

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-274

Revision 22

Lycoming Engines

O-320-A1A, -A1B, -A2A, -A2B, -A2C, -A2D, -A3A, -A3B,
-A3C, -B1A, -B1B, -B2A, -B2B, -B2C, -B3A, -B3B, B3C,
-B2D, -B2E -C1A, -C1B, -C2A, -C2B, -C2C, -C3A, -C3B,
-C3C, -D1A, -D1B, -D1C, -D1D, -D1F, -D2A, -D2B, -D2C,
-D2F, -D2G, -D2H, -D2J, -D3G, -E1A, -E1B, -E1C, -E1F,
-E1J, -E2A, -E2B, -E2C, -E2D, -E2F, -E2G, -E2H, -E3D,
-E3H, -H1AD, -H1BD, -H2AD, -H2BD, -H3AD, -H3BD

April 30, 2013

TYPE CERTIFICATE DATA SHEET NO. E-274

Engines of models described herein conforming with this data sheet, (which is part of type certificate No. 274) 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 Civil Air Regulations/Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder

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

Type Certificate Holder Record

Textron Lycoming/Subsidiary of Textron, Inc. transferred TC E-274 to Lycoming Engines, An Operating Division of AVCO Corporation on December 17, 2003

| | | | | | | | | |
|----------|----|----|----|----|----|----|----|--|
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| Rev. No. | 22 | 22 | 16 | 16 | 20 | 14 | 17 | |

| | | | | |
|--|--|----------------------------|---|---|
| Model | O-320-A1A, -A1B, -A2A, -A2B, -A2C, -A2D, -A3A, -A3B, -A3C, -C1A, -C1B, -C2A, -C2B, -C2C, -C3A, -C3B, -C3C, -E1A, -E1B, -E1C, -E1F -E1J, -E2A, -E2B, -E2C, -E2D, -E2F, -E2G, -E2H, -E3D, -E3H | | O-320-H1AD, -H1BD, -H2AD, -H2BD, -H3AD, -H3BD | O-320-B1A, -B1B, -B2A, -B2B, -B2C, -B2D, -B3A, -B3B, -B3C, -B2E -D1A, -D1B, -D1C, -D1D, -D1F, -D2A, -D2B, -D2C, -D2F, -D2G, -D2H, -D2J, -D3G |
| Type | 4H0A | - - | - - | |
| Rating | | | | |
| Max. continuous, h.p. r.p.m. full throttle at: | | | | |
| Sea level pressure altitude | 150-2700 | 160-2700 | 160-2700 | |
| Takeoff, h.p. r.p.m. full throttle at: | | | | |
| Sea level pressure altitude | 150-2700 (See NOTE 8) | 160-2700 See NOTE 8 | 160-2700 (See NOTE 8) | |
| Fuel | | | | |
| (Minimum grade aviation gasoline) | 80/87* | 100 or 100LL* | 91/96* | |
| Carburetion** | LVC-5-4PA | - - | - - (-B2D, -D1D- LHC-6-6BPA) | |
| Pressure limits | See NOTE 2 | - - | - - | |
| Pump Drive | See NOTE 3 | - - | - - | |
| Oil, Lubrication | | | | |
| (Lubricants should conform to the specifications as listed or to subsequent revisions thereto) | Lycoming Specification No. 301-F | - - | - - | |
| Oil sump capacity, Qt. | 8 | 6 | 8 | |
| Usable oil sump capacity, Qt. | 6 | 4 | 6 | |
| Temperature Limits | See NOTE 1 | - - | - - | |
| Pressure Limits | See NOTE 2 | - - | - - | |
| Ignition | | | | |
| Dual magnetos | See NOTE 9 | - - | - - | |
| Timing BTC | 25 | 25 | 25 | |
| Spark plugs | See NOTE 4 | - - | - - | |
| Compression | | | | |
| Bore and stroke, in. | 5.125 x 3.875 | - - | - - | |
| Displacement, cu. in. | 319.8 | - - | - - | |
| Compression ratio | 7.00:1 | 9.00:1 | 8.50:1 | |
| Weight (dry) Lb. | See NOTE 9 | - - | - - | |
| C.G. location (dry) | | | | |
| From face of propeller mounting flange, in. | 14.25 14.57 | 14.25 | 14.25 14.70 | |
| Off propeller shaft C.L., in. | .97 Below .71 Below .03 Right .12 Left (-E2D, -E3D, -E2H, -E3H) | .97 Below .00 (on C.L.) | .97 Below .79 Below .03 Right .11 Left (-B2D, -D1D) | |
| Propeller shaft-specification A.S. 127 | | | | |
| Integral flanged hub | SAE 2 modified | - - | - - | |
| Crankshaft dampers (torsional) | — | — | — | |

* See latest revision of Lycoming Service Instruction 1070 for alternate fuel grades

** See latest revision of Lycoming Service Instruction 1523 for alternate carburetors.

NOTES:

"- -" indicates "same as preceding model."

