



USE AND MAINTENANCE MANUAL

TOP 80

CHASSIS AND COMMON PARTS

Welcome Onboard!!!

Congratulations!!! You have decided to fly a **PAP** machine. This airplane will let you access in a very simple manner an easy type of flight similar to that you had in your childhood dreams. So, please take the time needed to read through the recommendations below in order to avoid this dream becoming a nightmare for you and for the people you will fly over.

Have nice flights!!!...



...and Happy Landings!!!

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TECHNICAL SPECIFICATIONS

Series	TOP 80		
Models and technical features			
	1000 T	1250 T	1400 T
User Manual	TOP 80 User Manual 		
Motor Type	TOP 80 single cylinder, 2-stroke, forced air cooled		
Cylinder	80 cc		
Carburettor	Walbro 24 mm. Optional Dell'Orto 17,5 mm		
Power & Ignition	15 HP at 9200 R.P.M., Electronic		
Reduction gear	Mechanical in oil bath, inclined teeth		
Reduction ratio	1/3.38	1/3.84	1/3.84
Centrifugal clutch transmission	yes		
Start	Manual (pull) with foot extension (kick start in flight)		
*Thrust (kg)	+/- 38	+/- 45**	+/- 50**
Fuel	leaded or unleaded Super grade + synthetic oil 2% (we recommend Castrol)		
Fuel tank	5 L	13,5 L	13,5 L
*Autonomy hours	1,30	3 h	3 h
Cage	Round pipes in stainless steel, T.I.G. welding		
Cage in 2 parts	no	yes	yes
Cage in 3 parts	no	Optional	Optional
Wood propeller (cm)	2 blades 90 cm	2 blades 115	2 blades 125
Metal reinforced Wood propeller	Optional	Optional	Optional
Carbon fibre propeller	no	Optional	Optional
Paramotor weight (harness inc.)	20 kg.	23 kg.	23,5 kg.
Max. Pilot weight	70 kg.	90 kg.	110 kg.
Recommended Pilot weight	60 kg.	80 kg.	90 kg.
Harness	Sup'Air Special PAP, with automatic buckles + neoprene pockets.		
Size (cm)	100 x 100 x 40	125 x 125 x 40	140 x 140 x 40
Propeller case	yes	yes	yes
H.R.S	no	yes	yes
Head rescue system	no	yes	yes
RPM counter	optional / yes	optional / yes	optional / yes
Transport bag in Maxi-trex	no	optional / yes	optional / yes
	PAP 1000 T / TL	PAP 1250 T2 / T2L / T3 / T3L	PAP 1400 T2 / T2L / T3 / T3L

* Thrust, autonomy and general performance depend greatly on the glider, the altitude and the pilot, so the data offered here must be taken only as reference data.

** The best thrust we have obtained with carbon prop

HANDLING SAFETY ON THE GROUND

If you are new to Paramotoring, it is extremely important to get used to use the Paramotor on the ground in order to be safe and avoid accidents. Our experience as pilots, and by comments provided by our beginners and advanced clients, tells us to be cautious with the Paramotor from the very moment you buy it until you are ready to fly with it. Therefore, please read through the following conclusions.

- Having acquired a **PAP** Paramotor, you should take a course by an authorized professional flying instructor qualified by your local air federation or similar organization. They will be responsible for training you and provide you with all the safety tips and standards. This is, without doubt, the best option...
- If after acquiring your **PAP** from your local dealer you have chosen not to take the course because:
 - You count on the help of a good experienced Paramotor pilot friend and on your own expertise as a free-flight pilot. This would be enough to acquire the necessary level to fly and enjoy the flight with Safety...
 - You have decided to acquire your experience and technique by yourself because you are a very experienced free-flight pilot

If these latter two are your options, please find below the following advice, because you have NOT obviously made the right choices to start with the exciting world of Paramotor.

WARNING: Most Paramotor accidents take place while operating on the ground.

ADVICE AND RECOMMENDATIONS

1. How do you carry your Paramotor to move it on the ground?

Since this is a dismantable model (2 parts version), you may notice there is a double horizontal tube in the middle. The lower tube corresponds to the fixed part of the chassis (base) and the upper tube to the dismantled part. This part is attached by 4 PVC separators and some nylon pegs. ALWAYS carry the Paramotor by the lower tubes in order to avoid loosening the connecting system. (PICTURE 1).

On the 3 part version, this horizontal tube corresponds to the dismantled area, but its design allows holding by this area (PICTURE 2).

2. What should I check and watch before starting up the unit?

Every unit goes through a quality control by PAP; therefore you can start your Paramotor as soon as you receive it. You must add a mix of petrol and synthetic oil – at the recommended ratio (see *Running-in of the Engine*)–, then open the safety valve placed behind the left **ACTIVE SYSTEM** arm –standard version– (PICTURE 3) or on the upper auxiliary tank –competition version– (PICTURE 3B). Check that there are no loose objects nearby or that any article of clothing can get sucked into the propeller, and that the Paramotor is properly placed on a mat (we recommend a thick and heavy mat so it is not sucked by the propeller) this will keep stones, grass, and/or ground dirt from the propeller. NEVER direct the propeller towards people, animals, paragliders, or any other object. Before starting up the Paramotor, you should warn everybody around.

3. What will occur when you pull the starting rope?

When you start up the engine, it begins to run, but the propeller is not turning unless you press the throttle. This is due to the centrifugal clutch. It is important that you are aware of this. The Paramotor becomes unstable on the ground due to its inertia, vibrations and movement, especially when you press the throttle. Therefore, it is **ESSENTIAL** to place the Paramotor on a flat surface so it is stable and steady. Then, you should securely hold the Paramotor during the start-up, acceleration, and warming-up phases. This will help you avoid the Paramotor falling over or produce any sudden movements and risk of accidents (PICTURE 4).

WARNING: From phase 4 and on, please handle the Paramotor with maximum caution. Your own safety depends on that!!!

