HB-KHN

AMERICAN CHAMPION AIRCRAFT
CORPORATION

"Dedicated to Preserving a Classic"

FLIGHT OPERATIONS MANUAL

FOR

MODEL 8KCAB

AMERICAN CHAMPION AIRCRAFT CORPORATION
ROCHESTER, WI 53167

FAA Approved

Airplane Flight Manual

American Champion Model 8KCAB

with Lycoming Engine AEIO-360-H1B (180 HP)

This manual only for aircraft
with serial numbers beginning with S/N 934-03 and up.

REGISTRATION NUMBER: HB-KHN

SERIAL NUMBER: 1047-2007

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

This AFM distinguishes FAA approved data from unapproved date by noting "FAA APPROVED" in the upper right hand corner of each page containing such FAA approved data. Other information is provided by American Champion Aircraft Corporation as an addendum to the manual and is included in the unapproved portion of the manual.

Revision "H" APPROVED: Joseph C Mass
For: Royce Prathers
Manager, Chicago Aircraft Certification Office

Date: 2 5 NOV 2003

Record of Revisions

Revision Number	By	Description	Date	Pages Affected
G	JKM	Retyped Manual; Added Heated Pitot Limitations; Noise Levels to FAR 36, Append. G; Added two and three bladed MT Composite Propellers; Changed Revision Block	11-22-02	All
H	JKM	Changed Normal Category Gross Weight Operation to 1950 lbs.	10-21-03	1, 2, 5-9, 16-19

Table of Contents

Table of Contents (continued)

1.0 Limitations: Compliance with this Section is Mandatory

1.1 Normal Category Limitations

1.1.1 Airspeed Limitations

Speed Designation	Calibrated Air Speed		Airspeed Indicator Marking
	MPH	Knots	
Maneuvering (V_A)	107	93	None
Normal Operating Range	54-160	47-139	Green Arc
Maximum Structural Cruising (V_{NO})	160	139	
Caution Range	160-200	139-174	Yellow Arc
Never-Exceed (V_{NE})	200	174	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-360-H1B
Engine Limits:	For all operations, 2700 RPM (180 HP)
Fuel:	91/96 minimum grade aviation gasoline (100/130 may be used 100% of the time).
Propeller:	Hartzell Constant Speed HC-C2YR-4CF/FC7666A-2 Diameter Limits 72" to 74" Pitch Settings at 30 in. st. low 11.0 ± 0.2° high 28.0 ± 1.0° Caution: "Avoid Cont. RPM 2600-2700 Acro Only."
Propeller: (Alternate) (2-Blade)	MT Constant Speed MTV-15-B-C/C188-34 Diameter Limits 73" to 74"
Propeller: (Alternate) (3-Blade)	MT Constant Speed MTV-9-B-C/C188-18a or MTV-9-B-C/C188-18b Diameter Limits 73" to 74"

Powerplant Instrument Markings

Instrument	Markings	
Cylinder Head Temperature	Green Arc Red Radial	90°-500° F 500° F
Fuel Pressure	Green Arc Red Radial	14-45 psi 14 and 45 psi
Oil Temperature	Green Arc Red Radial	100°-245° F 245° F
Oil Pressure	Green Arc Yellow Arc Red Radial	60-100 psi 25-60 psi 25 psi & 100 psi
Tachometer (Hartzell)	Green Arc Red Arc Green Arc Red Arc Red Radial	500-2000 RPM 2000-2250 RPM 2250-2700 RPM 2600-2700 RPM 2700 RPM
Tachometer (MT)	Green Arc Red Arc Red Radial	500-2600 RPM 2600-2700 RPM 2700 RPM
Manifold Pressure	Red Radial	29 in.

1.1.3 Weight and Balance

Maximum Gross Weight	1950 Lbs.
Center-of-Gravity Limits	(+14.7 in.) to (+18.5 in.) at 1950 lb. (+11.5 in.) to (+18.5 in.) at 1550 lb. 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 for Weight and Balance procedures.

1.1.4 Flight Load Factors

Maneuvering Load Factors at 1950 lb. Gross Weight:

Normal Category:	Positive: +3.80 G
	Negative: -1.52 G

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, operation are approved Flight into known icing conditions is not approved.

1.1.6 Heated Pitot Operation

When Pitot Heat is "ON," magnetic compass may deviate as much as 30°. Use Pitot Heat only as required.

1.1.7 Unusable Fuel

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

1.1.8 Placards

In Full View of Pilot:
"Normal Category Airspeed Limits

Maneuvering Speed 107 MPH (93 Knots) CAS
Demonstrated Crosswind Velocity 20 MPH (17 Knots)"

"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" (Standard)

"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 are Not Installed)

"Magnetic Compass May Deviate As Much as 30° When Pitot Heat is On."
(When Pitot Heat is Installed)

On Tachometer Face (Hartzell Propeller Only)
"Avoid. Cont. RPM
2000-2250 All Oper.
2600-2700 Acro Only"

In Baggage Compartment
"Maximum Baggage 100 Lbs."

On Forward Left Side Window
"Do Not Open Above 130 MPH"
"Alternate Emergency Exit Unlatch – Push Out Past Stop"

On Fuel Shutoff Control
"Fuel 40 Gal Useable - Down 'ON'"

On Emergency Door Release Handle
"Emergency Door Release
Pull Pin – Pull Handle"

Adjacent to Fuel Gauge
"Fuel In Tank When Gauge Reads 'E' (Empty) Cannot Be Safely Used In Flight."

Adjacent to Strobe Light Switch
"Turn Strobe Light Off When Taxiing in Vicinity of Other Aircraft or When Flying in Fog or Clouds. Standard Position Lights to be used 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" (as Appropriate)

1.2 Acrobatic Category Limitations

1.2.1 Airspeed 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.
3. Avoid 2600-2700 RPM Acrobatic Flight.

1.2.3 Weight and Balance

Maximum Gross Weight	1800 Lbs.
Center-of-Gravity Limits	(+13.5 in.) to (+18.5 in.) at 1800 lb. (+11.5 in.) to (+18.5 in.) at 1550 lb. 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 Factors

Maneuvering Load Factors at 1800 lb. Gross Weight:

Acrobatic Category:	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 Unusable Fuel

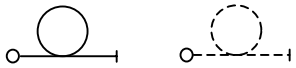
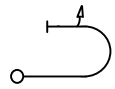
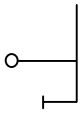
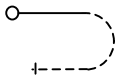
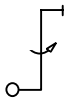
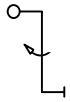
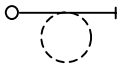
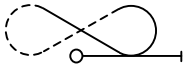
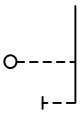
Any fuel remaining in the tanks when fuel gauge reads “E” (Empty) cannot be safely used in flight.

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.

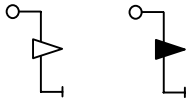
1.2.7 Maneuvers

Basic Approved Acrobatic Maneuvers and Recommended Entry Speeds

Maneuver	Aresti Symbol	Entry Speed IAS MPH	Remarks – Airspeeds I.A.S. MPH
Loop Normal – Inverted		140*	Enter 3.5 to 4 G's Speed at Top Approx. 40 MPH Exit 3.5 to 4 G's** Speed 140 – 150 MPH
Immelman		145*	Enter +4 G's Speed at Top Approx. 50 MPH Exit +1 G
Hammer Head Turn		140*	Enter +4.5 G's Speed at Top Before Turn: 40 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 or without Power –3.5 to –4.0 G's** when Pushing Thru from Vertical to Inverted Exit Inverted 140-150 MPH*
Vertical Slow Roll Up		180*	Enter 180 MPH Level Flight +4.5 Pull Up. Exit 40 MPH Up Push Over to Level Flight. Caution: Flight Above V_C (160 MPH-CAS) in Smooth Air Only
Vertical Slow Roll Down		60	Enter 60 MPH Push Over to Vertical Down Exit 150 MPH* Pull Out 4.5 G's** to Level Flight
Slow or Barrel Roll		130	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 or Without Power. Push 3.5 to 4 G's** to Inverted Speed at the Bottom 140-150 MPH* Add Full Power, Push Up 3.5 to 4 G's**. Exit Straight & Level 40-50 MPH
Horizontal Eight Inside – Outside		140*	Enter +4 G's Pull Up, Hold 45° Down Inverted, Enter Outside Loop 140 MPH* -3.5 to –4 G's. Exit From 45° Down Normal Flight – 140 MPH
Hammer Head Turn (Inverted Entry & Exit)		140*	Enter –3.5 to –4 G's Speed at Top Before Turn 40 MPH Exit From Vertical Down –3.5 to –4 G's** to Level Flight Inverted

1.2.7 Maneuvers (Continued)

Basic Approved Acrobatic Maneuvers and Recommended Entry Speeds

Maneuver	Aresti Symbol	Entry Speed IAS MPH	Remarks – Airspeeds I.A.S. MPH
Spin Normal – Inverted		Stall	Recover with Positive Movement of Stick to Neutral Position & Opposite Rudder Until Rotation Stops – Then Neutral Rudder & Smooth Recovery from Dive to Level Flight. Free Release at Control is Not Adequate for Recovery. Positive 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
(2) Lomcevak

* 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.

