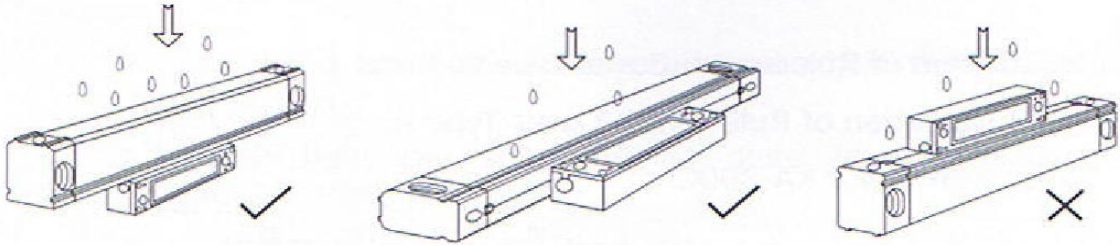


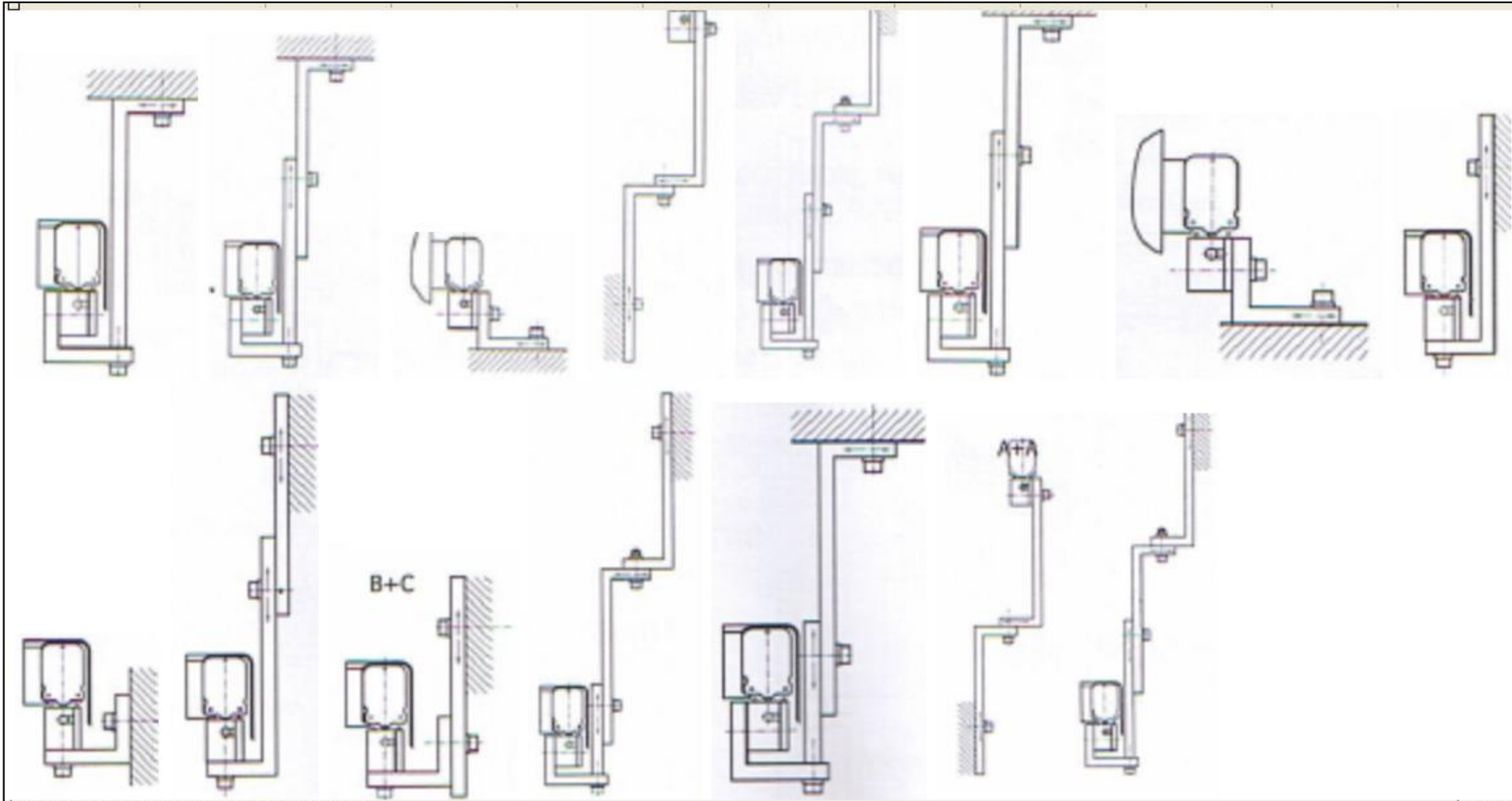
VISUAL GUIDE MANUAL

DRO INSTALLATION ON LATHE / TURNING MACHINE

By
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	Basic Installation Principles
1	<p>scale should be centered and be aligned such that it could cover the whole travel length of the machine. If in any case it does not cover the whole travel length, it is advisable to install a screw to limit the travel so that the scale will not be accidentally damaged by over-traveling.</p>
2	<p>The preferred method is to mount the scale to the moving axis and the reader head to stationary axis, this is to prevent cable from wear and tear during operation. Normally it can be done for X axis, but Y axis, most of the time the reader head will be on the moving axis.</p>
