Flight Manual

Falco F8L / I-DIET

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3rd Revision

Foreword

The F.8L Falco is a true dual-purpose aircraft, combining high-speed cross-country flight with complete aerobatic capability. In the best traditions of Italian design, this “Ferrari” offers exceptional handling characteristics and performance better than most production aircraft with twice the power.

The Falco was designed by the Italian designer Stelio Frati and first flew in 1955. During the 1950’s and 1960’s the aircraft was produced by three Italian companies. The Falco is widely recognized as an outstanding example of aircraft design. The Falco is now produced by Sequoia Aircraft Corporation as a series of kits for construction by individual homebuilders.

The aircraft I-DIET is based on plans and kits supplied by Sequoia and it was built by Sign. Giovanni Fulcheri in Mondovi, Italy starting in the late 80s. The aircraft was completed in Spring 2008. The first flight was performed by test pilot Attilio Caiazzo in the same year.

A test flight program according to ENAC standards was performed by Attilio Caiazzo during summer 2008 (see chapter *I-DIET Flight Test Program*). The permit-to-flight (permesso di volo) issued by ENAC according to NAV-15D in December 2009.

I-DIET was bought by Dr. Raoul Schild in late summer 2009. Following the purchase a modification to the avionics and necessary electric systems including the panel layout was done in 2010. In 2011 a new MT three-bladed propeller was installed for more economical and smoother operation. Subsequently during summer 2011 until autumn 2012 a test program proving the capability to operate the aircraft under daytime IFR in VMC conditions was concluded.

This flight manual includes all instructions for the safe operation of I-DIET including the all modifications. It is written in compliance with EASA CS-23 documentation standards.

This manual is prepared by Dr. Raoul Schild, Schild & Partner GmbH, Schaeffergasse 20/52, 1040 Vienna, Austria. based on the information provided by Sequoia, Giovanni Fulcheri, Attilio Caiazzo and Ing. Thomas Tschirk.

Vienna, Austria - October 2012

0. Record of Revisions

All revisions of this manual, with the exception of:

- Temporary Revisions,
- updates of mass and balance information
- updates of the equipment inventory

are recorded in the revision table.

Revisions need to be approved by the responsible authority (i.e. ENAC). Revised chapter and/or text passages are indicated with

- blue text color for revision 1,
- orange text color for revision 2,
- violet text color for revision 3.

This manual extends but not necessarily supersedes the Sequoia Flight Manual and the original I-DIET Maintenance Program and Manual.

Rev. No.	Reason	Part / Chapter	Page(s)	Date of Revision	Approval	Date of Approval
1	Modifications of avionics and systems	1. Flight Manual	various, new manual	October 2010		
		2. Maintenance Program & Manual		October 2010		
2	Change of Propeller to a MTV-12 3-bladed propeller from MT-Propeller	1. Flight Manual		July 2011		
		2. Maintenance Program & Manual				
3	IFR/VMC/ day operation	1. Flight Manual	67	October 28th, 2012		
		2. Maintenance Program & Manual	27	November 19th, 2012		

1. Description of the Airplane and its Systems

The F.8L Falco is a two seat aircraft with side by side seating for the pilot and passenger and provisions for adding a third seat in the luggage compartment behind the pilot and passenger's seat. This third seat is limited to a maximum weight of 90 pounds. On I-DIET this seat is not installed.

1.1 Engine and Engine Controls

The engine is the 180 hp Lycoming AEIO-360 B1E with a constant-speed propeller installed.

The engine controls consist of throttle, propeller and mixture control levers located in a center throttle quadrant. These controls are connected to the engine by Teflon-lined stainless-steel push-pull control cables. A friction control knob is located on the left side of the throttle quadrant.

Alternate air (for the fuel injected engine) are provided. The control is located below the center throttle quadrant.

1.2 Landing Gear

The tricycle landing gear is retractable, operated by a single electric motor which drives screw-jacks to each of the gear legs. A hand crank is provided for emergency operation. The hand crank is located under a cover on the console between the pilot and passenger's seats.

The landing gear switch is located in the middle of the instrument panel. The switch has a wheel-shaped knob, and the switch is of the lever-lock type to prevent the accidental operation of the switch. The landing gear switch has two positions, "Up" and "Down", and the knob must be pulled out before the switch will move.

The landing gear indicator lights are located at the top center of the instrument panel next to the landing gear switch. Three green lights indicate that the landing gear is down. A red light indicates that the landing gear is "in transit": specifically that the landing gear motor is running to retract or extend the landing gear. When the landing gear is fully retracted, both the red and green lights are extinguished. A landing gear warning light is provided in the annunciator panel. In addition, a landing gear warning horn is available. The landing gear circuit has a pitot-pressure switch which senses airspeed and a throttle lever microswitch which senses throttle position. The system is calibrated such that in case a landing is attempted (IAS ≤ 85 knots, MAP ≤ 15 inches) with the landing gear in „UP" position a warning horn will sound and the red warning light next to the gear lever will flash.

The landing gear horn may be switched off (for e.g. acrobatics). This switch is located in the annunciator panel, along with a “horn off” warning light. The landing gear warning light will continue to operate when the horn is switched off.

1.3 Flight Controls and Flaps

Dual control sticks are provided, and the stick on the right side is removable to allow for freedom of movement for the passenger. The control system transfers the control forces of the sticks to the ailerons and elevator via pushrods and control cables.

Rudder pedals are provided for both pilot and passenger. The rudder pedals are connected to the steerable nose gear and rudder with control cables. When the landing gear is retracted, the nose gear is automatically disengaged from the control system.

Brakes are provided for the pilot only, and a parking brake valve is located in the console between the pilot's and passenger's seats.

An elevator trim tab is provided. It is manually operated by a trim control wheel located in the console between the pilot's and passenger's seats or using the trim switch („U“ for trim up and „D“ for trim down) located on top of the pilot control stick. Alternatively if the AP is switched on but the VNAV modes are not engaged the rotary encoder and pushbutton on the Pro Pilot autopilot control head can be used to electrically operate the elevator trim.

The elevator trim control wheel is attached to an angle drive which operates a screw-jack. The electrical trim system is driven by a motor underneath of the trim control wheel which is connected through an elastic ring to the manual trim control wheel. This ring has enough friction to allow the motor to drive the wheel and also enables the pilot to manually override the electrical trim with minimal force if required. The motion of the screw-jack is transferred to the elevator tab by a single push-pull control cable. An indicator for the elevator trim is located on the instrument panel left of the gear handle and indications. The electrical trim system is connected to the two axis autopilot system allowing auto-trimming.

The Falco is provided with large, effective slotted flaps for landing and take-off. The flaps are controlled by an electric actuator. The flap switch has a shaped handle and is located on the instrument panel underneath the variometer. The flap indication is located to the right of the flap switch. The flaps can be set to 4 positions briefly moving and holding (more that 0.5 seconds) the flap switch in the desired direction. The flaps will automatically move to the next position (up or down). The 4 positions are "up", "take-off (about 10 degrees down)", "30 degrees down" and "45 degrees down". For normal landing and/or moderate to strong wind situations the flaps are set to the „30 degrees down“ position. The „45 degrees down“ enables slightly lower touch-down speeds and is used for short or grass field landings.

1.4 Audio System

The audio system is based on a Garmin GMA 340 audio panel with integrated intercom system. The audio panel is located at the bottom of the avionics stack. The push-to-talk switches are located on each control stick. Microphone and phone jacks are located at the center console between the pilot and passenger seat. This audio interface console also provides a stereo audio input jack (3.5 mm) for e.g. music or warnings generated from an external GPS unit.

1.5 Electrical System

The Falco has a 14 volts triple bus, noise suppressed electrical system driven by a 60 ampere alternator and backed up by two batteries (one for the main electrical bus and a second for the essential electrical bus). The electrical bus system consists of the main electrical bus, the avionics bus and the essential bus. Each system can be switched separately through switches located to the right of the starter/ignition switch on the instrument panel. The circuit breakers of the push-pull type on the right side of the instrument panel are associated to each bus system and each circuit breaker is marked to which electrical subsystem it belongs.

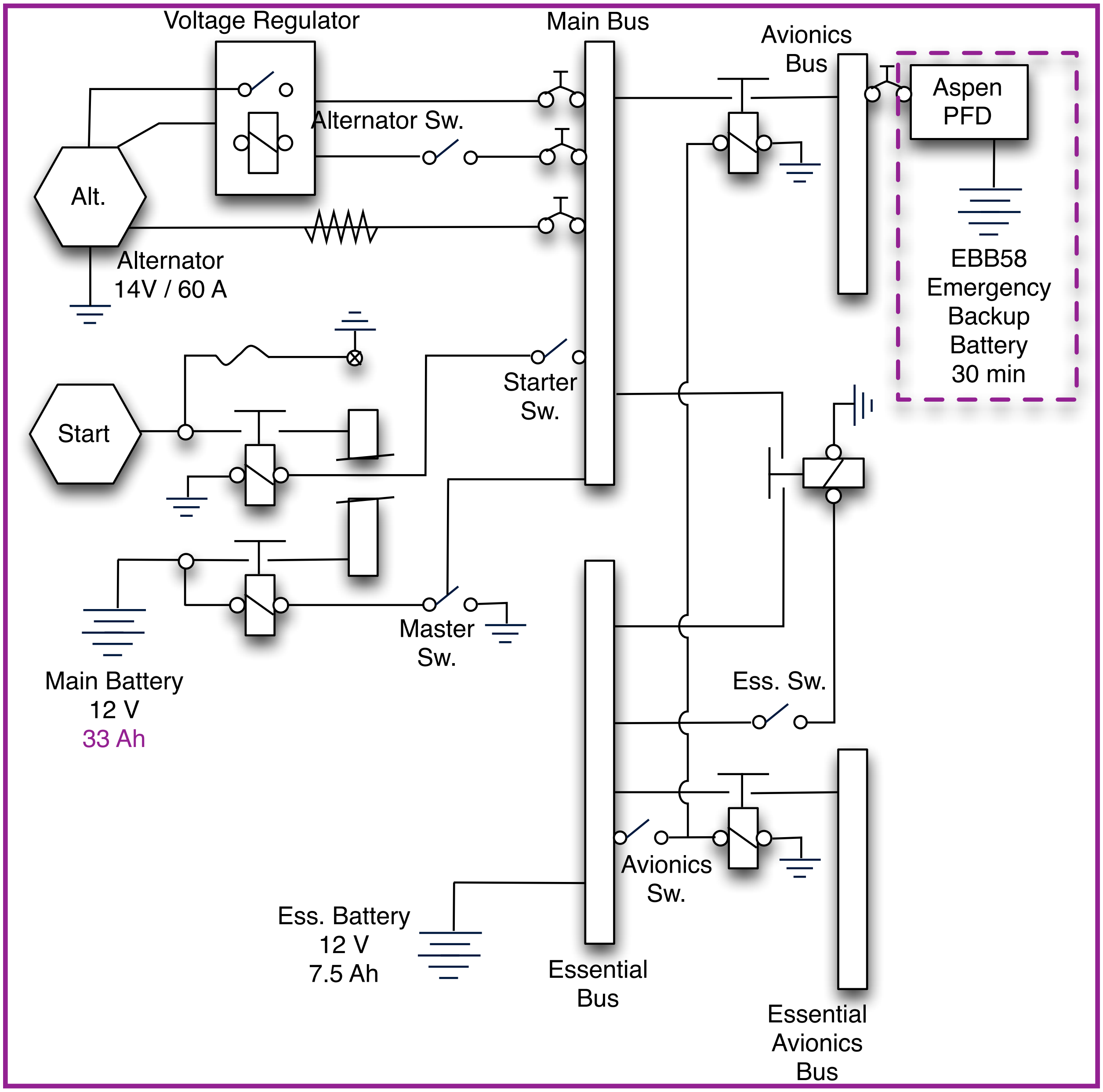
The main bus electrical system is the system which is used for normal operation in combination with the avionics bus. It is connected to the alternator and a battery. In case of an alternator failure the battery is capable of providing at least 30 minutes of power for the main systems in day and night operation. In addition the primary flight display has its own backup battery allowing autarkic and automatic emergency operation if the main bus voltage drops below 12.5 volts.

The voltage regulator is set at 14 volts. In the event that the system voltage reaches 16 volts, the voltage regulator will automatically cut off the alternator. The voltage regulator may be reset by switching the alternator switch “off” and then back “on”.

The avionics bus through the separate switching allows the avionics sub-systems to be activated after engine start using only one switch.

The essential bus electrical system may be used before starting the engine for getting clearances while using no power from the main battery. The essential bus is supported by its own battery. The essential bus is also a backup electrical system supplying the CRM 2100 engine and systems monitoring, NavCom 1 (Bendix), external NAV input, glare-shield lights, gear and flap systems. The essential battery is rated at 7.5 Ah and provides additional time to land the aircraft at an appropriate airport in case of an alternator failure.

