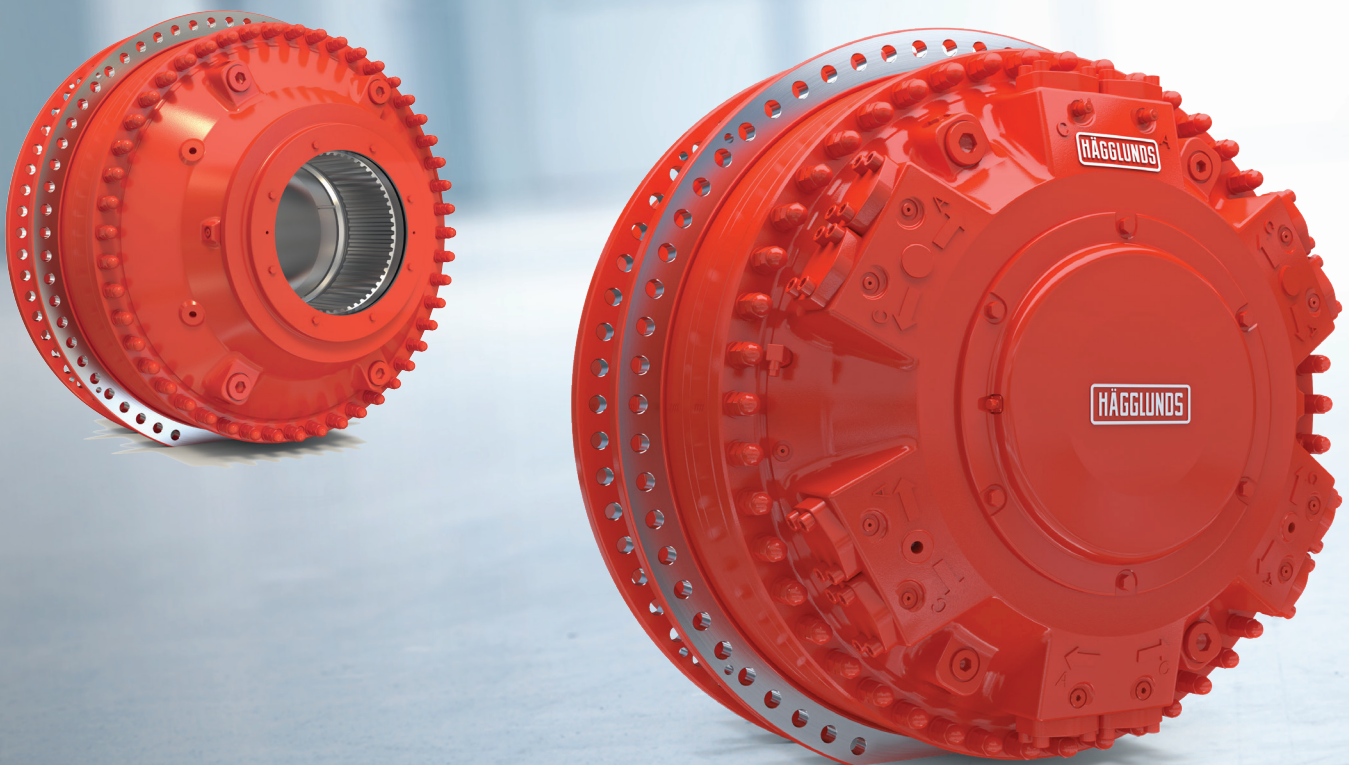


Häggglunds CBm

Radial piston hydraulic motor



The data specified in this documentation, only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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Changes in the equipment may occur. We therefore reserve the right to introduce amendments in the manual as we deem necessary without notice or obligations.

The cover shows an example configuration. The product supplied may therefore differ from the figure shown.

The original operating instructions were prepared in English.

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1 This documentation

1.1 Validity of the documentation

This documentation applies to the high torque a low rotation radial piston hydraulic motor Hägglunds CBm and is intended for machine/system manufacturers, users and service engineers.

This documentation contains important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the product.

- ▶ Prior to working with the Hägglunds CBm, read the entire documentation carefully, in particular the “Safety instructions” chapter

1.2 Required and additional documentation






- ▶ Before commissioning the product, make sure to have received and fully understood the documentations identified by the book symbol  and observe the instructions included in these documentations.

Table 1: Required and additional documentations

	Title	Document no	Document type
	Radial piston hydraulic motor, Hägglunds CBm	RE 15300	Data sheet
	Order confirmation	Contains the order-related technical data for your Hägglunds CBm.	Order confirmation
	Hägglunds TC A, DTCA, DTCB, DTCBM	RE 15355	Data sheet
	Hydraulic fluid quick reference	RE 15414	Data sheet

1.3 Presentation of information

Consistent safety instructions, symbols, terms and abbreviations are used in the present documentation to facilitate orientation for the reader and to ensure safe product handling. The explanations in the following sections will provide for easy understanding

1.3.1 Safety messages




This documentation includes safety messages placed before sequential operating procedures that may involve the risk of personal or property damage. The described precautionary measures must be observed.

Safety messages are structured as shown below:

 SIGNAL WORD
Type and source of risk Consequences if disregarded ► Precautionary measures

- **Warning sign:** draws attention to the risk
- **Signal word:** identifies the hazard level
- **Type and source of risk:** identifies the type and source of the hazard
- **Consequences:** describes what occurs when the safety messages are not complied with
- **Precautions:** indicates how the hazard can be avoided



Table 2: Risk categories to ANZI Z535.6-2006

Warning sign, signal word	Meaning
 DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates potential property damage: the product or the environment may be damaged.

1.3.2 Symbols

The following symbols identify notices that are not safety-relevant, but enhance the comprehensibility of the documentation.

Table 3: Meaning of the symbols

Symbol	Meaning
	When this information is not observed, optimum use or operation of the product cannot be ensured.
►	Single, independent step
1. 2. 3.	Numbered instructions: The number indicates that the different steps are to be performed successively.
	Center of gravity Markings on packaging to indicate where the center of gravity is.

2 Safety instructions

2.1 About this chapter

This product has been manufactured in strict compliance with the generally accepted rules of technology. However, this does not exclude the risk of damage to persons or property if this chapter and the safety instructions included in the present documentation are not observed.

- ▶ Read the entire documentation carefully before starting to use the product.
- ▶ Keep this documentation in a location where it is accessible to all users at any time.
- ▶ When passing over the product to third parties, make sure to include the necessary documentation.

2.2 Intended use

The Häggglunds CBm is a radial piston hydraulic motor.

In an application the CBm motor is classified as component. The CBm motor may only be commissioned after it has been installed in the machine/system for which it is intended and the safety of the entire system has been established in accordance with the machine directive.

The product is intended for professional and not for private use.

Intended use includes having read and understood the entire documentation, in particular the “Safety instructions” chapter.

The product is intended for the following use:

- Radial piston motor in open or closed circuit: The radial piston motor is approved to be used in motor mode or pump mode.

Observe the technical data, application and operating conditions and performance limits as specified in the product-specific data sheet and in the order confirmation.

2.3 Improper use

Any use other than that described as intended use shall be considered as improper and is therefore impermissible.

Bosch Rexroth shall accept no liability whatsoever for damage resulting from improper use. The user shall bear all risks arising from improper use.

Similarly, the following foreseeable faulty usages are also considered to be improper:

- Using outside the operating parameters approved in the product-specific data sheet or in the order confirmation (unless customer-specific approval has been granted)
- Use of fluids outside of the standards as specified in *15.1.1: Hydraulic fluids* and in [Data sheet RE 15414 Hydraulic fluid quick reference](#).
- Modification of factory settings by non-authorized persons
- Use of add-on parts (e.g. mountable filter, control unit, valves) that are not specified by Bosch Rexroth has to be approved by contact at Bosch Rexroth.

- Extension or conversion is not permissible and has to be approved by contact at Bosch Rexroth.
- Using the Radial piston motor under water without necessary additional measures.
- Using the Radial piston motor when the exterior pressure is greater than the interior pressure (case pressure).
- Using the Radial piston motor in explosive environments unless the component or machine/system has been certified as compliant with the ATEX directive 2014/34/EU
- Using the Radial piston motor in an aggressive atmosphere without necessary additional measures

2.4 Personnel qualification

The work steps described in the present documentation require basic skills in mechanical, electrical and hydraulic knowledge, as well as knowledge of the associated technical terms. In order to ensure safety at work, these jobs must be exclusively carried out by qualified technical personnel or by trained staff under the direction and supervision of qualified personnel.

For transporting and handling of the product, additional knowledge is necessary with regard to working with a lifting device and the corresponding attachment equipment. In order to ensure safe use, these activities may therefore only be carried out by appropriate qualified personnel or a trained person under the direction and supervision of qualified personnel.

Qualified personnel are in a position to recognize possible hazards and institute appropriate safety measures thanks to their professional training, knowledge and experience, as well as their understanding of the relevant conditions pertaining to the work to be done. Qualified personnel must observe the subject-specific rule and have the necessary hydraulic knowledge.

Hydraulic knowledge means, for instance:

- reading and fully understanding hydraulic diagram,
- fully understanding in particular the interrelationships regarding safety devices and having knowledge on the function and assembly of hydraulic components.



Bosch Rexroth offers training support for special fields. For more information about training, please contact your Bosch Rexroth representative.

2.5 General safety instructions

- Observe the regulations for accident prevention and environmental protection.
- Comply with the local safety provisions and regulations of the country in which the product is used.
- Make sure to use Rexroth products in perfect working order.
- Strictly observe all instructions on the product.
- Persons, who assemble, operate, disassemble or maintain Rexroth products must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to respond.
- Use exclusively accessories and spare parts explicitly approved by the manufacturer (genuine Bosch Rexroth spare parts) to avoid accidents due to improper accessories and spare parts.
- Strictly observe the technical data and ambient conditions specified in the product documentation.

- Inadequate products installed or used for safety-relevant applications may produce unintended operating behavior and result in product or property damage. For this reason, use a product in safety-relevant applications only on condition that such use is specified and allowed in the corresponding product documentation.
- Prior to commissioning the product, make sure that the end product (e. g. a machine or line), into which Rexroth products are integrated, perfectly complies with the country-specific provisions, safety regulations and standards applicable to its use.

2.6 Product and technology-related safety messages

The safety instructions below is valid from chapter 6: *Transport and storage* to chapter 15: *Technical data*.

DANGER

Danger from excessively high pressure

Danger to life or risk of injury, damage to equipment.

Operating the motor above the permissible maximum pressure can cause components to burst and hydraulic fluid to escape under high pressure.

- ▶ Operate the motor only within permissible maximum pressure.

Danger from suspended loads

Danger to life or risk of injury, damage to equipment.

Improper transportation may cause the Hågglunds motors to fall down leading to injuries e.g. crushed or broken bones or damage to the product.

- ▶ Make certain that the forklift truck or lifting device has adequate lifting capacity.
- ▶ Never stand under or put you hands under suspended loads.
- ▶ Ensure your position is stable during transportation.
- ▶ Use Personal Protective Equipment, PPE (e.g. safety glasses, safety gloves, suitable working clothes, safety shoes).
- ▶ Use suitable lifting device for transport and storage, installation and for removal and repair. Make sure the motor is well mounted or anchored when the lifting device is disconnected.
- ▶ Observe the prescribed position of the lifting strap.
- ▶ Observe the local Federal laws and regulations on work and health protection and transportation.

Pressurized machine/system

Danger to life or risk of injury, serious injuries when working on energized machines/systems. Damage to equipment.

- ▶ Protect the complete system against being energized.
- ▶ Make sure that the machine/system is depressurized. Please follow the machine/ system manufacturer's instructions.
- ▶ Do not disconnect any line connections, ports and components when the machine/system is pressurized.
- ▶ Switch off all power-transmitting components and connections (electric, pneumatic, hydraulic, mechanical) in accordance with the manufacturer's instruction and secure them against being switched back on.

WARNING

Escaping oil mist

Risk of explosion, fire, health hazard, environmental pollution.

- ▶ Depressurize the machine/system and repair the leak.
- ▶ Keep open flames and ignition sources away from the Hägglunds motors.
- ▶ If Hägglunds motors are to be situated in the vicinity of ignition sources or powerful thermal radiators, a shield must be erected to ensure that any escaped hydraulic fluid can not ignite, and to protect hose lines from premature aging.

CAUTION

High noise development in operation

Danger of hearing damage and hearing loss.

- ▶ The noise emission of Hägglunds motors depends on speed, operating pressure and installation conditions.
- ▶ Always wear hearing protection when in the vicinity of the operating Hägglunds motor.

Hot surfaces on the Hägglunds motor

Risk of burns.

- ▶ Allow the Hägglunds motors to cool down sufficiently before touching it.
- ▶ Wear heat-resistant protective clothing, e.g. gloves.

Improper routing of cables and lines

Tripping hazard and damage to equipment.

- ▶ Lay cables and lines so that they can not be damaged and nobody can trip over them.

Contact with hydraulic fluid

Hazard to health e.g. eye injuries, skin damage, toxication during inhalation.

- ▶ Avoid contact with hydraulic fluids.
- ▶ When working with hydraulic fluids, strictly observe the safety instructions provided by the lubricant manufacturer.
- ▶ Use your personal protective equipment (e.g. safety glasses, safety gloves, suitable working clothes, safety shoes).
- ▶ If hydraulic fluid inadvertently comes into contact with your eyes or bloodstream or is swallowed, consult a doctor immediately.

Escaping hydraulic fluid due to machine/system leakage

Risk of burns and risk of injury due to escaping oil jet.

- ▶ Depressurize and de-energiize the machine/system and repair the leak.
- ▶ Never attempt to block or seal the leak or oil jet with a cloth.

2.7 Personal protective equipment (PPE)

PPE is the responsibility of the user of the Hägglunds motors. Observe the safety regulations and provisions of your country. All components of the PPE must be intact.

3 General notes regarding property damages and product damages

NOTICE

Danger from improper handling

Product can be damaged.

- ▶ Do not expose the product to an impermissible mechanical load.
- ▶ Never use the product as a handle or step.
- ▶ Do not place/lay any objects on the product.
- ▶ Do not strike the Häggglunds motor or any part of it or its accessories.
- ▶ Do not set/place the Häggglunds motor on the drive shaft or fittings.
- ▶ Do not strike fittings (e.g. sensors or valves).
- ▶ Do not strike sealing surfaces (e.g. service line ports).
- ▶ Leave the protective covers on the Häggglunds motor until shortly before the lines are connected.
- ▶ Make sure that the electronics are not electro-statically charged (e.g. for painting operations).

Damage to equipment due to improper lubrication

Product can be damaged or destroyed.

- ▶ Never operate the Häggglunds motor with insufficient hydraulic fluid.
- ▶ When commissioning a machine/system, make sure that the case interior and the main lines of the Häggglunds motor are filled with hydraulic fluid and remain filled during operation.
- ▶ With above-reservoir installation, the case interior may drain via the drain line after longer standstill periods (air enters via the shaft seal).

Mixing of hydraulic fluids

Product can be damaged.

- ▶ Before installation, remove all fluids from the Häggglunds motor to prevent mixing with the hydraulic fluid used in the machine/system.
- ▶ Any mixing of hydraulic fluids of different manufacturers or different types of the same manufacturer is not permissible in general.

Damage from electro-welding

Product can be damaged.

- ▶ Do not perform electro-welding on the Häggglunds motor.
- ▶ Do not perform any electro-welding on the driven machine without disconnecting the pivoted attachment from ground.
- ▶ Do not perform any electro-welding at all on the driven machine with a flange mounted motor without providing some special grounding to avoid any current going through the hydraulic motor.
- ▶ Remove any sensitive electronic equipment before performing any electro-welding on the machine.

NOTICE

Contamination of the hydraulic fluid

The cleanliness of the hydraulic fluid has a considerable impact on the cleanliness and service life of the hydraulic system. Contamination of the hydraulic fluid could cause premature wear and malfunctions.

- ▶ Make sure that the working environment at the installation site is fully free of dust and foreign substances in order to prevent contaminants, such as welding beads or metal cuttings, from getting into the hydraulic lines and causing product wear or malfunctions. The Hägglunds motor must be installed in a clean condition.
- ▶ Use only clean connections, hydraulic lines and attachments (e.g. measuring equipment).
- ▶ No contaminants may enter the connections when they are plugged.
- ▶ Before commissioning, make sure that all hydraulic connections are tight and that all of the connection seals and plugs are installed correctly to ensure that they are leakproof and fluids and contaminants are prevented from penetrating the product.
- ▶ Use a suitable filter system to filter hydraulic fluid during filling to minimize solid impurities and water in the hydraulic system.

Improper cleaning

Product can be damaged.

- ▶ Plug all openings with the appropriate protective equipment in order to prevent detergents from entering the hydraulic system.
- ▶ Never use solvents or aggressive detergents. Use only water and, if necessary, a mild detergent to clean the Hägglunds motor.
- ▶ Do not point the power washer at sensitive components, e.g. shaft seal, electrical connections and components.
- ▶ Use lint-free cloths for cleaning.

Environmental pollution due to incorrect disposal

Careless disposal of the Hägglunds motor and its fittings, the hydraulic fluid and the packaging material could lead to pollution of the environment.

- ▶ Dispose of the Hägglunds motor, hydraulic fluid and packaging in accordance with the national regulations in your country.
- ▶ Dispose of the hydraulic fluid in accordance with the applicable safety data sheet for the hydraulic fluid.

Escaping or spilling hydraulic fluid

Environmental pollution and contamination of the ground water.

- ▶ Always place a drip tray under the Hägglunds motor when filling and draining the hydraulic fluid.
- ▶ Use an oil binding agent if hydraulic fluid is spilled.
- ▶ Observe the information in the safety data sheet for the hydraulic fluid and the specifications provided by the system manufacturer.

The warranty applies only to the delivered configuration.

The entitlement to warranty cover will be rendered void if the product is incorrectly installed, commissioned or operated, or if it is used or handled improperly.

4 Scope of delivery

Included in the delivery contents is Hägglunds CBm as per order confirmation.

5 About this product

5.1 Performance description

The Hägglunds CBm is a radial piston hydraulic motor that converts hydraulic flow into mechanical rotation. Refer to product-specific data sheet and the order confirmation for technical data, operating conditions and operating limits of the specific CBm motor.

5.2 Product description

The Hägglunds CBm is a radial piston hydraulic motor with a rotating cylinder block shaft and a stationary housing. The cylinder block is mounted in fixed roller bearings in the housing. An even number of pistons are radially located in bores inside the cylinder block, and the distributor directs the incoming and outgoing oil to and from the working pistons. Each piston is working against a cam roller. When the hydraulic pressure is acting on the pistons, the cam rollers are pushed against the slope on the cam ring that is rigidly connected to the housing, thereby producing a torque. The cam rollers transfer the reaction force to the piston which are guided in the rotating cylinder block. Rotation therefore occurs, and the torque available is proportional to the pressure in the system.

Oil main lines are connected to ports in the connection block and drain lines to ports in the motor housing.

The motor is connected to the shaft of the driven machine through the cylinder block. The torque is transmitted by splines or shrink disc coupling.

- 1 Cam ring
- 2 Cam roller
- 3 Piston
- 4 Cylinder block, spline
- 5 Cylinder block, hollow shaft
- 6 Shrink disc
- 7 Cylindrical roller bearing
- 8 Housing cover
- 9 Wear ring
- 10 Distributor
- 11 Connection housing
- 12 Product identification

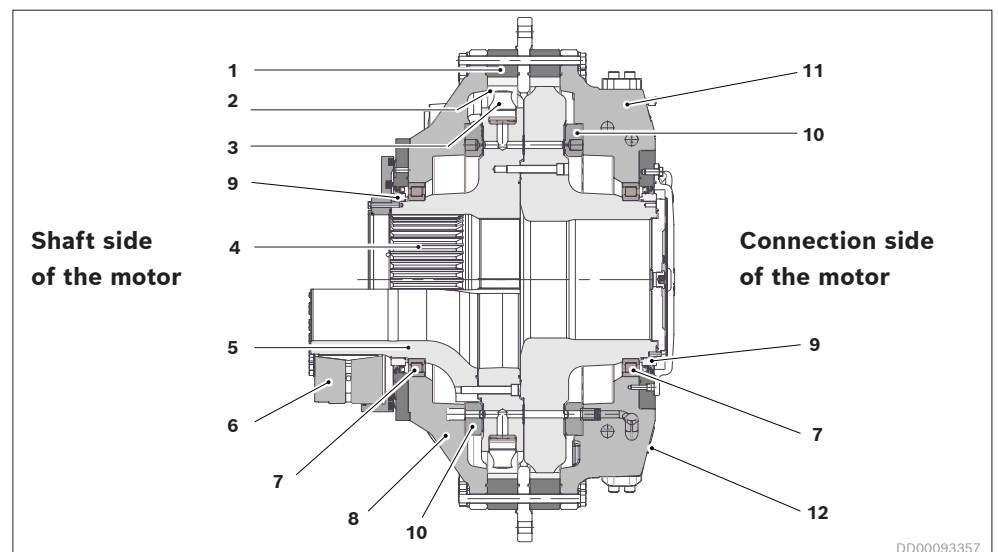


Fig. 1: The CBm radial piston motor

5.3 Product identification

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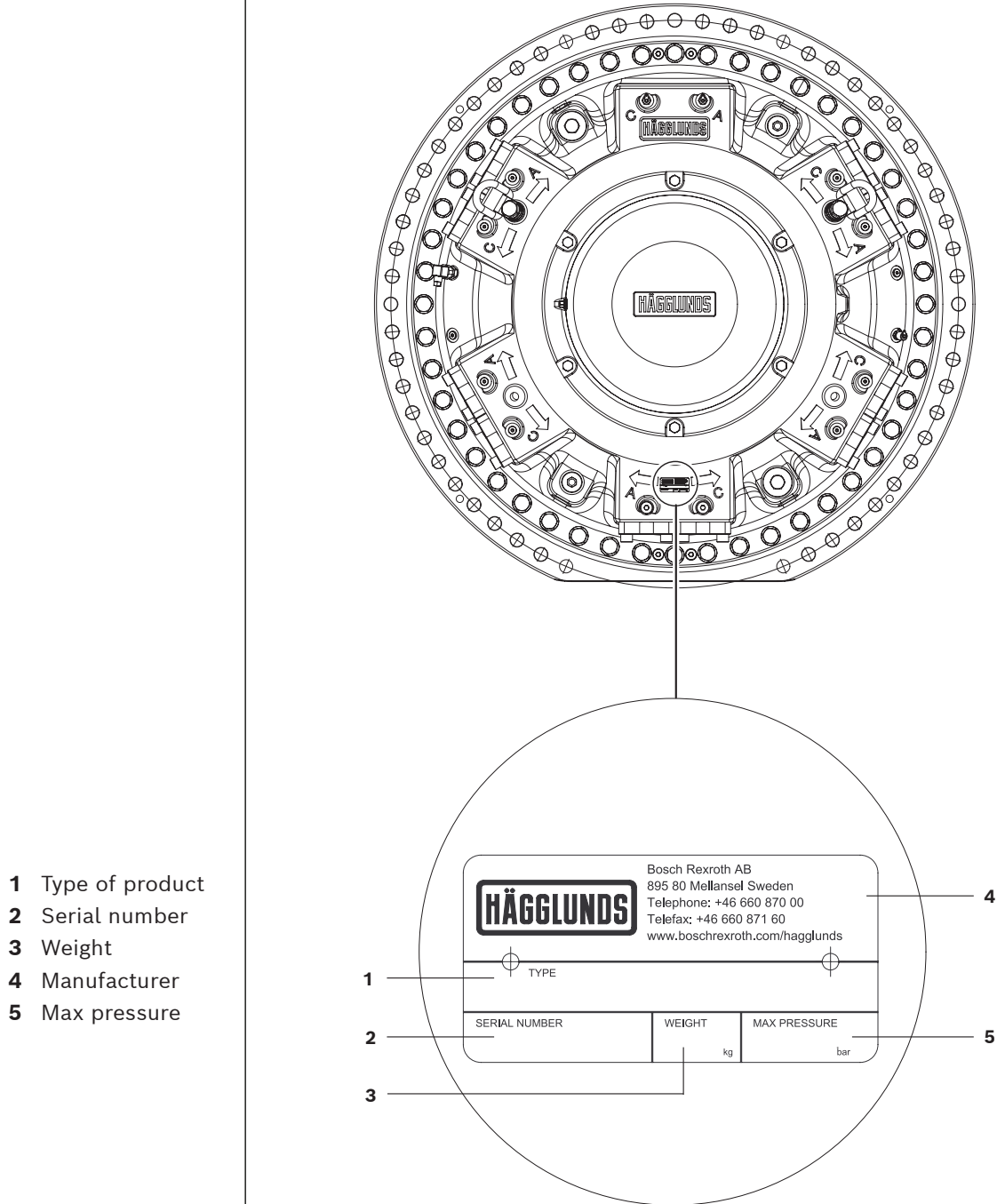


Fig. 2: Plate on motor

6 Transport and storage

6.1 Product transport

6.1.1 Lifting methods

! DANGER

Danger while transporting or lifting Häggglunds motors due to heavy weight!
 Danger to life, risk of injury or serious injuries and risk of damage to equipment!

- ▶ Make sure that lifting device is correctly installed and are approved for the total weight of motor and mounted accessories
- ▶ Do not stand under suspended load.

Danger if using wrong lifting eyes!
 Danger to life, risk of injury or serious injuries and risk of damage to equipment!

- ▶ Make sure the correct lifting eye is used, see Fig. 4: and Table 5.

