rexroth

A Bosch Company

Radial piston hydraulic motor Hägglunds CBp

HÄGGLUNDS

Valid for

▶ Torque range: up to 280 kNm [up to 206 517 lb-ft]

▶ Speed range: up to 400 rpm

▶ Power range: up to 3166 kW

▶ Maximum operating pressure: 350 bar [5 076 psi]

▶ Frame size: 140, 280, 400, 560, and 840

▶ Displacement: 5 024 to 52 800 cm3/rev
  [303,6 to 3220 in3/rev]

▶ Specific torque: 80 to 840 Nm/bar
  [4 068 to 42 700 ft-lbs/1 000 psi]

Features

▶ Very high power density

▶ High torque density

▶ High power output

▶ High speed

▶ Energy efficient

▶ Flexible, many sizes, few mechanical interfaces

▶ Front mounting possibility

▶ Insensitive for shock loads

▶ Very low moment of inertia

▶ Small footprint (total occupied volume)

▶ Freewheeling possibility

▶ Through hole diameter up to 170 mm

▶ Tandem mounting possiblilty

Contents

1   Ordering code

In order to identify Hägglunds equipment exactly, the following ordering code is used. These ordering codes should be stated in full in all correspondence e.g. when ordering spare parts.
Example Hägglunds CBp motor:

CB	P	140	120	S	A	0	V	0	C	F	02	00
01	02	03	04	05	06	07	08	09	10	11	12	13

01	**Motor series**	
	Compact	**CB**

02	**Type**	
	High Power	**P**

03	**Frame size**	
	CBP 140	**140**
	CBP 280	**280**
	CBP 400	**400**
	CBP 560	**560**
	CBP 840	**840**

04	**Nominal size , specific torque, Nm/bar** (see section *4.3*)							
	Frame size 140				**80**	**100**	**120**	**140**
					●	●	●	●
	Frame size 280				**160**	**200**	**240**	**280**
					●	●	●	●
	Frame size 400			**240**	**280**	**320**	**360**	**400**
				●	●	●	●	●
	Frame size 560				**440**	**480**	**520**	**560**
					●	●	●	●
	Frame size 840	**600**	**640**	**680**	**720**	**760**	**800**	**840**
		●	●	●	●	●	●	●

05	**Mounting alternatives, shaft**	
	Splines	**S**

06	**Motor prepared for multi disc brake or tandem kit**	
	Motor not prepared for brake or tandem kit	**A**
	Motor prepared for brake [1] or tandem kit [2]	**B**

07	**Displacement shift**	
	Motor not prepared for displacement shift	**0**

08	**Type of seal**		
	NBR (Nitrile(	–	N
	FPM (Viton)	●	V

09	**Through hole kit** *(see section 5)*	
	No	0
	Yes	H

10	**Increased robustness** *(see section 6)*		
	No	–	0
	Yes	●	C

11	**Mounting type**						
		140	280	400	560	840	
	Center	●	–	●	●	●	C
	Front	●	●	●	●	–	F

12	**Modification**	
	Standard	02

13	**Design**	
	Standard	00
	Special index	01-99

● = Available   – Not available

[1] Only CBp 140 Contact Technical help desk!
[2] Only CBp 280 to CBp 840

2   Functional description
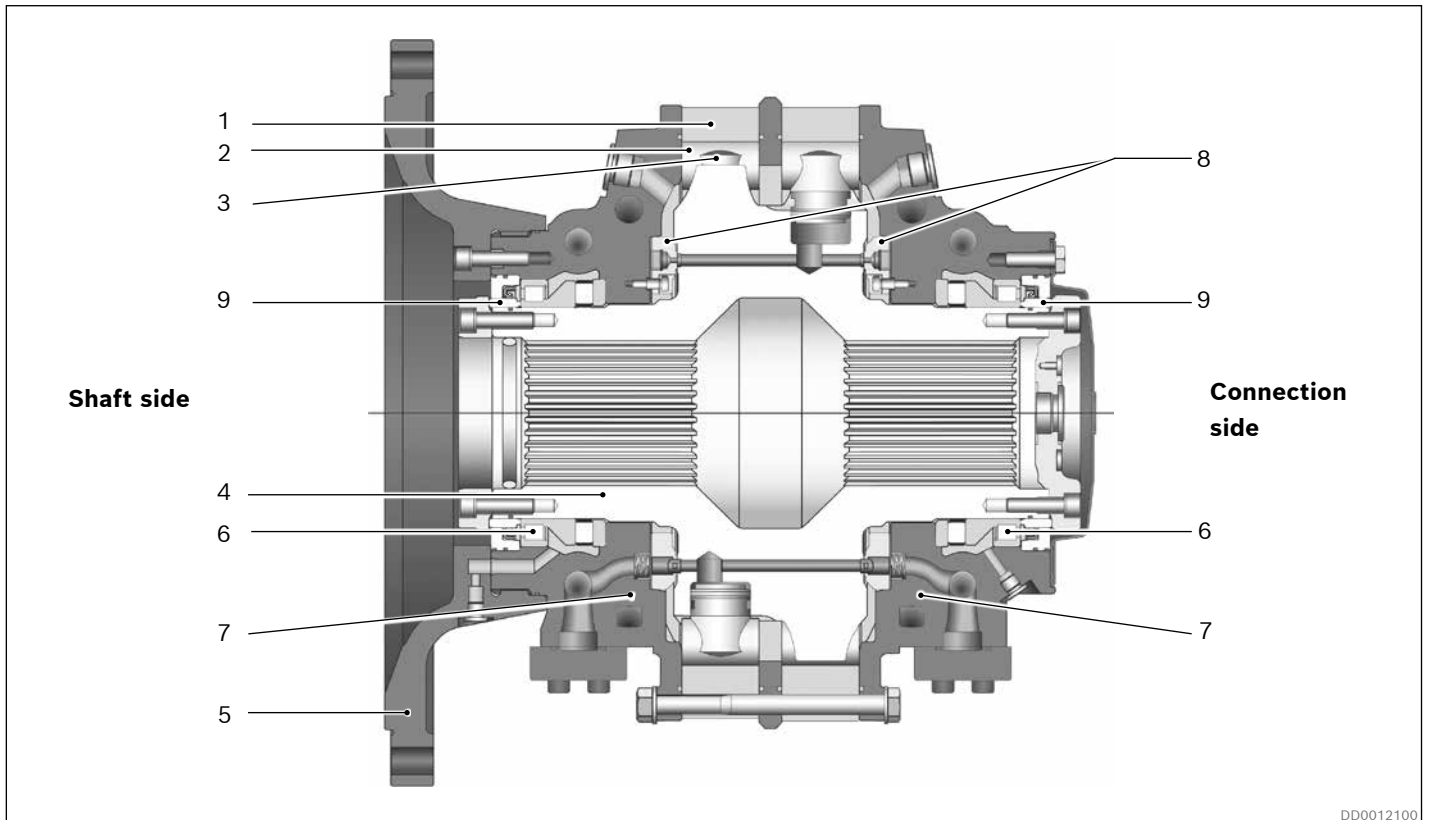
Fig. 1: Example section view of radial piston hydraulic motor Hägglunds CBp 140 mounting type front
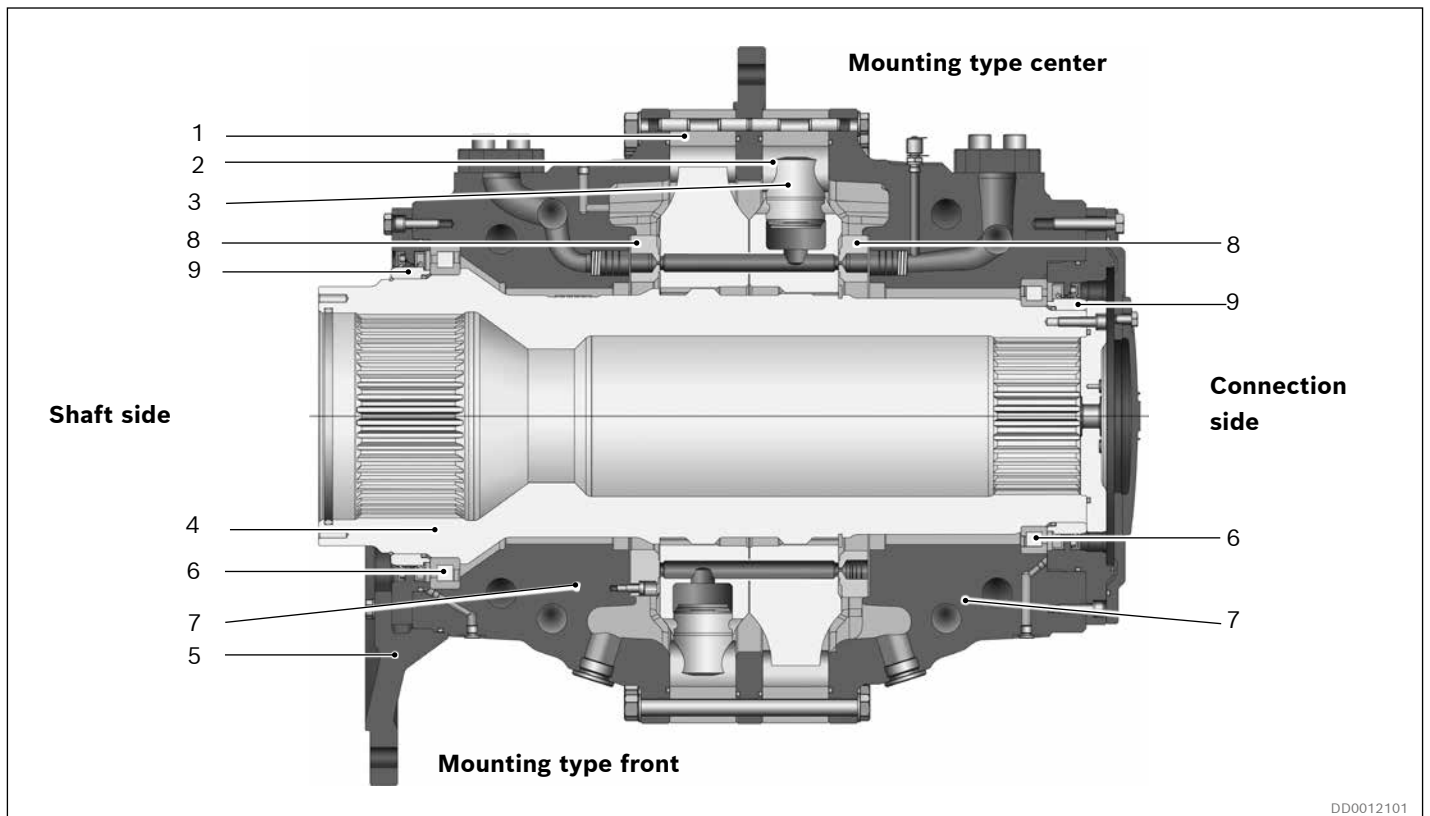
Fig. 2: Example section view of radial piston hydraulic motor Hägglunds CBp 560 mounting type front/center

1. Cam ring	**6. CBp 140** Combined
2. Cam roller	axial and radial bearing
3. Piston	**CBp 280 to CBp 800**
4. Cylinder block, spline	Cylindrical roller bearing
5. Flange	**7.** Connection housing
	8. Distributor
	9. Wear ring

Bosch Rexroth's hydraulic industrial motor Hägglunds CBp is of the high torque and low rotation radial piston type with a rotating cylinder block/hollow 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 pistons which are guided in the cylinder block. Rotation therefore occurs, and the torque available is proportional to the pressure in the system.

Oil main lines are connected to ports A and C in the connection housing and drain lines to one of the D -ports in the motor housing. (See *3.2 Port connections*)

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

Quality

To assure our quality we maintain a Quality Assurance System, certified to standard ISO 9001.
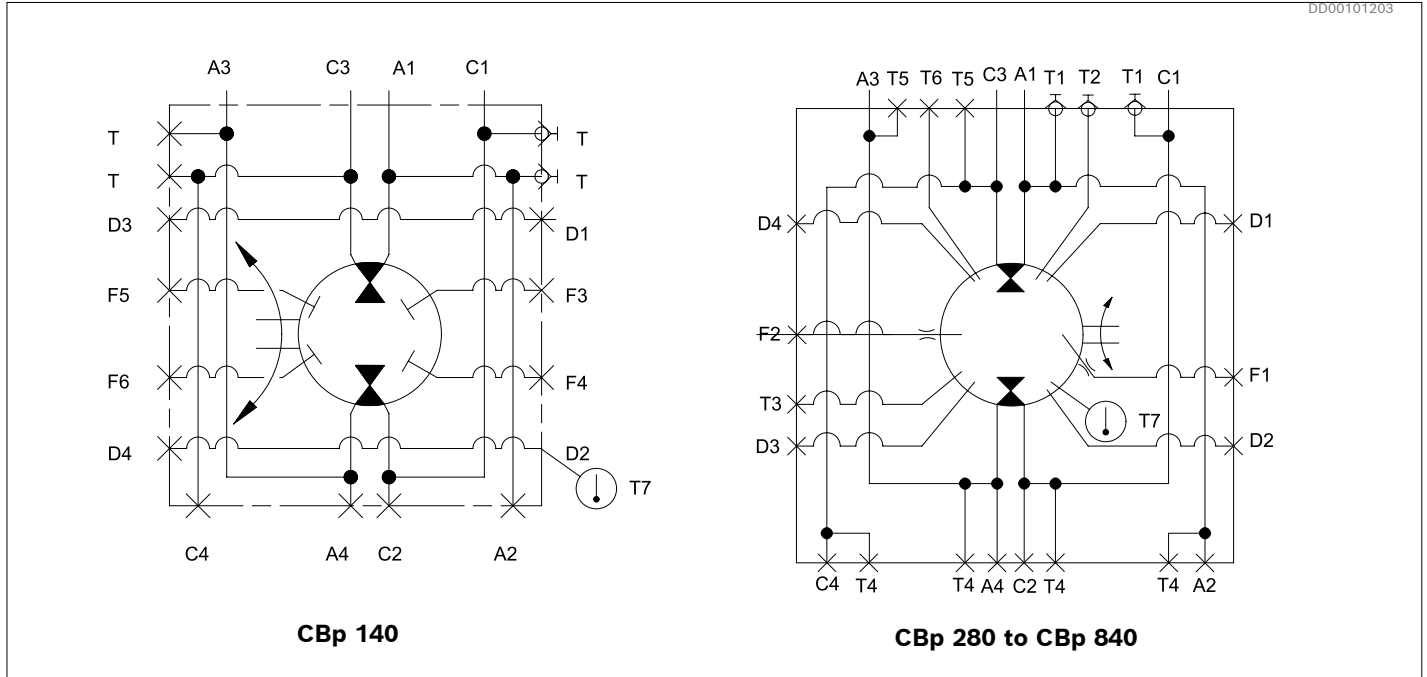
3   Fluid connections

3.1 Hydraulic symbol

Fig. 3: Hydraulic symbol

Port locations and dimensions, see *Table 1, Table 2, Fig. 4 and Fig. 5*
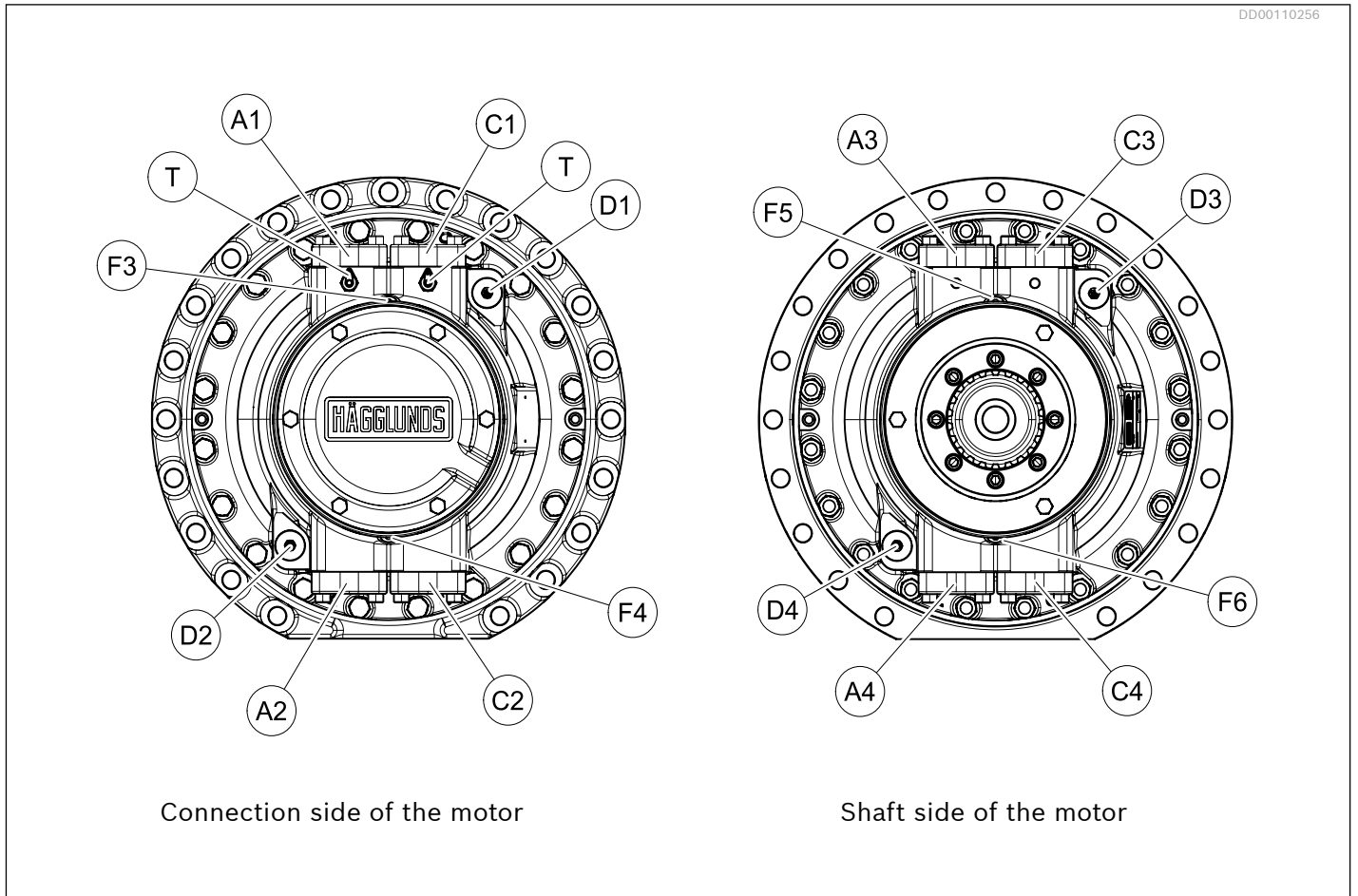
3.2 Port connections

Connection side of the motor   Shaft side of the motor

Fig. 4: Hydraulic connections CBp 140

Table 1: Port dimensions CBp 140

Connection	Description	Dimensions	Remarks
A1, C3	Main connection	1 1/4" *	If A1, C3 is used as the inlet, the motor shaft rotates counterclockwise, viewed from the motor shaft side
C1, A3	Main connection	1 1/4" *	If C1, A3 is used as the inlet, the motor shaft rotates clockwise, viewed from the motor shaft side
A2, A4	Alternative main connection	1 1/4" *	
C2, C4	Alternative main connection	1 1/4" *	
D1	Drain connection	G 3/4"	
D2, D3, D4	Alternative drain connection	G 3/4"	Temperature sensor normally mounted in D2 (T7)
T	Test connection	G1/4"	Used to measure pressure and/or temperature at the main connections. Minimess M16
D2	Temperature sensor Pt 100	EN 175301-803	
F3, F4, F5, F6	Alternative flushing connections	G1/4"	For flushing of motor housing and radial lip seal

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

All connections are normally plugged at delivery.
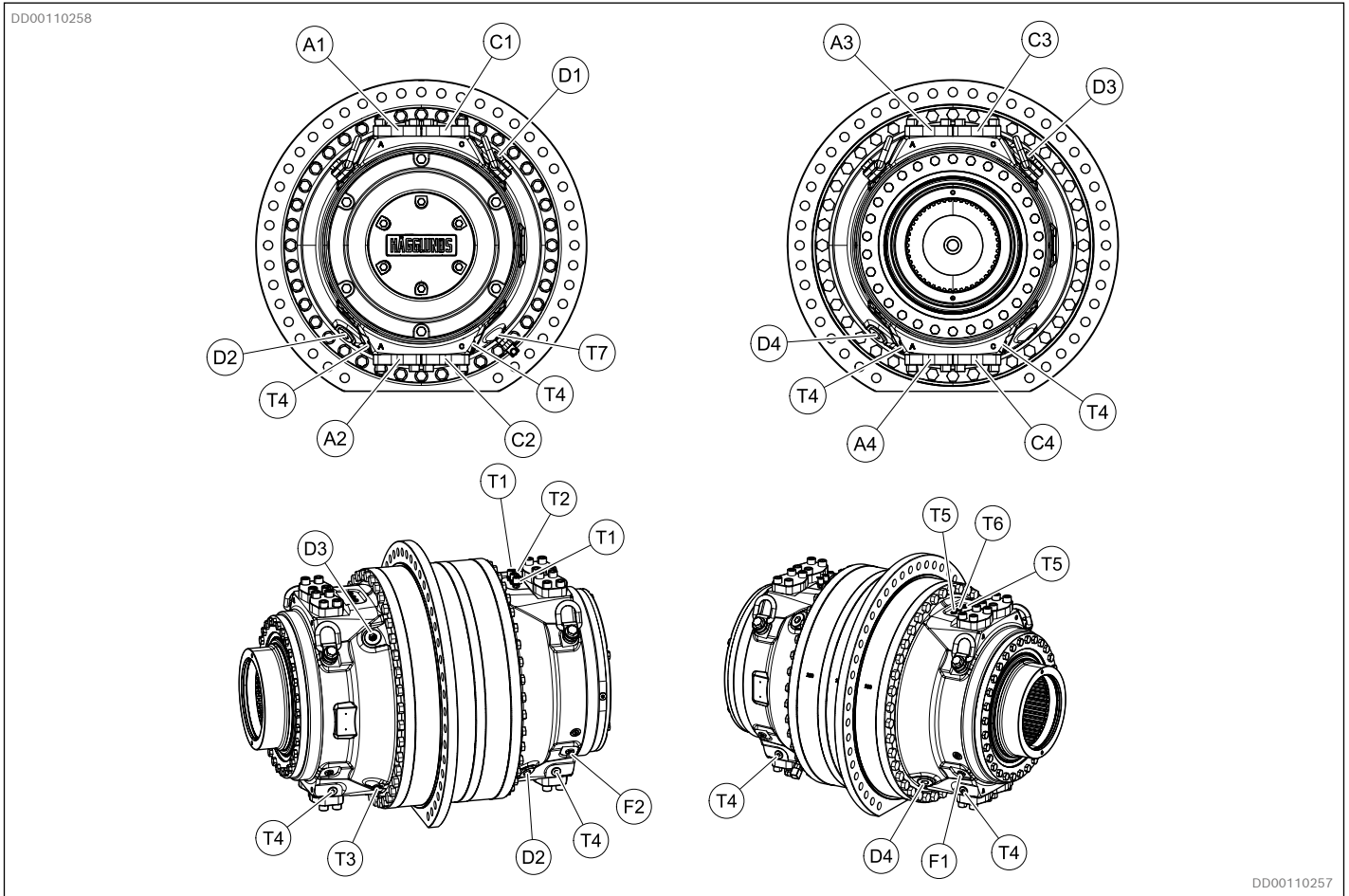
Fig. 5: Hydraulic connections CBp 280 to CBp 840

Table 2: Port dimiensions CBp 280 to CBp 840

Connection	Description	Dimensions	Remarks
A1, C3	Main connection	2" *	If A1, C3 is used as the inlet, the motor shaft rotates counterclockwise, viewed from the motor shaft side
C1, A3	Main connection	2" *	If C1, A3 is used as the inlet, the motor shaft rotates clockwise, viewed from the motor shaft side
A2, C4	Alternative main connection	2" *	
C2, A4	Alternative main connection	2" *	
D1	Drain connection	G 1 1/4"	
D2, D3, D4	Alternative drain connection	G 1 1/4"	
T1, T2,	Test connection	G1/4"	Used to measure pressure and/or temperature at the main connections. Minimess M16
T3	Test connection	G1/4"	
F1, F2	Flushing connection	G1/4"	For flushing of radial lip seal
T4	Pressure connection	G1/2"	
T5, T6	Pressure connection	G1/4"	
T7	Temperature sensor Pt 100	EN 175301-803	

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

All connections are normally plugged at delivery.

4   Technical data

4.1 Calculation fundamentals

Table 3: Calculation fundamentals.

		Metric			US	
Output power	P=	$\dfrac{T \cdot n}{9549}$	(kW) on driven shaft	P=	$\dfrac{T \cdot n}{5252}$	(hp) on driven shaft
Output torque (η_m=98%)	T=	$T_s \cdot (p - \Delta p_l - p_c) \cdot \eta_m$	(Nm)	T=	$\dfrac{T_s \cdot (p - \Delta p_l - p_c) \cdot \eta_m}{1000}$	(ibf·ft)
Pressure required (η_m=98%)	p=	$\dfrac{T}{T_s \cdot \eta_m} + \Delta p_l + p_c$	(bar)	p=	$\dfrac{T \cdot 1000}{T_s \cdot \eta_m} + \Delta p_l + p_c$	(psi)
Flow rate required	q=	$\dfrac{n \cdot V_i}{1000} + q_l$	(l/min)	q=	$\dfrac{n \cdot V_i}{231} + q_l$	(gpm)
Output speed	n=	$\dfrac{q - q_l}{V_i} \cdot 1000$	(rpm)	n=	$\dfrac{q - q_l}{V_i} \cdot 231$	(rpm)
Inlet power	P_{in}=	$\dfrac{q \cdot (p - p_c)}{600}$	(kW)	P_{in}=	$\dfrac{q \cdot (p - p_c)}{1714}$	(hp)

Quantity	Symbol		Metric	US
Power	P	=	kW	hp
Output torque	T	=	Nm	lbf·ft
Specific torque	T_s	=	Nm/bar	lbf·ft/1000 psi
Rotational speed	n	=	rpm	rpm
Required pressure	p	=	bar	psi
Pressure loss	Δp_l	=	bar	psi
Charge pressure	p_c	=	bar	psi
Flow rate required	q	=	l/min	gpm
Total volumetric loss	q_l	=	l/min	gpm
Displacement	V_i	=	cm^3/rev	in^3/rev
Mechanical efficiency	η_m	=	0,98 [1]	

[1] Not valid as starting efficiency

4.2 General data

Table 4: General data (metric)

			CBp 140		CBp 280	CBp 400		CBp 560		CBp 840
					Frame size					
Type of mounting			See section *8: Mounting alternatives*							
Port connections			See section *3.2: Port connections*							
External loads			See section *4.14: Permissible external loads*							
Hydraulic fluids			See section *4.5: Hydraulic fluids*							
Pressure	Maximum operating pressure	bar	350		350	350		350		350
	Maximum peak pressure [1]	bar	420		420	420		420		420
	Charge pressure	bar	See section *4.4: Recommended charge pressure*							
	Maximum case pressure		For continuous duty, the service life of the shaft seal is affected by case oil temp, case pressure and speed, see *Fig. 6 and Fig. 7*							
	Maximum case peak pressure [2]	bar	8		8	8		8		8
Temperature limits of case drain oil										
Seal type FPM (Viton)	Minimum	°C	-20-		-20	-20-		-20		20
	Maximum	°C	+100		+100	+100		+100		+100
Oil volume in motor case		l	5.2		29.0	35.0		35.0		41.0
Moment of inertia for rotary group			F	C	F	F	C	F	C	C
		kg·m²	3.0	3.0	13.5	23.0	23.0	24.5	24.5	30.0
Weight		kg	406	353	1579	1928	1879	1992	1894	2168

[1] Peak pressure 420 bar maximum, allowed to occur up to 10 000 times.
[2] Momentary pressure spikes t< 0.1 s of up to 8 bar are permitted.

Table 5: General data (US)

			CBp 140		CBp 280	CBp 400		CBp 560		CBp 840
					Frame size					
Type of mounting			See section *8: Mounting alternatives*							
Port connections			See section *3.2: Port connections*							
External loads			See section *4.14: Permissible external loads*							
Hydraulic fluids			See section *4.5: Hydraulic fluids*							
Pressure	Maximum operating pressure	psi	5076		5076	5076		5076		5076
	Maximum peak pressure [1]	psi	6091		6091	6091		6091		6091
	Charge pressure	psi	See section *4.4: Recommended charge pressure*							
	Maximum case pressure		For continuous duty, the service life of the shaft seal is affected by case oil temp, case pressure and speed, see *Fig. 6 and Fig. 7*							
	Maximum case peak pressure [2]	psi	116		116	116		116		116
Temperature limits of case drain oil										
Seal type FPM (Viton)	Minimum	°F	-31-		-31	-31-		-31		-31
	Maximum	°F	+158		+158	+158		+158		+158
Oil volume in motor case		US gal	1.37		7.66	9.25		9.25		10.83
Moment of inertia for rotary group			F	C	F	F	C	F	C	C
		lb·ft²	71	71	320	546	546	580	580	710
Weight		lb	895	778	3481	4250	4142	4392	4176	4780

[1] Peak pressure 6091 psi maximum, allowed to occur up to 10 000 times.
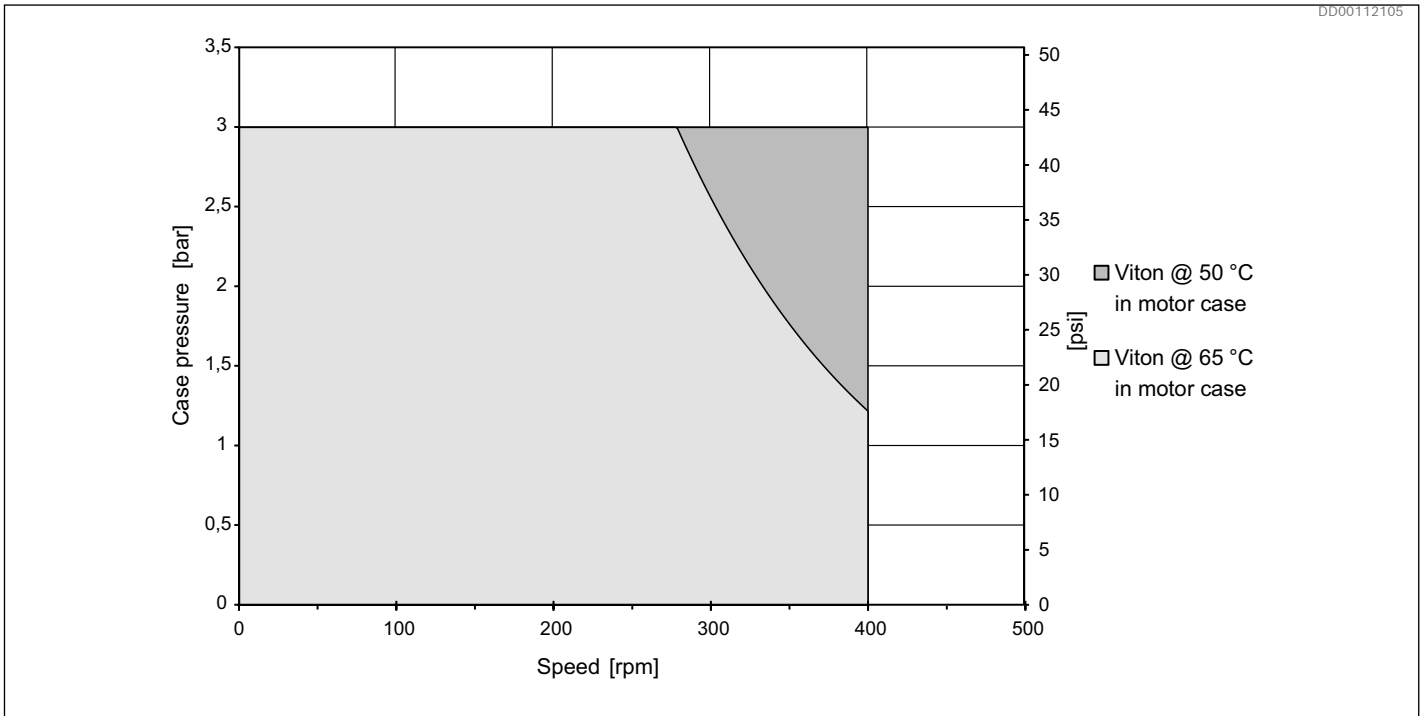[2] Momentary pressure spikes t< 0.1 s of up to 116 psi are permitted

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Fig. 6: Maximum case pressure vs. speed, continuous operation for CBp 140
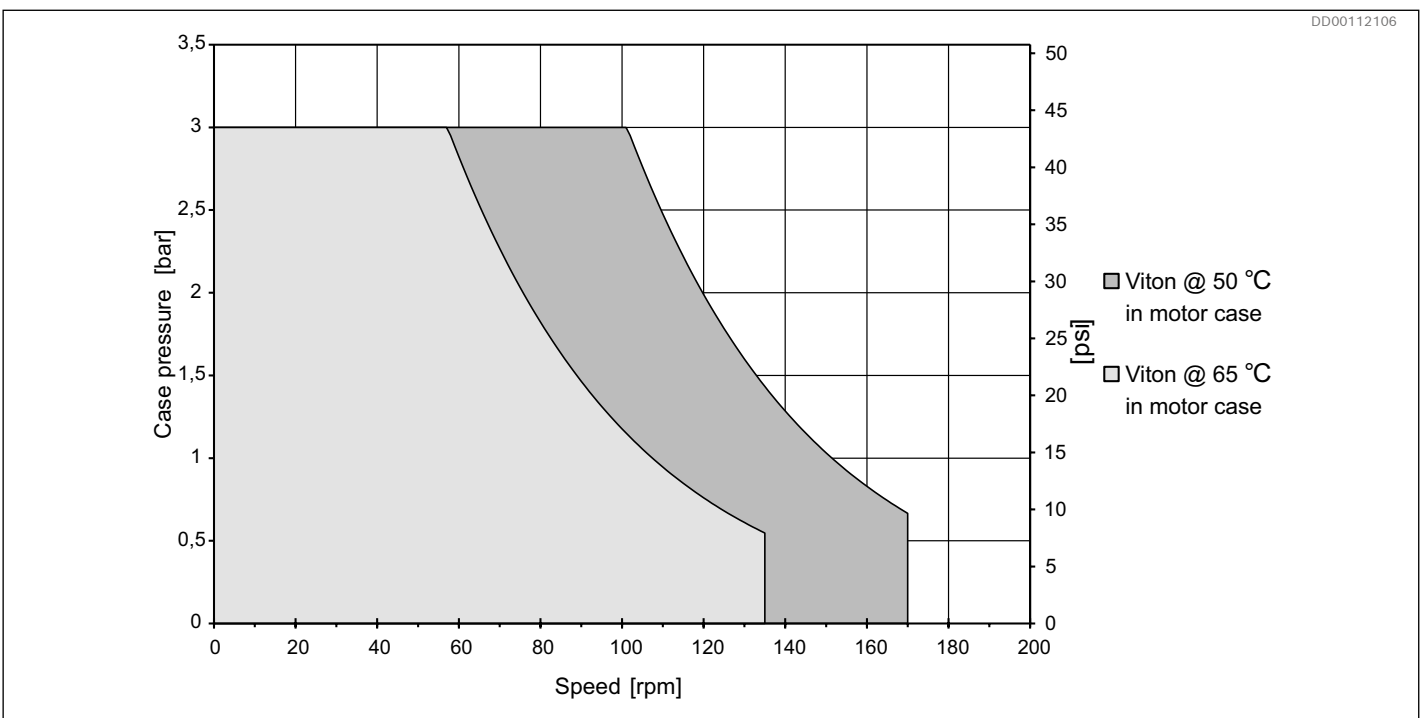
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Fig. 7: Maximum case pressure vs. speed, continuous operation for CBp 280 to CBp 840

4.3 Motor data

Table 6: Specific data (metric)

Frame size	Nominal size	Specific torque	Displacement	Maximum torque [1]	Maximum speed	Maximum operating pressure [2]	Maximum operating power [3]
		Nm/bar	cm3/rev	kNm	rpm	p bar	kW
CBp 140	80	80	5024	26	400	350 [4]	1062
	100	100	6280	33	390	350 [4]	1274
	120	120	7543	39	320	350 [4]	1257
	140	140	8800	46	275	350 [4]	1264
CBp 280	160	160	10100	53	170	350	925
	200	200	12600	66	170	350	1150
	240	240	15100	79	170	350	1369
	280	280	17600	92	170	350	1584
CBp 400	240	240	15100	79	170	350	1389
	280	280	17600	92	170	350	1618
	320	320	20100	110	170	350 [4]	1846
	360	360	22600	120	170	350 [4]	2070
	400	400	25100	130	170	350 [4]	2293
CBp 560	440	440	27600	140	135	350 [4]	2014
	480	480	30200	160	135	350 [4]	2091
	520	520	32700	170	135	350 [4]	2366
	560	560	35200	180	135	350 [4]	2541
CBp 840	600	600	37700	200	135	350	2683
	640	640	40200	210	135	350	2841
	680	680	42700	220	135	350	3017
	720	720	45200	240	135	350	3166
	760	760	47800	250	125	350	3096
	800	800	50300	260	120	350	3142
	840	840	52800	280	115	350	3151

[1] Calculated as: Metric = Ts · (350-15) · 0,98
[2] The motors are designed according to DNV-rules. Test pressure 420 bar. Peak pressure 420 bar maximum, allowed up to 10 000 times.
[3] Flushing of motor case is required. See section *4.10: Flushing*
[4] Alternating torque direction is not allowed for front mounting flange.

