



DUC *Helices* Propellers

Instruction manual 3-blade propeller Certified FLASH-R



Approved by



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Revision update

Date	Revision	Index	Object of modification
09/05/2019	A	-	Creation
20/02/2020	B	(00)	Adding engine configuration + corrections

Each modification relating to the last revision or index in the list above has a dark red font color.
With each new revision or index, the entire body of the text is switched back to black.

Identification form

Date		Delivery note n°	
Owner		Engine/Gearbox ratio	
Aircraft		1 st recommended pitch blade angle	
Notes:			
.....			
.....			
.....			
.....			

This instruction manual is to be maintained throughout the life of the propeller.
He may have to evolve. The owner must check with the DUC Hélices company
the latest version being valid applicable to the propeller.

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1. Presentation of the Certified FLASH-R propeller

1.1. Description

The **certified FLASH-R** propeller has a new innovative design, specific about its twisting axis and center of pressure.

Its aerodynamic design allows a "**Constant Speed**" effect, limiting variations in engine speed between on ground and in flight.

This propeller allows **high efficiency** throughout the flight envelope i.e.:

- **Improved takeoff and climb rate due to higher engine speed, then higher engine efficiency**
- **Many cruise extension**
- **A high user comforts**

The blades and the hub of the FLASH-R propeller are manufactured according the DUC Hélices company technologies, from unidirectional layers of carbon fibers prepreg epoxy resin.

The blade composite structure is defined to obtain the **maximum strength in torsion and bending**. Therefore "constant speed" effect is not related to deformation of the blade but its geometry and specific profile.

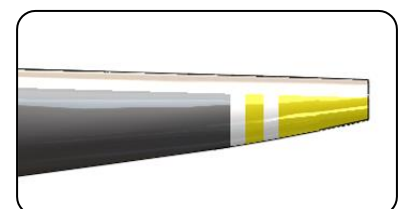
Due to its **specific geometric definition**, **excellent performance** is obtained in **both aerodynamic and acoustic, but also in consumption**.



1.2. Characteristics

The Certified FLASH-R propeller range is available:

- Ground adjustable propeller
- Tractor configuration available in right rotation
- Diameters Ø1520 to Ø1900mm (Ø59.8 to Ø74.7")
- Shielded leading edge in Inconel®
- Carbon composite hub with metallic inserts
- Protected against lightning strike
- Direct assembly on the propeller-shaft Ø101.6mm
- Safety marking on the tip of the propeller

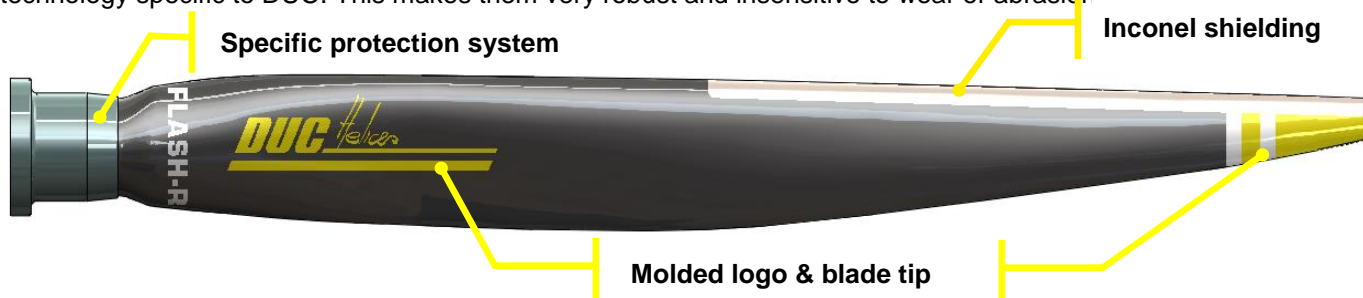


1.3. Shielding leading edge in Inconel®

The leading edge of the **FLASH-R** blades is equipped with a metallic shielding in Inconel®. This material is a superalloy containing mainly nickel, with a very high hardness of surface.

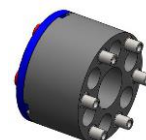
In addition, the composite structure and the aluminum shade used at the foot of the blade are specific to fully block the phenomenon of galvanic corrosion between 2 materials of different natures.

Finally, the color decorations (DUC logo + blade tip) are integrated during molding in the composite structure using technology specific to DUC. This makes them very robust and insensitive to wear or abrasion



1.4. Accessories

- **Aluminum mounting spacer (Direct mounting on P.C.D Ø101.6mm/Ø4")**
 Moves the plane of the propeller to adjust the position according the engine hood



- **Aluminum adaptor spacer (Other mounting as SAE1, SAE2, ...)**
 Move the propeller plane and adaptor the P.C.D fixation of the propeller



- **Spinner available in diameter Ø250mm (Ø9.8") to Ø340mm (Ø14.4")**



- **Adjusting tool for the setting of the pitch angle of the blades**



- **Neoprene cover protection of the blade**



- **Cleaning treatment for composite propellers**

Save money! A clean propeller is more efficient and decreases the fuel consumption.



1.5. Sales references

Designation	Reference	Part number
Three-blade Inconel FLASH-R Right (ROTAX mounting)	01-40-001	H-FSH_3-D-R_I_RX_C
Three-blade Inconel FLASH-R Right (AN6 mounting)	01-40-011	H-FSH_3-D-R_I_AN6_C
Three-blade Inconel FLASH-R Right (AN8 mounting)	01-40-021	H-FSH_3-D-R_I_AN8_C

Note:

Specify the flight regulation aircraft (E.g.: **Ultra-light, LSA...**) and diameter when ordering (E.g.: ref. 01-21-001/1730).

2. Applications

DUC propellers are given for a flight potential under normal operating conditions. To maintain this potential, DUC Propellers has determined a TBO (time between revisions) for a propeller based on the engine it equips. See the section 7.1 **Airworthiness Limitations** for Information Benefit.

Engine	Gearbox	Propellers limits	Propeller diameter (mm)	Blade angle (°)	Blade angle allowed range (°)	TBO- Time Between Overhaul* (hour)
ROTAX 912S ROTAX 912iS ROTAX 914	2.43	160 HP 2 700 RPM	Ø1730	24°± 2°	22° → 30°	2 000 hours or 6 years
			Ø1750	24°± 2°	22° → 30°	
			Ø1800	19°± 2°	17°→25°	
			Ø1850	19°± 2°	17°→25°	
			Ø1900	18°± 2°	16°→24°	
CONTINENTAL O-200	-		Ø1660	20°± 2°	18° → 26°	
LYCOMING O-233 / O-235	-		Ø1660	20°± 2°	18° → 26°	
LYCOMING O-320 / IO-320	-		Ø1900	20°± 2°	18° → 26°	

* It is the maximum period of propeller use allowed by propeller type certificate.

Compliance with CS-P, Subpart D has not been demonstrated as part of the propeller certification.

Remark

The values of the pitch angle are defined by flight test on each engine. If necessary, this setting should be adjusted according to the aircraft.

For proper use of the propeller, refer to section 7. **Continuing airworthiness**

3. Installation precautions

WARNING

Make sure the ignition is turned off before starting any type of operation on the propeller.
Do not run the engine without propeller, engine damage will result

IMPORTANT

The blades of a propeller are part of a whole. **DO NOT INTERCHANGE** with other similar blades from propeller. The propeller blades are manufactured to their application. Their structure, weight and balance are different from a propeller to another.

The spinner is an important element for cooling the engine. The aircraft must not fly without a spinner.

Fitting a different spinner will be an addendum to this manual approved by the DUC to confirm its compatibility with the mounting of the propeller.

The propeller is delivered with the appropriate screws. **The change of the screws is contrary to our recommendations unless validated by the manufacturers.**

WARRANTY CONDITIONS

The user is still flying under its full responsibility (see.8. **General terms of sale**).

