

Mounting Instructions

Belt Driven Centrifugal Fans

with deep groove ball bearing, self-aligning bearing or swivel-joint roller bearing

(Translation of the Original)

MA-CFB_BEARING 4.3 – 11/2014

		<p>RZR</p>
		<p>VZR TZR</p>
		<p>RER</p>

Mounting Instructions

Deep groove ball bearing
 a) with profile strut support
 b) with tubular strut support

a)
 RZR 11-0200/-1000
 RZR 12-0200/-0710
 TZR B1-0160/-0710
 TZR B2-0160/-0710
 VZR 71-0200/-0560

b)
 RZR 11-0200/-0710 IWN
 RZR 12-0200/-0710 IWN
 RZR 19-0200/-0355 (IWN)



The greased deep groove ball bearings sealed on both sides are designed for a nominal service life (L_{10h} according to DIN ISO 281-1) of 20,000 respectively 40,000 operating hours. Maintenance must be carried out according to the chapter on upkeep/maintenance in the RZR / RER operating instructions. **If it is required to change the bearings, the safety instructions stipulated in the RZR / RER operating instructions must be followed without fail!**

General information

To expose the fan bearings, various dismantling work (e.g. disconnection from the mains, belt drive, protective and monitoring devices, ducts), must be performed in compliance with the safety and accident protection regulations and the local and structural conditions.

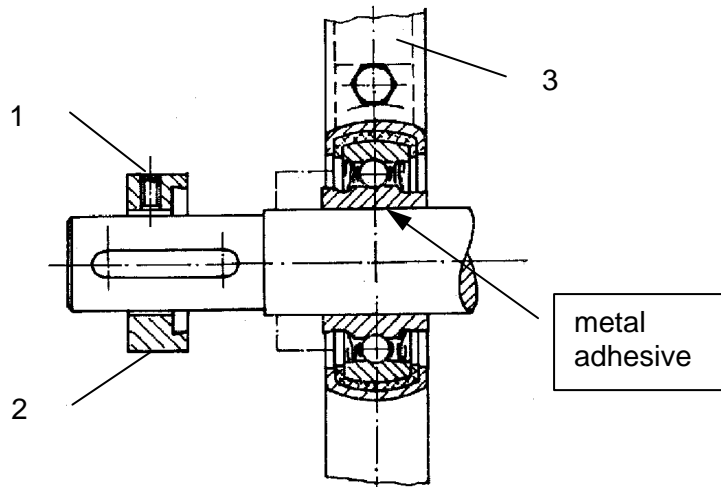
Dismounting the bearing

1. Unscrew the locking screw (1), unscrew the eccentric clamping ring (2) against the direction of rotation of the running wheel and remove it.
2. Prop and secure running wheel or shaft
3. a) Dismount profile strut support (3), Remove rubber insulating ring and pull the bearing off the inner ring with a suitable tool (Warming the bearings up to 200°C facilitates dismantling substantially, is however not necessarily required).
3. b) Loosen the bearing pipe fastening on the housing and pull off the complete bearing support and bearing with a suitable tool. (Warming the bearings up to 200°C facilitates dismantling substantially, is however not necessarily required).

