# SERVICE LETTER

**SUBJECT:** **HARTZELL SERVICE LETTER 61T - OVERHAUL PERIODS AND SERVICE LIFE LIMITS FOR HARTZELL PROPELLERS AND GOVERNORS**

All Operators: Date: July 10/97

This service letter draws the attention of operators to vendor information that provides information on the above topics as follows:

APPENDIX A Hartzell Service Letter 61T, Propeller -- Overhaul Periods and Service Life Limits for Hartzell Propellers and Governors.

Firstly, contact the vendor (at the address provided in the appendix information) for any specific inquiries concerning the subject matter.

If you have difficulty, make inquiries at the following address:

PILATUS AIRCRAFT LTD.
CUSTOMER LIAISON MANAGER,
CH-6371 STANS,
SWITZERLAND.

Tel: + 41 41 619 6509
Fax: + 41 41 610 3351

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## Appendix A to Pilatus Service Letter No. 025

(Hartzell Service Letter 61T - Overhaul Periods and Service Life Limits for Hartzell Propellers and Governors, dated 04-04-97)

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HARTZELL PROPELLER INC.
One Propeller Place
Piqua, Ohio 45356-2634 U.S.A.
Telephone: 937.778.4200
Fax: 937.778.4321

HARTZELL

# SERVICE LETTER

**SERVICE LETTER NO. 61T**
Codes: A, B, C, D, E

April 4, 1997

**SUBJECT:**

Overhaul Periods and Service Life Limits for Hartzell Propellers and Governors

**DISCUSSION:**

This Service Letter replaces Service Letter 61S. The following is a summary of major changes:

1. TBO for all X and V shank propellers, HC-( )(2,3)(X,V)( )-( ), has been changed to 1000 hours of operation.
2. Propeller life limit information has been updated and revised to avoid redundant sources of information.
3. Blade life limits have been deleted for all applications using M10876( ) blades.

The overhaul period for a propeller is based on a number of limiting factors:

1. The engine to which the propeller is applied determines the pattern of vibration or stress the propeller must absorb.
2. The practices employed maintaining a propeller while in service are also limiting factors if they are not carried out per recommended procedures.
3. The calendar time which affects the life of seals directly or indirectly exposed to the elements, and other parts subject to corrosion, are also limiting factors.
4. Propellers are constantly subjected to natural corrosion and erosion from use and environmental exposure.

The following overhaul periods have been categorized as follows:

| | |
|---|---|
| Category I | Reciprocating Engine Propellers |
| Category II | Turbine Engine Propellers |
| Category III | Governors |
| Category IV | Life Limited Installations |
| Category V | Calendar Limits and Long Term Storage |

Hartzell considers the following overhaul specifications to be mandatory.

In the U.S.A., the Federal Aviation Agency (FAA) considers compliance with life limited items (category IV) to be mandatory. Other TBO specifications may be mandatory depending on the type of operation (FAR 91 vs. FAR 135) or if addressed in airworthiness directives.

In other countries, the governmental agency (FAA equivalent) may specify different compliance requirements.

In conjunction with hour and calendar limitations, other factors must be observed:

1. If propeller flight time or calendar time in service are unknown, the propeller should be overhauled to confirm its airworthiness.

   NOTE: Propeller logbook entries are required to indicate Time Since Overhaul (TSO) and Total Time Since New (TTSN). The information is used as the basis for subsequent overhauls as well as the basis for life limited parts and for compliance with Airworthiness Directives. For propellers that have been rebuilt with parts from other propellers, consideration of TTSN of the hub and each blade should be made.

2. In order to achieve TBO, propellers must be maintained in accordance with Hartzell Propeller Inc. applicable publications.

3. Propellers exposed to impact damage, lightning strikes or overspeed **must** be inspected in accordance with the Special Inspections chapter of Hartzell Standard Practices Manual 202A (dated March 1993 or subsequent revision) prior to return to service.

