

SKY 100 User's Manual

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1.0 INTRODUCTION

Thank you for purchasing a SKY100 engine, developed and manufactured by SKY ENGINES.

WE ADVISE YOU TO CAREFULLY READ THIS MANUAL AND FOLLOW ALL THE MAINTENANCE INSTRUCTIONS GIVEN BELOW **BEFORE USING THE ENGINE** IN ORDER TO AVOID SEVERELY DAMAGING IT.

If you require more information, have queries or need to purchase spare parts, please contact us byphone or e-mail using the contact details printed on the cover.

We thank you for the attention, wish you the best of fun and hope you are satisfied with yourpurchase.Best regards,

Sky Engines s.r.l.

1.1 GENERAL WARNINGS

• SKY ENGINES shall not be directly or indirectly liable for the use of the engine, especially if it is altered or tampered with by third parties.

• MAINTENANCE IS ESSENTIAL to avoid severely damaging the engine.

Therefore, we advise you to CAREFULLY read Chapter 4.0 of this manual and thoroughly follow all the instructions. For information on damaged spare parts, see paragraph 3.3, which illustrates the assembly procedures for all the secondary components that tend to deteriorate in time.

• SKY ENGINES shall not be liable for damages caused by an inaccurate maintenance or incorrect assembly, except for the replacement of components covered by the warranty.

• The engine has a maximum capacity of 90-100 Kg, which means that it is able to transport a person with a maximum body weight within these parameters. The use of the engine to transport heavier weights may cause problems to the trimming.

• It is advisable to perform all the inspections required in order to verify that the engine is safe and in good working order before flying.

• Technical alterations made by the user, though permitted, are full responsibility of the user. Spare parts used for said alterations shall not be covered by warranty.

• Alterations carried out by the user or the removal of original spare parts may jeopardize the safety of the engine..

• SKY ENGINES reserves the right to change models and/or catalogues without warning and without any whatsoever obligation. Further information is provided on Web site www.skyengines.com

• Aircraft driven by this engine must be used in open spaces only and in areas reserved for these activities. The user must be aware of all the hazards connected with the use of this engine and be aware of the fact that it may accidentally switch off.

• For detailed information on the warranty terms, see Chapter 6.0 in this manual

WARNING!!

This is not a certified engine! It is intended to be used for experimental and not certified engines.

1.2 RECOMMENDATIONS FOR THE PREVENTION OF ACCIDENTS

As the use of this engine can be very dangerous, it is important to adopt all the necessary precautions both during, before and after the flight in order to avoid severe accidents.

We advise you to follow the general precautions illustrated below in order to avoid damages or accidents.

• As the engine does not solve all flying problems, it is important to avoid risky moves. One of the most common mistakes is flying above areas that do not allow you to land at very low heights. It is always important not to underestimate the possibility of faults and the need of having to make an emergency landing.

• Always take into account that the lack of thrust of the engine may affect the flight stability.

- Pay particular attention to swinging movements caused by the change of trimming that cause falls of 4-5 meters.

- As the engine could switch off at any time, it is important to make sure you are able to perform an emergency landing if required.

• ALWAYS avoid flying above water for your own safety and in order not to damage the engine.

2.0 DIRECTIONS FOR USE

The directions for use provided in this manual refer to models available at the time of print. Although the manufacturer is not obliged to provide updates on changes, users may request specific information on the upgrade of single products. For more information, visit Web site www.skyengines.com.

2.1 FUEL

SKY100 is a 2 stage engine that employs a mixture of fuel and oil.	WARNINGS!!! FUEL IS EXTREMELY FLAMMABLE AND EXPLOSIVE. ALWAYS PERFORM REFUELING OPERATIONS OUTDOORS, IN AN ADEQUATELY VENTILATED AREA AND WHEN THE ENGINE IS NOT RUNNING. DO NOT SMOKE CLOSE TO FUEL AND DO NOT STORE IT IN AREAS WHERE IT COULD BE EXPOSED TO SPARKS OR FREE FLAMES. KEEP THE FUEL OUT OF THE REACH OF CHILDREN.	
Always remember that a correct carburetion and fuel mixing are essential to prevent the seizure of pistons fitted on 2 stage engines, which are not covered by warranty.		
ATTENTION!! MIX FUEL AND OIL WITH A 3% RATIO USING PREMIUM QUALITY SYNTHETIC OIL FOR 2 STAGE ENGINES.		
Always check the amount and presence of oil as THE LACK OR EXCESSIVE AMOUNTS COULD DAMAGE THE ENGINE.	ATTENTION!! NEVER MIX DIFFERENT TYPES OF OILS. °Only use100% BARDAHL KTS synthetic oil.	

INTERVAL OF TIME	OIL PERCENTAGE
BREAK - IN	3%
SUBSEQUENT PERIOD	2,5 %

U S e

2.2 RUNNING - IN

A good breaking-in ensures a long life of the engine and enhances the performance of its components.

Use the engine very carefully during the first 3 hours of flight.

Do not use the engine at maximum power for extended intervals of time.

Do not keep the accelerator in the same position for several seconds; in this case it is preferable to open and close the accelerator without increasing the elevation in order not to force the engine

Use the engine for 10 minutes at a time, then allow it to cool.

Repeat the same operations every time you check the engine.

THE BREAK-IN PERIOD CAN BE CONSIDERED COMPLETED AFTER 3 HOURS OF FLIGHT OR THE USE OF 10 LITERS OF FUEL!

2.3 STARTING THE ENGINE

SKY100 engine is started by a manual starter. It must strongly pull the rope and avoid to flooding the engine.

WARNINGS!

The exhaust gases of the engine contain carbon monoxide, which can cause death. DO NOT START THE ENGINE INDOORS. ALWAYS VERIFY THAT THIS OPERATION IS PERFORMED OUTDOORS IN ADEQUATELY VENTILATED AREAS.
Always start the engine after it has

been completely assembled as the lack of some components could cause severe damage.

• Always handle the propeller with utmost care at it may reach very high speeds to the point of becoming hardly visible. Always maintain a safety distance. If the engine is cold, always wait a few minutes after start-up to heat the engine and accelerate at regular intervals to avoid damaging it.

3.1 FIGURE OF THE ENGINE



1: CYLINDER	SK006	11: IGNITION COIL	SK033
2: RADIATOR CAP	SK013	12: MUFFLER	SK040
3: RADIATOR	SK010	13: RADIATOR'S HOSES	SK011/012
4: LAMINAR BUNDLE	SK021/24/26	14: DRAIN RESERVOIR	SK014
5: MUFFLER SEAL	SK043	15: RADIATOR RODS	SK017
6: HEAD + COVER	SK007/08	16: GUARD	SK001
7: WALBRO CARBURETOR	SK019	17: SPIDER	SK032
8: MUFFLER MAINFOLD	SK045	18: MANUAL STARTER	SK036
9: REDUCTION GEAR	SK031	19: SILENT BLOCK	SK015/016
10: SILENCER	SK041		

3.2 TECHNICAL SPECIFICATION

TYPE	SINGLE-CYLINDER 2 STAGE ENGINE WITH LIQUID COOLING
SWEPT VOLUME:	102 CC
MAX POWER	18 HP @ 10200 RPM
MAX. RATED SPEED:	10600 RPM
BORE	55 mm
STROKE	43 mm
REDUCTION	MECHANICAL 1:4 OIL LUBRICATED
THRUST:	60 Kg WITH THREE 220 cm VANES @10400 RPM
CARBURETOR	WALBRO WG8
TOTAL WEIGHT:	WITH LIQUIDS 13 Kg
EGT:	700 ℃
CHT:	170°C
MAX COOLANT TEMPERATURE:	95°C
MAXIMUM CAPACITY:	MAXIMUM WEIGHT OF USER: 90-100 Kg
CLUTCH	DRY CENTRIFUGAL

WARNINGS!

The general recommendations included in the Technical Specifications sections are very important to prevent severe damage to the engine and for the safety of users. ALWAYS FOLLOW THE INSTRUCTIONS GIVEN ABOVE AND DO NOT EXCEED THE MAXIMUM VALUES SPECIFIED.

SKY ENGINES SHALL NOT BE LIABLE FOR INJURIES TO PEOPLE OR DAMAGES TO PROPERTY ARISING FROM THE FAILURE TO FOLLOW THE AFOREMENTIONED TECHNICAL SPECIFICATIONS.

3.3 ASSEMBLY OF SECONDARY COMPONENTS

3.3.1 SPECIAL ASSEMBLY INSTRUCTIONS

Engine SKY100 is more complex than other models and a greater experience is therefore required to assemble its components and specifically its internal ones. As the engine is liquid cooled, the assembly of the components that use the radiator's coolant requires the implementation of specific tasks that only a skilled mechanics is able to carry out.

Therefore, all users who are not specifically skilled or trained to perform these operations SHOULD NOT TOUCH THE ENGINE EXCEPT FOR ORDINARY MAINTENANCE OPERATIONS, WHICH SHOULD BE PERFORMED FOLLOWING THE DETAILED INSTRUCTIONS SPECIFIED BELOW. DO NOT IMPROVISE OR ATTEMPT TO MAKE UNAUTHORIZED CHANGES THAT COULD DAMAGE THE ENGINES NOT COVERED BY WARRANTY.

• Unauthorized changes could make the engine highly unstable!

• Replace the components of the engine with original SKY ENGINES spare parts to guarantee a reliable operation.

3.3.2 RADIATOR

Assemble the silent blocks on the radiator, then fit the whole assembly on the radiator rods.



Threads tubes 1, 2, and 3 in the corresponding inlets a, b, c of the radiators.

Carefully check the position of the fittings on the tube clamps straps and make sure that they have been applied as shown in the photo.





3.3.3 MUFFLER



Firmly tighten the fittings of the muffler with the silent blocks of the engine frame using two M8 TCCE screws and washers.

Apply sealant glue to the manifold of the muffler, then position the muffler on the manifold close to the glue layer, firmly pushing the pipe union on the manifold.





Insert the springs between the hooks of the muffler and those of the manifold.

Thread the steel cable between the hooks that keep the springs in place, insert it between the springs and fix them on the side of the manifold, as shown in the photo.



3.3.4 CLUTCH



After reduction's unmounting, unscrew the center nut by a pneumatic or manual wrench (in the second case block crankshaft rotation). Remove the washer.

Unscrew the nut of pad's pin by an 8 mm wrench.





Remove the pin (squeeze pads to better extract it)

In the new pad, unscrew completely the dowel and put the spring in his site (greater diameter into body clutch).





Squeeze the pad (as in unmounting case) to center holes (It could be useful to use a little tube) and put in the pin.





Use a medium force screw blocker, replace the washer and tighten the nut (it is normal that washer could move a little)





Put some medium force screw blocker on the registration dowel and tighten it.



Adjust dowel to have a little space between pad and clutch when you try to open it. It's the same for the other tecssigge

Mount clutch on crankshaft without forcing a lot.





Reassemble washer and nut.

If you need to tune up clutch, it is possible to adjust dowels by a wrench in carter's holes without unmounting clutch.



NOTE:

Tightening dowels, you have a smaller opening of pads, releasing them, you have a faster contact of pads on bell housing.

3.3.5 STARTER

Remove the cover from the manual starter loosening the screws in a crossed pattern.



Remove the worn wire from the side hole of the wire reel and replace it with a new one. Knot the end of the wire and firmly insert the knot into the hole.



Delicately tighten the spring on the cover, holding it with one hand.

Insert the wire reel and turn the spring



Loosen the wire reel and remove it from the cover. Then, loosen the handle and remove the wire reel from the spring.



To replace the spring, insert the end side into the cover duct, as shown in the photo.

Attention! When inserting the spring, always make sure that the tip of the spring is facing the channel from which the wire projects.

Thoroughly lubricate the area in contact with the spring.





by one revolution.

Install the new teeth following the procedure described in points 1, 2 and 3.





3.3.6 RODS AND SILENT BLOCK

Install the silent blocks with the Teflon plate on the rod supports.



Install the silent blocks on the rods.

Install the tank as shown in the photo, slightly tightening the nut until the tip of the screw is visible.



Install the radiator on the silent blocks.



Install the rods on the silent blocks.







3.3.7 SILENCER

Loosen the small bolts that join the manifold to the base of the maffler.



remove the pipe while maintaining in place the manifold muffler.



remove the base of the pipe.



remove the old glass wool





couple the new glass wool







3.3.8 LAMINAR BUNDLE



Apply a minimum amount of Sili Motoron the mouth of the laminar bundle, distribute it consistently with a finger and verify that there are no traces of material inside the bundle.



Insert the Teflon plate and the laminar bundle. Repeat this operation for all surfaces.

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Install the Walbro plate above the laminar bundle.



Install the ring and the Walbro carburettor on the small plate using M 6 x 50 screws.





3.3.9 CARBURETOR













Loosen the Walbro and replace membranes 1 and 2.screws.

4.0 MAINTENANCE

THIS CHAPTER CONTAINS VERY IMPORTANT INFORMATION. IN ORDER TO ENHANCE THE LIFE OF YOUR ENGINE AND PREVENTING PROBLEMS CAUSED BY WEAR, IT IS ESSENTIAL TO CAREFULLY READ ALL THE WARNINGS AND DATA ON SCHEDULES, AND FOLLOW ALL THE INSTRUCTIONS PROVIDED. IT IS USEFUL TO REMEMBER THAT DAMAGE ORIGINATING FROM AN INSUFFICIENT MAINTENANCE ARE NOT COVERED BY THE WARRANTY.

4.1 CLEANING

SKY100 engines do not require specific cleaning operations. However, when performing this operation, always remember not to use corrosive solvents on the external or internal parts of the engine.

ALWAYS KEEP THE INTERNAL PART OF THE ENGINE CLEAN TO PREVENT RESIDUALS FROM ENTERING THE INTERIOR OF THE CYLINDER OR, WORST STILL, THE GUARD AND CAUSING THE SEIZURE OF THE ENGINE.

* When using a filter box, always remember to disassemble it and wash the internal filter with water and a degreasing detergent after approximately 100 hours of flight. Cleaning the muffler does not improve the performance of the engine, but only the quality and quantity of exhaust emissions. Customers who prefer not to hear so much noise while flying should carry out the maintenance operations described in the chapter above with a frequency of at least 50 hours of flight for an optimum operation of the muffler.

4.2 TOPPING UP LIQUIDS

The only liquids that need replacing are:

RADIATOR COOLAN THE LEVEL OF THE RADIATOR COOLANT MUST BE INSPECTED APPROXIMATELY AFTER 10 HOURS OF FLIGHT BY PERFORMING THE FOLLOWING OPERATIONS:

1. Loosen the RADIATOR CAP.

2. Verify that the liquid inside the radiator reaches the side nut next to the cap.

3. If the liquid level is below the indicator, top up the radiator coolant as specified above.

4. When replacing the whole amount of coolant, always remember not to exceed the amount of 700 ml:

- 600 ml directly in the radiator
- 100 ml in the recovery tank

ATTENTION!

COOLANT MUST ALWAYS BE TOPPED UP WHEN THE ENGINE **IS COLD!!!**

WHEN PERFORMING THIS OPERATION, ALWAYS REMEMBER TO POUR THE LIQUID INTO THE RADIATOR AND NOT INTO THE SMALL CONTAINER, AS THE LATTER IS DESIGNED TO BE USED TO COLLECT THE COOLANT IN EXCESS, NOT TO FILL THE RADIATOR. THE LIQUID IN EXCESS MAY EXIT FROM THE SMALL TANK.

IF LEAKS ARE VISIBLE, ALWAYS THOROUGHLY CHECK THE SMALL TANK AND VERIFY THAT THE COOLANT DOES NOT EXCEED THE RECOMMENDED LEVEL.

THE SMALL TANK MUST BE FILLED UP TO THE INDICATOR WITH THE BLACK "MAX" WORD SITUATED ON THE EXTERNAL SIDE, AS SHOWN IN THE PHOTO.

ALWAYS REMEMBER NOT TO FILL THE SMALL TANK ABOVE THE MAXIMUM LEVEL AS THIS COULD CAUSE LEAKS.





naintenance







REDUCTION GEAR OIL:

1. REGULARLY INSPECT THE OIL LEVEL IN THE REDUCTION GEAR USING THE BUSHING ON THE FRONT SIDE.

2. REPLACE THE WHOLE AMOUNT OF OIL AFTER APPROXIMATELY 100 HOURS OR IF YOU NOTICE THAT THE BUSHING IS PLACED IN PERFECT VERTICAL POSITION.

3. OPEN THE BUSHING AND INSERT 30 mI OF SYNTHETIC OIL OF GEARS.

* Our technician recommend Bardahl SAE 75W-90 synthetic oil

4.3 ADJUSTMENTS

The only adjustment that may enhance the operation of the engine is the regulation of the maximum and minimum level of the carburetor:

STANDARD ADJUSTMENT:

- OPEN INDICATED SCREW BY A QUARTER OF REVOLUTION (3)

4.4 SCHEDULES AND GENERAL RECOMMENDATIONS

This paragraph lists a few recommendations that have been defined as a result of the tests carried out by our mechanics and on the basis of the feedback provided by customers. We kindly ask you to report anomalies or maintenance procedures that are not described in this manual using the space provided in chapter 7.0. You can also use this space for feedback or queries, to which we will be glad to answer.



Some components of SKY100 are subject to wear. Therefore, to avoid damaging the engine or affecting its operation, we recommend you perform the operations described below at the specified intervals:

Before flying, always check the safety devices of the muffler, silencer and filter box (verify that the steel cables are in place and correctly connected).

Replace the sparking plug after approximately 80 hours of flight.

Inspect the silent blocks that support the radiator every 50 hours and replace them after approximately 100 hours of flight.

The same applies to the silent blocks of the crosspiece and muffler, which have to be replaced after 100 hours of flight.

Inspect the blocks of the clutch after approximately 50 hours of EFFECTIVE flight. For information on how to disassemble them, see the section on the disassembly of secondary components in Chapter 3.0.

• the depurtures increase the wearing out of the blocks of the clutch:an exagerated number of departures decrease the effective hours of flight.in this case we recommend (especially to the beginner, who are making exercises of departures) to check constantly the wear of the different component of the clutch.

Replace the membranes of the carburetor after approximately 100 hours of flight. Inspect the laminar bundle under the radiator every 50 hours of flight. Carefully inspect the conditions of the blades because they could damage or break the engine if damaged. Inspect the bank bearings approximately every 150 hours.

Regularly inspect the teeth of the flywheel.

CHECK THE LEVEL OF COOLANT INSIDE THE RADIATOR EVERY 10 HOURS OF FLIGHT USING THE CAP SITUATED ON THE TOP OF THE RADIATOR, NOT THE ONE IN THE DISCHARGE CONTAINER.

✓ Our technicians recommend the use of Arexons Glitech 4100 Coolant

5.0 SPARE PARTS

The manufacturer always recommends the use of original SKY ENGINES parts only. The catalog of spare parts is available on Web site: www.skyengines.it

Spare parts can be ordered by contacting us directly by phone or e-mail, or through local distributors.

For information on how to replace components covered by warranty, see the following chapter.

6.0 WARRANTY

6.1 REQUIREMENTS

The warranty is valid for 12 months from the date of sale or from the date in which the product has been sold by the distributor. Specific requirements are listed below:

2) THE WARRANTY APPLIES TO:

- All spare parts and labor, except transportation charges that shall have to be paid by the customer, provided that the product has been used and serviced according to instructions.

To order spare parts:

- Send the order by e-mail or fax, remembering to quote the serial number printed on the side of the engine guard. Always attach a photo of the faulty spare part, clearly highlighting the damage and describing in detail the problem. If the product has not been purchased directly from us, please contact your distributor first.

3) THE WARRANTY SHALL NOT APPLY TO:

- Failures/faults caused by an improper use or negligence.
- Engine modifications not specifically authorized and approved by Sky Engines S.r.l.
- Ordinary wear of components, parts and spare parts
- Damages caused by the failure to perform to perform a regular maintenance
- Damages caused by the use of the engine without a propeller
- Damages caused by corrosion.
- Damages (seizure) caused by the use of gasoline without added lubricant
- Damages caused by the use of parts not specifically designed by Sky Engines

- Damages caused by the use of the engine at speeds above those recommended by Sky Engines S.r.l.

- Damages caused by the loss of components during a flight, originating from the improper tightening of assembly/disassembly parts, which is responsibility of the owner

- Accidents, injuries, abuse or negligence caused by the owner or by any other person using the engine in his name.

- Damages caused by the suction of foreign material.

- Damages caused by maintenance carried out by incompetent mechanics or unskilled personnel

4) **SPECIFIC INFORMATION:**

This is not a certified engine!

Alterations carried out by the user or the removal of original spare parts may jeopardize the safety of the engine.

The user agrees to accept full liability and acknowledges that the engine may switch off during use.

FOR ADDITIONAL INFORMATION ON THE USE OF THIS ENGINE, PLEASE CONTACT SKY ENGINES SRL DIRECTLY.



6.2 WARRANTY CERTIFICATE

ENGINE CODE:
MODEL AND COLOR:
DISTRIBUTOR NAME:
DATE OF PURCHASE:
SITE OF PURCHASE:

THIS CERTIFICATE GUARANTEES THE ENGINE FOR ONE YEAR, STARTING FROM THE DATE OF PURCHASE.

FOR DETAILED INFORMATION ON THE TERMS, CAREFULLY READ THE MANUAL. FOR FURTHER INFORMATION, PLEASE CONTACT US DIRECTLY BY PHONE OR E-MAIL OR VISIT www.skyengines.com

ALWAYS REMEMBER TO RETURN THE COMPLETED AND SIGNED WARRANTY CERTIFICATE TO ACTIVATE THE WARRANTY.

DATE

SIGNATURE OF DISTRIBUTOR

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