Installation and Operating Manual

(Translation of the original installation and operating manual)

Hydraulic Removal Device for Voith Turbo Couplings with Constant Fill Sizes 422 - 1150

Version 2
91800268710 en
Protection Class 1: Internal - Transfer to third parties in substantiated cases only!

ATTENTION!
Please read this manual, at any rate, prior to installation and commissioning, and keep it for further use!

Coupling size	Size of puller spindle	Material No. of puller spindle [1)]
422 – 487 T	G 1 ¼ (cylindrical Whitworth pipe thread)	TCR.10063480
562 – 650 T	G 1 ½ (cylindrical Whitworth pipe thread)	TCR.10450060
750 – 1150 T	G 2 ¼ (cylindrical Whitworth pipe thread)	201.03447310

Please consult VOITH in case that the data on the cover sheet are incomplete.

[1)] Please indicate the material number in any correspondence (→ see above).

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91800268710 en / Version 2

This document describes the state of design of the product at the time of the editorial deadline on 2020-01-17.

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1 Preface

1.1 General information

This manual will support you in using the removal device in a safe, proper and economical way.

If you observe the information contained in this manual, you will

– increase the reliability and lifetime of the removal device,
– avoid any risks
– reduce repairs and downtimes.

This manual must

– **always be available at the place of use of the removal device,**
– **be read and used by every person transporting the coupling, working on the coupling or commissioning the same.**

The removal device has been manufactured according to the latest design standard and approved safety regulations. Nevertheless, the user's or third party's life may be endangered or the turbo coupling or other property impaired in case of improper handling or unintended use.

This manual has been issued with utmost care. However, should you need any further information, please contact:

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2 Safety

2.1 Safety instructions

Safety information indicating the descriptions and symbols as described in the following are used in the operating manual.

2.1.1 Structure of safety information

⚠ DANGER WORD
Results of a hazardous situation Source of hazard • Warding off of danger

Danger word
The danger word divides the severity of the danger in several levels:

Danger word	Severity of danger
⚠ DANGER	Death or serious injury (irreversible personal injury)
⚠ WARNING	Death or serious injury possible
⚠ CAUTION	Minor or moderate injury possible
NOTICE	Possible damage to property of - the product - its environment
SAFETY INFORMATION	General applications details, useful information, safe job procedure and proper safety measures

Table 1

Results of a hazardous situation
Hazard consequences indicate the kind of hazard.

Source of hazard
The source of hazard indicates the cause of hazard.

Warding off of danger
Warding off of danger describes the measures to be taken to ward off a danger.

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2.2 Intended use

– The removal device serves to remove the turbo coupling from the shaft and must not be used for other purposes.
– Intended use also includes observing the installation and operating manual of the turbo coupling.
– The manufacturer is **not** liable for any damages resulting from unintended use. The operator solely bears the risk.

⚠ DANGER

Remaining risks on the turbo coupling

Unintended use or incorrect operation may cause death, serious injuries or minor injuries as well as damage to property and the environment.

- Only persons who are sufficiently qualified, trained and authorized are allowed to work on or with the turbo coupling!
- Please observe the warnings and safety information!

2.3 Unintended use

Please see the corresponding information as to dangerous situations in the respective chapters.

2.4 Structural changes

⚠ DANGER

Danger to lift Risk of damage to property

Structural/design changes

- Structural changes done on the removal device are not permitted and can result in personal injury and damage to property!

2.5 Staff selection and qualifications

Only qualified and authorized professional staff are allowed to perform work, such as transportation, storage, installation, electrical connection, commissioning, operation, maintenance, servicing and repair.

Qualified professional staff in the sense of these basic safety information is persons who are familiar with transportation, storage, installation, electrical connection, commissioning, maintenance, service and repair, and who have the necessary qualifications for their job.

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This staff must be trained, instructed and authorized to:
– operate and service units in a professional manner in accordance with the technical safety standards
– use lifting appliances, slings (ropes, chains, etc.) and lifting points in a professional manner
– properly dispose of media and their components, e.g. lubricating grease
– service and use safety equipment in accordance with technical safety standards
– prevent accidents and provide first aid.

Staff to be trained may only perform work on the turbo coupling under supervision of a qualified and authorized person.

The staff in charge of any work to be done on the coupling must
– be reliable,
– have the legal age,
– be trained, instructed and authorized with regard to the intended work.

2.6 General information as to dangerous situations

⚠ DANGER

Danger of accident

Working on the turbo coupling
- Switch off the unit in which the coupling is installed and secure the switch against inadvertent switch-on.
- For all work performed on the turbo coupling ensure that both the drive motor and the driven machine have stopped running and that unintended starting is absolutely impossible!
- There is the risk of injury by cutting, squeezing and cold burns in case of minus degrees.
  Never touch the turbo coupling without wearing protective gloves!
- Start working on the coupling only after it has cooled down below **44 °C** as otherwise there is a risk of burning!
- Ensure that there is sufficient light, a sufficiently large working space and good ventilation when working on the turbo coupling.

⚠ DANGER

Danger of accident

Operating fluid leaking out
- If operating fluid leaks out of the turbo coupling, immediately remove the same to prevent hazards (e.g. risk of slipping, risk of fire)!
- Collect any operating oil leaking out to prevent contact with parts (motor, belt) which might ignite or catch fire.

