

FUEL 6 LBS/GAL.
80 - RED .5 ML LEAD
100 LL - BLUE 2. ML LEAD
100 - GREEN 3. ML LEAD

80 or 100 LL - O.K. (LYCOMING JUN 81 #38)

OIL 7.5 LBS/GAL BELLANCA AIRCRAFT CORPORATION

Osceola, Wisconsin
Alexandria, Minnesota

FAA APPROVED

AIRPLANE FLIGHT MANUAL

BELLANCA MODEL 8KCAB

WITH LYCOMING ENGINE AEIO-320-E1B (150 HP CONSTANT SPEED)

OR LYCOMING ENGINE AEIO-320-E2B (150 HP FIXED PITCH)

REGISTRATION NUMBER N2804Z

SERIAL NUMBER 371-78

THIS MANUAL IS PART OF THE REQUIRED EQUIPMENT AND MUST REMAIN
IN THE AIRPLANE AT ALL TIMES.

APPROVED

Keith D. Anderson

Keith D. Anderson, Chief
Engineering and Manufacturing Branch
FAA Great Lakes Region

DATE: 8-16-77

RECORD OF REVISIONS

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

*For Chief, Engineering and Manufacturing Branch, Great Lakes Region, FAA

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1. LIMITATIONS: COMPLIANCE WITH THIS SECTION IS MANDATORY

1.1 NORMAL CATEGORY LIMITATIONS

1.1.1 AIRSPPEED LIMITATIONS

Speed Designation	Calibrated Airspeed		Airspeed Indicator Marking
	MPH	Knots	
Maneuvering (V_A) (Gross Weight)	121	105	None
Normal Operating Range	54-160	47-139	Green Arc
Maximum Structural Cruising (V_{NO})	160	139	-----
Caution Range	160-180	139-156	Yellow Arc
Never Exceed (V_{NE})	180	156	Red Radial Line

GREEN ARC extends from power-off stall speed (V_{S1}) to maximum structural cruising speed (V_{NO}).

YELLOW ARC extends from maximum structural cruising speed to never-exceed speed (V_{NE}). Operate in this range with caution and only in smooth air.

RED RADIAL LINE marks the never-exceed speed, which is the maximum safe airspeed.

1.1.2 POWERPLANT LIMITATIONS

ENGINE: Lycoming AEIO-320-E1B Constant Speed Propeller

ENGINE: Lycoming AEIO-320-E2B Fixed Pitch Propeller

ENGINE LIMITS: For all operations, 2700 RPM (150 HP)

FUEL: 80/87 Minimum Grade Aviation Gasoline

PROPELLER: Hartzell Constant Speed Model HC-C2YL-4/C7663-4 or HC-C2YL-4F/FC7663-4 or HC-C2YL-4BF/FC7663-4

Diameter Limits 72" to 70"

Pitch Settings at 30 in. Sta. Low 11° High 20°

PROPELLER: Sensenich Fixed Pitch Model 74DM6S8

Diameter Limits 74" to 73"

Approved Pitch Range 56" thru 60"

POWERPLANT INSTRUMENT MARKINGS

Instrument	Markings
Cylinder Head Temperature	Green Arc 90-500° F Red Radial 500° F
Fuel Pressure	Green Arc 12-45 psi Red Radial 12 and 45 psi

POWERPLANT INSTRUMENT MARKINGS (Continued)

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Instrument	Markings
Oil Temperature	Green Arc 100-245° F Red Radial 245° F
Oil Pressure	Green Arc 60-100 psi Yellow Arc 25- 60 psi Red Radial 25 psi & 100 psi
Tachometer	Green Arc 500-2700 RPM Red Radial 2700 RPM

1.1.3 WEIGHT AND BALANCE

Maximum Gross Weight: 1800 Lbs.

Center-Of-Gravity Limits: (+13.5) to (+21.0) at 1800 Lbs.
(+11.5) to (+21.0) at 1550 Lbs. or less

Straight line variation between points
given.

DATUM: Wing Leading Edge

Each operator must assure that the airplane is properly loaded. See
Section 4.0, Weight and Balance Procedures.

1.1.4 FLIGHT LOAD FACTORS

Maneuvering Load Factors

Positive: +5 G
Negative: -3 G

Gust load factors are less than maneuvering load factors. Maximum load
factors for Normal Category operation are shown by the ends of the green
arc on the accelerometer. Load factors within the yellow arc range are
permitted only in Acrobatic Category.

1.1.5 KINDS OF OPERATION

Only VFR, day [or night]* operations are approved. Flight into known
icing conditions is prohibited.

1.1.6 UNUSEABLE FUEL

Any fuel remaining in the tanks when fuel gauge reads "0" (Empty)
cannot safely be used in flight.

*VFR night operation with optional strobe anticollision lights only
(Fixed Pitch).

1.1.7 PLACARDS

In Full View Of Pilot

"Normal Category Airspeed Limits

Maneuvering Speed	121 MPH (105 Knots) CAS
Demonstrated Crosswind Velocity	20 MPH (17 Knots)

Solo from front seat only. No acrobatic maneuvers, including spins, approved in normal category. Day VFR operation only. Flight into known icing prohibited. To recover from normal or inverted spin, use full opposite rudder and neutralize elevator. ①

Solo from front seat only. No acrobatic maneuvers, including spins, approved in normal category. Day or night VFR operation only. Flight into known icing prohibited. To recover from normal or inverted spin, use full opposite rudder and neutralize elevator. ②

This airplane must be operated as a normal or acrobatic category airplane in compliance with the operating limitations stated in the form of placards, markings and manuals. Markings and placards (except accelerometer markings) refer to normal category only. See Airplane Flight Manual for acrobatic category information, weight and balance information and other operating limitations."

"No Smoking" (When Ashtrays Not Installed)

In Baggage Compartment

"Maximum Baggage 100 Lbs."

On Forward Left Side Window

"Do Not Open Above 130 MPH"

"Alternate Emergency Exit-Force Forward Portion Past Stop"

On Fuel Valve Control

"Off--Fuel--On
40 Gal. Useable"

On Emergency Door Release Handle

"Emergency Door Release
Pull Pin, Pull Handle"

Adjacent To Fuel Gauge

"Fuel In Tank When Gauge Reads "0" (Empty)
Cannot Be Safely Used In Flight"

① Not Equipped With Strobe Anti-Collision Lights

② Equipped With Strobe Anti-Collision Lights

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Adjacent To Strobe Light Switch (If Installed)

"Turn Off Strobe Lights When Taxiing In Vicinity Of Other Aircraft Or During Flight Through Cloud, Fog or Haze. Standard Position Lights To Be On For All Night Operations."

