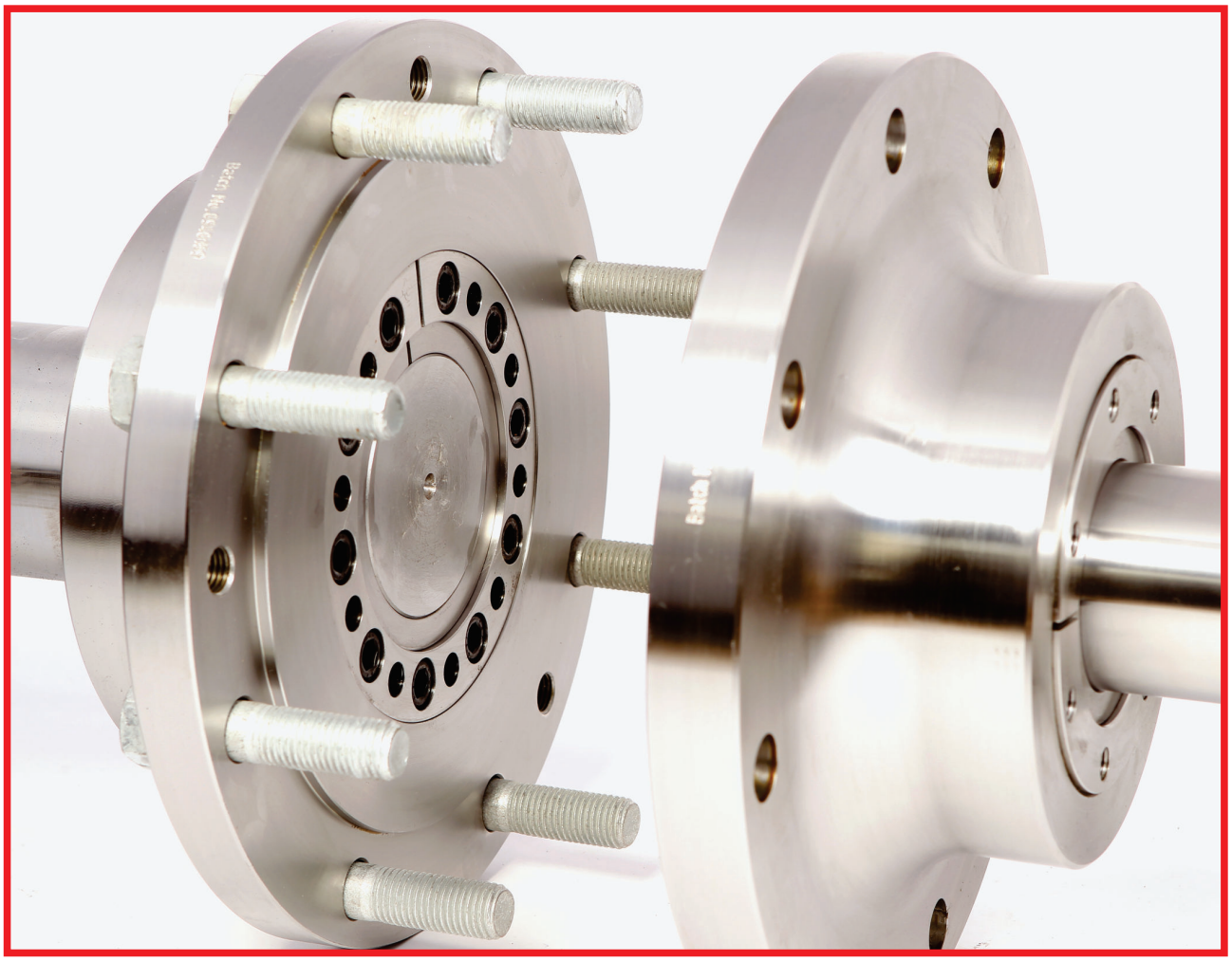
Tru - Line

Rigid Flange Coupling



Transmission Components (PTY) LTD

2014 / 2015

TRU-LINE RIGID FLANGE COUPLING

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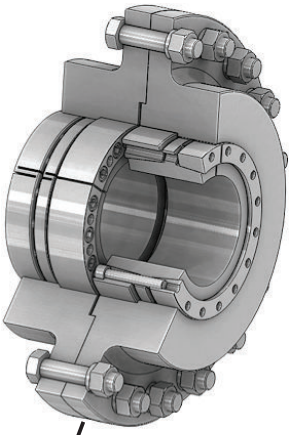
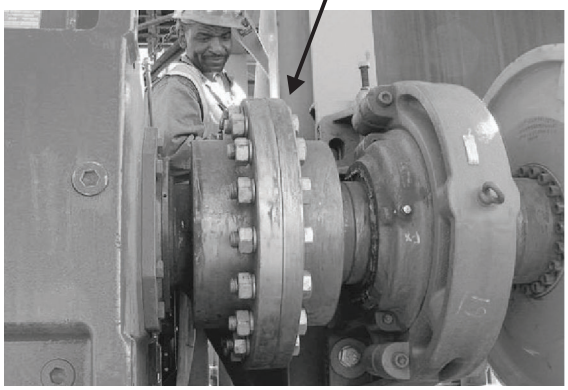
AT A GLANCE

The **Tru-line** rigid flange coupling consists of two connecting flanges: Male (TC10) and female (TC20), which together make up the TC30 coupling as a unit. Each coupling is locked onto its respective shaft by means of the TC114 locking element. All parts of the TC114 locking element are split and have self-locking tapers. No fretting corrosion will occur on the locked contact surfaces. All flanges are protected against rust and corrosion with a Tectyle coating.





FEATURES

- Stronger connection than traditional 'keyed' connections
- No fretting corrosion
- Compact design
- Small axial space required for installation
- Fast assemble/disassembly for minimal downtime
- Proven solution in many applications

APPLICATIONS

- Conveyor pulley drives
- Bucket elevators
- Papermaking and printing
- Fans
- Many other applications

BENEFITS

- Parts reusable after disassembly
- Maintenance free - No wearing parts
- Supporting shaft sizes Ø25mm - Ø350mm

SELECTION

Select the proper coupling for each application based upon the allowed transmissible torque under existing bending moment conditions.

TRANSMISSIBLE TORQUES

The transmissable torques of the Tru-Line coupling are subject to the following characteristics :

Tolerances
h8 for shaft diameter d

Surfaces
Average surface roughness at the contact surfaces of the shafts Ra ≤ 3,2 µm

Materials
The following apply to the shaft and the hub: E-module ≥ 170 kN/mm2

SIMULTANEOUS TRANSMISSION OF TORQUE AND AXIAL FORCE

If torque and axial force are to be transmitted simultaneously, the maximum torque is reduced. For a given axial force FA, the reduced torque M_{red} is calculated as:

Formula symbols
M = Maximum torque according to table [Nm]
MA = Maximum actual application torque [Nm]
M_{red} = Reduced torque [Nm]
FA = Maximum actual application axial force [kN]
d = Shaft diameter [mm]

$$M_{red} = \sqrt{M^2 - \left(F_A \times \frac{d}{2}\right)^2}$$

BENDING MOMENTS

Where there are bending moments in addition to the torque MA or the axial force FA, the maximum torque is reduced compared to the values for M as listed in the tables. Please contact us.

