

Challenge Trikes Kingpin System

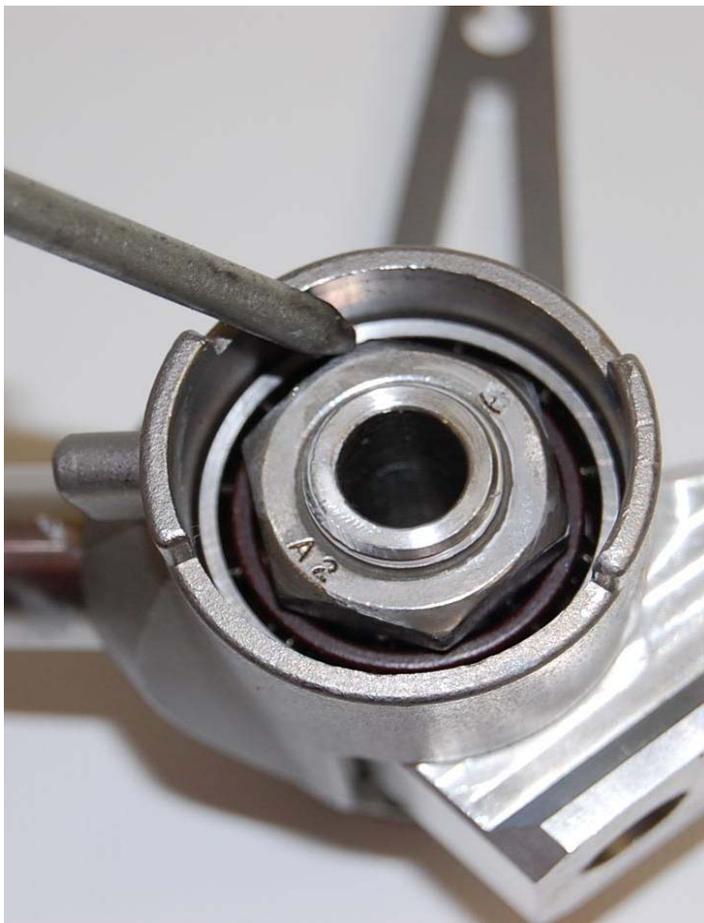
Maintenance, parts list and assembly manual

The Challenge kingpin system has been developed to deliver a long service life with a minimum of maintenance. Challenge has achieved this through the use of standard industrial bearings instead of the traditional cup and cone cycle bearings. Because trike steering does not employ bicycle forks and stems, the use of a classic headset bearing set with its associated disadvantages is not necessary or appropriate.

The main advantages of the Challenge kingpin system are that play is easily adjusted out without applying wear-accelerating preload to the bearings, and that it can be re-lubricated without the need for further adjustment.

So what is a long service life? We believe it should mean an unlimited period. The main bearing will not be worn even under rough use. For this reason we give a lifetime warranty on this bearing for the first owner and with the proviso that the bearing races remain free of rust. Rust is an indication that lubrication has been severely neglected: regular maintenance and lubrication as described below will prevent the appearance of rust and guarantee unlimited service life.