4. Propellers must comply with all applicable FAA Airworthiness Directives, some of which may affect overhaul periods.

5. Some propellers may require overhaul prior to the specified TBO limits. Propellers subjected to abnormal use or environmental exposure, particularly seaplanes and agricultural aircraft, often require premature overhaul when abnormal damage or corrosion is evident.

## TBO EXTENSION

The TBO specifications in this document are mandatory for many operators. Because of this, Hartzell frequently receives individual requests for extension of published TBO limits. In all cases, actual **approval must be obtained from the operator's FAA (or foreign equivalent) controlling authority**. Any statement by Hartzell does not, in itself, constitute approval. TBO extensions, if allowed, may be either permanent or temporary in nature:

Permanent - Fleet operators often desire a permanent TBO extension. Such extensions must result from a program of approved sampling and are normally incremental in nature. For example, a 3000 hour TBO may be increased to 3300

after evaluating the results of several 3000 hour overhauls, further extension requires evaluation of several 3300 hour overhauls, etc. The sampling program should be established through coordination with the government agency, the operator, the propeller overhaul facility, and Hartzell Propeller Inc. All TBO extensions must be FAA (or foreign equivalent) approved and documented in the operator's approved maintenance or operational publications.

Temporary - Hartzell considers that "temporary" or "one time only" extensions of 100 hours or three months (beyond published limits) to be acceptable in cases where a more flexible overhaul schedule will avoid grounding of aircraft. Approval must be obtained from the operator's FAA (or foreign equivalent) controlling authority and should be limited to a specific aircraft. Such extensions should not be construed to allow a permanent TBO extension or allow an operator to routinely deviate from published TBO limits.

**FAA Airworthiness Directive (AD) 77-12-06 Compliance**

NOTE: The FAA has determined that the previous AD compliance can be relaxed. The FAA is currently reviewing AD 77-12-06 for reduced applicability.

AD 77-12-06 requires repetitive blade inspections in accordance with overhaul intervals specified in Hartzell Service Letter 61B, or later FAA approved revision. Beginning with revision 61R dated February 28, 1992, the repetitive blade inspection intervals for compliance with AD 77-12-06 have been relaxed. The repetitive calendar month interval has been ELIMINATED and the time-in-service interval REVISED to 12,000 hours. Therefore, AD 77-12-06 NOW only requires a repetitive time-in-service inspection interval of 12,000 hours.

Service Letter 61R, 61S, and this revision, 61T, were approved by the Manager, FAA, Chicago Aircraft Certification Office, ACE 115C, by approval document dated April 1, 1997 as an altenative method of compliance with AD 77-12-06 paragraphs (a), (b), (c), and (d).

**NOTE: AD 77-12-06 calls for repetitive blade inspection, not overhaul. The AD's repetitive blade inspection no longer coincides with time between overhaul intervals. The overhaul periods listed in Categories I & II are NOT affected by the above revision to AD compliance for blade inspection.**

## CATEGORY I

## RECIPROCATING ENGINE PROPELLERS

All Hartzell propellers installed on piston engine aircraft are to be overhauled as follows:

| Propeller Model | Engine Model | Hours* | Calendar Months* |
|---|---|---|---|
| All Models | Franklin 6A8-215 | 1000 | 60 |
| All Models | Franklin 6( )-335 | 1500 | 60 |
| All Models | Franklin 6( )-350 | 1500 | 60 |
| All Models | Bristol Siddeley Gypsy Queen 30MK-2 | 1000 | 60 |
| All Models | Jacobs R-755 | 1000 | 60 |
| All Models | Ranger 6-440-( ) | 1000 | 60 |
| All Models | **All Other Engines** | 2000 | 60 |

*Exceptions, CATEGORY I:

1. Propellers installed on piston engine **acrobatic aircraft** (certificated as acrobatic or other aircraft routinely exposed to acrobatic use) are limited to a 1/2 of the TBO hour limit specified in the above table.
2. Calendar time is limited to 36 months for **agricultural aircraft.**
3. Hartzell Hydro-Selective propellers: **HC-(1,D)2X20-(7,8) and HC-(1,D)2V20-(7,8)** require replacement of rubber diaphragm (P/N B119-2) at intervals not to exceed 24 months or 250 hours of operation whichever occurs first. (These propellers utilize a non-rotating piston attached to the engine.)
4. All **HC-( )(2,3)(X,V)( )-( ) and HC-( )(2,3)(X,V)( )-( )** series propellers are not to exceed **1000** hours of operation time between overhaul.

## CATEGORY II

## TURBINE ENGINE PROPELLERS

All Hartzell propellers installed on turbine engine aircraft are to be overhauled at 3000 hours of operation or 60 calendar months, whichever occurs first, except for: 1) agricultural aircraft which are limited to 36 calendar months and 2) HD-E6C-3( ) propellers and systems on Dornier 328 aircraft (inspection intervals are published in Hartzell Manual 161).

## CATEGORY III

## GOVERNORS

Hartzell propeller governors are to be overhauled at the same time as engine overhaul, but not to exceed 2000 hours of operation (the 5 year calendar limit is not applicable to governors).

## CATEGORY IV

## LIFE LIMITED INSTALLATIONS

The following data summarizes all current information concerning Hartzell life limited parts, propeller assemblies, and propeller blades.

In recent years, life limits have been published in the Airworthiness Limitations section of the appropriate Hartzell propeller maintenance manual. In the following summary, where applicable, the manual is referenced for details concerning life limit information (this will avoid redundant sources of information and prevent the possibility of having conflicting published data if both the manual and this Service Letter were to have different revision dates). Life limit data is provided in the following summary for data that has not yet been incorporated into manuals.

NOTE: Blade life limits have been deleted for all applications using M10876( ) blades.

NOTE: Blade models shown are life limited only on the specified applications. They are not life limited on other installations. However, **time accumulated toward life limit accrues when first operated on aircraft/engine/ propeller combinations listed and continues regardless of subsequent installations (which may or may not be life limited)**. If a subsequent application is also life limited, the most conservative life limit is applicable.

NOTE: Previously, blades to be installed on life limited installations were to have the letter "L" stamped on the butt of the blade. This is no longer a requirement. Operators and propeller repair stations are reminded that propeller logbooks are required to contain the status (total time in service) of life limited parts, ref. FAR 91.417, 121.380, & 135.439.

Aviat S2B with Lycoming AEIO-540-D4A5 and HC-C3YR-1A/7690C propeller - see Hartzell Manual 113B revision 16 or subsequent for blade life limits.

Beech 1900D Airliner with P & W PT6A-67D and HC-E4A-3(A,I)/E10950( )K propeller - see Hartzell Manual 143A revision 3 or subsequent for blade life limits.

Beech T34C,T34C-1 with P & W PT6A-25(R) and HC-B3TN-3( )/T10173-11R propeller - see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

CASA 212 with Allied Signal TPE331-5-251C and HC-B4TN-5CL/LT10282+4 propeller - see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

Dornier 328 propeller system - see Hartzell Manual 161 revision 11 or subsequent for life limits.

Embraer EMB-312 with P & W PT6A-25C and HC-B3TN-3(C,D)/T10178(B,K)-8R propeller - see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

Fairchild Swearingen SA226TC Metro IIA with Allied Signal TPE331-10UA-501G or 511G and HC-B3TN-5()/T10282()() propeller - see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

Grumman S-2 Marsh conversion with Allied Signal TPE331-14A-801Z and HC-E5B-5/E12902K propeller, - see Hartzell Manual 158A revision 1 or subsequent for blade life limits.

