



Barflex™ TCBR Barrel Coupling

METRIC



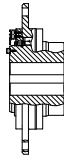
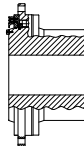
JAURE™ COUPLINGS AND POWER TRANSMISSION SOLUTIONS

We are a leading supplier of couplings and power transmission solutions. Experience, manufacturing expertise, innovation and close cooperation with leading international companies enable us to provide customized solutions to our customers.

For over 50 years, we have developed couplings for the most demanding applications in marine, wind, energy, steel, railway and paper industries among others.

We have a broad range of manufacturing capabilities, particularly with respect to power and speed. We continue developing new products for future challenges.

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BARFLEX™ BARREL COUPLING INTRODUCTION

Jaure™ TCB™ and TCB-HD barrel couplings were developed in the 90s as the optimum coupling solution for hoisting applications. The advantage of these couplings compared to gear couplings is that they can absorb high misalignment and have less bending stress wear, and result in longer life.

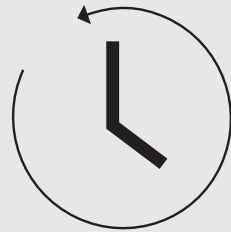
The Barflex TCBR barrel coupling is an upgraded version of the original barrel coupling. It is 100% interchangeable with the TCB and TCB-HD coupling ranges and provides the following benefits:

Barflex™ TCBR Coupling Design Features

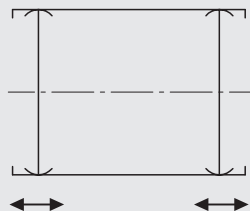
- **ABOUT 10% HIGHER TORQUE CAPACITY**, allowing a more favorable size selection and thus an important cost saving.



- **ASSEMBLY TIME REDUCTION**



- **INCREASED AXIAL MISALIGNMENT TOLERANCE**



- **IMPROVED VISUAL WEAR INDICATOR:**

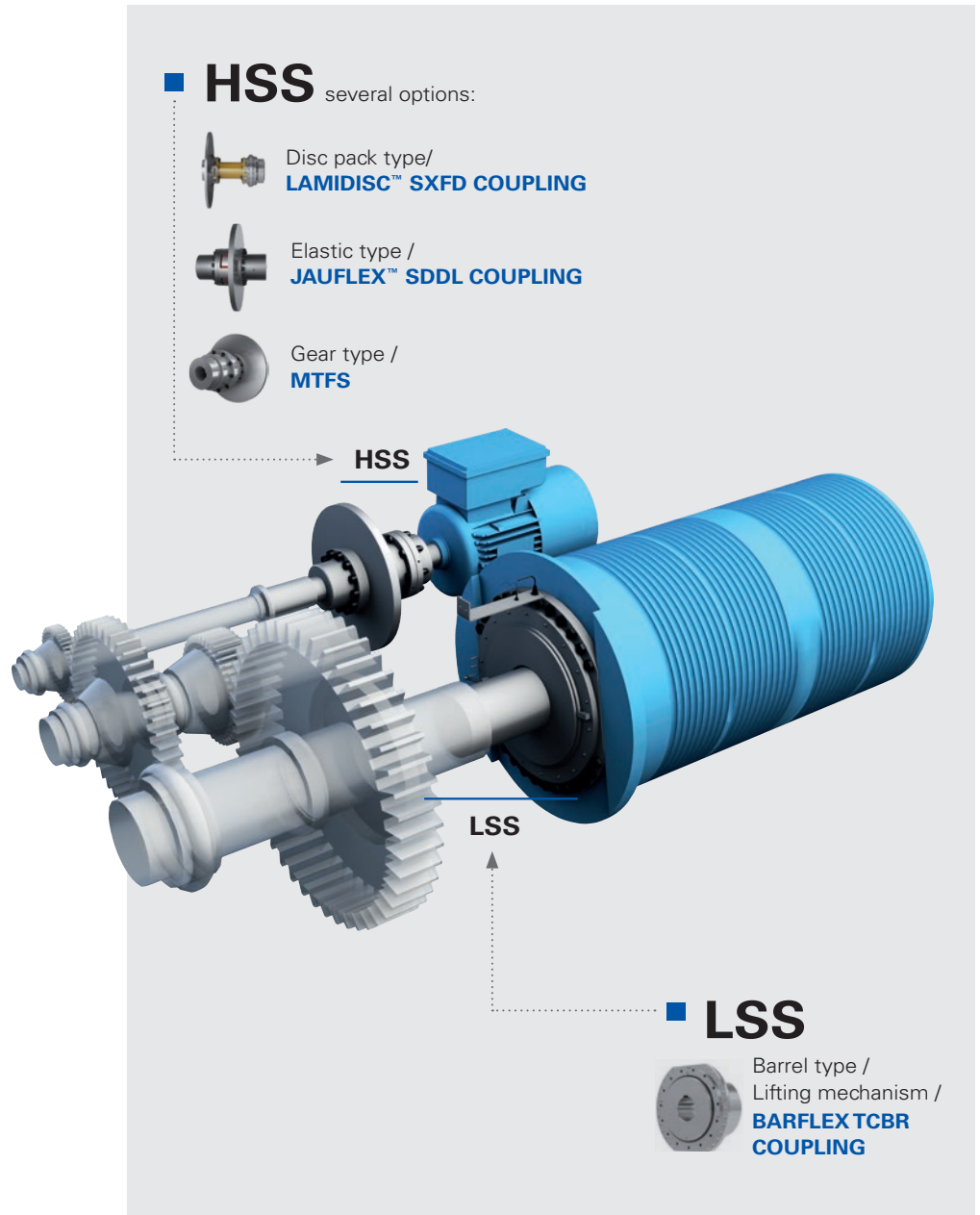
Easier to read the wear.



APPLICATION

JAURE™ Barflex™ TCBR barrel coupling is specially designed for installation in cranes & hoisting applications to connect the cable drum with the gear box output shaft. This coupling is also used in steel mills, winch and conveying applications as well as in stackers and reclaimers.

Barflex TCBR coupling satisfies the requirements described by German Steel & Iron Standard (Stahl-Eisen-Betriebsblatt) SEB 666212, issued in March, 1992.



A generalized layout of lifting mechanism is shown in Figure 1. The electric motor shaft is coupled to gear box input shaft by means of high speed flexible coupling, while a TCBR barrel coupling is installed in between gear box output shaft and the cable drum flange.

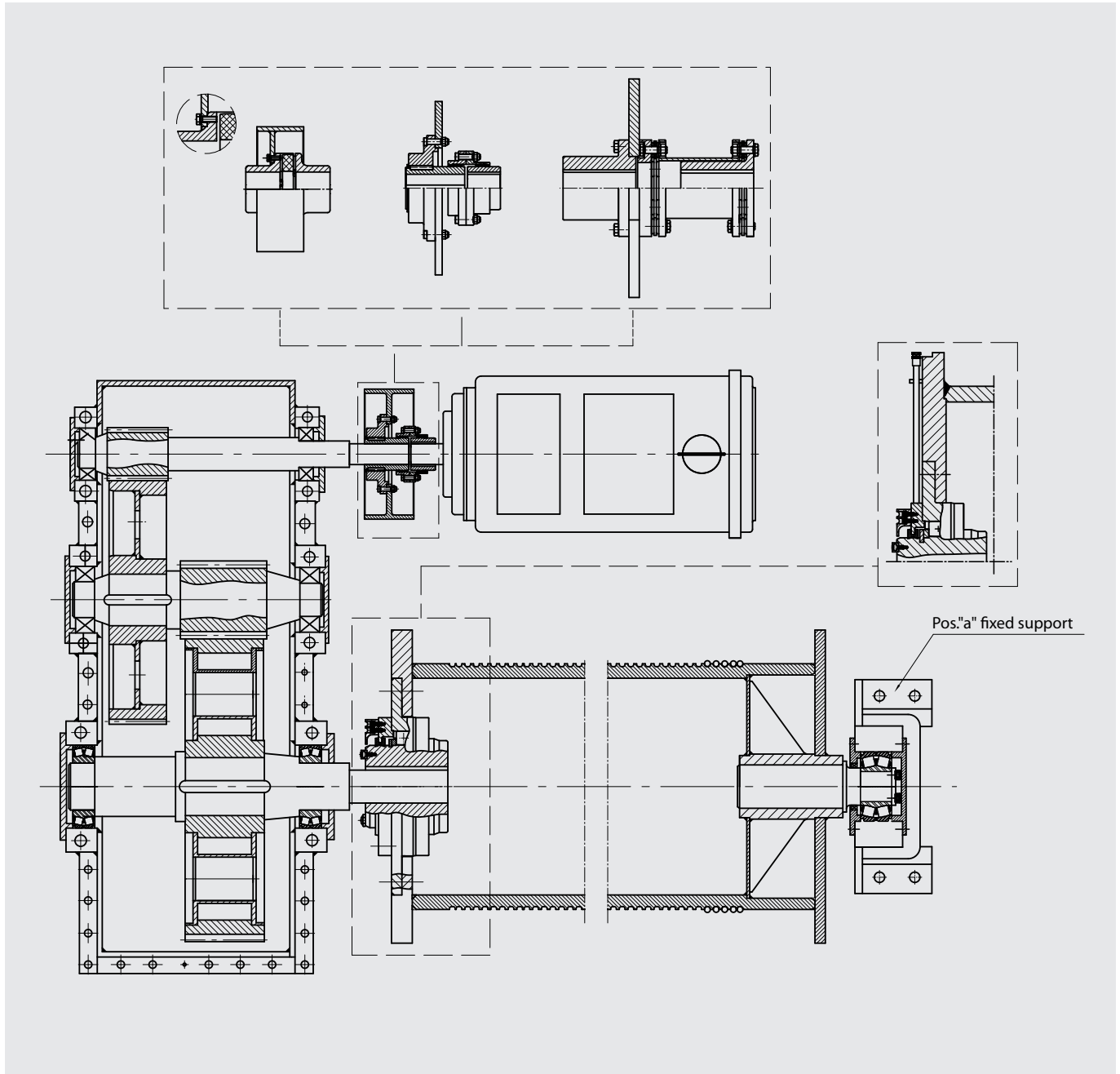


Figure 1
Mounting of a barrel coupling in a lifting mechanism.

