



**YUKON PROPELLER BY WIPAIRE AND HARTZELL**

# **YUKON 208 PROPELLER INSTALLATION GUIDE**

**HARTZELL HC-E4N-KTV ( )/GC11114**

Revision	Pages Affected	Description	Date
1	All	Original Issue	3/1/2024
2	All	Complete format change, added all tech manual references, publications references, tooling references, etc...	7/26/2024
3	2 18 28 41 42 43	Updated TOC to reflect pages added as noted below Added new photos for prop removal, removal wrenches Added new slide for oil seal reference Added REF for spinner screw misalignment Changed photo for spinner hole overlap Added new slide for cowl to spinner fitment issues	08/14/24
4	2 20 27 54-62 39-40 44	Updated TOC to reflect pages added as noted below Added page for deice brush block bracket removal Added note to install washer under beta ring puller foot Deleted all duplicated information now found on Wipaire drawing 1012329 REV B or later Added spinner IPC data from REV 26 of Hartzell Manual 127 Removed various hardware and part identifications now found in various Hartzell manuals.	9/4/24



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## REQUIRED TOOLING

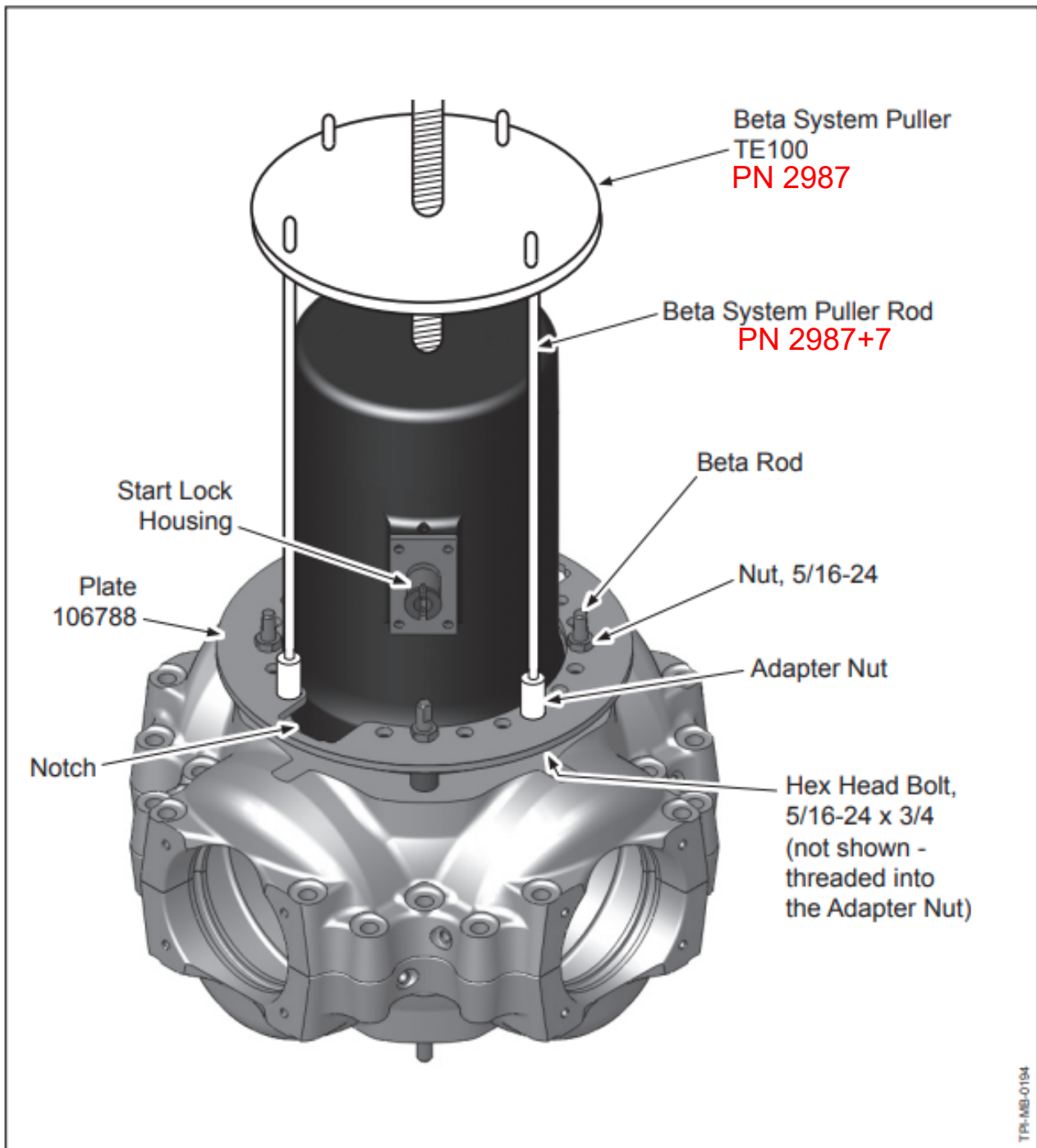
BETA RING PULLER PN CST-2987

# CST-2987

PULLER, BETA RING

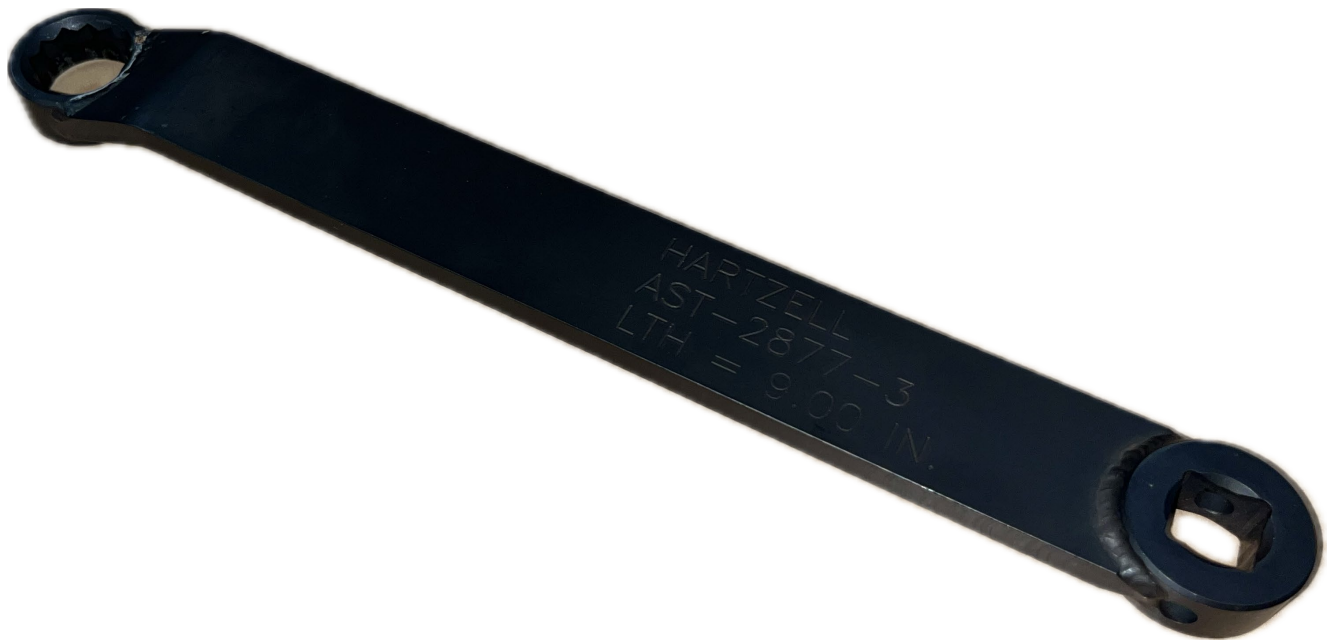


# BETA RING PULLER PN CST-2987



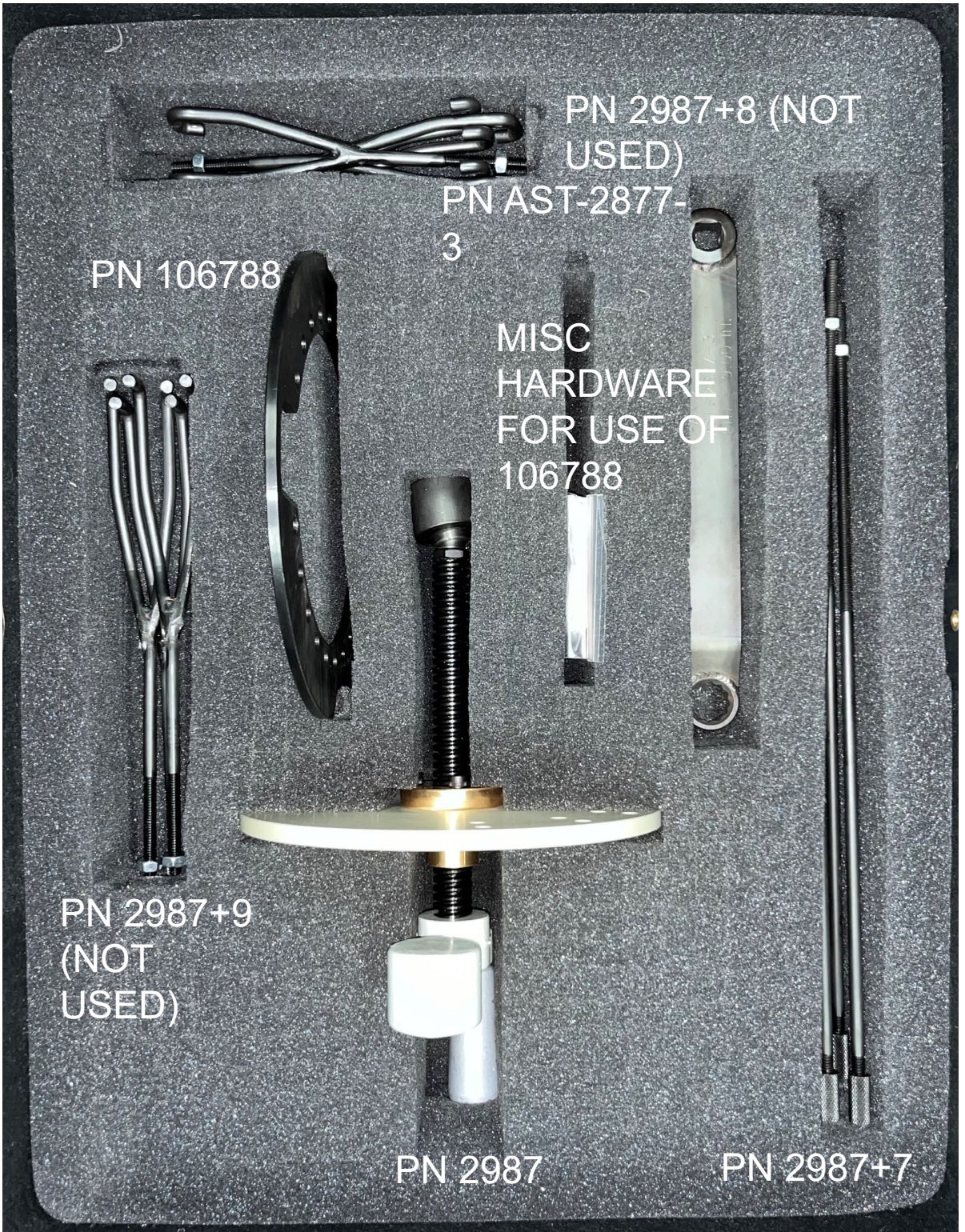
Using the Plate Kit 106804  
Figure 1

# TORQUE WRENCH ADAPTER PN AST-2877-3



**AST-2877-3  
ADAPTER, TORQUE WRENCH**

# WPC00419 YUKON PROP TOOL KIT (RENTAL UNIT)

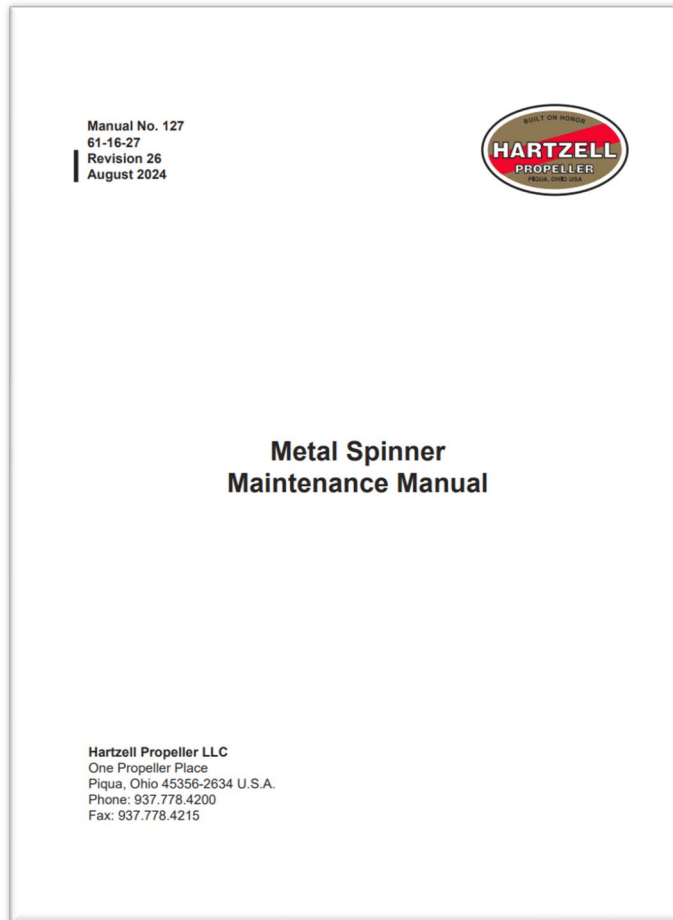
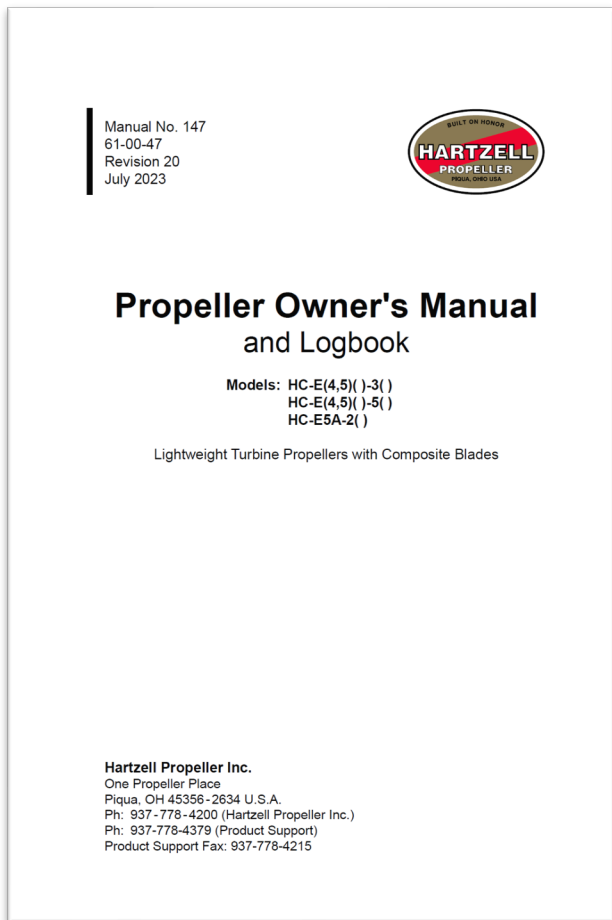




## REQUIRED TECHNICAL DATA

APPLICABLE TECHNICAL DATA  
\*\*AVAILABLE AT [WWW.HARTZELLPROP.COM](http://WWW.HARTZELLPROP.COM)

-PROPELLER OWNERS **MANUAL 147**  
-METAL SPINNER MAINTENANCE **MANUAL 127**



CURRENT REVISIONS AVAILABLE AT  
[WWW.HARTZELLPROP.COM](http://WWW.HARTZELLPROP.COM)

# APPLICABLE TECHNICAL DATA

\*\*AVAILABLE AT [WWW.HARTZELLPROP.COM](http://WWW.HARTZELLPROP.COM)

## -COMPOSITE BLADE FIELD MAINTENANCE **MANUAL 170** -ICE PROTECTION SYSTEM **MANUAL 180**

Manual No. 170  
61-13-70  
Revision 21  
September 2023



### Composite Blade Field Maintenance and Minor Repair Manual

#### Legacy Composite

B7421(K)  
( )7690( )  
7890K  
E8190K  
E9193(B,K)  
M10083(K)  
A10460(E)(K)  
LM10585(A)(N)(B,K)+4  
M10877K  
E10950P(C)(B,K)  
E11990K  
E12902K  
E12903( )  
E13890K  
108MH92  
138MH91

#### N-shank Composite

N7605(B,K)( )  
N7605C( )  
N76M05C( )X  
N7893( )  
N( )8301( )  
N( )8302( )  
N( )8304( )  
NM8410( )  
NM8411( )  
NC8834( )  
NC9208( )  
NC9405( )  
NC10244( )  
NC10245( )  
NC10320( )  
NC10445( )  
(J)NC10904( )

#### Bantam Composite

( )75A01( )  
L76A01( )X( )  
( )79A06X( )

#### Raptor Composite

75C( )08( )  
76C( )03( )  
76C( )04( )  
78D01( )  
( )79C03( )  
80C( )01( )  
84DB26( )  
86DB01( )  
91D1(5,7)( )  
100DD44( )

#### G-shank Composite

GC1111(4,5)( )

Hartzell Propeller Inc.  
One Propeller Place  
Piqua, Ohio 45356-2634 U.S.A.  
Phone: 937.778.4200  
Fax: 937.778.4215

Manual No. 180  
30-61-80  
Revision 41  
September 2023



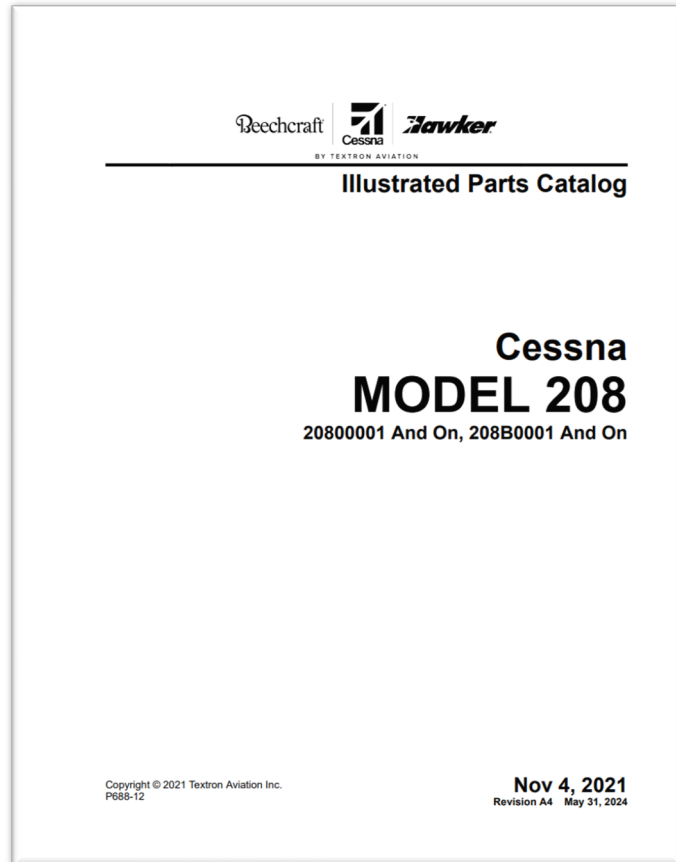
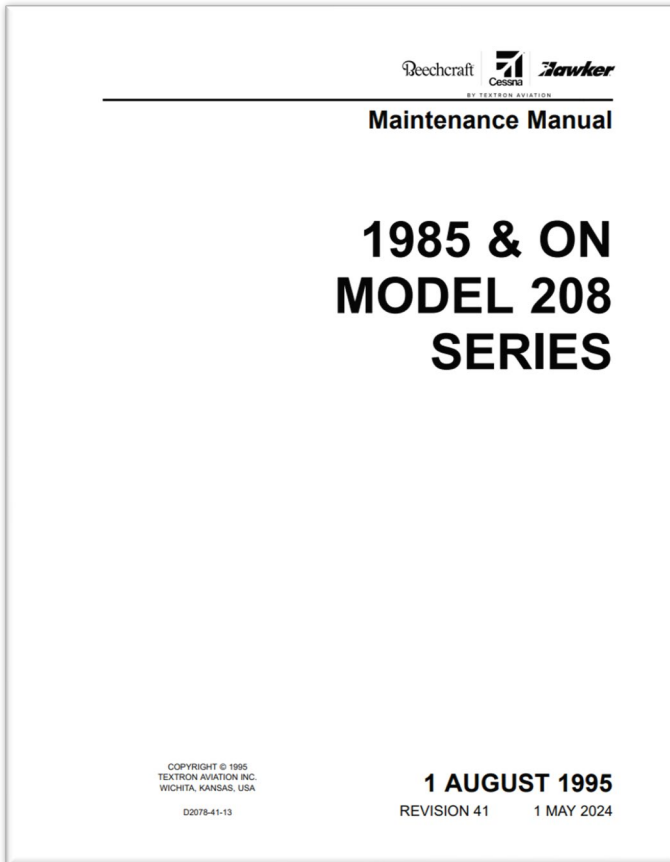
### Ice Protection System Manual

Hartzell Propeller Inc.  
One Propeller Place  
Piqua, Ohio 45356-2634 U.S.A.  
Phone: 937.778.4200  
Fax: 937.778.4215

CURRENT REVISIONS AVAILABLE AT  
[WWW.HARTZELLPROP.COM](http://WWW.HARTZELLPROP.COM)

# APPLICABLE TECHNICAL DATA

- CESSNA 208 MAINTENANCE MANUAL
- CESSNA 208 ILLUSTRATED PARTS CATALOG



AVAILABLE BY SUBSCRIPTION ONLY FROM TXTAV

# APPLICABLE TECHNICAL DATA

## -PRATT AND WHITNEY PT6A-140 IPC AND SERVICE MANUALS

ILLUSTRATED PARTS CATALOG			
TURBOPROP GAS TURBINE ENGINE			
Model(s)			
PT6A-140			
Manual Part No.3075744			
Original Issue date 18 May 2012			
Export Control Classification			(X) if Applicable
Contains no Technical Data			( )
Not Subject to the EAR pursuant to 15 CFR 734.76(a) or Not Subject to the ITAR pursuant to 22 CFR 120.11 (NSR)			( )
Jurisdiction and Classification based on Physical Location of the Item.	Location	Regulations	
		EAR	ITAR
	Outside US*	NSR	NSR
	U.S.	NSR	NSR
		EPA (ECL)	DPA (CS)
	Canada	NSR	No

\* Additionally, refer to the classification under the local export regime where the item is located, as provided in the grid.

