious crushing injuries caused by improper machine movement during installation!

- Never reach into the gap between machine tool / spindle flange and force compensating module.

6. Using the least possible force and speed, move the drawtube on the machine to its rear limit stop [see »Preparing the machine for installation« chapter].



7. Screw in the fixing screws of the force compensating module until they make contact.
8. Unfasten and remove any lifting gear that may have been required.
9. Remove the mounting aid on a vertically suspended spindle if one was used.
10. Check the axial run-out on the test surface of the axial run-out of the force compensating module [ideally ≤ 0.005 mm] and if necessary, correct carefully with a plastic hammer.



11. Torque the fixing screws of the force compensating module to specification [see chapter »Screw tightening torques«].
12. Check face run-out on the test surface for the face run-out of the force compensating module [ideally ≤ 0.005 mm].

If the face run-out exceeds the maximum permissible value:

13. Dismount the force compensating module.
14. Clean the support surface and mating surfaces of spindle flange and force compensating module.
15. If there is a burr or slight damage to the support surface of the force compensating module and the spindle flange, rub it down gently with an oil stone.
16. Reinstall the force compensating module.
17. Repeat the alignment process.
18. Repeat the face run-out test.

8 Use

8.1 Use-related safety

WARNING

Serious injuries caused by unskilled personnel during the installation / removal of the clamping device!

- Installation / removal of the clamping device must be performed by skilled specialists from the relevant field.

WARNING

Serious injuries can be caused if the machine tool starts up accidentally!

- Set the machine tool into set-up mode.
- Remove all tools, auxiliary equipment and items of test equipment immediately from the working area of the machine.
- Remove all lifting gear from the product and from the working area of the machine.

WARNING

Serious injuries caused by tools and items of test equipment being ejected centrifugally!

- Prior to commissioning, ensure that all tools and items of test equipment are removed from the working area of the machine.

WARNING

Serious injuries caused by escape of media under high pressure!

- Shut down media supply during installation / removal of the clamping device.
- Relieve any pressure trapped in the system.
- Shut down the system.

WARNING

Serious crushing injuries and breakages caused by parts dropping off due to incorrect installation / removal of the clamping device!

- Ensure that the product cannot roll away or fall off.
- For installation / removal of the clamping device on a vertically suspended spindle in the machine, use a suitable mounting aid if necessary.

WARNING

Serious crushing injuries caused by inappropriate machine movement during installation / removal of the clamping device!

- Machine movements are only permitted in set-up mode during installation and removal of the clamping device.
- Never reach into the gap.
- Watch out for gaps between moving parts.

WARNING

Serious head injuries caused by bending into the operating area of the machine!

- Only bend down into the working area of the machine if it contains no cutting tools or sharp objects, or if these are covered.
- Never place parts of your body below items in the working area of the machine that might drop down.
- For installation / removal of the clamping device on a vertically suspended spindle in the machine, use a suitable mounting aid if necessary due to the weight.

WARNING

High level of physical strain due to the weight of the product or of its components if not transported properly!

- From a weight of 10 kg, use appropriate transport equipment, lifting gear and lifting tackle.

NOTE

Damage to materials caused by lifting gear left in the product!

- Always remove lifting gear immediately after installation / removal of the clamping device.

NOTE

Damage to components caused by cooling lubricants with sufficient levels of corrosion inhibitor!

- The components made of steel materials must be protected before the usual oxidation process.
- Only ever use cooling lubricants with sufficient levels of corrosion inhibitor.

NOTE

Damage to materials caused by contaminated / unprocessed cooling lubricants!

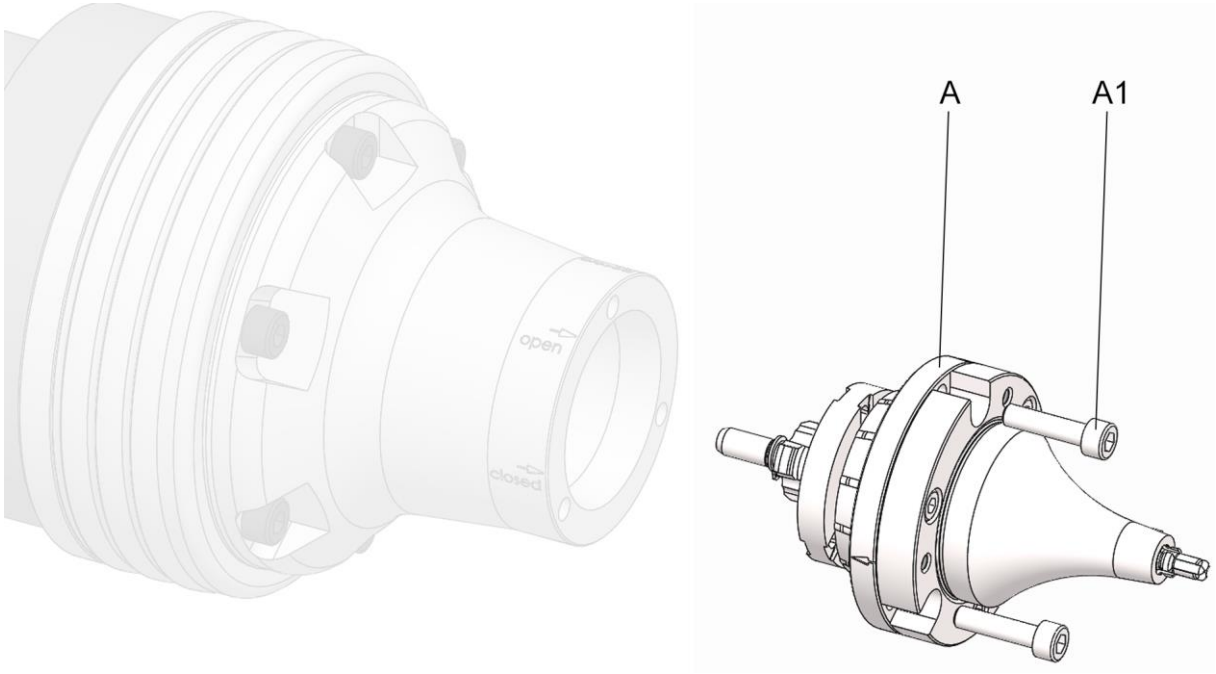
- For the product to function properly, in particular for internal flushing with cooling lubricants and/or when using tools with internal flushing, ensure that the cooling lubricant is cleaned / processed, and that it contains no particles measuring >100 microns [filtered with a mesh width of 100 microns].

