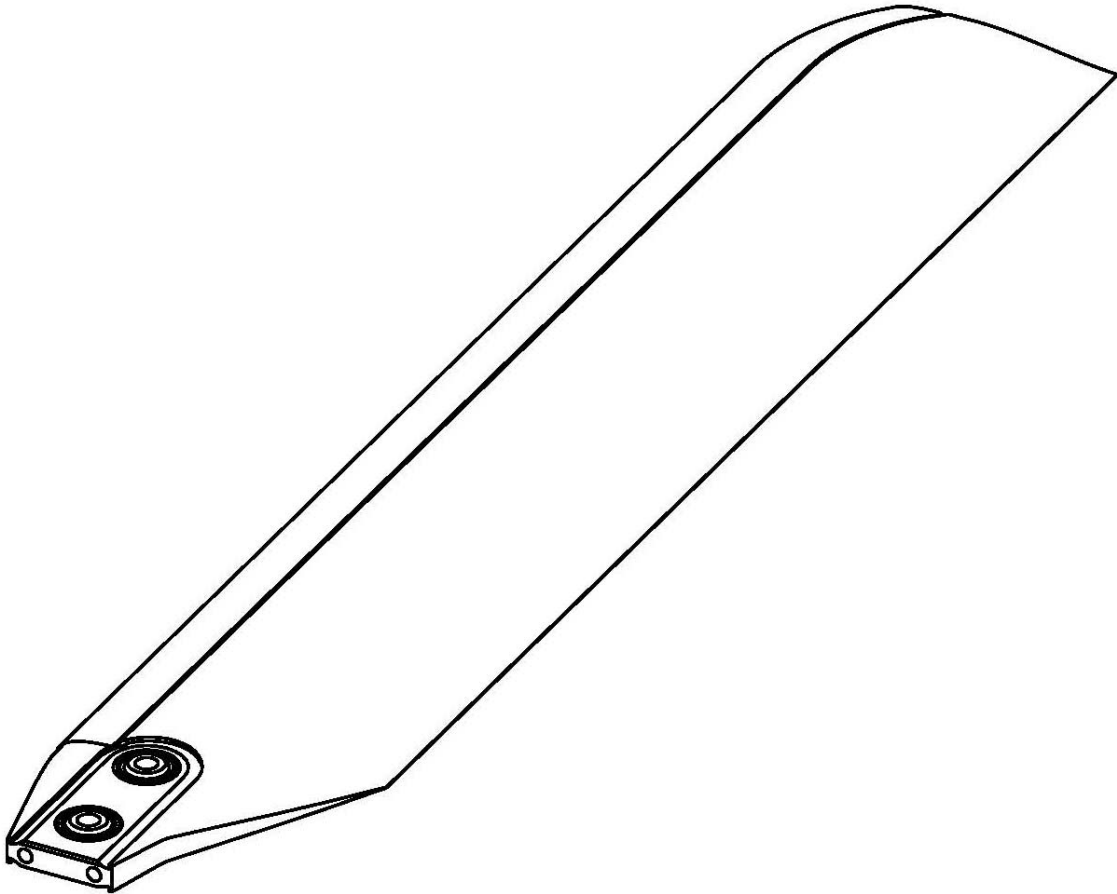




**Van Horn Aviation, L.L.C.**  
*1510 W. Drake Drive*  
*Tempe, Arizona 85283*

## **INSTRUCTIONS FOR CONTINUED AIRWORTHINESS**



### **ICA MANUAL No. VMM-206L3-307**

**Tail Rotor Blade Assembly 2062200-101/-301**  
**Eligible for Installation on Model 206L3**

**REVISIONS**

REV	DATE	DESCRIPTION	APPROVED
N/C	10/30/09	Initial Release	JVH
A	06/8/10	Revised installation and rigging instructions – Page 9 only.	JVH
B	03/10/11	Replaced all references to 2062200-101 with 2062200-101/-301.	JVH
C	07/19/11	Revised 5.1 to replace “inspection” with “check”.	JVH
D	04/11/12	Revised 62.3 Control Rigging.	JVH
E	05/31/12	Revised 5.2 and 5.3 to add inspection time tolerance.	JVH
F	06/28/12	Revised ICA to incorporate Van Horn Aviation's new address.	JVH
G	07/29/13	Added 5.8 Damage Limits.	JVH
H	10/09/13	Revised 62.3 Control Rigging to correct blade rigging angles. Was: 18.5° to 19.0° Is: 22.75° to 23.25°.	JVH
I	9/15/14	Revised pages 2, 4, and 6.	JVH

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## **CHAPTER O - INTRODUCTION**

### **0.1 SCOPE**

This manual contains information, descriptions, and instructions essential for the continued airworthiness of the Van Horn Aviation L.L.C. 2062200-101/-301 Tail Rotor Blade Assembly.

### **0.2 ARRANGEMENT**

This manual follows the Airline Transport Association (ATA) specification 100 numbering system where practical.

### **0.3 UNITS OF MEASUREMENT**

All measurements, tolerances, and other numbers referenced in this manual will be in English units.

### **0.4 CHANGES TO THE ICA**

0.4.1 Changes to text and tables, including new material on added pages shall be indicated by a vertical bar in the outer margin extending close to the entire area of the material affected.

