MAINTENANCE AND INSPECTION PROCEDURES MANUAL

FOR SUPER PETREL LS

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List of Effective Pages

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00	All	All	New Issue for all Super Petrel LS Serial Number	11/08/2018

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1 SCOPE

Scoda Aeronáutica Ltda has prepared this manual in accordance with the latest revision of the ASTM F2483 standard. The manual provides the practices for the servicing and the maintenance of the Super Petrel LS with guidance for the qualifications necessary to perform the various level of maintenance. It provides practices and guidance for servicing, preventive maintenance requirements of a 100-hour and annual condition inspection, and the corrective line maintenance action for the repairs, alterations, and the removal and re-installation of components.

1.1 Authorized Personnel

The Super Petrel LS is a composite biplane amphibious light sport aircraft powered by a compact size Rotax Aircraft Engine installed on pusher configuration. Considering these particularities, Scoda Aeronautica as well as ROTAX BRP-Powertrain authorized training are required to assure equally qualified technicians in the field.

Technicians that will service the Super Petrel LS need to be identifiable as having met a high standard of training, knowledge and experience on Super Petrel LS aircraft as well as Rotax Aircraft Engines. Therefore, every organization or individual should hold a formal instruction from Scoda Aeronautica and ROTAX BRP-Powertrain authorized training facility.

It is a requirement that all organizations or individuals have a recurrent knowledge status for the level of work they intend to perform. Any inspection, repair, and alteration outlined in this Maintenance Manual should be performed if the organization or individual holds the following maintenance rating:

- LSA Repairman Maintenance Certificate
- A&P Certificate
- iRMT Training (at least Service ROTAX® Aircraft Engines Rating)
- Super Petrel LS Maintenance Training (at least Line Maintenance Super Petrel LS Rating)

1.2 Super Petrel LS Training Courses

Scoda Aeronáutica established a globally standardized training guideline covering the different scope of work, target audiences and educational levels which ranges from familiarization to task specific on the Super Petrel LS aircraft. All technical training courses are offered by Scoda Aeronáutica or an authorized training center.

The Super Petrel LS Maintenance Training Pyramid is built on 3 main levels:

1. **Line Maintenance**

   The Line Maintenance course covers and gives the necessary knowledge to perform inspection on Super Petrel LS up to 100 hours inspection or annual inspection.

   Certification: Line Maintenance Super Petrel LS Aircraft

   Validity: Valid only for 24 month from date of issue

   Recurrent Training: This course/rating has to be renewed every 2 years, with focus on the Maintenance Manual revisions or changes since the last course.

2. **Heavy Maintenance**

   Additional to Line Maintenance course, the Heavy Maintenance course covers and gives the necessary knowledge to perform 5 years / 1000 hours and 10 years / 2000 hours inspection on Super Petrel LS.

   Certification: Heavy Maintenance Super Petrel LS Aircraft

   Validity: Valid only for 24 month from date of issue

   Recurrent Training: This course/rating has to be renewed every 2 years, with focus on the Maintenance Manual revisions or changes since the last course.

3. **Task Specific Training**

   This course is available by invite only. Applicants must meet requirements set by Scoda Aeronáutica to be eligible for the applicable training.

1.3 Owner / Operator Responsibilities

The owner / operator is reminded that it is their responsibility to ensure that Scoda Aeronáutica Ltda has the appropriate contact information on file, to allow for flight safety and other important information can be communicated in a timely manner. Please use the FORM_SPLS_001_Aircraft Registration Form on Scoda Aeronáutica's website (www.scodaeronautica.com.br) to register any changes in ownership or address and sent via email to enginnering@scodaero.com.br.

Notices of Corrective Actions and the latest version of the Maintenance Manual for this aircraft may be found on Scoda Aeronáutica's website.

NOTE
SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the Advisory Circular 43.13 – 1B Aircraft, Repair and Alterations Acceptable Methods, Techniques, and Practices.

NOTE
This maintenance manual does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.4 Safety of Flight and Service Difficulty Reporting

Please report any safety of flight or any other service difficulty directly to Scoda Aeronáutica Ltda using the FORM_SPLS_002_Continued Operational Safety Reporting Form on Scoda Aeronáutica´s website (http://www.scodaeronautica.com.br/blog_anexos/c667c8609b3e92488fcc075d51070562.pdf) and sent via email to engineering@scodaero.com.br.

1.5 Application of Notes, Cautions and Warnings

NOTES, **CAUTIONS** and **WARNINGS** are used in the Maintenance Manual to emphasize instructions for information considered to be unusual or critical. The conditions that warrant use of **NOTES**, **CAUTIONS** and **WARNINGS** are defined in the following:

NOTE

Maintenance procedures, practices or conditions, which is essential to highlight or explain.

CAUTION

Maintenance procedures, practices or conditions, which, if not strictly observed or corrected, could result in damage or destruction of equipment.

WARNING

MAINTENANCE PROCEDURES, PRACTICES OR CONDITIONS, WHICH, IF NOT STRICTLY OBSERVED OR REMEDIED, COULD RESULT IN SERIOUS PERSONAL INJURY OR LOSS OF LIFE.

2 Reference Documents

ASTM Standards:

- F2245 – Specification for Design and Performance of a Light Sport Airplane.
- F2295 – Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft.
- F2483 – Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft

Federal Standards:

- 14 CFR Part 21.190 – Issue of a Special Airworthiness Certificate for a Light-Sport Category Aircraft.
- 14 CFR Part 43 – Maintenance, Preventive Maintenance, Rebuilding, and Alteration.
- 14 CFR Part 65 – Certification: Airmen Other Than Flight Crewmembers
- AC 43.13-1B – Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair

3 Terminology and Acronyms

(1) DEFINITIONS:

Annual Condition Inspection – detailed inspection accomplished once a year on a LSA in accordance with instructions provided in the maintenance manual supplied with the aircraft. The purpose of the inspection is to look for any wear, corrosion, or damage that would cause an aircraft to not be in a condition for safe operation.

A&P – airframe and powerplant mechanic as defined by 14 CFR Part 65 in the U.S. or equivalent certification in other countries.

FAA – United States Federal Aviation Administration.

Heavy Maintenance – any maintenance, inspection, repair, or alteration a manufacturer has designated that requires specialized training, equipment, or facilities.

Line Maintenance – any repair, maintenance, scheduled checks, servicing, inspections, or alterations not considered heavy maintenance that is approved by the manufacturer and is specified in the manufacturer's maintenance manual.

LSA (Light Sport Aircraft) – aircraft designed in accordance with ASTM standards under the jurisdiction of Committee F37 Light Sport Aircraft, for example, Specification F2244 for powered parachutes, Specification F2245 for airplanes, and Specification F2352 for gyroplanes.

LSA Repairman Inspection – U.S. FAA-certificated repairman (light sport aircraft) with an inspection rating as defined by 14 CFR Part 65, authorized to perform the annual condition inspection on experimental light sport aircraft the holder owns, or an equivalent rating issued by other civil aviation authorities.

LSA Repairman Maintenance – U S. FAA-certificated repairman (light sport aircraft) with a maintenance rating as defined by 14 CFR Part 65, authorized to perform line maintenance on aircraft certificated as special LSA aircraft. Authorized to perform the annual condition/100-h inspection on an LSA, or an equivalent rating issued by other civil aviation authorities.

Maintenance Manual – manual provided by an LSA manufacturer or supplier that specifies all maintenance, repairs, and alterations authorized by the manufacturer.

Major Repair, Alteration, or Maintenance – any repair, alteration, or maintenance for which instructions to complete the task excluded from the maintenance manual(s) supplied to the consumer are considered major.

Manufacturer – any entity engaged in the production of an LSA or component used on an LSA.

Minor Repair, Alteration, or Maintenance – any repair, alteration, or maintenance for which instructions provided for in the maintenance manual(s) supplied to the consumer of the product are considered minor.

Overhaul – maintenance, inspection, repair, or alterations that are only to be accomplished by the original manufacturer or facility approved by the original manufacturer of the product.

Overhaul Facility – facility specifically authorized by the aircraft or component manufacturer to overhaul the product originally produced by that manufacturer.

Repair Facility – facility specifically authorized by the aircraft or component manufacturer to repair the product originally produced by that manufacturer.

14 CFR – Code of Federal Regulations Title 14 Aeronautics and Space also known as the “FARs” or Federal Aviation Regulations.

100-h Inspection – same as an *annual condition inspection*, except the interval of inspection is 100 h of operation instead of 12 calendar months. This inspection is utilized when the LSA is being used for commercial operations such as flight instruction or rental, or both.

(2) ACRONYMS:

100 LL – 100 Octane Low Lead
AC – Alternating Current
ALT – Altimeter
ASTM – American Society for Testing and Materials
AVGAS – Aviation Gasoline
C – Celsius
CG – Center of Gravity
CHT – Cylinder Heat Temperature
DC – Direct Current
EMS – Engine Monitoring System
F – Fahrenheit
FAA – Federal Aviation Administration
GPS – Global Position System
GYRO – Gyroscopic
HP – Horse Power
hr – Hour
in – inches
Kg – Kilograms
Lbs – Pounds
LH – Left
LSA – Light Sport Aircraft
Min - minutes
ml – milliliters
mm – millimeters
MOGAS – Motor Gasoline
N*m – Newton per meter
N/A – Not Applicable
NAV – Navigation
OHV – Overhead Valve
Pcs - Pieces
Psi – Pounds per square inch
PVC – Polyvinyl Chloride
RH – Right
RPM – Revolutions per Minute
STC – Supplemental Type Certificate
TC – Turn and Coordinator
TCAS – Traffic Collision Avoidance System
US Gal – Gallon
V – Volt
VHF – Very High Frequency
XPDR – Transponder

4 SIGNIFICANCE AND USE

The purpose of this maintenance manual is to provide guidance to owners, mechanics, airports, regulatory officials, and aircraft and components manufacturers who may accomplish maintenance, repairs, and alterations on the Super Petrel LS.

5 Aircraft Maintenance Manual

5.1 General

Scoda Aeronáutica Ltda developed this aircraft maintenance manual, which contains the information needed to maintain the Super Petrel LS in an airworthy condition. The Aircraft Maintenance Manual was prepared to meet the ASTM F2483 – Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft. Nevertheless, information about the engine, propeller and any other equipment not fabricated by Scoda Aeronáutica Ltda will never prevail over information supplied by their own manufacturer.

The provisions set forth in this manual will assist to apply and establish correct procedures. Any further modifications or variations will be advised through Notice of corrective Actions (Safety Alerts, Service Bulletins or Notifications). For further information or explanation, contact Scoda Aeronáutica Ltda.

As defined, a good operating condition, its reliability and ready to fly, achieved by the completion of maintenance of maintenance tasks in due, and the standards prescribed in this manual, or in a separate component manufacturers documentation. To resolve any discrepancies and non-conformities found during inspections and maintenance, qualified personnel using adequate approved methods, tools, and other necessary equipment and spare parts must carry out all inspections and repair.

Only the aircraft's manufacturer, or the manufacturer of a component on the aircraft, may perform or authorize the performance of repair or modification to that aircraft or component.

Because of the fact, this manual contains information that will be useful to any future owners of this aircraft; it must be considered an integral part of the aircraft.

- **Manufacturer Data**

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➢ Aircraft Description

1. Three Plane View

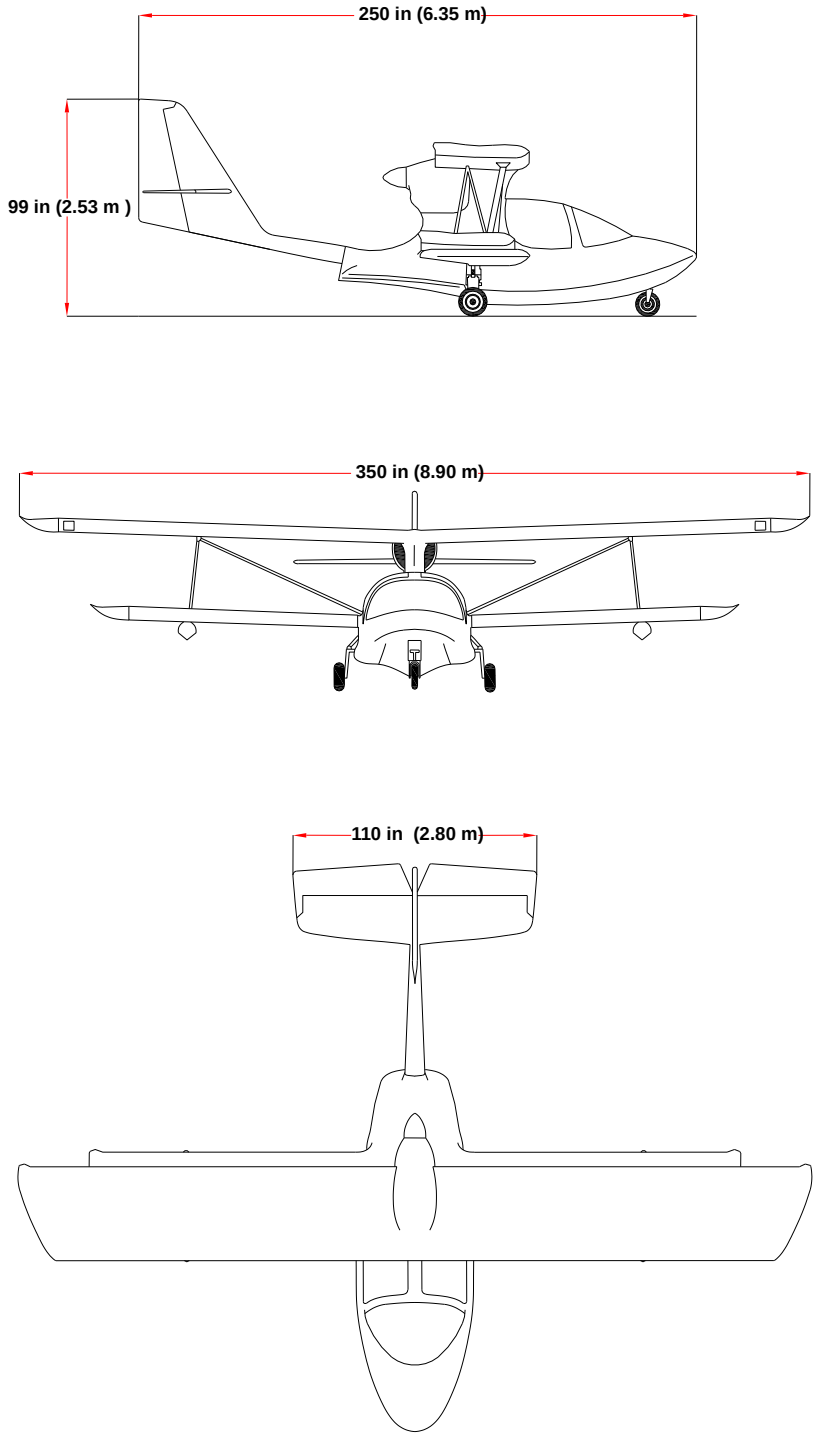


Figure 5-1

Configuration

Super Petrel LS is an amphibious seaplane with equilibrium floats attached to its lower wings. The ailerons are located in the upper wings and the tail is conventional, with the horizontal stabilizer built half way up the tail fin.

The two seats are side by side with dual controls and equipped with 4-point seat belt. Both seats may be adjusted into three longitudinal positions.

The engine is a pusher configuration attached to the upper wing pylon. A carbon fiber cowling encloses the engine.

Two big doors give access to the enclosed cockpit. Both can be opened / closed from inside and outside using a single rotating lock. It is possible to fly without the doors that are easily removed by removing the cotter pins to pull the hinge pins.

CAUTION

When operating the aircraft without doors, loose objects in the cabin or baggage compartment can fly into the propeller and cause damage.

2. Airframe

Two parts comprise the fuselage: The main fuselage and tail.

The main fuselage is molded in fiberglass, carbon and Kevlar® reinforced by fiberglass/PVC foam bulkheads.

The tail, the horizontal stabilizer and the elevator are molded in carbon fiber and have internal PVC foam reinforcements. The rudder is built using the same process and is covered with fabric.

The upper wings structure has a carbon fiber "C" channel spar, forming a “D” box when bonded to the carbon fiber and fiberglass/PVC foam leading edge. The wing tips are made of carbon fiber and the wings are covered with fabric.

The lower wings are built in the same way; the difference is that tanks are located in the leading edge. The floats are attached to the lower wing's structure.

The struts are made of 6061-T6 aluminum profile.

3. Landing Gear

The main landing gear is equipped with oil pneumatic shock absorbers, hydraulic disk brakes, aluminum wheels and 11x4.00-5 tires with inner tubes. The nose gear is equipped with 10X3.00-4 tire and inner tube.

The landing gear retraction system is manually operated and the operating load of the system is balanced by a gas spring.

4. Flight Controls

Stainless steel cables operate the rudder, the elevator and ailerons are operated by rigid tubes. Elevator trim is electrically operated.

Control Ranges:

- **Ailerons:** 17° up / 10° down (± 2°)
- **Elevator:** 30° up / 20° down (± 2°)
- **Rudder:** 30° up / 30° down (± 2°)
- **Trim:** 17° up / 13° down (± 2°)

5. Instrument Panel and Flight Instruments

The typical instrument panel contains all flight, navigation and engine instruments that are required for day and night operations. Switches are located as follows:

- **Engine Panel:** Located on the left side of the instrument panel.
- **Lights Panel:** Located in the middle of the instrument panel below the GPS.
- **Miscellaneous Panel:** Located on the center console.
- **Circuit Breaker Panel:** Located on the right side of the instrument panel.

The instrument panel for each aircraft is detailed on the Instrument Panel and Flight Instruments Supplement of the Pilot´s Operating Handbook.

6. Engine

The aircraft is powered by Rotax Aircraft Engines. This may be equipped with three versions of engine:

- 912 ULS
- 914 UL
- 912 iS Sport

7. Propeller

The aircraft is equipped with three blade propellers with ground adjustable pitch:

- POWERFIN PROPELLERS Model F 65”
- DUC Three-Blade Inconel FLASH – 2 propeller

5.1.1 Equipment List

Typical Equipment List is divided into Avionics, Emergency Equipment, Miscellaneous, Engine, Propeller, Lights and Others. This includes the following items:

- Description
- Manufacturer Part Number
- Serial Number
- Weight
- Arm

The actual equipment list is detailed on the Equipment List Supplement of the Pilot´s Operating Handbook.

5.1.2 Supply Sources for Parts

Spare parts and components can be ordered from their respective manufacturers, except structural parts, which can only be ordered from Scoda Aeronáutica Ltda. or an authorized reseller using the Super Petrel LS Illustrated Parts Catalogue. Follows below a list of sources according to the assembly:

PARTS	SOURCE
General Assemblies	Scoda Aeronáutica Ltda
Materials for Major Repairs	Contact Scoda Aeronáutica Ltda: **major repairs are not authorized.**
Hardware	Scoda Aeronáutica Ltda / Aircraft Spruce
Instruments / Avionics	Scoda Aeronáutica Ltda / OEM (Original Equipment Manufacturer)
Engine Parts	Scoda Aeronáutica Ltda / Rotax
Propeller Parts	Scoda Aeronáutica Ltda / DUC Hélices

5.1.3 List of Disposable Replacement Parts

The following table shows a list of commonly replaced parts, as well as the components with lifetime limitations.

SYSTEM	ITEM	PART NUMBER	SUPPLIER	INTERVAL	ACTION
ENGINE	Air Filter **(912 ULS)**	RC – 1820	K&N Scoda Aeronáutica Ltda	100 h	Replace
	Air Filter **(914 UL / 912 iS Sport)**	825750	Rotax Scoda Aeronáutica Ltda	100 h	Replace
	Engine Mount **(all engines)**	J-3608-1	LORD Corp. Scoda Aeronáutica Ltda	On Condition	Replace
	Tension Spring	SE-412.002-2	Scoda Aeronáutica Ltda	50 h	Replace
	Exhaust Muffler **(912 ULS / 912 iS Sport)**	SE-412.005-3	Scoda Aeronáutica Ltda	On Condition	Replace
FUEL	Inline Fuel Filter 3/8'' 85 micron **(912 ULS / 914 UL)**	230206ERL	Summit Racing Scoda Aeronáutica Ltda	200 h	Replace
	Inline Fuel Filter 3/8'' 62 micron **(912 iS Sport)**	FX375-M	Andair Scoda Aeronáutica Ltda	200 h	Replace
	Fuel Selector Valve	05-01033 PI-530.013	Aircraft Spruce Scoda Aeronáutica Ltda	On Condition	Replace
	Fuel Shut Off Valve	05-01033 PI-530.013	Aircraft Spruce Scoda Aeronáutica Ltda	On Condition	Replace
	Pierburg Electric Fuel Pump 7.21440.51.0 **(912 ULS)**	PI-530.004-1	Scoda Aeronáutica Ltda	5 years	Replace
NOSE GEAR	Nose Landing Gear Tire	TIRT 3.00-4 PI-312.003	Matco Mfg Scoda Aeronáutica Ltda	On Condition	Replace
	Nose Landing Gear Tire Inner Tubes	06-00761 PI-312.004	Aircraft Spruce Scoda Aeronáutica Ltda	On Condition	Replace
	Nose Landing Gear Wheel	SE-311.026	Scoda Aeronáutica Ltda	On Condition	Replace
	Nose Gear Bearing	6302DDUC3 PI-312.040	NSK Scoda Aeronáutica Ltda	100 h	Replace
MAIN GEAR	Main Landing Gear Tires	06-01573 PI-311.025	Aircraft Spruce Scoda Aeronáutica Ltda	On Condition	Replace
	Main Landing Gear Tire Inner Tubes	15-04651 PI-311.027	Aircraft Spruce Scoda Aeronáutica Ltda	On Condition	Replace
	Main Landing Gear Wheel	SE-311.015-1	Scoda Aeronáutica Ltda	On Condition	Replace
	Main Landing Gear Bearings	6004DDUC3 PB-311.076	NSK Scoda Aeronáutica Ltda	100 h	Replace
	Gas Spring	SE-323.050	Scoda Aeronáutica Ltda	On Condition	Replace
	Shock Absorber	SE-323.120	Scoda Aeronáutica Ltda	On Condition	Replace
CONTROLS	TFXtreme Control Cable CCX633, 9' Length	CCX63309 PI-213.002	TFXtreme Scoda Aeronáutica Ltda	On Condition	Replace
BRAKES	Brake Pads + Caliper Set	SE-520.022	Scoda Aeronáutica Ltda	On Condition	Replace
	Brake Discs	PB-520.023	Scoda Aeronáutica Ltda	On Condition	Replace
BATTERY	12-Volt / 18A Sealed Lead Acid or Gel Battery	PB-510.001	Scoda Aeronáutica Ltda	On Condition	Replace

5.1.4 Engine Specifications

The Super Petrel LS is powered by Rotax Aircraft Engines. This may be equipped with three versions of engine:

- 912 ULS
- 914 UL
- 912 iS Sport

NOTE

For engine parameters information please refer to the latest revision of the Operator's Manual for the applicable ROTAX engine or the Pilot´s Operating Handbook supplied with the aircraft.

5.1.5 Weight and Balance Information

Super Petrel LS is structurally and aerodynamically engineered for certain load conditions which result from specific weights and forces anticipated to occur in normal operations within the specified flight envelope.

WARNING

AIRCRAFT'S HANDLING QUALITIES AND STRUCTURAL INTEGRITY MAY BE SERIOUSLY COMPROMISED IF THE WEIGHT AND BALANCE LIMITS ARE EXCEEDED.

For further information regarding Weight and Balance Practices, refer to the Chapter 10. Weight and Balance of the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – AIRCRAFT INSPECTION, REPAIR AND ALTERATION ACCEPTABLE METHODS, TECHNIQUES, AND PRACTICES

Definitions:

ARM: The horizontal distance from the reference datum to the center of gravity (CG) of an item.

BASIC EMPTY WEIGHT: Standard empty weight plus optional equipment.

CENTER OF GRAVITY (CG): The point at which an airplane would balance if suspended. Its distance from the reference datum is determined by dividing the total moment by the total weight of the airplane.

CG ARM: The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.

CG LIMITS: The extreme center of gravity locations within which the aircraft must be operated at a given weight.

DATUM: An imaginary vertical plane from all horizontal distances are measured for balance purposes.

MOMENT: The product of the weight of an item multiplied by its arm.

MAXIMUM LANDING WEIGHT: Maximum weight approved for the landing touchdown.

MAXIMUM TAKEOFF WEIGHT: Maximum weight approved for the start of the takeoff run.

PAYLOAD: Weight of occupants, cargo, and baggage.

STANDARD EMPTY WEIGHT: Weight of a standard airplane including unusable fuel, full operating fluids, and full oil.

UNUSABLE FUEL: Fuel remaining after a runout test has been completed in accordance with governmental regulations.

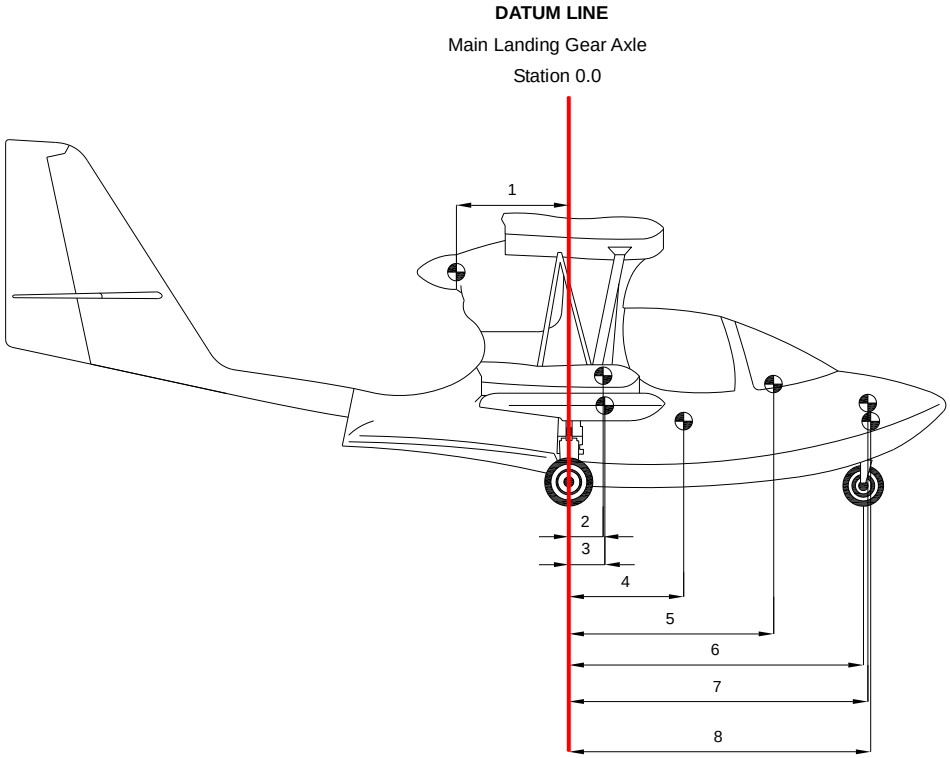
USABLE FUEL: Fuel available for flight planning.

USEFUL LOAD: Difference between takeoff weight and basic empty weight.

5.1.5.1 Weight and Balance Chart

The aircraft total weight and the aircraft empty weight center of gravity location should be checked:

- After Major repairs.
- After repainting.
- After fitting the airplane with additional equipment apart from its manufacturing configuration.



Nº	Equipment	Arm
1	Propeller	-32 in (-82 cm)
2	Fuel	12 in (31 cm)
3	Baggage	13 in (32 cm)
4	Pilot / Passenger	33 in (85 cm)
5	Instruments	53 in (135 cm)
6	Nose Wheel	81 in (205 cm)
7	Battery	82 in (208 cm)
8	Ballast	82.5 in (210 cm)

Figure 5-2

5.1.5.2 Empty Weight Center of Gravity Location

Weighing Procedure

The center of gravity must be determined with the airplane fully equipped according to the Equipment List of the corresponding aircraft.

Be sure to remove any items not listed in the Equipment List (such as rags, charts, tools, etc.) from the aircraft prior to weighing.

NOTE

Weighing the aircraft in a hangar with doors closed where the wind will not affect the readings of the scales.

1. Clean the aircraft in order to remove dirt and grease.
2. The fuel tanks should be empty except for unusable fuel.
3. Oil, coolant and reservoir tanks must be properly filled before weighing.
4. Put the airplane on three scales (one under each wheel) or one scale with leveling blocks. The scales must be calibrated correctly. All the scales must be set on level ground.

Figure 5-3

5. The aircraft must be weighed in a level flight attitude, both laterally and longitudinally (front to back).

Laterally: Put a digital level in the stainless steel triangle located behind the seats, which is connected to the main struts in order to obtain 0°.

Longitudinally: Put a digital level on the Tail Boom insertion part in the fuselage. Put a chock under the nose wheel in order to obtain 12°.

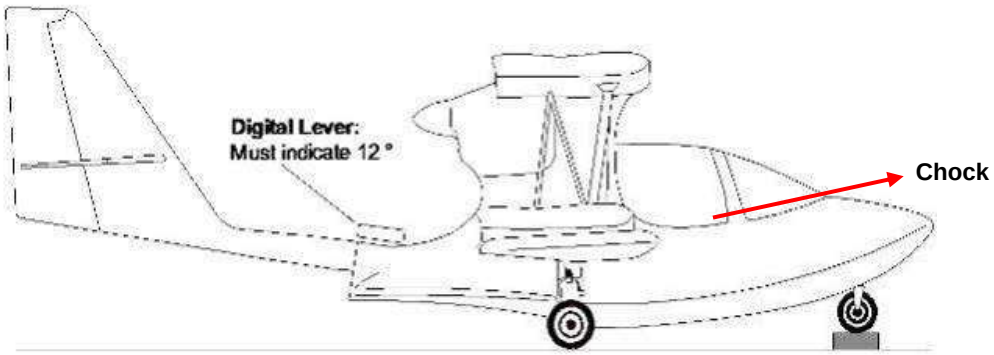


Figure 5-4

6. Put a load of 20 lbs (10 kg) on the aircraft nose. That load must be aligned with nose gear axis.

7. After recorded the data (Nose, LH and RH weights), it should be subtracted the load of 20 lbs (10 kg) from the nose weight. Example: On the display is reading 11 lbs (5 kg), so the total weight of the nose is -9 lbs (-5 kg).

8. The mechanic or repairman who conducts a weight and balance procedure must ensure that the weight and balance data in the aircraft records is updated and accurate.

NOTE

It is the pilot's responsibility to use the most updated weight and balance data when operating the aircraft.

WARNING

THE TOTAL WEIGHT OF THE AIRCRAFT MUST BE NO GREATER THAN THE MAXIMUM WEIGHT ALLOWED AND THE CENTER OF GRAVITY MUST BE MAINTAINED WITHIN THE ALLOWABLE LIMITS.

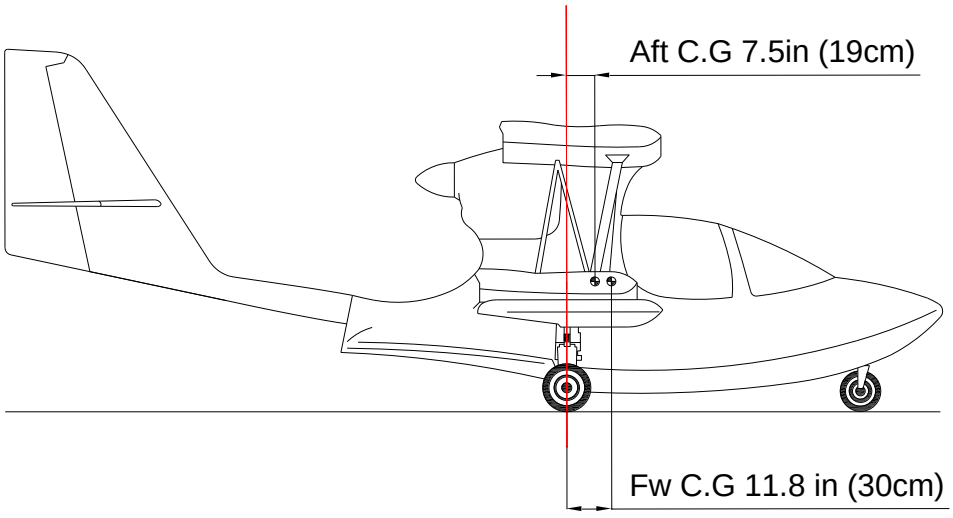
5.1.5.3 Loading Method

LOADING CHART

Aircraft Serial Number: S0_____ Date: _____

Registration Number: _____ Owner: _____

Item		Weight Lbs (Kg)	x	Arm	=	Moment lbs x in (kg x cm)
	Empty Weight		x		=	
	Pilot		x	33 in (85 cm)	=	
	Pax		x	33 in (85 cm)	=	
	Baggage		x	13 in (32 cm)	=	
	Ballast		x	82.5 in (210 cm)	=	
Fuel Left Tank	**10 US GAL/38 LTR**		x	12 in (31 cm)	=	
Fuel Right Tank	**10 US GAL/38 LTR**		x			
Header Tank	**4 US GAL/17 LTR**		x			
Total Weight =			**Total Moment =**			
Center of Gravity		**Total Moment**	**/**	**Total Weight**	=	**CG:_____ in (cm)**
THE VALUE OF CG MUST BE HIGHER THAN 7.5 in (19 cm) AND LOWER THAN 11.8 in (30 cm)						



1. Multiply each item´s weight times its arm to find the moment. Record each on its respective line.
2. Add all the weights and moments and record each on its respective total line.
3. Divide the total moment by the total weight and the result is the CG.
4. Determine that the airplane´s Loaded CG. falls within the applicable limits (Forward and Aft CG. Limits).

SAMPLE LOADING CHART (Maximum Forward CG)

Item		Weight Lb (Kg)	x	Arm	=	Moment lb x in (kg x cm)
	Empty Weight	784 Lbs	x	0	=	0
	Pilot	250 Lbs	x	33 in (85 cm)	=	8250 Lb.in
	Pax	182 Lbs	x	33 in (85 cm)	=	6006 Lb.in
	Baggage	0	x	13 in (32 cm)	=	0
	Ballast	0	x	82.5 in (210 cm)	=	0
Fuel Left Tank	6.6 US Gallons	40 Lbs	x	12 in (31 cm)	=	480 Lb.in
Fuel Right Tank	6.6 US Gallons	40 Lbs	x			480 Lb.in
Header Tank	4 US Gallons	24 Lbs	x			288 Lb.in
Total Weight =		**1320**	**Total Moment =**			15504 Lb.in
Center of Gravity		**Total Moment**	**/**	**Total Weight**	=	**CG: 11.745 in**
THE VALUE OF CG MUST BE HIGHER THAN 7.5 in (19 cm) AND LOWER THAN 11.8 in (30cm)						

SAMPLE LOADING CHART (Maximum AFT C.G)

Item		Weight Lb (Kg)	x	Arm	=	Moment lb x in (kg x cm)
	Empty Weight	784 lbs	x	0	=	0
	Pilot	110 lbs	x	33 in (85 cm)	=	3630 Lb.in
	Pax	0 lbs	x	33 in (85 cm)	=	0
	Baggage	0 lbs	x	13 in (32 cm)	=	0
	Ballast	44 lbs	x	82.5 in (210 cm)	=	3630 Lb.in
Fuel Left Tank	0 US Gallons	0 lbs	x	12 in (31 cm)	=	0
Fuel Right Tank	0 US Gallons	0 lbs	x			0
Header Tank	2.5 US Gallons	15 lbs	x			180 Lb.in
Total Weight =		953	**Total Moment =**			7440 Lb.in
Center of Gravity		**Total Moment**	**/**	**Total Weight**	=	**CG: 7.8 in**
THE VALUE OF CG MUST BE HIGHER THAN 7.5 in (19 cm) AND LOWER THAN 11.8 in (30 cm)						

5.1.5.4 Operating Weights and Loading

5.1.5.4.1 Weight Definitions

Maximum Takeoff Weight	1320 lbs (600 kg)
Maximum Landing Weight	1320 lbs (600 kg)
Maximum Empty Weight	895 lbs (407 kg)
Typical Empty Weight	792 lbs (360 kg)
Basic Empty Weight	770 lbs (350 kg)
Minimum Useful Load	425 lbs (193 kg)

NOTE

The limits of CG range are measured forward of Datum.

