ID: 899

E-PROPS In-flight Variable Pitch Propellers GLORIEUSE for Gear-Drive Engines
INSTRUCTION MANUAL

Document ID: 899 Rev. 01.00 Ref EPCSU3 Date: 230808

E-PROPS – CARBON-TITANIUM PROPELLERS - www.e-props.fr - helices@e-props.fr
195, Route de l'Aviation - ZI Aérodrome de Sisteron - 04200 Vaumeilh – France +33 (0)4 92 34 00 00

Table of Contents

1. INSTRUCTIONS

1.1. Propellers are not accessories

Read carefully the manuals and instructions published by the E-PROPS company and strictly follow the instructions. Contact our team for any question.

This document is to be kept for the entire life of the propeller.
It is your responsibility to ensure that you have the current version of this document. This updated version is always available on our website: **aircraft.e-props.fr** (MANUALS page)

- ✗ GLORIEUSE models: designed for Rotax 9xx engines equipped with a gearbox. It is strictly forbidden to mount these models of propellers on direct drive engines.
- ✗ Never cut any E-Props parts: blades, triflex, hub, spacer, adapter, spinner, plate...
- ✗ Always use the screws and bolts supplied by E-Props. The quality, length and threading of the screws are essential to ensure correct assembly and tightening.
- ✗ Never cut and/or re-thread screws for aircraft use.
- ✗ Use a calibrated torque wrench to apply the correct tightening torque.
- ✗ Screw tightening torques depend on the quality and diameter of the screws. Incorrect tightening of the propeller fastening screws can be dangerous: follow the E-Props instructions.
- ✗ Do not remove the labels on the E-Props parts.
- ✗ Never change the balance of an E-Props propeller.
- ✗ Any modifications or assembly different to this document would invalidate your warranty.

The user assumes the risks of using such propellers, and acknowledges that his engine/propeller set is subject to sudden stop.

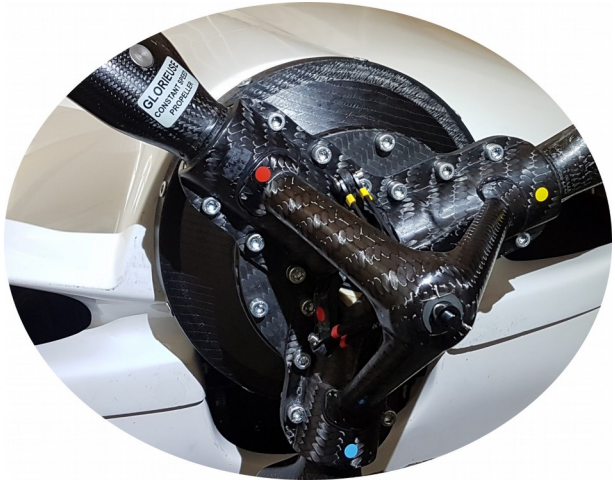
1.2. Certification

E-Props propellers comply with **ASTM F2506-13 (LSA)**.
Their use on an aircraft is the sole responsibility of the aircraft owner. ASTM F2506-13 establishes minimum requirements for the design, testing, and quality assurance of fixed-pitch, ground adjustable pitch and in-flight variable pitch propellers for light aircraft (LSA).
Tensile tests, mechanical strength measurements, fatigue tests, endurance tests, and tear down inspections must be performed to meet the prescribed requirements.

2. DESCRIPTION

Designation	GLORIEUSE
Propeller type	In-flight Variable Pitch Propeller for gear-drive engines Rotax 912S – 912iS – 914 – 915iS Configuration "2": without pre-equipment for variable pitch propellers or configuration "3" with hydraulic pre-equipment Tractor configuration / Clockwise CW rotation sense
Number of blades	3
Diameters	8 diameters available, from 155 to 190 cm (each 5 cm)
Weight	3,2 kg [dia 170 cm]
System	electro-hydraulic control
Propeller Max Power	145 hp
Propeller Max Torque	465 N.m
Propeller RPM max	2600 RPM
Regulation	max pitch / min pitch in less than 3 seconds without jerks or speed variations
Pitch variation	max. range 16° / optional 21°
Moment of inertia	2400 kg.cm² [dia 170 cm]
Material	Carbon + Epoxy resin + Titanium leading edge protection

