AMERICAN CHAMPION AIRCRAFT
CORPORATION

"Dedicated to Preserving a Classic"

PILOT'S OPERATING MANUAL

8KCAB
Super Decathlon

934-2003 and Newer*

*Model year is indicated by serial number suffix.

Issued: March, 2007

Revision	Pages Affected	Description of Change	Date

FOREWORD

This manual has been prepared to inform the pilot of features and systems incorporated into the American Champion Aircraft Super Decathlon. Recommended operation procedures and performance data are provided so that maximum utilization can be obtained with the utmost safety, economy and serviceability.

It is strongly recommended that the pilot be familiar with the aircraft and this manual prior to flight. It is considered mandatory that the pilot familiarize them self with the Emergency Procedures Section prior to flight.

This manual applies only to the aircraft indicated on the cover page. Use of this manual with other aircraft is not recommended.

This manual does not replace the FAA Approved Airplane Flight Manual. If an inconsistency exists between the manuals, the FAA Approved Airplane Flight Manual is to be the authority.

The words "WARNING", "CAUTION" and "NOTE" are used throughout the manual with the following definitions:

WARNING

An operating procedure, practice or condition, etc. which may result in injury or fatality, if not carefully observed or followed.

CAUTION

An operating procedure, practice or condition, etc. which if not strictly observed, may damage the aircraft or equipment.

NOTE

An operating procedure, practice or condition, etc. which is essential to emphasize.

TABLE OF CONTENTS

This Manual is current as of its issue date and will be revised as necessary by Service Letters published by American Champion Aircraft Corporation. Service Letters are distributed to American Champion Aircraft Dealers and also available through the American Champion website, www.amerchampionaircraft.com. You must consult with your American Champion Aircraft Dealer for information concerning the revision status of this Manual. Changes to the Manual should be installed and the Log of Revisions updated immediately after receipt of such revisions. The Manual should not be used for operational purposes unless it is maintained in a current status.

SECTION I
OPERATING LIMITATIONS

INDEX

GENERAL

This section lists all power plant and airframe operating limitations. These limitations are also displayed in the aircraft in the form of placards, instrument color markings and in the FAA Approved Airplane Flight Manual. The aircraft placards and instrument markings are the authority if an inconsistency exists with this manual.

AIRSPEED LIMITATIONS

NOTE

Limitations are applicable to both Normal and Acrobatic Categories except where designated as applying to only one category.

Airspeed Designation	CAS (MPH)	Airspeed Indicator Marking
Never Exceed (V_{NE})	200	Red Line
Caution Range	160-200	Yellow Arc
Maximum Structural Cruise (V_{NO})	160	End of Green Arc
Normal Operating Range	54-160	Green Arc
Maneuvering (V_A) Acrobatic Category	132	None
Maneuvering (V_A) Normal Category	107	None

NOTE

CAS – Calibrated Airspeed is indicated airspeed corrected for position and instrument errors.
IAS – Indicated airspeed assumes zero instrument error.
V_{NE} – Maximum safe airspeed which is not to be exceeded at any time.
V_{NO} – Maximum structural cruising speed which is not to be exceeded except in smooth air and then only with caution.
V_A – No full or abrupt control movements allowed above this airspeed.

POWERPLANT LIMITATIONS AND INSTRUMENT MARKINGS

Model	Super Decathlon
Engine, Lycoming	AEIO-360-H1B
Rated Horsepower (hp-rpm)	180-2700
Fuel, Minimum Octane Rating (Approved for Continuous Use)	91/96
Cylinder Head Temperature (°F)	
Maximum (red radial)	500
Normal Range (green arc)	90-500
Oil Temperature (°F)	
Maximum (red redial)	245
Normal Range (green arc)	100-245
Oil Pressure (psi)	
Maximum (red radial)	100
Normal Range (green arc)	60-100
Caution Range (yellow arc)	25-60
Minimum (red radial)	25

Super Decathlon – Hartzell	
Propeller, Hartzell	HC-C2YR-4FC/FC7666A-2
Tachometer (rpm)	
Maximum (red radial)	2700
Normal Range (green arc)	500-2150, 2350-2600
Avoid Continuous Operation (red arc)	2150-2350
Avoid Continuous Operation Acrobatics Only (red arc)	2600-2700

Super Decathlon – MT Propellers	
Propeller, MT Propeller	MTV-15-B-C/C188-34 or MTV-9-B-C/C188-18b
Tachometer (rpm)	
Maximum (red radial)	2700
Normal Range (green arc)	500-2600
Avoid Continuous Operation Acrobatics Only (red arc)	2600-2700

WEIGHT AND BALANCE LIMITS

Super Decathlon	
Maximum Gross Weight	1950 lb
Center of Gravity Range	
Normal Category	+14.7 to +18.5 at 1950 lb +11.5 to +18.5 at 1325 lb or less Straight Line Variation Between Points Given
Acrobatic Category	+13.5 to +18.5 at 1800 lb +11.5 to +18.5 at 1325 lb or less Straight Line Variation Between Points Given
Datum	Wing Leading Edge

FLIGHT LOAD FACTORS

Category	Load Factor Limits	
Normal – 1950lb Gross Weight	Positive	+3.8 G
	Negative	–1.52 G
Acrobatic – 1800lb Gross Weight	Positive	+6.0 G
	Negative	–5.0 G

NOTE

Maximum load factors for Normal Category operations are shown by the ends of the green arc on the accelerometer. Load factors within the yellow arc up to the red radial lines are permitted in the Acrobatic Category only.

FLIGHT OPERATIONS

The Super Decathlon is equipped for day and night VFR operation. FAR part 91 establishes the minimum required equipment for these operations. Inoperative equipment or removal of equipment may further limit operations. The reference to types of operation on the operating limitation placard reflects equipment installed at the time of Airworthiness Certificate issuance.

Flight into known icing conditions is prohibited.

Crosswind landings have been demonstrated in 90° crosswinds up to 17 kts (20 mph).

UNUSABLE FUEL

Fuel remaining in the tanks when fuel gauge reads “0” or “E” (empty) cannot safely be used in flight. Each wing tank holds 20 gallons. The total useable fuel capacity is 20 gallons per tank, 40 gallons total.

A 1.5-gallon header tank provides for inverted fuel, 0.75 gallons are unusable. The useable 0.75 gallons provides for 2.0 minutes of continuous inverted flight. The header tank will automatically refill after approximately one minute of upright, straight and level flight

INVERTED FLIGHT

The Super Decathlon is equipped with inverted fuel and oil systems. The header tank provides fuel for two minutes of continuous inverted flight. Monitor oil pressure while inverted; minimum oil pressure is 60 psi.

WARNING

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

MANEUVERS (Refer to Section III Before Attempting any Maneuver)

Maneuvers	Recommended Entry Speeds (IAS MPH)
Loop (Normal or Inverted)	140
Immelmann	145
Hammerhead Turn	140
Hammerhead Turn (Inverted Entry and Exit)	140
Snap Roll (Normal or Inverted)	90
English Bunt	70
Vertical ½ Slow Roll Up	160
Vertical Slow Roll Up	180
Vertical Slow Roll Down	60
Slow or Barrel Roll	130
Outside Loop (Entry from Top)	70
Horizontal Eight (Inside – Outside)	140
Spin (Normal or Inverted)	Stall

NOTE

Variations or combinations of the above maneuvers are approved provided that the speed or load factor limitations are not exceeded. The aircraft must be operated within the acrobatic category weight and balance envelope without baggage. Refer to Section III before attempting any acrobatic maneuver.

WARNING

Tail slides and tumbling maneuvers are not approved.

WARNING

Flight above 160 mph (CAS) in smooth air only.

WARNING

Maneuvering speed for acrobatic category operations is 132 MPH (CAS). Do not apply full or abrupt use of flight controls above maneuvering speed

REQUIRED PLACARDS

See FAA Approved Airplane Flight Manual for placards required in a specific aircraft. The following placards represent a typical airplane.

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.

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

Seat Belt Restrainer Cable Must be Connected
Before Flight Unless Control Stick is Removed

In Baggage Compartment

Maximum Baggage 100 lbs

On Forward Portion of Left Side Window

Do Not Open Above 130 MPH

Alternate Emergency Exit
Unlatch - Force Forward Portion Past Stop

On Fuel Valve 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 Lights Off When Taxiing in Vicinity of Other Aircraft, or When Flying In Fog or Clouds. Standard Position Lights To Be On for All Night Operations.

On Front Seat Rear Leg (Adjustable Front Seat)

Rear Seat P/N 7-1500 or 7-1501 And
Rear Control Stick P/N 4-1711 Req’d.
With This Seat Install.

On Rear Control Stick

Rear Stick P/N 4-1711

On Rear Seat Front Leg

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

SECTION II
EMERGENCY PROCEDURE

INDEX

GENERAL

This section covers the recommended procedures to follow during emergency and adverse flight conditions. As it is not possible to define every type of emergency that may occur, it is the pilot's responsibility to use sound judgment based on experience and knowledge of the aircraft to determine the best course of action.

NOTE

All airspeeds in this section are indicated airspeeds (IAS) unless stated otherwise.

Familiarization and practice of any emergency procedure must be done under the supervision of a qualified flight instructor under carefully controlled conditions. Refer to Section III prior to performing any maneuvers.

ENGINE FIRE DURING START

If the fire is believed to be confined to intake or exhaust system (result of flooded engine):

1. Continue cranking engine with starter
2. Mixture Control – IDLE CUT-OFF
3. Throttle – FULL OPEN
4. Inspect aircraft thoroughly for damage and cause prior to restart

If fire persists or is not limited to intake or exhaust systems:

1. Mixture Control – IDLE CUT-OFF
2. Fuel Shut-Off Valve – OFF
3. Electrical and Magneto Switches – ALL OFF
4. Exit aircraft
5. Direct fire extinguisher through the bottom of the cowl or through the cowl access door

ENGINE FIRE IN FLIGHT

1. Mixture Control – IDLE CUT-OFF
2. Fuel Shut-Off Valve – OFF
3. Electrical and Magneto Switches – ALL OFF
4. Cabin Heat – OFF Front and Rear
5. Use hand fire extinguisher if available and necessary
6. Land immediately using “Forced Landing Procedures”

ELECTRICAL FIRE

An electrical fire may be indicated by an odor of hot or burning insulation and wisps of smoke.

1. Electrical Switches – ALL OFF (leave magneto switches ON)
2. Air Vents/Windows – CLOSED, open only if absolutely necessary for smoke removal and ventilation
3. Use hand fire extinguisher if available and necessary
4. If fire continues, land immediately

If fire/smoke stops and electrical power is required for the remainder of the flight, turn the master switch ON, followed by the desired circuit switch. Allow one minute between turning on each switch to determine the faulty circuit. Switch faulty circuit OFF.

ALTERNATOR OR ELECTRICAL FAILURE

An alternator failure is indicated by a steady discharge on the ammeter.

1. Master Switch – CYCLE in attempt to reset the over voltage relay
2. If excessive battery discharge continues, turn OFF all nonessential electrical equipment to conserve battery power
3. Land as soon as practical

NOTE

Engine operation is unaffected by a complete electrical system failure with the exception of the engine starter.

ENGINE FAILURE ON TAKEOFF

If sufficient runway remains:

1. Throttle – CLOSED
2. Land using brakes as required

If airborne and insufficient runway remains for landing, select the most favorable landing area ahead. Attempt an engine restart if altitude permits using ENGINE AIR RESTART procedures.

If no restart is possible, land in pre-selected area using FORCED LANDING procedures.

WARNING

Maintain flying speed at all times. Do not attempt to turn back towards the runway unless sufficient altitude has been achieved.

ENGINE AIR RESTART

1. Maintain Airspeed – 80 MPH minimum recommended
2. Emergency Fuel Pump – ON
3. Alternate Air – FULL HOT
4. Mixture – FULL RICH or LEANED as required at high altitude
5. Fuel Shut-Off Valve – CHECK ON
6. Magneto Switches – BOTH ON (Up)
7. Propeller Control – FULL INCREASE
8. If restart is not possible, change throttle, mixture, primer settings in attempt to restart
9. Follow “Forced Landing Procedure” if unable to restart

NOTE

The engine starter may be engaged if the propeller has stopped wind milling.

PARTIAL POWER LOSS OR ROUGH RUNNING

1. Follow the ENGINE AIR RESTART procedures
2. Land as soon as practical using PRECAUTIONARY LANDING APPROACH procedure

Obstruction of the engine intake or induction ice may be indicated by a gradual power loss. Alternate air should be applied to the FULL HOT position and left in that position as long as suspected icing or blockage conditions exist.