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DANGER

Danger of accident

Operating fluid leaking out

- Please provide a catch pan of sufficient size, if required!
- Please pay attention to the information contained in the safety data sheets!

WARNING

Fire hazard

After the fusible plugs responded, spraying off oil may ignite on hot surfaces causing fire, as well as releasing toxic gases and vapor. There is a risk of burning and intoxication, as well as a risk of harm to machines, the environment and property.

- Immediately switch off the driving machine when the fusible plugs respond.
- Please pay attention to the information contained in the safety data sheets!

DANGER

Fire hazard Risk of injury Explosion hazard

Exclusion of explosive atmosphere

During all work performed, such as transportation, storage, installation, electrical connection, commissioning, maintenance, and servicing, no explosive atmosphere may exist.

Methane content

- In order to guarantee safety when working on turbo couplings with the aluminum alloy housing and the protective cover removed during underground installation, maintenance and removal, the methane content needs to be checked on the jobsite using appropriate instruments.
- Before starting and while performing this work, the methane content in the area of the turbo coupling must not exceed the permissible limit value (e.g. 1 % vol. in Russia). Should this limit be exceeded, the work has to be stopped until the value is again below the limit value.

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DANGER

Fire hazard Risk of injury Explosion hazard

User information, tools, auxiliaries

Explosion hazard due to sparking!

- Observe EN 1127-1, Annex A,
  EN 1127-2, Annex B,
  EN 1127-2, Chapter 7.
- Use only tools which are approved for use in potentially explosive atmospheres. Avoid formation of sparks.

Protection against impacts

Explosion hazard due to sparking!

- In order to avoid exothermal reactions, protect rusty steel or iron parts against impacts!

DANGER

Danger of accident

Spindle breakage

In case of a spindle breakage, the spindle fraction may be thrown out.

- Be careful if the thrust bolt has to be turned with great force. Very high hydraulic pressures occur that may result in a component failure (spindle thread) in case of mal-operation or defective spindle.
- Wear helmet, face shield and safety goggles!

2.7 Remaining risks

DANGER

Danger of accident

Improper use or incorrect operation may cause death, serious injuries or minor injuries as well as damage to property and the environment.

- Only persons who are sufficiently qualified, trained and authorized are allowed to work on or with the turbo coupling!
- Please observe the warnings and safety information!

2.8 What to do in case of accidents

SAFETY INFORMATION

- Please observe the local codes of practice!

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3 Lifting, Transport and Storage of the Turbo Coupling

In this connection, please refer to the respective chapters in the manual for the turbo coupling 3626-011000.

DANGER

Danger to life

Suspended loads

- Do not walk under suspended loads!
- After removal, carefully set the coupling down on a wooden board / pallet, and secure it against tilting.

NOTICE

Damage to property

Danger of frost

- When storing couplings of type "TW" below 0°C, drain the water!

4 Working Principle

The new hydraulic removal device works hydrostatically, i.e. a very high pressure is generated in the housing of the removal device with a small piston that then acts on a bigger piston and thus presses off the turbo coupling.

5 Design

The removal device consists of the following main components:

- Thrust bolt with wrench
- Cylindrical housing
- Pressure medium
- Piston with piston rod and pressure cap

Except for the wrench which is attached as loose part, all components are connected and sealed with lead with each other. In order to ensure a troublefree functioning of the removal device, it is not allowed to arbitrarily open the removal device.

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6 Application of the Removal Device

The detaching thread of the removal device on the bottom end of the housing is:

Size of detaching thread	Usable for coupling size
G 1 ¼ (cylindrical Whitworth pipe thread)	422 – 487 T
G 1 ½ (cylindrical Whitworth pipe thread)	562 – 650 T
G 2 ¼ (cylindrical Whitworth pipe thread)	750 – 1150 T

Table 2

Removal procedure of the turbo coupling is as follows:

See **Chapter 7.2,** Removal.

7 Coupling Disassembly

⚠ DANGER

Risk of injury Danger to life

In particular, please observe Chapter 2, (Safety) when working on the turbo coupling!

Unauthorized or unintentional switching on of the machine could result in death or serious injury!

- Before beginning to work on the turbo coupling, switch off the main switch of the drive motor and secure it against being switched on!
- For all work performed on the turbo coupling ensure that both the drive motor and the driven machine have stopped running and that unintended starting is absolutely impossible!

NOTICE

Risk of damage to property due to incorrect disassembly

This chapter describes the disassembly of turbo couplings of basic type T.

- Couplings of basic type TN are disassembled in reverse order according to Installation and Operating Manual 3626-011000_Rev.11, Chapter 8.4, page 47.

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7.1 Preparation

- Prepare suitable tools and lifting appliances; keep the turbo coupling weight in mind!

SAFETY INFORMATION

The weight of the turbo coupling is indicated on the cover sheet.

The weight is also stamped with figure stamps on the outer diameter of the coupling flange, if it exceeds 100 kg.

DANGER

Danger to life

Damaged load carrying attachments or those with insufficient carrying capacity may break under load, with the consequence of most serious or even fatal injuries!

