Swift'Light-PAS

Engine kit for Swift'Light

Adaptation Manual
Rigging Manual
Engine Manual

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We welcome feed back to this manual, so any suggestions you may have, please pass them on to us.

Presentation

This engine kit is intended to give full autonomy to the Swift'Light, giving it the ability to taxi and take off without any help. But the engine unit doesn't turn the Swift'Light into an aircraft or an ultra light. The powered Swift'Light is more an ultralight sailplane with self launch device.
This is why we choose usually to make think as simple as possible but not always in the « aircraft » mind:

- front wheel steering as a trike instead of the aircraft way
- no spring or damping on the gears
- small fuel tank
- engine close to the pilot's ears

Our main purpose is to keep the Swift'Light qualities and behavior with the engine.

The kit is designed to make the changing from one version to the other easy.

Introduction

The Swift'Light is designed to be very light and strong. The wings are very tough in flight and the machine is made to be rigged frequently. The main problems are encountered when the rigging procedure is not carried out according to manufacturer specifications, these are found in the **RIGGING MANUAL**. So, you must carry out to the letter the procedure to avoid wasted energy and damage, notably on the skin of the wings.

If you follow the rigging sequence precisely,

- The machine will rig quickly
- You wont leave out anything that could be dangerous
- And you will have a perfect result

Full reading and comprehension of the **SWIFT'LIGHT-PAS FLIGHT MANUAL** is imperative before the 1st flight!

Consult also the **TUNING/MAINTENANCE MANUAL** for maintenance. If there are repairs or spare parts needed then look in **SPARE PARTS LIST**.

Transport

It is strongly recommended to transport the Swift Light in its XC container. It supports the wings with no pressure points and in respect of the wing twist. The walls are relatively insulated and reflect a good amount of sunlight; this protects the wings from UV and hot temperature. It is very important not to get it too hot to which composite materials are sensitive. The wings are well protected from mechanical insult.

Handling

Don't put point pressure on any of the skin (rocks etc). The wing is reinforced where you have to handle it following the procedure below. Always support the wing with **flat hands** on the bottom surface, level with the spar (the thickest part of the wing) or at either end of the wing. Avoid putting pressure on the top surface, as it is not re-enforced.

Careful of **the big leverage effect** owing to the great span of the wing when:

- Pushing on a winglet to move the glider, this twists the cockpit, as this can bend the structure.
- When slotting on a wing make sure it is well lined up with the spar or else you could damage the spar box. And, always support the wing tip until the wing is fully slotted onto the spar.

Storage

The wings must be stored in the **dry**, out of direct sunlight and avoid extreme temperatures.

If the wings get wet they must be dried ASAP.

If the wings are not stored in the XC container then wing supports must be wide and in respect of the twist of the wings.

Engine

Always disconnect the battery when breaking down. Reconnect the battery at the last moment when rigging the Swift'Light, just before putting the engine covering: an unexpected action on the electric starter switch will damage the propeller (at least) and can be very dangerous.

Pointers

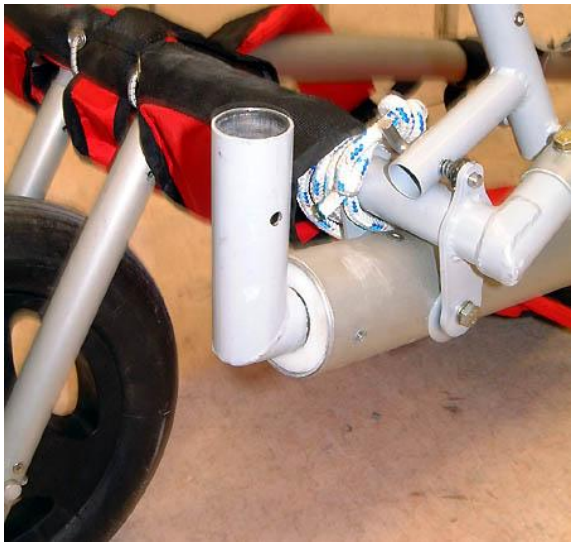
Careful when adding equipment:

1. **The Swift is very sensitive to the Centre of Gravity position**: don't add things that may alter the C.G. position, i.e. things that weigh more than ½ kg in the nose of tail fairing.
2. **Careful not to interfere with the air flow**, i.e. a camera remote control cable fixed to the undersurface, top surface or particularly the leading edge of the wing, can seriously change the behavior of the wing.

"PAS" adaptation on an existing Swift'Light

The first adaptation needs time to make good adjustment and a nice job. For the owners who will change from one version to other several times, next adaptation will be much faster.

a. Engine unit

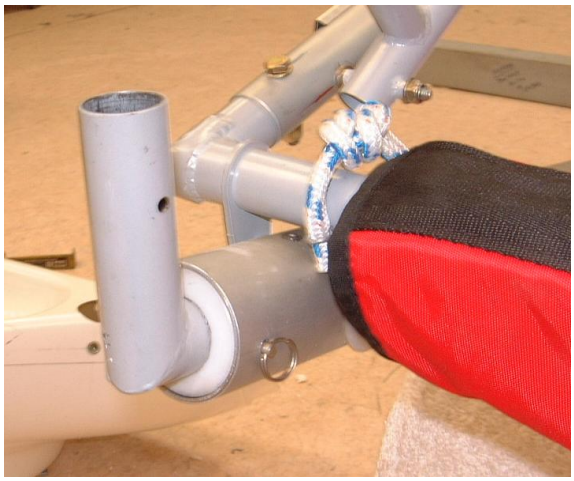


1. Put the fuselage stand alone on trestle. Insert the **2 engine support adaptation parts** in the main cage tubes. Mark the left (L) and the right (R) parts.

2. Slip the engine support into the 2 adaptation parts. Be sure that the adaptation parts are slipped into the main fuselage tube to the stop. If possible, place the clevis pin, from outer side to inner side (= with the head at the outer side). Put the safety ring.

3. ***If it is not possible to place the clevis pins,*** *the holes have to be adapted. Check if every parts are at the right position, on the stops, then drill through the main fuselage tubes with a 5 mm (0.199" or #8) drill bit. Drill in 2 steps: outer side from outer side, inner side from inner side, then through all.*

4. *…To make the rigging and the break down easier, the adaptation parts should have a play in rotation* ***=> redrill the holes with a 6 mm (1/4'')drill bit.***



5. Remove the engine support, but keeping the adaptation parts with the clevis. Remove the 2 bolts that keep the main gear arm on the frame and **remove the rear gear**.

6. Remove the push-pins on the main frame and rotate the oblique tubes to the main tubes. Position the wheel pants in a rocking movement (the nylon mud flap is removed).

5. Replace the light tire by the reinforced one. Put back temporary the rear gear (do not put the bolts).

b. Front gear

1. **Slip the front gear unit into the main fuselage tubes.** Lock the rudder pedals on their stops with sticky tape. At this step, the unit is not yet locked with the clevis pins. Remove the wood plate around the wheel.

2. Remove the stick handle grip**, pulling from the base.**

3. Put the brake lever on the stick tube. Keep the tongs open with a screwdriver to slip it easier.

4. Fasten the brake lever at 1 cm (1/2'') from the black plate, slightly rotated to the outside to make the stick free in all position. Tight the tong bolt then put back the handle grip (a drop of liquid soap will help).

c. Parachute

1. Remove the parachute from the head rest :
- Remove the parachute handle from the shoulder strap (unscrew the bolt on the shoulder strap and remove the plastic tie rap).
- Disconnect the main line from the quick link.
- Unrivet the parachute bag (drill through the rivet with a 4 mm (5/32'') drill bit.

2. Remove the rocket and the launch tube (just remove the 2 bolts at the tube base).

3. Put a grommet, centered on the line between the 2 existing grommets, on the side that was originally oriented to the pilot's head:
   - Draw the grommet position
   - Make a hole with a punch tool, or better with a soldering iron.
   - Attach the grommet with a grommet tool.

   Caution: do not damage the parachute bag, or, worst, the parachute! use a piece of wood to protect the parachute during punching and grommeting.
   The kit is provided with a grommet. If you have not the proper grommet tool, it is easy and inexpensive to buy a set of grommets + the proper tools in a hardware shop.

4. Position the parachute into the fairing, under the clear plastic sheet (it is easier to install the parachute into the fairing before installing the fairing on the fuselage).
   - Bolt the parachute bag through the new grommet to a hole drilled through the fairing.
   - With a pencil, mark the position of the 2 others grommets on the fairing.
   - Remove the parachute and drill 2 holes diam. 6 mm (0.238'' or size B).

5. Bolt the parachute with 3 bolts with large head, size M6, head outside, with protection caps on the nut to avoid damaging the parachute.

6. Tie up the parachute bag with a belt hooked between the 2 webbing bridges.

7. Put the rocket on its support, using 2 bolts and a large plastic tie-rap to fasten it.
   - Connect the rocket lines to the parachute extractor with 2 quick link diam 3,5 or 4 mm (stainless steel) firmly tighten.

8. Connect the main parachute line to the 2 steel wires with a quick link (minimum 7 mm stainless steel or 8 mm steel).
   The other end of these lines will be connected to the fuselage later.

9. Check carefully if the parachute way is free for deployment.
   Especially, the steel lines coming from under the fairing have to arrive over the plastic clear sheet but the parachute has to be under this sheet!

Put the head rest on the support and rivet it. This head rest has a cushion: this is to move the pilot frontward, to keep the CG in the good range. Another head rest without cushion is available for tall and large pilots!

d. Fairing and parachute lines

1. Position the main fairing under the fuselage.

2. In a first step, put temporarily only 2 bolts (instead of 4) to fasten the fairing on the front gear.

3. Fasten now the rear part of the main fairing on the wheel pants. Use 4 button head bolts, head outside. Do not tighten too much.

4. Remove the front gear. Pass the parachute steel lines through the hole in front of the wheel.

5. Put the foam protection around the steel lines. Pass the steel line end through the hole in the other side of the wheel pants and position the rubber grommets.

6. Route the lines along the lower corner of the wheel pants. Tie carefully the lines with Tie-rap to avoid damage by vibrations.

7. The steel lines come through the wheel pants close to the rear fuselage tube. They have to be connected to the fuselage with a 10 mm polyester line (700daN), 4 loops, not too loose.

8. One of the loops pass between the 2 tangs going to the main fuselage tube. The 2 line ends are knotted with a "true lovers" knot. The free ends of this knot have to be tie with a tie-rap.

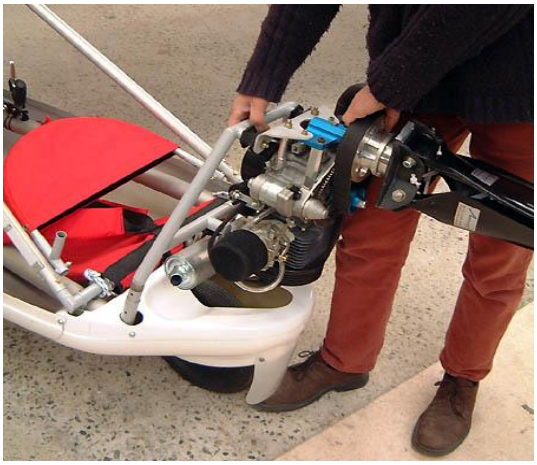
9. Put back definitively the rear gear with its bolts. To slip the rear gear on the fuselage frame, the oblique tubes have to be in high position. To place the bolts, these tubes have to be in low position.

10. Put now the nylon mug flap.

e. Engine fairing and main fairing adjustment.

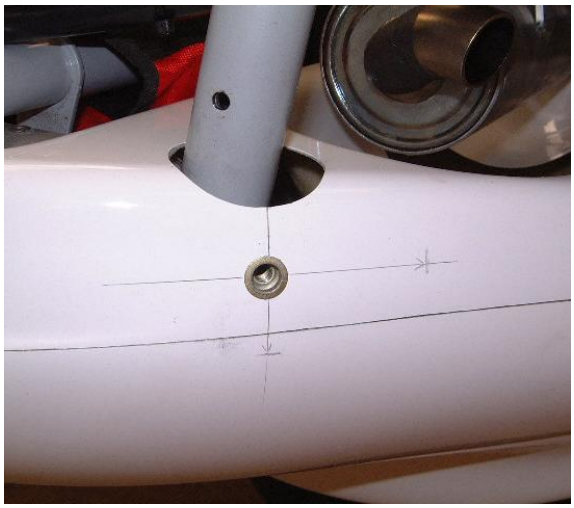
To have the windows fitting perfectly with the wings, it is important that the fairings are in the exact position with the wings. There are 3 adjustment points:

- A frontward/backward translation movement of the fairing along the main tubes of the fuselage (+/- 2 cm or 1 inch).
- The angle between the engine cover and the main fairing
- The height of the wheel pants above the frame (some mm or 1/10th of inch).



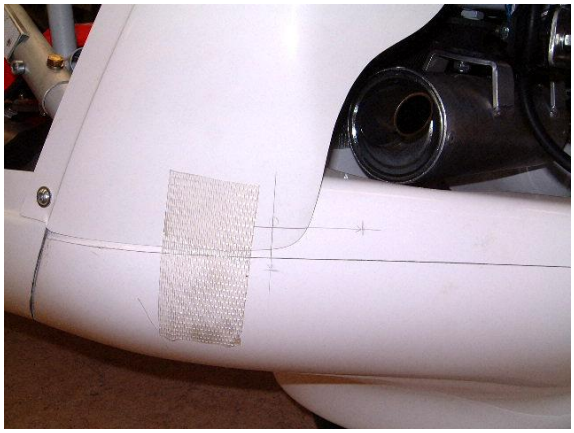
1. Position the engine on the fuselage.

