

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE DATA SHEET E9EA	TCDS NUMBER E9EA REVISION: 13* DATE: April 30, 2013 Franklin Sp. z.o.o. MODELS: FRANKLIN 6A-350-C1 6A-350-D1 6A-350-C1R 6A-350-C1A 6A-350-D1A 6A-350-C1L 6A-350-C2 6A-350-D1B 6A-350-C2A 6V-350-A 6A-350-D 6V-350-B		
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Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E9EA) 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 Federal Aviation Regulations, provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER Franklin Sp. z.o.o.
 Ul. Chelmińska 208
 86-300 Grudziądz
 Poland

TYPE CERTIFICATE (TC) HOLDER RECORD WSK-PZL-RZESZOW transferred TC E9EA to Franklin Sp. z.o.o.
 on August 17, 2006

I. MODELS	6A-350-C1	6A-350-C1A	6A-350-C2	6A-350-C2A	6A-350-C1R, -C1L
TYPE	60A Horizontally-Mounted Direct Drive				
RATINGS					
Maximum Continuous hp, r.p.m., at: Sea level pressure altitude	220-2800	--	215-2800	212-2800	205-2800
Takeoff hp, r.p.m., full throttle at: Sea level pressure altitude	220-2800	--	215-2800	212-2800	205-2800
FUEL (See Note 13)					
Minimum grade aviation gasoline	100/130	--	--	--	--
OIL GRADE (See Note 13)					
above 40øF ambient air temp.	SAE 50	--	--	--	--
below 40øF ambient air temp.	SAE 30	--	--	--	--
all ambient air temp.	SAE 15W50	--	--	--	--
	SAE 20W50	--	--	--	--

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REV.	13	11	11	11	13	10	12	11

LEGEND: "--" INDICATES "SAME AS PRECEDING MODEL"

"--" INDICATES "DOES NOT APPLY"

NOTICE: ALL PAGES ARE REFORMATTED. SIGNIFICANT CHANGES, IF ANY, ARE BLACK-LINED IN THE LEFT MARGIN.

I. MODELS (Continued)	6A-350-C1	6A-350-C1A	6A-350-C2	6A-350-C2A	6A-350-C1R/C1L
COMPRESSION					
Bore and stroke, in.	4.625 x 3.5	--	--	--	--
Displacement, cu. in.	350	--	--	--	--
Compression ratio	10.5:1	--	--	--	--
WEIGHT (DRY) (lb)	325	334	325	328	330
CENTER OF GRAVITY (in) (with all accessories)					
Forward from rear face of crankcase	10.0	8.0	10.0	7.2	--
Above C.L. of crankshaft	2.0	0.31	2.0	0.3	--
DRIVE SHAFT END	Integral flange, six 1/2 in. holes on 4 in. circle	--	--	--	--
CARBURETION	Marvel Schebler MA4-5, MA-5, Bendix PS5BD	MA-5	--	--	--
IGNITION (dual)	Bendix-Scintilla S6RN-21	--	--	--	S6RN-21 (C1R) S6LN-1227 (C1L) -- (C1R only)
	Slick 6399	--	--	--	-- (C1R only)
TIMING, ϕ BTC	28	--	--	--	See NOTE 12
SPARK PLUGS	AC 273, Champion RHB32E, RHB32N, RHB33E, RHB36P, RHB36W	--	--	--	--
OIL SUMP CAPACITY, QT.	8.8	--	--	--	--
USEABLE OIL, QT. (starting with full tank)	See NOTE 3 (c) 6.8 (d) 5.8	--	--	--	--
NOTES	1-3, 5, 7-10, 13, 14	1-3, 5, 7, 9,10, 13, 14	--	--	1-3, 7, 9-14