0.4.2 Please send any comments or corrections to Van Horn Aviation L.L.C., 1510 West Drake Drive, Tempe, Arizona, 85283 USA. Or call 01-480-483-4202.

### **0.5 DISTRIBUTION**

The ICA can be found on Van Horn Aviation's website at [www.vanhornaviation.com](http://www.vanhornaviation.com).

**CHAPTER 4 – AIRWORTHINESS LIMITATIONS**

**4.1 AIRWORTHINESS LIMITATIONS SCHEDULE**

<b>Part Number</b>	<b>Part Name</b>	<b>Airworthiness Limitation</b>
2062200-101/-301	Tail Rotor Blade	5000 Hours

FAA Approved:



Date:

10/18/13

**CHAPTER 5 – INSPECTION/ CHECK REQUIREMENTS**

**5.1 PRE-FLIGHT CHECK**

No.	Requirements	Airworthiness Criteria
1.	Visually check the tail rotor blades for any visible damage. See 5.8.1 Damage Description.	See 5.8 DAMAGE LIMITS.

**5.2 100 (+/- 10 hour tolerance) HOUR INSPECTION AND ANNUALLY**

No.	Inspection Requirements	Airworthiness Criteria
1.	Check the general condition of the rotor blade. See 5.8.1 Damage Description.	See 5.8 DAMAGE LIMITS.
2.	Inspect feathering bearings for excessive axial wear. .015 inches of axial play at the bearing is permitted.	See note at bottom of page.
3.	Inspect the abrasion strip for wear, edge voids, or damage. See 5.8.1 Damage Description.	See 5.8 DAMAGE LIMITS.

**5.3 300 (+/- 30 hour tolerance) HOUR INSPECTION**

No.	Inspection Requirements	Airworthiness Criteria
1.	Perform dynamic balance of tail rotor	Balance to .20 IPS or lower.

**5.4 SUDDEN STOPPAGE OR ACCELERATION**

No.	Inspection Requirements	Airworthiness Criteria
1.	No inspection required.	Remove the rotor blades and return to Van Horn Aviation for evaluation.

**Note:**

Bearings are replaceable by the operator. See specification CSS-500. This specification can be downloaded from VHA's website at [www.vanhornaviation.com](http://www.vanhornaviation.com).