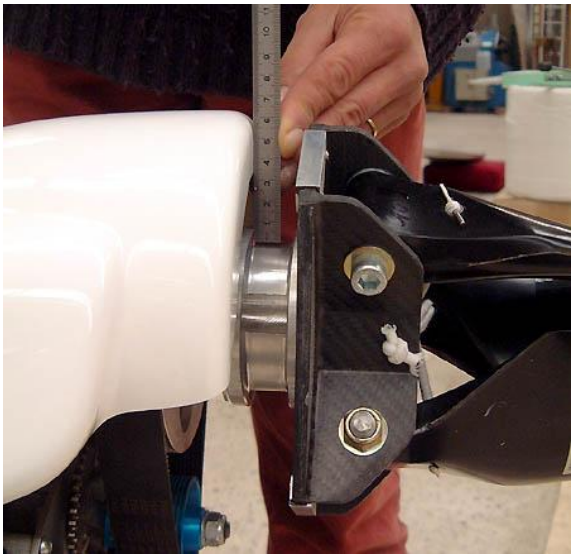
2. Install the engine command group on the main fuselage tube, with a clean routing of the line.



3. Before positioning the engine cover, mark the position of the riveted nut with 2 lines – so, it will be easy to find the exact place of this nut when it will be hidden by the engine cover. Draw a mark 2 '' backward of the nut center on the horizontal line, and 1 '' below the nut on the vertical line.

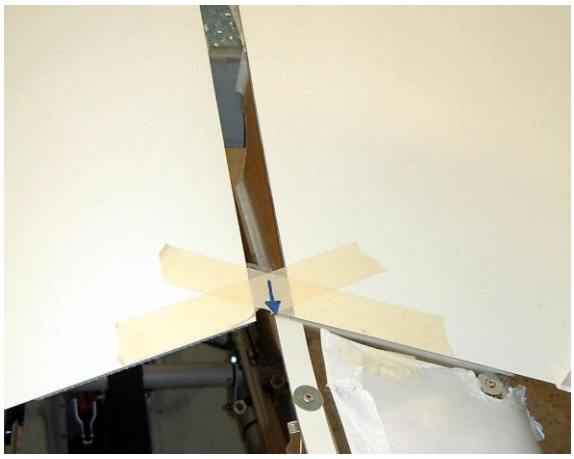
4. Position the engine cover and place the 2 front bolts (button head). The front fairing overlaps the engine cover. Do not tighten the bolts.





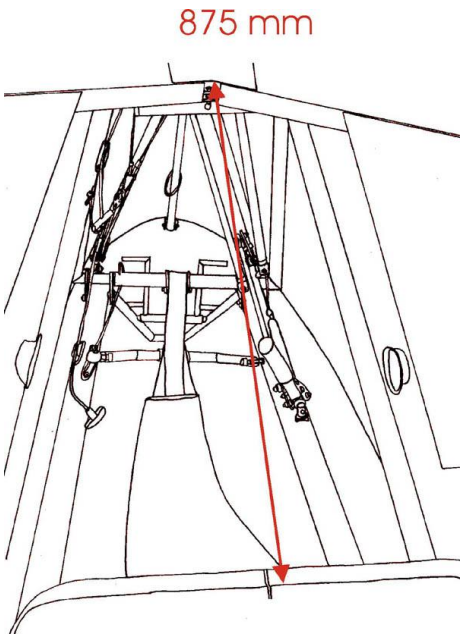
5. Rotate the engine cover to have the lower edge parallel with the wheel pants joint line. Hold the engine fairing with strong sticky tape.

6. Check if the engine cover is in the right position with the propeller: The end of the engine cover should be roughly aligned with the propeller extension.



7. Put the connecting spar on the fuselage and rig the wings. Draw the virtual trailing edge intersection with 2 strip of masking tape.

8. Measure the distance between this virtual intersection and the engine cover at the window step. This distance has to be 875 mm +/- 1 mm. *See drawing …*



9. If the distance is different, it is possible to move backward or frontward the whole fairing with the front gear: the front gear can be slip more or less in the main fuselage tube. When the right distance is achieve, check if the upper windows (with the zip) fit correctly with the oblique tube and the engine cover. Check also with the side windows.
   If the windows don't fit well, it is possible to rotate slightly the engine cover around its 2 bolts. It is also possible to move the wheel pants upward with a piece of sticky back foam (provided) to be glued inside of the wheel pants, where the wheel pants is supported by the main fuselage tubes.

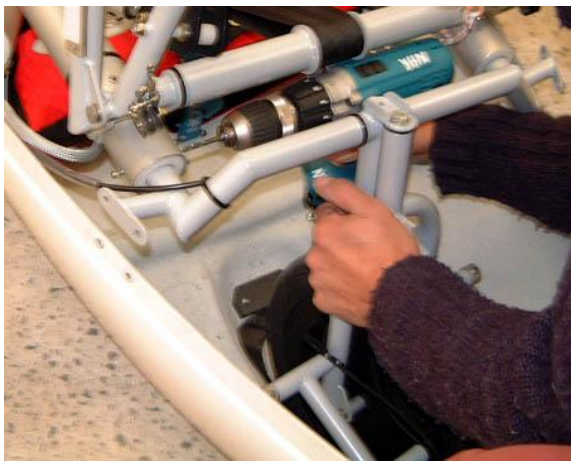
10. When the engine cover is at the right position, mark the exact position of the riveted nut (with the previously drawn lines). Drill the bolt hole with a 6 mm (0.238 '' or size B) drill bit. Put the button head bolt. Do the same on both sides.

☝ **This adjustment has to be made very carefully to make easy and nice rigging next time.** A small error on the hole makes a big difference on the top of the engine cover!

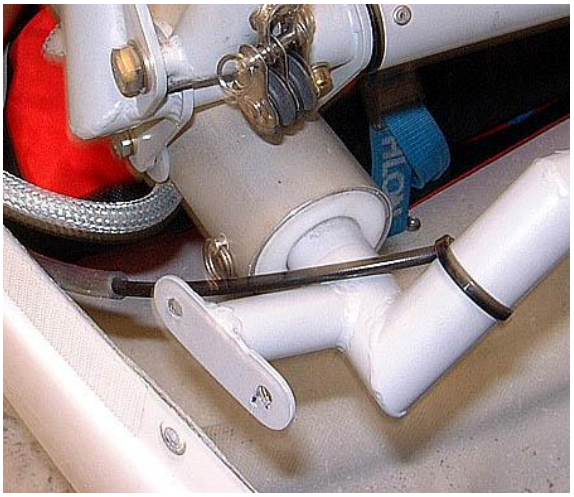
Note: To avoid damaging the front riveted nut on the wheel pants, pay attention to insert the button head screw right with the nut. If necessary, increase to hole size in the side fairing to 8 mm, and trim a little bit the side fairing edges to avoid interference with the engine cover.

11. When the fairing is in the right position, mark the position of the front gear into the main fuselage tube. Remove the 2 bolts that attach the fairing on the front gear frame.

12. Check if the front gear frame is still at the right position, and drill the clevis pin holes in 2 steps : from outside …



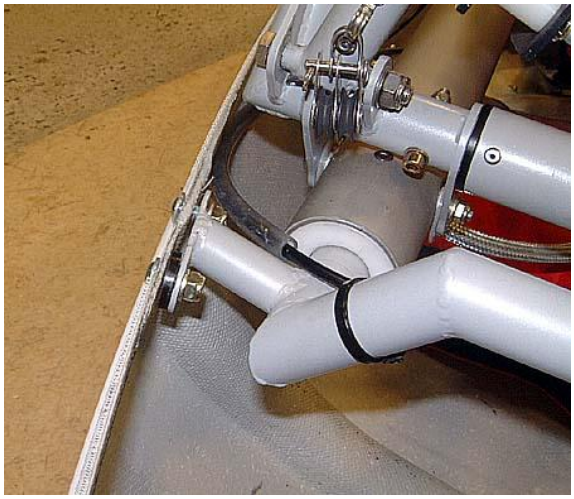
13. …, and from inside (diam. 5 mm or 0.196'' or # 8). Caution: the main fuselage tube is not perpendicular to the front gear frame. The drill is perpendicular to the tube, not to the frame!



14. Put the clevis pins,, with the ring oriented outside.

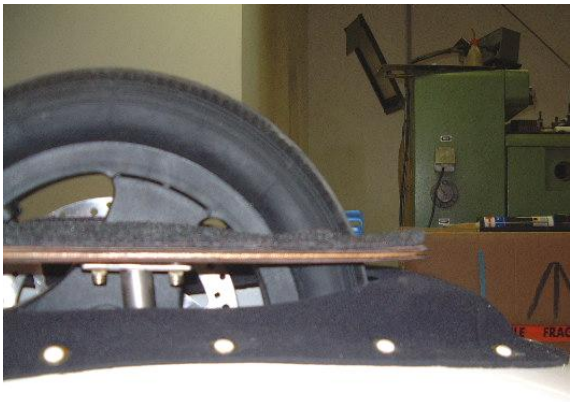
15. Position the strap that will support the parachute handle. According to the way the strap is fitted, there are 2 possible positions for the handle. The strap is bolt in front (in the riveted nut on the main tube).

16. Remove the rivet just aft the stick (drill with a 5 mm (or 0.196'' or # 8) drill bit), then rivet the strap in the same hole. Put a piece of sticky back foam on the main fuselage tube in front of the center strap hole, to protect the tube from the bolt head. Bolt the parachute handle on the strap.



17. Attach for good the fairing on the front gear frame: there are 2 bolts on each side. Because of the variable thickness of the fairing skin (reinforcement), a plastic washer is fitted between the fairing skin and the support plate along the front hole.

18. The fairing is now perfectly installed.



19. Position the front wheel wood plate. It is attached on the front fork with 4 bolts size M5. Center the plate along the wheel and the brake disk (check from inside).

20. Check that there is a gap around 5-10 mm (1/4 to ½ inch) between the wood plate and the fairing, aft of the wheel. If not, slightly ply the support plate or put a shim between the wood plate and the support plate.

21. Pass the neoprene foam over the wood plate. Check if the neoprene foam fits nicely at each position of the wheel. Check if the neoprene foam doesn't interfere with the wheel or the brake disk in each position – if necessary, trim the neoprene foam.

f. Tiplets

- The Swift'Light in the foot launchable version is delivered with frontward tiplets. These tiplets are oriented frontward to protect the leading edge when the Swift is flipped on the nose before foot launch.

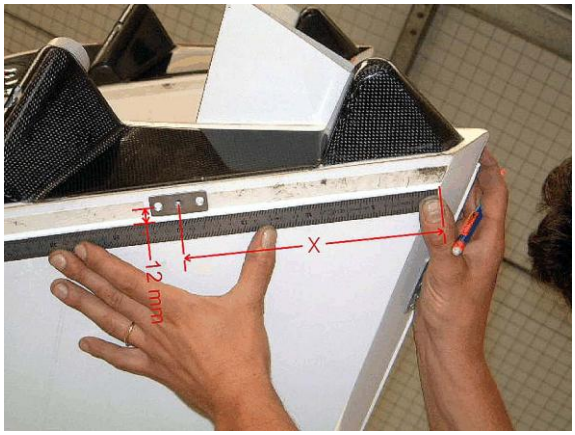
- To make the taxiing easier, it is easy to adapt in-line skate wheels: 2 flat areas on the side of the tiplets are intended for this purpose, to support the bolts for these wheels. Use a wheel of 60 or 70 mm diameter.

- The Swift'Light originally delivered with an engine are provided with backward tiplets. These tiplets are much stronger, with a wider support on the wings. With this backward shape, there are much better for taxiing.

- These tiplets, with a 80 mm wheel, are available separately.

"PAS" tiplets adaptation on a "foot launchable" Swift'Light

The tiplet is bolt with 2 plastic screws size M6. the front screw is bolt in the rear riveted nut of the "frontward " tiplet. On the first serial production of the Swift'Light, the rear riveted nut for the "PAS" tiplet is not installed. It is necessary to rivet this nut (provided in the "PAS" kit, or, if the proper tool is not available, to POP rivet plate with a welded nut. The first solution is better, because the riveted nut is flush with the wing skin – of course, the "plate" solution is not perfectly flush.
When the rear nut is installed, it is still necessary to position the tiplet before drilling the holes at the right place.



1. Position for the new nut:
   - In the "span" axis, at 12 mm (= ½'') from the winglet fairing overlap.
   - In the "chord" axis :
     x = 198 mm for the left wing
     x = 204 mm for the right

2. Remove the Velcro at the nut place.
   For the riveted nut (=nut AVK), drill a 10 mm hole (0.397 '' or size X).
   For the plate with welded bolt, the nut hole is 12 mm (=1/2'') and the rivet holes are 4.1 mm (0.161'' or #20). Rivet the nut.

3. Mark the nuts position with 2 lines and a distance, then assemble the winglet on the wings + the winglet fairings.

4. Offer up the tiplet. There is a mark that has to be aligned with the fairing edge on the wing. For the front/back position, align the rear hole mark on the tiplet with the wings drawn line. Drill the rear hole into the tiplet (6 mm or 0.238'' or size B) and install the rear plastic screw.

5. Find the best tiplet position, rotating the tiplet on its rear plastic screw. In principle, the mark on the tiplet should be aligned with the fairing edge.

6. With the line drawn on the wings, and taking into account the 12 mm gap between the riveted nut and the fairing edge, mark and drill the front screw hole into the tiplet (6 mm or 0.238'' or size B).