- Check the lifting appliances and load carrying attachments for
  - sufficient carrying capacity (for weight, see cover sheet),
  - sound condition.
- Do not walk under suspended loads!

→ For lifting appliances, see 3626-011000 Rev.11 Chapter 6.4

- Fix the coupling to a suitable lifting appliance.

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7.2 Removal

⚠ CAUTION

Risk of damage to bearings

- It is not allowed to use an impact screwdriver to apply the torque!

→ For removal devices, see Chapter 7.2.1

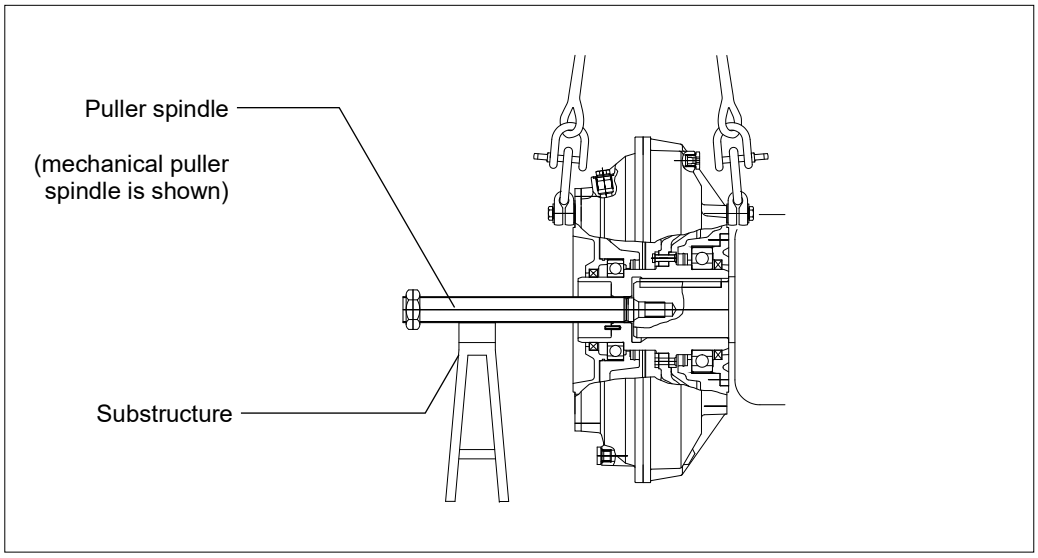


Fig. 1

7.2.1 Removal using the hydraulic removal device

Very high forces with a low torque can be applied with the hydraulic removal device so that no substructure below the removal device (Fig. 1) is necessary for absorbing the force.

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Hydraulic removal devices available at VOITH for turbo couplings of basic type T:

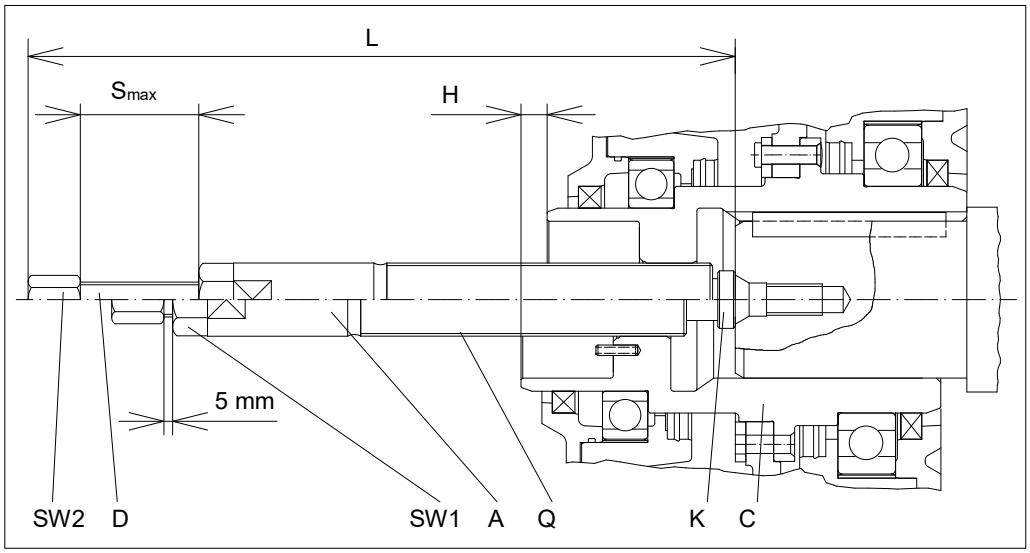


Fig. 2

A: Puller spindle
C: Coupling hub
D: Thrust bolt
H: Stroke
K: Piston
L: Total length
Q: Dimension of puller spindle thread
S_{max} maximum screwing-in dimension of thrust bolt
SW1: Width across flats (spindle)
SW2: Width across flats (thrust bolt)

Coupling sizes	**L** in mm	**H** in mm	**Q** in inches	**SW1** in mm	**SW2** in mm	**S_{max}** in mm	**Material No. of puller spindle**
422, 487	406	15	G 1-¼	36	24	66	TCR.10063480
562, 650	580	15	G 1-½	36	–	125	TCR.10450060
750, 866, 1000, 1150	1330	12	G 2-¼	46	36	305	201.03447310 (Serial No. 001-004)
750 T…RI… *)	1360	13.2	G 2-¼	46	36	335	201.03447310 (Serial No. 005-020)
	1393	14.5	G 2-¼	46	36	368	201.03447310 (from Serial No. 021)

Table 3

*) For the removal of Voith turbo couplings of type 750 T…RI…, an extension with Voith Material No. 201.04099510 is required for the hydraulic removal device 201.03447310.