Mitsubishi MU-2B-26A, -36A, -40, -60 & other MU-2s with affected propeller with Allied Signal TPE-331-(5,10)-( ) and HC-B4TN-5/LT10282N(S)(B,K)-5.3R propeller - per AD 95-01-02 blades are limited to 10,000 hours.

Mooney M-20L with Porsche PFM and BHC-J2YF-1C/B7421 propeller - see Hartzell Manual 113B revision 16 or subsequent for blade life limits.

NDN-1T Firecracker with P & W PT6A-25A and HC-B3TN-3(B,C)/T10173(B,K)-17 propeller - see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

Piaggio P-180 Avanti with P & W PT6A-66 and HC-E5N-3( )/( )E8218 propeller, depending on engine nacelle and exhaust stack usage, for some propellers the blades and hub are life limited, for other propellers only the blades are life limited - see Hartzell Manual 158A revision 1 or subsequent for life limits.

Pilatus PC-7 with P & W PT6A-25,-25A and HC-B3TN-2()/T10173C()-8 propeller - see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

Pilatus PC-7 modified by Sierra industries with P & W PT6A-25C and HC-B3TN-2( )/ T10178(N)-8R propeller- see Hartzell Manual 118F revision 3 or subsequent for blade life limits.

Pilatus PC-7 mk II with P & W PT6A-25C and HC-D4N-2D/D9512A( ) propeller, blades are life limited to 11,500 hrs.

Pilatus PC-9 with expanded flight envelope with P & W PT6A-62 and HC-D4N-2AA/ D9512AE(B,K) propeller, blades are life limited to 9,000 hrs.

Pilatus PC-9 with P & W PT6A-62 and HC-D4N-2A/D9512A(B,K) propeller, blades are life limited to 11,500 hrs.

Piper Aerostar PA60- 600,601(P),602P with Machen conversion with Lycoming (T)IO-540 series and HC-C4YR-2(L)/F(J)C6660(B,K) propeller, blades are life limited to 10,500 hrs.

Shorts SD3-60-300 with HC-A6A-3A propellers in compliance with SB 168, D-4905 Pitch Change Rod is life limited to 37,000 hours. (If SB 168 is not performed, other component parts are life limited, call Hartzell Product Support for details.)

Shorts S312 Tucano with Allied Signal TPE331-12B and HC-D4N-5C/D9327() propeller, blades are life limited to 53,900 hrs.

Twin Commander 500 modified by Merlyn Products Inc. with TIO-540-J2B( ) and HC-C4YR-2/FC6660( ) propeller - see Hartzell Manual 117D revision 3 or subsequent for blade life limits.

## CATEGORY V

## CALENDAR LIMITS AND LONG TERM STORAGE

### CALENDAR LIMITS:

The effects of exposure to the environment over a period of time create a need for propeller overhaul regardless of flight time. Therefore, a five year (60 calendar month) limit between overhauls is specified in Categories I and II.

**Start date for calendar limit is when the propeller is first installed on an engine. Calendar limit is not interrupted by subsequent removal and/or storage.**

NOTE: Start date for calendar limit should not be confused with warranty start date (which, with certain exceptions, is normally the date of sale to the first retail customer).

Experience has shown that special care, such as keeping an aircraft hangared, is not sufficient to allow extension of the five year calendar limit.

### LONG TERM STORAGE:

Propellers (with 0 hours since new or overhaul) that have been in long term storage have additional inspection requirements prior to installation. These requirements are, generally, 1) if shelf life is two years or less a visual inspection is required before installation, 2) if shelf life exceeds two years the propeller must be disassembled and inspected for internal corrosion and seals and lubricants must be replaced before installation. Details of these requirements are published in Hartzell Standard Practices Manual 202A (dated March 1993 or subsequent revision).

### APPROVAL:

FAA approval has been obtained on the technical data contained in this publication that affects product type design.

### PUBLICATIONS AFFECTED:

This Service Letter replaces Service Letter No. 61S dated December 10, 1993. This Service Letter supersedes all previously published data concerning TBO.