The typical arrangement for connecting the cable drum with the gear box output shaft is shown in Figures 2 and 3.

When the gearbox output shaft is rigidly connected to drum flange in a lifting mechanism (Figure 2), this originates a statically indeterminate case. This type of arrangement requires special care and considerable amount of time for doing the initial alignment, which is difficult to achieve in practice. Moreover, mounting inaccuracies, as well as deformation in structure and wear in moving part, lead to generate enormous additional forces which result in fatigue failure of shaft, driving gear or bearings.

It is highly recommended to use barrel coupling for installation between gear box output shaft and cable drum flange. As shown in Figure 3, the barrel coupling acts as an articulated joint, allowing limited axial and angular misalignment. Thus, making the connection statically determinate and helping to avoid high bending moment loads which can cause fatigue failure of shaft, driving gear or bearings.

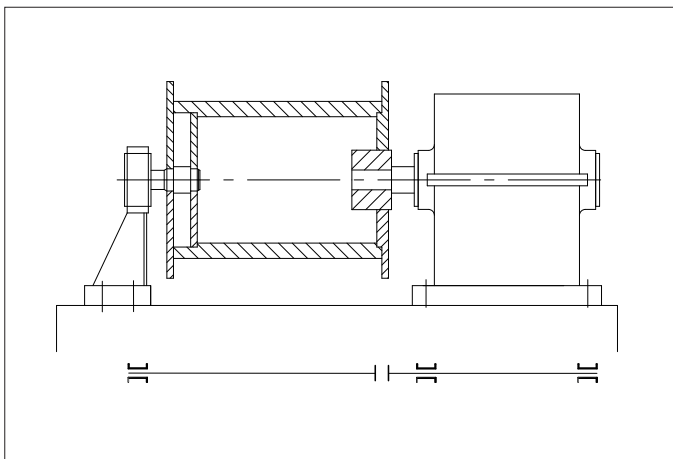


Figure 2
Rigid mounting of gearbox-drum connection. Support at three points.

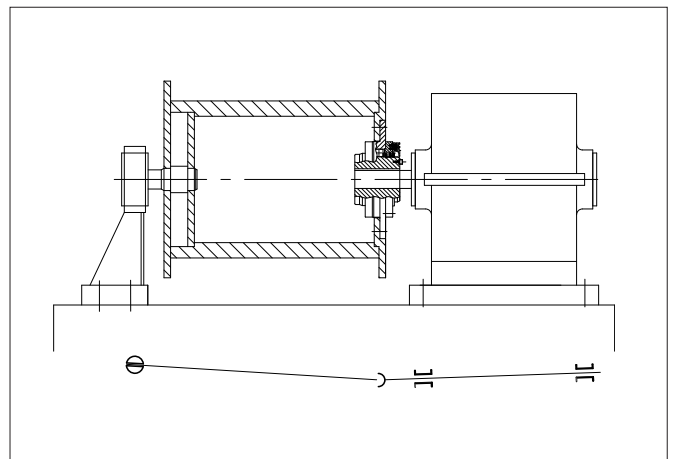


Figure 3
Mounting with barrel coupling.

Since the barrel coupling allows a limited axial displacement it is imperative to use a self-aligning roller bearing fixed at the opposite end of drum shaft in order to withstand the axial forces that may be generated.

BARFLEX™

BARREL COUPLING

DESCRIPTION

The barrel coupling consists of a sleeve which is provided with semi-circular toothing around its internal diameter and a hub which is provided with similar kind of toothing over its external diameter. A series of specially designed spherical hardened barrels are inserted inside the hub and sleeve pockets.

The torque is transmitted from hub to sleeve through these self-aligning barrels, which act as a floating member. The internal space between the hub and sleeve pockets, in addition to the convex shape of the barrels with a specially designed crowning radius allow the coupling to take angular misalignment up to 1° and an axial displacement in the range of $\pm 3\text{mm}$ to $\pm 12\text{mm}$. See product data on [pages 18-19](#).

The sleeve is provided with two diametrically opposite flat faces on flange to establish a connection between the sleeve flange and drum flange. The torque is transferred partially in friction through a series of high tensile bolted connection between the sleeve flange and drum flange and in compressive mode between the flat faces.

The axial movement of barrel is restricted with a retainer ring & seeger ring.

The external cover and sleeve are provided with specially designed seals to avoid lubrication losses by assuring perfect integrity of lubrication zone and avoiding penetration of foreign particles.

The barrel design is appropriate to minimize the contact pressure under large radial loads and minimize the effect of alternating bending stress on the toothing. The sliding velocity is kept to minimum under the misalignment compensation which helps to minimize the wear in the hub and sleeve pockets.

The teeth design is robust and in semi-circular shape. The height of teeth is small compared to its width at the bottom. In addition to this, due to the effect of a “crush polishing” of the hardened barrel on the tooth profile, its wear resistance is appreciably improved.

Barrel couplings are prone to wear during usage. Wear is a common phenomenon which occurs due to sliding and rolling actions of the barrel over the coupling hub and sleeve pocket interface. Due to this, there is a relative displacement between the hub and sleeve. This displacement as a function of wear is detected by means of a mechanical wear indicator. The coupling should be replaced when the predefined wear limit is reached.

The torque and radial load rating of new Barflex™ TCBR coupling is improved significantly. Extensive research in the field of design optimization, Finite Element Analysis, and rigorous testing enabled us to improve the performance of newly designed TCBR coupling.

New TCBR coupling is equipped with modern mechanical wear indicator system. The specially designed pointer/Indicator is mounted on cover which moves relative to the axially mounted square pin on the hub as a function of wear, permits control of internal wear of the toothing without the need to disassemble any part of the coupling. The same indicator also controls the axial position of the sleeve relative to the hub. Optionally, an electronic wear indicator can be installed for remote control (for more details see [page 24](#)).

TCBR couplings can be used at -30° C to 70° C temperature range. For other temperatures, please contact the Jaure™ couplings engineering team.

The Barflex TCBR coupling design is verified by Finite Element Analysis (see Figure 4) and validated by performing in-house test.

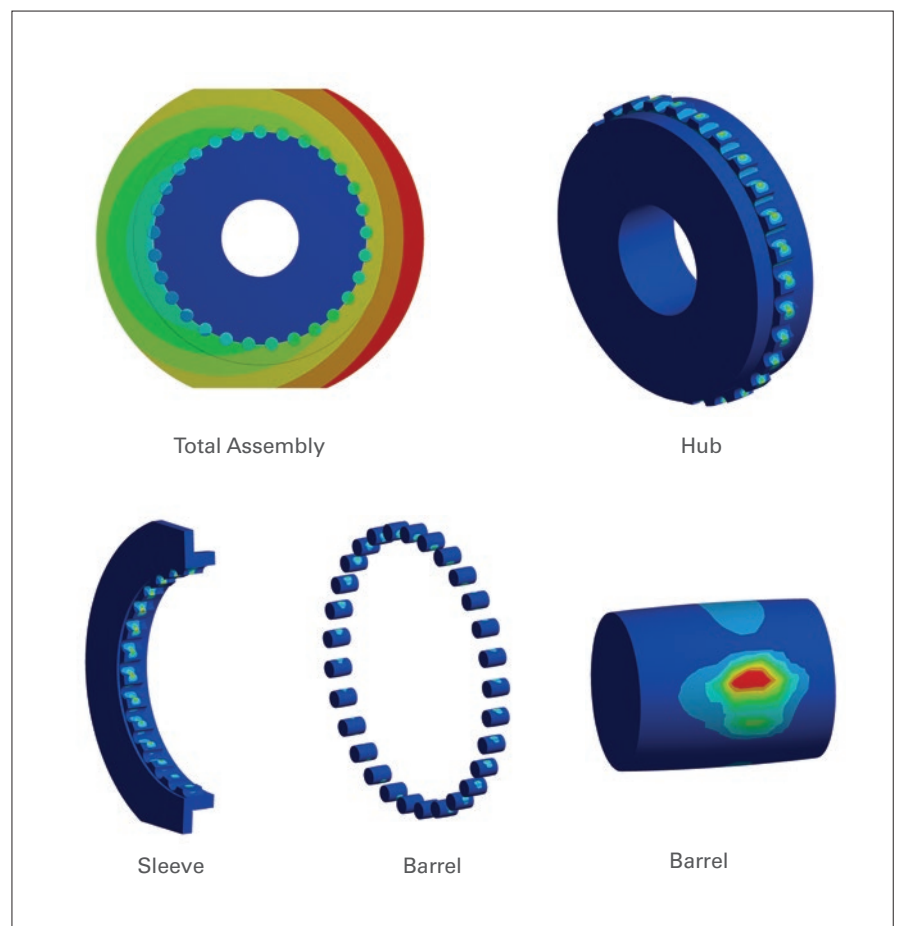


Figure 4

BENEFITS OF USING BARREL COUPLINGS INSTEAD OF GEAR COUPLING

The mounting space required for barrel coupling is significantly lower as compared to a gear coupling. A barrel coupling is narrower than the equivalent gear coupling, and it is partially positioned inside the drum.