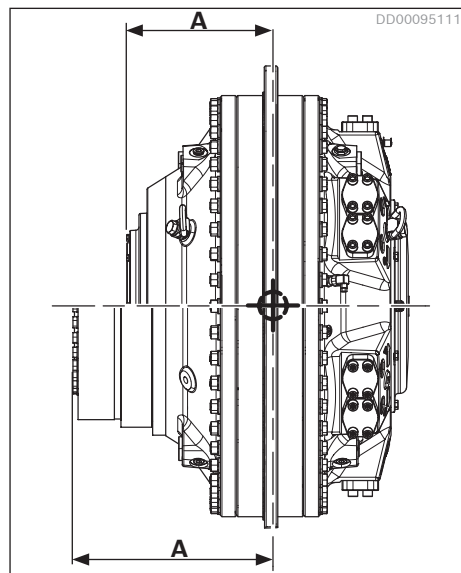


Fig. 3: Center of gravity

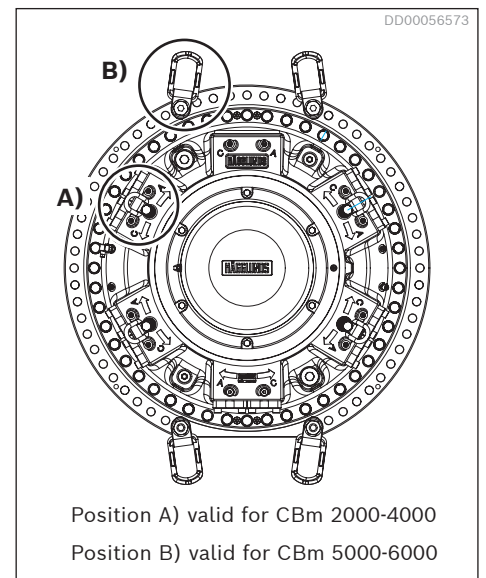


Fig. 4: Lifting eyes at motor

Table 4: Necessary and supplementary documentation Center of gravity

Motor	Measure A					
	Splines		Shrink disc coupling			
			Ø 360		Ø 340	
CBm 2000	445 mm	17.52 in	608 mm	23.9 in	571 mm	22.5 in
CBm 3000	502 mm	19.76 in	671 mm	26.4 in	—	—
CBm 4000	555 mm	21.85 in	—	—	—	—
CBm 5000	630 mm	24.80 in	—	—	—	—
CBm 6000	690 mm	27.17 in	—	—	—	—

Table 5: Tightening torque for lifting eyes

Motor type	Screw dimension	Number of screws	Tightening torque	
			Nm	lbf-ft
CBm 2000 to CBm 4000	M24	4	400	295
CBm 5000 to CBm 6000	M36	4	800	590

6.1.2 Lifting motors and accessories

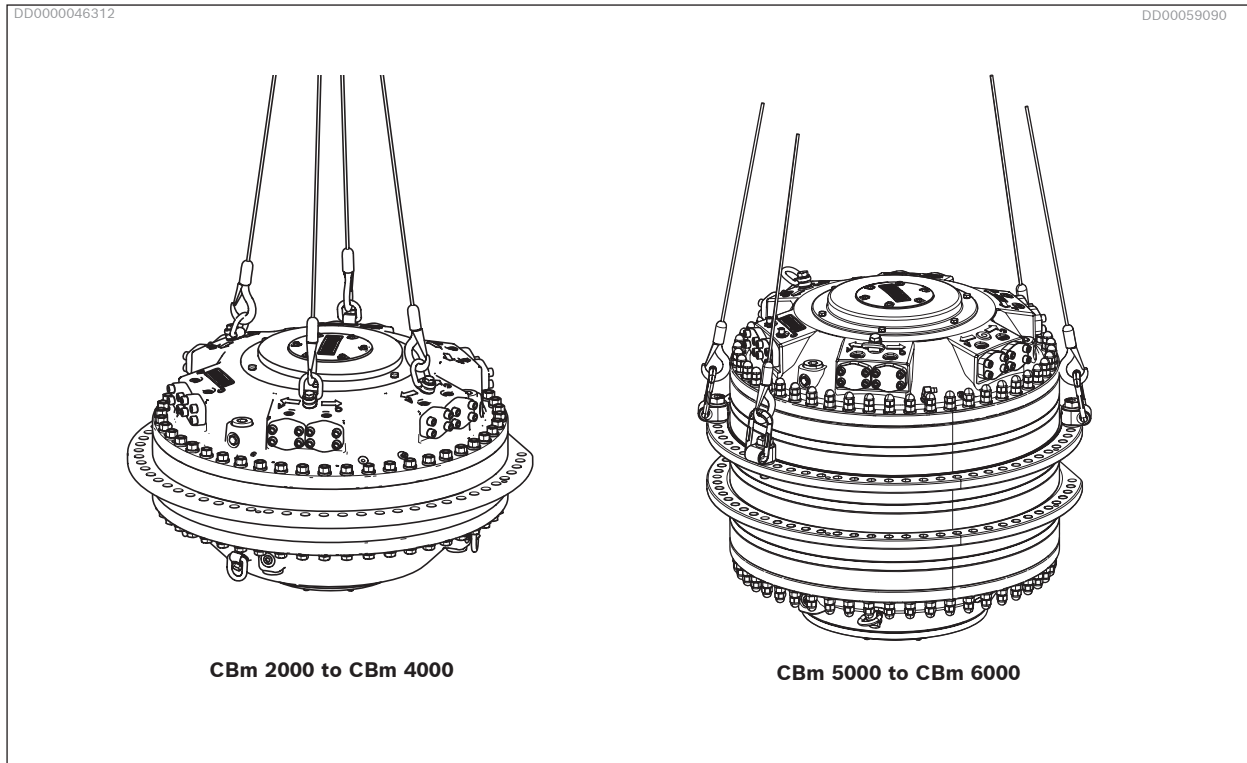


Fig. 5: Lifting motor with shaft in vertical plane

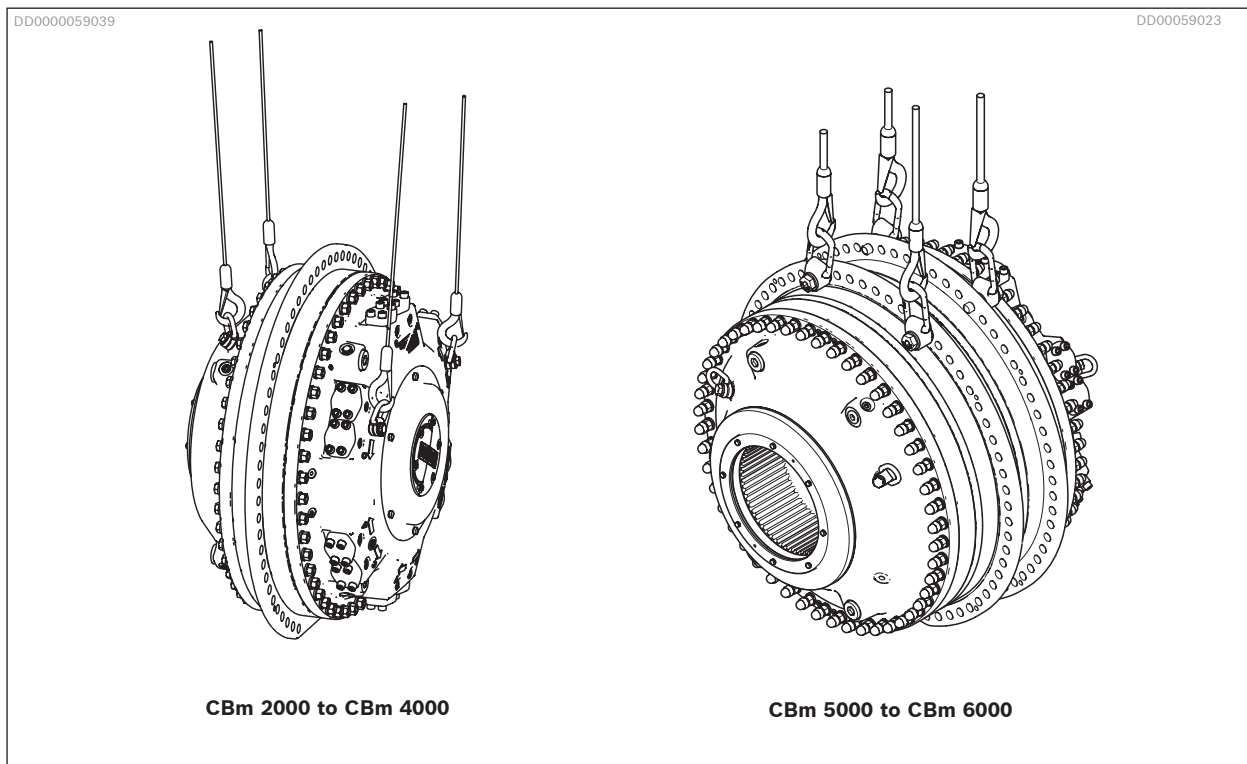


Fig. 6: Lifting motor with shaft in horizontal plane

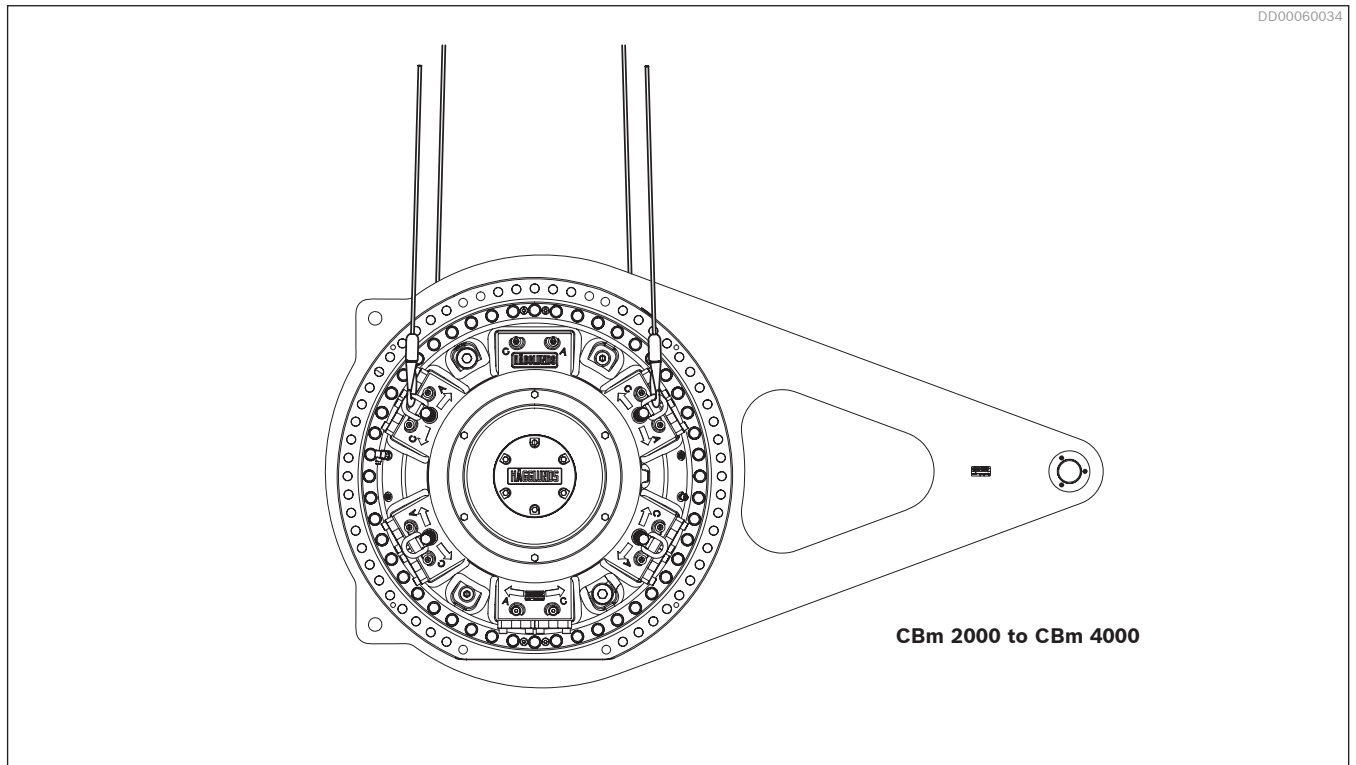


Fig. 7: Lifting motor and mounted single ended torque arm

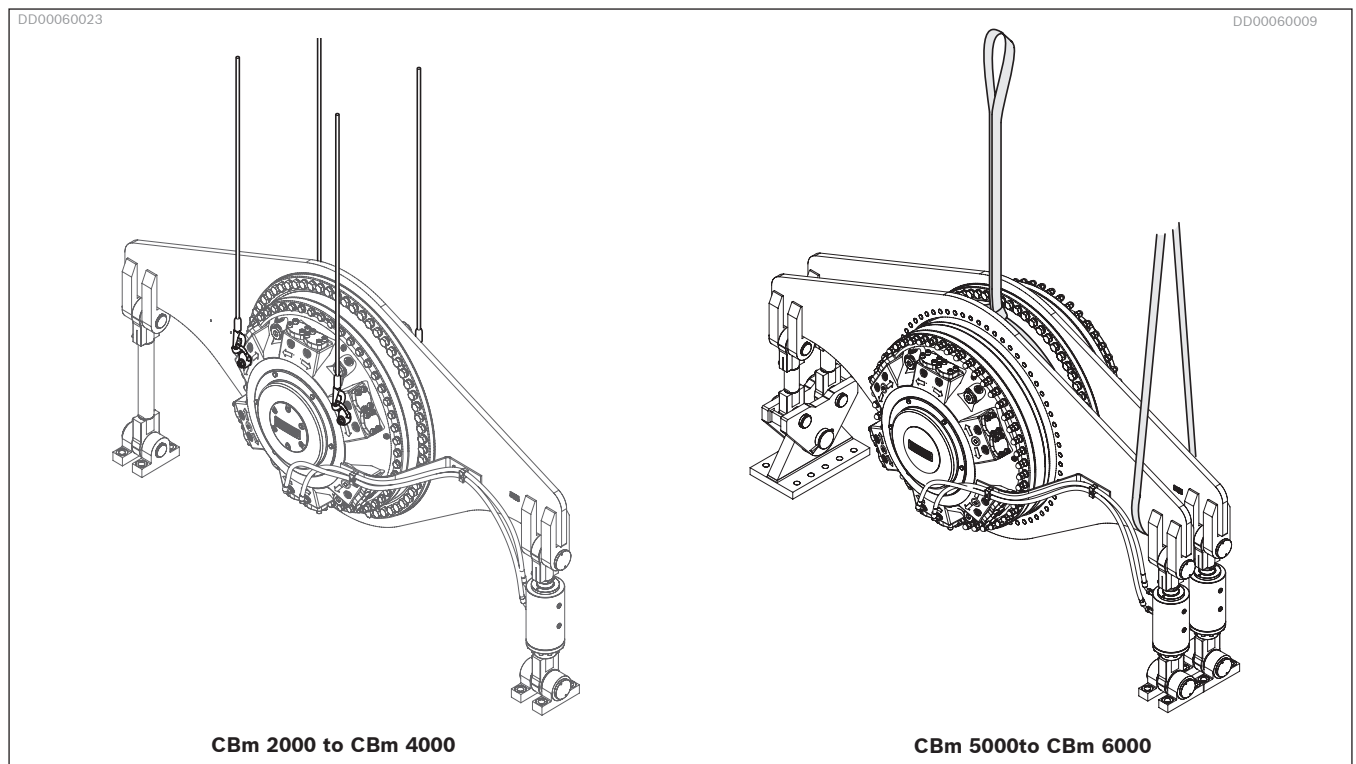


Fig. 8: Lifting motor and mounted double ended torque arm

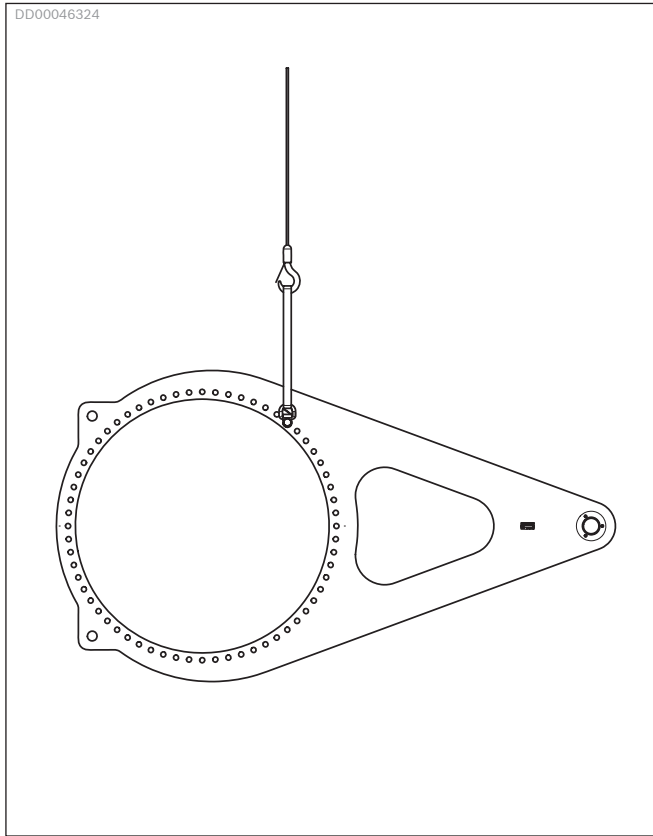


Fig. 9: Lifting single ended torque arm

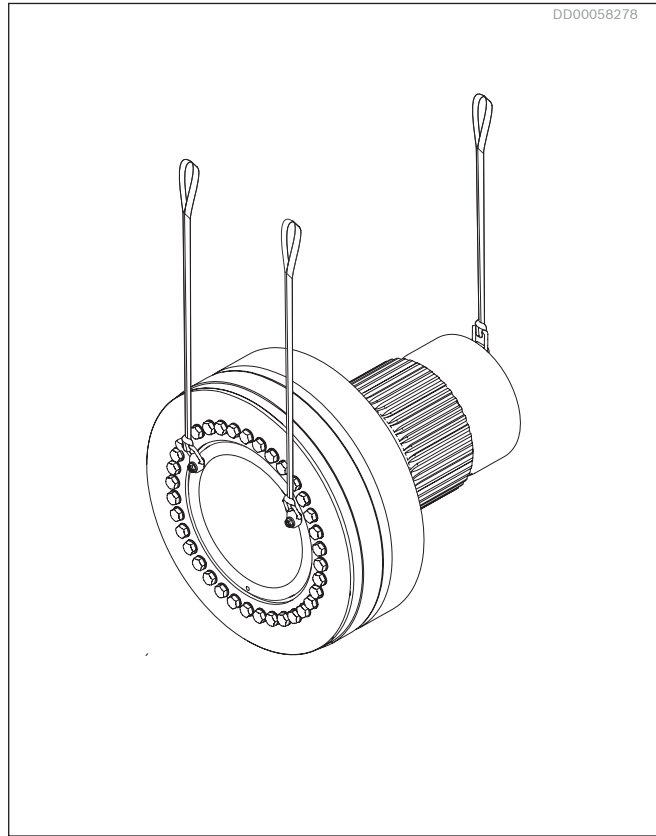


Fig. 10: Lifting Coupling adapter

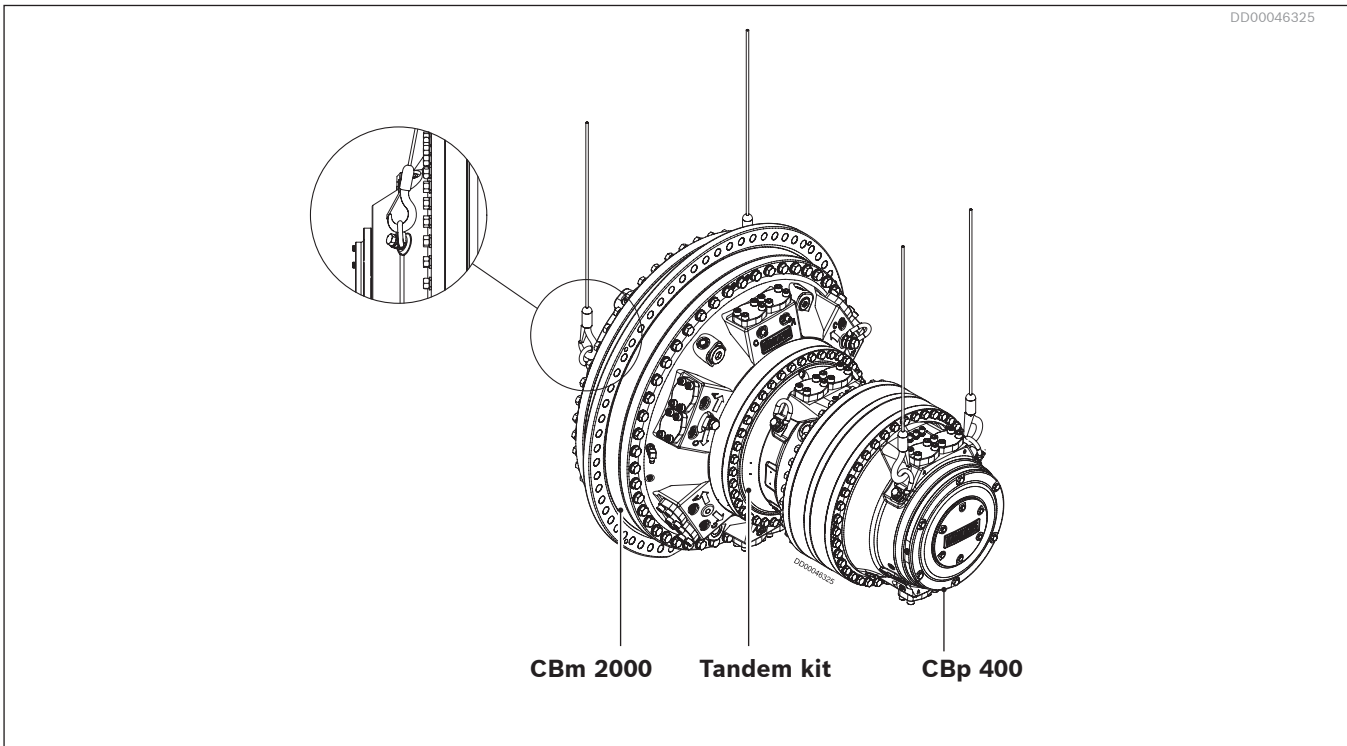


Fig. 11: Lifting CBm 2000 in tandem with CBp 400

6.2 Product storage

The motor is delivered with internal protection in form of an oil film with vapor state corrosion inhibitors, and external protection in form of a VCI plastic bag. This provides sufficient protection for indoor storage in normal temperatures for about 12 months.

6.2.1 Standing the motor on a flat surface

DANGER

Unsecured motor can fall!

Danger to life or risk of injury, damage to equipment!

- ▶ When in storage or during oil filling, the motor must always be secured from falling.

NOTICE

Incorrect placement of the motor!

Risk of damage to equipment.

- ▶ When in storage with shaft vertical, the motor must always be placed with the hollow shaft facing down.
- ▶ It is also advisable to provide supports at the mounting surface of the motor, see Fig. 12

When the motor is placed on a flat surface such as a floor, it must stand either on its outer diameter or on the suitably protected end face of the hollow shaft. It is also advisable to provide supports shown in Fig. 12.

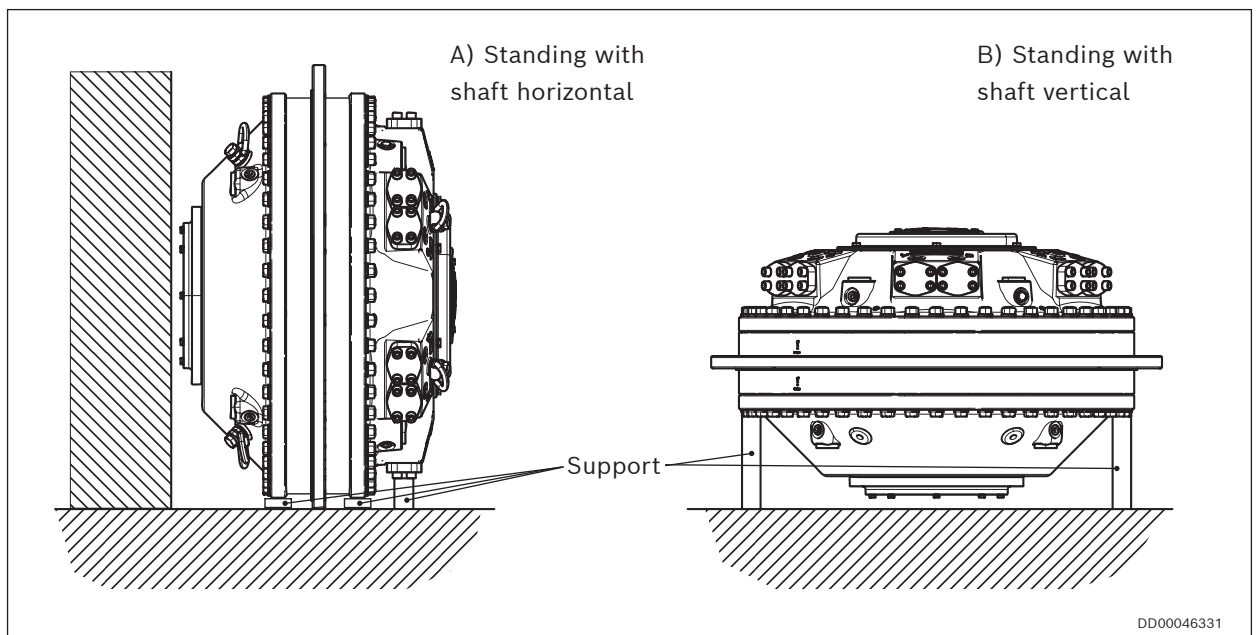


Fig. 12: CBm motor standing on a flat surface

6.2.2 Storing for extended periods or in uncontrolled environment

<h2 style="margin: 0;">NOTICE</h2>
<p>Insufficient cleanliness! Risk of damage to equipment. ► Take extreme care to ensure that no contamination enters inside the motor.</p>

If the motor is stored for more than 3 months in uncontrolled environment or more than 12 months in controlled environment, it must be filled full with oil according to below:

1. Place the motor as shown in *Fig. 12, alt.A*) Standing with shaft horizontal.
2. Fill the motor full with filtered oil containing a mixture of 0,4% FUCHS ANTICORIT VCI UNI O 40, or similar corrosion inhibitor compatible with the selected fluid in the following order: D1, A1 and C1.

NOTE! See *Table 6.* for oil volume

3. Fit the plug to D1.
4. Seal connections A1 and C1 with the cover plates fitted to the connection surfaces at delivery. Check that the O-rings or rubber seals are in position in the cover plates.
5. Position the motor as shown in *Fig. 12, alt. A*) Standing with shaft horizontal or B) Standing with shaft vertical.

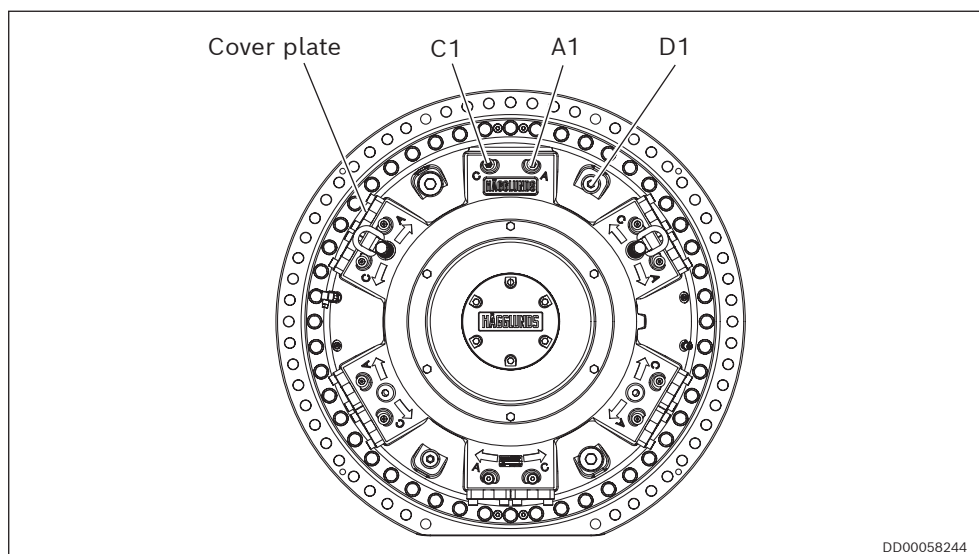


Fig. 13: Filling the motor with oil

Table 6: Motor case oil volume

Motor size	Motor case oil volume including channels	
	Litre	US gallon
CBm 2000	75	19.8
CBm 3000	91	24.0
CBm 4000	107	28.2
CBm 5000	123	32.4
CBm 6000	138	36.4

6.2.3 Storing during maintenance

If the motor has been in operation and the oil in the hydraulic system fulfills the requirements in [data sheet RE 15414](#), regarding water content, the drained motor can be stored for one month without additional rust protection.

