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| U.S. DEPARTMENT OF TRANSPORTATION<br><br>FEDERAL AVIATION ADMINISTRATION<br><br>TYPE CERTIFICATE DATA SHEET E6EA | TCDS NUMBER E6EA<br><br>REVISION: 9*<br>DATE: April 30, 2013<br><br>Franklin Sp. z.o.o.<br><br>MODELS:<br><br>FRANKLIN<br>4A-235-B 4A-235-B31<br>4A-235-B2 4A-235-B4<br>4A-235-B3 4A-235-B6 |

Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E6EA) 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 — Franklin Sp. z.o.o.<br>Ul. Chelmińska 208<br>86-300 Grudziądz<br>Poland

TYPE CERTIFICATE (TC) HOLDER RECORD — WSK-PZL-RZESZOW transferred TC E6EA to Franklin Sp. z.o.o. on August 17, 2006

| **I. MODELS** | **4A-235-B** | **4A-235-B2** | **4A-235-B3** | **4A-235-B31** |
|---|---|---|---|---|
| TYPE | 4HOA horizontally-mounted direct drive | | | |
| RATINGS | | | | |
| Maximum Continuous hp, r.p.m., at: Sea level pressure altitude | 130-2800 | 125-2800 | 123-2800 | 116-2800 |
| Takeoff hp, r.p.m., full throttle at: Sea level pressure altitude | 130-2800 | 125-2800 | 123-2800 | 116-2800 |
| FUEL (See Note 7) | | | | |
| Minimum grade aviation gasoline | 100/130 | - - | - - | - - |
| OIL GRADE (See Note 7) | | | | |
| above 40øF ambient air temp. | SAE 50 | - - | - - | - - |
| below 40øF ambient air temp. | SAE 30 | - - | - - | - - |
| all ambient air temp. | SAE 15W50 | - - | - - | - - |
| | SAE 20W50 | - - | - - | - - |

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**LEGEND: "- -" INDICATES "SAME AS PRECEDING MODEL"**
**"---" INDICATES "DOES NOT APPLY"**
**NOTICE: ALL PAGES ARE REFORMATTED. SIGNIFICANT CHANGES, IF ANY, ARE BLACK-LINED IN THE LEFT MARGIN.**

| I. MODELS (Continued) | 4A-235-B | 4A-235-B2 | 4A-235-B3 | 4A-235-B31 |
|---|---|---|---|---|
| COMPRESSION | | | | |
| Bore and stroke, in. | 4.625 x 3.5 | - - | - - | - - |
| Displacement, cu. in. | 235 | - - | - - | - - |
| Compression ratio | 8.5:1 | - - | - - | - - |
| WEIGHT (DRY) (lb) | 225 | 223 | 230 | 226 |
| CENTER OF GRAVITY (in) (with all accessories) | | | | |
| Forward from rear face of crankcase | 4.75 | 5.18 | 5.0 | 4.33 |
| Below C.L. of crankshaft | .94 | .87 | .94 | 1.42 |
| DRIVE SHAFT END | SAE ARP502 six 1/2 in. bolts on 4 in. circle | - - | - - | - - |
| CARBURETION | Marvel-Schebler MA-3SPA | - - | - - | - - |
| IGNITION (dual) | Scintilla S4RN-20, 21 | Slick 4074, 4075 | Scintilla S4RN-20, 21 | - - Slick 4392 |
| TIMING, øBTC | 32 | 26 | 32 | - - |
| SPARK PLUGS | AC 271, 281, Champion RHB-32E, -32N, -33E, -36P, -36W | - - | - - | - - (SD-48BSM) |
| OIL SUMP CAPACITY, QT. | 5.5 | - - | - - | 6.5 |
| USABLE OIL, QT. (starting with full tank) | | | | |
| 15ø nose down | 4.5 | - - | 4.8 | 5.8 |
| 20ø nose up | 3.5 | - - | 4.7 | 5.7 |
| NOTES | 1-8 | - - | - - | - - |