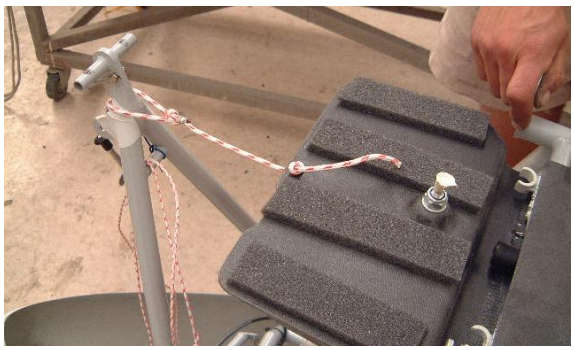
g. Windshield rubber stop

A piece of rubber tube (provided) has to be installed on the front triangular frame to support the windshield instead of the front tube.

h. Fuel tank

The fuel tank is placed on the fuselage frame, offer up from rear in a tip up movement (to be done BEFORE installing the connecting spar). If necessary (depending on Swifts) remove the plastic clips and the triangular frame plastic stop. 2 adaptations have to be done:

- The locking cord has to be adjusted in length to keep a slight tension frontward. This adjustment has to be done the first time that the wings are rigging up on the fuselage frame. The adjustment is making mowing the knot position. Do this adjustment when offer up the first wing (= before coming with the 2nd wing).
- 2 aluminum supports have to be glued on the tank side.



1. Fuel tank locking cord. To be adjusted the first time the wings are assembles on the fuselage. To be done when the first wing is positioned.

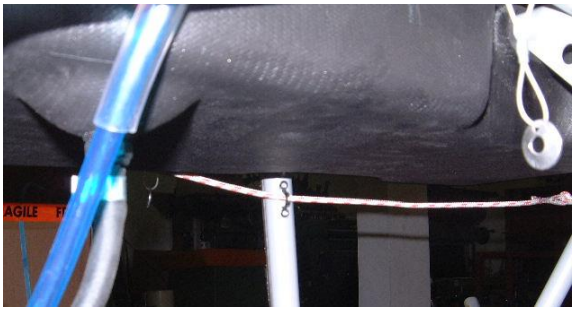
2. Install the fuel tank then the wings. Position temporarily the aluminum support on the tank and mark the position with a pencil. The left support is modified to avoid interference with the rudder adjustment line.

3. Disassemble the wings and the fuel tank. Use masking tape to mask the fuel tank around the aluminum support, then file (with sandpaper) and degrease (acetone or alcohol). Do not forget to degrease also the aluminum support.

4. Place the tank on a support that keeps the side horizontal, and then glue the aluminum support with fast 2-component epoxy. Wait that the glue is strong enough before gluing the other aluminum support.

i. Rudder line adjustment modification

This modification is not mandatory, but will improve the behavior of the adjustment device. A deck eye is installed on the medium frame left tube to avoid that the adjustment line slept under the fuel tank.



1. Install the fuel tank (it is not necessary to rig the wings). Undo the knots on the adjustment line to remove the handle.

2. Remove the line from the hole in the medium frame. Position the deck eye to keep the line just under the fuel tank. Mark and drill the 2 rivet hole (diam 4,1 mm or 0.161'' or #20). The deck eye is riveted with 2 stainless steel 4 mm x 8 mm rivets. Re-install the handle.

2. Rigging

a. Rigging the cockpit

1. Put cockpit where you want to rig.

2. Assemble the median frame to the oblique tubes.

3. Fix these 2 parts with pushpins, with the head up and the wire to the washer going downward to avoid this interfering with the wing.

4. Slot the stick assembly rear pin into the eyebolt found on the right horizontal tube. To do this it is necessary to pivot the triangular part forward.

5. Install the fuel tank: offer up from rear in a tip up movement.

6. Put the locking cord on the triangular frame.

7. Attach the spar. The tips of the spar push against the inside of the wing and so the angled end of the spar faces forward. The bolts come from the back to the front. A plastic washer goes underneath the wing nut to avoid hanging on the threaded part of the bolt.

8. Attach the fuel line with the right oblique tube with provided Velcro straps. Stabilize the cockpit with a support under the spar (for example, the wood box provided with the fuel tank). Don't let the cockpit sway side to side as this could damage the fairing.

b. Rigging the wings

The procedure below describes rigging the wings on your own. It is, however, easier to have help to slide the wings on the spar, especially if the wind is strong. (Then above all don't get helped!)

1. Put a protection mat underneath the container. Start by pushing the **right wing (Lower one)** by the rib in order to release the last elevon hinge.

2. Pull out 2/3 of the wing. Take the wing by the bottom surface at the balance point, one hand on the leading edge, and the other on the trailing edge. Take the wing right out of the container.

3. Put the wing tip on the ground so you can pivot it.

4. Hold the wing at CG position, one hand on the leading edge, the other on the trailing edge. The upper skin to the holder.

5. Put the tip on the protection mat and grab the wing root.

6. Put yourself in front of the spar on the opposite side of the wing and slide the wing onto the spar.

Photo

7. Release the inner elevon rod before sliding totally the wings because the fuel tank will make the operation no easy later.

8. Line up the finger of the triangular frame with its reciprocal female location on the root rib and engage the wing completely home on to this. Pass the rudder control line through the shackle. At this step, connect already the elevon's rod and the right rudder pedal..

9. Line up the left wing. Put the wing on the spar tip .

10. Take hold of the wing tip and slide it onto the spar. **Be careful not to force the spar box**, it will slide on easily when it is properly lined up in all axes.

Photo

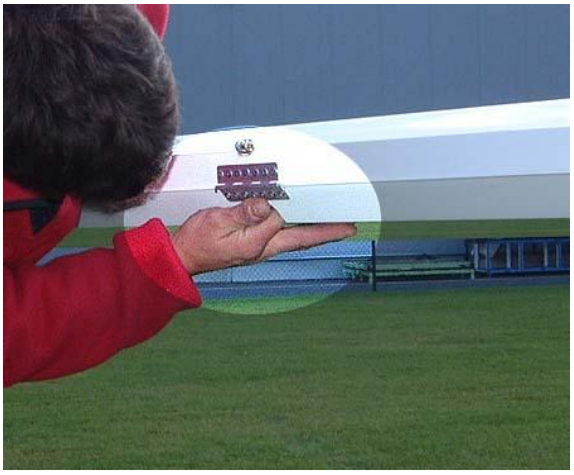
11. Release the inner elevon rod before sliding totally the wings.

12. When the wing is completely on you may have wiggle the wing a tiny amount to get the finger of the triangular frame to go into its location in the rib. Attention to the fuel tank that can damage the wing root.

1. Put in the front pin locking the 2 wings together then **IMMEDIATLY put in its ring**. Put the 2nd winglet / rudder cable in its guide.

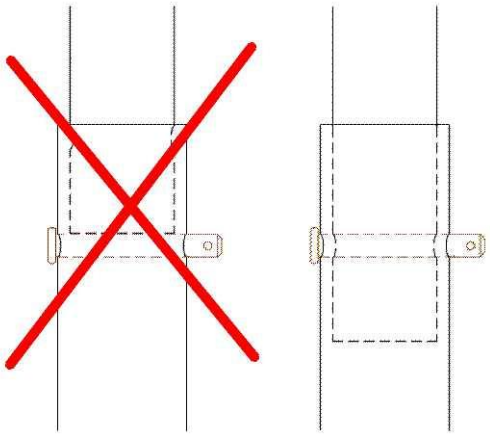
13. At the wing tip push it a little backwards to tighten the wings together …

14. … and to aide getting the pin in to fix the back of the wings together then IMMEDIATLY put in its ring.



15. *(From this point on it is strongly advised to continue the rigging alone).* Take out the elevon push rod that was pushed into the wing for transport.

1. If not already made, connect up the elevon rods to the control stick rods with the pins, putting the rings on facing backwards to help the preflight check.



16. Be sure that the pin goes through the 2 rods!

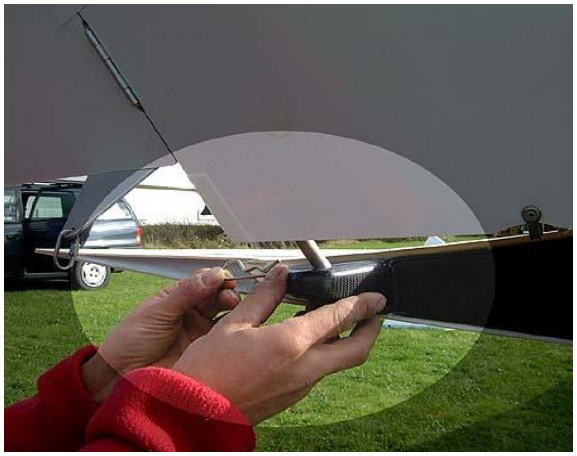
5. Connect up the flap cables.

6. Pulling almost all flap you can release pressure on the flap push rods and so take the retaining pins out and releasing the rods from the inside of the wing.

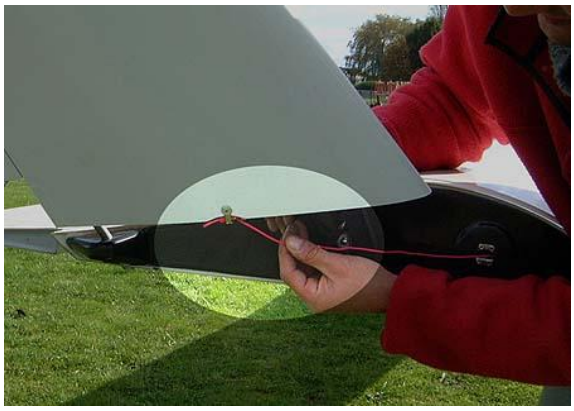
7. Connect the elevons up with the pin and ring.. The elevons must be connected before the winglets are put on. Do not connect up the flaps yet.

8. Put the bracket on the rudder together with its elastic return. The knot of the elastic is facing up

9. Fit the winglet and make sure that the spring pin is properly engaged.



10. Put the split pin through the rib and the rear winglet tube. The split pin must come out the other side of the rib. The split pin is twisted towards the wing and goes from the back to the front.



11. Pass the rudder line through the stainless steel bracket.

12. Offer up the tip fairing and position. Pass the rudder cable through the little window.

13. Rest the bottom surface on your knee. Line up the turbulator on the top surface with the corresponding mark on the fairing.

14. Press down to engage the Velcro from the line up point …

15. … towards the leading and trailing edges.

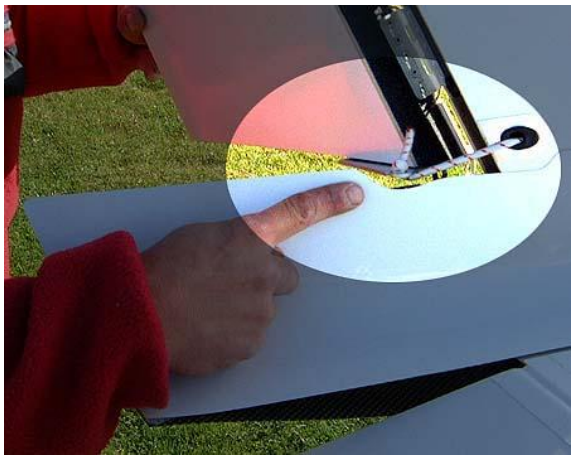
16. Do the same thing on the bottom surface, from the leading edge to the trailing edge one hand on each side of the tip rib.

17. Line up the exterior superior edge of the fairing with a Velcro just underneath the hinge of the rudder. In doing this you can tension that edge so that the fairing will marry up the exact form of the winglet.

18. Close up the rear horizontal part of the fairing making sure that the 2 skins line up perfectly with the elevon.

19. Close up the vertical part making sure that they line up with the rudder

20. Make sure that the fairing fits snugly to the winglet, you can adjust by playing with the rear Velcro's.



21. See that the rudder has full and free movement and does not touch the fairing

22. Connect up the rudder control. Make sure that the quick link is properly closed. Never put tension on the quick link until it is screwed shut.

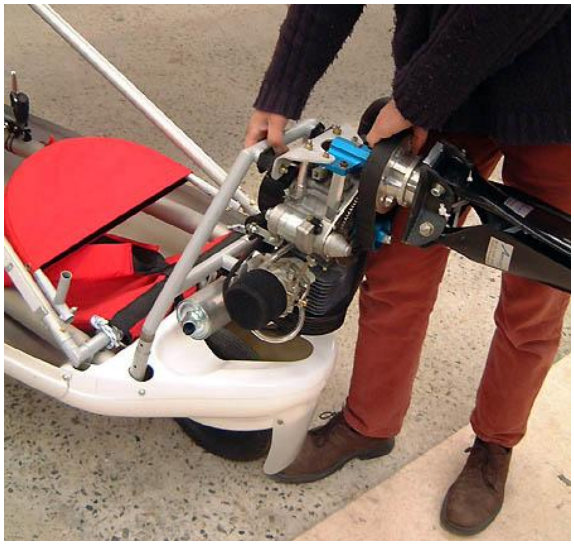
23. Offer up the tiplet. First put in the rear screw a few turn and then put the front screw in and screw up all the way. Finally, screw up the rear one.

24. Put the vortillons on, **point facing forward**!

25. Connect up the cables to the pedals.
Do not put them round the wrong way!
The left wing line to the left pedal.

26. Put the ASI probe on.

c. Rigging the engine unit



27. Offer up the engine on the fuselage, holding the engine frame with one hand on the upper tube and the other under the propeller wheel. Pay attention to not make torsion on the engine support connectors.

28. Put the clevis pins and safety rings. A rubber spacer has to be inserted under the pin's head to limit damages from engine vibrations.

