European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

Number : E.014
Issue : 04
Date : 26 September 2007
Type : Thielert Aircraft Engines
Centurion 4.0 series engines

Variants
Centurion 4.0 BE-210
Centurion 4.0 BE-221
Centurion 4.0 BE-228
Centurion 4.0 BE-239
Centurion 4.0 BE-250
Centurion 4.0 BE-257

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I - General

1. Type / Variants : Centurion 4.0 / Centurion 4.0 BE-210, Centurion 4.0 BE-221, Centurion 4.0 BE-228, Centurion 4.0 BE-239, Centurion 4.0 BE-250, Centurion 4.0 BE-257

2. Type Certificate Holder :

Thielert Aircraft Engines GmbH
Platanenstraße 14
D-09350 Lichtenstein
Germany

DOA EASA.21J.010

3. Manufacturer: Thielert Aircraft Engines GmbH

4. EASA Certification Application Date:

Centurion 4.0 BE-210	Centurion 4.0 BE-221	Centurion 4.0 BE-228	Centurion 4.0 BE-239
13 August 2007	13 August 2007	30 April 2001	13 August 2007
Centurion 4.0 BE-250	Centurion 4.0 BE-257		
13 August 2007	13 August 2007		

Note: Application was made to JAA before EASA has been established.
Certification Reference Date: 30 October 2001
The Centurion 4.0 BE has been renamed in Centurion 4.0 BE-228.
The Centurion 4.0 BE-257 engine variant was previously approved as Major Change (power increase to 257 kW) to the initial 228 kW engine version under EASA approval number EASA.E.C.01064 on 28 August 2006 (application date: 11 May 2005).
The Centurion 4.0 BE-210, -221, -228, -239 and -250 engine variants were previously approved as Major Change (down rating) to the 257 kW engine version under EASA approval number EASA.E.C.01378 on 03 January 2007 (application date: 11 September 2006).

5. EASA Certification Date:

Centurion 4.0 BE-210	Centurion 4.0 BE-221	Centurion 4.0 BE-228	Centurion 4.0 BE-239
26 September 2007	26 September 2007	28 October 2004	26 September 2007
Centurion 4.0 BE-250	Centurion 4.0 BE-257		
26 September 2007	26 September 2007		

II - Certification Basis

1. EASA Certification Basis:

1.1 Airworthiness Standards

- JAR-E Change 10 dated August 15, 1999

1.2 Special Conditions (SC):

- SC1 Electronic Engine Control System
- SC2 Contaminated Fuel
- SC3 Failure Analysis
- SC4 Fire Precautions
- SC5 Certification of Programmed Logic Devices
- SC6 Use of Object Oriented Technology

1.3 Deviations: None

1.4 Equivalent Safety Findings (ESF):

- JAR-E180 Propeller Functioning Test
- JAR-E140(b), E310(a), E400(a)(1) and E440(a)(2) Engine Test Control Parameters
- JAR-E70 and E110 Engine Type Design

1.5 Environmental Standards: None (not required for piston engines)

III - Technical Characteristics

1. Type Design Definition:

As defined by TDD-03-01.

2. Description:

The Centurion 4.0 engine is an 8-cylinder, four stroke Diesel piston engine with a displacement of 3996 cm^3, equipped with common rail high pressure direct injection, 2 turbochargers, a gearbox with reduction ratio of 1:1.689, propeller governor and FADEC.

3. Equipment:

See Installation Manual.