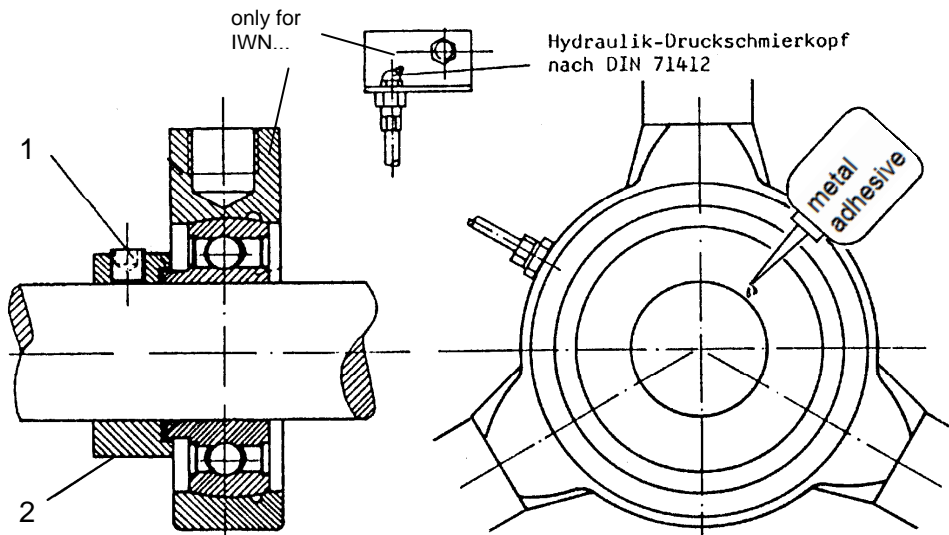
Mounting the bearing

1. Clean the seat of the roller bearing on the shaft and the inner ring of the bearing thoroughly and remove the grease from them with fat dissolving agents (petroleum benzene, etc.).
2. Push pre-assembled supporting unit (star-shaped support and bearing) on the shaft and fasten it to the housing. Apply drops of adhesive to the seat of the bearing.
3. Adjust the air gap between the fan wheel and the inlet nozzle.
4. After adjustment apply drops of adhesive between the inner ring of the bearing and the shaft as shown in the drawing.
5. Push the eccentric clamping ring (2) on the shaft and tighten it with the bearing in the direction of rotation of the running wheel with a light jarring blow, tighten the locking screw (1). The hardening time of the adhesive depends on the temperature, it takes approx. 24 h at +20°C.

a)



b)



Mounting Instructions

Self-aligning bearing
with cast housing and tubular strut support

RZR 15-0400/-1000 (IWN)
RZR 19-0400/-1000 (IWN)
TZR B5-0400/-1000 (IWN)

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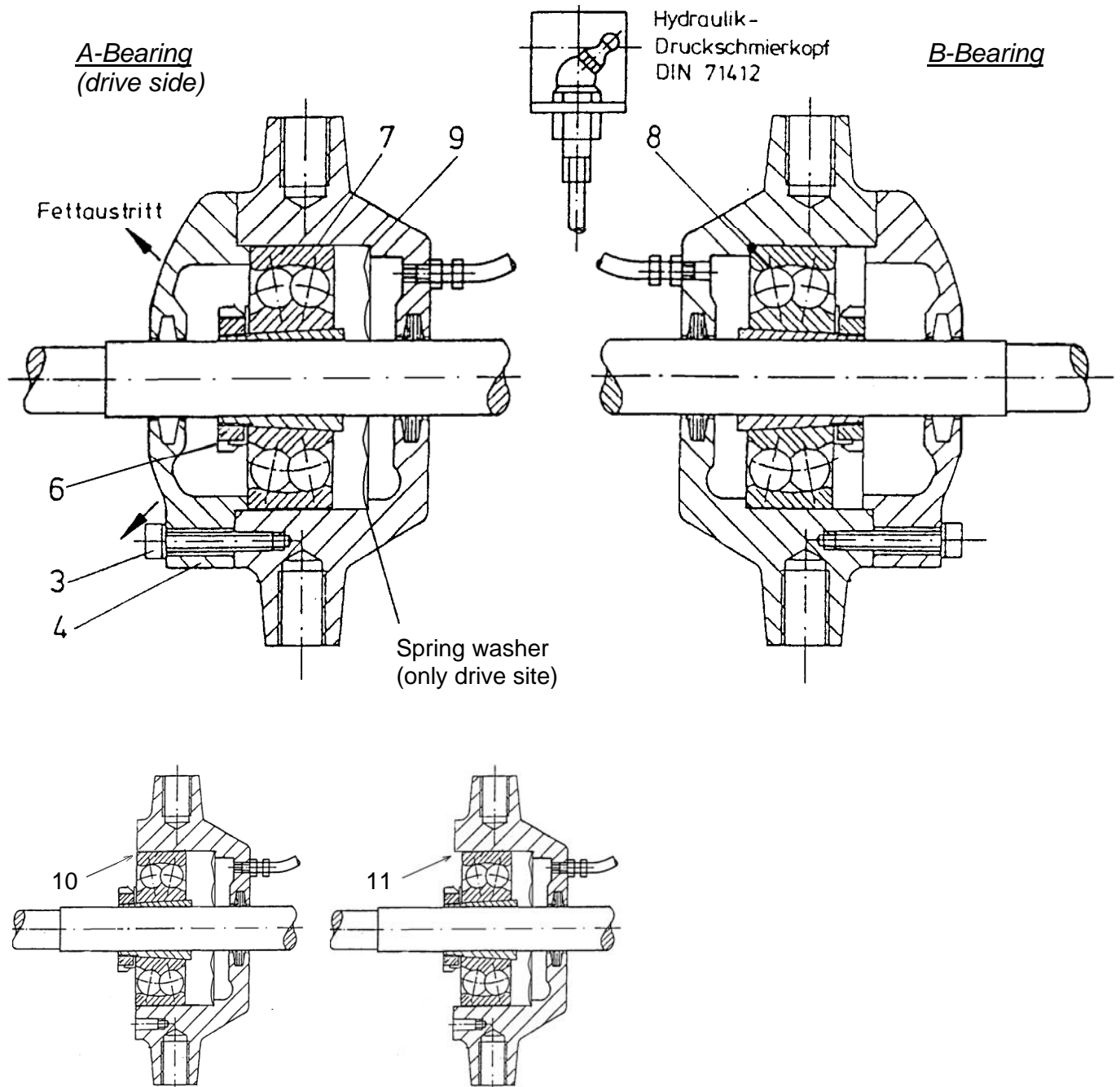
The built-in self-aligning bearings with clamping sleeve are designed for a nominal service life (L_{10h} according to DIN ISO 281-1) of 20,000 respectively 40,000 operating hours. Maintenance must be carried out according to the chapter on upkeep/maintenance in the RZR / RER operating instructions. **If it is required to change the bearings, the safety instructions stipulated in the RZR / RER operating instructions must be followed without fail!**

