DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-228
Revision 17
Lycoming Engines

O-435, -A, -A2
O-435-B (O-435-5)
O-435-C (O-435-1)
O-435-C1 (O-435-11)
O-435-C2 (O-435-13)
O-435-K
O-435-K1 (O-435-4)

GO-435
GO-435-C2 (O-435-17)
GO-435-C2A, -C2A2
GO-435-C2B, -C2B1, -C2B2
GO-435-C2C, -C2D, -C2E
GO-435-D1

June 23, 2010

TYPE CERTIFICATE DATA SHEET NO. E-228

Engines of models described herein conforming with this data sheet (which is a part of type certificate No. E-228) 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 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 — Lycoming Division AVCO Corporation., Williamsport, PA. transferred TC 284 to Lycoming Engines, An Operating Division of AVCO Corporation on June 23, 2010

Model Lycoming	O-435	O-435-B	O-435-A2	O-435-K, K1	O-435-A
Type	6H0A	- -	- -	- -	- -
Reduction gearing ratio	Direct Drive	- -	- -	- -	- -
Rating					
Max. continuous, hp., r.p.m., S.L. pressure altitude	175-2300-S.L.	235-3000-S.L.	225-3000-S.L.	240-3000-S.L. (-K) 250-3200-S.L. (K1)	190-2550-S.L.
Takeoff, 5 min., hp., r.p.m. at full throttle	175-2300	235-3000	225-3000	- -	190-2550
Fuel (Min. grade aviation gasoline)	73	100	91/98	- -	80
Lubricating oil	Lycoming Spec. No. 301-G*	- -	- -	- -	- -
Bore and stroke, in.	4.875 x 3.875	- -	- -	- -	- -
Displacement, cu. in.	434	- -	- -	- -	- -
Compression ratio	6.25:1	7.5:1	- -	7.3:1	6.5:1
Weight (dry), lb.	347	362	365	405	348 (with -8 mag.) 342 (with -20 mag.)
C.G. location (dry) Fwd. of rear mounting face, in.	10.6	- -	—	10.9	—
From prop. shaft C.L., in.	0.5 below	- -	—	0.3 below	—
C.G. location (with starter and generator)					
Fwd. of rear mounting face, in.	8.9	—	9.6	—	9.6
Below prop. shaft C.L., in.	0.5	—	0.6	—	0.6
Propeller shaft, SAE No.	20	20 (See NOTE 5)	20	- -	- -

* See latest edition of Lycoming Service Instruction 1014

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Model Lycoming (cont'd)	O-435	O-435-B	O-435-A2	O-435-K, K1	O-435-A
Carburetion	MA-4*	MA-4-5*	- -	- -	MA-4-5* or PS-5C#
Ignition, dual	SF6LN-8 Magnetos+	SF6LN-8+ or Edison-Splitdorf SF6L-D	SF6LN-8+	- -	SF6LN-8+ or S6LN-20+
Ignition timing, °BTC	25	- -	- -	- -	20
Spark plugs	See NOTE 12	- -	- -	- -	- -
Oil sump cap., qts. (wet sump)	12	- -	- -	- -	- -
Usable oil sump cap., qts. (wet sump)	9-1/4	- -	- -	- -	- -
NOTES	1,2,3,6,7,8,12	1,2,3,4,5,6,7,8 ,12	1,2,3,6,7,12	1,2,3,4,6,7,10,12	1,2,3,6,7,12

Model Lycoming	O-435-C1	O-435-C, -C2	GO-435	GO-435-C2, -C2A, -C2A2, -C2B, -C2B1, -C2B2, -C2C, -C2D, -C2E	GO-435-D1
Type	6H0A	- -	- -	- -	- -
Reduction gearing ratio	Direct Drive	- -	.642	- -	- -
Rating					
Max. continuous, hp., r.p.m., S.L. pressure altitude	175-2300-S.L.	- -	210-3000-S.L.	240-3000-S.L. or 245-3100-S.L.	- -
Takeoff, 5 min., hp., r.p.m. at full throttle	175-2300	- -	210-3000	260-3400	- -
Fuel (Min. grade aviation gasoline)	80	80	- -	(See NOTE 9)	- -
Lubricating oil	Lycoming Spec. No. 301-G**	- -	- -	- -	- -
Bore and stroke, in.	4.875 x 3.875	- -	- -	- -	- -
Displacement, cu. in.	434	- -	- -	- -	- -
Compression ratio	6.25:1	- -	- -	7.3:1	- -
Weight (dry), lb.	366	356 (-C) 368 (-C2)	407	438 (C2A) 432 (C2A2) 430 (C2B) 422 (C2, C2C) 420 (C2D, C2E)	458
C.G. location (dry) Fwd. of rear mounting face, in.	10.2	10.6 (-C) 10.2 (-C2)	11.0	20.0 (C2A) 19.70 (C2A2) 19.30 (C2) 19.4 (C2B, C2C, C2D) 19.08 (C2E)	8.9
From prop. shaft C.L., in.	0.5 below	- -	0.7 below	0.04 right (C2A, C2A2) 0.41 below (C2A2) 0.05 left (C2B, C2C, C2D) 0.5 below (C2, C2A, C2B, C2C, C2D, C2E)	.03 below .13 left

