

Bottom Bracket Bearing BBRS

Sensor bottom bracket bearing for e-bikes and pedelecs

Foreword

The performance capability and range of e-bikes und pedelecs are determined to a significant extent by the components used.

FAG has decades of experience in the development and production of bicycle bottom bracket bearings, which can be seen once again in the sensor bottom bracket bearing BBRs.

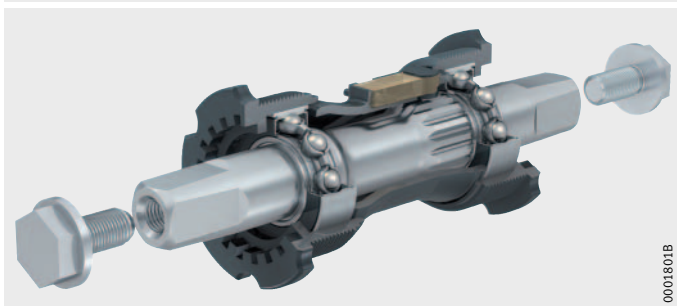
As a result, e-bikes and pedelecs fitted with the sensor bottom bracket bearing have a technical advantage and greater market acceptance.

FAG sensor bottom bracket bearings have a high load carrying capacity, are of a ready-to-fit design and can be fitted easily.

Product overview **Sensor bottom bracket bearing BBR5**

Sensor bottom bracket bearing

BBR5



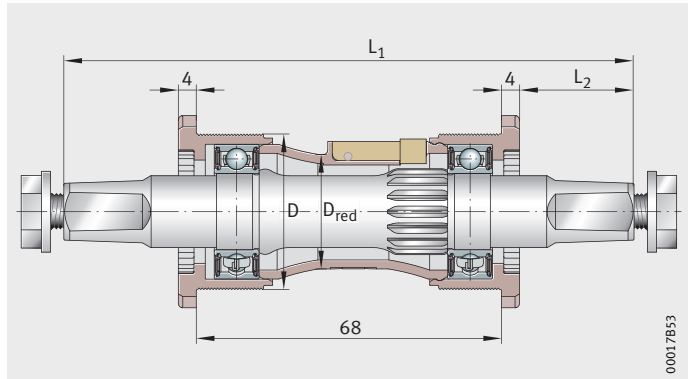
Sensor bottom bracket bearing BBRS

Features

The sensor bottom bracket bearing BBRS fulfils the requirements in accordance with DIN EN 14764. Due to the smaller housing diameter at the centre of the bearing, there is more space available for lighting cables. The bottom bracket bearing is available as standard in the spindle lengths 119 mm, 122,5 mm and 127 mm. The pedal cranks are fixed to the spindle using two screws M8×1 of grade 10.9. The bottom bracket bearing has a mass of 271 g.

$D = 1,37''$
 $D_{red} = 25,5 \text{ mm}$

Figure 1
 Sensor bottom bracket bearing BBRS



The spindle of the bottom bracket bearing BBRS has a conical square section 12,63 mm to the Japanese standard (JIS) on both sides.

Designs

Bottom bracket bearing	Spindle lengths	
	L_1 mm	L_2 mm
BBRSBSA-JIS119/23	119	23
BBRSBSA-JIS122,5/24	122,5	24
BBRSBSA-JIS127/25,5	127	25,5

Sensor bottom bracket bearing BBRS

The sensor bottom bracket bearing BBRS is based on the bottom bracket bearing BB29. It measures the direction and angle of rotation by non-contact means in order to determine the speed. It is suitable for use in e-bikes and pedelecs.

Since the sensor functions are completely integrated in the bottom bracket bearing, the sensor is protected and no additional friction occurs. The connector of the sensor to the power supply allows easy handling.

The sensor bottom bracket bearing is characterised by:

- non-contact measurement of angle of rotation
- non-contact measurement of direction of rotation
- smooth-running design
- deep groove ball bearings sealed on both sides
- anti-corrosion protection
- FAG or Shimano® mounting device (DUAL Fix)
- more space for feeding cables.

