



**TORG2.0**  
**BB-integrated Torque/Cadence Sensor**  
*User Guide*

**KCLAMBER**

- **One. Product Features and Strengths:**

TORG2.0 is a new PAS sensor of our latest development to be used on pedelecs, which integrates both torque & cadence sensing.

- **It features mainly below:**

- ♦ High precision and good linearity;
- ♦ No particular mounting angle required and rapid dynamic response;
- ♦ Maintenance free, with good interchangeability;
- ♦ Small in size (compatible with standard BB);
- ♦ Long service life with non-contact working mechanism;
- ♦ Low power consumption and constant reliability.

- **Two. Application**

- It is a dual-mode torque & cadence sensor intended for use on pedal assisted ebikes.

- **Three. Ambient Conditions of Application**

- Excessive mechanical force on the sensor, such as: longitudinal stretching or load, intensive vibration or impact, might damage the sensing module and result in false signal output. Meanwhile, strong external magnetic field may compromise the sensor measurement accuracy.

- **Four. Precautions**

- 1) Do not attempt to open the sensor housing under any circumstances;
- 2) Be aware of the max. working voltage and related mechanical loads applied on the sensor, as stipulated in part Five;
- 3) Do not expose sensor to any electromagnetic field that' s beyond the EMC limit during its shipment, assembly or storage;
- 4) Highly corrosive gases, liquids, and any medium that affects electrical insulation will impair functionality of the sensor .
- 5)  $\Phi 10$ mm wiring hole beneath BB at 40~41mm to the right;
- 6) 67.5~68.5mm BB width suggested for 68mm version; 72.5~73.5mm BB width for 73mm version; 83.5~84.5mm BB width for 84mm version; 99.5~100.5mm BB width for 100mm version

## • Five. Technical Parameters

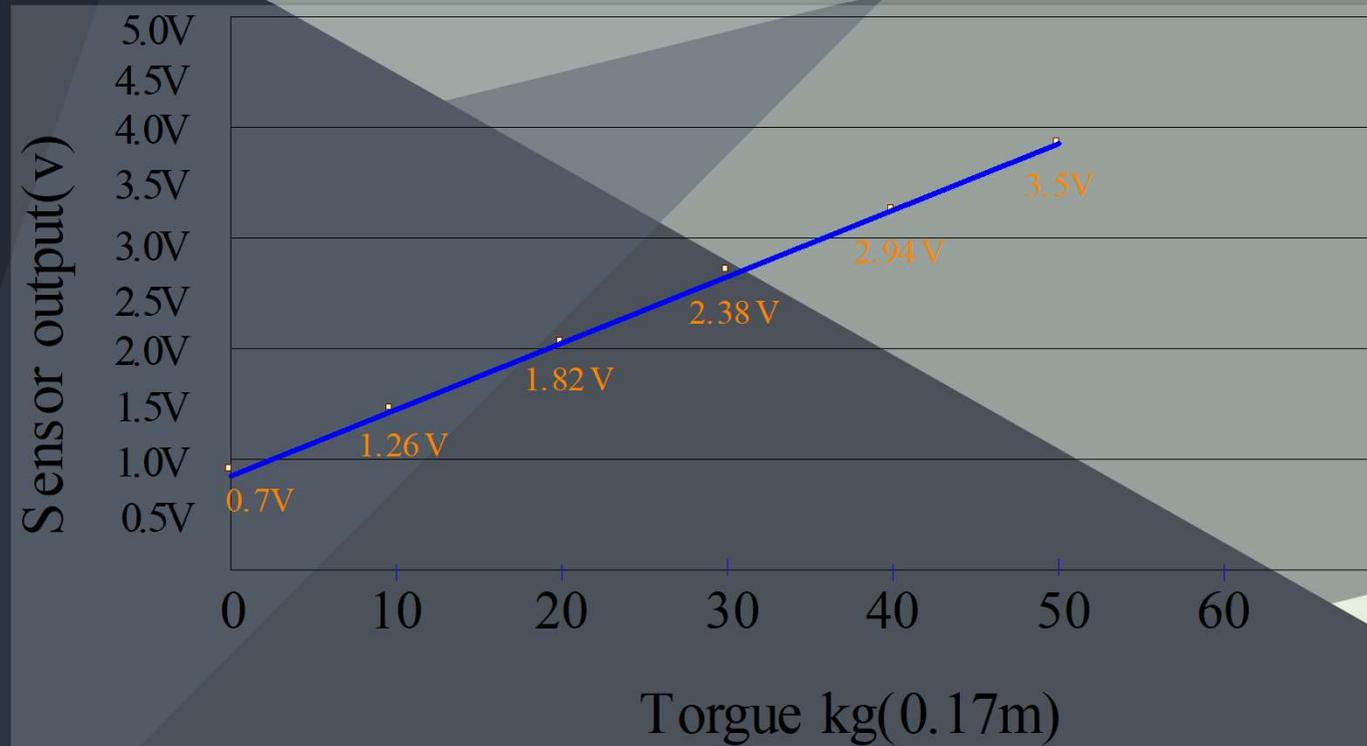
- (1) Input Voltage: DC 5V (4.7~5.3V);
- (2) Input Current: <25mA;
- (3) Output Analog Voltage: DC 0.7V-4.3V;
- (4) Speed Pulse Number per Cycle: 32pulse (45-55%duty cycle) ;
- (5) Signal Gradient: 35mV/ N.m (25Kgf, 170mm crankarm, signal strength  $1.43V \pm 0.1$ );
- (6) Accuracy: 5% at both L&R sides;
- (7) Measuring Range: 0.5 N.m-83N.m;
- (8) Measuring Type: static & dynamic;
- (9) Waterproofness: IP67;
- (10) Working Temperature: -20 ~ 85°C;
- (11) Storage Temperature: 0 ~ 60 °C;
- (12) Relative Humidity: (15~95) %RH;
- (13) Certification: CE, EN15194/14764.

## • Six. Connector & Pinout

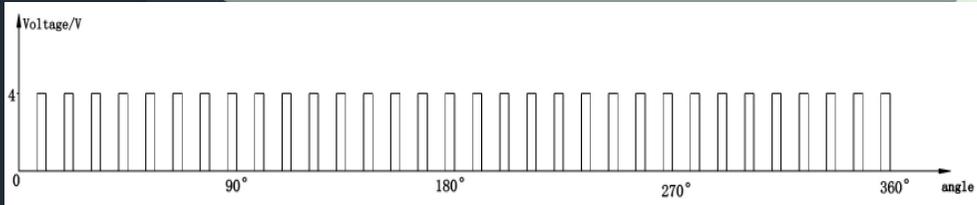
Connector & PINs	SN	Color	Description
<p>防呆口</p> <p>红色</p> <p>绿色</p> <p>黑色</p> <p>黄色</p> <p>公端正视图-4</p> <p>33.4</p> <p>G6.4.2</p>	1	Red	+5V
	2	Black	GND
	3	Yellow	Cadence Signal
	4	Green	Torque Signal

- Connector parameters:
- 4pin waterproof QR connector
- Cable length: 150mm
- Cable diameter: 1.6\*5mm
- Note: definition of product code: TORG2B-\*\*-\*-\*\*\*, \*\*, like TORG2B-S68C-148, 68 refers to the BB width, like 68, 73, 84 and 100mm, while C refers to sensor version, and 148 refers to the axle length.

