Hartzell Propeller Inc. Owner's Manual & Log Book

HARTZELL

Propeller Owner's Manual & Log Book

HARTZELL PROPELLER INC.
One Propeller Place
Piqua, OH 45356-2634 U.S.A.
Telephone: 513-778-4200
Fax: 513-778-4391

F.A.A. Approved
Manual No. 115N
Revision 3
January 1994

Propeller Owner's Manual & Log Book

Installation Operation Service

All "Compact" Models
Series: ( )HC — ( )(2, 3, 4)Y( ) — (1, 2, 4, 5, 7)( )
Constant Speed, Feathering and Reversing

Hartzell Propeller Inc.
One Propeller Place
Piqua, OH 45356 - 2634 U.S.A.
Ph: 513 - 778 - 4200
Fax: 513 - 778 - 4391
Telex: 4332032 HRTZLP

HARTZELL PROPELLER INC.
Manual No. 115N

CAUTION: KEEP THIS SERVICE RECORD WITH THE PROPELLER AT ALL TIMES WHEN THE PROPELLER IS INSTALLED AS PART OF AN AIRCRAFT OR ENGINE. THIS RECORD MUST BE MAINTAINED CONCURRENTLY WITH AND BECOME A PART OF THE AIRCRAFT AND ENGINE SERVICE RECORDS.

NOTE: Nearly all propeller models covered by this manual use aluminum propeller blades. There are, however, a few applications (such as the Porsche/Mooney propeller) which use composite blades. Composite blade information is not normally provided with this manual. A composite blade supplement to this manual is available upon request from the Hartzell Product Support Department.

For updated information and additional copies of the Log Book, contact:

Hartzell Propeller Inc.
Product Support Department
One Propeller Place
Piqua, OH 45356-2634 U.S.A.

HARTZELL PROPELLER INC.
Manual No. 115N

REVISION NO. 3 HIGHLIGHTS:

Composite blade section updated and replaced in its entirety.

(This page is intentionally blank.)

HARTZELL PROPELLER INC.
Manual No. 115N

RECORD OF REVISIONS TO THIS MANUAL

Rev. No.	Issue Date	Date Inserted	By	Remarks
1	10/87			
2	5/92			
3	1/94			

(This page is intentionally blank.)

HARTZELL PROPELLER INC.
Manual No. 115N

LIST OF EFFECTIVE PAGES

Page	Original/ Revision	Date	Page	Original/ Revision	Date
*Cover	Rev. 3	1/94			
*ii	Rev. 2	5/92			
*iii	Rev. 3	1/94			
*iv	Blank	5/92			
*v	Rev. 2	5/92			
*vi	Blank	5/92			
*vii	Rev. 3	1/94			
*viii	Blank	5/92			
Guide to Flying	Original	7/86			
1	Rev. 2	5/92			
2	Original	7/86			
3 - 4	Rev. 2	5/92			
5 - 25	Original	7/86			
25a, 25b	Rev. 2	5/92			
26 - 30	Original	7/86			
31	Rev. 2	5/92			
32 - 35	Original	7/86			
36	Rev. 2	5/92			
37, 37a, 37b	Rev. 2	5/92			
38 - 39	Rev. 2	5/92			
40	Original	7/86			
Announcement	Original	7/86			
*Composite Blade Section (A)	Rev. 3	1/94			

(This page is intentionally blank.)

HARTZELL PROPELLER INC.
Manual No. 115N

Hartzell. . . A Guide to Better Flying

IMPORTANT

People who fly should recognize that various types of risks are involved; and they should take all precautions to minimize them, since they cannot be eliminated entirely. The propeller is a vital component of the aircraft. A mechanical failure could cause a forced landing or even create vibrations sufficiently severe as to damage the aircraft.

Propellers are subjected to constant vibration stresses coming from the engine and airstream, which are added to high bending and centrifugal stresses.

Before a propeller is certified as being safe to operate on an airplane, an adequate margin of safety must be demonstrated. Even though every conceivable precaution is taken in the design and manufacture of a propeller, history has revealed rare incidents of failures, particularly of the metal fatigue type.

It is essential that the propeller be properly maintained according to the recommended service procedures, and a close watch be exercised to detect impending problems before they become serious. Any unusual vibration should be investigated and eliminated as it could be a warning that something serious is wrong.

(This page is intentionally blank.)

HARTZELL PROPELLER INC.
Manual No. 115N

Table of Contents

Revision Highlights iii
Record of Revisions to this Manual v
List of Effective Pages vii
Table of Contents 1
Introduction 2
Model Designation 3
Description of Various Propeller Models 5
Operating Advisory 12
Governor Description—Hartzell 14
Propeller Installation Instructions 26
Adjustments 29
Operating Instructions 32
Service Instructions 33
Recommended Greases 37a
Hartzell Synchrophasers 38
Service Policy 39

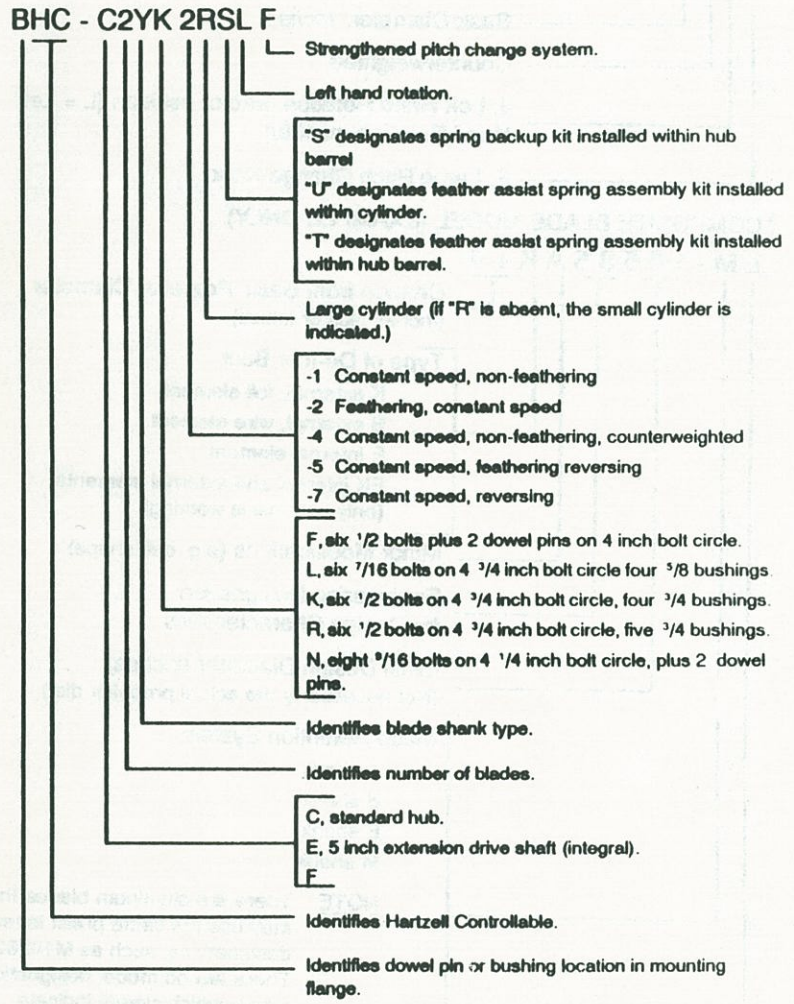
HARTZELL PROPELLER INC.
Manual No. 115N

Introduction

The purpose of this Manual is to enable one to properly install, operate and maintain a Hartzell Constant Speed or Feathering propeller. Separate handbooks are available for overhaul of Hub/Blades.

The present Manual covers several series of the design types being currently used in large numbers, viz., HC-C3Y, HC-C2Y, HC-E2Y, and HC-E3Y, 2-blade, 3-blade, and 4-blade constant speed and feathering propellers.

PROPELLER HUB MODEL (EXAMPLE ONLY)



ALUMINUM BLADE MODEL (EXAMPLE ONLY)

F JC8475-3

- F, Large Pitch Change Knob
- J, Left Hand Rotation, tractor position (L = Left Hand Rotation, pusher)
- Counterweighted
- Basic Diameter, *inches*
- Design Number
- Basic Diameter Reduction, *inches*

COMPOSITE BLADE MODEL (EXAMPLE ONLY)

L M - 1 0 5 8 5 A K + 4

- Change from Basic Propeller Diameter (inches plus or minus)
- Type of De-Icer Boot
  - K external, foil element
  - B external, wire element
  - E internal element
  - EK internal and external elements (only external is working)
- Minor Modifications (e.g. cuff shape)
- Engineering Designation for Design Characteristics
- Initial Design Diameter (inches) (Not necessarily the actual propeller dia.)
- Blade Retention System
  - A shank
  - B shank
  - E shank
  - M shank

  NOTE: There are aluminum blades that may use the same prefix letter designations, such as M10282. There are no model designation letters which clearly indicate whether a blade is composite or aluminum)
- Direction of Rotation (L = Lefthand Blade)

Description OF VARIOUS PROPELLER MODELS

(a) HC-C2YL, K, R; HC-E2YL, K, R; HC-E3YR
The "Compact" propellers represent new concepts in basic design. They combine low weight with simplicity in design and rugged construction.

In order to achieve these ends, the hub is made as compact as possible, utilizing aluminum alloy forgings for most of the parts. The hub shell is made in two halves, bolted together along the plane of rotation. This hub shell carries the pitch change mechanism and blade roots internally. The hydraulic cylinder, which provides power for changing the pitch, is mounted at the front of the hub. The "Compact" propeller can only be installed on engines having flanged mounting provisions. These propellers are currently made in two-and three-blade configurations.