The ignition switch is located to the bottom left of the instrument panel. To its right are the separate master and alternator switch. The master switch is provided with a green indicator light. Next to the alternator is the avionics bus switch with a green light on top when switched on. Again next to the avionics switch is the essential bus switch. A read light indicates the essential bus is on.



Schematic Electrical Diagram of I-DIET

1.6 Engine and Airplane Systems Monitoring

All engine, electrical and the vacuum systems are monitored by an electronic display based monitoring system with integrated LED based backup in case of display failure - the AuRACLE CRM 2100 system. In case of a display failure four green LEDs show whether RPM, oil pressure, amperage and vacuum are within normal operation limits. If one of these systems exceed either the upper of lower limits the corresponding LED will indicate red. The monitoring system display is located in the centre of the instrument panel just above the throttle quadrant for easy reading and accessibility. It includes am automatic visual and aural warning system (annunciation panel) if the system detects and exceeding of limits of the sub-systems it monitors.

The system is controlled through a rotating, push knob and a function button. The system provides the following information:

- engine rotation per minute (RPM)
- manifold pressure
- engine power output in horse power and % power
- cylinder heat and exhaust gas temperatures in degrees celsius for each of the 4 cylinders including leaning assistance
- oil temperature and pressure
- fuel pressure
- outside air temperature
- voltage of main electrical bus (and essential electrical bus is main electrical bus is switched off) and ampere drawn from the alternator
- vacuum produced by the dry vacuum pump
- fuel information including: fuel remaining, fuel flow, endurance remaining at current fuel flow and endurance remaining at destination (based on flight plan set in NavCom 2)

Further information about the operation of the monitoring system is provided in the manual („AuRACLE-Pilots-Guide-Rev-E“).

1.7 Instrumentation

The aircraft contains a complete analog and digital primary instrumentation consisting of

- analog (round dial) and digital (tape) airspeed indication,
- analog and digital altitude indication,
- analog and digital variometer,
- artificial vacuum driven horizon,
- solid state micro-electro-mechanical systems (MEMS) based digital artificial horizon.

The digital indications for airspeed, altitude and vertical speed can be switched off while the analog indications are always on.

The primary instrumentation is driven by the same pitot and static system. The two static ports are located on the sides of the fuselage tail cone. In the event that these two ports become clogged, an alternate static source is provided. This is located at the base of the instrument panel on the left. The alternate static source is a drain valve, and it is opened by pushing up and turning the two protruding rods to the locked-open position.

The pitot tube is located on the left wing and is heated. The switch for the pitot heat is located on the upper, middle part of the instrument panel.

The analog airspeed indicator is marked with the operating speeds of the aircraft. The white arc indicates the flap speeds. The white arc is stepped. Full flaps may be used only for the speeds indicated by the broad white arc, while 20° of flaps may be used for the full range indicated by the white arc. The maximum landing gear retraction or extension speed is indicated by a small G . The maneuvering speeds are also indicated, MU for the utility category and MA for the acrobatic category. The digital airspeed indicator replicates the markings on the tape based indication.

The rate of climb and altimeter share the pitot static system of the airspeed indicator. The analog artificial horizon is of a special design for acrobatic flight, thus no special procedures are required for acrobatic flight. The analog artificial horizon is operated by the vacuum system, and a suction gauge indication is provided on the engine monitoring system. A filter is provided to supply clean air to this instruments This filter is located on the forward—away from the pilot—side of the instrument panel, directly in front of the master switch. The suction gauge is vented into the filter, thus the gauge is a proper "differential" gauge, indicating both a clogged filter or a failure of the vacuum pump.

The turn-and-bank, slip-skit indicator is integrated in the digital primary flight display as part of the artificial horizon. An alternate analog slip-skit indicator is integrated in the autopilot head unit.

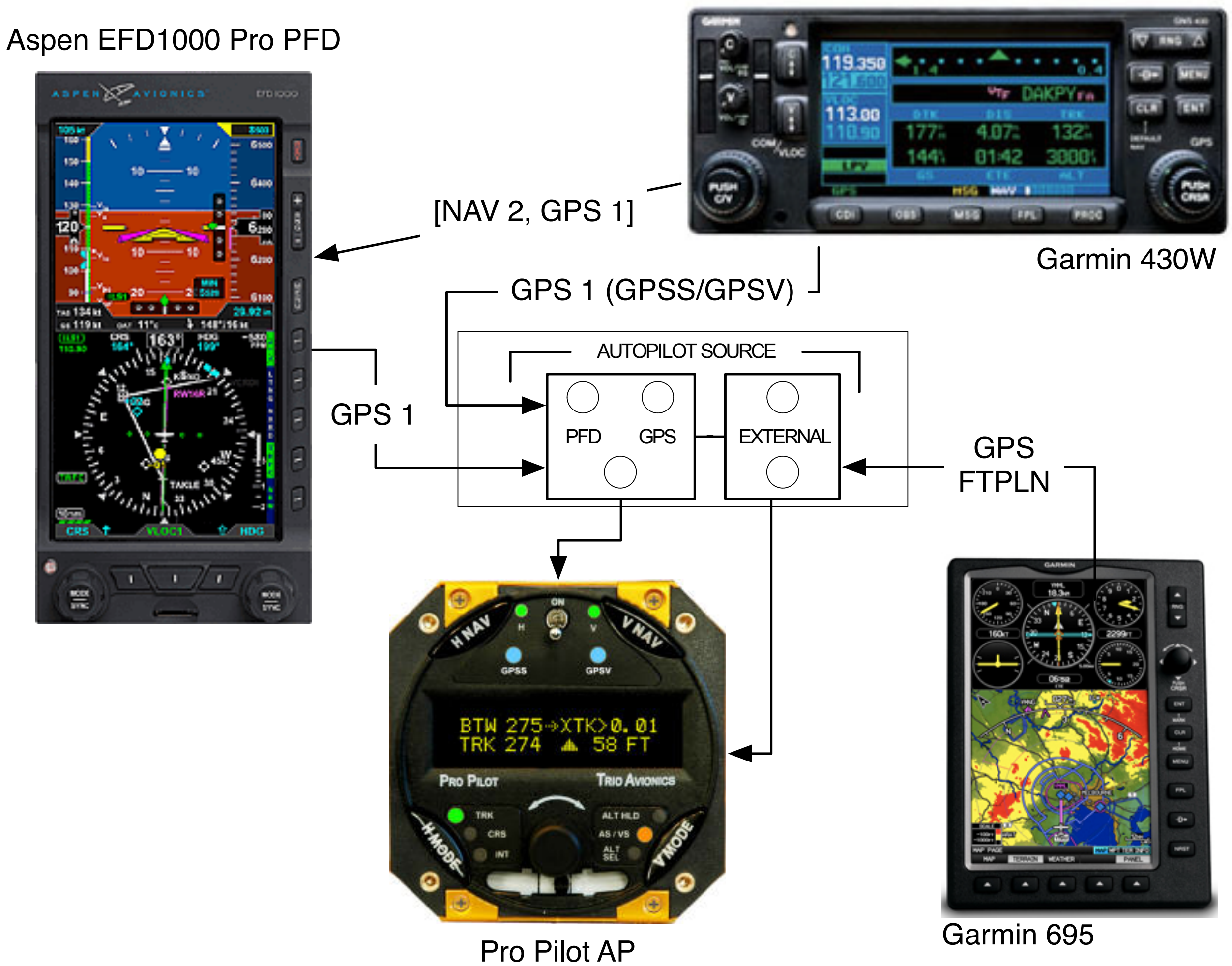
Refer to the documentation of the digital primary flight instrument (PFD) for further information (see „EFD1000_PFD_Pilots_Guide“).

1.8 Autopilot System

A digital two axis autopilot with automatic flight envelope protection is available and located on the instrument panel next to the avionics stack. The flight envelope protection system, which is automatically engaged when the autopilot and servos are activated, prevents the aircraft from stalling, over-speeding or over-stressing.

The autopilot has a pilot override function through a clutch system integrated in the servos driving the aircraft aileron and elevator control. This way the pilot may at any time override an engaged servo if required.

The autopilot is connected to the internal GPS 1 / NAV 2 or PFD system. It may also be connected to an external source (GPS via RS 232 or ARINC 429). The source may be selected through two switches located on the instrument panel above the PFD. The selected source is indicated through the switch position and a corresponding LED light (see Autopilot Source Setup diagram).



Autopilot Sources Setup

If the autopilot is directly switched to the Garmin 430W GPS source and a flight-plan is active the autopilot will follow the flight plan route using GPSS steering (blue LED is illuminated). Alternatively if a Garmin 430W GPS flight-plan is active but the autopilot source switch selects the Aspen PFD as a source the autopilot tracks the route on a waypoint basis rather than through GPSS steering. In GPSS mode the Pro Pilot autopilot will follow the ARINC roll commands to the extent that it will fly complete horizontal flight plans (as entered into the GPS receiver), including procedure turns and some holding patterns.

The autopilot is capable of flying the aircraft shortly after takeoff until short before landing (even providing RNAV(GNSS) APV approach capabilities) using horizontal and vertical modes. The power setting and leaning has to be done by the pilot.

In horizontal mode the autopilot requires a valid GPS position either from the internal or external GPS source. The internal GPS source (being the GPS from the NavCom 2) only provides GPS position data if either a valid flight plan or at least a direct-to is activated. The autopilot will indicate "no GPS" if neither is activated and only the wing leveling function can be used. If a flight plan is available to the autopilot in horizontal mode the autopilot can be used to follow the flight plan, follow a selected course or intercept a track after a course deviation. The horizontal mode supports GPSS if it is provided by the GPS source.

In the vertical mode the autopilot can be used to hold an altitude, follow a selected vertical speed and automatically level off at a target altitude. The vertical mode also provides an airspeed capture mode which might be used to climb or descend at a given airspeed. The vertical airspeed mode supports GPSV if the GPS source is programmed to follow an APV approach. The vertical modes also interface to the electrical trim system performing automatic trimming of the aircraft if required. This feature is especially helpful in vertical speed modes in combination with automatic leveling off, or during APV approaches done to minimums providing the pilot a properly trimmed aircraft upon disengagement of the autopilot on short final. The automatic trimming is only available with flaps up (zero position). This is a safety feature to prevent any out-of-trim situation during approach with speed below 100 knots IAS. Electric trimming from the control stick or manual trimming using the trim wheel is available.

The autopilot is capable of executing an APV approach as provided by an appropriate GPS navigation system.

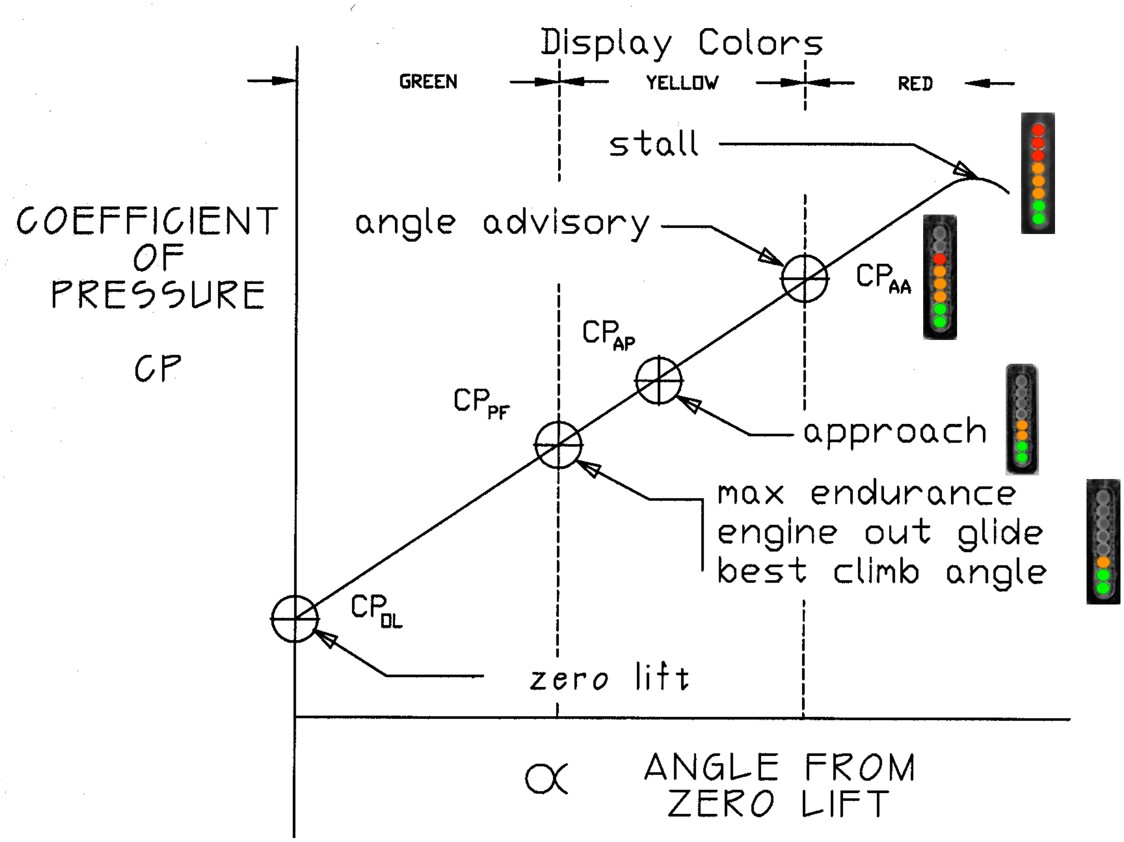
On the left control stick there is an autopilot disconnect switch (black rocker switch) which can be used to disengage all servos from the controls. The autopilot disconnect switch also provides the „pilot control steering“ functionally. Upon pressing and holding the button (for more than 5 seconds) the aircraft can be manually flown to a given course, vertical speed (min. 200 feet/min) and altitude which is then hold by the autopilot switching to the appropriate modes upon depressing the button again.

