



Instruction Manual

TB Composites Spinners



Revision Update

Date	Index	Object of modification
19/10/2017	A	Creation
30/05/2018	B	Minor change §.3 & Update §.7
26/06/2019	C	Updating the spinner fixing screws in the bulkhead.

Each change to the last revision / index in the list above has a dark red font color.

Summary

1.	Object.....	3
2.	Description	3
3.	Characteristics	3
4.	Sales reference	4
5.	Applications.....	4
6.	Installations Precautions	4
7.	Exploded views of spinners	5
8.	Mounting instructions	6
8.1.	Preliminary indications	6
8.2.	Additional specifications	6
8.3.	TB spinner mounting	7
9.	Precautions	10
9.1.	Primary precautions	10
9.2.	Secondary precautions: Regular checking of the spinner by the user.....	10
10.	Imperative static test	11
11.	Continued airworthiness	11
11.1.	Limit of navigability & Warranty.....	11
11.2.	Spinner checking planning	11
11.3.	General checking of the spinner (During the propeller inspection).....	12
11.4.	Defects evaluation on the carbon structure for spinner	12

1. Object

This manual presents the assembly instructions for the change of original TB aluminum spinners by new composite spinners manufactured by DUC Hélices Propellers for DAHER AEROSPACE.

Also, this manual specifies the instructions for the use and continuing airworthiness of these new TB composite spinners.

2. Description



This new TB aircrafts spinner is entirely made of composite materials (carbon fiber combined with fiberglass) and is coated with a white gelcoat on the surface in standard.

Its aeronautical shape is identical to the original TB spinner according to the DAHER AEROSPACE definition, so it has not impact on the cooling performance of the engine.

Two versions of TB spinners exist to be compatible with the following types of propellers:

- A. **2-blades variable pitch HARTZELL propellers (P/N: C345TBA)**
- B. **2-blades fixed pitch SENSEICH propellers (P/N: C345TBB)**

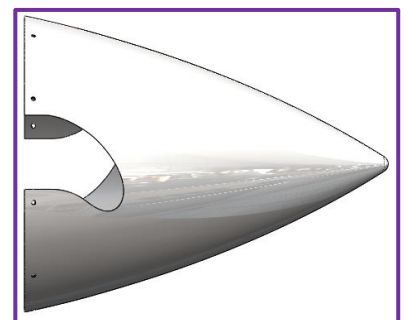
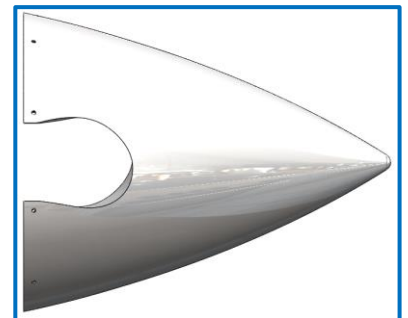
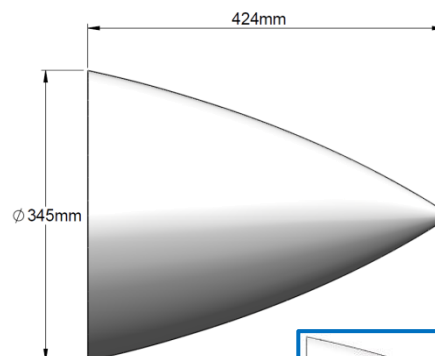
3. Characteristics

- **Diameter:** Ø345 mm (13,6")
- **Length:** 424 mm (16,7")
- **Opening of the blades:**
 - A. **for 2-blades HARTZELL Propellers**
 - B. **for 2-blades SENSENICH Propellers**
- **Weight of the spinners:**
 - A. **HARTZELL version:** 492±30 gr (1,084±0.06 lb)
 - B. **SENSENICH version:** 494±30 gr (1,089±0.06 lb)
- **Lever-arm modification:**

