Gunther Todd

From: Jason.M.Major[redacted]
Sent: Thursday, August 28, 2014 8:23 PM
To: Gunther Todd
Subject: weight balance sheet
Attachments: 1.pdf

Estimated weights for everyone per Mr. Spencer:

Darrel: 230 +10
Daphne: 150 +10
Marcene: 180 +10
Forest: 160 +10
Gear: 30
Fuel: 100 gal
Empty weight a/c: 1987
Max weight: 3150

Jason M. Major AL-01
Aviation Safety Inspector
Alaskan Region, Flight Standards Division
[redacted]

2.7 WEIGHT AND BALANCE AND OPERATING INFORMATION, (CONT'D)

2750 POUNDS, THE LANDING GEAR MUST MEET THE FOLLOWING REQUIREMENTS: THE MAIN INNER SHOCK STRUT (RYAN PART #145-33104), MUST TEST ROCKWELL 100,000 PSI. THE MATERIAL IS 4130 CHROMEMOLY STEEL. ANY HARDNESS TEST CONVERTED TO PSI IS ACCEPTABLE. ALL NAVIONS SERIAL #2000 AND SUBSEQUENT HAVE RYAN PART #145-33104-7 WHICH MEETS THE REQUIRED 100,000 PSI AND NEED NOT BE CHECKED. DO NOT REMOVE STRUT FOR HARDNESS CHECK. IF IT IS NECESSARY TO CHECK, CONTACT BRITTAIN INDUSTRIES AS A PORTABLE HARDNESS TESTER FOR THIS PURPOSE IS AVAILABLE ON LOAN BASIS.

TABLE I - MAXIMUM ALLOWABLE GROSS WEIGHT WITH WING TIP TANKS

MODEL	HP	EMPTY TIP TANKS	FULL TIP TANKS
NAVION	185	2750 LBS.	2750 LBS.
NAVION A	205	2850 LBS.	2850 LBS.
NAVION A	225	2850 LBS.	3000 LBS.
NAVION A	240	2860 LBS.	3100 LBS.
NAVION A	250	2860 LBS.	3100 LBS.
NAVION A	260	2860 LBS.	3100 LBS.
NAVION B	260	2860 LBS.	3100 LBS.
NAVION D	240	2860 LBS.	3100 LBS.
NAVION E	250	2860 LBS.	3100 LBS.
NAVION F	260	2860 LBS.	3100 LBS.

LIMITATIONS: IN ALL INSTANCES ANY WEIGHT OVER 2860 LBS. MUST BE CARRIED AS TIP TANK FUEL LOAD.

ON NAVIONS WITH PRESSURIZED CARBURETORS, THE NORMAL QUANTITY OF FUEL RETURNED FROM THE CARBURETOR TO THE RIGHT MAIN TANK IS 3 GALLONS PER HOUR. WHEN OPERATING ON WING TIP TANKS, THE LEVEL OF FUEL IN THE MAIN TANKS MUST BE LOW ENOUGH TO ALLOW FOR THIS RETURN. IN NAVIONS POWERED BY ENGINES WITH FUEL INJECTION, THERE IS A RETURN OF 10 GALLONS PER HOUR. IN THESE AIRCRAFT, WING TIP TANKS SHOULD BE USED ONLY SO LONG AS THE MAIN FUEL QUANTITY GAGE REGISTERS BELOW 30 GALLONS. THIS WILL ALWAYS LEAVE AT LEAST 9.5 GALLONS FUEL SPACE IN THE MAIN TANK FOR THE RETURNED FUEL. (THE 9.5 GALLONS BEING THAT AMOUNT OF FUEL WHICH DOES NOT NORMALLY REGISTER ON THE MAIN FUEL QUANTITY GAGE OF THE NAVION). IF THE MAIN FUEL QUANTITY GAGE REGISTERS OVER 30 GALLONS, THEN OPERATION FROM WING TIP TANKS SHOULD BE SUSPENDED AND MAIN TANKS SHOULD BE SELECTED, UNTIL NEEDLE RETURNS TO A POSITION BELOW 30 GALLONS.

CONTINENTAL E-225 — CLIMB POWER CHART — MAX. CONTINUOUS HP

ALT	SL	1000	2000	3500	4500	5500	6500	7500	8500	9500	10500
RPM	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
FT/HP	228	223	215	204	197	190	183	177	171	165	158
FF	133	131	127	121	117	112	108	104	100	97.0	93.0
2750 # TIME											
2750 # FUEL											
2300 # TIME											
2300 # FUEL											
Ts	15°c	13°c	11°c	8°c	6°c	5°c	3°c	1°c	-1°c	-3°c	-5°c

NOTES: CORRECT HP 1% FOR EACH 6°C ABOVE OR BELOW TS. F/F'S SHOWN ARE BASED ON MAINTAINING SL F/A RATIO THROUGHOUT THE CLIMB.

