

ASW 22 BE Flight Manual

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| Rev. No. ->                | TN 02             |          |
| Affected Section and Pages | 0.4,<br>2.6       |          |
| Date of Issue              | 15.07.93          |          |
| Approval                   | LEA-<br>App.      |          |
| Date of Approval           | 28.09.93          |          |
| Date of Insertion          | 17.06.98          |          |
| Ref. / Signature           | Juw<br><i>Juw</i> |          |
| Rev.No./Date               | Sig.              | Author   |
|                            | Juw/GW            | 29.02.92 |
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2.4 Power-plant

Engine Manufacturer: Bombardier-Rotax GmbH  
A-4623 Gunskirchen, Austria

Engine Model: Rotax, Type 505 A, aircooled,  
inverted, two-cylinder,  
two-stroke engine,  
LBA-data-sheet Number 4599

Maximum Power, Take-off: 31.6 kW/43 HP  
Continuous: 31.6 kW/43 HP

Maximum Engine rpm at MSL: 6800 rpm  
Take-off: 6800 rpm  
Continuous: 6800 rpm

Maximum Cylinder Head Temperature: 250°C / 482°F

Fuel\* Approved octane rating: minimum 96 ROZ  
(research octane rating)  
Approved fuel grades: High-octane  
"MOGAS" and AVGAS 100LL

Oil Oil-fuel mixture, ratio 1 to 5o,  
Super two-stroke oil according  
to specification TSC 3

Reduction ratio: Toothed belt,  
3 to 1 (engine to propeller)

Propeller model: MT 158 R 120 - 1 A, 32.110/12,  
Propeller manufacturer: mt-Propeller, Straubing,  
Germany

or optional

Propeller model: KS-1C-158-R-108  
Propeller manufacturer: TECHNOFLUG Leichtflugzeug-  
bau GmbH

\* not yet in German flight manual!



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Power-plant

Engine Manufacturer: Bombardier-Rotax GmbH  
A-4623 Gunskirchen, Austria

Engine Model: Rotax, Type 505 A, aircooled,  
inverted, two-cylinder,  
two-stroke engine,  
LBA-data-sheet Number 4599

Maximum Power, Take-off: 31.6 kW/43 HP

Continuous: 31.6 kW/43 HP

Maximum Engine rpm at MSL: 6800 rpm

Take-off: 6800 rpm

Continuous: 6800 rpm

Maximum Cylinder Head Temperature: 250°C / 482°F

Fuel:\* Approved octane rating: minimum 96 ROZ  
(research octane rating)

Approved fuel grades: High-octane "MOGAS"  
and AVGAS 100LL

Oil: Oil-fuel mixture, ratio 1 to 50,  
Super two-stroke oil according to specific-  
ation TSC 3

Reduction ratio: Toothed belt, reduction rate  
3 to 1 (engine to propeller)

Propeller model: MT 158 R 120 - 1 A, 32.110/12,

Propeller manufacturer: mt-Propeller, Straubing,  
Germany

or optional

Propeller model: KS-1C-158-R-108

Propeller manufacturer: TECHNOFLUG Leichtflugzeug-  
bau GmbH

\* not yet in German flight manual!



To the front of the engine a belt driven reduction gear is fixed which reduces the engine revolutions by a ratio of 3:1 into the propeller revolutions. The advantages of such a reduction gear are an improved efficiency of the propeller and lower noise emission. The upper gear wheel is the propeller mounting flange.

An electric fuel pump which is fixed low in the fuselage ensures fuel supply. A pneumatic diaphragm type pump installed in line supplements the fuel flow.

### 2.3.2 Propeller Type and Installation

For the ASW 22 BE two propeller models may be used. A fixed pitch two bladed wooden propeller of the mt-propeller factory, Straubing, Germany specified as MT 158 R 120 - 1A, 32.110/12 can be used or alternatively:

A fixed pitch two bladed FRP propeller from the TECHNOFLUG Leichtflugzeugbau GmbH, Germany, specified as KS-1C-158-R-108 can be used.

With its flange it is connected to the upper belt wheel, where it is fixed by six coaxial bolts.

#### Removing the Propeller

Marc the position of the propeller relative to the flange!

Remove the safety wires from the bolts and untighten the six size M8 bolts. Remove Aluminum alloy ring including propeller now ( for the TECHNOFLUG propeller also remove the spacer).

#### Removed mass (weight) and mass arm:

|                           | Mass (weight)    | mass arm        |
|---------------------------|------------------|-----------------|
| mt-Propeller              | 3.0 kg, 6.6 lbs  | 1.48 m, 4.86 ft |
| TECHNOFLUG-Prop. & spacer | 2.2 kg, 4.85 lbs | 1.48 m, 4.86 ft |

Fitting the Propeller

The installation of a propeller is subject to an inspection by an inspector authorised to do so!

