INSTALLATION INSTRUCTIONS

BEAROMOS® 2020 “Short adaptation”

Sensor for monitoring sliding bearings

Determining the friction regime on hydrodynamically lubricated sliding bearings

Version date: 07/07/2026

Version: Version 1.0

Document No.: Part number 153202

The original installation instructions are written in German.
Any translations are based on the original installation instructions.

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LEGAL NOTICE

The installation instructions apply to the following product:

- **BEAROMOS® 2020** (part number 153150)

Firmware version at time of publication:
V5.2 dated 15/07/2025

Copyright

We reserve the right to make technical changes to the hardware and software for the BEAROMOS® 2020 product without prior notice. We do not assume any liability for a currently delivered device having all the features described in this operating manual.

These installation instructions may only be passed on to third parties together with the BEAROMOS® 2020 device.

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VERSION HISTORY AND CHANGE NOTES

Version	Change	Date	Author
0.223	First version	25/02/2023	P. Emser
1.0	• Revised all content against and adapted to the standard. ➔ The technical functionality and properties of the device remain excluded from the changes! • Reorganised and adapted content of all sections • Added further sections • New layout with revised formatting	07/07/2026	J. Wahl

Table 1 : Version history and change notes

Table of contents

1 Information about the installation instructions

These instructions are original installation instructions based on EU Regulation 2023/1230 and are structured with text and images. They contain important information about installation of the product, in particular the safety instructions and warnings.

Please read the instructions carefully, then keep them in a safe place!

1.1 Symbols in these installation instructions

Various types of notation and symbols are used in the text of this manual. They are used as follows:

Numbered steps:

- ▶ Required action
  - ☑ Result of the sequence of actions
- Symbol for a list
  1. Points of the list

⇨ *Reference to a section or figure*

`Display text`

Additional information and instructions

Environmental and energy-saving tips

Different warning symbols are used for warnings. Please see the descriptions and instructions in Section ⇨. *Section 2 Safety instructions*

1.2 Validity of the installation instructions

These installation instructions apply to the following product:

- **BEAROMOS® 2020**

hereafter referred to as the “device”.

1.3 Applicable documents and regulations

Further documents apply and must be observed in conjunction with these installation instructions:

- ▶ Operating manual for **BEAROMOS® 2020**, currently valid version and various languages in translation (Document No.: 183007)
- ▶ For additional components, the manuals supplied with them must be observed.

1.4 Digital installation instructions (online installation instructions)

The current version of these installation instructions is also available online and can be accessed at any time. You can find the manual under:

[Installation instructions | Schaller Automation (schaller-automation.com)]

To access the manual, select the manual for your product on our online portal and then start downloading by clicking the icon. The document then opens automatically in your browser.

1.5 Qualifications of personnel

Installation, starting up, operation and maintenance of the device may only be carried out by appropriately qualified personnel.

The operator must therefore ensure that the personnel for the work/activities defined in this operating manual have the appropriate qualifications and fully understand the contents of these installation instructions.

The operator must define and provide rules for the area of responsibility, the authority and the supervision of personnel for such work in advance.

1.6 Document storage

- This manual, as well as all other applicable documents, must be kept in a central place so that they are always available to the qualified personnel at the place of use.
- The documents must be handed over in full to subsequent owners.

1.7 Legal information about the product

For all legal questions and activities arising in connection with the above product, please contact SCHALLER Automation in advance:

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1.8 Variables and units of measurement that are used

The following table lists the variables and units of measurement that are currently used in the installation instructions. We reserve the right to add to or change the table, as necessary.

Variable	Unit
Lengths	mm, m
Mass	g, kg
Temperature	°C, K
Acceleration (vibration)	g, m/s^2
Torque (M)	Nm
Protection rating	IP

Table 2 : Variables and units of measurement that are used

2 Safety instructions

2.1 Information, warning and mandatory signs that are used

The following symbols and signs according to DIN EN ISO 7010 and DIN 4844-2 are used in these installation instructions:

Symbol	Explanation
	General warning sign
	Warning; electricity
	Warning; hot surface
	Warning; the risk of being drawn in unintentionally (body parts)
	Warning; risk of being crushed (body parts)
	Warning; risk of slipping, tripping and falling, caused by the working environment
	Disconnect before carrying out maintenance or repair Connect an earth terminal to the ground
	Use personal protective equipment (PPE)
	Refer to operating manual/instructions
	Note: Important information!
	Note: Action required!

Table 3 : Information, warning and mandatory signs

2.2 General safety instructions

The basic safety instructions are instructions that always apply in order to operate the machine safely and keep the device in a safe condition.

If the following safety instructions are not observed, the following may occur:

- there may be personal injury, environmental damage or damage to property;
- important functions of the device may fail;
- specified methods of maintenance and servicing may fail;
- any claims may fail.

⚠ CAUTION

Safe and proper use of the device

- ▶ Read the operating manual and other documents that accompany the product carefully and keep them in a suitable place for future reference.
- ▶ For repair and service work, you must follow the instructions in the operating manual.

NOTE

Personal protective equipment

Working on the device without protective equipment may result in serious injury. For the workplace PPE, the following protective equipment must be used or is recommended:

- ▶ DIN EN 388:2016 Protective gloves against mechanical risks, 2341X, and DIN EN 407:2020-06, Protective gloves against thermal risks, X1XXXX.
- ▶ Safety glasses in accordance with DIN EN 166 or DIN EN 170.
- ▶ Safety helmet in accordance with DIN EN 397 or DIN EN 50365.
- ▶ Safety footwear in accordance with DIN EN ISO 20345.

⚠ DANGER

Malfunction

Operating the device with a malfunction creates a risk of death and may cause environmental damage and/or damage to the device.

- ▶ The device must be taken out of operation immediately in the event of a malfunction.

⚠ DANGER

Noise pollution

At the mounting position of the device, there are high noise emissions from running of the engine, which can damage hearing and cause environmental noise pollution.

- ▶ Wear suitable ear protection when the engine is running.
- ▶ Observe the statutory regulations for protection against noise.




DANGER

Mechanical hazards

Serious injuries from incorrect assembly or installation.

- You may only install and remove the device when the engine is switched off, and the complete set of all components must be attached.
- The device/sensor must be centred in accordance with Section 6 of these instructions, otherwise the sensor shaft may be damaged, which may then damage the engine as a result. You must use the centring pin supplied with the product for this purpose.
- The device must not be painted, varnished or otherwise altered in any other way.
- Only trained specialist personnel are allowed to carry out assembly, installation and starting up of device.
- There may be risks of slipping, tripping and falling in the working environment. These should be minimised or eliminated altogether.




DANGER

Electrical hazards

Electrical damage to the device from welding work on the engine as a result of overvoltage.

- Disconnect the device from the power supply before starting work.

Electrical damage to the device when installing and removing the device.

- Disconnect the device from the power supply before starting work.

Electrical damage during repair work on the device

- Disconnect the device from the power supply before starting work.


DANGER

Risk of burns

Depending on the media that are used, the installation location and the operating mode, the surfaces of the device and the connected parts of the system may become hot. The heat can cause serious injury.

- Make sure that the surfaces have cooled down sufficiently.
- Install guards that prevent contact with the device.
- Observe the allowed ambient temperature Ta (during intended use): +5 °C ≤ Ta ≤ +70 °C.
- Wear suitable protective gloves.

WARNING

Risk of injury from design changes

Unauthorised modification or removal of functional parts puts the function of important safety components at risk and can lead to serious damage to property or the environment and to serious injuries or even death.

- Statutory regulations must be observed and complied with.
- Only use approved and suitable components and spare parts.

NOTE

Maintenance and repair work

It is only safe to operate the device when it is in perfect working condition. The operator is responsible for proper and safe condition of the device, which means:

- Have the specified inspections and maintenance work carried out regularly.
- Carry out the specified checks before operation.

3 Overview and description of components

▶ **For crankshaft clearances ≤ 300 mm (short adaptation)**

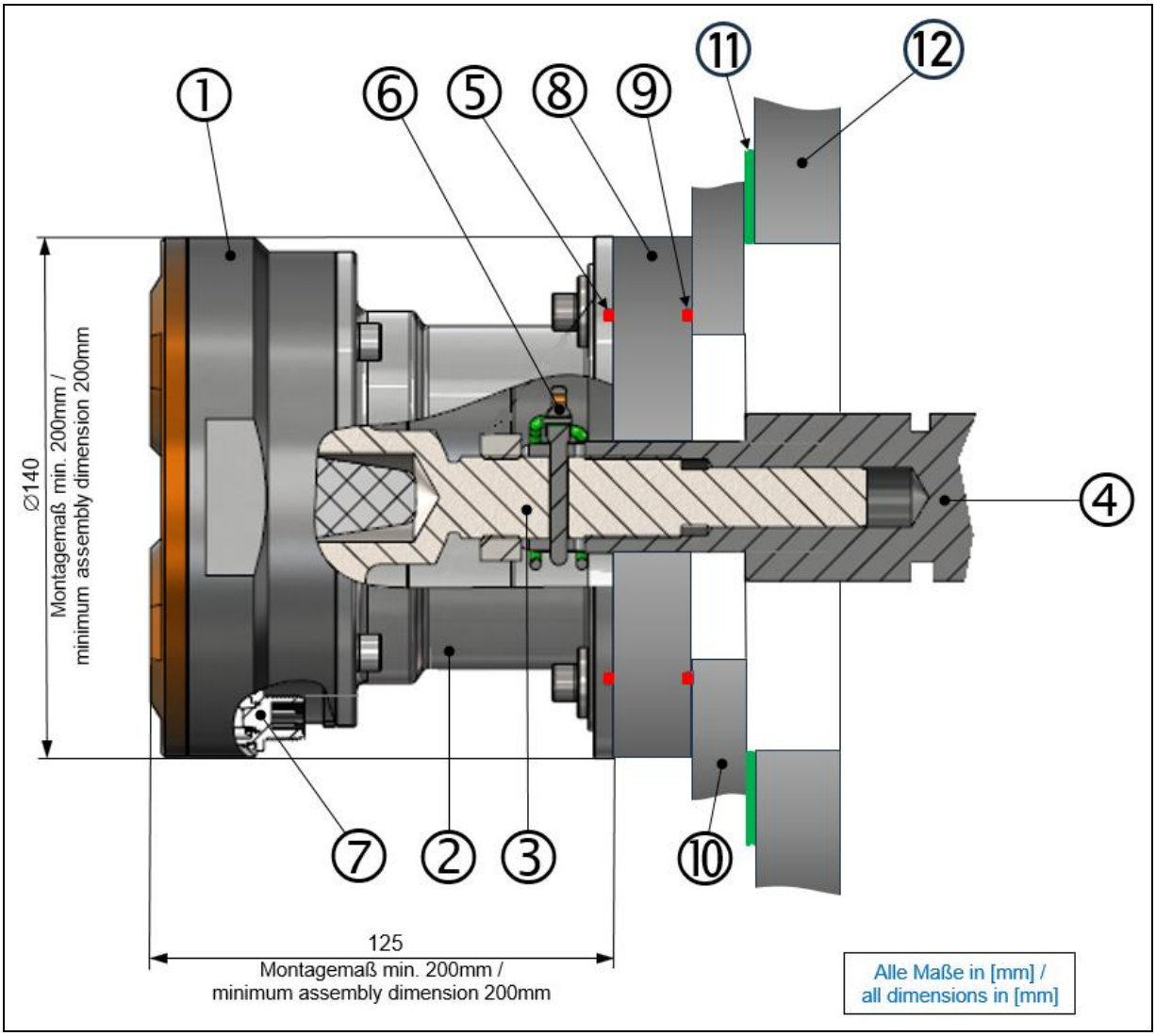


Fig. 1 : Complete overview of components, BEAROMOS® 2020

1: BEAROMOS® 2020 sensor unit
2: Supporting tube
3: Coupling shaft (short version)
4: Crankshaft adapter (customer-specific)
5: Supporting tube seal (included in delivery)
6: Tube locking pin
7: M12 connection plug
8: BEAROMOS® 2020 crankshaft seal system
9: Supporting tube seal (included in delivery)
10: Engine wall cover (machined/new)
11: Flat seal (available on request)
12: Engine wall

IMPORTANT INFORMATION

Maintenance and repair work

It is only safe to operate the device when it is in perfect working condition. The operator is responsible for proper and safe condition of the device, which means:

- ▶ Have the specified inspections and maintenance work carried out regularly.
- ▶ Carry out the specified checks before operation.

The short version (standard version) of the device, as shown in the figure above, consists of the sensor unit (①), the supporting tube (②) with sealing element (⑤) and the optionally available BEAROMOS® 2020 crankshaft seal system (⑧, ⇨ *Section 4.2 Installing the BEAROMOS® 2020 (version with crankshaft seal system)*), which is mounted directly onto the engine wall cover (⑩) – which in turn is attached to the engine wall (⑫). A flat seal (⑪) is fitted between the engine wall cover (⑩) and the engine wall (⑫).

The customer can either mechanically adapt the existing engine wall cover themselves in accordance with Schaller Automation's drawing specifications as set out in Section 4.2 (⇨ *Section 4.2 Installing the BEAROMOS® 2020 (version with crankshaft seal system)*) or purchase it from Schaller Automation as a component that has already been adapted.

The coupling shaft (③, short version) connects the sensor unit (①) to the crankshaft via a customer-specific crankshaft adapter (④), thereby setting the required axial clearance between the sensor unit and the engine wall cover. For this, the customer can either manufacture the crankshaft adapter themselves in accordance with Schaller Automation's drawings or purchase it from Schaller Automation as a component that has already been adapted.

Finally, the coupling shaft and the crankshaft adapter are secured together by a tube locking pin (⑥). The tube locking pin has the function of a conventional locking bolt and can be used continuously up to a maximum (engine) speed of 1,500 rpm.

The BEAROMOS® 2020 requires a minimum installation space of 200 mm x 200 mm x 200 mm (L x W x H) at the installation site.

The electrical connection (⑦) of the BEAROMOS® 2020 is on the rear of the sensor unit, where the bus and power supply are connected using an M12 connection plug.

4 Assembly and installation

▶ **For crankshaft clearances ≤ 300 mm (short adaptation)**

NOTE

- If the sensor is opened or removed from the object to be monitored for maintenance or repair, the O-ring seals of the sensor must be replaced. To do this, use the “O-rings” maintenance kit. (Kit No. 290048)
- If the flat seal is removed for maintenance or repairs, it must be replaced with a new flat seal.
- This section supplements the currently valid version of the operating manual in the applicable language of translation, (document/part number 183007_DE) with regard to Section 6.0 “Assembly and installation” by adding further topics and details to existing installation steps. ⇨ *Section 1.3 Applicable documents and regulations*

4.1 Installing the BEAROMOS® 2020 (version without crankshaft seal system)

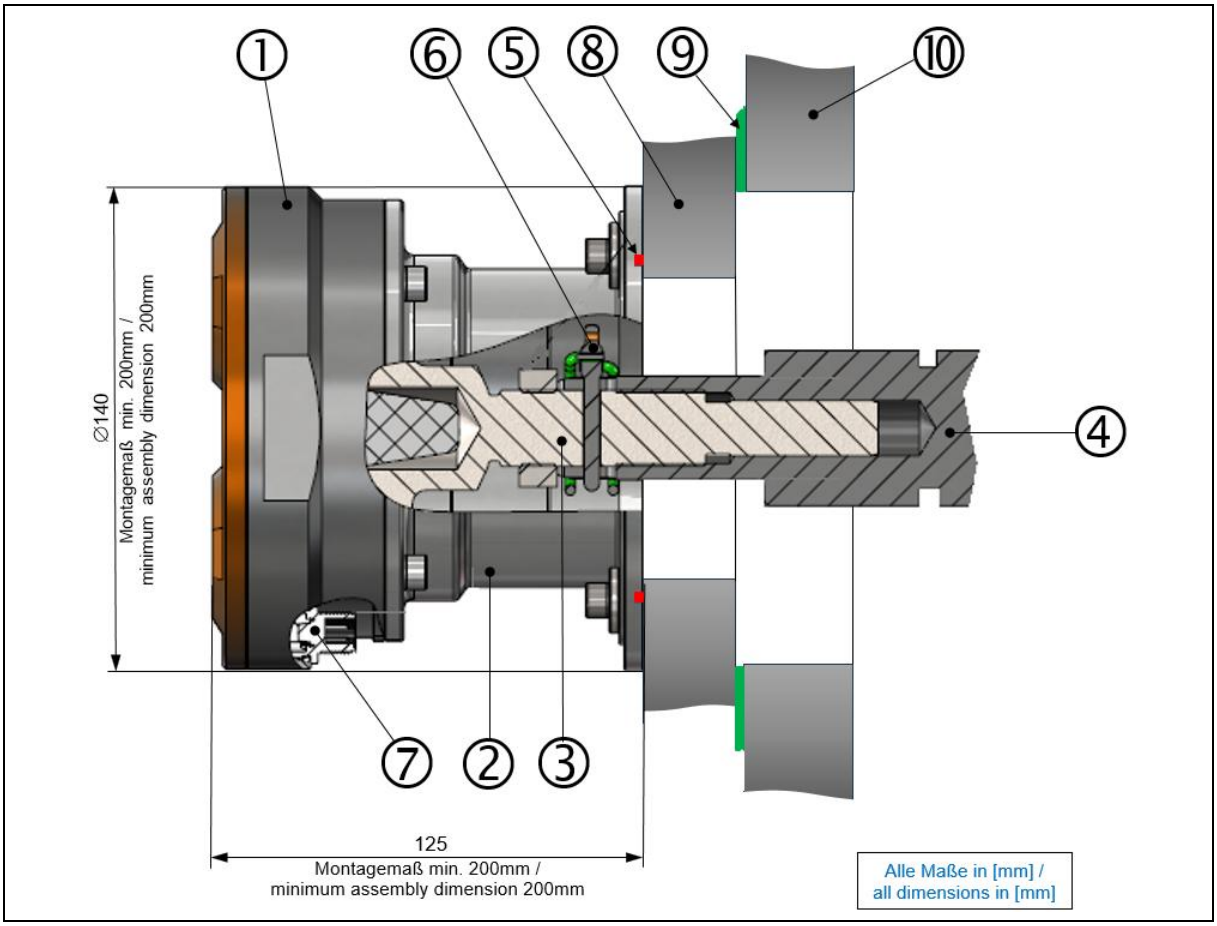


Fig. 2 : Overview of components, BEAROMOS® 2020 (version without crankshaft seal system)

1: BEAROMOS® 2020 sensor unit
2: Supporting tube
3: Coupling shaft (short version)
4: Crankshaft adapter (customer-specific)
5: Supporting tube seal (included in delivery)
6: Tube locking pin
7: M12 connection plug
8: Engine wall cover (machined/new)
9: Flat seal (available on request)
10: Engine wall

Before starting installation, first drill the following hole pattern (②) in the engine wall cover (①), as shown in the figure below:

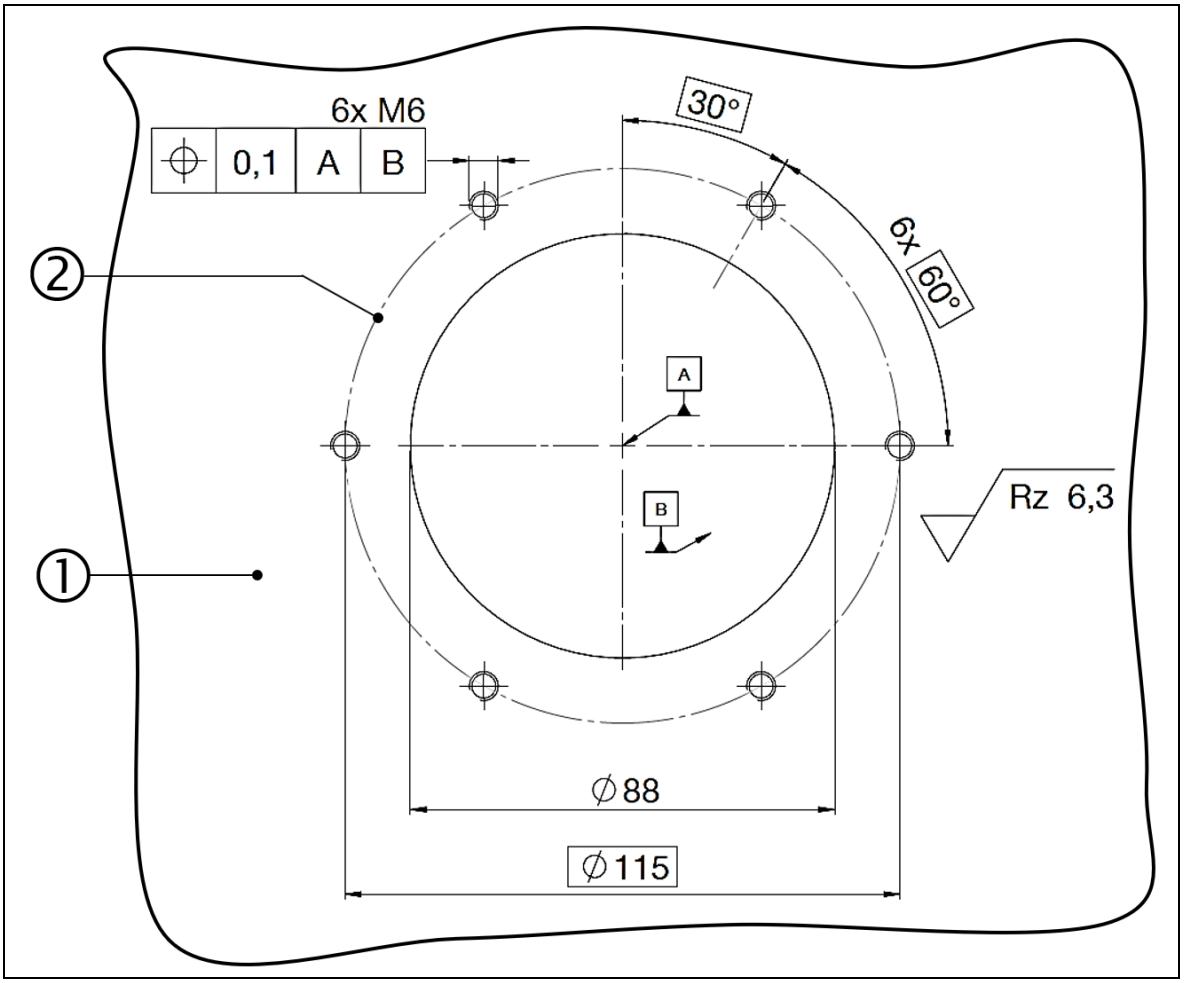


Fig. 3 : Hole pattern on the engine wall cover, BEAROMOS® 2020

1: Engine wall cover (machined/new) 2: Hole pattern (bolt circle)

IMPORTANT INFORMATION

- If the customer machines or modifies the engine wall cover, Schaller Automation **shall not** be liable for any machining errors or mechanical malfunctions of the BEAROMOS® 2020 that can be shown to have occurred as a result of previous machining by the customer.