29. Install the engine command group on the main fuselage tube, with a clean routing of the line. This device is positioned between the rear clam cleat and the shoulder belt web eye.

30. **Connect the battery** then install the engine cover. Bolt the cover with 4 button head screws. A notch in the firewall allows the engine command line routing.

Photo

31. The engine cover is clammed between the front fairing and the wheel pants.

32. Connect the fuel line.
    Caution: Pay attention to avoid any fuel drop on the windows. One drop of fuel will fragilize immediately the clear plastic materials.
    Install the Tiny Tach RPM meter.

a. Check if the controls surfaces work properly
b. Install your instruments – the Tiny-Tach can be velcroed on the fuel tank.
c. Adjust the hammock

… before putting on the screens !

d. Putting on the windows

1. Offer up the right window lining up the rear top corner with its line up mark on the engine cover.

2. Follow down the vertical recess of the engine cover.

3. Then follow along the oblique tube. The fairing has a little play with the fuselage frame. With this play, it is possible to correct a slight decay.

4. Do the same things to the other side window then close up the zip between them.
   Put the flaps of the windows on the trailing edge of the wings (if not already done) and make the windows lining up with the top surface.

5. Offer up the side window starting with the bottom forward corner following the side tube down.

6. Follow the vertical edge engaging the Velcro.

7. Then follow along the bottom fairing.

8. Make sure that the Velcro is properly in by squeezing tightly.

9. Tighten up the Velcro on the oblique tube as well. Then fit the left side widow in the same manner.

10. Offer up the wind screen

11. Begin from the right edge. Note the position of the lower corner and go on along the vertical tube, pressing firmly the velcro..

12. Follow the fairing to the nose, and then go on along the fairing.

13. Go up the upright tube pressing the Velcro firmly in.

14. Go again along the fairing pressing firmly the Velcro in.

15. Offer up the windscreen fairing symmetrically.

16. Velcro progressively starting from the front, lining up with the windscreen Velcro.

17. Connect up the flap push rods. (The flap control should be set at 0 to 15 degrees to make the connection easy.)

18. *A careful pre-flight check has to be done before each flight!*

3. Derigging

In general follow the rigging instruction starting at the end and working back wards. Take care with the windows as these scratches easily. It is best to keep them very clean and only clean them with a damp rag – never dry. Store the windows in their protective bags as soon as you have take them off, making sure that there is no dust in them.

Polycarbonate (lexan) material is extremely sensitive to abrasion and contact with hydrocarbons. Even a single drop of petrol can be enough to shatter the material. Put a piece of rag around the quick connector when disconnecting the fuel line.

Disconnect the battery, to avoid damage if the switches are moved inadvertently.

Before taking off the wings make sure that you have disconnected all the control cables. Make sure:

- The flap push rods are pinned to the wing (do to before disconnecting the flap control inside the cockpit.)
- The elevon push rods are pushed inside the wing both at the elevon and cockpit ends.
- The flap cables are hidden inside the wing.

Before pushing the wings inside the container make sure that there are not any stones or other things that could scratch the wing.

1. To remove the engine unit, put one foot on the wheel pants as shown on the picture, then pull with the hands at the right position (important to avoid any bending moment on the engine adaptators. Pay attention to not overload the adaptator in torsion otherwise the clevis pins can be broken by shears.

2. In the bag:
   a. 1 tiplet with the 4 screws.
   b. The second tiplet comes in the first one.
   c. 2 rudder brackets and 2 vortillons

1. Start with the **left** wing (top wing in the container) After having taken out the fixing pins take the wing by its balance point in front of the leading edge. **With 2 people: one at the tip and one at the root cord**, leading edge side**.**

3. Carry the wing vertically

4. Put the tip on the ground on a protection mat and take hold of the root cord.

5. Rotate the wing to horizontal and work your way to the balance point

6. Once you have found the balance point put the wing on the top level in the container. Remove the fuel tank.

7. After removing the push pin fold the front tube down back wards. Swing the triangular frame forwards a bit to disengage the control column then bring the control stick against the thick side tube and fold down the triangular tube.

8. Before folding down the side frames get the flap pulleys out of the way so that they don't get squashed when you fold the side tubes down.

9. Fold the side frames down before the rear tubes and then the parachute stay / head rest.

4. Engine

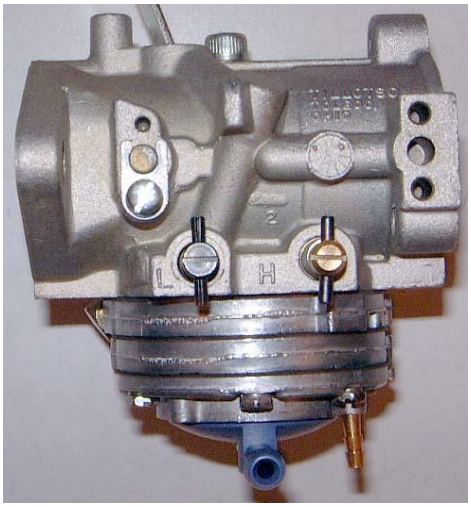
The engine has to be running in before first flight. See procedure in appendix.

a. 2-stroke fuel mixing

The engine lubrication is done by oil mixed with the fuel.
Use 2-stroke **Synthetic** oil to make the mixture.
The first fuel tank filling (+/- 6 liters or 1 ½ gallon) with 4 % mix ratio, the 2nd with 3 % mix ratio, and then use 2,5 % (tuned exhaust pipe) or 2 % (standard exhaust pipe).
Caution: this rich mix ratio (4 %) can be advised only with synthetic oil – with non-synthetic oil, carbon deposit will damage the engine.

b. Adjustment :

On the Solo engine with electronic ignition, the only device that has to be adjusted is the carburetor.



Carburetor Tillotson HR181 B

Caution: 2-stroke engine are partially cooled by the vaporization of the mixture in the cylinder! It is absolutely prohibited to make the engine running with too lean gas mixture (not enough gas in the air/fuel mixture), because this can lead to a local superheating that can make engine seize!
The engine slow down then is blocked, making big damage to the piston and cylinder).

To avoid engine seize, always stay in the rich part of the right adjustment window, i.e. the 2 adjustments screws turning to the counterclockwise side of the right engine behavior area.

Tillotson membrane carburetor

There are 3 adjustment screws:
- 1 stop screw for idle (propeller side)
- 1 black screw, marked L (Low) for low RPM mixture
- 1 mess screw marked H (High) for high RPM mixture.

The adjustment has to be done with a clean spark plug!
Check if the throttle line allows plain valve movement.

The initial adjustment:
Tighten thoroughly the L screw and untighten 1 turn. Tighten thoroughly the H screw and untighten 1 turn.

L : 1	H : 1

When the engine is at proper temperature, make it run few second at the whole range of speed. Then adjust temporarily the idle.
Move L screw to have the best engine behavior at low speed, turning the screw by 1/8 turn.
Then adjust the H screw, also by 1/8 turn to have the higher possible RPM, then reduce throttle below 3.000 RPM.
If the engine runs in a four-cycle way (rough mid range RPM), adjust L screw.
These operations have to be made several times because there is an interaction between both screws.
Then, readjust the idle that should be above 2.000 RPM to avoid low speed vibrations.

During adjustment procedure, avoid that the engine runs full RPM more than few second: on the ground, the engine is not properly cooled and can overheat!

Control the color of the spark plug. It might be with two colors: light brown and dark brown. If the spark plug is too white, the mixture is too lean (dangerous).
If the engine shows an **auto-ignition** behavior (i.e. the engine doesn't stop immediately after switching off), the mixture is clearly too **lean**.

Too lean mixture will drive the engine to seize!

To avoid superheating and engine seize, it is important to stay in rich side of the adjustment window (= anticlockwise side).
But a rich adjustment of the L screw leads the engine to easily run in a four-stroking mode (= more vibrations) below 4.000 RPM. With a lean mixture, the engine can run very smoothly at low RPM, but makes a « hole » during acceleration and start less easily.
For a new engine, more sensitive to seize, it is better to accept some four-stroking mode below 4.000 RPM, and to improve the adjustment after running in (= after 10 hours).
After few hours, the engine runs much smoother than in the beginning of his life!

c. Starting

On the ground, cold engine :
The pilot has to be inside the Swift to avoid any hazards!

Because there is no choke, the air filter has to be flooded by the gas before starting. During this maneuver, it is important that the excess of gas runs into the air filter, and not into the engine. If the gas comes into the engine, it will flood the spark plug => no more ignition, and the engine will not start!

- Place the Swift into the wind in such a way than the left wing tip stays on the ground (= air filter side).
- Open the fuel tap.
- Throttle to 0 (or very few!).
    - Check if the fuel line is primed – if necessary, action the primer bulb to fill the fuel line.
    - Put the left wing tip on the ground to tilt the engine side air filter.
    - Carefully press the primer bulb until some fuel drops comes from the air filter.
- Switch on the 2 electric switches (to the front).
- Push the electric starter push button.
- When the engine starts, put more throttle to drive the engine above the low RPM vibration mode (3.000 – 4.000 RPM).
- After +/- 1 minute warm up, check the full range of speed. Do not stay full throttle more than few second on the ground.

In general, do not let the engine runs at RPM giving more vibrations – vibrations can cause a lot of damage on the whole Swift'Light PAS !

In flight, cold engine:
The engine cooled very fast in flight!

- Tip the Swift on left with a side slip (stick left, foot right) – the efficiency of this maneuver can be check using the 2 fuel level windows on the fuel tank !
- Press carefully the primer bulb, but not too much to avoid flooding the engine.
- Push the electric starter push button, still pressing the primer bulb, until the engine starts.

Warm engine:

Do not use the primer bulb

Push the electric starter push button, throttle to 0. If the engine doesn't start immediately, put progressively more throttle.

To avoid brutal propeller opening, that can damage the blades, it is better to follow this procedure:

- Put the electric starter switch (left one) ON, but keep the ignition swift (right one) OFF.
- Push the electric starter push buttons (this will open the propeller) 2 seconds, then, keeping the electric starter running, switch the ignition ON.

So, the propeller blades will be open before the first engine ignition.

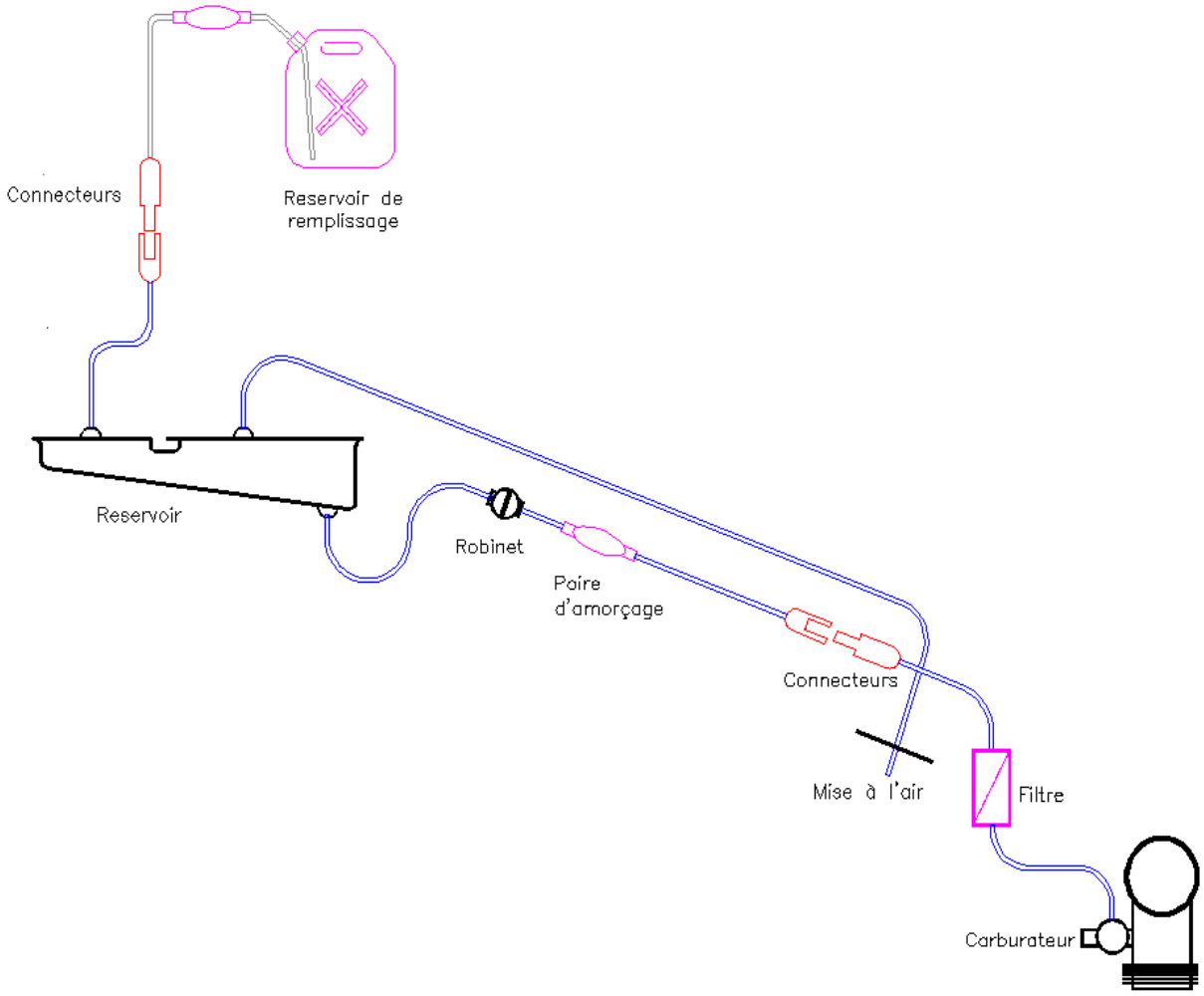
d. Engine use

After the engine is started, warm it for 1 minute at middle RPM.
Above all, do not stay at idle for a long time: at idle, the engine makes more vibrations. These vibrations can damage the whole aircraft and mainly the propeller (axis of the foldable blades).
Before taking off, check full throttle if maximum RPM is OK (above 6.000 RPM).
Use full throttle to take off. However, do not keep the engine full throttle for a long time (especially with the tuned exhaust pipe version). Full throttle, the engine can overheat , and wears more quickly => after taking off, slightly reduce throttle.

