

Mirror cell movement in a 10 inch LXD telescopes.

Confirmation of the problem and the cure.

PETER BRUCE. CROYDON.UK. MAY 2007.

Detecting the problem.

I recently found my scopes collimation seemed to be altering when I used the scope in different elevations and I went looking for the cause and the cure to help others using the Meade LXD scopes.

This simple test will confirm if your scope has the same problem of mirror flop...

Set up a Laser collimator securely in your eyepiece holder - ensure it will not move – the red dot should hit the centre of your mirror. You are only checking the red dots position on the main mirror NOT the lasers return path.

Turn the scope to face east and horizontal look at the red dot again – has it moved!

Now turn the scope to face horizontally west and check the red dots position on the main mirror again... Has it moved in the other direction!

If the red laser dot has moved first re-check the lasers security in the eyepiece holder to convince yourself its not moved and then re-check the results again to fully confirm it's the mirror cell which has moved.

The problem(s).

It was found on my unit that the springs had become weaker over the years and they were not loading the cell with enough force to counteract the weight of the mirror cell so it was indeed “floating” in the true sense of the word. I also noticed that the larger mirror adjustment knobs are such a loose fit into the lower mirror cell casting support that a problem also exists there – more on this later on as I will deal with the simple cure first.

The simple cure.

First undo the three smaller knurled holding knobs next to the larger collimation knobs at the base of the mirror cell but don't remove them.

Next tighten up each of the main adjustment knobs fully so each spring is fully under compression.

Now slacken off each of the three main adjustment screws two turns – this allows for your adjustment.

With your laser still installed re-position the red dot in the centre of the main mirror by trying to **tighten** each mirror adjuster knob to get the red dot centred rather than loosening any adjustment knob because we need to keep the tension in the springs, which will then prevent the mirror from moving.

Check the laser dot position again on the main mirror using the same test described above and you should find the laser red dot has not moved on the main mirror.

The final cure.

If you are unlucky (like me) and find the laser dot still moves when you do the red dot test the key problem factor will now be due to the large mirror adjusting knobs flopping around within the rear of the adjustment cell casting – the adjustment knobs are too small in the cast aluminium hole. The cure is less simple and a bit more drastic but don't be put off as it's easy to accomplish.

Remove and fully disassemble the whole mirror cell - remembering to put the mirror in a safe place.

Look at the way the large adjustment knobs flop around within the rear holding cell – the holes in the rear cell are far too large by about 3mm (thanks Meade) so the adjustment knobs flop around in the holding retainer hole which does little to help in the mirrors security of position one bit.

To cure this use clear PVC tubing and sleeve it over the shoulder of the three large mirror adjustment knobs - cut to a length which is the thickness of the aluminium casting. I had to ream out the casing holes to make them larger to obtain a tight sliding fit. The PVC tube must sit in snugly and still allow the large adjustment knob to turn freely.

Once this is done you will see that even without any springs there is no sideways movement of the mirror cell at all within the rear holding / adjustment section casting and movement can only take place along the adjustment screw axis with slight angular differences being allowed for with the flexibility of the installed clear PVC bushes you just installed...

Check the lengths of the springs before re-installing (I had one slightly shorter but opened it out to the same length as the others as a cure).

Re assemble the mirror cell with the PVC bushed in place.

Remember to do up fully the large adjustment knobs and back off the two turns to keep the springs loaded

This will cure all your problem's, as the red dot test will now stay spot on.

Unless...

Meade uses a very poor way to secure the OTA tube to the mirror cell. Although the 4 fixing screws used are fine initially you could find that you have movement occurring here after a few years.

My scope is now a bit old in the tooth and I found dew on the OTA runs down into the recess on the mirror cell and corrosion started around the holes where the OTA is secured to the mirror cell.

The corrosion has made the holes within the OTA become larger and oval.

It does not matter how hard you tighten up the four screws the OTA to mirror cell configuration will always move slightly due to you placing the OTA on the floor each time you put it away.

The only cure here is to carefully re-drill 4 new holes (the right size) in the OTA to give a tight fit which also means if you have this problem you may as well do all the upgrades listed in this article.

I hope this will help others but please remember that if you are unsure about doing this then Don't unless you can get the assistance of a friend who will help you.

Best regards to all.

PETER BRUCE.

Croydon. Surrey. UK

Email me if you need help - peterbruce@blueyonder.co.uk