The oil connections of the motor must be properly plugged/covered during the whole storage period to avoid any contamination or humidity/water to enter the motor.

If the storage time is longer than one month, follow the instructions in 6.2.2, or if the motor is kept on the shaft, the power unit must be started and the motor rotated once a month.

7 Installation

7.1 Unpacking

CAUTION

Danger from parts falling out!

If the packaging is not opened correctly, parts may fall out and damage the parts or even cause injuries!

- 1** Place the packaging on a flat and solid surface.
- 2** Only open the packaging from the top.
- 3** Remove the packaging from the Hägglunds motor.
- 4** Check the Hägglunds motor for transport damage and completeness, see chapter 4: *Scope of delivery*.
- 5** Dispose of the packaging according to the environmental regulations of your country.

7.2 Installation conditions

7.2.1 Spline shaft end

The splines shall be lubricated, with hydraulic oil or filled with transmission oil from the connected gearbox (see : *Mounting the spline motor to the coupling adapter/ driven shaft page 46*).

To avoid wear in the splines, the installation must be within the recommendations and specified tolerances according to data sheet [RE 15300](#).

7.2.2 Plain shaft end

Recommended design of driven shaft end on normally loaded shaft

In drives with only one direction of rotation and/or load where the stresses in the shaft are moderate, the shaft can be plain. For further information see data sheet [RE 15300](#).

Recommended design of driven shaft end on heavily loaded shaft

Where the driven shaft is heavily loaded and is subject to high stresses, for example for changes in the direction of rotation and/or load, it is recommended that the plain driven shaft should have a stress relieving groove. For further information see data sheet [RE 15300](#).

Thread for assembly tool

To make it easier to mount the motor on the driven shaft end or to remove the motor from the shaft it is recommended that a hole should be drilled and tapped in the centre of the shaft for a mounting tool. For further information see data sheet [RE 15300](#).

7.3 Required tools

7.3.1 Assembly tool for coupling adapter

An assembly tool can be used for easier and faster mounting of the coupling adapter to the driven shaft. The assembly tool is passed through the coupling adapter and screwed into the threaded hole in the driven shaft. The coupling adapter is pulled onto the shaft by turning the nut on the assembly tool.

Material ID Assembly tool for coupling adapter:

Material ID R939003803

For installations when the threaded hole on the customer shaft is M30, a M30 to M20 adapter, material ID R939067679, must be used on the customer shaft.

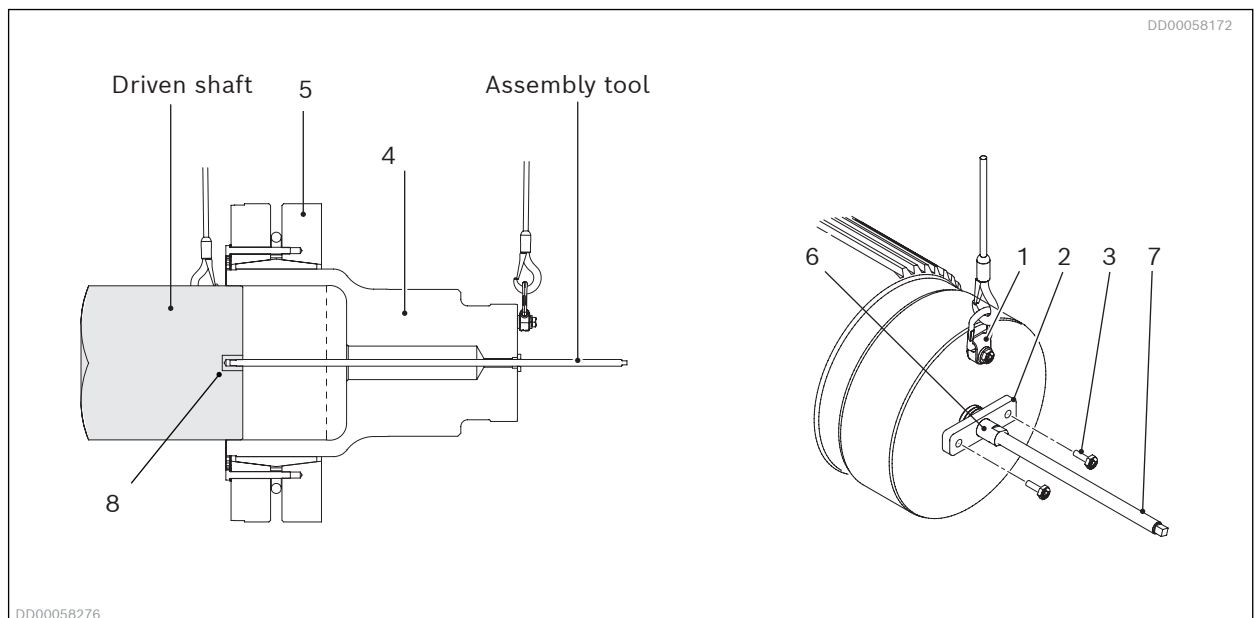


Fig. 14: Mounting coupling adapter with assembly tool

Coupling adapter:

- 1 Lifting eye
- 2 Dismounting tool
- 3 Screws
- 4 Adapter shaft
- 5 Shrink disc

Assembly tool for coupling adapter:

- 6 Nut
- 7 Carriage beam
- 8 Adapter M30 to M20 (included in delivery)

7.3.2 Tool for spline alignment

Before the motor is mounted on the driven shaft, the spline teeth in the cylinder block must be aligned against the spline teeth gap of the driven shaft. The spline align tool is used to rotate the cylinder block to the correct position.

The tool is also recommended to be used when mounting the mounting kit as a support for the socket and torque multiplier.

Material ID Spline alignment tool:

Material ID R939061395

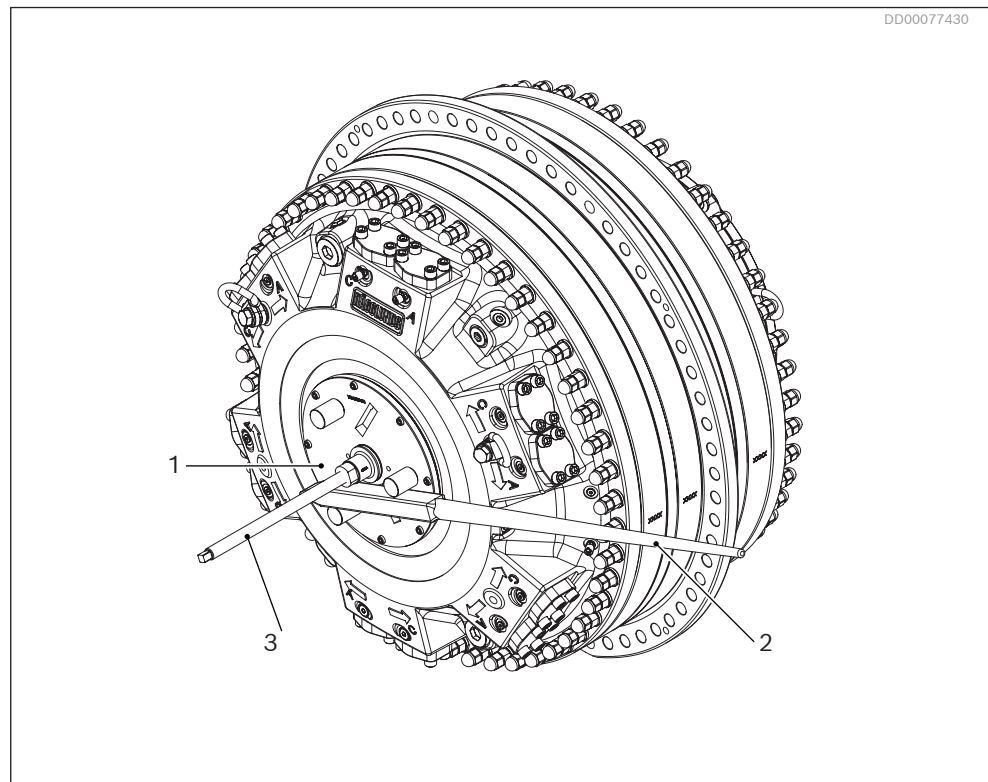


Fig. 15: Spline align tool

- 1 Spline align tool
- 2 Bar (Not included)
- 3 Assembly tool R939003866 (not included)

Mount the spline alignment tool

1. Remove the end cover including screws and washers (**pos A & B**).
2. Remove the retainer, including screws (**pos C & D**).
3. Mount the spline align tool with screws (**pos C & E**).

Remove the spline alignment tool

Step 1 to 3 above in reverse order to remove the tool. Tightening torque according to Fig. 16.

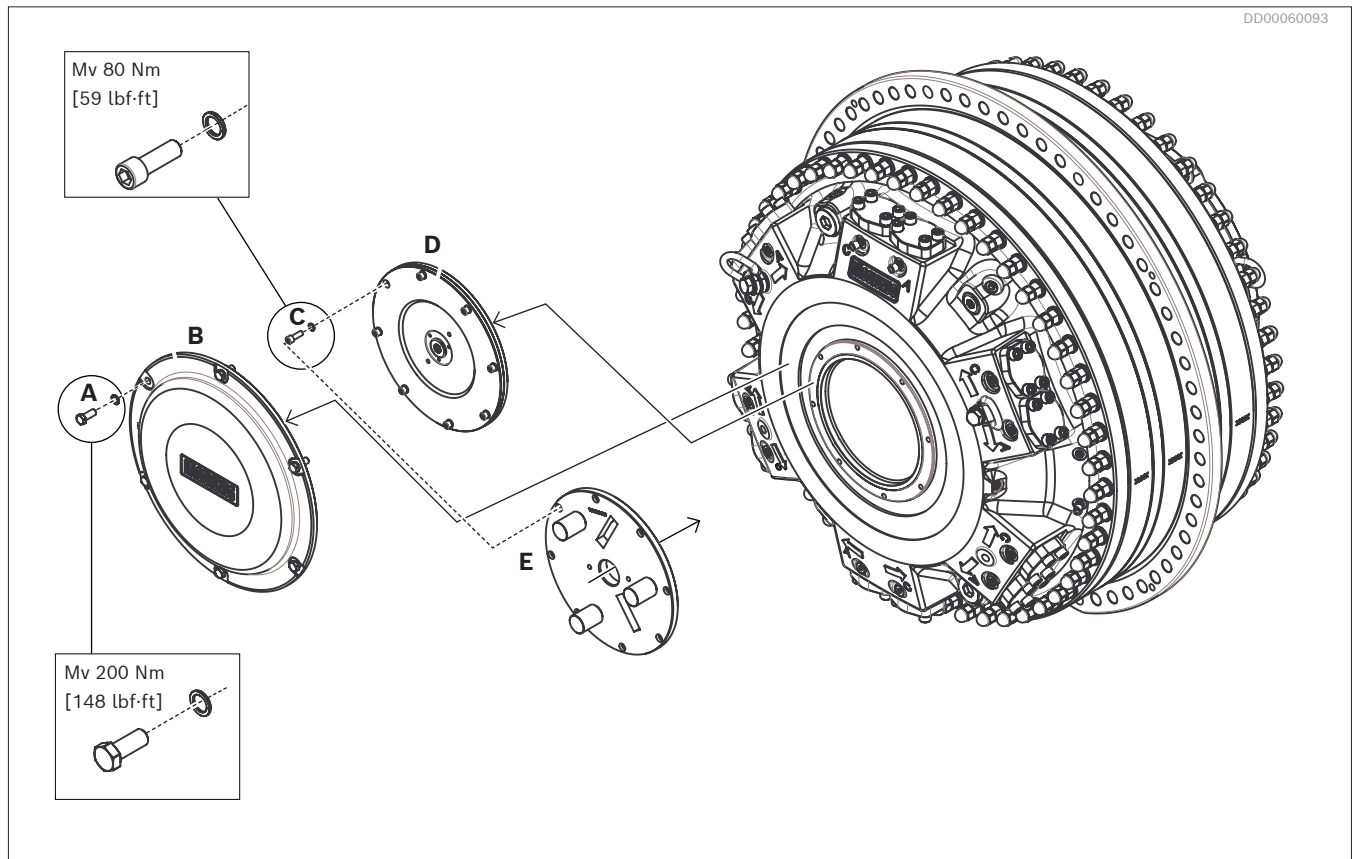


Fig. 16: Mounting the spline alignment tool

7.3.3 Assembly tool for motor

For easier and faster mounting of the CBm motor on the coupling adapter or driven shaft, a special assembly tool can be used. The assembly tool is passed through the motor and screwed into the pre made thread in the coupling adapter or driven shaft. The motor is pulled onto the shaft by turning the nut on the assembly tool.

Material ID Assembly tool for CBm motor:

Material ID R939003866

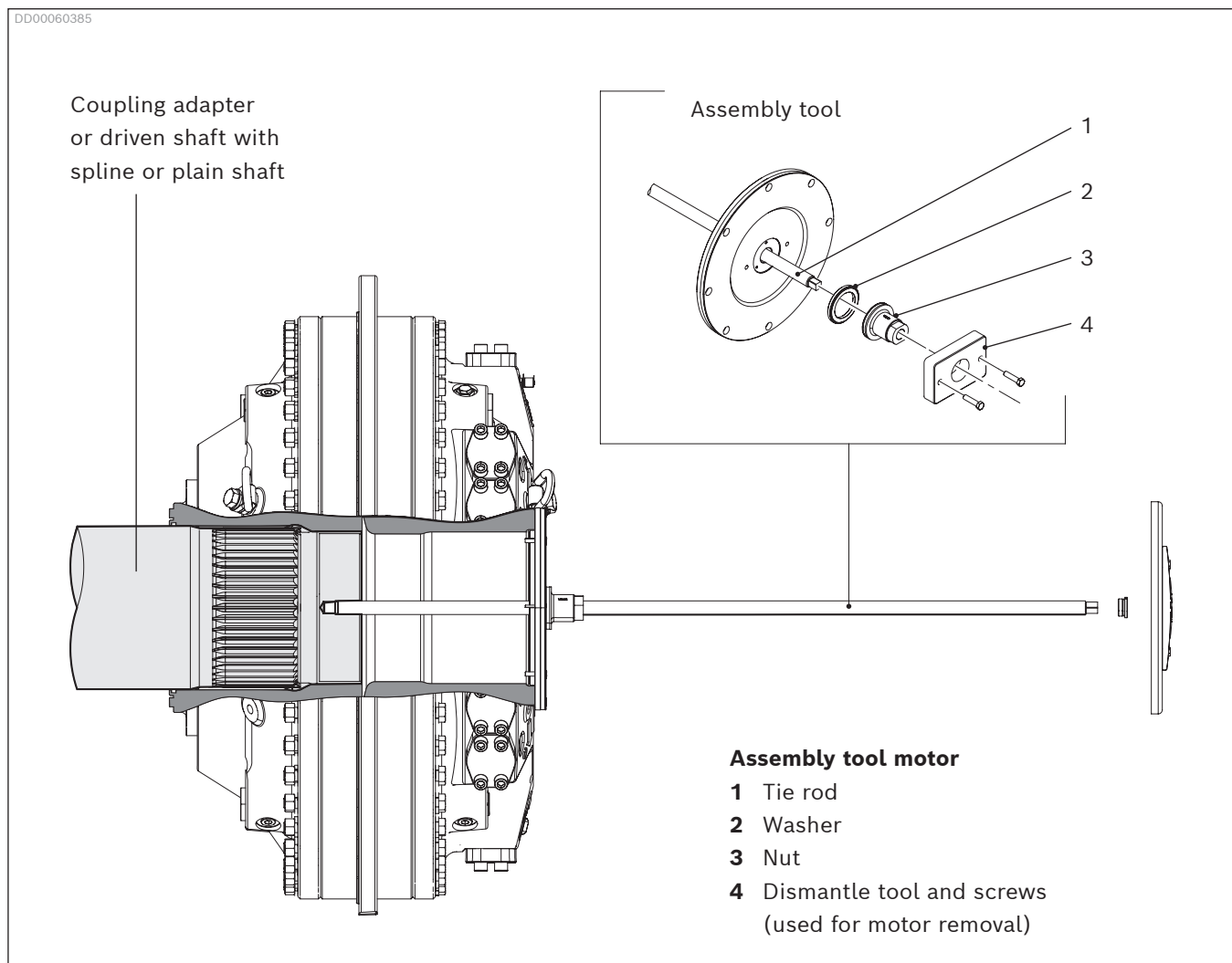


Fig. 17: Mounting CBm motor with assembly tool

7.4 Product installation

Before the installation, drain all fluids from the motor.

CAUTION

Risk for pressurised hydraulic fluid in the motor due to temperature variations!

Risk health hazard, environmental pollution!

- ▶ Be careful when opening plugs
- ▶ Use your personal protective equipment (e.g. safety glasses, safety gloves)

7.4.1 Fitting the torque arm on the motor

NOTICE

Unauthorized processing of component

Risk of damage equipment

- ▶ Do not weld, drill, grind or carry out any similar work on the torque arm without Bosch Rexroth approval.

General information for TC A and DTCBM

The torque arm shall be fitted to the motor before the motor is mounted on the driven shaft. See also data sheet [RE 15355](#)

1. Clean the mating surfaces on the torque arm and motor.
2. Oil the screws (1).
3. Make sure that the foundation can withstand the forces from the torque arm, see *Fig. 25, Fig. 33, Table 9 and Table 12*.
4. The motor case must be turned until the drain outlets are positioned according to *7.4.6: Draining and venting the motor*.
5. Mount the torque arm on the motor with the screws and washers.
6. Tighten the screws (1) to the torque stated in *Table 7: Screw dimensions*.

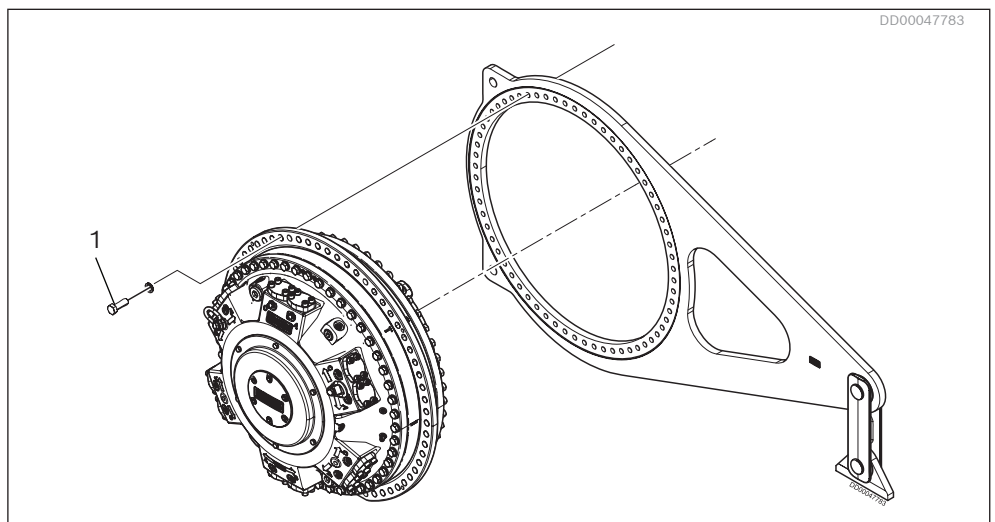


Fig. 18: Mounting single ended torque arm TC A 2000 and TC A 4000 for CBm 2000 to CBm 4000

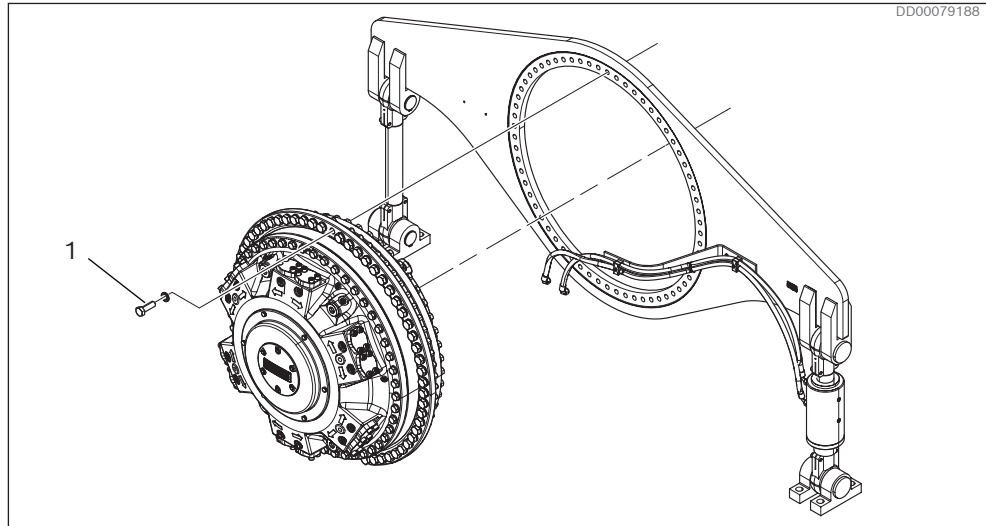


Fig. 19: Mounting double ended torque arm DTCBM 1600 to 4000 for CBm 2000 to CBm 4000

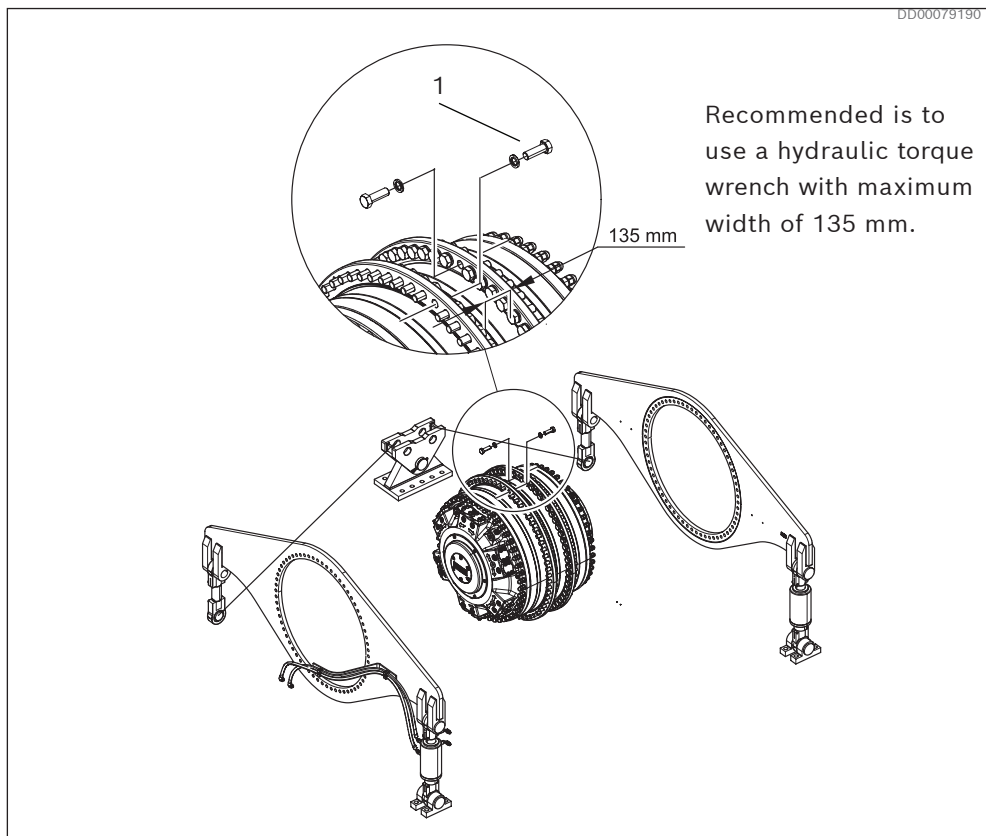


Fig. 20: Mounting double ended torque arm DTCBM 4600 to 6000 for CBm 5000 to CBm 6000

Table 7: Screw dimensions

Torque arm	Motor type	Screw dimension	Number of screws	Tightening torque Nm	lbf·ft
TC A 2000	CBm 2000	M30x90 10.9	57	1840	1357
TC A 4000	CBm 3000 to CBm 4000	M30x90 10.9	57	1840	1357
DTCBM 1600 to 4000	CBm 2000 to CBm 4000	M30x90 10.9	57	1840	1357
DTCBM 4600 to 6000	CBm 5000 to CBm 6000	M30x90 10.9	114	1840	1357

7.4.2 Single ended torque arm installation

The single ended torque arm is fitted to the motor before the motor is mounted on the driven shaft. See 7.4.1: *Fitting the torque arm on the motor, Fig. 18.*

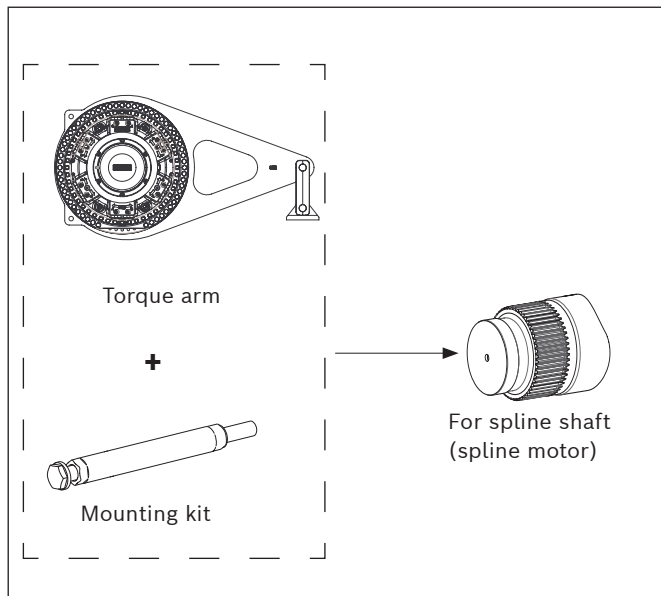


Fig. 21: Single ended torque arm mounting at spline shaft, only allowed for CBm 2000 to CBm 4000 (Not allowed for CBm 5000 to CBm 6000)

