



Vodolská 4  
250 70 Odolena Voda  
Czech Republic  
Tel.: 283971309  
e-mail:[info@woodcomp.cz](mailto:info@woodcomp.cz)  
<http://www.woodcomp.cz>

## **USER MANUAL**

**UM – 06 EN**

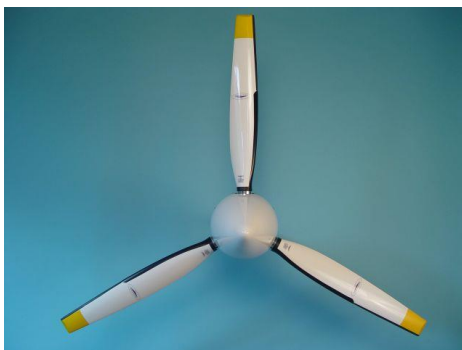
### **AIRCRAFT PROPELLER**

**Type-Model: KW-30**

**Variant:**

**Part Number:**

**Serial No:**



---

---

**CONTENT**

<b>1.</b>	<b>List of Valid Pages .....</b>	<b>4</b>
<b>2.</b>	<b>Revision List .....</b>	<b>5</b>
<b>3.</b>	<b>Introduction .....</b>	<b>6</b>
<b>4.</b>	<b>Manufacturer .....</b>	<b>6</b>
<b>5.</b>	<b>Type Certificate Holder .....</b>	<b>6</b>
<b>6.</b>	<b>Serial Number .....</b>	<b>7</b>
<b>7.</b>	<b>General Information .....</b>	<b>7</b>
<b>8.</b>	<b>Operational Safety.....</b>	<b>7</b>
<b>9.</b>	<b>Propeller Properties.....</b>	<b>8</b>
<b>10.</b>	<b>Technical Description.....</b>	<b>9</b>
10.1.	Product Label.....	10
10.2.	Propeller Designation System.....	11
10.3.	The Hub .....	11
10.4.	Blades .....	11
<b>11.</b>	<b>Basic Performance Data .....</b>	<b>12</b>
<b>12.</b>	<b>Connection of KW-30 Propeller to Engine .....</b>	<b>13</b>
12.1.	Propeller flange dimensions .....	13
<b>13.</b>	<b>Propeller Unit set-up .....</b>	<b>14</b>
13.1.	Adjustment before First Flight .....	14
<b>14.</b>	<b>Operation Instruction .....</b>	<b>17</b>
14.1.	Mounting propeller on engine .....	17
14.2.	Starting engine and performing engine test .....	17
14.3.	Taxiing .....	18
14.4.	Take Off .....	18
14.5.	Horizontal Flight.....	18
14.6.	Aircraft Manoeuvres and Turbulence .....	19
14.7.	Maximum speed .....	19
14.8.	Landing .....	19
14.9.	Stopping the Engine .....	19
14.10.	Emergency Procedures .....	19
<b>15.</b>	<b>Transport, Handling, Storage.....</b>	<b>21</b>
15.1.	Propeller Delivery .....	21
15.2.	Handling.....	21
15.3.	Storage .....	21
15.4.	Transport .....	21
15.5.	Responsibility for Transport .....	22
<b>16.</b>	<b>Inspections .....</b>	<b>23</b>
16.1.	Pre-flight Inspection .....	23
16.2.	After first 25 flight hours or after each new installation .....	24
16.3.	After 100 flight hours .....	24
16.4.	Medium Repair .....	24

---

16.5.	Overhaul .....	24
<b>17.</b>	<b>Airworthiness Limitations .....</b>	<b>25</b>
<b>18.</b>	<b>Special Inspections .....</b>	<b>26</b>
<b>19.</b>	<b>Repairs .....</b>	<b>27</b>
19.1.	Blade Repairs .....	27
19.2.	Repairs of Propeller Hub and Metal Parts .....	28
19.3.	Repairs of Propeller Spinner .....	28
19.4.	Replacement of Polyurethane Protective Tape .....	28
<b>20.</b>	<b>Troubleshooting .....</b>	<b>30</b>
<b>21.</b>	<b>Warranty Conditions.....</b>	<b>31</b>
21.1.	Warranty Period .....	31
21.2.	Warranty Conditions .....	31
21.3.	Responsibility .....	31
21.4.	Honoring the Claim .....	31
	<b>WARRANTY CERTIFICATE.....</b>	<b>32</b>
	<b>KW-30 PROPELLER.....</b>	<b>33</b>

## 1. List of Valid Pages

Page	Revision	Date	Page	Revision	Date
<b>1</b>	4	30.03.2022	<b>24</b>	2	31.05.2018
<b>2</b>	4	30.03.2022	<b>25</b>	4	30.03.2022
<b>3</b>	4	30.03.2022	<b>26</b>	3	08.04.2020
<b>4</b>	4	30.03.2022	<b>27</b>	2	31.05.2018
<b>5</b>	4	30.03.2022	<b>28</b>	3	08.04.2020
<b>6</b>	3	08.04.2020	<b>29</b>	2	31.05.2018
<b>7</b>	0	21.01.2014	<b>30</b>	0	21.01.2014
<b>8</b>	0	21.01.2014	<b>31</b>	2	31.05.2018
<b>9</b>	4	30.03.2022	<b>32</b>	0	21.01.2014
<b>10</b>	4	30.03.2022	<b>33</b>	1	11.08.2014
<b>11</b>	2	31.05.2018	<b>34</b>	0	21.01.2014
<b>12</b>	4	30.03.2022	<b>35</b>		
<b>13</b>	4	30.03.2022	<b>36</b>		
<b>14</b>	0	21.01.2014	<b>37</b>		
<b>15</b>	1	11.08.2014	<b>38</b>		
<b>16</b>	1	11.08.2014	<b>39</b>		
<b>17</b>	4	30.03.2022	<b>40</b>		
<b>18</b>	0	21.01.2014	<b>41</b>		
<b>19</b>	0	21.01.2014	<b>42</b>		
<b>20</b>	2	31.05.2018	<b>43</b>		
<b>21</b>	0	21.01.2014	<b>44</b>		
<b>22</b>	0	21.01.2014	<b>45</b>		
<b>23</b>	2	31.05.2018	<b>46</b>		

## **2. Revision List**

Changes to this manual are done by means of revisions and may only be made by the manufacturer.

