

BELLANCA, INC.
Alexandria, Minnesota

F.A.A. APPROVED
AIRPLANE FLIGHT MANUAL
FOR THE
VIKING MODEL 17-30A
WITH IO-550-F ENGINE
(Beginning with Serial No. 96-301023)

This manual eligible only for aircraft with
serial number 96-301023 and subsequent
when equipped with IO-550-F engine.

SERIAL NO. 00-301030
REGISTRATION NO. N27FF

THIS DOCUMENT MUST BE KEPT IN THE AIRPLANE
AT ALL TIMES.

FAA APPROVED

Joseph C. Mura
Royace H. Prather, Manager
Chicago Aircraft Certification Office
Federal Aviation Administration
Central Region

DATE: September 17, 1996

AIRPLANE FLIGHT MANUAL
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LOG OF REVISIONS

Rev. No.	Description	Date	FAA* Approved

Revised material is indicated on the applicable page by a black vertical line.

*For Manager, Chicago Aircraft Certification Office, Central Region

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SECTION I LIMITATIONS

It is required by law that the following limitations be observed in the operation of this aircraft.

A. ENGINE: Continental Model IO-550-F

ENGINE LIMITS:

1. Takeoff (5 min. max.) 300 HP at 2700 RPM Full Throttle
2. Maximum Continuous 285 HP at 2700 RPM 26.6 Inches Hg MAP
3. Maximum Normal Operating 225 HP at 2500 RPM

FUEL: 100/130 Minimum Grade Aviation Gasoline

PROPELLER:

McCaughey: D3A34C401/90DFA 78 - 80 Inches Diameter

Pitch: Measured at 30" Station

High: $28.5^{\circ} \pm .5^{\circ}$ Low: $11.8^{\circ} \pm .2^{\circ}$

Diameter: Not Over 80" Not Under 78"

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B. POWER PLANT INSTRUMENTS

Oil Temperature

Green Arc---Normal 75 -225 °F
Red Radial---Maximum 240 °F

Oil Pressure

Red Radial--Minimum 10 psi
Green Arc---Normal 30-60 psi
Red Radial--Maximum 100 psi

Fuel Flow

Red Radial--Minimum 3.5 psi
Green Arc---Normal 3.5-18.5 psi

Cylinder Head Temperature

Green Arc---Normal 250° - 420° F
Red Radial--Maximum 460° F

Tachometer

Green Arc---Normal 2200-2500 RPM
Red Radial--Maximum 2700 RPM

Manifold Pressure

Green Arc---Normal 13.5-26.6 Inches Hg
Yellow Arc---5 Minutes 26.6 - 29.5 Inches Hg

C. AIRSPEED LIMITS (CAS)

Red Radial--Never Exceed	226 MPH
Yellow Arc--Caution	190-226 MPH
Green Arc--Normal Operations	79-190 MPH
White Arc---Flap Operations	70-120 MPH
Maximum Design Maneuvering	148 MPH
Maximum Design Cruising	190 MPH
Maximum Gear Operation Speed	160 MPH
Maximum Speed With Gear Down	160 MPH

NOTE: Use controls with caution above 148 MPH and extreme
caution above 190 MPH especially in turbulent air.

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D. FLIGHT LOAD FACTORS

Maneuvering load factors at 3325 lbs. gross weight.

Flaps Up Maximum Positive	3.8 G
Flaps Up Maximum Negative	1.5 G
Flaps Down Maximum Positive	2.0 G

E. MAXIMUM WEIGHT & C.G. RANGE

Maximum Weight: 3325 Lbs.

C.G. Range:	(+22.0) to (+23.5)	3325 Lbs.
	(+19.0) to (+24.0)	3200 Lbs.
	(+16.0) to (+24.0)	2450 Lbs. or Less

Straight line variation between points.

DATUM: Leading edge of rib No. 1 (23.5 in. outboard of airplane centerline). Forward face of the firewall is 17.05 in. forward of Datum when the aircraft is leveled.

NOTE: It is the responsibility of the operator to determine that the aircraft is properly loaded. Refer to Section IV, Weight and Balance Data, for loading information.

F. MANEUVERS

This airplane must be operated as a Normal Category Airplane.

