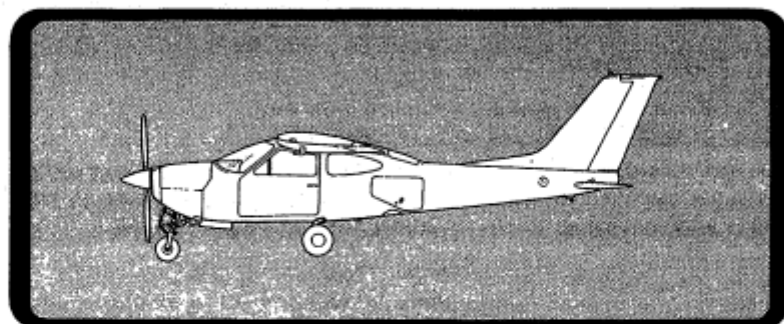


PILOT'S OPERATING HANDBOOK

Cessna.



CARDINAL RG

1976 MODEL 177RG

Serial No. _____

Registration No. _____

THIS HANDBOOK INCLUDES THE MATERIAL
REQUIRED TO BE FURNISHED TO THE PILOT
BY FAR PART 23

CESSNA AIRCRAFT COMPANY
WICHITA, KANSAS, USA

D1060-13

PERFORMANCE -
SPECIFICATIONS

CESSNA
MODEL 177RG

PERFORMANCE - SPECIFICATIONS

SPEED:

Maximum at Sea Level 156 KNOTS
Cruise, 75% Power at 7000 Ft 148 KNOTS

CRUISE: Recommended Lean Mixture with fuel allowance for
engine start, taxi, takeoff, climb and 45 minutes
reserve at 45% power.

75% Power at 7000 Ft	Range	715 NM
60 Gallons Usable Fuel	Time	4.9 HRS
Maximum Range at 10,000 Ft	Range	895 NM
60 Gallons Usable Fuel	Time	7.5 HRS

RATE OF CLIMB AT SEA LEVEL 925 FPM
SERVICE CEILING 17,100 FT

TAKEOFF PERFORMANCE:

Ground Roll 890 FT
Total Distance Over 50-Ft Obstacle 1585 FT

LANDING PERFORMANCE:

Ground Roll 730 FT
Total Distance Over 50-Ft Obstacle 1350 FT

STALL SPEED (CAS):

Flaps Up, Power Off 57 KNOTS
Flaps Down, Power Off 50 KNOTS

MAXIMUM WEIGHT 2800 LBS

STANDARD EMPTY WEIGHT:

Cardinal RG 1707 LBS
Cardinal RG II 1768 LBS

MAXIMUM USEFUL LOAD:

Cardinal RG 1093 LBS
Cardinal RG II 1032 LBS

BAGGAGE ALLOWANCE 120 LBS

WING LOADING: Pounds/Sq Ft 16.1

POWER LOADING: Pounds/HP 14.0

FUEL CAPACITY: Total 61 GAL.

OIL CAPACITY 9 QTS

ENGINE: Avco Lycoming IO-360-A1B6I
200 BHP at 2700 RPM

PROPELLER: Constant Speed, Diameter 78 IN.

CENTER OF GRAVITY LIMITS

Center of Gravity Range with Landing Gear Extended:

Forward: 101.0 inches aft of datum at 2200 lbs. or less, with straight line variation to 105.8 inches aft of datum at 2800 lbs.

Aft: 114.7 inches aft of datum at all weights.

Moment Change Due To Retracting Landing Gear: +2776 lb. -ins.

Reference Datum: 54.0 inches forward of the front face of the lower portion of the firewall.

MANEUVER LIMITS

This airplane is certificated in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and steep turns in which the angle of bank is not more than 60°.

Aerobatic maneuvers, including spins, are not approved.

FLIGHT LOAD FACTOR LIMITS

Flight Load Factors

*Flaps Up: +3.8g, -1.52g

*Flaps Down: +2.0g

*The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

KINDS OF OPERATION LIMITS

The airplane is equipped for day VFR and may be equipped for night VFR and/or IFR operations. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The reference to types of flight operations on the operating limitations placard reflects equipment installed at the time of Airworthiness Certificate issuance.

Flight into known icing conditions is prohibited.