General info

To expose the fan bearings, various dismantling work (e.g. disconnection from the mains, belt drive, protective and monitoring devices, ducts), must be performed in compliance with the safety and accident protection regulations and the local and structural conditions.

Dismounting the bearing

1. Unscrew the bearing cover fastening screws (3) and remove the bearing cover (4)
2. Bend up the safety plate of the sleeve nut and loosen the sleeve nut (6) (approx. 2-3 rotations) until the front face is flush with the clamping sleeve
3. Set blow cap or pipe section against the sleeve nut and loosen the clamping sleeve with jarring blows
4. Prop and secure running wheel or shaft
5. Unscrew the star-shaped support fastening off the fan housing and remove star-shaped support.
Now the bearing can be replaced.



Mounting Instructions

Self-aligning bearing
with cast housing and tubular strut support

RZR 15-0400/-1000 (IWN)
RZR 19-0400/-1000 (IWN)
TZR B5-0400/-1000 (IWN)

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- Mounting the bearing** The bearings are accordingly mounted in the reverse order, it must be ensured that the components are absolutely clean.
- Centre the covering of the inlet ring and running wheel
 - For re-greasing the bearings see following section
1. The bearings are mounted so that a floating layout is created.
 2. The B-bearing abuts the inner collar of the housing at (8) with the shoulder of the outer ring.
 3. To the A-bearing is a spring washer (9) attached that can execute a spring range of ~3mm.
 4. The A-bearing should line up precisely with the bearing housing (10). When tightening, the bearing moves about 0,4mm towards inside (11). With the housing cover, the bearing is pushed further by around 1,5mm inwards into the bearing housing.
 5. The bearing clearance must be set at the same time that the bearing is fastened to the shaft. To ensure that the bearing lifespan is long, special care must be taken here!
In order to avoid premature damage, please note the following:
 - Do not subject the bearing mounting to knocks and blows!
 - The tightening methods of the different manufacturers must not be interchanged!
 Tighten the sleeve nut as per the following two steps:
 - **Step 1:** The sleeve nut must be evenly tightened until the shaft, the sleeve and the inner ring of the bearing are as close together as possible (interlocking) (look for the so-called "fixed point").
 For FAG bearings this point is reached when the sleeve nut is tightened with a defined torque. To do this, you will however need the special tool supplied by FAG. When using the "standard tool" other tightening torques than those for the original FAG tool apply! (Note the differences in Table 1!)
 - **Step 2:** Depending on the fan or the bearing size, the sleeve nut is tightened as stated in Table 1. As this process results in the necessary bearing clearance, this process must be undertaken with care.
 - The procedures and tightening values must be observed as given by the bearing manufacturer. It is not permitted to exchange one process for the other!
 - Only the approved tools must be used to tighten the locknut, e.g. hook spanner, hydraulic nut, etc. It is not permitted to tighten the locknut with a mandrel or hammer and chisel!
 6. Secure the sleeve nut (bend back a tab of the safety plate)



Never turn sleeve nuts back to secure them! Always continue to turn them in the tightening direction until a tab of one the nuts can be bent backwards.