II. MODELS	6A-350-D	6A-350-D1	6A-350-D1A	6A-350-D1B
TYPE	60A Horizontally-Mounted Direct Drive			
RATINGS				
Maximum Continuous hp, r.p.m., at: Sea level pressure altitude Takeoff	235-3200	200-3200	230-3200	220-3000
hp, r.p.m., full throttle at: Sea level pressure altitude	235-3200	200-3200	230-3200	220-3000
FUEL (See Note 13) Minimum grade aviation gasoline	100/130	80/87	100/130	--
OIL GRADE (See Note 13) above 40øF ambient air temp. below 40øF ambient air temp. all ambient air temp.	SAE 50 SAE 30 SAE 15W50 SAE 20W50	-- -- -- --	-- -- -- --	-- -- -- --
COMPRESSION Bore and stroke, in. Displacement, cu. in. Compression ratio	4.625 x 3.5 350 10.5:1	-- -- --	-- -- --	-- -- --
WEIGHT (DRY) (lb)	304	--	--	--
CENTER OF GRAVITY (in) (with all accessories)				
Forward from rear face of crankcase	7.2	8.0	--	7.3
Below C.L. of crankshaft	.67	--	--	--
DRIVE SHAFT END	Integral flange, eight 5/16 in. threaded holes on 3-3/16 in. circle	--	--	--
CARBURETION	Marvel Schebler MA-5	--	--	--
IGNITION (dual)	Bendix-Scintilla S6RN-21 Slick 6399	-- -- --	-- -- --	-- -- --
TIMING, øBTC	28	--	--	--
SPARK PLUGS	AC 273, Champion RHB32E, RHB32N, RHB33E, RHB36P, RHB36W	--	--	--
OIL SUMP CAPACITY, QT.	8.8	--	--	--
USEABLE OIL, QT. (starting with full tank)	See NOTE 3 (c) 6.8 (d) 5.8	-- -- --	-- -- --	-- -- --
NOTES	1-4, 6, 7, 9, 10, 13	--	--	--

III. MODELS	6V-350-A, -B			
TYPE	60A Vertically-Mounted Direct Drive			

RATINGS

Maximum Continuous
hp, r.p.m., at:
Sea level pressure altitude
Takeoff
hp, r.p.m., full throttle at:
Sea level pressure altitude

FUEL (See Note 13)
Minimum grade aviation gasoline

OIL GRADE (See Note 13)
above 40°F ambient air temp.
below 40°F ambient air temp.
all ambient air temp.

COMPRESSION
Bore and stroke, in.
Displacement, cu. in.
Compression ratio

WEIGHT (DRY) (lb)

CENTER OF GRAVITY (in)
(with all accessories)

Above rear face of crankcase
From crankshaft C.L. forward
carburetor

DRIVE SHAFT END

CARBURETION

IGNITION (dual)

TIMING, °BTC

SPARK PLUGS

OIL SUMP CAPACITY, QT.
USEABLE OIL, QT.
(starting with full tank)

NOTES

235-3200			
235-3200			
100/130			
SAE 50 SAE 30 SAE 15W50 SAE 20W50			
4.625 x 3.5 350 10.5:1			
308			
6.8 2.0			
Integral flange, eight 5/16 in. threaded holes on 3-3/16 in. circle			
MA-5AA			
Bendix Scintilla S6RN-21 Slick 6399			
28			
AC 273, Champion RHB32E, RHB32N, RHB33E, RHB36P, RHB36W			
10.0			
See NOTE 3 (a) 6.0 (b) 8.0			
1-4, 6, 7, 9, 10, 13			

CERTIFICATION BASIS

CAR 13, effective June 15, 1956, as amended by 33-1 to 13-6, inclusive.

The 6A-350-C1R and 6A-350-C1L engine models comply with Federal Aviation Regulation Part 33, effective February 1, 1965, including amendments 33-1 to 33-14, inclusive, for sections 33.17, 33.19, 33.23, 33.25, 33.27, 33.35, 33.43, and 33.49.