- Seven. Curve Graph of Torque and Cadence Signal Output

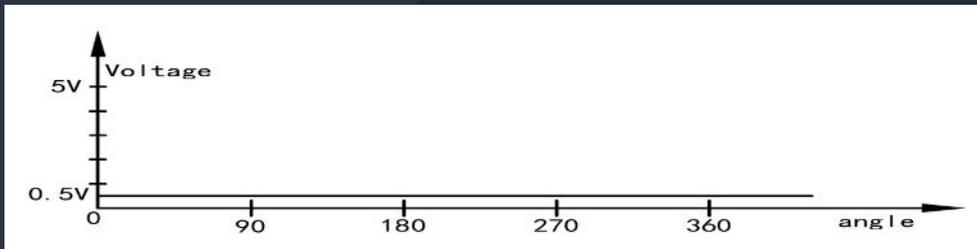


- 1、Bottom Bracket Forward Rotation Signal Oscillogram



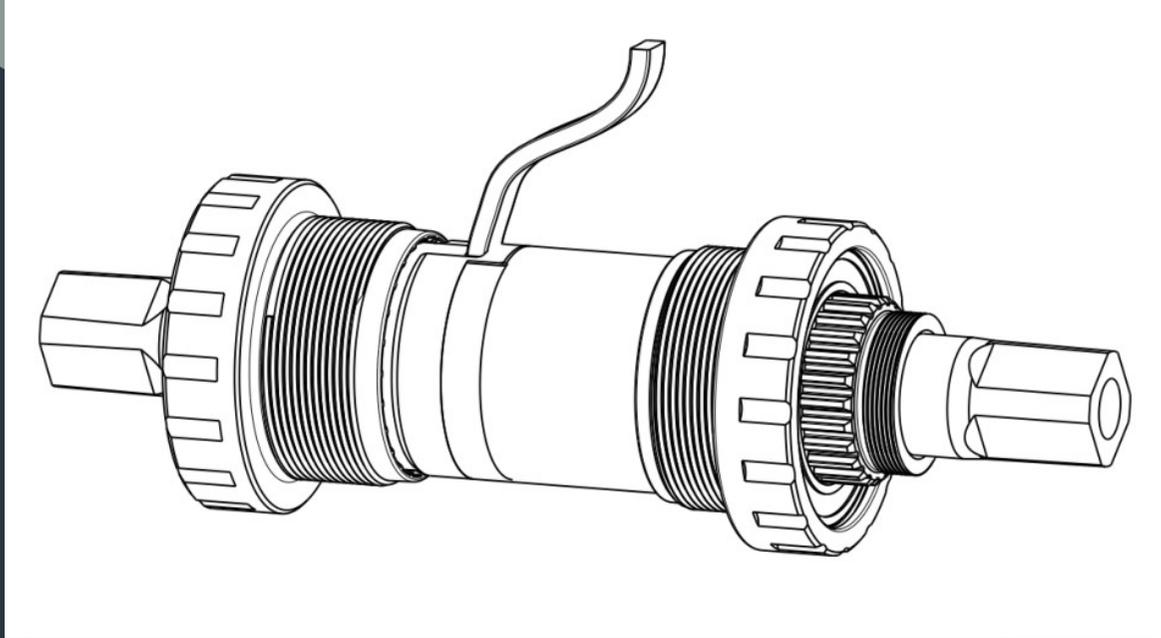
- Note: There are 32pcs pulse signal output for one cycle of forward rolling (360°) ;

- 2、Bottom Bracket Backward Rotation Signal Oscillogram

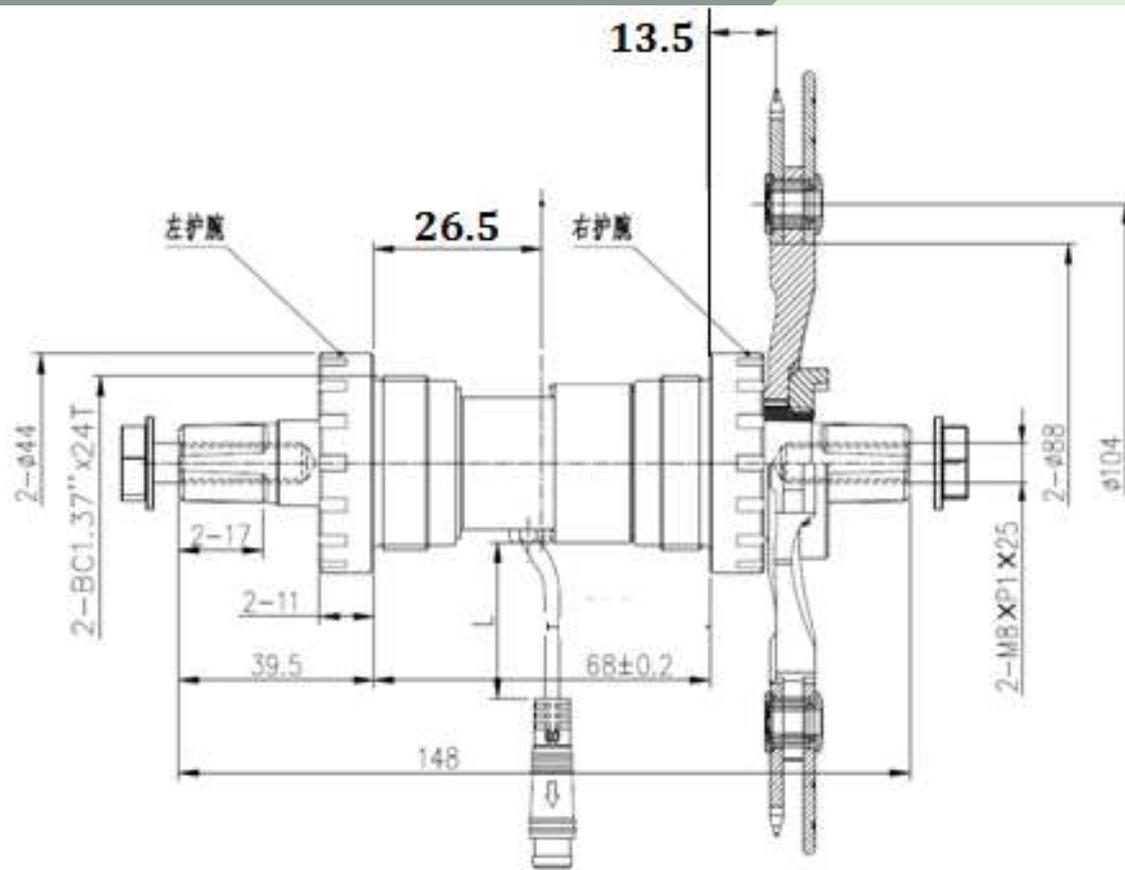


- Note: Always stable output when backward rolling

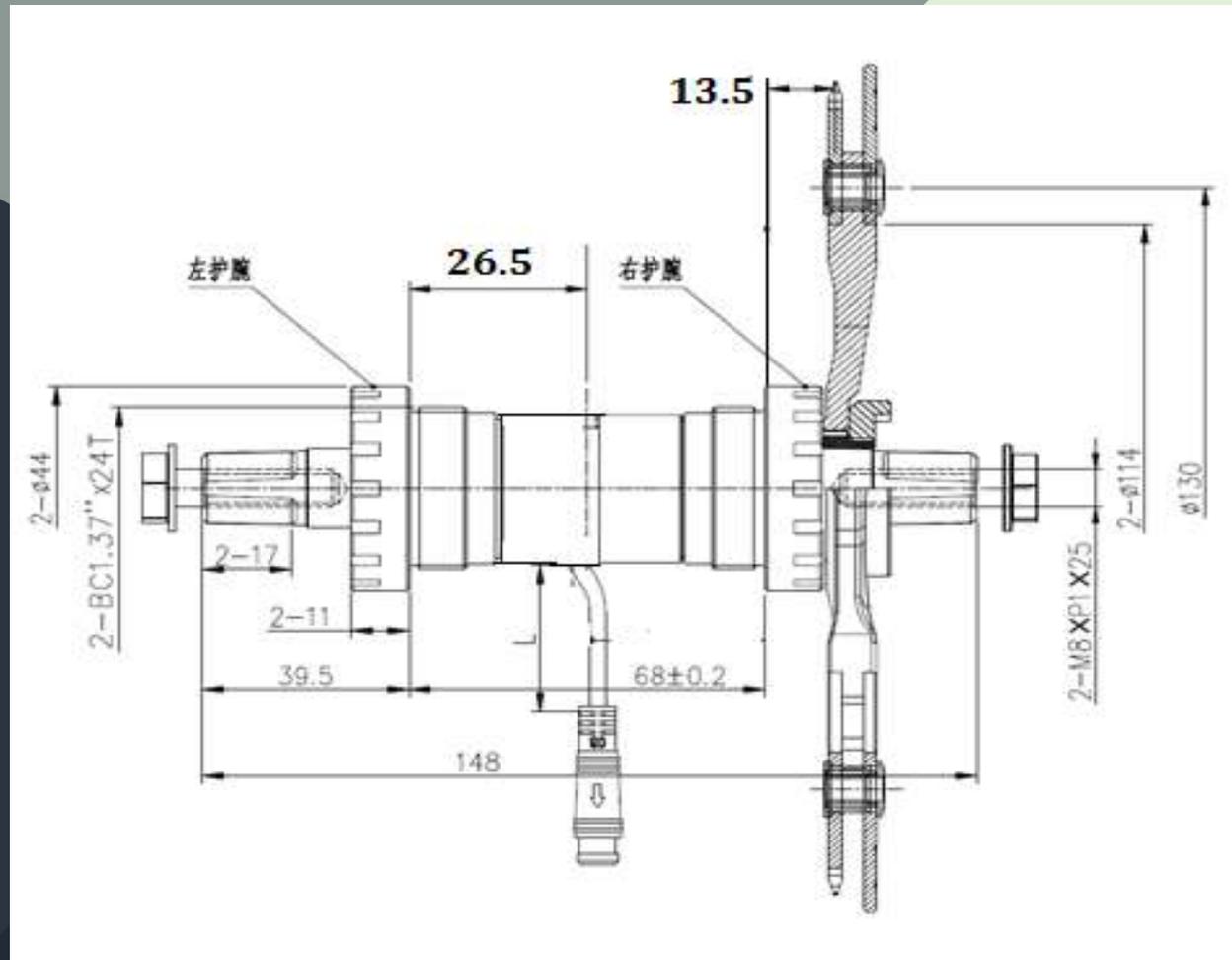
- **Eight. Product Appearance and Structure**