Due to the profile of barrel and shape of hub and sleeve pocket, barrel couplings are subjected to much lower bending stress on the root of the teeth. Therefore, increased safety factor is obtained against bending and peak radial loads.

The radial load in barrel coupling is better distributed due to the increased contact area (Figure 5) and hence the life of the coupling is increased.

Below graph (Figure 6) shows the comparison of stresses in barrel coupling and gear coupling under the radial load. This radial load is even better distributed with coupling wear in barrel coupling.

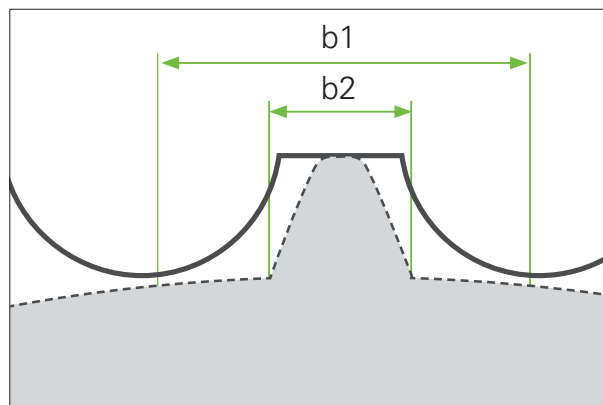


Figure 5
Technical modifications reserved. $b_1 \geq 2 \cdot b_2$

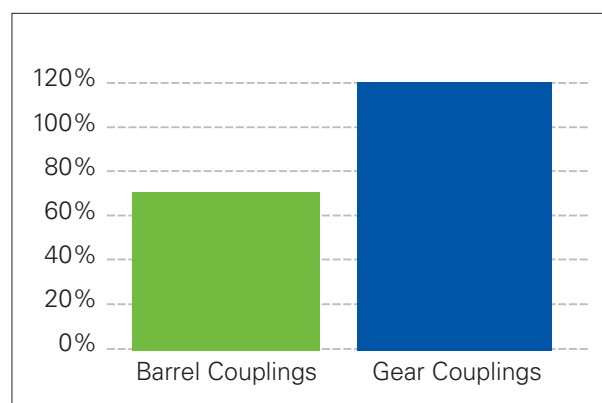


Figure 6
Bending stress in the coupling for a given radial load (%).

COUPLING SELECTION

Coupling selection requires the validation of:

1. Coupling maximum permissible torque $T_{c\ MAX}$
2. Coupling admissible radial load F_r
3. Connection between coupling and shaft

1. COUPLING MAXIMUM PERMISSIBLE TORQUE $T_{c\ MAX}$

Selection Torque can be calculated in two ways depending on the available data:

1. When limited information is available, Installed Power (P_i) can be used for calculation
2. When detailed information is available, calculation can be done based on consumed Power (P_c) considering the efficiencies and losses of the system.

Coupling maximum permissible torque $T_{c\ MAX}$ rating must be bigger than the calculated selection Torque T per section 1.1 or 1.2.

1.1 Based on installed power (P_i)

The calculation based on the installed power of the motor (P_i) requires knowing the value of the drum turning speed (n) and applying the correction of the operating factor (K_1) according to the cable transmission group.

①

$$T = 9550 \cdot \frac{P_i}{n} \cdot K_1$$

WHERE:

P_i (kW) = max. installed power of the motor

n (rpm) = drum turning speed

K_1 = operating factor (see Table 1)

Table 1 - Operating Factor K_1 , According to Cable Transmission Group

GROUP DIN 15020	1B m	1A m	2 m	3 m	4 m	5 m
GROUP FEM (1970)	IB	IA	II	III	IV	V
GROUP FEM (1987)	M1, M2, M3	M4	M5	M6	M7	M8
GROUP BS 466 (1984)	M1, M2, M3	M4	M5	M6	M7	M8
Operating factor K_1	1, 12	1,25	1,40	1,60	1,80	2

1.2 Based on consumed power (P_c)

The formula for the calculation of the torque based on the consumed power of the motor (P_c) is the same as the previous case, but for knowing the consumed power of the motor, values of the drum static pull (F_p) and the drum lifting speed rate (V_r) are required. The drum lifting speed is calculated with the turning speed (n) and the drum diameter (D):

$$\textcircled{2} \quad T = \frac{P_c \cdot 9550}{n} \cdot K_1$$

$$\textcircled{3} \quad P_c = \frac{F_p \cdot V_r}{60000}$$

$$\textcircled{4} \quad V_r = \pi \cdot D \cdot n$$

Different examples of hoist tackle configurations.

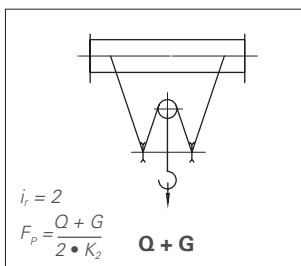


Figure 7
Twin hoist, 2 sheaves. Double line to drum.

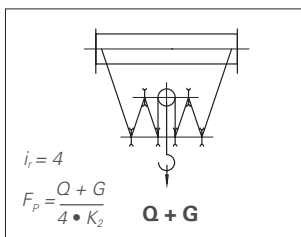


Figure 8
Twin hoist, 4 sheaves. Double line to drum.

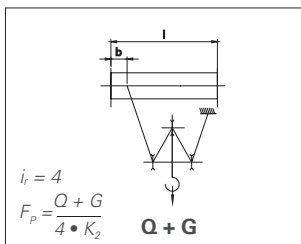


Figure 9
Hoist, 2 sheaves. Single line to drum.

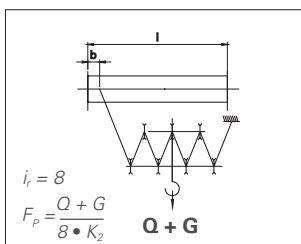


Figure 10
Hoist, 4 sheaves. Single line to drum.

WHERE:

P_c (kW) = max. power consumed by the motor

F_p (N) = drum static pull, including cable and pulley efficiency (see Equation 6)

V_r (m/min) = drum cable lifting rate

n (rpm) = drum turning speed

D (m) = drum pitch diameter

K_1 = operating factor (see Table 1)

The determination of the Drum Static Pull (F_p) is based on the Max load on the hook (Q), the weight of the hoist tackle and cables (G), transmission ratio (i_r) and the operating factor of drum and hoist (K_2).

The transmission ratio (i_r) depends on the hoist tackle configuration. Examples on Figures 7, 8, 9 and 10 for different configurations.

$$\textcircled{5} \quad F_p = \frac{Q + G}{i_r \cdot K_2}$$

WHERE:

Q (N) = max. load on hook

G (N) = weight of hoist tackle and cables

K_2 = operating factor of drum and hoist tackle efficiency (see Table 2)

i_r = transmission ratio = $\frac{\text{Total number of lines}}{\text{Number of lines leaving the drum}}$

Table 2 - Operating Factor K_2 According to Drum and Tackle Efficiency

Hoist tackle reduction i_r	2	3	4	5	6	7	8
K_2 , with bronze bearings	0,92	0,90	0,88	0,86	0,84	0,83	0,81
K_2 , with ball bearings	0,97	0,96	0,95	0,94	0,93	0,92	0,91

2. COUPLING ADMISSIBLE RADIAL LOAD F_R

Selection of radial load calculation is based on static pull of the drum (F_p), the weight of the drum with cables and parts of the coupling (w) and the geometry of the drum.

Coupling radial load F_r rating must be over this selection radial load.