SECTION 2
LIMITATIONS

CESSNA
MODEL 177RG

FUEL LIMITATIONS

- 2 Standard Tanks: 30.5 U.S. gallons each
Total Fuel: 61 U.S. gallons
Usable Fuel (all flight conditions): 60 U.S. gallons
Unusable Fuel: 1 U.S. gallon

NOTE

Use both tanks for takeoff and landing.

NOTE

To ensure desired fuel capacity when refueling, place the fuel selector valve in either LEFT or RIGHT position to prevent cross-feeding.

Fuel Grade (and Color): 100/130 Minimum Grade Aviation Fuel (green).
100/130 low lead aviation fuel (blue) with a lead content limited to 2 cc per gallon is also approved.

PLACARDS

The following information is displayed in the form of composite or individual placards.

- (1) In full view of the pilot: (The "DAY-NIGHT-VFR-IFR" entry, shown on the example below, will vary as the airplane is equipped.)

This airplane must be operated as a normal category airplane in compliance with the operating limitations as stated in the form of placards, markings, and manuals.

MAXIMUMS

MANEUVERING SPEED (IAS)	113 knots
GEAR EXTENSION SPEED (IAS)	125 knots
GROSS WEIGHT	2800 lbs.
FLIGHT LOAD FACTOR	Flaps Up . . +3.8, -1.52
	Flaps Down . . +2.0

No acrobatic maneuvers, including spins, approved.
Altitude loss in a stall recovery - 190 ft. Flight into known icing conditions prohibited. This airplane is certified for the following flight operations as of date of original airworthiness certificate:

DAY - NIGHT - VFR - IFR

INTRODUCTION

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with Optional Systems can be found in Section 9.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 2800 pounds and may be used for any lesser weight. However, to achieve the performance specified in Section 5 for takeoff distance, the speed appropriate to the particular weight must be used.

Takeoff:

Normal Climb Out	65-75 KIAS
Maximum Performance Takeoff, Speed at 50 Feet . . .	62 KIAS

Enroute Climb, Flaps and Gear Up:

Normal	85-100 KIAS
Best Rate of Climb, Sea Level	82 KIAS
Best Rate of Climb, 10,000 Feet	79 KIAS
Best Angle of Climb, Sea Level	67 KIAS
Best Angle of Climb, 10,000 Feet	73 KIAS

Landing Approach:

Normal Approach, Flaps Up	70-80 KIAS
Normal Approach, Flaps 30°	60-70 KIAS
Short Field Approach, Flaps 30°	63 KIAS

Balked Landing:

During Transition to Maximum Power, Flaps 20° . . .	65 KIAS
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Maximum Recommended Turbulent Air Penetration Speed:

2800 Lbs	113 KIAS
2400 Lbs	105 KIAS
2000 Lbs	96 KIAS

Maximum Demonstrated Crosswind Velocity:

Takeoff or Landing	16 KNOTS
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SECTION 4
NORMAL PROCEDURES

CESSNA
MODEL 177RG

- b. Propeller -- CYCLE from high to low RPM; return to high RPM.
- c. Engine Instruments and Ammeter -- CHECK.
- d. Suction Gage -- CHECK.
- (7) Flight Instruments and Radios -- SET.
- (8) Navigation Lights, Flashing Beacon and Strobe (if installed) Lights -- ON (as required).
- (9) Throttle Friction Lock -- ADJUST.
- (10) Wing Flaps -- 0°-10°.

TAKEOFF

NORMAL TAKEOFF

- (1) Wing Flaps -- 0°-10° (10° preferred).
- (2) Power -- FULL THROTTLE and 2700 RPM.
- (3) Mixture -- RICH (lean for field elevation per fuel flow placard above 3000 feet).
- (4) Stabilator Control -- LIFT NOSE WHEEL at 55 KIAS.
- (5) Climb Speed -- 65-75 KIAS.
- (6) Brakes -- APPLY momentarily when airborne.
- (7) Landing Gear -- RETRACT in climb out.
- (8) Wing Flaps -- RETRACT (if extended).

