# LION - CALIBRATED DOWNHAUL

## I) Setting the Downhaul When You HAVE the Correct Ezzy Mast:

a) First, check that the length of your Ezzy mast falls within the recommended lengths (chart 1).

b) If your mast is **LONGER**, move the downhaul gauge **DOWN** by the difference.

c) If your mast is **SHORTER**, move the downhaul gauge **UP** by the difference.

**Note:** Use the factory drawn medium line on the sail as your reference.

d) Then, downhaul your sail until the calibration mark lines up with the bottom of the mast (Fig. 1).

e) Refer to Fig.2 for which line to use of the downhaul gauge.

**Additional Information:**

- We have set the adjustable head cap to its shortest setting. **Do not re-adjust the head webbing.**

- Do not over-downhaul. Too much downhaul will make the sail unstable.

- It's best to adjust the downhaul and outhaul together. For example, if you increase the downhaul for strong wind, you should also increase the outhaul. And, for light wind, to get maximum power, reduce the outhaul as well as the downhaul (see section VII on the last page).

- See Chart 2 for additional tuning tips.

| | Correct Ezzy Mast | Total Length (including tip plug) |
|---|---|---|
| **6.0** | 430 | 430.5 |
| **6.5** | 430 | 430.5 |
| **7.0** | 460 | 460.5 |
| **7.5** | 460 | 460.5 |
| **8.0** | 460 | 460.5 |
| **8.5** | 490 | 490.5 |
| **9.5** | 490 | 490.5 |

*Chart 1: correct mast combinations and lengths.*

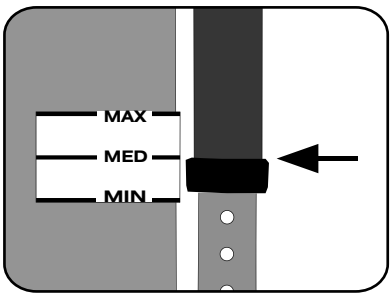



*Fig. 1: Downhaul until the calibration mark lines up with the bottom of the mast.*

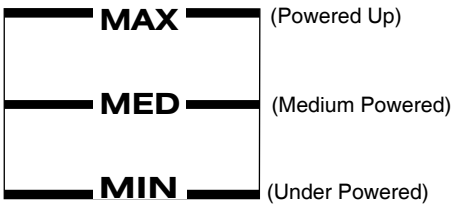



*Fig. 2: Downhaul Gauge with suggested settings.*

## II) Setting the Downhaul if You DO NOT Have the Correct Ezzy Mast:

This method involves measuring the length of your mast, then repositioning the downhaul gauge up or down depending on the length of your mast. After doing this, the downhaul gauge will be set and ready for rigging.

**Follow these steps:**

1) Measure your mast, including the tip plug.

2) Refer to chart 1 and note the required mast length for your sail.

3) If your mast is **LONGER**, move the downhaul gauge **DOWN** from the original position by the difference your mast is longer by in Chart 1.

4) If your mast is **SHORTER**, move the downhaul gauge **UP** by the difference.

5) Once repositioned, you are ready to use the downhaul gauge.

6) Depending on your mast, you may need to refine the gauge position based on how the sail feels. Refer to Chart 2 for fine tuning tips. Then, once you have found your medium wind sweet spot, move the gauge so the MED line is even with the bottom of your mast, Fig 1.

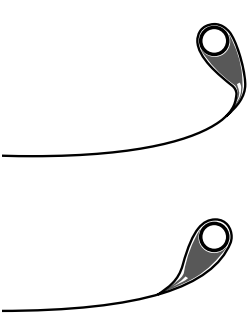



*Fig. 3: Increasing the downhaul reduces cam rotation*

| Problem | Adjust Downhaul | Adjust Outhaul |
|---|---|---|
| Unstable | +2 mm | +2 cm |
| Back Handy | 0 to -2 mm | +2 cm |
| Stiff, front handy | 0 to +2 mm | 0 to -2 cm |
| Lacks power | -2 mm | -2 cm |
| Too much power | +2 mm | +2 cm |
| Feels Heavy | +2 mm | 0 to +2 cm |
| Cams are over-rotated | +5 mm (or more) | 0 to +2 cm |

*Chart. 2: Tuning at the beach.*

## III) Tension the Tack Strap

a) The tack strap requires a lot of tension. Its purpose is to tension the foot and add shape to the bottom of the sail. It also lowers the sail's center of effort. When properly tensioned, the tack strap will improve your sail's performance and handling.

**You always want a lot of tension on the tack strap**.

b) Tension the strap until you see a wrinkle extending out from the tack, see Fig 4.

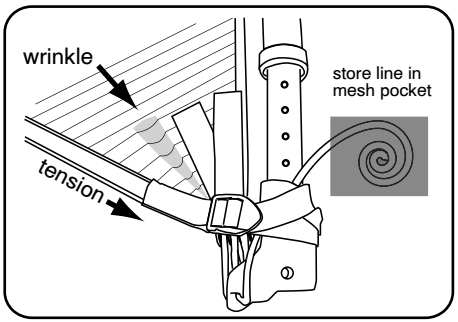



*Fig. 4: Tension tack strap and store downhaul line in mesh pocket.*

## IV) Setting the Outhaul:

The Lion requires positive outhaul when tuned for powered-up conditions (Fig. 5).