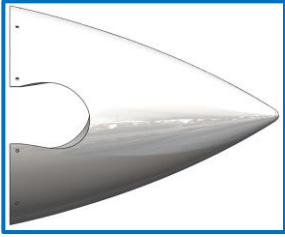
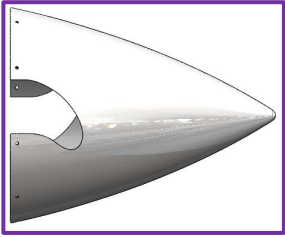
Replacing origin aluminum spinner by the composite version gives a weight gain of about 1kg (2,2lb). It has been shown that this mass difference has negligible impact on the centering.
- **Spinner fixing:**

Backward compatibility of the assembly with the back aluminum mounting plate of TB aircrafts:

 - A. **HARTZELL propellers:** No more front centering on the propeller
 - B. **SENSENICH propellers:** Front plate must be removed
- **Finishing:**
 - Withe gelcoat in standard.
 - On request: Transparent gelcoat to keep carbon aspect...
- **Others remarks:**
 - Original blade opening covers (equipped covers) must be removed.
 - Presence of an angular mark on the spinner by a Ø2mm hole.
 - **Use of news M5x16mm screws (CMS 5169911176).**
 - Possibility of painting the spinners after delivery (refer to the instructions prescribed in chapter 20-00-03 of maintenance manual of the aircraft).



4. Sales reference

View	Designation	Reference	Part Number
	2-blade HARTZELL propeller Ø345 TB spinner	01-70-127	C345TBA
	2-blade SENSENICH propeller Ø345 TB spinner	01-70-128	C345TBB

5. Applications

The TB spinners made by DUC Hélices Propellers are given for flight potential under normal operating conditions. To maintain this potential, DUC Hélices Propellers recommends frequency of verification. Refer to section 11.2 Spinner checking planning for more information.

Aircrafts	Aircraft TCDS	Engines*	Propellers	Compatible spinners P/N	Frequency of verification
TB 9	EASA. A.378	Lycoming O-320-D2A Lycoming O-320-D1A	SENSENICH 74DM6 S8 061 SENSENICH 74DM6 S8 054 SENSENICH 74DM6 S8 058 HARTZELL HC-C2YL-1BF/F 7663 A-4	C345TBB	Refer to section 11.2 Spinner checking planning of this manual
TB 10		Lycoming O-360-A1AD	HARTZELL HC-C2YK-1BF/F 7666 A-2	C345TBA	
TB 20		Lycoming IO-540-C4 D5D Lycoming IO-540-C4 B5D	HARTZELL HC-C2YK-1BF/F 8477 – 4		
TB 21		Lycoming TIO-540-AB1AD	HARTZELL HC-C2YK-1BF/F 8477 – 4		
TB 200		Lycoming IO-360-A1B6	HARTZELL HC-C2YK-1BF/F 7666 A-2		

* The applicable limits for carbon spinners are the same limits as the engines listed in this table

6. Installations Precautions

WARNING

Make sure that the ignition circuit is turned off before starting any type of operation on the spinner.

IMPORTANT

The spinner is an important element for the cooling of the engine. Be sure to follow the TB Aircrafts Flight Manual recommendations.

