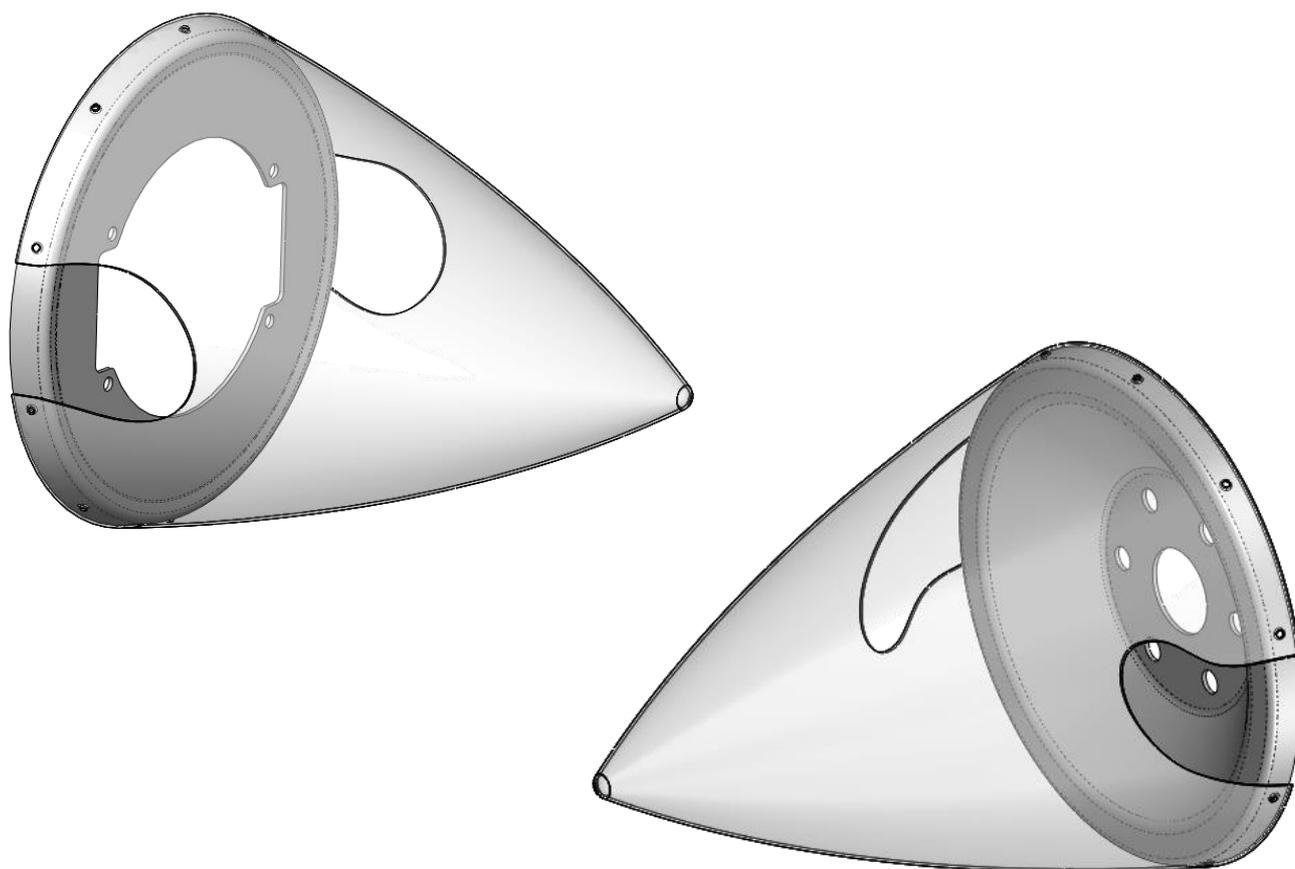




Instruction Manual

TB Composites Spinners Backplates



Revision Update

Date	Index	Object of modification
30/05/2018	A	Creation
26/06/2019	B	Update of the fixing screws of the cone in the plate.