On Front Seat Rear Leg (Adjustable Front Seat Only)

"Rear Seat P/N 7-1500 or 7-1501 and Rear Control Stick P/N 4-1711 Req'd With This Seat Installation"

On Rear Control Stick (With Adjustable Front Seat Only)

"Rear Stick P/N 4-1711"

On Rear Seat Front Leg (With Adjustable Front Seat Only)

"Rear Seat P/N 7-1500" or "Rear Seat P/N 7-1501"

1.2 ACROBATIC CATEGORY LIMITATIONS

1.2.1 AIRSPPEED LIMITATIONS

With the exception of the maneuvering speed (V_A), all airspeed limitations given in Section 1.1.1 are applicable to the Acrobatic Category. For the Acrobatic Category, the maneuvering speed is 132 MPH (CAS) at maximum gross weight (1800 lbs.). Since V_A decreases as operating weight decreases, subtract 3 MPH for each 100 lbs. decrease in operating weight below 1800 lbs. (See Section 2.1.8).

1.2.2 POWERPLANT LIMITATIONS

All powerplant limitations given in Section 1.1.2 are applicable to the Acrobatic Category. In addition, the following limitations apply to the Acrobatic Category:

1. Minimum Acrobatic Oil: 6 Qts.
2. Avoid Extended Right Knife Edge Flight.

1.2.3 WEIGHT AND BALANCE

Maximum Gross Weight: 1800 Lbs.

Center-Of-Gravity Limits: (+13.5) to (+18.5) at 1800 Lbs.
(+11.5) to (+18.5) at 1550 Lbs. or Less

Straight line variation between points given.

DATUM: Wing Leading Edge

Carrying of baggage during acrobatics is prohibited.

Each operator must assure that the airplane is properly loaded. See Section 4.0 for weight and balance procedures.

1.2.4 FLIGHT LOAD FACTOR

Maneuvering Load Factors

Positive: +6 G

Negative: -5 G

Gust load factors are less than maneuvering load factors. Maximum load factors for Acrobatic Category operation are shown by red radial lines on the accelerometer. The accelerometer is required for Acrobatic Category operations.

1.2.5 UNUSEABLE FUEL

Any fuel remaining in the tanks when fuel gauge reads "0" (Empty) cannot safely be used in flight (see Section 1.2.6).





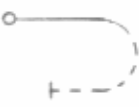




1.2.6 INVERTED FLIGHT

The inverted-fuel header tank provides fuel for at least 2.0 minutes of continuous inverted flight. As much as one minute of positive "g" flight may be required to completely refill an exhausted header tank.

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1.2.7 MANEUVERS

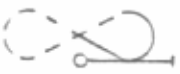


BASIC APPROVED ACROBATIC MANEUVERS AND RECOMMENDED ENTRY SPEEDS

MANEUVER	ARESTI SYMBOL	ENTRY SPEED MPH-IAS	REMARKS-AIRSPEEDS I.A.S. MPH
Loop Normal-Inverted		140*	Enter 3.5 to 4 G's--Speed At Top Approximately 50 MPH. Exit 3.5 to 4 G's** Speed 140 MPH
Immelmann		145*	Enter +4 G's--Speed at Top Approximately 50 MPH. Exit +1 G
Hammerhead Turn		140*	Enter +4.5 G's--Speed at Top Before Turn 50 MPH. Exit +4.5 G's** 140 MPH
Snap Roll Normal & Inverted		90	Enter With Power-Exit With Power No Full or Abrupt Use of Flight Controls Above V_A
English Bunt		70	Enter With Reduced Power -3.5 to -4.0 G's** When Pushing Thru From Vertical To Inverted Exit Inverted 140-150 MPH*
Vertical 1/2 Slow Roll Up		160*	Enter 160 MPH Level Flight +4.5 G's Pull Up. Exit 60 MPH Push Over To Level Flight. Caution-Flight Above V_C (160 MPH-CAS) In Smooth Air Only.
Vertical Slow Roll Down		60	Enter Power-Off 60 MPH Push Over To Vertical Down. Exit 150* MPH Pull Out 4.5 G's to Level Flight
Slow or Barrel Roll		120	Use Smooth Application of Controls No Full or Abrupt Use of Controls Above V_A
Outside Loop (Enter From The Top)		70	Enter 70 MPH or Slower With Reduced Power. Push -3.5 to -4 G's** to Inverted-Speed at the Bottom 140 MPH*. Push Up -3.5 G's** Add Full Power Exit Straight and Level at the Top

1.2.7 MANEUVERS (Cont.)

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BASIC APPROVED ACROBATIC AND RECOMMENDED ENTRY SPEEDS

MANEUVER	ARESTI SYMBOL	ENTRY SPEED IAS-MPH	REMARKS-AIRSPEEDS I.A.S. MPH
Horizontal Eight Inside-Outside		140*	Enter +4 G's Pull Up, Hold 45° Down Inverted, Enter Outside Loop 140 MPH* -3.5 +4 G's**. Exit From 45° Down Normal Flight 140 MPH*
Hammerhead Turn (Inverted Entry & Exit)		140*	Enter -3.5 to -4 G's--Speed at Top Before Turn 50 MPH. Exit From Vertical Down -3.5 to -4 G's** to Level Flight Inverted.
Spin Normal or Inverted		Stall	Recover with Positive Movement of Stick to Neutral Position & Opposite Rudder Until Rotations Stops--Then Neutral Rudders & Smooth Recovery From Dive to Level Flight. Free Release of Controls is <u>Not</u> Adequate For Recovery. <u>Positive</u> Movement of Controls by the Pilot is Required For Spin Recovery.

NOTE: Refer to Section 2.1.8 for acrobatic operation procedures that apply to all approved maneuvers.

NOTE: Variations or combinations of the above maneuvers are approved, provided that the speed and load factor limitations are not exceeded.

NOTE: The following maneuvers are not approved: (1) Tail Slide and (2) Lomcevak.

NOTE: Aircraft equipped with fixed pitch propeller requires use of throttle to control RPM during aerobatic maneuvers. Reduce power when operating above normal level flight speed to avoid overspeeding engine RPM.

*No full or abrupt use of flight controls above V_A (Maneuvering Speed).

**Proper use and application of controls and maneuvering load factors are essential to speed control. Improper and/or inadequate application of maneuvering load factors may result in rapid acceleration resulting in unsafe flight situations.

2. PROCEDURES

2.1 NORMAL PROCEDURES

2.1.1 EMERGENCY FUEL PUMP

The emergency electric fuel pump is used only to (1) provide fuel pressure for priming prior to starting engine and (2) provide fuel pressure in case the engine-driven pump fails. The emergency pump should be off during normal flight.

2.1.2 PARACHUTES

Back parachutes may be used by removing back seat cushions.

2.1.3 INVERTED FUEL AND OIL SYSTEMS

The inverted fuel system consists of a 1.5 gal. header tank in the forward cabin with a standpipe to draw fuel from the center of the tank. One-half (0.75 gals.) of the tank capacity is useable in inverted flight. The system is completely automatic; however, sufficient time (see Section 1.2.6) must be allowed between periods of continuous inverted flight to allow the header tank to refill.