Table 7: Specific data (US)

Frame size	Nominal size	Specific torque	Displacement	Maximum torque [1]	Maximum speed	Maximum operating pressure [2]	Maximum operating power [3]
		lbf·ft/1000 psi	in3/rev	lbf·ft	rpm	p psi	hp
CBp 140	80	4 068	306,6	19177	400	5000 [4]	1424
	100	5 085	383,2	24340	390	5000 [4]	1708
	120	6 102	460,3	28765	320	5000 [4]	1686
	140	7 119	537	33928	275	5000 [4]	1695
CBp 280	160	8 100	610	39090	170	5000	1240
	200	10 200	760	48679	170	5000	1542
	240	12 200	920	58267	170	5000	1836
	280	14 200	1070	67856	170	5000	2124
CBp 400	240	12 200	920	58267	170	5000	1863
	280	14 200	1070	67856	170	5000	2170
	320	16 300	1230	81132	170	5000 [4]	2476
	360	18 300	1380	88507	170	5000 [4]	2776
	400	20 300	1530	95883	170	5000 [4]	3075
CBp 560	440	22 400	1690	103258	135	5000 [4]	2701
	480	24 400	1840	118010	135	5000 [4]	2804
	520	26 400	1990	125385	135	5000 [4]	3173
	560	28 500	2150	132761	135	5000 [4]	3408
CBp 840	600	30 500	2300	147512	135	5000	3598
	640	32 500	2450	154888	135	5000	3810
	680	34 600	2610	162263	135	5000	4046
	720	36 600	2760	177015	135	5000	4246
	760	38 700	2910	184390	125	5000	4152
	800	40 700	3070	191766	120	5000	4213
	840	42 700	3220	206517	115	5000	4226

[1] Calculated as: US = Ts • (5076-215) • 0,98
[2] The motors are designed according to DNV-rules. Test pressure 6000 psi. Peak pressure 6000 psi maximum, allowed up to 10 000 times.
[3] Flushing of motor case is required. See section *4.10: Flushing*
[4] Alternating torque direction is not allowed for front mounting flange.

4.4 Recommended charge pressure

The hydraulic system must be such that the motor will recieve sufficient charge pressure at the charge pressure port (low pressure port). This applies to all types of installations.

4.4.1   The motor working in driving mode only

The pressure at the charge pressure port (low pressure port), should, during operation of the motor, be at least one bar above the case pressure independent of numbers of ports that are connected. Two cases to be considered:

Case 1: No shock loads.
Required charge pressure = case pressure + 1 bar (14.5 psi) during operation, but shall not be below 2 bar (29.0 psi)

Case 2: With shock loads.
Required charge pressure at the **outlet** port corresponds to 30 % of value given in diagram. See *Fig. 8, Fig. 9, Fig. 10 and Fig. 11.*

4.4.2   The motor working in braking mode

For motors working in braking mode (pump mode), the required charge pressure at the **inlet** port is according to diagram. See See *Fig. 8, Fig. 9, Fig. 10 and Fig. 11.*

> **Note!**
> The diagrams are valid for 1 bar (14,5 psi) case pressure. With increasing case pressure the charge pressure must be increased accordingly.
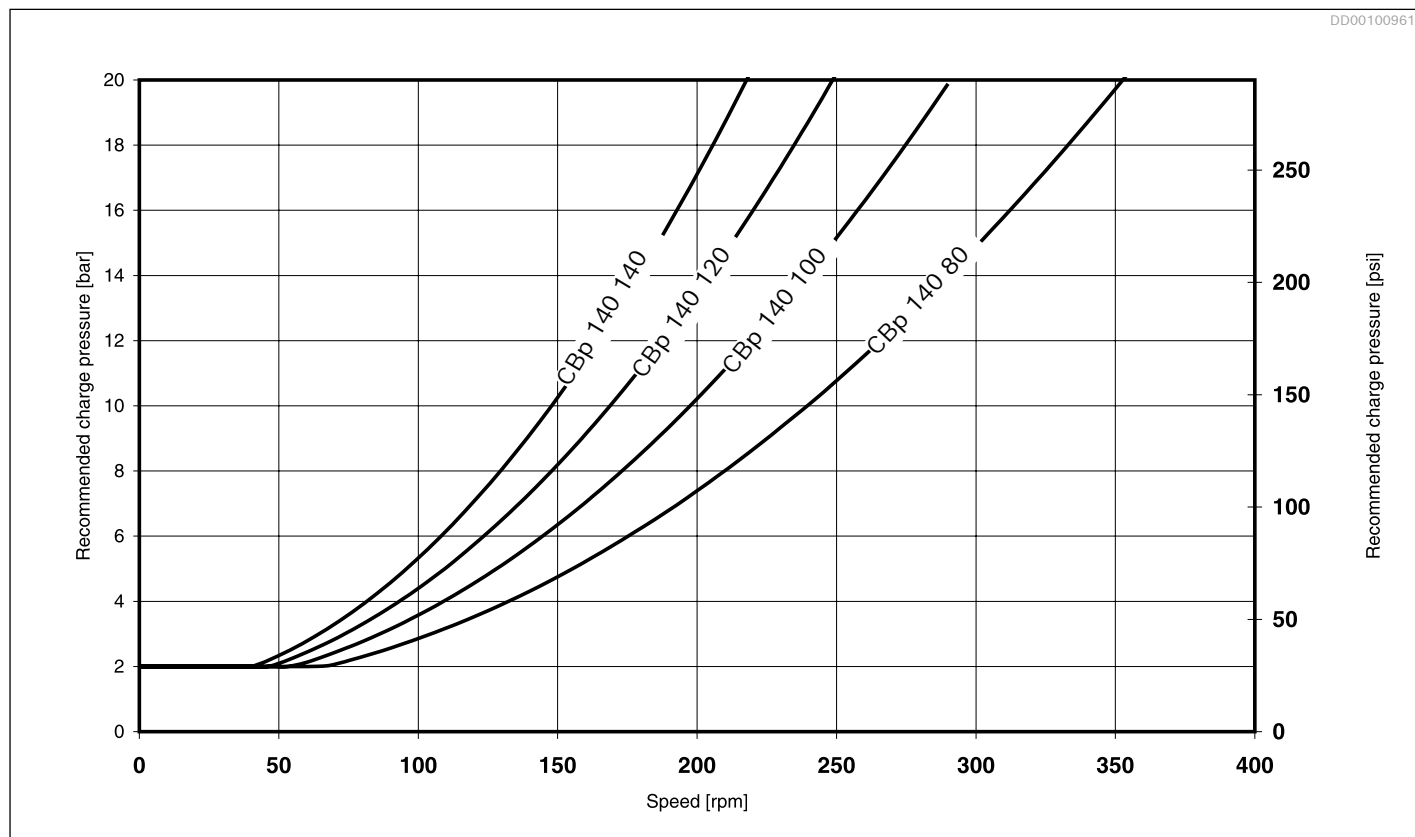
Fig. 8: Recommended charge pressure for motor workning in braking mode, Hägglunds CBp 140, 4-port connection. Valid for oil viscosity 40 cSt.

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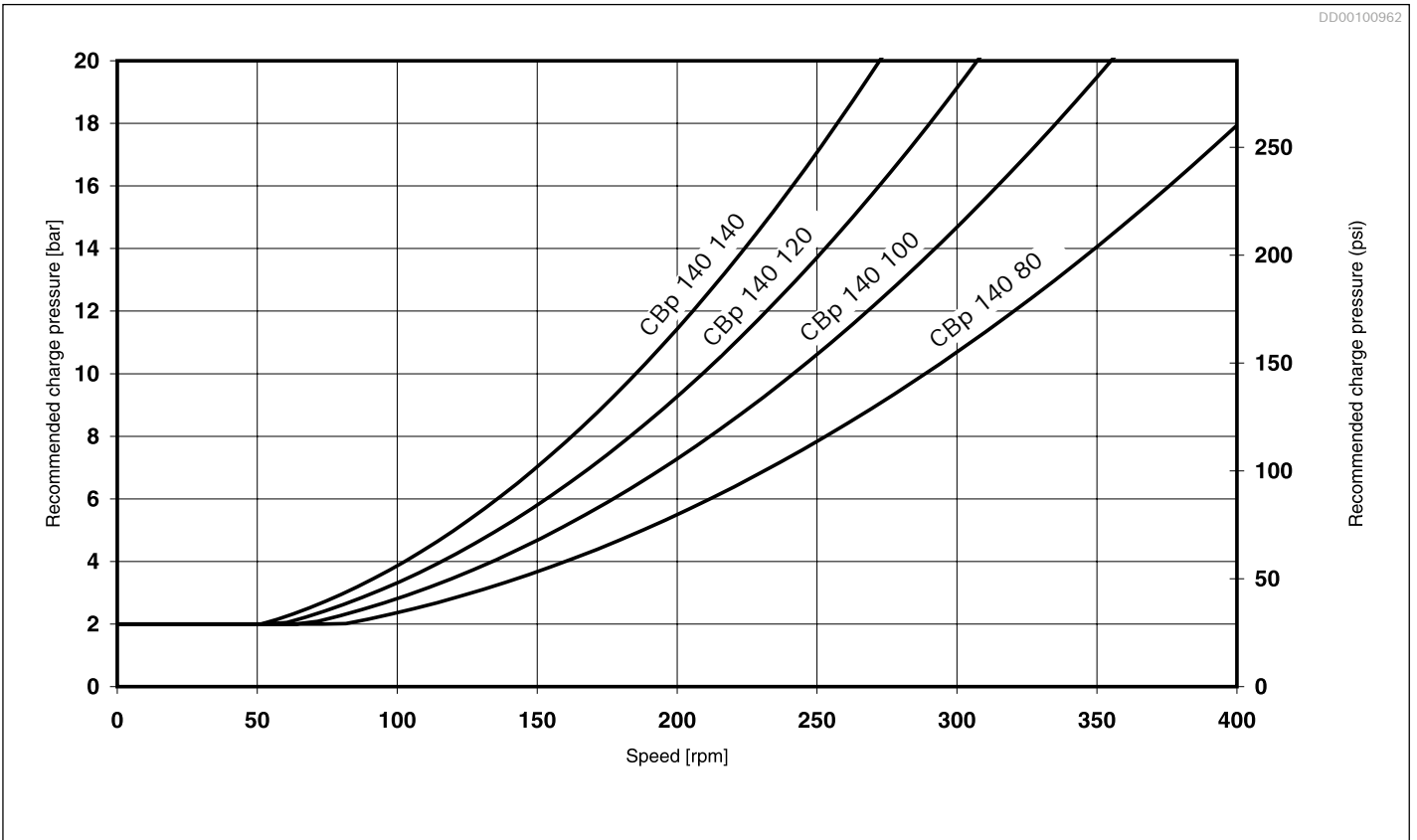
Fig. 9: Recommended charge pressure for motor workning in braking mode (pump mode), 8-port connection.
Valid for oil viscosity 40 cSt.

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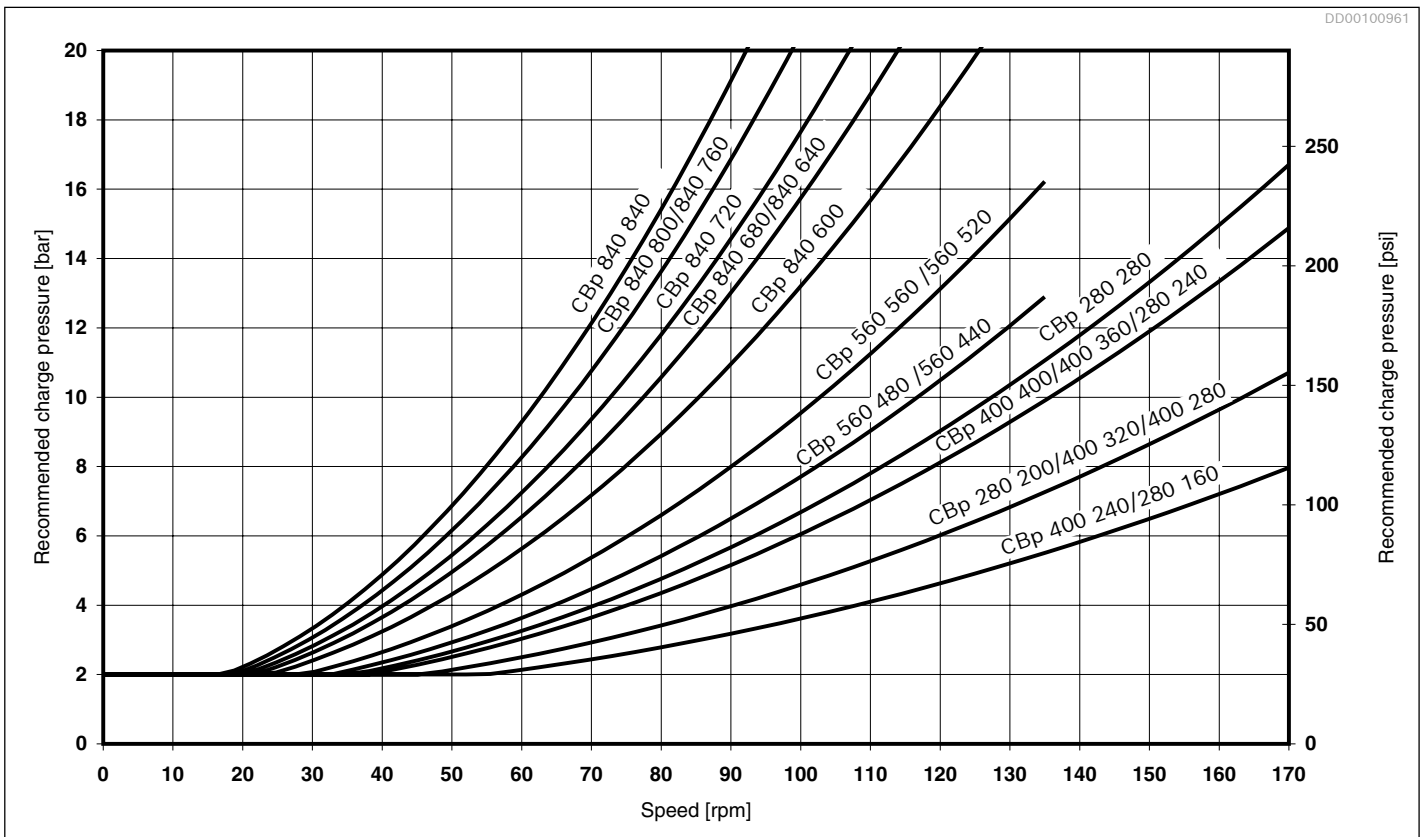
Fig. 10: Recommended charge pressure for motor workning in braking mode (pump mode), 4-port connection.
Valid for oil viscosity 40 cSt.
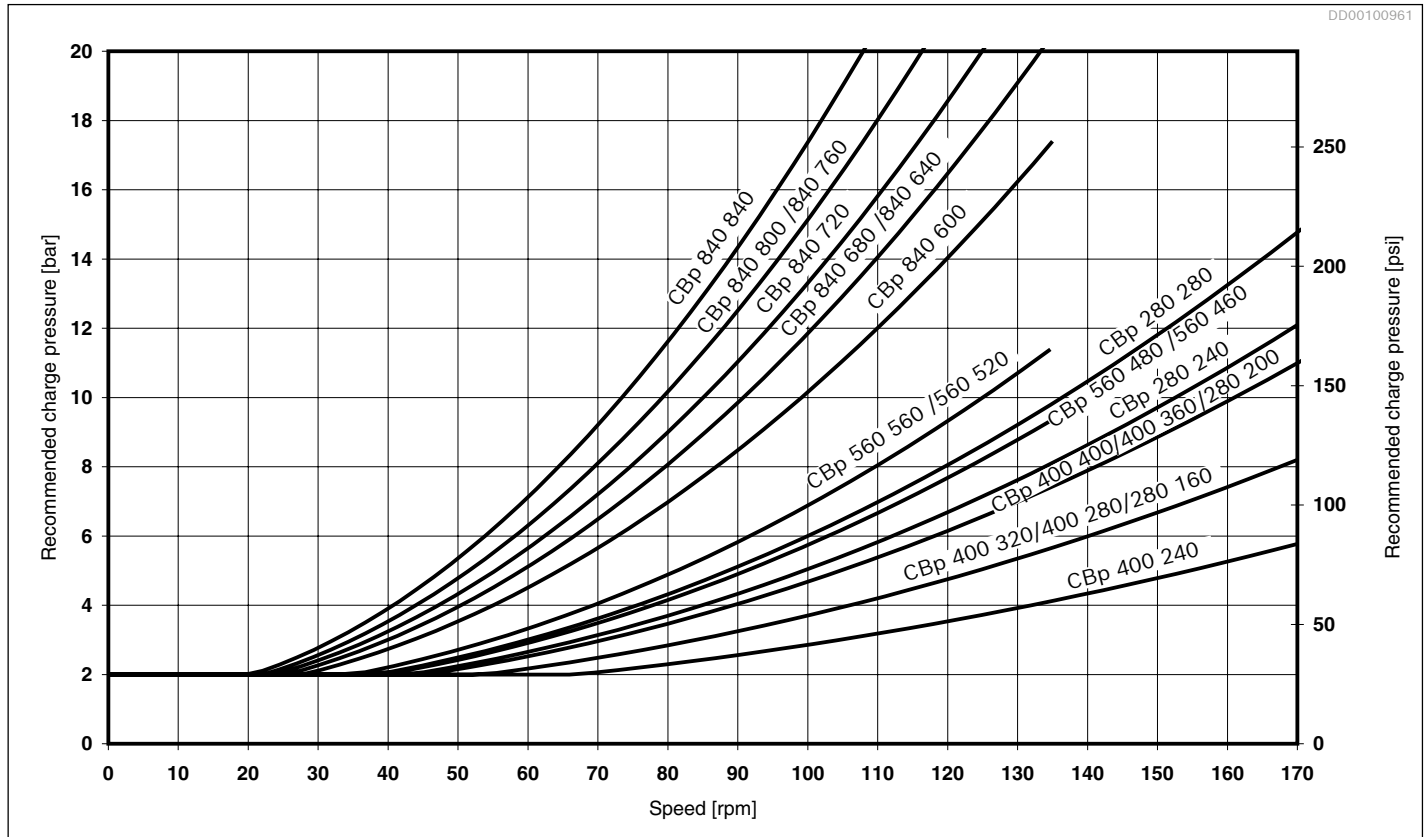
Fig. 11: Recommended charge pressure for motor workning in braking mode (pump mode), 8-port connection.
Valid for oil viscosity 40 cSt.

4.5 Hydraulic fluids

The hydraulic motor Hägglunds CA 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.

Table 8: Applicable fluids

ISO 11158	ISO 15380	ISO 12922
Mineral oil based and mineral oil related hydraulic fluids	Environmentally acceptable hydraulic fluids	Fire resistant hydraulic fluids

Within these standards, not all fluid classes are allowed, some are recommended, and there are also additional demands (see data sheet RE 15414).

Filtration of the hydraulic fluid

A contamination level better than 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, see *Fig. 12*. General recommendation is to have a system temperature of 50°C, see dotted line in *Fig. 12*. An ISO VG 68 fluid will render just above 40 cSt at this point.

- Optimum viscosity range is 40 to 150 cSt.
- Running above 150 cSt or below 40 cSt results in reduced efficiency.
- Running above 400 cSt results in substantial efficiency loss.
- Starting at above 10 000 cSt imparts unnecessary strain on parts.
- Running below 30 cSt may impact service life.
- Running below 10 cSt for CBp 140 and 30 cSt above 80 rpm for CBp 280 to CBp 840 may render instant seizure.

The operating temperature is also limited by the seal type, see *Table 4: General data (metric) or Table 5: General data (US)*.

*

*) Running below 30 cSt above 80 rpm for CBp 280 to CBp 840 may render instant seizure.

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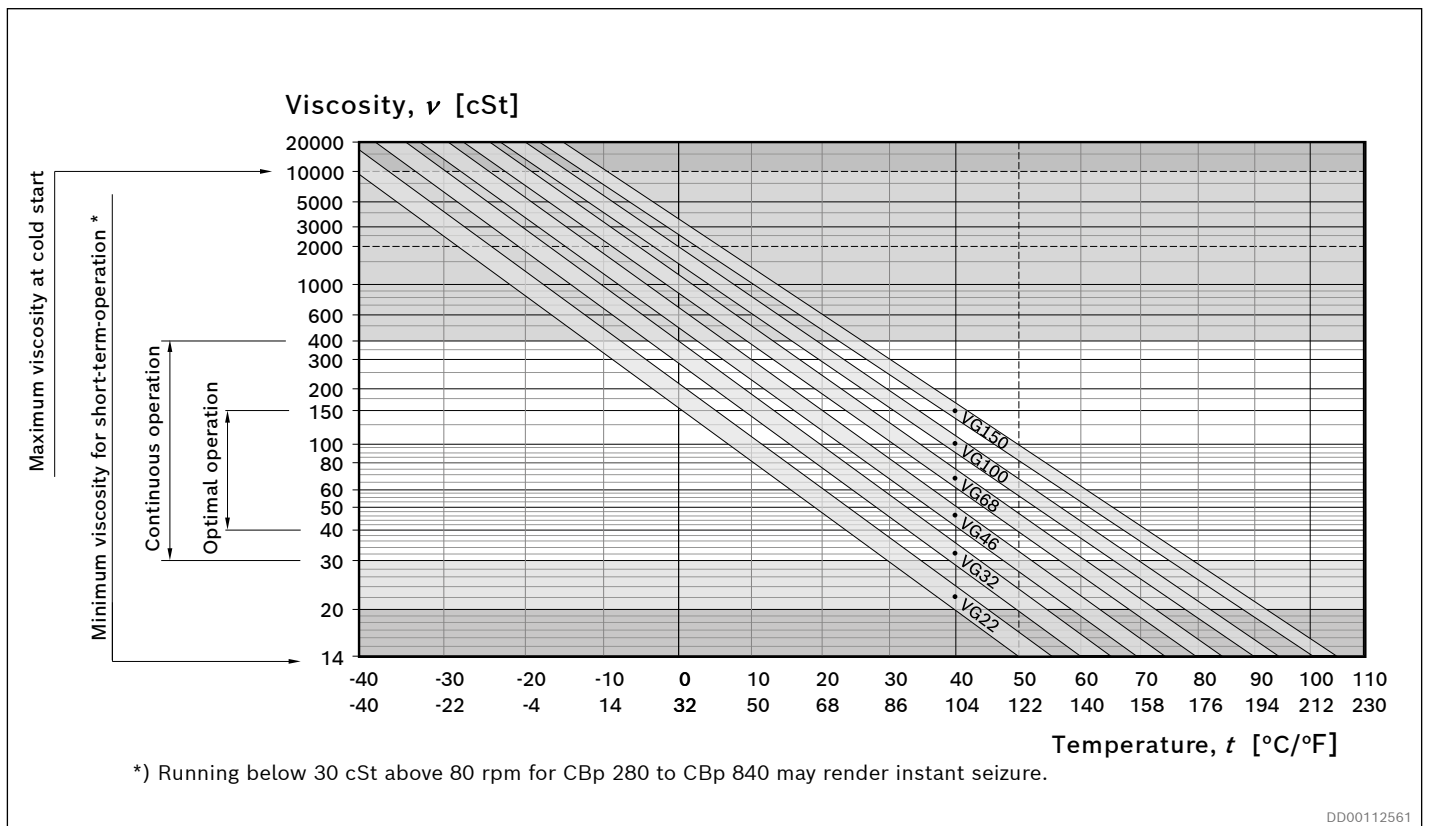
Fig. 12: Selection diagram for viscosity ranges with straight fluids, i.e. viscosity index 100

4.6 Overall efficiency

The diagrams are valid for oil viscosity 40 cSt and charge pressure 15 bar (218 psi) at the motor main ports A or C.

Each diagram has the following label definitions:

1. Output power
2. Overall efficiency
3. Flushing of motor case is required
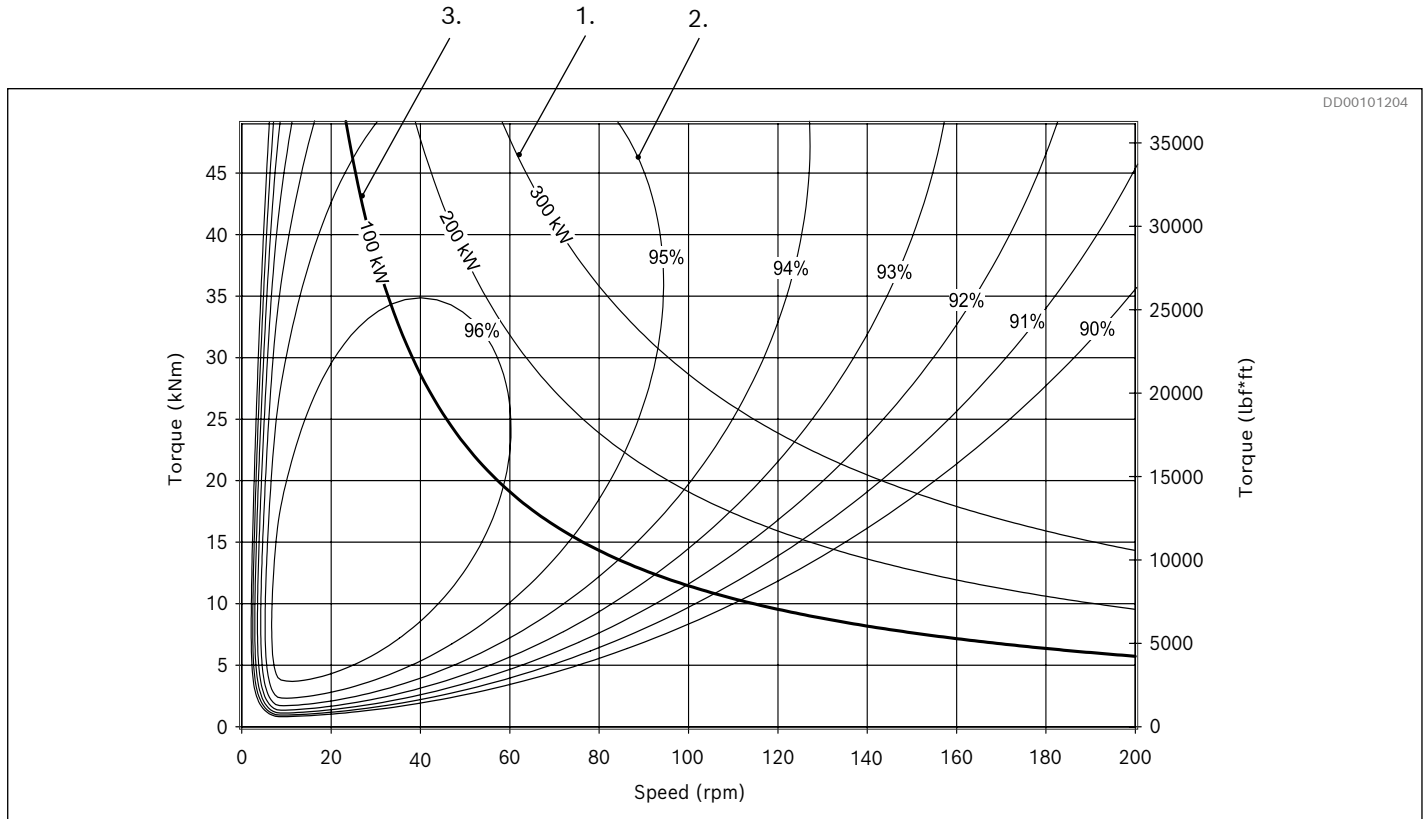
Fig. 13: CBp 140, 4-port

Fig. 14: CBp 140, 8-port

Bosch Rexroth AB, RE 15301, 09.2020

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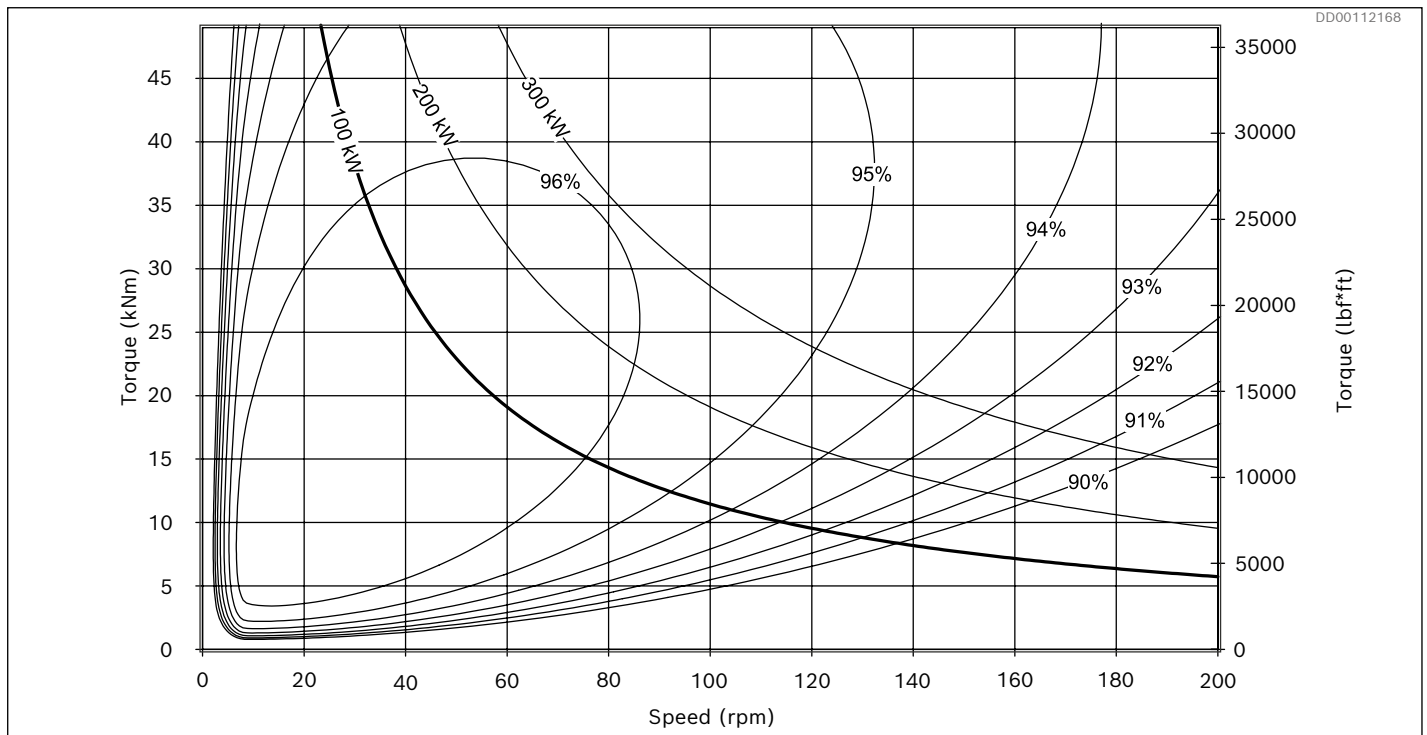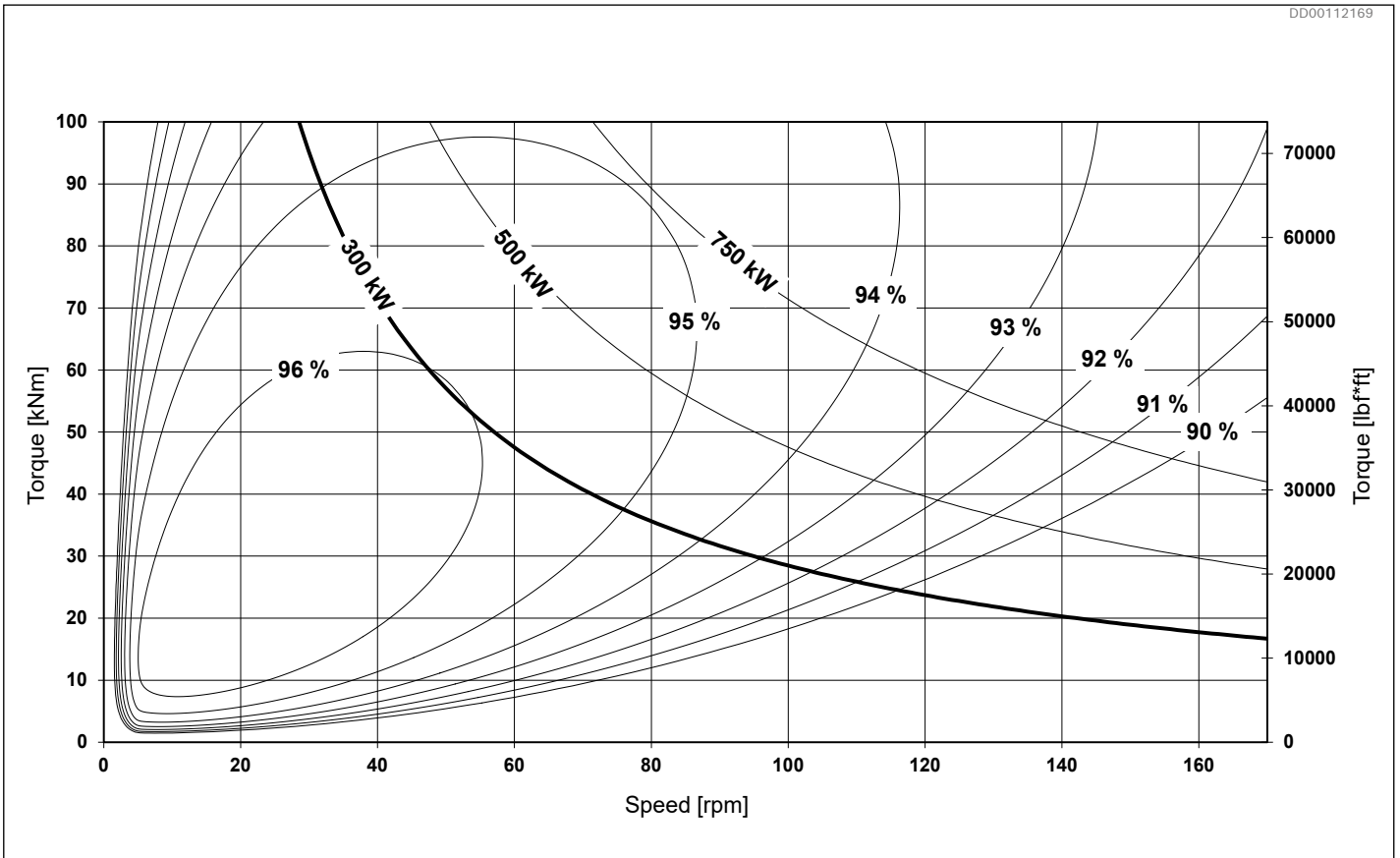
Fig. 15: CBp 280, 4-port