The constant speed, dash 1, propellers utilize oil pressure from a governor to move the blades into high pitch (reduced RPM). The centrifugal twisting moment of the blades tends to move them into low pitch (high RPM) in the absence of governor oil pressure.

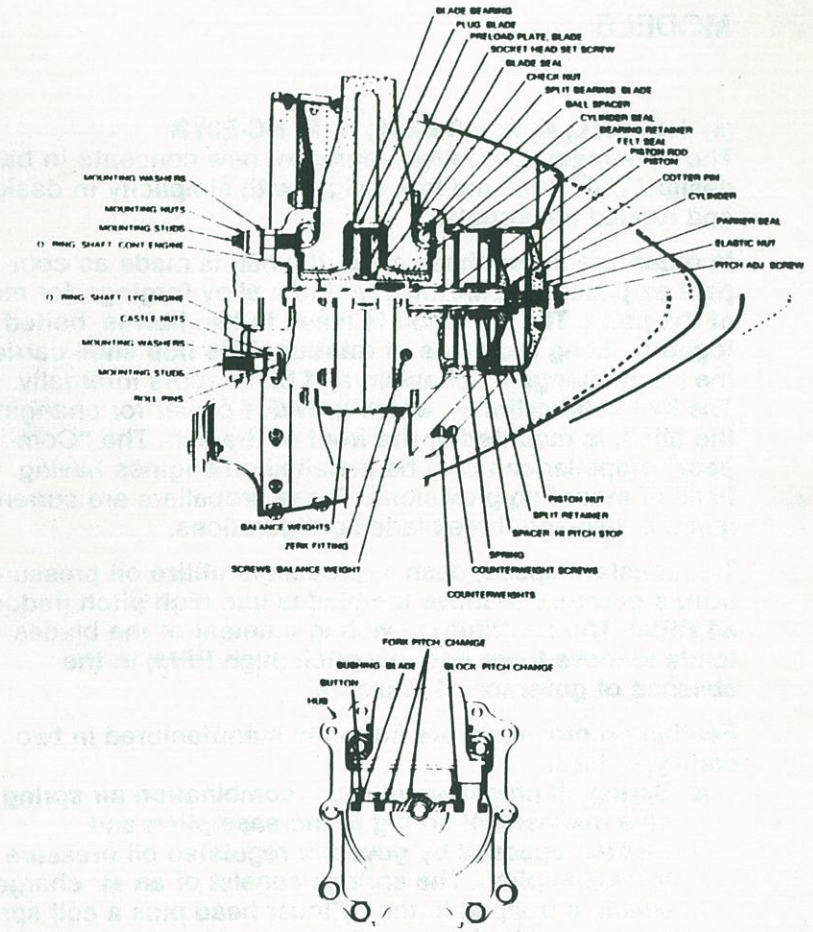
Feathering propellers are currently manufactured in two configurations:

a) Spring-oil propellers utilize a combination air spring plus mechanical spring to increase pitch and feather, opposed by governor regulated oil pressure to reduce pitch. The springs consist of an air charge which is trapped in the cylinder head plus a coil spring located in the propeller shaft extension housing. Only 2-blade propellers with the extension shaft can be constructed in this manner.

b) Spring-counterweight-oil propellers utilize a combination air spring plus blade counterweights to increase pitch and feather, opposed by governor regulated oil pressure to reduce pitch. All 3-blade feathering propellers are constructed in this manner.

In both types of propellers, feathering is accomplished by the pilot pulling the pitch control knob or lever back to the limit of travel, which allows oil to drain out of the propeller back to the engine sump.

BASIC CONSTANT SPEED PROPELLER ASSEMBLY



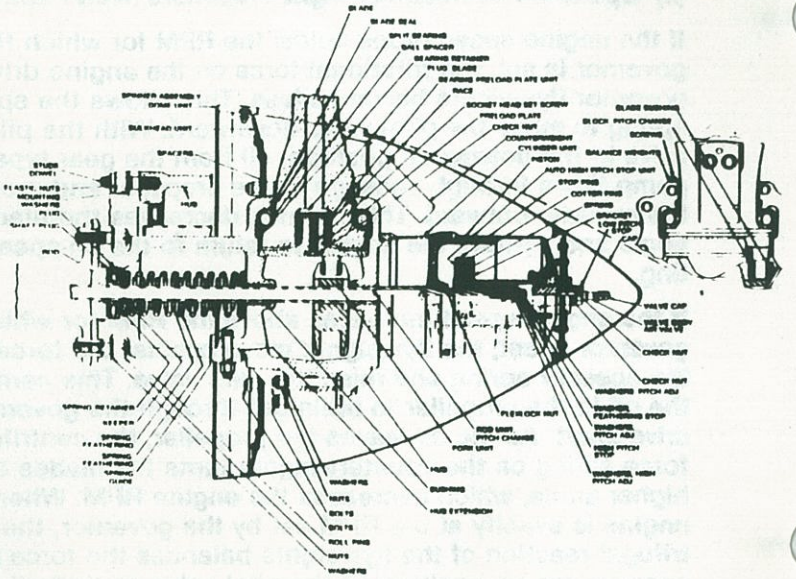
FOR INFORMATION ONLY — NOT TO BE USED AS SPECIFIC PART REFERENCES

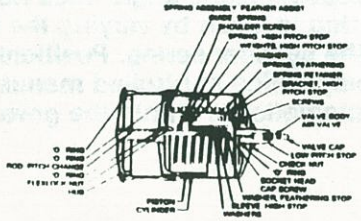
(b) Operation of Counterweight Propellers (Non-Feathering)

If the engine speed drops below the RPM for which the governor is set, the rotational force on the engine driven governor flyweights becomes less. This allows the speeder spring to move the pilot valve downward. With the pilot valve in the downward position, oil from the gear type pump flows through passage to the propeller and moves the cylinder outward. This, in turn, decreases the blade angle and permits the engine to return to the on-speed setting.

If the engine speed increases above the RPM for which the governor is set, the flyweights move against the force of the speeder spring and raise the pilot valve. This permits the oil in the propeller to drain out through the governor drive shaft. As the oil leaves the propeller, the centrifugal force acting on the counterweights turns the blades to a higher angle, which decreases the engine RPM. When the engine is exactly at the RPM set by the governor, the centrifugal reaction of the flyweights balances the force of the speeder spring, positioning the pilot valve so that oil is neither supplied to nor drained from the propeller. With this condition, propeller blade angle does not change. Note that the RPM setting is made by varying the amount of compression in the speeder spring. Positioning of the speeder rack is the only action controlled manually, all others being controlled automatically within the governor.

BASIC COMPACT SERIES FULL FEATHERING
FEATHERING ASSIST SPRINGS ARE ILLUSTRATED IN BOTH HUB AND CYLINDER AREAS TO SHOW EITHER LOCATION





FOR INFORMATION ONLY — NOT TO BE USED AS SPECIFIC PART REFERENCES

(c) Operation of Non-Counterweight Constant Speed Propellers (Non-Feathering)

The operation of the propeller and governor is reversed from the case of the counterweight propellers. Blade centrifugal twisting movement tends to reduce pitch and the governor oil pressure increases pitch; which is the opposite of that for counterweight propellers.

(d) Operation of Feathering Propellers, Counterweight Type; Also Compact Types

*The feathering propellers operate similarly to the non-feathering ones except the feathering spring assists the counterweights to increase the pitch.

Feathering is accomplished by releasing the governor oil pressure, allowing counterweights and feathering spring to feather the blades. This is done by pulling the governor pitch control back to the limit of its travel, which opens up a port in the governor allowing the oil from the propeller to drain back into the engine. The time necessary to feather depends upon the size of the oil passage from the propeller to the engine, and the force exerted by the spring and counterweights. The larger the passages through the governor and the heavier the spring, the quicker is the feathering action. Elapsed time for feathering, between three and ten seconds, is usual with this system.

The ability to unfeather the blades, or reestablish normal pitch, within the same elapsed time is not considered important for the light twin-engine airplane. The possibility of feathering the wrong propeller in an emergency is remote, as the wrong action will become apparent in ample time to be corrected. Furthermore, there is no need to restart the dead engine for landing, as the light twin can be easily landed with the one engine. About the only requirement for unfeathering is for demonstration purposes.

Unfeathering is accomplished by repositioning the governor control to the normal flight range, and restarting the engine. As soon as the engine cranks over a few turns the governor starts to unfeather the blades and soon windmilling takes place, which speeds up the process of unfeathering. In order to facilitate cranking of the engine, the feathering blade angle is set at 80 to 85 degrees at the ¾ point on the blade, allowing the air to assist the engine starter. In general, restarting and unfeathering can be accomplished within a few seconds.

Special unfeathering systems are available for certain aircraft, for which restarting the engine is difficult, or for demonstrators. The system consists of an oil accumulator connected to the governor through a valve.

In order to prevent the feathering spring from feathering the propeller when the airplane is on the ground and the engine stopped, automatically removable high-pitch stops were incorporated in the design. These consist of spring-loaded latches fastened to the stationary hub which engage high-pitch stop-plates bolted to the movable blade clamps. As long as the propeller is in rotation at speeds over 800 RPM, centrifugal force acts to disengage the latches from the high-pitch stop-plates so that the propeller pitch may be increased to the feathering position. At lower RPMS, or when the engine is stopped, the latch springs engage the latches with the high-pitch stops, preventing the pitch from increasing further due to the action of the feathering spring.

One safety feature inherent in this method of feathering is that the propeller will feather if the governor oil pressure drops to zero for any reason. As the governor obtains its supply of oil from the engine lubricating system, it follows that, if the engine runs out of oil or if oil pressure fails due to breakage of a part in the engine, the propeller will feather automatically. This action may save the engine from further damage in case the pilot is not aware of trouble.