ABNORMAL OIL PRESSURE AND TEMPERATURE INDICATIONS

Oil pressure and temperature problems are generally related. Before any drastic action is taken, cross check other engine instruments and control settings in an attempt to determine the source of the problem.

High oil temperature may result from low oil quantity, overheating or a malfunctioning oil cooler by-pass valve. If the situation remains unchecked, oil pressure may drop resulting in engine damage. Power should be reduced while maintaining cruise airspeed; place mixture in FULL RICH position and land as soon as practical.

Little or no oil pressure may result from a failed pump, failed pressure relief valve, loss of oil, high oil temperature, clogged oil line or a defective gauge. A landing should be made as soon as practical using minimum power. Plan a "PRECAUTIONARY LANDING APPROACH" as complete engine failure is possible at any time.

LOSS OF PROPELLER CONTROL

In the event of loss of oil pressure to the propeller and/or propeller governor, the propeller will automatically go to the coarse pitch, low RPM position. The throttle may be used as necessary to climb or maintain level flight. A precautionary landing should be made as soon as practical.

PRECAUTIONARY LANDING APPROACH

A precautionary landing approach should be used whenever power is still available, but a complete power failure is considered imminent. Maintain a higher and closer pattern than normal to remain well within gliding distance of the intended touchdown point. Use the normal landing procedures in addition:

1. Airspeed – 75 mph recommended (70 mph minimum)
2. Throttle – CLOSED when in gliding distance to runway
3. Propeller Control – FULL INCREASE
4. Slip the aircraft to increase rate of descent as required

FORCED LANDING (Complete Power Failure)

If the engine cannot be restarted in flight, trim the aircraft to the recommended glide speed. Remain within gliding distance of the intended point of landing. Maintain a higher and closer pattern than normal making allowance for wind.

Additional altitude can be lost by slipping the aircraft. Diving the aircraft in an attempt to lose altitude will only increase the required landing distance.

1. Airspeed – Maintain 75 MPH
2. Mixture – IDLE CUT-OFF
3. Fuel Shut-Off Valve – OFF
4. Master Switch – ON
5. Radio – MAYDAY 121.5 MHz
6. Attempt to position the aircraft approximately 1000 feet above ground level (AGL) over the intended point of landing or 500 feet when downwind and abeam the intended point of landing
7. Electrical Switches – ALL OFF
8. On Final Approach – Airspeed 75 MPH (70 MPH minimum)
9. Touchdown with minimum airspeed (three point full stall) if landing on rough terrain

NOTE

If necessary, after aircraft has come to a complete stop, remove and activate the emergency locator transmitter from the aircraft for increased transmitting range.

DITCHING

Should it become necessary to make a forced landing over water, follow the "FORCED LANDING APPROACH" in addition to the following:

1. Cabin Side Door – JETTISON
2. Land into wind if high winds are evident or parallel to swells with calm winds
3. Contact the water with a nose high attitude
4. DO NOT STALL prior to touchdown
5. After coming to complete stop – EXIT AIRCRAFT

NOTE

Aircraft cannot be depended on to provide floatation after contacting the water.

STATIC SYSTEM FAILURE

A malfunction in the static system will affect the airspeed, altimeter and vertical speed indicator and may be a result of an obstructed static opening. An alternate static source can be provided from within the cabin by breaking the glass in the airspeed, altimeter or rate of climb instrument face.

WARNING

With an alternate static source provided from within the cabin, subtract approximately 65 feet from indicated altitude and 10 mph from indicated airspeed.

SEVERE TURBULENCE

To prevent overstressing the aircraft do not exceed 107 MPH in rough air. To minimize personal discomfort, decrease airspeed below 100 MPH. Maintain a constant pitch attitude rather than flying by reference to the altimeter and airspeed indicator.

STALLS

The Super Decathlon stall characteristics are conventional. The stall warning horn will precede the stall by 5-10 MPH depending on the amount of power used. There is very little aerodynamic buffeting preceding the stall.

Aileron control in a fully stalled condition is marginal. Large aileron deflections will aggravate a near stalled condition and their use is not recommended to maintain lateral control. The rudder is very effective for maintaining lateral control in a stalled condition with the ailerons placed in the neutral position.

To recover from a stall, proceed as follows:

1. LOWER NOSE and add FULL POWER simultaneously
2. Use the rudder to maintain lateral control

WARNING

Do not allow aircraft to stall unless sufficient altitude exists for safe recovery. Before raising nose ensure airspeed is adequate to avoid a secondary stall.

SPINS

Normal or inverted spins are approved in this aircraft when flown in the acrobatic category. Spins are prohibited in the normal category.

WARNING

Do not allow aircraft to spin unless sufficient altitude exists for safe recovery.

WARNING

During the spin recovery, the airspeed will build very rapidly with a nose low attitude. Smooth but positive recovery from the dive is important to avoid an over-speed condition. Do not use full or abrupt elevator control movements after recovery to avoid secondary stall-spin.

Use the following recovery procedure for a normal spin.

1. Throttle – CLOSED
2. Ailerons – NEUTRAL POSITION
3. Rudder – FULL DEFLECTION in the opposite direction to the rotation
4. Elevator – POSITIVE FORWARD TO NEUTRAL (free release of elevator control is not adequate for recovery)
5. Rudder – NEUTRALIZE when rotation stops and positive control and flying speed is restored
6. Nose Attitude – RAISE smoothly to level flight attitude
7. Throttle – only after recovery from diving attitude, then as required

Use the following recovery procedure for an inverted spin.

1. Throttle – CLOSED
2. Ailerons – NEUTRAL POSITION
3. Rudder – FULL DEFLECTION in the opposite direction to the rotation
4. Elevator – POSITIVE REARWARD TO NEUTRAL (free release of elevator control is not adequate for recovery)
5. Rudder – NEUTRALIZE when rotation stops and positive control and flying speed is restored
6. Nose Attitude – RAISE smoothly to level flight attitude
7. Throttle – only after recovery from diving attitude, then as required

INFLIGHT OVERSTRESS

An in-flight overstress can occur if either airspeed or load factor limits are exceeded or controls are misused. Aerobatics should be terminated immediately. Fly at a reduced airspeed (60-70 mph) to a suitable landing point. DO NOT under any circumstances, make large control movements or subject the aircraft to additional “g” loadings above that required for straight and level flight, and gentle turns. After landing, the aircraft should be inspected for damage by a qualified mechanic prior to the next flight.

EMERGENCY EXIT AND BAIL OUT

1. Throttle – CLOSED
2. Door – JETTISON using emergency release handle
3. Use the cabin doorframe for support. Dive straight out and slightly aft of the wing struts
4. Use left side window as alternate exit if you are unable to exit through the door. Force forward portion of window past stop to open as alternate exit
5. Parachute – OPEN immediately when clear of aircraft (preflight and familiarize yourself with operating procedures of the parachute before the flight)

SECTION III
NORMAL OPERATING PROCEDURE

INDEX

GENERAL

This section covers all recommended normal operating procedures using a checklist format whenever possible with additional information if further explanation is required.

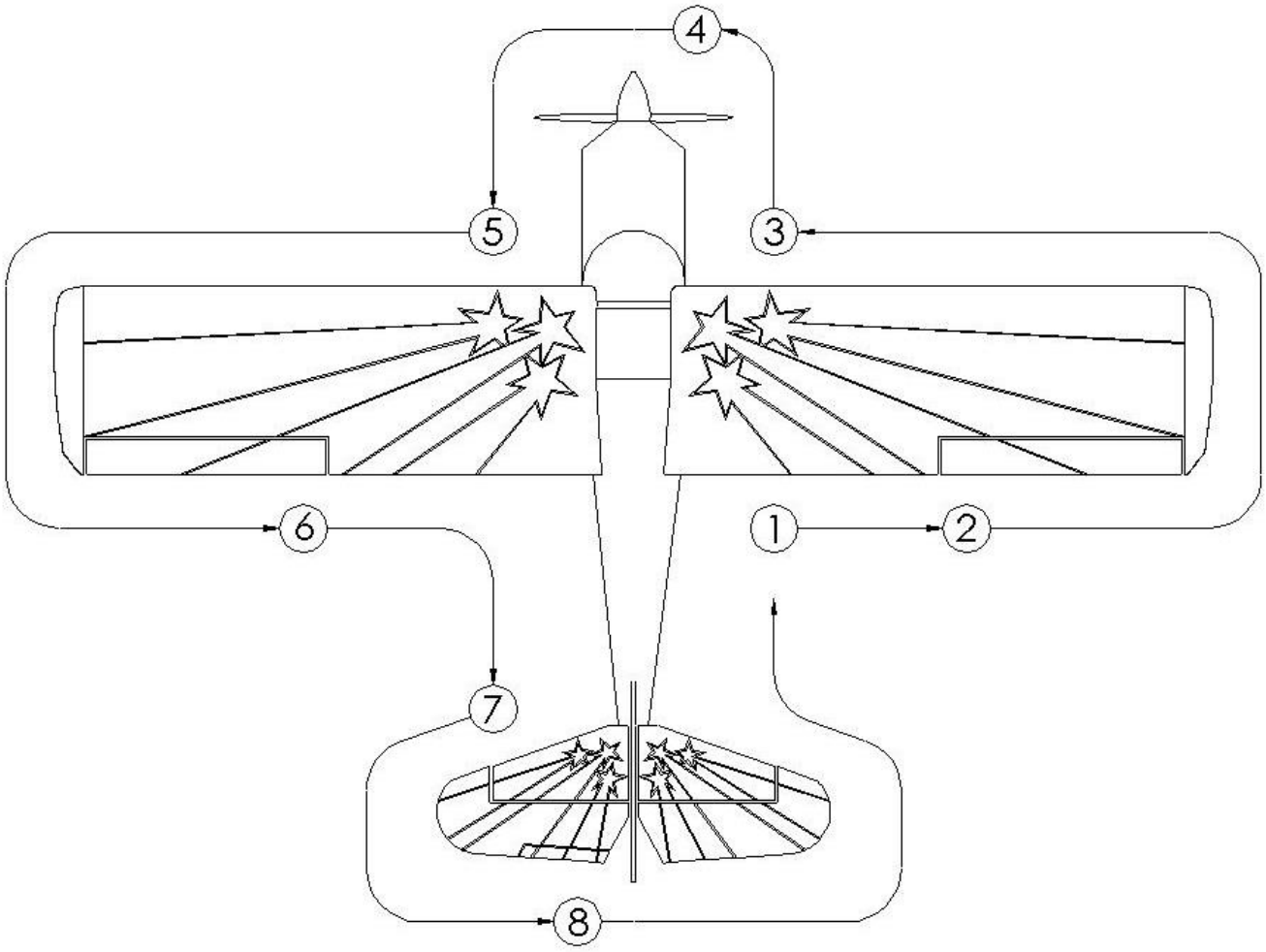
NOTE

All airspeeds in this section are indicated airspeeds (IAS), unless stated otherwise.

PREFLIGHT INSPECTION

The following inspection should be conducted prior to each flight. The inspection is broken down by area; the following circled numbers correlate with those listed in this section.

This checklist emphasizes areas of importance. However, the preflight inspection should also consist of a thorough look at the aircraft for general condition and airworthiness.



