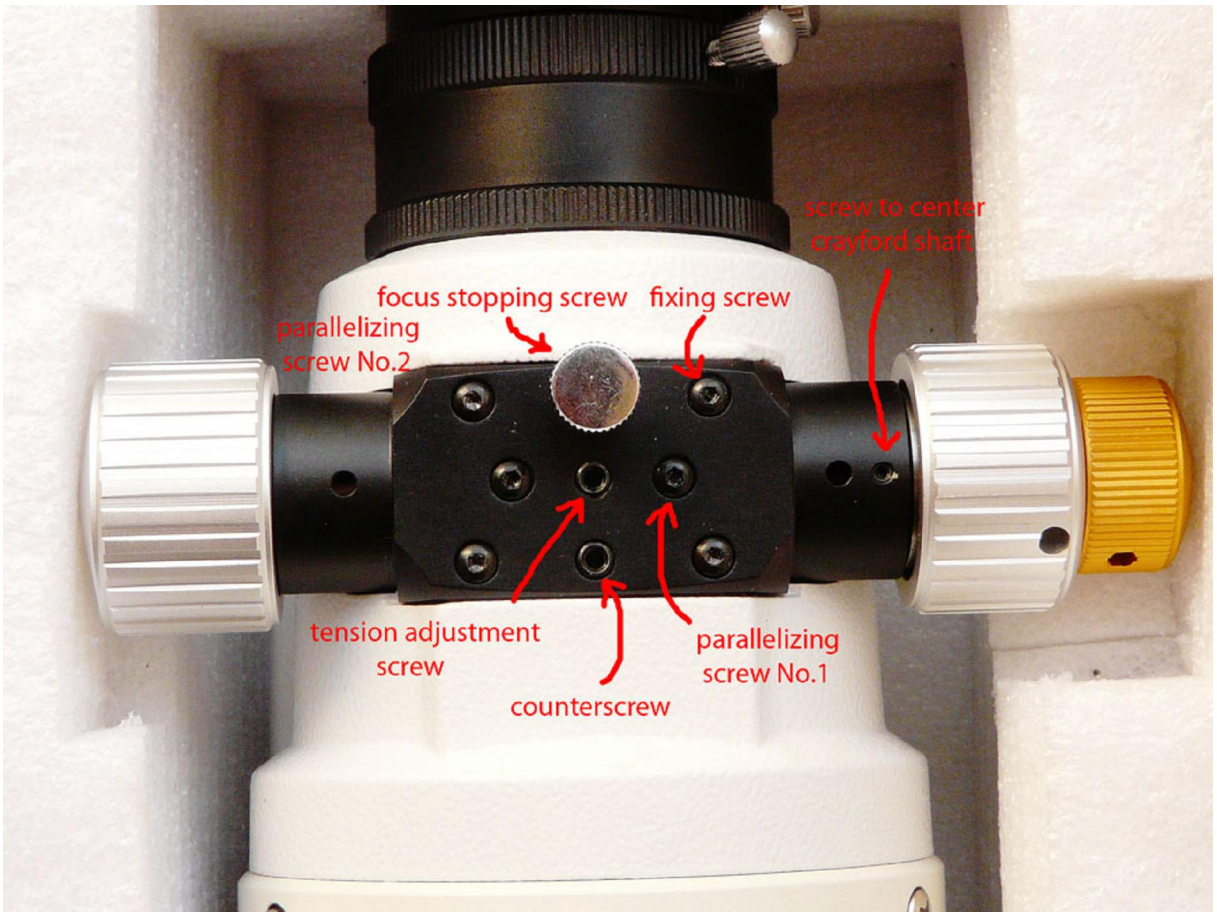
adjusting the Skywatcher 1:10 refractor crayford focuser (120/900ED etc)