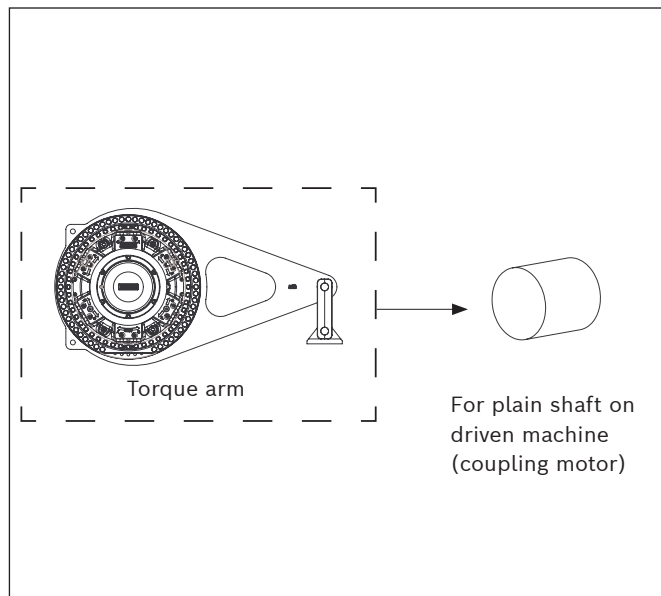


Fig. 22: Single ended torque arm mounting for plain shaft (Only for CBm 2000 and CBm 3000 coupling version)

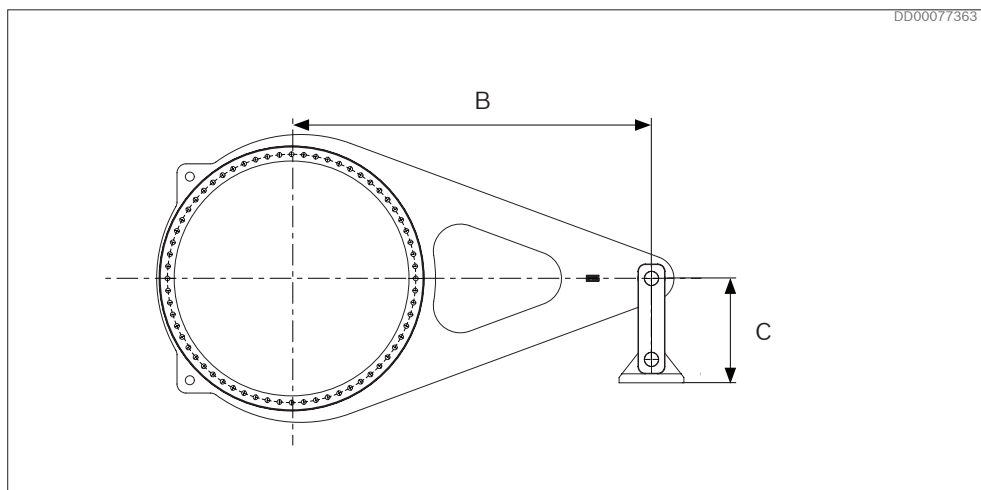


Fig. 23: Single ended torque arm TC A

Table 8: Dimensions torque arm TC A

Torque arm	Motor type	B		C		Weight	
		mm	in	mm	in	kg	lb
TC A 2000	CBM 2000	2 000	78.74	580	22.83	445	981
TC A 4000	CBM 3000 to CBm 4000	3 000	118.11	690	27.17	875	1 929

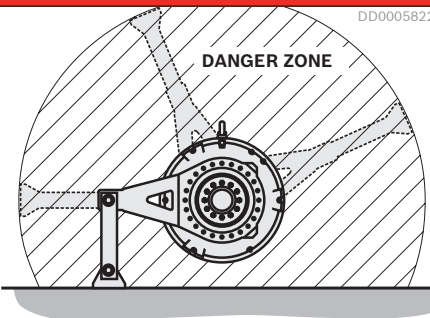
Mounting of articulated connection

DANGER

Torque arm and articulated connection rotates with the motor!

Risk to life and risk of injury or serious injuries and risk of damage to equipment!

- ▶ Make sure the foundation and the customer machine, can withstand the forces from the torque arm. See *Fig. 25, Fig. 33, Table 9 and Table 12*
- ▶ Do not stand in the danger zone.



WARNING

Heating of material (welding).

Risk of fire, health hazard, damage to equipment, environmental pollution!

- ▶ Only perform welding work when the machine/system is depressurized.
- ▶ The product is painted with thermosetting plastic paint containing an isocyanate component. When a thermosetting plastic paint is heated to over 150-175°C, gases are emitted that can cause serious health risk. If hot work (e.g. welding) is done on the product, protective breathing equipment must be used.
- ▶ Never use motor as grounding point.

- 1 $x \leq \pm 2 \text{ mm}$ (0,079 inch) misalignment in installation.
 $x \leq \pm 15 \text{ mm}$ (0,59 inch) movement when in use.
- 2 The spherical plain bearing must be dismantled during welding. See Fig. 26 and Fig. 27 and the articulated connection must be disconnected.
- 3 Steel: EN 10025-3 – S355N (1.0545), Protected against corrosion, after welding.

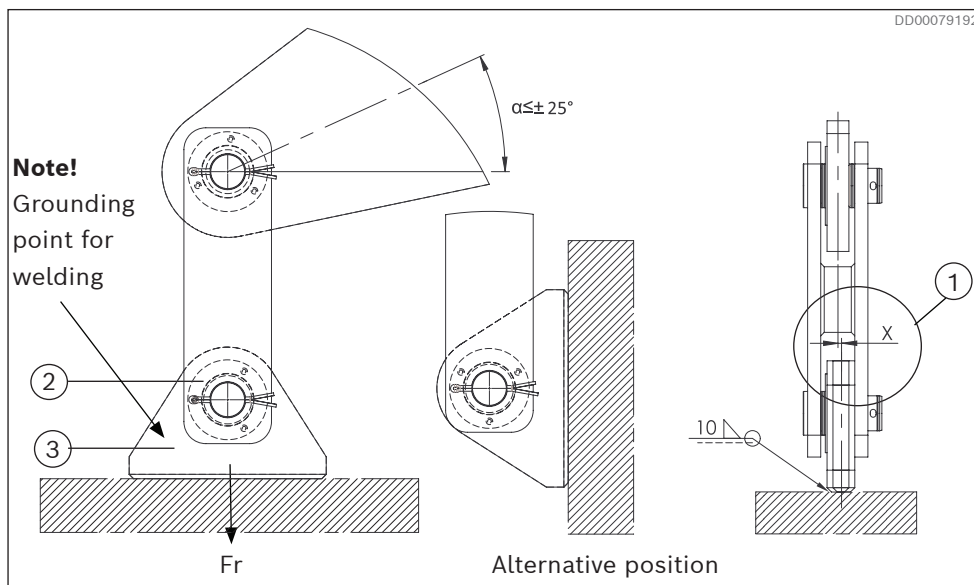


Fig. 24: Installation instruction for articulated connection for TC A

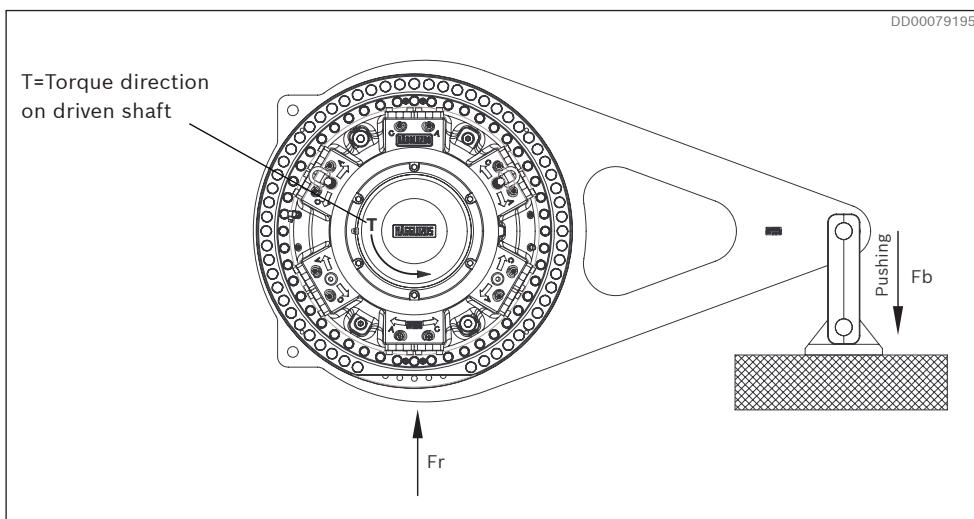


Fig. 25: External forces Fr, Fb for TC A

Table 9: External forces single ended torque arm valid for a pressure difference of 420 bar [6000 psi] static

Torque arm	Motor	Force Fb		Force Fr ¹⁾	
		N	lbf	N	lbf
TC A 2000	CBM 2000 2000	420 000	94 419.76	375 845	84 493.32
TC A 4000	CBM 3000 3000	308 000	69 241.15	251 553	56 551.36
TC A 4000	CBM 4000 4000	560 000	125 893.00	495 705	111 438.90

¹⁾ The force Fr is calculated including the weight of motor and torque arm.

1. The bearing shall be mounted so that the slot in the outer ring is perpendicular towards the load direction. See Fig. 26 (also valid for Fig. 27)
2. The bearing (5) shall be mounted by using a mounting sleeve or tube applied on the bearing outer ring.
3. Mount the screws (6) with a tightening torque 47 Nm [34,.67lb ft]
4. Assemble the rest of the components according to Fig. 26 and Fig. 27

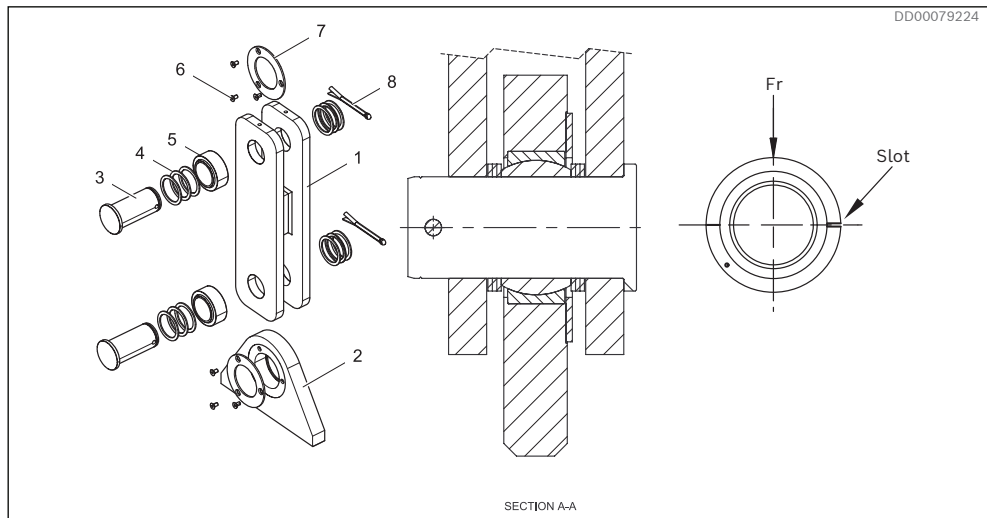


Fig. 26: Articulated connection TC A

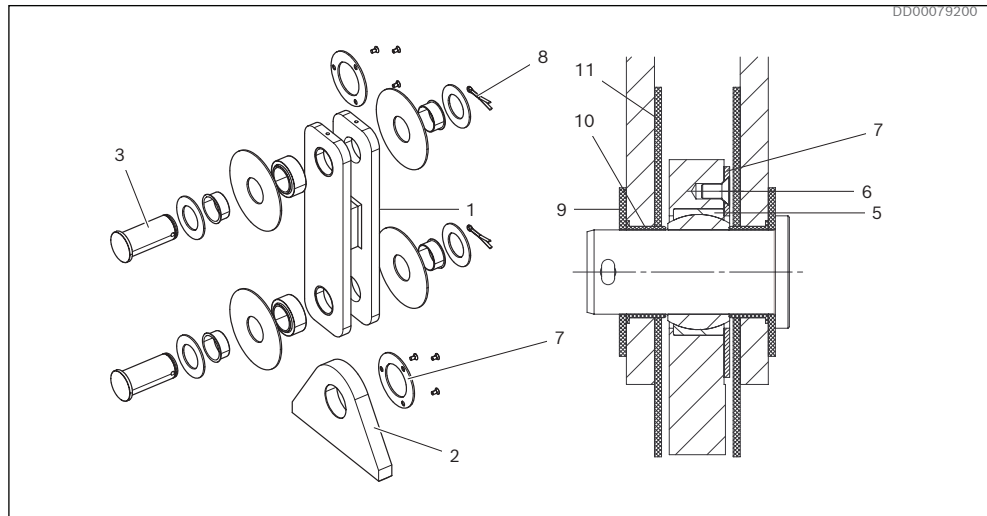


Fig. 27: Electrical isolated articulated connection TC A

Pos	Description	Pcs	Pos	Description	Pcs
1	Linkage part	1	7	Bearing cover	2
2	Fastening support	1	8	Split pin	2
3	Bolt	2	9	Washer (electrical isolated)	4
4	Supporting disc	12	10	Bushing (electrical isolated)	4
5	Spherical plain bearing	2	11	Washer (electrical isolated)	4
6	Countersunk head screw	6			

7.4.3 Double ended torque arm installation

The double ended torque arm is fitted to the motor before the motor is mounted on to the driven shaft, see 7.4.1: *Fitting the torque arm on the motor* See Fig. 19 and Fig. 20.

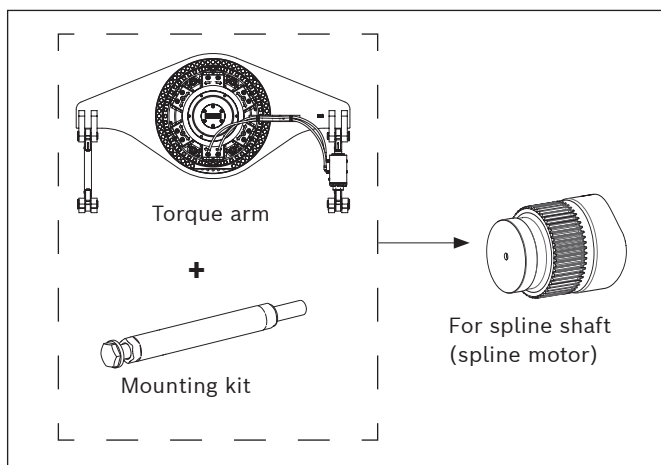


Fig. 28: Double ended torque arm mounting at spline shaft

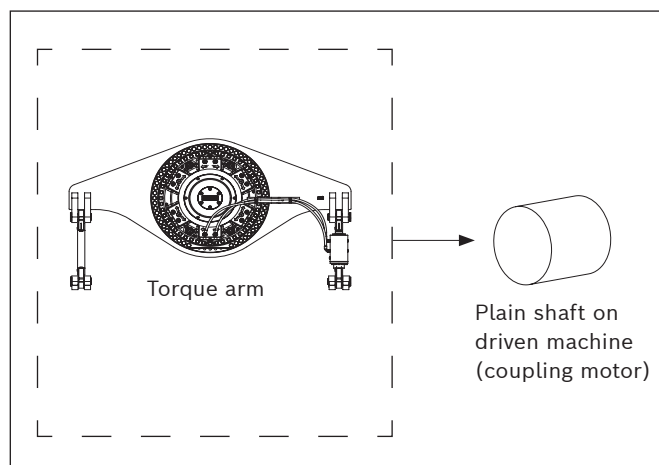


Fig. 29: Double ended torque arm mounting at plain shaft (Only for CBm 2000 and CBm 3000 coupling version)

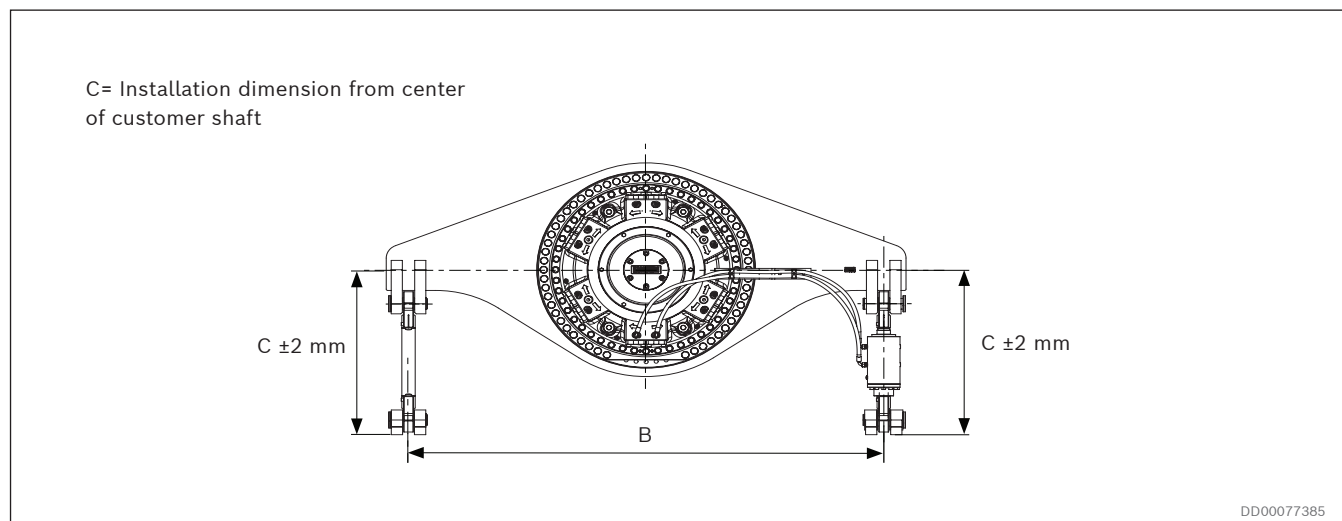


Fig. 30: Double ended torque arm DTCBM

Table 10: Dimensions torque arm DTCBM

Torque arm	B		C		Weight	
	mm	in	mm	in	kg	lb
DTCBM 1600	2 800	110.24			740	1 631
DTCBM 2600	3 200	125.98			850	1 874
DTCBM 3600	3 600	141.73			950	2 094
DTCBM 4000	4 200	165.35	1 235	48.62	1 130	2 491
DTCBM 4600	2 800	110.24			1 760	3 880
DTCBM 5600	3 200	125.98			1 960	4 321
DTCBM 6000	3 600	141.73			2 170	4 784
DTCBM 1600 electrical isolated	2 800	110.24			740	1 631
DTCBM 2600 electrical isolated	3 200	125.98			850	1 874
DTCBM 3600 electrical isolated	3 600	141.73	1 558	1 149.12	950	2 094
DTCBM 4000 electrical isolated	4 200	165.35			1 130	2 491

Mounting of hydraulic cylinder and articulated connection DTCBM 1600 to DTCBm 4000

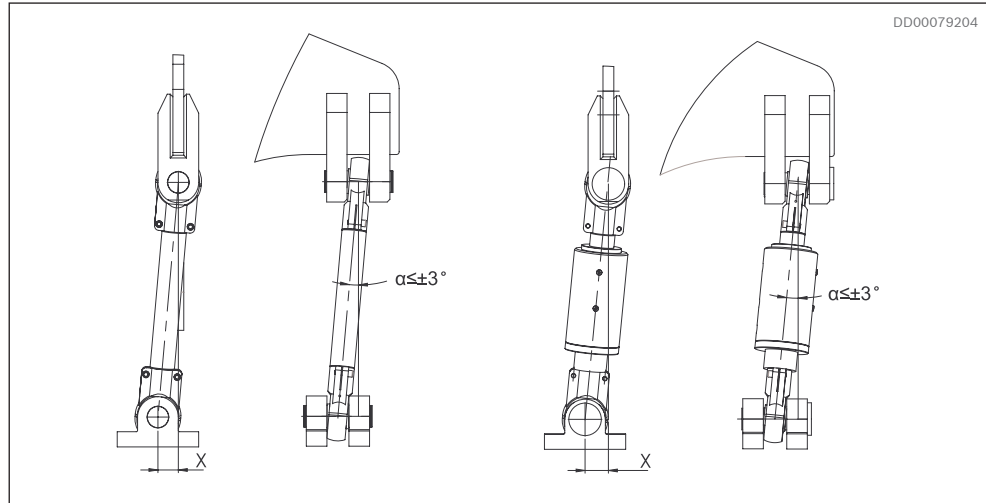


Fig. 31: Installation instruction for articulated connection and hydraulic cylinder for DTCBM 1600 to DTCBM 4000

- 1 $x \leq \pm 2$ mm (0,079 inch) misalignment in installation.
 $x \leq \pm 15$ mm (0,59 inch) movement when in use.
- 2 Hole pattern and dimensions for ground attachment see *Fig. 32 and Table 11*

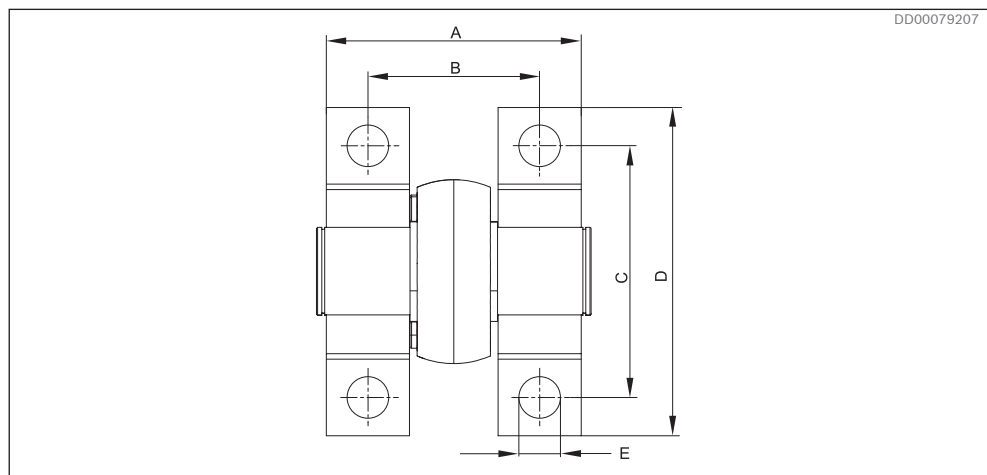


Fig. 32: Hole pattern articulated connection and hydraulic cylinder for DTCBM 1600 to DTCBM 4000

Table 11: Hole pattern dimensions for articulated connection and hydraulic cylinder DTCBM 1600 to DTCBM 4000

Torque arm	A		B		C		D		E	
	mm	in	mm	in	mm	in	mm	in	mm	in
DTCBM 1600 to 4000	233	9.17	158	6.22	230	9.06	606	23.86	38	1.50
DTCBM 1600 to 4000 electrical isolated	245	9.65	169	6.65	230	9.06	300	11.81	38	1.50

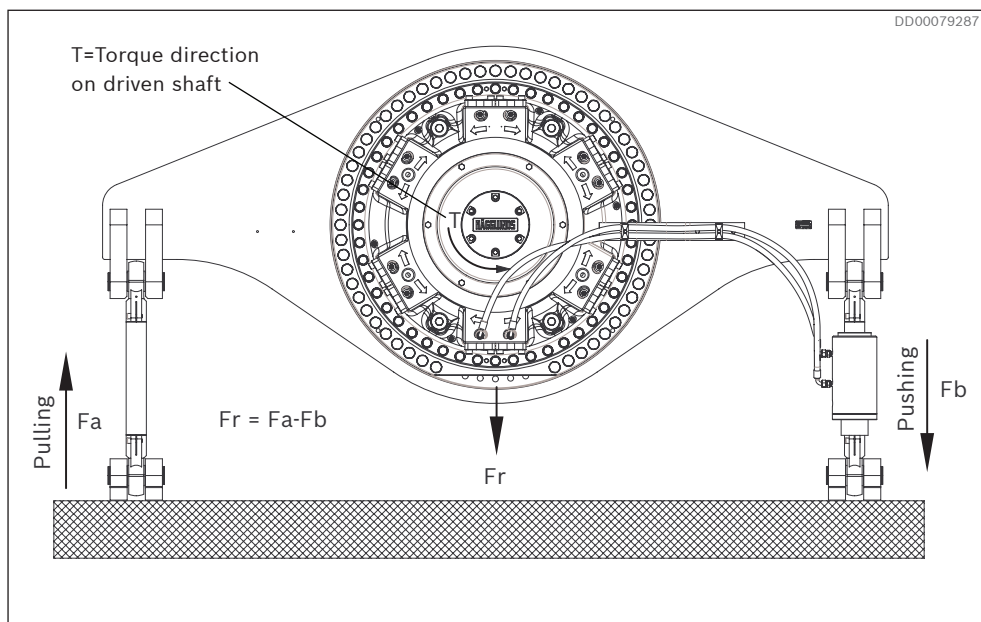


Fig. 33: External forces Fr, Fa, Fb for DTCBM

Table 12: External forces double ended torque arm valid for a pressure difference of 420 bar [6000 psi] static

Torque arm	Motor	Force Fa, Fb on foundation		Force Fr on driven shaft ¹⁾	
		N	lbf	N	lbf
DTCBM 1600 12	CBM 2000 1200	167 600	37 677.98	48 502	10 903.68
DTCBM 1600 13	CBM 2000 1600	233 800	37 677.98	70 957	15 951.77
DTCBM 2600 13	CBM 2000 1800	227 000	51 031.63	64 086	14 407.11
DTCBM 2600 14	CBM 3000 2200	290 000	65 194.59	101 912	22 910.73
DTCBM 2600 15	CBM 3000 2600	320 000	52 560.33	66 094	14 858.52
DTCBM 3600 15	CBM 3000 3000	336 000	75 535.80	82 125	18 462.43
DTCBM 3600 16	CBM 4000 3600	404 000	71 938.86	98 822	22 216.07
DTCBM 4000 16	CBM 4000 4000	367 100	90 822.81	62 179	13 978.40
DTCBM 4600 17	CBM 5000 4600	636 200	82 527.36	64 940	14 599.09
DTCBM 5600 17	CBM 6000 5600	710 500	143 023.40	114 590	25 760.86
DTCBM 6000 17	CBM 6000 6000	646 400	159 726.80	82 527	18 552.81

¹⁾ The force Fr is calculated included the weight of spline motor and torque arm.