The inverted oil system consists of an inverted/upright shuttle valve, an oil/air separator canister and a system of interconnecting lines. This system is completely automatic (see also Section 2.1.7).

Oil pressure may be interrupted momentarily in certain aircraft attitudes or during certain combinations of maneuvers. These interruptions are normal but should not be allowed to extend beyond 15 seconds (avoid extended right knife edge flight).

2.1.4 ROTATING BEACONS AND STROBE LIGHTS

Particularly at night, reflections from clouds, haze or dust can produce optical illusion and intense vertigo. Under these conditions, rotating beacons and strobe lights should be turned off prior to entering.

2.1.5 FUEL SYSTEM

The total useable fuel capacity is 40 gallons, of which approximately 20 gallons is carried in each wing tank. The wing tanks are interconnected both in the vent system and the fuel feed system, and may be considered as one tank. Fuel feeds simultaneously from both tanks and the total fuel quantity in both tanks is shown by a gauge in the right tank. The gauge is marked in fractions of the total fuel (0, 1/4, 1/2, 3/4, F) and reads "0" (Empty) with unuseable fuel in the tanks. Fuel tank caps are not vented and must seal completely to prevent a difference in fuel level between the two tanks.

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2.1.6 ALTERNATE AIR

Avoid using alternate air on the ground. With alternate air on, induction air is not filtered and abrasive dirt particles may enter the engine. In flight, use alternate air only when icing is suspected, i.e. since heat causes partial loss of power, do not use when landing unless atmospheric conditions indicate that icing is probable, because full power may be needed on a go-around.

2.1.7 COLD WEATHER OPERATION

For operational procedures related to cold weather operation consult the Lycoming Operators Manual. Due to the length of oil lines, special care should be exercised during starting to assure that engine oil pressure is obtained within 30 seconds after start.

It is recommended that the engine compartment be preheated prior to start if the ambient temperature is below 20° F.

2.1.8 ACROBATIC OPERATION

Maneuvering speed (V_A) is the maximum speed (for an established operating wt.) at which full and/or abrupt use of the elevator control will not cause load factors in excess of the +6 G's in Normal Operations or -5 G's in Inverted or Outside Operations.

Full and/or abrupt movement of ailerons may be used at speed up to V_A provided that the load factor does not exceed a +4 G's or a -3.2 G's. Use of ailerons above V_A or above +4 G's or -3.2 G's should be smooth and limited to deflections which will cause a roll rate not exceeding that roll rate achieved with full aileron at V_A .

CAUTION: Full abrupt use of the aileron with simultaneous use of full abrupt elevator at V_A may produce loads in excess of design limits.

For solo acrobatic operations, determine that the rear seat folding back has restrainer cables to prevent back from folding completely forward and interfering with rear stick movement. Ascertain that all loose or hanging objects are removed from the aircraft or are secured to prevent movement in flight.

2.1.9 OCCUPANT RESTRAINT SYSTEMS

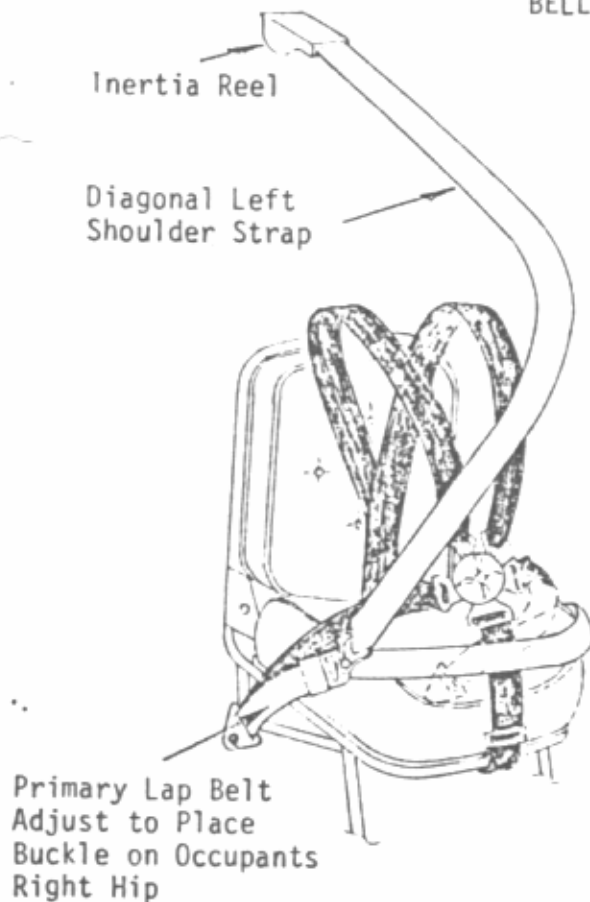
NORMAL CATEGORY OPERATIONS

A standard seat belt and a diagonal shoulder strap is provided for each seat. When rear seat is not occupied, stow shoulder strap by connecting it to seat belt, tightening both the seat belt and strap securely to seat or use Velcro fastener provided on left side panel to secure shoulder strap. When the acrobatic harness is not in use, stow the harness portions as shown in Figure 1.

ACROBATIC CATEGORY OPERATIONS

On aircraft provided with acrobatic harnesses, route the front seat straps and belts per Figure 1.

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NOTE:

Acro harness does not provide for forward restraint crash protection and therefore should always be used with primary lap belt and shoulder strap.

WEARING FRONT SEAT ACRO HARNESS

ACRO HARNESS ASSEMBLY INCLUDES:

- Double Shoulder Harness with retractor reel.
- Lap belt (L & R portions).
- Groin strap.
- Five point buckle.

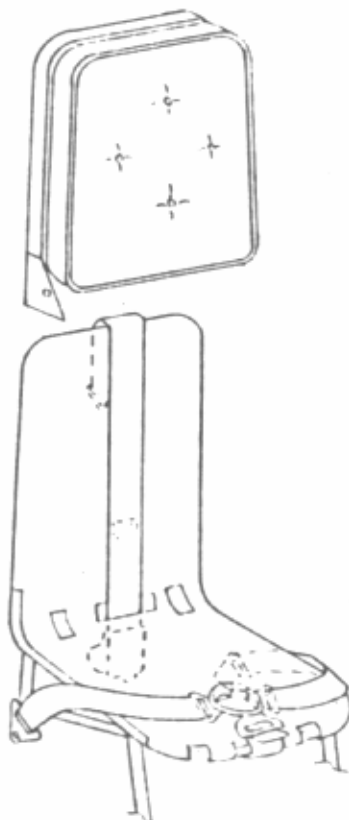
Installation:

- Extend shoulder harness from reel.
- Adjust over shoulders and couple to buckle.
- Allow shoulder harness reel to retract and adjust harness placing the buckle above the waist but below the chest.
- Attach both lap belt portions to buckle and tighten.