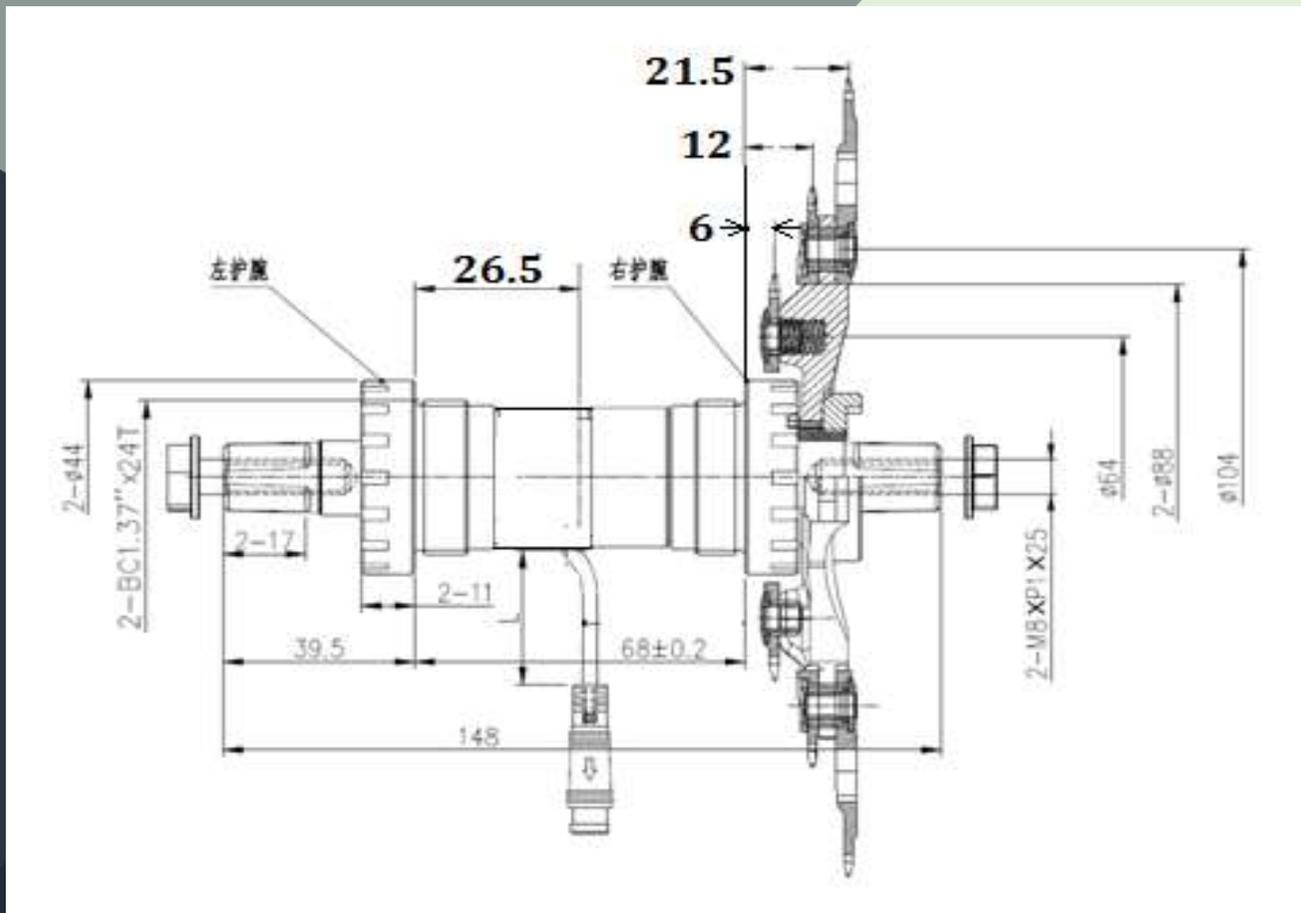
Appearance of BB-integrated Torque Sensor TORG2.0



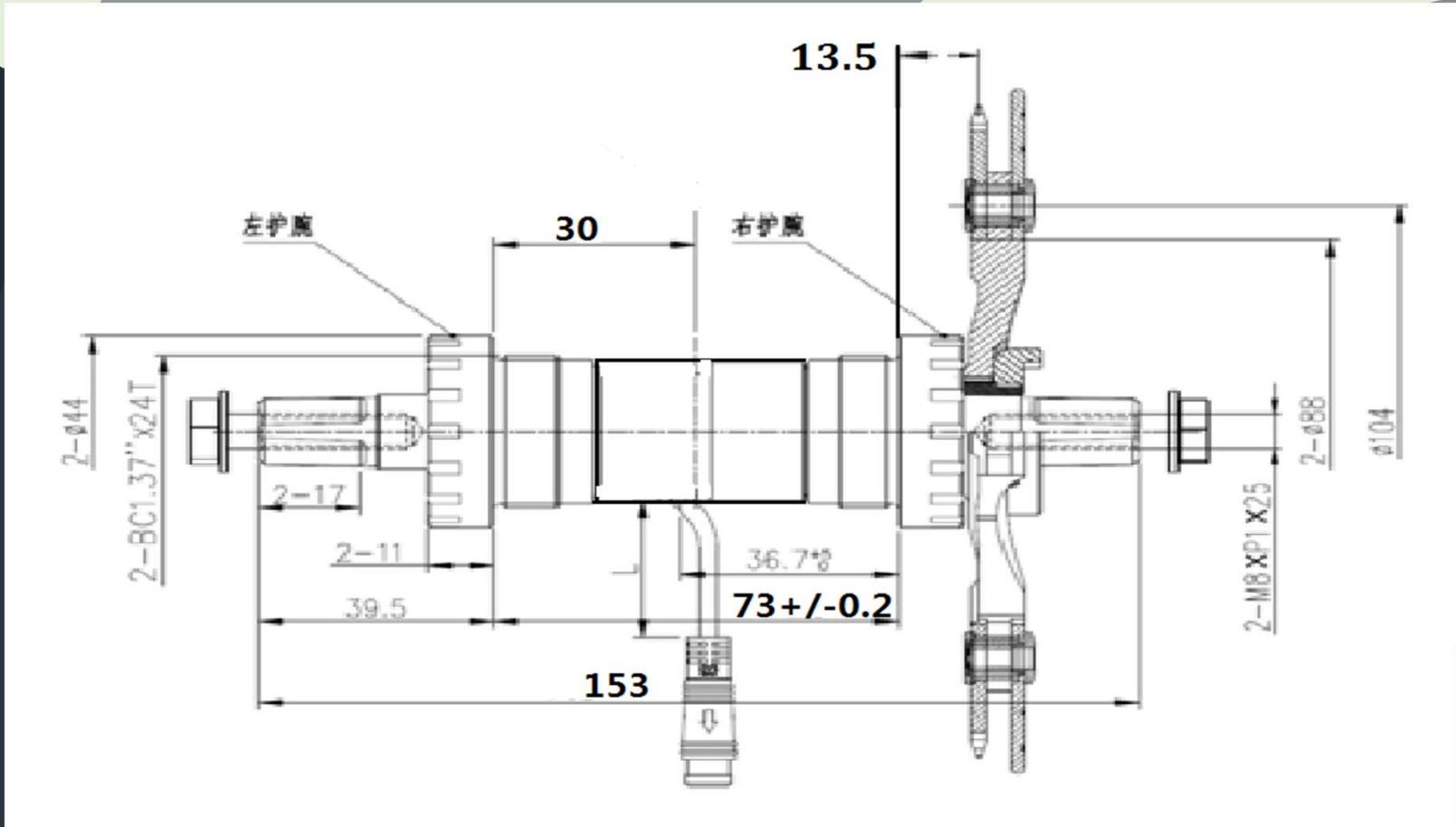
- Intended for 68±0.2mm BB, square shaft + single chainwheel, suggested chainwheel: 36T~48T;



- Intended for 68±0.2mm BB, square shaft + single chainwheel (spider arm), suggested chainwheel: 52T;