How to mount the extension:

- Screw in the thrust spindle up to the stop.
- Loosen the hexagon socket head screw and remove the thrust piece.
- Fix the thrust piece with the hexagon socket head screw to the extension.
- Fix the extension with thrust piece to the piston rod of the removal device.

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Procedure:

1. Loosen and unscrew the fixing bolt (50) of turbo coupling.
2. Unscrew thrust bolt (D) until reaching the maximum removal dimension $\mathbf{S_{max}}$ (manually only, do not use an impact screwdriver!).
3. Check the spindle thread (Q) for dirt and damages.
4. Apply lubricant to the thread of puller spindle (A) and to the thread of thrust bolt (D).
5. Screw the puller spindle (A) via SW1 hexagon, up to the stop, into the thread of coupling hub (C), i.e. until the piston rests on the gear shaft or puller disk.

→ For lubricants, see Chapter 7.3

SAFETY INFORMATION

- For 201.03447310 (from coupling size 750), do not exceed the maximally permissible torque (see drawing) of the thrust bolt as otherwise the integrated overpressure protection will trip.
- After the overpressure protection tripped, it is mandatory to replace it in a qualified specialist workshop.

⚠ CAUTION

Danger

If the dimension 5 mm is not observed, there is the risk of seizing of the thread (wear).

- The pressure chamber of the hydraulic removal device is subject to high pressure and must not be opened!

6. Screw in the thrust bolt (D), stop 5 mm before the limit stop.
   This generates the pressure required for the removal of the turbo coupling and the turbo coupling is removed.
7. Unscrew the thrust bolt (D).
8. Screw the puller spindle (A) via SW1 hexagon, up to the stop, into the thread of coupling hub (C).
9. Repeat steps 6 to 8 until the coupling can be easily removed with SW1.

After removal, turn back the thrust bolt and the piston into the outer end position (manually only, to do use an impact screwdriver!).

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7.3 Lubricants for shaft-hub-connection

NOTICE

Lubricant
Use a lubricant with the following characteristics:

- Operating temperature range: -20°C…+180°C,
- water- and wash-out-resistant,
- protection against fretting corrosion and corrosion.

Proposed lubricants:

Producer	Designation	Notice
Dow Corning	Molykote G-N Plus Paste Molykote G-Rapid Plus Paste Molykote TP 42	
Fuchs	Gleitmo 815	
Liqui Moly	LM 48 Montagepaste	
Dow Corning	Molykote D 321 R Anti-Friction Coating	**Hazardous substance!**
Castrol Optimol	Molub-Alloy Paste White T Molub-Alloy Paste MP 3	

Table 4

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8 Annex

8.1 Drawings - Hydraulic Removal Devices

Coupling size	Drawing No.	Size of detaching thread	Maximum compres-sive force
422 - 487	91500842010	G 1 ¼ (cylindrical Whitworth pipe thread)	30 t
562 - 650	91500842110	G 1 ½ (cylindrical Whitworth pipe thread)	50 t
750 - 1150	201.03447310	G 2 ¼ (cylindrical Whitworth pipe thread)	90 t
750 T…RI…	201.04099510	Extension for 201.03447310	90 t

