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0	Initial release	JTS	
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## SI-0023

# BLADE INSTALLATION PROCEDURE

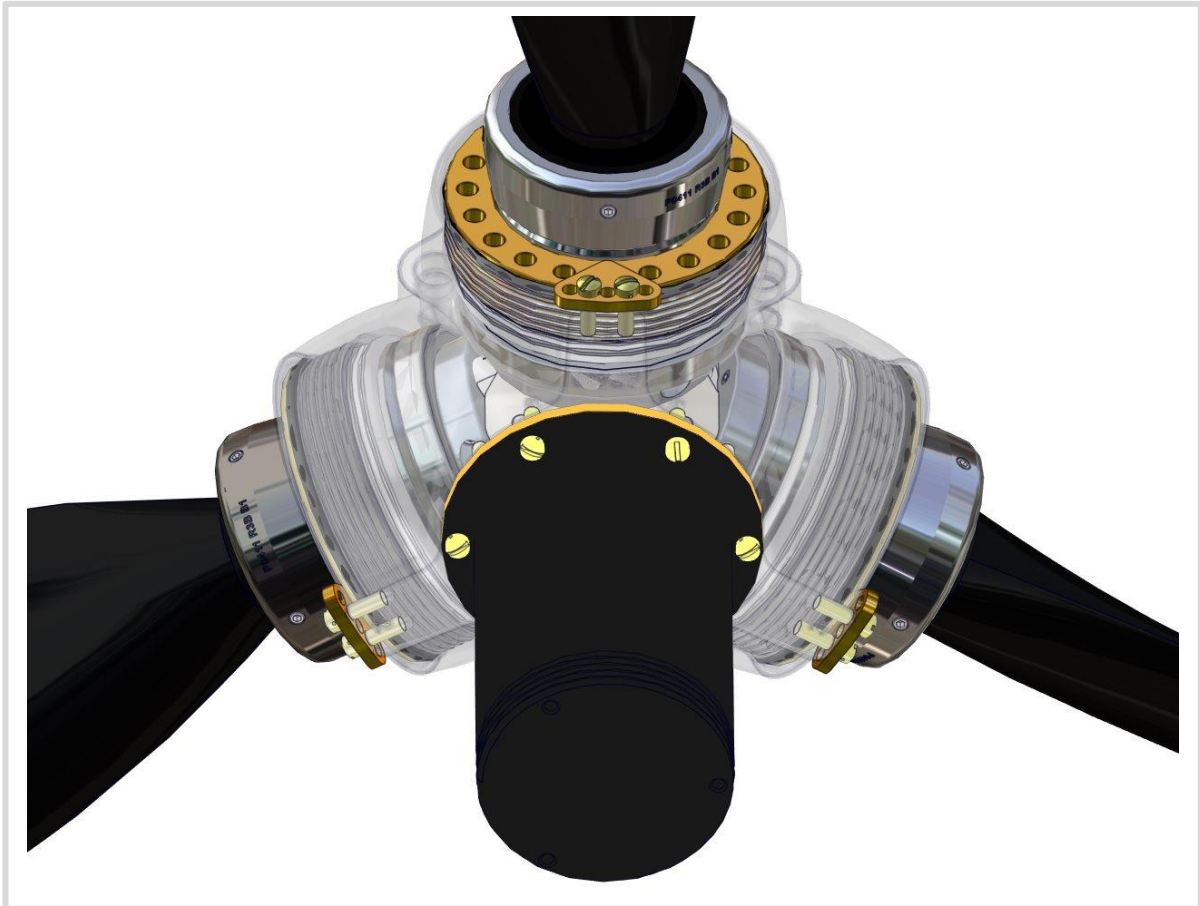
### Part/Assy No.

### Applicability

AB-xxx (Airmaster Blade Assy)

All models excl. AP332(S)

AH-xxx (Airmaster Hub Assy)





**Subject:** Blade Installation Procedure

## 1. INTRODUCTION




This instruction describes the correct method for installing Airmaster blade assemblies into the propeller hub.

## 2. MATERIAL INFORMATION


### 2.1 Parts Required

Item	Qty	Part No.	Description	Image
1.	As required	AB-xxx	Airmaster Blade Assembly	
2.	1	AH-xxx	Airmaster Hub Assembly	

### 2.2 Tooling

Item	Qty	Description	Image
1.	1	Blade Assembly C-Spanner (AT-x)	
2.	1	Torque Wrench (3/8-inch square drive)	
3.	1	Twist Pliers	

### 2.3 Consumables

Item	Qty	Description	Image
1.	As required	0.025" SS Lock-wire	

### 2.4 Prerequisites

Complete the following tasks before proceeding with this instruction:

- Install Propeller hub (and mount kit) onto aircraft in accordance with applicable installation procedure. This is the recommended method, however in some cases operators may find it easier to assemble the blades to the hub before it is installed onto the aircraft.
- Inspect Hub Bores for nicks and burrs.
- Inspect each Blade Retention assembly for damage including threads on Retention Nut and Thrust Bearing elements.
- Lubricate Hub assembly in accordance with **Hub Lubrication Instruction**.