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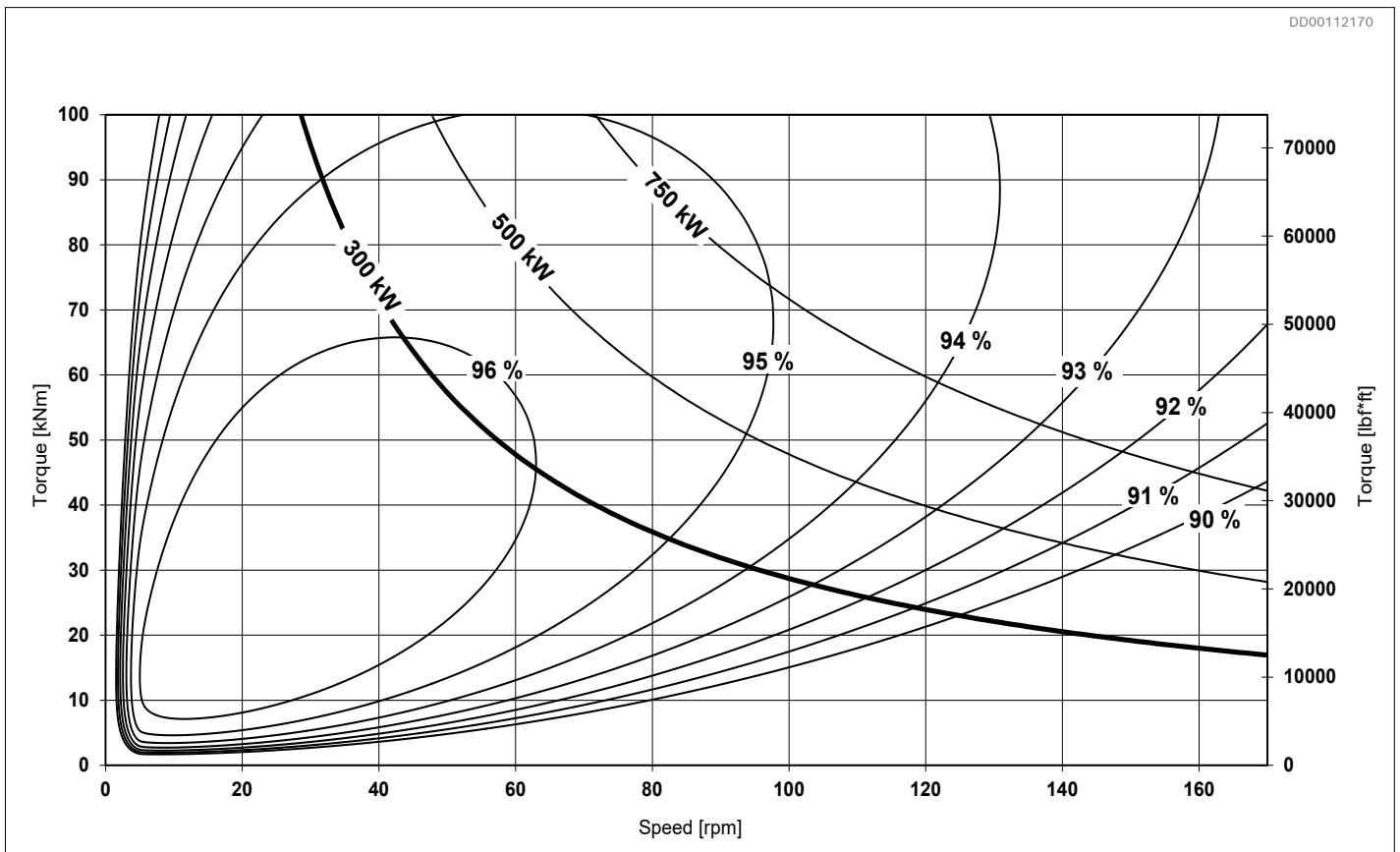
Fig. 16: CBp 280, 8-port

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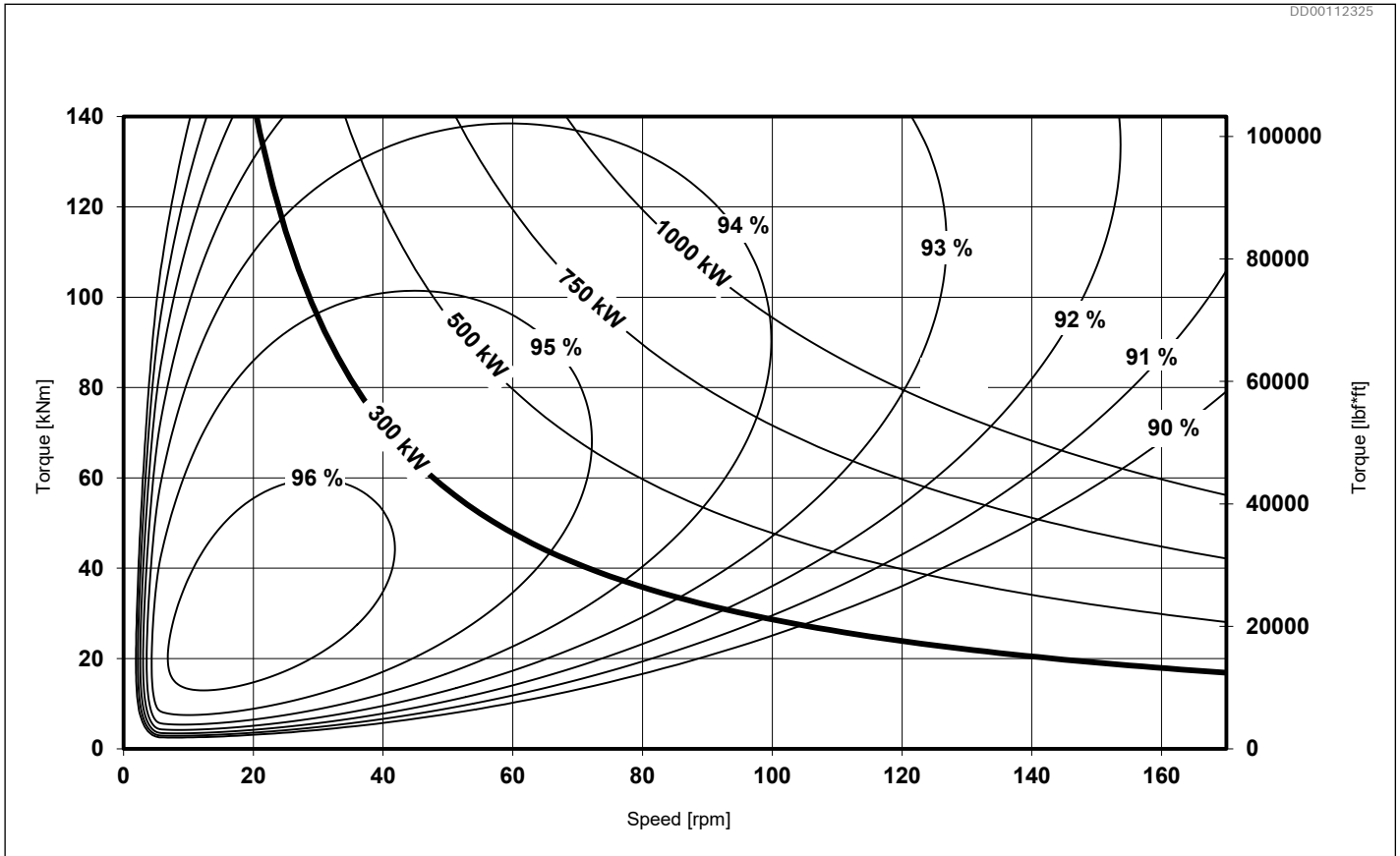
Fig. 17: CBp 400, 4-port

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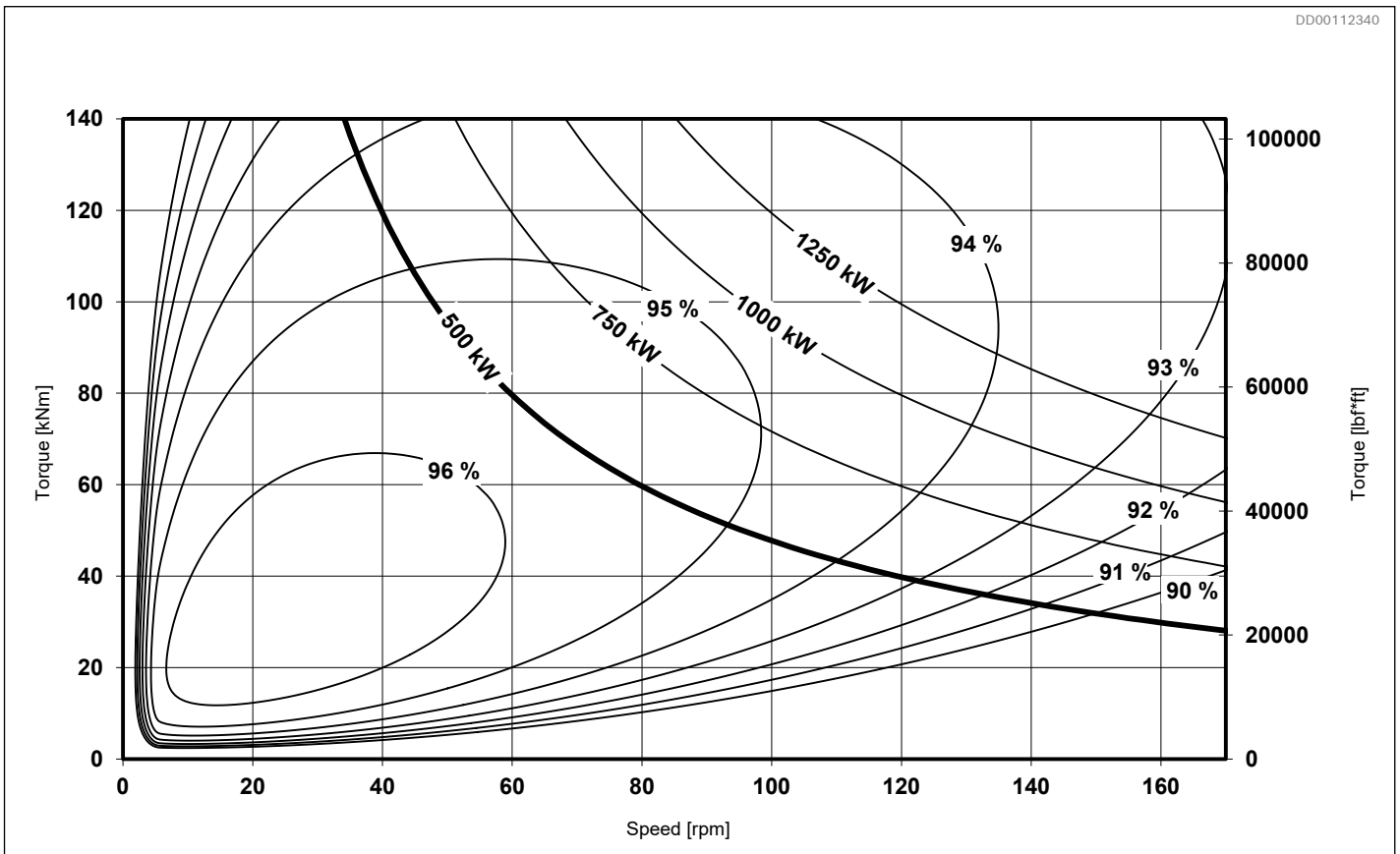
Fig. 18: CBp 400, 8-port

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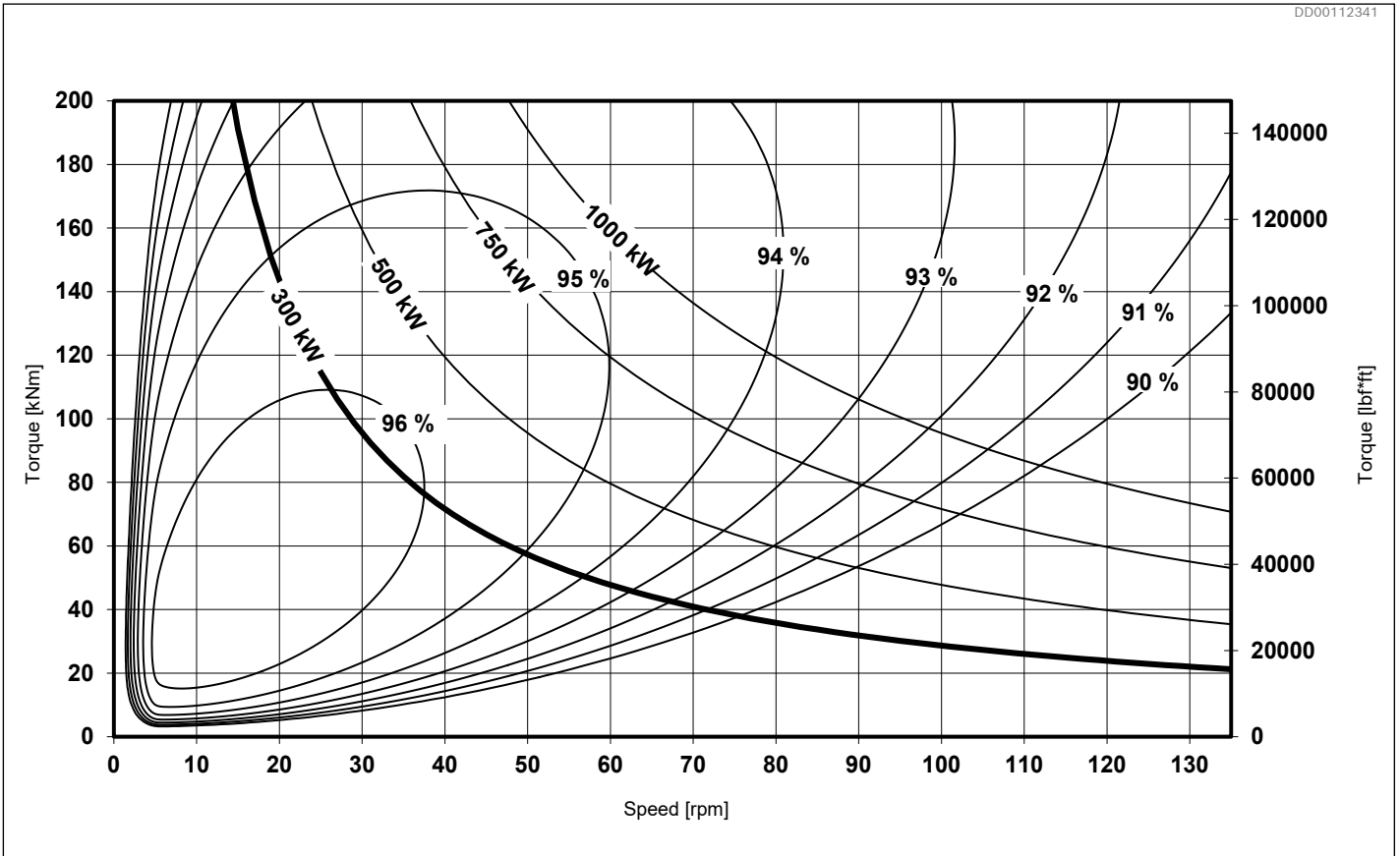
Fig. 19: CBp 560 4-port

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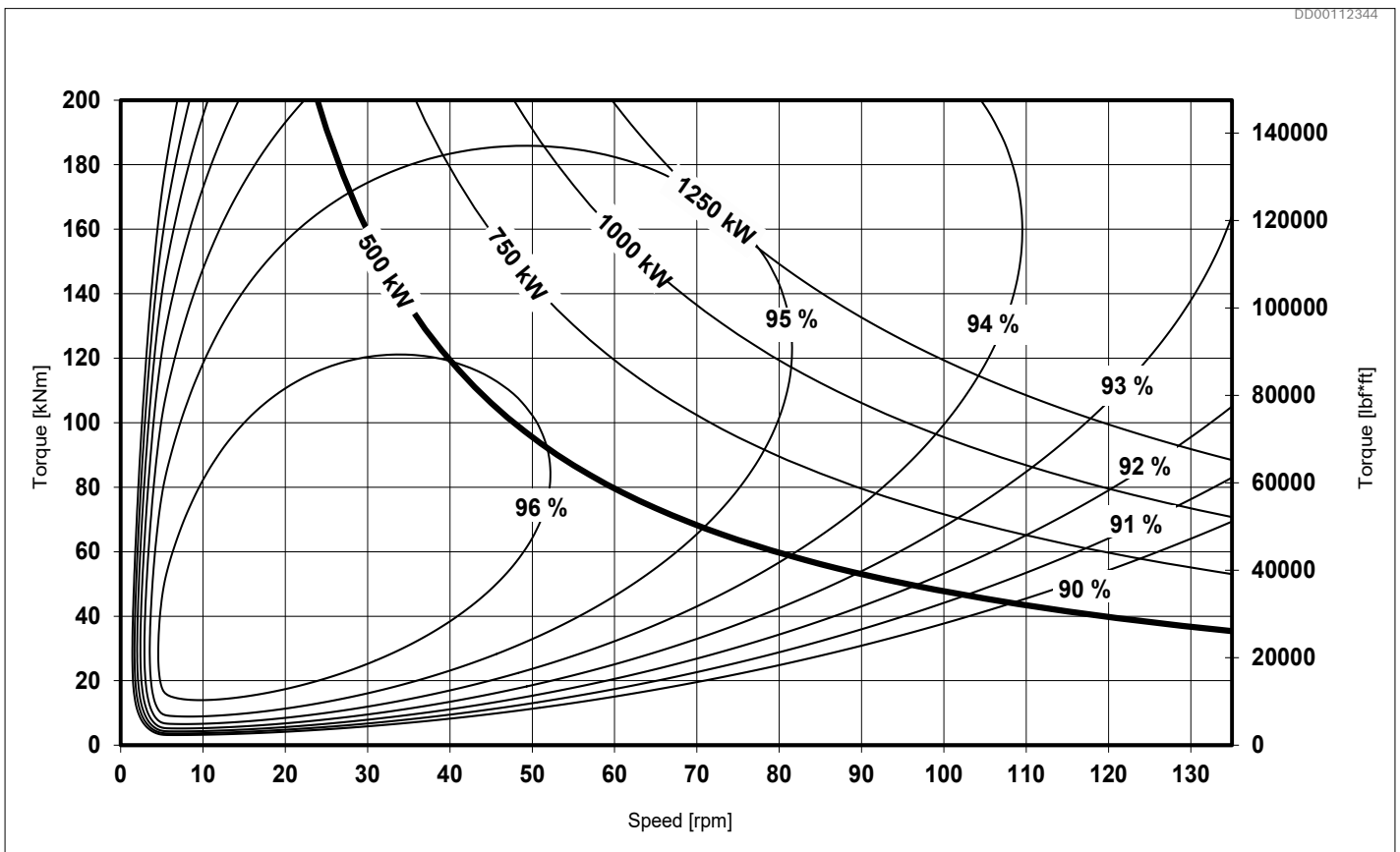
Fig. 20: CBp 560, 8-port
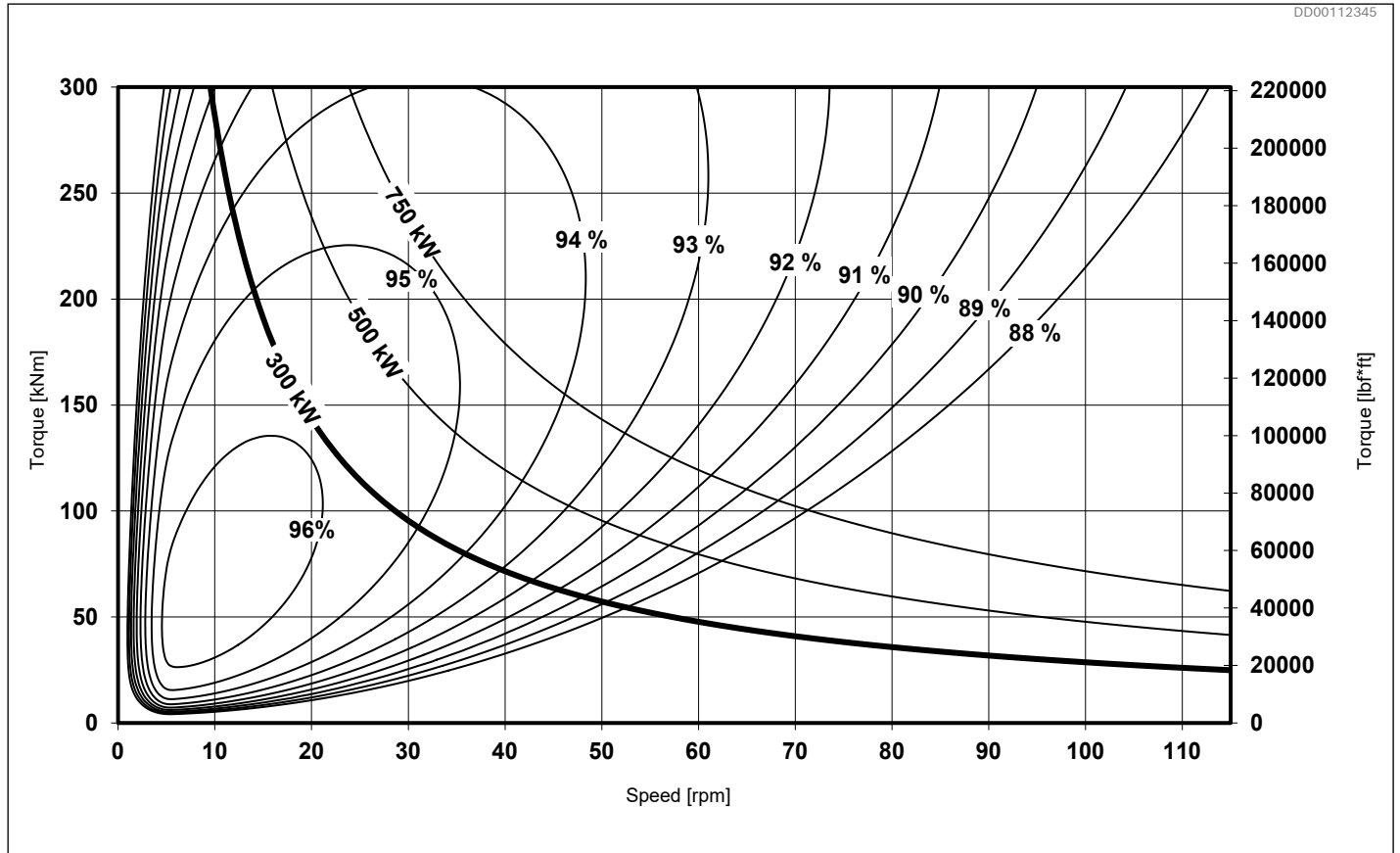
Fig. 21: CBp 840, 4-port
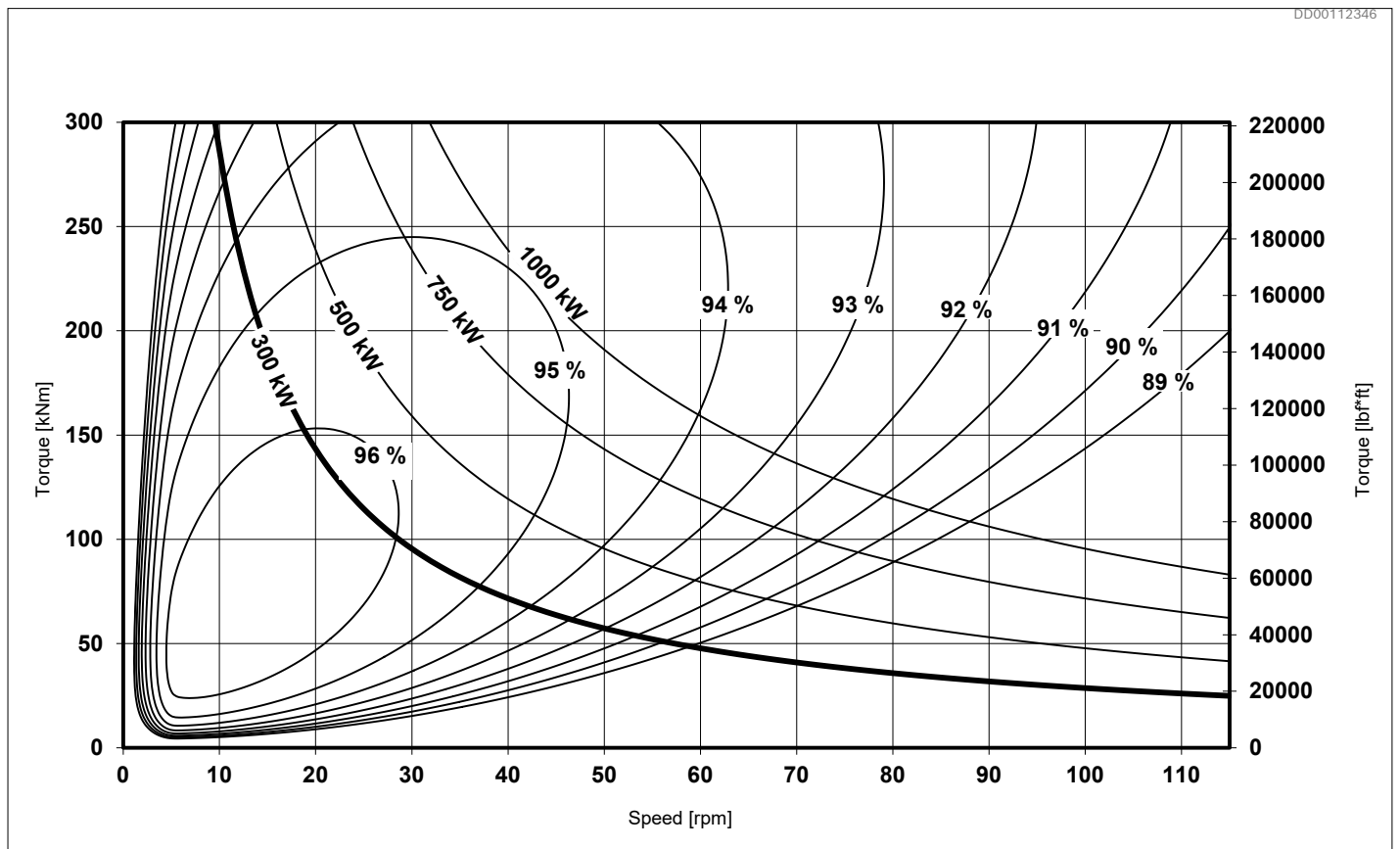
Fig. 22: CBp 840, 8-port

4.7 Pressure loss diagrams

Oil viscosity 40 cSt

$$\text{Actual pressure difference} = \frac{\text{output torque}}{\text{specific torque} \cdot \text{mechanichal effiency}} + \text{pressure loss} \qquad \Delta p = \frac{T}{Ts \cdot \eta_m} + \Delta p_l$$
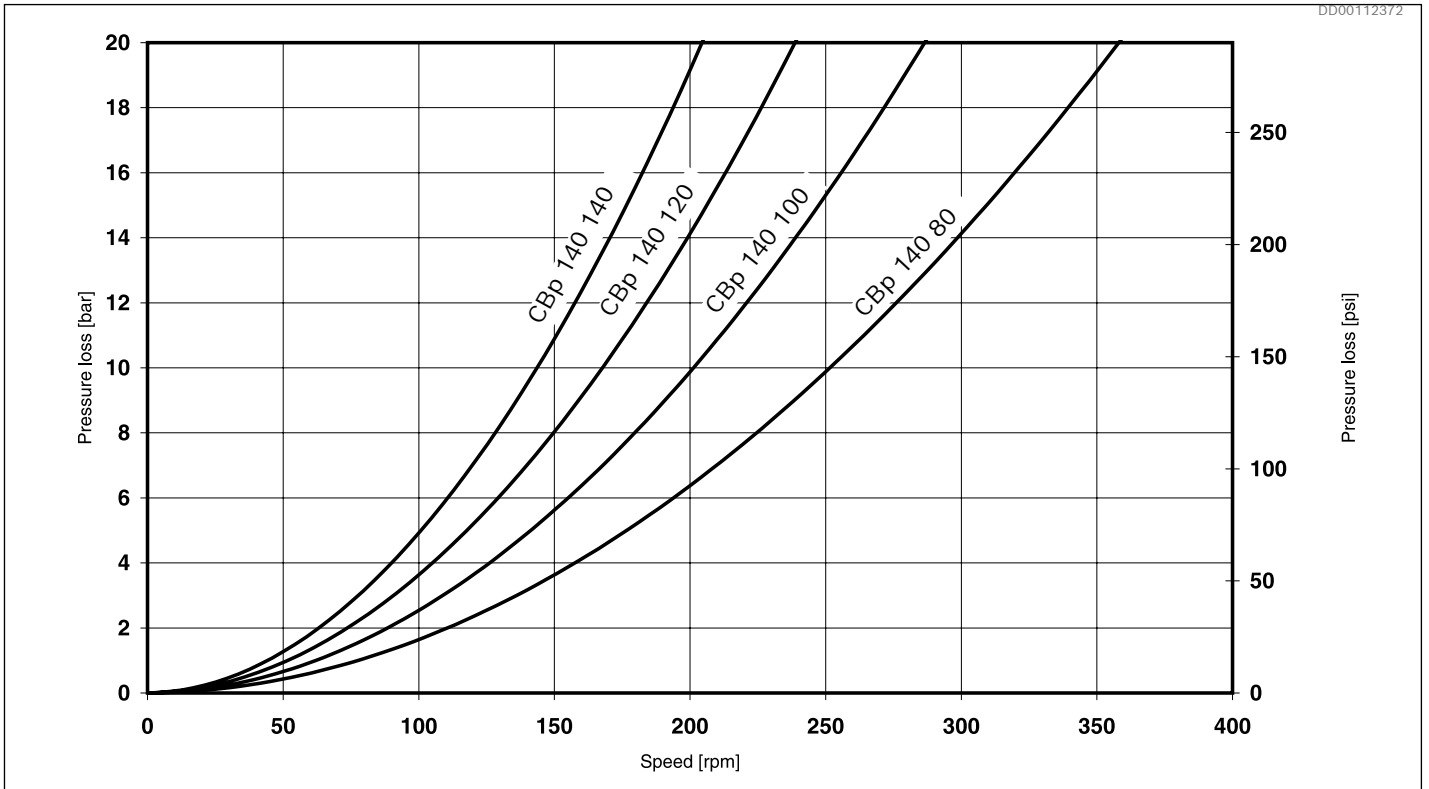
DD00112372

Fig. 23: CBp140 pressure loss, 4 port

DD00101033
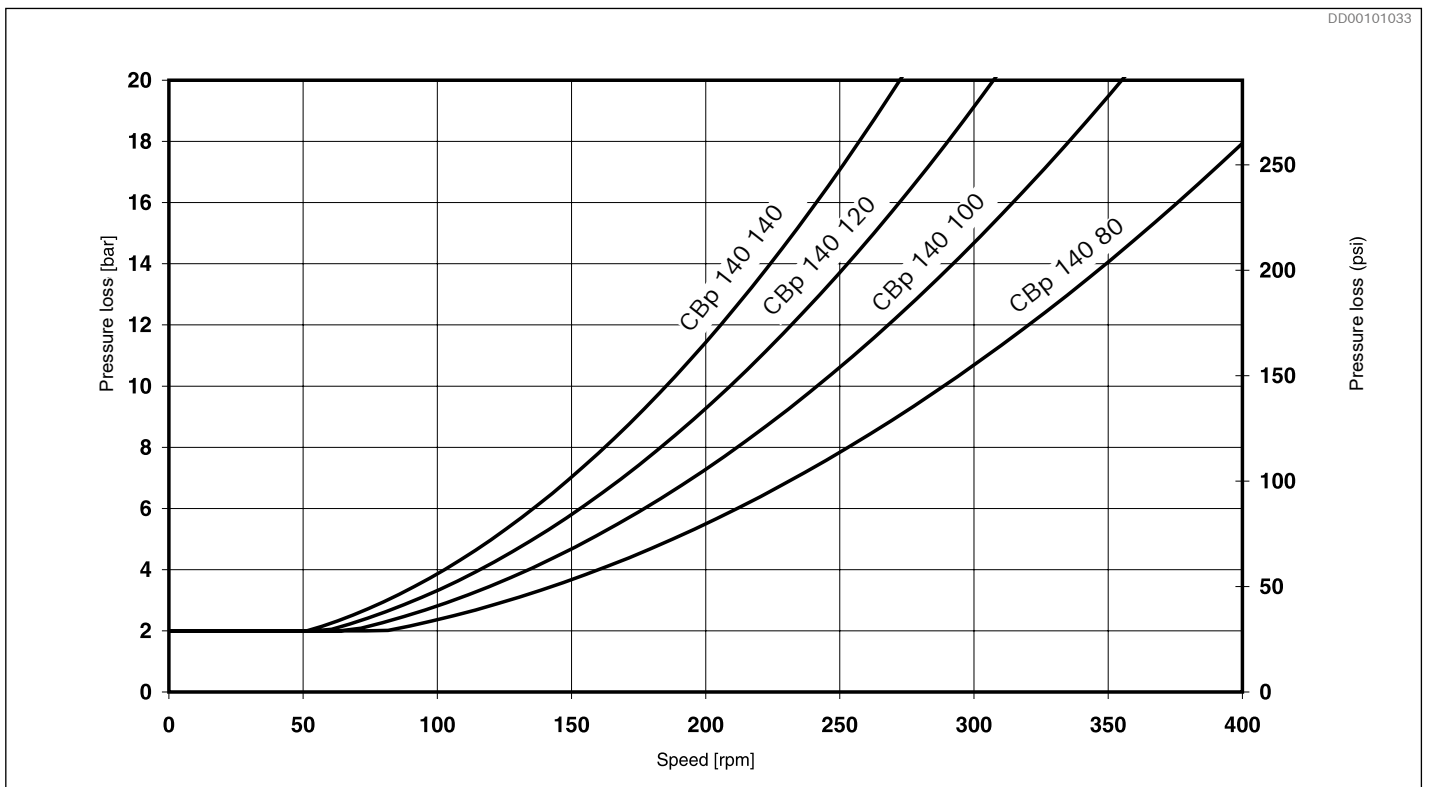
Fig. 24: CBp 140 pressure loss, 8 port