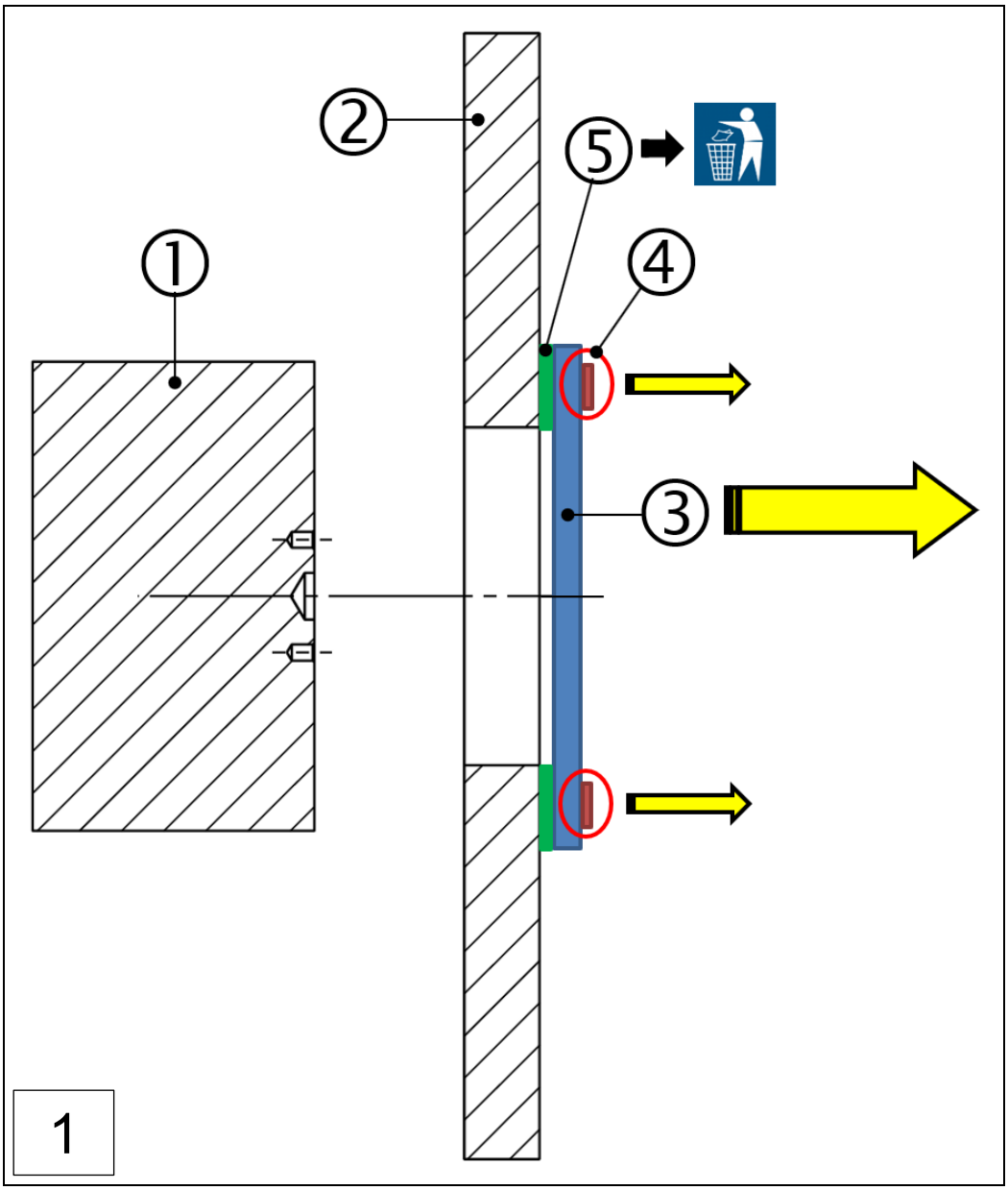
If it is decided that the customer will machine or modify the engine wall cover (①), it is essential to check the flatness of the flange surface on the engine wall cover **before** drilling the hole pattern, so that the sensor can be aligned correctly afterwards, as necessary.

During installation, make sure that there is an electrically conductive connection between the sensor unit (including the supporting tube) and the engine wall cover. Please also follow the instructions in Section 6.4.1 of the current version of the operating manual.

☑ **The hole pattern on the engine wall cover has been produced successfully!**

The individual components in Fig. 2 are installed by completing the following steps:

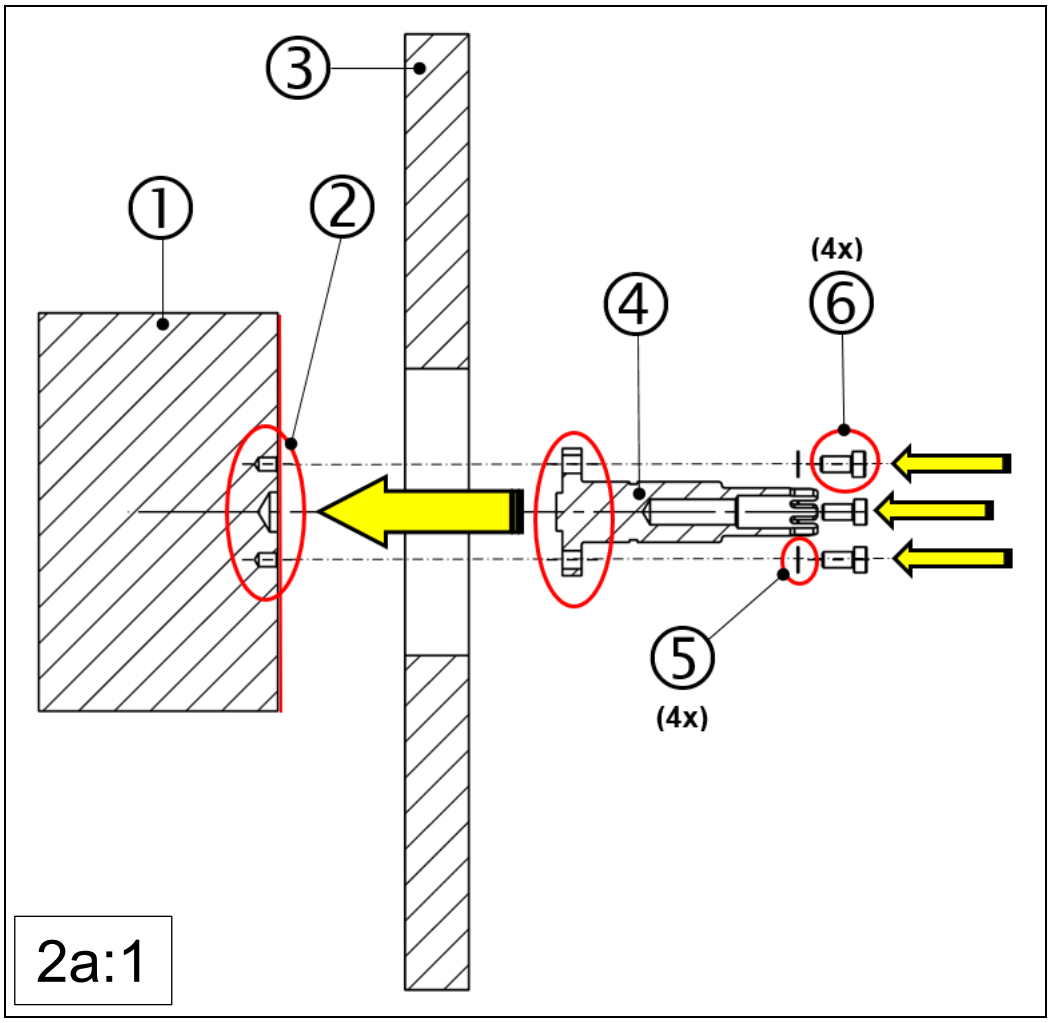
Step 1: Remove the customer's engine wall cover



1: Crankshaft
2: Engine wall
3: Engine wall cover (machined/new)
4: Fixing screws (customer-specific)
5: Flat seal (old)

- Loosen all the fixing screws (④) and then remove the engine wall cover (③) and the flat seal (⑤) from the engine wall. (②)
- The removed flat seal (⑤) must not be reused and must be disposed of.
  - ➔ The replacement seal can be sourced by the customer or, alternatively, it can be requested from Schaller Automation.
- After removing, store the components (③, ④) carefully for later use.

Step 2a: Install the crankshaft adapter on the crankshaft using the existing bolt pattern (②)

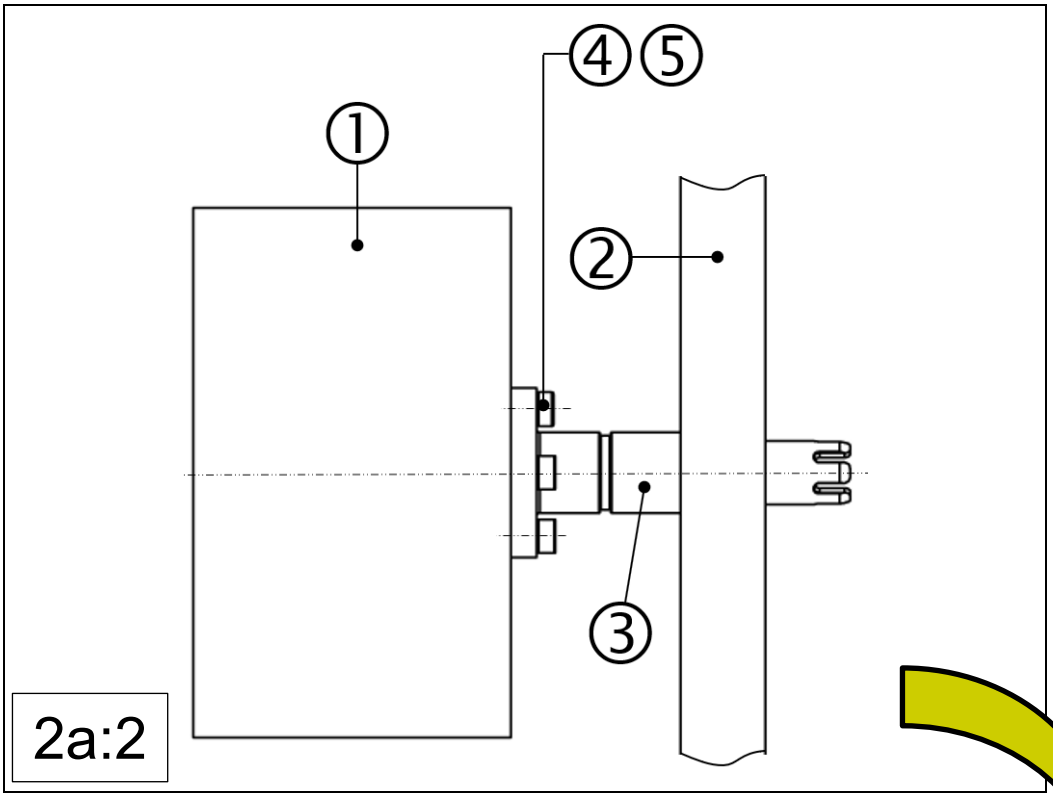


1: Crankshaft
2: Bolt pattern, crankshaft (example)
3: Engine wall
4: Crankshaft adapter (customer-specific)
5: 4x lock washers (example)
6: 4x screws (example)

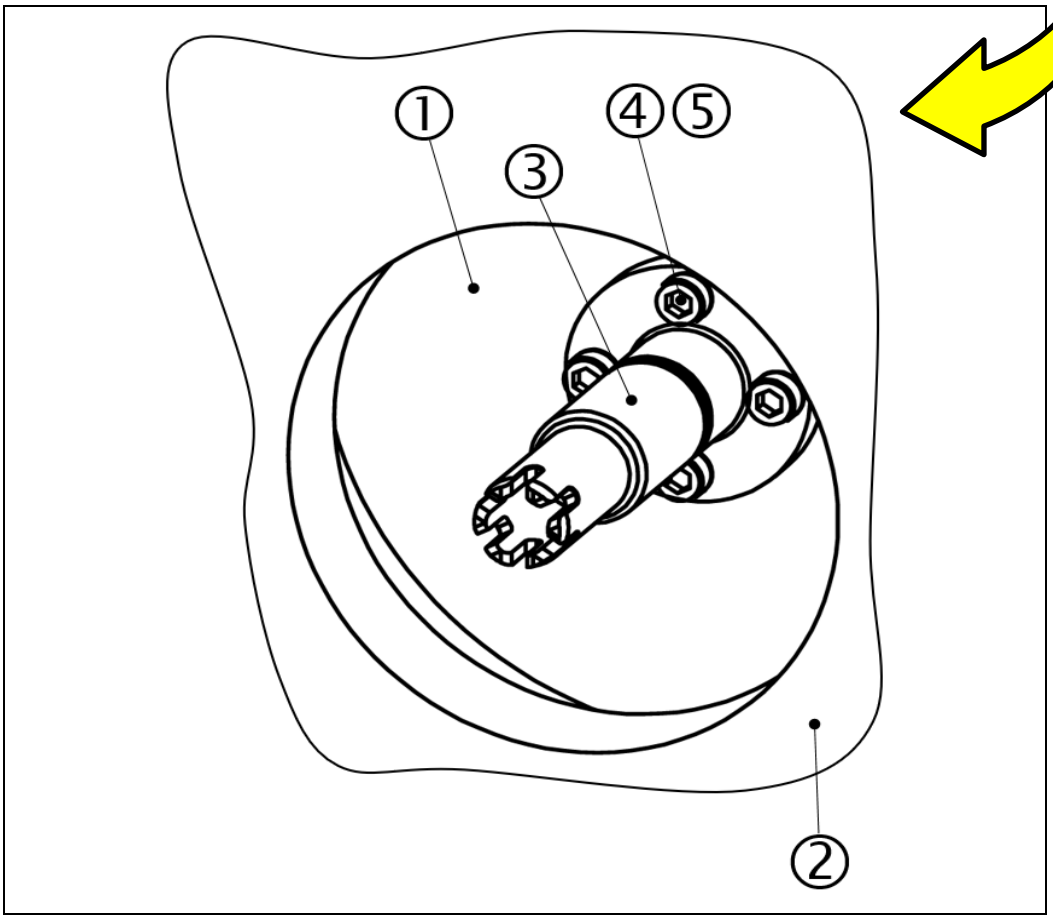
- Check first that the threaded holes (②) on the crankshaft (①) are clean and, if necessary, remove any dirt and metal swarf.
- Install the crankshaft adapter (④) on the end face (highlighted red) of the crankshaft using the lock washers (⑤) and the fixing screws (⑥). (①)

IMPORTANT INFORMATION

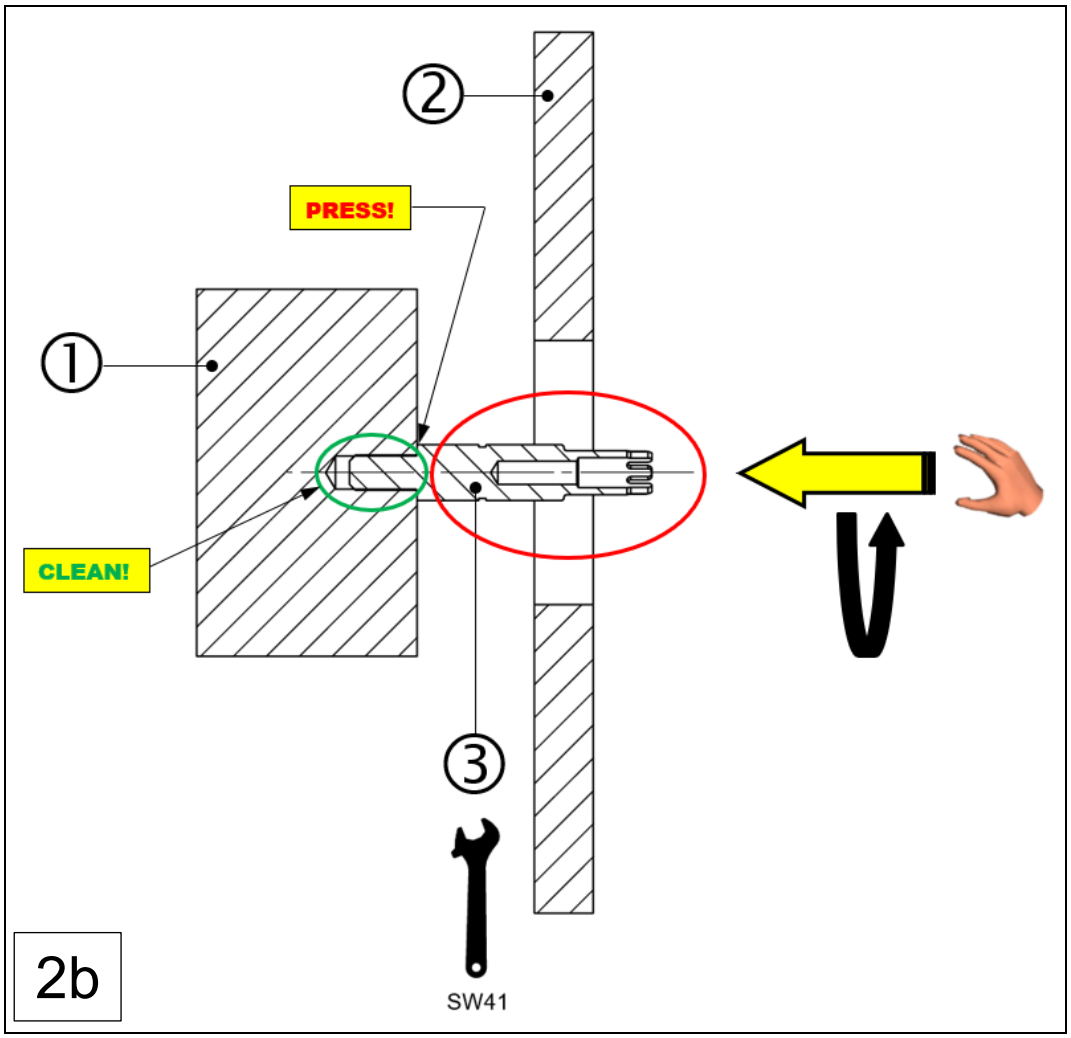
- If the crankshaft adapter has been sourced **by the customer**, use suitable lock washers and fixing screws to secure it.
- If the crankshaft adapter has been supplied **by Schaller Automation**, use the supplied lock washers and fixing screws to secure it.
- Unless otherwise specified, the required tightening torque for the customer-specific screw connection (⑥) is the maximum permissible torque of the screw that is used.



1: Crankshaft
2: Engine wall
3: Crankshaft adapter, installed (customer-specific)
4: 4x lock washers (example)
5: 4x screws (example)



Step 2b: Install with a central threaded hole (highlighted in green) in the crankshaft



1: Crankshaft
2: Engine wall
3: Crankshaft adapter, installed (customer-specific)

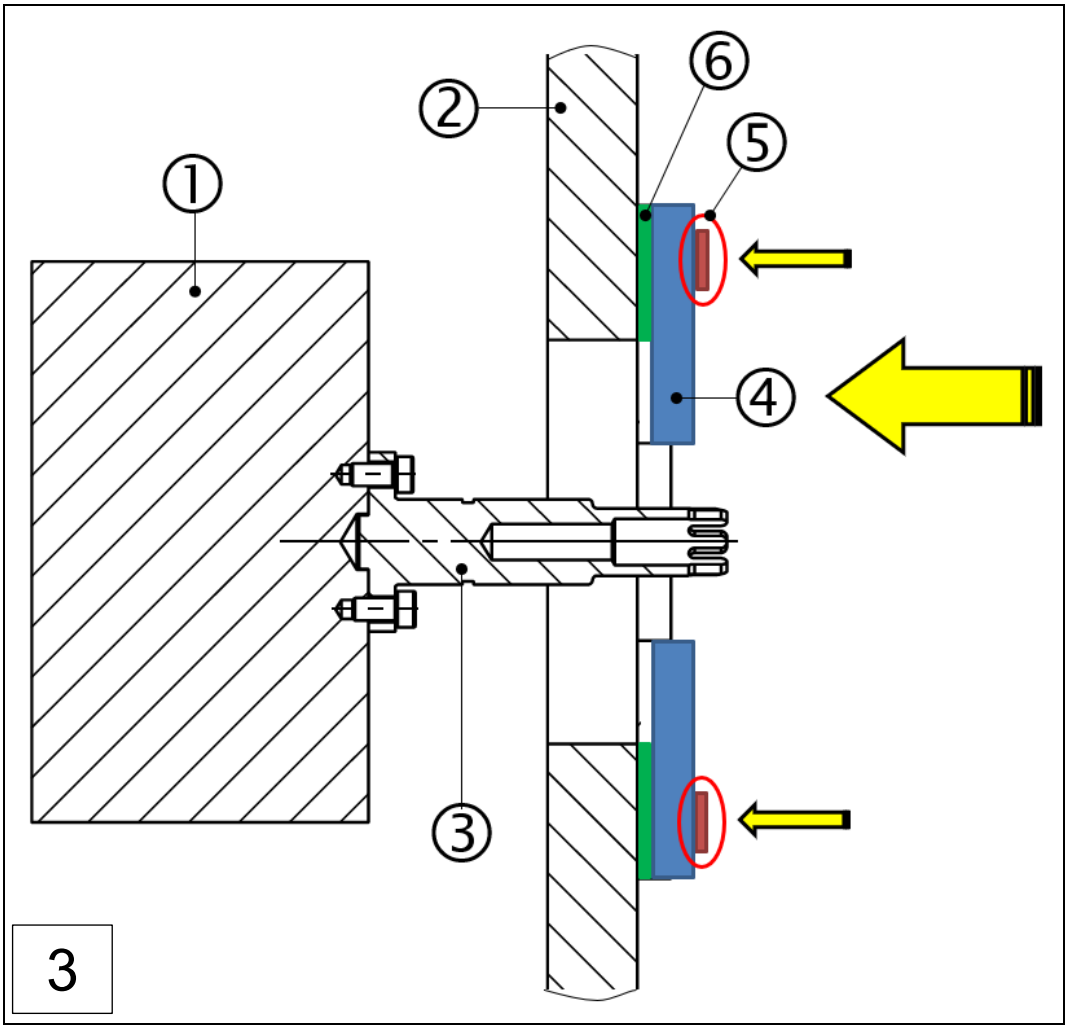
- Check first that the central threaded hole on the crankshaft (①) and the threaded stud on the crankshaft adapter (③) are clean and, if necessary, remove any dirt and metal swarf.
- Insert the crankshaft adapter (③) through the central opening in the engine wall (②) and then screw the threaded stud on the crankshaft adapter (③) into the central threaded hole of the crankshaft (①) **as far as it will go (PRESS!)**.

