



Propeller Operator's Manual **FP02-80 Propeller**

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PROPELLER OPERATOR'S MANUAL

FP02-80 PROPELLER

Model: Propeller FP02-80

This manual, along with all other applicable instructions for continued airworthiness, includes all of the guidance required to be provided to the operator/owner by applicable regulations. Additional information, deemed necessary by the manufacturer, is also included.

This publication includes the material required to be supplied to the pilot by ASTM F2506

The device must be operated and/or maintained in compliance with information and limitations contained herein.

SCOPE

This manual contains all information needed for the appropriate and safe use of the Pipistrel FP02-80 propeller.

In case of aircraft damage or personal injury resulting from disobeying the instructions in this manual PIPISTREL denies any responsibility.

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**IT IS MANDATORY TO CAREFULLY STUDY THIS MANUAL PRIOR TO USE
OF PROPELLER**

USING THIS MANUAL

The following warnings, cautions and notes can be found throughout this manual. They provide additional information about particular procedures and makes the owner/operator/mechanic aware of any safety hazards.

WARNING: These provide crucial information about things that may cause bodily harm.

CAUTION: These provide information about things that may component damage.

NOTE: These provide information such as tips and hints that aid the mechanic when carrying out a specific procedure.

REVISION TRACKING, FILING AND IDENTIFYING

Pages to be removed or replaced in the Propeller Operator's Manual (POM) are determined by the list of effective pages located in this section. This log contains the page number and revision number for each page within the manual. As revisions to the document occur, the revision number on the effected pages is updated and the page number in the list is highlighted with bold font type. When two pages display the same page number, the page with the latest revision shall be used in the manual.

The revision number on the list of effective pages shall also coincide with the revision number of the page in question. As an alternative to removing and/or replacing individual pages, the owner can also print out a whole new manual in its current form, which is available at www.pipistrel-aircraft.com or can be requested through Pipistrel support.

Revised material is marked with a vertical bar that extends the full length of deleted, new, or revised text added to new or previously existing pages. This marker will be located adjacent to the applicable text in the marking on the outer side of the page. The same system applies to revised figures, tables and any other elements inside this POM. A list of document revisions is located at the beginning of the log of effective pages. Pipistrel is not responsible for technical changes/updates to OEM manuals supplied with the aircraft (eg. radio, transponder, GPS, etc.).

Index of document revisions

Document revision	Reason for revision	Date of issue
A00	Initial release*	3 July 2019
B00	Layout update, propeller dimensions updated, editorial improvements	28 July 2025

NOTE: A change of revision index letter indicates that a major document revision occurred. The document has undergone some significant changes since the previous revision. All pages are revised and all page revision indexes have been reset to the same number. All the changes and amendments introduced into the current revision, however, are marked by a vertical amendment bar so as to highlight the differences between the previous and the current revision of the document.

* this document supersedes Pipistrel ALPHA Trainer wooden propeller operator's manual REV 6 (20th May, 2016)

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CHAPTER 01 – GENERAL

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01-00 PROPELLER DESCRIPTION

The Pipistrel FP02-80 propeller is a fixed-pitch two-blade wooden propeller is primarily used in tractor configuration on the Pipistrel ALPHA Trainer airplane and derivatives. The propeller sizing and pitch is designed to match the engine power curve of the Rotax 912 UL2 80 HP engine and maintain compliance with the LSA performance requirements, when applicable.

Starting May 2016 the supplier of the FP02-80 propeller is Woodcomp Propeller s.r.o., Vodolska 4, 250 70 Odolena Voda, Czech Republic.

This propeller is to be used primarily on the Rotax 912 80 HP series engines and is matched to the ALPHA Trainer series (including Garud) performance envelope.

01-01 MANUFACTURING METHODS

The propeller core is made of laminated wood-composite, then milled, then protected with a thin layer of fibreglass (70 g/sqm grade) and varnished for surface protection, the blade leading edge is protected by an insert. The propeller is fixed to the gearbox hub on the engine by using 6 bolts that pass through the propeller and equalize the pressure via a metal retaining plate.