NOTE

Damage to seals caused by using the wrong coolant lubricants!

- To clean the product, never use a cooling lubricant that attacks and damages the sealing elements installed. Those installed sealing elements can be made of NBR, Viton and PUR materials.
- Never use cooling lubricants that contain ester or a polar solvent.

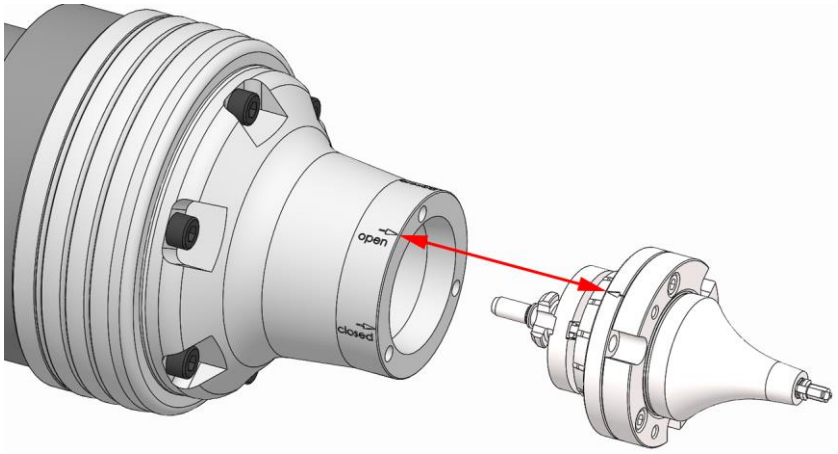
8.2 Installation of the clamping device



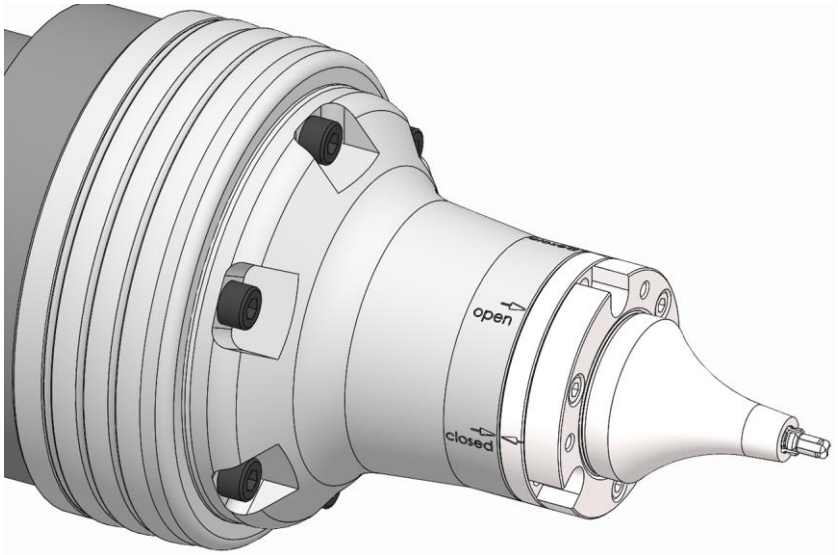
A Clamping device
A1 Fixing screws, clamping device

1. As described in the »Preparation of the machine for installation« chapter, prepare for the following steps.
2. Move the force compensating module into its front limit stop position.
3. Attach any lifting gear that may be required.

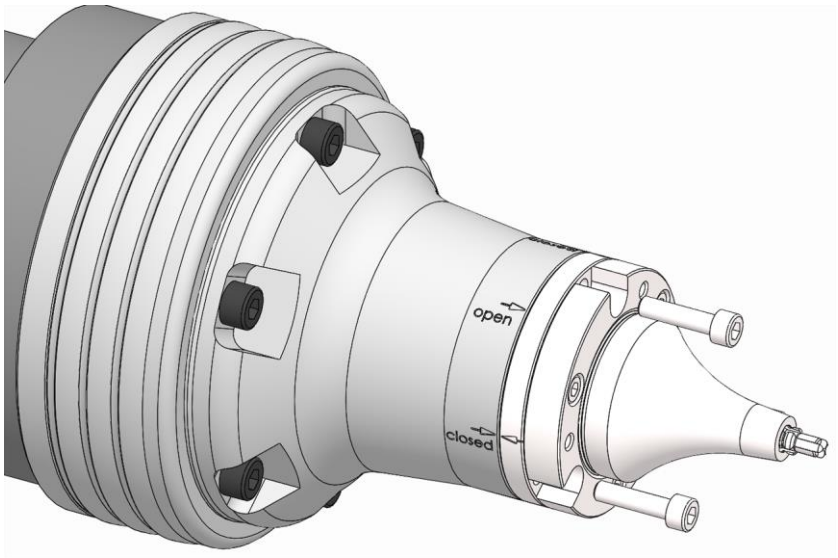
4. If necessary, fit the mounting aid onto a vertically suspended spindle.
5. Clean the flat surface of the force compensating module and clamping device with a lint-free cloth.



6. Place the clamping device on the force compensating module so that the mark on the clamping device is aligned with the »OPEN« mark on the force compensating module. For this, the clamping bolts must be flush or recessed backwards on the clamping device.



7. Rotate the clamping device to the force compensating module or rotate the spindle with the force compensating module attached so that the mark on the clamping device is aligned with the »CLOSED« mark on the force compensating module.
8. Move the force compensating module into its rear limit stop position.