No aerobatics (including spins) are approved.

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G. PLACARDS

On Left Side Panel

"This airplane must be operated as a Normal Category Airplane in compliance with the FAA Approved Flight Manual. No aerobatic maneuvers including spins are approved. Operation is approved for VFR, IFR, DAY or NIGHT. Operation in known icing conditions is prohibited.

Max. Gear Operating Speed	160 MPH CAS
Max. Gear Extended Speed	160 MPH CAS
Max. Demonstrated Crosswind	20 MPH
Maneuvering Speed	148 MPH CAS

Takeoff weight above 3200 lbs. must be carried in wing fuel."

ALTERNATE STATIC SOURCE (If Installed)

AIRSPEED AND ALTIMETER CORRECTIONS

<u>Normal</u> <u>C.A.S.</u>	<u>Storm Window</u>		<u>Open</u>	
	<u>Closed</u>			
	<u>I.A.S.</u>	<u>FT.</u>	<u>I.A.S.</u>	<u>FT.</u>
80	75	-5	86	-70
90	86	-15	98	-90
100	99	-25	110	-100
120	122	-35	133	-120
140	144	-40	155	-140
160	167	-50	178	-150
180	190	-65	---	----

Add altimeter correction algebraically to observed altitude.

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PLACARDS (Continued)

Turn off strobe lights when taxiing in vicinity of other aircraft or during flight through clouds or fog. Standard position lights to be on for all night operations.

Emergency Gear Operation

1. Gear switch in down position.
2. Reduce airspeed to 90 mph, power for level flight.
3. The emergency gear extension lever is located directly below fuel selector. Push emergency gear extension lever down firmly until it snaps into spring lock.

Storm Window On Pilot's Left

"Do Not Open Above 140 mph."

Adjacent To Auxiliary Pump Switch

"Use only to restore fuel pressure."

Adjacent To Fuel Gauges

"Fuel remaining when gauge reads empty cannot be used safely."

On Fuel Selector Valve

Left Tank: Useable 34.5 Gals.

Right Tank: Useable 34.5 Gals.

Following only when auxiliary tank installed.

Aux. Tank: Useable 15.0 Gals. ("Use Aux. Tank In Level Flight Only")

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PLACARDS (Continued)

In Baggage Compartment

"Maximum total baggage compartment load: 186 lbs., 20 lbs. of total may be on hat shelf. Refer to Section IV of the Flight Manual for instructions."

On Door To Ski-Tube (If Installed)

"Maximum loading 20 lbs. consult weight and balance for loading."

Adjacent to Manifold Pressure and Tachometer Gauges (Only when equipped with McCauley D3A34C401/90DFA propeller)

"Avoid continuous operation between 1900 and 2200 RPM"

Adjacent to Control Column and Below the Directional Gyro

"Magnetic compass error $\pm 10^\circ$ with pitot heat on."

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SECTION II PROCEDURES

A. NORMAL PROCEDURES

1. Fuel System: The auxiliary fuel pump switch is a three position rocker switch. The switch has OFF, LOW and PRIME positions and is spring loaded for momentary on in the PRIME or top position. The switch has a lighted rocker which shows red, when the switch is on, either in the LOW or PRIME position. Takeoff and land with fuel selector valve on main tank containing most fuel. Use fuel from auxiliary tank in level flight only. If a tank is run completely dry, it is necessary to switch the selector valve to a tank containing ample fuel and then hold the boost pump on PRIME (top position). The auxiliary fuel pump must be turned on in order to ensure fuel flow to the engine. If ample fuel is available and boost is used, an air restart should occur in less than ten seconds. Normal engine restart can be accomplished without changing the throttle or mixture control positions. The auxiliary fuel pump is not required for normal operation after engine power is restored.
2. Fuel Gauges: Fuel gauges indicate fuel remaining in each tank regardless of tank selection.

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NORMAL PROCEDURES (Continued)

3. Circuit Breakers: The circuit breaker panel is located at the right side of the cockpit. Push to reset.
4. Landing Gear: To extend the gear, place the gear handle in the down position (speed 160 mph or less). If the gear has not been extended manually, when the airspeed is reduced to approximately 100 mph, the gear will extend automatically unless the throttle is full open. If the gear extends automatically, the red "unlocked" light will be on until the gear lever is placed in the down position. On takeoff, if the landing gear lever is placed in the up position at a speed below approximately 100 mph, the gear will not retract unless the throttle is full open.