4. Components of the Certified FLASH-R

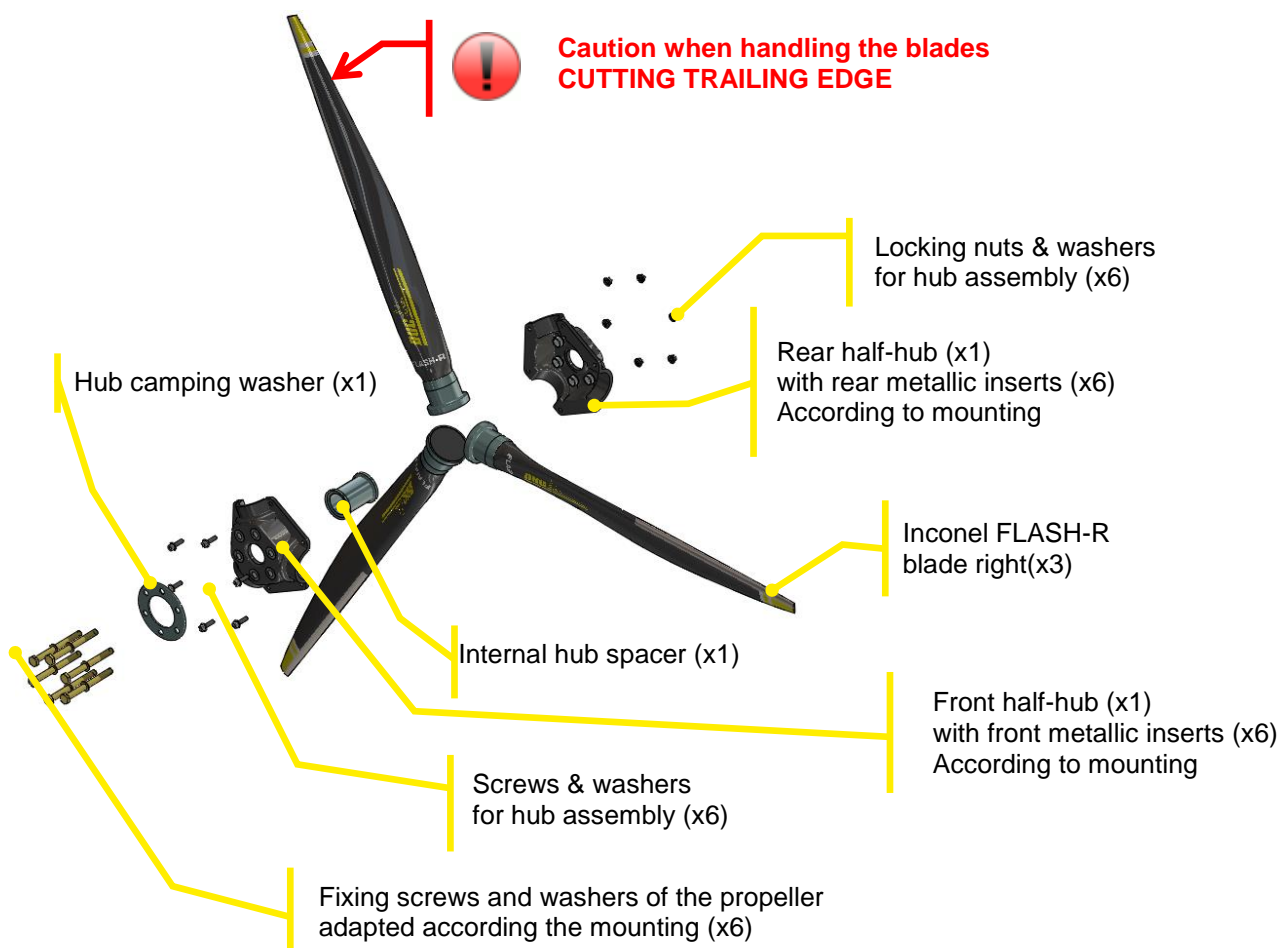
4.1. Mounting configuration of the FLASH-R propeller

Here is a configuration table of the three-blade certified FLASH-R propeller mounting according the propeller-shaft of the engine.

If needed, see annex 9.1 Dimension of the engine propeller-shaft

MOUNTING	ENGINE PROPELLER-SHAFT		
	Ø4" / Ø101.6mm (Rotax)	Type SAE1 Ø4-3/8" / Ø111.125mm (Ex: Continental O-200)	Type SAE2 Ø4-3/4" / Ø120.65mm (Ex : Lycoming O-320 / IO-320)
direct on propeller-shaft (without spacer)	X		
with spacer	X		
with adaptor spacer		X	X

4.2. Exploded view for propeller



Remark

This exploded view shows the principle of the certified FLASH-R propeller assembly. The size of all of these components changes depending on the configuration of the propeller (diameter hole of the metallic inserts of the half-hub, length of the screws...).

4.3. List of components

Designation	Optional (According to the recommend mounting)	Part Number	Qua ntity
Spacer (optional)			
912H spacer - 3mm	X	EI-912H-3	01
912H spacer - 5mm	X	EI-912H-5	
912H spacer - 6mm	X	EI-912H-6	
912H spacer - 10mm	X	EI-912H-10	
912H spacer - 15mm	X	EI-912H-15	
912H spacer - 20mm	X	EI-912H-20	
912H spacer - 25mm	X	EI-912H-25	
912H spacer - 30mm	X	EI-912H-30	
912H spacer - 40mm	X	EI-912H-40	
912H spacer - 45mm	X	EI-912H-45	
912H spacer - 50mm	X	EI-912H-50	
912H spacer - 60mm	X	EI-912H-50	
912H spacer - 70mm	X	EI-912H-70	
912H spacer - 75mm	X	EI-912H-75	
912H spacer - 80mm	X	EI-912H-80	
912H spacer - 100mm	X	EI-912H-100	
912H spacer - 120mm	X	EI-912H-120	
SAE2-AN6 spacer - 20mm	X	EI- SAE2AN6-20	
SAE2-AN8 spacer - 20mm	X	EI- SAE2AN8-20	
Dowel spacer DUC Ø13 L20	X	PI-DUC13-20	
Dowel spacer DUC Ø13 L30	X	PI-DUC13-30	
Dowel spacer DUC Ø13 L40	X	PI-DUC13-40	
Dowel spacer DUC/ROTAX Ø13 M8 L28	X	PI-RX-28	
Dowel spacer DUC/ROTAX Ø13 M8 L30	X	PI-RX-30	
Screws CHC M8x40mm (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	X	V-CHC8-40	
Screws CHC M8x50mm (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	X	V- CHC8-50	
Adaptor spacer (optional)			
SAE1-AN6 adaptor spacer - 30mm	X	E- SAE1AN6-30	01
SAE1-AN6 adaptor spacer - 70mm	X	E- SAE1AN6-70	
SAE1-AN6 adaptor spacer - 80mm	X	E- SAE1AN6-80	
SAE1-AN6 adaptor spacer - 100mm	X	E- SAE1AN6-100	
SAE2-AN6 adaptor spacer - 30mm	X	E- SAE2AN6-30	
SAE2-AN6 adaptor spacer - 70mm	X	E- SAE2AN6-70	
SAE2-AN6 adaptor spacer - 100mm	X	E- SAE2AN6-100	
SAE2-AN7 adaptor spacer - 30mm	X	E- SAE2AN7-30	
SAE2-AN7 adaptor spacer - 70mm	X	E- SAE2AN7-70	
SAE2-AN7 adaptor spacer - 90mm	X	E- SAE2AN7-90	
SAE2-AN7 adaptor spacer - 100mm	X	E- SAE2AN7-100	
SAE2-AN8 adaptor spacer - 30mm	X	E- SAE2AN8-30	
Dowel spacer DUC Ø17 AN6	X	PI-DUC17-AN6	
Dowel spacer DUC Ø17 AN8	X	PI-DUC17-AN8	
Safety washer DUC AN6	X	RS-AN6	06
Safety washer DUC AN7	X	RS-AN7	
Safety washer DUC AN8	X	RS-AN8	
Screws 3/8" UNF 1-3/4"	X	V-3/8-1_3/4	
Screws 1/2" UNF 1-1/2"	X	V-1/2-1_1/2	
Screw 3/8" UNF 2-1/2"	X	V-3/8-2_1/2	
Screw 3/8" UNF 3"	X	V-3/8-3	
Screw 7/16 UNF 3"	X	V-7/16-3	
Hub			
3-blade rear half-hub Certified FLASH-R ROTAX	-	DMFSH-3-AR_RX_C	01
3-blade rear half-hub Certified FLASH-R AN6	-	DMFSH-3-AR_AN6_C	
3-blade rear half-hub Certified FLASH-R AN8	-	DMFSH-3-AR_AN8_C	
Certified internal FLASH-R hub spacer	-	EMFSH_C	
3-blade front half-hub Certified FLASH ROTAX	-	DMFSH-3-AV_RX_C	
3-blade front half-hub Certified FLASH AN6	-	DMFSH-3-AV_AN6_C	

