TYPE-CERTIFICATE DATA SHEET

No. E.129

for Engine
TWD-10B/PZL-10S

Type Certificate Holder
Pratt & Whitney Rzeszów S.A.

ul. Hetmańska 120
35-078, Rzeszów
POLAND

For Models:
TWD-10B/PZL-10S

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I. General

1. Type / Models

TWD-10B/PZL-10S

2. Type Certificate Holder

Pratt & Whitney Rzeszów S.A.
(formerly: Wytwórnia Sprzętu Komunikacyjnego S.A.)
ul Hetmańska 120
35-078 Rzeszów
POLAND
Design Organisation Approval No.: EASA.21J.115

3. Manufacturer

As Type Certificate Holder (Production Organisation Approval No PL.21G.001).

4. Date of Application

CC-45 Application was made to CAA-Poland before existence of EASA. Date not known.

5. EASA Type Certification Date

14 July 2000. EASA Type-Certification is granted in accordance with Article 3 of EU Commission Regulation (EU) 748/2012 based on CAA-Poland TC No. CC-45.

II. Certification Basis

1. EASA Certification Basis

1.1. Airworthiness Standards

NLGS-2 issue 2 dated 1974 with amendments 1И1 ÷ 20И2 till 1st July 1984 – Chapter 6

1.2. Special Conditions (SC)

None

1.3. Equivalent Safety Findings (ESF)

None

1.4. Deviations

None

1.5. Environmental Protection

ICAO Annex 16 Volume II, 2nd Edition, 1993 - Emission and Fuel Venting

III. Technical Characteristics

1. Type Design Definition

TWD-10B/PZL-10S: 19.00.5000

2. Description

Turboprop, twin-spool with free power turbine, single flow; compressor: axial centrifugal with automatic air bleeding; combustion chamber: annular type; compressor turbine: axial, two stage; power turbine: axial, single stage; with forward installed propeller reduction gearbox.

3. Equipment

The engine equipment list is included in the Installation Manual.

4. Dimensions

Length (from the propeller shaft flange to the gearbox drive unit rear plane)	2060 ± 10 mm
Height (from the oil tank bottom to the propeller regulator to plane)	900 ± 10 mm
Width (at the exhaust pipes)	555 ± 10 mm

5. Dry Weight

Engine dry weight 230 + 2% kg

The dry weight includes only the equipment needed to run the engines without residual fluid.

6. Ratings

The engine ratings are based on dry sea level static ICAO standard atmospheric conditions. No power extraction for engine and airplane accessories, no air bleed for engine/aircraft system.

Engine Operative Power (propeller shaft maximum output)

Flight idle	73,5 kW
Reverse	300÷400 kW
Take-off (6 minutes)	705 kW
Maximum Continuous	574 kW

7. Control System

Fuel metering pump:
- manufacturer: HS Wrocław (formerly KTEHS "PZL-Hydral" Wrocław)
- type: ALRP-8H/4058H

Propeller speed governor:
- manufacturer: HS Wrocław (formerly KTEHS "PZL-Hydral" Wrocław)
- type: R24AHN

Corrector:
- manufacturer: HS Wrocław (formerly KTEHS "PZL-Hydral" Wrocław)
- type: ALK-2/908 B 2000

Thermal corrector:
- manufacturer: HS Wrocław (formerly KTEHS "PZL-Hydral" Wrocław)
- type: 908 B 5000

Signal device:
- manufacturer: HS Wrocław (formerly KTEHS "PZL-Hydral" Wrocław)
- type: 908 B 5000

Fuel pump:
- manufacturer: HS Wrocław (formerly KTEHS "PZL-Hydral" Wrocław)
- type: 702V

8. Fluids (Fuel, Oil, Coolant, Additives)

Refer to the Maintenance Manual of the model.

9. Aircraft Accessory Drives

GT16PCz8 – A. C. generator	Ratio: 2,738
DTE-5T – Rotation speed feeder	Ratio: 9,778

10. Maximum Permissible Air Bleed Extraction

Air bleed limits for de-icing system and cabin heating system:

a) Air bleed at take-off limits:

- for cabin heating at ambient temperature not above 5ºC and not above 2000 m altitude,
- simultaneous use of air bleeds for aircraft and engine de-icing systems at ambient temperature not above 5ºC and not above 1000 m altitude,
- if air bleeds for aircraft and engine de-icing systems are used simultaneously above 1000 m altitude, engine should be removed from service,
- no cabin heating bleed is allowed during simultaneous use of air bleeds for aircraft and engine de-icing.

b) Simultaneous use of air bleeds for aircraft de-icing, engine de-icing and cabin heating is allowed up to 4200 m altitude for all ratings except take-off, at following temperature conditions: aircraft and engine de-icing in icing conditions and temperature not above +5ºC, cabin heating at temperatures from –48ºC to +20ºC.

c) With engine control level position not changed, switching on aircraft and engine de-icing may cause the compressor turbine rpm drop down by 7%.

d) During switching on aircraft and engine de-icing at flight idle the propeller speed may drop to 1240 rpm (68%).

IV. Operating Limitations

1. Temperature Limits

Maximum measured compressor turbine outlet gas temperatures area:

Maximum Continuous	620 ºC
Take-off	670 ºC
For 0.9 nominal	600 ºC
For ground idle	510 ºC

Maximum allowable compressor turbine outlet gas temperatures during operation area:

For take-off	740 ºC
For nominal	690 ºC
During starting	680 ºC

2. Speed Limits

Engine Operative speed (rpm):

	Take-off	Maximum Continuous	0.9 nominal	Flight idle	Ground idle	Reverse
Compressor turbine	29600	28400	27800	22800	25000	-
Propeller shaft	1682	1570	1570	29 330	1400	1615

NOTE: 100% propeller speed = 1826 rpm
100% power turbine shaft speed = 24445 rpm
100% compressor turbine speed = 31537 rpm

3. Torque Limits

None

4. Pressure Limits

4.1 Fuel Pressure

Absolute pressure:

- airframe pumps switched on 117.5÷245 kPa
- airframe pumps switched off 29.4÷245 kPa
- before injectors 1475 kPa

4.2 Oil Pressure

ground idle and flight idle ranges
- compressor turbine 196.0 kPa
- power turbine and reduction gearbox 245.2 kPa
- entrance of propeller speed governor 196.0 kPa

other ranges
- compressor turbine, power turbine, reduction gearbox 343.2 kPa
- entrance of propeller speed governor 294.2 kPa

5. Time Limited Dispatch (TLD)

The engine is not approved for Time Limited Dispatch in accordance with CS-E 1030.

6. ETOPS Capability

The engine is not approved for ETOPS capability in accordance with CS-E 1040.

V. Operating and Service Instructions

19.0.646 - Maintenance Manual with Appendix
19.0.682 - List of the critical parts and assemblies of the TWD-10B/PZL-10S engine

VI. Notes

Note 1. The TWD-10B/PZL-10S engine is the same as TWD-10B engine except that:
– changed attachment propeller hub,
– redesigned feedback control between the propeller and propeller governor,
– changed settings of propeller governor; changed propeller shaft speed at take-off to 92,1%, at maximum continuous to 86% and control pressure to 3432 kPa,

– changed power turbine speed governor settings in fuel pump; changed speed for ground idle rating to 75%.

Note 2. The TWD-10B/PZL-10S engine has common parts with the PZL-10W engine: compressor, combustion chamber, compressor turbine, power turbine rotor.

SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

n/a

II. Type Certificate Holder Record

n/a

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	12 August 2015	Transfer from existing Polish TC (CC-45) into EASA TC / Company Name change	15 December 2016

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