

HARTZELL PROPELLER LLC
SERVICE BULLETIN
HC-SB-61-411
Falcon Propeller Preload Post

1. Planning Information

A. Effectivity

- (1) Hartzell 3H1-QP275B1X Falcon-series propellers with serial numbers listed in Table 1 are affected by this Service Bulletin.

WARNING: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE BULLETIN. INFORMATION CONTAINED IN THIS SERVICE BULLETIN MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. FAILURE TO COMPLY WITH THIS SERVICE BULLETIN OR THE USE OF OBSOLETE INFORMATION MAY CREATE AN UNSAFE CONDITION THAT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. REFER TO THE SERVICE BULLETIN INDEX FOR THE MOST RECENT REVISION LEVEL OF THIS SERVICE BULLETIN.

B. Concurrent Requirements

- (1) Additional service documents may apply to the components/propellers affected by this Service Bulletin. Compliance with additional service documents may be necessary in conjunction with the completion of the Accomplishment Instructions in this Service Bulletin. Refer to the Hartzell Propeller website at www.hartzellprop.com for a cross-reference of service documents.

B51357	B53832	B54440	B56581	B56758	B57679
B51358	B53833	B54442	B56582	B57094	B57680
B51359	B53834	B54443	B56583	B57095	B57683
B51360	B53835	B54444	B56585	B57096	B57709
B51361	B53836	B54445	B56749	B57097	B57710
B51408	B53837	B54447	B56750	B57098	B57711
B51410	B54166	B54473	B56751	B57099	B57712
B51411	B54168	B54476	B56752	B57100	B57713
B51412	B54169	B55863	B56753	B57101	B57714
B51413	B54170	B55865	B56754	B57102	B57715
B51414	B54171	B56576	B56755	B57676	B57716
B51415	B54438	B56577	B56756	B57677	B57717
B51416	B54439	B56579	B56757	B57678	B57949

Serial Numbers of Affected Propellers
Table 1

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C. Reason

- (1) The blade preload system on the affected propellers can loosen during operation resulting in excessive blade play.

D. Description

- (1) This Service Bulletin provides Instructions for Continued Airworthiness (ICA).
- (2) This Service Bulletin provides instructions for upgrading the preload system on affected propellers.
- (3) Refer to the Appendix section of this Service Bulletin for information about the warranty program.

E. Compliance

- (1) At next annual propeller inspection or within 100 flight hours from the release date of this Service Bulletin, whichever occurs first, install the upgraded preload system components in accordance with the Accomplishment Instructions section of this Service Bulletin.

F. Approval

- (1) This technical document is approved by Hartzell Propeller LLC.

G. Manpower

<u>Procedure</u>	<u>Allowable Man-hours</u>
Propeller Removal/Installation	2 hours per propeller
Preload System Upgrade	2 hours per propeller

CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION.
PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH
THE MOST RECENT REVISION OF A DOCUMENT.

H. References

- (1) Hartzell Propeller Standard Practices Manual 202A (61-01-02)
- Consumable Materials chapter is available on the Hartzell website at www.hartzellprop.com
- (2) Hartzell Propeller Owner's Manual 670 (61-00-70)
- available on the Hartzell website at www.hartzellprop.com
- (3) Hartzell Propeller Falcon-series Propeller Overhaul Manual 675 (61-10-75)

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2. Material Information

A. Parts Supplied by Hartzell Propeller

<u>Part Number</u>	<u>Description</u>	<u>Qty</u>
110220-KITX	Falcon Preload Upgrade Kit	1
110136X	• Post, Preload	1
110137X	• Retainer, Spring	1
110139X	• Screw, Set, 5/16-24, Oval Point	3
110151X	• Nut, 5/16-24, Self-locking	3
A-2043-1	• Nut, 3/8-24, Hex, Self-locking	1
B-6747	• Seal, Washer	1
B-3821	• Screw, 10-32, Cap	12
C-3317-154	• O-ring	1
C-3317-334-1	• O-ring	1
A-5839-112	• Ring, Retaining, Internal Spiral	1
C-3317-225-1	• O-ring	1
102632	• Tubing, Silicone	3
109797X	• Pin, PTFE, 3/16 in.	6
C-3317-011-2	• O-ring	1

B. Consumables

<u>CM Number</u>	<u>Description</u>
CM399	Threadlocker (Loctite 243)

NOTE: All CM numbers in this Service Bulletin refer to the Consumable Materials chapter of Hartzell Propeller Standard Practices Manual 202A (61-01-02).

