TOST

Flugzeuggerätebau

*80 Years of Safety in Flying*

*Pilots in Action for Pilots!*

# PRODUCT CATALOG

March 2026

**QUALITY MADE IN GERMANY**

Dear fellow aviators, dear customers!

In 2025 we were celebrating a very special event – our 80th anniversary as a company. This is not only an anniversary we are very proud of, but also a perfect moment to say THANK YOU to our loyal customers. Our aim always has been to support you with reliable and durable products and provide a service at eye level, be this by way of personal advice, the fast supply of spare parts or a well-stocked storehouse.

We want to be your reliable partner in aviation in the future as well. It is only thanks to you, our loyal customers, that we can look back on 80 successful years of operation.
What we particularly cherish is the fact that many of our developments and optimizations are the result of close contacts and cooperations with you. Your feedback based on your daily experience on the airfield has always helped us improve our products.
We really appreciate this close cooperation with our customers.

We wish you marvelous flights and always HAPPY LANDINGS.

Susanne Dupont & Michael Dörflein


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**Our EASA certifications as a development, manufacturing and maintenance organisation underscore the professionalism and versatility of our family-owned business.**

**EASA Production Organisation DE.21G.0065**
**EASA Maintenance Organisation DE.145.0411**
**Design Organisation EASA.AP230**

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# AIRCRAFT WHEELS

# AIRCRAFT WHEELS

In 80 years of development and production of high-grade aircraft wheels, we have created a vast and varied product-range and delivery programm.

Tost wheels are used worldwide in gliders, motor gliders, aircraft, ultralight, amphibium aircraft, helicopters and gyrocopters. Also in heavy-duty applications, Tost wheels convince with high load factors and customer-oriented solutions.

High service efficency is an important feature of an aircraft wheel. That's why we pursue our philosophy of wheel hubs for tube type tires. You can easily change the tire with standard tools, even on the airfield, without great effort.

The operation of Tost wheels is very economical. Not only are quality and durability convincing, but also the ease of maintenance: the wheel hubs are maintenance-free and fitted with high-quality groove ball bearings. We can supply spare parts over decades and we offer maintenance and repair of your wheels.

In case you do not find "your" wheel for your aircraft, we manufacture custom-made wheels, regarding installation width and ball bearing diameter.

As a matter of course, we also deliver completely mounted wheels. Our wide range of aircraft tires and tubes are available from stock.

Being an EASA certified production and maintenance organisation, we supply most of our wheels with EASA Form 1.

***TOST wheels "Made in Germany" are a synonym for highest quality***


5" Disk brake wheel Penta 135-30
with brake assembly BZT2



# LANDING WHEELS

We offer landing wheels for use as nose wheel, tail wheel, support wheel or as unbraked main wheel, in various dimensions and constructions.

## Landing wheel Mini 150 and 180

The smallest available wheel with pneumatic or foam-filled tire, with the advantage of good suspension and absorption properties. Easy tire mounting thanks to split wheel halves, despite very narrow dimensions. Tire diameter 150 mm or 180 mm, installation width only 30/35 mm. Ideal for narrow installation spaces. Suitable for retrofit of tail wheels as well as for steerable tail wheels. Anodised in blue or in silver.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **031512** | LR Mini 150 N | 30 | 12 mm | 150x30 | 300 | |
| **031513** | LR Mini 150 V | 30 | 12 mm | 150x30 | 300 | special valve hole |
| **031515** | LR Mini 150 Z | 30 | 0.5" | 150x30 | 300 | for axle in inch |
| **031582** | LR Mini 150 F | 30 | 12 mm | 150x30 | 300 | foam-filled tire |
| **031522** | LR Mini 150 D | 30 | 12 mm | 150x30 | 300 | with valve hole cover |
| **031518** | LR Mini 150 L | 30 | 12 mm | 150x30 | 230 | light weight! |
| **031812** | LR Mini 180 | 35 | 12 mm | 180x35 | 330 | |
| **031816** | LR Mini 180 N | 35 | 12 mm | 180x35 | 330 | for tube 180x35, 062182 |
| **031882** | LR Mini 180 F | 35 | 12 mm | 180x35 | 330 | foam-filled tire |

Explanation: LR stands for "Laufrad" = landing wheel


Landing wheel 150 N
(031512)


Landing wheel 150 V
(031513)

Landing wheel 150 L
(031518)


Landing wheel 180
(031812)

3" Landing wheel Moritz
(032100)

## 3" Landing wheel Moritz and Moritz II

Our extensively tested 3-inch tail wheel (LR) is available in two versions:
**Moritz**: as a sturdy aluminium cast wheel hub with fin sector
**Moritz II**: as a two-part wheel hub CNC-milled from aluminium

The fin sector system ensures emergency roll capability also with extremely hard landings. Due to its two-part wheel structure, the CNC-milled wheel hub Moritz II is attractive because of its lower weight and the considerably easier tire mounting. Thanks to its anodised surface, the Moritz II wheel hub offers maximum corrosion protection.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **032100** | 3" LR Moritz | 50 | 20 | 210x65 | 360 | one-part |
| **032112** | 3" LR Moritz II | 50 | 12 | 210x65 | 335 | two-part |
| **032120** | 3" LR Moritz II | 50 | 20 | 210x65 | 330 | two-part |

3" Landing wheel Moritz II
(032112)

3" Landing wheel Moritz II brass
(032502)

## 3" Landing wheel Moritz II from brass

To achieve good flight characteristics and the maximum aircraft performance, the ideal position of the aircraft's center of gravity is significant. By using our heavy wheel hub Moritz II, which is manufactured from solid brass, you can compensate for too top-heavy moments without making modifications to the aircraft.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **032501** | 3" LR Moritz II brass | 50 | 20 | 210x65 | 1490 | two-part |
| **032502** | 3" LR Moritz II brass | 50 | 12 | 210x65 | 1510 | two-part |

Explanation: LR stands for "Laufrad" = landing wheel



## 3.5" Landing wheel Max and Max II

The tire size 200x50 is one of the well-established sizes for tail wheels of gliders and motor gliders. In addition to the well-tried one-part cast wheel hub Max, we now offer with the wheel hub Max II, a lightweight, two-part version. The wheel Max II combines most simple tire mounting with the lowest possible mass. Thanks to its anodised surface, the Max II wheel hub offers a maximum of corrosion protection.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **033100** | 3.5" LR Max | 50 | 20 | 200x50 | 430 | one-part |
| **033112** | 3.5" LR Max II | 50 | 12 | 200x50 | 375 | two-part |
| **033120** | 3.5" LR Max II | 50 | 20 | 200x50 | 365 | two-part |
| **033412** | 3.5" LR Max II Version Arcus | 50 | 12 | 200x50 | 375 | two-part, valve hole further outside |
| **033420** | 3.5" LR Max II Version Antares | 50 | 20 | 200x50 | 360 | two-part, valve hole further outside |
| **033812** | 3.5" LR Max II | 50 | 12 | 200x50 | 370 | two-part, with foam-filled tire |
| **033820** | 3.5" LR Max II | 50 | 20 | 200x50 | 360 | two-part, with foam-filled tire |

3.5" Landing wheel Max
(033100)

3.5" Landing wheel Max II
(033112)

3.5" Landing wheel Max II brass
(033501)

## 3.5" Landing wheel Max II from brass

The wheel Max II is also available in a brass version and can thus help you to compensate for too top-heavy moments, without performing changes on the aircraft.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **033502** | 3.5" LR Max II brass | 50 | 12 | 200x50 | 2105 | two-part |
| **033501** | 3.5" LR Max II brass | 50 | 20 | 200x50 | 2080 | two-part |
| **033542** | 3.5" LR Max II brass Version Arcus | 50 | 12 | 200x50 | 2105 | two-part |

Explanation: LR stands for "Laufrad" = landing wheel

4" Landing wheel 100-20 Diamond
(034201)

## 4" Landing wheel Classic

Especially as sturdy nose wheels and main wheels or when used for special purposes our 4-inch Classic landing wheels (LR) have proven their worth. They feature the thoroughly tested deformable fin sector and thus provide a high load capacity, combined with compact installation measurements. The wheel halves are manufactured from die-cast aluminium and threefoldly screwed.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **034000** | 4" LR Classic 85-20 | 85 | 20 | 4.00-4/3.00-4 260x85 | 1010 | two-part |
| **034015** | 4" LR Classic 85-15 | 85 | 15 | 4.00-4/3.00-4 260x85 | 1045 | two-part |
| **034100** | 4" LR Classic 100-17 | 100 | 17 | 4.00-4/5.00-4 260x85 | 1200 | two-part |
| **034200** | 4" LR Classic 100-20 | 100 | 20 | 4.00-4/5.00-4 | 1140 | two-part |
| **034201** | 4" LR Classic 100-20 | 100 | 20 | 4.00-4/5.00-4 | 1120 | two-part Diamond |
| **034300** | 4" LR Classic 100-25 | 100 | 25 | 4.00-4/5.00-4 | 1112 | two-part |
| **034401** | 4" LR Classic 60-20 | 60 | 20 | 2.80/2.50-4 | 870 | asymmetr. split |
| **034600** | 4" LR Classic 85-17 | 85 | 17 | 4.00-4/3.00-4 260x85 | 1018 | two-part |
| **034700** | 4" LR Classic 85-25 | 85 | 25 | 2.80/2.50-4 3.00-4 260x85 | 990 | two-part |



## 4" Landing wheel Classic seawater-resistant

For use in amphibians or equipment exposed to saltwater, we also manufacture the 4-inch landing wheel (LR) Classic in a seawater-resistant version. With a special surface treatment, bearings from stainless steel with special seals, and coated wheel bolts, these wheel hubs are highly corrosion-resistant.

4" Landing wheel
seawater-resistant
(034002)

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **034002** | 4" LR Classic 85-20 seawater-resistant | 85 | 20 | 4.00-4/3.00-4 260x85 | 1010 | two-part |
| **034018** | 4" LR Classic 85-15 seawater-resistant | 80 | 15 | 4.00-4/3.00-4 260x85 | 1045 | two-part |
| **034325** | 4" LR Classic 100-25 seawater-resistant | 100 | 25 | 4.00-4/5.00-4 | 1100 | two-part |
| **034415** | 4" LR Classic 60-20 seawater-protected | 60 | 20 | 2.80/2.50-4 | 870 | two-part |
| **034419** | 4" LR Classic 60-20 seawater-resistant | 60 | 20 | 2.80/2.50-4 | 870 | two-part |

## 4" Landing wheel Tria

4-inch landing wheels (LR) Tria are convenient for applications, in which a low weight combined with a high strength is the determining factor. Through our CNC manufacturing from the solid material, we realize a weight-optimised wheel hub for high loads, with a high-class surface treatment (anodised in blue, other colours available on request) and a threefold bolting with high-tensile wheel bolts. The asymmetric split of the wheel halves allows for the easiest tire mounting without special tools.

Landing wheel Tria
(034482)

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **034462** | 4" LRT Tria 60-40-20 | 40 | 20 | 2.80/2.50-4 260x85 | 645 | two-part |
| **034482** | 4" LRT Tria 80-60-20 | 60 | 20 | 260x85 to 4.00-4 | 690 | two-part |
| **034485** | 4" LRT Tria 80-60-25 | 60 | 25 | 260x85 to 4.00-4 | 734 | two-part |

5" Landing wheel Classic
(035420)

## 5" Landing wheel Classic

The 5-inch landing wheels (LR) Classic are used as nose wheels in aircraft and are also suitable for heavy-duty applications. Wheel hub with six-fold bolting, manufactured from die-cast aluminium with deformable fin sector.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **035000** | 5" LR Classic 102-20 | 102 | 20 | 5.00-5 336x115-5 | 1480 | two-part |
| **035100** | 5" LR Classic 102-30 | 102 | 30 | 5.00-5 336x115-5 | 1450 | two-part |
| **035110** | 5" LR Classic 100-30 | 100 | 30 | 5.00-5 336x115-5 | 1870 | two-part |
| **035150** | 5" LR Classic 105-20 | 105 | 20 | 5.00-5 336x115-5 | 1500 | two-part |
| **035170** | 5" LR Classic 102-25 | 102 | 25 | 5.00-5 336x115-5 | 1450 | two-part |
| **035200** | 5" LR Classic 115-20 | 115 | 20 | 5.00-5 380x150 350x135 336x115-5 | 1550 | two-part |
| **035255** | 5" LR Classic 115-25 B | 115 | 25 | 5.00-5 380x150 350x135 336x115-5 | 1720 | two-part |
| **035305** | 5" LR Classic 115-30 B | 115 | 30 | 5.00-5 380x150 350x135 336x115-5 | 1780 | two-part |
| **035400** | 5" LR Classic 125-17v | 125 | 17 | 5.00-5 380x150 350x135 336x115-5 | 1590 | two-part |
| **035420** | 5" LR Classic 125-20 | 125 | 20 | 5.00-5 380x150 350x135 336x115-5 | 1600 | two-part |
| **035450** | 5" LR Classic 125-25 | 125 | 25 | 5.00-5 380x150 350x135 336x115-5 | 1600 | two-part |
| **035505** | 5" LR Classic 125-30 B | 125 | 30 | 5.00-5 380x150 350x135 336x115-5 | 1590 | two-part |



## 5" Landing wheel Classic seawater-resistant

For the use in amphibians or equipment exposed to saltwater we manufacture the 5-inch landing wheel (LR) Classic also as seawater-resistant version. With a special surface treatment, bearings from stainless steel with special seals and coated wheel bolts, these wheel hubs are highly corrosion-resistant.

5" Landing wheel Classic
seawater-resistant
(035301)

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **035301** | 5" LR Classic 115-30 seawater-resistant | 115 | 30 | 5.00-5 380x150 350x135 336x115-5 | 1780 | two-part |

## 5" Landing wheel Penta

The 5-inch Penta landing wheels (LR) can be used to save weight, as well as a possible replacement for landing wheels equipped with inch-sized bearings. They are CNC-milled from solid material and feature low weight and high load capacity due to the high-tensile aluminium alloy. The wheel halves are fivefoldly screwed.
Thanks to the set distance bushing, distortion of the bearings on the axle is not possible. Due to the asymmetric split of the wheel hub and the use of a tire and tube, fast and straightforward tire changes – without special tools or repair shop equipment – are possible. The anodized surface of the Penta wheel hubs provides maximum corrosion protection.

5" Landing wheel Penta
(035531)

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **035520** | 5" LRP Penta 79-51-20 | 51 | 20 mm | 5.00-5 336x115-5 | 1060 | two-part |
| **035530** | 5" LRP Penta 79-55-30 | 55 | 30 mm | 5.00-5 336x115-5 | 1100 | two-part |
| **035531** | 5" LRP Penta 101-77-1/1/4 | 77 | 1/1/4" | 5.00-5 380x150 336x115-5 | 1222 | two-part |

## 5" Landing wheel tubeless

To realisze a further weight reduction you can use our 5-inch wheel tubeless (TL). The weight reduction is about 15% of the total weight compared to a wheel hub with tire and tube (tube type, TT).
The exchange of the tire is relatively easy to handle, contrary to other TL wheels.

5" Landing wheel Penta tubeless
(035590)

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **035590** | 5" LRP Penta Tubeless 99-75-30 | 75 | 30 mm | 5.00-5 TL 380x150 TL | 1227 | two-part |

6" Landing wheel Mike (036650)

## 6" Landing wheel Mike

Apart from the "small" landing wheels (LR) we also manufacture unbraked, approved landing wheels in big sizes. Our 6-inch landing wheels Mike made from die-cast aluminium with a deformable fin sector are particularly suitable for high loads.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **036630** | 6" LR Mike 144-95-30 | 95 | 30 | 6.00-6, 7.00-6, 15x6.00-6, 8.00-6 | 2650 | two-part |
| **036650** | 6" LR Mike 144-95-40 | 95 | 40 | 6.00-6, 7.00-6, 15x6.00-6, 8.00-6 | 3170 | two-part |

6" Landing wheel Ultralight

## 6" Landing wheel Ultralight

Suitable for our light 6-inch UL disk brake wheels and the wide spread tire size 4.00-6, we can also supply a 6-inch landing wheel (LR) for Ultralight aircraft.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **036820** | 6" LRP UL 80-50-20 | 50 | 20 | 4.00-6 | 1075 | two-part |

## 6" Landing wheel Penta

With the 6-inch Penta landing wheel you can save weight compared to the landing wheel (LR) of the 6-inch Classic series.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **036950** | 6" LRP UL | 110 | 30 mm | 6.00-6 | 2110 | two-part |
| **036970** | 6" LRP UL | 110 | 1 1/4" | 6.00-6 | 2110 | two-part |

10" Landing wheel Classic (039000)

## 10" Landing wheel Classic

Especially in the range of high-tensile special applications you will be impressed by our 10-inch landing wheels (LR) Classic.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Type of hub |
|---|---|---|---|---|---|---|
| **039000** | 10" LR Classic 210-45 | 210 | 45 | 8.50-10 | 11200 | two-part |
| **039040** | 10" LR Classic 210-40 | 210 | 40 | 8.50-10 | 10900 | two-part |



# SHOE BRAKE WHEELS

For a large number of gliders, the Simplex shoe brake (BB) continues to be the right choice. The advantages are simple construction, reduced space requirements, low weight, lower force on the brake lever due to the servo action, and of course, the low price.

## 4" Shoe brake wheels

Our smallest shoe brake wheels (BB) Liliput and Kobold are the first choice for club-class single seaters. With smallest possible installation dimensions of the wheels, very good brake results can be achieved.

## 4" Shoe brake wheel Liliput

The shoe brake (BB) wheel Liliput features a big torque flap for ideal torque transfer.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Type of hub |
|---|---|---|---|---|---|---|---|
| **044210** | 4" BB Liliput | 88 | 17 | 2.80/2.50-4 260x85 4.00-4 | 1340 | 130 | two-part |

4" Shoe brake wheel Liliput (044210)

## 4" Shoe brake wheel Kobold

Small installation dimension with the brake power of a 5" wheel: this is our 4-inch shoe brake (BB) wheel Kobold.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Type of hub |
|---|---|---|---|---|---|---|---|
| **044300** | 4" BB Kobold 103-20 | 103 | 20 | 4.00-4 5.00-4 | 1760 | 200 | two-part |
| **044325** | 4" BB Kobold 103-25 | 103 | 25 | 4.00-4 5.00-4 | 1740 | 200 | two-part |
| **044400** | 4" BB Kobold 113-20 | 113 | 20 | 4.00-4 5.00-4 | 1830 | 200 | two-part |
| **044500** | 4" BB Kobold 113-25 | 113 | 25 | 4.00-4 5.00-4 | 1810 | 200 | two-part |

4" Shoe brake wheel Kobold (044300)

## 4" Shoe brake wheel Gnom

The 4-inch wheel Gnom with the big brake assembly is ideally suited for motor gliders with a central wheel, vintage gliders, or high demands in terms of load capacity with small wheel hub diameter.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Type of hub |
|---|---|---|---|---|---|---|---|
| **044700** | 4" BB Gnom 187-30 | 187 | 30 | 355x150 | 3200 | 280 | three-part |
| **044800** | 4" BB Gnom 213-30 | 213 | 30 | 8.00-4 | 3610 | 280 | three-part |

4" Shoe brake wheel Gnom (044800)

5" Shoe brake wheel Standard
(045700)

## 5" Shoe brake wheel Standard

For single-seater or double-seater gliders, motorgliders or aircraft: our shoe brake wheel (BB) Standard offers a huge selection of installation dimensions in the well-established wheel size 5 inch.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Type of hub |
|---|---|---|---|---|---|---|---|
| **045000** | 5" BB Standard 95-20 | 95 | 20 | 3.50-5<br>336x115-5<br>5.00-5 | 2170 | 200 | two-part |
| **045100** | 5" BB Standard 113-20 | 113 | 20 | 336x115-5<br>5.00-5 | 2300 | 200 | two-part |
| **045255** | 5" BB Standard 115-25 | 115 | 25 | 336x115-5<br>5.00-5<br>350x135 | 2330 | 200 | two-part |
| **045200** | 5" BB Standard 115-30 | 115 | 30 | 336x115-5<br>5.00-5<br>360x135 | 2350 | 200 | two-part |
| **045417** | 5" BB Standard 125-17v | 125 | 17 | 336x115-5<br>5.00-5<br>380x150 | 2500 | 200 | two-part |
| **045400** | 5" BB Standard 125-20 | 125 | 20 | 336x115-5<br>5.00-5<br>380x150 | 2450 | 200 | zwei-teilig |
| **045600** | 5" BB Standard 125-25 | 125 | 25 | 336x115-5<br>5.00-5<br>380x150 | 2460 | 200 | zwei-teilig |
| **045430** | 5" BB Standard 125-30 | 125 | 30 | 336x115-5<br>5.00-5<br>380x150 | 2440 | 200 | zwei-teilig |
| **045500** | 5" BB Standard 130-20 | 130 | 20 | 336x115-5<br>5.00-5<br>380x150 | 2440 | 200 | two-part |
| **045700** | 5" BB Standard 130-30 | 130 | 30 | 336x115-5<br>5.00-5<br>380x150 | 2440 | 200 | two-part |
| **045810** | 5" BB Standard 130-35 | 130 | 35 | 336x115-5<br>5.00-5<br>380x150 | 2460 | 200 | two-part |

5" Shoe brake wheel Bimbo
(045950)

## 5" Shoe brake wheel Bimbo

For double seaters made of glass fibre, a higher brake momentum is needed due to the higher mass and landing speed. With its significantly bigger brake drum, bigger brake shoes and an optimised brake lever transmission, the 5-inch wheel Bimbo fulfills these high requirements.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Type of hub |
|---|---|---|---|---|---|---|---|
| **045950** | 5" BB Bimbo | 155 | 30 | 380x150 | 2870 | 280 | two-part |



## 6" Shoe brake wheel Super

For many different 6-inch tires, we offer our 6-inch shoe brake wheel Super with its significant braking torque.

| P/N | Description | Install. width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Type of hub |
|---|---|---|---|---|---|---|---|
| **046100** | 6" BB Super | 154 | 30 | 6.00-6<br>7.00-6<br>8.00-6 | 3150 | 270 | two-part |

6" Shoe brake wheel Super
(046100)

**Bear the following hints in mind during installation and maintenance:**

- Make sure the brake cable is laid correctly:
  as short and direct as possible, but without tight bends
- Use a Bowden cable with a set screw
- Adjust the brake lever at regular intervals
- Roughen brake linings with emery paper (grit size 40 to 80)
  until the complete surface is matte
- Check minimum lining thickness (at least 1.5 mm)

## Shoe brake wheel retrofit for Bocian

We offer a retrofit kit to shoe brake wheel 5-inch Standard 115-25 for Bocian to improve its braking capacity. The kit consists of the shoe brake wheel, an axle with diameter 25 mm, the torque plate kit and optional a new tire 5.00-5 with tube.

| P/N | Description | Remarks |
|---|---|---|
| **045910** | 5" Retrofit kit Bocian | with new tire |
| **045911** | 5" Retrofit kit Bocian | without new tire |

# DISK BRAKE WHEELS

Disk brake wheels have been the preferred choice for many years as brake wheels for gliders, motor gliders, ultralight aircraft, powered aircraft, as well as helicopters and autogyros. Thanks to their excellent controllability, automatic compensation for brake pad wear, and high, long-lasting braking performance, disk brake wheels ensure optimal braking in all situations, providing a safe and reliable landing.

**Note on the overview tables:**
The wheel weight includes the hub with ball bearing and brake disk. Individual weights for brake calipers and tires are provided in the respective chapters.

**Pay attention to the following points to ensure the operational function of the brake system in your aircraft:**

- The min. thickness of the **brake disk** may not be underrun, see page 29
- The minimum thickness of the **brake lining** may not be underrun, see page 48-56
- Watch out for seals and boltings so that no leakage may occur
- Change the brake fluid regularly
- Never mix brake fluid DOT 4 and Mineral Fluid
- The brake system should be well-bleeded

## Disk brake wheel Mini 150 and 180

Extremely small and light disk brake wheels (SB) are used in a growing number of applications as operational and differential brakes in flight objects with an all-up weight of up to about 100 kg. The smallest possible installation space is realised by our disk brake wheels Mini 150 und Mini 180.

Disk brake wheel Mini (051150)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **051150** | SB Mini 150 | 30 | 42 | 12 | 150x30 | 390 | 15 | 057310 | BZM |
| **051118** | SB Mini 150 L | 30 | 42 | 12 | 150x30 | 340 | 15 | 057310 | BZM |
| **051180** | SB Mini 180 | 35 | 47 | 12 | 180x35 | 420 | 15 | 057310 | BZM |

## 3.5" Disk brake wheel Max II

Our Max II wheel, with its flange-mounted brake disk, offers a combination of a highly stressable, but small tire 200x50 and the small disk brake wheel (SB).

3,5" Disk brake wheel Max II (053020)

3,5" Disk brake wheel Max II RBD (053035)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **053012** | 3.5" SB Max II 62-50-12 | 50 | 62 | 12 | 200x50 | 460 | 15 | 057310 | BZM |
| **053020** | 3.5" SB Max II 62-50-20 | 50 | 62 | 20 | 200x50 | 450 | 15 | 057310 | BZM |
| **053032** | 3.5" SB Max II 70-50-12 | 50 | 70 | 12 | 200x50 | 870 | 100 | 057312 | BZT M |
| **053030** | 3.5" SB Max II 70-50-20 | 50 | 70 | 20 | 200x50 | 860 | 100 | 057312 | BZT M |
| **053035** | 3.5" SB Max II RBD | 50 | 70 | 20 | 200x50 | 735 | 100 | 057315 | BZT M |

## 4" Disk brake wheels

High braking torque combined with compact installation dimensions characterise our 4-inch disk brake wheels (SB) Classic and Tria. Therefore, they are qualified especially for the retrofitting of hydraulic disk brake wheels in single-seat gliders, or as original equipment in ultralights or LSA/VLA.

## 4" Disk brake wheel Classic

4-inch Classic disk brake wheel (SB), from die-cast aluminium, with a well-proven fin sector.

4" Disk brake wheel Classic (054111)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **054111** | 4" SB Classic 110-20 | 85 | 110 | 20 | 260x85 4.00-4 | 1900 | 370 | 057011 | 30-9, BZT, BZT2 |
| **054131** | 4" SB Classic 113-20 | 85 | 113 | 20 | 260x85 4.00-4 | 1900 | 380 | 057031 | 30-9, BZT, BZT2 |
| **054125** | 4" SB Classic 110-25 | 85 | 110 | 25 | 260x85 4.00-4 | 1885 | 370 | 057011 | 30-9, BZT, BZT2 |

## 4" Disk brake wheel Tria

4-inchTria disk brake wheel, CNC-milled from solid high-tensile aluminium alloy, anodised in blue as standard. Thanks to our CNC milling production method, we can reduce the weight by more than 500 g compared to the Classic disk brake wheel of the same dimension.

4" Disk brake wheel Tria (054482)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **054462** | 4" SRT Tria 90-40-20 | 40 | 90 | 20 | 2.80/ 2.50-4 260x85 | 1265 | 370 | 057420 | 30-9, BZT, BZT2 |
| **054482** | 4" SRT Tria 110-60-20 | 60 | 110 | 20 | 260x85 3.00-4 4.00-4 | 1320 | 370 | 057420 | 30-9, BZT, BZT2 |
| **054483** | 4" SRT Tria 125-60-20 | 60 | 125 | 20 | 4.00-4 5.00-4 | 1390 | 370 | 057421 | 30-9, BZT, BZT2 |
| **054484** | 4" SRT Tria UL 102-60-20 | 60 | 102 | 20 | 260x85 | 830 | | 057311 | UL-BZ |

## 4" Disk brake wheel Gnom

For motor gliders with a central wheel and 8.00-4 ballon tire, we also offer a disk brake wheel (SB) with a 4-inch tire seat.

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **054811** | 4" SB Gnom 202-172-30 | 172 | 202 | 30 | 8.00-4 | 3400 | 450 | 057093 | 30-63A, BZT2 |
| **054812** | 4" SB Gnom 212-172-30 | 172 | 212 | 30 | 8.00-4 | 3400 | 450 | 057094 | 30-63A, BZT2 |

5" Disk brake wheel Classic (055161)

## 5" Disk brake wheel Classic

Wheels with a tire seat of 5 inch are the standard size for the main landing gear of many gliders, motor gliders and powered aircraft of various approval classes. For this wheel and tire size, we offer a wide range of disk brake wheels (SB) available ex stock. We will be pleased to prepare a quotation for you, especially for the production of customized wheels.
Our 5-inch disk brake wheels (SB) Classic, manufactured from die-cast aluminium with their specific ductile fin sector, have demonstrated their proven performance over decades.

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **055188** | 5" SB Classic 109-92-20 | 92 | 109 | 20 | 5.00-5 336x115-5 | 2300 | 370 | 057000 | 30-9, BZT, BZT2 |
| **055191** | 5" SB Classic 115-102-20 | 102 | 115 | 20 | 5.00-5 336x115-5 | 2365 | 370 | 057000 | 30-9, BZT, BZT2 |
| **055192** | 5" SB Classic 115-102-25 | 102 | 115 | 25 | 5.00-5 336x115-5 | 2360 | 370 | 057000 | 30-9, BZT, BZT2 |
| **055152** | 5" SB Classic 122-105-20 | 105 | 122 | 20 | 5.00-5 336x115-5 | 2450 | 370 | 057000 | 30-9, BZT, BZT2 |
| **055145** | 5" SB Classic 122-105-25 | 105 | 122 | 25 | 5.00-5 336x115-5 | 2290 | 370 | 057000 | 30-9, BZT, BZT2 |
| **055151** | 5" SB Classic 122-105-30 | 105 | 122 | 30 | 5.00-5 336x115-5 | 2415 | 370 | 057000 | 30-9, BZT2 |
| **055153** | 5" SB Classic 134-115-30 | 115 | 134 | 30 | 5.00-5 336x115-5 380x150 | 2510 | 370 | 057000 | 30-9, BZT2 |
| **055155** | 5" SB Classic 134-115-35 | 115 | 134 | 35 | 5.00-5 336x115-5 380x150 | 2520 | 370 | 057000 | 30-9, BZT2 |
| **055161** | 5" SB Classic 145-115-30 | 115 | 145 | 30 | 5.00-5 336x115-5 380x150 | 2765 | 400 | 057070 | 30-9, BZT2 |
| **055162** | 5" SB Classic 145-115-30v | 115 | 145 | 30 | 5.00-5 336x115-5 380x150 | 2920 | 400 | 057070 | 30-9, BZT2 |
| **055171** | 5" SB Classic 154-115-30 | 115 | 154 | 30 | 5.00-5 336x115-5 380x150 | 2840 | 400 | 057070 | 30-9, BZT2 |
| **055213** | 5" SB Classic 122,5-77,5-30 | 77.5 | 122.5 | 30 | 5.00-5 336x115-5 380x150 | 2600 | 370 | 057513 | 30-9, BZT2 |
| **055212** | 5" SB Classic 127-77,5-30 | 77.5 | 127 | 30 | 5.00-5 336x115-5 380x150 | 2620 | 370 | 057514 | 30-9, BZT2 |
| **055110** | 5" SB Classic 135-115-30 | 115 | 135 | 30 | 5.00-5 336x115-5 | 2500 | 260 | 057030 | TOG |
| **055120** | 5" SB Classic 135-115-35 | 115 | 135 | 35 | 5.00-5 336x115-5 | 2500 | 260 | 057030 | TOG |

Explanation: SB stands for disk brake wheel



## 5" Disk brake wheel Penta

The 5-inch disk brake wheels of our series Penta captivate with their extra lightweight wheel hub, the asymmetric split for easy tire mounting (the tube cannot be pinched between the wheel halves) and the high-quality, maintenance-free precision ball bearings. The compact wheel body prevents the accumulation of foreign particles. Thanks to the robust tire and tube system, the tire can be changed quickly and easily, without the need for special tools or workshop equipment.
The disk brake wheels are anodized in in blue as standard colour. Other colours (red, silver, black, orange) are available on request.