9. Screw the fixing screws into the clamping device and tighten them to their specified tightening torque [see the »Screw tightening torques« chapter].
10. Remove the mounting aid on a vertically suspended spindle if one was used.
11. Unfasten and remove any lifting gear that may have been required.

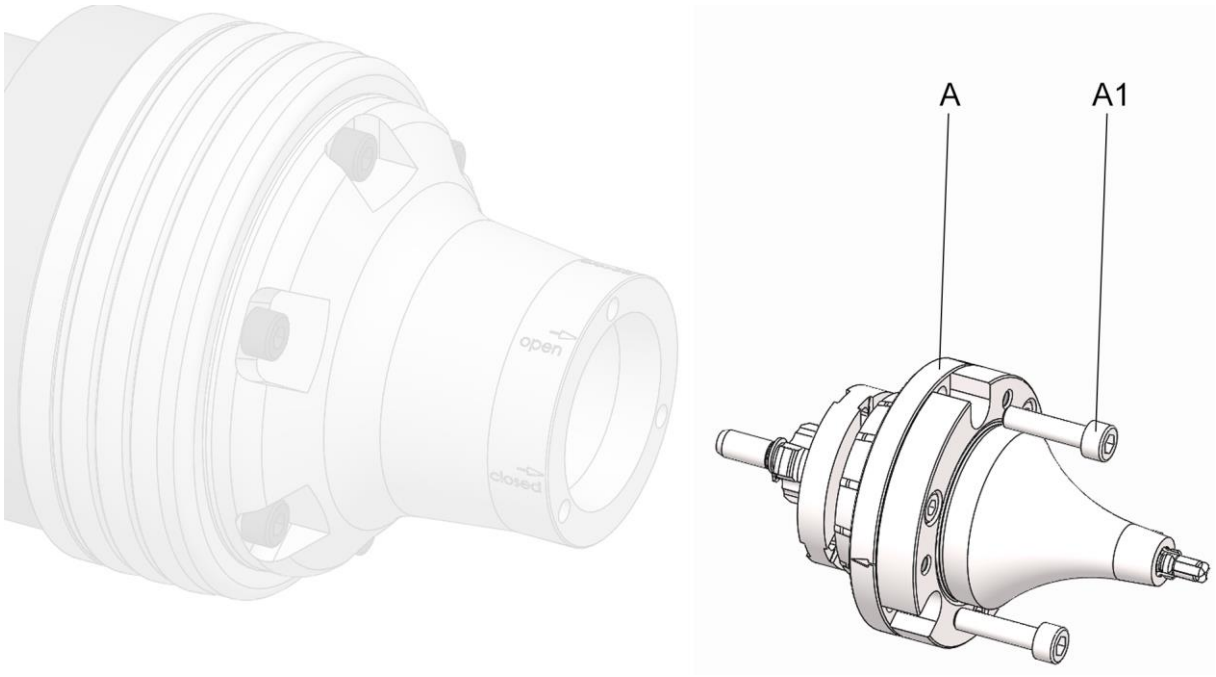
WARNING

Serious injuries caused by failure to follow the commissioning procedure for the clamping device!

- In addition to the operating instructions, also read and follow the operating instructions for the relevant clamping device.

12. Set the operating pressure to the permitted machining value. The machine tool must not start up until full operating pressure has built up.

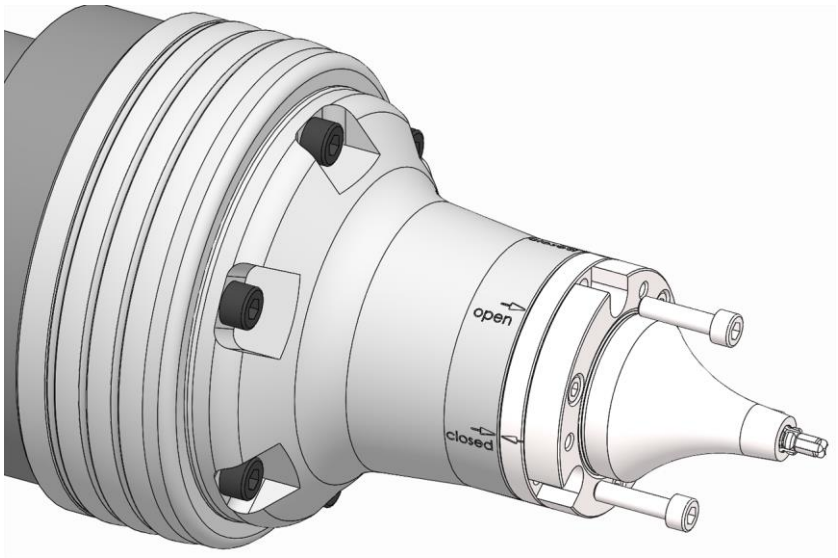
8.3 Removal of the clamping device



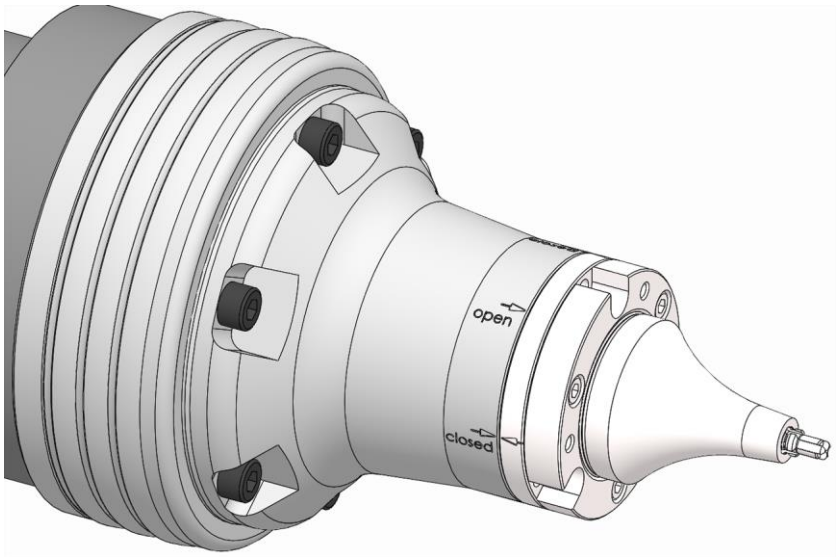
A Clamping device
A1 Fixing screws, clamping device

If a break in production occurs that lasts for more than three days, the clamping device must be removed and stored safely in accordance with the manufacturer's stipulations [see operating instructions for the clamping device].