***NOTE: The HC-C( )Y( ) and HC-E( )Y( ) models utilize compressed air plus a mechanical spring or counterweight to feather the blades.**

OPERATING ADVISORY FOR AIR-CHARGED PROPELLERS

The purpose of these instructions is to advise pilots of indications of loss of air in air charged propellers. Since in most cases the operation of propeller is unaffected by loss of air charge, it is advisable to maintain the recommended pressures at all times. The aircraft flight manual has precedence over these instructions.

1. Propellers having air charge to feather using counterweights or spring assist to high pitch, ( )HC-( ) (2,3) Y (K,R,F)-2( )( ) C ( )( )( )( ); letter "S" after -2 suffix in hub model designates spring; letter "C" in prefix of blade model designates counterweights.
   a. If the air charge is lost, or low, the pilot may notice the following:
      1) Preflight feathering check will be sluggish or slow.
      2) RPM control may be sluggish in flight, particularly in the direction of reducing RPM.
      3) Slight overspeed or poor synchronization at the upper end of the cruising speed range.
      4) Propeller overspeed with throttle burst, poor RPM recovery.
   b. In the event of lost air charge the pilot should:
      1) In the event of any of the above signs, reference Propeller Service Manual for corrective action.
      2) In case of propeller overspeed in flight, the throttle should be reduced first and then the airspeed reduced to the point where RPM control is regained, but not below the best single-engine rate of climb speed as published in the aircraft's flight manual. Slowly add throttle to regain power without overspeeding the propeller. Once proper RPM and power is recovered, hold the airspeed well below that at which overspeed occurred. Flight can be continued at reduced speed without further incident, except feathering capability is lost in the case of the "C" prefix.

2. Propellers having air charge to feather **without counterweights and with spring assist** will be identified with the letter "S" following the -2 suffix in the propeller model number. The **absence** of the "S" indicates the air charge only is employed to feather or move the propeller servo system to a higher pitch.

3. Propellers having air charge to feather **with counterweights and spring assist** will be identified with the letters "T" or "U" following the -2 suffix in the propeller model number. The absence of the "T" or "U" indicates the air charge and counterweights only are employed to feather or move the propeller servo system to a higher pitch.

The following are control procedures to follow in case air charge is inadvertently lost:

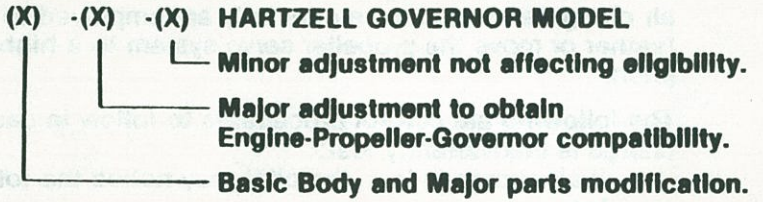
a. If air charge is lost, the pilot may notice the following:
   1) The propeller will not change pitch on preflight feathering check.
   2) RPM will increase in flight as power and airspeed are increased, and propeller RPM control has no effect.

b. In the event of lost air charge, the pilot should:
   1) Check air charge pressure if propeller does not change pitch on the ground feathering check.
   2) In case of a propeller overspeed in flight, the throttle should be reduced first, then maintain an airspeed at which RPM will not exceed rated. Keep the airspeed at or above the best single-engine rate of climb airspeed as published in the aircraft's flight manual.
   The propeller will operate at a fixed low pitch blade angle with no feathering capability. Control RPM with throttle and airspeed. Only a slight amount of throttle may be added without overspeeding the propeller.
   Flight can be continued to nearest airport.

(a) Hartzell Governors

Hartzell Governors are new governors of different designs than the Woodward X210XXX Series, reworked in some instances to produce the desired results. These governors are listed in following table.

HARTZELL GOVERNOR DESIGNATION



A 1A1, 1Q12, 1M12, 1P12 modified
(Base reworked - B-149
Exception: A-1-1 - base not reworked)

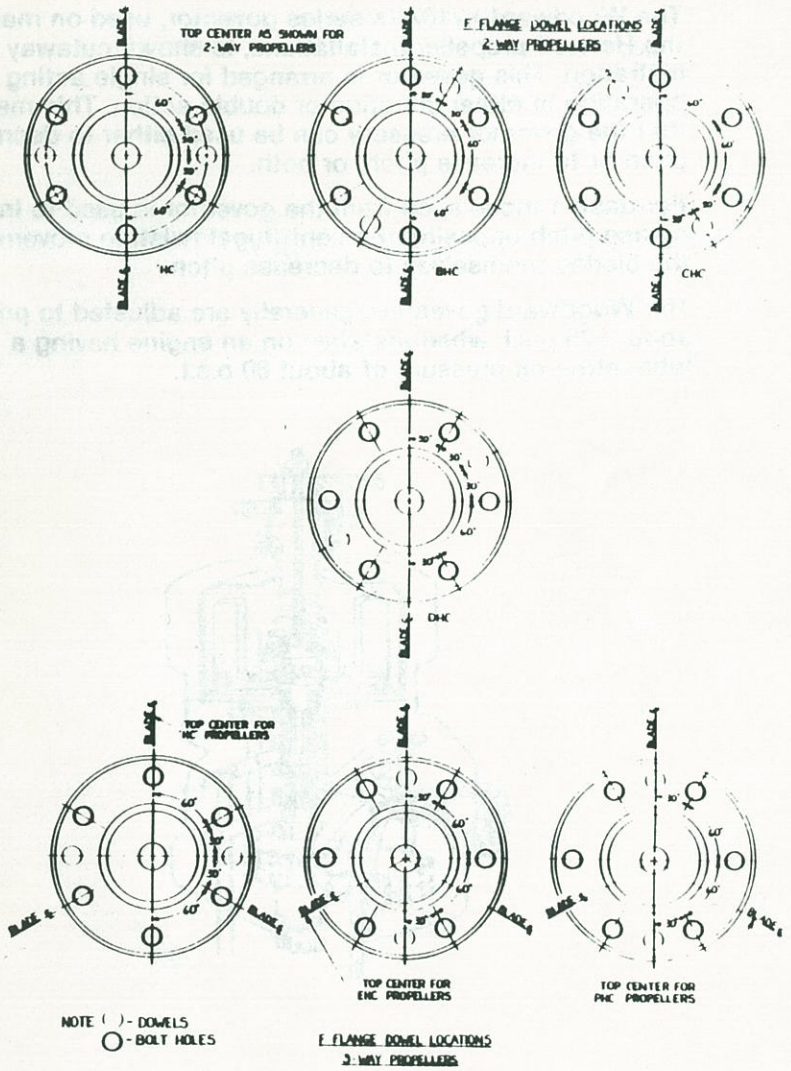
B 1Q12, 1P12, 1M12
(Head, body, base)

C 1A2-G5

D 1M12, 1Q12, 1P12
(Modified to reverse sense, incorporating new spool)

E 1A1, 1Q12, 1M12, 1P12
(Modified base reworked B-149, 52141 drive gear)

F 4G8


TOP CENTER AS SHOWN FOR
2-WAY PROPELLERS
HC
E FLANGE DOWEL LOCATIONS
2-WAY PROPELLERS
BHC
CHC
DHC
TOP CENTER FOR
HC PROPELLERS
TOP CENTER FOR
ENC PROPELLERS
TOP CENTER FOR
PHC PROPELLERS
NOTE ( ) - DOWELS
O - BOLT HOLES
E FLANGE DOWEL LOCATIONS
3-WAY PROPELLERS

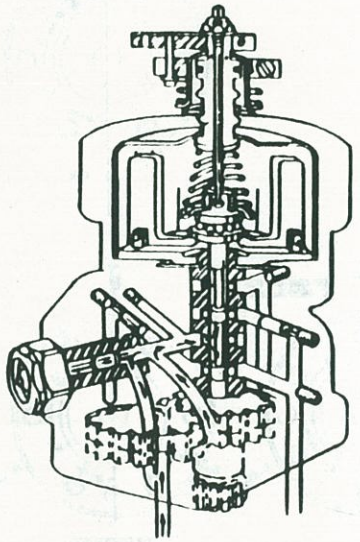
Governor Description

(b) Woodward Governors

The Woodward X210XXX series governor, used on many of the Hartzell propeller installations, is shown cutaway in illustration. This governor is arranged for single acting operation in either direction or double action. This means that the governor pressure can be used either to decrease pitch or to increase pitch, or both.

For dash 1 models, oil from the governor is used to increase pitch opposing the centrifugal twisting movement of the blades themselves to decrease pitch.

The Woodward governors generally are adjusted to produce about 275 p.s.i. when installed on an engine having a lubricating oil pressure of about 60 p.s.i.



Hartzell Propeller
Manual No. 115 N

PROPELLER MAINTENANCE RECORD

LEFT ENGINE

Hub Model HC-C3YF-1RF

Blade Design F8468A-8R

Diameter _____

Hub Ser. No. EC-1375A

Blade Ser. Nos. _____

No. 1 H79271

No. 2 H79273

No. 3 H79270

No. 4 _____

PITCH RANGE

High 32 ± 1.0 Low 10 ± .2

Feather _____ Reverse _____

Governor Model _____

Hartzell Propeller
Manual No. 115 N

RIGHT ENGINE

Hub Model _____

Blade Design _____

Diameter _____

Hub Ser. No. _____

Blade Ser. Nos. _____

No. 1 _____

No. 2 _____

MAINTENANCE RELEASE

TYPE OF UNIT Governor SERIAL No. 2346314T
MANUFACTURER Woodward
MODEL P210452

The component identified above was repaired and inspected in accordance with current Regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair are on file at this agency under
WORK ORDER No. 99018 DATE 7-15-96
SIGNED Conrad T. Maxwell FOR

MAXWELL AIRCRAFT SERVICE, INC.
CRYSTAL AIRPORT • MINNEAPOLIS, MINN. 55429
FAA Approved Repair Station No. UF2R211L

(over)

MAINTENANCE RELEASE

TYPE OF UNIT Propeller SERIAL No. EC-1375A
MANUFACTURER Hartzell
MODEL HC-C3YF-1RF/F8468A-8R

The component identified above was repaired and inspected in accordance with current Regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair are on file at this agency under
WORK ORDER No. 98159 DATE 12-26-95
SIGNED Conrad T. Maxwell FOR

MAXWELL AIRCRAFT SERVICE, INC.
CRYSTAL AIRPORT • MINNEAPOLIS, MINN. 55429
FAA Approved Repair Station No. UF2R211L

(over)

Blade Ser-Nos. H79270, H79271 & H79223
Overhauled Propeller.
Complied with AD 77-12-06 paragraph (a)(3) effective 12-21-77 in accordance with Hartzell Bulletin #118D.
Complied with Hartzell Bulletins #31, #136H, #142B & #212.
Complied with Hartzell Service Letters #12, #61S, #143A & #148A.
Complied with Hartzell Instructions #144G, #152A & #185.