Sensor bottom bracket bearing BBRS

Fitting requirements, technical data

A summary of the requirements for fitting and an overview of the technical data for the sensor bottom bracket bearing are given below.

Fitting requirements

The frame must have a BSA thread 1,37"×24:

- left hand thread on the chain ring side
- right hand thread on the non-chain ring side.

Technical data

For technical data on the bottom bracket bearing and sensor, see tables. Representation of sensor signal processing and an example circuit, *Figure 2* and *Figure 3*, page 5.

Sensor bottom bracket bearing

Features	Bottom bracket bearing BBRS	
Housing	Width	68 mm
	Material	Glass fibre reinforced PA
	Finish	Black
Bottom bracket bearing thread	BSA 1,37"×24	
Minimum thread length	20 mm (each side)	
Crank mounting	JIS	
Spindle lengths	119 mm, 122,5 mm, 127 mm	
Mass	271 g	
Certification	DIN EN 14764	

Sensor

Features	Value		
Limit frequency	4 kHz		
Measurement range (theoretical)	0 min ⁻¹ to 15 000 min ⁻¹		
Pulses per revolution	16		
Output	Rotational angle signal	Low level	7 mA (5 mA to 8 mA)
		High level	14,5 mA (12 mA to 16,5 mA)
	Rotational direction signal	Forward	90 μs (76 μs to 104 μs)
		Reverse	45 μs (38 μs to 52 μs)
Cable	Number of strands	2 (unshielded)	
	Cable length	1 000 mm (other lengths optional)	
	Plug	Optional	
Current consumption	<20 mA		
Operating temperature	-40 °C to +85 °C		
Supply voltage	5 VDC to 18 VDC		

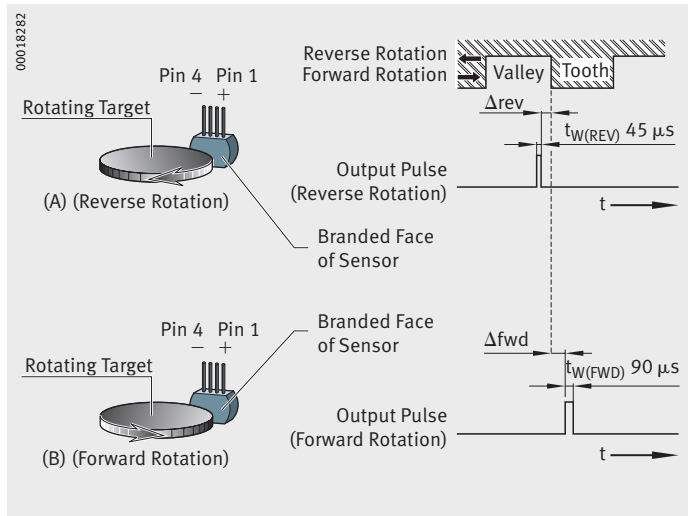


Figure 2
Signal processing in sensor

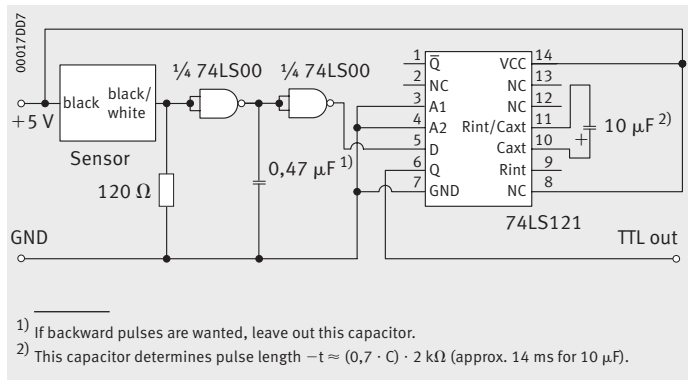


Figure 3
Example circuit for voltage signal

Tools and accessories

For the correct fitting of the sensor bottom bracket bearing in the frame, the following tools are available:

- bottom bracket bearing hand wrench (designation Z-564414-1071 MWKZ#K)
- bottom bracket bearing socket wrench (by agreement)
- pressing sleeve (by agreement)
- pressing ring (by agreement).