In the other hand, avoid flying a long time with very little throttle (for example in slight slope). In this condition, the engine turns quite high RPM (4.000 or 5.000 RPM), but because the lubrication is done by the oil in the gas mixture, the engine is badly lubricated. This can lead to engine seize without overheating!
During long stabilized flight at medium speed, it is advised to give sometimes full throttle for few seconds.
The battery is charged when the engine is running. Full charge is achieved after more or less 30 minutes. If the engine is often started and stopped, the battery can not achieve full charge. If necessary, use the provided battery charger.
The battery (lead/acid) has to be stocked full charge – a discharged battery will quickly loose capacity!
Always stop the engine BEFORE landing. In case of hard landing, this wills highly decrease the damage. Also, even at idle, the engine is still "pushing" and gives a smaller landing slope, making difficult a precise landing.

e. Fuel line

Fill the fuel tank from another tank – use the provided tube with a quick-disconnect provided with a primer bulb. This allows the filling using gravity.
An easier way is to use an electric pump working on battery, available in auto parts shop.
Do not fill the fuel tank more than necessary.
Avoid any fuel drop on the screens. When connect and disconnect the fuel line, use a piece of rag around the quick connector.
Before disconnecting the filling fuel line, empty it completely in the fuel tank.



5. Propeller

Foldable propeller has to be carefully checked before each flight.
The main stress on the propeller comes from the cycling torque from the crankshaft – the engine pushes the propeller only a low ratio of the full engine cycle. This cycling torque leads to a beating of the blades on their axis, if there is even a small play. The beating is much more violent at low RPM or idle.
It is necessary to check the blades play in the rotation plan – blades opened – and if necessary to tighten the axis bolts.
These bolts have to be tightened just less than blades can not completely close.
Time to time, disassemble the blades, clean the axis bolts, grease and re assemble (do not forget the Teflon washers between the blades and the blade support.
Check also frequently if the screws that lock the propeller on the engine are tightened.

Appendix

○ 2-Stroke Mixture

Use synthetic 2-stroke oil.
The first fuel tank filling (+/- 6 liters or 1 ½ gallon) with 3 % mix ratio, the 2nd with 3 % mix ratio, and then use 2,5 % (tuned exhaust pipe) or 2 % (standard exhaust pipe).

Whichever blend of oil and petrol you use, there follow some advices that will help you keep the engine in perfect running order.

- The presence of impurities in petrol is the main cause of engine failure. To prevent the petrol from being contaminated, it is necessary to take action at source, because the potential risk increases if impurities enter the petrol tank. Always use a clean petrol can that complies with safety standards. Always filter the petrol when you fill or change the can. Do not fill the can to the brim; never forget that petrol may increase in volume.

- Do not uses blend which have been stored for a long time or which have been exposed to sunlight in a translucent container. Blend the petrol and oil thoroughly before filling the petrol tank because there is a risk of the two liquids separating in time.

- Choose the same type and brand of oil and stick to it unless it causes problems. By doing so, you will get to know the product well and you will be able to assess whether it suits your engine. If you change the type of oil frequently and your engine has problems, you will never know which type of oil is responsible.

- It is extremely important to avoid switching from synthetic oil to traditional oil. The two types are not always compatible and, if blended, it is possible that a film may form and obstruct the engine's components or cause other problems. As a rule of thumb, 20% of cases where the user has switched from synthetic oil to traditional oil have resulted in problems with the engine.

- Because the engine has been installed the opposite way up (with the spark plug pointing downwards), choose oil that leaves few carbon deposits. Oil deposits tend to build up in the lowest parts, for example, in the spark plug cavity. If these deposits do not burn during normal use, the candle is fouled and this may result in self-ignition. Manufacturers of top brand lubricants guarantee the quality of their products.

Oil specifications: **synthetic oil for two-stroke engines**
Petrol specifications: the octane rating should be minimum M.O.N.83 or R.O.N.90 or more.

How to prepare the blend

A good method for preparing the blend could prevent a good deal of problems. By adopting the same method every time, the preparation will become an automatic process that will simplify matters no end.

1. Always use a suitable container: ensure it is clean, free of condensation and that you know the exact capacity. To dilute the oil more easily, pour a small amount of petrol into the container.

2. Pour in the required amount of oil. Shake slowly to blend the oil and petrol.

3. Add sufficient petrol to obtain the prescribed blend. If you use a filter at this stage, it should have a very fine mesh in order to filter any water or foreign particles.

4. Screw the lid back onto the container and shake vigorously. Pour the blend into the fuel tank of your aircraft. Use a funnel with a filter that is fine enough to prevent any impurities from entering the fuel tank whilst allowing the oil to pass through.

Froms 'manuel du moteur MZ34', ULM Technologie.

- Running in procedure

It is mandatory to running in the engine before using its full potential. A part of the running in can be done in flight.
During running in, the engine will smooth all the friction surfaces coming from the machining and increase the play around the rings and the piston.
The risk of seize the piston into the cylinder is much increased during the first 10 hours.

- **Use fuel with 4 % oil (25 : 1)**
- **Stay on the "rich side" (= unscrewed) of the adjustment windows: spark plug** should be **dark**, the engine can run a little bit rough, in 4-stroke mode between idle and 4,500 RPM – an engine that runs "too nicely" must be suspected to be too lean
- **Do not overheat the engine**: avoid staying full throttle for a long period during first flights.
- **Keep a good lubrication**: avoiding flying with too little throttle. Long landing slope with engine at idle mode is prohibited!

The engine will runs smoother, with more power, less vibrations after few hours.

GROUND CHECKS TO BE CARRIED OUT BEFORE STARTING UP THE ENGINE FOR THE FIRST TIME

Before starting up the engine for the first time, carry out a general inspection, checking in particular:

- Ensure the carburetor and fuel feed circuit are securely installed.
- Check the suction pressure piping between the crankcase inlet and the carburetor.
- Check the condition of the electric cables and that the spark plug's high tension lead has been fitted correctly.
- Ensure the silent-block engine mountings are properly installed and that the locking bolts have been tightened sufficiently.
- Check the reducer and the belt tension.
- Never run the engine without the propeller.
- Ensure the propeller and locking bolts are in good condition.
- **Check if any parts, electric wire, fuel line, throttle wire, … are properly installed to avoid wear by vibrations**.

STARTING UP THE ENGINE FOR THE FIRST TIME AND RUNNING IN

1. The first time you start it up, run the engine at 3000 - 3500 rpm for the first 15 - 20 seconds, and then run it at the lowest revs (2000 rpm) for a few seconds, before stepping up the revs to 3000 - 3500 rpm. Switch off the engine few minutes.
2. Switch on the engine and run it at 3500 to 4000 rpm for 5 minutes, then step up the revs to 5000 rpm for few seconds before dropping to 3000 rpm.
3. Repeat the process, increasing the revs to 5500.
4. Settle at 4500 rpm for 5 minutes, and then drive the engine to the maximum revs for few seconds before returning to 3000 rpm.
5. Repeat the above process, running the engine at maximum revs for 10 seconds.
6. Repeat the above process, running the engine at maximum revs for 10 seconds.
7. Repeat the above process, running the engine at maximum revs for 10 seconds.
8. Switch off the engine for few minutes.
9. Settle at 3000 rpm for 5 minutes, then at 4000 rpm for 5 minutes, then run at the maximum revs for 15 seconds and return to 3000 rpm.

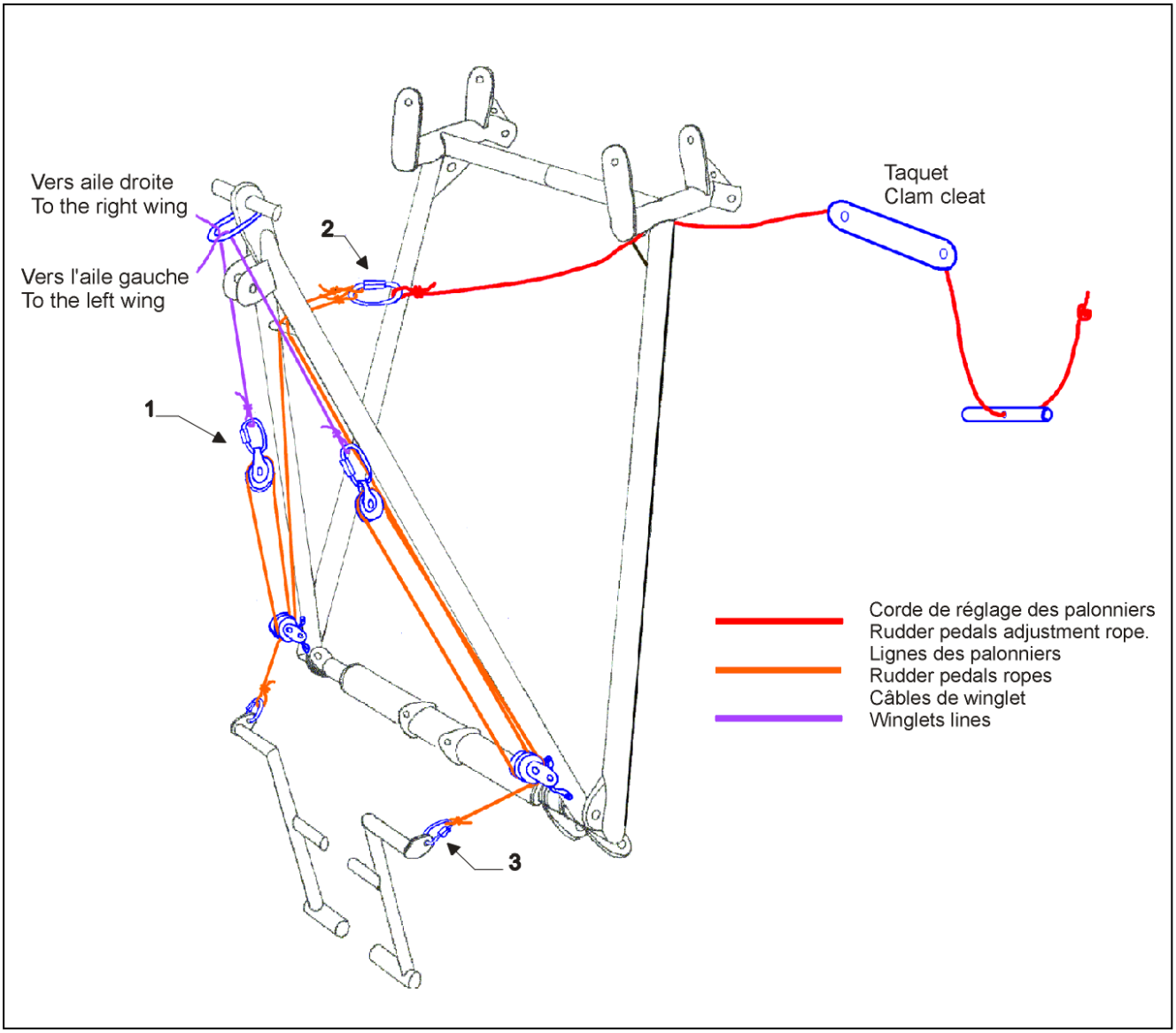
The rest of the running in can be proceed in flight : warm slowly the engine at 3.000 RPM, then take off full throttle – do not use full throttle more than one minute (the time for taking off).
If possible, during the above operations, check that the temperature of the cylinder head never exceeds 260°C.
By running-in the engine thoroughly, you will prolong its life-span. The engine will loosen up and function at full power after approximately five hours.

Any irregularities in the engine speed may be caused by a badly adjusted carburetor.

After the first hour of use, check that all bolts are tightly fastened in accordance with the torque settings given in the table above.

