TYPE-CERTIFICATE DATA SHEET

No. IM.P.136

for Propeller
5D3 series propellers

Type Certificate Holder
Hartzell Propeller Inc.

One Propeller Place
Piqua, OH 45356
USA

For Models:
5D3-N338A1
5D3-NK366( )
5D31-NK366( )

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I. General

1. Type / Models

5D3 / 5D3-N338A1, 5D3-NK366A1, 5D3-NK366B1, 5D31-NK366B1

2. Type Certificate Holder

Hartzell Propeller Inc.
One Propeller Place
Piqua, OH 45356
USA

3. Manufacturer

Hartzell Propeller Inc.

4. Date of Application

5D3-N338A1: 21 January 2016
5D3-NK366A1: 31 October 2019
5D3-NK366B1: 11 August 202
5D31-NK366B1: 11 August 2021

5. EASA Type Certification Date

5D3-N338A1: 10 March 2017
5D3-NK366A1: 24 January 2020
5D3-NK366B1: 07 December 2021
5D31-NK366B1: 07 December 2021

II. Certification Basis

1. State of Design Authority Certification Basis

Refer to FAA TCDS no. P00015CH.

2. Reference Date for determining the applicable airworthiness requirements

30 August 2017 for 5D3-N388A1, 5D3-NK366A1, 5D3-NK366B1 and 5D31-NK366B1.

3. EASA Certification Basis

3.1. Airworthiness Standards

5D3-N338A1, 5D3-NK366( ) and 5D31-NK366( ):
CS-P Amendment 1 dated 16 November 2006 as issued by EASA Decision No 2006/09/R, except the requirements of Subpart D as allowed by CS-P 10(b) (See Note 10a).

3.2. Special Conditions (SC)

None.

3.3. Equivalent Safety Findings (ESF)

None.

3.4. Deviations

None.

III. Technical Characteristics

1. Type Design Definition

The propeller type is defined by a propeller assembly drawing including a parts list (or later approved revisions).
5D3-N338A1: Drawing 106178, rev 0, dated 11 December 2015
5D3-NK366A1: Drawing 107479, rev A, dated 05 October 2019
5D3-NK366B1: Drawing 107701, rev -, dated 12 April 2021
5D31-NK366B1: Drawing 107447, rev B, dated 07May 2021

2. Description

The 5D(3,31)-( ) propellers have 5 blades and a hydraulically operated variable pitch control with constant speed.
The models incorporate reversing, feathering and unfeathering features (See Notes 3 and 4).
The hub is milled out of aluminium alloy. The 5D(3,31)-( ) propellers have a two-piece aluminium hub and a single acting hydraulic control system. The pitch change mechanism uses a slotted fork to move the pitch change knob and rotate the blade. The blade material is carbon composite.
The only difference is the 5D31 has a different beta ring designed for use with an electronic system and the cylinder is bigger.
Optional equipment includes spinner and ice protection.

3. Equipment

Spinner: See Note 7
Governor: See Note 3
Propeller deicing: See Note 7

4. Dimensions

Diameters from 243,8 cm to 194,3 cm. (See Table of Section IV)

5. Weight

Depending on Propeller-Design Configuration. (See Table of Section IV)

6. Hub / Blade Combinations

Details are mentioned within Table of Section IV.

7. Control System

Propeller governor. (See Note 3)

8. Adaptation to Engine

Special flange. (See Note 1)

9. Direction of Rotation

Direction of rotation (viewed in flight direction) as identified by a letter-code in the propeller designation. (See Note 5)

IV. Operating Limitations

Blades (see Note 2)	Maximum Continuous kW	Maximum Continuous RPM (min^{-1})	Take Off kW	Take Off RPM (min^{-1})	Diameter Limits (cm) (see Note 2)	Approx. Max Wt. Complete (kg) (see Notes 3 and 7)	Blade Construction
			5D3-N338( )				
78D01-0 to 78D01-6	633,8	2000	633,8	2000	209,6 to 194,3 (-0 to -6)	59,87	Carbon Composite
			5D3-NK366( ), 5D31-NK366( )				
86DB01-0 to 86DB01-10	708,4	2000	708,4	2000	231,1 to 205,7 (-0 to -10)	60,78	Carbon Composite
			5D3-NK366( )				
91D15-0 to 91D15-7	633,8	2000	633,8	2000	243,8 to 226,1 (-0 to -7)	66,68	Carbon Composite
91D17-0 to 91D17-7	559,3	2200	559,3	2200	243,8 to 226,1 (-0 to -7)	61,69	Carbon Composite

