**TYPE CERTIFICATE DATA SHEET Nº EM-2023T04**

Type Certificate Holder:

**Lycoming Engines**
An Operating Division of AVCO Corporation
Williamsport, Pennsylvania 17701
USA

EM-2023T04-00
Sheet 01
LYCOMING ENGINES
IO-320-D1B

31 August 2023

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Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 2023T04, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

**MODEL** IO-320-D1B

**TYPE** 4HOA Direct Drive - the Lycoming Engines models of the IO-320 series are a fuel injection Direct Drive, four cylinders, horizontally opposed, air cooled engines. These engines are supplied at the factory with automotive type alternator and starter. Available as optional equipment are a propeller governor type, a vacuum pump and the hydraulic pump drives.

**RATINGS**

| | IO-320-D1B |
|---|---|
| Max. continuous, kW (hp.) - rpm. full throttle at: | |
| Sea level pressure altitude: | 119 kW (160 hp.) at 2700 engine rpm |
| Takeoff, kW (hp.) - rpm full throttle at: | |
| Sea level pressure altitude: | 119 kW (160 hp.) at 2700 engine rpm |

**FUEL TYPE** Minimum grade aviation gasoline, see latest revision of Lycoming Service Instruction No. 1070

**OIL, LUBRICATION** Latest revisions of Lycoming Spec.No. 301 and Service Instruction 1014
Obs.: Lubricants should conform to the specification as listed or subsequent revisions)

**BORE AND STROKE, mm (in.)** 130.2 x 98.4 (5.125 x 3.875)

**DISPLACEMENT, $cm^3$ (cu.in.)** 5,243 (320)

**COMPRESSIOM RATIO** 8.50:1

**WEIGHT DRY, Kg (lb.)** 119 (263)
Standard engine dry weight less starter and generator/alternator.

**WEIGHT AND C.G. LOCATION** From front face of Prop. Shaft Flange, mm (in.) ➔ 370.6 (14.59)
Off Crankshaft Center Line, mm (in.) ➔ 25.9 (1.02) Below – 2.03 (0.08) Left

**PROPELLER SHAFT FLANGS, SAE No.** AS 127 Type 2 modified

**CRANKSHAFT DAMPERS AND BALACERS** None

**FUEL INJECTOR** Bendix RSA-5AD1

**IGNITION, DUAL** Bendix S4LN-1209, S4LN-1208
For alternate magnetos see latest issue of Lycoming Service Instruction 1443.

**TIMING, °BTC** 25

**SPARK PLUGS** See latest revision of Lycoming Service Instruction No. 1042 for approved equipment.

**OIL SUMP CAPACITY, liters (qt.)** 7.6 (8)

**MINIMUM USABLE OIL, liters (qt.)** 1.9 (2)
**(30° nose up or down)**

**MINIMUM USABLE OIL, liters (qt.)** Does not apply.
**(30° nose up, 20° nose down)**

**IMPORT REQUIREMENTS** Each engine imported separately and/or spare parts must be accompanied by a FAA Export Airworthiness Approval, Authorized Release Certificate (or a third country authority, in case of used engine imported from such country), certifying that the engine conforms to a type design approved by the ANAC, as specified in the ANAC type certificate data sheet (TCDS) No. EM-2023T04-latest revision, is in condition for safe operation and has undergone a final operational check. The original Authorized Released Certificate should be sent with the engine and a copy remains with the issuing organization.
For each engine it is required a list of exceptions (if any) in respect to the ANAC approved Type Design, listed in the FAA Authorized Release Certificate above mentioned.

**CERTIFICATION BASIS** Brazilian Type Certificate No. 2023T04 is based in RBAC 21 - Certificação de Produto e Artigo Aeronáuticos (Certification Procedures for Products and Articles), Section §21.29, including the following Airworthiness Requirements:

- CAR 13 effective June 15,1956. As amended by 13-1,13-2,13-3 & 13-4.

| Model | Application | Issued TC |
|---|---|---|
| IO-320-D1B | 05 Jul. 2023 | 31 Aug. 2023 |

**STATE OF DESIGN AUTHORITY REFERENCE DOCUMENT** TCDS FAA 1E12; Rev. 10, 04 April 2018

**PRODUCTION BASIS** FAA Production Certificate no. 3

**NOTES:**

**NOTE 1** **Maximum permissible temperatures, °C (°F):**

| | Temperature in °C / °F | Comments |
|---|---|---|
| Cylinder head | 260 °C / 500 °F | Well-type thermocouple |
| Cylinder Base | 163 °C / 325 °F | Not applicable to engine models which incorporate internal piston cooling oil jets |
| Oil inlet | 118 °C / 245 °F | |

**NOTE 2** **Pressure Limits:**

**Fuel:**

| Inlet to Diaphragm Pump | | Inlet to Injector | |
|---|---|---|---|
| Maximum | Minimum | Maximum | Minimum |
| 35 p.s.i. | -2 p.s.i. | 45 p.s.i. | 12 p.s.i. |

| Boost pump outlet limits to injectors: | Parallel Boosts | | Series Boosts | |
|---|---|---|---|---|
| | Maximum | Minimum | Maximum | Minimum |
| Zero Fuel Flow | 45 p.s.i | - | 35 p.s.i. | - |
| Maximum Fuel Flow | - | 14 p.s.i. | - | 14 p.s.i |

**Oil:**

| Maximum | | Minimum | |
|---|---|---|---|
| Normal Operating | Starting and Warm-up | Normal | Idling |
| 90 p.s.i. | 100 p.s.i. | 60 p.s.i. | 25 p.s.i. |

**NOTE 3** The following accessory provisions are incorporated:

| Accessory | Rotation Facing Drive Pad | Speed Ratio to Crankshaft | Max. Torque N.m (in.lb) Cont | Max. Torque N.m (in.lb) Static | Maximum Overhang Moment N.m (in.lb) |
|---|---|---|---|---|---|
| Starter * | CC | 13.556:1 | - | 50.8 (450) | 16.9 (150) |
| Starter ** | CC | 16.556:1 | - | 50.8 (450) | 16.9 (150) |
| Alternator * | C | 3.250:1 | 6.8 (60) | 13.6 (120) | 19.8 (175) |
| Fuel Pump, plunger * | - | 0.5:1 | - | - | 1.1 (10) |
| Vacuum Pump * | CC | 1.300:1 | 7.9 (70) | 50.8 (450) | 2.8 (25) |
| Tachometer* | C | 0.5:1 | 0.8 (7) | 5.7 (50) | 0.6 (5) |
| Hydraulic Pump * | C | 1.300:1 | 11.3 (100) | 90.4 (800) | 4.5 (40) |
| Propeller Governor * | C | 0.866:1 | 14.1 (125) | 135.6 (1200) | 4.5 (40) |

"C" = Clockwise, "CC" = Counterclockwise

* Standard, ** Optional

**NOTE 4** Reserved

**NOTE 5** This engine incorporates provisions for absorbing propeller thrust in both tractor and pusher type installations.

**NOTE 6** This engine is approved for horizontal helicopter application and operation.

**NOTE 7** Reserved

**NOTE 8** Starters, generators and alternators approved for use on these engines are listed in the latest revision of AVCO Lycoming Service Instruction No. 1154.

**NOTE 9** Reserved

**Change Record**

| Revision | Application Date | Changes | TC Issue/Reissued Date |
|---|---|---|---|
| Rev. 00 | 05 July 2023 | Original Issue | 31 Aug. 2023 |
| | | | |

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This TCDS is available at ANAC website:
https://sistemas.anac.gov.br/certificacao/Produtos/EspecificacaoOrgE.asp