5.1.5.4.2 Center of Gravity Forward and Aft Limits

Forward C.G. Limit	Maximum Takeoff Weight with heavy passenger and pilot and 70% of the fuel capacity (Approx. 17 US Gallons – 65 Liters). ***SEE SAMPLE LOADING CHART (Maximum Forward CG.)***
Aft C.G. Limit	With a very light pilot only and reserve fuel. ***SEE SAMPLE LOADING CHART (Maximum AFT CG.)***

5.1.5.4.3 Baggage Compartment

The baggage compartment is located next to the CG, therefore has little effect on the balance. The baggage area is located behind the seats, above the main landing gear.

The baggage area limit is 66 lbs (30 kg)

NOTE

The maximum baggage load will be limited by the MTOW.

5.1.5.4.4 Ballast Tank

NOTE

The aircraft is equipped with a ballast tank, located next to the nose gearbox. When the occupants' total weight (Pilot and Passenger) is less than 290 lbs (132 kg), additional ballast will be necessary. The minimum required ballast added is located in the following table:

Weight (PILOT+ PASSENGER)		MINIMUM BALLAST WEIGHT	BALLAST
120 – 210 lbs	54,4 – 95 kg	44 lbs (20 kg)	1/1
210 – 290 lbs	95 – 132 kg	22 lbs (10 kg)	1/2
above 290 lbs	above 132 kg	0 lbs (0 kg)	0

5.1.5.4.5 Center of Gravity (CG) range

Longitudinal Limits

DATUM	Main Landing Gear Shaft
Forward Limit	11.8 in (30 cm)
Aft Limit	7.5 in (19 cm)

Procedure

Chart above (in order to calculate the final position of the CG.

NOTE

It is the pilot's responsibility to use the most updated weight and balance data when operating the aircraft.

WARNING

THE TOTAL WEIGHT OF THE AIRCRAFT MUST BE NO GREATER THAN THE MAXIMUM WEIGHT ALLOWED 1320 LBS (600 KG) AND THE CENTER OF GRAVITY MUST BE MAINTAINED WITHIN THE ALLOWABLE LIMITS 11.8 in (30 cm) and 7.5 in (19 cm)

5.1.6 Tire Inflation Pressures

The recommended tire inflation pressures are:

TIRES	MINIMUM PRESSURE	MAXIMUM PRESSURE
Nose Wheel Tire	20 PSI	28 PSI
Main Wheel Tires	32 PSI	40 PSI

AIRCRAFT TIRE CARE RECOMMENDATIONS

(Reference: FAA ADVISORY CIRCULAR 65-15A – AIRFRAME OF POWERPLANT MECHANICS)

Tires are as vital to the Operation of aircraft as they are to the Operation of an automobile. During ground operation tires can be considered as ground control surfaces. Contrary to what most people think including many beginning pilots, the toughest demand on aircraft tires is rapid heat buildup during lengthy ground operation, not the impact of hard landings.

The best safeguards against heat buildup in aircraft tires are short ground rolls, slow taxi speeds, minimum braking, and proper tire inflation. Proper inflation assures the correct amount of flexing and keeps heat buildup to a minimum, increasing tire life and preventing excessive tread wear. Inflation pressure should always be maintained as specified in the aircraft maintenance manual.

Even though using a tire gage is the only accurate way to spot-check inflation, a quick visual inspection of the thread can reveal if air pressure has been consistently high or low. Excessive wear in the shoulder area of the

tire is an indication of under inflation. Excessive wear in the center of the tire suggests over inflation.

Tire pressures should be checked with an accurate gage at least once a week or oftener, and it is recommended that they be checked before each flight. Otherwise, if a slow leak should develop, it could cause severe loss of air within two or three days, with resulting damage to the tire and tube. Air pressures should be only checked when tires are cool. Wait at least two hours after a flight before checking pressures (three hours in hot weather).

SUMMARIZING THE PROPER INFLATION PRESSURE IS ONE OF THE MOST IMPORTANT MAINTENANCE PROCEDURES TO ACHIEVE LONG TIRE LIFE:

- Inflation pressure practices are essential for balanced wear and durability.
- Perform weekly inflation checks with a calibrated pressure gauge.
- Inflation pressures can be obtained from the POH and Maintenance Manual of the Super Petrel LS.
- Underinflation can:
    - Reduce casing life
    - Cause fast wear
    - Cause irregular wear
    - Reduce fuel economy
    - Cause sudden tire destruction

- Over inflation can:
    - Decrease resistance to punctures and impacts
    - Reduce tire footprint size
    - Cause irregular shoulder wear
    - Cause improper handling
    - Cause ride and handling disturbances
    - Cause reduced traction

NOTE
In addition, it is recommended to consult the latest edition of the **FAA ADVISORY CIRCULAR AC 20-97B – AIRCRAFT TIRE MAINTENANCE AND OPERATIONAL PRACTICES.**

5.1.7 Approved Oils and Capacities

5.1.7.1 Engine

For selection of suitable operating fluids for ROTAX Engine type 912 i, 912 and 914 (Series), refer to the latest edition of the Rotax Service Instruction SI-912 i-004 / SI-912-016 / SI-914-019.

- **Engine Oil:** Perform maintenance checks according to the latest Rotax Maintenance Manual. In accordance to the latest edition of the Rotax Service Instruction SI-912 i-004 / SI-912-016 / SI-914-019 the frequency of oil changes must be increased regardless off the type of fuel mainly used (MOGAS or AVGAS).

- **Oil Specification:** Motor oils tested and released by BRP-Rotax (for use MOGAS or AVGAS), which Rotax recommended for use with their ROTAX engine types 912 i, 912 and 914 Series: **SHELL ® AeroShell Oil Sport Plus 4 (SAE 10 W-40)**

  Oil Level: It should be in the middle of the dipstick:

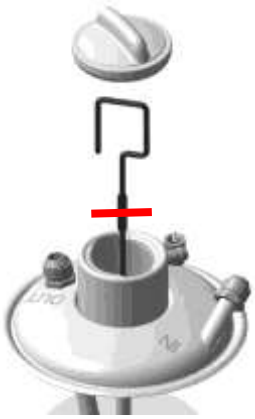


Figure 5-5

- **Engine Coolant:** Remember that different coolants **cannot be mixed**. In accordance to the latest edition of the Rotax Service Instruction SI-912 i-004 / SI-912-016 / SI-914-019, in principle 2 different types of coolant are permitted:
  - Conventional coolant based on ethylene glycol with 50% water.
  - Waterless coolant based on propylene glycol.
- **Coolant Specification:** Aircraft manufacturer recommends the use **Honda Genuine Coolant Type 2 – All season antifreeze.**
- **Coolant Level:** It should be in the middle of the overflow bottle:

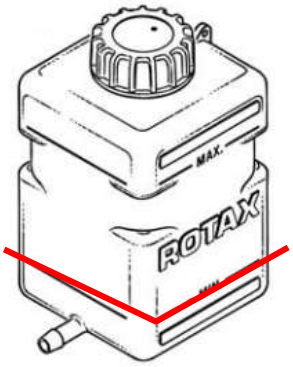


Figure 5-6

5.1.7.2 Brake Fluid

Super Petrel LS uses ATF (Automatic Transmission Fluid) Type A Suffix A in the lines of the brake system.

Brake Fluid Specification: The aircraft manufacturer recommends the use of **Shell ATF Type A Suffix A** or **AeroShell Fluid 41**

CAUTION

It is not allowed the use of DOT type brake fluid.

5.1.8 Recommended Fastener Torque Values

DESCRIPTION	TORQUE VALUE
Firewall Bolts M10 **(912 ULS, 912 iS Sport)**	350 lb.in (40 N.m)
Firewall Bolts M8 **(914 UL)**	180 lb.in (20 N.m)
Engine Suspension Frame Bolts M10 **(912 ULS, 914 UL, 912 iS Sport)**	350 lb.in (40 N.m)
Hub Bolts M8 **(DUC Propeller)**	220 lb.in (25 N.m)
Blades Bolts M8 **(DUC Propeller)**	220 lb.in (25 N.m)
Horizontal Stabilizer Bolts M8 **(Empennage)**	70 lb.in (8 N.m)
Front and Rear Fixation Bolts M8 **(Upper Wings)**	130 lb.in (15 N.m)
Rear Fixation Bolt M8 **(Lower Wings)**	130 lb.in (15 N.m)

CAUTION

Struts bolts torque values are not specified. These locknuts should be tightened until they are secure with at least one (1) thread protruding passed the nut.

For general information regarding aircraft hardware torque values and practices, refer also to the latest edition of **FAA ADVISORY CIRCULAR AC 43.13-1B Chapter 7.**

5.1.9 General Safety Information

There are many hazards inherently present when performing any maintenance task on this aircraft. To minimize the risk to owner, mechanic and others, begin by thinking through each task that is to be performed before starting any work. Use common sense, think of ways to avoid these hazards. Remember also that many accidents happen because of carelessness. Be sure to also use the right tool for the task at hand to use the proper personal protective equipment. Such equipment may include, but is not limited to:

- Eye protection
- Gloves
- Hearing protection – ear plugs or muffs
- Protective footwear with non-slip soles

You should also keep on hand a suitable fire extinguisher, absorbent material to contain spills, an eyewash bottle, and a general-purpose first aid kit. It is also advisable to have on hand the material safety data sheet (MSDS) for all products and chemicals that will be used during the servicing of the aircraft.

While carrying out tasks on the airplane, strictly observe some safety precautions:

- Avoid exposing the main fuselage to temperatures above 140º F (60º C).
- Never move the aircraft by pushing it by the wings, specially the trailing edges.
- Do not step on the wings, tail boom or horizontal stabilizer.
- Do not rest machines or containers on the airplane skin.
- Never leave the ignition switch or the master switch turned on when the engine is not running.
- Never operate the engine with untrained personnel around.
- Remove any loose clothing, such as hats, neckties and scarves. Tuck in your shirt and secure any long hair to prevent them from becoming tangled in power tools.
- Remove all jewelry. Not only can items such as rings, watches, and necklaces become caught in rotating tools, they can also conduct electricity and may cause a short circuit. This could result in burns or damage to electrical circuits.
- Disconnect the negative lead from the battery when doing any electrical work that does not involve trouble shooting the electrical systems. This will reduce the risk of a short circuit or even a fire.
- Aviation gasoline is also highly flammable. When working with the fuel system, always work in a well-ventilated environment. Any nearby source of ignition such as sparks or an open flame can result in a fire or explosion. Keep all ignition sources away. Always ground the airframe to a suitable earth ground during fueling/defueling operations to reduce the risk of a static discharge ignition source.
- When working with dangerous chemical substances (adhesives, thinners), use adequate protective equipment such as goggles, gloves, etc.
- When working with the landing gear, always support the aircraft properly with jacks. Do not work underneath the aircraft unless it is properly supported.
- For engine's assembling or disassembling, use only adequate and tested lifting equipment.
- While running the engine on the ground, keep away from the propeller.
- Upon completion of work, carefully check to remove tools and unwanted objects from the airplane.

5.1.9.1 Ground Handling

5.1.9.1.1 Towing

The aircraft can be moved manually, this can be executed by pushing or pulling the wing struts. Also, the nose of the aircraft can be pushed, to turn the aircraft, lift the nose and spin it around the main wheels. Refer to Figure 5-2.

To tow the aircraft, one person is required:

1. Make sure the space near the aircraft is clear of obstacles and people.

2. Pull the nose of the aircraft up using the front wheel opening in the hull as a handle.
3. Push the aircraft in the needed direction.

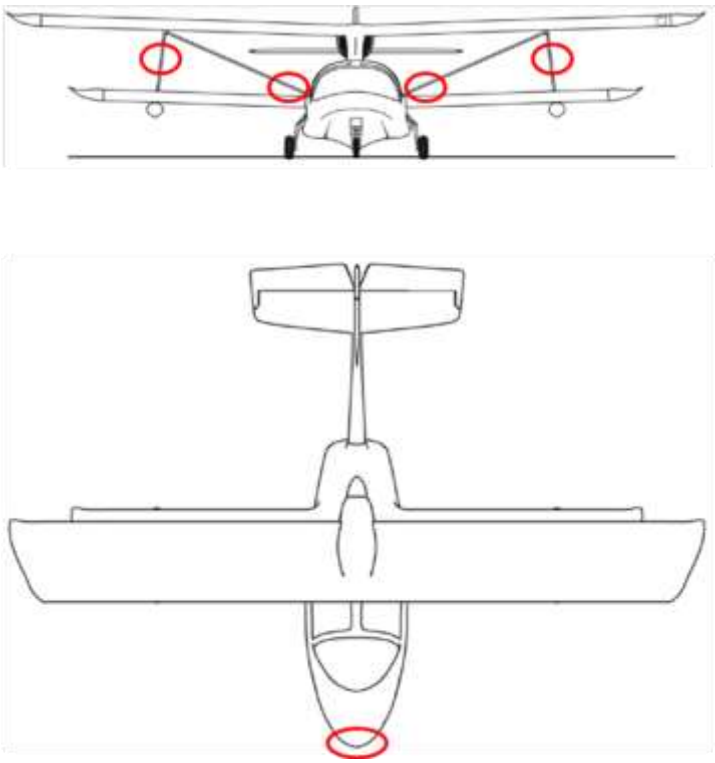


Figure 5-7

5.1.9.1.2 Jacking Up

This process is only used to change the wheels or to make the operational test of the landing gear system. One person is required to lift the nose of the aircraft and put a support under the keel located under the fuselage. Then put a jack under each point of the main gear as shown below.

CAUTION

Use protective foam among the support – keel and jack – fuselage

CAUTION

Lift the aircraft simultaneously with the jack placed in each point of the main gear, do not lift too high, just enough to let the wheels turn freely.

(a) Support under the keel

(b) Jack under the main gear

(c) Aircraft lifted

Figure 5-8

5.1.9.1.3 Parking

To accomplish this process it is good to know the local conditions. It is advisable to place chocks in each wheel of the main gear (as shown below) to avoid any displacement of the aircraft during the inspection. There is no need to place a chock in the nose wheel.

Figure 5-9

5.1.9.1.4 Tie-Down Instructions

To tie the aircraft down, one person is required:

1. Make sure the plane is set on the wheel chocks.
2. Attach the tie down lines to the support of the wing struts and nose gear.
3. Attach the lines to the mooring arrangements on the ground. Make sure the lines are taught.

Figure 5-10

CAUTION

If the aircraft is left in the sunlight, do not use dark covers. Preferably, use a white light cover.

5.1.9.2 Cleaning and Care

The washing and cleaning of the aircraft can be made according to the criteria of the owner; it is not obligatory for each inspection. When washing and cleaning the aircraft the following steps are recommended:

5.1.9.2.1 Canopy External Part

CAUTION

Only recommended cleaning products should be used to clean the aircraft´s canopy.

1. Spray enough water on the surfaces.
2. Spread generously with a good quality neutral soap over the entire surface of the aircraft.
3. Pass the palm of your hand and fingers softly, spreading the soap forward and backward (lengthwise).

CAUTION

Do not make circular moves.

4. Remove insects and dirt which can eventually cause staining. Do it with your fingernail. **(Slightly).**
5. Wash and remove remaining dirt, repeating the process only on that spot.
6. Apply a specific product for Plexiglass cleaning and gently dry with a clean and new soft cloth.
7. If polishing is needed it must be done at the moment in order to complete the surface cleaning as following:

- Use specific product for Plexiglass polishing.
- Open it carefully in order to not spill dust into the recipient.
- Remove a thin layer of polish and throw it away.
- Use only a clean piece of cotton.
- Complete the polishing moving the piece of cotton forward and backward.

5.1.9.2.2 Canopy Internal Part

1. Sprinkle specific product for Plexiglass cleaning generously.
2. Clean softly with a clean and new piece of cotton.

5.1.9.2.3 Fuselage External Part (Wings / Tail)

1. Seal the Pitot tube, vents, etc., with masking tape.
2. Seal the possible water intakes in the aircraft with masking tape.
3. Use a good quality neutral soap.
4. Soap the surface with a clean and soft cloth.
5. Wash the surface generously.
6. Wipe clean all surfaces with a clean cloth.
7. If necessary polish the entire surface with a specific product for polishing.

WARNING

IN THE END OF WASHING REMOVE ALL SEALS FROM COVERED COMPONENTS.

5.1.9.2.4 Fuselage Internal Part

1. Clean the seats with a neutral soap with a clean and new cloth.
2. Hydrate the skin of the seats with liquid Vaseline if necessary.

5.1.10 Safety of Flight Report

Instructions for reporting possible safety of flight concerns found during inspection / maintenance

According to the latest edition of the ASTM F2295 – Continued Operational Safety Monitoring, owner / operator shall be responsible for notifying the manufacturer of any safety of flight issue or significant service difficulty upon discovery.

Please report any service difficulties or any other issue relating to flight safety directly to Scoda Aeronáutica Ltda using the FORM_SPLS_002_Continued Operational Safety Reporting Form on Scoda Aeronáutica´s website and sent via email to engineering@scodaero.com.br.

5.2 Inspections

This section is intended to serve as a guide for an Owner, LSA Repairman Maintenance (LSRM) and A&P to perform routine maintenance on the aircraft. It is the responsibility of the owner / operator to maintain the aircraft in an airworthy condition and ensure that all applicable Notice of Corrective Actions have been complied with. This inspection guide is not intended to replace the good judgment of an Owner, LSRM and A&P.

The guide will make reference to service information provided by other OEM (Original Equipment Manufacturer), such as the engine, propeller and avionics manufacturer. The latest editions of the OEM publications should be consulted prior to inspections / repairs; this guide will not make reference to revision levels of these publications.

NOTE
Inspection Form Checklist can be found in the Appendix Section of this Manual

Inspections Groups and Criteria

(1) VISUAL INSPECTION

Visual inspection will normally apply to those areas, surfaces, and/or items that become visible by the removal or opening of access doors, panels, fairings, or cowlings. Visual inspection criteria will normally consist of, but are not limited to the following criteria:

(A) Moving Parts

Proper operation, correct alignment, security, sealing, cleanliness, lubrication, adjustment, tension, travel, condition, binding, excessive wear, cracking, corrosion, deformation, and any other apparent damage.

(B) Fabric Covered Parts

Security, condition, cleanliness, wear, cracking, obstruction of drainage or vent holes, deformation, heat deterioration, fluid saturation, and any other apparent damage.

(C) Metal Parts

Security, condition, cleanliness, wear, cracking, obstruction of drainage or vent holes, deformation, heat deterioration, fluid saturation, and any other apparent damage.

(D) Fuel and Hydraulic Oil Lines and Hoses

Cracks, dents, kinks, loss of flexibility, deterioration, obstruction, chaffing, improper bend radius, cleanliness, security, and any other apparent damage.

(E) Electrical Wiring

Cleanliness, loose, corroded, or broken terminals; chaffed, broken, or worn insulation; security, heat deterioration, and any other apparent damage.

(F) Bolts and Nuts

Fretting, wear, damage, stretch, proper torque and safety wiring.

(G) Filters and Screens

Filters and screens shall be removed, cleaned, inspected for contamination, or replaced as applicable.

(H) Fuel Tank Areas

Evidence of leaks.

NOTE
Inspection forms in the Appendix Section may be used as a guidance to perform the visual inspection.

(2) OPERATIONAL INSPECTION

An operational inspection is a check intended to determine that a component or system is fulfilling its intended purpose. The operational inspection does not require quantitative tolerances.

(3) FUNCTIONAL INSPECTION

When called for by an inspection task, a functional inspection is a quantitative check to determine if one or more functions of a component perform within specified limits. The functional inspection is a comparative examination of a component or system against a specific standard.

5.2.1 Condition Inspection Checklist

According to the latest revision of the ASTM F2483 standard, all LSA category airplanes must undergo a complete inspection at least once every 12 calendar months. An authorized maintenance person, as described in the latest revision of ASTM F2483 standard, must perform this inspection. A signed and dated record must be maintained as each inspection task is completed. When the last task of the inspection has been completed, the Inspection Report is to be signed off in the logbook / maintenance record. The inspection items to be covered in the condition inspection are identical to the 100-hour Inspection items. The inspection interval to the next condition inspection may not exceed twelve calendar months.

5.2.2 Periodic Inspection Tasks

If the aircraft is operated commercially (for hire), it must also have an inspection every 100 flight hours. The 100-hour interval between inspections should never be exceeded by more than 10 hours, and then only if additional time is required to reach a place where the inspection can be satisfactorily accomplished. Additionally, the time or interval that was exceeded must be included as flight hours in the next 100-hour interval. Inspection tolerances cannot be accumulated.

NOTE

Scoda Aeronáutica Ltda considers the inspections described in the following chapters as mandatory / obligatory to ensure the safe operation of the Super Petrel LS. Therefore, strictly follow the instructions as hereunder.

5.2.3 Level of Certification

Owner	Items that can be expected to be completed by a responsible owner who holds a pilot certificate (at least a sport pilot certificate) but who has not received any specific authorized training.
LSA Repairman Maintenance (LSRM)	Items that can be expected to be completed on a SLSA by a responsible individual who holds a FAA repairman certificate (light sport aircraft), with a maintenance rating or equivalent.
A&P	Items that can be expected to be completed by a responsible individual who holds a mechanic certificate with airframe or powerplant ratings, or both, or equivalent.
Task Specific	Items that can be expected to be completed by a responsible individual who holds either a mechanic certificate or a repairman certificate and has received task specific training to perform the task.

5.2.4 Inspections Schedule

The interval periods for the inspections noted in this schedule are based on normal usage under average environmental conditions. Airplanes operated in humid tropics, cold damp climates, etc. may need more frequent inspections for wear, corrosion, lubrication, and / or lack of maintenance. Under these adverse conditions, perform periodic inspections in compliance with this guide at more frequent intervals may be necessary.

The recommended periods do not constitute a guarantee that the item will reach the period without malfunction, as in-service factors cannot be controlled by the manufacturer. Any item on the aircraft should be repaired, overhauled, or replaced when inspection or performances of these items reveal a potentially unserviceable or unsafe condition.

NOTE

SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed in the inspections. Please refer to the last revision of the Advisory Circular 43.13 – 1B Aircraft Inspection, repair and Alterations Acceptable Methods, Techniques, and Practices.

5.2.4.1 Daily Inspection

The daily inspection should be performed before every flight day of the aircraft. This inspection is of vital importance for your safety and aircraft´s integrity. The scope of this inspection is specified in Section 4.1 of the Pilot's Operating Handbook for Super Petrel LS. Special attention must be devoted to the parts, which are affected by the high vibrations and high temperatures from the powerplant.

Level of Certification: OWNER

5.2.4.2 First 25 Hours Inspection

Detailed inspection accomplished after the first 25 hours of flight. This inspection should never be exceeded by more than 5 hours. The purpose of this inspection is to look for any wear, corrosion, or damage that would cause the aircraft to not be in a condition for safe operation. The scope of this inspection is specified in the Appendix Section of this Manual **(100 hours / Annual Inspection Form).**

Level of Certification: LSA Repairman Maintenance or A&P, with iRMT Training (at least Service ROTAX® Aircraft Engines Rating) and Super Petrel LS Line Maintenance Rating.

5.2.4.3 Every 100 Hours / Annual Inspection

Detailed inspection accomplished every 100 hours of flight or at least once every 12 calendar months. This inspection should never be exceeded by more than 10 hours. The purpose of this inspection is to look for any wear, corrosion, or damage that would cause the aircraft to not be in a condition for safe operation. The scope of this inspection is specified in the Appendix Section of this Manual **(100 hours / Annual Inspection Form)**.

Level of Certification: LSA Repairman Maintenance or A&P, with iRMT Training (at least Service ROTAX® Aircraft Engines Rating) and Super Petrel LS Line Maintenance Rating.

5.2.4.4 Every 1000 Hours / Five (5) Years Inspection

Detailed inspection accomplished every 1000 hours of flight or five (5) years. This inspection must be made by the Aircraft Manufacturer or a Mechanic / Repairman, which has received a **Heavy Maintenance Super Petrel Training** to perform this inspection**.**

Level of Certification: LSA Repairman Maintenance or A&P, with iRMT Training (at least Maintenance ROTAX® Aircraft Engines Rating) and Super Petrel LS Heavy Maintenance Rating.

5.2.4.5 Every 2000 Hours / Ten (10) Years Inspection

Detailed inspection accomplished every 2000 hours of flight or ten (10) years. This inspection must be made by the Aircraft Manufacturer or a Mechanic / Repairman, which has received a **Heavy Maintenance Super Petrel Training** to perform this inspection**.**

Level of Certification: LSA Repairman Maintenance or A&P, with iRMT Training (at least Maintenance ROTAX® Aircraft Engines Rating) and Super Petrel LS Heavy Maintenance Rating.

5.3 Structures

5.3.1 Fuselage

5.3.1.1 Description

The fuselage is composed by two parts: main fuselage and empennage.

The main fuselage is molded in carbon and Kevlar® reinforced by fiberglass/PVC foam bulkheads. The tail boom is molded in carbon fiber and has internal PVC foam reinforcements. The integrated vertical stabilizer is made of composite shell and two carbon fiber spars. The detachable horizontal stabilizer is made of composite shell, two carbon fiber spars and PVC foam ribs.

5.3.1.2 Fuselage Inspection

Required Tools:	Allen Wrench 6 mm (1 pc)
	Flashlight
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

In this section, the fuselage will be completely inspected. Check before every flight the correct assembling. Do not take off if you suspect any kind of abnormal behavior.

To avoid any future problems, the instructions listed below should be accurately followed to ensure that all parts of the fuselage are within condition. These should be carried out after 25 flight hours, 100 flight hours or annually.

All the inspections must be made visually, it is not necessary to disassemble to check the general condition of the components.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment, before starting the inspection.

5.3.1.2.1 Covering

The fuselage covering consists of the surface of one big assembly, but here it is divided into two parts, namely as the Upper Fuselage Assembly and the Hull Assembly. No disassembling is necessary.

5.3.1.2.2 Deterioration

Inspect the whole covering for deterioration. If it occurs, the high temperature area around the engine is most likely to show the first signs of deterioration, it will probably occur as deformation “waves” in the engine cowling. If this is the case, contact Scoda Aeronáutica Ltda.

5.3.1.2.3 Cracks

Cracks can be occasioned by excessive or heavy impacts. Therefore, all cracks in the fuselage covering will appear as cracks in the paint.

Thus, start inspecting carefully for cracks on the whole covering of the fuselage and make sure to not forget any area. Pay special attention to edges, sharp corners, connection points and other critical areas where loads are higher and cracks are more likely to occur. If you find any cracks out, carefully inspect if it is only the paint that is damaged or also the structure. If you find any cracks out in the fuselage contact Scoda Aeronáutica Ltda.

Figure 5-11

5.3.1.2.4 Impacts or Damages

There is only a slight chance that delamination will occur. Generally, delamination is caused by significant impacts. Use a flashlight if necessary.

1. Impacts or Damages: on the fuselage outside and inside part (connection between Hull and Upper Fuselage) should be inspect for impacts and general damage, as this may be an indication for possible leakages.

2. Canopy: Inspect for any looseness at the bonding of the canopy´s structure to the fuselage.

3. Windshield and Doors: inspect for any looseness at the bonding. Detachment can occur due to frequent washing, weather influence and alternate loads on the windshield.

Figure 5-12

5.3.1.2.5 Canopy Inspection

1. General Condition: check for cracks, scratches or considerable damages.
2. Doors Hinges: check the correct position of the pins and general condition of the circular pins.
3. Windows Vents: check for correct operation. Opening and closing them.

Figure 5-13

4. Doors Lock: check the correct operation (move the locking mechanism) inside and outside the fuselage. Check using one (1) Allen wrench 6 mm if the bolt has lessened in the external mechanism.

Figure 5-14

5.3.1.2.6 Seats Inspection

1. Upholstery: Check for general condition.
2. Pins: Check for general condition. Replace if necessary.

5.3.1.2.7 Safety Belts Inspection

1. General Condition: Check the lap belt for cuts, fraying, extreme or unusual wear. Check the buckle for corrosion.
2. Attachment and Security: Check the safety belts for proper operation. Insert the latch and listening for an audible click.

5.3.1.2.8 Fire Extinguisher Inspection

NOTE

Fire extinguisher should be inspected according to the manufacturer maintenance instructions.

5.3.1.2.9 Doors Removal

CAUTION

When operating the aircraft without doors, loose objects in the cabin or baggage compartment can fly towards the propeller and cause damage.

1. Remove the circular pin located at the two door hinges and then remove the pins.
2. Remove the door.

Figure 5-15

5.3.1.2.10 Ballast Draining

The ballast tank is located inside the fuselage front part. To accomplish this process the following steps must be completed:

1. Open the drain valve located below the passenger seat.
2. The water will begin entering into the hull; therefore, the bilge pump is activated automatically to drain the water.

NOTE

The bilge pump can be activated manually as well.

3. After completing the draining process, activate the bilge pump manually for any remaining presence of water in the hull.

5.3.1.3 Fuselage Repair and Alteration

Repairs or alterations on the fuselage, windshield, windows and doors are not authorized at this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br

5.3.2 Wings

5.3.2.1 Description

The upper wings structure consists of a C channel carbon front spar and PVC foam ribs. The ribs, which carry loads (root rib, and ribs where the struts are attached), are reinforced. A C channel composite rear spar supports the aileron and the rest of the wing has a thin rear spar, which connects the ribs at the trailing edge. The leading edge, made of fiberglass composite, forms a “D” box when bonded to the front spar. The covering consists of fabric.

The lower wings structure, as the upper wings, consists of a C channel carbon front spar, a thin trailing edge and foam ribs. The leading edge is also made in fiberglass composite and forms a “D” box when bonded to the front spar. The principal difference between upper and lower wings is that the leading edge of lower wings shelters the integrated wing fuel tanks. The covering also consists of fabric.

The struts are made of aluminum profile and the wings are attached to the fuselage by means of fasteners located on the root ribs. The floaters are attached to lower wings.

5.3.2.2 Wings Inspection

Required Tools:	Combined Wrench 13 mm (2 pcs)
	Combined Wrench 10 mm (2 pcs)
	Combined Wrench 8 mm (2 pcs)
	Allen Wrench 6 mm (1 pcs)
	Socket Wrench 10 mm (1 pcs)
	Ladder Support
	Flashlight
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

In this section, the wings and struts will be completely inspected. Check before every flight the correct assembling of each wing and strut and the correct functionality of the aileron system as described in the pre-flight checklist. Do not take off if you suspect any kind of abnormal behavior.

To avoid any future problems, the instructions listed below should be accurately followed to ensure that all parts of the wings and struts are in within condition. These should be carried out after 25 flight hours, 100 flight hours or annually.

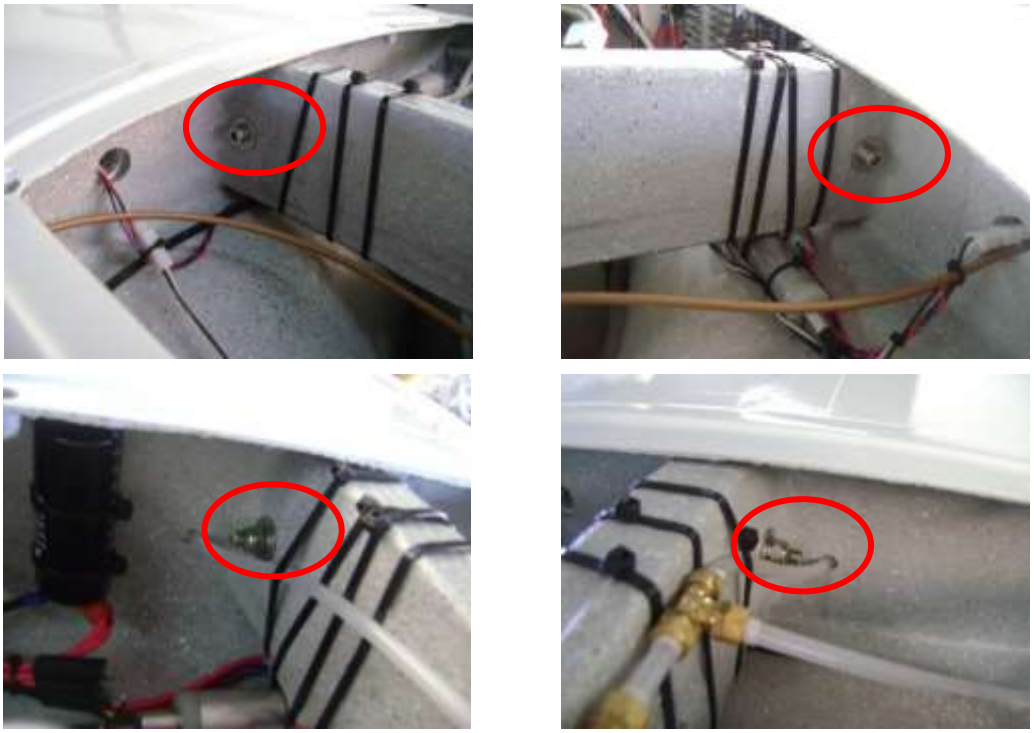
All the inspections must be visually made. It is not necessary to disassemble the wings surface or components, just check the attachment condition.

NOTE
Remove or open all cowlings, inspection windows**,** access doors and baggage compartment, before starting the inspection.

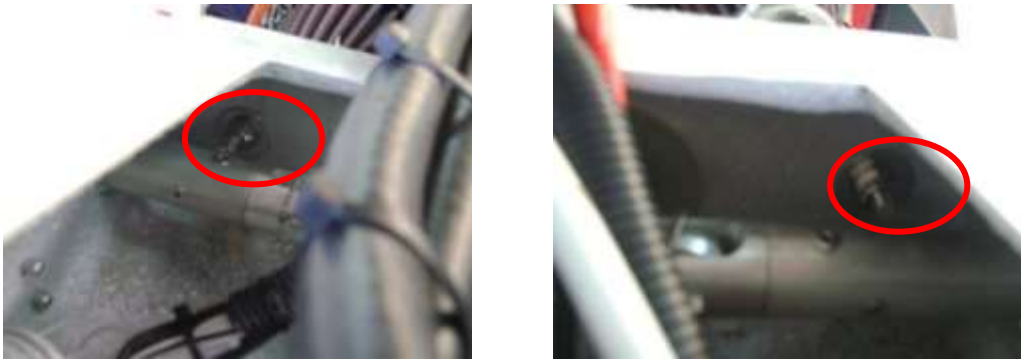
5.3.2.2.1 Upper Wings Inspection

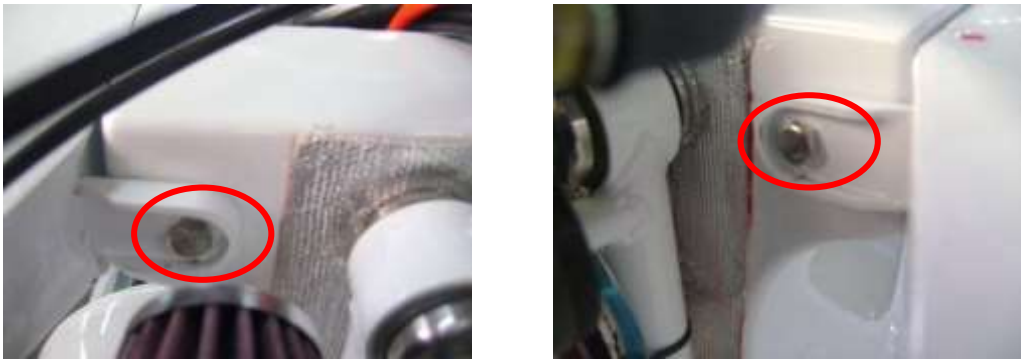
1. Wings Attachment: check the wings attachment with the fuselage.