1. Cabin
    a. Cabin door and release mechanism – CHECK condition, security
    b. Flight Controls – CHECK for freedom of movement and full control travel
    c. Magneto and Electrical Switches – OFF (Check operation of lights if required and stall warning system with respective switches ON)
    d. Fuel Quantity Gauge – CHECK quantity
    e. Fuel Shut-Off Valve – ON
    f. Seat Belts – CHECK CONDITION, SECURE rear belt and harness if not in use
    g. Emergency Locator Transmitter – ARMED
    h. Before Aerobatic Flights, Remove Loose Articles and Equipment – ensure the cabin is clean

PREFLIGHT INSPECTION (cont'd)

2. Right Wing
    a. Wing Root Fairing and Greenhouse Roof – CHECK secure
    b. Aileron – CHECK condition, freedom of movement, security
    c. Wing Tip and Light – CHECK condition
    d. Struts
        i. Inspect the front and rear lift struts for straightness, dents and other damage.
        ii. Check strut drain holes to ensure that they are not plugged and the struts do not contain water.
        iii. If either of the above conditions is found, contact an authorized aircraft mechanic to determine aircraft airworthiness.
    e. Tie-Down – REMOVE
    f. Fuel – CHECK quantity, color, cap secure

3. Right Main Gear
    a. Chocks – REMOVE
    b. Tires – CHECK condition, inflation
    c. Brakes – CHECK condition, leakage
    d. Wheel Fairing – CHECK condition, security

4. Nose Section
    a. Windshield – CHECK condition, cleanliness
    b. Oil – CHECK quantity, dipstick secure
    c. Fuel – DRAIN gascolator and sample fuel for contamination and color, CHECK leakage
    d. Engine Compartment – CHECK condition, leakage, etc.
    e. Cowling and Inspection Door – CHECK condition, security
    f. Propeller and Spinner – CHECK condition, security
    g. Air Filter – CHECK condition
    h. Landing Light - CHECK condition

5. Left Main Gear
    a. Same as right main gear

6. Left Wing
    a. Same as right wing – in addition
    b. Fuel Vent – CHECK unobstructed
    c. Pitot Tube – CHECK to ensure it is unobstructed
    d. Stall Warning Vane – CHECK freedom of movement

7. Fuselage (Left Side)
    a. Fabric – CHECK condition, oil, battery acid, leakage, etc.
    b. Windows – CHECK condition, cleanliness and security
    c. Fuel Belly Drain – DRAIN, CHECK and sample fuel for contamination and color, CHEAK leakage
    d. Radio Antenna(s) – CHECK secure
    e. Static Source – CHECK to ensure it is unobstructed

8. Empennage
    a. Horizontal Stabilizer and Brace Wires – CHECK condition, security
    b. Vertical Stabilizer and Tail Light – CHECK condition
    c. Elevator, Trim Tab and Rudder – CHECK condition, freedom of movement security
    d. Tail Wheel – CHECK condition, inflation, security
    e. Tie-Down – REMOVE

9. Fuselage (Right Side)
    a. Same as fuselage left side – no fuel drain on right side

COLD WEATHER OPERATIONS

The following operating practices are recommended for cold weather operations (below 20°F).

Engine preheat (if aircraft is not kept in a heated hangar): Prior to starting, the engine compartment should be thoroughly preheated. Should moisture be present in the oil or breather system, preheating will assure that ice is not blocking passages or lines. The preheat is best accomplished with a large volume of warm air (200°F maximum) directed into the engine compartment through the oil access door. This preheat should be continued long enough to assure that the oil and breather systems components have been thoroughly heated. This preheat time will be dependent upon the volume and temperature of the preheat air.

Care should be taken during preheating that the preheated air is not above 200°F as many components in the engine compartment or the cowling may be damaged or scorched.

It is important to use the proper viscosity engine oil and to run the engine sufficiently long to bring the engine oil temperature and pressure to the normal operating range. Under some extreme winter conditions, oil temperature may not indicate on the oil temperature gauge until airborne; it is very important that oil pressure be within the green arc prior to run-up and takeoff regardless of oil temperature. This is particularly important as the Super Decathlon utilizes the Christen inverted oil system. This system has external oil supply lines. The flow of oil from the engine sump through the external houses and components of the Christen system will be severely impeded until the oil, the engine and all external system parts are warm.

The engine should be operated such that the oil temperature is maintained as high as is practical but not exceeding red line. Extended ground warm-up will help increase oil temperatures. These warm-up runs are best accomplished at 1500 to 2000 RPM. Extended periods of operation at low throttle settings should be avoided during flight as these operations lower oil temperatures.

It is recommended that the 25-hour oil change interval be observed and that the oil and breather lines be checked for moisture accumulation during the oil change. It is also recommended that an inspection for moisture accumulation be made every five to ten hours of operation. See Section VII for maintenance details.

BEFORE STARTING

1. Airplane Preflight Inspection – COMPLETE
2. Seat Belts/Shoulder Harness – FASTENED and adjusted or STOWED
3. Cabin Door – CLOSED (windows as desired)
4. Brakes – SET
5. Electrical Switches – OFF
6. Circuit Breakers – CHECK in
7. Radios – OFF
8. Fuel Shut-Off Valve – ON
9. Flights controls – CHECK for free and correct movement

NOTE

Set the parking brake by depressing the brake pedals while pulling the parking brake knob. Control is located under the far right side of the instrument panel.

STARTING

Engine Cool

1. Alternate Air – COLD
2. Propeller Control – FULL INCREASE
3. Master Switch – ON
4. Engine Prime (as required)
    a. Mixture – FULL RICH
    b. Throttle ¼ to ½ inch OPEN
    c. Electric Fuel Pump – ON until fuel pressure indicated, then OFF
5. Mixture – IDLE CUT-OFF
6. Throttle – ½ to 1 inch OPEN
7. Magneto Switches – BOTH ON
8. Ensure Propeller and Propeller Blast Areas is CLEAR
9. Brakes –ON
10. Starter – ENGAGE, release after engine fires
11. Mixture – FULL RICH after engine fires
12. Throttle – 1000 to 1200 RPM
13. Oil Pressure – CHECK, must indicate pressure within 30 seconds maximum
14. Electrical and Radio Switches – AS DESIRED
15. Brakes – release when ready to taxi

Engine Hot

The amount of fuel priming will vary with each engine and temperature condition. If the engine is warm, little or no prime is required. A hot engine can be easily flooded.

CAUTION

Over priming may result in engine fire.

To clear an engine that has been flooded due to excessive priming, proceed as follows:

1. Electric Fuel Pump – OFF
2. Mixture – IDLE CUT-OFF
3. Throttle – FULL OPEN
4. Magneto Switches – OFF
5. Starter – ENGAGE for several propeller revolutions
6. Repeat normal starting procedures using no prime

CAUTION

Limit the use of the starter to 20 seconds duration maximum with a two-minute cooling off period between each starter engagement.

During ground operation, the mixture should be FULL RICH and the alternate air COLD to ensure good engine cooling and filtered air. Prolonged idle below 1000 RPM is not recommended due to plug fouling and insufficient cooling air when the aircraft is not in motion.

WARNING

Do not attempt to turn over and/or start the engine by hand unless you have had proper instruction and experience. If pulling the propeller through by hand is necessary, be sure the master and magnetos are in the OFF position and the throttle closed. Have a pilot at the controls and chock/tie down the aircraft. When pulling the propeller through by hand, treat it as if the ignition switch is turned on. A loose or broken ground wire on either magneto could cause the engine to fire.

TAXI

Taxi operations during high wind require the conventional use of the flight controls. With a headwind or quartering headwind, place the control stick full aft and into the wind. With a tail wind or quartering tail wind, use the opposite procedures. Cautious use of the wheel brakes in conjunction with the rudder will assist the pilot in maintaining directional control.

BEFORE TAKEOFF

1. Brakes – SET
2. Flight Controls – CHECK freedom of movement, proper operation
3. Elevator Trim – SET takeoff position
4. Flight Instruments/Radio(s) – CHECK and SET
5. Check Master Switch – ON
6. Fuel Shut-Off Valve – ON
7. Mixture – FULL RICH (lean as required for high density altitude)
8. Engine Instruments – CHECK normal indications
9. Engine Run-Up – 1800 RPM (Elevator Control – FULL BACK)
    a. Magnetos – CHECK (175 RPM maximum drop, 50 RPM maximum differential) return both switches to ON
    b. Propeller – CYCLE (300 RPM drop minimum) return to FULL FORWARD
    c. Alternate Air – CHECK operation then return to COLD position
    d. Engine Instruments – within green arc
    e. Throttle – 1000 RPM
10. Electrical Fuel Pump – ON
11. Cabin Door and Windows – CLOSED and LATCHED
12. Seat Belts/Shoulder Harness – FASTENED and adjusted
13. Brakes – Release when ready for takeoff, check park brake full OFF

Engine warm-up should be conducted at 1000 to 1200 RPM. High power operation, above 2200 RPM, and engine run-up should be made into the wind and kept to a minimum especially during high temperature conditions. The stick must be held full aft to prevent the possibility of the aircraft nosing over. The magneto check is run at 1800 RPM using the BOTH-LEFT-BOTH-RIGHT-BOTH sequence. Maximum RPM drop on each magneto is not to exceed 175 RPM and the differential between magnetos should not exceed 50 RPM. The carburetor heat should result in 50 RPM minimum drop. Avoid using carburetor heat on the ground. With the carburetor heat on, induction air is not filtered and abrasive dirt particles can enter the engine.

TAKEOFF – NORMAL

1. Throttle – FULL OPEN applying smoothly
2. Engine Instruments – CHECK normal indications and satisfactory takeoff power
3. Attitude – RAISE TAIL
4. Lift-Off – 55-60 mph
5. Climb – 75-80 mph

Takeoff characteristics are conventional for tail-wheel aircraft. It is recommended to raise the tail with the elevator during the takeoff roll for better forward field of view and directional control. Transition to flight with a smooth and positive rotation. After lift-off, allow aircraft to accelerate to desired climb speed.

CAUTION

On the ground in the level flight attitude, the wheel brakes are very sensitive. It is recommended that directional control be maintained with the use of the rudder only.

Check full-throttle engine operation early in the takeoff run. The takeoff should be discontinued if there are any signs of rough engine operation or sluggish engine acceleration.

During crosswind conditions, place the control stick into the wind (up-wind aileron up) and assume a tail high attitude with the elevator to prevent drifting or premature lift-off.

High altitude takeoffs are accomplished by using the normal takeoff procedures with the addition of leaning the mixture control for smooth engine operation and allowing for the effects of density altitude.

TAKEOFF-OBTACLE

During an obstacle takeoff, use the Normal Takeoff Procedures with the following exceptions (refer to Section IV for appropriate distances)

1. Apply full power rapidly but smoothly
2. Accelerate in three-point (tail down) attitude
3. Lift-Off – 50-55 MPH
4. Maintain 58 MPH until clear of obstacle

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.

TAKEOFF-SOFT FIELD

For soft field takeoff, use the Normal Takeoff Procedures with the following exceptions

1. Attitude – TAIL LOW but clear of ground
2. Lift-Off – As soon as possible
3. After Lift-Off – LEVEL FLIGHT to obtain safe margin of airspeed prior to climb

WARNING

Good pilot judgment and experience are required to determine suitability of a soft field for safe takeoff operation.

The aircraft will lift-off at very low IAS, however, continued climb-out below takeoff-obstacle speed is not recommended.

Be sure to account for the additional takeoff roll and distance to clear an obstacle resulting from the added drag of a soft field. Good pilot judgment is required to make these allowances, as it is not possible to tabulate such corrections due to their large variability.

CLIMB

1. Throttle – FULL OPEN
2. Propeller Control – FULL INCREASE
3. Mixture – FULL RICH, Lean only as require to maintain smooth engine operation
4. Airspeed – 75-80 mph
5. Electric Fuel Pump – OFF after safe altitude has been reach.

For maximum performance climbs, use full throttle and the following speeds.

Best Rate of Climb (V_y) = 80 mph (IAS)
Best Angle of Climb (V_x) = 58 mph (IAS)

If best rate of climb (or best angle of climb) is not required, a climb speed between 80 and 90 mph will provide good forward visibility and engine cooling in a warm climate. The mixture should be full rich; lean only as required to maintain smooth engine operation at altitudes above 5000ft.

CRUISE

1. Level-Off – TRIM
2. Airspeed – ACCELERATE to desired cruise airspeed
3. Power – SET to cruise power
4. Mixture – LEAN when below 75% power

The fuel mixture should be leaned at any altitude when below 75% of maximum power. Lean to peak EGT if equipped. If no EGT is installed, lean until engine roughness or loss of power is noted then enrich until smooth.

WARNING

Range and endurance information is based on a properly leaned fuel mixture. Failure to lean the fuel mixture will increase fuel consumption appreciably.

Continuous use of alternate air during cruising flight decreases engine efficiency. Unless conditions are severe, do not cruise with alternate air on. When selecting alternate air, do so slowly to the full-on position and only for a few seconds at intervals to determine if ice may have developed in the induction system or on the air filter. The Super Decathlon is not approved for flight into known icing conditions.

AEROBATICS

The Super Decathlon is certified in the Aerobatic Category. Flying aerobatics places a much greater demand on the pilot's ability, knowledge of the aircraft and current regulations. The following information is provided to make aerobatic flying enjoyable, with the utmost emphasis on safety. The pilot should not attempt aerobatics unless training by a qualified aerobatic instructor has been received.

Federal Aviation Regulations Part 91.303 specifies the airspace and altitudes required for aerobatic flight. Altitude may be the pilot's greatest safety factor and should not be compromised. The wearing of approved parachutes is specified in Part 91.307. It is strongly recommended that parachutes always be worn during aerobatic flight.