"—" indicates "does not apply."

| <u>Regulations & Amendments</u> | <u>Models</u> | <u>Date of Application</u> | <u>Date T.C. No. 274 Issued/Revised</u> |
|---|---|--|--|
| CAR 13 effective March 5, 1952 | O-320, O-320-A1A | October 13, 1952 | July 28, 1953 |
| As amended by 13- & 13-2 | O-320-A2A | October 21, 1954 | October 28, 1954 |
| CAR 13 effective June 15, 1956 As amended by 13-1 & 13-2 | O-320-B1A, -B2A O-320-A1B, -A2B, -A3A, -A3B, -B1B, -B2B, -B3A, -B3B | May 24, 1957 February 1959 | July 25, 1957 March 23, 1959 |
| 13-3 | O-320-C2A, -C2B, -C3A, -C3B O-320-A2C, -A3C, -B2C, -B3C | January 18, 1960 March 29, 1960 | February 11, 1960 April 27, 1960 |
| 13-3 | O-320-D1A, -D2A O-320-D1B, -D2B O-320-E1A, -E2A, -E1B, -E2B | November 1, 1961 December 8, 1961 January 26, 1962 | November 30, 1961 December 20, 1961 February 15, 1962 |
| 13-4 | O-320-C1A, -C1B, -C2C, -C3C O-320-E2C O-320-D2C O-320-E2D O-320-E1C O-320-E1F, -E2F O-320-E2G O-320-E3D O-320-D1F, -D2F O-320-E2H, -E3H O-320-D1C O-320-A2D O-320-D2G O-320-D1D O-320-E1J O-320-H1AD, -H1BD, -H2AD, -H2BD O-320-H3AD, -H3BD O-320-D3G O-320-D2H O-320-D2J O-320-B2D O-320-B2E | January 22, 1963 November 11, 1965 April 14, 1966 December 19, 1966 May 27, 1969 July 24, 1970 December 11, 1970 January 26, 1971 February 26, 1971 July 15, 1971 September 14, 1971 March 2, 1972 March 14, 1974 March 27, 1974 January 21, 1975 September 10, 1975 June 1, 1976 August 11, 1976 May 17, 1977 December 28, 1978 June 11, 1992 January 30, 2003 | March 3, 1964 November 24, 1965 May 2, 1966 January 27, 1967 June 4, 1969 August 3, 1970 December 23, 1970 February 3, 1971 March 3, 1971 July 27, 1971 September 30, 1971 March 14, 1972 March 21, 1974 May 1, 1974 January 29, 1975 January 26, 1976 June 4, 1976 August 23, 1976 May 20, 1977 January 4, 1979 June 25, 1992 July 8, 2003 |

Production basis

Production Certificate No. 3

NOTE 1. Maximum permissible temperatures are as follows:

Cylinder head 500°F (well-type thermocouple)
Cylinder barrel 325°F
Oil inlet 245°F

NOTE 2. Fuel pressure limits: Minimum 0.5 p.s.i. - Maximum 8 p.s.i. For gravity feed systems, minimum fuel pressure is 15.0 inches of gasoline differential pressure across the fuel inlet fitting on O-320-D2J.

Oil pressure limits: (Normal operation) Minimum 55 p.s.i. - Maximum 95 p.s.i.
(Idling) 25 p.s.i.
(Starting and warm-up) Maximum 115 p.s.i.

NOTE 3. The following accessory drive provisions are available:

O-320 Models

| Accessory | All Models not otherwise Shown | -H1AD, -H1BD, -H3AD, -H3BD | -A2D, -E2D, -E2G, -E2H, -E3D, -E3H | -H2AD, -H2BD | Rotation facing Drive Pad | Speed Ratio to Crankshaft | Max. Torque (in.-lb.) Cont. Static | Max. Overhang Moment (in.-lb.) |
|---|--------------------------------|----------------------------|------------------------------------|--------------|---------------------------|---------------------------|------------------------------------|--------------------------------|
| Starter | * | * | * | * | CC | 13.556:1 | — 450 | 150 |
| Starter | ** | ** | ** | ** | CC | 16.556:1 | — 450 | 150 |
| Generator | * | — | — | — | C | 1.910:1 | 60 120 | 175 |
| Generator | ** | — | — | — | C | 2.500:1 | 60 120 | 175 |
| Alternator | — | ** | — | ** | C | 1.910:1 | 60 120 | 175 |
| Alternator | ** | * | * | * | C | 3.250:1 | 60 120 | 175 |
| Vacuum Pump | * | — | * | — | CC | 1.300:1 | 70 450 | 25 |
| Vacuum Pump | — | * | — | ** | CC | 1.313:1 | 70 450 | 25 |
| Hydraulic Pump | — | — | — | — | C | 1.300:1 | 100 800 | 40 |
| Tachometer | * | * | * | * | C | .500:1 | 7 50 | 5 |
| Prop. governor | — | — | — | — | C | .895:1 | 125 1200 | 40 |
| Prop. governor | * | — | — | — | C | .866:1 | 125 1200 | 40 |
| Fuel Pump (Plunger) | ** | ** | * | ** | — | .500:1 | — — | 10 |
| Fuel Pump | ** | ** | — | ** | CC | 1.000:1 | 25 450 | 25 |
| Optional Dual Drive Mounting on Vacuum Pump Drive Pad | | | | | | | | |
| Vacuum Pump | ** | — | — | — | CC | 1.300:1 | 70 450 | 6 |
| Hydraulic Pump | ** | — | — | — | CC | 1.300:1 | Total Total | 10 |
| or | | | | | | | | |
| Vacuum Pump | ** | — | — | — | CC | 1.300:1 | 70 450 | 6 |
| Vacuum Pump | — | ** | — | ** | CC | 1.313:1 | 70 450 | 6 |
| Prop. Governor | ** | — | — | — | CC | 1.300:1 | Total Total | 10 |
| Prop. Governor | — | ** | — | ** | C | 1.000:1 | 125 1200 | 40 |

"—" Does not apply

*Standard

**Optional

"C" Clockwise

"CC" Counter Clockwise

| Accessory | -D1C -D1D | -D1F -E1E -E1J | -B2E -D2F -E2F | -B2D -D2G -D2H -D3G | -D2J | Rotation facing Drive Pad | Speed Ratio to Crank shaft | Max. Torque (in.-lb.) Cont. Static | Max. Overhang Moment (in.-lb.) |
|---|--------------|----------------------|----------------------|------------------------------|------|---------------------------|----------------------------|------------------------------------|--------------------------------|
| Starter | * | * | * | * | * | CC | 13.556:1 | — 450 | 150 |
| Starter | ** | ** | ** | ** | ** | CC | 16.556:1 | — 450 | 150 |
| Generator | — | — | — | — | — | C | 1.910:1 | 60 120 | 175 |
| Generator | — | — | — | — | — | C | 2.500:1 | 60 120 | 175 |
| Alternator | — | — | — | — | — | C | 1.910:1 | 60 120 | 175 |
| Alternator | * | * | * | * | * | C | 3.250:1 | 60 120 | 175 |
| Vacuum Pump | ** | ** | ** | * | * | CC | 1.300:1 | 70 450 | 25 |
| Vacuum Pump | — | — | — | — | — | C | 1.910:1 | 60 120 | 175 |
| Hydraulic Pump | — | * | ** | — | — | C | 1.300:1 | 100 800 | 40 |
| Tachometer | * | * | * | * | * | C | .500:1 | 7 50 | 5 |
| Prop. governor | — | * | — | — | — | C | .895:1 | 125 200 | 40 |
| Prop. governor | * | — | — | — | — | C | .866:1 | 125 1200 | 40 |
| Fuel Pump (Plunger) | * | ** | * | * | — | — | .500:1 | — — | 10 |
| Fuel Pump | — | — | — | — | — | CC | 1.000:1 | 25 450 | 25 |
| Optional Dual Drive Mounting on Vacuum Pump Drive Pad | | | | | | | | | |
| Vacuum Pump | ** | — | — | ** | ** | CC | 1.300:1 | 70 450 | 6 |
| Hydraulic Pump | ** | — | — | ** | ** | CC | 1.300:1 | Total Total | 10 |
| or | | | | | | | | | |
| Vacuum Pump | ** | — | — | ** | ** | CC | 1.300:1 | 70 450 | 6 |
| Vacuum Pump | — | — | — | — | — | CC | 1.313:1 | 70 450 | 6 |
| Prop. Governor | ** | — | — | — | ** | CC | 1.300:1 | Total Total | 10 |
| Prop. Governor | — | — | — | — | — | C | 1.000:1 | 125 1200 | 40 |

"—" Does not apply

*Standard

**Optional

"C" Clockwise

"CC" Counter clockwise

NOTE 4. Spark plugs approved for use on these engines are listed in the latest revision of Lycoming Service Instruction No. 1042.

