MODELS: General Dynamics (Consolidated-Vultee) 28-5ACF, 25 PCAmM

T.C. NUMBER: 785

Engines — 2 P&W R-1830-92 (SIC-3G); or 2 P&W R-1830-75 (2SC9G) installed per NOTE 10.

Fuel (See NOTE 3) — 91/96 minimum grade aviation gas

Engine Limits

	HP	RPM	*MP In. Hg.	Alt.
R-1830-92:				
Maximum continuous	1050	2550	41.5	S.L.
Maximum continuous	1050	2550	39.5	7500
Take-off (2 minutes)	1200	2700	48.0	S.L.
Take-off (2 minutes)	1200	2750	47.0	S.L.
R-1830-75:				
Maximum continuous	1100	2600	43.5	S.L.
Maximum continuous	1100	2600	42.7	7300
Take-off (2 minutes)	1200	2700	47.0	S.L.
Take-off (2 minutes)	1200	2700	46.0	6500

*(Straight line manifold pressure variation with

	altitude shown)
Airspeed Limits (T.I.A.S.) (See NOTE 10 for Vne with underwing boats)	Maneuvering - 122 mph (106 knots) Cruising - 158 mph (137 knots) Never Exceed - 199 mph (173 knots) Landing Gear Opr. - 140 mph (122 knots) Landing Gear Ext. - 160 mph (139 knots)
C.G. Range	(+242.2) (22.9 percent MAC) to (+251.0) (28.2 percent MAC)
(Gear Down)	Effect of L.G. Retraction +12485 in. lbs.
Datum	302 in. forward of step (bulkhead No. 5)
MAC	165.3 in., L.E. of MAC Sta. (+204.4)
Leveling Means	Leveling lugs in tail between bulkheads 7 and 8 (+500 and 550), or longitudinal inclometer at Flight Engineer's station (right side at deck line).
Weight Limits	Take-off and landing 28,000 lbs. (See NOTES 5A-2, 6, 9 and 10 for further limits.)
Maximum passengers	22 (location variable) (See NOTES 5A-12 and 5A-16)
Minimum crew	2 (+110) or 2 (+110) and 1 (+260 (See NOTE 5B-5)
Maximum baggage	(See NOTE 5A-11)
Fuel capacity (See NOTES 4 and 70	Total capacity 1750 gallons (2 tanks 875 gallons each). Maximum allowable capacity variable (See NOTE 7) (+267)
Oil capacity (See NOTE 4)	110 gallons (2 tanks, 1 each nacelle, 55 gallons each) 825 lbs. (+209)
Control surface movements	Elevator: Up 30 degrees, Down 20 degrees Aileron: Up 21 degrees, Down 19-3/4 degrees Rudder: Right 17 degrees, Left 17 degrees Elevator tab: Up 5 degrees, Down 15 degrees Rudder tab: Right 15 degrees, Left 20 degrees
Serial Nos. eligible	9747, 9749, all Army and Navy PBY-5A and RCAF PBY-5A and 28-5AMC serial numbers 9751 through 9805 (See NOTE 5)
Required equipment	Items 1(a), 2(a), 3(a), 101, 102, 103, 104, 105, 106, 201(a), 202(a) or (b) (see NOTE 6), 203, 204, 301, 302, 401, 402, 403, 404, 405, 501, 601

Specifications Pertinent to All Models:
Certification basis Type Cert. No. 785 (Comb. CAR 3 and 4a).
Export eligibility Eligible for export to all countries subject to the provisions of MOP 2-4.

EQUIPMENT:

Propellers and Propeller Accessories.

1.	(a)	Propellers, Hamilton Standard hubs 23E50, blades 6353-12. For interchangeable blade models see Prop. Spec. No. 603 (NOTE 6). Diameter: Maximum 12'3/8", minimum allowable for repairs 11'9-1/4". No further reduction permitted. Low pitch setting 18 degrees at 42" sta. See NOTE 2(d) for required placard.	796 lbs.	(+135)
2.	(a)	2 Propeller governors, Hamilton Standard Model 4L11-GOT, 4L11-GOJ, and 4G8-G23G1 or equivalent.	12 lbs.	(+161)
3.	(a)	2 Propeller feathering pump installations, Pesco Type 1E-R280-BH or equivalent.	47 lbs.	(+198)