The revisions shall be recorded in the table below.

New or revised text on a revised page will be marked by a black vertical line on the right side of the page. The date and number of the revision will be recorded on the bottom edge of the revised page.

<b>Revision</b>	<b>Date of the revision</b>	<b>Revised pages</b>	<b>Date of insertion</b>	<b>Signature</b>
<b>1</b>	11.08.2014	4, 5, 12, 15, 16, 33		
<b>2</b>	31.05.2018	4, 5, 9 - 12, 17, 20, 23, 24 – 29, 31		
<b>3</b>	08.04.2020	1 - 6, 12, 13, 17, 25, 26, 28		
<b>4</b>	<b>30.03.2022</b>	<b>1 – 5, 9, 10, 12, 13, 17, 25</b>		

### **3. Introduction**

Read this manual carefully before putting the product into service to get basic information on operational safety.

If you do not understand the contents or if in doubt, always contact propeller manufacturer – Woodcomp Propellers s.r.o.

We wish you many pleasant flights with Aleš KŘEMEN – WOODCOMP propellers.

### **4. Manufacturer**

#### **Woodcomp Propellers s.r.o.**

Vodolská 4, Dolíněk  
250 70 Odolena Voda  
Czech Republic

Legal form: Limited Liability Company, registered in the Trade Register maintained by City Court in Prague, section C, file 80616

Company ID: 018 93 351

VAT No: CZ01893351

Phone: +420 283 971 309

e-mail: [info@woodcomp.cz](mailto:info@woodcomp.cz)

<http://www.woodcomp.cz>

### **5. Type Certificate Holder**

#### **Ales KREMEN Company**

Vodolská 4, Dolíněk  
250 70 Odolena Voda  
Czech Republic

Legal form: Natural person authorized to perform business according to Law on Entrepreneurship, registered in the Trade Register maintained by City Court in Prague, section A, file 58514

Company ID: 279 52 428

VAT No: CZ6006101046

Phone: +420 283 971 309

Email: [info@woodcomp.cz](mailto:info@woodcomp.cz)

<http://www.woodcomp.cz>

## 6. Serial Number

Please state the correct type designation and serial number of the propeller each time you contact the manufacturer.

These data are specified on the first page of this User Manual, on Warranty Certificate and on Product plate fixed on the propeller blade No. 1

## 7. General Information

KW-30 propellers are reliable and field tested in long lasting operation, however problems might occur as with any product.

Although it is impossible to eliminate all the risks involved just by reading the manual, they can be minimized by applying the information presented here in this manual to allow proper use and operation of the propeller.

Information and descriptions in the manual are valid at the time of the publication. Users of Aleš Křemen propellers may be informed about changes or mandatory measures by publication in the form of service bulletins at Woodcomp Propellers website (<http://www.woodcomp.cz>).

Illustrations in this manual are for information only and do not replace drawings in technical documentation.

Technical data are specified in SI metric system.

The manual may be translated from Czech to any other language, but the original Czech text will held decisive validity.

## 8. Operational Safety



**This propeller is subject to approval by aviation authorities, and is always operated on users' own risk!**

**Aerobatics and intentional spins with this propeller are prohibited!**

- ❖ Only use propeller on engine and aircraft combination recorded in the Propeller Log Book.
- ❖ Do not over speed the propeller to higher than maximum permitted rpm, with the exception of emergency procedures stated in Chapt. 14.10.
- ❖ Do not start the engine manually by turning the propeller.
- ❖ Pulling/pushing the aircraft using the propeller is only possible when holding the propeller at the blade root part near to the hub.

- ❖ Before starting the engine, always check the condition of propeller and its assembly.
- ❖ Before starting the engine, always ensure that the propeller and its surroundings are clear.
- ❖ Record all data concerning propeller operation and repairs in the Propeller Log Book.
- ❖ Do not transport nor store the propeller standing on blade tips, even for short period of time!
- ❖ Do not store the propeller in extremely damp environment, and do not leave it outside in rain for extended periods.

## **9. Propeller Properties**

Hydromechanical propellers KW-30 family are equipped with an automatic rpm governor (Constant Speed Propeller). This concept allows best possible use of engine power while offering much better comfort in cruising.

Propeller governor ensures automatic control of engine rotational speed (boost pressure must be within the range recommended by the engine manufacture) to keep propeller speed constant, regardless of changes in cruise speed, descent, turbulence, and flight manoeuvres, all without pilot's control. Maximum permissible rpm of the engine and propeller will not be exceeded.

ConstantSpeed propeller features a short takeoff run, high rate of climb to reach the desired flight level, low fuel consumption for the flying range or endurance demanded, and the possibility of a quick change to the maximum flight speed. The propeller also improves aircraft's service ceiling.

Constant speed propeller protects the engine from damage caused by mishandling during operation.



## **10. Technical Description**

KW-30 family of propellers is designed for aircraft with piston engines up to 117kW (160HP), coupled with reducing gearbox, pressure oil distribution system and with a pad for governor installation.

KW-30 propellers are of hydro-mechanical design. Control is exerted by a hydraulic governor, which increases oil pressure when the propeller speed goes up (“increase” type). Pressurised oil flows through the propeller shaft into the propeller hydraulic cylinder where it acts on the piston, which is connected to the pitch-change mechanism and increases blade pitch angle. When the propeller speed goes down the governor lowers oil pressure, which causes the blades to move to lower pitch. Down pitching of blades is ensured by mass and aerodynamic effects acting on them and by springs. In order to increase down pitching forces, some propeller variants may be equipped with additional weights mounted on the blade ferrules.

In the rest position (without oil pressure), propeller blades are set to the fine pitch, which can be adjusted by an adjustable mechanical stop.

The propeller hub and other load carrying parts are made from aluminum alloys.

Blade root is inserted into aluminum ferrule, and secured by steel screws with special fine thread. Blade outboard leading edges are protected against damage with a layer of cast polyurethane or optionally by stainless steel sheaths, their inboard part (near the propeller centre) with a self-adhesive wear resistant tape

Blade assembly can rotate in two axial needle-type bearings and is secured to the hub by a large retention nut.