01-02 TECHNICAL DATA AND OPERATIONAL LIMITATIONS

Propeller designation	FP02-80
Number of blades	2
Propeller diameter	1660 ±15 mm (65.35" ±0.59")
Max blade length difference	5 mm (0.2")
Propeller pitch at 3/4 of prop. radius	14°
Blade width	110 mm (4.3")
Maximum safe propeller RPM (corresponds to 5800 engine RPM)	2555 RPM
WARNING! In the case the propeller is operated at over speed by a value exceeding 5% the maximum (2.684 rpm) rotation speed and not beyond the maximum time of 20 seconds, it must be removed and sent back to the factory for full inspection and corrective procedures.	
Maximum safe engine power (permanent load)	80 HP
Central hole diameter	25.4 mm (1")
Propeller head (hub) bolts & nuts type	M8
Mounting holes' circle diameter	75 mm
Propeller bolt torque	16-18 Nm (11.8 -13.3 ft/lbs)
Maximum temperature limit	80 °C / 176 °F

01-03 PROPELLER CONSTRUCTION

Basic material used for the construction of the propeller is Western Maple wood carefully selected for this special application.

The material is preserved and conditioned according to the specifications of the manufacturer and is continuously tested during curing and storage in order to maintain the quality requirements.

The propeller can be fully or partially covered with different materials (fibreglass, carbon fibre, Kevlar). The propeller is constructed by the "propeller block" method by laminating 7 wood planks together with ureic resin. This lamination is highly resistant to humidity and temperature variations.

The high density laminated construction is ideal to make a propeller lacking any twist and/or fissure defaults. The leading edge is inserted with a blade protection material.

The blade protection covers the leading edge up (about 2/3) to the tip of the propeller. It is protected by an amniopolymer plastic material that is resilient in extreme conditions. It is elastic and can easily withstand the stresses of normal use.

The blade protection strip is attached with polymer material pins fixed into holes made in the wood, it can be replaced by the factory if damaged.

If required, the blade protection strip can be manufactured from structural brass extrusions, fixed onto the leading edge by glue and rivets.

In order to further improve the hardness and rigidity of the propeller, the blade is covered in a fibreglass coating, applied with polyester resin.

This process allows the propeller both superficial hardness and elastics in operation and the blade will be more resistant to stone chips and cracks.

A further benefit of these manufacturing processes is excellent resistance to propeller twist and an increase in dimensional stability.

CHAPTER 02 – HANDLING AND MAINTENANCE

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02-00 INTRODUCTION

This chapter provides information on handling and maintenance of the Pipistrel FP02-80 propeller.

02-01 DELIVERY

On delivery check all parts inside the package for damage which may have occurred during transportation. Included are: propeller (1 pcs), attachments bolts (6 pcs), washers (6 pcs), retaining plate (1 pcs), nuts (6pcs).

02-02 PROPELLER REMOVAL

Step	Action	Required parts, materials and tools	Reference
1	Loosen the nuts tightening the propeller to the engine gearbox.	- ratchet set	
2	Remove the 6 bolts and washers.		
3	Remove the metal retaining plate on the front of the propeller.		
4	Remove the propeller.		

02-03 PROPELLER INSTALLATION

Step	Action	Required parts, materials and tools	Reference
NOTE: The set-up procedure must be completed on an assembled aircraft.		- ratchet set - torque wrench	
1	Place the propeller onto the engine gearbox hub.		
2	Attach the metal retaining plate to the front of the propeller.		
3	Insert the 6 bolts and washers.		
4	Cross tighten the nuts gradually and apply 16-18 Nm (11.8 -13.3 ft/lbs).		
CAUTION! When the propeller is new or you have fitted a replacement propeller you must check the bolt torque at the following intervals. 10 hours, 25 hours, 50 hours and then verify the bolt torque every 50 engine hours.			

