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## **PROPELLER**

### **OPERATIONS MANUAL**

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## 8. Propeller maintenance and repair schedule

Date	Propeller operating time, hours	Type of repair and/or maintenance	Remarks

**Attention!** As we are permanently improving our products, it is possible that some elements do not fully correspond to the description and image in the manual.

## 1. Function

This propeller is designed to be used as a propulsive device for vehicles equipped with engines rated up to 120 hp.

## 2. Technical data

Propeller model	
Diameter, mm	
Direction of rotation	
Operating blade angles	10° ÷ 30°
Engine	
Approximate blade angle	
Moment of inertia, kg*m2	
Max. allowed propeller rotation rate, rpm	2700
Propeller number	
Sale date	

### 3. Delivery set

Number of propeller blades	2	3	4
Hub	1	1	1
Bolts M8	6	6	6
Washers 8 mm	6	6	6
Bolts M6	4	6	8
Washers 6 mm	8	12	16
Nuts M6	4	6	8
Operations manual	1	1	1

### 4. Assembly and installation

4.1 Insert the blade roots into the hub half with numbers 1, 2, 3, ensuring that the numbers at the bottom of the root correspond to the numbers on the hub (see fig. 1a).

4.2 Put the other half of the hub over the first one, matching the figures on the end surfaces of each hub cone (see fig. 1b).

4.3 Pre-bolt both hub halves with M6 bolts.

### 7. Propeller service life

7.1 The manufacturer guarantees the propeller's service life of 12 months counting from the date of sale, provided the terms and rules of its maintenance, storage and transportation are observed.

The running time within this period should not exceed 300 hours.

Further the propeller can be used based on its condition, but not more than for 4 years from the date of sale.

7.2 The manufacturer bears no responsibility for the defects caused by the failure to observe the propeller's operating instructions, storage and transportation conditions.

7.3 If within the warranty period defects are detected that are the manufacturer's fault and do not allow further use of the propeller, the manufacturer will at his discretion repair or replace the propeller at his own expense.

--- besides the steps listed in paragraph 5.1.1, it is also necessary to fully take the propeller apart and clean the blade roots and the hub;

--- check all fastening bolts M6, M8 and all nuts for defects, replace the damaged ones.

### 5.3 Repair

Repair of the propeller consists in replacement of one or more damaged blades and all damaged bolts and nuts by the new ones.

Capital repair of the propeller includes replacement of all blades and bolt joints by the new ones.

## 6. Safety requirements

Certain safety precautions are to be observed when operating the propeller. The rules as follows are to be observed when mounting the propeller:

--- the minimum distance between the propeller and the ground surface is 230 mm;