MAXIMUM PERFORMANCE TAKEOFF

- (1) Wing Flaps -- 10°.
- (2) Brakes -- APPLY.
- (3) Power -- FULL THROTTLE and 2700 RPM.
- (4) Mixture -- RICH (lean for field elevation per fuel flow placard above 3000 feet).
- (5) Brakes -- RELEASE.
- (6) Stabilator Control -- LIFT NOSE WHEEL at 50 KIAS.
- (7) Climb Speed -- 62 KIAS until all obstacles are cleared.
- (8) Brakes -- APPLY momentarily when airborne.
- (9) Landing Gear -- RETRACT after obstacles are cleared.
- (10) Wing Flaps -- RETRACT after reaching 70 KIAS.

NOTE

Do not reduce power until landing gear and wing flaps have been retracted.

ENROUTE CLIMB

NORMAL CLIMB

- (1) Airspeed -- 85-100 KIAS.
- (2) Power -- 25 INCHES Hg or FULL THROTTLE and 2500 RPM.
- (3) Mixture -- LEANED to 13 GAL/HR (with full throttle, lean 2 GPH less than maximum power mixture placard).
- (4) Cowl Flaps -- OPEN as required.

MAXIMUM PERFORMANCE CLIMB

- (1) Airspeed -- 82 KIAS at sea level to 79 KIAS at 10,000 feet.
- (2) Power -- FULL THROTTLE and 2700 RPM.
- (3) Mixture -- LEAN per fuel flow placard.
- (4) Cowl Flaps -- FULL OPEN.

CRUISE

- (1) Power -- 15-25 INCHES Hg, 2100 - 2500 RPM (no more than 75%).
- (2) Mixture -- LEAN per Cessna Power Computer or data on page 4-17.
- (3) Cowl Flaps -- CLOSED.

DESCENT

- (1) Power -- AS DESIRED.

NOTE

Avoid continuous operation between 1400 and 1750 RPM with less than 10 inches Hg.

- (2) Mixture -- ADJUST for smooth operation.
- (3) Cowl Flaps -- CLOSED.
- (4) Wing Flaps -- AS DESIRED (0°-10° below 130 KIAS, 10°-30° below 95 KIAS).
- (5) Landing Gear -- AS DESIRED (do not extend above 125 KIAS).

TAKEOFF

POWER CHECK

It is important to check full-throttle engine operation early in the takeoff run. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff.

The auxiliary fuel pump is normally off during takeoffs. However, if there is evidence of fuel vapor, as indicated by fluctuation of the fuel flow indicator needle, or rough engine operation, the pump should be turned on. It is not necessary to readjust the mixture control when operating with the auxiliary fuel pump turned on because the mixture is only slightly enriched.

Full-throttle runups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be corrected immediately as described in Section 8 under Propeller Care.

Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned in accordance with the maximum power fuel flow placard located on the instrument panel control pedestal.

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed throttle setting.

WING FLAP SETTINGS

Takeoffs are accomplished with the wing flaps set in the 0° to 10° position. The preferred flap setting for normal takeoff is 10°. This flap setting (in comparison to flaps up) produces an approximate 15% shorter ground run and total takeoff distance over an obstacle. In addition, it provides easier lift-off and increased visibility over the nose in the initial climb-out.

Flap settings greater than 10° are not approved for takeoff.

LANDING GEAR RETRACTION

Since the landing gear swings downward approximately one foot as it starts the retraction cycle, retraction should be avoided until well clear of the runway and after a positive climb is established. This is especially important when attempting a short field takeoff, where a premature lift-off might result in the airplane settling back onto the ground. On long runways the landing gear retraction can be delayed until reaching the point over the runway where a wheels-down forced landing on that runway would be impractical.

Before retracting the landing gear, the brakes should be applied momentarily to stop wheel rotation. Centrifugal force caused by the rapidly spinning wheel expands the diameter of the tire. If there is an accumulation of mud or ice in the wheel wells, the rotating wheel may rub as it is retracted into the wheel well.

CROSSWIND TAKEOFF

Takeoffs into strong crosswinds normally are performed with the minimum flap setting necessary for the field length to minimize the drift angle immediately after takeoff. The airplane is accelerated to a speed slightly higher than normal, and then pulled off abruptly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

ENROUTE CLIMB

Normal climbs are performed with landing gear and flaps retracted at airspeeds 5 to 15 knots higher than best rate-of-climb speed, and with reduced power (down to 25 inches of manifold pressure and 2500 RPM) for an optimum combination of performance, visibility and increased passenger comfort due to lower noise level. The mixture may be left full rich as long as the engine is smooth. However, for optimum power and climb economy with 25 inches of manifold pressure and 2500 RPM, set the mixture to 13 GPH. With full throttle and 2500 RPM, set the mixture to 2 GPH less than shown in the maximum power mixture placard.