2.0 Procedures

2.1 Normal Procedures

2.1.1 Emergency Fuel Pump

The emergency 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

Backpack style parachutes may be used by removing seat back 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 consist 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 each tank is shown by a right and left tank gauge. The gauges are marked in fractions of the total fuel (E, ¼, ½, ¾, F) and reads “E” (Empty) with unusable 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.

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 cause 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 maximum speed (for an established operating weight) 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 speeds up to V_A provided that the load factor does not exceed +4 G's or –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 exceed that roll rate achieved with full aileron at V_A.

Caution: Full abrupt use of the ailerons with simultaneous use of full abrupt elevator at VA may produce loads in excess of design limits.

Propeller RPM is limited to 2600 RPM maximum during acrobatic maneuvers.

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, including unused seatbelts, are removed from the aircraft or are secured to prevent movement in flight.

2.1.9 Pre-Flight Check (See Page 14)

1) a. Release controls.
   b. Check ignition switches "OFF."
   c. Check fuel quantity on fuel gauges.
   d. Fuel valve "ON."
   e. Inspect seat belt 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 & struts for general condition.

3) a. Check right main wheel for proper inflation.
   b. Visually check fuel quantity, then check filler cap security.
   c. Check pitot-static tube for stoppage.
   d. Check if pitot heat is functioning if going into know IMC.

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.
   g. Check air filter for cleanliness and security

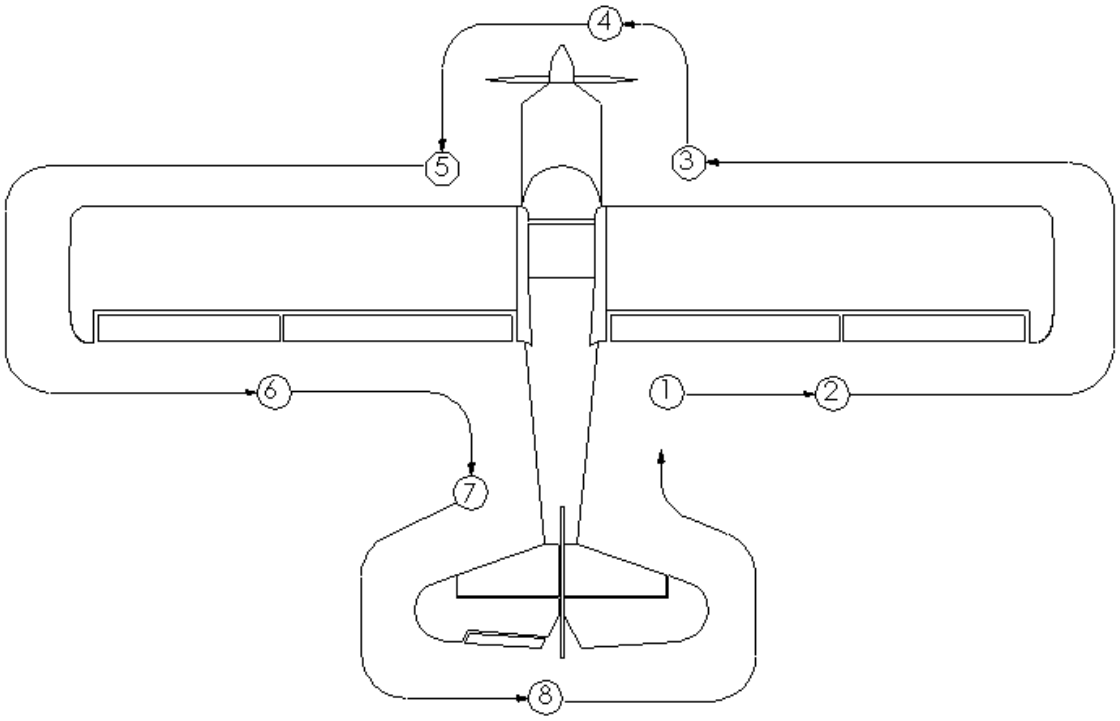
5) a. Check left main wheel for proper inflation.
   b. Check left fuel tank quantity, and then check filler cap security.
   c. Inspect stall warning vane for freedom.
   d. Inspect fuel vent for stoppage.

6) a. Check wing root cover for security.
   b. Check aileron for freedom of movement and security.
   c. Check wing & struts for general condition.

* Determine that the rear seat folding back has restrainer cables to prevent back from folding completely forward and interfering with rear stick movement.

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 & brace wires for general condition.
   b. Check control surfaces for freedom of movement and security.
   c. Check tail wheel security and proper inflation.
   d. Inspect left static port for stoppage.



Pre-Flight Inspection (See Page 9)

2.1.10 Pre-Start Check

1) Seat belts - Adjust and secure.
2) Fuel Valve handle - “ON”.
3) Brakes - Test and set.
4) Radios and electrical equipment - “OFF”.

2.1.11 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.

2.1.12 Cockpit Pre-Flight

1) Cabin door - latched.
2) Flight controls - Check for freedom and operation.
3) Trim tab - take-off setting.
4) Flight instruments and radios - set.

2.1.13 Engine Run-Up

1) Throttle setting - 1800 RPM.
2) Magnetos - check
   (200 RPM maximum drop - 50 RPM max. differential between mags.)
3) Alternate Air - Check operation.
4) Engine instruments - within green arc.
5) Propeller control - Check operation. (Constant speed propeller)

2.1.14 Take-Off

1) Alternate Air - cold.
2) Throttle - full open.
3) Mixture full rich. (or as required by field evaluation)
4) Engine instruments within green arc.
5) Propeller control full increase - RPM (Constant speed propeller)

2.1.15 Climb (Normal)

1) Throttle - full open.
2) Mixture - rich or leaned as required.
3) Engine instruments - within green arc.
4) Climb speed - Best rate of climb.

2.1.16 Cruising

1) Power - as desired. (2550 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.

2.1.17 Landing Check-List

1) Mixture - rich.
2) Alternate Air - check operation and return to cold.
   (Unless icing conditions exist.)
3) Propeller control - full increase RPM.
4) Airspeed - 75-80 mph.

2.1.18 Balked Landing (Go Around)

1) Throttle - full open.
2) Alternate Air - cold.
3) Airspeed 75 mph.
4) Trim - Re-Set.

2.1.19 After Landing

1) Alternate Air - cold.

2.1.20 Shut Down 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.
7) Flaps - full down.

2.1.21 Noise Characteristics

The noise level for this airplane measured in accordance with FAR 36, Appendix G at full throttle, 2700 RPM.	All Propellers: 76.79 dBA

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

2.2 Emergency Procedures

2.2.1 Engine Restart

Caution: If propeller ceases to turn, diving will not cause windmilling.

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 – ¾ Forward
3) Mixture – Full Forward
4) Propeller – Full Forward
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 & magneto switches - OFF.
4) Cabin heater off.
5) Extinguish with fire extinguisher.

2.2.5 Engine Fire (In 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 file develop, the following procedures are recommended:

1) Master switch “OFF”.
2) All electrical switches “OFF”.
3) Open air vents or windows **ONLY** if absolutely necessary for ventilation.
4) Proceed to the nearest suitable airport for landing.

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

1) Disengage and isolate each power circuit.
2) Engage each circuit separately. Allow sufficient time to analyze for faulty operation.
3) When faulty circuit is identified, disengage faulty circuit.
4) Properly functioning circuits may be re-engaged.
5) 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 upon the red emergency door release handle and pushing door away from aircraft. If necessary, exit may be made from left side of aircraft by opening left window. Force forward portion of window past its hinge stops by pushing out on forward window frame.

