



CHECK AND CONTROL MANUAL

 **APCO Aviation**
Setting Future Standards

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APCO Aviation Guidelines for periodic control procedures on paragliders

(This is just a guideline and does not replace trained, knowledgeable controller)

The annual checks and repair must be performed by personnel having necessary knowledge, experience and tools and be authorized by APCO

Check and control of APCO paragliders must be carried out by a service center authorized by APCO.

Frequency of checks and maintenance should be as directed by the manual of the particular wing and stated on certification sticker.

This instruction can be used for all models of APCO paragliders. Their use must be supported with technical data of each model.

PARAGLIDER IDENTIFICATION

The paraglider model and serial number are found on manufacturer's sticker in the wing's interior (on the center rib, or bottom panel). The sticker must be filled out completely and clearly. The numbers and year of production can be confirmed on inquiry with APCO.

TECHNICAL DATA

All the technical data (material descriptions, line plan, risers arrangement, etc.) must be downloaded from www.apcoaviation.com manuals or supplied by APCO

CLOTH VISUAL VERIFICATION

Top and under surface of the paraglider must be checked in respect of damage such as: holes, tears, scratches, etc. For this paraglider can be hung up and filled with air. Both paraglider surfaces must be checked: random stitching, suspension points condition, condition of the ribs, seams on all air-intake reinforcements; In case of any doubts they must be replaced.

Tears, those which are max. 5 cm long and no closer to the ribs than 5 cm on both surfaces can be repaired with self-adhesive tape (on non-siliconised cloth). To fix it, choose a shape that will cover the damage with 5 cm to spare and place the tape on both sides of the cloth. Major damage has to be repaired by qualified personnel in a specialized service department. Often it requires replacement of whole panels. Similar repair must be performed when the ribs are damaged. APCO can provide panels or part of panels on request

WING'S LEADING EDGE CHECK

The wing edges can be measured to check their symmetry and length. It has to be the same as on the technical data which is certified.

CLOTH POROSITY TEST

The measurement has to be taken with a porosity meter, on the upper surface of the wing. It has to be taken in 3 or better 5 cells: centre (half of wing span), 1/4 wing span and the last open cell - closest to the stabiliser. The device should be mounted at midpoint on the wing chord.

The place of measurement is very important and must be checked very carefully because the smallest tears can alter the results.

The results are then recalculated to obtain an arithmetical average. If any of the results are radically different from the average, the place of measurement must be carefully checked again and possibly changed.

The porosity measurements checked by JDC instrument will depend on amount of time glider had been used, varying from 1,000 or more seconds when new, up to 10-20 seconds for very used. Porosity readings below 10-20 seconds, indicate possible problem with glider – launch difficulties, early stall. Glider will have to be test flown to determine its state



CLOTH AND STICHING CONDITION CHECK

The check has to be made in a few places on the top surface in the vicinity of leading edge using betsonmeter. This instrument has 2 needles. The straight one is used to make cloth resistance test. The hooked one to make stitching strength test. The measurement with this device is the force needed to break the cloth fibres, and practically its tear resistance under a minimal, predetermined force.

In order to take the measurement, the straight needle is driven into a stretched piece of cloth, and then the balance is loaded up to 600 g. If the cloth will not tear, the test is considered positive (passed). It is to be made in three places on the top surface above the air intakes, and in three places on the lower surface near the suspension points of the A row. If the cloth breaks in any of tested places, the paraglider is no longer considered airworthy.

The stitching is examined with hooked needle. The hook is driven between the folds, and balance is loaded up to 1000 g. If the stitching holds, the test is successful.

RISERS CHECK

This check must be done as follows:

wear damage to risers as a whole, places of contact with steering lines (if some fibres are melted or hardened, the entire riser is to be replaced), end loop of the risers (whether they are damaged by carabiners), smooth operation of steering lines and speed-system pulleys, speed-system cord length (can not be strained when the riser is loaded) and overall quality, all seams of the risers (if in doubt, the entire riser must be replaced), closure of the quick links (should not be opened by bare hands), o-rings holding the lines on the quick-links together (they stiffen in time).

LINES CONDITION CHECK

For this check lines must be sorted out. It can be hung up. Every line must be visually checked (sheath, stitching, tears), manually checked to find any changes on the core. Positioning of the brake handles (should be fastened at the original marks, this length must be controlled). If any changes are found, this line must be replaced.

LINES SYMMETRY CHECK

Both risers left and right must be hooked together. They remain in equal position and distance from the measuring person. Then the lines of right and left side must be slightly stretched, to check their length. It must be the same. After checking the risers the brakes must be hooked together, to be check them in the same way.

MEASURING OF SUSPENSION LINES LENGTH

Line length must be checked is the distances between upper edge of suspension point loops (seam at the wing surface) and lower part of the risers (position that the carabiners have in flight). If the design of the risers does not allow that, we measure the distance to their upper part the quick links position in flight). The results should be compared with expected values.

This test is considered positive when maximum variation from expected value does not exceed 30 mm, and the tolerance from nominal measurements do not exceed +/- 15 mm.

If the less-loaded suspension lines (most often of C and D rows) are shown to be considerably shortened, they can be stretched back to their original length with a 20 daN force. The stretching must be done symmetrically, and afterwards the lines must be measured again. The lines must be replaced when necessary.



SUSPENSION LINES BREAKING STRENGTH (DESTRUCTION TEST)

One of each bottom lines A1, B1, C1 and D1, as well as one or two lines from mid or upper floor should be dismantled and tested. If any of these lines have been replaced earlier, or show any damage, the next line of the same row and layer must be taken. Breaking strength is measured with a specialized device. Minimum values for specific lines must be calculated as instructed by the manual.

If any of the lines do not pass this test, then the other lines of the same row and layer to be checked. In case of doubts all lines of given group must be replaced. Lines broken on this check must be replaced.

FLYING TEST

If after the realization of all tests they appear no matter which doubts one ought to perform the flight checking.

After the complete check one ought to protocol containing all data concerning performed tests.

Safe flying



APCO wishes you many hours of enjoyable flying.

Take Air!