Best rate of climb is achieved with full throttle and 2700 RPM with the mixture leaned for altitude in accordance with the maximum power fuel flow placard.

If an enroute obstacle dictates the use of a steep climb angle, the best angle of climb speed should be used with landing gear and flaps retracted and maximum power.

AIRSPPEED CALIBRATION **NORMAL STATIC SOURCE**

FLAPS UP												
KIAS	---	60	70	80	90	100	110	120	130	140	150	
KCAS	---	62	71	81	91	100	110	119	128	137	147	
FLAPS 10°												
KIAS	50	60	70	80	90	100	110	120	130	---	---	
KCAS	52	62	71	81	91	100	110	119	129	---	---	
FLAPS 30°												
KIAS	40	50	60	70	80	90	95	---	---	---	---	
KCAS	43	52	62	72	81	90	95	---	---	---	---	

Figure 5-1. Airspeed Calibration (Sheet 1 of 2)

STALL SPEEDS

CONDITIONS:
Power Off
Gear Up or Down

NOTES:

1. Maximum altitude loss during a stall recovery is approximately 190 feet.
2. KIAS values are approximate.

MOST REARWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2800	UP	55	57	59	61	65	68	78	81
	10°	51	53	55	57	61	63	72	75
	30°	48	50	52	54	57	59	68	71

MOST FORWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2800	UP	59	61	63	66	70	73	83	86
	10°	55	57	59	61	65	68	78	81
	30°	50	52	54	56	59	62	71	74

Figure 5-3. Stall Speeds

SAMPLE LOADING PROBLEM	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (lb.-ins. /1000)	Weight (lbs.)	Moment (lb.-ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	1774	184.5		
2. Usable Fuel (At 6 Lbs./Gal.) Standard Tanks (60 Gal. Maximum) Reduced Fuel (43 Gal.)	258	28.7		
3. Pilot and Front Passenger (Station 90 to 97)	340	32.0		
4. Rear Passengers	340	45.6		
5. Baggage-Area A (on and forward of wheel well) - Sta. 145 to 172				
6. Baggage-Area B (aft of wheel well) and Hatshelf - Sta. 172 to 195	88	15.8		
7. TOTAL WEIGHT AND MOMENT	2800	306.6		
8. Locate this point (2800 at 306.6) on the Center of Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable.				