3	<p>You can install the scale facing downwards /outwards, but it should not be install upside down, as it will expose the scale to coolant or metal chips</p> 

You can mount the Z axis in various configuration as shown in the following pictures.



Z axis installation



Z1. Dismantle the 8 screws from the Red plastic securing the reader head.

Remove screws from
the Red Plastic



Z2. Dismantle the Rear Cover (if your lathe has it)



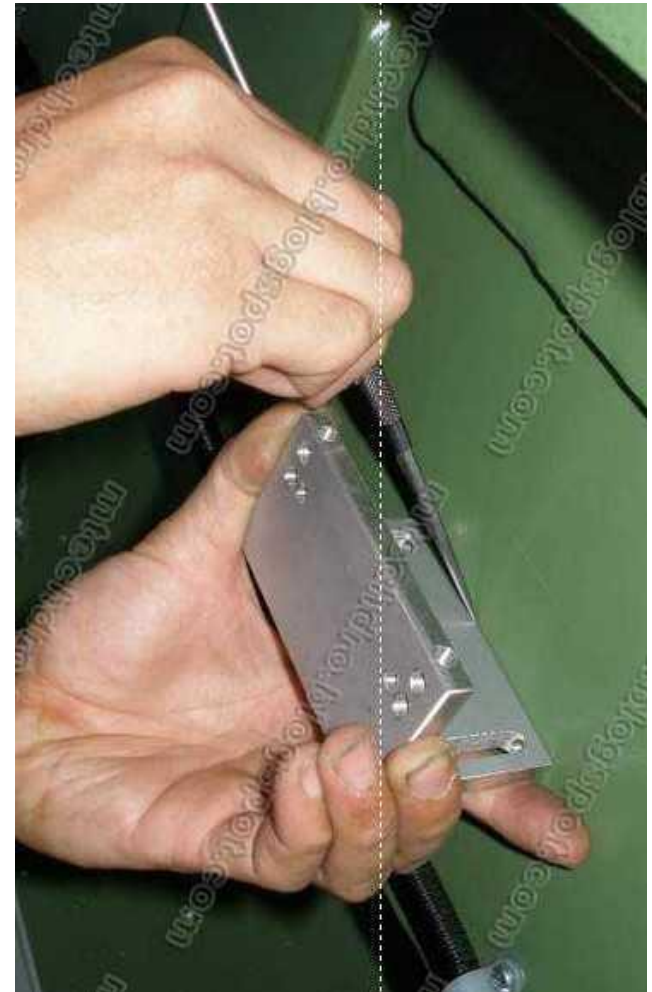
Z3. Move the saddle to the extreme left (close to the spindle)



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Z4. Plan the mounting of the Reader Head, this also determine where you mount the scale. Use a scribe to mark the bottom bracket. This is where the Reader head is resting.



Z5. Placed the Scale with the reader head above the marked line.