Composite spinner is also a part of the propeller.

### 10.1. Product Label

Propeller blade No. 1 bears a label, containing the following information:

- Manufacturer's name
- Propeller type designation
- Propeller serial number

	Woodcomp Propellers s.r.o. Czech Republic <a href="http://www.woodcomp.cz">www.woodcomp.cz</a>	CZ 21G.0055 CZ 145.0082
Manuf. <b>WOODCOMP PROPELLERS</b>	TCDS	<input type="text"/>
Model	<input type="text"/>	S / N <input type="text"/>
Date	<input type="text"/> WO <input type="text"/>	<input type="text"/> P / N <input type="text"/>

Where:

TCDS - Type authorization number (EASA.P.177)

Model - Propeller variant (např.: KW-30-A-H-3-0-0-F/LP-173-033)

S/N - Propeller Serial Number

Date - Date of manufacture (MM/YY)

WO - Work Order number

- Abbrev. NEW – New product; OH – Overhauled; REP – Repaired;
- INSP – Inspected/Tested; MOD – Modified

P/N - Propeller Part Number e.g. C-4012-00

Each installed propeller blade bears manufacturing label, containing the following information:

<b>BLADE</b>	.....
<b>Pos.</b>	<b>S/N</b> .....
<b>HUB</b>	.....

Where:

BLADE -Type of blade (Part Number)

Pos. - Position within propeller hub

S/N - Propeller blade Serial Number

HUB - Propeller Serial Number

## 10.2. Propeller Designation System

HUB
/
BLADES  
**KW – xx – ( ) – ( ) – ( ) – ( ) – ( ) – ( ) / ( ) – ( ) – ( )**  
 1    2    3    4    5    6    7    8    /    9    10    11

## 10.3. The Hub

- |          |  |   |
|----------|--|---|
| <b>1</b> | KW   | Propeller Type  |
| <b>2</b> | Propeller Model  | Number of propeller model   |
| <b>3</b> | Code letter for propeller category:                                      | A - Automatic Propeller<br>F - Fixed Pitch Propeller<br>G - Ground Adjustable Propeller<br>V - Variable Pitch Propeller |
| <b>4</b> | Code letter for blade pitch change system:                               | H – Hydraulic<br>E – Electric<br>M – Mechanical   |
| <b>5</b> | Number of blades installed   |   |
| <b>6</b> | Code letter for feathering system:                                       | F – Feather position installed<br>0 – No feather position possible  |
| <b>7</b> | Code letter for reverse provision:                                       | R – Reverse position installed<br>0 – No reverse position possible  |
| <b>8</b> | Code letter for flange type listed in Aleš KŘEMEN Service Bulletin No. 4 |   |

## 10.4. Blades

- |           |   |  |
|-----------|---|--|
| <b>9</b>  | Code letter for blade design and installation:  | R - Right-hand tractor<br>RP - Right-hand pusher<br>L - Left-hand tractor<br>LP - Left-hand pusher |
| <b>10</b> | Propeller diameter in v cm  |  |
| <b>11</b> | Blade type identification (contains design configuration and aerodynamic data) according to the certified hub/blade-combinations. |  |

## 11. Basic Performance Data

<b>Propeller model</b>	<b>KW-30</b>				
<b>Number of blades installed</b>	<b>3</b>				
<b>Blade type</b>	- 031 („W“)	- 033 („C“)	- 034 („B“)	- 037 (“WA”)	- 038 (“WA”)
<b>Diameter ± 4mm</b>	Right:1744 Left: 1720	1732	1752	1950	1950
<b>Min. angle setting</b>	5°				
<b>Max. angle setting</b>	50°				
<b>Max. engine power output</b> N <sub>max</sub> - (HP / kW)	141 / 104			160/117	
<b>Max. propeller RPM – n<sub>max</sub></b>	2550			2300	2283 continues 2323 max 3min 2441 max 1min
<b>Temperature Service Rate</b>	-25°C / +45°C				
<b>Moment of mass inertia</b> (kg m <sup>2</sup> )	0,6			0,94	0.9
<b>Mass of complete propeller</b>	~ 11			~ 13	~ 12
	acc. to type of blades and spinner				
<b>Mass of Jihostroj governor</b> (kg)	0,90				
<b>Lifetime</b>	Propeller lifetime is not specified if every mandatory periodical inspection is performed in specified intervals				

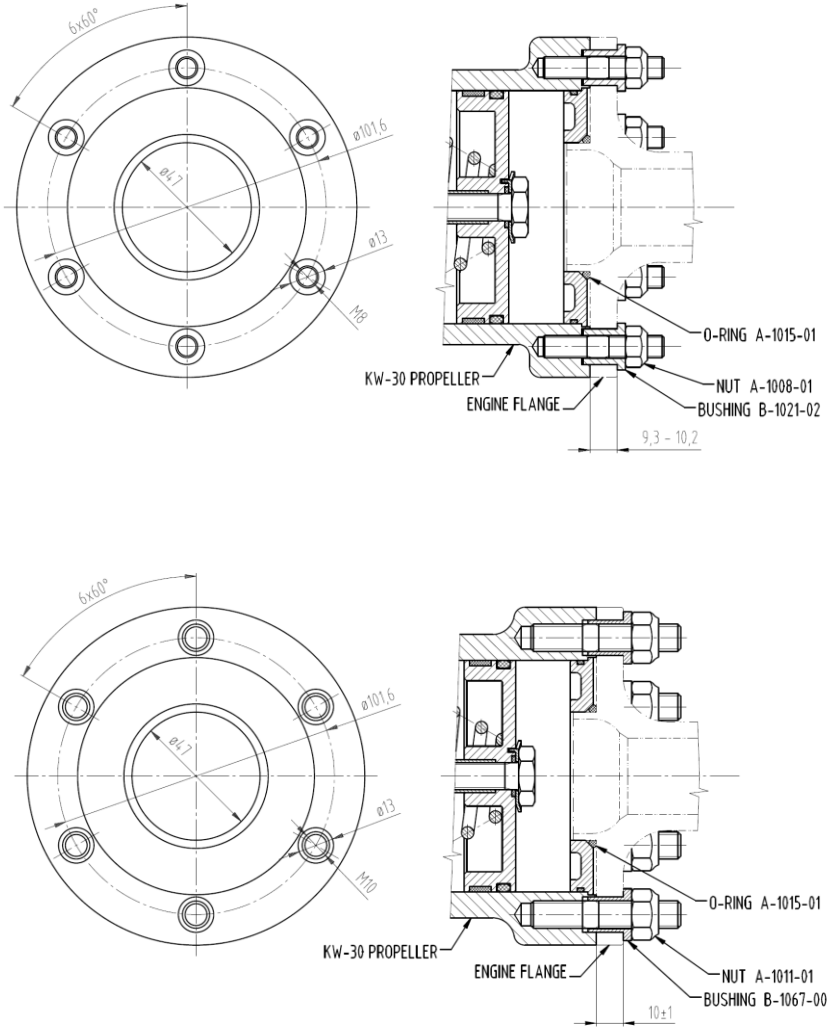
To be compatible with KW-30 propeller the aircraft engine must be equipped with:

- Reducing gearbox with governor drive pad,
- Propeller shaft supplying pressure oil to the propeller,
- Hydraulic governor\*,
- Governor control from cockpit.

\* List of operationally validated governors is provided in Aleš Křemen Service Bulletin SB No. 03 in the current version.

## 12. Connection of KW-30 Propeller to Engine

### 12.1. Propeller flange dimensions



Dia. 13mm holes on dia. 101.6mm circles are used to attach KW-30 propeller.

### 13. Propeller Unit set-up

Propeller unit consists of a propeller and a governor. Connection between the governor and pilot is part of aircraft fuselage installation, it can differ in each particular case, and as such, is not detailed in this text.



**Adjustment of propeller unit by persons not authorized by the manufacturer is strictly prohibited.**

Although the adjustment of propeller unit on aircraft is simple, improper modification of settings may be dangerous to propulsion unit and operational safety.

#### 13.1. Adjustment before First Flight

This chapter discusses propulsion unit setting before the first flight of new aircraft and/or after a replacement or repair of the propeller, or its governor.

The manufacturer supplies units already factory-adjusted and ready for installation on to aircraft. Simply fit the unit, bleed the air, and conduct pre-flight tests followed by test flight pilot/technician.

Propeller unit must be set correctly to work properly and to be “fail safe”. KW-30 propeller units, i.e. the propeller with the governor, is reliable; however, regulations for standard category aircraft, according to which this propeller unit is built, require that a plane should be able to fly, albeit with limited flight envelope, even after the propeller control has been damaged. This effectively means that the plane must be able to keep flying in the case when its propeller remains fixed at the minimum pitch (take-off position) while the governor is off, if the propeller remains fixed at maximum pitch angle, and also when it becomes stuck in any position in-between.

The regulations also require that the propeller unit must not require any pilot intervention (change of controls set before the takeoff) during takeoff and initial climb phases of the flight.

To meet these requirements, the propeller unit has a number of setting elements. All speed and angle settings are determined by the manufacturer. You should require these to be changed, always consult the issue with the manufacturer.

### 13.1.1. Propeller Governor Adjustment

Governor maximum speed is the only setting to be made. Minimum governed speed is determined by governor design, and usually these are 50-60% of maximum speed. In case of failure of pilot-governor control link, the governor will set takeoff regime (fine pitch) automatically.

#### Adjustment procedure:

1. Loosen propeller fine pitch stop (self locking nut) by 2 turns, this moves piston rod deeper inside the propeller. This nut is located at front part of the hub, and as such it is accessible after removal of aerodynamic spinner.

This adjustment of the moment when propeller governor actually starts to reduce engine speed allows you to adjust lower maximum speed allowed by the governor.

2. Start the engine.

3. Slowly and carefully increase the power output of the engine by acting on the gas lever, while observing the engine rpm.

The engine speed will go up to 5730 to 5750rpm (ROTAX 912 engine). Speed increase should stop at this moment.

If the speed settles at lower rpm than given above, stop the engine and adjust the lever stop of the governor speed selector so as to extend the lever movement in the direction in which it is pulled by the return spring.

If the speed increases above this value, shorten the lever travel by adjusting the stop.

4. Repeat steps 2 and 3 until you reach desired maximum governed speed.

5. Secure governor speed selector lever stop.

### 13.1.2. Propeller Fine Pitch Angle Stops Adjustment

This adjustment is performed after governor adjustment (see Chapter 13.1.1 above) as follows:

1. Screw in propeller fine pitch stop nut by 2 turns. (This moves piston rod out of the propeller.)

2. Check that the governor speed selector remains in the takeoff position, i.e. on the stop to which it is pulled by the return spring.

3. Start the engine.

4. Increase engine power output up to its maximum.

Rpm must increase smoothly, up to full throttle without governor intervention. At full throttle, rpm must be lower than the maximum allowed by propeller manufacturer.

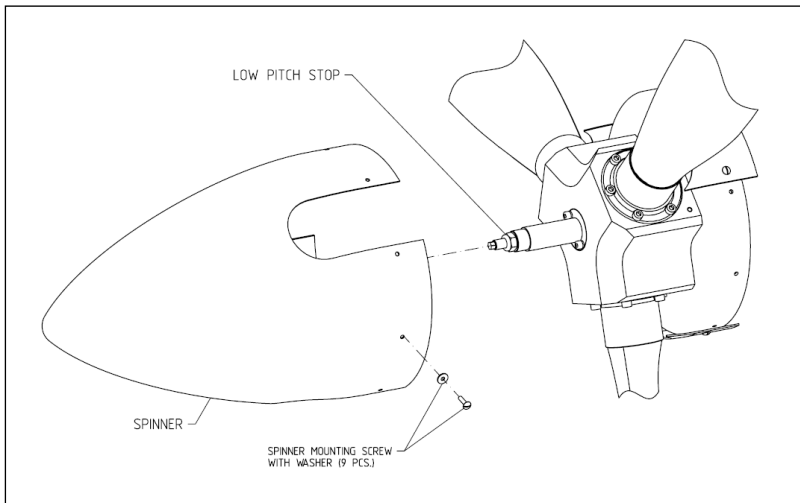
If not specified by the aircraft manufacturer different it is recommended to set the nut so as to obtain the speed less by approximately 20rpm than the governor setting. In planes climbing at higher velocity (ca 110 - 120km/h), this engine should reach about 120 - 150rpm less.