The autopilot is dually switched. The system itself has an on/off switch on the control head. In addition a separate switch and LED indication is provided on the instrument panel. The autopilot system is powered from the avionics bus.

Refer to the autopilot manual for further information on the operation of the autopilot (see „Pro Pilot Manual“).

1.9 Angle-of-Attack / Stall Warning System

An computer controlled angle-of-attack system is available supporting speed control during approaches, best gliding and it provides stall warning. The system consist of pressure ports on the upper and lower side of the starboard (i.e right) wing, interfaces to the pitot and static system of the aircraft and a computer supported by the main electrical bus. The angle-of-attack is calculated comparing the pressure differences from the pressure ports and is supported by a flaps switch for clean and landing configurations. The system provides visual indications to the pilot using an LED bar which is located on the instrument panel left of the accelerometer. In addition the system provides voice warnings through the intercom system if the angle-of-attack is reaching a critical level (i.e. stall warning if the speed drops to below 1.15 times the stall speed in either clean or landing configuration; this is an accordance with the CS-23 rules requiring a stall warning not later than 5 knots before an imminent stall and no warnings during normal landing an takeoff procedures).



Angle-of-attack as a function of the pressure coefficient and corresponding LED indications

An accelerometer is provided on the left side of the instrument panel. This instrument has a green arc for the Utility category. Red lines are provided for the Utility category and for the Acrobatic category, and each is marked with a U or A.

1.10 Navigation Systems

The aircraft has full set of navigation instruments with area navigation capability allowing normal instrument flying. The navigation instruments include:

• localizer and glideslope information with minimums setting displayed as part of the ADI of the primary flight display; the marker beacons are integrated in the GMA 340 audio panel,

• a digital horizontal situation indicator (HSI) with multiple source switching (NAV 1, NAV 2, Internal GPS and External GPS) and autopilot interface as part of the primary flight display,

• conventional course deviation indicator (CDI) with localiser and glideslope information displaying information from NAV 1, and on the avionics stack a

- BendixKing KX155 as NavCom 1
- Garmin GNS 430W as GPS 1 / NavCom 2 with integrated CDI
- BendixKing KN64 DME linked to the NavCom 1

A magnetic compass is provided above the instrument panel at the center of the airplane.

1.11 Aircraft Lightning

The Falco is provided with dual circuits for the instrument panel lighting and each is controlled with a solid state dimmer. The combined switch/dimmers are located on the right side of the instrument panel. The dimmers control the internal lighting of the cluster of instruments, most avionics, and the magnetic compass. In addition, the glare shield has green lighting strips which illuminate the instrument panel. The LEDs are dimmed as "high" or "low" illumination using a switch above the two dimmers.

A landing light switch is located in the row of switches above the altimeter and standby vacuum horizon. The switches for the navigation and anti-collision (strobe) lights are located in the same row, along with their blue indicator lights.

1.12 Fuel Control

The fuel selector valve is located below the throttle quadrant. The valve has four positions, one for each tank, a "both" position and an “off” positions. The front tank is normally used during takeoff. The "both" position may be used during cruise to balance fuel between the front and aft tank. The aft tank is used for aerobatics especially sustained inverted flight. Only the aft tank is connected to the inverted header tank with a capacity of 2 gallons for approximately 10 min flight time. An auxiliary electric fuel pump is provided for aircraft with fuel injected engines. The switch is located in the row above the altimeter, along with its red indicator light.

1.13 Other Systems

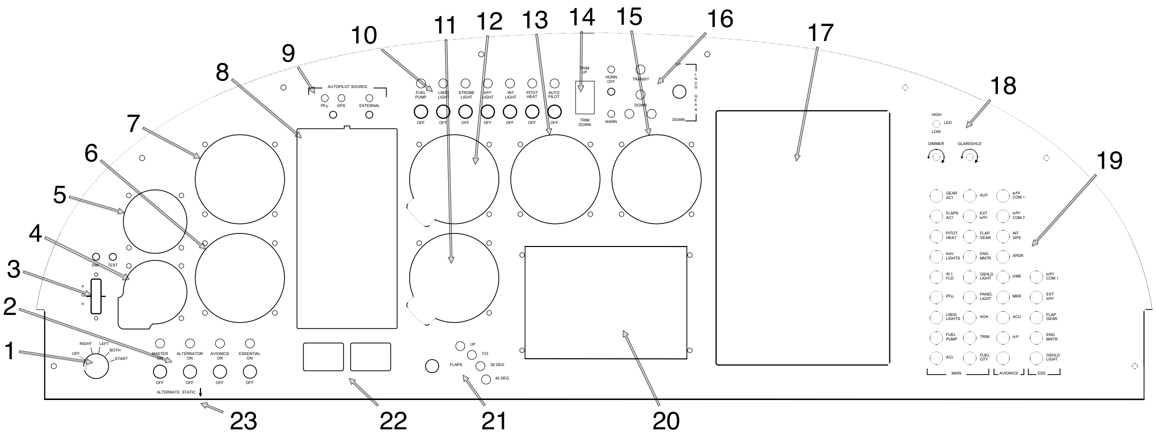
Fresh air is provided from a vent located on the front side of the cockpit, below the instrument panel. The amount for fresh air is controlled through a knob located below the throttle quadrant. Cabin heat is controlled by a knob located below the throttle quadrant. Adjustable ball valves are located underneath the instrument panel, each for the pilot and passenger.

The seats are adjustable fore-and-aft, and the seat or back cushions can be removed to accommodate a back-type or seat-type parachute.

The restraint system consists of a five-point harness for pilot and passenger. Each belt end may be individually inserted into the buckle. After take-off, the two shoulder belts may be released by pressing on a metal tab on the upper back of the buckle. This allows the other belts to remain in place.

1.14 INSTRUMENT PANEL

The instrument panel with systems operative

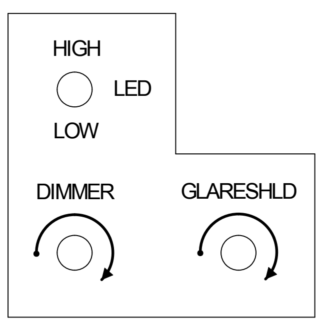


The instrument panel with numbers pointing to the different instrument, gauges and sections which are described in detail in the following table

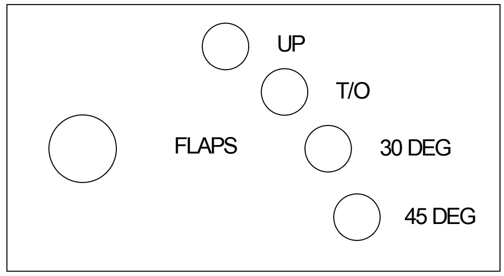
Number	Description
1	Ignition switch (Off, Right, Left, Both, Start)
2	Main switches (buses): Master, Alternator, Avionics and Essential
3	Angle-of-Attack System (AOA) with indication, dimming and test switch
4	G-Meter
5	Digital Chronometer from Thommen
6	CDI from Bendix-King (connected to Bendix KX 155 = NAV 2), available on Master and Essential Bus with Avionics switched ON
7	Airspeed Indicator (analog)
8	Aspen EFD 1000 Pro as primary flight display (PFD)
9	Autopilot source switches: PFD/GPS (if internal) and External
10	System and Light switches: Fuel Pump, Landing Light, Strobe Lights, Navigation Lights, Internal (Instrument) Lights, Pitot Heat, Autopilot
11	Variometer (analog)
12	Altimeter (analog)
13	Vacuum driven Artificial Horizon (Attitude gyro) - backup for PFD

Number	Description
14	Trim Indication (LED based)
15	Trio Pro Pilot Autopilot System
16	Gear System: Gear Up/Down lever, Warning switch, Transition Light, Horn Off Light, Warning Light, Gear Down Lights
17	Avionics Stack (from top): Bendix-King KX155 Nav/Com (NAV 2 / COM 1), Bendix King KN64 DME, Garmin 430W (GPS/Nav/Com (GPS 1 / NAV 1 / COM 2), Garmin GTX 328 Mode S Transponder, Garmin GMA 340 Audio/Intercom Panel
18	Lighting Regulation: LED intensity high/low, Internal light dimmer, Glare-shield light on/dimming
19	Circuit Breaker Board for Main, Avionics and Essential Buses
20	AuRACLE CRM 2100 Engine and System Monitoring Display including interfaces and backup LEDs (RPM, Oil Pressure, Ampere, Suction Inst.)
21	Flaps System: Lever and Indication (UP, T/O, 30°, 45°)
22	Analog Fuel Gauges: Front Tank and Aft Tank
23	Alternate Static Source Lever (underneath Instrument Panel)