Engines and Engine Accessories - Fuel and Oil System

101.	2 fuel pumps, Type G-9 AN4101, 2P-R6000-CWT or equivalent.	6 lbs.	(+181)
102.	2 oil coolers, either AiResearch No. 2E-5050, No. 2J-6232, or equivalent.	80 lbs.	(+187)
103.	2 oil temperature regulator valves, U.A.P. 2D-3058-4 or equivalent.	8 lbs.	(+198)
104.	2 fuel booster pumps, Pesco 2P-R600-CWX-1 or equivalent.		
105.	System fuel and oil (See NOTE 4)		
	(a) System fuel	66 lbs.	(+267)
	(b) System oil	112 lbs.	(+206)
106.	Firewall shut-off valves		
	(a) 2 oil system valves, General Controls 40R584 or equivalent.		
	(b) 2 fuel system valves, Whittaker W7951, 1-1/4"D, or equivalent.		
	(c) 2 hydraulic system valves, Whittaker W7950, 1-1/4" D, or equivalent.		

Landing Gear

201.		Two (2) main wheel-brake assemblys, 47", Type I		
	(a)	Goodyear Model A47SC Wheel Assembly #530144A-1 Brake Assembly #510628A		
202.	(a)	Two (2) main wheel 12-ply-rating tires, 47", SC, Type I, with regular tubes.		
	(b)	Two (2) main wheel 10-ply-rating tires, 47", SC Type I, with regular tubes. (See NOTE 6)		
203.		Nose wheel assembly, 30", SC, Type I, Hayes 5950A (G-3-96)		
204.		Nose wheel 8-ply-rating tires, 30", SC, Type I, with regular tubes		

Electrical Equipment

301.	2 generators, Type P1 or equivalent	89 lbs.	(+191)
302.	2 batteries, AN 3152 or equivalent	80 lbs.	(+210)

Interior Equipment

401.	(a)	FAA approved Airplane Flight Manual (Basic)
	(b)	FAA approved Flight Manual, Southern California Aircraft Corp., Report No. R1007 dated 6/25/51, when P&W R-1830-75 engines are installed.
402.		Indicator, carburetor air temperature, Lewis 77B3 or equivalent.
403.		Gage, hydraulic press, Hollsman AU-Q-148 or equivalent.
404.		Indicator, cowl flap position, GE8DJ-12-PBC or equivalent.
405.		Indicator, cylinder head temperature AN 5536-2A or equivalent.

De-Icing Equipment

501.	2 carburetor alternate air installations, CVAC 2 8P5008 or equivalent.

Miscellaneous

601.	2 windshield wipers, Marquette D12364 or equivalent.

NOTE 1. Current Weight and Balance report including list of equipment included in certificated weight empty, and loading instructions when necessary, must be in each aircraft at the time of original certification and at all times thereafter (except in the case of air carrier operators having an approved weight control system).

NOTE 2. The following placards must be installed in front of and in clear view of the pilot:

(a) "This airplane must be operated in compliance with the 'Approved Operating Limitations' of the Airplane Flight Manual."
(b) "No acrobatic maneuvers, including spins are approved."
(c) "Do not exceed engine temperature limits during water taxiing."
(d) "Avoid continuous operations between 1700 and 1850 rpm."

NOTE 3. The dash-one setting on the Stromberg PD12H1 or H4 carburetors and standard 25 degree BTC ignition timing should be used on R-1830-92 engines to permit use of either 91 or 100 grade fuel.

NOTE 4.

(a) "System Fuel and Oil" (Equipment Item 105) is that amount required to fill both systems and the tanks up to the tank outlets to the engines when the airplane is in the level altitude. "System Fuel and Oil" and all hydraulic fluid must be included in certificated weight empty. (See also NOTE 7.)
(b) Fuel and Oil tank capacities do not include any "System Fuel and Oil."

NOTE 5. The Model 28-5ACF is fundamentally a Navy CVAC Model PBY-5A modified in accordance with the requirements of CAR 3 to be eligible for passenger-carrying operations. (Aircraft Specification 2-548 describes the modifications which are necessary to modify the Model PBY-5A aircraft to provide eligibility for cargo-carrying operations only.) Listed as follows are the modifications which are necessary to convert the Model PBY-5A, RCAF PBY-5A and 28-5AMC to a Model 28-5ACF.

A. Modifications required for PBY-5A aircraft previously certificated in accordance with Aircraft Specification 2-548:

(1) Modifications in accordance with the following CVAC Drawings: 28T 15000 D Empennage Inst., Mod. (Details shown on Dwgs. 28T15001 to 28T15020 and 28T15022 to 28T15024, inclusive) 28D 5000 BD Cowl Inst., Engine 28P 15012 Springs - Carburetor Air Scoop Rework (Installation of these springs shown on Drawing 28P5008Y.)