CAUTION

DO NOT ALLOW SHOULDER HARNESS TO RUN UP BEHIND THE FRONT SEAT BACK WHERE IT MAY POSSIBLY INTERFERE WITH REAR STICK MOVEMENT.

STOWING FRONT SEAT ACRO HARNESS

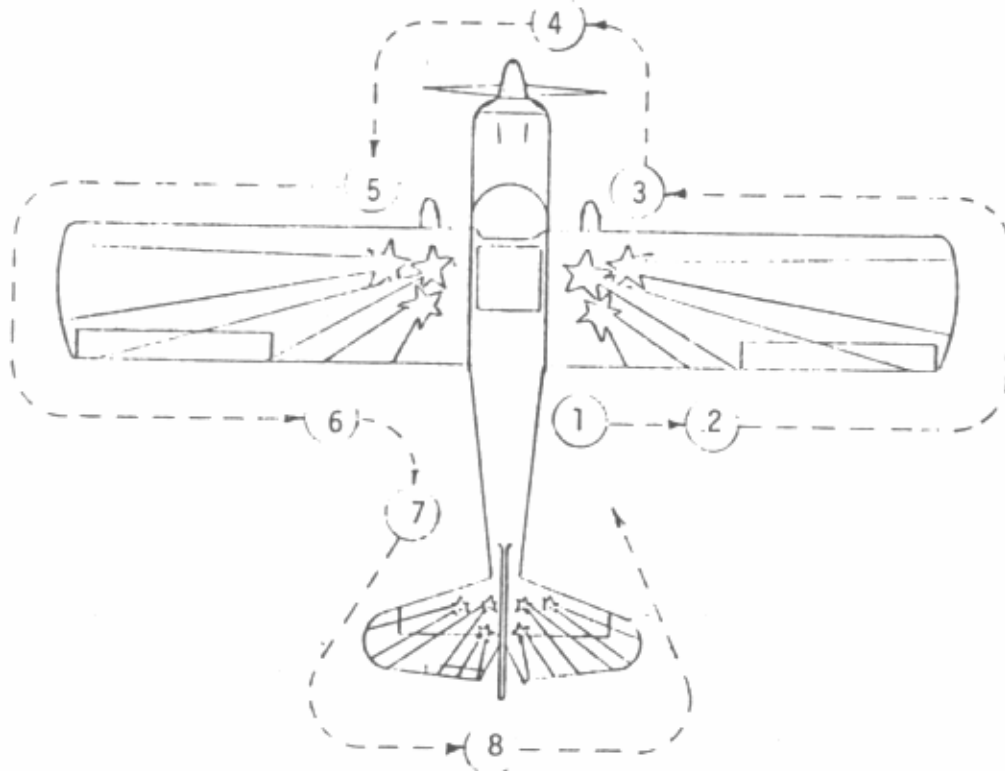


- Remove back cushion.
- Lay shoulder harness over seat back frame.
- Replace back cushion.
- Lift forward edge of bottom cushion.
- Attach lap belts to buckle and adjust and tighten with buckle at forward edge of seat frame.
- Insure that belts do not interfere with rudder pedal operation.
- Replace forward edge of cushion.

Figure 1

2.1.10 PREFLIGHT CHECK (See Page 16)

1.
 - a. Release controls.
 - b. Check ignition switches "OFF".
 - c. Check fuel quantity on fuel gauge.
 - d. Fuel valve "ON".
 - e. Inspect seat belts for condition.
 - f. Secure rear seat belt, shoulder harness and all other loose or hanging objects if not in use.
 - g. Emergency locator transmitter--armed.
2.
 - a. Check right wing root cover for security.
 - b. Check aileron for freedom of movement and security.
 - c. Check wing and struts for general condition.
3.
 - a. Check right main wheel for proper inflation.
 - b. Visually check fuel quantity, then check filler cap security.
4.
 - a. Check oil level and secure dip stick. Inspect engine compartment for general condition, fuel leaks, oil leaks, etc.
 - b. On first flight each day, drain fuel from gascolator.
 - c. Check that the oil dip stick access door is properly latched.
 - d. Check windshield for cleanness.
 - e. Check prop for nicks, and prop spinner for security.
 - f. Check prop blade shanks for evidence of excessive bearing grease leakage (constant speed only).
 - g. Check air filter for cleanliness and security.
5.
 - a. Check left main wheel for proper inflation.
 - b. Visually check left fuel tank quantity, then check filler cap security.
 - c. Inspect stall warning vane for freedom.
 - d. Inspect fuel vent for stoppage.
 - e. Inspect pitot tube for stoppage.
6.
 - a. Check wing root cover for security.
 - b. Check aileron for freedom of movement and security.
 - c. Check wing and struts for general condition.
7.
 - a. On first flight each day, drain fuel from aft fuselage drain.
 - b. Inspect bottom of aircraft for general condition.
 - c. Inspect right static port for stoppage.
8.
 - a. Check tail surfaces and brace wires for general condition.
 - b. Check control surfaces for freedom of movement and security.
 - c. Check tailwheel security and proper inflation.
 - d. Inspect left static port for stoppage.



PREFLIGHT INSPECTION
(See Page 15)

2.1.11 PRE-START CHECK

1. Front Seat--Adjust and Secure
2. Seat Belts--Adjust and Secure
3. Fuel Valve Handle--"ON"
4. Brakes--Test and Set
5. Radios and Electrical Equipment--"OFF"

2.1.12 ENGINE START

1. Mixture--"Rich"
2. Alternate Air--Cold
3. Throttle Cracked Open
4. Prime--As Required
5. Propeller Area--Clear
6. Master Switch--"ON"
7. Ignition Switches--"ON"
8. Starter Button--"Start" (Release When Engine Starts)
9. Oil Pressure--Check

2.1.13 COCKPIT PREFLIGHT

1. Cabin Door--Latched
2. Flight Controls--Check For Freedom and Operation
3. Trim Tab--Takeoff Setting
4. Flight Instruments and Radios--Set

2.1.14 ENGINE RUN-UP

1. Throttle Setting--2000 RPM
2. Magnetos--50 RPM Differential Between Mags, 175 RPM Maximum Drop
3. Propeller--Check Operation--Full Decrease But Not To Exceed 300 RPM Drop (Constant Speed Propeller Only)
4. Alternate Air--Check Operation
5. Engine Instruments--Within Green Arc

2.1.15 TAKEOFF

1. Alternate Air--Cold
2. Mixture--Full Rich
3. Propeller--Full Increase (Constant Speed Propeller Only)
4. Throttle--Full Open
5. Engine Instruments Within Green Arc

