

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-279
Revision 10
Lycoming Engines

(O-435-21) VO-435-A1A
(O-435-6) VO-435-A1B
(O-435-23; -23A, -23B, 23C) VO-435-A1C
(O-435-6A) VO-435-A1D
VO-435-A1E, -A1F
VO-435-B1A

November 04, 2010

TYPE CERTIFICATE DATA SHEET NO. E-279

Engines of models described herein conforming with this data sheet (which is a part of type certificate No. 279) 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 Division, Avco Corp. Williamsport PA transferred TC E-279 to Lycoming Engines, An Operating Division of AVCO Corporation on November 04, 2010

Model	Lycoming VO-435	-A1A	-A1B, -A1C, -A1D	-A1E	-A1F	-B1A
Type 6H0A Vertical Mounting						
Direct Drive						
Rating						
Maximum continuous, hp., r.p.m., full throttle, at:						
Sea level pressure altitude (ft.)	250-3200-S.L.	--	--	--	--	265-3200-S.L.
Takeoff (5 min.), hp., r.p.m., full throttle, at:						
Sea level pressure altitude	260-3400-S.L.	--	--	--	--	265-3200-S.L.
Fuel (Minimum grade aviation gasoline)	80/87	--	--	--	--	100/130
Bore and stroke, in.	4.875 x 3.875	--	--	--	--	--
Displacement, cu. in.	434	--	--	--	--	--
Compression ratio	7.3:1	--	--	--	--	8.7:1
Weight (dry), lb.	See NOTE 6	--	--	--	--	--
C.G. location (dry & in horizontal position)						
From front face of crankcase, in.	15.50	15.30	14.95	--	--	15.39
Off propeller shaft C.L., in.	0.15 above & 0.25 left	0.14 above & 0.24 left (-A1B & -A1D)	0.07 above & 0.26 left (-A1C)	--	--	0.37 below & 0.18 left
Propeller shaft	Flange type power takeoff	--	--	--	--	--

Model	Lycoming VO-435	-A1A	-A1B, -A1C, -A1D	-A1E	-A1F	-B1A
Carburetion *		MA4-5 or MA4-5AA	--	MA4-5AA	--	--
Ignition dual		S6RN-20, -21 magnetos	S6RN-21, S6LN-20	S6LN-204, S6RN-200	--	S6LN-1208, S6RN-1209
Timing, °BTC		25	--	--	--	--
Spark plugs		See NOTE 5	--	--	--	--
Oil sump capacity, qt.		Dry sump	--	--	--	10
Usable oil, qt. (15° nose up or down)		—	—	—	—	6
NOTES		1,2,3,4,5,6,7,9	--	1,2,3,4,5,6,9	1,2,3,4,5,6, 8,9	--

"--" indicates "same as preceding model"

"—" indicates "does not apply"

* See latest edition of Lycoming SI 1523 for alternate approved Carburetors

Certification basis:

<u>Regulations and Amendments</u>	<u>Model</u>	<u>Date of Application</u>	<u>Date Type Certificate No. 279 Issued/Revised</u>
CAR 13 Effective March 5, 1952			
As Amended By 13-1	VO-435	March 10, 1954	October 11, 1954
	VO-435-A1A (VO-435 Redesignated)		October 29, 1954
13-2	VO-435-A1B	May 13, 1955	June 10, 1955
	VO-435-A1C	July 14, 1955	July 18, 1955
CAR 13 Effective June 15, 1956	VO-435-A1D	August 9, 1956	September 27, 1956
As Amended By 13-1, 13-2	VO-435-A1E	September 18, 1959	October 15, 1959
13-3	VO-435-A1F	January 25, 1961	March 6, 1961
	VO-435-B1A	August 10, 1965	December 15, 1965

Production basis: Production Certificate No. 3

NOTE 1. Maximum permissible temperatures:

<u>Cylinder Head (Well Type)</u>	<u>Cylinder Base (See Note 8)</u>	<u>Oil Inlet</u>
500°F	325°F -A1A, -A1B	225°F
	350°F -A1C, -A1D, -A1E	235°F, -A1F, -B1A

NOTE 2.