Overhauled Governor
Complied with Woodward Bulletins #33531, #33570 & #33572

Hartzell Propeller
Manual No. 115 N

DESCRIPTION OF ALL OPERATIONS PERTAINING TO AIRWORTHINESS DIRECTIVES, SERVICE BULLETINS, SERVICE LETTERS, & MINOR ADJUSTMENTS

DATE	TACH TIME	DESCRIPTION OF WORK	SIGNATURE
9/2/95	2509.3	Installed on Cessna A185F, N8393S per Hartzell Propeller, Inc's STC No. SA1443NM. Maxwell Aircraft Service, Inc, CRS # UF2R211L, Repair Order No 91737.	Conrad S. Maxwell 2386511
10-2-95		Serviced propeller only as needed to repair loose blades - No. 1 & No. 3. (Hartzell warranty. Corrected pitch, track & balance. Maxwell Aircraft Service, Inc, Mpls/MN CRS # UF2R211L, Repair Order No. 91838.	
		Conrad S. Maxwell	2386511
12-26-95		Overhauled Propeller. Complied with AD 77-12-06 paragraph (a)(3) effective 12-21-77 in accordance with Hartzell Bulletin # 118D. Complied with Hartzell Bulletins #31, #136H, #142B & #212. Complied with Hartzell Service Letters #12, #15, #143A & #148A. Complied with Hartzell Instructions #144G, #152A & #185. Maxwell Aircraft Service, Inc. Mpls, Mn. CRS # UF2R211L, Repair order no 98159	
		Conrad S. Maxwell	2386511

DESCRIPTION OF ALL OPERATIONS PERTAINING TO AIRWORTHINESS DIRECTIVES, SERVICE BULLETINS, SERVICE LETTERS, & MINOR ADJUSTMENTS

DATE	TACH TIME	DESCRIPTION OF WORK	SIGNATURE
9-4-96	2539.3	I CERTIFY THIS Prop HAS BEEN INSPECTED I/A/W Annual INSPECTION AND IS DETERMINED TO BE IN AN AIRWORTHY CONDITION. David Anderson A+P 5202693 IA	
		DATE 2-23-97 TACH OR HOBBS TIME 2556.3 1855 DYNAMICALLY BALANCED PROP/SPINNER COMBINATION IN ACCORDANCE WITH INSTRUCTIONS SET FORTH BY THE PROP MANUFACTURER AND/OR CHADWICK-HELMUTH PUBLICATION AW-9511-2. DYNAMIC BALANCE WEIGHTS MUST BE REMOVED AFTER PROP OR ENGINE OVERHAUL. INITIAL "IPS" .44 FINAL "IPS" .02 BALANCED BY [signature] A&P # 130580057 HARMONY AVIATION DOUG SHEARS 1-800-774-6225	
10-10-97	2615.0	I CERTIFY THIS Propeller HAS BEEN INSPECTED I/A/W Annual INSPECTION AND IS DETERMINED TO BE IN AN AIRWORTHY CONDITION. David Anderson A+P 5202693	

DSS MICROVIB BALANCE HISTORY # 1

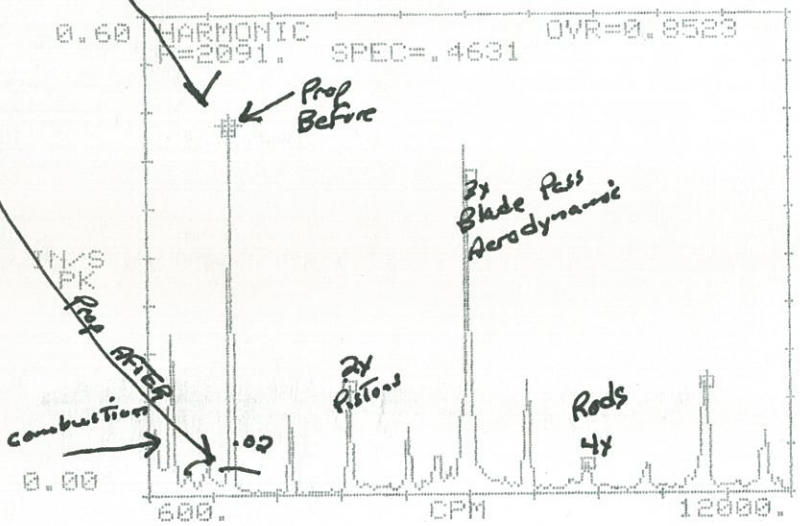
DATE: 2-23-97 A/C MODEL: 185 TAIL #: 18355 ENG MODEL:

RUN	TYPE	RPM	VIB LEVEL	PHASE	WT1	LOC1	WT2	LOC2	SENS	TACH
1	L	2086.5	0.443 IN/S	244.1	30.0	217	0.00	0	68.0	80
2	L R	2088.3	0.025 IN/S	52.2	28.4	217	0.00	0	64.3	79

MECHANIC SIGNATURE: App 130580057 ENG TIME: Tach 2556.

DSS MICROVIB ANALYSIS REPORT

DATA DESCRIPTION=[AS001] SPEC01
DATE/TIME:



FREQ	PEAK	FREQ	PEAK	FREQ	PEAK	FREQ	PEAK
211.1	1.449	2091.	0.4631	5940.	.03397	8371.	.04293
698.9	.08893	3140.	0.1096	6266.	0.4943	9445.	.04129
1042.	0.2226	4181.	0.1475	6887.	.01929	10140.	.02050
1354.	.03346	5201.	.08906	7340.	0.1551	10475.	0.1737
1672.	.04269	5728.	.05486	8072.	.02102	11539.	.08078

DESCRIPTION OF ALL OPERATIONS PERTAINING TO AIRWORTHINESS DIRECTIVES, SERVICE BULLETINS, SERVICE LETTERS, & MINOR ADJUSTMENTS

DATE	TACH TIME	DESCRIPTION OF WORK	SIGNATURE
4348	26 7517	I CERTIFY THIS Prop HAS BEEN INSPECTED I/A/W 100hr Annual INSPECTION AND IS DETERMINED TO BE IN AN AIRWORTHY CONDITION. Leslie Blount A&P 263502653	
		04/13/2000 TACH TIME 2730.0 PROP TT. 220.7 TSPOH 190.8 COMPLETED 100 HOUR INSPECTION OF PROP ON THIS DATE. ALL ROUTINE MAINTENANCE AND LUBRICATION ACCOMPLISHED. I CERTIFY THAT THIS PROPELLER HAS BEEN INSPECTED IN ACCORDANCE WITH A 100 HOUR INSPECTION AND IS APPROVED FOR RETURN TO SERVICE. A&P 468583936	
5-24-01	Tach 2751.3 I certify that this prop was inspected for 100hr inspection and found to be Airworthy Leslie Blount A&P 263502653		

Hartzell Propeller
Manual No. 115 N

DESCRIPTION OF ALL OPERATIONS PERTAINING TO AIRWORTHINESS DIRECTIVES, SERVICE BULLETINS, SERVICE LETTERS, & MINOR ADJUSTMENTS

DATE	TACH TIME	DESCRIPTION OF WORK	SIGNATURE
5/23/03		Overhauled propeller in accordance	
		with Hartzell Manuals 113B Rev. 26, 133C	
		Rev. 14 & 202A Rev. 17. Complied with	
		Hartzell Bulletins 118F, 136I, Service	
		Letters 61X, 184, 189 Rev. 1, 190, 217 &	
		Instructions 152A. Maxwell Aircraft	
		Service, Inc, Mpls, MN, CRS# UF3R211L,	
		Repair Order No. 108157. Cust. Mayfield 2386511	
6/10/03	2910.0	Installed This Propeller on N8355	
		ground ran good, Leslie Blount A+P 2653	
5/15/05	2983.6	PERFORMED 100hr INSPECTION &	
		CHECKED AD's Kenneth Jubel	
		A+P 2656709	
4/18/06	3002.0		
		I CERTIFY THIS Prop HAS BEEN INSPECTED I/A/W 100 hr INSPECTION AND IS DETERMINED TO BE IN AN AIRWORTHY CONDITION. Leslie Blount A+P 2637	
		S/N _____ WAS INSPECTED ON THIS DATE I/A/W FAA ACTION NOTICE AND FOUND TO MEET THE REQUIREMENTS OF FAR 91.207(D)	

MAINTENANCE RELEASE

TYPE OF UNIT Propeller SERIAL No. EC-137SA

MANUFACTURER Hartzell

MODEL HC-C3YF-1RF/F8468A-8R

The component identified above was repaired and inspected in accordance with current Regulations of the Federal Aviation Administration and is approved for return to service. Pertinent details of the repair are on file at this agency under

WORK ORDER No. 108157 DATE 5-23-03

SIGNED Carol P. Maxwell FOR

MAXWELL AIRCRAFT SERVICE, INC.