4. How should you proceed to start the engine?

- A) Check that the throttle is not sticking by squeezing it several times. Hold the throttle with your left hand in order to conveniently use it (PICTURES 5 and 5B) and hold the chassis against the ground when pulling the starting rope. Do not leave the throttle hanging from the net, on its original location, or on the ground (PICTURE 6).
- B) Press your left forearm tight on the top area of the harness or on the H.R.S. system. (PICTURE 7).
- C) Press your left foot tight on the lower curved part of the chassis, next to the tank, and place your right foot firmly so you will have a strong support in order to avoid falling down or unbalancing when you pull the start rope (PICTURES 4 and 7).
- D) After pressing the starter or priming the petrol circuit (depending on the carburettor) (see *Starting up the Engine*), firmly grip the pull start handle and pull quickly and accurately. This will let the engine to respond more efficiently. Low cubic capacity motors need a small amount of throttle to start-up. Do not exceed doing this, since the Paramotor could get out of balance and fall over you if you have not held it tight (PICTURES 4 and 7).
- E) It works! Eureka! Now, when you open the throttle you will have to resist the thrust, pressing yourself against and down the ground. Let the engine run during one minute before opening the throttle (PICTURE 8).
- F) Then, get used to the throttle by squeezing smoothly and strongly in order to become familiar with the reactions of the Paramotor. The more you press the throttle, the bigger the thrust will be and the more unbalanced you will become. Therefore, you will have to strengthen your support on the Paramotor (PICTURE 8).
- G) The picture chapter shows examples on INCORRECT WAYS TO HANDLE THE PARAMOTOR during the phases of moving/transportation (PICTURE 2), starting-up (PICTURE 9) and warming-up (PICTURE 10).

WARNING: If you lose control of the Paramotor and it suddenly falls on the ground pressing to your side: you should NEVER try to stop or hold it, but jump backwards and let it fall. Be aware that a propeller turns at 700 km/h becoming a giant blade/hammer! You are more important than a Paramotor, it can always be repaired (at the very worst)...

5. The engine is hot now, then what?

You should now stop the engine to check that the stop switch is functioning. Before sitting on the harness, you should place the footstrap of the F.A.S. system on your left foot in order to auto start the Paramotor (PICTURES 11 and 11B). Once you have sat yourself on the harness, tighten the chest strap and get up carefully in order to not to lose your balance. The way of getting up depends on you. Now that you are standing, adjust the shoulders straps, place correctly the seat and adjust the legs straps. In order to do this, we recommend sitting on the harness without sitting completely when you are on the ground, just being on your knees, carry the Paramotor on your back and get up by walking ahead a little bit (PICTURES 12 to 12F).

Do not press the throttle while doing this since the propeller will start turning and this may unbalance you!

6. And now, how do I start it up?

Due to the little resistance low cubic capacity motors offer to start-up, once you are standing you should use the F.A.S. system (see *Foot Auto-Start*) to start-up the Paramotor with your foot (PICTURES 13 to 13D).

7. Then, am I ready now to take off?

Once you know how to properly start-up your Paramotor ON YOUR OWN, check one last time that the leg straps of your harness are fastened (PICTURE 14), simulate take-off runs with the engine on, and practise inflations with engine off. When these training runs are complete, practise as many real take-offs and landings as possible. Choose easy wind conditions and sites not too high above the sea level.

8. At this stage, please read through these detailed points:

- Remember that when you fly you do it under your one and only responsibility
- Be aware of your flying ability and your knowledge of the wind.
- COMPLETELY avoid flying over air restricted or forbidden areas (airports, cities, etc.) unless your countries laws allow.
- Fly under appropriate weather conditions for paragliding and paramotoring.

- If you are already a paragliding pilot, please consider a small period of adaptation to the Paramotor, since its thrust slightly modifies the reactions of the wing and, therefore, your sensations when flying.
- The extra weight of the Paramotor at your back will also make you feel 'different' when taking off and landing.
- If you are learning to fly a Paramotor from scratch and you are not familiar with the free flight at all, you will nevertheless be able to feel the best flying sensations thanks to the *ACTIVE SYSTEM*. This system will also help you on your safely learning of free flight
- Do NOT fly under the influence of alcohol, drugs, and/or medicines
- After a few hours flying, (depending on your pilot expertise and skills), you will feel happy and comfortable aboard: Your PAP Paramotor.

Thank you for reading these recommendations.

PAP CHASSIS SECTIONS AND COMPONENTS

CHASSIS AND *ACTIVE SYSTEM* ARMS

The PAP chassis is made using a stainless steel TIG weld with argon gas. Its simplicity should not let you forget its highly technical level of construction. The ratio between its weight and strength properties represent ideal protection for the pilot in case there is an impact because it properly warps and smoothly absorbs the impacts. Its strength when inflating the wing is another advantage of this chassis, especially when there is little wind and the integrity of the chassis and the propeller could be compromised.

The AS (*ACTIVE SYSTEM*) system consists of two parallel arms that join the harness with the chassis (**PICTURE 15**). It includes two karabiners to attach the glider. It works as a lever balance between the pilot and the weight of the Paramotor. That is why it is so important to find the right static balance to your weight. You can do this by hanging yourself with the Paramotor out of a gantry (like a swing). Move the anchor points in parallel: lighter pilots backwards (**A**), and heavier pilots forwards (**E**). These 5 options (**A, B, C, D, or E**) will let you find the best tilting angle for the propeller to the ground, approximately 20° backwards to a vertical line, but it should never be tilted forwards (**PICTURE 15B**).

PAP 1250 and 1400: A = > 60 kg B = > 70 kg C = > 85 kg D = > 95 kg E = > 100 kg

The *ACTIVE SYSTEM* anti-torque shackles should be placed to the left, as specified on the image (**PICTURE 15C**).

DISMANTLED CHASSIS INTO 2 PARTS (T2 and R2)

In order to assemble the top part of the chassis, you first should position the central part nylon pegs (**1**), and then, the sides (**2**). Be sure that all parts to fit are properly cleaned. It is important to properly place the clips checking they press correctly (**PICTURES 16 to 16C**). To dismantle, start with the sides (**2**), and then the centre (**1**). The structure should not be forced when assembling and dismantling (**PICTURES 16D and 16E**).

