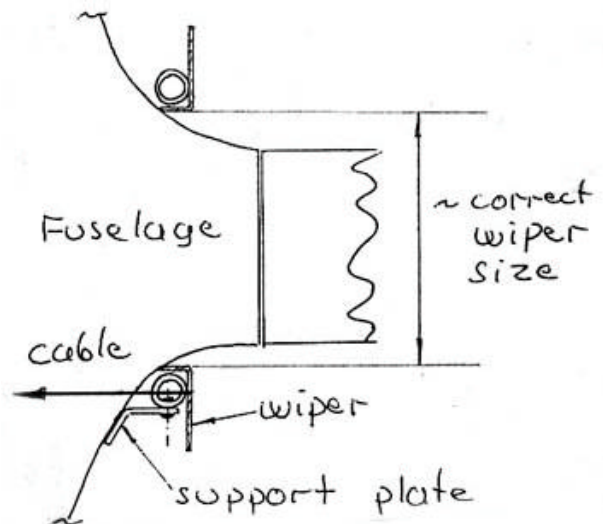


Note: Read both instructions (Mounting and Users) before proceeding. It requires a general understanding of where all parts are located, how they are mounted and operate, and particularly how the bug wiper is deployed and retracted, to assemble the hardware for proper operation.

- 1 Mount the winch to the fuselage bulkhead using the four larger screws provided. Be sure that there is nothing behind the bulkhead that will be damaged by the location you choose. Before mounting, visualize the routing for the black guide tubing for the winch cable. Also the support bracket described in 6 has to be taken into account. Avoid any extra or sharp bends in guide tubing causing unnecessary friction which causes higher minimum speed for correct outward travel and lowers the max. speed for retrieval.

Note: for the pre-flight check the winch must be visible and easily attachable.

The bug wiper is sized according to the thickness of the sail-plane's wing. The shape of the bug wiper support plate may have to be adjusted to properly support the bug wiper. This is done by noticing how the wiper "nests" against the fuselage, while standing in an upright position for proper deployment



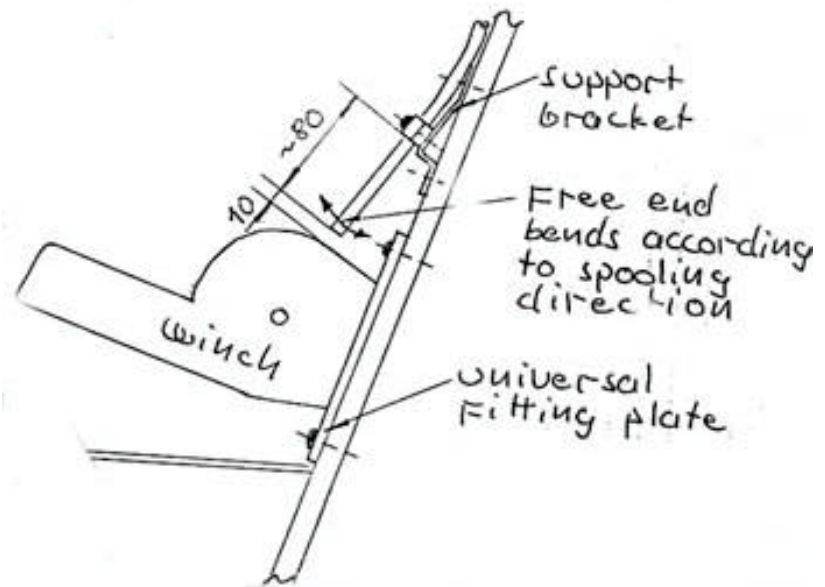
- 3 It will be necessary to drill a hole in the side of the fuselage for the bug wiper cable to pass through. The location of this hole is to be determined according to the wiper nesting against the fuselage.
- 4 To fit the guide tube on the fuselage skin there are two joint pieces to be inserted. Drill minimum hole through the skin (max 1.5 mm). If there is enough material available enlarge it from inside to 5.0 mm and to the depth needed for the joint piece thread. Use quick epoxy to glue the joint piece on the fuselage. Some kind of fillet around the joint piece is recommended.

Note: be careful not to drill through the skin with 5.0mm drill. The small hole is needed to stop the cable. The copper sleeve must not pass through this hole.

Note: The heads of the pop-rivets provided can be used as bushings for the hole. Use 2.5mm drill instead.

5 The next step is to cut the guide tubing to the right length. Note that on both ends of the tubing there is a small conic part made to make the tubing fit on the joint piece. Do not remove it when cutting the tubing. The other end of guide tubing will be supported by a bracket which will be positioned near the winch.

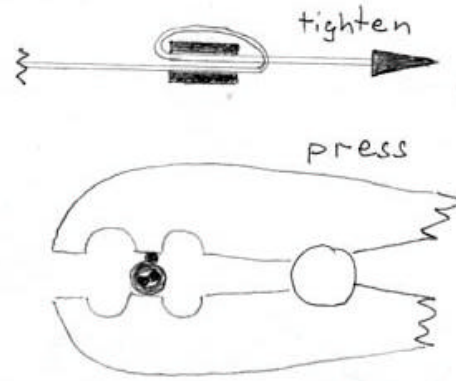
6 The length of the Tubing should be such that the ends are some 5-10 mm apart from the reels. The support bracket should be positioned 50 to 80 mm from the winch reels. Be sure that the ends of the guide tube do point towards the middle of its respective reel. Tighten the tubing clamp in proper position



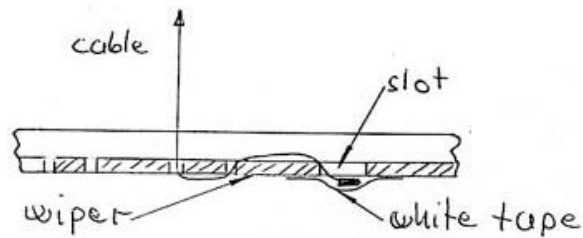
7 Feed the cables through the guide tubing and out the guide holes on the fuselage. Take carefully some 1m of free cable from both reels. Make use of the delivered 1.5m piece of cable by bending it double at the midpoint and pushing it outside through the guide tubing and pulling the actual wire through.

