DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

1E7
Revision 7
Lycoming Engines
IGSO-540-A1A, -A1C
-A1D, -A1E, -A1F,
-A1H
IGSO-540-B1A, -B1C

June 23, 2010

TYPE CERTIFICATE DATA SHEET NO. 1E7

Engines of models described herein conforming with this data sheet (which is a part of Type Certificate No. 1E7) 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	AVCO Lycoming Div., AVCO CORP., Williamsport, PA. transferred TC 284 to Lycoming Engines, An Operating Division of AVCO Corporation on June 23, 2010

Model	IGSO-540-A1A, -A1D	-A1C, -A1E, -A1H	-A1F	-B1A, -B1C
Type 6H0A; reduction gear ratio	77:120	- -	- -	- -
Rating				
Maximum continuous, hp., r.p.m, in. Hg., at:				
Critical pressure altitude	360-3200-41.7-10,500	360-3200-41.7-10,500	360-3200-41.7-10,500	360-3200-40.5-11,500
Sea level pressure altitude	360-3200-45.0-S.L.	360-3200-45.0-S.L.	360-3200-45.0-S.L	360-3200-45.0-S.L.
Takeoff (5 min.), hp., r.p.m., in. Hg., at:				
Critical pressure altitude	380-3400-43.5-10,500	380-3400-43.5-10,500	380-3400-43.5-10,500	380-3400-43.5-12,000
Sea level pressure altitude	380-3400-47.0-S.L.	380-3400-47.0-S.L.	380-3400-47.0-S.L.	380-3400-47.0-S.L.
Fuel (Minimum grade aviation gasoline)	100/130	- -	- -	- -
Lubricating oil (Lubricants should conform to the specifications as listed or later revision thereto.)	Lycoming Spec. No. 301-G*	- -	- -	- -
Bore and stroke. in.	5.125 X 4.375	- -	- -	- -
Displacement, cu. in.	541.5	- -	- -	- -
Supercharger gear ratio	11.27:1	- -	- -	- -
Compression ratio	7.30:1	- -	- -	- -
Weight (dry), lb.	See NOTE 8	- -	- -	- -
C.G. location				
From front face of thrust nut face, in.	23.55	23.70	23.55	23.55
Off crankshaft center line, in.	.50 above & .16 left	.95 above & .16 left	.50 above & .16 left	.50 above & .16 left
Propeller shaft, SAE No. AND 10152	30 spline	- -	- -	- -
Crankshaft dampers (torsional)	Five 3rd order and One 6th order	- -	- -	- -

* See latest edition of Lycoming Service Instruction 1014

Model (cont'd)	IGSO-540-A1A, -A1D	-A1C, -A1E, -A1H	-A1F	-B1A, -B1C
Fuel injection	See NOTE 8	- -	- -	- -
Ignition, dual	See NOTE 8	- -	- -	- -
Timing, °BTC	25	- -	- -	- -
Spark plugs	See NOTE 6	- -	- -	- -
Oil sump capacity	dry sump	- -	- -	- -
NOTES	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,8,9	1,2,3,4,5,6,8,9	1,2,3,4,5,6,7,8,9

"- -" indicates "same as preceding model"
"—" indicates "does not apply"

Certification basis:

Regulations and Amendments		Model (s)	Date of Application	Date Type Certificate No. 1E7 Issued/Revised
CAR 13 Effective June 15, 1956				
As Amended By 13-1, 13-2, & 13-3		IGSO-540-B1A	March 4, 1960	June 17, 1960
		-A1A	March 14, 1961	September 22, 1961
		-A1B	November 29, 1961	December 19, 1961 (Note No. 7)
		-A1C	March 16, 1962	May 31, 1962
	13-4	-B1B	November 13, 1963	December 20, 1963 (Note No. 7)
		-A1D	February 8, 1965	March 22, 1965
		-B1C	February 8, 1965	March 22, 1965
		-A1E	August 10, 1965	August 20, 1965
		-A1F	June 7, 1966	July 11, 1966
		-A1H	August 19, 1974	August 29, 1974

Production basis: Production Certificate No. 3

NOTE 1. Maximum permissible temperatures:

Cylinder head (bayonet type thermocouple)	475°F (except 500°F for -A1A, -A1C, -A1H models)
Cylinder base	315°F (See NOTE 9)
Oil inlet	235°F

NOTE 2. Fuel pressure limits - p.s.i.

