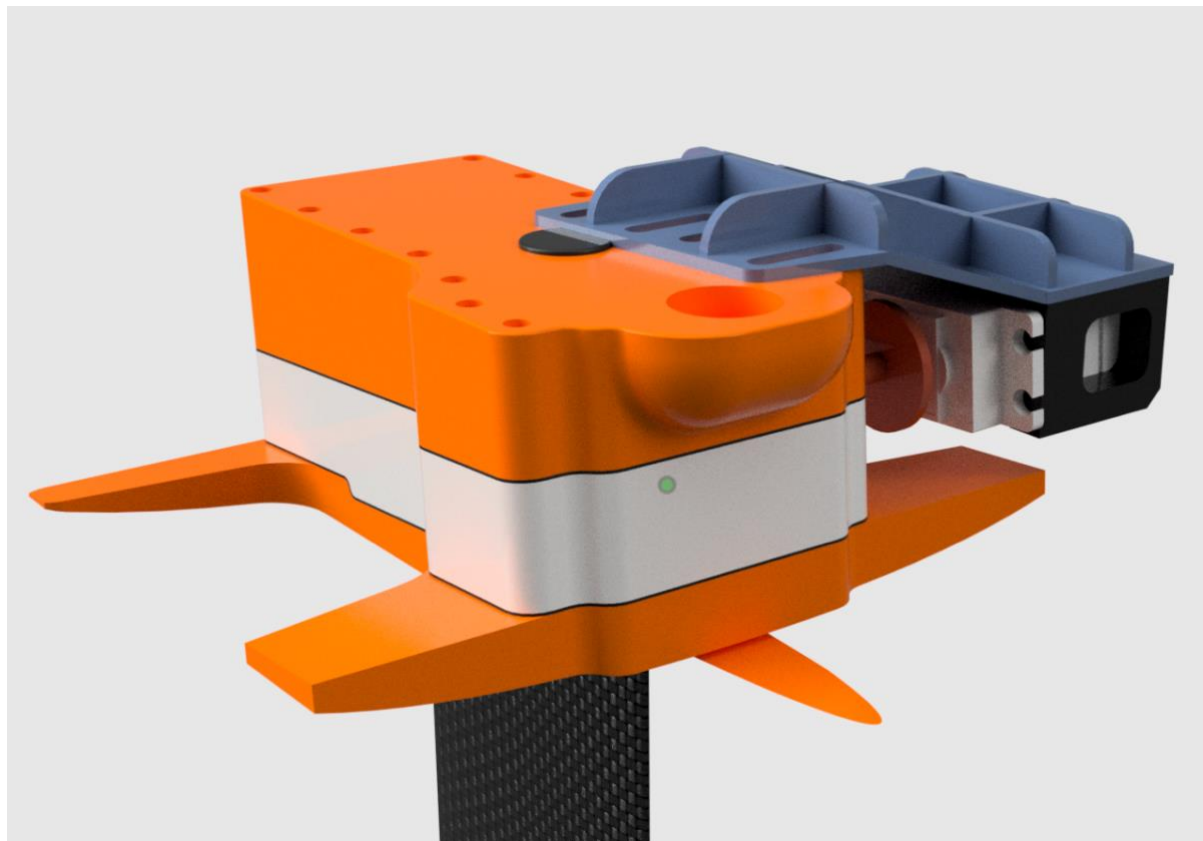


Canting Keel Mechanism for RC-Yachts

by Erwin Keller and YACHTPRINT

Version 3.0, 09/2026



The canting keel is one of the key innovations that has transformed modern IMOCA offshore racing. By swinging the keel up to approximately 38° to either side, the system increases the boat's righting moment, allowing either a lighter keel or significantly greater stability and sail-carrying power compared with a conventional fixed keel.

Our canting keel is operated by a standard-size sail winch with six turns. The canting axis is inclined by 4° , increasing the keel's effective angle of attack when canted and generating additional hydrodynamic lift. This helps to reach foiling conditions earlier.

The fully water-sealed canting system is actuated by a worm drive. Because the worm drive is self-locking, the servo does not need to apply continuous force to hold the keel fully canted. However, the loads are still very high, so the drive itself must be machined. The additionally required parts are listed below. The system is prepared to accept the carbon fiber fin of a DF95 sailboat.