ACAC – Addendum

Model 8KCAB with

Lycoming Engine AEIO-360-H1B (180 HP)

Record of Revisions

LET	By	Description	Date	Pages Affected
A	JJB	Retyped Addendum, Updated for 1950 lbs Gross Weight	10-23-03	All

3.0 PERFORMANCE INFORMATION

3.1 CLIMB SPEEDS

Best Rate-of-Climb Speed at Sea Level: 82 MPH (71 Knots) CAS
Best Angle-of-Climb Speed at Sea Level: 58 MPH (50 Knots) CAS

Best Rate-of-Climb Speed Decreases 1 MPH per 2000ft Gain of Pressure Altitude.
Best Angle of Climb Speed Increases 1 MPH per 1500ft Gain of Pressure Altitude.

3.2 SERVICE CEILING

Service Ceiling: 16000 ft

3.3 AIRSPEED SYSTEM CALIBRATION

Indicated airspeed (IAS) is identical to calibrated airspeed (CAS) from stall up to 140 MPH. From this speed the following calibration exists.

IAS (MPH)	CAS (MPH)
140	139
150	148
160	158
170	167
180	185
200	194

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.

ACAC Addendum Page 3 shows the moment and loading envelope diagrams applicable to the 8KCAB. A weight and balance report containing the airplane empty weight, 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 the total airplane moment from the minimum weight to the 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 100lb passenger, move vertically upward along the weight scale to 100lbs., move horizontally to the passenger line, the moment contribution is read vertically downward from this point, i.e. 4500 lbs.

To determine if a particular weight configuration is acceptable, find the total weight and the total moment by summing the contributions of each component, including the empty airplane (oil moment is negative and must be subtracted). On the loading diagram, locate the intersection to the horizontal total weight line and the vertical total moment line. If this intersection lies within the envelope, the configuration is acceptable.
(ACAC Addendum Page 4)

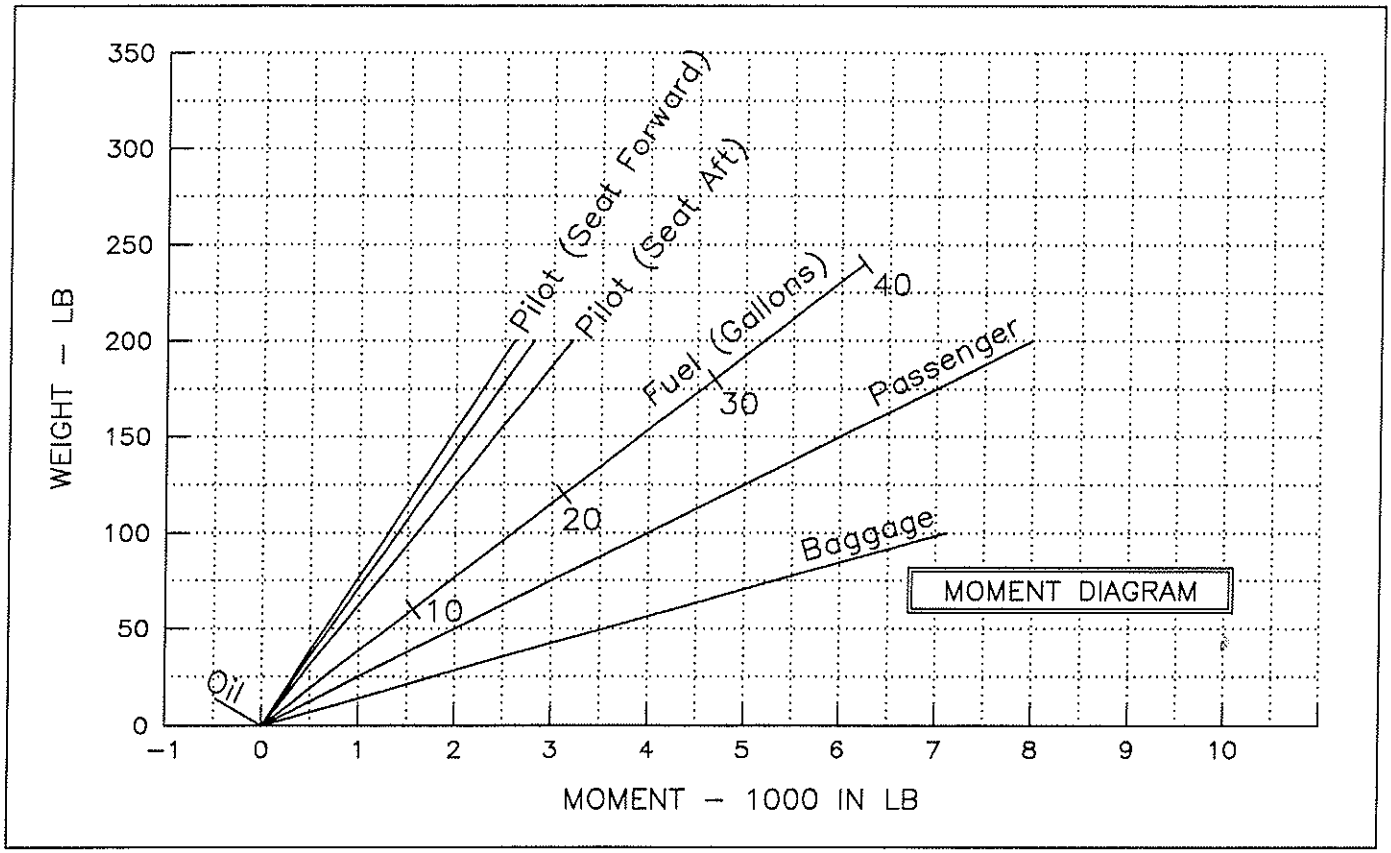
Note the distinction of normal and acrobatic category areas. Acrobatic category operations are prohibited outside of the acrobatic category envelope and at total weights above 1800 lbs. Reference section 1.2 of the aircraft flight manual for aerobatic category limitation.

4.2 WEIGHT AND BALANCE

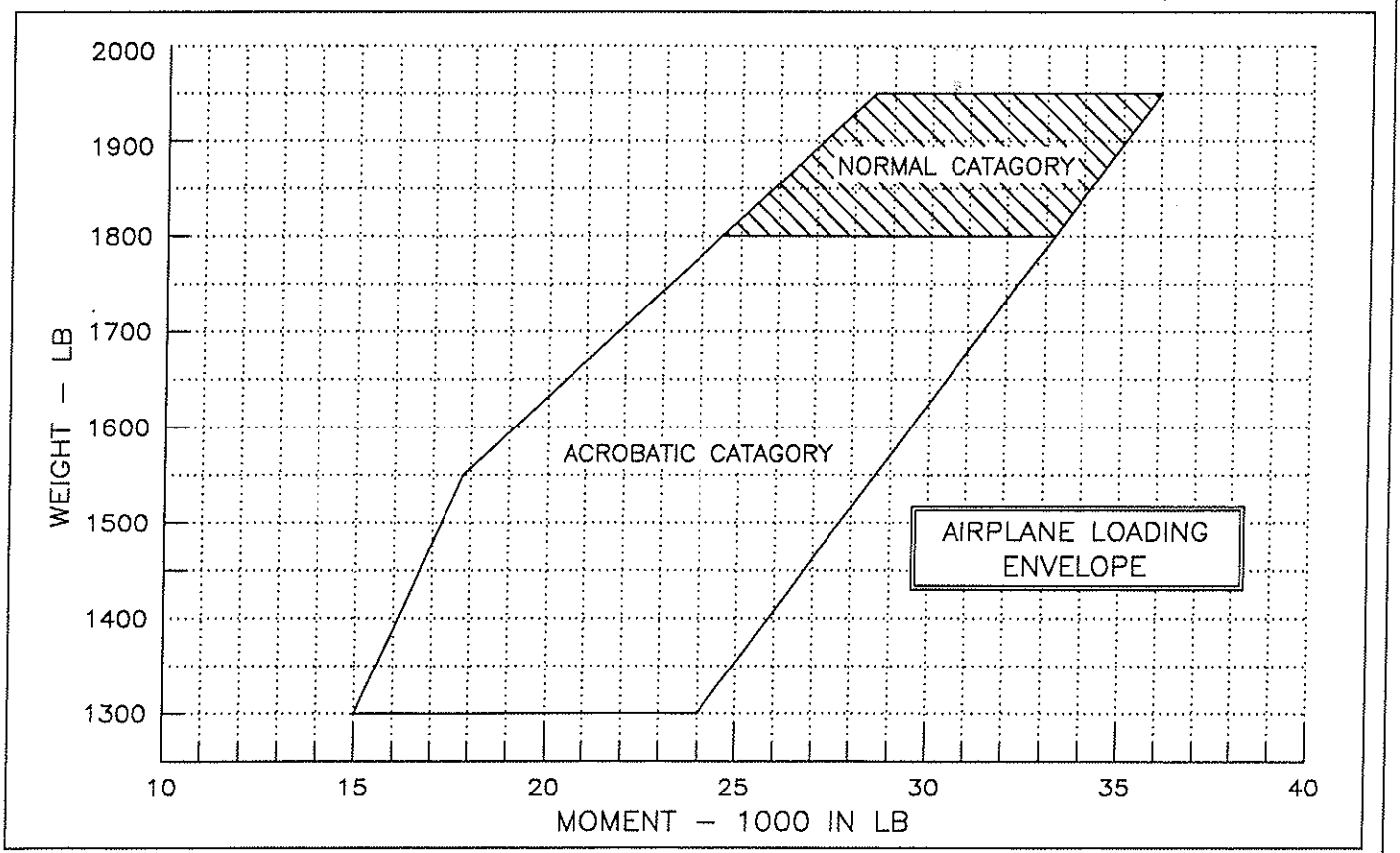
The weight and balance report give the official aircraft empty weight, empty moment, empty CG, and useful load. The empty weight includes unusable fuel and undrainable oil. (ACAC Addendum Page 3)