MAINTENANCE MANUAL			
TURBOPROP ENGINE			
MODEL(S)			
PT6A-140 ENGINES			
Manual Part No.3075742			
Issued 04 June 2012			

**AVAILABLE BY SUBSCRIPTION ONLY**



# APPLICABLE TECHNICAL DATA

## -PRATT AND WHITNEY PT6A-114A IPC AND SERVICE MANUALS

### ILLUSTRATED PARTS CATALOG

TURBOPROP GAS TURBINE ENGINE

Model(s)

PT6A-114/-114A/-135/-135A

Manual Part No.3043514

Original Issue date 31 January 1997

Export Control Classification			<input type="checkbox"/> (X) If Applicable	
Contains no Technical Data			<input type="checkbox"/> (I)	
Not Subject to the EAR pursuant to 15 CFR 734.7(a)(1) or Not Subject to the ITAR pursuant to 22 CFR 120.11(NSR)			<input type="checkbox"/> (I)	
Jurisdiction and Classification based on Physical Location of the Item.			Regulations	
	Location	EAR	ITAR	
	Outside US*	NSR	NSR	
	U.S.	BE991	NSR	
		EPA(ECL)	DPA(CO)	
	Canada	NSR	No	

\* Additionally, refer to the classification under the local export regime where the item is located, as provided in the grid.

### MAINTENANCE MANUAL

TURBOPROP GAS TURBINE ENGINE

Model(s)

PT6A-114/-114A/-135/-135A

Manual Part No.3043512

Original Issue date 31 October 1997

The contents of this manual have been examined and found acceptable to the Minister in meeting the requirements of an Engine Maintenance Manual for the Pratt & Whitney Canada PT6A-114/-114A/-135/-135A engine, as required by the Canadian Airworthiness Manual, Chapter 533.4 "Instructions for Continued Airworthiness".  
[20240708v7.2]

Export Control Classification			<input type="checkbox"/> (X) If Applicable	
Contains no Technical Data			<input type="checkbox"/> (I)	
Not Subject to the EAR pursuant to 15 CFR 734.7(a)(1) or Not Subject to the ITAR pursuant to 22 CFR 120.11(NSR)			<input type="checkbox"/> (I)	
Jurisdiction and Classification based on Physical Location of the Item.			Regulations	
	Location	EAR	ITAR	
	Outside US*	NSR	NSR	
	U.S.	BE991	NSR	
		EPA(ECL)	DPA(CO)	
	Canada	NSR	No	

\* Additionally, refer to the classification under the local export regime where the item is located, as provided in the grid.

**AVAILABLE BY SUBSCRIPTION ONLY**



# APPLICABLE TECHNICAL DATA

## WIPAIRE INSTALLATION DRAWING 1012329

REVISION HISTORY				
REV	DATE	ECO	DR	DESCRIPTION
A	11/15/2023	ECN-10513	DJK	INITIAL RELEASE

EXISTING:  
PROP HEAT WIRES  
(REF)

MOUNTING BRACKET (REF)  
RIGHT SIDE OF ENGINE, VERTICALLY

BRUSH BLOCK (REF)

MOV (REF)

**DETAIL "A"**  
108053 AIRFRAME DE-ICE KIT  
INSTALL PER HARTZELL MANUAL 180, 30-61-80, REV

KIT CONFIGURATION LIST	
DASH NO.	DESCRIPTION
-01	HARTZELL 4-BLADE 110", START LOCKS, PLAIN
-02	HARTZELL 4-BLADE 110", START LOCKS, DE-ICE
-03	HARTZELL 4-BLADE 110", START LOCKS, ANTI-ICE
-04	HARTZELL 4-BLADE 110", NO START LOCKS, PLAIN
-05	HARTZELL 4-BLADE 110", NO START LOCKS, DE-ICE
-06	HARTZELL 4-BLADE 110", NO START LOCKS, ANTI-ICE

PARTS LIST								
ITEM	-01	-02	-03	-04	-05	-06	PART NUMBER	DESCRIPTION
1	0	1	0	0	1	0	108053	KIT, AIRFRAME DE-ICE
2	0	0	1	0	0	1	1012332	BRACKET, RING, NOZZLE SLINGER
3	1	1	1	1	1	1	1012333	PLACARD, RPM LIMITS, 4-BLADE 110"
4	1	0	0	0	0	0	E4N10545S	START LOCKS, PLAIN
5	0	1	0	0	0	0	E4N10550S	START LOCKS, DE-ICE
6	0	0	1	0	0	0	E4N10556S	START LOCKS, ANTI-ICE
7	0	0	0	1	0	0	E4N10547S	PLAIN, (NO START LOCKS)
8	0	0	0	0	1	0	E4N10553S	DE-ICE (NO START LOCKS)
9	0	0	0	0	0	1	E4N10559S	ANTI-ICE (NO START LOCKS)

**NOTES:**

- INSTALL HC-E4N-3KT(V)YGC11114(B/K)-2 PROPELLER PER HARTZELL MANUAL 147, 61-00-47, REV. 20 OR LATER
- INSTALL 1012332 PROP NOZZLE BRACKET IN PLACE OF 13125-02 WITH ANTI-ICE INSTALL
- INSTALL 1012333 PLACARD ON INSTRUMENT PANEL NEAR Np INDICATOR
- PROPELLER PIN INCLUDES SPINNER  
108048P SPINNER (REF) FOR PLAIN AND DE-ICE PROP  
107124P SPINNER (REF) FOR ANTI-ICE PROP
- BLADE ANGLES (AT 42 INCH STATION)  
LOW PITCH: 10.3° ± 0.2°  
REVERSE: -14.5° ± 0.5°  
FEATHER: 82.4° ± 0.5°  
START LOCK: -4.1° ± 0.1°
- WEIGHT AND MOMENT ARM OF THE HC-E4N-3KT(V)YGC11114(B/K)-2 PROPELLER IS 137 LB AT 27.8 INCHES (THIS INCLUDES SPINNER 6 LB, DE-ICE 2 LB, AND START LOCKS 1 LB)  
IF REPLACING A HARTZELL HC-B3M-3M10083, EXCHANGE WEIGHT IS -10 LB AT 27.8 INCHES  
IF REPLACING A HARTZELL HC-B3TN-3AF(Y)T10890CN(B/K)-2, EXCHANGE WEIGHT IS -22 LB AT 27.8 INCHES  
IF REPLACING A MCCAULEY 30FR34C7031/1056A-0, EXCHANGE WEIGHT IS +8 LB AT 27.8 INCHES  
IF REPLACING A MCCAULEY 4HFR34C778/102BHA-0, EXCHANGE WEIGHT IS -17 LB AT 27.8 INCHES
- WITH PT6A-114A ENGINE ADJUST LOW IDLE Ng 56.5% TO 58.5% (Np 1050 RPM MIN)
- WITH PT6A-140 ENGINE ADJUST LOW IDLE Ng 56.0% TO 57.5% (Np 1050 RPM MIN)  
POSITION BETA CABLE ONE HOLE BELOW CENTER ON REVERSING CAM (AS REQ'D FOR REVERSE PICKUP)
- THIS MODIFICATION IS COMPATIBLE WITH STC SA149CH AND STC SA02546LA
- THIS MODIFICATION IS COMPATIBLE WITH THE AIRCRAFT ON FLOATS OR WHEELS

MATERIAL: SEE PART LIST		FINISH: NONE		<b>WIPAIRE, INC.</b> 1700 HENRY AVE. SOUTH ST. PAUL, MN 55075 (651) 451-1205 TITLE: INSTALLATION, HARTZELL 4-BLADE (110"), CESSNA 208/208B	
BREATHER: NONE		TOLERANCES: X±.05 XX±.015 XXX±.005 X±.5			
BREATHER: NONE		THIRD ANGLE PROJECTION		SIZE: C	SCALE: 1:1
BREATHER: NONE		BREATHER: NONE		PART NO. 1012329	
BREATHER: NONE		BREATHER: NONE		REV A	

Pay particular attention of notes shown on LH side of drawing



# HC-E4N-3KTV(Y)/GC11114(B/K)-2 PROPELLER

KIT CONFIGURATION LIST	
DASH NO.	DESCRIPTION
-01	HARTZELL 4-BLADE 110", START LOCKS, PLAIN
-02	HARTZELL 4-BLADE 110", START LOCKS, DE-ICE
-03	HARTZELL 4-BLADE 110", START LOCKS, ANTI-ICE
-04	HARTZELL 4-BLADE 110", NO START LOCKS, PLAIN
-05	HARTZELL 4-BLADE 110", NO START LOCKS, DE-ICE
-06	HARTZELL 4-BLADE 110", NO START LOCKS, ANTI-ICE

KIT PN
1012329
1012329
1012329
1012329
1012329
1012329

## WIPAIRE KIT BILLS OF MATERIALS

- **1012329-01**
  - 1012333 Placard, Caravan, RPM Limits, Hartzell 4-Blade
  - E4N10545S Prop, Hartzell, Yukon, Four Blade Carbon Composite For Cessna Caravan, No Ice Protection, Includes Pitch Locks
- **1012329-02**
  - 108053 Kit, Airframe De-ice
  - 1012333 Placard, Caravan, RPM Limits, Hartzell 4-Blade
  - E4N10550S Yukon, Four Blade Carbon Composite For Cessna Caravan, Electrically Heated De-Ice Protection, Includes Pitch Locks
- **1012329-03**
  - 1012332 Bracket, TKS, Nozzle
  - 1012333 Placard, Caravan, RPM Limits, Hartzell 4-Blade
  - E4N10556S Prop, Hartzell, Yukon, Four Blade Carbon Composite For Cessna Caravan, TKS Anti-Ice Protection, Includes Pitch Locks
- **1012329-04**
  - 1012333 Placard, Caravan, RPM Limits, Hartzell 4-Blade
  - E4N10547S Prop, Hartzell, Yukon, Four Blade Carbon Composite For Cessna Caravan, No Ice Protection, No Pitch Locks
- **1012329-05**
  - 108053 Kit, Airframe De-ice
  - 1012333 Placard, Caravan, RPM Limits, Hartzell 4-Blade
  - E4N10553S Prop, Hartzell, Yukon, Four Blade Carbon Composite For Cessna Caravan, Electrically Heated De-Ice Protection, No Pitch Locks
- **1012329-06**
  - 1012332 Bracket, TKS, Nozzle
  - 1012333 Placard, Caravan, RPM Limits, Hartzell 4-Blade
  - E4N10559S Prop, Hartzell, Yukon, Four Blade Carbon Composite For Cessna Caravan, TKS Anti-Ice Protection, No Pitch Locks





# ORIGINAL PROPELLER REMOVAL

REFERENCE **208 MAINTENANCE MANUAL 61-11-00** FOR MCCAULEY PROPELLER REMOVAL.

REFERENCE **208 MAINTENANCE MANUAL 61-10-00** FOR HARTZELL PROPELLER REMOVAL

Safely secure the prop to be removed with a forklift or hoist in position as shown.

Remove existing propeller using **208 Maintenance Manual, Chapter 61** as applicable

Clean up all spilled oil, search for FOD and overall condition of the area after old prop is removed.

**IMPORTANT**-Record removed propeller total times (TSN, TSO, etc..) and enter into appropriate logbook. Retain this logbook with removed propeller.

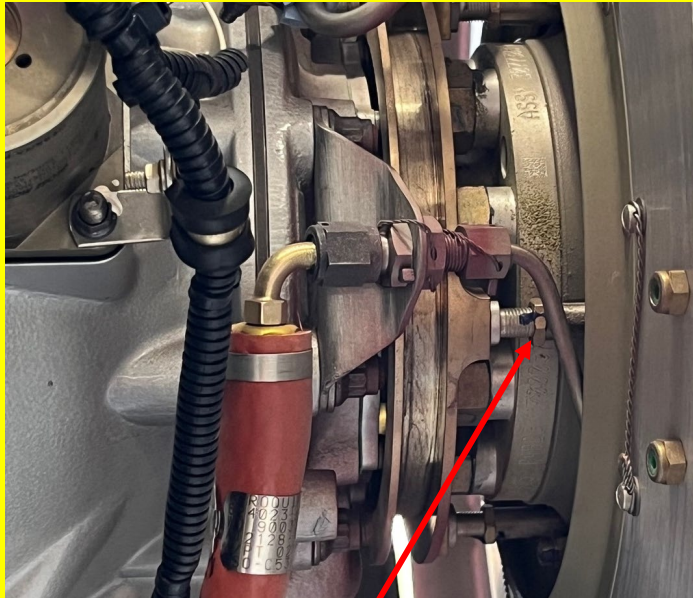
**Note:** Reference below for wrench adapters for each application



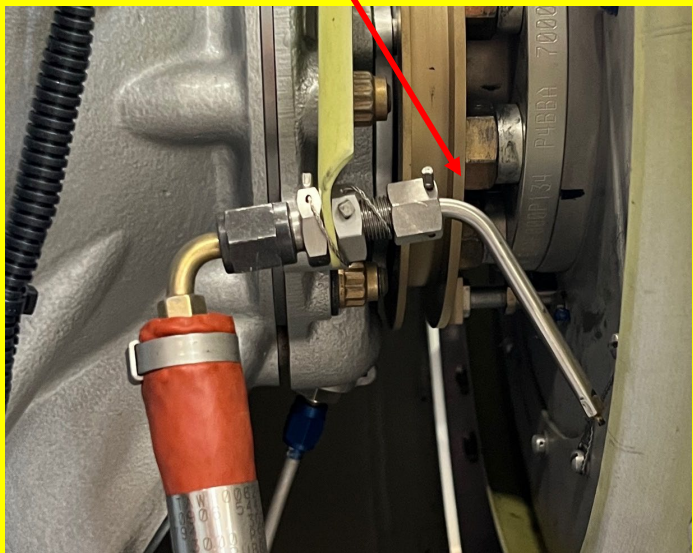
- AST 2877 Hartzell

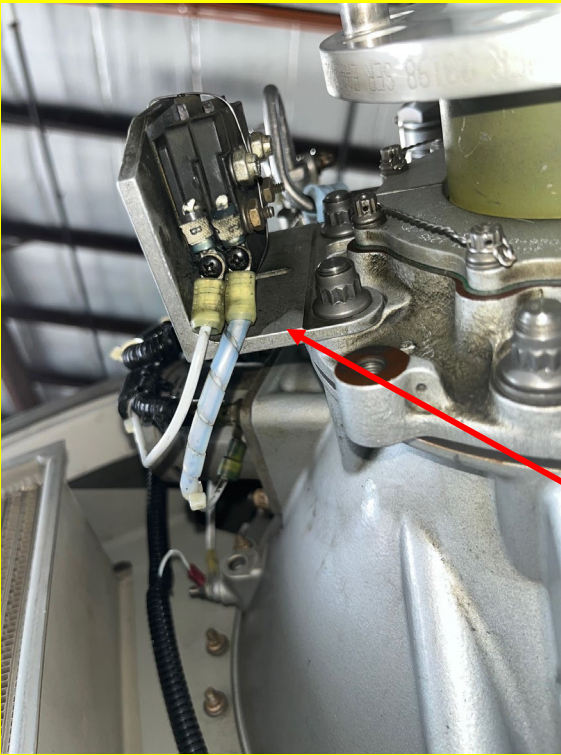


- B-5588 McCauley

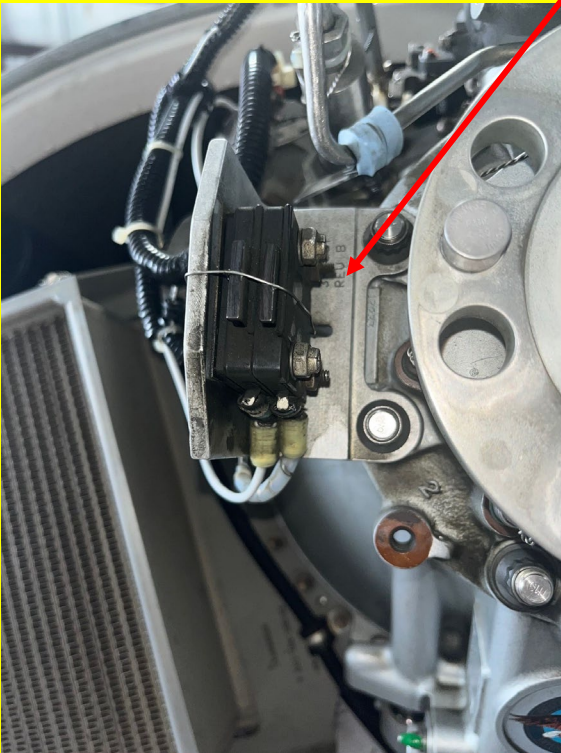


**TKS EQUIPPED AIRCRAFT MUST LOOSEN OR REMOVE TKS NOZZLE TO PREVENT DAMAGE DURING PROPELLER REMOVAL**





- DEICE (ELECTRIC BOOT) EQUIPPED PROPS MAY BENEFIT FROM DEICE BRUSH BLOCK BRACKET REMOVAL PRIOR TO REMOVAL OF THE PROPELLER FOR EASE OF ACCESSING PROP FLANGE NUTS.