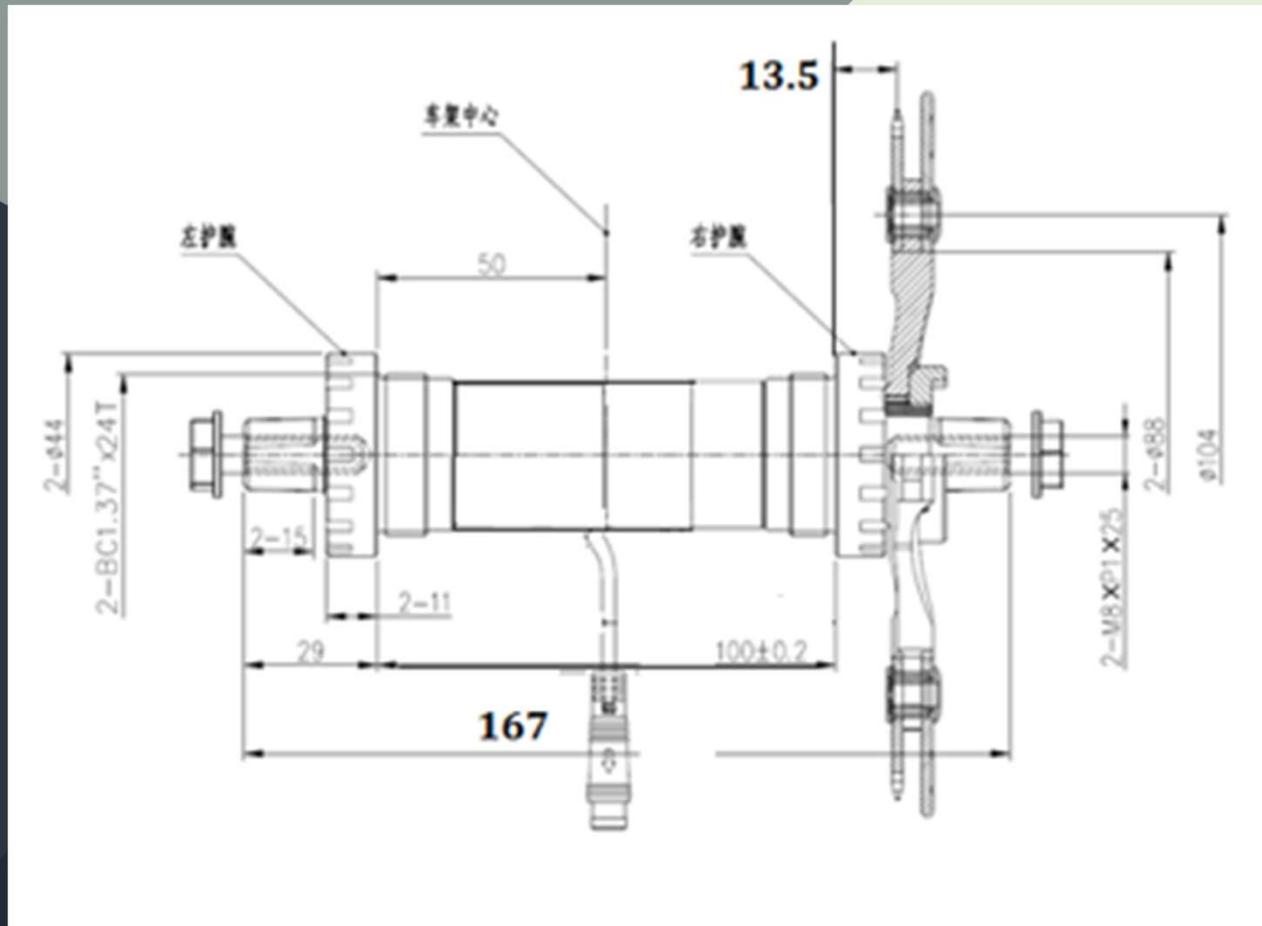


- Intended for 68±0.2mm BB, square shaft + 3-speed chainwheel, suggested chainwheel: 22-32-44T;

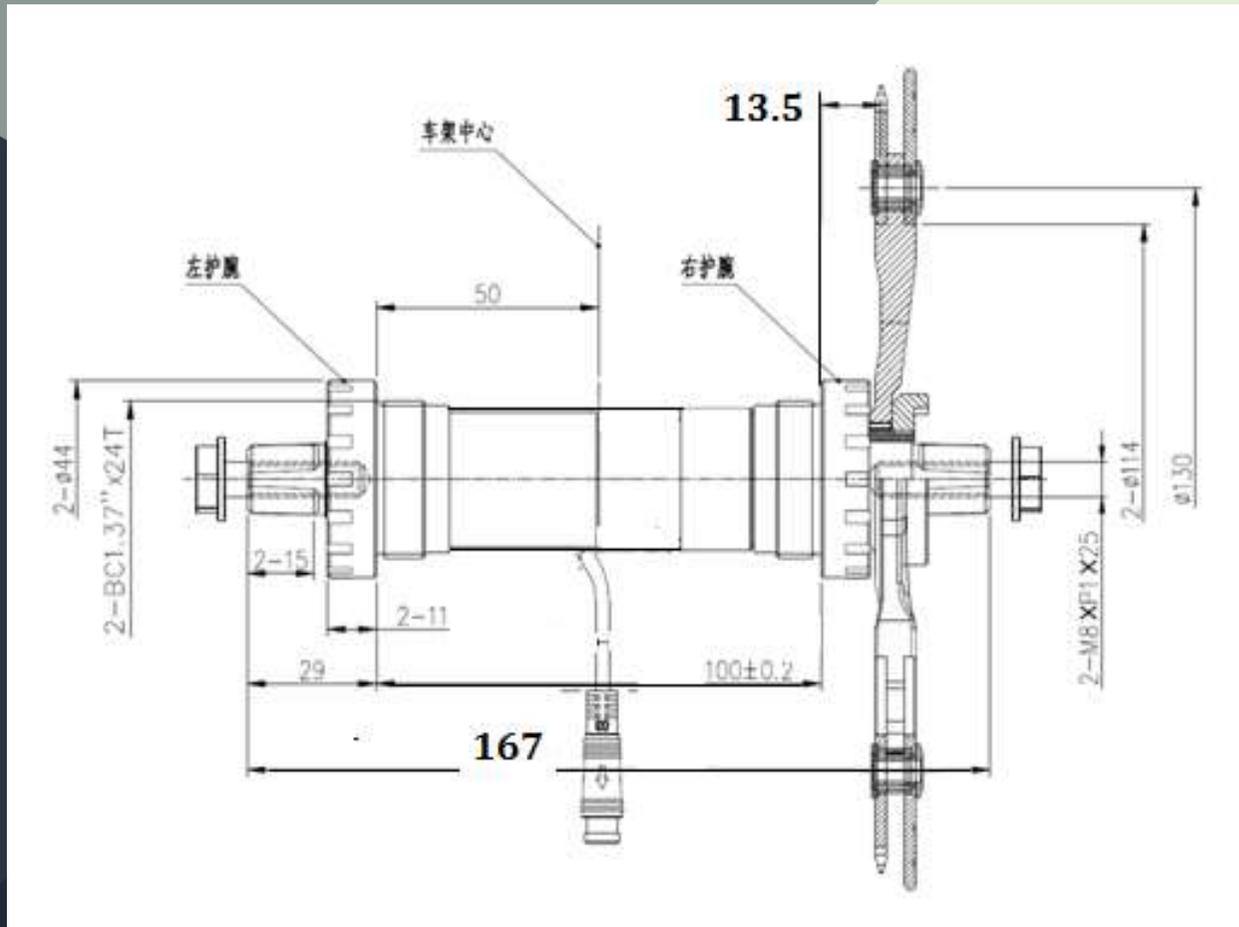


- Intended for 73±0.2mm BB, square shaft + 3-speed chainwheel (with 4-arm spider), suggested chainwheel: 22-32-

44T



- Intended for 100±0.2mm BB, square shaft + single chainwheel (with 4-arm spider) , suggested chainwheel: 36~48T;



- Intended for 100±0.2mm BB, square shaft + single chainwheel (with 5-arm spider) , suggested chainwheel: 52T;

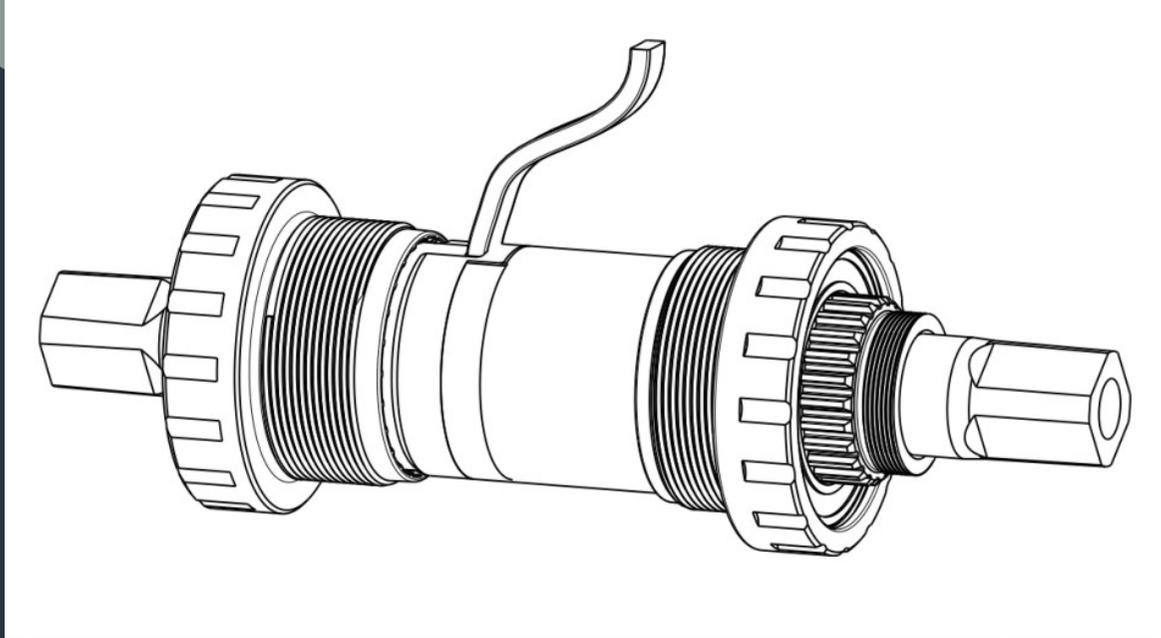
- **Note:** This BB-integrated sensor is to be mounted on standard bottom bracket of a pedelec, while the BB width and the axle length can be customized, and even for belt drive..