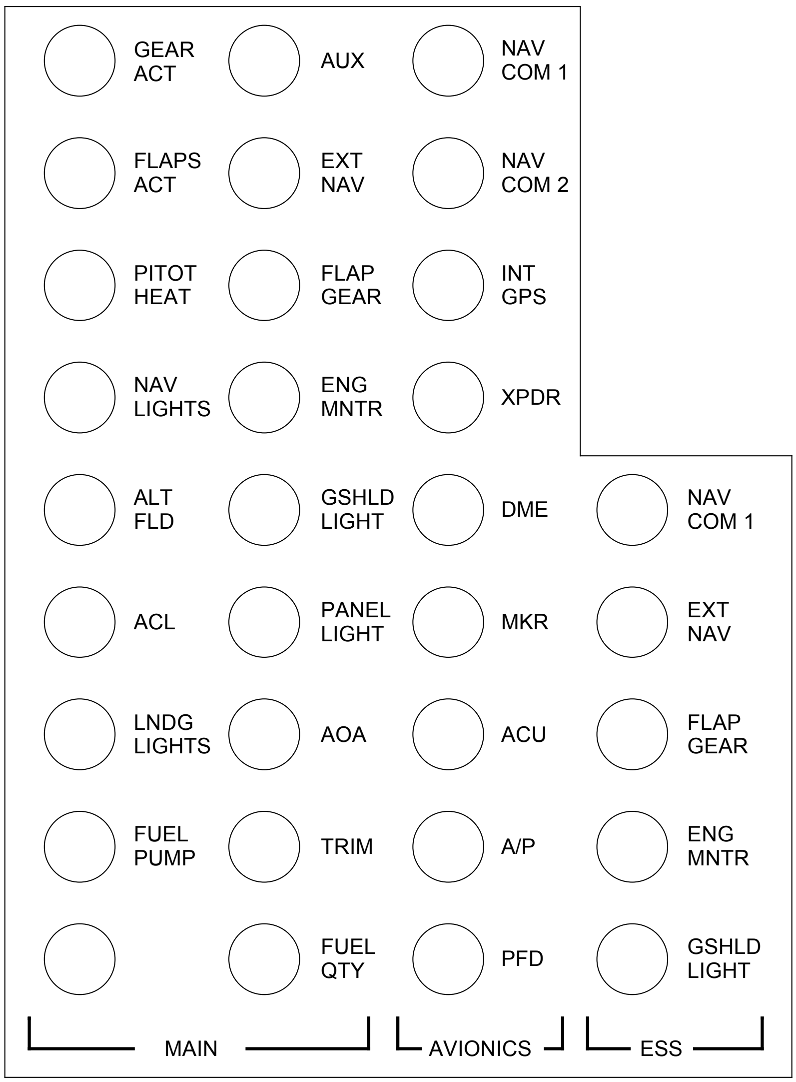
1.14.1 Placards



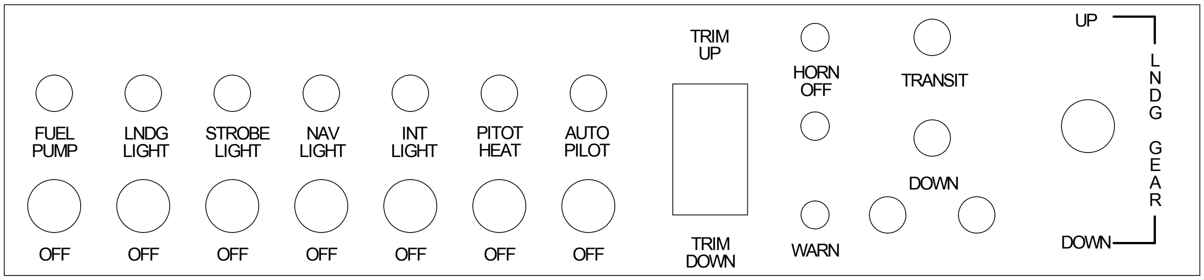
Lights and Dimming



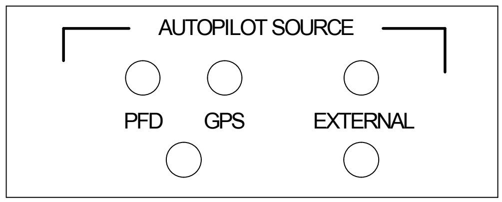
Flaps System and indications



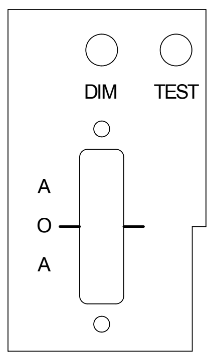
Main, Avionics and Essential Buses



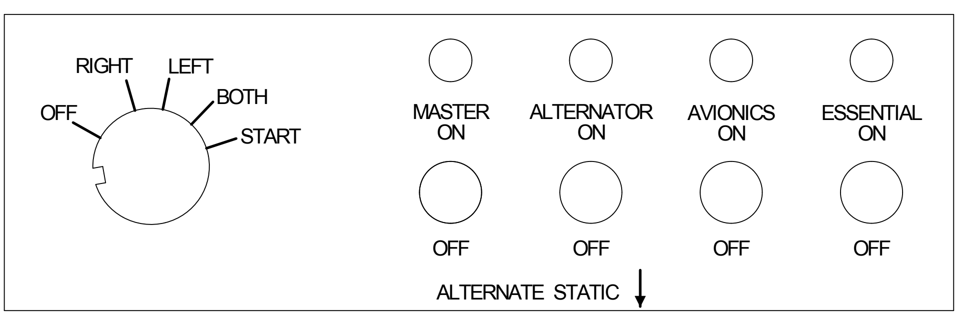
Systems, Lights, Autopilot, Trim Indication and Gear System



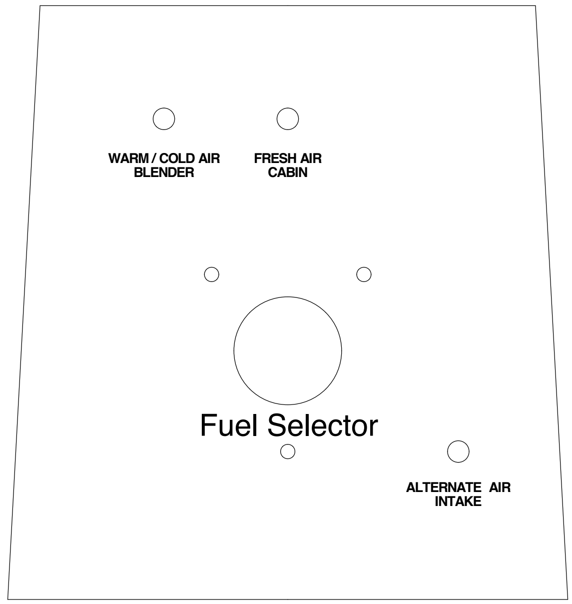
Autopilot Sources switches and indications



Angle-of-Attack System including switches and indication



Ignition, Main switches (Master, Alternator, Avionics and Essential) and Alternate Static Source

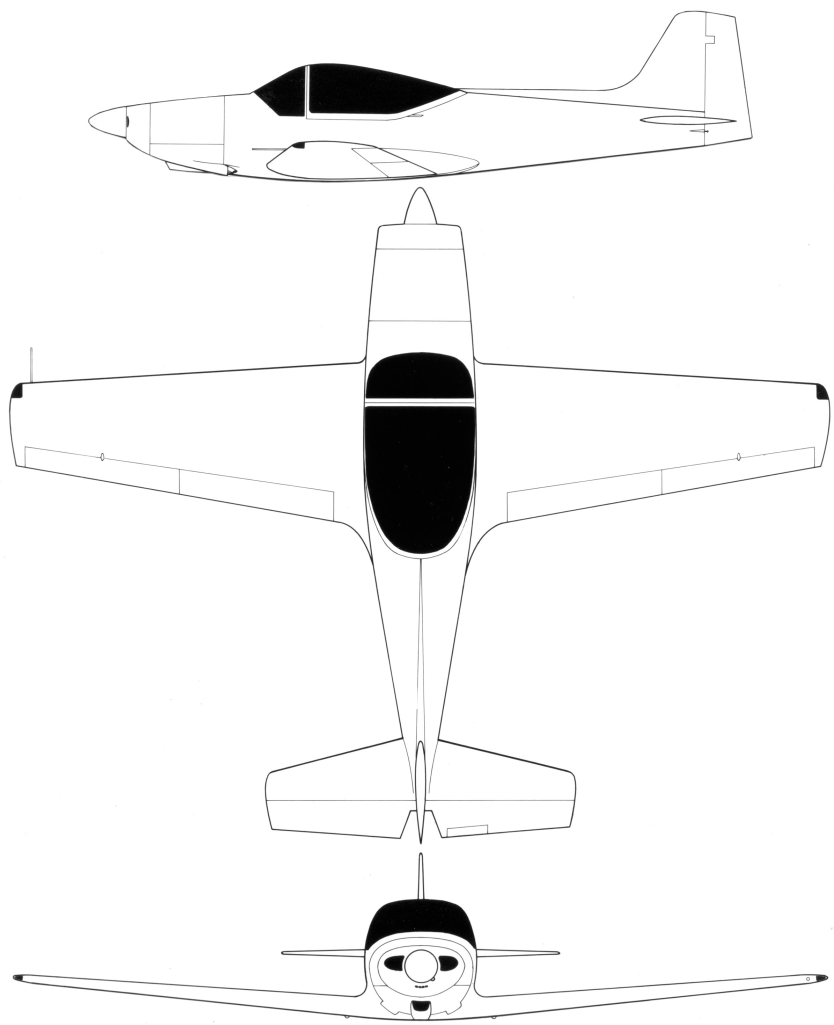


Push/Pull Levers for Warm/Cold Air, Fresh Air and Alternate Air Intake

Middle: Fuel Selector (Off, Front, Both, Aft)

1.15 Aircraft Dimensions and specifications

1.15.1 Aircraft Dimensions



Three-side view of the F8L

Dimensions	
Wings	
Wing Area	107.5 sq ft (9.9871 m2)
Wing span	26’ 3" (8.001 m)
Aspect ratio	6.4
Dihedral	5.5°
Washout	3°

Dimensions	
Airfoil, wing root	NACA 642 212-1/2
Airfoil, wing tip	NACA 642 210
Ailerons	
Percent of wing span	38 %
Average relative chord	30 %
Movement	24° up, 16° down
Area (each)	3.45 sq ft (0.3205 m2)
Flaps	
Percent of wing span	39 %
Average relative chord	30 %
Movement	Neutral to 45° down
Surface area (each)	5.06 sq ft (0.4701 m2)
Fuselage	
Overall length	21’ 4” (6.502 m)
Interior width (cockpit)	40” (1.016 m)
Height	7’ 6” (2.286 m)
Horizontal tail surfaces	
Span	9’ 10.11” (3 m)
Total area	23.44 sq ft (2.1776 m2)
Aspect ratio	4.1
Fixed surface	14.44 sq ft (1.3415 m2)
Movable surface	9 sq ft (0.8361 m2)
Movement	22° up, 16° down
Elevator trim tab	

Dimensions	
Surface area	.39 sq ft (0.0362 m2)
Movement	20° up, 20° down
Vertical tail surfaces	
Height	4’ 2.6” (1.285 m)
Total area	10.88 sq ft (1.0108 m2)
Movable surface	5.21 sq ft (0.484 m2)
Movement	20° left, 20° right

1.15.2 Landing Gear Specifications

Landing Gear Specifications	
Landing gear, main	
Width	6’ 10” (2.083 m)
Tire size	5.00 x 5 or 5.30 x 6
Tire pressure	30 psi (2.1 bar)
Oleo strut pressure	600 psi (41.4 bar)
Cleveland wheel (40-78B) and brake (30-9) with upgrade #199-93 kit installed for increased braking capacity.	
Landing gear, nose	
Tire size	11.4 x 5
Tire pressure	30 psi (2.1 bar)
Oleo strut pressure	115 psi (7.9 bar)

1.15.3 Engine & Propeller Specifications

Engine & Propeller Specifications
Engine
Lycoming AEIO-360-B1E

Engine & Propeller Specifications	
Nominal power	180 hp at 2,700 RPM
Cruising RPM, 75% power	2450
Cruising RPM, 65% power	2350
Propeller	
MT-Propeller MTV-12-B 183-59b hub serial no.: 110090 blade serial no.1: ABK-41358 no.2: ABK-41359 no.3: ABK-41360	
Pitch setting at 30" station	low: 13° high: 30°
Diameter:	72" (1.829 m)
Spinner	MT-Propeller P-615-1, MTV-12-B

1.15.4 Fuel and Lubrication Specifications

Fuel and Lubrication Specifications	
Fuel Capacity	
Front tank	21 U.S. gallons (79.5 liter)
Aft tank	19 U.S. gallons (71.9 liter)
Inverted header tank	2 U.S. gallons (7.6 liter)
Total	42 U.S. gallons (159 liter)
Total cruise usable	40 U.S. gallons (151.4 liter)
Fuel Grade	Avgas 100LL
Oil Capacity	8 qts (7.5 liter)
Oil Used	
Above 60°F (15.5 °C)	SAE 50
32°F to 90°F (0°C to 32.2 °C)	SAE 40

Fuel and Lubrication Specifications	
-4°F to 68°F (-20°C to 20°C)	SAE 30
Below 14°F (-10°C)	SAE 20
Note: Mineral oil is recommended during engine break-in (first 50 hours).	

2 Operating Limitations

The following limitations must be observed when flying the F8L Falco I-DIET with the Lycoming AEIO 360 B1E engine.

2.1 Speed Limitations

	Airspeed	TIAS		Remarks
Vne	Maximum speed, never exceed speed in smooth air	208.5 knots		do not exceed this speed in any operation
Vno	Maximum structural cruise speed	161 knots		do not exceed this speed except in smooth air and with caution
		Utility	Acrobatic	
Va	Maneuvering speed	122 knots	135 knots	do not make full or abrupt control surface movements above this speed
vle	Maximum landing gear extension speed	108.5 knots		do not extend the gear above this speed (except in emergencies; inspection is required in this case)
	Flaps extension speed for flaps beyond T/O setting	97.5 knots		beginning of white arc (analog indicator) beginning of white strip (PFD)
vfe	Maximum full flaps extension speed	87 knots		beginning of broader white arc (analog indicator)

2.2 Airspeed Indicator Markings

Marking	CAS	Significance
White arc / band	53 - 97.5 knots	operating range from Vs0 (stall speed with full flaps) to maximum flaps extension speed

Marking	CAS	Significance
Green arc / band	65 - 161 knots	normal operating range
Yellow arc / band	161 - 208.5 knots	caution range (only smooth air)
Red line	208.5 knots	never exceed speed
only on analog airspeed indicator		
MA	135 knots	maneuvering speed, acrobatic
MU	122 knots	maneuvering speed, utility
G	108.5 knots	maximum speed gear down

2.3 Load Limit Factors and Markings

Category	Positive	Negative	Markings
Utility category	4.4 g	2.2 g	green arc on analog G-Meter; red line „U“ on upper and lower limits
Acrobatic category	6 g	3 g	red line „A“ on upper and lower limits

2.4 Markings on Analog Fuel Gauges

Tank	Markings	Quantity
Front Tank	green band	3 - 21 US gallons
	red band	0 - 3 US gallons
Aft Tank	green band	3 - 19 7/8 US gallons
	red band	0 - 3 US gallons

2.5 Limitations and Markings on AuRACLE System Monitor

Item	**Markings**	**Values**
RPM	red line	2700 RPM
	normal range (blue arc)	0 - 2700 RPM
Oil Pressure	Minimum Pressure (red arc)	25 psi
	Caution Range, idling (yellow arc)	25 - 60 psi
	Normal range (green arc)	60 - 90 psi
	Caution Range, warm up (yellow arc)	90 - 100 psi
	Maximum pressure (red arc)	100 psi
Oil Temperature	Caution range, warm up (yellow arc)	0 - 100°F (0 - 38°C)
	Normal range (green arc)	100 - 245°F (38 - 118°C)
	Maximum (red arc)	from 245°F (118°C)
Fuel Pressure	Normal operating range	0 - 9.5 psi
	Maximum pressure (red; warning)	from 9.5 psi
Cylinder Head Temperature (CHT)	Normal operating range (green bars)	65 - 224°C
	Caution range (yellow bar)	224 - 260°C
	Maximum temperature (red, warning)	260°C
Suction Gauge	Normal operating range (green arc)	4.5 - 5.4 inches Hg. (0.152 - 0.183 bar)
Alternator Amp Markings	Normal operating range (green arc)	0 - 48 Amps
	Caution Range (yellow arc)	48 - 60 Amps
	Maximum (red arc)	60 Amps

2.5 Approved Maneuvers

2.5.1 Utility Category:

It is prohibited to apply full flight controls at speeds higher than maximum maneuvering speed. Only the following aerobatic maneuvers are permitted with the recommended entry speeds shown:

Steep turn: 126 knots

Chandelle: 126 knots

Lazy eight: 126 knots

Stall (except snap roll): 65 knots

2.5.2 Acrobatic Category:

It is prohibited to apply full flight controls at speeds higher than maximum maneuvering speed.