| II. MODELS | 4A-235-B4 | 4A-235-B6 | |
|---|---|---|---|
| TYPE | 4HOA horizontally-mounted direct drive | | |
| RATINGS | | | |
| Maximum Continuous hp, r.p.m., at: Sea level pressure altitude | 125-2800 | - - | |
| Takeoff hp, r.p.m., full throttle at: Sea level pressure altitude | 125-2800 | - - | |
| FUEL (See Note 7) | | | |
| Minimum grade aviation gasoline | 100/130 | - - | |
| OIL GRADE (See Note 7) | | | |
| above 40øF ambient air temp. | SAE50 | - - | |
| below 40øF ambient air temp. | SAE30 | - - | |
| all ambient air temp. | SAE 15W50 | - - | |
| | SAE 20W50 | - - | |

| II. MODELS (Continued) | 4A-235-B4 | 4A-235-B6 | |
|---|---|---|---|
| COMPRESSION<br>Bore and stroke, in.<br>Displacement, cu. in.<br>Compression ratio | | | |
| WEIGHT (DRY) (lb) | | | |
| CENTER OF GRAVITY (in)<br>(with all accessories)<br><br>Forward from rear face of crankcase<br><br>Below C.L. of crankshaft | | | |
| DRIVE SHAFT END | | | |
| CARBURETION | | | |
| IGNITION (dual) | | | |
| TIMING, øBTC | | | |
| SPARK PLUGS | | | |
| OIL SUMP CAPACITY, QT. | | | |
| USEABLE OIL, QT.<br>(starting with full tank)<br>15ø nose down<br>20ø nose up | | | |
| NOTES | 1-8 | - - | |

CERTIFICATION BASIS

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

The 4A-235-B31 engine model complies with Federal Aviation Regulation Part 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, and 33.49.

Type Certificate E6EA issued/revised:

| Model | Date of Application | Date TC Issued/Revised |
|---|---|---|
| 4A-235-B | 01/17/64 | 07/22/64 |
| 4A-235-B3 | 10/10/68 | 12/27/68 |
| 4A-235-B2 | 07/20/70 | 10/08/70 |
| 4A-235-B4 | 10/29/70 | 02/16/71 |
| 4A-235-B6 | 07/12/71 | 05/02/72 |
| 4A-235-B31 | 09/30/92 | 12/8/94 |
| Reissued to PEZETEL | | 08/01/79 |
| Reissued to WSK "PZL-RZESZOW" | | 11/05/81 |
| Reissued to WSK "PZL-RZESZOW" SA | | 12/8/94 |
| Reissued to Franklin Sp. z.o.o. | | 04/30/13 |

The General Inspectorate of Civil Aviation of Poland originally type certificated this engine. The FAA validated this product under U.S. Type Certificate Number E6EA. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of Poland.

PRODUCTION BASIS

1. Production Certificate No. 9 for U.S. production. There will be no further production of engines or replacement parts under this production certificate.

2. FAR 21.500 for production of engines or replacement parts under this type Certificate by WSK "PZL-RZESZOW" SA under control of the Republic of Poland General Inspectorate of Civil Aviation (GICA).

   Parts produced under either production basis are eligible to be used interchangeably.

IMPORT REQUIREMENTS

To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with the General Inspectorate of Civil Aviation of Poland or EASA airworthiness approval shall have a Joint Aviation Authorities (JAA) or EASA Form 1, Authorized Release Certificate. The JAA or EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E6EA, 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.

