

RINGFEDER POWER TRANSMISSION GMBH

**Installation and Operating Manual
Series RLT**

RINGFEDER®

Tyre Couplings



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1 Legal Information

This installation and operation manual contains instructions that must be followed to ensure your personal safety and to prevent injury or damage to property.

Only qualified personnel are permitted to use the product or system to which this documentation applies. Please read and observe all related documents, especially the safety instructions and warnings.

2 Liability of RINGFEDER POWER TRANSMISSION GMBH

All contents of this document, including texts, graphics, and figures, are protected by copyright. Unless otherwise stated, the copyright is held by **RINGFEDER POWER TRANSMISSION GMBH** (hereinafter referred to as RPT). This document may not be copied, reproduced, shortened, or expanded, either in whole or in part, without prior consent from the manufacturer.

RPT reserves the right to modify these instructions as part of ongoing development and considering new findings.



- RINGFEDER® couplings must be used in accordance with the intended functionality described in the technical paper and this installation and operation manual.
- Third-party products or external components may only be used with prior approval from RPT.
- Proper transport, storage, positioning, assembly, installation, commissioning, operation, and maintenance are essential prerequisites for the fault-free and safe functioning of the products.
- The permissible environmental conditions must be observed.
- The design and dimensioning of the shaft-hub-connections are the responsibility of the user.
- For future development of the product, we reserve the right to make technical modifications.

3 Safety Instructions

This installation and operation manual describes the coupling and provides guidance on its use from assembly to disposal. Retain this manual for future reference. Read the instructions carefully before using the coupling and follow all guidelines provided. Always observe the safety instructions.

3.1 Legend

Table 1 displays all symbols used in this manual.

Table 1: Legend for Warning Symbols

Warning Notice	Symbol	Warning Message
General Mandatory Sign		Instructions marked with this symbol must be followed with particular care to ensure the correct operation of the coupling and consequently of the machine or system.
Warning of Personal Injury		This symbol indicates warnings that, if ignored, may result in serious or fatal injuries.
Warning of Product Damage		This symbol indicates warnings that, if ignored, may result in damage to the coupling or the system.
Warning of Suspended Load		This symbol warns of the risk of injury from falling loads being transported, e.g., by crane.
Warning of Crushing Hazard		This symbol indicates work steps where there is an increased risk of crushing injuries.
Warning for Hot Surface		This symbol warns of hot surfaces that may cause burns, avoid contact to prevent injury.
Torque Specification Notice		Refer to the table for the tightening torques before installation.
Heating or Cooling Required		This symbol indicates that a heating or cooling process is required for assembly and/or disassembly.

Cleaning		This symbol indicates that the surface and/or object must be cleaned of all contaminants that could hinder assembly and/or operation.
Inject Lubricant		This symbol indicates that the application of lubricant is required for proper operation and/or assembly of the coupling.
Recycling / Disposal		Any item to be recycled or disposed of must be handled in an environmentally friendly manner.

3.2 General Safety Instructions

Safe and trouble-free operation of the coupling is only ensured through familiarity with this manual. Failure to follow the instructions may result in damage to the product, property, and/or personal injury. RPT assumes no liability for damages or operational disruptions resulting from non-compliance with the manual.



During assembly, operation, and maintenance of the coupling, it must be ensured that the entire drive train is secured against unintentional activation. Rotating parts can cause serious injuries. Therefore, be sure to read and follow the instructions below:

- All work on and with the equipment must be carried out in accordance with safety regulations.
- In accordance with accident prevention regulations, all freely rotating parts must be protected against unintentional contact and falling objects by fixed protective devices.
- In case of a special coupling, the coupling design takes precedence.
- Unauthorized modifications to the coupling are not admissible. We decline any warranty due to consequent damage.
- Only use original spare parts from RPT.
- Visibly damaged parts must not be installed or put into operation.
- Note that improperly tightened screws can lead to serious personal injury and property damage.

3.3 EC Machinery Directive 2006/42/EC

The equipment supplied by RPT is a component and not a machine or incomplete machine within the meaning of the EC Machinery Directive 2006/42/EC. Accordingly, RPT is not required to issue a separate installation declaration.

4 Transportation, Delivery, and Storage

4.1 Transportation



Always use suitable transport equipment and lifting devices during transport to avoid injuries caused by falling components or crushing, as well as any kind of damage.

4.2 Scope of Delivery



Upon delivery, check for the presence of all items listed in the enclosed shipping documents. Any damaged or missing parts must be reported to the supplier immediately in writing.

4.3 Delivery Condition

The coupling is packaged in individual components. The surfaces of the coupling hubs and flange rings are delivered with black phosphate coating as standard.

4.4 Storage

The coupling components may be stored for up to 6 months in the as-delivered condition at a dry, covered location and at normal room temperature.

For longer storage periods, long-term preservation is required (please consult RPT for this purpose).



- The coupling must not be exposed to aggressive media, extreme temperatures, or moisture.
- The coupling must not be stored together with acids, alkalis, or other corrosive chemicals.
- The storage location should be dry and dust-free. Humidity should not exceed 65%, and condensation must be avoided.
- Elastomer components must not be exposed to UV radiation during storage.

5 Technical Description

5.1 Description

The RINGFEDER® RLT series couplings are highly elastic couplings for backlash-free torque transmission. They can simultaneously compensate for large radial, angular, and axial misalignments without generating particularly high restoring forces on other components.

- The tyre coupling is particularly suitable for protecting other components of the system from strong shocks caused by sudden load changes.
- The coupling can be used in horizontal or vertical alignment.
- The elastomer element of the tyre coupling can be mounted, dismounted, or replaced radially during maintenance or repair work without having to move the connected units.

5.2 Intended use

The intended use of the coupling is to connect in- and output of a power transmission drive with each other, in most cases these are two shafts. For stationary applications additional equipment like brake drums, torque limiters, etc. can be added to the coupling and will not change the intended use (contact RPT for more information).



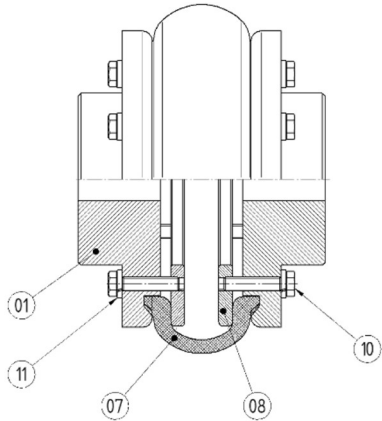
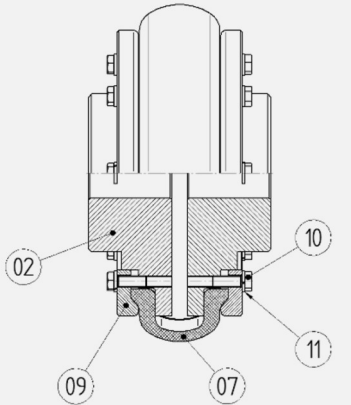
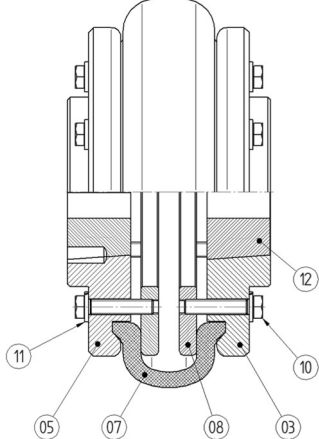
- The coupling may only be used in accordance with the technical data sheet.
- In the case of special couplings, the coupling design takes precedence.
- The coupling shall only be used and operated within the frame of the conditions as defined in the performance or delivery contract.
- Any change in the operation conditions or service parameters requires the verification of the coupling design.
- Unauthorized modifications to the coupling are not admissible. We decline any warranty due to consequent damage.
- For future development of the product, we reserve the right to make technical modifications.