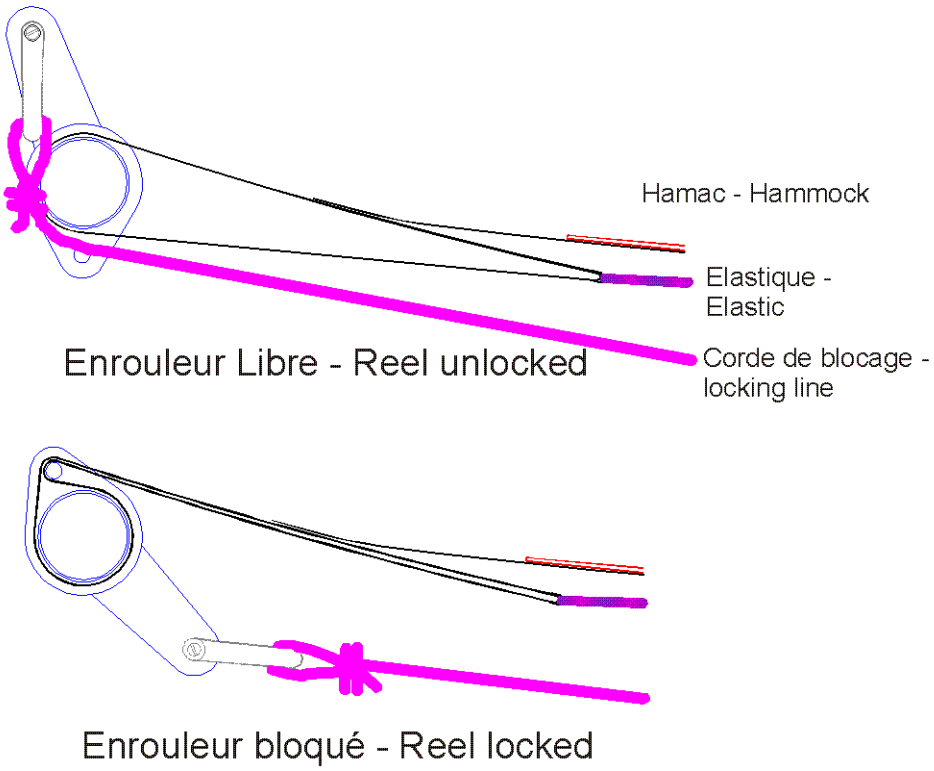
*Sometimes, with the **Tillotson** carburetor, and after a long time of non use, the carburetor can **flood**: the needle (with a rubber end) is no more "fuel tight".*
In these conditions, the carburetor flood when the engine is stopped, engine start is very difficult, and carburetor adjustment is impossible.
In this case, disassemble the carburetor to clean the needle. Untighten the 6 screws to take off the 3 membranes (take care of the spring under the fork). Take the needle out, clear it, put it in a small cup of fuel for 5 minutes, and blow inside before reassembling. See detailed procedure lower.
Never torque the fork, nor try to pull or press the spring!

- Rudders control lines



To take the wings away, only remove the quick links '1'. To fold down the cage, the adjustment rope has to be removing from the cleat.

- Hammock locking device



- Reinforced skin area

The following areas are reinforced regarding handling stresses:

- Lower skin:
  1. Between the leading edge and the spar (thickest airfoil zone).
  2. Around the tip rib (winglet support).
  3. Around the root rib.
- **The upper skin is not reinforced. Do not grab the airfoil!**

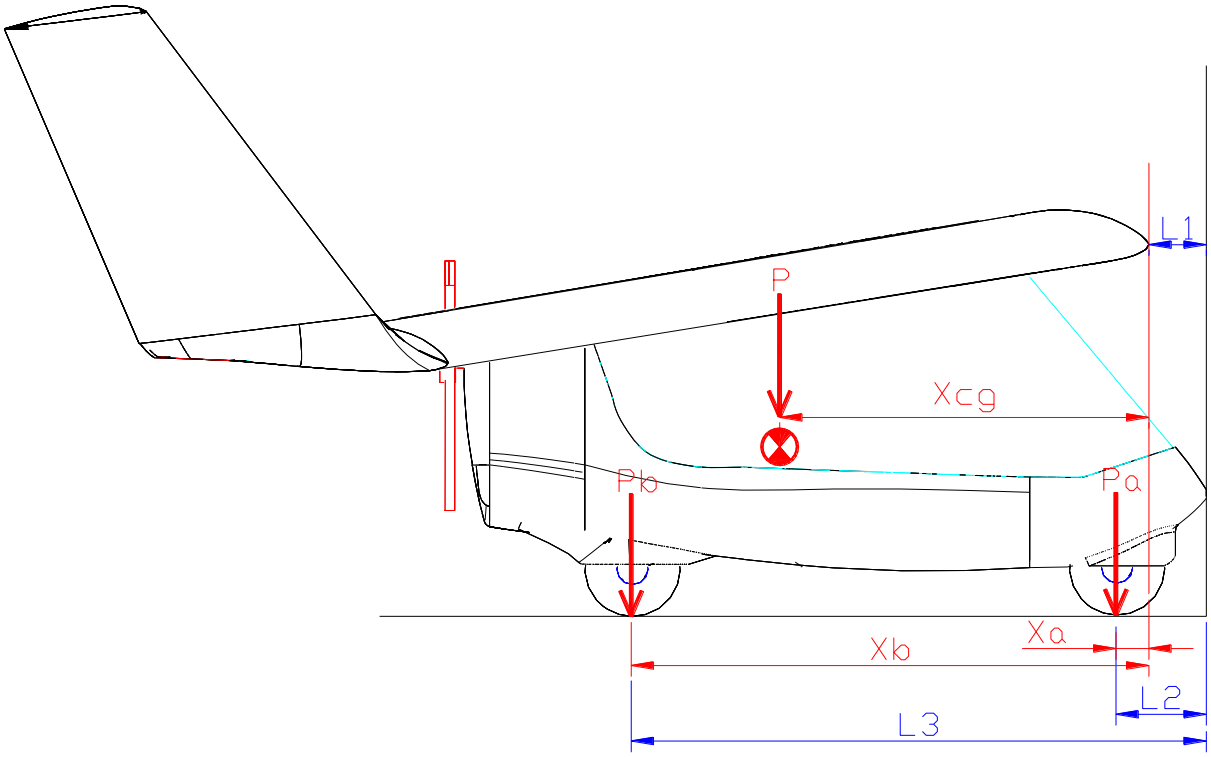
The wing is not reinforced behind the main spar (the thickest part of the wing section) => only handle the wing following the procedure!

○ Centre of Gravity

- Limits 1.200 =>1.160 mm
- Empty (with fairing and parachute) +/-1.300 mm

Center of Gravity position from the wing nose, on horizontal ground, on 2 scales.

Weighing procedure:



Xcg	Horizontal distance between CG and wing nose
Pa	Weight on scale "a"
Pb	Weight on scale "b"
P	= Pa + Pb = total weight
Xa	Horizontal distance between wing nose and "a"
Xb	Horizontal distance between wing nose and "b"

$$Xcg = (Pa \cdot Xa + Pb \cdot Xb)/P$$

With

Xa = L2 – L1

Xb = L3 – L1

On the reference aircraft:

L1 = 220 mm

L2 = 355 mm

L3 = 1.940 mm

=>

Xa = 355 – 220 = 135 mm

Xb = 1.940 – 220 = 1.720 mm.

○ Engine : Service – Fault finding – Technical information
(*From Adventure engine manual)*

Mixture: 3 % during the 10 first hours, then 2,5 % with tuned exhaust pipe, 2 % with standard exhaust.

A. MAINTENANCE BY THE PILOT

Mechanical safety

All screws and nuts are tightened with thread locker, nyloc nuts or specific washers.

Carburetor

The carburetor is fastened with two nuts (MR24) which prevent untightening. In the option « carburetor silencer set », the 3 screws (MC13) are tightened with removable thread locker.

Exhaust

Standard, silence or tuned exhausts are adjusted on the cylinder with an aluminum gasket (Cu564) and high temperature silicone seal paste. The tightening is secured by two screws(M 7) and two washers (SOO34115).
It is advisable to change the gasket and washers and to put seal paste after any disassembly.

Reduction

The whole reduction is adjusted with screws and nuts. Only the screws MR11V, MR14V, MR26 and the propeller bolts are tightened with removable thread locker.
The bearings (MR22) are adjusted in the pulley with a press and tightened with glue. They must be changed if any major damage on the propeller occurs or if lubricant pours out.

Cylinder head standard

The cylinder head is tightened crosswise. It is secured by S0072148 washers which must be changed every 3 disassemblies.

Special cylinder head and tuned exhaust

The cylinder head is tightened crosswise. It is secured by S0072148 washers which must be changed every 3 disassemblies.
The cylinder head is adjusted on the cylinder with nuts (Cu3) on bolts (Cu2) that are adjusted on the cylinder with Loctite.
The cylinder head gasket is in aluminum and must be changed on every disassembly.
A perfect seal is assured with high temperature silicone sealant.
The exhaust (Cu9B) is fastened with two mount shocks (MR25) which must be replaced as soon as they are worn; if not, it can damage the exhaust.
The exhaust is adjusted on the exhaust pipe (Cu9A) with three springs. They are secured by stainless thread as well as the two springs that hold the exhaust silencer (Cu9C) on the exhaust.

Before each flight, check that the junctions between the exhaust, the exhaust pipe and the silencer are free. If not, disassemble immediately, clean and sand down the parts in contact. Use plenty of high temperature graphite grease before assembling.
Every 20 hours: disassemble the two ball joints, check and put on some high temperature graphite grease.
Every 100 hours: change the silencer if necessary.

Ignition

Earth

The earth on the electric bundle is VERY important.
The regulator, the CDI and relay are connected to the earth.
If it is not connected, there is no ignition (CDI disconnected). If only the regulator earth is disconnected, the tension to the battery is no longer regulated; the battery gets overheated and may be destroyed. Therefore, it is compulsory not to remove the plugs on the regulator and on the CDI. **In case of disassembly, these plugs must be fixed with glue again.**

Connectors

All the connectors are **welded** and must remain welded after any disassembly or repair.

Fuse

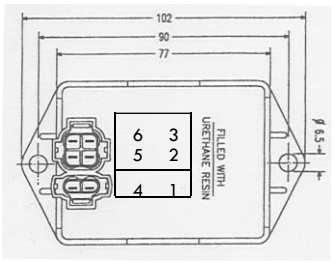
There is a 4A fuse in the charge circuit and on the CDI supply. If the charge is no longer regulated, the fuse will fail and the battery wills no longer charge, although the engine will keep turning.
Check the regulator earth and add a new 4A fuse. If nothing happens when you start (you don't hear the starter, or the «clic-clic» of the relay check the fuse: it may be broken (replace it) or there may be a bad contact on the fuse holder.

Spark plug cap

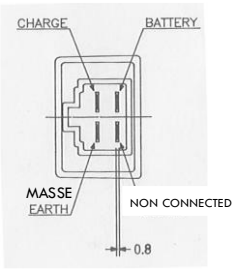
Its resistance must compulsorily be10 kς
The use of a spark plug cap not provided by Adventure is **forbidden** because it may involve irreversible damage to different parts of Adventure's digital ignition.

Battery charge
The battery charges during the flight. Full charge will be reached in more than 30 minutes.
Short flights of 5 to 10 minutes will not enable a full charge, yet it will be enough for one start.

CDI – Electronic box

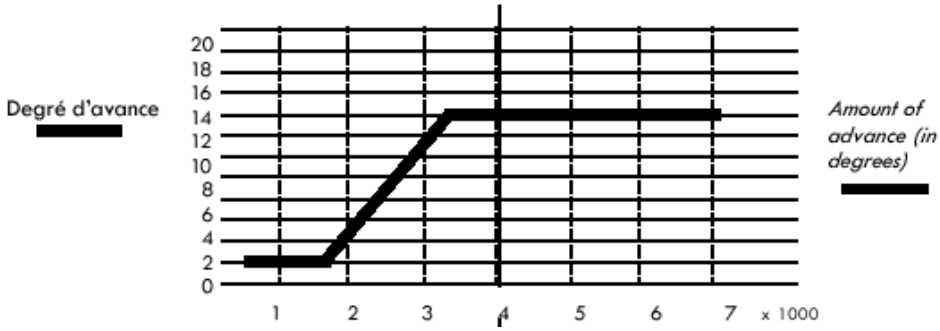


1	Masse : non utilisée *Earth : no use*
2	Non connecté *Not connected*
3	Batterie / *Battery*
4	Bobine / *Coil*
5	Masse / *Earth*
6	Fil d'excitation *Exciting wire*



Regulator
It allows the regulation of the current produced by the ignition to charge the battery.

Ignition advance and spark plug tension
This means that the spark point is different ac-cording to the RPM. The Adventure ignition enables smooth running with a very low idle speed, while keeping an optimal power. The maximum of the spark tension is at 1500 rpm (this ex-plains the quality of the idling) and starts from 280 rpm.



Electric starter
Mechanical parts must be regularly checked: teeth of the electric starter crown, starter itself and adjustment of the starter on its support.
Also check the electric bundle (cut wire or unusual overheating, etc.).
If the starter does not start, do not insist: it will get heated and may be damaged. Push several times on the starter; if it does not work, check the battery. If it is correct, check the compression. If it is very high, clear the integrated decompressor.
If nothing happens, contact your retailer who will test the starter.
Beware if you start a warm engine: a simple push on the switch and it will start! Release it as soon as the motor starts, otherwise it will drive the starter and damage it.
Battery: 12 V, 2,5 A
(13 V when it is charged). No specific maintenance is required. If the battery is too weak, charge for15 minutes with the car converter (motor running) and you will start again. Full charge will be reached during flight.
Yet, you can charge the battery with the car converter the day before a flight (no memory effect). It will be full charged in 3 hours (800 mAh x 3 h = 2,4 A).
Note: as the CDI is supplied with current by the battery, never leave the engine with the battery connected and the main switch on ON: it would discharge the battery!

Belt

Control of the tension
Between the two pulleys, press a rule on the whole width of the belt : the rule should not sink more than 5 mm and not less than 2 mm.
Change of the belt
First, take off the spark plug and the propeller. Turn the propeller pulley (MR7) with the hand and pull by the same time the belt : one tooth of the belt should be released.
Do the same on the engine pulley (M5, M8 or MRB3), tooth by tooth. Do the same in the reverse order with the new belt.
The belt may be changed after the running- in because of the vibrations during that time.
If the belt makes a shrill noise at low rating, check the carburetion and change the belt if necessary.
Tension adjustment
You can adjust the tension of the belt by adding thin washers (0,5 mm) in diameter 8 under the reduction gear (MR1).
Note: if the belt is well adjusted, it does not slip nor leap and there are fewer vibrations. If it is too tight, it strains the axes and bearings and may even break in the air or damage the pulley or the reductor.
Alignment of the pulleys
If the reduction has been disassembled, the pulleys must be aligned again to prevent a strain on the belt. Put a rule on the pulley (MR7) and adjust the reduction with the help of the oblong holes on the reduction gear support (MR1).