1. Mount the articulated connection on the left side of the torque arm (viewed from the motor main connection side), use the pins (2) and lock them in place with circlips (3).
2. Mount the hydraulic cylinder with the piston rod facing upwards on the right side of the torque arm (viewed from the motor main connection side), use the pins (2) and lock them in place with circlips (3). Turn the cylinder so the hydraulic connections A, B & C are facing the motor.
3. Check and adjust the distance C for the cylinder according to *Table 10* (Note! depending on application this distance can be different). Shim between the torque arm attachment brackets and the foundation or if possible, adjust the mounting plate of the foundation to reach the required distance.
4. Attachment brackets (6) for torque arm should be fastened with screws (7)

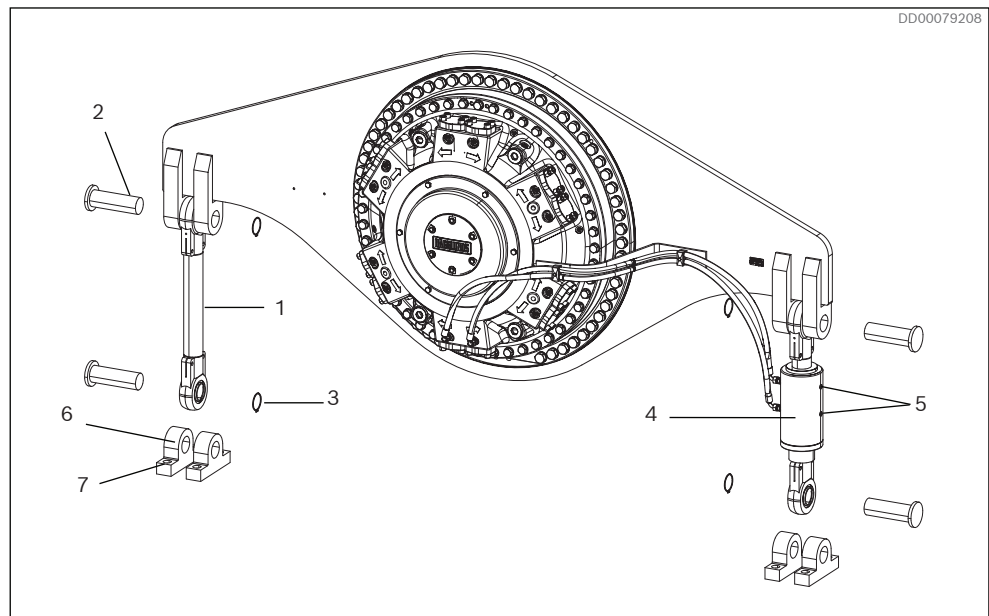


Fig. 34: Articulated connection and hydraulic cylinder for DTCBM 1600 to DTCBM 4000

Pos	Description	Tightening torque	Pcs
1	Articulated connection		1
2	Shaft		4
3	Circlips		4
4	Hydraulic cylinder		1
5	Air bleeding G ¼"		2
6	Attachment brackets		4
7	Screw M36-8.8	2280 Nm / 1681 lbf ft	8 (Not included in delivery)

Mounting of hydraulic cylinder and articulated connection DTCBM 4600 to DTCBM 6000

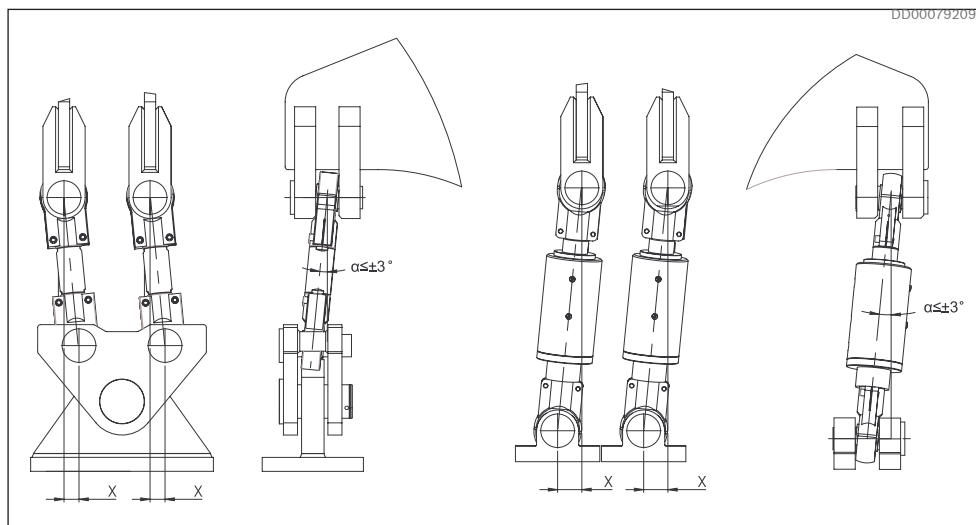


Fig. 35: Installation instruction for articulated connection and hydraulic cylinder for DTCBM 4600 to DTCBM 6000

- 1 $x \leq \pm 2 \text{ mm}$ (0,079 inch) misalignment in installation.
 $x \leq \pm 15 \text{ mm}$ (0,59 inch) movement when in use.
- 2 Hole pattern and dimensions for ground attachment see Fig. 36 and Table 13

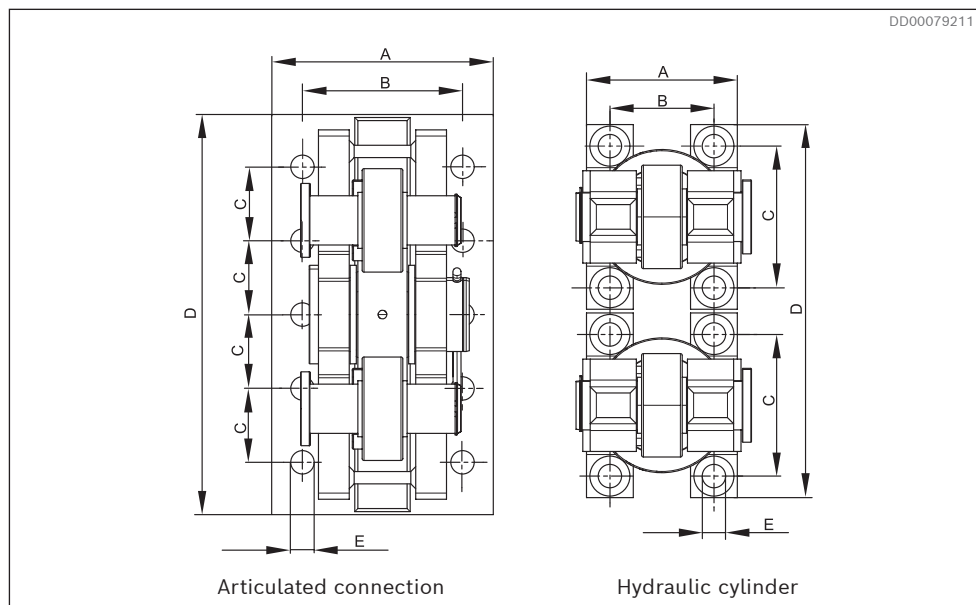


Fig. 36: Hole pattern articulated connection and hydraulic cylinder for DTCBM 4600 to DTCBM 6000

Table 13: Hole pattern dimensions for articulated connection and hydraulic cylinder DTCBM 4600 to DTCBM 6000

Torque arm	A		B		C		D		E	
	mm	in	mm	in	mm	in	mm	in	mm	in
DTCBM 4600 to 6000 (Articulated connection)	360	9.17	260	10.27	120	4.72	650	25.59	38	1.50
DTCBM 4600 to 6000 (Hydraulic cylinder)	233	9.17	158	6.22	230	9.06	606	23.86	38	1.50

1. Mount the articulated rod on the left side of the torque arm (viewed from the motor main connection side), use the pins (2) and lock them in place with circlips (3).
2. Mount the hydraulic cylinder with the piston rod facing upwards on the right side of the torque arm (viewed from the motor main connection side), use the pins (2) and lock them in place with circlips (3). Turn the cylinder so the hydraulic connections A, B & C are facing the motor.
3. Check and adjust the distance C for the cylinder according to *Table 10* (Note! depending on application this distance can be different). Shim between the torque arm attachment brackets and the foundation or if possible, adjust the mounting plate of the foundation to reach the required distance.
4. The spherical plain bearing (9) shall be mounted with the slot in the outer ring perpendicular towards the load direction. See *Fig. 26*
5. The spherical plain bearing (9) shall be mounted by using a mounting sleeve or tube applied on the bearing outer ring.
6. Mount the screws (15) with a tightening torque 47 Nm [34,.67lb ft]
7. Assemble the rest of the components according to *Fig. 37*
8. Attachments (6), (12) for torque arm shall be fastened with screws (7).

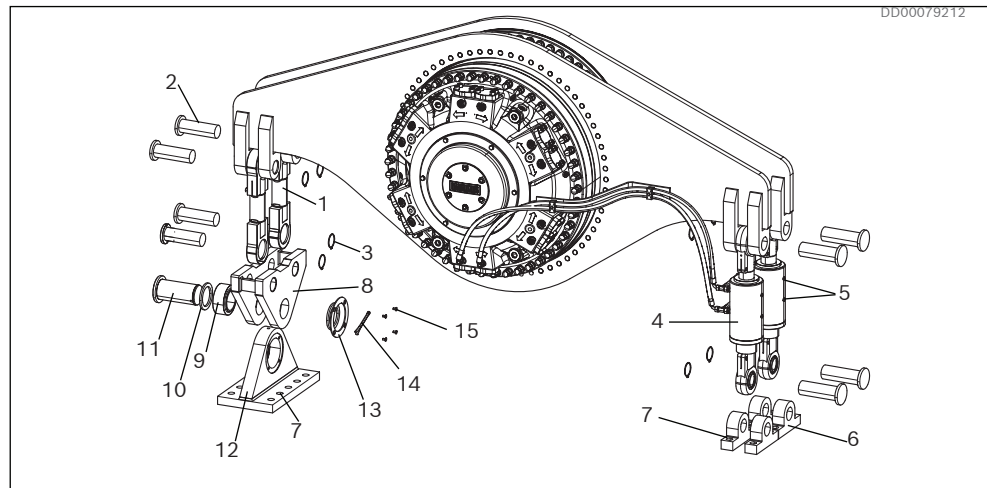


Fig. 37: Articulated connection and hydraulic cylinder DTCBM 4600 to DTCBM 6000

Pos	Description	Tightening torque	Pcs
1	Rod end		2
2	Shaft		8
3	Circlips		8
4	HydraulicCylinder		2
5	Air bleeding G 1/4"		4
6	Attachment brackets		4
7	Screw M36-8.8	2280 Nm / 1681 lbf ft	18 (Not included in delivery)
8	Fastening		1
9	Spherical plain bearing		1
10	Washer		2
11	Shaft		1
12	Fastening		1
13	Bearing cover		1
14	Split pin		1
15	Countersunk head screw		4

Hydraulic connection between motor and hydraulic cylinder

This is valid with the hydraulic cylinder on the right hand-side of the motor.
See Fig. 38

1. Mount the hoses, The hose mounted to connection T4A has to be mounted to the hydraulic cylinder connection (A) and the hose from connection T4C has to be mounted to the cylinder connection (B).
2. Detail view A valid for DTCBM 4600-6000. Mount the hoses between the cylinders. Connection A to connection A and connection B to connection B

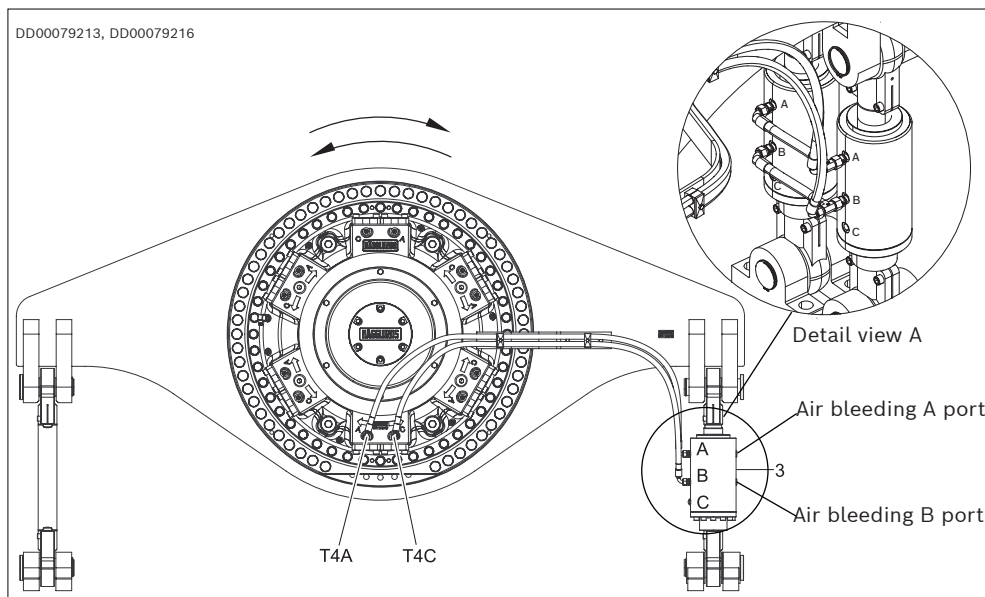


Fig. 38: Hydraulic connections DTCBM

Table 14: Hydraulic connections DTCBM

Connection	Description	Dimensions	Remarks
T4A	Pressure connection	G½"	To be connected to A on cylinder
T4C	Pressure connection	G½"	To be connected to B on cylinder
3	Cylinder		
A	Pressure connection	G½"	
B	Pressure connection	G½"	
C	Air ventilation	G½"	Air filter

NOTICE

Overload of driven shaft!

Damage of equipment.

- Make sure to follow the installation instructions regarding hydraulic connections .



The cylinders should be vented from air during commissioning by using the air bleeding screws on the cylinder, see Fig. 34 and Fig. 37

7.4.4 Mounting of motor and shrink disc adapter

Mounting of shrink disc to adapter shaft or coupling motor

1. You should note that the shrink disc are from the factory lubricated with grease on the conical surfaces and the screws (see *Fig. 40*). This lubricants shall remain on these surfaces
2. For coupling motor, mount the V-ring seals on the harsh kit ring and lubricate the lip with a thin layer of grease Texaco Multifac EP2 or equivalent

NOTICE

Slipping shaft.

Damage of motor or customer shaft.

- ▶ Grease must under no circumstances be transferred to the surfaces between the driven shaft and the coupling motor or shaft adapter (see *Fig. 40*).
- ▶ Clean hands free from grease before start of mounting

3. It is therefore important that you clean your hands free from grease.
4. Clean the outside of the hollow shaft.
5. Remove the spacers between the two clamping rings of the shrink disc.
6. Mount the shrink disc on the hollow shaft. Use a approved sling between the clamping rings.(see *Fig. 39* and *Fig. 40*) The coupling must be pushed right up to the stop of the hollow shaft. If nescesary separate the clamping ring for easier mounting.
7. Absolutely no grease on the surfaces between driven shaft and hollow shaft. Clean the driven shaft and the inside of the hollow shaft

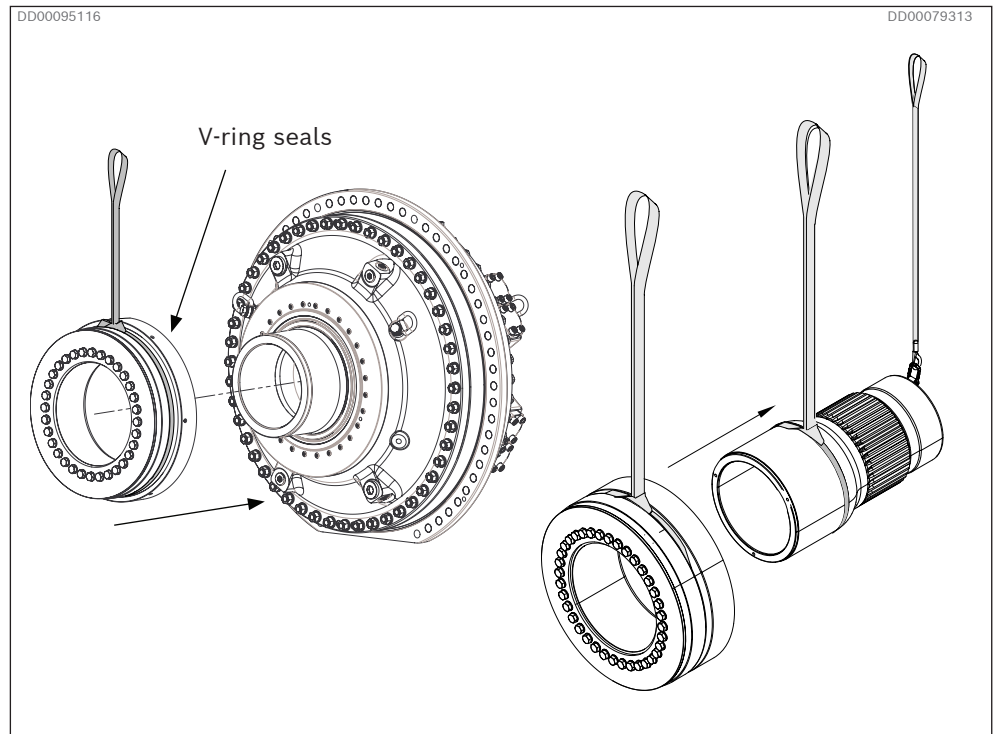


Fig. 39: Mounting of shrink disc to adapter shaft or coupling motor

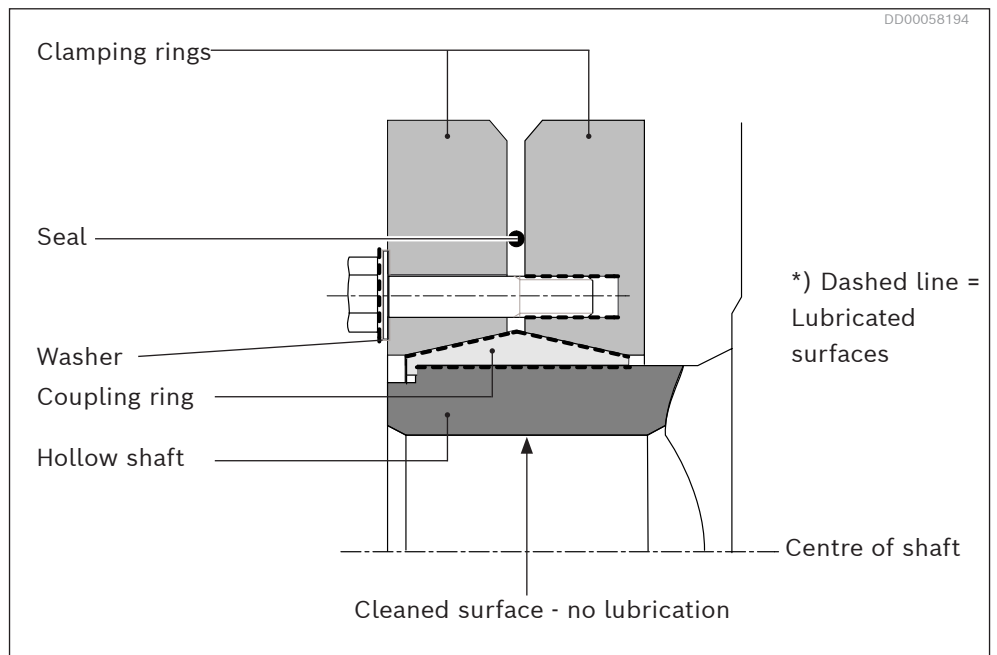


Fig. 40: Shrink disc



*) The conical surface between the coupling ring and the clamping rings as well as the screws shall be coated with Molykote G-Rapid plus paste, (see Fig. 40). This is done from the factory at delivery.

When a motor has been in for overhaul or service and shall be reassembled it may be necessary to relubricate those surfaces with Molykote G-Rapid plus paste again but remember only the specified surfaces.

Mounting the coupling adapter to the driven shaft

1. Mount 3 lifting eyes on the coupling adapter for lifting, see *Fig. 10* in chapter *6.1.2: Lifting motors and accessories*.
2. Mount the M30 to M20 adapter in customer shaft if needed.
3. Align the coupling adapter with the driven shaft.
4. Pass the assembly tool through the centre of the coupling adapter and screw it into the driven shaft by using the squared key in the end of the tool, see *Fig. 41*
5. Pull the coupling adapter on the shaft by turning the nut on the assembly tool to specified clamping length (length B, see *Fig. 42* and *Fig. 43* and *Table 15*).
6. Tighten the shrink disc, (see : *Tightening of shrink disc page 44*).
7. Remove the assembly tool.
8. Remove the lifting device and the lifting eyes from the coupling adapter.

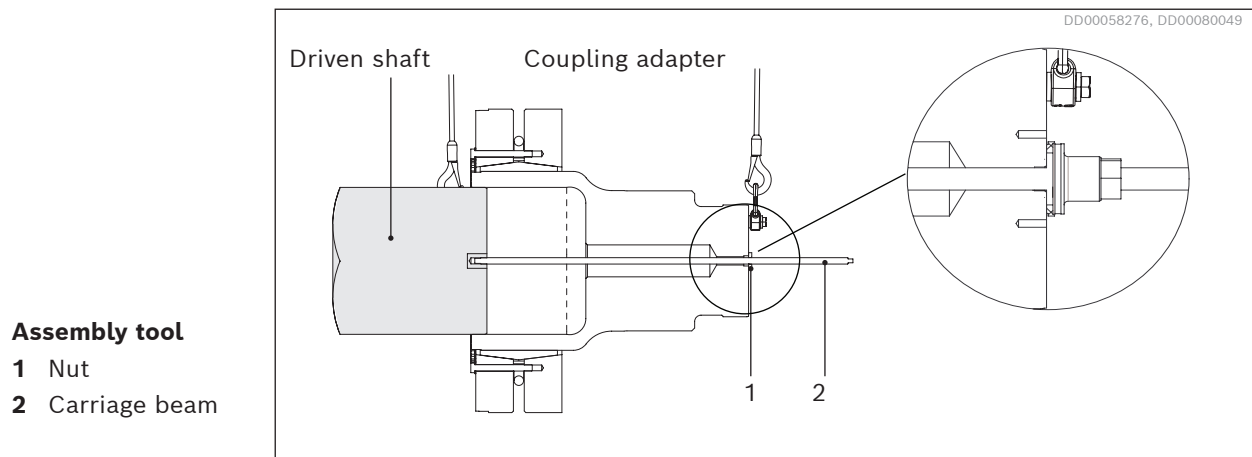


Fig. 41: Mounting the coupling adapter on the driven shaft with the assembly tool.

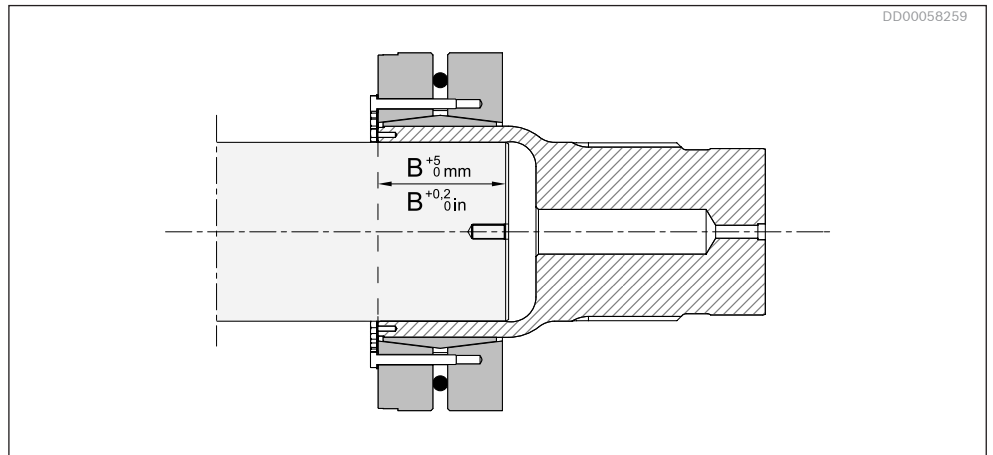


Fig. 42: Driven shaft without stress relieving groove

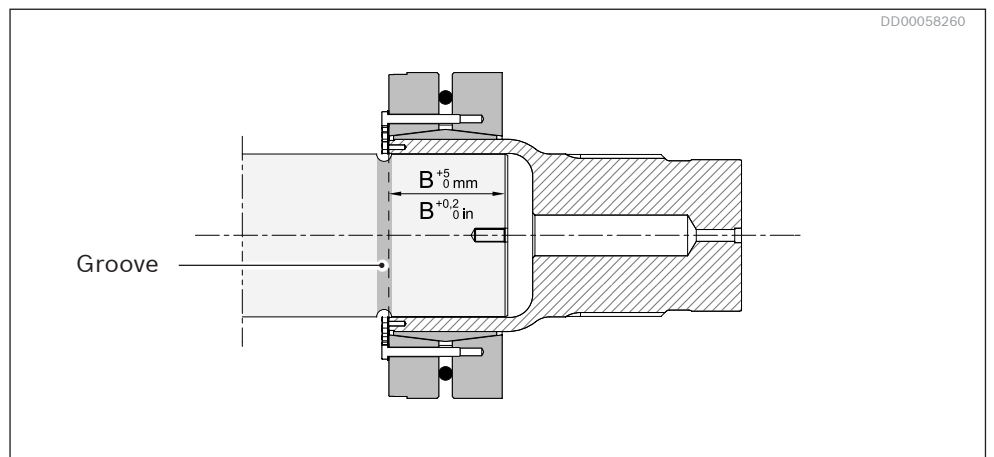


Fig. 43: Driven shaft with stress relieving groove

Table 15: Clamping length

Customer shaft	Length B	
	mm	in
Ø 340 mm CBm 2000	215	8.46
Ø 360 mm CBm 2000 to CBm 3000	257	10,12
Ø 460 mm CBm 3000 to CBm 4000	300	11,81
Ø 480 mm CBm 5000 to CBm 6000	320	12,60

Tightening of shrink disc

1. Keep tension in your lifting straps to avoid a skew setting of the coupling adapter or coupling motor during the tightening of the screws. Wobbling caused by a skew setting gives extra forces on the main bearings.
2. In order to avoid misalignment of the two clamping rings during the tightening of the screws, the gap between the rings must be measured in several places during the process, see *Fig. 44*. The difference between the measured gaps must never vary more than 1 mm (0,04") during any stage of the tightening process.
3. Pre-set the coupling screws in opposite pairs (12-6-9-3 o'clock) to max 1/3 of the of the torque specified for the screws, see *Table 16*. It is very important that when you reach this stage the misalignment is kept within the tolerance as described above
4. Mark the screw head at 12 o'clock with a pen or paint so that you can follow the turning sequence of the screws.
5. Set the torque wrench to max 1/3 of the specified maximum torque for the coupling screws, tighten all bolts in sequence, shown in *Fig. 45*, for 2 or 3 passes. Increase the torque to max 2/3' of maximum torque and tighten the bolts another 2 or 3 of passes
6. Set the torque wrench for the specified maximum torque. Tightening torque of the coupling screws; see the sign on the coupling, or *Table 16*.
7. Start tightening the screws in sequence shown in *Fig. 45*.
8. Keep on doing this until you have reached the stated torque. Several passes are required before the screws are tightened to specified torque. Keep checking the alignment of the coupling. (15-20 passes may be necessary).
9. When the specified torque is reached it is important that all screws are tightened with specified torque and that no further movement can be observed.