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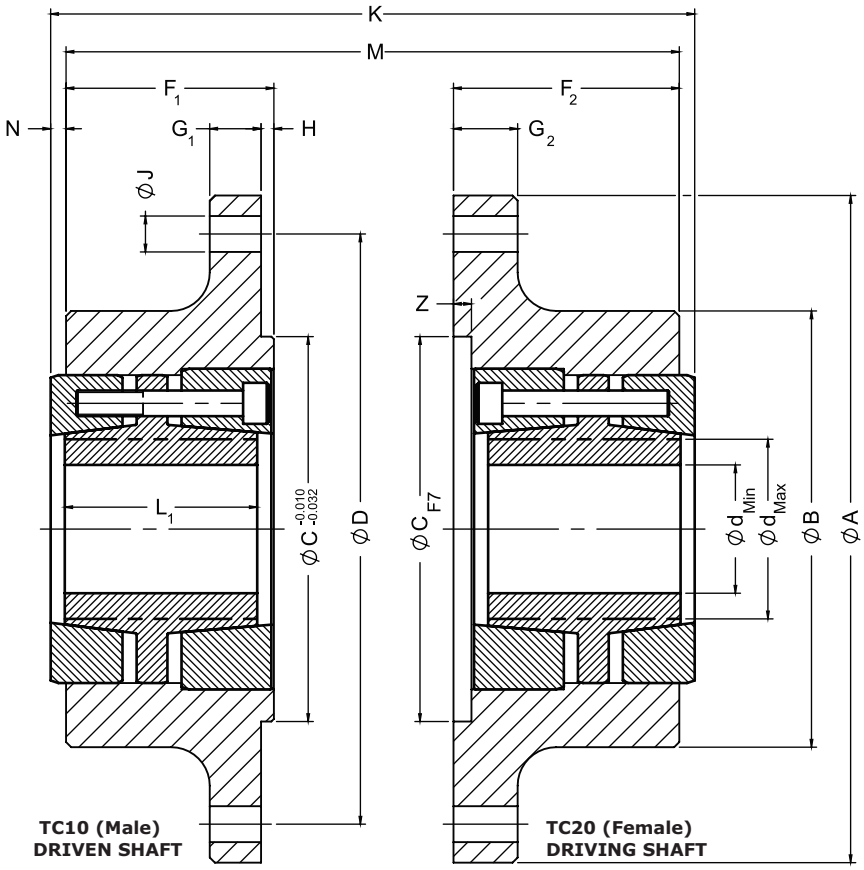

TECHNICAL AND DIMENSIONAL DATA

TC TYPE 10 or 20 B / A	Bore Range d (mm)	Torque (Nm)	FLANGE / COUPLING DIMENSIONS (All Dimensions in mm)													
			A	B	C	D (PCD)	F_1	F_2	G_1	G_2	H	J	K	M	N	Z
120/190	**25 50**	2 500 5 250	190	120	100	160	65	70	10	15	3	11	136	132	2	5
170/260	**50 70**	6 300 10 000	260	170	150	230	81	88	20	25	3	15	170	164	3	5
200/320	**70 90**	16 000 20 000	320	200	180	280	91	103	25	30	5	18	204	194	5	7
230/400	**90 115**	28 000 35 500	400	230	300	350	105	115	30	35	6	25	224	214	5	10
270/400	**115 140**	45 000 56 000	400	270	300	350	105	115	30	35	6	25	224	214	5	10
330/560	**140 170**	90 000 112 000	560	330	300	480	135	145	36	41	8	32	286	272	8	12
390/560	**170 210**	160 000 200 000	560	390	300	480	135	145	36	41	8	32	286	272	8	12
430/630	**170 210**	160 000 200 000	630	430	350	550	135	145	40	45	8	32	286	272	8	12
470/630	**210 250**	265 000 315 000	630	470	350	550	150	160	40	45	8	32	312	302	5	12
510/710	**250 270**	375 000 400 000	710	510	550	630	169	179	40	45	8	32	352	340	6	12
550/710	**270 290**	450 000 490 000	710	550	550	630	169	179	40	45	8	32	35	340	8	12
580/750	**290 320**	520 000 540 000	750	580	550	680	190	200	40	45	8	32	402	382	9	12
630/800	**320 350**	590 000 625 000	800	630	550	720	190	200	40	45	8	32	402	382	9	12

We reserve the right to make any changes without prior notice.

NOTE: Only flanges with the same outside diameter **A** may be coupled together to form a complete Rigid Flange Coupling (TC 30).