5" Disk brake wheel Penta (055538)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **055520** | 5" SBP Penta 100-51-20 | 51 | 100 | 20 mm | 5.00-5 336x115-5 | 1650 | 370 | 057220 | 30-9, BZT, BZT2 |
| **055523** | 5" SBP Penta 103-51-20 | 51 | 103 | 20 mm | 5.00-5 336x115-5 | 1700 | 370 | 057223 | 30-9, BZT, BZT2 |
| **055530** | 5" SBP Penta 110-55-30 | 55 | 110 | 30 mm | 5.00-5 336x115-5 380x150 | 1880 | 370 | 057230 | 30-9 |
| **055531** | 5" SBP Penta 115-55-30 | 55 | 115 | 30 mm | 5.00-5 336x115-5 380x150 | 1830 | 370 | 057238 | 30-9, BZT2 |
| **055532** | 5" SBP Penta 119-55-30 | 55 | 119 | 30 mm | 380x150 | 2156 | 370 | 057080 | BZT2 |
| **055535** | 5" SBP Penta 110-55-30 | 55 | 110 | 30 mm | 5.00-5 336x115-5 380x150 | 1700 | 370 | 057236 | 30-9, BZT2 |
| **055536** | 5" SBP Penta 130-75-30 | 75 | 130 | 30 mm | 5.00-5 336x115-5 380x150 | 1880 | 370 | 057236 | 30-9, BZT2 |
| **055538** | 5" SBP Penta 135-75-30 | 75 | 135 | 30 mm | 5.00-5 336x115-5 380x150 | 1980 | 370 | 057238 | 30-9, BZT2 |
| **055544** | 5" SBP Penta 120-75-30 | 75 | 120 | 30 mm | 5.00-5 336x115-5 380x150 | 1800 | 370 | 057244 | 30-9, BZT2 |
| **055572** | 5" SBP Penta 125-77,5-1¼" | 77 | 125 | 1¼" | 5.00-5 336x115-5 380x150 | 1860 | 370 | 057272 | 30-9, BZT2 |
| **055560** | 5" SBP Penta 120-55-30 | 55 | 120 | 30 mm | 5.00-5 336x115-5 | 2020 | 260 | 057040 | TOG |

## 5" Disk brake wheel Penta tubeless

We can also supply 5-inch disk brake wheels of the Penta series as tubeless (TL) wheel hubs. Compared with tube-type (TT) wheels, this allows a weight saving of up to 10% per wheel unit. In contrast to other tubeless wheels, the tire exchange with our tubeless wheels can be done easily.

5" Disk brake wheel Penta Tubeless (055500)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **055500** | 5" SBP Penta 130-75-30 TL | 75 | 130 | 30 | 5.00-5 TL 380x150 TL 350x135 TL | 1960 | 370 | 057500 | 30-9, BZT2 |

6" Disk brake wheel Classic (056650)

## 6" Disk brake wheel Classic

With our very highly stressable 6-inch disk brake wheels (SB), manufactured from die-cast aluminium, combined with the large brake assemblies 30-63A and BZT2, we offer an ideal solution for aircraft with high landing speeds and high maximum take-off weights.

| P/N | Description | Install. width mm | Total width mm | Bearing Ø | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **056161** | 6" SB Super 151-113-30 | 113 | 151 | 30 mm | 6.00-6<br>15x6.00-6<br>7.00-6 | 3500 | 420 | 057091 | 30-63A, BZT2 |
| **056607** | 6" SB Classic 148.5-85-1½" | 85 | 148.5 | 1½" | 6.00-6<br>15x6.00-6<br>7.00-6 | 3500 | 450 | 057099 | 30-63A, BZT2 |
| **056608** | 6" SB Classic 151-85-1 1/4" | 85 | 151 | 1 1/4 | 6.00-6<br>15x6x.00-6<br>7.00-6 | 3500 | 450 | 057099 | 30-63A BTZ2 |
| **056650** | 6" SB Classic 140-95-40 | 95 | 140 | 40 mm | 6.00-6<br>15x6.00-6<br>7.00-6 | 3200 | 450 | 057095 | 30-63A, BZT2 |
| **056652** | 6" SB Classic 120-80-50 | 80 | 120 | 50 mm | 6.00-6<br>15x6.00-6<br>7.00-6 | 3150 | 370 | 057515 | 30-9, BZT2 |

6" Disk brake wheel Classic seawater-resistant (056640)

## 6" Disk brake wheel Classic seawater-resistant

For use in amphibian aircraft or saltwater exposed equipment, we also manufacture the 6-inch disk brake wheel (SB) Classic in a seawater-resistant version. With a special surface treatment, stainless steel bearings with special seals, and coated wheel bolts, these wheel hubs offer a high level of corrosion resistance.

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **056640** | 6" SB Classic 140-95-40 seewater resistant | 95 | 140 | 40 | 6.00-6<br>15x6.00-6<br>7.00-6 | 3200 | 450 | 057096 | 30-63A, BZT2 |

6" Disk brake wheel Ultralight (056820)

## 6" Disk brake wheel Ultralight

For Ultralight aircraft every gram counts. That is why we designed a light disk brake wheel (SB) with compact 6-piston brake assembly. The tire seat is adapted to the well-spread Ultralight tire size 4.00-6.

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|
| **056820** | 6" SBP UL 105-50-20 | 50 | 105 | 20 | 4.00-6 | 1350 | 057316 | BZ-UL |



## 6" Disk brake wheel Penta

Particularly for double-seated gliders of the 20 m class or Open class, our light-weight 6-inch Penta disk brake wheel (SB) is ideally suited. It offers the same advantages as the 5-inch Penta disk brake wheel (see page 21): an extra lightweight wheel hub with an asymmetric split for easy tire mounting.

6" Disk brake wheel Penta (056960)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **056950** | 6" SBP Penta 128-100-30 | 100 | 128 | 30 | 6.00-6<br>15x6.00-6<br>7.00-6 | 2600 | 370 | 057260 | 30-9, BZT2 |
| **056960** | 6" SBP Penta 138-110-30 | 110 | 138 | 30 | 6.00-6<br>15x6.00-6<br>7.00-6 | 2711 | 370 | 057260 | 30-9, BZT2 |
| **056980** | 6" SBP Penta 114-65-30 | 65 | 114 | 30 | 4.00-6 | 2390 | 370 | 057260 | 30-9, BZT2 |

## 6" Disk brake wheel SBL tubeless

Manufactured from a special aluminium alloy and combined with our new four-piston brake assembly BZT 4 and a reinforced brake disk, the new 6-inch tubeless disk brake wheel (SB) delivers very high braking torque and can therefore absorb a high level of braking energy. It is also appropriate for heavy single-engine aircraft.
The tire exchange can be done easily, compared to other tubeless wheel types.

6" Disk brake wheel tubeless (056990)

| P/N | Description | Install. width mm | Total width mm | Bearing Ø mm | Tire size | Weight g w/o tire | Brake torque Nm max. | Brake disk | Suitable brake assembly |
|---|---|---|---|---|---|---|---|---|---|
| **056990** | 6" SBL 145-85-40 tubeless | 85 | 145 | 40 | 15x6.00-6 TL<br>6.00-6 TL<br>7.00-6 TL | 2980 | 1000 | 057098 | BZT4 |
| **056996** | 6" SBL 139-85-40 tubeless | 85 | 139 | 40 | 14.5x5.5-6<br>15x6.006<br>6.00-6<br>17.5x6.25-5<br>7.00-6 | 2700 | 450 | 057502 | 30-63, BZT2 |

# RETROFIT TO DISK BRAKE WHEEL

Many modern gliders and power gliders are originally equipped with disk brake wheels nowadays. To also make their advantages availalbe for older aircraft types, we offer retrofit kits for converting shoe brake wheels to disk brake wheels.
Depending on the aircraft type, the installation options vary. With very limited space in the landing gear box, the existing shoe brake wheel must be replaced by a new disk brake wheel. If sufficient installation space is available, a brake disk can be fitted to the existing shoe brake wheel.

## Retrofit from shoe brake wheel to disk brake wheel

EASA-approved retrofit kits, where the existing shoe brake wheel is replaced by a new disk brake wheel or a brake disk is fitted onto the existing shoe brake wheel.
The extend of delivery includes the full documentation acc. to the Technical Note / Minor Change Approval with detailed installation instructions, parts list, drawing and EASA FORM 1.

| P/N | Aircraft type | Disk brake wheel | Approval |
|---|---|---|---|
| **051412** | Discus a - 2a<br>Ventus a - 2b<br>Discus CS | 4" Classic 110-20 | EASA Minor Change Approval<br>Tost TN 03-2011 |
| **051415** | LS3 - 8 | 4" Classic 110-20 | EASA Minor Change Approval<br>Tost TN 01-2018 |
| **051564** | Mosquito | 5" Clas. 122-105-20 | Streifeneder<br>TN Nr. 303-20 |
| **051562** | ASK13 | 5" Classic 109-92-20 | EASA Minor Change Approval<br>Tost TN 10 |
| **051570** | Swift | 5" Classic 115-102-25 | Marganski SB |
| **051520** | Twin-Astir | Brake disk 170-35-5 | Grob TN 315-50 |
| **051810** | Piaggio P149D | 8" Cleveland 40-98B | Bundeswehr |
| **051530** | Astir CS | 5" Standard | TN 01-2020 |

## Retrofit to disk brake wheel Penta

The advantages of the 5-inch Penta disk brake wheel – low weight and good serviceability – can be transferred to modern gliders with the help of the following retrofit kits. All retrofit kits are EASA approved as Minor Change Approvals.

**Important notice:**
We recommend the retrofitting of your brake system to TOST brake hydraulics at the same time. You will find detailed information in the chapter "Brake hydraulics".

Retrofit for two-seat glider

| P/N | Aircraft type | Disk brake wheel | Remarks |
|---|---|---|---|
| **051710** | Duo Discus,<br>Arcus, Nimbus | 5" SBP 135-75-30 | replaces 5" Classic wheel<br>Tost TN 01-2011 |
| **051720** | Duo Discus,<br>Arcus, Nimbus | 5" SBP 135-70-30 | replaces 5" Beringer wheel<br>Tost TN 01-2011 |
| **051740** | Discus 2b up to Discus 2cT<br>Ventus 2c up to Ventus 2cM<br>Nimbus 2 + 3 | 5" SBP 100-51-20 | replaces 5" Classic wheel<br>Tost TN 02-2011 |
| **051742** | Discus 2b up to<br>Discus 2cT<br>Ventus 2c up to<br>Ventus 2cM | 5" SBP 100-51-20 | replaces 5" Beringer wheel<br>Tost TN 02-2011 |
| **051730** | ASK 21<br>ASK 21 Mi | 5" SBP 125-77.5-1¼" | Schleicher TN 33<br>Schleicher TN 5 |

## Retrofit to disk brake wheel Classic

For the following aircraft types, we offer complete retrofit kits to disk brake, that include all necessary components. Please check for an approval previously with your inspector.

| P/N | Aircraft type | Disk brake wheel |
|---|---|---|
| **051430** | Avo Samburo | 4" Gnom 202-30 |
| **051433** | Scheibe SF 25B<br>Slingsby T61 | 4" Gnom 212-30 |
| **051571** | SZD-50 Puchacz | 5" Classic 122-25 |
| **051572** | SZD-9 Bocian | 5" Classic 122-25 |
| **051567** | PW-6 | 5" Classic 122-20 |
| **051566** | DG600 | 5" Classic 122-20 |
| **051564** | Glasflügel 304 | 5" Classic 122-20 |
| **051564** | Kiwi | 5" Classic 122-20 |
| **051565** | SZD-45 Ogar | 5" Classic 115-25 /115-35 |
| **051570** | Jantar | 5" Classic 115-25 |
| **051550** | SZD-55 Promyk | 5" Classic 115-25 |
| **051610** | Bölkow 207 | 6" Classic 128-1.5" |
| **051640** | DR 400 | 6" Classic 80/120-50 |
| **051651** | DR 1050/DR 1051 | 6" Classic 95/50 |
| **051661** | Morane | 6" Classic 95/50 |
| **051510** | Scheibe SF 34 B | Brake disk is fitted to the existing wheel |
| **051560** | Kiwi | Brake disk is fitted to the existing wheel |
| **051560** | Mosquito | Brake disk is fitted to the existing wheel |

**The following components are included in each retrofit kit:**

- Brake disk or complete hub with brake disk
- Brake calliper with the suitable anchor plate assembly
- Master cylinder
- Hydraulic hose and connecting part

Feel free to contact us if you have any questions regarding the retrofit kits, we will be pleased to tell you more about them.

# SPARE PARTS

You can obtain all necessary spare parts for Tost aircraft wheels from us. Our delivery programm includes brake disks, ball bearings, wheel bolts, brake shoes, brake levers and cams. The indication of the part number and serial number of your wheel (engraved in the wheel hub side) as well as the aircraft type make the choice of the suitable parts easier.

## Brake disks

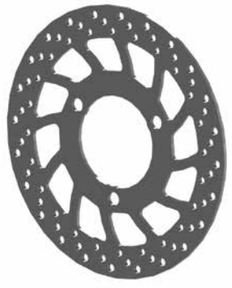
Tost brake disks are made from heat-treated steel and turned from full material. So there is no welded joint between flange and disk with its problem of corrosion respectively fracture danger. The perfect true running is a further advantage.

By our special heat treatment the operating life is increased and the optimum braking efficiency achieved. The spot-grinding of the brake surface ensures a constant brake effect from the beginning and reduces the breaking-in-period.

In addition to the standard brake disks, available from stock, we also manufacture brake disks custom-made to your drawing or sample.

## 3.5" Brake disks

### for use with Mini and Max II disk brake wheels



3.5" Brake disk Max II
(057310)

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057310** | 100 | - | 1.5 | 3.5" Max II: disk brake wheel p/n 053012, 053020 flat type<br><br>Mini 150 SB: p/n 051150<br>Mini 180 SB: p/n 051180 |
| **057312** | 134 | 20 | 4 | 3.5" Max II: disk brake wheel p/n 053030 Z-type for BZT M |
| **057315** | 114 | 20 | 4 | 3.5" Max II RBD: 3.5" Max II: disk brake wheel p/n 053035 Z-type for BZT M |

## 4" Brake disks

### for use with Classic and Tria disk brake wheels

(Z-type disk for use with brake assembly 30-9, BZT and BZT2)

4" Brake disk Tria
(057420)

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057011** | 164 | 28 | 5 | 4" Classic disk brake wheel: p/n 054111 |
| **057031** | 168 | 31 | 5 | 4" Classic disk brake wheel:p/n 054131 |
| **057093** | 192 | 36 | 6 | 4" Gnom disk brake wheel: p/n 054811, 054812 |
| **057420** | 164 | 40 | 5 | 4" Tria disk brake wheel: p/n 054462, 054482 |
| **057421** | 164 | 55 | 5 | 4" SRT Tria disk brake wheel: p/n 054483 |

## 5" Brake disks

### for use with Classic, Cleveland and Penta disk brake wheels

(Z-type for use with brake assembly 30-9, BZT and BZT2)

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057710** | 162 | 52 | 5 | Cleveland wheel 40-78B: p/n 075100 |
| **057000** | 166 | 22 | 5 | 5" Classic disk brake wheel: p/n 055145, 055151, 055152, 055153, 055155, 055156, 055158, 055188, 055191, 055192 |
| **057090** | 170 | 35 | 5 | Retrofit to disk brake wheel Classic Twin Astir |
| **057070** | 180 | 42 | 5 | 5" Classic disk brake wheel: p/n 055161, 055162, 055171 |
| **057080** | 180 | 52 | 8 | 5" Penta disk brake wheel: p/n 055532 |
| **057220** | 164 | 33 | 5 | 5" Penta disk brake wheel: p/n 055520 |
| **057230** | 180 | 43 | 5 | 5" Penta disk brake wheel: p/n 055530 |
| **057236** | 164 | 43 | 5 | 5" Penta disk brake wheel: p/n 055535, 055536 |
| **057238** | 180 | 48 | 5 | 5" Penta disk brake wheel: p/n 055538 |
| **057244** | 164 | 43 | 5 | 5" Penta disk brake wheel: p/n 055544 |
| **057272** | 162 | 36.3 | 5 | 5" Penta disk brake wheel: p/n 055572 |

5" Brake disk Penta
(057238)

## 5" Step-type disks

### for mounting on Classic disk brake wheels, as well as retrofit to shoe brake wheel Standard

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057513** | 164 | 50.5 | 5 | 5" Classic disk brake wheel: p/n 055213 |
| **057512** | 164 | 55 | 5 | 5" Classic disk brake wheel: p/n 055212 |
| **057509** | 164 | 45.5 | 5 | Retrofit 5" Standard shoe brake wheel to 5" Classic disk brake wheel, for Astir CS, Jeans Astir, SF-34, Kiwi, Mosquito |
| **057510** | 180 | 48 | 5 | Retrofit 5" Standard shoe brake wheel to 5" Classic disk brake wheel, for ASK13 |
| **057511** | 180 | 52 | 5 | 5" Classic disk brake wheel: p/n 055211 |
| **057815** | 185 | 56 | 6.5 | for Speed Canard |
| **057520** | 198 | 39 | 5 | for DR 300 und DR 400 |

5" Step-type disk
(057510)

## 5" U-type disks

### for use with TOG brake assembly with Classic and Penta disk brake wheels

| P/N | Ø mm | Hight mm | Thick-ness mm | Application |
|---|---|---|---|---|
| **057030** | 160 | 42 | 4 | 5" Classic disk brake wheel: p/n 055110, 055120, 055130, 055135, 055140 |
| **057040** | 160 | 53 | 4 | 5" Penta disk brake wheel: p/n 055560 |

5" Brake disk TOG
(057040)

6" Brake disk
(057095)

## 6" Brake disks
### for use with Classic, Cleveland and Penta disk brake wheels
(Z-type for use with brake assembly 30-9, 30-63A and BZT2)

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057075** | 184 | 25 | 5 | 6" Classic disk brake wheel: p/n 056131 |
| **057091** | 184 | 44 | 6 | 6" Classic disk brake wheel: p/n 056161 (Fournier RF-5) |
| **057095** | 192 | 52 | 6 | 6" Classic disk brake wheel: p/n 056650 (Ruschmeyer R90) |
| **057720** | 190.5 | 54 | 6 | Cleveland wheel 40-97A: p/n 076100 |
| **057260** | 180 | 35 | 5 | 6" Penta disk brake wheel: p/n 057260 |
| **057098** | 190 | 50 | 7 | 6" SBL: p/n 056990 |
| **057502** | 180 | 44 | 6 | 6" SBL TL: p/n 056996 |

6" Brake disk UL
(057316)

## 6" Brake disks
### for use with UL Penta disk brake wheels
(flat-type for brake assembly BZ-UL)

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057316** | 185 | - | 2 | 6" UL-Penta disk brake wheel: p/n 056820 |

## Brake disks seawater-resistant
### for use with wheels exposed to salt water conditions

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057002** | 166 | 22 | 5 | 5" Classic disk brake wheel: p/n 055145, 055151, 055152, 055153, 055155, 055156, 055158, 055188, 055191, 055192 |
| **057096** | 192 | 52 | 6 | 6" Classic disk brake wheel seawater-resistant p/n 056640 |

4" Brake disk for
Tria disk brake wheel
(057311)

## Special brake disks
### flat-type for special aircraft types

| P/N | Ø mm | Hight mm | Thickness mm | Application |
|---|---|---|---|---|
| **057314** | 145 | - | 5.5 | AMS Carat A |
| **057317** | 178 | - | 5 | Klemm Kl 35 |
| **057311** | 120 | - | 5 | 4" Tria disk brake wheel p/n 054484 |



**Maintenance notes for brake disks:**

1. Inspect brake disk for cracks, excessive wear and tear, grooves, corrosion and deformation.
2. Remove corrosion and smooth smaller nicks with fine emery paper (400 grain).
3. Replace the brake disk, if it is worn beyond the wear limit (see below). Measure this minimum at two or three spots.
4. Replace the brake disk if it has an axial throw of 0.2 mm.
5. Brake disks are surface-treated only for special applications. A rust film of varying degree may form on the brake disk which can be removed with a few brake actuations with taxi speed.
6. If rust has progressed further, it may be necessary to dismantle the disk from the wheel so that both disk surfaces can be cleaned properly. First use a steel brush, then follow with 220 grain emery paper. Finally polish with 400 grain emery paper. This procedure may allow you to continue using the brake disk.

**Wear limits**

| Disk thickness mm | Wear limit mm |
|---|---|
| 1.5 | 1.3 |
| 2.0 | 1.7 |
| 4.0 | 3.3 |
| 5.0 | 4.3 |

| Disk thickness mm | Wear limit mm |
|---|---|
| 6.0 | 5.2 |
| 6.5 | 5.5 |
| 8.0 | 7.0 |

# SPARE PARTS FOR SHOE BRAKE WHEELS

All spare parts for Tost wheels are available ex stock. We can also supply spare parts for wheels that were built 40 years ago. You can prolong the life time of your wheel by regular maintenance and repair, see page 17.

## Anchor plates

Tost anchor plates are completely fitted with all components: brake shoes with springs, anchor bolt, brake lever and cam.

| P/N | Description | Application | Axle dia. mm | Anchor bolt |
|---|---|---|---|---|
| **048428** | Anchor plate 4" | 4" Liliput shoe brake wheel | 17 | - |
| **048422** | Anchor plate 4" | 4" Kobold shoe brake wheel | 20 | - |
| **048423** | Anchor plate 4" | 4" Kobold shoe brake wheel | 25 | - |
| **048522** | Anchor plate 5" | 5" Standard shoe brake wheel | 17 | M8 |
| **048520** | Anchor plate 5" | 5" Standard shoe brake wheel | 20 | M8 |
| **048523** | Anchor plate 5" | 5" Standard shoe brake wheel | 25 | M8 |
| **048521** | Anchor plate 5" | 5" Standard shoe brake wheel | 20 | M10x1 |
| **048524** | Anchor plate 5" | 5" Standard shoe brake wheel | 25 | M10x1 |
| **048525** | Anchor plate 5" | 5" Standard shoe brake wheel | 30 | M10x1 |
| **048526** | Anchor plate 5" | 5" Standard shoe brake wheel | 35 | M10x1 |
| **048620** | Anchor plate 6" | 6" Super shoe brake wheel | 30 | Inside thread M8 |
| **048421** | Anchor plate Gnom/Bimbo | 4" Gnom and 5" Bimbo shoe brake wheel | 30 | Inside thread M8 |

With your order please indicate the type of aircraft, axle diameter and anchor bolt.


Anchor plate 5" (048521)

Anchor bolt M10x1 (048417)

**Besides the complete anchor plates, we also supply all spare parts for shoe brake wheels seperately:**

## Anchor bolt fitted with flanged nut:

| P/N | Thread size | Thread length mm | Flange height of nut mm |
|---|---|---|---|
| **048418** | M10x1 | 25 | 6 |
| **048419** | M10x1 | 30 | 3 |
| **048417** | M10x1 | 30 | 6 |
| **048518** | M8 | 25 | 6 |
| **048519** | M8 | 30 | 3 |

Brake lever and cam

## Brake lever and cam

Sold only as a set due to the indentation of both parts.

| P/N | Description | Application | Remarks |
|---|---|---|---|
| **048478** | Brake lever and cam, set | 4" Liliput BB wheel | |
| **048570** | Brake lever and cam, set | 4" Kobold BB wheel<br>5" Standard BB wheel | |
| **048672** | Brake lever and cam, set | 4" Gnom BB wheel<br>5" Bimbo BB wheel<br>6" Super BB wheel | replaces p/n 048671 |

## Brake shoes including springs

| P/N | Description | Application | Remarks |
|---|---|---|---|
| **048475** | Brake shoes Liliput | 4" Liliput BB wheel | |
| **048576** | Brake shoes Kobold | 4" Kobold BB wheel | |
| **048575** | Brake shoes Standard | 5" Standard BB wheel | |
| **048675** | Brake shoes Gnom/Bimbo | BB wheel Gnom or Bimbo | ab Baujahr 1978 |
| **048685** | Brake shoes Super | 6" Super BB wheel | also Gnom and Bimbo up to 1977 |

Complete axle set Gnom (048465)

## Axles and axle sets for shoe brake wheels

| P/N | Description | Application | Remarks |
|---|---|---|---|
| **048450** | Axle 17mm | 4" Liliput BB wheel | with bushings |
| **048461** | Axle 20mm | 4" Kobold BB wheel 103-20 | p/n 044300 |
| **048465** | Complete axle set Gnom | 4" Gnom BB wheel | |
| **048660** | Complete axle set Super | 6" Super BB wheel | |
| **048665** | Torque arm | p/n 048465 und 048660 | |

**Important advise:**
For all types of Tost aircraft wheels (landing wheels, tail and support wheels, shoe brake wheels, and disk brake wheels) we can supply wheel bolts and ball bearings, provided the serial number and part number are indicated.



# WHEEL SELECTION TABLE

The wheel selection table that used to be included here in the catalog will now be available online. This allows us to update it more quickly and always provide you with the latest information.

You will find the always up-to-date wheel selection table in the **"Service & Technology"** section at **www.tost.de** – clearly structured and accessible at any time. At a glance, you can see which wheels are installed on the respective aircraft and which tires (tire and inner tube) are required.

QR code linking to the always up-to-date wheel selection table

## If you are unsure which wheel is suitable for your aircraft, please feel free to contact us at any time. We will be happy to advise you comprehensively.

## For the identification of the wheel, we require the following information:

- exact aircraft type designation
- indication of whether the wheel is a nose wheel, main wheel or tail wheel
- for main wheels: whether it is a shoe brake wheel or a disk brake wheel
- ideally: part number, serial number and tire size
- if possible, one or more photographs – this makes it much easier to identify correctly

# AIRCRAFT TIRES & TUBES

# AIRCRAFT TIRES AND TUBES

We offer a wide selection of aircraft tires from 3 inch to 10 inch available from stock.

We can supply all Michelin brands: Condor, Michelin Aviator and Michelin AIR.
Typical tire sizes for General Aviation are shown in the following tables.
Other brands are also available ex stock.

For more than 30 years, we have been manufacturing aircraft tires exclusively under the brand TOST AERO in the sizes: 200x50, 260x85, 4.00-4, 336x115-5 und 210x65.

They have a long lifetime, are very robust, and can handle high loads and speeds.


