



**LAA TYPE ACCEPTANCE DATA SHEET
TADS P20
WARP DRIVE**

Issue 1	Initial issue	Dated 17/03/21	JP
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This TADS is intended as a summary of available information about the propeller type and should be used during the overhaul, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete a summary as possible, other sources contain more complete information, e.g. the manufacturer's website.

Section 1 contains general information about the propeller type and its variants.

Section 2 contains information about the propeller type that the LAA considers **mandatory** and must be complied with.

Section 3 contains advisory information that owners and inspectors should review to help them maintain the propeller in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

Section 1 Introduction

1.1 Contact Information

UK Contact: n/a

Manufacturer contact information:

Address: Warp Drive Inc
1207 Hwy 18 E
Ventura
IA 50482
USA

Tel: +1 641 903 2535
Email: [Warp Drive Inc: Contact Us](#)
Website: www.warpdriveinc.com

1.2 Description

Warp Drive Inc propellers are a range of ground-adjustable pitch propellers commonly seen on Rotax engines and also, amongst others: BMW, small Continental, Hewland, Hirth, Jabiru, Lycoming NSI, Subaru and VWs. The airframe types are a wide and varied mixture including fixed wing and gyros.

The propellers use 2, 3 and 4 blades manufactured of solid carbon fibre, with aluminium alloy blade roots. The hubs are generally two-piece affairs of either machined or die-cast aluminium alloy construction, bolted together.

Section 2 Mandatory information for owners, operators and inspectors

At all times, responsibility for the maintenance and airworthiness of an aircraft (including the propeller) rests with the owner. A condition stated on a Permit to Fly requires that: *"the aircraft shall be maintained in an airworthy condition"*.



**LAA TYPE ACCEPTANCE DATA SHEET
TADS P20
WARP DRIVE**

2.1 Lifed Items

No type-specific information, refer to any specific manufacturer's information wherever possible.

2.2 Operator's Manuals

Where possible, the manuals describing setup, operation and maintenance procedures for the propeller should be obtained from the manufacturer or importer and retained with the aircraft's records.

Check also the [Downloads](#) and [News](#) sections of the Warp Drive website for continuing airworthiness information, revisions and other useful information.

2.3 Maintenance Schedule

Refer to information supplied by Warp Drive, otherwise standard maintenance procedures for composite blade propellers applies (noting also the aluminium hub). Check also information in paragraph 3.3 below.

Check also the [Downloads](#) and [News](#) sections of the Warp Drive website for continuing airworthiness information, revisions and other useful information.

Propellers fitted to LAA administered aircraft that are maintained either in accordance with the manufacturer's maintenance schedule, the CAA Light Aircraft Maintenance Schedule (LAMS) [CAP 411](#) or the LAA Generic Maintenance Schedule, further details of which can be found in LAA Technical Leaflet [TL 2.19: The LAA Generic Maintenance Schedule](#). Note: The CAA and LAA produced maintenance schedules were originally written around the maintenance requirements of aircraft fitted with traditional aircraft engines and propellers.

Some aircraft may have mandated maintenance requirements and/or schedules which are stated on the aircraft's Operating Limitations document and these must be followed.

More information on maintenance schedules can be found in the [Aircraft Maintenance](#) section of the LAA website.

2.4 Airworthiness Directives

Non-certified type so no type-specific applicable Airworthiness Directives.

2.5 Mandatory Permit Directives

<i>Reference ID</i>	<i>Dated</i>	<i>Description</i>
MPD 1995-103	29 Dec 95	Warp Drive 'Standard Hub' propellers. Applicability is for microlights but advise to apply to other category aircraft as well. Refer also to PFA/WDP/001 and Section 3.4 note 3 below.

Check CAA [CAP 661](#) which lists MPDs issued before 31 January 2012 and is no longer being updated.



**LAA TYPE ACCEPTANCE DATA SHEET
TADS P20
WARP DRIVE**

The CAA now provides links to MPDs issued after 31 January 2012 on the [CAA MPD Listing](#) page of their website.

The LAA website should be checked for MPDs that are non-type specific in LAA Technical Leaflet [TL 2.22: Non-Type Specific MPDs](#).

2.6 CAA Mandatory Requirements for Airworthiness CAP747 and Civil Aircraft Airworthiness Information and Procedures (CAAIP) CAP562

No type-specific requirements or information at this time.

CAA publications [CAP 747](#) and [CAP 562](#) contain information that may be relevant to LAA administered aircraft and should be checked for applicability.

In particular, refer to [CAP 747](#) Generic Requirement GR No. 17 which concerns the maintenance requirements for variable pitch propellers installed on aircraft holding a UK Certificate of Airworthiness but may also be pertinent to LAA administered aircraft.