The system requires tight tolerances and must withstand very high loads. Careful fine tuning may be needed to ensure smooth movement, minimal play, and no part interference. The system is thus recommended for **experienced model builders**.

3D PRINTING

Print settings:

Infill 15%, part 2 100%

Layer height 0,2 mm

Wall loops 2, 5 wall loops for part 6

Seal all printed parts against water ingress with wallpaper sealant (Elefantenhaut)

3D printed parts list	recommended filament
1. Canting keel bearing	PLA or ABS
2. Keelbearinghouse bottom	PLA or ABS
3. Seal bottom middle	TPU
4. Keelbearinghouse middle	PLA or ABS
5. Seal middle top	TPU
6. Keelbearinghouse top	PLA or ABS
7. Servobracekt	PLA or ABS
8. Servoattachment	PLA or ABS
9. Plug	TPU

All files are in STL format. "keelbearinghouse bottom" which is available in 4 versions:

1. Keelbearinghouse bottom MACIF.stl
2. Keelbearinghouse bottom MALICIA 4.stl
3. Keelbearinghouse bottom.3MF
4. Keelbearinghouse bottom. F3D

Versions 3 and 4 are for adapting this part to other boat hulls

ADDITIONAL PARTS

Additional parts needed besides the printables (screws, shafts, worm gears, etc.)

1. 14 M3 screws M3 x 50mm incl. washer (pan head with internal hexagon)
2. 14 short M3S press in nuts / threaded inserts
3. Worm drive M1, 25 teeth, gear bore 6 mm, worm rod bore 5 mm (see shopping list)
4. Shaft 5mm diameter, material brass (see shopping list)
5. Shaft 6mm diameter, material brass (see shopping list)
6. Flange coupling for shaft of 5mm diameter (see shopping list)
7. Servo winch 37 kg cm, minimum 5 revolutions (see shopping list)
8. 1 O-ring 4 x 7 x 1,5 mm
9. Carbon fiber keel with bolts from DF95. Important note: this part has to be shortended by 60 mm and a CORNER has to be filed to leading edge (see further below).

INSTRUCTIONS – CANTING KEEL (BY ERWIN KELLER)

BILL OF MATERIAL

Lieferung ausstehend

Bestellung aufgegeben am: 3. Jun 2025
Bestellnummer: 305511211572478 [Kopieren](#)

Bestelldetails >

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1M Worm Gear + Word Rod 1 Satz 1 Modul Turbinen schnecken räder 1 m Messing Schnecken getrieb...



Worm Rod - Bore 5mm, 25T Gear-Bore 6mm

13,39€ x2

Kostenlose Rückgabe · Garantierte Lieferung

Gesamt:30,94€

Empfang bestätigen

Bestellung verfolgen





LAVMHAB Messingstab 6mm x 150mm, Massive Runde
Messingstangen für DIY Handwerk (4 Stück)
Marke: LAVMHAB
4,9 ★★★★★ (57) | [Diese Seite durchsuchen](#)
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5mm x 150mm 10,99€ (2,75€ / Stück) GRATIS Lieferung Donnerstag	5mm x 300mm 12,69€ (3,17€ / Stück) GRATIS Lieferung Donnerstag	6mm x 150mm 12,99€ (3,25€ / Stück) GRATIS Lieferung Donnerstag	6mm x 300mm 13,69€ (3,42€ / Stück) GRATIS Lieferung Donnerstag	8mm x 150mm 11,99€ (3,00€ / Stück) GRATIS Lieferung Donnerstag	8mm x 300mm 11,99€ (3,00€ / Stück) GRATIS Lieferung Donnerstag

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winwill 4 Stück Flansch Kupplung für Wellenkuppler für Modellbaumotoren 5mm 5mm
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9,99 €

prime
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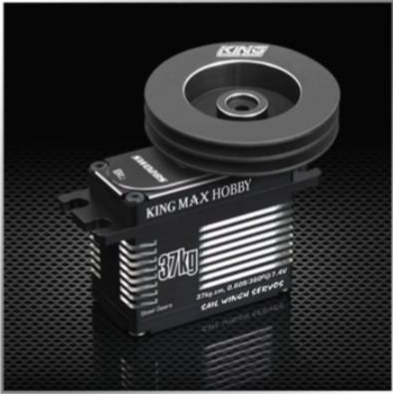
Größe: 5mm