CRYSTAL AIRPORT • MINNEAPOLIS, MINN. 55429

FAA Approved Repair Station No. UF2R211L

(over)

Blade Ser. Nos. H79270, H79271 & H79273
Overhauled Propeller in accordance with Hartzell
Manuals 113B revision 26, 133C revision 14 & 202A
revision 17.
Complied with Hartzell Bulletins #118F & #136I
Complied with Hartzell Servie Letters #61X, #184,
#189 revision 1, #190 & #217.
Complied with Hartzell Instructions #152A.

DESCRIPTION OF ALL OPERATIONS PERTAINING TO AIRWORTHINESS DIRECTIVES, SERVICE BULLETINS, SERVICE LETTERS, & MINOR ADJUSTMENTS

DATE	TACH TIME	DESCRIPTION OF WORK	SIGNATURE
3/5/8	3037.4	I CERTIFY THIS Prop HAS BEEN INSPECTED I/A/W Annual 100 hr INSPECTION AND IS DETERMINED TO BE IN AN AIRWORTHY CONDITION.	Kyle Wayne Pt 136250653

Propeller Logbook

04-14-2009
N83SS
Hartzell HC-C3YF-1RF
s/n: EC-1375A

ACTT: 3255.4 TACH: 3048.4
ETT: 3390.5 ETSO: 851.1 PTT: 539.1 PTSO: 138.4

I certify that this propeller has been inspected in accordance with a Annual/100-hour inspection and was determined to be in airworthy condition.

Wyat Hatz A&P2706256IA

Propeller Logbook

04-29-2010
N83SS
Hartzell HC-C3YF-1RF
s/n: EC-1375A

ACTT: 3257.5 TACH: 3050.5
ETT: 3392.6 ETSO: 853.2 PTT: 541.2 PTSO: 140.5

I certify that this propeller has been inspected in accordance with an Annual/100-hour inspection and was determined to be in airworthy condition.

Wyat Hatz A&P2706256IA

HARTZELL PROPELLER INC.
Manual No. 115N

DESCRIPTION OF ALL OPERATIONS PERTAINING TO AIRWORTHINESS DIRECTIVES, SERVICE BULLETINS, SERVICE LETTERS,

Propeller Logbook

04-29-2011
N83SS
Hartzell HC-C3YF-1RF
s/n: EC-1375A

ACTT: 3263.7
TACH: 3056.7
ETT: 3398.8
ETSO: 859.4
PTT: 547.4
PTSO: 146.7

I certify that this propeller has been inspected in accordance with an Annual/100-hour inspection and was determined to be in airworthy condition.

Wyat Hatz A&P2706256IA

PROP LOG ENTRY

DATE	TACH	MAKE/MODEL	N-NUMBER	SERIAL #	TOTAL TIME	SOH
April 30, 2012	3062.8	Hartzell HC-C3YF-1RF	N83SS	EC1375A	553.5	152.8

Completed an annual inspection in accordance with FAR 43 appendix D. Completed AD research through current bi-weekly, no new ADs found. Greased prop with Aeroshell 5 I/A/W Hartzell MM not to exceed 1 oz. per hub /blade. I certify that this propeller has been inspected in accordance with an annual inspection and was determined to be in airworthy condition.

Central Wisconsin AVIATION

Corey Marschke A&P 2716624IA

PROP LOG ENTRY

DATE	TACH	MAKE/MODEL	N-NUMBER	SERIAL #	TOTAL TIME	SOH
June 27, 2013	3076.1	Hartzell HC-C3YF-1RF	N83SS	EC1375A	566.8	166.1

Removed the above propeller from Cessna A185F s/n: A185F02166 with engine IO-520-D s/n: 556243 and sent to Maxwell aircraft and overhaul..

Central Wisconsin AVIATION

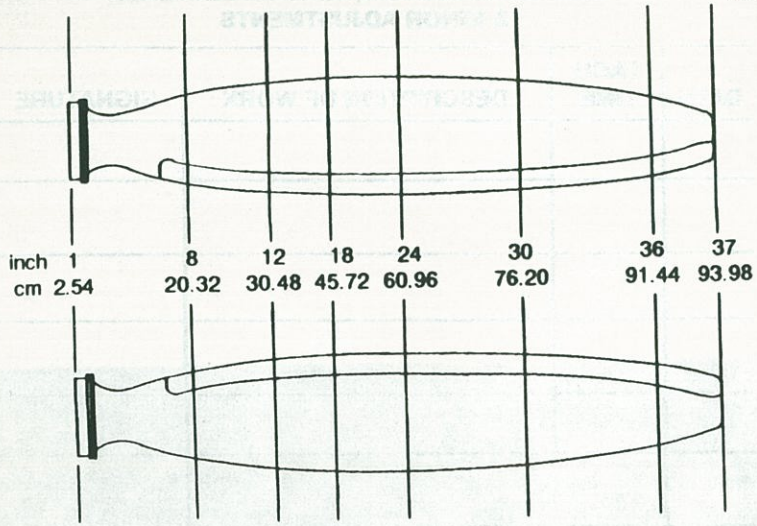
Corey Marschke A&P 2716624

Record of Model B7466 Composite Blade Damage Repair

Blade Design _____

Blade Serial Number _____

APS-910



Location of Damage

Date of Entry	Flight Hours	Degree of Damage (airworthy/unairworthy) Description of Damage	Description of Repair	Repaired By

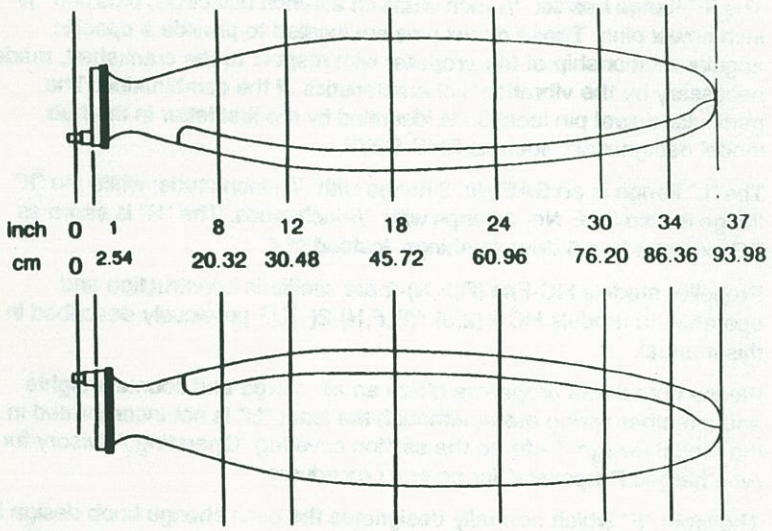
HARTZELL PROPELLER INC.
Manual No. 115N

Record of Model B7421 Composite Blade Damage Repair

Blade Design _____

Blade Serial Number _____

APS-911



Location of Damage

Date of Entry	Flight Hours	Degree of Damage (airworthy/unairworthy) Description of Damage	Description of Repair	Repaired By

Propeller Installation Instructions

The Compact propellers are manufactured with five basic flange mountings: "F" flange, "L" flange, "K" flange, "R", and "N".

The "F" flange has six 1/2-inch studs on a 4-inch bolt circle, plus two 1/2-inch dowel pins. These dowel pins are located to provide a specific angular relationship of the propeller with respect to the crankshaft, made necessary by the vibrational characteristics of the combination. The particular dowel pin location is identified by the first letter in the hub model designation, such as BHC-C2YF.

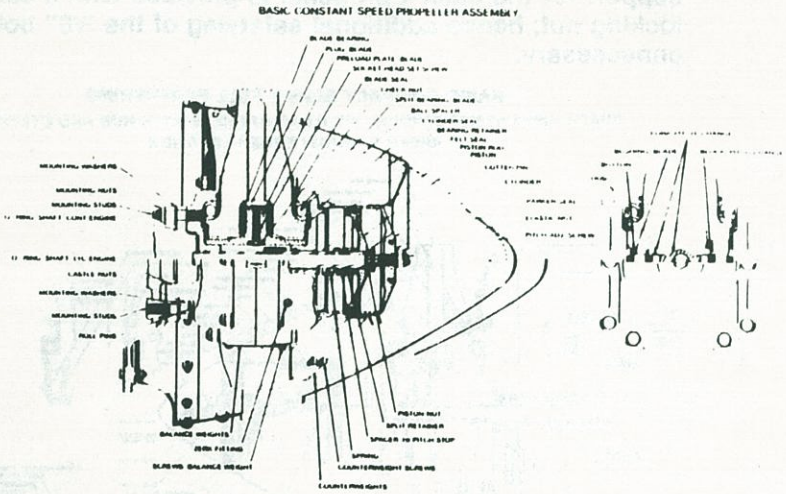
The "L" flange is an SAE No. 2 flange with 7/16-inch studs; while the "K" flange is also SAE No. 2 flange with 1/2-inch studs. The "R" is same as "K" except it has 5 drive bushings, instead of 4.

Propeller models HC-F4Y(R,F,N)-2 are similar in construction and operation to models HC-F(2,3)Y(R,F,N)-2( )UF previously described in this manual.

Please note these propellers utilize an air charge and counterweights and a feather spring assist although the letter "U" is not incorporated in the model design. Refer to the section covering "Operating Advisory for Air-Charged Propellers" for control procedures.

The letter "F" which normally designates the pitch change knob design is approved for use. The "F" is still required on the blade design to distinguish between large and small knob blades. Only the large knob blade is approved for use in the HC-F4Y(R,F,N)-2 propeller.