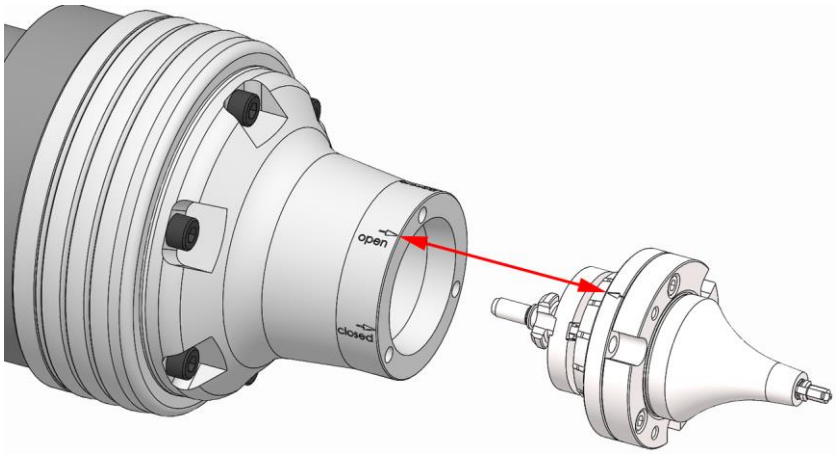
1. As described in the »Preparing the machine for removal« chapter, prepare for the following steps.
2. Move the force compensating module into its front limit stop position.
3. Attach any lifting gear that may be required.
4. If necessary, fit the mounting aid onto a vertically suspended spindle.



5. Unfasten and remove the fixing screws from the clamping device.



6. Rotate the clamping device to the force compensating module or rotate the spindle with the force compensating module attached so that the mark on the clamping device is aligned with the »OPEN« mark on the force compensating module.



7. Remove the clamping device from the force compensating module.

8.4 Tests

NOTE

Serious damage to, or destruction of, the machine tool and the workpiece caused by damaged, incomplete or incorrectly installed products!

- Only install undamaged and complete products properly.
- If in doubt, contact the manufacturer.

Assure the following points before every installation and/or before every time the products are put into service:

- The products used are undamaged.
- All fixing screws are present on the products, and are tightened to the correct tightening torque.
- None of the edges and races are chipped or show any signs of wear.
- The speed set on the machine tool must not exceed the maximum speed of the product. Always take the lowest value of all maximum speeds for combined products indicated.
- Do not exceed the maximum actuating force indicated on the product.
  Always take the lowest value of all actuating forces indicated for combined products.
- All installation tools are removed from the machining area.

8.5 Procedure after a collision

In the event of a collision, the product and its components must be checked for cracks and damage before being used again.

For this, remove the product from the machine [see »Removal of the product« chapter] and dismantle it [for level of disassembly, see »Cleaning« chapter].

9 Activities after end of production

1. Switch off machine tool and secure it to prevent it from being switched back on.
2. Open the safety door / hood.

WARNING

Eye injuries and cuts caused by failure to wear protective clothing during cleaning operation!

- Never use compressed air to clean the product.
- Also wear the following items of personal protective equipment, in addition to the basic equipment:

3. Clean the product of swarf and production residue with a soft, lint-free cloth and apply a light coating of oil.
4. Close the safety door / hood.

10 Removal

If a break in production occurs that lasts for more than three days, the product must be removed and stored safely in accordance with the manufacturer's stipulations [see »Transport, packaging, storage« chapter].

10.1 Safe removal

WARNING

Serious injuries caused by unskilled staff during installation / removal!

- Installation and removal must be performed by skilled staff from the relevant specialist field.

WARNING

Serious injuries can be caused if the machine tool starts up accidentally!

- Set the machine tool into set-up mode.
- Remove all tools, auxiliary equipment and items of test equipment immediately from the working area of the machine.
- Remove all lifting gear from the product and from the working area of the machine.

WARNING

Serious injuries caused by the escape of media under high pressure!

- Shut down media delivery during installation and removal.
- Relieve any pressure trapped in the system.
- Shut down the system.

WARNING

Serious crushing injuries and breakages caused by falling parts during incorrect installation or removal!

- Ensure that the product cannot roll away or fall.
- If necessary, use an appropriate mounting aid for installation or removal on a vertically suspended machine spindle.

WARNING

Serious crushing injuries caused by improper machine movement during installation or removal!

- Machine movements are only permitted in set-up mode during installation and removal.
- Never reach into a gap.
- Pay attention to the gap dimensions of moving parts.

WARNING

Serious head injuries caused by bending into the working area of the machine!

- Only ever bend into the working area of the machine if there are no cutting tools or sharp objects in it, or if these are covered.
- Never move body parts under parts in the working area of the machine with the potential to drop down.
- Depending on weight, use an appropriate mounting aid for installation or installing on a vertically suspended machine spindle.

WARNING

High level of physical strain due to the weight of the product or of its components if not transported properly!

- From a weight of 10 kg, use appropriate transport equipment, lifting gear and lifting tackle.

INFORMATION

If necessary, use any forcing / extraction threads in the components of the product, changing parts or clamping elements.