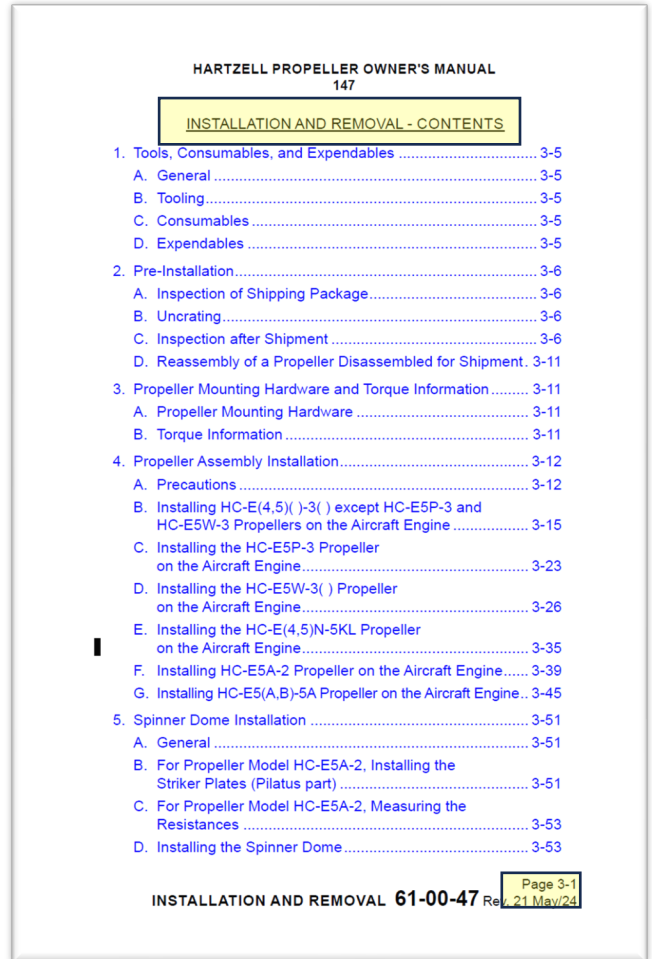
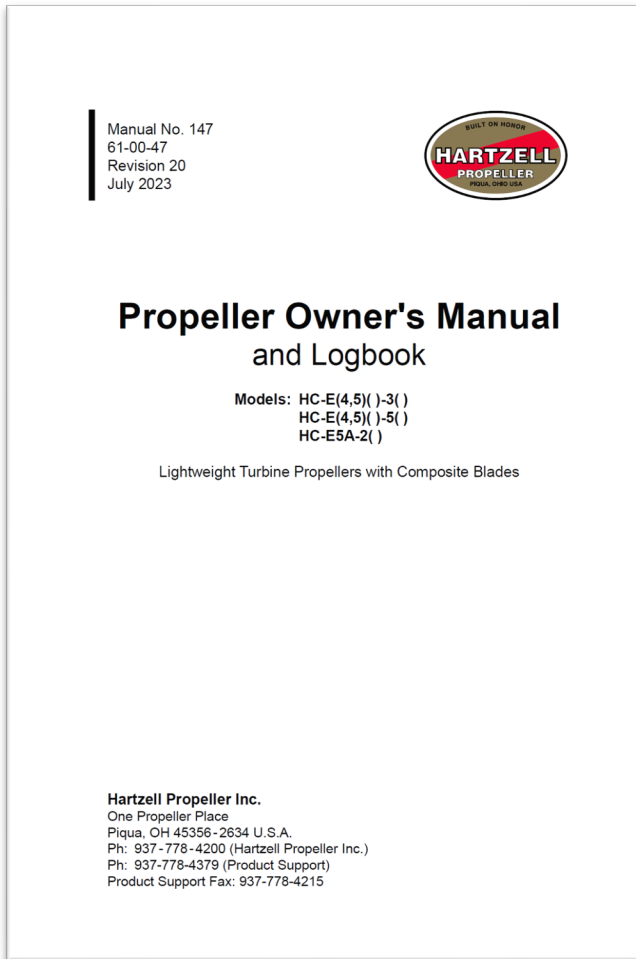
# YUKON PROPELLER INSTALLATION

PROPELLER INSTALLATION SHALL BE PERFORMED USING HARTZELL, CESSNA, AND APPLICABLE PRATT AND WHITNEY DATA.

WIPAIRE HAS CHOSEN TO PROVIDE TIPS ON KEY POINTS TO WATCH OUT FOR DURING PROPELLER MOUNTING TO ENGINE, CITING MANUFACTURERS DATA ALONG THE WAY.

APPLICABLE TECHNICAL DATA  
\*\*AVAILABLE AT [WWW.HARTZELLPROP.COM](http://WWW.HARTZELLPROP.COM)

## -PROPELLER OWNERS MANUAL 147 SECTION 3 INSTALLATION AND REMOVAL PROCEDURES



CURRENT REVISIONS AVAILABLE AT  
[WWW.HARTZELLPROP.COM](http://WWW.HARTZELLPROP.COM)

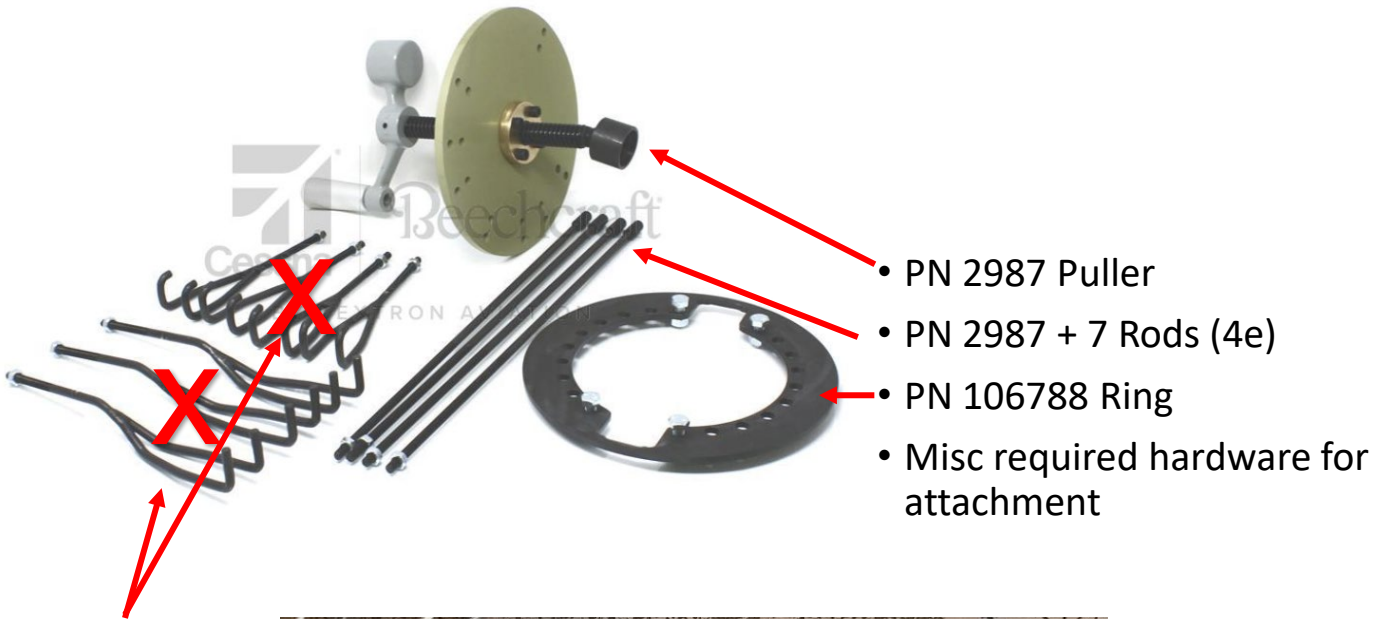


The YUKON propeller will consist of a KIT containing the propeller that was ordered to your configuration (plain, deice, anti ice, start locks, etc..) and a spinner dome and spinner bulkhead, spacers, and attach hardware as a single part number, boxes 1 of 2 and 2 of 2. Optional small items may be associated with your installation such as airframe deice kit, TKS bracket, etc... Verify all paperwork serial numbers match the actual propeller that was shipped.





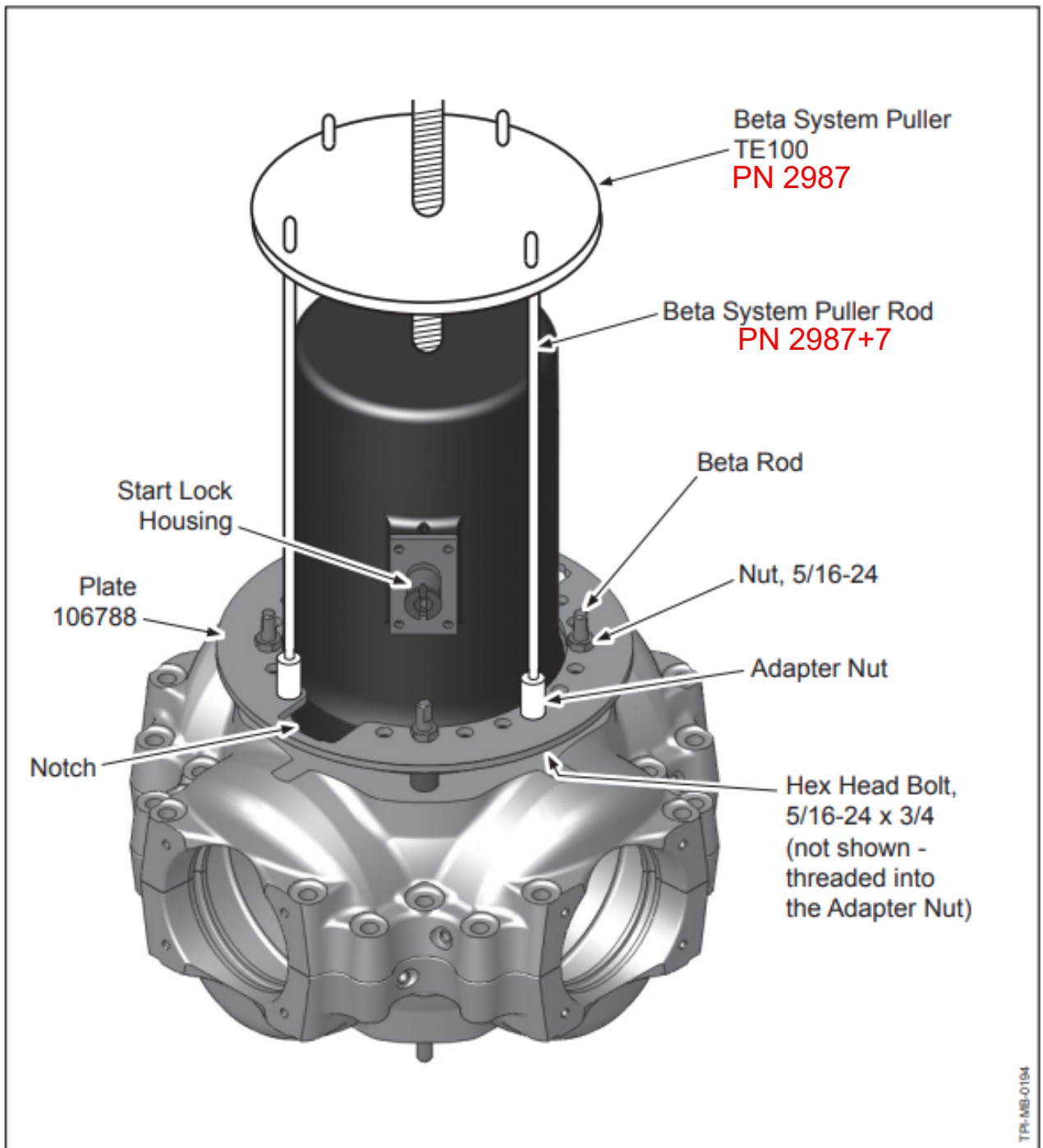
Using the CST-2987 Beta Ring decompression tool, configure the puller as shown below.



• Not used



# BETA RING PULLER PN CST-2987



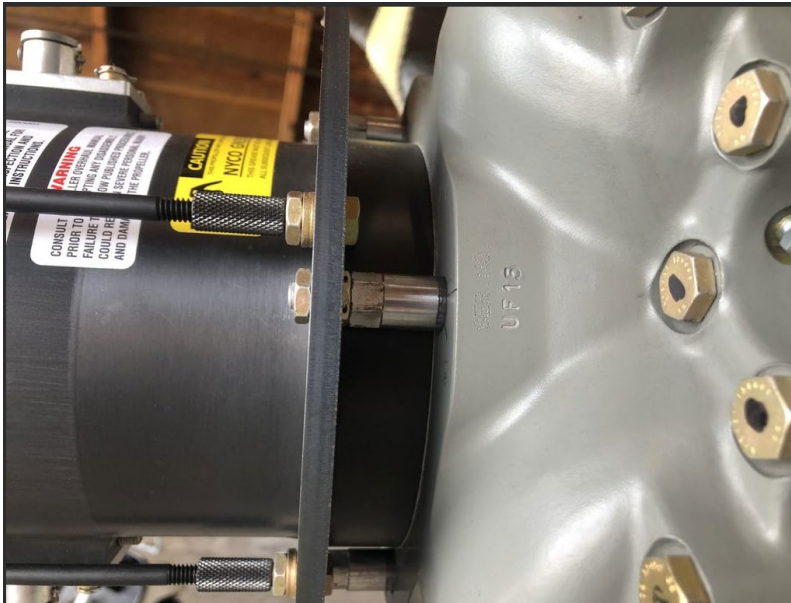
Using the Plate Kit 106804  
Figure 1

TP-MB-0194

Install Beta Ring decompressing tool to propeller utilizing plate PN 106788 and related misc hardware as shown.



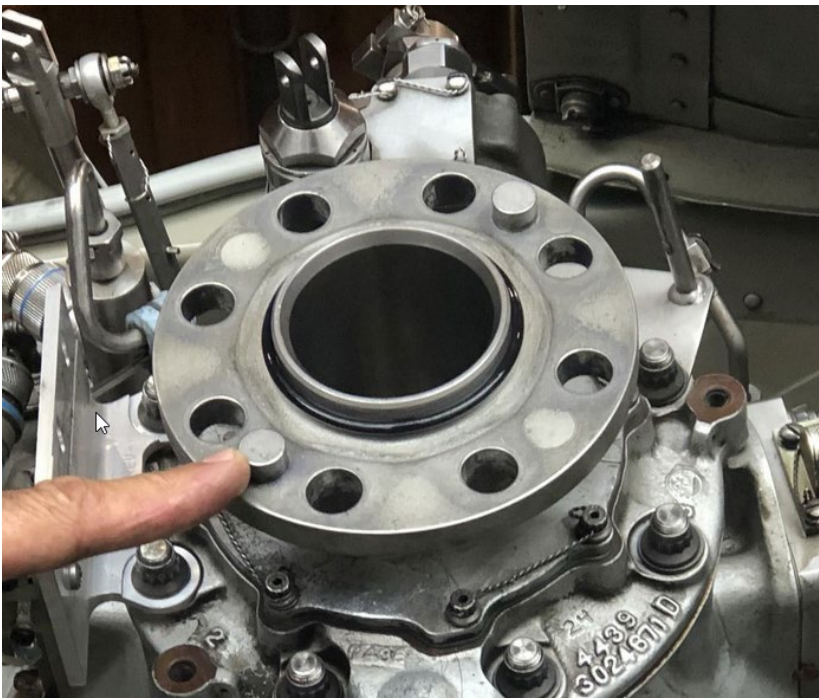
- Install NAS1149F0963P (AN960-916) washer between beta ring and prop as shown to provide stability to swivel.





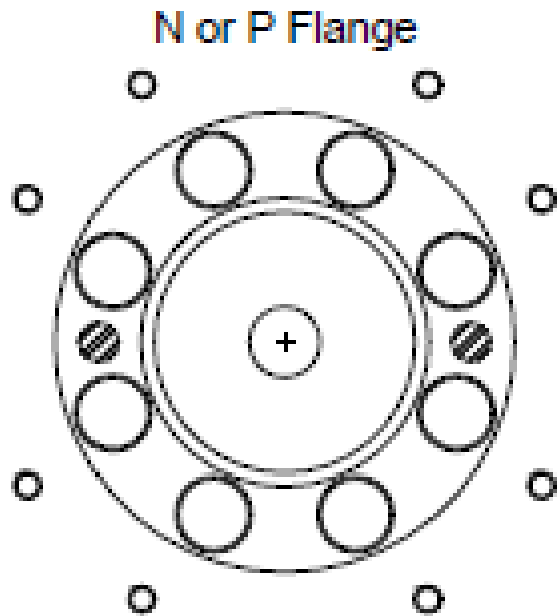
Install new prop flange O ring seal, this will be in your new prop kit.



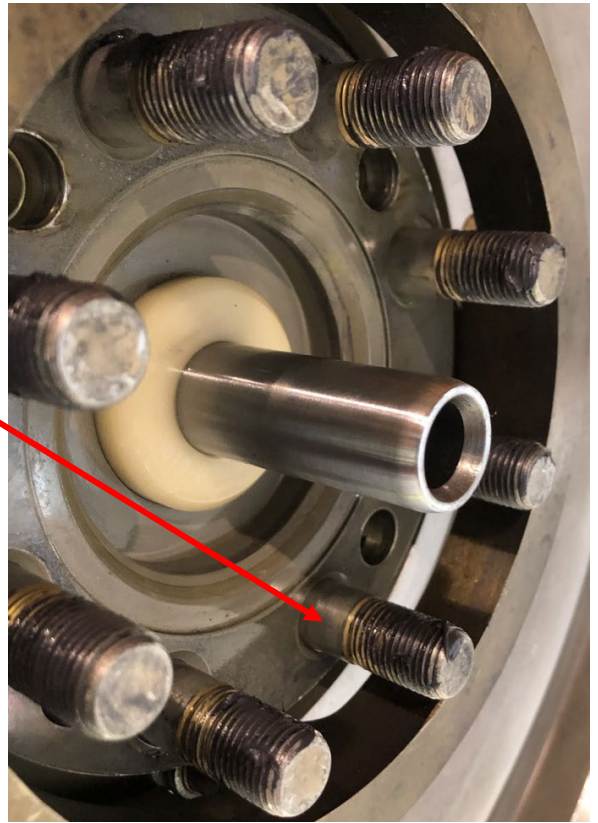


Important! Locate the orientation of the propeller pins on the prop shaft.

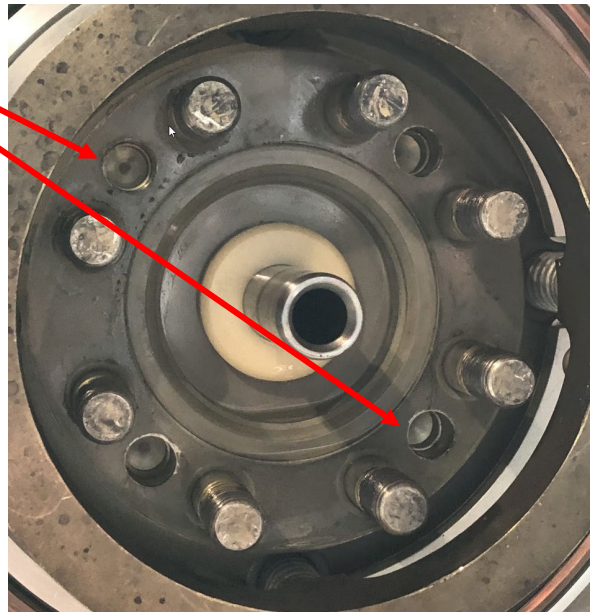
The PT6 on this installation utilizes the **N flange** as referenced in Hartzell Owners Manual 147, Figure 3-5



Apply Hartzell provided anti-seize compound PN A-3338 to threaded studs on prop. This is typically provided with your new propeller.



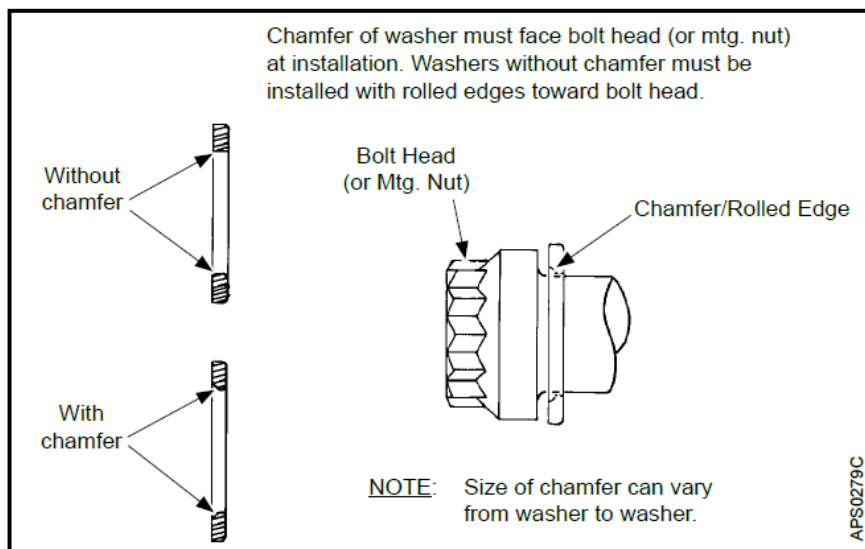
Align the Yukon prop in the correct orientation to the prop shaft dowell pins



Make note of washer, nut, and O ring reference as noted in Hartzell Owners Manual 147, Chapter 3, Figure and Table 3-1 as referenced below. Orientate washers accordingly

**HARTZELL PROPELLER OWNER'S MANUAL**

147



**Mounting Bolt/Nut and Washer**  
**Figure 3-1**

Flange	O-ring	Bolt/Stud	Washer	Nut	Misc
A - except E5A-2	C-3317-239-2	B-3347	A-2048-2	n/a	n/a
E5A-2	C-3317-239-2	B-7435	A-2048-2	C-6006	n/a
B	C-3317-239-2	B-3347	A-2048-2	n/a	n/a
N - except E(4,5)N-5KL and E4N-3KTV(Y)	C-3317-230	B-3339-1	A-2048-2	n/a	n/a
E(4,5)N-5KL and E4N-3KTV(Y)	C-3317-230	103560	A-2048-2	C-6006	n/a
P - except E5P-3	C-3317-230	B-3347	A-2048-2	n/a	n/a
E5P-3	C-3317-230	103560	A-2048-2	C-6006	n/a
E5W-3 - except E5W-3Y	C-3317-230	104720	B-7624	C-6006	106943 Spacer B-3868-S60 Screw
E5W-3Y	C-3317-230	104720	B-7624	C-7458	106943 Spacer B-3868-S60 Screw

**Propeller/Engine Flange O-rings and Mounting Hardware**  
**Table 3-1**



Torque per the installation instructions found in Hartzell Owners Manual 147, Section 3, Table 3-2 utilizing torque adapter PN AST-2877-3. Torque per sequence found in Figure 3-3.