3-blade front half-hub Certified FLASH AN8	-	DMFSH-3-AV_AN8_C		
Screws CHC M8x30 (Included narrow plain washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-30	06	
Certified hub clamping washer FLASH ROTAX	-	RS-FSH-RX_C	01	
Certified hub clamping washer FLASH AN6	-	RS-FSH-AN6_C		
Certified hub clamping washer FLASH AN8	-	RS-FSH-AN8_C		
Blade FLASH-R				
Certified Inconel FLASH-R blade, Right	-	FSH-D-R_I_C	03	
Fixing screws				
Screws CHC M8x130 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-130	06	
Screws CHC M8x140 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-140		
Screws CHC M8x150 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-150		
Screws CHC M8x160 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-160		
Screws CHC M8x170 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-170		
Screws CHC M8x180 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-180		
Screws CHC M8x200 (included pins contact lock washer Ø8mm and Nylstop self-locking nut M8)	-	V-CHC8-200		
Screws DUC AN6-52	-	V-AN6-52		
Screws DUC AN6-64	-	V-AN6-64		
Screws DUC AN6-72	-	V-AN6-72		
Screws DUC AN8-52	-	V-AN8-52		
Screws DUC AN8-60	-	V-AN8-60		
Screws DUC AN8-64	-	V-AN8-64		
Screws DUC AN8-72	-	V-AN8-72		
Accessories: Spinner & Mounting plate				
3-blade spinner mounting plate Ø250mm ROTAX	X	P-250_3-RX		01
3-blade spinner mounting plate Ø250mm Ø17	X	P-250_3-17		
3-blade spinner mounting plate Ø260mm ROTAX	X	P-260_3-RX		
3-blade spinner mounting plate Ø260mm Ø17	X	P-260_3-17		
3-blade spinner mounting plate Ø270mm ROTAX	X	P-270_3-RX		
3-blade spinner mounting plate Ø270mm Ø17	X	P-270_3-17		
3-blade spinner mounting plate Ø290mm ROTAX	X	P-290_3-RX		
3-blade spinner mounting plate Ø290mm Ø17	X	P-290_3-17		
3-blade spinner mounting plate Ø300mm ROTAX	X	P-300_3-RX		
3-blade spinner mounting plate Ø300mm Ø17	X	P-300_3-17		
3-blade spinner mounting plate Ø340mm ROTAX	X	P-340_3-RX		
3-blade spinner mounting plate Ø340mm Ø17	X	P-340_3-17		
3-blade spinner Ø250mm	X	C-250_3		
3-blade spinner Ø250mm L=350mm	X	C-250_350_3		
3-blade spinner Ø260mm	X	C-260_3	01	
3-blade spinner Ø270mm	X	C-270_3		
3-blade spinner Ø290mm	X	C-290_3		
3-blade spinner Ø300mm	X	C-300_3		
3-blade spinner Ø340mm	X	C-340_3		
Spinner closure plate	X	CC-250_350		03
Spinner screws M5x16mm	X	V-P5-16	09	
Spinner screws AN-525-10R8	X	AN-525-10R8		

4.4. List of required tools

Rotax mounting	SAE1/SAE2 mounting (Lycoming, Continental, ...)
6 Torque Allen Wrench (Torque: 25 Nm) Flat key 13 Inclinometer (angle adjustment tools) Nylon mallet Torque screwdriver (Torque: 4 Nm)	6 Torque Allen Wrench (Torque: 25 Nm) Flat key 13 3/8 or 1/2 Torque Wrench (Torque: 30 to 45 Nm) 7/16 Torque Wrench (Torque: 30 to 80 Nm) Inclinometer (angle adjustment tools) Nylon mallet Torque screwdriver (Torque: 4 Nm)

5. Assembly instruction of the propeller

The assembly of the Three-blade Certified FLASH-R propellers is shown below. It is recommended to assemble the propeller on a worktable before installing it on the plane. For further information, contact the DUC Hélices Company.

5.1. Assembly of the propeller

A « **Propeller Form** » will be done to insure a propeller follow-up. Parts Number and component serial number of propeller will be written on this form.

STEP 1.

Place the **rear half-hub** on a worktable.



Be careful not to invert with the front hub half. Depending on your installation, the rear half-hub is one mounted on the propeller-shaft of the engine or on a spacer. The diameter of the bore of the metal inserts of the rear half-hub is larger than the bore of the metal inserts of the front half-hub.

STEP 2.

Place the hub spacer in the center of the rear half-hub.



STEP 3.

Positioning the blades in their hub slots by placing them outwards.



The three blades of the propeller have been balanced at DUC Hélices before their dispatch.

Position the DUC logo facing you.



Note that the metal inserts of the half-hub allow a locking of the blades in their axis within the hub.

STEP 4.

Place the **front half-hub** (metal insert with small hole) on the set to fit with the blade roots and internal spacer.



STEP 5.

From the front hub, set up the 6 screws and washers for hub assembly. At the rear, place washers and lock nuts.

Perform initial moderate tightening.

STEP 6.

Place the hub clamping washer on the front of the propeller hub (logo side). **Be sure the direction of the clamping washer (rounded edge outwards).**



Place the 6 fixing screws and their washer.

In the case of pin contact washers, the pins are oriented towards the screw head.

5.2. Installation on the aircraft

As presented in section 4.1. **Mounting configuration of the FLASH-R propeller**, several mountings are possible:

1. Installing **directly on propeller-shaft** of the engine
2. Use a **spacer** for spacing propeller from the propeller-shaft
3. Use an **adaptor spacer** to adjust the diameter fixing of the propeller and for spacing the propeller from the propeller-shaft

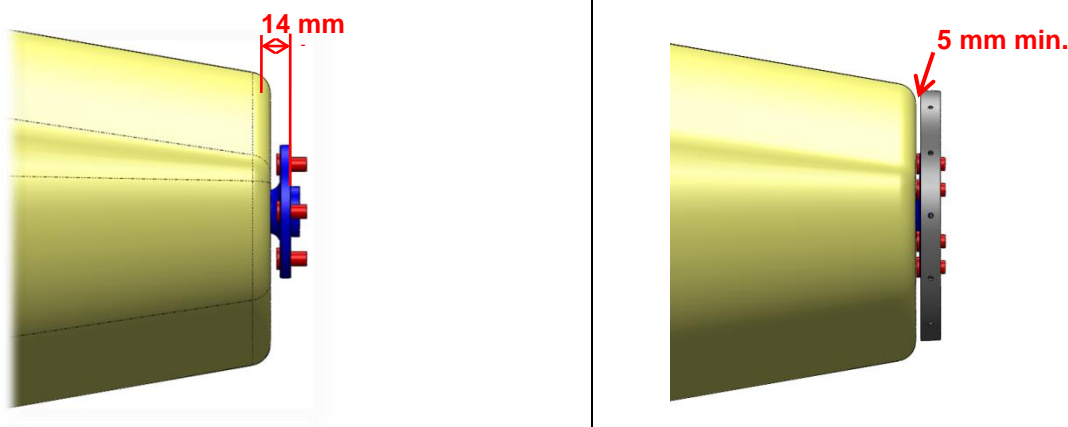
5.2.1. Direct installation on the aircraft

The direct installation of the FLASH-R propeller is possible only with the following conditions:

- ✓ Engine propeller-shaft type Rotax (6 indexing dowels Ø13 on P.C.D. Ø101.6mm/Ø4")
- ✓ Engine propeller-shaft out of the engine hood of 14mm for the mounting of the DUC spinner

If needed, see in annex 9.1 **Dimension of the engine propeller-shaft**.