3mm 9,95€ GRATIS Lieferung Donnerstag	3.17mm 9,99€ GRATIS Lieferung Donnerstag	4mm 9,99€ GRATIS Lieferung Freitag	5mm 9,99€ GRATIS Lieferung Donnerstag	6mm 9,99€ GRATIS Lieferung Donnerstag	6.35mm 9,99€ GRATIS Lieferung Donnerstag
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Material Metall

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Segelwinde SW02BS, 37kg, Stahlgetriebe



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1 Stück

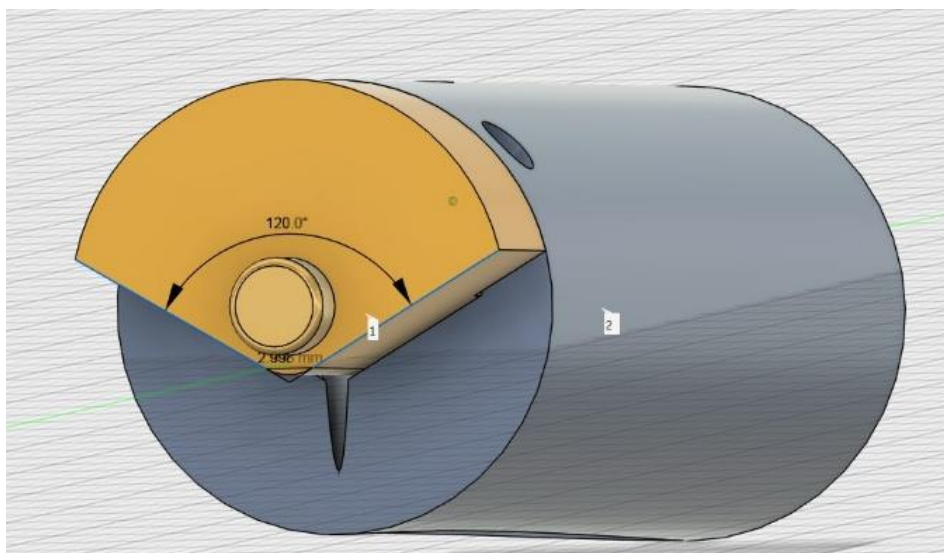
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Product number: 4.48

ASSEMBLY

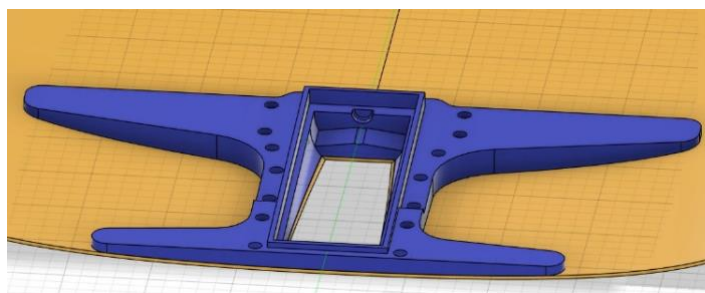
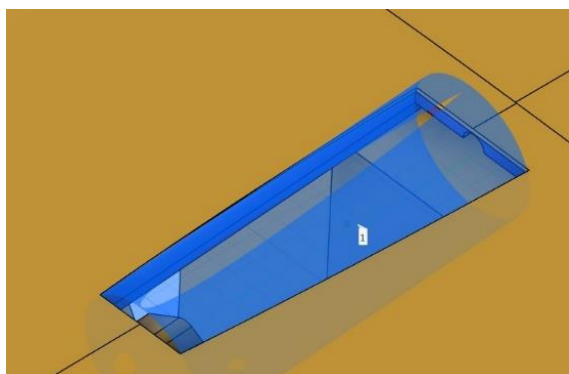
take part 2 and heat-set the short M3S press-in nuts. Make sure they sit vertically, flush with both the top and underside of part Next, glue part 2 to the hull in the correct position. Make sure the press-in nut threads remain free of adhesive.