4.3 EQUIPMENT

Each item installed on the airplane at the time of weighting is marked with and X on the equipment list. The weight and moment are of each item are also shown. The accelerometer is required for acrobatic category operation only. (ACAC Addendum Pages 5-9)

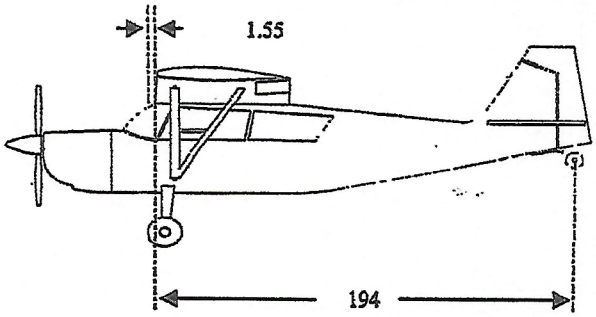


Add weights and moments of items in MOMENT DIAGRAM to airplane empty weight and moment. (negative oil moment) Locate intersection of total weight and moment on AIRPLANE LOADING ENVELOPE. Any point within the envelope meets all balance requirements.



AMERICAN CHAMPION AIRCRAFT CORPORATION
ROCHESTER, WISCONSIN 53167

WEIGHT AND BALANCE WORKSHEET



Model Number 8KCAB (180 HP/CS Prop)
Serial Number: 1047-2007
Identification Number: HB-KHN
Date: 08.08.2023
Signed:

HM-2507 AG HELI-MAINTENANCE CH-145.0241

Aircraft Leveling Means: Drop plumb line from wing leading edge so that it is 12.18 inches forward of front face fuselage wing strut fitting.

Weight Actual: 1395

1. Left Wheel Weight: 662 lbs. Right Wheel Weight: 661 lbs.
2. Tail Wheel Weight 72 lbs.
3. Total Aircraft Weight (Full Oil): 1395 lbs.

C.G. = (194 in. x 72 lbs.) / 1395 lbs. + 1.55 in. = 11.56 in Aft L.E.

	WEIGHT (lbs.)	ARM (in.)	MOMENT (in. lbs.)
Aircraft Weight with Full Oil	1395	11.56	16126,2
Subtract Drainable Oil (of 19 lbs, 5 lbs. is undrainable)	-14	-34	476,0
Add 0.75 Gallons Unuseable Fuel (Header Tank)	+4.5	-13	- 58,5
Add 2.25 Gallons Unuseable Fuel (Wing Fuel Tanks)	+13.5	+26	351,0
TOTALS	1399	XXXXX	16894,7

Aircraft Empty C.G. 12,08 in. aft datum
Normal Category Useful Load 612 lbs.
Acrobatic Category Useful Load 462 lbs.

Datum: Wing Leading Edge

CENTER OF GRAVITY LIMITS:
NORMAL CATEGORY (+ 14.7 in.) To (+ 18.5 in.) At 1950 lbs.
ACROBATIC CATEGORY (+ 13.5 in.) To (+ 18.5 in.) At 1800 lbs.
(+ 11.5 in.) To (+ 18.5 in.) At 1550 lbs. or less
Straight line variation between points given.

SECTION IV

FLIGHT PERFORMANCE

INDEX

GENERAL

This data is to inform the pilot what he can expect from the aircraft in the way of performance and to assist in preflight planning.

Flight performance data is included for the Super Decathlon (8KCAB). The data has been compiled from both estimated calculations and actual flight test using average piloting techniques, with an aircraft and engine in good operating conditions. All information is corrected for standard atmospheric conditions.

Performance may vary from the given data due to the many possible variables present with a specific aircraft and flight condition. The pilot is therfore encouraged to maintain a personal flight log for his aircraft. This will not only provide more accurate preflight planning information for future flights, but also can be used as an indicator in determining the general condition of a particular aircraft.

WARNING

This manual includes the performance data for the Super Decathlon. It is the pilot's responsibility to insure that the correct performance chart is used.

AIRSPEED CALIBRATION

CAS (MPH)	IAS (MPH)
60	60
70	70
80	80
90	90
100	100
120	120
140	141
160	163
180	184
200	206

NOTE

1. Assumes zero instrument error
2. Maximum gross weight of 1950lb at the forward CG limit

STALL SPEEDS

Model	CAS (MPH)			
	Angle of Bank			
	10°	20°	30°	40°
Super Decathlon	56	57	60	64

NOTE

1. Gross weight of 1950lb
2. Power off

TAKEOFF DISTANCE

CONDITIONS

1. Level, Hard Surface, Dry Runway
2. Zero Wind
3. Aircraft Loaded to 1950lb

PILOT TECHNIQUE: Refer to "TAKEOFF – OBSTACLE" in Section III

1. Speed at Lift-Off – 50 mph IAS
2. Speed at 50 Feet – 58 mph IAS

WARNING

The aircraft must be pitched forward to a safe power off speed should a power failure occur during climb-out; failure to respond immediately may result in a stall at low altitude.

Pressure Altitude (ft)	Distance (ft)									
	0°C		10°C		20°C		30°C		40°C	
	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'
0	533	978	564	1032	596	1089	626	1144	656	1198
1000	569	1016	601	1097	634	1158	665	1216	697	1276
2000	610	1116	645	1179	678	1240	714	1305	750	1372
3000	658	1204	694	1268	732	1339	771	1409	807	1476
4000	706	1292	745	1363	786	1436	826	1510	868	1589
5000	765	1398	810	1480	851	1556	894	1636	941	1721
6000	831	1517	876	1599	917	1688	971	1777	1020	1864

NOTE

1. Data presented in this table represents maximum airplane capability at speeds shown and requires aircraft in good operating condition and a proficient pilot.
2. Decrease distance 20% for each 10 mph of head wind.
3. This data does not consider the effects of takeoff from soft and/or grass fields and takeoff with tail wind. Takeoff performance under these conditions varies substantially. Good pilot judgment must be used under all conditions to insure safe operation.

TIME, FUEL AND DISTANCE TO CLIMB

CONDITIONS

1. Standard Temperature.
2. Data for 1800 lb Weight
3. Full Throttle, 2700 RPM.

PILOT TECHNIQUE: Refer to "CLIMB" in Section III.

1. Maximum Rate of Climb.
2. Lean Only as Required to Maintain Smooth Engine Operation.

Pressure Altitude (ft)	Standard Temp (° C)	Climb Speed (mph-IAS)	Rate of Climb (fpm)	From Sea Level		
				Time (min)	Fuel (gal)	Distance (sm)
0	15	80	1230	0	1.0	0
1000	13	80	1160	1	1.2	1
2000	11	79	1090	2	1.4	2
3000	9	79	1020	3	1.7	4
4000	7	78	940	4	1.9	5
5000	5	78	880	5	2.2	7
6000	3	77	790	6	2.4	8
7000	1	77	730	7	2.7	10
8000	-1	76	660	9	3.0	12
9000	-3	75	590	10	3.3	14
10000	-5	75	520	12	3.7	17
11000	-7	74	440	14	4.0	20
12000	-9	74	370	17	4.5	24
13000	-11	73	300	20	5.0	28
14000	-13	73	230	23	5.6	34
15000	-15	72	160	29	6.4	42

NOTES

1. Data presented in this table represents maximum airplane capability at speeds shown and requires aircraft in good operating condition and a proficient pilot.
2. Distances shown are based on zero wind.
3. Allow one gallon fuel for engine start, taxi and takeoff.
4. Decrease distance for head wind or increase distance for tail wind with the following increment: Time(min)/60 x wind component in the direction of flight (mph).