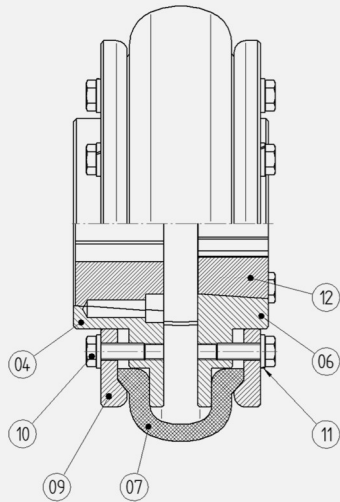
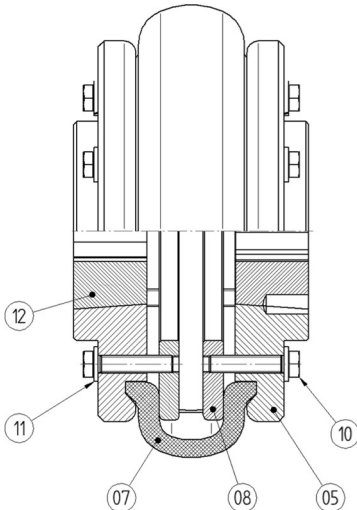
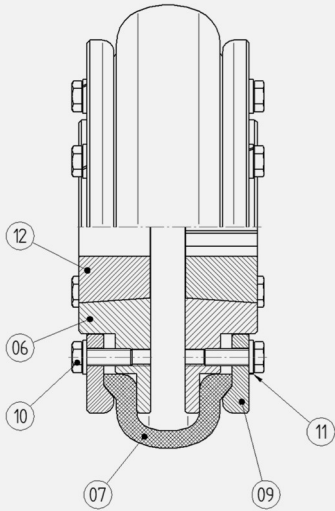
5.3 Layout

The RINGFEDER® RLT tyre coupling consists of a drive-side and a driven-side coupling hub and an elastomer tyre. The tyre is clamped axially to the coupling hubs using clamping rings.

The illustrations below show the RLT series with its respective components and part numbers for ordering spare parts.

Table 2: Schematic structure of the Ringfeder ® RLT

Name	Size	Number x Part	RLT- Coupling
RLT BIB	40 to 60	2x Part 1 1x Part 7 2x Part 8 1x Part 10 1x Part 11 2x Part 13 ^{*1}	
RLT BOB	70 to 250	2x Part 2 1x Part 7 2x Part 9 1x Part 10 1x Part 11 2x Part 13 ^{*1}	
RLT HIF	40 to 60	1x Part 3 1x Part 5 1x Part 7 2x Part 8 1x Part 10 1x Part 11	

RLT HOF	70 to 220	1x Part 4 1x Part 6 1x Part 7 2x Part 9 1x Part 10 1x Part 11 2x Part 12	
RLT HIH	40 to 60	2x Part 5 1x Part 7 2x Part 8 1x Part 10 1x Part 11 2x Part 12	
RLT HOH	70 to 220	2x Part 6 1x Part 7 2x Part 9 1x Part 10 1x Part 11 2x Part 12	

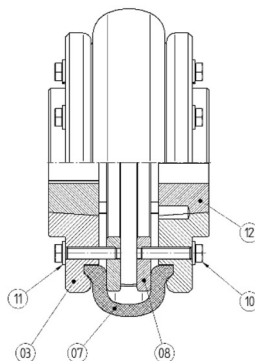
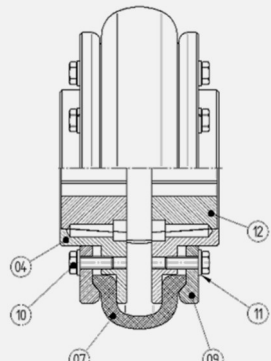
RLT FIF	40 to 60	2x Part 3 1x Part 7 2x Part 8 1x Part 10 1x Part 11 2x Part 12	
RLT FOF	70 to 220	2x Part 4 1x Part 7 2x Part 9 1x Part 10 1x Part 11 2x Part 12	

Table 3: Naming of RLT – components

Part	Designation
1	Coupling Hub B (with straight bore) for internal clamping ring
2	Coupling Hub B (with straight bore) for external clamping ring
3	Coupling Hub F (Taper locking bush - internal) for internal clamping ring
4	Coupling Hub F (Taper locking bush - internal) for external clamping ring
5	Coupling Hub H (Taper locking bush - external) for internal clamping ring
6	Coupling Hub H (Taper locking bush - external) for external clamping ring
7	Elastomer (Tyre)
8	Clamping ring – internal
9	Clamping ring – external
10	Clamping ring – screws (Hexagon screw) *1
11	Spring washer *1
12	Taper locking bush coupling
13	Set screw (optional)

Note: *1 - Number depends on the coupling size (see GA and/or tech paper).

5.4 Coupling hubs

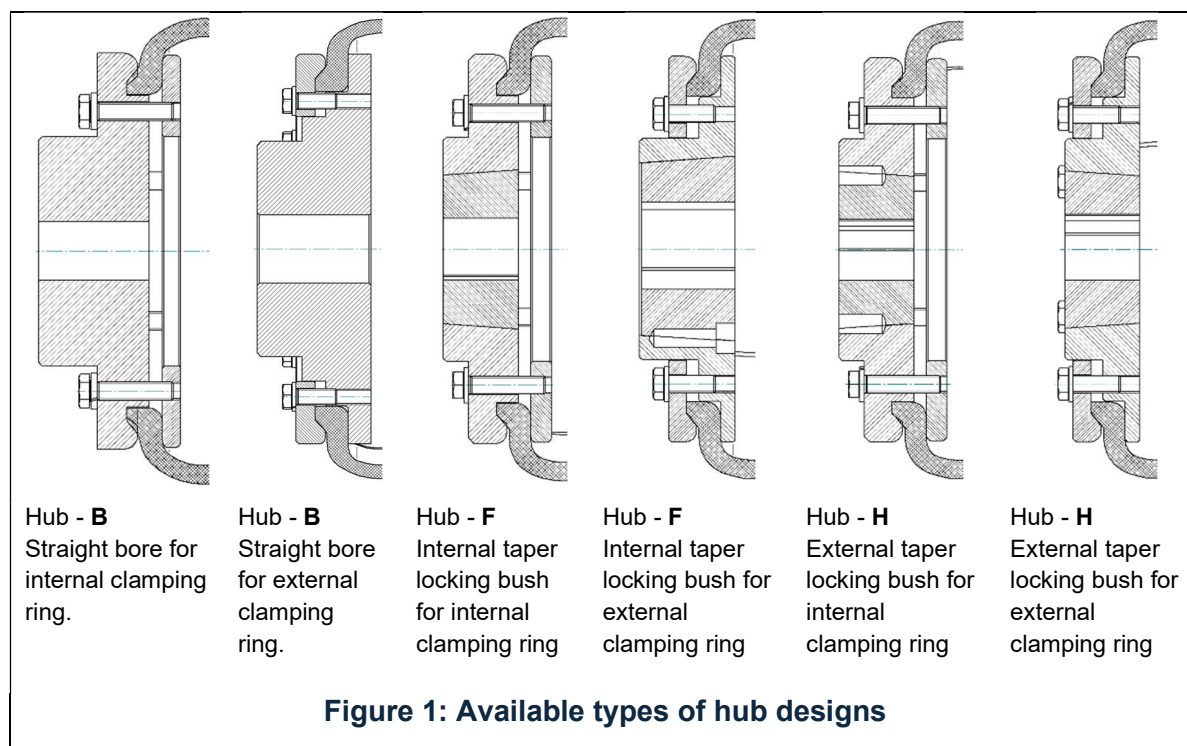
The RLT coupling consists of a driving-side and a driven-side coupling hub, the design of which may vary depending on the execution.

Depending on the execution, the hubs are supplied with a cylindrical bore and keyway, or with taper locking bushes (see Figure 1).

- Standard hubs with straight bore are designated B.
- Coupling hubs for mounting taper locking bushes are designated F and H.

For the selection of the taper locking bushes, various sizes are available. On the operator side, the respective limit values for the hub bore diameter according to Table 4, as well as their suitability for torque transmission to the shaft, shall be verified.

In the case of a shaft design without a keyway, torque transmission is achieved solely by frictional engagement. In case of doubt, please contact RPT.



5.5 Machining of Finished Bores in RLT B Hubs

For producing the finished bore in a coupling hub (Parts 1 and 2), observe the following procedure:

- Clean the coupling hub to remove any corrosion protection agents.
- Clamp the coupling hub on the surfaces marked with Γ and carefully align the hub (Figure 2).
- The values for $\varnothing d1_{max}$ and $\varnothing d2_{max}$ specified in Table 4 apply to a keyed connection in accordance with DIN 6885/1 and shall not be exceeded.
- Select the bore tolerance such that, in combination with the shaft tolerance, an interference fit or press fit is achieved, e.g. H7/m6.
- Ensure that the keyway is positioned as far as possible between two flange holes (Figure 3).
- Position the threaded holes for optional set screws on the hubs in accordance with the specifications (Figure 2, SL1, SL2) and Table 4.