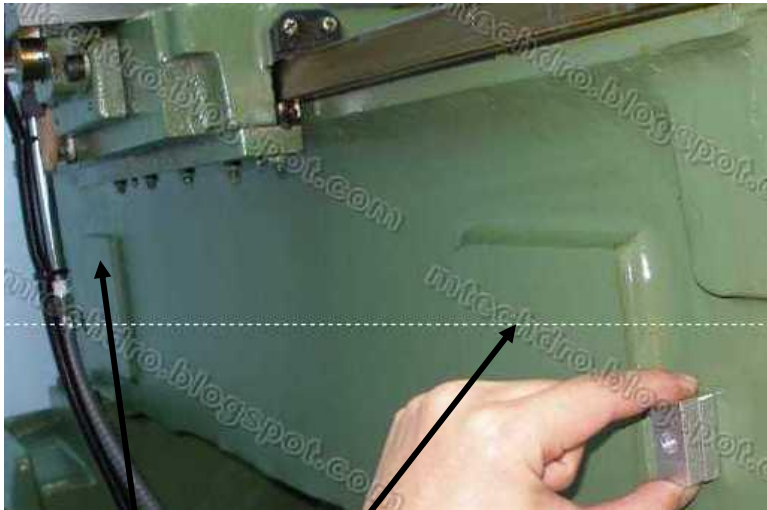
Z6. Use the bracket as a guide, adjust the scale left and right to make sure that there is enough space for it to move to the extreme. Once satisfied, use the scriber to make a marking.



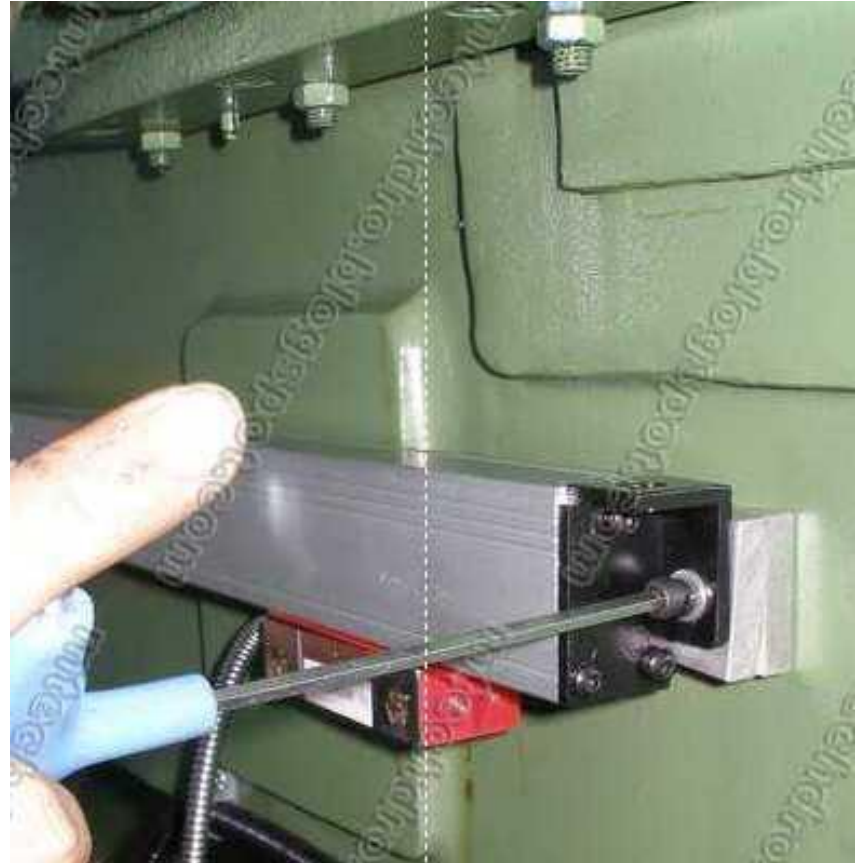
Z7. Drill and Tap holes for the scale mounting



