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| 1 | Published release | JTS | 27/11/2025 |
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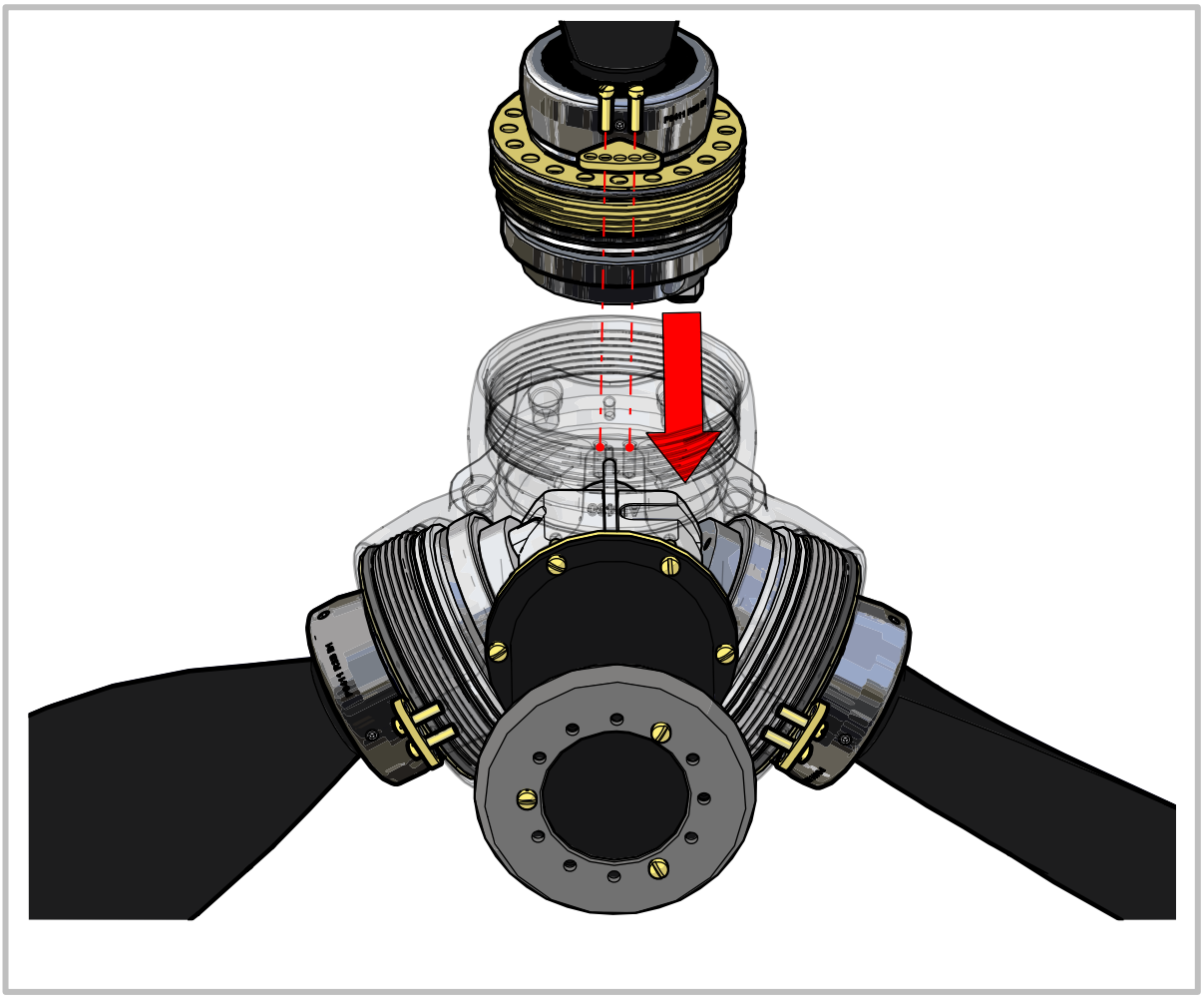
# ASI-4-6

# BLADE INSTALLATION

## *PROCEDURE*



| SUBJECT: | |
|---|---|
| Blade Installation | |
| **ASSEMBLY NO:** | **APPLICABILITY:** |
| AH-xxx \| AB-xxx | All propeller models excluding AP332(S) |

# 1. TOPIC

## 1.1 Introduction

This document covers the procedure for installing Airmaster blade assemblies into the propeller hub.