**5.5 OVERSPEED – 107 PERCENT OR GREATER**

No.	Inspection Requirements	Airworthiness Criteria
1.	Inspect the tail rotor blades for any evidence of high centrifugal force (CF) unique damage in addition to 5.8.1 Damage Description. CF unique damage would be bearings that exceed axial play limits that were acceptable prior to the overspeed, loose tip balance weights, or delamination at the root.	If any damage exists on only one blade, scrap both blades and the tail rotor hub assembly.

**5.6 OVERTORQUE**

No.	Inspection Requirements	Airworthiness Criteria
1.	No inspection is required for overtorques between 100 to 110 percent.	N/A
2.	Overtorques 110 to 120 percent, Inspect tail rotor blade root area for voids and surface cracks. Inspect bearings for axial play. If cracks exist, remove the rotor blades and return to Van Horn Aviation for evaluation.	See 5.8 DAMAGE LIMITS.
3.	Overtorques above 120 percent require the inspections in 2. above at the time of the overtorque and again after 25 hours of operation.	See 5.8 DAMAGE LIMITS.

**5.7 LIGHTNING STRIKE**

No.	Inspection Requirements	Airworthiness Criteria
1.	Scrap the blades if there is any evidence of a lightning strike. Return the scraped blades to Van Horn Aviation for testing.	No defects permitted.

## 5.8 DAMAGE LIMITS

### 5.8.1 Damage Description

Damage may take the form of cracks, scratches, nicks, dents, disbonds, or voids.

Limits are provided for each of these types of damage. Damage exceeding these limits require evaluation, and if possible, repair at an authorized FAA repair station. Contact VHA for repair station recommendations.

### 5.8.2 Abrasion Strip

- a. Non-sharp dents not exceeding 0.020 inch are acceptable at any location.
- b. Sharp dents are not permitted.
- c. Punctures or cracks are not permitted.
- d. Tap test an area 1.0 inch either side of the dent for voids. See Figure 5.3 for locations of ply drop-offs. A tonal change may occur at these drop-offs when tapping across them depending on tapping force. If a dent is on or near a ply drop-off, it may be required to tap an undamaged blade in the same area to help distinguish a tonal change from a void.
- e. Inspect for trailing edge disbond.
- f. If disbonds or voids exist, there is a possibility of underlying carbon fiber damage; therefore, evaluation at an approved FAA repair station is required. Contact VHA for repair station recommendations.
- g. If there are no disbonds or voids, polish out any sharp edges or protrusions. Leave the dent exposed so it may be monitored for evidence of cracking in the future.
- h. If abrasion strip is worn thru because of erosion, send blade to an approved FAA repair station for repair. Contact VHA for repair station recommendations.

### 5.8.3 Skin

Impact damage may progress from little evidence of external damage to puncture with surrounding voids depending on impact force. In all cases of suspected skin damage, a tap test is required to determine extent of the damage. Figure 5.3 shows the blade internal components including locations of ply drop-offs. Take note of the various thicknesses and ply drop-off locations. A tonal change may occur at these drop-offs when tapping across them depending on tapping force. If suspected damage is on or near a ply drop-off, it may be required to tap an undamaged blade in the same area to help distinguish a tonal change from a void.

- a. Voids are not allowed within 0.50 inch of the trailing edge.



- b. Voids not exceeding 1.00 inch diameter are acceptable at any location except for edge voids at the tip of the blade.
- c. Edge voids between the skin and tip closeout are not permitted.
- d. If voids are detected, remove paint in the damaged area to check for broken fibers. Remove paint and primer only. Do not sand into skin plies.
- e. Broken fibers are not permitted. If broken fibers are detected, send blade to an authorized FAA repair station for evaluation, and if possible, repair. Contact VHA for repair station recommendations.
- f. Scratches, nicks, or fiber damage in the extreme trailing edge 0.10 deep or less may be blended out over a distance of at least 2.0 inches each side of the damage. See Figure 5.1 below.
- g. Damage at the tip trailing edge may be removed by blending up to a 0.50 inch radius at the tip. See Figure 5.1 below.