NOTE

- To get the crankshaft adapter (③) to its end position in the crankshaft (①), you can also use an open spanner with size 41 width across flats, if necessary.

➔ **The following installation steps apply to both steps 2a and 2b.**

Step 3: Install the engine wall cover (machined/new)

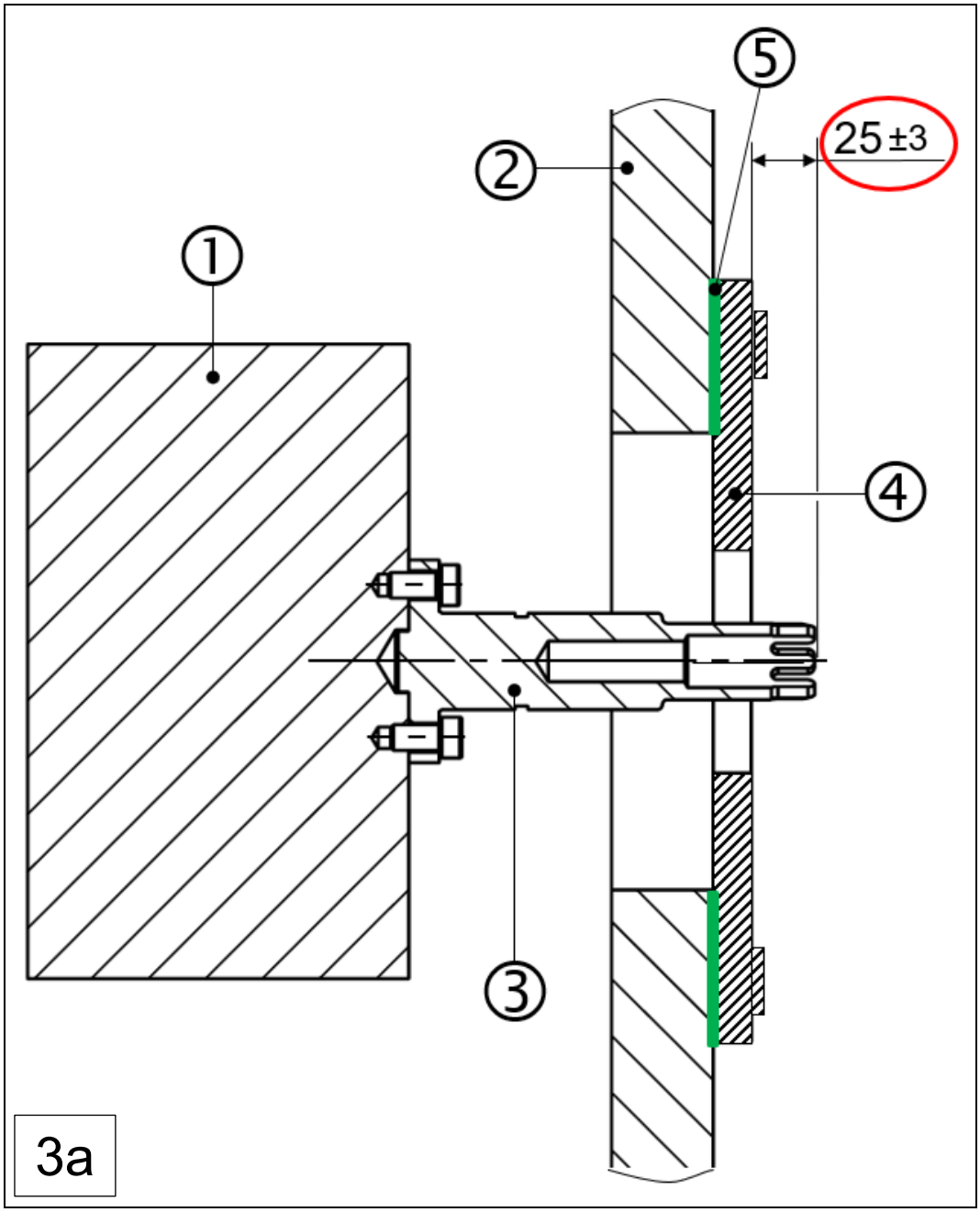


1: Crankshaft
2: Engine wall
3: Crankshaft adapter, installed (customer-specific)
4: Engine wall cover (machined/new)
5: Fixing screws (customer-specific)
6: Flat seal (new)

- Install the engine wall cover (④, from step 1) to the engine wall, together with the **new** flat seal (⑥), using the corresponding fixing screws (⑤). (②)

IMPORTANT INFORMATION

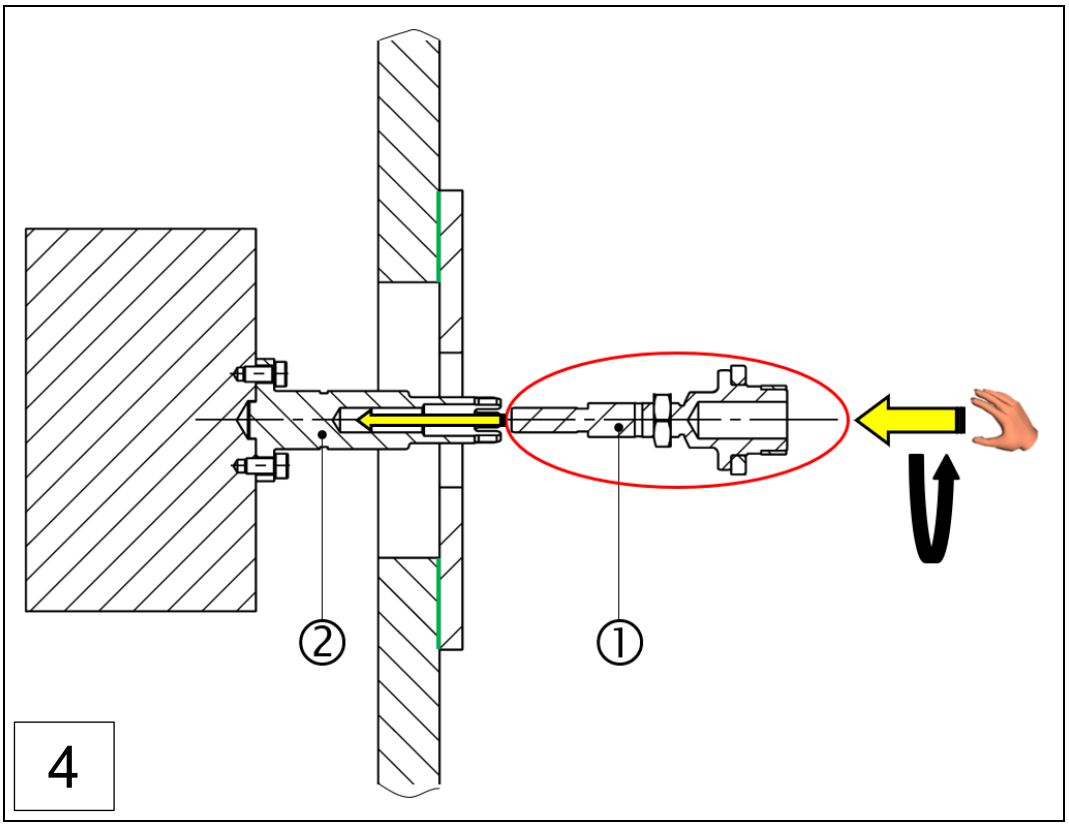
- A new flat seal (⑥, the replacement seal) must be used every time the engine wall cover is installed. The replacement seal can be sourced by the customer or, alternatively, it can be requested from Schaller Automation.
- Unless otherwise specified, the required tightening torque for the customer-specific screw connection (⑤) is the maximum permissible torque of the screw that is used.



1: Crankshaft
2: Engine wall
3: Crankshaft adapter, installed (customer-specific)
4: Engine wall cover (machined/new)
5: Flat seal (new)

- As shown in the figure above, in the version without a crankshaft seal system, the crankshaft adapter (③) must have a **clearance of 25 mm (±3)** (circled in red) in its end position, i.e. protruding beyond the outer edge of the engine wall cover (④).
  - ➔ Based on the specified clearance, the crankshaft adapter is manufactured specifically in advance, either by the customer or by Schaller Automation.

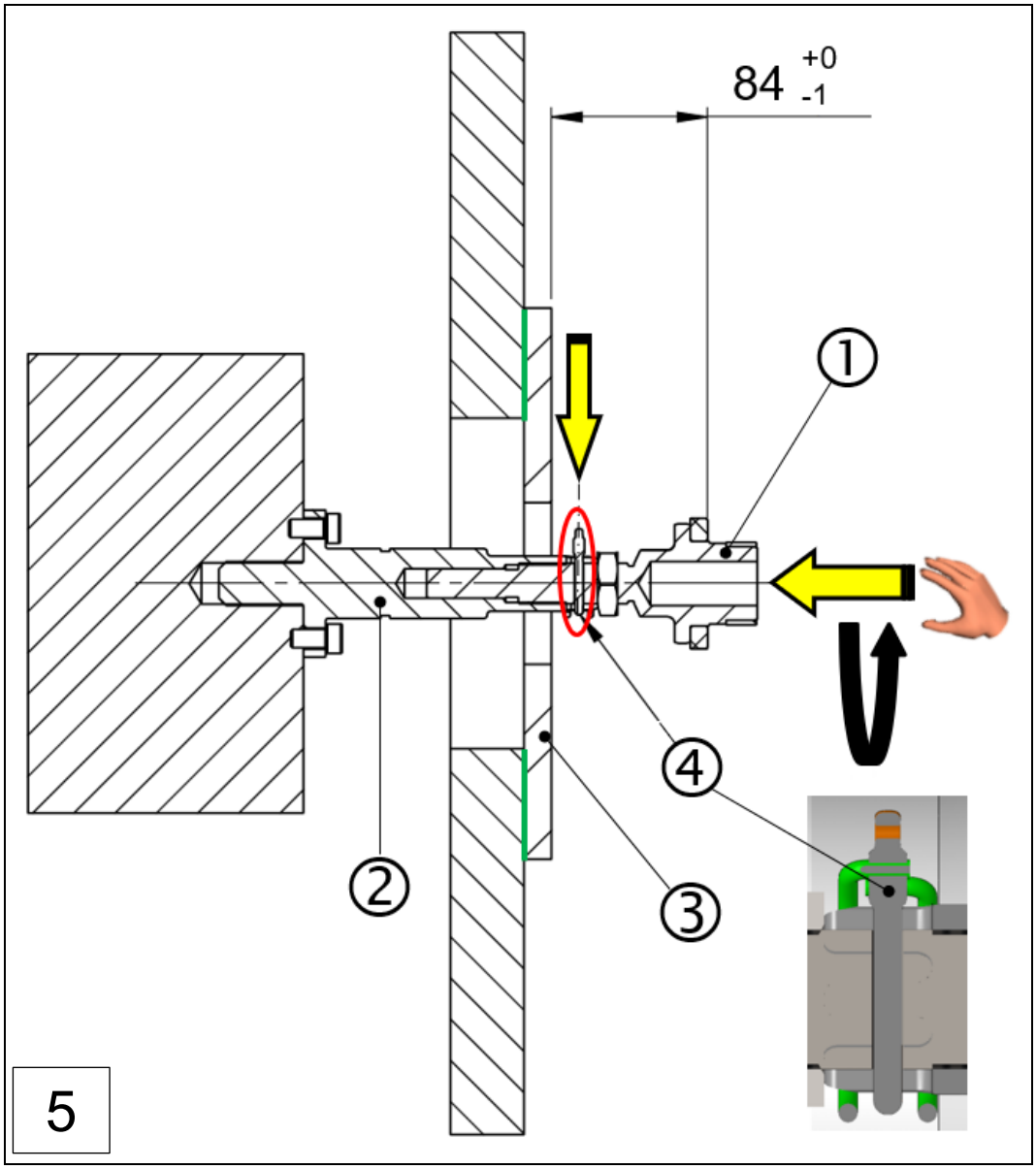
Step 4: Install the coupling shaft (short version) on the customer-specific crankshaft adapter



1: Coupling shaft (short version) 2: Crankshaft adapter (customer-specific)

- Check first that the threaded hole on the crankshaft adapter (②) and the threaded stud on the coupling shaft (①) are clean and, if necessary, remove any dirt or metal swarf.
- Start by screwing the coupling shaft (①) into the customer-specific crankshaft adapter (②) by hand, turning it about **five turns**.

Step 5: Adjust the coupling shaft to the customer-specific crankshaft adapter

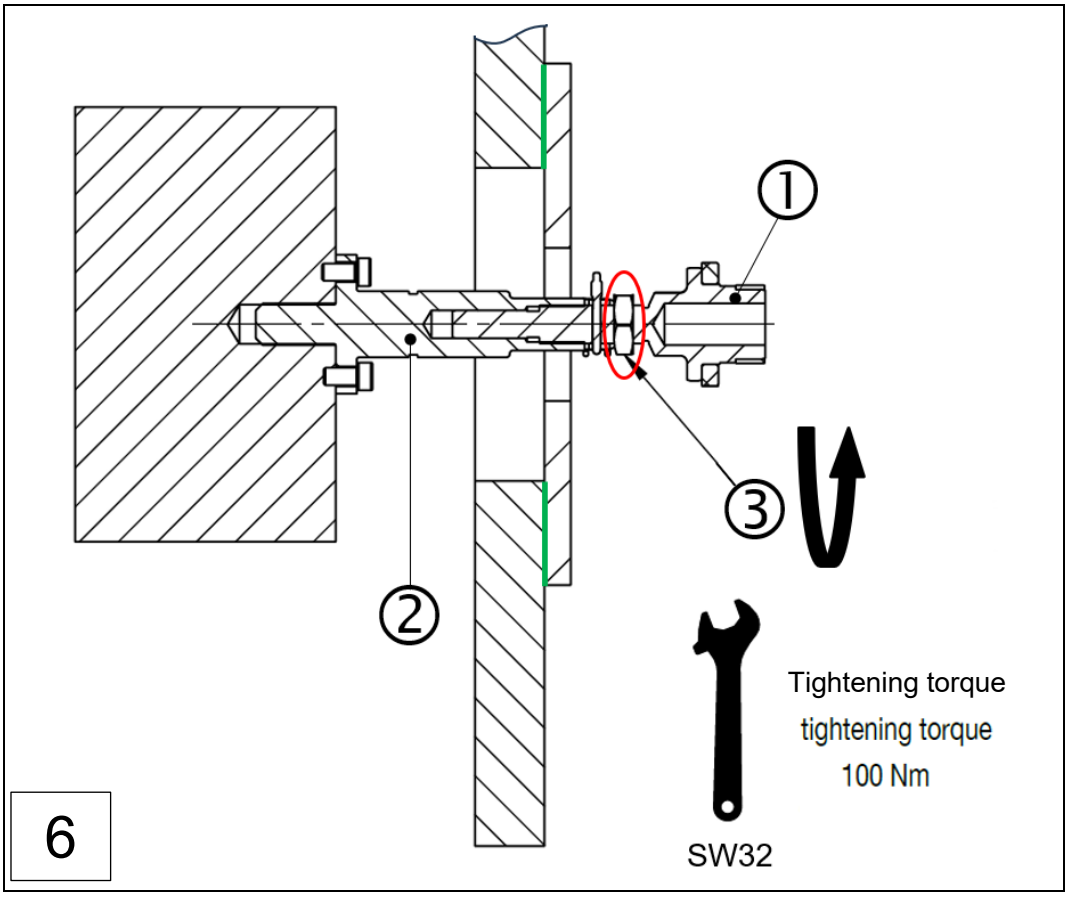


1: Coupling shaft (short version)
2: Crankshaft adapter (customer-specific)
3: Engine wall cover (machined/new)
4: Tube locking pin

- Adjust the **clearance to 84 mm (+0/-1)** as precisely as possible between the engine wall cover (③) and the coupling shaft (①) as shown in the figure above, by first screwing the coupling shaft (①) into the customer-specific crankshaft adapter (②) accordingly.

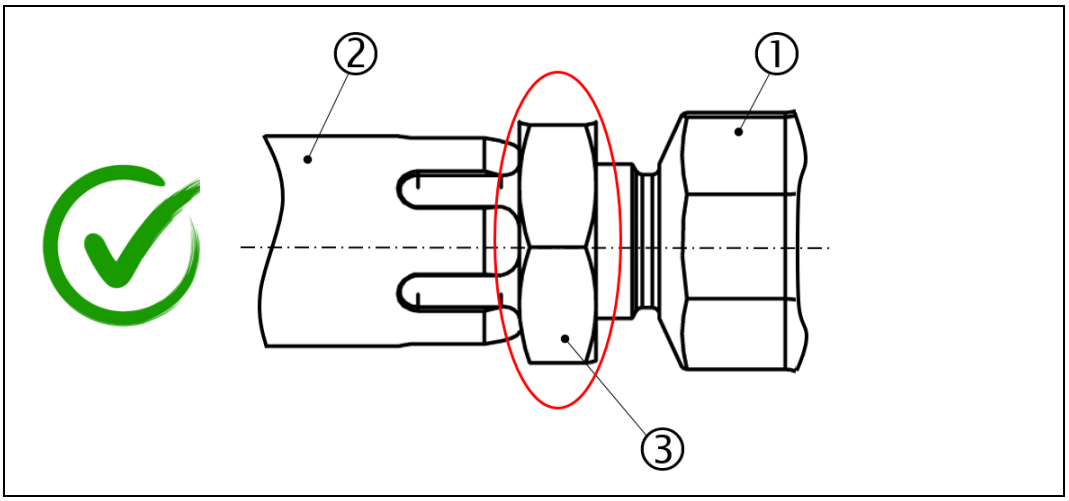
- Lock the clearance you have just adjusted by inserting the tube locking pin (④) into the hole provided in the coupling shaft (①) and on the crankshaft adapter (②) and then locking it in place. (see detail in the figure above)

Step 6: Locking the counternut



1: Coupling shaft (short version) 2: Crankshaft adapter (customer-specific)
3: Hexagon nut M22 x 1.5

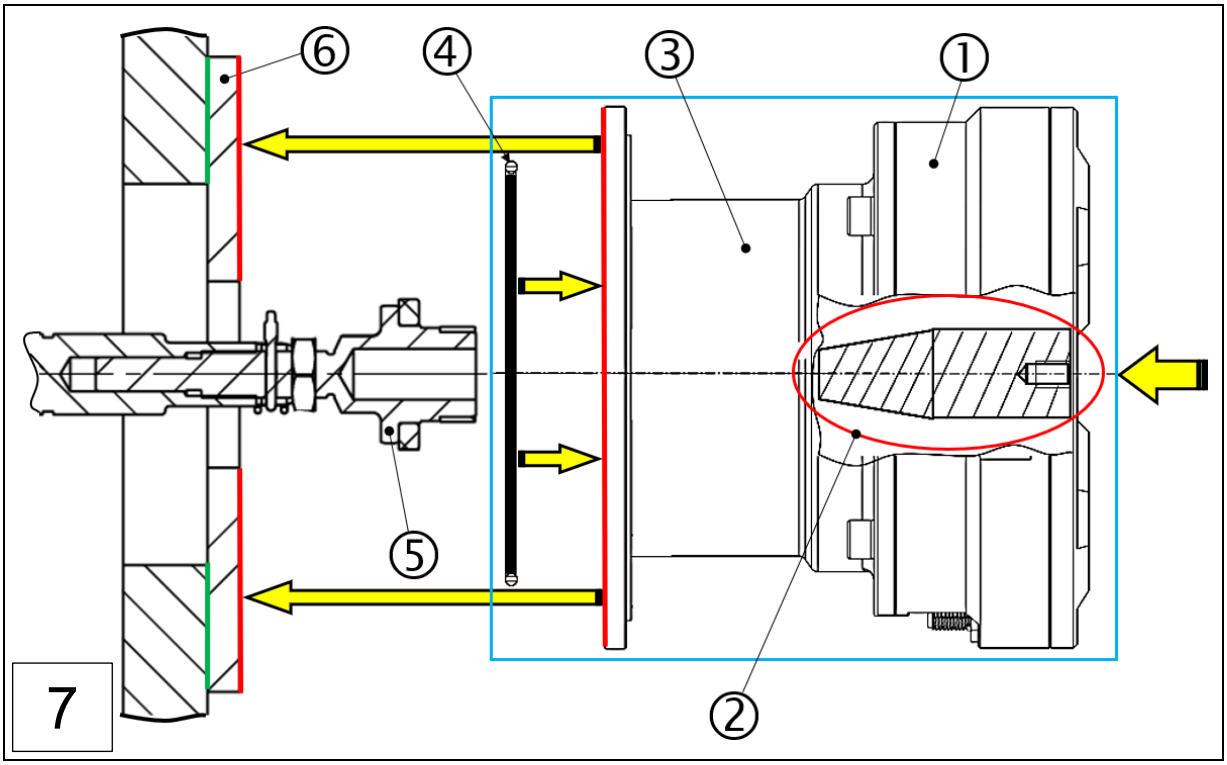
- Tighten the counternut (③) against the crankshaft adapter (②) to a tightening torque of 100 Nm. To do this, use a torque spanner with size 32 width across flats.