American Champion Aircraft Corporation also recommends that pilots utilizing aircraft for aerobatics read the Advisory Circular 91-48: Acrobatics - Precision Flying With A Purpose. This advisory circular provides information to persons who are interested in aerobatics to improve their piloting skills as recreation, sport, or as a competitive activity. It also discusses Federal Aviation Regulations pertaining to aerobatic aircraft airworthiness considerations, aerobatic instruction, operations and aerobatic flight safety.

Know and respect your airplane's structural limitations. The Super Decathlon structure is designed to withstand a maximum load factor of +6 G and –5 G at a maximum gross weight of 1800lb.

WARNING

Do not exceed +6.0 G positive load factor or –5.0 G negative load factor. Do not perform aerobatics in turbulent air.

Never exceed the above load factors regardless of weight. Flying at reduced weights improves performance. Acrobatic flight above 1800lb is not only prohibited but also greatly increases the chances of a serious overstress resulting in damage or possible structural failure. The FAA Approved Airplane Flight Manual has information concerning aerobatic limits and maneuvers and should be consulted.

The rear center of gravity (C.G.) limit is critical for aerobatic flight. This limit is specified in Section I and IV. Baggage is NOT allowed during aerobatic flight. Also, all personal equipment (charts, flight computer, etc.) should be properly secured.

A person learning to fly must be taught how to do so safely. The same holds true for a pilot learning aerobatics. To attempt an aerobatic maneuver with no prior aerobatic instructions is extremely dangerous and is NOT recommended.

Aerobatic flight places a greater demand on both the pilot and aircraft. A thorough preflight inspection/evaluation for both is considered essential. The pilot must know and abide by the limitations of the aircraft and his own personal limitations as well. Do not do aerobatics unless you are in good physical condition – not when you have a hangover, a cold or any other illness.

If you are not in good physical condition, your reaction time is increased and your tolerance to g-loading is decreased.

Watch for other traffic while doing aerobatics. Perform a 90° clearing turn in each direction before beginning, checking for traffic all around the airplane. See Part 91 of the Federal Air Regulations for airspace in which aerobatics are prohibited.

Oil pressure during inverted flight may normally be 5 to 10psi less than the oil pressure during normal flight. During the transition from normal to inverted flight and from inverted to normal flight, an oil pressure fluctuation may be indicated on the oil pressure gauge. This fluctuation is normally 20-40psi and lasts about one second after which the normal oil pressure should be maintained.

Oil quantities in excess of normal oil level may be lost during the aerobatic sequence, but once the normal level is reached, oil losses should be small. The oil capacity is 8 quarts, but normal oil level is between 6 and 7 quarts. Oil should be added when the level falls below 6 quarts. Steep climbing-diving vertical attitudes or knife-edge flight may cause interruption of the oil pressure and/or loss of oil through the breather.

It is important to monitor the oil pressure during aerobatic flight. This is especially important when operating in extremely cold weather. Inadequate warm-up of the oil system components could cause impeded operation and inadequate oil pressure in the inverted position.

Extended inverted flight or a sequence of maneuvers involving a large percent of negative "G" maneuvers may exhaust the inverted fuel supply, causing loss of fuel pressure and power. At the first signs of fuel pressure loss or engine roughness, assume normal flight this will assure normal fuel flow and will automatically refill the inverted fuel supply.

NOTE

Continuous inverted flight at full power will exhaust inverted fuel supply in approximately two minutes. Approximately one minute of positive "G" conditions is required to completely refill the inverted fuel supply.

WARNING

Complete loss of fuel flow and power, caused by depletion of inverted fuel supply, may result in an interruption of power for up to 10 seconds after return to normal flight. AVOID THIS CONDITION UNLESS SUFFICIENT ALTITUDE INSURES SAFE RESTART.

The approved aerobatic maneuvers are presented in Section I along with recommended entry speeds. Variation or combinations of the approved aerobatic maneuvers are also approved provided the speed and load factor limitations are not exceeded. The following information and aresti symbols are presented to assist a properly trained aerobatic pilot to perform the maneuvers shown. They do not include all procedures necessary to properly complete the maneuver and should not be used in lieu of appropriate aerobatic flight instruction.

WARNING

Tail slides and tumbling maneuvers are NOT APPROVED. Do not attempt any maneuver without proper instruction and checkout.

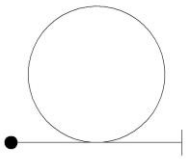
WARNING

Flight above 160 mph (CAS) in smooth air only.

WARNING

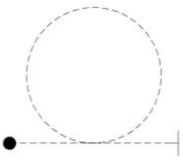
Maneuvering speed for acrobatic category operations is 132 MPH (CAS). Do not apply full or abrupt use of flight controls above maneuvering speed. Proper use and application of controls and maneuvering load factors are essential to speed control. Improper and/or inadequate application of maneuvering load factors may result in rapid speed buildup resulting in unsafe flight situations.

LOOP



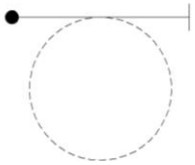
Enter the maneuver at 140 MPH with a 3.5 to 4.0 "G" load factor. Speed at the top of the loop should be 40-50 MPH. Exit the loop with ±3.5 to ±4.0 "G" load factor.

OUTSIDE LOOP



Enter the maneuver at 140 MPH with a -3.5 to -4.0 "G" load factor. Speed at the top of the loop should be about 40-50 MPH. Exit the loop with -3.5 to -4.0 "G" load factor.

OUTSIDE LOOP DOWN

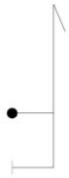


Enter the maneuver at 60 mph with steadily increasing push to –3.5 to –4.0 "G" load factor at the bottom of the loop. Speed at the bottom should be 140 to 160 MPH. Continue –3.5 to –4.0 "G" push through bottom of loop. Steadily decrease negative load factor to +1.0 "G" at top of loop.

IMMELMANN

Enter the maneuver at 140 to 145 MPH with a 4.0 "G" load factor. Speed at the top should be 55-65 MPH. Perform ½ slow roll at the top.

HAMMERHEAD



Enter the maneuver at 140 MPH with 3.5 to 4.0 “G” load factor. Speed at the top before the pivot should be about 20 MPH. Exit with 3.5 to 4.0 “G” load factor and approximately 140 MPH.

HAMMERHEAD INVERTED

Enter the maneuver at 140 MPH with -3.5 to -4.0 “G” load factor. Speed at the top before the pivot should be about 20 MPH. Exit inverted with -3.5 to -4.0 “G” load factor and approximately 140 MPH.

SNAP ROLL

Enter upright or inverted with power at 90 MPH.

ENGLISH BUNT

Enter the maneuver at 60-70 mph with a steadily increasing push to -3.5 to -4.0 “G” load factor. Exit maneuver inverted at 140-150 mph.

VERTICAL ½ ROLL UP

Enter the maneuver at approximately 160 MPH using a 4.0 to 4.5 “G” pull. Exit upright with push to level flight.

VERTICAL ROLL UP

Enter the maneuver at approximately 180 MPH using a 4.0 to 4.5 “G” pull. Exit upright with push to level flight.

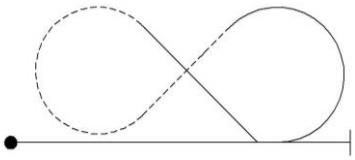
VERTICAL ROLL DOWN

Enter the maneuver at approximately 60 MPH push to vertical down. Exit with approximately 4.5 “G” load factor and 160 MPH. Exit with pull to level flight.

SLOW OR BARREL ROLL

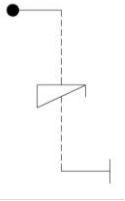
Enter the maneuver at 120 to 130 MPH.

INSIDE-OUTSIDE EIGHT



Enter the first half of the maneuver at 140 mph with a +4.0 “G” load factor. Enter the second half of the maneuver from about 140 mph with a –3.5 to –4.0 “G” load factor.

NORMAL SPINS



Enter from normal stall, power off with full aft stick and full rudder in desired direction of spin. Maintain spin with full pro spin control until ¼ to ½ turn prior to recovery heading. Recover with full opposite rudder and positive movement of stick to neutral position: Hold recovery control until rotation stops and positive control and flying speed is restored. Neutralize the rudder and smoothly recover from the dive to level flight. Free release of controls by the pilot is not sufficient for spin recovery.

INVERTED SPINS

Enter inverted from stall, power off with full aft stick and full rudder in desired direction of spin. Maintain spin with full pro spin control until ¼ to ½ turn prior to recovery heading. Recover with full opposite rudder and positive movement of stick to neutral position: Hold recovery control until rotation stops and positive control and flying speed is restored. Neutralize the rudder and smoothly recover from the dive to level flight. Free release of controls by the pilot is not sufficient for spin recovery.

WARNING

Spin aircraft only if sufficient altitude exists for safe recovery.

DESCENT

1. Mixture – FULL RICH
2. Throttle – REDUCE as desired
3. Airspeed – AS DESIRED

The descent should be made with enough power to maintain cylinder head and oil temperatures in green arc. If possible, avoid wind milling the engine with the propeller by decreasing airspeed or increasing power.

LANDING – NORMAL

1. Seat and Shoulder Harness – FASTENED
2. Propeller Control – FULL INCREASE
3. Mixture – RICH
4. Electric Fuel Pump – ON
5. Brakes – CHECK FIRM (Park Brake – OFF).
6. Approach Airspeed –70-75 MPH
7. Throttle – As necessary for desired glide path
8. After Touchdown – Power Off, brake as required
9. Electric Fuel Pump – OFF

Aircraft landing characteristics are conventional for a tail-wheel airplane. Either wheel landings or full stalls (3 point) are permissible. During gusty wind conditions, increase airspeed approximately 5 MPH above normal.

As a general rule, it is good practice to contact the ground at a minimum safe speed consistent with existing conditions. In calm or light wind conditions and in short and/or soft field conditions, a full stall landing is recommended. In a full stall landing, the flare or round-out should be made with power off. A three-point landing attitude should be held just above the ground which increasing the backpressure on the stick as airspeed drops until the stick is in the full aft position at the time of touchdown. Brake as necessary.

In high gusty wind or when a crosswind exists, a wheel landing is recommended, preceded by an approach of about 75 to 80 MPH. The flare is made with slight power (900-1200 RPM) to a level flight attitude just above the ground. Contact with the ground is made on the main landing gear. At the time of contact, the stick is brought slightly forward of neutral to hold the airplane firmly on the ground in a tail up attitude. As speed decreases, lower the tail slowly to the ground and then hold full aft stick. Brake as necessary. During crosswind conditions, maintain cross-control corrections by using the rudder to maintain runway heading and the ailerons to correct for wind drift throughout the landing flare and rollout.

CAUTION

The use of wheel brakes is not recommended until after the tail wheel is in contact with the ground. For maximum braking, the control stick should be FULL AFT.

LANDING – OBSTACLE/SHORT FIELD

Use Normal Landing procedures with the following additions:

1. Approach Airspeed – 60 MPH
2. Throttle – AS DESIRED to control rate of descent.
3. Slip aircraft as necessary to increase rate of descent.
4. Touchdown in full stall three-point attitude with stick full back.
5. Brake as required.

WARNING

A 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.

WARNING

As speed decreases, braking must be moderated to prevent possible nose-over.

LANDING – SOFT FIELD

Use Normal or Obstacle Landing Procedure with the following additions:

1. Flare to three-point landing attitude and add small amount of power.
2. Touchdown in full stall three-point attitude with stick full back.
3. Use power to assist in maintaining tail-low attitude.

WARNING

Good pilot judgment and experience are required to determine suitability of a soft field for safe landing operation.

SHUTDOWN

1. Brakes – SET
2. Electrical Equipment – OFF
3. Mixture – IDLE CUT-OFF
4. Magnetos/Master Switch – OFF after propeller stops
5. Controls – SECURE with lap belt around forward control stick only
6. Wheels – CHOCKED
7. Wing/Tail Tie Down – SECURE

Before engine shutdown, turn off all radio equipment and other electrical equipment. The engine is shut down by closing the throttle and pulling the mixture control full aft to idle cut-off. After the engine stops, turn off the master switch and both magnetos.

NOTE

If high winds are anticipated, the aircraft should be hangared. If the aircraft must be left out, park into the wind and use additional tie-down ropes for security. Secure the forward control stick with the lap belt.

GROUND HANDLING

The Super Decathlon is easily handled on the ground by using the handle on the lower right side of the fuselage just forward of the tail section. The tail can be lifted and the airplane can be pushed, pulled, and turned from this position. Tie-down rings are provided under each wing on the main wing strut. The tail is secured by tying the rope or chain through the tail wheel unit. The aileron and elevators can be locked by securing the seat belt around the front control stick in a full aft position. Ground handlers should specifically avoid pushing or pulling on propeller spinner, propeller tips, wing struts, fuselage stringers or tail surfaces.