2.1.16 CLIMB - (NORMAL)

1. Throttle--Full Open
2. Propeller--2700 RPM (Constant Speed Propeller Only)
3. Mixture--Rich or Leaned As Required
4. Engine Instruments--Within Green Arc

2.1.17 CRUISING

1. Power--As Desired (2700 RPM Max.)
2. Elevator Trim--Adjust
3. Mixture--Lean To Best Power With 75% Power or Less
4. Engine Instruments--Within Green Arc
5. Alternate Air--As Required

2.1.18 LANDING CHECKLIST

1. Mixture--Rich
2. Alternate Air--Check Operation and Return to Cold (Unless Icing Conditions Exist)
3. Airspeed--75-80 MPH IAS
4. Prop--Full Increase (Constant Speed Propeller Only)

2.1.19 BALKED LANDING (GO AROUND)

1. Throttle--Full Open
2. Prop Setting--Full Increase (Constant Speed Propeller Only)
3. Alternate Air--Cold
4. Airspeed--80 MPH
5. Trim--Reset

2.1.20 AFTER LANDING

1. Alternate Air--Cold

2.1.21 SHUTDOWN AND SECURING AIRCRAFT

1. Parking--Into The Wind If Possible
2. Park Brake--Set
3. Radios and Electrical Equipment--"OFF"
4. Mixture--Idle Cut-Off (Pulled Full Out)
5. Ignition and Master Switches--"OFF"
6. Control Lock--Secure Seat Belt Around Front Control Stick

2.2 EMERGENCY PROCEDURES

2.2.1 ENGINE RESTART

CAUTION: If propeller ceases to turn, diving will not cause windmilling (constant speed only).

Fuel starvation may occur after a series of inverted maneuvers since the header tank may have had insufficient time to refill. (See Section 1.2.6)

CHECK:

1. Assume ERECT Flight Attitude
2. Throttle--3/4 FORWARD
3. Mixture--FULL FORWARD
4. Propeller--FULL FORWARD (Constant Speed Propeller Only)
5. Fuel Valve--ON
6. Emergency Fuel Pump--ON
7. Magnetos--ON
8. Master--ON
9. Starter--ENGAGE if Windmill RPM is Insufficient

2.2.2 ALTERNATE AIR

If induction ice is indicated (gradual decrease in manifold pressure), use full alternate air until all ice is dissipated.

2.2.3 FUEL PRESSURE LOSS

For fuel pressure loss or fluctuation turn "ON" the emergency Fuel Pump.

2.2.4 ENGINE FIRE (GROUND)

1. Mixture--Idle Cut-Off
2. Fuel Valve Off
3. Master and Magneto Switches--OFF
4. Cabin Heater Off
5. Evacuate Aircraft
6. Extinguish With Fire Extinguisher

2.2.5 ENGINE FIRE (FLIGHT)

1. Fuel Valve--Off
2. Master Switch--Off
3. Cabin Heaters--Off
4. Accomplish Emergency Landing and Evacuate Aircraft

2.2.6 ELECTRICAL SYSTEM MALFUNCTION/FIRE

The ammeter indicates current to or from the battery.

A steady discharge on the ammeter indicates an inoperative alternator system. Turn off unnecessary electrical equipment to reduce battery drain. Master switch may be turned off to conserve battery power if necessary.

Indication of electrical fire(s) may be wisps of smoke or the smell of hot or burning insulation. Should an electrical fire develop, the following procedures are recommended.

- a. Master Switch "OFF"
- b. All Electrical Switches "OFF"
- c. Open Air Vents or Windows ONLY if Absolutely Necessary For Ventilation
- d. Proceed to Nearest Suitable Airport For Landing

If electrical power is necessary for safety of flight under the above conditions, the following procedures are recommended.

- a. Disengage and Isolate Each Power Circuit
- b. Engage Each Circuit Separately. Allow Sufficient Time to Analyze For Faulty Operation
- c. When Faulty Circuit is Identified, Disengage Faulty Circuit
- d. Properly Functioning Circuits May Be Re-Engaged
- e. Land as Soon as Practicable For Repairs

2.2.7 EMERGENCY EXITS

The right cabin door can be removed by releasing the upper window latches and pulling the safety pin and then pulling up on the red emergency door release handle and pushing door away from aircraft. If necessary, emergency exit may be made from left side of aircraft by opening left window. Force forward portion of window past its hinge stop by pushing hard on forward window frame.

3. PERFORMANCE INFORMATION

3.1 CLIMB SPEEDS

CONSTANT SPEED PROPELLER

Best Rate-Of-Climb Speed At Sea Level: 76 MPH (66 Knots) CAS

Best Angle-Of-Climb Speed At Sea Level: 64 MPH (56 Knots) CAS

Best rate-of-climb speed decreases 1 MPH per 3000 feet of altitude.
Best angle-of-climb speed increases 1 MPH per 3000 feet of altitude.

FIXED PITCH PROPELLER (CLIMB)

Best Rate-Of-Climb At Sea Level: 79 MPH

Best Angle-Of-Climb At Sea Level: 65 MPH

Best rate-of-climb decreases 1 MPH per 3000 feet of altitude.
Best angle-of-climb increases 1 MPH per 3000 feet of altitude.

3.2 SERVICE CEILING

Service Ceiling: 16000 Feet

3.3 AIRSPEED SYSTEM CALIBRATION

<u>IAS (MPH)</u>	<u>CAS (MPH)</u>
50	54
60	63
80	83
100	102
120	121
140	140
162	160

4.0 LOADING INFORMATION

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

Page 23 shows the moment diagram and loading envelope applicable to the Model 8KCAB. A weight and balance report containing the airplane empty weight and moment and the approved equipment list is attached to this manual. These items are explained below.

4.1 MOMENT AND LOADING

The loading envelope shows the allowable limits of total airplane moment from minimum weight to maximum gross weight. The moment diagram gives the moment contribution of the pilot, passenger, fuel, oil and baggage. To find the moment contribution of a 100 pound passenger, for instance, move up vertically along the weight scale to 100 lbs., move down vertically to the moment scale where the moment contribution of 4500 in-lbs is read.

To determine if a particular weight configuration is acceptable, find the total weight and the total moment by summing the contribution of each component including the empty airplane (the oil moment is negative and must be subtracted). On the loading diagram, locate the intersection of a horizontal line at the total weight and a vertical line at the total moment. If this intersection lies within the indicated envelope, the configuration is acceptable (see Page 23).