1: Coupling shaft (short version) 2: Crankshaft adapter (customer-specific)
3: Hexagon nut M22 x 1.5 (locked)

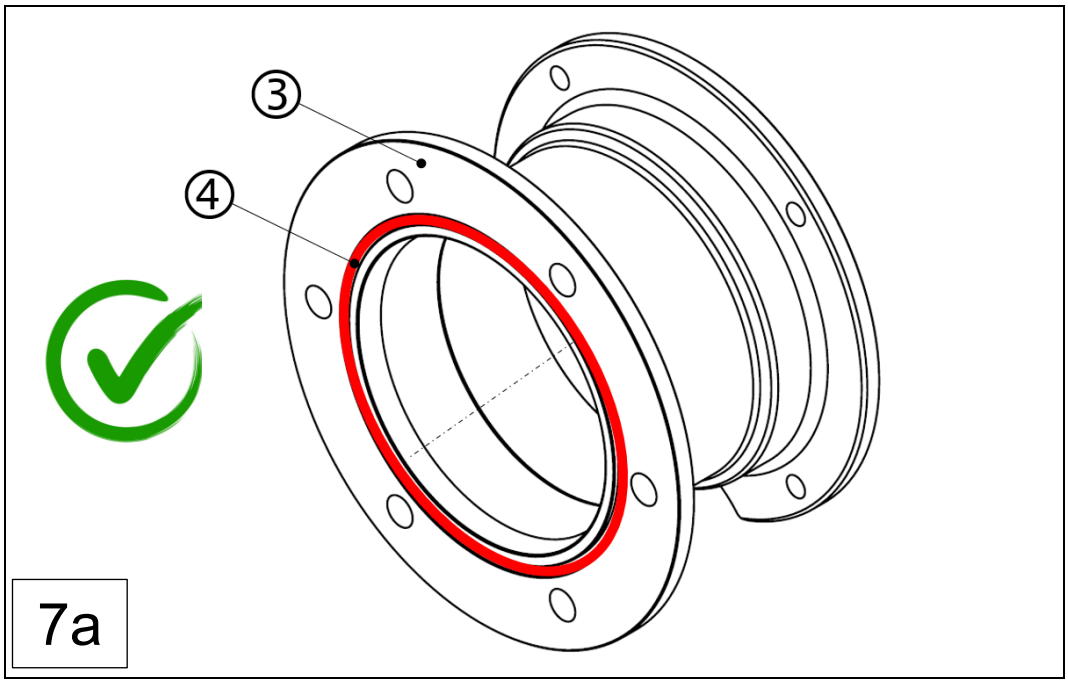
- **IMPORTANT**: The instructions for step 6 apply to both steps 2a and 2b.

Step 7: Install the sensor unit with supporting tube on the engine wall cover

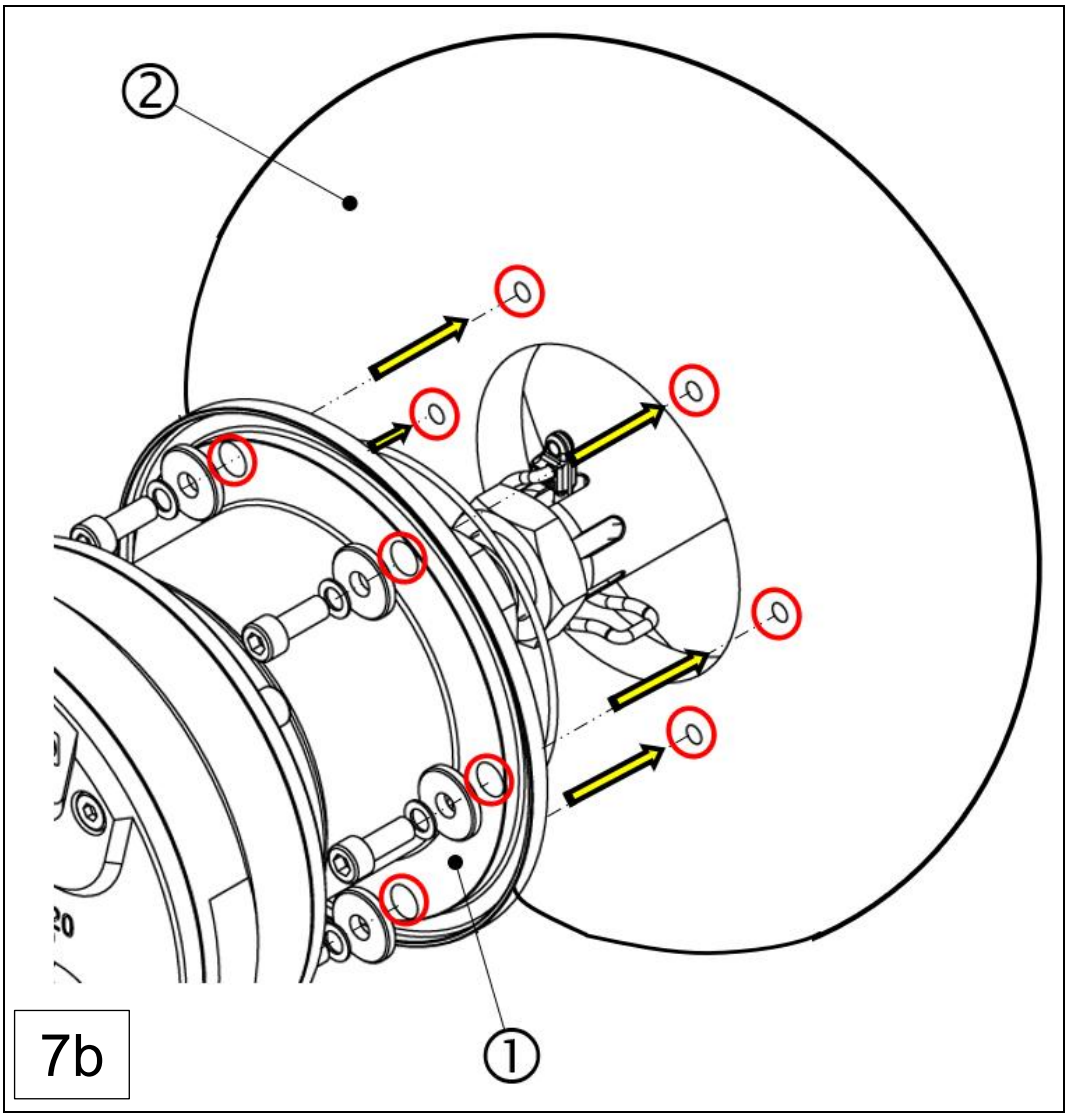


1: “Short” sensor unit, BEAROMOS®
2: Centring pin
3: Supporting tube
4: Supporting tube seal (included in delivery)
5: Coupling shaft (short version)
6: Engine wall cover (machined/new)

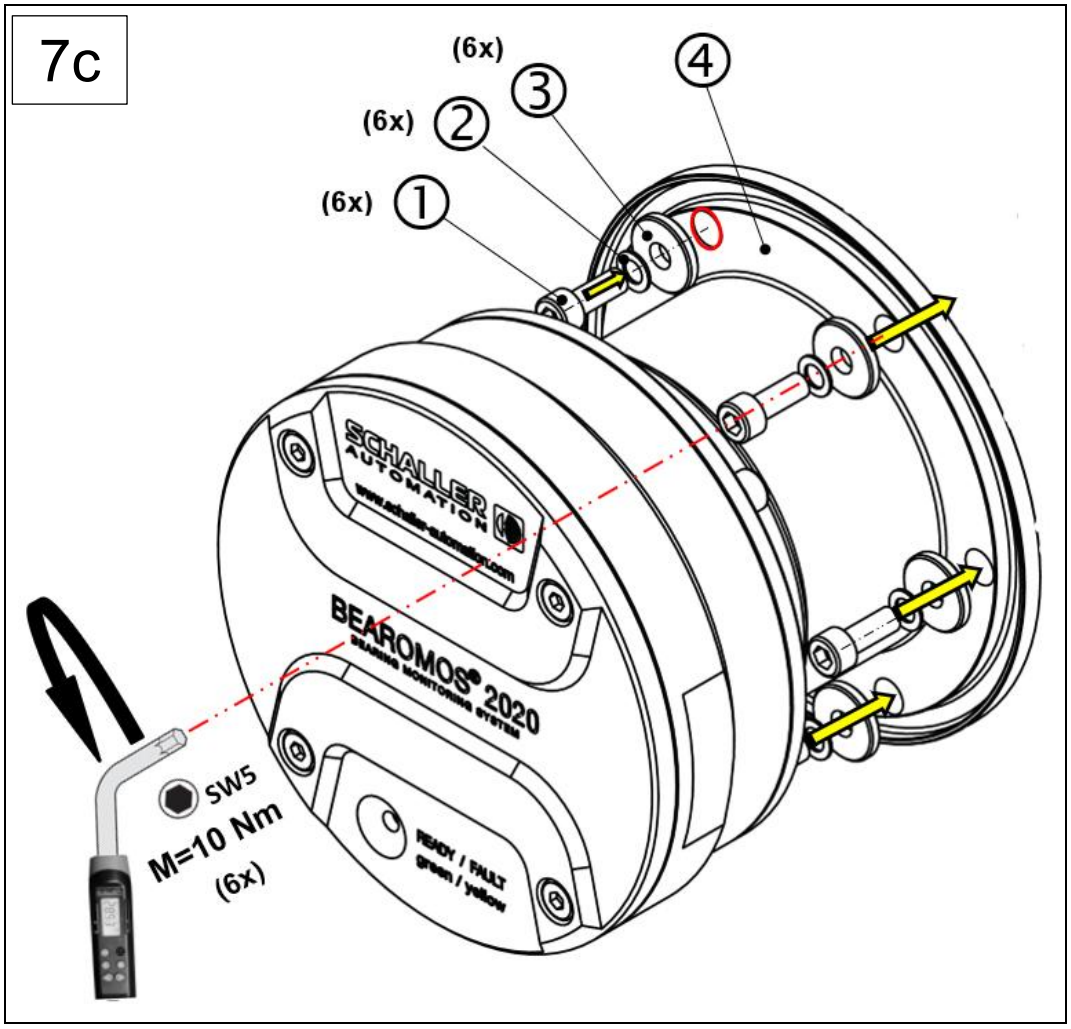
- As shown in the figure above, start by inserting the supporting tube seal (④, O-ring) supplied with the product into the seal groove of the supporting tube (③).
  - ➔ The figure below shows the supporting tube seal correctly fitted in the supporting tube.



- As described in step 7, carefully slide the sensor unit (①) – with the supporting tube (③) already fitted – over the coupling shaft (⑤) up to the engine wall cover. (⑥)
  - ➔ The internal centring pin (②) in the sensor unit (①) automatically centres the unit on the coupling shaft (⑤) during installation.
  - ➔ For the installed end position, always make sure that the outer surface of the supporting tube (③, highlighted red) is fully in contact with the outer surface of the engine wall cover (⑥, highlighted red).
- As shown in the figure below, make sure that the bolt circle (highlighted red) between the supporting tube (①) and the engine wall cover (②) is aligned for the screws then to be installed.



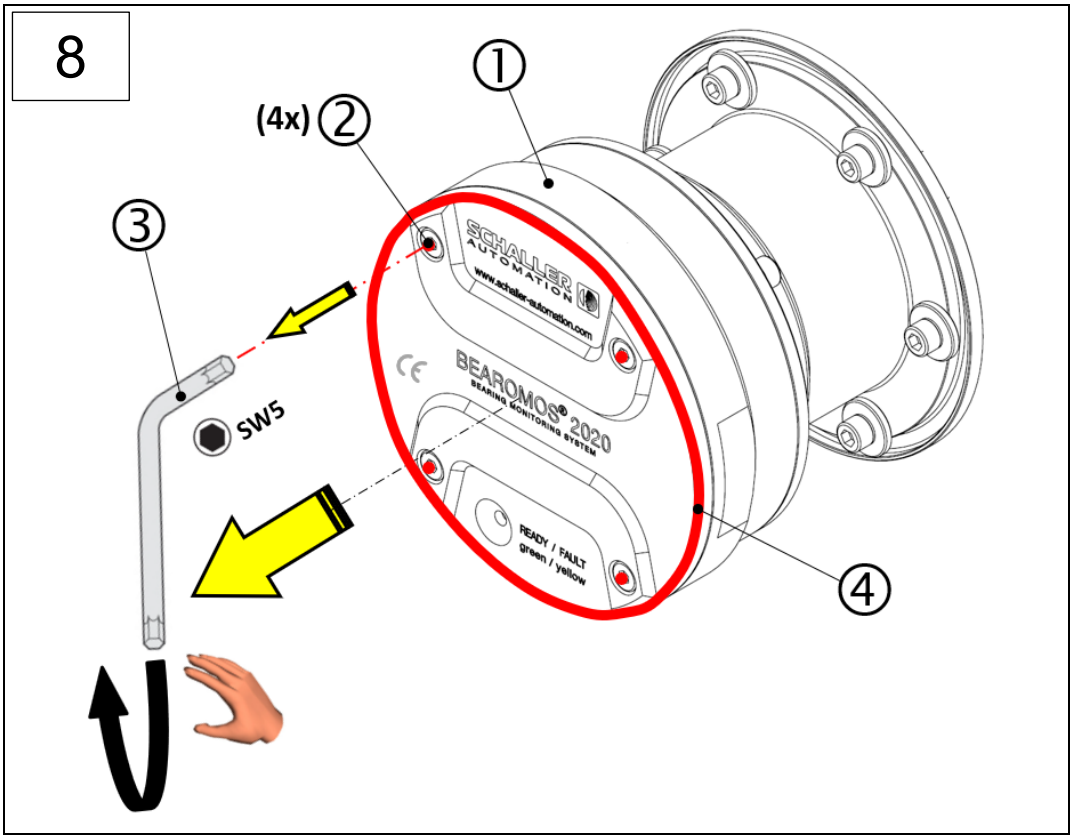
1: Supporting tube (included in delivery) 2: Engine wall cover (machined/new)



1: Hex socket screw M6 (included in delivery)
2: Lock washer (included in delivery)
3: Washer (included in delivery)
4: Supporting tube (included in delivery)
5: Engine wall cover (machined/new)

- Install the fixing screws (①), lock washers (②) and washers (③) in the same way for all penetrations, as shown in the figure above.
- Then attach the supporting tube (④) to the engine wall cover (⑤) hand-tight, using the six hex socket screws (①).
- Align the supporting tube (④), if necessary. Then tighten the hex socket screws (①) to the specified tightening torque (**M = 10 Nm**).
- Tighten the fixing screws (①) crosswise (switching diagonally).

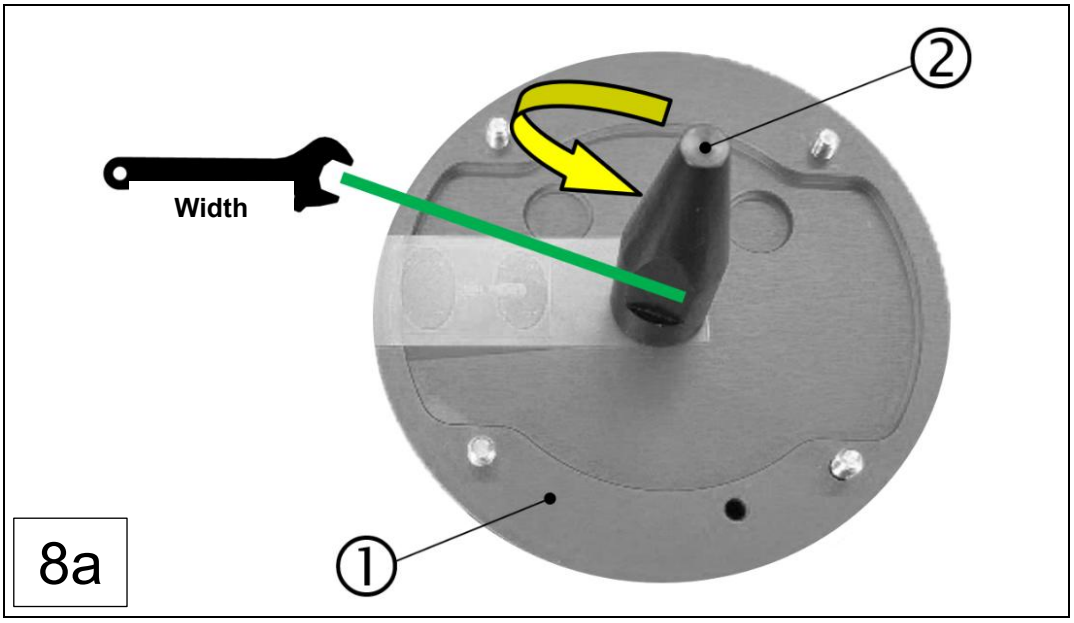
Step 8: Remove the centring pin on the sensor unit



1: Sensor housing
2: Hex head screws M6x20 (4x)
3: Allen key, L-shaped, size 5 width across flats
4: Cover plate

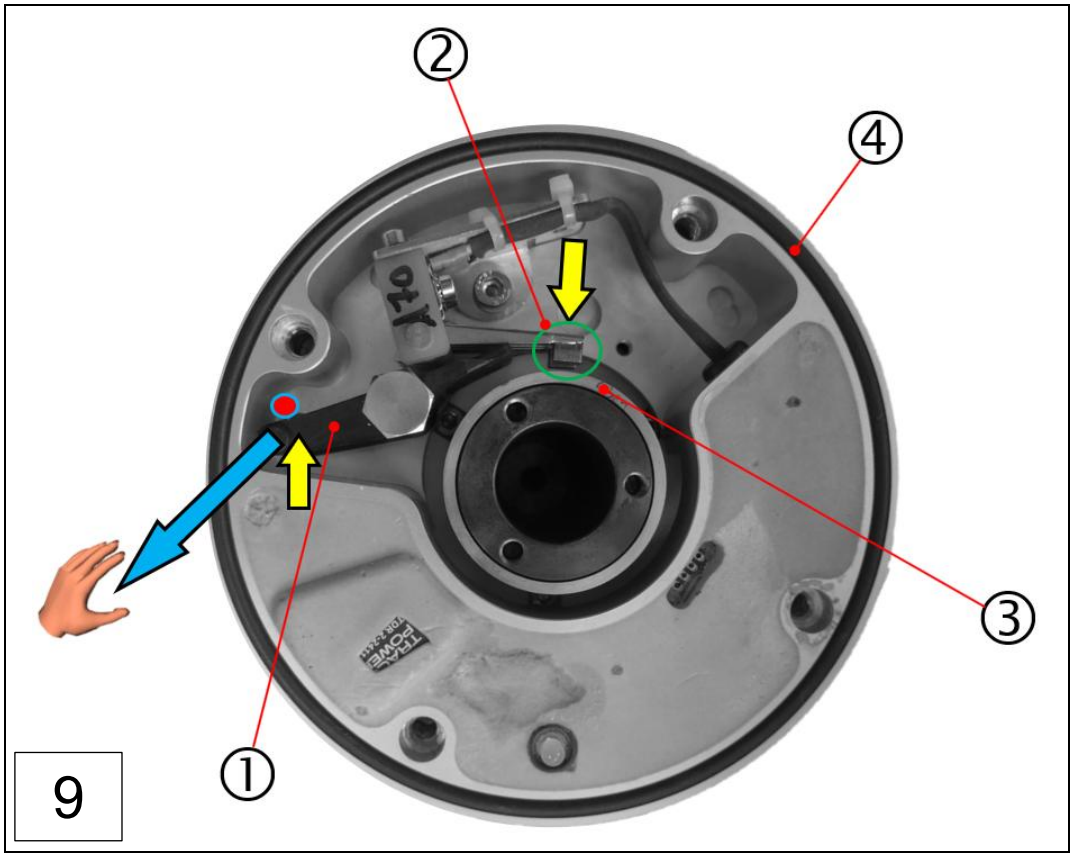
- Loosen the four hex socket screws (②) using the Allen key (③) and then remove the cover plate (④) from the sensor housing. (①)

- To remove the centring pin (②), use an open spanner with size 18 width across flats, as shown in the figure below.