## TIRE SIZE INDICATOR

### Two-part indication of tire size: N – D

N = tire width at the largest point, indication in inch
D = diameter of the tire seat, indication in inch, equal to the wheel hub size

**Example:**
5.00-5 = Tire width 5" respectively 127 mm and tire seat 5"
4.00-6 = tire width 4" respectively 102 mm and tire seat 6"

### Two-part indication of tire size: M x N

M = outer diameter of the tire, indication in mm or in inch
N = tire width at the largest point, indication in mm or in inch

**Example:**
210x65 = Outer diameter of the tire 210 mm, tire width 65 mm

### Three-part indication of tire size: M x N – D

M = outer diameter of the tire, indication in mm or in inch
N = tire width at the largest point, indication in mm or in inch
D = diameter of the tire seat, indication in inch, equal to the wheel hub size

**Example:**
380x150-5 = outer diameter of the tire 380 mm, tire width 150 mm, tire seat 5" respectively 127 mm
15x6.00-5 = outer diameter tire 15"/380 mm, tire width 6"/150 mm, tire seat 5"

**Please note that deviations of the outer diameter of the mounted tire are possible, depending on the wheel hub.**



# TIRES FOR MINI 150 AND MINI 180

### Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | |
| **062151** | 150x30 | 6 | Industry | Rib | 150 | 30 | 135 | for Mini 150, p/n 031500 |
| **062181** | 180x35 | 4 | Industry | Rib | 180 | 35 | 195 | for Mini 180, tube p/n 063192 |

### Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **062152** | 150x30 | 30°60°25G | 43 | for Mini 150 N, p/n 031500 |
| **062153** | 150x30 | 30°45°25G | 43 | for Mini 150 V / Mini 150 L, p/n 031501 |
| **062182** | 180x35 | 90°30° | 48 | for Mini 180 N, p/n 031816 |
| **063192** | 200x50 | 90° 90° 28G | 80 | for Max II, two-part and Mini 180 |

### Spare tires already filled with foam

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | |
| **060150** | 150x30 | 6 | Industry | Rib | 150 | 30 | 340 | incl. foam filled tube, for Mini 150 F |
| **060180** | 180x35 | 4 | Industry | Rib | 180 | 35 | 570 | incl. foam filled tube, for Mini 180 F |

# 3" TIRES

### Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **063591** | 255x110 | 4 | Aero | Rib | 260 | 110 | 1250 | 195 | Nose wheel Puchacz |
| **062095** | 210x65 | 4 | TOST AERO | Rib | 210 | 65 | 550 | 127 | in 4 PR |
| **062081** | 2.50-3 (210x65) | 4 | Industry | Rib | 210 | 63 | 375 | 66 | light tire |

### Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **063592** | 255x110 | 90° 45G | 310 | Nose wheel Puchacz |
| **062093** | 2.50-3 (210x65) | 90° 28G | 120 | for LR Moritz |

# 3.5" TIRES

## Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **063191** | 200x50 | 6 | TOST AERO | Rib | 190 | 54 | 450 | 200 | for Max und Max II |

## Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **063093** | 200x50 | 90° 30° 28G | 80 | for Max, one-part |
| **063192** | 200x50 | 90° 90° 28G | 80 | for Max II, two-part and Mini 180 |

## Spare tires already filled with foam

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **060200** | 200x50 | 6 | TOST AERO | Rib | 190 | 54 | 1050 | 200 | incl. foam filled tube, for Max II F |
| **060201** | 200x50 | 6 | TOST AERO | Rib | 190 | 54 | 950 | 200 | incl. foam filled tube, **special form for Schempp-Hirth wheel hubs only!** |



# 4" TIRES

## Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **064591** | 2.80/2.50-4 | 4 | STA | ZigZag Rib | 230 | 61 | 840 | 195 | Tail wheel Dimona |
| **064181** | 10x3.50-4 | 4 | Aircraft | Rib | 260 | 85 | 1080 | 230 | |
| **064991** | 260x85 | 6 | TOST AERO | Rib | 260 | 83 | 880 | 400 | |
| **064491** | 4.00-4 | 8 | TOST AERO | Rib | 300 | 100 | 1380 | 600 | |
| **064391** | 5.00-4 | 6 | Goodyear | Rib | 329 | 117 | 2050 | 540 | replaces 330x130 |
| **064791** | 8.00-4 | 4 | Goodyear | Rib | 440 | 202 | 4700 | 500 | |
| **064891** | 3.00-4 | 4 | Industrie | Rib | 250 | 79 | 810 | | No longer available; replacement for Schempp-Hirth nose wheels: p/n 064591 |
| **064881** | 4.00-4 | 4 | Industrie | Rib | 300 | 100 | 800 | | Light tire for reduced requirements |
| **064831** | 4.10/3.50-4 | 4 | Industrie | ZigZag Rib | 260 | 85 | 940 | | Light tire for reduced requirements |

## Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **064582** | 2.80/2.50-4 to 3.00-4 | 90° TR87 | 110 | Multi-purpose tube |
| **064292** | 260x85 3.00-4 | 90° 32G | 160 | Valve length 32 mm |
| **064692** | 4.00-4 4.10/3.50-4 | 90° 32G | 190 | Valve length 32 mm |
| **064462** | 4.00-4 | 90° 41 | 282 | Valve length 41 mm, long valve e.g. for nose wheel ASK 21 |
| **064832** | 260x85 3.00-4 4.10/3.50-4 4.00-4 | 90° 28G | 250 | Multi-purpose tube Valve length 28 mm |
| **064392** | 5.00-4 | 90° TR67 | 470 | Valve length 55 mm |
| **064792** | 8.00-4 | TR13 | 1020 | Aero Classic |

# 5" TIRES

## Tires

| P/N | Size | PR | Manufacturer | TT/TL | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Outer Ø mm | Width mm | | | |
| **065488** | 11x4.00-5 | 8 | Aero Classic | TL | Rib | 280 | 115 | 1750 | 295 | |
| **065221** | 336x115-5 | 10 | TOST AERO | TT | Rib | 336 | 115 | 2650 | 975 | for narrow installation space (e.g. Schempp-Hirth single seater) |
| **065091** | 5.00-5 | 6 | Michelin Condor | TT | Rib | 353 | 115 | 2700 | 580 | |
| **065591** | 5.00-5 | 10 | Air Hawk | TT | Rib | | | | | |
| **068521** | 5.00-5 | 10 | Michelin Aviator | TL | Rib | 361 | 126 | 2600 | 980 | |
| **067511** | 5.00-5 | 6 | Michelin Air | TT | Rib | 361 | 126 | 2530 | 580 | |
| **065561** | 5.00-5 | 6 | Goodyear | TT | Rib | | | 2400 | | Flight Special II |
| **065501** | 5.00-5 | 10 | Goodyear | TT | Rib | | | 2600 | | Flight Special II |
| **065681** | 380x150 (15x6.00-5) | 6 | Michelin Air | TT | Rib | 377 | 131 | 3100 | 725 | replaces 5.50-5 |
| **065691** | 380x150 (15x6.00-5) | 6 | Goodyear | TT | Rib | 377 | 131 | 3650 | 725 | replaces 5.50-5 |
| **065881** | 400x140 | 4 | Stomil | TL | Rib | 409 | 149 | 4500 | 800 | Suitable tube: 5.00-5 |
| **065891** | 350x135 | 4 | AERO | TT | Rib | 350 | 120 | 2700 | 650 | e.g. for L-13 Blanik |
| **065185** | 3.50-5 (4.10/3.50-5) | 4 | Industrie | TT | Rib | 285 | 88 | 1000 | | Light tire for reduced requirements |
| **065381** | 4.00-5 | 4 | Industrie | TT | Rib | 320 | 85 | 1300 | | Light tire for reduced requirements |
| **065481** | 11x4.00-5 | 4 | Industrie | TT | Rib | 280 | 115 | 1000 | | Light tire for reduced requirements |

**Explanation: TT/TL**
TT tube type tire: tire must be used with inner tube
TL tubeless tire: tire may be used without inner tube

## Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **065092** | 5.00-5 | 90° TR67 | 450 | Michelin Airstop, standard valve length 55 mm, also for tire 380x150 and 350x135 |
| **065492** | 5.00-5 | 90° TR67 | 580 | Aero Classic, standard valve length 55 mm, also for tire 380x150 und 350x135 |
| **065562** | 5.00-5 | 90° TR67 | 510 | Goodyear, standard valve length 55 mm, also for tire 380x150 und 350x135 |
| **065995** | 5.00-5 | 90° TR87 | 500 | Short valve 28 mm, for 5" Penta LW und SBP, also for tire 380x150 und 350x135 |
| **065193** | 3.40/3.00-5 | 90° 28G | 190 | light tube |
| **065192** | 4.10/3.50-5 | 90° TR87 | 270 | Light tube, also for tire 4.00-5 |
| **065483** | 11x4.00-5 | 90° TR87 | 200 | Light tube, valve length 32 mm |

# 6" TIRES

## Tires

| P/N | Size | PR | Manufacturer | TT/TL | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Outer Ø mm | Width mm | | | |
| **066688** | 4.00-6 | 6 | Aero Classic | TL | Rib | 358 | 90 | 1640 | 260 | for Ultralight |
| **066788** | 4.00-6 | 8 | Aero Classic | TL | Rib | 356 | 102 | 2840 | 385 | for Ultralight |
| **066091** | 6.00-6 | 6 | Michelin Condor | TT | Rib | 444 | 160 | 4300 | 795 | |
| **067611** | 6.00-6 | 6 | Michelin AIR | TT | Rib | 444 | 160 | 4120 | 795 | |
| **066881** | 6.00-6 | 8 | Michelin Condor | TT | Rib | 444 | 160 | 4400 | 1065 | |
| **066561** | 6.00-6 | 6 | Goodyear | TT | Rib | 444 | 160 | 4120 | 795 | Flight Special II |
| **066591** | 15x6.00-6 | 6 | Michelin Condor | TT | Rib | 380 | 160 | 3400 | 885 | |
| **068621** | 15x6.00-6 | 6 | Michelin Aviator | TT | Rib | 380 | 160 | 3300 | 885 | |
| **066592** | 15x6.00-6 | 10 | Goodyear | TL | Rib | 380 | 132 | 4350 | 1450 | Flight Custom II |
| **066381** | 7.00-6 | 8 | Michelin Condor | TT | Rib | 471 | 182 | 5300 | 1160 | |
| **068711** | 7.00-6 | 8 | Michelin Aviator | TT | Rib | 471 | 182 | 5400 | 1160 | |
| **066491** | 8.00-6 | 6 | Michelin Condor | TT | Rib | 495 | 202 | 5600 | 930 | |
| **068721** | 8.00-6 | 6 | Michelin Aviator | TT | Rib | 495 | 202 | 5800 | 930 | |
| **066681** | 4.10/3.50-6 | 4 | Industry | TT | Rib | 310 | 100 | 1200 | | Light tire for reduced requirements |
| **066691** | 4.00-6 | 4 | Industry | TT | Rib | 350 | 80 | 1000 | | Light tire for reduced requirements |
| **066981** | 13x5.00-6 | 4 | Industry | TL | Rib | 300 | 105 | 1520 | | Light tire for reduced requirements |
| **066789** | 15x6.00-6 | 6 | Industry | TT | Rib | 325 | 140 | 2250 | | Light tire for reduced requirements |

## Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **066692** | 4.10/3.50-6 | 90° TR87 | 240 | for tire 4.00-6 |
| **066092** | 6.00-6 | straight TR20 | 750 | Michelin Airstop |
| **066562** | 6.00-6 | straight TR20 | 600 | Goodyear |
| **066082** | 6.00-6 | straight TR20 | 990 | Aero Classic |
| **066992** | 6.00-6 | 70° 32G | 730 | for 6" shoe brake wheel Super 046100 |
| **066993** | 6.00-6 | 90° TR87 | 925 | short bent valve |
| **066492** | 15x6.00-6 | straight TR20 | 550 | Michelin Airstop |
| **066382** | 7.00/8.00-6 | straight TR20 | 880 | Michelin Airstop |
| **066792** | 15x6.00-6 | 90° TR87 | 380 | Light tube |
| **066793** | 15x6.00-6 | straight | 370 | Light tube, valve length 35 mm |
| **066982** | 13x5.00-6 | 90° TR 87 | 280 | Light tube, valve length 32 mm |
| **066983** | 13x5.00-6 | straight | 270 | Light tube, valve length 35 mm |

## 6.5" TIRES

### Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **067391** | 420x150 (6.00x6½) | 4 | Aero Classic | Rib | 420 | 150 | 3200 | 795 | e.g. Tiger Moth |

### Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **067392** | 15x6.00-6 | TR20 | 620 | Multi-purpose tube for tire 420x150 (6.00x6½) |
| **067492** | 15x6.00-6 | 90° TR67 | 600 | Multi-purpose tube for tire 420x150 (6.00x6½) |

## 8" TIRES

### Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **068391** | 6.50-8 | 8 | Michelin Condor | Rib | 495 | 172 | 5640 | 1430 | |

### Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **068392** | 6.50/7.00-8 | TR15 | 1070 | Michelin Airstop |



## 10" TIRES

### Tires

| P/N | Size | PR | Manufacturer | Profile | Dimensions (mounted) | | Weight g | Static load kg | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Outer Ø mm | Width mm | | | |
| **068911** | 6.50-10 | 10 | Michelin AIR, TL | Rib | 561 | 169 | 8000 | 2155 | |
| **068391** | 6.50-10 | 8 | Michelin Condor | Rib | 561 | 169 | 5640 | 1701 | |
| **068291** | 8.50-10 | 8 | Michelin Condor | Rib | 652 | 221 | 9000 | 1996 | |

### Tubes

| P/N | Size | Valve | Weight g | Remarks |
|---|---|---|---|---|
| **068892** | 6.50-10 | TR25 | 860 | Michelin Airstop |
| **068292** | 8.50-10 | TR25 | 1590 | Michelin Airstop |

## VALVE EXTENSIONS

To fill or refill the tire pressure or to check the correct tire pressure the valve extension is indispensable. We offer suitable types for all possible installation or operation situations:

| P/N | Type | Length | Remarks |
|---|---|---|---|
| **069981** | straight | 24 mm, with short valve thread | incl. cap with valve key |
| **069980** | straight | 24 mm | incl. cap |
| **069987** | 90° | 35 mm | incl. cap |
| **069986** | straight | 94 mm | incl. cap |

Valve extensions

# NOTES TO AIRCRAFT TIRES

## Tire exchange

**Removal:**

1. Jack up aircraft at specified point.
2. Deflate tire completely before removing wheel unit.
3. Do not unscrew the valve insert until the tire pressure has dropped to 0.2 bar.
4. Remove wheel from axle.
5. Loosen wheel bead from the hub shoulder with a rubber or plastic hammer.
6. Undo wheel bolts (with 5 mm hexagon key), remove bolts and washers, split hub halves.

**Mounting:**

1. Tires and wheel hubs must be clean and dry.
2. Do not apply excessive force when replacing a wheel.
3. Apply a dehesive agent (or talcum powder) to the hub shoulder.
4. Remove dirt, sand, labels, etc. from the tire. Apply a moderate amount of talcum powder to reduce friction between tube and tire.
   **Caution: Too much talcum has the opposite effect.**
5. Fill air into tube (placed in the tire) until it is evenly round.
   Remove nut and washer from valve.
6. Place tire (red mark at valve hole) and tube on the wheel half with the valve hole, push valve through valve hole.
7. Push other wheel half onto tire, match bolt holes with centering shaft.
8. Insert wheel bolts, washers and any nuts, and tighten to the correct torque (M6: 9 to 10 Nm). Tighten bolts diagonally.
9. Place a tire in a safety cage when inflating it to mounting pressure for the first time. If you do not have a safety cage, take great care when inflating the tire. Inflate the tire to mounting pressure. The mounting pressure is 10% more than the specified operating pressure. Check carefully for leaks. Leave to adjust at this pressure for 12 to 24 hours. Once the tire shows no leaks and is at operating pressure, the wheel unit can be mounted on the aircraft.
10. Make sure that the wheel unit is mounted perfectly balanced to avoid vibration and excessive wear.

**Red Dot:**

Larger aircraft tires are marked with a red dot. This is an indication of the lightest spot of the tire. The valve must be placed at this point to eliminate or minimize a balance/vibration problem of the tire.

Red Dot marking
on larger aircraft tires

**WARNING**

**An inflated tire is a potentially explosive device:**
**treat it with the correct equipment and precautions!**

## Notes on inner tubes

Aircraft inner tubes are made from natural rubber and are slightly undersized, so that they are easier to install in a new tire. The layers of an aircraft tire are made of nylon – they therefore tend to become larger with use.

The inner tube also increases in size, adapting to the larger inside diameter of the tire. If a tube enlarged in this way is later fitted in a new tire, it can happen that it is too big for the inside of the tire, with the result that the tube may crease.

These creases may rub through during operation, causing the tube to lose pressure. Rubbing through slowly results in slow pressure loss – the pilot is thus warned before a dangerous situation arises. If the tube tears during a start, the pilot will fail to notice that he is flying with a flat tire.

Taking into consideration all the risks involved in fitting an old tube into a new tire, it is advisable always to fit new inner tubes when installing new tires.

## Tire maintenance instructions

1. Maintain stipulated air pressure, check at regular intervals!
   Underpressure results in reduced load capacity and shortens service life.
2. Inspect tires at regular intervals for damages, shredding, flat areas and foreign objects
3. Wheel units must be mounted perfectly balanced.
   Wheel imbalance can result in a damage to bearings and brake drums.
4. Keep tires free of oil, grease, brake fluid and tar.
   Clean tires with rag soaked with petrol, then wash off with soap and water.

# HYDRAULIC BRAKE SYSTEM TOST

# HYDRAULIC BRAKE COMPONENTS

As completion of our disk brake wheels we can offer brake assemblies, master cylinders and hydraulic equipment, fitting to all our wheel dimensions. With the various hydraulic components it is possible to generate a hydraulic brake system, which combines the highest level of safety, the maximum of braking torque, a long-life cycle and easy maintenance.

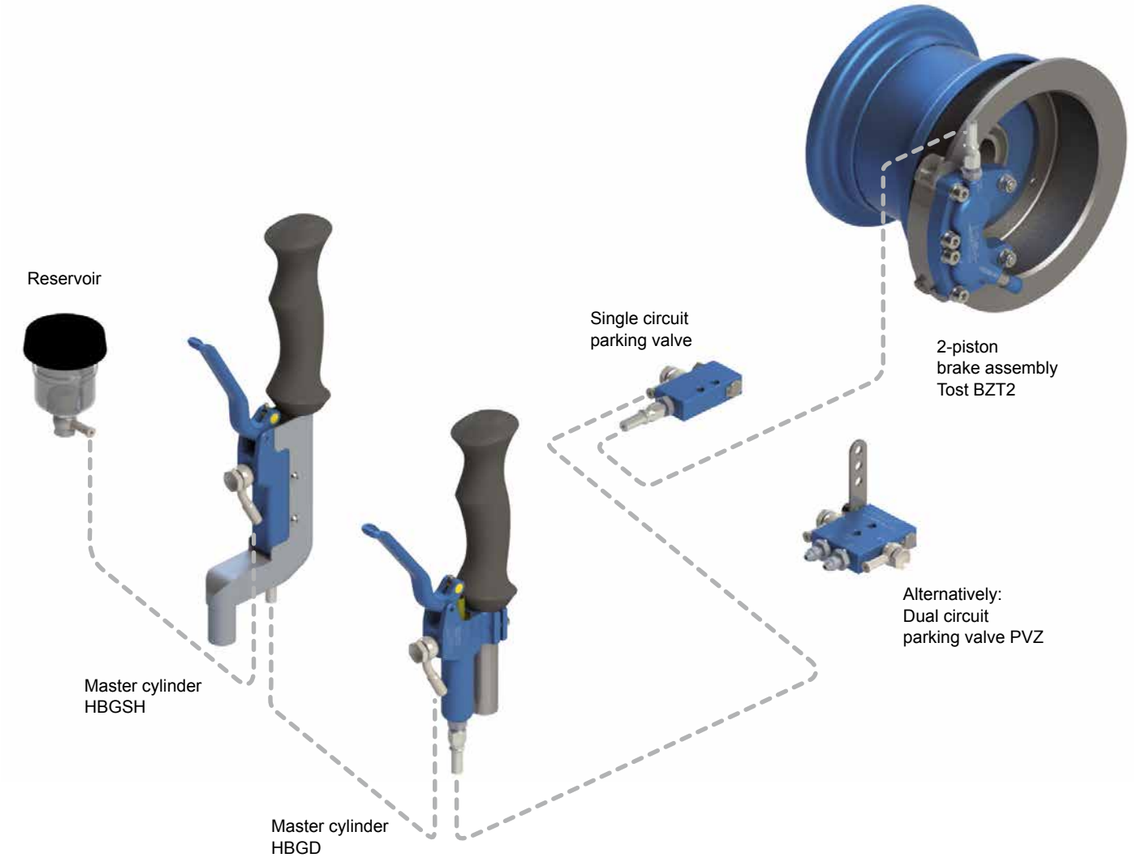
The varying hydraulic components are described in the following, grouped according to their mode of operation. Furthermore, the possible combinations of the various brake components are described. Of course, we provide you with advice in the lay-up of a hydraulic brake system. In the same manner, our Service Department will assist you, if there are any questions regarding one of our brake components or the whole hydraulic brake system.

For all hydraulic brake components, technical specifications and installation drawings are available.

# BRAKE SYSTEM TOST

## Overview of all components

5" Disk brake wheel Penta






# BRAKE ASSEMBLIES

Hydraulic brake assemblies have got many advantages compared with mechanical shoe brakes because of their mode of operation. Due to the automatic wear adjustment the maintenance is much easier.
Disk brake assemblies ensure a high rate of heat dissapation, a high and easy-to-dose brake power and they offer a remarkable endurance strength. All these advantages can be obtained with our customized brake assemblies for all wheel sizes.

## Brake assembly BZT and BZT M

The 3-piston brake assembly BZT is designed as a floating brake caliper and can be fitted to 3.5", 4" and 5" disk brake wheels of the series Max II, Tria and Penta. The brake assembly features an extremely light weight of 440 g and very compact dimensions. The change of the brake linings can be carried out without any special tools because of their metric screw connection. Equipped as standard with the Stahlbus bleeder valve (see page 75) filling and bleeding of the brake system can be easily performed.

Especially for light single seated sailplanes or UL-motorplanes, in which a low weight of the components is fundamental, the brake assembly BZT is convenient.


3 piston brake assembly Tost BZT

| P/N | Description | Fluid | Application | Braking torque Nm | Connecting thread | Weight g | Anchorbolt length mm | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|---|
| **080100** | BZT | DOT 4 | 4" SRT Tria<br>5" SBP Penta | 250 | M10x1 | 440 | 52.5* | 5 |
| **080101** | BZT | Mineral Fluid | 4" SRT Tria<br>5" SBP Penta | 250 | M10x1 | 440 | 52.5* | 5 |
| **080108** | BZT | DOT 4 | 4" SB Classic | 250 | M10x1 | 440 | 45.5 | 5 |
| **080110** | BZT M | DOT 4 | Max II SB | 100 | M10x1 | 400 | 27 | 3.5 |
| **080111** | BZT M | Mineral Fluid | Max II SB | 100 | M10x1 | 400 | 27 | 3.5 |
| **080120** | BZT M RBD | DOT 4 | Max II SB RBD | 100 | M10x1 | 400 | 24 | 4 |
| **080121** | BZT M RBD | Mineral Fluid | Max II SB RBD | 100 | M10x1 | 400 | 24 | 4 |

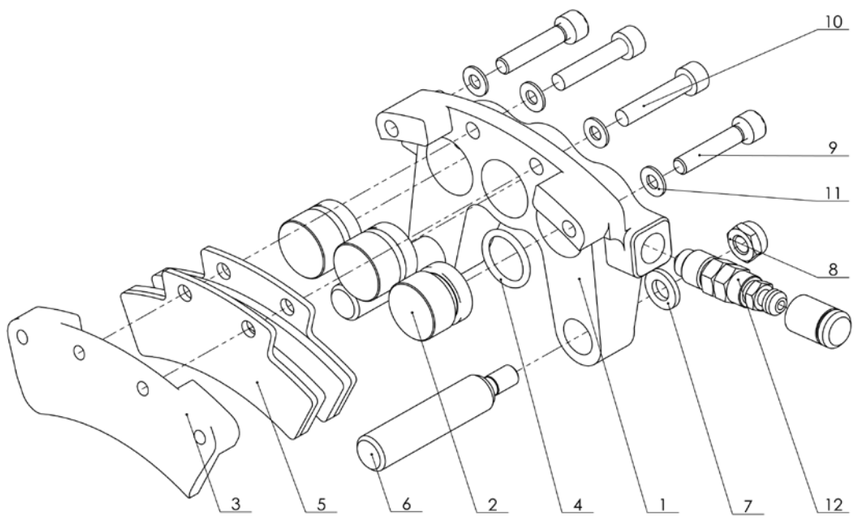
* *length variable*

The bolt length is specified without thread!

We can offer various universal or customized anchor (torque) plates for mounting the brake assembly to the landing gear, according to your requirements.

## Spare parts for brake assembly BZT

| P/N | Description | Fluid | Remarks | Item |
|---|---|---|---|---|
| **080801** | Housing BZT | N/A | | 1 |
| **080802** | Piston BZT | N/A | | 2 |
| **080803** | Counter plate BZT | N/A | | 3 |
| **080805** | Piston seal BZT | DOT 4 | | 4 |
| **080806** | Piston seal BZT | Mineral Fluid | | 4 |
| **080810** | Brake lining BZT | N/A | glued to brake lining retainer | 5 |
| **080811** | Anchor bolt BZT | N/A | for 080100 / 080101 | 6 |
| **080912** | Anchor bolt BZT for 4" Classic wheel | N/A | for 080108 | 6 |
| **080812** | Anchor bolt BZT M | N/A | for 080110 / 080111 | 6 |
| **080815** | Washer anchor bolt BZT | N/A | | 7 |
| **080816** | Nut anchor bolt BZT | N/A | | 8 |
| **080817** | Housing screw BZT | N/A | | 9 |
| **080819** | Retainer screw BZT | N/A | | 10 |
| **080820** | Washer for housing or retainer screw | N/A | | 11 |
| **059102** | Stahlbus bleeder valve M10x1 | DOT 4 | | 12 |
| **059202** | Stahlbus bleeder valve M10x1 | Mineral Fluid | | 12 |




**Brake lining wear limit:**
The minimum replacement thickness for organic linings is 0.7 mm.
The total thickness of the brake linings at any point must not be less than this value.

**Installation note:**
After mounting the brake assembly, tighten the hexagonal bolt (Pos. 9 and 10) with a tightening torque of 6 Nm.



## Brake assembly BZT2

The 2-piston brake assembly BZT2 is designed as a floating brake caliper and can be fitted to 5" and 6" disk brake wheels of the series Penta and Classic. Due to the two big pistons and special seals high braking torques are achieved to cope with the growing demand of heavy airplanes with high touch down speeds and ensure a save operation. The brake linings with their big connecting surface are designed to achieve an outstanding cold braking performance. The brake linings can be replaced easily and fast. With the BZT no special tools are needed to carry out a change of the brake linings. Also the brake assembly BZT2 is equipped with a Stahlbus bleeder valve.

2-piston brake asembly BZT2

The brake assembly BZT2 has an ETSO-approval of the EASA and is delivered with FORM 1.

The retrofitting of the BZT2 into different aircraft types is approved with Minor Change Approvals – see also page 66.

| P/N | Description | Fluid | Application | Braking torque Nm | Connecting thread | Weight g | Valve position mm | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|---|
| **080200** | BZT2 5L | DOT 4 | 5"/6" SBP Penta 5" SBR Classic | 480 | M10x1 | 590 | LH | 5 |
| **080201** | BZT2 5L | Mineral Fluid | 5"/6" SBP Penta 5" SBR Classic | 480 | M10x1 | 590 | LH | 5 |
| **080202** | BZT2 5L | DOT 4 | 5"/6" SBP Penta 5" SBR Classic | 480 | 1/8" NPT | 610 | LH | 5 |
| **080203** | BZT2 5L | Mineral Fluid | 5"/6" SBP Penta 5" SBR Classic | 480 | 1/8" NPT | 610 | LH | 5 |
| **080230** | BZT2 5R | DOT 4 | 5"/6" SBP Penta 5" SBR Classic | 480 | M10x1 | 590 | RH | 5 |
| **080231** | BZT2 5R | Mineral Fluid | 5"/6" SBP Penta 5" SBR Classic | 480 | M10x1 | 590 | RH | 5 |
| **080233** | BZT2 5R | Mineral Fluid | 5"/6" SBP Penta 5" SBR Classic | 480 | 1/8" NPT | 610 | RH | 5 |
| **080234** | BZT2 5R | DOT 4 | 5"/6" SBP Penta 5" SBR Classic | 480 | 1/8" NPT | 610 | RH | 5 |
| **080210** | BZT2 6L | DOT 4 | 6" SBR Classic | 480 | M10x1 | 600 | LH | 6 |
| **080211** | BZT2 6L | Mineral Fluid | 6" SBR Classic | 480 | M10x1 | 600 | LH | 6 |
| **080240** | BZT2 6R | DOT 4 | 6" SBR Classic | 480 | M10x1 | 600 | RH | 6 |
| **080241** | BZT2 6R | Mineral Fluid | 6" SBR Classic | 480 | M10x1 | 600 | RH | 6 |
| **080250** | BZT2 8L | DOT 4 | for wheel 055532 | 480 | M10x1 | 615 | LH | 8 |
| **080251** | BZT2 8L | Mineral Fluid | for wheel 055532 | 480 | M10x1 | 615 | LH | 8 |
| **080220** | BZT2 8R | DOT 4 | for wheel 055532 | 480 | M10x1 | 615 | RH | 8 |
| **080221** | BZT2 8R | Mineral Fluid | for wheel 055532 | 480 | M10x1 | 615 | RH | 8 |
| **080239** | BZT2 5R | Mineral Fluid | for wheel 055572 org. pads ASK 21 | 480 | 1/8" NPT | 610 | RH | 5 |

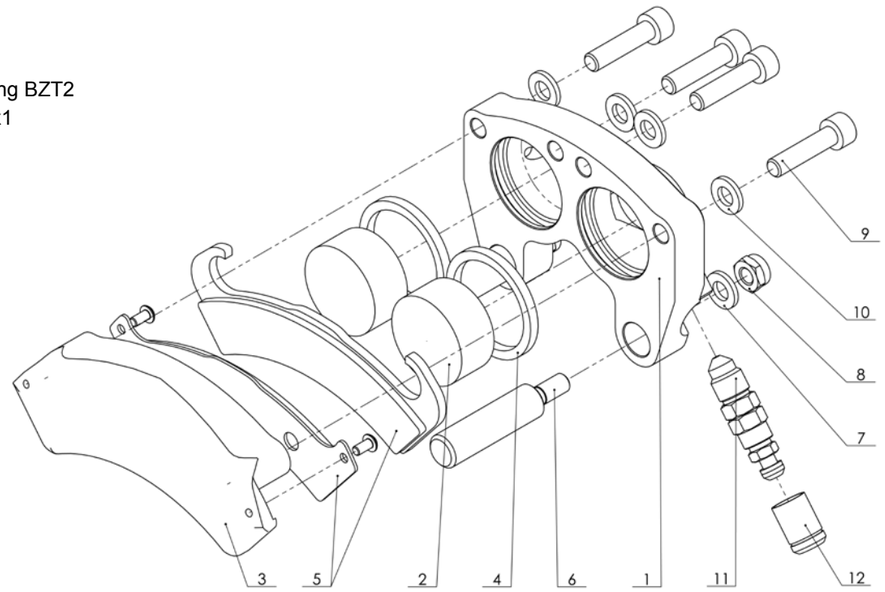
We can offer various universal or customized anchor (torque) plates for the mounting the brake assembly to the landing gear according to your requirements.

Spare parts for the brake assembly BZT2 can be found on the next page.