CRUISE PERFORMANCE (cont'd)

% POWER	RPM	M.P.	TAS MPH	GPH
		7500 Ft.		
80	2600	23.0	154	12.0
75		21.8	151	9.7
70		20.6	146	9.3
65		19.5	141	8.8
60		18.4	136	8.3
55		17.2	131	7.9
80	2500	23.6	154	11.8
75		22.4	151	9.6
70		21.2	146	9.1
65		20.0	141	8.7
60		18.7	136	8.1
55		17.5	131	7.7
80	2400	24.3	154	11.5
75		23.0	151	9.5
70		21.8	146	8.9
65		20.5	141	8.5
60		19.2	136	8.0
55		18.0	131	7.6
		10,000 Ft.		
70	2600	20.2	150	9.3
65		19.0	145	8.8
60		17.8	139	8.3
55		16.7	133	7.9
50		15.5	125	7.4
70	2500	20.6	150	9.1
65		19.4	145	8.7
60		18.2	139	8.1
55		17.0	133	7.7
50		15.8	125	7.2
70	2400	21.2	150	8.9
65		20.0	145	8.5
60		18.7	139	8.0
55		17.4	133	7.6
50		16.2	125	7.1

NOTE

eeds shown bases on aircraft with optional strut fairings and streamlines tail wires. Redeuce figures shown by 2% for aircraft not so equipped.

CRUISE PERFORMANCE

CONDITIONS

1. Standard Temperature.
2. Data for 1800 lb Weight
3. Maximum cruise is normally limited to 75% power.
4. All fuel consumption estimates are based on the recommend lean mixture (see Section III) when at or below 75% power and full rich above 75% power.

% POWER	RPM	M.P.	TAS MPH	GPH
2500 Ft.				
85	2600	25.3	151	12.5
80		24.1	147	12.0
75		23.0	144	9.7
70		21.8	139	9.3
65		20.6	136	8.8
60		19.5	131	8.3
85	2500	25.9	151	12.3
80		24.7	147	11.8
75		23.5	144	9.6
70		22.3	139	9.1
65		21.1	136	8.7
60		19.9	131	8.1
85	2400	26.5	151	12.2
80		25.2	147	11.5
75		24.0	144	9.5
70		22.8	139	8.9
65		21.5	136	8.5
60		20.3	131	8.0
5000 Ft.				
80	2600	23.6	151	12.0
75		22.4	147	9.7
70		21.3	143	9.3
65		20.1	139	8.8
60		18.9	134	8.3
55		17.7	128	7.9
80	2500	24.1	151	11.8
75		22.9	147	9.6
70		21.7	143	9.1
65		20.5	139	8.7
60		19.3	134	8.1
55		18.1	128	7.7
80	2400	24.9	151	11.5
75		23.6	147	9.5
70		22.3	143	8.9
65		21.0	139	8.5
60		19.8	134	8.0
55		18.5	128	7.6

NOTE
Speeds shown based on aircraft with optional strut fairings and streamlined tail wires. Reduce figures shown by 2% for aircraft not so equipped.

TAKEOFF DISTANCE

CONDITIONS

4. Level, Hard Surface, Dry Runway
5. Zero Wind
6. Aircraft Loaded to 1950lb

PILOT TECHNIQUE: Refer to "LANDING – OBSTACLE / SHORT FIELD" in Section III

3. Approach Speed – 60 mph IAS
4. Throttle – as required to control decent rate
5. Maximum Braking

WARNING

A relatively high rate of descent is possible in this configuration when at full gross weight and the throttle closed. If airspeed is allowed to decrease below the approach speeds shown, landing flare can only be assured with an application of power.

Pressure Altitude (ft)	Distance (ft)									
	0°C		10°C		20°C		30°C		40°C	
	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'	Ground Run	Total to Clear 50'
0	484	1094	494	1115	502	1137	510	1154	521	1176
1000	494	1115	502	1137	511	1155	520	1177	529	1198
2000	503	1137	512	1156	521	1178	531	1200	539	1219
3000	512	1156	522	1179	532	1201	540	1220	550	1244
4000	522	1179	532	1201	541	1222	551	1245	559	1265
5000	532	1201	542	1223	552	1246	561	1267	571	1289
6000	542	1223	552	1246	562	1268	572	1290	581	1311

NOTE

1. Data presented in this table represents maximum airplane capability at speeds shown and requires aircraft in good operating condition and a proficient pilot.
2. Decrease distance 20% for each 10 mph of head wind.

SECTION V

WEIGHT AND BALANCE

INDEX

GENERAL

It is the pilot's responsibility to insure that the aircraft is loaded properly and within the weight and balance limitations. All flight performance, procedures and characteristics are based on this prerequisite.

If the aircraft is to be used for aerobatic flight, it must be loaded within the approved flight envelope. The rear center-of-gravity limit is considered critical. In addition, no baggage is allowed.

The gross weight limit is the same for both normal and acrobatic category. The importance of this limit cannot be over emphasized especially when performing aerobatics. Subjecting the aircraft to the maximum approved load factor limits in an overgross condition may result in damage or complete structural failure of the airframe.

The actual licensed empty weight and center of gravity (C.G.) of a specifice aircraft can be found in Section 4 of the FAA Approved Airplane Flight Manual. All additional changes to the aircraft empty weight and C.G. after the time of manufacture must also be attached to Section 4 of the flight manual. From this information and the following instructions, the pilot can easily determine the "Useful Load" and proper loading distribution for the aircraft.

A loading graph and flight envelope is given in this section and in Section 4 of the FAA Approved Flight Manual as an aid to weight and balance calculation.

LOADING PROCEDURE

1. Determine from the Weight and Balance Sheet, in the aircraft file, the "Licensed Empty Weight and Moment" (in lbs.). Enter these figures under "Your Airplane" of the Sample Loading Problem, Figure 5-1.

2. Full oil capacity can be assumed for all flights. For ease of future loading computations, the new "Empty Weight and Moment With Oil" should be determined and entered in the Sample Loading Problem under "Your Airplane".

3. Using the Loading Graph, Figure 5-2, determine the weight and the moment of the following items and enter these figures on the Sample Loading Problem.
   a) Pilot
   b) Rear Passenger
   c) Wing Fuel - 40 Gals. Maximum Useable @ 6 Lbs./Gal.
   d) Baggage - 100 Lbs. Maximum (Normal Category Only).

4. Add the "Aircraft Empty Weight and Moment with Oil" and all the items in Step 3 to determine the "Gross Takeoff Weight and Moment".

5. Using the Flight Envelope, Figures 5-3, determine that the gross takeoff weight and moment are within limit-

WARNING

If the aircraft is not within the approved flight envelope limits, it must be reloaded. Under no circumstances should the aircraft be flown with an out of limits condition, particularly if aerobatic flight is contemplated.

SAMPLE LOADING PROBLEM				
ITEM	SAMPLE AIRPLANE		YOUR AIRPLANE	
	WEIGHT (lbs)	MOMENT (in-lbs)	WEIGHT (lbs)	MOMENT (in-lbs)
1) Licensed Empty Weight	1270	17851		
Oil-8qts @ 7.5 lbs/gals	+15	-543		
2) Licensed Empty Weight & Moment with Oil	1285	17308		
3) Pilot	190	3025		
Rear Passenger	190	8500		
Wing Fuel 40 Gals Max @ 6 lbs/gal	120 (20 gal)	3125		
Baggage-100 lbs Max (Normal Category Only)	-0-	-0-		
4) Gross Takeoff Weight & Moment	1785	31958		

NOTE:
1) Use Figure 5-2 loading graph to etermine moment.
2) To determine Takeoff Center of Gravity (inches aft of datum), divide the Gross Takeoff Moment by the Gross Takeoff Weight. Center of Gravity Limits are listed in Section I.
3) The above sample problem is loaded for aerobatic flight conditions and assumes a 170 pound pilot and passenger with parachutes.