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

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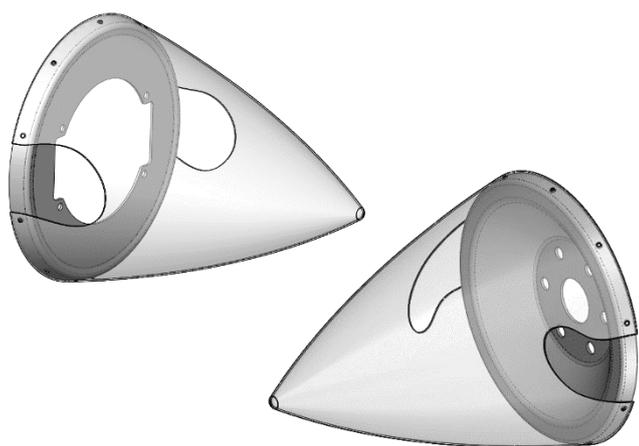
TB spinner backplates

1. Object

This manual presents the assembly instructions for the change of original TB aluminum spinners mounting plates by new composite spinners backplates 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 spinner backplates.

2. Description



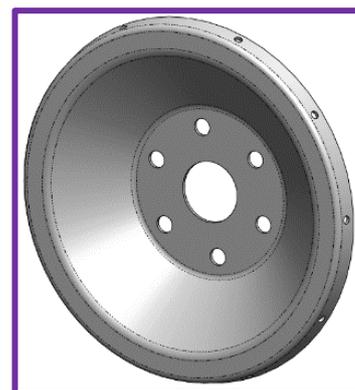
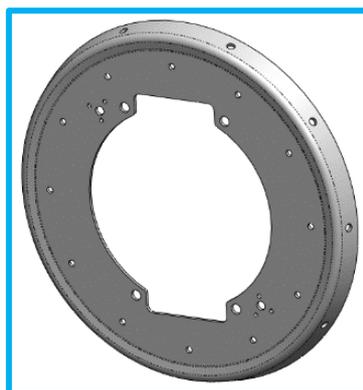
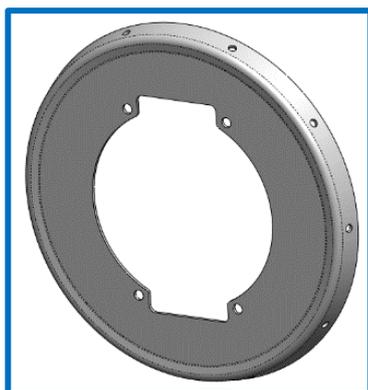
These new TB aircrafts spinner backplates are entirely made of composite materials (carbon fiber exclusively).

The shapes of these interface parts are identical to the original assembly according to the DAHER AEROSPACE definition, so it has not impacted on the position of the spinner and the propeller.

3 versions of TB spinner backplates exist to be compatible with the following propellers configurations:

- A. **2-blade variable pitch HARTZELL propeller (Backplate P/N: PTBA)**
- B. **2-blade variable pitch HARTZELL propeller with TKS deicing system (Backplate P/N: PTBAD)**
- C. **2-blade fix pitch SENSENICH propeller (Backplate P/N: PTBB)**

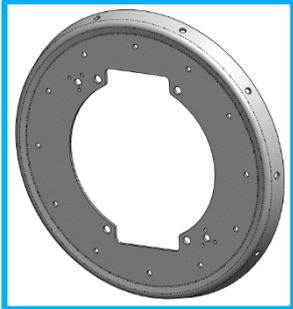
3. Characteristics



Available version	P/N	Diameter	Weight
A. for 2-blade HARTZELL propeller	PTBA	Ø345 mm	380±30 gr
AD. for 2-blade HARTZELL propeller with TKS deicing system	PTBAD	Ø345 mm	530±30 gr
B. for 2-blade SENSENICH propeller	PTBB	Ø345 mm	550±30 gr

