

Miniplane Harness Adjustment

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Proper adjustment is necessary for maximum thrust, flying comfort, and ease of launch. This adjustment must be done with the all-up weight of the pilot which means that all accessories, water, instruments, reserve, etc. must be included when this adjustment is done. However, do not have any fuel in the tank.

1. SUSPEND THE HARNESS The harness must be suspended from the hang points by some means, the fuel tank filled with fuel, the pilot in full gear including reserve, if used. The harness cannot be adjusted properly unless the weight of the pilot is "all up". Note: As fuel is used, the harness will tip slightly forward. This is not as important as having the harness/frame horizontal during takeoff when weight is the maximum and the most thrust is required. It is at this time that the maximum climb out rate is needed. Having an assistant is helpful when adjusting the harness.

2. ADJUST THE HANG POINTS While the pilot is sitting in the harness, use a level to adjust the hang points so that the propeller is plumb. If you do not have help, you can use masking or duct tape to hold to attach the level to the propeller and then use a mirror to view the level. This will ensure that the thrust from the propeller is perpendicular to the glider overhead. Loosen the socket head screws on the collets and then move them as needed. In order to ensure that both sides are equally spaced, measure from the center of the collet (the arrow in the photo) to the hole in the suspension arm where it attaches to the frame. Make sure both collets are the same distance. Now shorten the distance of the right hang point collet by 3/8". This last adjustment will help ensure that the horizontal thrust of the propeller will be the same as the forward direction of the glider. In any case, it is a minor adjustment but important enough that Miniplane website notes it.

In flight, there is significant drag created by the pilot's legs and feet which affects the thrust vector of the propeller, causing the paramotor to tip forward a significant amount. This tip forward causes a reduction in thrust in the direction we want. To account for this drag, move each collet forward 3/4" of an inch.

Take a test flight and have someone take a look at the angle of your paramotor to the vertical as you fly by. If you are flying straight and level,

the paramotor should be perpendicular to the ground or sloping slightly back.

Note that the suspension arms are shaped differently in order to minimize the torque effects of the paramotor – it is not the result of damage in transit or some other defect. This adjustment is important for getting maximum thrust at takeoff for your Miniplane.



3. **LEG STRAPS** Adjust the leg straps so that they are comfortable. The leg straps' primary function is for safety. However, they also hold the seat board up and away from your legs when running. If they are too loose, the pilot may have difficulty running and getting in the harness or sitting after launch (slipping forward). If they are too tight, the pilot may be uncomfortable. When the pilot stands up in the harness to launch or land, there are other straps that keep the harness from getting too low.

4. **SHOULDER STRAPS** Adjust the shoulder straps so that they are comfortable when the pilot is in the sitting position. If you shrug your shoulders and they bind, the straps are too tight.



5. **SEAT STRAPS** Adjust the seat straps so that your legs are at a comfortable angle when sitting in the harness. For long flights it is recommended that a footrest strap be installed. It will prevent the uncomfortable sensation of having your legs hanging from the edge of a chair for long periods. Free flight harnesses do not have this problem because the pilot sits so much further back in the harness. The short seat on the Miniplane is necessary for the launch run. If it were longer, the pilot's legs would be hindered while running.



6. SECONDARY SHOULDER STRAPS While standing up, tighten the secondary shoulder straps indicated in the photo below to make the harness/frame high enough so that the pilot can comfortably run while launching. The lower the frame is, the more likely the back of your legs will hit it. If the primary shoulder straps (step #4) are too loose, there will be problems getting this adjustment correct. The tighter they are, the higher the harness/frame is on the pilot's back while launching. If these straps are adjusted too loose, the lower part of the frame will tend to hit the back of the pilot's legs when launching.

Unfortunately, the tighter they are on some harness models, the greater the risk of breaking the buckles where it connects to the frame if you have a hard landing. Some newer models have a different connection to the frame which is not as prone to breakage. If you have an older model, go to [this page](#) to see different ways to get around and permanently fix this problem.



7. **CHEST STRAPS** There are two chest straps. The main chest strap (the lower of the two) must be tightened just enough to keep the suspension bars from separating around the circular contact point with the frame. In other words, there should be no space around the circular plastic disk indicated by the arrow in the photo below. This strap is primarily a safety strap.



If this strap is too tight or too loose, it will strain the contact point between the bar and the frame. While sitting in the suspended harness, loosen or tighten the main chest strap so that the circular contact points on the bars are flush with the circular contact points on the frame. This adjustment will also affect the spacing between the hang points which will, in turn, affect the safe handling of the glider.

the upper chest strap is used to help prevent the shoulder straps from slipping off the pilot.



FINAL CHECK Sit in the harness and check all adjustments. Some of these adjustments, such as the seat angle, can be made while flying when safely away from the ground. Comfort is the most important consideration when adjusting the harness. An uncomfortable harness is a distraction and is a safety issue as a result.