## Spare parts for brake assembly BZT2

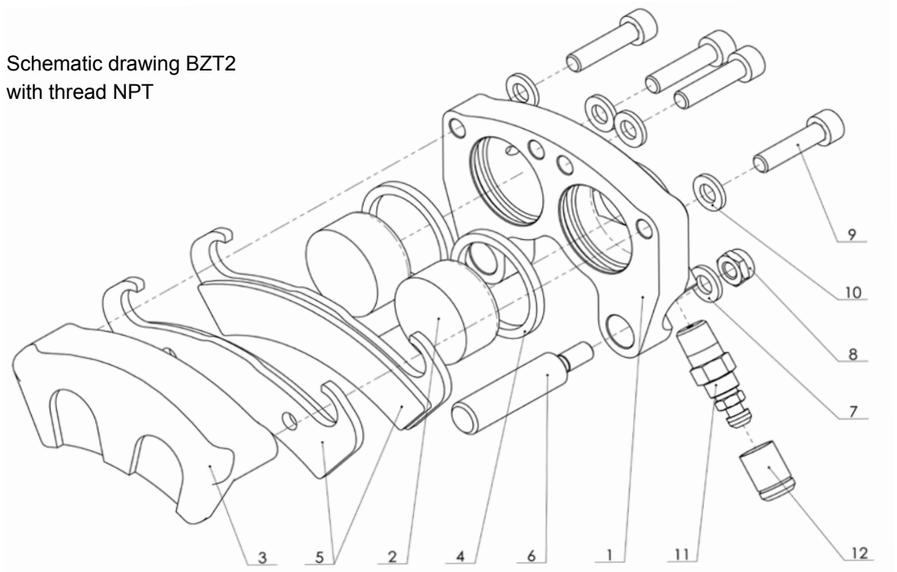
| P/N | Description | Fluid | Remarks | Item |
|---|---|---|---|---|
| **080901** | Housing BZT2 left | N/A | valve on left side | 1 |
| **080919** | Housing BZT2 right | N/A | valve on right side | 1 |
| **080902** | Piston BZT2 | N/A | | 2 |
| **080907** | Counter plate BZT2 5 M10x1 | N/A | for P/N 080200/080201/080230/080231 see below | 3 |
| **080903** | Counter plate BZT2 5 | N/A | for P/N 080202/080203/080233/080234 see right | 3 |
| **080904** | Counter plate BZT2 6 M10x1 | N/A | for P/N 080210/080211/080240/080241 see below | 3 |
| **080938** | Counter plate BZT2 8 M10x1 | N/A | for P/N 080220/080221/080250/080251 see schematic drawing: M10x1 thread | 3 |
| **080905** | Piston seal BZT2 | DOT 4 | | 4 |
| **080906** | Piston seal BZT2 | Mineral Fluid | | 4 |
| **080910** | Brake lining BZT2 organic | N/A | for BZT2/ASK 21 | 5 |
| **080949** | Brake lining BZT2, set | N/A | for thread M10x1, see below screwed on | 5 |
| **080948** | Brake lining BZT2, set | N/A | for thread NPT, see right and for all p/n prior to 2017 | 5 |
| **080911** | Anchor bolt BZT2 | N/A | length: 52.5 mm | 6 |
| **080912** | Anchor bolt BZT2 | N/A | for 4" Disk brake wheel Classic, length: 45.5 mm | 6 |
| **080815** | Washer anchor bolt BZT2 | N/A | | 7 |
| **080816** | Nut anchor bolt BZT2 | N/A | | 8 |
| **080917** | Housing screw BZT2 | N/A | | 9 |
| **080818** | Washer housing screw BZT2 | N/A | | 10 |
| **059102** | Bleeder valve M10x1 | DOT 4 | | 11 |
| **059202** | Bleeder valve M10x1 | Mineral Fluid | | 11 |
| **059199** | Protective cap for Stahlbus bleeder valve | | | 12 |

Schematic drawing BZT2
with thread M10x1






Schematic drawing BZT2
with thread NPT




**Brake lining wear limit:**
The minimum replacement thickness for organic linings is 0.7 mm.
The total thickness of the brake linings at any point must not be less than this value.

**Installation note:**
After mounting the brake assembly, tighten the hexagonal bolt (item 9) with a tightening torque of 17 Nm.

## Brake assembly BZT4

The four piston brake assembly BZT4 is designed as floating brake caliper and can be combined with the 6 inch disk brake wheel Penta. It has a high brake momentum and can take up a considerable brake energy, combined with the associated brake disk. It offers a high brake moment also for heavy aviations.
You can exchange the brake linings easily with standard metric tools.

The brake assembly BZT4 has an ETSO-approval of the EASA and is delivered with FORM 1.


Brake assembly BZT4 Tost

| P/N | Description | Fluid | Application | Braking torque Nm | Connecting thread | Weight g | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|
| **080400** | BZT4 | DOT 4 | 6" SBL | 1000 | M10x1 | 1500 | 7 |
| **080401** | BZT4 | Mineral Fluid | 6" SBL | 1000 | M10x1 | 1500 | 7 |
| **080402** | BZT4 | Mineral Fluid | 6" SBL | 1000 | M10x1 | 1500 | 14 |

We can offer various universal or customized torque plates for the mounting of the brake assembly to the landing gear, according to your requirements.

Brake assembly 30-9

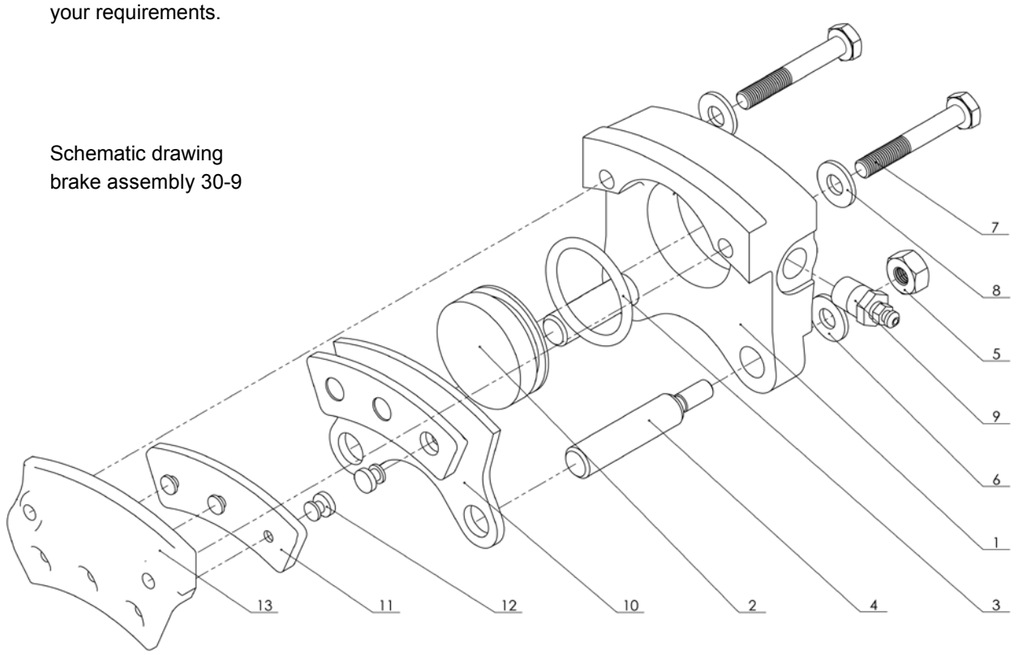
## Brake assembly 30-9

The brake assembly 30-9 by Cleveland is designed as a floating brake caliper and can be used with 4", 5" and 6" disk brake wheels of the series Penta, Tria and Classic and the 5" Cleveland wheels. The simple but robust design of the brake assembly ensures a long service time and easy maintenance with good deceleration values.

| P/N | Description | Fluid | Application | Braking torque Nm | Connecting thread | Weight g | Anchor bolt length mm | Brake disk thickness mm | incl. Anchor plate |
|---|---|---|---|---|---|---|---|---|---|
| **075820** | 30-9 | DOT 4 | 4" SB Classic<br>4" SRT Tria<br>5" SB Classic | 370 | 1/8" NPT | 700 | 31 | 5 | shortened |
| **075821** | 30-9 | DOT 4 | 4" SB Classic<br>5" SB Classic | 370 | 1/8" NPT | 700 | 29 | 5 | shortened |
| **075823** | 30-9 | DOT 4 | 5" SBP Penta<br>6" SBP Penta | 370 | 1/8" NPT | 700 | 44.5 | 5 | shortened |
| **075822** | 30-9 | Mineral Fluid | 4" SB Classic<br>4" SRT Tria<br>5" SB Classic | 370 | 1/8" NPT | 700 | 31 | 5 | Type I |
| **075819** | 30-9 | DOT 4 | 5" Cleveland<br>5" SBP Penta<br>6" SBP Penta | 370 | 1/8" NPT | 700 | 44.5 | 5 | original form |
| **075818** | 30-9 | Mineral Fluid | 4" SB Classic<br>4" SRT Tria<br>5" SB Classic | 370 | 1/8" NPT | 700 | 31 | 5 | shortened |
| **075810** | 30-9 | Mineral Fluid | 5" SBP Penta<br>6" SBP Penta | 370 | 1/8" NPT | 700 | 44.5 | 5 | original form |

The anchor plate (torque plate) for the mounting to the landing gear is part of the scope of delivery. Customized anchor plates can be offered according to your requirements.

Schematic drawing
brake assembly 30-9






### Spare parts brake assembly 30-9

| P/N | Description | Fluid | Remarks | Item |
|---|---|---|---|---|
| **075829** | Piston housing | N/A | | 1 |
| **075825** | Piston | N/A | | 2 |
| **075834** | O-ring | Mineral Fluid | | 3 |
| **075835** | O-ring | DOT 4 | | 3 |
| **075870** | Anchor bolt | N/A | 5" Cleveland, 5"/ 6" SBP Penta | 4 |
| **075869** | Anchor bolt | N/A | 4" SRT Tria, 4" SB Classic,<br>5" SB Classic | 4 |
| **075881** | Nut anchor bolt | N/A | | 5 |
| **075882** | Washer anchor bolt | N/A | | 6 |
| **075873** | Housing bolt | N/A | | 7 |
| **075882** | Washer housing bolt | N/A | | 8 |
| **075832** | Bleeder valve complete | N/A | also Stahlbus bleeder valve possible | 9 |
| **075872** | Pressure plate | N/A | | 10 - 12 |
| **075862** | Brake lining | N/A | | 11 |
| **075861** | Rivet for brake lining | N/A | | 12 |
| **075871** | Back plate with brake lining | N/A | | 11 - 13 |
| **075865** | Service kit for brake lining replacement | N/A | 2 x brake lining, 6 x rivet | 11, 12 |
| **075891** | Anchor plate for brake assy. 30-9, original, for brake disks Ø 162 mm | | | |
| **075892** | Anchor plate for brake assy. 30-9, shortened for Tost-wheels | | | |

**Brake lining wear limit:**
The minimum replacement thickness for organic linings is 2.5 mm.
The total thickness of the brake linings at any point must not be less than this value.

**Installation note:**
After mounting the brake assembly, tighten the hexagonal bolt with a tightening torque of 6.8 Nm (60 in-lb) and secure with locking wire 0.8 mm Spec. MS-20995.

Brake assembly 30-63A

## Brake assembly 30-63A

The brake assembly 30-63A by Cleveland is designed as a floating brake caliper and can be mounted to 6-inch disk brake wheels of the series Classic and Cleveland. The simple but robust design of the brake assembly ensures a long service time and easy maintenance with good deceleration values.

| P/N | Description | Fluid | Application | Braking torque Nm | Connecting thread | Weight g | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|
| **076810** | 30-63A | Mineral Fluid | 6" SB Classic | 450 | 1/8" NPT | 840 | 6 |
| **076820** | 30-63A | DOT 4 | 6" SB Classic | 450 | 1/8" NPT | 840 | 6 |

The anchor plate for the mounting to the landing gear is part of the scope of delivery. Customized anchor plates can be offered according to your requirements.

### Spare parts brake assembly 30-63A

| P/N | Description | Fluid | Remarks | Item |
|---|---|---|---|---|
| **076829** | Piston housing | N/A | | 1 |
| **076825** | Piston | N/A | | 2 |
| **076834** | O-ring | Mineral Fluid | | 3 |
| **076835** | O-ring | DOT 4 | | 3 |
| **075870** | Anchor bolt | N/A | 5" Cleveland, 5"/6" SBP Penta | 4 |
| **075869** | Anchor bolt | N/A | 4" SRT Tria, 4" SB Classic, 5" SB Classic | 4 |
| **075881** | Nut anchor bolt | N/A | | 5 |
| **075882** | washer anchor bolt | N/A | | 6 |
| **076873** | Housing bolt | N/A | | 7 |
| **075882** | Washer housing bolt | N/A | | 8 |
| **075832** | Bleeder valve complete | N/A | also Stahlbus bleeder valve possible | 9 |
| **076872** | Pressure plate with brake lining | N/A | | 10-12 |
| **076862** | Brake lining | N/A | | 11 |
| **075861** | Rivet brake lining | N/A | | 12 |
| **076871** | Back plate with brake lining | N/A | | 11-13 |
| **076865** | Service kit for brake lining replacement | N/A | 2 x brake lining, 4 x rivet | 11,12 |
| **076891** | Anchor plate for brake assembly 30-63A | | | |

**Brake lining wear limit:**
The minimum replacement thickness **for** organic linings is 2.5 mm
The total thickness of the brake linings at any point must not be less than this value.

**Installation note:**
After mounting the brake assembly, tighten the hexagonal bolt with a tightening torque of 6.8 Nm (60 in-lb) and secure with locking wire 0.8 mm Spec. MS-20995.

*For the correlation of the spare parts kindly refer to the schematic drawing of the brake assembly 30-9 on page 52!*



## TOG Brake assembly

The brake assembly TOG is designed as a fixed caliper brake and can be mounted to 5-inch disk brake wheels of the series Penta and Classic. Due to the simple but robust design the brake assembly ensures a long service time and easy maintenance with good deceleration values.

| P/N | Description | Fluid | Application | Braking torque Nm | Connecting thread | Weight g | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|
| **058110** | TOG | DOT 4 | 5" SB Classic 5" SBP Penta | 260 | M10x1 | 460 | 4 |

TOG brake assembly

### Spare parts TOG Brake assembly

| P/N | Description | Fluid | Remarks |
|---|---|---|---|
| **058530** | Seal kit | DOT 4 | |
| **058531** | Piston gasket set for TOG brake assembly | | |
| **058533** | Separation seal | DOT 4 | |
| **058534** | Bleeder valve | DOT 4 | |
| **058512** | Set brake linings | | |
| **058511** | Split pins | | |
| **058545** | Gasket ring (cover for seals) for master cylinder type 6+7 | | |

**Brake lining wear limit:**
The minimum replacement thickness **for** organic linings is 1.5 mm
The total thickness of the brake linings at any point must not be less than this value.

**Installation note:**
1. Mount brake assembly vertically, maximum 15° inclination.
2. Tightening torque of fastening bolts M8x45 at assembly with 20 Nm, maximum 22 Nm.
3. The brake assembly is tested to 120 bar prior to delivery.
   On delivery the brake assembly may still contain brake fluid.
4. The M6 hexagonal bolts are tightened to a torque of 12 Nm.
   This torque must be maintained to prevent pressure loss.
5. Only use DOT4 brake fluid.

UL brake assembly

## UL brake assembly for Ultralights

The brake assembly UL is designed as a fixed caliper brake with 6 pistons and can be mounted to the 6 inch disk brake wheel UL. The design with 6 pistons makes it possible to achieve good deceleration values with a minimum of component weight.

| P/N | Description | Fluid | Application | Braking torque Nm | Connec-ting thread | Weight g | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|
| **058820** | BZ-UL | Mineral Fluid | 6" SB UL | 100 | M6 | 170 | 2 |

### Spare parts

| P/N | Dscription | Fluid | Remarks |
|---|---|---|---|
| **058822** | Set brake linings | | |

**Brake lining wear limit:**
The minimum replacement thickness **for** organic linings is 0.5 mm.
The total thickness of the brake linings at any point must not be less than this value.

Brake assembly BZM

## Brake assembly BZM

The brake assembly BZM is designed as an extremely small fixed caliper brake with one piston. In combination with the disk brake wheel Max II or Mini 150/180 it is the smallest variant of a hydraulic brake system. It is suitable for very light aircraft as differential brake for steering or as assisting brake for deceleration after touch-down.

| P/N | Descrip-tion | Fluid | Application | Braking torque Nm | Connec-ting thread | Weight g | Brake disk thickness mm |
|---|---|---|---|---|---|---|---|
| **058222** | BZM | Mineral Fluid | Max II SB<br>Mini 150 SB<br>Mini 180 SB | | M5 | 31 | 2 |

### Spare parts brake assembly BZM

| P/N | Dscription | Fluid | Remarks |
|---|---|---|---|
| **058223** | Set brake linings | | |

**Brake lining wear limit:**
The minimum replacement thickness **for** organic linings is 0.5 mm.
The total thickness of the brake linings at any point must not be less than this value.

# MASTER CYLINDER

Master cylinder are the components in hydraulic brake system, which produce the necessary brake respectively hydraulic pressure to push the brake linings against the brake disk. In addition to our brake assemblies we manufacture a wide variety of master cylinders, available from stock, which can be used in different combinations.

- **Hydraulic brake lever**, which can be mounted directly to the control stick. The actuation is carried out directly by the pilot. e.g. HBG, HBGD, HBGSH
- **Rudder pedal master cylinder**, which can be mounted to additional small pedals on the rudder pedals or at a user-defined place in the fuselage. If the installation is not realized at the rudder pedals, the actuation has to be realized with a bowden cable or push-rods. e.g. PHBZ, 10-30, HBZS, PBG
- **Universal master cylinder** for user-defined installation in the fuselage. The actuation has to be realized with a bowden cable or push-rods: e.g. Form 7

## HBG

Our master cylinder HBG is the smallest brake cylinder for an integrated mounting to the control stick. Due to high-quality materials and optimized pressure seals, it ensures a fast response characteristic and a very good modulation of braking force.


Master cylinder HBG

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g |
|---|---|---|---|---|---|---|
| **050100** | HBG | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 125 |
| **050101** | HBG | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 125 |

We recommend the use of our thin and high flexible hydraulic lining Steelflex (p/n 058002) for the feed and the pressure line, if the master cylinder is mounted to the control stick.

## HBGD

The HBGD is a compact master cylinder for direct mounting to the control stick. Due to high-quality materials and optimized pressure seals, it ensures a fast response characteristic and a very good modulation of braking force.

The mounting to the control stick is completed with retaining clamps, including a quick fastener. Suitable retaining clamps are available for various control stick diameters (Ø 18 mm, Ø 19 mm, Ø 20 mm, Ø 24 mm). Additional diameters can be customized according to your requirements.

A valve-based control mechanism always ensures that the higher braking pressure reaches the brake assembly. Especially in double-seated planes, this will offer you a significant increase in safety.


Master cylinder HBGD

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g |
|---|---|---|---|---|---|---|
| **050200** | HBGD | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 150 |
| **050201** | HBGD | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 150 |

We recommend the use of our thin and high flexible hydraulic lining Steelflex (p/n 058002) for the feed and the pressure line, if the master cylinder is mounted to the control stick.

## HBGSH

The master cylinder HBGSH has the same hydraulic design as the master cylinder HBGD. This ensures a fast response characteristic, a very good modulation of braking force and the overflow function. The installation is completed with four thread bores.

Master cylinder HBGSH

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g |
|---|---|---|---|---|---|---|
| **050220** | HBGSH | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 140 |
| **050221** | HBGSH | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 140 |

We recommend the use of our thin and high flexible hydraulic lining Steelflex (p/n 058002) for the feed and the pressure line, if the master cylinder is mounted to the control stick.

Master Cylinder
for Pedals
PHBZ

## PHBZ

Fast response characteristic and a good modulation of braking force can also be realized with the master cylinder PHBZ. It is suitable for direct mounting at the rudder pedal and can either be fitted with fork head or rod end. Apart from the installation at the rudder pedals, an alternative installation in the fuselage is possible because of the flexible mounting length. The master cylinder PHBZ is also equipped with the overflow function and can be used in series.

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Mounting device | Weight g |
|---|---|---|---|---|---|---|---|
| **050300** | PHBZ | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | Fork head | 135 |
| **050301** | PHBZ | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | Fork head | 135 |
| **050310** | PHBZ | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | Rod end | 149 |
| **050311** | PHBZ | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | Rod end | 149 |

Master Cylinder
HBZS

## HBZS

Smaller and lighter than the master cylinder PHBZ.
With the type HBZS, you can replace a single master cylinder 10-30. This results in the advantages of a clear weight reduction, a flexible installation position, and more economical spare parts prices.

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Mounting device | Weight g |
|---|---|---|---|---|---|---|---|
| **050302** | HBZS | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | Bore | 99 |
| **050303** | HBZS | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | Bore | 99 |
| **050304** | HBZS | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | NPT | Bore | 99 |
| **050305** | HBZS | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | NPT | Bore | 99 |

Master Cylinder
PTC Pull-type

## PTC Pull-type

The master cylinder PTC is a newly designed product. It is special because of its actuation by pulling. The installation can be made, e.g., in LS gliders for actuation of the brake via the pedals. The installation dimensions are very small. The seal and overall quality are of a high grade.

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g |
|---|---|---|---|---|---|---|
| **050400** | PTC | DOT 4 | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 120 |
| **050401** | PTC | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 120 |



## PBG

The master cylinder PBG is qualified especially together with the four piston brake assembly BZT4 due to its large volume flow, or for the connection of two brake assemblies, BZT or BZT2, to a single master cylinder.
The type PBG is applicable for mounting to the rudder pedals or also the free positioning in the fuselage.
This master cylinder is also provided with an overflow function and can be used in series.

Master cylinder PBG

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Mounting device | Weight g |
|---|---|---|---|---|---|---|---|
| **050610** | PBG | DOT 4 | BZT, BZT2, BZT4 30-9, 30-63A | 100 | M10x1 | Bore | 135 |
| **050611** | PBG | Mineral Fluid | BZT, BZT2, BZT4 30-9, 30-63A | 100 | M10x1 | Bore | 135 |

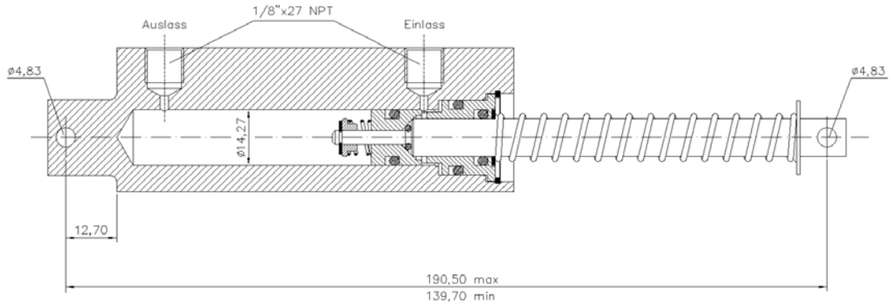
## Type 10-30

A sturdy, high load-capable pedal master cylinder manufactured by Cleveland and equipped with an overflow function.

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g |
|---|---|---|---|---|---|---|
| **078230** | 10-30 | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 70 | NPT 1/8" | 263 |

### Spare parts

| P/N | Description | Remarks |
|---|---|---|
| **078240** | Seal kit | N/A |




Master cylinder
with overflow function
(078230)

## Universal Master Cylinder Models 3, 4 and 7

Suitable for many different installation situations. Our universal master cylinders, due to the integrated actuation lever, provide a remarkable increase in actuation force, allowing very high braking pressures to be generated. The solid design, together with high-quality seals, ensures long service intervals.

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g | Remarks |
|---|---|---|---|---|---|---|---|
| **058230** | Model 3 | DOT4 | BZT, BZT2, 30-9, 30-63A, TOG | 100 | M10x1 | 400 | |
| **058240** | Model 4 | DOT4 | BZT, BZT2, 30-9, 30-63A, TOG | 100 | M10x1 | 400 | |
| **058291** | Model 7 | DOT4 | BZT, BZT2, 30-9, 30-63A, TOG | 100 | M10x1 | 360 | replaces P/N 058270 |
| **058299** | Model 7 | Mineral Fluid | BZT, BZT2, 30-9, 30-63A | 100 | M10x1 | 360 | replaces P/N 058279 |

Universal Master Cylinder Model 3

Universal Master Cylinder Model 4

Universal Master Cylinder Model 7 with Reservoir

### Spare parts

| P/N | Description |
|---|---|
| **058541** | Gasket set master cylinder, Model 6 and 7, DOT4 |
| **058543** | Gasket set master cylinder, Model 3 and 4 – without cover seal – |
| **058544** | Gasket set master cylinder, Model 6 and 7, Mineral Fluid |
| **058545** | Gasket ring (cover for seals) for master cylinder, Model 6 and 7 |
| **058174** | Bellow for master cylinder, Model 3 and 4, DOT 4 |
| **058269** | Fluid reservoir master cylinder, Model 7, Mineral Fluid |
| **058271** | Fluid reservoir master cylinder, Model 7, DOT4 |
| **058273** | Bellow for fluid reservoir 058269, Mineral Fluid |
| **058274** | Bellow for fluid reservoir 058271, DOT 4 |
| **058277** | Cover, dummy ring and bellow, DOT 4 |

**Installation guidelines for master cylinders Model 3, 4 and 7:**

1. The master cylinder must be installed in the specified position, maximum deviation 5°, ascending in direction of flight.
2. The available brake lever travel must allow for the necessary piston stroke.
3. The active stroke of the master cylinder piston must not be exceeded. The brake lever travel must therefore be restricted in both directions (be careful not to damage the piston collars).
4. There must be play of 1 mm between piston and brake lever in release position.
5. The brake lever must be pulled back to release position by a return spring. The spring must be attached to a fixed structural element.
6. The mounting bracket for the master cylinder must not yield when the brake is activated.

**Important note:**

Brake fluid DOT4 is strongly hygroscopic, i.e. it absorbs water. This is the reason why old brake fluid has a corrosive effect. Replace brake fluid DOT4 once a year according to manufacturer‘s maintenance manual.



## Master cylinder Max and Mini HBM

Suitable for our smaller brake assembly BZM we offer the master cylinder HBM.
It features compact outer dimensions, an universal actuation and an easy installation.
With the generated braking pressure one or two brake assemblies BZM can be operated.

| P/N | Description | Fluid | Application (suitable brake assembly) | Max. operating press. bar | Connecting thread | Weight g | Remarks |
|---|---|---|---|---|---|---|---|
| **058821** | HBM | Mineral Fluid | BZM | 60 | M5 | 69 | replaces P/N 058220 |

Master Cylinder HBM

# PARKING VALVES

Especially when operating powered aircraft, a permanent brake is essential for parking and to perform the run-up. With the help of so-called parking valves, it is possible to hold a once produced hydraulic pressure in the brake system, without permanently actuating the normal master cylinder. Suitable for our hydraulic brake component, we offer parking valves for single-circuit or dual-circuit use.

Sinlge-circuit parking valve

## Single-circuit parking valve

For limited installation space and various types of actuation, our single-circuit parking valve is the proper choice. The installation is completed with two bores or two threaded bores. It is actuated via a turning handle or a turnable actuation lever. The hydraulic connection can be configured individually using different hydraulic fittings.

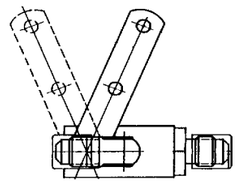
| P/N | Description | Fluid | Max. operating press. bar | Connecting thread | Weight g | Remarks |
|---|---|---|---|---|---|---|
| **050094** | PVE | DOT4 | 100 | M10x1 | 90 | Actuation lever |
| **050095** | PVE | Mineral Fluid | 100 | M10x1 | 90 | Actuation lever |
| **050096** | PVEmA | DOT4 | 100 | M10x1 | 95 | Mech. stop and turning handle |
| **050099** | PVEmA | Mineral Fluid | 100 | M10x1 | 95 | Mech. stop and turning handle |

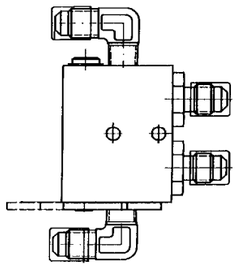
Dual-circuit parking valve

## Dual-circuit parking valve

If a differential brake is installed, we recommend our dual-circuit parking valve PVZ. The mounting is completed with two bores, the actuation is carried out with a lever, turnable mounted on the control shaft. The hydraulic connection can be configured individually using different hydraulic fittings.

| P/N | Description | Fluid | Max. operating press. bar | Connecting thread | Weight g | Remarks |
|---|---|---|---|---|---|---|
| **050090** | PVZ | DOT4 | 100 | M10x1 | 125 | Actuation lever |
| **050091** | PVZ | Mineral Fluid | 100 | M10x1 | 125 | Actuation lever |





Parking valve 60-5

## Parking valve 60-5

The parking valve 60-5, manufactured by Cleveland, is a very sturdy dual-circuit parking valve for the use with Mineral Fluid. The mounting is completed with two bores and the actuation is carried out by a lever.

| P/N | Description | Fluid | Max. operating press. bar | Connecting thread | Weight g |
|---|---|---|---|---|---|
| **079610** | 60-5 | Mineral Fluid | 103 | JIC04 | 150 |

# RETROFIT OF COMPLETE HYDRAULIC BRAKE SYSTEM

The retrofit of the Hydraulic Brake System in Schempp-Hirth gliders results in a clear increase in braking force, while the braking can be modulated very well. Pilot and copilot can brake simultaneously. All control sticks are equipped with a master cylinder. The control stick itself is replaced by a CNC-milled one; in double-seaters, this applies only to the forward control stick. The complex actuation of the brake via a bowden cable is omitted and a clear improvement in braking force and the operational safety can be obtained. An existing disk brake wheel can be used further on; the retrofit can be realised easily and quickly in any gliding club's workshop.

| P/N | Description | Aircraft type | Remarks |
|---|---|---|---|
| **050920**<br>**050921**<br>**050922** | Retrofit kit Schempp-Hirth double-seaters | Duo-Discus<br>Arcus<br>Nimbus | incl. Minor Change Approval see TN 1-2015 |
| **050910**<br>**050911**<br>**050912** | Retrofit kit Schempp-Hirth single-seaters | Discus<br>Ventus<br>Mini-Nimbus<br>Nimbus 2 - 4 | incl. Supplemental Type Certificate see TN 1-2016 |

The retrofit kit includes all components like the master cylinder, hydraulic hoses and suitable fittings and the complete documentation with installation instructions. Supplied with EASA FORM 1.

In case the glider is equipped with a drum brake wheel, you need to perform the modification to a disk brake wheel first, please refer to page 24.

**Please always indicate with your order the aircraft type and the serial number.**

To complete the retrofit with the brake assembly BZT2, we issued a Minor Change Approval (TN 2-2018) for additional aircraft types. A brake assembly with hydraulic fitting will be supplied. In the Pilot-Owner-Maintenance you can perform this retrofit by yourself and also release it.

| P/N | Description | Aircraft type | Remarks |
|---|---|---|---|
| **050930** | Retrofit BZT2 (080200) | Schempp-Hirth | TM 2-2018 |
| **050931** | Retrofit BZT2 (080230) | ASK 13 | TM 2-2018 |
| **050934** | Retrofit BZT2 (080233) | ASK 21 | TM 2-2018 |
| **050935** | Retrofit BZT2 (080234) | SZD Perkoz, DG 1000 Classic-SB-Rad | TM 2-2018 |
| **050936** | Retrofit BZT2 (080234) | DG 1000 Penta-SB-Rad | TM 2-2018 |
| **050937** | Retrofit BZT2 (080202) | DG 500 | TM 2-2018 |
| **050940** | Retrofit BZT2 (080202/080234) | Grob G 109/Diamond H36/HK36 for DOT 4 | TM 2-2018 |
| **050941** | Retrofit BZT2 (080203/080233) | Grob G 109/Diamond H36/HK36 for Min.Fluid | TM 2-2018 |



# HYDRAULIC SHOE BRAKE WHEEL

To increase the braking force of the 4-inch and 5-inch shoe brake wheels, they can be fitted with a hydraulically actuated anchor plate. The advantage is that the friction of the mechanical actuating cables is omitted due to the hydraulic actuation. As a result, braking power is increased and better controllable. The effort involved in the modification is minimal: only the anchor plate has to be replaced. All connecting dimensions of the wheel (installation width, position of the anchor bolt) remain unchanged.

