

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE DATA SHEET E00092EN	TCDS NUMBER: E00092EN REVISION: 0 DATE: October 24, 2016 MODELS: RED A03
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Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E00092EN and other approved data on file with the Federal Aviation Administration), meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations, provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER Raikhlin aircraft Engine Developments, GmbH
 Am alten Wehr 23
 D-53518 Adenau
 Germany

I. MODEL	RED A03
TYPE	The RED A03 engine is a 12 cylinder (V-configuration), four stroke Diesel reciprocating engine with a displacement of 6134 cm ³ , equipped with common rail high pressure direct injection, turbocharger, and gearbox with a ratio of 1:1.88. The engine is equipped with a single lever controlled Full Authority Digital Engine Control (FADEC) and Electronic Engine Control System (EECS).
RATINGS (NOTE 1) (minimum values defined under the conditions of ICAO or ARDC standard atmosphere)	
Takeoff (5 minutes)	368 kW (500 hp) at 4000 RPM (2127 prop RPM)
Maximum Continuous	338 kW (460 hp) at 3750 rpm (1995 prop RPM)
Maximum Best Economy Cruising	294 kW (400 hp) at 3500 rpm (1862 prop RPM)
FUEL (See NOTE 4)	Def Stan 91-91, ASTM D1655 (Jet A, Jet A-1)
OIL	Castrol Edge FST, 10W/60
OIL SUMP CAPACITY	N/A – engine utilizes a dry sump system. Total oil capacity is 18.5 liters (19.5 quarts). Difference between minimum and maximum oil levels is 1.2 liters(1.3 quarts).
PRINCIPAL DIMENSIONS Length, mm/inches Width, mm/inches Height, mm/inches	1100/43.3 850/33.5 750/29.5
CENTER OF GRAVITY	Refer to Engine Installation Manual.
DRY WEIGHT, kg/lbs (see NOTE 13)	363/800.3

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LEGEND: "-" INDICATES "SAME AS PRECEDING MODEL"
 "—" NOT APPLICABLE

NOTICE: ALL PAGES ARE REFORMATTED. SIGNIFICANT CHANGES, IF ANY ARE BLACK.LINED IN THE LEFT

MARGIN

I. MODEL (Continued)	RED A03
DISPLACEMENT TOTAL	6,134 cm ³ (374.3 in ³)
BORE	86.00 mm (3.386 in)
STROKE	88.00 mm (3.465 in)
COMPRESSION RATIO	16:1
PROPELLER ROTATION	CCW (viewed in flight direction assuming tractor configuration)
GEAR REDUCTION (crankshaft to propeller)	1.88:1
CONTROL SYSTEM (See NOTES 6, 7, 8, and 10)	FADEC/EECS is controlled by the Engine Electronic Control Unit (EECU) and the software is verified to RTCA Document DO-178B Level B. EECU: P/N A03-111-06-001-01 or later approved standard. Hardware/software: TEM_RED_ECU_ECU-1.0.3 or later approved standard.
FLUIDS (FUEL/OIL/ADDITIVES):	See Engine Operation Manual.

II. AIRCRAFT ACCESSORY DRIVES	RED A03				
	Rotation*	Max. speed**	Max. torque	Max. power	Type of drive
Accessory Drive A (in type certificate configuration used by governor)	CW	2736 RPM	1.7 N*m / 15.1 in*lb	0.5 kW / 0.67 hp	AND 20010
Accessory Drive B	CW	3706 RPM	9.1 N*m / 80.5 in*lb	3.5 kW / 4.69 hp	AND 20000
Accessory Drive C	CW	4000 RPM	30.2 N*m / 267.3 in*lb	6.9 kW / 9.25 hp	for V-belt
Accessory Drive D	CW	6182 RPM	19.5 N*m / 172.6 in *lb	6.9 kW / 9.25 hp	for V-belt

*Accessory drive rotation direction as viewed when facing the drive.

** Speed is indicated for an engine crankshaft reference speed of 4000 RPM.

CERTIFICATION BASIS

14 CFR, part 33 effective February 1, 1965, and Amendments 33-1 through Amendment 33-33.

Model	Date of Application	Date Type Certificate Issued
RED A03	January 8, 2015	October 24, 2016

IMPORT REQUIREMENTS

To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States shall be accompanied by a Certificate of Airworthiness for export with EASA Form 1, Authorized Release Certificate. The EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E00092EN, is in a condition for safe operation and has undergone a final operational check.

Additional guidance is contained in FAA Advisory Circular 21-23, "Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products Imported into the United States."