Tightening torque	M6 screw = 11 N.m / M8 screw = 24 N.m / M10 banjo = 15 N.m
Accessories	Carbon spinners: 13 different models Carbon spacers: 38 different lengths
Certification	ASTM F2506-13 (LSA)
Manufacturing	Made in France (Sisteron) since 2008



3. PROPELLER ASSEMBLY

Assembly is detailed in the video :
E-PROPS GLORIEUSE: Assembly of variable pitch propeller
YouTube E-Props channel - **https://youtu.be/0GNCCJh0MrY**
or flash the following QR-code:

4. PROPELLER INSTALLATION

4.1. Remove the drive lugs if applicable

The assembly of E-Props propellers does not require Rotax drive lugs. The drive lugs are made of carbon, integrated in the hub of GLORIEUSE series propellers. Never cut them.

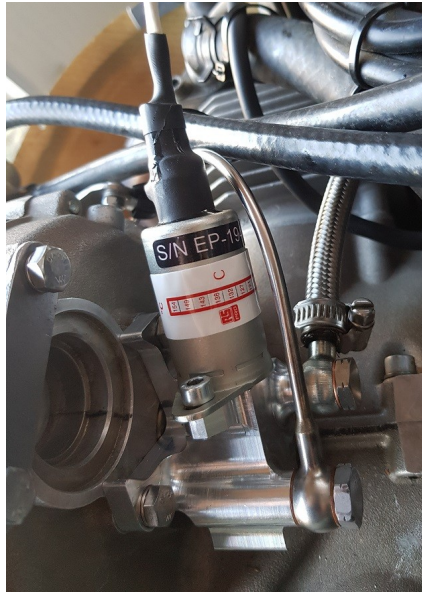
There should be no drive lugs on the gearbox flange.
If you have trouble removing them, E-Props offers a drive lugs extractor.

See article in the store and video on the YouTube channel E-Props =>

4.2. On configuration « 2 » engines

This operation is detailed in the video :
E-PROPS GLORIEUSE: MOUNTING ON THE ENGINE
YouTube E-Props channel - https://youtu.be/GdDSiwd_Qvo
or flash the following QR-code:

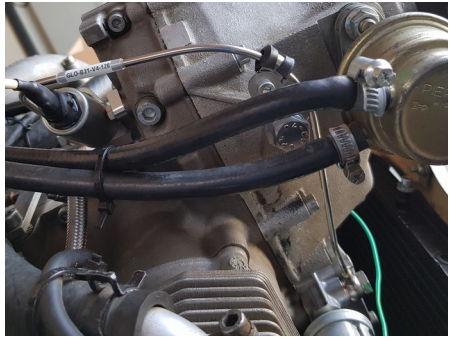
The rigid oil pipe is on the left side of the Governor



The flexible hose is on the right side of the governor

There are 2 configurations for the oil pipe:

- With the pipe above the solenoid-valve:



- Or with the pipe below the solenoid-valve:

Torques: - Banjo M10×1: 15 N.m - M10 bolt with Heico washers: 24 N.m

4.3. On configuration « 3 » engines

Prepare the cylinder with grease and install it on the propeller flange:

Install the governor with the gasket on the governor flange:

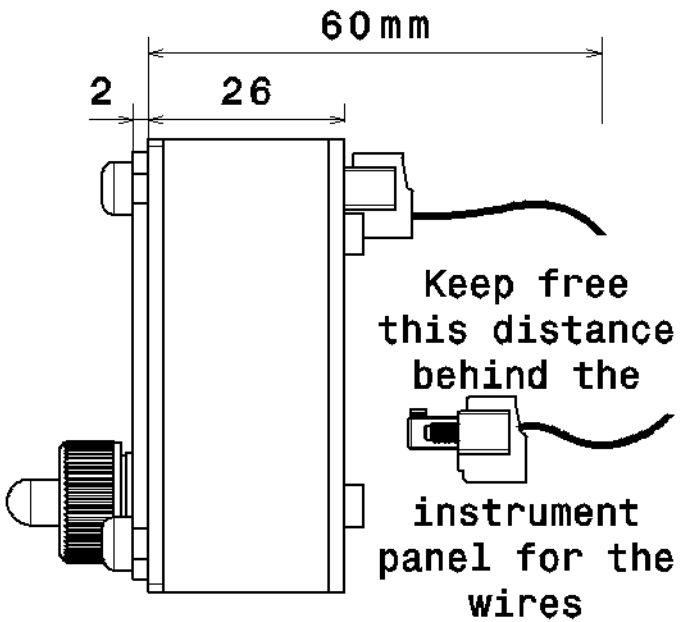
The governor is marked on the back side for the top, never fix this in any other position.