7. Mounting confirmation of the spinners

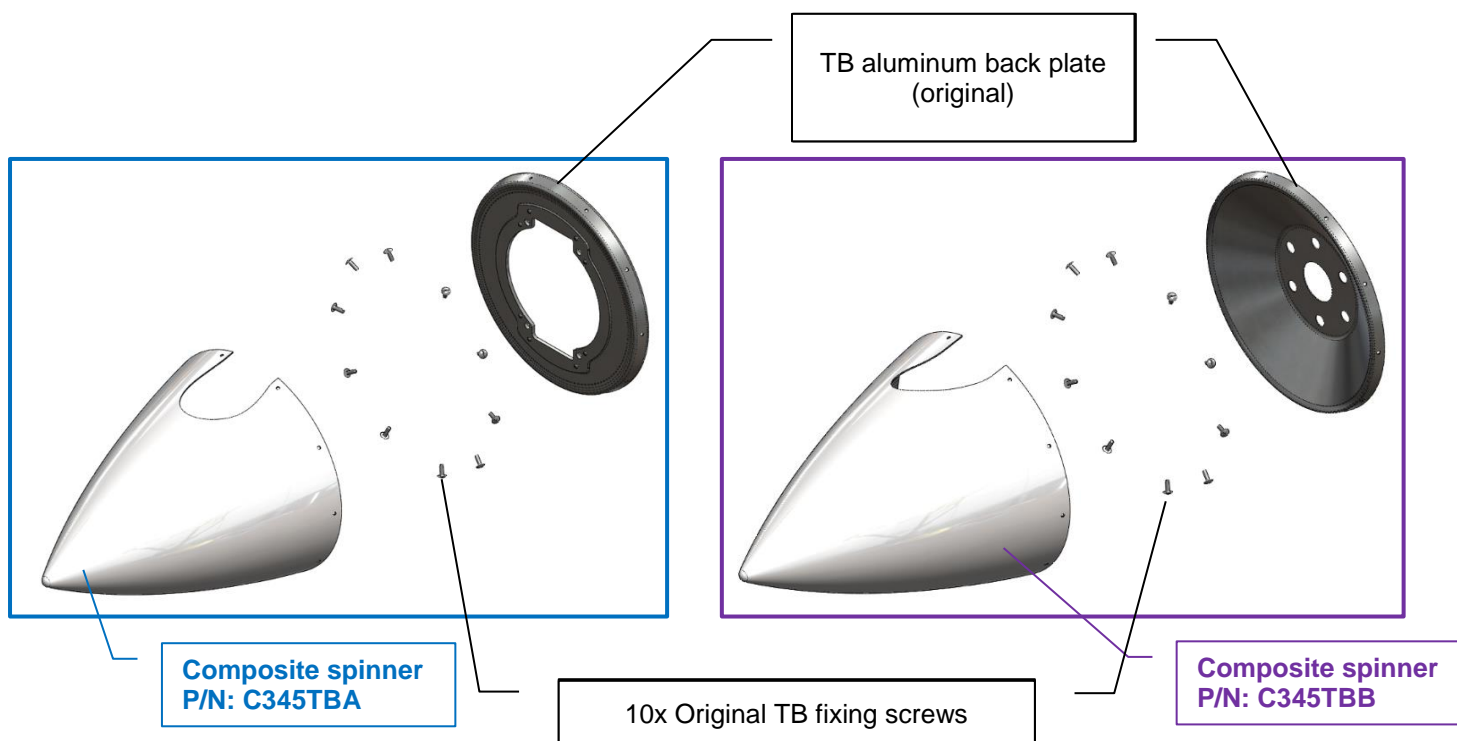
This manual presents the assembly instructions for the new TB composite spinner. However, new composite rear flanges have been developed for spinner mounting.

The composite spinners and flanges made by DUC are respectively interchangeable with the original aluminum spinners and flanges.

Thus, according to the needs, the following configurations are possible:

Configuration	Spinner		Rear Flange		Front Flange	Blade opening covers
	DUC Composite	Aluminum	DUC Composite	Aluminum	Aluminum	
Initial		✓		✓	✓	✓
A		✓	✓		✓	✓
B	✓		✓		✗	✗
C	✓			✓	✗	✗

As an indication, here is an exploded view of the configuration C:



8. Mounting instructions

8.1. Preliminary indications

a) Adjustment of the spinner on the mounting plate

During the initial assembly of the composite spinner on the original TB aluminum back plate, adjustments should be realized to obtain a conformal assembly of the spinner. Indeed, manufacturing variations on the aluminum back plate may exist, and the addition of paint on it may slightly modify its dimension, and thus, its mounting interface with the composite spinner.