- Torque the rear fixation bolt using two (2) combined wrenches 13 mm. **Tightening torque: 130 lb.in (15 N.m).**
- Torque the front fixation bolt using one (1) combined wrench 13 mm and one (1) Allen wrench 6 mm. **Tightening torque: 130 lb.in (15 N.m).**
- Check for looseness. Move the wings tips upward-downward, frontward-backward.



(a) Wing Front Part bolts and nuts





(b) Wing Rear Part Bolts and nuts

Figure 5-16

2. General Condition: Use a flashlight if necessary.

- Check visually the wings surface, leading and trailing edge for general condition (paint, damages, cracks, dents, etc.).
- Check visually the coating (fabric condition).

3. Ailerons: Use a flashlight if necessary.

- Check visually the ailerons for general condition (paint, cracks and dent).
- Check visually the ventilation holes of the ailerons for obstruction.

4. Winglets: use a flashlight if necessary.

- Check visually the winglet condition (paint, cracks and dent).

5.3.2.2.2 Lower Wings Inspection

1. Wings Attachment: check the wings attachment with fuselage (lower wing root).

- Check if the circular pin in the front attachment is in the correct position and good condition.
- Torque the rear fixation bolt using one (1) combined wrench 13 mm and one (1) Allen wrench 6 mm. **Tightening torque: 130 lb.in (15 N.m).**
- Check for looseness. Move the wings tips upward-downward, frontward-backward.

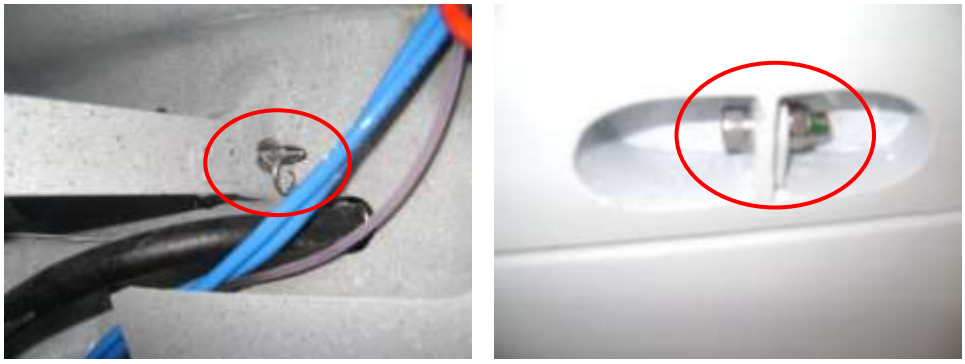


Figure 5-17

2. General Condition: use a flashlight if necessary.

- Check visually the wings general condition (damages, denting, etc).
- Check the coating (fabric condition).

3. Fuel Tanks: use a flashlight if necessary.

- Check visually the fuel tanks condition (cracks, leakage) located in leading edge of the lower wings.
- Check the correct operation of the fuel caps and their general condition (O-ring).
- Check the closing pressure and if necessary adjust the nut using one (1) socket wrench 10 mm.
- Check the header tank for leakage, connections and general condition (Header Tank is located inside the fuselage, behind the passenger´s seat).

(a) Fuel Tank

(b) Fuel Cap

Figure 5-18

4. Fuel Tanks Vent: check for obstructions.

- Check visually the vent hoses located inside of the inner struts, inside and outside of the upper part of the fuselage.
- With the help of two people, check the correct airflow through the hoses. One person blowing through the hoses located outside of the upper part of the fuselage and the other person listening to the airflow through the filler tank.

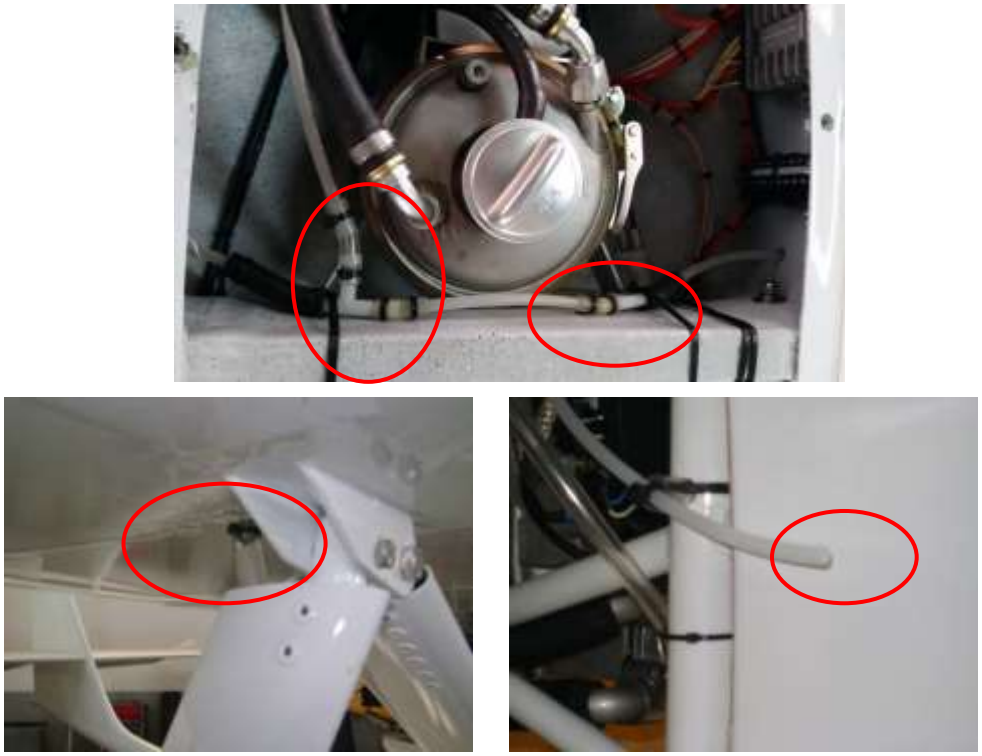


Figure 5-19

5. Winglets: use a flashlight if necessary.

- Check visually the winglet´s condition (attachment, cracks and dent).

6. Floaters: use a flashlight if necessary.

- Check the attachment using two (2) combined wrenches 10 mm in the floater´s front and rear sides.
- Check visually for general condition (cracks, dent).

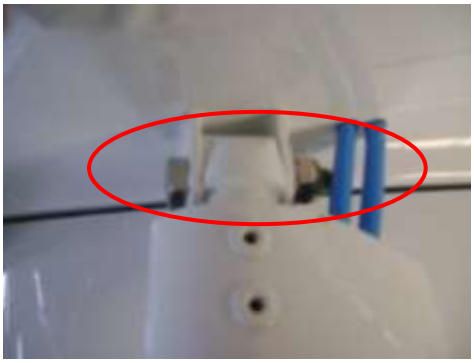
7. Landing Gear Leg Housing: use a flashlight if necessary.

- Check visually the landing gear leg housing for general condition.

5.3.2.2.3 Struts Inspection

1. Struts Attachment: check the attachment of the struts.

- Check the main strut attachment with the upper wing and fuselage using two (2) combined wrenches 13 mm.
- Check the attachment of the inner strut (N-Strut) with the upper and lower wing using two (2) combined wrenches 10 mm.
- Check the attachment of the jury strut with the upper wing and main strut using two (2) combined wrenches 8 mm.



a) Main strut attachment with fuselage

b) Main strut attachment with upper wing

c) Inner strut attachment with upper wing

d) Inner strut attachment with lower wing

e) Jury strut

Figure 5-20

2. General Condition:
    - Check visually the strut, inner strut (N-Strut) and jury strut for corrosion and looseness.
3. Pitot Tube:
    - Check the attachment of the Pitot tube located on the left inner strut wing.
    - Check the general condition and correct operation.

5.3.2.3 Wings Repair and Alteration

Repairs or alterations in the internal wings structure (ribs, stringers) and wings surface (impacts, denting) are not authorized at this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.3.3 Empennage

5.3.3.1 Description

The tail boom (fin), horizontal stabilizers (left and right), elevators (left and right), rudder and their components compose the empennage. The gluing of the tail boom with the fuselage is made with mixture of resin epoxy with cotton flocks, resulting in only one set.

- **Horizontal Stabilizer:** The structure of the horizontal stabilizer consists of a circular carbon front spar, a “C” channel carbon rear spar and reinforced foam ribs. The skin consists of a composite shell. These parts are all integrally assembled as the right and left horizontal stabilizers.

- **Vertical Stabilizer**: The structure of the vertical stabilizer consists of reinforced foam ribs, fiberglass/PVC foam bulkheads and its skin consists of a composite shell. These parts are all integrally assembled as the vertical stabilizer.

5.3.3.2 Empennage Inspection

Required Tools:	Ladder support
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

In this section, the empennage will be completely inspected. Check before every flight the correct assembling. Do not take off if you suspect any kind of abnormal behavior.

To avoid any future problems, the instructions listed below should be accurately followed to ensure that all parts of the empennage are in within condition. These should be carried out after 25 flight hours, 100 flight hours or annually.

All the inspections must be visually made. It is not necessary to disassemble, just check the general condition of the components.

The inspection of the empennage control surfaces (rudder, elevators and trim tab) are describe in the Structural Control Surfaces of this manual.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

- General Condition: Check visually the tail boom, horizontal stabilizer leading edges for general condition. Inspect visually cracks, impacts, denting or some considerable damages on the surface.

Figure 5-21

- Attachment: Check the condition of the horizontal stabilizer attachment with the vertical stabilizer. Move the tips upward-downward and frontward-rearward. It cannot have looseness.

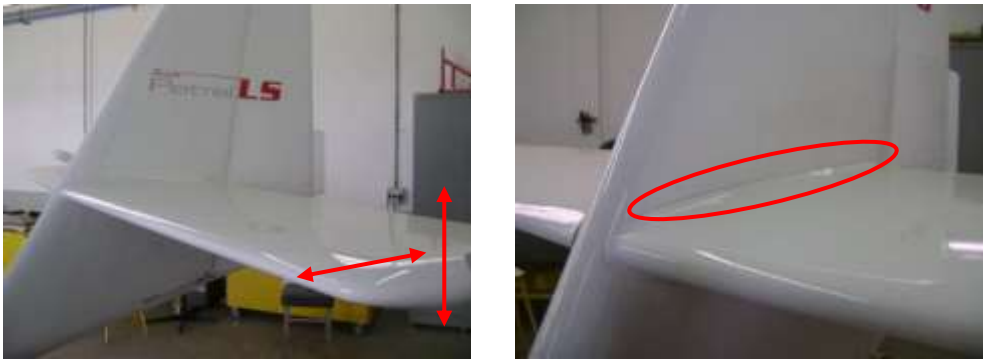


Figure 5-22

- Empennage Fixation Bolts ***(it should be performed every 200 hours)***:

  - Remove rudder.
  - Remove the safety wire.
  - Torque the empennage bolts using one (1) Allen wrench 6 mm. **Tightening torque: 70 lb.in (8 N.m)**
  - Reinstall the safety wire.
  - Reinstall rudder.

Figure 5-23

5.3.3.3 Empennage Repair and Alterations

Repairs or alterations in the internal empennage structure and empennage surface are not authorized at this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.3.4 Landing Gear

The Super Petrel LS is equipped with a retractable tricycle landing gear with mechanical actuation. The nose gear is free swivel and the main landing gear legs are manufactured in fiberglass composite and equipped with oil pneumatic shock absorbers and aluminum wheels.

Main wheels are fitted with disk brakes, hydraulic operated and controlled by pedals.

	USABLE TIRES
MAIN LANDING GEAR	11x4.00-5 – 8 Ply
NOSE LANDING GEAR	10x3.00-4 – 4 Ply

5.3.4.1 Landing Gear Inspection

Required Tools:	Slotted Screwdriver
	Phillips Screwdriver
	Cutter Pliers
	Combined Wrench 13 mm (1 pcs)
	Allen Wrench 6 mm (1 pcs)
	Parallel Pin Punch 8 mm (1 pcs)
	Steel Hammer
	Nylon Head Hammer
	Combined Wrench 15/16 ‘’ (1 pcs)
Parts and Materials Required:	Refer to Illustrated Parts Catalog
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

In this paragraph the landing gear system will be completely inspected. Check before every flight the correct functionality of the landing gear system, as described in the pre-flight checklist. Do not take off if you suspect any kind of abnormal behavior of the landing gear system.

To avoid any future problems, the instructions listed below should be accurately followed to ensure that all parts of the landing gear system are and remain in within condition. These should be carried out after 25 flight hours, 50 flight hours, 100 flight hours or annually.

Because the landing gear system contains many parts, for sake of clarity, the inspection of the complete landing gear system is divided into 5 different subassemblies:

- Nose Gear
- Main Gear
- Landing Gear Retraction System
- Wheels and Brake System
- Shock Absorber

Most of the inspections must be made visually; it is not necessary to disassemble, just check the general condition of some components. Some components must be replaced in the 100 hours inspection or just if necessary as explained below.

NOTE
Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

NOTE
Lift the aircraft if necessary. See **5.1.9.1 Ground Handling** for instructions.

5.3.4.1.1 Nose Gear

1. General Condition: lift the nose of the aircraft up and use a flashlight.

Figure 5-24

- Check the condition of the bolts and attachment.
- Check the condition and attachment of the rubbers.
- Check the springs for attachment, wear and looseness.
- Check the nose gear for looseness, bending, cracks and wear.
- Check the condition of the wheel (cracks, corrosion, free rotation).
- Check the bearings condition, free rotation of the wheel and looseness. Replace them at 100 hours inspection.

Figure 5-25

2. Nose Gear Doors: put the nose of the aircraft up and use the flashlight.

- Check for attachment, condition of the hinges and springs, correct operation and general condition.


a) Inner and outer parts of the nose gear door.

b) Springs inside the nose gear doors.

Figure 5-26

5.3.4.1.2 Main Gear

1. <u>General Condition:</u> lift the aircraft if necessary and use a flashlight.

- Check the condition of the bolts (loose and damaged).
- Check for cracks, excessive looseness, attachment and general condition of the main gear legs. Check the rubber foam for general condition and detachment.
- Check the condition of the wheel (cracks, corrosion, and free rotation).
- Check the bearings condition, free rotation of the wheel and looseness. Replace them at 100 hours inspection.

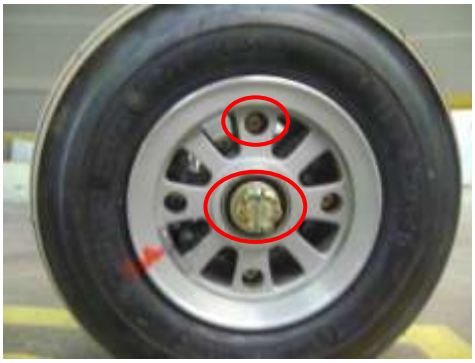



Figure 5-27

5.3.4.1.3 Landing Gear Retraction System

CAUTION

Lift the aircraft to carry out this inspection.

1. Main Gear: use a flashlight if necessary.

- Remove the bottom and the back of the seats.
- Remove the baggage compartment floor with a Phillips screwdriver.

Figure 5-28. Baggage Compartment

- Gas spring: Check for wear, looseness, leakage, attachment and correct operation. If landing gear retraction system is heavy to operate, a gas spring test should be performed **(See Section 6.2.3.10.1 Gas Spring Test).**

Figure 5-29

NOTE

Gas spring should be replaced on condition, however, it is recommended to replace it in the 1000 hours / 5 years Inspection **(See Section 6.2.3.10.2 Gas Spring Replacement).**

- Check the tension cable of the main landing gear and the safety wires condition of the turnbuckles**.**

NOTE

Landing Gear Cables should be replaced on condition, however, it is recommended to replace it in the 1000 hours / 5 years Inspection **(See Section 6.2.3.8 for Landing Gear Cable Inspection and Replacement)**.

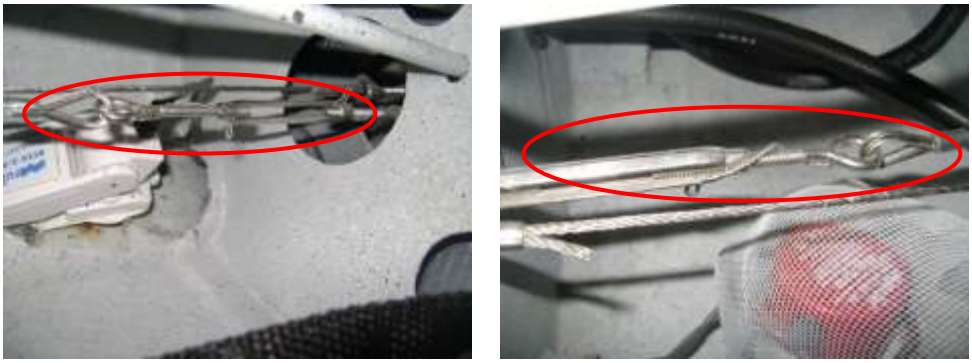


Figure 5-30. Main Gear Cables

- Lift the aircraft up for accomplishing this process. Check the landing gear actuation, retract and lower several times verifying the correct operation.

Figure 5-31

- The rubber band should be checked. Retract the landing gear and place the rubber band onto the lever. The rubber band should be partially tensioned. If the rubber band loses its elastic property, it should be replaced.

  Specification: Bungee Cord, diameter 3/16 (5 mm), size 16 inches (0.4 m)

Figure 5-32

- Check the correct operation of the landing gear sensor. Lower and retract it, verify in the instrument panel the position.
- Check electrical terminals (connectors) for corrosion and general condition. Replace them if necessary.

Figure 5-33

- Rear pulley, lubricate the rear pulley pin with liquid grease, back and front of the bulkhead of the fuselage (**See 6.2.2.2 Lubrication Table**).

Figure 5-34

2. Nose Gear: use a flashlight if necessary.

- Open the inspection window located in the fuselage nose. Check the tension cables and the pulley of the nose gear.

Figure 5-35. Nose Gear Pulley

- Check the attachment of the safety wire located in the back of the nose gear box.

5.3.4.1.4 Tires and Brake System

1. Tires Condition: replace them if necessary.

- Check for cuts, excessive wear and/or uneven and slippage on the wheels.

2. Tire Pressure: consult the POH (Pilot Operating Handbook).

- Calibrate with recommended pressure.

a) Main Tire **b)** Nose Tire

Figure 5-36

3. Brake System Hoses: use the flashlight if necessary.

- Open the inspection window located on the fuselage nose.
- Check the connection of the hoses located on the pedals, check for leakage and general condition.

Figure 5-37

- Check the connection of the hoses located in the main gear legs, check for leakage and general condition.

Figure 5-38

4. Hydraulic Fluid: use the flashlight if necessary

- Open the inspection window located on the fuselage nose.
- Check the attachment of the hydraulic fluid reservoir.
- Change the hydraulic fluid (**See 6.2.3.4 Filling Brake System**). – ***It should be changed every 5 years***

Figure 5-39

5. Brake Pads:

- Check the condition of brake pads, equal pad wearing.
- Replace the brake pads if necessary **(See 6.2.3.5 Brake Pads Replacement)**.

6. Brake Discs:

- Check the brake discs for cracks, deformation and attachment.
- Replace the brake discs if necessary **(See 6.2.3.6 Brake Discs Replacement).**

5.3.4.1.5 Shock Absorber

1. General Condition:

- Check the shock absorber for corrosion, wear and leakage.
- Clean the shock absorber.
- Calibration and replacement procedures can be found in the **Section 6.2.3.9 Shock Absorber Calibration and Replacement**.

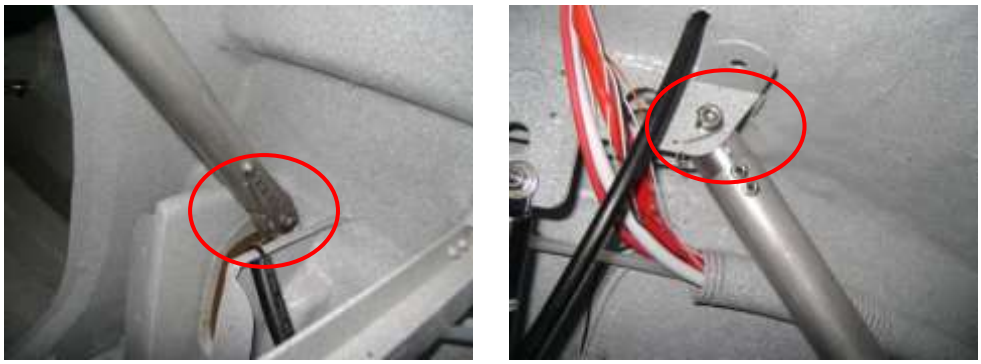
NOTE
Shock absorber should be replaced on condition.

Figure 5-40

2. Attachment: use the flashlight if necessary

- Check the shock absorber attachment with the main gear leg and inside fuselage.

a) Attachment with the main gear leg



b) Attachment inside the fuselage

Figure 5-41

5.3.4.2 Landing Gear Repair and Alterations

Repairs or alterations in landing gear structure (composite parts) are not authorized in this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.3.5 Structural Control Surfaces

The controls are the most sensitive and important parts of the aircraft and their conditions must be checked before every flight.

WARNING

NEVER TAKE-OFF IF THERE IS ANY ABNORMAL LOOSENESS IN THE SYSTEM, IT MIGHT LEAD TO A VERY DANGEROUS ANOMALY.

5.3.5.1 Control Surfaces Inspection

Required Tools:	Flashlight.
	Ladder Support
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

The ailerons, elevators, rudder and their hinges will be inspected in this paragraph. Check before every flight the correct functionality of the control surfaces, as described in the pre-flight checklist. Do not take off if you suspect any kind of abnormal behavior of the control surfaces.

To avoid any future problems, the instructions listed below should be accurately followed to ensure that all parts of the structural control surfaces are and remain in within condition. These should be carried out after 25 flight hours, 100 flight hours and annually.

All the inspections must be visually made. It is not necessary to disassemble; just check the attachment condition and movement of the control surfaces.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

5.3.5.1.1 Ailerons

The construction of the aileron is very simple. It is a carbon front spar, foam ribs, a fiberglass trailing edge and foam/carbon-Kevlar sandwich covering. The covering is also totally constructed of derakane.

1. General Condition: use a flashlight and a ladder support if necessary.
    - Check the surface condition (damages and paint damages) and trailing edge.
    - Check the attachment of the aileron trim tab.

Figure 5-42

2. Drain Holes: use a the flashlight if necessary.

- Check the drain holes of each aileron for obstruction. Lower the aileron and check the holes located in each aileron extremity.

Figure 5-43

3. Operation: use a flashlight and a Ladder Support if necessary.

- Check for free operation (condition of hinges and looseness). Move the aileron up and down, check for full free movement and sufficient space between the wing and the aileron.
- Check the correct operation of the aileron tie rod. Check the support, bolt and nut.

Figure 5-44

- Check the aileron bell-crank located inside of the upper part of fuselage. Move the aileron up and down, check attachment of the bell-crank and free movement.
- Check the Teleflex cable for wearing, looseness and correct operation.

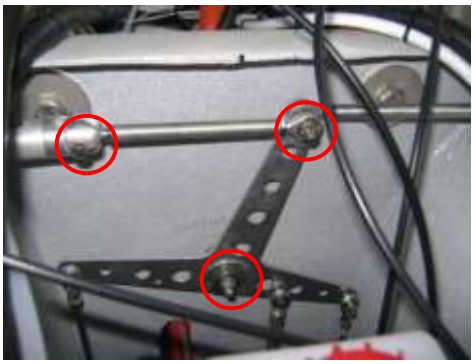


Figure 5-45

NOTE
Teleflex cable should be replaced on condition, however, it is recommended to replace it in the 2000 hours /10 years Inspection.

5.3.5.1.2 Rudder

The construction of the rudder is a carbon front spar, foam ribs, and a fiberglass trailing edge. It is covered with Dacron fabric.

1. <u>General Condition:</u> use a flashlight and a ladder support.

- Check the general condition of the rudder surface (damages and rips in the fabric).
- Check the trim tab attachment.

Figure 5-46

2. Drain Hole: use flashlight if necessary.

- Check the drain hole of the rudder for obstruction located on the bottom.

Figure 5-47

3. Operation: use a flashlight and a ladder support if necessary.

- Check for free operation and looseness. Move the rudder to the left and right and check for full free movement and sufficient space between the vertical stabilizer, elevator and rudder.
- Check the rudder control cables, attachment bolts and correct operation.

Figure 5-48

- Check the attachment of the rudder castle nut and the cotter pin condition.

Figure 5-49

5.3.5.1.3 Elevators and Trim Tab

As the ailerons, the construction of the elevators is also very simple. It is a carbon front spar, foam ribs, a fiberglass trailing edge and foam/carbon-Kevlar sandwich covering.

1. General Condition: use a flashlight and a ladder support if necessary.
    - Check the surface condition (damages and paint damages) and trailing edge of the elevator.
    - Check the elevator attachment (nuts, bolts, bell-crank attachment and safety wires). Check the elevator control rods.
    - Check the surface condition of the trim tab and check the trailing edge.

Figure 5-50

2. Drain Hole: use a flashlight if necessary.
    - Check each elevator´s drain hole for obstruction. Lower the elevator and check the hole located in each elevator´s inner part.

Figure 5-51

3. Operation: use a flashlight and a ladder support if necessary.
    - Check free operation and looseness. Move the elevator up and down and check for full free movement and sufficient space between the horizontal stabilizer and the elevator.

Figure 5-52

- Check the attachment of the elevator trim tab (hinges, pins, and rod). Turn on the battery master switch and check the correct operation on the instrument panel and trim tab.

Figure 5-53

5.3.5.1.4 Joysticks and Pedals

1. Check the joysticks for free operation. Remove foreign objects and contamination.
2. Check the pedals for movement strength, joints safety, general condition and cables attachment.

5.3.5.2 Control Surfaces Repair and Alterations

Repairs or alterations in the internal control surfaces structure are not authorized in this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.4 Engine

5.4.1 Description

Description	912 ULS	914 UL	912 iS Sport
4 strokes, 4 cylinder horizontally opposed, spark ignition engine, one central camshaft – push-rods – OHV	✓	✓	✓
Liquid cooled cylinder heads	✓	✓	✓
Ram air cooled cylinders	✓	✓	✓
Dry sump forced lubrication	✓	✓	✓
Dual breakerless capacitor discharge ignition	✓	✓	X
2 constant depression carburetors	✓	✓	X
Mechanical fuel pump	✓	X	X
2 electric fuel pumps	X	✓	X
Electric starter	✓	✓	✓
Integrated AC generator with external rectifier-regulator	✓	✓	X
Incorporated reduction gearbox	✓	✓	X
Fully redundant electronic engine management (EMS) includes fuel injection, characteristic ignition, etc.	X	X	✓
Propeller drive via gearbox with integrated mechanical shock absorber and overload clutch	X	X	✓
Oil tank	X	X	✓
Fuel pump Assy	X	X	✓

Because of engine's complexity and importance to the flight safety, it is necessary the operator be conscious that a very rigorous inspection/maintenance program must be adhered to.

Consult the manufacturer's manuals, service bulletins and instruction books regarding the repair and overhaul, inspection, installation and maintenance of the engine.

For inspection and maintenance of the engine or its systems listed below, refer to the latest edition of Maintenance Manual (Line Maintenance) for ROTAX Engine Type 912i Series, 912 and 914 Series supplied by the manufacturer.

- Cooling System
- Fuel System
- Lubrication System
- Electric System
- Propeller Gearbox

CAUTION

ROTAX engines must receive any heavy maintenance at an authorized ROTAX service center.

5.4.2 Engine Inspection

Required Tools:	Socket Wrench 17 mm **(1 pcs)**
	Allen Wrench 6 mm (1 pcs)
	Slotted Screwdriver
	Phillips Screwdriver
	Flashlight
	Ladder Support
Parts and Materials Required:	Liquid Grease
	Refer to Illustrated Parts Catalogue
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

To avoid any future problems, the instructions listed below should be accurately followed to ensure that all parts of the engine and components are in within condition. These should be carried out after 25 flight hours, 100 flight hours or annually.

All the inspections must be visually made. It is not necessary to disassemble, just check the attachment condition.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

The following instructions are in order to inspect aircraft structural parts, which make up the powerplant system such as engine cowling, engine mount, exhaust and carburetor heater **(only for 912 ULS)**.

5.4.2.1 Engine Cowlings

1. Cowlings removing: use a ladder support if necessary.

- First remove the upper cowling with a slotted screwdriver
- Then remove the lower cowling with a Phillips screwdriver

2. Cowlings Inspection: use a flashlight if necessary. Remove the cowlings**.**

- Check the upper and lower cowlings for general condition (cracks, burns, damaged protections, rubbers and general condition of fasteners).
- Check the condition of asbestos, detachment and general condition in the lower cowling.
- Check the supports of oil and water cooler for looseness and general condition in the lower cowling.
- Check the rubbers of the upper and lower cowlings for general condition and detachment.
- Check the protection grille for attachment and general condition in the lower cowling.

Figure 5-54

5.4.2.2 Engine Suspension Frame

The inspection of the engine suspension frame is only performed in the first 25 hours inspection, as explained below:

1. Firewall Bolts (Engine Suspension Frame bolts with the Fuselage) ***(912 iS Sport and 912 ULS)***:

   - Torque the firewall bolts using one (1) socket wrench 17 mm and then using the torque wrench, check the torque. **Tightening torque: 350 lb.in (40 N.m).**

Figure 5-55

2. Firewall Bolts (Engine Suspension Frame bolts with the Fuselage) ***(914 UL)***:

   - Torque the firewall bolts using one (1) Allen wrench 6 mm and then using the torque wrench, check the torque. **Tightening torque: 180 lb.in (20 N.m).**

Figure 5-56

3. Engine Suspension Frame Bolts ***(912 iS Sport, 914UL and 912 ULS)***:

   - Torque the engine suspension frame bolts using one (1) socket wrench 17 mm and then using the torque wrench, check the torque. **Tightening torque: 350 lb.in (40 N.m).**

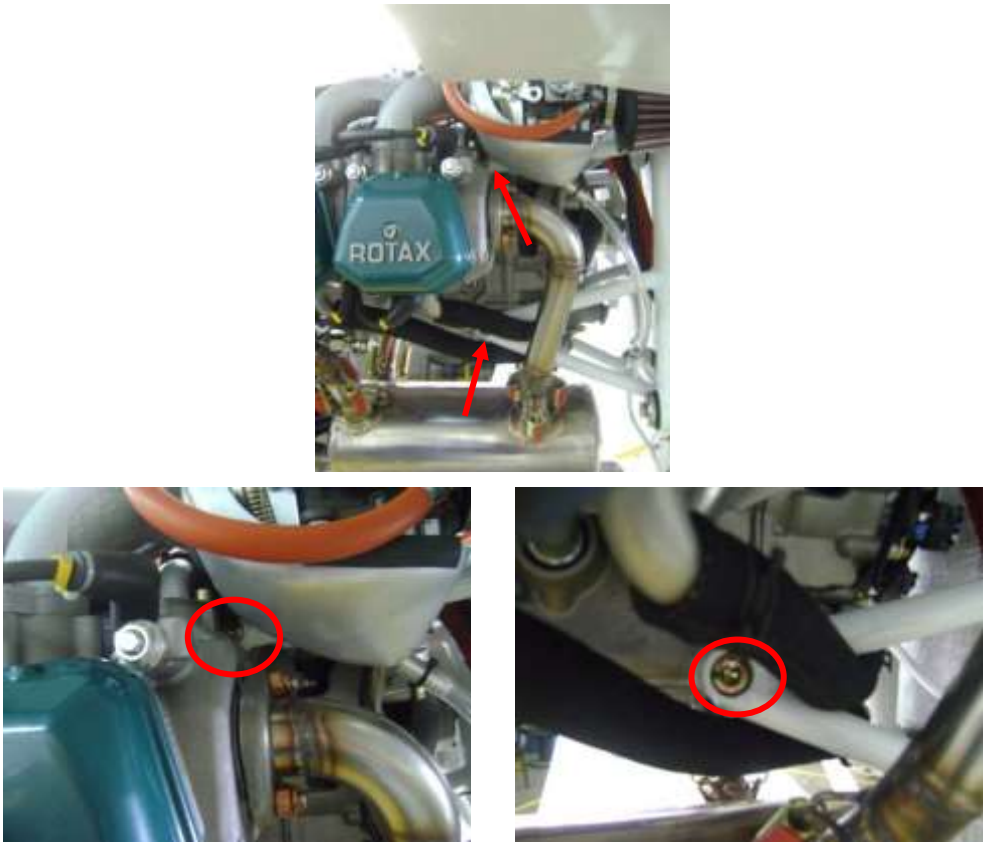


Figure 5-57

4. Engine Mounts:

- ***912 ULS / 912 iS Sport***

NOTE

Engine Mounts for Super Petrel LS equipped with Rotax Engines 912 Series should be replaced on condition, however, it is recommended to replace them every 500 hours.

- ***914 UL***

NOTE

Engine Mounts for Super Petrel LS equipped with Rotax Engines 914 Series should be replaced on condition, however, it is recommended to replace them every 300 hours.

5.4.2.3 Cooling System

The cooling system hose clamps should be re-tightened in the first 25 hours inspection and each 100 hours / annually inspection. Hoses should be inspected for leakage, cracks, kinks, and security of mounting. Ensure that hoses do not interfere with adjacent equipment or lines. Make sure that they are not kinked, and not in contact with hot, moving parts or sharp edges.

CAUTION

Clamps too tight may damage the hoses.

5.4.2.4 Exhaust System

1. General Condition: use a flashlight if necessary.
    - Check the general condition of the exhaust system (cracks, deformations, damages).
2. Exhaust System Pipes: use a flashlight if necessary.
    - Check the pipes of the exhaust system for attachment and general condition.
3. Muffler: use a flashlight if necessary.
    - Check the muffler for general condition (cracks, damages, and attachment). Repair with weld if necessary.
    - Remove the muffler every 200 hours for performing a detailed inspection **(See Section 6.2.3.13 Exhaust Muffler Inspection and Replacement).**
4. Tension Springs *(only for 912 iS Sport and 912 ULS):* remove the engine cowlings.
    - Check the condition and attachment of the tension springs.
    - Replace the tension springs **(See 6.2.3.12.1 Tension Springs Replacement).**

NOTE
Tension springs should be replaced every 50 hours during engine inspection.

Figure 5-58

5.4.2.5 Carburetor Heater (If Installed) – Only for 912 ULS

1. Check visually the general condition and attachment of the thermo straps located in the carburetors. Use a Ladder Support.

Figure 5-59

2. Make an operational check of the carburetor heater. First turn on the battery master switch and then turn on the carb heater switch. Check if the carb heater LED is on and check the correct operation (touch over the carburetor and verify if it is heating).

5.4.2.6 Engine Controls

NOTE
For throttle and choke cables setting please refer to Engine Manufacturer Maintenance Manuals

1. Throttle: Check for correct operation and free movement.
2. Choke: Check for correct operation and lock **(912 ULS and 914 UL)**

5.4.3 Engine Maintenance, Repair and Overhaul

Maintenance, Repair and Overhaul of the engine requires a Rotax training. Before performing any inspection or maintenance task on the engine, check manuals for available updates through Rotax website.

5.4.3.1 Spark Plugs Replacement

- As per Rotax recommendations, operation with leaded fuels (e.g. AV GAS 100LL) can result in increased wear of the spark plugs. Reduce renewal intervals accordingly.
- Aircraft manufacturer recommends to replacement the spark plugs each 100 hours inspection when using either MOGAS or AVGAS. This should be applied to the three engine types.
- Spark plugs replacement should be made according to the latest revision of the Rotax Line Maintenance Manual.

5.5 Fuel System

5.5.1 Description

The fuel system is fed by two wing tanks built of fiberglass inside the lower wings leading edges and a header tank located behind the passenger´s seat (right side of the aircraft).

These two wing tanks, each having a capacity of 10.3 US gallons – 39 liters (10 US gallons usable – 38 liters), are not interconnected but are connected to a fuel selector valve which has three positions (right wing, left wing or closed) which feeds the header tank with a capacity of 4.5 US gallons – 17 liters (4 US gallons usable – 15 liters).