Figure 6-5. Sample Loading Problem

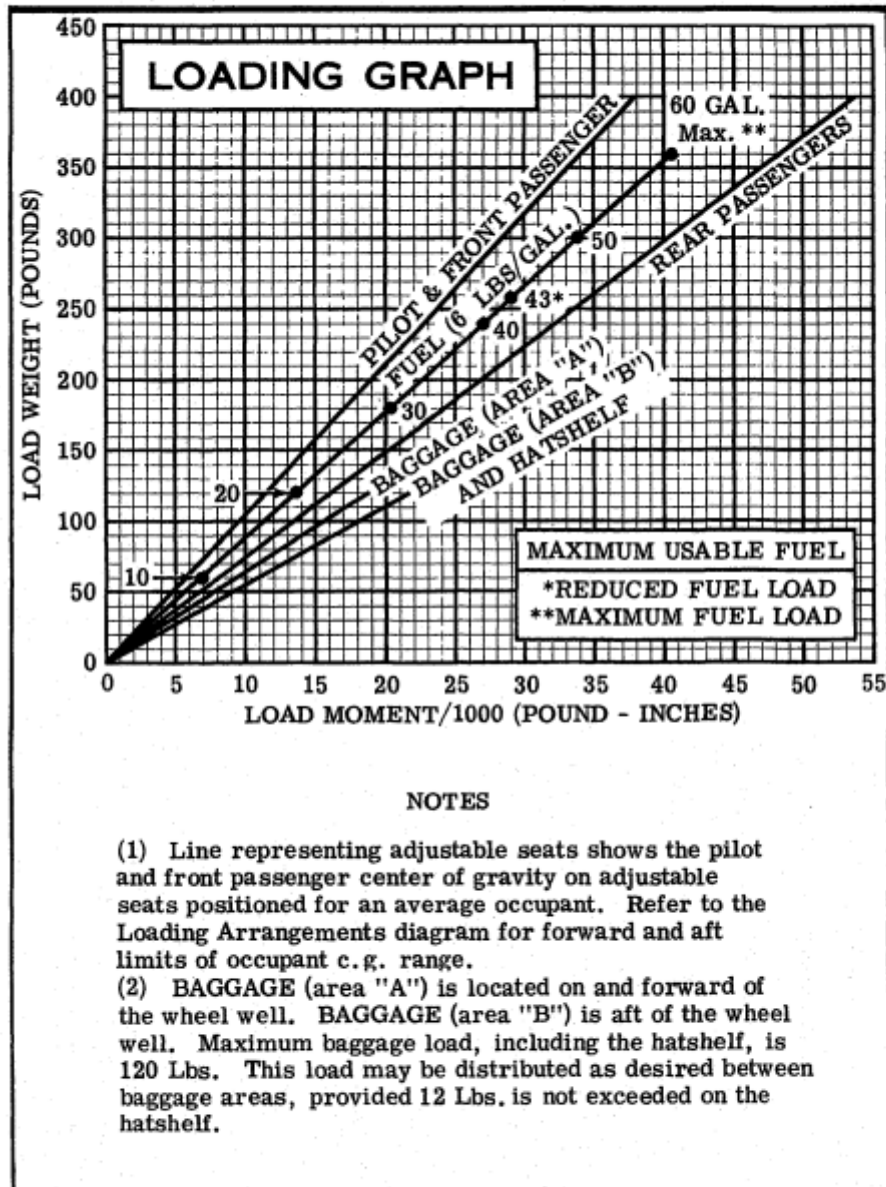


Figure 6-6. Loading Graph

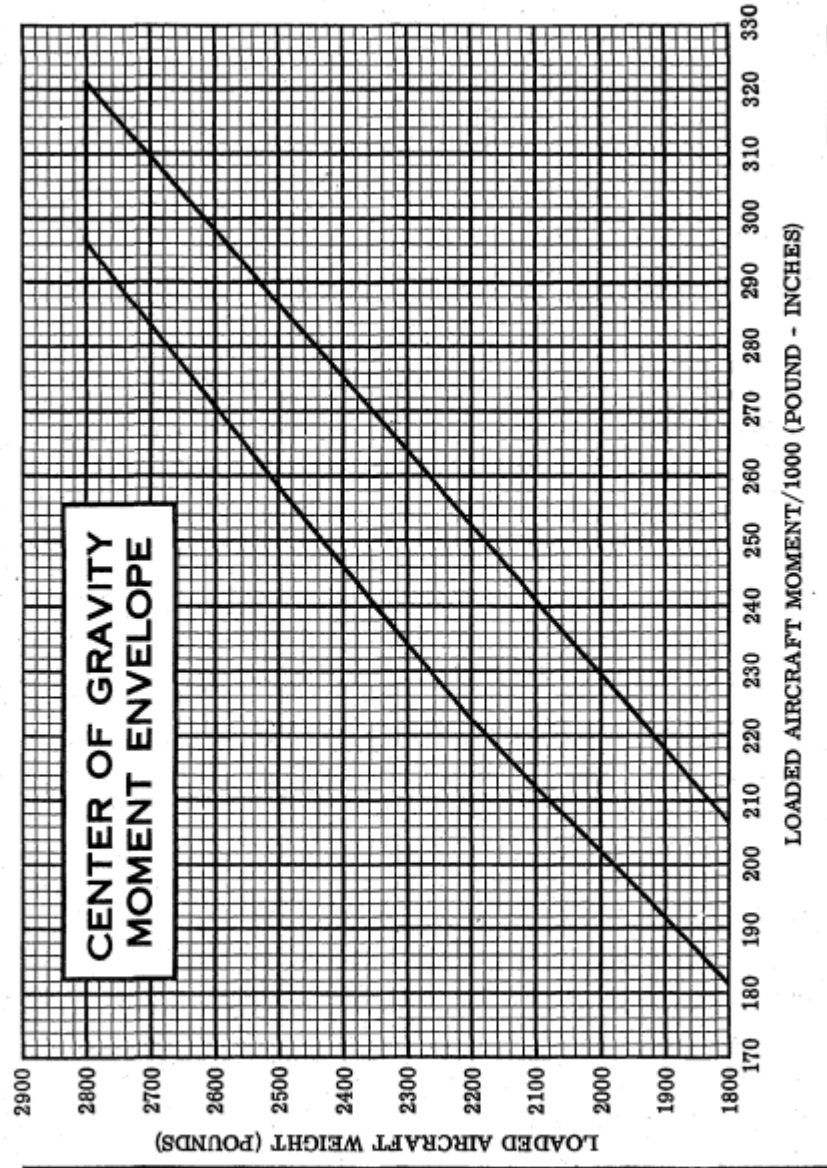