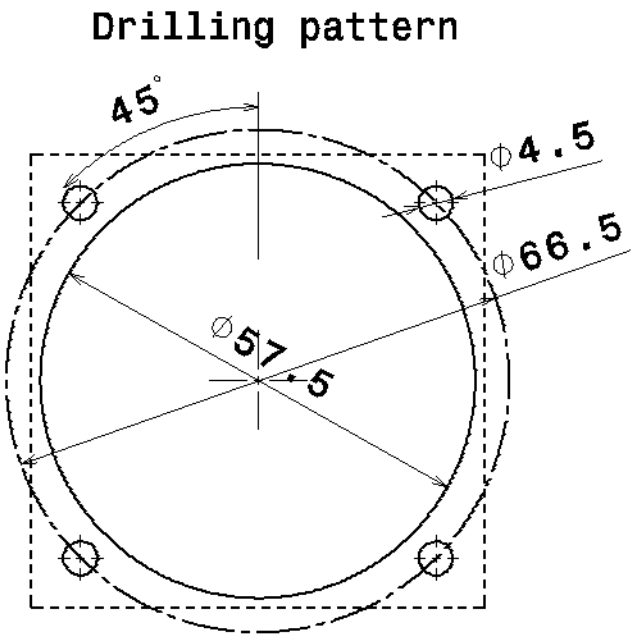
4.4. High pitch stop

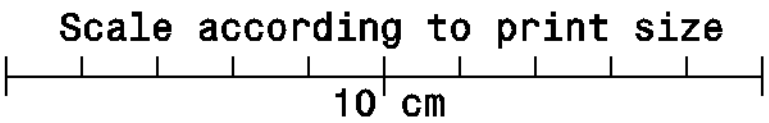
It’s an aluminum ring in the cylinder, the size depends of the maximum cruising speed of the aircraft.

5. REGULATOR INSTALLATION

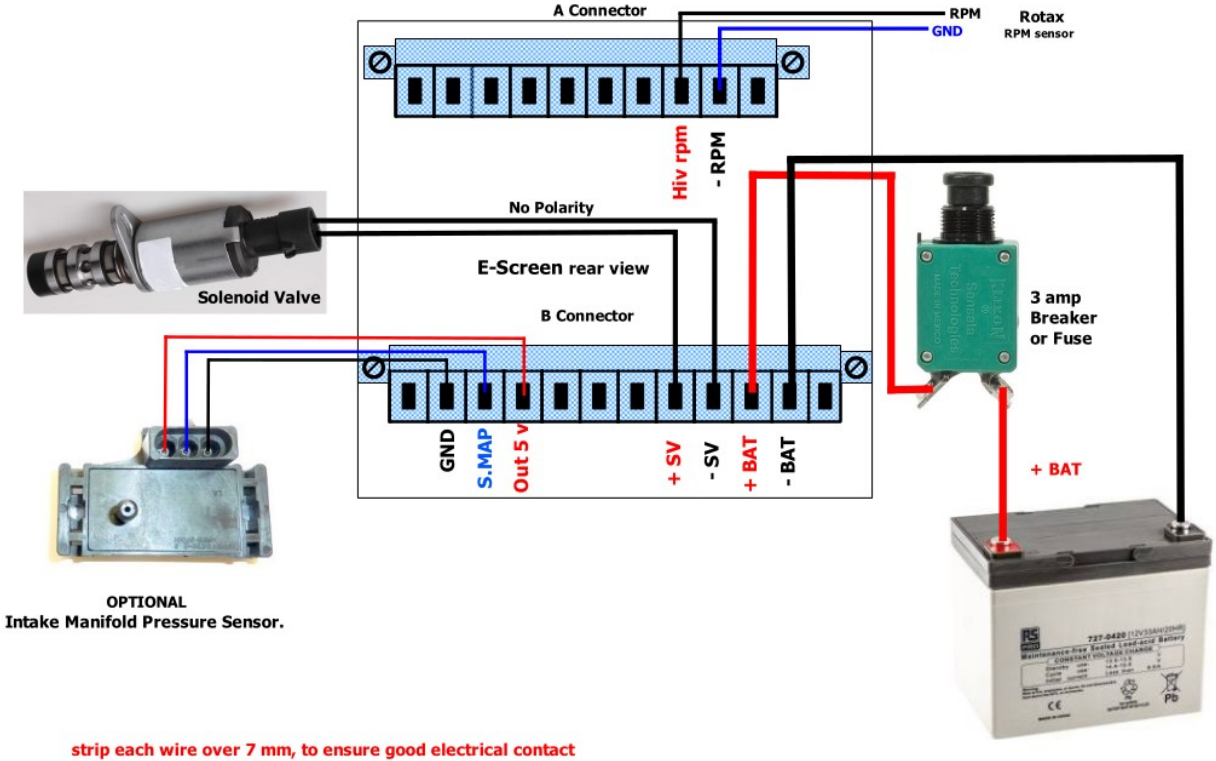
5.1. Regulator panel cutout (standard 2 1/4”)