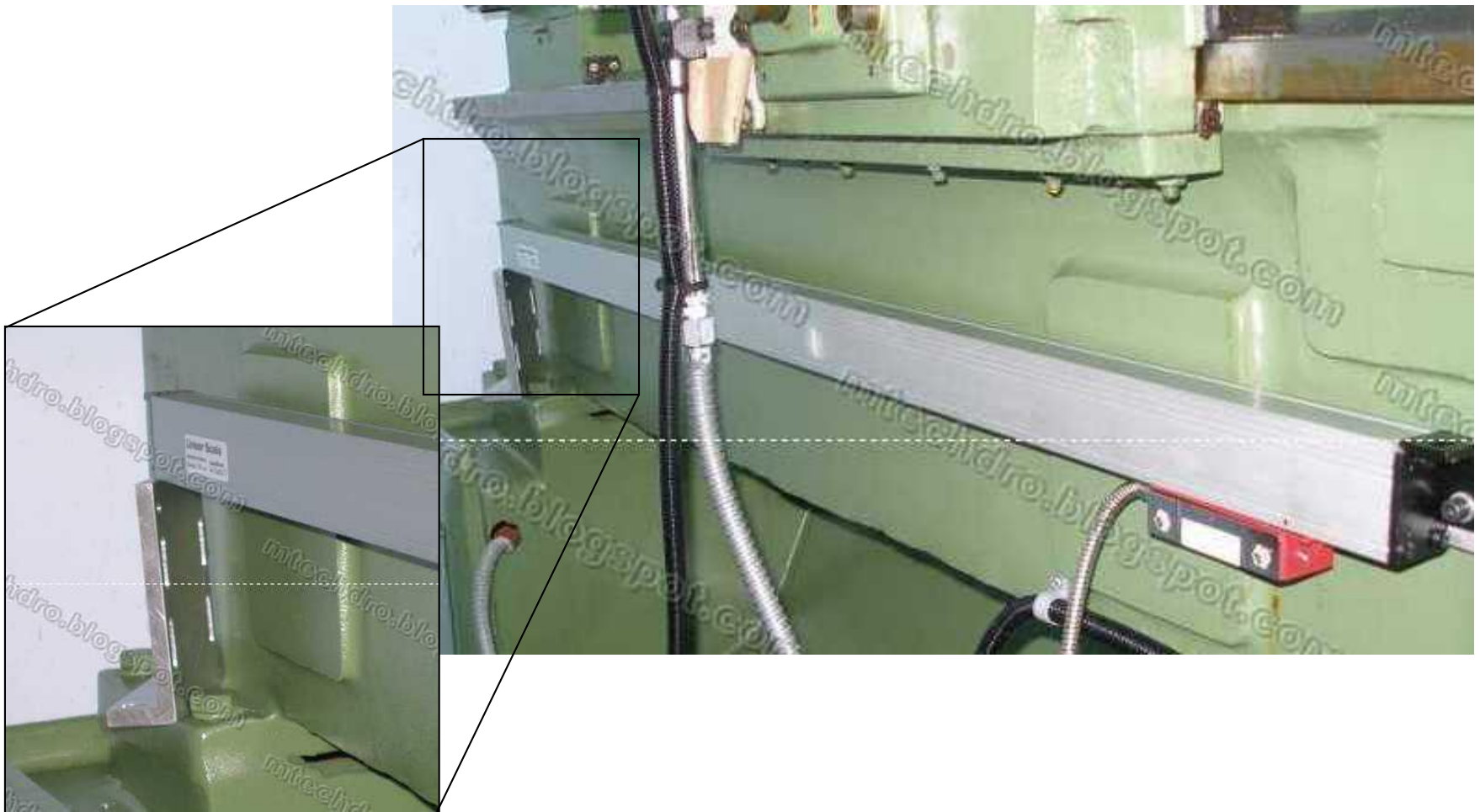
Z8. Use the mounting Blocks if there are uneven surface or obstruction.
Tighten the scale with the screw.



Surface protruding, so we need to use blocks to elevate the scale



Z9. Keep the scale horizontal, if you are alone, use something to support the other end.



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Z10. We are going to make the scale roughly aligned. Use a Vernier to measure from a reference point (e.g. the rail) to the scale.



Z11. Using the same distance on the vernier, align the other end of the scale. Now the scale will be roughly aligned. Mark with a scribe.