Maintenance, bearing lubrication

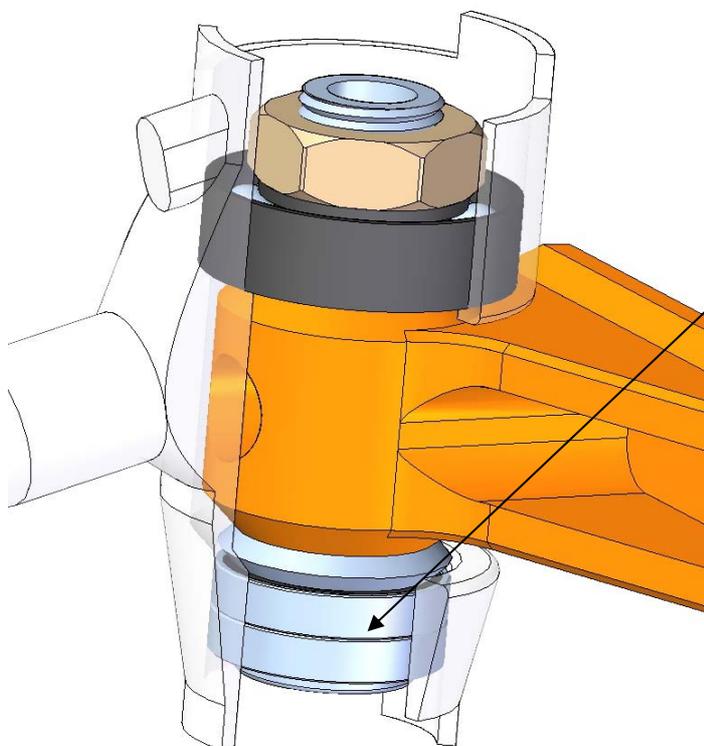


To prevent unnecessary wear, you should check at least once a year that the bearing is still sufficiently greased, and if necessary apply more grease.

To carry out this check only the top cap need be removed. (On 2007 and 2008 models, the separate pressure-sleeve must also be removed - see page 6)

While carrying out this servicing it is advisable to check that the nut is still sufficiently tight. The tightening torque for the nut is 50 Nm.

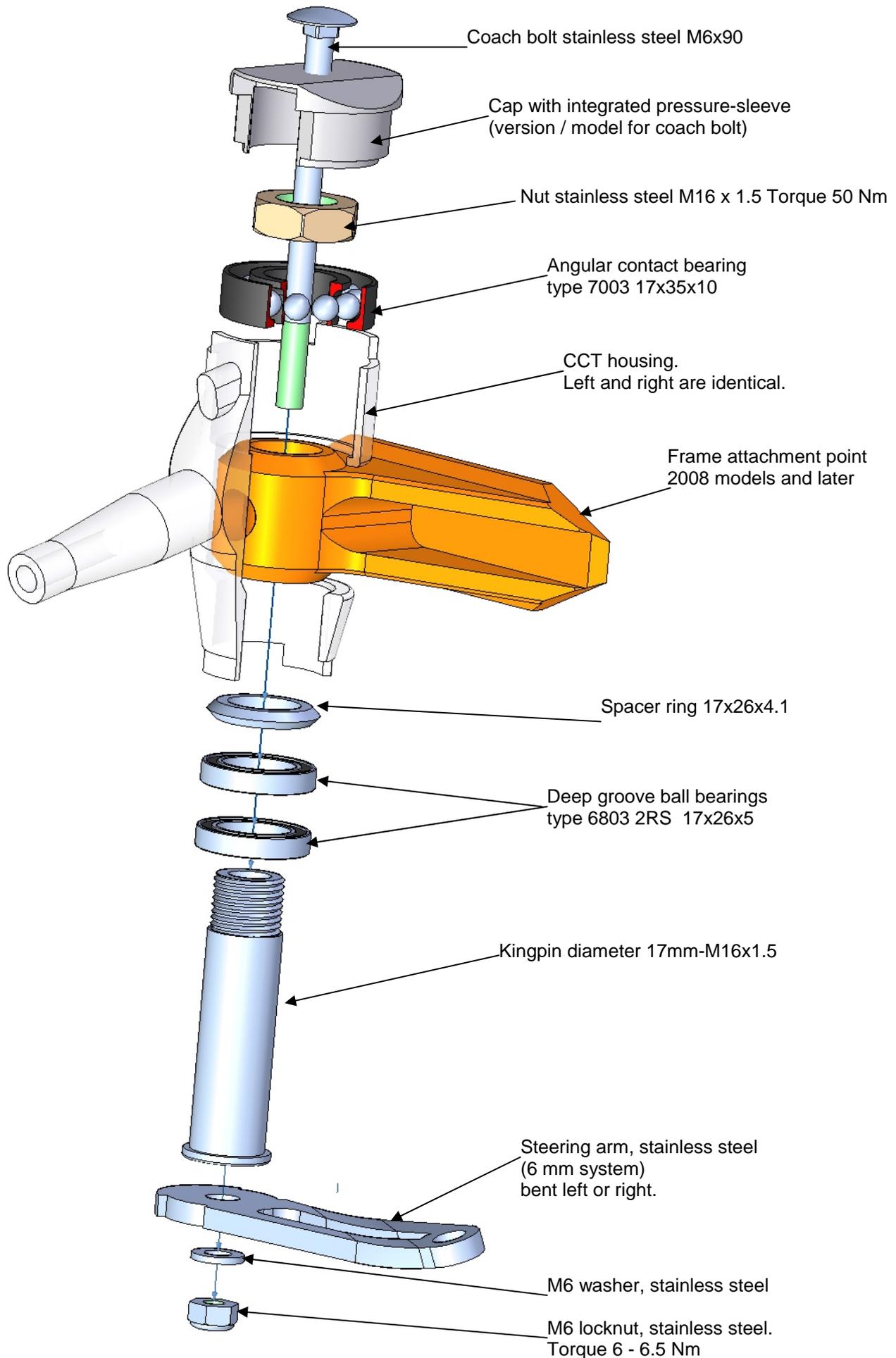
Note: Unless the cap with integrated pressure-sleeve is fitted, the housing will be able to move 2 mm up and down!