	Min.	Max.	Emergency Min.	Emergency Max.
For Simmonds injectors (-B1A, -B1C)				
Series 580 - P/N 580056-B Inlet to injector Integral supply pump	-2	+15	+9	+15
Series 582 - P/S's 582025 & 582026 Inlet to injector Integral supply pump	-2.5	+24	+9	+35
Integral supply pump to injector	+9	+35	+9	+35
For PAC (formerly Bendix) injector				
Inlet to injector	+17	+35	—	—

Oil pressure limits - p.s.i.

	Normal Operation Min.	Normal Operation Max.	Idle
-A1D, -A1E, -A1F	65	85	25
-A1A, -A1C, -A1H	55	85	25
-B1A, -B1C	65	85	35

NOTE 3. The following accessory provisions are incorporated:

Accessory	-A1A, -A1D, -A1C, -E1E, A1F, -A1H	-B1A -B1C	Rotation Facing Drive Pad	Speed Ratio to Crankshaft	Maximum Torque in. -lb. Cont	Maximum Torque in. -lb. Static	Maximum Overhang Moment in. - lb.
Starter	X	X	C	1.000:1	—	12,000	300
Generator	X	X	C	2.600:1	500	2,200	400
Vacuum Pump	X	X	CC	1.083:1	200	800	25
Hydraulic Pump	X	X	C	1.083:1	400	1,650	175
Tachometer	X	X	CC	.500:1	7	50	—
Propeller governor	X	X	C	.779:1	125	1200	25
Fuel pump **	X	—	C	1.000:1	25	450	25

"C" - Clockwise, "CC" - Counter clockwise
** - Fuel pump pad supplied only on engines with PAC (formerly Bendix) Fuel Injector.
X - Standard

NOTE 4. These engines incorporate provisions for absorbing propeller thrust in both tractor and pusher type installations.

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

IGSO-540 Models	Characteristics
-A1A	Basic model - six-cylinder horizontally opposed air cooled, supercharged geared drive dry sump engine with side mounted accessories. Incorporates internal piston cooling oil jets. Has PAC* RS-10FB1 fuel injection system and new supercharger air inlet housing and supporting brackets.
-A1C	Same as -A1A has straight through inlet housing between injector and supercharger.
-A1D	Similar to -A1A except has TCM+ S6RN-1208 and S6RN-1209 magnetos.
-A1E	Similar to -A1C has TCM+ S6RN-1208 and S6RN-1209 magnetos.
-A1F	Same as -A1D except has no PAC* modulator unit.
-A1H	Same as -A1E except does not incorporate the PAC* modulator unit.
-B1A	Same as -A1A except has updraft exhaust cooling and Simmonds type 580 fuel injection system.
-B1C	Similar to -B1A except has TCM+ S6RN-1208 and S6RN-1209 magnetos.

* PAC formerly Bendix
+TCM formerly Bendix

NOTE 6. Spark plugs: See latest revision of Lycoming Service Instruction No. 1042 for approved equipment.

NOTE 7. The IGSO-540-A1B and -B1B engine models were canceled from Engine Type Certificate No. 1E7 on March 21, 1963 and March 22, 1965 respectively. There were no production models of these engines.

NOTE 8.

IGSO-540-Models	Weight (dry), lb.	Fuel Injection	Ignition, dual
-A1A	540	RS10-FB1+	S6RN-604, S6RN-600#
-A1C	539	* (-A1C) RS10-FB1+	S6RN-604, S6RN-600#
-A1D	530	RS10-FB1+	S6RN-1209, S6RN-1208#
-A1E	529	RS10-FB1+	S6RN-1209, S6RN-1208#
-A1F	530	RS10-FB1+	S6RN-1209, S6RN-1208#
-A1H	541	RS10-FB1+	S6RN-1209, S6RN-1208#
-B1A	532	Simmonds 580 Series, P/N 580056-B Simmonds 582 Series, P/N 582025 or 582026	S6RN-604, S6RN-600#
-B1C	522	Simmonds 580 Series, P/N 580056-B Simmonds 582 Series, P/N 582025 or 582026	S6RN-1209, S6RN-1208#

+ PAC (Precision Airmotive Corporation llC) formerly Bendix

TCM formerly Bendix

* The fuel vent line between the fuel injector system and the aircraft fuel tank must incorporate a flow restriction within pressure limits of 20 to 28 p.s.i. at 30 p.p.h. fuel vapor vent flow for the IGSO-540-A1C only.

NOTE 9. This parameter dispensed with, for engines of these models equipped with internal piston cooling oil jets.

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