Remark: All engines having a propeller-shaft with a P.C.D. Ø101.6mm/Ø4" can install the FLASH propeller directly. **The holes of the metal inserts of the rear half-hub must be adapted to suit with the indexing dowels of the propeller-shaft.** For further information, contact the DUC Propellers.



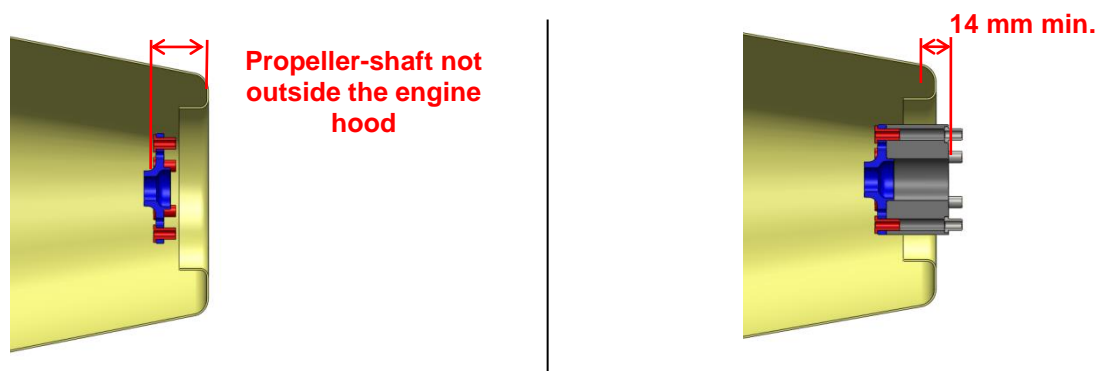
5.2.2. Use of a spacer

A spacer is necessary in the following case:

- ✓ Engine propeller-shaft type Rotax (6 indexing dowels Ø13 on P.C.D. Ø101.6mm/Ø4")
- ✓ Engine propeller-shaft positioned inside the engine hood or positioned at less than 14mm

Determination of the spacer length:

Measure the **distance X** between the propeller-shaft and the engine hood limit, then add **14mm**.



Available spacer:

Engine	Model	P/N	Length (XX)
ROTAX	Spacer 912H	E-912H-XX	3, 6, 10, 15, 20, 30, 45, 50, 60, 70, 75, 80, 100, 120mm

→ The length of the hardware necessary to fix the propeller is defined by the DUC Hélices design office. This is also the case when it is necessary to set up an intermediate spacer.

→ Tightening screws: see step 7 of § 5.3. Propeller adjustment & Finalizing the assembly.

→ The spacers are delivered with the dowels.

5.2.3. Use of adaptor spacer

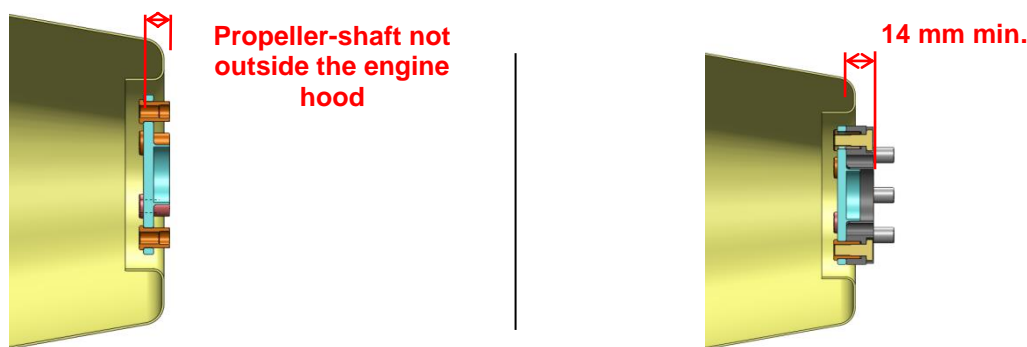
An adaptor spacer is necessary in the following case:

- ✓ Engine propeller-shaft different than the type Rotax (other than P.C.D. Ø101.6mm/Ø4")

If needed, see in annex **9.1 Dimension of the engine propeller-shaft**

Determination of the adaptor spacer length:

Measure the **distance X** between the propeller-shaft and the limit of the engine hood, then add **14mm**.



Available adaptor spacer:

Engine	Type	Model	Length (XX)
Continental O-200 Lycoming O-233 / 235	Adaptor spacer SAE1 AN6	E-SAE1AN6-XX	30, 70, 80, 100mm
Lycoming O-320 / IO-320 (3/8 dowels)	Adaptor spacer SAE2 AN6	E-SAE2AN6-XX	30 mm
Lycoming O-320 / IO-320 (7/16" dowels)	Adaptor spacer SAE2 AN7	E-SAE2AN7-XX	90 mm 100 mm

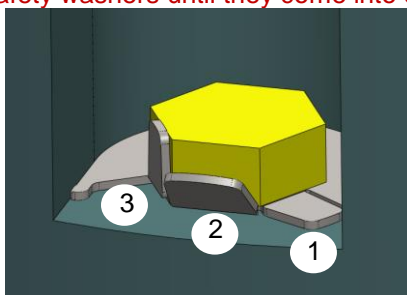
→ The spacers are delivered with the pawns that go to the side of the propeller.

→ The length of the screws required to fix the propeller is defined by the DUC Hélices design office. This is also the case when there is a need to install an adaptation spacer.

→ Installation of brake plates under the heads of the spacer fixing bolts to prevent them from loosening.

→ Tightening screws: see step 7 of § 5.3. Propeller adjustment & Finalization of assembly.

→ Complete folding of the 3 tabs of the safety washers until they come into contact with the flat of the screw.



5.3. Setting of the propeller & Finalization of the installation



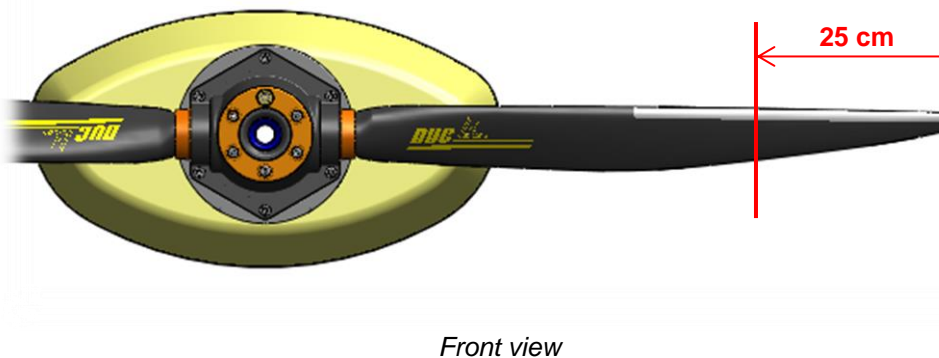
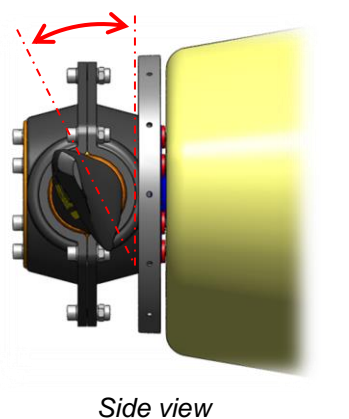
At this point, the propeller is installed on your aircraft with the spinner mounting plate.