NOTE: A dimming resistor is placed in series with the gear position lights when the Nav light switch is ON to provide dimming of the gear lights at night. If the Nav light switch is ON during the day, the gear lights will be more difficult to see.

5. Flaps: To extend the flaps, move the flap lever to the desired position (half or full). The flaps will automatically stop at the desired position. Indicator lights indicate flap position, green for up, amber for half or more and red indicates full down.
6. Cowl Flaps: To open the cowl flaps, pull the handle out and move the cowl flap lever to the full open position and release. The handle may require a slight push in to insure engagement of the lock. To close the cowl flaps, reverse the procedure. The cowl flaps should be fully open for all high power, low speed operations. The cowl flaps can usually be closed for cruise climb and cruise under normal temperature operating conditions. During unusually high temperature conditions, the cowl flaps may be trailed or opened fully, as required to maintain the cylinder head temperatures in the green arc.

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NORMAL PROCEDURES (Continued)

7. Stall Warning Indicator: Since the aerodynamic stall warning is slight, a stall warning signal is sounded when the airplane's speed is five to ten mph above stall speed. The stall warning indicator is inoperative when the master switch is in the OFF position.
8. Turn off strobe lights when encountering clouds or fog.
9. Loss of altitude during recovery from a stall may be as much as 250 feet.
10. Maximum crosswind landing was demonstrated with 90° component of 20 mph.

VOLTAGE SENSOR

The Model 17-30A is equipped with a solid state voltage sensor which is connected directly to the bus. The purpose of the voltage sensor is to give the pilot an immediate warning of an unsafe condition in the aircraft electrical system. Normal bus voltage ranges between 13 and 15 volts. Bus voltage outside this range will be immediately sensed by the voltage sensor and the appropriate indicator will light. The warning lights are located on the lower left panel just above the rocker switches and are marked "VOLTAGE HI-LOW". The high voltage indicator will light anytime the bus voltage rises above 15 volts. An improperly adjusted or malfunctioning voltage regulator and loss of the overvoltage relay protection could cause this condition. If the high voltage light pulses on or remains on, cycle the master switch in an attempt to correct the malfunction. Cross-check the ammeter for a charge condition to verify the malfunction. If the high voltage light continues to pulse or remains on, the alternator must be shut down (pull field and/or main alternator circuit breaker) to prevent high voltage damage to the radios and other electrical components. Turn off all unnecessary electrical load items to conserve remaining battery power and land as soon as practical.

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VOLTAGE SENSOR (Continued)

The low voltage indicator will light anytime the bus voltage falls below 13 volts. A low voltage light for a short period of time does not indicate an immediate hazard. With a high electrical load, for example, retracting the landing gear may cause the low voltage light to come on during the retract cycle. This is normal. If the low voltage light remains on, check the alternator circuit breakers and cycle the master switch in an attempt to bring the alternator back on-line. Cross-check the ammeter for a discharge condition to verify the malfunction. If the low voltage light remains on, turn off all unnecessary electrical load items to conserve remaining battery power and land as soon as practical.

A press to test switch is provided to check proper operation of both indicator lamps. The low voltage light will normally be on if the engine is not running and the master switch is on.

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B. EMERGENCY PROCEDURES

1. Emergency Extension Of Landing Gear

- a. Gear switch in down position.
- b. Reduce airspeed to 90 mph power for level flight.
- c. The emergency gear extension lever is located directly below fuel selector. Push emergency gear extension lever down firmly until it snaps into spring lock.

2. Gear Up Landings

If all wheels do not indicate down and locked and a visual check from the tower or other source indicates it is not down, release the emergency extension lever and attempt to retract the gear and land with it in the "UP" position when a main gear fails to extend. Should the nose gear fail to extend, land with the main gear down and hold the nose off as long as possible on landing. Do not use brakes on landing. Turn all switches and main tank selector valve to "OFF" position before contact with the ground.