Recent wind-tunnel research in France has shown that abrupt maneuvers can put excessive loads on the wings of some aircraft, even below the maneuvering speed. This phenomenon is particularly apparent in aircraft with very clean wings, like the Falco. For this reason, the full and quick deflection of the elevator as speeds below or equal to the maneuvering speed can cause loads in excess of the limit load factors and cause structural damage and failure. Because of this, the maximum speed for snapped maneuvers is 105 kts.

The recommended entry speeds for the main acrobatic maneuvers are as follows:

Spin: Stall

Loop: 160 knots

Roll: 135 knots

Immelman: 160 knots

2.6 Operating altitude

The maximum demonstrated operating altitude is 16 500 feet (5 030 meters).

Under normal conditions and above 12 500 feet it is mandatory for the pilot to use supplemental oxygen.

2.7 Flight Crew

Minimum Crew member: 1 person (pilot)

Maximum number of occupants: 2 persons (pilot and passenger)

It is mandatory for each pilot flying I-DIET as pilot in command to be operationally checked out by the owner/ manufacturer and primary pilot Dr. Raoul Schild. The successful check-out has to be approved by ENAC. The minimum conditions for a pilot-in-command according to ENAC NAV-15D apply.

2.8 KINDS OF OPERATION

Provided that national operational requirements are met, the following kinds of operation are approved:

- daytime flights according to Visual Flight Rules (VFR) with visibility of the ground;
- daytime flights according to Visual Flight Rules (VFR) without visibility of the ground; and
- IFR daytime flights in visual meteorological conditions (VMC).

Flights into known or forecast icing conditions are prohibited.

Flights into areas of known thunderstorms or expected lightning activity are prohibited.

Flights in the vicinity of installation with known HIRF activity (e.g. defined in navigation maps; usually are restricted or prohibited areas) such as weather and (military) surveillance radar or equivalent facilities are prohibited as they may cause harm to the electronic and navigation equipment of the aircraft.

The **category of operation is stated in the actual, valid permit-to-fly as approved by ENAC.**

2.8.1 Minimum operational equipment (serviceable)

The following table lists the minimum serviceable equipment required by circolare NAV-15D, REGOLAMENTO TECNICO ENAC - TITOLO TERZO, and EASA CS-23 (as far as it applies). Additional minimum equipment for the intended operation may be required by national operating rules and also depends on the route to be flown.

No ADF system is installed. Therefore procedures (i.e. NDB approaches) requiring an ADF system cannot be flown with the Falco F8L I-DIET.

minimum operational equipment (serviceable)			
Equipment Categories	**daytime flights according to Visual Flight Rules (VFR) with visibility of the ground;**	**daytime flights according to Visual Flight Rules (VFR) without visibility of the ground**	**IFR daytime flights in visual meteorological conditions (VMC)**
Flight and navigation instruments	• airspeed indicator • altimeter • magnetic compass • 1 headset	• vertical speed indicator (VSI) • attitude gyro (artificial horizon) • turn & bank indicator • directional gyro • OAT indicator • chronometer with indication of hours, minutes, and seconds • VHF radio (COM) with speaker and microphone • VOR receiver • transponder (XPDR), mode A and mode C	• second VHF radio (COM) • VOR-LOC- GP receiver • marker beacon receiver
Engine instruments	• fuel indicators • integrated engine instrument	• ammeter (included in AURacle CRM) • voltmeter (included in AURacle CRM)	
Lighting		• position lights • strobe lights (anti collision lights) • landing light • instrument lighting • flood light • flashlight	
Other operational minimum equipment	• stall warning system • fuel quantity measuring device • safety belts for each occupied seat • airplane flight manual	• pitot heating system • alternate static valve • essential bus	• emergency battery

2.9 Other limitations

2.9.1 Temperature

The airplane must not be operated when its temperature is less than -40 °C (-40 °F).

NOTE: Prolonged operation of the airplane in temperatures below -10 °C (14 °F) may have an adverse effect on the battery capacities in case of an alternator failure.

CAUTION: For cold weather starting of the engine refer to the latest instructions given by the engine manufacturer.

2.9.2 Battery Charge

Taking off for an IFR flight with an empty main battery is not permitted.

The use of an external power supply for engine starting with an empty main battery is not permitted if the subsequent flight is intended to be an IFR flight. In this case the main battery must first be charged.

2.9.3 Electronic equipment

Any electronic equipment may only be operated as long it does not interfere with the installed avionics or systems.

Mobile phones shall only be used in emergency situations (e.g. a COM equipment failure) as a backup.

3 Normal Operating Procedures

3.1 Ground Pre-Flight Check

Ignition switch	Off (remove key)
Parking brake	Set
Overnight Covers	
Pitot tube	removed
AOA port	open/drained
Aileron Locks	removed
Engine Covers	removed
Canopy Cover	removed
Engine Compartment	
Engine	Check condition
Oil	Check (min. 4q)
Alternator	Check belt
Brake	Check fluid level
Gascolator	Drain water
All Openings	Check clear
Doors	All closed
Propeller/Spinner	Check condition
Landing Gear	
Tire Pressure	Check (30 psi)
Well Doors	Check condition
Oleo strut	Check (115/600 psi)

Front fuel tank	cap secure, drain
Canopy and windshield	Clean
L.H. Wing Walk	
Pitot tube	Check condition
L.H. Wing, Flap, Aileron	Check condition
L.H. Wing Nav, Strobe	Check condition
L.H. static port	Check condition
Battery compartment	closed
ELT	Check Armed
Aft fuel tank	cap secure, drain
Empennage	
Elevator	Check condition
Trim tab	Check condition
Rudder	Check condition
Nav, Strobe	Check condition
R.H. Wing Walk	
R.H. static port	Check condition
R.H. Wing, Flap, Aileron	Check condition
R.H. Wing Nav, Strobe	Check condition
AOA probes	Clear, drain
Check Maps, Documents, Flashlight, Tools, etc.	
Check Equipment for Water, Alpine Environment if required!	
Check Overnight Equipment	

If the engine has been inactive for several hours, especially in cold weather, rotate the propeller by hand for two or three complete turns. During cold weather operation, make a thorough check of airplane for freedom from frost, snow and ice on exterior surfaces.

3.2 Cockpit Pre-Flight Check, Before Starting Engine

Ignition switch	Off (key inserted)
Fuel/oil quantity	Checked
Load	Secured
Controls	Checked
Seats	Adjusted
Seat belts	Fastened
Parking brake	On
Canopy	Closed (and locked)
Landing gear switch	Down
Fuel selector	Front
Master switch	On (green indicator)
Alternator switch	On
Essential Bus	On
Strobe	On
Landing gear	3 x green lights
Avionics	Off
Engine Monitor	Check Initialized
Fuel Indication	Confirm OR Set
Voltmeter	Check voltage
Fuel quantity	Check gauges

Compare to Engine Monitor Fuel	
Flight controls	Full movement

3.3 Engine Starting Procedure

Alternate air	Off
Cold Engine	
Throttle	Open 1/2 Travel
Propeller RPM	Full increase
Mixture	Rich
Auxiliary fuel pump	On
until fuel pressure stabilizes (4-5 sec) then Off	
Mixture	Lean
Throttle	Open 1/4 Travel
Ignition switch	Start
Mixture	Slowly Move Rich
Throttle	Retard
Oil Pressure	Green (30 sec)
Warm Engine	
Throttle	Open 1/2 to Full
Propeller RPM	Full increase
Mixture	Lean
Brakes	Step On
Ignition switch	Start
Mixture	Slowly Move Rich

Throttle	Retard quickly
Oil Pressure	Green (30 sec)
Essential Bus	Off
Avionics	On

3.4 Warm Up / Taxi

Parking brake	Release
Flaps	T/O
Brakes	Check
Instruments	Set (Altimeters)

3.5 Run-Up Check

Mixture	Check Rich
Propeller RPM	Check Full increase
Throttle 1200 RPM, then:	
Suction gauge	Green sector
Cylinder Temp	Green sector
Oil Temp	Green sector
Oil pressure	Green sector
Ammeter	on + side
Fuel gauges	Check
Fuel pressure	positive
Voltmeter min 12.5 volts	
AOA	Test

Alternate Static	Check Off
Throttle 1700 RPM, then:	
Magneto	check Max drop 75-100 RPM
Propeller RPM	drop/increase 5 sec

3.6 Before TakeOff

Canopy	Closed & locked
Seat belts	Fastened, Tight
Flaps	Check T/O
Elevator trim	Neutral
Autopilot Servos	Off
Fuel selector	Front tank
Aux Fuel pump	On
Mixture	Check Rich
Time	Noted
Flight controls	Final check free
Approach Sector	Clear
Landing Lights	On
Transponder	Set

3.7 Take Off / Inital Climb

Takeoff Power	Set, Engine all green
Airspeed	Alive
Rotation Speed	63 knots

Positive Climb	Gear Up
Airspeed	75 knots
400 GND	Power Reduce
IAS	90 knts
Flaps	Up
Aux Fuel Pump	Off
Landg Lights	Off
Gear Transition	Check Off

3.8 Climb / Cruise / Descend

Fuel selector	as required
Mixture below 5000 ft	
Pattern or Climb	Rich
≤ 75% Cont. Power	carefully reduce
CHT Temp. < 224°C during climb	
CHT Temp. < 205°C during cruise	
Leaning	
75% Power Cruise	ROP ≤ -80°C
<< 75%, Econ. Power	at Peak EGT
	LOP ≥ -10°C
Power Setting	
75%, 2450 RPM, 42 L/hr, ROP EGT	
65%, 2350 RPM, 33 l/hr, Peak EGT	

! Warning Failure to use aft fuel tank after intial climb can cause CG of aircraft to shift beyond aft limits, creating a dangerous situation. When the aft CG limits are exceeded, the aircraft will become unstable and uncontrollable. !

3.9 Approach / Landing

Seat belts	Fastened
Mixture	Rich
Reduce Speed to va	≤ 122 knts
Enter Pattern or 30 sec dw threshold	
Aux Fuel Pump	On
Fuel selector	Front tank
Landing Light	On
Speed < 95 knts	Flaps T/O
Long Final	
Gear	DOWN
Propeller RPM	Full increase
Speed Chckd, Flaps	30°
Final Check (perform by heart)	
Flaps (as required)	45°
Speed	85 knts, AOA
Gear	Down 3 x green
Autopilot	Off
RPM	Full
Aux Fuel Pump	On
Fuel selector	Front

3.10 After Landing

Fuel Pump	Off
Landing Lights	Off

Transponder	Check GND
Flaps	UP

3.11 Engine Shut Off / Parking

Parking brake	Set
Avionics	Off
Tachometer ≤ 1000 RPM	
Mixture	Lean
Ignition switch	Off
All switches	Off
Fuel selector	OFF

4 Emergency Procedures

4.1 Electrical System Failure

If the electrical system fails, switch off the master switch and land as soon as practical. The landing gear must be extended manually.

! Caution If the electrical system has failed, it is impossible to extend the flaps. Revise landing approach as necessary. !

4.2 Electrical System Malfunctions

4.2.1 Alternator Failure

When the ammeter needle is left of the zero (center) position during flight, there is usually a malfunction in the alternator or regulator. In this case, switch off all equipment not essential to flight safety and land as soon as practical.

4.2.2 Short in an Electrical Circuit

The failure of a load due to a short circuit is shown when its associated circuit breaker trips. The circuit breakers are of two types. The push-pull circuit breaker trips by popping out, revealing a white band. The switch-type circuit breakers trip by switching themselves to the "off" position (toggle lever down).

About half a minute after the circuit breaker has tripped, close the circuit breaker again by depressing the push button (or switching on a switch-type circuit breaker). In the circuit breaker trips again, no further attempts should be made to reset the circuit breaker, and in no case should it be kept depressed (on held in the "on" position in the case of a switch-type circuit breaker), since this could cause a fire in the electrical system.

Fuses are used to protect the wires for the ammeter, alternator amps meter, landing gear in transit light and starter warning light. These fuses are difficult or impossible to replace in flight. The failure of these circuits does not prevent the safe completion of the flight.