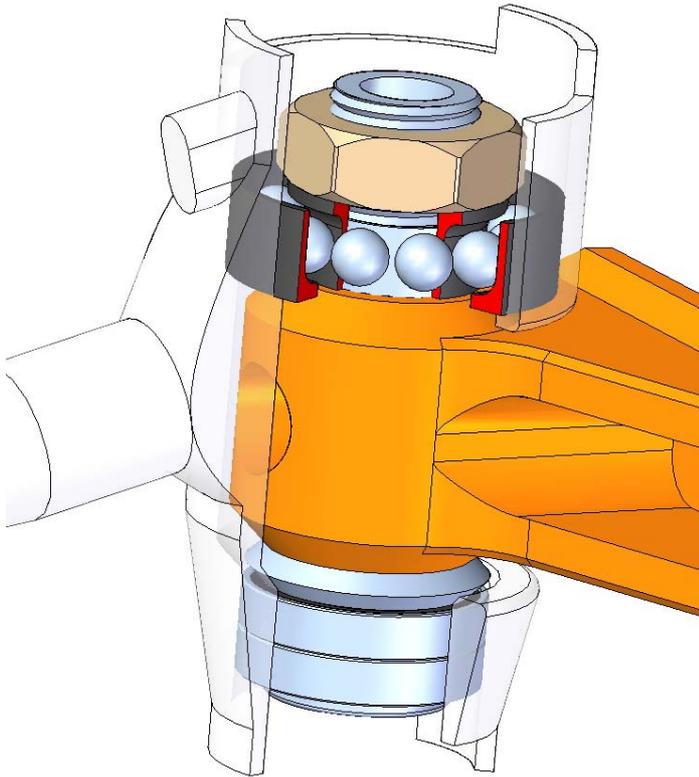
The two smaller bearings at the bottom of the kingpin are only for lateral location, and are lightly loaded. These bearings are fitted with 2RS (rubber seals both sides), and should in principle need no further lubrication. Before checking or re-greasing these bearings the nut should be unscrewed so that the shaft can be pushed out downwards.