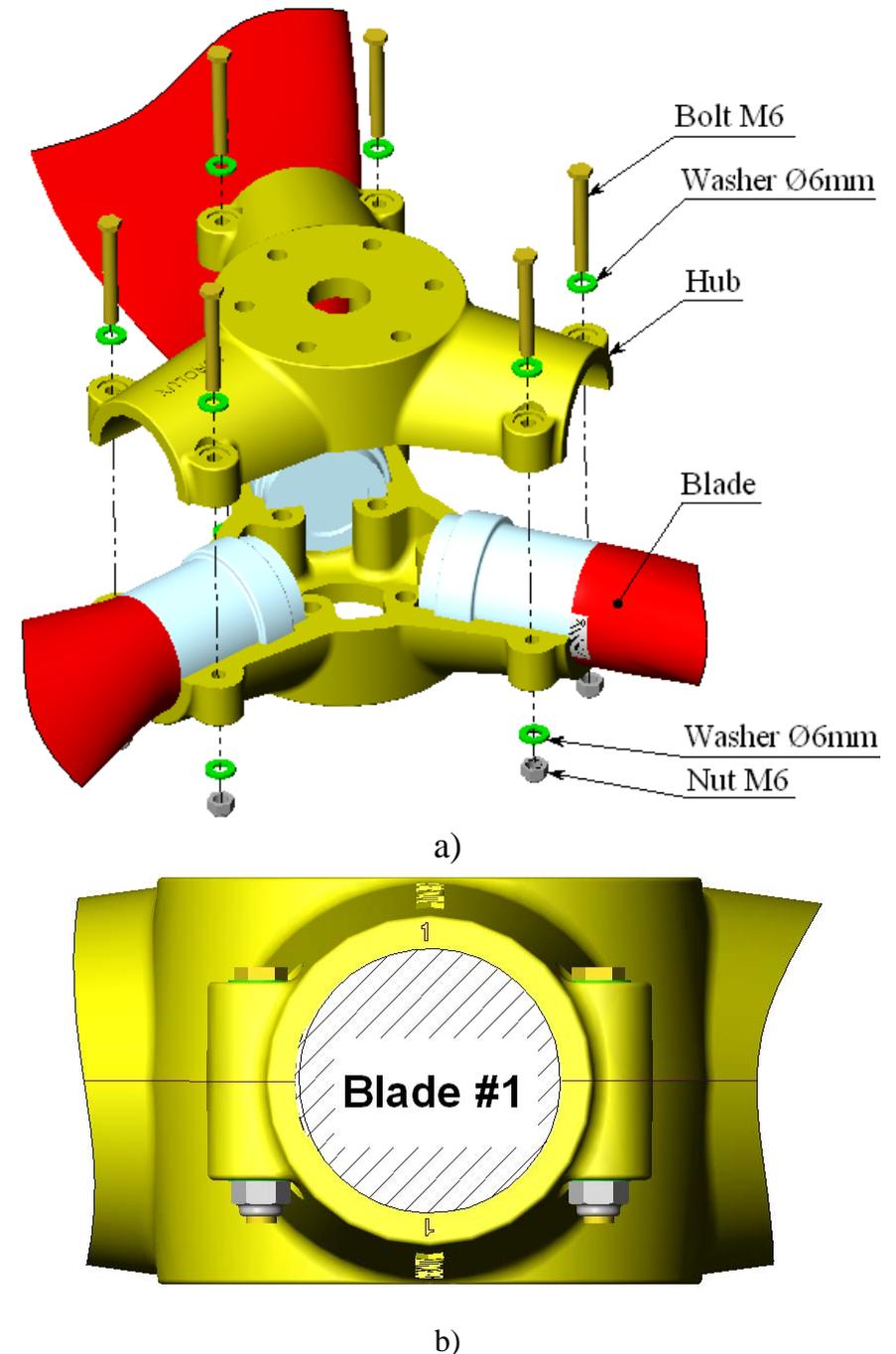
--- the minimum distance between the propeller and the water surface is 460 mm;

--- it is necessary to ensure safe distance between the rotating parts of the propeller and the stationary structural elements;

--- **it is prohibited** to run the propeller that has handling marks over 3 mm deep on the front and/or rear edge of the blade;

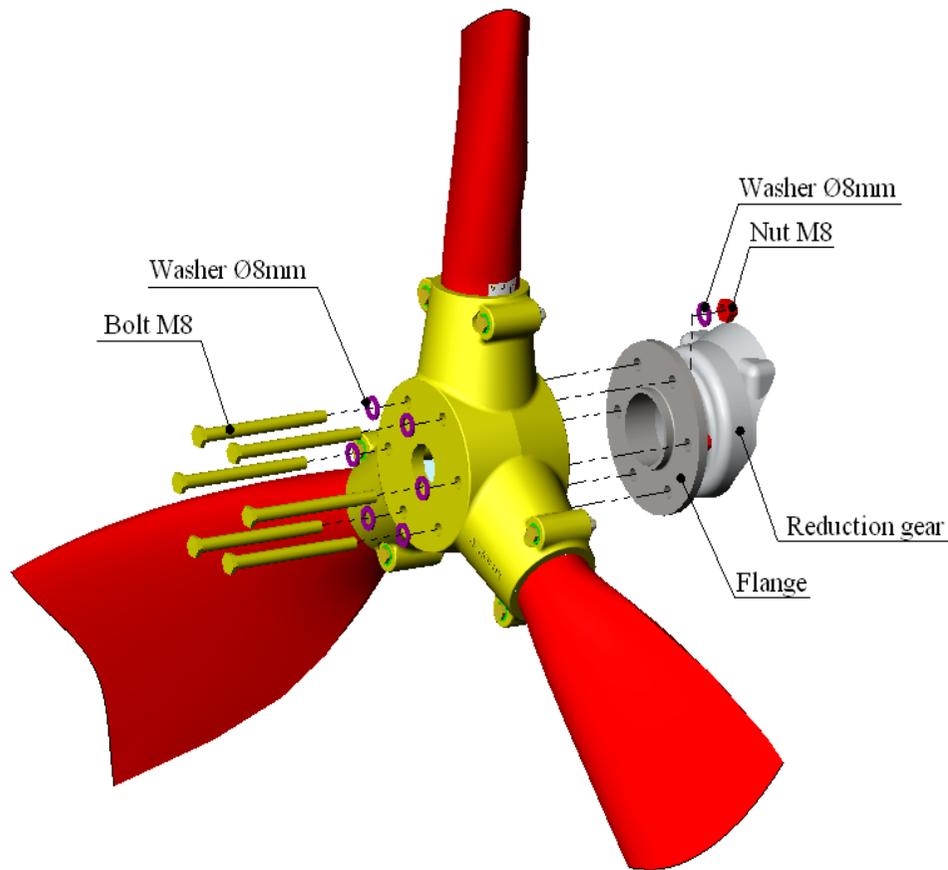
--- **it is prohibited** to run the propeller if excessive vibration occurs;