If you need lower rpm, tighten propeller fine pitch stop nut. Loosen it to obtain higher setting.

5. Repeat steps 2 to 4 until you reach desired governed speed.
6. Install spinner back onto propeller. Position spinner so that the red dot on the spinner external surface meets the red dot on the backplate (withal blade No. 1). Fasten the spinner using 9 screws and washers, with Loctite 243 applied.

**Remark:**

Propeller adjustment must be performed with clean propeller blades, as any soiling (e.g. insects) influences its aerodynamic properties, leading to the misadjusted of fine pitch stop. Do not adjust the propeller at strong winds or gusts. It is not recommended to set the propeller at extreme temperatures.



Fine (low) pitch stop location



## **14. Operation Instruction**

### **14.1. Mounting propeller on engine**

1. Put an oil pan underneath the engine to contain the oil which may escape from propeller reducer shaft or from the propeller servo-system.
2. Check flange contact surfaces of reducer shaft and propeller and clean them to make sure they are dry and rust free.
3. Fit centring bushings (dia 13mm) into six flange holes at reduction gearbox side.
4. Put rubber sealing O-ring P/N A-1015-01 onto 47mm centering piece. It is recommended to use new O-ring at each assembly.
5. Check that the aerodynamic spinner holding plate is mounted on the propeller hub.
6. Mount propeller on flange and fix it using six self-locking nuts P/N A-1008-01, resp. A-1011-01; torque the nuts to 22Nm (M8 nuts) resp. 43Nm (M10 nuts).
7. Start the engine and perform engine test according to Chapter 14.2; observe the joints to ensure that oil is not leaking.
8. Perform propeller unit adjustment according to the Chapter 13.1.1 and 13.1.2 when necessary.
9. Install spinner back onto propeller. Position spinner so that the red dot on the spinner external surface meets the red dot on the backplate (withal blade No. 1). Fasten the spinner using 9 screws and washers, with Loctite 243 applied.

### **14.2. Starting engine and performing engine test**

Always observe the following procedure:

1. Check propulsion unit according to its manufacturer's instructions.
2. Check propeller integrity.
3. Set speed selector to the takeoff regime, i.e. to the fine pitch. This position of the speed selector corresponds to maximum rpm of propulsion unit.
4. Start the engine.

After starting the engine, the propeller will achieve its idle speed. Observe engine warm-up instructions and gradually increase the speed using throttle lever. Propeller remains at the fine blade pitch stop; the governor usually does not intervene. It may intervene if weather conditions differ considerably from standard and near engine's maximum power output. Under standard conditions ROTAX 912 engine will run at 5400 to 5500rpm depending on the plane type, with the governor limiting the speed at 5730 to 5750rpm.

#### 5. Bleed the control system

If engine test is carried out after installation of new propeller, after oil change, or after a long period when the propeller was out of operation, it is necessary to bleed propeller control system. To carry out bleeding, set full throttle and set speed selector to maximum propeller speed (same position as when warming up engine). Then, move the selector gently toward lower propeller speed, i.e. toward higher pitch. When the propulsion unit speed decreases by 50–100rpm (without any manipulation with throttle lever), put the selector back to maximum speed position. Repeat these steps five times.

It is a serious mistake to decrease propeller speed further toward minimum value during this procedure, as the blade angle will become too high for this regime and the blades operate at too high pitch. The propeller will withstand this mishandling, but its life will be shortened.

Presence of air in the control system translates to “softness” of constant speed during flight, but this should disappear as soon as the propeller will finish the bleeding process.

#### 6. Verification of governor function

During engine test, which is part of normal operation of aircraft, it is not necessary to bleed the system. Checking the operation of control system will suffice. The method is the same as during bleeding process; simply check the rpm dropping and recovering once.

### **14.3. Taxiing**

Leave the speed selector in takeoff position i.e. fine pitch and maximum speed during taxiing. Control the aircraft velocity using throttle lever or brakes, as necessary. Propeller speed will be controlled by throttle lever and with governor not intervening.

### **14.4. Take Off**

Set full throttle and keep the speed selector in the takeoff position. As the plane speeds up during takeoff run and initial climb, the propulsion unit rpm rises automatically till it reaches maximum value set by the governor. Then the governor intervenes, keeping rpm constant.

### **14.5. Horizontal Flight**

Constant speed propeller offers the most economical operation in the horizontal flight – minimum fuel consumption for a given range or endurance.

## 14.6. Aircraft Manoeuvres and Turbulence

The propulsion unit keeps the set speed without pilot's intervention.

## 14.7. Maximum speed

The governor will protect the engine from overspeeding up to aircraft's never exceed speed plus a small safety margin ( $V_{NE}$ ).

## 14.8. Landing

During landing, speed selector must be set to takeoff position no later than after the final turn. This makes the recovery of speed and height too low easier in these critical situations (wrong landing calculation, obstacle on runway). You need not to be afraid of fast opening engine throttle from idling to maximum power, as the governor will protect the propulsion unit from overspeed.

## 14.9. Stopping the Engine

Before stopping the engine, set speed selector to takeoff position and keep it in this position when not airborne, as well.

## 14.10. Emergency Procedures

KW-30 propellers are reliable, but the possibility of failure can never be completely eliminated, all pilots must know correct procedures to allow safe completion of the flight in case of a failure.

Propeller governor failure usually results in blocking of certain propeller pitch between the stops or at one of the stops. Propeller then effectively becomes fixed-pitch propeller. In this case, propulsion unit can only be controlled by throttle lever. The other type of failure includes loss of control stability due to e.g. impurities in oil entering the governor or the propeller. Depending on the position in which the blades have locked and depending on the flight regime, the pilot should act as follows:

### A) Propeller blades locked in fine pitch range

The failure is indicated by increased rpm at flight speeds higher than the optimum climb speed.

If this failure occurs before or during takeoff or initial climb, it will go unnoticed and takeoff will be completed as normal. The pilot will notice this failure as the aircraft levels off, gains speed and the engine starts overspeeding.