The cable furnished is 9 m long. It is recommended not to cut it to the exact wing length but leave it as it is. The cables are damaged allways at the outer ends and this leaves you the possibility to cut the damaged part some times away and still have adequate amount of wire. This of course means that you must be careful not to drive the wipers out from the wing tip when deploying them. The cable is attached to the bug wiper in a manner which allows easy removal of the bug wiper when not in use. The free end of each cable is terminated by making a cable stop.

Press the copper sleeve by standard AMP electric pliers. Only a light press is needed but just on the wire to keep the diameter below 2.5 mm (holes at the wipers)



- 8 Attach the cable by threading the end through the wiper and then through the secondary hole into the slotted hole. Tape down the end piece along the wiper's side with white tape.



- 9 The main power switch for the winch is to be mounted in a location that is easy for the pilot to operate during flight. It is suggested that the location of the power switch be on the left side of fuselage so the pilot can operate the power switch without taking his right hand off the control stick. A proper square hole is needed to mount the switch.

The power wires to the battery should have min. 8 amperes in-line slow blow fuse installed (not provided). It is recommended these power wires be wired directly to the battery. If additional wire length is required, be sure to use the same gauge wire or larger.

Note: be sure that any part of the wiring does not in any way interfere with the sailplane controls.

Note: the usage of the winch motor does cause a small radio disturbance.

- 10 In mounting the winch hardware to a fiberglass sailplane, it may be better to bond a wooden block or equivalent on the fiberglass structure and mount the hardware to the block. In this way, you are not drilling holes into structure that may be a critical load bearing member.

IF THERE IS ANY DOUBT ABOUT THE METHOD OF ATTACHMENT AND ITS AFFECT ON THE STRUCTURAL INTEGRITY OF THE SAILPLANE, CONSULT WITH AN AUTHORIZED INSPECTOR OR THE SAILPLANE MANUFACTURER.

- 1** After sailplane assembly and the bug wipers are installed, be sure that both wipers are held firmly against the fuselage and the cables lay correctly on their reels.
- 2** An daily preflight test must be carried out.
 - open the wipers some 50mm (spring force opens them) and monitor them opening simultaneously
 - the winch must continue to rotate after closing (clutches on the reels)
- 3** To operate, the power switch must be held continuously (positive safety feature). The power switch is capable of operating the winch in either direction.
- 4** Starting the operation in the air press the power switch briefly for:
 - 1** to find out if this was the right direction (if not, the motor is working hard, the clutch is sliding)
 - 2** to control both wipers opening simultaneously. First shot some 50mm second some 200mm.
(if not, do not continue, shoot the trouble on ground)

The cable is then reeled out and both bug wipers will travel outward along the wing due to the airload on them.

The wipers shall not be driven further than 200-300mm from the tip of the wing. They can be left there for waiting the right moment for retrieval.

It is recommended to deploy them before coming into the thermal and retrieve while thermalling.

Note: do not operate the wipers at airspeeds less than 100 km/h for correct outward travel. 120 km/h is the maximum for deploying.

- 5** As the cable is reeled in, both bug wipers are retrieved. Once the bug wipers reach the fuselage, the load on the winch motor substantially increases, and the audible sound of the hard-working winch motor indicates it is time to release the power switch.
- 6** The motor shall not be overloaded for longer periods. There are no thermal fuse inside of the motor. The maximum permissible current is 4A for driving in the wipers. The clutch must be adjusted so that when both reels are not turning (kept by hand) the motor does not take more than 5A. If the current is higher, the clutch must be loosened and if lower, the clutch starts to slide before the maximum operation speed of 120-130km/h.

**This adjustment is done through the large nut on the winch's shaft.
Before adjustment loosen the locking screw.**

Note: the correct locking of this nut is essential.

- 7** When the winch is adjusted as described, the winch will reel in the bug wipers with sailplane airspeeds up to 120-130 km/h. At this point, the load on the winch motor becomes too high and the clutch starts to slide when adjusted properly. To assure retrieval of the bug wipers, the airspeed must be reduced.
To lengthen the lifespan of the motor the retrieving speed is recommended to be kept below 120 km/h.
If there are significant differences between the max. retrieving speeds of the right/left wipers, the clutch should be cleaned and the reel surfaces roughened by 80-100 grade grinding paper.
- 8** Normal power consumption while retrieving varies between 3 to 4 A for 100 to 130 km/h respectively. Deploying takes some 1.5-2 A.
- 9** The idea is to install the bug wiper on the sailplane only when needed. The bug wipers are easily removed due to the method of cable attachment. After disconnecting the cables from the bug wiper tighten the cables against the fuselage.
- 10** The bug wiper can be used in rainy conditions. The deploying of the wipers does shorten the drying time of the wing after leaving a rain shower.
- 11.** It is recommended to cut yearly some 100-300mm of the cable to ensure proper strength and avoid the friction caused by the twisted outer end of the cable.
New copper sleeves must be installed. They are available at the sales agent and the manufacturer.

Manufacturer:

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