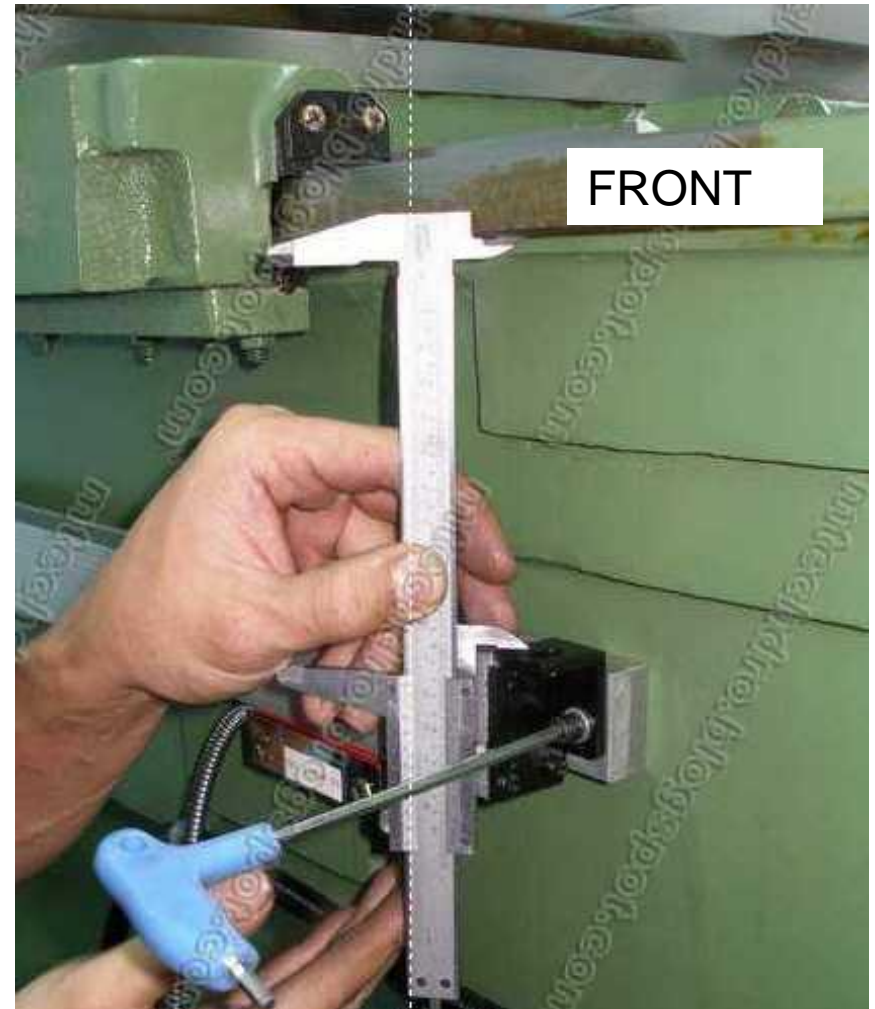
Z12. Drill and Tap Hole for the scale mounting



Z13. Screw with the mounting block in place.



Z14. Check with the vernier again for parallel alignment. Adjust if required. This is just a rough alignment, we will do the fine tune shortly.



Z15. Mark the 2 slot for the bracket mounting



Z16. Drill and Tap 2 holes to hold the bracket



Z17. Put 2 Dial Indicator at the end and set it to zero. One for checking flatness, the other for check levelness



Z18. Move the Z axis to the other end and check how much is the misalignment. Adjust the flatness and levelness to achieve zero error and tighten the screw. (Recommended error to be within 0.020mm).