It is necessary to reduce the speed to aircraft's optimum climb speed. At lower speeds, engine's entire performance envelope can be used.

If this failure occurs at high cruise speeds, the engine rpm may increase considerably. The pilot should react by quickly closing throttle, to idle position if possible, and wait for the

speed to drop to optimum climb speed, then open throttle again and continue flying at lower speed.

In both cases described above, slightly increased engine speed is tolerable for short time period, if necessary.

**Continue flying to nearest location suitable for precautionary landing.**

### **B) Propeller blades locked in high pitch angle**

The failure is indicated by reduced rpm which can only be compensated by opening engine throttle. Pilot should increase engine power and if flight level allows it, descend to increase speed. Gaining sufficient speed is absolute priority. Propulsion unit is capable of maintaining level flight in this condition, and slow climb as well, at appropriate speeds. Consider your landing approach thoroughly, as "go around" may be impossible depending on many factors (wing equipment and/or landing gear in landing configuration).

**Continue flying to nearest location suitable for precautionary landing.**

### **C) Loss of control stability**

This failure is indicated by fluctuating speed of the propulsion unit. Speed control should be quickly set to maximum rpm position, and engine power reduced to value sufficient for safe completion of current manoeuvre. This will reduce governor's workload.

**Continue flying to nearest location suitable for precautionary landing.**

## **15. Transport, Handling, Storage**

### **15.1. Propeller Delivery**

Propeller is delivered complete, with a governor, attachment hardware, and necessary documentation.

### **15.2. Handling**

Propeller must be handled very carefully, to prevent damage, including e.g. damage by impact.

When transporting disassembled propeller, blades must be protected by cloth covers. For safer transport, we recommend to place propeller into solid box (cardboard, plywood). Compete propeller must be transported in horizontal position with the hub supported.

### **15.3. Storage**

During storage, blades must be protected by cloth covers. Before long-term storage, we recommend to clean propeller body and blades with lukewarm water and detergent.

Compete propeller must be stored in horizontal position with the hub supported, or hanged by attachment holes.

Storage condition: temperature 5° to 25°C, relative humidity up to 80%.



**It is prohibited to store and/or transport the propeller standing on blade tips – even for short time!**

### **15.4. Transport**

Propeller is always delivered in special carton package, which may be used to return the propeller to manufacturer or authorized service centre for service inspections.

Note:

When sending propeller for overhaul, it may only be sent disassembled provided that disassembly was performed by authorized service centre.

### **15.5. Responsibility for Transport**

When standard packing recommended by the manufacturer is used to transport the propeller, the manufacturer bears responsibility for proper packing at manufacturing plant, up to acceptance of the package by the transport company, which takes over the responsibility afterwards.

Customer must always check that propeller packing is undamaged on receipt of the package from the transport company.

If packing is damaged on receipt, unpack the product in presence of the transport company representative, observe, record, and/or claim the damage.

## 16. Inspections

Mandatory inspections must be performed by the manufacturer or a service centre authorized to perform aircraft maintenance according to the internationally valid regulations (EASA, FAA, etc.) – “Authorized service centre” in the following text, in the intervals specified below:

Chap.	Type of inspection	Operating hours	Performed by
16.1	Pre-flight inspection	Before each flight	Pilot or designated mechanic/technician
16.2	Check tightening the fastening bolts/nuts	After 25 operating hours from each new installation to the engine	Aircraft engineer (AML ICAO, AML Part 66, etc.)
16.3	On-aircraft periodical inspection	Each 100 op. hrs / 1 year <sup>1)</sup>	Maintenance organization of the aircraft with the certified propeller
16.4	Medium repair	See Chap. 16.4	Propeller manufacturer or Authorized service centre
16.5	Overhaul	Service Bulletin No. 01	Propeller manufacturer or Authorized service centre
18	Exceptional	Special inspections	Propeller manufacturer

<sup>1)</sup> Whichever occurs first



**CAUTION**

**Each inspection must be recorded in Propeller Log Book.**

### 16.1. Pre-flight Inspection

Perform visual check before each flight:

- Tightening of all screws;
- Attachment of propeller to engine flange;
- Condition of blades, leading and trailing edges. Condition of blade roots at connection to propeller hub;
- Condition of propeller spinner, attachment to propeller.

Defects, if discovered, must not exceed the scope detailed in Chapter 19.

On discovering unacceptable defects, stop using the propeller immediately and send the propeller for repair to manufacturer or authorized service centre!

### **16.2. After first 25 flight hours or after each new installation**

Check tightening torque of flange nuts. Use torque wrench with valid calibration.

### **16.3. After 100 flight hours**

Perform actions described by TN-30 technological process.

The 100 hours inspection is performed after each 100 hours of operation or as a part of each one-year aircraft inspection - whichever occurs first.

The 100 hours inspection may be performed by the Authorized maintenance organization of the aircraft including the propeller installed.

### **16.4. Medium Repair**

Medium Repair is performed when half of the established operational hours or calendar interval of Overhaul (TBO) is met –whichever occurs first.

Medium Repair may only be performed by the manufacturer or an Authorized service centre.

### **16.5. Overhaul**

The time between overhauls (TBO) of the KW-30 propellers is established by Service Bulletin No. 01 in the current wording (see [www.woodcomp.cz](http://www.woodcomp.cz)).

Overhaul may only be performed by the manufacturer or an Authorized service centre.



**Without mandatory inspections being regularly performed,  
the propeller is not airworthy and must not be used.**



## **17. Airworthiness Limitations**

**This Airworthiness Limitations Section (ALS) is EASA approved in accordance with Part 21A.31(a)(3) and CS-P40(b). Any change to mandatory replacement times, inspection intervals and related procedures contained in this ALS must also be approved.**

## **18. Special Inspections**

Special inspections are necessary when:

- When major damage to blade by impact of foreign object (stone, bird, hail, etc.) is detected
- In case of careless or prohibited handling;
- In case of propeller overspeeds specified for particular configuration, by more than 150rpm not exceeding max. 30sec;
- In case of lighting strike;
- In all cases of operating the propeller outside the conditions/ranges stated in this manual.

