European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

Number : E.087
Issue : 01
Date : 17 August 2006
Type : Franklin 4A-235 series engines

Variants
Franklin 4A-235-B3
Franklin 4A-235-B31
Franklin 4A-235-B4

List of effective Pages:

Page	1	2	3	4	5	6												
Issue	1	1	1	1	1	1												

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I - General

1. Type / Variants : Franklin 4A-235 / Franklin 4A-235-B3; Franklin 4A-235-B31; Franklin 4A-235-B4

2. Type Certificate Holder :

Franklin Sp. z o.o.
ul. Chełmińska 208
86-300 Grudziądz
Poland

EASA ADOA reference: AP196

3. Manufacturer:

Franklin Sp. z o.o.

4. EASA Certification/Validation Application Date:

4A-235-B3	4A-235-B31	4A-235-B4
05 Jan. 2005	05 Jan. 2005	05 Jan. 2005

Note : Application date for transfer of Type Certificate

5. Validation Reference Date:

17.January 1964, (E6EA, original application date to FAA)

6. EASA Certification Date:

4A-235-B3	4A-235-B31	4A-235-B4
18 June 1976	18 June 1976	18 June 1976

- Validation of FAA TC by CAO-Poland (CB-200) on 18 June 1976
- Transfer of Type Certificate from " Franklin (USA) " to " WSK PZL-RZESZOW (Poland)" on 11 May 1981
-Transfer of Type Certificate from "WSK-PZL-RZESZOW (Poland) to Franklin SP. zo.o. (Poland) on 17 August 2006

II - Certification Basis

1. EASA Certification Basis:

1.1. Airworthiness Standards:

CAR 13, effective June 15, 1956, as amendment by 13-1 to 13-5, inclusive.

The 4A-235-B31 engine model complies with FAR 33, effective February 1, 1965, including amendments 33-1 to 33-14, inclusive, for sections 33.17, 33.19, 33.23, 33.25, 33.27, 33.35, 33.43, 33.49.

1.2 Special Conditions (SC): none

1.3. Equivalent Safety Findings (ESF): none

1.4. Deviations: none

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

III - Technical Characteristics

1. Type Design Definition:

As defined by: ILUSTRATED PARTS CATALOG, 4A-235-B31 and 4A-235-B4
Model Specification, Doc. No. 16519, 4A-235-B3.

2. Description:

The Franklin 4A-235 series engines is a free aspired, horizontally mounted opposed, direct drive, four cylinder, four stroke, spark ignited, aircooled, . rotation: clockwise facing engine rear.
Displacement: 3.851 dm^3 (235 cu. in.)
Bore x stroke: 117.5 mm x 88.9 mm (4.625 in. x 3.5 in.)
Compression ratio: 8.5 : 1
Gear ratio: N/A

3. Equipment:

See latest revision of Description, Operation and Service Manual

4. Dimensions:

Overall Length mm (in)	738 (29)
Overall Height mm (in)	583 (23)
Width mm (in)	792 (31.2)

5. Dry Weight:

4A-235-B3	4A-235-B31	4A-235-B4
104 kg	103 kg	106 kg
(230 lbs)	(226 lbs)	(233 lbs)

6. Ratings:

Rating		4A-235-B3	4A-235-B31	4A-235-B4
Power, HP (KW)	Take-off and Maximum Continuous, full throttle at sea level pressure altitude	123 (91.7 KW) at 2800 rpm	116 (86.5 KW) at 2800 rpm	125 (93.2 KW) at 2800 rpm

Note: Ratings are based on static sea level standard conditions of dry inlet air at 15 degrees C and 760 mmHg, with no aircraft accessory drive loads
Power tolerance for production engines is +4%, -3% of the Maximum Continuous rating

7. Carburetion

4A-235-B3	4A-235-B31	4A-235-B4
Marvel Schebler MA-3SPA	Marvel Schebler MA-3SPA	Marvel Schebler MA-3SPA

8. Fluids (Fuel/Oil/Additives):

Fuel: Aviation Gasoline, minimum grade 100/130
up to the standard: ASTM-D-910, MIL-G-5572, DERD.2485, AIR3401, GOST 1012-72

Oil: SAE-J-1966 (MIL-L-6082) DERD.2472 or SAE-J-22851 (MIL-L-22851) DERD.2450

Above 5^0C ambient air temp. SAE 50
Below 5^0C ambient air temp. SAE 30

All ambient air temp. SAE 15W50, SAE 20W50

9. Aircraft Accessory Drives:

Designation	Rotation direction	Speed ratio to crankshaft	Max. Torque Nm (in.lbs.) Continuous	static	Max. Overhang moment Nm (in.lbs.)
Tachometer	CCW	0.5:1	0.8 (7.0)	5.6(50)	0.6 (5.0)
Starter	CCW	11.44:1	-	50.8 (450)	10.2 (90)
Dual Drives Mounting on Alternator Drive Pad					
Alternator	CCW	1.08:1	11.3 (100)	90.4(800)	
Vacuum Pump	CCW	1.08:1	Total	Total	2.8 (25)
Optional Dual Drive Pad (as required)					
Fuel Pump (See Note)	Plunger	1.08:1	11.3 (100)	90.4(800)	0.6 (5.0)
Prop. Governor (See Note)	CCW	1.08:1	Total	Total	2.8 (25)
or					
Fuel Pump (See Note)	Plunger	1.08:1	11.3 (100)	90.4(800)	0.6 (5.0)
Hydraulic Pump (See Note)	CCW	1.08:1	Total	Total	2.8 (25)
Fuel Pump (See Note)	CCW	1.08:1	11.3 (100)	90.4(800)	5.78 (51.6)

Note: Optional Dual Drive Pad is replaced by Slide Vane Fuel Pump Drive. See Bulletin PZL-F/73/2002..

IV - Operational Limitations

1. Temperature limits: K (^{0}C, ^{0}F) :

	4A-235-B3	**4A-235-B31**	**4A-235-B4**
Cylinder head	473 (200 , 392)	473 (200 , 392)	478 (204 , 399)
Cylinder base	533 (157, 315)	533 (157, 315)	433 (160, 320)
Oil inlet	383 (110, 230)	383 (110, 230)	413 (140, 284)

2. Pressure Limits:

2.1 Fuel Pressure kPa (p.s.i) :

Fuel pressure limits inlet to carburettor, minimum 3.4 (0.5)
maximum 41.4 (6.0)

2.2 Oil Pressure Limits kPa (p.s.i.) :

Idle 172 (25.0)
Normal Operation 379 – 552 (55.0–80.0)

V - Operational and Service Instructions

	4A-235-B3	4A-235-B31	4A-235-B4
ILUSTRATED PARTS CATALOG		26.0.450 (English) 26.0.430 (Polish)	26.0.480
DESCRIPTION, OPERATION AND SERVICE MANUAL		26.0.061 (English) 26.0.055 (Polish)	26.0.061 (English) 26.0.055 (Polish)
INSTALATION INSTRUCTIONS		26.0.058	26.0.185
INSTALATION DRAWING	16512		

VI - Notes