When chassis is dismantled, *H.R.S.* system (as long as it is installed on the structure) remains attached to the top part of the bottom half of the chassis, over the harness (see chapter *Assembly and Dismantling of the H.R.S.*), (**PICTURE 18F**).

DISMANTLED CHASSIS INTO 3 PARTS (T3 and R3)

The assembly of the 2 sides of the chassis (left = **A** and right = **B**) should be done according to the following points:

It is important to properly place the clips checking they press correctly (**PICTURES 16 to 16C**).

1. The two side parts of the chassis should be attached by the top area, using both clips (**1**).
2. Fit the top central part on the nylon pegs, under the *H.R.S.* system (**2**).
3. Fit parts A and B (located more to the bottom) of the central area on the nylon side pegs (**3**).
4. Attach the horizontal clips located behind the *ACTIVE SYSTEM* anchor arms (**4**).
5. Turn the down ends of the chassis hoop outwards until they stop, then fit the nylon pegs of the hoop dismantled parts **A and B** (**5**).

6. Open each rod **C and D** outwards and in diagonal (6) in order to match them to the metallic peg located on the horizontal bent bar. This last step should be accomplished by applying some upwards force to the chassis bar in order to fit in rods **C and D**.
7. Once rods **C and D** are located, insert the safety rings into their corresponding holes.
8. The dismantling process should be done in reverse order to assembly.
9. The start rope guide pulley should be hooked on to the welded rod on the chassis before starting the engine. For dismantling, simply slide the pulley off this rod (PICTURE 17F).
10. (PICTURES 17 to 17F).

When the chassis is dismantled, the *H.R.S.* system (as long as it is installed on the structure) remains attached to the top part of the central part of the chassis, over the harness (see chapter *Assembly and Dismantling of the H.R.S.*), (PICTURE 18F).

PARACHUTE SYSTEM *H.R.S.* (Head Rescue System)

This system has been exclusively designed by **PAP** for its paramotors. **PAP** was the first manufacturer worldwide to use this location for the safety parachute. Simple, comfortable, and easy to use thanks to its location that properly distributes the weight of the parachute over the structure and provides the best inertia lever for fast and/or delicate releases (PICTURE 18).

The external **PAP** container is included with the Paramotor and you only need to install your parachute (it is required that the main riser ends in an H form). In order to do this, you should attach the parachute handle to your inside container on its front side, and with the help of two separate lines, pack the parachute on its container as specified below:

1. Place the parachute on its container with the flaps spread (be sure to choose the right position according to the rear straps that will attach the parachute to the chassis subsequently).
2. First insert the side flaps, then the lower flap (where the white cord loops are located), and finally the top flap. When operating, the parachute handle should remain between the two loops.
3. With the help of two separate lines, insert the cord loops through the holes of the lower and top flaps and use both curved pins to secure the flaps under the release handle panel.
4. Once the parachute is installed inside the container, close the front side of the parachute handle using the Velcro. Press the "package" where necessary in order to give it an aesthetic shape. Then, attach it to your Paramotor chassis following the next chapter instructions.
5. We recommend simulating a partial parachute release in order to be sure the installation of the parachute is correct on both container and chassis.
6. Repeat these steps for a definitive installation, and...
7. We wish you'll never have to use this system on your **PAP!!!**

WARNING: IT IS ADVISED THAT YOUR PARACHUTE IS TO BE INSTALLED TO THE *H.R.S.* SYSTEM BY A PROFESSIONAL OR AN EXPERT. THIS COULD BE YOUR INSTRUCTOR, LOCAL DEALER, PILOT FRIEND, ETC. AS LONG AS HE/SHE IS FAMILIAR WITH PARACHUTING INSTALLATION.

ASSEMBLY AND DISMANTLING OF *H.R.S.* ON THE CHASSIS

Once the parachute is in its container, please read through the following instructions to install it on the chassis:

1. Unscrew one of the Allen screws and 6mm nuts that hold the tube that secures the harness behind the pilot's neck. Release the harness by sliding one of the chassis-attachable top straps through the steel tube.
2. Orientate the parachute so the loops of the handles look upwards on to the chassis behind the pilot's head in the location for this purpose (you should now be able to read the PAP logo the correct way up) (PICTURES 18 and 18B).
3. Thread the two loop straps located on the lower part of the container over the steel tube, and then assemble the harness in reverse order to dismantling. (PICTURE 18C).
4. Fasten together clips to the back container straps over the chassis tube where the net is anchored (A). Then, tighten the parachute to the chassis using both clips (PICTURE 18D).
5. Once this operation is finished, attach right and left parachute risers to their respective karabiners, placed behind the shoulder taps cover, as shown on the image (PICTURE 18E). Karabiners are NOT included with your Paramotor.
6. In order to dismantle the chassis, you should only release the back container clips, so it will hang out of the harness top attachable bar to the chassis (PICTURE 18F).

WARNING: IT IS ADVISED THAT YOUR *H.R.S.* SYSTEM IS TO BE INSTALLED TO THE CHASSIS BY A PROFESSIONAL OR AN EXPERT. THIS COULD BE YOUR INSTRUCTOR, LOCAL DEALER, PILOT FRIEND, ETC. AS LONG AS HE/SHE IS FAMILIAR WITH PARACHUTING INSTALLATION.

We use a prestigious Sup'Air harness, worldwide pioneer on flying harnesses construction. This is specially designed for **PAP** Paramotors. Cordura is the material used, one of the best worldwide fabrics used for mountain and sports materials. Black and grey colours. Three different sizes (S, M and L) that include:

- 3 automatic clips, one ventral and two for the legs
- External extension for the harness sit
- Separate legs
- Elastic straps on the shoulder taps
- High-quality pulleys for the foot accelerator
- Parachute preinstallation system
- 2 side neoprene pockets
- Sup'Air automatic steel karabiners.

This harness is specially design to provide the best comfort for long-lasting flights (PICTURES 12F, 15C, and 19).

PROPELLER

The propeller included is a wood double blade (PICTURE 20). Torque 1 kgm (10 Nm). After applying torque, it is very important to check the propeller TRACKING. Tracking is the difference between the tips of the propeller on its path. If this occurs, it means that the propeller bols may have been tightened asymmetrically. To track the propeller properly, you have to:

1st. Use a long device (a shaft or a switch) and support it on the down part of the chassis, then turn the propeller and check that all the planes pass through by the same point.