Special inspections may also be required e.g. when installing propeller on other engines than those approved in Service Bulletin No. 4.

Special Inspections can be performed only by the propeller manufacturer.



**WARNING!**

**Damage to the propeller is more dangerous than damage to the engine!**

## 19. Repairs

This chapter describes repairs of small damages which may be performed by the user. Description of damage and method of repair must be recorded in the Propeller Log Book.



### **WARNING!**

**More serious damage can only be repaired by the manufacturer**

### 19.1. Blade Repairs

Only small dents and cuts on the blade surface or leading edge may be repaired. In case of any doubt about blade condition contact the manufacturer or authorized service centre.

#### **Blade surface:**

Maximum permitted depth of damage to suction or pressure side of blade is 0.7mm. Surface area of single repaired spot must not exceed 0,5cm<sup>2</sup>

Maximum permitted depth of damage to trailing edge is 2mm, repaired locations must be farther than 80mm away from each other, and must not be longer than 15mm.

Pay special attention on leading edge or trailing edge damage. Such damage may cause penetrating of moisture to wooden core and must be repaired as soon as possible.

#### **Repair procedure:**

1. Clean and dry the location.
2. Use fine file or sandpaper to prepare the location.
3. Fill the location with epoxide filler.
4. Let cure and grind to blend with the surroundings.
5. Apply polyurethane paint to repaired location.

Hairline cracks of the top surface are permitted when located in the gelcoat layer. In the case of fast development (growing) into the composite skin stop the propeller operation immediately and contact the manufacturer or an authorized service centre.

#### **Polyurethane leading edge sheath**

Maximum permissible depth of damage is 2 mm providing that the repaired locations are minimum 80 mm far away each from each other and do not exceed 15 mm of length each. No cracks in the sheath are permitted. The sheath must always be well glued along its whole length.

The sheath repair shall be done only by means of grinding or using a fine file to make smooth transition between the damaged location and surrounding area. No filling of damaged location using any material is permitted.

### **Stainless steel leading edge sheath**

Maximum permissible depth of damage of the stainless steel sheath is 1 mm providing that repaired locations are minimum 80 mm far away each from each other and do not exceed 5 mm of length each. The sheath must not be pierced and no cracks in the sheath are permitted. The sheath must always be well glued along its whole length.

Repairs of the stainless leading edge sheath are prohibited.

### **19.2. Repairs of Propeller Hub and Metal Parts**

Repairs of propeller hub and metal parts are strictly prohibited!!

### **19.3. Repairs of Propeller Spinner**

Only small surface cuts on outside surface not deeper than 0.5mm may be repaired.

#### **Repair procedure:**

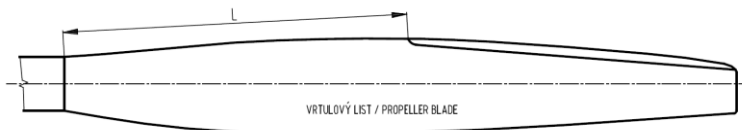
1. Clean and dry the location.
2. Use fine file or sandpaper to prepare the location.
3. Apply polyurethane paint to the dent/cut.

### **19.4. Replacement of Polyurethane Protective Tape**

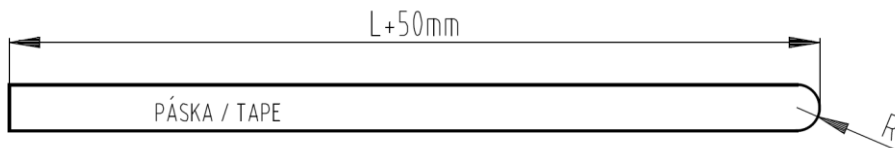
Use only the tape provided or specified by the propeller manufacturer only, see the illustrated catalogue of parts IPC KW-30.

#### **Replacement procedure:**

1. Carefully remove old tape (slightly heat the tape using hairdryer).
2. Clean the surface from dust and oil. The rest of glue carefully remove using acetone or MEK (methylethylketone).
3. Measure the distance from the root section to the leading edge sheath (polyurethane or stainless steel).



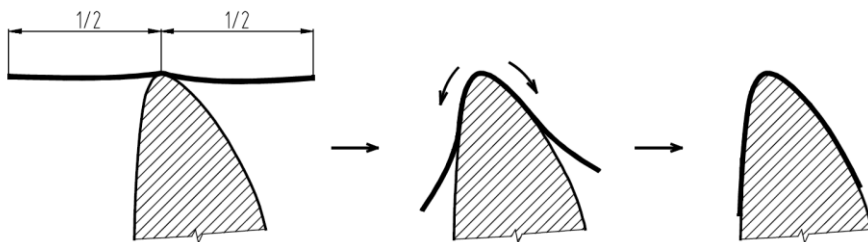
4. Prepare a piece of the self bonding protective tape approximately 50 mm longer than the measured length. Finish one end of the tape by radius.



5. Carefully remove backing tape from the new tape, taking care not to touch/soil the glue surface. The end with the radius shape shall be oriented in the blade tip direction and glued approximately 10 mm over the sheath (polyurethane or stainless steel). Cut the opposite end of tape in line with the rim of the blade sleeve.



6. Apply tape to prepared blade surface. Use plastic spatula to force out air bubbles, or puncture the tape by a pin, and press out air using a roller or finger pressure. Do not use a blade or razor to cut the tape!!



7. Do NOT operate the propeller for 24 hours from applying the tape, when the glue is fully cured.

## 20. Troubleshooting

If you cannot solve a problem according to the following instructions, contact the manufacturer or an authorised service centre.

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Propeller vibrates	Propeller damaged	Check propeller and its accessories visually. Repair damage or contact manufacturer
	Wrong propeller installation	Check propeller-to-engine proper installation. If defect is found, reinstall propeller or contact manufacturer
	Unbalanced propeller	Dismantle, check balance or have the propeller balanced by manufacturer
	Defective engine	Follow instructions provided by engine manufacturer
Speed fluctuation	Defective propeller	Contact propeller manufacturer
	Defective governor	Contact governor manufacturer
	Defective engine	Contact engine manufacturer
Oil leak between engine flange and propeller	Defective sealing ring	Change sealing ring according to chapter 14.1. - item 4.
Oil leak from other propeller parts	Defective propeller	Contact propeller manufacturer
When on ground, propeller does not return to small pitch angle or returns slowly	Passive forces of servo mechanism	If this only happens with propelleris on ground without airplane forward motion, there is actually no problem. When the plane sets into motion, the blade setting moment will increase to a sufficient value. If this does not happen, contact the manufacturer.