Type Certificate E9EA issued/revised:

<u>Model</u>	<u>Date of Application</u>	<u>Date TC Issued/Revised</u>
6V-350-A, -B	03/27/62	10/12/64
6A-350-D	03/15/65	07/29/65
6A-350-C1	06/04/63	12/01/65
6A-350-C2	06/04/63	03/11/66
6A-350-D1	01/17/66	04/07/66
6A-350-D1A	05/22/67	07/26/67
6A-350-C2A	04/15/68	10/04/68
6A-350-C1A	11/11/68	11/21/68
6A-350-D1B	03/21/72	05/12/72
6A-350-C1R	09/30/92	12/8/94
6A-350-C1L	09/30/92	12/8/94
Reissued to PEZETEL		08/01/79
Reissued to WSK "PZL-RZESZOW"		11/05/81
Reissued to WSK "PZL-RZESZOW" SA		12/8/94
Reissued to Franklin Sp. z.o.o.		04/30/13

The General Inspectorate of Civil Aviation of Poland originally type certificated this engine. The FAA validated this product under U.S. Type Certificate Number E9EA. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of Poland.

PRODUCTION BASIS

1. Production Certificate No. 9 for U.S. production. There will be no further production of engines or replacement parts under this production certificate.
2. FAR 21.500 for production of engines or replacement parts under this type certificate by WSK "PZL-RZESZOW" SA under control of the Republic of Poland General Inspectorate of Civil Aviation (GICA).

Parts produced under either production basis are eligible to be used interchangeably.

IMPORT REQUIREMENTS

To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with the General Inspectorate of Civil Aviation of Poland or EASA airworthiness approval shall have a Joint Aviation Authorities (JAA) or EASA Form 1, Authorized Release Certificate. The JAA or EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E9EA, is in a condition for safe operation and has undergone a final operational check.

Additional guidance is contained in FAA Advisory Circular 21-23, Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products, imported into the United States.

NOTES

NOTE 1. Maximum permissible temperatures (øF):

Cylinder head	390 (bayonet thermocouple)
Cylinder base	315
Oil inlet	
All models except 6A-350-C1R/C1L	235
6A-350-C1R/C1L	230

NOTE 2. Fuel pressure limits (p.s.i.):

	<u>Min</u>	<u>Max</u>
All models except 6A-350-C1R/C1L		
Inlet to carburetor	0.5	6.0
6A-350-C1R/C1L		
Inlet to fuel pump	1.4	8.5
Oil pressure limits (p.s.i.):	<u>Idle</u>	<u>Normal Operation</u>
Inlet to engine		
All models except 6A-350-C1R/C1L	25	55-80*
6A-350-C1R/C1L	25	55-81.2*

*50 p.s.i. instead of 55 p.s.i. with external filter

NOTE 3. 6V Model Engines (Vertical)

(a) With crankshaft flange tilted 15ø from vertical in the direction of the oil pan.
 (b) With crankshaft flange tilted 15ø from vertical in the direction of the crankcase cover.

6A Model Engines (Horizontal)

(c) 15ø Nose down
 (d) 20ø Nose up

NOTE 4. The following accessory drives are provided:

ACCESSORY	Type of Drive Pad	Rotation Facing Drive Pad	Speed Ratio to Crankshaft	Max. Torque (in. lb.)		Maximum Overhang Moment (in. lb.)
				Cont.	Static	
Starter	Special	CC	11.44:1	140	300	90
Generator	Special	CC	1.50:1	25	70	75
Tachometer	AND 10005	CC	0.50:1	2	6	3
Fuel Pump	AND 10000 (modified)	CC	1.50:1	5	600	7

"C" - Clockwise facing engine drive pad, "CC" - counter clockwise facing engine drive pad

NOTE 5. The following accessory drives are provided:

ACCESSORY	Type of Drive Pad	Rotation Facing Drive Pad	Speed Ratio to Crankshaft	Max. Torque (in. lb.)		Maximum Overhang Moment (in. lb.)
				Cont.	Static	
Starter	Special	CC	11.44:1	140	450	90
Alternator	Belt	CC	1.60:1	100	800	---
Tachometer	AND 10005	CC	0.50:1	7	50	5
Fuel Pump or Fuel Pump (See Note 14)	Diaphragm	Plunger	1.65:1	100	800	30
	Special	CC	1.65:1	100	800	50.6
Propeller Governor	AND 20010	CC	0.847:1	125	825	25
	AND 20000	C	0.847:1	125	825	25
Vacuum Pump						

"C" - clockwise facing engine drive pad, "CC" - counter clockwise facing engine drive pad

NOTE 6. These engines are approved for helicopter application.