- The maximum bore diameters apply to a keyed connection in accordance with DIN 6885/1 and shall not be exceeded (see Table 4).
- Exceeding these values may cause the coupling to crack.
- There is a risk of fatal injury due to flying fracture fragments!

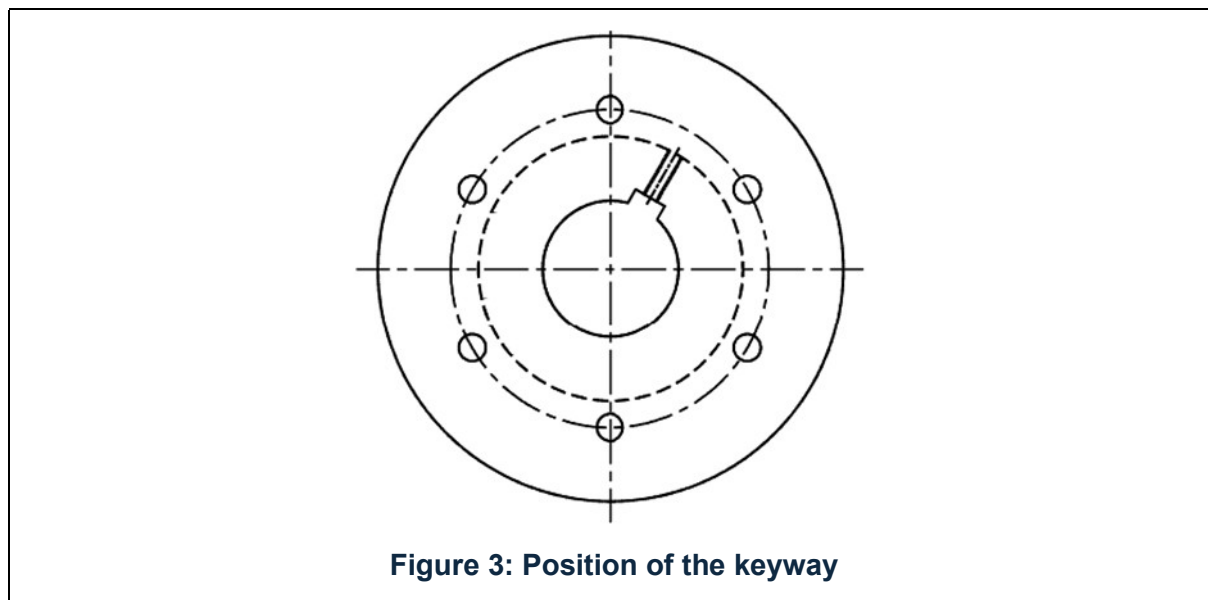
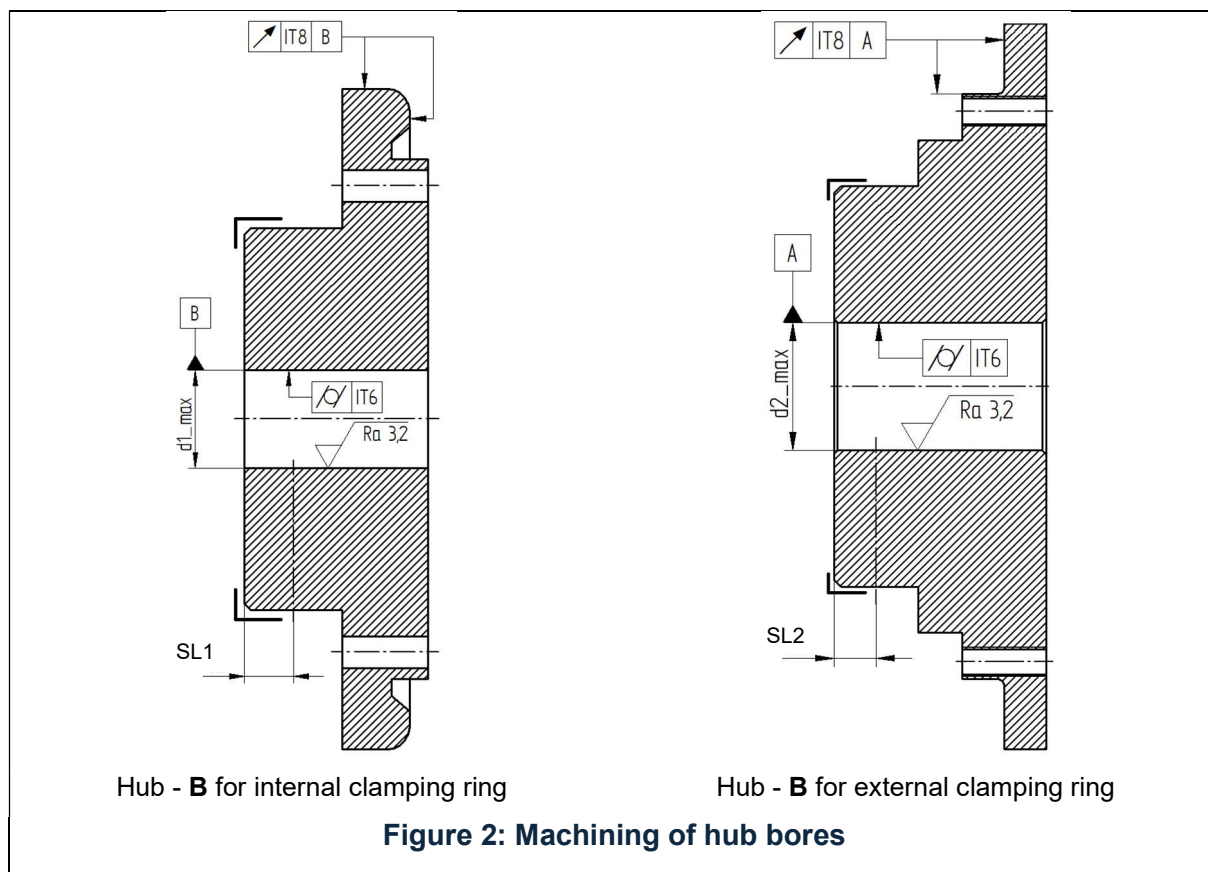


Table 4: Maximum permissible bore

Coupling Size	Ød1 max. / Ød2 max. [mm]			SL1 [mm]	SL2 [mm]
	B	F	H		
40	32	22	22	8	-
50	38	32	32	6.5	-
60	45	35	35	7	-
70	50	45	35	11.5	13
80	63	60	45	13.5	14
90	75	60	60	15	17
100	80	75	60	16	18.5
110	90	75	75	17	21
120	100	90	75	21	25.5
140	125	90	90	-	20
160	140	100	100	-	30.5
180	150	110	110	-	23
200	150	110	110	-	19
220	160	125	125	-	19
250	190	-	-	-	19

5.6 Tyre material

Description	Characteristics	Hardness	Temperature range
STDR	Natural Rubber (Standard)	80±5 A	-20 to +70 °C
NEUR	Natural Rubber (without labeling)		-20 to +70 °C
FRAS	Fire Resistant Anti- Static		-15 to +70 °C



For different operating temperature requirements, please refer to the RPT.

5.7 Taper locking bushes

For the respective RLT coupling sizes, RPT specifies the taper sizes assigned in the following Table 5 (Part 12) as standard.

Up to and including size 3020 (Figure 12), these taper locking bushes are clamped to the receiving coupling hub by means of two threaded set screws with internal hexagon.

For larger taper locking bushes, three hexagon socket head cap screws are provided in each case (Figure 13).

Unless otherwise specified, the following information refers to taper locking bushes with BSW (British Standard Whitworth) threads and with a half key in accordance with DIN 6885/1.



The use of taper sizes with a different assignment or with an imperial ANSI taper design requires prior consultation with and approval by RPT.

The maximum transmissible slip torques (TR) specified in Table 5 are, in some cases, lower than the transmissibility values T_{kmax} stated in the technical paper.

Compare the specifications for the transmissible slip torque of the taper locking bush with the possible transmission of the maximum system torques.



It is the responsibility of the user to ensure adequate dimensioning of the taper locking bush for the transmission of system-related shock loads, in particular to the shaft.



RPT recommends, for the selection of F / H hub taper inserts, providing a minimum safety factor of $S_f = 1.5$ for the transmission of shock torque loads.