When the engine with the propeller is running, **it is prohibited to stay at the propeller's plane of rotation;**

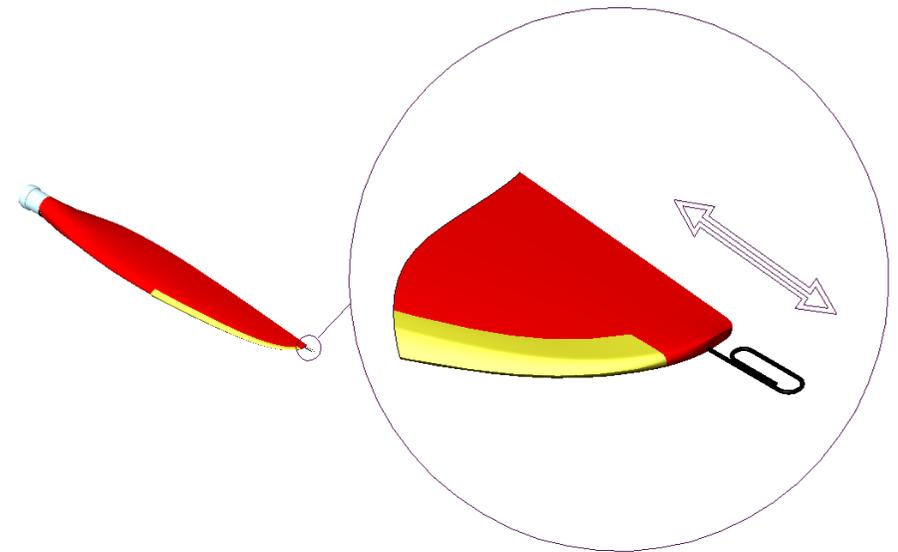


**Fig.1** Propeller assembly diagram

4.4 Place the assembled propeller on the centering rib of the flange on the reduction gear of your engine and pre-bolt it with 6 M8 bolts (see fig. 2.1, 2.2).



**Fig. 2.1** Propeller installation on the flange of the reduction gear of the Rotax 912, 914 and other similar engines



**Fig.5** Clearing the drainage holes in the blades.

--- check the propeller for any other possible reasons of the imbalance.

If vibration is still there after all the above steps has been done, **DO NOT CONTINUE TO USE** the propeller! Contact the manufacturer.

**5.1.8 Check the propeller daily**, before and after using it.

## 5.2 Maintenance

5.1.1 After every 50 hours of the propeller operating time:

- clean the blades;
- examine the blades for microfractures, handling marks, delamination (root part, front and rear edge of the blade);
- clear the drainage holes at the blade tips (as shown in fig. 5)
- check the bolting.

5.2.2 After every 100 hours:

### 5.1.3 To change the propeller pitch:

- loosen six M6 bolts and six M8 bolts;
- set the necessary blade angle, using the scale on the blade root;
- tighten all bolts with the moment specified above;
- check that the blade angle is the same on all blades;

### 5.1.4 Acceptable propeller damage:

- small handling marks up to 3 mm on the binding and blade;
- scratches up to 0.5 mm deep on the paint-and-laquer coating.