TRU-LINE RIGID FLANGE COUPLING

Transmission Components (PTY) LTD

TIGHTENING TORQUES FOR BOLTS AND SCREWS

TC TYPE 10 or 20 B / A	TC 114 LOCKING ELEMENTS					FLANGE CONNECTING BOLTS			
	Bore Range d (mm)	L_1	Cap Screws (Grade 12.9)			SIZE	QTY	TA (Nm) (Grade 8.8)	TA (Nm) (Grade 10.9)
			Size (mm)	Qty	TA (Nm)				
120/190	25 to 50	60	M 8 x 55	8	41	M10 x 50	8	49	69
170/260	50 to 70	75	M10 x 60	9	83	M14 x 60	8	135	190
200/320	70 to 90	90	M12 x 75	9	145	M16 x 75	8	210	295
230/400	90 to 115	100	M14 x 80	7	230	M24 x 100	8	710	1000
270/400	115 to 140	100	M14 x 80	10	230	M24 x 100	8	710	1000
330/560	140 to 170	128	M16 x 110	11	355	M30 x 120	18	1450	2000
390/560	170 to 210	128	M16 x 110	16	355	M30 x 120	18	1450	2000
430/630	170 to 210	128	M16 x 110	16	355	M30 x 130	18	1450	2000
470/630	210 to 250	140	M20 x 120	14	650	M30 x 130	18	1450	2000
510/710	250 to 270	158	M20 x 130	16	650	M30 x 130	24	1450	2000
550/710	270 to 290	158	M20 x 130	18	650	M30 x 130	24	1450	2000
580/750	290 to 320	180	M20 x 150	20	690	M30 x 130	28	1450	2000
630/800	320 to 350	180	M20 x 150	20	690	M30 x 130	28	1450	2000

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NOTE: All standard bore ranges are in increments of 5mm. Non-Standard as well as inch bore sizes are available upon request.

EXAMPLE: Driving Shaft = Ø100mm
Driven Shaft = Ø130mm
Flanges: TC20 to fit driving shaft of 100mm - TC20: 230/400 with TC114-90/155 Ø100mm bore
TC10 to fit driven shaft of 130mm - TC10: 270/400 with TC114-115/140 Ø130mm bore
Coupling: TC30 to connect driving and driven shafts of Ø100mm and Ø130mm
230/400 (Ø100mm) + 270/400 (Ø130mm)

Recommended shaft tolerance : h8

MASS AND MOMENTS OF INERTIA

TC TYPE 10 or 20 B / A	Bore Range d (mm)	MASS PER FLANGE				MOMENTS OF INERTIA*		
		Min. Bore (Kg)		Max. Bore (Kg)		Male TC10 (kgm^2)	Female TC20 (kgm^2)	Complete TC30 (kgm^2)
		Flange and Locking Element	Coupling	Flange and Locking Element	Coupling			
120/190	25 to 50	7.5	13	7	15	0.0180	0.0228	0.0438
170/260	50 to 70	18	34	17	32	0.0912	0.1084	0.2048
200/320	70 to 90	32	62	30	59	0.2751	0.3148	0.6211
230/400	90 to 115	50	105	47	98	0.7658	0.7889	1.7088
270/400	115 to 140	54	113	51	105	0.8644	0.9088	1.9273
330/560	140 to 170	121	256	114	242	3.3459	3.7031	8.3093
390/560	170 to 210	140	289	128	265	4.0464	4.5207	9.8275
430/630	170 to 210	184	378	172	354	6.7898	7.4923	16.0105
470/630	210 to 250	207	421	191	389	8.0789	8.9382	18.7454
510/710	250 to 270	258	545	247	525	13.5824	13.8004	30.4045
550/710	270 to 290	279	585	268	563	15.4504	15.9137	34.3859
580/750	290 to 320	342	710	322	670	20.5657	21.4833	46.1550
630/800	320 to 350	406	832	384	787	28.5128	30.2460	63.3611

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** Moment of Inertia calculated with smallest bore*