DD00112362
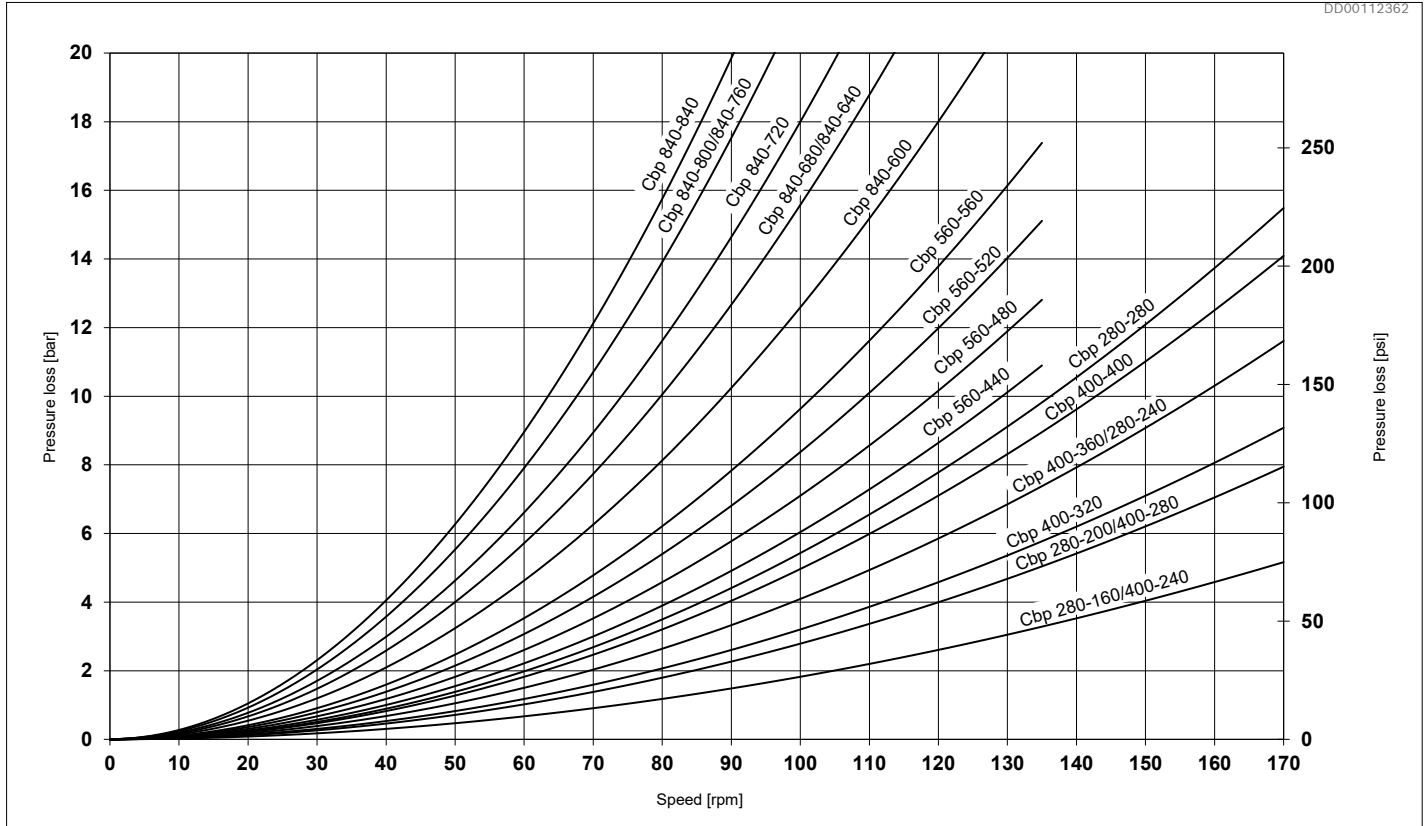
Fig. 25: CBp 280 to CBp 840 pressure loss, 4 port

DD00112369
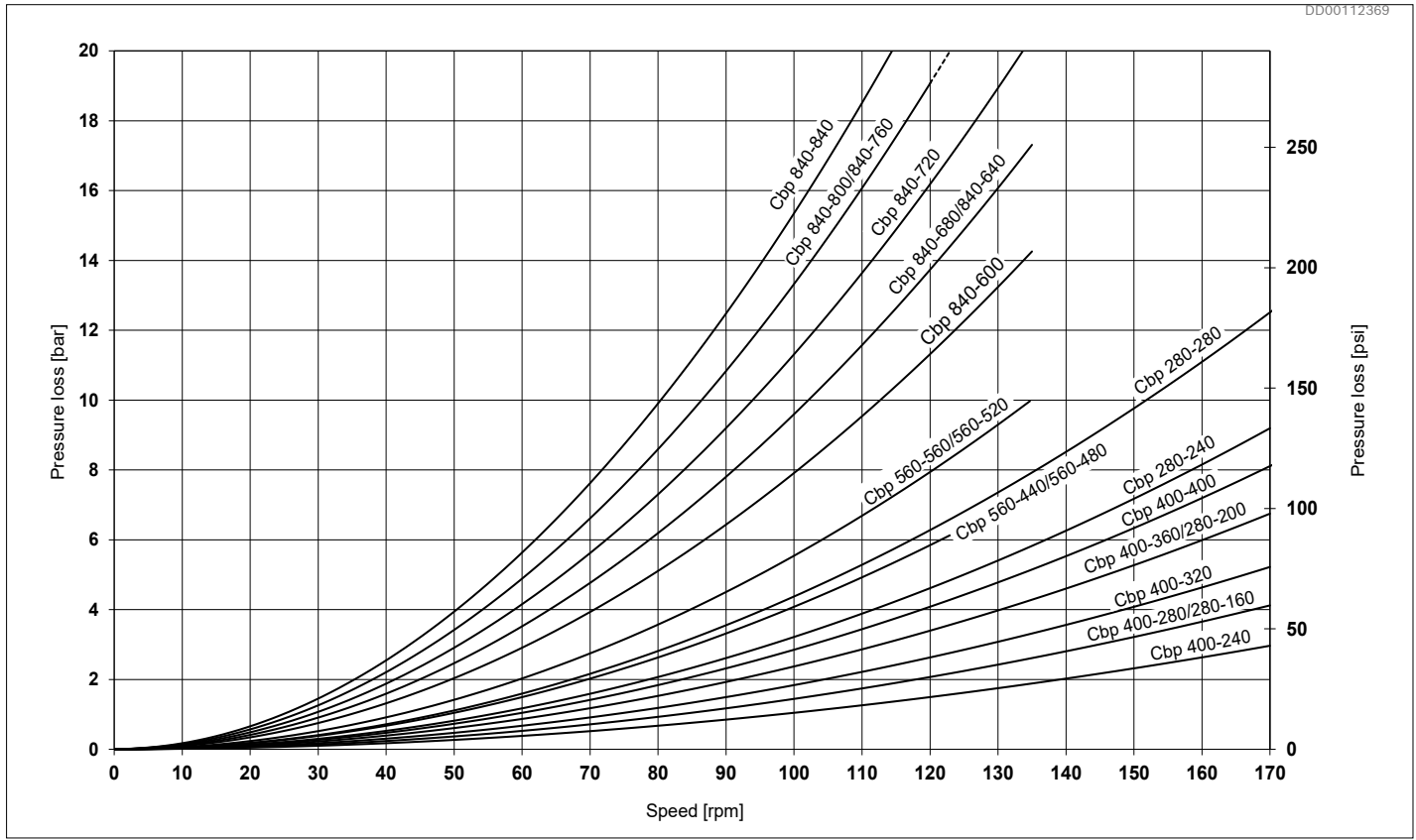
Fig. 26: CBp 280 to CBp 840 pressure loss, 8 port

4.8 Quick selection diagram

Rated life for Hägglunds CBp is calculated according to
DIN ISO 281 Appendix 1.

The graphs below represents the torque and speed,
corresponding to a modified rating life L10aah = 40 000
hours. Oil viscosity in the motor case 40 cSt (187 SSU).
Contamination level not exceeding ISO 4406; 16/13 (NAS
7). The diagram is based on a charge pressure
of 15 bar (218 psi).
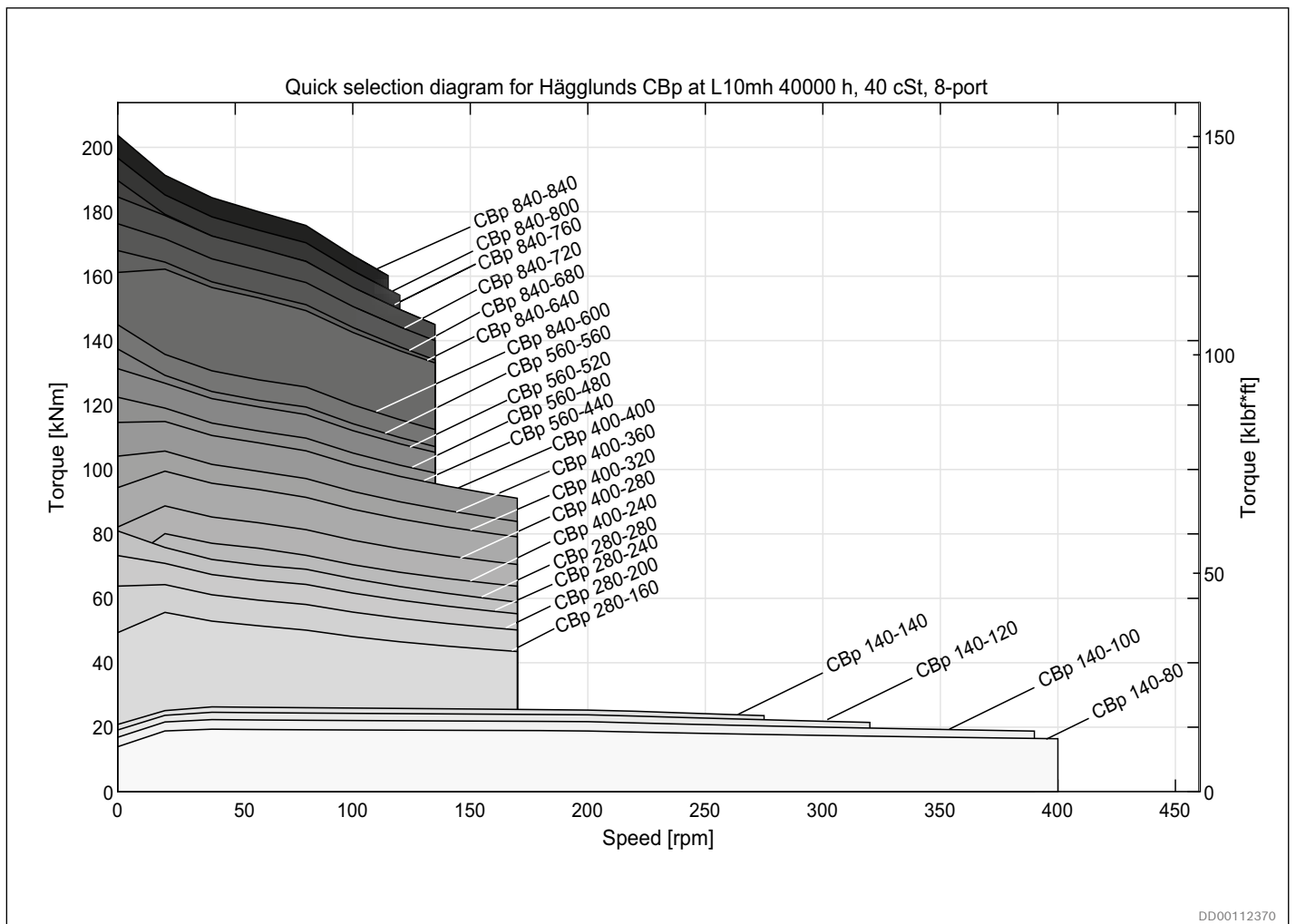
Fig. 27: Quick selection diagram CBp 140 to CBp 840

Note!
Higher case oil viscosity increases the motor rating life
considerably. Reduced temperature in the motor case
will increase rating life for the motor.

4.9 Draining, venting and flushing of the motor

DD00101061

Drain line connection

(D1)

(D3)

(D2)

(D4)

Alternative flushing flow inlet for
flange mounted motors

Flushing flow inlet
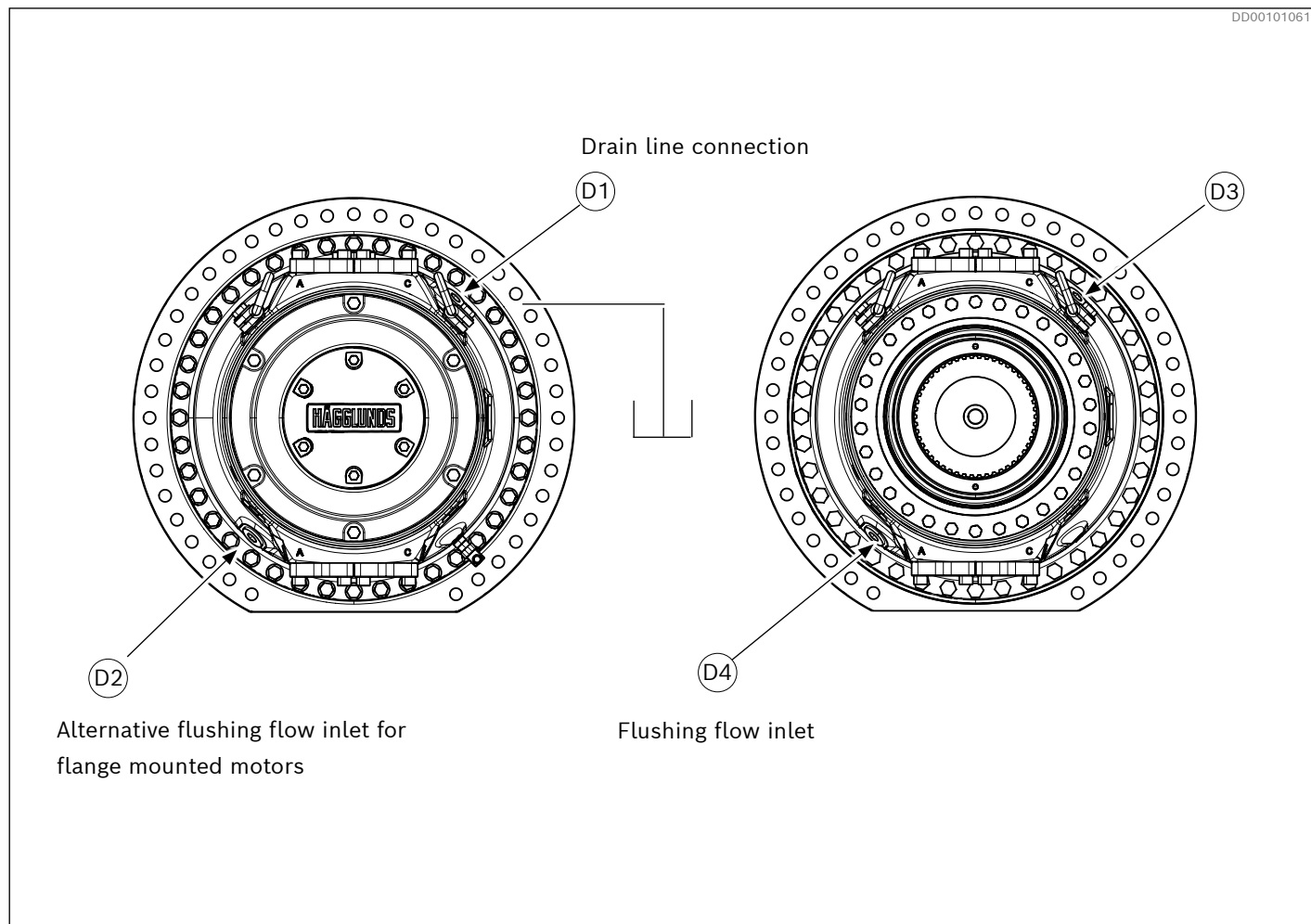
Fig. 28: Horizontal mounting

4.9.1   Horizontal mounting

When the motor is installed with the shaft in the
horizontal plane, the highest of the drain outlets D1 to D4
must always be used (see *Fig. 28*).
Drain line must be connected to the tank with a minimum
of restrictions, to ensure that the maximum case pressure
is not exceeded.
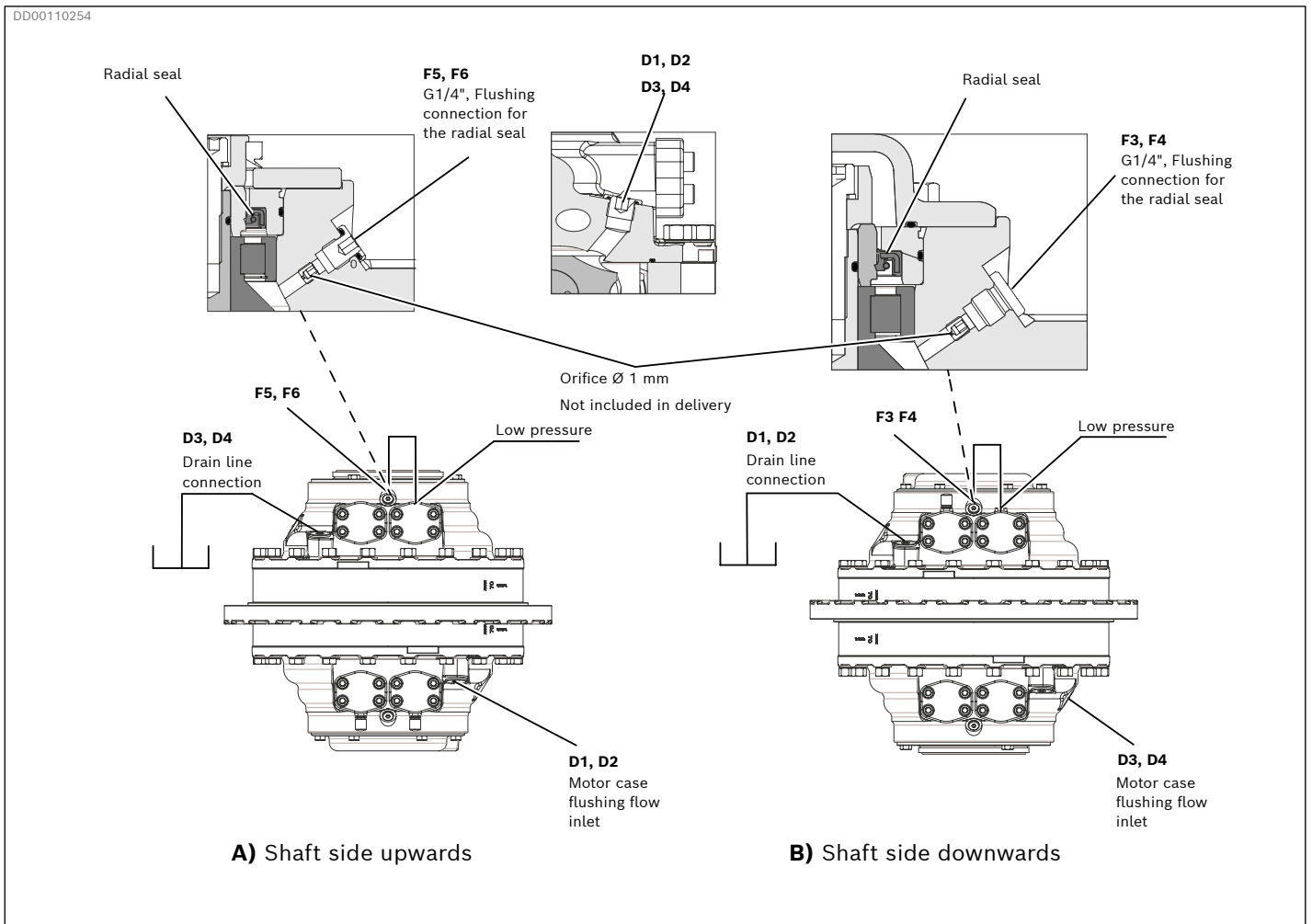
Fig. 29: Vertical mounting CBp 140

4.9.2   Vertical mounting
CBp 140

When the motor is mounted vertically, the highest of drain ports D1 to D4 must be used. Flushing (lubrication) of radial seal from charge pressure (low pressure) is necessary. Install orifice Ø 1 mm R939004236.
 With bidirectional drives, use the connection with lowest average pressure. (Connecting to high pressure will increase the motor drain flow).

A) Motor shaft pointing upwards (See *Fig. 29* alt. *A*) Shaft side upwards).
- The drain line must be connected to one of the drain ports D3 or D4
- The flushing line must be connected to one of the flushing ports F5 or F6

B) Motor shaft pointing downwards (See *Fig. 29* alt. B) Shaft side downwards).
- The drain line must be connected to one of the drain ports D1 or D2
- The flushing line must be connected to one of the flushing ports F3 or F4
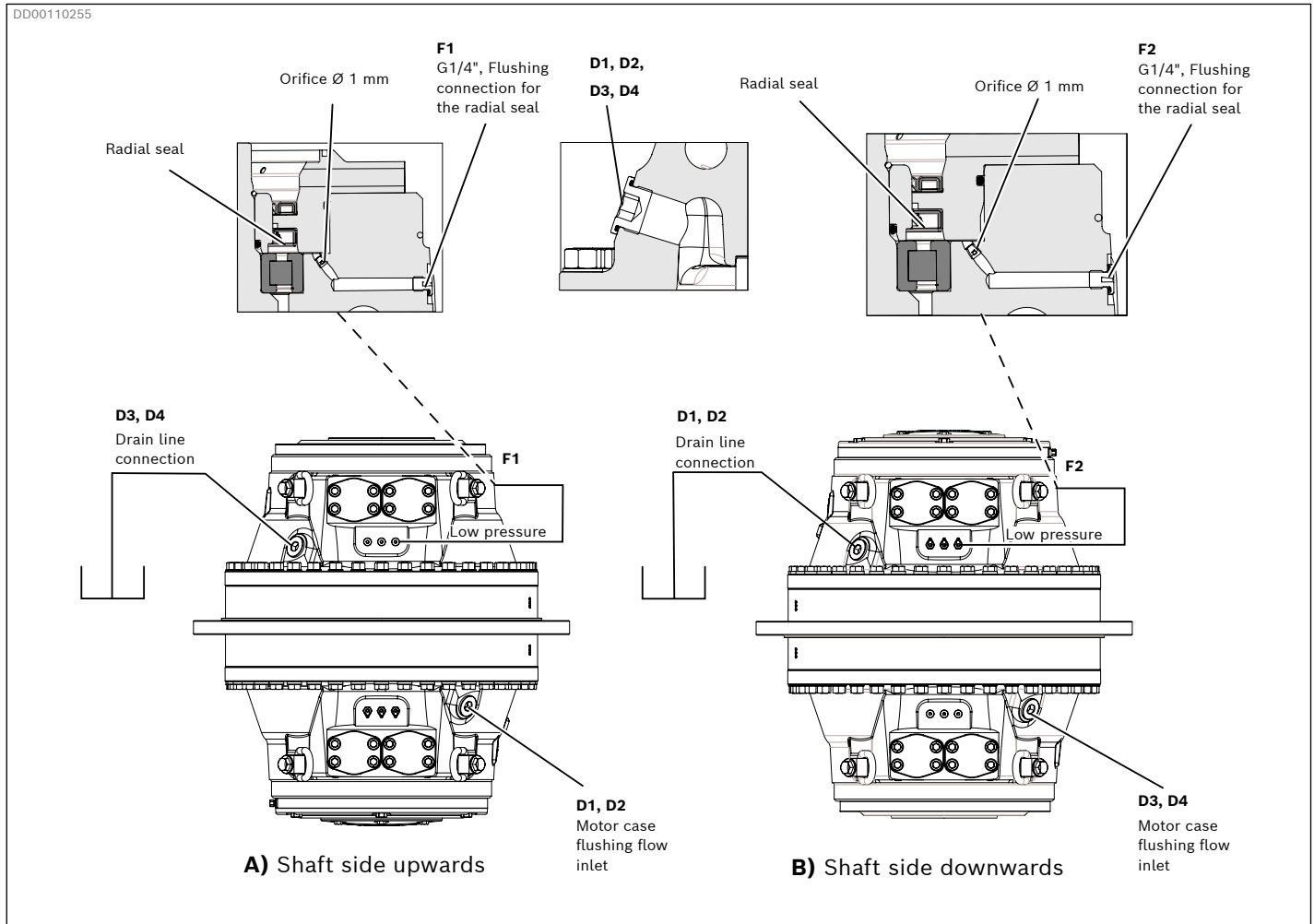
Fig. 30: Vertical mounting CBp 280 to CBp 840

CBp 280 to CBp 840

When the motor is mounted vertically, the highest of drain ports D1 to D4 must be used. Flushing (lubrication) of radial seal from charge pressure (low pressure) is necessary. Install orifice Ø 1 mm R939004236.
With bidirectional drives, use the connection with lowest average pressure. (Connecting to high pressure will increase the motor drain flow).

A) Motor shaft pointing upwards (See *Fig. 30* alt. *A*) Shaft side upwards).
- The drain line must be connected to one of the drain ports D3 or D4
- The flushing line must be connected to one of the flushing ports F1

B) Motor shaft pointing downwards (See *Fig. 30* alt. B) Shaft side downwards).
- The drain line must be connected to one of the drain ports D1 or D2
- The flushing line must be connected to one of the flushing ports F2

4.10 Flushing

Flushing of motor case

The CBp motors have very high overall efficiency, and they are frequently used in applications with high power.
To avoid high temperature in the case, the losses generated in the motors must be cooled away. High temperature gives lower viscosity and this gives reduction in basic rating life and max allowed power for the motor.
For flushing flow inlets, see *Fig. 28,Fig. 29* and *Fig. 30*.
For continuous duty the motors must be flushed when the shaft power exceed the following max power:

$$E_1 = \frac{c \cdot p_{high} \cdot n \cdot V_i}{600 \cdot 1000} \ \ (kW)$$

$$E_2 = \frac{q_l \cdot p_{high}}{600} \ \ (kW)$$

$$E_{1US} = \frac{c \cdot p_{high} \cdot n \cdot V_i}{1714 \cdot 231} \ \ (hp)$$

$$E_{2US} = \frac{q_l \cdot p_{high}}{1714} \ \ (hp)$$

p_{high} = motor high pressure   [bar] [psi]
n = motor speed   [rpm]
V_i = motor displacement   [cm³/rev] [in³/rev]
q_l = motor leakage   [l/min] [gpm] (see *Fig. 31*)
c = 0,01

Table 9: Maximum motor power without flushing

Frame size	Flushing limit power, E_{FL}	
	kW	hp
CBp 140/ CBp 280	120	160
CBp 400/CBp 560/CBp 840	120	160

When the motor has to be flushed, the required flushing flow can be calculated according to following:
E_1 = Power loss due to mechanical losses = $c \cdot$ motor power
E_2 = Power loss due to volumetric losses

Table 10: Heat transmitted to air at ambient temperature +20°C (68°F) and motor case temperature +50°C (122°F)

Frame size	Heat transmitted to air	
	kW	hp
CBp 140/ CBp 280	0.9	1.20
CBp 400/CBp 560/CBp 840	1.4	1.8

Required flushing to keep motor case maximum 15°C (27°F) warmer than flushing oil:
q flushing = 2.2 · (E_1 + E_2 - Heat dissipated to air) l/min.
q flushing US = 0.44 · (E_1 + E_2 - Heat transmitted to air) US gal/min.
Viscosity in the motor case must be controlled according to diagram, *Fig. 12*.

Exemple:
Hägglunds CBp 560 working at 200 bar and *n* = 80 rpm.

$$\text{Total power} = \frac{p_{high} \cdot n \cdot V_i}{600 \cdot 1000} = \frac{200 \cdot 80 \cdot 35200}{600 \cdot 1000} = 938 \ kW \ . \ \text{The motor case must be flushed}$$

$$E_1 = 0.01 \cdot 938 = 9.4 \ kW \ (12.6 \ hp)$$

$$E_2 = \frac{8 \cdot 200}{600} = 2.7 \ kW \ (3.6 \ hp)$$

q flushing = 2.2 · (E_1 + E_2 - Heat transmitted to air) = 2.2 · (9.4 + 2.7 - 1.4) = 24 l/min
q flushing $_{US}$ = 0.44 · (E_{1US} + E_{2US} - Heat transmitted to air) = 0.44 · (12.6 + 3.6 -1.8) = 1.3 gpm

4.11 External leakage

External leakage is from the distributor to the motor case
and from the piston assembly to the motor case.
Valid for 40 cSt and at **1/3 of max speed**.
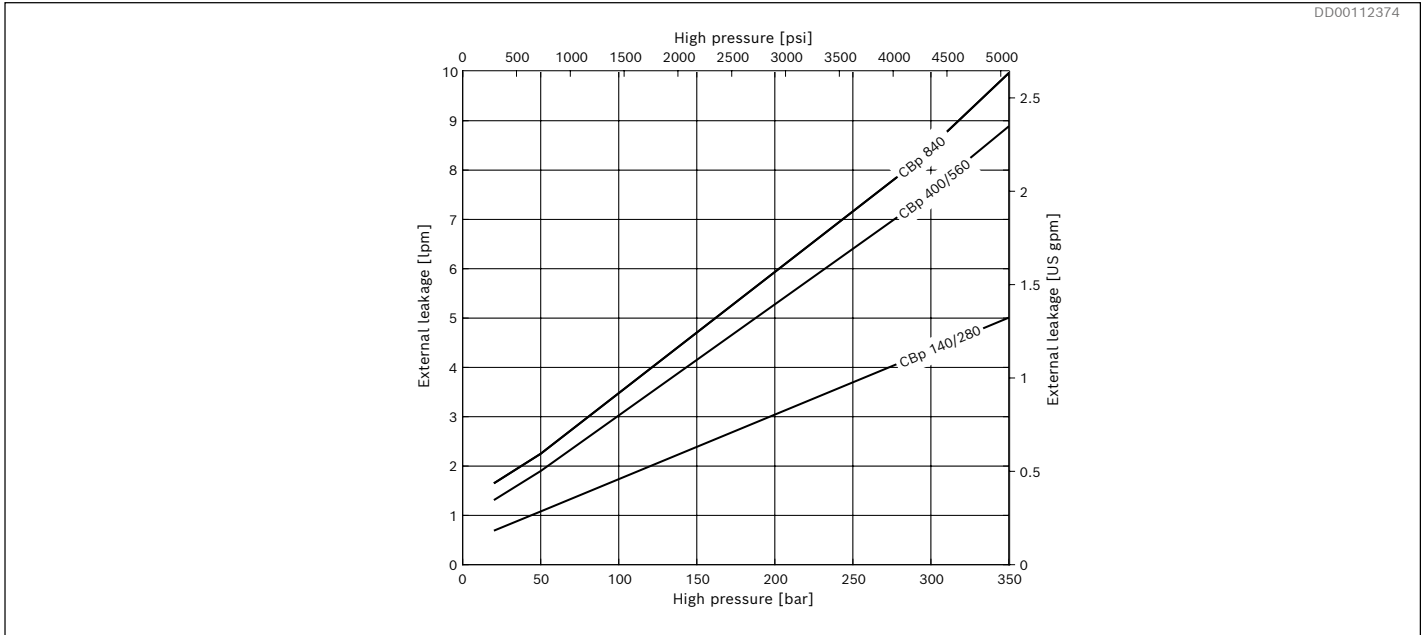
Fig. 31: External leakage

4.12 Viscosity factor K

The diagram shows the average values.
Actual flow rate = speed · displacement + external leakage

$$q = \frac{n \cdot V_i}{1000} + q_i \cdot K \quad \textbf{[l/min]}$$

Variation in external leakage at different oil viscosities.
When calculating external leakage using other viscosities
than 40 cSt, multiply the value given in the external
leakage diagram by the factor K.

$$q_{US} = \frac{n \cdot V_i}{231} + q_i \cdot K \quad \textbf{[gpm]}$$
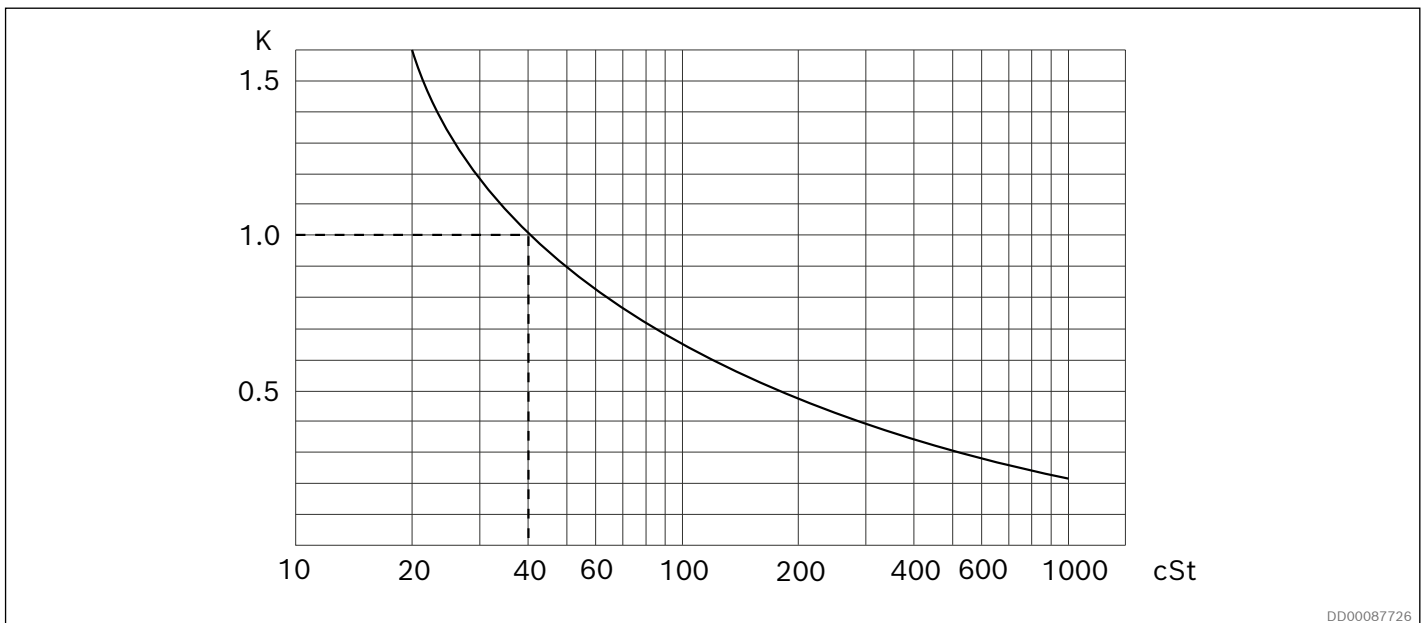
Fig. 32: Viscosity factor K

4.13 Freewheeling

4.13.1 The function of freewheeling

Hägglunds CBp motors can be operated in freewheeling mode.

Principally this is performed by disengaging the pistons, allowing the rotating group to rotate as a flywheel on its main bearings. The piston units are not engaged and thus there is no oil flow to cause a flow loss, Hägglunds motors of standard design are suitable for this performance due to the following facts:

1. Pistons are not actuated by any return springs.
2. The motor case can withstand sufficient case pressure to force the pistons toward the bottom of each cylinder bore and keep them in this position.

The basic function of the freewheeling is to have the motor housing (via drain ports D1 to D4) lightly pressurized (see *Fig. 35 and Fig. 36*) while main ports A and C are without restriction drained directly to the fluid reservoir. See *Fig. 34.* The case pressure introduced in the normal drain connection will then act on the outer surface of each piston assembly pressing them towards the motor centre.

The rotating part of the motor (cylinder block with piston and cam roller) can now rotate on its main bearings without any pumping of oil, as the piston with cam rollers have lost any contact with the cam ring. See *Fig. 33*.