2nd. In case they do not pass or touch the device at the same distance and on the same shaft, you will have 2 alternatives to work with. You should prioritize the first one:

- A. Dismantle it again and turn $\frac{1}{4}$ or $\frac{1}{2}$ over the propeller support.
- B. Tighten a little more the side that is further away from this point of reference.

Tracking tolerance 1 mm. (PICTURES 20B to 20D).

A carbon fiber propeller is optional (PICTURE 21), dismantled into two parts. This type of propeller is especially interesting for those who travel very often as it comes in two parts. It is quite resistant to impacts produced by small stones, pebbles, and sand (PICTURES 21B and 21C).

IMPORTANT: When the Paramotor is brand-new, it is required to tighten the propeller again after a few hours of flight in order to avoid the screws unscrewing due to the centrifugal force. Every time you dismantle and assemble a propeller it is required to tighten screw the propeller screws after the next hour of flight.

WARNING: If you do not have a torque wrench, just tighten it only a little bit more than the maximum pressure applied by the weight of your hand. Otherwise, the centre of the propeller against the propeller thrust hub could be damaged and cause rotation unbalances, introducing vibrations that could even damage the chassis.

FOOT STARTING SYSTEM F.A.S. (Foot Auto-Start)

All **PAP** Paramotors include the foot starting system, also known as F.A.S. (Foot Auto-Start), created by **PAP**. This system lets you auto start the Paramotor to take-off without any external help. You can also turn your Paramotor off when flying and start it again using this system. A complex electric system means additional weight that is not necessary either. A simple strap on your left foot will help you proceed.

Here is a list with recommended steps:

1. Place the strap on your left foot. The loop should be placed behind your heel and the fastening clip over the top of you foot (PICTURE 11B).
2. When the Paramotor is on your back, look for a support, e.g., a person, a car, or a tree. If you are not a very experienced pilot, do not try to start the Paramotor without this support, you might loose your balance and fall and damaging yourself or the Paramotor (chassis, propeller, arms, etc.).
3. Lift your left heel bending your knee and with your left hand hold the pull start handle and insert it into the loop on the balck of the foot strap, always from underneath (PICTURE 13).
4. Place the engine on the maximum compression point smoothly using the handle.
5. Stand firmly and kick forwards without putting your heel on the ground. It's like kicking a ball. You should not need to do it very hard since the engine does not need too much effort to start-up (PICTURES 13B to 13D).
6. Release the pull start handle from the foot strap by turning it and without releasing it completely from your hand, then take it back to its original position on the chassis (bending your knee and lifting your heel can help you on this operation). Note do not just release the handle with the rope extended as it recoils it may get wrapped around the machie, enter the propeller and damage the mechanism.

7. Once you have gone through an adaptation period you will likely be able to start it up without the help of a support.
8. If you want to re-start during flight, please be sure you are high enough and that you have a landing spot within gliding distance. Release your left steering line and follow above instructions. You will notice that starting up is easier when flying since there is no balancing.
9. If there is a long interval since you turned the engine off, we recommend following the cold start instructions (*see Starting up the Engine, Cold Start*).

WARRANTY

A **PAP** Paramotor includes a 1 (one) year warranty in chassis welding and engine (manufacturing and/or assembly faults). Seizing of the engine not included in warranty. In the event of a problem, please contact your dealer and then please send the faulty parts to factory. When requested by the manufacturer you will have to include pictures of the faulty parts of the engine and/or Paramotor.

NOTE: The owner or client will be liable for the courier and/or mail expenses.

PRE-FLIGHT CHECK

According to our experience as manufacturers since 1990, we can state that most of the issues, failures, faults, etc., on a Paramotor could be easily avoided, or at least, minimized if the pilot would regularly go through a pre-flight check.

In fact, all other air disciplines go through a **COMPULSORY** pre-flight check by means of a check-list. This works as a previous procedure against failures and, most important, to avoid accidents. Therefore, we recommend apart from a pre-flight check, also a post flight check of the Paramotor in general, engine, and all other parts.

1. Do a physical inspection (and rectify if necessary) of the engine and all other parts related for a proper operation:
 - Engine, thermal group, dampers attached to chassis, and all fastening parts.
 - Exhaust pipe: Tube, silencer, slip ring, springs, and all fastening parts.
 - Reduction Gear: Whole body, levels, clutch, springs, and all fastening parts.
 - State of the propeller, support and, all fastening parts.
 - Inlet: Carburettor, air filter, cable and throttle sleeve, and all fastening parts.
 - Fuel system: Tank, tubes, manual pump, filters, and all fastening parts.
 - Electric installation: Ignition coil, spark plug, engine cut off switch, cables, and all fastening parts.
 - Start-up mechanism: Start-up handle, pulley, rope, internal mechanism, and all fastening parts.
2. Do a physical inspection (and rectify if necessary) on the chassis and on all other parts related for a proper operation:
 - Chassis: Weldings, tolerances and distances between chassis sections, dismantling mechanisms, net, arms, and all fastening parts.
 - Piloting position: Harness, pockets, flying accessories (variometer, GPS, wind line, radio, antennas, map-holder, mirrors, etc.), throttle, paraglider accelerator, carabiners, H.R.S. system, paraglider steering lines, and all fastening parts.

ADVICE:

- Do not put your hands inside the Paramotor when the engine is running and the propeller is not turning
- After your flight, clean your engine and propeller for possible oil, dust, etc. with a clean cloth. This is the best way of finding possible faults. Besides, you are doing your post flight check more relaxed than when you decide to fly.

If you have any doubt, do not go flying and check with your instructor, local dealer, and/or manufacturer.

IN FLIGHT

Please check with your flight instructor, local dealer, and/or local training school. If you are already a paragliding pilot you should feel almost the same sensations as in free-flight, especially in thermal conditions...

However, we **DO NOT recommend** learning without an instructor, especially if you do not have any previous experience. Remember that the Paramotor engine could stop at any time you should **ALWAYS** have an alternative landing and a safe glide to a landing spot. If you are flying low, do it always into the wind direction.