The hydraulic actuated anchor plates are supplied including master cylinder, hydraulic hose and detailed working instructions.

| P/N | Description | Fluid | Connecting thread | Remarks |
|---|---|---|---|---|
| **045930** | Hydraulic actuation 4" Liliput | Tost Mineral Fluid | M5 | Technical consultation recommended prior to modification. |
| **045940** | Hydraulic actuation 4" Kobold | Tost Mineral Fluid | M5 | |
| **045945** | Hydraulic actuation 5" Standard | Tost Mineral Fluid | M5 | Axle diameter 20 mm |
| **045943** | Hydraulic actuation 5" Standard | Tost Mineral Fluid | M5 | Axle diameter 30 mm |
| **045925** | Hydraulic actuation 5" Standard, Special version for ASW 19/20 | Tost Mineral Fluid | M5 | Axle diameter 20 mm *EASA approval in progress!* |
| **045948** | Hydraulic actuation 5" Standard | Tost Mineral Fluid | M5 | Axle diameter 35 mm |

**Please indicate the aircraft type, axle diameter, and type of anchor bolt with your order, so that we can supply the appropriate anchor plate. If the wheel is more than 30 years old, we recommend a technical consultation prior to the modification.**

## Conversion kit for Schempp-Hirth Cirrus

For the Schempp-Hirth Cirrus, we can supply a complete conversion kit from the 4-inch Liliput wheel to 4-inch Kobold wheel with hydraulic actuation of the shoe brake wheel. The kit is EASA approved under a Minor Change Approval. The components of the kit are shown below.

| P/N | Description | Fluid | Connecting thread | Remarks |
|---|---|---|---|---|
| **045921** | Conversion kit for Cirrus | Tost Mineral Fluid | M5 | Including full documentation and Minor Change Approval |

# HYDRAULIC HOSES

Just as important as the brake components (master cylinder, brake assembly) is their connection with each other. Here should only be used high-quality hydraulic hoses, which are adequate for the specific fluid and for the arising operational and maximum pressure. With our hoses, ready manufactured for you, we offer you for every application and for every type of connection the correct hydraulic hose.

## Steelflex hoses

Steelflex hoses are the standard for highly stressed hydraulic systems how they get employed in the scope of aviation, motor sport or industrial plants.The multilayered structure of Steelflex hoses (high pressure stable Teflon core and encasing stainless steel meshwork) provides the tightest bending radii for very high operating pressure – without pressure loss, even in extended hose lengths.

A special feature of our Steelflex hoses are the pressed-in connection fittings. The pressing process provides a maximum of leak tightness, also after a long time of operation under high hydraulic pressure.

## Steelflex hose -03

Our standard Steelflex hose features, in addition to the stainless steel mesh, an extra PVC protective coating. This provides excellent protection against chafing, especially in tight fuselage spaces made of fibre-composite material.

| P/N | Description | Fluid | Operational pressure bar | Bursting pressure bar | Possible connecting fittings (pressed into the hose) |
|---|---|---|---|---|---|
| **058001** | Steelflex hydraulic hose -03, PVC coated, ø 7.5 mm | DOT4, Mineral Fluid | 290 | 870 | Banjo fitting for hollow screw M10x1 (straight, 20° cranked, 90° cranked) spigot nut JIC03 |



## Steelflex hose lightweight -03

For very small bend radii or for connecting master cylinders at the control stick, we recommend our lightweight Steelflex hydraulic hose without PVC coating.

| P/N | Description | Fluid | Operational pressure bar | Bursting pressure bar | Possible connecting fittings (pressed into the hose) |
|---|---|---|---|---|---|
| **058002** | Steelflex hydraulic hose lightweight -03, ø 6 mm | DOT4, Mineral Fluid | 290 | 870 | Banjo fitting for hollow screw M10x1 (straight, 20° cranked, 90° cranked) spigot nut JIC03 |

## Steelflex hose -04

This Steelflex hose with a large inner diameter is especially robust.
It is recommended for applications where high flow rates are needed.

| P/N | Description | Fluid | Operational pressure bar | Bursting pressure bar | Possible connecting fittings (pressed into the hose) |
|---|---|---|---|---|---|
| **058008** | Steelflex hydraulic hose -04 | DOT4, Mineral Fluid | 280 | 840 | Spigot nut JIC04 |

## Hydraulic hose -05

Lightweight hydraulic hose for low flow volume.
For brake assembly BZM and HBM.

| P/N | Description | Fluid | Operational pressure bar | Possible connecting fittings (pressed into the hose)) |
|---|---|---|---|---|
| **058236** | Hydraulic hose -05 | Mineral Fluid | 60 | banjo fitting for hollow screw straight connecting fitting |

## Hydraulic line -06

Lightweight hydraulic line for low flow volume like in Ultralights with brake assembly BZ-UL and UL handle.

| P/N | Description | Fluid | Operational pressure bar | Possible connecting fittings (pressed into the hose)) |
|---|---|---|---|---|
| **058225** | Hydraulic line -06 | Mineral Fluid | 60 | banjo fitting for hollow screw straight connecting fitting |

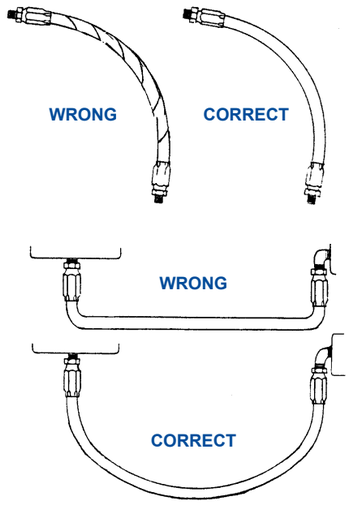
**Please indicate with your order the total length of the hydraulic hose, as well as the required end fittings for both ends.**

**Example:**
p/n 058008, length XXXX mm, o/s banjo fitting 20°, o/s spigot nut JIC 03

## Standard hydraulic hoses

In addition to individually fitted hydraulic hoses, we also offer a wide range of standard hydraulic hoses. Our Polyflex hoses are lightweight, while Steelflex hoses are designed for tight bends and longer hose lengths.

| P/N | Descripton | Fluid | Material | Length mm | Connection |
|---|---|---|---|---|---|
| **058712** | Type 1 | DOT4, Mineral Fluid | Steelflex | 250 | straight pipe socket for pipe fitting |
| **058716** | Type 1 | DOT4, Mineral Fluid | Steelflex | 600 | straight pipe socket for pipe fitting |
| **058721** | Type 1 | DOT4, Mineral Fluid | Steelflex | 1120 | straight pipe socket for pipe fitting |
| **058724** | Type 1 | DOT4, Mineral Fluid | Steelflex | 1240 | straight pipe socket for pipe fitting |
| **058423** | Type 2 | DOT4, Mineral Fluid | Polyflex | 300 | o/s: straight pipe socket o/s: JIC04 spigot nut |
| **058765** | Type 2 | DOT4, Mineral Fluid | Steelflex | 500 | o/s: straight pipe socket o/s: JIC04 spigot nut |
| **058766** | Type 2 | DOT4, Mineral Fluid | Steelflex | 600 | o/s: straight pipe socket o/s: JIC04 spigot nut |
| **058490** | Type 2 | DOT4, Mineral Fluid | Polyflex | 900 | o/s: straight pipe socket o/s: JIC04 spigot nut |
| **058330** | Type 3 | DOT4, Mineral Fluid | Polyflex | 300 | o/s: Banjo fitting Ø 10 mm o/s: JIC04 spigot nut |
| **058350** | Type 3 | DOT4, Mineral Fluid | Polyflex | 500 | o/s: Banjo fitting Ø 10 mm o/s: JIC04 spigot nut |
| **058360** | Type 3 | DOT4, Mineral Fluid | Polyflex | 600 | o/s: Banjo fitting Ø 10 mm o/s: JIC04 spigot nut |
| **058375** | Type 3 | DOT4, Mineral Fluid | Polyflex | 750 | o/s: Banjo fitting Ø 10 mm o/s: JIC04 spigot nut |
| **058380** | Type 3 | DOT4, Mineral Fluid | Steelflex | 850 | o/s: Banjo fitting Ø 10 mm o/s: JIC04 spigot nut |
| **058390** | Type 3 | DOT4, Mineral Fluid | Polyflex | 900 | o/s: Banjo fitting Ø 10 mm o/s: JIC04 spigot nut |
| **058310** | Type 4 | DOT4, Mineral Fluid | Polyflex | 700 | both sides Banjo fitting Ø 10 mm |
| **058366** | Type 5 | DOT4, Mineral Fluid | Polyflex | 600 | for Janus |




**Installation notes:**

- Hydraulic hoses must be installed without twisting to prevent material weakening. Twisted hoses under pressure can loosen from their fittings.
- Hydraulic hoses must be routed with sufficiently large bends to prevent pinching. Pinching reduces the cross-sectional area and impairs braking performance.
- The life expectancy of a hydraulic hose is significantly reduced by too small bending radii. Use hoses made of Steelflex (material B) if tight bends cannot be avoided.



# HYDRAULIC FITTINGS

For the connection of hydraulic components (master cylinder, brake assembly etc.) or the relevant hydraulic hoses, so-called connection fittings or male stud couplings are required. We offer the suitable connectors for all our hydraulic components to joint the hydraulic hoses.

We are pleased to give you advise at any time to select the correct fitting for your brake system.

## Connecting fittigs JIC03

Connecting fittings from aluminium, one-sided with Standard screwing JIC03

| P/N | Description | Thread size 1 | Thread size 2 | Thread size 3 | Form |
|---|---|---|---|---|---|
| **075850** | Fitting straight NPT 1/8"-JIC03 | JIC03 | NPT 1/8" | N/A | straight |
| **075851** | Fitting 45° NPT 1/8"-JIC03 | JIC03 | NPT 1/8" | N/A | 45° |
| **075853** | Fitting 90° NPT 1/8"-JIC03 | JIC03 | NPT 1/8" | N/A | 90° |
| **058050** | Fitting straight M10x1-JIC03 | JIC03 | M10x1 | N/A | straight |
| **058051** | Fitting 45° M10x1-JIC03 | JIC03 | M10x1 | N/A | 45° |
| **058053** | Fitting 90° M10x1-JIC03 | JIC03 | M10x1 | N/A | 90° |
| **058058** | T-Fitting JIC03 | JIC03 | JIC03 | JIC03 | T-Fitting |

Fitting straight (058050)

Fitting straight (075850)

Fitting 90° (075853)

## Connecting fittings JIC04

Connecting fittings from aluminium, one-sided with Standard screwing JIC04

| P/N | Description | Thread size 1 | Thread size 2 | Thread size 3 | Form |
|---|---|---|---|---|---|
| **075830** | Fitting straight NPT 1/8"-JIC04 | JIC04 | NPT 1/8" | N/A | straight |
| **075831** | Fitting 45° NPT 1/8"-JIC04 | JIC04 | NPT 1/8" | N/A | 45° |
| **075833** | Fitting 90° NPT 1/8"-JIC04 | JIC04 | NPT 1/8" | N/A | 90° |
| **058054** | Fitting straight M10x1-JIC04 | JIC04 | M10x1 | N/A | straight |
| **058055** | Fitting 45° M10x1-JIC04 | JIC04 | M10x1 | N/A | 45° |
| **058056** | Fitting 90° M10x1-JIC04 | JIC04 | M10x1 | N/A | 90° |
| **075838** | T-Fitting JIC04 | JIC04 | JIC04 | JIC04 | T-Fitting |

Fitting 45° (075851)

T-Fitting JIC03 (058058)

## Hydraulic reductions from aluminium

| P/N | Description | Thread size 1 | Thread size 2 | Thread size 3 | Form |
|---|---|---|---|---|---|
| **058063** | Hydraulic reduction M10x1-M5 | M5 | M10x1 | N/A | straight |
| **058064** | Hydraulic reduction M10x1-M6 | M6 | M10x1 | N/A | straight |

## Hollow screws

For the connection of hydraulic hoses and hydraulic components, hollow scews are a very good choice.
The angle between hose and axis of the hollow screw is to be defined freely.

| P/N | Description | Connecting thread | Application | Gasket |
|---|---|---|---|---|
| **058227** | Hollow screw M5x14 | M5 | BZM | 2 x O-ring included in p/n 058227 |
| **058226** | Double hollow screw M5x21 | M5 | BZM | 4 x O-Ring,included in p/n 058226 |
| **058062** | Hollow screw M6 | M6 | Hydraulic hose 06 | 2 x Cu gasket, included in p/n 058062 |
| **058550** | Hollow screw M10 | M10x1 | Standard hydraulic hose p/n 058330, 058350, 058360, 058375, 058380, 058390, 058310 | 2 x Cu gasket, included in p/n 058550 |
| **058281** | Hollow screw M10 VA | M10x1 | Steelflex hydraulic hose and Steelflex hydraulic hose lightweight p/n 058001, 058002 | 2 x Aluminium gasket, included in p/n 058281 |
| **058282** | Hollow screw M10 double VA | M10x1 | Steelflex hydraulic hose and Steelflex hydraulic hose lightweight p/n 058001, 058002 | 3x Aluminium gasket, included in p/n 058282 |

### Suitable Banjo fittings:

| P/N | Description | Application | Remarks |
|---|---|---|---|
| **058224** | Banjo fitting M5 | Hydraulic hose -05, p/n 058236 hollow screw M5, p/n 058226/058227/058237 | incl.cutting ring and spigot nut |
| **058060** | Banjo fitting M6 | Hydraulic hose -06 | incl. hollow screw |
| **058257** | Banjo fitting M6 | Hydraulic hose -05, p/n 058236 hollow screw M6 | incl. cutting ring and spigot nut |
| **058003** | Screw-in fitting Banjo M10 | Hydraulic hose -03, p/n 058001 hollow screw M10x1, p/n 058281/058282 | incl. cutting ring and spigot nut |

### Suitable gaskets as spare parts:

| P/N | Description | Application |
|---|---|---|
| **058238** | O-Ring | for hollow screw M5 |
| **058283** | Copper gasket M10 | for hollow screw p/n 058550 |
| **058286** | Copper gasket M6 | for hollow screw p/n 058062 |
| **058289** | Aluminium gasket M10 | for hollow screw p/n 058550, 058281, 058282 |

**Remark:**
Gaskets (from aluminium or copper) may be used only once!



## Male stud connectors

a further option for the connection of hydraulic components are copper pipes.

| P/N | Description |
|---|---|
| **058695** | Copper pipe 6x1 |

The connection of copper pipes to the respective hydraulic component is made using male stud couplings.

| P/N | Description | Form | Connecting thread 1 | Connecting thread 2 | Remarks |
|---|---|---|---|---|---|
| **058630** | C1 | straight | NPT 1/8" | M10x1 | with spigot nut and cutting ring |
| **058640** | C2 | 90° | NPT 1/8" | M10x1 | with spigot nut and cutting ring |
| **058670** | C3 | straight | M10x1 taper thread | M10x1 | with spigot nut and cutting ring |
| **058680** | C4 | 90° | M10x1 taper thread | M10x1 | with spigot nut and cutting ring |
| **058651** | C5 | straight | M10x1 | M10x1 | with copper gaskets, for connection of Master cylinder model 7 with reservoir |

Straight pipe fittings or T-pieces are suitable
for connecting copper tubes to each other or to hydraulic lines:

| P/N | Description | Connecting thread 1 | Connecting thread 2 | Connecting thread 3 | Remarks |
|---|---|---|---|---|---|
| **058620** | Straight coupling | M10x1 | M10x1 | | with spigot nut and cutting ring |
| **058610** | T-coupling | M10x1 | M10x1 | M10x1 | with spigot nut and cutting ring |

**Assembly notes for male stud couplings**
(p/n 058630, 058640, 058670, 058680)

- Cut off pipe at a right angle (do not use a pipe cutter).
- Deburr pipe on the inside and outside (caution: do not bevel).
- Lightly lubricate thread and cone of the male stud coupling.
- Lubricate cutting ring and spigot nut (on the inside).
- Push spigot nut and cutting ring over the pipe end.
- Tighten spigot nut by hand.
- Push the pipe against the stop of the inner cone.
- A mark on the spigot nut helps to check the correct number of turns.
- Turn spigot nut approximately 1½ turns (pipe must remain stationary).
  The tightening force increases as the pipe presses against the stop face.

**Check:**

- Release spigot nut and check whether the visible bead fills the space in front of the cutting ring face. If not, tighten the spigot nut further.
- The cutting ring may turn but must not move in the axial direction.

# ACCESSORIES

We offer all necessary accessories and tools for the first installation or maintenance of a hydraulic brake system.

Universal torque plate

## Torque plate

You can realise the easy mounting of a floating brake assembly (BZT, BZT2) to the landing gear structure with the help of our Universal torque plate.

| P/M | Description | Fixation | Application |
|---|---|---|---|
| **075992** | Universal torque plate | 4 x bore Ø 6.5 mm | BZT, BZT2 |

On request, we can manufacture individual torque plates (5-axis CNC milled) to your specifications. Please request a quotation.

## Fluids

Hydraulic brake systems in aviation are used with two different fluids: Mineral Fluid to Spec Mil-H5606, based on Mineral Fluid, or brake fluid DOT4, based on polyglycol. Both fluids may not be mixed or interchanged, as the seals in the hydraulic system would be affected and destroyed.

Please always refer to the indications in the Maintenance Manual of your aircraft.

| P/N | Description | Packing |
|---|---|---|
| **058221** | Hydraulic oil | 100 mL |
| **059940** | Mineral Fluid | 1 qt/946 mL |
| **059950** | Brake fluid DOT 4 | 0.5 L |
| **059951** | Brake fluid DOT 4 | 1.0 L |

Reservoir HB 7

## Reservoirs

So-called open hydraulic systems – like the majority of hydraulic systems – require a fluid reservoir or slops tank. The trailing hydraulic fluid can be used to compensate for wear on the brake pads.

| P/N | Description | Hydraulic fluid | Volume | Connecting thread |
|---|---|---|---|---|
| **058910** | Reservoir 100 | Mineral Fluid | 60 cm³ | NPT 1/8" |
| **058271** | Fluid reservoir HB 7 | DOT 4 | 30 cm³ | M10x1 |
| **058269** | Fluid reservoir HB 7 | Mineral Fluid | 30 cm³ | M10x1 |
| **058971** | Mounting bracket for reservoir HB 7 | N/A | N/A | N/A |
| **058972** | Holding clamp for reservoir HB 7 | N/A | N/A | N/A |

## Stahlbus bleeder valves

The filling and bleeding of hydraulic brake systems is one typical task in the maintenance field. We recommend the Stahlbus bleeder valve to simplify this task considerably. In every Tost brake assembly the Stahlbus bleeder valve is mounted as a standard, in all other brake assemblies it can be retrofitted easily. One person can perform the filling "from bottom to top" thanks to an integrated non-return valve. When filling the system "from bottom to top", the additional integrated gasket eases the procedure clearly.

| P/N | Description | Connecting thread | Hydraulic fluid | Valve type |
|---|---|---|---|---|
| **059100** | Stahlbus bleeder valve | NPT 1/8" | DOT 4 | screw-in valve |
| **059200** | Stahlbus bleeder valve | NPT 1/8" | Mineral Fluid | screw-in valve |
| **059102** | Stahlbus bleeder valve | M10x1 | DOT 4 | screw-in valve |
| **059202** | Stahlbus bleeder valve | M10x1 | Mineral Fluid | screw-in valve |
| **059125** | Stahlbus bleeder valve flat-seal | M10x1 | DOT 4 | screw-in valve |
| **059225** | Stahlbus bleeder valve flat-seal | M10x1 | Mineral Fluid | screw-in valve |
| **059105** | Stahlbus bleeder valve | M10x1.5 | DOT 4 | screw-in valve |
| **059101** | Stahlbus bleeder valve | M6x1 | DOT 4 | screw-in valve |
| **059201** | Stahlbus bleeder valve | M6x1 | Mineral Fluid | screw-in valve |
| **059221** | Stahlbus bleeder valve | M6x1, shortened | Mineral Fluid | screw-in valve |
| **059231** | Stahlbus bleeder valve | M8x1.25 | DOT 4 | screw-in valve |
| **059205** | Stahlbus bleeder valve | 1/4"-28UNF-16 | Mineral Fluid | screw-in valve |
| **059206** | Stahlbus bleeder valve | 3/8"-24UNF-22 | Mineral Fluid | screw-in valve |
| **059400** | Stahlbus hollow screw | M10x1 | DOT 4 | hollow screw |
| **059199** | Cap for Stahlbus bleeder valve | all | all | |

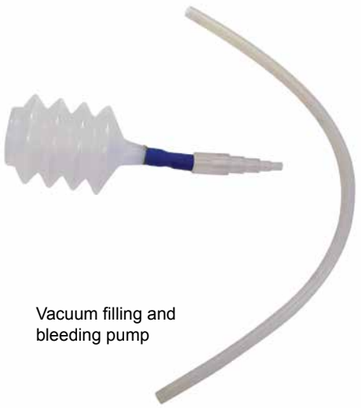
Stahlbus bleeder valve

Stahlbus hollow screw (059400)

## Service kits

We supply service kits for the installation and the filling and bleeding of the small hydraulic systems Max II SB with BZM, 6" UL SBP with BZ-UL, hydraulic actuation of shoe brake wheels. In every service kit, you will find all necessary fittings, filling tools, hydraulic hoses, and Mineral Fluid.

| P/N | Description |
|---|---|
| **058202** | Service kit hydraulic actuation of shoe brake wheels |
| **058209** | Service kit for Max II disk brake wheels Mini and Max II |
| **058211** | Service kit 6" UL SBP with BZ-UL |



Vacuum filling and bleeding pump

## Filling tools

### Vacuum filling and bleeding pump

The vacuum filling and bleeding pumps are helpful tools for fast and easy filling and bleeding. You can use them to evacuate the brake fluid at the brake assembly when filling "from top to bottom". The other option is to absorb brake fluid and to fill it into the system with pressure – when filling from the brake assembly "from bottom to top".

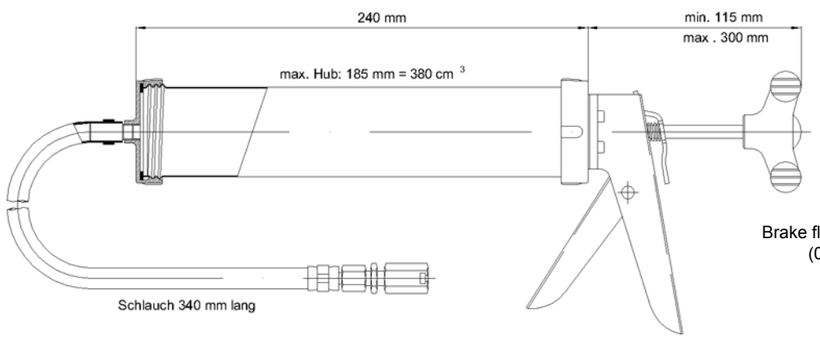
| P/N | Description | Volume mL |
|---|---|---|
| **059300** | Vacuum filling and bleeding pump | 50 |
| **059330** | Vacuum filling and bleeding pump, big | 150 |

### Brake fluid gun

Device for initial charging and bleeding of hydraulic brake systems. Simple handling, high filling pressure and a big filling volume. Supplied with complete operating instructions.

The brake fluid gun is always supplied with lever mechanic, tube and quick-screw-connector (for connection to the bleeder valve).

| P/N | Description | Hydraulic fluid |
|---|---|---|
| **059030** | Brake fluid gun Type H | DOT 4 and Mineral Fluid |




Brake fluid gun (059030)

Quick-screw-connector (075899)

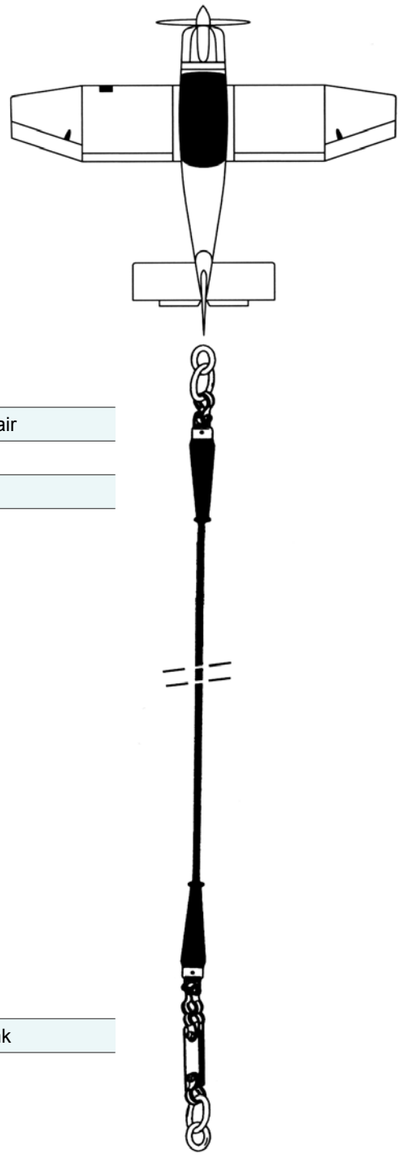
### Quick-screw-connector

Suitable for the brake fluid gun Type H, we supply quick-screw-connectors for a simple, fast and clean connection of the brake fluid gun to the respective bleeder valve.

| P/N | Description | Anschluss |
|---|---|---|
| **075890** | Quick-screw-connector, Standard | to all Cleveland bleeder valves |
| **075899** | Quick-screw-connector, Stahlbus | to all Stahlbus bleeder valves |

# CRG

## SCHEMATICS



**Tow release**
E 85 or E 22

| | |
|---|---|
| **102000** | Connecting ring pair |

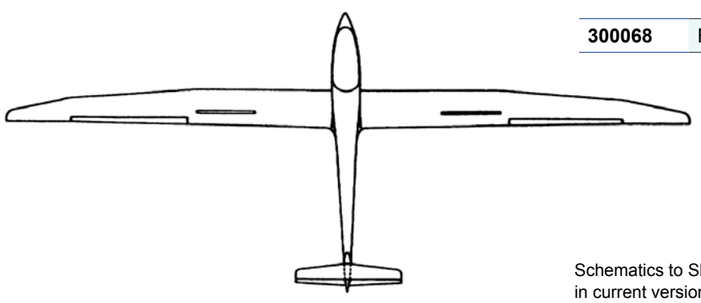
| | |
|---|---|
| **113400** | Shackle |

**Aero Tow Rope**
Length 40–60 m

**Complete weak link**
with connecting ring pair

| | |
|---|---|
| **110010** | Complete weak link |

**Nose release**
E 85 or E 22

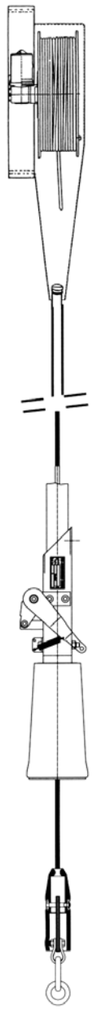


Schematics to SBO
in current version

**CRG**
Design of winch unit, depending on the aircraft type

**CRG cable**
50 or 60 m

**Cable stop plate and guillotine**



**End piece**
with connecting ring pair and weak link

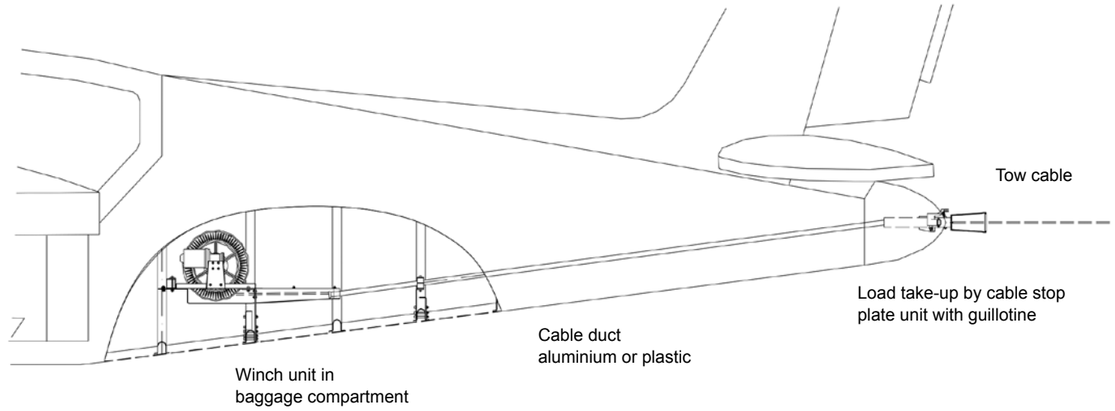
| | |
|---|---|
| **300068** | End piece with wings |



## CRG – TOW CABLE RETRACTOR WINCH WITH GUILLOTINE

The Tow Cable Retractor Winch with guillotine allows the tow cable to be retracted during descent, and, in the event of danger, to be cut. This offers substantial safety and cost advantages compared with conventional aero tow:

- Reduced risk to people and aircraft, as cable dropping is eliminated.
- Significantly reduced noise levels, as the aircraft can land immediately.
- More economical operation through elimination of cable drops and reduced flight time.
- No delays in aircraft starts due to tracing and retrieving tow cables.
- In the event of danger, the tow cable can be cut at any time to sever the link between glider and tug, even under high loads and at large cable angles.




The retractor winch is installed in the fuselage (baggage compartment); the load is taken up by the cable stop plate unit mounted to the tow support in the aircraft tail. Once the glider pilot has released the tow cable, the tug pilot retracts the cable and is ready for the next towing operation.

Since 1981, about 750 of these CRGs (previously known as System Feuerstein) have been successfully deployed world-wide. Refer to the tables for a list of EASA-approved installations.

CRGs are installed as standard by aircraft manufacturers, but retrofitting older aircraft is also possible and is done very often by gliding clubs. We will be pleased to provide you with comprehensive advice.

The requirements of the regional authorities for airfield approvals are increasing. With the installation of a CRG in the towing aircraft those requirements can be fulfilled more easily. Local residents also benefit from reduced emissions.