4. Dimensions:

Overall Length	900 mm
Overall Height	770 mm
Width	670 mm

5. Dry Weight: 286 kg

6. Ratings: (see Note 1)

Rating		Centurion 4.0 BE-210	Centurion 4.0 BE-221	Centurion 4.0 BE-228
Power, kW	Take-off	210 at 3900 rpm	221 at 3900 rpm	228 at 3900 rpm
	Maximum Continuous	210 at 3900 rpm	221 at 3900 rpm	228 at 3900 rpm
	Maximum Best Economy Cruising	154 at 3300 rpm	154 at 3300 rpm	154 at 3300 rpm

Rating		Centurion 4.0 BE-239	Centurion 4.0 BE-250	Centurion 4.0 BE-257
Power, kW	Take-off (5 minutes)	239 at 3900 rpm	250 at 3900 rpm	257 at 3900 rpm
	Maximum Continuous	228 at 3900 rpm	228 at 3900 rpm	243 at 3900 rpm
	Maximum Best Economy Cruising	154 at 3300 rpm	154 at 3300 rpm	154 at 3300 rpm

Note : The performance values specified above correspond to minimum values defined under the conditions of ICAO or ARDC standard atmosphere.

7. Control System

The engine is equipped with a Full Authority Digital Engine Control (FADEC), P/N 02-7610-55003R1 or later approved standard.

8. Fluids (Fuel/Oil/Additives):

See Operation & Maintenance Manual for approved fluids (see also note 3).

9. Aircraft Accessory Drives:

There are no provisions for customer/aircraft furnished equipment.

IV - Operational Limitations

1. Temperature limits, °C

Minimum ambient temperature for starting	-25
Minimum opening up oil temperature	50
Maximum oil temperature	140
Minimum opening up cooling fluid temperature	60
Maximum cooling fluid temperature	105
Maximum gearbox temperature	120

2. Rotational Speeds:

Max. Engine Overspeed (JAR-E 400): 4220 rpm

3. Pressure Limits:

2.1 Fuel Pressure Limit at LP Engine Pump Inlet

Minimum: 70 kPa absolute

2.2 Oil Pressure Limits

Minimum: 100 kPa
Normal operation 300…400 kPa
Max., for cold start, up to 20 sec: 700 kPa

4. Oil Consumption Limit:

Max. oil consumption: 0.1 l/h

5. Oil Capacity:

Oil tank: 7…10 litres

V - Operational and Service Instructions

Installation Manual	IM-03-01
Operation & Maintenance Manual	OM-03-01
Overhaul Manual	OHM-03-01
Service Bulletins and Service Letters	As issued

VI - Notes

Note 1: Engine model numbers may include suffixes in parentheses to define installation specific configuration changes. The software of the electronic engine control for each application has a specific software mapping. See Service Bulletin TM TAE 000-0007 for the installation versions and software mappings. Also refer to Installation Manual for appropriate installation.

Note 2: The Centurion 4.0 engine is approved for the installation in CS-23/JAR-23/FAR-23 normal and utility category airplanes.

Note 3: The Centurion 4.0 engine is approved for the operation with Jet fuels (see Operation & Maintenance Manual).

Note 4: The engine, including the FADEC, is approved for use with the propeller MTV-14-D/( )-( ) and MTV-9/ ( )-( ) model up to the max. diameter of 230 mm. The suitability of the propeller blade for a certain aircraft/engine-combination must be demonstrated within the scope of the type certification of the aircraft. This approval does not include the approval of the propeller and its control systems (see also Note 11).

Note 5: For the core engine a recommended engine life has been established. The Time Between Replacement (TBR) is published in Service Bulletin TM TAE 310-0001.

Note 6: The engine control system has been tested according to DO-160D for lightning protection and magnetic interference. The demonstrated levels are declared in IM-03-01.

Note 7: The FADEC must not be installed in a dedicated fire zone. The installation conditions are defined in IM-03-01.

Note 8: Overhaul is permitted for several engine parts only, see Overhaul Manual.

Note 9: Installation Assumptions: See Installation Manual IM-03-01.

Note 10: Dispatch Limitations: At present there are no dispatch limitations.

Note 11: This engine design features an integrated propeller control in the FADEC. The software in the FADEC has been developed in accordance with DO-178B at level C. The approval of the engine and its FADEC does not include approval of the propeller control system.