



Maximum weight	1350 lbs.
No. seats	2 (+20)
Maximum baggage	100 lbs. (+41.5)
Fuel capacity	24 gals. (two 12 gal. wing tanks at +22). See Item 203 for larger fuel capacity.
Oil capacity	5 qts. (-45). See Item 204 for larger oil capacity.
Control surface movements	Aileron 27 degrees up 27 degrees down Elevator 30 degrees up 33 degrees down Rudder 27 degrees left 27 degrees right Elevator trim tab 27.5 degrees up 20.5 degrees down
Serial Nos. eligible	1501 and up mfrd. prior to 2-4-49. Approval expired as of that date.
Required equipment	Items 101, 102, 103, 104, 105 and 106

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**III - Model 180F, 2 PCLM, Approved October 25, 1941**


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Engine	Franklin 4AC-176-F3. See Item 311 for optional engines.
Fuel	80 min. octane aviation gasoline
Engine limits	For all operations, 2500 rpm (80 hp)
Airspeed limits	Level flight or climb 115 mph True Ind. Glide or dive 145 mph True Ind.
Propeller limits	Static rpm at maximum permissible throttle setting - not over 2350, not under 2150. No additional tolerance permitted. Diameter - not over 70 in., not under 68 in.
C.G. range	(+10.4) to (+17.2)
Empty weight C.G. range	(+8.4) to (+12.6) with standard fuel system. (+8.4) to (+10.8) with 18 gal. fuel tanks and 2 gal. oil tank. When Empty weight C.G. falls within pertinent range, computation of critical fore and aft C.G. positions is unnecessary. Ranges are not valid for non-standard arrangements except as noted.
Maximum weight	1350 lbs.
No. seats	2 (+20)
Maximum baggage	100 lbs. (+41.5)
Fuel capacity	24 gals. (two 12 gal. wing tanks at +22). See Item 203 for larger fuel capacity.
Oil capacity	5 qts. (-45). See Item 204 for larger oil capacity.
Control surface movements	Aileron 27 degrees up 27 degrees down Elevator 30 degrees up 33 degrees down Rudder 27 degrees left 27 degrees right Elevator trim tab 27.5 degrees up 20.5 degrees down
Serial Nos. eligible	1530 and up mfrd. prior to 2-4-49. Approval expired as of that date.
Required equipment	Items 101, 102, 103, 104, 105 and 106

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**IV - Model 190F, 2 PCLM, Approved September 1, 1942**


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Engine	Franklin 4AC-199-B3.
Fuel	80 min. octane aviation gasoline
Engine limits	For all operations, 2500 rpm (90 hp)
Airspeed limits	Level flight or climb 115 mph (100 knots) True Ind. Glide or dive 145 mph (126 knots) True Ind.
Propeller limits	Static rpm at maximum permissible throttle setting: Not over 2200, not under 2100. No additional tolerance permitted. Diameter: not over 72 in., not under 70 in.
C.G. range	(+10.3) to (+16.2)
Empty weight C.G. range	(+8.5) to (+11.5) with standard fuel system. (+8.5) to (+9.9) with 18 gal. fuel tanks and 2 gal. oil tank. When Empty weight C.G. falls within pertinent range, computation of critical fore and aft C.G. positions is unnecessary. Ranges are not valid for non-standard arrangements except as noted.
Maximum weight	1450 lbs.
No. seats	2 (+20)
Maximum baggage	100 lbs. (+41.5)
Fuel capacity	24 gals. (two 12 gal. wing tanks at +22). See Item 203 for larger fuel capacity.
Oil capacity	5 qts. (-45). See Item 204 for larger oil capacity.
Control surface movements	Aileron 27 degrees up 27 degrees down Elevator 30 degrees up 33 degrees down Rudder 27 degrees left 27 degrees right Elevator trim tab 25 degrees up 20 degrees down
Serial Nos. eligible	1575 and up mfrd. prior to 2-4-49. Approval expired as of that date.
Required equipment	In addition to the pertinent required basic equipment specified in CAR 4a, the following items of equipment must be installed: 101, 102, 103, 104, 105 and 106



		<u>175</u>	<u>180</u>	<u>180F</u> <u>190F</u>	<u>185</u>
4. Propeller - Sensenich M76AK-2, fixed pitch metal	24 lbs.	—	—	—	(-60)
Static rpm at maximum permissible throttle setting: Not over 2320, not under 2220.					
No additional tolerance permitted.					
Diameter: Not over 74 in., not under 72 in.					
5. Propeller - Sensenich M74Ck-2, fixed pitch metal	21 lbs. (-60)				
Static rpm at maximum permissible throttle setting: Not over 2470, not under 2120.					
No additional tolerance permitted.					
Diameter: Not over 72 in., not under 70 in.					
101. Propeller - wood (fixed or adjustable pitch) including hub.	12 lbs.	(-60)	(-60)	(-58)	(-60)
Limits as shown under pertinent model.					

