

MODELS: Grumman G-21 and G-21A (Army OA-9, Navy JRF-1, JRF-2, JRF-3, JRF-4, JRF-5 and JRF-6B - See NOTE 8), 8 PCL-AM-FcM (Approved 9/29/37 and 2/5/38 respectively)

T.C. NUMBER: 654

(For difference between G-21 and G-21A, see NOTE 5)

Engines	2 P&W Wasps Jr. SB or SB-2 with one 4-1/2N and one 9N damper (See also Item 111)
Fuel	80 minimum octane aviation gasoline (for 400 hp rating), 87 minimum octane aviation gasoline (for 450 hp takeoff rating)
Engine limits	Maximum, except takeoff (Sea level) 34.5 in. Hg., 2200 rpm (400 hp) (Straight line manifold pressure variation with altitude to 5000 ft.) 33.5 in. Hg., 2200 rpm (400 hp) Takeoff (one minute) (With 80 octane fuel) 33.5 in. Hg., 2200 rpm (400 hp) (With 87 octane fuel) 36.5 in. Hg., 2300 rpm (450 hp)
Airspeed limits (T.I.A.S.)	Level flight or climb - 194 mph (169 knots) Glide or dive - 225 mph (195 knots) Flaps extended - 110 mph (96 knots)
Propeller limits	Item 109, 228 or 302 must be installed
Ceilings	(a) Without de-icers; 6000 ft. absolute (density alt.) either engine inoperative (b) With de-icers: Zero ft. (usable in standard air at 8048 lbs. with either engine inoperative and the inoperative propeller idling in high pitch)
C.G. range	(+20.5) (15.2 percent MAC) to (+33.0) (28.0 percent MAC)
Datum	Wing leading edge at fuselage
MAC	97.4 in. L.E. of MAC (+5.7)
Leveling means	Lugs on right side and aft bulkhead of pilot's compartment
Maximum weight	Model G-21A: 8000 lbs. (See NOTE 7) Model G-21: 7500 lbs. (See NOTES 5 and 7)
No. seats	8 (2 at -5, 2 at +24, 2 at +62, 2 at +102)
Baggage	700 lbs. maximum (300 lbs. in front compartment (-65), 400 lbs. in rear compartment (+169)) (See NOTES 2 and 3)
Fuel capacity	200 gallons (one 110 gallon tank in each center

Oil capacity	section) (+30) 15 gallons (one 7-1/2 gallon tank in each nacelle) (+8)
Control surface movements	Not available
Serial Nos. eligible	1001 and up and B-1 and up
Required equipment	Items 101 (See NOTE 5), 102, 103, 104, 105, 106(a), 107, 108, 109 and 110

Specifications Pertinent to All Models:

Certification basis	Type Certificate No. 654 (Aero. Bulletin 7A)
Production basis	Production Certificate No. 23
Export eligibility	Eligible for export except as follows, subject to provisions of MOP 2-4:
	(a) Canada
	- Landplane, Amphibian and Flying boat eligible.
	- Skiplane not eligible.

EQUIPMENT:

Propellers and Propeller Accessories (except de-icing equipment)

109.	Two controllable metal (Hamilton Standard hubs 2D30, blades 6095A-12)	308 lbs.	(-52)
201.	Constant speed propeller controls	13 lbs.	(-23)
228.	Two constant speed full feathering hydromatic (Grumman Drawings 13709A and 13710) (Hamilton Standard hubs 22D30, blades 6181A-12, 6183A-18, or 6381A-12)	+67 lbs.	(-38)
302.	Two controllable metal (Hamilton Standard hubs 2D30, blades 6167A-12 or 6101A-18) (for interchangeable blade models see Prop Spec. No. 206) (NOTE 6)	No weight change	