- **Nine. Mounting**

- Tools to use

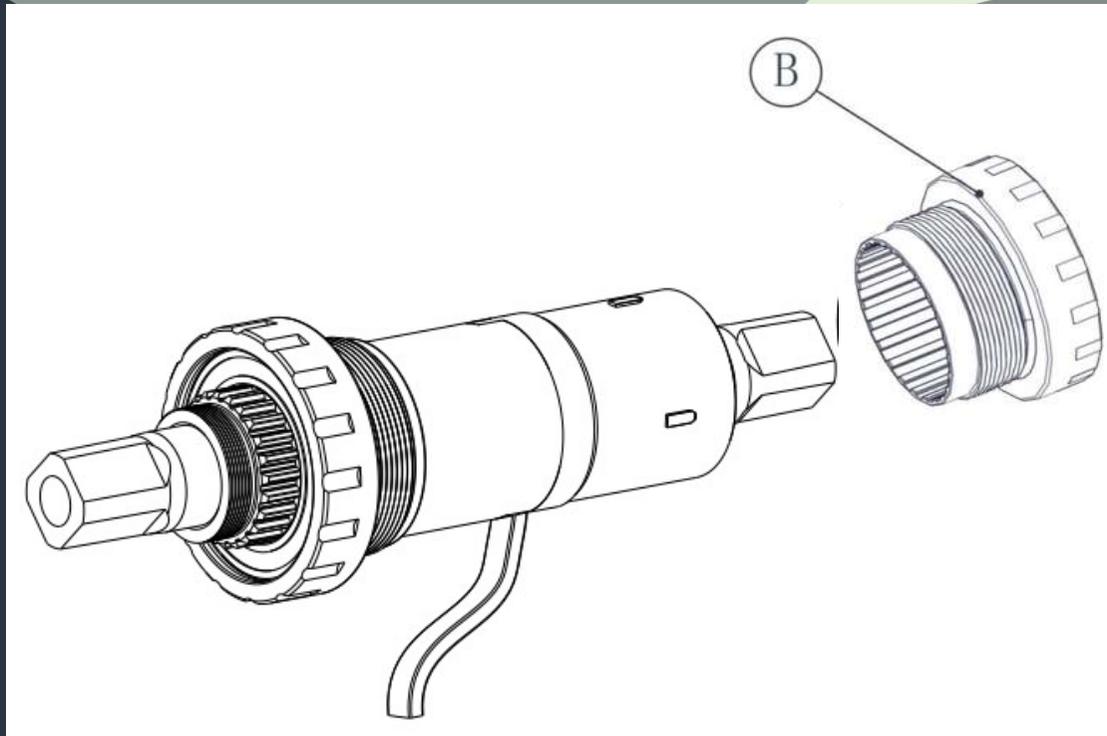
Where applicable	Tools	
Mounting and removal of L/R bowls		Special tool SHIMANO TL-FC38
Mounting and removal of chainwheel locking ring		Special tool SHIMANO TL-UN65/66/70
Fastening and unfastening of M8 lock nut on crankarm		14mm socket wrench

- 1、 Unpack the product to take out the torque sensor and then screw of the bolts on both ends.



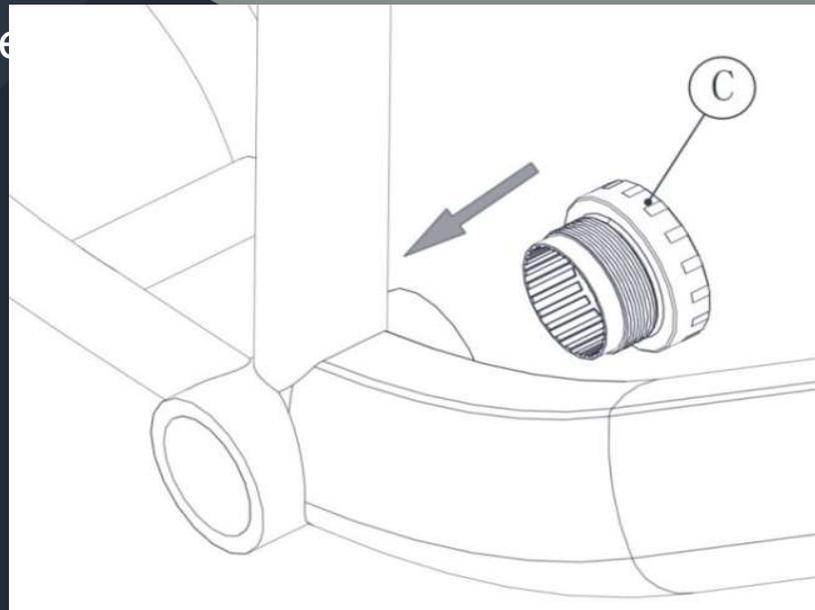
A: Bolt

- 2、 Remove the bowl set B from the axle at the non-spline end;

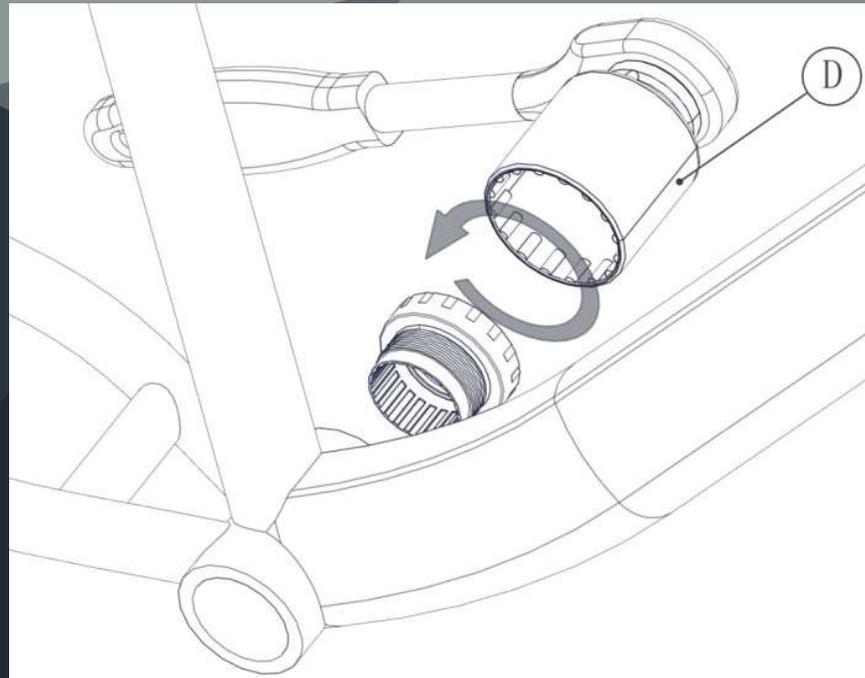


B: left bowl

- 3、 Examine the BB tube;
- 3.1 Remove the iron scraps or painting left in the inner thread of the tube if there' s any;
- 3.2 Remove the burrs in the inner thread of the tube if there' s any;
- 3.3 Apply lubricating grease to the inner thread of the tube and bowl-C;

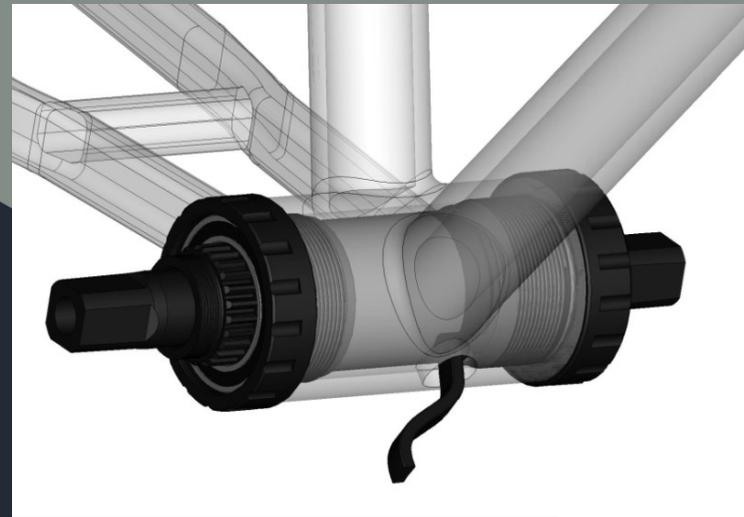
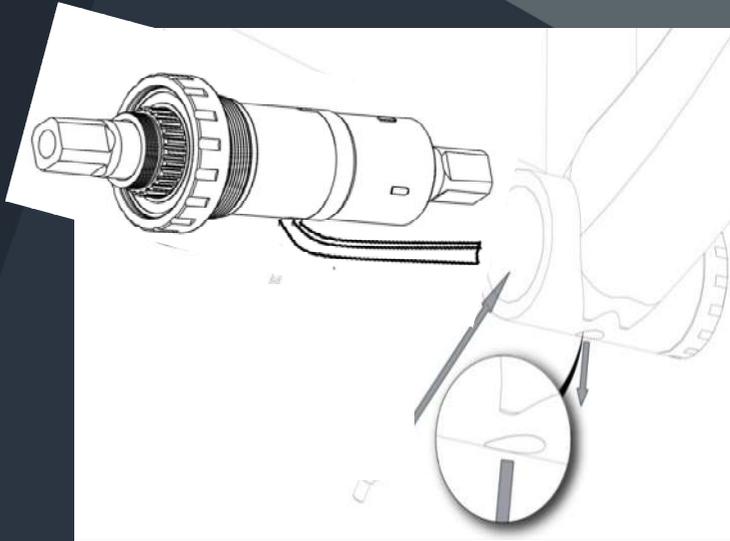