So, 2 types of adjustments are to be checked during the first assembly:

1. The correct insertion of the spinner on the back plate
2. The correct concentricity of the holes on the spinner with the holes on the back plate

b) Implementation of an angular marking

It is strongly recommended to apply a mark on the back plate to index the orientation of the spinner, to maintain, after many dismounting, this orientation between these 2 assembled parts. The spinner is angularly marked by a Ø2mm hole near a blade opening. **Be careful not to clog this when painting.**



c) Presence of de-icing system

In the case of de-icing system installed on the propeller, the placement of the glycol sprinklers close to the blade root must be checked. In the event of their positions generate a collision or contact with the spinner, the sprinkler tubes must be adjusted away from the composite spinner at the risk of generating a defect on the spinner.

Below, find the mounting indication of the spinner according to the configuration.

8.2. Additional specifications

8.2.1. Lever-arm validation

Although there is a gain of 1kg (2,2lb) between the composite and the aluminum version, there is no significant impact on the lever-arm of the TB aircrafts. So there is no impact on the aircraft centering too.

8.2.2. Application of paint on the spinner


The new composite spinner can be paint. Refer to instructions in section 20-00-03 of the aircraft maintenance manual.

8.2.3. Fixing screws / Screw length

The original fixing screws of the TB spinner must be maintained for mounting on the original TB aluminum bulkhead.

In the case of mounting on composite bulkhead, it is now planned to install 10 screws M5 x 16mm (CMS 5169911176) to replace the 12 screws M5 x 12mm originally provided on TB spinner.

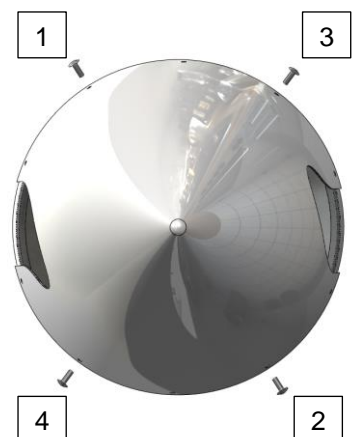
8.3. TB spinner mounting

TB spinner for HARTZELL propeller P/N: C345TBA	TB spinner for SENSENICH propeller P/N: C345TBB
<p>Step 1 – Disassembly of the original spinner</p> <p>First of all, disassemble the original aluminum spinner according to the instructions of the TB maintenance manual. Also, carefully remove the covers of the openings blade (equipped covers).</p>  <p>In previous mounting, adhesive tapes may be affixed on the back plate to reduce the clearance between it and the old aluminum spinner. With the new composite spinner, it is imperative to remove all adhesive tapes which are on the back plate or on the propeller because it can be create mounting defect. If necessary, restore the aluminum protection. Indeed, the adhesive tapes are sometime too sticky; it is possible the primary comes with it.</p>	<p>Step 1 – Disassembly of the original spinner & front plate removal</p> <p>First of all, disassemble the original aluminum spinner according to the instructions of the TB maintenance manual. Also, carefully remove the covers of the openings blade (equipped covers).</p> <p>Then, it is necessary to disassemble the propeller to remove the aluminum front plate placed on the front of the SENSENICH propeller.</p> <p>For the installation of the composite spinner, there is no need of the original front plate but only the original back plate for the fixation of the spinner.</p> <p>In previous mounting, adhesive tapes may be affixed on the back plate to reduce the clearance between it and the old aluminum spinner. With the new composite spinner, it is imperative to remove all adhesive tapes which are on the back plate or on the propeller because it can be create mounting defect. If necessary, restore the aluminum protection. Indeed, the adhesive tapes are sometime too sticky; it is possible the primary comes with it.</p>

Step 2 – New composite spinner presentation & Initial adjustments

Make a first placement of the spinner on the back plate by passing it through the propeller blades.