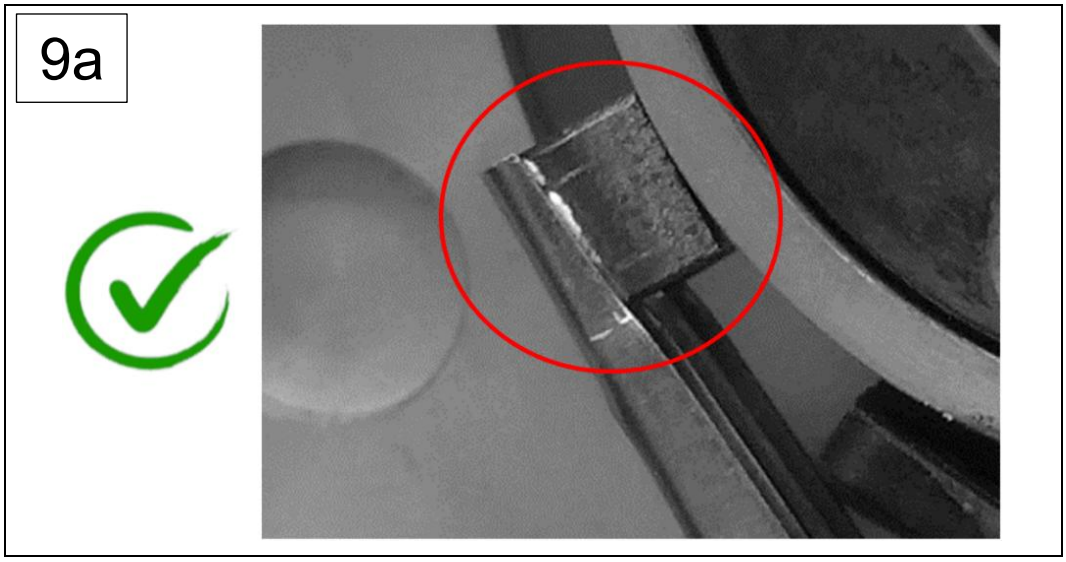
1: Cover plate, sensor housing
2: Centring pin

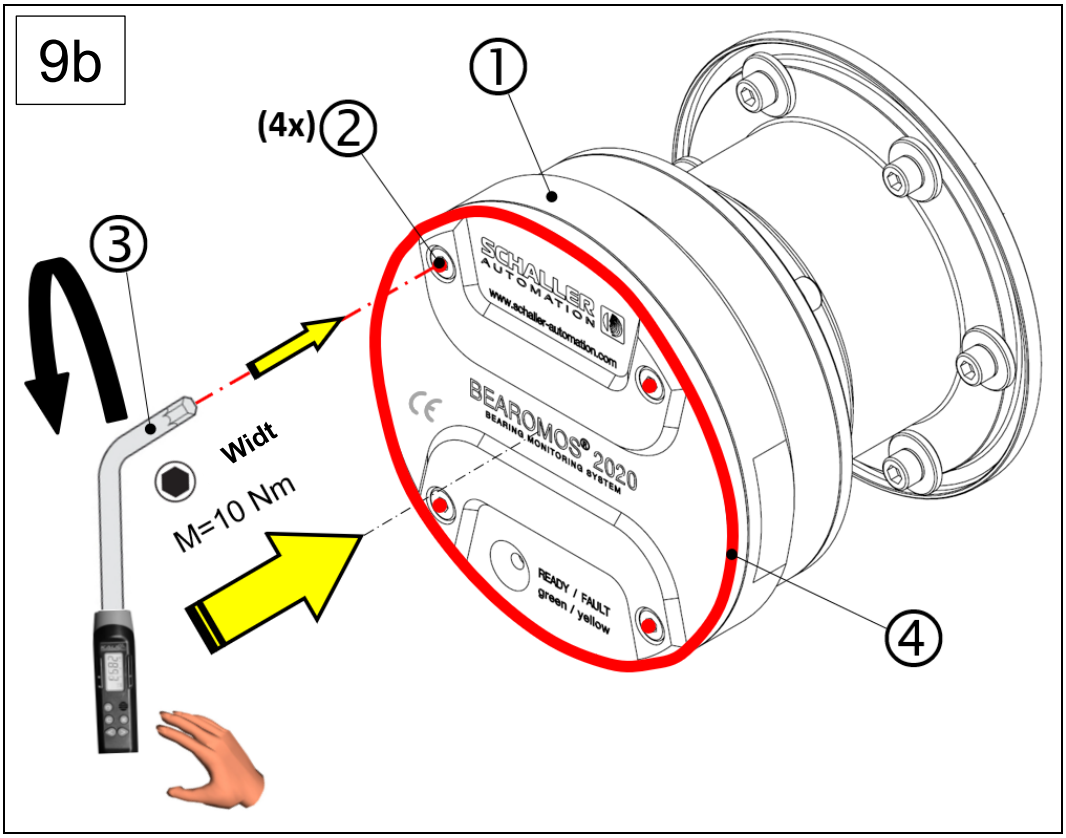
Step 9: Place the brush on the slip ring body



1: Adjusting lever (brush)
2: Brush
3: Slip ring body
4: O-ring (included in delivery)

- Make sure that the O-ring (④) **is undamaged and correctly seated** in the seal groove. If it is damaged, replace it with a new sealing ring. To do this, use the “O-rings” maintenance kit. (Kit No. 290048)
- Pull the adjusting lever (①) forwards (in direction of the blue arrow) and, at the same time, turn it upwards until it reaches the top engagement point (blue circle).
  ➔ The brush (②) then lowers onto the slip ring body (③), as shown in the figure below.





1: Sensor housing
2: Hex socket screws M6x16 (4x)
3: Allen key, L-shaped, size 5 width across flats
4: Cover plate

- Place the cover plate (④) on the sensor housing (①). Then screw the cover plate to the sensor housing using the four hex socket screws (②) and start by tightening the screws hand-tight.
- Then tighten the hex socket screws (②) to the specified tightening torque (**M = 10 Nm**).

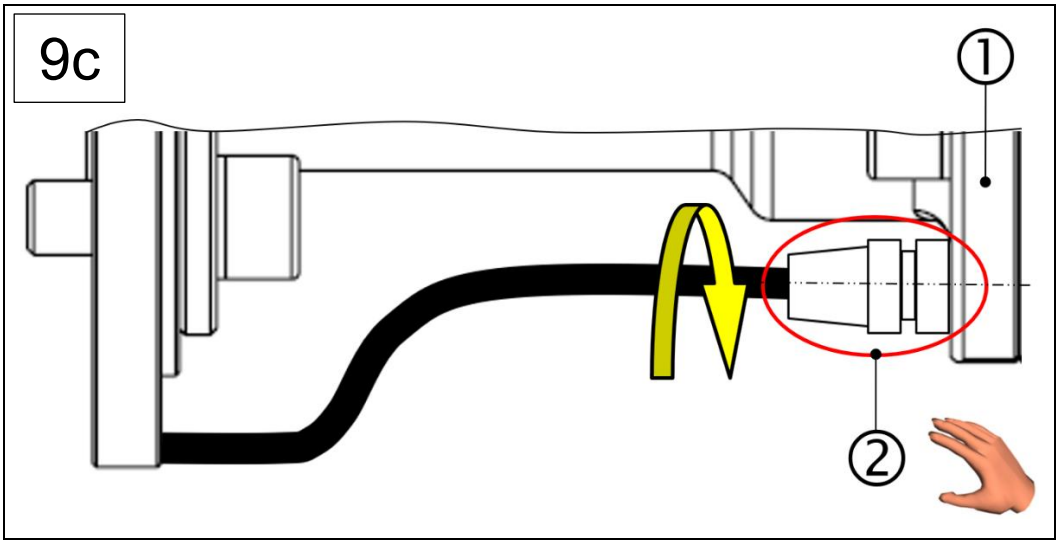


Fig. 4 : Installing the sensor unit, BEAROMOS® 2020 (short version, steps 1-9)

1: Sensor housing
2: M12 connection plug (similar to shown)

- Connect the M12 connection plug (②) to the socket of the sensor housing (①) and tighten it hand tight.

The figure below shows the sensor unit fully installed:

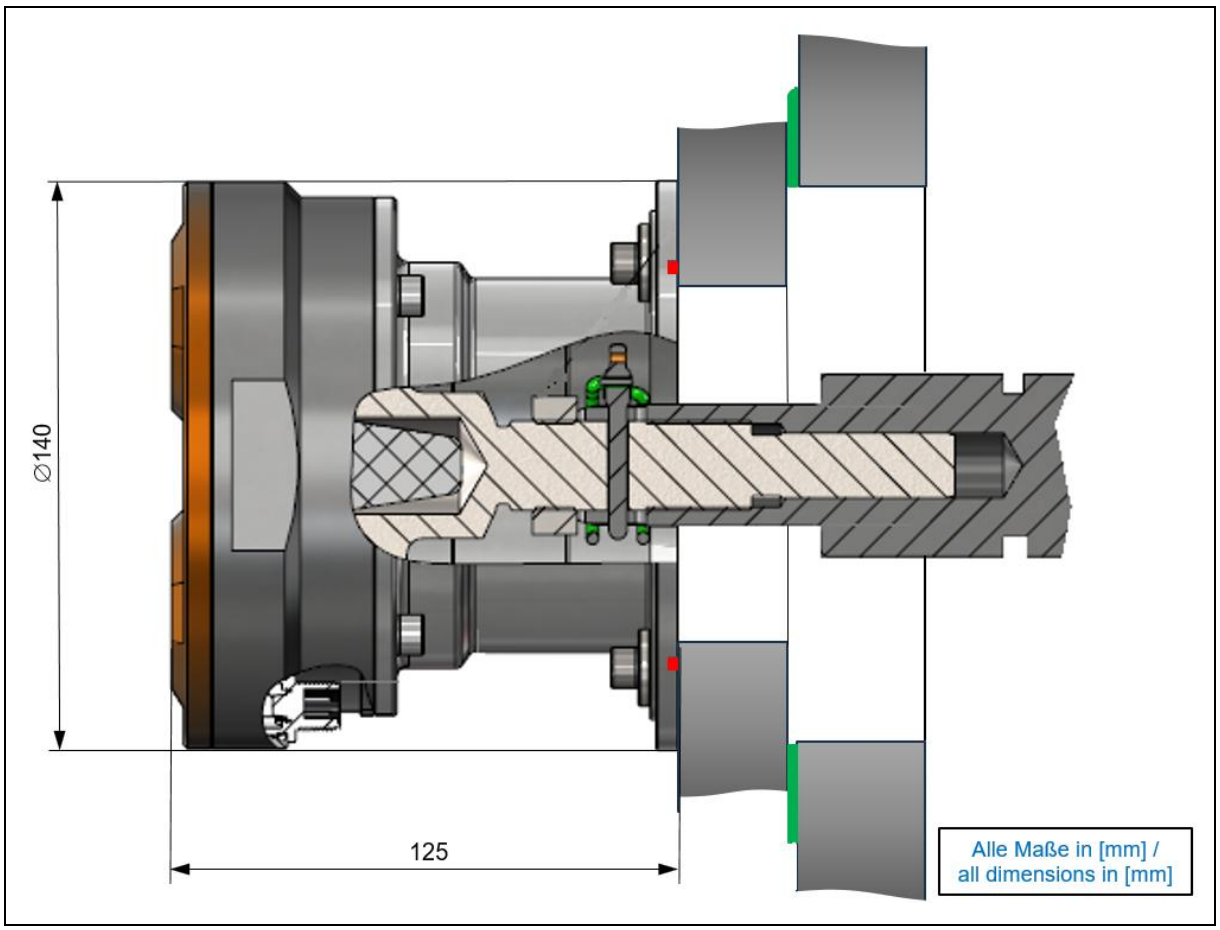


Fig. 5 : BEAROMOS® 2020, installed

☑ **Installation of the BEAROMOS® 2020 sensor unit has been completed successfully and the device is now ready for operation!**

4.2 Installing the BEAROMOS® 2020 (version with crankshaft seal system)

If, because of the design or operating conditions of the engine or machine to be monitored, there is a risk of liquids entering the BEAROMOS® 2020 sensor unit, or if ingress of liquid has already been detected (e.g. from oil splashing in the direction of the sensor shaft), it is absolutely essential to use the crankshaft seal system available from Schaller Automation, as shown in the figure below.

The ingress of liquids can cause malfunctions and, ultimately, failure of the sensor. Using the optionally available seal system effectively prevents liquids from entering the sensor unit and ensures that the sensor operates reliably and correctly.

For further information about the BEAROMOS® 2020 crankshaft seal system, please also see Section 6.3.2 of the current version of the operating manual. (⇨ *Section 1.3 Applicable documents and regulations*)

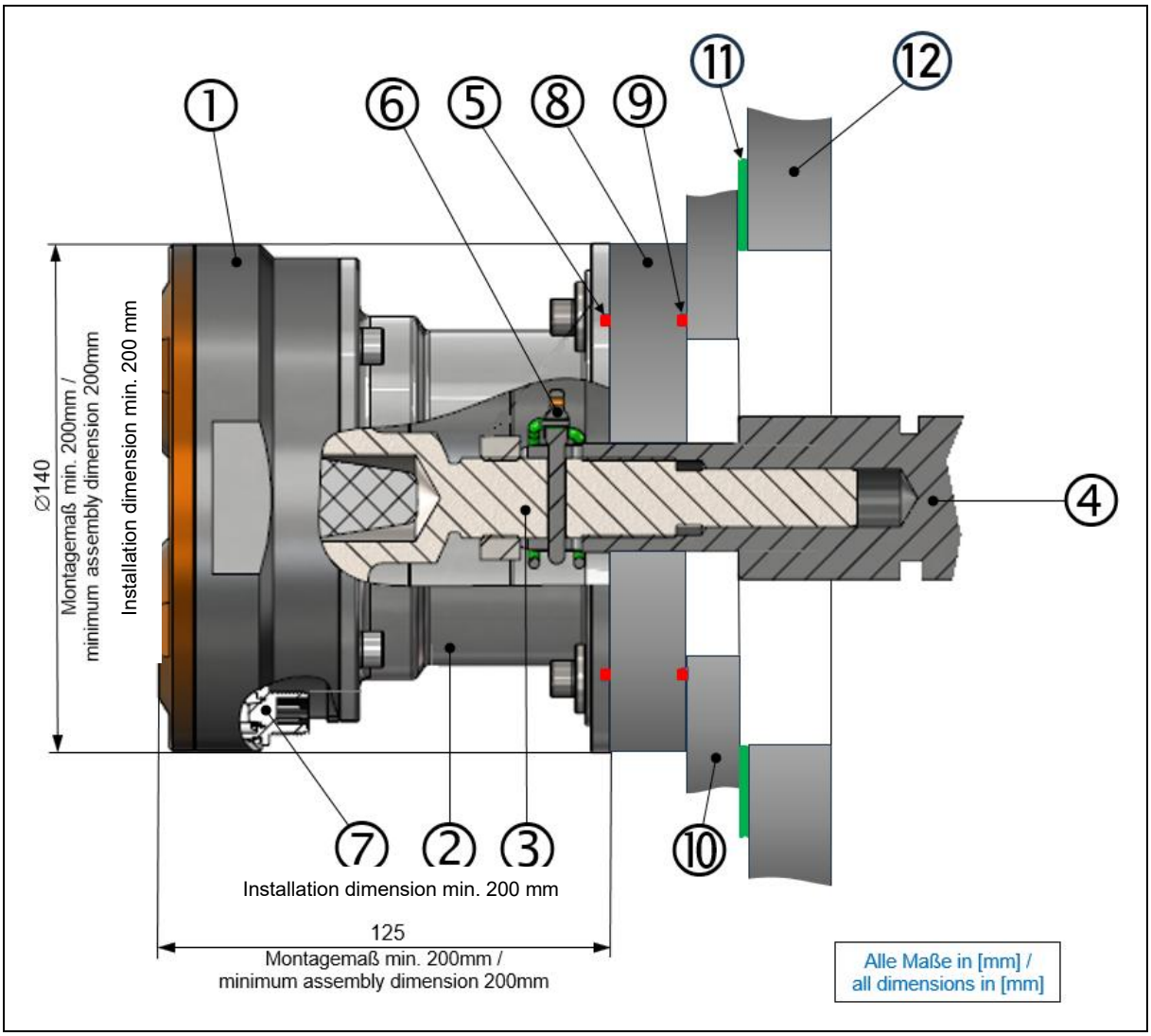


Fig. 6 : Overview of components, BEAROMOS® 2020 (version with crankshaft seal system)

1: BEAROMOS® 2020 sensor unit
2: Supporting tube
3: Coupling shaft (short version)
4: Crankshaft adapter (customer-specific)
5: Supporting tube seal (included in delivery)
6: Tube locking pin
7: M12 connection plug
8: BEAROMOS® 2020 crankshaft seal system
9: Supporting tube seal (included in delivery)
10: Engine wall cover (machined/new)
11: Flat seal (available on request)
12: Engine wall

Before starting installation, first drill the hole pattern (②) **and** (③) in the engine wall cover (①), as shown in the figure below:

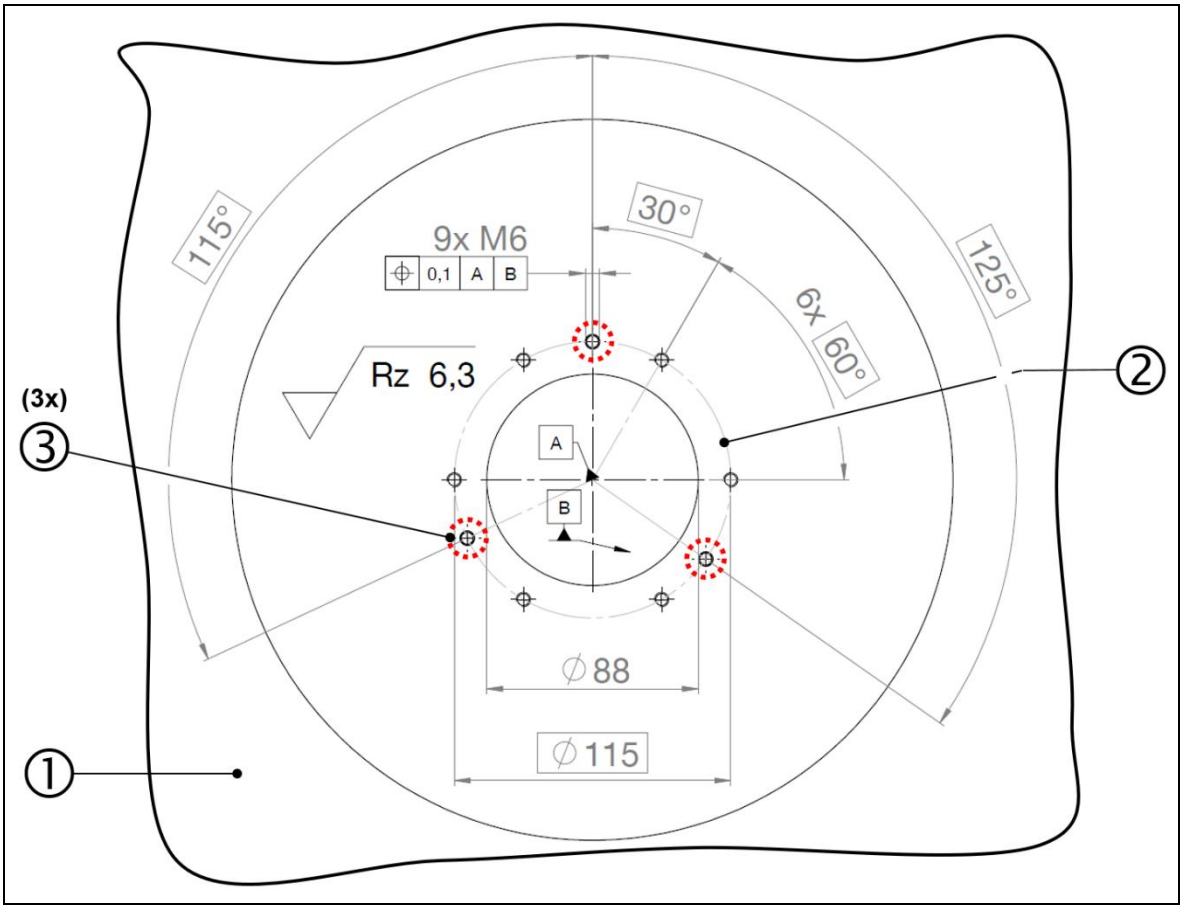


Fig. 7 : Hole pattern on the engine wall cover, BEAROMOS® 2020

1: Engine wall cover (machined/new)
2: Hole pattern (bolt circle)
3: 3x additional M6 threaded holes for the crankshaft seal system (optional)

IMPORTANT INFORMATION

- If the customer machines or modifies the engine wall cover, Schaller Automation **shall not** be liable for any machining errors or mechanical malfunctions of the BEAROMOS® 2020 that can be shown to have occurred as a result of previous machining by the customer.

If it is decided that the customer will machine or modify the engine wall cover (①), it is essential to check the flatness of the flange surface on the engine wall cover **before** drilling the hole pattern, so that the sensor can be aligned correctly afterwards, as necessary.