Winch unit for DR 400 with strong Tendo driving unit

Cable stop plate unit with guillotine with rubber funnel and end piece

# CRG MODULES

## Winch unit

Depending on the model, the retractor winch is mounted either on a base plate or a motor support and installed in the fuselage of the tug either behind the seat or in the baggage compartment. If necessary, the winch unit can be dismantled quickly. The main components are a 12 V (standard) or 24 V (optional) motor with a worm gear, motor bracket, cable drum and cable cover.

The tow cable runs through or under the fuselage, either in an aluminium or in a plastic cable duct, to the cable stop plate unit at the tail.

## Cable stop plate unit with guillotine

For tugs of the type Robin and Morane or for motor gliders or ultralight aircraft the new cable stop plate is bolted to the existing tow support. For tailwheel aircraft, e.g., Piper, Maule, or Husky, the system is supplied with a new tow support on which the cable stop plate with guillotine is mounted.

The guillotine is activated by the existing release cable. The cable is simply transferred to the guillotine lever. An additional tow release can optionally be used, e.g., for banner tows or double tows by transferring the cable from the guillotine back to the tow release.
**Please note:** Only one of the two towing devices may be used at a time.

The cable load is taken up by the stop plate via a sleeve screwed over a knot in the tow cable. The cable load is not taken by the winch unit. The permitted cable load is equivalent to the permitted towing capacity of the tug.

A rubber funnel takes up the conical end-piece after rewinding the tow cable. The fuselage is protected against damage.

## Electric switch unit

The rewinding of the cable is started by means of a toggle switch fitted with a control light. The switch unit (switch, fuse and cable set for standard 12 V on-board voltage) is prewired and assembled on an aluminium plate that can be mounted on the instrument panel in the pilot‘s line of sight.

Once the glider has been released, the electrical switch unit starts the retractor winch. Operation can be checked in the rear-view mirror. The control light in the panel is on during the whole duration of rewinding. After the cable has been fully rewound, an overload switch switches the motor off automatically. If the cable retraction sensor is installed, the motor will be cut off immediately.

## Tow cable

The tow cable, with a diameter of 6.1 mm, has a standard length of 50 m. The cable is terminated by an aluminium end piece, complete with weak link and connecting ring pair. The breaking load of the weak link is according to your requirements. Unless otherwise specified with the order, we supply a standard 500 daN white weak link.

The kit is ready to tow, i.e., you receive all necessary parts for the installation. You can start operation immediately after approval. The aluminium cable duct is not supplied as part of the standard kit due to the high transport costs. On request, we can include this item in the scope of delivery, correctly flared.



# CRG OPTIONAL EQUIPMENT

## Cable retraction sensor with cut off

It is not always possible to monitor the cable retraction in the rear-view mirror.

**The solution:** A proximity switch permits contactless detection of the end piece and a control light indicates that the cable is completely retracted. The drive switches off immediately and cannot be switched on again.
**Benefits:** Increased safety because of monitored cable retraction and a longer motor service life. Easy to upgrade on all systems.
We recommend this option for all original installations. Retrofitting of all units already in operation is also possible.

| P/N | Description |
|---|---|
| **300200** | Cable retraction sensor with cut off |

## Modification to 60 m cable length

For flight students, the use of a 60 m cable is more comfortable. This is why we offer a modification kit for a 60 m cable length for the existing CRGs. Only the cable drum needs to be exchanged. A bigger installation space than for the 50 m cable drum is not required. With a smaller root diameter, the 60 m drum is optimised to match the motor torque.

| P/N | Description |
|---|---|
| **300020** | Cable drum for 60 m cable |
| **300556** | 60 m cable |

Cable drum for 60 m cable

## Powerful Driving Unit PM 42

Higher torque and higher rpm for faster cable retraction, also during fast descents. The increased performance ensures a longer service life, especially under tough long-term operation. Available for 12 V and 24 V.

| P/N | Description |
|---|---|
| **300942** | Driving unit PM 42 12V |

When retrofitting the driving unit PM 42, the fuse and the toggle switch must be exchanged as well.

# CRG FOR AIRCRAFT

Our CRG basically can be installed in every tug which is certified for towing. We are happy to prepare an offer and advise you about the installation and the approval. All units for Class E towing aircraft are equipped with the powerful driving unit PM 42 available in 12 V and 24 V on-board voltage. This driving unit also guarantees the full cable wind-up for fast descents.

Scope of delivery CRG for Husky including cable retraction sensor with automatic cut-off

CRG in PA 25 with parallel use of tow release E 85

## EASA approved installations in aircraft

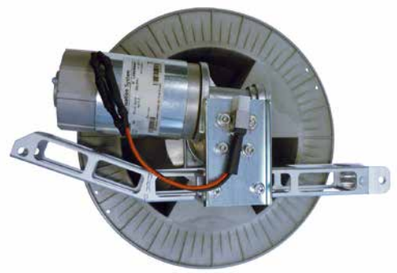
| TCDS | Type |
|---|---|
| **1001** | DR 300/180 R, DR 400/RP, DR 400/180, DR 400/180 R |
| **741** | DR 253, DR 253 B |
| **661** | Job 15-150, Job 15-180/2 |
| **640** | MS 880 B, MS 883, MS 887<br>Ralley 150 ST-D, Ralley 150 T-D,<br>Ralley 180 T-D, Ralley 180 TS, Ralley 150 SVS |
| **657** | MS 892-A 150, MS 893 A, MS 894 A,<br>MS 892E-150, MS 893E, MS 893E-D, MS 894 E, MS 235 E-D |
| **548** | Piper PA 12 |
| **722** | Piper PA 18, PA 19 |
| **525** | Champion Citabria 7GBC, 7GCBC |
| **525a** | Champion Citabria 8GCBC and all types approved for towing |
| **674** | Stinson L 5 |
| **536** | Stinson 108-3 and all types approved for towing |
| **739** | Cessna FR 172 |
| **1088** | Christen A-1 Husky, A-1A, A-1B |
| **669** | Maule M-6-235, M-7-235, MX-7-180, MX-7-235 |
| **1000** | Piper PA 25 |
| **1098** | Zlin Z 143 |



# CRG FOR MOTOR GLIDERS

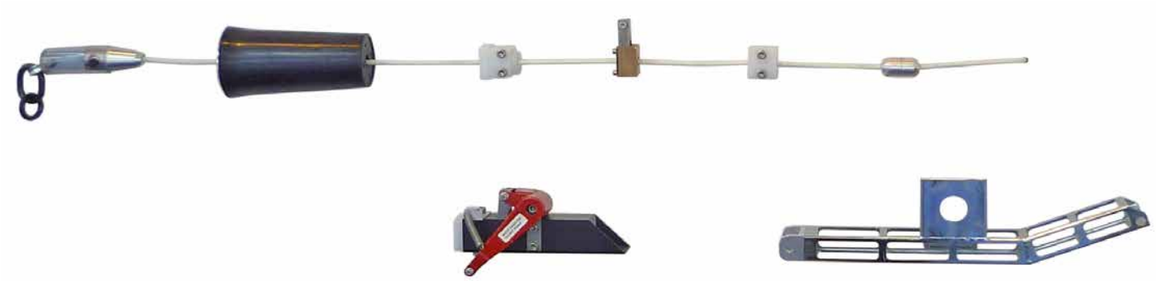
We have modified the CRG according to the certification of motor gliders for aero tow. Winch and tow support are optimised in terms of size and weight.

The CRGs are installed as standard in the following **motor gliders** and are EASA approved. Retrofit is only possible in coordination with the manufacturer.



Winch unit for Scheibe Falke SF 25

| Manufacturer | Type |
|---|---|
| Scheibe Aircraft | SF 25C |
| Diamond Aircraft | Super Dimona HK 36 |



Schematics of the CRG modules

Schematics of the CRG modules

Cable stop plate
with guillotine for UL

Winch unit installed in Dynamic

Cable stop plate unit with guillotine
and rubber funnel in MCR

# CRG FOR ULTRALIGHT

All components of our lightweight version for Ultralight are weight- and volume-optimized. With driving unit PM 41 in 12 V. For installation in the baggage compartment; if required, the winch unit can quickly be disassembled.

**Weight:**
Winch 4.55 kg, stop plate and guillotine 0.96 kg, plus cable (50 m) 1.88 kg
→ **Total weight:** 7.7 kg (including electrical components )

| P/N | Description |
|---|---|
| **309000** | CRG for UL |

Approval through manufacturer of Ultralight, installation as standard in:

| Manufacturer | Type |
|---|---|
| A2 CZ | Ellipse Spirit |
| Aerospool | WT9 Dynamic |
| Aeropro | Eurofox |
| Breezer Aircraft | LSA B400-6 |
| Comco Ikarus | C42 |
| Dyn Aero | MCR 01 / MCR R180 |
| Flight Design | CTLS |
| G1 Aviation | G1 SPYJ |
| Zenair | Zodiak 601/602 |

Please ask for further installation options. We will be happy to offer you a solution.
We are continuously enlarging the range of applications of the CRG in Ultralight.



# CRG SPARE PARTS

Request our SEK spare parts list, which contains all available components.
This page shows only our "bestsellers." All spare parts are available from stock, which is important in AOG situations.
Retrofitting older CRG ("System Feuerstein") models is also possible.

## Rubber funnel

Made from UV-resistant material; the aluminium ring stiffens the rubber funnel and prevents the slipping out of the end piece.

| P/N | Description | Weight g |
|---|---|---|
| **300149** | Rubber funnel | 190 |

Terminator with steel bush

## End piece

Made of aluminium, aerodynamically optimised, slides easily into the funnel.
It features a weak link with a breaking load of 500 daN and a connecting ring pair.
The weak link can be replaced on request.
**NEW** – the end piece with wings: During cable retraction, the end piece is stabilised in the air thanks to the side wings, significantly reducing the risk of contact with the sailplane.

| | | |
|---|---|---|
| **300061** | End piece | 230 |
| **300068** | End piece with wings | 252 |

End piece

End piece with wings

## CRG Cable

The cable is supplied on a cardboard reel; the 250 m length is intended to be cut to length by the user, suitable for frequent tugs such as flying schools.

| | | |
|---|---|---|
| **300550** | CRG cable 50 m on cardboard reel | 1920 |
| **300556** | CRG cable 60 m on cardboard reel | 2250 |
| **300560** | CRG cable 250 m on cardboard reel | 8700 |

## CRG Spare parts – Excerpt

| | | |
|---|---|---|
| **300150** | Terminator with steel bush | 275 |
| **300071** | Mirror, colour white, mounting on left side or right side | 318 |
| **300070** | Mirror, colour black, mounting on left side or right side | 318 |
| **300116** | Drum hub for cable drum | 500 |
| **300057** | Aluminium sleeve, two-part | 30 |
| **A30120** | Cable drum for 50 m cable with attachment | 755 |
| **300031** | Helical drum cover | 382 |
| **300148** | Complete guillotine for CRG, knives from niro steel | 220 |

Please ask for the complete spare parts list.

Mirror black
with ball-and-socket-joint

Cable drum 50 m

# TOW RELEASES

# RELEASES

Since 1952, the Tost company has manufactured releases for gliders. The first product was the manually actuated nose release type "BUG".
1953 followed the first Tost safety release (Universal), which has been installed near the centre-of-gravity. Its automatic release at a defined cable angle made the winch launch safe.

Tost releases are the standard worldwide for safe gliding starts for all types of starts and are being operated "from Australia to Cyprus".
In total, more than 73.000 units have been produced. All are still being serviced, including those units from the very beginning. Most of the releases are still serviceable and will remain in service for further decades.

**History of Tost releases**
During the decades, Tost releases have been developed further and optimised as well. The sequence of the release types is as follows:
**For the nose and tail releases:** BUG - E 72 - E 75 - E 85
**For the centre-of-gravity releases:** UNIVERSAL - KK - G 72 - G 73 - G 88

One important step to high dimensional accuracy and rigidity of the releases was the use of precision casting components: hook, segment, ring automatic, as well as fine cast release housing, as a successor of the welded release housing (up to type E 72 and G 72). When used in vintage gliders, please always check the installation space: narrow release brackets may possibly not allow the installation of the latest release types G 73/G 88 and E 75/E 85, which need a bit more space.

A further milestone was the increase of the cable force from 11.7 kN for the predecessor types to 14.1 kN for the E 85 and G 88 series.
The exchange of the older release types against the recent ones has always been guaranteed through the retention of the outer dimensions and fixation holes of the releases.


Connecting ring pair
according to LN 65091

## Important operating advice to the connecting ring pair

For the safe connection of the tow cable and release, as well as for flawless separation, the correct connecting ring pair is essential.

The type certificate strictly requires that each Tost release may only be operated with a connecting ring pair according to LN 65091 (in its currently valid edition).

### IMPORTANT NOTICE: OVERHAUL OF TOST RELEASES

Releases are certified aviation components. Safety and service life are only ensured by adhering to the prescribed overhaul intervals. After 10,000 actuations (equivalent to 2,000 launches), a major overhaul and inspection by the manufacturer are mandatory.

We recommend a **major overhaul after 4 years**, as environmental factors can cause corrosion and stiffness, potentially leading to operational malfunctions.
The aircraft owner is responsible for monitoring and complying with the maintenance intervals.



# TOST RELEASES FOR WINCH LAUNCHING

## G 88 SERIES

The Europa G 88 safety release is installed at the centre-of-gravity of gliders and motor gliders. The release is approved by the German aviation authority (LBA) under TCDS 60.230/2 to the airworthiness regulations for tow releases: for cable loads up to 14.1 kN, for maximum all-up weight of 900 kg; automatic release at a cable angle of 83°±7°, maximum manual release force is 140 N.

### G 88 with lever

Standard version, with 4-position release lever.

### G 88 without lever

Allows a release lever to be fitted by the aircraft manufacturer.
The release cable can also be attached directly to one of the segment holes..

### G 88/1-83

For limited installation space in some gliders: the segment is shortened by three holes. The segment bolt is extended to allow the attachment of a special release lever on the side of the release body.

| P/N | release | Weight g |
|---|---|---|
| **028000** | G 88 with lever | 720 |
| **028200** | G 88 without lever | 670 |
| **028400** | G 88/1-83, bushing 33x10x2, for lever left hand | 670 |
| **028450** | G 88/1-83, bushing 34.5x8x1, for lever left hand | 670 |
| **028470** | G 88/1-83, bushing 20x9x1.5, for lever left hand | 670 |
| **028500** | G 88/1-83, bushing 34.5x8x1, for lever right hand | 670 |

## S 72, SH 72, PICCOLO RELEASE SERIES

The release types S 72 and SH 72 for light-weight gliders and motor gliders are constructed without movable ring mechanism.
Aircraft-sided cable deflectors are stipulated to ensure release even for extreme lateral cable angles.
Approved by LBA TCDS 60.230/2 for a maximum all-up-weight of 500 kg.

### S 72

Without release lever, for attaching the release cable directly to one of the segment holes.

### SH 72

The segment has been shortened by three holes due to space constraints.
The segment bolt has been extended for an external special release lever.

### Piccolo

Specially designed for winch launching of light gliders of up to 200 kg.
Same design as for the S 72.

| P/N | Release | Weight g |
|---|---|---|
| **022100** | S 72 | 620 |
| **022200** | SH 72 DG, lever left hand | 585 |
| **022210** | SH 72 GL, lever right hand | 585 |
| **022300** | Piccolo | 270 |

G 88 with lever

G 88 without lever

G 88/1-83

SH 72 DG

Piccolo

E 85 with lever

E 85 without lever

E 85/1-79

E 85/1-85

E 85 with special release lever
e.g., for CRG and release support

E 22

## E 85 SERIES

The E 85 tow release is used as a nose release for gliders. As a tail release for tugs, it can be used for aero tow and banner towing. Approved for a maximum cable load of 14.1 kN. The E 85 has no automatic release. The maximum manual release force is 140 N. Approved by the German aviation authority (LBA – Luftfahrt-Bundesamt) under TCDS 60.230/1, and, as conforming to airworthiness regulations for tow releases, it also corresponds to JAR-22 requirements. Suitable for all-up weights up to 900 kg. Approved for all aircraft.

### E 85 with lever
Standard version with 4-position release lever.

### E 85 without lever
Allows a release lever to be fitted by the aircraft manufacturer.
The release cable can also be attached directly to one of the segment holes.

### E 85/1-79
This nose and tail tow release is offered with a shortened segment for mounting in tight installation spaces and has a special angled release lever.

### E 85/1-85
This version is equipped with a standard segment, but features an extended segment bolt for fitting a special release lever on the outside the release body.

### E 85 with special release lever
This version of the E 85 is equipped with the lateral special release lever (300320). It is used for the installation on various release supports, e.g., Piper. Also works as optional equipment parallel to the CRG, e.g., for banner towing.

| P/N | Release | Weight g |
|---|---|---|
| **014000** | E 85 with lever | 560 |
| **014100** | E 85 without lever | 525 |
| **014200** | E 85/1-79 | 535 |
| **014210** | E 85/1-85 | 550 |

## E 22 SERIES

Small, light nose and tail release. Type approval through the LBA as per type certificate 11.402/9NTS for maximum all-up weights of 700 kg. Compared with the E 85, the mounting space is reduced by almost half to 75 x 65 mm, the mass to just 310 g. Installation is compatible with the E 85.

| P/N | Release | Weight g |
|---|---|---|
| **015000** | E 22 | 310 |



## HANG GLIDER RETAINING RELEASE

Retaining unit for hang gliders for start with rubber cable.
Maximum operating load 150 daN.

| P/N | Release | Weight g |
|---|---|---|
| **012000** | Hang glider retaining release | 115 |

Hang glider retaining release

## TOW SUPPORT

For banner towing or aero tow without CRG you need to have a release support at the rear of your aircraft to mount the tow release. We manufacture this release support for various aircraft types, see table.

The Tost E 85 tow release is mounted on this support. This release has airworthiness approval and can be mounted on any aircraft type. The release support has no certification of its own. It is certified as a component of the EASA-certified Tow Cable Retractor Winch.

The scope of delivery of a release support includes a 10 m long Bowden cable for actuation.

| P/N | Aircraft type | Weight g |
|---|---|---|
| **303030** | PA 12/18/19 | 2100 |
| **018525** | PA 25 | 1050 |
| **303030** | Husky A-1, A-1A | 2100 |
| **018540** | Maule with new rudder operating lever | 2400 |
| **018510** | Husky A-1B | 1350 |
| **303035** | Citabria with spring pad 1.75 | 2100 |
| **018620** | Zenair 650 | 1200 |
| **303037** | Zenair CH 640 | 2300 |

Release support PA 12/18/19

Release support PA 25

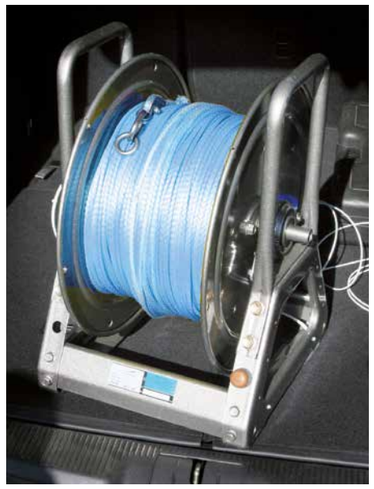
## RETROFIT OF TOST RELEASE

The Aerazur release from a long-defunct manufacturer is not approved for towing outside Germany. Extensive load tests have shown that at loads above 300 daN, the safe operation of this release is no longer guaranteed.
To protect the pilot and the aircraft from this serious safety defect, a Tost E 85 tow release can be mounted **on the KT12 adapter** to replace the Aerazur release.
LBA/EASA-approved for Morane and DR 400.

| P/N | Description | Weight g |
|---|---|---|
| **300182** | KT 12 adapter for Aerazur<br>including lateral special release lever and<br>mounting bolts | 380 |

KT 12 adapter

Vehicle tow device



Device for winding up the cable

## VEHICLE TOW DEVICE

An alternative way of getting up in the air is being used again, known from former times: the vehicle tow. The pilot just needs an airfield and a helper with a car to get up into the air.

The vehicle tow device is fixed to the trailer hitch of the car, the necessary tools are included in the scope of delivery. No modifications to the vehicle are needed. The vehicle tow device is based on a tow release E 85; release is performed by the driver with a Bowden cable.
For the vehicle tow we recommend the synthetic winch cable Dynalaunch which we can supply in every length. On one side, a Jumbo thimble can be spliced into the cable. We can also supply the complete cable assembly according to the German SBO (Gliding regulation).

We offer as additional "helper" a device for winding up the cable which is stored in the trunk of your car. This device helps to wind up the cable which is laying on the airfield after the tow. It is powered by the 12-V on-board electricity of the car.

Beside the development of the equipment described above, we also have achieved a broad knowledge in the field of vehicle tow. You can contact us with your questions regarding the legal situation or the qualification of the pilot.

| P/N | Description | Weight g |
|---|---|---|
| **011520** | Vehicle tow device<br>E 85 with brackets, Bowden cable, release unit and tooling | 3700 |
| **200700** | Device for winding up the cable | |



## OVERHAUL OF TOST RELEASES

- Releases are certified aviation components and can only be serviced by TOST as an EASA-approved maintenance organisation in Munich, using the approved maintenance documentation.
- During the overhaul, the spring (a life-limiting component) is replaced. The release has a maximum service life of 2,000 launches or 10,000 actuations (release TBO).
- All components are inspected and replaced if needed, especially hook connecting to ring pair and glider.
- Release angle and manual force are checked and adjusted.
- After the overhaul, the release is returned to you with an EASA Form 1.
- Overhaul duration: 2 to 4 weeks.

Send your releases to:
TOST GmbH
"Overhaul"
Thalkirchner Str. 62
D-80337 München

Please provide us with:
- Your name, email, phone number
- Billing and shipping address
- Release type and serial number
- Position of the lever
- Aircraft type

Please remove all attachments, such as special levers, guide plates, etc., from the release before sending it in, as these cause additional work and costs.

## EXCHANGE RELEASE

**Here's how it works:**

**1 ORDER AN EXCHANGE RELEASE**
via e-mail: info@tost.de (or use our order form: www.tost.de / order / order form)

**2 RECEIVE THE EXCHANGE RELEASE**

**3 INSTALL THE EXCHANGE RELEASE**

**4 SHIP THE REMOVED RELEASE TO:**
TOST GmbH
"EXCHANGE RELEASE"
Thalkirchner Str. 62
D-80337 München

**5 OVERHAUL**
of the returned release, invoiced upon completion

**The exchange release principle is a special service we offer our customers:** Exchange releases are used, fully overhauled units which we supply with an EASA FORM 1. If a release needs to be overhauled during the flying season but time is short, using an exchange release can save valuable time.

# TOWING/LAUNCHING EQUIPMENT

# TOST WEAK LINKS

Tost weak links in their optimized format combine the following improvements:
- Longer service life
- Correct marking with load group and manufacturer's name
- Made of high-quality certified aircraft steel
- Clear distinction from inferior copies
- Manufacturing tolerance only 5% (10 % are demanded in the requirements)

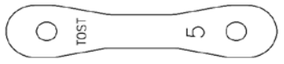
Like our type-approved products, our weak links are also manufactured according to EASA approved production methods. Each batch is tested on computerized test equipment and the results are documented. This guarantees consistent high quality and traceability.

**Important Notes:**
- Weak links protect your aircraft against overloading
- Use only the weak link stipulated in your aircraft TCDS or aircraft manual
- Checking the cable preamble is mandatory according to SBO (German Gliding Operation Regulations); this includes the inspection of weak links
- Replace the weak link immediately in the case of a visible damage
- We recommend that the weak link inserts are replaced after 200 starts.
- Always use the protective steel sleeve
- Use only the correct shackles: they prevent the weak link and the steel sleeve from twisting, leading to an undefined increase of the breaking load
- Never use two equal inserts, eg, both with round holes, in a reserve system, since this would double the breaking load

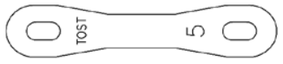
*An insert replaced in time is always more cost-effective and safer than an aborted launch!*

**Warning:**
Using combinations of weak link inserts from different manufacturers can double the breaking load because of the elongation of inferior inserts!

## Tost weak links: examples

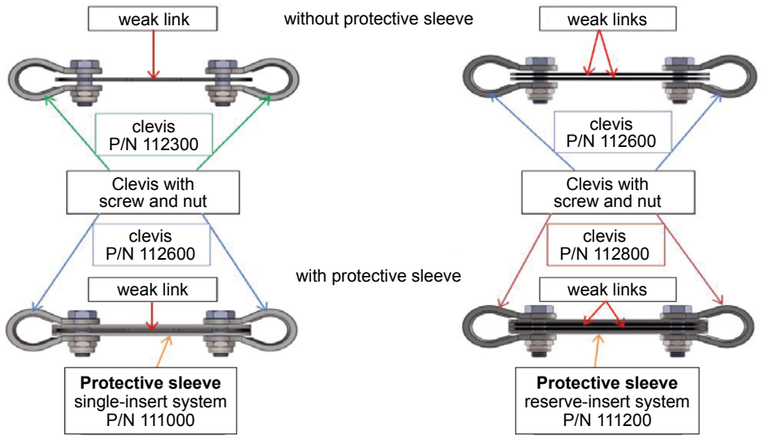



Weak link insert – round hole for
**Single-insert system**




Weak link insert – round hole for
**Reserve-insert system**

**Tost weak links example**





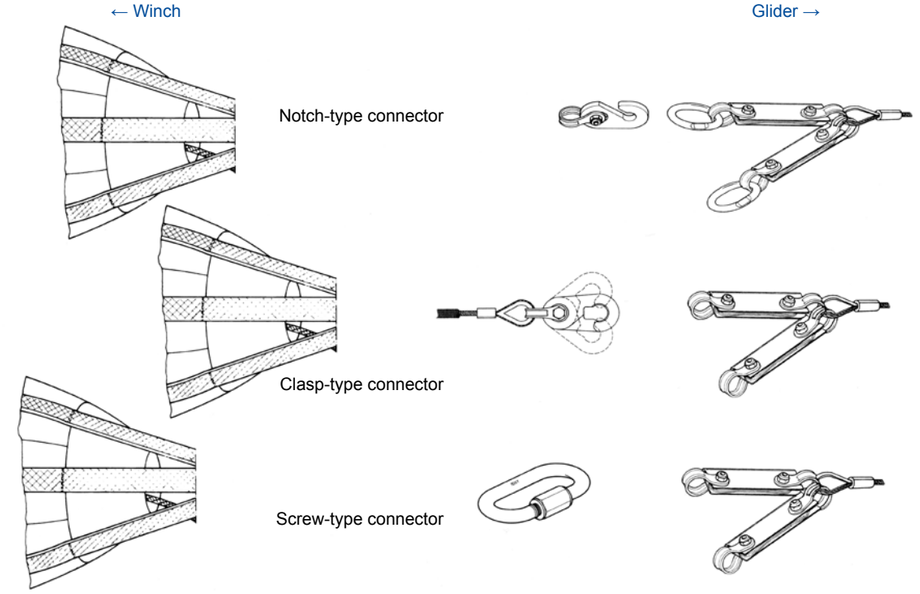

## Load table
## Winch launch and aero tow

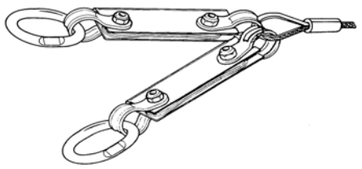
| Insert No. | Colour | Breaking load daN | Single insert round hole P/N | Reserve insert oval hole P/N |
|---|---|---|---|---|
| 1 | black | 1000±100 | **110101** | **110121** |
| 2 | brown | 850±85 | **110102** | **110122** |
| 3 | red | 750±75 | **110103** | **110123** |
| 4 | blue | 600±60 | **110104** | **110124** |
| 5 | white | 500±50 | **110105** | **110125** |
| 6 | yellow | 400±40 | **110106** | **110126** |
| 7 | green | 300±30 | **110107** | **110127** |

## Load table
## Kites, hang gliders, ultralights

| Insert No. | Colour | Breaking load daN | Single insert round hole P/N | Reserve insert oval hole P/N |
|---|---|---|---|---|
| 8 | mauve | 200±20 | **110108** | **110128** |
| 9 | grey | 150±15 | **110109** | **110129** |
| 14 | turquoise | 120±12 | **110114** | **110134** |
| 11 | orange | 80±10 | **110111** | **110131** |

## Tow cable and fan assembly





Tost weak link shackles

## Weak link shackles

Tost weak link shackles, made from stainless steel, with high-strength bolt (length of shaft matched to the open width) and self-locking nut.

| P/N | Open width mm | Bolt | Application |
|---|---|---|---|
| **112300** | 3 | M6 x 15 | Single system without protective sleeve |
| **112600** | 6 | M6 x 20 | Single system with protective sleeve<br>or<br>Reserve system without protective sleeve |
| **112800** | 8 | M6 x 23 | Reserve system with protective sleeve |

## Protective sleeves

Protective sleeves protect the weak link from deformation, premature wear and tear and uncontrolled changes in the breaking load.
Tost protective sleeves are manufactured from stainless steel. They have inspection holes on both sides to check for the correct weak link insert and its condition.

| P/N | Application |
|---|---|
| **111000** | Single-insert weak link (1 weak link) |
| **111200** | Reserve-insert weak link (2 weak links) |


Connecting ring pair
to LN 65091

## Connecting ring pair

Connecting ring pairs are essential for the safe connection between the tow cable and the tow release, as well as for reliable separation.

The Type Certificate mandates that each TOST release may only be operated with a connecting ring pair in accordance with LN 65091 (as amended).
Connecting ring pairs manufactured in accordance with this aerospace standard must be permanently marked with the standard designation and the manufacturer's identification.

**Welded rings are categorically prohibited!**
Their use voids the warranty of our releases. Welded rings can damage the releases. Moreover, undersized or deformed rings may cause the ring pair to jam the release and inhibit correct operation under load, a potential danger for the pilot.

Connecting ring pairs must be visually inspected and measured at regular intervals. Ring pairs that deviate from the standard dimensions must be replaced.
Please contact us for the permissible measurements.

| | |
|---|---|
| **102000** | Connecting ring pair to LN 65091 |



# CONNECTORS, QUICK-RELEASE LINKS

The German SBO regulation stipulates that when operating a double-drum winch, the leeward winch cable must be used first and the parachute of the other cable must be disconnected.
For this purpose, we offer quick-disconnect points for simple and fast connections, e.g., for predetermined breaking points in fan circuits and rope parachutes.