The three cords sewn at the clew indicate how much positive outhaul is needed for varying wind conditions. The longest cord shows the maximum outhaul for strong wind; the shortest cord indicates the minimum outhaul for light wind and the middle cord shows a medium outhaul setting.

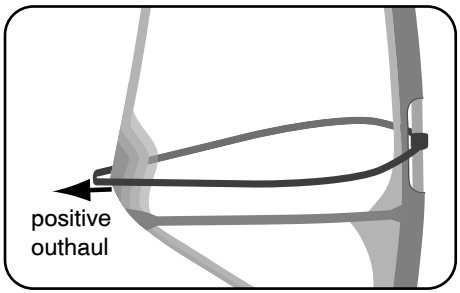



*Fig. 5: Positive outhaul*

**Follow these steps to set the outhaul:**

**a)** First, correctly set the downhaul.

**b)** Next, release all outhaul tension.

**c)** Then, gently pull on the outhaul cord and set your boom to the end of the cord (Fig. 6).

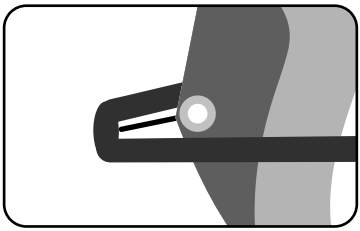


*Fig. 6: Set the boom length to the outhaul cord*

**d)** Finally, outhaul your sail to the end of the boom (Fig. 7).

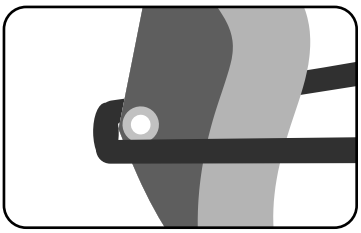


*Fig. 7: Outhaul sail to the end of the boom*

**Additional Information:**

- When setting your boom to the cord, don't pull the clew.

- We suggest starting with the medium length cord. If you feel over-powered (back-hand pressure), increase the outhaul about 1 to 2 cm. If you feel under-powered, reduce the outhaul by about 1 to 2 cm.

## V) Tensioning the battens:

Use the tensioner key that is stored in the pad of the sail and tension the battens until you eliminate any vertical wrinkles that extend out from either side of the batten pocket (Figure 8).

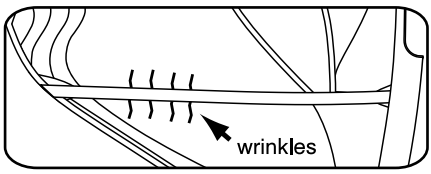



*Figure 8: Tension the battens until there are no vertical wrinkles on either side of the batten pocket.*

**Note:** Your battens have already been tuned by us in the factory and most likely will not need further tuning. Be careful not to over-tension your battens.

## VI) Sail Care:

- To avoid mold and mildew, dry your sail thoroughly before storing it.

- Creasing damages the sail cloth. Avoid creasing your sail when rigging and de-rigging.

- Sunlight kills all sail cloth. Keep your sail out of the sun when not sailing.

- Don't rig on sharp objects.

- After rolling the sail, tuck the pad so it rests along the sail, wrap the tack strap around the pad and the sail, then attach the velcro (Fig. 9).

- Insert your sail sleeve-end first into the sail bag (Fig. 10).

- Never store your sail upright resting on the clew.

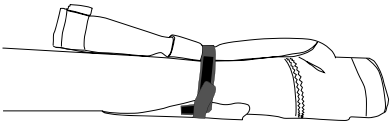


*Fig. 9: After rolling, tuck the pad, then wrap with the tack strap and secure the velcro.*



*Fig. 10: Insert with the sleeve-end first into the sail bag and store horizontal.*

## VII) Basic Theory Relating to Outhaul and Downhaul:

- Adding downhaul, in addition to loosening the leech, moves the **draft back** because it flattens the luff.

- Adding outhaul, in addition to flattening the sail, reduces tension along the luff and moves the **draft forward**.

**It is important to adjust the downhaul and outhaul together.**

1) If your sail feels unstable, give a few millimeters of downhaul and a few centimeters of outhaul.

2) If your sail feels stable, but has back-hand pressure, give a couple of centimeters of outhaul until the back hand pressure goes away.

3) If your sail feels "stiff" and wants to pull you forward, release some outhaul and possibly increase the downhaul.

4) If your sail lacks power, reduce downhaul and outhaul.

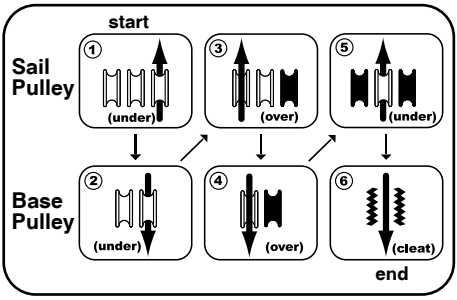



*Fig. 11: Threading the tack pulley for a Chinook-style extension.*