2.7 LAA Required Modifications (including LAA issued AILs, SBs, etc)

<i>Reference ID</i>	<i>Dated</i>	<i>Description</i>
PFA/WDP/001	27 Mar 95	Warp Drive 'Standard Hub' propellers. Applicability is for microlights but advise to apply to other category aircraft as well. Refer also to MPD 1995-103 and Section 3.4 note 3 below.

2.8 Operating Limitations to be Placarded or Shown by Instrument Markings

The Operating Limitations document for the aircraft will specify aircraft and powerplant limitations for that particular aircraft. Where a propeller is being fitted in accordance with a Propeller Type List ([PTL/1](#)), any limitations proscribed by the relevant [PTL/1](#) document must be adhered to.

Notes:

- Refer to the propeller manufacturer's latest documentation for the definitive parameter values and recommended placards.
- Data stated on the aircraft's Operating Limitations document must be displayed by means of cockpit placards or instrument markings.

Section 3 Advice to owners, operators and inspectors

3.1 General

Where possible, the manuals describing setup, operation and maintenance procedures for the propeller should be obtained from the manufacturer or importer and retained with the aircraft's records.



**LAA TYPE ACCEPTANCE DATA SHEET
TADS P20
WARP DRIVE**

3.2 Standard Options

There are no Standard Options for any propellers fitted to LAA administered aircraft at this time.

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

In the absence of any over-riding LAA classification, inspections and modifications published in the manufacturer's continuing airworthiness data should be satisfied according to the recommendations therein. It is the owner's responsibility to be aware of and supply such information to their inspector.

<i>Reference ID</i>	<i>Dated</i>	<i>Description</i>
04-01-10	04 Jan 10	HP and HP-L hub assembly instructions
06-01-10	06 Jan 10	HPL-R assembly instructions
19-02-18	19 Feb 18	Leading-edge tape instructions
SB-218-HHP-01	17 Jul 19	2 and 3 blade hub cracking
001-02-21	01 Jan 21	Protractor instructions, setting blade pitch
003-01-20 Standard	03 Jan 20	Standard hub assembly instructions
003-01-20 Oversize	03 Jan 20	Oversize hub assembly instructions

Check also the [Downloads](#) and [News](#) sections of the Warp Drive website for continuing airworthiness information, revisions and other useful information.

3.4 Special Inspection Points

1. Cracking problems have been experienced with these hubs through prop strikes, spinners coming off and striking the blades, and through fatigue particularly when fitted to direct drive engines. Great care should be taken to check for cracks in the hub components, dismantling if necessary, for access. Spinners, if fitted, must always be removed to allow a proper check on these hubs at regular maintenance intervals.
2. Note that cracking problems in the lightweight type hubs may well be triggered by inbuilt stresses caused by incorrect assembly of the propeller previously. It is particularly important to tighten up the blade retaining bolts evenly so as to keep the plates flat and ensure even distribution of the loads between all the bolts. It has been suggested that the 'nominal gaps' between the spacer blocks which grip the propeller blade roots should be checked for uniformity using feeler gauges after setting the blade pitch and torquing-up the bolts. This serves as a double-check on the correct bolt tightening having been carried out, and that the hub halves are not being distorted by the bolts.
3. Warp Drive 'Standard Hub' propellers are subject to [MPD 1995-103](#) and [PFA/WDP/001](#). Applicability is for microlights but advise applies to other category aircraft as well.

One of the hub plates of a Warp Drive propeller fitted to a Rotax 582 engine in an LAA administered aircraft was found to have cracked through fatigue after very few running hours. The propeller hub concerned was what Warp Drive designated their 'Standard Hub', in which the hub consists of two flat aluminium plates with the blades sandwiched between the two using plastic spacer blocks. The crack occurred in the plate adjacent

**LAA TYPE ACCEPTANCE DATA SHEET
TADS P20
WARP DRIVE**

to the propeller-driving flange (i.e. the rear plate in a tractor installation, front plate in a pusher) which is the more highly loaded of the two plates. The crack propagated almost three-quarters of the way across the plate before being noticed on a post-flight inspection. It is not known whether the crack developed over the course of one flight or over many.

At the time, Warp Drive advised that there had been two previous cases of such cracks occurring, neither of which led to a catastrophic failure. As a result of these failures a design change was made during 1991 to incorporate a 1/8" thick steel disc adjacent to the propeller 'engine side' hub plate to better spread the load, described by Warp Drive as the spacer support plate.

At the same time, the aluminium alloy used in manufacturing the hub plates was changed to one of a stronger specification. No cracking of the improved hubs has been reported.

In view of the possibility that such cracks might lead to catastrophic failure of the propeller, Warp Drive equipped aircraft fitted with a standard hub should be inspected to determine whether the hub is a 'pre-mod' or 'post-mod' example. Propeller hubs of the older type can be identified visually by the absence of the steel spacer support plate. These units were made prior to September 1991 and have serial numbers commencing with R followed by a number less than 4510.

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Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com