** See latest edition of Lycoming Service Instruction 1014
*Volare formerly PAC, formerly Marvel-Schebler
PAC formerly Bendix
+ TCM formerly Bendix-Scintilla

Model Lycoming	O-435-C1	O-435-C, -C2	GO-435	GO-435-C2, -C2A, -C2A2, -C2B, -C2B1, -C2B2, -C2C, -C2D, -C2E	GO-435-D1
C.G. location (with starter and generator)					
Fwd. of rear mounting face, in.	8.9	—	—	10.0 (-A2)	—
Below prop. shaft C.L., in.	0.5	—	—	0.4 (-A2)	—
Propeller shaft, SAE No.	20	- -	- -	20 (See NOTE 5)	20
Carburetion	MA-4*	MA-4SPA*	MA-4-5*	MA-4-5* or PS-5BD#	- -
Ignition, dual	SF6LN-8 Magnetos+		SF6LN-8+ or Edison-Splitdorf	SF6LN-8+ or S6LN-50+, -51+ or S6LN-20+, -21+	S6RN-50+,-51+
Ignition timing, °BTC	25	- -	25	- -	- -
Spark plugs	See NOTE 12	- -	- -	- -	- -
Oil sump cap., qts. (wet sump)	12	- -	- -	- -	- -
Usable oil sump cap., qts. (wet sump)	9-1/4	- -	- -	- -	- -
NOTES	1,2,3,4,6,7,12	1,2,3,4,6,7,12	1,2,3,4,6,7,8,11, 12	1,2,3,5,6,7,8,9,11, 12	1,2,3,7,9,11, 12

"- -" indicates "same as preceding model"
"—" indicates "does not apply"
*Volare formerly PAC, formerly Marvel-Schebler
#PAC formerly Bendix
+ TCM formerly Bendix-Scintilla

Certification basis Regulation & Amendments	Model	Date of Application	Date Type Certificate E-228 Issued/Revised
CAR 13 As Amended to November 15, 1940	O-435		February 11, 1942
	O-435-A	July 18, 1941	February 11, 1942
CAR 13 Effective August 1, 1941	O-435-B	August 25, 1942	October 7, 1943
	O-435-5	August 25, 1942	October 7, 1943
	O-435-C	December 3, 1942	January 11, 1943
	O-435-1		January 11, 1943
	O-435		Canceled February 25, 1944
	GO-435	August 12, 1944	August 30, 1944
	O-435-C1	March 14, 1946	January 2, 1948
	O-435-11	March 14, 1946	January 2, 1948
	O-435-C2	October 9, 1947	January 2, 1948
	O-435-13	October 9, 1947	January 2, 1948
	O-435-A2	January 10, 1949	October 19, 1949
	GO-435-A2	July 14, 1949	October 19, 1949
	GO-435-C2	July 14, 1949	October 19, 1949
	O-435-B		Canceled November 2, 1950
	GO-435		Canceled November 2, 1950
CAR 13 Effective August 1, 1949	GO-435-C2A	July 18, 1950	January 2, 1951
As Amended By 13-1	O-435-A3	September 28, 1950	January 5, 1951
	O-435-K	January 12, 1951	January 24, 1951
	O-435-4	January 12, 1951	March 30, 1951
13-1 and 13-2	O-435-K1	March 19, 1951	March 30, 1951
CAR 13 Effective March 5, 1952			
	GO-435-C2B	October 30, 1952	November 6, 1952
As Amended By 13-1	GO-435-C2C	September 25, 1953	November 24, 1953
	GO-435-D1		September 25, 1953
	O-435-17	December 18, 1953	December 30, 1953
	GO-435-C2D	March 19, 1954	July 20, 1954
	O-435-A3		Canceled February 8, 1955
	GO-435-A2		Canceled February 8, 1955