## Quick-release links

We offer practical solutions for all connections in the cable pre-tensioning system that need to be easily disconnectable – e.g., fan assemblies, weak links, or cable parachutes.

## Tost notch-type connector

This combined connector consists of a drop-forged hook and an oval ring with a flat section, which is inserted into the notch of the hook. Low weight, no sharp edges, no deformation even under heavy cable loads, and a very long service life.

| P/N | Description | Load kN | Weight g | Connection with shackle | Eyelet mm |
|---|---|---|---|---|---|
| **096000** | Tost notch-type connector, two-part | 15 | 116 | 112800 | 8 |

Tost notch-type connector

## Tost clasp-type connector

One-piece, exceptionally lightweight connector link.
Simply clip it onto the connecting shackle.

| P/N | Description | Load kN | Weight g | Connection with shackle | Eyelet mm |
|---|---|---|---|---|---|
| **097000** | Tost clasp-type connector, one-part | 15 (when closed) | 98 | 112312 | 12 |

Tost clasp-type connector

## Screw-type connector

The connection is screwed and universally suitable for winch launches and aero tows.

| P/N | Description | Load kN | Weight g | Eyelet mm |
|---|---|---|---|---|
| **095000** | Screw-type connector | 55 | 135 | 12 |

Screw-type connector

## Delta screw-type connector

Universal connector with screw plug, especially suited for belts, e.g., shroud line belts of BT parachute.

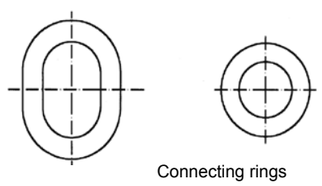
| P/N | Description | Load kN | Weight g | Eyelet mm |
|---|---|---|---|---|
| **095010** | Delta screw-type connector | 45 | 152 | 12 |

Delta screw-type connector

## Connecting rings

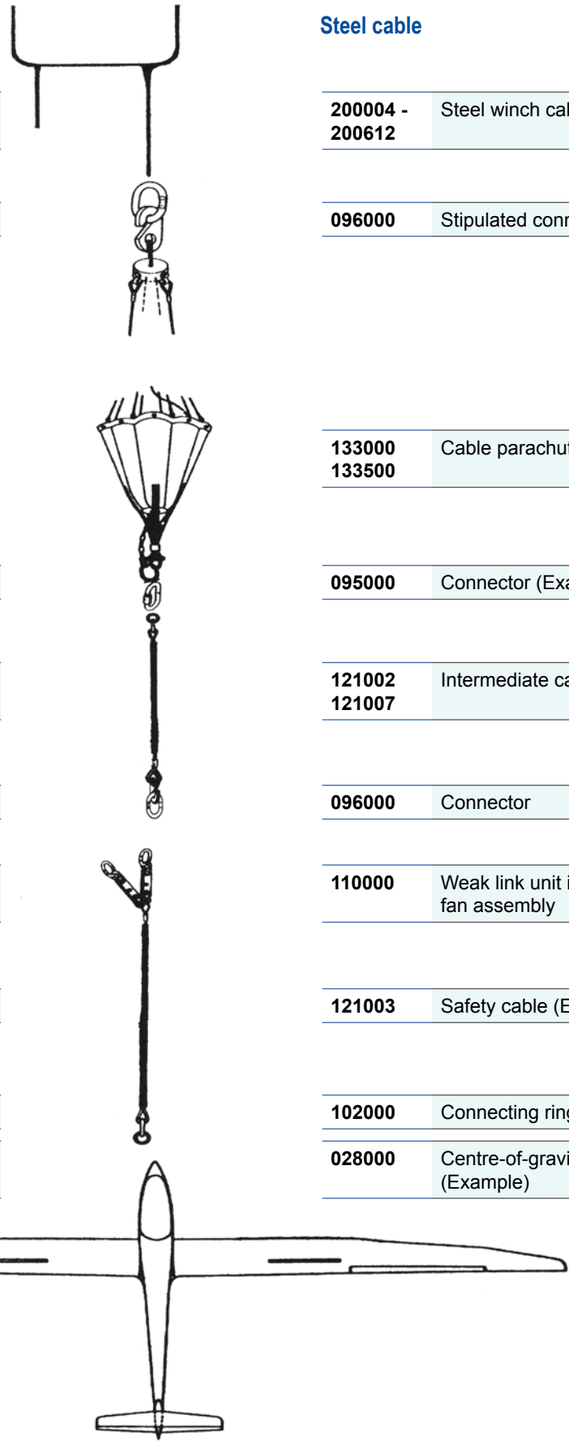
Connection with shackle 8 mm. Do not use with TOST releases!

| P/N | Form | Dimensions mm | Weight g |
|---|---|---|---|
| **096010** | large, oval | 50 x 41 x Ø 8 | 48 |
| **101100** | small, round | Ø 35 x Ø 7 | 27 |



Connecting rings

# SCHEMATIC ILLUSTRATION OF A WINCH LAUNCH



## Synthetic cable

| | |
|---|---|
| **205050** | Dynalauch<br>synthetic winch cable |
| **096000** | Stipulated connector |
| **133600**<br>**133100** | Cable parachute Kuwi<br>Cable parachute Dyni |
| **095000** | Connector (Example) |
| **121012**<br>**121017** | Intermediate rope |
| **096000** | Connector |
| **110000** | Weak link unit in<br>fan assembly |
| **121006** | Safety rope |
| **102000** | Connecting ring pair |
| **028000** | Centre-of-gravity release<br>(Example) |

## Steel cable

| | |
|---|---|
| **200004 -**<br>**200612** | Steel winch cable |
| **096000** | Stipulated connector |
| **133000**<br>**133500** | Cable parachute |
| **095000** | Connector (Example) |
| **121002**<br>**121007** | Intermediate cable |
| **096000** | Connector |
| **110000** | Weak link unit in<br>fan assembly |
| **121003** | Safety cable (Example) |
| **102000** | Connecting ring pair |
| **028000** | Centre-of-gravity release<br>(Example) |



# STEEL WINCH CABLES

## Winch cable Ø 4.2 mm

6 x 7 x 0.45 mm construction with a 7 x 0.50 mm steel core, right-hand cross-lay, un-galvanised, non-rotating, stress-free; breaking load 14.8 kN, mass 7 kg per 100 m.
Standard length 1200 m ex stock; other lengths available at short notice.

| P/N | Description |
|---|---|
| **200012** | Winch launching cable 4.2 mm on disposable wooden reel |

## Winch cable Ø 4.6 mm

6 x 7 x 0.52 mm construction with one 7 x 0.60 steel core, rest see above.
Breaking load 17.7 kN, mass 8 kg per 100 m.
Standard length 1200 m ex stock, other lengths available on short notice.

| P/N | Description |
|---|---|
| **200612** | Winch launching cable 4.6 mm on disposable wooden reel |

Steel winch launching cable

**Operating instructions**
To improve the life time of your winch launching cable, you should observe the following hints (excerpt from the operating instruction):

- Wind on the cable with lowest drum torque.
- Use swivel only if necessary. Never use the swivel during the launch, only during pulling out the cable.
- Only experienced winch drivers should perform launches with a new cable.
- Increase the load gradually up to the maximum load capacity of the cable.
- Always retrieve the cable at a constant, moderate speed!

We deliver our winch cables with a detailed operating instruction for the correct "Cable treatment".

## Swivel

Maintenance-free, rugged, with high-grade ball bearings.
Connect with 14 mm shackle. Operating instruction is included.

**Caution:** Use only when pulling out the cable – never during launch!

| P/N | Description | Length mm | Weight g |
|---|---|---|---|
| **215000** | Swivel | 85 | 175 |

Swivel

# CABLE PREAMBLE WINCH LAUNCH

The German Gliding Operation Order (SBO), latest edition, also newly regulates the winch cable equipment, however considering the Air Technical Note LTA 73-16:

### Connecting sequence

- 3 m safety cable with connecting ring pair
- Weak link
- Intermediate Cable: Length 2 m or 10 m

Please see picture of the connecting sequence on page 102:
"Schematic drawing of a winch launch".

### Safety Cable

To reduce the risk of loops and tangled cables at the glider, a "stiffened" safety cable 3 m long is required at the beginning of the launch.

### Weak link

Select the correct breaking load according to the manual or TCDS of the towed glider. The weak link position can now also be between the connecting ring pair and the safety cable.

### Quick release link

When using a double-drum winch the leeward winch cable has to be used first. The parachute of the other cable must be disconnected.
Please look for suitable parts on page "Connectors, Quick Release Links".

### Intermediate cable

For a parachute canopy diameter of 1.5 to 2.0 m, LTA 73-16 stipulates a minimum distance of 13 m between the glider's release and the and the apex of the canopy. In addition to the 3 m safety cable, an intermediate cable of 10 m in length must be used.
If the canopy diameter is less than 1.5 m, the distance between the tow release and the apex of the canopy may be shorter; however, the minimum distance is 5 m. In this case, an intermediate rope 2 m long must be used.

### Cable parachute

The maximum permissible canopy diameter of the cable parachute is 2.0 m.



# CABLE PREAMBLE – EQUIPMENT FOR STEEL WINCH CABLES

## Safety cables 3 m

Manufactured from steel cable encased in rubber tubing.
We use red tubing for better visibility of the safety cable in the field.
Both ends are fitted with Tost aluminium solid thimbles for optimal durability.
At the glider side, the connecting ring pair is fitted with an 8 mm shackle.
Connect the appropriate weak link to the winch cable side;
an 8 mm shackle is pre-assembled.

Safety cable from steel

| P/N | Description | Colour | Length m |
|---|---|---|---|
| **121003** | Safety cable from steel incl. connecting ring pair and oval ring | red | 3 |

Our safety rope for synthetic winch cables is also well suited for use with steel cables (weight saving).

| P/N | Description | Colour | Length m |
|---|---|---|---|
| **121006** | Safety rope incl. connecting ring pair and oval ring | white | 3 |

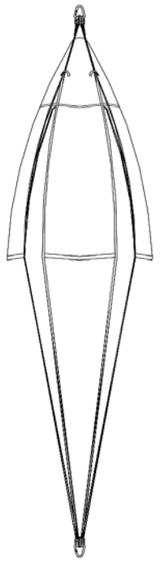
## Intermediate cables

The length depends on the canopy diameter of the cable parachute.
Manufactured from steel cable encased in rubber tubing.
We use red tubing for better visibility of the cable in the field.
The stiffened rubber tubing is not stipulated for the intermediate cable, but it is recommended.
Both ends are fitted with Tost aluminium solid thimbles for optimal durability and with 8 mm shackles.

Intermediate cable from steel

| P/N | Description | Colour | Canopy Ø m | Length m |
|---|---|---|---|---|
| **121002** | Intermediate cable from steel | red | up to 1.5 | 2 |
| **121007** | Intermediate cable from steel | red | more than 1.5 | 10 |

# CABLE PARACHUTES FOR STEEL WINCH CABLES



BT cable parachute

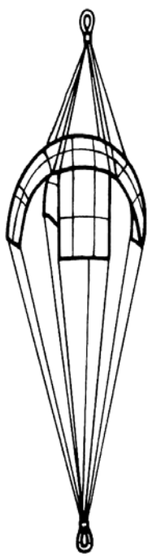
## BT Cable parachute

The durable parachute with high life expectancy. The large canopy enables pulling in of the winch cable at a low engine torque. The second generation of this cable parachute is smaller, is dropping faster and thus less affected from sidewinds.
Available in colour red.

**Description**
Four-segment canopy, now made of even stronger and more abrasion-resistant nylon. With 8 black end-to-end shroud streps, reinforced parachute edges. The long shroud streps are replaceable; if damaged, replacement straps can be ordered and installed by the user.
The shroud lines are held together by a delta screw-type connector.

| P/N | Description | Colour | Canopy base Ø (in flight) | Length parachute mm | Canopy surface |
|---|---|---|---|---|---|
| **133000** | BT Cable parachute | red | 1000 mm | 2750 | 1.7 qm |

**Important notes on the use of the BT cable parachute:**
The BT cable parachute is now smaller, so a 10 m intermediate cable must no longer be used (according to SBO/LTA 73-16, this is mandatory only for a canopy diameter larger than 1500 mm). The 2 m intermediate cable (together with the 3 m safety cable) is now sufficient. If the 10 m intermediate cable has proven reliable in operation, you may of course continue to use it.



Cross-panel cable parachute

## Cross-panel cable parachute

This lightweight parachute combines high strength with a large canopy surface. Its special construction allows for the parachute to descend very slowly and with minimal rotation

**Description**
Canopy made of two polyamide panels, stitched together in a cross pattern. The canopy edges are reinforced with straps. Parachute colour: white. Eight shroud lines are held together at both the top and bottom with large leather thimbles. The shroud straps are tied to loops at the canopy base.

**Connecting sequence according to SBO:**
For canopy diameters smaller than 1.5 m:
3 m safety cable – weak link unit (may also be positioned between the connecting ring pair and the safety cable) – 2 m intermediate cable.

| P/N | Description | Colour | Canopy base Ø (in flight) | Length parachute mm | Canopy surface |
|---|---|---|---|---|---|
| **133500** | Cross-panel cable parachute | white | 1450 mm | 3600 | 3.2 qm |

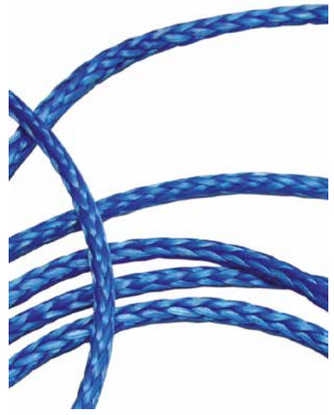


# SYNTHETIC WINCH ROPE DYNALAUNCH

The synthetic winch rope DYNALAUNCH has been specially designed for winch launching. It stands out due to its improved protection against abrasive wear thanks to a special impregnation.

**Advantages of DYNALAUNCH as compared to steel cable**
- More launching heigth
- Minor weight – only 15% of a steel cable
- Easy handling
- Simple to splice
- Long service life

**Technical data**
- Material 100 % Dyneema
- 12-fold plaited
- Special impregnation
- High UV-resistance
- Water and dirt repellent



Synthetic winch rope
DYNALAUNCH

**Special offer from Tost company only:**
On your first order of at least 1.000 m of rope, we will provide you with a free splicing kit:

- A premium splicing needle
- A detailed, illustrated splicing instructions
- Important hints on how to adapt your winch
- 2 jumbo solid thimbles made of aluminium

We can supply any rope length according to the customer's wishes, ex stock!
Due to its minimal weight, the rope can be shipped as a standard post parcel.

| P/N | Description | Colour | Ø mm | Breaking load kN | Weight g/100 m |
|---|---|---|---|---|---|
| **205050** | Dynalaunch | blue | 5 | 25 | 1240 |

## Splicing needle for synthetic winch rope

A well-designed tool made from aluminium, designed for splicing synthetic winch ropes. The wire basket can be opened to catch the synthetic rope. The wire loops spread out and grip the rope strands. Then the wire basket is closed and holds the synthetic winch rope in place. You can now start splicing.
A detailed instruction manual is included.

| P/N | Description | Length mm | Weight g |
|---|---|---|---|
| **213000** | Splicing needle | 300 | 35 |

Splicing needle
for synthetic winch rope

Safety rope for synthetic cables, 3 m length

Reinforced safety rope for synthetic ropes, 3 m length

# ROPE PREAMBLE – EQUIPMENT FOR SYNTHETIC ROPE

## Safety rope 3 m

Manufactured from stiff synthetic rope, accessory parts sewed in directly into the rope ends: at the glider side the connecting ring pair, at the winch cable side a large oval ring, for fitting the appropriate weak link.

The special construction of the synthetic rope – a multi-layer design with a tightly braided cover – results in a very smooth surface and high stiffness, meeting the requirements of the SBO. An additional stiffening cover is no longer required. Stitching and junctions at the rope ends are protected with a heat-shrink sleeve.
No sharp edges can damage the glider. This safety rope can also be used with steel winch cables.

| P/N | Description |
|---|---|
| **121006** | Safety rope, colour white, length 3 m<br>with oval ring and connecting ring pair |
| **121016** | Safety rope, as above, but with special reinforced area<br>for use in double seaters with nose wheel and for vehicle tow |

## Intermediate ropes

Length depends on the diameter of the cable parachute.
Manufactured from Dyneema rope with high load capability. At both ends our solid aluminium thimbles "Jumbo" are spliced in. The splices are double protected trough a shrinkable tubing and a synthetic cover.
The screw type connector can be fitted directly into the bore of our "Jumbo" thimbles.

Intermediate rope for synthetic cable, 10 m length

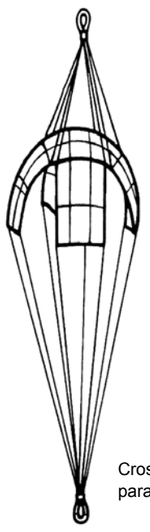
| P/N | Description | Colour | Canopy Ø m | Length m |
|---|---|---|---|---|
| **121012** | Intermediate rope<br>from Dyneema | blue | up to 1.5 | 2 |
| **121017** | Intermediate rope<br>from Dyneema | blau | over 1.5 | 10 |

# CABLE PARACHUTES FOR SYNTHETIC WINCH CABLES

## Cross-panel cable parachute Kuwi

This lightweight parachute combines high strength with a large canopy surface. Its special construction allows the parachute to descend very slowly and with minimal rotation. This smaller canopy is specially designed for use with synthetic winch launching cables.

**Description:**
Canopy made of two polyamide panels, stitched together in a cross pattern. The canopy edges are reinforced with straps. Parachute colour: white. Eight shroud lines are held together at both the top and bottom with large leather thimbles. The shroud straps are tied to loops at the canopy base.



Cross-panel cable parachute Kuwi

| P/N | Description | Canopy basis Ø (open during flight) | Length parach. mm | Canopy surface |
|---|---|---|---|---|
| **133600** | Cross-panel cable<br>parachute Kuwi | 1200 mm | 3400 | 1.8 qm |



# CABLE PARACHUTE FOR SYNTHETIC ROPE

## Cable parachute Dyni

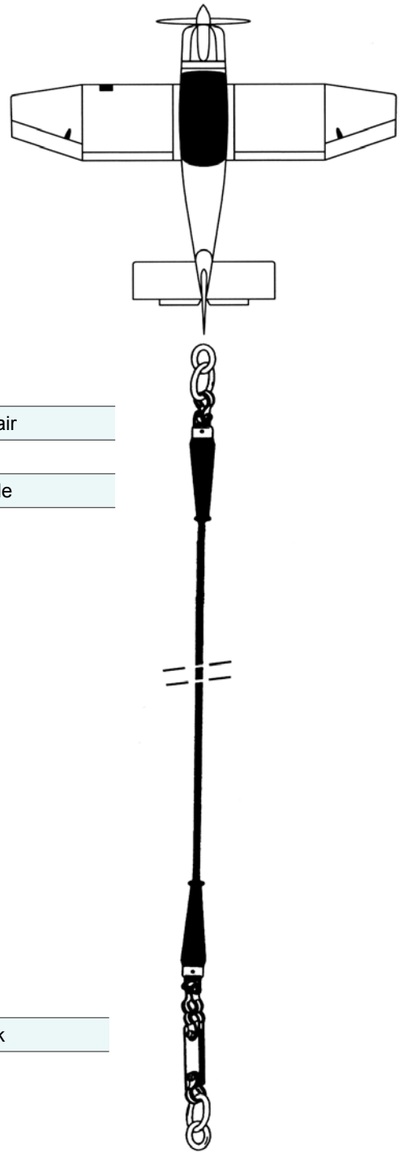
A durable cable parachute with a long service life.
BT parachute reduced in size, especially designed for use with synthetic winch launch cables.

**Description:**
Four-segement canopy made of UV-resistant nylon. Eight one-piece black suspension straps with high tensile strength are sewn on; reinforced parachute edges. The long shroud streps are replaceable; if damaged, replacement straps can be ordered and installed by the user.
The shroud lines are held together by a delta screw-type connector.

| P/N | Description | Canopy base Ø (open during flight) | Length parach. mm | Canopy surface |
|---|---|---|---|---|
| **133100** | Cable parachute Dyni | 1000 mm | 2150 | 0.75 qm |

**Important notes on the use of the parachute according to SBO regulations:**
The canopy diameter is less than 1.5 m.
The connecting sequence is therefore as follows: 3 m safety cable with weak link unit (which can also be positioned between the connecting ring pair and the safety cable) – 2 m intermediate cable.

# SCHEMATIC ILLUSTRATION AERO TOW



**Tow release**
E 85 or E 22

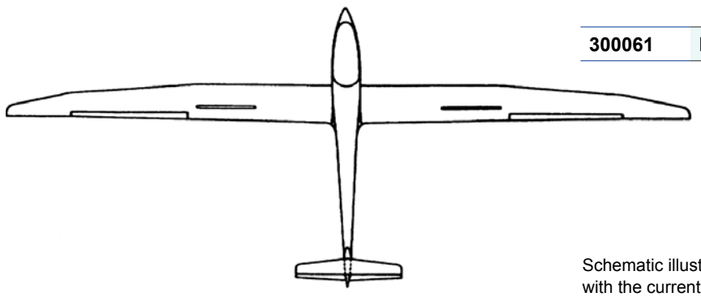
| | |
|---|---|
| **102000** | Connecting ring pair |
| **113400** | Connecting shackle |

**Aero tow ropes**
Length 40–60 m

**Complete weak link**
with connecting ring pair

| | |
|---|---|
| **110010** | Complete weak link |

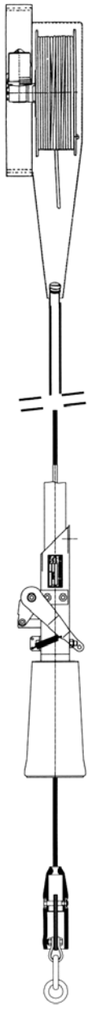
**Nose release**
E 85 or E 22



**CRG**
Form of winch unit depending on aircraft type

**CRG cable**
50 or 60 m

**Cable stop plate with guillotine**



**End piece**
with connecting ring pair and weak link

| | |
|---|---|
| **300061** | End piece |

Schematic illustraion in accordance with the current edition of the SBO



# AERO TOW ROPES

For aircraft tow ropes, a distinction is made between the special cable for the Tow Cable Retractor Winch (CRG), ropes for aircraft towing, and ropes for banner towing.

## Cable for CRG

Synthetic cable with multi-layer construction and a smooth surface for knot-free retraction.
The cable is delivered on a cardboard reel, ready for direct winding onto the cable drum in the aircraft's fuselage.

| P/N | Description | Length m | Minimum breaking load daN | Colour | Ø mm | Weight g |
|---|---|---|---|---|---|---|
| **300550** | Cable for CRG, standard length | 50 | 1160 | white | 6.1 | 1920 |
| **300556** | Cable for CRG | 60 | 1160 | white | 6.1 | 2250 |
| **300560** | Cable for CRG, cut to length | 250 | 1160 | white | 6.1 | 8700 |

Cable for CRG

## Aero tow ropes RED STAR, EXKLUSIV, ELASTIK

All aero tow ropes from Tost are delivered completely fitted "ready to tow":

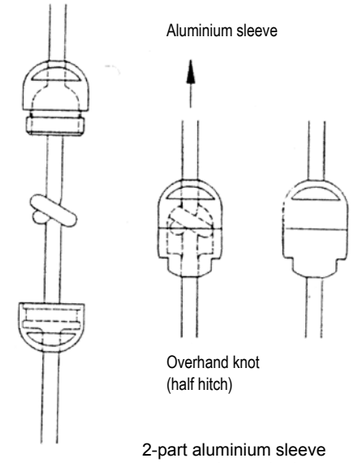
- At the tug side equipped with connecting ring pair to LN 65091
- At the glider side equipped with complete weak link unit in reserve system, including protective sleeve and connecting ring pair

As standard, the white weak link No. 5 with a breaking load of 500 daN is fitted. Please specify on your order if a different breaking load is required. In this case, the requested weak link will be fitted ex works.

**Excerpt from the SBO**
Regarding aero tow ropes please refer to section 2.2 for single tow and 2.3 for double tow.

The following rope lengths are stipulated:
Single tow, 40–60 m length
Double tow short rope, 30–40 m length
Lee-position long rope, 50–60 m must be released first

The difference between the short and the long rope has to be at least 20 m.




2-part aluminium sleeve screwed over the knot in the cable

Aero tow rope RED STAR

## Aero tow rope RED STAR

The all-rounder of aero tow ropes, offering an excellent price/performance ratio:

- Step-index fibres from polyester, 32-fold casing
- Code colour: red
- Rope diameter: 9 mm
- Minimum breaking load: 11 kN
- Approx. 10 % elongation at 10 kN, linear increase
- Spliced-in rope eyes on both ends, with directly fitted connecting parts,
  - one end with connecting ring pair to LN 65091,
  - other end with large oval ring
- On glider side, equipped with complete weak link unit in reserve system, with protection sleeve and connecting ring pair to LN 65091

**Advantages**

- High grade and long lasting rope thanks to step-in fibre construction
- Easy to find on the airfield due to its red colour
- Connecting parts are directly spliced in
- Rope ends protected with scoring coating
- There are no sharp edges that could damage the aircraft fuselage, metal parts are kept to a minimum.

| P/N | Description | Length m | Minimum breaking load daN | Colour | Ø mm | Weight g |
|---|---|---|---|---|---|---|
| **185400** | Rope RED STAR | 40 | 1100 | red | 8 | 2550 |
| **185500** | Rope RED STAR | 50 | 1100 | red | 8 | 3110 |
| **185600** | Rope RED STAR | 60 | 1100 | rot | 8 | 3690 |

## Banner tow rope

- Step-index fibres from polyester
- Code colour: red
- Spliced-in rope eyes on both ends
- Equipped and ready:
  - one end with oval ring for connecting the banner
  - other end with complete weak link unit in reserve system, with connecting ring pair to LN 65091

**Please specify the required breaking load of the Tost weak link when placing your order.**

| P/N | Description | Length m | Minimum breaking load daN | Colour | Ø mm | Weight g |
|---|---|---|---|---|---|---|
| **185900** | Banner tow rope | 25 | 1100 | rot | 8 | 1720 |



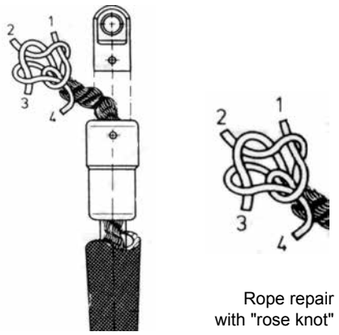
## Aero tow rope EXKLUSIV

The high-grade, durable rope for heavy-duty operational demands.
Material: PES, cable-laid, UV-resistant
Its high load capacity and rugged construction make it suitable for a wide range of applications, ensuring a long service life.

Aluminium end pieces are fitted with knots at both ends of the rope. For additional protection, sturdy rubber sheaths are applied.
In case of wear and tear or damage at the rope ends, a simple do-it-yourself repair is possible: just retie the knots, as shown in the picture (the knot is called a "rose knot").

Aero tow rope EXKLUSIV

| P/N | Description | Length m | Minimum breaking load daN | Colour | Ø mm | Weight g |
|---|---|---|---|---|---|---|
| **181400** | Rope EXKLUSIV | 40 | 1000 | white | 10 | 3700 |
| **181500** | Rope EXKLUSIV | 50 | 1000 | white | 10 | 4400 |
| **181600** | Rope EXKLUSIV | 60 | 1000 | white | 10 | 5200 |




Rope repair with "rose knot"

## Aero tow rope ELASTIK

The lightest and most comfortable aircraft tow rope

Material crimpe crepe white, hawser-laid

The stretching of more than 30% under normal load results in a particularly elastic tow, without dangerous recoil.

The ELASTIK rope is ecommended especially for motor glider and ultralight tows. With this elastic rope, a smooth tow can be achieved even with less powerful tugs. To save weight, we manufacture the ELASTIK rope without aluminium end pieces or rubber sheaths. The connecting parts are spliced directly into the rope ends.

Aero tow rope ELASTIK

| P/N | Description | Length m | Minimum breaking load daN | Colour | Ø mm | Weight g |
|---|---|---|---|---|---|---|
| **183300** | Rope ELASTIK | 40 | 870 | weiß | 10 | 1500 |
| **183400** | Rope ELASTIK | 50 | 870 | weiß | 10 | 1900 |
| **183500** | Rope ELASTIK | 60 | 870 | weiß | 10 | 2100 |

The declaration of rope length is in stretched condition and under normal load.

# TOOLS AND ACCESSORIES

# NICOPRESS SLEEVES AND TOOLS

for Nicopress sleeves made from copper

**Operating notes (excerpt):**
- Grease crimping gauge before each crimping
- Follow correct sequence for partial crimping
- Never re-crimp a sleeve at the same spot

**Detailed operating instructions supplied with the tool.**

Nicopress sleeve
from copper

## Allocation Nicopress sleeve to cable and tool

| P/N Sleeve | Cable Ø mm | Crimping gauge | P/N Tool |
|---|---|---|---|
| **217280** | 1.2 stainless steel | VB4 | **217221** |
| **217291** | 1.5 – 2.0 stainless steel | C | **217000, 217221, 217240** |
| **217281** | 1.5 – 2.0 | C | **217000, 217221, 217240** |
| **217282** | 2.4 – 2.6 | G | **217000, 217200, 217221, 217240** |
| **217283** | 3.0 – 3.2 | M | **217000, 217100, 217200** |
| **217284** | 4.0 – 4.2 | P | **217000, 217100, 217200** |
| **217286** | 4.6 – 5.0 | X | **217100** |

Nicopress stop sleeves

## Nicopress stop sleeves

For proper crimping of control cable ends using a Nicopress tool.
The stop sleeve prevents the cable end from splaying.

| P/N | Cable Ø mm | Crimping gauge |
|---|---|---|
| **217371** | 1.5 – 2.0 | C |
| **217372** | 2.4 – 2.6 | G |
| **217373** | 3.0 – 3.2 | G |

Nicopress tool
(217100)

## Nicopress tool

**Each tool comes with its own operating instructions.**

| P/N | Cable Ø mm | Crimping gauge | Length mm | Handle/lever mm | Weight g |
|---|---|---|---|---|---|
| **217000** | 1.5 – 4.2 | C, G, M, P | 520 | 370 | 2530 |
| **217100** | 3.0 – 5.0 | M, P, X | 520 | 370 | 2530 |
| **217221** | 1.2 – 2.6 | VB4, C, G | 296 | 220 | 1000 |
| **217240** | 1.8 – 2.6 | C, G | 296 | 220 | 1000 |

| | |
|---|---|
| **217099** | Gauge and wrench for adjusting Nicopress tools, marks: C–G–M–P |

Nicopress tool
(217221)

## Tost Cable crimping tool

Compact, without long lever arms. Tool can be used in cramped spaces of the fuselage. The most economic alternative to Nicopress tools.

| P/N | Cable Ø mm | Crimping gauge | Length mm | Handle/lever mm | Weight g |
|---|---|---|---|---|---|
| **217200** | 2.4 – 4.2 | G, M, P | 280 | 160 | 390 |

Tost Cable crimping tool



# ALUMINIUM CABLE CLAMPS AND TOOLS

Tools for cable clamps made from aluminium

## Tost Top and bottom tool for aluminium cable clamps

For simple and economical cable connections using aluminium cable clamps, Type A, cylindrical.
Tool sizes 2–5, made of forged steel, specially hardened, extra strong, sturdy high-quality construction, with replaceable guide pins.
Tool length: 185 mm, weight: 1.580 g.