4.2 WEIGHT AND BALANCE

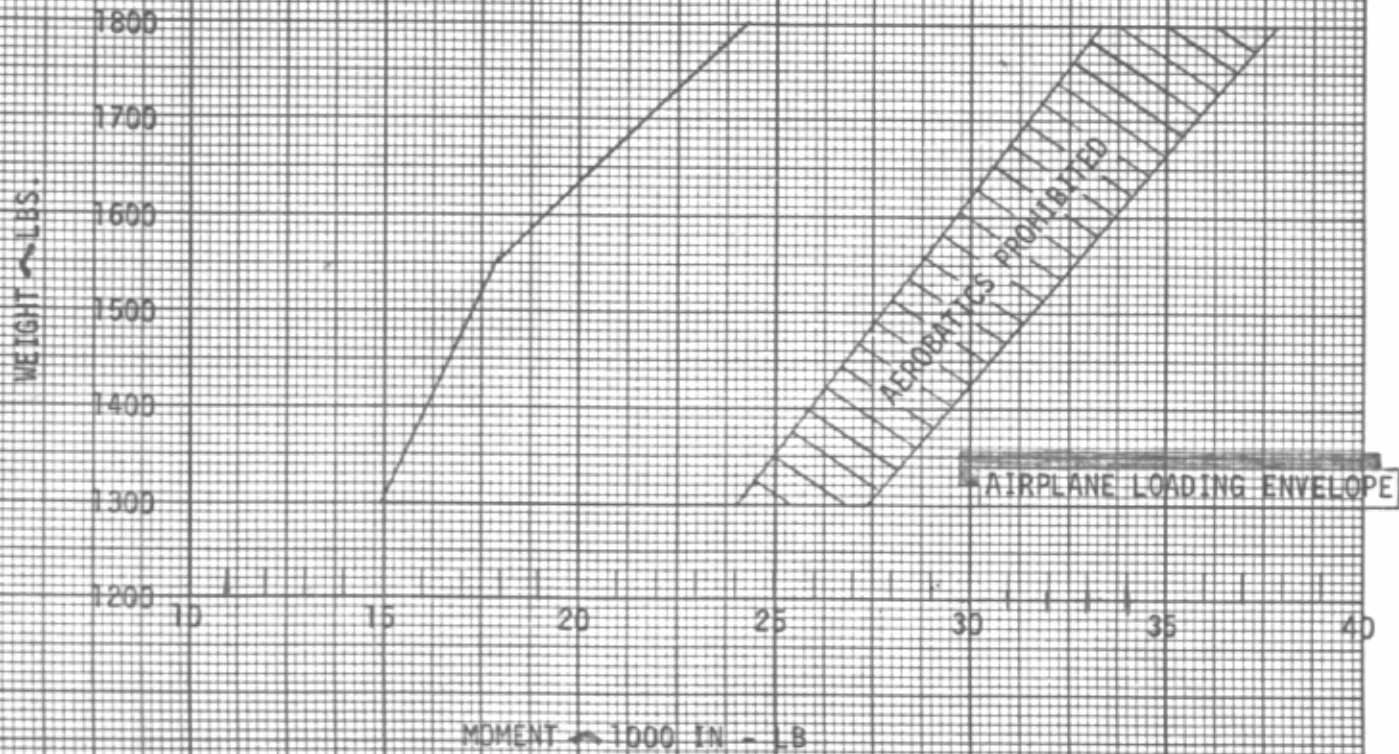
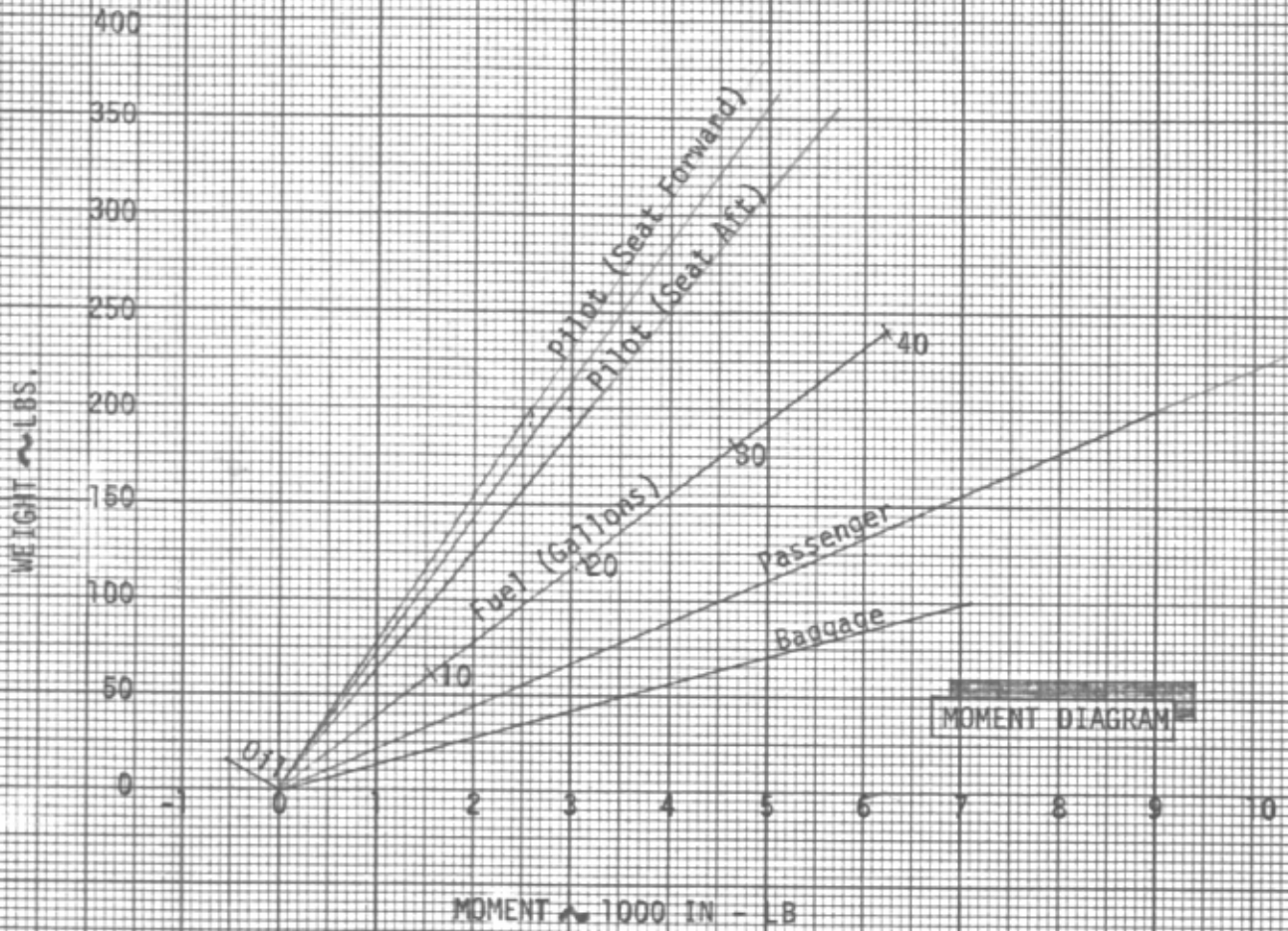
The weight and balance report gives the official aircraft empty weight, empty moment, empty C.G. and useful load. The empty weight includes unuseable fuel and undrainable oil (see Page 24).