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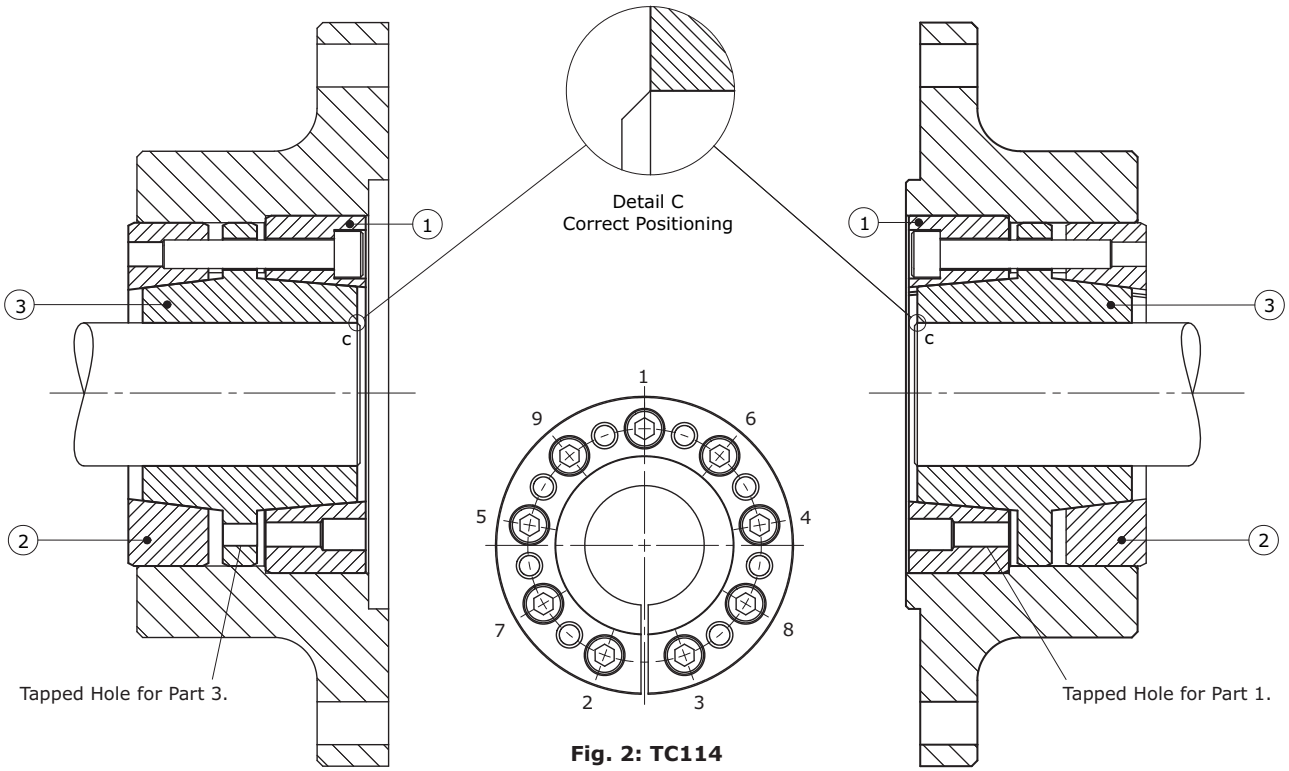

Fig. 1: TC20 (Female)
DRIVING SHAFT

Fig. 2: TC114

Fig. 3: TC10 (Male)
DRIVEN SHAFT

FITTING INSTRUCTIONS

PREPARATION

Making sure your coupling is ready for installation is very important and could save you a lot of time later on in the exercise!

1.1 Remove the rust-preventative tectyl and any visible dirt from the bore as well as from the face of the flange.

1.2 Make sure that contact surfaces of the locking element and the shaft are clean and lubricated. This can be done with a lightly oiled cloth or rag. We recommend using a light machine or hydraulic oil. **DO NOT use copper slip or Molybdenum disulphide!**

1.3 Make sure the locking element is correctly assembled and that all splits of the front, back and centre rings are in line with one another.