III. ENGINE LIMITS:

1. Temperature limits:

	Temperature in °C/ °F
Minimum engine structure and internal engine fluids temperature for starting	-20 / -4
Minimum engine oil temperature for takeoff	60 / 140 (measured at engine entry)
Engine oil temperature range (normal operation)	60-97 / 140 – 207 (measured at engine entry)
Maximum engine oil temperature (5 min.)	102 / 216
Minimum cooling fluid temperature for takeoff	60 / 140 (measured at engine exit)
Cooling fluid temperature range (normal operation)	60-90 / 140-194 (measured at engine exit)
Maximum cooling fluid temperature (5 min.)	95 / 203 (measured at engine exit)
Minimum gearbox oil temperature for takeoff	50 / 122 (measured at engine exit)
Gearbox oil temperature (normal operation)	50-95 / 122-203 (measured at engine exit)
Maximum gearbox oil temperature (5 min.)	100 / 212 (measured at engine exit)
Minimum exhaust gas temperature	250 / 482
Exhaust gas temperature (normal operation)	500 – 830 / 932 – 1526
Maximum exhaust gas temperature	850 / 1562
Maximum exhaust gas temperature transient limit	900 / 1652 (maximum 5 minutes)

2. Speed Limits:

Maximum engine overspeed (crankshaft)	4200 RPM (2234 prop RPM)
Takeoff speed	4000 RPM (2127 prop RPM)
Maximum continuous speed	3750 RPM (1995 prop RPM)
Maximum turbocharger speed	135,000 RPM (See NOTE 12)

3. Pressure Limits:

Minimum fuel pressure (at inlet of HP engine pump)	2.0 bar absolute (29.0 psia)
Maximum fuel pressure (at inlet of HP engine pump)	3.5 bar absolute (50.8 psia)
Minimum oil pressure at idle conditions	2.4 bar absolute (34.8 psia)
Minimum oil pressure at maximum continuous power	4.3 bar absolute (62.4 psia)
Maximum oil pressure	7.0 bar absolute (101.5 psia)

4. Operating Altitude:

Maximum altitude	7620 m (25,000 ft)
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NOTES

NOTE 1:	Engine model numbers may include suffixes to define minor engine changes related to installation specific configurations. These differences are specified in applicable service bulletins. The software of the electronic engine control for each application has specific software application data. Refer to the applicable service bulletins associated with different installations and the Engine Installation Manual for more information.
NOTE 2:	<p>Manuals required by 14 CFR 33.4: Engine Maintenance Manual: A03-180-03-001-01 Overhaul Manual: To be determined The Airworthiness Limitations Section is FAA approved.</p> <p>Instructions for continued airworthiness are incomplete. 14 CFR 21.50(b) requires the holder of this type certificate to ensure these instructions are complete and furnished prior to when the aircraft incorporating these engines are issued standard airworthiness certificates or delivered/returned to service, whichever occurs later.</p> <p>Manuals required by 14 CFR 33.5: Engine Installation Manual : A03-180-01-001-01 Engine Operating Manual:A03-180-02-001-01</p>
NOTE 3:	The RED A03 engine is approved for installation in Part 23 Normal and Utility aircraft categories only.
NOTE 4:	The engine has been tested for fuels up to a maximum ignition delay time of 8.06 ms / minimum derived cetane number of 27.9 (determined according to EN 15195/ASTM D6890. Refer to Engine Operation Manual for more details.
NOTE 5:	The recommended Time Between Overhaul is published in the Engine Maintenance Manual.
NOTE 6:	The EECU must not be installed in a dedicated fire zone. The installation conditions are found in the Engine Installation Manual.
NOTE 7:	The EECU must have a backup power source which is independent and isolated from the primary power supply when installed on an aircraft.
NOTE 8:	Dispatch Limitations: No Time Limited Dispatch has been approved. All engine systems and equipment must be functional prior to aircraft take-off. Any detected engine system or equipment failure must be corrected before next flight. Refer to the Engine Operation Manual for special instructions.
NOTE 9:	The RED A03 engine is approved for use with propellers and propeller governors as listed in the Engine Installation Manual. The propellers and propeller governors are not part of the engine type design.

NOTE 10:	EMI/Lightning: The FADEC and EECS have been tested according to RTCA Document DO-160G for lightning protection and magnetic interference. The demonstrated levels are provided in the Engine Installation Manual.
NOTE 11:	<p>Service Information:</p> <p>Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA). Any such documents including those approved under a delegated authority, are accepted by the FAA and are considered FAA approved.</p> <ul style="list-style-type: none"> • Service bulletins, • Vendor manuals, • Installation and Operation manuals, and • Airworthiness Limitations Section. <p>These approvals pertain to the type design only.</p>
NOTE 12:	Containment has been demonstrated for maximum turbocharger speed of 140,000 RPM.
NOTE 13:	The engine dry weight includes the engine loom with brackets, electrical engine starter, oil-coolant heat exchanger, integrated oil tank, exhaust systems with turbochargers and wastegates, oil pumps and water pumps. It does not include the propeller, governor, water coolers, coolant piping, charge coolers, oil catch tanks, exhaust gas tailpipes, electronic engine control unit and glow plug unit, adapter loom, alternators, belt drives, and engine fluids.
NOTE 14:	The engine propeller feathering and reversing functions are not part of the engine type design. Propeller feathering and reversing installation and operation procedures must be implemented and certified by the aircraft manufacturer without violating the general engine instructions which are described in the Engine Installation Manual and the Engine Operation Manual.
---THE END---	