8.2 Representatives - J.M. Voith SE & Co. KG

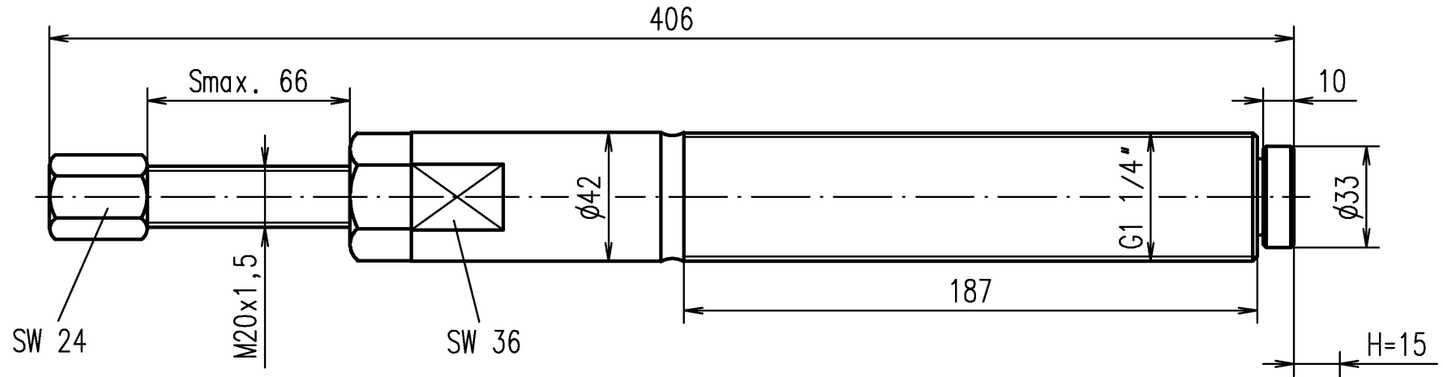
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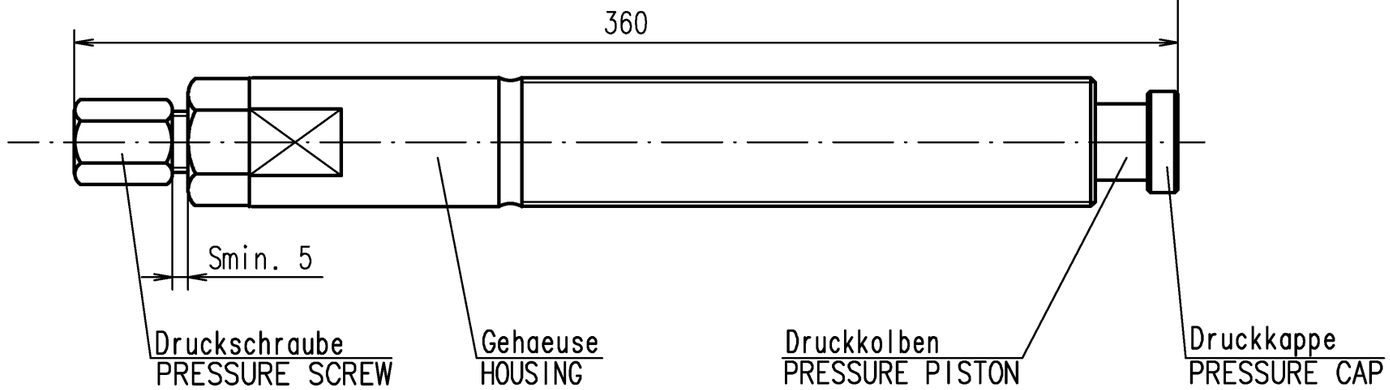
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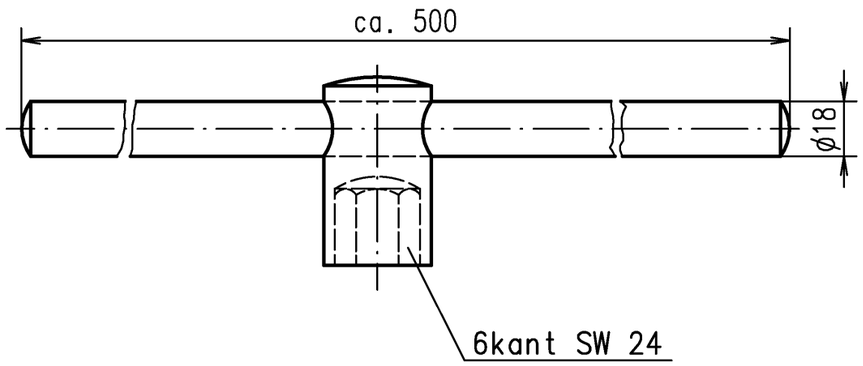
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Endstellung (nach dem Druecken)
END POSITION (AFTER PRESSING)





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Dimension | Tolerances

VTK 422 u. 487

CAD | Released for microf.

Language: DE

Chamfers: ISO 13715 (+1,6 / -0,2)
Gen. tolerances: Tolerancing ISO 14405
Surface quality: R_a in µm

Scale of orig.: 1:2
Mass: 4 kg
Material:
Pattern / Die No.:
Blank-No.:

	Date	Name
Draw.	2014-12-23	MPre
Check.	2014-12-23	WoW
Dept.	amde	Appr.
Stand.		

Doc. type:

