



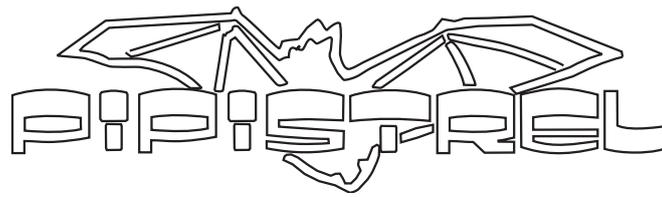
# Low-noise propeller

## Operation manual

**Hint** Online readers press F5 to see table of contents, if it is not already displayed on the left-hand side of the screen.  
Use full-option smoothing display in Adobe Acrobat™ family for best results (Edit - Preferences - General - Display)  
All schematics and pictures can be zoomed for detailed look (use Adobe Acrobat™ family zoom tool).







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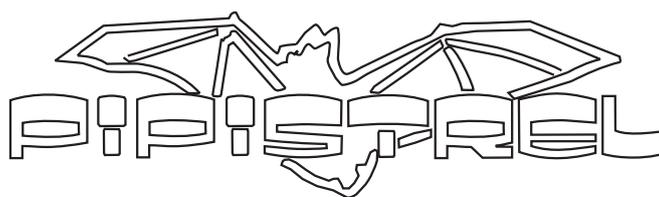
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# ***General***

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**Introduction**

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# Introduction

This manual contains all information needed for appropriate and safe use of Pipistrel Low-noise propeller.

In case of aircraft damage or people injury resulting from disobeying instructions in the manual PIPISTREL d.o.o. denies any responsibility.

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

## Notes and remarks

Safety definitions used in the manual:

**WARNING!** Disregarding the following instructions leads to severe deterioration of flight safety and hazardous situations, including such resulting in injury and loss of life.

**CAUTION!** Disregarding the following instructions leads to serious deterioration of flight safety.

## Propeller markings

Every Pipistrel Low-noise propeller is marked during manufacture for easier recognition. The markings read the following the manner shown below:

**“LN” / “no. of blades” / “direction of rotation”**

e.g. **LN 4 R** - Low-noise, four-bladed propeller, rotating to the right (observing top blade tip when propeller is viewed from behind.)

## Shipping list

### Standard package includes:

Propeller head (hub)  
Propeller blades (3 or 4)  
Propeller head (hub) bolts & nuts (6 or 8)  
Mounting screws  
Blade protection cloth (bag type)

### Extras:

Spinner (comes with base plate and screws)  
Vibration reduction flange (comes with rubber washers, screws and mounting instructions)

# Propeller description

The Pipistrel Low-noise propeller is an adjustable fixed pitch propeller for Ultralight and Experimental aircrafts. The LN propeller may be used as both, push or pull-type propeller and therefore suits all aircraft construction types.

Propeller pitch may easily be adjusted on ground (see chapter "Handling and maintenance") to achieve maximum efficiency for every aircraft and type of operation.

**WARNING!** The Pipistrel Low-noise propeller does not comply with ICAO rules and regulations and is therefore used at one's own responsibility.

## Manufacturing method

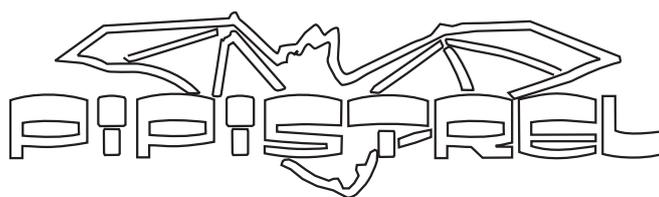
The LN propeller's outer skin and inside parts are made of composite materials, namely fibre reinforced plastic. Blade's base is made of aluminium and stainless steel tube, which lies within to ensure blade's safe attachment to the propeller base (hub).

The propeller base (hub) is made of an aluminium alloy and features monolite construction.

To achieve highest levels of propulsion efficiency combined with lower noise output the manufacturer recommends a spinner to be mounted. Furthermore, a vibration reduction flange can be mounted to significantly reduce engine vibrations that otherwise directly affect the propeller.