Prepare the worm gear for mounting with the canting keel bearing by cutting out a 120° segment. You can use the little sawing jig to mark the exact cutting line.



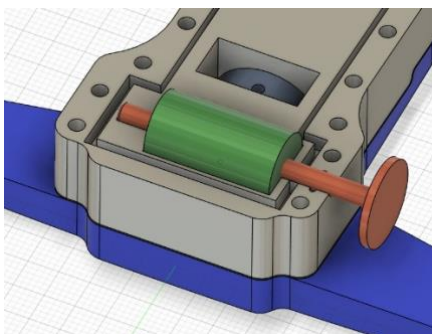
Mount the chamfered 6 mm shaft with a 3 mm front overhang on the gear, then glue the assembly into part 1. Make sure the gear is centered and sits flat against the front of the canting keel bearing.

Carefully cut the canting keel opening in the hull, checking it repeatedly to ensure the canting keel bearing can move freely. CAUTION: The canting keel bearing is angled 4° relative to the hull's horizontal line, so the opening is not rectangular.



Prepare the worm drive by assembling it to the 5 mm shaft as shown in the sketch. The screws of the worm drive must be positioned towards the shaft outlet. Also assembly the O-ring, the flange coupling and the connection adapter for the winch.

INSTRUCTIONS – CANTING KEEL (BY ERWIN KELLER)



Glue part 7 and 8 together, mount the winch.

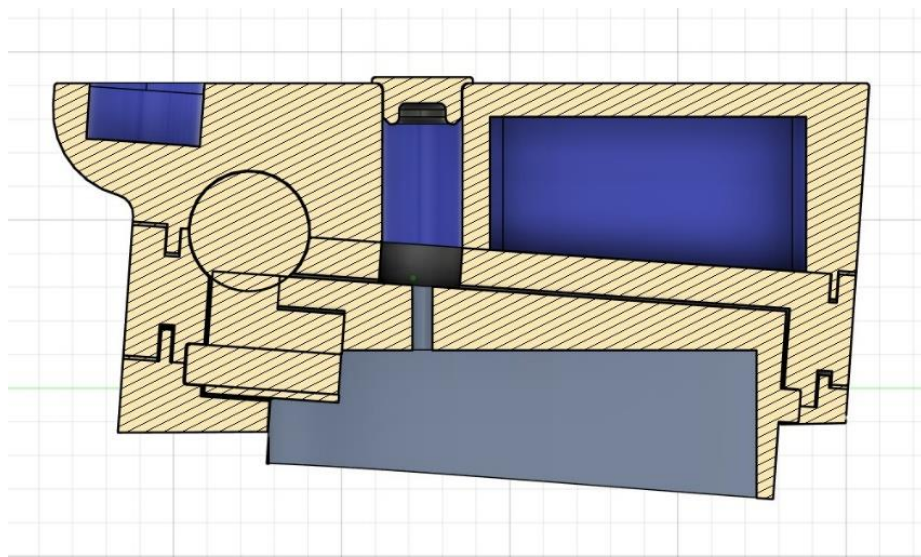
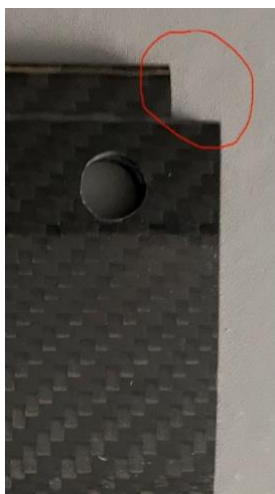
Finally, seal and screw together the canting keel assembly. For sealing, we recommend a universal jointing compound, such as Hylo.