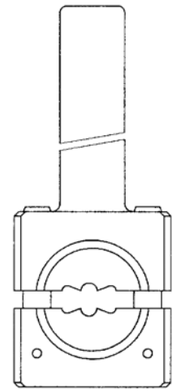
Cable clamp
from aluminium

**Operating notes:**
- Grease the bore hole well before pressing
- Place the tool on a thick steel plate
- Select the correct combination of cable/clamp/tool
- Put the tool halves together correctly

**Each tool comes with its own operating instructions.**

## Allocation cable clamp to cable and tool

| P/N Tool | Cable Ø mm | Tool No. | P/N clamp |
|---|---|---|---|
| **220200** | 1.2 – 1.6 | 2 | **221200** |
| **220250** | 1.7 – 2.1 | 2.5 | **221250** |
| **220300** | 2.2 – 2.6 | 3 | **221300** |
| **220350** | 2.7 – 3.1 | 3.5 | **221350** |
| **220400** | 3.2 – 3.6 | 4 | **221400** |
| **220450** | 3.7 – 4.2 | 4.5 | **221450** |
| **220500** | 4.3 – 4.6 | 5 | **221500** |

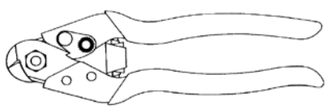


Tost Top and bottom tool

## Cable cutter

For proper cutting of steel cables
- Proper cut, no deformation or crushing
- Single strands do not splay
- Cutting without excessive effort, easy one-handed operation
- Suitable for use inside the aircraft fuselage

| P/N | Rope Ø in mm | Type of cable | Length mm | Weight g |
|---|---|---|---|---|
| **216070** | up to 5 mm | Steel cable with steel or hemp core also stainless steel cable | 170 | 290 |

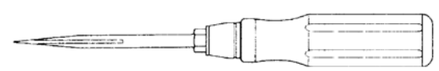


Tost Cable cutter

## Splicing needle

For splicing and thimble splicing of steel cables. The tool features a wooden handle and a hardened needle with a groove for the strands.

| P/N | Length mm | Length of needle mm | Weight g |
|---|---|---|---|
| **212000** | 210 | 90 | 85 |



Splicing needle

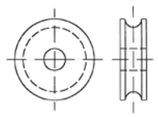
Control cable

## CONTROL CABLES

Aircraft control cable according to DIN ISO 2020 (previously LN 9374), steel galvanized, low-twist, low stress, flexible.

Delivered in coils of 10, 15, 20, 25, 50, 100 and 200 m. Available ex stock.
The Certificate of Conformance is printed on the shipping documents. A separate certificate is available upon request and will incur an additional charge.

| P/N | Diameter mm | Wire construction | Minimum breaking load | Weight g/m |
|---|---|---|---|---|
| **200024** | 2.4 | 7 x 7 | 4.1 kN | 24 g/m |
| **200032** | 3.2 | 7 x 19 | 8.9 kN | 43 g/m |

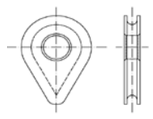


Round thimble

## TOST SOLID THIMBLES FROM ALUMINIUM

- From Tost production
- Lightweight, high load capacity, non-deformable
- High strength prevents the thimble from deforming, which protects the synthetic winch rope from damage.
- We recommend the Jumbo solid thimble especially for use with synthetic winch cables. It lays well protected in the groove.

| P/N | Description | Cable in mm | Connection |
|---|---|---|---|
| **222550** | Round thimble | 4.2 – 5.0 | Shackle 8 mm |
| **222700** | Solid thimble | 4.2 – 5.0 | Shackle 8 mm |
| **222750** | Solid thimble Jumbo | 4.2 – 5.0 | Screw-type connector |



Solid thimble

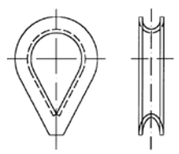
Solid thimble Jumbo

**We manufacture solid aluminium thimbles in any size to your requirements. Colour anodising in your brand colour is available on request.**

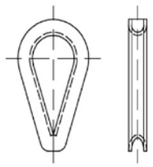
## STEEL THIMBLES

Made in Germany, for control cables and steel winch cables.

| P/N | Description | Cable in mm | Material |
|---|---|---|---|
| **222200** | Heart-shaped thimble 2 | 1.5 – 2.0 | stainless steel |
| **222300** | Heart-shaped thimble 3 | 2.1 – 3.0 | stainless steel |
| **222350** | Thimble 3.5 | 3.1 – 4.0 | galvanized |
| **222500** | Heart-shaped thimble 5 | 4.1 – 5.0 | galvanized |
| **222600** | "Strong" thimble 6 for safety cables | 4.6 – 6.0 | galvanized |



Heart-shaped thimble



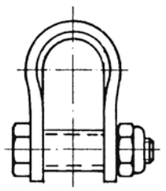
Thimble



## CONNECTING SHACKLES

Stainless steel shackle, with spacer bushing, high-strength bolt and self-locking nut.

| P/N | Width mm | Eylet mm | Bolt mm |
|---|---|---|---|
| **113000** | 10 | 14 | M6x22 |
| **112312** | 12 | 14 | M6x26 |
| **113400** | 14 | 14 | M6x30 |
| **113900** | 19 | 19 | M6x35 |

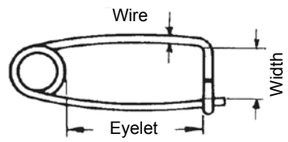


Connecting shackle

## SAFETY PINS

Material: spring wire

| P/N | Width mm | Eyelet mm | Wire mm |
|---|---|---|---|
| **920010** | 5 | 20 | 1.4 |
| **920012** | 8 | 51 | 1.3 |




Safety pin

## LOCKING WIRE

to MS 20995-C-32, for aircraft.
Material: stainless steel, 0.8 mm Ø (0.032 inch)

| | |
|---|---|
| **920080** | Roll with approx. 0.5 kg |

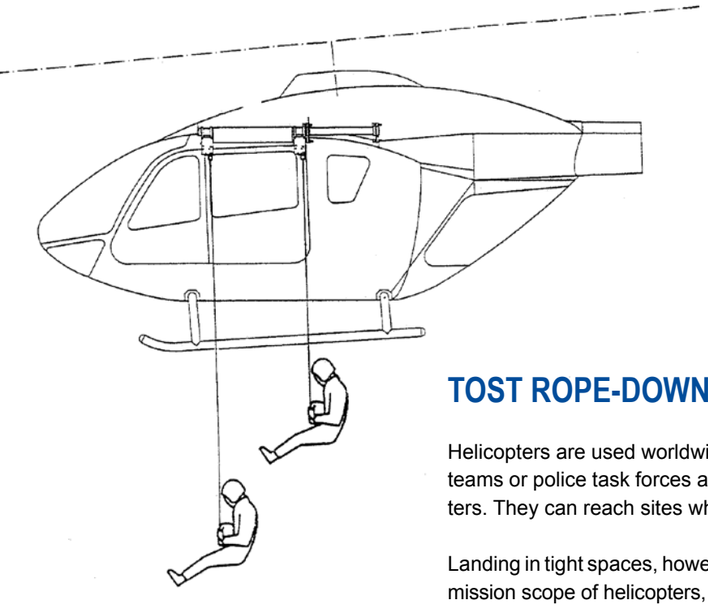
Locking wire

# HELICOPTER EQUIPMENT

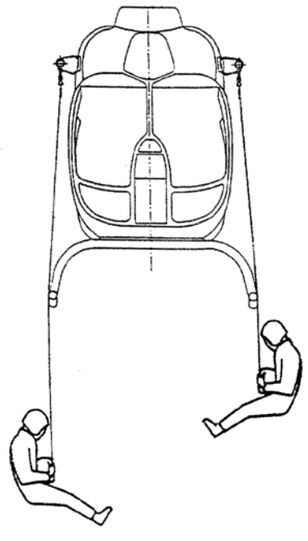
## HELICOPTER EQUIPMENT

**We develop and manufacture equipment for various applications:**

- For the descend of task forces through internal or external attached rope down securing units
- Rescue cages for picking-up people or for transport of high loads
- Cable Cutter as redundant safety system for cable winches, with suitable pockets
- Load cables for the transportation of external loads, hanging under the helicopter
- High-tensile connectors



2-person rope-down securing unit
"External" for EC 135 and BK 117 C-2



## TOST ROPE-DOWN SECURING UNIT

Helicopters are used worldwide as a fast and safe means of transport. Fire-fighting teams or police task forces are quickly brought into an operational area by helicopters. They can reach sites which are inaccessible to surface transport.

Landing in tight spaces, however, entails great risks for any helicopter. To expand the mission scope of helicopters, we developed our "rope-down securing unit" to ensure the safe descent of rescue teams. They rope down to a precise location while the helicopter hovers in position overhead.

During the rope-down operation, members of the task force are safely attached to the helicopter via the Tost rope-down securing unit, installed internally or externally on the helicopter. On completion of the rope-down operation, the pilot or a crew member disconnects the rope with a single pull to release the team members, either singly or in groups. The helicopter is ready for the next mission immediately.

Apart from standard police or fire-fighting missions, the rope-down securing unit can be used in a number of special applications, e.g.:

- Fighting forest fires
- Flood rescue operations
- Mountain and sea rescue operations
- Fires in multi-storey buildings
- Dropping emergency personnel
- Redundant safety system
- Operations of special forces teams



## Attachment to the floor unit, inside

for 1-, 2-, 4-, 6- or 8-person teams

- with self-centering snap-on connectors in airline rails
- fixed to stretcher adapter rail
- bolted directly to the floor unit

All Tost rope-down securing units for internal installation can be loaded up to 15 kN. Ultimate Load per attaching point and can also be released under this load. This is the ultimate load per attachment point and the unit can also be released under this load. This means that the load capability is only limited by the load capacity of the helicopter or the fixing points.

**Used in:** BO105 / BO105 S / BO105 CBS
BK117 / BK117 C-2
EC135 / EC145 / EC155
MD Explorer / Bell 212 / PZL Sokol

Manufacture for other types on request!

| P/N | Description | Number persons |
|---|---|---|
| **190162** | Rope-down securing unit with snap-on connectors | 1 |
| **190143** | Rope-down securing unit for EC135, MD Explorer<br>Attachment with self-centering snap-on connectors | 2 |
| **190121** | Rope down-securing unit EC135<br>Attachment with self-centering snap-on connectors | 4 |
| **190080** | Rope-down securing unit HEXA for EC155<br>Attachment with self-centering snap-on connectors | 6 |
| **190030** | Rope-down securing unit<br>Attachment with self-centering snap-on connectors | 8 |

## Attachment outside, Type "External"

for 1- or 2-person teams (per side)

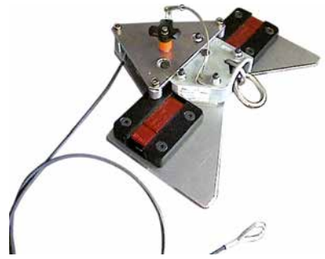
The Tost rope-down securing unit is appropriate for the technique of fast-roping or rappelling, as the fixation point is above the cabin. The person can start the rope-down procedure directly into the tight rope.

Attachment
• on existing winch fittings with ball lock pins
• attachment on either the left hand, right hand or on both sides
For version 192141 (left-hand) and version 192142 (right-hand) the Ultimate Load according to JAR 29 is 8 kN = 800 kg per attachment point.

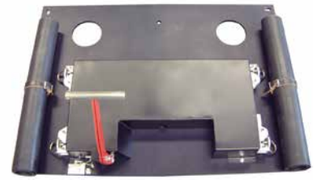
**Used in:** EC135, BK 117 C-2

The installation in the helicopter is completed with edge-protection mats.

| P/N | Attachment | Number persons |
|---|---|---|
| **192141** | External, attachment left-hand | 1-2 |
| **192142** | External, attachment right-hand | 1-2 |

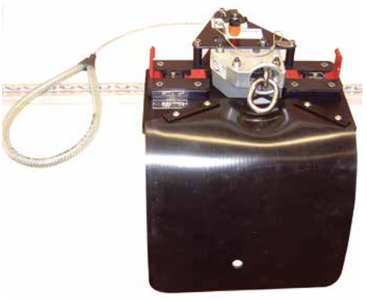


1-person rope-down securing unit



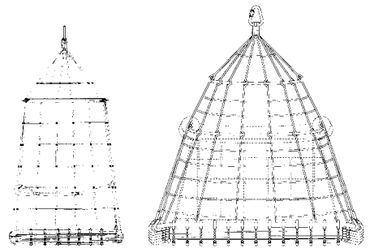
4-person rope-down securing unit

6-person rope-down securing unit



1-person rope-down securing unit
with protection mat


Tost External rope-down securing unit



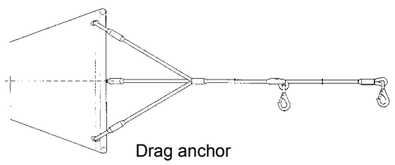
Rescue cage for 1 person

Rescue cage for 2 persons

## Rescue cages

The rescue cage is used for picking up or dropping people (also injured people) in difficult terrain, from water, etc.
The frame is made of non-rusting and acid-proof tubing, the cage mesh is made of polypropylene rope. Rope material is light, rot-resistant and unsinkable. Colour: bright orange. The rescue cage is floatable through the optional mounting of floating bodies.

| P/N | Description | Weight g |
|---|---|---|
| **190211** | Rescue cage for 1 person | 6000 |
| **190210** | Rescue cage for 2 persons | 14000 |



Drag anchor

## Drag anchor

for stabilizing rescue cages; prevents the cage from twisting. The drag anchor consists of a textile funnel with a sewn-in retaining ring and and a cable harness to attach it to the rescue cage. Two spring hooks allow the drag anchor to be attached in different positions on the rescue cage (load-dependent).

| | | |
|---|---|---|
| **190300** | Drag anchor | 1080 |

Cable cutter with safety wrist-strap

## Cable cutter

Manual cable cutter for cutting winch cables in the event of on-board power failure. The catching of the cable is eased through the integrated capture angle brackets. The cable cutter cuts steel wire cables of up to 6 mm diameter. The cable cutter can also be supplied with a safety wrist strap.

| | | |
|---|---|---|
| **216160** | Cable cutter with safety wrist strap | 950 |
| **216161** | Cable cutter | 925 |

Poket sssy

## Pocket assy

The cable cutter can be stored in a handy leather pouch, which can be attached to the cabin wall. With defined attachment points. Can optionally be delivered with opening for the safety wrist strap. Different pocket types for BO105, BK117 and EC 135 available.

| | | |
|---|---|---|
| **216166** | Cable cutter Pocket Assy, with opening for safety wrist strap, for 216160 | 570 |
| **216167** | Cable cutter Pocket Assy, without opening for safety wrist strap, for 216161 | 575 |

Load cable

## Load cable

Made to order: Load cable assemblies for helicopter external load operations.

- Manufactured to your drawings and specifications
- End fittings either cable fittings or thimbles
- Cable diameter: 6.4 or 8 mm
- Test load from 17 up to 30 kN (breaking load from 29 to 44 kN)

Alternative load cables on request.



## Connectors

| P/N | Description | Load kN | Load capacity kN | Breaking Load kN | Weight g |
|---|---|---|---|---|---|
| **113410** | Load shackles for all connections | 15 | | | 34 |
| **113428** | | 28 | | | 120 |
| **113435** | | 38 | | | 208 |
| **215020** | Load swivel, eye diamter 30 mm | | 20 | | 495 |
| **096062** | Suspension ring for heavy-duty releases eyelet 75 x 135 mm | | | | 830 |
| **095500** | Delta scew-type connector to hang in harnesses | | 25 | | 400 |
| **095014** | Screw-type connectors for all connections | | 15 | | 270 |
| **095100** | | | 20 | | 270 |
| **102010** | Connecting ring pair, high tensile | | | 30 | 70 |
| **191300** | Edge protection mat, width 1000 mm; width can be adapted, with self-centering snap-on connectors | | | | 5000 |

# SPECIAL PURPOSE SOLUTIONS

# WEAK LINKS FOR SPECIAL APPLICATIONS

We manufacture custom-made weak link elements to your requirements with a defined breaking load. Load ranges from 100 N to 10 kN can be covered in the low-load range, and from 11 kN to 50 kN in the high-load range. By the use of different materials we can meet your requirements regarding corrosion protection, food compatibility or any other standard. An individual marking of the weak links, (e.g. with a company logo) is available on request.

**Application examples:**
- Bracing of antennas
- Retaining of flagpoles
- Parachute testing
- Ship rigging
- Offshore operations
- Harbor tugs
- Balloon mooring
- Trade fair constructions
- Food industry
- Mechanical engineering

## Configuration weak link element

3- to 5-part weak link elements, with or without protective sleeve, weak link inserts in single or reserve systems, with two heavy-duty shackles, covering the load range of 11 kN to 50 kN.

4-part weak link element, single circuit

| P/N | Description | Load range |
|---|---|---|
| **190550** | Heavy-duty weak link element, 5 pcs., in reserve system | 11 to 20 kN |
| **190560** | Heavy-duty weak link element, 4 pcs., in single system | 20 to 50 kN |
| **190561** | Weak link insert for p/n 190560 | |



# SPECIAL TOW RELEASES

Apart from our aviation releases, we offer a wide range of special tow releases for precise load retention and controlled release. The load range and type of remote activation can be varied: mechanical, electrical, hydraulic, or pneumatic.

**Application examples:**
- Test rigs
- Drop tests
- Harbor tugs
- Cable positioning
- Towing of oil barriers
- Rope-down securing units
- Mining and surface mining
- Automotive engineering
- Towing and securing units

Please contact us for a quotation for your special application.


Heavy-duty release E 85 L with electrical remote actuation and side plates

## Heavy-duty releases

The E 85 L load release is available in different variants, such as a seawater-proof type or versions equipped with mechanical activation, electrical remote activation, or special side plates. Further special versions of the load release can be manufactured according to your requirements (e.g., with mounting supports, hydraulic or pneumatic activation, etc.).

| P/N | Description | Max. load |
|---|---|---|
| **011320** | Heavy-duty release E 85 L | 20 kN |
| **011321** | Heavy-duty release E 85 L seawater-proof | 20 kN |
| **011395** | Heavy-duty release E 85 L with mechanical acitvation + side plates | 20 kN |
| **011390** | Heavy-duty release E 85 L with electrical remote activation + side plates | 20 kN |
| **011490** | Heavy-duty release E 85 L with electrical remote activation + side plates | 30 kN |

## Fail-safe release

Unlike other release variants, the fail-safe release remains open when unactuated. Applying an electric voltage locks the mechanism, which immediately opens as soon as the voltage is removed.

| | | |
|---|---|---|
| **015100** | E 22 Fail-safe release | 2 kN |

E 22 Fail-safe release

5-inch wheel with tire
336x115-5 TOST AERO 10 pr
as a ground handling wheel
for EC 145 T2

## WHEELS FOR SPECIAL SOLUTIONS

Tost wheels prove their worth beyond aviation as well. Thanks to their high load capacity and maintenance-free bearings, they offer the perfect solution for a wide range of applications, including heavy-duty use, and have been extensively tested in practice.

- Guidance pulley in transportation systems
- Heavy load carriage
- Airships
- Vehicle trailers
- Snowploughs
- Transportation wheels
- Camera holding and guidance systems for movie and TV productions

Seawater-proof wheels with special corrosion protection, e.g., for amphibious aircraft, are listed in the "Aircraft Wheels" chapter.

Please let us know your requirements regarding load capability, tire size and application and we will be happy to prepare an individual offer for you.

## CABLE RETRACTORS WITH GUILLOTINE

Different variants of the Tow-Cable-Reactor Winch with Guillotine (CRG) have already been constructed for special applications. They are used for test flights, trailing probes, trailing antennas, and targeting with helicopters and aircraft.

Quick-release connector

## HYDRAULIC COMPONENTS

A further sector in which we develop and deliver custom solutions is hydraulic components. Draining valves, hydraulic quick connectors and bleed valves are available in a wide range of thread sizes, application fluids, and dimensions.

With our experience and know-how, we support you in the conceptual design and construction of hydraulic brake systems for individual applications or small series.

**Please contact us!**

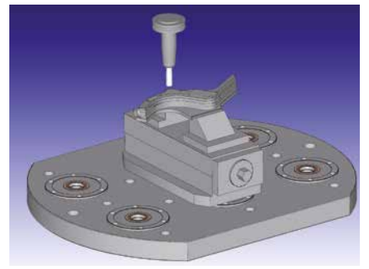


## CONSTRUCTION, DESIGN, SIMULATION, CONTRACT MANUFACTURING

Based on our long-term experience in the design and production of aviation components, we develop special solutions for you, including individual applications and small batches. We offer design, simulation, construction, prototyping, and production – all from a single source.
Let us know your requirements and we will be happy to prepare an individual offer for you.

**Our portfolio includes:**

- CAD, 2D and 3D
- Data transfer in all established data formats (dwg, dxf, stp, igs etc.)
- Preparation and management of product documents (PDM)
- FEM-based simulation and analysis of parts and assemblies
- Conservative strength and dimension calculations
- CAM, with milling center connected to network
- 5-axis CNC-milling
- 7-axis CNC-turning
- Classic machining (focus on precision mechanics)
- Gas-shielded welding (according to aviation standards)
- Manufacturing of simulators/mock-ups
- Product marking with engraving laser or engraving milling machine
- Production according to drawing within the framework of a DOPO agreement, delivery with EASA Form 1



CAM Computer-aided Manufacturing

FEM-based analysis
of Penta disk brake wheel

## TESTING INFRASTRUCTURE

In-house, we can prepare, carry out, and document a wide range of tests and trials on your behalf. The necessary test and trial parameters are discussed with you in advance and are subsequently verified and documented.

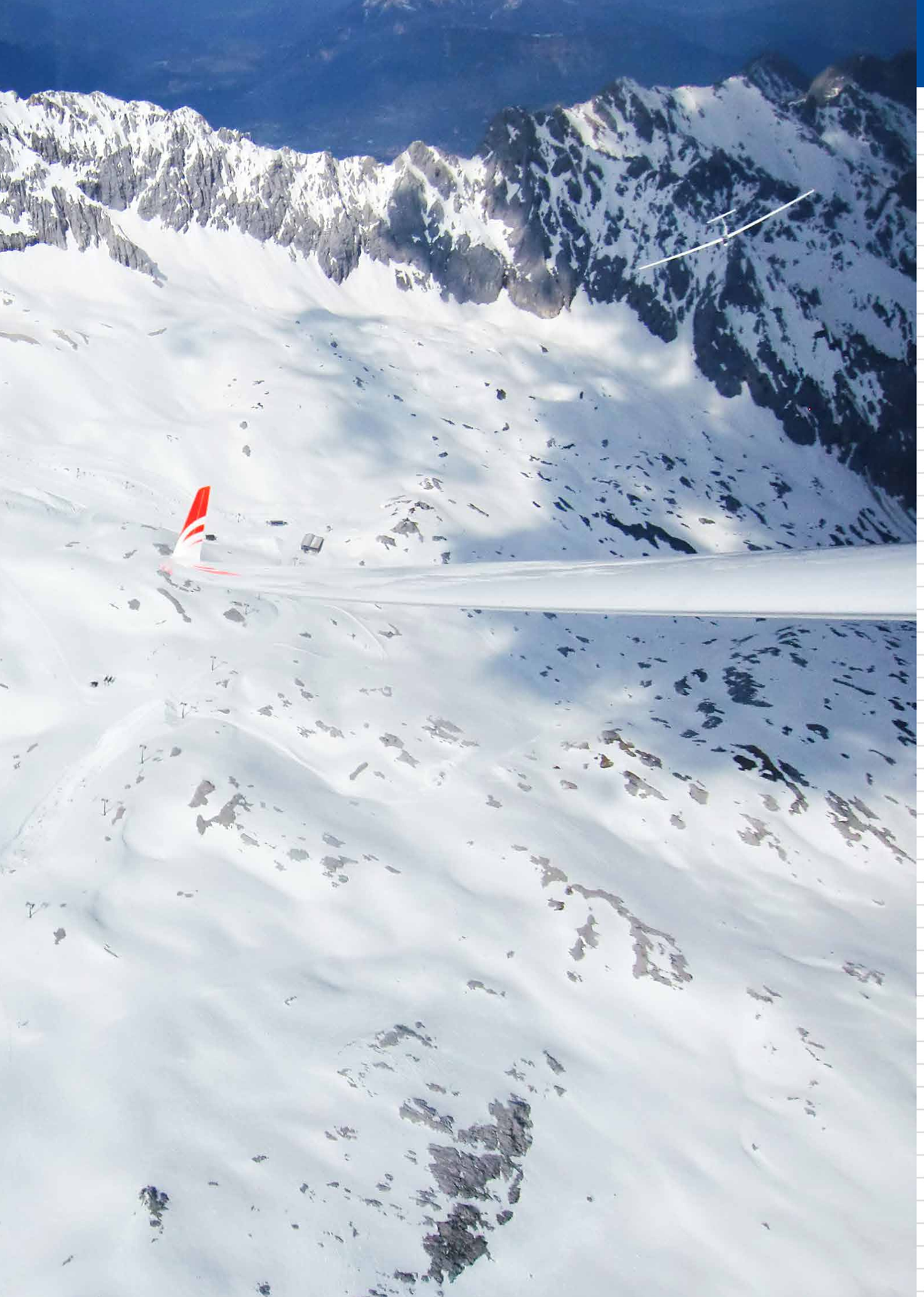
**Examples of our test machines, devices and procedures:**

- Static and dynamic load tests
- Determination of static and dynamic tire deflection curves
- Endurance test of tires and wheels
- Linear tensile and pressure tests
- Leakage and function test of hydraulic components
- Hardness testing
- Dynamometer test with flywheel
- Experimental determination of brake energy and brake momentum of disk brakes and drum brakes

Static load test of a complete wheel

Brake test
with flywheel to
determine braking
performance

System test
for realistic
simulation of
landing cycles

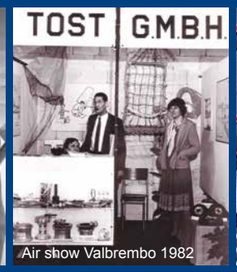


# COMPANY HISTORY


Founder Richard Tost, locksmith's workshop 1948


Richard Tost with young pilots Barbara and Hans-Jürgen


First solo of Hans Jürgen Fenzl 1960



Air show Valbrembo 1982


3 generations of enthusiastic aviators: Susanne, Barbara und Anneliese


Continuous development


Barbara Dörflein, Michael Dörflein, Susanne Dupont


Expansion of the machinery fleet

Management


Office expansion 2023

AERO 2025 exhibition

TOST team 2025

**1945** Foundation of Tost company as a locksmith's shop

**1951** Gliding in Germany is permitted again. TOST begins developing safety equipment for gliding

**1952** Manufacture of the first TOST nose release

**1953** Type approval of the TOST weak link.

The first TOST safety releases are produced in series. Today, over 70.000 TOST releases are used every day all over the world.

**1955** Start of aircraft wheel manufacture:
Landing wheels, shoe brake wheels and hydraulic disk brake wheels, for use in gliders, motor gliders and aircraft

**1958** Development and production of shoulder harness release for aircraft

**1978** Start of development and manufacture of rescue cages and rope-down securing units to ensure the safety of rescue teams

**1981** Focus on the core business of safety equipment, tow releases and wheels

**1982** Start of manufacture of a proprietary aircraft tire:
TOST AERO 4.00-4, 260x85, 200x50

**1987** Development of retrofit kits for disk brake wheels for gliders and motor gliders

**1992** TOST production of Tow Cable Retractor Winch with Guillotine (CRG)

**1998** Rope-down device External for EC 135

**1999** LBA approval as production organisation LBA.G.0065

**2000** For helicopter rescue teams: 1-person rope-down securing unit for fast mounting in airline rails

**2001** Distributor for Condor aircraft tires

**2002** Distributor for Michelin aircraft tires

**2003** LBA approval of the small, light E22 tow release

**2004** Certification as EASA production organisation DE.21G.0065

**2006** Redesign of the TOST premises

**2007** TOST weak links in optimised format

**2008** Stahlbus bleeder valve –
exclusive distribution for aviation
Split tail wheels Max II and Moritz II
Brass tail wheels Max II and Moritz II

**2009** Design Organisation EASA.AP230
EASA Maintenance Organisation DE.145.0411
Light weight wheels 5" Penta and 4" Tria

**2010** Hydraulic actuation of shoe brake wheels

**2011** 6" Disk brake wheel for UL
6" Disk brake wheel Penta

**2012** Mini 180 Disk brake wheel
Special Tire 336x115 TOST AERO 10 pr
for narrow landing-gear boxes

**2013** New development of TOST Hydraulic Brake System

**2014** Landing wheel Mini 150 F, foam-filled

**2015** Expansion of the machinery

70th anniversary of TOST

**2016** Retrofit of TOST Hydraulic Brake System with EASA approval

**2017** Design of 14" wheel for Me 109

**2018** ETSO approval of BZT2
Retrofit disk brake wheel in LS4-8 with new master cylinder PTC pull-type

**2019** EASA approval of retrofit BZT2
for Schleicher- and Schempp-Hirth gliders

**2021** Barbara Dörflein transfers management to her children, Susanne Dupont und Michael Dörflein, after over 60 years at TOST

**2022** Retrofit of BZT2 in further aircraft types

**2023** Expansion of our company facilities,
new office with spacious customer reception

**2024** Introduction of Safety Management

Commissioning of the new high-performance wheel, brake, and tire test rig

**2025** 80th company anniversary

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EASA Maintenance Organisation DE.145.0411
EASA Design Organisation EASA.AP230