CONTINENTAL E-225 — CLIMB POWER CHART — 200 HP TO FT

ALT	SL	1000	2000	3500	4500	5500	6500	7500	8500	9500	10500
RPM	2550	2550	2550	2550	2650	2650	2650	2650	2650	2650	2650
MP/HP	26.2	26.0	25.8	25.5	*197	*190	*183	*177	*171	*165	*158
FF	115	115	115	115	117	112	108	104	100	97.0	93.0
2750 # TIME											
2750 # FUEL											
2300 # TIME											
2300 # FUEL											
Ts	15°c	13°c	11°c	8°c	6°c	5°c	3°c	1°c	-1°c	-3°c	-5°c

NOTES: CORRECT HP 1% FOR EACH 6°C ABOVE OR BELOW TS. F/F'S SHOWN ARE BASED ON MAINTAINING SL F/A RATIO THROUGHOUT THE CLIMB. *ASTERISK DENOTES FT HP.

CONTINENTAL E-225 — CLIMB POWER CHART — 178 HP TO FT

ALT	SL	1000	2000	3500	4500	5500	6500	7500	8500	9500	10500
RPM	2450	2450	2450	2450	2450	2450	2500	2650	2650	2650	2650
MP/HP	24.6	24.4	24.2	23.9	23.7	23.5	*178	*177	*171	*165	*158
FF	101	101	101	101	101	101	102	104	100	97.0	93.0
2750 # TIME											
2750 # FUEL											
2300 # TIME											
2300 # FUEL											
Ts	15°c	13°c	11°c	8°c	6°c	5°c	3°c	1°c	-1°c	-3°c	-5°c

NOTES: CORRECT HP 1% FOR EACH 6°C ABOVE OR BELOW TS. F/F'S SHOWN ARE BASED ON MAINTAINING SL F/A RATIO THROUGHOUT THE CLIMB. *ASTERISK DENOTES FT HP.

CONTINENTAL E-225-4 — CRUISE POWER CHART — 70% (157 HP)

ALT	SL	1000	2000	3500	4500	5500	6500	7500	8500	9500	10500
RPM	2350	2350	2350	2350	2350	2350	2350	2350	2350	2400	2500
MP	23.0	22.8	22.6	22.3	22.1	22.0	21.8	21.7	21.2	20.9	19.7
FF	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	82.0
2750 # IAS											
2750 # TAS											
2300 # IAS											
2300 # TAS											
Ts	15°c	13°c	11°c	8°c	6°c	5°c	3°c	1°c	-1°c	-3°c	-5°c

NOTES: BHP MAY VARY PLUS OR MINUS 2.5%. FUEL FLOW MAY VARY PLUS 6% MINUS 2%. CORRECT HP IN ACCORDANCE WITH FREE AIR TEMP. AS FOLLOWS: ADD .1" MP FOR EACH 6°C ABOVE TS. SUBTRACT .1" MP FOR EACH 6°C BELOW TS.

CONTINENTAL E-225-4 — CRUISE POWER CHART — 65% (146 HP)

ALT	SL	1000	2000	3500	4500	5500	6500	7500	8500	9500	10500
RPM	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2350
MP	22.2	22.0	21.8	21.5	21.3	21.1	20.9	20.7	20.5	20.3	19.7
FF	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0
2750 # IAS											
2750 # TAS											
2300 # IAS											
2300 # TAS											
Ts	15°c	13°c	11°c	8°c	6°c	5°c	3°c	1°c	-1°c	-3°c	-5°c

NOTES: BHP MAY VARY PLUS OR MINUS 2.5%. FUEL FLOW MAY VARY PLUS 6% MINUS 2%. CORRECT HP IN ACCORDANCE WITH FREE AIR TEMP. AS FOLLOWS: ADD .1" MP FOR EACH 6°C ABOVE TS. SUBTRACT .1" MP FOR EACH 6°C BELOW TS.