- **Lever-arm modification:**
The replacement of the original aluminum spinner flanges by the composite version provides negligible mass variation for the 3 configurations. This mass difference has been shown to have a negligible impact on aircraft centering.
- **Assembly / interchangeability of flanges:**
Rearward compatibility with the original aluminum spinners of TB aircrafts
 - A. & AD. **HARTZELL propellers: No change, identical mounting**
 - B. **HARTZELL propellers: Front plate must be removed**
- **Finishing:**
 - Apparent carbon/epoxy prepreg.
 - Possibility of painting the spinners after delivery (refer to the instructions prescribed in chapter 20-00-03 of maintenance manual of the aircraft).
- **Other remarks:**
 - Use of **special screws longer than 4 mm (CMS 5169911176)**.
 - The flanges are equipped with crimped nuts. They are therefore fixed with the flanges.
 - These new carbon flanges are compatible with the original aluminum spinner as well as the new TB composite spinners manufactured by DUC Propellers (P/N: C345TBA & P/N: C345TBB).

4. Sales reference

View	Designation	Reference	Part Number
	TB spinner backplate Ø345 for HARTZELL propeller	01-70-129	PTBA
	TB spinner backplate Ø345 for HARTZELL propeller with TKS deicing system	01-70-130	PTBAD
	TB spinner backplate Ø345 for SENSENICH propeller	01-70-131	PTBB

TB spinner backplates

5. Applications

The TB spinners flanges 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 backplate 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	C345TBB	Refer to section 11.2 Spinner backplate checking planning of this manual
TB 10			Lycoming O-360-A1AD	HARTZELL HC-C2YL-1BF/F 7663 A-4	
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 flanges 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

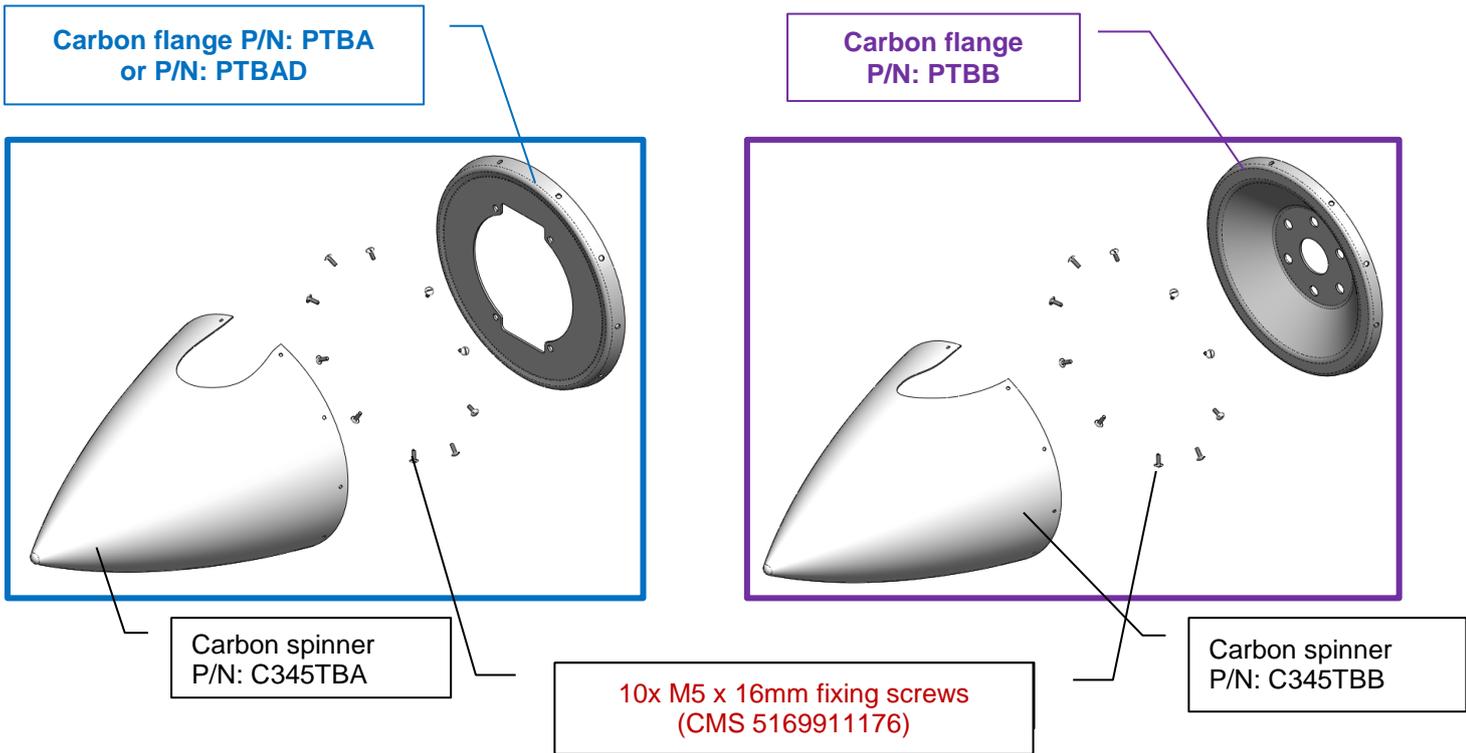
This manual presents the assembly instructions for the new TB composite rear flanges. However, new TB composite spinners have been developed.