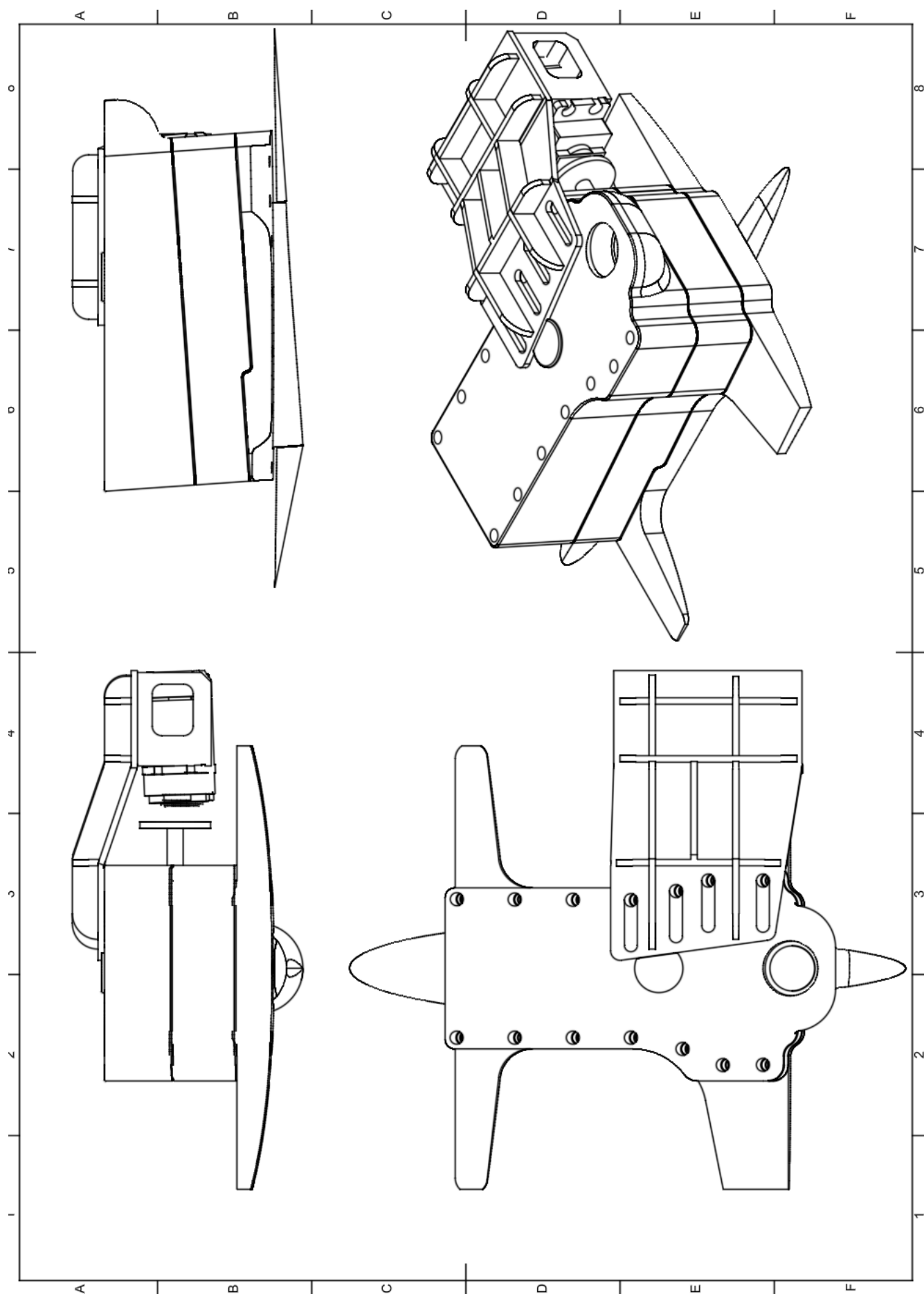
Insert the canting keel bearing into part 2 and apply high-viscosity lubricant to the gear. Place seal part 3 onto part 2. Using a cannula, half-fill the grooves on the top and bottom of housing middle part 4 with universal jointing compound.

Place housing middle part 4 onto part 2. Insert the worm gear with the fitted O-ring into part 4, then lubricate the worm. Place part 5 onto part 4, then add part 6 on top and screw the assembly together with parts 7 and 8 using the 14 screws.

Let the assembly rest, then lightly retighten the screws if needed. After 24 hours, the universal sealant will have cured and the assembly can be leak-tested.

Shorten the DF95 carbon fiber keel by 60 mm; otherwise, the loads will be too high. For a proper fit in the canting keel bearing, file an 8 x 8 mm cutout into the front edge of the shortened DF95 keel. Secure the keel in the bearing from above with an M3 x 20 mm screw, then close the opening with part no. 9.





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