Table 5: Taper locking bush data

Coupling size	Taper size	Hub design	TR ^{*1} [Nm]	n _{Sc} ^{*2}	BSW Thread	TA ₃ ^{*3} [Nm]
40	1008	F H	136	2x	1/4"	5.6
50	1210	F H	147	2x	3/8"	20
60	1610	F H	407	2x	3/8"	20
70	2012	F	808	2x	7/16"	31
70	1610	H	486	2x	3/8"	20
80	2517	F	1311	2x	1/2"	48
80	2012	H	808	2x	7/16"	31
90	2517	F H	1311	2x	1/2"	48
100	3020	F	2712	2x	5/8"	60
100	2517	H	1311	2x	1/2"	48
110	3020	F H	2712	2x	5/8"	60
120	3525	F	5062	3x	1/2"	112
120	3020	H	2712	2x	5/8"	60
140	3525	F H	5062	3x	1/2"	112
160	4030	F H	8735	3x	5/8"	170
180	4535	F H	12430	3x	3/4"	192
200	4535	F H	12430	3x	3/4"	192
220	5040	F H	14238	3x	7/8"	270

Notes:

- *1 – TR: Maximum transmissible slip torques with key.
- *2 – n_{Sc}: Number of fastening screws.
- *3 – TA₃: Tightening torques for the fastening screws of the taper locking bushes.

5.8 Bolted connection – hub / clamping ring (Parts 10 and 6)

Table 6: Bolted connection between hub and clamping ring

Hub design	Coupling size	Hexagon screw	Wrench size: SW [mm]
B, F, H	40, 50, 60	M6	10
B, F, H	70, 80	M8	13
B, F, H	90, 100	M10	16
B, F, H	110, 120	M12	18
B, F, H	140 *1	M12	18
B, F, H	160 *1	M14	21
B, F, H	180 *1	M16	24
B, F, H	200	M20	30
B, F, H	220	M20	30
B	250	M24	36

Note: *1 – Not used when an internal clamping ring is present.

6 Technical Data

6.1 Technical operating data

The geometric specifications of the dimensions with tolerances can be found in the technical paper “Tyre Coupling RINGFEDER® RLT”, which is available for standard couplings at www.ringfeder.com.



Further extended requirements apply to commissioning and inspection of the coupling alignment.

In the event of any change to the specified operating conditions (e.g. temporary power increase, maximum speed, starting frequency, or ambient temperatures), the coupling selection shall be re-evaluated without exception.

Table 7: Technical data for RLT operation

(geometric specifications for standard versions are provided in the respective technical paper)

RLT	T_{KN}	T_{Kmax}	Dynamic torsion spring stiffness	n_{max}	Relative Damping	Permissible misalignment values during operation (Figure 15) at $n = 1500$ rpm			
Size	[Nm]	[Nm]	[Nm/°]	[1/min]	ψ	Δka [mm]	Δkr [mm]	Δkw [mm]	(Δkw) [°]
40	24	64	5	4500	0.9	1.3	1.1	2.9	2
50	66	160	13	4500	0.9	1.7	1.3	3.5	2
60	127	318	26	4000	0.9	2.0	1.6	4.4	2
70	250	487	41	3600	0.9	2.3	1.9	5.0	2
80	375	759	63	3100	0.9	2.6	2.1	5.8	2
90	500	1096	91	3000	0.9	3.0	2.4	6.6	2
100	675	1517	126	2600	0.9	3.3	2.6	11.3	3
110	875	2137	178	2300	0.9	3.7	2.9	12.2	3
120	1330	3547	296	2050	0.9	4.0	3.2	13.8	3
140	2325	5642	470	1800	0.9	4.6	3.7	16.3	3
160	3730	9339	778	1600	0.9	5.3	4.2	24.1	4
180	6270	16455	1371	1500	0.9	6.0	4.8	27.8	4
200	9325	23508	1959	1300	0.9	6.6	5.3	30.0	4
220	11600	33125	2760	1100	0.9	7.3	5.8	32.9	4
250	14675	42740	3562	1000	0.9	8.2	6.6	37.2	4



The specifications for the permissible torques T_{KN} and T_{Kmax} are valid for:

- Operation within an ambient temperature range from -20 °C to $+70\text{ °C}$
- Operation within the specified alignment limits
- In the case of reversing rotational operation of the coupling and alternating torque loads, additional reductions shall be applied.

The values Δka , Δkw , Δkr specified in Table 7 and Figure 15 shall be reduced for operating speeds greater than 1500 rpm.

Furthermore, these values shall also be reduced when they occur simultaneously. See Chapter 9.

6.2 Determination of coupling size

For the determination of the coupling size, the effective nominal torque (T_{AN}) of the system shall be taken as the basis.

Using the following (increase) factors:

- The degree of load and the type of driving- and driven-side components are taken into account by means of the operating factor S_B according to Table 8.
- Consideration of the ambient temperature is required only in cases where the coupling with tyre is operated outside the permissible temperature range specified in Chapter 5.6. In such cases, contact RPT to determine the temperature factor S_9 .
- The starting frequency factor remains at $S_Z = 1$, provided that the number of starts is limited to 25 starts per hour. (For a higher number of starts per hour, please consult RPT).

Table 8: Operational factor S_B

Driven machine Drive machine	Uniform load fans, centrifugal pumps, generators	Medium load mills, construction machinery	Heavy load piston pumps, presses, reciprocating compressors
E- Motor, Turbine	1	1,75	2,5
Combustion engine 4 or more cylinders	1,25	2	2,75
Combustion engine 1-3 cylinders	1,5	2,25	3,00

6.2.1 Determination of coupling size example

Driving-side component: Electric motor 10 kW | 2975 rpm

$$T_{AN} = \frac{9550 * 10}{2975} = 32,1 \text{ Nm}$$

Driven-side component: Piston pump → SB = 2.5

At an operating temperature of 50 °C and with FRAS tyre, S ϑ = 1 applies.

Thus, the required coupling size is: $T_{kN} \geq T_{AN} \times SB \times S\vartheta = 32.1 \times 2.5 \times 1 = 80.25 \text{ Nm}$

Selection: RLT 60.

For the final design, it shall also be observed that, in addition to compliance with operating-related and individual torque shocks, the speed limits with alternating loads in accordance with the specifications in Table 7 must be observed.

The correct dimensioning of the shaft–hub connection (as well as the selection of the coupling size) for safe operation is not the responsibility of RPT.

7 Assembly

7.1 Before Installation



Check the coupling assembly for visible damage. If you find any damage, please contact RPT immediately.



Use suitable transport equipment and lifting devices for installation to prevent injuries caused by falling components or crashes, as well as any type of damage.

Ensure that the system is disconnected from the power supply and other possible energy sources before starting work!



Remove all protective coatings/lubricants from the individual components.

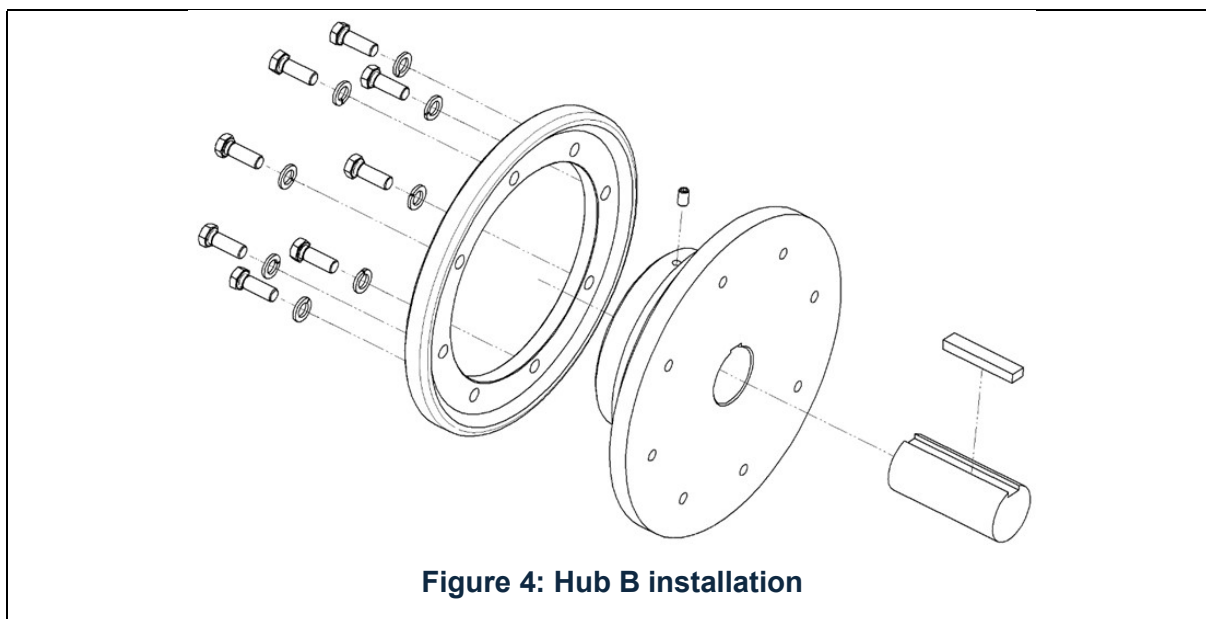


To protect against burns caused by hot coupling components, always wear gloves when working!