Hartzell Propeller
Manual No. 115 N



FOR INFORMATION ONLY — NOT TO BE USED AS SPECIFIC PART REFERENCES

A. Installation of "F" and "N" Flange

Models — ( ) HC-C ( ) Y ( ) -1, -2, -4 ( ) ( ) ( )
( ) HC-J ( ) YF-1 ( ), -2, -4 ( ) ( ) ( )
( ) HC-F ( ) Y ( ), -2 ( ) ( ) ( )
( ) HC-L ( ) YF-1 ( ), -2, -4, ( ) ( ) ( )
( ) HC-H ( ) Y ( ) -1, -2, -4 ( ) ( ) ( )

1. Install the spinner bulkhead on the propeller hub, using the four long bolts which clamp the two halves together. In most cases, extra long bolts are furnished with the spinner, together with the proper spacers. Torque these 3/8-24 nuts to 22 ft. lb.

2. Clean the engine shaft and hub flange.

3. "F" flange — Insert the PRP-909-6 "O" ring into groove located inside the hub at the flange mounting.

3b. "N" flange — Insert the PRP-914-45 "O" ring into the groove located inside the hub at the flange mounting.

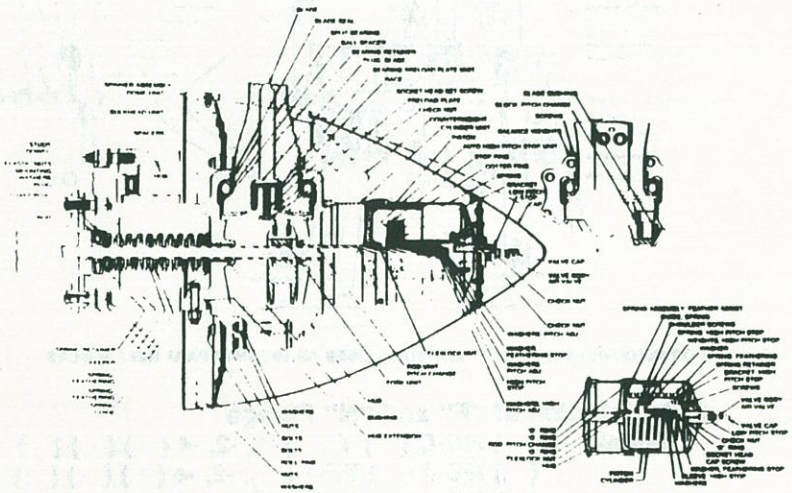
4. Install the propeller on the engine shaft.

4a. "F" flange — Torque the ½" nuts to 60-70 ft. lb. except Continental IO 520 which is 70-80 ft. lb. torque.

4b. "N" flange — Torque the 9/16" nuts to 90 to 100 ft. lb.

5. Install spinner dome. Attach nose spinner to hub support as shown for either the dash 1, 4 or 2 designs. The spinner support for the dash 1 propeller is provided with a self-locking nut; hence additional safetying of the 3/8" bolt is unnecessary.

BASIC COMPACT SERIES FULL FEATHERING
FEATHERING ASSIST SPRINGS ARE ILLUSTRATED IN BOTH HUB AND CYLINDER AREAS TO SHOW EITHER LOCATION



B. Installation of "L", "K", "R", and "N" Flange Models HC-(C, E, F, G, H, J, L)(2, 3, 4,)Y(L, K, R)-(1, 2, 4,)

1. Install spinner adaptor ring to engine starter gear.

2. Clean engine shaft and propeller hub at flange.

3. Insert the PRP-909-6 "O" ring into the groove located inside the flange mounting.

4. Install propeller onto engine shaft. Torque the 7/16" studs used in the "L" flange to 50 ft. lb. Torque the 7/16 bolts or studs used in the "L" flange propellers to 50 ft. lb., the ½ bolts on studs used in the "K" and "R" flange propellers to 60-70 ft. lb., and the A-3254 stud used in the "N" flange propellers to 90 ft. lbs. Wire safety pairs of studs or bolts together. (Exception: For IO-720 engine, use 90-100 lb. ft.)

5. Install spinner dome. The spinner nose is supported by the cylinder, only for the feathering models. Wire safety the nut used to secure the nose in place.

NOTE: When installing the HC-E2YL-2BS propellers (which have spring kits installed) on the PA-30 or PA-39 aircraft, be sure that the front inside of the **engine** shaft does **not** contain the spring assembly, consisting of: A-2488 sleeve, 9-2410-31 spring, A-2487 thimble, and A-2496 shim. These parts are no longer needed.

C. Installation of Models (B)HC-I2YF-1( )F

These models are identical to the (B)HC-C2YF-1( )F except for the location of the blade centerline with respect to the shaft mounting surface. This is a solid metal 2 inch extension.

(B)HC-C2YF-1( ) - 3.25 inches
(B)HC-I2YF-1( ) - 5.25 inches

D. Installation of Models (B)HC-I2YF-4( )F

These models are identical to the (B)HC-C2YF-4( )F except for the location of the blade centerline with respect to the shaft mounting surface. This is a solid metal 2 inch extension.

(B)HC-C2YF-4( ) - 3.25 inches
(B)HC-I2YF-4( ) - 5.25 inches

E. Adjustments

1.STATIC RPM

The low pitch stop on the propeller should be set to obtain take-off RPM, or about 50 RPM below, during engine runup on the ground. This stop is normally set for each application at the factory. In the event that an adjustment is required, this can be accomplished by adjusting the screw in the nose of the cylinder. Backing the screw out ½ turn will increase the static RPM about 100; or vice versa.

CAUTION

Before adjusting the low stop screw on the Feathering Propeller, the air pressure must be dropped to zero. Unless this is done, it is possible to unscrew the low stop far enough to disengage the threads, allowing the pressure to blow the low stop screw out with great force. There must be at least four threads engaged during normal operation. Replace air as per applicable charging instructions.

The high RPM stop on the governor should be set for take-off RPM.

2. There is no high pitch stop adjustment for either the constant speed or feathering propellers.

3. The feathered blade angle for the dash 2 propellers can be adjusted by adding or removing shims. Adding shims increases the feathered angle.

In order to test whether the governor or the propeller low stop is limiting the static RPM, the operator can run the engine up on the ground. With the throttle wide open, increase RPM slowly with the RPM control. If the propeller low stop is limiting the RPM, the RPM will stabilize before the RPM control reaches the limit of its travel. If the RPM increases continuously during the entire movement of the RPM control, the governor is limiting the static RPM and not the propeller low stop. As mentioned above, it is desirable that the propeller stop limit the RPM to about 50 below the engine rating, so that in the event the governor malfunctions during takeoff, the propeller will overspeed a minimum amount.

(b) High Pitch Stop

The high pitch stop is of significance only for non-feathering propellers. This stop is set at the factory and cannot be adjusted for this model.

(c) Feathering Pitch Stop

The feathering stop should be adjusted such that the propeller will stop turning when the propeller is feathered.

For the "Compact" air feathering propeller HC-E2Y( )-2, the feathering stop can be adjusted by adding or removing shims in the location shown. Adding shims increases the feathering angle. In order to make this adjustment, first let out the air from the cylinder, then remove the low stop adjusting screw. Use a socket key wrench to remove the feathering stop screw. After the adjustment has been made, reinstall the feathering stop screw with "Locktite #222" on the screw threads. Torque to 19 - 23 ft lb.

(d) Charging the Feathering Propeller with Air

Using proper control, charge the cylinder with dry air or nitrogen to a pressure according to table which is on the spinner cap or side of the cylinder. (Hartzell tool part no. BST-2806 is available for this purpose.) The basic pressures are:

(a) HC-( )2Y(L, K)-2 which do not have spring kits, 175 PSI at 70°F.

(b) HC-( )2Y( )-2U( )S which have spring kits, 50 PSI at 70°F.

(c) HC-( )2Y(K, R)-2RBS which have spring kits, 70 PSI at 70°F, which do not have spring kits.

(d) All propellers having blade counterweights, 80 PSI at 70°F, which do not have spring kits.

(e) HC-C3YN-2( )( )( ) on Piper PA-31P aircraft with feather assist spring assembly kit A-1588A, 41 PSI at 70°F.

(f) All ( )HC-E( )Y( )-2( )S counterweighted propellers with feather assist spring assembly kit A-1587 or A-1587-1, 41 PSI at 70°F.

(g) All ( )HC-(*)(2, 3)Y( )-2( )( ) counterweighted propellers; (*) except "E" extension; with feather assist spring assembly kit A-1588A, 41 PSI at 70°F.

(h) BHC-C2YF-2C(L)KUF on Piper PA-34-200T with feather assist spring assembly kit A-1588A, 22 PSI at 70°F.

Operating Instructions

(a) Normal Control

1. The governor control is arranged to provide HIGH RPM when full forward and LOW RPM when pulled back. The governor will control over a certain RPM band, which can be covered by moving the control through a portion of its travel at the forward end of its range when the throttle is well forward.

2. Most ground operation of the aircraft is done with full forward position of the governor, so starting and stopping should likewise be done in low pitch, although there is no reason why other settings could not be used.

3. An operational check of the governor and propeller should be made during run up.

4. Take-off should be made with propeller setting FULL IN to obtain take-off RPM.

5. During landing the propeller control should be FULL IN so that propeller will act as a brake and be in position for immediate take-off if necessary.

(b) Feathering Procedure

1. Feather the propeller several times after installation is made in order to purge air from the system. Partially feather each propeller during each pre-flight check; but feathering action should be stopped when 500 RPM is lost.

2. Feathering on the ground is accomplished by reducing RPM with throttle to 1000-1500 propeller speed and pulling propeller control FULL BACK against the stop. Do not feather when operating at high manifold pressure. Unfeathering is accomplished by returning propeller control to normal range with engine running.