HARTZELL PROPELLER OWNER'S MANUAL  
147

**CAUTION 1:** FOR A PROPELLER THAT DOES NOT USE A LUBRICATED (WET) TORQUE, THE MOUNTING HARDWARE MUST BE CLEAN AND DRY TO PREVENT EXCESSIVE PRELOAD OF THE MOUNTING FLANGE.

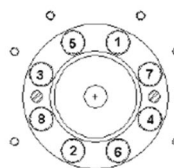
**CAUTION 2:** TORQUE VALUES WITH "WET" NOTED AFTER THEM ARE BASED ON LUBRICATED THREADS WITH APPROVED ANTI-SEIZE COMPOUND MIL-PRF-83483( ).

**CAUTION 3:** REFER TO FIGURE 3-2 FOR TORQUE READING WHEN USING A TORQUE WRENCH ADAPTER.

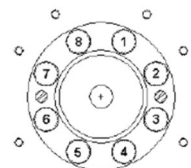
A flange propeller mounting bolts (except ESA-2)	100-105 Ft-Lbs (136-142 N*m) Wet
E5A-2 flange propeller mounting nuts	120-130 Ft-Lbs (163-176 N*m) Wet
B flange propeller mounting bolts	100-105 Ft-Lbs (136-142 N*m) Wet
N flange propeller mounting bolts except HC-E(4,5)N-(3,5)K(L) and HC-E4N-3K(T)(V)(Y)	100-105 Ft-Lbs (136-142 N*m) Wet
N flange propeller mounting nuts HC-E(4,5)N-(3,5)K(L) and HC-E4N-3K(T)(V)(Y)	120-130 Ft-Lbs (163-176 N*m) Wet
P flange propeller mounting bolts except HC-ESP-3	100-105 Ft-Lbs (136-142 N*m) Wet
HC-ESP-3 propeller mounting nuts	120-130 Ft-Lbs (163-176 N*m) Wet
W flange propeller mounting nuts	120-125 Ft-Lbs (163-170 N*m)
Adapter Plate to Hub bolts -B-3384-4H	8-10 Ft-Lbs (10.8-13.5 N*m)
Slip Ring and adapter Plate Unit to Hub screws - A-2070-7	8-10 Ft-Lbs (10.8-13.5 N*m)
Bulkhead to Adapter Plate screws -B-3867-269	8-10 In-Lbs (0.9-1.1 N*m)
Pulley to Adapter Ring - Pilatus fastener	48 In-Lbs (5.4 N*m)
Balance weight screws or bolts- Aircraft quality #10-32 or AN-3( )	30-36 In-Lbs (3.4-4.0 N*m)

Torque Table  
Table 3-2

N, P or W Flange



SEQUENCE A



SEQUENCE B

Use Sequence A for steps one and two.

Use Sequence B for step three.

**Step 1** - Torque all bolts/nuts to 40 Ft-Lbs (54 N\*m).

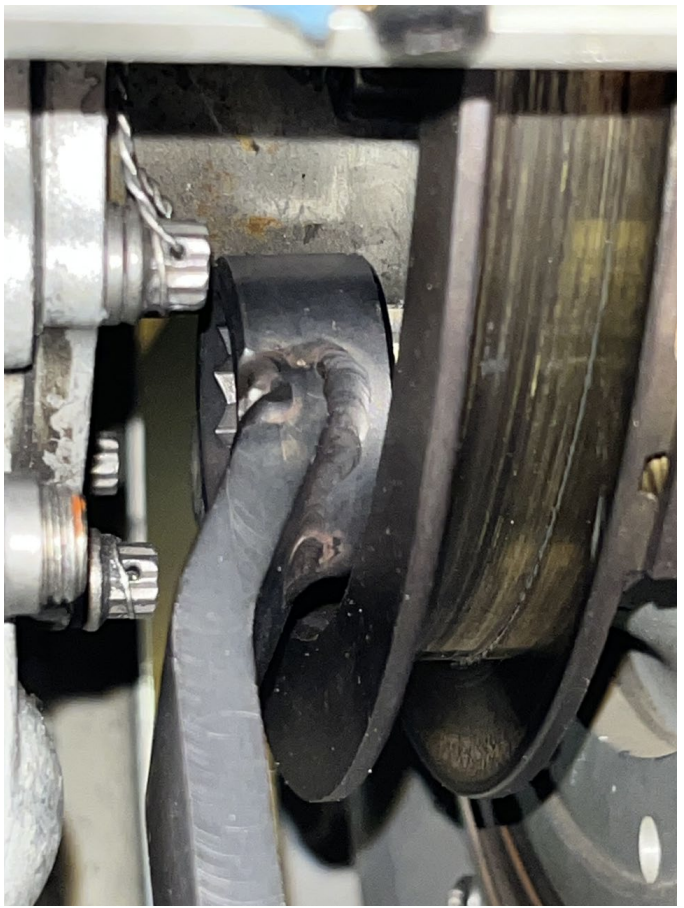
**Step 3** - Torque all bolts/nuts

**Step 2** - Torque all bolts/nuts to 80 Ft-Lbs (108 N\*m).

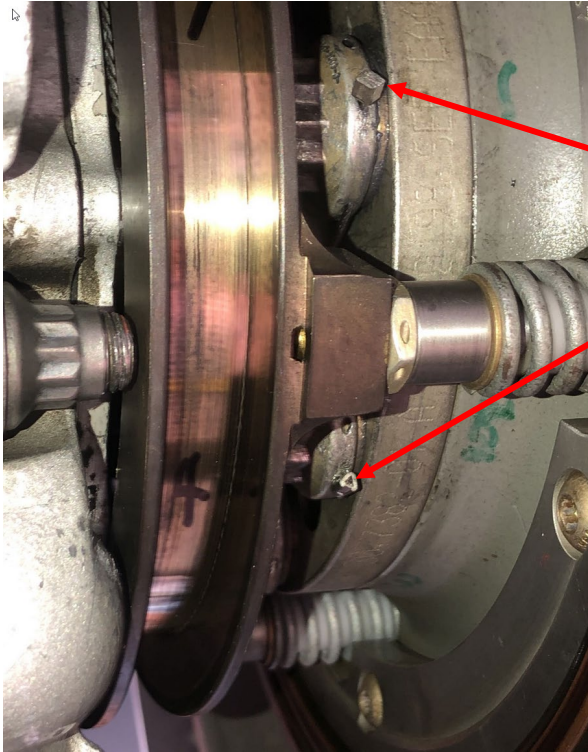
to Table 3-2.

Torquing Sequence for Propeller Mounting Bolts/Nuts  
Figure 3-3

WIPAC  
WIPAC  
WIPAC

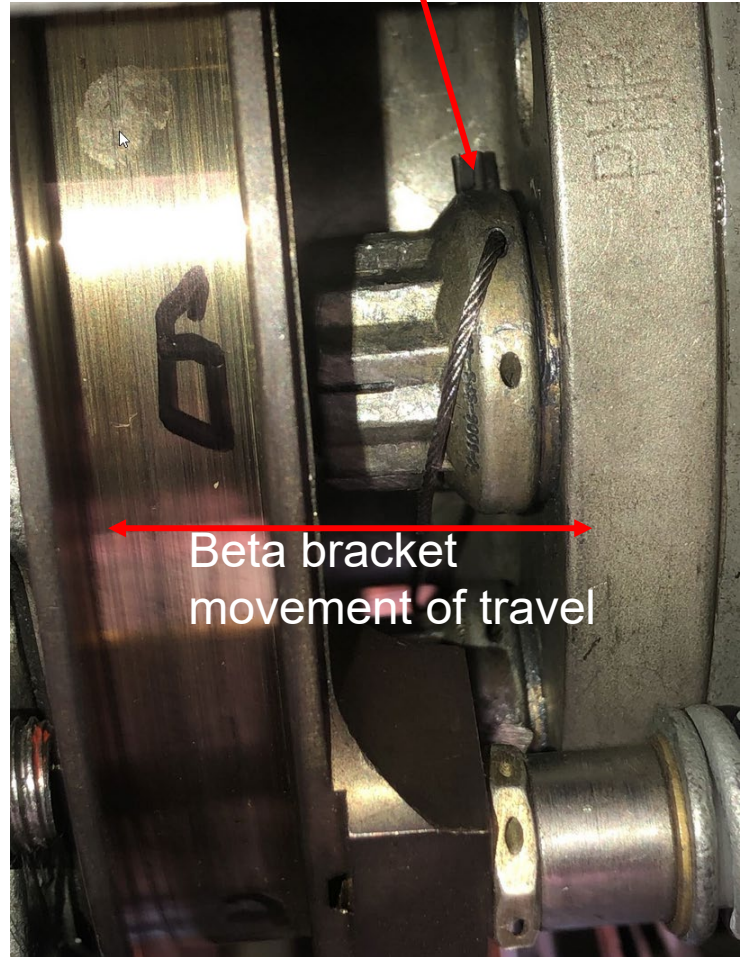


Safety wire or Safe-T-Cable to secure prop nuts after torque sequences. Do not allow pig tails or cable crimps to protrude outwards. This may result in undesirable contact with the beta bracket as it moves forward and aft. **Note: Highly recommended to use Safe-T-Cable over safety wire**



Incorrect

Correct



Beta bracket  
movement of travel

**CAUTION:** THE BETA FEEDBACK COLLAR MUST NOT CONTACT ANY ENGINE COMPONENT OR MOUNTING BOLT SAFETY WIRE. THE BETA FEEDBACK MECHANISM COULD BE DAMAGED IF IT CONTACTED ANY STATIC ENGINE COMPONENT WHILE ROTATING.

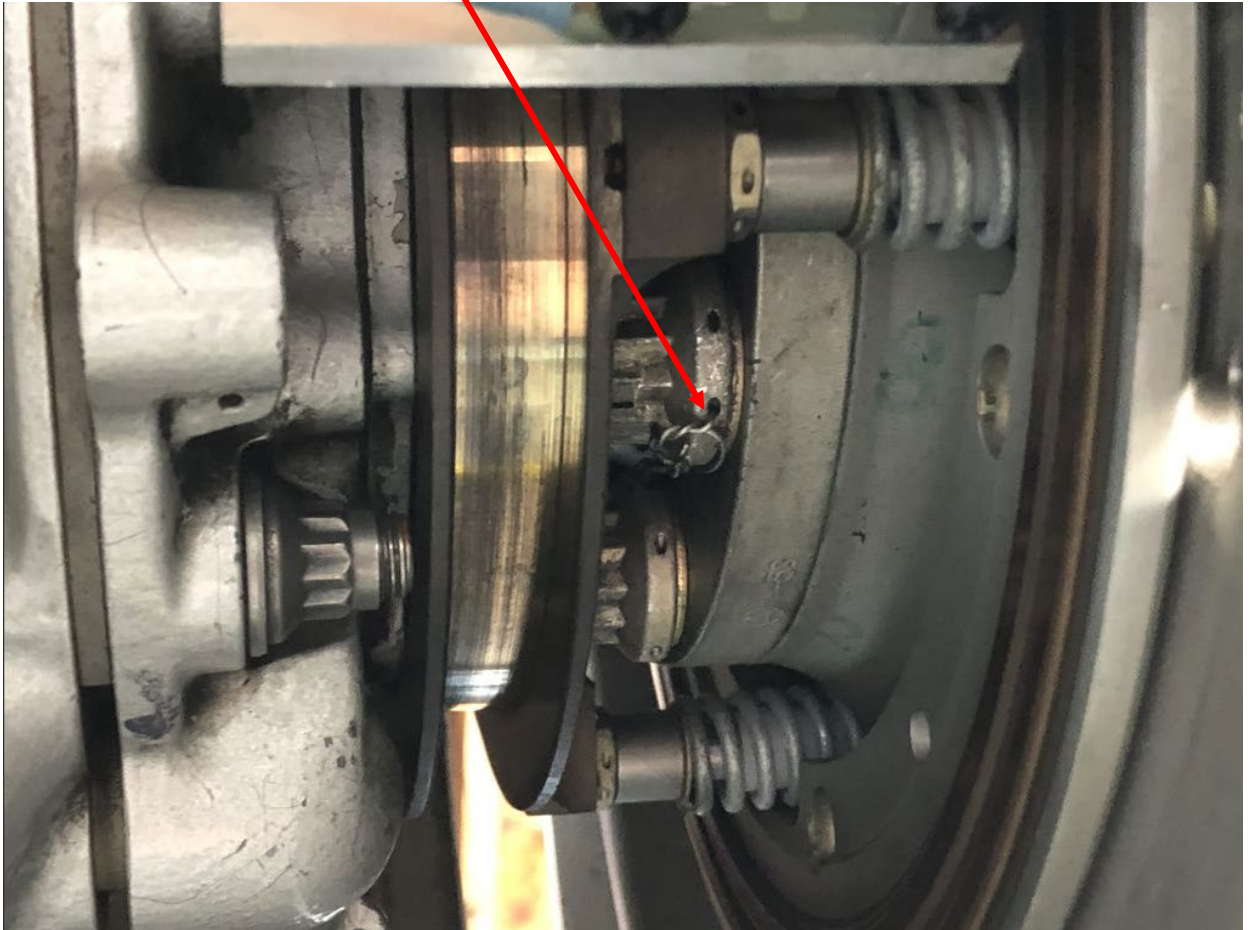
SUGGESTED SAFETY CABLE TOOL  
[WWW.DMCTOOLS.COM](http://WWW.DMCTOOLS.COM)



- (8) Safety all propeller mounting nuts with 0.032 inch (0.81 mm) minimum diameter stainless steel wire or equivalent aircraft safety cable, two nuts for each safety.

Important-While you CAN use safety wire, it will be very difficult to access the nuts adequately and wire cleanly, let alone keep the wire away from beta ring.

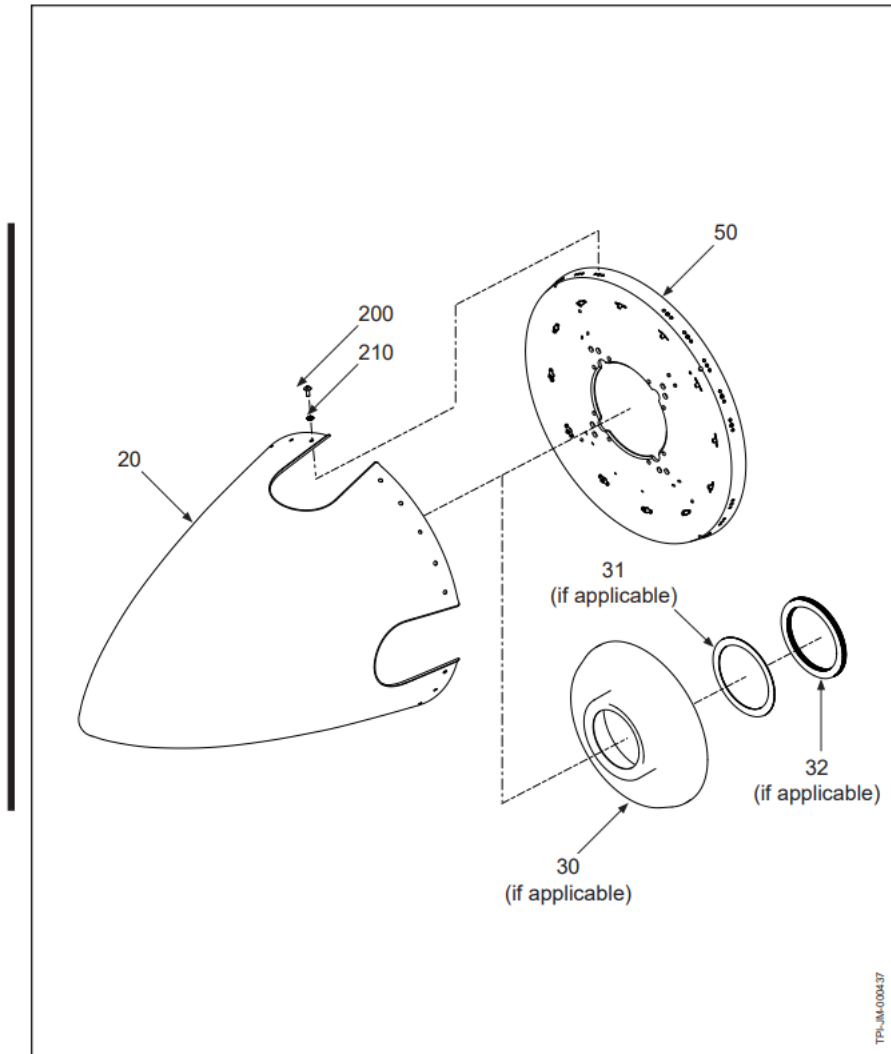
Extremely  
tight area



# SPINNER DOME INSTALLATION

# REFERENCE HARTZELL SPINNER PARTS BREAKDOWN PER HARTZELL MANUAL 127, **REV 26 OR LATER**

HARTZELL METAL SPINNER MAINTENANCE MANUAL  
127



Example of a Four-Bladed Propeller Spinner -  
One-piece Dome without Filler Plates  
Figure 10.4-3

ILLUSTRATED PARTS LIST **61-16-27**

Page 10.4-4  
Rev. 23 Feb/24

TPN-JM-00437

# REFERENCE HARTZELL SPINNER PARTS BREAKDOWN PER HARTZELL MANUAL 127, **REV 26 OR LATER**

## TKS CONFIGURATION

<b>10.4-3</b>				
-10	107124(P)	<b>SPINNER ASSEMBLY</b>		
20	107196(P)	• DOME	1	
30	C-5324	• FORWARD BULKHEAD	1	
31	B-632	• SHIM, SPINNER	15	
50	107123(P)	• BULKHEAD UNIT (INCLUDES BONDED BULKHEAD RING, SLINGER RING, AND FITTING)	1	
-59	B-3846-3	• • NUTPLATE, FIXED	16	
-61	B-3849-3	• • NUTPLATE, FLOATING	16	
-62	B-3847-5	• • RIVET, 100° HEAD, .094 DIA, AL	64	
-230	B-3384-4H	• • BOLT, 1/4-28, HEX HEAD	8	Y
-255	B-3837-0432	• • WASHER, CORROSION RESISTANT	8	Y
200	B-3845-8	• SCREW, 10-32, TRUSS HEAD (DOME-TO-BULKHEAD)	20	Y
210	A-1020	• WASHER, FIBER	20	Y

## DEICE AND PLAIN CONFIGURATION

<b>10.4-3</b>				
-10	108048(P)	<b>SPINNER ASSEMBLY</b>		
20	107196(P)	• DOME	1	
30	C-5324	• FORWARD BULKHEAD	1	
31	B-632	• SHIM, SPINNER	15	
50	108049(P)	• BULKHEAD UNIT	1	
-59	B-3846-3	• • NUTPLATE, FIXED	16	
-61	B-3849-3	• • NUTPLATE, FLOATING	16	
-62	B-3847-5	• • RIVET, 100° HEAD, .094 DIA, AL	64	
200	B-3845-8	• SCREW, 10-32, TRUSS HEAD (DOME-TO-BULKHEAD)	20	Y
210	A-1020	• WASHER, FIBER	20	Y



# INSTALLATION OF SPINNER DOME IS PERFORMED PER HARTZELL OWNERS 143, SECTION 3, PAR 5 AS SHOWN BELOW

HARTZELL PROPELLER OWNER'S MANUAL  
147

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5. Spinner Dome Installation

**CAUTION 1:** TO PREVENT DAMAGE TO THE BLADE AND BLADE PAINT, WRAP THE BLADE SHANKS IN SEVERAL LAYERS OF MASKING OR DUCT TAPE BEFORE INSTALLING THE SPINNER DOME. REMOVE THE TAPE AFTER THE SPINNER IS INSTALLED.

**CAUTION 2:** SPINNER DOME WILL WOBBLE IF NOT ALIGNED PROPERLY. THIS MAY AFFECT DYNAMIC BALANCE OF PROPELLER.

A. General

- (1) The following instructions relate to Hartzell Propeller spinners only.
  - (a) In some cases, the airframe manufacturer produced the spinner assembly. Refer to the airframe manufacturer's manual for spinner dome installation instructions.

B. For Propeller Model HC-E5A-2, Installing the Striker Plates (Pilatus part). Refer to Figure 3-15.

- (1) The striker plates must have a curvature to match that of the dome and must have a weight of not more than 0.458 ounces (13 grams).
- (2) Using screws, part number B-3867-272, install the striker plates centered between the blades, using the mounting holes provided.

**NOTE:** Washers, part number B-3860-10L, are not used at the striker plate attachment points.



Installation of the FWD spinner bulkhead PN C-5324 onto hub as shown below may require Hartzell Propeller Tape PN B-6654-100 to be installed as shim material for shimming radially (side to side)

There is an optional use of this same tape between bulkhead and spinner dome as noted in Par D and Figure 3-18 shown below.