It is recommended to align the coupling hubs as accurately as possible during installation in order to provide sufficient misalignment reserves for operational position deviations of the shafts (e.g. due to thermal expansion).

7.2 Installation of coupling hub B



The bore of the coupling hub as well as the receiving shaft seat shall be cleaned prior to installation.

Pay particular attention to ensuring that the torque-transmitting contact surfaces are dry and free of grease.



Before installing the hub, the set screws must be removed or backed out sufficiently so that no risk of collision with the key exists when mounting the hub onto the shaft.



Use appropriate assembly aids and lifting equipment, such as a crane, for larger couplings.



Use suitable calibrated torque wrenches for the installation of all screws, with a deviation of less than $\pm 5\%$.



Uniformly heating the hub to a temperature between 80 °C and 120 °C facilitates easier installation of the hub onto the shaft.

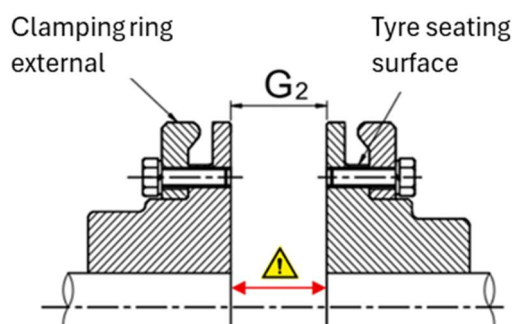


Figure 5: B-hub with external clamping ring

For the installation of the hub with external clamping ring (Part 2), both clamping rings must be preassembled on the shaft before installing the hubs.

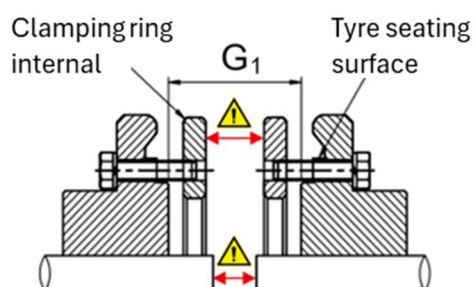


Figure 6: B-hub with internal clamping ring

For the installation of the hub with internal clamping ring (Part 1), the clamping rings may be installed after alignment, provided that sufficient clearance remains between the shaft ends.

- Install the hubs/adapters, including the keys, at the specified position so that the hubs are as flush as possible with the shaft ends.
- Secure the position of the hubs on the shaft by means of set screws or by using a shaft-side retaining washer.
- Move the driving- and driven-side system components together, including the hub assemblies, in order to achieve the respective gap dimension "G" as specified in Table 11, as closely as possible.
- Secure the set screws (Part 13) against self-loosening and ejection by applying an adhesive, such as Loctite 222, before tightening.
- Tighten the set screws to the tightening torque specified in Table 9.

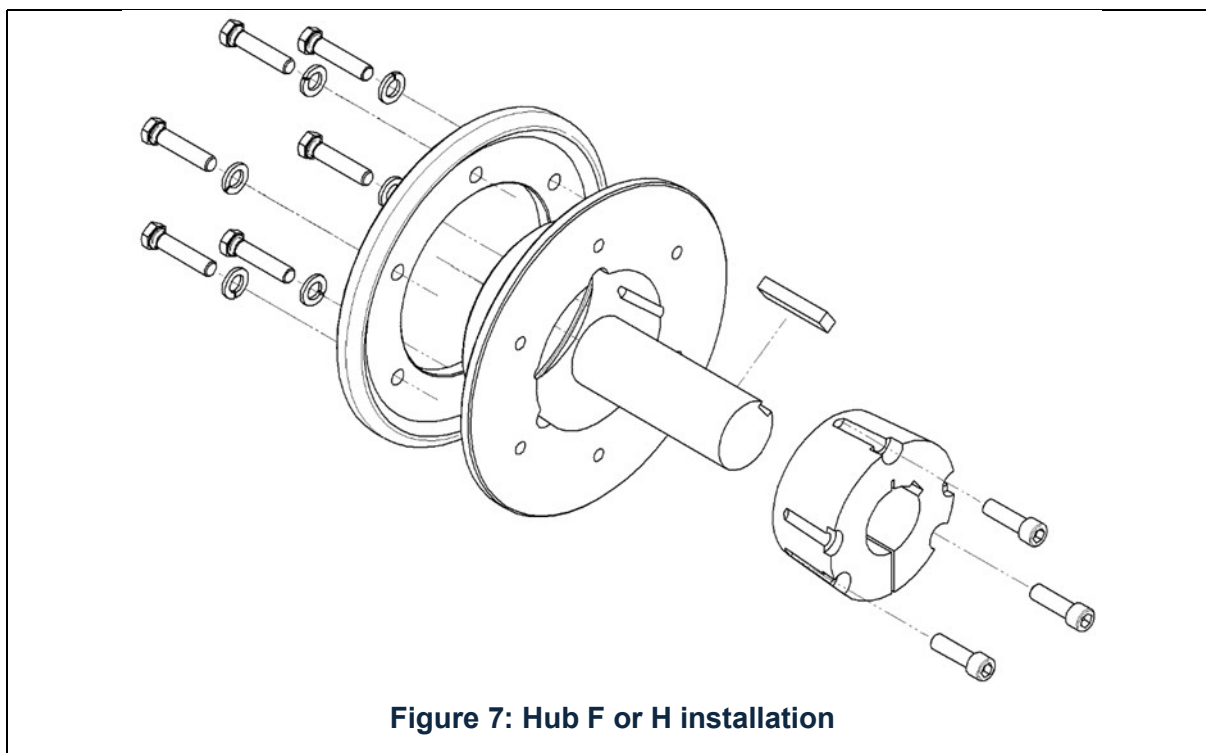


- To check for possible operation-related axial displacement between the hub and the shaft during regular maintenance, position markings must be applied to both the shaft and the hub.
- Align the hubs with each other and maintain the specified tolerances for the distance dimension “G” in accordance with Table 11.
- Ensure that sufficient clearance remains  between the shaft ends and the internal clamping rings (Figure 8 to Figure 11).

Table 9: Tightening torques for the Set screws

Screw size	T_{Ast} [Nm]
M5	3
M6	4
M8	8
M10	15
M12	25
M16	70

7.3 Installation of the coupling hub with taper locking bushes F and H



Before installation, clean all torque-transmitting contact surfaces, in particular the hub bores, shaft seats, and the taper locking bushes. All surfaces must be clean, dry, and free of grease.



Use appropriate assembly aids and lifting equipment, such as cranes, for larger couplings.



Use suitable and calibrated torque wrenches for installing the fastening screws, with a maximum deviation of less than $< 5\%$.

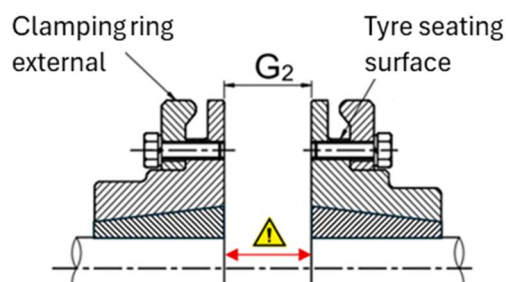


Figure 8: F-hub with external clamping ring

For the installation of the F-hub with external clamping ring, the clamping rings and hubs must be preassembled on the shaft before installing the taper locking bushes.