Sensor bottom bracket bearing BBRS

Design and safety guidelines

Mounting of sensor bottom bracket bearing BBRS



The mounting of the sensor bottom bracket bearing BBRS is described below. Please read the fitting instructions fully before carrying out any fitting work and observe the fitting guidelines.

Use the appropriate tools only. Do not use an impact wrench. Observe the tightening torque.

Scope of delivery

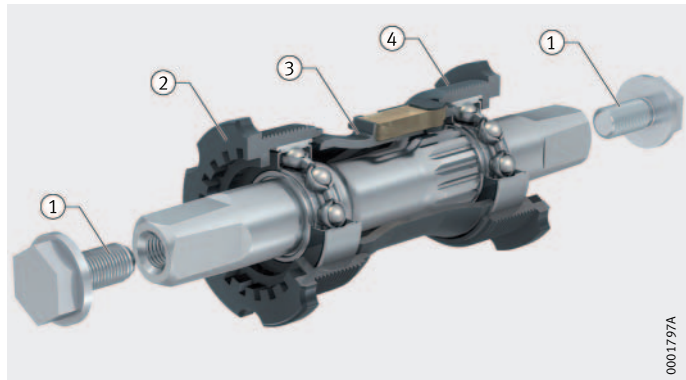
Before starting any fitting work, check that all parts in the scope of delivery are present.

The sensor bottom bracket bearing comprises:

- 1 sensor bottom bracket bearing with cable (cable length 1 000 mm)
- 1 bottom bracket bearing housing for chain ring side with snap-fit contour (left hand thread, marked LH)
- 1 bottom bracket bearing housing for non-chain ring side (right hand thread, marked RH)
- 2 screws M8×1 (grade 10.9).

- ① Screws M8×1
- ② Bottom bracket bearing housing for non-chain ring side (RH)
- ③ Sensor bottom bracket bearing
- ④ Bottom bracket bearing housing for chain ring side (LH)

Figure 4
Scope of delivery of sensor bottom bracket bearing BBRS



Tools

The sensor bottom bracket bearing must only be fitted using the appropriate tools.

Appropriate tools are:

- bottom bracket bearing hand wrench
- bottom bracket bearing wrench socket
- Shimano® bottom bracket wrench
- pressing sleeve
- pressing ring.

The sensor bottom bracket bearing unit can be pressed into the right hand crank sleeve using a vice or a lever press.

Fitting Check whether the thread in the frame is cleanly cut and free from paint. If necessary, clean the thread.
Check whether the frame tubes have any burrs in the area where cables will be fed. If necessary, remove the burrs.
Apply some grease or mounting paste to the threads of the bottom bracket bearing housing.
Screw in the bottom bracket bearing housing for the chain ring side (left hand thread) on the chain ring side by hand. The screwing-in direction is anticlockwise, *Figure 5*.

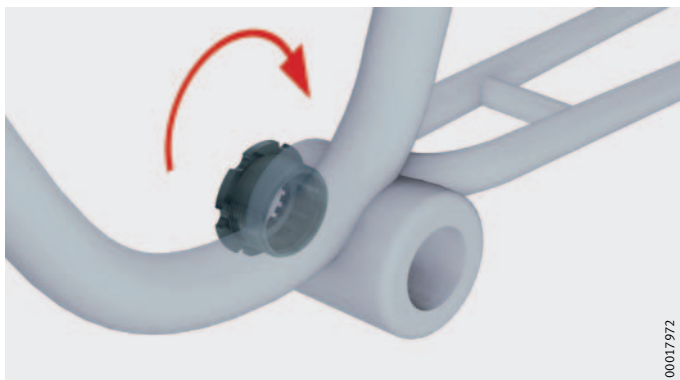


Figure 5
Screwing in the bottom bracket bearing housing on the chain ring side

Tighten the bottom bracket bearing housing for the chain ring side (left hand thread) using the bottom bracket bearing hand wrench or the bottom bracket bearing wrench socket, *Figure 6*.