- Check the insertion of the spinner on the back plate and the angular positioning of the holes.
- Try a first assembly with only 4 fixing screws in the order presented on the figure beside.
- Possibly test the second angular position of the spinner on the 2-blade propeller.
- Before to continue, choice the angular position of the spinner on the back plate you prefer and make a mark on the back plate to coincide with the Ø2mm hole reference on the spinner.





IMPORTANT

During the assembly, a firm pressure can be realized by technician's hand on the tip of the composite spinner to assist its mounting and alignment.

Be careful not to apply too much stress which can damage the spinner and its fixation.

If the insertion of the spinner permit to obtain the mounting holes aligned in depth (in the axis of the propeller), then it is not necessary to adjust the thickness of the base of the spinner.

If the insertion of the spinner does not permit to align the holes and at least to screw the 4 first screws, then it is necessary to slightly reduce the thickness of the base of the spinner.

With an abrasive, resume the internal surface of the spinner which corresponds of the assembly zone with the back plate (height approx. 30mm) to slightly reduce the thickness of the spinner and permit to get a better insertion of the spinner on the back plate.

The final thickness should not be less than 1,5mm. Be careful to not damage the spinner during the operation.

Adjust the thickness recovery by successive mounting tests of the spinner on the back plate, always with at least 4 fixing screws.

If the thickness is not enough to compensate the shifting of the holes, **the Ø5,1mm holes on the spinner can be increased to Ø5,3mm, or Ø5,5mm if necessary.**



When the first 4 screws at least can be installed:

- Try to place all of others screws.
- Otherwise, mark the angular placement defects exposed to modify the lateral hole.



When the type of defect is met, the Ø5,1mm holes should be increase only in lateral direction:



Thus, at this stage, all of fixing screws must be able to be installed for the new spinner mounting on the original back plate.

TB spinner for HARTZELL propeller P/N: C345TBA

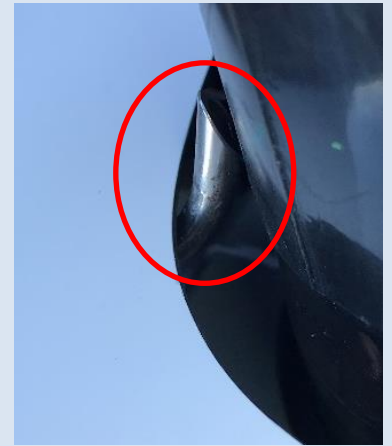
Step 3 – Presence of a de-icing system (Optional)

During the installation, check if the de-icing sprinklers are not in contact or too close to the composite spinner.

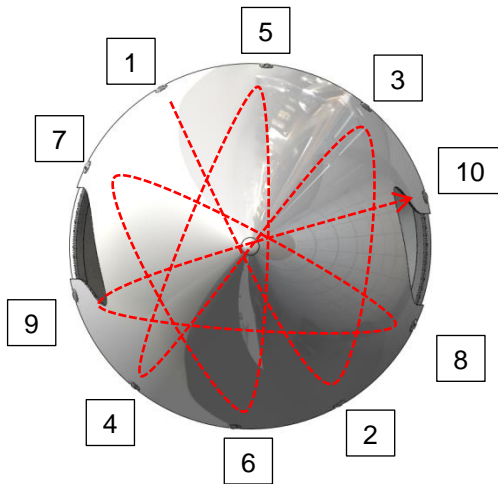
Refer to instructions in the sections 30-60-00 of the aircraft maintenance manual.

For information, the sprinkler must be at least 2mm from the spinner. If it is not the case, make a correction to the shape of the sprinklers to shift them from the spinner.

A minimum distance of 3mm is ideal between the sprinklers and the composite spinner.



Step 4 – Final mounting of the spinner



When all the depth and lateral adjustments are made, and the sprinklers placements have been checked when de-icing system installed, realize the final assembly of the spinner with all the screws according to the figure (see left).