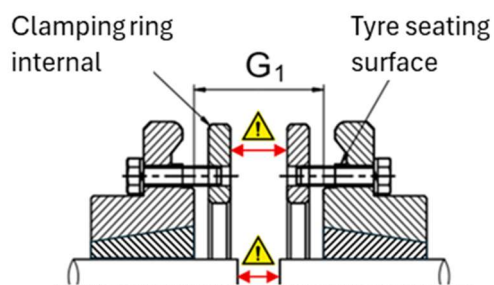


Figure 9: F-hub with internal clamping ring

For the installation of the F-hub with internal clamping ring, the hubs must be preassembled on the shaft before installing the taper locking bushes.

If sufficient space is available between the shaft ends, the clamping rings may be installed after alignment, if required.

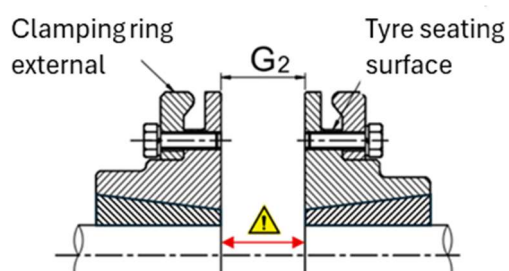


Figure 10: H-hub with external clamping ring

For the installation of the H-hub with external clamping ring, first preassemble the external clamping ring, then install the taper locking bushes onto the shaft, and finally mount the hub.

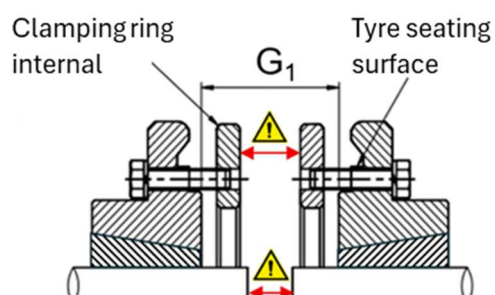


Figure 11: H-hub with internal clamping ring

For the installation of the H-hub with internal clamping ring, the taper locking bushes must be installed on the shaft before the hubs.

If sufficient space remains between the shaft ends, the clamping rings may be installed after alignment, if required.



- If increased force is detected while mounting the hub with taper locking bush, the installation must be stopped immediately, and the cause must be identified.
- Check all dimensions, in particular the keyway dimensions. Note that after installation of the hub, a clearance must remain between the key and the bottom of the keyway.
- Further pressing on with increased force may result in pre-damage or failure of the taper locking bush.
- Tighten the fastening screws of the taper locking bush evenly, circumferentially, and in stages up to the tightening torque T_{A3} specified in Table 5.
- Check the secure seating of the taper locking bushes in the hub and their correct position on the shaft.



- Fill the remaining free holes of the taper locking bush with grease.
- Note that when installing the taper locking bushes, a key must always be provided, and it must not protrude from the coupling hub or beyond the shaft end (Figure 14).
- Pre-align the installed driving- and driven-side hubs with each other in order to achieve the distance dimensions "G1" or "G2" in accordance with Table 11.
- Ensure that sufficient clearance remains  between the shaft ends and the internal clamping rings (Figure 8 to Figure 11).
- To ensure a secure shaft–hub connection and to allow regular inspection for possible axial displacement of the hub on the shaft, position markings must be applied between the respective taper locking bush and the shaft.

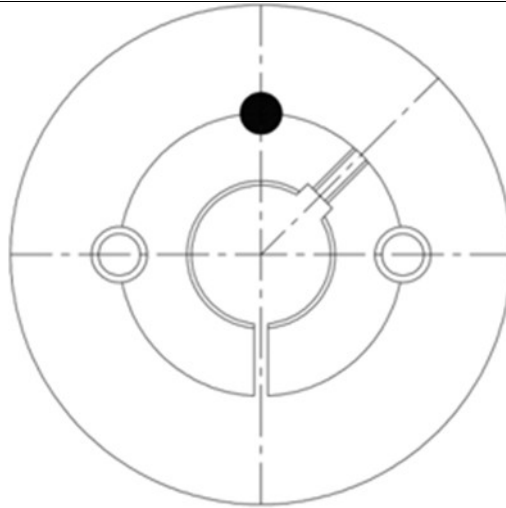


Figure 12: Fastening screws of the taper locking bushes, sizes 1008 to 3030

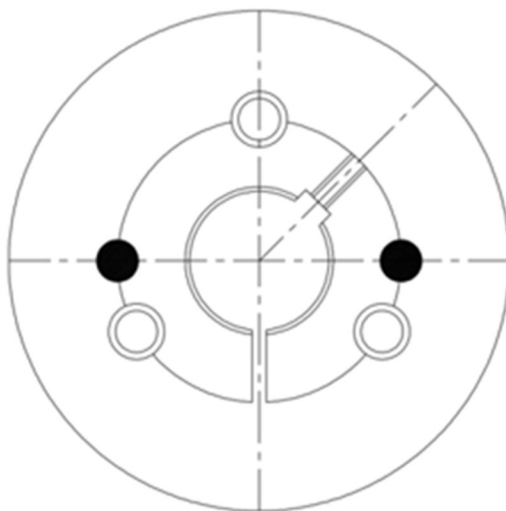


Figure 13: Fastening screws of the taper locking bushes, sizes 3525 to 5050

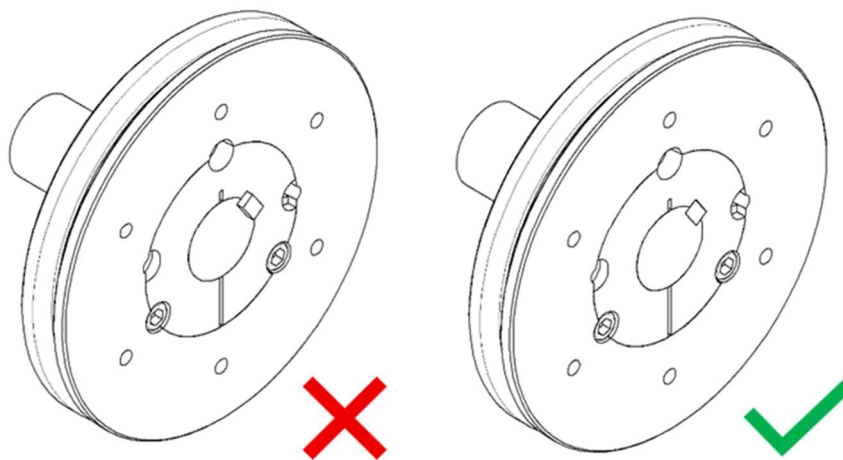


Figure 14: Taper locking bush key

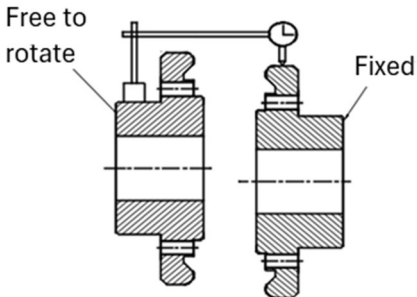
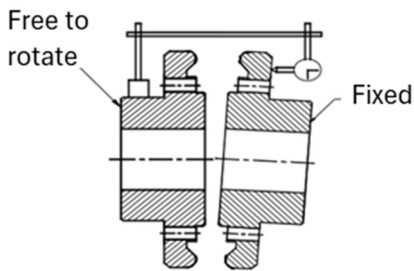
7.4 Alignment of the coupling hubs

The coupling hubs mounted on the driving and driven sides must be finally aligned with each other prior to commissioning.

For this purpose, the nominal dimensions (including tolerances) specified in Table 11 shall be observed during initial installation.

The specifications for hub alignment together with the associated tolerances shall be considered as independent limit values.

Table 10: Alignment methods

Method	Parallel/Radial	Angular
1	Alignment using a dial gauge 	Alignment with dial gauge 
	• Attach the dial indicator to the hub of one coupling half and place the probe against the outer diameter of the other half. • Record the measured value at each quarter turn of the hub by rotating one side. • For the parallel/radial method “P” and for the angular method “X”, half of the total indicated runout (TIR) shown on the dial indicator applies and must not exceed the value of the initial misalignment.	