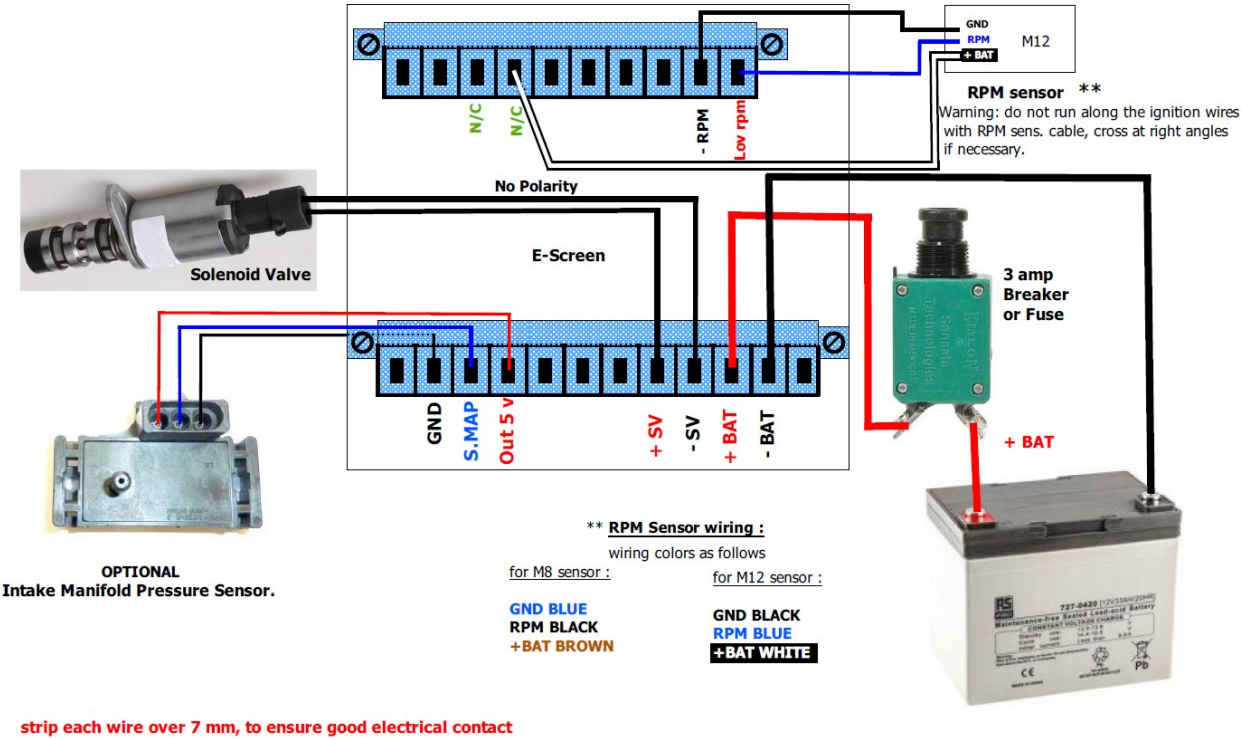




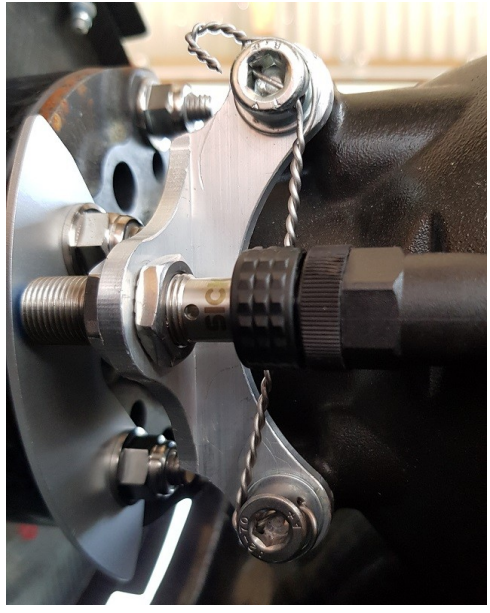
5.2. Regulator wiring diagram – Rotax 912 / 912s / 914



5.3. Regulator wiring diagram – Rotax 912 iS/915 iS / Inductive sensor



Installation of RPM sensor:



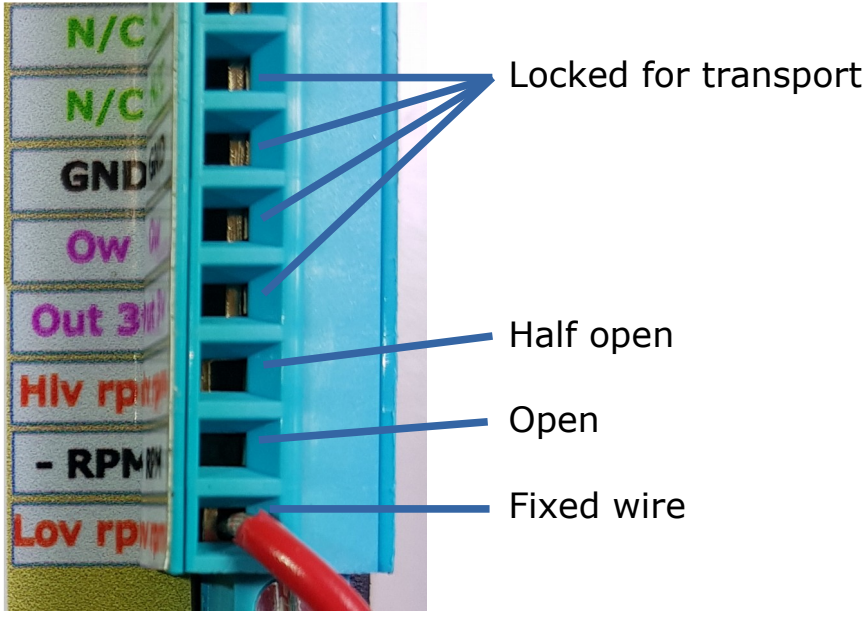
The gap between the sensor and the steel plates must be between 1.5 and 2.5 mm. Check the gap on both plates.

Mounting the bracket on the gearbox :
Tighten the M8 bolts to 24 N.m with threadlocker
Install a safety lock wire, 1.04mm / .041”.

Mounting the sensor on its bracket :
Tighten the M12 bolts (locking teeth on the bracket) to 32 N.m with threadlocker.

Secure the wire of the sensor as far as possible from the ignition harness and make the crossing in a perpendicular way.

5.4. Control of the correct contact of the wire in the socket



5.5. Programming the regulator

The regulator is ready to use from our factory, if you need to adjust a parameter or the display, these operations are detailed in the video:
E-PROPS GLORIEUSE: use of the Regulator
YouTube E-Props channel - https://youtu.be/tZVvJTSf_2w
or flash the following QR-code:

Web page with the version 1.61 for android smartphone or tab is here:
https://aircraft.e-props.fr/glorieuse/Eprops_PV_v1.61.php
(compatible with Google Chrome)

Bluetooth tab: version, connection, mode and status
Adjustable spanner tab: parameters
« e » tab: Useful tool to calibrate the indications for manifold pressure, battery voltage and options.
« disp » tab: Display: parameter displayed, actif (visible) 0 or 1, position, size etc.
« sphere »tab: Save and recover the previous setting of your instrument.