On your first flights, we you stop the engine before landing so the propeller is not working when you touch the ground, and thus avoiding breaking it.

Remember you are carrying a weight of almost 30 kg on your back. Please take it into account when you decide to take off and to land.

Do not let the circumstances to take you by surprise!!!

MOST OF THE DANGER COMING FROM THE PARAMOTOR OCCURS ON THE GROUND

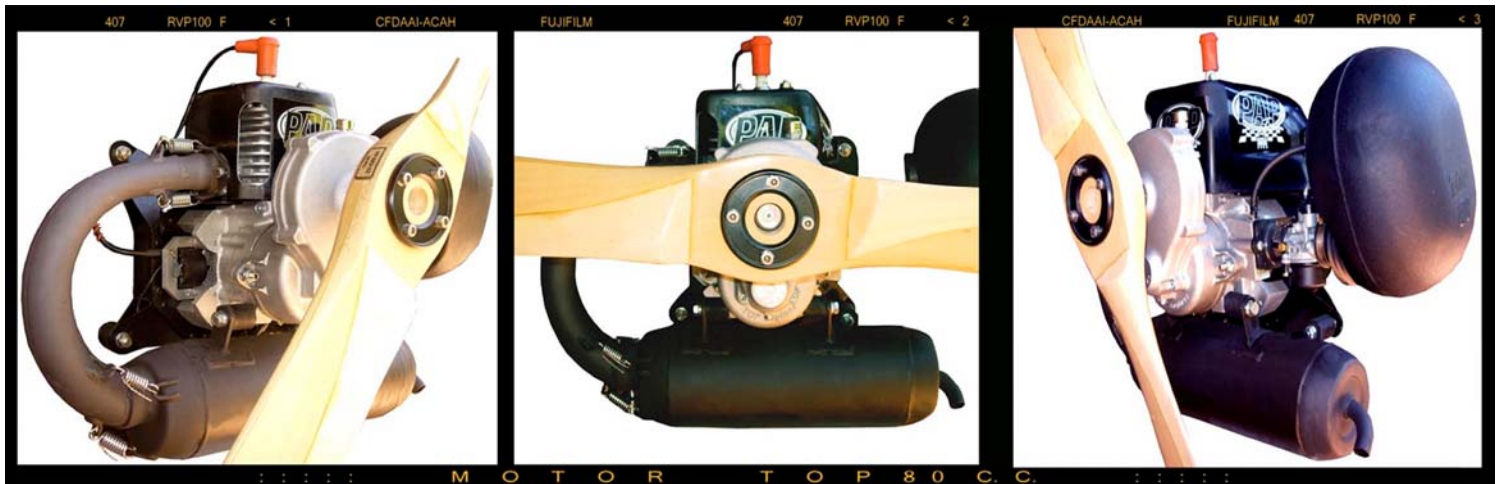
WATCH OUT ALL YOUR MOVEMENTS AND DO NOT LET ANYBODY HELP YOU, UNLESS IT IS ANOTHER EXPERIENCED PARAMOTOR PILOT





ENGINE MANUAL

USE AND MAINTENANCE



TOP 80 cc ENGINE

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TOP 80 ENGINE - COMPONENTS AND ELEMENTS

ENGINE

This engine is especially conceived and created for the sport of Paramotor. It is a two-stroke monocylindrical engine of 80 cc, high compression, cooled by forced air maintaining temperature of the motor at its best and high performance. It uses premium-grade petrol with a ratio of 2% (50:1) of synthetic oil per litre. The excess or lack of oil will damage the operation of your engine. Therefore, it is important to always use the same oil ratio. Never mix different types of oils. We recommend NOT using petrol that has been mixed more than 50 days ago, since the oil molecules will break down with the petrol molecules. We also recommend filtering the petrol when filling up (PICTURE 24).

PAP recommends CASTROL TTS PREMIX and MOTUL 700.

RUNNING-IN OF THE ENGINE

All engines include a 15 to 20 minutes running-in on the ground, where they are regulated and adjusted on carburation at sea level. The propeller is checked to be perfectly balanced and other elements of the Paramotor (clutch, reductor gear, etc.). We recommend warming it up for 15 minutes over 5000 RPM (in order to not to harm the clutch mechanism) before start flying. During the first hours, you should not force the engine at its maximum RPM (we recommend flying on a gentle breeze or meteorological weather to help the engine). Complete running-in is finished after 10 hours of use (on the ground and/or on the air) with unleaded petrol and a ratio of 2%. This ratio should never change during the use of your Paramotor.

If you go through a proper running-in, the useful life of the engine could increase by 100% and any mechanical failures will be minimized. Otherwise, it may suffer from important and irreversible damages.

The engine regime should change often in a progressive increase. Do not apply violent pushes to the accelerator, since the centrifugal clutch (PICTURE 22) will suffer from anomalous loads.

Every time you start-up the engine we recommend going through a thorough check so all mechanical parts work properly. All screws, bolts, and nuts should be checked as well.

Apart from the first 15 minutes, we recommend doing the running-in by flying, but remember not to operate at the maximum regime too often. If you are a heavy pilot, we recommend going through a 1 hour running-in on the ground before flying.

Revisions and checks during this phase are detailed on section Maintenance, First 10 hours.

If you feel the engine is losing power, it may be due to a poor carburation because it is not properly adjusted or because the filter is dirty. Depending on the altitude, you will have to readjust the carburation in order to avoid it being too poor. It is always recommended that the engine carburation is richer than poorer; you will therefore avoid the risk of seizing.

After one or two hours of flight, it is important to control the torque of the screws of the cylinder head (see torque table). You will usually notice that the cylinder head is loose because dull noises can be produced or stains of oil are placed over when removing the cooling cover out of the cylinder.

STARTING UP THE ENGINE

It is forbidden to start-up the engine without the propeller and/or the reductor gear. A two-stroke engine has very little mass and without the load of these elements, it reaches its maximum regime in a fraction of a second. There is no RPM limiter. All mechanical components are designed to stand only to those RPM regimes of the propeller. An overflow regime could be terrible for the engine.