Each blade is matched to a specific hub port number, as configured when the propeller was statically balanced. The blade number is scribed on the cam plate at the base of each blade. Installers must ensure that blades are installed in the designated hub port configuration.

Installers must also ensure that the propeller hub and blade retention assemblies are correctly lubricated before blade installation. Excess grease in this region can create a hydraulic effect, which may prevent proper torque application and potentially cause damage to the propeller or engine.

Before locking the blade retention nut, installers must check that each blade is fully seated inside the hub. Improper blade seating can result in propeller imbalance, leading to potential damage to the propeller or engine. Recommended blade seating checks are provided in this document.

> ⓘ ***Note***
> *The blade installation procedure for AP332(S) propeller models differs due to an alternative retention nut design. This method is covered in the Airmaster Operator's Manual R5.*

## 1.2 Prerequisites

Complete the following tasks before proceeding:

- Mount hub to engine flange in accordance with the applicable installation procedure.

> ⓘ ***Note***
> *This is the recommended method, however in some cases, installers may find it easier to install the blades into the hub prior to mounting the hub to the engine flange.*

- Lubricate propeller hub in accordance with procedure ***ASI-4-5***.
- Lubricate each blade retention assembly in accordance with procedure ***ASI-4-5***.

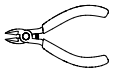
> ⚠ ***Caution*** *Ensure that greased surfaces are not contaminated with dust or other debris.*

# 2. MATERIAL REQUIREMENTS

## 2.1 Parts

| ITEM | QTY | PART NO. | DESCRIPTION | IMAGE |
|---|---|---|---|---|
| **1.** | 1 | AH-xxx | Airmaster Hub Assembly |  |
| **2.** | As required | AB-xxx | Airmaster Blade Assembly |  |

## 2.2 Tooling

| ITEM | QTY | DESCRIPTION | IMAGE |
|---|---|---|---|
| **1.** | 1 | Blade Assembly Spanner (AT-*x*) |  |
| **2.** | 1 | Torque Wrench (3/8” Square Drive) |  |
| **3.** | 1 | Twist Pliers |  |
| **4.** | 1 | Wire Cutter |  |

## 2.3 Consumables

| ITEM | QTY | DESCRIPTION | IMAGE |
|---|---|---|---|
| **1.** | As required | 0.025” Stainless Steel Lockwire (Safety Wire) |  |

# 3. PROCEDURE

**WARNING**
*Ensure that aircraft power is turned off, especially before rotating engine flange.*

**WARNING**
*Proper installation of the blade assemblies is imperative for safe function of the propeller and ensuring the safety of the pilot. Installers must ensure that the final blade seating checks are performed after the blades are fitted inside the hub and before they are locked.*

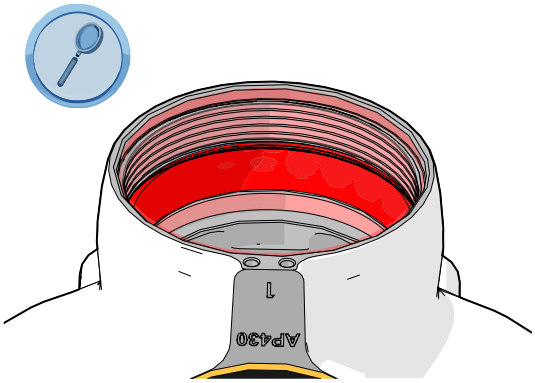
## 3.1 Preparation

**PROCEDURE**

### *Step 1* Inspect Hub Ports

- Inspect each hub port for signs of damage or defect (e.g. nicks, burrs or corrosion).
- Check hub ports are lubricated correctly in accordance with procedure ***ASI-4-5.***

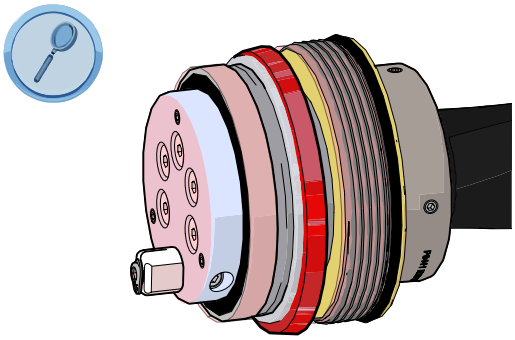
*Note*
*A thin film of grease should be applied to all bores and threads inside the hub port. Only the larger thrust bearing bore should be packed with grease to immerse the blade's thrust bearing pack.*