WARNING

DO NOT push or pull on wing struts to move aircraft. Struts can be damaged by improper handling.

SECTION IV
FLIGHT PERFORMANCE

INDEX

GENERAL

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

Flight performance data has been compiled from both estimated calculations and actual flight test using average piloting techniques, with an aircraft and engine in good operating condition. All information is corrected for standard atmospheric conditions.

Performance may vary from the given data due to the variables present with a specific aircraft and actual flight conditions. The pilot is 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.

AIRSPEED CALIBRATION

IAS (MPH)	CAS (MPH)
54	54
60	60
70	70
80	80
90	90
100	100
120	120
140	139
160	158
180	176
200	194
207	200

NOTE

1. Assumes zero instrument error
2. Maximum gross weight of 1950 lb

STALL SPEEDS

IAS (MPH) Angle of Bank			
0°	20°	40°	60°
56	58	64	76

NOTE

1. Gross weight of 1950 lb
2. Power off

BEST GLIDE

Height AGL (ft)	Distance (sm)
2000	3.4
4000	6.8
6000	10.2
8000	13.6
10000	17.0

1. Best glide airspeeds IAS (MPH), 1950lb–61, 1800lb–58, 1650lb–56
2. Best glide range and airspeeds are substantially affected by headwind or tailwind and updrafts or downdrafts, chart is for still-air only

TAKEOFF DISTANCE

CONDITIONS

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

PILOT TECHNIQUE

Refer to "TAKEOFF-OBSTACLE" in Section III

1. Speed at Lift-Off – 50-55 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.

	Distance (ft)									
	0° C		10° C		20° C		30° C		40° C	
Pressure Altitude Ft.	Ground Run	Total To Clear 50 ft.	Ground Run	Total To Clear 50 ft.	Ground Run	Total To Clear 50 ft	Ground Run	Total To Clear 50 ft	Ground Run	Total To Clear 50 ft
0	533	978	564	1032	596	1089	626	1144	656	1198
2000	610	1116	645	1179	678	1240	714	1305	750	1372
4000	706	1292	745	1363	786	1436	826	1510	868	1589
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 ensure safe operation.

TIME, FUEL AND DISTANCE TO CLIMB

CONDITIONS

1. Standard Temperature
2. Aircraft Loaded to 1950 lb
3. Full Throttle

PILOT TECHNIQUE

Refer to "CLIMB" in Section III

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

From Sea Level						
Pressure Altitude (ft)	Standard Temp (° C)	Best Climb Speed (MPH-IAS)	Rate of Climb (fpm)	Time (min)	Fuel (gal)	Distance (sm)
0	15	82	1145	0	0	0
1000	13	81	1075	1	0.2	1
2000	11	81	1006	2	0.5	2
3000	9	80	936	3	0.7	4
4000	7	80	867	4	1.0	5
5000	5	80	797	5	1.3	7
6000	3	79	728	7	1.6	9
7000	1	79	658	8	1.9	10
8000	-1	78	589	10	2.2	12
9000	-3	78	519	11	2.5	15
10000	-5	77	450	13	2.9	17
11000	-7	77	380	16	3.3	20
12000	-9	76	311	19	3.8	24

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. 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

CONDITIONS

1. Standard temperature
2. All figures based on gross weight of 1950 lb
3. Recommended lean mixture, see Section III.

Super Decathlon

% BHP	RPM	M.P	TAS MPH	GPH	% BHP	RPM	M.P	TAS MPH	GPH
2500 FT					7500 FT				
85	2600	25.3	151	12.5	80	2600	23.0	154	12.0
80		24.1	147	12.0	75		21.8	151	9.7
75		23.0	144	9.7	70		20.6	146	9.3
70		21.8	139	9.3	65		19.5	141	8.8
65		20.6	136	8.8	60		18.4	136	8.3
60		19.5	131	8.3	55		17.2	131	7.9
85	2500	25.9	151	12.3	80	2500	23.6	154	11.8
80		24.7	147	11.8	75		22.4	151	9.6
75		23.5	144	9.6	70		21.2	146	9.1
70		22.3	139	9.1	65		20.0	141	8.7
65		21.1	136	8.7	60		18.7	136	8.1
60		19.9	131	8.1	55		17.5	131	7.7
85	2400	26.5	151	12.2	80	2400	24.3	154	11.5
80		25.2	147	11.5	75		23.0	151	9.5
75		24.0	144	9.5	70		21.8	146	8.9
70		22.8	139	8.9	65		20.5	141	8.5
65		21.5	136	8.5	60		19.2	136	8.0
60		20.3	131	8.0	55		18.0	131	7.6
5000 FT					10000 FT				
80	2600	23.6	151	12.0	70	2600	20.2	150	9.3
75		22.4	147	9.7	65		19.0	145	8.8
70		21.3	143	9.3	60		17.8	139	8.3
65		20.1	139	8.8	55		16.7	133	7.9
60		18.9	134	8.3	50		15.5	125	7.4
55		17.7	128	7.9	45		14.3	116	6.9
80	2500	24.1	151	11.8	70	2500	20.6	150	9.1
75		22.9	147	9.6	65		19.4	145	8.7
70		21.7	143	9.1	60		18.2	139	8.1
65		20.5	139	8.7	55		17.0	133	7.7
60		19.3	134	8.1	50		15.8	125	7.2
55		18.1	128	7.7	45		14.3	116	6.8
80	2400	24.9	151	11.5	70	2400	21.2	150	8.9
75		23.6	147	9.5	65		20.0	145	8.5
70		22.3	143	8.9	60		18.7	139	8.0
65		21.0	139	8.5	55		17.4	133	7.6
60		19.8	134	8.0	50		16.2	125	7.1
55		18.5	128	7.6	45		14.3	116	6.7

NOTE

Speeds shown are based on aircraft with optional strut fairings. Reduce cruise speeds shown by 2% for aircraft not so equipped. Use the engine operator's manual to determine brake horsepower and fuel burn for actual conditions.

RANGE AND ENDURANCE

Range and endurance vary significantly with power, airspeed, and altitude. The "CRUISE PERFORMACE" chart should be used to determine range and endurance based on power setting, fuel flow, and true airspeed. Allowances should be made for climb fuel, fuel reserves, and any headwind or tailwind component.

LANDING DISTANCE

CONDITIONS:

1. Level, hard surface, dry runway
2. Zero wind
3. Aircraft loaded to 1950 lb

PILOT TECHNIQUE:

Refer to "LANDING-OBSTACLE/SHORT FIELD" in Section III

1. Approach Speed – 65 MPH -IAS
2. Throttle – as required to control descent rate
3. 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.

	Distance (ft)									
	0° C		10° C		20° C		30° C		40° C	
Pressure Altitude Ft.	Ground Run	Total To Clear 50 ft.	Ground Run	Total To Clear 50 ft.	Ground Run	Total To Clear 50 ft	Ground Run	Total To Clear 50 ft	Ground Run	Total To Clear 50 ft
0	484	1094	494	1115	502	1137	510	1154	521	1176
2000	503	1137	512	1156	521	1178	531	1200	539	1219
4000	522	1179	532	1201	541	1222	551	1245	559	1265
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 the distance shown by 20% for each 10 MPH of head wind.

SECTION V
WEIGHT AND BALANCE

INDEX

GENERAL

It is the pilot's responsibility to ensure 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 over gross 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 specific 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.

The 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 "Licensed Empty Weight and Moment" from the Weight and Balance Sheet located in the Approved Flight Manual. Enter these figures under "Your Airplane" of the Sample Loading Problem.

2. Full oil capacity can be assumed for all flights. The full oil capacity is 8 quarts, the corresponding weight is 15 lb. "Empty Weight and Moment with Oil" should be computed and entered in the Sample Loading Problem under "Your Airplane".

3. Using the Moment Diagram, 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 Gal. Maximum Useable (6 lbs/gal)
   d. Baggage – 100 lbs. Maximum (Normal Category Only)

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

5. Determine that the takeoff weight and moment are within limits using the Loading Envelope.

WARNING

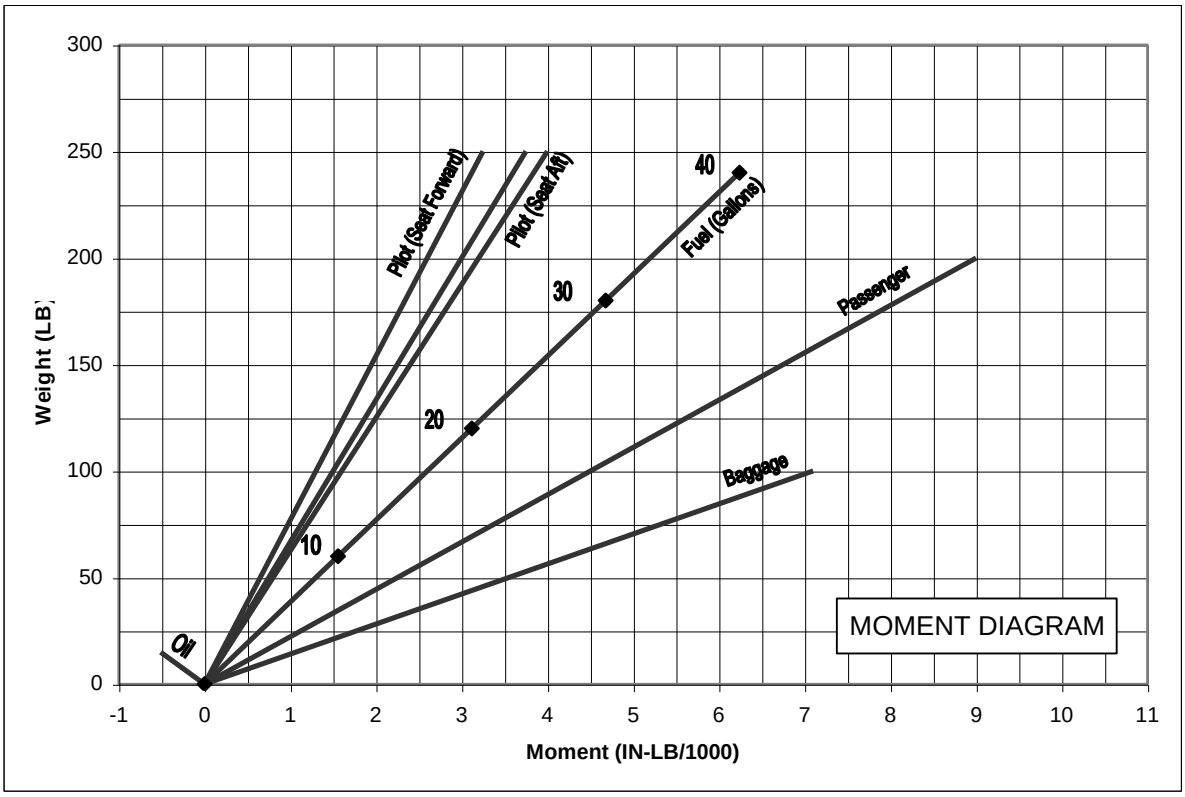
If the aircraft is not within the approved flight envelope limits, it must be reloaded. Under no circumstances should the aircraft be flown with an out-of-limits condition, particularly if aerobatic flight is contemplated.

