DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-274
Revision 18
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

December 17, 2003

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 A Division of AVCO Corporation A wholly owned subsidiary of Textron Inc. Williamsport, Pennsylvania 17701
Type Certificate Holder Record	AVCO Lycoming Division, AVCO Corp. transferred TC E-274 to Lycoming Engines, A Division of AVCO Corporation on December 17, 2003.

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	- -
Carburetion	PAC MA-4SPA	- -	- - (-B2D,-D1D-PAC HA-6)
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

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Model (cont'd)	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
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)	—	—	—

* Precision Airmotive Corporation formally Marvel-Schebler

NOTES:
"- -" indicates "same as preceding model."
"—" indicates "does not apply."

Regulations & Amendments	Models	Date of Application	Date T.C. No. 274 Issued/Revised
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	O-320-B1A, -B2A	May 24, 1957	July 25, 1957
As amended by 13-1 & 13-2	O-320-A1B, -A2B, -A3A, -A3B, -B1B, -B2B, -B3A, -B3B	February 1959	March 23, 1959
13-3	O-320-C2A, -C2B, -C3A, -C3B	January 18, 1960	February 11, 1960
	O-320-A2C, -A3C, -B2C, -B3C	March 29, 1960	April 27, 1960
13-3	O-320-D1A, -D2A	November 1, 1961	November 30, 1961
	O-320-D1B, -D2B	December 8, 1961	December 20, 1961
	O-320-E1A, -E2A, -E1B, -E2B	January 26, 1962	February 15, 1962

13-4	O-320-C1A, -C1B, -C2C, -C3C	January 22, 1963	March 3, 1964
	O-320-E2C	November 11, 1965	November 24, 1965
	O-320-D2C	April 14, 1966	May 2, 1966
	O-320-E2D	December 19, 1966	January 27, 1967
	O-320-E1C	May 27, 1969	June 4, 1969
	O-320-E1F, -E2F	July 24, 1970	August 3, 1970
	O-320-E2G	December 11, 1970	December 23, 1970
	O-320-E3D	January 26, 1971	February 3, 1971
	O-320-D1F, -D2F	February 26, 1971	March 3, 1971
	O-320-E2H, -E3H	July 15, 1971	July 27, 1971
	O-320-D1C	September 14, 1971	September 30, 1971
	O-320-A2D	March 2, 1972	March 14, 1972
	O-320-D2G	March 14, 1974	March 21, 1974
	O-320-D1D	March 27, 1974	May 1, 1974
	O-320-E1J	January 21, 1975	January 29, 1975
	O-320-H1AD, -H1BD, -H2AD, -H2BD	September 10, 1975	January 26, 1976
	O-320-H3AD, -H3BD	June 1, 1976	June 4, 1976
	O-320-D3G	August 11, 1976	August 23, 1976
	O-320-D2H	May 17, 1977	May 20, 1977
	O-320-D2J	December 28, 1978	January 4, 1979
	O-320-B2D	June 11, 1992	June 25, 1992
	O-320-B2E	January 30, 2003	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 0-320-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.	Max. Torque (in.-lb.) 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.	Max. Torque (in.-lb.) 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:

O-320 Models	Characteristics
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-D1E, -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.

O-320 Models	Characteristics
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-2O21 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.

Models	Weight Lb.	Magnetos *
-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....