Observe the tightening torque of 30 Nm.

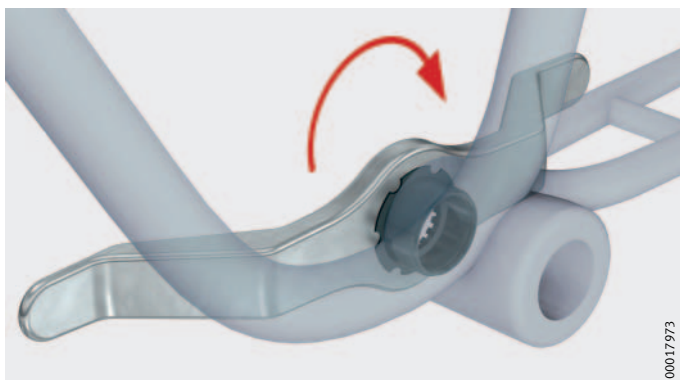


Figure 6
Tightening the bottom bracket bearing housing on the chain ring side using an bottom bracket bearing hand wrench

Sensor bottom bracket bearing BBRS

Guide the cable into the frame on the side opposing the chain ring and draw it through the frame. Secure the cable against slipping back.

Guide the sensor bottom bracket bearing into the frame, *Figure 7*.

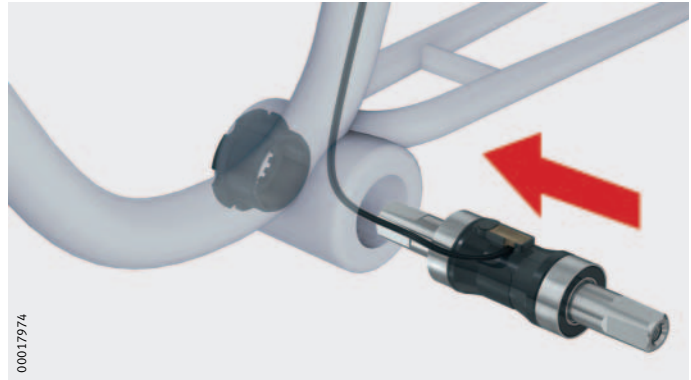


Figure 7
Guiding the sensor cable
and bottom bracket bearing
into the frame

Place the pressing ring for the chain ring side on the bottom bracket bearing housing.

Place the pressing sleeve on the outer ring of the sensor bottom bracket bearing, *Figure 8*.



Place the pressing sleeve only on the outer ring of the ball bearing so that the ball bearing is not damaged.

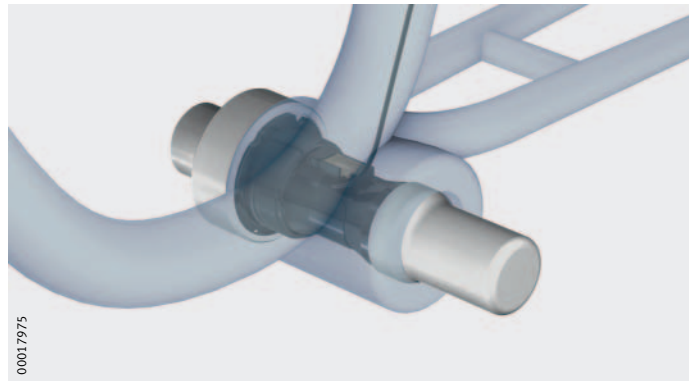


Figure 8
Placing the pressing sleeve

Clamp the frame in the vice or the lever press, *Figure 9*.

Press the bottom bracket bearing into the snap-fit contour of the right hand bottom bracket bearing housing using the pressing sleeve.

Open the vice or lever press and remove the frame.

Remove the pressing sleeve and the pressing ring from the sensor bottom bracket bearing.