SAMPLE LOADING PROBLEM		SAMPLE AIRPLANE		YOUR AIRPLANE	
Item	Arm	Weight (lb)	Moment (in/lb)	Weight (lb)	Moment (in/lb)
Licensed Empty Weight & Moment	12.2	1325	16165		
Oil	-36.0	+15	-540		
Aircraft Empty Weight & Moment with Oil	**11.7**	**1340**	**15625**		
Pilot	12	185	2220		
Rear Passenger	43	185	7955		
Fuel	24.5	90	2205		
Baggage	69	-0-	-0-		
Takeoff Weight & Moment	**15.8**	**1800**	**27680**		

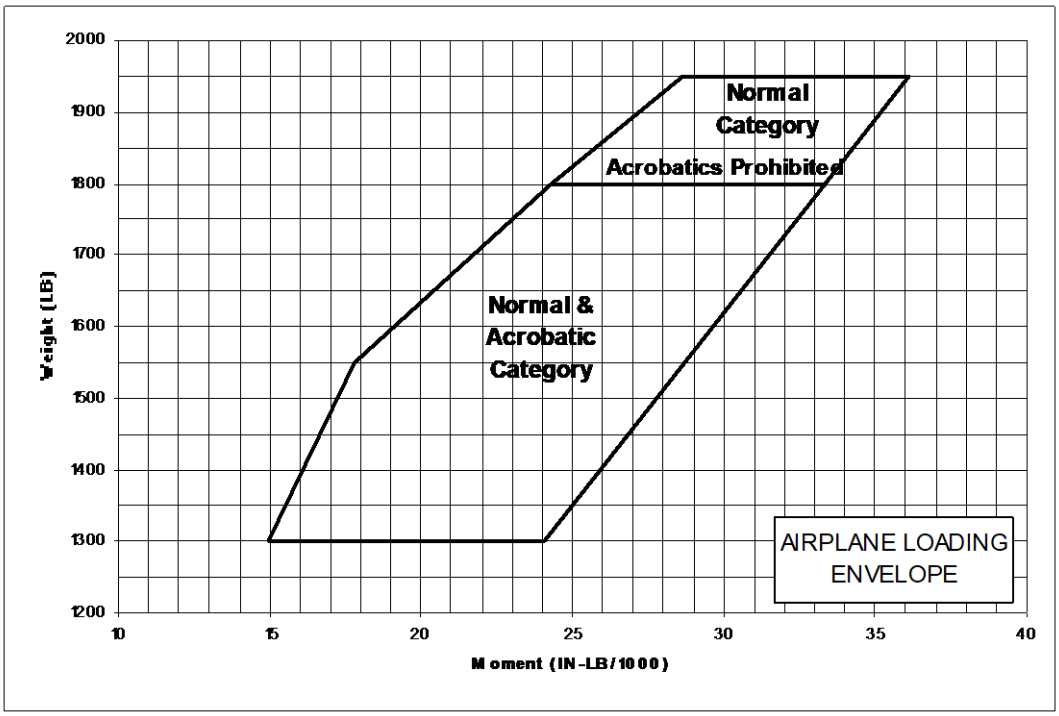
NOTE

1. Use moment diagram to determine moment.
2. To determine Takeoff Center of Gravity (inches aft of datum), divide the Takeoff Moment by the 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.

LOADING SCHEDULE



Add weights and moment 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 falling within the envelope meets all balance requirements.

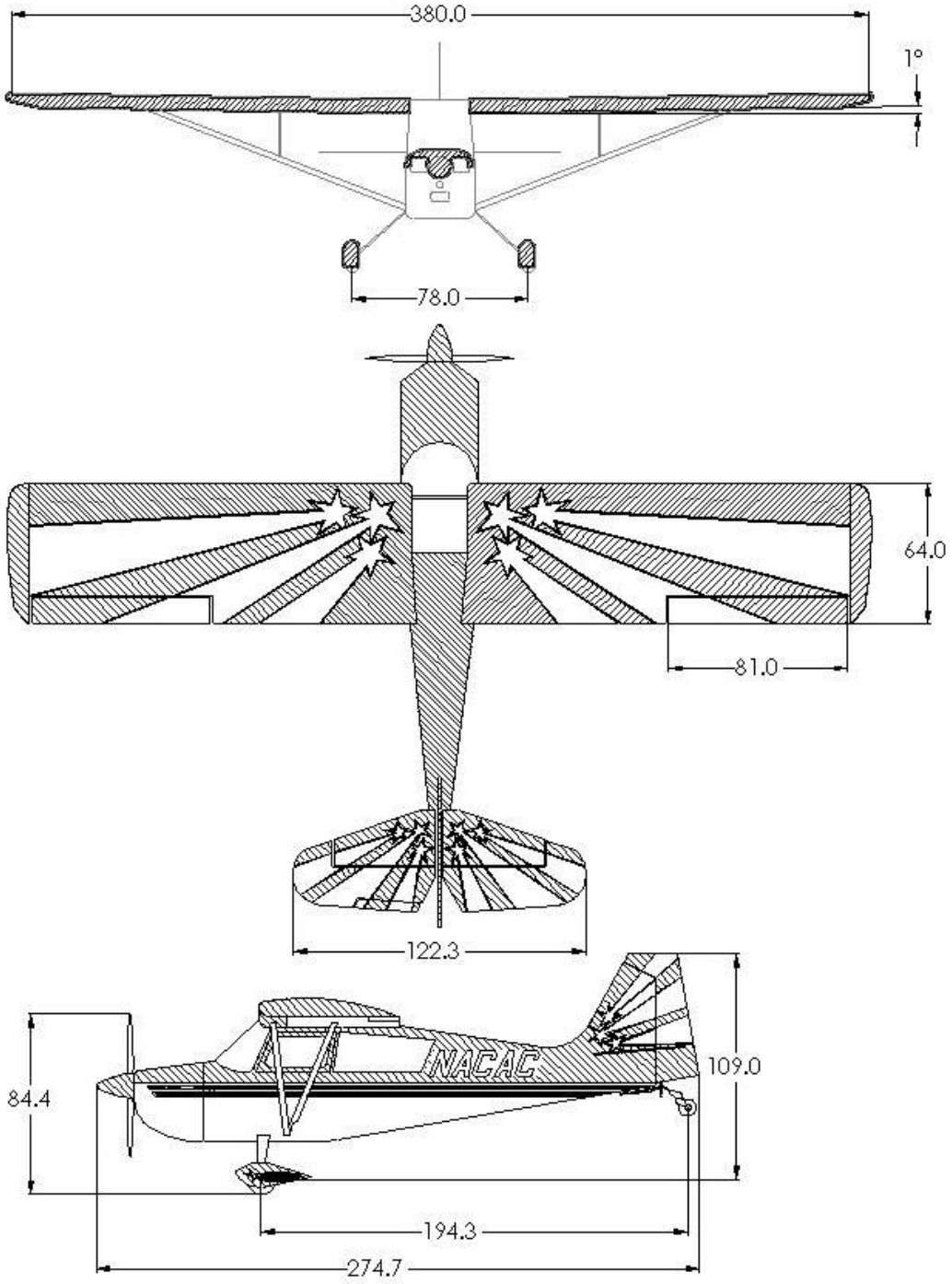


SECTION VI
AIRCRAFT AND SYSTEM DESCRIPTION

INDEX

GENERAL

The Super Decathlon is a single-engine, tandem two-place, strut-braced, high-wing airplane equipped with conventional landing gear. The fuselage is a welded steel tube frame, with wood fairings, covered with Dacron fabric. The strut-braced wing is constructed from formed aluminum ribs and spars covered with Dacron fabric.



ENGINE AND PROPELLER

The engine is a Lycoming, 180 horsepower, 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 the "Engine Oil System" section for schematic and detailed operation information.

The Hartzell propeller is an aluminum, counterweighted, constant speed propeller with a diameter of 74 inches. 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 over speed condition. A venier propeller control is located at the left side of the instrument panel.

The Super Decathlon may be optionally equipped with 74-inch diameter, 2 or 3 blade MT propellers. Operation and function of these propellers are identical to the Hartzell propeller. The propeller blades are of composite design utilizing a wood core and stainless steel erosion sheaths.

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. Pulling the control knob to the rear provides alternate hot air. 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, pull the control away from the panel as required. Pulling the mixture control all the way out provides the fuel cutoff to the engine. Mixture should be leaned at altitudes above 5000ft or when engine power is less than 75%.

BATTERY

The Super Decathlon uses a Concord gas recumbent battery. The battery is located aft of the baggage compartment and is enclosed in a leak proof case with a transparent removable cover. The battery provides electrical power for engine starting and reserve power when the alternator is inoperative.

ALTERNATOR

The 60 amp alternator provides charging current to the battery and has sufficient capacity to operate all electrical equipment without battery drain. The alternator circuit is operative when the master switch is on. The alternator circuit is protected with a circuit breaker located behind the instrument panel.

OVER-VOLTAGE CONTROL

The airplane electrical system is protected from surge by an over voltage control which is integral to the voltage regulator. The over voltage control can be reset by cycling the master switch on-off-on.

VOLTAGE REGULATOR

The voltage regulator controls alternator output and is mounted on the inside, upper right portion of the firewall. This regulator also protects the alternator circuit against overload and should be adjusted only by a qualified mechanic.

LOW VOLTAGE LIGHT

The Super Decathlon may be optionally equipped with a low voltage light. If equipped, the light is located on the left hand side of the instrument panel. The amber light is illuminated when bus voltage drops below 13 volts. Low voltage is indicative of alternator failure and subsequent battery draw or extended storage without charging. In the event of low voltage, procedures for "Alternator and Electrical System Failure" in Section II should be followed.

ELECTRICAL PANEL

Electrical switches (except the starter) are on the electrical panel located on the upper left side of the cabin. These electrical circuits are protected by push-to-reset type circuit breakers, positioned above each circuit switch. In the event of an over amperage condition, due to a voltage spike or excessive current draw, the circuit breaker will open the circuit. Circuit breakers should only be reset once to determine if the over amperage condition was momentary or the result of a more serious problem, i.e. short circuit.

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. The engine will continue to function as ignition is provided by the magnetos.

IGNITION SYSTEM

Ignition is provided by two engine driven magnetos, which are independent of the electrical system and each other. Separate magneto switches are located on the electrical panel forward 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.

CIRCUIT BREAKERS

Each electrical accessory is protected by a separate circuit breaker directly above the electrical switch. In the event of an over amperage condition, due to a voltage spike or excessive current draw, the circuit breaker will open the circuit. To avoid circuit damage, only reset the circuit breaker once.

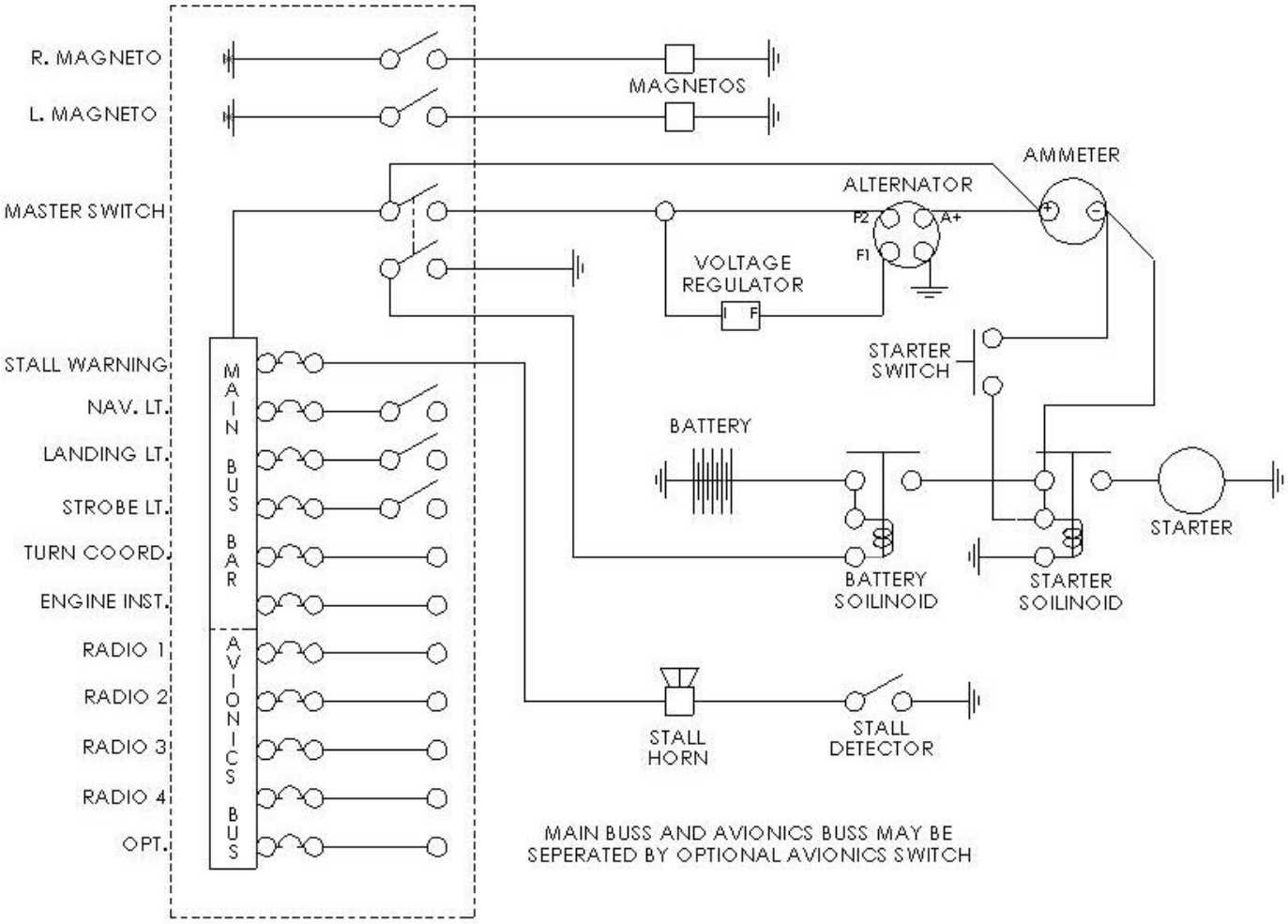
STARTER SWITCH

A momentary 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 zero or a plus reading on the ammeter indicates a normal condition. A negative reading indicates a current draw from the battery.