Exploded view

2009 model year and newer

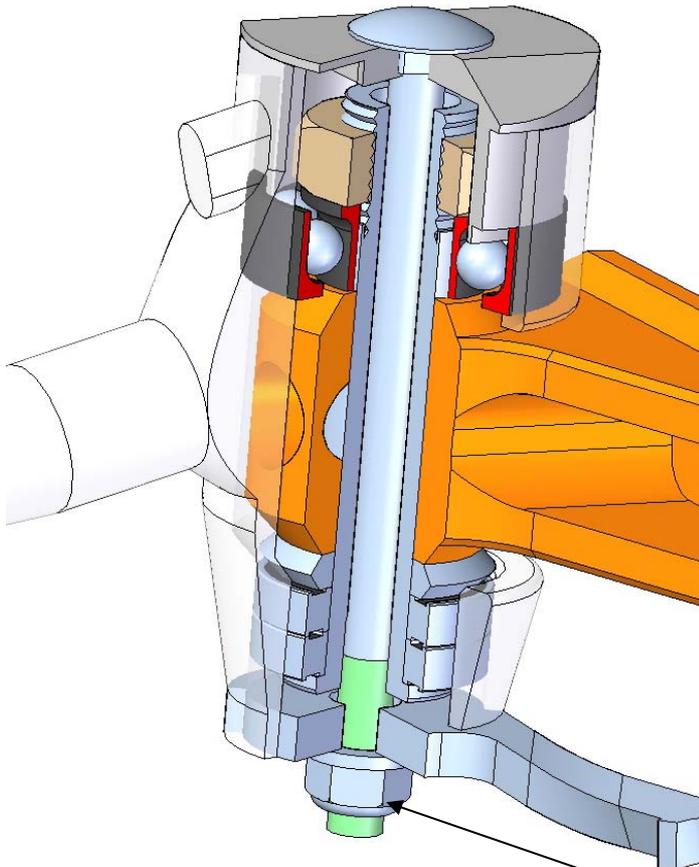
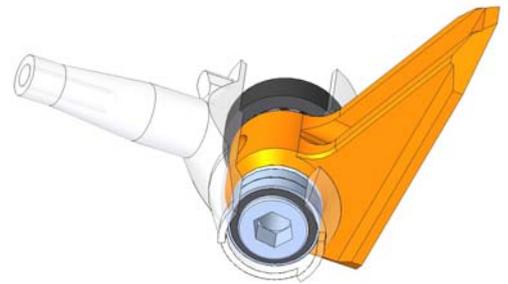


Eliminating vertical play.



With this design, adjusting for play is not necessary. To achieve zero play the 17 mm diameter bearing should be placed firmly against the frame and the large nut tightened. To do this use a 24 mm socket and a 10 mm Allen key from below to hold it. Nut tightening torque should be 50 Nm.

It is advisable to check this at the first service.



Without the cap in place, the housing can move up and down by 2 mm!
Only when the cap is fitted and secured by the M6 nut is this movement (vertical play) eliminated. The integrated pressure sleeve at the bottom of the cap presses the outer race of the bearing against the housing so that it can no longer move. The inner race of the bearing is mounted solidly against the frame, so the whole assembly is now secured vertically.

(Models from 2006 to 2008 may be equipped with a stainless steel cap and separate pressure sleeve)

The M6 nut should be tightened with a torque of around 6.5 Nm. If greater torque is applied the housing may deform and steering rotation will require excess force. If you should feel while tightening that the steering no longer rotates 100% freely, then the tightening torque is too high. Not harm will be done to the housing but the two smaller stabilising bearings may be damaged by this.

Naturally if steering rotation requires force then the trike's steering will not feel pleasant.

M6 Locknut - torque 6 - 6.5 Nm

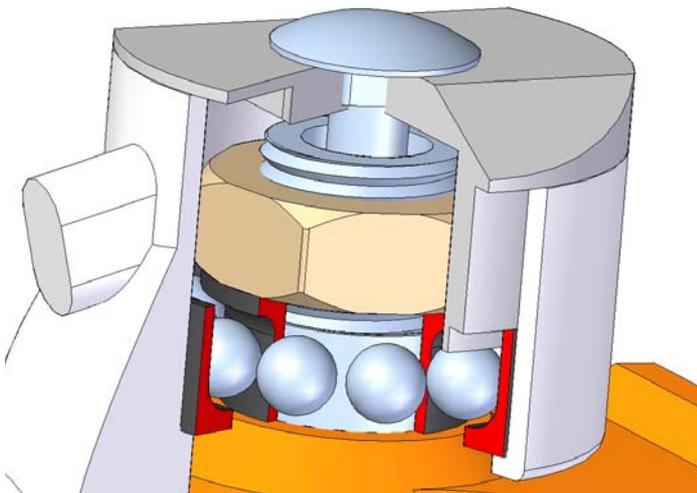
Angular contact ball bearing - assembly instructions