C. Special Tool

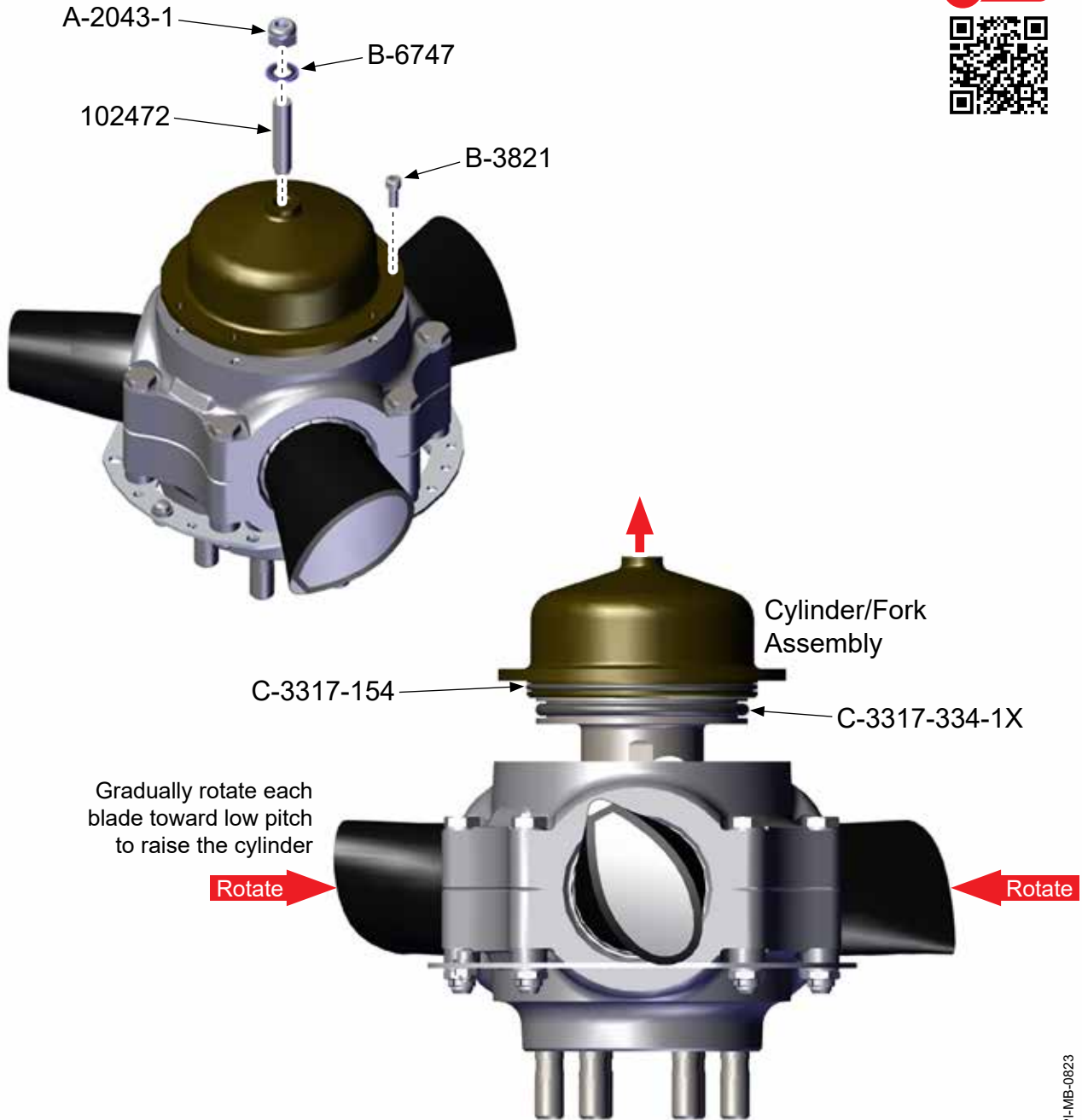
<u>TE Number</u>	<u>Description</u>
TE662	Spring Installation Tool
DT-7252	Blade Retainer Seat
DT-7253	Blade Retainer

NOTE: All TE numbers in this Service Bulletin refer to Hartzell Propeller Illustrated Tool and Equipment Manual 165A (61-00-65).

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Cylinder/Fork Removal
Figure 1

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3. Accomplishment Instructions

A. Preload System Upgrade Instructions

- (1) Remove the spinner dome in accordance with Hartzell Propeller Owner's Manual 670 (61-00-70).
- (2) Remove the propeller from the aircraft in accordance with Hartzell Propeller Owner's Manual 670 (61-00-70).
 - (a) Retain the propeller mounting nuts and washers to reinstall the propeller.

ATTENTION: Steps (3) thru (23) of this procedure must be performed by a certified propeller repair station with the appropriate rating.

CAUTION: TO PREVENT DAMAGE TO THE SCREW HEADS, DO NOT USE BALL-END ALLEN WRENCHES WHEN PERFORMING THIS PROCEDURE.

- (3) Remove the cylinder/fork assembly in accordance with Figure 1 and the following steps:
 - (a) Remove the low pitch stop nut (p/n A-2043-1) and washer seal (p/n B-6747).
 - (b) Remove the low pitch stop screw (p/n 102472) from the cylinder.
 - (c) Slowly release the spring pressure on the cylinder in accordance with the following steps:
 - 1 Using an alternating pattern, gradually loosen six screws (p/n B-3821) to evenly release the spring pressure on the cylinder/fork assembly.
 - 2 When the spring pressure is released, remove and discard the screws (p/n B-3821).

CAUTION: MOVE THE BLADES EVENLY TO PREVENT THE CYLINDER/FORK ASSEMBLY FROM BINDING.

- (d) Working gradually and evenly, rotate each blade toward low pitch to raise the cylinder/fork assembly to the top of its travel.

NOTE: When the cylinder/fork assembly stops moving up, it has reached the top of its travel and can be removed.

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- (e) Remove the cylinder/fork assembly.
 - 1 Using a crayon or soft non-graphite pencil such as CM162, mark each blade, fork pocket, and spherical bearing so they can be reinstalled in the same location.
- (f) Carefully tip the cylinder/fork assembly over a bucket or container to drain the engine oil from the cylinder.
- (g) Working over a bucket or container to catch the engine oil from the cylinder, separate the cylinder from the fork assembly.
- (h) Remove and discard the cylinder O-ring (p/n C-3317-154) and the piston O-ring (p/n C-3317-334-1X).
- (4) Remove the screw (p/n 109689X) and spherical bearing (p/n 109693X) from each blade. Refer to Figure 2.

NOTE: The spherical bearings must be reinstalled on the same blades from which they were removed. Make a record that matches the bearings with the repective blade.