Title: Hydraulische Abdrueckvorrichtung

VOITH

Drawing No. / Docu-No.: 91500842010

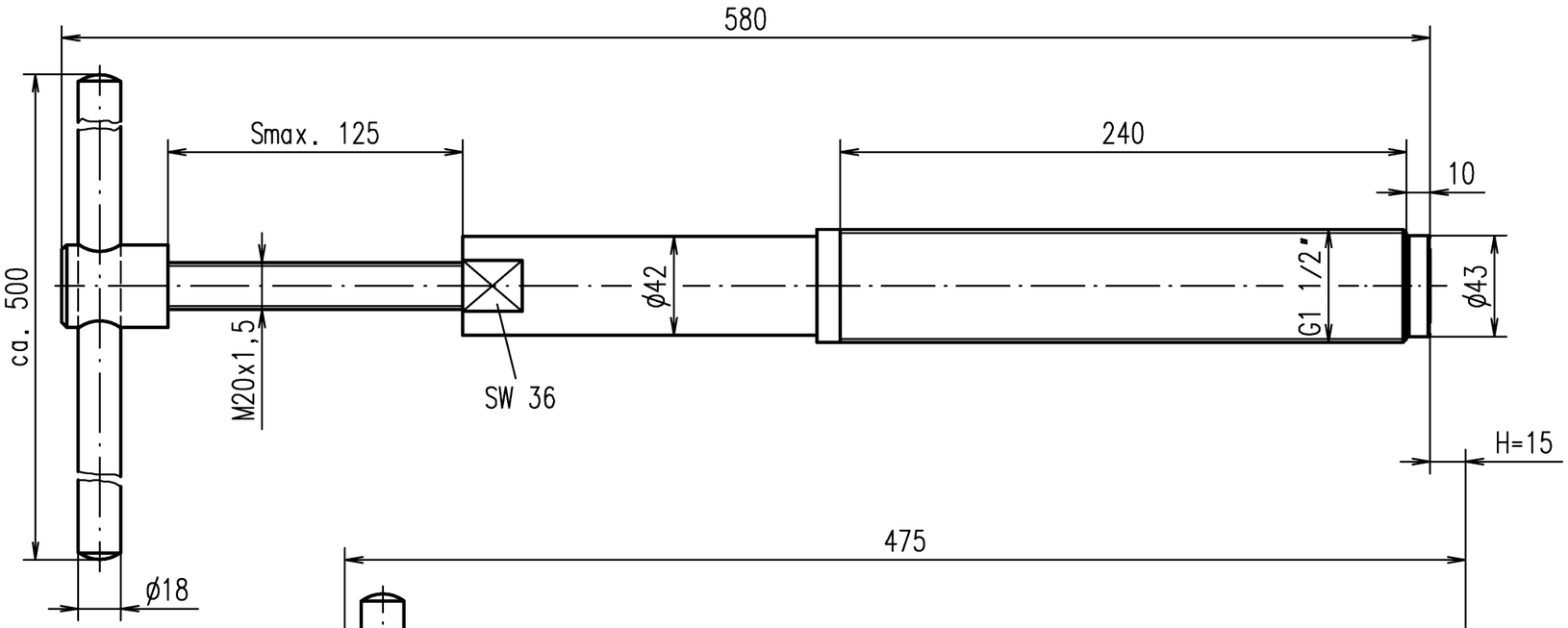
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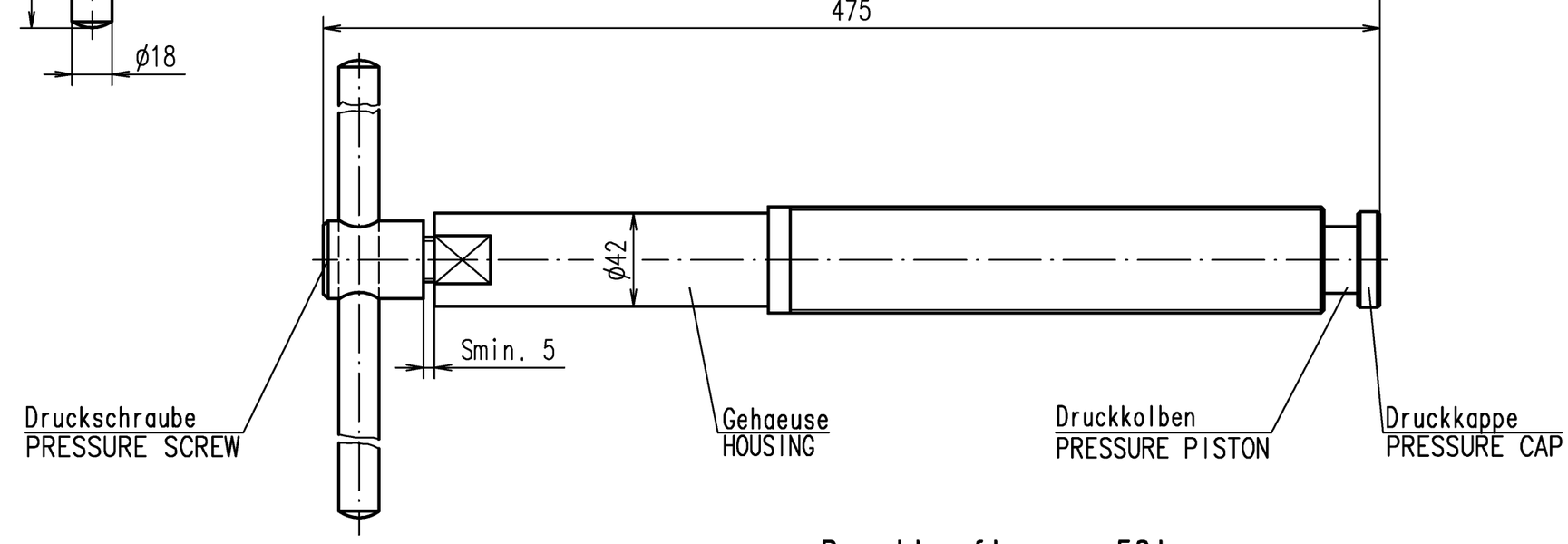
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FORCE OF PRESSURE max. 50t

Rev.	Iss.	Revision-Nr.	Rev. descr. (shop and eng. info only)	Index	Date: draw.	Name	Check.

Dimension | Tolerances

VTK 562 u. 650

CAD | Released for microl.

Language: DE

Chamfers ISO 13715 (I+1,6 I-0,2) | Gen. tolerances | Tolerancing ISO 14405 | Surface quality R_a in µm

Scale of orig. 1:2,5 | Mass 5,7 kg

Material

Pattern / Die No. | Blank-No.