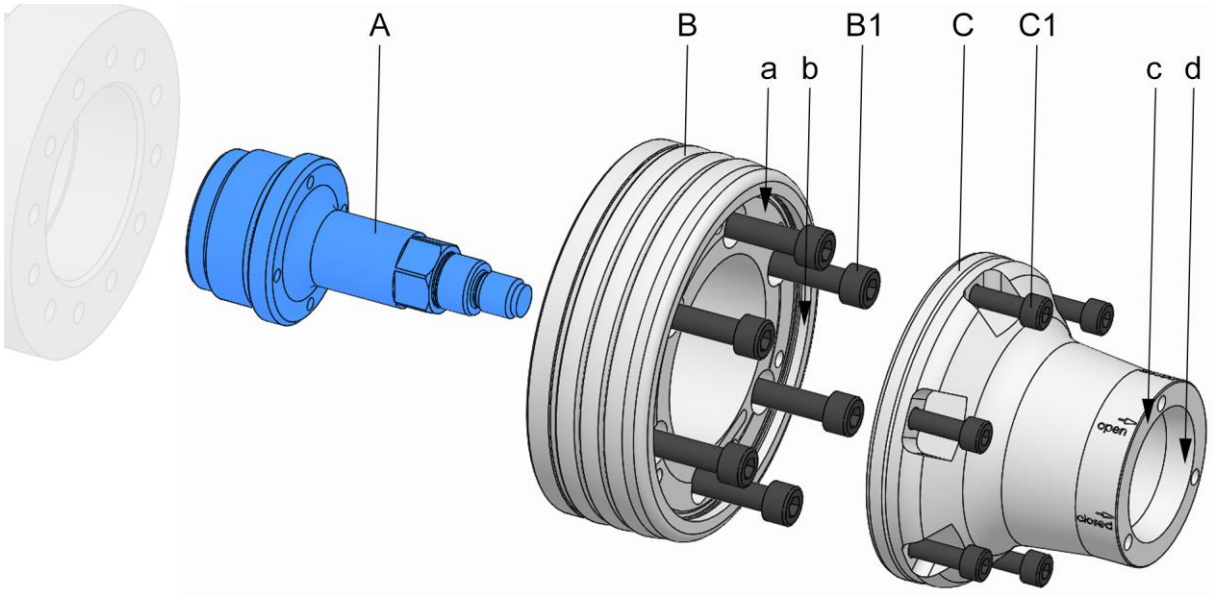
10.2 Preparing the machine for removal

1. Set the machine into set-up mode.

INFORMATION
The minimum operating pressure is reached when the drawtube can still just be moved without triggering an error message.

2. Reduce the operating pressure to a minimum.
3. Remove cutting tools and/or sharp objects from the working area of the machine, or cover them.
4. Remove operating and auxiliary materials as well as remaining processing materials and dispose of them in an environmentally responsible manner.

10.3 Removal of the product

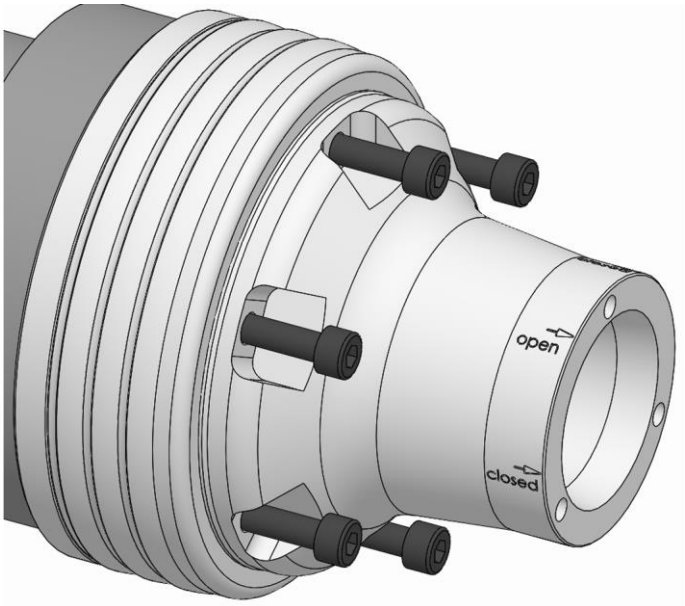


A Drawtube adapter
B Spindle flange
B1 Fixing screws, spindle flange
C Force compensating module
C1 Fixing screws, force compensating module
a Test surface, face run-out, spindle flange
b Test surface, axial run-out, spindle flange
c Test surface, face run-out, force compensating module
d Test surface, axial run-out, force compensating module

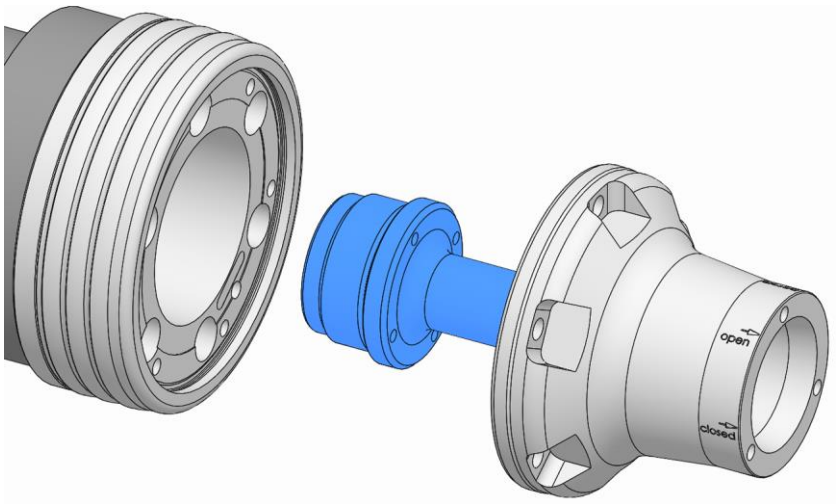
1. As described in the »Preparing the machine for removal« chapter, prepare for the following steps.

10.3.1 Disassembly of the force compensating module

1. Attach any lifting gear that may be required.
2. If necessary, fit the mounting aid onto a vertically suspended spindle.
3. Move the machine drawtube to its rear limit stop.



4. Unfasten and remove the fixing screws on the force compensating module.
5. Using the least possible force and speed, move the drawtube on the machine to its front limit stop [see »Preparing the machine for removal« chapter].