ELECTRICAL SCHEMATIC



SEATS

Front and rear seats are welded steel tube construction with removable 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 ensure 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 that can be jettisoned if necessary. The door is secured by a lock-equipped latch at the rear and two additional latches located on the top and forward edge.

The emergency door release 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 far 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 stop by pushing hard on forward window frame.

INSTRUMENTS

All instruments except the fuel gauge are in 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

The Super Decathlon is equipped with a five-point harness in both the front and rear seats. The five-point harness consists of a crotch, lap, and two shoulder belts. A secondary inverted harness is available as optional equipment.

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 aircraft just aft of the cabin section (one port on each side of the aircraft). Any obstruction of these ports or pressure lines will affect pitot-static instruments, i.e. airspeed, altimeter, vertical speed indicator.

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. A ground adjustable tab provides rudder trim.

CABIN HEATER

An exhaust shroud heater provides cabin heat. An optional rear seat heater provides additional heat to the rear of the cabin whenever carburetor heat 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 accommodates 100 lbs. of baggage or cargo. The back of the rear seat folds for access.

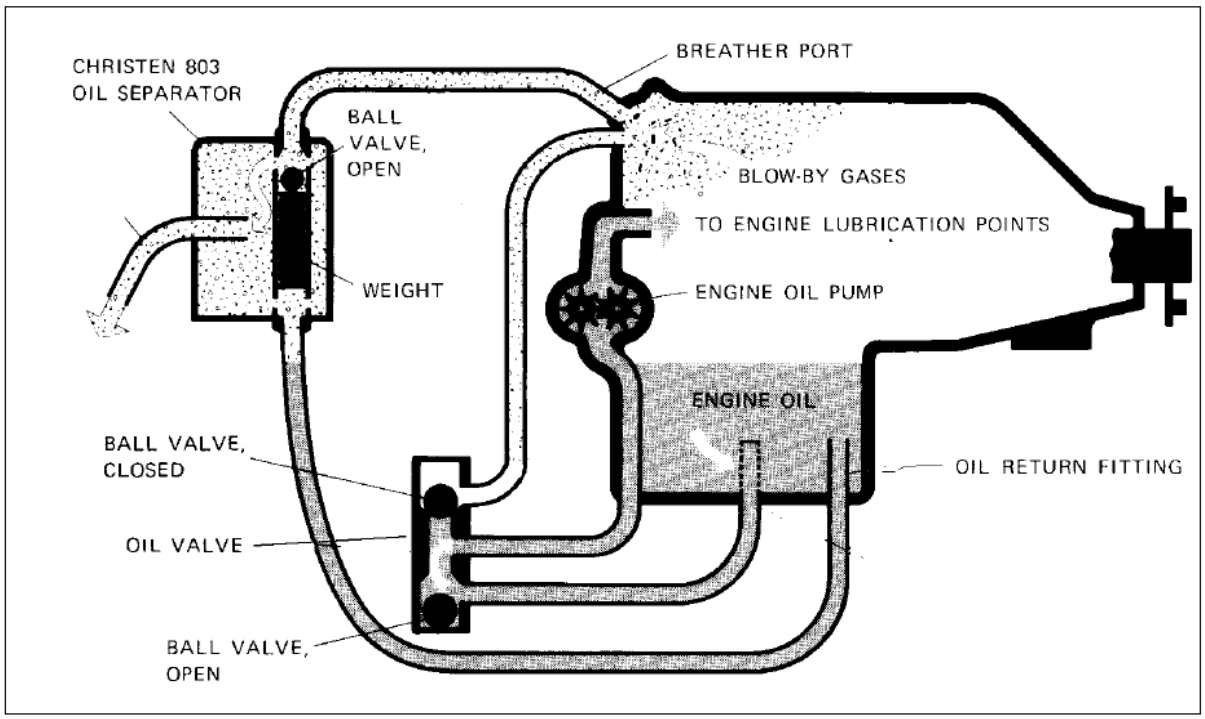
No baggage or loose articles are to be carried during aerobatic flight.

ENGINE OIL SYSTEM

The Super Decathlon is equipped with a Christen inverted oil system. The system consists of an air-oil separator that provides inverted crankcase ventilation and an oil valve that allows for inverted oil pickup. During normal flight, the weighted ball valve at the top of the oil separator is open, allowing blow-by gases from the engine crankcase to be vented from the breather port to the top of the oil separator and out though the breather line. The top port of the oil valve is closed and the bottom port is open allowing oil to flow from the sump to the oil pump and out to engine lubrication points.

NOTE

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



Normal Oil Schematic

When the aircraft is inverted, engine oil falls to the top of the crankcase. The weighted ball valve in the oil separator closes, preventing loss of oil through the oil separator. Blow-by gases from the engine crankcase are vented from the sump to the bottom of the oil separator and out though the overboard breather line. The top ball valve of the oil valve is open and the bottom valve closed allowing oil to flow out from the breather port to the oil valve, through the sump fitting and the sump screen, to the oil pump and out to the engine lubrication points.

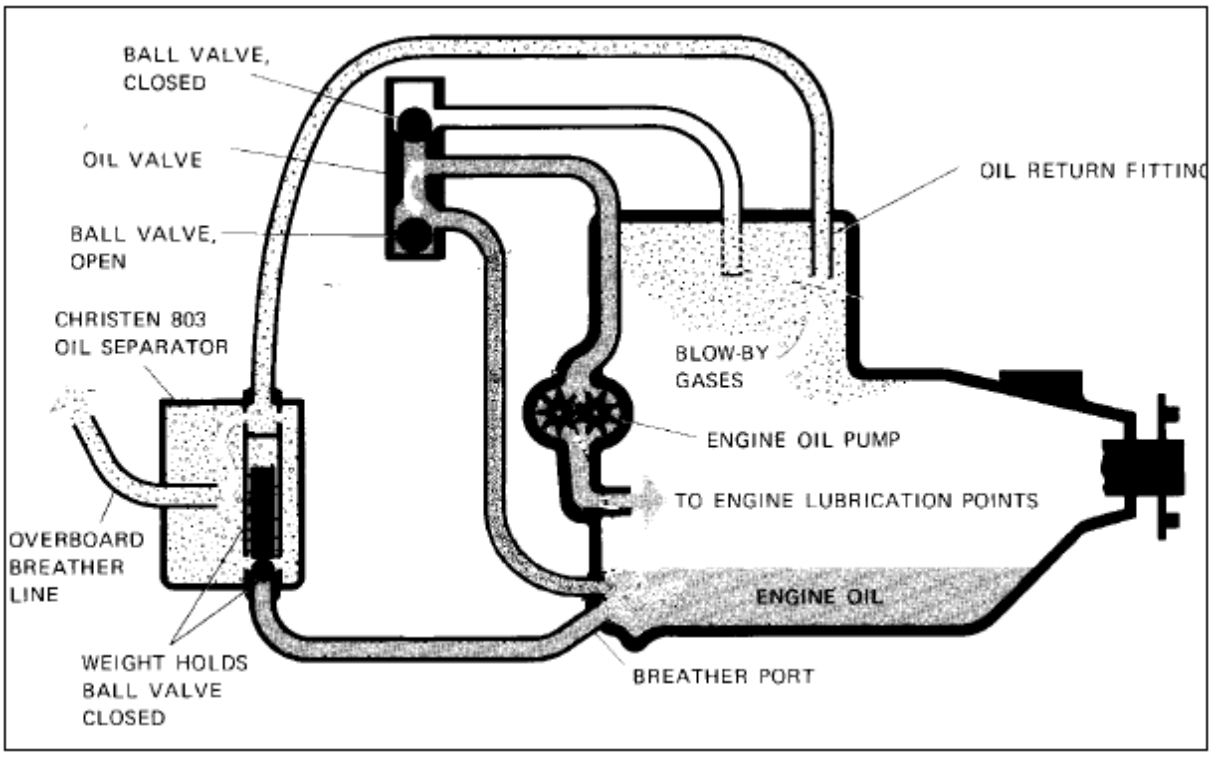
Any oil in the lines that fails to return to this sump during the transition between normal and inverted flight, drains into the oil separator. This oil then returns to the sump from the bottom of the oil separator during periods of normal flight.

NOTE

Oil pressure during inverted flight may normally be five to ten pounds less than oil pressure during normal flight. Inverted oil pressure should be in excess of 60 psi.

NOTE

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



Inverted Oil Schematic

Total oil capacity for the Super Decathlon is approximately ten quarts. The maximum capacity of the oil sump is eight quarts; the minimum operating level is six quarts. Oil level can be determined by means of a dipstick accessible through the cowling access door. Oil level should be maintained between six and eight quarts.

Oil temperature is automatically controlled by a thermostat controlled bypass valve and oil cooler. Hot oil is routed through the oil cooler, while cool oil is not. In cold climates (below 40°F), a restrictor may be installed limiting airflow through the oil cooler.

Oil pressure is automatically controlled by an internal engine driven gear pump and pressure relief valve. The pressure relief valve regulates oil pressure by allowing excess oil to return to the oil sump while the rest of the oil is circulated to engine components.

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. Main gear tire pressure is to be maintained between 29 and 31 psi. Tailwheel tire pressure is to be maintained at 40610 psi. Tire condition should be checked during preflight. If tire tread is no longer visible, the tire should be replaced.

TOWHOOK

The Super Decathlon may be fitted with a towhook for glider and banner tow operations. The release lever is located on the cabin floor, left of centerline, forward of the front seat. Towline breaking strength must not exceed to 1200 lbs. The operator must determine an adequate towline strength safety margin. American Champion Aircraft recommends a maximum glider weight of 1000 lbs and maximum banner weight of 600 lbs.

FUEL SYSTEM

The Super Decathlon fuel system is a gravity flow "ON – OFF" system, shown below. Two 20-gallon welded aluminum fuel tanks are located in the inboard section of each wing. Wing tanks can be drained by removing a ¼ inch pipe plug from the inboard corner of the tank. Fuel lines between the tanks and rear sump are drained from a quick drain located on the belly of the aircraft.

The gascolator is mounted on the firewall in the engine compartment and is equipped with a quick drain. The sediment bowl is removable for cleaning and replacement of the fuel screen. The fuel shut-off valve is located on the left side of the cabin.

Mechanical float type gauges provide fuel quantity indications; the gauges are only accurate in a level flight attitude.

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.

NOTE

The fuel filler cap used on the Super Decathlon is a non-venting type. A loose cap, or one that is not sealing properly, may cause a fuel imbalance from one tank to another. If an excessive fuel imbalance 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 imbalance. Do not assume fuel in left tank is identical to that shown on right tank fuel gauge.