3. Automatic Landing Gear Extension System Failure

Should the pressure switch fail and cause the gear to extend at cruise speeds or above its normal operating speed, do the following:

- A. Push the throttle to full open position and hold there until the gear has fully retracted.
- B. Turn the master switch off to hold the gear up.
- C. Reset the throttle to resume normal cruise.

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EMERGENCY PROCEDURES (Continued)

4. Air Restart

If engine loses power because of fuel starvation, select another tank containing ample fuel and actuate the auxiliary fuel pump switch to the prime position. The prime position should be used for all normal air restarts. It is recommended that the mixture control be left in the optimum position for the flight altitude and power being used. For optimum air restart, the throttle should remain well forward and the airspeed maintained approximately the same as it was prior to loss of power.

If an engine driven fuel pump failure is suspected (air restart is normal but engine does not regain full power), turn the auxiliary fuel pump switch to the PRIME or TOP position. The prime position is required in flight only if the engine-driven fuel pump fails and will supply enough fuel pressure to operate the engine at normal power. However, mixture control adjustment is necessary when reducing power or if engine operation is rough.

5. Alternate Static Source (Optional Installation)

Should ice or other foreign material obstruct the primary static tube outlets, place the alternate static source valve control in the ON or UP position. Keep this valve in the OFF or DOWN position except when the alternate static source is required. Altitude and airspeed corrections are necessary when the alternate static source position is selected. For corrections, refer to the following charts.

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ALTIMETER CORRECTION

<u>Normal Static Source</u>	<u>Alternate Static Source</u>	
	<u>Storm Window</u>	
CAS MPH	Closed Feet	Open Feet
80	-5	-70
90	-15	-90
100	-25	-100
120	-35	-120
140	-40	-140
160	-50	-150
180	-65	----

Altimeter correction should be added algebraically to the observed altitude.

AIRSPEED CALIBRATION

<u>Normal Static Source</u>	<u>Alternate Static Source</u>	
	<u>Storm Window</u>	
CAS MPH	Closed IAS-MPH	Open IAS-MPH
80	75	86
90	86	98
100	99	110
120	122	133
140	144	155
160	167	178
180	190	---

NOTE: These calibrations are not affected by the selection of heated or fresh air or by gear or flap position.

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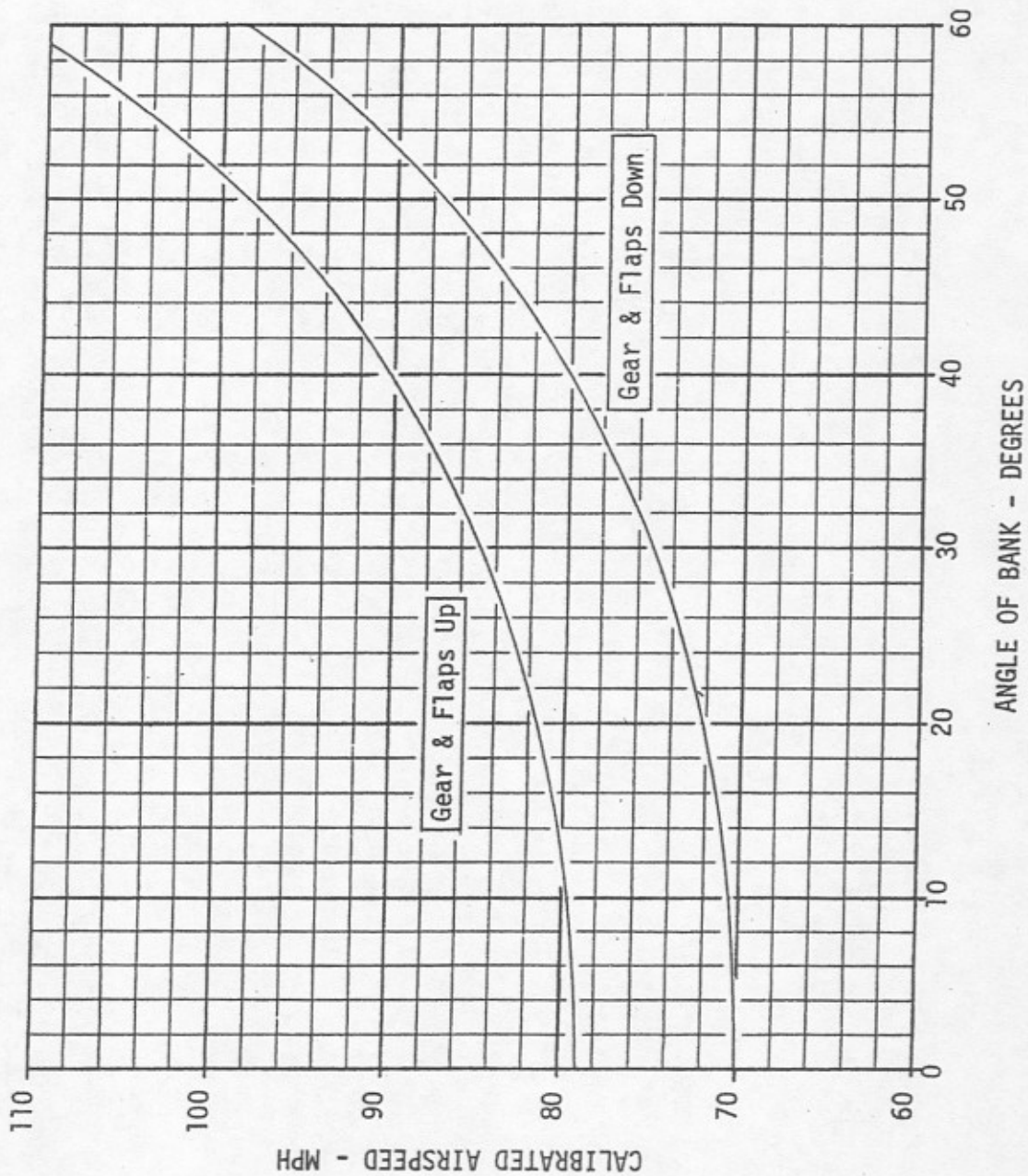
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SECTION III PERFORMANCE