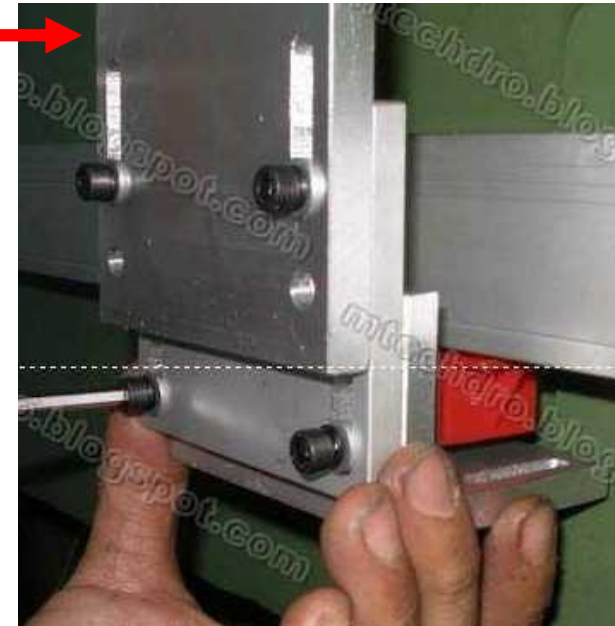
Z19. Adjust the flatness by adding shim to reduce the error.



Z20. Adjust the levelness by adjusting the scale up and down.



Z21. Install the bracket



Z22. Tighten the Reader Head to the bracket.

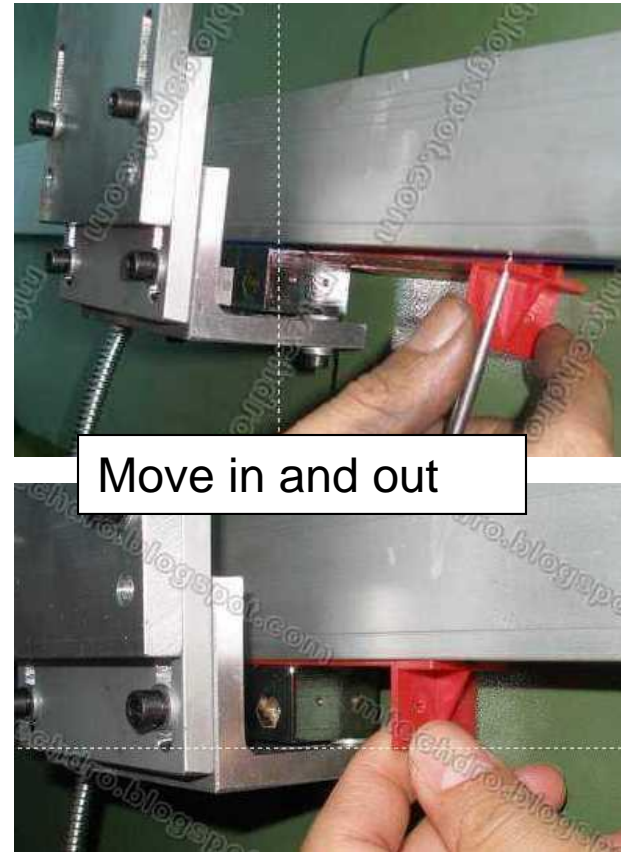
Make sure the reader head is align to the scale body



Z23. Adjust the height of the reader head. Visually check the Red Plastic should fill the gap nicely. The red pastic must also be able to move in and out without difficulty. Tighten the Reader Head and check the gap again.