1. Approved Installations

The 5D3-N338A1 propeller is initially intended for use on a new version of the Piper Meridian aircraft.
The 5D3-NK366A1 propeller is initially intended for use on a King Air 250 aircraft modified by Raisbeck.
The 5D3-NK366B1 propeller has currently no specific intended customer. Hartzell chose to include the version of the propeller in case a customer will arise.
The 5D31-NK366B1 propeller is initially intended for use on Dahar aircraft model TBM700N.
(See Note 10)

2. Maximum Take Off Power and Speed

Details are mentioned within Table of Section IV.

3. Maximum Continuous Power and Speed

Details are mentioned within Table of Section IV.

4. Propeller Pitch Angle

The propeller has variable pitch capability. Pitch control is provided by a governor. (See Note 3)

V. Operating and Service Instructions

Instruction for continued airworthiness (ICA):

Propeller Owner's Manual and Logbook for Raptor Turbine Series (incl. Airworthiness Limitations, if any)	Hartzell Manual 486 (*)
Hartzell Propeller Owner's Manual – Composite blades	Hartzell Manual 147 (*)
Five Blade Raptor Series Turbine Propeller Overhaul Manual	Hartzell Manual 496 (*)
Composite Blade Overhaul Manual	Hartzell Manual 135F (*)
Standard Practices Manual	Hartzell Manual 202A (*)
Metal Spinner Maintenance Manual	Hartzell Manual 127 (*)

(*): or later approved revision

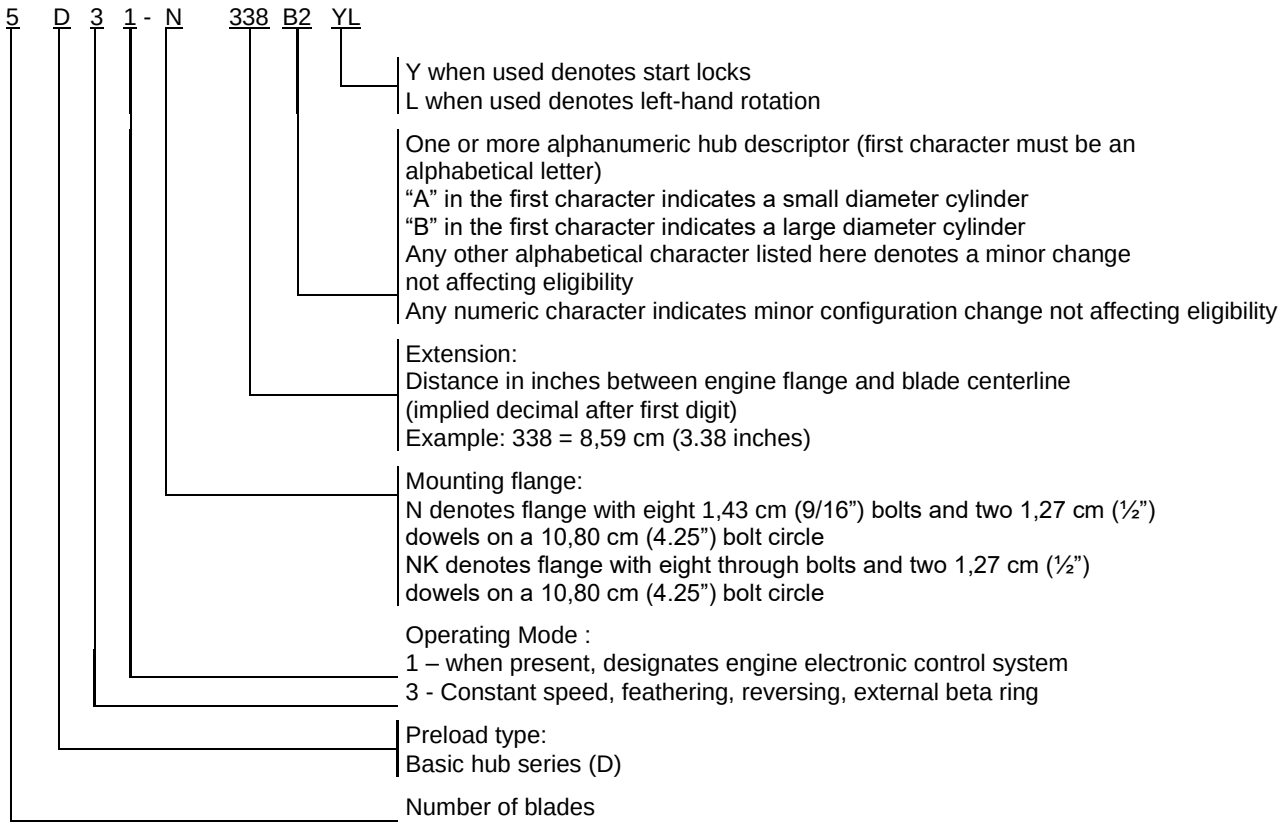
Instruction for propeller installation and operation:

Propeller Integration Manual	Hartzell Manual 190 (*)
Service Bulletins	

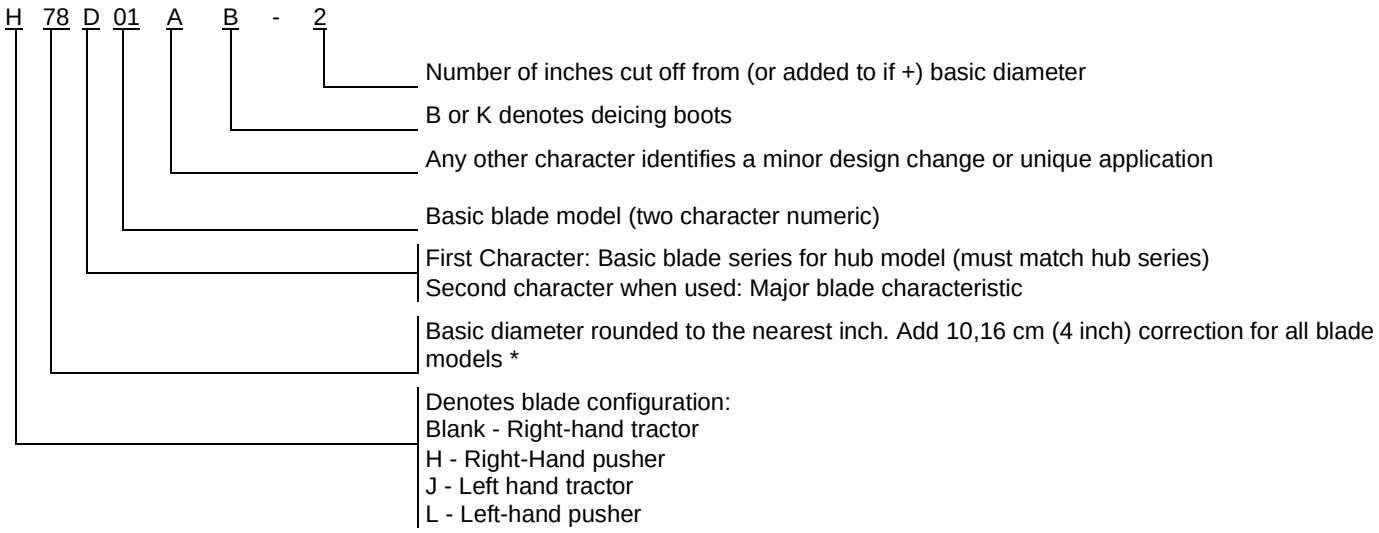
(*): or later approved revision

VI. Notes

1. Hub Model Designation: (See Notes 4 and 5)



2. Blade Model Designation: (See Notes 5 and 6)



*: Diameter limits are nominal diameters of the assembled propeller. They do not include the + or – 0,32 cm (1/8 inch) manufacturing tolerance the FAA allows for propeller with a basic diameter of less than 426,7 cm (14 feet).

