

2.6 Aircraft Operational and Maneuvering Limits

2.6.1 Center of Gravity Limits

Center of gravity limits in a flex wing, weight shift control aircraft are controlled by hang block position on the keel of the wing. The carriage attaches to the wing through this universal junction known as hang block. Variations in cockpit and fuel loading cannot affect aircraft's balance significantly for purposes of safety. The Revo is therefore not critical in terms of center of gravity. However, distribution of load in a trike carriage affects the attitude of the trike carriage in-flight in a minor way as long as prescribed weight limits per seat are followed which are 250 lb (113 kg) per seat max and 90 lb (41 kg) minimum pilot seat and 0 lb minimum passenger rear seat.

NOTE

The trike may optionally be equipped with an electric speed trim device that allows the pilot to change the trim position of the wing within limits to speed up or slow down the aircraft. In such a case it is advisable that pilots set their trim position in the center of the range for take-off and slow down the aircraft to proper approach speed using this trim during an approach to landing. If the electric speed trim is not set properly, it will require more pressure to slow the aircraft down when trimmed fast and more pressure to maintain higher air speed when trimmed slow which may be taxing to the body. Ultimately, the pilot controls the speed not the trim setting of the aircraft.

Base Suspension Range	Dimension (Metric -millimeters)	Dimension (Imperial/US -inches)
Competition (from front edge of nose keel tube of the wing to the center of the hangbolt)	1295 mm – 1397 mm	51” – 55”
Reflex Sport (from front edge of nose keel tube of the wing to the center of the hangbolt) (discontinued)	1346 mm – 1448 mm	53” - 57”
Discovery (from front edge of nose keel tube of the wing to the center of the hangbolt)	1397 mm – 1499 mm	55” – 59”
Rival (from front edge of nose keel tube of the wing to the center of the hangbolt (discontinued)	1270 mm- 1397 mm	50”-55”
Rival S (from front edge of nose keel tube of the wing to the center of the hangbolt)	1270 mm- 1397 mm	50”-55”

6 Weight and Loading

Center of gravity limits are not critical in a flex wing weight shift control aircraft. The carriage attaches to the wing through a universal junction known as hang block assembly. Variations in cockpit and fuel loading cannot affect aircraft's balance. The Revo is therefore not critical in terms of center of gravity. However, distribution of load in a trike carriage affects the attitude of the trike carriage in-flight in a minor way.

Please refer to weight and loading document for the particular aircraft as that document over-rides the generalized information here.

6.1 Center of Gravity Limits

Refer to the **weight and loading document** of the aircraft.

NOTE

If the wing is optionally equipped with electric in-flight trim, it is possible to change the CG in flight by using the electric trim. Do not exceed V_{NE} using electric trim in a dive attitude.

NOTE

There is a max 250 lbs (113 Kg) per seat max weight limit. Remain under gross weight of aircraft. Refer to each individual aircraft weight and loading document for more detail. Minimum weight in the front seat is 90 lbs (40 kg).

NOTE

The trike may optionally be equipped with an electric trim device that allows the pilot to change the trim position of the wing within limits to speed up or slow down the aircraft. In such a case, it is advisable that pilots set their trim position in the slow to center of the range for takeoff and slow down the aircraft to proper approach speed using this trim during an approach to landing (control bar approximately 10 in from compression strut). If the electric trim is not set properly, it may take longer to takeoff than normal and also the aircraft may have excess airspeed to bleed off before touchdown at the proper speed during landing. If the runway is long enough this is not a problem.

7.6 Electric In-Flight Trim Systems

7.6.1 Electric In-Flight Speed Trim

The electric in-flight speed trim is an option that allows the pilot to fly hands off by changing the speed of the wing with the push of a momentary switch. The electric in-flight speed trim shifts the entire hang block fore and aft on the keel. It is important to understand that this system only relieves the pilot's arms from holding the bar in a position that may be different than a fixed hang point trim speed. In **No Way** can it over-ride the pilot's input. To use the speed trim press and hold the momentary switch. Holding down the switch will pull the hang block forward and shift the CG of the wing forward causing it to trim faster. Holding up the switch will allow the hang block to slide back and shift the CG of the wing aft causing it to trim slower.

To set the trim for takeoff first hold the trim switch to full slow for 10 sec. This ensures the trim is at its slowest position and has stopped. Release the slow (up) switch and press down for approximately 3 seconds. This is the ideal start point prior to takeoff. The slowest trim speed setting will not give you the shortest takeoff roll. This is due to the AOI/AOA of the wing being limited by the compression strut a few degrees less than when trimmed in the preferable takeoff trim position. Takeoff in a full fast trim setting will require much more pressure to push the control bar forward. The control bar is the best indicator of where the trim is set when in flight. It is also possible to simply look up and note the position of the hang block between the stops for trim setting.