Shock mounts

They must be changed every year or after 50 hours flight and scrutinized during each preflight check.

Filters

Fuel filters
They must be regularly cleared (with fuel). The first one is located on the fuel pipe, before the carburetor. The second one (more important) can be reached after disassembling the blue plate under the carburetor (1 screw). Clear all the dust on the round screen (under the cork gasket). **Carefully tighten the blue cap : FRAGILE !**
Air filter
Foam rubber filter
Clean it carefully and check **through the foam** that the 3 screws (MC13) are well tightened. If necessary tighten with an Allen key warning : the screw MC13 is a US screw of 1/4 of inch and the Allen key is a 3/16 of inch) through the foam.

B – FAULT FINDING

Carburetor Tillotson

Membranes kit: P/N Si15

The motor is flooded

Check the adjustment of the L screw. Take off the spark plug, turn several times the propeller with the hand. Dry the spark plug and adjust it.

If the motor keeps on flooding, disassemble the carburetor to clean the needle. Untighten the 6 screws to take off the 3 membranes (take care of the spring under the fork). Take the needle out, clear it and blow inside before reassembling.

Never torque the fork, nor try to pull or press the spring !

The motor gets clogged: Tighten or untighten the H screw to have the maxi RPM.

How to adjust the carburetor

Tighten thoroughly the L screw and untighten 1 turn. Tighten thoroughly the H screw and untighten 1 turn.

Start the engine; check that the RPM increase smoothly. If necessary, untighten the L screw to suppress any judder. Put the maximum RPM and tighten/untighten the H screw until you find the correct setting.

Warning: if the L screw is too much tightened, there will be an important hole during the acceleration, the mixture air/oil will be too weak and the engine may seize! Control the color of the spark plug. It might be with two colors: light brown and dark brown

How to clean the carburetor

Needle: cf « flooded motor »

Screen: cf « fuel filter »

For fast cleaning, tighten thoroughly the L screw, disassemble the H screw (pay attention to the toric gasket and the brass washer), prime to let the fuel pour from the H jet. Prime 2 or 3 times, assemble H and tighten thoroughly. Do the same with the L screw and adjust the carburetor.

After each day of flight, leave fuel in the pipe between the fuel filter and the carburetor: the next priming will be much easier!!

ADVENTURE Digital Ignition

If the ignition seems not to work...

1st case: the motor does not work, the starter is correct but there is no spark:

- Check that the cut off button on the hand throttle is not pushed;
- Replace the spark plug with a new one;
- Test the HT coil AL3: the resistance between the inlet plug (blue) and the spark plug wire (take off the spark plug cap) is 9 kς ;
- Test the spark plug cap (AL4): resistance 10 kς
- Test the stator (AL1)/ connector (AL6) : check the resistance between the square plug and the earth (300 ς) and between the round plug and the square plug (300 ς),
- Test the CDI (AL13): put the voltmeter on alternative voltage, reconnect the whole electric bundle and the battery, main switch ON.

Connect the « minus » of the voltmeter to the earth of the motor, and the « plus » to the connector of the high tension coil (blue plug connected). Start: you should read a value corresponding to the spark point, i.e. intermittent, of 180 V.

2nd case: the motor does not run anymore (it sparks erratically), the starter is correct, there is a spark but not at the correct time. Two possibilities:

- The CDI unit is defective;
- Or the key that wedges the flywheel magneto on the crankshaft is broken.

Warning: remove grease from the surface in contact on the crankshaft and the magneto flywheel before assembling the crankshaft on the magneto flywheel and tighten the nut at 6 m.kg with a dynamic spanner.

The starter does not work anymore:

- Nothing happens but you hear « clic-clic » in the relay: Check the general earth of the electric bundle (cable terminal on the upper gear square of the reduction). Check the fixing of the red wire connected to the starter. One or the other wire is broken or a cable terminal is not correctly connected.
- Nothing happens and you hear nothing:

Check the connection battery/electric bundle and the main switch ON/OFF. Disassemble the fuse holder. One fuse is broken or here is a false contact on the fuse holder.

- The starter seems to work but cannot pass the compression point:

Check the compression (see hereunder « too much compression »), then check the battery (refer to § « battery » on p.6). Finally, check the teeth of the starter (DEM31) and the crown (DEM2).Check the starter gear (take it out with a screw-driver reverse clockwise) and test that the meshing is correct between the starter gear and crown.

If all is correct, contact your retailer.

Engine

Too much compression? Difficult start?

You have to clear the integrated decompressor (it is composed of a 4 mm hole between the cylinder head and the exhaust, and a 3 mm hole slantwise in the cylinder out which gases escape during the compression). If it is blocked, it makes a visible mark.

To clear it, take off the cylinder head, remove the 4 mm screw (with an Allen key in diam. 3 mm) from the hole of the cylinder head plane, and by hand, with a 3 mm drill, clear the two holes (3 and 4 mm).

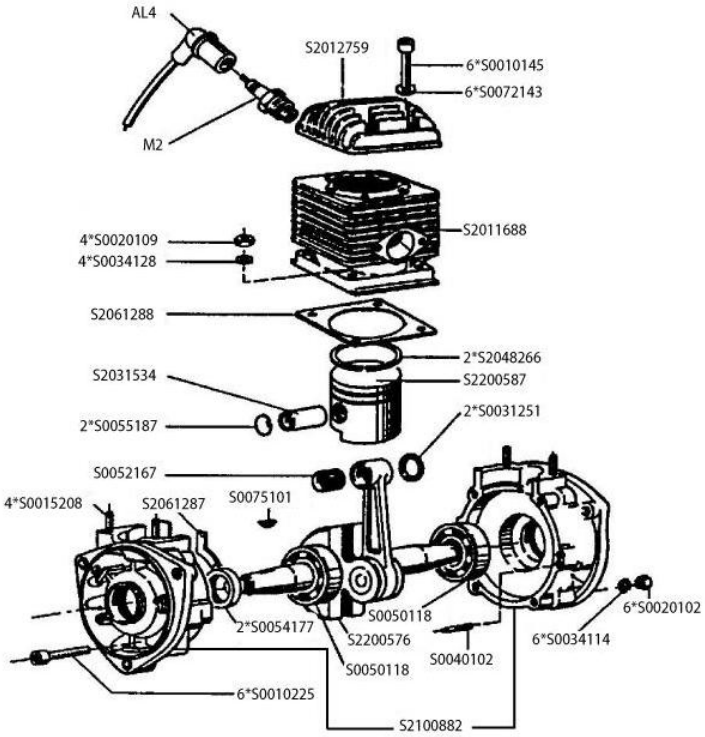
No more compression?
You may have stuck piston rings or even a seized motor. Disassemble the exhaust in order to check the piston.

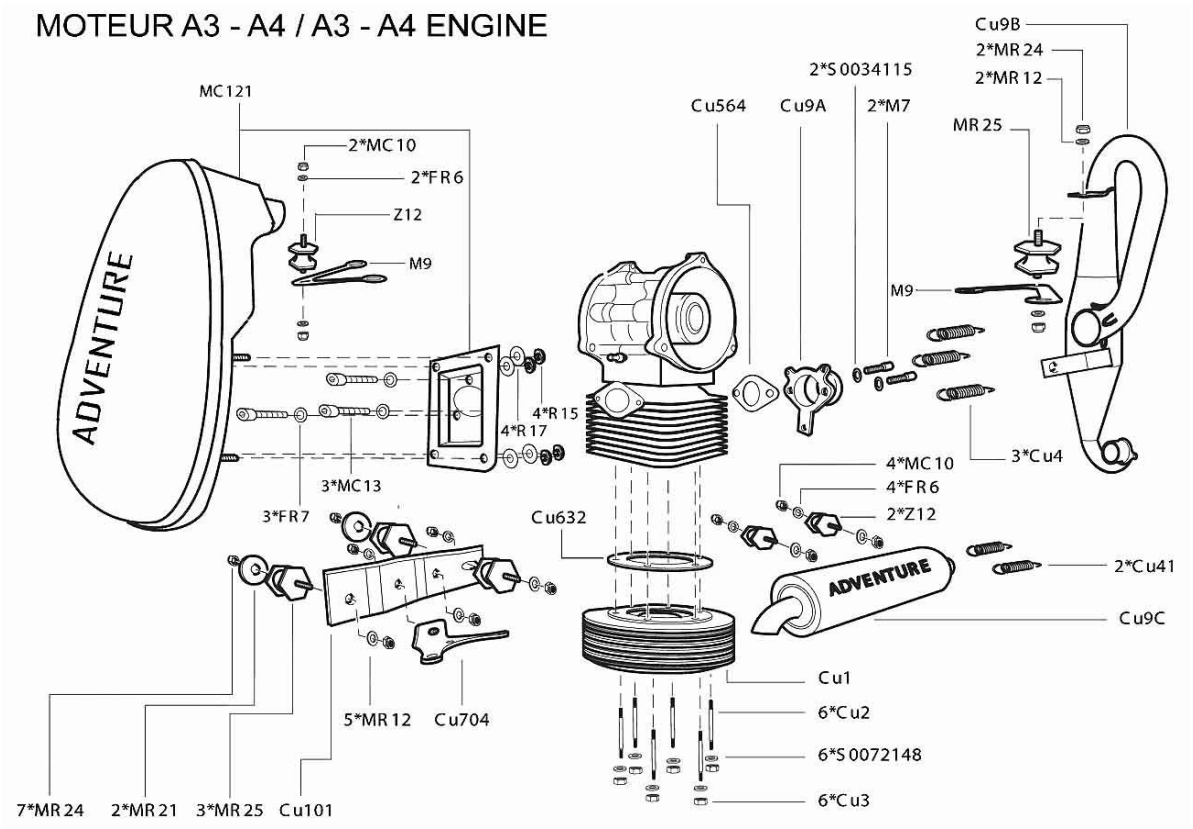
Technical Information

Torque settings
Reduction: 2,5 m/kg
Cylinder head : 1,6 m/kg
Exhaust: 2,5 m/kg
Composite propeller: 2,0 m/kg
Repair and fixing products
- Removable Loctite thread locker : 243
- Permanent Loctite thread locker : 270
- Loctite retaining: 641
- High temperature Loctite silicone sealant :
5999 (cylinder head Cu1 and exhaust)
- High temperature graphite grease: exhaust
- High temperature black paint: exhaust
- Sikaflex 221 polyurethane paste : air filter foam rubber
- Polisher: body
- Polyester filler: wooden propeller