For systems with double cables to the drum (Figures 7 and 8) formula is:

$$\textcircled{6} \quad F = \frac{F_p}{2} + \frac{w}{2}$$

And for systems with a single line to the drum (Figures 9 and 10):

$$\textcircled{7} \quad F = [F_p (1 - \frac{b}{l})] + \frac{w}{2}$$

WHERE:

F_p (N)= Static pull of drum, including cable and pulley efficiency

b (mm)= Shortest possible distance from cable in drum to the geometric centre axis of barrels in the coupling.

l (mm)= Distance between drum supports

w (N)= Own weight of drum with cables and parts of the coupling

2.1. Corrected radial load F_A

When selection torque is below coupling torque $T_{C\text{ MAX}}$ and selection radial load is greater than the admissible radial load F_r , it is possible to increase the coupling admissible radial load by considering the operating factor (K_1) according to the cable transmission group using below equation:

$$\textcircled{8} \quad F_A = F_r + (\frac{T_{C\text{ MAX}} - T}{K_1})$$

WHERE:

F_A = Corrected radial load (N)

T = Selection Torque (Nm)

F_r = Coupling max radial load (N)
(See Table on pages 18-19)

K_1 = operating factor (see Table 1)

$T_{C\text{ MAX}}$ = Coupling maximum torque (Nm)
(See Table on pages 18-19)

The reverse procedure, i.e. to increase the max. permissible torque if the radial load is not fully used, is not allowed.

3. CONNECTION BETWEEN COUPLING & SHAFT

There is a limitation in the maximum shaft diameter allowed in a coupling size. The diameters shown in the Table on [pages 18-19](#) are valid for shaft with keyways according DIN 6885/1.

If a different connection is used such as splines shafts according 5480, interference connection, or other connection, validation is required.

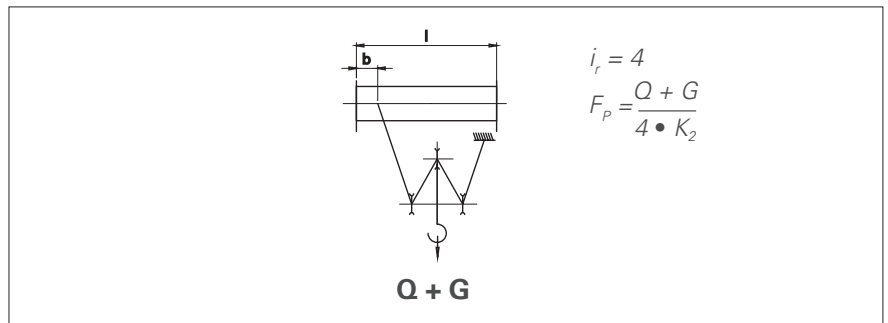
Please contact the Regal Rexnord™ Engineering Department.

SELECTION EXAMPLE

As a coupling selection example, the crane has the following characteristics:

Q = 300000 N (useful load to be lifted)	K₁ = 1.8 (Group IV)
G = 10000 N (hoist weight)	K₂ = 0.95 (drum and hoist efficiency)
w = 14000 N (weight of drum and cables)	b = 400 mm (distance between cable and coupling)
P_i = 30 kW (motor power)	l = 1200 mm (drum length)
n = 8 rpm (drum turning rate)	d = 200 mm (gearbox output shaft, with key)
D = 800 mm (drum diameter)	
i_r = 4 (hoist reduction)	

And the installation layout is the one shown in Figure 9:



**Table 3 -
Conversion Table**

1 mm	0,0394 inch
1 inch	25,4 mm
1 m	39,4 inch 3.283 ft
1 kg	2,2046 lb (weight)
1 lb (wt)	0,4536 kg
1 N	0,2248 lbs (force)
1 lb (f)	4,4482 N
1 Nm	0,7376 lb-ft
1 lb-ft	1,3558 Nm
1 kgm	23,76 lb-ft
1 lb-ft	0,1382 kgm
1 kW	1,34 HP
1 HP	0,746 kW

1. COUPLING MAXIMUM PERMISSIBLE TORQUE **T_{C MAX}**

1.1 Based on installed power (P_i)

$$T = \frac{9550 \cdot P_i}{n} \cdot K_1 = \frac{9550 \cdot 30}{8} \cdot 1,8 = 64462 \text{ Nm}$$

1.2 Based on consumed power (P_c)

First calculate the drum static pull (F_p):

$$F_p = \frac{Q + G}{i_r \cdot K_2} = \frac{300000 + 10000}{4 \cdot 0,95} = 81579 \text{ N}$$

And with the drum lifting speed rate (V_r):

$$V_r = \pi \cdot D \cdot n = \pi \cdot 0,8 \cdot 8 = 20,1 \text{ m/min}$$

Consumed Power of the motor (P_c) is calculated:

$$P_c = \frac{F_p \cdot V_r}{60000} = \frac{81579 \cdot 20,1}{60000} = 27,3 \text{ kW}$$

And then the Torque:

$$T = \frac{9550 \cdot P_c}{n} \cdot K_1 = \frac{27,3 \cdot 9550}{8} \cdot 1,8 = 58660 \text{ Nm}$$

Worst case of 1.1 and 1.2 is 64462 Nm, coupling maximum permissible Torque $T_{c \text{ MAX}}$ must be over this value.

With this requirement, minimum size of coupling is TCBR - 500 with a value of 102600 Nm.

2. COUPLING ADMISSIBLE RADIAL LOAD F_r

With the layout like Figure 9, Equation 7 is required for the Radial Load:

$$F = [F_p (1 - \frac{b}{l})] + \frac{w}{2} =$$

$$[81600 (1 - \frac{400}{1200})] + \frac{14000}{2} = 61400 \text{ N}$$

Since the TCBR – 500 can withstand a radial load F_r of 133400 N and is over the calculated 61400 N, the selection is correct.

2.1 Corrected Radial Load F_A

If there is a case where the calculation required radial load F is over the coupling admissible radial load F_r , prior to select a bigger coupling, there is a chance of doing a calculation for the Corrected Radial Load F_A . using Equation 8:

$$F_A = F_r + \frac{[(T_{c \text{ MAX}} - T)]}{K_1}$$
$$[133400 + (102600 - 64462) / 1,8] = 154588 \text{ N}$$

So, in this case the coupling will be able to withstand a radial load F up to 154588 N.

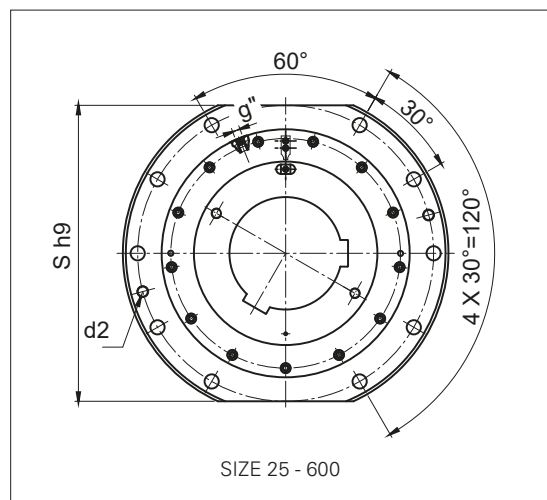
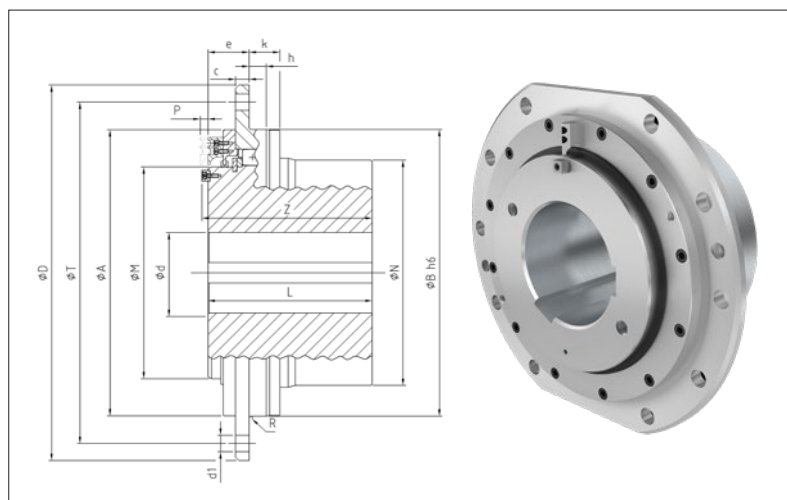
3. CONNECTION BETWEEN COUPLING & SHAFT

Last step is to check shaft connection.

Maximum allowed diameter for TCBR – 500 coupling is 215 mm, since the shaft diameter is 200 mm, selection is correct. This maximum bore is for an execution with keyways according to DIN 6885/1, for other type of connections validation of torque transmission must be performed.