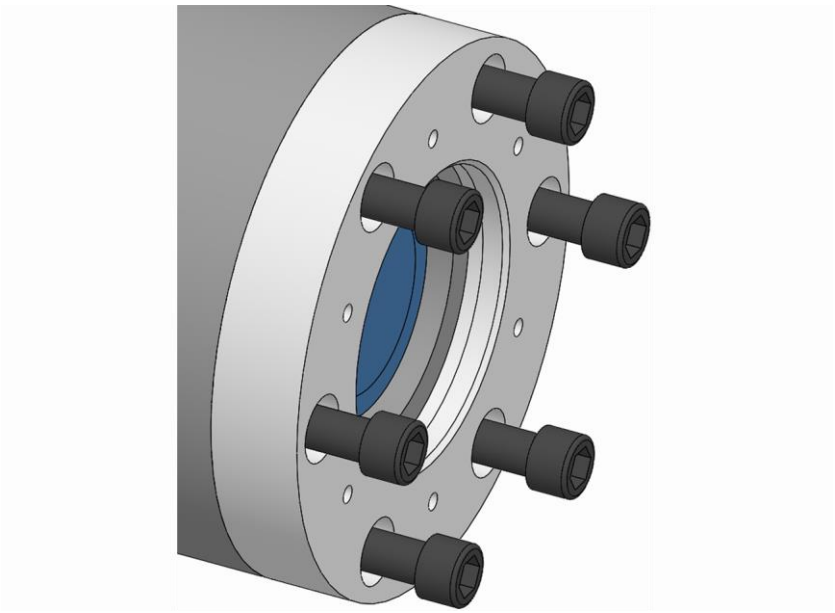
INFORMATION

If lifting gear needs to be used, rotate the spindle flange and machine spindle manually to tighten / untighten the force compensating module.

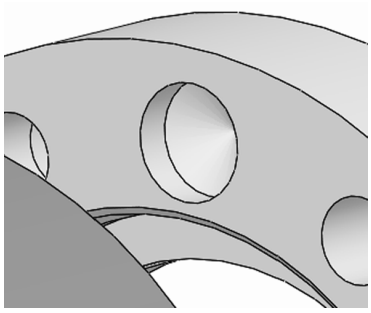
6. Unscrew and remove the force compensating module from the machine drawtube.

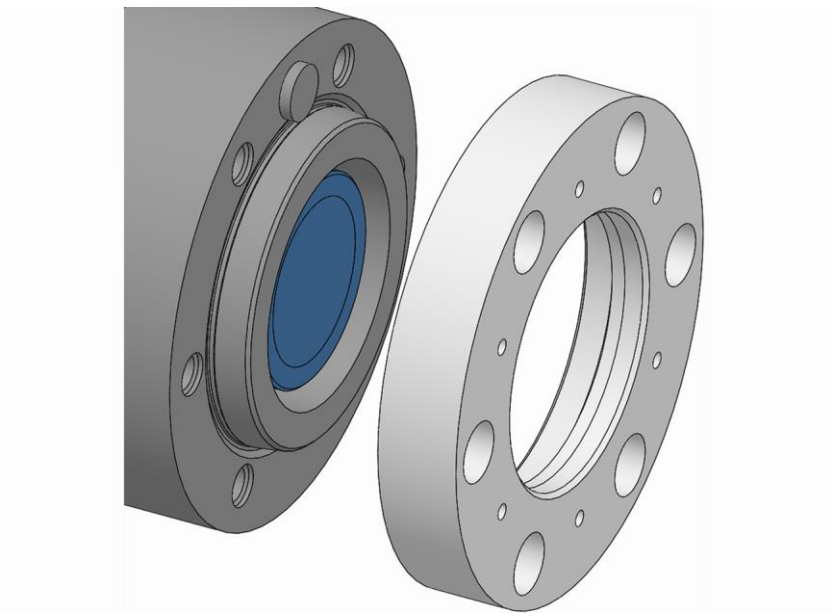
10.3.2 Removal of the spindle flange

1. Attach any lifting gear that may be required.
2. If necessary, fit the mounting aid onto a vertically suspended spindle.



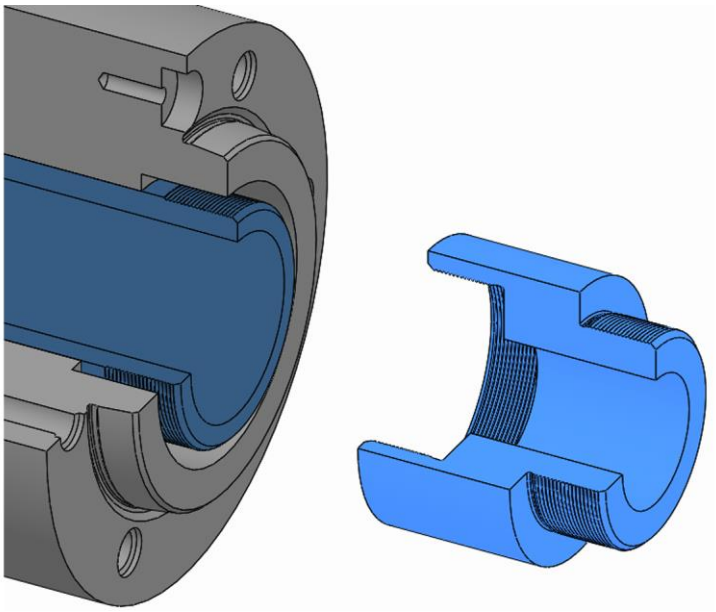
3. Unfasten and remove the fixing screws on the spindle flange.





4. Take down the spindle flange from the machine spindle.

10.3.3 Removal of the drawtube adapter



1. If the drawtube adapter was mounted on the machine drawtube, use its thread to unscrew and remove it from the machine drawtube.

11 Maintenance

11.1 Maintenance safety

WARNING

Serious injuries caused by parts being ejected centrifugally after a loss of clamping power!

- Maintain the maintenance and cleaning intervals of the product at all times.

CAUTION

Health risks caused by incorrect handling of cleaning agents!

- Pay attention to hazard specifications and the safety data sheet of the manufacturer.