- Lubricate Blade Retention assemblies in accordance with **Blade Assembly Lubrication Instruction**.

## 2.5 Admonishments

**WARNING** Ensure that aircraft power is turned off throughout this procedure.

**WARNING** Proper installation of the blade assemblies is imperative for safe function of the propeller and ensuring the safety of the pilot. Ensure that all blade assembly checks contained within this instruction have been verified after the installation is complete.

**Note** Blades are marked to denote their configuration in the propeller hub.

## 3. PROCEDURE

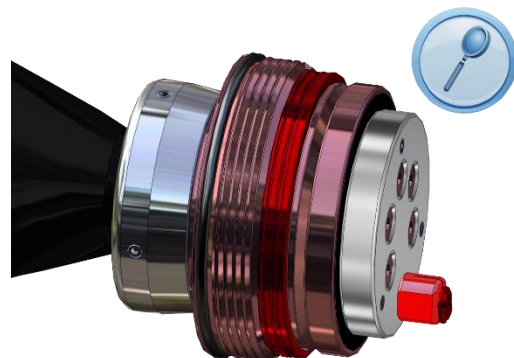
### 3.1 Preparation

#### **Procedure:** Preparing for Blade Installation

#### **Step 1 Preparation**

- Ensure that all pre-requisites listed at the start of this instruction are completed.
- The hub and blade assemblies must be inspected for improper condition and lubricated in accordance with relevant instruction.

**Note** Park the pitch change mechanism at the coarse pitch limit for easier blade assembly.



## 3.2 Install Blade Assembly to Hub

### **Procedure:** *Seat Blade Assembly*

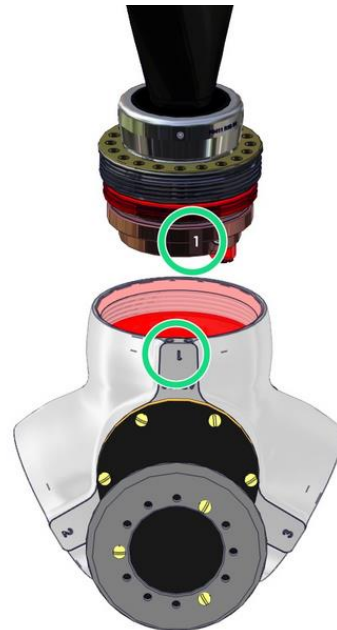
#### **Step 1 Match Blade to Hub Port**

- Select one blade assembly and note the blade number marked.

**Note** Each blade is marked with a single digit number on the cam plate, this indicates the hub port number associated for that blade, as configured when the propeller was statically balanced.

- Orient the propeller hub with the corresponding hub port number face up.

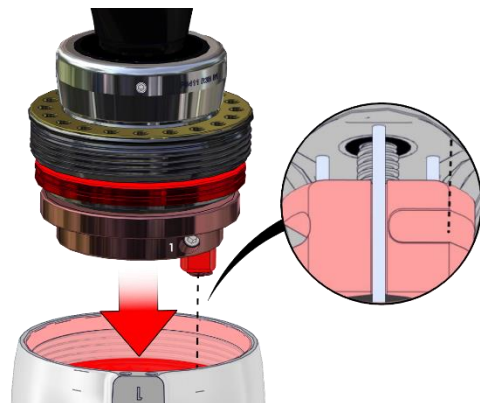
**WARNING** Ensure aircraft power is turned off before rotating propeller.



#### **Step 2 Locate Blade into Hub**

Lower the blade assembly into the corresponding hub port and carefully align the cam-follower (blade) such that it locates into the slot of the pitch change slide (hub).

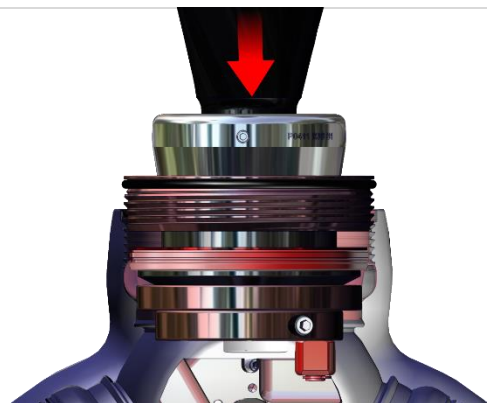
**Note** By holding the blade retention nut with one hand while slightly twisting/moving the tip of the blade from side to side, the correct alignment is easily found. This can be felt when the blade feels restrained from further twisting at its base.