COUPLING DESIGN

TCBR HEAVY DUTY STANDARD DESIGN



SIZE	SELECTION STANDARD SEB	T _c MAX	Fr ADMISSIBLE RADIAL LOAD	Ød MAX (1)	Ød MIN	ØD	L	L min	ØM	ØN	ØA	ØB
TCBR		Nm	N	mm	mm	mm	mm	mm	mm	mm	mm	mm
25	-	7500	19600	68	38	250	95	85	95	106	154.5	160
50	-	9500	22250	80	48	280	100	85	110	122	175	180
75	-	12000	24000	90	58	320	110	95	125	138	191	200
100	-	16300	29700	100	58	340	125	95	140	154	209	220
130	-	23500	41800	115	78	360	130	95	160	174	230.5	240
160	-	29100	46000	130	78	380	145	95	180	194	250	260
200	SG 130	33900	50850	136	98	400	170	95	198	212	270.5	280
300	-	42600	58250	156	98	420	175	95	220	234	290	310
400	SG 140	57200	82500	185	98	450	185	120	260	273	336	340
500	-	102600	133400	215	98	510	220	132	300	318	388	400
600	SG 185	138150	143650	235	118	550	240	132	310	330	400	420
1000	SG 200	185300	158050	250	138	580	260	140	350	368	440	450
1500	SG 240	250700	190750	295	158	650	315	143	400	432	509	530
2100	-	381500	288850	305	168	665	330	153	420	456	538	545
2600	SG 270	442800	334800	315	168	680	350	153	440	471	553	560
3400	SG 315	532500	372750	340	198	710	380	170	470	500	590	600
4200	SG 355	665650	426000	385	228	780	410	170	530	563	655	670
6200	SG 400	816200	498200	430	258	850	450	170	600	626	720	730
8200	-	900000	525000	455	255	940	500	191	630	673	781	800
9200	-	1050000	550000	500	255	1025	500	191	695	736	841	860
10200	-	1300000	600000	560	270	1120	500	191	780	820	928.5	950

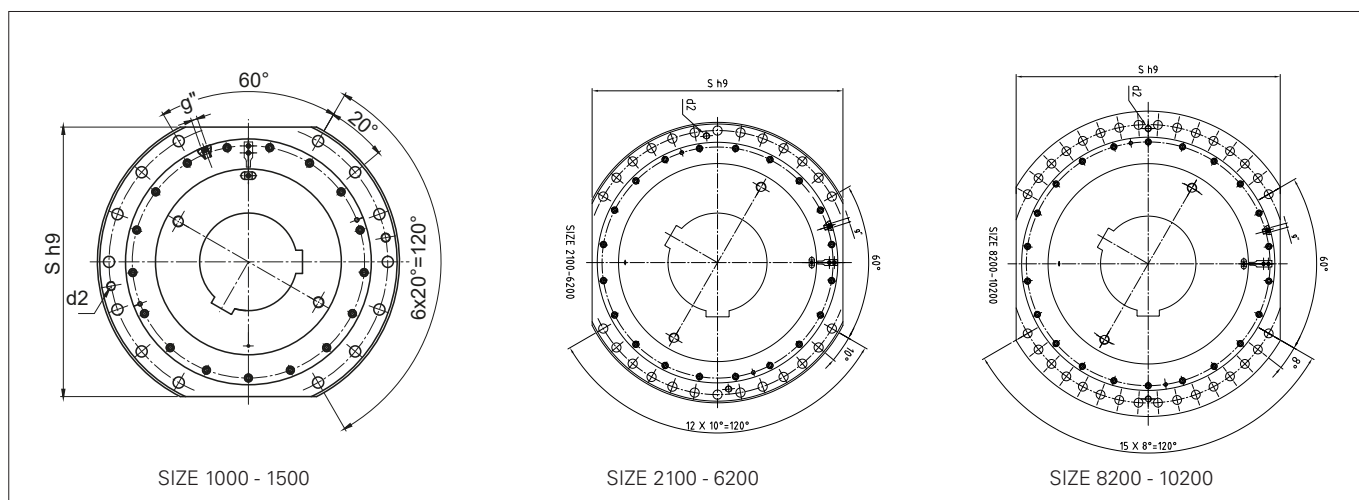
1) Maximum bore diameters for execution with keyways according to DIN 6885/1. For other type of connections consult our Technical Department.

2) Approximate weight at minimum bore dimension.

g = lubrication point.

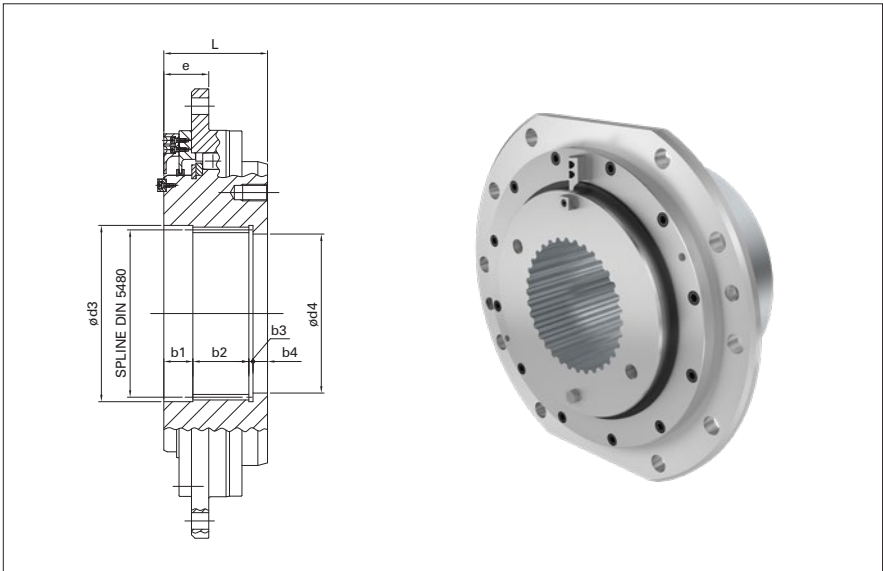
Up to size 160: R. 1/8" Gas, above size 200: R. 1/4" Gas.

Technical modifications reserved



ØT	Ød1	S	e	C	R	h	k	Ød2	P	Z	MAXIMUM DISPLACEMENT	WEIGHT (2)	SIZE
mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	+/- mm	kg	TCBR
220	15	220	42	12	2.5	13	33	M 12	4	99	3	13	25
250	15	250	42	12	2.5	13	33	M 12	3.5	104	3	21	50
280	19	280	45	15	2.5	15	33	M 16	5	114	4	25	75
300	19	300	45	15	2.5	14	33	M 16	5	129	4	30	100
320	19	320	45	15	2.5	16	36	M 16	4.5	134	4	36	130
340	19	340	45	15	2.5	16	36	M 16	4.5	149	4	46	160
360	19	360	45	15	2.5	16	36	M 16	4.5	174	4	59	200
380	19	380	45	15	2.5	16	38	M 16	4.8	179	4	77	300
400	24	400	60	20	2.5	15.5	31.5	M 20	5	189	4	105	400
460	24	460	60	20	2.5	25.5	46	M 20	7.3	226	6	161	500
500	24	500	60	20	2.5	25	46	M 20	6.5	246	6	178	600
530	24	530	60	20	2.5	27	47	M 20	7	266	6	215	1000
600	24	580	65	25	2.5	25	51	M 20	11	325	10	336	1500
615	24	590	65	25	4	36	69	M 20	11.3	340	10	363	2100
630	24	600	65	25	4	38	69	M 20	11	360	10	396	2600
660	28	640	81	35	4	22	58	M 20	11.5	390	10	449	3400
730	28	700	81	35	4	33	63	M 20	13	422	12	638	4200
800	28	760	81	35	4	33	63	M 20	13	462	12	787	6200
875	28	830	86	40	4	43	73	M 20	13.3	512	12	1370	8200
945	34	900	86	40	4	43	73	M 20	13.5	512	12	1669	9200
1040	34	1000	86	40	4	40.5	73.5	M 20	13.3	512	12	1791	10200

TCBR WITH SPLINED SHAFT



SIZE	L	e	SPLINE	d3	d4	b1	b2	b3	b4
TCBR with spline	mm	mm	DIN-5480	H7 mm	H7 mm	mm	mm	mm	mm
200	95	45	N100x5x30x18x9H	100	85	15	55	10	15
300	95	45	N140x5x30x26x9H	140	125	15	55	10	15
400	120	60	N180x8x30x21x9H	180	160	15	75	10	20
500	135	60	N180x8x30x21x9H	180	160	20	75	10	30
600	135	60	N180x8x30x21x9H	180	160	20	75	10	30
1000	140	60	N200x8x30x24x9H	200	180	20	80	10	30
1500	145	65	N240x8x30x28x9H	240	220	25	85	10	25
2100	155	65	N240x8x30x28x9H	240	220	25	85	10	35
2600	155	65	N300x8x30x36x9H	300	280	30	83	10	33
3400	170	81	N300x8x30x36x9H	300	280	30	100	10	30
4200	170	81	N340x8x30x41x9H	340	320	30	100	10	30
6200	170	81	N340x8x30x41x9H	340	320	30	100	10	30
8200	191	86	N400x8x30x48x9H	400	380	35	111	10	35
9200	191	86	N440x8x30x54x9H	440	420	35	111	10	35
10200	191	86	N500x10x30x48x9H	500	475	35	111	10	35

Note:

- Spline bore & associated dimensions shown are for reference only.
- For other dimensions refer to [page 18](#).
- The geometry of spline bore can be adapted to customer's requirement.