(1) To be eligible for maximum weight of 28,000 lbs., a slipper bow in accordance with CVAC Drawing No. 28B 15001 B and pertinent detail drawings must be installed. The airplane is eligible for a maximum weight of only 27,000 lbs. with the original PBY-5A nose and turret installed, provided the turret revolving mechanism is removed or made inoperative and the opening between the nose and turret are faired over.

(3) The rear gun blisters must be removed and a satisfactory passenger door installed. The number of auxiliary exits required will be governed by CAR 3.387. The navigator's excape hatch in the top of the cabin near bulkhead 3 will be considered as one auxiliary exit, provided it is properly placarded and a suitable ladder or other equivalent means of access is stowed adjacent to the hatch so as to readily permit easy egress through the hatch. CVAC Drawings which cover approved entrance doors and auxiliary exits are:
28B5223A, Door-Hull Cargo (one left, one right)
28B15000 Hull, Rework Assembly
28B15016A, Escape Hatch - Sta. 6.4 R.H.
28B15017B, Main Entrance Hatch
28B15030A, Rework Blister Compartment - Station 6-7
See NOTE 9 with reference to waist blisters.

(4) At or near the firewalls, emergency shut-off valves (Equipment Item 106, a, b and c) must be incorporated in all lines carrying inflammable fluid into the engine compartments. If these valves are located forward of the firewall, they and any other system components between the valves and the firewall must be fireproof or adequately protected by fireproof wrapping or stainless steel shrouds. The control installation shall be acceptable to the FAA representative and the operating name shall be located convenient to the pilot and co-pilot or to the flight engineer, and shall be properly marked.

(5) The identification plate must be marked to show the designation as Model 28-5ACF and to indicate the date of conversion.

(6) Combustion heaters for tail de-icer or cabin heating, if installed, must be of type approved by the FAA. Their installation, fuel system, etc., must be thoroughly inspected to insure that no hazardous conditions may exist (see paragraph A-10 below).

(7) If an exhaust heat-type wing de-icer system is installed, the system must be thoroughly inspected for evidence of corrosion, deterioration or possible hazardous conditions, with particular attention given to the engine section.

(8) A stainless steel diaphragm must be installed between the power and accessory sections of each engine. All openings in these diaphragms shall be sealed with close-fitting fire resistant grommets, bushings or firewall-type fittings.

(9) If not previously accomplished, the firewall must be completed by downward extension to the nacelle skin.

(10) Unless installed in an otherwise approved manner, all equipment (such as auxiliary power plants, fuel-burning heaters, etc.) which create potential fire zones during flight must be isolated from the remainder of the airplanes by means of fireproof material, or adequately protected by a fire detection and extinguishing system. In either case, suitable means must be provided to shut off the flow of inflammable fluids to this equipment.

(11) Cargo and baggage compartment flooring and floor beams and all new interior equipment installations must be substantiated for ultimate load factors of 6.5 (positive) and 1.7 (negative). The cargo and baggage compartments must be provided with adequate tie-down fittings and contain adequate placards to indicate the maximum approved capacities. If the original flooring and floor support structure are retained, the following approved compartment capacities based upon uniformly distributed loads and use of the airplane as a cargo carrier, may be used as a basis for determination of allowable compartment loads and placards:

Compartment (hull stations)	Total Capacity (lbs.)	C.G. (Approx.)
2-4	3740	+172
4-5	936	+266
5-6	4100	+344
6-7	3240	+422

(12) Safety belt and passenger seat installation other than originally

provided by the manufacturer must be shown to at least meet the strength requirements of CAR 4a.

(13) The bottom of the forward super-structure compartment (forward of the flight engineer's instrument panel) must be sealed to prevent any spilled fluid from entering the hull, and the compartment must be adequately drained and vented.

(14) The compartment containing the flight engineer's station must be placarded against smoking.

(15) All hose connections in the oil return line in each engine accessory section must be double clamped.

(16) Installation of provisions for more than 22 passengers is contingent upon incorporation of additional emergency exits complying with CAR 3.337.

(17) The pilot static head of the airspeed system must be modified by adding a ring to the head 15/32 inch forward of the center line of the static opening. The ring should be made of .063 music wire, should fit tightly on the head, and be attached to the head with silver solder.

(18) For opertation of the airplane as an amphibian, it is necessary that the original PBY-5A (or their equivalent) water-tight doors be supplied for hull bulkhead Sta. 2, 4, 6 and 7. These doors must not be closed during takeoffs and landings, but should either be hinged to, or positioned adjacent to their respective bulkheads, so that they may be readily positioned in case of a water emergency.