NOTE 7. Power tolerance for production engines is +4%, -3% of the nominal rating..

NOTE 8. When the MA4-5 carburetor is used on the 6A-350-C1 for improved acceleration the takeoff and Max. Continuous ratings are 215 hp. at 2800 r.p.m.

NOTE 9. The above models incorporate additional characteristics as follows:

<u>Model</u>	<u>Characteristics</u>
6A-350-C1A	Same as -C1 except for geared starter located over the top of the crankcase.
6A-350-C2	Same as -C1 except for induction system piping.
6A-350-C2A	Same as -C2 except for modified mounts and induction system piping.
6A-350-C1R	Same as -C1 except for new starter, alternator, and voltage regulator to be compatible with 12 volt system; modified starter gear and damper assembly; injectors; and new propeller shaft seal and speed governor; relocated starting oil sump modification.
6A-350-C1L	Same as -C1R except for new starter, magnetos, propeller speed governor, camshaft, and oil pump drive gear to be compatible with engines opposite direction of rotation.
6A-350-D1	Differs from -D also in location of the carburetor.
6A-350-D1A	Has -D1 carburetor location; otherwise same as -D.
6A-350-D1B	Derated D1A with crankshaft torsional damper.
6V-350-B	Same as -A except for zone pipes, oil tank and other external hardware.

NOTE 10. Service Bulletins, structural repair manuals, vendor manuals, aircraft flight manuals, and
SERVICE INFORMATION:

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or, for approvals made before September 28, 2003 by the General Inspectorate of Civil Aviation of Poland. Any such documents including those approved under a delegated authority, are accepted by the FAA and are considered FAA approved.

- Service bulletins,
- Structural repair manuals,
- Vendor manuals,
- Aircraft flight manuals, and
- Overhaul and maintenance manuals.

These approvals pertain to the type design only.

NOTE 11. The following accessory drives are provided:

ACCESSORY	Type of Drive Pad	Direction of Rotation Facing Engine Drive Pad		Speed Ratio to Crankshaft	Max. Torque (in. lb.)		Maximum Overhang Moment (in. lb.)
		Model C1R	Model C1L		Cont.	Static	
Starter	Special	CC	C	11.44:1	140	450	90
Alternator	Belt	CC	C	2.40:1	100	800	---
Tachometer	AND 10005	CC	C	0.50:1	7	50	5
Fuel Pump or Fuel Pump (See Note 14)	Diaphragm	Plunger	Plunger	1.65:1	10010 0125	800	30
	Special	CC	C	1.65:1	125	800	50.6
Propeller Governor	AND 20010	CC	C	0.847:1		825	25
Vacuum Pump	AND 20000	C	CC	0.847:1		825	25

NOTE 12. Ignition advance angle is individually adjusted for each engine in the range 28-32 BTC. This angle is marked on the nameplate and recorded in engine document.

NOTE 13. Fuels and oils that meet the following specifications and the specified grades are acceptable for all engine models.

Fuel - ASTM-D-910, MIL-G-5572, DERD 2485, AIR 3401, GOST 1012-72.

Oil - SAE-J-1966(MIL-L-6082), DERD 2472, or SAE-J-22851(MIL-L-22851), DERD 2450.

NOTE 14. Engine Serial Numbers xxxxx130 and above incorporate slide vane fuel pump drive instead of diaphragm pump drive. The serial number of these engines incorporates letter "S". When slide vane fuel pump drive is installed in service, the suffix "/S" is affixed to the serial number.

Fuel pump PLL-7-6R (WSK Part No 26.11.8300) is approved for 6A-350-Cxx engines (excluding 6A-350-C1L).

Fuel pump PLL-7-6L (WSK Part No 26.11.8310) is approved for 6A-350-C1L Engine.

These pumps comply with Federal Aviation Regulation Part 33, effective February 1, 1965, including amendments 33-1 to 33-5.

---THE END---