The fuel system also contains a shut-off valve, which avoids the engine being fed by usable fuel during emergency procedures. The shut-off valve is located next to the header tank behind the passenger´s seat.

The fuel drain system contains an electric drain pump located inside the aircraft fuselage and a drain valve located below the right wing root of the aircraft outside part (**See 5.5.1.5 Draining Process**).

The full capacity of the system is 25 US gallons – 95 liters (24 US gallons usable – 91 liters).

The fuel quantity instrument, located on the instruments panel, will indicate the amount of fuel existent inside the selected wing tank, **IT WILL NOT INDICATE THE TOTAL AMOUNT OF FUEL EXISTENT IN THE WHOLE SYSTEM**. Therefore, in order to know the amount of fuel existent in the whole system, it is necessary to achieve the readings of both left and right wing position of the fuel valve, and then add the header tank amount.

NOTE
After wing tank selection, wait for 60 seconds until you can do a consistent reading.

In case of unbalanced load or passengers it is recommended that the fuel valve is set to the heavier tank or to the heavier side of the aircraft, in order to level it. It is also recommended the switch between the tanks in intervals of about 30 minutes of flight time. Such procedure will also help to maintain the aircraft's lateral balance.

NOTE

The aircraft is able to use fuel which contains up to 10% of ethanol. In case this type of fuel is needed, use high-octane fuel.

NOTE

For more details about the fuel's correct selection, refer to the engine manufacturer's original manuals.

WARNING

ALWAYS BE AWARE OF FUEL CONTAMINATION OR DETERIORATION CAUSED BY IMPURITIES OR LONG PERIODS OF INACTIVITY AND STORAGE. ALWAYS DRAIN THE SYSTEM AND CHECK FUEL CONTAMINATION BEFORE FLIGHT.

The following diagrams (next pages) describe the Super Petrel LS fuel system for each engine type.

5.5.1.1 SPLS Fuel System Diagram for 912 ULS

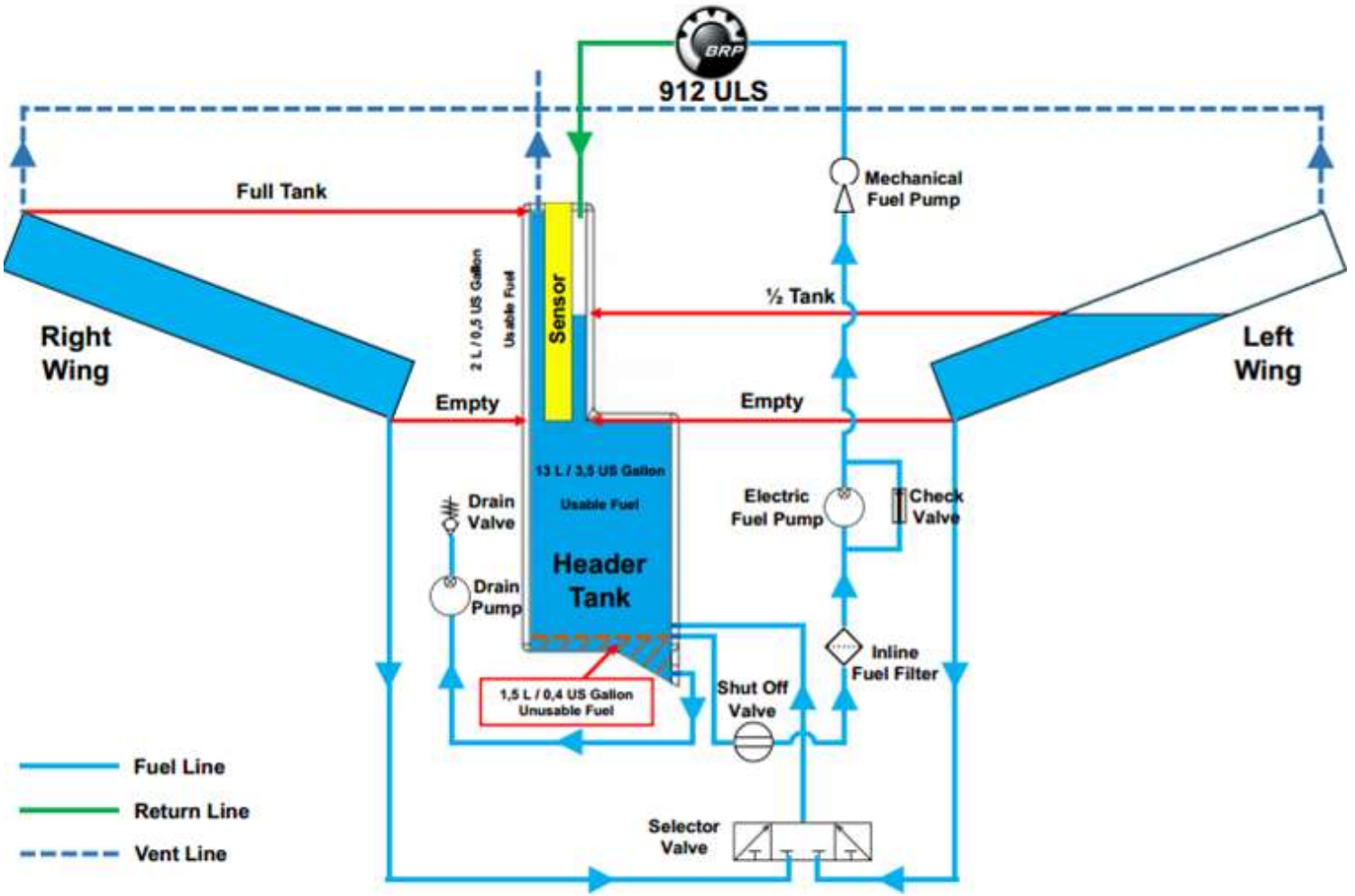


Figure 5-60

5.5.1.2 SPLS Fuel System Diagram for 914 UL

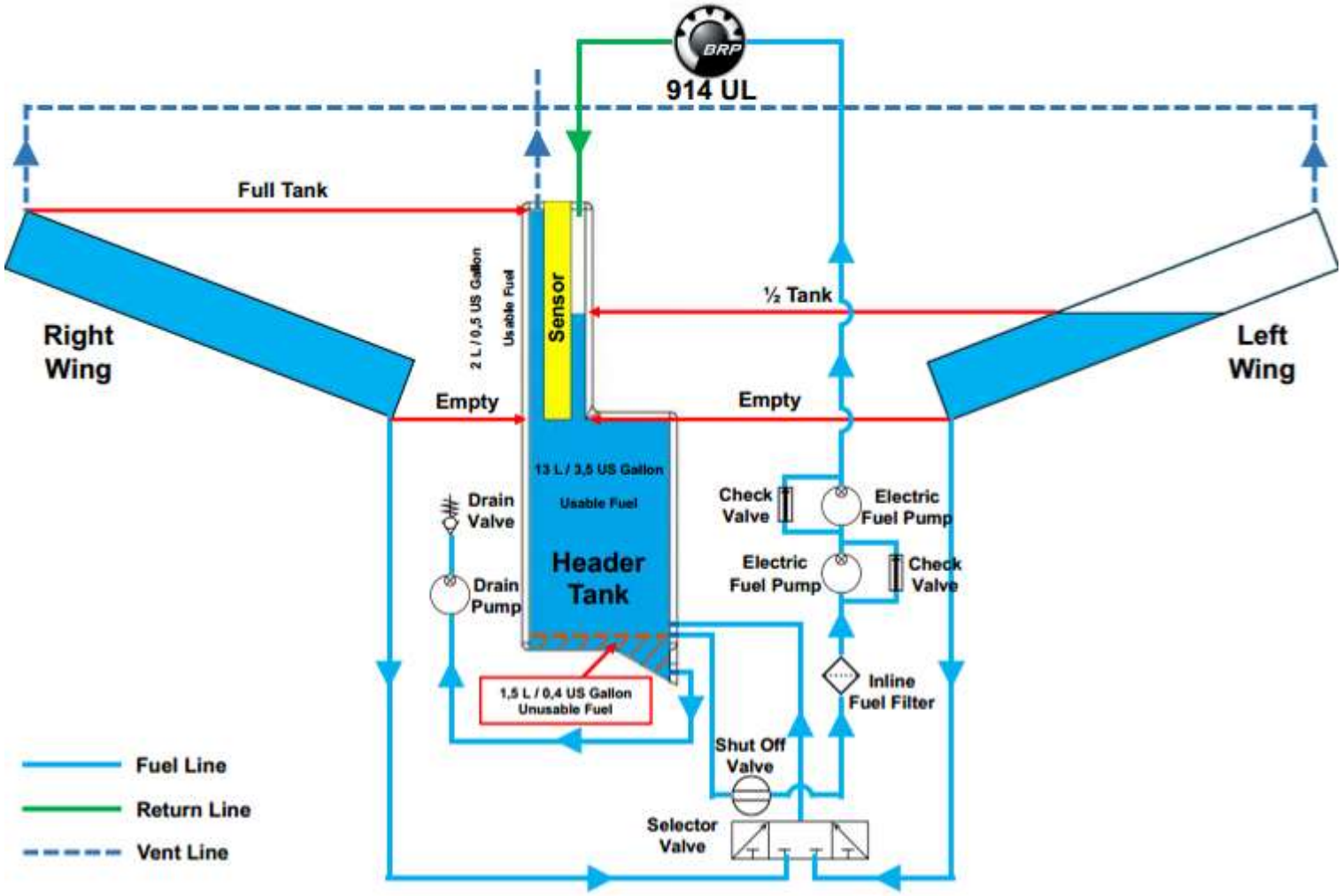


Figure 5-61

5.5.1.3 SPLS Fuel System Diagram for 912 iS Sport

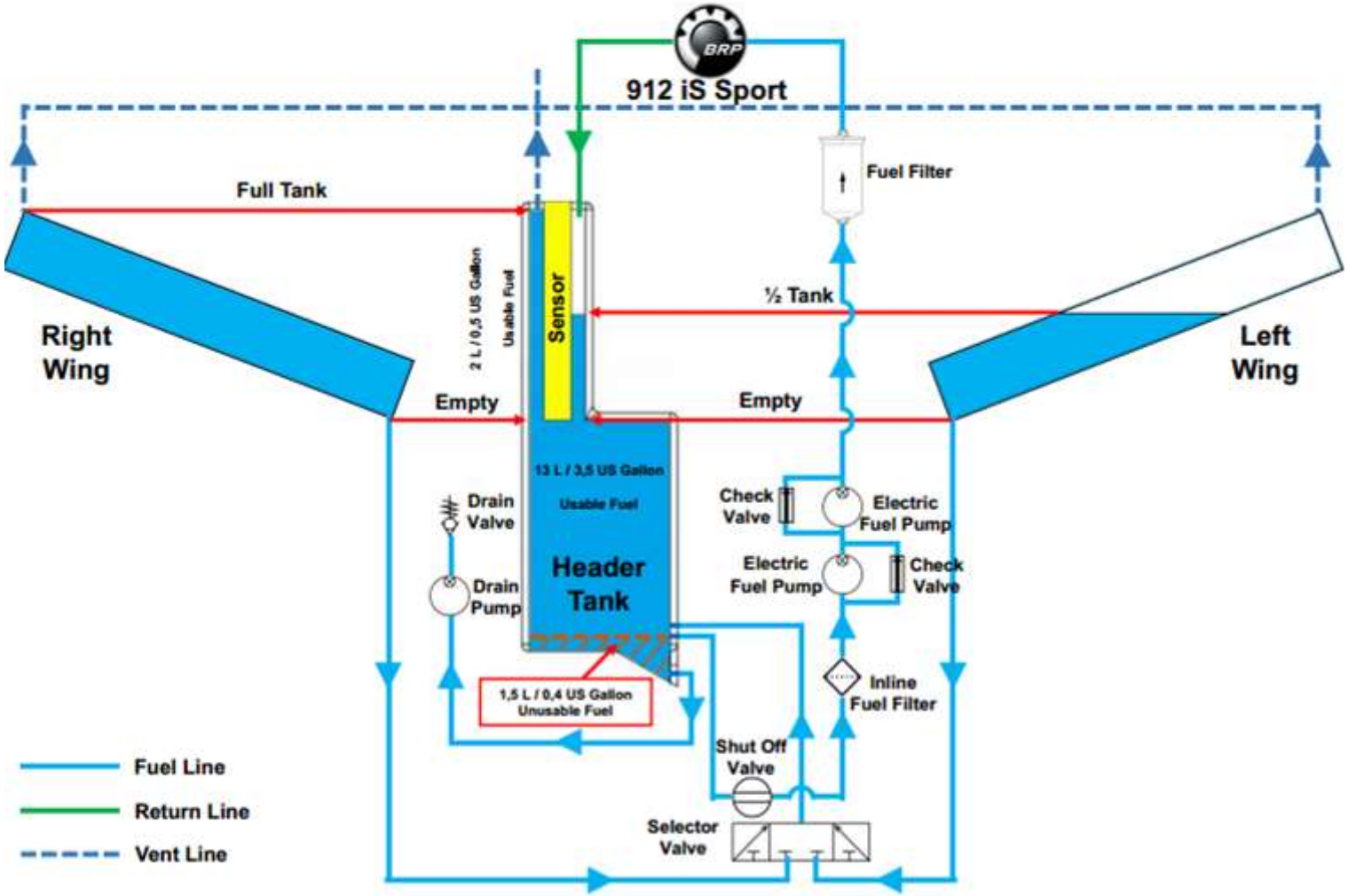


Figure 5-62

5.5.1.4 Refueling: Safety Precautions

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 00-34 A – AIRCRAFT GROUND HANDLING AND SERVICING, Section 8. Aircraft Fueling.

In servicing the fuel system, the following precautions should be taken:

- Aircraft being serviced or having the fuel system repaired must be properly grounded;
- No electrical or radio equipment in the aircraft is energized or being maintained while fuel is being dispensed into the aircraft;
- Fueling personnel should not carry objects in the breast pockets of their clothing when servicing aircraft because loose objects can fall into the fuel tanks;
- Matches or lighters should never be carried during fueling operations;
- In event of fuel spillage, discontinue the fueling operations until the spill can be removed, using proper safety precautions. Remove or neutralize the spilled fuel as quickly as possible;
- Fire-extinguishing equipment must always be available.

WARNING

IN SERVICING THE FUEL SYSTEM, REMEMBER THAT FUEL IS FLAMMABLE AND THAT THE DANGER OF FIRE OR EXPLOSION ALWAYS EXISTS.

5.5.1.5 Draining Process

In order to begin the draining process to draining process, the aircraft must be in a static condition. Use protection gloves.

1. Turn on the battery master switch.
2. Open the drain valve located in the right lower wing bottom part.

Figure 5-63

3. Press the drain button located in the instrument panel.
4. Use a clear container in order to collect fuel sample.

5.5.2 Fuel System Inspection

Required Tools:	Flashlight
	Ladder Support
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

In this section, the fuel system will be completely inspected. Check for leakage before every flight as described in the pre-flight checklist. Do not take off if you suspect any kind of abnormal behavior.

To eliminate any (future) problems, the instructions listed below should be accurately followed to ensure that all parts of the fuel system are in within condition. These should be carried out after 25 flight hours, 100 flight hours or annually.

All the inspections must be visually made. It is not necessary to disassemble any wing´s surface or components, just check the attachment condition.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

- Fuel and Vent Hoses: use a flashlight if necessary.
  - Check the fuel hoses condition (integrity, attachment, security, excessive bending) in the baggage compartment, header tank, lower wings and inside of the engine compartment.
  - Check the vent hoses condition (integrity, attachment, security) in the header tank, the inner struts connection and pylon of the fuselage.

- Fuel Filter:
  - Check the fuel filter for general condition (leakage and attachment).
  - Replace it in the **200 hours** inspection **(See 6.2.3.1 Fuel Filter Replacement).**

- Fuel System: check all fuel system for leakage (blue spots in the connections). Use a flashlight if necessary.
  - Check the header tank (hose connection).
  - Check electrical terminals (connectors) for corrosion and general condition of the sensor and ground located on the top of the header tank sensor. Replace them if necessary.
  - Check the lower wing (hose connection inside the fuselage).
  - Check the wing tanks (cracks, denting, and damages) and the condition of the fuel cap (rubber, operation, sealing).
  - Check the drain valve (attachment and hose connection). Test it for correct operation.
  - Check the drain pump for leakage and general condition.
  - Check electrical terminals (connectors) for corrosion and general condition of the drain pump. Replace them if necessary.

- Shut Off Valve:
  - Check the shut off valve for correct operation, opening and closing the valve.
  - Check the connections.

- Selector Valve:
  - Check the selector valve for correct operation; turn the valve (change the valve position).
  - Check the connections.

- Auxiliary Fuel Pump: Use a flashlight if necessary.
  - Check hose connections.
  - Check for leakage.
  - Check electrical terminals (connectors) for corrosion and general condition.
  - Make an operational check of the auxiliary fuel pump. First turn the master/avionics switch on and then turn the aux. fuel pump switch on.

5.5.3 Fuel System Repair and Alterations

Repairs or alterations in the Fuel System of the Super Petrel LS are not authorized in this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.6 Propeller

5.6.1 Description

Super Petrel LS is equipped with three-blade propeller with ground adjustable pitch:

- POWERFIN PROPELLERS Model F 65”
- DUC Three-Blade Inconel FLASH – 2 propeller

CAUTION

Always remember that composite blades do not resist certain impacts.

WARNING

BE SURE THAT NOTHING TOUCHES THE PROPELLER WHILE THE ENGINE IS RUNNING.

5.6.2 Propeller Inspection

Required Tools:	Combined Wrench 13 mm (1 pcs)
	Combined Wrench 10 mm (1 pcs)
	Allen Wrench 5 mm (1 pcs)
	Torque Wrench
	Phillips Screwdriver
	Flashlight
	Ladder Support
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

In this section, the propeller will be completely inspected. Check for general condition of propeller before every flight as described in the pre-flight checklist. Do not take off if you suspect any kind of abnormal behavior.

To avoid any future problems the instructions listed below should be accurately followed to ensure that all parts of the propeller are in within condition. These should be carried out after 25 flight hours, 100 flight hours or annually.

All the inspections must be visually made. It is not necessary to disassemble some surface of wing or components, just check the attachment condition.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

1. Propeller Hub: use a flashlight if necessary.

- Remove the spinner using a Phillips Screwdriver.
- Remove the bolts safety wire of the propeller.
- Torque the M8 bolts attachment using one (1) combined wrench 13 mm and check the condition of the safety wire. **Tightening torque: 220 lb.in (25 N.m).**
- Reinstall the safety wire of the propeller bolts.

NOTE

Marking Paint of all the bolts/washer/hub after tightening can be done in order to help make a visual check outside of the general maintenance.

NOTE

For Safetying, refer to the latest edition of the FAA ADVISORY CIRCULAR 43-13B, CHAPTER 7. SAFETYING

2. Blades: use a flashlight if necessary.

- Check the fixation of the blades by shaking the blade tip firmly.

- Check the blades for general condition (abrasions, cracks, nicks, scratches, paint damages, leading edges and tips).
- Check for corrosion in the blades root.
- Check the Inconel leading edge for general condition and detachment (applied for **FLASH – 2**).

3. Spinner: use a flashlight if necessary.

- Remove the spinner using a Phillips Screwdriver.
- Check the spinner for general condition (cracks, denting).
- Reinstall the spinner and check the attachment after finishing the propeller´s inspection.

NOTE
For more details about the other propeller´s inspection, maintenance, repair, removal or installation, refer to the propeller manufacturer website for downloading the applicable documents.

NOTE
For more details about the FLASH-2 propeller´s inspection, maintenance, repair, removal or installation, refer to the DUC propeller website for downloading the applicable documents.

5.6.3 Propeller Maintenance, Repair and Overhaul

Repairs or alterations in the Propeller are not authorized in this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.6.4 Propeller Installation

Required Tools:	Combined Wrench 13 mm (1 pcs)
	Combined Wrench 10 mm (1 pcs)
	Allen Wrench 6 mm (1 pcs)
	Allen Wrench 5 mm (1 pcs)
	Torque Wrench
	Digital Level (Goniometer)
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

1. Install the blades in the hub. The pitch angle should be set on the blade tip as follows:

912 ULS	914 UL	912 iS Sport
16°	19º	17º

2. Install the propeller in the aircraft (see picture below).

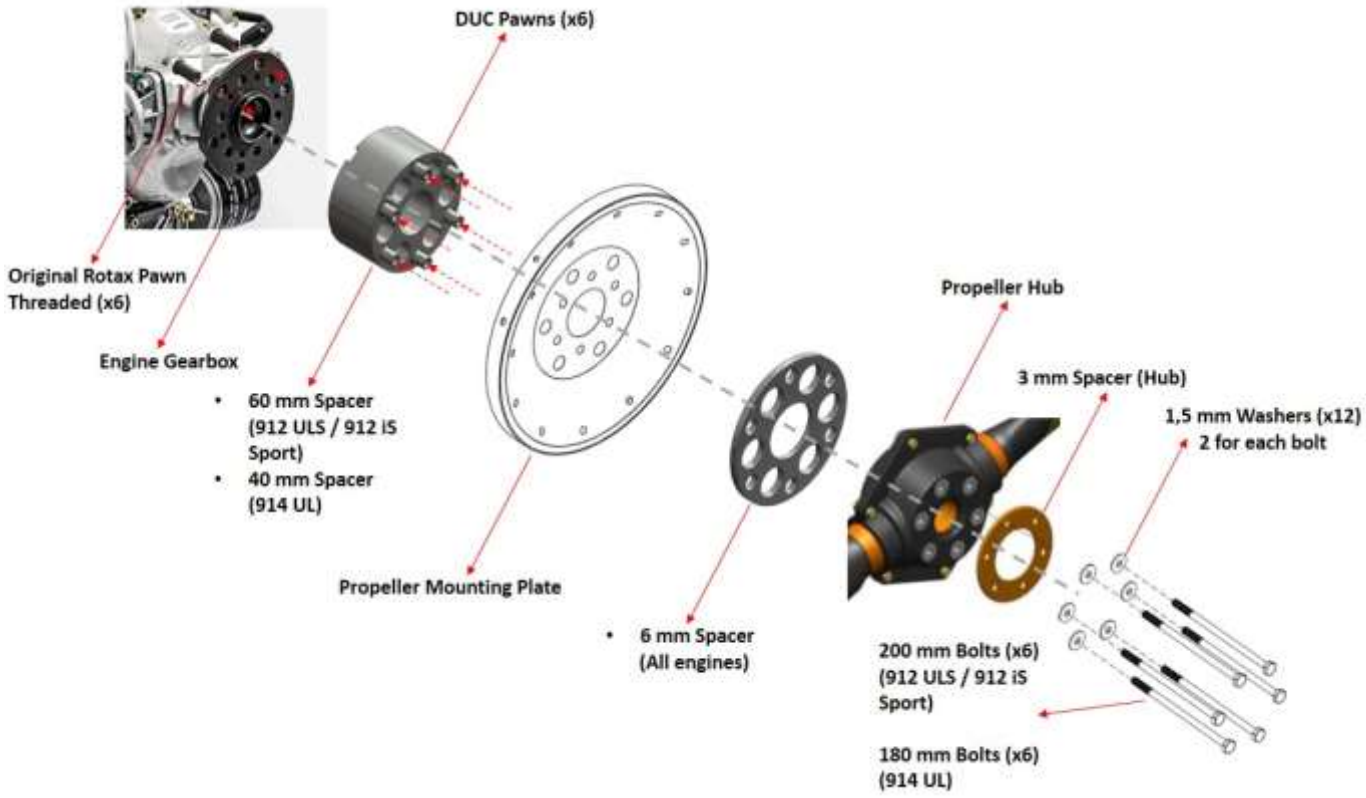


Figure 5-64

3. Torque the hub and blades according the table below:

HUB	BLADES
25 N.m	25 N.m

4. Make a static engine run test in order to get the following RPM:

912 ULS / 912 iS Sport	914 UL
5300 RPM +/- 100 RPM	5500 RPM +/- 100 RPM

5. If necessary make the fine pitch adjustment.

6. After getting the specified static RPM, check again the hub and blades torque value.

7. Install the safety wire on the hub bolts.

8. Install the Spinner.

NOTE

Please refer to the section below (**GENERAL RECOMMENDATIONS FOR PROPELLER BALANCING),** for positioning of the aircraft when is performing the RPM check after propeller installation.

5.6.5 Propeller Balancing

- Propeller balancing should be made each **100 hours inspection**. This procedure should be a dynamic balancing method.
- For balancing procedures, use the Balancer OEM manuals.

NOTE
For Propeller Balancing Best Practices, refer to the latest edition of the FAA ADVISORY CIRCULAR AC 20-37E, CHAPTER 3. ACCESSORIES AND BALANCING.

GENERAL RECOMMENDATIONS FOR PROPELLER BALANCING

- The vibration sensor should be fixed to the engine gearbox.
- The sensor should be placed vertically, centralized on the engine with the cable pointing upwards.
- Place the photo sensor on the engine or cowling between 30-45 centimeters behind of the propeller at the 12-o´clock position. The fixation should be properly in order to avoid vibrations in the sensor.
- The cables of the photo sensor should be far from the engine´s heated and moving parts.
- Place the reflective tape on the spinner mounting plate in vertical position.
- Do not exceed the aircraft and engine limitations.
- Pay particular attention in the engine water temperature.
- The vibration levels should not exceed 1.20 inches per second (1.20 IPS). If this value is exceeded, the propeller should be balancing statically.
- The maximum weight is 30 grams per bolt.
- Chock the aircraft and perform the engine starting on a clean and hard surface.
- Fixed pitch propellers should be turned to a low cruise RPM. Constant speed propeller should be turned to a low cruise RPM using minimum power torque.
- Wind speed should be limited to 20 mph with a gust-limited factor between 5 – 7 mph. An attempt of performing the balancing with winds, will make the process more difficult or impossible to complete.
- Do not place the aircraft near any obstacles when the wind is more than 5 mph. Turbulent air around of the obstacle, would cause air loads on the propeller and the balancing will became difficult to complete.
- ALWAYS place the aircraft in the opposite direction of the Wind.
- NEVER attempt to balance with crosswinds or tailwinds.

5.6.5.1 Propeller Balancing Parameters

- Propeller specification: DUC FLASH - 2
- Run engine test: at 5000 Static RPM.
- The IPS final (inches per second): less than 0,1 IPS as per Rotax instructions.

5.7 Utility Systems

5.7.1 Cabin Heater System

Super Petrel LS cabin heater system uses the engine coolant as a heat source. The coolant is bled from the engine and taken to the heater radiator inside the cabin. A fan, coupled to the radiator, blows hot air through the cabin. Cabin heater system is protected with a fuse in order to avoid any damage or overvoltage on the electrical fan. This fuse is located inside the aircraft nose above the electrical fan.

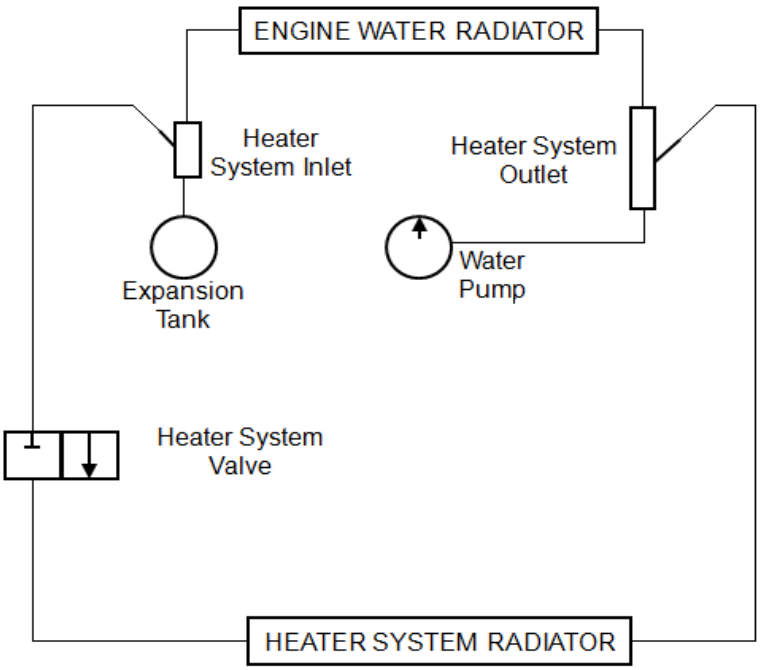


Figure 5-65

5.7.2 Cabin Heater Inspection

Required Tools:	Flashlight
	Ladder Support
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

The inspection of cabin heater system must be made visually. It is not necessary to remove the parts or components of system.

NOTE
Remove or open all cowlings, inspection windows**,** access doors and baggage compartment, before starting the inspection. Use a flashlight.

5.7.2.1 Under Cowling Inspection (Engine)

1. Insure hoses are not rubbing on anything and are not showing signs of any leakage.
2. Check condition of hose clamps and security.
3. Follow hoses toward firewall to insure they have not been rubbing on anything or showing signs of cracking or stiffness.
4. Check hoses and grommets where they go through the firewall for cracks or wear.

5.7.2.2 In Cockpit Inspection

1. Inspect grommets and hoses where they enter through the firewall into the cockpit for the same issues as inspected under the cowling.
2. Check both red (+) and black (-) wire connections at sources, toggle switch and fan. Replace them if necessary.
3. Insure there is no sign of corrosion at connections and that wires are clean and have no missing / worn off insulation.
4. Check the amp draw on heater fan. If more than 4 amps are recorded, the fan should be replaced.
5. Check for any evidence of the heater core leaking coolant. If any evidence is noted, change heater core.
6. Check to insure the unit is secure in its mounts, tight and not rubbing on anything.
7. Check the correct operation of the hydraulic valve located in the pilot seat bottom part.
8. Check that the hoses are still hooked to the heater unit and are not cracking.
9. Check that hose clamps are still tight.
10. Make an operational check of the cabin heater. First, turn the master switch on and then turn on the cabin heater switch.

NOTE

Cabin Heater hoses and lines should be replaced on condition, however, it is recommended to replace them in the 1000 hours / 5 years Inspection.

CAUTION

It is not recommended to operate the cabin heater system with the valve open and the switch turned OFF.

5.7.3 Cabin Heater Maintenance, Repair and Overhaul

Repairs or alterations in the Cabin Heater System are not authorized at this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.8 Instruments and Avionics

5.8.1 Description

Super Petrel LS is equipped with two version of instrument panel: ANALOG and FULL DIGITAL.

Typical instrument panels contain all flight, navigation and engine instruments that are required for day and night operations. Switches are located as follows:

- **Engine Panel:** Located on the left side of the instrument panel.
- **Lights Panel:** Located in the middle of the instrument panel below the GPS.
- **Miscellaneous Panel:** Located on the center console.
- **Circuit Breaker Panel:** Located on the right side of the instrument panel.

5.8.1.1 Instrument Panel and Flight Instruments

The instrument panel of each Super Petrel LS is detailed on the Instrument Panel and Flight Instruments Supplement of this Manual.

5.8.2 Instruments and Avionics Inspection

Required Tools:	Flashlight
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

The inspection of the instruments and avionics must be made visually. It is not necessary to remove the parts or components of system.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment before starting the inspection.

CAUTION

Magnetic tools must not be used during this procedure.

1. Instrument Panel: use a flashlight if necessary.
    - Check visually the instrument panel for attachment and general condition.
    - Check the readability and condition of the placards, which are located on the instrument panel. Replace them as necessary.

2. Instruments and Avionics: Follow the OEM (Original Equipment Manufacturer) manuals for maintenance and inspection instructions as applicable.
    - Check the correct operation of the instruments. Make an operational test on the instruments as applicable.

CAUTION

After performing the operational test on the instruments, turn off the Battery Master and Avionics Master Switch.

5.8.3 Instruments and Avionics Maintenance, Repair and Overhaul

Repairs or alterations on the Instruments and Avionics are not authorized in this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

CAUTION

Replace defective instruments and avionics, only with approved instruments.

5.9 Electrical System

5.9.1 Description

The electrical system of the Super Petrel LS consists of a 12-volt DC system. This contains the following electrical components and equipment:

- 12-Volt / 18A Sealed Lead Acid or Gel Battery
- Bilge Pump / Automatic
- Fuel Sensor Quantity
- Fuel Drain Pump
- External Lights (Nav / Strobe Lights, Landing Lights)
- Elevator Electrical Trim
- Headphones Plugs
- Cabin Heater
- Carburetor Heater **(Applied only for 912 ULS)**
- ELT
- Instrument Panel (Switches, Indicator Lights and Instruments)
- Instrument Panel Light **(Applied for Night VFR)**
- Cabin Light **(Applied for Night VFR)**

5.9.1.1 Engine

Rotax 912 ULS

- Dual Ignition
- Electrical Starter (12 V 0.9 kW)
- Rectifier-Regulator
- Internal Generator 250 W DC
- Electric Fuel Pump (12 V DC)

Rotax 914 UL

- Electronic Control of Boost Pressure (TCU = Turbo Control Unit)
- Dual Ignition
- 2 Electric Fuel Pumps (12 V DC)
- Electric Starter (12 V 0.7 kW)
- Rectifier-Regulator
- Internal Generator 250 W DC

Rotax 912 iS Sport

- Fully redundant EMS (Electronic Engine Management)
- Electric Starter (12 V 0.8 kW)
- 2 Electric Fuel Pumps (12 V DC)
- Rectifier-Regulator A
- Rectifier-Regulator B
- Generator A 220 W
- Generator B 420 W

5.9.1.2 Circuit Breakers

The Super Petrel LS electrical system is protected with Circuit Breakers in order to avoid any damage or overvoltage.

CIRCUIT BREAKERS	AMPERAGE (A)
GYRO	5
TC	5
TCAS	3
GPS	3
VHF	5
XPNDR Dynon	5
SCREEN 1 LEFT	5
SCREEN 2 RIGHT	5
TRIM	3
EMS	5
AUTOPILOT	5
STROBE	5
ALTERNATOR	5
MAIN FUEL PUMP	5
AUX. FUEL PUMP	5
LANDING LIGHT	5
BILGE PUMP	5
AUX. 12 V	5
DRAIN	3
ADSB Dynon	3
PANEL LIGHTS	3
ELT	1
TCU	5
BACKUP	25
POWER	25
ADAHRS Dynon	3
ADAHRS Garmin	2
BACKUP BATTERY	5
CABIN HEATER	5
XPNDR/ADSB Garmin	3

NOTE

Circuit Breakers are installed according to the engine configuration.