Lubrication

Lubrication must always be undertaken with the recommended quality lubricant (see the RZR Operating Instructions).

- Fill the hollows of the self-aligning bearings completely with lubricant.
- Fill the bearing housing half (50%) with lubricant.

Table 1

Fan RZR ..-	Bearing Type	Bearing clearance C3 - Before mounting [µm]		SKF bearing	SNR bearing	FAG bearings			
		min.	max.	Tightening angle α	Tightening angle α	Step 1: Tightening torque		Step 2: Angle	
						FAG tool	Torque tool	+ Tightening angle α	
0400 / 0450 / 0500	2307 K/C3 + H 2307	Self-aligning bearing	29	46	70°	80°	35 Nm	38 Nm	+ 66°
0560 / 0630	2309 K/C3 + H 2309		33	52	70°	80°	58 Nm	61 Nm	+ 72°
0710 / 0800	2311 K/C3 + H 2311		41	61	75°	100°	93 Nm	100 Nm	+ 66°
0900 / 1000	2313 K/C3 + H 2313		50	75	80°	100°	97Nm	107 Nm	+ 80°
TZR B5-		Self-aligning bearing							
0400 / 0450 / 0500	2307 K/C3 + H 2307		29	46	70°	80°	35 Nm	38 Nm	+ 66°
0560 / 0630	2309 K/C3 + H 2309		33	52	70°	80°	58 Nm	61 Nm	+ 72°
0710 / 0800	2311 K/C3 + H 2311		41	61	75°	100°	93 Nm	100 Nm	+ 66°
0900 / 1000	2313 K/C3 + H 2313	50	75	80°	100°	97Nm	107 Nm	+ 80°	

When mounting new bearing components, observe the enclosed instruction manual and, where applicable, the instructions and values provided by the respective manufacturer!

Mounting Instructions

Self-aligning bearing
with clamping sleeve and cast housing

RZR 13-0400/-1600 (IWN)
RER 13-0200/-1600 (IWN)
RER 17-0200/-1000 (IWN)

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The built-in self-aligning bearings with clamping sleeve are designed for a nominal service life (L_{10h} according to DIN ISO 281-1) of 20,000 respectively 40,000 operating hours. Maintenance must be carried out according to the chapter on upkeep/maintenance in the RZR / RER operating instructions. **If it is required to change the bearings, the safety instructions stipulated in the RZR / RER operating instructions must be followed without fail!**

General information

To expose the fan bearings, various dismantling work (e.g. disconnection from the mains, belt drive, protective and monitoring devices, ducts), must be performed in compliance with the safety and accident protection regulations and the local and structural conditions.

Dismounting the bearing

1. Dismount bearing housing cover (1)
2. Bend up the safety plate of the sleeve nut and unscrew the sleeve nut (2) (approx. 2-3 rotations) until the front face is flush with the clamping sleeve.
3. Set blow cap or pipe section against the sleeve nut and loosen the clamping sleeve with jarring blows axial and radial released bearings can also be hammered from the clamping sleeve.
4. Unscrew fastening screws on the bottom part of the bearing housing
5. Prop and secure running wheel or shaft
6. Remove the bottom part of the bearing housing with the bearing off the shaft.

Mounting the bearing

The bearings are accordingly mounted in the reverse order, it must be ensured that the components are absolutely clean
- Centre the covering of the inlet ring and running wheel

Do not switch or twist the upper and lower parts of the cast casing! Mark the upper and lower shell before dismantling



