Procedure

Lotem 800/400 – *Focus Pre-Load*

Prepared By: Dennis Kaliser	**Date: February 2002**

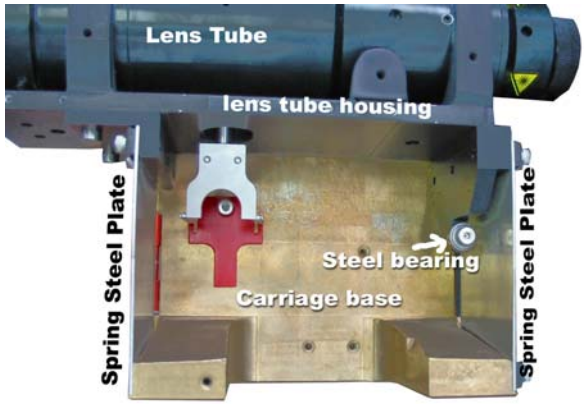
Description

Precise control of optical focus requires a preset tension between the focus arm and the spring steel mounting plates. This procedure describes how to set the correct tension.

Once set, the correct tension is normally maintained regardless of the focus calibration. The procedure is only required when replacing the focus motor or when the focus calibration procedure fails to establish a focus value within the recommended range of 300 to 400 focus motor steps.
Note: This factory pre-set range is new as of February 2002. The recommended range for older machines was 200 to 300 focus motor steps.

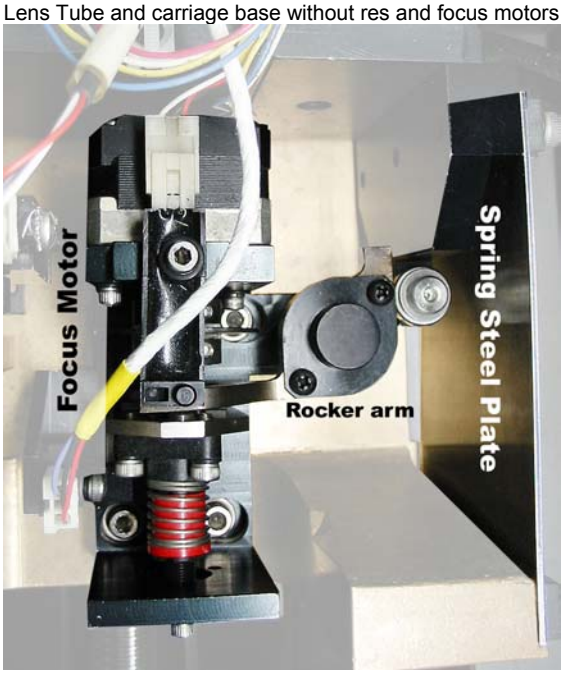
Background

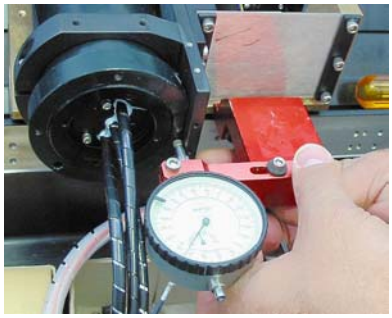
To follow the procedure, it is helpful to first understand the mechanical design of focus control.
The lens tube housing is mounted on two brackets, which in turn, are mounted on the ends of two spring steel plates. The other ends of the plates are secured to the carriage base. A rocker arm turns against a steel bearing that presses against the forward spring steel plate, deforming it slightly. Since the optic tube is mounted on the plates, the tube moves back and forth proportionately to the rocker arm rotation.



Lens Tube and carriage base without res and focus motors

Movement of the rocker arm is controlled by the focus stepper motor. The range of lens to drum focus adjustment for different plate thicknesses is very small, about 200 microns. To control such small movement, maintain a consistent setting, and assure correlation of motor steps to lens movement, the focus motor must begin turning (HP) when the spring plate is under tension. Tension is measured by measuring the movement of the optic tube as the focus motor begins to activate the rocker arm.