If the propeller is already **assembled and the blades angle set**, pass directly **STEP 7**.

Otherwise, follow all the steps below to **adjust the pitch angle** before the final tightening of the screws.

A reminder of the definition of the airfoil and its vocabulary is presented in annex Erreur ! Source du renvoi introuvable..

STEP 1.

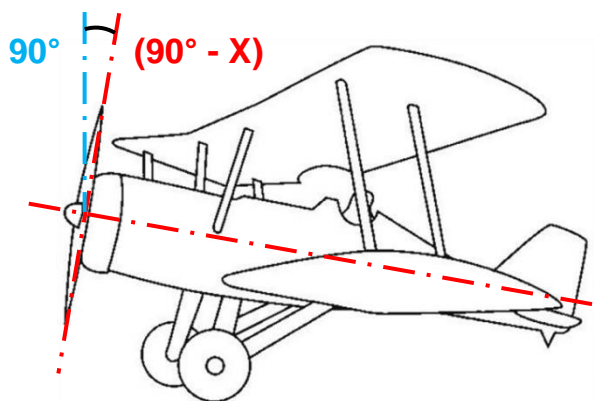
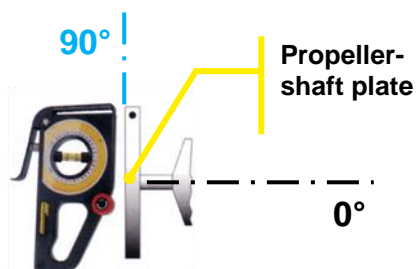


For the setting, the concerned blade must be **place in horizontal position**.

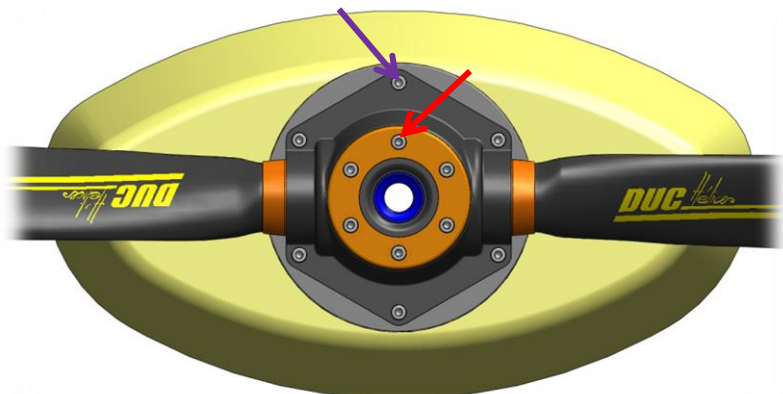
The setting is done with the adjusting tool flatten against the intrados (leading edge up) at **25 cm from the blade tip**. The angle of attack is formed by the **vertical and the intrados of the blade**.

To do this, place your aircraft horizontally, so that the propeller mounting flange is perfectly vertical.

Check with the level of the adjustment tool (measured value = 90°). **If unable to change the longitudinal axis of the aircraft, raising the value of the X angle propeller shaft plate to subtract the value of the blade angle to be resolved.**

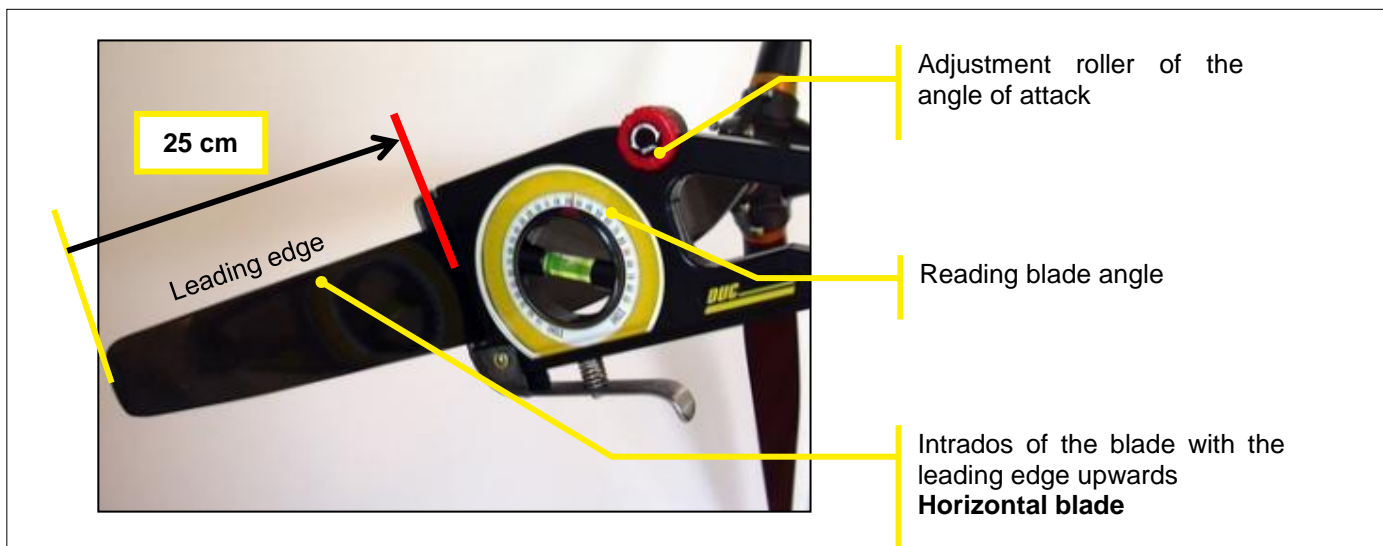


STEP 2.



Slightly untighten the **propeller fixing screws** and the **hub assembly screw**.

STEP 3.



Horizontal blade, leading edge upward, place the adjustment tool at 25 cm from the tip of the blade, intrados side (flat), handle down.

STEP 4.

Set the desired value of the adjustment tool.

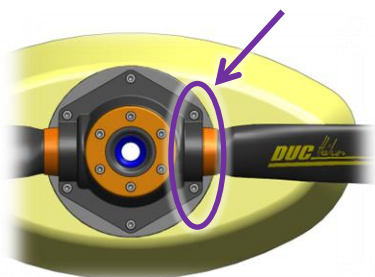
Caution to apply the value X if a correction of the aircraft plan was needed.

STEP 5.

Correct the position of the bubble on the adjustment tool by rotating the blade in the hub. To do this, using a mallet, lightly tap on the foot of the blade in the desired direction.

Do not apply pressure near the trailing edge, thinner area.

STEP 6.



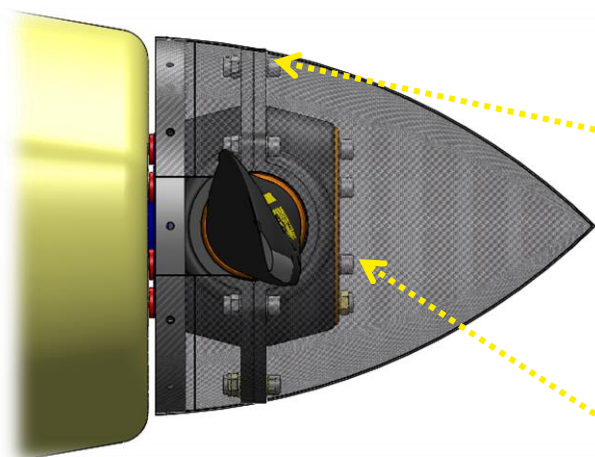
Once the desired pitch angle obtained, slightly tighten the **assembly screws of the hub**, those around the foot blade and then perform the same operation on each of the other blades.