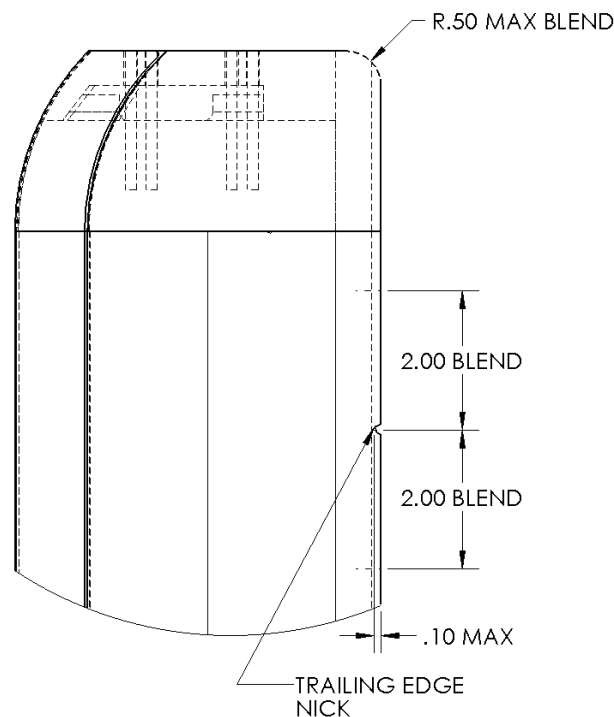


Figure 5.1  
Trailing Edge and Tip Damage Limits

5.8.4 Spot Refinishing

VHA finishes the tail rotor blade using an epoxy surfacing film co-cured with the skin, epoxy paint primer, and polyurethane top coat. Basic blade color is white with 2.0 inch high visibility black stripes as shown in Figure 5.2.

- a. When preparing the blade for touch-up, do not sand into skin plies. Primer and surfacing film is gray. Carbon/epoxy skin plies are black. Copper mesh lightning strike protection is bonded over the outboard 10.0 inches of skin.
- b. Paint wear due to erosion at the tip may expose the carbon/epoxy skin to ultra violet radiation and moisture absorption.
- c. Exposed skin not exceeding 0.20 inch aft of abrasion strip trailing edge must be protected by at least one coat of epoxy primer within 25 flight hours of exposure. See Figure 5.2.
- d. Exposed skin exceeding 0.20 inch aft of abrasion strip trailing edge must be protected by at least one coat of epoxy primer within 10 flight hours of exposure. See Figure 5.2.
- e. Paint peeling may occur. Feather paint edges using 320 grit or finer abrasive paper to stop peeling. Touchup paint required for appearance only if black carbon/epoxy skin is not exposed. Touch up exposed skin with one coat of epoxy primer.
- f. Paint nicks and scratches require touchup paint for appearance only if black carbon/epoxy skin is not exposed. Touch up exposed skin with one coat of epoxy primer.
- g. Paint is DuPont Imron Elite SS Single Stage Color. Any aerospace quality polyurethane paint may be substituted. Use a compatible epoxy primer.
- h. White paint is DuPont color 786255.
- i. Black paint is DuPont color 99.