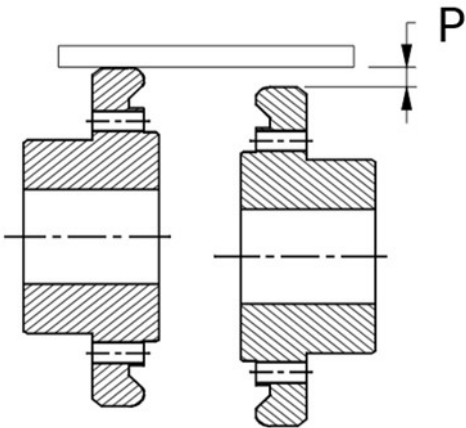
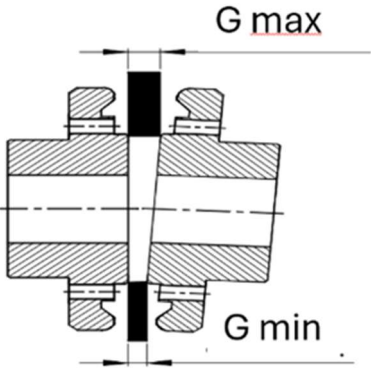
Method	Parallel/Radial	Angular
2	Alignment using a straightedge 	Alignment using a feeler gauge  $TIR = G_{max} - G_{min}$
	• If the use of a dial indicator is not possible, a straightedge and a feeler gauge may alternatively be used for alignment in order to measure parallel or angular alignment. • Note that the gap “G” must be measured at each quarter position, without rotating the shafts. The difference between the maximum and minimum gap then represents the total angular misalignment measurement value (TIR).	

Table 11: Permissible misalignment deviations after complete installation

RLT Size	Permissible misalignment values after complete installation				Flange spacing G	
	Parallel / Radial P	Axial Tolerance	Angular	Total Indicated Runout TIR	G1	G2
					Clamping ring internal	Clamping ring external
	[mm]	[mm]	[°]	[mm]	[mm]	[mm]
40	0.28	±0.32	0.50	0.70	24	-
50	0.33	±0.42	0.50	0.87	29	-
60	0.40	±0.50	0.50	1.09	35	-
70	0.48	±0.58	0.50	1.25	43	16
80	0.53	±0.65	0.50	1.45	48	22
90	0.60	±0.75	0.50	1.64	51	24
100	0.65	±0.82	0.75	2.82	58	24
110	0.73	±0.92	0.75	3.05	53	22
120	0.80	±1.00	0.75	3.45	58	24,5
140	0.93	±1.15	0.75	4.07	-	23
160	1.05	±1.32	1.00	6.02	-	8
180	1.20	±1.50	1.00	6.95	-	22
200	1.33	±1.65	1.00	7.48	-	30
220	1.45	±1.81	1.00	8.27	-	27
250	1.65	±2.06	1.00	9.28	-	30

Note: The gap G1 or G2 specified in the table above is given when the angular and axial displacements are zero.

7.5 Final assembly of tyre coupling



Ensure that the driving-side and driven-side hubs have already been finally aligned in accordance with Table 11.



Clean all contact surfaces relevant to the tyre on the hubs and clamp rings.

Ensure that the tyre, especially in the area of the tyre bead, is clean and free of grease or oil.



- Open the split tyre (Part 7) and insert it between the respective hub design and the clamping ring.
- Ensure that the tyre bead is correctly seated between the respective hub flange and the clamping ring (internal / external rings).
- Installation can be facilitated by using a small plastic hammer and applying light taps to the outer diameter of the tyre.
- Install the internal clamping rings (Part 8) together with the clamping screws and washers (Parts 10 and 11).
- Initially tighten the clamping ring screws lightly, working circumferentially.
- Then tighten the clamping ring screws circumferentially, using suitable torque wrenches (deviation less than $\pm 5\%$), step by step, up to the specified tightening torque T_A according to Table 12.

Table 12: Tightening torque for flange bolted connection TA2

RLT size	Flange screw	T _{A2} [Nm]
40	M6	5
50	M6	5
60	M6	5
70	M8	10
80	M8	10
90	M10	18
100	M10	18
110	M12	30
120	M12	30
140	M12	30
160	M14	48
180	M16	70
200	M20	140
220	M20	140
250	M24	230

8 Disassembly



Observe all occupational safety instructions, see Chapter 3.

Before disassembly, secure all clamping rings and coupling hubs against possible falling.

Use suitable pull-off devices and securing equipment for disassembling the coupling elements in order to avoid injuries caused by crushing or falling coupling components.

8.1 Disassembly of the elastomer tyre

For coupling sizes with an external clamping ring (Part 9), loosen all clamping ring screws circumferentially so that the tyre can be released from the hub without constraint.

Remove the tyre and secure the clamping rings with screws to prevent them from falling out.

For sizes with an internal clamping ring (Part 8), loosen all clamping ring screws circumferentially so that the elastomer tyre can be released from the hub without constraint.



If the bolted connection (Parts 10 and 11) is completely loosened, the clamping rings (Part 8) may fall into the inner area of the tyre.

Therefore, when subsequently removing the tyre, pay attention to the possible falling out of these clamping rings.

8.2 Disassembly of coupling hub B (with and without key)

Before pulling off the hubs, loosen all provided set screws and any other retaining elements.



Avoid injuries caused by partially loosened set screws protruding beyond the rear face of the hub.

Remove them completely before disassembly.

Secure the hubs and clamping rings with screws to prevent loosening and falling.

Move the driving side and driven side apart so that sufficient space remains for disassembling the hubs and for the use of pull-off devices.

Use only pull-off devices that are suitable and will not damage the hub.

Pay particular attention to the tyre contact surfaces.

We recommend pull-off devices that can be mounted, if possible, to the flange threads.

Apply the pull-off device.

When pulling off, watch for unusually high force being required and clarify the cause if this occurs.



To reduce the pull-off forces, the hubs may be locally heated up to a maximum temperature of 80 °C.

Avoid damage to the shaft seat and the hub seat!



When pulling off the hub, also pay attention to the following:



- Be aware of a possible sudden release of the hub from the shaft.
- Be aware of individual coupling components falling down and becoming damaged.
- Risk of injury due to crushing.
- Take appropriate measures to prevent these hazards.

Inspect the condition of all coupling components after disassembly.

Before reinstallation, replace all damaged coupling components.

Inspect the hub–shaft seating surfaces for slip marks and fretting corrosion in order to identify possible operation-related overloads and determine the cause. In such cases, take appropriate corrective measures before reinstallation.

8.3 Disassembly of coupling hubs F | H (with taper locking bushes)

Take appropriate measures to prevent coupling components from falling, which may occur as a result of loosening the taper locking connection.

Move the driving side and driven side apart so that sufficient space remains for disassembling the hubs.

Remove all fastening screws of the taper locking bushes.

- For F hubs, these screws must be loosened from the shaft-end side
- For H hub versions, they are removed from the rear side of the hub.

Insert the previously removed screws into the designated pull-off threaded holes (see Figure 12 and Figure 13; marked in black).

Using a torque wrench, tighten the screw or screws gradually and alternately until the taper locking bush has completely released from the hub seat.

Avoid tightening the screws on one side only, especially for taper locking bushes from size 3525 onwards, in order to prevent damage to the hub and the taper locking bush.

Remove all coupling components.

Before reinstallation, inspect all components for possible damage.

9 Commissioning

Before actual commissioning of the coupling, as well as after initial installation and after all maintenance work, first carry out a short trial run.



- Avoid operating the coupling under impermissibly high vibration levels of the system in accordance with DIN ISO 10816-3 and avoid operation in resonance ranges.
- During the trial run, verify that the dynamic displacement values specified in Figure 15 and Table 7 are complied with under all intended operating conditions and operating speeds.
- If, during the trial run, it is determined that the dynamic misalignment and operating limit values (Δk_a , Δk_r , and Δk_w) are not complied with, the alignment condition must be checked, and the radial misalignment (P) in combination with the angular misalignment (TIR) must be further reduced.
- The individual specifications for the permissible dynamic displacements (Δk_a , Δk_w , Δk_r according to Table 7) shall not be fully utilized simultaneously.
- In this case, RPT recommends utilizing only 50% of the individual limit values in order to achieve optimal performance and service life of the tyre.

10 Operation

For continuous operation of the coupling, it shall be ensured that the coupling is always operated within the scope of the designed application.

Therefore, any change in operating conditions or operating parameters makes a reevaluation of the coupling design mandatory.



Pay attention during operation of the coupling to changes in running noise and vibrations.