- 4、 Screw the left bowl into the BB tube by hand(the non-chainwheel side) in clockwise direction, then fasten it with the wrench D at 30Nm;



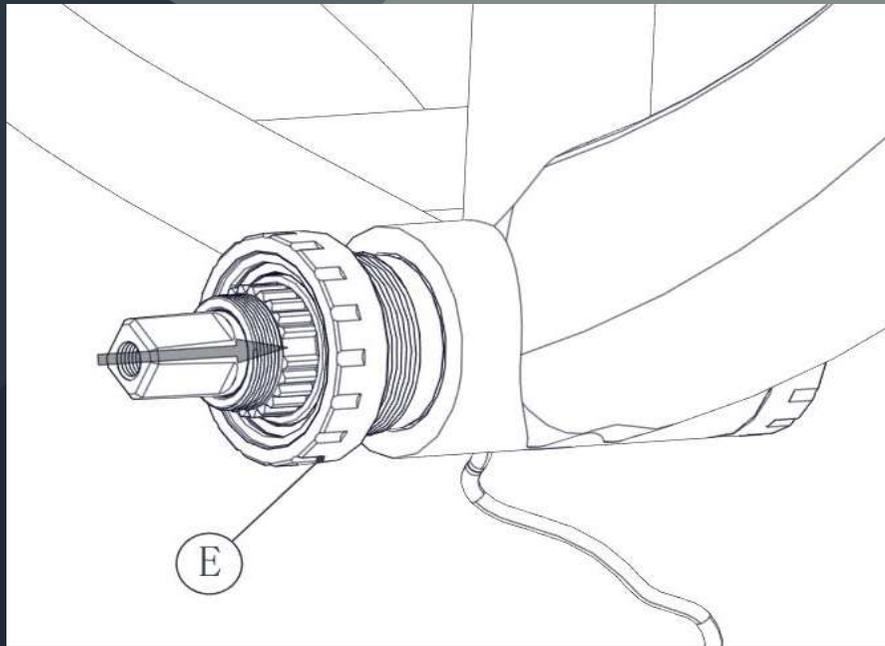
D: SHIMANO TL-FC38

- 5、 Thread the connector from the chainwheel side into the BB tube and through the drill hole, then insert the sensor body into the BB tube. Make sure the cable stays in during the process.



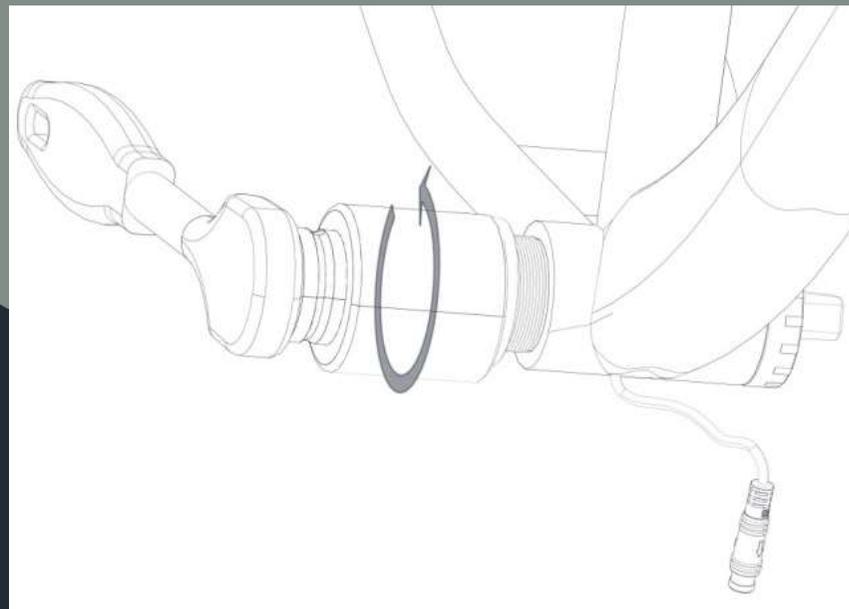
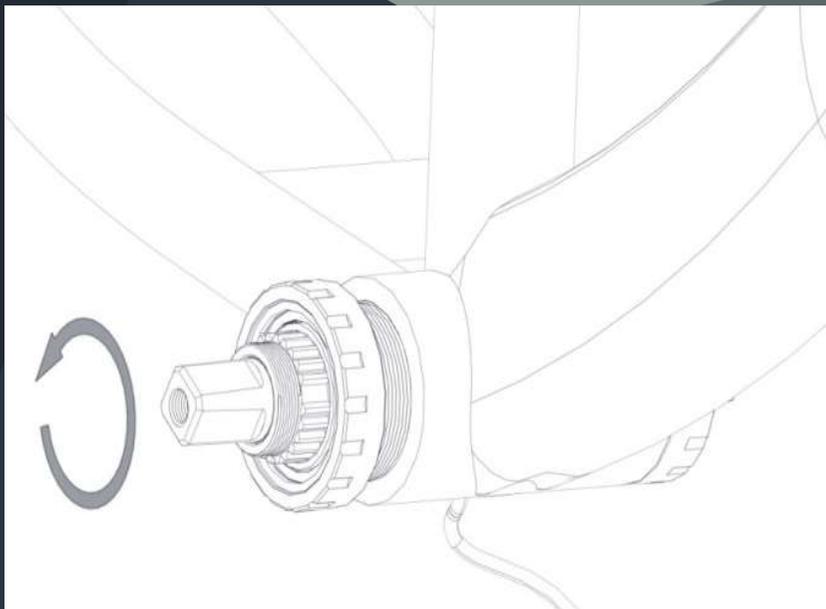
- Note: please align the convex plate on the plastic holder of the sensor with the groove of the left bowl before inserting the sensor body so as to fix the sensor positioning. Make sure the cable doesn't get scratched during the insertion.

- 6、Screw the right bowl E into the BB tube by hand(in anti-clockwise direction). In case the it detaches from the BB parts, align them against the slots as indicated by the drawing below and re-do the insertion process;

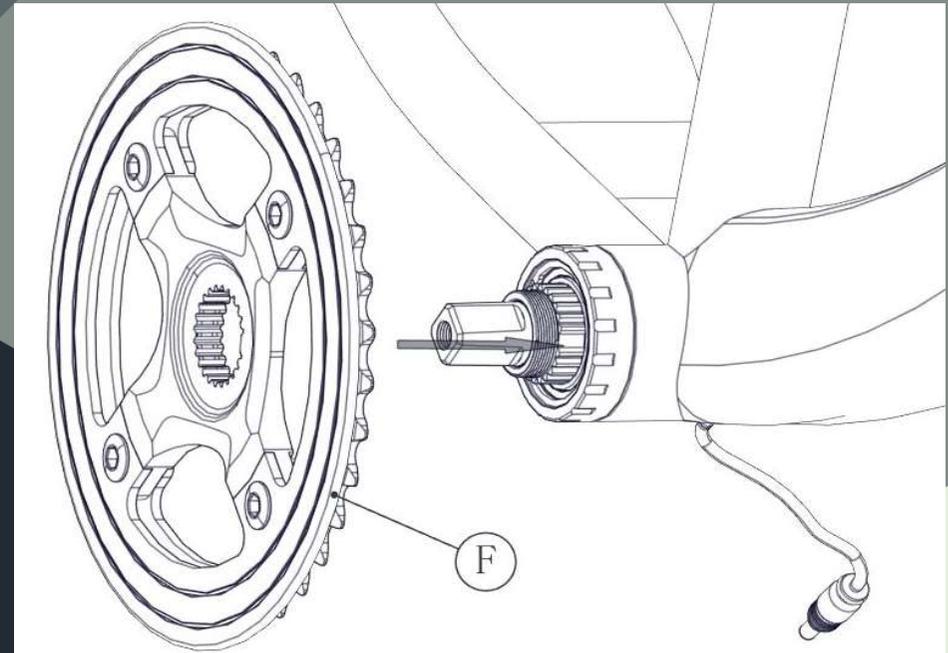
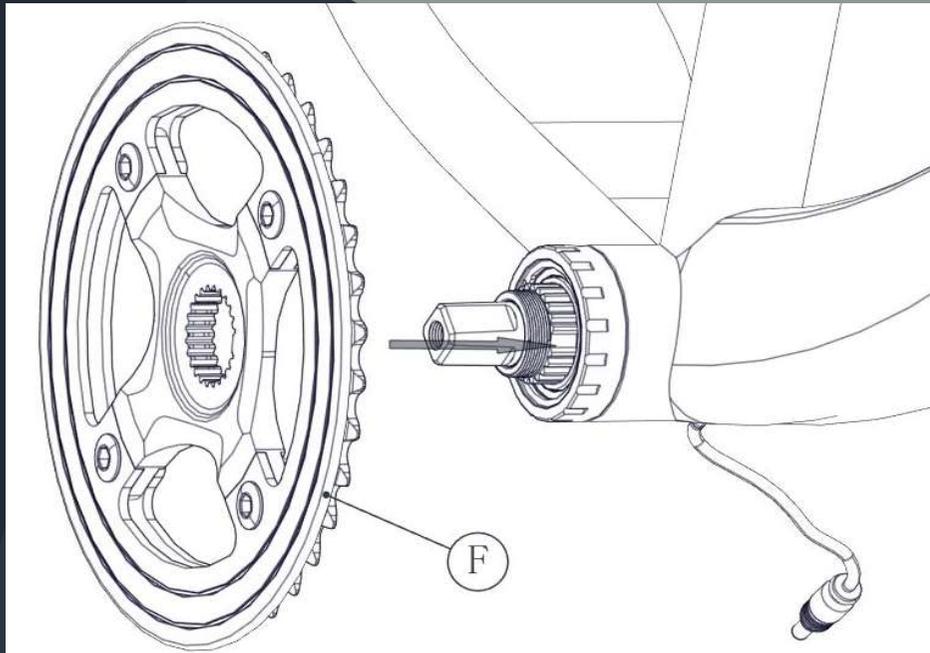