Take care and save your different versions when changing a parameter!

The principle of the coefficient formula is:
$y=a + bx + cx^2 + dx^3$
with a0 = a a1 = b a2 = c a3 = d

Frequently modified parameters:
36: rpm_motor_smooth → 0,99 to avoid fluctuations on the display
51: MP_smooth → 0,99 to avoid fluctuations on the display
47 to 50: MP_coef → Adjusted via the « e » tab.

6. Flying with a constant speed propeller

Low pitch means low angle of attack (small bite)
High pitch means high angle of attack (big bite)
MP is manifold pressure
RPM is engine revolutions

We recommend setting the low pitch stop between 5500 and 5600 rpm on the ramp:
→ It's enough power for very efficient take off.
→ In case of a system failure, the propeller will return to the low pitch stop. If the pitch stop is setting is an excessive low pitch, the rpm to maintain the flight will be too high.

Start-up and taxiing: «full low pitch / 5750 rpm»

Run-up checks: Cycle the pitch of the propeller 3 times*. With 5750 rpm setting on the regulator, push the power lever to 4400 rpm. Change the regulator to target rpm = 4000 rpm*. Wait for the engine RPM to stabilize at 4000 rpm and set the regulator back to 5750 rpm.
- First one to check the rpm variations
- Second one to check the reverse variation of MP and RPM
- Third one to check if any oil pressure variations or any splashes of oil on the canopy or the cowling.

Before take-off: select the maximum rpm possible (5750 rpm).

Continuous climb and cruising: within the MP/RPM torques of the Rotax table.

Descent: cruise speed maintained, reduction of 1 inch.Hg per 100 ft of desired sink rate.

Landing: to allow a go-around in good conditions and without over-torque, the propeller must imperatively be set to low pitch, therefore with a high regulator set point. The E-Screen back-lighting will turn green for a propeller set-point of 5500 rpm or higher.

In general:

→ Power increase: first increase RPM (E-Props regulator) then increase MP with throttle lever.
→ Power reduction: first reduce MP then reduce rpm

In the event of a regulator or a governor failure, the propeller returns to low pitch, allowing flight to continue and, if necessary, to climb or perform a going around.

7. PROPELLER MAINTENANCE

7.1. Each day of flight

Cleaning after each flight with a sponge: water + soap, window cleaner

7.2. Annual / 200 hours check

Tightening of screws: every 200 hours and/or every 12 months for Titanium screws
Screw M6= 11 N.m
Screw M8= 24 N.m
Never put thread-locker (Loctite) on these screws, otherwise it would not be possible to check the tightening torque.

7.3. Inspection

For Rotax 912S, 912iS, 914: recommended inspection at **1000 hrs**
For Rotax 915iS: recommended inspection at **600 hrs**
✗ Disassembly
✗ General inspection of the propeller
✗ Change 14 bearings (rotation transmission supports)
✗ Reassembly

7.4. Overhaul

For Rotax 912S, 912iS, 914: recommended overhaul at **2000 hrs**
For Rotax 915iS: recommended overhaul at **1200 hrs**
✗ Disassembly
✗ General inspection of the propeller
✗ Change 14 bearings (rotation transmission supports)
✗ Change of pitch control axes (6)
✗ Change of 3 blade axes (taking over the centrifugal force)
✗ Reassembly

8. REPAIRS

8.1. Small impacts

Small impacts on the carbon + epoxy parts of the blades can be easily repaired, with for example the repair kit available on the E-PROPS website.

Small impacts on the Titanium leading edge can be repaired in the E-PROPS workshops. The Titanium part of the blades can be completely replaced.

8.2. Major repairs

If an incident or shock requires a major repair of the propeller, this must be carried out by E-PROPS in its workshops, or by a specialist after discussion with the E-PROPS team.

A major repair made without E-PROPS approval would void all warranty.