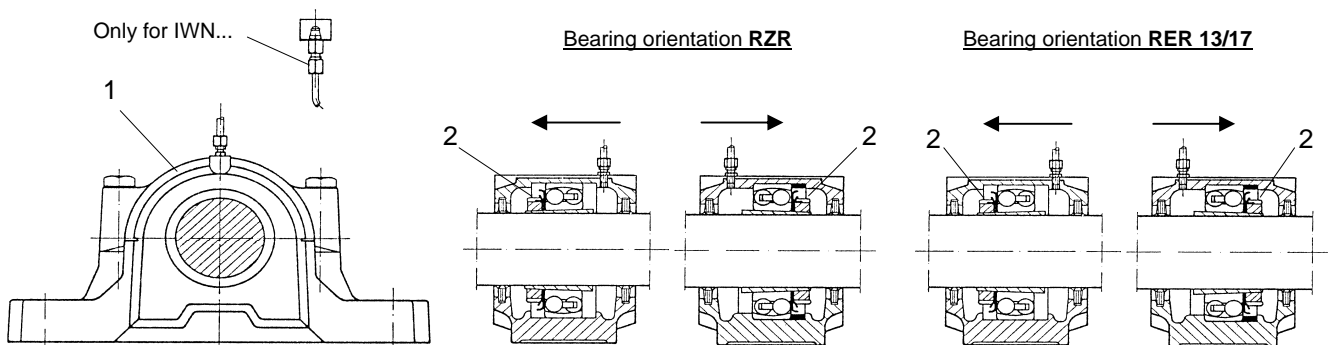
1. Designate one of the bearing as a fixed bearing by fitting a fixed ring, preferably on the drive side.
Do not insert any fixed rings on the floating bearing side!
2. The bearing clearance must be set at the same time that the bearing is fastened to the shaft. To ensure that the bearing lifespan is long, special care must be taken here!
In order to avoid premature damage, please note the following:
 - Do not subject the bearing mounting to knocks and blows!
 - The tightening methods of the different manufacturers must not be interchanged!
 Tighten the sleeve nut as per the following two steps:
 - **Step 1:** The sleeve nut must be evenly tightened until the shaft, the sleeve and the inner ring of the bearing are as close together as possible (interlocking) (look for the so-called "fixed point").
For FAG bearings this point is reached when the sleeve nut is tightened with a defined torque. To do this, you will however need the special tool supplied by FAG. When using the "standard tool" other tightening torques than those for the original FAG tool apply! (Note the differences in Table 2+3!)
 - **Step 2:** Depending on the fan or the bearing size, the sleeve nut is tightened as stated in Table 2+3. As this process results in the necessary bearing clearance, this process must be undertaken with care.
 - The procedures and tightening values must be observed as given by the bearing manufacturer. It is not permitted to exchange one process for the other!
 - Only the approved tools must be used to tighten the locknut, e.g. hook spanner, hydraulic nut, etc. It is not permitted to tighten the locknut with a mandrel or hammer and chisel!
3. Secure the sleeve nut (bend back a tab of the safety plate)
Never turn sleeve nuts back to secure them! Always continue to turn them in the tightening direction until a tab of one the nuts can be bent backwards.
4. Tighten the connecting bolts of the upper and lower part of the casing with the torque given in Table 2+3.



Lubrication

Lubrication must always be undertaken with the recommended quality lubricant (see the RZR / RER Operating Instructions).
- Fill the hollows of the self-aligning bearings completely with lubricant.
- Fill the bearing housing half (50%) with lubricant.

Standard and IWN



Mounting Instructions

Self-aligning bearing
with clamping sleeve and cast housing

RZR 13-0400/-1600 (IWN)
RER 13-0200/-1600 (IWN)
RER 17-0200/-1000 (IWN)

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Table 2 (only for RZR)

