

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

TCDS NUMBER E00006NY
Revision No. 5
LYCOMING ENGINES

MODEL : IO-390-A1A6, -A3A6, -A1B6, A3B6
AEIO-390, -A1A6, -A3A6, -A1B6, -A3B6

August 13, 2014

TYPE CERTIFICATE DATA SHEET NO. E00006NY

Engines of models described herein conforming with this data sheet (which is a part of Type Certificate No. E00006NY) 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

Model:	IO-390-A1A6, -A3A6, -A1B6, -A3B6 AEIO-390-A1A6, -A3A6, -A1B6, -A3B6
Type	4 HOA Direct Drive
Rating Takeoff and Maximum continuous, hp., r.p.m. full throttle at: Sea level pressure altitude	210-2700-S.L.
Fuel	
Minimum grade aviation gasoline	100/100LL
Pressure	NOTE 2
Injector and pump	NOTE 6
Pump drive	NOTE 3
Oil, Lubrication	
(Lubricants should conform to the specification as listed or to subsequent revisions thereto)	Service Instruction 1014
Temperature	NOTE 1
Pressure	NOTE 2
Sump capacity, qt.	8
Usable oil qt.	2
Ignition, dual	
Magnetos	NOTE 6
Timing °BTC	20
Spark plugs	NOTE 4
Bore and stroke, in.	5.319 x 4.375
Displacement, cu. in.	389
Compression Ratio	8.9:1
Weight (dry) lb.	NOTE 6
C.G. Location	NOTE 6
Propeller shaft, SAE No. AS-127	Flange, Type 2 Modified
NOTES	1,2,3,4,5,6,7,8

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Certification basis:

Regulations & Amendments FAR 33 effective February 1, 1965, as amended by 33-1 through 33-24

Model	Date of Application	Date Type Certificate No. E00006NY Issued/Revised
IO 390-A1A6	April 11, 2008	March 30, 2009
IO-390-A3A6	February 20, 2009	August 27, 2009
IO-390-A1B6, -A3B6	July 9, 2009	January 21, 2010
AEIO-390-A1A6, -A3A6	April 6, 2010	April 5, 2012
AEIO-390-A1B6, -A3B6	April 6, 2010	April 5, 2012

Production basis: Production Certificate No. 3

NOTE 1. Maximum permissible temperatures:

Cylinder Head (Well Type Thermocouple)	Oil Inlet
465°F	235°F

NOTE 2. Pressure limits:

Fuel:

	Inlet to Fuel Pump			Inlet to Injector		
	<u>Maximum</u>	<u>Minimum</u>	Maximum with Injector Idle Cutoff	<u>Maximum</u>	<u>Minimum</u>	<u>Minimum Idle</u>
IO-390-A1A6, -A3A6 -A1B6, -A3B6	35 p.s.i.	-2 p.s.i.	55 p.s.i.	45	14	—
AEIO-390-A1A6, -A3A6 -A1B6, -A3B6						

Boost Pump Outlet Limits to Injector:

	<u>Parallel Boosts</u>		<u>Series Boosts</u>	
	<u>Maximum</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Minimum</u>
Zero fuel flow	45 p.s.i.	—	35 p.s.i.	—
Maximum fuel flow	—	14 p.s.i.	—	14 p.s.i.

Oil:

	<u>Maximum</u>	<u>Minimum</u>
Normal	95 p.s.i.	55 p.s.i.
Idle	—	25 p.s.i.
Starting and warm-up	115 p.s.i.	—

NOTE 3. The following accessory provisions are available:

Accessory	-A1A6, -A3A6	-A1B6 -A3B6	Direction of Rotation	Drive Ratio	Maximum Torque (in. lb)		Maximum Overhang Moment
					Continuous	Static	
Starter	*	*	CCW	13.556:1	--	450	150
Alternator	*	*	CW	3.20:1	60	120	175
Accessory Drive #1	*	*	CCW	1.300:1	70	450	25
Accessory Drive #2		*	CW	1.300:1	100	800	40
Tachometer	*	*	CW	0.500:1	7	50	5
Fuel Pump	*	*	Plunger	0.500:1	-	-	10
Propeller Governor	*	-	CW	0.866:1	125	1200	40
Propeller Governor	-	*	CW	0.895:1	125	1200	40
Optional dual drives mounting on Accessory drive pad for:							
Accessory and Accessory	**	-	CCW CCW	1.300:1 1.300:1	70 Total	450 Total	6 10
Or:							
Accessory and Propeller Governor	**	-	CCW CCW	1.300:1 1.300:1	70 Total	450 Total	6 10

"C" - Clockwise, "CC" - Counter-Clockwise, * Standard, ** Optional
Total - refers to total torque of dual drives

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

NOTE 5. These engines incorporate provisions for absorbing propeller thrust in both tractor and pusher installations.

NOTE 6. The following tabulations show std. dry weight (less alternator and starter), C.G.'s, fuel injectors, fuel pumps and magnetos for this model.

Model	Weight *	Center of Gravity		Fuel Injector	Fuel Pump	Ignition, Dual Slick
		From Front Face of Prop Shaft Flange in.	Off Crankshaft Center Line, in.			
IO-390-A1A6, -A3A6	307	14.13	.64 below .16 left	RSA-5AD1	Diaphragm Type	4345 4370
IO-390-A1B6, -A3B6	307	14.13	.64 below .16 left	RSA-5AD1	Diaphragm Type	4345 4370
AEIO-390- A1A6, -A3A6	312	14.13	.64 below .16 left	RSA-5AD1	Diaphragm Type	4345 4370
AEIO-390- A1B6, -A3B6	312	14.13	.64 below .16 left	RSA-5AD1	Diaphragm Type	4345 4370

* Less Starter and Alternator

NOTE 7. The listed models incorporate the following additional similarities or differences:

<u>Model</u>	<u>Characteristics</u>
IO-390-A1A6	Basic Model. Four cylinder air-cooled, horizontally opposed, direct drive, fuel injected, tuned induction engine having oil jets for internal piston cooling. Provisions for single action controllable pitch propeller.
IO-390-A3A6	Same as the -A1A6 except propeller flange bushings are reindexed.
IO-390-A1B6	Same as the -A1A6 except propeller governor located on left front of crankcase.
IO-390-A3B6	Same as the -A3A6 except propeller governor located on left front of crankcase.
AEIO-390-A1A6	Same as the IO-390-A1A6 except equipped with an inverted oil system kit for aerobatic flight.
AEIO-390-A3A6	Same as the IO-390-A3A6 except equipped with an inverted oil system kit for aerobatic flight.
AEIO-390-A1B6	Same as the IO-390-A1B6 except equipped with an inverted oil system kit for aerobatic flight.
AEIO-390-A3B6	Same as the IO-390-A3B6 except equipped with an inverted oil system kit for aerobatic flight.

NOTE 8. Starters and alternators approved for use on this engine are listed in the latest revision of Lycoming Service Instruction No. 1154.

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