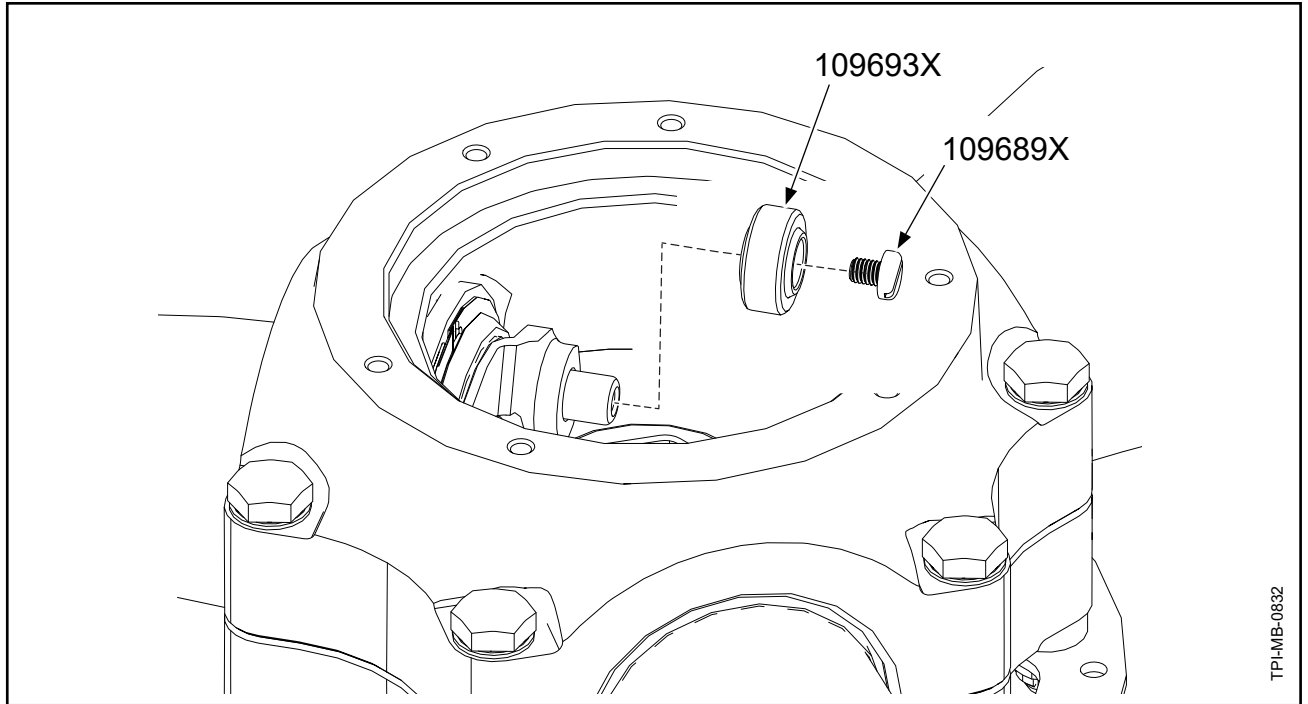
CAUTION: IF NOT USING THE BLADE RETAINER TOOL, USE CAUTION TO PREVENT THE BLADES FROM BEING PUSHED INWARD BEYOND THE HUB SOCKET.

- (5) **OPTIONAL:** Install the blade retainer seat (p/n DT-7252) and blade retainer (p/n DT-7253) onto each blade as shown in Figure 3.

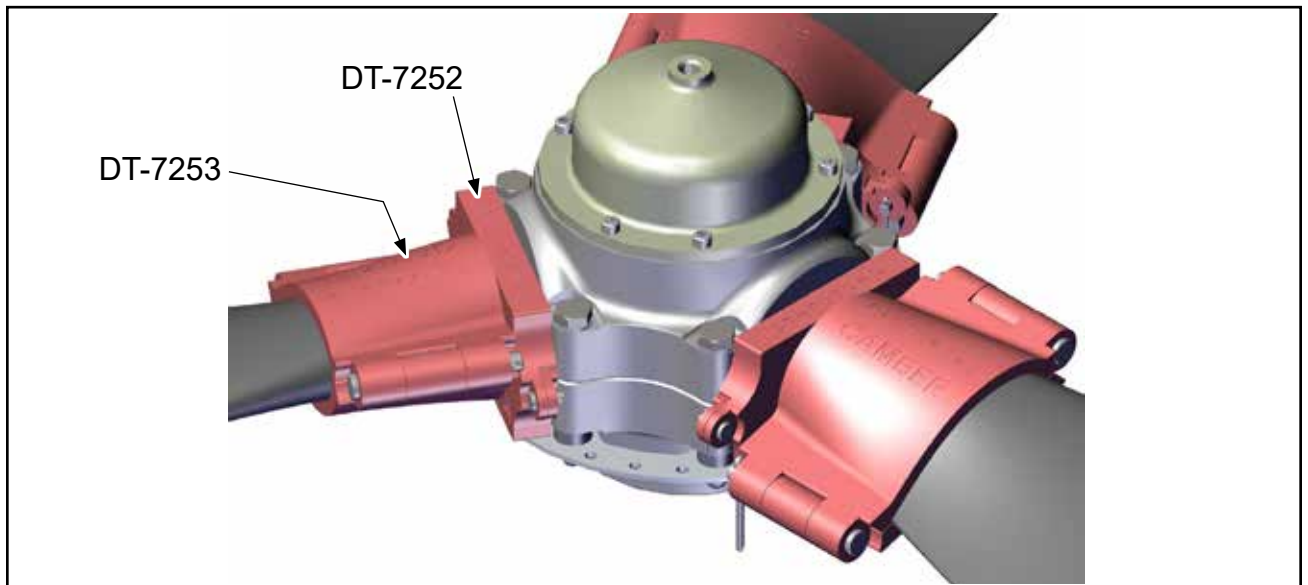
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Spherical Bearings
Figure 2