STEP 7.

Remove the adjusting tool from the propeller then perform a **first tightening of the bolts manually**.

Then, carry out a **progressive tightening** of all the screws by **applying the correct torque** with a torque wrench:

Mounting with a 912H spacer:



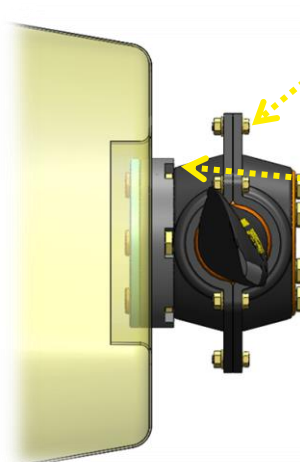
Assembly of the three-blade hub + Fixation of the spacer (EI-912H-80, 100, 120):
 (screw length adapted according the adaptor spacer length and the starter flange on the propeller-shaft)

TIGHTENING TORQUE
 2,5 Kg/m 25 N.m

Propeller fixing: (or spacer if spacer > 80mm)
 Screw CHC M8 & pin contact washer (screw length adapted according the length of the spacer).
 Use with dowel threaded on the engine propeller shaft
 (Ex: For Rotax 912S, **Screws CHC M8x130mm**)

TIGHTENING TORQUE
 2,5 Kg/m 25 N.m

Mounting with an Adaptor spacer:



Assembly of the three-blade hub

TIGHTENING TORQUE
 2,5 Kg/m 25 N.m

Fixation of the Adaptor spacer:

Screws AN6 or AN8
 (screw length adapted according the adaptor spacer length and the starter flange on the propeller-shaft)

TIGHTENING TORQUE ADAPTOR SPACER
 AN6 bolt (3/8"): 3.0 Kg/m 30 N.m
 AN7 bolt (7/16"): 3.5 Kg/m 35 N.m
 AN8 bolt (1/2"): 4,5 Kg/m 45 N.m

Propeller fixing screws:

SAE1: Screws DUC AN6-52
 SAE2: Screws DUC AN8-52

TIGHTENING TORQUE PROPELLER FIXING
 AN6 bolt (3/8"): 3 Kg/m 30 N.m
 AN8 bolt (1/2"): 4,5 Kg/m 45 N.m

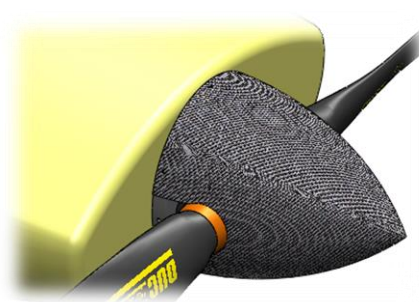
Remark: It is imperative to use a spinner when using propeller FLASH-R. The mounting plate of the spinner can be placed before or after the spacer adaptation. It is necessary to adapt the mounting in function of its position



IMPORTANT

After a 1-hour operation following the installation or modification of the assembly, recheck the assembly of your propeller according the instructions manual using appropriate tools (tightening torque, pitch angle...).

STEP 8.



After a final verification (position and orientation of parts, tightening...), mount the spinner on its plate **by tightening the spinner screws to a torque of 4Nm (0.4kg/m)** with the appropriate tools.

In the presence of a marking, please respect the indexing of the spinner from its plate.



At this point, the Certified FLASH-R propeller is ready for first tests.
The user must perform the appropriate regulations procedures to change the propeller in accordance with applicable regulations of the aircraft

6. Precautions

PRECAUTIONS

If you notice any abnormal installation or operation, do not undertake the flight and immediately contact the DUC Hélices company.



Being aware of potential risks during assembly and initial testing of the propeller. Stay focused, attentive and vigilant to your environment. Recheck several times points to be observed. Maintaining high safety clearance during the set operation.

The products of the DUC Hélices company must be installed and used according to the instruction manuals provided. No modification can be made without the agreement of DUC Hélices company. The non-compliance of these data assumes no responsibility for the DUC Hélices company and makes out the warranty of the considered products (See section 8. **General terms of sale**).

7. Continuing airworthiness

7.1. Airworthiness limitations

Today, the three-blade Certified FLASH-R has a limited flight potential of 2000 hour.

However, a program is organized by DUC Hélices to improve this flight potential.

This paragraph « Airworthiness limitations » is approved by EASA according to the Part 21.A.31 (a) and CS-P 30(b).

Any changes to this paragraph or documents which are linked to this paragraph should be submitted to EASA for a new agreement.

For more information contact the DUC Hélices Company

7.2. Schedule of propeller check

Type	Frequency
Screws tightening	After the first working fly
Regular	Each pre-flight
General	Every 100 hours or annually
TBO	Every 2000 hours See manual DH_TBO_BE_01_A – Instruction Manual TBO

7.3. Regular maintenance (by the user)

For a safety use of the FLASH propellers, it is necessary that the user performs regular maintenance to detect any abnormalities.

Frequency of checking: Each pre-flight

Checkpoints	Control methods	Location	Possible problems	Actions
Fixation of the propeller	Manually maintaining the tip of a blade of the propeller, shake it firmly to feel if a too much clearance appears in the setting of the propeller.	Propeller fixation screws	Clearance in the propeller fixation	Stop propeller use and apply these corrective actions Check screws. If necessary, change the propeller fixations screws & Check all the mounting to avoid problems.
Degradation of propeller	Check visually the entire propeller without dismantling (blade root, Inconel leading edge, surface of the blade, spinner, hub, etc.)	Blade root	Big scratch/marking on the blade	Stop blade use* . You have to change the blade.
			Small scratch/marking on the blade	If small marking without deformation, continue to use it.
			Crack	Stop blade use* . You have to change the blade.
		Shielding leading edge in Inconel	Lifting	Stop blade use* . You have to change the blade.
			Significant impact: deep scratches, break, deformation (see. paragraph 7.5.)	Stop blade use* . You have to change the blade.
			Low impact: not deep scratches (see. paragraph 7.5.)	No mechanic risk, continue to use it.
		Blade	Significant impact: deep scratches Local delamination (see. paragraph 7.5.)	Stop blade use* . You have to change the blade.
			Low impact: not deep scratches, small scratch, small impact (see. paragraph 7.5.)	No significant risk
Propeller adhesive loss	No significant risk, continue to use it.			
Fixation of the spinner	Check visually the fixation screws of the spinner	Spinner fixation screws	Play/Gap in the spinner	Check the screws. If necessary, change it. Tighten the screws to proper torque with wrench A marking paint of all the screw/washer/hub after tightening can be done to help make a visual check outside of the general maintenance.

* *Nota: All the blades are balanced together. When a blade is changed, the blade has to be balanced to keep this balancing. For this, contact the DUC Hélices company.*

7.4. Maintenance of 100 hours or yearly maintenance.

A propeller general check by the user or a certified aeronautic workshop must be done from time to time. During this check, clean the propeller.

