

## SECTION I LIMITATIONS

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## LIMITATIONS

### POWER PLANT

Engine:

Two Continental GTSIO-520-F

Engine Operation Limitations:

#### Maximum Power For All Operations

BHP	Engine RPM	Manifold Pressure
435	3400	44.5" Hg. *

#### \* MAXIMUM ALLOWABLE MANIFOLD PRESSURE

Altitude	Manifold Pressure	Altitude	Manifold Pressure
Sea Level to 17,000 Ft	44.5" Hg	22,000 Ft	39.8" Hg
19,000 Ft	44.1" Hg	23,000 Ft	37.8" Hg
20,000 Ft	43.8" Hg	24,000 Ft	35.8" Hg
21,000 Ft	41.8" Hg	25,000 Ft	33.9" Hg

Oil Temperature:                      Maximum                      240°F

Oil Pressure:                      Minimum (idling)                      10 PSI  
    Maximum (cold oil)                      100 PSI

Cylinder Head Temperature:                      Maximum                      460°F

Fuel:                      100/130 (Minimum) Octane Aviation Gasoline - usable capacity standard tanks - 256 gallons. Usable capacity optional tanks - 322 gallons.

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Oil Grade:                   Above 40°F Ambient Air (S. L.) - SAE 50  
                              Below 40°F Ambient Air (S. L.) - SAE 30 or 10W-30

Cowl Flaps - should be open for takeoff and all ground operations. Do not open cowl flaps above 224 Kts CAS.

Annunciator Lights - Illuminate when cowl flaps are full open.

**PROPELLERS**

Two Hartzell propellers with C8475+2 or FC8475+2 blades and hub model HC-H3YN-2 or HC-H3YN-2F are installed. The propellers are 3-blade, full feathering, constant speed.

**INSTRUMENT MARKINGS**

See Figure 1-1.

**AIRSPEED LIMITATIONS**

All airspeeds are given in Knots, Calibrated Airspeed (KCAS)

Never Exceed Speed ( $V_{NE}/M_{NE}$ )	252 KCAS .55 Mach
Maximum Structural Cruising Speed ( $V_{NO}/M_{NO}$ )	224 KCAS .49 Mach
Maneuvering Speed ( $V_A$ )	136 KCAS
Flap Operation - Full Flaps 40° ( $V_F$ )	130 KCAS
- Half Flaps 20°	156 KCAS
Landing Gear Operation ( $V_{LO}$ )	200 KCAS
Landing Light Extension	156 KCAS
Minimum Control Speed ( $V_{MC}$ )	77 KCAS

**NOTE**

To prevent exceeding the Mach limitations, the following schedule must be observed:  
Never exceed Speed: 252 Kts S. L. to 20,400 Ft. Decrease by 5 Kts for every 1000 ft above 20,400 feet.  
Maximum structural cruising speed: 224 Kts S. L. to 20,200 Ft. Decrease by 4.5 Kts for every 1000 feet above 20,200 feet.

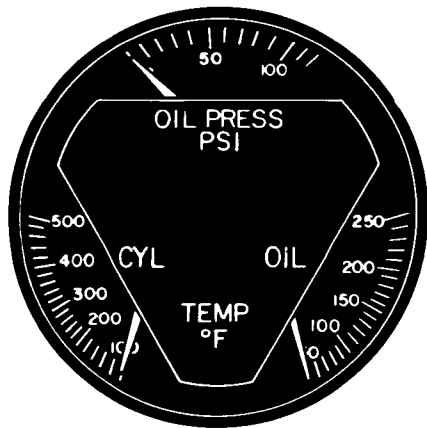
**FLIGHT LOAD FACTORS**

Maximum - Flaps UP	Positive 3.36 G's	Negative 1.35 G's
Maximum - Flaps DOWN	Positive 2.00 G's	Negative 0.00 G's

**WEIGHT AND CENTER OF GRAVITY**

See Weight and Balance Section for Loading Schedule. (See Figure 1-2 for Flight Envelope.)

Maximum Weights -	Ramp	9050 lbs
-	Takeoff	9000 lbs
-	Landing	9000 lbs



## ENGINE GAGE UNIT

### OIL TEMPERATURE

75 - 240°F	Green Arc	NORMAL
240°F	Red Line	MAXIMUM

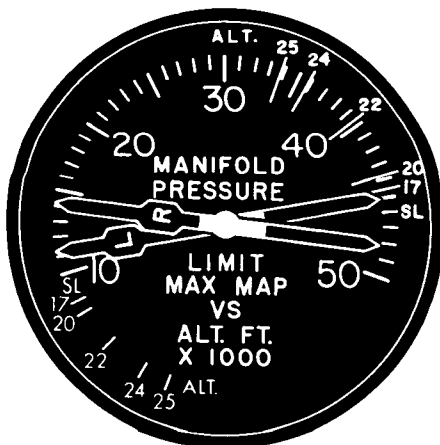
### OIL PRESSURE

10 PSI	Red Line	MINIMUM
10 - 30 PSI LO	Yellow Arc	CAUTION
30 - 60 PSI	Green Arc	NORMAL
60 - 100 PSI HI	Yellow Arc	CAUTION
100 PSI	Red Line	MAXIMUM