3. Emergency feathering in flight is accomplished by pulling back on propeller control to limit of travel.

4. Unfeathering in flight is accomplished by starting the engine with propeller control in low RPM range, or about halfway between each end of travel. Engine should be idled until it becomes warm before increasing power.

Service Instructions

(a) Propeller Care

1. Avoid operation of aircraft in areas with loose stone or gravel that could be pulled into the blades, causing damage to the blade face or leading edge. When initiating take-off from a non-hard surface runway, allow the aircraft to build up speed prior to opening the throttle. Keep blade clean of stains and foreign matter. DO NOT move aircraft by pulling on propeller blades.

2. IMPORTANT - Nicks, gouges, and scratches in the leading or trailing edge and on the blade surfaces, both face and camber sections, must all be removed prior to flight. Operating in conditions as this may produce a condition in which fatigue cracks will start and blade failure will occur. A small nick may be as detrimental as a larger one. It is extremely important that all nicks be removed prior to each aircraft operational period. Nicks in the outer 18 inches of the propeller diameter must be treated as critical. This is the area of highest vibratory blade stress.

3. How to Properly Repair Nicked Blades - Tools Required:
Fine cut round and flat files
Emery tape or cloth
10X magnifying glass
Crocus cloth
Dye penetrant

Propeller blades with nicks, gouges, scratches, and leading edge pitting can be repaired most often by a qualified mechanic in the field. Blades with larger nicks, gouges, etc. that may affect the structure, balance, or operation of the propeller should be referred to a qualified propeller repair station for repair or replacement. There is normally sufficient material available to allow a number of repairs prior to replacement.

Local Repairs: This repair may be made using files, small air or electrical powered equipment with suitable grinding and polishing attachments. All repairs must be accomplished parallel to the blade axis.

a) For damaged areas in the leading or trailing edge, begin with a round file removing damaged material to the bottom of the damaged area. Remove material from this point out on both sides, providing a smooth faired depression, maintaining the original airfoil concept. Using emery cloth, the area must now be smoothly faired, removing all traces of initial filing and rework. Crocus cloth may then be used to polish the area. When all rework has been completed, inspect the reworked area with a 10X magnifying glass and dye penetrant, assuring no indications of damage or cracks remain.

b) Damaged areas on the face of camber sections of the blade are to be reworked employing the same methods as the leading edge. However, repairs that form a continuous line across the blade section are **not acceptable.**

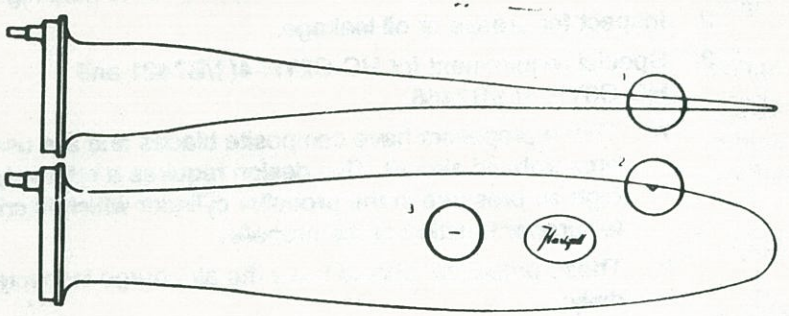
c) All repaired areas are to be chemically treated to prevent corrosion. Alodine or Hartzell Polane paint must be properly applied to the repaired area prior to return to service.

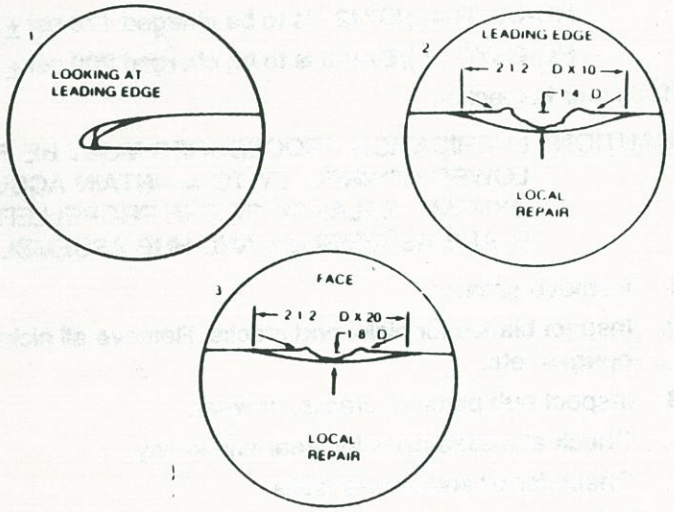
CAUTION

All methods such as leading edge rolling or cold working which will result in **moving** metal covering and possibly concealing damage are not acceptable.

CAUTION

Small nicks and gouges are just as detrimental as large ones. Repairs must be made immediately to prevent propeller failure.





TO DETERMINE THE NEEDED AMOUNT OF REWORK, USE THE FOLLOWING FORMULA
- LEADING AND TRAILING EDGE DEPTH OF NICK x 10
- FACE AND CAMBER DEPTH OF NICK x 20

NOTE: LOCAL WIDTH OR THICKNESS REPAIR DEPTH MAY NOT EXCEED THE MANUFACTURERS MINIMUM REPAIR TOLERANCE.

Repair Limitations

4. Steel hub parts must not be permitted to rust. When the cadmium plating is worn off, the surface should be cleaned, treated, and Hartzell polane paint applied. Replate and bake parts at overhaul. Inspect all parts for wear or fretting and lubricate as per inspection procedure.

(b) Daily Inspection Procedure

1. Inspect blades for nicks, gouges, etc., spinner and visible hub parts for damage or cracks. Repair prior to next flight.
2. Inspect for grease or oil leakage.
3. Special requirement for HC-C2YR-4( )/B7421 and HC-C3YR-4( )/B7466.

a. These propellers have composite blades and are used on acrobatic aircraft. This design requires a relatively high air pressure in the propeller cylinder which is critical for proper function of the propeller.

b. These propellers should have the air charge inspected daily:

HC-C2YR-4( )/B7421 is to be charged 178 psi ± 10 psi.

HC-C3YR-4( )/B7466 is to be charged 200 psi ± 10 psi.

(c) 100 Hour Inspection

CAUTION: LUBRICATION PROCEDURES MUST BE FOLLOWED CORRECTLY TO MAINTAIN ACCURATE DYNAMIC BALANCE OF THE PROPELLER BLADE ASSEMBLIES AND HUB ASSEMBLY.

1. Remove spinner.
2. Inspect blades for nicks and cracks. Remove all nicks, gouges, etc.
3. Inspect hub parts for cracks, or wear.
4. Check all visible parts for wear and safety.
5. Check for oil and grease leaks.
6. Lubricate the propeller assembly:

CAUTION: REMOVE THE LUBRICATION FITTINGS ON ONE HALF OF THE HUB UNIT BEFORE ADDING GREASE THROUGH THE LUBRICATION FITTINGS ON THE OTHER HALF OF THE HUB.

CAUTION: USE HARTZELL APPROVED LUBRICANTS ONLY.

a. Remove the grease fittings from the engine-half of the hub unit.

b. Add an equal number of pumps of grease, a maximum of one (1) ounce, through each of the grease fittings on the cylinder-half of the hub unit.

NOTE: 1 ounce is approximately 6 pumps with a hand held grease gun.

c. If necessary, work a probe (such as a loop of wire) in and out of the open holes in the engine-half of the hub to help release air pockets in the grease.

NOTE: Make sure the ball of each lubrication fitting is properly seated.

NOTE: The above procedure differs slightly from that for Hartzell steel hub propellers. This procedure is improtant becaruse if excessive grease is used, the hub cavity may unknowingly be filled with grease.

d. Make an entry in the Log Book verifying that this inspection has bee completed.

7. For feathering propellers which incorporate an air charge in the cylinder, check air pressure each 100 hours or one time each month, whichever comes first (except for -4 composite blade propellers which are to be checked daily).

8. Make an entry in this log book verifying this inspection.

(d) Overhaul Inspection (See Service Letter 61( ) for overhaul periods for specific propeller-engine/governor combinations).

1. Remove propeller and completely overhaul as per Hartzell overhaul manual and other applicable service requirements. Overhaul is to be accomplished only by a FAA (or foreighn equivalent) approved propeller repair station.

NOTE: Governor overhaul is recommended at same time intervals as engine.

2. Make an entry in this log book verifying that this inspection has been accomplished.

RECOMMENDED GREASES

The following greases are approved by Hartzell Propeller Inc.:

Aeroshell 5 with certain limitations, see Bulletin 159( )

Aeroshell 6

Aeroshell 7

Aeroshell 22

Exxon 5114EP

Royco 22C

NOTE: Other, previously issued, Hartzell documents indicate additional greases by brand name and/or MIL-specification. Not all of these greases meet our current performance standards. Hartzell has chosen to specify only those greases which have sufficient testing or field experience to establish that they are acceptable.

NOTE: For further information, see Service Advisory 17( ).

(This page is intentionally blank.)

HARTZELL SYNCHROPHASERS

All Hartzell synchrophasers operate in basically the same manner regardless of the synchrophaser model or the type of aircraft on which it is installed. The synchrophaser is designed to hold the engines in sync and phase after the pilot has manually synchronized the engines in the conventional manner.

Most installations have only two positions on the switch, Phase or Sync and Manual. The Manual position should be used for take-off, landing, single-engine operation, and while manually syncing the engines.

IMPORTANT

To attain a quick and positive response when operating this system, the engines should be synchronized by the pilot as close as possible with the Phase switch in the Manual position.

NOTE: Errors in tachometer readings and sound levels must be carefully considered when establishing the initial settings. By establishing this setting the system will be in its center-most position and allow for the automatic in-flight adjustment to attain synchronization and phasing of the engine firing order. These two features combined provide an ultra-smooth operation.