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 B:



8. Mounting instructions

8.1. Mounting instructions

a) Ajustement du cône avec la nouvelle flasque carbone

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

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

In the case of mounting a composite spinner on the new carbon flange, there must be no necessary adjustment. However, check these adjustments.

b) Implementation of an angular marking

It is strongly recommended applying a mark on the new backplate and the spinner to index the orientation of them, to maintain, after many dismounting, this orientation between these 2 assembled parts.

c) Presence of de-icing system

In the case of the presence of a de-icing system on the propeller, it must be installed in accordance with the aircraft's original manual.

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

8.2. Additional specifications

8.2.1. Lever-arm validation

The mass variation between the old aluminum version and the new carbon version varies between configurations but remains below 500 gr in all cases. Thus, there is no significant impact on the leverage it exerts on the centering of TB aircrafts.

8.2.2. Application of paint on the spinner

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

8.2.3. Fixing screws

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 backplates mounting

<p style="text-align: center;">TB spinner backplate for HARTZELL propeller P/N: PTBA & PTBAD</p>	<p style="text-align: center;">TB spinner backplate for SENSENICH propeller P/N: PTBB</p>
<p>Step 1 – Complete disassembly of the propeller</p> <p>First, dismantle:</p> <ul style="list-style-type: none"> ▪ The original aluminum spinner (also remove the closing caps of the blade openings), ▪ The 2-blade HARTZELL propeller (assembled with the original aluminum rear flange), <p>according to the instructions in the TB maintenance manual.</p> <p>In previous mountings, it is possible that adhesive was placed to the spinner to reduce the clearance between it and the aluminum flange. With the new carbon flange, checked the usefulness of this adhesive otherwise remove it at the risk of creating a mounting fault. Restore the protection of aluminum if necessary. Indeed, the adhesive tapes are sometimes too sticky; it is possible the primary comes with it.</p>	<p>Step 1 – Complete disassembly of the propeller</p> <p>First, dismantle:</p> <ul style="list-style-type: none"> ▪ The original aluminum spinner (also remove the closing caps of the blade openings), ▪ The 2-blade SENSENICH propeller (assembled with the original aluminum front flange), ▪ The original aluminum rear flange, <p>according to the instructions in the TB maintenance manual.</p> <p>In the case of assembling a TB composite spinner, it is necessary to remove from the assembly the front aluminum flange present on the front of the SENSENICH propeller. When installing the composite spinner, there is no longer a front flange but only the rear flange for fixing the spinner. Refer to the instructions in the TB composite spinner manual from DUC Hélices Propellers.</p> <p>In the case where the original TB spinner of aluminum is kept, the front flange must be kept in the assembly because it is useful for centering the aluminum spinner.</p> <p>In previous mountings, it is possible that adhesive was placed to the spinner to reduce the clearance between it and the aluminum flange. With the new carbon flange, checked the usefulness of this adhesive otherwise remove it at the risk of creating a mounting fault. Restore the protection of aluminum if necessary. Indeed, the</p>