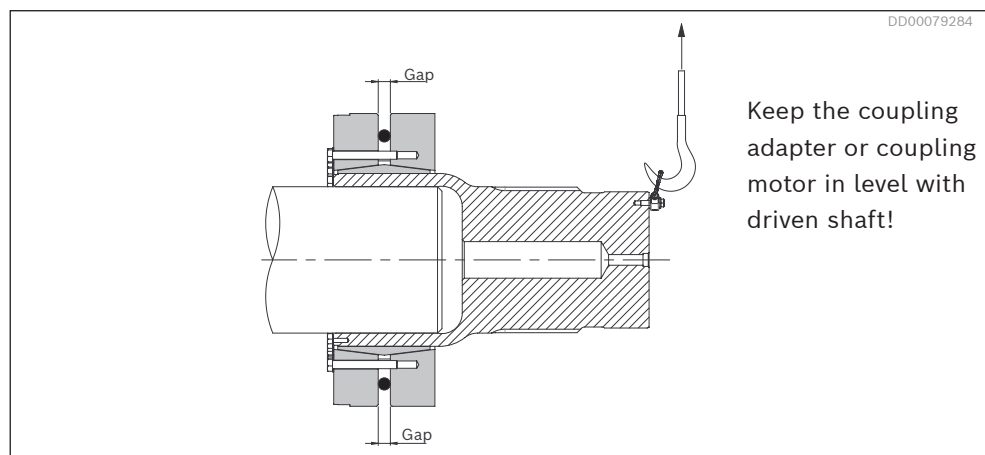


Fig. 44: Gap between the clamping rings

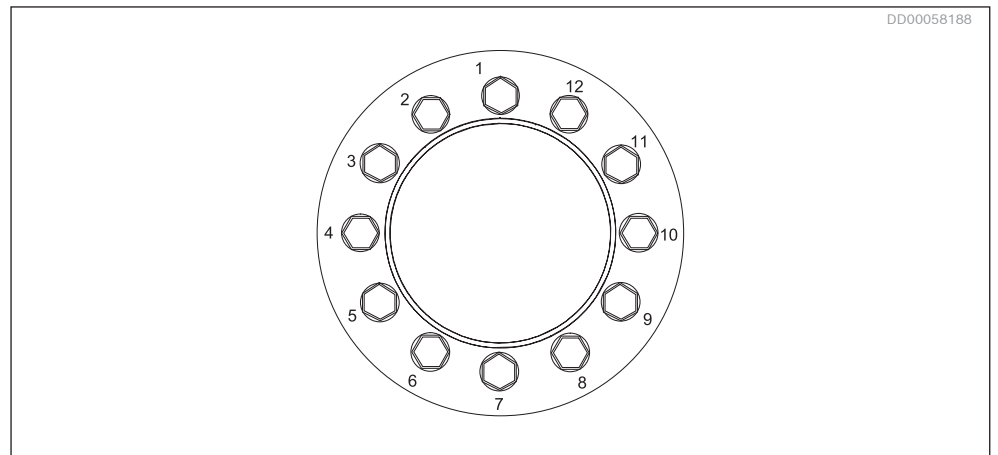


Fig. 45: Tightening order

Table 16: Screws and tightening torque, for standard shrink discs

Motor type	Shrink disc size	Number of screws	Screw dim.	Strength	Tightening torque	
					Nm	lbf ft
CBm 2000 S with coupling adapter	∅ 425	36	M20x160	12.9	570	421
CBm 2000 E	∅ 420	32	M20x130	10.9	490	362
CBm 2000 C	∅ 425	36	M20x160	12.9	570	421
CBm 3000 to CBm 4000 S with coupling adapter	∅ 560	48	M20x180	12.9	570	421
CBm 3000 C	∅ 425	36	M20x160	12.9	570	421
CBm 5000 to CBm 6000 S with coupling adapter	∅ 590	32	M30x240	12.9	1650	1217

NOTICE

Slipping shaft.

Damage of motor or customer shaft.

- ▶ There is a metallic sign on every shrink disc with a tightening torque stamped on it. This torque is always to be used.
- ▶ Tightening torque value is critical. Use calibrated torque wrench.
- ▶ Uncoated screws shall be greased with Molykote G-Rapid plus paste.

Mounting the spline motor to the coupling adapter/driven shaft

The motor can be mounted to the driven shaft with or without a mounting tool, but the use of a mounting tool is recommended since it makes the work easier.

This instruction is related to the pictures *Fig. 46*, *Fig. 47* and *Fig. 49*.

1. Mount torque arm to the motor with screws supplied as described in chapter 7.4.1: *Fitting the torque arm on the motor*.
2. Make sure that the o-ring (6) is undamaged and lubricate it.
3. Check shaft/splines for burrs, to minimize the risk to damage the o-ring. Lubricate shaft/splines with hydraulic fluid.
4. Remove the cover (1) together with screws and washers.
5. Mark spline tooth location on outside of motor bore to assist alignment during installation. Install the spline align assembly tool to align the motor spline with the driven shaft according to section : *Mount the spline alignment tool page 25*.
6. Align the motor with the driven shaft.
7. Install the assembly tool by pass the tie rod through the centre of the motor, and screw it into the driven shaft by using a wrench at the key grip at the end of the assembly tool. Assemble the washer and then the nut tight to the bearing holder (3).
8. Use a bar to rotate the cylinder block to fit the teeth with the drive shaft.
9. Pull the motor onto the shaft by turning the nut on the assembly tool.
10. Remove the assembly tool and the spline alignment tool.
11. Fix the motor to the driven shaft by using the mounting kit (4): Mount the spline alignment tool again. Torque the spacer to 1840 Nm (1357 lbf·ft).
12. Remount bearing holder (3). Torque 80 Nm (59 lbf·ft).
13. Fill up with hydraulic oil to the G 1¼ thread. Axial clearance 10 mm [0,4 in] during filling, see *Fig. 47*. Oil volume, see *Table 17*. Mount the screw M30 (5). Torque 1840 Nm (1357 lbf·ft).
Alternatively: Mount the screw M30 (5). Torque 1840 Nm (1357 lbf ft.) Remove one of the two G ¼ plug (7) on the bearing holder and G ¼ plug (8) on shaft side seal retainer and pump in oil until oil is coming out from the G ¼ connection on shaft side seal retainer, see *Fig. 49*. Torque the G ¼ plugs. Torque 30 Nm (22 lbf ft.)
14. Remount the cover (1). Torque 200 Nm (148 lbf·ft).

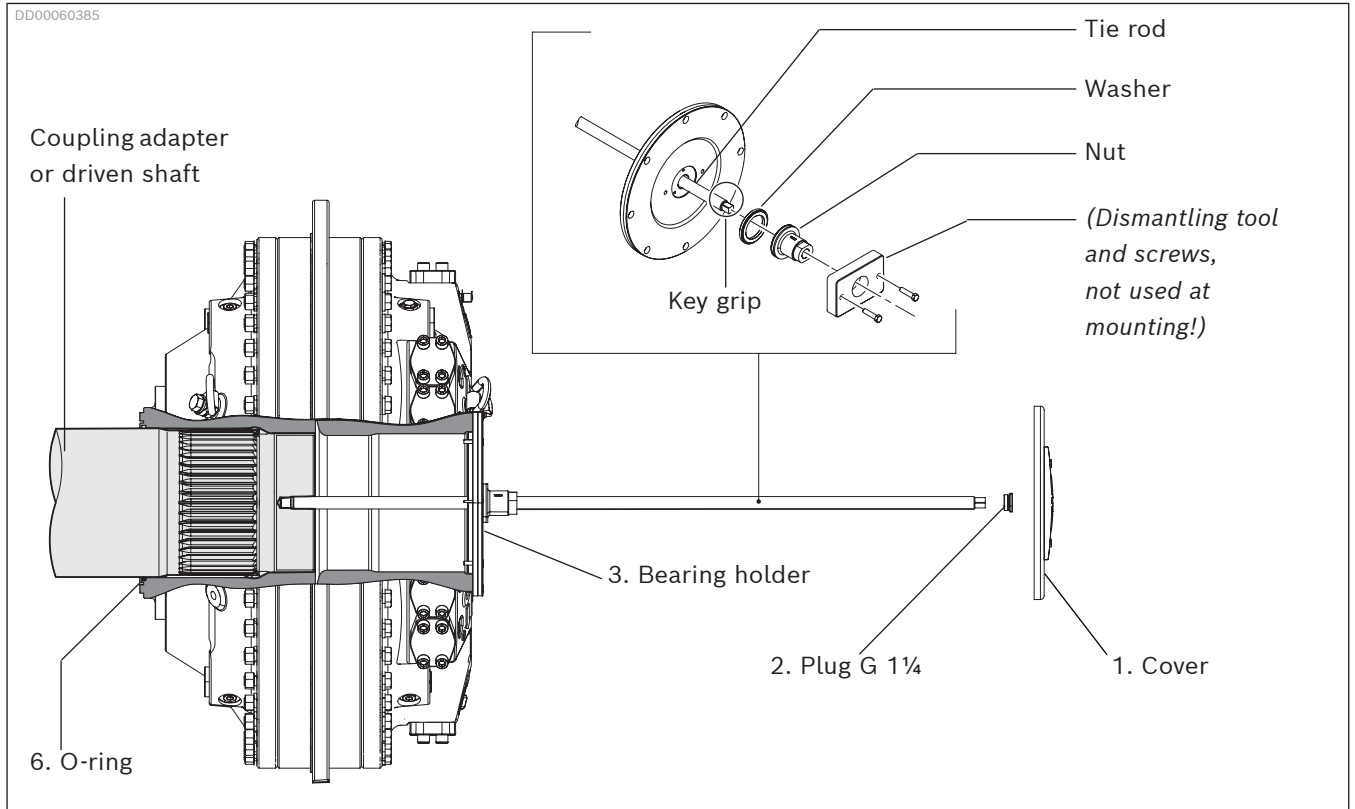


Fig. 46: Mounting spline motor with assembly tool

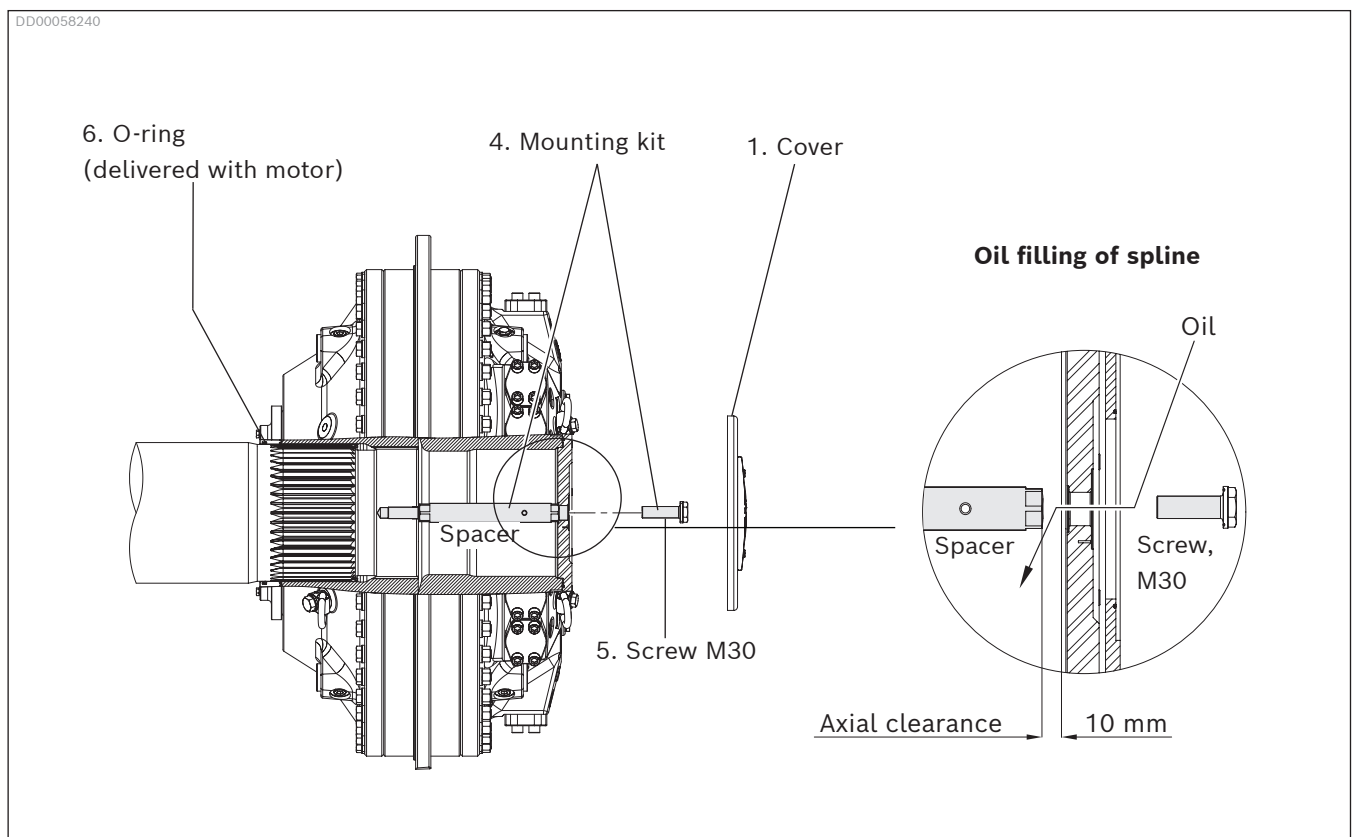


Fig. 47: Fix the spline motor with the mounting kit, horizontal mounting

Mounting the coupling motor to the driven shaft

The motor can be mounted to the driven shaft with or without a mounting tool, but the use of a mounting tool is recommended since it makes the work easier. Ensure that the full clamping length is used by, for example, measuring and marking the driven shaft. This is of particular importance if the driven shaft has a stress relieving groove. See *Fig. 42*, *Fig. 43* and *Table 15*.

1. Remove the end cover (1) together with screws and washers.
2. Remove the plug G1¼ (2).
3. Align the motor with the driven shaft.
4. Install the assembly tool by pass the tie rod through the centre of the motor, and screw it into the driven shaft by using a wrench at the key grip at the end of the assembly tool. Assemble the washer and then the nut tight to the bearing holder (3). See *Fig. 48*.
5. Pull the motor onto the shaft by turning the nut on the mounting tool until the length stated in the *Table 15*, is obtained; see *Fig. 42* and *Fig. 43*.
6. Tighten the shrink disc see : *Tightening of shrink disc page 44*
7. Remove the mounting tool.
8. Remount the plug G1¼ (2).
9. Remount the end cover (3) and tighten the screws together with washers.
Torque 81 Nm (59 lbf-ft).
10. Adjust the harsh kit (4) according to *Fig. 48* and tighten the M10 stop screws gradually crosswise to 25 Nm (18 lbf ft).
11. Check the gap according to *Fig. 48* after test drive

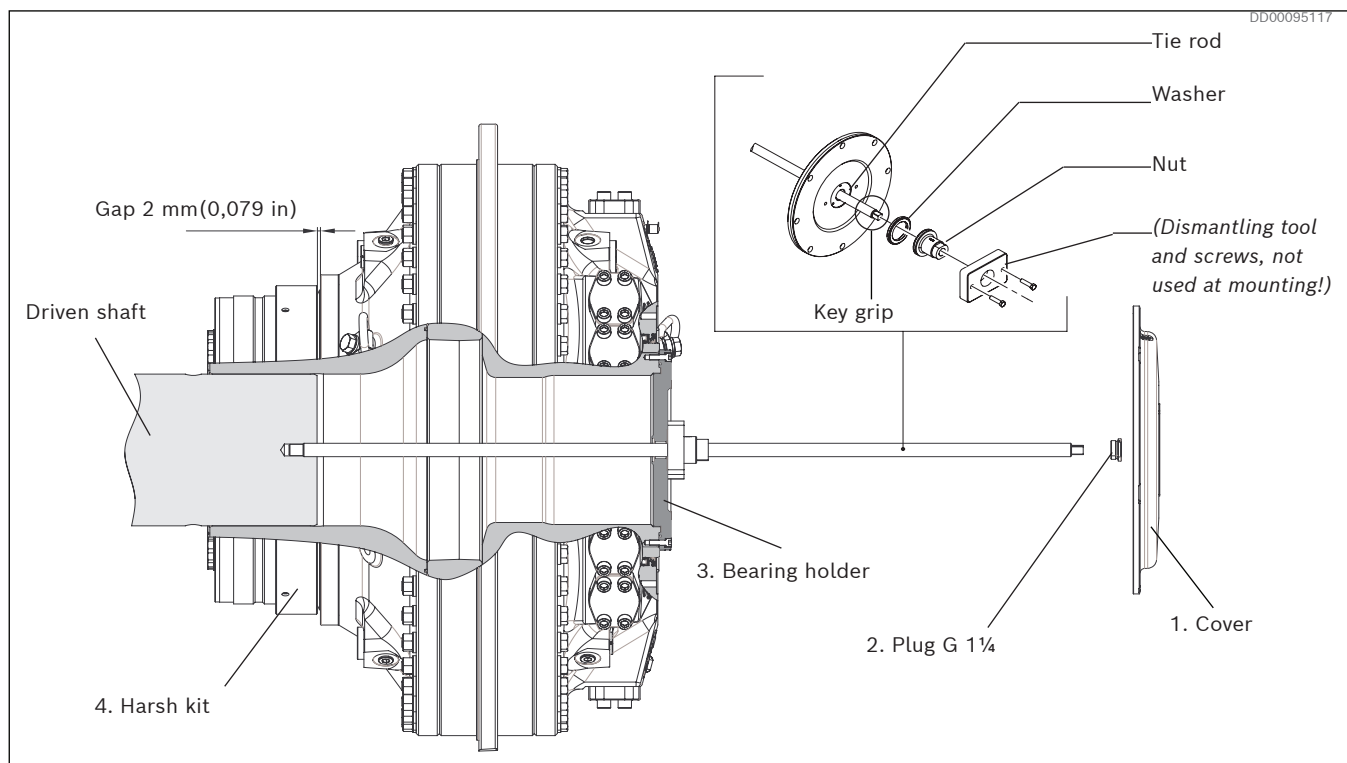


Fig. 48: Mounting of coupling motor with assembly tool

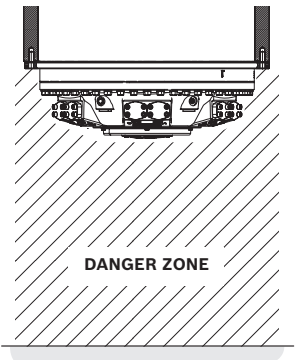
Vertical mounting of motor

! DANGER

Vertical mounted motor: Motor/flange falls down!
 Risk to life and risk of injury or serious injuries and risk of damage to equipment!

- ▶ Make sure that the flange is correctly mounted to the foundation and can withstand the weight and forces from the motor.
- ▶ Make sure the motor is correctly mounted to the flange.
- ▶ Do not stand in the danger zone!
- ▶ The spline area must always be lubricated with hydraulic oil to prevent wear of spline interface. Wear of spline increase relative movement between driven shaft and motor, which can cause the mounting kit, holding the motor axially, to break.
- ▶ Torque arm mounted motor with spline and mounting kit can be used only for horizontal mounting and/or motor driven shaft pointing downwards unless extra safety arrangements is installed to secure the motor from falling.

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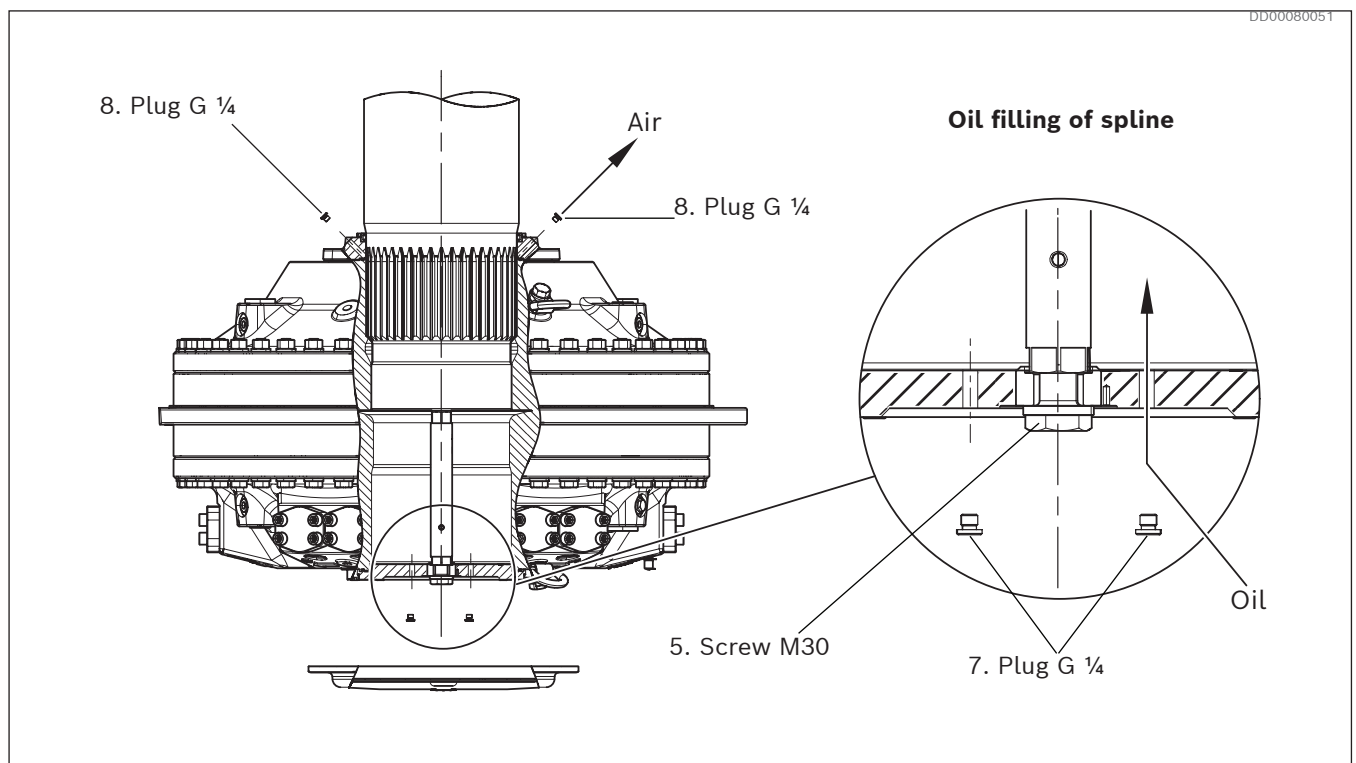


Fig. 49: Vertical mounting of spline motor

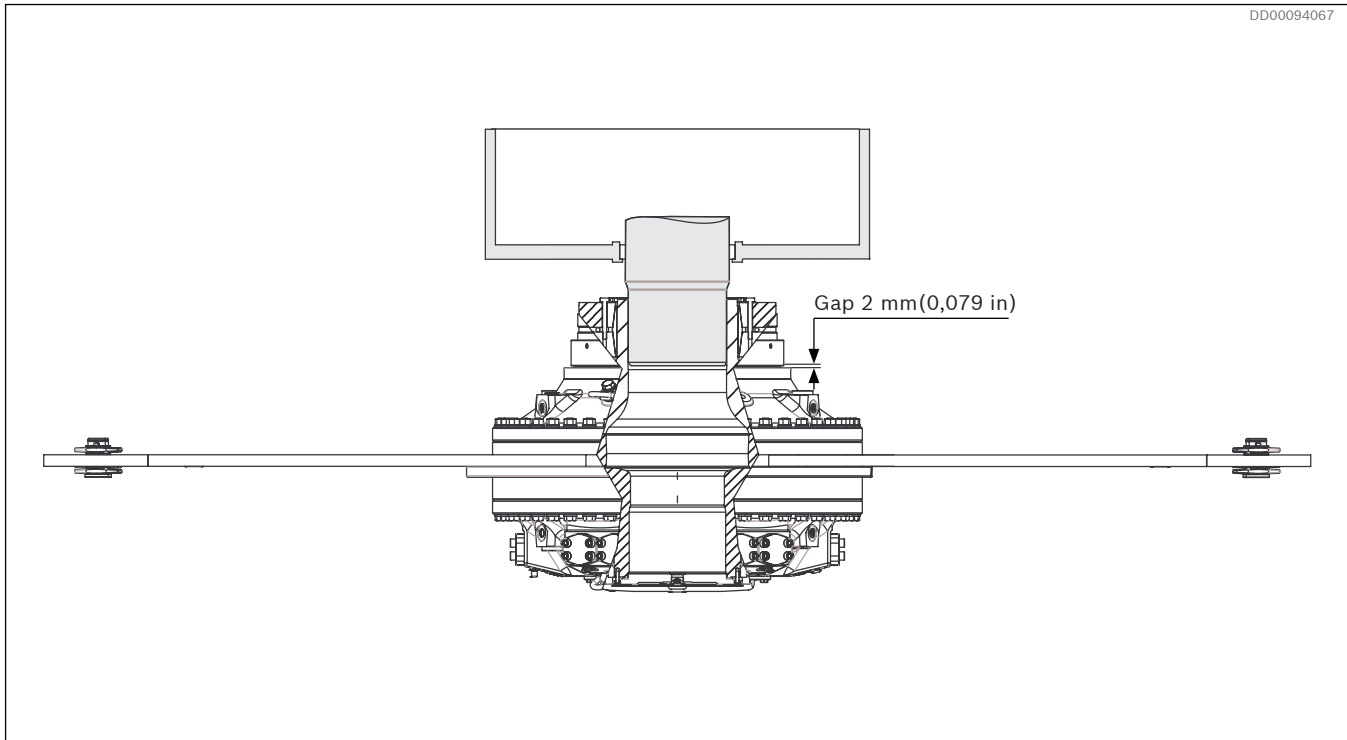
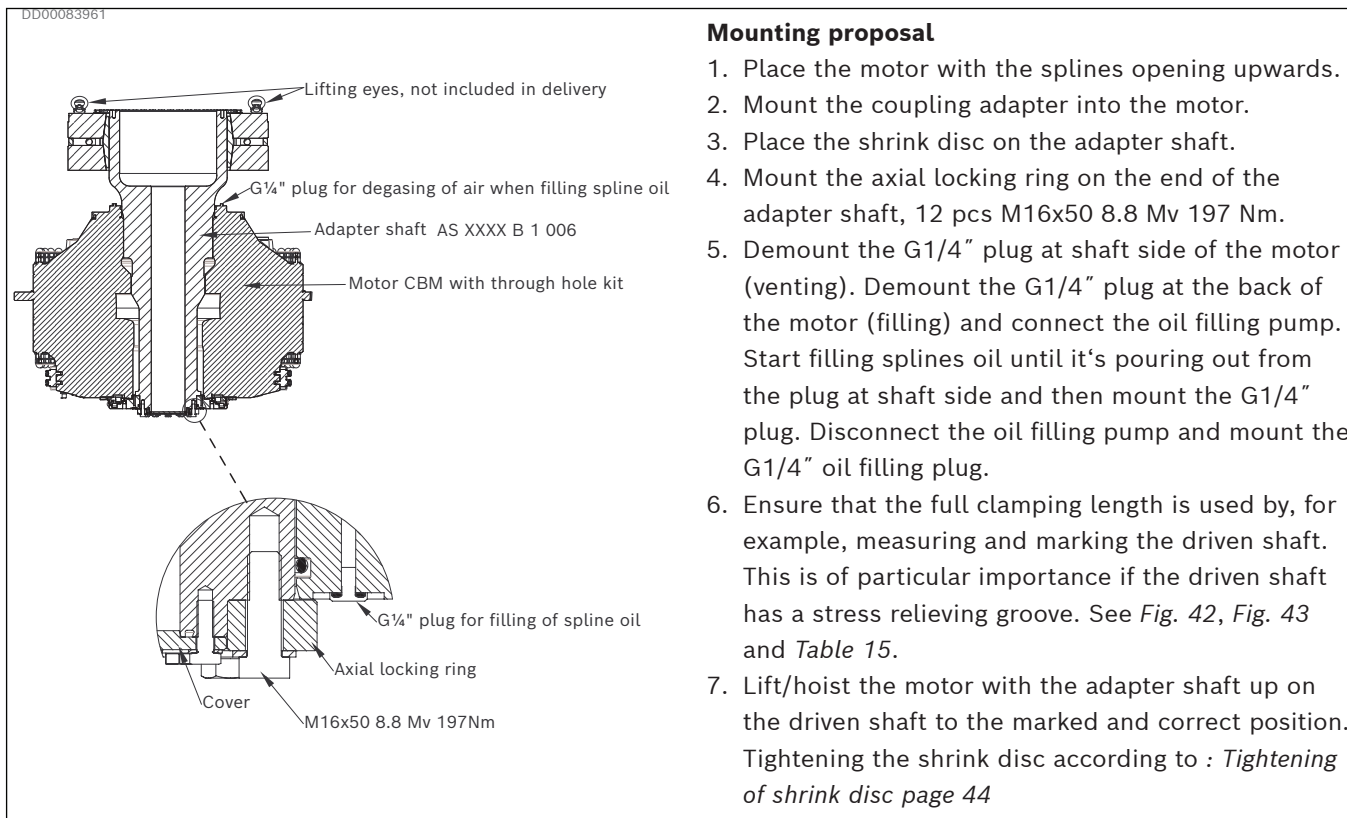


