

# SunArx tech note: Actuator limit switch adjustment.

Rev. 3/29/2010

This tech note provides information on adjustment of actuator limit switches for the SunArx T-21 Tracker. Correct adjustment of the limit switches is necessary for correct operation. User adjustment of limit switches should only be necessary if for some reason the adjustment was changed or if the actuator was shipped with incorrect adjustment. The adjustments can be checked on an installed actuator, or on a bench, using any DC power supply 12-36V applied to the terminals holding the white and red wires to move the motor. Be careful not to apply voltage to the black and purple sensor wires. "Correct" polarity, that is positive to red, negative to white, will retract the actuator, reversed polarity will extend it.

## How the Limit Switches affect Tracker operation:

There are 2 microswitches in the actuator gearbox, the Retracted Limit and the Extended Limit. The limit switches are a feature which stops the actuator the ends of its range of motion. When a limit switch is activated, power is disconnected to the motor, and diodes attached to the limit switches only allow movement again if in the opposite direction.

The daily movements of the actuator are all based on counting signals from a reed sensor, also in the gear box. All counting is based from the Retracted Limit position. So when the actuator is initialized, and every day at the end of the day, the actuator reaches the Retracted Limit position, and the control system is essentially recalibrated at this time. So the length of the actuator in the Retracted Limit position is important, and is adjusted before shipping to be 10-1/2".

## Things that can go wrong:

If for some reason the limit switches are adjusted incorrectly at either end and the motor continues to run after the end of the main screw drive is reached, it is possible the main drive screw will become jammed against the main nut inside the actuator tube.

If for some reason the limit switches are adjusted incorrectly, or are jammed by a stray wire in the gearbox for example, the red plastic traveler can jam at the end of its travel and the black plastic worm gear which moves the red plastic traveler can become stripped.

In the event of a jammed or damaged actuator please contact SunArx for assistance.

## Adjusting the Retracted Limit:

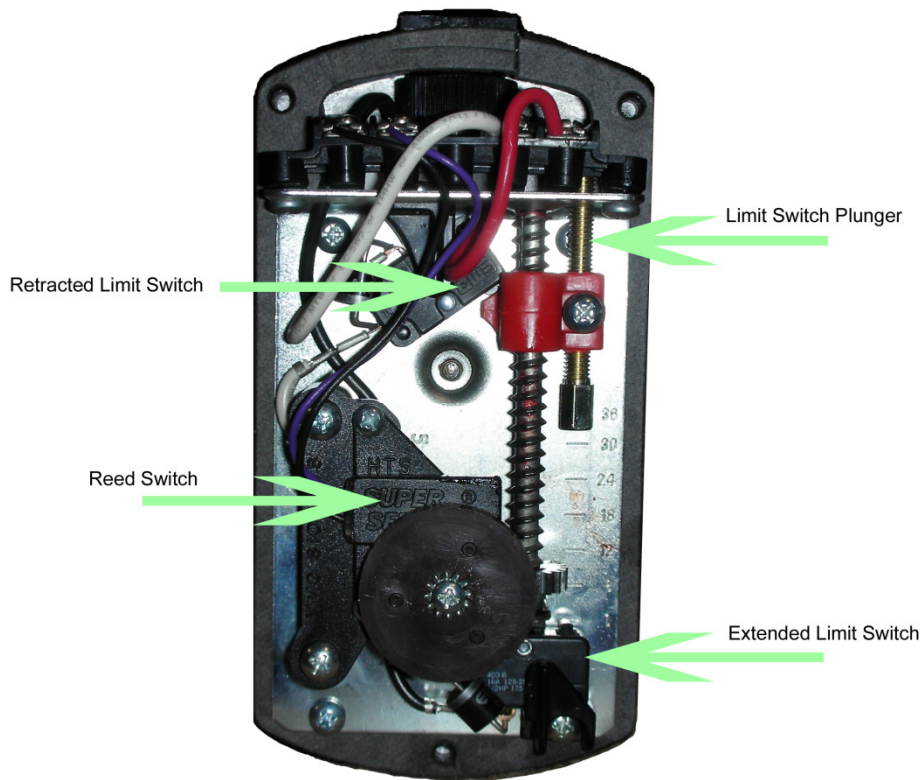


Fig. 1 Actuator gearbox in retracted position with Retracted Limit activated.