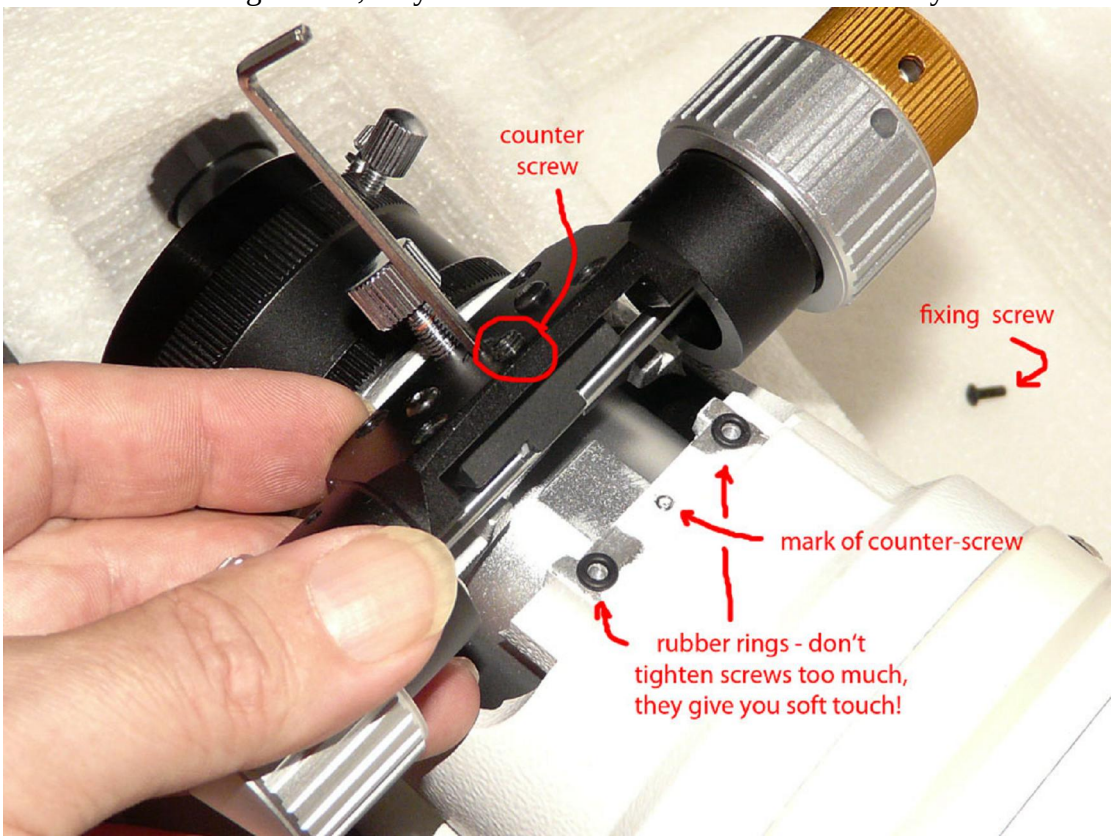
here is how to fine-tune the strength of a Skywatcher crayford focuser with 1:10 microfocus. This type of crayford allows for a smooth but total control of the strength, but at the first glance it may look a little complicated.

Quick summary:
First, loosen the counterscrew, focus stopping screw and the two screws to the left and right of the tension adjustment screw in the middle of the crayford focuser bearing plate. Then tighten (or loosen) the tension adjustment screw, so that the focuser tube does have a good grip and does not slide by itself. Now, carefully tighten the the two screws left and right of the tension screw, they are here to exactly parallelize the teflon bearing to the crayford shaft and to limit the pressure of the tension screw.. Do not really tighten them, they should just touch! Now you may tighten the tension screw a little more and counterbalance it with the two screws left and right. You can put a tiny amount more pressure, because in the final part you may regulate that with the counter screw, placed in the middle and near to the telescope tube.

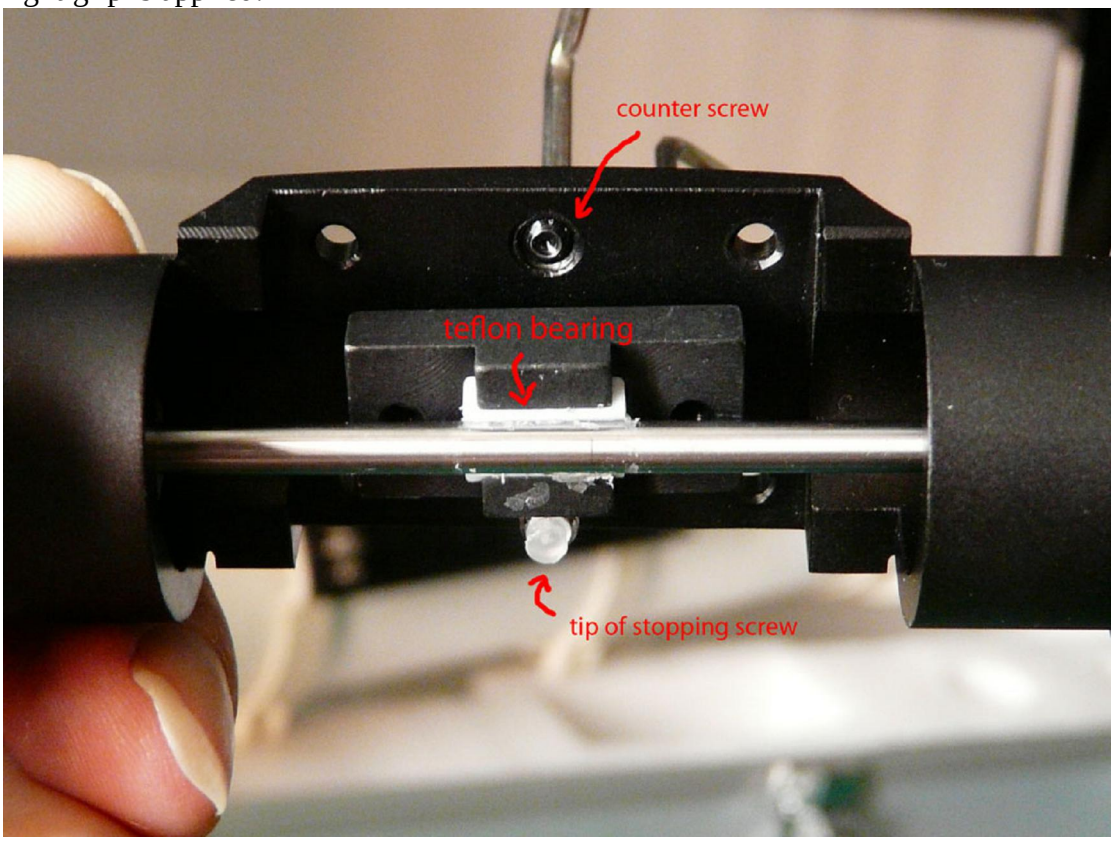
As this may sound confusing, here are some pictures of the disassembled crayford to make clear how things work. Here the parts of the assembled crayford: focuser:



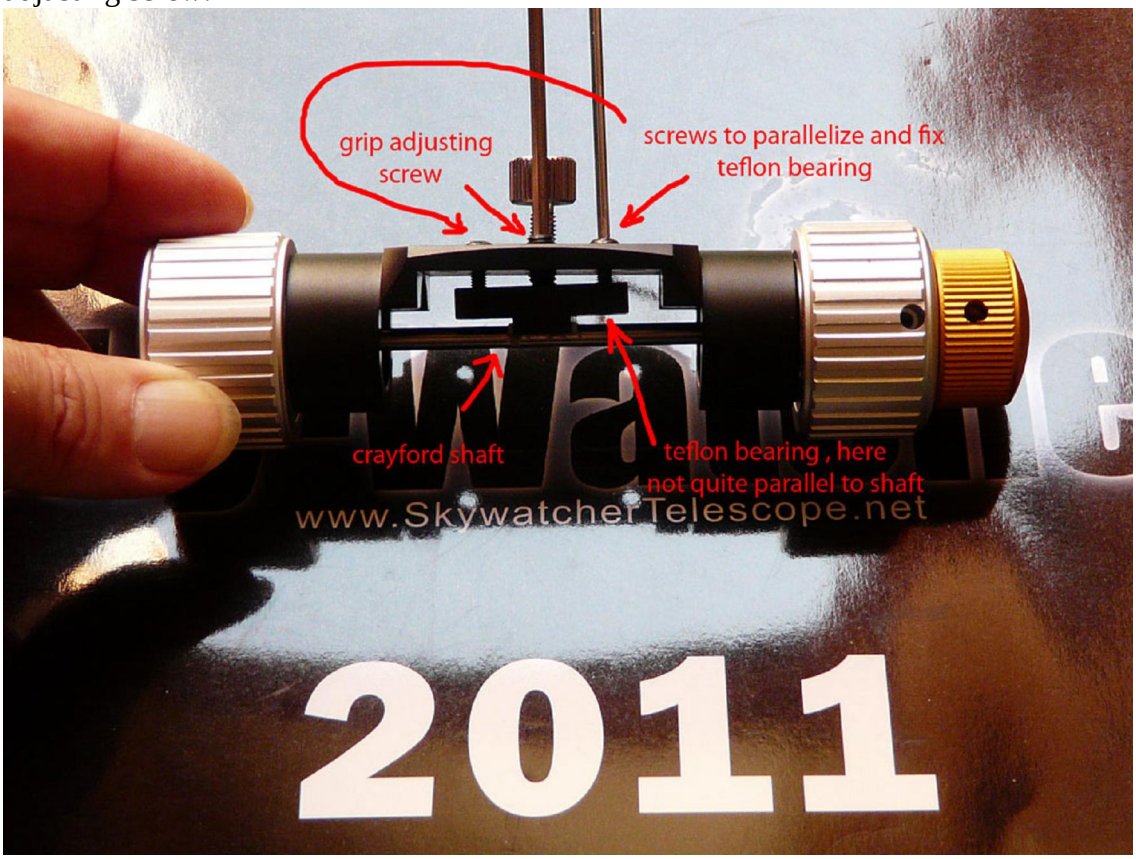
Here the 4 fixing screws have been removed – take care to keep that rubber rings at the threads of the fixing screws, they make for the final soft touch of the crayford:



Here you see the teflon bearing where the crayford shaft is moving and the pressure for the right grip is applied:



The holder of the teflon bearing can be tilted or parallelized to the shaft by the 2 screws left and right of the grip adjusting screw. At the same time they act as limiter for the pressure. If they are too tight, the focuser tube may slip, no matter how much you tighten the grip adjusting screw:



As you see, there are 2 systems counteracting – first the tension adjustment screw and the 2 screws nearby, second the countersrew and the 4 fixing screws buffered by the rubber rings. It is a good idea to use the first system to make the course adjustment, and a little extra strength, and the second system to fine-tune that.

If the crayford shaft is not centered, it may scratch on the focuser tube – adjust that by using the centering screw (see first picture)