	Date	Name	Doc. type
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Check.	2014-12-23	WoW	
Dept.	amde	Appr.	
Stand.			

Title: Hydraulische Abdrueckvorrichtung

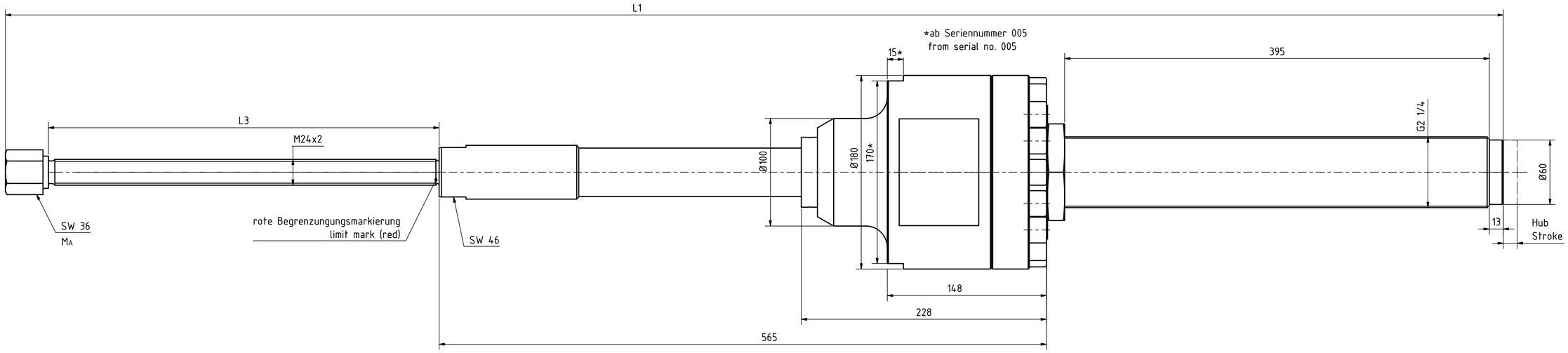
VOITH

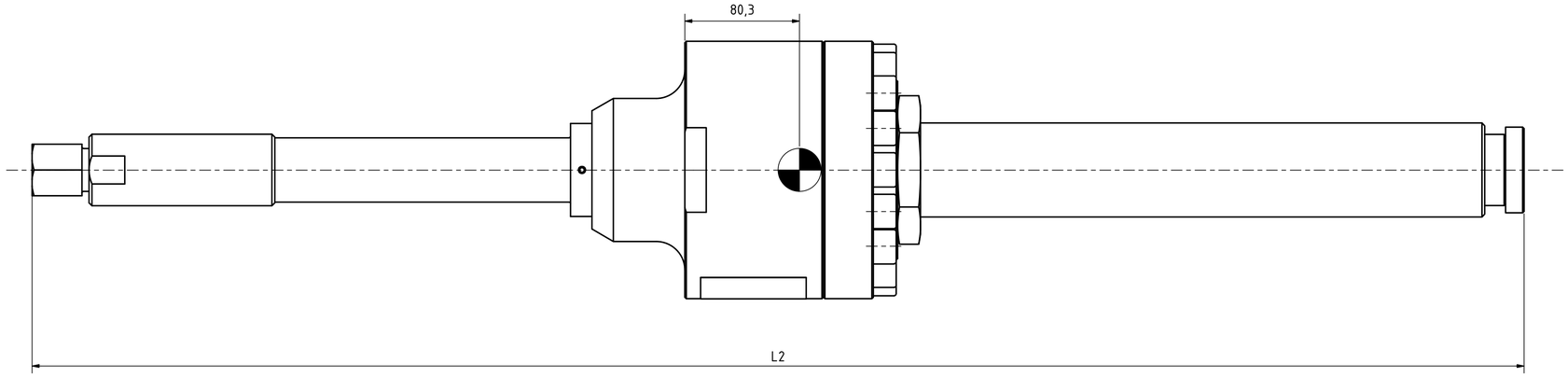
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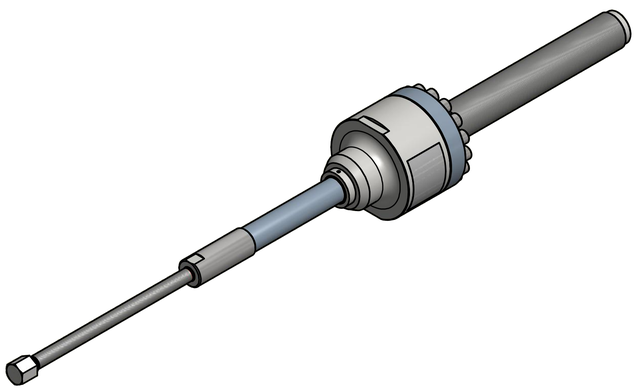


IMI HERION

Engineered and produced for VOITH

VOITH ID:	201.03447310
VOITH Serial No.:	XXX
(IMI HERION ID:	4012391000000000
Type:	Removal device
Serial No.:	XXXXXXX
Force/Torque max.:	900 kN / 48 Nm
Weight:	45 kg