5.9.1.3 Schematic Diagrams

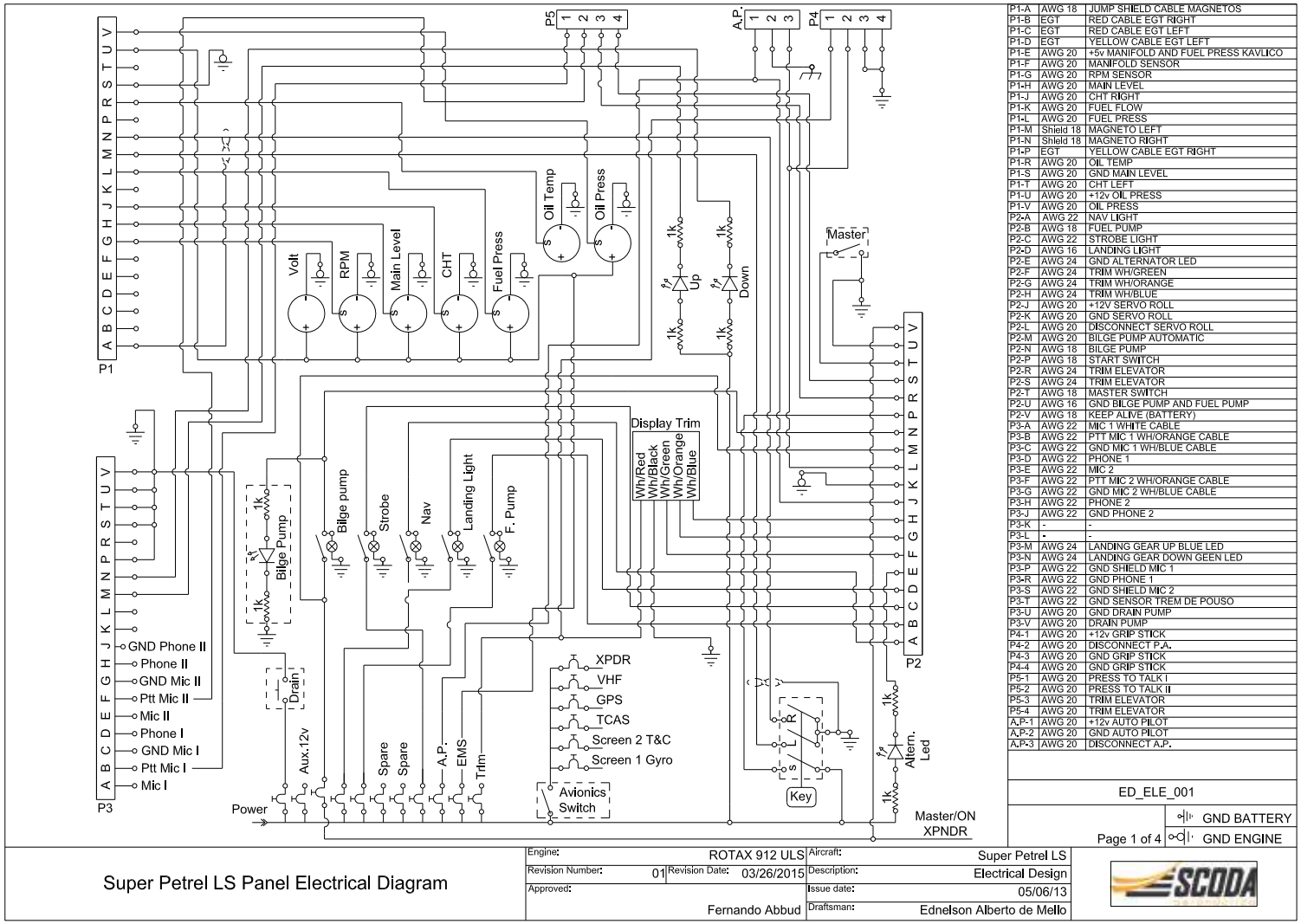
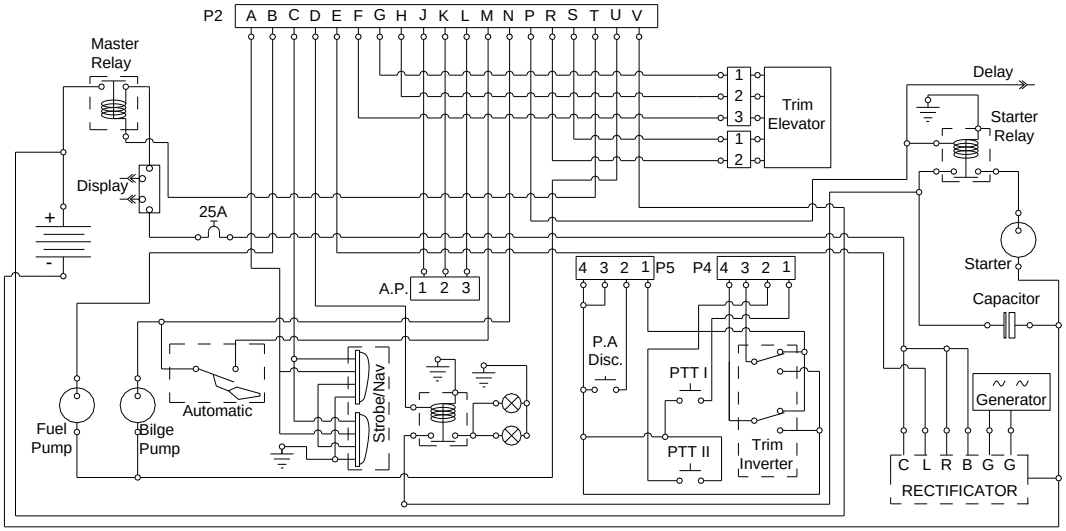


Figure 5-66. Panel Electrical Diagram 912 ULS



P2-A	AWG 22	NAV LIGHT
P2-B	AWG 18	FUEL PUMP
P2-C	AWG 22	STROB LIGHT
P2-D	AWG 16	LANDING LIGHT
P2-E	AWG 24	GND ALTERNATOR LED
P2-F	AWG 24	TRIM WH/GREEN
P2-G	AWG 24	TRIM WH/ORANGE
P2-H	AWG 24	TRIM WH/BLUE
P2-J	AWG 20	+12V SERVO ROLL
P2-K	AWG 20	GND SERVO ROLL
P2-L	AWG 20	DISC SERVO ROLL
P2-M	AWG 20	BILGE PUMP AUTOMATIC
P2-N	AWG 18	BILGE PUMP
P2-P	AWG 18	START SWITCH
P2-R	AWG 24	TRIM ELEVATOR
P2-S	AWG 24	TRIM ELEVATOR
P2-T	AWG 18	MASTER SWITCH
P2-U	AWG 16	GND BILGE PUMP AND FUEL PUMP
P2-V	AWG 18	KEEP ALIVE (BATTERY)
P4-1	AWG 20	+12V GRIP STICK
P4-2	AWG 20	DISCONNECT P.A.
P4-3	AWG 20	GND GRIP STICK
P4-4	AWG 20	GND GRIP STICK
P5-1	AWG 20	PRESS TO TALK I
P5-2	AWG 20	PRESS TO TALK II
P5-3	AWG 20	TRIM ELEVATOR
P5-4	AWG 20	TRIM ELEVATOR

Notes:

ED_ELE_002

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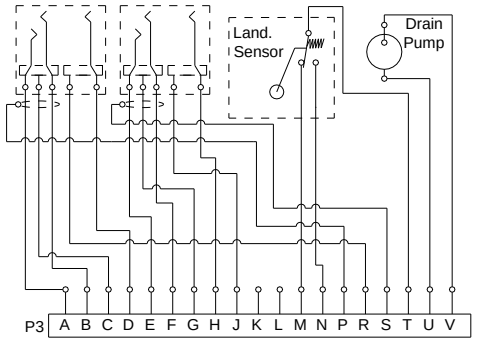
GND BATTERY
GND ENGINE

Super Petrel LS Feeding Electrical Diagram	Engine: ROTAX 912 ULS	Aircraft: Super Petrel LS	
	Revision Number: 01 / Revision Date: 03/26/2015	Description: Electrical Design	
	Approved: Fernando Abbud	Issue date: 05/06/13	
		Draftsman: Ednelson Alberto de Mello	

Figure 5-67. Feeding Electrical Diagram 912 ULS



P3-A	AWG 22	MIC 1 WHITE CABLE
P3-B	AWG 22	PTT MIC 1 WH/ORANGE CABLE
P3-C	AWG 22	GND MIC 1 WH/BLUE CABLE
P3-D	AWG 22	PHONE 1
P3-E	AWG 22	MIC 2
P3-F	AWG 22	PTT MIC 2 WH/ORANGE CABLE
P3-G	AWG 22	GND MIC 2 WH/BLUE CABLE
P3-H	AWG 22	PHONE 2
P3-J	AWG 22	GND PHONE 2
P3-K	-	-
P3-L	-	-
P3-M	AWG 24	LANDING GEAR UP BLUE LED
P3-N	AWG 24	LANDING GEAR DOWN GEEN LED
P3-P	AWG 22	GND SHIELD MIC 1
P3-R	AWG 22	GND PHONE 1
P3-S	AWG 22	GND SHIELD MIC 2
P3-T	AWG 22	GND SENSOR TREM DE POUSO
P3-U	AWG 20	GND DRAIN PUMP
P3-V	AWG 20	DRAIN PUMP

Notes:

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GND BATTERY
GND ENGINE

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Super Petrel LS Jacks, Drain and Landing Sensor Electrical Diagram

Engine:	ROTAX 912 ULS	Aircraft:	Super Petrel LS
Revision Number: 01	Revision Date: 03/26/2015	Description:	Electrical Design
Approved:	Fernando Abbud	Issue date:	05/06/13
		Draftsman:	Ednelson Alberto de Mello

Figure 5-68. Jacks, Drain and Landing Gear Sensor 912 ULS

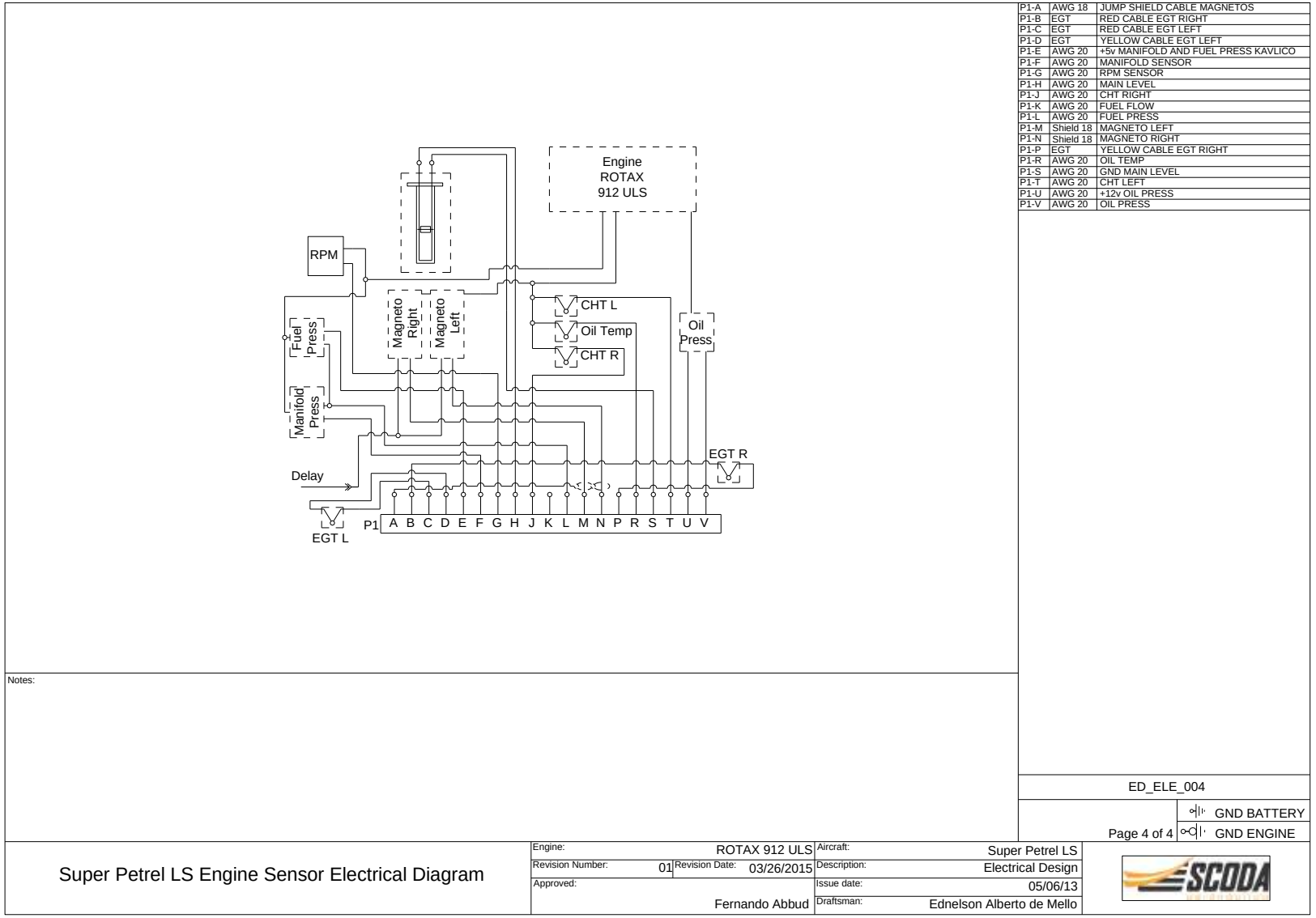
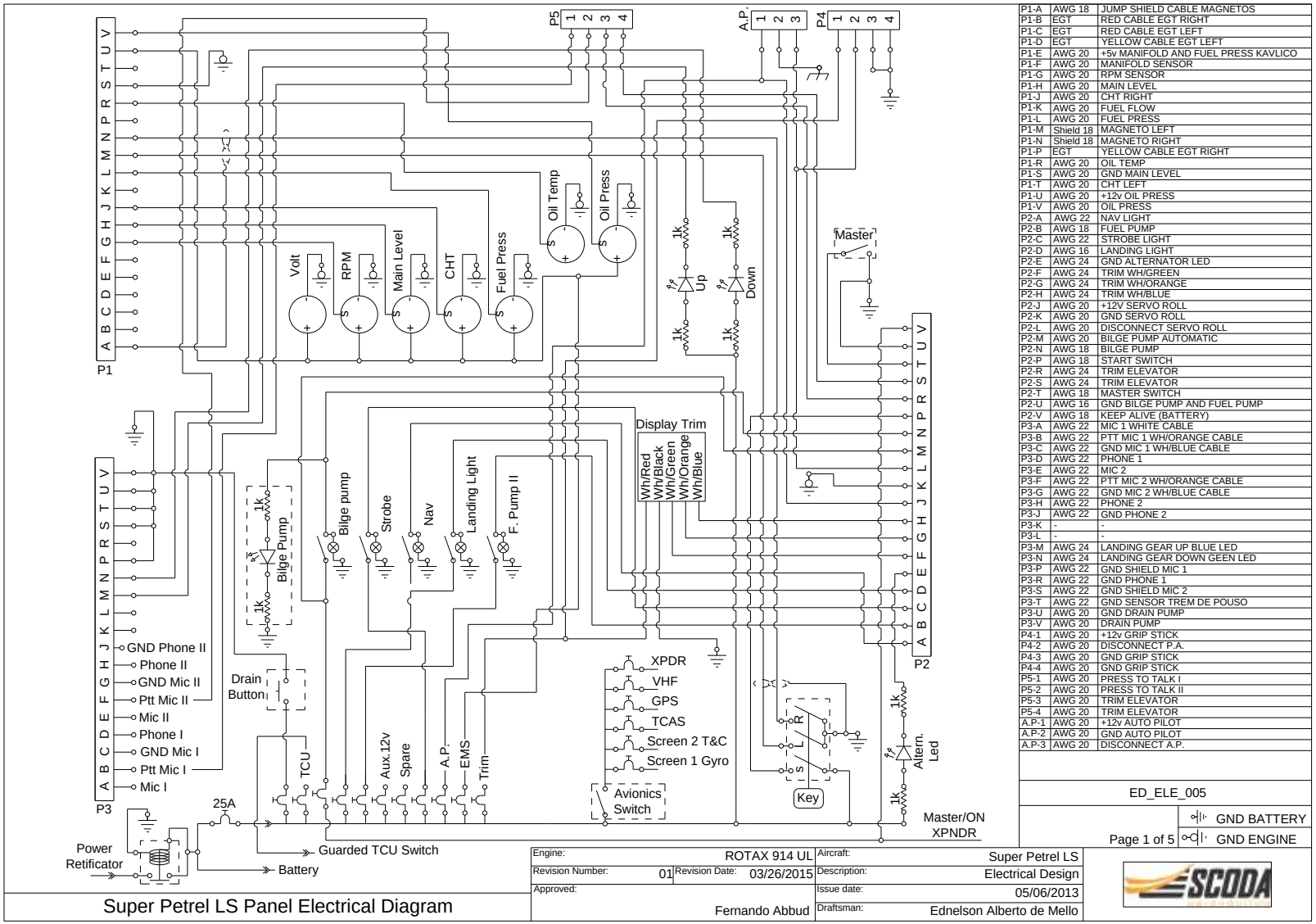


Figure 5-69. Engine Sensor Electrical Diagram 912 ULS



P1-A	AWG 18	JUMP SHIELD CABLE MAGNETOS
P1-B	EGT	RED CABLE EGT RIGHT
P1-C	EGT	RED CABLE EGT LEFT
P1-D	EGT	YELLOW CABLE EGT LEFT
P1-E	AWG 20	+5v MANIFOLD AND FUEL PRESS KAVLICO
P1-F	AWG 20	MANIFOLD SENSOR
P1-G	AWG 20	RPM SENSOR
P1-H	AWG 20	MAIN LEVEL
P1-J	AWG 20	CHT RIGHT
P1-K	AWG 20	FUEL FLOW
P1-L	AWG 20	FUEL PRESS
P1-M	Shield 18	MAGNETO LEFT
P1-N	Shield 18	MAGNETO RIGHT
P1-P	EGT	YELLOW CABLE EGT RIGHT
P1-R	AWG 20	OIL TEMP
P1-S	AWG 20	GND MAIN LEVEL
P1-T	AWG 20	CHT LEFT
P1-U	AWG 20	+12v OIL PRESS
P1-V	AWG 20	OIL PRESS
P2-A	AWG 22	NAV LIGHT
P2-B	AWG 18	FUEL PUMP
P2-C	AWG 22	STROBE LIGHT
P2-D	AWG 16	LANDING LIGHT
P2-E	AWG 24	GND ALTERNATOR LED
P2-F	AWG 24	TRIM WH/GREEN
P2-G	AWG 24	TRIM WH/ORANGE
P2-H	AWG 24	TRIM WH/BLUE
P2-J	AWG 20	+12V SERVO ROLL
P2-K	AWG 20	GND SERVO ROLL
P2-L	AWG 20	DISCONNECT SERVO ROLL
P2-M	AWG 20	BILGE PUMP AUTOMATIC
P2-N	AWG 18	BILGE PUMP
P2-P	AWG 18	START SWITCH
P2-R	AWG 24	TRIM ELEVATOR
P2-S	AWG 24	TRIM ELEVATOR
P2-T	AWG 18	MASTER SWITCH
P2-U	AWG 16	GND BILGE PUMP AND FUEL PUMP
P2-V	AWG 18	KEEP ALIVE (BATTERY)
P3-A	AWG 22	MIC 1 WHITE CABLE
P3-B	AWG 22	PTT MIC 1 WH/ORANGE CABLE
P3-C	AWG 22	GND MIC 1 WH/BLUE CABLE
P3-D	AWG 22	PHONE 1
P3-E	AWG 22	MIC 2
P3-F	AWG 22	PTT MIC 2 WH/ORANGE CABLE
P3-G	AWG 22	GND MIC 2 WH/BLUE CABLE
P3-H	AWG 22	PHONE 2
P3-J	AWG 22	GND PHONE 2
P3-K	-	-
P3-L	-	-
P3-M	AWG 24	LANDING GEAR UP BLUE LED
P3-N	AWG 24	LANDING GEAR DOWN GEEN LED
P3-P	AWG 22	GND SHIELD MIC 1
P3-R	AWG 22	GND PHONE 1
P3-S	AWG 22	GND SHIELD MIC 2
P3-T	AWG 22	GND SENSOR TREM DE POUSO
P3-U	AWG 20	GND DRAIN PUMP
P3-V	AWG 20	DRAIN PUMP
P4-1	AWG 20	+12v GRIP STICK
P4-2	AWG 20	DISCONNECT P.A.
P4-3	AWG 20	GND GRIP STICK
P4-4	AWG 20	GND GRIP STICK
P5-1	AWG 20	PRESS TO TALK I
P5-2	AWG 20	PRESS TO TALK II
P5-3	AWG 20	TRIM ELEVATOR
P5-4	AWG 20	TRIM ELEVATOR
A.P-1	AWG 20	+12v AUTO PILOT
A.P-2	AWG 20	GND AUTO PILOT
A.P-3	AWG 20	DISCONNECT A.P.

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GND BATTERY

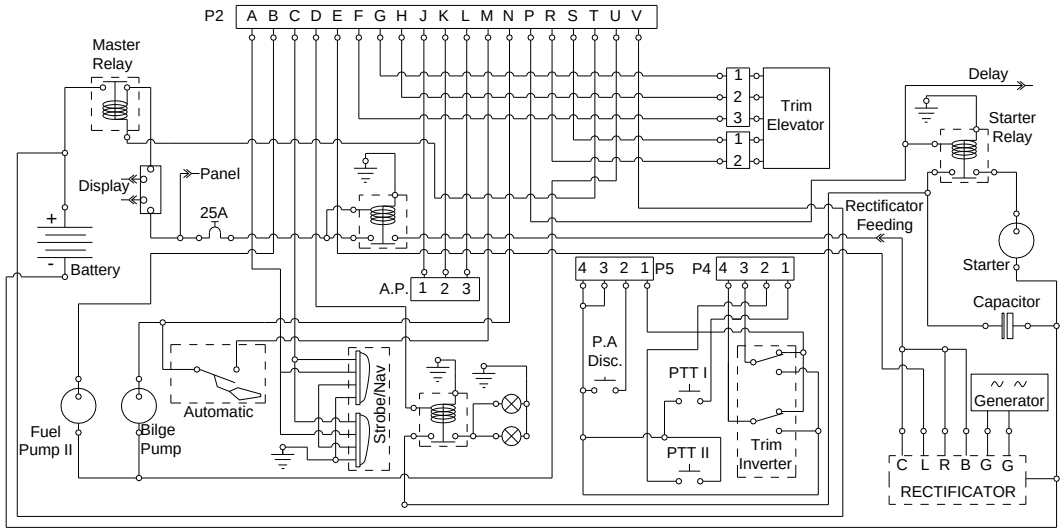
GND ENGINE

Super Petrel LS Panel Electrical Diagram

Engine:	ROTAX 914 UL	Aircraft:	Super Petrel LS
Revision Number: 01	Revision Date: 03/26/2015	Description:	Electrical Design
Approved: Fernando Abbud		Issue date:	05/06/2013
		Draftsman:	Ednelson Alberto de Mello

SCODA aeronautica

Figure 5-70.Panel Electrical Diagram 914 UL



P2-A	AWG 22	NAV LIGHT
P2-B	AWG 18	FUEL PUMP
P2-C	AWG 22	STROBE LIGHT
P2-D	AWG 16	LANDING LIGHT
P2-E	AWG 24	GND ALTERNATOR LED
P2-F	AWG 24	TRIM WH/GREEN
P2-G	AWG 24	TRIM WH/ORANGE
P2-H	AWG 24	TRIM WH/BLUE
P2-J	AWG 20	+12V SERVO ROLL
P2-K	AWG 20	GND SERVO ROLL
P2-L	AWG 20	DISCONNECT SERVO ROLL
P2-M	AWG 20	BILGE PUMP AUTOMATIC
P2-N	AWG 18	BILGE PUMP
P2-P	AWG 18	START SWITCH
P2-R	AWG 24	TRIM ELEVATOR
P2-S	AWG 24	TRIM ELEVATOR
P2-T	AWG 18	MASTER SWITCH
P2-U	AWG 16	GND BILGE PUMP AND FUEL PUMP
P2-V	AWG 18	KEEP ALIVE (BATTERY)
P4-1	AWG 20	+12v GRIP STICK
P4-2	AWG 20	DISCONNECT P.A.
P4-3	AWG 20	GND GRIP STICK
P4-4	AWG 20	GND GRIP STICK
P5-1	AWG 20	PRESS TO TALK I
P5-2	AWG 20	PRESS TO TALK II
P5-3	AWG 20	TRIM ELEVATOR
P5-4	AWG 20	TRIM ELEVATOR

Notes:

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GND BATTERY

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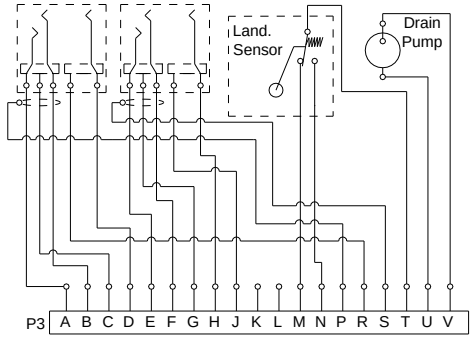
GND ENGINE

Super Petrel LS Feeding Electrical Diagram

Engine:	ROTAX 914 UL	Aircraft:	Super Petrel LS
Revision Number: 01	03/26/2015	Description:	Electrical Design
Approved:	Fernando Abbud	Issue date:	05/06/13
		Draftsman:	Ednelson Alberto de Mello

Figure 5-71.Feeding Electrical Diagram 914 UL



P3-A	AWG 22	MIC 1 WHITE CABLE
P3-B	AWG 22	PTT MIC 1 WH/ORANGE CABLE
P3-C	AWG 22	GND MIC 1 WH/BLUE CABLE
P3-D	AWG 22	PHONE 1
P3-E	AWG 22	MIC 2
P3-F	AWG 22	PTT MIC 2 WH/ORANGE CABLE
P3-G	AWG 22	GND MIC 2 WH/BLUE CABLE
P3-H	AWG 22	PHONE 2
P3-J	AWG 22	GND PHONE 2
P3-K	-	-
P3-L	-	-
P3-M	AWG 24	LANDING GEAR UP BLUE LED
P3-N	AWG 24	LANDING GEAR DOWN GEEN LED
P3-P	AWG 22	GND SHIELD MIC 1
P3-R	AWG 22	GND PHONE 1
P3-S	AWG 22	GND SHIELD MIC 2
P3-T	AWG 22	GND SENSOR TREM DE POUSO
P3-U	AWG 20	GND DRAIN PUMP
P3-V	AWG 20	DRAIN PUMP

Notes:

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GND BATTERY
GND ENGINE

Super Petrel LS Jacks, Drain and Landing Sensor Electrical Diagram	Engine: ROTAX 914 UL	Aircraft: Super Petrel LS	
	Revision Number: 01 03/26/2015	Description: Electrical Design	
	Approved: Fernando Abbud	Issue date: 05/06/13	
		Draftsman: Ednelson Alberto de Mello	