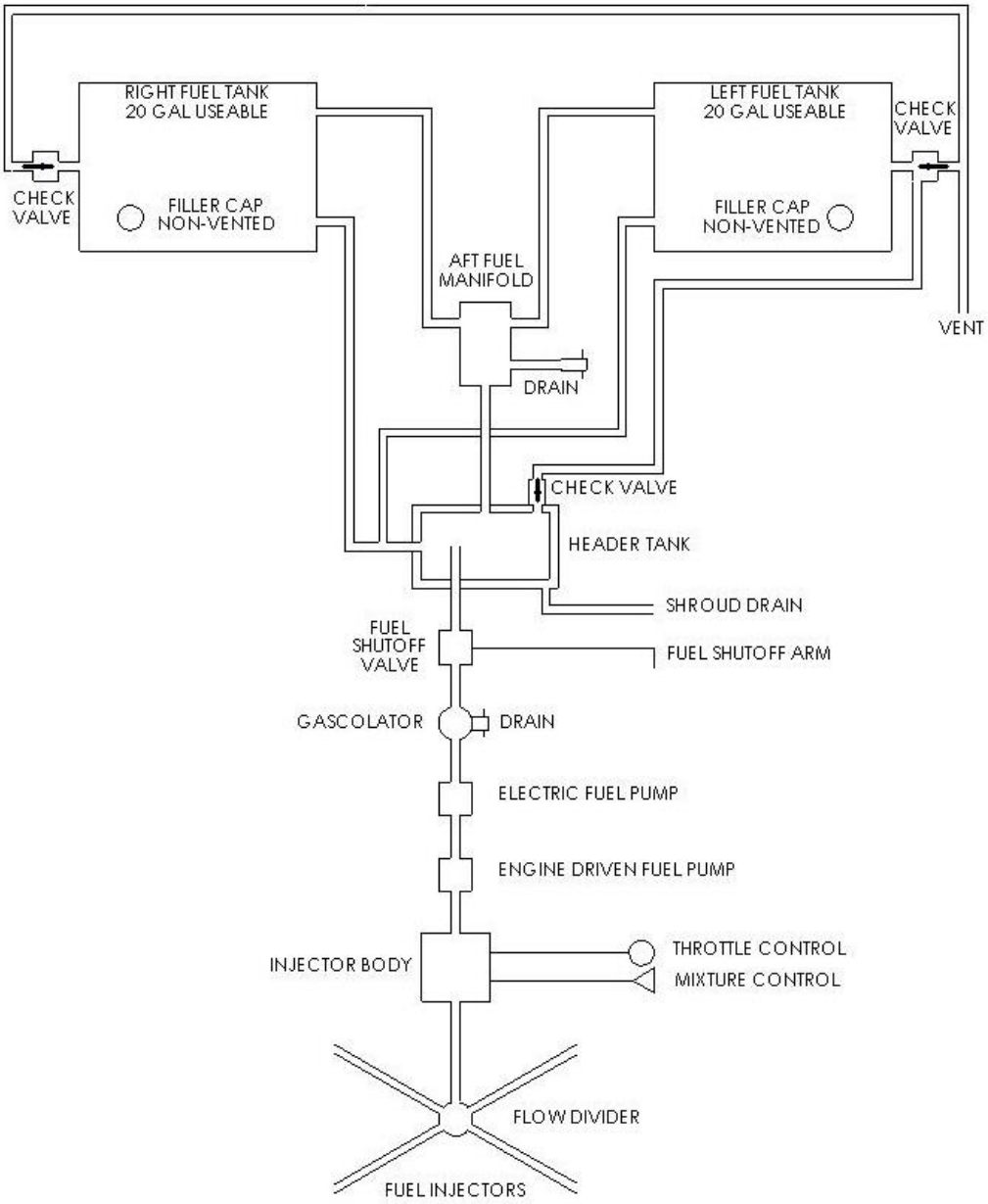
HEADER TANK

A 1.5 gallon, shrouded header tank provides for inverted fuel. The 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 fuel is usable in the inverted position. Even though the inverted fuel supply has not been exhausted inverted light must be terminated immediately if oil pressure should drop below acceptable limits.

FUEL PUMPS

Positive fuel pressure is assured by the use of an engine driven fuel pump and electric emergency pump. The engine driven pump is a cam actuated pump that supplies fuel at the proper pressure to the fuel injector whenever the engine is running. The electric pump is mounted on the firewall and supplies pressure for priming and redundant pump for takeoff and landing operations. The control switch for the electric pump is located on the instrument panel adjacent to the mixture control and starter switch. Fuel pressure should remain within the green arc as indicated by the fuel pressure gauge.

FUEL SCHEMATIC



SECTION VII
SERVICING REQUIREMENTS

INDEX

GENERAL

This section describes ground handling, routine servicing, cleaning and storage procedures. No information is provided for making mechanical adjustments or repairs. Refer to the Super Decathlon Service Manual for complete servicing instructions. The Super Decathlon Parts Manual lists replacement components.

The FAA requires that the aircraft undergo an annual inspection performed by a properly designated individual or repair station. If the aircraft is flown for commercial reasons, as specified by the Federal Aviation Regulations, an additional inspection is required every 100 hours of operation. An appropriately rated mechanic must perform this inspection. The annual and 100 hr inspections are identical in scope.

American Champion Aircraft recommends that inspections are conducted at 100 hr intervals to provide owners and operators with the highest degree of utilization and safety.

NOTE

Above inspections are in addition to daily preflight inspections and routine servicing (i.e. oil change, etc.)

GROUND HANDLING

The Super Decathlon is easily handled on the ground by using the handle on the lower right side of the fuselage just forward of the tail section. The tail can be lifted and the airplane can be pushed, pulled, and turned from this position. A sufficient side load disengages the tailwheel steering mechanism. Ground handlers should specifically avoid pushing or pulling on propeller spinner, propeller tips, rear wing struts, fuselage stringers or tail surfaces.

JACKING

The tail can be lifted by hand with a suitable support placed under the tail wheel spring at the fuselage attach point.

The main wheels can be raised by lifting one side at a time from the strut attach fittings. Reference the Super Decathlon Service Manual for complete jacking instructions.

MOORING

In the event of high winds, the aircraft should be properly secured. Tie-down rings are provided under each wing on the main wing strut. The tail can be secured by tying a rope or chain through the tailwheel unit.

1. Face aircraft into the wind if possible
2. Attach tie-down chains or ropes to the tail wheel assembly and tie down fittings at the upper end of the main wing struts
3. Set parking brakes
4. Secure the control stick aft with the forward seat belt
5. Install control surface blocks for the rudder
6. Install pitot tube cover

INSPECTION AND SERVICING ACCESS

The top half of the cowling can be quickly removed for inspection or maintenance by removing 12 screws retaining the upper cowling and lifting the top cowl free. To remove the lower cowl once the top is removed:

1. Disconnect landing light wires at the right side of the cowl from the firewall.
2. Remove screws (10) from rear edge of cowl.
3. Pull cowl slightly forward and down.

Installation of cowl is in reverse order of removal. However, when installing lower cowl, ensure that the rubber duct which connects the air filter to air intake manifold is installed over the connecting flange. When installing upper cowl, be certain rubberized cloth is in correct position to seal engine baffles to the cowl.

Additional inspection plates are provided on the wings and fuselage to gain access to control cables, fuel lines, wiring, etc. Zippers are provided in the cabin headliner to allow easy access to the overhead control cables and fuel lines.

FUEL

Aviation grade 100LL fuel is the standard fuel for the Super Decathlon, 91/96 octane aviation fuel is the minimum. Use of a lower grade can cause serious engine damage and engine failure. Fill each wing tank through the respective filler neck on the top surface of the wings. The caps are non-vented and must be properly secured or fuel will siphon out and feed unevenly during flight.

NOTE

Because of crossfeeding between the two tanks, they should be re-topped during refueling to assure a maximum capacity.

A quick drain is provided on the gascolator and should be used during the preflight inspection to check for fuel contamination. The system low point drain is located externally on the fuselage belly aft of the rear seat and should be used during high moisture conditions or if water is present in the gascolator. Each tank also has a drain plug to remove fuel from the tank if necessary.

WARNING

After using fuel drains, ensure that valve is properly seated and no leakage is evident.

ENGINE LUBRICATION

Oil sump capacity is eight quarts and minimum safe quantity is six quarts. The oil filler port and dipstick can be accessed through the inspection door on the engine cowling. The oil level should be checked prior to flight and oil added if below six quarts.

Temperature	Single Viscosity Grades	Multi-Viscosity Grades
All Temperatures	See Below	SAE 15W50 or SAE 20W50
Above 80° F	SAE 60	SAE 15W50 or SAE 20W50
Above 60° F	SAE 50	SAE 15W50 or SAE 20W50
30° to 90° F	SAE 40	SAE 15W50 or SAE 20W50
0° to 90° F	SAE 40	SAE 15W50 or SAE 20W50
0° to 70° F	SAE 30 or SAE 40	SAE 20W40
Below 10° F	SAE 30	SAE 20W30

It is recommended that engine oil be changed approximately every 25 hours. Depending on operating conditions, a longer or shorter period may be used at the discretion of the owner. The above grades should be used for the specified temperatures. The oil must also conform to Lycoming Service Instructions SI-1014. To change the oil, first fly the airplane for a short period to allow oil to reach normal operation temperature. If your engine is not equipped with a quick-

drain, the oil is drained by first removing the bottom engine cowling then unsafetying and removing the pipe plug on the right side of the oil sump bottom. After draining, reinstall plug, secure with safety wire and replace cowling.

REQUIREMENTS FOR NEW ENGINES

Your engine is filled at the factory with the proper grade of straight mineral oil. Only straight mineral oil (not additive oil) should be used for the first 50 hours or until oil consumption stabilizes.

ENGINE CLEANING

The engine can be washed down with a commercial engine solvent or kerosene based solvent. Avoid excessive contact of solvent with electrical components such as the magnetos, starter, voltage regulator, etc.

BRACKETT AIR FILTER

The engine air filter element should be replaced every 200 hours, every 12 calendar months, or when more than 50% of the filter service is covered with foreign matter.

TIRES

Tire condition should be checked during preflight. If the tire tread is no longer visible, it should be replaced. Inflate tires with compressed air.

Main Wheels 29 to 31 psi
Tail Wheel 40± 10psi

BRAKE SERVICING

To fill and/or bleed the brake system, remove the rubber cap from the bleeder valve on the bottom of the brake assembly located on the gear leg at the axle attachment. Turn the valve open and connect a pressure brake bleeder to the valve. Fill brake until fluid runs out of the over flow tubes located on the underside of the fuselage cabin section. Continue to fill until the brake pedal pressure is firm. Close bleeder valve on the brake assembly before disconnecting the hose of the pressure pot. Each brake is filled separately.

CAUTION

Use only MIL-H-5606 hydraulic fluid or equivalent.

BATTERY AND BATTERY BOX

The battery is located behind the baggage compartment in a sealed battery box. The battery should be inspected every 50 hours (10 hours for acrobatic flight) or 30 days for security and evidence of acid leakage. If the battery is to be removed, disconnect the ground cable first and install last.

NOTE

If signs of acid spillage exist inside the case or battery box, neutralize all the spilled acid with soda and clean battery, battery box and other affected parts. Replace battery prior next flight.

EXTERIOR CARE

Your Super Decathlon has a long lasting, all weather finish and should require very little maintenance. However, it may be desirable to wax and polish the airplane. It is recommended that this work be delayed until at least 30 to 60 days after date of manufacture so that the paint may cure completely. If you choose to wax your airplane, use a good aircraft type wax and apply wax liberally to areas subject to high abrasion such as leading edges of the wings and tail surfaces.

The finish can be kept bright simply by washing with water and mild soap. Avoid abrasive soaps or harsh detergents. Grease and oil may be removed with solvent or non-leaded gas. Rinse with clear water and dry with terry cloth towels or chamois.

Ice may be removed from the wings using a 50/50 solution of isopropyl alcohol and water. Do not allow solution to come in contact with the Plexiglass windows.

WINDSHIELD AND WINDOW CARE

A certain amount of care is required to keep the Plexiglas in the windshield and cabin windows clean and unscratched. The following cleaning procedure is recommended.

1. If large deposits of mud and dirt have accumulated on the Plexiglas, flush with clean water and dislodge excess dirt and mud.
2. Wash with soap and water. Use a sponge or heavy wadding of soft cloth. Do not rub as the abrasive in the dirt and mud residue will cause fine scratches in the surface.
3. Grease and oil spots may be removed with a soft cloth soaked in kerosene.
4. After cleaning, wax the surface with a thin coat of hard polishing wax or a commercial brand of Plexiglas polish. Buff with a soft cloth.
5. If a severe scratch or marring should occur, use jeweler's rouge to rub out the scratch. Smooth it and apply wax.

CAUTION

Never use gasoline, benzene, alcohol, acetone, carbon tetrachloride, anti-ice fluid, lacquer thinner or glass cleaner to clean the Plexiglas. These materials will attack the plastic and may cause severe crazing.

INTERIOR CARE

The vinyl interior can be washed with mild soap and water. The carpet should be cleaned with any commercial or household upholstery or carpet cleaner for nylon type material.

STORAGE

Aircraft placed in non-operational storage for long periods of time should be given a thorough cleaning. Every ten days the propeller should be pulled through several revolutions to reactivate the oil film and prevent corrosion.

WARNING

Check that all engine switches and controls are OFF prior to rotating the propeller and stay clear of the propeller arc.

To ensure long engine life, the aircraft should be flown at least once a month to reduce moisture buildup. Excessive ground running to bring engine to operating temperature is not recommended. Consult the engine manual for further recommendations if this is not possible

The fuel tanks should be kept full to prevent moisture buildup due to condensation.

Ensure that the battery is kept fully charged or the electrolyte may freeze and damage the battery in cold weather.