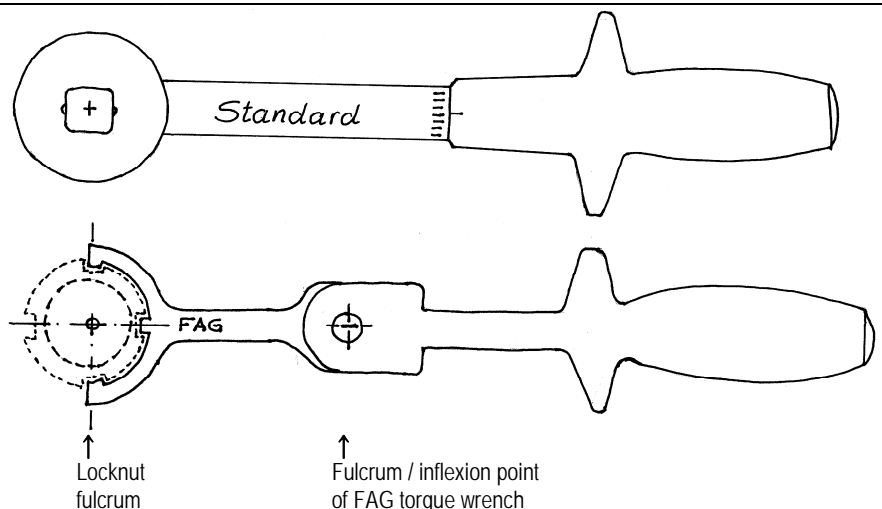
Fan-Size	Bearing Type	Bearing Type	Bearing clearance C3 before mounting [µm]		Radial internal clearance in mm	Bearing housing type	Tightening torque Connecting bolts Cast casing	SKF-bearing Tightening angle α	SNR-bearing Tightening angle α	FAG bearing		
			min.	max.						Step 1: Tightening torque		Step 2: Angle
									FAG tool	Torque tool	+ Tightening angle α	
RZR 0400 RZR 0450 RZR 0500	2307 K/C3 + H 2307	Self-aligning bearing	29	46		SKF: SNL 508-607 TG SNR: SNC 508-607 FAG: SNV 080-L	=> 50Nm / M10 => 65Nm / M12 => 36Nm / M10	70°	80°	35 Nm	38 Nm	+ 66°
RZR 0560 RZR 0630	2309 K/C3 + H 2309		33	52		SKF: SNL 511-609 TG SNR: SNC 511-609 FAG: SNV 100-L	=> 80Nm / M12 =>150Nm / M16 => 61Nm / M12	70°	80°	58 Nm	61 Nm	+ 72°
RZR 0710 RZR 0800	2311 K/C3 + H 2311		41	61		SKF: SNL 513-611 TG SNR: SNC 513-611 FAG: SNV 120-L	=> 80Nm / M12 =>150Nm / M16 => 61Nm / M12	75°	100°	93 Nm	100 Nm	+ 66°
RZR 0900 RZR 1000	2313 K/C3 + H 2313		50	75		SKF: SNL 516-613 TG SNR: SNC 516-613 FAG: SNV 140-L	=> 80Nm / M12 =>290Nm / M20 => 61Nm / M12	80°	100°	97 Nm	107 Nm	+ 80°
RZR 1120	22216 EK/C3 +H316	Self-aligning bearing	95	120	0,03 to 0,04	SKF: SNL 516-613 TG SNR: SNC 516-613 FAG: SNV 140-L	=> 80Nm / M12 =>290Nm / M20 => 61Nm / M12	130° Control value: 0,04	Tighten the sleeve nut according to the column "Radial internal clearance"; play 0,045-0,08 Control value for the lowest radial play: 0,04mm			
RZR 1250	22218 EK/C3 +H318		110	140	0,04 to 0,05	SKF: SNL 518-615 TG SNR: SNC 518-615 FAG: SNV 160-L	=>150Nm / M16 =>290Nm / M20 =>150Nm / M16	150° Control value: 0,05	Tighten the sleeve nut according to the column "Radial internal clearance"; play 0,05 ... 0,095 Control value for the lowest radial play: 0,05mm			
RZR 1400 RZR 1600	22220 EK/C3 +H320		110	140	0,045 to 0,06	SKF: SNL 520-617 TG SNR: SNC 520-617 FAG: SNV 180-L	=>200Nm / M20 =>500Nm / M24 =>301Nm / M20	150° Control value: 0,05				

When mounting new bearing components, observe the enclosed instruction manual and, where applicable, the instructions and values provided by the respective manufacturer!

CAUTION!

As the types of the FAG and the "standard" torque wrench differ, the correct torque values as mentioned in Step 1 of the bearing fitting must be used!
It is not permitted to interchange the processes.