INFORMATION

If necessary, use any forcing / extraction threads in the components of the product, changing parts or clamping elements.

11.2 Maintenance schedule

The following sections describe the maintenance work needed to ensure optimum and fault-free operation.

If increased levels of wear are detected during regular checks, shorten the maintenance intervals to reflect the actual rate at which signs of wear appear.

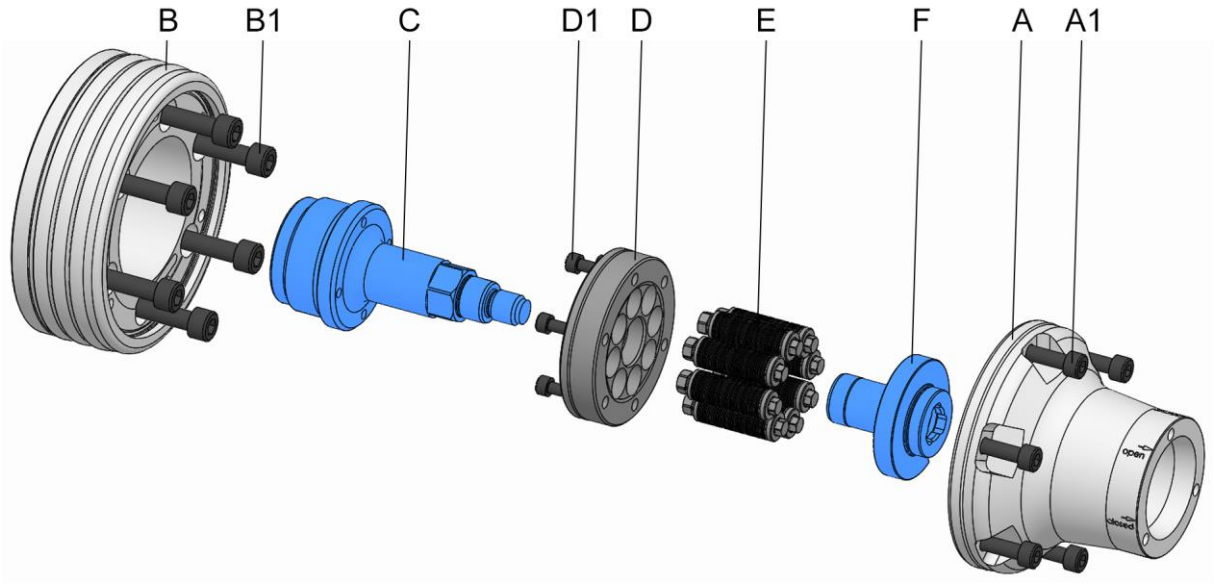
Contact the manufacturer for questions relating to maintenance work and maintenance intervals [see »Contact« chapter].

Interval	Maintenance work
daily	Visual inspection of wear locations, nicks and cracks [see »Visual inspection« chapter]
	Complete cleaning if heavily soiled [see »Cleaning« chapter]
six-monthly or after 1500 operating hours*	Completely clean the product [see »Cleaning« chapter]
	Lubricate the product [see »Lubricating the product« chapter]
with storage	See »Storage« chapter

* depending upon which stipulation is achieved first

Table 5: Maintenance table

11.3 Cleaning



A Housing
A1 Housing fixing screws
B Spindle flange
B1 Fixing screws, spindle flange
C Drawtube adapter
D Cover
D1 Fixing screws, cover
E Springs
F Bayonet adapter

WARNING

Eye injuries and cuts caused by failure to wear protective clothing during cleaning operation!

- Never use compressed air to clean the product.
- Also wear the following items of personal protective equipment, in addition to the basic equipment:

NOTE

Damage to seals caused by the wrong solvent!

- To clean the product, never use a solvent that attacks and damages the sealing elements installed. Those installed sealing elements can be made of NBR, Viton and PUR materials.
- To clean the product, never use a solvent that contains ester, nor a polar solvent.

NOTE

Damage to materials caused by incorrect installation of sealing elements!

- Replace missing or damaged sealing elements.
- Ensure that the sealing elements do not fall out or get damaged during installation / removal, and apply a thin coat of grease if necessary.

Cleanliness of the relevant limit stop and guide diameter are essential for achieving axial and face run-out tolerances.

1. Remove the clamping device from the product [see »Removal of clamping device« chapter].
2. Remove the product from the machine [see »Removal of the product« chapter].

WARNING

Serious injuries caused by imbalance resulting from incorrect reassembly!

- The product components must be installed back in the same position.
- If necessary, mark out the relative positions of components prior to disassembly.

WARNING

Serious injuries caused by an absence of clamping force resulting from incorrect reassembly!

- Pay attention to the sequence and arrangement of the springs.

NOTE

Damage to materials caused by incorrect Removal of the product!

- More extensive disassembly than shown on the exploded drawing is prohibited.

3. Dismantle the product as shown on the exploded drawing. Pay attention to the following during disassembly:
   - Unfasten the cover fixing screws uniformly, alternately and crosswise.
   - Pay attention to the sequence and arrangement of the springs because these need to be reinstalled in the same place.
4. Clean all oil and grease residues off all components with an ester-free, non-polar, soft, lint-free cloth and check for visible signs of damage.
5. Assemble the product in accordance with the exploded drawing and lubricate during assembly [see »Lubricating

the product« chapter]. Pay attention to the following during assembly:

- Reinstall the springs in the same sequence and arrangement.
- Replace worn or damaged fixing screws.
- Tighten all fixing screws to the specified tightening torque [see nomenclature and/or »Screw tightening torques« chapter]. When tightening the screws, do so evenly to prevent any distortion under load.
- Only apply lubricant to the mechanical mating surfaces. Pay attention to notes about lubricants [see »Use of lubricants« chapter].
- Avoid too much lubricant on the locating face because this can cause face run-out errors.
- Apply grease to the sealing elements [for example O-rings, rectangular rings] and sealing surfaces. Pay attention to notes about greases [see »Use of lubricants« chapter].