Figure 5-72.Jacks, Drain and Landing Sensor 914 UL

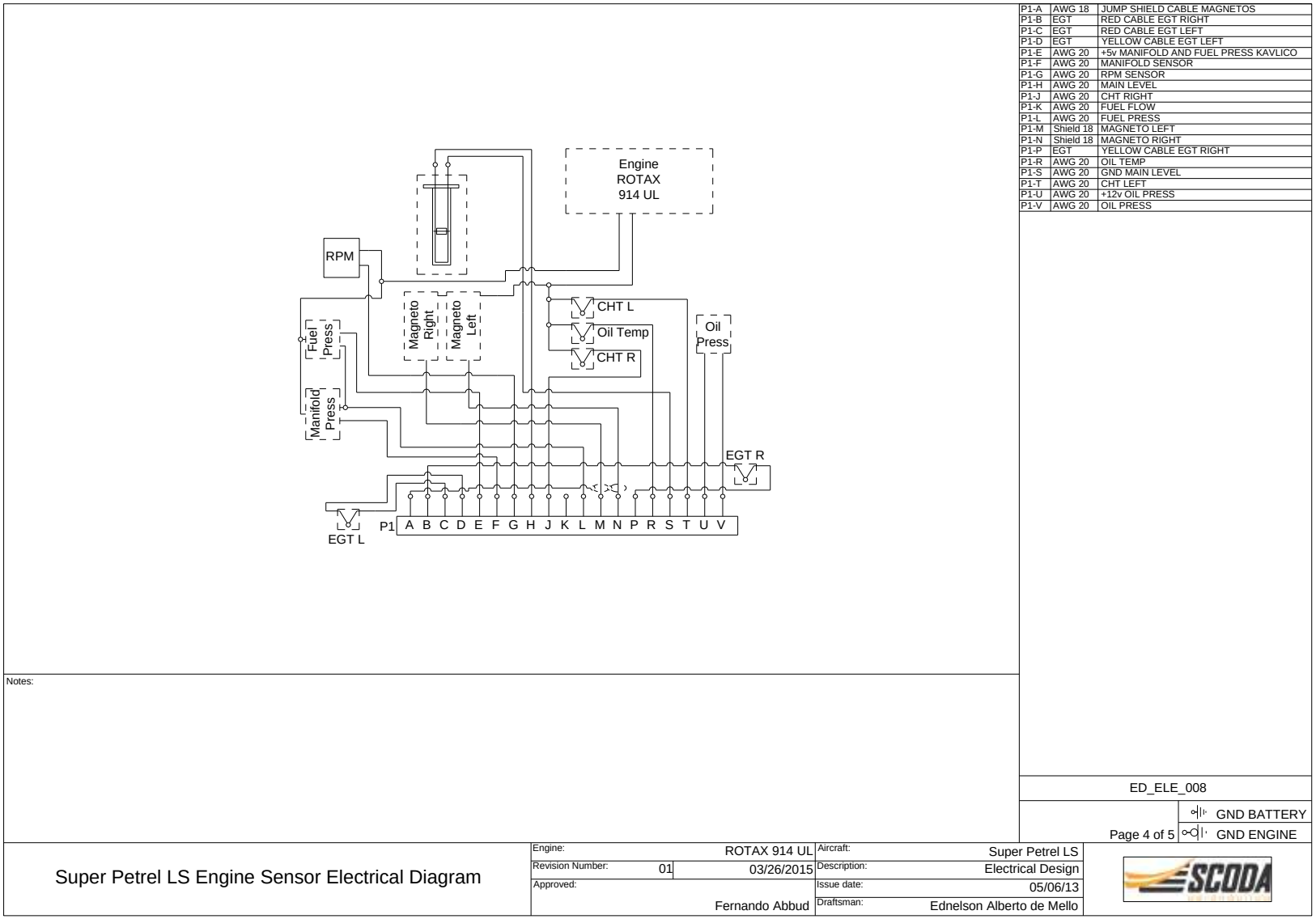


Figure 5-73. Engine Sensor Electrical Diagram 914 UL

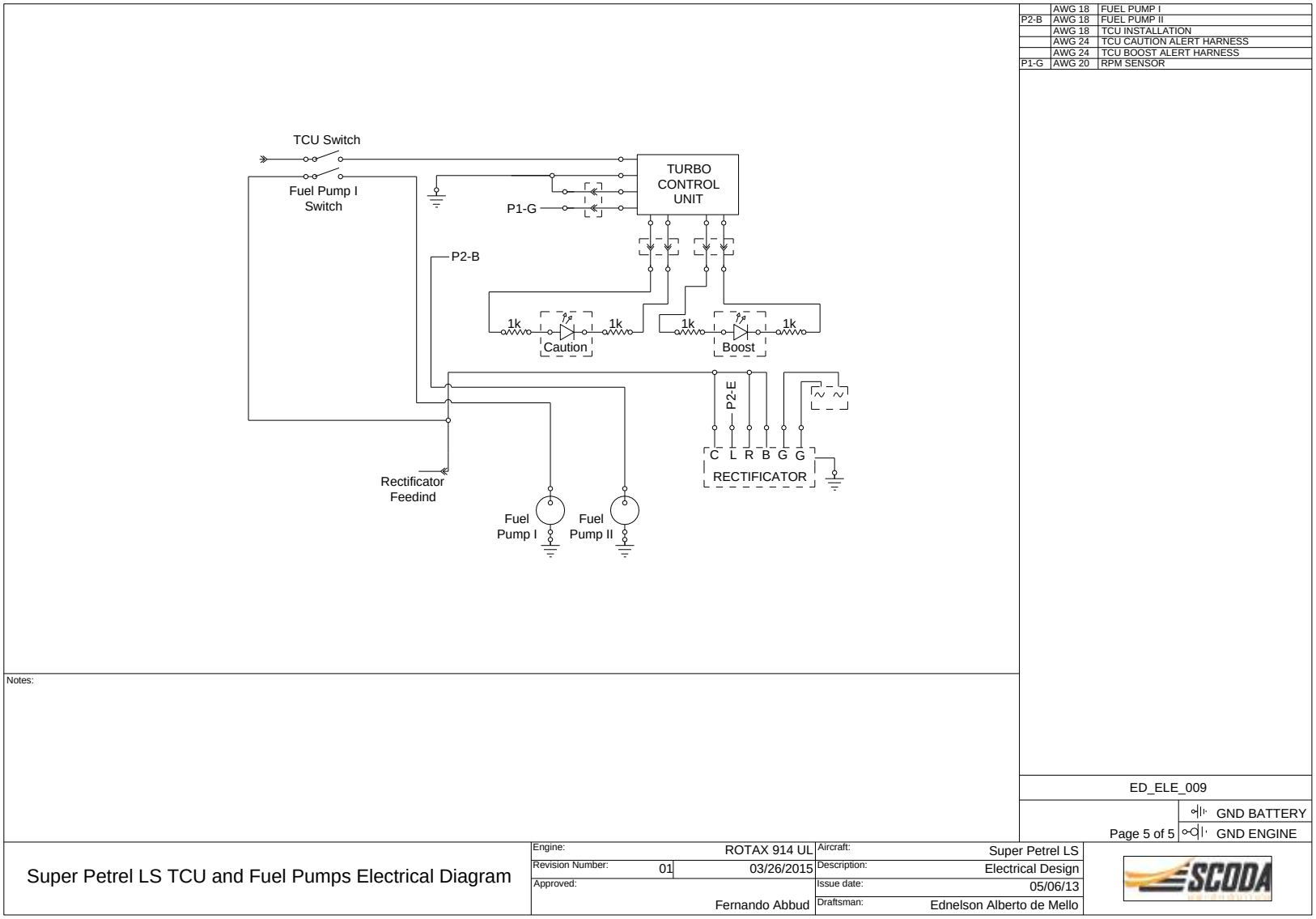


Figure 5-74. TCU and Fuel Pumps 914 UL

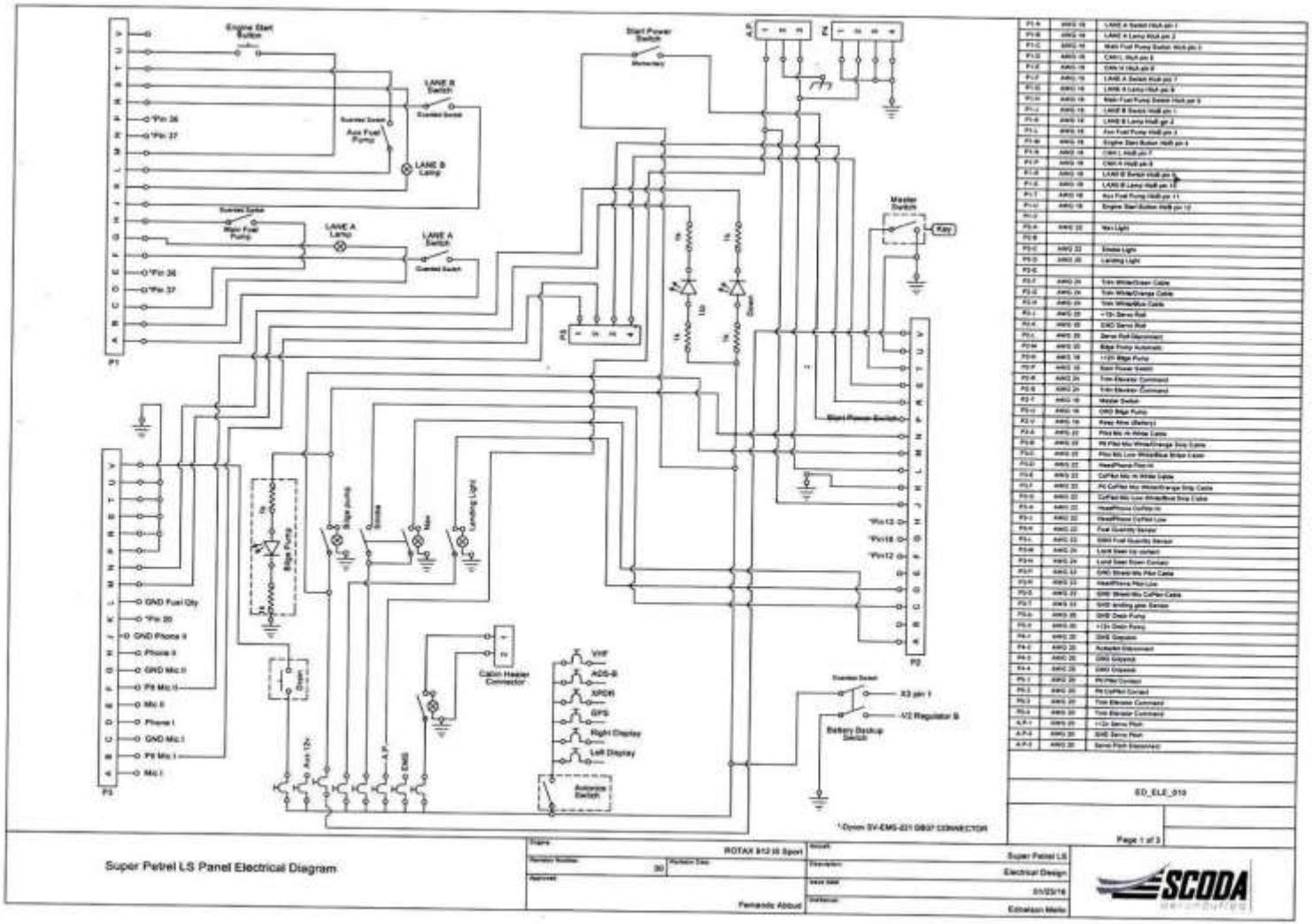


Figure 5-75. Panel Electrical Diagram 912 iS Sport

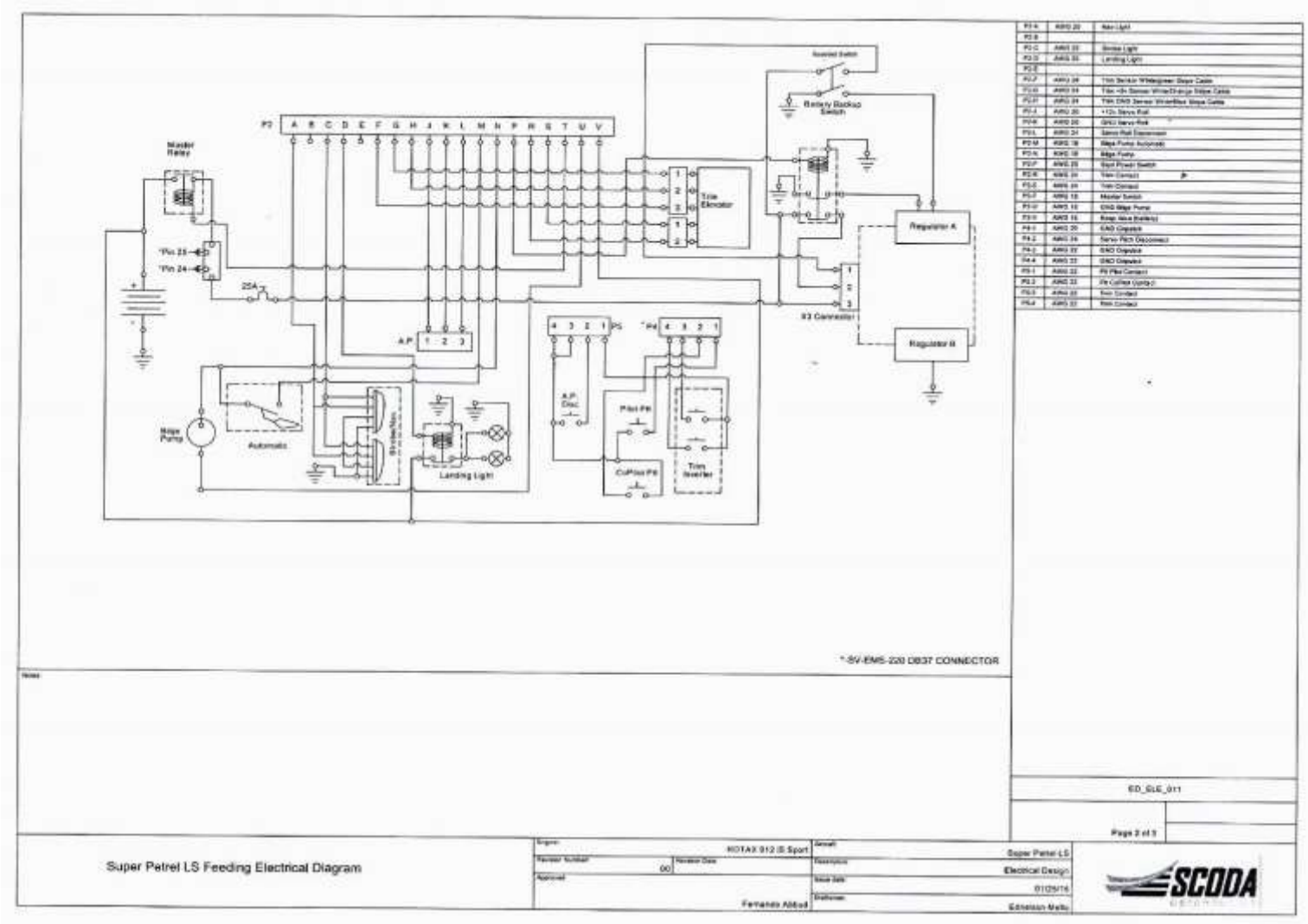


Figure 5-76. Feeding Electrical Diagram 912 iS Sport

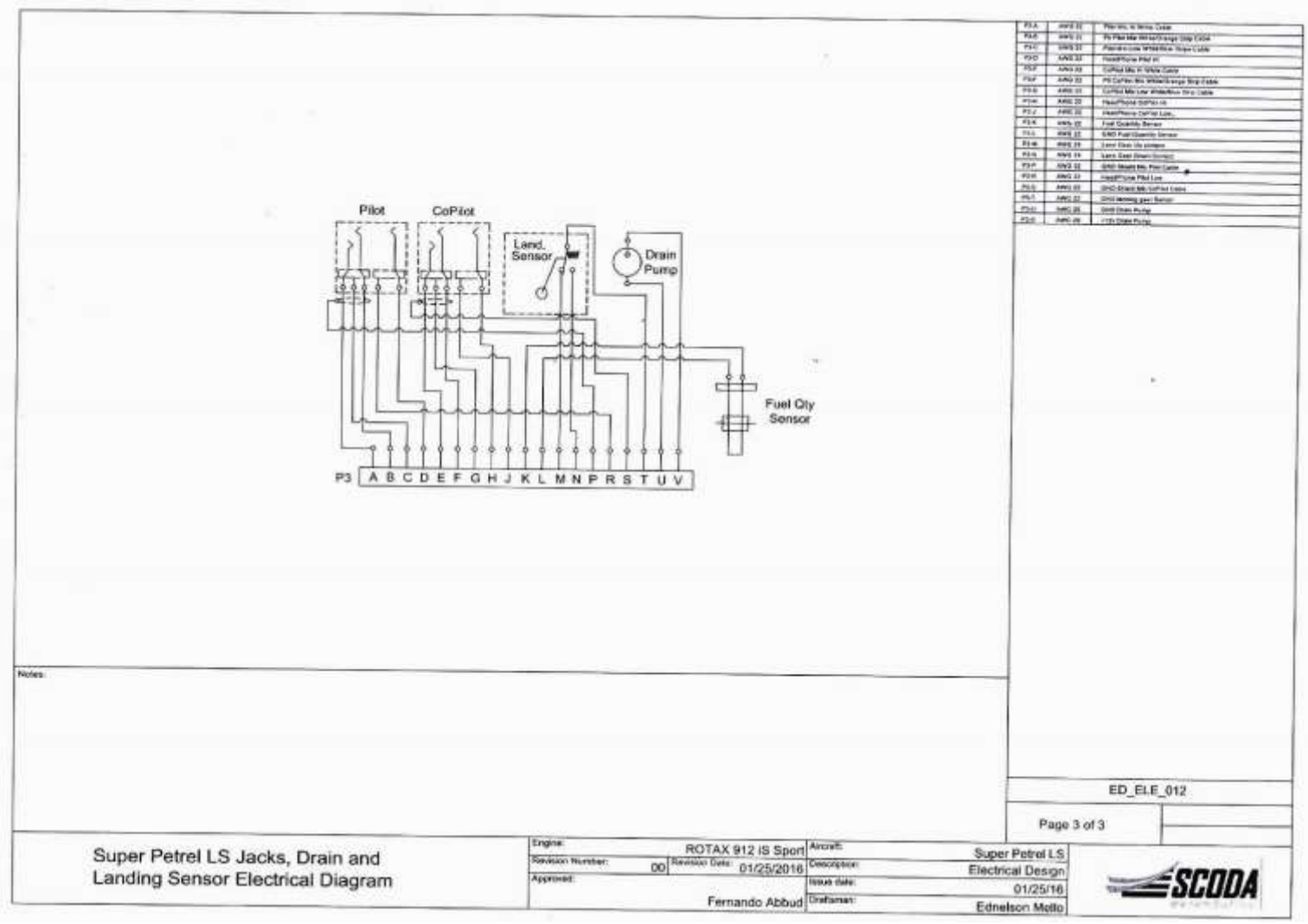


Figure 5-77. Jacks, Drain and Landing Gear Sensor 912 iS Sport

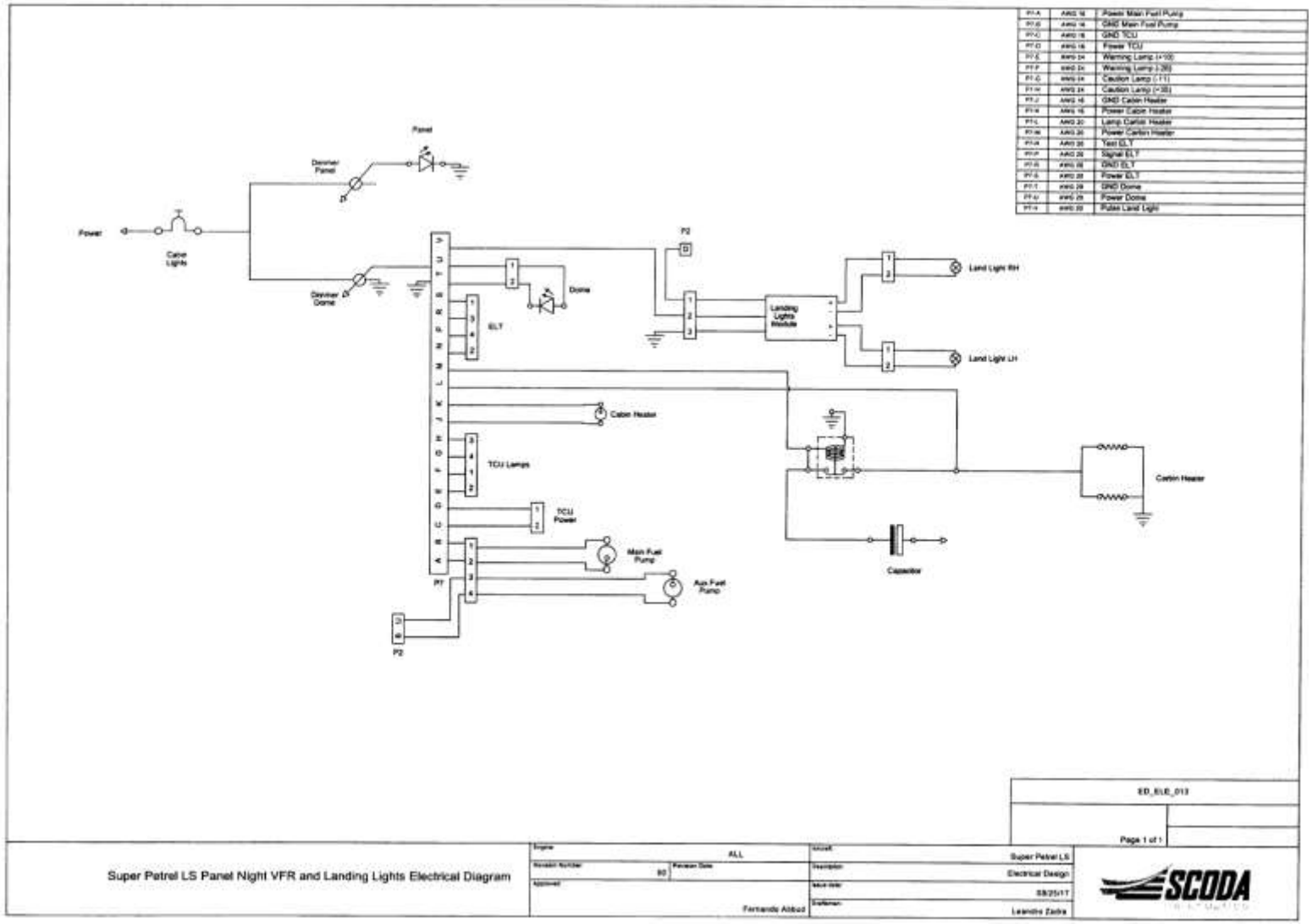


Figure 5-78. Super Petrel LS Panel Night VFR and Landing Lights Electrical System

5.9.1.4 Acceptable Methods, Techniques and Practices for Electrical System Maintenance

The satisfactory performance of an aircraft is dependent upon the continued reliability of the electrical system. Damaged wiring or equipment in an aircraft, regardless of how minor it may appear to be, cannot be tolerated. Reliability of the system is proportional to the amount of maintenance received and the knowledge of those who perform such maintenance. It is, therefore, important that maintenance be accomplished using the best techniques and practices to minimize the possibility of failure.

Inspect equipment, electrical assemblies and wiring installations for damages, general condition and proper functioning to ensure the continued satisfactory operation of the electrical system. Replace components of the electrical system that are damaged or defective with identical parts.

Annual cleaning of electrical equipment to remove dust, dirt and grime is recommended. Suitable solvents or fine abrasives that will not score the surface or remove the plating may be used to clean the terminals and mating surfaces if they are corroded or dirty. Only cleaning agents that do not leave any type of residue must be used. Avoid using emery cloth to polish commutators or slip rings because particles may cause shorting and burning. Be sure that protective finishes are not scored or damaged when cleaning.

Annually check bus bars for general condition, cleanliness, and security of all attachments and terminals. Grease, corrosion, or dirt on any electrical junction may cause the connections to overheat and eventually fail. Bus bars that present corrosion, even in limited amounts, should be disassembled, cleaned, brightened and reinstalled.

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 11. Aircraft Electrical Systems.

WARNING

TURN THE POWER OFF BEFORE CLEANING.

5.9.2 Electrical System Inspection

Required Tools:	Flashlight
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

The inspection of the electrical system must be visually made. It is not necessary to remove the parts or components of system. Do not take off if you suspect any kind of abnormal behavior.

NOTE

Remove or open all cowlings, inspection windows, access doors and baggage compartment, before starting the inspection.

5.9.2.1 Battery Inspection

Open the inspection window located on the fuselage´s nose and inspects the battery as follows:

1. Cables Condition: use a flashlight if necessary.
   a) Check the cables for general condition and attachment. Replace them if necessary.
2. Battery Condition: use a flashlight if necessary.
   - Check the battery for security and attachment.
   - Replace the battery if necessary.

CAUTION

Battery should be replace on condition, however, it is recommended to replace it every 2 years.

5.9.2.2 Wiring Harness Inspection

1. Check the condition, integrity, connection and security of the wiring harness (loose, damaged, burned) as follows:
   - Open the inspection window located on the fuselage´s nose and check the instrument panel wiring harness.
   - Inside the fuselage, check the wiring harness that goes to the engine (Fuselage and Pylon).
   - Inside the engine compartment, check the wiring harness condition.

5.9.2.3 Bilge Pump Inspection

1. General Condition: use a flashlight if necessary.
   - Check the cover (fabric) of the bilge pump. Remove the bilge pump body from its support if necessary and inspect for presence of dirty and correct operation of rotor (free rotation). Reinstall correctly after the inspection (bilge pump and cover).
2. Operational Condition: use a flashlight if necessary.

NOTE

Battery Master Switch must be OFF to complete this inspection.

- Check the correct operation of the bilge pump electrical system. Ensure the full functional of the ON/OFF switch on the instruments panel (flashing light).
- Pour water (approx. 5 liters) through the inspection window and make an operational check of the bilge pump.
- When the inspection is finished, clean the hull internally with water and remove all dirt and material loose which could obstruct the bilge pump. Drain the water from the washing using the bilge pump and clean the protection cover if necessary.

5.9.2.4 Fuses and Fuses Holders

Inspect as follows:

- Check the security of the fuse holder connections
- Inspect for presence of corrosion and evidence of overheating on fuses and fuse holders. Replace corroded fuses and clean fuse holders. If evidence of overheating is found, check for correct rating of fuse
- Check the security of fuse holder mounts
- Replace previously used spare fuses with appropriate rating fuses.

5.9.2.5 Other Components

Inspection of the components such as Elevator Electrical Trim, Instrument Panel Light, Dome Light, Nav / Strobe Lights, Landing Lights, Headphones Plugs, etc., should be performed as follows:

- Check for general condition and attachment.
- Check electrical terminals (connectors) for corrosion and general condition. Replace them if necessary.

5.9.3 Electrical System Maintenance, Repair and Overhaul

Repairs or alterations in the Electrical System are not authorized at this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

5.10 Structural Repair

Aircraft structural components are designed to perform a specific function or to serve a definite purpose. The main objective of the aircraft repair is to restore damaged parts to their original condition. Very often, replacement is the only way in which this can be done effectively.

Repairs or alterations on Structural Parts are not authorized at this time. To obtain engineering approvals for any repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br

5.11 Painting and Coatings

Super Petrel LS uses Polyurethane UHS paint as topcoat on flying surfaces as well as composite parts. Dacron fabric is used for Wings and Rudder covering.

NOTE
Please refer to the latest edition of the FAA-H8083-31 A – Aircraft Maintenance Technician Handbook, Chapter 8. Aircraft Painting and Finishing

Paint is more than aesthetics; it affects the weight of the aircraft and protects the integrity of the airframe. The topcoat finish is applied to protect the exposed surfaces from corrosion and deterioration. In addition, a properly painted aircraft is easier to clean and maintain. The exposed surfaces are more resistant to corrosion and dirt, oil does not adhere as readily to the surface.

5.11.1 Paint Code and Specification

Manufacturer: PPG

Description: Bco UHS White SPLS AIR

Composition:

Code	Quantity
Deltron D525	1.1
Deltron D528	3.9
Deltron D503	7.1
Deltron D500	1234.0

5.11.2 Painting Repairs

NOTE

It is recommended that all the following procedures be performed in a well-ventilated area, at temperatures between 68°F and 100°F (20°C - 37°C).

NOTE

Please refer to the latest edition of the FAA-H8083-31 A – Aircraft Maintenance Technician Handbook, Chapter 8. Aircraft Painting and Finishing

CAUTION

Before starting the repair, cover the windshield and doors.

Required Tools:	N/A
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

SAFETY RULES

When working with paints, thinners and solvents follow the following safety rules:

1. It is necessary to follow safety rules for working with flammable and volatile substances.
2. Working area should be properly ventilated.
3. Smoking and open flames are prohibited in the work area.
4. Use protective equipment such as goggles, gloves, respirator, etc.

CAUTION

By applying permanent protective coating, aircraft weight and balance are affected. The increases in weight depend on the type of coating and its thickness.

5.11.2.1 Puttying

- Preparing the surface for repair, sand it with 180-grit sandpaper as applicable in order to remove the brightness/gloss.
- Apply finishing pastes (Epoxy Filler, Polyester Paste with Catalyst and Gray Paste) in order to fill the cavities and interstices between the fibers of the fabric. Attempt to minimize the thickness of the repair by skimming the paste.
- Remove the excess finishing paste with a 120 – 220 grit sandpaper.
- Remove the dust with a wet cotton fabric.
- Inspect the surface being repaired thoroughly for cavities needed to be corrected. If no defects found, the surface can be primed.

5.11.2.2 Priming

- Place the part being repaired into a paint room.
- Apply one layer of Primer.
- Place the part into a compartment with a temperature at least 68 °F (20 °C) for 1 hour.
- Smooth down the surface with a 320 grit sandpaper.
- Remove the dust with a wet cotton fabric.

5.11.2.3 Painting

- Apply one layer of paint onto the surface being repaired so that it just covers the primer.
- Place the part into a compartment with a temperature at least 68 °F (20 °C) for 1 hour.
- As soon as the first layer of paint gets dry, apply the second layer of paint minimally needed to cover the first one.
- Place the part into a compartment with a temperature at least 68 °F (20 °C) for 12 hours.

5.11.2.4 Polishing

- Sand the surface that needs to be polished with 1500-grit Water Sandpaper.
- Apply Polishing Paste onto the surface and rub with smooth circular hand motions, applying light pressure.
- Continue polishing with a right-angle orbital polisher for a minimum of 2-3 passes.
- Clean the polished surface with a piece of cotton fabric in order to remove excess polishing paste.
- Apply Polishing crème to the surface with a dry cotton fabric to bring surface to a gloss. A right-angle orbital polisher can be used.

5.11.2.5 Method of Verification

- Touch the painted surfaces the finished surface should be smooth, no dents or bumps.
- Inspect painted surface visually from various viewpoints. Paint runs and unpainted areas are unacceptable. Quality of polishing should be the same as adjacent areas.

5.11.3 Corrosion, Inspection and Protection

Required Tools:	N/A
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

The information supplied here is as a general guideline only. It is by no means intended to be exhaustive, complete or authoritative.

It is important to keep the aircraft clean and to remove any collection of corrosive causing agents such as water, anti-freeze, oil, grease, dregs and other foreign matter.

To avoid damage to the finish, do not use polishing detergents. Original or equivalent corrosion prevention, if used, should be re-applied after any alteration or repair. If any trace of corrosion is detected it should be removed as soon as possible and the applicable part should be treated immediately to prevent further corrosion. Treatment consists of mechanically removing as much as possible of any corrosion by-products, applying corrosion inhibitor and replacing any original finish.

For more information in order prevent, control, identify, and treat various types of corrosion, refer to the latest edition of FAA ADVISORY CIRCULAR AC 43-13-1B, Chapter 6. Corrosion, Inspection and Protection.

NOTE

Refer to the latest edition of FAA ADVISORY CIRCULAR AC 43-4A, CORROSION CONTROL FOR AIRCRAFT for a more in-depth study on the detection and treatment of corrosion.

5.12 Revisions

Revisions to this maintenance manual can be located in the revision control page and the list of effective pages section.

5.13 Feedback Form

Reports, comments or difficulties in relation with the use of this manual are welcome by completing the FORM_SPLS_002_Continued Operational Safety Reporting Form. This form is located in the Appendix Section of this Manual or Scoda Aeronáutica's website (www.scodaeronautica.com.br). This form should be completed and sent to: engineering@scodaero.com.br

6 Line Maintenance, Repairs, and Alterations

6.1 Authorization to Perform Line Maintenance, Repairs and Alterations

Any inspection, repair, and alteration outlined in this Section should be performed if the organization or individual holds the following maintenance rating:

- LSA Repairman Maintenance Certificate
- A&P Certificate
- iRMT Training (at least Service ROTAX® Aircraft Engines Rating)
- Super Petrel LS Maintenance Training (at least Line Maintenance Super Petrel LS Rating)

Typical Tasks Considered as Line Maintenance for LSA´s Include:

1. 100-h inspection / Annual Condition Inspection,
2. Servicing of Fluids,
3. Removal and replacement of components for which instructions are provided in the maintenance manual,
4. Repair of components and structure for which instructions are provided in the maintenance manual and which do not require specialized training.

Guidance for accomplishing such maintenance, repairs, alterations, and inspections is contained in this manual and should be accomplished in accordance with the practices described in the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – ACCEPTABLE METHODS, TECHNIQUES, AND PRACTICES – AIRCRAFT INSPECTION AND REPAIR.

6.2 Line Maintenance Tasks

6.2.1 100-h Inspection / Annual Condition Inspection

Refer to Inspection´s Section of this manual for 100-hour / Annual Inspection requirements

6.2.2 Servicing of Fluids

This information gives the general servicing procedures and maintenance practices that are to be used when servicing the aircraft.

For additional detailed information concerning the unit servicing of the engine, refer to the applicable chapters of the Manufacturer's Engine Manual.

For tire pressure information, please refer to Tire Inflation Pressures Section of this Manual.

The intervals specified in this section are considered adequate to meet average requirements under normal operating conditions. It is advisable to shorten the service and maintenance intervals when operating under abnormal environmental conditions, such as high humidity and moisture, salt-water environments, dusty

atmospheric conditions and extreme temperature ranges. In salt-water areas, special care should be taken to keep the engine, accessories, and airframe clean to help prevent oxidation and corrosion.

6.2.2.1 Coolant Replacement

NOTE
This procedure should be accomplished every 2.5 years.

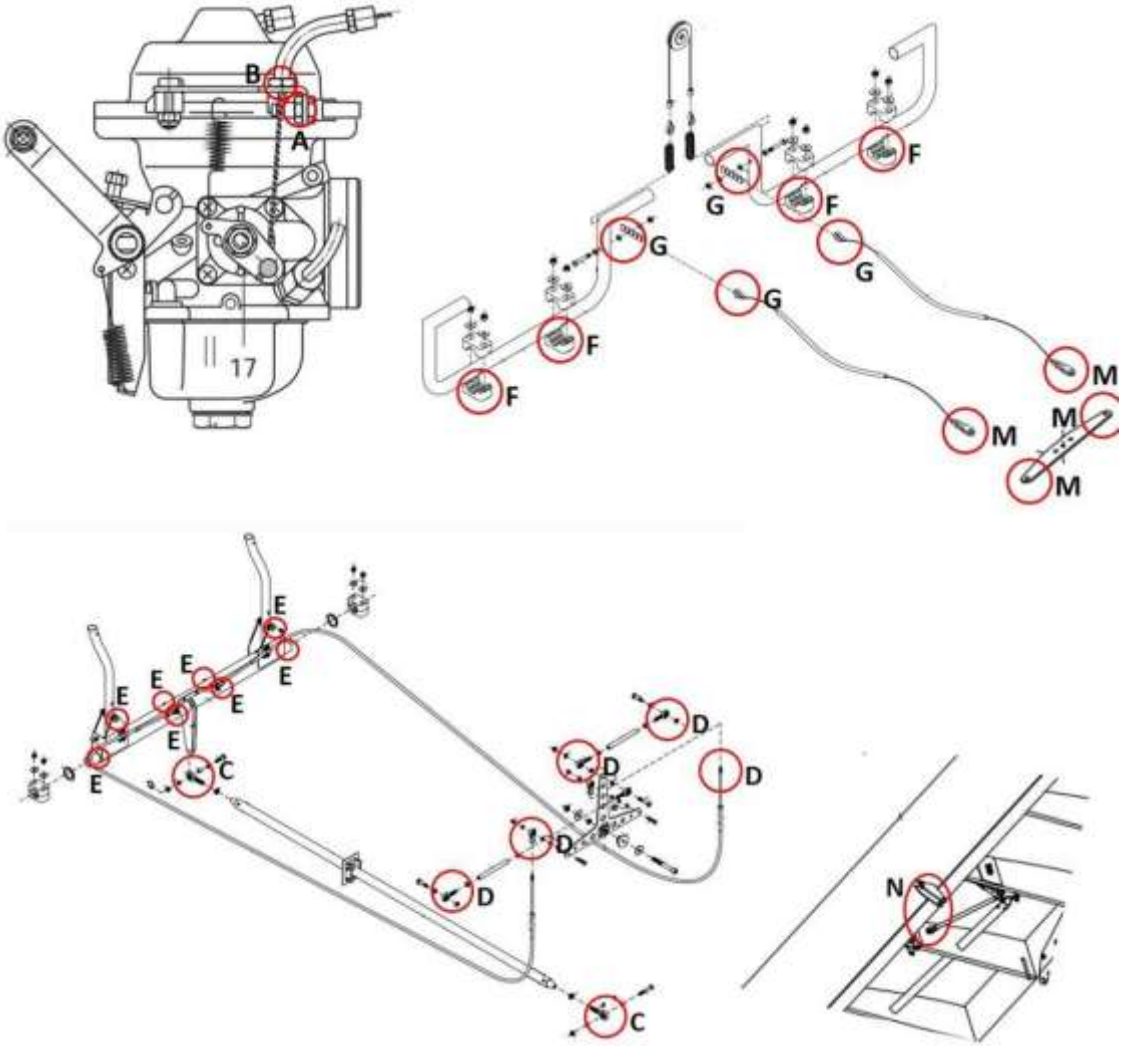
Types of coolant	As per Rotax Engine original manuals.
Aircraft manufacturer recommends the use **Honda Genuine Coolant Type 2 – All season antifreeze.**	

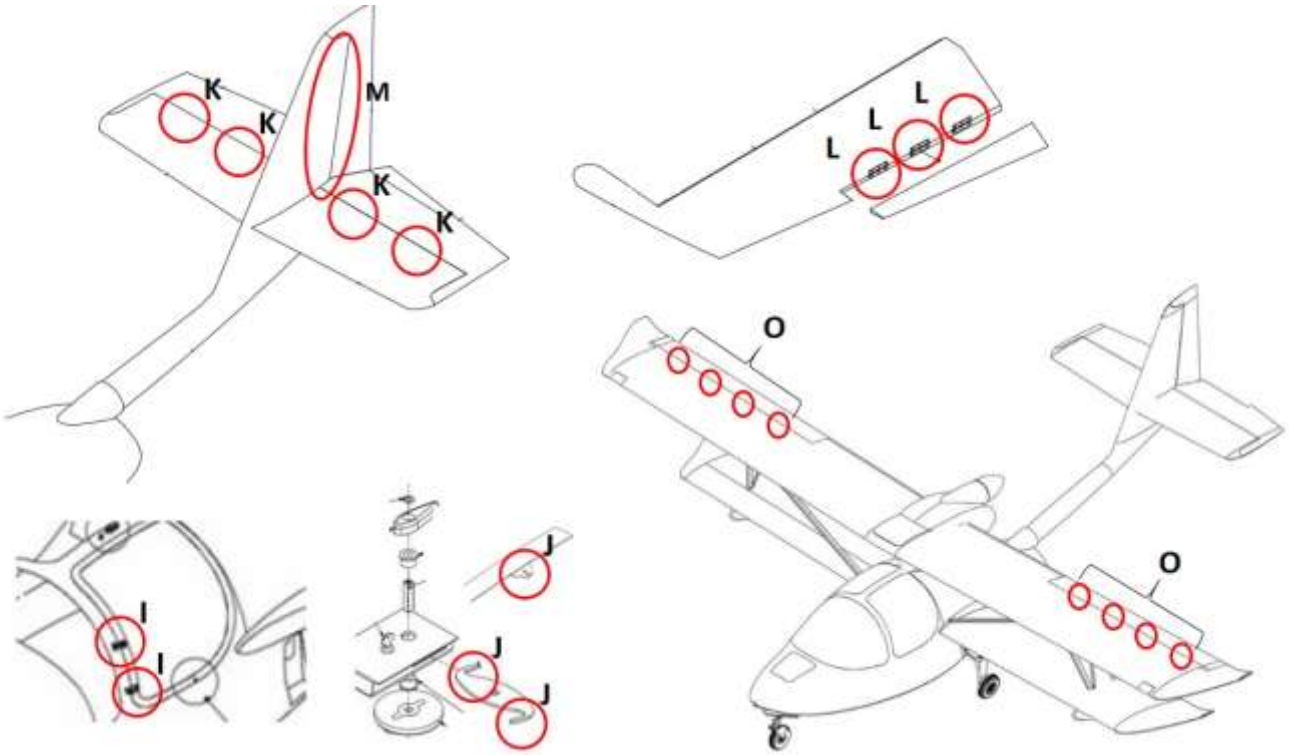
6.2.2.2 Lubrication Table

SECTION	LUBRICATION AREA	VIEW	NUMBER OF SERVICE POINTS	INTERVAL	LUBRICANT
ENGINE	Oil Reservoir	---	1	Every 50h	AeroShell Sport Pus 4
	Throttle Cable	A	2	Every 50h	Chain Lube
	Choke Cable	B	2	Every 50h	Chain Lube
FUSELAGE	Elevator Control Push-Pull Tube	C	1	Every 50h	Chain Lube
	Aileron Control (Inside Pylon)	D	3	Every 50h	Chain Lube
	Joystick Assembly (Movable Joints)	E	8	Every 50h	Chain Lube
	Pedals (Movable Joints)	F	4	Every 50h	Chain Lube
	Rudder Cables and Movable Joints	G	4	Every 50h	Chain Lube
	Landing Gear Retraction System	H	10	Every 50h	Chain Lube
	Door Hinges	I	4	Every 50h	Chain Lube
	Door Lock System	J	4	Every 50h	Nautical Grease
EMPENNAGE	Elevator (Movable Joints)	K	4	Every 50h	Chain Lube
	Trim Tab Hinges	L	3	Every 50h	Chain Lube
	Rudder Cables and Movable Joints	M	4	Every 50h	Chain Lube
WINGS	Aileron Rod End	N	2	Every 50h	Chain Lube
	Aileron Hinges	O	8	Every 50h	Chain Lube

NOSE LANDING GEAR	Axle	P	1	Every 100h	Graphite or Nautical Grease
	Articulated Joints	S	7	Every 100h	Chain Lube
MAIN LANDING GEAR	Axle	Q	2	Every 100h	Graphite or Nautical Grease
SHOCK ABSORBERS	Rod Ends	R	4	Every 50h	Chain Lube or Nautical Grease

6.2.2.3 Lubrication View

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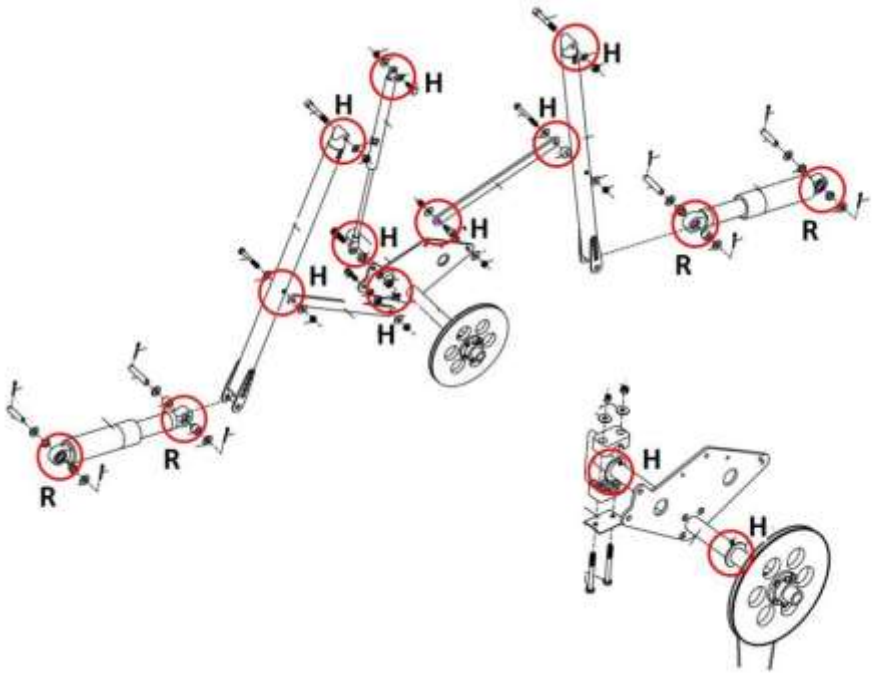
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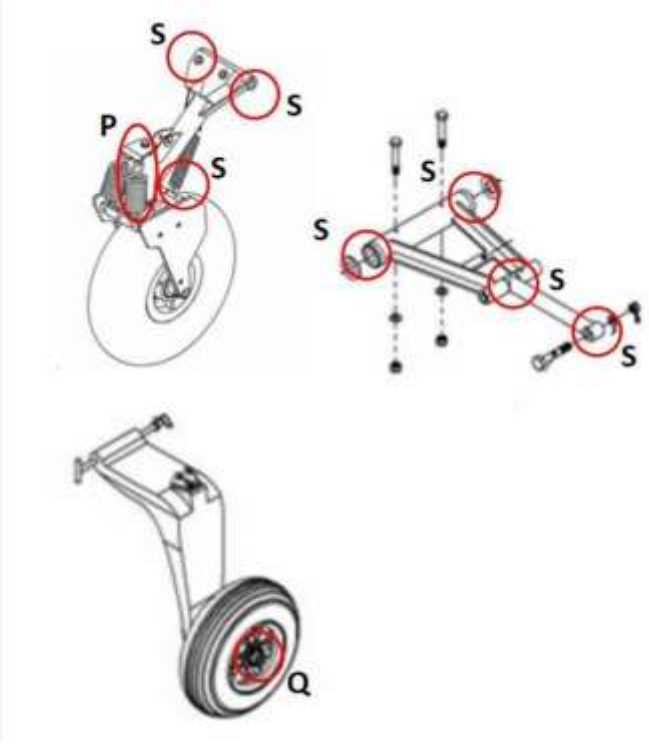

6.2.3 Removal and Replacement of Components

NOTE
Check the List of Disposable Replacement Parts for consulting Part Number and Supplier of the Items.

NOTE
SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the Advisory Circular 43.13 – 1B Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair.

6.2.3.1 Fuel Filter Replacement

Required Tools:	Ear Clamp Plier (1 pc)
	Combined Wrench 17 mm (1 pc)
	Combined Wrench 1 inch (1 pc))
	Torque Wrench (1 pc)
	Tray
Parts and Materials Required:	Inline Fuel Filter 3/8'' 85 Micron – P/N 230206ERL (912 ULS / 914 UL)
	Inline Fuel Filter 3/8'' 62 Micron – P/N FX375-M (912 iS Sport)
	Female Hose Fitting AN6 – P/N FBM1512 (All engines)
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

The following procedure is applicable for Earl´s and Andair inline fuel filter installation.

1. Remove the lower baggage compartment.
2. Close the Fuel Shut Off Valve and Fuel Selector Valve.

Figure 6-1

3. Remove the old fuel filter.

NOTE

Use a tray in order to collect the small quantity of residue fuel.

Figure 6-2

4. Install the hose fittings onto the new fuel filter. Apply a torque between **75 - 125 in-lb (8.5 - 14 N.m).**

- Torque recommended for hoses with outside diameter of 3/8 inches and Fittings - 6. Reference: FAA-H-8083-30A – Aviation Maintenance Technicians Handbook.

Figure 6-3

5. Install the new fuel filter in the fuel lines.

NOTE
Check for the flow direction that is indicated on the fuel filter housing.

Figure 6-4

6. Tighten the ear clamps.

Figure 6-5

7. Open the Fuel Shut Off Valve and Fuel Selector Valve and check for leakage.

8. Engine running test recommended prior to flight.

9. Install the lower baggage compartment.

6.2.3.2 Battery Replacement

Required Tools:	Combined Wrench 8 mm
Parts and Materials Required:	N/A
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

Super Petrel LS uses a 12-volt, 18 AMP Hour sealed lead acid or gel battery, which is located in front of the rudder pedals.

To remove and/or replace the battery, follow the steps:

1. Open the inspection door.
2. Disconnect the two battery connector leads, negative side first.
3. Remove the attachment ribbon.
4. Remove the Battery.

The battery installation follows the same steps in a reverse sequence.

WARNING

DO NOT REPLACE THE SEALED LEAD ACID BATTERY BY A WET LEAD ACID BATTERY.

6.2.3.3 Instruments

Required Tools:	As Applicable
Parts and Materials Required:	As Applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

Replacement should be made according to the Original Equipment Manufacturers Installation Manual as applicable.

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 12. Aircraft Avionics Systems.

6.2.3.4 Filling Brake System

Required Tools:	As Applicable
Parts and Materials Required:	Reservoir
	Hose
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE
This procedure should be accomplished every 5 years.

Two individuals are required to perform this inspection. Before starting, visually check the brake system for integrity and tightness.

To fill the brake system, follow the procedure described below:

1. Disconnect the oil reservoir from its support and with assistance, hold it in a position higher than the master cylinders;
2. Attach the oil-can to a brake assembly lower valve, open it and pump oil through the line (As shown below). Notice that as you are pumping oil through the brake line, bubbles of air will flow to the master reservoir. Soon the oil will reach and fill the reservoir;

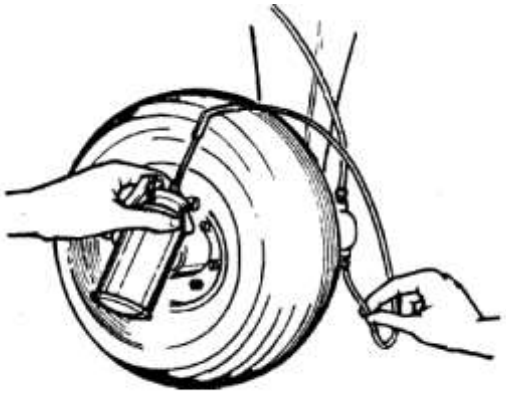

Figure 6-6

3. Close the valve, disconnect the filling tube and repeat with the other brake assembly. Ask your assistant to fill the oil reservoir with brake fluid;
4. After closing the valve, disconnect the filling tube from the oil can and leave it in an empty can;
5. Ask your assistant to pump the respective brake pedal several times and then keep it pressed while you open the valve allowing the oil and bubbles to spill out;
6. Close the valve and repeat the process. Notice that each time you repeat the process, the pedals will get harder, because the amount of air bubbles is diminishing;
7. Fill the oil reservoir, because it tends to empty;
8. Do the same process to the other brake line and when noticing that the lines are free of air bubbles, fill the reservoir as required and reinstall.

CAUTION

Be careful to avoid spilling oil, in particular, on painted parts, because the oil is corrosive and can cause damages.

6.2.3.5 Brake Pads Replacement

Required Tools:	Combined Wrench 24 mm (1 pcs)
	Combined Wrench 8 mm (1 pcs)
	Pliers
Parts and Materials Required:	Brake Pads (PB-520.026)
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

1. Lift the aircraft
2. Remove the cotter pin with the pliers and remove the castle nut. Then remove the wheel.

Figure 6-7

3. Remove the brake disc.

Figure 6-8

4. Remove the five bolts using one (1) combined wrench 8 mm and replace the brake pads.

Figure 6-9

5. Reinstall the brake disc.

6. Reinstall the wheel. Tighten the castle nut using one (1) combined wrench 24 mm until the bearing and axis are fitted. Then install the cotter pin.

CAUTION

Do not leave the castle nut tightened to the maximum in order to avoid applying force the bearing. The wheel must have free rotation.

Figure 6-10

6.2.3.6 Brake Discs Replacement

Required Tools:	Combined Wrench 24 mm (1 pcs)
	Combined Wrench 8 mm (1 pcs)
	Pliers
Parts and Materials Required:	Brake Discs
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

- For the brake discs replacement, you should follow the first three items of the procedure above. Replace the brake disc and then reinstall the wheel as explained on the sixth item of the procedure above.

Figure 6-11

6.2.3.7 Bearing Replacement

6.2.3.7.1 Main Wheels

Required Tools:	Combined Wrench 24 mm (1 pcs)
	Combined Wrench 8 mm (1 pcs)
	Pliers
	Punch Pin
	Nylon Hammer
	Steel Hammer
Parts and Materials Required:	Bearing for Main Wheels
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

1. Lift the aircraft
2. Remove the cotter pin with the pliers and remove the castle nut. Then remove the wheel.

Figure 6-12

3. Remove the old bearing. Use a punch pin and nylon hammer as shown below.

Figure 6-13

4. Install the new bearing. Use the old bearing over the new and with a steel hammer fit it in the wheel as shown below.

CAUTION

Be careful to not deform the new bearing

Figure 6-14

5. Reinstall the wheel.

6.2.3.7.2 Nose Wheel

Required Tools:	Allen Wrench 6 mm (1 pcs)
	Combined Wrench 13 mm (1 pcs)
	Slotted Screwdriver
	Pliers
Parts and Materials Required:	Bearing for Nose Gear
	Thread Lock
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

1. Lift the nose of the aircraft up.

Figure 6-15

2. Remove the nose wheel cowling located on the left side, using a slotted screwdriver.

Figure 6-16

3. Remove the cotter pin. Before removing the wheel, make a mark over the nut to the cotter pin direction in order to facilitate its installation.

Figure 6-17

4. Remove the wheel using one (1) Allen Wrench 6 mm and one (1) Combined Wrench 13 mm. Then remove the nylon bushing.

Figure 6-18

5. Replace the bearing following steps 3 and 4 from the Main Wheel bearing replacement.
6. Reinstall the nose wheel. Execute this process in reverse of the removing process.

Figure 6-19

6.2.3.8 Landing Gear Cable Inspection and Replacement

Required Tools:	As Applicable
Parts and Materials Required:	As Applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 7. Aircraft Hardware, Control Cables and Turnbuckles, Section 8. Inspection and Repair of Control Cables and Turnbuckles.

Cables are generally fabricated from carbon steel or corrosion-resistant steel wire of either flexible or non-flexible-type construction. Cables are subject to a variety of environmental conditions and deterioration. Wire or strand breakage is easy to visually recognize.

6.2.3.8.1 Cable Inspection

To assure the continued landing gear cable integrity, it is recommended to accomplish an inspection each 100 hours or annually.

Landing gear cables should be inspected for wear, corrosion, and/or distortion. Any cable assembly that has one broken wire strand located in a critical fatigue area must be replaced.

A critical fatigue area is defined as the working length of a cable where the cable runs over, under, or around a pulley, sleeve, or through a fair lead; or any section where the cable is flexed or rubbed.

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 7. Aircraft Hardware, Control Cables and Turnbuckles, Section 8. Inspection and Repair of Control Cables and Turnbuckles.

6.2.3.8.2 Cable Replacement

NOTE

Landing Gear Cables should be replaced on condition, however, it is recommended to replace them in the 2000 hours / 10 years Inspection.

Replace landing gear cables when they become worn, distorted, corroded, or otherwise damaged. Use materials of the same size and quality as the original. Standard swaged cable terminals develop full cable strength and may be substituted for the original terminals wherever practical.

LANDING GEAR CABLES REPLACEMENT TIPS (CABLES POSITION):

1. There are two cables: **Cable 1 and Cable 2.**

NOSE GEAR (Cable Length: 105 feet – 3.2 meters)

Cable 1 which has 52.5 feet (1.6 meters). This comes from the upper part of the nose gear pulley, goes to pilot side of the double pulley, passes through the single pulley (located in the aircraft floor) and goes to the upper part of the retraction lever pulley.

Cable 2 which has 52.5 (1.6 meters) comes from the lower part of the nose gear pulley, goes to the copilot side of the double pulley and goes directly to the lower part of the retraction lever pulley.

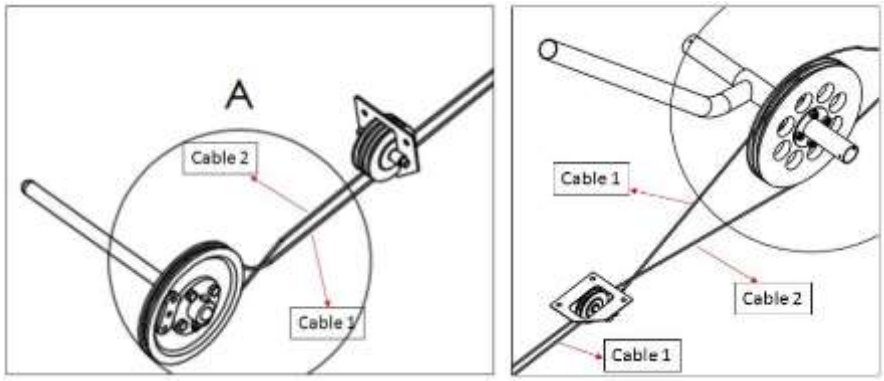

Figure 6-20

MAIN GEAR (Cable Length 145 feet (4.4 meters)

Cable 1 has 72 feet (2.2 meters). 36 feet (1.1 meters) comes from the upper part of the retraction lever pulley and passes through the single pulley (located behind the seats) and goes to the turnbuckle of the pilot side. The other 36 feet (1.1 meters) comes from the turnbuckle of the pilot side, passes through the pilot side single pulley (located in the bulkhead) and goes up to pilot side of the main pulley.

Cable 2 has 72 feet (2.2 meters). 36 feet (1.1 meters) comes from the lower part of the retraction lever pulley goes directly to the turnbuckle of the copilot side. The other 36 feet (1.1 meters) comes from the turnbuckle of the copilot side, passes through the copilot side single pulley (located in the bulkhead) and goes up to copilot side of the main pulley.

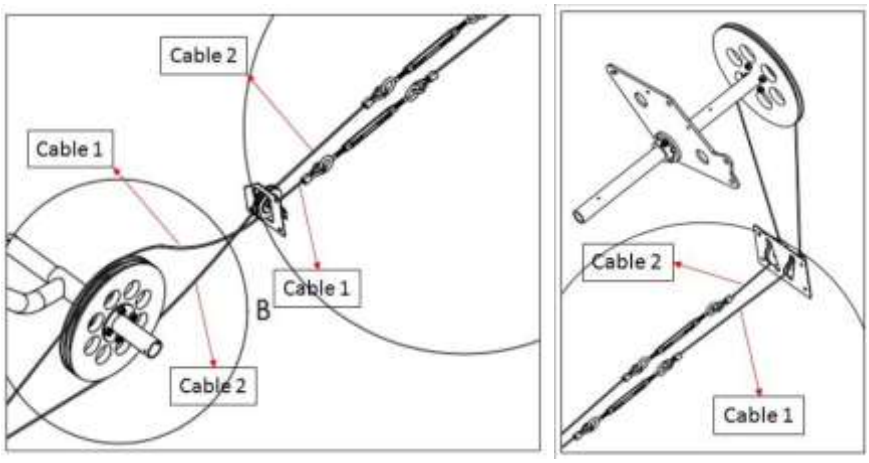

Figure 6-21

2. Lift the aircraft.
3. Lower the landing gear (DOWN position).
4. Press the nose leg linkage back against the rubber stop.

NOTE

Lock the nose gear assembly. This should be resting on a chock, simulating that it is on the ground. See picture below.

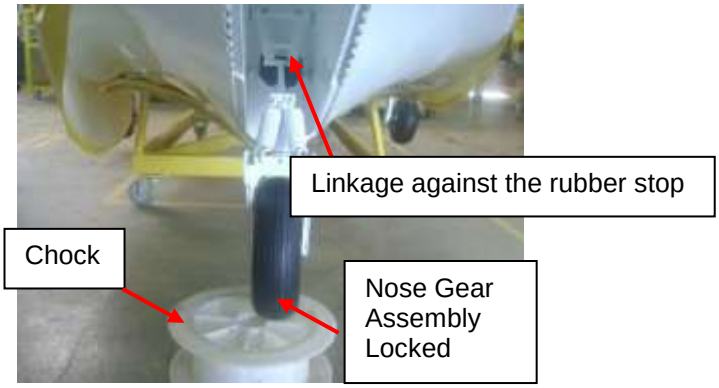

Figure 6-22

5. Loosen the screws of the clamp which is fixing the nose gear cables, without removing.
6. Cable 2 should be pulled first applying good tension. Then tighten the screw.
7. In sequence make the same process with Cable 1.
8. Lastly tighten the screw of the middle.

NOTE

Two people is recommended to perform this procedure.

NOTE

Careful should be taken with the Installation of the cables inside the clamp. The cables should be between the stainless steel and brass clamp (see picture below).

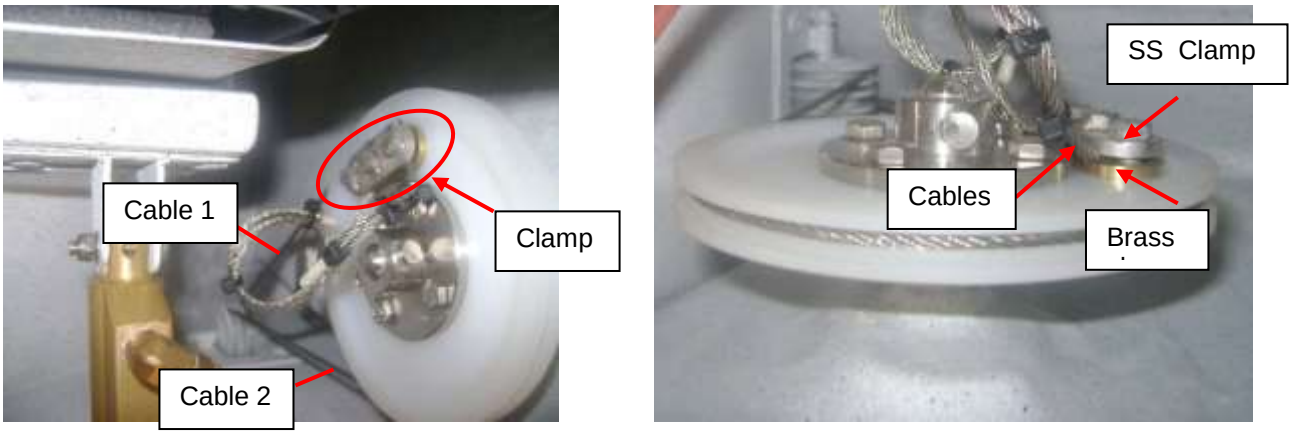

Figure 6-23

9. Retract and lower the landing gear system several times, checking for correct operation.

10. Check the correct position of the Nose Gear Pulley when cycling the landing gear system (see pictures below).

LANDING GEAR LOWERED

LANDING GEAR RETRACTED

Figure 6-24

11. It is very important to check if the cable runs properly through all the pulleys of the landing gear retraction system.

CAUTION

Crossing cables should be avoided in order to keep the correct functionality of the system.

NOTE

SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the Advisory Circular 43.13 – 1B Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair.

6.2.3.8.3 Cables Specification

DESCRIPTION	TECHNICAL SPECIFICATION	QUANTITY	SCODA PART NUMBER
Nose Gear Cable	Stainless Steel 316 Cable 3/32”	105 feet (3.2 meters)	SE-324.004
	Nicopress Oval Sleeve 3/32”	2 pieces	
Main Gear Cable	Stainless Steel 316 Cable 3/32”	145 feet (4.4 meters)	SE-323.004
	Nicopress Oval Sleeve 3/32”	4 pieces	

6.2.3.9 Shock Absorber Calibration and Replacement

Required Tools:	As Applicable
Parts and Materials Required:	As Applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 9. Aircraft Systems and Components, Section 1. Inspection and Maintenance of Landing Gear.

NOTE

Please refer to the latest edition of the FAA-H-8083-31-AMT-Airframe-Vol-2 – Aviation Maintenance Technician Handbook Airframe, Vol. 2 Chapter 13. Aircraft Landing Gear Systems.

The shock absorber of the Super Petrel LS is constructed of two telescoping cylinders or tubes that are closed on the external end. The upper cylinder is fixed to the aircraft landing gear retraction system and is free to slide in and out of the lower cylinder. The lower cylinder is fixed to the main landing gear leg.

6.2.3.9.1 Shock Absorber Inspection

Shock absorber should be inspected for evidence of leaks, cracks, and possible bottoming out of the piston, as the condition causes overloading of landing gear components and contributes to fatigue cracks. Check all bolts, bolts holes, pins, and bushings for condition, lubrication and proper tightening.

- **Calibration** of the shock absorber should be made while the aircraft is on the ground, presents symptoms of bend/sagging outward of the landing gear legs **(See Section 6.2.3.9.2 Shock Absorber Calibration).**
- **Replacement** of the shock absorber should be made when the component presents evidence of leakage **(See Section 6.2.3.9.3 Shock Absorber Replacement).**

6.2.3.9.2 Shock Absorber Calibration

Insufficient fluid or air in the shock absorber, will cause the compression stroke to not be properly limiting. The shock absorber could bottom out, resulting in impact forces to be transferred directly to the airframe through the shock absorber structure.

WARNING

THE TECHNICIAN MUST BE THOROUGHLY FAMILIAR WITH THE OPERATION OF THE HIGH-PRESSURE SERVICE VALVE FOUND AT THE TOP OF THE SHOCK ABSORBER UPPER CYLINDER.

1. Lift the aircraft. Shock absorber must be expanded, there should be zero load (weight) on it.
2. Remove the cap from the servicing valve located on the upper cylinder.
3. Using a sharp object activate the servicing valve for 1/100 seconds. This step is to make sure the valve is operating freely.
4. A threaded fitting from a controlled source of nitrogen should be screwed onto the servicing valve.
5. Inflate the shock absorber. **The servicing of nitrogen pressure 700 psi (50 bar).**

CAUTION

Shock absorber should always be inflated slowly to avoid excess heating and over inflation.

6. Once inflated, it is recommended to wait for 10 seconds.
7. Remove the controlled source of nitrogen from the servicing valve.
8. Install the cap onto the servicing valve.

NOTE

SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the FAA-H-8083-31-AMT-Airframe-Vol-2 – Aviation Maintenance Technician Handbook Airframe, Vol. 2 Chapter 13. Aircraft Landing Gear Systems.

6.2.3.9.3 Shock Absorber Replacement

NOTE

SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the Advisory Circular 43.13 – 1B Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair.

1. Lift the aircraft.
2. The landing gear should be lowered.
3. Loosen the bolt or pin of the lower cylinder.
4. Loosen the bolt or pin of the upper cylinder.
5. Remove the shock absorber.
6. Install the shock absorber. Execute this process in reverse of the removing process.

CAUTION

Do not forget to install the bushing in the shock absorber ends.

CAUTION

When installing the nuts, these should be tightened until they are secure and then back one thread. The bolt should be able to move freely in order to not restrict the mechanism.

6.2.3.9.4 Shock Absorber Specification

DESCRIPTION	QUANTITY	SCODA PART NUMBER
Shock Absorber	2	SE-323.120

6.2.3.10 Gas Spring Test and Replacement

Required Tools:	As Applicable
Parts and Materials Required:	Spring Compressor Device **(SEE APPENDIX 12.7)**
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair.

The gas spring is a pressurized device; where the piston is permanently subjected to a pressure imposed by an existing gas inside the pressure tube. The gas spring helps the landing gear retraction system to maintain its operating load and balancing.

6.2.3.10.1 Gas Spring Test

1. Lift the aircraft.
2. The landing gear should be retracted.
3. Place a weighing scale at the bottom of the landing gear grip (see picture below).

Figure 6-25

4. Pulling up the weighing scale should require minimum load of **26 lbs** (**12 kg)** before unlocking the system.

5. If the retraction landing gear system unlocks with less than **26 lbs (12 kg)** replace gas spring (**See Section 6.2.3.10.2 Gas Spring Replacement).**

6.2.3.10.2 Gas Spring Replacement

NOTE
Two people is recommended to perform this procedure.

NOTE
Considering a load of 420 Newton is require to contract the gas spring, it is recommended to use a Spring Compressor Device to help spring compression.

1. Retract the landing gear.

2. One person should fit the spring compressor device onto the upper end of the gas spring.

Figure 6-26

3. Loosen the bolts so that the spring compressor device fits on the gas spring lower end.

Figure 6-27

4. The other person should be handling the landing gear lever. It will be necessary to move the lever until fitting the spring compressor device on the gas spring.

Figure 6-28

5. As soon as the lower end of the gas spring is fitted with the spring compressor device, loosen the bolts completely. Place a tie wrap on the spring compressor device body in order to avoid inadvertent expansion.

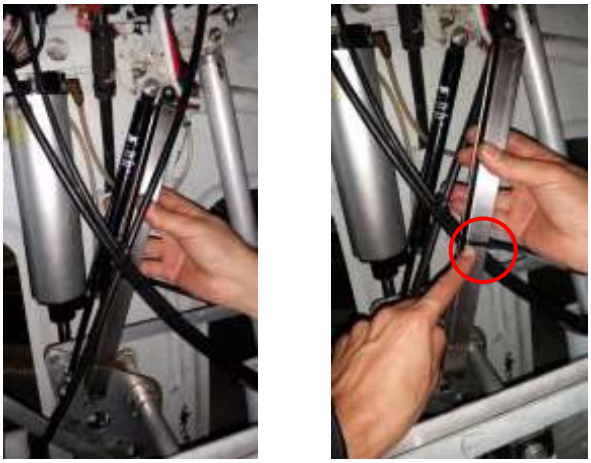

Figure 6-29

CAUTION

Be careful! After removing the gas spring the landing gear will lower abruptly. It is necessary to place a support below the landing gear leg in order to avoid falling down.

6. Take out the gas spring from the spring compressor device. Use a cloth and press down one end of the gas spring until out from the spring compressor device.

Figure 6-30

7. Place the new gas spring on the spring compressor device. Fit one end of the gas spring and press down in order to fit the other end of the gas spring.

Figure 6-31

8. Place a tie wrap on the spring compressor device body.

Figure 6-32

9. Install the gas spring. Execute this process in reverse of the removing process.

NOTE
SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the Advisory Circular 43.13 – 1B Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair.

6.2.3.10.3 Gas Spring Specification

DESCRIPTION	QUANTITY	SCODA PART NUMBER
Gas Spring	1	SE-323.050

6.2.3.11 Wiring and Connectors Replacement

Required Tools:	As Applicable
Parts and Materials Required:	As Applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE
Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 11. Aircraft Electrical Systems.

Wiring must be replaced with equivalent wire when found to have any of the following defects:

- Wiring that has been subjected to chafing or fraying, that has been severely damaged, or that primary

insulation is suspected of being penetrated;

- Wiring of which the outer insulation is brittle to the point that slight flexing causes it to crack;
- Wiring having weather-cracked outer insulation;
- Wiring that is known to have been exposed to electrolyte or on which the insulation appears to be, or is suspected of being, in an initial stage of deterioration due to the effects of electrolyte;
- Check wiring that shows evidence of overheating (even if only to a minor degree) for the cause of the overheating;
- Wiring of which the insulation has become saturated with engine oil, hydraulic fluid, or another lubricant;
- Wiring that bears evidence of having been crushed or severely kinked;
- Shielded wiring of which the metallic shield is frayed and/or corroded. Cleaning agents or preservatives should not be used to minimize the effects of corrosion or deterioration of wire shields;
- Wiring showing evidence of breaks, cracks, dirt, or moisture in the plastic sleeves placed over wire splices or terminal lugs;
- When replacing wiring, identify them properly at both equipment and power source ends.

6.2.3.12 Exhaust Tension Springs Replacement

Required Tools:	As Applicable
Parts and Materials Required:	As Applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

Tension springs should be replaced every 50 hours during engine inspection.

CAUTION

Due to its pusher configuration, tension springs installed on Super Petrel LS´s muffler system are specific. Market tension springs shall not meet requirements.

6.2.3.12.1 Tension Springs Replacement

Replace the springs as explained below:

1. Use a piece of rope to loop around one end of the spring to allow for the release of tension while removing spring hook.
2. Check the spring hook for wear. It is possible to find hooks worn out due the friction with the spring. If necessary, repair the hook using TIG welding method and stainless-steel material.
3. Install the new spring reversing the process of removal.
4. After installation of each spring, apply high temperature silicone.

Figure 6-33

6.2.3.12.2 Tension Springs Specification

DESCRIPTION	TECHNICAL SPECIFICATION	QUANTITY	SCODA PART NUMBER
Tension Springs	Material: Spring Steel Length Inside Hooks: 53 mm Wire Diameter: 2 mm Outside Diameter: 16.5 mm Gap Opening: 6 mm	12	SE-412.002-2

6.2.3.13 Exhaust Muffler Inspection and Replacement

Required Tools:	As applicable
Parts and Materials Required:	As applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices.

6.2.3.14 200 hours Inspection

- Remove the engine´s cowling.
- Loosen the nuts of the exhaust pipes without removing them.
- Remove the tension springs (Use as reference the Tension Spring Replacement Section).

CAUTION

As soon as the tension springs are removed, the muffler can falling.

- Remove the muffler.
- Inspect the muffler for cracks and fatigues inside the component, loosing particles, etc. If any malfunction is

suspected perform an inside visual inspection using Borescope.

- If no evidence of malfunction is detected, reinstall the muffler.
- If evidence of malfunction is detected, replace the muffler. Install the new muffler following the process in reverse of the removing process **(See Section 6.2.3.15 Muffler Replacement).**

6.2.3.15 Muffler Replacement

- Install the new exhaust muffler.

CAUTION

Be aware that locked up stresses cause cracks.

CAUTION

Careful should be taken with the free space between the muffler and hoses.

CAUTION

All ball joints have to be greased regularly with heat resistant lubricant (e.g. ANTI-SEIZE LOCTITE or PERMATEX 1315°C / 2400°F) to avoid gripping and seizing of the joints.

- Install the tension springs.
- After setting muffler on the correct position, tighten the nuts of the exhaust pipes.
- Apply high temperature silicone in each tension spring.

NOTE

Exhaust Muffler should be replaced on condition.

6.2.3.16 Muffler Specification

DESCRIPTION	QUANTITY	SCODA PART NUMBER
Exhaust Muffler	1	SE-412.005-3

6.2.3.17 Hoses and Lines

Required Tools:	As applicable
Parts and Materials Required:	As applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

NOTE

Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices.

Generally hoses are manufactured from synthetic rubber, their limited service life depends on factors such as age, shelf life, temperature (ambient and fluid), and other environmental conditions.

6.2.3.17.1 Hose and Line Inspection

To assure the continued hose and line integrity, it is recommended to accomplish an inspection each 100 hours or annually.

Hoses and lines should be inspected for leakage, cracks, kinks, and security of mounting. Check clamps for tightness and condition. Ensure that hoses and lines do not interfere with adjacent equipment or lines. Make sure that they are not kinked, and not in contact with hot, moving parts or sharp edges.

6.2.3.17.2 Hose and Line Replacement

NOTE

Hoses and lines should be replaced on condition, however, it is recommended to replace them in the 1000 hours / 5 years Inspection.

When replacement of a flexible line is necessary, use the same type, size, part number, and length of hose as the line to be replaced. During the reinstallation of the hose assemblies, consider the following precautions:

- Ensure the hose is not twisted. High pressures applied to a twisted hose can cause failure of the hose or loosening of the fitting.
- Provide a large bend radius (as much as allowable), however, never use a bend radius less than the minimum specified by the hose manufacturer.
- Do not attempt to straighten a hose having a bend in it as this could result in damage to the hose. Rubber hoses will take a permanent set during extended service periods. Care should also be taken during removal and reinstallation of such hoses to assure the are not bent excessively and that they are returned to their original position.

NOTE

SCODA AERONAUTICA cannot accept any responsibility for the quality of work performed. Please refer to the last revision of the Advisory Circular 43.13 – 1B Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair.

6.2.3.17.3 Hoses and Lines Specification

AIRCRAFT SYSTEM	DESCRIPTION	TECHNICAL SPECIFICATION	SCODA PART NUMBER
Fuel System	Selector Valve Lines **(All)** Shut Off Valve Lines **(All)**	3/8'' SAE30R7	MP-900.232
	Return Line **(912 ULS)** Manifold Line **(912 ULS / 914 UL)**	3/16'' SAE30R7	MP-900.397
	Fuel Drain Line **(All)**	1/4'' SAE30R7	MP-900.412
	Return Line **(914 UL)** Flow Line **(914 UL)**	5/16'' SAE30R7	MP-900.431
	Return Line **(912 iS Sport)** Flow Line **(912 iS Sport)**	3/8'' SAE30R2	2556-6
Oil System	Input Line **(All)** Output Line **(All)**	8C6H 1/2'' SAE100R6	MP-900.653
	Turbocharger Return Line **(914 UL)**	5C6H 5/16'' SAE100R6	MP-900.573
Coolant System	Expansion Tank Output Hose	Clear Hose 1/4''	MP-900.047
	Radiator Output Hose	Molded Coolant Hose Gates 20002	PE-413.022
	Water Pump Output Hose	Molded Coolant Hose Gates 21878	PB-413.005-1
	Expansion Tank Output Hose	Molded Coolant Hose Gates 20259	PB-413.020-1
	Radiator Input Hose	Molded Coolant Hose Gates 21872	PB-413.021-1
Bilge Pump	Bilge Pump Drain Hose	Clear Hose 3/4''	PB-621.002
Cabin Heater	Radiator Input Hose Radiator Output Hose	1/4'' SAE30R7	MP-900.412
Ballast Tank	Ballast Tank Output Hose	Clear Hose 1/2''	MP-900.034

6.2.4 Repairs of Components

6.2.4.1 Fabric Covering Minor Damages

Required Tools:	As applicable
Parts and Materials Required:	Butyrate Dope
	Thinner
	Dacron Fabric 1.8 OZ
	Cotton Braid 8 mm White
	Nylon Sewing
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

This section is intended for repairing of small holes or even minor damages in the Super Petrel LS fabric covered components.

All materials used to make repairs to the fabric covering must be of a quality at least equal to the original material and the repair methods must be made in a manner that will return the fabric covering to its original condition.

NOTE
Please refer to the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices, Chapter 2. Fabric Covering.

NOTE
Fabric covering should be replaced on condition.

NOTE
Major Repairs or Alterations on Fabric Covering are not authorized at this time. To obtain engineering approvals for any Major Repairs or Alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br

6.2.4.2 Repair of Non-Structural Composite Components

Required Tools:	As applicable
Parts and Materials Required:	As applicable
Type of Maintenance:	Line Maintenance
Level of Certification:	LSRM, A&P

Damage to non-structural composite components may be repaired using techniques described in the latest edition of the FAA ADVISORY CIRCULAR AC 43.13-1B – Acceptable Methods, Techniques and Practices

NOTE
For further information regarding repair of Non-Structural Composite Components please contact Scoda Aeronáutica at engineering@scodaero.com.br

6.2.4.3 Stop Drilling Cracks

Stop Drilling Cracks procedures are not authorized at this time. To obtain engineering approvals for any Stop Drilling Cracks procedures, please contact Scoda Aeronáutica at engineering@scodaero.com.br

6.2.5 Alterations

6.2.5.1 Compliance with Manufacturer's Service Directives

Service directives are issued in the form of (NOA) Notice of Corrective Actions (Safety Alert, Service Bulletin or Notifications). All NOA will be primarily published online and readily accessible on http://www.scodaeronautica.com.br/avioes/index.php?pagina=blog. In addition, these will be sent to the email address of the known Super Petrel LS Owner / Operators.

7 Heavy Maintenance, Repairs, and Alterations

7.1 Authorization to Perform Heavy Maintenance, Repairs and Alterations

No heavy maintenance, major repairs or alterations, as outlined in ASTM F2483, FAR 23, or in this manual are authorized at this time.

To obtain engineering approvals for any major repairs or alterations, please contact Scoda Aeronáutica at engineering@scodaero.com.br.

7.2 Heavy Maintenance Tasks (Not authorized at this time)

- Repair of Components or Aircraft Structure
- Alterations of Components or Aircraft Structure

8 Overhaul

8.1 Authorization to Perform Overhaul

No Overhauls as outlined in ASTM F2483, FAR 23, or in this manual are authorized at this time.

NOTE
For Engine Overhaul, refer to the engine manual for a list of Rotax approved service centers

9 Major Repairs and Alterations

9.1 All major repairs or alterations made to aircraft subsequent to its initial design and production acceptance testing to applicable ASTM standards and sale to a consumer are evaluated relative to the requirements of the applicable ASTM design and production specification(s).

9.2 Scoda Aeronáutica Ltda will provide a written affidavit that the aircraft being altered will still meet the requirements of the applicable ASTM design and performance specification subsequent to the alteration through a Letter of Authorization (LOA).

9.3 Scoda Aeronáutica Ltda will provide written instructions and diagrams on how, who, and the level of certification needed to perform the alteration or repair through a Letter of Authorization (LOA).

9.4 Scoda Aeronáutica Ltda will provide information to the owner of the aircraft for the documentation of the alteration in the aircraft´s records.

MAJOR REPAIRS AND ALTERATIONS PROCEDURE

1. Owner/Operator will request a LOA using the FORM_SPLS_005_LSA Major Repair and Alterations MRA Form, which is located on the http://www.scodaeronautica.com.br/avioes/index.php?pagina=blog. This form should be sent to engineering@scodaero.com.br.

2. Scoda Aeronáutica Ltda will analyze the MRA Form and issue a LOA with approval or not.

3. If LOA is approved, Owner/Operator should demonstrate that the alteration or repair described in the LOA was performed correctly and the aircraft is in a condition for safe operation.

10 Task-Specific Training

10.1 Scoda Aeronáutica Ltda may require task-specific training in order to accomplish a task in either the maintenance manual or in an authorization for a major repair, maintenance, or alteration. The FAA does not give approval to these task-specific programs for SLSA. Scoda Aeronáutica Ltda may specify any task-specific training it determines is appropriate to accomplish the task.

11 Safety Directives

11.1 A Super Petrel LS may have a safety directive issued against an aircraft or component part. Scoda Aeronáutica Ltda issues the directive as outlined in the last revision of the ASTM F2295 – Continued Airworthiness in for of (NOA) Notice of Corrective Actions (Safety Alerts, Service Bulletins or Notifications).

11.2 Scoda Aeronáutica Ltda is responsible for providing the applicable instructions to comply with any NOA, which will include:

11.2.1 A list of the tools needed to accomplish the task.

11.2.2 A list of the parts needed to perform the task.

11.2.3 Type of maintenance (Line or Heavy Maintenance).

11.2.4 The level of certification needed to accomplish the task (A&P, LSRM).

11.2.5 Detailed instructions and diagrams as needed to perform the task.

11.2.6 Method to test / inspect to verify the task was accomplished properly.

11.3 Notice of Corrective Actions are considered mandatory task in order to maintain a condition of safe operation and compliance with the applicable ASTM design specification.

12 Appendixes

12.1 Improvement or Corrections

In order to report any improvements or corrections in this manual, please advise to the following email address: engineering@scodaero.com.br

12.2 Aircraft Registration Form

FORM_SPLS_001	AIRCRAFT REGISTRATION FORM	SCODA aeronautica

REGISTRATION TYPE		
☐ New Aircraft (Original Owner)	☐ Change of Ownership	
AIRCRAFT DETAILS		
Serial Number:	Model:	Registration Number:
Name of Dealer or Previous Owner:		
Date of Delivery or Change of Ownership:		
The Aircraft is Used For:	☐ **Training:** Flight school or similar activity.	
	☐ **Personal Use:** Operated for recreational purposes.	
	☐ **Special Use:** Rentals, Aerial Works, etc.	
OWNER DETAILS		
Name:		
Full Address:		
Country:		
Contact Phone Number:		
Email Address:		

12.3 Continued Operational Safety Reporting Form

FORM_SPLS_002	CONTINUED OPERATIONAL SAFETY REPORTING FORM	SCODA aeronáutica

AIRCRAFT DETAILS		
Serial Number:	Model:	Registration Number:
Total Flight Time (*Hobbs*):		
OWNER DETAILS		
Name:		
Country:		
Email Address:		
DESCRIPTION OF FLIGHT SAFETY ISSUE OR SERVICE DIFFICULTY		

** Attach any pictures or file that might complete or support your communication*

FOR SCODA AERONÁUTICA LTDA USE ONLY	
Log Number:	Received Date:

12.4 Warranty Claim Form

FORM_SPLS_003	WARRANTY CLAIM FORM	SCODA aeronautica

AIRCRAFT DETAILS		
Serial Number:	Model:	Registration Number:
Total Flight Time (*Hobbs*):		
OWNER DETAILS		
Name:		
Country:		
Email Address:		
THE AIRCRAFT, PARTS OR COMPONENTS WERE INSPECTED BY OR ARE BEING INSPECTED BY A NON-AUTHORIZED MANUFACTURE´S MAINTENANCE CENTER?	☐ YES ☐ NO	
EVENT REPORT		
Date:	Time:	The issue occurred: ☐ ON LAND ☐ ON WATER ☐ IN FLIGHT
DESCRIPTION OF FLIGHT SAFETY ISSUE OR SERVICE DIFFICULTY		
** Attach any pictures or file that might complete or support your communication*		

FOR SCODA AERONÁUTICA LTDA USE ONLY	
Log Number:	Received Date:

12.5 One Hundred (100) Hours / Annual Condition Inspection Form

100 HOURS / ANNUAL CONDITION INSPECTION CHECKLIST		
Owner Name:	**Inspector Name** (LSRM or A&P):	
Aircraft Make / Model: Scoda Aeronáutica Ltda / Super Petrel LS		**S/N:**
Engine Make / Model: Rotax Aircraft Engines /		**S/N:**
Hours Flown (Hobbs):	**Date:**	

Before Starting the inspection:	• Remove or open all cowlings, inspection windows, access doors and baggage compartment.
	• Clean the aircraft, if necessary.
	• Sign all the applicable items and N/A for non-applicable items.

NOTE

Lubrication of components and parts, please refer to the Lubrication Table Section of this Manual.

Item	Description	Inspection		Chapter Ref.	Carried out by	Inspected by
		Special	100 hours			
1. ENGINE						
NOTE *Refer to the Recommended Fastener Torque Values Section of this Manual*						
1.1	Re-Torque and check the condition of the firewall bolts ***Applied for 912 iS Sport, 912 ULS (See the Recommended Fastener Torque Values Section of this Manual 5.1.8)***	**First 25 h**	✓	**5.4.2.2** Sec. 1		
1.2	Re-Torque and check the condition of the firewall bolts ***Applied for 914 UL (See the Recommended Fastener Torque Values Section of this Manual 5.1.8)***	**First 25 h**	✓	**5.4.2.2** Sec. 2		
1.3	Re-Torque and check the condition of the engine suspension frame bolts ***Applied for 912 ULS, 914UL and 912 iS Sport (See the Recommended Fastener Torque Values Section of this Manual 5.1.8)***	**First 25 h**	✓	**5.4.2.2** Sec. 3		
1.4	Inspect visually the engine cowlings for cracks, burns, damaged protections, general condition of fasteners, asbestos, support of oil and water cooler, rubbers in general, engine mounts and attachment of protection grille.		✓	**5.4.2.1**		
1.5	Check visually the inline fuel filter for general condition (leakage and attachment).		✓	**5.5.2**		
1.6	Replace the inline fuel filter.		**200 Hours**	**6.2.3.1**		
1.7	Check visually the fuel system for leakage.	**First 25 h**	✓	**5.5.2**		
1.8	Check visually the shut off valve for correct operation.	**First 25 h**	✓	**5.5.2**		
1.9	Check visually the selector valve for correct operation.	**First 25 h**	✓	**5.5.2**		
1.10	Re-tighten hoses clamps of the cooling system.	**First 25 h**	✓	**5.4.2.3**		
1.11	Check visually the carburetor heater for correct operation **(if installed). *Only 912 ULS***	**First 25 h**	✓	**5.4.2.5**		
1.12	Check visually the muffler and pipes for general condition and attachment.	**First 25 h**	✓	**5.4.2.4 Sec. 3**		
1.13	Remove the muffler for detailing inspection.		**200 Hours**	**5.4.2.4 Sec. 3**		
1.14	Replace the tension springs of exhaust. ***Only 912 iS Sport, 912 ULS.***	**Every 50 h**	✓	**5.4.2.4 Sec. 4**		
1.15	Check the throttle for correct operation and free movement.	**First 25 h**	✓	**5.4.2.6 Sec. 1**		
1.16	Check the choke for correct operation and lock. ***(912 ULS, 914 UL).***		✓	**5.4.2.6 Sec. 2**		

Item	Description	Inspection		Chapter Ref.	Carried out by	Inspected by
		Special	100 hours			
2. PROPELLER						
NOTE *Inspection, maintenance, repair, removal or installation of FLASH -2, refer to the latest revision of the Instruction Manual for FLASH Propeller Range from DUC.*						
2.1	Remove the spinner and check for cracks and general condition.	**First 25 h**	✓	**5.6.2 Sec. 3**		
2.2	Check manually the fixation of the propeller.	**First 25 h**	✓	**5.6.2 Sec. 2**		
2.3	Check visually the entire propeller without disassembly (blade root, Inconel leading edge, blade surface, hub, etc.) for general condition.	**First 25 h**	✓	**5.6.2**		
2.4	Remove the bolts safety wire of the propeller.		✓	**5.6.2 Sec. 1**		
2.5	Check the proper tightening of the bolts.		✓	**5.6.2 Sec. 1**		
2.6	Install the safety wire in the propeller bolts.		✓	**5.6.2 Sec. 1**		
2.7	Reinstall the spinner and check the fixation.	**First 25 h**	✓	**5.6.2 Sec. 3**		
2.8	Perform a propeller dynamic balancing: **Propeller Balancing Time: _____** **IPS (INITIAL) _____** **IPS (FINAL) _____** **Weight 1 _____ Position _____** **Weight 2 _____ Position _____**		✓	**5.6.5**		
3. LANDING GEAR SYSTEM – *Before starting the inspection lift the aircraft, if necessary*						
3.1	Check visually the nose gear (bolts, rubbers, tension cables, nose gear lock, looseness, bending, cracks and wear). Check if the nose gear spins freely on vertical shaft. Check the correct operation of nose gear doors.	**First 25 h**	✓	**5.3.4.1.1 Sec. 1**		
3.2	Replace the bearings of the nose and main landing gear.		✓	**6.2.3.7**		
3.3	Check visually the condition of nose gear doors for attachment, hinges and general condition.	**First 25 h**	✓	**5.3.4.1.1 Sec. 2**		
3.4	Check the nose gear springs for attachment, wear and looseness.	**First 25 h**	✓	**5.3.4.1.1 Sec. 2**		
3.5	Check visually the main landing gear for cracks, excessive looseness, attachment, loose or damaged bolts, and general condition of wheel.	**First 25 h**	✓	**5.3.4.1.2 Sec. 1**		
3.6	Check if the retraction system cable is tensioned.	**First 25 h**	✓	**5.3.4.1.3**		
3.7	Check the safety wires of the turnbuckles for general condition.	**First 25 h**	✓	**5.3.4.1.3**		
3.8	Inspect the landing gear retraction system (retract and lower), check it for correct operation, looseness, cracks, bend and maximum strength for retracting.	**First 25 h**	✓	**5.3.4.1.3**		
3.9	Check the gas spring for wear, looseness, leakage, corrosion and correct operation.		✓	**5.3.4.1.5**		
3.10	Check the lock resistance (rubber band) of landing gear lever.	**First 25 h**	✓	**5.3.4.1.3**		
3.11	Check the position sensor of the landing gear for correct operation.	**First 25 h**	✓	**5.3.4.1.3**		
3.12	Check visually the tires for condition, cuts, excessive wear and/or uneven and slippage in the wheel – replace if necessary. Check the pressure – calibrate with recommended pressure (Check the Tire Inflation Pressure Section of the POH).	**First 25 h**	✓	**5.3.4.1.4 Sec. 1, 2**		

Item	Description	Inspection		Chapter Ref.	Carried out by	Inspected by
		Special	100 hours			
3.13	Check the hoses of the brake system for leakage and general condition.	**First 25 h**	✓	**5.3.4.1.4 Sec. 3**		
3.14	Check the condition of the Brakes hydraulic fluid – **change every 5 years.**		✓	**5.3.4.1.4 Sec. 4 6.2.3.4**		
3.15	Check visually the condition of the brake pads. Replace them if necessary.		✓	**5.3.4.1.4 Sec. 5**		
3.16	Check visually the discs for cracks and permanent deformations. Replace if necessary. Check the bearings condition, free rotation of wheel and play.		✓	**5.3.4.1.3 Sec. 1 6.2.3.6**		
3.17	Check visually the shock absorber for corrosion, wear, leakage and attachment. Clean the shock absorber cylinder.	**First 25 h**	✓	**5.3.4.1.5**		
3.18	Check visually the general condition of the rubber foam of the housing of main landing gear leg.	**First 25 h**	✓	**5.3.4.1.2**		
	4. UPPER WINGS					
4.1	Re-Torque the front and rear fixation bolts of the upper wings. ***(See the Recommended Fastener Torque Values Section of this Manual 5.1.8)***	**First 25 h**	✓	**5.3.2.2.1 Sec. 1**		
4.2	Check visually the wing surface for damages, denting and general condition of coating (fabric).	**First 25 h**	✓	**5.3.2.2.2 Sec. 2**		
4.3	Check visually the general condition and attachment of the main struts, inner struts (N-Struts) and jury strut.	**First 25 h**	✓	**5.3.2.2.3 Sec. 1, 2**		
4.4	Check the attachment and general condition of the pitot tube.	**First 25 h**	✓	**5.3.2.2.3 Sec. 3**		
4.5	Check visually the aileron surface for damages and paint damages.	**First 25 h**	✓	**5.3.5.1.1 Sec. 1**		
4.6	Check visually the drain holes of aileron for obstruction.	**First 25 h**	✓	**5.3.5.1.1 Sec. 2**		
4.7	Check the aileron for freedom of operation, hinges and looseness.	**First 25 h**	✓	**5.3.5.1.1 Sec. 3**		
4.8	Check visually the bell-crank of the aileron.	**First 25 h**	✓	**5.3.5.1.1 Sec. 3**		
4.9	Check the Teleflex cable for wear, looseness and correct operation.	**First 25 h**	✓	**5.3.5.1.1 Sec. 3**		
4.10	Check visually the winglets for attachment, cracks and dent.	**First 25 h**	✓	**5.3.2.2.1 Sec. 4**		
4.11	Check the looseness of wings suspension. Move the wings tips upward-downward, frontward-rearward.		✓	**5.3.2.2.1 Sec. 1**		
	5. LOWER WINGS					
5.1	Re-Torque the rear fixation bolts of the lower wings. ***(See the Recommended Fastener Torque Values Section of this Manual 5.1.8)***	**First 25 h**	✓	**5.3.2.2.2 Sec. 1**		
5.2	Check visually the wing surface for damages, denting and general condition of coating (fabric). Check the general condition of registration number (detachment).	**First 25 h**	✓	**5.3.2.2.2 Sec. 2**		
5.3	Check visually the fuel tanks (lower wings leading edge) for cracks, leakage and general condition.	**First 25 h**	✓	**5.3.2.2.2 Sec. 3**		
5.4	Check the general condition and correct operation of the fuel tanks filler caps.	**First 25 h**	✓	**5.3.2.2.2 Sec. 3**		
5.5	Check the header tank for leakage, connection and general condition.	**First 25 h**	✓	**5.3.2.2.2 Sec. 3**		
5.6	Check visually the output of the fuel tanks vent for obstruction.	**First 25 h**	✓	**5.3.2.2.2 Sec. 4**		
5.7	Check visually the condition of the floaters and winglets (attachment, cracks and dents).	**First 25 h**	✓	**5.3.2.2.2 Sec. 6**		
5.8	Check visually the landing gear legs housing for general condition.	**First 25 h**	✓	**5.3.2.2.2 Sec. 7**		

Item	Description	Inspection		Chapter Ref.	Carried out by	Inspected by
		Special	100 hours			
6. FUSELAGE						
6.1	Check visually the fuselage surface for damages, cracks, denting and general condition.	**First 25 h**	✓	**5.3.1.2.1 5.3.1.2.2 5.3.1.2.3**		
6.2	Inspect visually for impacts or damage of the hull internal and external part, canopy structure, windshield and doors.		✓	**5.3.1.2.4**		
6.3	Check visually the canopy condition for cracks, scratch and other damages on the door hinges. Check the snap vents for operation condition.	**First 25 h**	✓	**5.3.1.2.5**		
6.4	Check the door locking system for operation condition.	**First 25 h**	✓	**5.3.1.2.5 Sec. 4**		
7. EMPENNAGE						
7.1	Check visually the tail boom surface for damages, cracks and denting. Check the condition of horizontal stabilizer attachment with vertical stabilizer.	**First 25 h**	✓	**5.3.3.2 Sec. 1**		
7.2	Check visually for general condition of the rudder coating (fabric).	**First 25 h**	✓	**5.3.5.1.2 Sec. 1**		
7.3	Check the elevator for free operation, hinges and looseness.	**First 25 h**	✓	**5.3.5.1.3 Sec. 3**		
7.4	Check visually the drain holes of elevator and rudder for obstruction.	**First 25 h**	✓	**5.3.5.1.2 Sec. 2 5.3.5.1.3 Sec. 2**		
7.5	Check visually the elevator trim tab for attachment and correct operation.	**First 25 h**	✓	**5.3.5.1.3 Sec. 3 5.3.5.1.2 Sec. 3**		
7.6	Check for looseness of elevator, rudder and trim tab.	**First 25 h**	✓	**5.3.5.1.2 Sec. 3 5.3.5.1.3 Sec. 3**		
7.7	Check visually all the nuts, tail bolts, control rods, bell-crank attachment, and safety wires.	**First 25 h**	✓	**5.3.5.1.3 Sec. 1**		
7.8	Re-Torque the empennage fixation bolts. ***(See the Recommended Fastener Torque Values Section of this Manual 5.1.8)***		**200 Hours**	**5.3.3.2 Sec. 3**		
7.9	Check visually the hinges, pins, rod of elevator trim tab for general condition.	**First 25 h**	✓	**5.3.5.1.3 Sec. 3**		
7.10	Check visually the rudder control cables and the castle nut.	**First 25 h**	✓	**5.3.5.1.2 Sec. 3**		
8. COCKPIT						
8.1	Check visually the battery electrical cables for condition and attachment – replace them if necessary.	**First 25 h**	✓	**5.9.2.1 Sec. 1**		
8.2	Check visually the battery for attachment and security.	**First 25 h**	✓	**5.9.2.1 Sec. 2 6.2.3.2**		

Item	Description	Inspection		Chapter Ref.	Carried out by	Inspected by
		Special	100 hours			
		Special	100 hours			
8.3	Check visually the condition and integrity cables, connections and security of wire that compose the wiring – replace them if necessary.		✓	**5.9.2.2**		
8.4	Inspect visually if the panel has all necessary´s placards and are readable.		✓	**5.8.2 Sec. 1**		
8.5	Check visually the safety belts for condition, attachment and security. Replace if necessary.		✓	**5.3.1.2.7**		
8.6	Check visually the upholstery condition and seats pins.		✓	**5.3.1.2.6**		
8.7	Check the fire extinguisher (Inspect according to the manufacturer maintenance instructions).	**First 25 h**	✓	**5.3.1.2.8**		
8.8	Check the joysticks for freedom of operation. Check for any presence of objects/FOD in the hull internal part.	**First 25 h**	✓	**5.3.5.1.4 Sec. 1**		
8.9	Check the control surfaces for deflections and looseness.	**First 25 h**	✓	**5.3.5.1**		
8.10	Check the pedals for movement strength, joints safety, general condition and cables attachment.	**First 25 h**	✓	**5.3.5.1.4 Sec. 2**		
8.11	Check the instrument panel for attachment and general condition.	**First 25 h**	✓	**5.8.2 Sec. 1**		
8.12	Check visually the attachment, condition and general condition of the instruments.	**First 25 h**	✓	**5.8.2 Sec. 2**		
8.13	Check the dome and instrument panel light for correct operation.	**First 25 h**	✓	**5.9.2.5**		
8.14	Check the Dimmer Lights for correct operation.	**First 25 h**	✓	**5.9.2.5**		
8.15	Check the position lights, strobe and landing light for correct operation.	**First 25 h**	✓	**5.9.2.5**		
8.16	Check the correct operation of electric trim tab of elevator.	**First 25 h**	✓	**5.9.2.5**		
8.17	Check for correct operation of the instruments.	**First 25 h**	✓	**5.8.2**		
8.18	Check the entire cabin heater system for general condition, security, proper installation and evidence of any leaks.		✓	**5.7.2**		
8.19	Check the bilge pump and the cover, if necessary remove the bilge pump body from its support and inspect for presence of dirty and the correct operation of the pump. Reinstall the pump and the protective cover correctly.		✓	**5.9.2.3 Sec. 1**		
8.20	Make an operational check in the electric system of bilge pump. Ensure the functional full of ON/OFF switch (flasher light) and automatic.		✓	**5.9.2.3 Sec. 2**		
8.21	When the inspection is finished, clean the hull internally with water and remove all dirt and material loose, which could obstruct the bilge pump. Drain the water from the washing using the bilge pump and clean the protective cover if necessary.		✓	**5.9.2.3 Sec. 3**		

Item	Description	Inspection		Chapter Ref.	Carried out by	Inspected by
		Special	100 hours			
9. CORROSION						
NOTE *Make a detailed inspection of the following components and parts of the Super Petrel LS for corrosion. Use the latest edition of the FAA ADVISORY CIRCULAR AC 43-13-1B, Chapter 6. Corrosion, Inspection and Protection.*						
9.1.1	**Engine:** Throttle control lever, throttle and choke cable, engine suspension frame, exhaust springs, fixation support of the lower engine cowling.		✓	**5.11.3**		
9.1.2	**Propeller:** Hub, Spacer and fasteners.		✓	**5.11.3**		
9.1.3	**Landing Gear System:** Retraction mechanism, rods, sensors connectors, gas spring, rod end and body of the shock absorber, main gear wheel axle, main gear wheel nut, main and nose gear wheel halves, nose gear fork, nose gear springs, landing gear retraction cables, turnbuckles.		✓	**5.11.3**		
9.1.4	**Struts:** Main struts, N-Struts and Jury Struts, fixation rivets.		✓	**5.11.3**		
9.1.5	**Brake System:** Cylinder, pedal rod end, brake disc, brake caliper.		✓	**5.11.3**		
9.1.6	**Aileron Controls:** Rod ends of the Teleflex cable, control rods, rod ends, bell-crank, hinges.		✓	**5.11.3**		
9.1.7	**Elevator Controls:** Control rods, rod ends, rivets, bell-crank, trim hinges.		✓	**5.11.3**		
9.1.8	**Rudder Controls:** Control cable, bell-crank.		✓	**5.11.3**		
9.1.9	**Fuel System:** Fuel selector valve, electrical fuel pumps housing, fixation clamp of the electrical fuel pumps, fuel sensor flange (Header Tank).		✓	**5.11.3**		
9.1.10	**Autopilot (Elevator and Aileron):** Servo housing, rod ends, control rod.		✓	**5.11.3**		
9.1.11	**Electrical System:** Battery terminals, battery relay terminals, instruments connectors, switches, instruments fixation bolts, panel fixation bolts, bilge pump connectors, electrical fuel pumps connectors and terminals, headphones connectors, electrical trim connectors, antennas connectors (VHF, XPNDR, ELT, etc.).		✓	**5.11.3**		
9.1.12	**Miscellaneous:** Fire extinguisher fixation support, cabin heater radiator, cabin heater valve, seat belts harnesses.		✓	**5.11.3**		

12.6 Assembly Quick Guide

12.6.1 Wings

Required Tools:	Combined Wrench 13 mm (2 pcs)
	Combined Wrench 10 mm (2 pcs)
	Combined Wrench 8 mm (2 pcs)
	Allen Wrench 6 mm (1 pcs)
	Combined Wrench 7/16” (1 pcs)
	Safety Wire Pliers
	Clamp Pliers

NOTE

All parts and components for installation can be found in the **Illustrated Parts Catalogue**.

NOTE

All the bolts must be installed from the outside to the inside, from the top to the bottom and from forward to backward.

NOTE

Remove or open all cowlings, inspection windows**,** access doors and baggage compartment, before the starting the assembly.

WARNING

BEFORE STARTING INSTALLATION, REMOVE ALL INSULATING TAPES ON THE VENTS AND FUEL TANK HOSES.

12.6.1.1 Upper Wings

1. Place the main strut in the junction of the fuselage, install the bolt (PE-131.033) and allow the other end to be supported on the floor.

NOTE

Observe the correct direction of the main strut installed.

Figure 12-1

2. While one person holds the wing tip, the other person holds the wing root, feeding the electrical cables (light position, strobe and landing position light), the vent hose and the aileron rod through the corresponding holes.

1. Electrical Cables and Communication Cable
2. Vent Hose
3. Aileron Rod

Figure 12-2

3. Fit the wing to the fuselage, installing the bolt **(SE-133.047)** and its respective washer **(DIN 9021 A2 M8)** in the front part of the upper wing junction. Procedure is completed with two people.

Figure 12-3

4. Fit the main strut in the junction with the upper wing and install the bolt **(PE-131.031)**. Procedure is completed with two people.

Figure 12-4

5. Install the bolt **(DIN 931 A2 M8X50)** in the upper wing rear junction of the fuselage.

Figure 12-5

6. Install the nuts, washers and tighten the bolts as explained below:

NOTE
Use the washers on the bolts and nuts as necessary.

NOTE
Before tighten the bolts and nuts, apply penetrating oil as necessary.

NOTE
After tightening, apply torque seal over the nut.

A) Main Strut Junction of the Fuselage: install the nut **(DIN 985 A2 M8)** with two (2) washers **(DIN 125 A2 M8)** and tighten with two (2) combined wrenches 13 mm.

Figure 12-6

B) Main Strut Junction of the Upper Wing: install the nut **(DIN 985 A2 M8)** with one (1) washer **(DIN 125 A2 M8)** and tighten with two (2) combined wrenches 13 mm.

Figure 12-7

C) Front Junction of the Upper Wing: install the nut **(DIN 985 A2 M8)** with one (1) washer **(DIN 9021 A2 M8)** and one (1) washer **(DIN 125 A2 M8)** as shown below and tighten with one (1) combined wrench 13 mm and one (1) Allen wrench 6 mm.

Figure 12-8

D) Rear Junction of the Upper Wing: install the nut **(DIN 985 A2 M8)** with one (1) washer **(DIN 9021 A2 M8)** and tighten with two (2) combined wrenches 13 mm.

Figure 12-9

E) Jury Struts: install the bolt **(SE-131.045)** and the nut **(DIN 985 A2 M5)** with one (1) washer **(DIN 125 A2 M5)** and tighten with two (2) combined wrenches 8 mm.

Figure 12-10

F) Connection between the Aileron Bell-Crank Tie Rod with the Aileron Rod: inside the upper part of the fuselage, install a bolt **(SE-211.034)** on both sides, tighten with one (1) combined wrench 10 mm and then install the safety wire.

Figure 12-11

G) Vent Hoses: Remove the insulating tape from the vent hose. Remove the nut from the T connection and connect the vent hose to the nut. Set the nut with the vent hose in the T connection and tighten with one (1) combined wrench 7/16".

Figure 12-12

H) Communication and Electric Cables: Connect the communication cables, two cables connected inside of the upper part of the fuselage and the other one must be connected to the antenna´s bottom. Connect the electrical cables.

Figure 12-13

12.6.1.2 N-Struts

1. **Front N-Strut:** Connect the vent hose to the upper wing. Pass the vent hose through the front N-Strut as shown below and install the bolt **(PE-131.035).**

Figure 12-14

2. **Rear N-Strut:** Install the bolt **(PE-131.035)** with its respective plastic washers **(PN-703.019)** as shown below.

Figure 12-15

3. **Pitot and Static:** Pass the blue hoses through the main strut and connect them inside the fuselage. (The pitot system must be installed in the left N-Strut).

Analog Instruments Panel Digital Instruments Panel

Figure 12-16

NOTE
Install the nuts and washers of the N-Struts just after you have installed the lower wing.

12.6.1.3 Lower Wings

1. Approximate the wing to the fuselage, connect the fuel hose to the fuel tank´s output. Use the clamp pliers to tighten it.

Figure 12-17

2. Fit the wing and install the L-pin **(SE-131.026)** inside the fuselage.

CAUTION

After installed the L-pin one person must hold the wing tip as shown below.

Figure 12-18

3. Connect the vent hose of the front N-Strut and install the bolt **(PE-131.032)**. One person must hold the wing tip until the bolt is installed.

Figure 12-19

4. Install the bolt **(SE-132.027)** in the rear of the wing root.

Figure 12-20

5. Install the bolt **(SE-131.019)** with its respective plastic washers **(PN-703.019)** in the junction of the rear N-Strut with the lower wing as shown below.

Figure 12-21

6. Install the nuts, washers and tighten the bolts as explained below:

NOTE
Use the washers on the bolts and nuts as necessary.

NOTE
Before tightening the bolts and nuts, apply penetrating oil as necessary.

NOTE
After tightening, apply torque seal over the nut.

A) **Rear N-Strut:** Install the nut **(DIN 985 A2 M6)** with its respective washer **(DIN 125 A2 M6)** and tighten with two (2) combined wrenches 10 mm (Lower and Upper Wing)

Figure 12-22

B) Front N-Strut: Install the nut **(DIN 985 A2 M6)** with its respective washer **(DIN 125 A2 M6)** and tighten with two (2) combined wrenches 10 mm in the junction with the upper wing. Install the nut **(DIN 985 A2 M8)** with its respective washer **(DIN 125 A2 M8)** and tighten with two (2) combined wrenches 13 mm in the junction with the lower wing.

Figure 12-23

C) Rear Wing Root: Install the nut **(DIN 985 A2 M8)** with its respective washer **(DIN 125 A2 M8)** and tighten with one (1) combined wrench 13 mm and one (1) Allen wrench 6 mm.

Figure 12-24

D) L-Pin: Inside the fuselage install the circular pin **(PN-704.010)** with its respective washer **(DIN 125 A2 M8).**

Figure 12-25

E) Floaters: Install the floaters. In the front install two bolts **(DIN 933 A2 M6X16)** with their respective washers **(DIN 934 A2 M5)** and nuts **(DIN 127B A2 M10),** tighten with two (2) combined wrenches. In the rear install the bolt **(DIN 931 A2 M6X40)** with its respective bushing **(SE-132.032-1),** washer **(DIN 125 A2 M6)** and nut **(DIN 985 A2 M6);** tighten with two (2) combined wrenches 10 mm.

NOTE
Install the floaters correctly. The floaters larger plates must be installed directed to the outer part of aircraft.

Figure 12-26

12.6.2 Empennage

12.6.2.1 Horizontal Stabilizer

Required Tools:	Allen Wrench 6 mm (1 pcs)
	Combined Wrench 10 mm (2 pcs)
	Torque Wrench
	Safety Wire Pliers
Parts and Materials Required:	Refer to Illustrated Parts Catalog

To install the horizontal stabilizer, a minimum of two people will be necessary.

NOTE

All parts and components for installation can be found in the **Illustrated Parts Catalogue**.

NOTE

Use the washers on the bolts and nuts as necessary.

1. Clean the circular spar internal part of the vertical stabilizer and the circular spar external part of the horizontal stabilizer before starting the installation as shown below.

Figure 12-27

2. First install the left horizontal stabilizer as shown below.

Figure 12-28

3. Then install the right horizontal stabilizer as shown below.

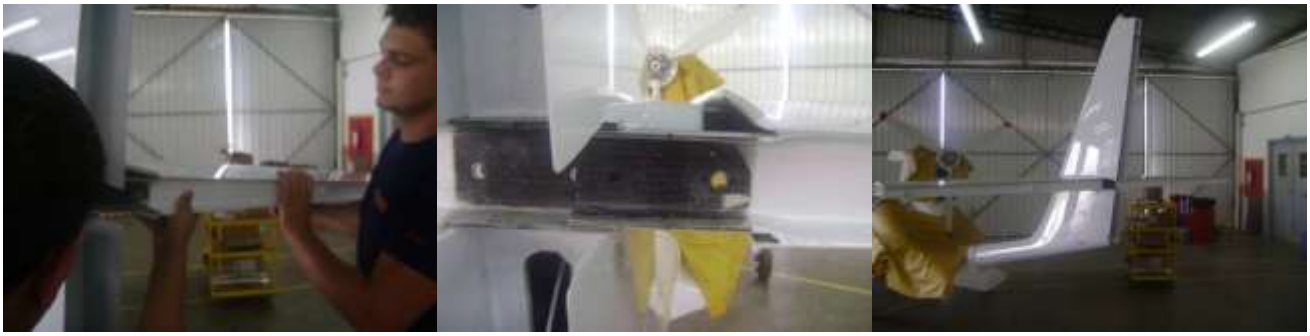

Figure 12-29

4. Install the attachment bolts **(SE-123.016)** with their respective washers **(DIN 9021 A2 M8)** and tighten with one (1) Allen wrench 6 mm. Verify the torque with a torque wrench **(8 N*m).** Install the safety wire.

Figure 12-30

5. Install the bolt **(SE-123.030)** with its respective washers **(DIN 934 A2 M5)** and nut **(DIN 985 A2 M6);** tighten with two (2) combined wrenches 10 mm.

Figure 12-31

12.6.3 Controls

12.6.3.1 Elevators

Required Tools:	Socket Wrench 10 mm **(1 pcs)**
Parts and Materials Required:	Refer to Illustrated Parts Catalog

To install the elevators, a minimum of two people will be necessary.

NOTE

All parts and components for installation can be found in the **Illustrated Parts Catalogue**.

NOTE

The left elevator has an electrical cable for the trim tab.

NOTE

Use the washers on the bolts and nuts as necessary.

NOTE

All the bolts must be installed from the outside to the inside, from the top to the bottom and from forward to backward.

NOTE

Before tightening the bolts and nuts, apply penetrating oil as necessary.

NOTE

After tightening, apply torque seal over nuts.

1. Install the elevator by fitting the pins with the hinges laterally.

Figure 12-32

2. Install the nut **(DIN 985 A2 M6)** and its respective washer **(DIN 125 A2 M6)** in the three points that join the elevator with the bell-crank and tighten with one (1) socket wrench 10 mm.

Figure 12-33

3. Connect the electrical cable of the trim tab.

Figure 12-34

12.6.3.2 Rudder

Required Tools:	Combined Wrench 8 mm **(2 pcs)**
Parts and Materials Required:	Refer to Illustrated Parts Catalog

NOTE

All parts and components for installation can be found in the **Illustrated Parts Catalogue**.

NOTE

The left elevator has an electrical cable for the trim tab.

NOTE

Use the washers on the bolts and nuts as necessary.

NOTE

All the bolts must be installed from the outside to the inside, from the top to the bottom and from forward to backward.

NOTE

Before tightening the bolts and nuts, apply penetrating oil as necessary.

NOTE

After tightening, apply torque seal over nuts.

1. Install the rudder. First, fit the bottom bolt and then fit the rudder top.

Figure 12-35

2. Install the rudder´s castle nut **(DIN 935 A2 M6)** with its respective washer **(DIN 9021 A2 M6)**; tighten it just enough to install the cotter pin **(DIN 94 A2 1,6X12)**.

Figure 12-36

WARNING

DO NOT TIGHTEN THE RUDDER´S CASTLE NUT TO THE MAXIMUM.

3. Install the bolts, washer and nut **(SE-122.021);** tighten with two (2) combined wrench 8 mm. Install the cotter pin.

Figure 12-37

12.6.4 Engine

12.6.4.1 Air Filters

Remove the plastic bags that cover the two air filters.

Figure 12-38

12.6.4.2 Oil Hoses

Connect the oil hose as shown below. First, remove the yellow cap and then connect the oil hose with a wrench.

CAUTION

Do not tighten the oil hose´s nut to the maximum.

Figure 12-39

12.6.5 Battery

- Open the inspection door located in the fuselage´s front part of the aircraft.
- Remove the insulating tape from the negative cable.
- Remove the bolt and washers located on the negative point of the battery.
- Install the negative cable on the battery.

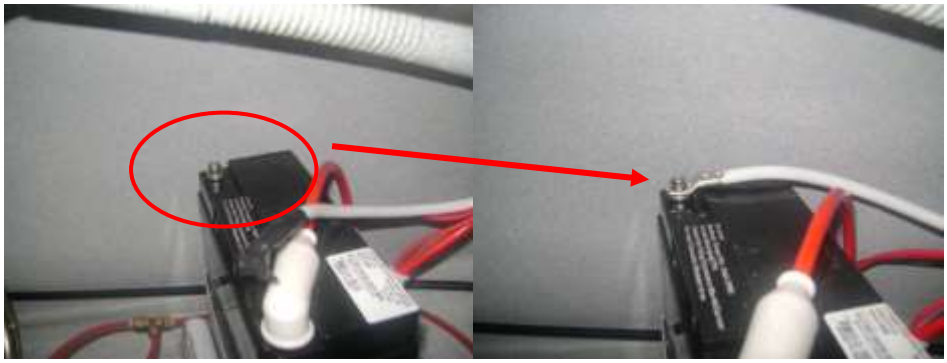

Figure 12-40

12.7 Spring Compressor Device Drawing