Fig. 50: Vertical mounting of coupling motor (only for CBm 2000 and CBm 3000)



Mounting proposal

1. Place the motor with the splines opening upwards.
2. Mount the coupling adapter into the motor.
3. Place the shrink disc on the adapter shaft.
4. Mount the axial locking ring on the end of the adapter shaft, 12 pcs M16x50 8.8 Mv 197 Nm.
5. Demount the G1/4" plug at shaft side of the motor (venting). Demount the G1/4" plug at the back of the motor (filling) and connect the oil filling pump. Start filling splines oil until it's pouring out from the plug at shaft side and then mount the G1/4" plug. Disconnect the oil filling pump and mount the G1/4" oil filling plug.
6. Ensure that the full clamping length is used by, for example, measuring and marking the driven shaft. This is of particular importance if the driven shaft has a stress relieving groove. See Fig. 42, Fig. 43 and Table 15.
7. Lift/hoist the motor with the adapter shaft up on the driven shaft to the marked and correct position. Tightening the shrink disc according to : *Tightening of shrink disc page 44*

Fig. 51: Vertical mounting of motor with special index coupling adapter AS XXXX B 1 006

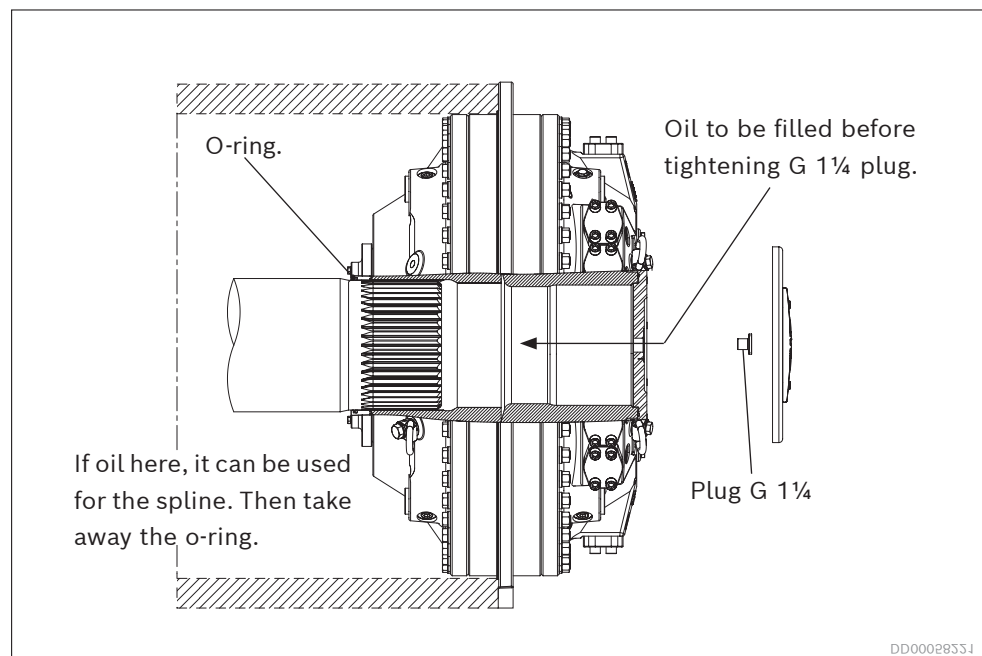
Table 17: Oil Volume for lubrication of spline connection

Frame size	Horizontal mounted	Vertical mounted	Horizontal mounted	Vertical mounted
	Litre		US gallon	
CBm 2000	14	28	3.7	7.4
CBm 3000	24	48	6.3	12.6
CBm 4000	36	72	9.5	19.0
CBm 5000	44	88	11.6	23.2
CBm 6000	54	108	14.3	28.6

7.4.5 Flange mounting of motor

The splines shall be filled up with hydraulic oil to minimize the risk of wear. Mounting the motor onto the driven shaft using the assembly tool, see : *Mounting the spline motor to the coupling adapter/driven shaft page 46.*

1. Mount the motor to the flange. For screw dimensions and tightening torque, see *Table 7.*
2. Fill up hydraulic oil to the G 1¼ thread. See *Fig. 52 or Fig. 49.*
Oil volume see *Table 17*
3. Mount the G 1¼ plug. Torque 180 Nm (133 lbf•ft).
4. Mount the cover. Torque 200 Nm (148 lbf•ft).

**Fig. 52: Flange mounted motor, shaft horizontal**

7.4.6 Draining and venting the motor

Horizontal mounting

When the motor is installed with the shaft in the horizontal plane, the highest of the four drain outlets D1, D2, D3 or D4 must always be used see *Fig. 53*.

Drain line must be connected to the tank with a minimum of restrictions, to ensure that the maximum case pressure is not exceeded.

A magnetic plug is pre assembled from factory in connection T8, in the drain outlet D3. If other drain outlet is used (D1-D2, D4-D8), the magnetic plug should be moved to the corresponding connection (T7 or T9) in the selected drain outlet.

For maintenance, see chapter 10.3: *Maintenance plan*.

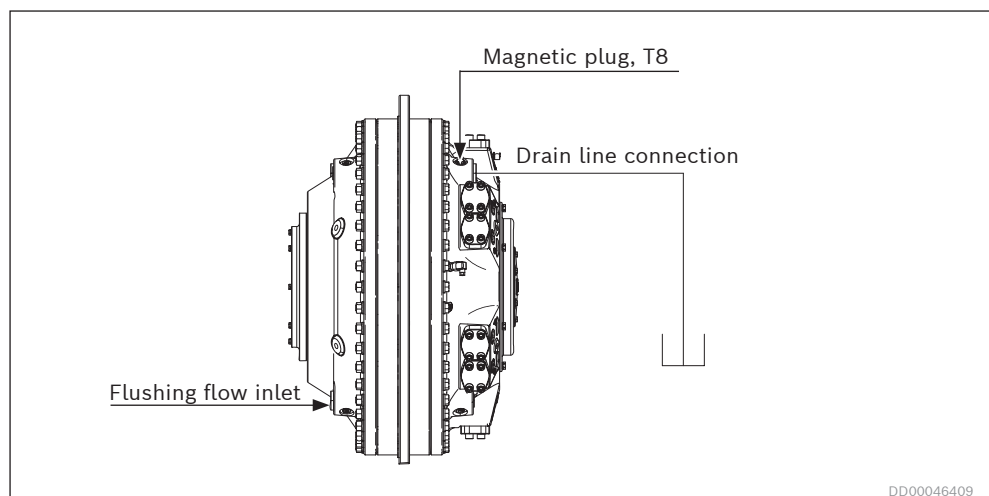


Fig. 53: Horizontal mounting

Vertical mounting

When the motor is mounted vertically, the highest of the drain outlets D1-D8 must be used. Flushing (lubrication) of radial seal from low pressure oil is necessary.

A) Motor shaft pointing downwards

The drain line must be connected to one of the drain outlets in the connection block. (See *Fig. 54*, alt. A).

The flushing connection F2 shall be connected to low pressure oil connection.

With bidirectional drives, use the connection with lowest average pressure.

(Connection to high pressure will increase the motor drain flow). It is advisable to fit the adapter and the hose to the motor before fitting the torque arm.

B) Motor shaft pointing upwards

The drain line must be connected to one of the drain outlets in the shaft end housing. (See *Fig. 54*, alt. B).

The flushing connection F1 on the shaft end housing should be connected to the low pressure oil connection. With bidirectional drives, use the connection with lowest average pressure. (Connection to high pressure will increase the motor drain flow).

It is advisable to fit the adapter and the hose to the motor before fitting the torque arm.

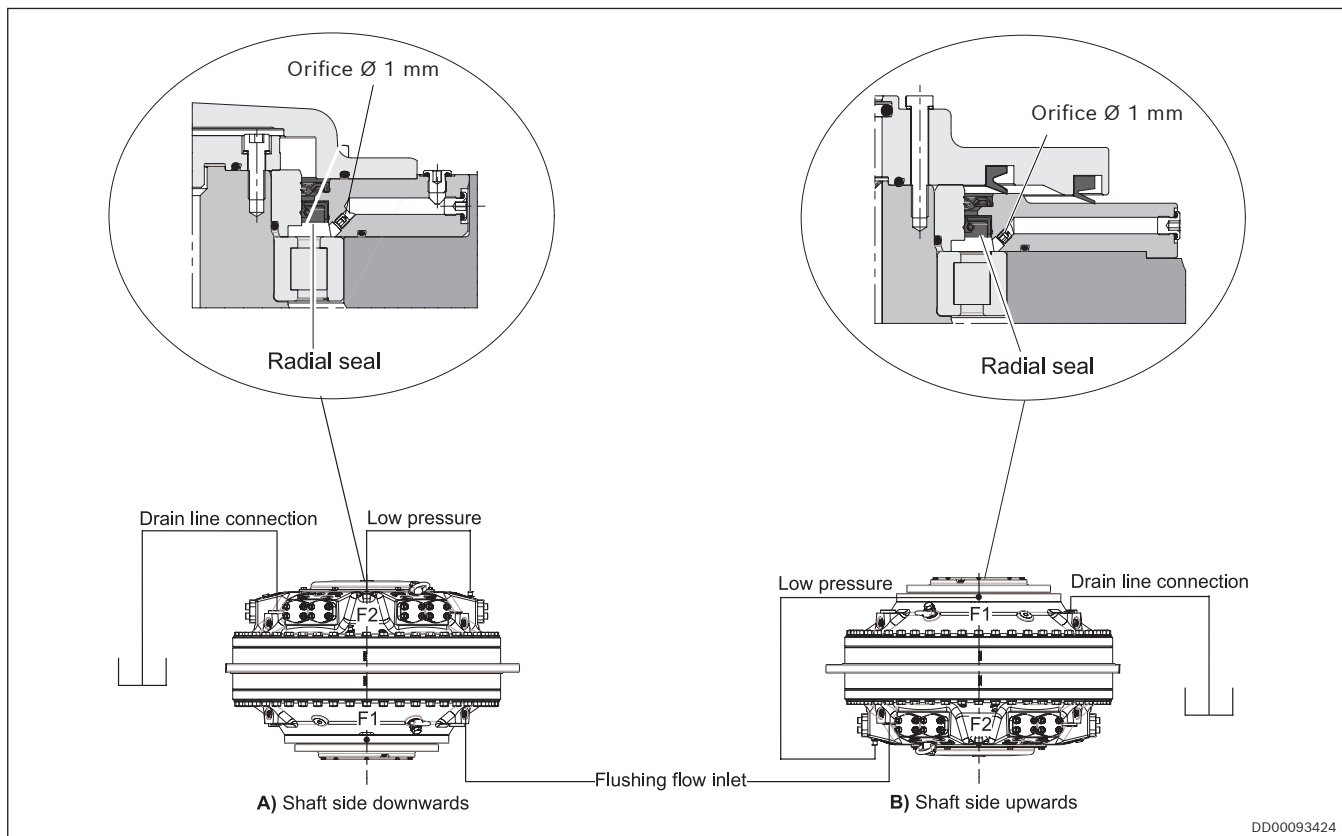


Fig. 54: Vertical mounting

7.4.7 Flushing

To avoid high temperature in the motor case the heat must be removed, because high temperature gives lower viscosity and that gives reduction in basic rated life / service life. The motor case must be flushed when the output power exceeds the max. values.

! CAUTION

High temperature in motor case!
 Reduction in basic rated life/service life.

- ▶ Max. power without flushing:
 CBm 2000 to CBm 6000 500 kW (670 hp)

For calculation of required flushing, see [data sheet RE 15300](#) or contact your Bosch Rexroth representative. The flushing oil shall be drained in the normal drainline, see chapter 7.4.6: *Draining and venting the motor*.

Connect the input flushing line at the lowest drain port, D1-D8 at opposite side compared to the drain outlet in order to obtain a cross flushing flow through the motor, see Fig. 53 and Fig. 54.

7.4.8 Port connections

When using (thick wall) piping and in applications with frequent reversal of rotation direction, it is recommended to fit flexible hoses between the motor and piping to avoid damage due to vibration and to simplify installation of the motor. The length of the hoses should be kept as short as possible.

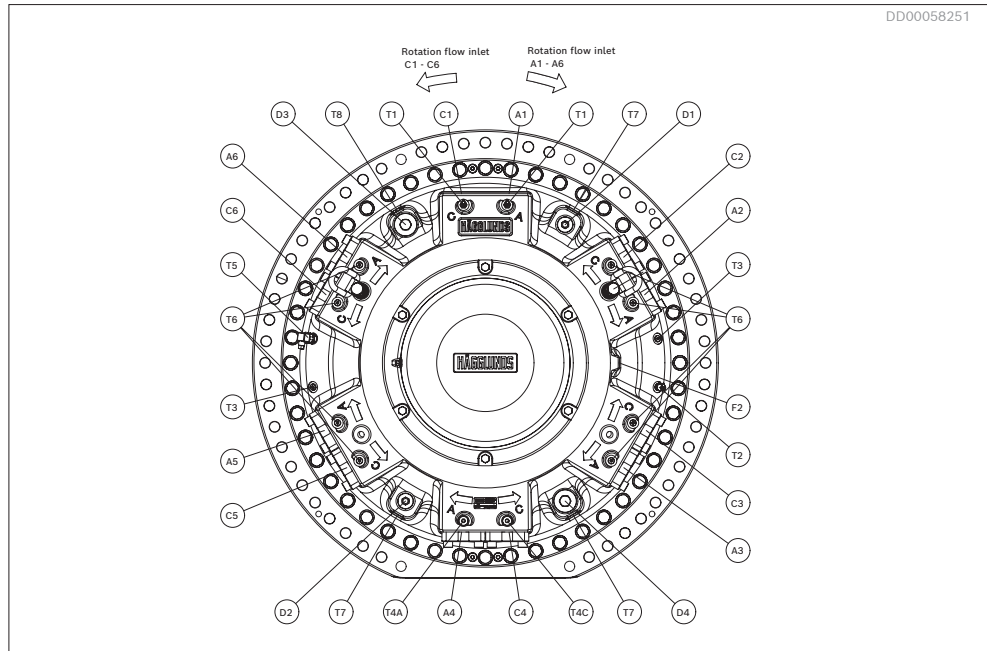


Fig. 55: Connection side of the motor

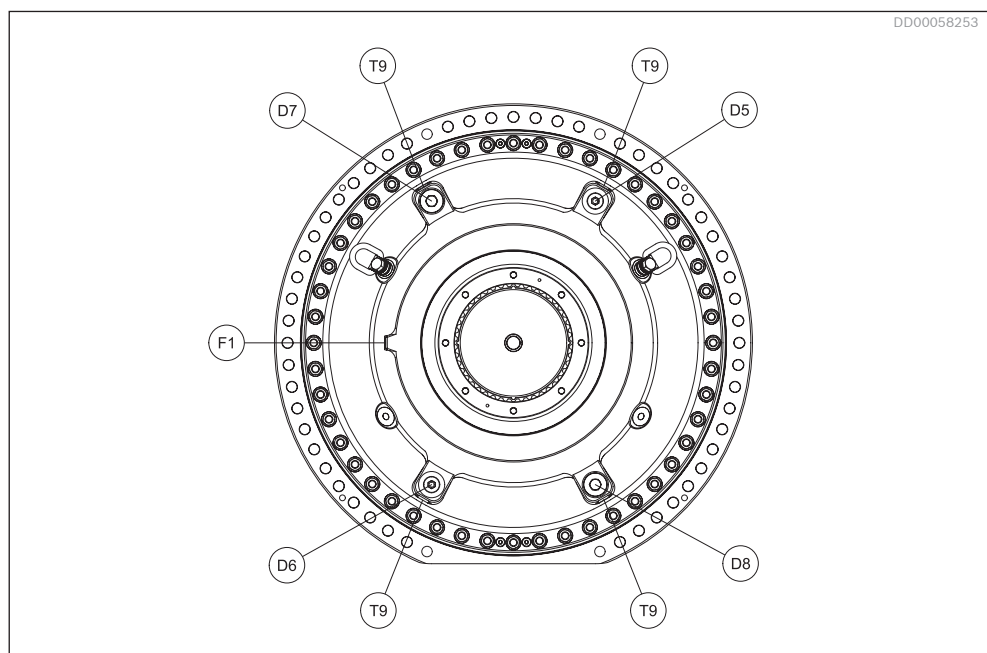


Fig. 56: Shaft side of the motor

Table 18: Port dimensions

Connection	Description	Dimensions	Remarks
C1	Main connection	2" *	If C is used as the inlet, the motor shaft rotates clockwise, viewed from the motor shaft side.
C2, C3, C4, C5, C6	Alternative main connection	2" *	Normally plugged at delivery.
A1	Main connection	2" *	If A is used as the inlet, the motor shaft rotates counterclockwise, viewed from the motor shaftside.
A2, A3, A4, A5, A6	Alternative main connection	2" *	Normally plugged at delivery.
D3	Drain outlet	G 2"	Normally plugged at delivery.
D1, D2, D5, D6	Alternative drain outlets / or flushing inlet	G 1 1/4"	Normally plugged at delivery.
D4, D7, D8	Alternative drain outlets / or flushing inlet	G 2"	Normally plugged at delivery.
F1, F2	Flushing connections	G 1/4"	For flushing of radial lip seal. Normally plugged.
T1	Test connection	M16 x 2	Used to measure pressure at the main connections.
T2	Test connection	M16 x 2	Used to measure case pressure in housing.
T3	Test connection	G 1/4"	Normally plugged at delivery. T3 can also be used to measure pressure in the housing by mounting pressure transducer R901066595
T4A, T4C	Pressure connection	G 1/2"	Connection for double ended torque arm.
T5	Temperatur sensor PT100	G 1/4"	Used to measure temperature in the housing.
T6	Alternative test connection or pressure connection	G 1/4"	Normally plugged at delivery.
T8	Magnetic plug	1 1/16-12-UN-2B	Used to monitor impurities in the oil.
T7, T9	Alternative magnetic plug connection	1 1/16-12-UN-2B	Normally plugged at delivery.

*SAE flange J 518 , code 62, 420 bar (6000 psi).

7.4.9 Direction of rotation of motor shaft

! WARNING

Rotating parts!
 Risk of injury or serious injuries.
 ► Do not touch rotating parts or be in the zone of rotating parts.

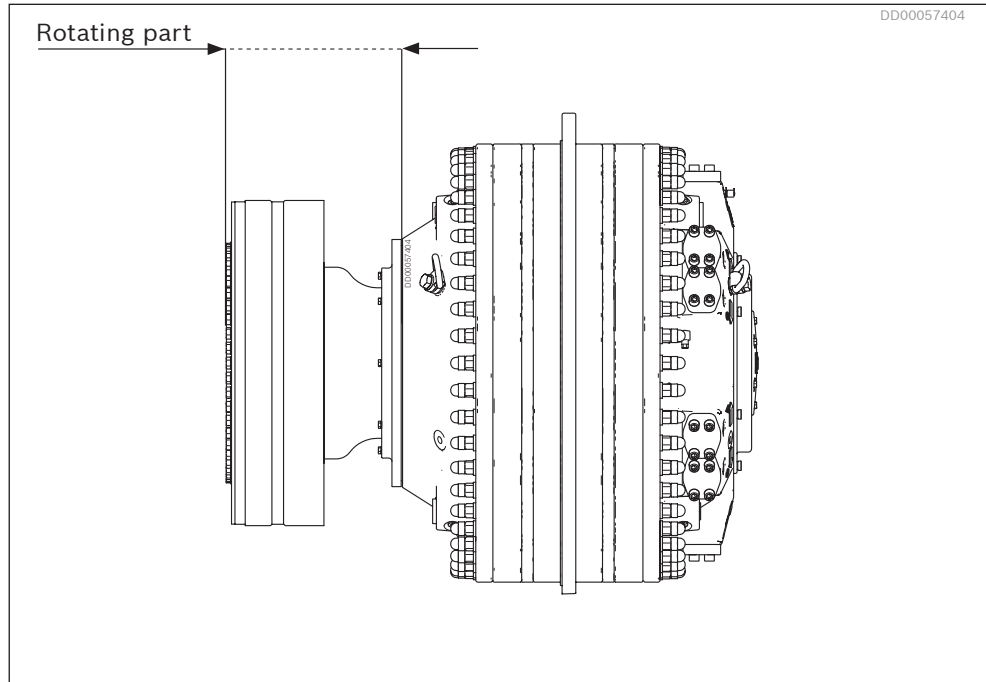


Fig. 57: Rotating part, motor with coupling adapter

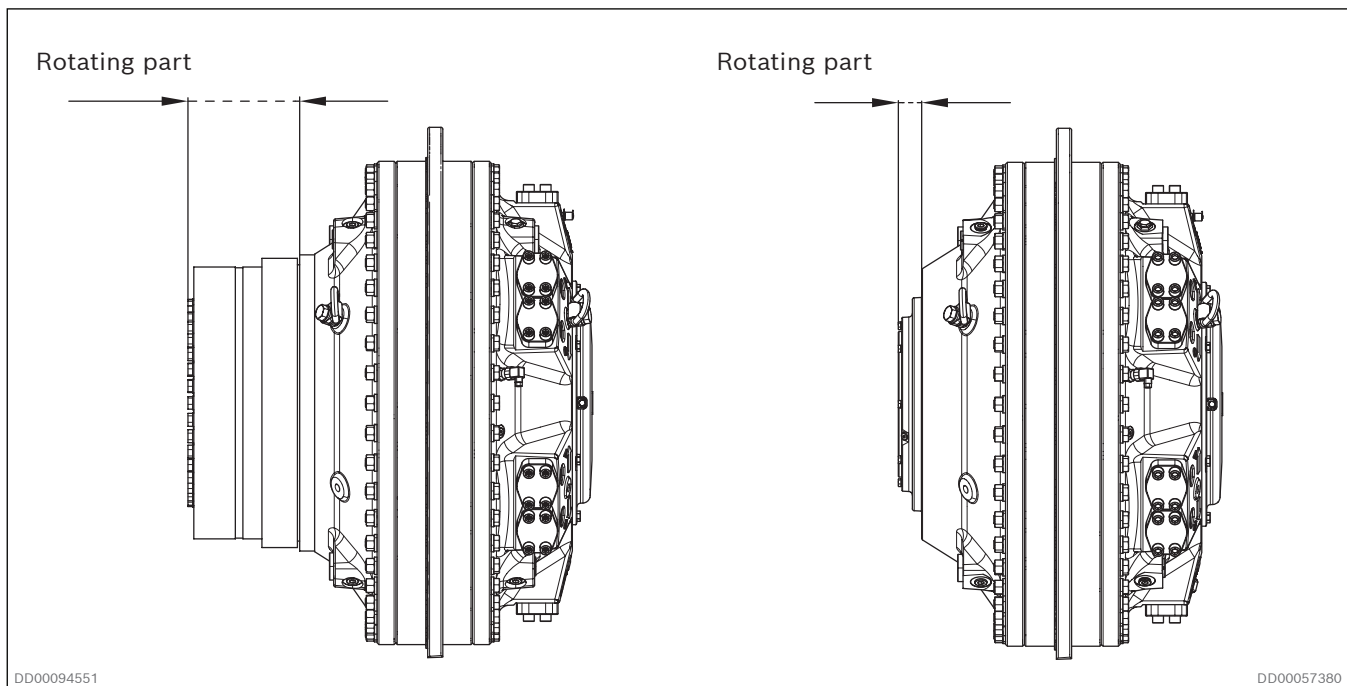


Fig. 58: Rotating part coupling motor and spline motor

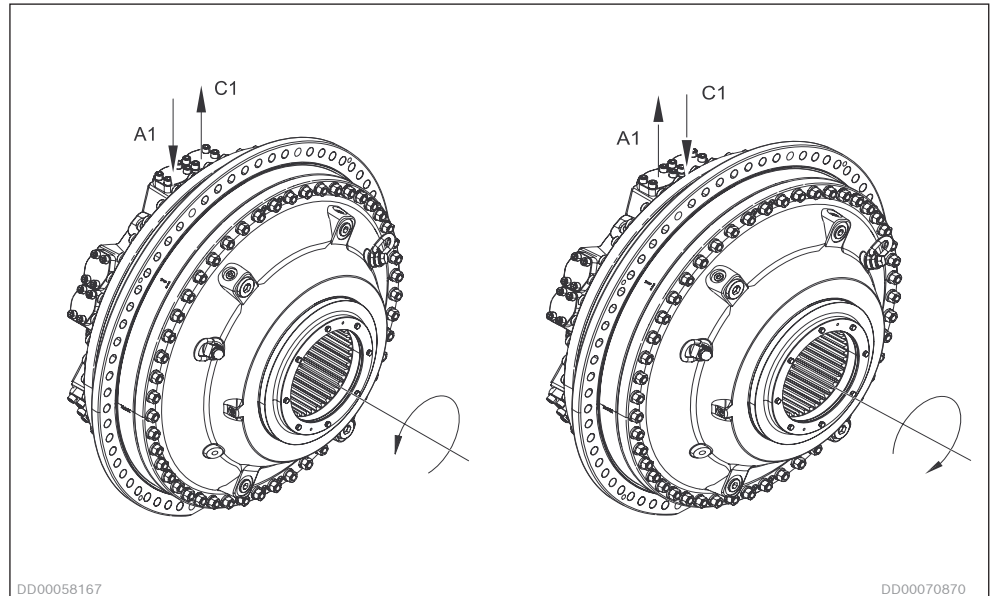


Fig. 59: Direction of rotation

With the inlet flow supply connected to port A, the motor shaft rotates in the direction shown by the arrow, anti-clockwise viewed from the shaft side of the motor.