For the FAG tool the centre of the locknut and the torque of the release mechanism are not identical.
This results in different leverages, and therefore, settings, for both torque wrenches



Mounting Instructions

Self-aligning bearing
with clamping sleeve and cast housing

RZR 13-0400/-1600 (IWN)
RER 13-0200/-1600 (IWN)
RER 17-0200/-1000 (IWN)

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Table 3 (only for RER)

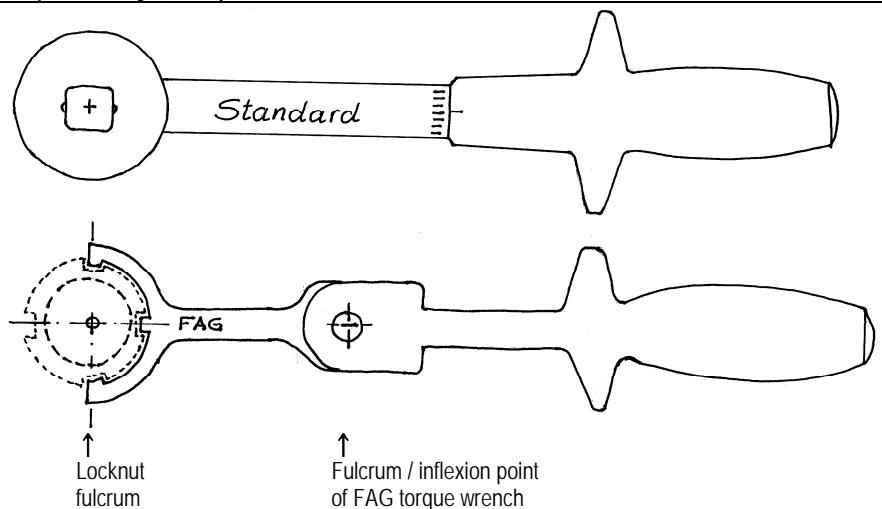
Fan-Size	Bearing type	Bearing Type	Bearing clearance C3 Before mounting [µm]		Radial internal clearance in mm	Bearing housing type	Tightening torque connecting bolt cast casing	SKF-Bearing Tightening angle α	SNR-Bearing Tightening angle α	FAG- Bearing		
			min.	max.						FAG tool	Torque tool	Tightening angle α
RER 0200 RER 0225 RER 0250	2306 K/C3 + H2306	Pendel - Kugel - Lager	23	39		SKF SNL 507-606 TG => 50Nm / M10 SNR SNC 507-606 => 65Nm / M12 FAG SNV 72-L => 36Nm / M10	55°	80°	35 Nm	37 Nm	+ 54°	
RER 0280 RER 0315 RER 0355 RER 0400 RER 0450 RER 0500	2307 K/C3 + H 2307		29	46		SKF SNL 508-607 TG => 50Nm / M10 SNR SNC 508-607 => 65Nm / M12 FAG SNV 080-L => 36Nm / M10	70°	80°	35 Nm	38 Nm	+ 66°	
RER 0560 RER 0630 RER 0710	2309 K/C3 + H 2309		33	52		SKF SNL 511-609 TG => 80Nm / M12 SNR SNC 511-609 => 150Nm / M16 FAG SNV 100-L => 61Nm / M12	80°	80°	58 Nm	61 Nm	+ 72°	
RER 0800 RER 0900 RER 1000	2311 K/C3 + H 2311		41	61		SKF SNL 513-611 TG => 80Nm / M12 SNR SNC 513-611 => 150Nm / M16 FAG SNV 120-L => 61Nm / M12	75°	100°	93 Nm	100 Nm	+ 66°	
RER 1120	22213 CCK/C3 +H2313	Pendel - Rollen - Lager	75	95	0,03 to 0,04	SKF SNL 516-613 TG => 80Nm / M12 SNR SNC 516-613 => 290Nm / M20 FAG SNV 140-L => 61Nm / M12	110° Control value: 0,04	Tighten the sleeve nut according to the column "Radial internal clearance"; play 0,035 ... 0,065 Control value for the lowest radial play: 0.035mm				
RER 1250	22216 CCK/C3 +H316		95	120	0,04 to 0,05	SKF SNL 516-613 TG => 80Nm / M12 SNR SNC 516-613 => 290Nm / M20 FAG SNV 140-L => 61Nm / M12	130° Control value: 0,04	Tighten the sleeve nut according to the column "Radial internal clearance"; play 0,045-0,08 Control value for the lowest radial play: 0,04mm				
RER 1400 RER 1600	22218 EK/C3 +H318		110	140	0,045 to 0,06	SKF SNL 518-615 TG => 150Nm / M16 SNR SNC 518-615 => 290Nm / M20 FAG SNV 160-L => 150Nm / M16	150° Control value: 0,05	Tighten the sleeve nut according to the column "Radial internal clearance"; play 0,05 ... 0,095 Control value for the lowest radial play: 0,05mm				

When mounting new bearing components, observe the enclosed instruction manual and, where applicable, the instructions and values provided by the respective manufacturer!