**NOTES**

NOTE 1. Maximum permissible temperatures (øF):

| | 4A-235-B, B3, B31 | 4A-235-B2, B4, B6 |
|---|---|---|
| Cylinder head | 390 (bayonet thermocouple) | 400 (bayonet thermocouple) |
| Cylinder base | 315 | 320 |
| Oil inlet | 230 | 285 |

NOTE 2. Fuel pressure limits (p.s.i.):

| | Min | Max |
|---|---|---|
| All models except 4A-235-B31 | | |
| Inlet to carburetor | 0.5 | 6.0 |
| 4A-235-B31 | | |
| Inlet to fuel pump | 1.4 | 8.5 |

Oil pressure limits (p.s.i.):

| | Idle | Normal Operation |
|---|---|---|
| Inlet to engine | | |
| All models except 4A-235-B31 | 25 | 55-80 |
| 4A-235-B31 | 25 | 55-81.2 |

NOTE 3. The following accessory drives are provided:

| ACCESSORY | Type of Drive Pad | Rotation Facing Drive Pad | Speed Ratio to Crankshaft | Max. Torque (in. lb.) Cont. | Max. Torque (in. lb.) Static | Maximum Overhang Moment (in. lb.) |
|---|---|---|---|---|---|---|
| **Starter** | Special | CC | 11.44:1 | --- | 450 | 90 |
| **Tachometer** | AND 10005 | CC | 0.5:1 | 7 | 50 | 5 |
| Dual Drives Mounting on Alternator Drive Pad | | | | | | |
| **Alternator** | Belt Drive | CC | 1.08:1 | 100 | 800 | --- |
| **Vacuum Pump** | AND 20000 | CC | 1.08:1 | Total | Total | 25 |
| Optional Dual Mounting on Alternator Drive Pad | | | | | | |
| **Fuel Pump** | Diaphragm | Plunger | 1.08:1 | 100 | 800 | 5 |
| **Prop. Governor** | AND 20010 | CC | 1.08:1 | Total | Total | 25 |
| **or** | | | | | | |
| **Fuel Pump** | Diaphragm | Plunger | 1.08:1 | 100 | 800 | 5 |
| **Hydraulic Pump** | AND 20000 | CC | 1.08:1 | Total | Total | 25 |
| **or** | | | | | | |
| **Fuel Pump** | Special | CC | 1.08:1 | 100 | 800 | 51.6 |
| "C" - clockwise facing engine drive pad, "CC" - counter clockwise facing engine drive pad | | | | | | |

NOTE 4. Power tolerance for production engines is +4%, -3% of the nominal rating.

NOTE 5. The 4A-235-B and -B2 models have the mounts in a horizontal plane below the cylinders and carburetor located behind the oil pan.

The 4A-235-B3 model has the mounts in a vertical plane at the crankcase rear face and the carburetor located under the oil pan.

The 4A-235-B4 model has the mounts in a vertical plane at the crankcase rear face and the carburetor located behind the oil pan.

The 4A-235-B6 model is similar to the 4A-235-B2 model except for improved engine parts.

The 4A-235-B31 model is the same as the -B3 except for modified oil pan, relocated carburetor, and modified alternator mount.

NOTE 6.

SERVICE INFORMATION:

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or, for approvals made before September 28, 2003 by the General Inspectorate of Civil Aviation of Poland. Any such documents including those approved under a delegated authority, are accepted by the FAA and are considered FAA approved.

- Service bulletins,
- Structural repair manuals,
- Vendor manuals,
- Aircraft flight manuals, and
- Overhaul and maintenance manuals.

These approvals pertain to the type design only.

NOTE 7.

Fuels and oils that meet the following specifications and the specified grades are acceptable for all engine models.

Fuel: ASTM-D-910, M1L-G-5572, DERD 2485, AIR3401, GOST 1012-72.

Oil: SAE-J-1966 (M1L-L-6082), DERD 2472 or
SAE-J-22851 (M1L-L-22851), DERD 2450.

NOTE 8.

Engine Serial Numbers xxxxx130 and above incorporate slide vane fuel pump drive instead of diaphragm pump drive. The serial number of these engines incorporates letter “S”.

When slide vane fuel pump drive is installed in service, the suffix “/S” is affixed to the serial number.

Fuel pump PLL-7-4 (WSK Part No 26.11.8320) is approved for these engines. This pump complies with Federal Aviation Regulation Part 33, effective February 1, 1965, including amendments 33-1 to 33-5.

---THE END---