In case of extensive damage to the blade it is necessary to replace the damaged blade with the new one.

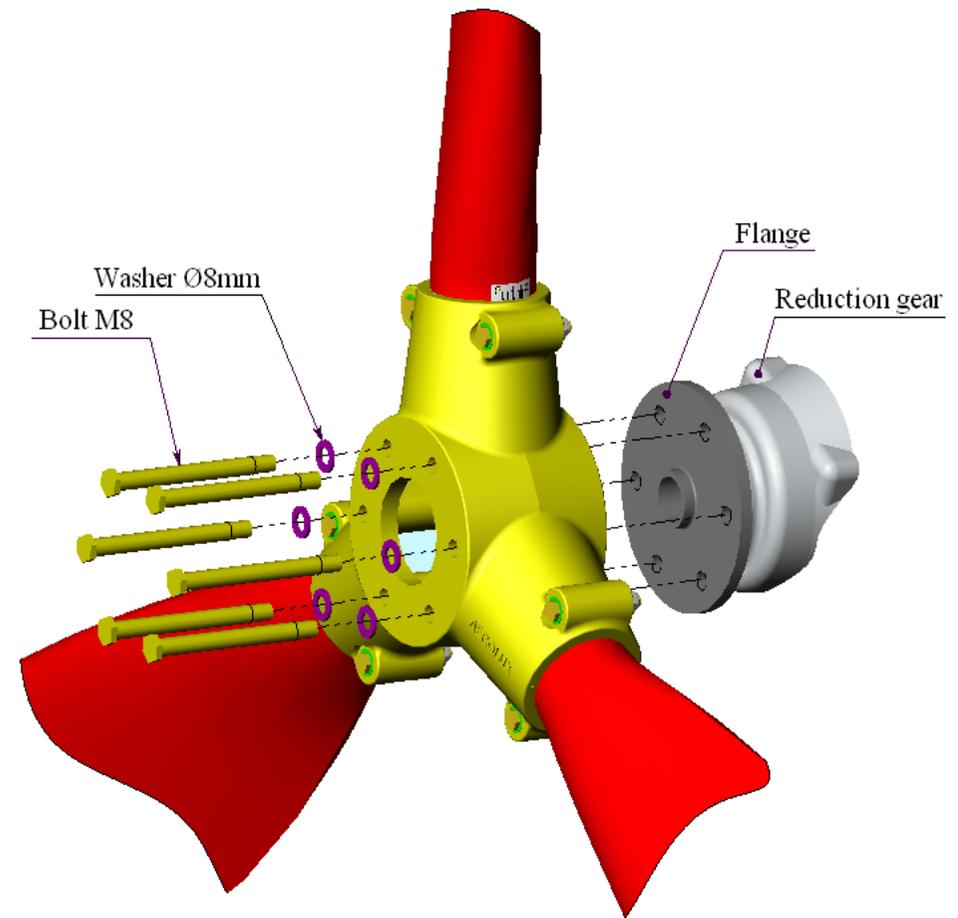
5.1.5 In case of mechanical damage to the paint-and-laquer coating the face-lift (filling and touch-up of the damaged place) is necessary.

**It is forbidden to paint the whole blade.**

5.1.6 Dirt on the blades causes deterioration of the propeller's aerodynamic properties. If the blades become dirty, clean them with water and detergent. **It is prohibited to use solvents.**

5.1.7 If excessive vibration of the propeller occurs:

- check the blades for any handling marks;
- verify that the blade number on the bottom of the blade root corresponds to the slot number on the hub;
- verify that all blades have the same blade angle;
- clear the drainage holes 0.8 mm diam. on the blade tips (using a clip, etc., as shown in fig. 5);