11.4 Visual inspection

Perform a daily visual inspection of the product to identify any damage to the product at an early stage.

Check the product for cracks and damage, in particular on the end-stop surfaces.

A check is also required to ensure that all fixing screws are tightened down.

If damage is detected, the relevant components must be exchanged immediately for genuine spare parts from the manufacturer.

Complete cleaning of the product is required if heavily soiled [see »Cleaning« chapter].

11.5 Lubricating the product

DANGER

Serious injuries caused by workpiece being ejected centrifugally due to insufficient lubrication of the product!

- Maximum clamping force is reduced by approximately 20% if lubrication is insufficient.
- Always comply with the maintenance intervals [see »Maintenance schedule« chapter].

Lubrication takes place every time the system is cleaned, maintained or assembled, and also when required.

1. Dismantle the product for lubrication purposes. Consult the »Cleaning« chapter for details of the level of disassembly required.
2. At all lubrication points, remove escaping, consumed or surplus grease, and dispose of it in accordance with locally enforceable legislative provisions.
3. After lubrication, perform the entire stroke several times.

11.6 Use of lubricants

To achieve ultimate performance from the products, use the specified lubricants.

Only use grease that complies with the fundamental requirements governing adhesion, pressure resistance and solubility in coolants. Furthermore, there must be no particles of dirt in the grease because these cause an operational malfunction if they come between two interference fit surfaces. For this, the following lubricants are recommended:

GP 355 universal grease

[see the HAINBUCH product catalogue]

Alternatively:

Lubricants	Manufacturer	Product designation
Grease	MicroGleit	GP 355
	Klüber	QNB 50
	Zeller & Gmelin	DIVINOL SD24440
	Bremer & Leguill	RIVOLTA W.A.P.

Table 6: Selection of lubricants

NOTE

Malfunction of the product due to a combination of different greases!

- Never mix different greases with one another.
- Clean the product completely before using a different grease.

11.7 Service life of the springs

WARNING

Serious injuries caused by breakage of individual components of the product when the service life of the springs is exceeded!

- Never exceed the service life of the springs in the power flow.
- Replace the springs before they exceed their service life.

The service life of the springs in the power flow is a maximum of $2x10^6$ load cycles.

The springs must be replaced before exceeding the specified service life [see »Cleaning« chapter].

12 Disposal

If no agreement exists for return or disposal, send dismantled components off for recycling.

NOTE

Substantial damage to the environment can result from incorrect disposal of environmentally hazardous substances!

- Lubricants, auxiliary materials and operating fluids are governed by legislation for the processing of special-category waste: All disposal to be performed by authorized waste disposal specialists.

Catch exchanged oils and greases in suitable containers and dispose of them in accordance with applicable local provisions.

The local municipal authority or specialist waste disposal companies can provide information about environmentally compliant disposal.

13 Faults

The following chapter describes possible causes for faults, and the work involved in remedial action.

If multiple faults occur, shorten the maintenance intervals in accordance with actual load levels.

Contact the manufacturer if faults occur that cannot be remedied by following these instructions [see »Contact« chapter].

13.1 Procedure with faults

This applies in all cases:

1. With faults that constitute an immediate danger to people or capital equipment, press the Emergency Stop button on the machine tool immediately.
2. Establish the cause of the fault.
3. If troubleshooting requires work to be conducted in the danger area, switch the machine tool into set-up mode.
4. Notify the person on location of the fault immediately.
5. Depending on the type of fault, get it remedied by authorized and appropriately skilled specialists.

INFORMATION

The troubleshooting table in the following section provides information about who is authorized to remedy a given fault.

6. In the event of a fault not caused by the product, the fault may be caused by something close to the machine tool. For this, refer to the operating instructions of the machine tool.

13.2 Fault table

Fault	Possible cause	Remedial action	Remedied by
Incorrect axial strokes in the force compensating module	Dirt in the parts in the power flow	Remove and clean the clamping device, if necessary remove, dismantle and clean the force compensating module	Skilled specialist
	Incorrect clamping device	Use a suitable clamping device	
	Defective drawtube adapter	Discussion with the manufacturer	Manufacturer
	Incorrect drawtube position	Check drawtube position	Skilled specialist

Fault	Possible cause	Remedial action	Remedied by
	Springs fatigued	Replace the springs	
Clamping device cannot be swapped in / out	Incorrect axial strokes in the force compensating module	See fault »Incorrect axial strokes in the force compensating module«	
	Coupling area dirty	Clean coupling area of clamping device and force compensating module	Skilled specialist
Clamping force is too weak	Axial actuating force on drawtube too weak	Check machine setting and correct if necessary	Skilled specialist
Clamping force is too high	Axial actuating force on drawtube too high	Check machine setting and correct if necessary	Skilled specialist
	Springs fatigued	Replace the springs	
Geometry deviation on the workpiece	Axial run-out error of the force compensating module	Check face run-out of the force compensating module and correct if necessary	Skilled specialist
	Face run-out error of the force compensating module	Check face run-out of the force compensating module and clean the mating surfaces if necessary	
Indentations on the clamping surface	Dirt on the CENTREX support	Remove and clean the clamping device and clean the CENTREX support	Skilled specialist

Table 7: Fault table

13.3 Commissioning after a fault has been remedied

After the fault has been remedied, perform the following steps to recommission it:

1. Reset the emergency stop equipment.
2. Acknowledge the fault on the control unit of the machine tool.
3. Ensure that no-one is in the danger area.
4. Start the machine tool.

14 Annex

14.1 Contact

The following hotlines are available to you for orders, schedule tracking and emergencies.

Order hotline

Ordered quickly, supplied swiftly. Just phone:

+49 7144. 907-333

Tracking hotline

Current status of your order? Just call:

+49 7144. 907-222

24 hour emergency phone line

Has a system crash occurred, or some other technical emergency?

Our experts are there for you around the clock:

+49 7144. 907-444

For advice or help, you can contact the sales partners and service staff listed in www.hainbuch.com.

14.2 Manufacturer certification

Manufacturer certification is supplied with the product and with this manual.

Index directory

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