Angular contact ball bearings are designed to withstand large forces in one axial (vertical) direction. Normal ball bearings cannot do this. Because these forces can only be resisted in one direction, it is of great importance that the bearing is mounted correctly.

The face that should be on the top can be identified by having grooves either side of the brown ball cage. To double check, the lip at the bottom of the cap should fit inside the outer groove. On the bottom of the bearing there is no such groove at the outer edge where it fits against the housing.

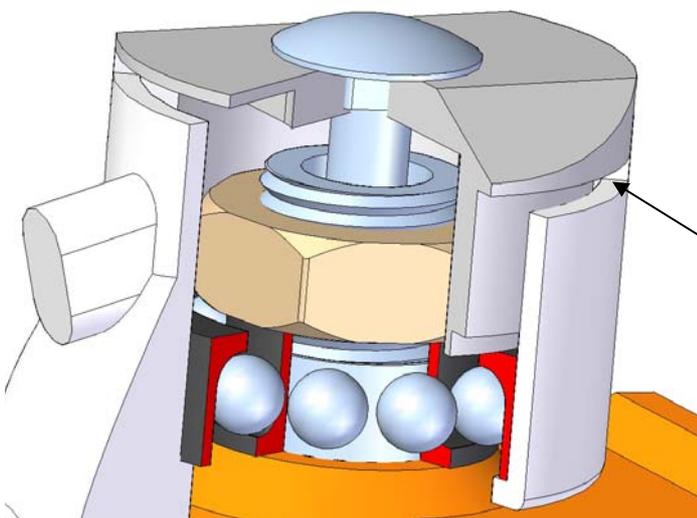


Bottom view of the bearing



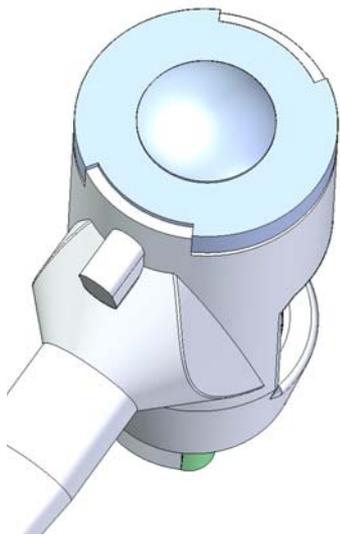
You can check whether the bearing has been mounted correctly by looking at the gap around the edge of the cap. When the bearing is correct then the pressure sleeve will drop into the groove and the cap will fit tightly. If the bearing is reversed then the cap will not drop fully into place and a distinct gap of around 2 mm will be visible.

Note: Trikes from 2006 to 2008 will be equipped with a stainless steel cap and a separate pressure sleeve. This pressure sleeve does not have the extra lip for checking. In this case the 2 mm gap will not appear even if the bearing is incorrectly mounted.