### *Step 2* Inspect Blade Assemblies

- Inspect each blade retention assembly for signs of damage or defect. Pay close attention to the threads of the retention nut and the thrust bearing elements.
- Check blade retention assemblies are lubricated correctly in accordance with procedure ***ASI-4-5.***

*Note*
*All external surfaces of the blade retention assembly should be lightly lubricated, including the o-ring fitted to the retention nut. The thrust bearing pack should be filled with grease.*



## 3.2 Seat Blade Assembly into Hub

**PROCEDURE**

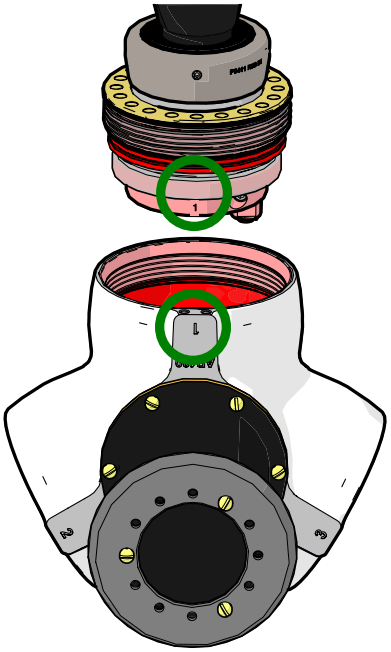
### *Step 1* Match Blade to Hub Port

- If operable, drive propeller to the coarse pitch limit stop (COARSE lamp illuminates green on controller) to facilitate easier blade installation.
- Retrieve (1) blade assembly and note the blade number scribed on the cam plate (base).

> *Note*
> *Each blade assembly is marked with a single digit number on the side of the cam plate. This indicates the corresponding hub port number.*

- Orient the corresponding hub port number face up, enabling the blade to be installed vertically.

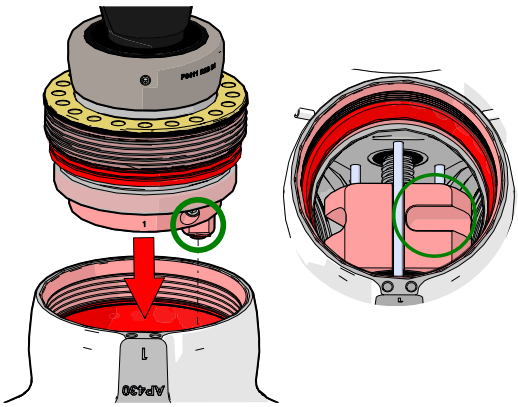
> ***WARNING***
> *Turn off aircraft power before rotating propeller.*



### *Step 2* Align Cam Follower

- Lower blade assembly into hub port whilst carefully aligning the cam follower (blade) into the slot of the pitch change slide (hub).

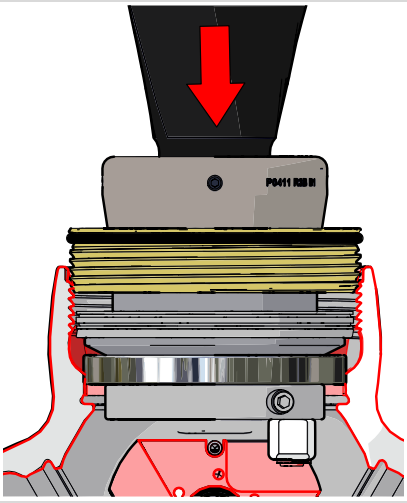
> *Note*
> *By holding the blade retention nut with one hand and slightly twisting/moving the tip of the blade from side to side, the correct alignment is easily found. This can be felt when the blade feels restrained from further twisting at its base.*



### *Step 3* Seat Blade Inside Hub

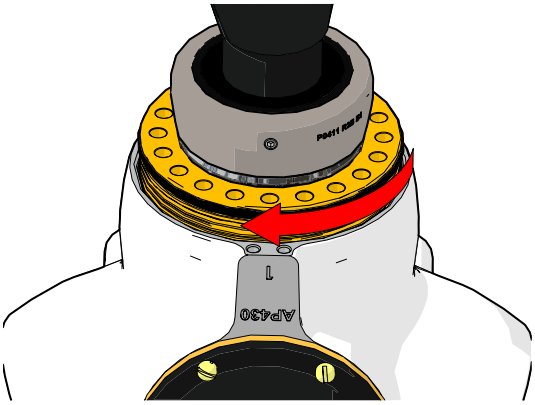
- With the cam-follower located inside the pitch change slide, gently wriggle the blade square into the hub, to partially seat the alignment bearing into the lower bore of the hub.