During freewheeling periods, the following functions must be performed:

1. Main connections A & C of the motor drained to reservoir.
2. Fail-safe type brake released, if used.
3. An adequate pressure introduced into the drain ports of the motor. See *Fig. 35 and Fig. 36 (*required case pressure).
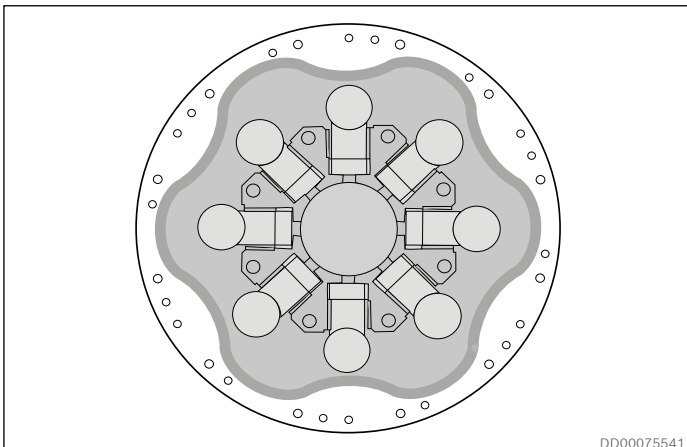
Fig. 33: Freewheeling

4.13.2 Circuit design

The following schematic explains a system (closed/open) with freewheeling (activated mode illustrated) as a permanent feature for the application.
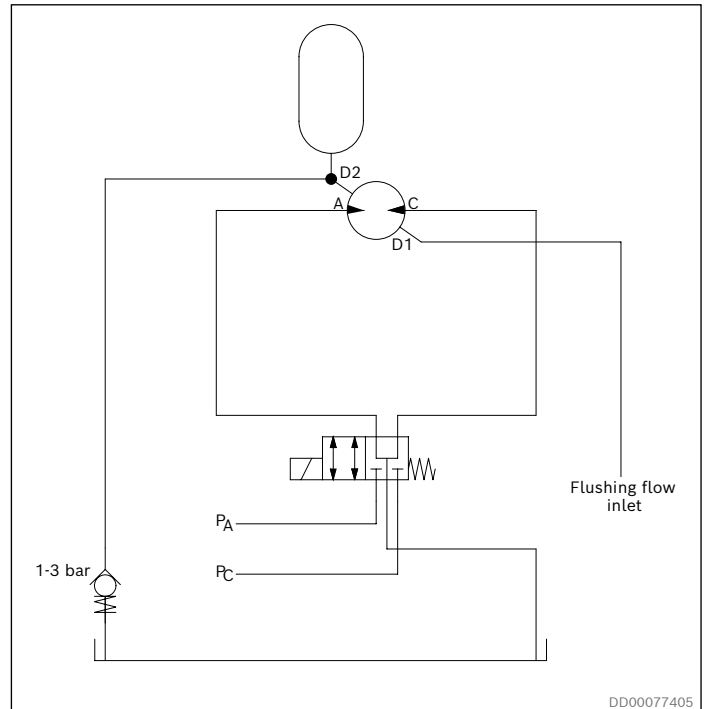
Fig. 34: Schematic principle freewheeling.

> **Note!**
> It is not allowed for the pistons to extend back to the cam ring, until the motor has reached a complete standstill.

> **Note!**
> If a motor is subject to external shock loads under freewheeling operation, this must be subject to attention. Please contact Bosch Rexroth representative for further information.

4.13.3 Oil volume for freewheeling

Freewheeling conditions are obtained by pressurizing the case via the drain connections and drain the main ports to tank. To retract all pistons completely, a certain oil volume is required depending upon motor type. This oil volume can be calculated from the following:

$$V_F = \frac{V_i}{2 \ N_L}$$

V_F = Needed Freewheeling volume [cm^3] or(in^3)
V_i = Total displacement of the motor [cm^3] or(in^3)
N_L = 10 (No of lobes for one camring)

To use Hägglunds CBp motor in freewheeling mode must following be maintained:
- The motor case must be pressurized all the time when the motor is in freewheeling mode, see *Fig. 35 and Fig. 36*.
- The motor case must be flushed all the time when the motor is in frewheeling mode, see *Fig. 35 and Fig. 36*.

An accumulator can be added into the circuit to shorten the time to retract all the pistons completely, see *Fig. 34*.

An accumulator can also be added into the circuit to reduce the pressure spikes in the motor case when the pistons are extracted, see *Fig. 34*.

4.13.4 Freewheeling restrictions for CBp 140

Freewheeling in vertical position is restricted for multi cam-ring motors

Note!

Freewheeling in vertical position > 70 rpm may increase the risk of wear in multi cam ring motors
(CBp 140).
For support regarding increased robustness in vertical freewheeling, please contact your Bosch Rexroth representative.

4.13.5 Power loss freewheeling

Even if the freewheeling operation takes place with lowest possible friction in the main bearings and with no flow losses in the main ports of the motor, a powerloss must take place in the motor case due to viscous friction between moving and fixed parts. This powerloss is expressed in *Fig. 35 and Fig. 36*.

Case flushing is required to prevent overheating, see diagram *Fig. 35 and Fig. 36*

Required case pressure 1.5 - 3 bar (21.8 - 43.5 psi).

Case oil temperatur to be below 50°C (122°F).

Note!

Freewheeling will require exchange of oil in the housing to prevent overheating.

In order to accomplish proper freewheeling, a case pressure according to *Fig. 35 and Fig. 36* has to be maintained.

On the other hand, a higher casing pressure than 2 bar (29 psi) should be avoided in order to achieve good service life of the main radial shaft seal.
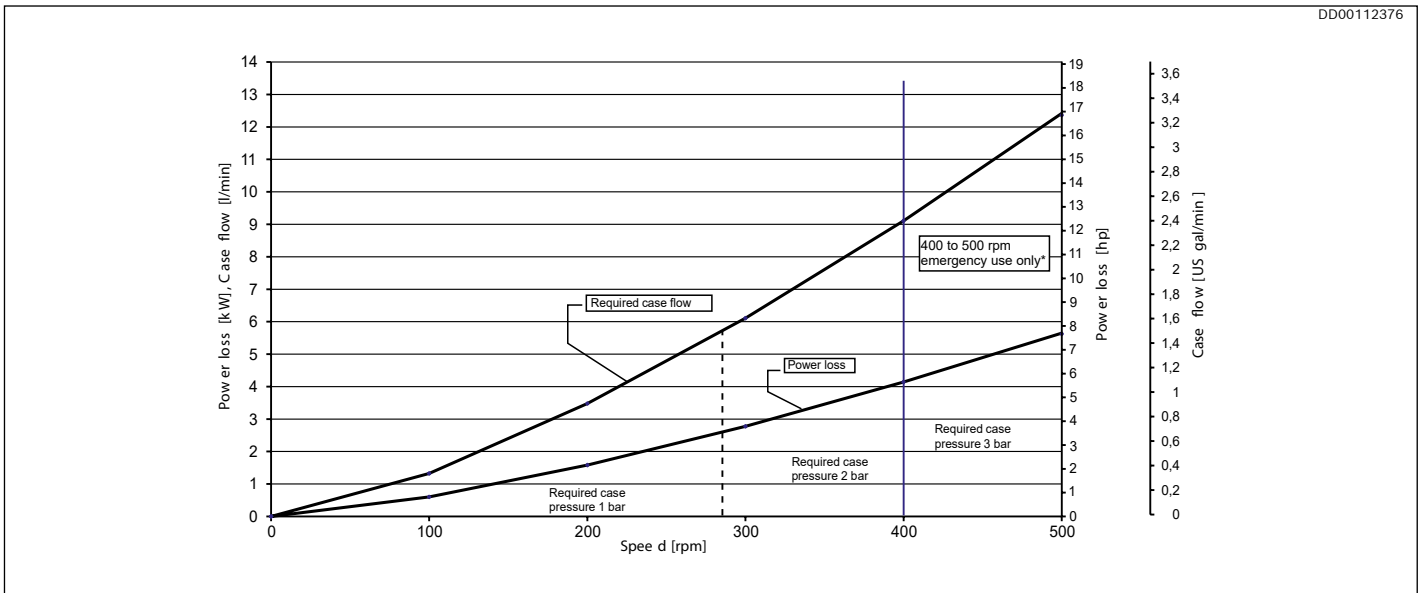
Fig. 35: Power loss freewheeling CBp 140, oil viscosity 40 cSt (187 SSU)
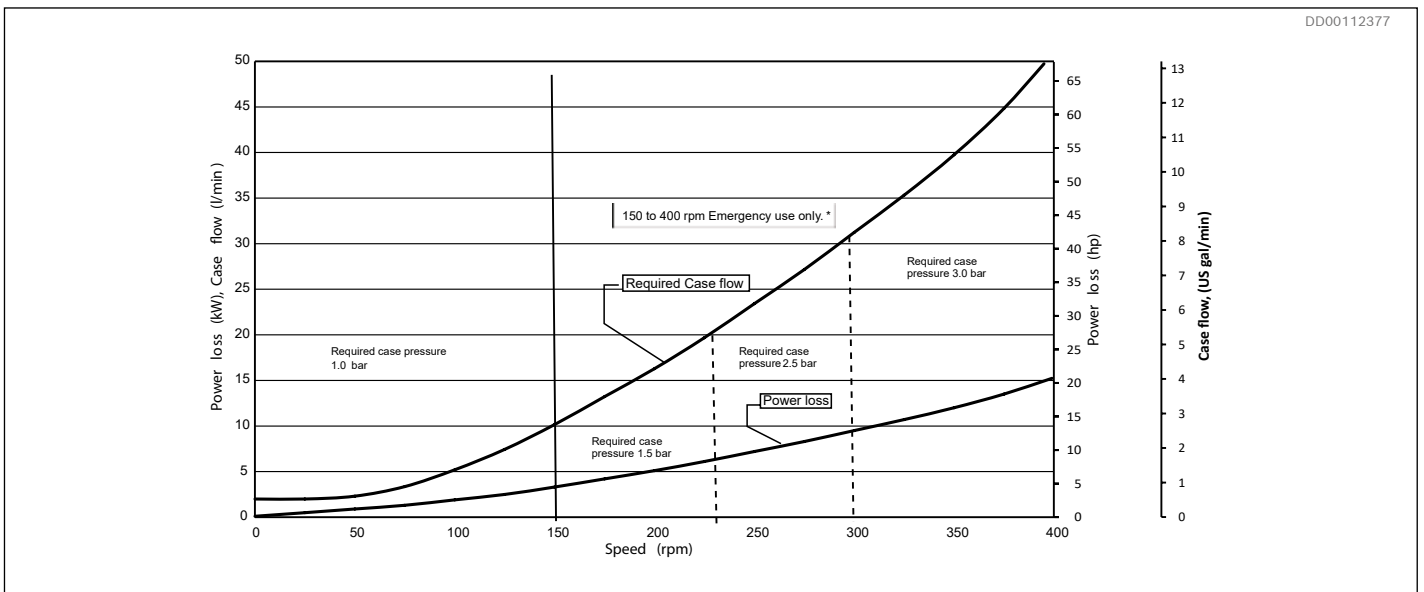
Fig. 36: Power loss freewheeling CBp 280 to CBp 840, oil viscosity 40 cSt (187 SSU)

*If the motor has been subject to freewheeling under e.g. winch quick release conditions the motor should be inspected before further use.

4.14 Permissible external loads

External load with torque arm mounting
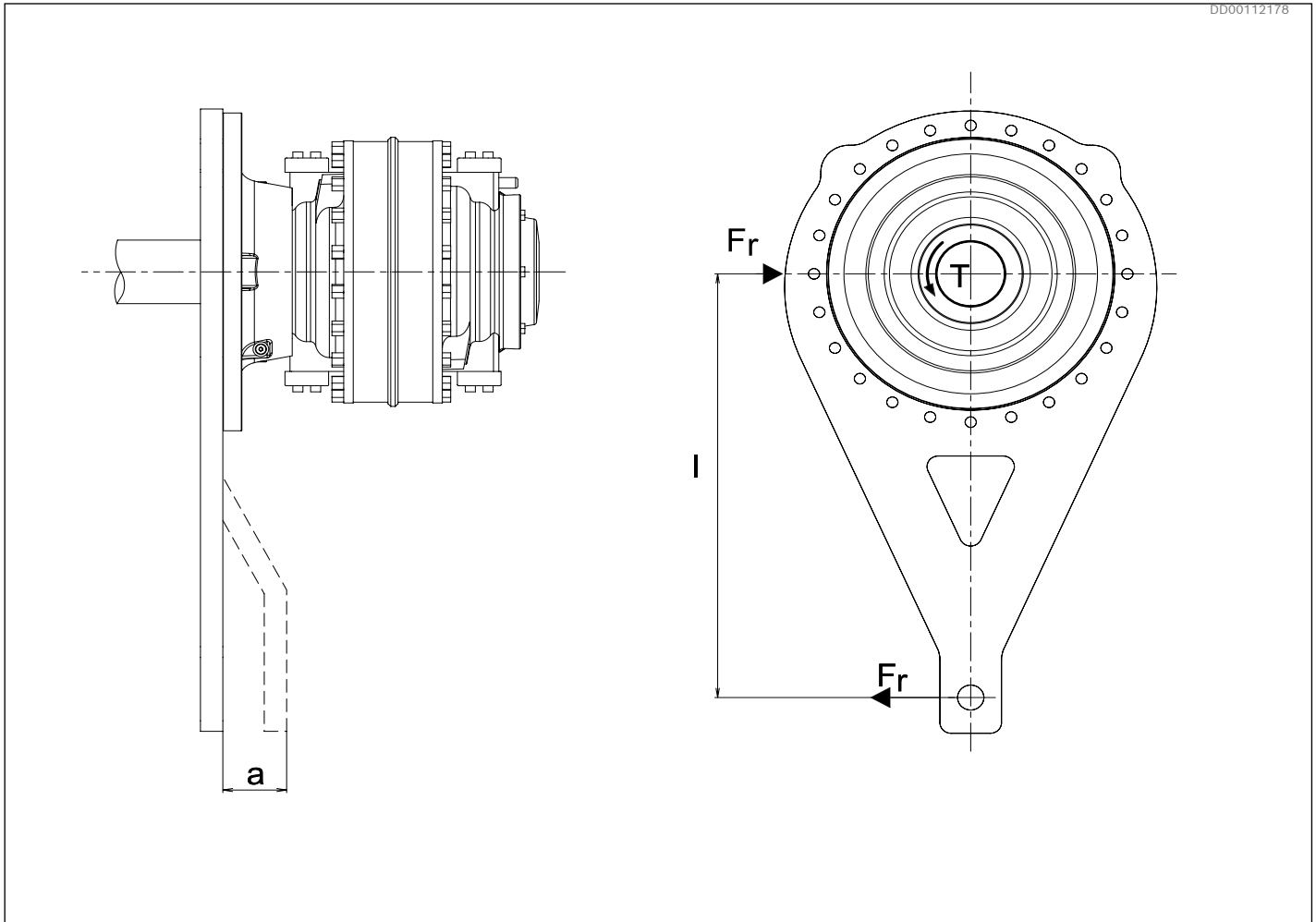
Fig. 37: Shaft mounted motor with torque arm

If non standard torque arms TC A are used, forces must be checked for main bearings and coupling.

a = The axial distance for action point of radial force

$$F_r = \frac{T}{l}$$

F_r = Total radial force on fixed motor mounting

T = Output torque for motor

l = Lever length

Note!

For flange mounted motor, be aware of required installation tolerances which will minimize the external forces on the motor. See section *8.1* or contact your Bosch Rexroth representative.

4.14.1 Permissible external dynamic loads

Permissible external dynamic loads Hägglunds CBp 140 C

Viscosity 40 cSt/187 SSU.
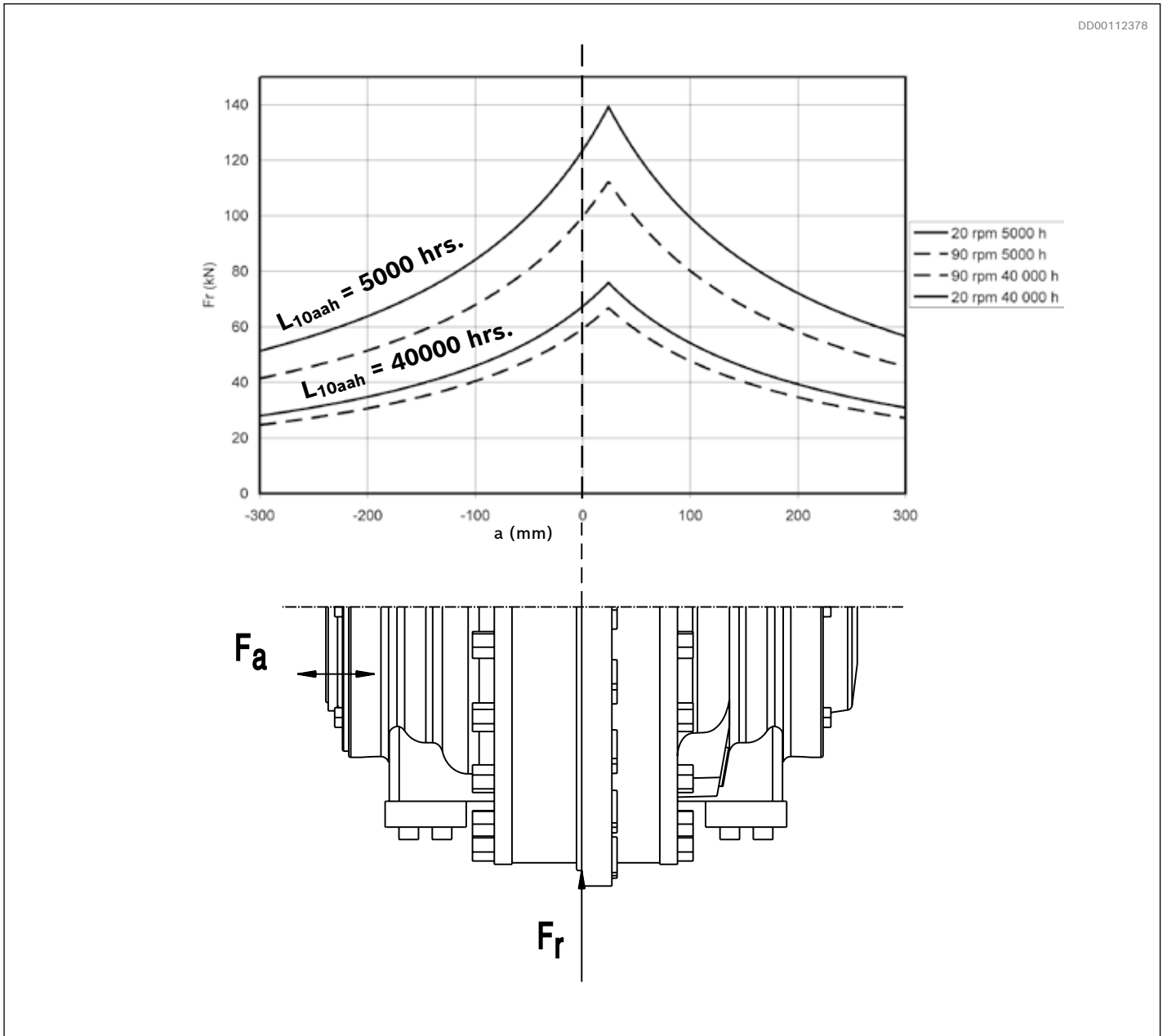
Fig. 38: Permissable external dynamic loads CBp 140 C

Axial loads: Permissible axial load for intermittent duty
F_a = 365 000 N (82 000 lbf).

Remark: For continuous axial load applications, please
contact your Bosch Rexroth representative.

Permissible external dynamic loads Hägglunds CBp 140 F

Viscosity 40 cSt/187 SSU.
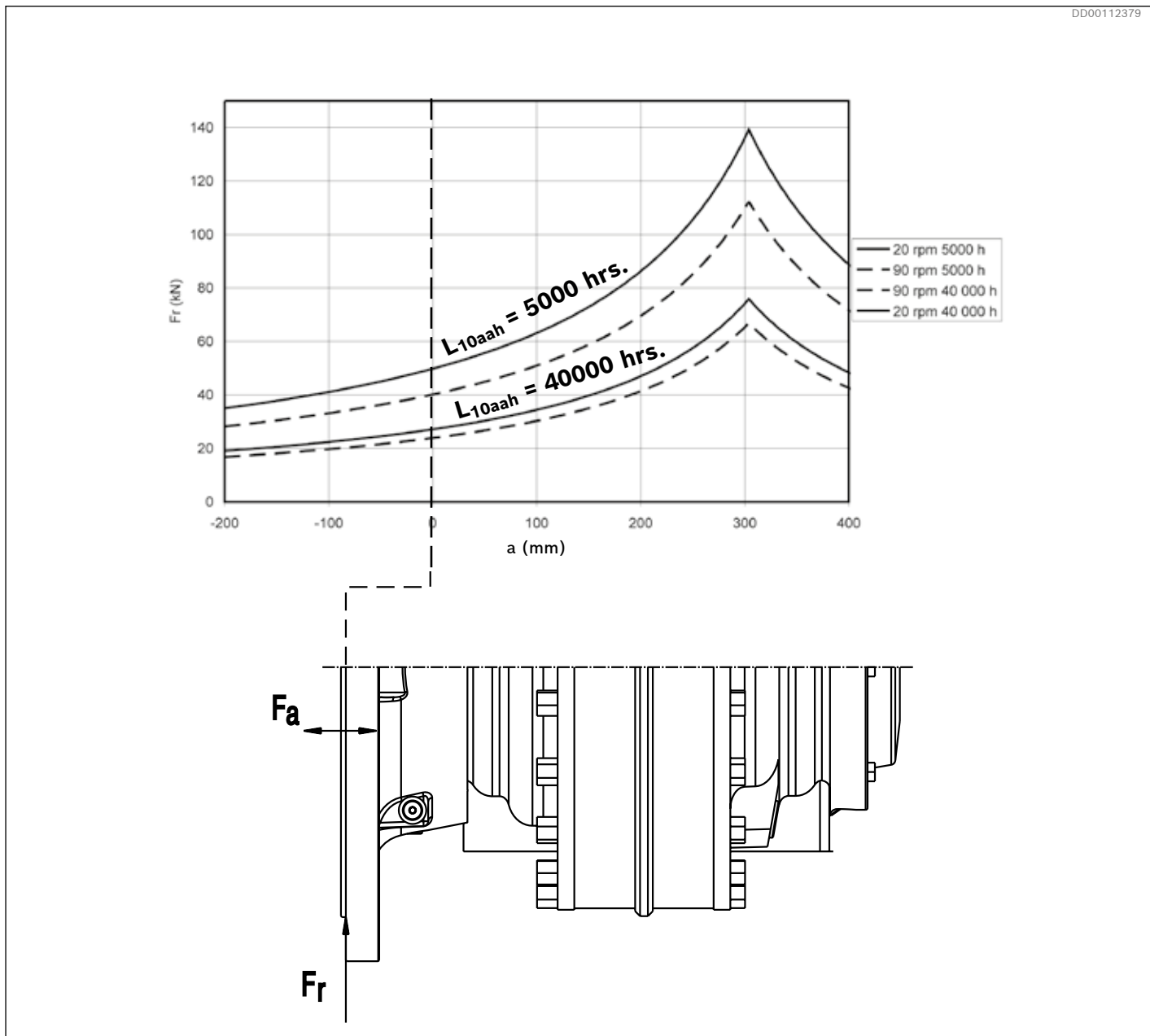
Fig. 39: Permissable external dynamic loads CBp 140 F

Axial loads: Permissible axial load for intermittent duty
F_a = 365 000 N (82 000 lbf).

Remark:
Alternating torque is not allowed

For continuous axial load applications, please contact
your Bosch Rexroth representative.

Permissible external dynamic loads Hägglunds CBp 280 F

Viscosity 40 cSt/187 SSU, speed 40 rpm.
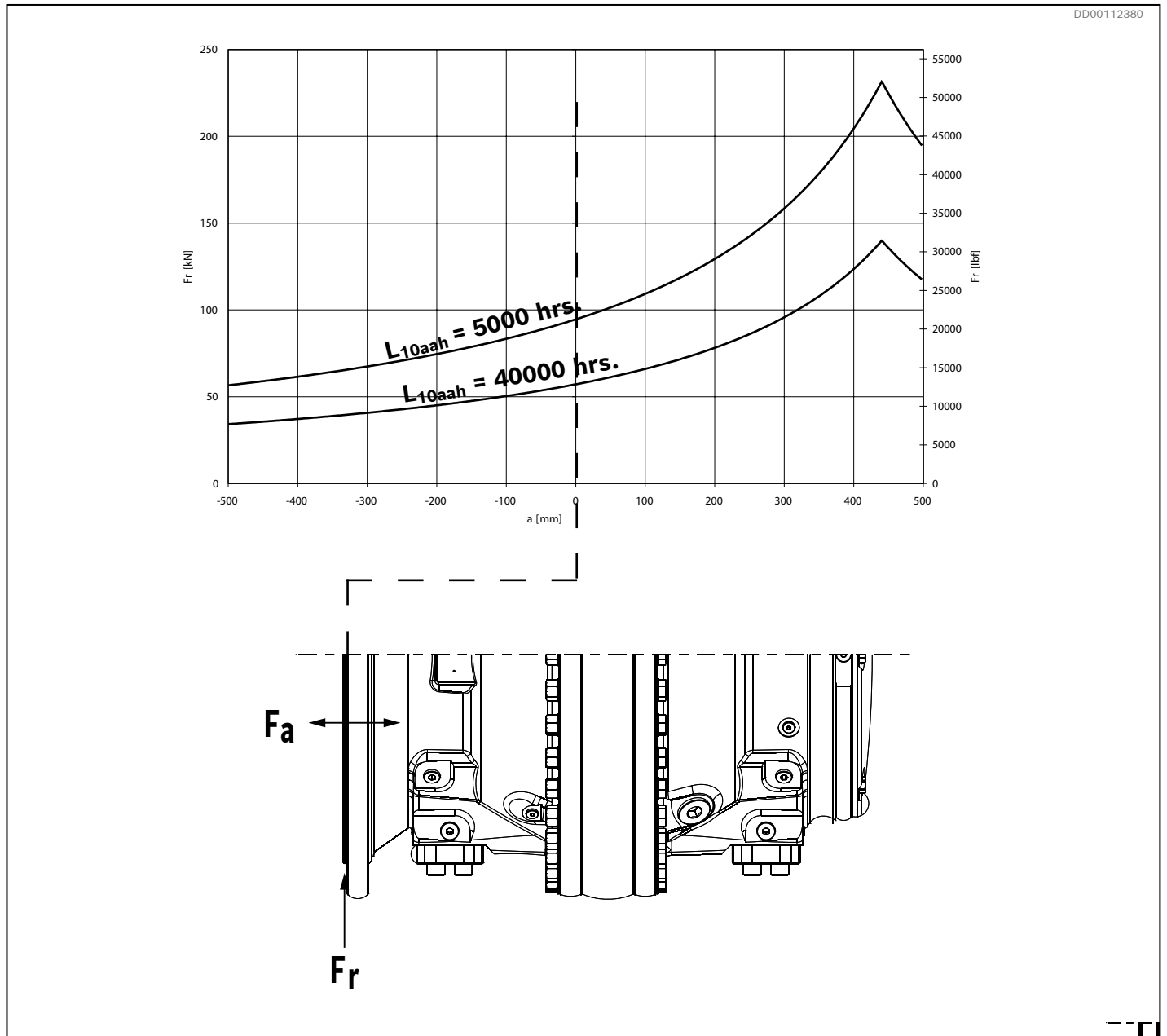
Fig. 40: Permissable external dynamic loads CBp 280 F

Axial loads: Permissible axial load for intermittent duty
F_a = 30 000 N (6 740 lbf).

Remark:
Alternating torque is not allowed

For continuous axial load applications, please contact
your Bosch Rexroth representative.

Permissible external dynamic loads Hägglunds CBp 400 F

Viscosity 40 cSt/187 SSU, speed 100 rpm.
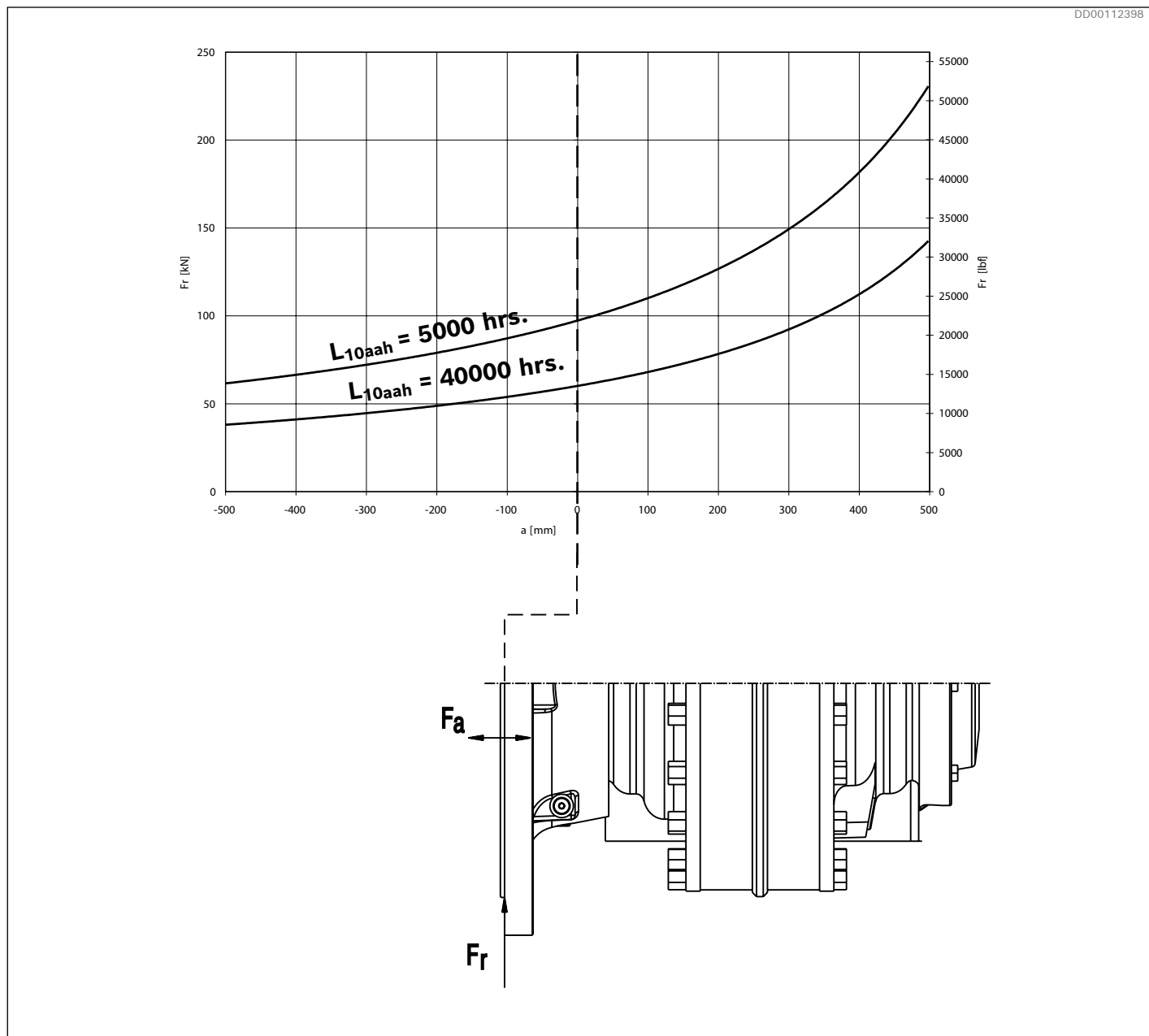
Fig. 41: Permissable external dynamic loads CBp 400 F

Axial loads: Permissible axial load for intermittent duty
F_a = 30 000 N (6 740 lbf).

Remark:
Alternating torque is not allowed

For continuous axial load applications, please contact
your Bosch Rexroth representative.

Permissible external dynamic loads Hägglunds CBp 560 F

Viscosity 40 cSt/187 SSU, speed 40 rpm.
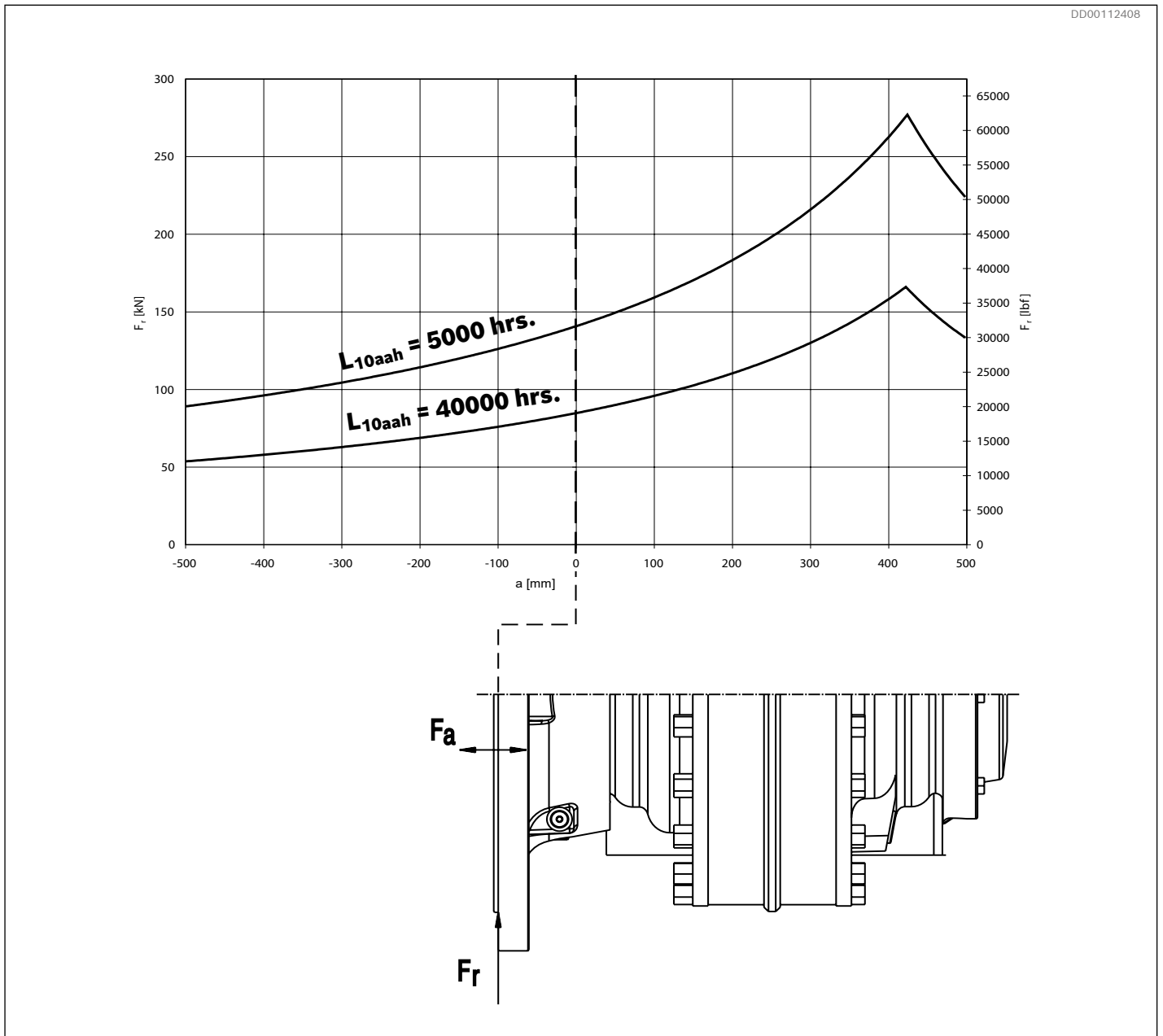
Fig. 42: Permissable external dynamic loads CBp 560 F

Axial loads: Permissible axial load for intermittent duty
F_a = 30 000 N (6 740 lbf).

Remark:
Alternating torque is not allowed

For continuous axial load applications, please contact
your Bosch Rexroth representative.