Engines and Engine Accessories - Fuel and Oil System

101.	Two engine ring cowls	56 lbs.	(-36)
102.	Two oil radiators (UAP No. U3160)	26 lbs.	(0)
103.	Two starters (Eclipse E-160)	77 lbs.	(-12)
108.	Pressure fire extinguisher (Lux type A-1)	21 lbs.	(-33)
111.	Engines (must have one 4-1/2 N and one 9N damper)	Use actual weight increase	
	(a) P&W Wasps Jr. SB-3 (limits same as SB)		
	(b) P&W Wasps Jr. T1B2 (limits as follows):		
	Maximum continuous		
	(Sea level) 35 in. Hg., 2200 rpm (400 hp)		
	(Straight line manifold pressure variation with alt. to 3800 ft.) 34 in. Hg., 2200 rpm (400 hp)		
	Takeoff (one minute)		
	35 in. Hg., 2200 rpm (400 hp)		
	37.5 in. Hg., 2300 rpm (450 hp)		
	(c) P&W Wasps Jr. T1B3 (limits same as T1B2, Item 111(b) above)		
	(d) Military R-985-AN-4 (limits same as SB)		
	(e) Military R-985-AN-6 or -AN-6B (limits same as SB)		
	(f) Military R-985-AN-12 or -AN-12B (limits same as SB)		
	(g) Military R-985-AN-14B (limits same as SB)		
	(h) Military R-985-25 (limits same as T1B2, Item 111(b) above)		
	(i) Military R-985-AN-1 or AN-3 (limits same as T1B2, Item 111(b) above)		
202.	Starters		
	(a) Two cartridge, Federal type (one standard battery may be omitted)	62 lbs.	(-5)
	(b) Two electric, Eclipse F-141	62 lbs.	(-12)
218.	Engine tool kit	13 lbs.	(+161)
221.	Engine work shelf	9 lbs.	(+189)
222.	Auxiliary fuel tank (60 gallons) (Drawings 12855 and 12854)	40 lbs.	(+27)

Landing Gear and Floats

106.	Two main wheel-brake assemblies, 30x7, Type II, with 32x8 6-ply rating tires		
	(a) Bendix type B		
	(b) Goodrich (formerly Hayes) Model 3070A		
	Wheel assembly G-3-56A		
	Brake assembly H-2-102		
107.	13.25 in. streamline tail wheel with Goodrich 6-ply special H.D. tire		
110.	Wing tip floats (Edo N-760) (See NOTE 6)	87 lbs.	
229.	Electrically or manually controlled landing gear retracting mechanism per "Instruction Report No. G-21-11" for kit installation, by Clifford W. Bryan, 6620 Aldea, Van Nuys, CA)	+43 lbs.	(-5)
301.	Wing tip floats (Grumman Drawing 13000)	No weight change	
304.	Skis		
	(a) Federal SA-12	Use actual weight change	
305.	12.50 in. smooth contour tail wheel with Goodrich 6-ply special H.D. tire		

Electrical and Radio Equipment

104.	Generator - 24 amp. (Eclipse D-1)	26 lbs.	(-23)
105.	Two batteries - 38 amp. hr. (Exide 6TS-13-1)	75 lbs.	(-7)
203.	Extra generator		
	(a) 25 amp. (Eclipse D-1)	26 lbs.	(-23)
	(b) 15 amp. (Eclipse G-1)	21 lbs.	(-23)
	(c) 50 amp. (Eclipse E-5)	+17 lbs.	(-23)
204.	Battery		
	(a) 65 amp. hr. (Exide 6TX-19-1)	75 lbs.	(-48)
	(b) 38 amp. hr. (Reading 6ARL-11)	38 lbs.	(-48)
	(c) (Exide 6-TAS-9-1)	80 lbs.	(-7)
207.	Miscellaneous radio installations		
	(a) Bow compartment including shelves	Maximum 150 lbs.	(-60)
	(b) Rear compartment	Maximum 150 lbs.	(+151)
215.	One or two landing lights (Grimes ST-1000)	8 lbs. each	(+60)

Interior Equipment

205.	Miscellaneous cabin furnishings		
	(a) Leather chair upholstery	+40 lbs.	(+77)
	(b) Lounge, replacing two chairs (Gillies No. 1203)	53 lbs.	(+102)
	(c) Bed, replacing two chairs (Gillies No. 1201)	100 lbs.	(+102)
	(d) Folding bench, replacing two chairs (Gillies No. 1205)	35 lbs.	(+102)
	(e) Buffet, replacing one chair and one auxiliary seat (Gillies No. 1214)	32 lbs.	(+25)
	(f) Writing table (Gillies No. 1215)	19 lbs.	(+54)
	(g) Locker (Gillies No. 1215)	12 lbs.	(+20)
	(h) Wash basin with 5 quarts water	16 lbs.	(+151)
	(i) Auxiliary seat	10 lbs.	(+24)
	(j) Special folding bench (replacing two chairs)	28 lbs.	(+92)
	(k) Four sets quick detachable chair leg locks (Drawing 13272)	12 lbs.	(+77) and
		4 lbs.	(+118)
		6 lbs.	(+184)
206.	Toilet (See NOTE 2a)		
209.	Camera installation (Zeiss RMK 20/3030) (Drawing 12840)	305 lbs.	(+93)
213.	Flares (I.F.S. MK. I pistol with 3 - 1 minute)	14 lbs.	(+17)
214.	Very's pistol and 12 rounds ammunition	4 lbs.	
219.	Parachutes	20 lbs. each	
220.	Life saving equipment		
	(a) Life raft (7 man)	75 lbs.	(+161)
	(b) Life preservers (8) (Air Associates E-1)	10 lbs.	
	(c) Life preservers (Air Associates C)	3 lbs. each	
	(d) Life preservers (approved Kapok)	3 lbs. each	(+169)
224.	Automatic pilot installations		
	(a) Sperry servo unit model No. C4-S1-C	34 lbs.	(-40)
	Provision for installation	15 lbs.	(-13)
	(b) Sperry servo unit model No. C6-D3-B	Total 131 lbs.	(-22)