E: right bowl

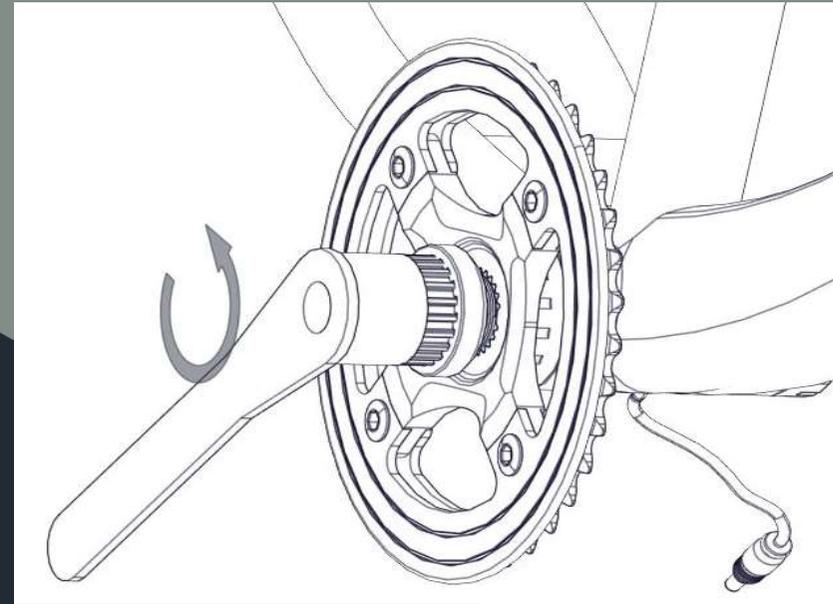
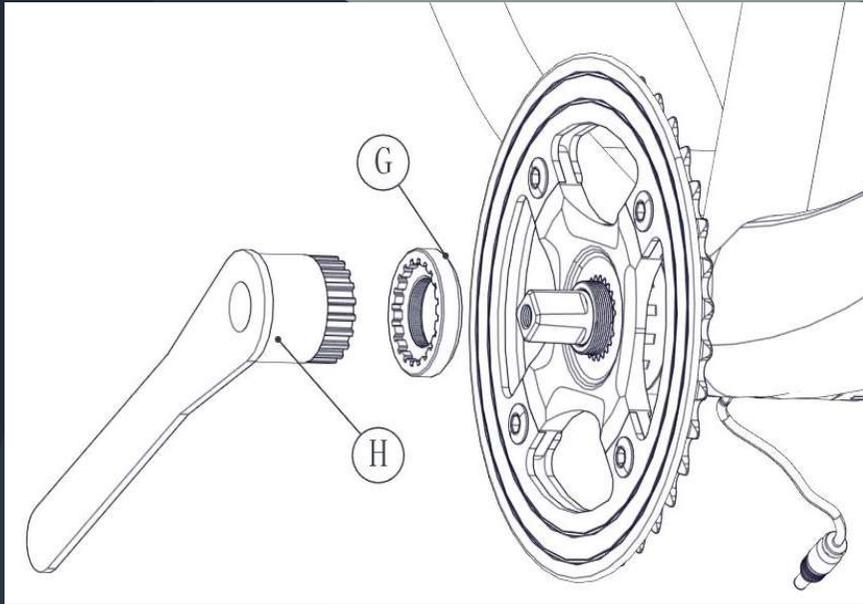
- 7、Screw the right bowl by hand, then fasten with the wrench D at 30Nm.



- 8、 Put the chainwheel onto the BB axle in alignment with the convex as shown below

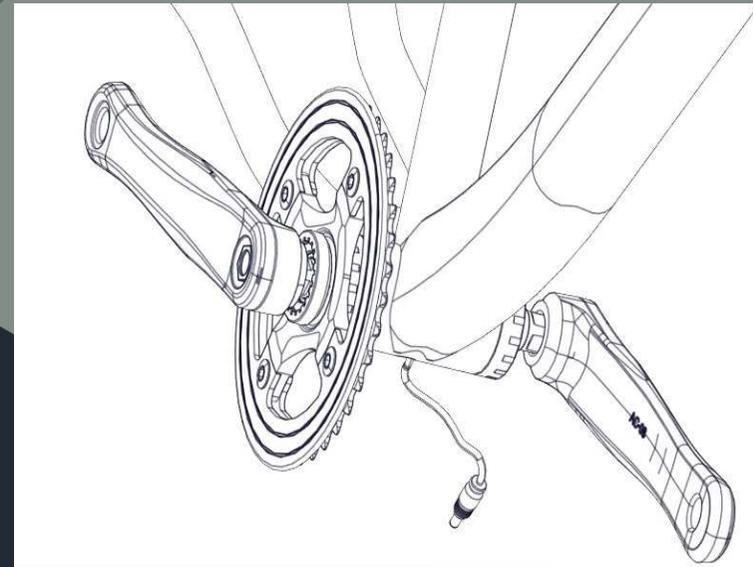
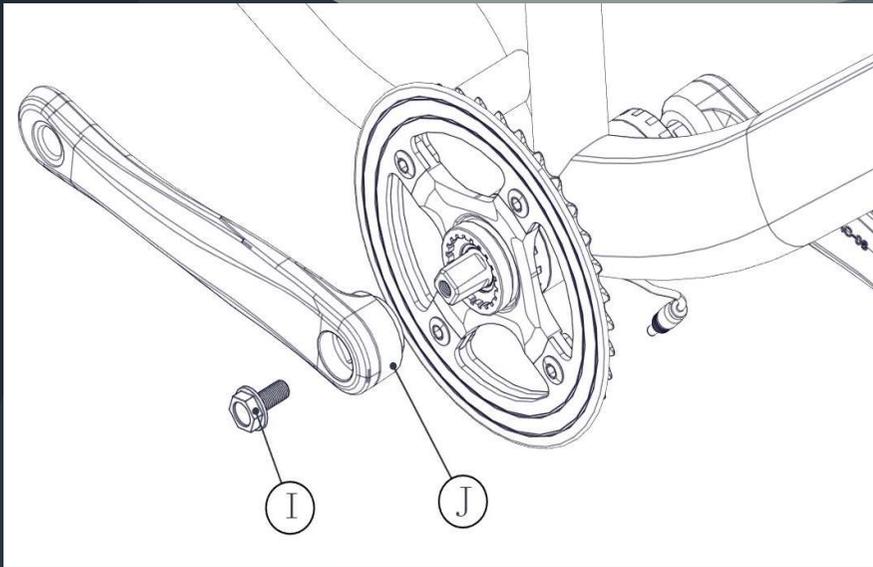


- 9、 Fasten the lock ring G with the dedicated wrench H (in anti-clockwise direction) at 35N.m