#### **Step 3 Seat Blade into Hub**

Once the cam follower (blade) has correctly located into the pitch change slide (hub), gently force the blade downwards to partially seat the blade's alignment bearing into the lower bore of the hub.

**Note** The blade and ferrule which it is attached to will slide partially into the hub, while the retention nut will remain seated on top of the hub threads.



### Step 4 Tighten Retention Nut

Use Blade Assembly C-spanner to firmly tighten the blade retention nut to 130% of final torque value (refer Step 3). This will help to expel excess grease which may cause improper blade seating.

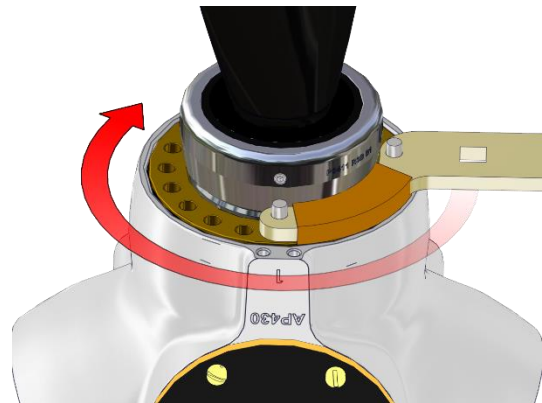
**Attention** Blade Assembly C-Spanner (AT-x), Torque Wrench (3/8-inch square drive)

**Note** A combination of tightening then further seating of the blade into the hub (as per previous step) may be required if there is limited clearance between the ferrule nut and retention nut.

**Note** While tightening retention nut, restrain the blade to prevent the assembly twisting or rotating inside the hub.

**Note** While tightening retention nut, support the head of the C-Spanner to prevent it slipping out.

**Caution** The retention nut should initially wind in smoothly by hand. Resistance may be met when the retention nut O-ring is fitted inside the hub (ensure O-ring is lubricated), however if resistance is met during initial tightening the blade is improperly seated or misaligned. Remove blade from hub and correct blade alignment before reattempting.



- Verify blade installation in accordance with Section 3.4 – Check Blade Assembly ahead.

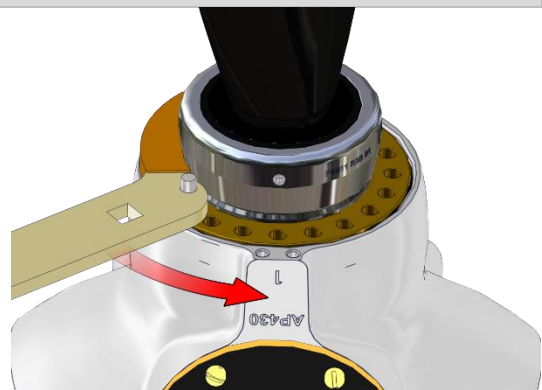
## 3.3 Torque Blade Assembly Retention Nut

### Procedure: Torque Retention Nut

#### Step 1 Back off Retention Nut

Loosen the retention nut a 1/4 turn.

**Attention** Blade Assembly C-Spanner (AT-x)



## Step 2 Torque Retention Nut

Re-tighten the retention nut to achieve specified pre-load torque setting by using a torque wrench applied perpendicular to the C-Spanner.

Propeller Model	Pre-Load Torque
AP332(S)	10.5Nm (8ft-lbs)
AP3x0	15Nm (12ft-lbs)
AP4x0	15Nm (12ft-lbs)
AP433	20Nm (15ft-lbs)
AP5x0	20Nm (15ft-lbs)

**Note** If torque wrench is applied parallel to C-Spanner, a higher torque than that of the wrench will be applied. This torque may be calculated if the length of the wrench is known using the ratio of levers method, as used with a crow's foot extension or torque adapter.

**Attention** Blade Assembly C-Spanner (AT-x), Torque Wrench (3/8-inch square drive)



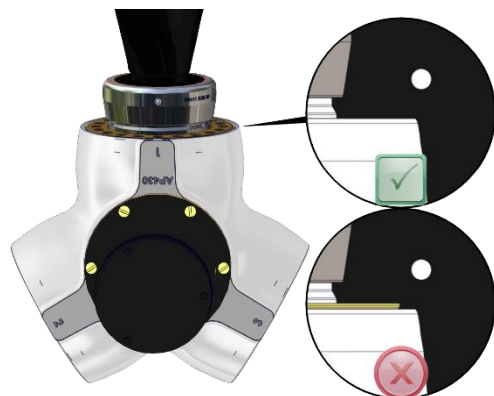
### 3.4 Check Blade Assembly

#### Procedure: Check Blade Assembly

##### Step 1 Check Blade Seating

Check top face of Retention nut is flush with hub face.