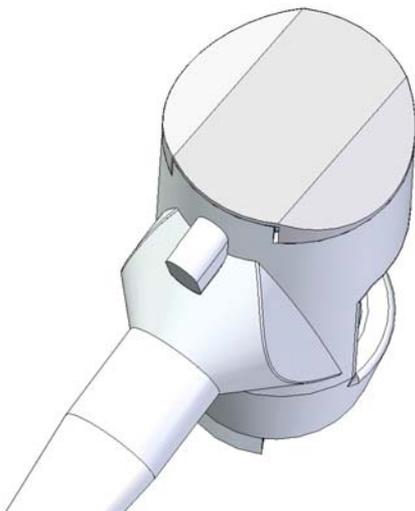
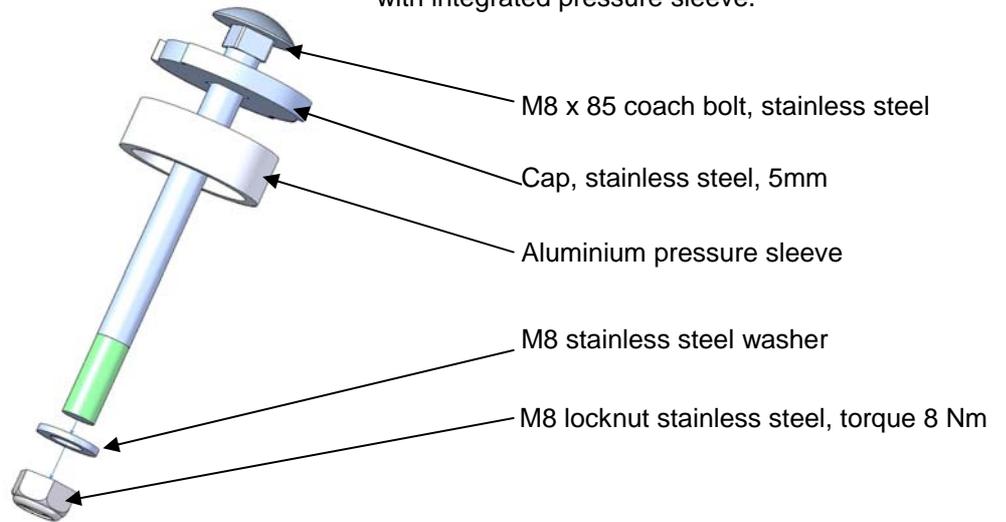


The distinct gap here means that the bearing has been mounted upside down.

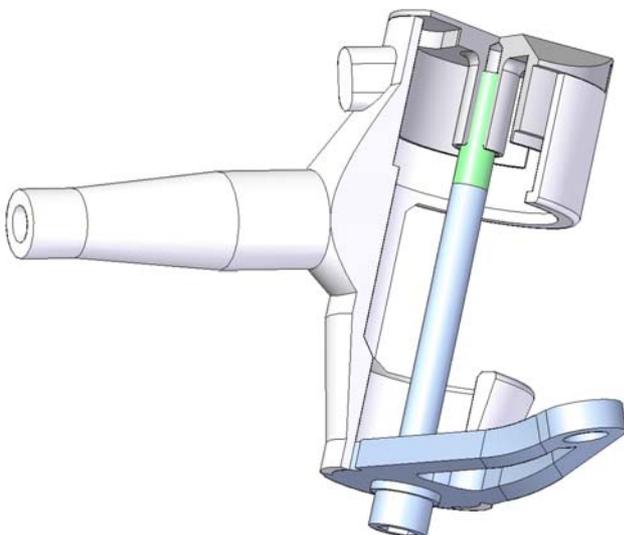
Other cap versions.