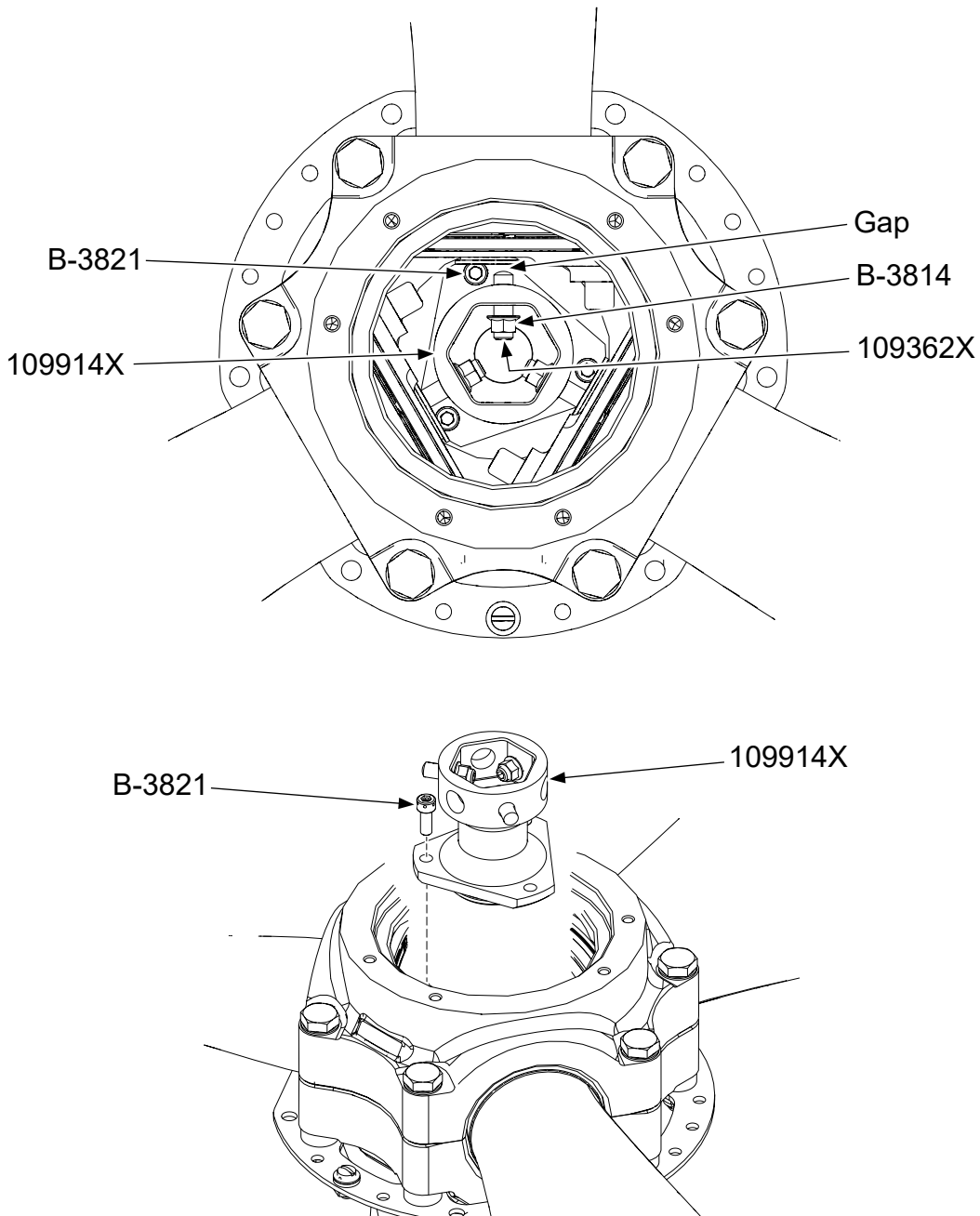


Blade Retainers
Figure 3

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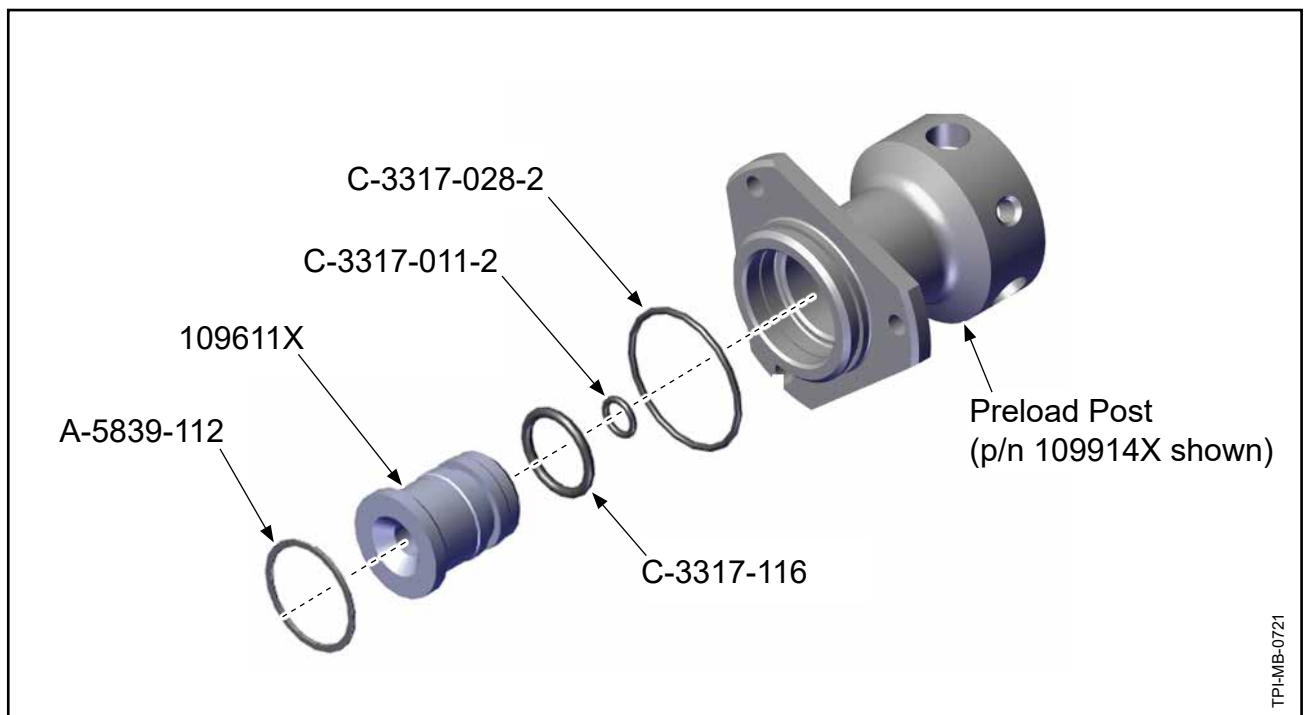
**Preload Post Removal
Figure 4**

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- (6) Remove the preload post (p/n 109914X) in accordance with Figure 4 and the following steps:
- (a) Rotate the blades as necessary to access the preload post (p/n 109914X) during this procedure.
 - (b) Remove the safety wire from the preload post mounting screws (p/n B-3821).
 - (c) Using a 5/16" wrench on the preload nut (p/n B-3814) and 1/8" Allen wrench in the preload set screw (109362X), rotate the nut and screw simultaneously to back the set screw out until there is a gap between the set screw and the butt of the blade.
 - (d) Use a T-handled 5/32" Allen wrench to remove the three preload post mounting screws (p/n B-3821).