When assembling the propeller, ensure correct blade position (see under "Dismantling the Propeller"). Tighten the six M8 bolts by use of a torque wrench and safety with wire. See Installation Directives Nr. E-112 or No. P3 respectively of the relevant propeller manufacturer!

See section 5.3 of this manual for the tightening torques!

2.3.3 Removing and installing the power-plant

The following two sections describe how to dismantle and re-fit the power-plant.

This may become necessary for maintenance, repair or weight reduction or compliance with competition rules. The only component groups left in the sail-plane are fuel system, swivel arms, and all cockpit engine controls.

According to NfL II-7/90 (german notice to airmen) the removing of the power-plant is regarded as a maintenance task according to § 6 LuftBO. A special inspection according to § 9 LuftBO is therefore not necessary in that case.

The reinstallation of the power-plant however has to be done in accordance with section 4 LuftGerPO and must therefore be certified by an institution approved for this (§ 31 LuftGerPO).

**Oxygen Installation**

Oxygen systems and oxygen supply must comply with JAR 22.1441 and 22.1449 !

For oxygen systems fitted, the relevant section of the appertaining Inspection Release Certificate states the overhaul time limit. Over and beyond this, the oxygen bottles must be re-inspected by a technical inspection institute every five years in accordance with pressure vessel regulations.

**Water Bags**

"Smiley"-Water bags have a preliminary service life of 6 years. Prior to the expiry of this time limit the customer should contact SCHLEICHERS and check whether it is possible to increase this service life by means of a special Inspection Program.

In a letter dated 12.05.98 the LBA agreed to a proposal of the manufacturer, that the "Smiley"-bags are from that date onwards subject of the annual inspection like the serial water bags.

**Power-plant**

The overhaul of the engine must be performed in agreement with the approved issue of the "MANUAL for ROTAX-engine type 505 A" which is valid for the individual engine or (for later engines) after 6 years of operation, a revision of the engine must be performed at the engine factory or a maintenance station authorized by the aviation authority.

**Propeller**

According to the instructions given in the "Betriebs- und Wartungshandbuch Nr. P3" the TECHNO-FLUG-Propeller has a limited time of operation.

**Flexible Wing Fuel Tanks**

The flexible fuel tanks have a time limit. The time limit is given in the relevant issue of the "Einbau- und Prüfungsanweisung für HKF T-LF".

**5.3 Bolt Tightening Torque Specifications Table**

Table of maximum permissible torques for bolts in standard bolted connections (not for engine or propeller!):

| Thread Size | daNm (mkp) |
|-------------|------------|
| M4          | 0,18       |
| M5          | 0,36       |
| M6          | 0,64       |
| M8          | 1,60       |
| M10         | 3,20       |
| M12         | 5,70       |
| M14         | 9,20       |

Table of bolt tightening torques of the engine:

**See Engine Manual!**

Table of bolt tightening torques of the propeller:

See the instructions given in "Betriebs-Einbauanweisung Nr. E-112 of mt-Propeller or in the "Betriebs- und Wartungshandbuch Nr. P3" of TECHNOFLUG Leichtflugzeugbau GmbH.

For the M 8 bolts which fix the propeller to the hub flange the values to be used are shown in the propeller operating manual. As the locking nuts add an additional torque moment, 0.3 Nm should be added to the stated specification.

**12.4 List of Maintenance Documents for Fitted Equipment**

- Valid edition of the Repair Manual for Rotax Engine Type 505 A for the installed engine S/N.
- Currently valid edition of the Operating and Maintenance Instructions No. E-112 for the Propeller, supplied by Messrs.Mühlbauer, issued 24 Jun 1983. Betriebs- und Wartungshandbuch Nr. P3 for die propellers of TECHNOFLUG Leichtflugzeugbau GmbH dated 16.09.91 in the applicable issue.
- Operating Manuals for Tow Release Couplings made by TOST for the series:  
Safety Release Coupling "Europa G 72", "Europa G 73" and "Europa G 88", LBA approved, according to the latest relevant issue.
- Operating Manuals for Tow Release Couplings made by TOST for the series:  
Nose Release Hook "E 72", "E 75" and "E 85", LBA approved, according to the latest relevant issue.
- Fitting and Test/Inspection Instructions for the HFK T-LF soft wing fuel bags, Drawing No.3/87.
- Einbau- und Prüfungsanweisung für Ta 90 Combi der kombinierten Wasser-Kraftstoff-Tanks der Firma Heimann, latest effective issue.
- WHEEL and BRAKE ASSEMBLIES CATALOGUE  
Component Maintenance Manual,  
Appendix A, Fits and Clearances  
A-1. Brake Lining Wear Limits  
A-2. Brake Disc Minimum Thickness  
from: Parker Hannifin Corporatin, Avon, OH. USA.