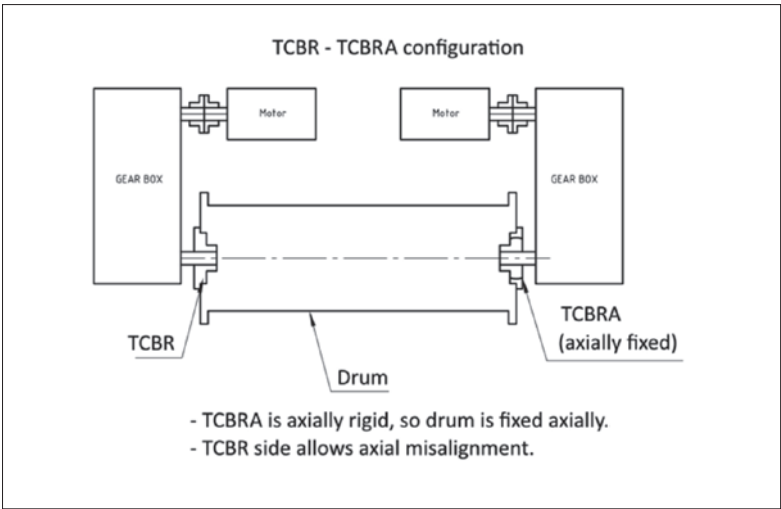
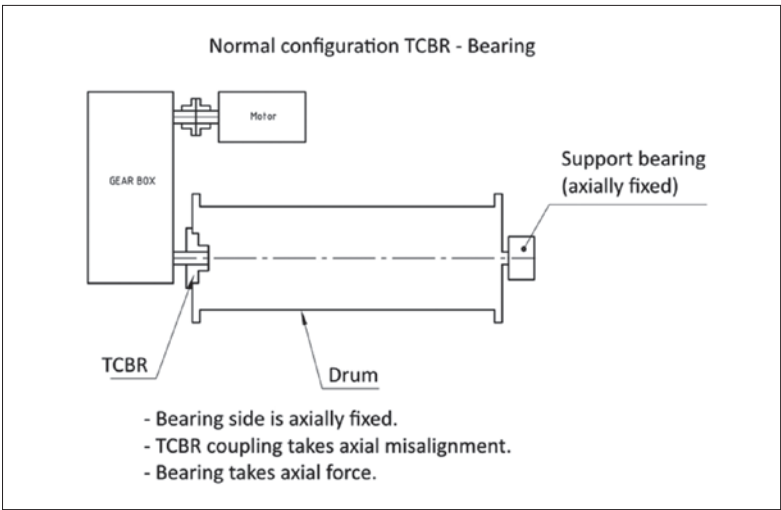
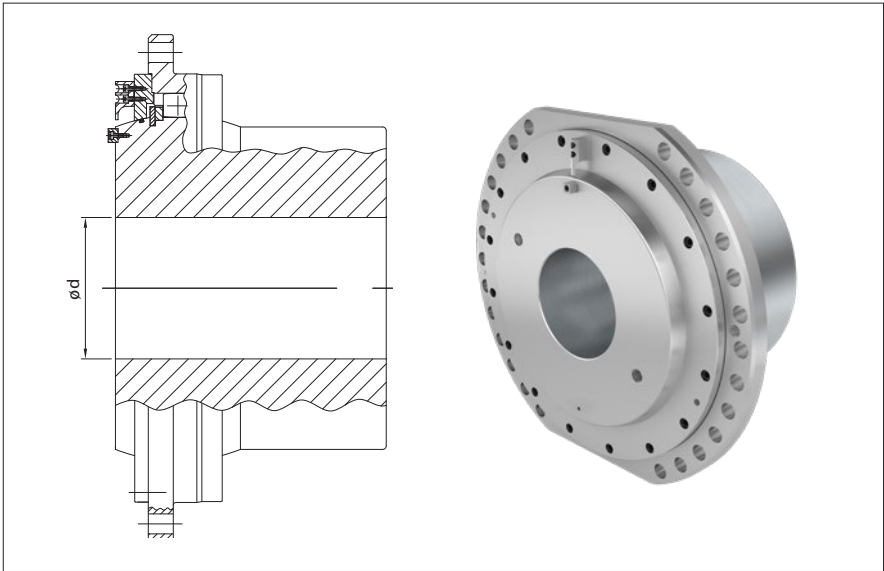
Technical modifications reserved

TCBRA WITH LIMITED AXIAL TRAVEL

TCBRA coupling acts as axially fixed bearing type coupling. TCBRA coupling is used in combination with standard Barflex™ TCBR coupling.

One end of the rope drum is connected with standard Barflex TCBR coupling and the other end is connected to TCBRA coupling which acts as axially fixed bearing and avoid axial displacement.

An example is a crane lifting layout where the drum is driven from both sides.



TCBRA COUPLING IS NOT DESIGNED TO SUPPORT AXIAL LOAD.

For each size, there is a maximum value that the coupling can withstand:

F _A MAXIMAL AXIAL LOAD (kN)		
SIZE	MAX AXIAL LOAD	d MAX (KEYED CONNECTION)
TCBR	kN	mm
200	60	135
300	65	150
400	76	178
500	95	215
600	112	217
1000	130	250
1500	147	295
2100	121	305
2600	130	315
3400	201	340
4200	226	378
6200	251	425
8200	277	445
9200	302	490
10200	327	520

CABLE DRUM DETAILS

The quality of the flange material will be S355JR acc. to EN-10025-2 or higher (material with minimum 350 Mpa yield strength).

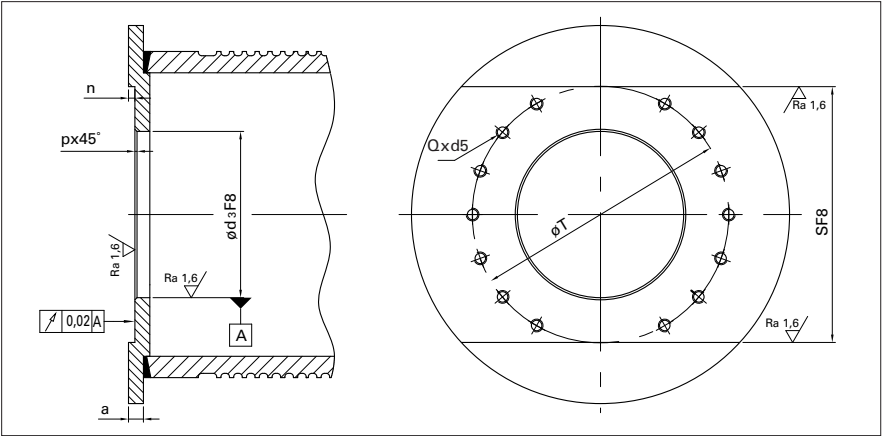


Figure 11
Cable drum flange details.

Table 4 - General Dimensions									
SIZE	T	S F8	a min.	d_5	$d_3 F8$	p	Q	n min. SEB 666212	n min. Coupling Flange Thickness (C)
TCBR	mm	mm	mm		mm	mm		mm	mm
25	220	220	25	M 12	160	3	10	10	12
50	250	250	25	M 12	180	3	10	10	12
75	280	280	25	M 16	200	3	10	10	15
100	300	300	25	M 16	220	3	10	10	15
130	320	320	25	M 16	240	3	10	10	15
160	340	340	25	M 16	260	3	10	10	15
200	360	360	25	M 16	280	3	10	10	15
300	380	380	25	M 16	310	3	10	10	15
400	400	400	30	M 20	340	3	10	10	20
500	460	460	30	M 20	400	3	10	10	20
600	500	500	30	M 20	420	3	10	10	20
1000	530	530	40	M 20	450	3	14	20	20
1500	600	580	50	M 20	530	3	14	25	25
2100	615	590	50	M 20	545	5	26	25	25
2600	630	600	50	M 20	560	5	26	25	25
3400	660	640	60	M 24	600	5	26	35	35
4200	730	700	60	M 24	670	5	26	35	35
6200	800	760	60	M 24	730	5	26	35	35
8200	875	830	70	M 24	800	6	32	40	40
9200	945	900	70	M 30	860	6	32	40	40
10200	1040	1000	70	M 30	950	6	32	40	40

Recommended to have the same recess thickness (n min) for drum flange as per coupling flange thickness "C" to transmit the torque via flanges in case of bolts gets loosen.

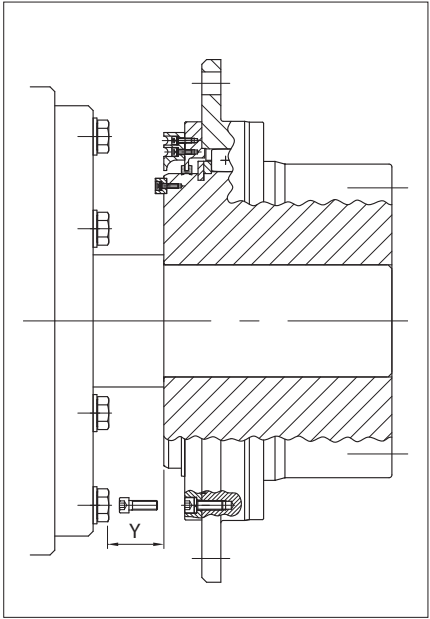


Figure 12
Distance necessary for cover screw removal.