FIGURE 5-1 SAMPLE LOADING PROBLEM

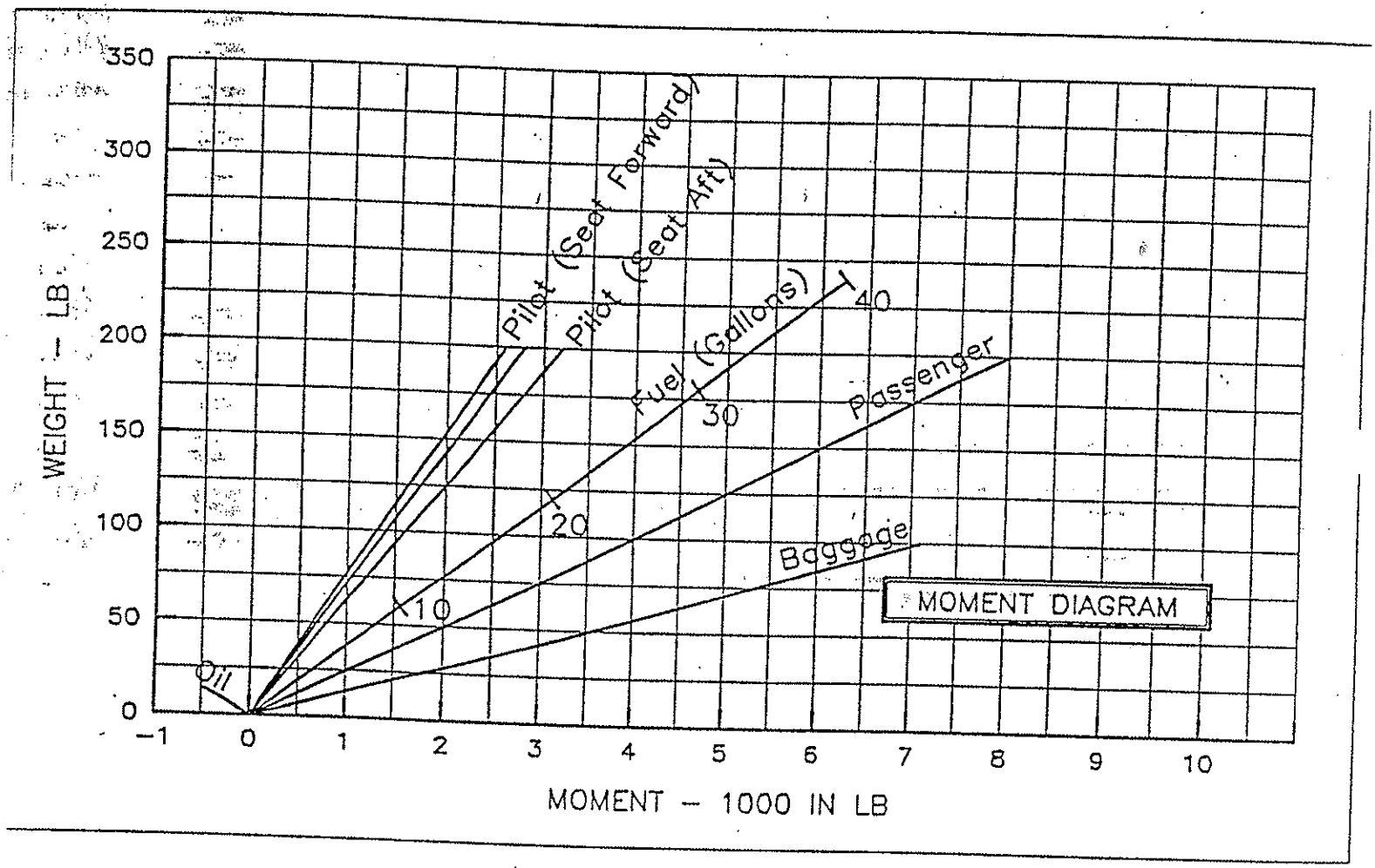


FIGURE 5-2 LOADING GRAPH

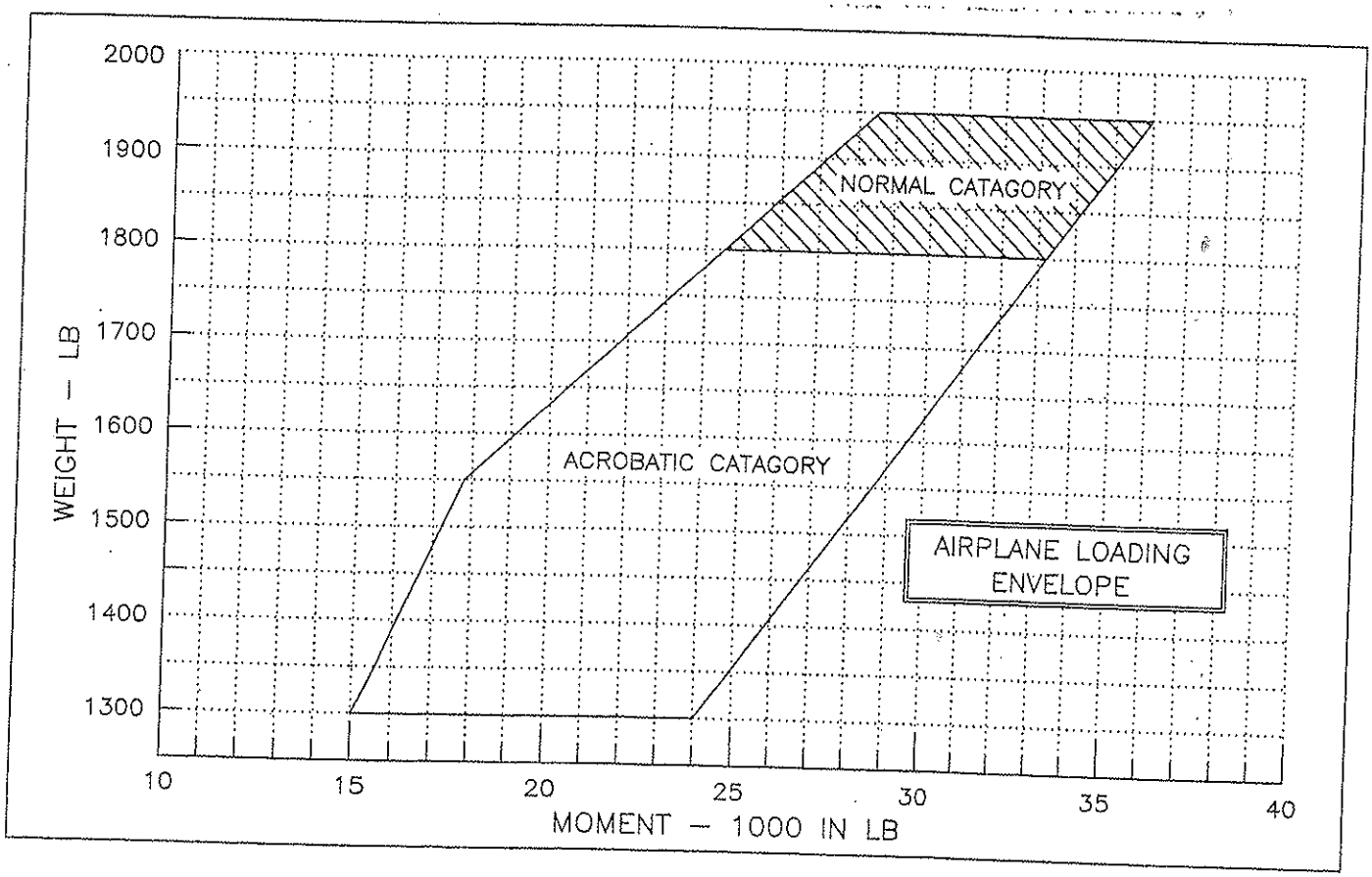


FIGURE 5-3 SUPER DECATHLON WEIGHT and BALANCE FLIGHT ENVELOPE

SECTION VI

AIRCRAFT AND SYSTEM DESCRIPTION

INDEX

GENERAL

The Super Decathlon is a single engine tandem two place, strut braced high wing airplane. The fuselage is a welded steel tube frame and the wing is constructed from formed aluminum ribs and spars. The airframe is covered with Dacron.

ENGINE/PROPELLER

The engine is a Lycoming normally aspirated, direct drive, air cooled, horizontally opposed, four-cylinder engine. The engine oil system differs from a conventional wet sump type in that its design provides for both normal and inverted operations. See Figure 6-1 for the system schematic and detailed operational information.