## **21. Warranty Conditions**

### **21.1. Warranty Period**

The manufacturer accepts responsibility for faults of new and unused product for the period of 24 consecutive months from sale to original purchaser recorded in the Warranty Certificate, or for 100 operating hours, whichever occurs sooner.

After 25 operating hours, propeller must be inspected by an aircraft mechanic (AML ICAO, AML Part 66, etc.) approved to perform works on the propeller, who will record the action into the Propeller Log Book, otherwise the warranty becomes void.

Actual operating hours must be recorded to Propeller Log Book and Aircraft Log Book.

No unauthorized works or modifications in conflict with the approved airworthiness state of the propeller may be performed, otherwise the warranty becomes void.

The propeller must be operated according to manufacturer's instructions and provision of this User Manual.

### **21.2. Warranty Conditions**

The user must present the manufacturer with completed Propeller Log Book and stamped/signed Warranty Certificate, along with proper records of propeller installation and operation.

### **21.3. Responsibility**

The warranty does not cover possible secondary damages.

All legal relationships resulting from purchase of the propeller by the user, from services provided by the manufacturer during maintenance, and also all legal relationships resulting from propeller operation, especially those resulting from responsibility for propeller faults, responsibility for damages, and remuneration of property and other damages related to propeller operation, propeller accident, and related events, will be assessed according to Czech law, and will be decided according to it by applicable court in the Czech Republic.

### **21.4. Honoring the Claim**

Faulty product will be assessed by the manufacturer within the warranty period, and if claim is accepted, faulty parts will be replaced with new ones, with parts and work free of charge. Original replaced parts become property of the manufacturer.

## **WARRANTY CERTIFICATE**

**Manufacturer:**

**Woodcomp Propellers s.r.o.**  
Vodolská 4  
250 70 Odolena Voda  
Czech Republic

**Propeller Type-Model: KW-30**

**Variant:**

**Type Certificate: EASA.P.177**

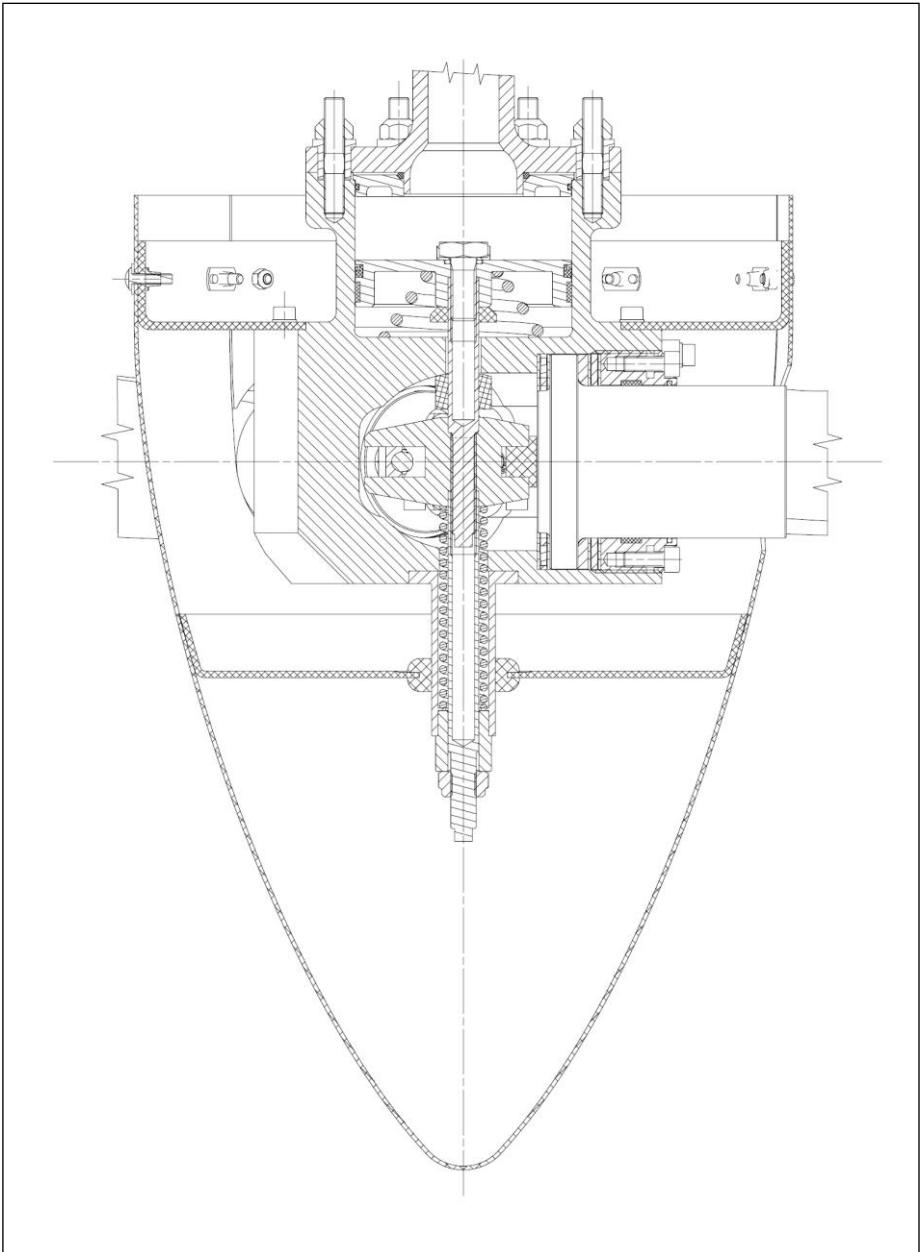
**Serial Number:**

**Date of Sale:**

**Supplier's Stamp and Signature:**

Product warranty is subject to warranty conditions listed in Chapter 21 of this User Manual.



**KW-30 PROPELLER**

This page intentionally blank