A. Stall Speeds at a Gross Weight of 3325 Lbs.

FIGURE 1: STALL SPEED VS. ANGLE OF BANK

Configuration: Power Off



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B. CERTIFICATED NOISE LEVEL

The certificated noise level for the Model 17-30A at 3325 pounds maximum weight is 77.5 dB(A). No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport. This data was obtained using full throttle and 2550 RPM (maximum normal operating).

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SECTION IV WEIGHT AND BALANCE

Weight and balance data is prepared individually for each airplane.
Procedures used in this section have been approved by the F.A.A.

Maximum Weight: 3325 Lbs.

C.G. Range: (+22.0) to (+23.5) 3325 Lbs.

(+19.0) to (+24.0) 3200 Lbs.

(+16.0) to (+24.0) 2450 Lbs. or Less

Straight line variation between points.

A. LOADING INFORMATION

1. It is the responsibility of the operator to ensure the proper loading of the aircraft.
2. The ski tube is designed for items similar to skis and fishing poles. Items with a high density or over 20 pounds are prohibited in this area.
3. The moment arm labeled "ARM" in Figure 2 is as follows:
 - a. 156.4 inches--when the tube is used full length to store skis or similar items
 - b. 120.0 inches--when only the large forward area of the ski tube is used to store low density and light weight baggage or freight

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Use the following procedure to determine if your Bellanca Model 17-30A is properly loaded and will remain so during flight.

4. Determine weight of passengers, baggage and equipment stored in the ski tube. Enter in Figure 2 along with corresponding moments from Figure 3. (The moment may also be determined by the equation $MOMENT = WEIGHT \times ARM.$)
5. Determine the total weight and C.G. for the aircraft under these conditions (Figure 2). It should lie in the envelope of Figure 4.
6. Enter the amount of fuel and its corresponding moment obtained from Figure 5 into Figure 2 and determine the loaded weight and C.G. If this point is within the envelope of Figure 4, the aircraft is loaded properly.