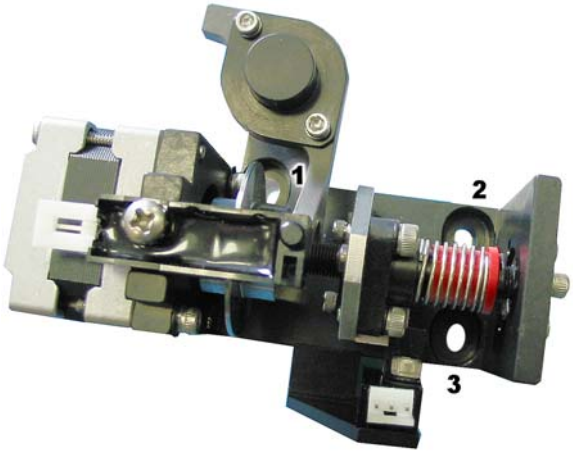




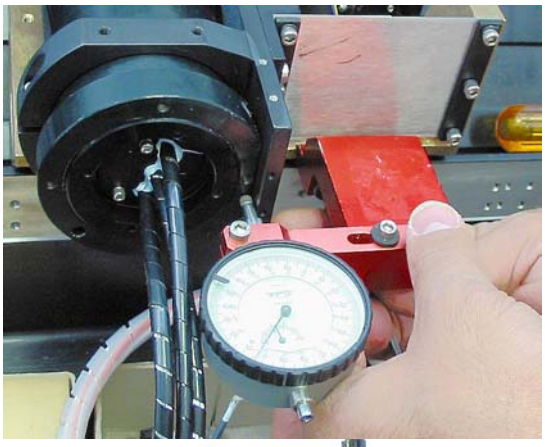
1. Step 1 Install the focus motor and coupling

If the focus motor is already installed, proceed to step 2.

Mount the focus motor on the carriage base using three 8-32 x 5/8” screws. Use a flat washer and a lock washer with each screw. Before tightening the screws, push the motor towards the drum so that the rocker arm rests securely against the steel bearing. Then tighten the screws.



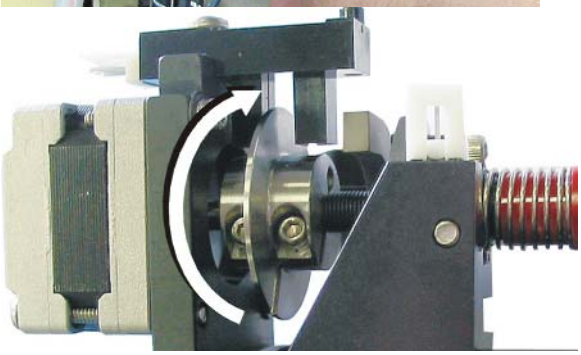
Mount the jig with dial indicator. Position the dial indicator so that it is touching the optic tube.



Manually rotate the fine detector wheel clockwise while keeping an eye on the dial indicator. The indicator should move. Continue to rotate the wheel slowly until the indicator stops moving. At that point, there is no tension on the spring steel plate.

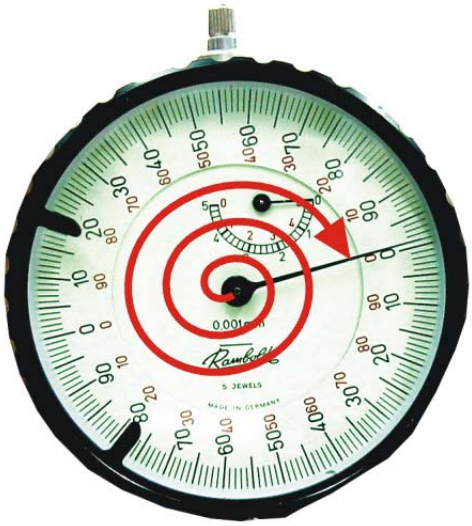
Set the dial indicator to 0.

Note: Be sure to keep your hand off of the spring when rotating the fine detector wheel.