4.3 EQUIPMENT

Each item installed on the airplane at the time of weighing is marked with an "X" on the equipment list. The weight and moment arm of each item are also shown. The accelerometer is required for acrobatic category operation only (see Page 25).

MAY 9 1977

4.4 MOMENT DIAGRAM AND LOADING ENVELOPE



NO. 2301TR20 20X20 PER INCH
LITHO IN U.S.A.

WTELEDYNE
NATIONAL TRACING PAPER DIVISION
INDIANAPOLIS, INDIANA

AIRPLANE FLIGHT MANUAL - BELLANCA MODEL 8KCAB (150 HP)

4.5 WEIGHT AND BALANCE REPORT - MODEL 8KCAB (150 HP)

DATE 3-7-78 WEIGHT ACTUAL _____ WEIGHT COMPUTED X
A/C SERIAL NO. 371-78 A/C REGISTRATION NO. N2804Z
TOTAL AIRCRAFT EMPTY WEIGHT INCLUDING UNUSEABLE FUEL (18 lb. @ +26) AND
UNDRAINABLE OIL (5 lb. @ -34 CONSTANT SPEED PROPELLER ONLY): _____
_____ 1314.15 lb.
AIRCRAFT EMPTY MOMENT: _____ 16908 in. - lb.
AIRCRAFT EMPTY C.G.: _____ 12.87 in. aft datum
USEFUL LOAD: _____ 485.85 lb.
DATUM: Wing Leading Edge. Superseded 4-7-78

LEVELING MEANS: Drop plumb line from wing leading edge such that plumb
line is 12.18 in. forward of front face of fuselage -
strut attach fitting.

See Service Manual for Weighing Procedure.

ARMS

Front Seat 16 in
Back seat 45 in
Baggage (max. 100 lbs) 70 in
Fuel Tanks 25.3 in
max weight 1800 lbs

4.6 EQUIPMENT LIST

Suffix Letters On Item Numbers:

R: Required For FAA Certification

S: Standard Equipment

A: Optional Equipment Not Required

O: Optional Equipment Replacing Standard Or Required Item

NOTE:

C.S. Denotes Constant Speed Propeller

F.P. Denotes Fixed Pitch Propeller

ITEM NO.	X	DESCRIPTION	DWG.	WT, LB	ARM, IN
1R	X	Engine, Lycoming AEIO-320-E1B (C.S.)	7-1413	289.32	-38.36
2R		Engine, Lycoming AEIO-320-E2B (F.P.)	7-1523	289.32	-38.36
3R	X	Propeller, Hartzell HC-C2YL-4BF/FC7663-4	7-1509-3	53.50	-57.50
4R		Propeller, Sensenich 74DM6S8-0-56 (F.P.)	7-1523	37.00	-56.00
5S	X	Spinner, Hartzell 836-52 (C.S.)	7-1509-3	4.63	-58.83
6S		Spinner Installation (F.P.)	3-1397	3.81	-58.63
7R	X	Propeller Governor (C.S.)	7-1509-3	4.00	-22.00
8R	X	Control, Propeller Governor (C.S.)	7-1509-3	1.00	-5.00
9R	X	Pump, Emergency Fuel	7-1413 or 7-1523	3.18	-23.40
10R	X	Oil Cooler	7-1413 or 7-1523	2.95	-27.18
11R	X	Starter - Prestolite	7-1413 or 7-1523	17.00	-44.44
12R	X	Alternator	7-1413 or 7-1523	10.63	-48.36
13R	X	Voltage Regulator	7-1413 or 7-1523	.65	-22.40
14R	X	Relay, Overvolt	4-1540	.50	-22.42
15R	X	Battery, 35 AMP w/Box	4-1599	30.81	88.47
16R	X	Relay, Battery	4-1599	.70	84.00

EQUIPMENT LIST

ITEM NO.	X	DESCRIPTION	DWG.	WT, LB	ARM, IN
17R	X	Tachometer, Recording	7-1422	.66	-3.40
18R	X	Gauge - Manifold Pressure (C.S.)	7-1422	1.19	-6.69
19R	X	Gauge - Fuel Pressure	7-1422	.36	-2.80
20R	X	Gauge - Oil Pressure	7-1422	.35	-2.80
21R	X	Gauge - Oil Temperature	7-1422	.57	-13.00
22R	X	Gauge - Ammeter	7-1422	.26	-2.80
23R	X	Altimeter, Sensitive	7-1422	1.40	-3.30
24R	X	Indicator, Airspeed	7-1422	.58	-3.00
25R	X	Accelerometer	7-1422	.40	-3.00
26R	X	Compass, Airpath	7-1422	.77	-4.00
27R	X	Stall Warning System	7-1510 or 4-1730	.85	0.00
28A		Turn & Bank Electric	7-1422	2.00	-3.00
29A	X	Turn Coordinator	7-1422	2.00	-3.00
30A		Rate of Climb	7-1422	1.00	-3.00
31A		Artificial Horizon Gyro	7-1422	2.19	-3.00
32A		Directional Gyro	7-1422	2.63	-3.00
33A		Vacuum Pump Installation	7-1125	2.81	-26.50
34A		Cylinder Head Temperature	7-1422	1.00	-3.00
35A		Engine Hour Meter	3-1354	.80	-3.00
36A		Gauge, Outside Air Temperature	7-1415	.17	8.00
37A		Gauge, Suction	7-1125	.22	-2.00
38A		8 Day Clock	7-1422	.25	-2.00
39A		Mixture Monitor	3-1412	.80	-3.00
40R	X	Tailwheel, Scott 3200	4-1080	7.80	193.33
41R	X	Brake Cylinder, Gerdes A-110-10 (Toe)	4-1624	1.00	-19.63