- Place all the screws in the specified order but don't tight them completely.
- Check the correct centering of the spinner by applying pressure by hand on the tip of the spinner.
- IMPORTANT:** Do not try to still install the blade opening covers (equipped covers). The composite spinner is not adapted to receive these covers.
- After checking, make the final tightening of the screws according to the specifications in section 61-10-00 of the aircraft maintenance manual.



At this point, your spinner is ready for first static tests.
The user must do the appropriate regulatory procedure to change the spinner in accordance with the applicable regulations of the aircraft.

9. Precautions

9.1. Primary precautions

PRECAUTIONS

If you notice any anomaly of assembly or utilization, do not flight and contact DAHER AEROSPACE or DUC Hélices Propellers companies.



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.



Moreover, it is forbidden to move the aircraft by handling the spinner or to push on it (leaning on the spinner...)

Non-compliance of these indications releases the responsibility of DAHER AEROSPACE and DUC Hélices Propellers.

9.2. Secondary precautions: Regular checking of the spinner by the user

For each pre-flight, it is recommended that the user realizes a regular checking to detect any anomalies on the spinner.

Checkpoint	Means of control	Location	Potential defect	Action
Fixation of spinner	Visually checking of the correct presence of the fixing screws and by the touch, the correct hold of the spinner and its screws.	Fixing screws of the spinner & holes of the composite spinner	Appearance of clearance on the spinner fixing points.	Change the impacted screws. Adjust the tightening of the screws according to the TB manual. According to their states, change the screws. A mark could be realized on each screws and the spinner to get a visual control of the correct position holding of the screws.
Spinner surface	Visually checking of surface state of the spinner, gelcoat or paint aspect.	Spinner surface	Appearance of a pressed or impacted zone due to shock of mishandling.	In the case of a defect on the spinner or impact on surface, it is imperative to stop the flight and to contact DAHER AEROSPACE to change the part. Refer to section 11.4 for the defect evaluation. If the defect is low, it can be attenuated by slight abrasion.
Blades opening	Visually checking of the shape conformity of the blade opening of the spinner where the blades through.	Blades opening	Appearance of hollows in the opening due to an abrasion realized by de-icing sprinklers.	Correct the orientation of the sprinklers to avoid the contact with the spinner. Minimum 3mm is required to avoid the contact during the using of the propeller. Attenuate the angle of the notch generated by abrasion. Sprinkler drilling in the carbon is acceptable up to a maximum depth of 2mm. Otherwise, thanks to contact DAHER AEROSPACE.

10. Imperative static test

During the initial mounting, it is imperative to perform a validation static test on the aircraft with engine in rotation on the ground. The goal is to check the correct rotation of the spinner. Check that there is no eccentricity or abnormal vibrations during rotation.



The static rotation test should be carried out over the entire rotation range of the engine. In the first time, make an evaluation during the engine rotation.

If no significant defects are noticed, after heating the engine according to the TB manual, gradually increase the rotation speed of the engine to reach full throttle position if the aircraft brake system allows.

The evaluation of the correct rotation of the spinner must be evaluated from the idle rpm up to max rpm.

It is important to note that on 4-cylinder engines (type Lycoming O-320), vibrations are usually present at low speeds. These can cause a visual eccentricity on the spinner. This is at high rpm that this visual defect should disappear.

If any anomalies are detected, you can proceed for a flight test (optional test). It is not imperative to realize flight test to valid the correct mounting of the spinner.

If there is a significant eccentricity observed, stop the test immediately. Check the mounting, disassemble and re-assemble the spinner, check the natural alignment of the spinner. If necessary, do again all the operations to adjust the correct mounting of the spinner.

Finally, when the ground tests are validated, as the position of the spinner is indexed with the back plate, it is not necessary to realize a new test after each future operation on the propeller.

If you notice any mounting or operating anomaly, do not flight and contact DAHER AEROSPACE or DUC Hélices Propellers companies.

11. Continued airworthiness

11.1. Limit of navigability & Warranty

The spinner has an unlimited lifetime.