HARTZELL PROPELLER OWNER'S MANUAL  
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- C. For Propeller Model HC-E5A-2, Measuring the Resistances
- (1) Using an ohm meter capable of accurately measuring the required resistance in accordance with Table 3-3, measure the resistance from the hub clamping bolt to a spinner dome mounting nutplate on the bulkhead. Refer to Figure 3-16.
  - (2) Before installation of the dome unit, measure the resistance of the dome unit in accordance with the section, "Resistance Check of the Dome" in the Finish Procedures chapter of Hartzell Propeller Composite Spinner Maintenance Manual 148 (61-16-48) that is available on the Hartzell Propeller website at [www.hartzellprop.com](http://www.hartzellprop.com).

**NOTE:** The dome is not installed on the bulkhead.

D. Installing the Spinner Dome

- (1) The spinner dome is supported by a forward bulkhead unit that encircles the propeller cylinder. Refer to Figure 3-14.

- (2) For propellers in this manual other than the HC-E5A-2 and HC-E4P-5, if the forward bulkhead unit does not fit snugly on the cylinder, the cylinder may need to be wrapped with one or more layers of fluoroglas or UHMW tape (Hartzell Propeller P/N B-6654-100).

- (a) Apply a layer of tape, examine, and repeat until the forward bulkhead unit fits snugly on the cylinder.

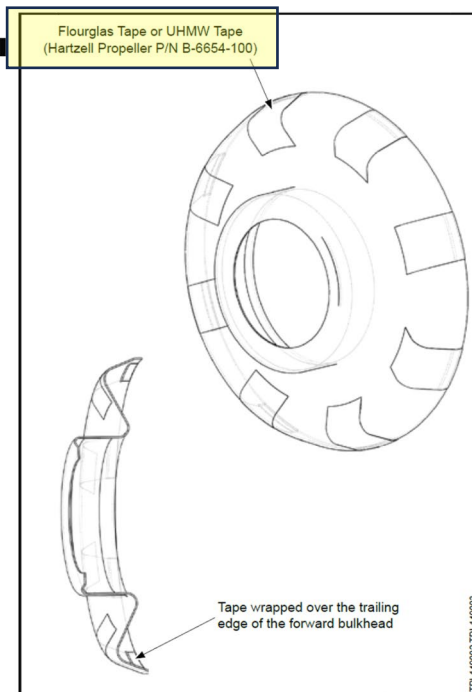
- 1 Using spacers, move the forward bulkhead unit away from the cylinder to cause the spinner dome mounting holes to stop short of full alignment with the bulkhead holes by 25% of the spinner dome mounting hole diameter. Refer to Figure 3-17.

Area to Check	Value
Hub Clamping Bolt to the Spinner Dome Mounting Nutplate	2 ohms Maximum

Resistance Checks  
Table 3-3

INSTALLATION AND REMOVAL 61-00-47 Page 3-53  
Rev. 21 May/24

HARTZELL PROPELLER OWNER'S MANUAL  
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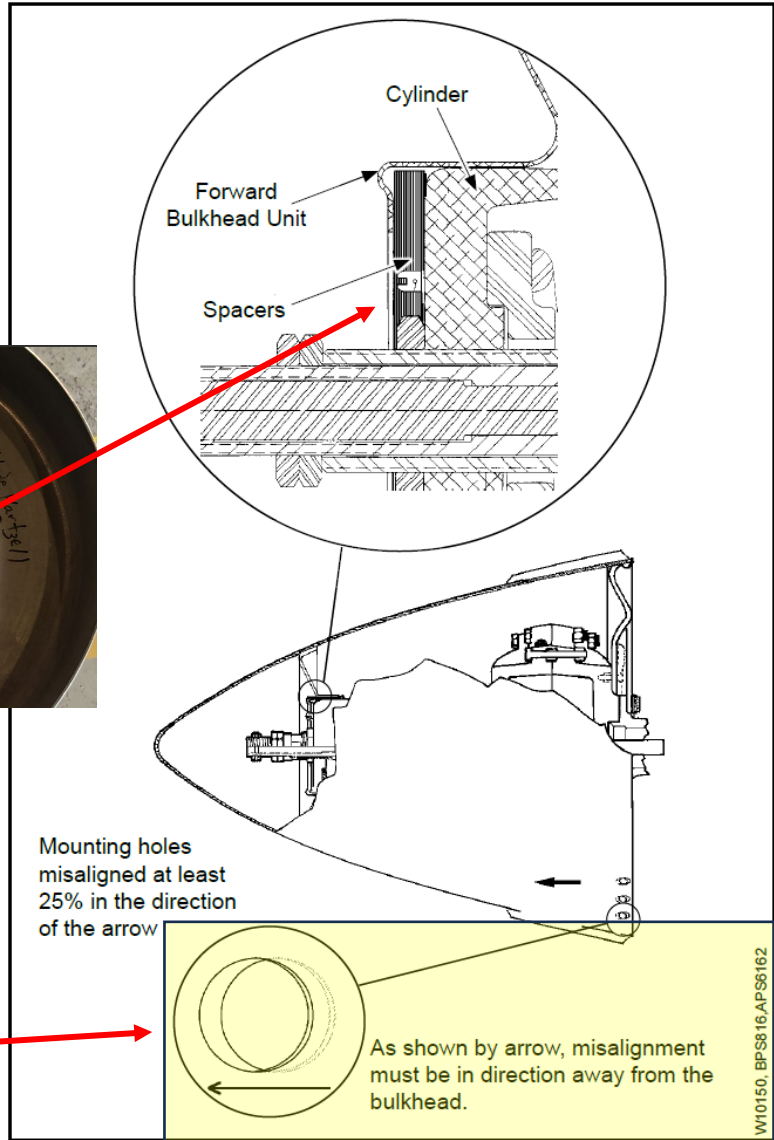
Optional Tape on the Forward Bulkhead  
Figure 3-18

INSTALLATION AND REMOVAL 61-00-47 Page 3-54  
Rev. 21 May/24

You are trying to achieve a fitment using supplied spacers with spinner to backplate hole misalignment as shown in Figure 3-17 Below.



HARTZELL PROPELLER OWNER'S MANUAL  
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REF  
NEXT  
SLIDE

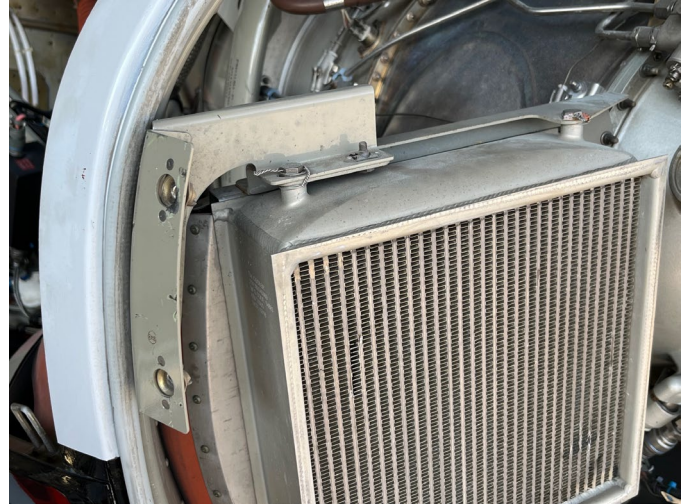
Spinner Reassembly Procedures  
Figure 3-17

Gently and evenly install the spinner. Once holes are aligned start with the center holes first in all four spinner quadrants.



Once these center four screws are installed, work outward on the remaining 4 screws.

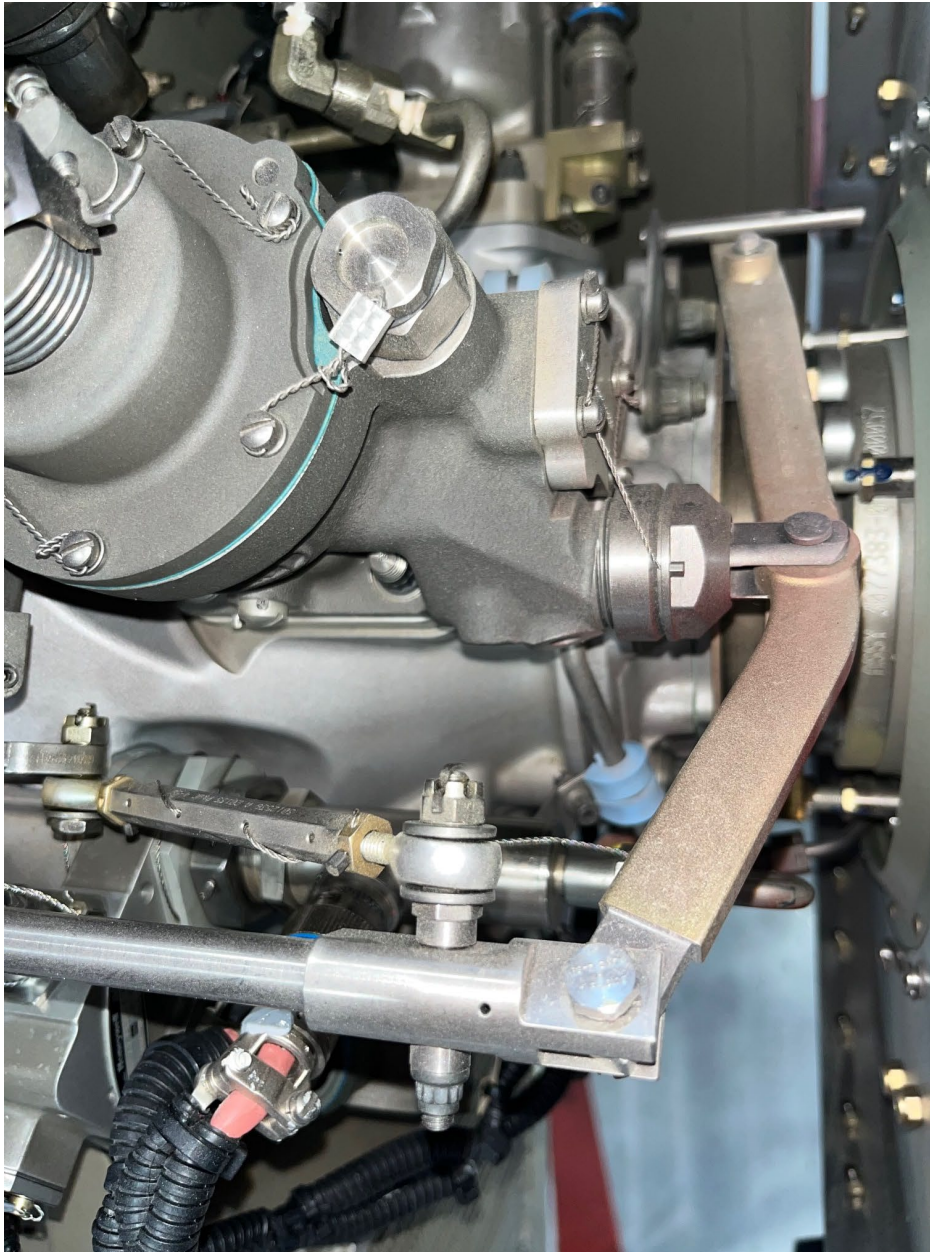
**NOTE:** There may be slight spinner to nose cowl clearance issues. You may have to adjust the RH nose cowl bracket at this location to achieve sufficient space needed for clearance. You may also have to elongate holes slightly and reposition bracket if more clearance is needed. In the photo below, note the tightest area is typically just above oil cooler opening on RH cowl half



## BETA FEEDBACK ARM

Installation of the reversing linkage arm is accomplished using **3 different data sources**.

1. Hartzell Owners Manual 147, Section 3 and Figure 3-7 for fitment of the block into the beta ring and ONTO the arm
2. Cessna Maintenance Manual 60-10-00 and 61-20-00
3. Pratt and Whitney Maintenance and Parts manual for applicable engine configuration (-114A or -140) Chapter 76 ENGINE CONTROLS



1. Hartzell Owners Manual 147, Section 3 and Figure 3-7 for fitment of the block into the beta ring and ONTO the arm

HARTZELL PROPELLER OWNER'S MANUAL  
147

- (11) Safety all mounting bolts with 0.032 inch (0.81 mm) minimum diameter stainless steel wire or equivalent aircraft safety cable. (Two bolts per safety.)
- (12) Decompress the external beta system and remove the beta ring puller TE100.

**CAUTION:** THE BETA RING MUST NOT CONTACT ANY ENGINE COMPONENT OR MOUNTING BOLT SAFETY WIRE. THE BETA MECHANISM FEEDBACK COULD BE DAMAGED IF IT CONTACTED ANY STATIC ENGINE COMPONENT WHILE ROTATING.

- (13) Examine the beta ring to make sure that it is not in contact with any engine components or mounting bolt safety wire.

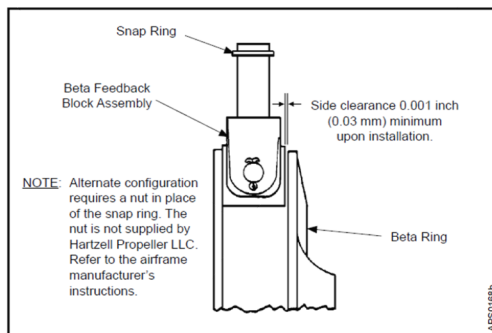
(a) If there is contact between the beta ring and any engine components or mounting bolt safety wire, consult a certified propeller repair station with the appropriate rating.

- (14) Install the beta feedback block assembly into the beta linkage lever, in accordance with the airframe manufacturer's instructions, if applicable.

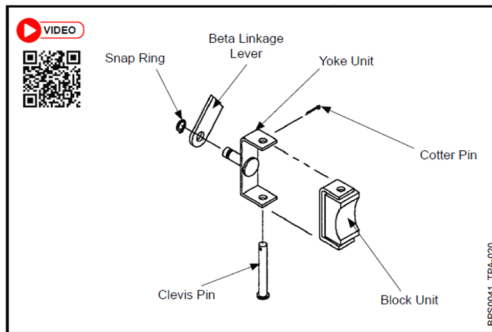
**CAUTION:** FIT THE BETA FEEDBACK BLOCK ASSEMBLY IN THE BETA RING WITH A MINIMUM SIDE CLEARANCE OF 0.001 INCH (0.03 mm). REFER TO FIGURE 3-6.

- (15) Install the beta feedback block assembly into the beta ring, if applicable. Refer to Figure 3-7.

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Beta Feedback Block Assembly and Beta Ring Clearance  
Figure 3-6



Beta Feedback Block Assembly  
Figure 3-7



## 2. Cessna Maintenance Manual 61-10-00 and 61-20-00

**NOTE:** The carbon block initially supplied with each propeller has been prefit. If a different carbon block is being installed, it may be necessary to sand it to obtain a total clearance between carbon block and side of groove of 0.001 to 0.002 inch at the tightest point.

(15) Install carbon block (3) onto reversing lever (1).

**NOTE:** The lower end of the propeller reversing lever is machined with a stepped notch.

**CAUTION:** make sure the stepped notch at the end of the propeller reversing lever (1) is under the guide pin (16) in the reversing lever guide pin bracket (15).

(16) Install reversing lever (1) to Beta valve clevis (2) and follow-up ring (4). For the installation procedures for the propeller reversing lever refer to the applicable Pratt & Whitney Engine Maintenance Manual found in the Introduction List of Publications

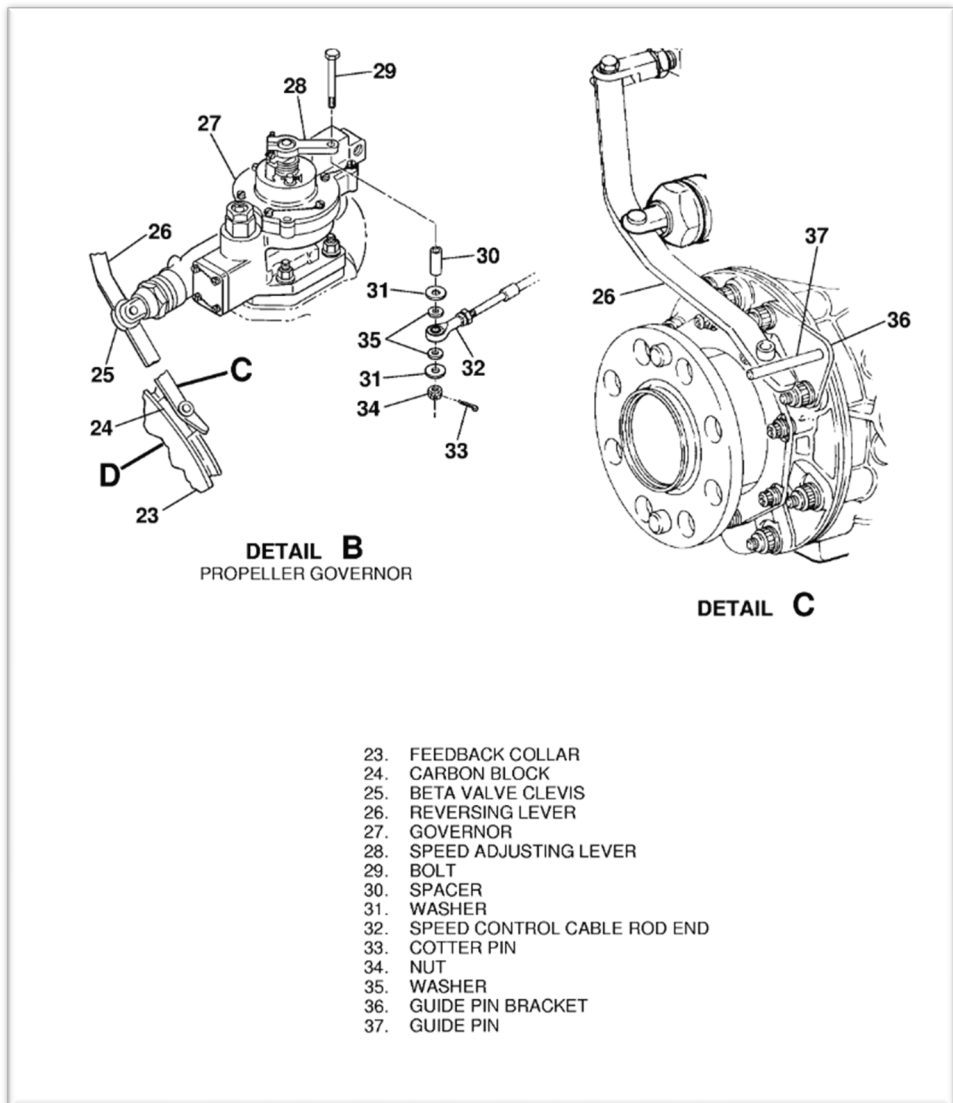
(17) Position spinner (15) to spinner bulkhead (22) as indexed during removal procedure and secure with screws and fiber washers (6).

(18) Install right nose cap.

(19) Check clearance between spinner (15) and nose cap, clearance should be 0.32 inch, +0.10 or -0.10 inch.

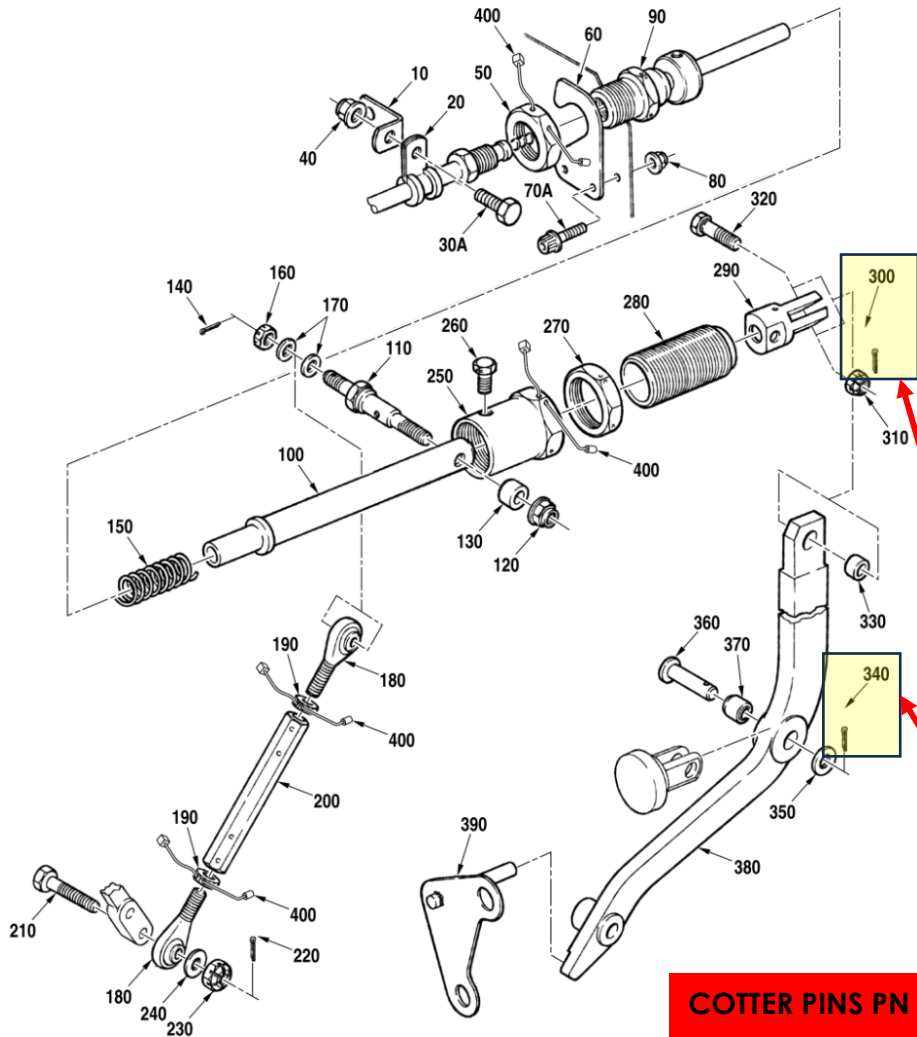
(20) For procedures to install and adjust TKS system propeller components, refer to Chapter 30, TKS Anti-Ice Propeller (McCauley) - Maintenance Practices.