	Consisting of gyro unit	39 lbs.	(-32)
	Controls and cables	52 lbs.	(-40)
	Accessories and tubing	40 lbs.	(+12)
(c)	Lear Model L-2B automatic pilot installation in accordance with Lear Drawing 91400	50 lbs.	(+107)
	Placards required near the auto-pilot controller:		
	"Do not use autopilot in cruise configuration below 450 feet above terrain."		
	"Do not use autopilot in the approach configuration below 150 feet above terrain."		
	"Do not manually overpower auto-pilot to increase angle of bank or angle of pitch."		
	Servo stall torque measured at the servo on the ground:		
	Aileron 25 in. lbs., elevator 75 in. lbs., rudder 100 in. lbs.		
225.	Cabin heater manifold	9 lbs.	
303.	Flare installation (wing) per Drawings 12436 and 13810	49 lbs.	

De-Icing Equipment

227.	De-icer installation (See NOTE 7)	125 lbs.	
(a)	Fixed portion (includes 62 lbs. (+17) piping, gages, valves, pump, tank, spinners, slinger rings, etc.)		
(b)	Removable portion		
	Wing boots	26 lbs.	(+9)
	Tail boots	18 lbs.	(+255)
	De-icer fluid	19 lbs.	(+146)

Miscellaneous (not listed above)

208.	Airline windshield (3/8 inch, 5-ply)	+20 lbs.	(-28)
210.	Window in emergency exit	1 lb.	
217.	Miscellaneous seaplane equipment		
(a)	Anchor (Northhill 12 lbs. and 100 ft. Manila line 1-3/4 in.)	19 lbs.	(-88)
(b)	Bilge pump, boat hook, fog horn and chart board	7 lbs.	
223.	Emergency exit (pilots' compartment) (Drawing 12149)	7 lbs.	(-7)
226.	Enlarged right hand cabin door (Drawing 13265)	+2 lbs.	(+118)

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.

- (a) When item 206 is installed, the maximum allowable rear compartment baggage must be reduced 176 lbs.
- (b) When items of optional equipment are installed in the baggage compartment, the compartments must be placarded for reduced capacities accordingly. Pertinent agent's report should indicate items so installed.

NOTE 3. When six passenger seats are removed (96 lbs.), the cabin may be loaded to a maximum weight of 1700 lbs. with a maximum of 25 lbs. per lineal inch, provided a weight and balance check is made.

NOTE 4. (Deleted - 2/6/43)

NOTE 5. Model G-21 same as G-21A except maximum standard weight of 7500 lbs. and 13.25 in. streamline tail wheel with Goodrich 6-ply tire in lieu of item 107.

NOTE 6.

- (a) Landplane - The wing tip floats may be removed provided the airplane is placarded for use as landplane only. No C.G. check is required.
- (b) Flying Boat - The landing gear and tail wheel, their retractive mechanisms and the brake operating system may be removed provided the airplane is placarded as a flying boat, and the support tubes, attachment bolts, etc., are installed so as to maintain hull water tightness. The decrease in weight is approximately 300 lbs. No

C.G. check is required.

NOTE 7. Maximum weight may be increased 48 lbs. when complete de-icer is installed.

NOTE 8. Prior to certification as civil airplanes, the following should be accomplished:

- (a) If uncertificated position lights are installed, they should be removed or replaced with certificated lights.
- (b) Remove the Navy MK IV-1 flares or modify the installation to accommodate approved flares in the Navy JRF airplanes.
- (c) If uncertificated flares are installed in Army OA-9 airplanes, they should be removed or replaced with certificated flares.
- (d) If plexiglass blisters are installed on the JRF-6B, they should be replaced with a regular window or the opening covered in a suitable manner.
- (e) If mixture control operation in reverse direction from standard civil practice is present in JRF-5 or JRF-5B airplanes, it should be changed to give a "forward" movement for full rich position. This may be accomplished by rotating the position of the mixture control bellcranks 180 degrees on the carburetors and reversing the toothed segments of the cockpit control end for end. The cockpit control placard should be revised accordingly.