During installation, make sure that there is an electrically conductive connection between the sensor unit (including the supporting tube) and the engine wall cover. Please also follow the instructions in Section 6.4.1 of the current version of the operating manual. (⇨ *Section 1.3 Applicable documents and regulations*)

☑ **The hole pattern on the engine wall cover has been produced successfully!**

The individual components in Fig. 6 are installed by completing the following steps:

NOTE

- For initial installation with the BEAROMOS® 2020 crankshaft seal system, carry out installation steps 1-3 in full as described in Section 4.1. ⇨ *Section 4.1 Installing the BEAROMOS® 2020 (version without crankshaft seal system)*
- Do not apply oil or grease to the shaft entry area of the BEAROMOS® 2020 crankshaft seal system.
- When installing the BEAROMOS® 2020 crankshaft seal system, you must make sure that the sealing component is correctly aligned. The correct alignment is shown below:

  ➔ **Adapter side (top)/bottom**

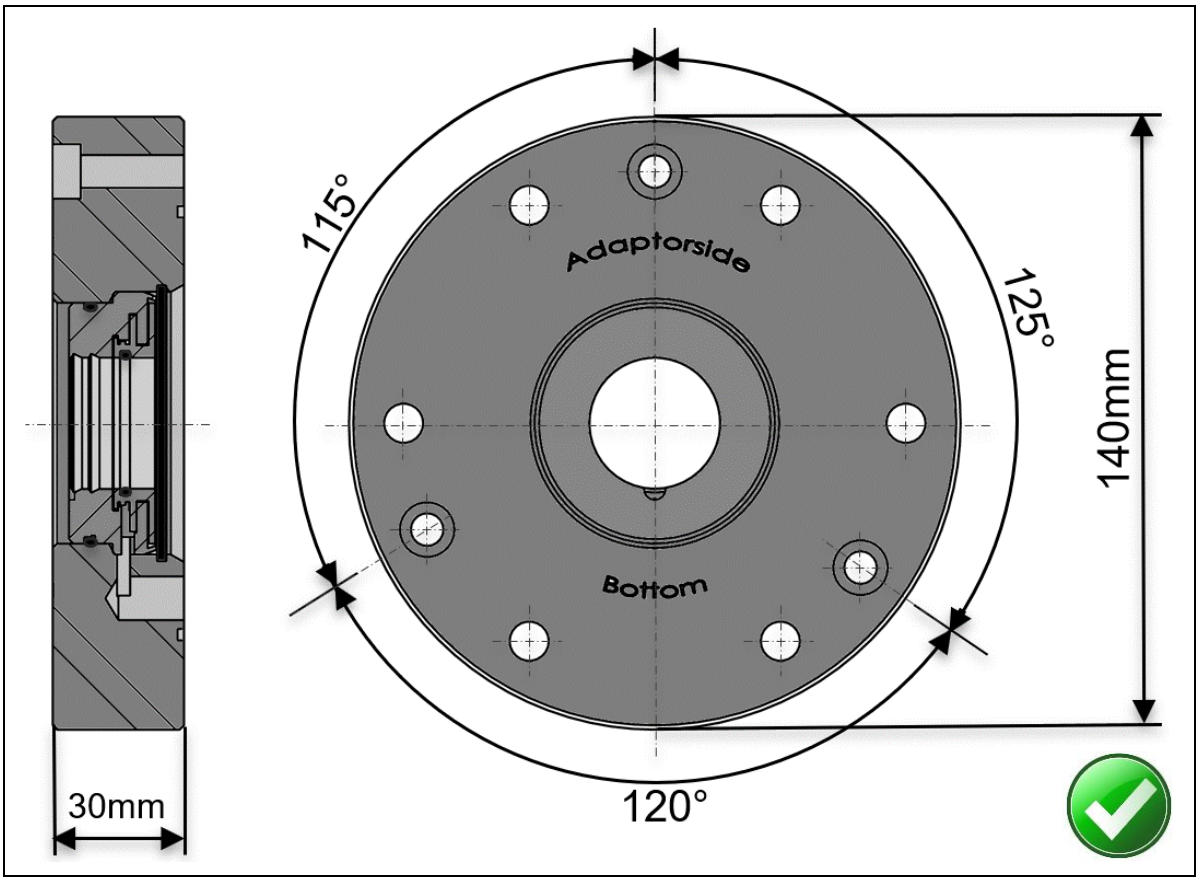
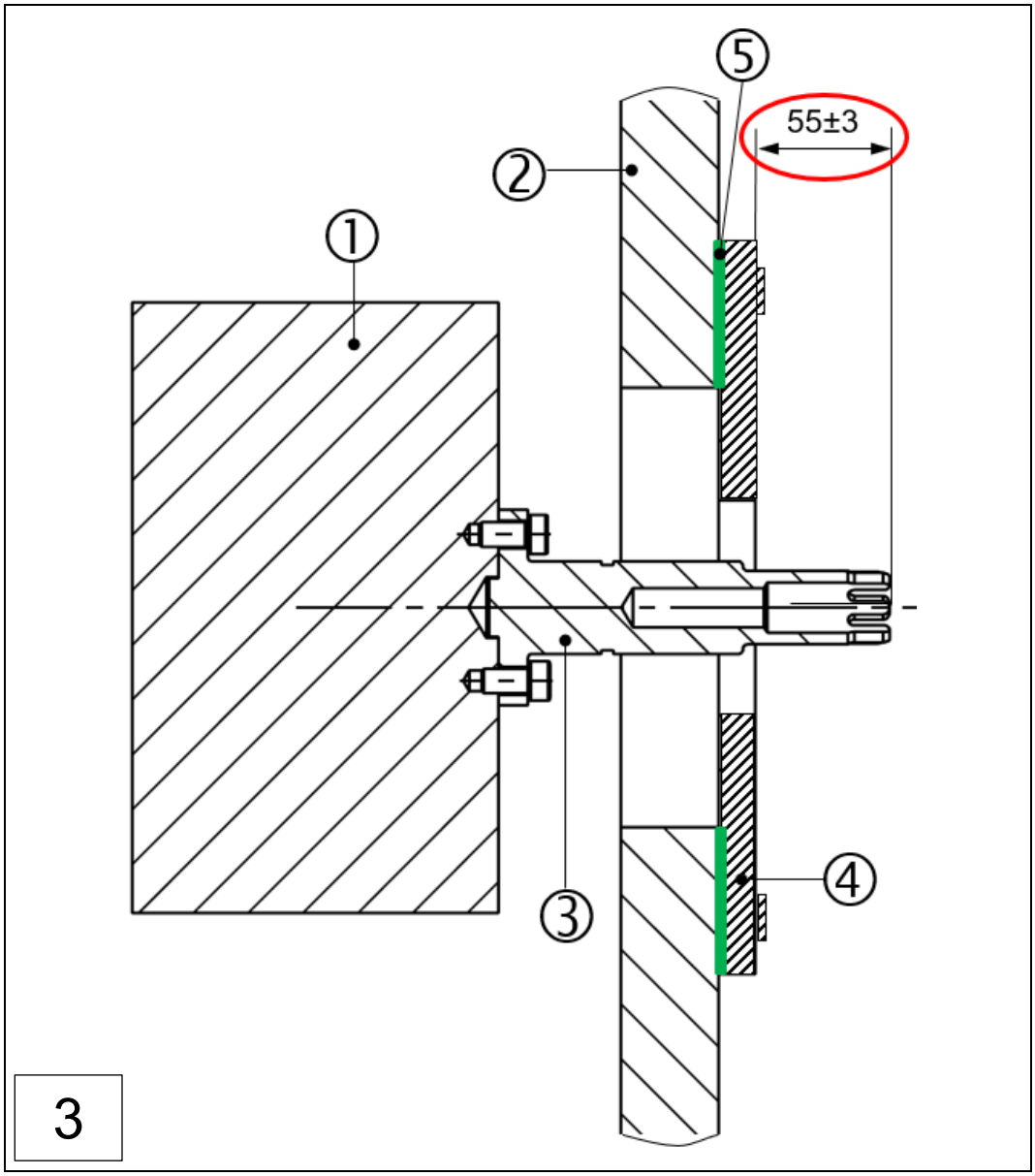


Fig. 8 : Aligning the BEAROMOS® 2020 crankshaft seal system

Step 3: Engine wall cover (machined/new), installed

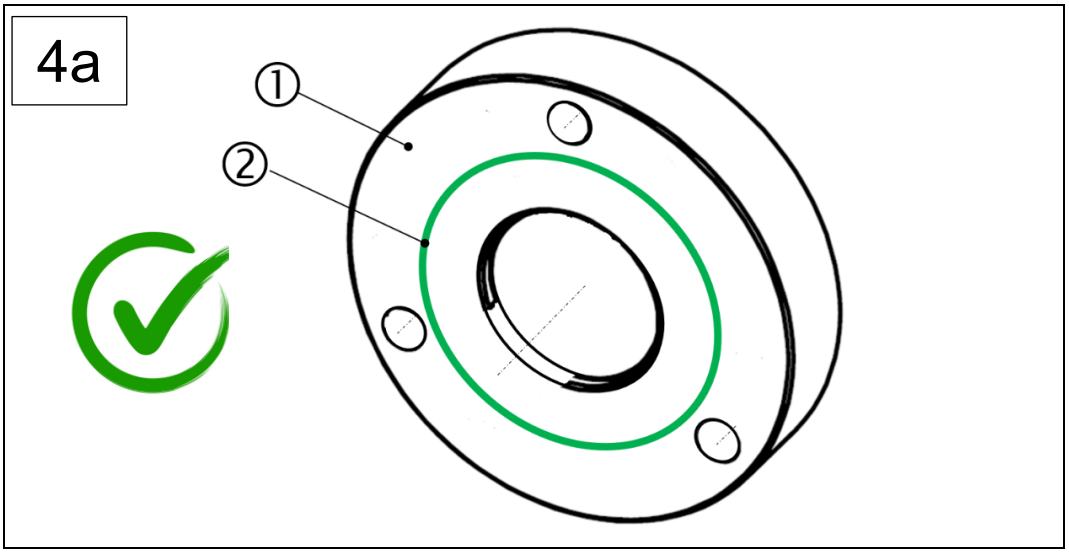


1: Crankshaft (customer-specific)
2: Engine wall (customer-specific)
3: Crankshaft adapter (customer-specific)
4: Engine wall cover (machined/new)
5: Flat seal (new)

- As shown in the figure above, in the version **with** crankshaft seal system, the crankshaft adapter (③) must have a **clearance of 55 mm (±3)** (circled in red) in its end position, i.e. protruding beyond the outer edge of the engine wall cover (④), after completing step 3.
  - ➔ Based on the specified clearance, the crankshaft adapter is manufactured specifically in advance, either by the customer or by Schaller Automation.

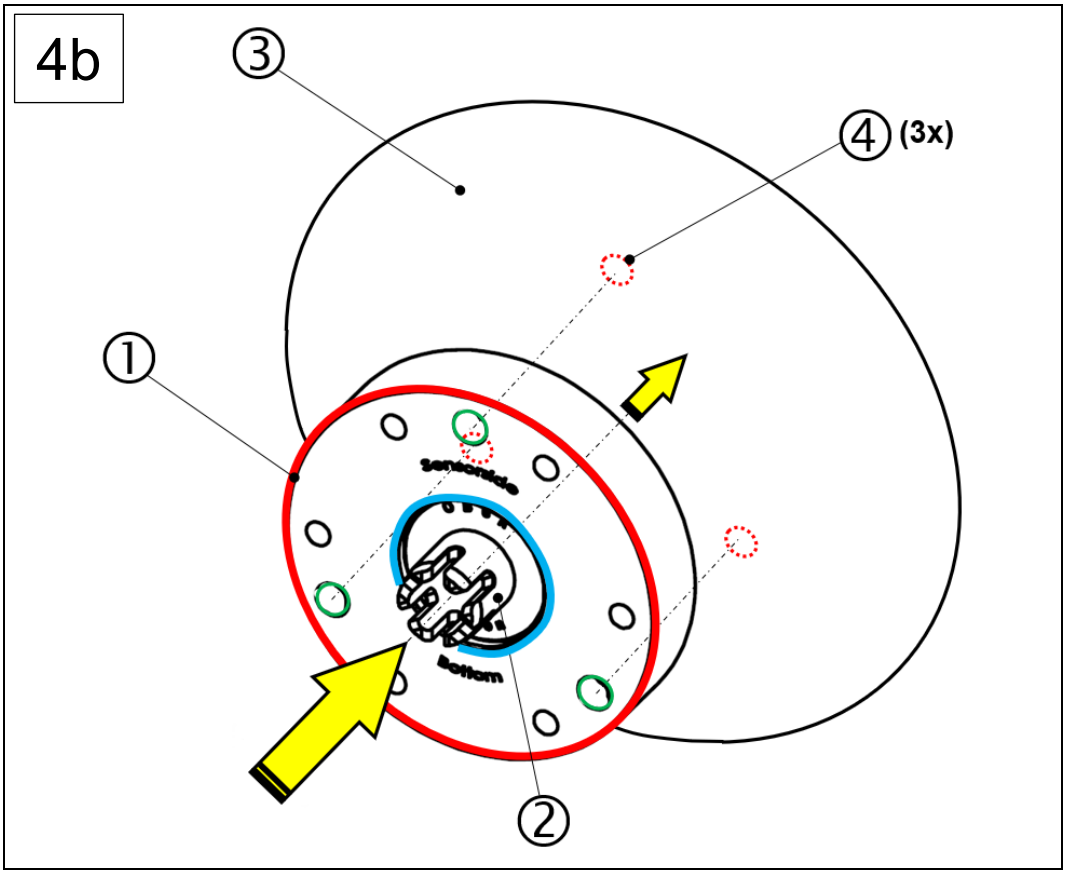
Install the BEAROMOS® 2020 crankshaft seal system on the engine wall cover as follows:

Step 4: Install the BEAROMOS® 2020 crankshaft seal system on the engine wall cover



- As shown in the figure above, start by inserting the O-ring (②) supplied with the product into the seal groove of the BEAROMOS® 2020 crankshaft seal system (①).

  NOTE: As shown in Fig. 8, the O-ring groove is on the rear of the labelled side.



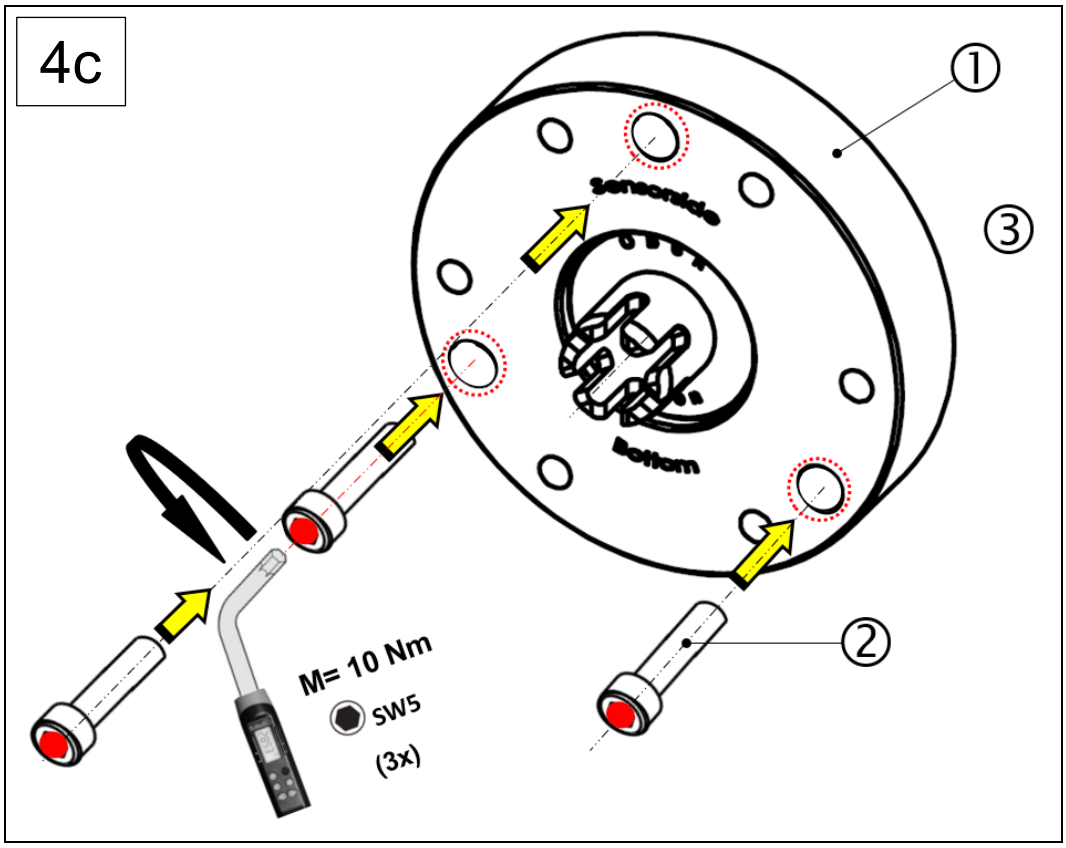
1: BEAROMOS® 2020 crankshaft seal system
2: Coupling shaft (short version)
3: Engine wall cover (machined/new)
4: 3x additional M6 threaded holes for the crankshaft seal system (optional)

IMPORTANT INFORMATION

- Do not apply oil or grease to the shaft entry area of the BEAROMOS® 2020 crankshaft seal system (①, highlighted blue).

- Start by carefully sliding the BEAROMOS® 2020 crankshaft seal system (①) over the coupling shaft (②), as described in *Step 4b*, up to the engine wall cover. (③)

- For the installed end position, always make sure that the through-holes of the BEAROMOS® 2020 crankshaft seal system (highlighted green) are lined up and flush with the M6 threaded holes (④, highlighted red).



1: Crankshaft seal system (included in delivery) 2: 3x M6 hex socket screws (included in delivery)
3: Engine wall cover (machined/new)

- Secure the BEAROMOS® 2020 crankshaft seal system (①) on the engine wall cover (③) using the three hex socket screws (②) (included in delivery) and start by tightening the screws hand tight.

- Then tighten the hex socket screws (②) to the specified tightening torque (**M = 10 Nm**).
  ➔ To do this, use a hexagon socket torque spanner with size 5 width across flats.

The figure below finally shows the fully assembled BEAROMOS® 2020 crankshaft seal system on the engine wall cover:

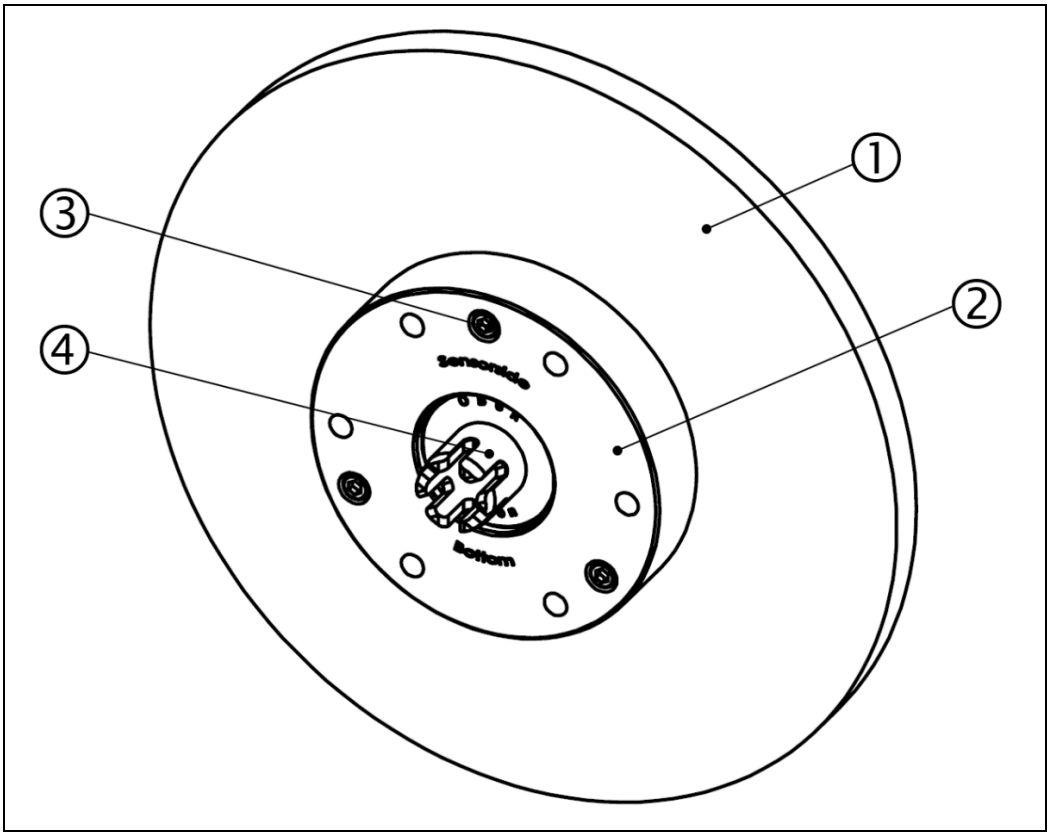
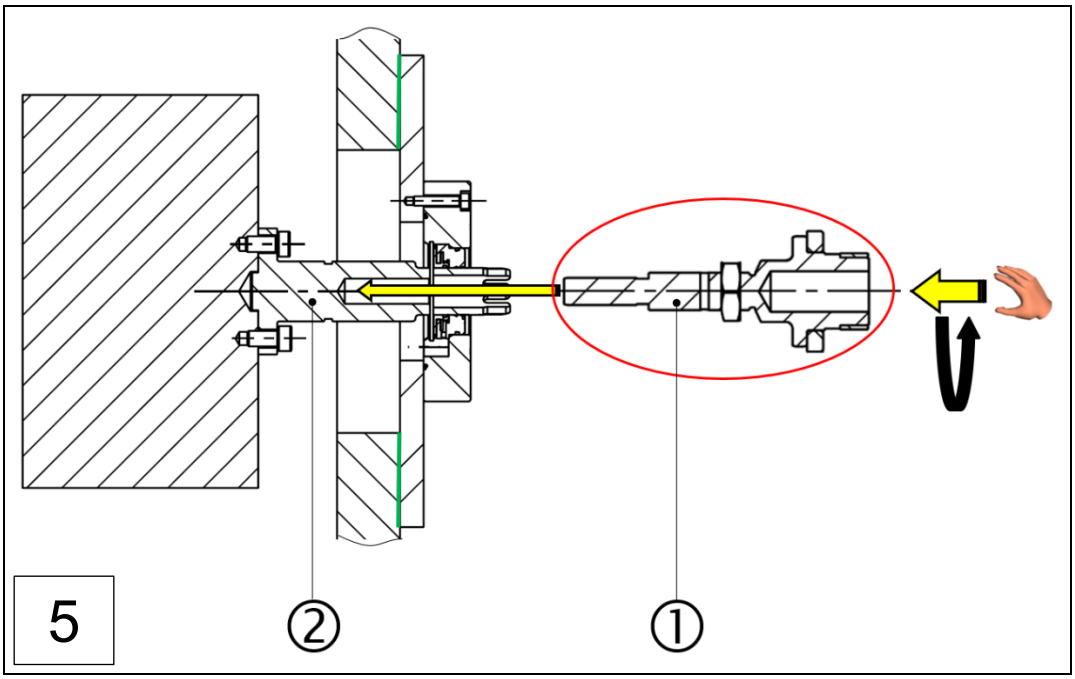