Ampere Indication Zero	
Alternator	Cycle On/Off
Essential Bus	On
PFD	Automatic Standby

Monitor Voltage Level	
Equipment	Switch Off Unneeded
Monitor Battery Voltage Level	
Land within 30 minutes	
Landing Gear	Check down manually
Shortage in Electrical Circuit	
Breaker Board	Check
Pop. Breaker	ReCycle
Essential Bus	On (if needed)

4.3 Drop in Fuel Pressure

If the fuel pressure falls below the minimum permissible value, the auxiliary electrical fuel pump must be turned on. The airplane should be landed as soon a practical.

A pressure drop can be caused by a leaky or clogged fuel line (for example, due to frozen condensation water). The problem may be confined to one tank only; therefore, switching tanks is suggested for diagnosis.

A pressure drop can also be caused by the failure of the mechanical fuel pump.

A temporary pressure drop will occur shortly before a fuel tank runs dry. Typically, the fuel pressure will become erratic for 5 to 20 seconds before the tank and fuel lines are completely empty, then the fuel pressure will drop sharply and the engine will falter and quit firing. Switch tanks immediately and restart the engine if it stops firing.

! Note: If the propeller continues to turn (windmill), no other action (other than switching tanks) is normally necessary. If the propeller stops turning, it may be necessary to lean the mixture of fuel injected engines to restart the engine.

4.4 Restarting Engine in Flight

Windmilling Propeller (KIAS > 80)

Fuel Selector	Front tank (Aft if fuller)
Aux Fuel Pump	On
Master switch	Check On
Ignition switch	Check Both
Throttle	Half Open
Alternate Air	Open
Mixture	Full Rich
if engine not starting	
Mixture	Lean
Mixture	Slowly forward until engine starts
Propeller stopped turning	
Airspeed	vbg (best glide)
Essential Bus	On
Avionics	Off
Master switch	Check On
Electr. Equip.Off (except essential)	
Fuel Selector	Front tank
Aux Fuel Pump	On
Propeller	Full Increase
Throttle	Half Open
Mixture	Lean
Ignition Switch	Start
Mixture	Slowly Move Rich
Oil Pressure Green (30 sec)	

Aux Fuel Pump	Off

! Note: It may be necessary to lean the mixture of fuel injected engines to restart the engine.

Engine Failure During Spin

In case of engine failure during a spin, immediately apply spin recovery techniques. A p p l y engine restart instruction only after spin recovery.

4.5 Propeller Spinner Failure

Spinner failure is usually indicated by slight, moderate or severe vibration in the engine. To minimize the vibration, reduce the engine RPM with throttle and propeller RPM controls. If vibration is severe, shut off engine as follows:

Propeller failure is usually indicated by severe vibration in the engine (for example, in the case of the loss of a single blade) or by sudden increase in the engine RPM (for example, in the case of total loss of the propeller). In either case it is imperative that the engine be stopped as quickly as possible since continued severe vibration could tear the engine from the airplane, rendering it uncontrollable due to the extreme aft center of gravity. Immediate action:

Propeller Overspeed (Governor Failure)	
Throttle	Reduce (RPM < 2700)
Mixture	Full Rich
Propeller RPM	Vary
Oil Pressure	Check
Airspeed	Reduce, until altitude can be maintained
(airspeed ≤ vbg)	
Land as quickly as possible	
Propeller Failure (IMMEDIATE ACTION)	
Mixture	Lean
Fuel selector	Off

Ignition switch	Off
Perform Emergency Landing	

4.6 Emergency Landings

! Caution The master switch should not be switched off until shortly before touchdown, as the flaps and landing gear are electrically operated. !

4.6.1 Engine Failure

If possible, establish cause (fuel selector position, ignition). If attempts to restart the engine fail, or if the propeller suddenly stops (seized pistons, due to lack of lubricant), reduce airspeed to 85 kt and trim the airplane.

Extend the landing gear, select suitable emergency landing field. No changes in direction greater than 15-20° near the ground! Maintain airspeed! Tighten seat belts, fuel selector OFF, ignition OFF, landing flaps as necessary, master switch OFF. Touch down, brake hard if necessary.

If a normal landing appears impossible, adjust your flight path to contact the ground/ obstacle at the slowest possible speed without stalling the aircraft. The aircraft's altitude should be wings-level, slightly nose-high to reduce the impact forces as much as possible. This will allow the aircraft structure to absorb much of the impact while affording the pilot/passenger the maximum protection from the restraint system.

Airspeed	vbg (85 knts, AOA)
Flaps	T/O (gear down land)
Essential Bus	On
Aux Fuel Pump	On
Fuel selector	Front tank
Landing Light	On
Gear Manual Extension (2 minutes)	
Gear	Manual Handle
	Check Clutch

	Rotate LEFT until
	physical resistance OR
	Down 3 x green
Flaps	as required
Seat belts	all straps tight
Short Final	
Avionics	Off
Alternator	Off
Mixture	Lean
Fuel Selector	Off
Master	Off
Ignition	Off
Airspeed before touch down	
Indicator	70 knts
AOA	Middle LED
After Landing	
Seat Belts	Unfasten
Canopy	Open
Fire extinguisher	grab
Evacuate immediately	

! Warning Do not allow the aircraft to stall. !

4.6.2 Emergency Extension of Landing Gear

If, for any reason, the landing gear cannot be extended, or if the green "gear down" indicator light does not illuminate after operation of the landing gear switch although the red "gear in transit" indicator light and yellow "gear warning" indicator are extinguished, check circuit breakers and then retract the landing gear again. Determine whether the red "gear in transit" indicator light illuminates during retraction and whether the yellow “gear warning” indicator light flashes (and gear warning horn sounds) when the throttle is pulled back. If this is the case, normal landing can be conducted after extending the landing gear, as it is simply the green “gear down” indicator light that is defective. In this case, the bulb may be replaced from supply of spare bulbs (or by using a bulb from another indicator light such as the starter warning light).

If the landing gear cannot be extended electrically, or if the red light continues to light up after actuation of the landing gear switch, the landing gear may be extended with the hand crank located between the pilot's and passenger's seats.

1. Disable landing gear actuation circuit by pulling out its 15 amp circuit breaker (not the 5 amp circuit breaker for the landing gear indication circuit).

2. Remove the cover between the seats marked “Emergency Landing Gear Actuation”.

3. Turn over the hand crank to engage with the slotted shaft fitting.

4. Disengage the motor by pulling up on the knurled knob just aft of the hand crank.

5. Turn the hand crank in the direction indicated by the arrow until the green “gear down” light illuminates or until the hand crank will not turn (about 100 revolutions).

Landing with Retracted Landing Gear

If, for any reason, a landing with retracted landing gear is necessary, a smooth grass landing strip should be selected if possible for minimum abrasion damage to the airplane. Land with flaps up. Prior to touchdown, stop engine with mixture FULL LEAN, then fuel selector OFF and ignition OFF.

Depending on the pilot's proficiency, an attempt may be made during the long approach to stop the engine. If the propeller fails to stop in a horizontal position, actuate the starter to inch the propeller to a horizontal position so as to preclude damage. Turn the master switch OFF. Adjust approach speed as required for flaps up landing.

4.6.3 Failure of Flaps to Lower

The only effect of flaps failure to lower is an increase of landing speed by 5-8 kts.

4.6.4 Failure of Flaps to Raise

If the flaps fail to raise during a go-around (balked landing), maintain a speed of 85-98 kts and avoid steep turns.

4.7 Engine Fire

In case of a fire in the engine compartment:

Fuel selector valve	Off

Throttle	Full open
Cabin heat	Off
Master switch	Off
Ignition switch	Off (after engine stops)
Airspeed	75 kts
Select suitable emergency landing field and land. Do not try to restart engine in flight.	

4.8 Primary Flight Control System Failure

4.8.1 Yaw Control Failure

If the rudder controls fail, turns above 30° bank and airspeed in excess of 135 kts must be avoided. Observing these limitations, the flight, including landing, may be completed using pitch and roll control.

4.8.2 Roll Control Failure

If the roll control is lost, a safe landing is possible if the following procedure is applied: Airspeed not less than 80 kts, flaps preferable in the 0° position (flaps up).

If the airplane drops a right wing, this condition should be corrected and the wing picked up by applying left rudder (“step on the high wing”), and vice versa (for a dropped left wing).

Make straight-in approach and make exceedingly wide turns.

Slight roll control can be accomplished by the pilot and passenger leaning to one side of the airplane to shift weight side-to-side.

Depending on the pilot's proficiency or on the availability of a passenger, an attempt may be made to remove the floor boards and at manipulating the rudder cables. Exercise great caution in manipulating control cables since an unknown failure has occurred and controls might become jammed in one direction. Remove the floor board on both pilot's and passenger's side before attempting to manipulate the cables. Attempt to diagnose the failure. If the forward aileron cables (attached to control sticks) have failed, the aft aileron cable may still work. Manipulate aft aileron cable in the same manner as the control stick, i.e. move cable to the left to roll left and vice versa. Forward cables are manipulated in the opposite manner from the control stick, so exercise great caution due to the likely confusion.

4.8.3 Pitch Control Failure

In case of inoperative pitch control, the airplane is trimmed for an angle of glide of approximately 3° by using the elevator trim control and power setting. It is recommended that a long straight approach at 85 knots and a rate of descent of 400 ft/min be used. Landing flap position may be selected as desired; however, adjustment should be accomplished slowly, i.e. in small increments. As the ground is approached, the aircraft may be flared out by carefully employing the elevator trim control. The throttle is closed immediately prior to contacting the ground.

4.9 Secondary Control System Failure

4.9.1 Elevator Trim Control Failure

In case of inoperative elevator trim control failure, the flight may be completed by use of the primary pitch control, i.e. by using the stick as in normal flight.

If possible, diagnose the failure. Turn the trim control wheel—if the indictor does not move the angle drive has failed, and the flight may be continued in a normal manner. If the indicator moves, the failure is elsewhere. One possible failure is that the elevator trim tab has become unattached to the push-pull control cable. Because of the risk of elevator trim tab flutter, this event can be extremely dangerous. Accordingly, reduce airspeed to 85 knots and land as soon as practical.

! Note: If unable to repair the elevator trim tab controls after landing, it may be possible to continue the flight by removing the elevator trim tab. If this is attempted, remove the elevator trim tab push pull control cable or secure it tightly to the elevator so that it will not vibrate and contribute to elevator flutter. Continue the flight at moderate speed (say 135 knots).

4.10 Evacuation of Aircraft

" Warning - No actual experience has occurred, and the following procedures are based only on general principals and experience in other aircraft and may be incorrect. "

The canopy is not designed to be jettisoned. The canopy is difficult to open at high speeds due to the suction created by the flow of air over the canopy. To open the canopy in flight, it is expected that the canopy will be easier to open if the airspeed is low; therefore, the slowest controllable speeds are advised. When the canopy if fully-open, it is expected that the suction will be broken and that the canopy will remain open and/or depart the aircraft (especially at high speeds); however, it is also possible that the canopy will slam shut.

If the aircraft is in a spin or in a turn, the evacuation should be made, if possible, towards the outside at the trailing edge of the wing. The pilot and passenger should remain in a crouching position as long as p o s s i b l e before opening the parachute in order to minimize the chances of the parachute becoming entangled with the aircraft when it opens.

If the aircraft is in a flat spin and standard recovery techniques have failed, experience with other aircraft has shown that opening the canopy can sometimes assist in the recovery since the airflow over the canopy can cause the aircraft to pitch nose-down.

4.11 Crash Landings

Most crash landings are survivable, but you can increase your chances of avoiding injury by practicing emergency procedures, briefing any passengers and keeping the aircraft under control at impact. If a crash is unavoidable, the following suggestions are offered.

The seat belts of the Falco are extremely strong and are designed to withstand a load of 40gs before failing. The seat belts (lap, shoulder and crotch straps) should be tightened as much as is possible. In particular, the crotch strap should be tight enough so that the lap belts transfers deceleration forces into the pelvic bone (and not into the soft tissues of the abdomen).

It is always preferable that the aircraft land in an upright position.

Landings in open fields are preferable to all other locations.

Landings in water are preferable to landing in obstructed area (cities, power lines, forests, etc.). Experience with other aircraft has shown that approximately 95% of emergency landings in water are survived at time of impact, although 5 to 6% more drown. Landings in water should be made with the landing gear retracted and with flaps down 20°. Full flaps are not suggested as they may increase the possibility of a nose-over. Touch down at minimum controllable speed. If possible, land parallel to waves. If possible, land near the shore or a ship.

If landing in an obstructed area cannot be avoided, it is preferable to land in such a way that the wings of the aircraft absorb most of the deceleration forces as possible. For example, the aircraft can be guided so that trees hit both wings simultaneously. Contact of a single wing will cause the aircraft to rotate violently, sometimes causing rotation-induced injuries.