Warming-up requires at least 1-2 minutes. During this period you should accelerate progressively in order to get the proper operating temperature. Do not let the engine turn below 4500 RPM, since at that regime, the clutch hammers are constantly opening and closing due to the limited centrifugal force; and due to hitting against the hood it is quite likely that the springs, and even the clutch, will break.

To know how much amount of petrol you should put in the engine every time you start it up you only need to press your finger against the proper push-button valve over the outer side of the carburettor and at the same time against the petrol circuit feeder pump.

By means of practising you will anticipate the proper technique to take. A good thing is to remember how long it has taken since you last start it up, thus determining if the next start will be cold or hot. You could use the carburettor choke, however, this system is quite uncommon but mainly used on extremely cold days.

REDUCTOR GEAR AND TRANSMISSION

The reductor gear leaning in oil bath is quite efficient and reliable, and has a very low noise production. Its ratio is 3,84 / 1. Almost no maintenance and adjustments are necessary, except check every 100 hours that oil level and state of the clutch (PICTURE 23) are correct.

The transmission from the crankshaft to the reductor gear is connected by means of a dry centrifugal clutch that allows the propeller to be not moving when idle. No maintenance is required (PICTURES 23 and 23B).

The amount of oil to apply is: 30 ml. of SAE 140.

INLET

WALBRO CARBURETTOR (STANDARD VERSION)

COLD START:

This carburettor also includes a choke cam (PICTURES 25 and 25B). To start up for the first time, place cam on position 2, start the engine up and wait for auto stop. Then, place cam on neutral position 1 and restart. With this action, the engine should start operating normally, unless the outside temperature is too low, therefore, we recommend repeating the above procedure. Leave the engine ticking over for a few seconds. Then, your Paramotor will be ready for normal operation.

IMPORTANT: Before start-up, check that throttle cable is not blocked. To avoid this, just press throttle several times (PICTURES 5 and 5B).

WARNING: If you start it up while accelerating, you should release the throttle before the engine's RPM increase.

HOT START:

No action is necessary on the throttle. You can directly start-up. If you feel the engine is about to stop just after starting it up, we recommend starting up by pressing throttle so the engine gets some petrol. The rest of the procedure is similar to cold start.

DELLORTO CARBURETTOR (TDR VERSION)

COLD START:

To start your engine up, open petrol circuit air valve and petrol cock (located on the top additional tank) (PICTURE 26), and, if outer temperature requires it, press carburettor choke (1). If this is the case, leave it ticking over for 10-15 seconds, unless it auto stops. This would mean that it is now ready to be started up without the use of choke (PICTURE 26B).

Pull twice the start-up handle to let the engine get some more petrol. You can now start up your engine following the normal procedure. If the engine is at compression state, starting up will be easier. Sometimes you may have to throttle just at the end of the string.

IMPORTANT: Before start-up, check that throttle cable is not blocked. To avoid this, just press throttle several times.

WARNING: In order to not to hit start-up mechanism, the string should be in tension when the engine is leaving compression point. Starting up should take place immediately. Do not force starting up an engine that is not easy to manual start-up. It would be useless and even dangerous. Keep this energy to find out the problem. 99 % of the cases it is due to lack or excess of petrol.

If you have not used your engine for a few weeks or it is flooded, you should dismantle and clean the spark plug. After a few sessions working with your engine, there will be no secrets for you and you will be able to start it up without any problems.

HOT START:

No choke is required. The rest of the procedure is similar to cold start.

ADJUSTMENT OF THE CARBURATION

The manufacturer has adjusted the carburettor before delivery. If you are not totally sure how to control this type of adjustment, avoid any action since this carburettor is quite stable at any heights and temperatures.

A rich engine vibrates and consumes too much petrol and a poor engine is more regular but gets hotter more often; and it becomes dangerous and can produce own damages. This is known as “holes” in carburation.

SPARK PLUG COLOR	YELLOW / GREY	CAFÉ AU LAIT	BROWN / BLACK
CARBURATION	POOR	JUST	RICH

WALBRO CARBURETTOR

It could be necessary to change carburation according to the season —spring/summer and autumn/winter—, and to the altitude. We recommend this procedure to be done by an expert. Low-medium regime carburation can be adjusted using the longest screw **1** (PICTURES 25 and 25B). Turning left (open) the mixture will enrich and turning right (close) will deplete.

Adjustment by default is 1 ½ turns starting from closed position. These adjustments will be done every five minutes, (scale according to a watch measurement).

If the minimum is very poor, starting up will be difficult and accelerating will fade it away. If minimum is very rich, it will vibrate and slowly loose RPM when accelerating. Besides, exhausting fume will be excessive.

Screw **2**, shorter, adjusts idling regime opening choker plate at its minimum.

Idling regime: Adjust until it reaches 2100 – 2200 RPM (PICTURE 25C).

NOTE: In order to adjust it, you should test it every one millimetre, since it is very sensitive.

DELLORTO CARBURETTOR

The manufacturer has adjusted the carburation at sea level. Therefore, you should change carburation depending on the altitude. Please check table below (*approximate values):

ALTITUDE (M.)	MINIMUM IDLE JET	POSITION OF THE POINTER
0 – 1000	93 *	3, from top to bottom
1000 – 2000	90 *	2, from top to bottom
More than 2000	88 *	2, from top to bottom

Small adjustments in order to achieve stability at low RPM should be done by turning carburettor lateral screw **(1)**. Once carburettor has been adjusted, carburation becomes very stable. Therefore, in order to achieve the best results no more procedures on the carburettor or mechanisms are necessary.

MAINTENANCE

FIRST 10 HOURS (RUNNING-IN)

1. Check torque of all screws and nuts of the engine and of all other elements related, especially the exhaust pipe.
2. Check torque of all screws and nuts of the chassis and all its elements.
3. Check torque of all cylinder head nuts with a torque wrench (**9 Nm or 0.9 Kgm**), with a cold engine in order to avoid distortions.
4. Check inside Walbro carburettor petrol filter by opening the inner part cover.
5. Check torque of all screws of the propeller (**max. 10 Nm or 1 Kgm**), (PICTURES 27 and 27B).
6. Check spark plug. The inner part colour should be clear brown and have a 0.5 mm gap between electrodes.