The Hartzell propeller on the Super Decathlon is a counterweighted constant speed propeller. The counterweights provide a fail safe feature causing the propeller to go to low RPM if oil pressure is lost. This protects against a possible overspeed condition. A venier propeller control is located at the left side of the instrument panel.

THROTTLE CONTROL

The throttle control is in a quadrant on the left side of the cabin with front and rear throttles interconnected.

ALTERNATE AIR CONTROL

This control is located directly below the throttle. Alternate hot air is provided by pulling the control knob to the rear. Extended use of alternate air is not recommended as this air is not filtered.

MIXTURE CONTROL

This control is located on the left side of the instrument panel. To lean the mixture (at 75% power or below), pull the control away from the panel as required. Pulling the mixture control all the way out, provides the fuel cutoff to the engine.

ELECTRIC FUEL PUMP CONTROL

The switch for the electric fuel pump is located on the control panel next to the mixture control.

BATTERY

The Super Decathlon has a
The battery is located behind the baggage compartment.

The battery must be inspected frequently when the aircraft is being used for aerobatics and serviced in accordance with instructions in Section VII of this manual.

ALTERNATOR

The 60 amp alternator provides charging current and has sufficient capacity to operate all electrical equipment without battery drain. During inverted flight, the charging circuit is disconnected by a mercury switch.

OVER VOLTAGE CONTROL

The airplane electrical system is protected from surge by an over voltage control which is mounted on the top right side of the firewall.

VOLTAGE REGULATOR

Alternator output is controlled by the voltage regulator. This regulator also protects the alternator circuit against overload and should be adjusted only by a qualified mechanic.

ELECTRICAL PANEL

All electrical switches (except the starter and the electric fuel pump switch), are on the electrical panel located on the upper left side of the cabin.

MASTER SWITCH

The master switch is on the electrical panel and activates the master switch solenoid which connects the battery and alternator to the rest of the electrical system. Electrical equipment will not operate with the master switch off; however, the engine will run with the master switch off since ignition is provided by the magnetos.

IGNITION SWITCHES

Ignition switches for the left and right magnetos are to the right of the master switch. Since ignition is provided by the magnetos, the ignition switches must be on to operate the engine.

EQUIPMENT SWITCHES

Switches for operation of standard electrical equipment -- navigational lights, landing light and optional equipment are to the left of the master switch.

STARTER SWITCH

A push button switch, located on the control panel, operates the electrical starter. The master switch must be on to operate the starter.

AMMETER

The ammeter measures current to or from the battery. A normal condition is indicated by a zero reading or a plus reading on the ammeter. A negative reading indicates a current draw from the battery which can result from an overloaded system or a faulty charging system.

SEATS

Front and rear seats are welded steel tube construction with removeable cushions to permit the use of parachutes. The front seat is adjustable fore and aft. The adjustment control knob is located on the right underside of the seat. Adjustments should be made before taxi or takeoff as necessary to insure full and comfortable access to all required controls.

BRAKES

Hydraulic brakes are provided for both front and rear seats. A parking brake control is also provided. To operate the parking brake, depress the brake pedals and pull out the control located under the far right side of the instrument panel. To release the parking brake, push the control all the way in.

CABIN DOOR

The Super Decathlon is equipped with a cabin door which can be jettisoned if necessary. The door is secured by a lock-equipped latch at the rear edge and a latch on the top and forward edge.

The emergency door release handle is near the forward edge of the door.

To jettison the cabin door:

1. To operate the door jettison handle, pull the red ring firmly to remove the safety locking pin, then pull the red handle aft and up as possible. This removes the door hinge pins.

2. Push or kick the door free of the aircraft.

NOTE

If necessary, emergency exit may be made from the left side of the aircraft by opening the left side window and forcing it past its hinge strap by pushing hard on forward window frame.

INSTRUMENTS

All instruments except the fuel gauge are on the instrument panel directly in front of the pilot. Basic instruments are marked with a green arc for the normal operating range, a yellow arc for the caution range and red radial lines for maximum or minimum permissible values. Specific markings for each instrument are given in the FAA Approved Airplane Flight Manual.

SEAT BELTS AND HARNESSES

All Super Decathlons are equipped with lap belts and shoulder harnesses in both front and rear seats. A secondar inverted harness is available as optional equipment.

The secondary inverfed flight harness consists of a double strap shoulder harness, a lap belt and a crotch strap. A five point rotary buckle connects the strap and will release the shoulder harness and lap belt with one movement.

The primary harness may be used alone; however, the inverted harness should not be used without the primar shoulder harness. The inverted harness does not restrain the pilot from forward movement.

PITOT STATIC SYSTEM

The pitot tube is located on the bottom side of the left wing. The static ports are located on the side of the aircraf just aft of the cabin section (one port on each side of the aircraft).

ELEVATOR TRIM TAB

The trim tab control is mounted on the left side of the cabin. This type of trim control permits very rapid trim inputs if necessary. Rudder trim is provided by a ground adjustable tab.

CABIN HEATER

Cabin heat is provided by an exhaust shroud heater. An optional rear seat heater provides additional heat to the rear of the cabin whenever alternate air is not in use.

Push-pull heater control is located on the left side of the cabin under the instrument panel. The optional rear heater control is located on the right side of the cabin under the instrument panel.

BAGGAGE COMPARTMENT

The baggage compartment behind the rear seat accomodates 100 lbs. of baggage or cargo. The back of the seat folds for access.

No baggage or loose articles are to be carried during aerobatic flight.

ENGINE OIL SYSTEM

Figure 6-1 presents the oil system schematic and detailed operational information. Components related to propeller control system are not shown.

NOTE

Oil pressure during inverted flight may normally be five to ten pounds less than oil pressure during normal flight.

Figure 6-1 shows the basic operating principles involved in the oil system. For more detailed information concerning a particular engine model, see the Lycoming Engine Operator's Manual.

INDUCTION AIR FILTER

An induction air filter is located in the cowling and filters all air entering the engine. Alternate (hot) air is not filtered and continuous use is not recommended.

TIRES

The Super Decathlon is fitted with conventional aircraft type 6.00 x 6, 4 or 6 ply tires.

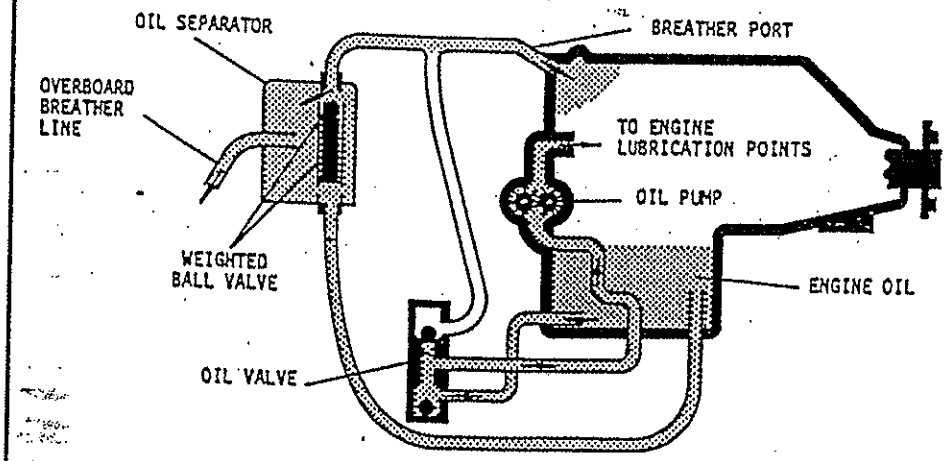
FUEL SYSTEM

The fuel system is shown in Figure 6-2. Welded aluminum fuel tanks are located in the inboard section of the wing. Two 20 gallon tanks are standard. Wing tanks proper can be drained by removeing a 1/4" pipe plug from the inboard corner of the tank. Fuel lines between the tanks and the rear sump are drained from a quick drain on the belly of the aircraft.

The gascolator is mounted on the firewall in the engine compartment. The sediment bowl is removeable for cleaning and replacement of the fuel filter. The fuel shut-off valve is located on the left side of the cabin. The Super Decathlon fuel system is an "ON - OFF" system.

Fuel quantity is read from mechanical float type gauge(s) located in the fuel tank(s). These gauges are only accurate in the level flight attitude.