NOTE: Using a magnetic wrench, or applying a dab of grease to the tip of the wrench will make screw removal easier.

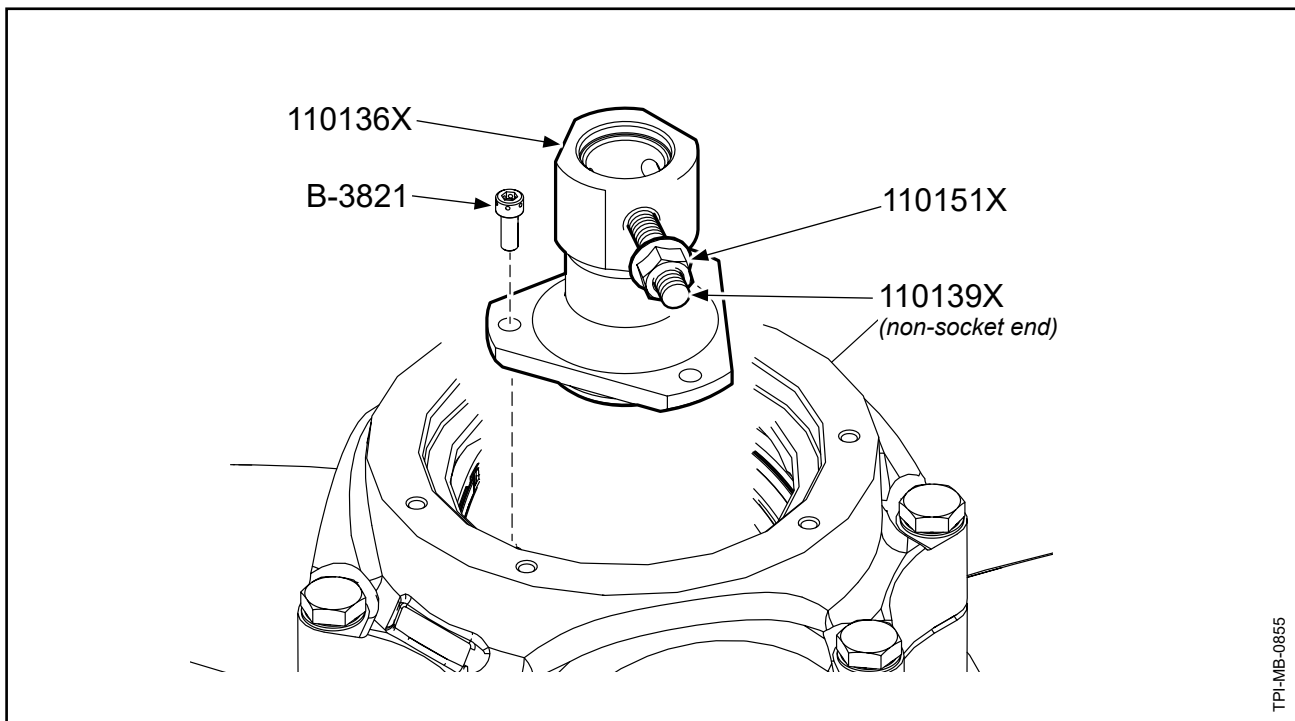
- (e) Remove the preload post (p/n 109914X) from the hub.



Preload Post Bushing Removal/Installation
Figure 5

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- (7) Remove the bushing (p/n 109611X) from the preload post (p/n 109914X) in accordance with Figure 5 and the following steps:
 - (a) Remove and discard the O-ring (p/n C-3317-028-2).
 - (b) Remove and discard the retaining ring (p/n A-5839-112), then remove the bushing (p/n 109611X) from the preload post (p/n 109914X).
 - (c) Remove and discard the external O-ring (p/n C-3317-116) and the internal O-ring (C-3317-011-2) from the bushing.
 - (d) Using MEK CM106 or MPK CM219, clean the bushing.
- (8) Install the bushing (p/n 109611X) into the new preload post (p/n 110136X) in accordance with Figure 5 and the following steps:
 - (a) Install the external O-ring (p/n C-3317-116) and the internal O-ring (p/n C-3317-011-2) onto the bushing (p/n 110136X).
 - (b) Install the bushing into the the preload post (p/n 110136X), then install the retaining ring (A-5839-112).
 - (c) Install the O-ring (p/n C-3317-028-2) onto the preload post.