- G: chainwheel lockring
- H: SHIMANO TL-UN65/TL-UN66/TL-UN70

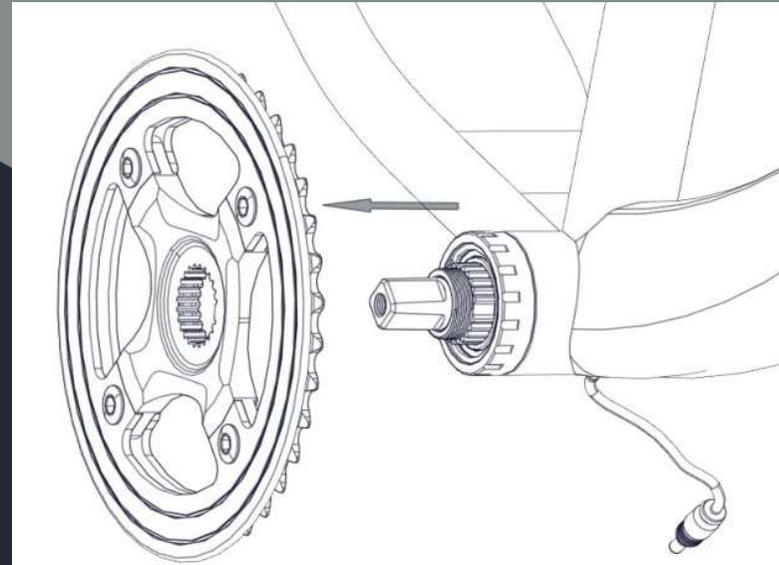
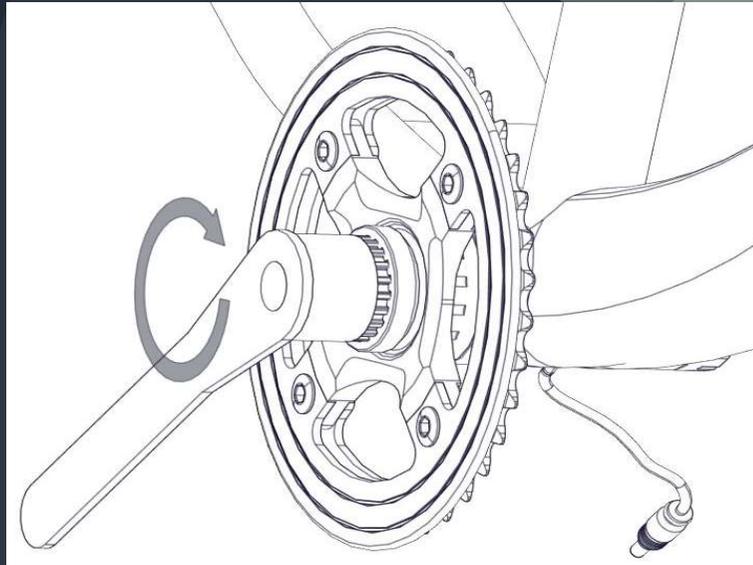
- 10、 Fasten L/R crankarm to the BB axle with M8 bolt at 35N.m;



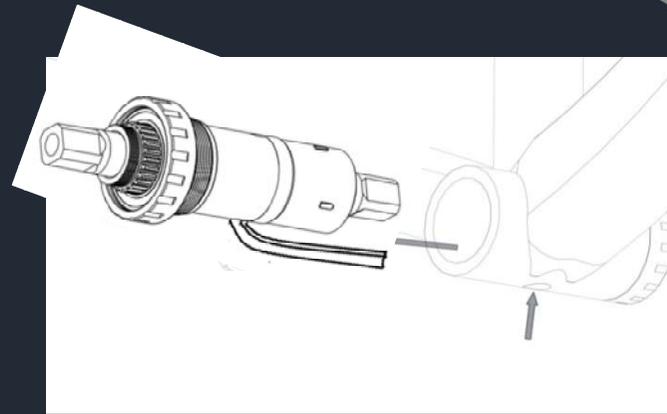
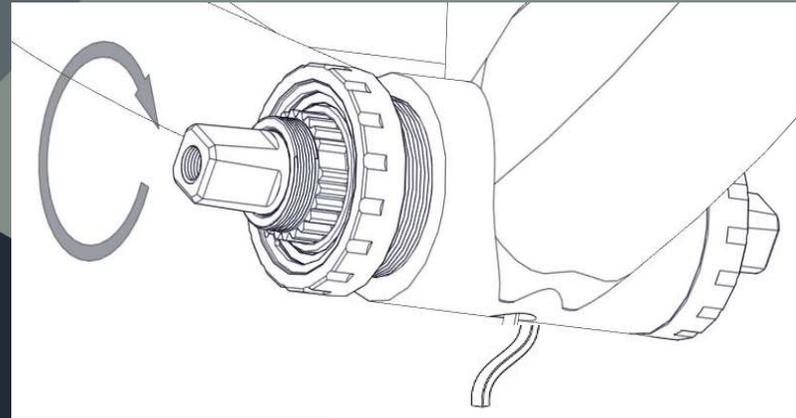
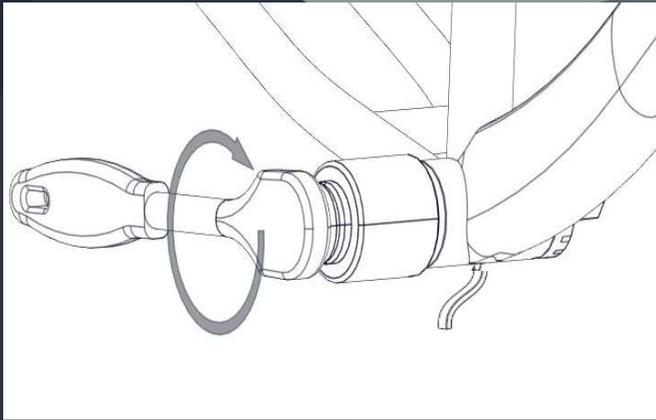
- I: M8 bolt (optional)
- J: crankarm (optional)

- **Ten. Removal of Sensor**

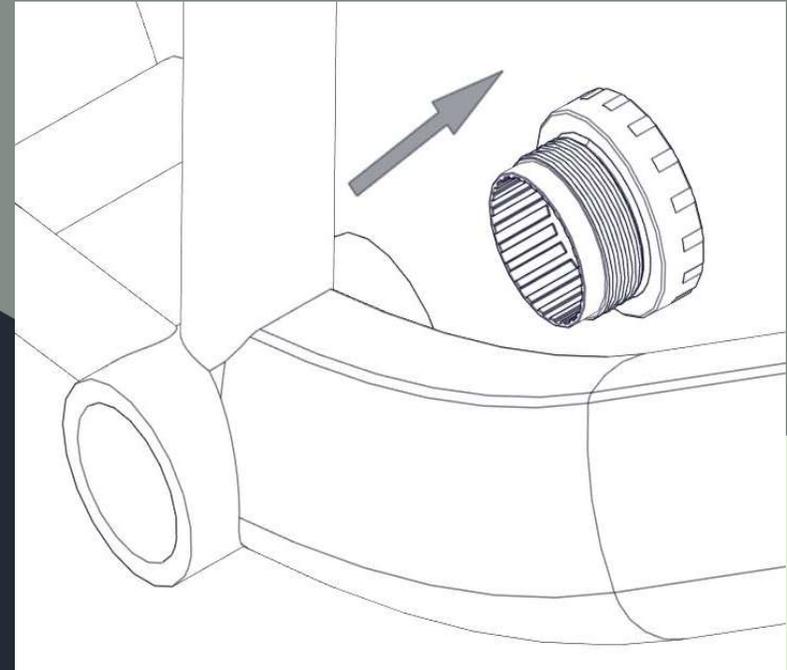
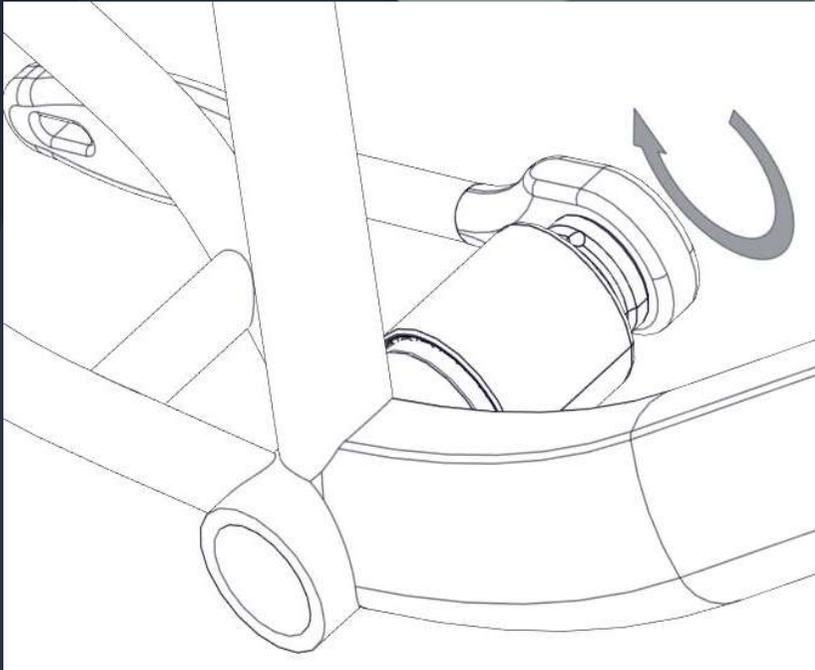
- 1、 First, remove both crankarms, then unfasten the chainwheel locking ring with a dedicated wrench in clockwise direction;



- 2、 Unscrew the right bowl with dedicated wrench in clockwise direction, making sure the sensor cable doesn't get scratched by the BB tube or drill hole during the process, then pull out the sensor body. ;



- 3、 Unscrew the left bowl with the same tool in anti-clockwise direction, and then put together the whole sensor set properly;



- Eleven. Parts List

Item	Drawing	Quantity	Description
Chainwheel holder set	104mm 4-arm spider, 130mm 5-arm spider	1	Optional
Holder locking ring	32T/34T/38T/39T/42T/44T /46T/48T/52T	1	Optional
M8×18 bolt	SR PA01.32.S07	2	Optional
L/R crankarm	152/165/170	1 (set)	170mm straight crankarm, optional