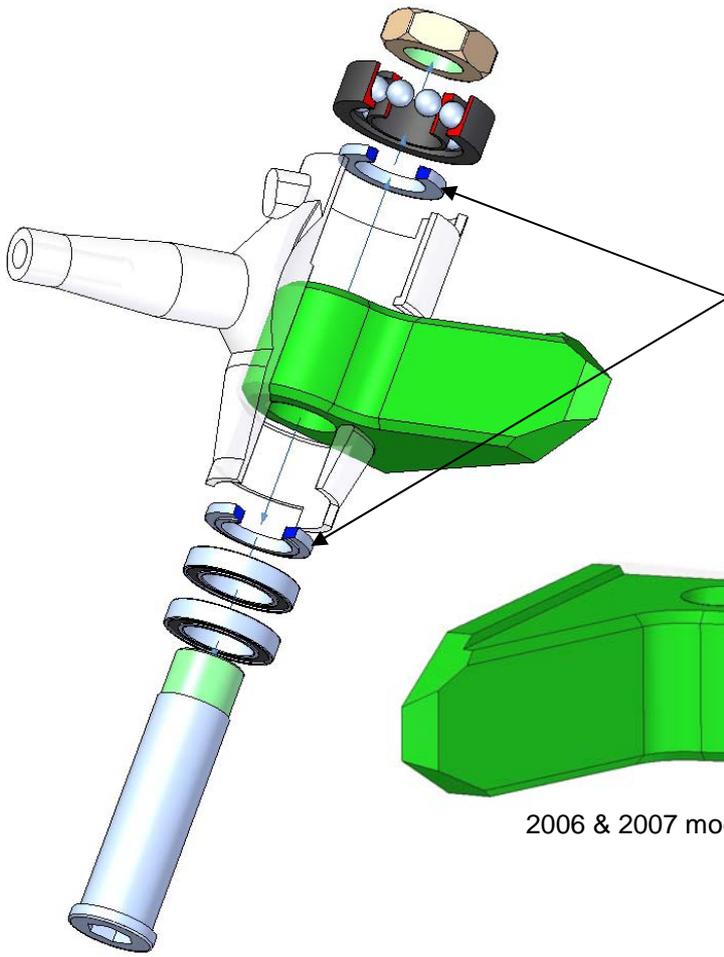
Cap system as used in models from 2006 to 2008. Components for this system are no longer available, but can easily be upgraded to the current version with integrated pressure sleeve.



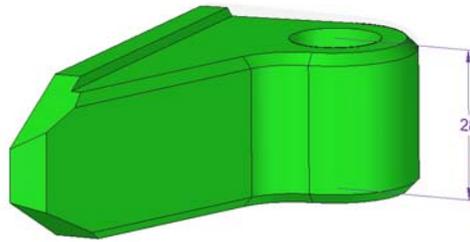
For a clean look, a cap is available with integrated bolt. Because the integrated bolt does not have an anti-vibration locknut function, it is not recommended to use this when riding regularly on unsurfaced roads.



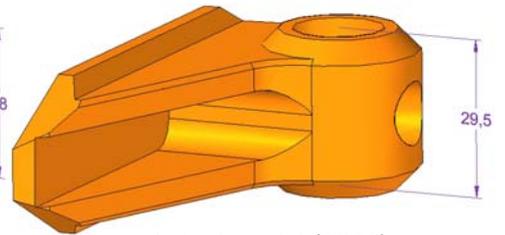
Frame attachment points (wingtips) from 2006 and 2007



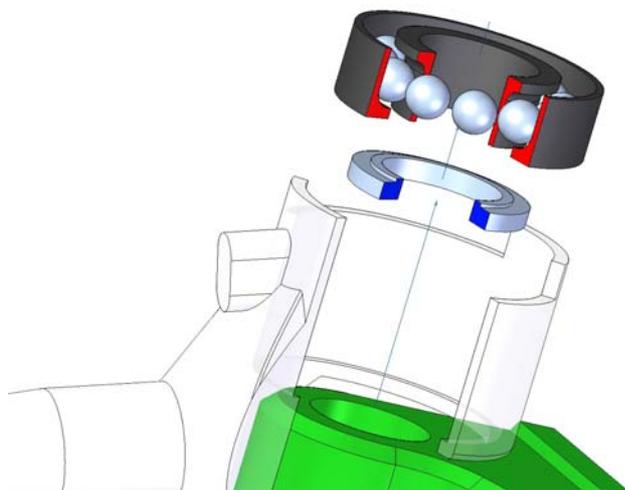
The wingtips of model years 2006 and 2007 were not produced with raised bosses. So these trikes need a different arrangement of spacer rings. For these systems two spacer rings are needed. The rest of the components (bearings, nuts etc) are unchanged.



2006 & 2007 models



Actual model (2008)



This type of spacer ring has a narrow lip on one side. This lip is needed so that it touches only the inner ring of the bearing. So the side with this narrow lip must always be against the bearing. The flat side should be against the aluminium frame.