WARNING: Do not loose the 2mm aluminium separation ring located between spark plug and cylinder head (PICTURE 28).

7. Dismantle reductor gear out of the engine casing body and clean the residue out of the Ferodo from clutch. Check state of clutch springs.
8. Adjust Paramotor *ACTIVE SYSTEM* anchor arms to paraglider in order to get the best balance in flight (during the 1st hour of flight).

EVERY 5 HOURS

1. Smooth cleaning of engine and all other elements related for a proper operation.
2. Fix any issue, especially if it is not under the normal checking periods.

EVERY 20 HOURS

Same as every 5 hours, and:

1. Check main engine elements: main screws and nuts, cylinder head torque (9 Nm or 0.9 Kgm), outside petrol filter and inside carburettor filter, propeller torque (max 10 Nm or 1 Kgm), spark plug check, clutch check and its springs.
2. Check spark plug. The inner part colour should be clear brown and have a 0.5 mm gap between electrodes.

WARNING: Do not loose the 2mm aluminium separation ring located between spark plug and cylinder head (PICTURE 28).

3. Proceed with internal cleaning of petrol pump pressure tube (TDR Dellorto carburettor version).
4. Check movement of exhaust pipe elements and their supports.

EVERY 50 HOURS

Same as every 5 + 20 hours, and:

1. Check state and elasticity of inlet plates. If they are worn or not elastic anymore, please replace them.
2. Check state and elasticity of carburettor films. If they are worn or not elastic anymore, please replace them.
3. Check state of the clutch and the hood, Ferodo and hood frictions. This should be 1.2mm thick minimum. Clean inside opening of the hood.
4. Check state of piston ring. Clean residue out of cylinder head, exhaust manifold, piston, and cylinder. Check rod needle bearing set by vertically moving the piston. Change cylinder seam (it should have the same thickness) and cylinder head seam (O-ring).
5. Change and check contact between spark plug cable and pipette.

WARNING: Do not loose the 2mm aluminium separation ring located between spark plug and cylinder head (PICTURE 28).

EVERY 100 HOURS

Same as every 20 + 50 hours, and:

1. Check state of the engine catches and change if necessary.
2. Replace la piston needle box and rings.
3. Replace main petrol tube and check state of the other circuit sections.

EVERY 200 HOURS

Same as every 20 + 50 + 100 hours, and:

1. Check state of the engine bearing and change if necessary.
2. Replace piston and engine catches.
3. Replace throttle cable and sleeve if necessary.
4. Check general state of electric elements and replace those that are worn.
5. Check general state of petrol circuit and inlet elements and replace those that are worn.

EVERY YEAR

If the number of flying hours is not too high, please continue with previous revisions and replacements schedule. Otherwise, if flying hours are more than 200, please send your Paramotor to manufacturer in order to replace worn elements and review thermal group.

1. Check state of petrol pump (Dellorto, TDR version) and replace films if necessary.
2. Check casing oil catches.
3. Check all plastic, rubber, and/or elastic parts, especially engine and exhaust pipe dampers and replace when cracks appear on the rubber.

TORQUE TABLE

CYLINDER – HEAD	0.9 KGM / 9 NM
IGNITION WHEEL	2.5 KGM / 25 NM
REDUCTOR GEAR	3 KGM / 30 NM
CLUTCH	2.5 KGM / 25 NM
PROPELLER SUPPORT	1.5 KGM / 15 NM
PROPELLER	1 KGM / 10 NM

**THANK YOU FOR ACQUIRING A PAP PARAMOTOR AND RELYING ON
OUR EXPERTISE**

ENJOY YOUR PARAMOTOR EVERY TIME YOU FLY

CREATED BY PILOTS FOR PILOTS

**Should you have any comments, suggestions, and/or queries regarding
this manual or your PAP Paramotor, please do not hesitate to contact us**



CHASIS Y ELEMENTOS COMUNES

CHASSIS AND COMMON ELEMENTS



!!! N. 1 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 2 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 3 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 4 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 5 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 5B !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 6 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 7 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 8 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 9 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 10 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 11 !!!
!!! CONSEJOS + SISTEMA FAS !!!
!!! ADVICES + FAS SYSTEM !!!



!!! N. 11B !!!
!!! CONSEJOS + SISTEMA FAS !!!
!!! ADVICES + FAS SYSTEM !!!



!!! N. 12 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 12B !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 12C !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 12D !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 12E !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 12F !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 13 !!!
!!! SISTEMA FAS !!!
!!! FAS SYSTEM !!!



!!! N. 13B !!!
!!! SISTEMA FAS !!!
!!! FAS SYSTEM !!!



!!! N. 13C !!!
!!! SISTEMA FAS !!!
!!! FAS SYSTEM !!!



!!! N. 13C !!!
!!! SISTEMA FAS !!!
!!! FAS SYSTEM !!!



!!! N. 13D !!!
!!! SISTEMA FAS !!!
!!! FAS SYSTEM !!!



!!! N. 14 !!!
!!! CONSEJOS !!!
!!! ADVICES !!!



!!! N. 15 !!!
!!! SISTEMA AS !!!
!!! ACTIVE SYSTEM !!!



!!! N. 15B !!!
!!! CHASIS ACTIVE SYSTEM !!!
!!! ACTIVE SYSTEM CHASSIS !!!



!!! N. 16 !!!
!!! CLIPS CHASIS !!!
!!! CHASSIS CLIPS !!!



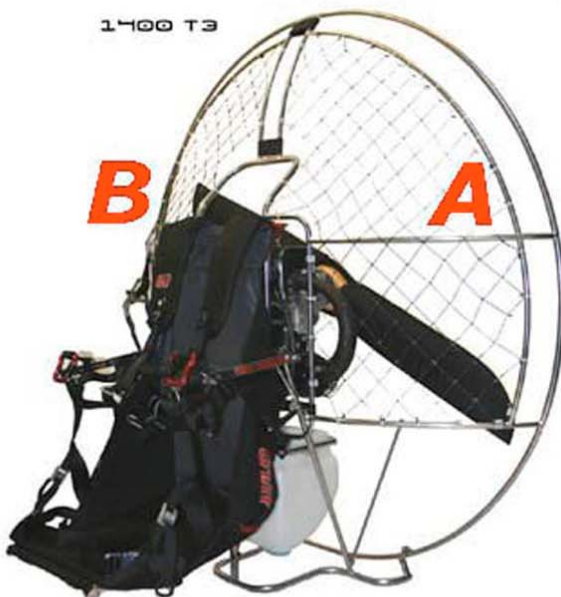
!!! N. 15C !!!
!!! SISTEMA AS !!!
!!! ACTIVE SYSTEM !!!