Lightly pull on the bottom bracket bearing to check whether it is correctly engaged. **It must be axially secure.**

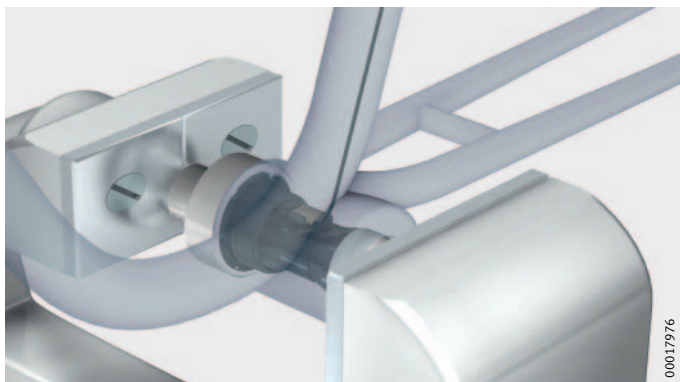


Figure 9
Clamp the frame in the vice

Screw in the bottom bracket bearing housing for the non-chain ring side (right hand thread) until the flange is in contact with the frame, *Figure 10*. The screwing-in direction is clockwise.

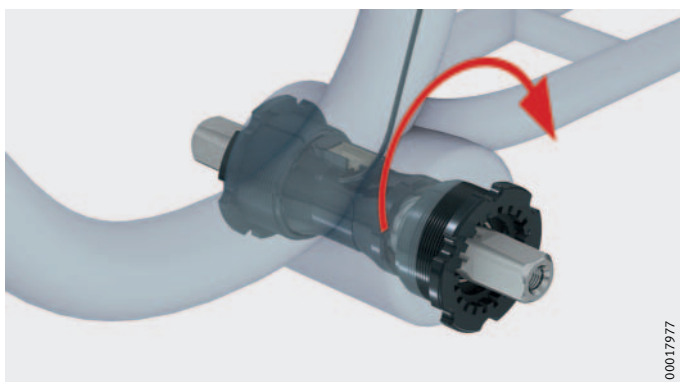


Figure 10
Screwing in the bottom bracket
bearing housing
on the non-chain ring side

Sensor bottom bracket bearing BBR5

Fully tighten the bottom bracket bearing housing for the non-chain ring side (right hand thread) using the bottom bracket bearing hand wrench or the bottom bracket bearing wrench socket, *Figure 11*.



Observe the tightening torque of 30 Nm.

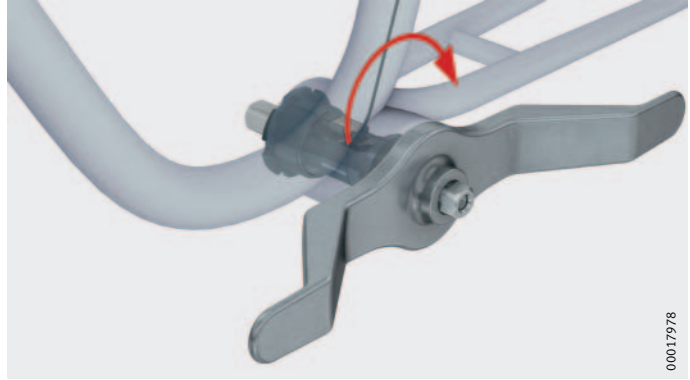


Figure 11
Tightening the bottom bracket bearing housing on the non-chain ring side using an bottom bracket bearing hand wrench

The bottom bracket bearing is now fitted.

Connect the sensor cable to the electronic system. Connect the black cable to the power supply and the black/white cable via a precision resistor (preferably 120 Ohm) to earth, see example circuit in *Figure 3*, page 5.

Fix the pedal cranks to the bottom bracket bearing using the supplied screws M8×1. Tighten the screws using a torque wrench.

Observe the tightening torque of 35 Nm.



Note!

If the position of the sensor bottom bracket bearing is subsequently altered after fitting and connection to the power supply, the sensor must be recalibrated by disconnecting the power.

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Issued: 2011, August

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TPI 215 GB-D