Made in Germany



Maße und technische Daten
Dimensions and technical data

VOITH Seriennummer VOITH Serial No.	Hub Stroke [mm]	L1 [mm]	L2 [mm]	L3 [mm]	MA max. [Nm]	Druckkraft Thrust [kN]
001 to 004	12,0	1330	1042	305	48	900
005 to 020	13,2	1357	1043	332	48	900
021 to ...	14,5	1394	1045	364	48	900

VOITH TURBO

Zeichn.-Nr.	:	20103447310
And.-Index / -Nr.	:	01 / 258818
Datum	:	2019-07-22
Abt. / Name	:	tidht / Breg 1 / 1

D	M1691			froehlichf	22.07.2019	jungem	22.07.2019
Revision	ECN-NO	Description / Beschreibung		Modified/Geaend.	Date/Datum	Checked/Geprüft	Date/Datum

Surface Finishing/Oberflaeche: brüniert / burnished DIN 50938	Mass/Masse (kg): 45 kg	Ident. No. Material/Werkstoff: 750-1150T		Scale/Massstab: 1:2	Size/Format: A1
All Dimensions/alle Masse in mm	BoM/Stueckliste			Gen.Tol./Allg.Tol.: ISO 2768-mK	Roughness/Rauheit: -

	Name	Date/Datum	Tol.Principle/Tol.Prinzip	Description/Bezeichnung
Created/Erst.	linkt	29.03.2019	DIN 7167	Abziehvorrichtung (hydr.)
Checked/Gepr.	hirschmann	01.07.2019	Projection 1st. Angle	HYDR. REMOVAL DEVICE
Zeichnungsstatus:				

IMI Precision Engineering
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Untere Talstraße 65
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Ident No/Ident Nr.: 4012391000000000

Sheet/Blatt: 2
Revision:

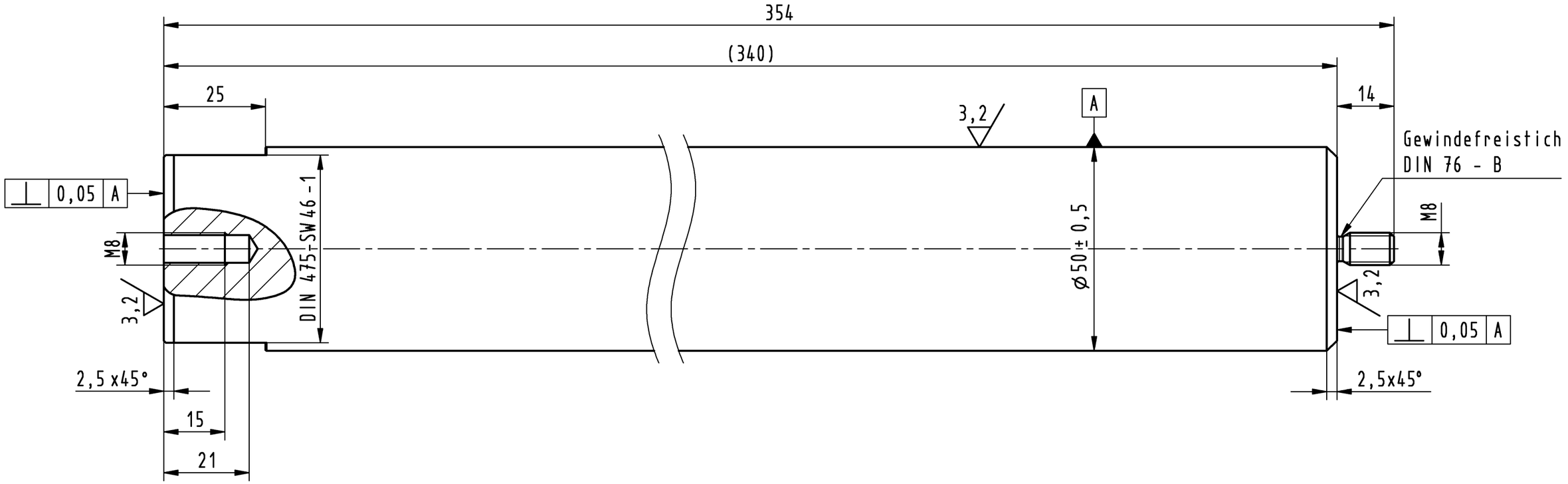
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Rev.	Iss.	Revision-No.	Rev. descr. (shop and eng. info only)	Index	Date: draw.	Name	Check.	
								Dimension
								Tolerances

750 - 1150 T

CAD

Released for microl. F

Language DE

Chamfers ISO 13715 +1.6 -0.2

Gen. tolerances ISO2768-mK-E

Size ISO 14405 E

Surface quality R_a in µm ISO 1302

Scale of orig. 1:1

Mass 5,2 kg

Material 42CrMo4

Pattern / Die No.

Blank-No.

	Date	Name
Draw.	2019-12-13	MPre
Check.	2019-12-13	Pi
Dept.	tidht	Appr. met
Stand.		

Doc. type Z01

Title
Verlaengerung
zu hydr. Abziehspindel G2-1/4"

VOITH

Drawing No. / Docu-No. 20104099510

Sheet 1 of 1 Sh.

Refer. | Reply for | Repl. by

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Installation and Operating Manual / Version 2 / 918002687 10,
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