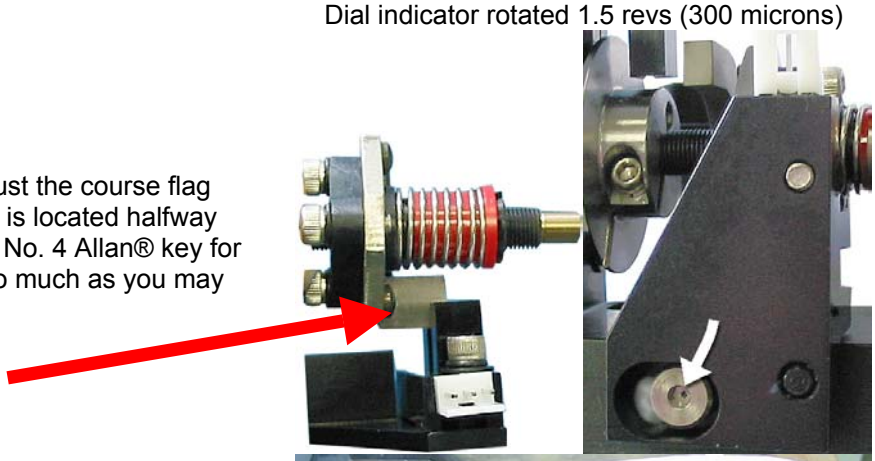
Rotate the fine detector wheel counter clockwise so that the dial indicator moves exactly 300 microns.

If the indicator reads 100 microns after turning 180 degrees, 300 microns = 1.5 revolutions.

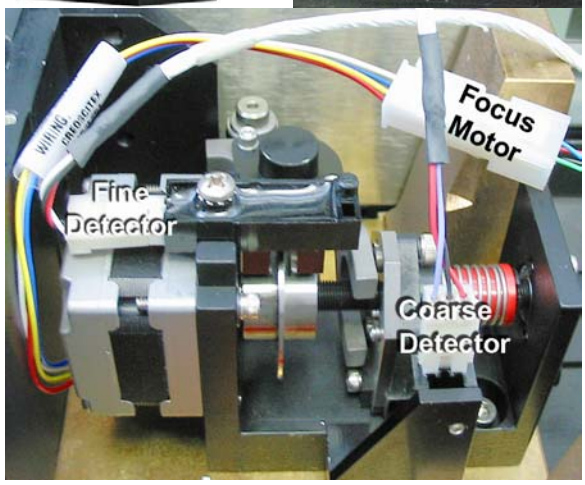


Dial indicator rotated 1.5 revs (300 microns)

If not already there, adjust the course flag detector so that the flag is located halfway into the detector. Use a No. 4 Allan® key for this. Do not tighten it too much as you may have to move it later.

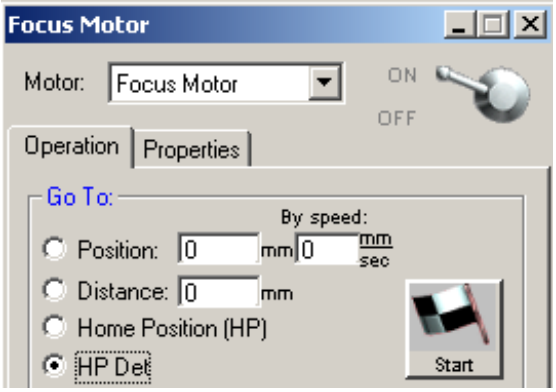


Attach the motor cable and the two focus detector cables (fine and course).



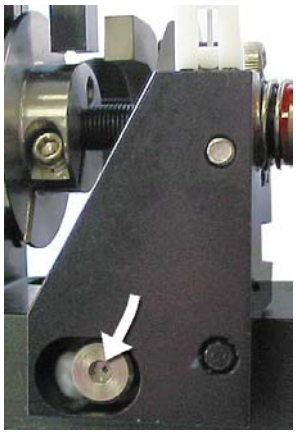
Open the Focus motor in the GUI and send it to the HP. Observe the indicator dial movement as the focus motor moves. It should move anywhere between 200 and 400 microns immediately followed by a backward movement of 130 microns.

If this is the case, the preload is correct and you can tighten the coarse HP detector.



If the indicator moves a distance greater than 400 microns, there isn't enough pressure on the spring steel plate. You need to move the coarse detector towards the optic tube.

If the indicator moves a distance less than 200 microns, there is too much pressure on the spring steel plate. You need to move the coarse detector away from the optic tube.



Note the limited distance you can move the coarse detector within the oval hole in the detector housing.

Last Update 11.04.2002