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FIGURE 2: C.G.-WEIGHT -MOMENT TABLE

ITEMS	WEIGHT Lbs.	ARM Inches	MOMENT In.-Lbs.
Aircraft Empty (Includes Unuseable Fuel)			
Pilot and Front Passenger		20	
Rear Seat Passengers		53	
Baggage - 186 Lbs. Max.		84	
**Ski Tube - 20 Lbs. Max.			
Oil		-41	
*Subtotal - No Fuel	Total Weight	C.G.	Total Moment
Fuel-Wing Tanks (69 Gals. Useable)		29	
(If Installed) Fuel-Fuselage Auxiliary Tank (15 Gals. Useable)		72	
*Total Loaded Aircraft	Total Weight	C.G.	Total Moment

*To find C.G., divide the "MOMENT" by the "WEIGHT".

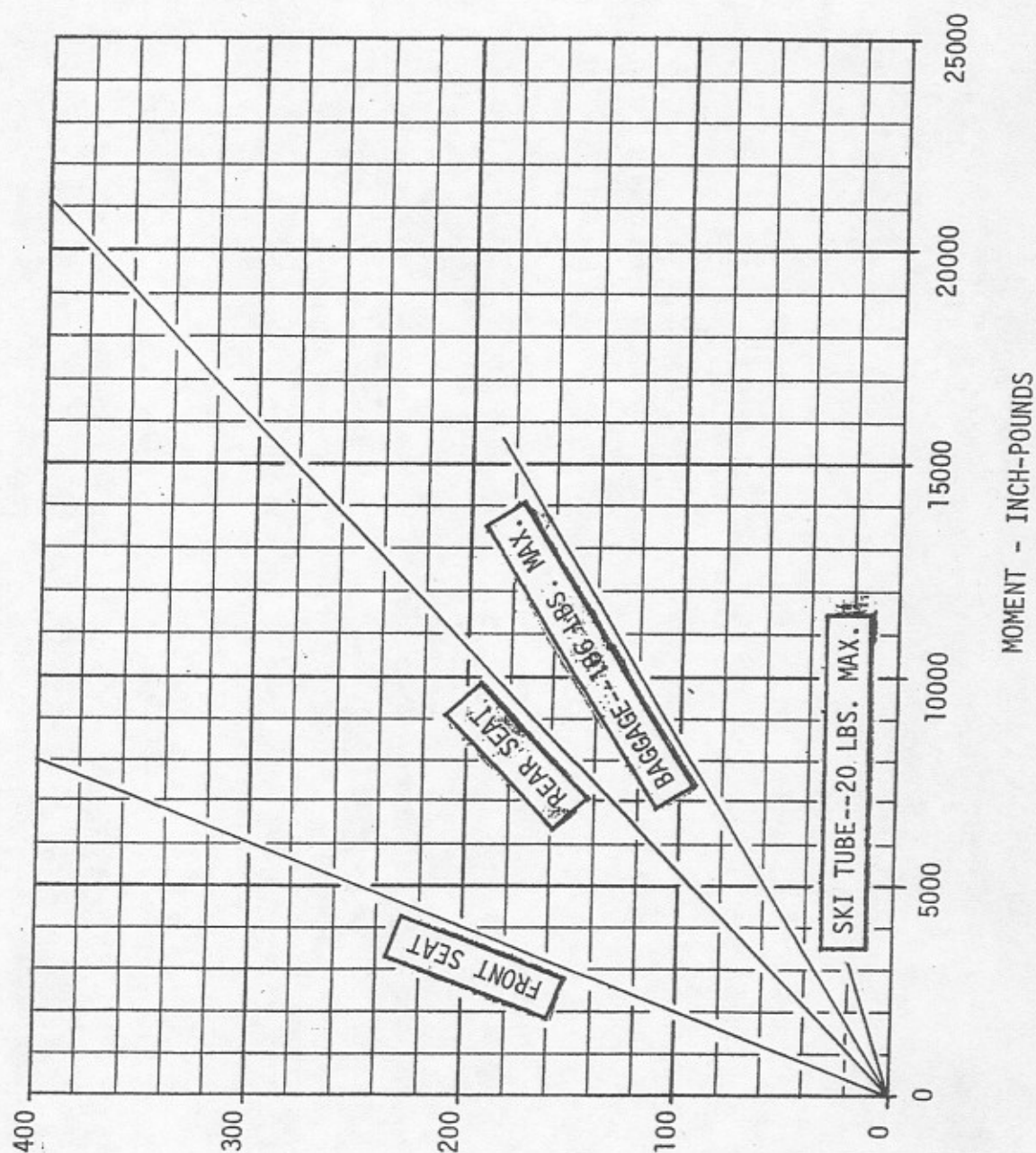
**See Section IV A. 3.