**Caution** If retention nut is proud this may indicate that excess grease was packed in the thrust-bearing bore and is causing the blade to seat improperly. Remove blade from hub and inspect grease applied in this region in accordance with **Hub Lubrication Instruction**. Remove excess grease as necessary.



### Step 2 Check Blade for Lateral Movement

Apply a moderate force fore-to-aft at the blade tip with one hand only and monitor the movement produced. No movement should be evident between the blade assembly and hub (ignore the deflection due to the bending of the blade itself).

**⚠ Caution** If blade assembly rocks within the hub this may indicate that excess grease was packed in the thrust-bearing bore and is causing the blade to seat improperly. Remove blade from hub and inspect grease applied in this region in accordance with **Hub Lubrication Instruction**. Remove excess grease as necessary.

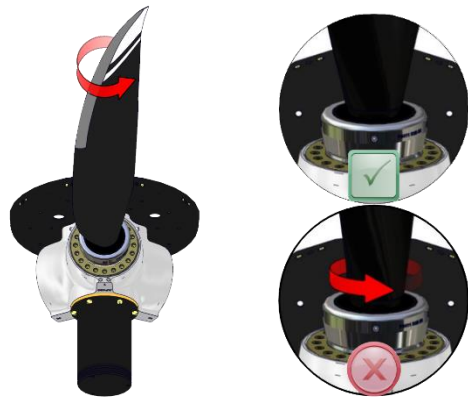


### Step 3 Check Blade for Twisting Movement

Apply a moderate torque by twisting blade with one hand only and monitor the movement produced. No movement should be evident between the blade and the ferrule into which it is mounted.

**📌 Note** A slight perceptible movement between the ferrule and the hub is acceptable, this is due to backlash in the pitch change mechanism.

**📌 Note** Some engines which incorporate a reduction gearbox (e.g Rotax) have a discernible backlash. Do not confuse this backlash with movement of the blade within the hub.



## 3.5 Lock Blade Assembly

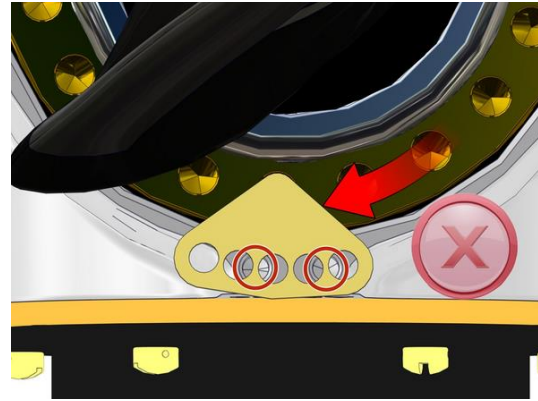
### Procedure: Lock Blade Assembly

#### Step 1 Fit Retention Nut Plate

- After verifying that the blade installation is acceptable in accordance with Section 3.4 – Check Blade Assembly, fit the retention nut securing plate (P0442).
- Check alignment between the two threaded holes in the hub and any two holes in the plate.



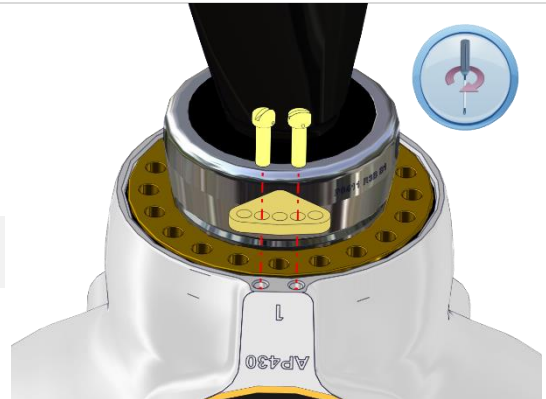
- Note** Further tightening of the retention nut in the hub may be required to achieve correct hole alignment. Up to 120% torque may be administered in this case.



## Step 2 Lock Retention Nut Plate

- Secure retention plate with two philister-head screws (P0107) and torque to 2Nm (1.5ft-lbs).

- Attention** Slotted Screwdriver, Torque Screwdriver (Slotted)



- Lockwire two screws. The single-wire method is acceptable.

- Attention** Twist Pliers, 0.025-inch SS lock-wire



## 3.6 Subsequent Action

Repeat this procedure to install the remaining blade assemblies into the propeller hub. The spinner cone may be fitted subsequently and adjusted if necessary.

- Note** After the propeller is run for the first time, operators may observe seepage of yellow jointing compound from the blade root area of the blade assembly. This compound is used during manufacture and such seepage is normal for the first few runs. Minor grease expulsion is also acceptable during first run. The blades should be wiped clean with a rag, which may be moistened with kerosene or methylated spirits if necessary.