FIRST STAGE INSTALLATION

This step serves only to get the flange aligned onto the shaft and ready for final installation, please DO NOT use a torque wrench during this step.

2.1 All the cap-screws should be loose at this stage to allow slight movement of the front and back rings of the locking element. Remove 2 or 3 cap-screws and turn them into the tapped holes of the centre ring (Part 3). This will prevent the back ring from sliding up and locking onto the centre ring as you now fit the locking element into the flange.

2.2 Slide the entire unit onto the shaft with the split of the locking element in the vertical position until you see the shaft protruding as shown in Detail C above. Return all cap-screws to their respective holes.

2.3 Using a hand held Allen Wrench/Key and following the numbered sequence in Fig. 2, you may now begin fastening the cap-screws in small increments until all the cap-screws are at an equal tension.

2.4 ALWAYS make sure that the flange is aligned! This can be done using a clock-gauge or by using a depth gauge to measure the distance through 4 opposite extraction holes to ensure that the front and back rings are parallel to one another. An ideal indicator reading of 0.01mm per 100mm of flange diameter should be achieved.

FINAL STAGE INSTALLATION

DO NOT continue with this final stage of installation if there is a run-out of more than 0.01mm per 100mm diameter of flange.

3.1 Using a hand held torque wrench set to 50Nm, verify that all the cap-screws are at an equal tension. For this verification, it is best to move around the locking element in a clockwise fashion.

3.2 Check the coupling for any miss-alignment as explained in step 2.4, this step should be repeated every time you move up to the next torque increment.

3.3 Continue to tighten the cap screws in increments of no more than 50Nm using the numbered sequence shown in Fig. 2. Always remember to verify the torque/tension of the cap-screws at the end of each increment by going around the locking element in the clock-wise fashion.

3.4 Once the flange has been tightened to its maximum or final torque setting, you should check to make sure that there is no miss-alignment. The flange is now ready for operation.

REMOVAL INSTRUCTIONS

Please follow these removal instructions STEP BY STEP! Attempting to remove the coupling in any other way could result in serious damage to both the coupling as well as your shaft!

1. Loosen all the cap-screws of the locking element and transfer as many as possible into the tapped holes of the CENTRE/INNER-RING (Part 3 in Fig. 4).

2. Starting at the split of the locking element, tighten the cap-screws in a clockwise fashion so as to push the BACK-RING (Part 2 in Fig. 4) off the taper of the centre/inner-ring.

3. Once the back-ring has come loose from the centre-ring, you may now transfer as many cap-screws as possible into the tapped holes of the FRONT-RING (Part 1 in Fig. 5).

4. Once again, starting at the split of the locking element and moving around in a clockwise fashion, tighten the cap-screws until the front-ring, together with the flange comes loose from the centre/inner-ring.

5. The coupling may now be removed from the shaft.

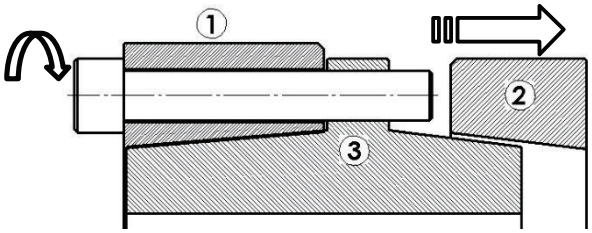

Fig. 4

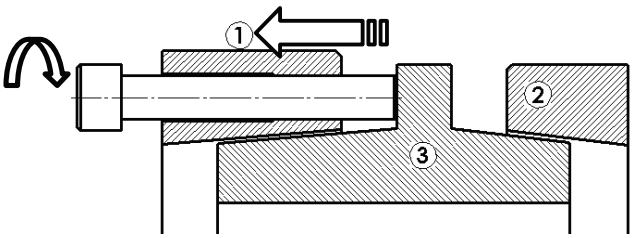

Fig. 5