### CYLINDER HEAD TEMPERATURE

225 - 460°F	Green Arc	NORMAL
460°F	Red Line	MAXIMUM

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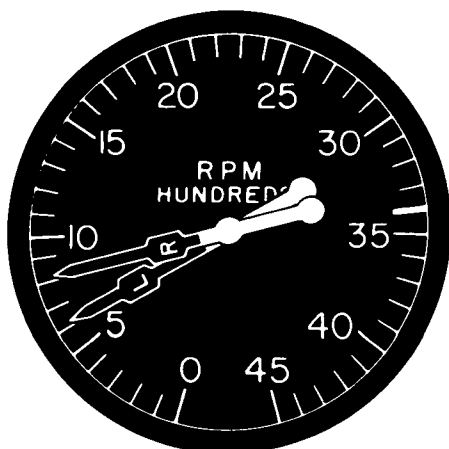
## MANIFOLD PRESSURE

15 - 33.9 IN. Hg	Green Line	NORMAL
33.9 - 44.5 IN. Hg	Yellow Arc	CAUTION
44.5 IN. Hg	Red Line	MAXIMUM

### MAXIMUM MAP VS ALTITUDE

44.5 IN. Hg at S. L. to 17,000 Ft	
43.8 IN. Hg at 20,000 Ft	
39.8 IN. Hg at 22,000 Ft	
35.8 IN. Hg at 24,000 Ft	
33.9 IN. Hg at 25,000 Ft	

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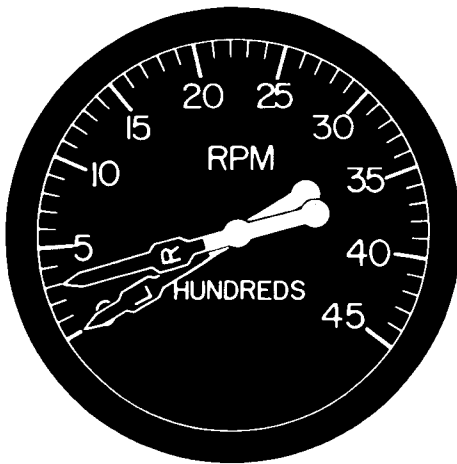


## ENGINE TACHOMETER

2000 - 3400 RPM	Green Arc	NORMAL
3400 RPM	Red Line	MAXIMUM

Effective Serial No's 12000 thru 12007

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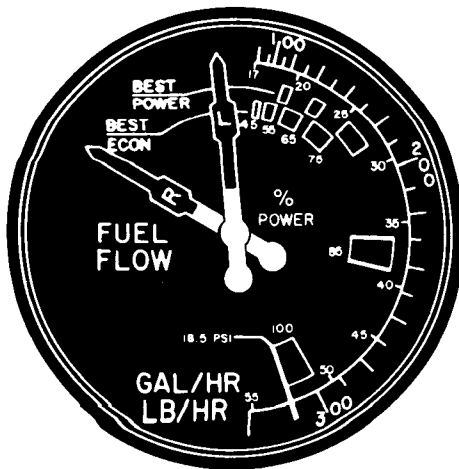


### ENGINE TACHOMETER

2000 - 3400 RPM	Green Arc	NORMAL
3400 RPM	Red Line	MAXIMUM

Effective Serial No's 12008 & Subs

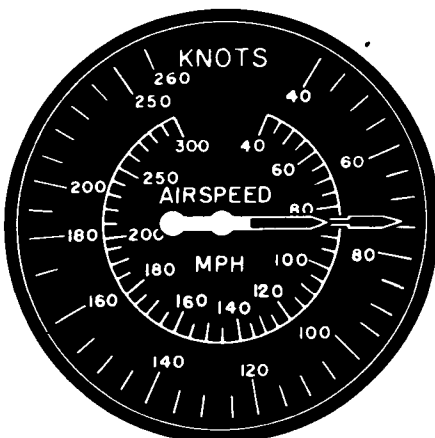
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### FUEL FLOW