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EQUIPMENT LIST

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ITEM NO.	X	DESCRIPTION	DWG.	WT, LB	ARM, IN
42R	X	Tire and Tube, 6.00 x 6, 4 Ply Type III (Both Sides)	7-1307	18.50	1.75
43R	X	Wheel and Brake, Cleveland, 40-28 30-19 (Both Sides)	7-1307	13.94	2.44
44A		Glider Tow, Schweitzer 3-1127	7-1143-3	3.94	113.00
45S	X	Wheel Pants (Cleveland Wheels)	4-1474	10.00	2.00
46S	X	Landing Gear Steps L/R	3-1559	2.00	2.00
47R	X	Position Lights - Wing (C.S.)	3-1512	.38	17.62
48R		Position Lights - Wing (F.P.)	7-1510	.38	17.62
49R	X	Tail Light Rudder	4-1548	.14	202.80
50R	X	Wing Tip Strobe Light Inst. (C.S.)	3-1512	4.25	-2.00
51A		Wing Tip Strobe Light Inst. (F.P.)	3-1512	4.25	-2.00
52S	X	Landing Light Cowling	7-1475	.47	-52.32
53A		Ash Trays (2)	7-1269	.75	26.25
54R	X	Seat Installation Front Adjustable	7-1499	15.63	17.25
55R	X	Seat Installation Rear	4-1708	13.63	48.63
560		Seat Installation Rear Wide	4-1709	18.44	48.63
57R	X	Seat Belts, Amer. Safety 500668-5 Fr. & Rr.	7-1499 or 4-1708	2.00	24.31
58S	X	Vertical Restraint Harness Front (Inertia) (C.S.)	3-1598	2.13	17.25
59A		Vertical Restraint Harness Front (Inertia) (F.P.)	3-1598	2.13	17.25
60A	X	Vertical Restraint Harness Rear (Inertia)	3-1598	2.13	47.63
61S	X	Shoulder Harness Rear	3-1557-1	.50	74.00
62S	X	Shoulder Harness Front (Inertia)	3-1557	1.00	44.00
63A		Shoulder Harness Rear (Inertia)	3-1557	1.00	74.00
64R	X	Cargo Net	3-1475	1.00	62.00
65A	X	Emergency Locator Trans. Larago	3-1590	3.00	68.38

EQUIPMENT LIST

ITEM NO.	X	DESCRIPTION	DWG.	WT, LB.	ARM, IN
66A		Fire Extinguisher	7-1415	5.38	-7.30
67A	X	Rear Seat Heater	7-1478	2.25	-6.55
68S	X	Cabin Light	7-1524-7	.57	24.00
69A	X	Cabin Speaker	7-1415	1.36	35.00
70A	X	Antenna, Nav. Meriden OD-1	3-1542	1.19	103.00
71A	X	Antenna, Broadband (Spike Type)	4-1631	.50	94.00
72A	X	Microphone Telex Tel-66T Front	2-2078	.38	11.00
73A	X	Microphone Telex Tel-66T Rear	2-2078	.38	45.00
74A		Microphone Narco M-700B Front	2-2078	.50	11.00
75A		Microphone Narco M-700B Rear	2-2078	.50	45.00
76A	X	Headset Telex A610-1 Front	2-2078	.50	11.00
77A	X	Headset Telex A610-1 Rear	2-2078	.50	45.00
78A	X	King KX 145/KI 205 Nav, Com	7-1527	3.80	-3.00
79A		King KR 86 ADF w/Antennas	7-1512-1	7.40	39.84
80A	X	King KT 76A Transponder	4-1743	3.25	-3.84
81A		Narco Escort 110G	7-1526	4.58	-4.00
82A		Narco Com 120, Nav 121	7-1528	6.00	-3.00
83A		Narco AT-150 Transponder	4-1742	3.25	-3.84
84A		Narco ADF-141 w/Antennas	4-1741	6.90	15.63
85A		Edo-Aire RT-553	7-1529	5.20	-3.80
86A		Edo-Aire RT-563	7-1529	5.20	-3.80
87A		Intercom Inst. (Less Mic. & Headset) (Escort 110G)	7-1526	.25	16.00
88A	X	Intercom Inst. (Less Mic. & Headset) (King KX 145)	7-1527	.25	16.00
89A		Intercom Inst. (Less Mic. & Headset) (Com 120)	7-1528	.25	16.00

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EQUIPMENT LIST

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ITEM NO.	X	DESCRIPTION	DWG.	WT, LB.	ARM, IN
90A		Intercom Inst. (Less Mic. & Headset) (Edo-Aire RT-553 or RT-563)	7-1529	.25	16.00
91A		Corrosion Proofing	CFP-2	5.00	49.40
92A		Filter Injector Air	7-1475	.50	-43.00
93	X	NARCO AR-850 ALTITUDE REPORTER		.70	-7.50
94	X	AIRWOLF REMOTE OIL FILTER	4-2026	4.7	-24.40

MAKE: AMERICAN CHAMPION
MODEL: 8KCAB
SERIAL#: 371-78
REGISTRATION: N2804Z

Computing New C.G.

* ITEM NUMBERS WHEN LISTED IN THE PERTINENT AIRCRAFT SPECIFICATION MAY BE USED IN LIEU OF "ITEM, MAKE, AND MODEL"

Prepared By

BRUCE HATCH AP3130546IA

Date _____

2/20/2015

CGR-30P Primary Engine Monitor

FAA-APPROVED POH/AFM Supplement, No. AFM022513, Rev. F

AMER. CHAMP 8KCAB
Airplane Make and Model

N 2804Z
Reg. Number

371-78
Serial Number

This supplement must be attached to the FAA approved Airplane Flight Manual when the aircraft is modified by the installation of the primary CGR-30P instrument in accordance with STC SA02283SE.

The information contained herein supplements and/or supersedes the basic manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the POH or AFM.

LIMITATION(S): No Change

PROCEDURES: The CGR-30P Main Screen displays the primary engine and aircraft instruments. This screen is displayed on power-up and is the screen that should be monitored for most of the flight.

Buttons and Knob operate as follows:

(S)creens Button - Switches the display between the various screens.
Rotary Knob (push and turn) - Moves the cursor, selects functions and changes digits.
(E)xit Button - Exits out of a field or screen, returns the display to the Main Screen and acknowledges blinking digits, annunciators and remote Warning and Caution lights. When Exiting a field, changes made in that field will remain. When Exiting a screen, if a change has been made, a pop-up message will give you the option to save or disregard the changes.

Operating Bands and Warnings - To assist the pilot in identifying the current operating band (green, yellow, red, etc.), the CGR-30P displays the digital value for each function in its appropriate color. When a function reaches a red or yellow operating band, blinking digits for that function will alert the pilot. If the remote Warning and Caution lights have been installed, they will also blink and alert the pilot. To acknowledge the alarm and stop the blinking, press the (E)xit Button while viewing the Main Screen.

Estimated Fuel - The Fuel Qty's screen displays estimated fuel remaining for each fuel tank. The digital readout for each estimated fuel level will be displayed in green unless the estimated remaining for that tank reaches zero, at which time it will be displayed in white. This calculation relies on the proper setting of the K-Factor and the action of the pilot to match the tank selected on the CGR-30P to the tank selected on the aircraft. The "Change To" column in the "Fuel Qty's" screen allows for transferring fuel from an Aux Tank and adding fuel to a tank. This procedure only manages the calculated fuel remaining in the instrument, it does not physically transfer fuel in the aircraft. It is the pilots responsibility to insure the CGR-30P fuel management matches the management of fuel for the aircraft.

Continued on back...

Electronics International Inc. • 63296 Powell Butte Highway • Bend, OR 97701
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