Regulation & Amendments	Model	Date of Application	Date Type Certificate E-228 Issued/Revised
As Amended by 13-1 (cont'd)	GO-435-C2A		Canceled February 8, 1955
13-1 and 13-2	GO-435-C2B1	January 11, 1955	February 8, 1955
	GO-435-C2A	Reinstated	July 15, 1955
	GO-435-C2B2	February 7, 1956	February 28, 1956
	GO-435-C2C		Canceled July 5, 1956
	GO-435-C2D		Canceled July 5, 1956
CAR 13 Effective June 15, 1956	GO-435-C2E	August 22, 1956	September 27, 1956
As Amended By 13-1	GO-435-C2A2		October 24, 1957
November 1, 1957			

Production basis Production Certificate No. 3

NOTE 1. Maximum permissible temperatures are as follows:

Models	Cylinder Head		Cylinder Barrel	Oil Inlet
	Spark Plug Gasket Thermocouple	Well Type Thermocouple		
O-435-B	540°F	515°F	325°F	225°F
O-435, -A, -A2, -C, -C1, -C2; GO-435	525°F	500°F	325°F	225°F
GO-435-C2, -C2B, -C2B1, -D1; O-435-A3, -K, -K1, -C2D, -C2A, -C2A2	—	475°F	325°F	225°F

NOTE 2.

	Minimum (p.s.i.)	Maximum (p.s.i.)
Fuel pressure limits - Marvel carburetor	0.5	5.0
Fuel pressure limits - Bendix carburetor	9.0	15.0
Oil pressure limits - (Normal operation)	60.0	85.0

NOTE 3. The above models incorporate additional different characteristics as follows:

O-435-A	Similar to O-435. Incorporates provisions for automotive type accessories.
O-435-B	Similar to O-435-A except compression ratio higher ratings and provisions for AN type accessories.
O-435-C	Similar to O-435A. Has provisions for AN type accessories.
O-435-C1	Similar to O-435-C. Has revised type valves, valve guides, and accessory case with generator and starter drive only.
O-435-C2	Similar to O-435-C1 except has provisions for O-435-C accessories carburetor.
GO-435-C2A2	Similar to GO-435-C2B2 except incorporates a dry sump and does not have provisions for hydraulic propeller control or governor.
GO-435-C2A	Similar to GO-435-C2A2 except incorporates S6LN-20, -21 magnetos.
O-435-A2	Similar to O-435-B. Has redesigned improved crankcase, cylinders, valves and valve seats, exhaust valve guides and rocker shaft bushing. Also, O-435-A2 has provisions for automotive type accessories.
O-435-K	Similar to O-435-A2 except incorporates GO-435-C2 accessory case and crankcase.
O-435-K1	Similar to O-435-K except maximum continuous rating increased and generator pad omitted.
GO-435	Similar to O-435-C. Incorporates six 3rd order crankshaft torsional vibration dampers and reduction gearing.
GO-435-C2	Similar to GO-435. Incorporates improved crankcase and cylinder assembly.

NOTE 3. (cont'd)

GO-435-C2B	Similar to GO-435-C2 except has provisions for hydraulic propeller and governor.
GO-435-C2B1	Similar to GO-435-C2B except incorporates dual generator and vacuum pump drive.
GO-435-C2B2	Similar toGO-435-C2B except incorporates S6LN-20, -21 magnetos.
GO-435-C2E	Similar to GO-435-C2 except incorporates S6LN-20, -21 magnetos.
GO-435-D1	Similar to GO-435-C2B except incorporates dry sump and crosswise accessory drives.

NOTE 4. Military models O-435-1, O-435-4, O-435-5, O-435-11, O-435-13, and O-435-17 are identical to the corresponding civil designated engines. When installed in certificated aircraft, the corresponding commercial model designations and type certificate Nos. should be added to the engine data plate.

NOTE 5. Model O-435-B, Serial No. 103-12, incorporates a special short crankshaft Part No. 66510 with a detachable flanged propeller hub, Part No. 66511. Model GO-435-C2D incorporates a flanged type propeller shaft with 4-7/8" diameter flange and 4" diameter bolt circle.

NOTE 6. Deleted. (Accessories such as generators, fuel pumps, etc., previously listed in NOTE 6 are satisfactory for continued use with these engines. Accessories of these types are not integral engine accessories and therefore are not evaluated for approval during engine certification testing. The airworthiness of such accessories is substantiated during aircraft-installation system approval. The suitability of the accessory to the engine mounting provisions as described in NOTE 7 of this data sheet must be determined when processing such approvals.)