## Technical data and operational limitations

Specifications	LN prop.
number of blades	3 (LN3) or 4 (LN4)
propeller diameter	1730 mm
propeller pitch at 3/4 of prop. radius	12° - 32°
blade width	110 mm
max. safe propeller RPM	2200 RPM
max. safe engine power (permanent load)	64 KW (80 HP)
central hole diameter	1" (25,4 mm)
propeller head (hub) bolts & nuts type	M8
mounting holes' circle diameter	75 mm



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# ***Handling and maintenance***



**Introduction**

**Assembling the propeller**

**Mounting the propeller**

**Detaching the propeller**

**Propeller pitch**

**Daily check-up**

**Overhauls**

**Repairs**

**Ground handling**

# Introduction

This chapter provides information on handling and maintenance of Pipistrel Low-noise propeller.

## Assembling the propeller

**WARNING!** The standard propeller head (hub) is intended to be mounted on a Rotax engine flange. Should you desire to mount the LN propeller onto another engine's flange, the manufacturer can provide you with a different propeller head (hub) to suit your needs. However, bear in mind the manufacturer denies any responsibility for eventual damage, if the propeller be used on an engine other than Rotax.

### Upon delivery

Upon delivery please verify all parts inside the package for eventual damage which could occur during transportation.

### Assembling the propeller

Pick one propeller head-half and place the blades in position. Make sure the leading edge of the propeller blade is orientated properly (check direction of rotation). After having put all the blades in p position, cover the assembly with the remaining propeller head-half in such a manner, that the markings match.

Use the provided 8 M6 (6 in case of LN3) bolts and nuts to carefully bond the propeller head (hub) together.

**CAUTION!** It is essential to put washers underneath all bolt-heads and all the self-locking nuts.

**WARNING!** The self-locking nuts may only be used once, therefore you **MUST** replace them if you desire to reassemble the unit.

## Mounting the propeller

**CAUTION!** The more precise the propeller is set-up, the more comfortable the flight is. Furthermore, propulsion efficiency may increase greatly while at the same time the noise output decreases.

The set-up procedure can be done at the aircraft or separately.

Should you desire to set-up the propeller at the aircraft (recommended), mount the propeller onto the engine flange firmly using the provided 6 M8 bolts together with a securing Loctite adhesive. Again make sure you put washers underneath every bolt and nut.

Should you desire do mount the spinner as well, place the spinner's base plate between the propeller head (hub) and the engine's flange in such a manner that the base's edge points towards the engine.

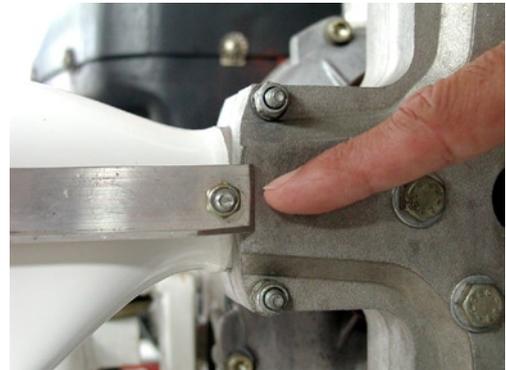
## Setting the propeller pitch and completing the mounting procedure

Use a setting rod (gauge) and set it to the desired pitch. Place the rod (gauge) along the back (black) side of the blade. Make sure the flat end of the rod lies flat on the propeller base, exactly between the M8 bolts.

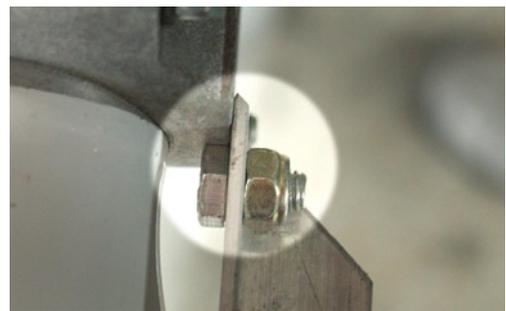
### Setting rod placed against the blade



### Setting rod at the propeller head-hub



### Setting rod base screw (top view)



Now carefully rotate the blade until the profiled edge of the setting rod (gauge) fits the blade's profile perfectly along the entire width. Repeat this procedure for every blade.

Cross-tighten all the 6 M8 bolts and nuts first using a 10 Nm torque, then a 24 Nm torque. Make sure also the M6 bolts and nuts too are now tightened at a 5 Nm torque.