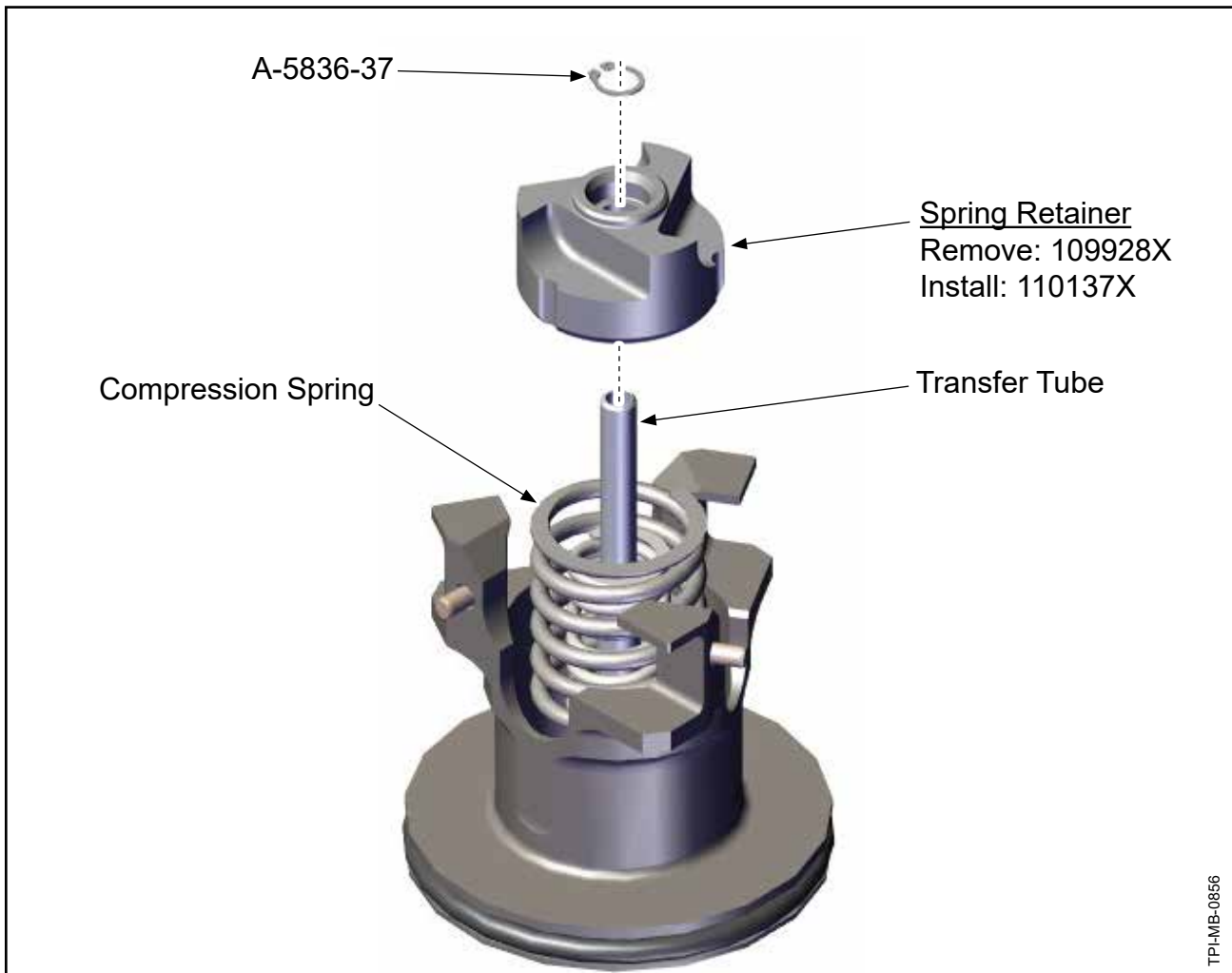
Preload Post Installation
Figure 6

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- (9) Install the new preload post (p/n 110136X) into the hub in accordance with Figure 6 and the following steps:
- (a) Thread new nuts (p/n 110151X) onto the non-socket end of the new preload set screws (p/n 110139X) until the full oval tip of the set screw extends from end of the nut locking feature as shown in Figure 6.
 - (b) Thread the socket-end of the preload set screws (p/n 110151X) into the preload post (p/n 110136X) far enough to clear the blades when installed.
 - (c) Install the preload post (p/n 110136X) into the hub.
 - 1 Be sure the preload post is firmly seated against the hub before installing the screws.
- CAUTION:** APPLY A SMALL AMOUNT OF GREASE TO THE END OF THE ALLEN WRENCH TO PREVENT THE SCREWS FROM FALLING INTO THE HUB.
- (d) Using three new screws (p/n B-3821), secure the preload post (p/n 110136X) to the hub.
 - 1 Tighten the screws evenly by hand, then torque to 54-66 In-Lbs.
- (10) Set the blade preload in accordance with Figure 6 and the following steps:
- (a) Tighten the three preload set screws (p/n 110139X) until there is firm contact with the preload plug on the butt of the blade.
 - 1 Do not torque the preload set screws at this time.
 - (b) Using 0.020-inch safety wire and a single wire method in accordance with NASM33540, safety the preload post screws (p/n B-3821).
 - 1 Install silicone tubing (p/n 102632 - not shown) over the safety wire between the preload post screws (p/n B-3821).
 - (c) Initial Torque:
 - 1 Torque each of the three preload set screws (p/n 110139X) to 30 In-Lbs.
 - (d) Final Torque:
 - 1 Torque each of the three preload set screws (p/n 110139X) to 60-65 In-Lbs.
 - (e) Check blade play in accordance with Hartzell Propeller Owner's Manual 670 (61-00-70).

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- (f) Position the nuts (p/n 110151X) so that a minimum of three threads on the preload set screw (p/n 110139X) are visible between the nut and the preload post (p/n 110136X).
- 1 Apply threadlocker CM399 to the threads of the preload set screw (p/n 110139X) between the nut (p/n 110151X) and the preload post (p/n 110136X).
 - 2 While holding the preload set screw (p/n 110139X) in place, torque the nuts (p/n 110151X) to 340-350 In-Lbs (39 N•m).
- (11) If applicable, remove blade clamps TExxx from the blades.



Spring Retainer Replacement
Figure 7

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- (12) Disassemble fork assembly and replace the spring retainer in accordance with Figure 7 and the following steps:

CAUTION: THE COMPRESSION SPRING IS UNDER APPROXIMATELY 100 LBS. OF PRESSURE. USE CAUTION WHEN PERFORMING THIS PROCEDURE.

- (a) Using the spring installation tool TE662, apply pressure to the spring retainer (p/n 109928X) to compress the spring until the snap ring (p/n A-5836-37) is exposed.
- (b) Remove and discard the snap ring (p/n A-5836-37) , then slowly release the pressure on the spring retainer (p/n 109928X).
- (c) Remove and discard the spring retainer (p/n 109928X).
- (d) Install the new spring retainer (p/n 110137X) with the flats on the spring retainer aligned with the pockets on the fork.
- (e) Using the spring installation tool TE662, apply pressure to the spring retainer (p/n 110137X) to compress the spring then install a new snap ring (p/n A-5836-37) onto the transfer tube.
 - 1 Slowly release the pressure on the spring making sure the snap ring is locked in place.