CAUTION!

As the types of the FAG and the "standard" torque wrench differ, the correct torque values as mentioned in Step 1 of the bearing fitting must be used!
It is not permitted to interchange the processes.

For the FAG tool the centre of the locknut and the torque of the release mechanism are not identical.
This results in different leverages, and therefore, settings, for both torque wrenches!



Mounting Instructions

RER 11-0200/-0710

RER 12-0200/-0710

RER 15-0400/-0710

Deep groove ball bearing with sheet metal flange sheet metal strut fastening

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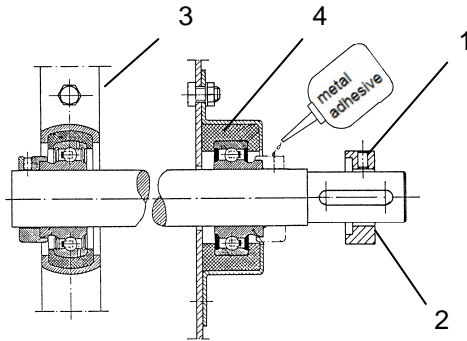


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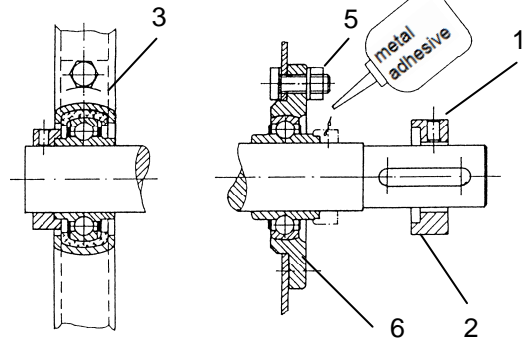
General information

The greased deep groove ball bearings sealed on both sides are designed for a nominal service life (L_{10h} according to DIN ISO 281-1) of 20,000 respectively 40,000 operating hours. **If it is required to change the bearings, the safety instructions stipulated in the RZR / RER operating instructions must be followed without fail!**

To expose the fan bearings, various dismantling work (e.g. disconnection from the mains, belt drive, protective and monitoring devices, ducts), must be performed in compliance with the safety and accident protection regulations and the local and structural conditions.



0200/-0355



0400/-1000

Dismounting the bearing 1. Unscrew the locking screw (1), unscrew the eccentric clamping ring (2) against the direction of rotation of the running wheel and remove it.

Bearing on intake side (0200/-1000)

2. Dismount profile strut support (3).

3. Remove rubber insulating ring and pull the bearing off the inner ring with a suitable tool (Warming the bearings up to 200°C facilitates dismantling substantially, is however not necessarily required).

Bearing on drive end (0200/-355)

4. Dismount the flange housing (4), remove the rubber insulating ring and pull off the bearing

Bearing on drive end (0400/-1000)

5. Loosen the nuts of the screws (5). Screw 2 screws M10×30 into the empty drill holes M10 in the housing, push back the housing so that a three-armed extractor can be set on it. Set the extractor on the cast housing (6) and pull off the cast housing with the bearing.

Mounting the bearing

1. Clean the seat of the roller bearing on the shaft and the inner ring of the bearing thoroughly and remove the grease from them with fat dissolving agents (petroleum benzine, etc.).
2. Push pre-assembled supporting unit on the shaft and fasten it to the housing. Apply drops of adhesive to the seat of the bearing.
3. Adjust the air gap between the fan wheel and the inlet nozzle.
After adjustment apply drops of adhesive between the inner ring of the bearing and the shaft as shown in the drawing.
4. Push the eccentric clamping ring (2) on the shaft and tighten it with the bearing in the direction of rotation of the running wheel with a light jarring blow, tighten the locking screw (1). The hardening time of the adhesive depends on the temperature, it takes approx. 24 h at +20°C.

NICOTRA | **Gebhardt**
fan|tastic solutions

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