<p>Step 2 – Replace the rear flange</p> <p>Place the propeller on a table and follow the instruction of the TB maintenance manual:</p> <ul style="list-style-type: none"> ▪ Disassemble the rear aluminum flange. <p>When there is a TKS defrost system (Optional) Disassemble the TKS de-icing system from the original aluminum flange and reassemble it on the new carbon flange according to the instructions in the TB maintenance manual.</p> <ul style="list-style-type: none"> ▪ Refit the new carbon rear flange to the same as the original one. <p>Step 3 – Reassemble the propeller and the spinner</p> <p>When the propeller is equipped with the new carbon plate, reassemble the propeller and spinner according to the instructions in the TB aircraft maintenance manual.</p> <p>In the case of the installation of an original TB aluminum spinner, the spinner opening covers must be retained according the TB spinner definition.</p> <p>In the case of the installation of a TB composite spinner, also apply the instructions of the TB composite spinner manual.</p>	<p>adhesive tapes are sometimes too sticky; it is possible the primary comes with it.</p> <p>Step 2</p> <p>None applicable.</p> <p>Step 3 – Reassemble the propeller, the spinner and the new flange</p> <p>Then reassemble the new composite rear flange, the propeller and the spinner according to the instructions in the TB aircraft maintenance manual.</p> <p>In the case of the installation of an original TB aluminum spinner, the spinner opening covers must be retained according the TB spinner definition.</p> <p>In the case of the installation of a TB composite spinner, also apply the instructions of the TB composite spinner manual.</p>
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At this point, your spinner backplate 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 flights and contact DAHER AEROSPACE or DUC Hélices Propellers companies.



Being aware of potential risks during assembly and initial testing of the propeller. Stay focused, careful 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 backplate by the user

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

Checkpoint	Means of control	Location	Potential defect	Action
Assembly of the spinner to the rear flange	Check visually the good presence of the fixing screws and the nuts embedded on the side of the plate, and by touch the good holding of the spinner, its screws and nuts embedded on the flange.	Screw fixing the spinner, nuts embedded on the flange & Drilling of the composite cone	Appearance of a clearance at the level of the mounting of the cone on the flange	Replace the degraded screws. Correct screw tightening according to TB manual. Depending on the condition, change the screws. Marking can be done between each screw and the spinner to have a visual control means of the proper maintenance of these screws in position. In the case where an embedded nut is no longer crimped into the flange, it is necessary to replace the flange.

10. Imperative static test

During the initial mounting, it is imperative to perform a validation static test on the aircraft with the engine in rotation on the ground. The goal is to check the correct rotation of the spinner and its backplate. 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. For 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 a flight test to validate 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 backplate has an unlimited lifetime.

However, thanks to respect the frequency of checking which are indicated in the 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 backplate checking planning

Type	Frequencies
Regular	Each pre-flight
General	Each propeller inspection

TB spinner backplates

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

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

Checking frequency: For each disassembly of the spinner backplate 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
Cleanliness of the flange	Check the internal and external cleanliness of the flange	Inside and outside surface of the flange	Accumulation of dirt	Clean the flange.
Flange structure	Check the internal and external structure of the flange	Inside and outside the flange	Appearance of crack close to the spinner fixing holes	The flange must be changed.
Fixing point on the flange	Check the resistance of the nuts embedded on the flange	On the flange flank	Mobility of a drowned nut	The flange must be changed.
Reassembling the cone on the flange	Check visually the good behavior of the cone and the correct mounting of it on the flange	Contact surfaces of the spinner on the flange	Appearance of a game between the cone and the aluminum flange	Tighten the screws to torque. If the game is too big, contact DAHER AEROSPACE.

DUC Hélices Propellers



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