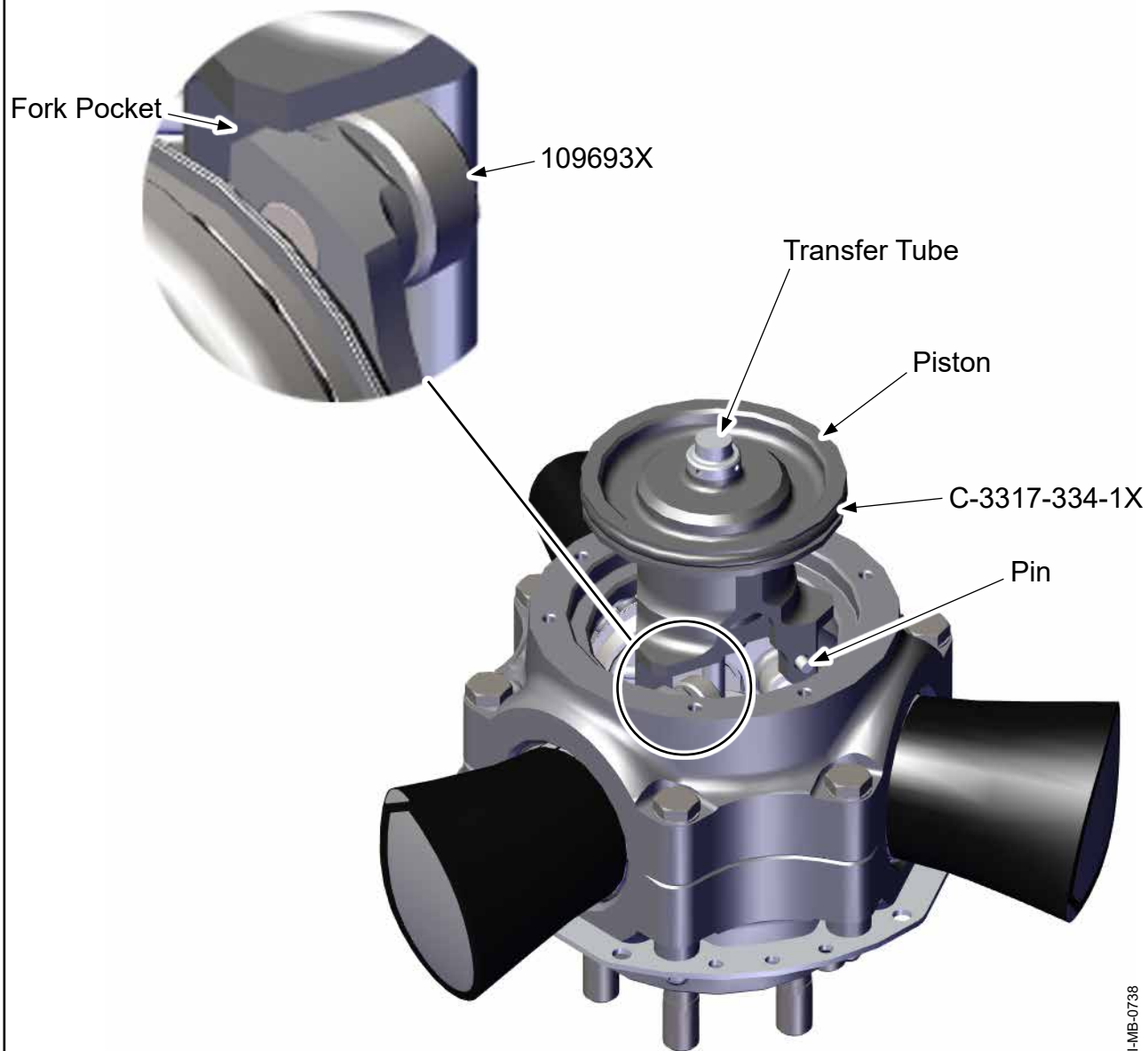
CAUTION: INSTALL THE SPHERICAL BEARINGS ONTO THE SAME BLADES FROM WHICH THEY WERE REMOVED.

- (13) Install the spherical bearings (p/n 109693X) onto the blades, then install screw (p/n 109689X) until tight. Refer to Figure 2.

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Fork Installation
Figure 8

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CAUTION: THE COMPRESSION SPRING IS UNDER APPROXIMATELY 100 LBS. OF PRESSURE. USE CAUTION WHEN HANDLING THE FORK ASSEMBLY.

(14) Install the fork assembly in accordance with Figure 8 and the following steps:

- (a) Rotate each blade toward low pitch to raise the spherical bearing (p/n 109693X) on the blade to the top of its travel.
- (b) Install the fork assembly into the hub aligning the transfer tube with the preload post (p/n 110136X).
 - 1 Align the three "pockets" in the fork with the three spherical bearings (p/n 109693X) on the blades.

CAUTION 1: MOVE THE BLADES EVENLY TO PREVENT THE FORK ASSEMBLY FROM BINDING.

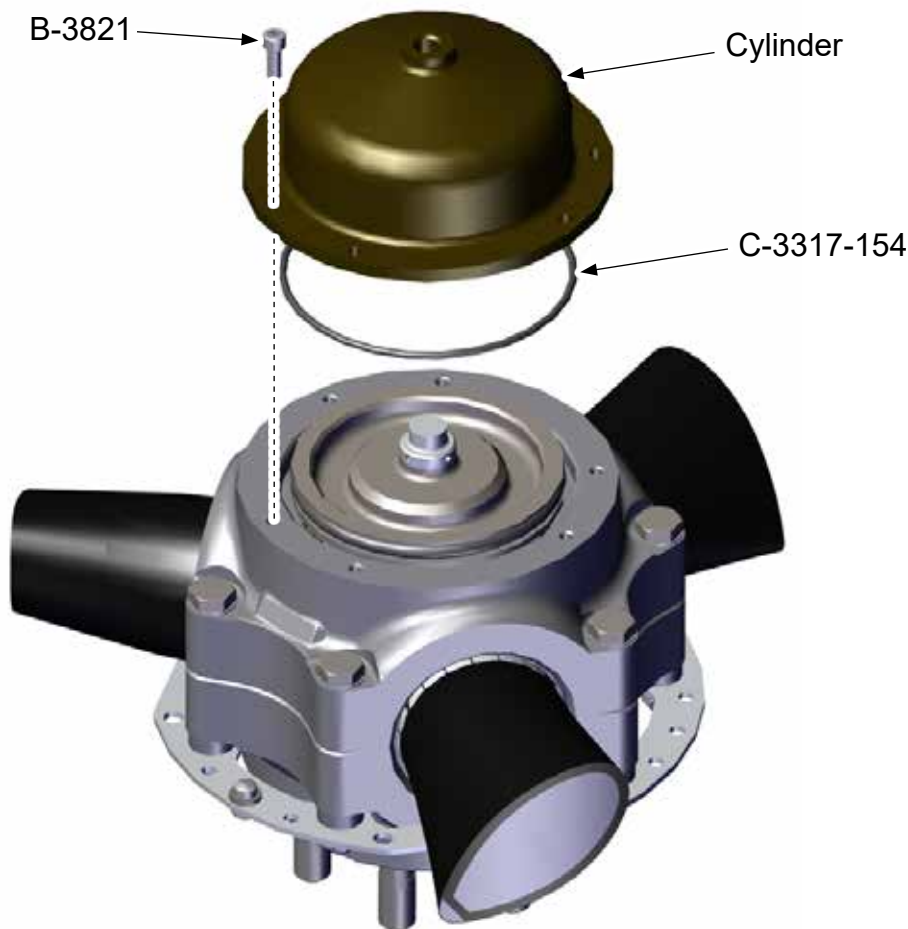
CAUTION 2: BE SURE THE THREE PINS DO NOT INTERFERE WITH THE BLADE SHANKS.