It is generally not necessary to return the switch to the Manual position during in-flight power changes after the initial cruise setttings have been made. However, if an out of sync condition should occur that the system does not seem to be able to correct, go to the Manual position for 30 to 45 seconds and resync the engines in the conventional manner. Then return the switch to the Phase or Sync position. Normal synchrophaser operation should resume. Field test equipment available from factory.

HARTZELL PROPELLER INC.
Manual No. 115N

Service Policy

It is the policy of Hartzell Propeller Inc. to provide a capable service organization throughout the world where Hartzell propellers are used, which can maintain propellers at maximum efficiency and with minimum cost and inconvenience.

A. Field Service Organizations

There are a number of Hartzell Propeller Distributors strategically located throughout the United Sates and the world. These distributors are carefully selected on their merits from the standpoint of having available:

1. Propeller service facilities.
2. Extensive Hartzell propeller service experience.
3. Spare propellers and parts maintained in inventory.

The distributor organization is being encouraged to set up exchange systems.

B. Other Aircraft and Propeller Service Organizations

There are a great number of service organizations that are capable of servicing Hartzell propellers in addition to the appointed distributors. These organizations deal directly with the nearest distributor for parts, new or reconditioned propellers, etc.

—NOTES—

Hartzell Propeller
Manual No. 115 N

IMPORTANT ANNOUNCEMENT

We wish to announce that Hartzell Propeller, Inc., Product Support, has placed into service for your convenience an after-hours telephone answering system.

When you use this system you will get a taped announcement after which you will be asked to leave your message. After doing so you may hang up and be assured your message has been recorded.

We invite you to use this system and appreciate the opportunity of being able to provide you with continuous service.

Our direct number is (513) 778-4376.

MAXWELL AIRCRAFT SERVICE, INC.

FAA Certified Repair Station UF2R211L

PROPELLER LOG BOOK

5800 Crystal Airport Rd.
Crystal, MN 55429

Phone: 763-533-8611
Fax: 763-533-3219

Crystal Airport
(MIC)

Logbook #_____

THIS SERVICE RECORD shall accompany the propeller equipment at all times. When equipment is installed as part of an Aircraft or engine, this record shall be maintained concurrently with and become a part of the Aircraft and Engine Service Records.

PROPELLER MAINTENANCE RECORD

Position _____

Propeller Model HC-C3YF-1RF

Propeller S/N EC-1375A

Blade Design F8468A-8R

Blade S/N's
No. 1 H79270

No. 2 H79271

No. 3 H79273

No. 4 _____

No. 5 _____

No. 6 _____

PITCH RANGE

High/Feather _____

Start Lock _____

Low _____

Reverse _____

Aircraft Manufacturer _____

Aircraft Model _____

S/N _____

Registration _____

1. Approving National Aviation Authority/Country:	2.	3. Form Tracking Number:
FAA/UNITED STATES	**AUTHORIZED RELEASE CERTIFICATE** FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG	118655

4. Organization Name and Address:	5. Work Order/Contract/Invoice Number:
MAXWELL AIRCRAFT SERVICE, INC. 5800 CRYSTAL AIRPORT ROAD MINNEAPOLIS, MN 55429	118655

6. Item:	7. Description:	8. Part Number:	9. Eligibility:*	10. Quantity:	11. Serial/Batch Number:	12. Status/Work:
1	HARTZELL PROPELLER	HC-C3YF-1RF/F8468A-8R	N/A	1	EC-1375A	OVERHAULED

13. Remarks:
BLADE SERIAL NUMBERS: H79270, H79271 AND H79273.
OVERHAULED PROPELLER IN ACCORDANCE WITH HARTZELL PROPELLER MANUALS: 113B REVISION 40, 133C REVISION 30, 159 REVISION 35 AND 202A REVISION 45.
COMPLIED WITH HARTZELL BULLETINS: 118F REVISION 1 AND 136I.
COMPLIED WITH HARTZELL SERVICE LETTERS: 61Y REVISION 3, 189 REVISION 2, 217, 229 REVISION 2, 267, 278 AND 293 REVISION 1.
COMPLIED WITH HARTZELL INSTRUCTIONS: 152A.

14. Certifies the items identified above were manufactured in conformity to:	19. ☒ 14 CFR 43.9 Return to Service ☐ Other regulation specified in Block 13
☒ Approved design data and are in condition for safe operation. ☐ Non-approved design data specified in Block 13.	Certifies that unless otherwise specified in block 13, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.

15. Authorized Signature:	16. Approval/Authorization No.:	20. Authorized Signature:	21. Approval/Certificate No.:
		Conrad E. Maxwell	UF2R211L
17. Name (Typed or Printed):	**18. Date:**	**22. Name (Typed or Printed):**	**23. Date (m/d/y):**
		CONRAD E. MAXWELL 2386511	JULY 18, 2013

User/Installer Responsibilities

It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.

Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/installer ensures that his/her airworthiness accepts parts/components/assemblies from the airworthiness authority of the country specified in Block1.

Statements in Blocks 14 and 19 do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.

FAA Form 8130-3 (6-01) *Installer must cross-check eligibility with applicable technical data. NSN: 0052-00-012-9005

Date	Propeller TSN	Propeller TSO	A/C Hrs	Description of all operations pertaining to Airworthiness Directives, Service Documents, Overhaul, Major or Minor Repair, and Inspections.
7/18/13	5668	0		07/18/2013 Overhauled Propeller in accordance with hartzell Propeller Manuals: 113B Rev. 40, 133C Rev. 30, 159 Rev. 35 and 202A Rev. 45. Complied with Hartzell Bulletins: 118F Rev.1, 136I. Complied with Hartzell Service Letters: 61Y Rev.3, 189 Rev.2, 217, 229 Rev.2, 267, 278 and 293 Rev.1. Complied with Hartzell Instructions: 152A. Maxwell Aircraft Service, Inc. Minneapolis, MN 55429 CRS# UF2R211L Repair Order No. 118655 Carl S. Maxwell 2386511

PROP LOG ENTRY

DATE	TACH	MAKE/MODEL	N-NUMBER	SERIAL #	TOTAL TIME	SMOH
July 20, 2013	3076.1	Hartzell HC-C3YF-1RF	N83SS	EC-1375A	566.8	0.0

Installed the above propeller on C-A185F s/n: A185F02166 I/A/W Hartzell manual No. 115N after overhaul by Maxwell Aircraft Services, Inc., torqued prop nuts to proper torque. Completed an annual / 100hr inspection in accordance with FAR 43 appendix D, AD research through current bi-weekly, see AD compliance log, no new ADs noted. I certify that propeller has been inspected in accordance with a 100 hr / annual inspection and was determined to be in airworthy condition.

Central Wisconsin Aviation

Corey Marschke A&P 2716624 IA

6 June 2014	Total time 578.4 11.6 SMOH ANNUAL INSPECTION completed, see Ad Logs FOR COMPLIANCE Tom Wundesluch 1831762 IA-A&P					

Date

PROP LOG ENTRY

DATE	TACH	MAKE/MODEL	N-NUMBER	SERIAL #	TOTAL TIME	SMOH
Aug. 08, 2015	3090.5	Hartzell HC-C3YF-1RF	N83SS	EC-1375A	581.2	14.4

Completed an annual / 100hr inspection in accordance with FAR 43 appendix D, AD research through current bi-weekly, see AD compliance log, no new ADs noted. Serviced prop I/A/W Hartzell MM, I certify that propeller has been inspected in accordance with a 100 hr / annual inspection and was determined to be in airworthy condition.

Central Wisconsin Aviation

Corey Marschke A&P 2716624 IA

1 Sept 2016 TACH 3094.8 SMOH 585.5 ANNUAL INSPECTION completed see AD logs FOR COMPLIANCE

Tom Wandulek 1831762 IA-A&P

Oct. 6, 2017 Hartzell HC-C3YFRF s.n. EC-1375A 586 hrs total 3094.5 hrs tach

I certify that this propeller has been inspected in accordance with an annual/100 hr. inspection and was determined to be in airworthy condition.

Allan Hatz
A&P 399782276

11-20-2018 Aircraft Tach 3095.5 TSMO 19.4 Prop TT 586.2 Performed 100hr inspection on propeller, spinner & backplate. Lubed as required. Checked ADs thru Bi Weekly 11-11-2018. "I certify that this propeller has been inspected IAW a 100hr inspection and was determined to be in airworthy condition." Paul A. Bennett AP 2756148

December 30, 2019 Hartzell HC-C3YFRF s.n. EC-1375A 588.8 hrs total 3098.1 hrs tach

I certify that this propeller has been inspected in accordance with an annual/100 hr. inspection and was determined to be in airworthy condition.

Robert Gaier
A&P 3495085

Date	

PROP MODEL: HC-C3YF-1RF
PROP S/N: EC-1375A
REG. NO: 83SS
WORK ORDER: 7762

Kubick Aviation Services, Inc.
Repair Station No. 2KAR596C
250 Riverhills Road
Kingsford, MI 49802
Phone: 906-779-5500

DATE: 4/1/2021
A/C TSN: 3349
PROP TT: 632.4
TSPOH: 65.6
TACH: 3141.7

Prop Entries

C/W Annual Inspection on this Propeller IAW FAR43 Appendix D using Kubick Aviation Services Annual Inspection Checklist. Reviewed AD's to date.

Maintenance Release

This Propeller was inspected IAW an Annual Inspection and was repaired in accordance with current FARs rules of the Federal Aviation Regulations and was found Airworthy for return to service. Pertinent details of the repair are on file at this Repair Station under Work Order No. 7762, Dated 4/1/2021.

DATE: 4/1/2021 SIGNED:

Tim Lawler
Certified Repair Station No. 2KAR596C

Work Order: 7762

Printed by EBis 3 (datcomedia.com)