Adjustment/Checks



### 3. Pratt and Whitney Parts Manual (PT6A-114A) 76-10-00 Figure 2

300	MS9245-23		• PIN, COTTER	A,B,C,D	1
310	3011976		• NUT, CASTELLATED, HEX INTRCHG WITH P/N MS9358-09	C	1
- 310A	MS9358-09		• NUT, CASTELLATED, HEX	A,B,C,D	1
320	3013166		• BOLT, MACHINE, HEX	A,B,C,D	1
330	3009087		• SPACER, SLEEVE	A,B,C,D	1
340	MS9245-23		• PIN, COTTER	A,B,C,D	1



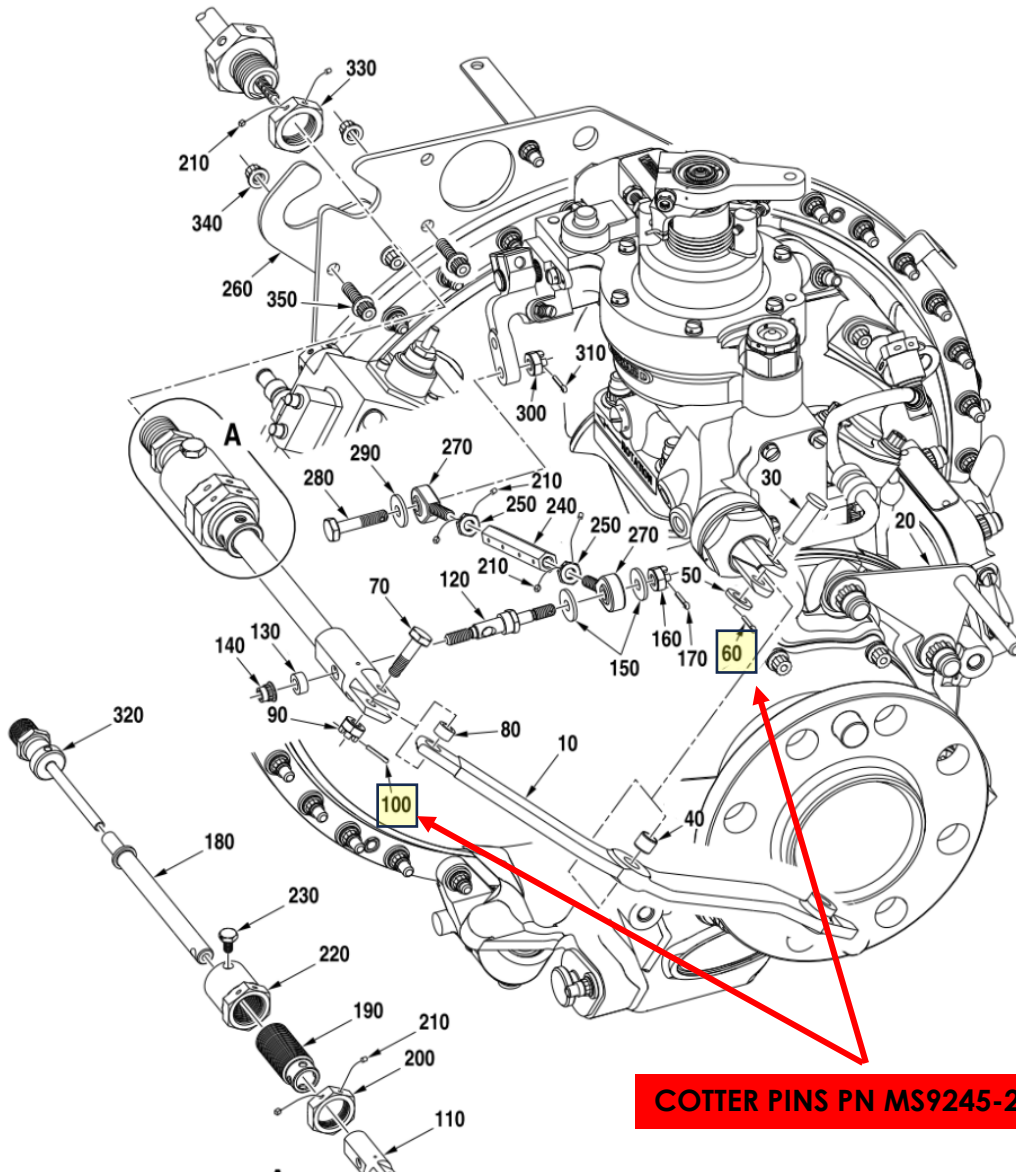
**COTTER PINS PN MS9245-23**

c2029

### 3. Pratt and Whitney Parts Manual (PT6A-140) 76-10-00 Figure 3


50	MS9321-10	• WASHER, FLAT	1
60	MS9245-23	• PIN, COTTER	1
70	3013166	• BOLT, MACH, HEX, DRILLED	1
80	3009087	• SPACER, SLEEVE	1
90	MS9358-09	• NUT, CASTLE, HEX	1
100	MS9245-23	• PIN, COTTER	1
110	3013166	• BOLT, MACH, HEX, DRILLED	1

Figure 3 Propeller Reversing Interconnect Linkage Installation, Front



### 3. Pratt and Whitney Maintenance Manual (PT6A-114A) 76-10-00, Par 5 (B,2,f-h)

MyP&WC POWER  Light Mode



76.10.00- PROPELLER REVERSING LINKAGE

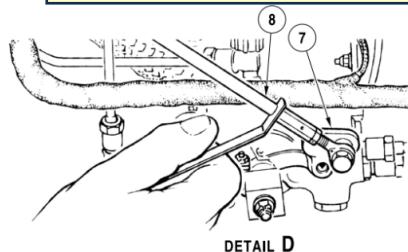
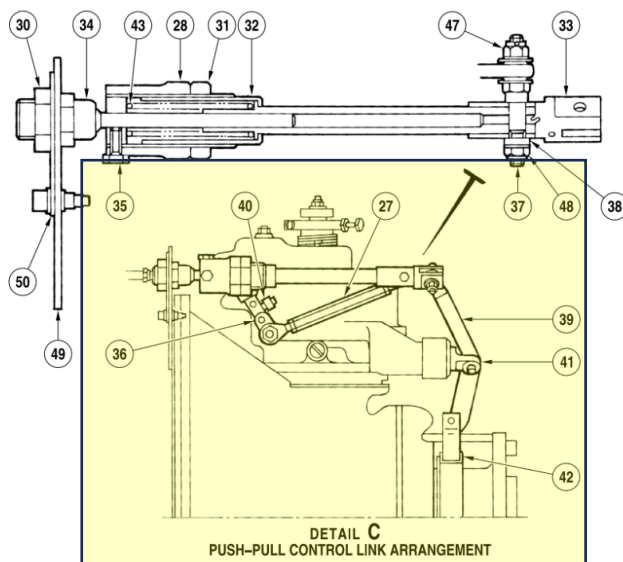
76-10-00  
PROPELLER REVERSING LINKAGE - MAINTENANCE PRACTICES

(f) Install the sleeve spacer in the hole at the upper end of the propeller reversing lever (39) and fit the lever into the rod end clevis (33). Secure with a bolt and castellated nut. Tighten the nut 12 to 18 lb.in., and lock with a cotterpin.

**CAUTION: THE LOWER END OF THE PROPELLER REVERSING LEVER (39) IS MACHINED WITH A STEPPED NOTCH. MAKE SURE THE STEPPED NOTCH AT THE END OF THE PROPELLER REVERSING LEVER (39) IS UNDER THE PIN IN THE REVERSING LEVER GUIDE PIN BRACKET ASSEMBLY (53) (REF. FIG. 201, DETAIL E).**

(g) Install the sleeve bushing in the center hole of the propeller reversing lever and locate the lever in the clevis of the Beta control valve (41). Secure the lever with a straight headed pin, washer and cotterpin.

(h) With the propeller feathered and the carbon block (42) resting against the rear face of the propeller feedback ring, adjust the low pitch adjuster stop (32) so that, with the linkage pulled fully forward, the Beta valve clevis slot end is flush with the valve capnut. Tighten the locknut (31) 150 to 250 lb.in., and secure the locknut to the stop adjuster (28) with lockwire.



# 3. Pratt and Whitney Maintenance Manual (PT6A-140) 76-10-01, Par 6, (E, 1-11)

MyP&WC POWER Light Mode

Search...

76.10.01- ENGINE REVERSING LINKAGE

76-10-01  
**PROPELLER REVERSING LINKAGE - MAINTENANCE PRACTICES**  
 Task 76-10-01-000-801

05.00 Time Limits  
 05.10 Operating Limits  
 05.20 Scheduled Maintenance Checks

Subtask 76-10-01-400-002

E. Installation of the Front Linkage  
 (Ref. Fig. 206)

- (1) Install the front linkage assembly on the lifting bracket (16). Attach it with the retaining plate (19), the two bolts (18) and the two nuts (17). Torque the nuts 27 to 30 lbf.in. (3.1-3.3 Nm).
- (2) Install the nut (15) on the front swivel joint (2). Torque the nut 95 to 105 lbf.in. (10.6-12.1 Nm).

**CAUTION: THE LOWER END OF THE PROPELLER REVERSING LEVER (13) HAS A MACHINED STEPPED NOTCH. MAKE SURE THAT THE STEPPED NOTCH OF THE LEVER IS BELOW THE GUIDE PIN IN THE REVERSING LEVER GUIDE PIN BRACKET ASSEMBLY (37).**

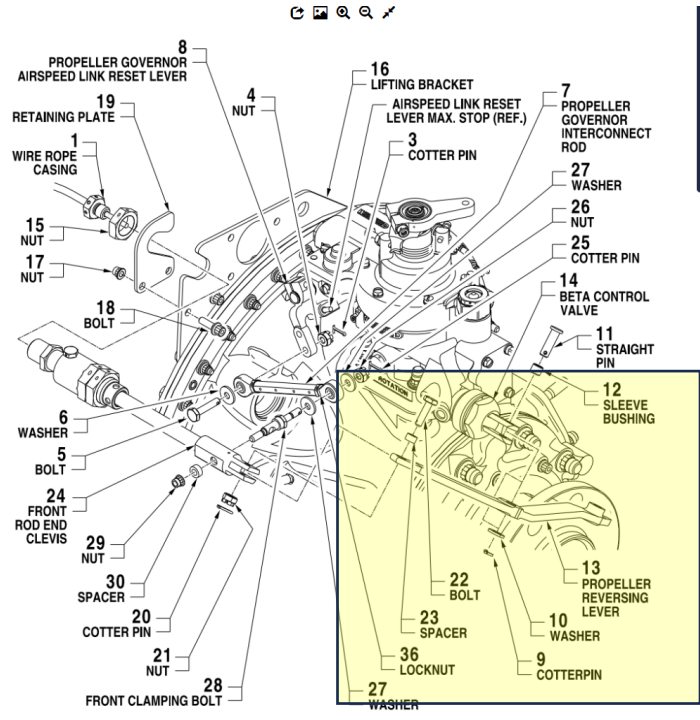
- (3) Install the sleeve bushing (12) into the middle hole of the propeller reversing lever (13). Put the lever in fork of the beta control valve (14).
- (4) Attach the propeller reversing lever (13) in the beta control valve (14) with the pin (11), the washer (10). Lock the straight pin with the cotterpin (9).
- (5) Install the adjustment fixture (PWC50956) on propeller shaft. Install the fixture ball lockpin to hold the propeller control lever (13).
- (6) Adjust the linkage until a slave bolt goes through freely the rear end of rod assembly (7) and propeller governor airbleed link (8).
- (7) Remove the slave bolt, then turn the two rod ends of the rod assembly one half turn counterclockwise to decrease the overhaul length of the rod.
- (8) Remove the adjustment fixture (PWC50956) from propeller shaft.
- (9) Apply light grease (PWC04-001) to the rod end of the interconnect rod (7). Attach the interconnect rod to the air bleed link reset lever (8) with the bolt (5), the washer (6), the nut (4).
- (10) Torque the nut (4) 24 to 36 lbf.in. (2.8-4.1Nm). Lock the nut with cotterpin (3).
- (11) Torque the two locknuts (36) 12 to 18 lbf.in. (1.4-2.0 Nm).

**WARNING: PUT ON EYE PROTECTION WHEN YOU INSTALL THE SAFETY CABLE. PIECES CAN BREAK OFF AND CAUSE INJURY**

- (12) Install safety cable (PWC05-344) on the two locknuts (36) and the nut (15) with the crimper (PWC90025).

F. Job Close-up Information

- (1) Remove all tools, equipment and items not necessary from the work area.
- (2) Install the wire rope casing (Ref. Task 76-10-01-400-802).



108053 DEICE (BRUSH BLOCK) INSTALLATION  
(IF APPLICABLE)

# KIT 108053 AIRFRAME DEICE INSTALLATION



## Hartzell Propeller Overhaul Kits

<u>Overhaul Kit</u>	<u>Description</u>	<u>Rev</u>
108053	AIRFRAME DE-ICE KIT	

<u>Component</u>	<u>Description</u>	<u>Quantity</u>
B-3837-N832	WASHER, CORROSION RESISTANT	6
B-3855-31	WASHER, LOCK, EXTERNAL TOOTH	2
B-6637-51	SCREW, PAN HEAD, CRES.	2
B-6637-52	SCREW, PAN HEAD, CRES.	2
B-6655-08	NUT, HEX, SELF-LOCKING	4
1H1157	SHIM, BRUSH BLOCK	1
105273	MOV MODULE - ASSEMBLY	1
108054	BRACKET, MOUNTING, BRUSH BLOCK	1
3H2090-1	MODULAR BRUSH BLOCK ASSEMBLY	1



USING HARTZELL ICE PROTECTION SYSTEM MANUAL 180, KIT PN 108053 CAN BE FOUND UNDER INSTALLATION INSTRUCTIONS 12AE. NOTE THAT IT SENDS YOU TO STC HOLDER. REFERENCE WIPAIRE DRAWING 1012329 (REV B AND LATER).

HARTZELL ICE PROTECTION SYSTEM  
MANUAL 180

This section includes the parts list(s) and installation instructions for the following airframe de-ice kit(s):  
**106095 and 108053**

**AE. Installation Instruction 12AE**  
(1) Install the airframe de-ice kit components in accordance with the applicable aircraft TC or STC holder's ICA.



FIG./ITEM NUMBER	PART NUMBER	DESCRIPTION	UPA	O/H
	106095	AIRFRAME DE-ICE KIT INSTALLATION INSTRUCTION 12AE		
	105070	• BRACKET, MOUNTING	2	
	1H1157	• SHIM, BRUSH BLOCK	2	
	3H2090-1	• MODULAR BRUSH BLOCK ASSEMBLY	2	
	106343	• MOV MODULE - ASSEMBLY	2	
	B-3837-N832	• WASHER, CORROSION RESISTANT	12	Y
	B-3855-31	• WASHER, LOCK, EXTERNAL TOOTH	4	Y
	B-6637-51	• SCREW, 8-32, PAN HEAD, CRES	4	
	B-6637-52	• SCREW, 8-32, PAN HEAD, CRES	4	
	B-6655-08	• NUT, HEX, SELF-LOCKING	8	Y
	108053	AIRFRAME DE-ICE KIT INSTALLATION INSTRUCTION 12AE		
	108054	• BRACKET, MOUNTING, BRUSH BLOCK	1	
	1H1157	• SHIM, BRUSH BLOCK	1	
	3H2090-1	• MODULAR BRUSH BLOCK ASSEMBLY	1	
	105273	• MOV MODULE - ASSEMBLY	1	
	B-3837-N832	• WASHER, CORROSION RESISTANT	6	Y
	B-3855-31	• WASHER, LOCK, EXTERNAL TOOTH	2	Y
	B-6637-51	• SCREW, 8-32, PAN HEAD, CRES	2	
	B-6637-52	• SCREW, 8-32, PAN HEAD, CRES	2	
	B-6655-08	• NUT, HEX, SELF-LOCKING	4	Y

- ITEM NOT ILLUSTRATED

Airframe De-ice Kit(s): 106095

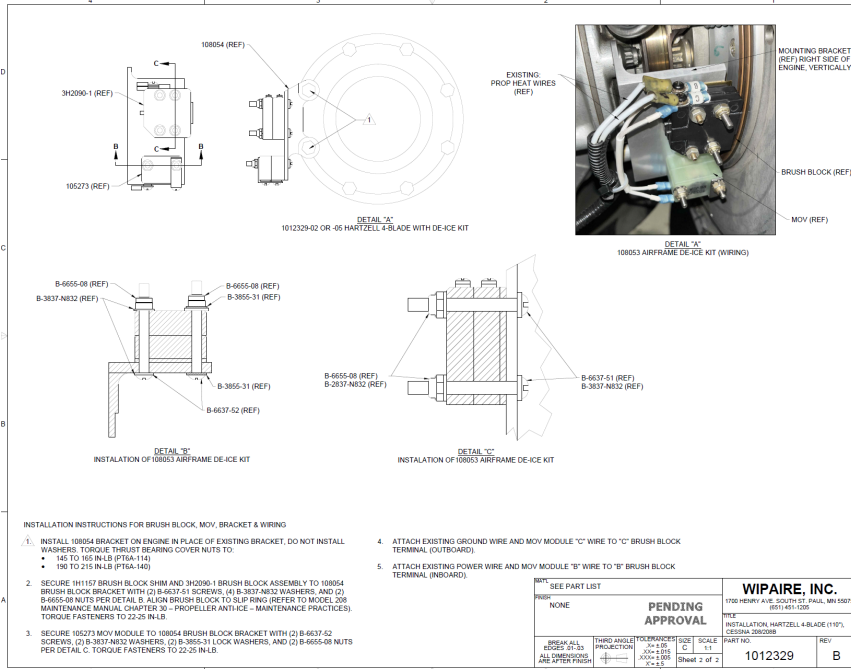
AIRFRAME DE-ICE INSTALLATION and PARTS **30-61-80**

Page 12AE-1  
Rev. 39 Dec/22



# DEICE BRUSH BLOCK BRACKET INSTALLATION.

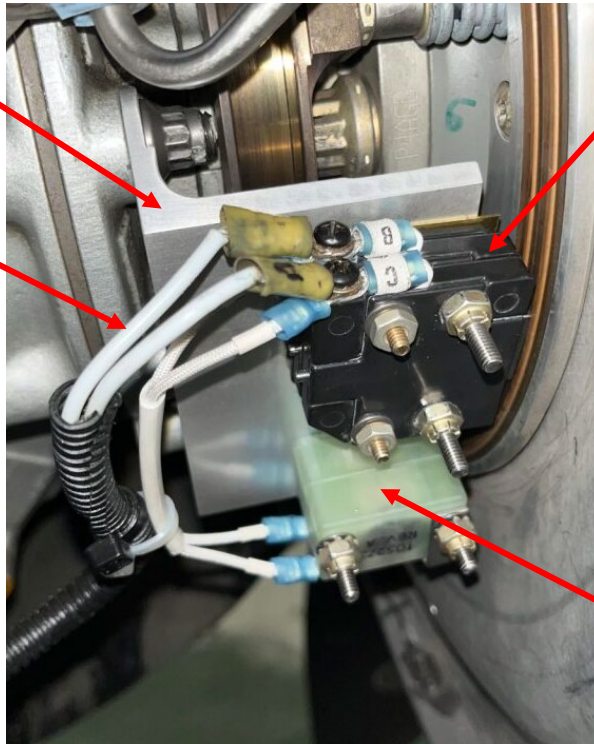
REFERENCE WIPAIRE DRAWING 1012329 (REV B OR LATER) FOR INSTALLATION AND BUILD UP REFERENCE



108054 BRACKET

MODULAR BRUSH BLOCK ASSEMBLY

AIRFRAME POWER WIRES



MOV MODULE ASSEMBLY

# ALIGN BRUSH BLOCK USING HARTZELL ICE PROTECTION MANUAL 180, FIGURE 7-1 AND 208 MM, 30-60-00, PAR 11, FIGURE 202 AS SHOWN BELOW