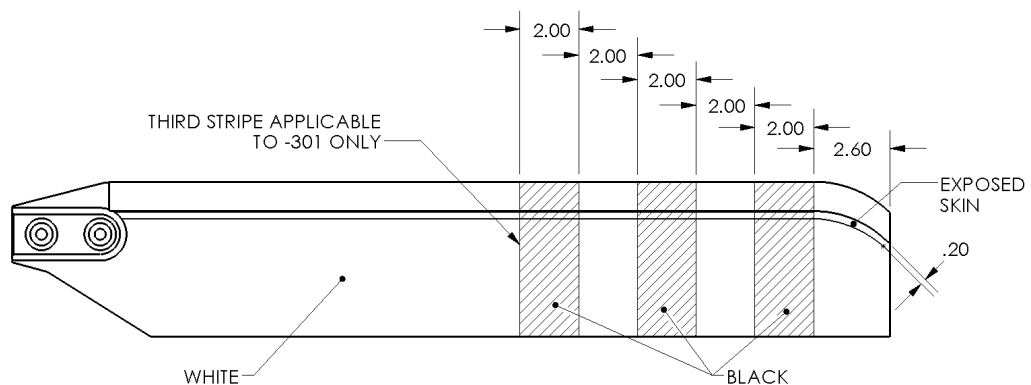


Figure 5.2  
 Paint Color Scheme

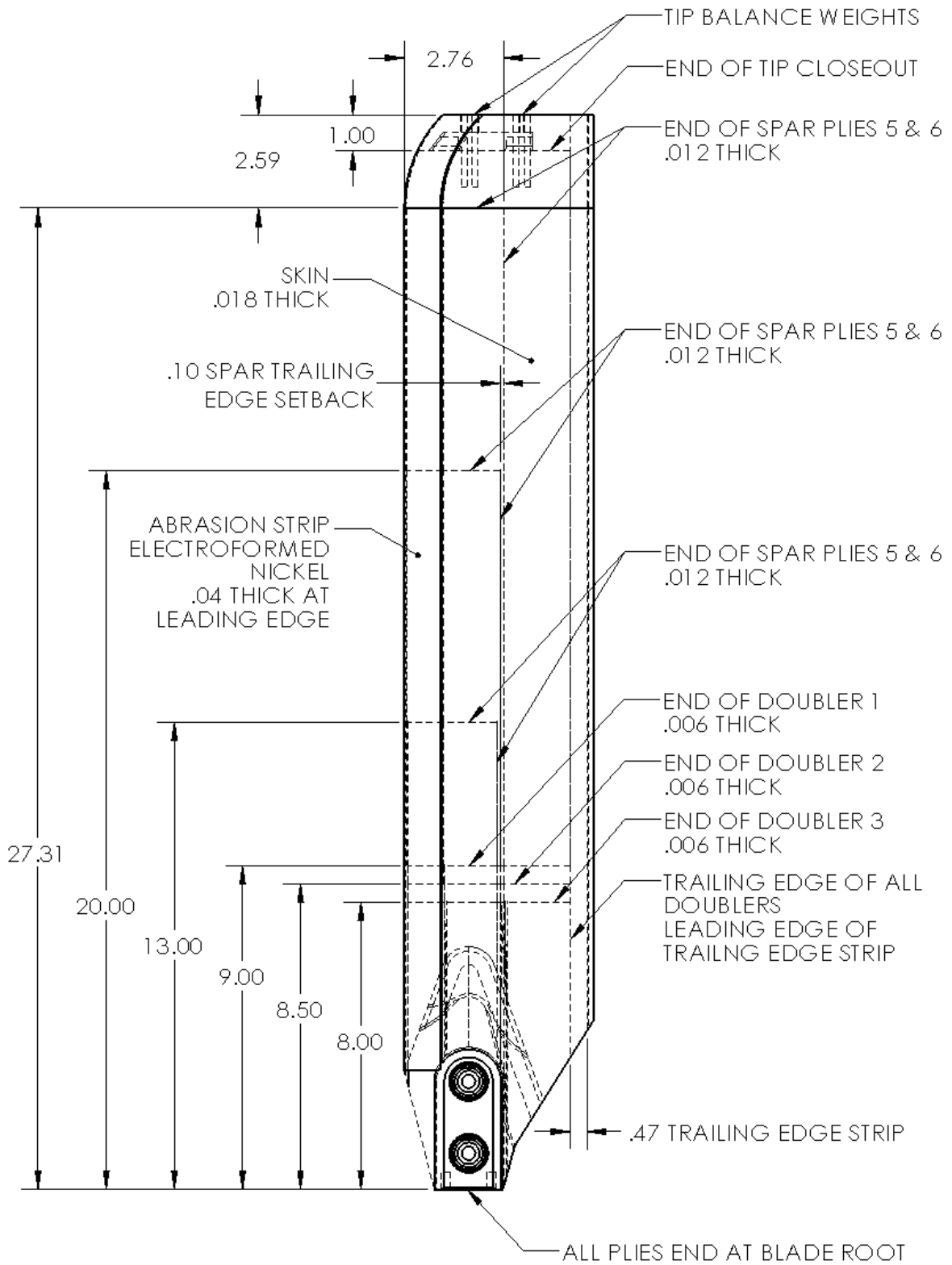


Figure 5.3  
 Tail Rotor Blade

## **CHAPTER 11 - PLACECARDS AND DECALS**

There are no placards or decals associated with this STC.

## **CHAPTER 62 – TAIL ROTOR BLADE**

### **62.1 DESCRIPTION**

The 2062200-101/-301 tail rotor blade is a composite and metallic structure incorporating the NASA developed RC(4)-10(10% thick) rotor blade airfoil. This is a highly efficient laminar flow airfoil developed to have near zero pitching moments across a broad range of airspeeds. The blade radius is approximately .10 inches shorter than the existing production tail rotor blade. The blade chord length is the same as the existing blade at 5.25 inches. The tip of the blade is rounded to reduce noise and tip drag. The root fitting is machined from titanium alloy plate. The pitch bearings incorporate both a stainless steel race and sphere, and a Teflon liner. The sphere is chrome plated. The basic blade section is fabricated using unidirectional carbon/epoxy tape with a rigid cell structural foam core. Span balance is accomplished using threaded stainless steel screws in a fiberglass/epoxy high pressure laminate tip cap. An electroformed nickel abrasion strip is added for erosion protection.