#### Engines and Engine Accessories - Fuel and Oil System

102. Engine cowl and baffles	9 lbs.	(-39)	(-39)	(-39)	(-39)
103. Two exhaust manifolds	3 lbs.	(-41)	(-41)	(-41)	(-41)
104. Carburetor air heater	3 lbs.	(-38)	(-38)	(-36)	(-38)
107. 5 qt. oil tank (Model 185 only).					
108. Oil cooler (Continental Motors Type EQ5334 (Required with Item 1).	+4 lbs.	—	—	—	(-39)
109. Oil filter, Fram PB-5 Kit K-510	4 lbs.	—	—	—	(-27)
Fram installation dwg. 61520.					
203. Two 18 gal. fuel tanks (replacing 12 gal. tanks) (Item 204 required)	+9 lbs.	(+22)	(+22)	(+22)	—
204. 2 gal. oil tank (replacing 5 qt. tank) +1 lb.	(-41)	(-41)	(-45)	—	
205. Engines					
(a) Continental A-80-9	+3 lbs.	—	(-46)	—	—
305. Starter					
(a) (Eclipse E-80)	18 lbs.	(-32)	(-32)	—	—
(b) (Eclipse Type 635 Model 4, Style A)	17 lbs.	(-34)	(-34)	—	—
(c) (Auto-Lite MBG)	16 lbs.	—	—	(-35.5)	—
(d) (Delco-Remy 110965-6, 12 volt)	15 lbs.	—	—	—	(-35)
308. Engine shielding	2 lbs.	(-35)	(-35)	(-35)	(-35)
311. Engines					
(a) Continental A-75-9 or 9J	+3 lbs.	(-46)	—	—	—
(b) Continental A-75-8J					
(Item 104 not required)	+3 lbs.	(-46)	—	—	—
(c) Franklin 4AC-176-F2	No weight change				
(Applies only to Model 180F)					

#### Landing Gear and Floats

105. 6.00-6 wheels (Shinn 6C5) with 6.00-6 4 ply tires	28 lbs.	(-5)	(-5)	(-5)	—
106. 6x2.00 tail wheel (Steerable) (Firestone 206-8BK) with 6x2.00 tail wheel tire (solid)	11 lbs.	(+180)	(+180)	(+180)	—
208. 6.00-6 wheels with brakes (Goodyear L6H/MBD) and 6.00-6 4 ply tires	33 lbs.	—	—	—	(-5)
209. 6x2.00 tail wheel, steerable, and 6x2.00 solid tire (Scott 3000-81)	13 lbs.	—	—	—	(+180)
210. Parking brake (Scott 4200)	1 lb.	—	—	—	(-23)
302. Parking brake	2 lbs.	(-14)	(-14)	(-14)	—
303. 6.00-6 wheels					
(a) Mechanical brakes (Shinn 6C5HB)	+4 lbs.	(-5)	(-5)	(-5)	—
(b) Hydraulic brakes (Shinn 6C5YFB)	+7 lbs.	(-5)	(-5)	(-5)	—
304. Wheel pants	12 lbs.	(-5)	(-5)	(-5)	(-5)
312. Skis	Use actual weight change				
(a) Federal SC-2					
(b) Federal SC-1					
(c) Federal A-1500, Federal Installation Dwg. 11R247					
(d) Federal A-1500A, Federal Installation Dwg. 11R247					
(e) Federal A-1850, Federal Installation Dwg. 11R247					
(f) Federal A-2000, Federal Installation Dwg. 11R247					
(g) Federal A-2000A, Federal Installation Dwg. 11R247					
(h) Federal CA1850-6, Federal Installation Dwg. 11R247					

Electrical Equipment

		<u>175</u>	<u>180</u>	<u>180F</u> <u>190F</u>	<u>185</u>
	Battery and box				
	(a) Airguide radio battery	8 lbs.	(-21)	(-21)	—
	(b) 12 bolt (Exide (6-TS-7-1)	31 lbs.	(-29)	(-29)	(-29)
	(c) 6 volt (Exide 3-AC-7-1)	13 lbs.	(-39)	(-29)	—
	(d) 12 bolt (Willard SYR-7-6)	20 lbs.	(-28)	(-28)	(-28)
	(e) 6 volt (Roading 333L)	17 lbs.	(-29)	(-29)	—
306.	Generator				
	(a) 12 volt (Auto-Lite GDY)	14 lbs.	—	(-33)	—
	(b) 6 volt (Auto-Lite GAS)	14 lbs.	—	(-33)	—
	(c) 12 volt (Lear 1030-A)	9 lbs.	(+6)	—	—
	(d) 12 volt (Delco-Remy 1101876)10 lbs.	—	—	(-34)	—
310.	Landing lights				
	(a) One (Grimes ST-250)	4 lbs.	(+12)	(+12)	(+12)
	(b) Two (Grimes ST-250)	8 lbs.	(+12)	(+12)	(+12)

Interior Equipment

301.	Cabin heater	2 lbs.	(-32)	(-32)	(-30)	(-32)
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Miscellaneous (not Listed Above)

207.	Fuselage and control system protective covering	5 lbs.	(+95)	(+95)	(+95)	(+95)
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NOTE 1. Weight and balance report including list of equipment included in certificated weight empty, and loading instructions, when necessary, must be submitted for each aircraft with original agent's report and each subsequent report covering changes in equipment.

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