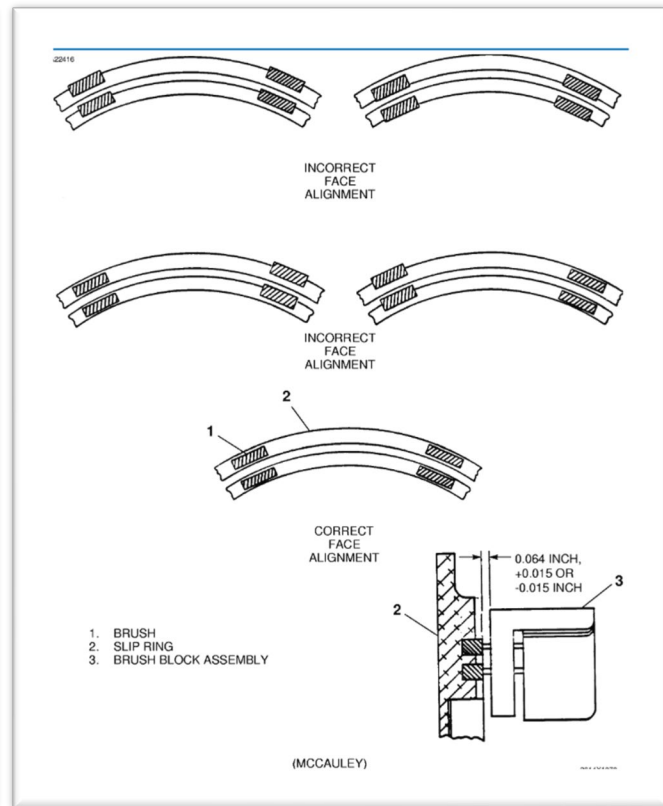
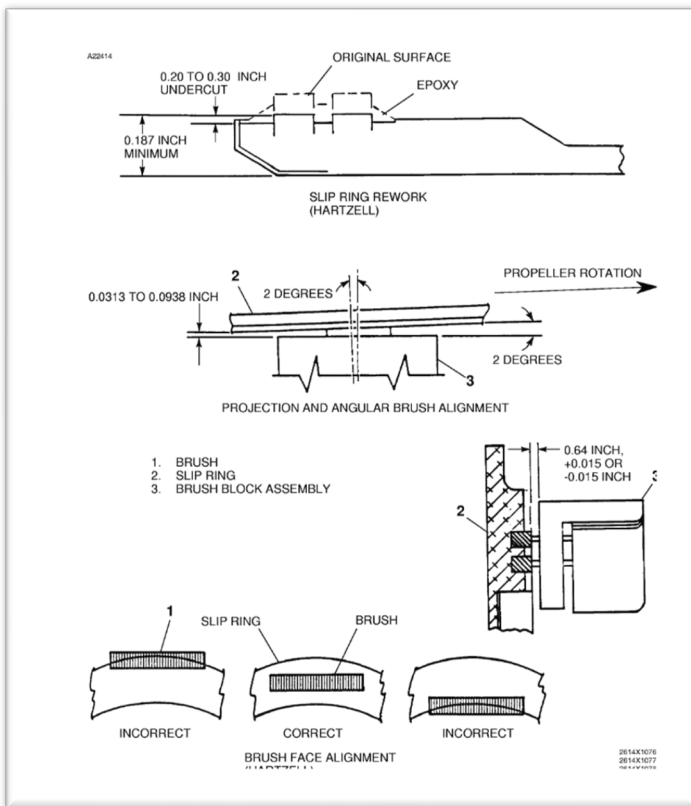
## 11. Brush Block Assembly to Slip Ring Alignment (Hartzell)

**CAUTION:** Ensure that slip ring alignment has been accomplished before attempting to align brushes on slip ring.

A. Align Brush Block Assembly to Slip Ring Attachment (Refer to Figure 202).

**NOTE:** Keep brushes retracted in brush block until slip ring and propeller assemblies have been installed. In order to get smooth, efficient and quiet transfer of electric power from brushes to slip ring, brush alignment must be checked and adjusted, to meet the following requirements.

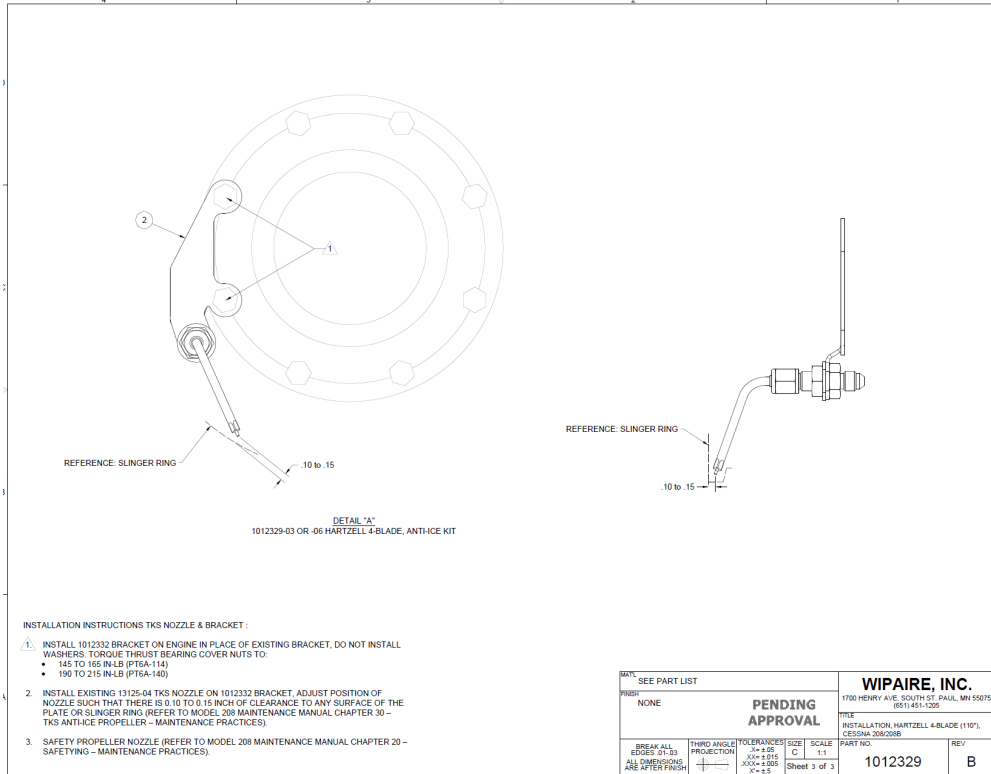
- (1) The clearance between brush block (3) and slip ring (2) must be 0.064 inch, +0.015 or -0.015 inch.
- (2) The brushes are to be lined up with slip ring so that entire face of each brush (1) is in contact with slip ring (2) throughout the full 360 degrees of slip ring rotation.
- (3) The brushes must contact slip ring at an angle of 2 degree from perpendicular to slip ring surface, measured toward the direction of rotation of slip ring.
- (4) Brush projection can be adjusted by loosening hardware attaching the brush block and holding the brushes in desired location while retightening hardware. Slotted holes are provided.
- (5) To center brushes on slip ring, a shim made of a series of laminates is provided and may be peeled for proper alignment. Layers of metal 0.003 inch are used to make up shims which are approximately 0.20 thick overall. Shims may also be fabricated locally.



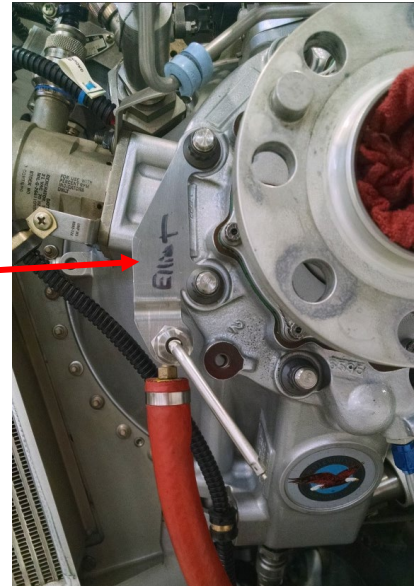
ANTI ICE (TKS) INSTALLATION  
(IF APPLICABLE)

# TKS BRACKET INSTALLATION.

REFERENCE WIPAIRE DRAWING 1012329 (REV B OR LATER)  
FOR INSTALLATION AND BUILD UP REFERENCE

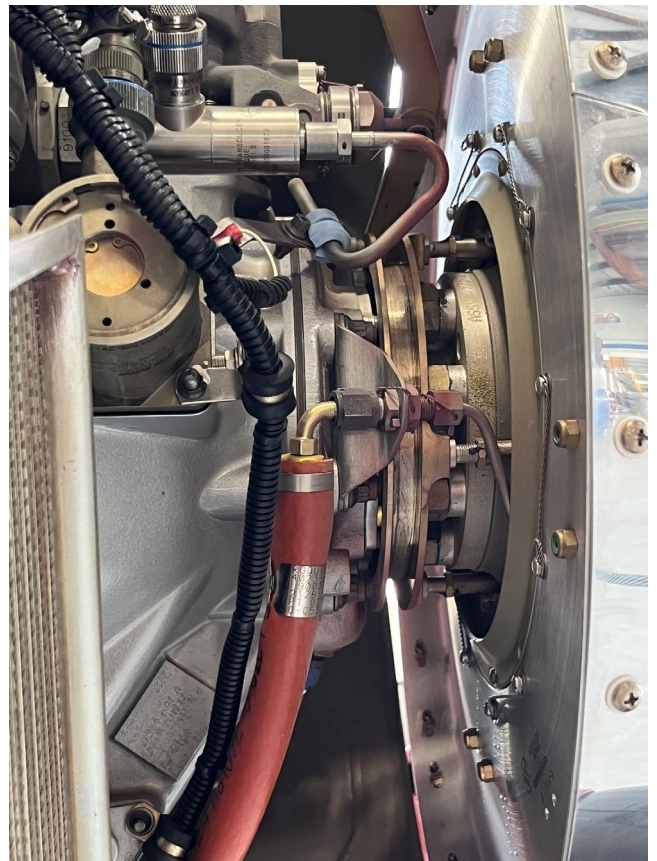


WIPAIRE  
1012332  
BRACKET



IT IS POSSIBLE THAT THE AIRFRAME HAS THE MCCAULEY 4HFR34C778 PROPELLER INSTALLED PER STC SA09850AC FROM **ALAMO AEROSPACE/MCCAULEY**. REMOVE PROPELLER PER ALAMO AEROSPACE ICA 55181-6.

THE BRACKET PN B-40763 WOULD BE REMOVED AND WIPAIRE BRACKET 1012332 BE INSTALLED. TKS NOZZLE TO BE INSTALLED AS ORIGINAL. STC TKS NOZZLE MAY NOT BE COMPATIBLE WITH HARTZELL INSTALLATION.

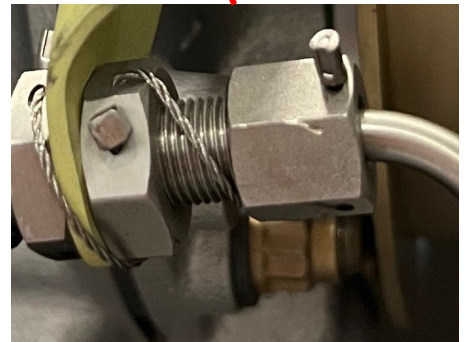
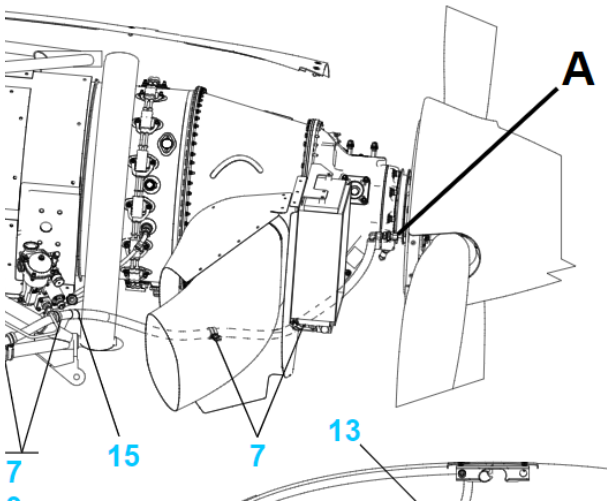
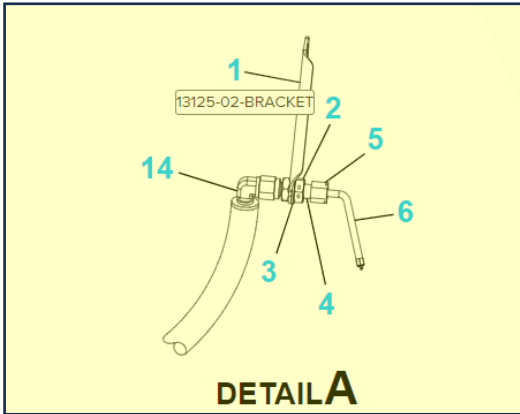
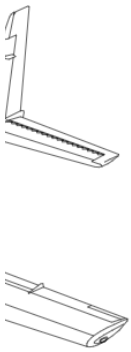


**B-40763**

BRACKET - TKS NOZZLE

ASSEMBLE TKS NOZZLE ONTO WIPAIRE BRACKET.

REFERENCE WIPAIRE DRAWING 1012329 (REV B OR LATER) FOR INSTALLATION AND BUILD UP REFERENCE



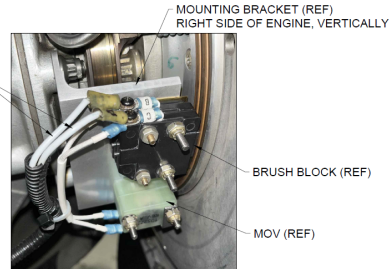
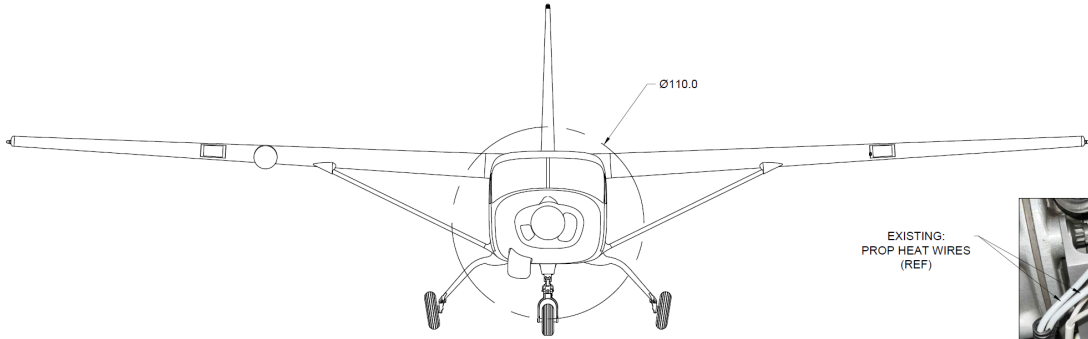
## ENGINE RIGGING HIGHLIGHTS

THIS OPERATION WILL REQUIRE AN ADVANCED AMOUNT OF KNOWLEDGE FOR RIGGING THE PT6 TO FACTORY SPECIFICATIONS. THE YUKON PROPELLER INSTALLATION CHANGES A SINGLE RIG POINT, HOWEVER THAT CHANGE MAY AFFECT OTHER RIGGING POINTS. BE PREPARED AND FAMILIARIZE YOURSELF WITH RIGGING A PT6 (-114A AND -140 AS APPLICABLE) PRIOR TO THIS PORTION OF YOUR YUKON PROPELLER INSTALLATION.

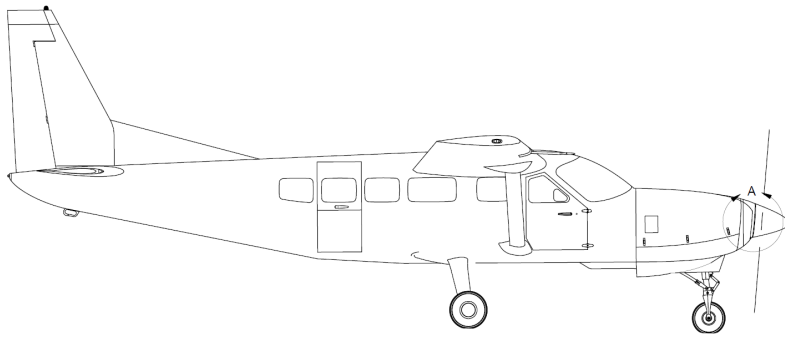


# WIPAIRE INSTALLATION DRAWING 1012329

REVISION HISTORY			
REV	DATE	ECO	DR
A	11/15/2023	ECN--10513	DJK
			DESCRIPTION
			INITIAL RELEASE



DETAIL "A"  
108053 AIRFRAME DE-ICE KIT  
INSTALL PER HARTZELL MANUAL 180, 30-61-80, REV



KIT CONFIGURATION LIST	
DASH NO.	DESCRIPTION
-01	HARTZELL 4-BLADE 110", START LOCKS, PLAIN
-02	HARTZELL 4-BLADE 110", START LOCKS, DE-ICE
-03	HARTZELL 4-BLADE 110", START LOCKS, ANTI-ICE
-04	HARTZELL 4-BLADE 110", NO START LOCKS, PLAIN
-05	HARTZELL 4-BLADE 110", NO START LOCKS, DE-ICE
-06	HARTZELL 4-BLADE 110", NO START LOCKS, ANTI-ICE

- NOTES:
- INSTALL HC-E4N-3KT(Y)GC11114(B)K-2 PROPELLER PER HARTZELL MANUAL 147, 61-00-47, REV. 20 OR LATER
  - INSTALL 1012333 PROP NOZZLE BRACKET IN PLACE OF 13125-02 WITH ANTI-ICE INSTALL
  - INSTALL 1012333 PLACARD ON INSTRUMENT PANEL NEAR Np INDICATOR
  - PROPELLER P/N INCLUDES SPINNER  
108048P SPINNER (REF) FOR PLAIN AND DE-ICE PROP  
107124P SPINNER (REF) FOR ANTI-ICE PROP
  - BLADE ANGLES (AT 42 INCH STATION)  
LOW PITCH: 10.3° ± 0.2°  
REVERSE: -14.5° ± 0.5°  
FEATHER: 82.4° ± 0.5°  
START LOCK: -4.1° ± 0.1°
  - WEIGHT AND MOMENT ARM OF THE HC-E4N-3KT(Y)GC11114(B)K-2 PROPELLER IS 137 LB AT 27.8 INCHES (THIS INCLUDES SPINNER 6 LB, DE-ICE 2 LB, AND START LOCKS 1 LB)  
IF REPLACING A HARTZELL HC-B3MN-3M10083, EXCHANGE WEIGHT IS -10 LB AT 27.8 INCHES  
IF REPLACING A HARTZELL HC-B3TN-3AF(Y)T10890CN(B)K-2, EXCHANGE WEIGHT IS -22 LB AT 27.8 INCHES  
IF REPLACING A MCCAULEY 3GFR34C703108GA-0, EXCHANGE WEIGHT IS +8 LB AT 27.8 INCHES  
IF REPLACING A MCCAULEY 4HFR34C7781028HA-0, EXCHANGE WEIGHT IS -17 LB AT 27.8 INCHES
  - WITH PT6A-140 ENGINE ADJUST LOW IDLE Ng 56.5% TO 58.5% (Np 1060 RPM MIN)
  - WITH PT6A-140 ENGINE ADJUST LOW IDLE Ng 56.0% TO 57.5% (Np 1060 RPM MIN)  
POSITION BETA CABLE ONE HOLE BELOW CENTER ON REVERSING CAM (AS REQ'D FOR REVERSE PICKUP)
  - THIS MODIFICATION IS COMPATIBLE WITH STC SA149CH AND STC SA0546LA
  - THIS MODIFICATION IS COMPATIBLE WITH THE AIRCRAFT ON FLOATS OR WHEELS

PARTS LIST									
ITEM	-01	-02	-03	-04	-05	-06	PART NUMBER	DESCRIPTION	
1	0	1	0	0	1	0	108053	KIT, AIRFRAME DE-ICE	
2	0	0	1	0	0	1	1012332	BRACKET, RING, NOZZLE SLINGER	
3	1	1	1	1	1	1	1012333	PLACARD, RPM LIMITS, 4-BLADE 110"	
4	1	0	0	0	0	0	E4N10545S	START LOCKS, PLAIN	
5	0	1	0	0	0	0	E4N10550S	START LOCKS, DE-ICE	
6	0	0	1	0	0	0	E4N10556S	START LOCKS, ANTI-ICE	
7	0	0	0	1	0	0	E4N10547S	PLAIN, (NO START LOCKS)	
8	0	0	0	0	1	0	E4N10553S	DE-ICE (NO START LOCKS)	
9	0	0	0	0	0	1	E4N10559S	ANTI-ICE (NO START LOCKS)	

MATERIAL: SEE PART LIST		<b>WIPAIRE, INC.</b>	
FINISH: NONE		1700 HENRY AVE. SOUTH ST. PAUL, MN 55075 (651) 461-1205	
BREAK ALL EDGES .01-.03		THIRD ANGLE PROJECTION	TOLERANCES: X±.05, .XX±.015, .XXX±.005, X'±.5
ALL DIMENSIONS ARE AFTER FINISH		SIZE: C	SCALE: 1:1
		PART NO. 1012329	REV A
		Sheet 1 of A	

Pay particular attention of notes shown on LH side of drawing for rigging points.