Table 5 - Y Distance			
TCBR Coupling Size	25 400	500 2600	3400 10200
Min. Y [mm]	50	65	75

WEAR INDICATOR

One big advantage of barrel couplings compared to other types of couplings is the ability to perform preventative maintenance using a wear indicator. The design of barrel couplings allows them to tolerate a greater amount of wear without appreciable decrease in operating capacity, which makes it possible to more easily monitor wear.

Although some manufacturers provide wear indicators for gear couplings, the small amount of wear allowed for this type of coupling makes them unreliable and overly complex to use for preventative maintenance purposes.

The amount of wear in the barrel coupling can be inspected by comparing the location of the pointer which is mounted on cover with respect to the edges of the indicator pin mounted on hub, as shown in Figure 13.

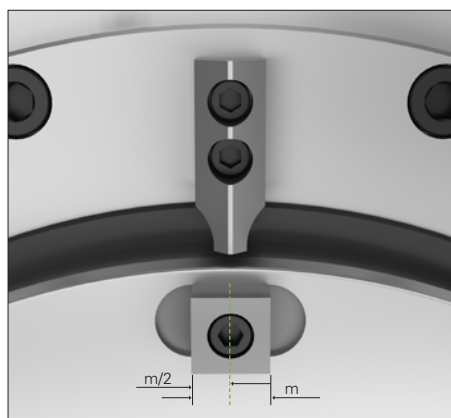
When this Pointer edge, reaches to either of the edge of indicator pin, then it is the time to replace the coupling.

Recommended wear limit values (m/2) are found in Table 6.

The recommended wear limits shown in Table 6 are for applications in which the load is applied in only one direction (example: crane hoists). In the case where the coupling is loaded in both directions (examples: travelling, looper cars in steel mills), then the recommended wear limits are HALF the values shown in Table 6. Unless otherwise specified in the customer's order, the wear indicator marks on the coupling will be equal to the values shown in Table 6.

Table 6 - Control of Coupling Wear											
Coupling Size	25	50	75	100	130	160	200	300	400	500	600
Max. wear m/2 [mm]	4	4	4	4	6	6	6	6	6	8	8
Coupling Size	1000	1500	2100	2600	3400	4200	6200	8200	9200	10200	
Max. wear m/2 [mm]	8	8	8	8	8	8	8	8	8	8	

Without Wear



Maximum Wear



Figure 13
Wear position

Technical modifications reserved

ELECTRONIC WEAR INDICATOR IN HOISTING SOLUTION

An electronic wear indicator feature is also available on demand. This feature allows the user to monitor wear remotely. So, in addition to the visual wear indicator, an electronic wear indicator can be connected either to the operator's control system or to an optional display unit to allow continuous or periodic monitoring of the barrel coupling wear.

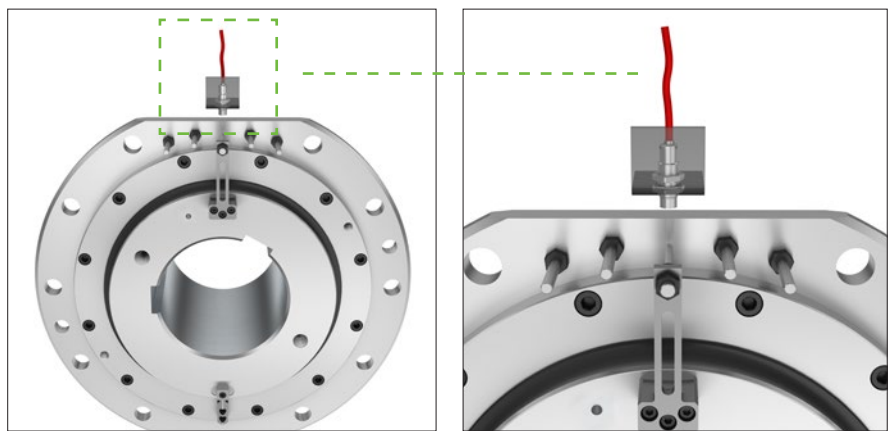


Figure 14
Electronic indicator

- Real time wear indicator: shows real progressive wear magnitude against wear limit.
- Reliable and accurate wear value, even in max. misalignment working conditions.
- Gives alarm once max. wear limit is reached.
- Can give direct signal to crane PLC.
- Can be placed inside crane control panel.
- In very dusty working atmosphere positively tested.
- Operating temperature from -15° C to 60° C.

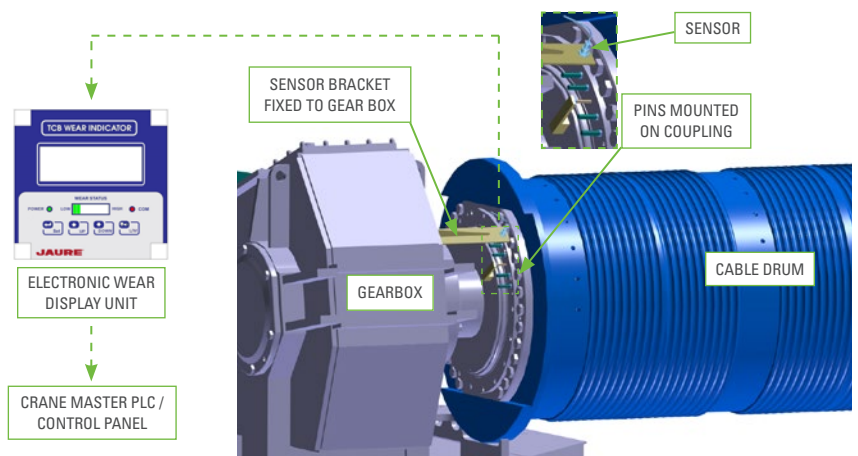
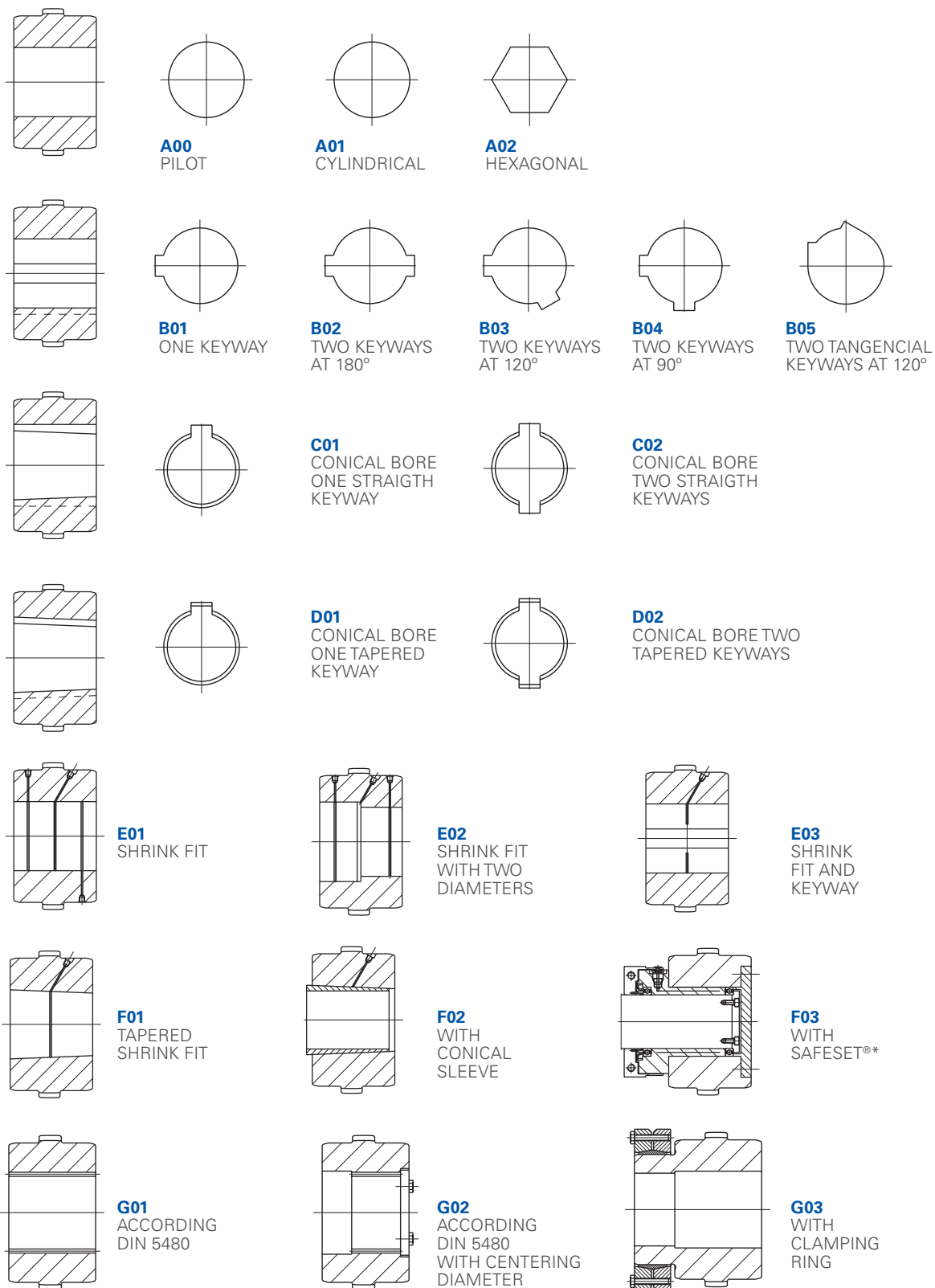


Figure 15
Electronic wear indicator working layout

Technical modifications reserved

OTHER INFORMATION

SHAFT CONNECTION TYPES



*SAFESET is believed to be the trademark and/or trade name of Voith Turbo Safeset AB Corporation Sweden, and is not owned or controlled by Regal Rexnord Corporation or its affiliates.