3. Pitch Control: (weight of pitch control extra) (See Notes 4 and 10)

(a) Maximum output pressure: 5D3( )-N( )A models 3447,38 kPa (500 psig)
5D3( )-N( )B models 4826,33 kPa (700 psig)

(b) All propeller models have counterweighted blades and use governor oil to decrease pitch.

(c) All governors and propeller control systems must be approved as part of the aircraft installation regardless of manufacturer.

(d) Hartzell propeller model 5D31-( ) is controlled by an integrated electronic system which is part of the engine type design. Propeller model 5D31-( ) complies with the propeller airworthiness requirements when used with the engine(s) listed in Hartzell Type Design Data (Manual 159). Any change to the engine, including its control system, which affects or may affect the propeller approval must be substantiated to demonstrate that the propeller as integrated with the changed engine, including its control system, still complies with the propeller certification basis. Also, any change to the engine resulting from a change to the propeller must be substantiated to demonstrate that the changed engine still complies with the engine certification basis

4. Feathering:

(a) The 5D3 and 5D31 models incorporate feathering and unfeathering features.

Reversing:

(a) The 5D3 and 5D31 models are approved for installation as reversing propellers with appropriate reversing controls.

5. Left-Hand Models: (See Notes 1 and 2)

The left-hand version of an approved propeller model is approved at the same rating and diameter as listed for the right-hand model.

6. Interchangeability:

(a) Refer to Hartzell Service Letter HC-SL-30-260 for ice protection system component interchangeability.

7. Accessories:

(a) Propeller spinner. (weight of spinner extra)
(1) Approved with Hartzell and other manufacturers' spinners when listed on Hartzell type design data.
(2) All propeller spinners must be approved as part of the aircraft installation regardless of manufacturer. (See NOTE 10)

(b) Propeller deicing (weight of deicing equipment extra)
(1) Propeller models listed in this data sheet are approved for use with propeller ice protection equipment listed in Hartzell Manual 159( ) or in other Hartzell type design data.
(2) All propeller ice protection equipment must be approved as part of the aircraft installation regardless of manufacturer. (See NOTE 10)

8. Shank Fairings: Not applicable.

9. Special Limits: Not applicable.

10. The suitability of a propeller for a certain aircraft/engine combination must be demonstrated within the scope of the type certification of the aircraft.

Propeller models listed herein consist of basic hub and blade models. Most propeller models include additional characters to denote minor changes and specific features as explained in Notes 1 and 2.

10a. This propeller has been certificated in accordance with CS-P subparts A, B and C. Compliance with the requirements of Subpart D, which is specific to each aircraft installation, has not yet been demonstrated.

11. Retirement Time:

(a) Life Limits and Mandatory Inspections

(1) Airworthiness limitations, if any, are specified in Hartzell Manual 486.
(2) The propeller CMACO must evaluate the propeller installation for each new aircraft installation to assess possible changes in the airworthiness limitations.

12. Special Notes:

(a) Refer to Hartzell Manual no. 202( ) for overspeed and overtorque limits.

(b) Refer to Hartzell Service Letter HC-SL-61-61( ) for overhaul periods.

13. The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the applicable Propeller Owner's Manual, chapter 5 "Airworthiness Limitations".

SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

None.

II. Type Certificate Holder Record

N/A.

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	10 March 2017	Initial Issue	10 March 2017
Issue 02	24 January 2020	Adding 5D3-NK366 hub model and 91D15 carbon composite blade.	24 January 2020
Issue 03	07 December 2021	Adding 5D3-NK366B1, 5D31-NK366B1 hub models and 86DB01 carbon composite blade. Aligning data with FAA TCDS P00015CH Revision 7. (EASA Approval 10077846)	07 December 2021
Issue 04	22 March 2023	Adding 91D17 carbon composite blade. (EASA Approval 10081512)	

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