B. PBY-5A not previously certificated in accordance with Aircraft Specification 2-548, as well as all RCAF 28-5AMC aircraft, must comply with all the provisions of NOTE 5A, above, plus the following:

(1) Two sea anchors and life rafts as required by the operations which are authorized, with adequate stowage provisions for these items, must be provided.

(2) The firewall either must be completely replaced by, or covered, or backed up by one of the following materials:
   (a) Stainless steel - .015 in. thick
   (b) Nickel-chromium-iron-alloy - .015 thick
   (c) Low carbon steel - .018 in. thick (aluminum coated or otherwise protected against corrosion)
   (d) Monel metal - .018 thick
   (e) Terneplate - .018 thick

(3) Guards must be installed to prevent the inadvertent operation of switches on control column and on forward side of bulkhead aft of pilot's compartment.

(4) The supports for the servo control fluid lines forward of the servo must be replaced with supports having adequate strength and rigidity.

(5) Positive means of communication between the flight engineer, if utilized, and the pilot and co-pilot must be installed.

(6) Fuel dump valves must be removed or made positively inoperative.

(7) Instruments must be marked for approved operation limits.

(8) The carburetor air intake systems must be modified in either of the following manner:
   (a) Install a carburetor alcohol de-icing system with a capacity of not less than 5 gallons per engine. The capacity of the alcohol pumps should be sufficient to provide a flow of 10 gallons per hour to each engine simultaneously. (CVAC Drawing 28 D 15000 or equivalent.)
   (b) Modify the carburetor air preheat system to provide a heat rise of 100 degrees F. when operating at 75 percent power at an outside air temperature of 30 degrees F. (Equipment Item 501 not adequate.)

(9) All fuel tank filler caps or adjacent surface must be marked with the word "Fuel", the minimum fuel octane rating, and the tank capacity.

(10) The oil tank filler caps must be marked with the word "oil" and the oil tank capacity.

(11) FAA approved number "5E-4" should be added to the military engine identification plates in lieu of the Type Certificate No.

(12) All electrical system circuit protectors must be made accessible in flight.

(13) The drain outlets for the A.E.L. strainer-wobble pump units must be moved to a position remote from the auxiliary power plant exhaust outlet, if the latter is installed.

NOTE 6. When equipment item 202(b) is installed, landplane operations are limited to a maximum weight of 27,000 lbs.

NOTE 7. The total fuel tank capacity for this model is 1,750 gallons (10,500 lbs.), but the usual empty weight of these airplanes is such that this total cannot be utilized. The maximum allowable capacity for each airplane should be determined in the following manner:
From the maximum certificated weight, subtract the sum of the airplane

empty weight (as equipped), fuel, oil, and minimum crew weight (170 lbs. each). The difference is the maximum allowable fuel in pounds. The fuel tank filler necks (or adjacent surface) and the fuel quantity indicators should be placarded accordingly (see also NOTE 4) and pertinent notes added to the loading schedule, if utilized, and to the Airplane Operating Limitations.

NOTE 8. Prior to certification as a Model 28-5ACF, each aircraft must satisfactorily pass:

(a) An inspection for possible hidden damage, for workmanship and materials used in making any repairs and/or alterations, and for conformity with drawings describing all required changes (see NOTE 5).

(b) A check of flight characteristics when the FAA representative consideres it necessary.

NOTE 9. Model 28-5ACF is approved with retention of waist blisters and a modified clipper bow at a maximum take-off and landing weight of 27,880 lbs. when modified per So. California Aircraft Co., Ontario, CA,, Form ACA-337, dated 12/27/48. Airplane Flight Manual must be revised in accordance with approved manual for aircraft N69043 owned by the So. California Aircraft Corp., Ontario, CA. When such blisters are retained, the fixed elevator trim tab, described in CVAC Drawing 28T15024, must not be incorporated.

NOTE 10. Under wing boats may be installed in accordance with Southern California Aircraft Corp., Ontario, California, Form ACA-337, dated 6/6/50. P&W R-1830-75 engines may be installed in accordance with Southern California Corp., Form ACA-337, dated 5/2/51. Item 401(b) is required with this installation. When either or both of these installations are incorporated, the following limitations apply:

Engine Installation	P&W R-1830-92	P&W R-1830-75
Take-Off and Landing without boats under wing	28,000 lbs.	29,310 lbs.
Take-Off and Landing with boats under wing	26,800 lbs.	28,030 lbs.

When under wing boats are installed, the never exceed speed must be reduced to 175 mph (152 knots).