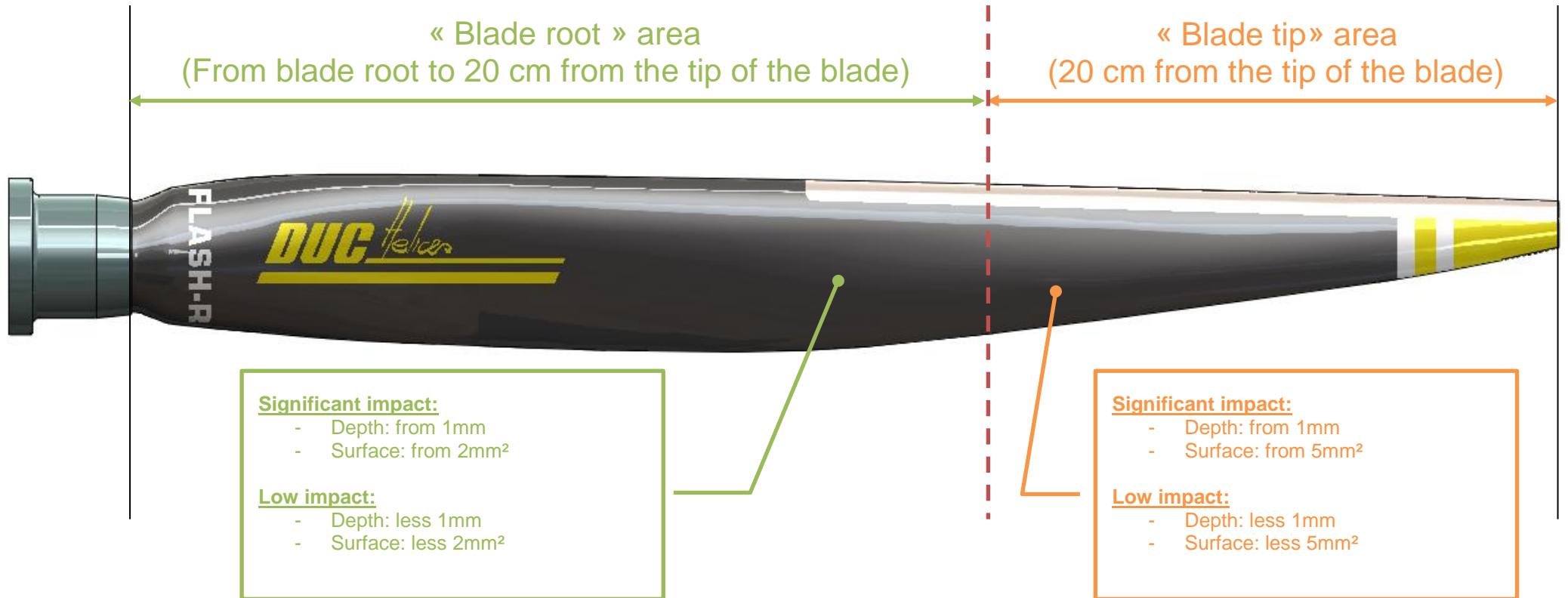
Frequency of checking: 100 hours or yearly

Checkpoints	Control methods	Location	Possible problems	Actions
Fixation of the propeller	By removing the spinner of the propeller, check the proper tightening of the screws with a torque wrench.	Propeller fixation screws, hub screws	Play/Gap in the propeller fixation	Stop propeller use and apply these corrective actions Check screws. If necessary, change the propeller fixations screws & Check all the mounting to avoid problems. These screws of the hub should be tightened to proper torque, defined in the installation instructions attached. Paragraph 5.3. Setting of the propeller & Finalization of the installation, step 7.
Degradation of propeller	Visual check of the propeller (Blade root, hub, spinner, shielding leading edge in Inconel ...)	Blade root	Big scratch/markings on the blade ring	Stop blade use* . You have to change the blade.
			Small scratch/markings on the blade ring	If small marking without deformation, continue to use it.
			Crack	Stop blade use* . You have to change the blade.
		Shielding leading edge in Inconel	Lifting	Stop blade use* . You have to change the blade.
			Significant impact: deep scratches, break, deformation (see. paragraph 7.5.)	Stop blade use* . You have to change the blade.
			Low impact: Non-deep scratches (see. paragraph 7.5.)	No mechanic risk, continue to use it.
		Blade	Important impact: Crack, deep impact, local delamination (see. paragraph 7.5.)	Stop blade use* . You have to change the blade.
			Low impact: not deep scratches (see. paragraph 7.5.)	No significant risk
			Propeller adhesive loss	No significant risk, continue to use it.
		Complete hub	Crack, delamination	Stop using this part. Change the half-hub
Surface deformation	Stop using this part. Change the half-hub			
Hub screws	Nylstop self-locking nut is damaged	Stop using this part. Change the Nylstop self-locking nut		
Fixation of the spinner	Check visually the correct fixing of the spinner and its fixing bolts	Spinner fixation screws	Play/Gap in the spinner	Check the screws. If necessary, change it. Tighten the screws to proper torque with wrench A marking paint of all the screw/washer/hub after tightening can be done to help make a visual check outside of the general maintenance.

* *Nota: All the blades are balanced together. When a blade is changed, the blade has to be balanced to keep this balancing. For this, contact the DUC Hélices company.*

7.5. Impact location on the blade carbon surface

If there is any doubt about the blade surface, contact the DUC Hélices company.



8. General terms of sale

8.1. Ordering procedure

Orders placed by fax, by phone or mail server engage the customer upon receipt by our Customer Service Order and the Regulations.

8.2. Delivery

DUC Hélices Company agrees to make every effort to deliver the order within the shortest time, and the receipt of the order together with the Regulation. The delivery times indicated on the order are only indicative and the possible delays do not entitle the buyer to cancel the sale, to refuse the goods or claim damages. Any claim for non-compliance or failure will be sent within one week following the date of receipt of order.

The DUC Hélices Company is released from its obligation to deliver for all fortuitous events or force majeure. As an indication, the total or partial strikes, floods, fires are cases of force majeure. The transfer of ownership of goods supplied or delivered is suspended until full payment of price by the customer and without affecting the transfer of risk.

8.3. Price

The DUC Hélices Company may change its prices at any time.

The customer agrees to pay the purchase price in effect at the time of order entry. Regulation Order is payable in advance in one payment when sending the DUC Hélices Company purchase order.

8.4. Right of withdrawal

Under Article L121-16 of the Consumer Code, the customer shall have seven clear days after the delivery of his order to return the products to the DUC Hélices Company for exchange or refund, without penalties except for the return costs. Returned products must not have suffered modification, damage consequence of shock or improper use and be packaged in original packaging. Goods shipped with postage due will not be accepted.

8.5. Warranties

The DUC Hélices Company's products must be installed and used in accordance with instruction manuals provided. No changes can be made without the prior approval of the DUC Hélices Company. The failure of these data releases any liability of the DUC Hélices Company and makes non-warranty the considered products.

The user is still flying under its sole responsibility.

The legal guarantee of industrial products is six months or for the potential duration of the helix (depends on which engine it is installed) against defects and hidden defects. See the section **2. Applications** to determine the potential value of an hour's flight engine.

DUC Hélices Company guarantees its product defect under normal use in the manner described below: If the customer finds a defect, he must report it immediately to the DUC Hélices and features of one month after its purchase to return to society DUC Hélices, all structural defects will snuff into account (except for damage result of incorrect operation, shock, injury, impairment or neglect, water or generally inappropriate use by the engine type, power, speed and gear). To qualify for this warranty, the customer must send at its expense within one month after its purchase to be returned to society with DUC Hélices delivery order attached to the product. In return, the DUC Hélices Company takes no responsibility for damage or loss during transit due to improper or inadequate packaging. The company DUC Propellers then returned at his expense to the customer at the address on the delivery note, an identical or equivalent.

In addition to these guarantees, the company DUC Hélices provides no other warranties.

8.6. Privacy Policy

All the data you entrust to us are able to process your orders. Under Law No. 78-17 of January 6, 1978 relating to data, files and freedoms you have with the customer service company DUC Hélices right to access, review, correct, correct and delete data you have provided.