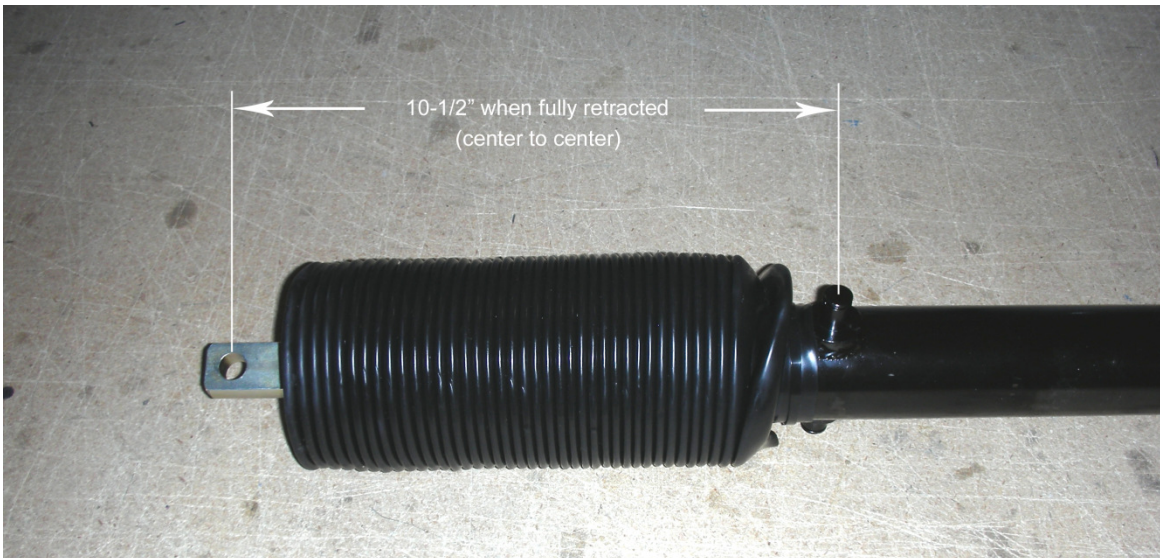


Fig. 2 When fully retracted the actuator should measure as shown – 10-1/2" from center of studs to center of hole.

If this dimension is not correct, it can be adjusted by running the actuator all the way to the retracted position, and then screwing the eye end in or out to obtain the 10-1/2" dimension. Note that this adjustment can be

lost if the eye end is ever allowed to spin. When handling the actuator or running it on the bench be careful not to allow the eye end to spin or limit switch adjustments will be lost. The 10-1/2" setting can also be checked on an installed actuator while mounted to the tracker, and if necessary adjusted without completely removing the actuator. The eye end can be detached and spun if necessary with the actuator still attached by the trunnions (studs).

### Adjusting the Extended Limit:

At the other end of the range of motion, the Extended Limit, the limit switch is not used at all by the controller and the actuator should never reach the Extended Limit switch in normal operation. The Extended Limit switch is still adjusted to act as a safety stop in case the control board malfunctions, so the actuator will stop before damaging the tracker or itself. The expected maximum length from center of studs to center of eye in normal operation is 43-1/2", for a total of 33" range of motion in normal operation. See Fig. 3. The set screw on the red plastic block should be snug and the gearbox should look like Fig. 3 when the actuator is fully extended by the control board, in Easterly morning position.