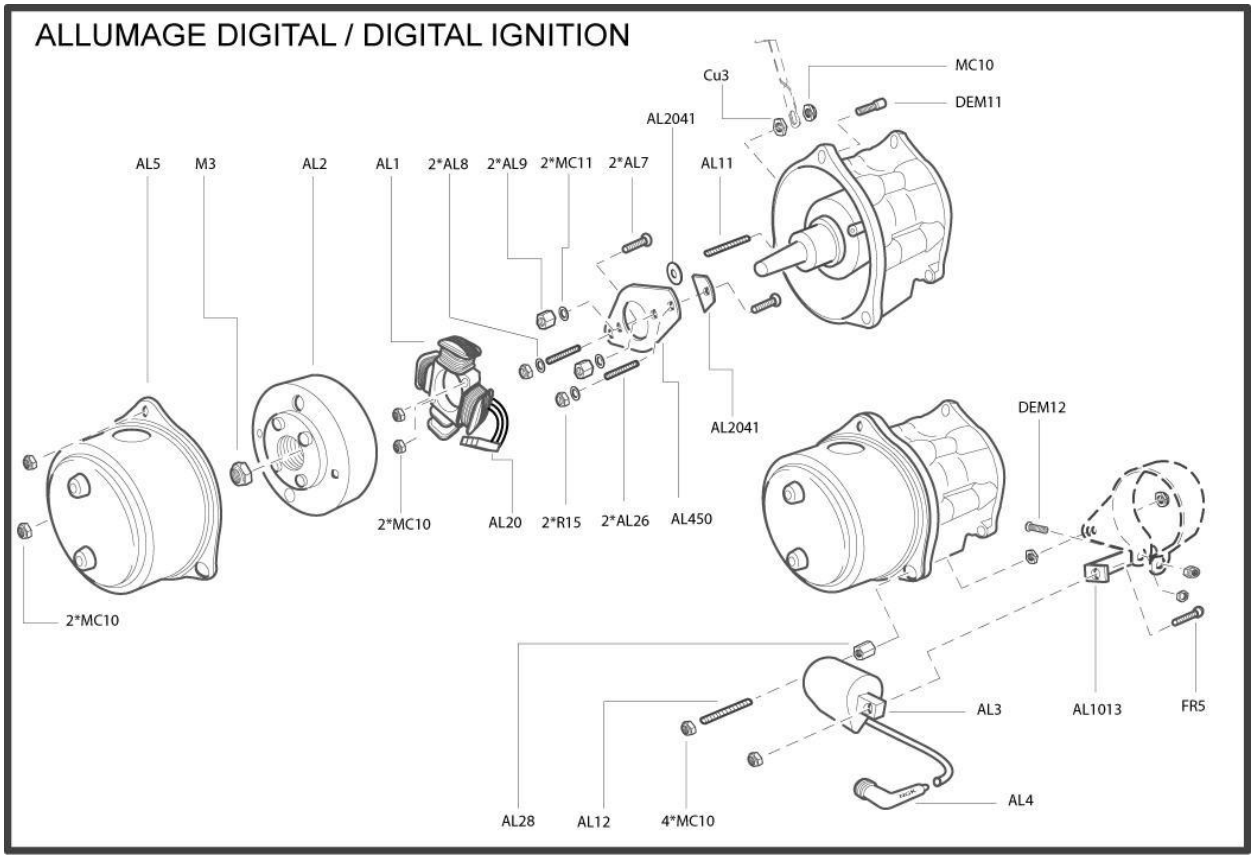
C – DRAWINGS – EXPLODED VIEWS

MOTEUR F... / F... ENGINE



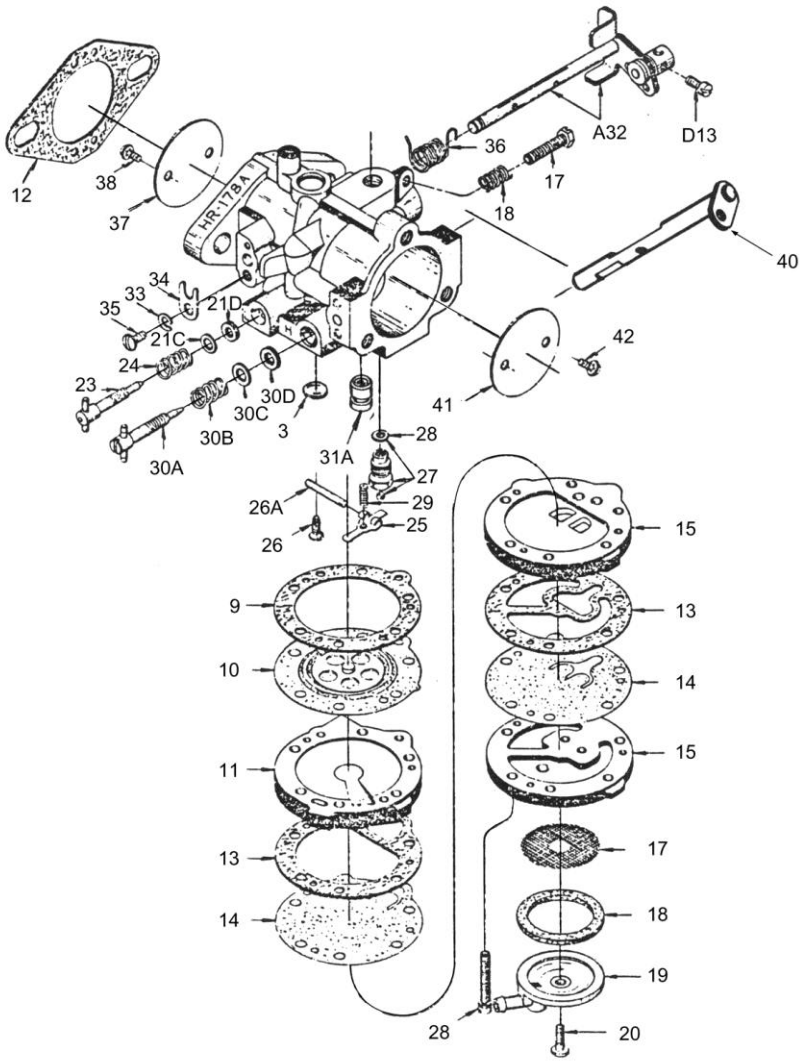


** Tuned exhaust pipe and silencer are modified for the Swift'Light-PAS.*



HR SERIES

Illustration of basic parts standard throughout HR series carburettor.
For individual model listing see following pages.



Parts illustrated are typical in appearance
and may not look exactly like the part required

Carburetor Tillotson Maintenance

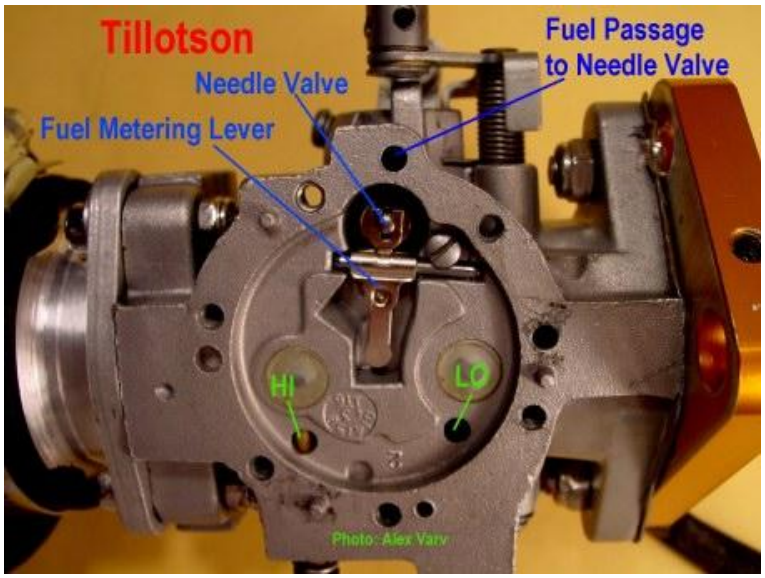
Sometimes, if the engine is stocked and did not run for a while, it can flood when the fuel tap is opened. It is probably the fuel needle, in the carburetor, that is not "fuel tight" because a little drop of "dry" fuel oil blocks the device.
In this case, close the fuel tap and start the engine. Open the fuel tap when the engine begins to slow down because it is out of fuel. Avoid letting the engine running at idle for a while.
After few minutes, stop the engine. The carburetor should not flood anymore. If the flooding continues, see below.

from Alex Varv, published on the web site http://www.aerocorsair.com/id27.htm

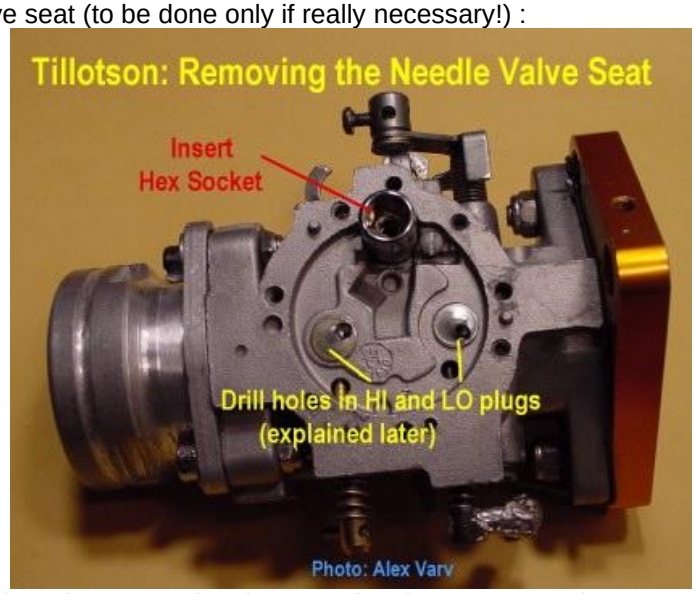
This documents perfectly described de disassembling/assembling of the Tillotson carburetor.

The carburetor can be disassembled in the following case:
- if the carburetor is flooding (probably the needle or a dust in the needle valve).
- To replace the membranes.
It is usually not necessary to remove the Jet – Do not remove the Jet plug if unnecessary!
After removing the carburetor from the engine, both ends of the venturi should be closed with paper or clean cloth. The carburetor should be externally cleaned with clean gasoline. (Some membranes may be damaged in contact with certain types of carburetor cleaners) Let us have a look at all the membranes of the Tillotson:

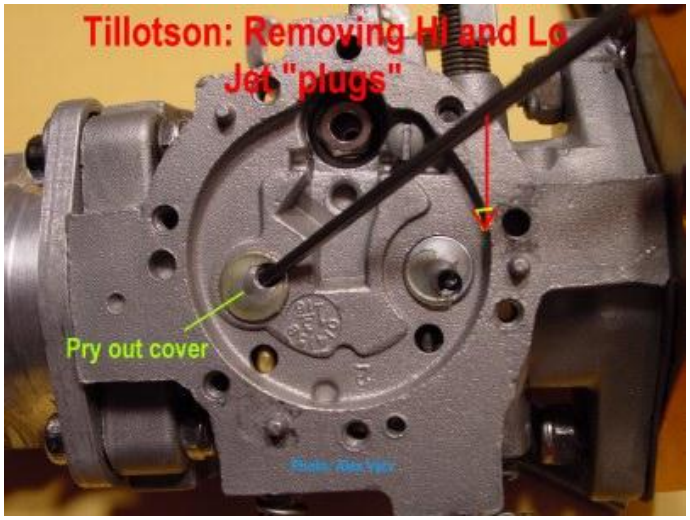
After removing all the bolts, the plates with membranes will come off. If the diaphragm has not come off, it should be gently peeled away. Now we have access to the metering system:



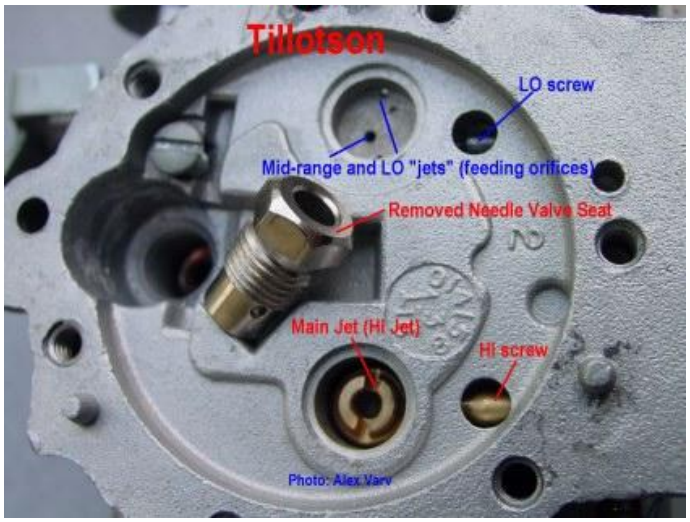
Loosen the bolt holding the metering lever; remove the lever, pin, spring and needle valve. Next we remove the needle valve seat (to be done only if really necessary!) :



Now, we shall remove the "plugs" covering the HI and Lo jets. As seen above, each plate (plug) had a small hole drilled into it for easier removal.

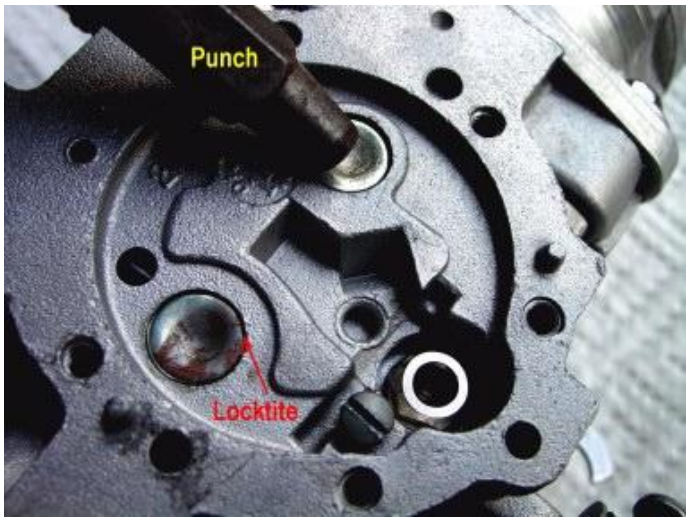


Removing the "plugs" we can access the Main Jet



Next, we unscrew the main jet. On the bottom, it has a check valve. It is very important that this valve opens and closes freely. This is how it looks:

Next, we remove the HI and Lo needles with their springs, washers and rubber seals. Using a good quality carburetor cleaner we should blow into all holes and passages. After drying ALL the cleaner, we can proceed with installing the new parts. Reinstall the HI and LO screws. Reinstall Main Jet and Needle Valve Seat. Using the new round plugs supplied with the repair kit and a small amount of Loctite around the rim of the holes, we install the HI and Lo "plugs" and lock them in place, using a blunt, rounded punch:

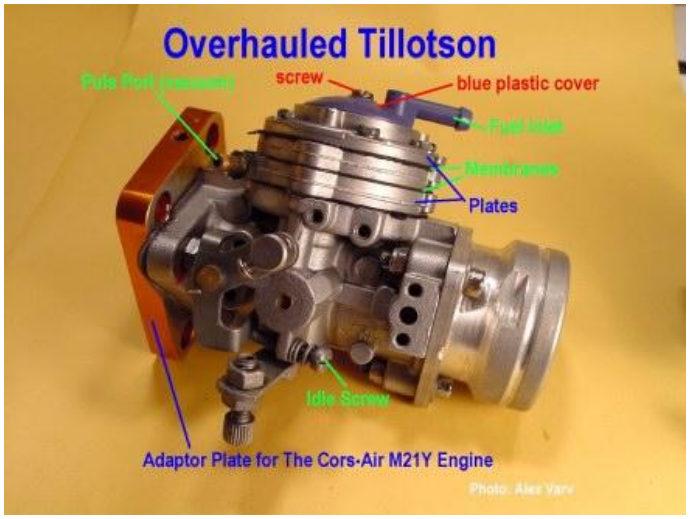


Next, install the Needle Valve, Spring, Metering Lever, tighten the bolt holding the lever in place, install new diaphragm gasket the plates and membranes in reverse order they were taken apart:


Diaphragm


Tillotson: first plate and check valve gasket
Photo: Alex Varv

Last step: install the blue plastic filter cover. **Important note**: the screw MUST not be overtorqued! It will damage the plastic.



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