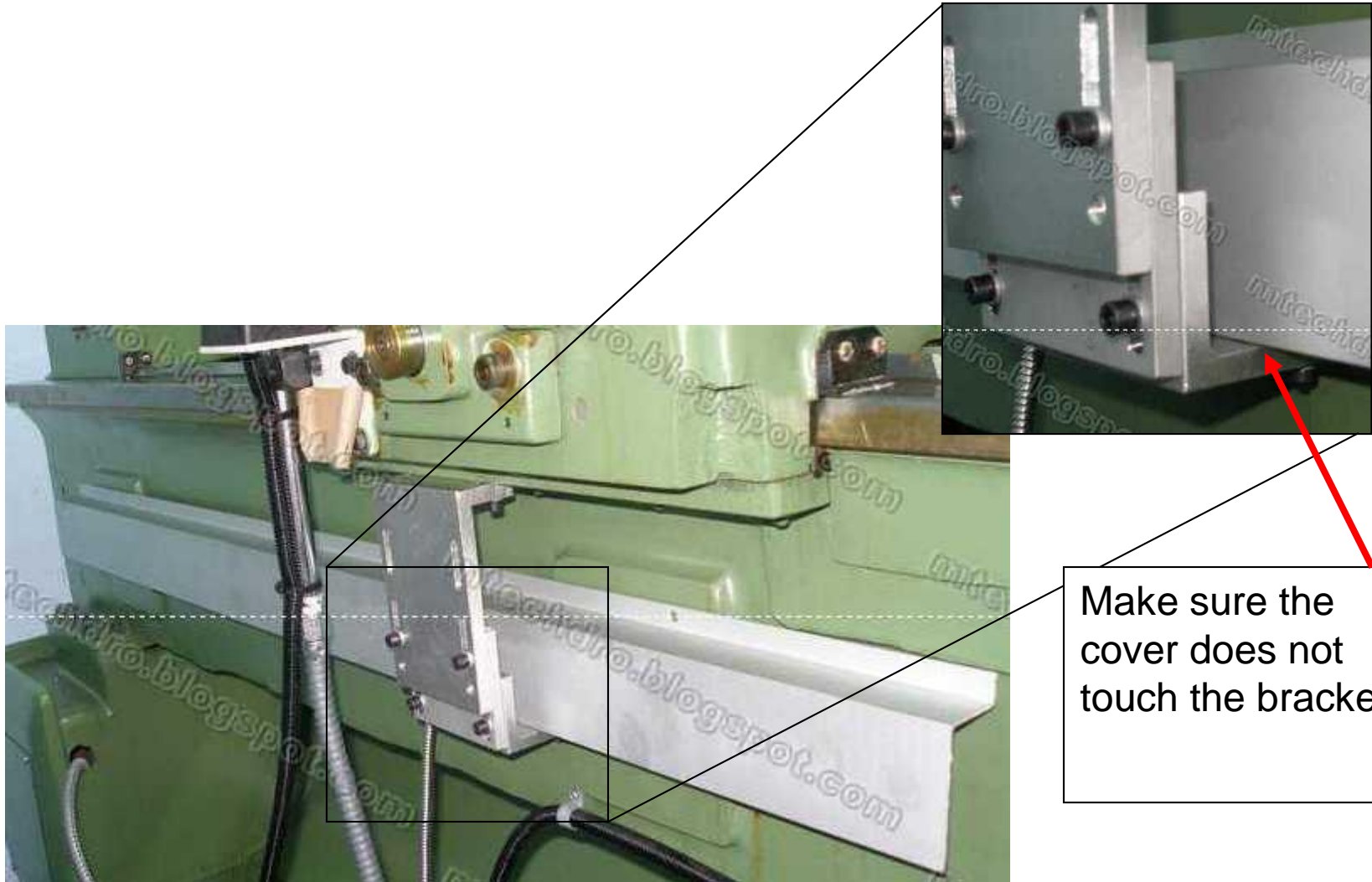
Push up and press against the red plastic



Z24. Z scale is installed

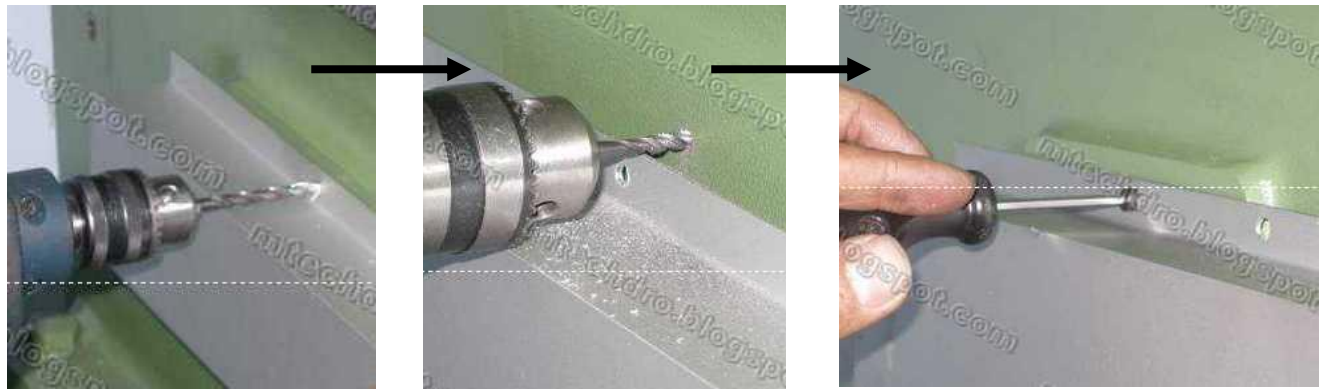


Z25. Now we install the Z cover. Put the cover on and make sure it cover the whole scale.