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FIGURE 3: WEIGHT VS. MOMENT



WEIGHT - POUNDS

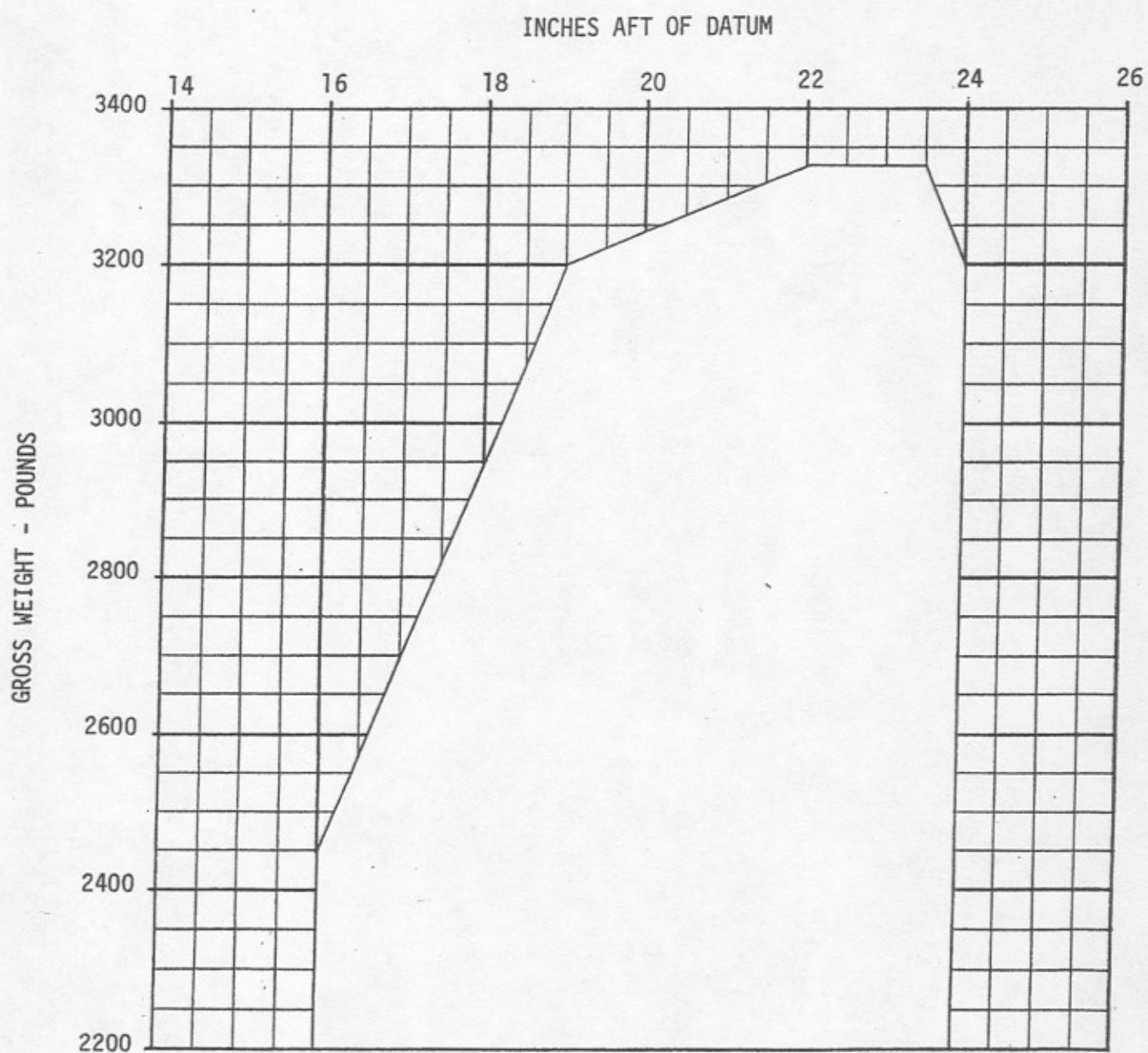
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FIGURE 4: C.G. ENVELOPE