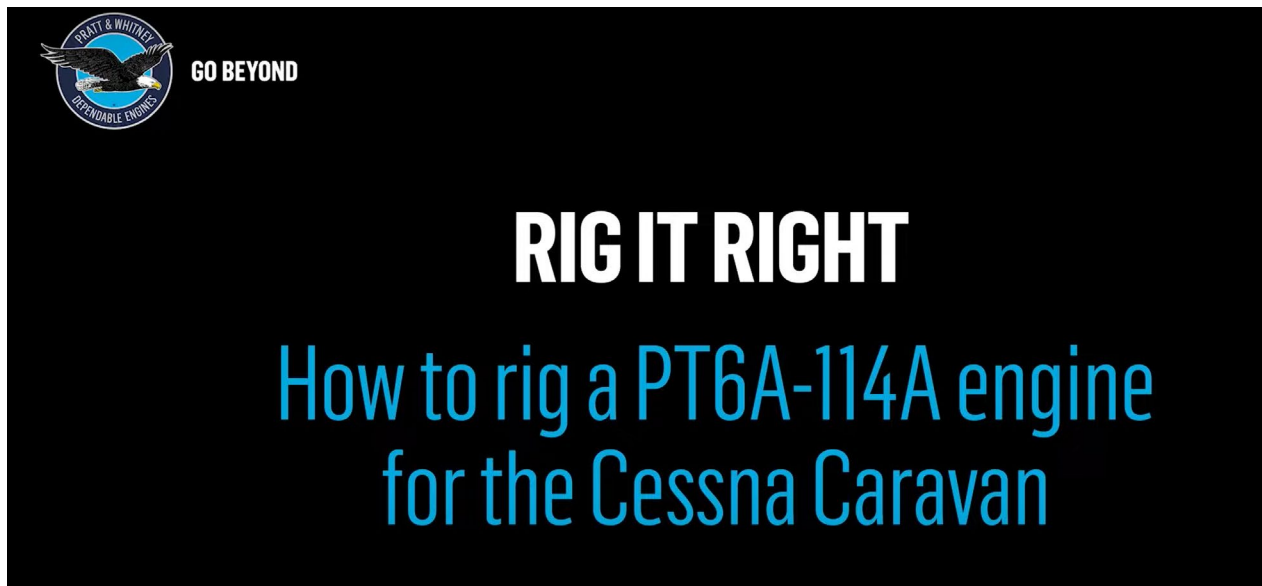


If the assumption is made that the engine is properly rigged prior to previous propeller removal, only one parameter is required to be changed on the PT6A-114A installation. This can be found in the video below, reference the **12:18** point of the video. NOTE: By adjusting the low idle NG per note 7, other parameters of the engine rigging may change. Be wary of completing a single adjustment and expecting all other rigging to hold properly.

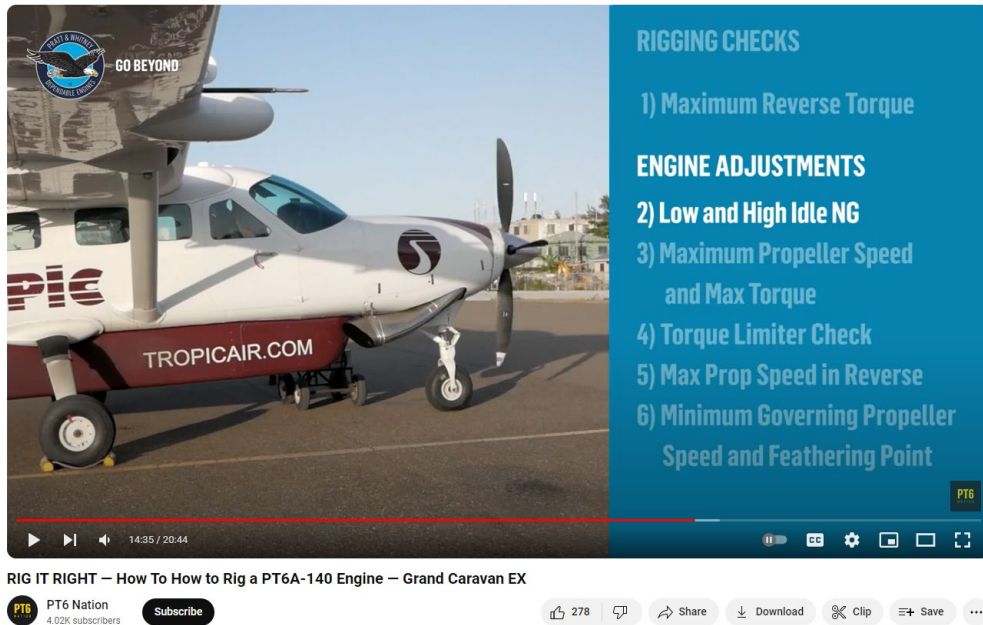


7. WITH PT6A-114A ENGINE ADJUST LOW IDLE Ng 56.5% TO 58.5% (Np 1060 RPM MIN)

<https://www.youtube.com/watch?v=H7c2NiFCNHo>



If the assumption is made that the engine is properly rigged prior to previous propeller removal, only one parameter is required to be changed on the PT6A-140 installation. This can be found in the -140 video below, reference the **14:35** point of the video. NOTE: By adjusting the low idle NG per note 8, other parameters of the engine rigging may change. Be wary of completing a single adjustment and expecting all other rigging to hold properly.



**RIGGING CHECKS**

- 1) Maximum Reverse Torque

**ENGINE ADJUSTMENTS**

- 2) Low and High Idle NG
- 3) Maximum Propeller Speed and Max Torque
- 4) Torque Limiter Check
- 5) Max Prop Speed in Reverse
- 6) Minimum Governing Propeller Speed and Feathering Point


RIG IT RIGHT - How To How to Rig a PT6A-140 Engine - Grand Caravan EX

PT6 Nation  
4.02K subscribers

278 | Share | Download | Clip | Save

8. WITH PT6A-140 ENGINE ADJUST LOW IDLE Ng 56.0% TO 57.5% (Np 1060 RPM MIN) POSITION BETA CABLE ONE HOLE BELOW CENTER ON REVERSING CAM (AS REQ'D FOR REVERSE PICKUP)

<https://www.youtube.com/watch?v=0pApXlmLiMw>



GO BEYOND

# PRATT & WHITNEY

## RIGGING YOUR PT6A: GRAND CARAVAN EX SETUP IN THE HANGAR

Reversing cam reference as noted below.

POSITION BETA CABLE ONE HOLE BELOW CENTER ON REVERSING CAM (AS REQ'D FOR REVERSE PICKUP)

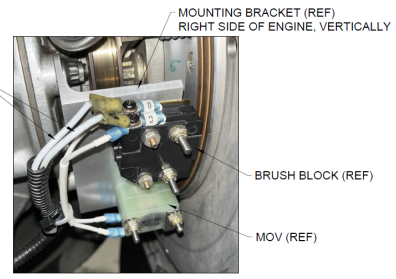
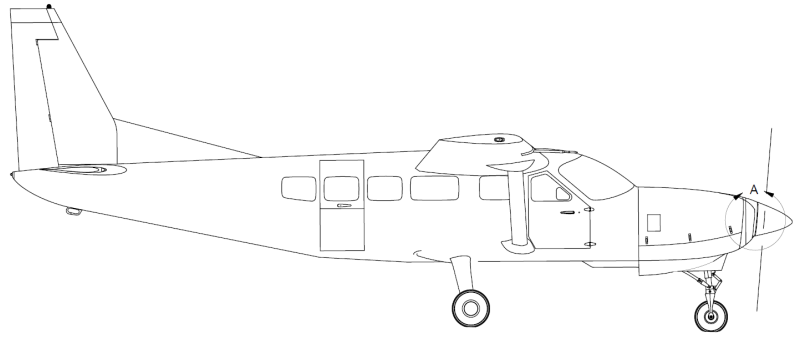
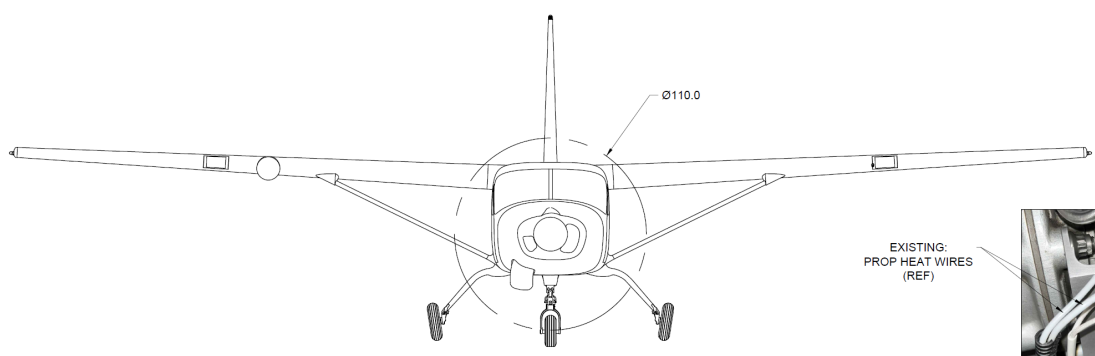


PERFORM FULL ENGINE RUNS WITH RIGGING CHECKS USING VIDEOS SHOWN AS A GUIDE. ENSURE THAT ALL STOCK PARAMETERS ARE BEING HIT INCLUDING THE INCREASED LOW IDLE NG PER WIPAIRE DRAWING 1012329 FOR YOUR INSTALLED ENGINE (-140 OR -114A) AND RIG AND ADJUST ACCORDINGLY.

PERFORM INSPECTION AND ENSURE ALL SAFETY WIRE, COTTER PINS, ETC.. . ARE REINSTALLED UPON RIGGING COMPLETION

## WEIGHT AND BALANCE NOTATIONS

REV	DATE	ECO	DR	REVISION HISTORY	DESCRIPTION
A	11/15/2023	ECN--10513	DJK		INITIAL RELEASE



DETAIL "A"  
108053 AIRFRAME DE-ICE KIT  
INSTALL PER HARTZELL MANUAL 180, 30-61-80, REV

KIT CONFIGURATION LIST	
DASH NO.	DESCRIPTION
-01	HARTZELL 4-BLADE 110°, START LOCKS, PLAIN
-02	HARTZELL 4-BLADE 110°, START LOCKS, DE-ICE
-03	HARTZELL 4-BLADE 110°, START LOCKS, ANTH-ICE
-04	HARTZELL 4-BLADE 110°, NO START LOCKS, PLAIN
-05	HARTZELL 4-BLADE 110°, NO START LOCKS, DE-ICE
-06	HARTZELL 4-BLADE 110°, NO START LOCKS, ANTH-ICE

- NOTES:
- INSTALL HC-E4N-3KT(V)(Y)GC11114(B/K)-2 PROPELLER PER HARTZELL MANUAL 147, 61-00-47, REV. 20 OR LATER
  - INSTALL 1012332 PROP NOZZLE BRACKET IN PLACE OF 13125-02 WITH ANTI-ICE INSTALL
  - INSTALL 1012333 PLACARD ON INSTRUMENT PANEL NEAR Np INDICATOR
  - PROPELLER PIN INCLUDES SPINNER  
108048P SPINNER (REF) FOR PLAIN AND DE-ICE PROP  
107124P SPINNER (REF) FOR ANTI-ICE PROP
  - BLADE ANGLES (AT 42 INCH STATION)  
LOW PITCH: 10.3° ± 0.2°  
REVERSE: -14.5° ± 0.5°  
FEATHER: 82.4° ± 0.5°  
START LOCK: -4.1° ± 0.1°
  - WEIGHT AND MOMENT ARM OF THE HC-E4N-3KT(V)(Y)GC11114(B/K)-2 PROPELLER IS 137 LB AT 27.8 INCHES (THIS INCLUDES SPINNER 5 LB, DE-ICE 2 LB, AND START LOCKS 1 LB)  
IF REPLACING A HARTZELL HC-B3MN-3/M10083, EXCHANGE WEIGHT IS -10 LB AT 27.8 INCHES  
IF REPLACING A HARTZELL HC-B3TN-3AF(Y)T10890CN(B/K)-2, EXCHANGE WEIGHT IS -22 LB AT 27.8 INCHES  
IF REPLACING A MCCAULEY 3GFR34C703/106GA-0, EXCHANGE WEIGHT IS +8 LB AT 27.8 INCHES  
IF REPLACING A MCCAULEY 4HFR34C778/102BHA-0, EXCHANGE WEIGHT IS -17 LB AT 27.8 INCHES
  - WITH PT6A-140 ENGINE ADJUST LOW IDLE NG 56.5% TO 58.5% (Np 1050 RPM MIN)
  - WITH PT6A-140 ENGINE ADJUST LOW IDLE NG 56.0% TO 57.5% (Np 1050 RPM MIN)
  - POSITION BETA CABLE ONE HOLE BELOW CENTER ON REVERSING CAM (AS REQ'D FOR REVERSE PICKUP)
  - THIS MODIFICATION IS COMPATIBLE WITH STC SA149CH AND STC SA02546LA
  - THIS MODIFICATION IS COMPATIBLE WITH THE AIRCRAFT ON FLOATS OR WHEELS

PARTS LIST									
ITEM	-01	-02	-03	-04	-05	-06	PART NUMBER	DESCRIPTION	
1	0	1	0	0	1	0	108053	KIT, AIRFRAME DE-ICE	
2	0	0	1	0	0	1	1012332	BRACKET, RING, NOZZLE SLINGER	
3	1	1	1	1	1	1	1012333	PLACARD, RPM LIMITS, 4-BLADE 110°	
4	1	0	0	0	0	0	E4N10545S	START LOCKS, PLAIN	
5	0	1	0	0	0	0	E4N10550S	START LOCKS, DE-ICE	
6	0	0	1	0	0	0	E4N10556S	START LOCKS, ANTI-ICE	
7	0	0	0	1	0	0	E4N10547S	PLAIN, (NO START LOCKS)	
8	0	0	0	0	1	0	E4N10553S	DE-ICE (NO START LOCKS)	
9	0	0	0	0	0	1	E4N10559S	ANTI-ICE (NO START LOCKS)	

MATERIAL:	SEE PART LIST	<b>WIPAIRE, INC.</b> 1700 HENRY AVE, SOUTH ST. PAUL, MN 55075 (651) 451-1205
FINISH:	NONE	
BREAK ALL EDGES 01-03 ALL DIMENSIONS ARE AFTER FINISH		TITLE INSTALLATION, HARTZELL 4-BLADE (110°), CESSNA 208/208B
THIRD ANGLE PROJECTION	TOLERANCES: .XX=±.05 .XXX=±.005 X=.5	PART NO. <b>1012329</b>
SIZE C	SCALE 1:1	REV <b>A</b>
Sheet 1 of A		

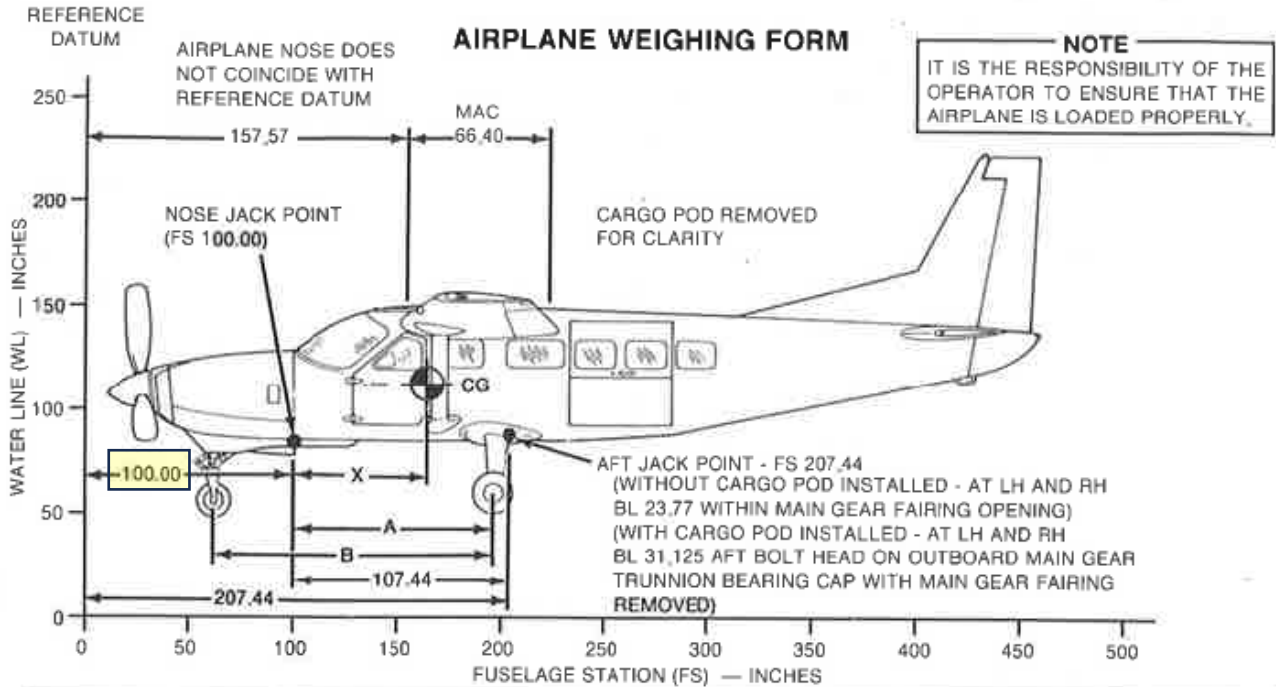
**6. WEIGHT AND MOMENT ARM OF THE HC-E4N-3KT(V)(Y)GC11114(B/K)-2 PROPELLER IS 137 LB AT 27.8 INCHES (THIS INCLUDES SPINNER 5 LB, DE-ICE 2 LB, AND START LOCKS 1 LB)  
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 IF REPLACING A MCCAULEY 3GFR34C703/106GA-0, EXCHANGE WEIGHT IS +8 LB AT 27.8 INCHES  
 IF REPLACING A MCCAULEY 4HFR34C778/102BHA-0, EXCHANGE WEIGHT IS -17 LB AT 27.8 INCHES**

NOTE: WEIGHTS AND ARMS APPLY TO BOTH THE 208B GRAND CARAVAN AND THE SHORTER 208. BOTH OF THE 208 CARAVAN MODELS HAVE A DATUM THAT IS 100" AHEAD OF THE FIREWALL AND RESULTING ARMS ARE NOT AFFECTED BY EITHER MODEL



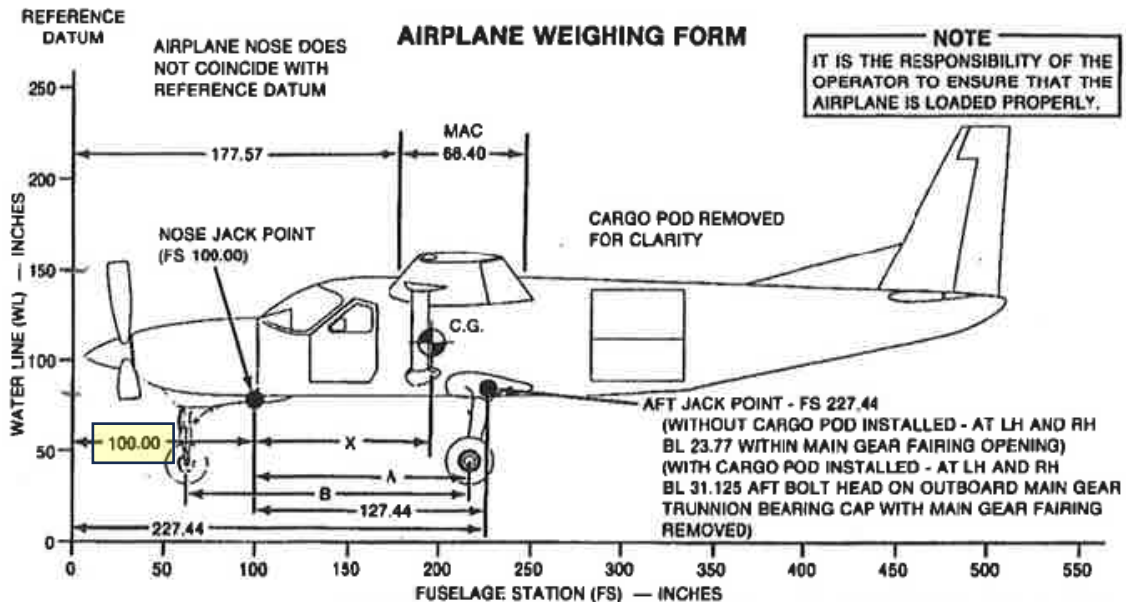
# SECTION 6 WEIGHT & BALANCE/EQUIPMENT LIST

**CESSNA  
MODEL 208**



# SECTION 6 WEIGHT & BALANCE/EQUIPMENT LIST

**CESSNA  
MODEL 208B**





END