NOTE: If the existing pin(s) are damaged, replacement pins (p/n 109797X) are provided with the preload upgrade kit. The replacement pins must be cut to length to clear the blade shanks.

- 2 Working gradually/evenly, rotate each blade toward high pitch to engage the spherical bearings (p/n 109693X) in the fork pockets.
 - a Rotate the blades toward high pitch until the the fork reaches the bottom of its travel.

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- (15) Install the cylinder in accordance with Figure 9 and the following steps:
- (a) Install the O-ring (p/n C-3317-154) on the OD of the cylinder.
 - (b) Align the mounting holes in the cylinder with the mounting holes on the hub, then loosely install six screws (p/n B-3821).
 - 1 Using an alternating pattern, gradually tighten the six screws (p/n B-3821) to evenly draw the cylinder down to the hub.
 - 2 Torque the six screws (p/n B-3821) to 54-66 In-Lbs.
 - 3 Safety wire the six screws (p/n B-3821) to each other in accordance with NASM33540.



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Cylinder Installation
Figure 9

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- (16) Perform the "Leak Check" in accordance with the procedure in the Assembly chapter of Hartzell Propeller Falcon-series Propeller Overhaul Manual 675 (61-10-75)
- (17) Install the low pitch stop screw (p/n 102472) into the cylinder.
- (18) Verify the propeller blade angles in accordance with Hartzell Propeller Application Guide Manual 159 (61-00-59).
- (19) Install the washer seal (p/n B-6747) and the low pitch stop nut (p/n A-2043-1).
 - (a) Torque the low pitch stop nut (p/n A-2043-1) to 13-17 Ft-Lbs.
- (20) Install the propeller onto the aircraft in accordance with Hartzell Propeller Owner's Manual 670 (61-00-70).
- (21) Install the spinner dome in accordance with Hartzell Propeller Owner's Manual 670 (61-00-70).
- (22) Make an entry in the propeller logbook indicating the preload post was replaced in accordance with this Service Bulletin.

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B. Recommended Service Facilities

- (1) Hartzell Propeller LLC has a worldwide network of Recommended Service Facilities for overhaul and repair of our products.
- (2) Each service facility must meet standard FAA requirements and additional Hartzell Propeller requirements before being recommended by Hartzell. Each service facility is audited by Hartzell Propeller to verify compliance with Hartzell standards.
- (3) Hartzell Propeller recommends that you use one of these service facilities when having your propeller overhauled or repaired.
- (4) For a current list of Hartzell Propeller Recommended Service Facilities, contact Hartzell Product Support or refer to the Hartzell website at www.hartzellprop.com.

C. Contact Information

Hartzell Propeller LLC
Attn: Product Support Department
One Propeller Place
Piqua, Ohio 45356-2634 USA
Phone: (001) 937.778.4379
Fax: (001) 937.778.4391
E-mail: techsupport@hartzellprop.com

HARTZELL PROPELLER LLC
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Falcon Propeller Preload Set Screws

1. Warranty Program Information

A. Eligibility

- (1) Hartzell 3H1-QP275B1X Falcon-series propellers with serial numbers listed in Table 1 of this Service Bulletin are eligible for this warranty program.

B. Parts

- (1) Hartzell Propeller will provide all of the parts listed in the Material Information section of this Service Bulletin free of charge for each affected propeller.
- (2) Complete and sign the Parts Order/Compliance Form in this Service Bulletin Appendix for processing.

C. Labor

- (1) Hartzell Propeller will authorize payment for the allowable labor charges when the "Preload System Upgrade" is performed in accordance with the Accomplishment Instructions in this Service Bulletin.
 - (a) Refer to the Manpower section of this Service Bulletin for warranted procedures and allowable man-hours.
 - (b) Labor charges will be reimbursed at the service facility's CURRENT POSTED SHOP LABOR RATE, pending Hartzell Propeller approval.
 - (c) Send the completed/signed Compliance Form and the invoice for labor charges to Hartzell Propeller for processing.

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Parts Order/Compliance Form

Warranty Claim Number:		
Propeller Information (if applicable):		
Propeller Model: 3H1-QP275B1X	Propeller S/N:	
TSN (Time Since New):	TSO (Time Since Overhaul):	
Aircraft Information (if applicable):		
Aircraft Model:	Aircraft Registration #:	
Owner Information:		
Name:		
City:	State:	
Zip/Postal Code:	Country:	
E-mail:	Phone:	
Repair Facility Information:		
Company:	Contact Name:	
Address:		
City:	State:	
Zip/Postal Code:	Country:	
E-mail:	Phone:	Fax:
Replacement Parts:		
Refer to the Material Information section in this Service Bulletin for a list of parts that will be provided.		
Signature:		
Repair Technician's Signature:	Date:	
Send this completed and signed form to Hartzell Propeller Product Support Department: Fax - (001) 937.778.4215 or E-mail - warranty@hartzellprop.com		

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Authorized By:
