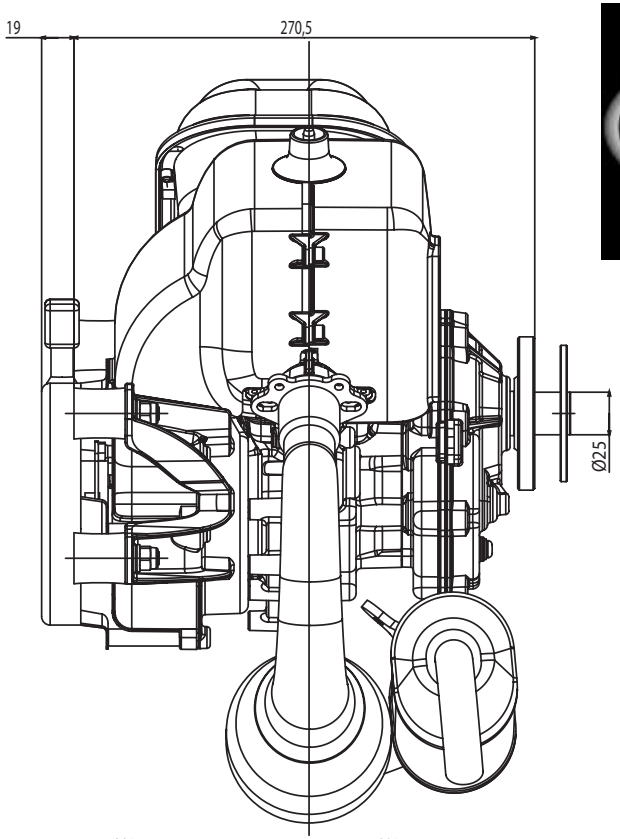
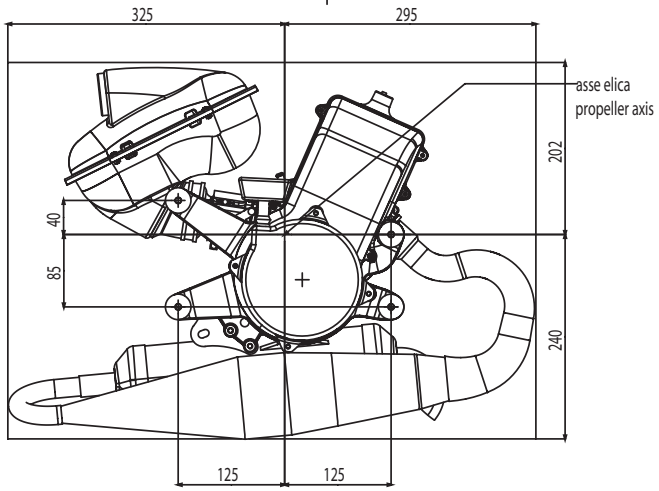
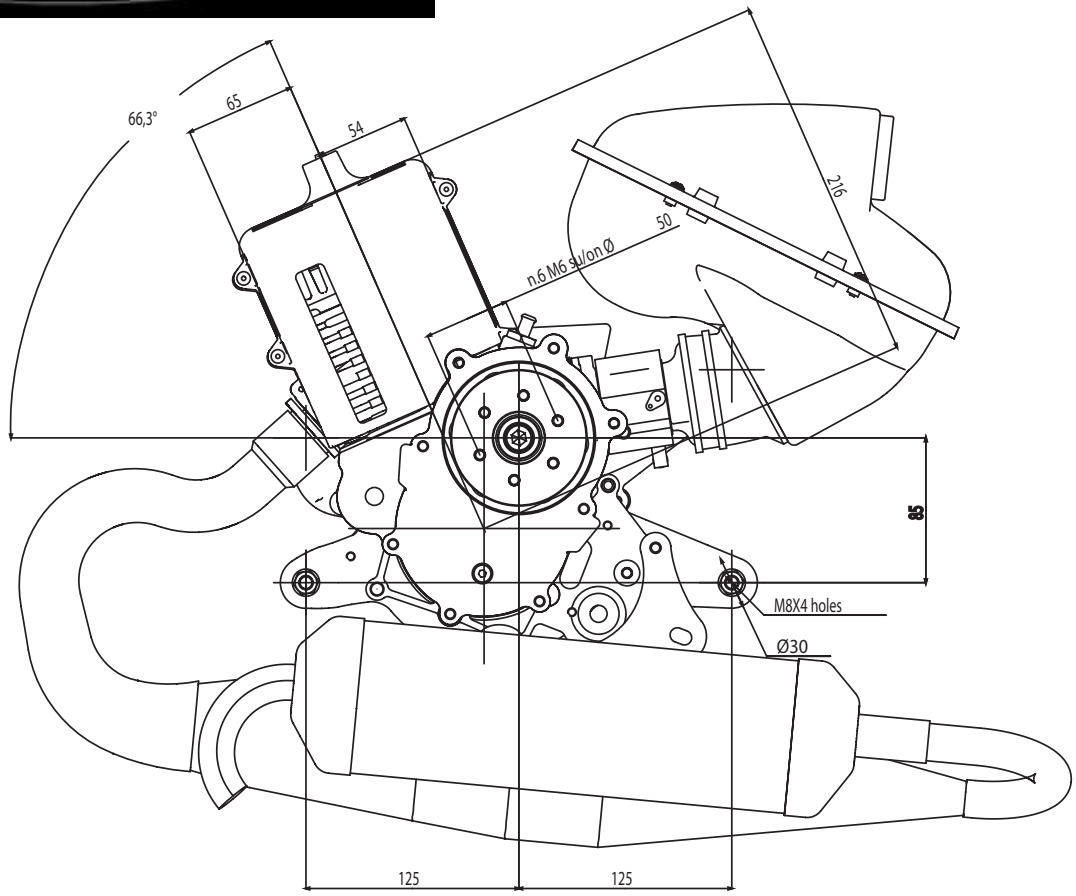
THOR 100

MANUALE D'USO E MANUTENZIONE - USE AND MAINTENANCE MANUAL







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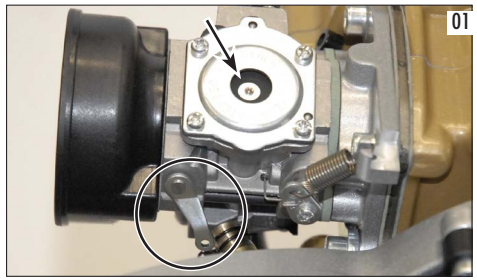

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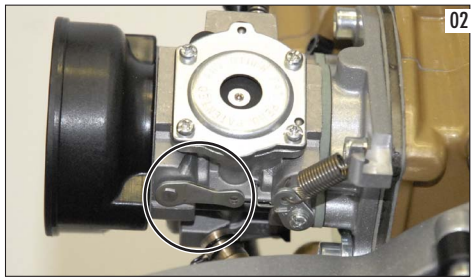

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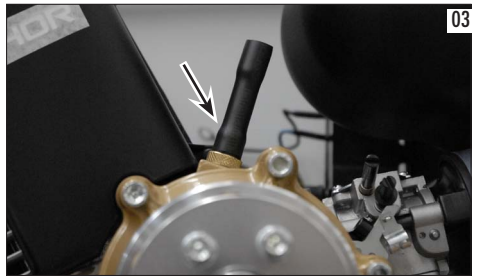

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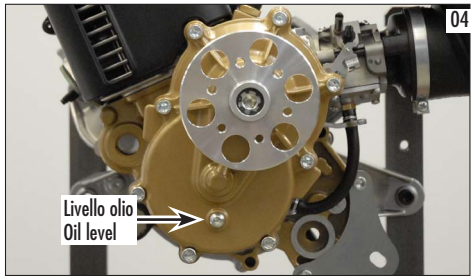

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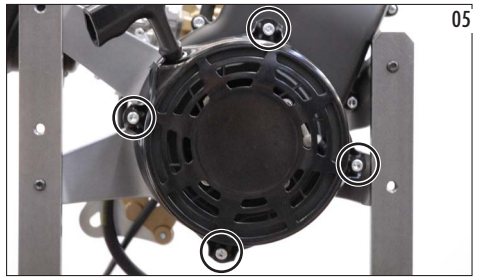

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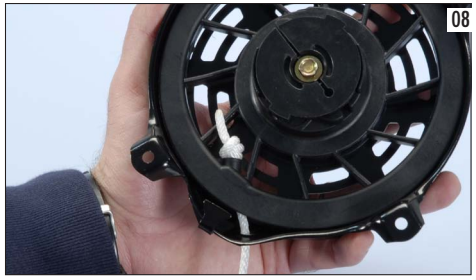

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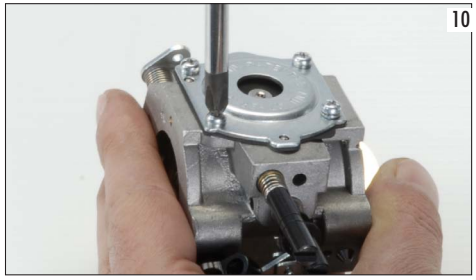

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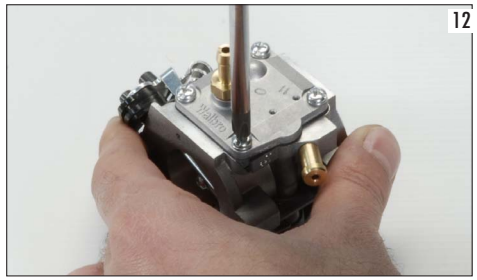

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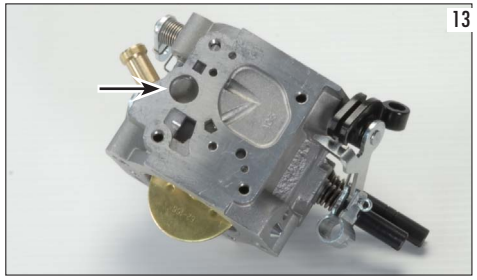

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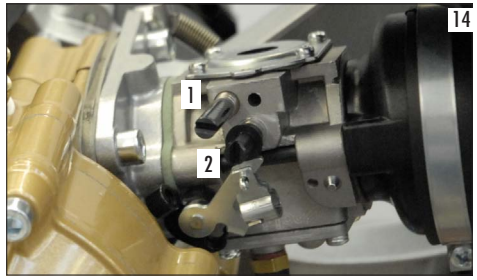

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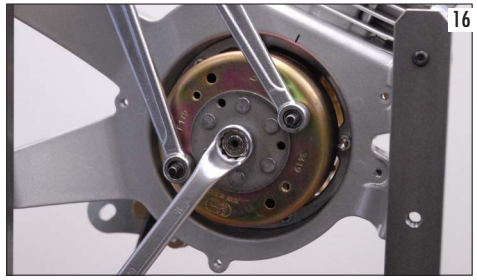

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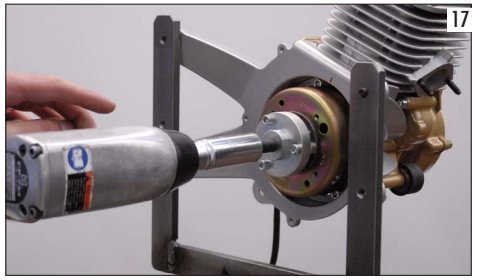

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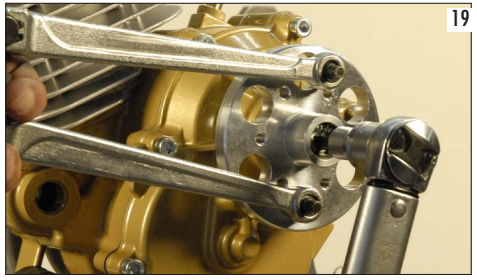

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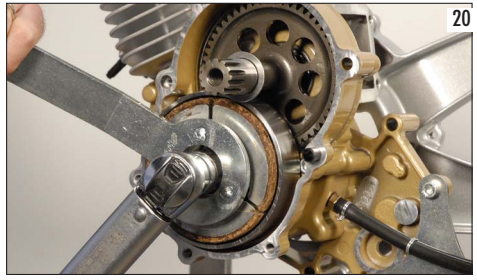

INTRODUCTION

Congratulation for purchasing a Polini engine. By purchasing it you have become one of a large family of satisfied Polini products owners. This product has been designed to perform as competitively as possible. Read this use and maintenance manual carefully throughout before flying with your new engine. This manual contains important information that will help you to achieve the best satisfactions with the use of the Thor 100 engine. To ensure carefree and satisfying usage you must get to know your new engine thoroughly and set it up correctly before you start using it.

CONTENTS

1 GENERAL ADVICE

Polini Motori and the distributors decline any and all responsibility whatsoever - either direct or indirect - for the use of the engine, above all in the case the engine is modified or manumitted by third parties. Polini Motori doesn't assume responsibility for damages caused by little servicing or wrong assembly, excluding the pieces from the warranty. Any technical modification may be introduced by the buyer, who assumes all the responsibilities for possible damages; spare parts for any modification are not under warranty. We advice you that any engine modification made by the buyer or the removal of original parts may make the engine dangerous to be used!

The user is invited to respect and follow what written in the use and maintenance manual for his own and third parties safety. When you use this engine you are making a very dangerous action, so you may have the maximum care before, during and after flying, in order to avoid serious accidents. We invite you to be careful to prevent accidents or damages and to keep always in mind that:

-the engine can't solve all the flight problems, so it is important to avoid dangerous maneuverings. One of the most common errors is to fly over zones where it is not allowed to land; you have always to take into consideration the possibility of engine failure or the need to make an emergency landing. It is forbidden to fly over built-up areas, urban centers, to drop things or liquids when flying.

- the lack of engine power can disturb the flight stability: the engine could stop suddenly and you may be obliged to make an emergency landing on a safety area.

Before using it, for your own and third parties safety, it is necessary to be sure that the weather conditions are good, or anyway adequate for a safety flight, in order not to compromise the good engine work. Rain or unfavorable weather conditions, besides being dangerous, could also damage the engine, prejudicing its normal working. It is not allowed to use the paramotor when raining or with strong wind. Only fly if the wind speed, its direction and the conditions grant a safety flight. It is important to check the weather forecasting for the hours close to the flight and to know the taking off and landing areas. Because of the risks inherent to the paramotor use, and the flight, Polini doesn't give any warranty against accidents, breakings, injuries or death. To fly with a paramotor always needs great attention. Be aware that you fly at your risk. Before every use check the good condition of your paramotor. **This engine is not covered by any responsibility insurance. By using it you automatically assume all the risks inherent the paramotor sport or the personal responsibility towards damages to yourself or to third parties, accidents, injuries or death. We invite you to carefully read the instructions contained in this manual since they are helpful for a better knowledge of the products and the use itself and useful to prevent and contain the risks.**

Warranty

All the Polini engines are manufactured with high quality materials which grant a product without defects, under the conditions that the buyer purchase the products from an authorized Polini's dealer

Validity of the warranty

The warranty is valid for a period of 24 months from the date of purchase. It is necessary to activate the warranty by filling the form out and keeping the payment slip or the invoice.

Coverage

The present warranty covers the engine damages caused by defective parts, in shape or materials, for projects not in conformity with the use indicated, wrong assembly by the manufacturer. The warranty includes spare parts and labor. Delivery costs are charged to the user.

The warranty doesn't cover damaged caused by:

- Engine modifications not approved by Polini;
- Wear and tear of the parts;
- Carelessness, lack of servicing, accidents, installations or wrong maintenance;
- Accidental fall or the engine fall or of its components;
- Engine improper use or misusage;
- Assembly of parts or components not specified for the engine use;
- Engine overheating or stop for long usage, beyond the term indicated by Polini;
- Missing or irregular engine servicing as suggested by Polini, use of improper petrol or oils, presence of dirty parts or foreign bodies in the engine, even sucked;
- Engine overwork because overloaded;
- Engine or parts deterioration because of improperly storage;
- Faulty engine assembly, including the use of not original Polini parts or coming from third parties;
- Damages to the engine caused by foreign bodies;
- Servicing operated by person outside Polini or by not authorized people;
- Competition use of the engine.

Final user obligations

Claims shall be done by delivering the engine to an authorized Polini dealer. The user shall provide the original document that proves the purchasing or the warranty ticket authenticated by Polini or by its distributor. To keep the validity of the warranty the user shall carry out recurrent servicing according to the use and maintenance manual.

Limited liability

Pursuant to this warranty, Polini's obligations are limited to the defective parts reparation or, at its discretion, to change one or more parts, necessary to remedy every malfunctioning caused by defective materials or labor covered by the warranty. Polini or the distributor can't be held responsible for problems or damages to persons/things/animals during the engine life. We remind you that this product is not certificated and it is only dedicated to experimental aircraft and that it can break or suddenly stop working. No warranty or compensation are foreseen for damages caused to:

- persons/animals/things during the engine use
- persons/animals/things caused by a collide with the propeller or with parts detached from the engine
- frame, parts and/or propeller caused by the collide with parts coming out from the engine
- costs for rescue, shipping, phone or rent after the collide, problems or lose of time, or other indirect damages.

⚠ **DANGER!** This not-certified engine can suddenly stop working. The engine stop can require emergency landings causing injuries or death. The aircrafts thrust by this engine should fly in open spaces only or during the daylight. The buyer assumes all the risks for the use and he knows that by using it the engine can suddenly stop working. This product is not covered by products and public liability. Who flies with a paramotor or only switch it on assumes all the risks inherent to the paragliding sport and all the responsibilities for damages to things or persons or death caused by the use of this product.

2- FUEL

Thor 100 is a 2-stroke engine that needs oil/petrol mixture. Only use good lead-free petrol purchased by a petrol station with a number of octane between 95 and 98. Add good 2% synthetic oil to the petrol. It is possible to use a 1,5% oil mixture with the following oils:

MOTUL 800 - CASTROL 242 - BARDAL KXT - ELF 976 - ELF 909.

Petrol with low antiknock value may cause serious problems when starting the engine, destroying the piston or seizing the cylinder. Before taking off test, warm the engine and test it at 7000/7500 rpm: some knocks can be generated causing a metal noise. In this case check the carburetion and look at the spark plug color that changes from a natural light-brown color to a grey color with sharpened deposits. If the problems persist, change all the mixture with a different brand one and check the carburetion again.

⚠**WARNING**: The nature of the carbon deposits on the cylinder head, spark plug and exhaust port gives important information about the fuel mixture burning in your engine. Remember that mixes that contain too much oil do not extend the engine's life.

⚠ **ATTENTION**: petrol is extremely inflammable and explosive. Carry out these operations in a well ventilate place and with the engine switched off. Refrain from smoking and avoid all naked flames or sparks where petrol is being drained or where re-fuelling is being performed.

3- ENGINE STARTING

Start the engine only when all is in good conditions and perfectly working. Furthermore check that all the nuts are well tightened. First cold starting: fill in the fuel system using the pump provided (carefully follow the instructions provided by the frame's manufacturer to find out it and use it in the correct way). To make this operation easier push softly with a finger the diaphragm through the hole indicated by the arrow in photo 1 (do not use sharpened tools that may damage the diaphragm, compromising its functioning). Fill it in till the petrol reaches the carburettor. At that moment immediately stop; if you go on acting on the pump the petrol will leak causing the engine flooding. Move the starter level to the off position (photo 1); now hand the starter and start pulling the rope till it grows hard. Pull with strength without accelerating till the engine seems to start working (do not repeat this operation more than 3 times otherwise the engine may flood). Now move the starter lever to the on position (photo 2) and act on the starting rope without accelerating. If the engine doesn't work with the first two attempts, try again accelerating gently.

⚠**ATTENTION**: during this operation always keep the stop switch in hand and be ready to activate it in case of defect. If it happens keep it pressed till the engine stops.
Once the engine works we suggest testing the stop switch works perfectly. After this operation re-start the engine without acceleration and without using the starter. Now leave it idle accelerating and then until the engine warms up to normal temperature.

4- RUNNING IN
Run your engine in as instructed below to ensure that the engine and transmission bed in correctly and to ensure continuous reliability in future. Once the engine starts, leave it idle until it warms up to normal temperature. We suggest running the engine 15 minutes at medium-low engine power output gently accelerating and with different intensity. Now we suggest checking the correct idling calibration. (section 10.1)
During the first flight or for the first 20 litres of petrol we suggest not keeping the engine at the maximum rpm for too much time, considering that the 2-stroke engine doesn't stand to the constant rpm even if of medium power. We suggest varying the engine rpm. Check the carburetion after the first landing (section 6).
Repeat the running in every time you change one of the following parts: piston, rings, cylinder, crankshaft or main bearings.

5- ENGINE SWITCING OFF
Switch the engine off by pressing the button till the complete stop (see the frame manufacturer's instructions to find the button position)

6- CARBURETION CHECK
For a complete carburetion check switch the engine off after having worked it for some minutes under load. Remove the spark plug; unscrew it by using the proper key and verify that the porcelain colour is light-brown. On the contrary, ask to an authorized dealer for the calibration.

7- CLEANING
Clean the engine when it is switched off and cold to avoid burns. Clean the engine with a soft cloth soaked with neutral cleansing and non-aggressive.
⚠**WARNING**: Do not use acids that may damage the engine.

8- CARRIAGE

⚠ **ATTENTION**: Carry the engine only when cold.

If the engine is carried in horizontal position, plug the breather pipe of the transmission case to avoid oil leaking (photo 3).
Follow the instructions of the frame manufacturer for its carriage. Be careful of the petrol during the carriage; its leaking may cause a fire.

9- ORDINARY SERVICING

⚠**ATTENTION**: THE SERVICING OPERATIONS MUST BE DONE BY QUALIFIED PEOPLE ONLY. IF THE INSTRUCTIONS MENTIONED BELOW WILL RESULT NOT CLEAR, WE SUGGEST ASKING FOR SPECIALISTS BY POLINI MOTORI RETAILERS OR WHOLESALERS. FOLLOW CAREFULLY WHAT DESCRIBED BELOW.

Maintenances and servicing necessary for the best set up of your engine should be done regularly, or on all occasions before you start flying. All the tasks and adjustments described below can be done easily by following the instructions given in this manual.
Refer to your POLINI MOTORI dealer for scheduled services and repairs, and insist that only original spare parts are used to replace worn or broken components. Refer to the servicing tables in sections 12 below for the frequency with which the various servicing operations must be performed.

9.1- REMOVE AND CLEAN THE AIR FILTER
Dirty air filter is one of the most common causes of poor engine performance.
Clean the filter periodically or change it. Remove the filter loosening the clamps, unscrew the 4 screws using a cross screwdriver, remove the filter cover and then the filter. Wash the filtering material with water and mild soap.
After rinsing and wringing the filter, moisten it with oil for filters. Clean filter box inside using a cloth and check the presence of foreign bodies. Now reassemble all the parts being careful to place correctly the 4 bars that maintain the filter in its position and screw the 4 screws again. Wash the filter for maximum 2-3 times, then replace it.

⚠ **WARNING**. If the filter becomes clogged with fine dust as well as normal dirt, replace it with a new one.
⚠ **WARNING**. Dirty air filters choke the engine and cause poor performance. Torn or broken filters can allow dirt to enter the engine and cause rapid deterioration of the piston rings, piston and barrel.

9.2- CHECKING OF THE GEAR OIL LEVEL
Operate when the engine is cold. Maintain the engine in vertical position and remove the oil level screw on the transmission crankcase. (photo 4). Check that the oil level reaches the lower edge of the level hole. If there is too much oil, let it flow out from the level hole until it stops flowing and collect the oil in a suitable container. If there is not enough oil, top up as required through the breather hole located at the top (photo 3). After checking it, tighten the screws. Use API-GL4 oil.

9.3- GEAR OIL REPLACEMENT
Change the oil when the engine is cold. Unscrew the screw on the lower side of the clutch/gear group. Collect the oil flowing out in a suitable container. Wait till the oil has completely flown out and, if necessary, tilt the engine to the side to make this operation easier. Tighten the screws. Unscrew the breather pipe in the top side of the carter and fill it out with 25cc API-GL4 oil. Replace the pipe and its tube.

⚠**WARNING**: Do not throw spent oil into the environment. Dispose of it correctly through authorised collection points.

9.4- STARTER ROPE REPLACEMENT
Remove the starter from the engine unscrewing the 4 screws (Photo 5). Remove the old rope. Be careful since the central wheel will turn till the complete spring discharge: keep it and discharge it slowly to avoid damages or possible injuries. Prepare the new rope and tie a knot at the top. Once the old rope has been completely removed, keep with a hand the external side and make the inside part rotate in anticlockwise for 5 times (photo 6). Stop rotating when the hole in the wheel is at the hole level on the outside part (photo 7). Now take the new rope and thread in both the holes the head without knot (photo 7) and make the rope pass completely till the knot beats (photo 8). Being careful not to leave the rope, let the spring withdraw automatically the rope winding it up on the inside wheel. Now make the free rope head pass through the handle and tie a double knot (photo 9). Reassemble the starter in the engine and screw the 4 M5 screws with strength (see the tightening torque values table).

9.5- DIAPHRAGM CHANGING
Remove the filter unscrewing the clamp by using a cross screwdriver. After removing the accelerator cable from the carburettor, the supplementary spring, the carburettor pipe and the diffusion pipe unscrew the two socket head screws and remove the carburettor from the engine. Now place the parts on a flat plane. Remove the upper cover by unscrewing the 4 screws (photo 10), remove the diaphragm and the gasket, check that the inside part is clean and reassemble by using the new diaphragm and the new gasket (photo 11).

⚠ **ATTENTION**: The carburettor is made of many small and delicate parts. Be very careful during all the phase with particular attention to the idling and its springs; they both must not be touched.

10- EXTRAORDINARY REPAIRS
Introduction: the following section contains information for calibration and reparations. It has been done according to the latest evolutions of this series: we reserve the right to change and improve the product without the obligation to review this manual. The manual doesn't include instructions concerning general workings that may be made in the workshop neither a list of workshop safety rules to be respected. It is taken for granted that reparations are made by specialists.

10.1- ADJUSTING ENGINE IDLING SPEED

⚠**WARNING**: These regulations must be done by specialists only. The engine comes with a standard calibration. Particular weather conditions or different altitudes can require a different adjustment of the idling.

The engine has two screws to adjust the idling (photo 14). Screw 1 adjusts the petrol flow at the idling, while screw 2 adjusts the throttle valve opening at the idling (even called mechanic idling). Standard calibration of screw 1 can be done by screwing the screw completely but stopping when you feel resistance. From this position unscrew the screw of one turn and then a quarter of turn. Starting from the standard calibration you have to act on both the screws to adjust it. The suggested speed rate for the idling is 1600-1800 rpm

10.2- CHECK-REPLACE THE REED VALVE
Remove the filter unscrewing the clamp by using a cross screwdriver. After removing the accelerator cable from the carburettor, the supplementary spring, the carburettor pipe and the diffusion pipe unscrew the two socket head screws and remove the carburettor from the engine. Unscrew the 4 manifold's socket head screws and take the manifold away. Remove the reed valve and check that the reeds are in good conditions. On the contrary, change the whole reed valve. Re-assemble all the parts following the inverted procedure and being very careful to place all the gaskets in their housings.

10.3- EXHAUST SYSTEM SERVICING
Remove the security cable and keep in mind its position in order to be able to fit it again. Take the springs away by using the proper tool (photo 15). Unscrew the two screws that keep the muffler and remove it from the engine. Do not remove the manifold from the cylinder. Unscrew the two screws that keep the silencer and remove it from the muffler. Using a 5mm drill remove the rivets from the silencer and take the two covers away. Remove the deadening material and through it away. Clean it from deposits and residuals and wrap up the perforated pipe with new deadening material. It must be well pressed. Assemble all the parts again and lock them with new steel rivets. Clean the muffler, reassemble the silencer changing the vibration small rubbers. Fit the whole muffler changing the silent blocks and inserting in the coupling some graphite grease resistant to high temperatures and change the o-rings. Verify the springs conditions and if necessary change them. Fit the security cable making it pass through the springs and their holes on the studs and lock it on itself (photo 15).
⚠ **ATTENTION**: use thread locking paste on all the screw when assembling.

10.4- DISASSEMBLY OF THE IGNITION FLYWHEEL
Remove the starter, both the parts of the air conveyor and the fan. In order to unscrew the flywheel central nut hold it using a proper tool placed on the two flywheel holes (photo 16). To remove the flywheel it is necessary to use puller, part no. 928.695.002 (photo 17); screw the 3 screws by placing the 3 spacers between the puller and the flywheel. We suggest using a compressed air gun to screw the puller central nut.

10.5- IGNITION AND COIL CHECKING
To find out if the ignition and the coil may be defective, using a tester make the following verifications on its resistance. Ignition: the measures between red /black cable and blue cable must be between 200 and 500 OHM. Coil: the measures between the spark plug cable and the black must be between 3500 and 7000 OHM.

10.6- IGNITON FLYWHEEL ASSEMBLY
Check that the key is correctly positioned on the crankshaft and insert the flywheel. Screw the central screw and lock it using a dynamometric key (see the tightening torque values table). To avoid the flywheel rotation it is necessary to use the proper tool placed on the two flywheel holes (photo 16). Reassemble the fun by screwing the 4 studs (use medium thread locking) and position the two plates one on top of the other, being careful to the inner teeth direction (photo 18).

10.7- CLUTCH-REDUCER DISASSEMBLY
Take the propeller support away by unscrewing the central nut (photo 19). Pump down the transmission group from the oil by unscrewing the screw positioned in the lower side, remove the 8 screws on the crankcase and take it away. Unscrew the central clutch screw by using the proper tool, part no. 144.695.006 (photo 20). To remove the clutch use the proper puller part. no. 144.695.004 screwing the 3 screws and the central screw using a screwdriver to avoid it from rotating (photo 21). Be careful not to lose the key placed in its housing on the crankshaft. Now remove the bell and the gear shaft.

10.8- CLUTCH-REDUCER ASSEMBLY
Verify the wear of the two rollers cages and, if necessary, change them (photo 22). Place the reducing gear on the upper bearing and fit the bell on the rollers cages. Place the washer on the shaft with the convex side towards the engine (we suggest changing the washer every time you disassemble it). Place the key in its housing on the crankshaft and fit the clutch. Screw the central nut and lock it using the dynamometric key (see the tightening torque values tables) and its tool (photo 20). Reassemble the cover verifying the presence of the two dowel pins. Replace the gasket with a new one and lock the 8 screws (see the tightening torque values table) using medium thread locking. Place the O-Ring on the shaft and then the bush with the internal bevel towards the O-Ring (photo 23). Fit the propeller support flange and close it by using a dynamometric key (see the tightening torque values table).

10.9- CYLINDER GROUP DISASSEMBLY
Remove the starter and then remove both the side of air conveyor. Remove the exhaust system (section 10.3). Unscrew the 4 head nuts and take the head and cylinder away. Now proceed with the servicing or change the parts you need to be changed. Carefully clean the head eliminating any carbon deposit and clean the decompression hole (photo 24). Before assembling it, accurately wash the cylinder, the piston and the head with solvents and blow in a jet of compressed air; then lubricate the cylinder liner and all the parts in movement with mixture oil. Assemble the piston keeping the arrow towards the exhaust; if there isn't any arrow fit the piston with the pin rings towards the induction. Check that the piston pin rings perfectly enter their housing without play. Assemble the cylinder without the piston pin rings and, making the crankshaft rotate, check that the piston slides freely. If a problem happens, detect the cause and eliminate it. Place the base gasket, the piston rings, fit the cylinder and the head with the related gasket. Lock the nuts in cross-way. Assemble all the parts previously disassembled.

⚠ **ATTENTION**: while changing the piston check the right selection.

10.10- CRANKCASE OPENING
Once all the parts have been removed, including the sub frame, be sure that even all the screws of the central cases have been taken away. To open the central cases it is necessary to use the proper puller, part no. 928.695.001 screwing the 2 screws and acting on the central screws till the cases have been completely opened (Photo 25).
To extract the crankshaft from the other half side of the case it is necessary to act with a press placing the case on its proper stands (Photo 26) and press on the crankshaft till its extraction.

10.11- BEARINGS REPLACEMENT AND CRANKCASE LOCKING
To remove the bearings warm the engine cases using a 130-140° furnace. If you place the cases inside the furnace with the bearings downwards they shall fall down; otherwise gently strike it using a pin to favour their exit. Prepare the new bearings; it is better to cool them in freezer and, with the warm case, make them fall down in their housing, being sure it is well beat. Wait some minutes till the bearings warm up; now the crankshaft will enter in the bearing. Close the two half cases using a new gasket and paying attention to the centring bushes. Tighten the case screws with the suggested torque values (see the tightening torque values table). Once the screws have been tightened, strike the edges of the crankshaft one or two times using a brass hammer to make the bedding easier and verify that it can rotate freely. Go on with the assembling of all the other parts.

10.12- ADJUSTMENT OF THE CLUTCH COUPLING RATE
The clutch is set by the manufacturer with a 4000 rpm coupling. If it is necessary to vary this rate, operate on the 3 nuts to adjust the calibration. Screw to increase the coupling rate, unscrew to decrease it.

⚠ **ATTENTION**: act in the same way on the 3 nuts. We suggest moving the regulation by ¼ of turn and verify the changing. If necessary, repeat the operation.

10.13- CHECK/CHANGE THE SPARK PLUG
Remove the spark plug hood and unscrew the spark plug using the proper tool. Using a thickness gauge check that the gap between the spark plug electrodes should be 0,9mm. If not, restore it.

⚠ **ATTENTION**:check and adjust the new spark plugs too to achieve 0,9mm gap between the electrodes.

11- ENGINE FITTING ON THE FRAME
The engine is supplied in a packaging and it is screwed on a cage to protect it during its carriage. Unscrew the 8 M8 screws that fix it and extract the engine. KEEP THE PACKAGING AND ITS CAGE FOR POSSIBLE REPARATIONS UNDER WARRANTY. WARRANTY IS NOT ACCEPTED IF THE ENGINE IS NOT SHIPPED IN THE ORIGINAL PACKAGING. The engine must be fixed on the frame using the 4 clamps with the silent-block and positioning some spacers if the frame doesn't have the necessary space to fit the manual starter. Refer to the drawing for the engine fixing measures.

⚠**ATTENTION**: The engine must be positioned as indicated in the picture. To assure a perfect lubrication, do not rotate it.

Because of the overall dimensions during the carriage the filter is 180° rotated. Do not unscrew the clamp to rotate it to reach the original position. The filter has a hole at the top to be used to avoid its rotation when using. Place the clamp or a small cable (they are not provided with the engine) fixing them in a proper zone of the frame.

⚠ **ATTENTION**: the filter may rotate if you do not fix it and it could collide with the propeller, breaking it. This may be very dangerous for your safety.

11.1- ELECETRICAL CONNECTION (PHOTO 27)
Steadily fix the coil on the frame using the two holes and their screws in a position that let the spark plug wire with its plug to reach the spark plug easily. If necessary, cut the wire if too long. The black wire with the eyelet (A) that comes out from the coil must be fixed together with the light-blue cable with eyelet (D), both earthed placed on the engine.
The light-blue cable of the coil (B) must be connected to the red-black cable of the stator. The stator comes with a connector that may be connected to the voltage regulator (optional); in this case on the red cable (E) with eyelet there is a +12V constant voltage while the engine is working. If you do not use the voltage regulator fix the cable and the connector to the frame.
The other red-black cable (C) must be earthed connected through the proper engine switch off button (not included).

⚠ **ATTENTION**: It is important to verify the proper functioning of the switching off button to be able to stop the engine in any moment. Its incorrect functioning may be very dangerous.

11.2- FUEL SYSTEM
Prearrange the frame with a proper tank and its pump to make the fuel reach the carburettor. Connect the fuel pipe to the manifold on the carburettor, fix it using a clamp and verify that there is not air coming in.

11.3- ACCELERATOR
Fix the carburettor by using the proper accelerator support (not supplied). After assembling the accelerator, check that its travel is enough or reach the carburettor throttle valve opening and check that recovery is good in order to avoid the engine staying accelerated. Check the presence and the right supplementary spring installation (photo 28).

11.4- REDUCTION GEAR
The reduction gear comes with oil from the manufacturer; to avoid oil leakage during the shipping, a small plugged tube is positioned on the breather pipe. The pipe must be kept for possible future shipments and on its place fit the supplied pipe (photo 29). Check that the pipe has been fit correctly and position some clamps to be sure it doesn't collide with the propeller. Check the oil level by unscrewing the proper level screw (photo 4).

⚠ **ATTENTION**: inside the reduction gear there is a clutch that works in a bath of oil. Only use specific API-GL4 oil.

11.5 SPARK PLUG
Remove the spark plug and check that the gap between the spark plug electrodes should be 0,9mm. Fit the spark plug hood inside the conveyor cap being careful to fit it completely. Now engage on the spark plug and enter the small rubber inside the hole in the plastic conveyor (photo 30). Spark plug type: NGK BR10EG

11.6 PROPELLER
Only use suggested propellers. The use of a not proper propeller may compromise the engine working.

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12- SERVICING TABLE

At every use	Check the bolts and screws tightening
	Check the silent-block conditions
After the first 10 hours	Change the gear oil
	Check carburetion
	Check the gap between the spark plug electrodes
Every 25 hours	Change the spark plug and adjust the electrodes gap
	Clean the air filter
	Change the gear oil
	Replace the muffler springs
Every 100 hours or every year	Replace the air filter
	Replace the starter rope
	Replace the diaphragm and clean it
	Replace the silent-block
	Replace the fuel system pipes
	Replace the reed valves
Every 100 hours	Check the piston and piston rings
	Replace the pin and rollers cage
	Decarbonise and clean the decompression hole
	Replace the silencer deadening material
	Disassemble the reduction gear and check the clutch and bell wear
Every 200 hours	Replace the piston and piston rings
	Replace the reed valve
Every 400 hours	Replace all the bearings and seals
	Replace the crankshaft

TIGHTENING TORQUE VALUE FOR ENGINE BOLTS AND SCREWS	M	N.m	Kgf.m	Lbf.ft	Locking compound
HEAD NUTS	7	14	1,4	10,36	
CRANKSHAFT NUT - CLUTCH SIDE	12	60	6	44,4	
CRANKSHAFT NUT - IGNITION SIDE	10	40	4	29,6	
PROPELLER CENTRAL SCREW	10	40	4	29,6	Loctite 243
SPARK PLUS		20	2	14,8	
CRANKCASE SCREWS	6	8	0,8	5,92	
CARBURETOR LOCKING SCREWS	6	8	0,8	5,92	
INTAKE MANIFOLD LOCKING SCREWS	6	8	0,8	5,92	
MUFFLER STUDS NUTS	6	10	1	7,4	Loctite 270
SILENCER LOCKING SCREWS	8	15	1,5	11,1	Loctite 243
MUFFLER LOCKING SCREWS	8	15	1,5	11,1	Loctite 243

STANDARD TIGHTENING TORQUE VALUES	N.m	Kgf.m	Lbf.ft
5mm Bolts and nuts	6	0,6	4,44
6mm Bolts and nuts	10	1	7,40
8mm Bolts and nuts	25	2,5	18,50
10mm Bolts and nuts	45	4,5	33,30
12mm Bolts and nuts	55	5,5	40,70

TECHNICAL LIST	THOR 100
Polini Engine	2 stroke monocylinder
Cooling	Forced air
Bore for stroke	52 x 52
Displacement	110 cm3
Power	20,5 HP a 8900 R.P.M.
Static thrust	Ø 130 - 64 Kg.
Cylinder	Aluminium with Gilnisil coating
Compression ratio	12,5:1
Piston	Two chromium plated rings mm 1
Intake	Reed vale in the crankcase
Carburettor	Walbro
Air filter	Air box
Ignition	Electronic and with battery charger possible
Battery charger prearrangement	Output power 80 W at 5500 RPM
Spark plug	NGK BR10EG (electrodes distance: 0,9mm)
Spark plug hood	5k Ω resistance
Fuel type	Lead free petrol with 2% synthetic oil
Gear reduction unit	Helical teeth in oil bath with 3,43 reduction ratio
Starting	Pull start with self winding cable
Clutch	Centrifugal in oil bath
Muffler	Expansion with oval silencer
Fuel Consumption	2,7/3 litres/hour at 6500 rpm - 30kg thrust
Engine weight	11,8 Kg.
Propeller rotation	Clockwise

ENGINE PROBLEMS DIAGNOSTIC	REASON	REMEDY
The engine doesn't start	Out of petrol	Add petrol
	Petrol doesn't reach the carburetor	Check the fuel system circuit
	Old or wrong petrol	Empty the tank and the fuel system circuit and replace the petrol.
	Flooded engine	Remove the spark plug, start the engine, dry or replace the spark plug.
	Defective spark plug	Replace it
	Blackened spark plug or wet	Clean and dry the spark plug or replace it
	Earthened switching off cable	Check the wiring
	Spark plug hood	Check it
	Carburetor has problems	Clean and check it; eventually replace the diaphragm
	No spark	Check the ignition, coil and wiring
The engine doesn't idle	Dirty carburetor	Calibrate the carburetor
	Out-of-adjustment screws	Clean and check it; eventually replace the diaphragm
	Defective spark plug	Replace it
The engine doesn't reach the maximum rpm	Wrong carburetion	Calibrate the carburetor
	The carburetor has problems	Clean and check it; eventually replace the diaphragm
	The reed valve has problems	Replace the reeds or the whole reed valve
	Dirty air filter	Clean or replace it
	Dirty exhaust system	Clean or replace the deadening material
Engine revved up when idling	Out-of-adjustment screws	Calibrate the carburetor
	Air through the gaskets	Replace the gaskets and seals

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