80.0 - 310.0 PPH	Green Arc	NORMAL
310.0 PPH	Red Line	MAXIMUM

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### AIRSPEED

77 Knots (CAS)	Red Line	MIN S.E. CONT. SPEED
75-130 Knots (CAS)	White Arc	FLAP OPER RANGE
113 Knots (CAS)	Blue Line	BEST R.O.C. (SE)
81-224 Knots (CAS)	Green Arc	NORMAL RANGE
224-252 Knots (CAS)	Yellow Arc	CAUTION (Operations should be conducted with Caution and only in smooth air)
252 Knots (CAS)	Red Line	MAX OPER

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### ALTITUDE & DIFFERENTIAL PRESSURE

0 - 4.0 PSI  
4.0 - 4.2 PSI  
4.2 PSI

Green Arc  
Yellow Arc  
Red Line

NORMAL  
CAUTION  
MAXIMUM

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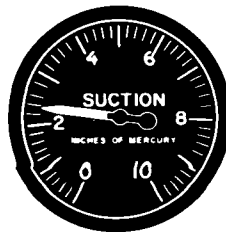
### HYDRAULIC PRESSURE

1250 PSI

Red Line

MAXIMUM

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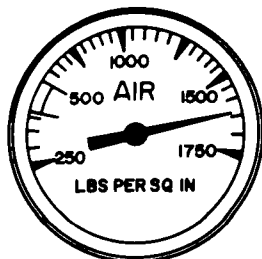
### VACUUM

3.8 IN. Hg  
3.8 - 5.0 IN. Hg  
5.0 IN. Hg

Red Line  
Green Arc  
Red Line

MINIMUM  
NORMAL  
MAXIMUM

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### EMERGENCY GEAR EXTENSION

425 PSI  
425 - 525 PSI  
525 PSI

Red Line  
Green Arc  
Red Line

MINIMUM  
NORMAL  
MAXIMUM

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C. G. Limits - Limits are given for landing gear down. Datum location is 196 inches forward of the wing leading edge and 50 inches forward of fuselage station zero.

Forward Limits:	208.67 inches aft of datum (17.0% MAC) at 9000 lbs 203.45 inches aft of datum (10.0% MAC) at 7500 lbs 203.45 inches aft of datum (10.0% MAC) at 5850 lbs Straight line variation between points.
Aft Limits:	216.88 inches aft of datum (28.0% MAC) at 9000 lbs 216.18 inches aft of datum (27.1% MAC) at 5850 lbs Variation between points: Inches aft of datum = 218.15 - (11,653/Weight).

**MANEUVERS**

This airplane must be operated as a normal category airplane. Acrobatic maneuvers, including spins, are unauthorized.

Up to 660 feet altitude loss may occur during recovery from full stall.

**ALTITUDE LIMITATIONS**

Maximum approved altitude is 25,000 feet MSL.

**CABIN PRESSURIZATION**

Maximum approved cabin differential pressure is 4.2 psi. Pressurization is prohibited during takeoff or landing.

**PLACARDS**

A. Located adjacent to pilots side window:

THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY TYPE IN COMPLIANCE WITH THE AIRPLANE FLIGHT MANUAL. ACROBATICS AND INTENTIONAL SPINS ARE PROHIBITED.

SHUTOFF LEFT ENGINE WHEN ENTERING AND LEAVING CABIN

AUTOPILOT MUST BE OPERATED IN ACCORDANCE WITH APPROVED FLIGHT MANUAL

THIS AIRPLANE NOT FULLY EQUIPPED FOR FLIGHT INTO KNOWN ICING

CAUTION - DO NOT SMOKE OR IGNITE FLAME WITH OXYGEN SYSTEM IN USE.

MAX GEAR EXTENDED: 200 KNOTS (230 MPH)

MIN. CONTROL ONE ENGINE: 77 KNOTS (89 MPH)

MAX. FULL MANEUVERING: 136 KNOTS (156 MPH)

NEVER EXCEED: 252 KNOTS (290 MPH), S. L. TO 20400 FT. DECREASE BY 5 KNOTS (6 MPH) FOR EVERY 1000 FT ABOVE 20400 FT.

MAX STRUCTURAL CRUISE: 224 KNOTS (258 MPH), S. L. TO 20200 FT. DECREASE BY 4.5 KNOTS (5 MPH) FOR EVERY 1000 FT ABOVE 20200 FT.

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- B. Located adjacent to appropriate switch:
- DEICER TO BE OFF DURING TAKEOFF AND LANDING.
- PITOT AND FUEL VENT HEAT - GND CHECK 30 SEC. MAX.
- RUDDER SLOT HEATER - GND CHECK 5 SEC. MAX.
- DO NOT EXTEND LANDING LIGHT ABOVE 156 KNOTS
- RELEASE SWITCH IF STARTER DOES NOT ENGAGE IMMEDIATELY.
- C. Located on the environmental control panel:
- PRESSURIZATION NOT PERMITTED DURING TAKEOFF AND LANDING.
- D. Located near pilots airspeed indicator:
- SEE PLACARD FOR AIRSPEED LIMITS
- E. Located on the lower quadrant, adjacent the cowl flap switches:
- DO NOT OPEN COWL FLAPS ABOVE 224 KNOTS

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AIRCRAFT OPERATION LIMITATION  
APPROVED GROSS WEIGHT-CENTER OF GRAVITY ENVELOPE.