However, thanks to respect the frequency of checking which are indicated in section below.

Any amendment to this paragraph or to the documents related to this paragraph shall be submitted to the competent authorities for approval.

The warranty applied by DUC Hélices Propellers on the composite spinner is 4000 flight hours or 10 years only if that manual is applied correctly.

11.2. Spinner checking planning

Type	Frequencies
Regular	Each pre-flight
General	Each propeller inspection

11.3. General checking of the spinner (During the propeller inspection)

The general checking of the spinner should be realized during the propeller inspection by an authorized aeronautical workshop.

Checking frequency: For each disassembly of the spinner to realize a propeller inspection (or de-icing system if installed) according to the manual maintenance of the aircraft.

Checkpoint	Means of control	Location	Potential defect	Action
Spinner	Check the inside and outside of the spinner	Internal and external surface of the spinner	Dirt accumulation	Clean the spinner.
Spinner disassembly	Check the internal structural of the spinner	Inside and outside the spinner	Appearance of impact or depression on the surface of the fixing holes of the spinner	Refer to section 11.4 for defect evaluation. If the defect is not acceptable, change the spinner. If the defect is low, attenuate it by slight abrasion.
Reassembly of spinner	Visually inspection of the spinner for proper tightening and proper mounting on the flange	Contact surfaces of the spinner on the back plate	Appearance of clearance between the spinner and the aluminum back plate	Tight screws with the correct torque. If the clearing is too much, contact the DAHER AEROSPACE.

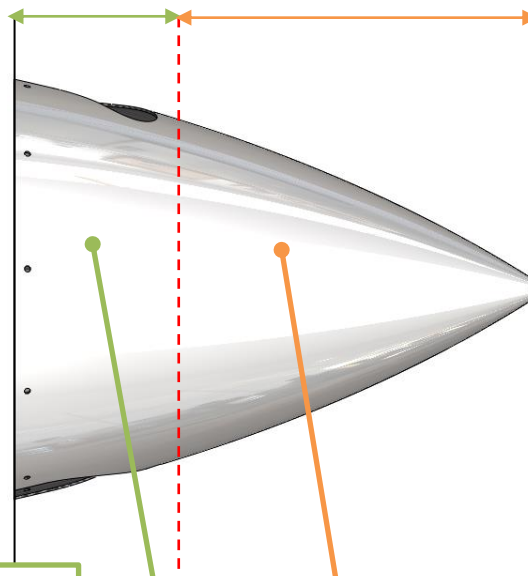
11.4. Defects evaluation on the carbon structure for spinner

An "IMPORTANT" grade is not acceptable and cannot be corrected. The spinner must be replaced.

A "LOW" grade defect is acceptable in the state and can be corrected or attenuated.

Refer to the actions specified in section 9.2 & 11.3.

"Spinner Base" zone 150mm "Spinner High part" Zone



IMPORTANT grade:

- Depth: from 1mm
- Area: from 2mm²
- Length: from 2mm

LOW grade:

- Depth: less than 1mm
- Area: less than 2mm²
- Length: less than 2mm

IMPORTANT grade:

- Depth: from 1mm
- Area: from 5mm²
- Length: from 5mm

FAIBLE grade:

- Depth: less than 1mm
- Area: less than 5mm²
- Length: less than 5mm

PAGE LEFT VOLUNTARY WHITE

DUC Hélices Propellers



Aérodrome de Villefranche-Tarare (LFHV)
289 Avenue Odette & Edouard DURAND
69620 FRONTENAS - FRANCE
Phone: + 33 (0)4 74 72 12 69
Mail: contact@duc-helices.com - www.duc-helices.com

Certified Company
ISO 9001:2015



Data and pictures included in this instruction manual are exclusively property of DUC Hélices Company. Any part of this manual can be reproduced or transmitted in any form with any means, electronic or manual, for any reason, without written approval of DUC Hélices Company.