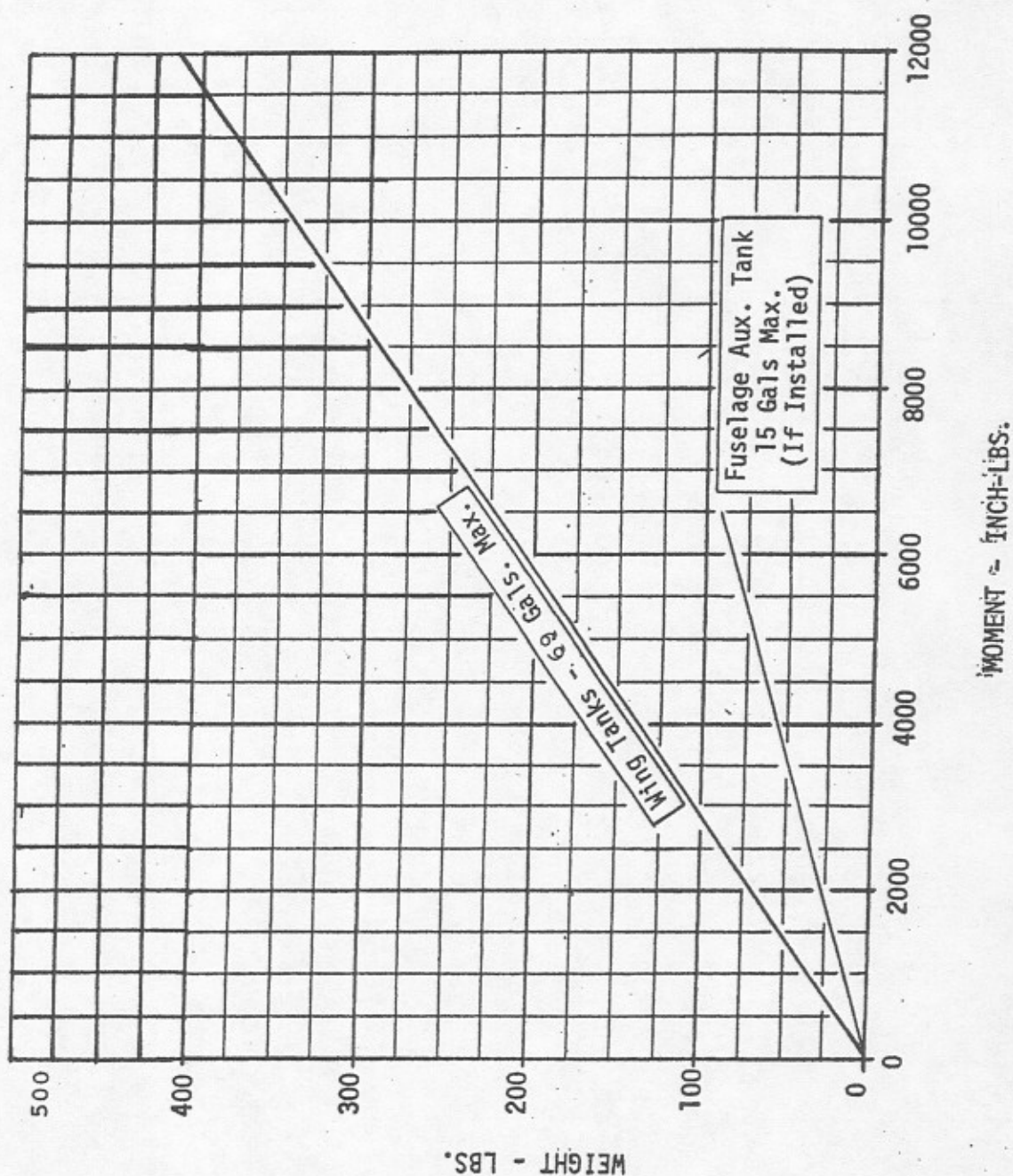


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FIGURE 5: WEIGHT VS. MOMENT



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