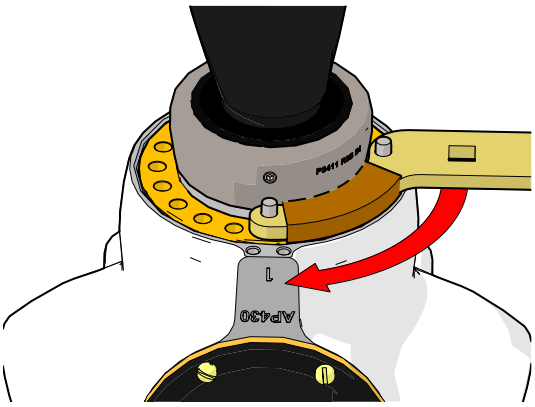
> *Note*
> *The blade and mounted ferrule will partially slide into the hub, whereas the retention nut will remain seated on top of the hub threads.*



## *Step 4* Tighten Retention Nut

- Use the Airmaster blade assembly spanner to firmly tighten the blade retention nut (CW):
    - The retention nut should initially wind in smoothly by hand. Resistance may be felt once the O-ring fits 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 recorrect alignment.
    - During initial tightening, restrain the blade with one hand to prevent it twisting or rotating inside the hub.
    - As the retention nut is wound in, clearance between the ferrule nut and retention nut reduces. Before these parts contact, the blade must be further seated inside the hub by repeating the previous step. This combination of incrementally tightening then further seating inside the hub may be repeated.





***Caution***

*Support the head of the blade spanner to prevent it slipping out and causing damage.*

***Attention*** *Blade spanner*

## 3.3 Torque Retention Nut

**Caution** *Support the head of the blade spanner to prevent it slipping out and causing damage.*

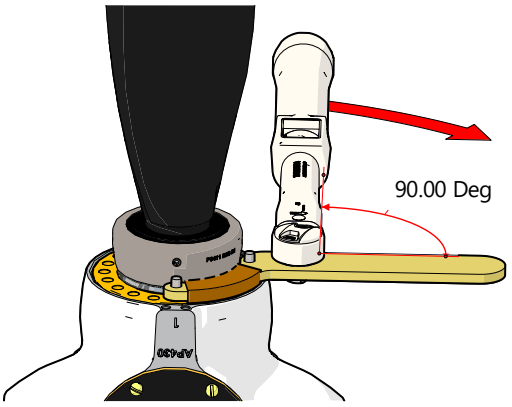
**PROCEDURE**

### *Step 1* Overtighten Retention Nut

- Fit a torque wrench (3/8" square drive) perpendicular to the blade spanner.
- Tighten retention nut to 130% of the prescribed final torque value (see step 3).

*Note*
*Overtightening helps to expel any excess grease which may cause improper blade seating.*

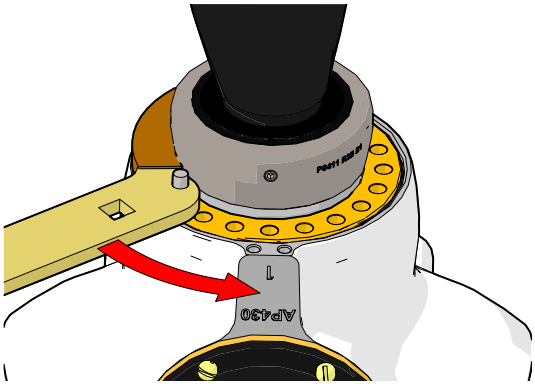
*Attention* *Blade spanner, Torque wrench*




### *Step 2* Back off Retention Nut

- Loosen retention nut a 1/4 turn.