With the inlet flow supply connected to C port, the motor shaft rotates clockwise viewed from the shaft side of the motor.

8 Commissioning

NOTICE

Dirt particles!

A not run-in motor in combination with dirt particles in the oil can badly affect the sliding surfaces in the motor. This is valid during the first 100 hours.

- ▶ The Hägglunds radial piston hydraulic motor must be installed and commissioned in a clean condition.

8.1 Commissioning

Check the following points before commissioning the motor, i.e. before starting the first time:

- Make sure that all fluids has been removed from the motor to prevent accidental mixing with the hydraulic fluid used in the system.
- Check that the motor is installed according to chapter 7: *Installation*
- Check that all hydraulic couplings and plugs are properly tightened to prevent leakage.
- Select the hydraulic fluid in accordance with the recommendations, See chapter 15.1.1: *Hydraulic fluids* and Data sheet [RE 15414 Hydraulic fluid quick reference](#).

8.1.1 Oil filling

1. Fill the motor housing with hydraulic fluid via a filter into the drain outlets D1 to D8 or the vent hole (depending on how the motor is mounted), for oil volumes see *Table 6*.
2. Check the drain line to ensure that excessive pressure does not build up in the motor case; see chapter 7.2: *Installation conditions* and: 7.4.6: *Draining and venting the motor*
3. Check that the motor is protected from overloads, see chapter Motor data in data sheet [RE 15300](#).

8.1.2 Start of the hydraulic supply

1. During initial starting and the period immediately after it, any hydraulic installation must be regularly and carefully checked at frequent intervals.
2. The working pressure and charge pressure must be checked to ensure that they correspond to the contracted values. Check that the charge pressure conforms to the charge pressure curve, see chapter, Recommended charge pressure in data sheet [RE 15300](#).
3. The pressure in the drain line measured at the motor must be less than 3 bar (43.5 psi). This pressure limit is important for the life of the motor seals.
4. If leakage occurs, correct the fault and carry out new measurements.
5. Check all lines, connections, screws, etc. and correct if necessary.
6. Check other possible leakage points and replace faulty parts.
7. During the start up period, dirt particles in the system are removed by the filters. The filter cartridges have to be changed after the first 100 working hours and after that according to the maintenance chart, *Table 19*. See also Chapter 10.3: *Maintenance plan* (second point) about filter clogged indicators.



It is important that the pressure is limited to 250 bar (3626 psi) when starting up the motor. This is valid for the first 100 hours.

8.2 Re-commissioning after standstill

For re-commissioning, proceed as described in chapter 8.1: *Commissioning*.



WARNING

Material or product damage!

Risk of injury or serious injuries.

- ▶ Before re-commissioning, make sure that the Häggglunds product not been damaged so that the original function changed.

In case of accident or malfunction where it is not possible to determine the status of the Häggglunds product, please contact your Bosch Rexroth representative.

9 Operation

The product is a component which requires no settings or changes during operation. For this reason, this chapter of the manual does not contain any information on adjustment options. Use the product only within the performance range provided in the technical data. The machine/system manufacturer is responsible for the proper project planning of the hydraulic system and its control.

10 Maintenance and repair

10.1 Cleaning and care

NOTICE

Damage to surface!

Aggressive solvents and detergents may damage the seals on the hydraulic motor and cause them to age faster.

- ▶ Never use solvents or aggressive detergents.
- ▶ If in doubt, check the compatibility of the detergent with the seal type (Nitrile or Viton) specified in the hydraulic motor.

Damage to the hydraulic system and the seals!

Using a high-pressure cleaner could damage the speed sensor and the seals of the hydraulic motor.

- ▶ Do not point the high-pressure cleaner at sensitive components, e. g. shaft seals, seals in general, electrical connections, speed sensors and valves.

For cleaning and care of the hydraulic motor, observe the following:

1. Plug all openings with suitable protective caps/devices.
2. Check whether all plugs and plug seals are securely seated to ensure that no moisture can penetrate into the hydraulic motor during cleaning.
3. Use only water and, if necessary, a mild detergent to clean the hydraulic motor.
4. Remove coarse dirt from the outside of the motor and keep sensitive and important components, such as sensors and valve blocks clean.

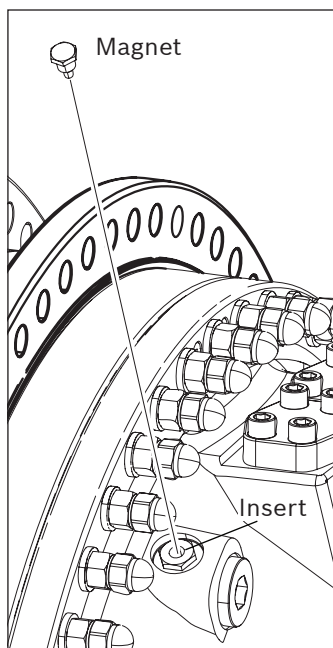


Fig. 60: Magnetic plug

10.2 Inspections

NOTICE

Contact of hydraulic fluids!

Risk for injury.

- ▶ Only remove the magnet.
- ▶ Oil leakage if insert is removed when the motor case is pressurised.

10.2.1 Magnetic plug inspection

A magnetic plug is installed in the drain connection. By regularly inspecting the magnetic plug a malfunction of the hydraulic system can be detected and corrected.

It is important that the inspection of the magnet will be done on a regular basis so changes in the amount of metal particles can be correctly detected. The valve insert is self-sealing and the magnet can be removed for inspections.

When running in a new motor, the metal content are higher than normal, and the magnet will therefore contain more metal particles than normal. This may also be the situation when inspecting the magnet the first time after work has been done in the system.

At normal conditions the magnetic plug may contain a minor amount of small visible particles.

Inspection routine

- First inspection after installation, or if work has been done in the system, shall be done after 12 hours and then according to *Table 19*. At this point, the metal content are higher than normal and metal particles on the magnet can be left without notice. Clean and re-install the magnet.
- Recommended inspection intervals are two weeks, see *Table 19*.
- The magnet shall be cleaned (wiped of) before re-installation.
- If more or larger visible particles are found on the magnet than normal, reduce the checking interval to every second day to determine the trend of the particle level. Please contact your Bosch Rexroth representative for further actions.

10.2.2 Oil inspection

Purpose to take oil sample

The purpose to take an oil sample is to check the condition of the oil. With scheduled oil analysis, wear products can be identified and corrective action can be taken before failure occurs. Oil analysis can indicate when an oil change is required, point out shortcomings in maintenance and keep repair cost to a minimum. Using oil analysis can create a “window of opportunity”, allowing the user to schedule, overhauls, maintenance or repairs, thus saving money on equipment repairs and downtime.

The most used method is to take samples in a clean sample bottle and send it to a fluid laboratory for an analysis and from the laboratory you get a report, which follow a specific international standard.

The analysis should cover viscosity, oxidation, water content, particle counting possibly including element analysis of particles. Another method is to install an inline particle counter direct in your hydraulic system which give you the contamination level according to international standards, the disadvantage with this method is that you only get the contamination level in the oil.

General

The intention is to verify the condition of the oil during operation. The motor should be running at normal operation while the sample is taken.

The cleanliness is extremely important during sampling.

Always use bottles adapted to oil samples, they can be ordered from any fluid analysis laboratory.

Never try to clean your own bottle if you want a true value of the result.

The sample should be taken by using a mini-mess hose connected to a mini-mess coupling.

Always clean the connections carefully before you connect the mini-mess hose to the coupling.

Be careful when connecting the mini-mess hose because the oil beam can be dangerous and should never point against any person or other sensible object.

Check and be aware of the pressure you may have on the connection before you connect.

How to do bottle samples

The sample shall be taken at the mini-mess coupling on the low pressure side of the motor in the main loop. Never take the sample out of the tank using the ball valves.

Clean the coupling and the hose carefully.

Connect the mini-mess hose to the coupling but be careful and be aware of the direction of the oil beam.

Let minimum 2 litres (0,53 gallon US) of oil flush into a bucket before you fill the bottle.

Remove the cap of the bottle as late as possible and don't let any contamination be in touch with the cap, bottle or the mini-mess hose when the sample is taken.

To get a reliable result the system must run without moving any valves and the mini-mess hose should not touch the bottle.

Only $\frac{3}{4}$ of the bottle shall be filled because the laboratory has to shake the sample to get a mixed fluid when they analyse it. Minimum 200 ml are needed for a good analysis.

When the bottle is filled close the cap as soon as possible to prevent contamination from the air that might enter the bottle and give you a wrong result.

Inline measure

The sample shall be taken at the mini-mess coupling on the charge pressure side of the motor in of the main loop system. Clean the coupling and the hose carefully.

Connect the hoses according to the particle counters manual.

To get a true value the contamination readings have to be stable about 10 min before you stop to measure.

10.3 Maintenance plan

When a hydraulic system has been in service for some time, it must undergo periodic maintenance and servicing at intervals which depend on the equipment and the type of duty. This periodic maintenance must include the following operations:

- Check the hydraulic system for leakage. Tighten the screws, fittings, replace faulty seals and keep the drive clean.
- Inspect tank, pump, filters (e.g. air-, oil-, magnetic filters etc.) and clean or change if necessary. Replace all filter cartridges for which a filter clogged indication has been given.
- Check the pressure and temperature of the hydraulic fluid and carry out routine operations. Adjust valves etc. if necessary.
- Check the hydraulic fluid; see chapter 10.4.2: *Oil maintenance*.
- Make sure that no dirt or other contaminations enter the system during inspection. Check that the outside of the hydraulic motor in an installation is kept free of dirt; thus leakage and faults will be detected earlier.
- We recommend that a running log be kept and that planned inspections are carried out at set intervals.
- Maintenance checks and operations, see *Table 19*.
- Check the magnetic plug, see 10.2.1: *Magnetic plug inspection* and *Table 19*.
- Check torque arm and pivoted attachment.

Table 19: Maintenance chart

In operation	Oil filters	Oil	Torque arm	Magnetic plug
After the first 100 hours	R	-	I	-
After 3 months or 500 hours	R	-	-	-
Once every 2 weeks	-	-	-	I
Once every 6 months	R	I	I	-
Once every 12 months	-	-	-	-

R = Replacement, **I** = Inspection

10.4 Maintenance

10.4.1 Filter maintenance

Filters in the hydraulic system must be changed after the first 100 working hours and the second change is to be carried out after 3 months or 500 working hours whichever is earlier. They must then be changed at regular intervals of 6 months or 4000 working hours.

10.4.2 Oil maintenance

See chapter 15.1.1: *Hydraulic fluids* and Data sheet [RE 15414 Hydraulic fluid quick reference](#).

Analysis

It is recommended that the oil should be analysed every 6 months. The analysis should cover viscosity, oxidation, water content, particle counting possibly including element analysis of particles.

Most oil suppliers are equipped to analyse the state of the oil and to recommend appropriate action. The oil must be replaced immediately if the analysis shows that it is outside the specifications.

Viscosity

Many hydraulic oils display viscosity loss with increasing use, and this means poorer lubrication. The viscosity of the oil in service must never fall below the minimum allowed viscosity for the actual fluid or the recommended viscosity for the motor, see chapter Hydraulic fluids in data sheet [RE 15300](#).

Oxidation

Hydraulic oil oxidizes with time of use and temperature. This is indicated by changes in colour and smell, increased acidity or the formation of sludge in the tank. The rate of oxidation increases rapidly at surface temperatures above 60 °C (140 °F), and the oil should then be checked more often.

The oxidation process increases the acidity of the fluid; the acidity is stated in terms of the "neutralisation number". Typical oxidation is slow initially and increases rapidly later.

A sharp increase (by a factor of 2 and 3) in the neutralisation number between inspections is a signal that the oil has oxidized too much and should be replaced immediately.

Water content

Contamination of the oil by water can be detected by sampling from the bottom of the tank. Most hydraulic oils repel the water, which then collects at the bottom of the tank. This water must be drained off at regular intervals. Certain types transmission oils and engine oils emulsify the water; this can be detected by coatings on filter cartridges or a change in the colour of the oil. Obtain the advice of your oil supplier in such cases.

Degree of contamination

Heavy contamination of the oil causes increased wear of the components in hydraulic system. The cause of the contamination must be immediately investigated and remedied.

All hydraulic fluids are affected differently. Obtain the advice of your oil supplier or by nearest Bosch Rexroth representative.

10.5 Repair

Bosch Rexroth offers a comprehensive range of services for repairs of Hägglunds products.

Repairs on the Hägglunds products may only be performed by service centers certified by Bosch Rexroth.

- ▶ Use exclusively original spare parts from Bosch Rexroth to repair the Hägglunds products, otherwise the functional reliability of the products can not be assured and you lose your entitlement under warranty.

In the event of questions regarding repairs, contact your responsible Bosch Rexroth Service partner or the service department of the manufacturer's plant for the Hägglunds products, see chapter 10.6: *Spare parts*.

10.6 Spare parts



Use of unsuitable spare parts!

Spare parts that do not meet the technical requirements specified by Bosch Rexroth may cause personal injury or property damage!

- ▶ Use exclusively original spare parts from Bosch Rexroth to repair the Hägglunds product, otherwise the functional reliability of the Hägglunds product can not be assured and you lose your entitlement under warranty.

Address all questions regarding spare parts to your responsible Bosch Rexroth Service partner or the service department of the manufacturer's plant for the Hägglunds products. Details of the manufacturer's plant can be found on the product identification plate of the Hägglunds product.

11 Removal and replacement

11.1 Required tools

In addition to standard tools the following are also needed, for example:

- ▶ Lifting tool/device
- ▶ Lifting eyes
- ▶ Assembly tool
- ▶ Oil barrel (wide opening)

11.2 Preparing for removal

1. Decommission the entire system as described in the instruction manual for the machine or system. Relieve pressure in the hydraulic system according to the instructions of the machine or system manufacturer. Make sure that the relevant system components are not under pressure or voltage.
2. Protect the complete system against being energized.
3. Remove the hoses, cables and pipelines from the motor.

11.3 Removing motor and coupling adapter

Proceed as follows to remove the motor:

DANGER

Danger from suspended loads!

Danger to life or risk of injury, damage to equipment!

Improper transportation may cause the Hågglunds motors to fall down lead to injuries e.g. crushing or broken bones or damage to the product.

- ▶ Make certain that the forklift truck or lifting device has adequate lifting capacity.
- ▶ Never stand under or put your hands under suspended loads.
- ▶ Ensure your position is stable during transportation.
- ▶ Use your personal protective equipment (e.g. safety glasses, safety gloves, suitable working clothes, safety shoes).
- ▶ Use suitable lifting device for transport and storage, installation and for removal and repair. Make sure the motor is well mounted or anchored when the lifting device is disconnected.
- ▶ Observe the prescribed position of the lifting strap.
- ▶ Observe the national laws and regulations on work and health protection and transportation.

CAUTION

Contact with hydraulic fluid!

Hazard to health/health impairment e.g. eye injuries, skin damage, toxication during inhalation!

- ▶ Avoid contact with hydraulic fluids.
- ▶ When working with hydraulic fluids, strictly observe the safety instructions provided by the lubricant manufacturer.
- ▶ Use your personal protective equipment (e.g. safety glasses, safety gloves, suitable working clothes, safety shoes).
- ▶ If hydraulic fluid should, nevertheless, come into contact with your eyes or bloodstream or is swallowed, consult the medical care immediately.

NOTICE

Escaping or spilling hydraulic fluid!

Environmental pollution and contamination of the ground water!

- ▶ Always place a drip tray under the Hågglunds motor when filling and draining the hydraulic fluid.
- ▶ Use an oil binding agent if hydraulic fluid is spilled.
- ▶ Observe the information in the safety data sheet for the hydraulic fluid and the specifications provided by the system manufacturer.

Removing the CBm spline motor

1. Secure the motor to a lifting device, see chapter 6.1: *Product transport*.
2. Place the oil barrel below the motor.
3. Remove the cover.
4. Dismount the screw M30 or plug G1¼
5. Remove the bearing holder. The oil will drain out.
6. Dismount the spacer (torque armed mounted motor) or the plug G 1¼ (flange mounted motor).
7. Mount the bearing holder.
8. Install the assembly tool by pass the tie rod through the centre of the motor and screw it into the driven shaft by using a wrench at the key grip at the end of the assembly tool.
9. Mount the nut and then the washer tight to the bearing holder. Mount the dismantling tool with the screws to the bearing holder.
10. If the motor is flange mounted, unscrew the motor from the flange. If the motor is torque armed mounted, disconnect the articulated connection.
11. Pull the motor off the shaft by turning the nut on the assembly tool.

Assembly tool motor

- 1 Tie rod
- 2 Nut
- 3 Washer
- 4 Dismantling tool and screws



If there are no screw holes predrilled in the bearing holder, use the dismantling tool as a template to drill and tap new holes,

M12 depth 15-20 mm.

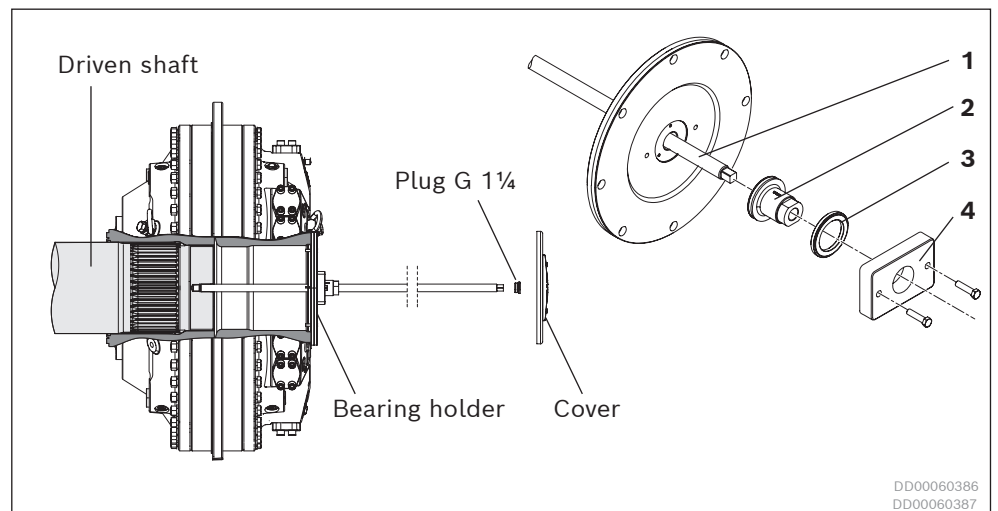


Fig. 61: Assembly tool for removing the CBm spline motor

Removing the CBm coupling motor

1. Secure the motor to a lifting device, see chapter 6.1: *Product transport*.
2. Remove the cover.
3. Dismount the plug G1¼.
4. Install the assembly tool by pass the tie rod through the centre of the motor and screw it into the driven shaft by using a wrench at the key grip at the end of the assembly tool.
5. Mount the nut and then the washer tight to the bearing holder. Mount the dismantling tool with the screws to the bearing holder.
6. Untighten the screws on the harsh kit.
7. Disconnect the torque arm from the articulated connection.
8. Untighten the screws on the shrink disc gradually, appr. a quarter turn each. Keep doing this until all screws are untighten.
9. Pull the motor off the shaft by turning the nut on the assembly tool.

Removing the coupling adapter

1. Secure the coupling adapter to a lifting device, see chapter 6.1: *Product transport*.
2. Install the assembly tool by pass the tie rod through the centre of the coupling adapter and screw it into the driven shaft by using a wrench at the key grip at the end of the assembly tool.
3. Mount the nut and then the washer tight to the coupling adapter. Mount the dismantling tool with the screws to the coupling adapter.
4. Mount one lifting eye above the dismantling tool at the end of the coupling adapter.
5. Mount two lifting eyes on the opposite side of adapter shaft.
6. Untighten the screws on the shrink disc gradually, appr. a quarter turn each. Keep doing this until all screws are untighten.
7. Remove the coupling-adapter from the customer shaft by turning the nut on the mounting tool counterclockwise.

Included in coupling adapter

- 1 Lifting eye
- 2 Dismounting tool
- 3 Screws

Assembly tool for coupling adapter

- 4 Nut and washer
- 5 Carriage beam

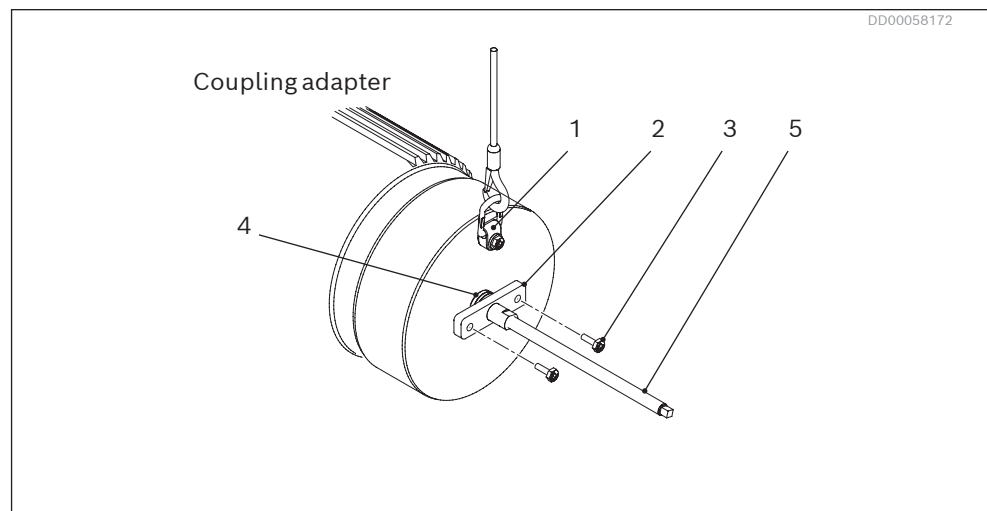


Fig. 62: Assembly tool for removing the coupling adapter

11.4 Preparing the components for storage or further use

Proceed as described in chapter 6.2: *Product storage*.

12 Disposal

12.1 Environmental protection

Careless disposal of the CBm motor, the hydraulic fluid and the packaging material could lead to pollution of the environment.

Observe the following points when disposing of the CBm motor:

1. Completely empty the motor from fluid.
2. Dispose of the motor and packaging material in accordance with the national regulations in your country.
3. Dispose of the hydraulic fluid according to the national regulations of your country. Also observe the applicable safety data sheet for the hydraulic fluid.
4. Remove the motor into its individual parts and properly recycle these parts separate according to, for instance:
 - Cast iron
 - Steel
 - Aluminum
 - Non-ferrous metal
 - Electronic waste
 - Plastic
 - Seals

13 Extension and conversion

Do not modify Hägglunds products. Please contact your Bosch Rexroth representative for extension or conversion.

14 Troubleshooting

Please, contact your nearest Bosch Rexroth representative.

Table 20: Troubleshooting hydraulic motor

Fault	Probable cause	Action
The motor does not run.	Mechanical stop in the drive.	Check system pressure. If the pressure has risen to the relief valve setting, remove the load from the drive.
	The motor does not deliver enough torque because the pressure difference across the motor is not enough for the load.	Investigate the pressure level in the system and correct the setting of the pressure limiting valve if necessary.
	Insufficient or no oil being supplied to motor.	Check the hydraulic system. Check the external leakage of the motor (D connection).
Motor rotates in wrong direction.	Oil supply connections to motor incorrectly connected.	Connect the oil supply correctly.
Motor runs jerkily.	Pressure or flow fluctuations in the hydraulic system.	Find the cause in the system or in the driven unit.
Noise in the motor.	The motor is being operated with too low charge pressure.	Adjust the charge pressure to the correct level. See chapter, Recommended charge pressure in data sheet RE 15300
	Internal faults in the motor.	Check the magnetic plug and check the material that sticks to the magnet. Steel particles indicate damage. Note that fine material from the castings may be deposited and does not mean internal damage in the motor. Investigate the drain oil.
External oil leakage on the motor.	The radial lip seals or other seals is worn or damaged.	Replace the damaged seals.

15 Technical data

15.1 Technical data, Hägglunds CBm

For complete technical data see [RE 15300](#).

DANGER

Hanging load falls down!

Danger to life, risk of injury or damage to equipment, in hanging load applications!

- ▶ Charge pressure at motors connection must be according to recommended pressure under all conditions, see data sheet [RE 15300](#) , chapter Recommended charge pressure
- ▶ Changes to the factory settings must only be made by Bosch Rexroth specialist personnel.

15.1.1 Hydraulic fluids

The hydraulic CBm motor is primarily designed for operation with hydraulic fluids according to ISO 11158 HM.

Before the start of project planning, see Data sheet [RE 15414](#), Hydraulic fluid quick reference, for detailed information on hydraulic fluids and specific additional demands.

Filtration of the hydraulic fluid

A contamination level of at most 18/16/13 according to ISO 4406 is required. The less contaminated the fluid, the longer the service life of the hydraulic motor.

Details regarding the selection of hydraulic fluid

The hydraulic fluid should be selected such that the operating viscosity in the temperature range, as measured in the motor housing, is within optimum operation range according to chapter Hydraulic fluids in data sheet [RE 15300](#)

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