NOTE 7. The following accessory drive provisions are available:

Drive	O-435-A2	O-435-C	O-435-C1	O-435-C2	GO-435-C2A GO-435-C2A2	O-435-K, -K1 GO-435-C2 GO-435-C2B GO-435-C2B2	GO-435-C2C GO-435-C2D	GO-435-C2B1	GO-435-D1
Starter	X								
Starter		X	X	X	X	X		X	
Starter									X
Generator	X								
Generator		X		X					
Generator			X		X	X**			
Generator							X		
Generator									X
Generator								X	
Fuel Pump	X								
Fuel Pump		X		X	X	X	X	X	
Fuel Pump									X
Vacuum Pump	X								
Vacuum Pump		X		X	X	X	X		
Vacuum Pump									X
Vacuum Pump								X	
Tachometer	X								X
Tachometer		X	X	X	X	X	X	X	
Hydraulic Pump									X
Prop. Governor					X		X		X
Dual Drive:									
Prop Governor						X		X	
Vacuum Pump						X		X	

Drive	Rotation Facing Pad	Drive Ratio	Max. Torque (in. -lb.)		Max. Overhang Moment (in. -lb.)
			Cont	Static	
Starter	C	13.462:1	-	240	150
Starter	C	1.000:1	-	3000	80
Starter		1.000:1	-	12000	300
Generator	CC	1.857:1	30	65	175
Generator	CC	1.385:1	175	500	200
Generator	C	1.250:1	175	500	200
Generator	C	2.577:1	90	250	200
Generator	C	2.600:1	500	2200	400
Generator	C	2.569:1	90	250	200
Fuel Pump	Plunger Operated	.500:1	-	-	10
Fuel Pump	C	1.000:1	50	450	10
Fuel Pump	CC	.803:1	25	450	25
Vacuum Pump	C	1.292:1	60	175	25
Vacuum Pump	C	1.333:1	100	800	25
Vacuum Pump	C	1.219:1	200	800	25
Vacuum Pump	C	1.250:1	100	800	25
Tachometer	CC	.500:1	7	50	5
Tachometer	C	.500:1	7	50	5
Hydraulic Pump	C	1.083:1	300	1650	75
Prop. Governor	C	.801:1	125	825	-
Dual Drive:					
Prop Governor	CC	1.013:1	50	450	25
Vacuum Pump	CC	1.013:1	50	450	25
			(Or Total of 100 -C2 & -C2E)		

Also the Hartzell "I" Drive, P/N C192 weighing 3 lbs. is an approved dual drive unit for installation on this drive with the following provisions:

Vacuum Pump Provision (Optional)		Hydraulic Pump Provision (Optional)	
Maximum weight, lbs.	4.5	Maximum weight, lbs.	2.4
Maximum overhand moment, in.-lbs.	11.2	Maximum overhang moment, in.-lbs.	7.0
Maximum continuous torque, in.-lbs.	16.0	Maximum continuous torque, in.-lbs.	17.5

Hartzell Propeller Company, Installation Instruction No. 2 dated May 4, 1951, explains details for accomplishing installation of the C192 "T" Drive.
*C = Clockwise, CC = Counter Clockwise. **Omitted from -K1.

NOTE 8. Approval of the following models have been canceled. No engines of the following models manufactured after the date shown or with serial numbers higher than those listed below are eligible for use in certificated aircraft:

Model	Date	Serial No.
O-435	2-25-44	493-8
O-435-B	11-2-50	157-12
GO-435	11-2-50	105-13
GO-435-C2C, -C2D	7-5-56	—

No engines of the following models are in operation in this country: O-435-A3
GO-435-A2

NOTE 9. Marvel MA-4-5 carburetor with setting 10-3391-1 may be used with either 80/87 or 91/98 grade fuel, but with setting 10-3391 only 91/98 grade fuel should be used. Either 80/87 or 91/98 grade fuel may be used with Bendix PS-5BD carburetor.

NOTE 10. The O-435-K1 engine has been approved specifically for helicopter installation.

NOTE 11. The GO-435 series engines incorporate crankshafts with six 3rd order torsional vibration dampers unless a "-6" follows the model designation. Engines so designated have five 3rd order and one 6th order torsional dampers.

NOTE 12. Spark plugs: See latest revision of Lycoming Service Instruction No. 1042 for approved equipment.

....END....