Figure 6-7. Center of Gravity Moment Envelope

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL 177RG

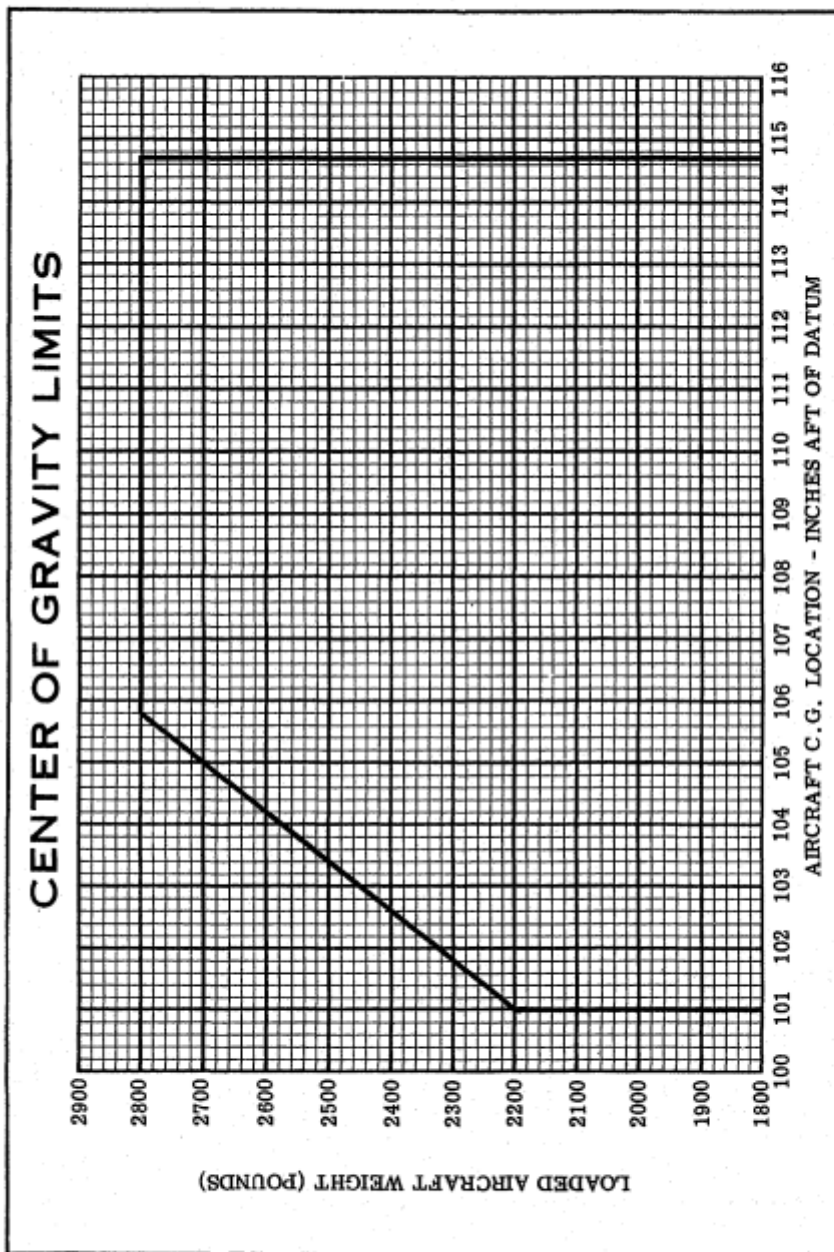


Figure 6-8. Center of Gravity Limits