02-04 MAINTENANCE

Maintaining proper bolt torque is the most important maintenance item for a wooden propeller. Loss of proper bolt torque will result in the decrease or loss of hub compression and thus the loss of drive friction between the propeller mounting hub face and the engine drive flange. At this point the torque is transferred only by the engine flange and attaching bolts, which will begin to elongate the bolt holes and counterbores in the rear face of the wooden propeller. This can eventually cause cracking in the hub and/or failure of the attaching bolts and possible separation of the propeller from the aircraft.

The main factor that leads to the loss of propeller bolt torque is the variation of the wood hub thickness. The hub thickness will vary with (a) wood moisture content changes and (b) temperature changes. Even though your propeller has been sealed and/ or painted, changes in wood moisture content will occur which can significantly change the thickness of the hub. A one percent (1%) change in the moisture content of a propeller (increase / decrease) will cause a 0.010" change in hub thickness. As the required compression for a typical 80 HP wood propeller is 0.025", almost half of the required hub compression has now been lost. Moisture content changes are not immediate and can span several weeks or months, depending on many factors such as temperature, humidity, and operating schedules.

Operating temperature changes have similar effects but are not as severe. For the above reasons, it is important to follow the maintenance schedule below:

- 1. Before First Flight (after aircraft assembly)** – After the first flight, recheck the bolt torque. Refer to Bolt Torque Check.
- 2. After First 10 Hours** – After the first 10 hours, recheck the propeller bolt torque. Refer to Bolt Torque Check Procedure.
- 3. After First 25 Hours** – After the first 25 hours, recheck the propeller bolt torque. Refer to Bolt Torque Check Procedure.
- 4. Every 50 Hours** – After the first 25 hour recheck, it is Mandatory that the propeller bolt torque be rechecked every 50 hours. Refer to Bolt Torque Check Procedure.
- 5. Environment Changes** - Should the operating environment change significantly in temperature and/or humidity for a long period of time, the propeller bolt torque must be rechecked.

BOLT TORQUE CHECK PROCEDURE

1. Be certain that magneto switch is off, MASTER OFF. Remove the spinner cone.
2. With a calibrated torque wrench, check bolt torque by applying the torque in a tightening direction until the bolt begins to turn. Torque check values and required actions are given below.

IMPORTANT! Improper torque values will be obtained by measuring the breaking torque in a loosening direction. The torque should be checked in a tightening direction and adjusted as needed.

Respect the following when applying torque values:

Torque below 10 Nm (below 7 ft-lbs) - Remove propeller, inspect hub for damage.

Torque between 10 Nm and 16 Nm (7-10.5 ft-lbs) - Adjust torque to 15-18 Nm (11-13 ft-lbs).

Torque between 16 Nm and 18 Nm (11-13 ft-lbs) - No action required.

Torque above 18 Nm (13 ft-lbs) - Loosen bolts, then retorque to 15-18 Nm (11-13 ft-lbs).

02-05 DAILY CHECKUP

Verify the following:

- blades surface: clean, no cracks, no varnish and/or edge separations
- blades base - no damage, cracks, varnish and/or edge separations
- retaining metal plate - no damage, no bends, cracks
- bolts, washers and nuts - no visible damage
- metal leading edge - no visible damage

WARNING! Should the propeller's status determined during daily check-up not comply with the conditions stated above, flying may result in further damage and/or injury, including loss of life.

Small superficial cracks of external lacquer are due to work vibrations and are not to be considered serious. However they should not be numerous and/or exceeding the layer of external lacquer. If the depth is deeper and there is a possibility that some dirt or moisture could have penetrated inside then please contact the factory.

Deep cracks to the extremity of the blade in the longitudinal direction indicate a flexing vibration action and are to be considered dangerous because they can cause breakages or damages in flight. Send the propeller to the factory in case of such cracks.

Transversal cracks are due to torque vibrations and are normally caused by external lacquer layer drying. This phenomena is not caused by structural causes but it's advisable to contact the factory, especially in case of deep cracks.