	<u>Minimum</u>	<u>Maximum</u>
Fuel Pressure Limits	0.5 p.s.i.	8 p.s.i.
Oil Pressure Limits (Normal Operation) (Idling 25 p.s.i.)	65 p.s.i.	85 p.s.i.

NOTE 3. The following accessory provisions are incorporated:

Accessory					Direction of Rotation Facing Pad	Speed X Crankshaft r.p.m.	Maximum Torque in. -lb.		Maximum Overhang Moment in. - lb.
	-A1A	-A1B -A1D -A1E -A1F	-A1C	-B1A			Cont.	Static	
Starter-Electric	X	X	X	X	C	1.000:1	—	12000	300
Starter-Manual	X	X	X	—	C	2.600:1	—	2200	—
Alternator	—	—	—	X	CC	2.250:1	60	400	175
*Generator	X	X	X	—	C	2.600:1	500	2200	400
**Fuel Pump	X	X	X	—	CC	.803:1	25	450	25
Vacuum Pump	—	—	—	X	C	1.105:1	200	800	25
Vacuum Pump	X	X	X	—	C	1.219:1	200	800	25
Hydraulic Pump	—	—	—	X	C	1.105:1	400	1650	175
Hydraulic Pump	X	—	X	—	C	1.083:1	400	1650	175
Tachometer	X	X	X	—	CC	.500:1	7	50	—
Tachometer	—	—	—	X	CC	.500:1	7	50	5

* Inoperative as generator drive when fitted with hand crank jaw.

** Accessory housing machined for drive but drive not supplied as standard on -A1A, -A1B, -A1D, -A1E; -B1A has no provisions for fuel pump drive.

C-Clockwise, CC-Counter Clockwise, X-Standard

NOTE 4. The VO-435 series engines are specially approved for helicopter applicants and operation.

NOTE 5. Spark plugs approved for use on these engines are listed in the latest revision of Lycoming Service Instruction No. 1042.

NOTE 6. The above models incorporate additional characteristics as follows:

<u>VO-435 Models</u>	<u>Weight (lb.)</u>	<u>Characteristics</u>
VO-435-A1A	396	Basic Model. Six cylinder air cooled, horizontally opposed, vertical direct drive dry sump engine with side mounted AN type accessory drives.
VO-435-A1B	391	Same as VO-435-A1A except for a modified accessory section.
VO-435-A1C	399	Same as VO-435-A1B for crankcase and oil sump modification to provide increased strength and incorporate an oil pump housing which is machined for a hydraulic pump drive.
VO-435-A1D	390	Same as VO-435-A1B except for crankcase and oil sump modifications to provide increased strength.
VO-435-A1E	392	Same as VO-435-A1D except for S6RN-200 and S6LN-204 magnetos.
VO-435-A1F	399	Same as VO-435-A1E except has internal piston cooling oil jets and heavy duty cylinders. Convertible to TVO-435-A1A.
VO-435-B1A	419	Differs from VO-435-A1F by incorporation of a redesigned accessory drive section with wet oil sump and a higher compression ratio of 8.7:1.

NOTE 7. The following military and civil engine models are equivalent:

VO-435-A1A	-	O-435-21
VO-435-A1B	-	O-435-6
VO-435-A1C	-	O-435-23, -23A, -23B, -23C
VO-435-A1D	-	O-435-6A

When installed in certificated aircraft, the corresponding civil model designation and type certificate number should be added to the engine data plate.

NOTE 8. Cylinder base temperature limits are not applicable to engine models which incorporate internal piston cooling oil jets.

NOTE 9. Starters, generators and alternators approved for use on these engines are listed in the latest revision of Lycoming Service Instruction No. 1154.

- END -