NOTE 5. The above models incorporate additional characteristics as follows:

| <u>O-320 Models</u> | <u>Characteristics</u> |
|---------------------------------|---|
| O-320 | Basic model - four cylinder, horizontally opposed air cooled, direct drive with automotive type generator and starter, provides for single acting controllable pitch propeller. |
| O-320-A1A | Same as O-320, model designation change only. |
| O-320-B1A | Same as O-320-A1A except for compression ratio, fuel grade and rating. |
| O-320-A1B, -B1B | Same as O-320-A1A and -B1A respectively except have straight bore carburetor riser. |
| O-320-A2A, -A2B, and -B2A, -B2B | Same as O-320-A1A, -A1B, -B1A and B1B respectively except have no provisions for controllable pitch propellers. |
| O-320-A2D | Same as O-320-E3D except crankcase machined for conical instead of Dynafocal mounts. |
| O-320-A3A, -A3B, -B3A, and -B3B | Same as O-320-A1A, -A1B, -B1A, and -B1B respectively except have provisions for 7/16" propeller attaching bolts. |
| O-320-A2C, -A3C | Same as O-320-A2B and -A3B respectively, except for magnetos. |
| O-320-B2C, -B3C | Same as O-320-B2B and -B3B respectively, except for magnetos. |
| O-320-B2D | Same as O-320-D1D except conical engine mounts and no prop governor |
| O-320-B2E | Similar to -B2B except carburetor located same as O-320-D models |
| O-320-C2A, -C2B, -C3A, -C3B | Same as O-320-B2A, -B2B, -B3A and B3B respectively, except have O-320-A series, low compression pistons, reduced ratings and lower grade fuel requirements. |
| O-320-C1A, -C1B, -C2C, -C3C | Same as O-320-B1A, -B1B, -B2C, -B3C respectively, except have been converted to low compression pistons. |
| O-320-D1A | Same as O-320-B3B except has provisions for dynafocal mounts. |
| O-320-D1B, -D2B | Same as O-320-D1A and -D2A receptively, except for magnetos. |
| O-320-D1C | Identical to O-320-D2C except has provision for controllable pitch propellers. |
| O-320-D1D | Similar to O-320-D1A except incorporates Slick instead of Bendix magnetos and has a horizontal carburetor and induction housing |
| O-320-D1F | Identical to O-320-E1F except is equipped with high compression pistons and has higher H.P. rating. |
| O-320-D2A | Same as O-320-D1A except has no provisions for controllable pitch propellers |
| O-320-D2C | Similar to model O-320-D2A except for magnetos. |
| O-320-D2F | Similar to O-320-D1F but does not have provisions for controllable pitch propeller. |
| O-320-D2G | Identical to O-320-D2A except incorporates Slick instead of Bendix magnetos and 7/16 instead of 3/8 prop. flange bolts. |

| <u>O-320 Models</u> | <u>Characteristics</u> |
|---------------------|---|
| O-320-D2H | Same as D2G except has O-320-B sump and intake pipes and provision for AC type fuel pump. |
| O-320-D2J | Similar to O-320-D2G except is equipped with two Slick impulse coupling magnetos and the prop. governor pad, fuel pump and governor pads on accessory housing are not machined. |
| O-320-D3G | Same as D2G except has 3/8 in prop. attaching bolts. |
| O-320-E1A, -E2A | Same as O-320-D1A and -D2A respectively, except have lower compression ratio and performance. |
| O-320-E1B, -E2B | Same as O-320-E1A and -E2A respectively except for magnetos. |
| O-320-E1C, -E2C | Same as O-320-E1A and -E2A respectively except have 1200 series magnetos. |
| O-320-E1F | Similar to O-320-E1C except has propeller governor drive located on left front of crankcase instead of on the accessory housing. |
| O-320-E1J | Same as O-320-E1F except is equipped with Slick magnetos. |
| O-320-E2D | Similar to O-320-E2A except has no provisions for controllable pitch propeller. |
| O-320-E2F | Identical to O-320-E1F including provisions for propeller governing but does not contain propeller governor drive gears. |
| O-320-E2G | Similar to O-320-E2D except is equipped with O-320-A series sump and intake pipes. |
| O-320-E2H | Identical to O-320-E2D except incorporates Bendix instead of Slick magnetos. |
| O-320-E3D | Identical to O-320-E2D except has provisions for .375 in. propeller flange bolts instead of .4375 in. flange bolts. |
| O-320-E3H | Identical to O-320-E2H except has .375 in. propeller flange bushings instead of .4375 in. flange bushings. |
| O-320-H1AD | Integral accessory section crankcase, front mounted fuel pump external mounted oil pump and D4RN-2021 impulse coupling dual magneto. |
| O-320-H2AD | Same as -H1AD but with fixed pitch propeller. |
| O-320-H3AD | Same as -H2AD but with 3/8 in. instead of 7/16 in. propeller flange bolts. |
| O-320-H1BD | Same as -H1AD but with D4RN-2200 retard breaker dual magneto. |
| O-320-H2BD | Same as -H2AD but with D4RN-2200 retard breaker dual magneto. |
| O-320-H3BD | Same as -H3AD but with D4RN-2200 retard breaker magneto. |