After having tightened all the bolts and nuts re-verify the propeller pitch setting for eventual flaws. Once you have determined all the blades are set exactly the same, tighten the M6 bolts using a 9 Nm torque.

Should you be provided with a factory pre-set propeller, mount it in the same way, disregarding the pitch-setting section above.

### Propeller head - hub



**WARNING!** Under no circumstances attempt to tighten the bolts and nuts with a tighter momentum (torque) that stated above!

Should you ever desire to replace the bolts and nuts, make sure you use bolts and nuts that comply with the durability class of at least 8.8.

**CAUTION!** Verify the torque holding the bolts and nuts every 5 flight hours.

## Mounting the spinner

### Spinner mounted on a UL Storch



Make sure the spinner's base plate is mounted between the propeller head (hub) and engine's flange with base's edge pointing towards the engine.

After having set the propeller pitch and mounted the propeller securely, mount the spinner and secure it to the base plate with screws provided. Every second hole in the base plate features an implemented nut. All other screws must be secured using the self-locking nuts provided.

Remember to put a washer underneath every nut!

## Detaching the propeller

Detach the propeller following the instructions above in reverse order.

## Propeller pitch

The propeller pitch is regarded as the angle of attack of propellers profile and cannot be measured anywhere along the propeller chord directly. Therefore you should use the provided setting rod (gauge) to set all blades' pitch equally.

For aircrafts that ship equipped with the LN propeller check the Pilot and maintenance manual for reference and recommended propeller pitch settings, otherwise you must discover the most suitable propeller pitch setting for your engine and aircraft yourself.

Be advised the manufacturer denies any responsibility for all settings that deviate from reference propeller pitch settings in any manner.

## Daily check-up

Verify the following:

- blades** - firmly attached to the propeller head (hub), no free play
- blades' surface:** clean, no cracks, no paint and/or edge separations
- blade's base** - no damage, cracks, paint and/or edge separations
- propeller base (hub)** - intact

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

# Overhauls

Overhauls must be done by the manufacturer once every 1000 flight hours.

## Maximum life span of the propeller

Until present time, no boundaries of LN propeller's life span are known. Several Pipistrel Low-noise propellers have been in operations for well over 1.000 flight hours without showing any structural abnormalities.

## Rapairs

Small damage (cracks) in the paint layer of the blades may be repaired by the owner him/herself using dabbing lacquer.

Should the blades be damaged during all sorts of transportation and/or hangaring, the individual blades can be replaced.

All damage which occurs during engine operation requires for the entire power plant and propeller to be verified for structural damage by authorised service personnel.

New, replacement blades are available at a bargain price, therefore the manufacturer recommends blade replacement in case of extensive damage. However, should you desire to repair the damage yourself from whatever reason, you should **ONLY** use "Schoiffler" epoxy hardener of 38% durability together with "Interglas" fiber roving of 180 and 280 g/m<sup>2</sup> density.

**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, manufacturer denies any responsibility.

## Paint jobs

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

# Ground handling

Use pure 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 best affordable car wax.

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

Storing the aircraft inside closed space, make sure there is not any dust accumulating on the blades. Clean your propeller regularly, preferably before and after each flight to maintain best propulsion performance.

## Avoiding damage

On ground, keep your propeller intact by putting the protection cloth onto the blades. Also, try to keep your propeller off the sun if possible, for eventual damage caused by UV radiation.

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

# ***Appendix***

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## **Propeller settings for Pipistrel Spider trikes**

# Propeller settings for Pipistrel Spider trikes

Rotax engine	Engine power	Max. RPM	reduct. ratio	Propeller type	Max. prop. RPM	Thrust	Prop. pitch	Noise output
503	37 (50)	6800	3,47	LN3	1960	1250	24	60
503	37 (50)	6800	4,00	LN4	1700	1350	22	59,8
582	47 (64)	6800	3,47	LN3	1960	1520	27	58
582	47 (64)	6800	4,00	LN4	1700	1680	24	57,2
618	55 (74)	6800	3,47	LN3	1960	1840	31	56,2
618	55 (74)	6800	4,00	LN4	1700	1910	26	56
912	60 (80)	see below	2,43	LN3	2000	2030	18	54
912	60 (80)	see below	2,43	LN4	2000	2100	17	54,7

**WARNING!** Rotax 912 engine's maximum RPM must be reduced to 4900 RPM in order not to exceed maximum propeller RPM count and by that ensure safe operation.



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