CONTINENTAL E-225-4 — CRUISE POWER CHART — 60% (135 HP)

ALT	SL	1000	2000	3500	4500	5500	6500	7500	8500	9500	10500
RPM	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250
MP	21.4	21.2	21.0	20.7	20.5	20.3	20.1	19.9	19.7	19.5	19.3
FF	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
2750 # IAS											
2750 # TAS											
2300 # IAS											
2300 # TAS											
Ts	15°c	13°c	11°c	8°c	6°c	5°c	3°c	1°c	-1°c	-3°c	-5°c

NOTES: BHP MAY VARY PLUS OR MINUS 2.5%. FUEL FLOW MAY VARY PLUS 6% MINUS 2%. CORRECT HP IN ACCORDANCE WITH FREE AIR TEMP. AS FOLLOWS: ADD .1" HG MP FOR EACH 6°C ABOVE TS. SUBTRACT .1" HG MP FOR EACH 6°C BELOW TS.

TABLE XVII

OPERATING TEST LIMITS

Feature	Value		
	E-165	E-185	E-225
Full Throttle Speed (RPM)	2050-2100	2300-2350	2650-2700
Fuel Consumption (at full throttle)	86-93 lbs./hr. @ 2050	95-103 lbs./hr. @ 2300	121-131 lbs./hr. @ 2650
Oil Viscosity	S.A.E. 50	S.A.E. 50	S.A.E. 50
Grade	1100	1100	1100
Fuel Rating (Octane)	80/87	80/87	80/87
Idling Speed (RPM)	575-625	575-625	575-625
Manifold Vacuum (at full throttle)	0.8-1.3 in. Hg	0.8-1.3 in. Hg	1.3-1.8 in. Hg
Magneto Spread (at full throttle) (RPM)	50 @ 2050	50 @ 2045	50 @ 1900
* Crankcase Pressure (Maximum)	1.5 in. H_2O	1.5 in. H_2O	1.5 in. H_2O
Oil Temperature (Desired)	150-200°F.	150-200°F.	150-200°F.
Oil Temperature (Maximum)	225°F.	225°F.	225°F.
Oil Pressure (at full throttle)	30-60 psi	30-60 psi	30-60 psi
Oil Pressure (at idle speed)	10 psi	10 psi	10 psi
Cylinder Head Temperature (Maximum) (at lower spark plug)	525°F.	525°F.	525°F.

* *A sudden increase in crankcase pressure, during which the liquid in the manometer fluctuates rapidly is not desirous and usually is an indication of rings beginning to stick. However, before removing cylinders, investigate the breather and the manometer to be sure such lines are not restricted in any way.*

d. Make one check on performance of each magneto alone at the RPM specified in Table XVII. Clear plugs by operating with both magnetos on for a few seconds between checks.

> *NOTE*
>
> *The maximum cylinder head temperature and maximum allowable oil temperature must not be exceeded at any time during the test.*

14-10. PRESERVATION.

If the engine is not to be installed in an aircraft and placed into service immediately, the last 15 minutes of operation should be used to circulate a corrosion-preventive oil mixture (suitable for flight operation). This will be an additional run period, since the engine must be stopped to change oil. During this same period unleaded gasoline should be supplied to the carburetor.

[redacted]
Fairbanks Ak. 99709
[redacted]
08-18-14

Weight and balance with/without POD installed, computed from weight and balance on 03-18-11 and 337 data 03-31-11 airwolf remote filter,tip tanks installed

Reg.# N4827K	Date 08-18-14
1949 Navion Ser# NAV4-1827	Tach 1608.5

calculated from actual weight and balance computed on 03-31-11
empty weight 1987 lbs. Maximum weight 3150 lbs.
C.G. Range 93.9 to 104.9 at 2350 lbs. UTILITY CATEGORY
C.G. Range 98.1 to 104.9 at 3150 lbs NORMAL CATEGORY

AIRCRAFT WEIGHT WITH FULL OIL AND UNUSABLE FUEL

Weight lbs.	Arm	Moment	Useful load lbs.
1987 Aircraft	97.93	194598.97	1163 Normal Category
28 POD	125.5	3514	-28
2015 Aircraft with POD installed	98.31	198094.65	1135 Normal Category
_____Front Seat	96		
_____Rear Seat	132		
_____Fuel Main	103		
_____Fuel Aux	130		
_____Fuel Tips	100.5		
_____Baggage	159		
_____Take off weight	_____arm	_____moment	_____C.G.

W.xA.= Mom. Mom divided by Weight = C.G. Any Weight and C.G. Combination between 93.9 and 104.9 is acceptable with tip tanks empty
Rear CG limited to 102.0(26.9% mac) TIP TANKS FULL.

Forest Kirst [redacted]