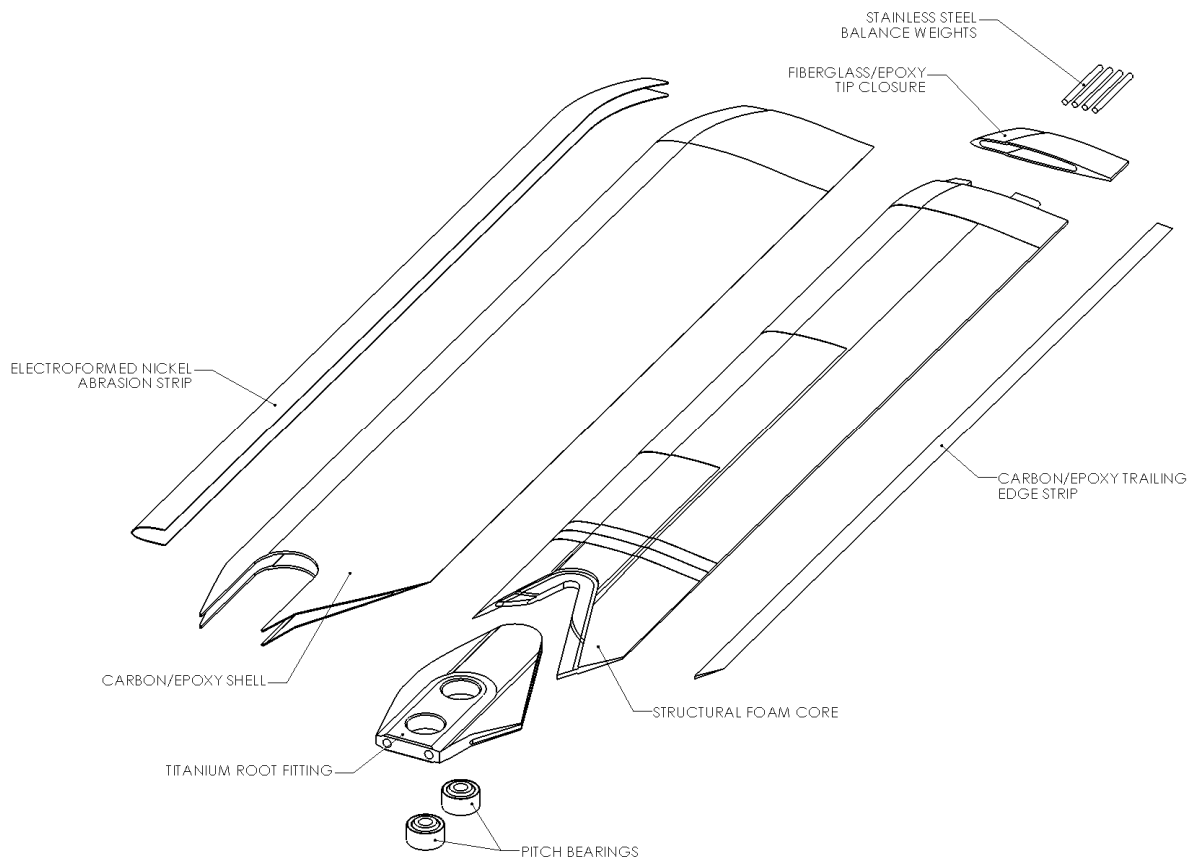


Figure 62.1.1  
Tail Rotor Blade Description

## 62.2 INSTALLATION

Install the 2062200-101/-301 tail rotor blade per the current FAA accepted maintenance manual for existing production tail rotor blade 206-016-201-131 and the instructions below.

62.2.1 A design feature of the 2062200-101/-301 tail rotor blade is reduced control forces. See section 62.3.1 for use of counterweight washers.

62.2.2 There is no pedal force requirement. Pedal friction adjustments are not required to obtain a 3 to 5 pound pedal force after the tail rotor blades are installed. Pedal forces greater than the FAA approved maintenance manual requirement of 3 to 5 pounds are permitted.

62.2.3 There is no overstaking check required after installation of VHA pitch bearings. The VHA bearings are installed differently than the existing pitch bearings. VHA pitch bearings may have higher static friction than the existing bearings, but the blades have lighter pedal forces in flight.

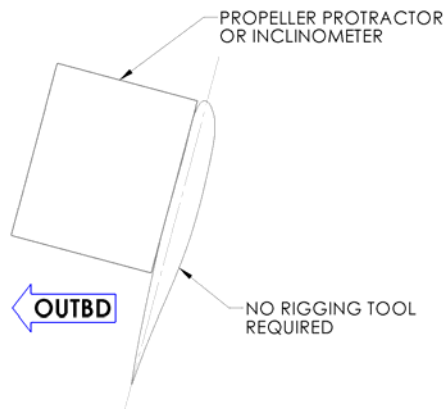
## 62.3 CONTROL RIGGING

Control rigging for the 2062200-101/-301 tail rotor blade is accomplished in exactly the same manner as production tail rotor blade 206-016-201-131 except as follows.

62.3.1 Counterweight washers may not be required. Begin rigging by removing all washers and the bolt and nut. If counterweights are required, use only one half of the maximum counterweight washers called out in the FAA accepted maintenance manual.

62.3.2 Mean blade angle to be  $22.75^{\circ}$  to  $23.25^{\circ}$ .

62.3.3 Use protractor as shown in the figure below.



**62.4 TRACK AND BALANCE**

Balance the 2062200-101/-301 tail rotor blades per the FAA accepted maintenance manual.

**62.5 WEIGHT AND BALANCE**

The 2062200-101/-301 tail rotor blade is approximately 0.1 lbs. lighter than the 206-016-201-131 tail rotor blade. Weigh the blades before installation and enter the data on the aircraft CHART C – BASIC WEIGHT AND BALANCE RECORD.