If extremely violent impacts are unavoidable, lean head forward, feet on instrument panel with knees at shoulder width, one arm across forehead for pilot, both arms across forehead for passenger and tighten body muscles. The pilot has the option of using both arms across forehead or using one arm to move the control stick to one side just prior to impact, since experience with other aircraft has shown that the stick can sometimes impale the body if the seat belts fail. If time permits, the passenger's control stick may be removed and placed on the floor under the instrument panel, along with loose objects behind the pilot and passenger. Luggage, loose clothing or other soft material may be placed in front of the forehead to cushion blows to the head. Such preparations, however, should not be used if they will prevent the control of the aircraft. All such impacts should be made in a normal landing attitude (wings level, nose high) and as slow as possible (flaps fully down).

5 Performance

All operating data have been calculated and empirically measured during extensive evaluation test flights with I-DIET.

The following tables have been developed to allow accurate and comprehensive determination of expected takeoff, landing and cruise performance. It was found that the difference between the indicated airspeed (IAS) and the calibrated airspeed (CAS) is normally negligible in all situations. The position of the landing flaps normally has no effect on airspeed indication.

5.1 Takeoff and Landing Distances

Takeoff settings: Engine-full throttle, mixture-full rich, carburetor heat-off, flaps in take-off position (15°), propeller rpm-full increase.

On grass runways, the takeoff and landing rolls can be much greater than the indicated 15%, especially the landing ground roll when the grass is wet. In the case of snow, slush or standing water, a takeoff can be completely impossible.

The chart is always available in the plane as part of the checklist.

Instructions to interpret the chart:

1. Determine the density altitude (pressure altitude + Δ ISA temperature x 120).
2. Determine the gross mass (weight): pilot/passenger, fuel, luggage).
3. Determine the wind components (headwind & crosswind): maximum demonstrated crosswind component is 15 knots to prevent overly stressing the retractable gear mechanism!
4. Start from the y-axis (density altitude) to either the green (landing) or blue (takeoff) ranges for the mass.
5. With the calculated landing/takeoff mass move down to the x-axis to read the takeoff/landing distances over a 50 feet obstacle in zero wind and no runway contamination.
6. Vr and Vx is a function of the aircraft mass. Use the purple paragraph to establish Vr, Vx and the estimated rate-of-climb with Vx.
7. Determine Vy and the estimated best rate of climb: From the blue (takeoff) ranges (before considering the wind) move up to the purple ranges and interpolate Vy and the best rate of climb along the mass ranges.
8. Wind correction: subtract or add landing/takeoff distance in a headwind or tailwind situation according to the chart (red paragraphs).
9. Runway contamination or grass strips: add 15% of landing/takeoff distance.

10. Obstacle free runway (takeoff and landing): up to 200 meters may be subtracted.

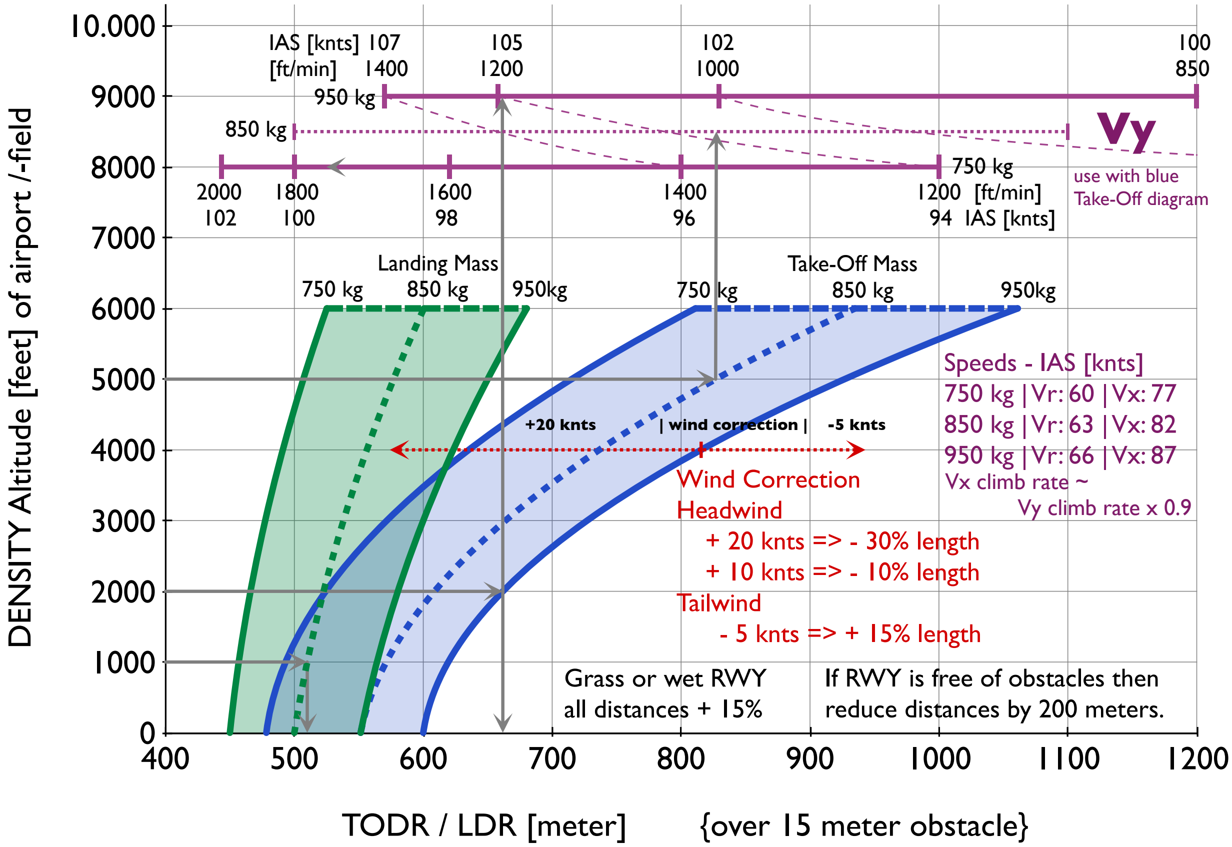


Chart to determine take-off and landing distances, V-speeds and rates-of-climb

5.2 Cruise Performance

For the most economical cruise the following chart shall be followed. It defines the setting of the engine (RPM and MAP) as a function of pressure altitude and provides expected fuel-flow and TAS (knots) in ISA conditions.

The chart is always available in the plane as part of the checklist.

Instructions to interpret the chart:

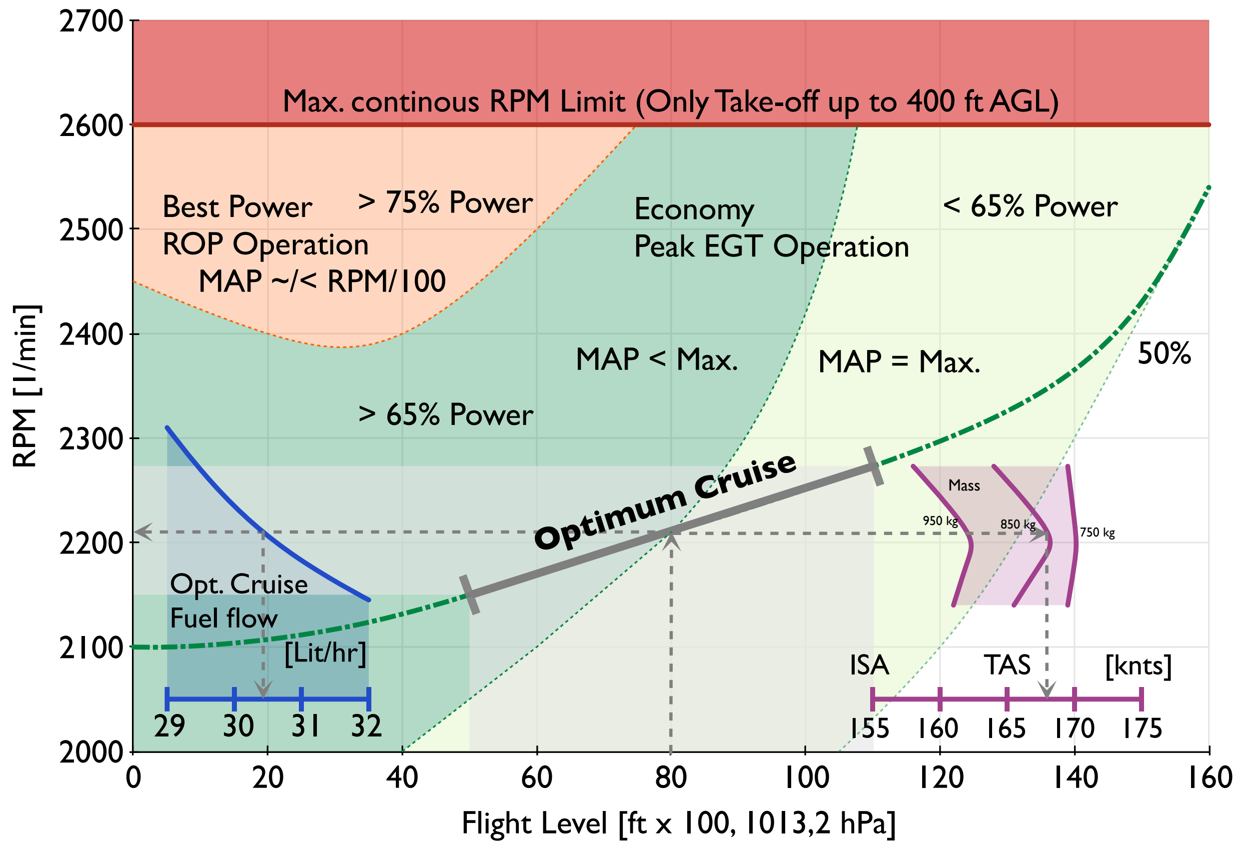
1. Start for the cruise altitude (pressure altitude) and move to the „Optimum Cruise“ line.

2. Determine the RPM yielding the best propeller efficiency from the y-axis (higher RPM for higher cruise altitude).

3. Use the blue fuel-flow diagram to establish the fuel flow (Liter per hour). The fuel-flow may be used as a good approximation for the Lycoming recommended peak EGT setting of

the engine during cruise. The actual mixture setting for peak EGT operation may vary slightly depending on actual atmospheric conditions.

4. Use the purple diagram to estimate the expected TAS (knots) as function of current aircraft mass.



Cruise performance (under most economical engine settings)

5.2.1 Endurance and Range:

The maximum usable fuel is 151 Liter. That provides:

- Economical cruise (FL 80) with an average fuel flow of about 32.5 Liter /hour (considering higher fuel-flow during take-off and climb) and considering 45 minutes reserve: 3 hours and 54 minutes endurance OR about 620 nautical miles (1150 kilometers) range in ISA conditions, 900 kg TOM and no wind.

- Lower altitude 75% power and fuel flow with ROP EGT setting of about 43 Liter/hour and 45 minutes reserve: 2 hours and 45 minutes endurance OR 454 nautical miles (841 kilometers) range in ISA conditions, 900 kg TOM and no wind.

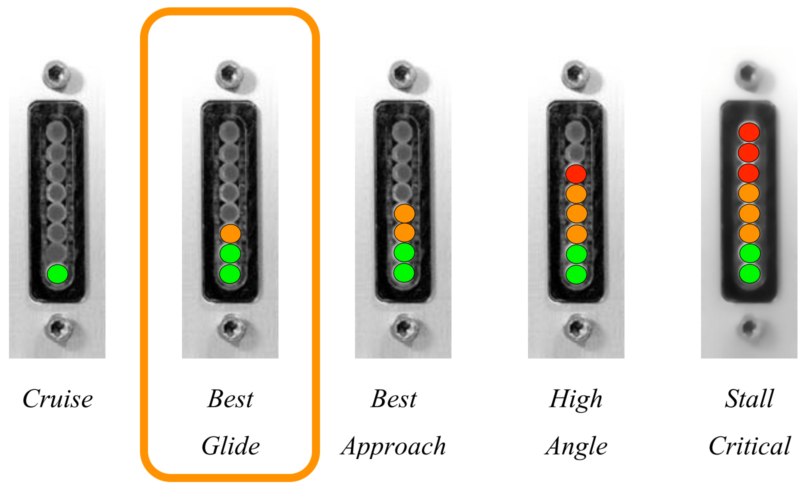
5.3 Glide with Engine Inoperative

With the engine inoperative, the airplane has a glide ratio in the range of about 1:7 with the flaps fully retracted, landing gear fully retracted and 90-95 knots IAS at a gross weight of 830 kg.

Alternatively, the glide ratio of 1:7 may be expressed as a glide of about 1.15 nautical miles (or 2.1 kilometer) per 1000 ft altitude.

The glide speed is to be reduced by one knot per 20 kg less of weight, and respectively the glide distance by 0.1 nautical miles per 1000 ft. Per 20 kg of weight increase the glide speed is increased by one knot, an respectively the glide distance is increased by 0.1 nautical miles per 1000 ft.