Fig. 9 : Installing the BEAROMOS® 2020 crankshaft seal system (steps 4a-4c)

1: Engine wall cover (machined/new)
2: Crankshaft seal system (included in delivery, installed)
3: 3x M6 hex socket screws (included in delivery)
4: Crankshaft adapter (customer-specific)

Step 5: Install the coupling shaft (short version) on the customer-specific crankshaft adapter

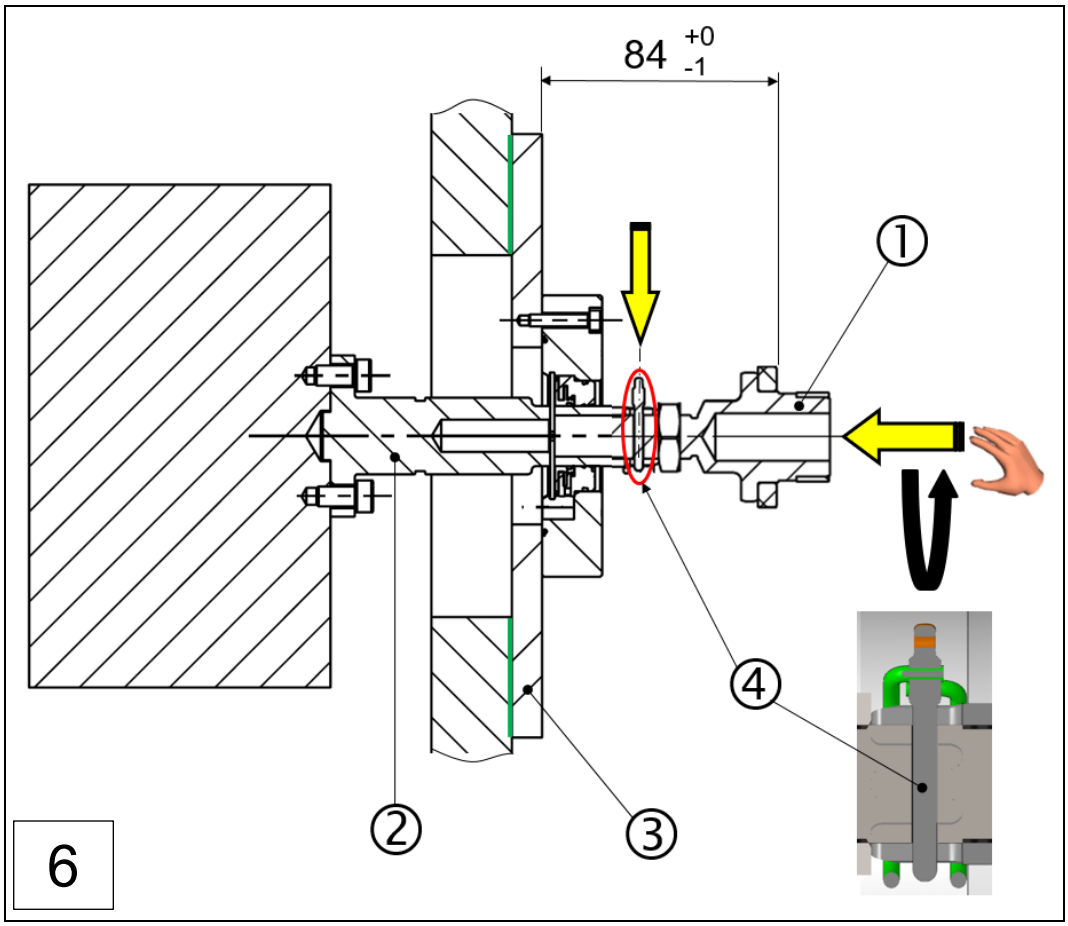


1: Coupling shaft (short version)
2: Crankshaft adapter (customer-specific)

- Check first that the threaded hole on the crankshaft adapter (②) and the threaded stud on the coupling shaft (①) are clean and, if necessary, remove any dirt or metal swarf.

- Start by screwing the coupling shaft (①) into the customer-specific crankshaft adapter (②) by hand, turning it about **five turns**.

Step 6: Adjust the coupling shaft to the customer-specific crankshaft adapter

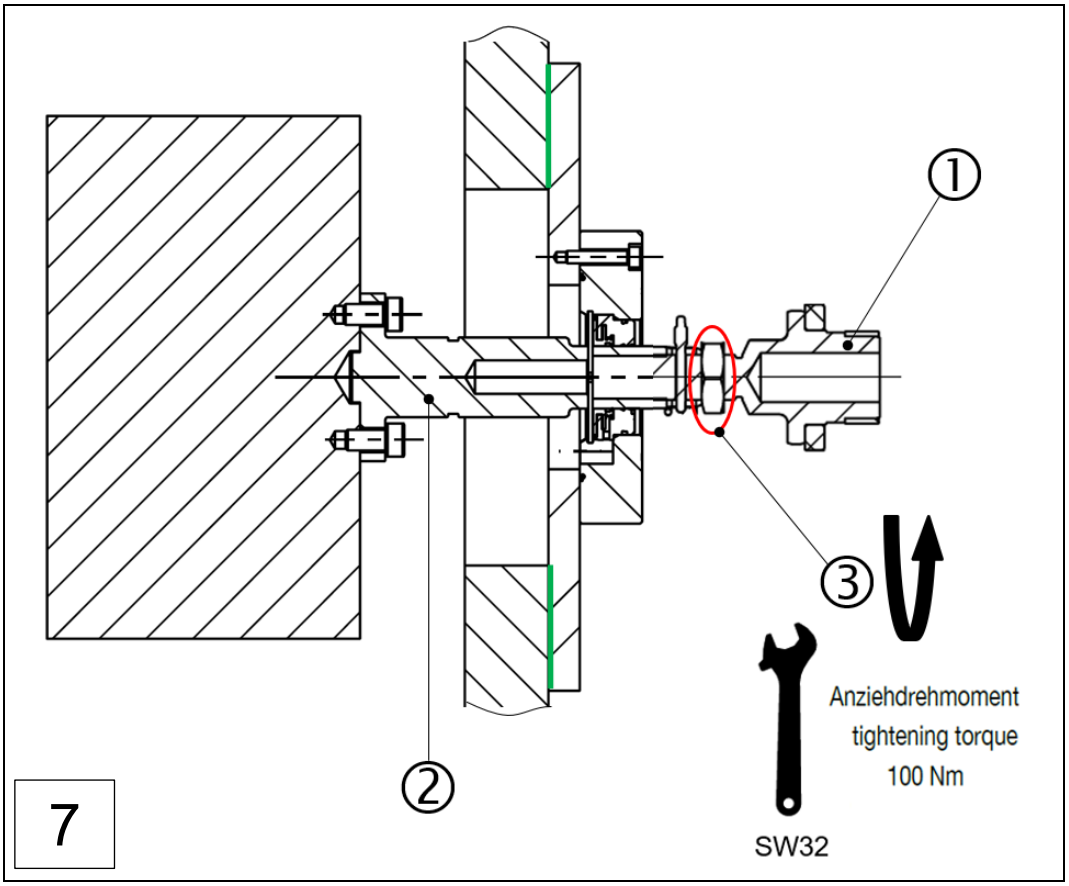


1: Coupling shaft (short version)
2: Crankshaft adapter (customer-specific)
3: Engine wall cover (machined/new)
4: Tube locking pin

- Adjust the **clearance to 84 mm (+0/-1)** as precisely as possible between the engine wall cover (③) and the coupling shaft (①) as shown in the figure above, by first screwing the coupling shaft (①) into the customer-specific crankshaft adapter (②) accordingly.

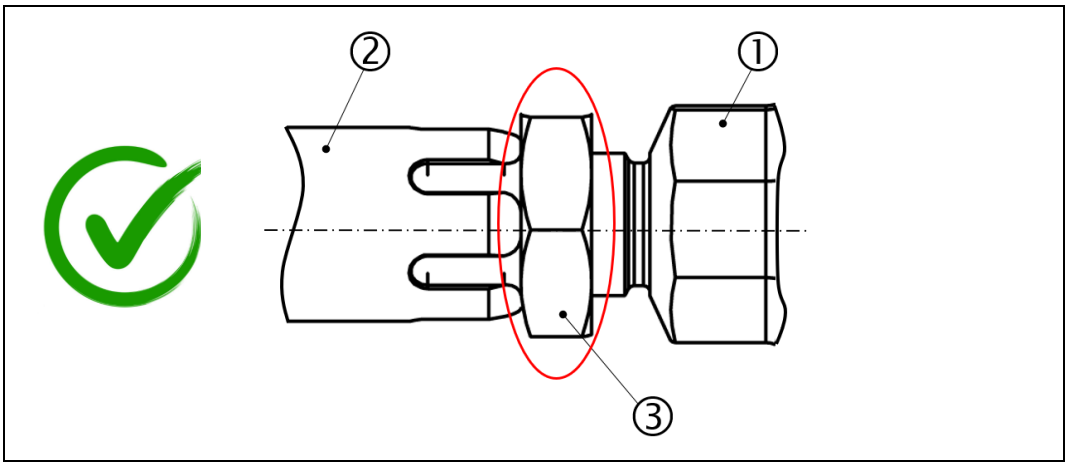
- Lock the clearance you have just adjusted by inserting the tube locking pin (④) into the hole provided in the coupling shaft (①) and on the crankshaft adapter (②) and then locking it in place. (see detail in the figure above)

Step 7: Locking the counternut



1: Coupling shaft (short version) 2: Crankshaft adapter (customer-specific)
3: Hexagon nut M22 x 1.5

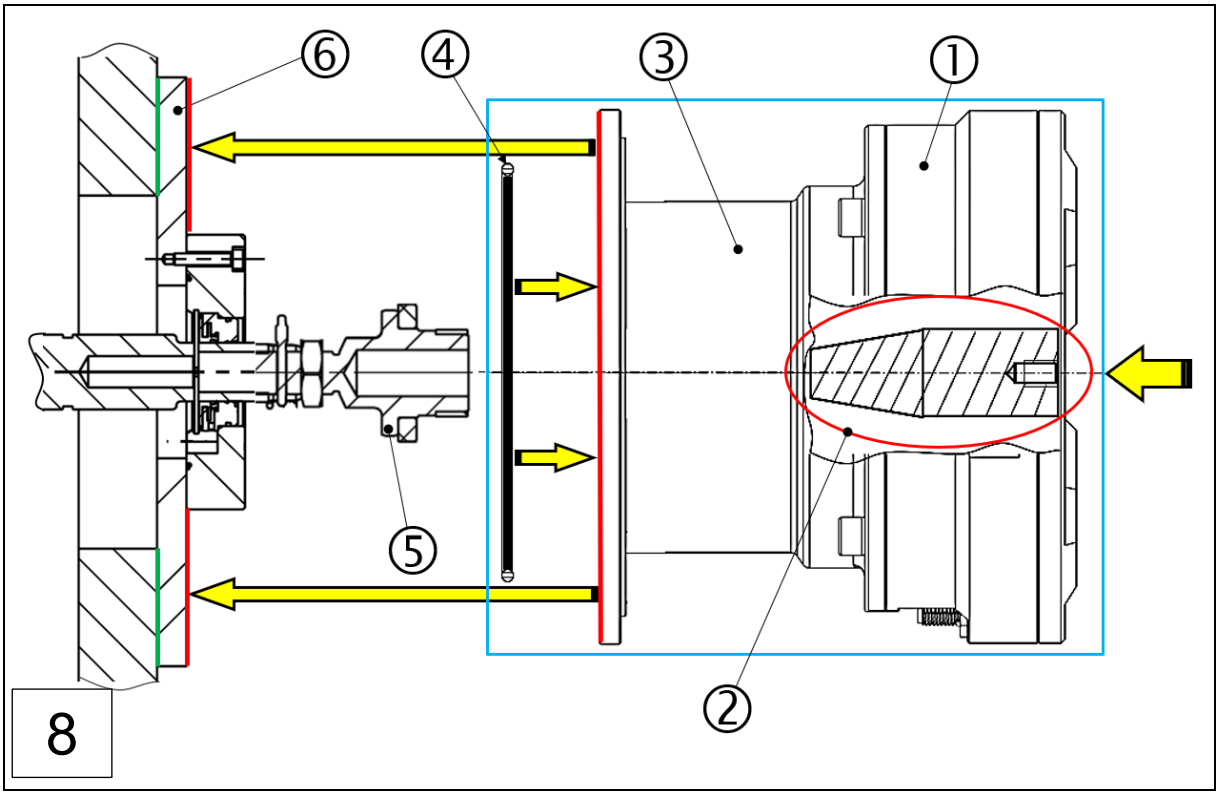
- Tighten the counternut (③) against the crankshaft adapter (②) to a tightening torque of 100 Nm. To do this, use a torque spanner with size 32 width across flats.



1: Coupling shaft (short version) 2: Crankshaft adapter (customer-specific)
3: Hexagon nut M22 x 1.5 (locked)

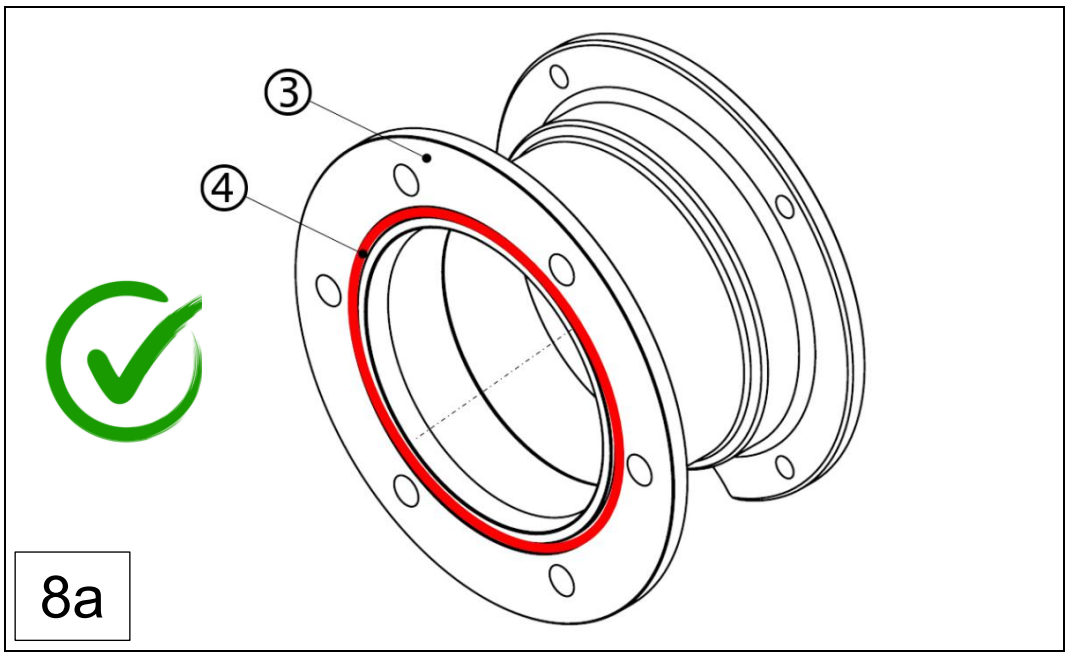
- **IMPORTANT**: The instructions for step 8 apply to both steps 2a and 2b as per Section 4.1.
  ⇨ Section 4.1 Installing the BEAROMOS® 2020 (version without crankshaft seal system)

Step 8: Install the sensor unit with supporting tube on the engine wall cover

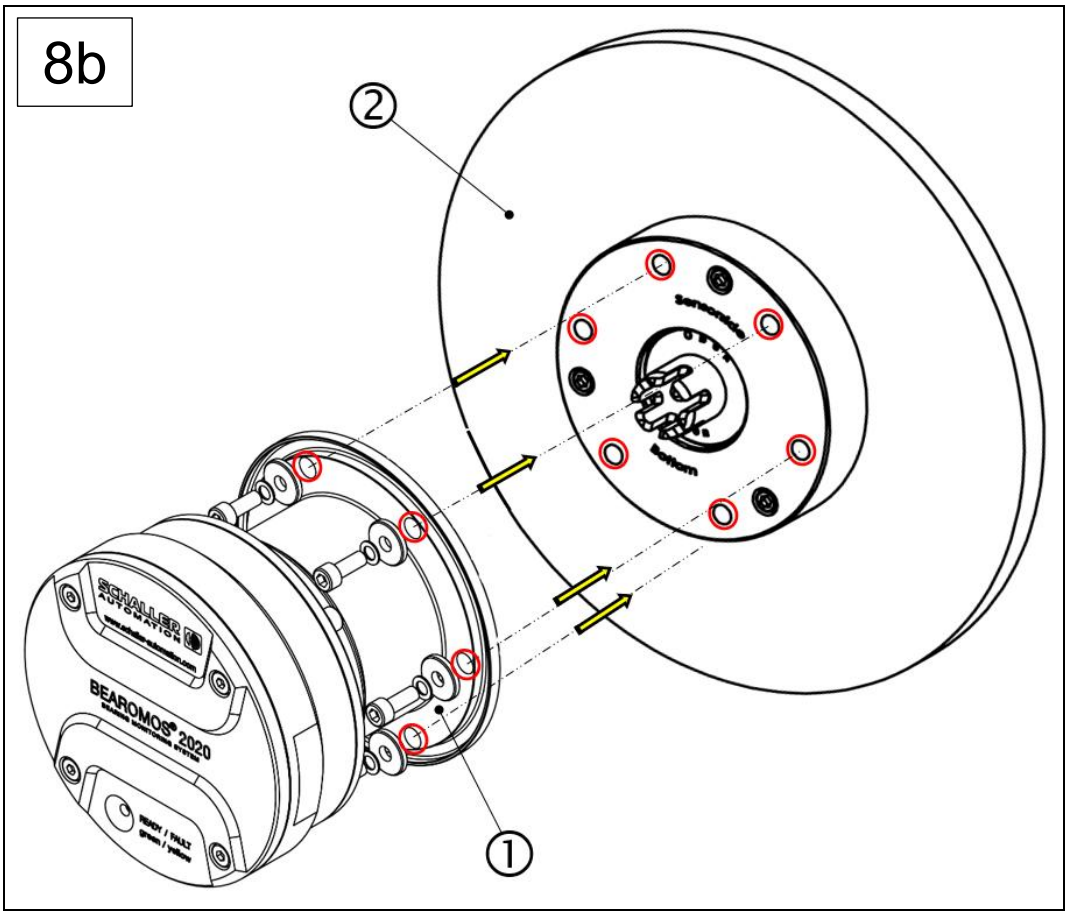


1: "Short" sensor unit, BEAROMOS®
2: Centring pin
3: Supporting tube
4: Supporting tube seal (included in delivery)
5: Coupling shaft (short version)
6: Engine wall cover (machined/new)

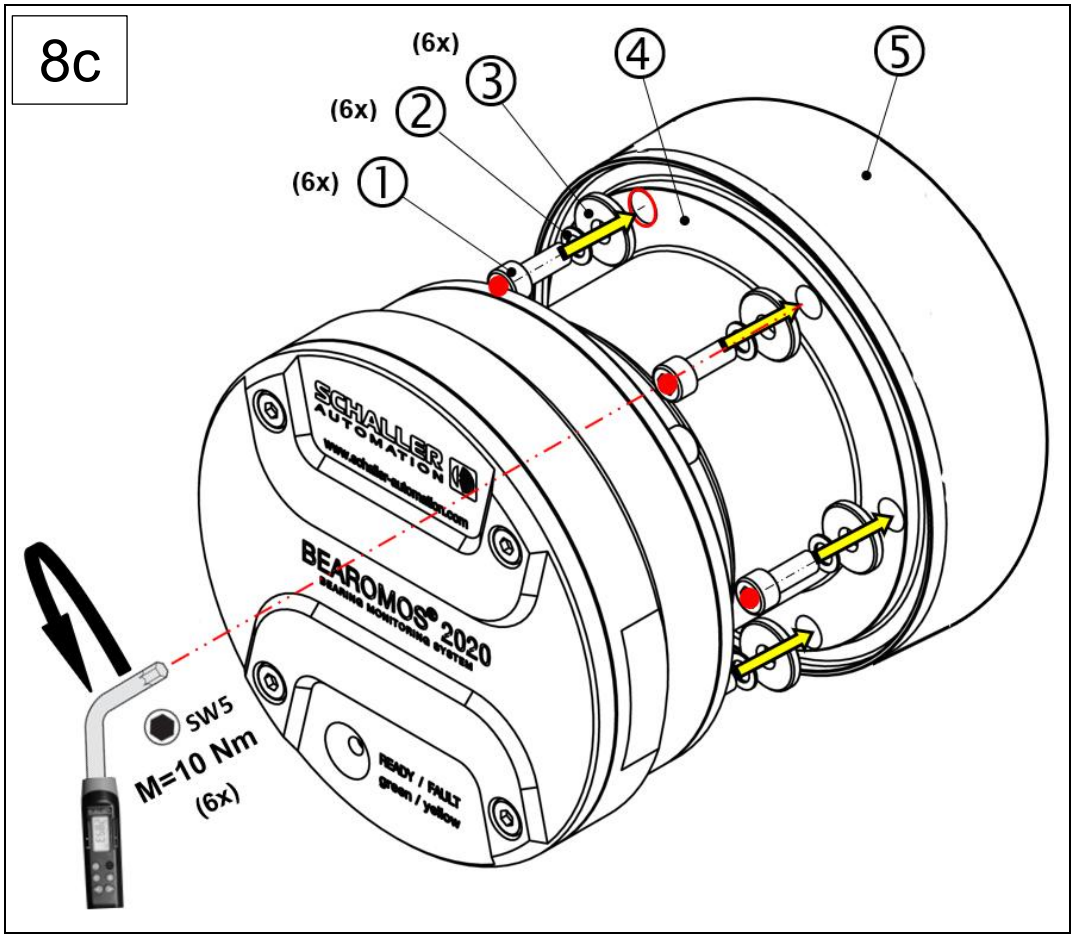
- ▶ As shown in the figure above, start by inserting the supporting tube seal (④, O-ring) supplied with the product into the seal groove of the supporting tube (③).
  - ➔ The figure below shows the supporting tube seal correctly fitted in the supporting tube.