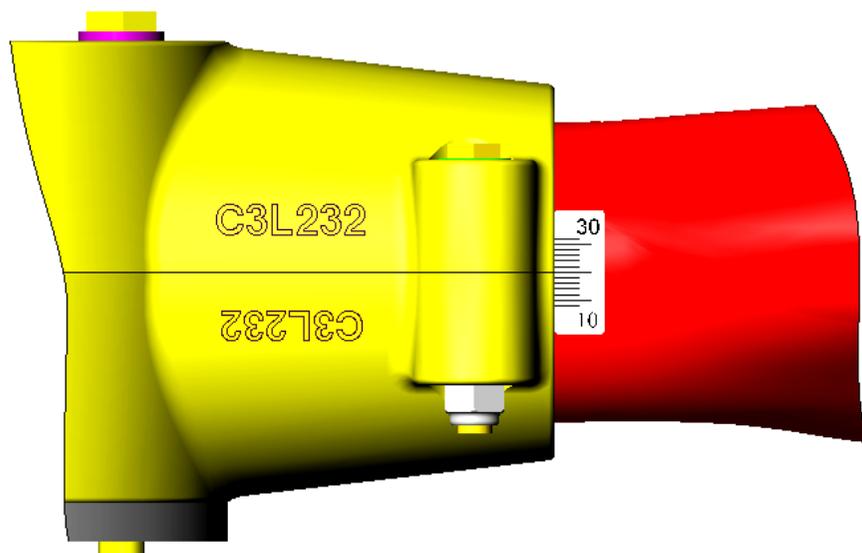


**Fig. 2.2** Propeller installation on the flange of the reduction gear of the Rotax 503, 582 and other similar engines

4.5 Set the necessary propeller pitch. To do this, align the respective calibration mark on the blade root with the hub detachment plane, as shown in Fig. 3. The scale interval is 2 degrees.

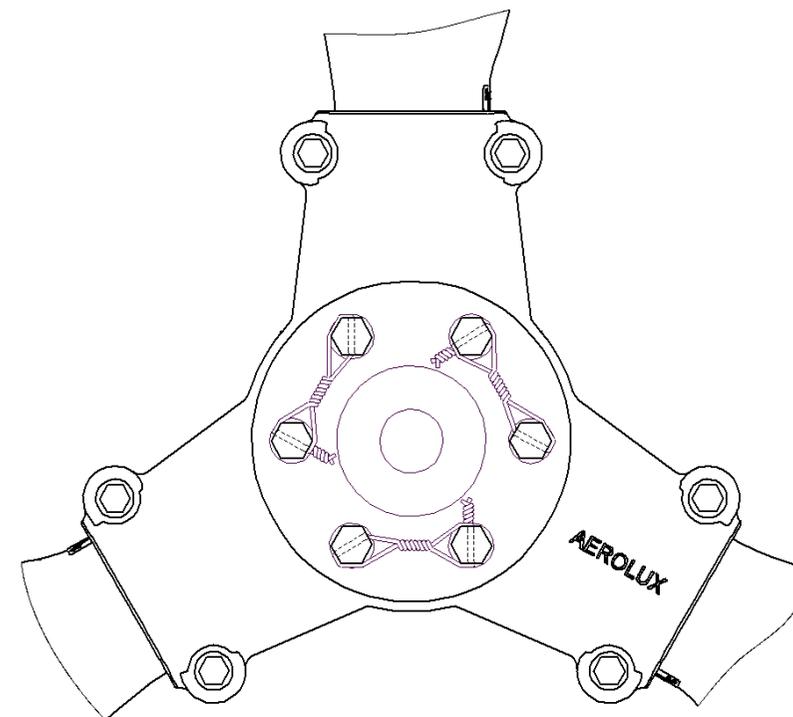
Tighten the **M6 nuts with 10 Nm moment.**

**Ensure that all blades are installed accurately.** Tighten the **M8 bolts with 22 Nm moment.**



**Fig. 3.** Setting the propeller pitch.

4.6 For Rotax 503, 582 and other similar engines, lock M8 bolts with safety wire according to the diagram in Fig. 4.



**Fig. 4** Diagram of locking the propeller fastening bolts for ROTAX 503, 582, 618 engines and the like

## 5. Propeller operation, maintenance and repair guide

### 5.1 Propeller operation

5.1.1 This propeller can be operated at the ambient temperature ranging from  $-20$  to  $+45$  °C.

5.1.2 Rotation rate of the engine crankshaft with the adjusted propeller should not exceed the rated maximum allowed rotation rate for this engine as well as for the propeller, either in flight or on the ground.