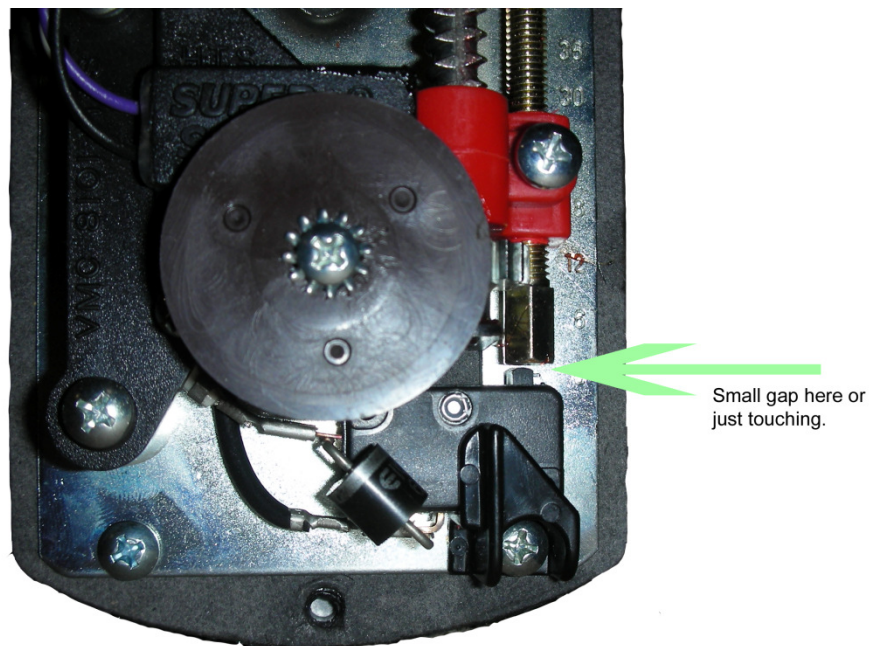


Fig. 3 The Extended Limit Switch should look like this when the actuator is extended in normal operation, when the tracker is in the East position, and the trunnion center to hole center should measure 43-1/2".

The Extended Limit can also be adjusted on the bench.

The actuator can be extended to 43-1/2" using a DC power supply from 12-36V, and the gearbox should look like Fig 3.

Alternatively, the Extended Limit switch can be adjusted such that if the actuator is extended until stopped by the limit, it measures approximately 44-1/2". The adjustment is made by screwing the brass limit switch plunger to move it and then verifying the dimension by running the actuator to maximum extension. See Figs 4 and 5. Again be careful not to let the eye spin when running the actuator. To lock in the adjustment gently tighten the set screw holding the plunger, being careful not to strip threads in the plastic.

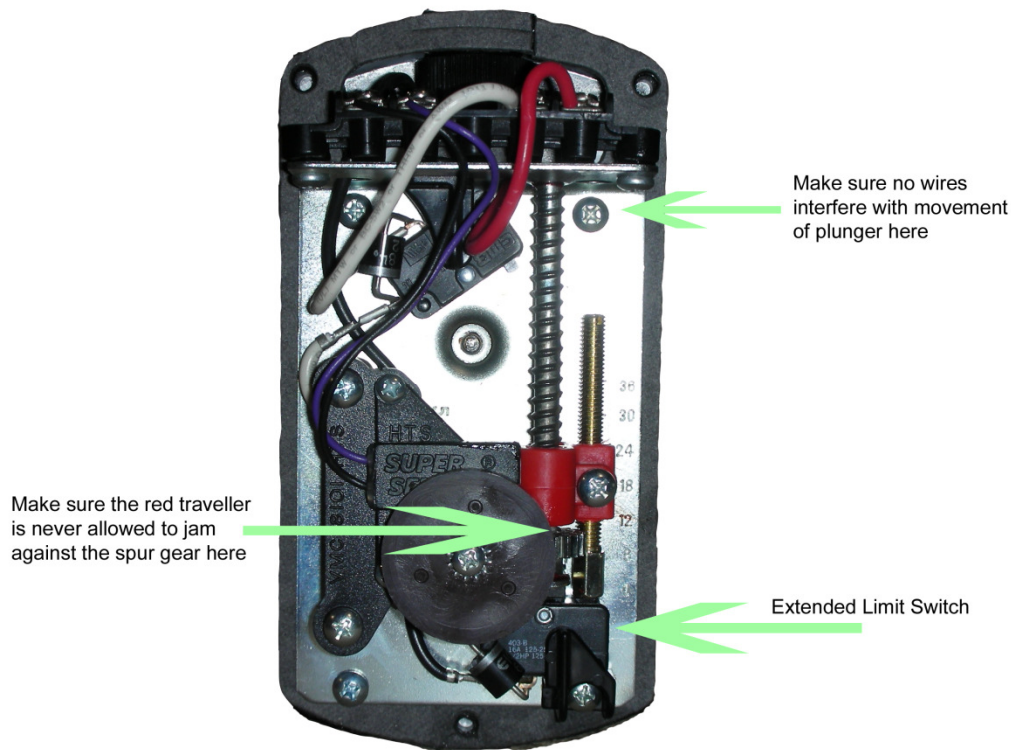


Fig. 4 Gearbox shown with actuator fully extended to 44-1/2", Extended Limit switch activated. This is done for a safety stop only and the controller will not extend the actuator this far in normal operation.



Fig. 5 Extended Limit should be adjusted so a completely extended actuator measures approx. 44-1/2" center to center. This dimension does not need to be especially precise.