It is strongly advised to use the angle-of-attack (AOA) system to achieve best gliding performance for a given weight. Best glide for the existing weight and atmospheric conditions is achieved if the first yellow LED (third LED from below; 2 green & 1 yellow LED) is illuminated. This angle shall be flow to get the best glide distance (see figures).



Angle-of-attack (AOA) indication for best glide

5.4 Stalling Speed

The angle-of-attack (AOA) system is functioning as a stall warning system giving visual and aural warning if a stall is pending i.e. if 1.15 x Vs is reached in a particular flight situation. This can be either level flight or curved flight with different bank angles.

In case 1.15 x Vs is reached an aural warning „angle, angle, push“ will be heard over the intercom system. This is to warn the pilot of a pending stall situation if the angle of attack is not reduced.

The angle-of-attack system is calibrated for the clean aircraft configuration and landing configuration.

If the pilot selects flaps an aural „flaps“ will be announced over the intercom. This is to remind the pilot of the AOA configuration.

The aural announcement of „flaps“ is also a safety feature for the pilot to remind the selection of flaps before take-off on the ground.

Power Off	Angle of bank			
IAS [knots]	0°	20°	40°	60°
Flaps up	61	63	70	86
Flaps full down	56	58	64	79

Stall Speeds as a function of bank angle, flap position and in power-off conditions

6 Mass and Balance / Equipment List

6.1 Maximum Mass

	Utility	Acrobatic
Maximum take-off mass	1808 lbs (820 kg)	1650 lbs (748.5 kg)
Maximum landing mass	1808 lbs (820 kg)	1650 lbs (748.5 kg)

NOTE: Operation of the aircraft in the Experimental, Amateur-Built category allows for the maximum mass to be determined by the builder of the aircraft. To such ends, the following suggestions are offered:

1. Center of gravity limitations should not be exceeded.

2. Limit load factors be observed for Utility category up to a mass of 2,250 lb (1,650 lb x 6g = 9,900 lb total flight load, 9,900 lb ÷ 4.4g = 2,250 lb (or 1021 kg)). Above 2,250 lb, Normal category limits (+3.8g, −1.9g) should be observed. Observe lower maneuvering speeds as necessary.

3. Any increase in maximum mass will result in an increase in take-off and landing roll, and will also decrease the rate of climb. For safe operations, the maximum mass should allow the aircraft to climb at a minimum of 600 ft/min in sea-level standard conditions.

6.2 Center of Gravity Limitations

With the aircraft in normal flight attitude, the distances of the center of gravity are measured from a vertical line passing through the front surface of the engine propeller flange (the datum).

Forward limit (distance from the datum): 68.5 in. (19% MAC, 1.74 meters)

Aft limit (distance from the datum): 74.8 in. (30% MAC, 1.9 meters)

! Note: The forward face of the cowling (directly aft of the spinner) is located .138” (3.5mm) forward of the datum, if the cowling is properly installed.

6.3 F8L / I-DIET Zero Fuel Mass and Centre of Gravity

	Weight [kg] / Fuel [Lit.]	Arm [m]	Moment [kg m]
Weight Left Wheel	236	2,182	514,95
Weight Right Wheel	234	2,182	510,59
Weight Front Wheel	184,5	0,648	119,56
Fuel Front Tank [Lit.]	-22,5	1,138	-18,44
Fuel Aft Tank [Lit.]	-11,0	3,261	-25,83
Fuel Inverted Tank [Lit.]	-7,8	3,000	-16,85
Radio	0,0	1,460	0,00
Prop MTV-12-b/183-59b	-5,6	0,100	-0,56
Zero Fuel Weight [kg]	619,2		1.083,43
	Zero Fuel Arm [m]	1,750	

These values are based on a weighing of I-DIET performed by AAC (Austrian Aircraft Cooperation), a certified EASA Part 145 company, located in Bad Voeslau airport (LOAV) in August 2010 and reweighing at the same location after the MTV-12-b three bladed propeller installation. The MTV-12 propeller is 5,6 kg lighter than the original 2-bladed Hartzell aluminum propeller (station arm 0,1 meter).

6.3.1 Centre of Gravity Range and Limitations

CG Range [m]	1,7399	1,9
Max. Weight Cat. Normal [kg]	1020	+3,8 g / - 1,9 g
Max. Weight Cat. Utility [kg]	820	+4,4 g / -2,2 g
Max. Weight Cat. Aerobatic [kg]	748,5	+6 g / -3 g

6.3.2 Centre of Gravity Calculation Example + Empty Sheet

	Weight [kg resp. Lit.]	Arm [m]	Moment [kg m]
Zero Fuel Weight [kg]	619,2	1,750	1083,60000
Pilot & CoPilot [kg]	170	2,164	367,88

Luggage [kg]	23	2,792	64,22
Front Fuel [Lit]	75	1,138	61,452
Aft Fuel [Lit]	69	3,261	162
Total Weight [kg]	916	Normal	1739,15448
	CG Arm [m]	1,899	OK

	Weight [kg resp. Lit.]	Arm [m]	Moment [kg m]
Zero Fuel Weight [kg]	619,2	1,750	1083,60000
Pilot & CoPilot [kg]		2,164	
Luggage [kg]		2,792	
Front Fuel [Lit]		1,138	
Aft Fuel [Lit]		3,261	
Total Weight [kg]			
	CG Arm [m]		

6.4 Equipment List

All approved equipment for the installation in the Falco F8L I-DIET is listed in the following table.

Aircraft Serial: 984		**Registration: I-DIET**	
Description	**Type**	**Part No.**	**Manufacturer**
Communication			
COM #1 antenna	Kit as provided	No. 861	Sequoia
COM #2 antenna	Kit as provided	No. 861	Sequoia
COM #1	KX155		Bendix / King

Aircraft Serial: 984		**Registration: I-DIET**	
Description	**Type**	**Part No.**	**Manufacturer**
COM #2	GNS430W	010-00412-01	Garmin Inc.
Audi Panel	GMA 340	010-00152-03	Garmin Inc.
Autopilot System			
Control Head	Trio Avionics w GPSS +GPSV		Trio Avionics Inc.
Roll Servo	Gold Standard Servo		Trio Avionics Inc.
Pitch Servo	Gold Standard Servo w auto-trim		Trio Avionics Inc.
Electrical Power			
Main Battery	Haze 12-33 GEL		Haze Battery Company Ltd
Essential Battery	RS Components Pb Acid	537-5488	
Ammeter	Auracle CRM + Current Shunt	CRM 2100 #081-000032	Ultra Electronics FLIGHTLINE SYSTEMS
Voltmeter	Auracle CRM	CRM 2100	Ultra Electronics FLIGHTLINE SYSTEMS
Voltage Regulator	Sequoia		Sequoia
Alternator	Electrosystem	ALY 8420	Electrosystem
Equipment			
Safety Belts	Pacific Scientific five-point system	No. 814	Sequoia
ELT unit	AK-451 406 MHz ELT		Ameri-King
ELT remote switch	AK-451 406 MHz ELT		Ameri-King
ELT battery	AK-451 406 MHz ELT		Ameri-King
Flight Controls			
AOA Warning	AOA Sport System	20522	Advanced Flight Systems

Aircraft Serial: 984		Registration: I-DIET	
Description	**Type**	**Part No.**	**Manufacturer**
Flaps Control Unit	Sequoia (+ Tschirk)	No. 804	Sequoia
Flaps Actuator assembly	Sequoia	No. 804	Sequoia
Safety Equipment			
First Aid Kit	Standard Car Emergency Kit		
Fuel System			
Front Tank Quantity Sensor	Sequoia	No. 809-1	Sequoia
Aft Tank Quantity Sensor	Sequoia	No. 809-1	Sequoia
Hydraulic			
Parking Valve	Sequoia	No. 810	Sequoia
Brake assembly	Cleveland + heavy duty upgrade kit	40-78B/30-9 + #199-93	Sequoia Cleveland
Clocks, Recording Systems			
Digital chronometer	Digital Chronometer CM20		Revue Thommen AG
Landing Gear			
Tires	Cleveland 5.00x5		Cleveland
Landing Gear assembly	Sequoia	No. 810	Sequoia
Landing Gear electrical motor / gearbox	Sequoia (for full landing gear doors)	No. 812	Sequoia
Lights			
Strobes	Wheelen HDACF series	01-0770028-0 5	Whelen Engineering Company Inc.
Instruments	Nulite for non internal lit Otherwise internal lighting		Nulite et al.

Aircraft Serial: 984		**Registration: I-DIET**	
Description	**Type**	**Part No.**	**Manufacturer**
Glareshield lighting	Glow strips	GS1-18-14	Superior Panel Technology
Instrument light dimmer assembly	Straubing Avionik		
Landing Lights	Whelen		Whelen Engineering Company Inc.
Position Lights	Whelen A650 PG/PR SERIES	70054	Whelen Engineering Company Inc.
Navigation			
Pitot / Static System	Sequoia	No. 815-3	Sequoia
Altimeter Primary	IFR Systems	No. 815-3	Sequoia
Altimeter Digital	Aspen EFD 1000 Pro PFD	920-00003-003	Aspen Avionics
Vertical Speed Indicator Primary	IFR Systems	No. 815-3	Sequoia
Airspeed Indicator Primary	Sequoia	No. 815-3	Sequoia
Outside Air Temperature #1	Aspen EFD 1000 Pro PFD RSM	920-00003-003	Aspen Avionics
Outside Air Temperature #2	Auracle CRM	CRM 2100	Ultra Electronics FLIGHTLINE SYSTEMS
Magnetic Compass	Sequoia	No. 815-3	Sequoia
Directional Compass System (incl. Flux valve)	Aspen EFD 1000 Pro PFD RSM	920-00003-003	Aspen Avionics
Attitude Indicator Primary	IFR Systems	No. 815-3	Sequoia
Electronic Flight Display (including attitude, airspeed, altitude, vertical speed, true airspeed, wind, outside air temperature, turn coordinator)	Aspen EFD 1000 Pro PFD	920-00003-003	Aspen Avionics
Marker antenna	Kit as provided	No. 861	Sequoia
DME	KN-62A	066-01068-0001	Bendix / King
DME antenna	Kit as provided	No. 861	Sequoia
Transponder	GTX 328	010-00634-01	Garmin Inc.

Aircraft Serial: 984		**Registration: I-DIET**	
Description	**Type**	**Part No.**	**Manufacturer**
Transponder antenna	Kit as provided	No. 861	Sequoia
Altitude digitizer	ACK A30	10.221/4	ACK Technologies Inc.
NAV/GS antenna coupler	Antenna Diplexer		Straubing Avionik
VOR/LOC/GS antenna	Kit as provided	No. 861	Sequoia
NAV/COM #1	KX155		Bendix / King
NAV/COM/GPS #2	GNS430W	010-00412-01	Garmin Inc.
Moving Map GPS System	Garmin 695	010-00667-50	Garmin Inc.
CDI VOR/LOC #1	KI 206 VOR/LOC/GI		Bendix / King
CDI VOR/LOC #2	Aspen EFD 1000 Pro PFD	920-00003-003	Aspen Avionics
GPS antenna	GNS430W	010-00412-01	Garmin Inc.
AP source switching assembly	Tschirk		Tschirk
Engine			
Engine	Lycoming AEIO 360 B1		Lycoming
Engine Fuel Control			
Fuel flow transmitter	Auracle CRM + Flow Sensor	#081-000018	Ultra Electronics FLIGHTLINE SYSTEMS
Fuel pressure transmitter	Auracle CRM + Fuel Pressure Sensor	#081-000030	Ultra Electronics FLIGHTLINE SYSTEMS
Engine Ignition System			
Magneto System	Slick	4373	Slick
Engine Indications			
RPM sensor	Auracle CRM + Tachometer Transducer	#081-000006 Slick RPM	Ultra Electronics FLIGHTLINE SYSTEMS

Aircraft Serial: 984		Registration: I-DIET	
Description	**Type**	**Part No.**	**Manufacturer**
Manifold sensor	Auracle CRM + Manifold Pressure	#081-000024	Ultra Electronics FLIGHTLINE SYSTEMS
Cylinder head temperature probes	Auracle CRM + CHT Probes	#081-000047	Ultra Electronics FLIGHTLINE SYSTEMS
EGT probes	Auracle CRM + EGT Probes	#081-000013	Ultra Electronics FLIGHTLINE SYSTEMS
Data processing unit	Auracle CRM EIU	CRM 2100	Ultra Electronics FLIGHTLINE SYSTEMS
Engine data display	Auracle CRM DU	CRM 2100	Ultra Electronics FLIGHTLINE SYSTEMS
Engine Oil System			
Oil temperature sensor	Auracle CRM + OT Probes	#081-000047	Ultra Electronics FLIGHTLINE SYSTEMS
Oil pressure sensor	Auracle CRM + OP Probes	#081-000026	Ultra Electronics FLIGHTLINE SYSTEMS
Engine Starting			
Starter	Aerospace	MZ4222	Lycoming

Updated on 28/10/2012