!!! N. 16C !!!
!!! CLIPS CHASIS !!!
!!! CHASSIS CLIPS !!!



!!! N. 16B !!!
!!! CLIPS CHASIS !!!
!!! CHASSIS CLIPS !!!



!!! N. 17 !!!
!!! CHASIS DESMONTABLE (T3 & R3) !!!
!!! DISMANTLED CHASSIS (T3 & R3) !!!



!!! N. 17B !!!
!!! CHASIS DESMONTABLE (T3 & R3) !!!
!!! DISMANTLED CHASSIS (T3 & R3) !!!



1400 T3
 ::: N. 17C :::
 ::: CHASIS DESMONTABLE (T3 & R3) :::
 ::: DISMANTLED CHASSIS (T3 & R3) :::



1400 T3
 ::: N. 17D :::
 ::: CHASIS DESMONTABLE (T3 & R3) :::
 ::: DISMANTLED CHASSIS (T3 & R3) :::



1400 T3
 ::: N. 17E :::
 ::: CHASIS DESMONTABLE (T3 & R3) :::
 ::: DISMANTLED CHASSIS (T3 & R3) :::



1400 T3
 ::: N. 17F :::
 ::: SISTEMA ARRANQUE :::
 ::: START SYSTEM :::



1400 T3
 ::: N. 18 :::
 ::: MONTAJE SISTEMA HRS :::
 ::: HRS SYSTEM ASSEMBLY :::



1400 T3
 ::: N. 18B :::
 ::: MONTAJE SISTEMA HRS :::
 ::: HRS SYSTEM ASSEMBLY :::



1400 T3
 ::: N. 18C :::
 ::: MONTAJE SISTEMA HRS :::
 ::: ACTIVE SYSTEM ASSEMBLY :::



1400 T3
 ::: N. 18D :::
 ::: MONTAJE SISTEMA HRS :::
 ::: HRS SYSTEM ASSEMBLY :::



1400 T3
 ::: N. 18E :::
 ::: SISTEMA HRS :::
 ::: HRS SYSTEM :::



1400 T3
 ::: N. 18F :::
 ::: MONTAJE SISTEMA HRS :::
 ::: HRS SYSTEM ASSEMBLY :::



1400 T3
 ::: N. 19 :::
 ::: SILLA SUP'AIR-PAP :::
 ::: SUP'AIR-PAP HARNESS :::



1400 T3
 ::: N. 20 :::
 ::: HELICE DE MADERA :::
 ::: WOODEN PROPELLER :::



!!! N. 20B !!!
:: TRACKING HELICE ::
:: PROP TRACKING ::



!!! N. 20C !!!
:: TRACKING HELICE ::
:: PROPELLER TRACKING ::



!!! N. 20D !!!
:: TRACKING HELICE ::
:: PROP TRACKING ::



!!! N. 21 !!!
:: HELICE FIBRA CARBONO ::
:: CARBON-FIBER PROPELLER ::



!!! N. 21B !!!
:: HELICE FIBRA CARBONO ::
:: CARBON-FIBER PROPELLER ::



!!! N. 21C !!!
:: HELICE FIBRA CARBONO ::
:: CARBON-FIBER PROPELLER ::





FOTOGRAFIAS DE CONSEJOS, SISTEMAS Y MOTOR ENGINE, SYSTEMS & ADVICES PHOTOS



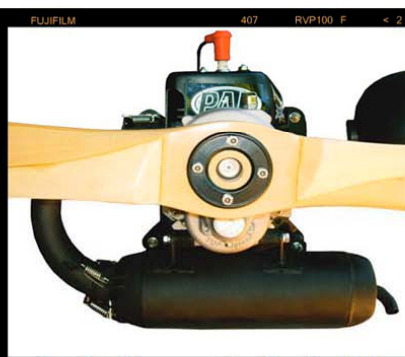
::: N. 22 :::
::: EMBRAGUE CENTRIFUGO :::
::: CENTRIFUGAL CLUTCH :::



::: N. 23 :::
::: REDUCTORA: VALVULA DE SEGURIDAD :::
::: REDUCTOR GEAR: SAFETY VALVE :::



::: N. 23B :::
::: REDUCTORA: CAMPANA EMBRAGUE :::
::: REDUCTOR GEAR: CLUTCH BELL :::



::: N. 24 :::
::: MOTOR TOP80 :::
::: TOP 80 ENGINE :::



::: N. 25 :::
::: CARB. WALBRO: AGUJAS DE REGULACION :::
::: WALBRO CARB: SETTING CONTROLS :::



::: N. 25B :::
::: CARB. WALBRO: MANDO DE AIRE :::
::: WALBRO CARB: CHOKE :::



::: N. 25C :::
::: CUENTA RPM & HRS DIGITAL :::
::: DIGITAL TACH & HOURMETER :::



::: N. 26 :::
 ::: MOD. TDR: VALVULA :::
 ::: TDR MODEL: AIR VALVE :::



::: N. 26B :::
 ::: CARBURADOR DELLORTO :::
 ::: DELLORTO CARBURETTOR :::



::: N. 27 :::
 ::: HELICE: CONTROL Y APRIETE :::
 ::: PROPELLER: RE-TIGHT AND CONTROL :::



::: N. 27B :::
 ::: HELICE: APRIETE Y REVISION :::
 ::: PROPELLER: TIGHT AND RE-CHECK :::



::: N. 28 :::
 ::: BUJIA: ARANDELA DE SEPARACION :::
 ::: SPARK PLUG: SEPARATION RING :::