- As described in step 8, carefully slide the sensor unit (①) – with the supporting tube (③) already fitted – over the coupling shaft (⑤) up to the engine wall cover. (⑥)
  - ➔ The internal centring pin (②) in the sensor unit (①) automatically centres the unit on the coupling shaft (⑤) during installation.
  - ➔ For the installed end position, always make sure that the outer surface of the supporting tube (③, highlighted red) is fully in contact with the outer surface of the engine wall cover (⑥, highlighted red).
- As shown in the figure below, make sure that the bolt circle (highlighted red) between the supporting tube (①) and the engine wall cover (②) is aligned for the screws then to be installed.



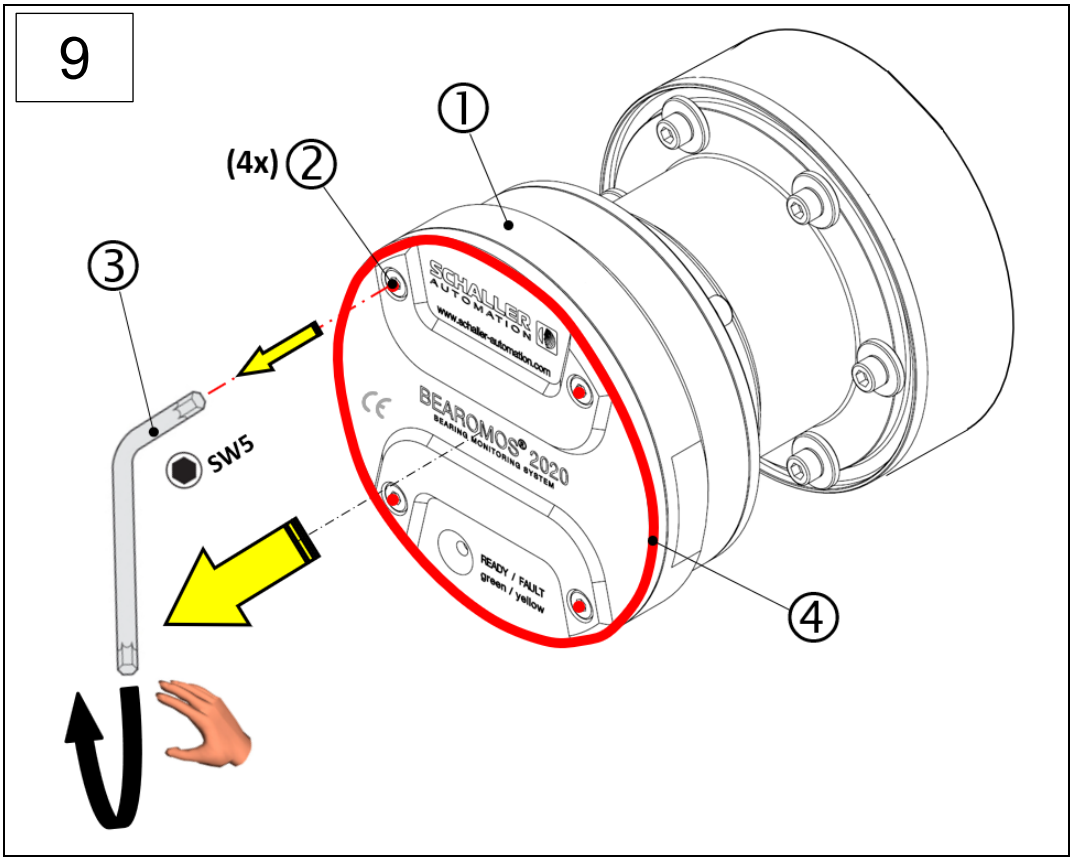
1: Supporting tube (included in delivery) 2: Engine wall cover (machined/new)



1: Hex socket screw M6 (included in delivery)
2: Lock washer (included in delivery)
3: Washer (included in delivery)
4: Supporting tube (included in delivery)
5: Crankshaft seal system (installed)

- Install the fixing screws (①), lock washers (②) and washers (③) in the same way for all penetrations, as shown in the figure above.
- Then attach the supporting tube (④) to the crankshaft seal system (⑤) hand-tight, using the six hex socket screws (①).
- Align the supporting tube (④), if necessary. Then tighten the hex socket screws (①) to the specified tightening torque (**M = 10 Nm**).
- Tighten the fixing screws (①) crosswise (switching diagonally).

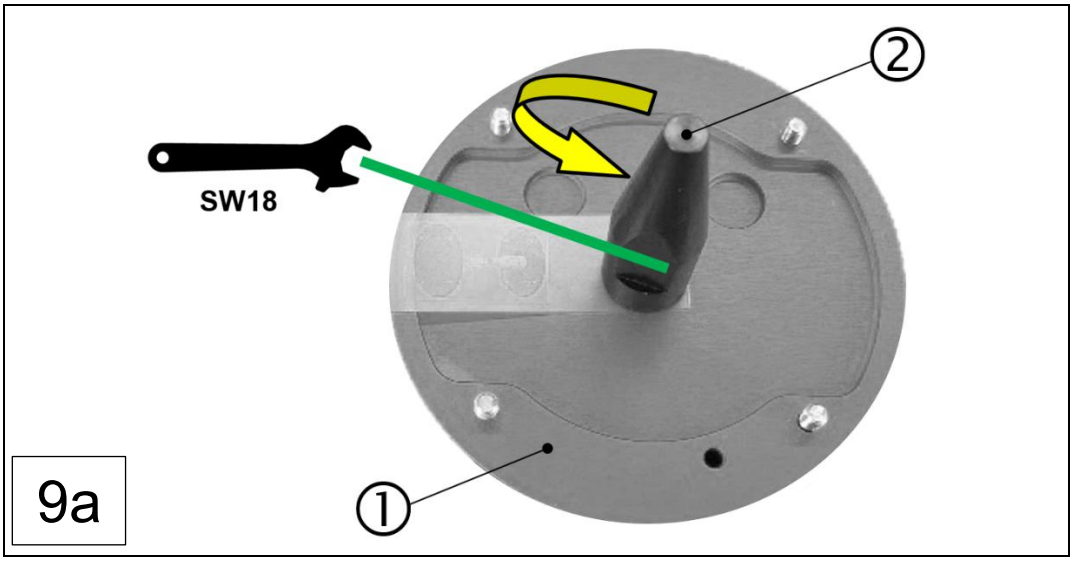
Step 9: Remove the centring pin on the sensor unit



1: Sensor housing
2: Hex head screws M6x20 (4x)
3: Allen key, L-shaped, size 5 width across flats
4: Cover plate

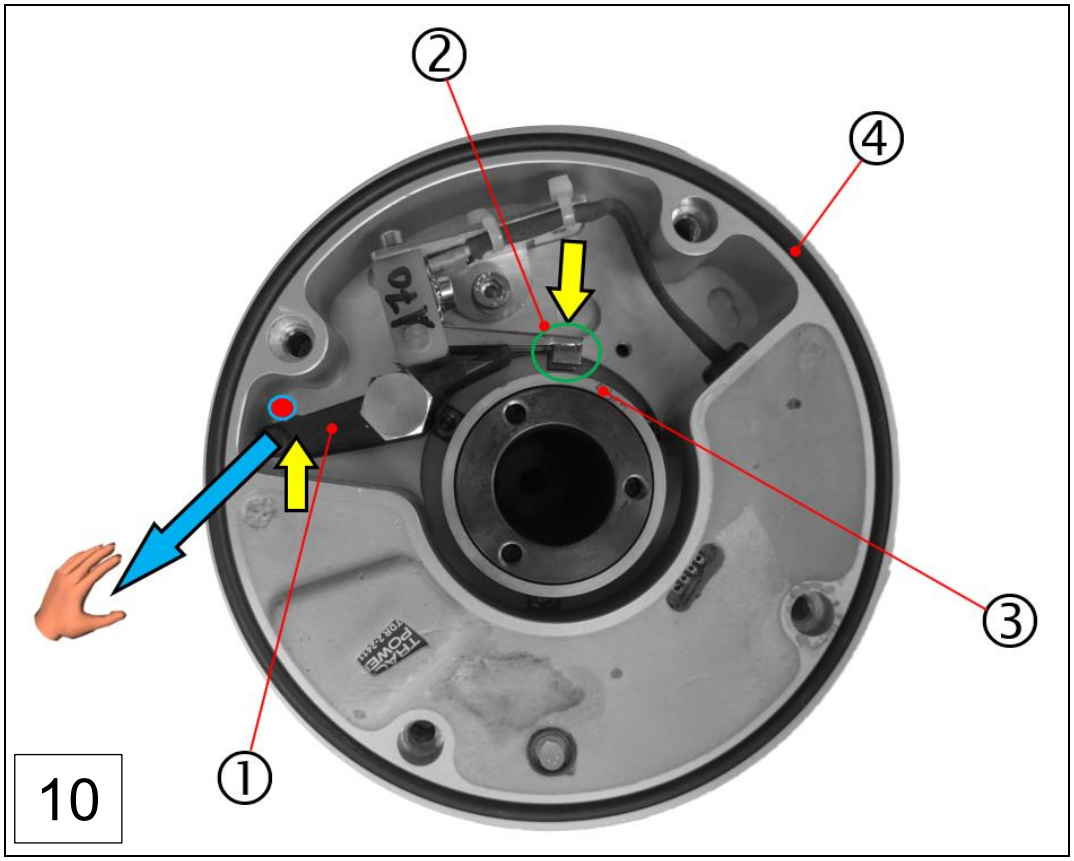
- Loosen the four hex socket screws (②) using the Allen key (③) and then remove the cover plate (④) from the sensor housing. (①)

- To remove the centring pin (②), use an open spanner with size 18 width across flats, as shown in the figure below.



1: Cover plate, sensor housing
2: Centring pin

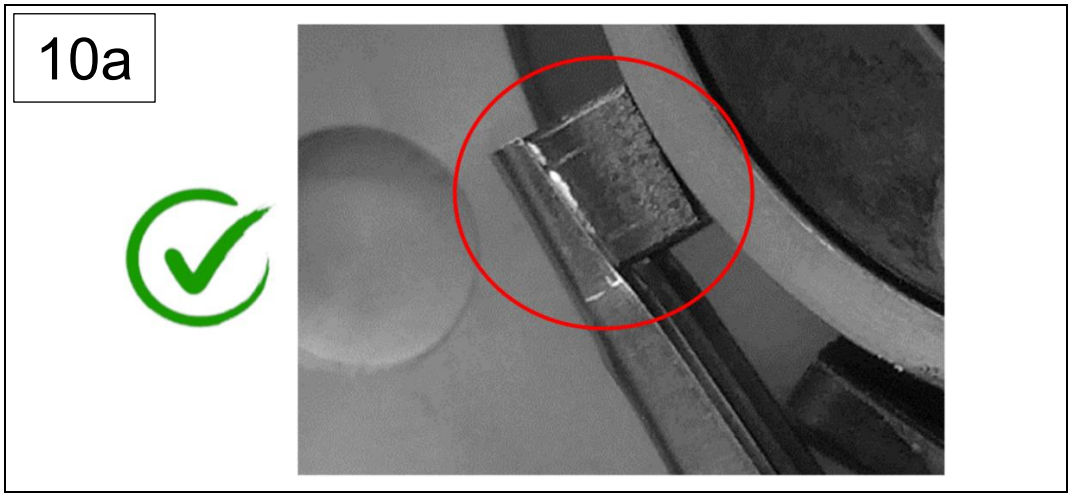
Step 10: Place the brush on the slip ring body

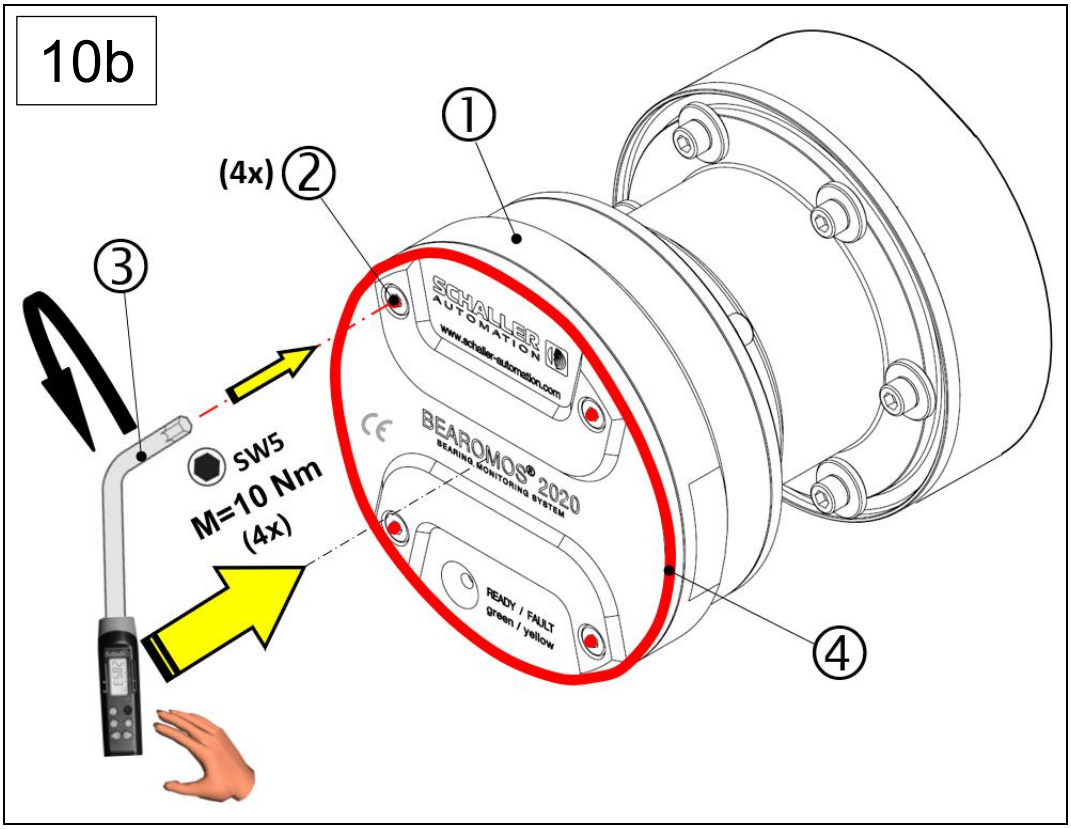


1: Adjusting lever (brush)
2: Brush
3: Slip ring body
4: “New” O-ring

- Make sure that the O-ring (④) **is undamaged and correctly seated** in the seal groove. If it is damaged, replace it with a new sealing ring. To do this, use the “O-rings” maintenance kit. (Kit No. 290048)
- Pull the adjusting lever (①) forwards (in direction of the blue arrow) and, at the same time, turn it upwards until it reaches the top engagement point (blue circle).

  ➔ The brush (②) then lowers onto the slip ring body (③), as shown in the figure below.





1: Sensor housing
2: Hex socket screws M6x16 (4x)
3: Allen key, L-shaped, size 5 width across flats
4: Cover plate

- Place the cover plate (④) on the sensor housing (①). Then screw the cover plate to the sensor housing using the four hex socket screws (②) and start by tightening the screws hand tight.
- Then tighten the hex socket screws (②) to the specified tightening torque (**M = 10 Nm**).

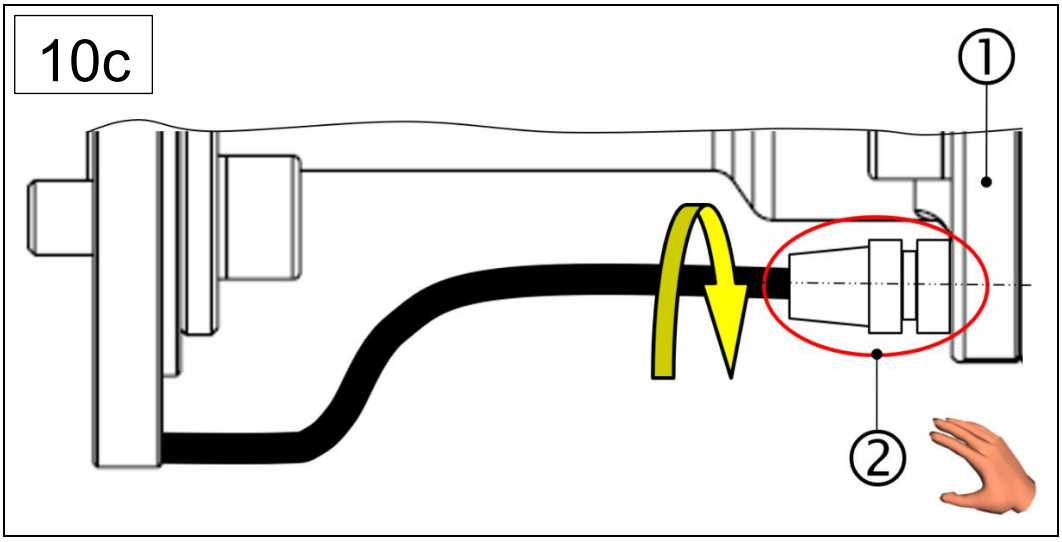


Fig. 10 : Installing the sensor unit, BEAROMOS® 2020 (short version, steps 1-10)

1: Sensor housing
2: M12 connection plug (similar to shown)

- Connect the M12 connection plug (②) to the socket of the sensor housing (①) and tighten it hand tight.

The figure below shows the sensor unit, fully installed, together with the BEAROMOS® 2020 crankshaft seal system, on the engine wall cover:

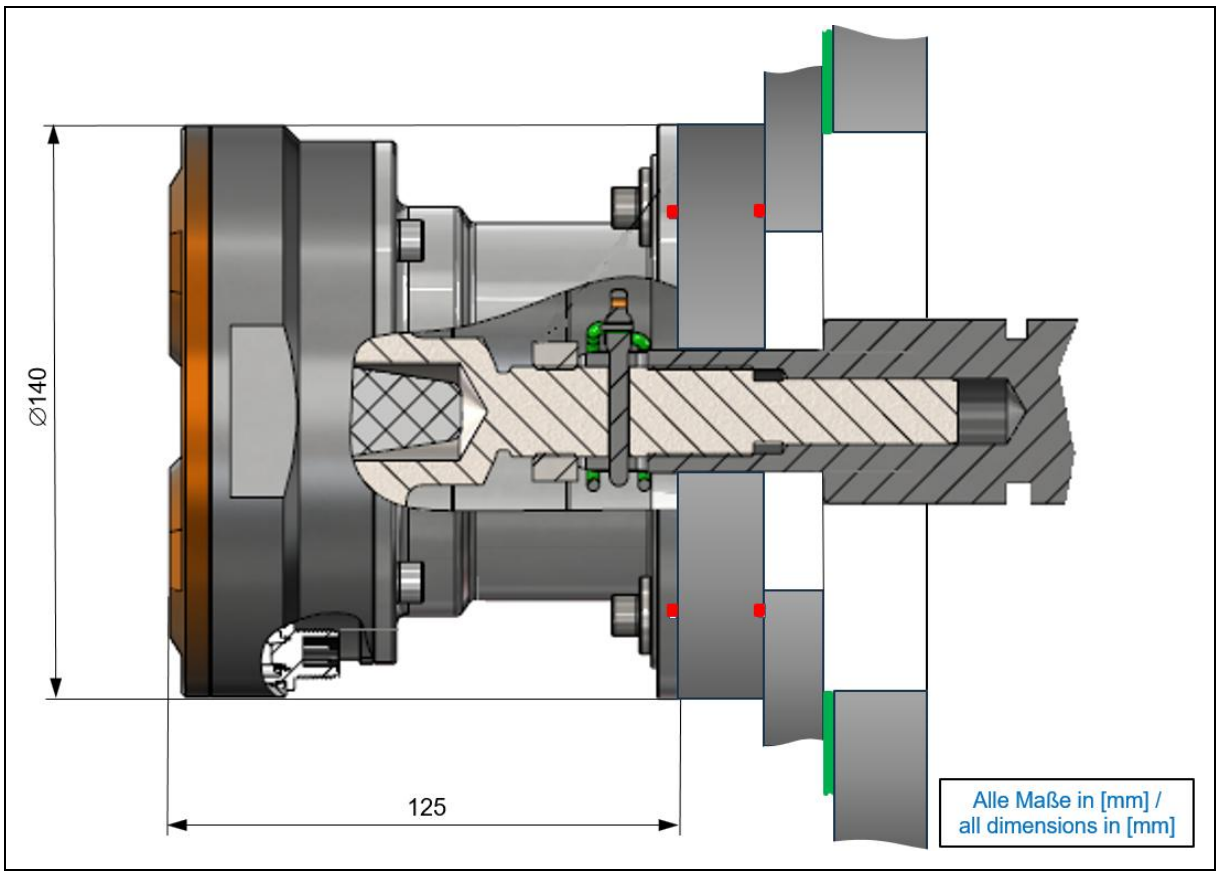


Fig. 11 : BEAROMOS® 2020 with installed crankshaft seal system

☑ **Installation of the BEAROMOS® 2020 sensor unit with crankshaft seal system has been completed successfully and the device is now ready for operation!**

5 Contact

You can use the following contact details to contact customer service at Schaller Automation Industrielle Automationstechnik GmbH & Co. KG:

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You can also find all our certified partners on our homepage at:

https://schaller-automation.com/partner/

6 Notes

Notes

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