*Attention* *Blade spanner*

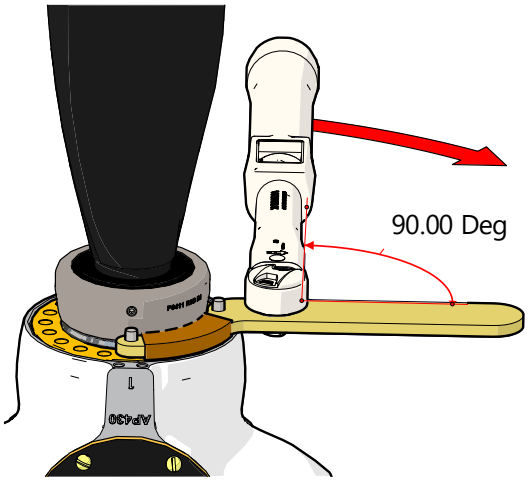


### *Step 3* Torque Retention Nut

- With torque wrench fitted perpendicular to blade spanner, retighten the retention nut to the prescribed pre-load torque setting below.

*Note*
*If the torque wrench is applied parallel to the blade 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.*

| PROPELLER MODEL | TORQUE |
|---|---|
| **AP332** | 10.5Nm (8ft-lbs) |
| **AP3xx** | 15Nm (12ft-lbs) |
| **AP4xx** | 20Nm (15ft-lbs) |
| **AP5xx** | 30Nm (23ft-lbs) |
| **AP6xx** | 40Nm (30ft-lbs) |

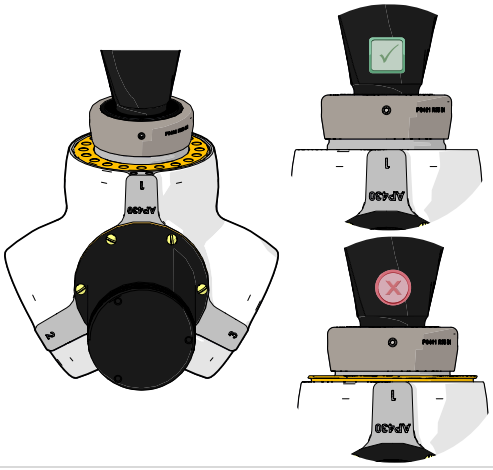


## 3.4 Check Blade Seating

**PROCEDURE**

### *Step 1* Check Blade Seating

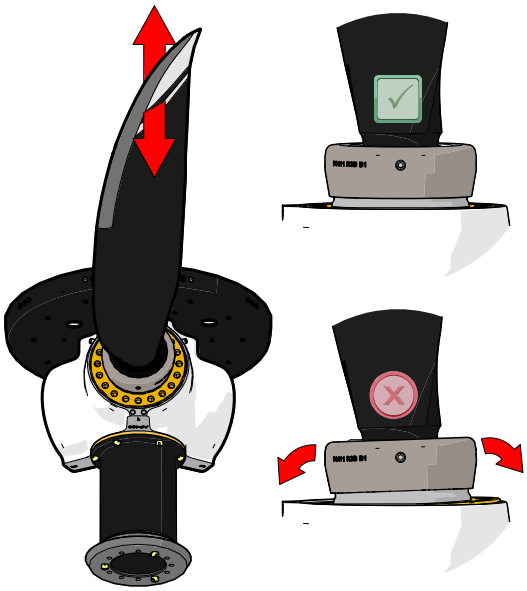
- Check top surface of retention nut is flush with face of hub port.



> ⚠ ***Caution***
> *If the retention nut is proud this may indicate that excess grease was packed inside the thrust-bearing bore of the hub, which is causing the blade to seat improperly. Remove the blade from the hub and inspect grease applied in this region in accordance with procedure **ASI-4-5**. Remove excess grease as necessary.*

### *Step 2* Check Lateral Blade Movement

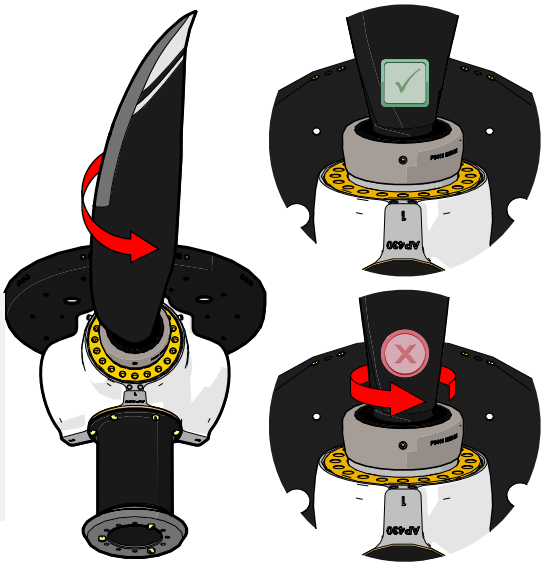
- Apply a moderate fore-to-aft force near the blade tip with one hand only and monitor the movement produced.
- No movement should be evident between the blade and the hub (ignore any deflection due to the bending of the blade itself).