Setting the trim for landing position is similar to the takeoff position. The preferable trim range for landing is to adjust the control bar until it is approximately 12-14in (.30-.36m) from the compression strut, although any trim position may be used. Landing in full slow trim however, will require more pressure to pull the control bar in. Some back pressure on the control bar may be needed to achieve the approach speed designated in the AOI.

NOTE

The trim position is impossible to detect while on the ground due to the hang block being allowed to float freely back and forth by design. Any trim position is safe for both takeoff and landing. However, there will be additional bar pressure for both takeoff and landing when not set at the ideal position for each.

7.6.2 Electric In-Flight Roll Trim

The design of the electric in-flight roll trim is to eliminate mild turns that show up in flex-wings at different speeds, different loads and different atmospheric conditions. The purpose of this trim system is **NOT** to eliminate standard wing tuning for removing an unwanted moderate turn in the wing or to control the trike in bank. If the wing has a moderate turn, set the trim tabs to center or equal deflection on both sides of the Revo and then tune the wing until there is little to no turn remaining (see Wing Manual). If the wing has a mild turn then using the trim switch will eliminate the turn. Setting the trim tabs is with a flip of a switch. This switch activates a servo driven trim tabs on the wheel spats. This may appear to look like a rudder trim, however due to the floating keel design of a trike, this pressure shifts the keel during flight slightly either left or right.

4.8.7 Cruise

Cruise	
1) Cruise Throttle – adjust foot throttle for level flight at desired speed and then adjust cruise hand throttle on right hand side of the trike to release pressure.	√
2) Airspeed – Establish cruise speed (V _C) Set electric trim to maintain airspeed (if available)	√

NOTE

When the hand throttle is actuated, a higher power setting can still be achieved with the use of the foot throttle. The rpm will always return to the set cruise RPM when foot throttle is disengaged. Please not to turn off the hand throttle to reduce power.

4.8.8 Descent

NOTE

You can increase these speeds for gusty conditions.

NOTE

All airspeeds are Indicated Airspeed (IAS) unless otherwise noted.

Descent	
1) Foot Throttle - reduce	√
2) Hand Throttle - OFF	√
3) Airspeed – all airspeeds are IAS • Competition = 75 MPH (65 Kts) (120 Km/hr) • Reflex Sport (discontinued) = 72 MPH (62.6 Kts) (115 Km/hr) • Discovery = 68 MPH (59 Kts) (109 Km/hr) • Rival (discontinued) = 72 MPH (62.6 Kts) (115 Km/hr) • Rival S = 72 MPH (62.6 Kts) (115 Km/hr)	√
4) Set electric trim to maintain airspeed (if available)	

4.8.9 Landing

Landing	
1) Hand Throttle - OFF	√
2) Airspeed – Best Glide Speed (consult section 5.5 under your wing model name) + 0.5 Max wind gust + 3 MPH NOTE Additional speed is recommended and can be bled off in ground effect float.	√
3) Set electric trim for landing (if available)	√
4) Nose Wheel – Straight	
5) Brake Pedal - Disengage	√
6) Final - Clear	√
7) Landing – Execute properly per training	√
8) Braking – Brake OFF and then as required. Only use brake when bar has been pulled back at least mid-way.	√

Landing should always be into the wind if possible with a long straight approach in normal operations.

The landing distance specified in performance section is the measured ground distance covered from an approach at 50 ft (15 m) above the average elevation of the runway used until the aircraft makes a complete stop.

An approach to the runway can be with or without power. However, the airspeed should be maintained above the nominated approach speed in either case.

The aircraft should be flown on final approach at or above the nominated safety speed. The additional airspeed allows for wind gradient, and to provide greater controllability in the rough air that may be encountered close to the ground. Maintaining airspeed on final is very important for engine-off landings, allowing a margin for round out before touchdown. The trike is designed to land with the rear wheels touching down slightly before the nose wheel. Once all three wheels are solidly on the ground, aerodynamic braking may be achieved by pulling in the control bar, then applying the front nose wheel brake.

NOTE

In the case of a hard landing the maintenance manuals for both the wing and the carriage should be referenced. It must be noted that after a hard landing, your aircraft must be completely checked and an entry to this effect logged in the aircraft logbook.