Permissible external dynamic loads Hägglunds CBp 400 C/CBp 560 C/CBp 840 C

Viscosity 40 cSt/187 SSU, speed 70 rpm.
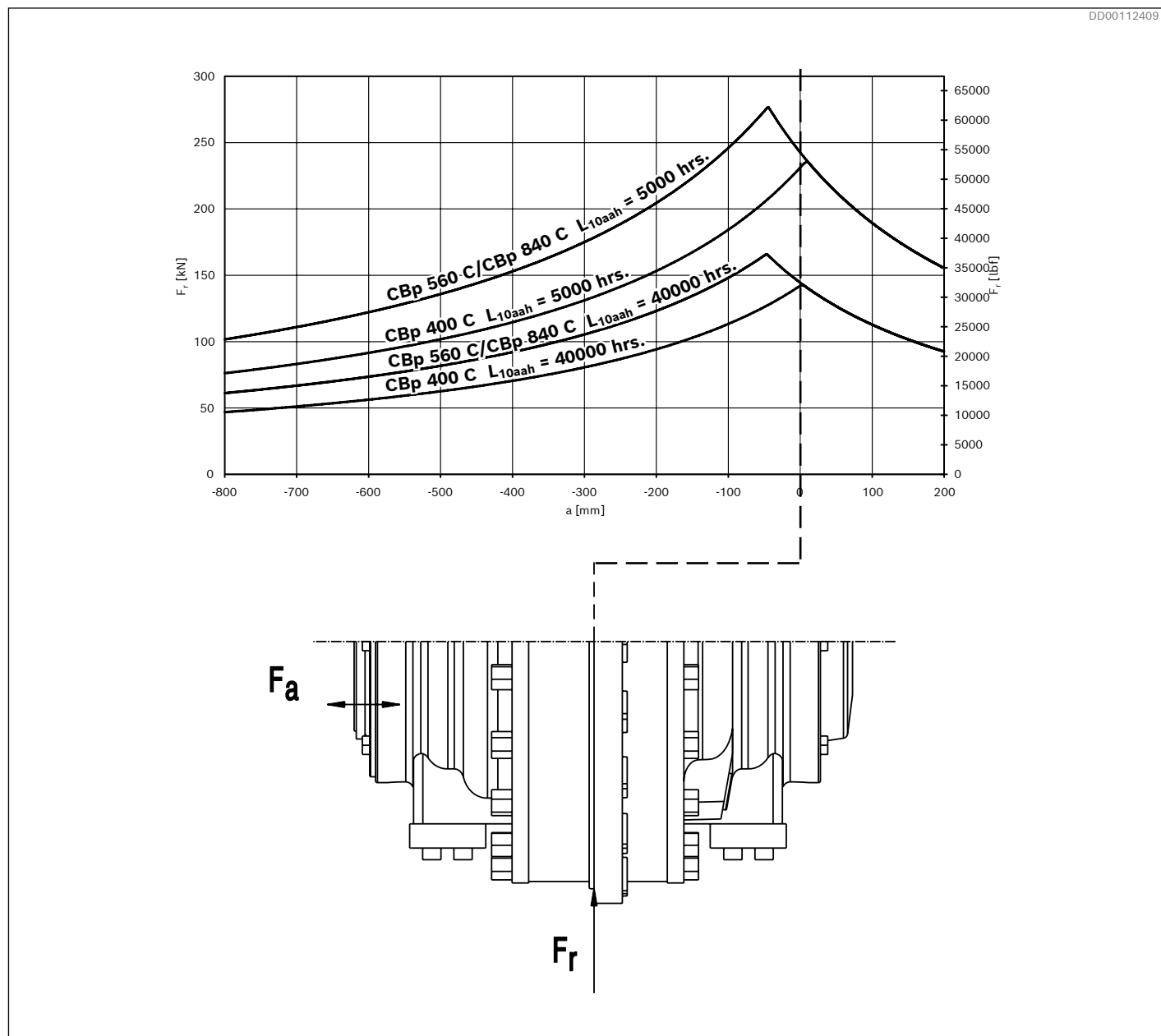
Fig. 43: Permissable external dynamic loads CBp 400 C/CBp 560 C/ CBp 840 C

Axial loads: Permissible axial load for intermittent duty
F_a = 30 000 N (6 740 lbf).

Remark: For continuous axial load applications, please
contact your Bosch Rexroth representative.

4.14.2 Permissible external static load
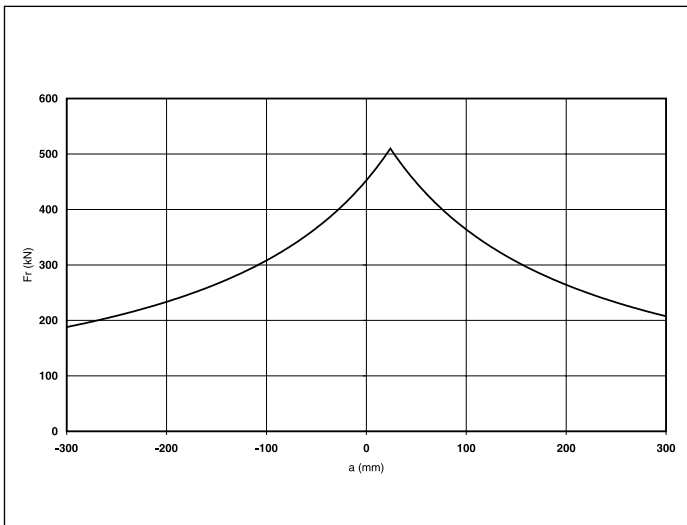
Fig. 44: Permissible external static load Hägglunds CBp 140 C
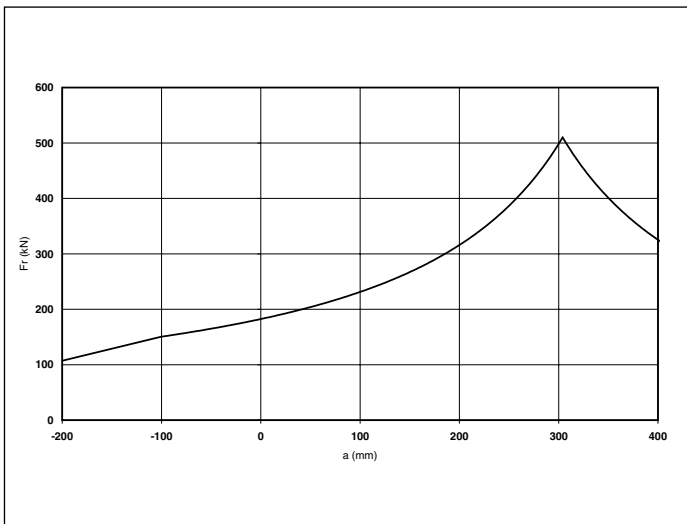
Fig. 45: Permissible external static load Hägglunds CBp 140 F

Fig. 46: Permissible external static load Hägglunds CBp 280 F

Fig. 47: Permissible external static load Hägglunds CBp 400 F

Fig. 48: Permissible external static load Hägglunds CBp 560 F
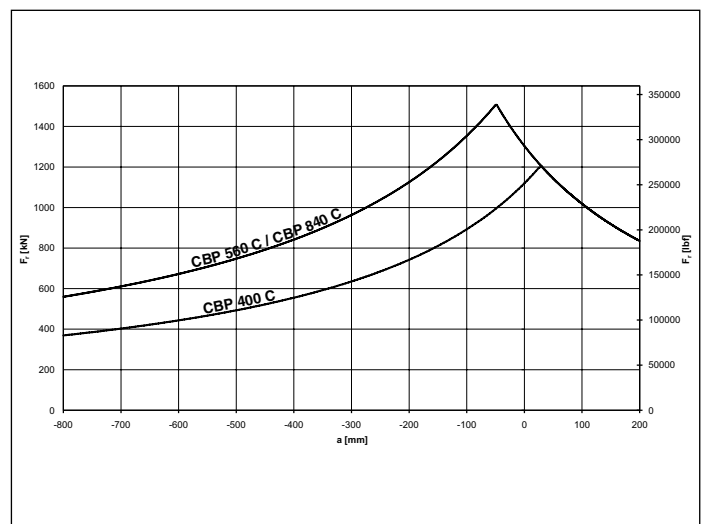
Fig. 49: Permissible external static load Hägglunds CBp 400 C, CBp 560 C, CBp 840 C

4.15 Painting system

Corrosion protection

The painting system of Hägglunds motors and accessories are avalible in two different corrosivity categories regarding corrosion protection in accordance with SS-EN ISO 12944:

- C3 - Corrosivity category Medium - which is recommended for normal urban and industrial atmosphere.

- C5M - Corrosivity category Very High - which is recommended for marine environment with high salt load or other aggressive atmosphere.

Colour

Standard colour for Hägglunds motors and accessories is orange (RAL 2002).

4.16 Temperature sensor

Function

The temperature sensor is as standard mounted in port D2 or T7, see *Fig. 51* and measure fluid temperature in the motor case. The sensor element is a Pt100 resistance sensor, which change resistance in relation to the fluid temperature in the motor case.

Table 11: Technical data, Pt 100/4-20 mA sensor

Sensor length l	CBp 140 : 30 mm (1.18 in), CBp 280 to CBp 840: 60mm (2.36 in)
Process connection	G 1/4" 100
Degree of protection	IP65
Ambient temperature	- 40...+85 ºC (-40...185 ºF)
Type of sensor element	Pt 100
Output	4-20 mA / 0..100 ºC (32...212 ºF)
Connector	DIN 43650 screw terminals
Cable connection	Pg9 cable Ø6-8 mm
Electrical connection	2-wire connection
Connection	Pin 1 - Ub Pin 2 – 4-20 mA output
Supply voltage Ub	7.5 - 30 VDC
Reverse polarity protection	Yes
Max, load	750 Ω at 24 V ((Ub - 7.5 V)/0.022)

Fig. 50: Temperature sensor

CBp 140   D2

CBp 280 to CBp 840   T7
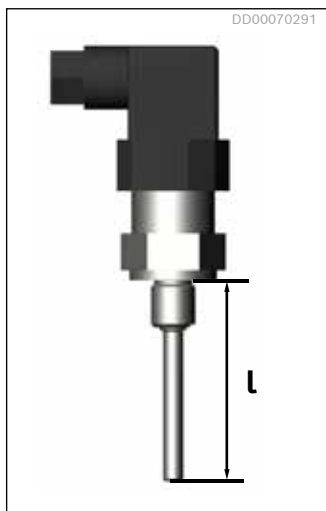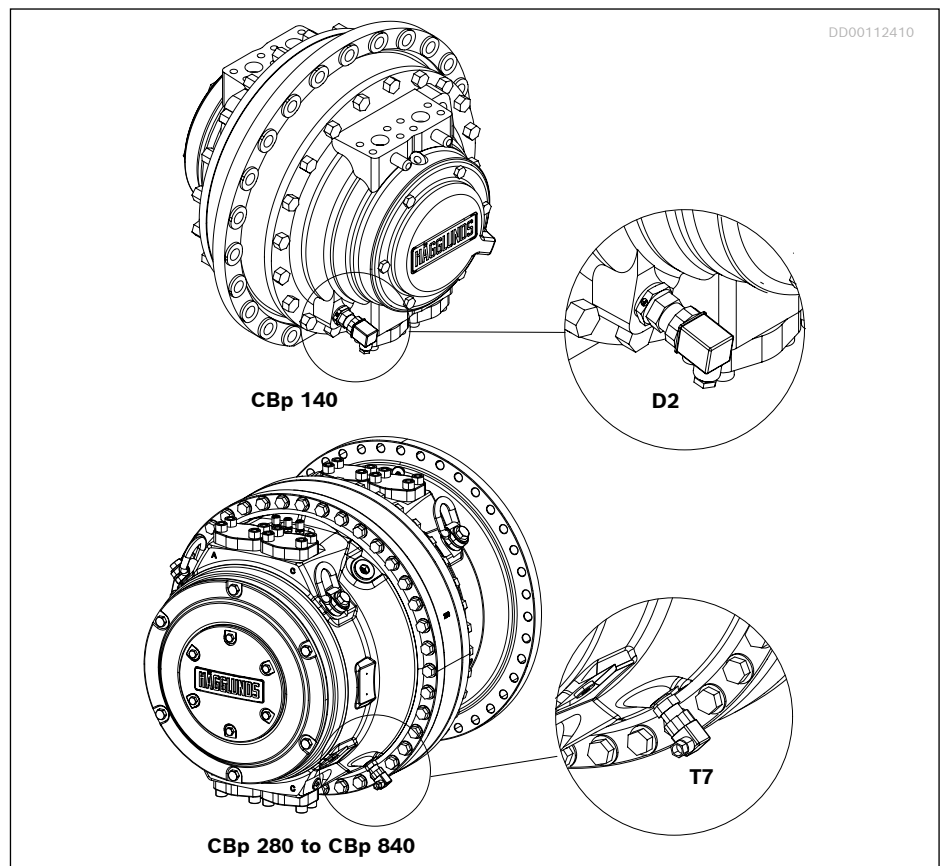
Fig. 51: Temperature sensor mounted on CBp motor

4.17 Sound

The sound power levels have been meassured according
to ISO 3747. Please see RE 15411 for more information
regarding sounds and vibrations.
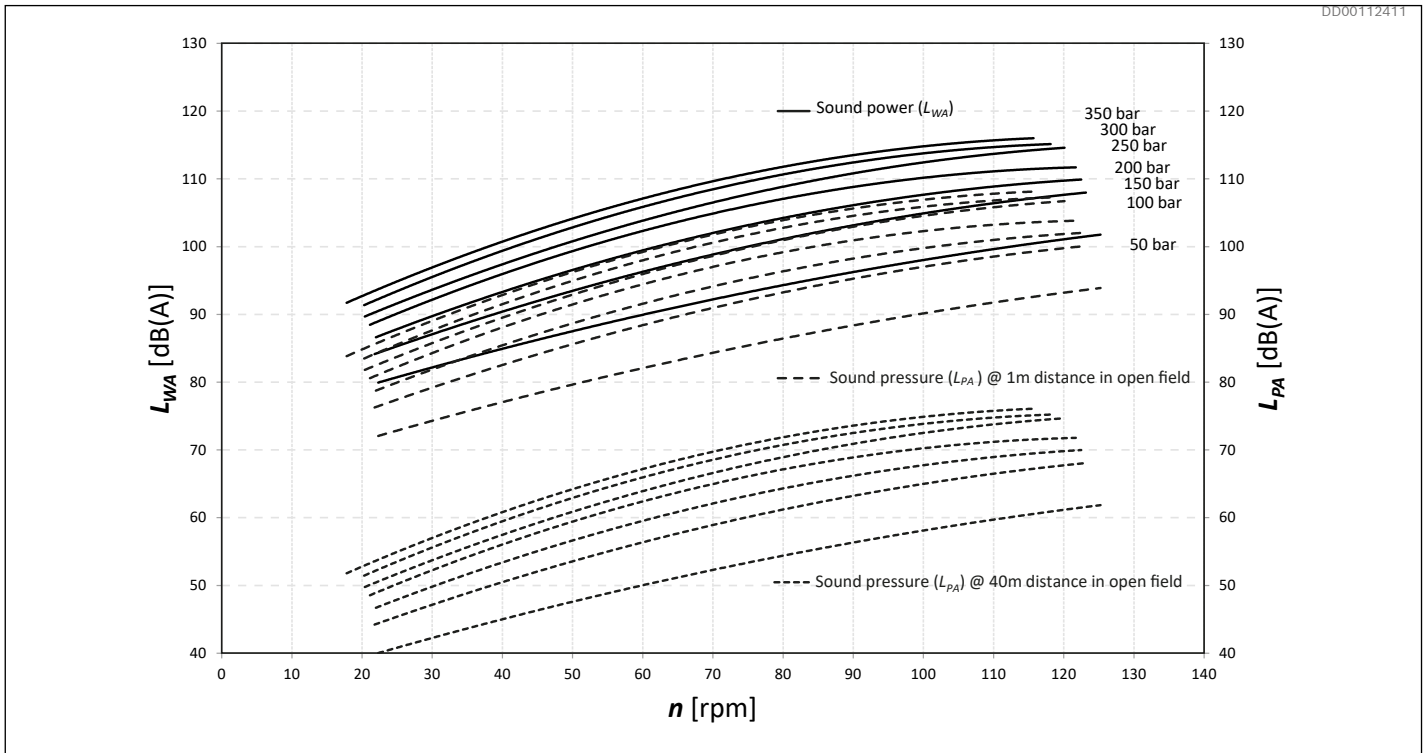
Fig. 52: A-weighted emission sound pressure and power level of CBp 280
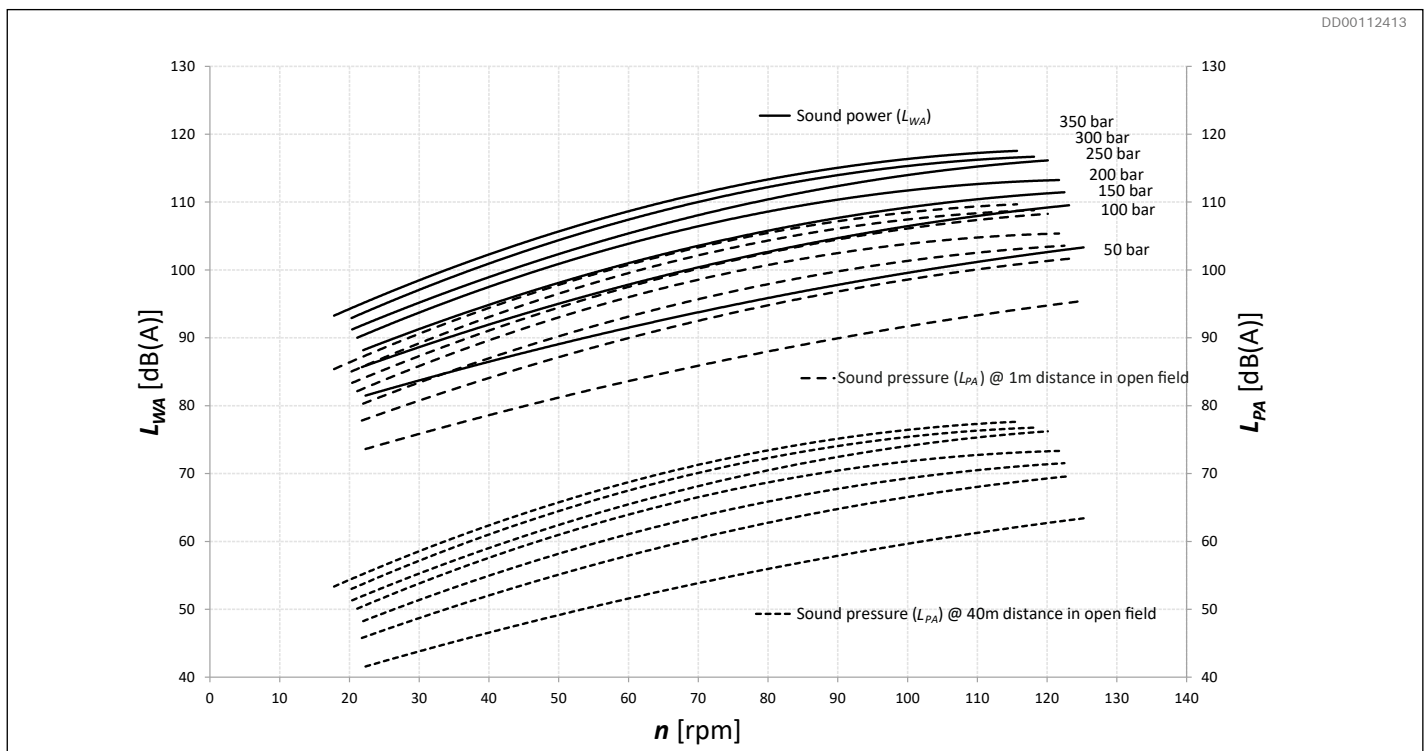
Fig. 53: A-weighted emission sound pressure and power level of CBp 400

DD00112414
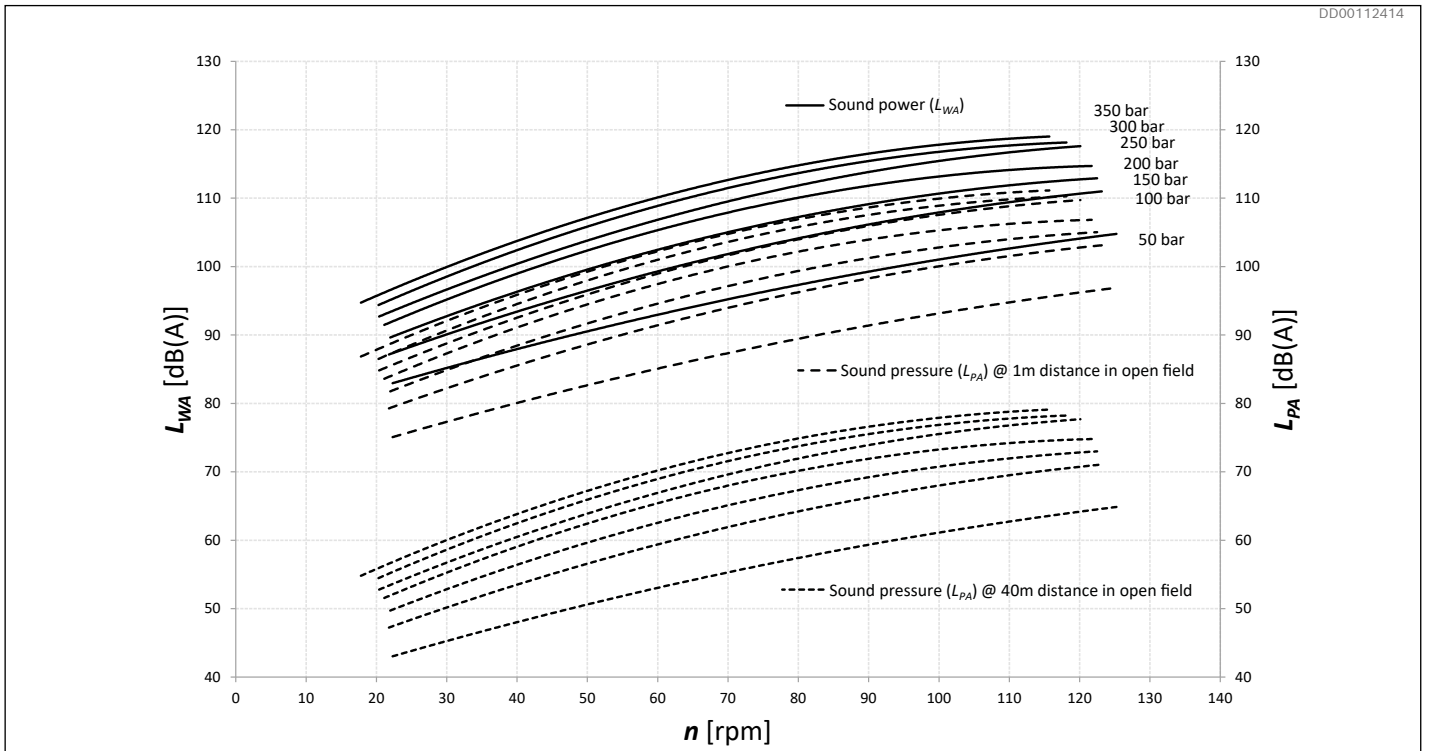
Fig. 54: A-weighted emission sound pressure and power level of CBp 560

DD00112415
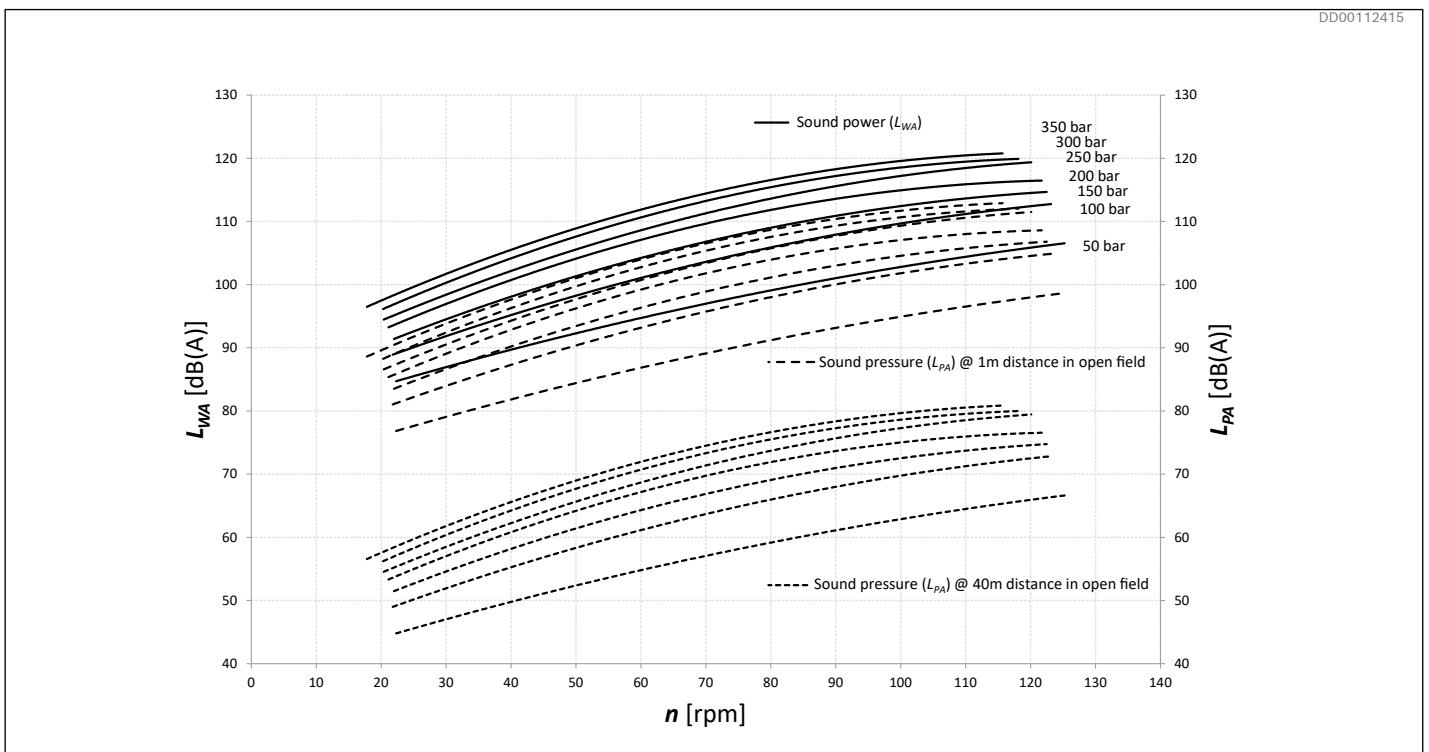
Fig. 55: A-weighted emission sound pressure and power level of CBp 840

5   Through hole kit

Through hole kit (option H) enables e.g. flushing through the motor to the driven machine or the possibility to draw electric cables through the motor.

Table 12: Dimensions Hägglunds CBp with through hole kit

Motor	L1		D6	
	mm	in	mm	in
CBp 140 C	501	19.72	110	4.33
CBp 140 F	560	22.05	110	4.33
CBp 280 F	853	33.58	170	6.69
CBp 400 C	955	37.60	170	6.69
CBp 400 F	972	38.27	170	6.69
CBp 560 C	1032	40.63	170	6.69
CBp 560 F	1032	40.63	170	6.69
CBp 840 C	1150	45.28	170	6.69

Dimension drawing

See section *10: Related documents*
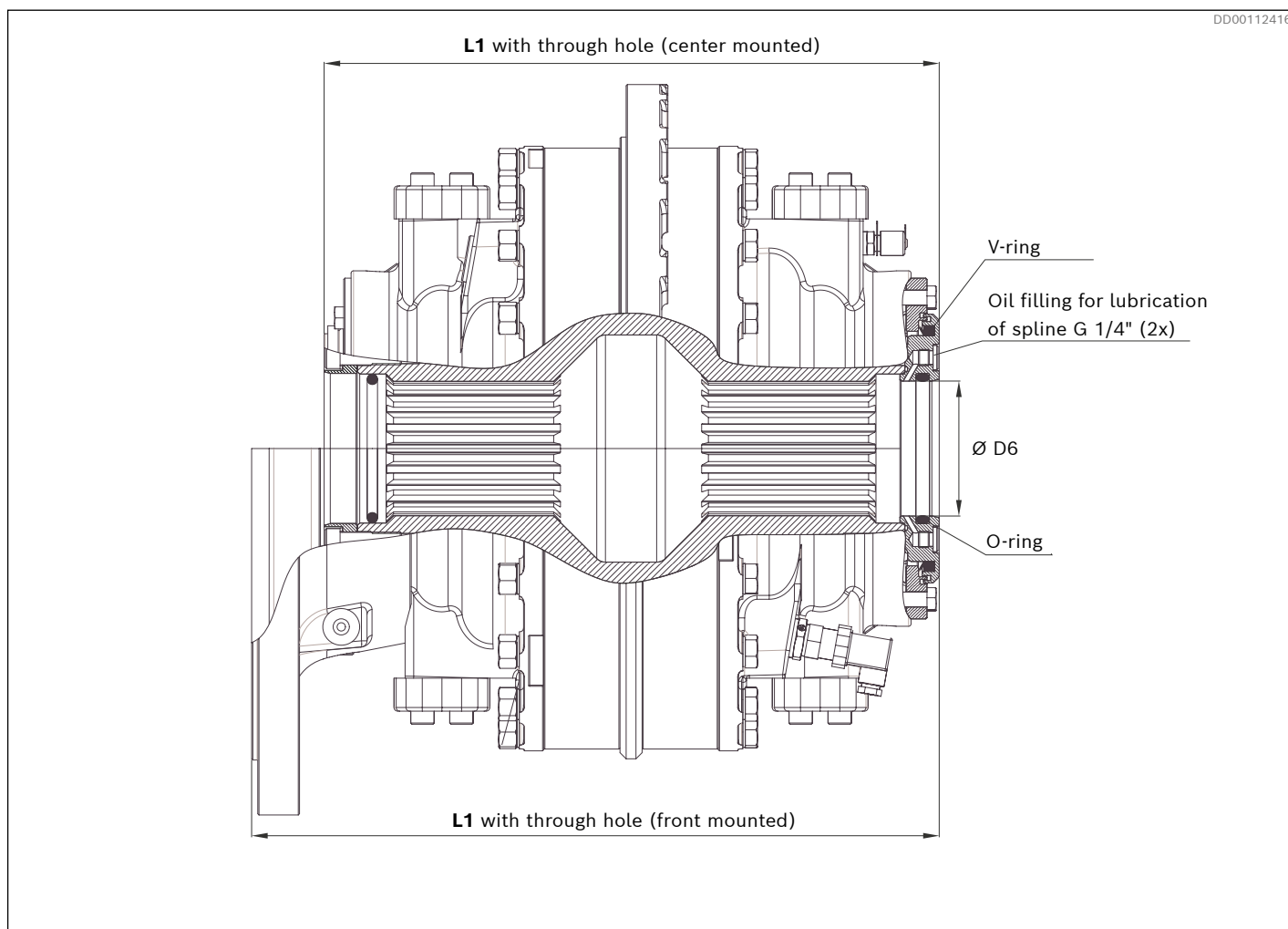
Fig. 56: Example: Hägglunds CBp 140 with through hole kit

6   Increased robustness

Option C:

DLC (Diamond-Like Carbon) coated pistons and cam rollers are standard for all CBp motors

7 Dimensions / Interface

7.1 Dimensions

DD00112418
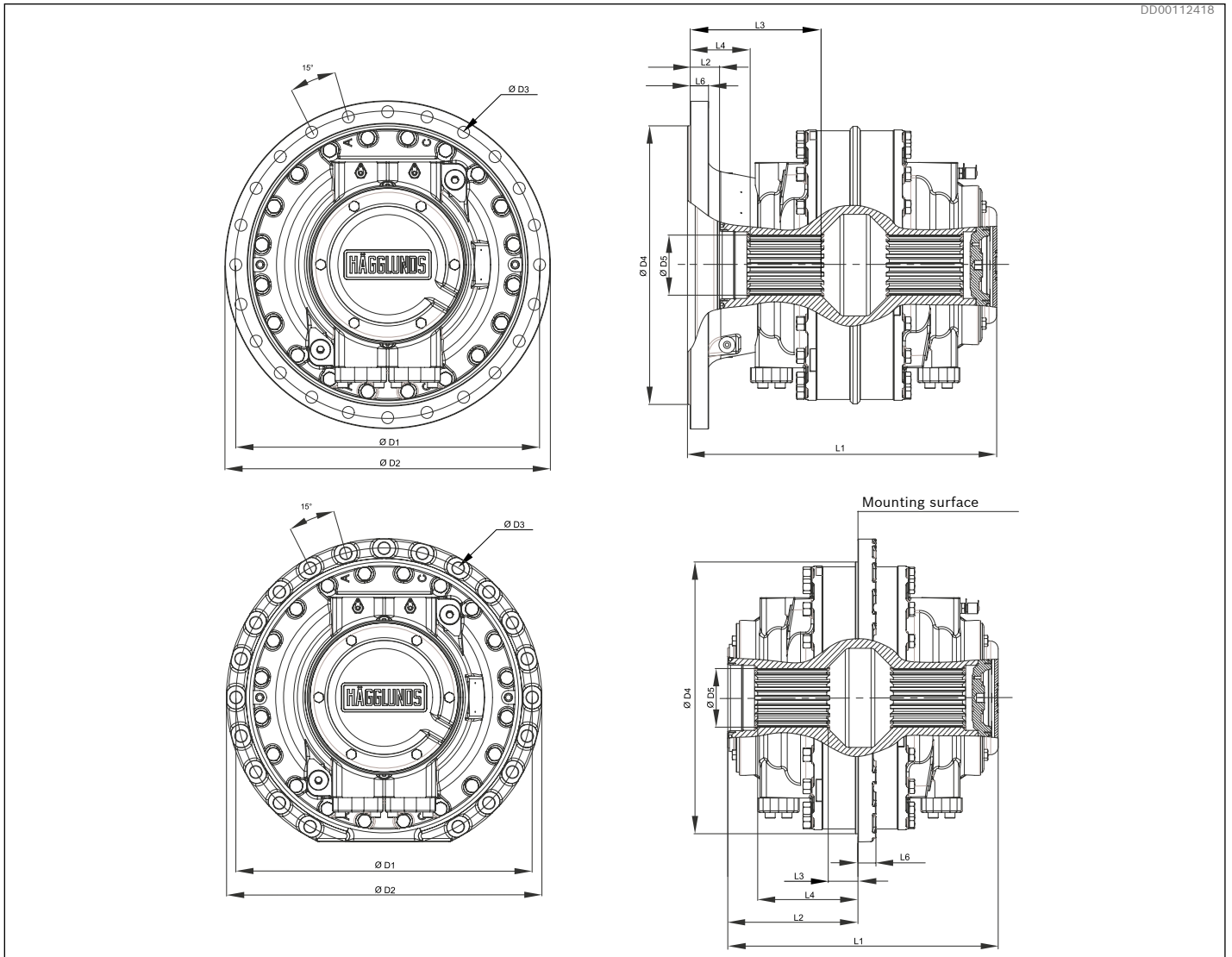
Fig. 57: CBp 140

Table 13: Dimensions CBp 140

			Dimensions			
			Center mounted		**Front mounted**	
			mm	**in**	**mm**	**in**
D1	Pitch diameter		560±0.6	22.05±0.02	560±0.6	22.05±0.02
D2	Outer diameter		600	23.62	600	23.62
D3	Screw hole		22	0.87	22	0.87
D4	Guide diameter		510	20.08	510	20.08
D5	Spline size	DIN 5480	N120 x 5 x 30 x 22 x 9H			
L1	Total length	*Without through hole*	511	20.12	570	22.44
L2	Length to hollow shaft		246	9.69	54	2.13
L3	Length to spline end		59	2.32	241	9.49
L4	Length to spline		189	7.44	4.37	0.17
L6	Thickness of mounting ring		34	1.34	34	1.34