NORMAL FLIGHT OPERATION

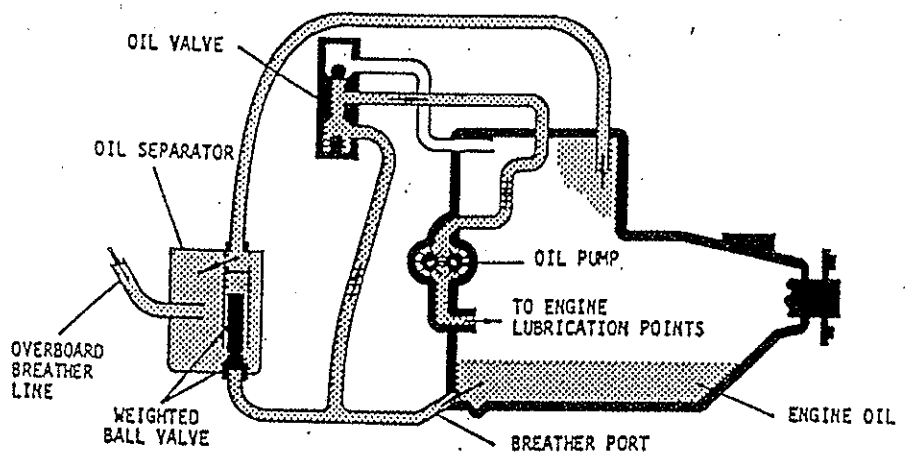


During normal flight, the weighted ball valve at the top of the oil separator is open allowing blowby gases from the engine crankcase to be vented from the breather port, to the oil separator and out through the overboard breather line. The top port of the oil valve is closed and the bottom port is open allowing oil to flow from the sump out through the oil valve, up to the pump and out to the engine lubrication points.

NOTE

Momentary oil pressure interruptions (up to a maximum of 15 seconds) is normal when the system is initially returned to normal operation from inverted flight.

INVERTED FLIGHT OPERATION



When the aircraft is inverted, engine oil falls to the top of the crankcase. The weighted ball valve in the oil separator closes permitting the engine oil pump to draw oil through the oil valve from the crankcase and preventing overboard loss of oil through the oil separator. Blow-by gases from the engine crankcase are vented from the sump to the oil separator and out through the overboard breather line. The top port of the oil valve is open and the bottom port is closed allowing oil to flow out from the breather port, to the oil valve, to the oil pump and out to the engine lubrication points. Any oil in the lines which fails to return to the sump during the transition between normal and inverted flight drains into the oil separator. This oil then returns to the sump from the bottom of the oil separator during periods of normal flight.

NOTE

Momentary oil pressure interruptions (up to a maximum of 15 seconds) is normal when the system is initially inverted.

FIGURE 6-1 OIL SYSTEM SCHEMATIC

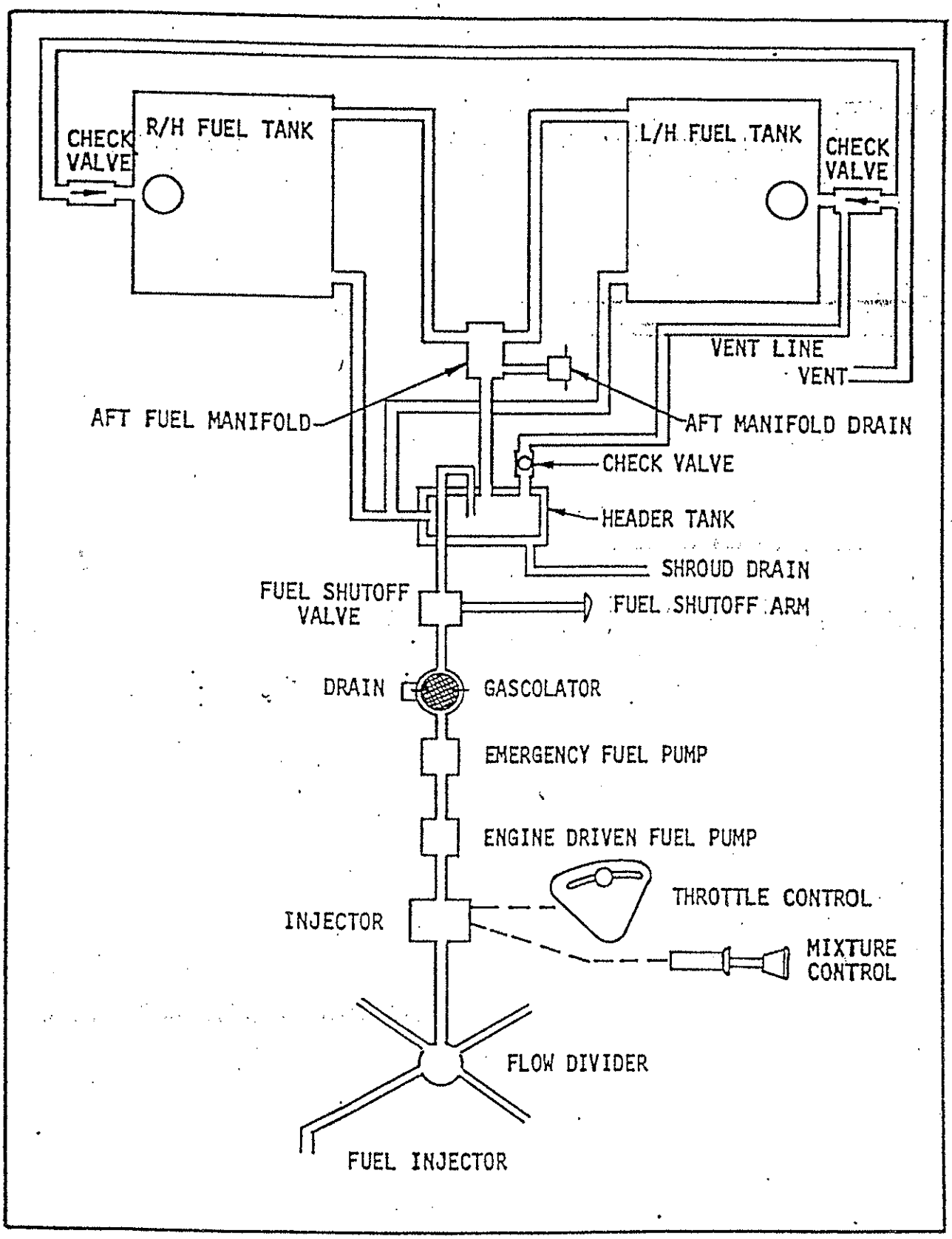


FIGURE 6-2 FUEL SYSTEM SCHEMATIC

VENT SYSTEM

Fuel tank air spaces are interconnected and positive venting is provided through a tube which protrudes from the bottom of the left wing just outboard of the tank. A check valve is provided at the vent outlet of each tank to minimize inverted fuel loss.

SYSTEM OPERATION

Fuel is gravity fed from the tanks to the engine.

FUEL PUMPS

The Super Decathlon engine is fuel injected and two fuel pumps are required.

1. An engine-driven, cam-operated pump which operates whenever the engine is running to supply fuel at proper pressure to the fuel injector.

2. An emergency electric pump on the firewall in the engine compartment. The control switch for the electric fuel pump is located on the control panel next to the mixture control.

PRIMER

To prime the engine, turn on the master switch and the electric fuel pump with throttle closed and mixture in idle cut-off. To provide one stroke of prime, move mixture control to full rich and back to idle cut-off. This injects fuel directly into the cylinders. Return electric fuel pump to "OFF" after priming.

FUEL PRESSURE GAUGE

The fuel pressure gauge on the right side of the instrument panel indicates the fuel pressure at the injector inlet.

HEADER TANK

To provide limited fuel in the inverted position, a shrouded 1.5 gallon header tank is located in the forward cabin under the instrument panel. The outlet from the header tank consists of a standpipe located at the center of the tank. Thus half of the tank capacity can be used in the inverted position. Even though the inverted fuel supply has not been exhausted, inverted flight must be terminated immediately if oil pressure should drop below acceptable limits.

NOTE

The fuel filler cap used on the Super Decathlon is a nonventing type. A loose cap, or one that is not sealing properly, may cause a fuel unbalance from one tank to another. If an excessive fuel unbalance exists, check the caps for security and the filler cap gasket for condition. Flying the aircraft in an uncoordinated manner or parking the aircraft on a slope may also cause fuel unbalance. Do not assume fuel in left tank is identical to that shown on right tank fuel gauge.