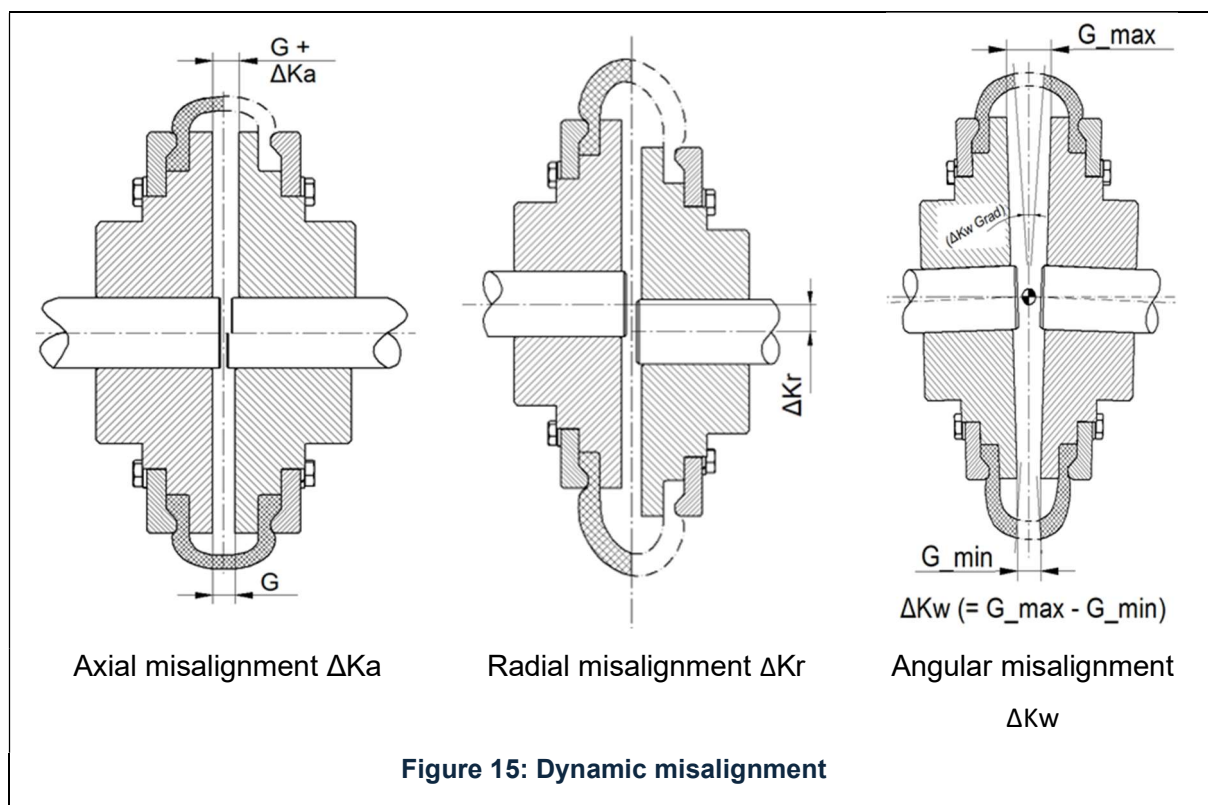
Check compliance with the dynamic displacement limits (Δk_a , Δk_w , Δk_r) in accordance with Table 7, using appropriate measures.

Also pay attention to significant changes compared to the conditions at commissioning.

If unusually high deviations are detected during operation of the coupling, switch off the drive immediately!

Identify the cause of the malfunction using Table 14 below and eliminate it.

For troubleshooting and corrective actions, all machine components and operating conditions must be taken into account.



11 Inspection and Periodic Maintenance

11.1 Maintenance

During routine monitoring or maintenance work, check the following:



- Check the condition of the tyre. Permanent deformation of the tyre or individual cracks in the tyre requires its replacement.
- Check the tightening torques of all bolted connections in accordance with Table 5, Table 9, and Table 12.
- If damage to individual components is detected, they must be replaced.
- Use only original spare parts to ensure reliable operation of the coupling.
- Check the alignment of the coupling in accordance with Table 11.

11.2 Inspection and maintenance intervals

For all maintenance activities, observe the occupational safety instructions, see Chapter 3.

Once per year, the misalignments acting on the coupling, the tightening torques of the bolted connections, and the condition of the tyre shall be checked.

If damage to the tyre is already detected during the initial inspection, first verify whether a possible cause according to Table 14 applies.

Carry out inspections and maintenance work at the specified intervals.

The inspection interval may be adjusted by the operator based on available operating experience and in coordination with other routine maintenance activities.

Under special operating conditions, the maintenance intervals may be extended by the operator.

Table 13: Inspection and maintenance intervals

Industry II 2G / II 2D		
1. Inspection	After 14 days	• Check the tightening torques of the tyre clamping connection. • Also verify whether any loosening or slippage can be detected between the taper locking bush and the hub, as well as at the clamping connection between the tyre and the hub. • Check, based on the measurement records or the applied position markings, that no slippage has occurred compared to the initial installation. • Ensure that all designated grounding connections and equipment bonding connections are securely fastened.
1. Maintenance	After 3 months	• Repeat the inspection measures performed during the initial inspection. • Inspect the tyre for signs of wear, cracks, damage, or permanent deformation. • If damage is detected, the damaged parts must be replaced, and the cause of the damage must be identified. • Inspect and remove any dust deposits from the coupling.
2. Maintenance	After 6 months	• Repeat the maintenance and initial inspection measures. • If significant dust deposits are detected, it is necessary to check that they have not penetrated into the interior of the tyre. For this purpose, the tyre must be disassembled and the dust removed. • If surface-covering dust accumulations are found inside the tyre, they must be removed and

		immediate measures must be taken to prevent future ingress of dust.
Any further maintenance	Once a year	• Repeat the measures of the second maintenance inspection. • Check the alignment of the coupling as well as the secure seating of all hubs and fastening elements. • If deviations are detected, determine the cause of the deviations and correct them. • Check the measures for preventing deposits, in particular inside the tyre. • If damage is detected, the damaged parts must be replaced, and the cause of the damage must be identified.

12 Malfunctions and their Possible Causes

Table 14: Malfunctions and their Possible Causes

Malfunction	Probable causes	Hazard warning	Corrective actions
Noisy running / vibrations	Alignment error	Tyre tearing and detaching from the clamping hub. Tyre rubs against the guard. Components are damaged.	• Switch off the drive. • Eliminate the cause of the misalignment. • Realign the coupling. • Inspect the tyre for damage such as cracks, bulging, or similar defects and replace it if necessary.
	Incomplete attachment of the tyre to the hub or clamping ring.	Tyre tearing and detaching from the clamping hub.	• Switch off the drive. • Inspect the coupling components for damage and replace them if necessary. • Check the alignment. • Check the tightening torques at the clamping ring. • Secure the clamping screws with Loctite.
	Imbalance	Loosening, slipping of the shaft-hub connection.	• Switch off the drive. • Check the balance condition of the system components and correct it if necessary. • Check that all components are completely installed (including the key). • Inspect the tyre for damage, such as cracks, bulging, or similar defects, and replace it if necessary.
	The screw connection between the clamping ring and the tyre is loose.	Loosening of the tyre.	• Switch off the drive. • Inspect the coupling components for damage and replace them if necessary. • Check the alignment of the coupling.

			Check the tightening torque and retighten if required.
	Loosening of the F/H hub	Sliding movement between the hub, shaft, and taper bushing.	- Switch off the drive. - Inspect the coupling components for damage and replace them if necessary. - Check the tightening torque and retighten if required.
	Operation of the coupling in the resonance range.	Loosening, slipping of the shaft-hub connection.	- Block critical speed ranges. - Eliminate critical excitation frequencies. - A new coupling design / reselection is required.
Damage to the tyre	Unacceptable high displacement and deformation of the tyre.	Loosening and slipping off the tyre.	- Switch off the drive. - Eliminate the cause of the misalignment. - Realign the coupling. - Check the condition of the tyre. - Replace the tyre if necessary.
	Overloading due to very high shock torques	Loosening and slipping off the tyre.	- Switch off the drive. - Review the coupling design in cooperation with RPT. - Replace the coupling. - Install a larger coupling if necessary.
	Contact with aggressive media	Loosening of the tyre.	- Switch off the drive. - Inspect the coupling components for damage and replace them if necessary. - Replace the tyre or change the tyre material. - Prevent contact with aggressive media.

	High torsional vibrations in the drive train	Loosening of the tyre. Local overheating of the tyre.	• Switch off the drive. • Analyze and eliminate the cause of torsional vibrations or resonances. • Inspect all coupling components for damage and replace them if necessary. • Check the alignment of the coupling.
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13 Disposal



When disposing of coupling parts, observe the locally applicable legal regulations.

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