Chips in the fibre glass protection are not important as long as they don't expose the wooden part of the blade. Even the presence of exposed wood of a diameter smaller than 2 mm doesn't compromise the propeller from functioning but it's advisable to keep them under control with regular inspection and immediate repair. Longitudinal cracks in the hub area are to be considered dangerous; they need to be valuated by the factory.

02-06 TIME LIMITS

The FP02-80 is a fiber glass reinforced propeller that has been in operation on many aircraft for well over 1000 flight hours without showing any abnormalities. It has a limited lifetime of 2000 hours, after which replacement is mandatory. Replace any bolts that have been over-torqued or damaged.

02-07 ANNUAL / 100 HR INSPECTION

Do the following procedures in addition to the daily check:

Remove the propeller from the hub, and check for any damage, especially on the two sides of the hub normally hidden by the front pressure plate and engine flange.

WARNING! Cracks beyond the lacquer layer are not permissible. Cracks on the surface can be repaired with another lacquer layer.

NOTE: Every material or product used for propeller repairing has to be original and suggested by the factory.

WARNING! If there is any doubt or more serious damage contact the factory for corrective measures or return the propeller for inspection/repair.

Clean the propeller using only neutral and not abrasive detergents and protect them with silicon free furniture spray wax like lemon pledge.

Install the propeller again on the engine.

02-08 REPAIRS

Only small repairs which are allowed to be done by the owner are presented here. The owner is obligated to make a record into the Propeller logbook about each repair and used technology. Other damages shall be repaired either by manufacturer or an authorized maintenance organization only.

Repairs of small scratches and cuttings which appear at the location above the blade radius $R = 250\text{mm}$ may be done by owner. Maximum 3 repairs may be done on one blade. All major repairs, especially damage which appears at the root section of the blade, shall be repaired either by manufacturer or an authorized maintenance organization only. Maximum permissible depth of damage that may be repaired by the owner at the leading or trailing edge is 2 mm. The minimum distance between two damaged locations is 80 mm and the length must be equal to 60 mm or less. Maximum permissible depth of damage that may be repaired by the owner at the top or bottom side of blade is 0.7 mm. The minimum distance between two damaged locations is 100 mm and the area of each of them must be less than 1 cm^2 .

Repair procedure:

1. Clean and dry the damage location.
2. Use fine sand paper or a file to make the damaged location smooth.
3. Apply epoxy-based filler to the location.
4. Shape the solid filler to the form of blade surface by a file or sand paper.
5. Coat the location with a layer of polyurethane or nitrocellulose-based lacquer.

WARNING! After every repair job, the propeller must be re-balanced to prevent potentially lethal vibrations.

WARNING! For all repair jobs conducted by owners themselves. The manufacturer denies any response

02-09 PAINT JOBS

Should you desire to repaint your propeller, please consult with the manufacturer prior to painting.

02-10 GROUND HANDLING

Use water and a soft piece of cloth to clean the blades. If you are unable to remove certain spots, consider using mild detergents. Afterwards, rinse the entire surface thoroughly. To protect the surfaces from the environmental contaminants, use a good quality silicon free furniture spray wax like lemon pledge.

CAUTION! Do not, under any circumstances, attempt to use a rough cloth to remove durable stains. This results in scratching the surface and that degrades propulsion performance greatly.

When storing the aircraft inside a closed area, make sure there is no dust accumulating on the blades. Clean your propeller regularly, preferably before and after each flight to maintain best performance.

02-11 AVOIDING DAMAGE

On the ground, keep your propeller in perfect condition by using the protection sleeves for the blades. Also, try to keep your propeller out of the sun if possible to avoid damage caused by UV radiation.

When starting-up the engine always make sure the space around the propeller is clear.

Be extremely careful when moving the aircraft in or out of the hangar not to damage the blades.

Don't attempt to move around the aircraft by pushing or pulling it by the propeller tips, if you must use the propeller to help move the aircraft only do so by grabbing the propeller at the base right next to the spinner.



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Contact us for more information



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