For dimension drawings CBp 140, see section *10: Related documents*

DD00112419
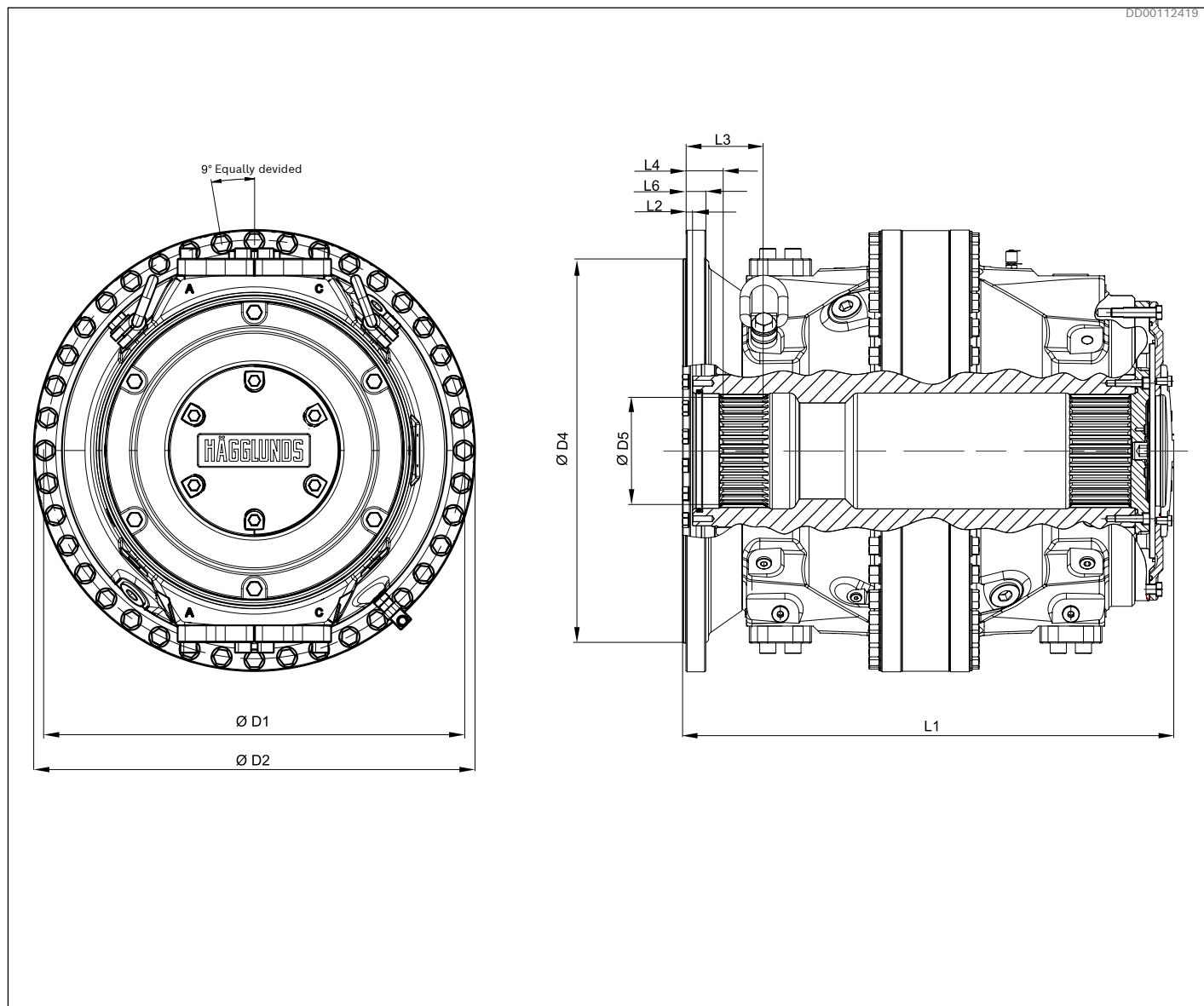
Fig. 58: CBp 280

Table 14: Dimensions CBp 280

| | | | Dimensions | |
| | | | Front mounted | |
			mm	in
D1	Pitch diameter		742	29.21
D2	Outer diameter		782	30.79
D3	Screw hole		22	0.87
D4	Guide diameter		680	26.77
D5	Spline size	DIN 5480	N200 x 5 x 30 x 38 x 9H	
L1	Total length	*Without through hole*	869	34.21
L2	Length to hollow shaft		11.6	0.46
L3	Length to spline end		135.6	5.34
L4	Length to spline		65.6	2.58
L6	Thickness of mounting ring		35	1.38

For dimension drawings CBp 280, see section *10: Related documents*

DD00112420
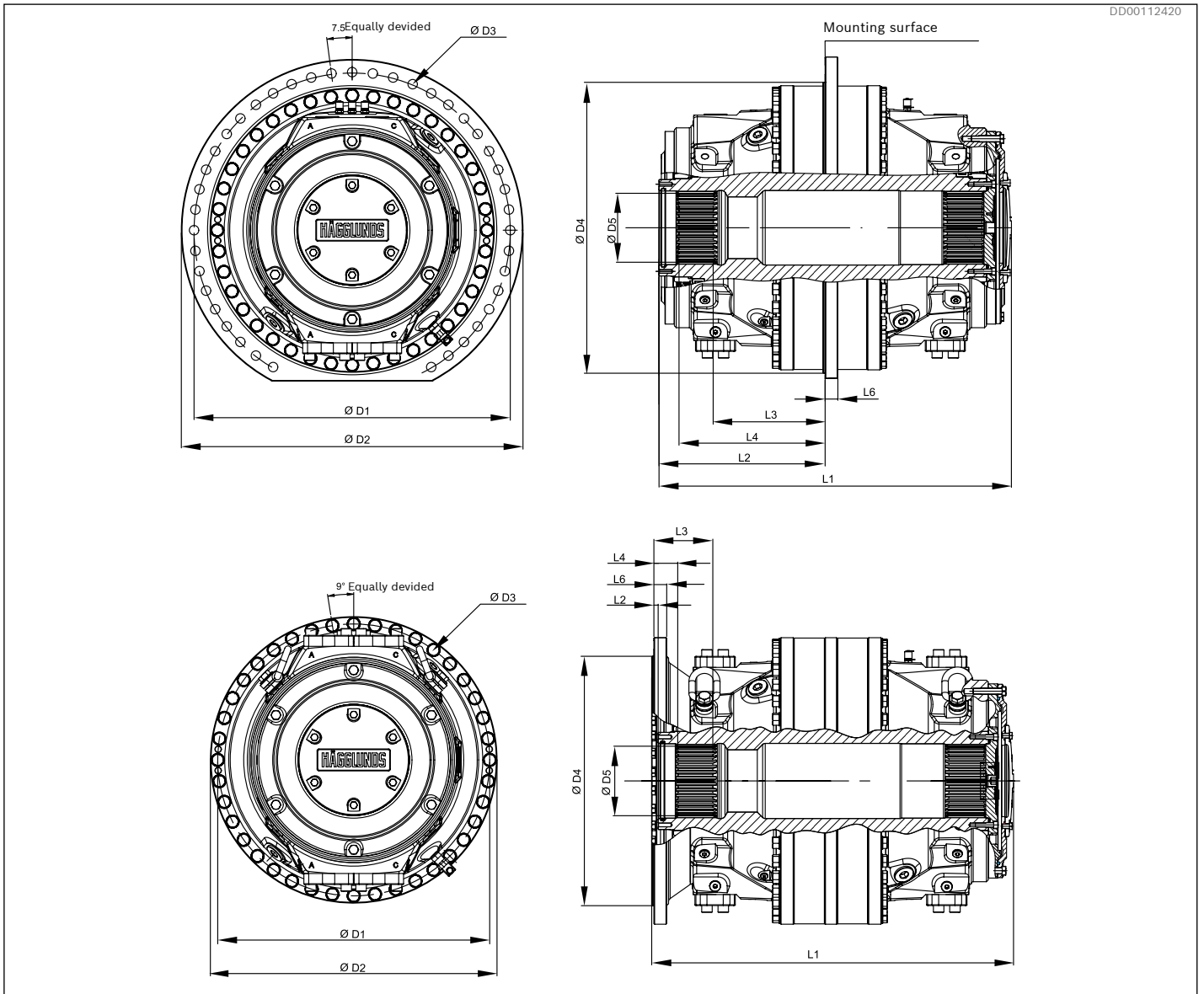
Fig. 59: CBp 400

Table 15: Dimensions CBp 400

			Dimensions			
			Center mounted		**Front mounted**	
			mm	**in**	**mm**	**in**
D1	Pitch diameter		870	34.25	742	29.21
D2	Outer diameter		940	37.01	782	30.79
D3	Screw hole		26	1.02	22	0.87
D4	Guide diameter		800	1.50	680	26.77
D5	Spline size	DIN 5480	N200 x 5 x 30 x 26 x 9H			
L1	Total length	**Without through hole**	969	38.15	987	38.86
L2	Length to hollow shaft		457	17.99	11.6	0.46
L3	Length to spline end		308	12.13	160.6	6.32
L4	Length to spline		403	15.87	65.6	2.58
L6	Thickness of mounting ring		35	1.38	35	1.38

For dimension drawings CBp 400, see section *10: Related documents*
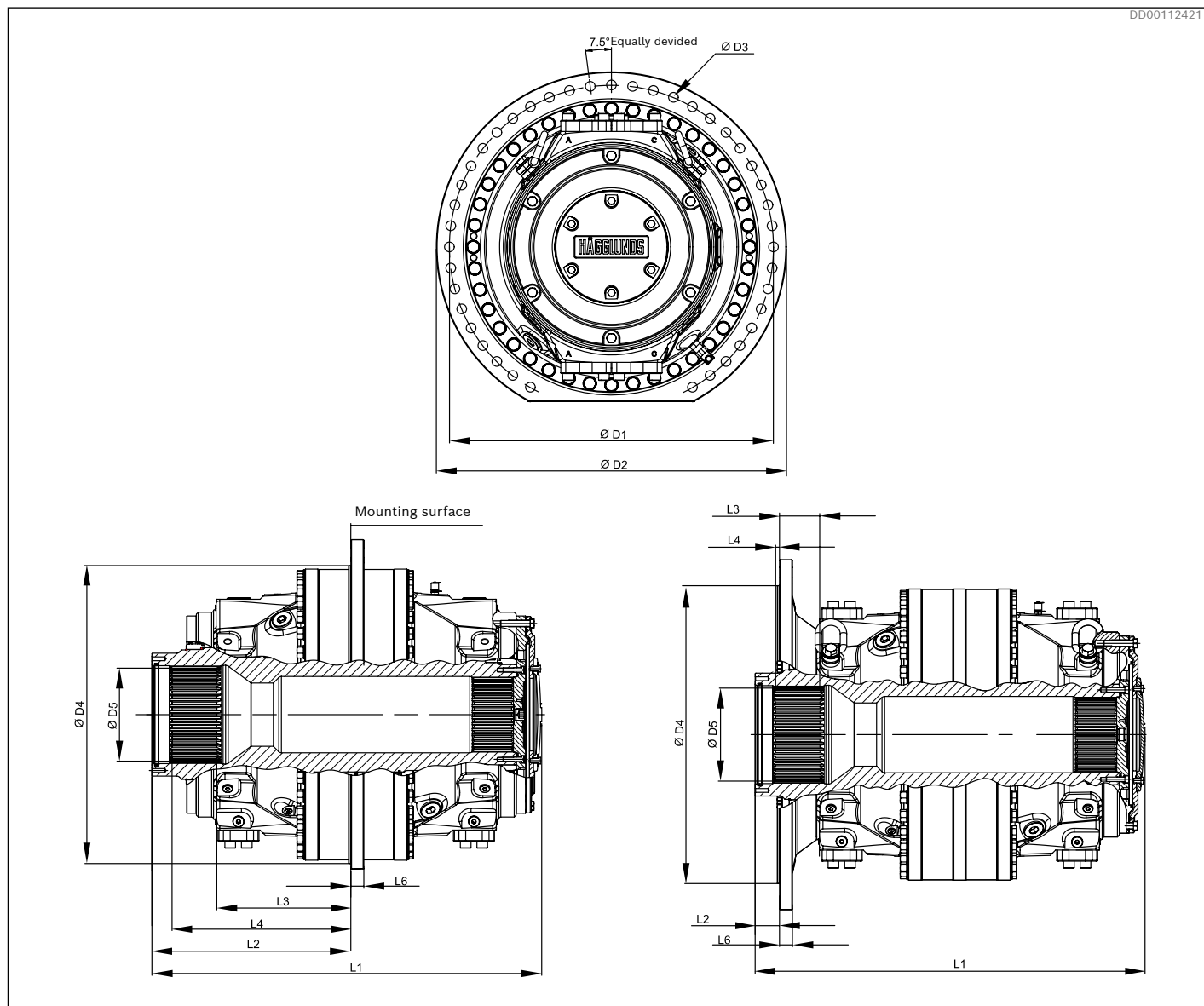
Fig. 61: CBp 560

Table 16: Dimensions CBp 560

		Dimensions			
		Center mounted		Front mounted	
		mm	in	mm	in
D1	Pitch diameter	870	34.25	870	34.25
D2	Outer diameter	940	37.01	940	37.01
D3	Screw hole	26	1.02	26	1.02
D4	Guide diameter	800	31.50	800	31.50
D5	Spline size DIN 5480	N260 x 5 x 30 x 50 x 9H			
L1	Total length *Without through hole*	1046	41.18	1047	41.22
L2	Length to hollow shaft	534	21.02	65.4	2.57
L3	Length to spline end	360	14.17	108.6	4.28
L4	Length to spline	480	18.9	11.4	0.45
L6	Thickness of mounting ring	35	1.38	35	1.38

For dimension drawings CBp 560, see section *10: Related documents*

DD00112423
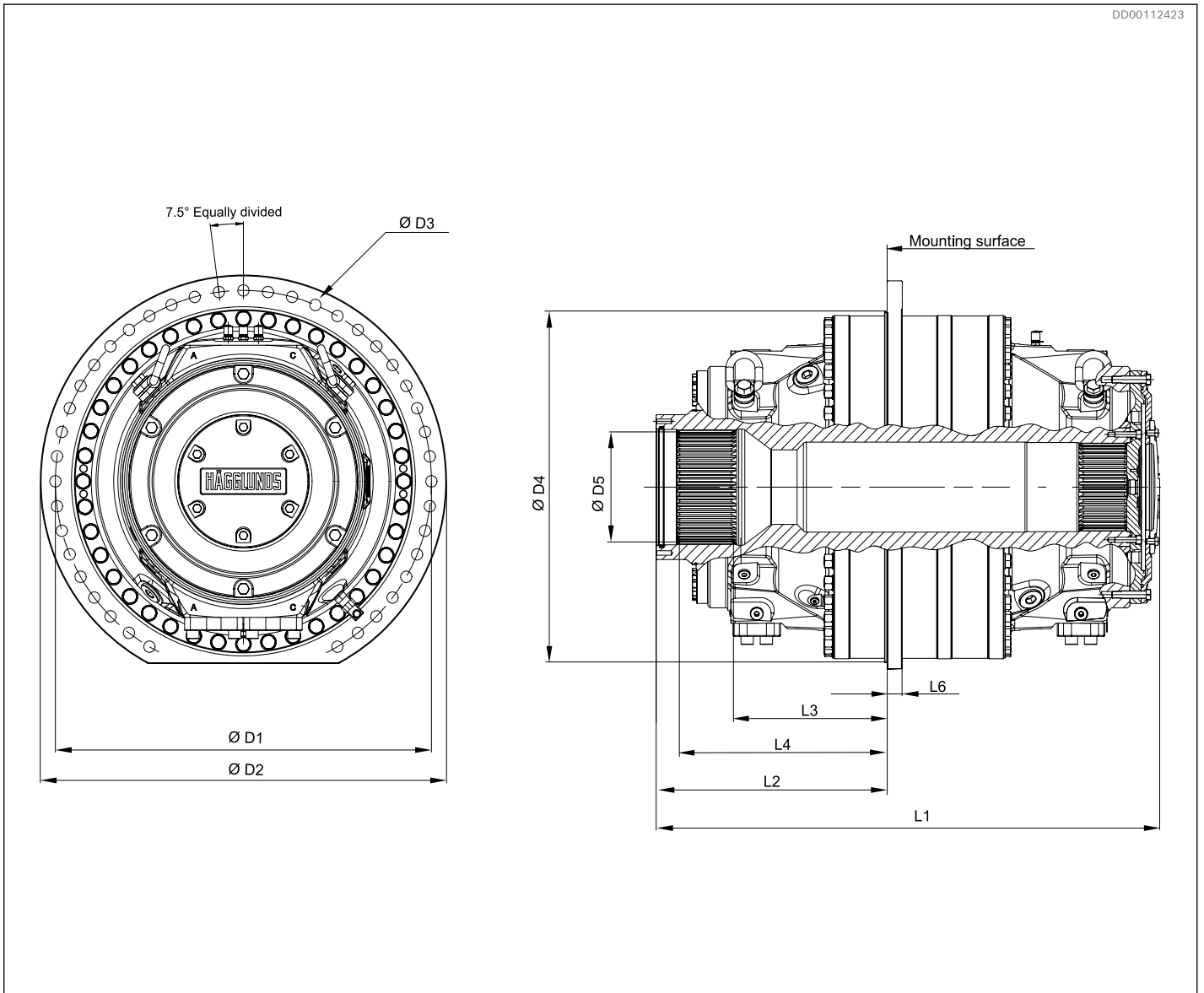
Fig. 62: CBp 840

Table 17: Dimensions CBp 840

			Dimensions	
			Center mounted	
			mm	in
D1	Pitch diameter		870	34.25
D2	Outer diameter		940	37.01
D3	Screw hole		26	1.02
D4	Guide diameter		510	20.08
D5	Spline size	DIN 5480	N260 x 5 x 30 x 50 x 9H	
L1	Total length	**Without through hole**	1165	44.87
L2	Length to hollow shaft		534	21.02
L3	Length to spline end		360	14.17
L4	Length to spline		480	18.90
L6	Thickness of mounting ring		35	1.38

For dimension drawings CBp 840, see section *10: Related documents*

8   Mounting alternatives

8.1 General information

With splines for flange or torque arm mounting
The splines shall be lubricated, and filled with hydraulic oil at assembly, or filled with transmission oil from the connected machine. To avoid wear in the splines, the installation before mounting of motor must be within the specified tolerances in *Fig. 63* For requirements of spline shaft, see section *10: Related documents*

8.1.1   Flange mounting with splines
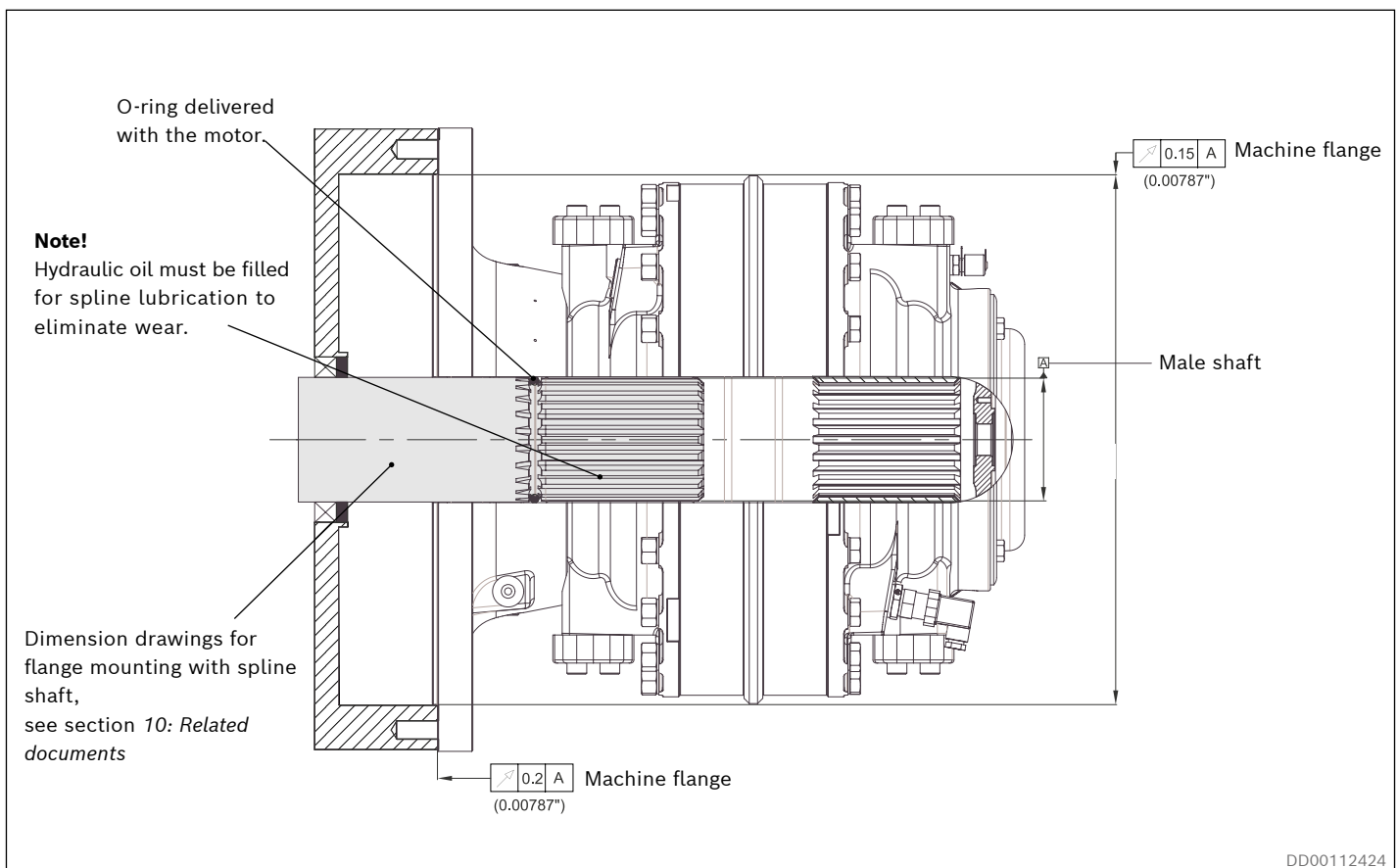
Fig. 63: Example: Flange mounting of CBp 140 with splines

Features

▶ Possibility to use the motor as a one side shaft support bearing
▶ Oil lubrication of splines give no wear
▶ Easy mounting of motor to driven shaft
▶ Space saving

Note!
Flange mounting gives high risk for overloading of motor main bearing. Always check that the shaft and motor bearings are statically determined.
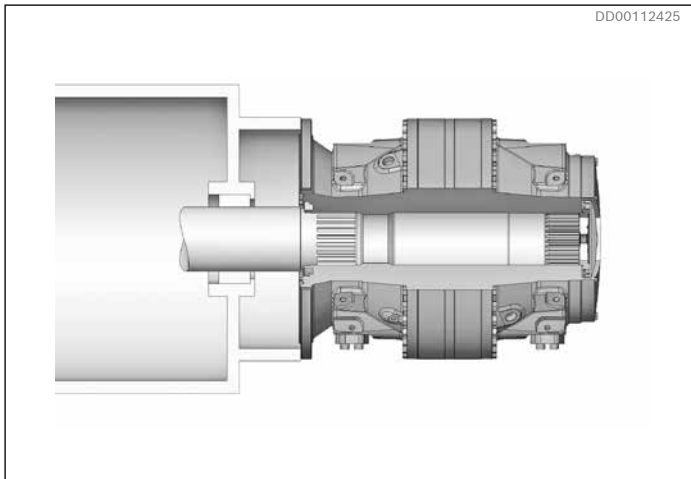
Fig. 64: Example: Flange mounted motor with spline and low radial load from driven shaft.
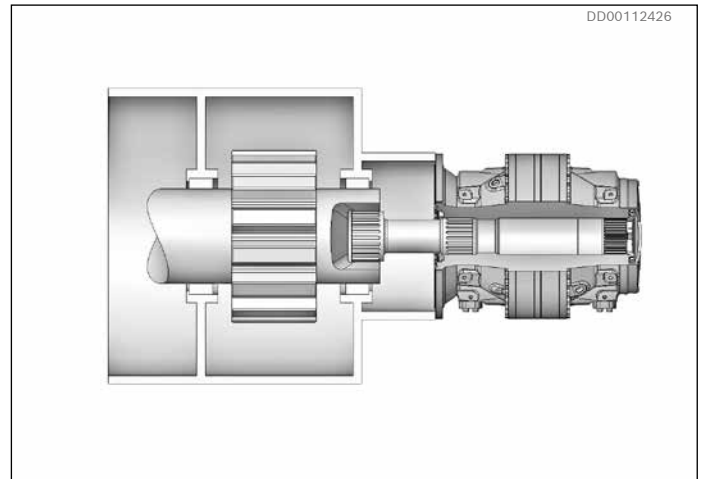
Fig. 65: Example: Flange mounted motor with spline to avoid high radial load from driven shaft.

Design of spline shaft

Table 18: Spline designation shaft

	Spline		
Frame size	**CBp 140**	**CBp 280, CBp 400**	**CBp 560, CBp 840**
Designation: Standard DIN 5480	W140x5x30x26x8f	W200x5x30x38x9H	W260x5x30x50x9H

Table 19: Recommended material in the spline shaft

Drive	**Steel with yield strenght**
Unidirectional drive	Rel_{min} = 450 N/mm² (65 000 lb/ft²)
Bidirectional drive	Rel_{min} = 700 N/mm² (101800 lb/ft²)

For shaft dimension drawings see section *10: Related documents*

8.1.2 Torque arm mounting with splines

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O-ring delivered with the motor.

Note!
Hydraulic oil must be filled for spline lubrication to eliminate wear.

Dimension drawings for torque arm mounting, spline shaft, see section *10: Related documents*

Mounting kit must be oredered seperately, see *Table 20*

Torque arm mounting, see section *9: Accessories*
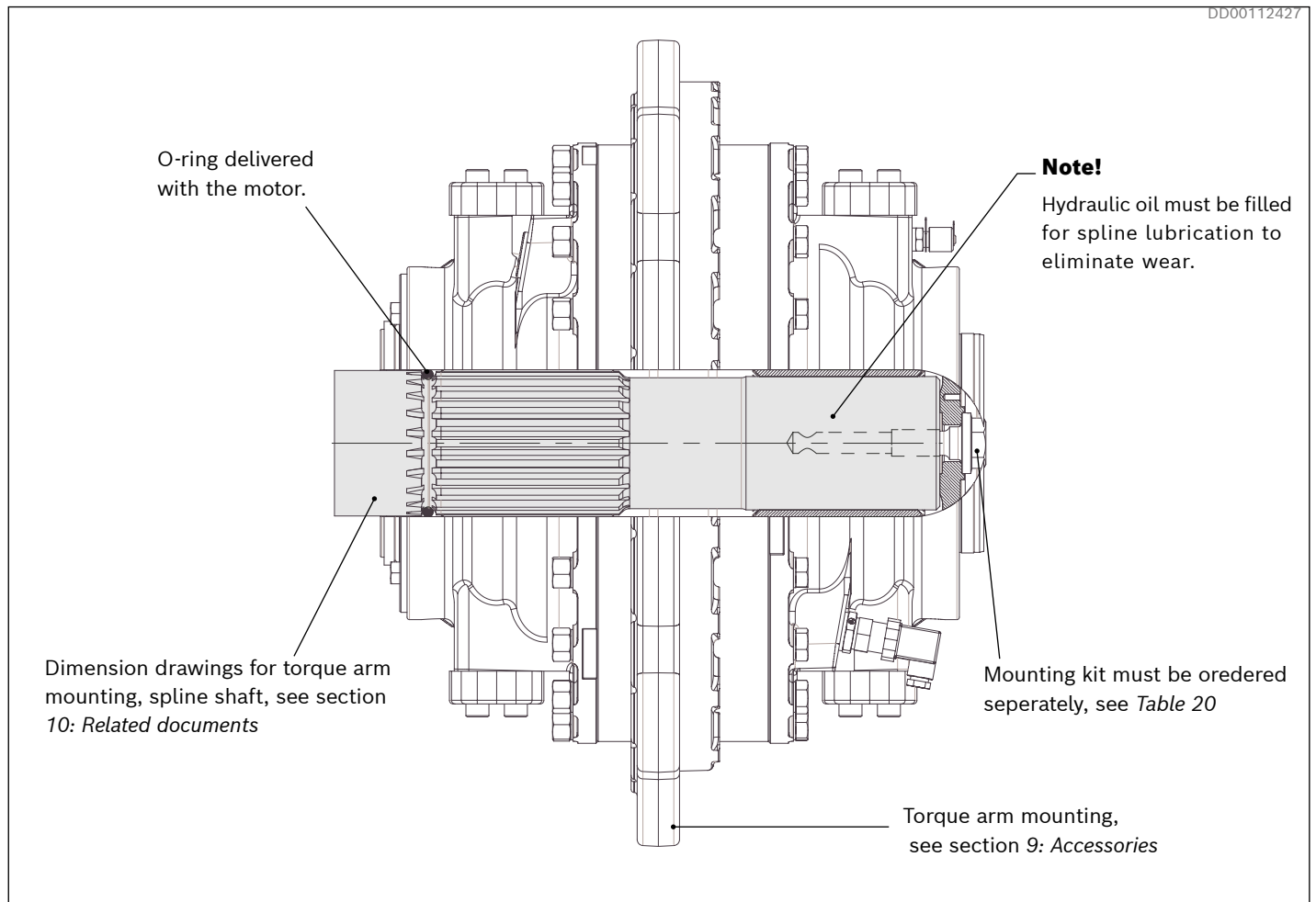
Fig. 66: Example: Torque arm mounting of CBp 140 with splines

Spline designation shaft, see *Table 18*.
Recommended material in the shaft, see *Table 19*.

Table 20: Material ID mounting kit for CBp 140 to CBp 840

Motor type	Material ID Mounting kit (Must be ordered separately)
CBp 140	R939002582
CBb 280	R939002608
CBp 400	R939002609
CBp 560	R939002610
CBp 840	R939002611

9 Accessories

9.1 Torque arms

Mounting alternatives

Dimensions, techical data, order code and material ID for torque arms, see separate data sheet: **RE 15355**
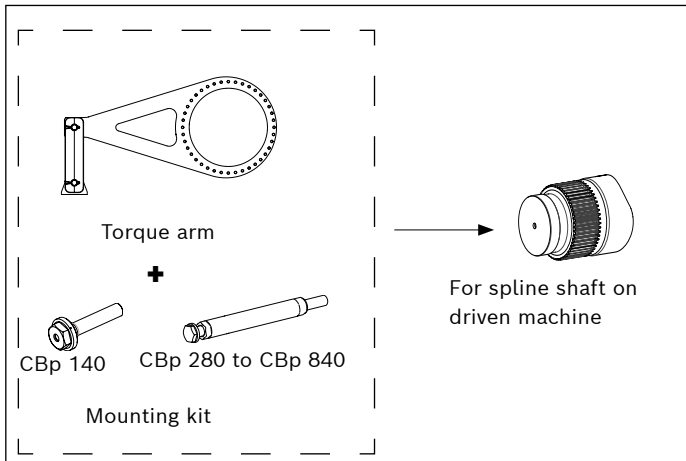
Fig. 67: **Single ended torque arm mounting for spline shaft**

Features

▶ Easy mounting i.e. no alignment problems.
▶ Quick mounting of motor to driven shaft
▶ Robust torque-transmitting.
▶ Controlled external forces on driven shaft.
▶ Space saving. i.e. close mounting to the driven machine.
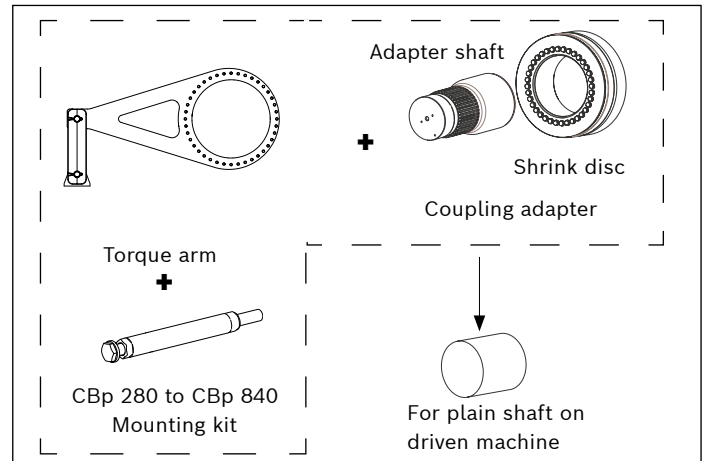
Fig. 68: **Single ended torque arm mounting for plain shaft**

Features

▶ Easy mounting i.e. no alignment problems.
▶ Simplified machining of customer shaft.
▶ Controlled external forces on driven shaft.
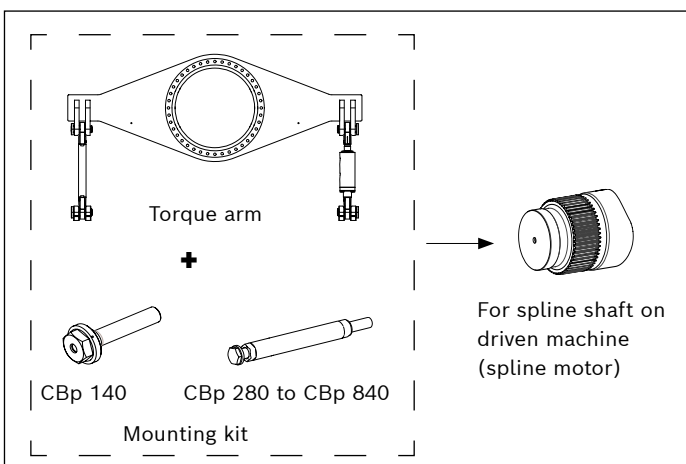
Fig. 69: **Double ended torque arm mounting for spline shaft**

Features

▶ Easy mounting i.e. no alignment problems.
▶ Quick mounting of motor to driven shaft
▶ Robust Torque-transmitting.
▶ Reduction of external forces on driven shaft.
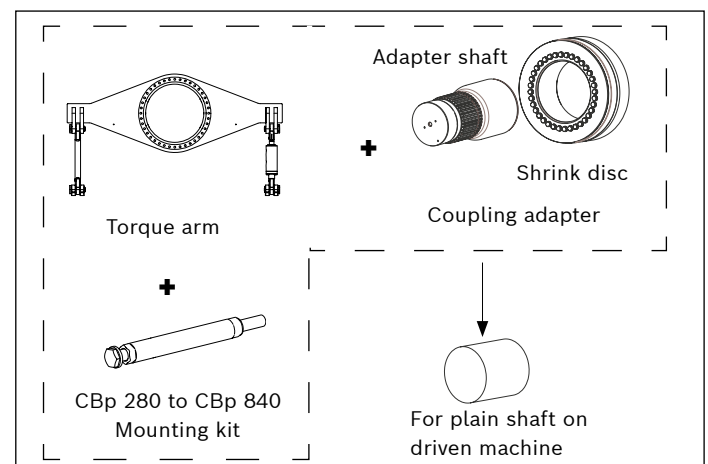
Fig. 70: **Double ended torque arm mounting with plain shaft**

Features

▶ Easy mounting i.e. no alignment problems..
▶ Simplified machining of customer shaft.
▶ Reduction of external forces on driven shaft.

9.2 Coupling adapter

The coupling adapter includes shrink disk and adapter shaft.

Mounting kit must be ordered separately.

The coupling adapter is designed only for torque arm mounting.

Note!

Hydraulic oil must be filled for spline lubrication to eliminate wear.