NOTE 6. These engines incorporate provisions for absorbing propeller thrust in both tractor and pusher type installations.

NOTE 7. These engines are approved for horizontal helicopter application and operation.

NOTE 8. The O-320-E2A and -E2C have alternate rating of 140 hp. @ 2450 r.p.m., the O-320-D series have alternate ratings of 150 hp at 2500 r.p.m. and 155 hp. at 2600 r.p.m.; the O-320-H series have an alternate rating of 150 h.p. at 2600 r.p.m.

NOTE 9. O-320- Weight (dry) and ignition, dual.

| <u>Models</u> | <u>Weight Lb.</u> | <u>Magnetos *</u> |
|----------------------------------|-------------------|-----------------------------------|
| -A1A, -A1B, -A2A-A2B, -A3A, -A3B | 244 | S4LN21, S4LN20 (TCM)+ |
| -A2D | 249 | 4251, 4250 (Slick) |
| -A2C, -A3C | 243 | S4LN-200, S4LN-204 (TCM) |
| -B1A, -B1B, -B2A | 250 | S4LN-21, S4LN-20 (TCM) |
| -B2B, -B3A, -B3B | 250 | S4LN-21, S4LN-20 (TCM) |
| -B2C, -B3C | 249 | S4LN-200, S4LN-204 (TCM) |
| -B2D | 283 | 4373, 4370 (Slick) |
| -B2E | 250 | 4373, 4370 (Slick) |
| -C1A, -C1B, -C2A | 250 | S4LN-21, S4LN-20 (TCM) |
| -C2B, -C3A, -C3B | 250 | S4LN-21, S4LN-20 (TCM) |
| -C2C, -C3C | 249 | S4LN-200, S4LN-204 (TCM) |
| -D1A, -D2A | 255 | S4LN-21, S4LN-20 (TCM) |
| -D1B, -D2B | 254 | S4LN-200, S4LN-204 (TCM) |
| -D1C, -D2C | 256 | 24LN-1227, SRLN-1209 (TCM) |
| -D1D | 253 | 4251, 4250 (Slick) |
| -D1F, -D2F | 255 | S4LN-1227, S4LN-1209 (TCM) |
| -D2G | 251 | 4251, 4250 (Slick) |
| -E1A, -E2A | 244 | S4LN-21, S4LN-20, S4LN-204 (TCM) |
| -E1B, -E2B | 243 | S4LN-200, S4LN-204 (TCM) |
| -E1C, -E2C | 245 | S4LN-1227, S4LN-1209 (TCM) |
| -E1F, -E2F | 248 | S4LN-1227, S4LN-1209 (TCM) |
| -E2D | 249 | 4251, 4250 (Slick) |
| -E2G | 249 | 4251, 4250 (Slick) |
| -E2H | 252 | S4LN-21, SRLN-20 (TCM) |
| -E3D | 249 | 4250, 4251 (Slick) |
| -E3H | 252 | S4LN-21, S4LN-20 (TCM) |
| -E1J | 245 | 4251, 4250 (Slick) |
| -D2H | 251 | 4251, 4250 (Slick) |
| -D2J | 255 | (2) 4251 (Slick) |
| -D3G | 251 | 4251, 4250 (Slick) |
| -H1AD | 253 | D4RN-2021 (TCM) |
| -H2AD | 253 | D4RN-2021(TCM) |
| -H3AD | 253 | D4RN-2021 (TCM) |
| -H1BD | 253 | D4RN-2200 (TCM) |
| -H2BD | 253 | D4RN-2200 (TCM) |
| -H3BD | 253 | D4RN-2200 (TCM) |

* For alternate magnetos see latest revision of Lycoming Service Instruction 1443

+ TCM formally Bendix

NOTE 10. All models equipped with one impulse coupling magneto may use two impulse coupling magnetos as optional equipment. Starters, generators and alternators approved for use on the engines are listed in the latest revision of Lycoming Service Instruction No. 1154.

----END----