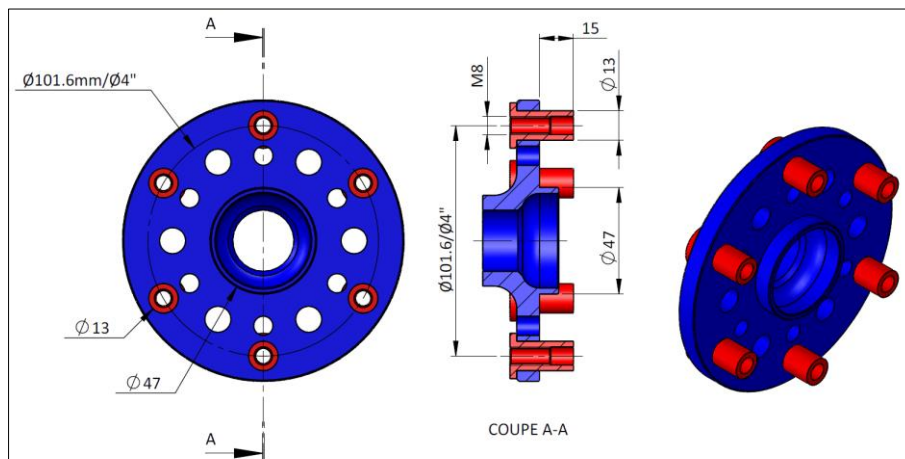
8.7. Litigation

Any order placed convincing the customer, without any restriction, the General Conditions of sale of the DUC Hélices Company. Any dispute concerning the sale (price, GTS, product ...) will be subject to French law before the Tribunal de Commerce de Lyon.

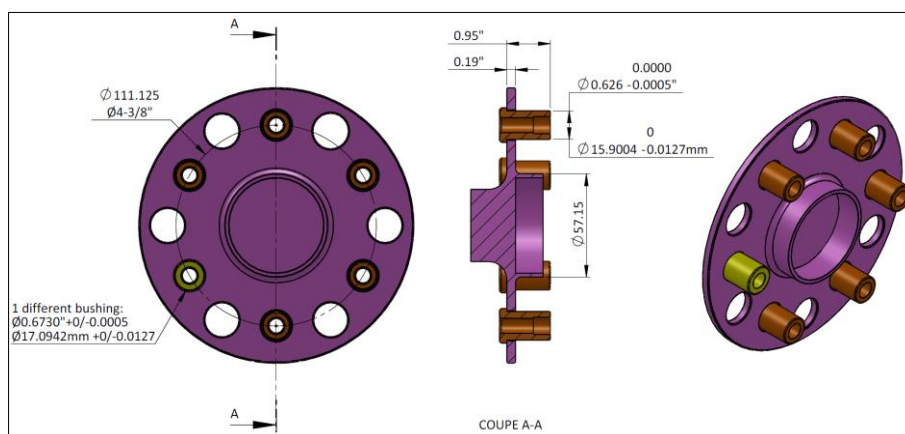
9. Annexes

9.1. Dimension of the engine propeller-shaft

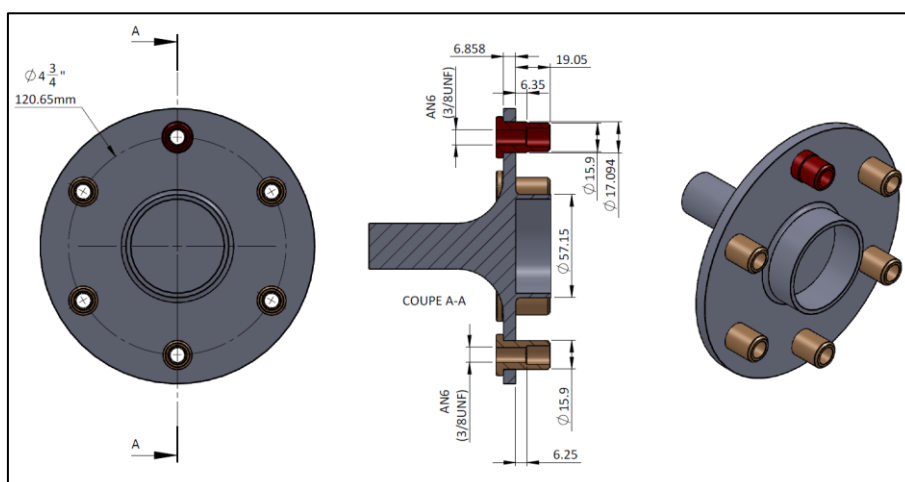
9.1.1. ROTAX 912S engine propeller-shaft



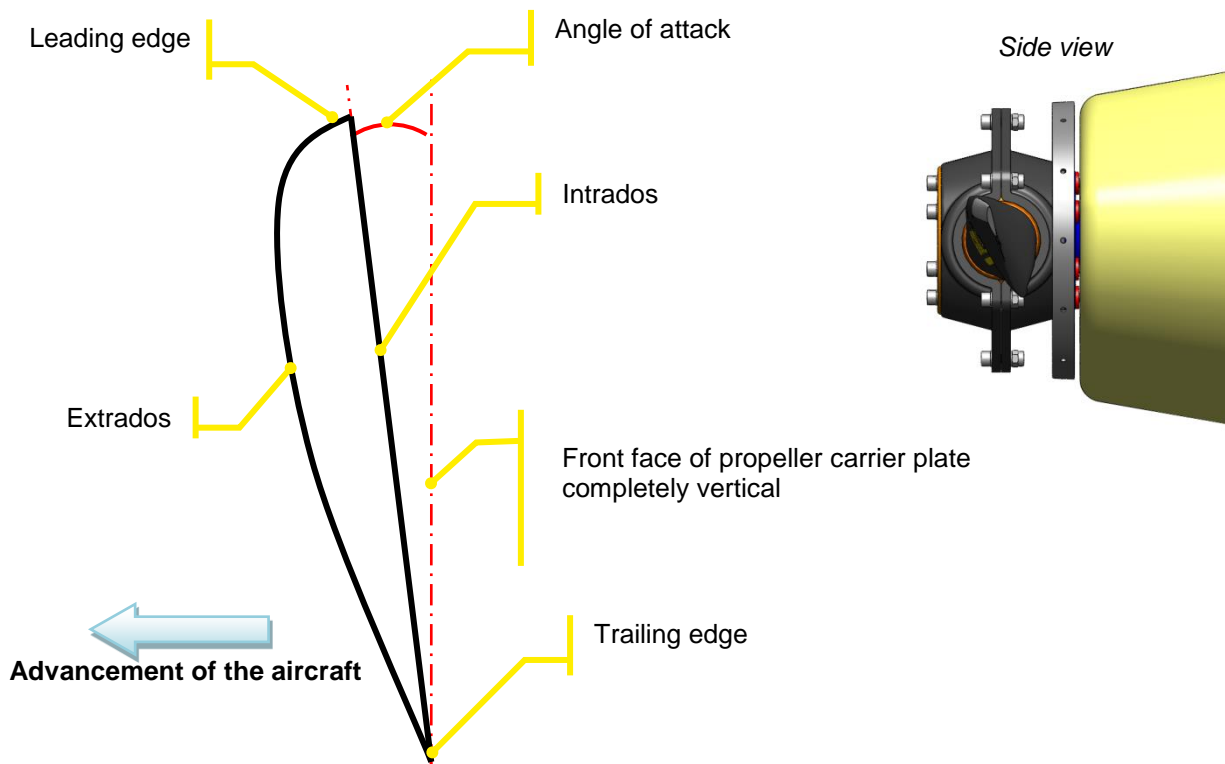
9.1.2. Lycoming O-235-H2C engine propeller-shaft, type SAE-AN6



9.1.3. Lycoming O-320-A2A propeller-shaft, type SAE2-AN6



9.2. Airfoil



		Record Claim		Document : DH_QU_000_FOR_52_A Modified : 02/11/2016	
Company/flightclub	Name/Surname	Town	Phone/Mobile	E-mail	Address
Aircraft	Engine	Propeller :	P/N Propeller :	S/N Hub :	S/N Blade :
Register	Apply	<input type="checkbox"/> aircraft <input type="checkbox"/> glider tow <input type="checkbox"/> Other :			
Claim					
Date	Signature				

DUC Hélices Propellers

ISO 9001 : 2015
N° TC EASA : EASA P.038
N° Part 21G EASA : FR.21G.0273

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Certified company
ISO 9001:2015



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