> ⚠ ***Caution***
> *If the blade assembly rocks within the hub this may indicate that excess grease was packed inside the thrust-bearing bore which is causing the blade to seat improperly. Remove the blade from the hub and inspect grease applied in this region in accordance with procedure **ASI-4-5**. Remove excess grease as necessary.*

### *Step 3* Check Twisting Blade Movement

- Apply a moderate torque halfway along the blade by twisting it 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. 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.*

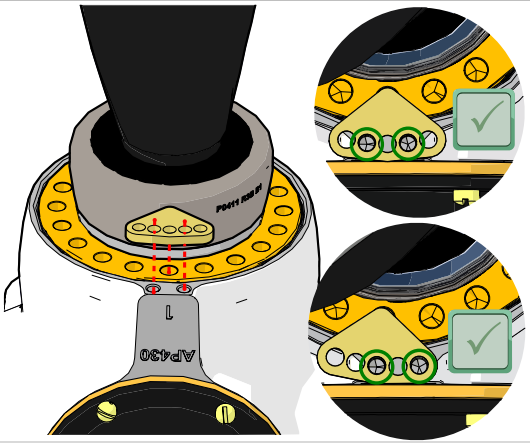
## 3.5 Lock Retention Nut

**PROCEDURE**

### *Step 1* Fit Securing Plate

- Fit spigot of securing plate (*P0442*) into front lightning hole of retention nut.
- Align two threaded holes (hub) with any two holes in the securing plate.

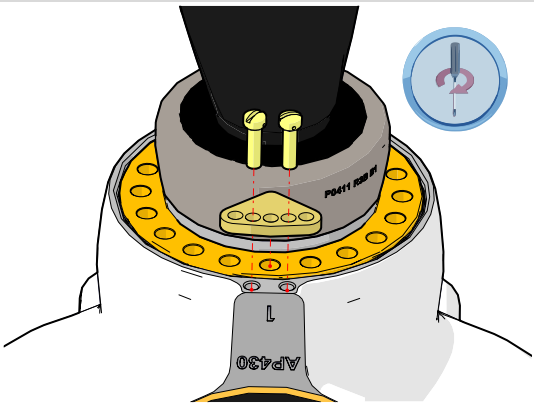
> *Note*
> *Further tightening of the retention nut in the hub may be required to attain correct hole alignment. Up to 120% torque may be administered.*



### *Step 2* Attach Securing Plate

- Attach securing plate to hub using (2) 10-32 UNC panhead screws (*P0107*).
- Torque screws to **2Nm (1.5ft-lbs)**.

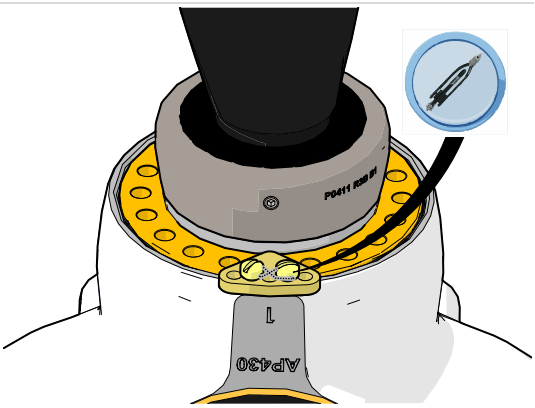
> *Attention* *Torque screwdriver (flathead)*



### *Step 3* Lock Securing Plate

- Secure both screws with lockwire. The single-wire method is acceptable.

> *Attention*
> *Twist pliers, 0.025" S.S lockwire, Wire cutter*



## 3.6 Subsequent Action

Perform the following tasks once this procedure is complete:

- Install remaining blade assemblies into propeller hub.
- Install spinner cone in accordance with procedure ***ASI-4-7-1***. If necessary, adjust spinner front support in accordance with procedure ***ASI-4-7-2***.

> *Note*
> *After the propeller is run for the first time, operators may observe minor grease expulsion. This is acceptable during first run. The blades should be wiped clean with a clean rag.*