RECOMMENDATIONS FOR SHAFT/BORE FITS

The following recommendations, according to ISO, are given for shaft/bores fits.

TYPE OF FIT	SHAFT TOLERANCES	BORE TOLERANCES
INTERFERENCE FITS WITH PARALLEL KEYWAY	h 6	S 7
	k 6	M 7
	m 6	K 7
	n 6	J 7
	p 6	H 7
SHRINK FITS* WITHOUT PARALLEL KEY	u 6	H 7
	v 6	
	x 6	

* The stresses on the hub must be checked.

For other types of connection, please consult our Engineering Department. For one keyway, a keyway tolerance width ISO P9 is recommended. For double keyway, ISO JS9 is recommended.

BARFLEX™ COUPLING DESIGNS

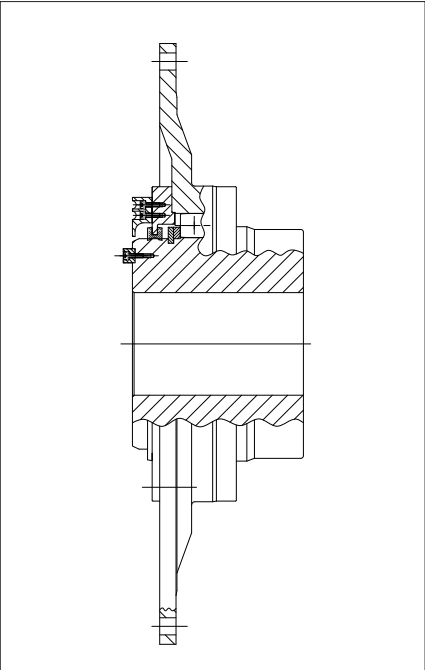


Figure 16
TCBR with special flange.

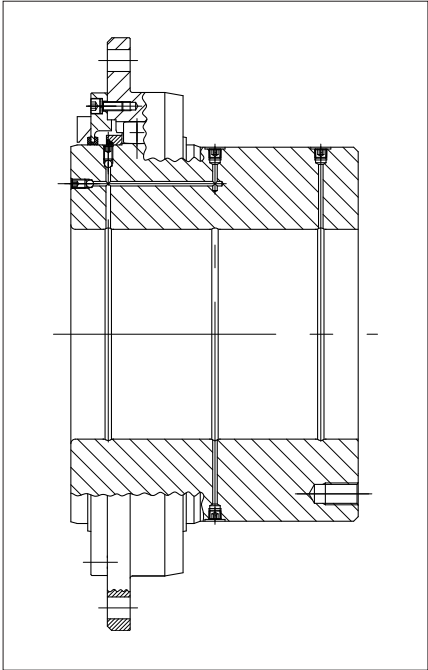


Figure 17
According - Sidmar
(standard SIDMAR BR3 - 550, 01-10-89
Rev. D)

REQUIRED MINIMUM DATA

MOTOR POWER (EACH IF MORE THAN ONE PRESENT) (OR TORQUE)	Pi		kW (kNm)
MOTOR SPEED	N		rpm
DRUM DIAMETER	D		mm
GEAR BOX OUTPUT SHAFT DIAMETER	d		mm
OPERATING FACTOR (Ki)			
GEARBOX RATIO	iG		
RADIAL LOAD			N
CONNECTION TYPE			
APPLICATION			

Additional data below are suitable for a more accurate selection

CRANE CAPACITY			Ton
USEFUL LOAD TO BE LIFTED	Q		N
HOIST WEIGHT (LIFTING BEAM + WIRE ROPE)	G		N
WEIGHT OF DRUM AND CABLES (EACH)	w		N
HOOK LIFTING RATE	Vr		m/min
DRUM SPEED		BOTH MOTORS RUNNING	ONE MOTOR RUNNING
HOIST REDUCTION	ir		
CLASS OF DUTY OR CABLE TRANSMISSION GROUP			
WHETHER USING JOURNAL BEARING OR ANTIFRICTION BEARING			
DISTANCE BETWEEN CABLE AND COUPLING	b		mm
DRUM LENGTH	l		mm
TOTAL NO. OF FALLS	nF		
TOTAL NO. OF ROPE ON ROPE DRUM	nB		
NO. OF DRUMS			
NO. OF MOTORS			

BARREL COUPLING REFERENCES



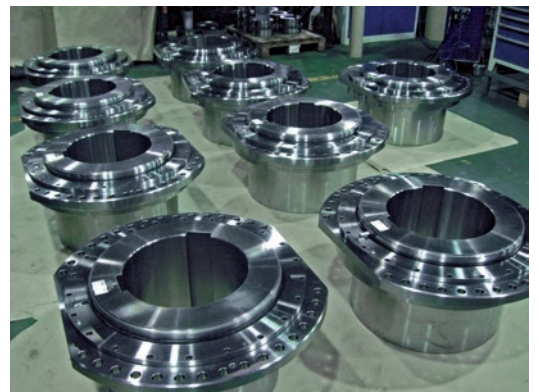
Painted barrel couplings



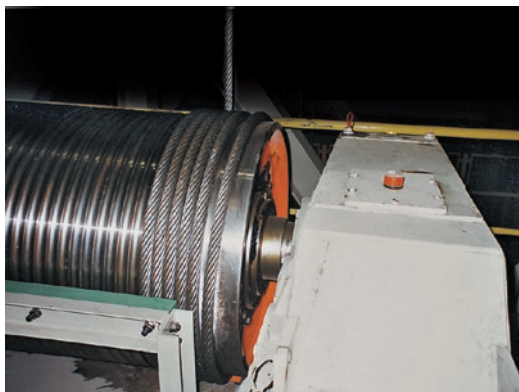
Machining of a barrel coupling hub



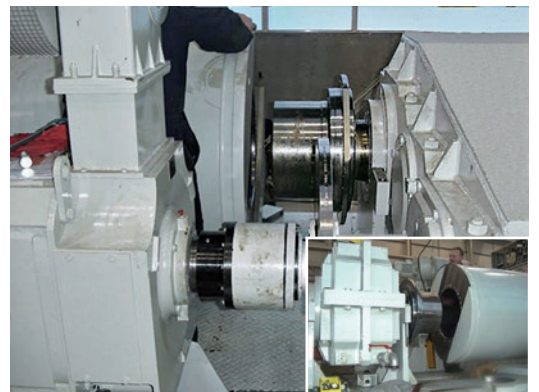
Different barrel coupling sizes



Set of TCBR 8200 couplings



Hoisting mechanism in a steel picking line



Barrel and gear coupling with brake disc

BARREL COUPLING REFERENCES



Travelling crane in steel plant.



Harbour crane for ship loading.



Harbour cranes for ship loading.



Wear indicator.

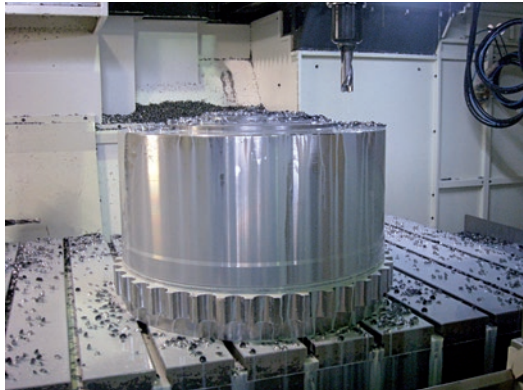


Harbour cranes for ship loading.



Rubber tyred gantry crane.

BARREL COUPLING REFERENCES



Machining of a TCBR 10200 hub.



TCBR 10200 assembly.



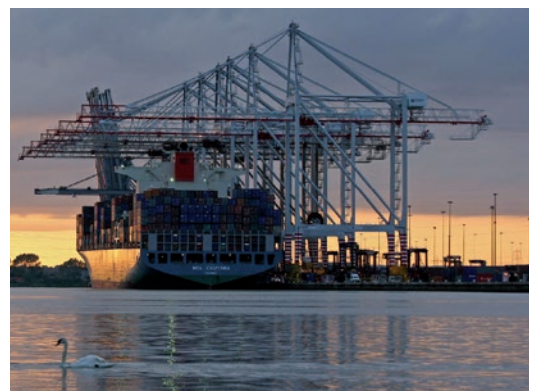
Disc pack configuration with brake disc.



Ship to shore cranes.



Gear coupling with brake disc.



Ship to shore cranes.



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