Shrink disk   Adaptershaft

Coupling adapter

O-ring, delivered with the motor

Mounting kit, must be ordered separately see *Table 20*
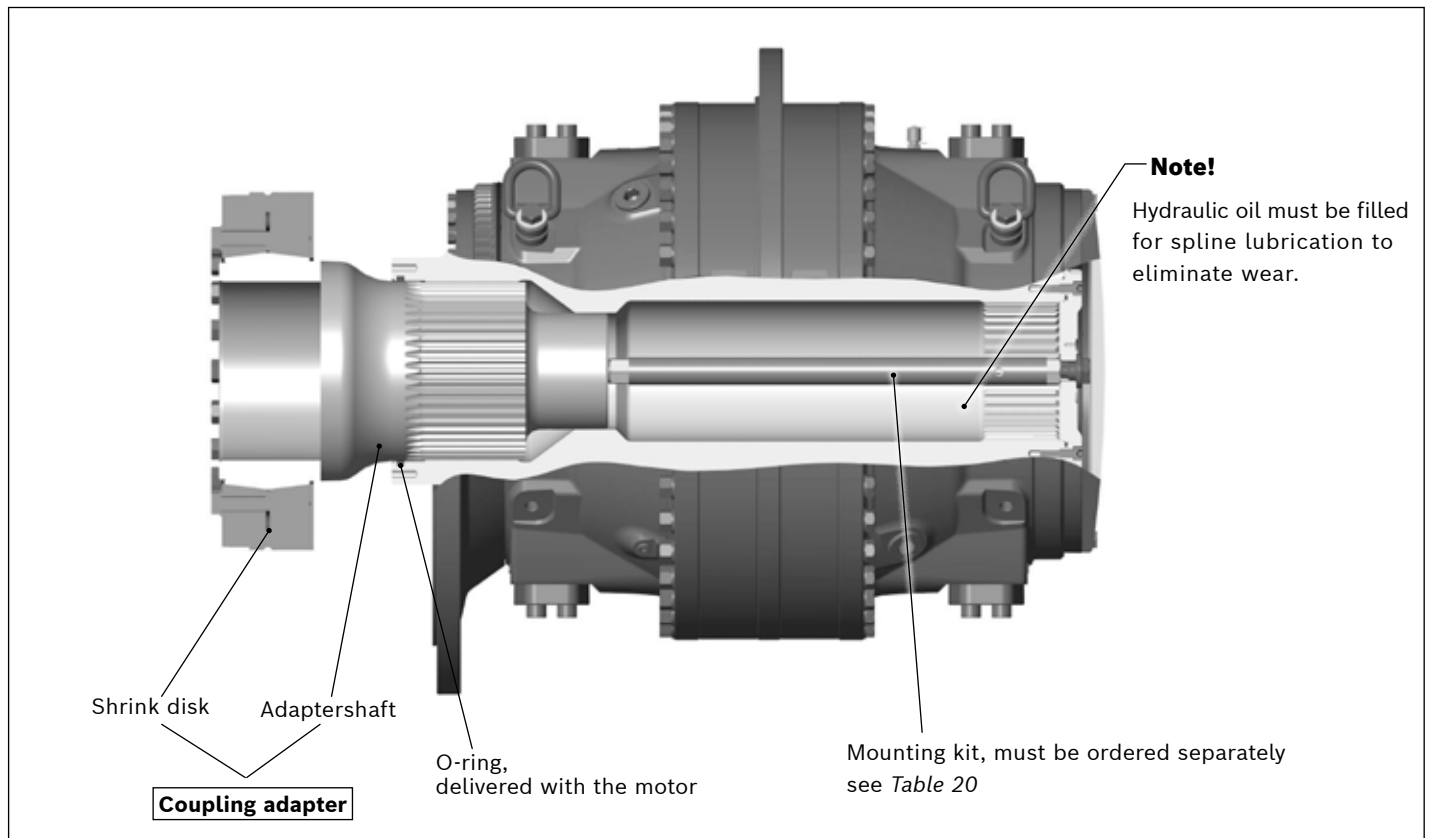
Fig. 71: Motor with coupling adapter

Table 21: Material ID coupling adapter

Motor type	Coupling adapter
CBp 140	R939057853
CBp 280	R939002789
CBp 400	R939002788
CBp 560/CBp 840	R939002787

For dimension drawings, see section *10: Related documents*

9.2.1   Torque arm mounting on plain shaft
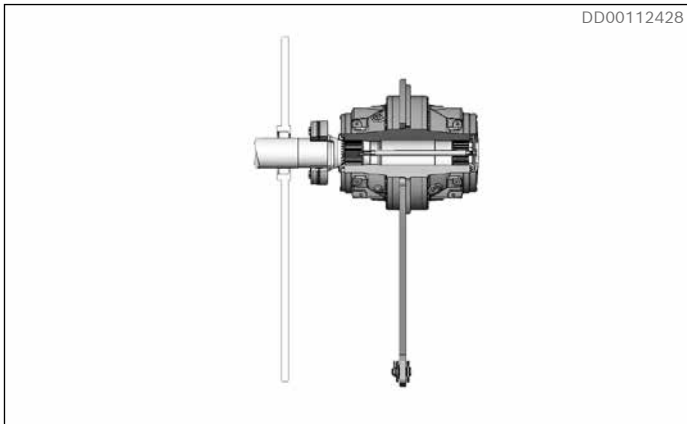
Fig. 72: Example: Torque arm mounted motor with shrink disc

Design of plain shaft

Fig. 73: Shaft end, normally loaded

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.

Fig. 74: Shaft end, heavily loaded

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 driven shaft should have a stress relieving groove.

Table 23: Thread dimensions for assembly tool in plain shaft

Measures	Dimensions, threads for assembly tool			
D	M20		UNC 5/8"	
E	ø >17 mm	ø 0.67 in	ø >13.5 mm	ø 0.53 in
F	25 mm	0.98 in	22 mm	0.87 in
G	50 mm	1.97 in	30 mm	1.18 in

Table 24: Recommended material in the plain shaft

Drive	Steel with yield strenght
Unidirectional drive	Rel_{min} = 300 N/mm²
Bidirectional drives	Rel_{min} = 450 N/mm²

Table 22: Shaft recommendations

Dim			CBp 140		CBp 280		CBp 400		CBp 560/CBp 800	
A	**mm**		ø140	0 / -0.025	ø180	-0.014 / -0.054	ø200	-0.015 / -0.061	ø260	-0.017 / -0.069
	in		ø140	0 / -0.00098	ø7,0866	-0.00055 / -0.00215	ø7.874	-0.00059 / -0.00240	ø10.2362	-0.00067 / -0.00272
B	mm		84.5		106		117		153	
	in		3.33		4.17		4.61		6.02	
C	mm		Ø 133		174		194		254	
	in		Ø 5.24		6.85		7.64		10.00	

9.3 Flushing set and Early warning kit

CBp 140

CBp 280 to CBp 840
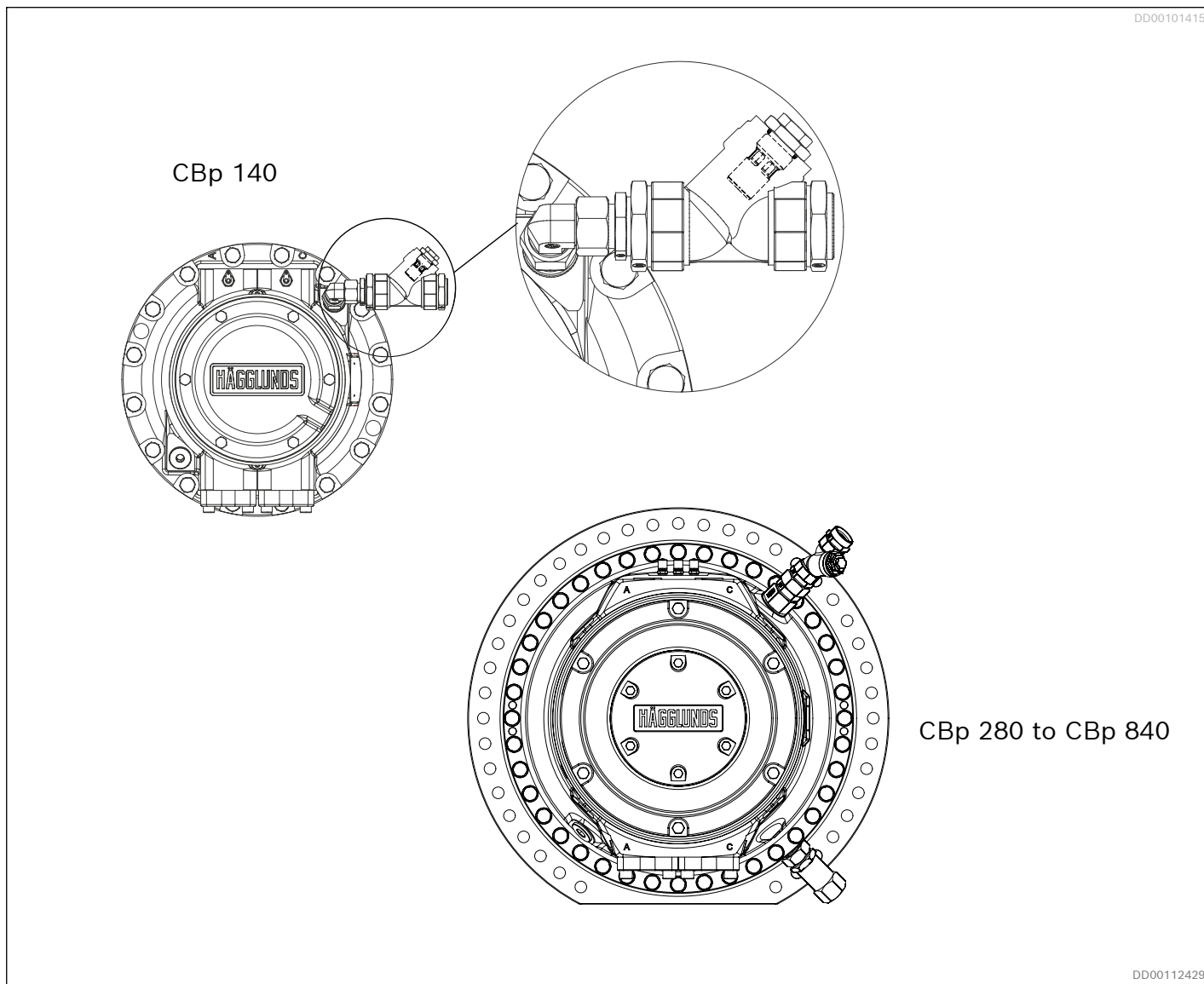
Fig. 75: Flushing set and Early warning kit including magnetic plug mounted on CBp

For technical data and inspection and maintenance routines, see document: **RE 15359** (Not available yet. Please contact your Bosch Rexroth representative)

Features

▶ Easy inspection of motor condition
▶ Early detection of potential failures

Description

The flushing set includes a magnetic plug installed in the drain line. By regularly inspecting the magnetic plug a malfunction of the hydraulic motor can be detected and corrected and a total breakdown can be avoided. It can be used for Hägglunds CBp 140 to CBp 840.

9.4 Tandem kit
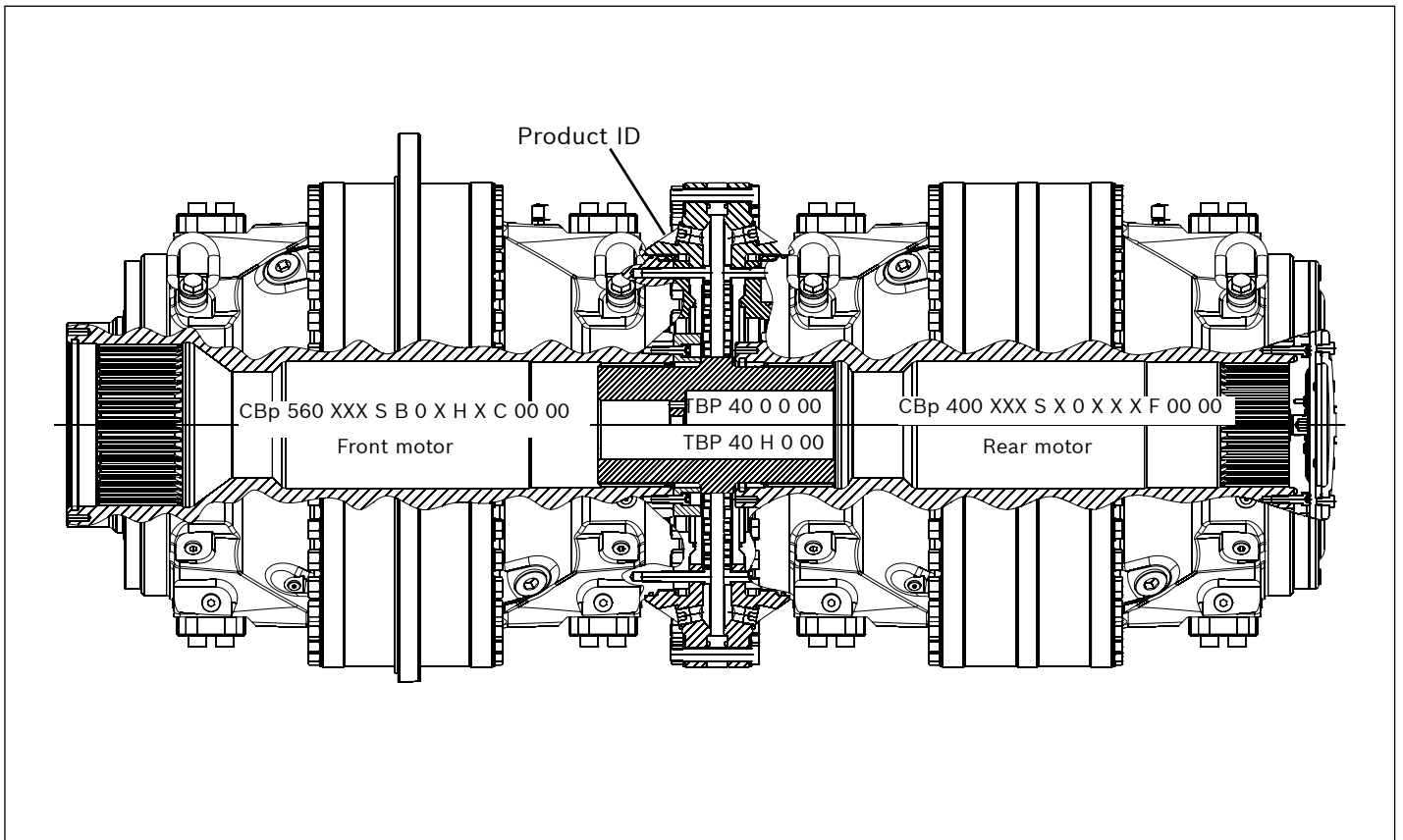
Fig. 76: Example: CBp 560 XXX S B 0 X H X C 00 + TBP 40 X 0 00 + CBp 400 XXX S X 0 X X X F 00 00

For technical data, see document: **RE 15356** (Not available yet. Please contact your Bosch Rexroth representative)

Features

▸ Enable more torque and speed with the same occupied diameter
▸ Enable possibility for displacement shift through freewheeling of rear or front motor

Description

The Hägglunds CBp motor can be used in tandem mounting. The front motor is then prepared for tandem mounting (B motor) and connected to the rear motor (standard splines motor) with a tandem kit.

9.5 Speed sensor

9.5.1   Hägglunds CBp with SPDC
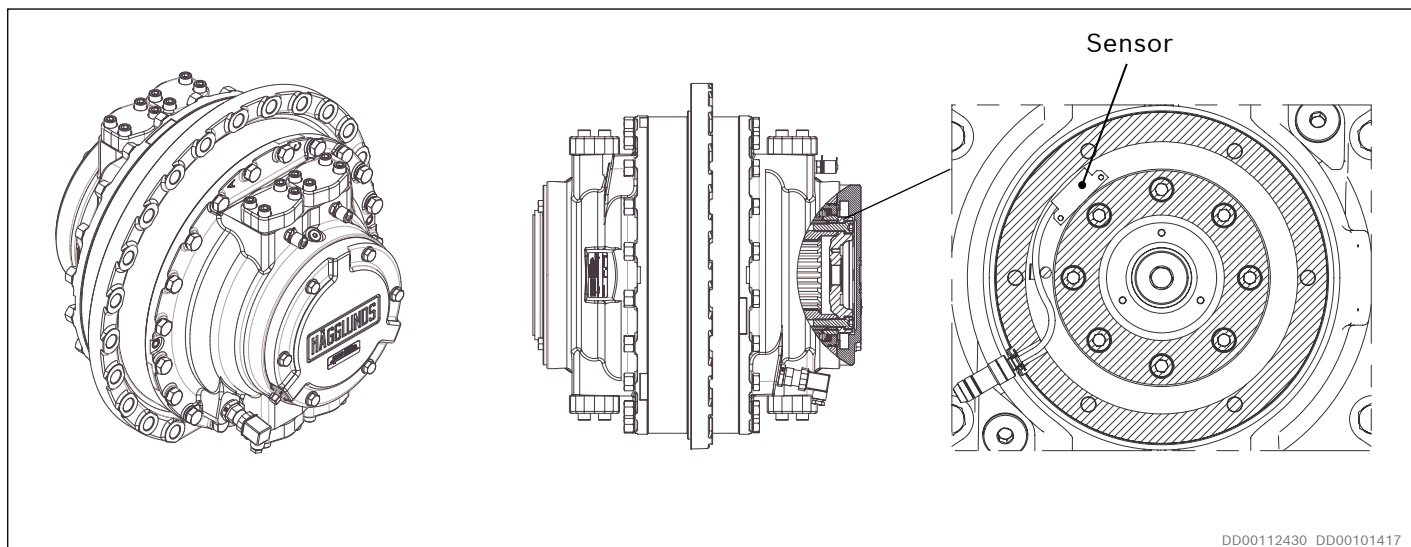
Fig. 77: Example CBp motor with SPDC
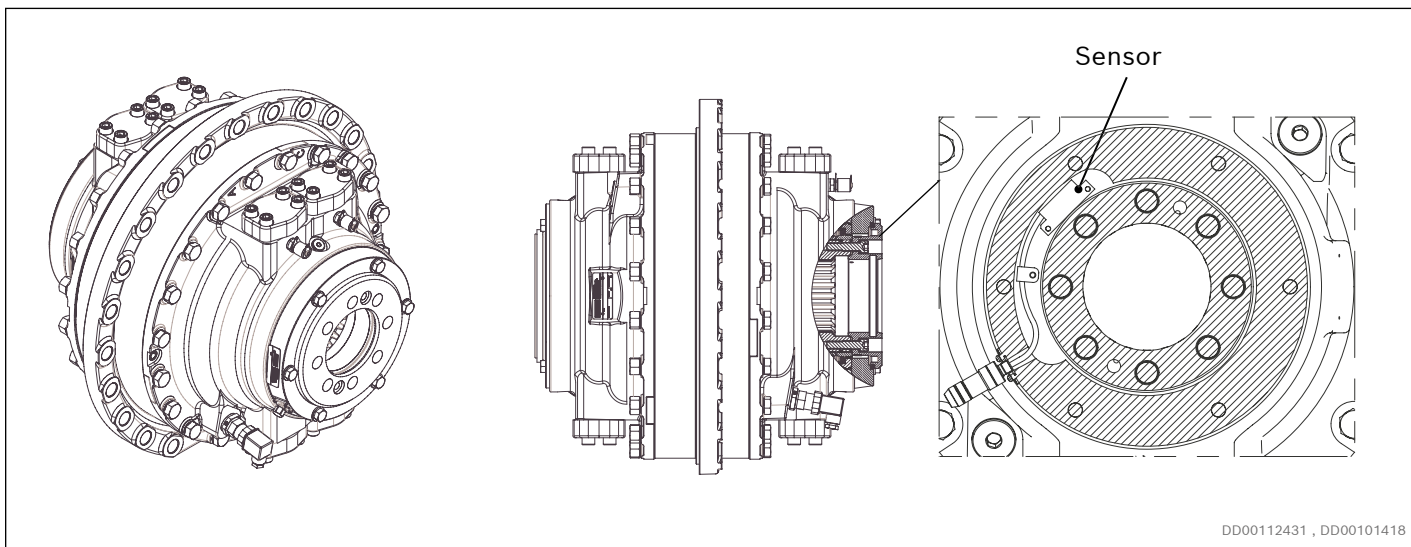
Fig. 78: Example CBp motor with through hole and SPDC

For technical data, see document: **RE 15350**

Features

▶ Possibility with through hole
▶ Slim design fully integrated in motors
▶ Non-contact, wear free sensing system
▶ Possibility to read directions of rotation from sensor
▶ CBp 140,1856 ppr / CBp 280 to CBp 840 2976 ppr for good speed control possibility
▶ Protection class IP67

Description

Speed sensor Hägglunds SPDC is a digital incremental encoder using magnetic sensing technology.

The sensor generates two square wave signals with 90° phase shift for detection of speed and direction of rotation.

9.5.2   Explosion proof speed sensor SPDB 2
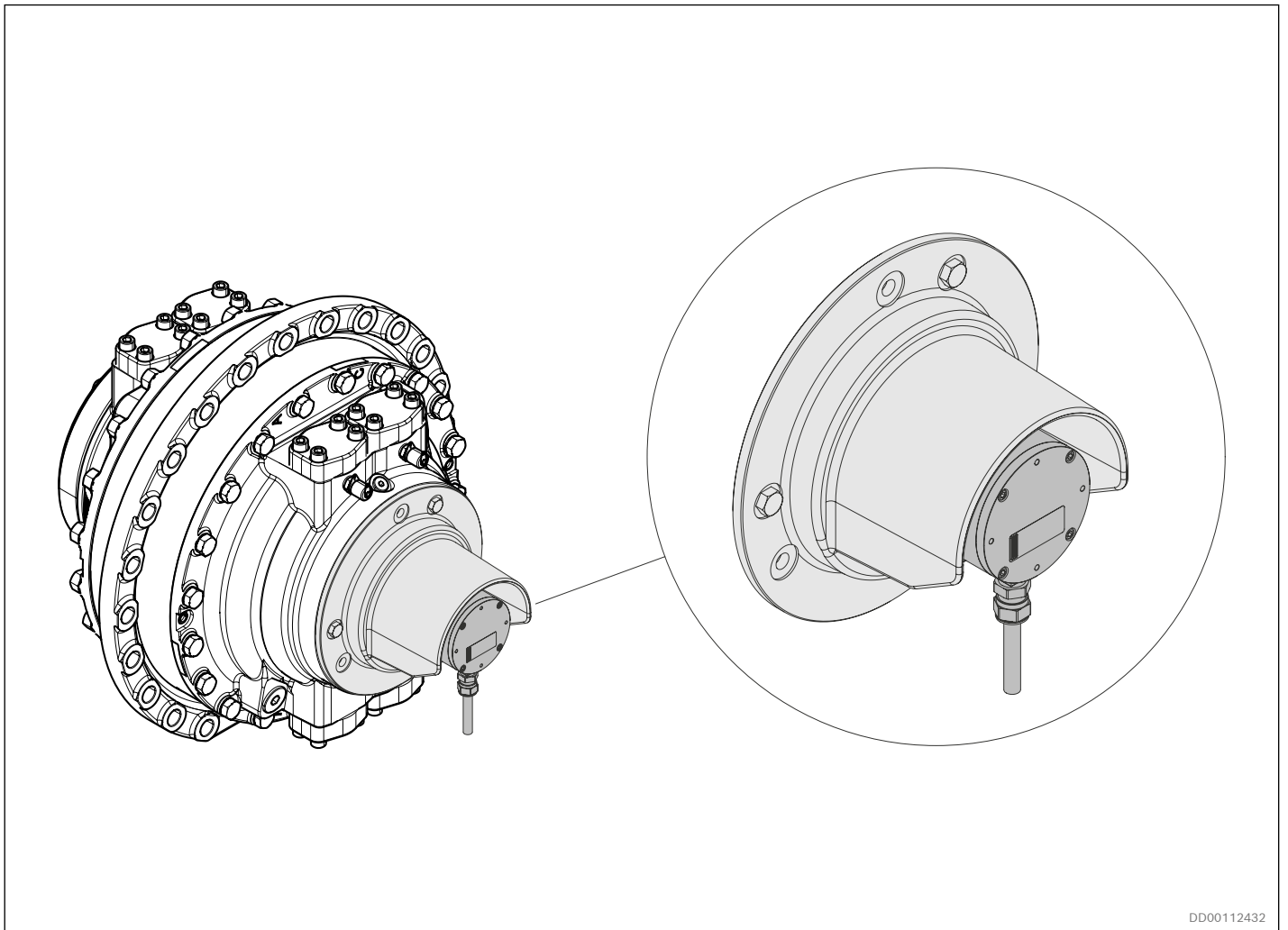
DD00112432

Fig. 79: Example CBp 140 with SPDB 2

For technical data and ordering code for respective motor type, see document: **RE 15352**

Features

▶ ATEX/IECEx approved
▶ 1000 and 3600 pulses per revolution for good speed control possibility
▶ Possibility to read directions of rotation from sensor
▶ Sensor is equipped with zero pulse
▶ Protection class IP65
▶ Optional cable set with junction box to simplify connection

Description

Speed sensor Hägglunds SPDB 2 is a digital incremental encoder.

The sensor generates two square wave signals with 90° phase shift for detection of speed and direction of rotation.

9.5.3   Inductive speed sensor SPDE
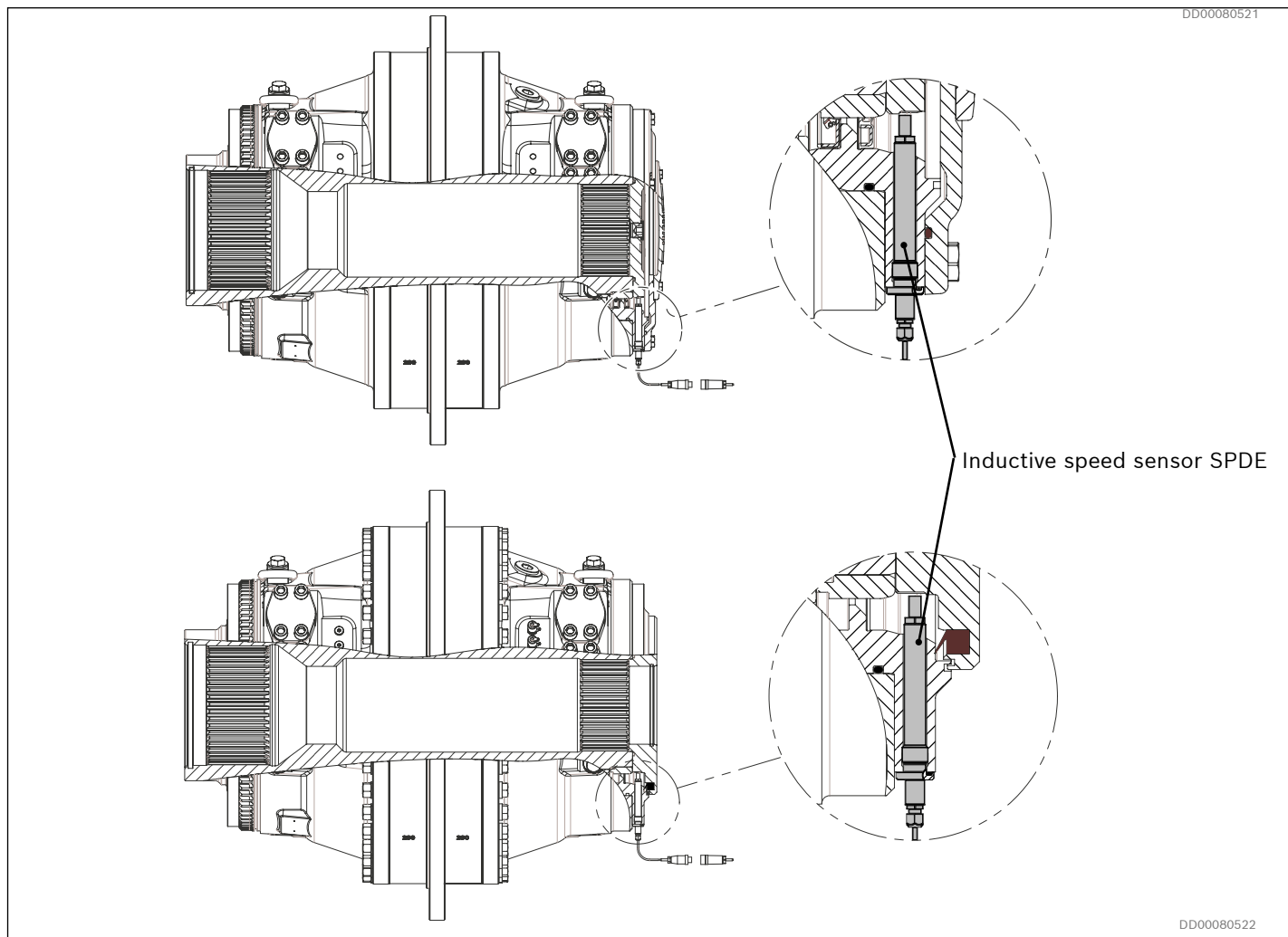
Fig. 80: Inductive speed sensor SPDE

For technical data, see document **RE 15351**

Features

▶ Non-contact, wear free system
▶ Robust design
▶ ATEX/IECEx -version available
▶ Through hole version available
▶ 40 pulses per revolution

The sensor is mainly intended for speed indication. Direction of rotation cannot be indicated.

Mounting is done by replacing a plug on the motor with the sensor and tighten to 35 Nm.

Description

Two types of sensors are available.

• The standard type has a PNP output for direct driving of load or digital input.
• The ATEX/IECEx type (explosion proof) needs an isolation amplifier outside explosive area.

DD00101503

9.6 Kit for harsh and marine environment

DD00112433

80 Nm

ØB

ØC

A

10 Nm after checking distance 2 mm.

Fill with silicone rubber.

ØC

ØB

A

2 ±1

Surfaces to be greased before mounting.

Surfaces to be greased before mounting.

CBp 280 to CBp 400

CBp 560 to CBp 840
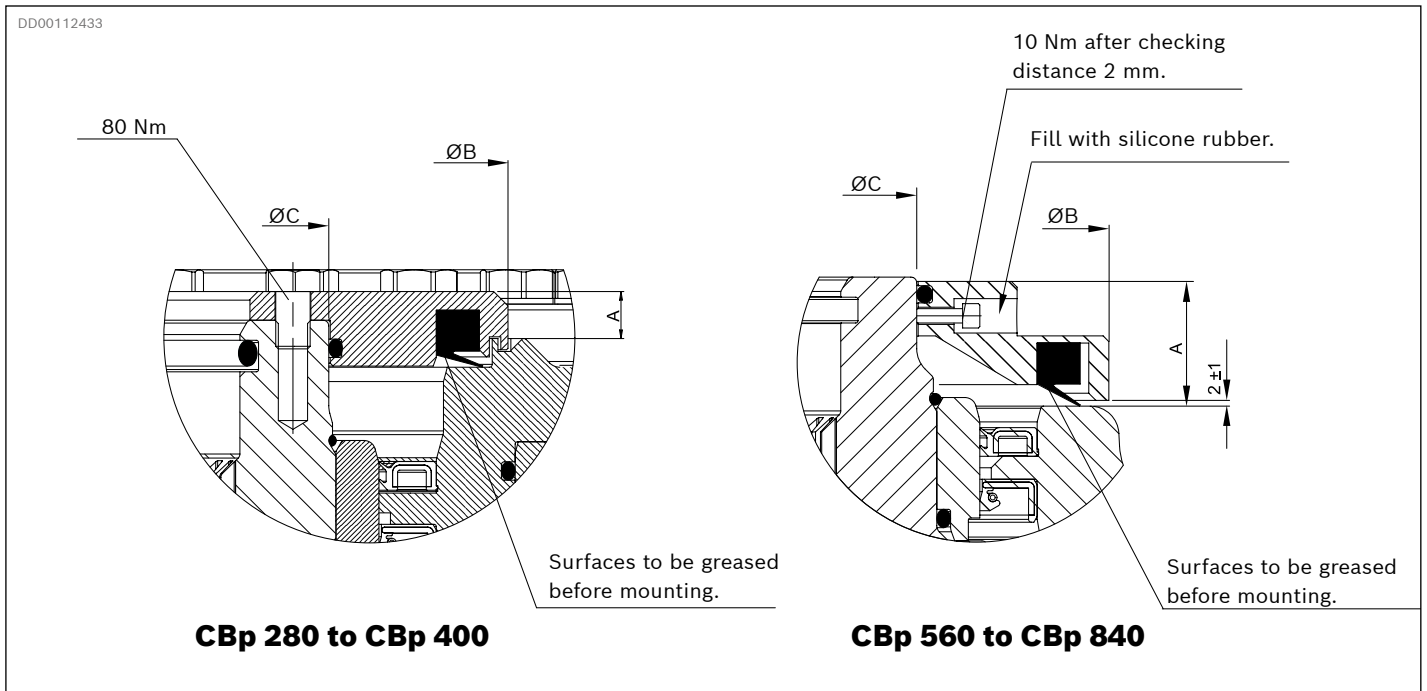
Fig. 81: Kit for harsh and marine environment

For technical data, see document nr: **RE 15364** (Not available yet. Please contact your Bosch Rexroth representative)

Features

► Protects the motor main seal
► Designed for harsh and marine environments
► Elongate the life time of the main sealings

Description

To protect the main seal, a kit with a v-ring can be mounted on the motors.
The kit is made for motors with splines and standard shrink disk coupling or hydraulic shrink disk.

Table 25: Dimensions kit for harsh and marine environment

Motor type	A		B		C	
	mm	in	mm	in	mm	in
CBp 280/400 S	16.4	0.646	390	15.35	265	10.43
CBp 560/840 S	49	1.93	470	18.50	331	13.03

Table 26: Material ID, kit for harsh and marine environment

Motor type	Material ID
CBp 280/400	R939002771
CBp 560/840	R939002769

10 Related documents

	Title	Document no	Document type
📖	Hägglunds CBp	RE 15301-WA	Installation & maintenance manual
📖	CBp 140 C	078 0141	Dimension drawing
📖	CBp 140 F	178 3112	Dimension drawing
📖	CBp 280 F	178 3164	Dimension drawing
📖	CBp 400 C	078 0125	Dimension drawing
📖	CBp 400 F	178 3165	Dimension drawing
📖	CBp 560 C	078 0126	Dimension drawing
📖	CBp 560 F	178 3166	Dimension drawing
📖	CBp 840 C	178 3167	Dimension drawing
📖	CBp 140 C with coupling adapter	078 1817	Dimension drawing
📖	CBp 140 F with coupling adapter	078 1818	Dimension drawing
📖	CBp 280 F with coupling adapter	078 1819	Dimension drawing
📖	CBp 400 C with coupling adapter	078 1822	Dimension drawing
📖	CBp 400 F with coupling adapter	078 1821	Dimension drawing
📖	CBp 560 C with coupling adapter	078 1824	Dimension drawing
📖	CBp 560 F with coupling adapter	078 1823	Dimension drawing
📖	CBp 840 C with coupling adapter	078 1825	Dimension drawing
📖	Splined shaft CBp 140, external load and torque arm mounted	078 0150	Dimension drawing
📖	Splined shaft CBp 140, flange mounted	078 0162	Dimension drawing
📖	Splined shaft CBp 140, external load and torque arm mounted with brake	078 0163	Dimension drawing
📖	Splined shaft CBp 280 and CBp 400, external load and torque arm mounted	278 5023	Dimension drawing
📖	Splined shaft CBp 280 and CBp 400, flange mounted	278 5024	Dimension drawing
📖	Splined shaft CBp 560 and CBp 840, external load and torque arm mounted	278 5025	Dimension drawing
📖	Splined shaft CBp 560 and CBp 840, flange mounted	278 5026	Dimension drawing
📖	Speed sensor, Hägglunds SPDC	RE 15350	Data Sheet
📖	Speed sensor explosion proof, Hägglunds SPDB 2 with mounting set	RE 15352	Data Sheet
📖	Speed sensor, inductive, Hägglunds SPDE	RE 15351	Data Sheet
📖	Torque arms Hägglunds TCA, DTCA, DTCB	RE 15355	Data Sheet
📖	Tandem motors, Hägglunds TA	RE 15356	Data Sheet
📖	Flushing set and Early warning kit	RE 15359	Data Sheet
📖	Kit for harsh and marin environment	RE 15364	Data Sheet
📖	Hydraulic fluid quick reference	RE 15414	Data Sheet