OPERATION OF THE AIRCRAFT  
OUTSIDE THE ENVELOPE BELOW IS PROHIBITED.

ENVELOPE MUST BE OBSERVED WITH LANDING GEAR EXTENDED.  
ALLOWANCE FOR LANDING GEAR RETRACTION IS AUTOMATIC.

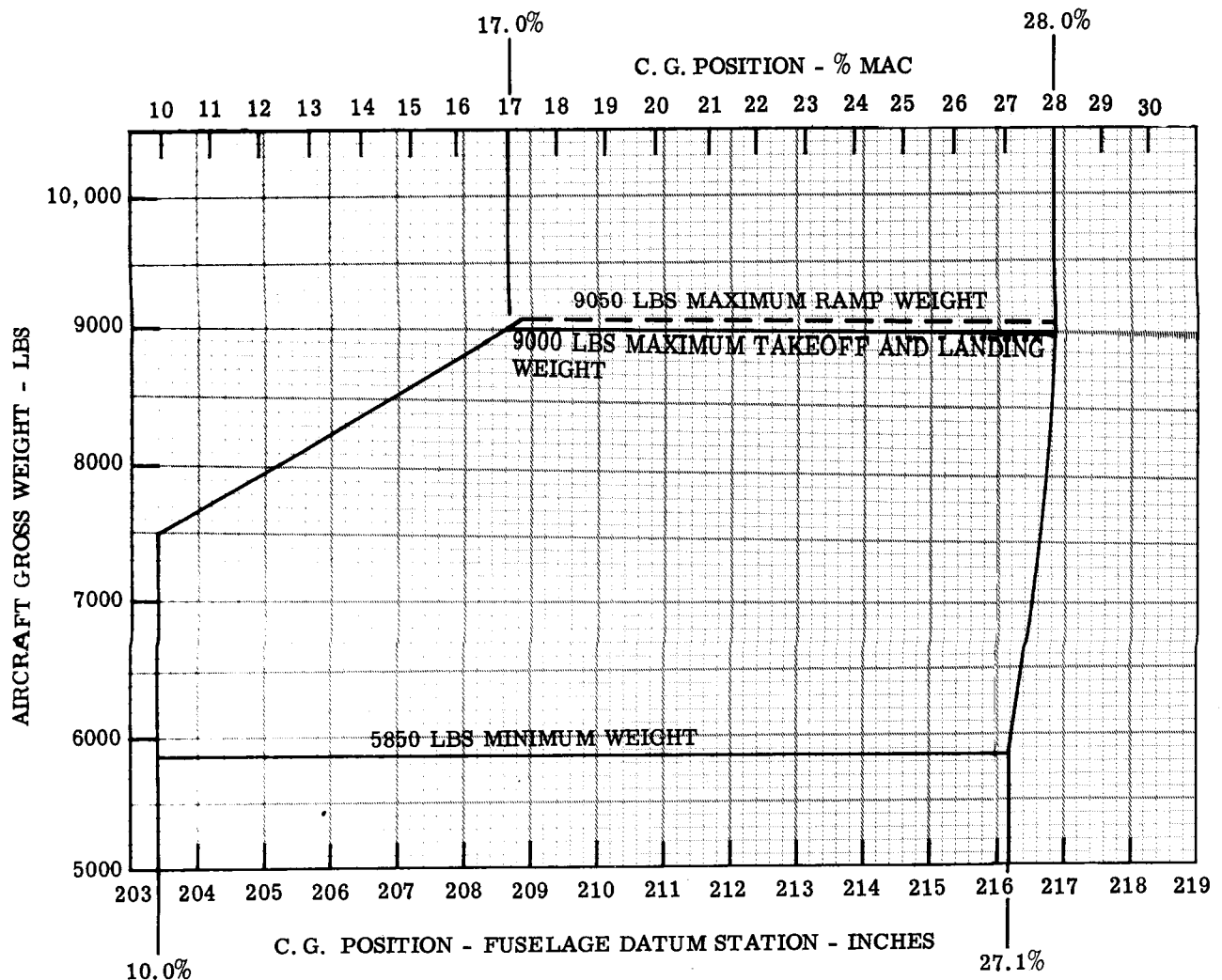


Figure 1-2. Flight Envelope