Z26. Drill and Tap and screw

REAR



FRONT



Z27. Move the Z axis to the extreme end and check the correct cable length



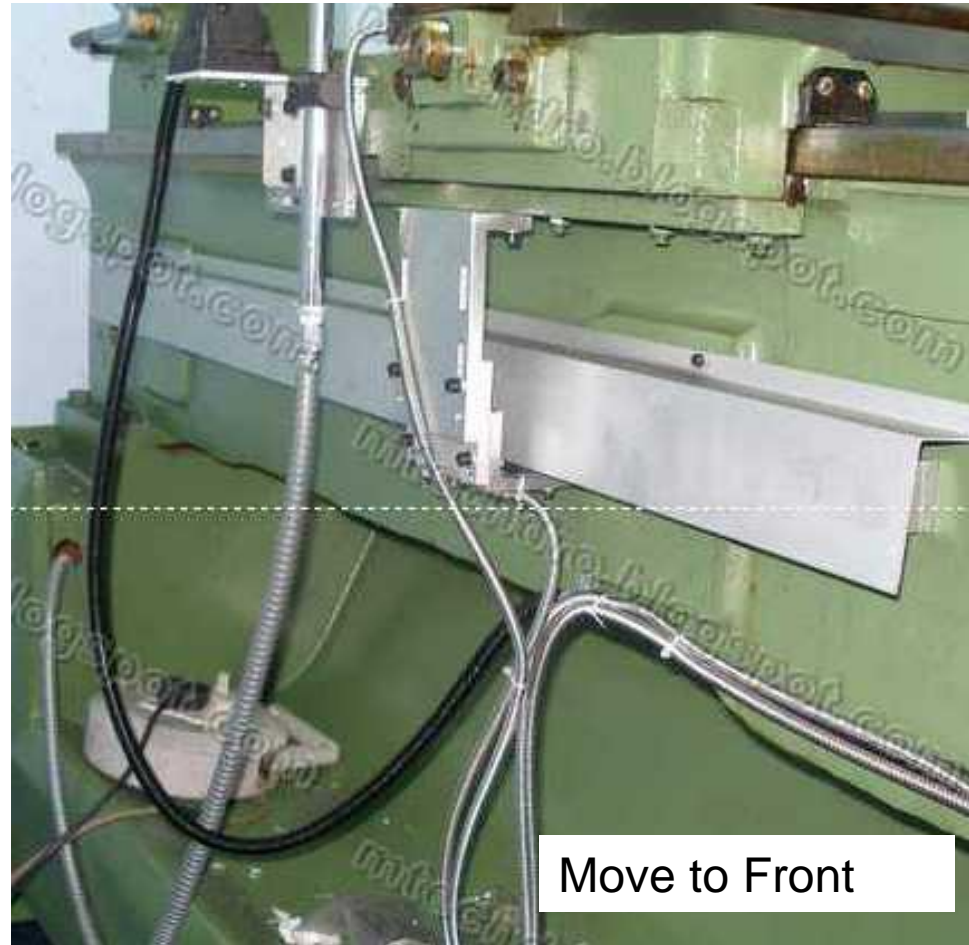
Z28. Tie cable-tie to arrange the cable nicely and prevent entanglement.
(Reader Head Area)



Z29. Tie cable-tie to arrange the cable nicely and prevent entanglement.
(Travel area)



Z30. Travel to both end to make sure the cable lag is enough for the complete travel and that there is no entanglement



Z31. Z axis installation completed

X1. For X axis installation, sometimes the lamp or coolant pipe may be a obstruction. So we need to dismantle them and re-locate them to a suitable place.



LAMP



COOLANT
PIPE

X2. We need to rotate the Tool post away to make some space for installation. We need to loosen the 3 screws.

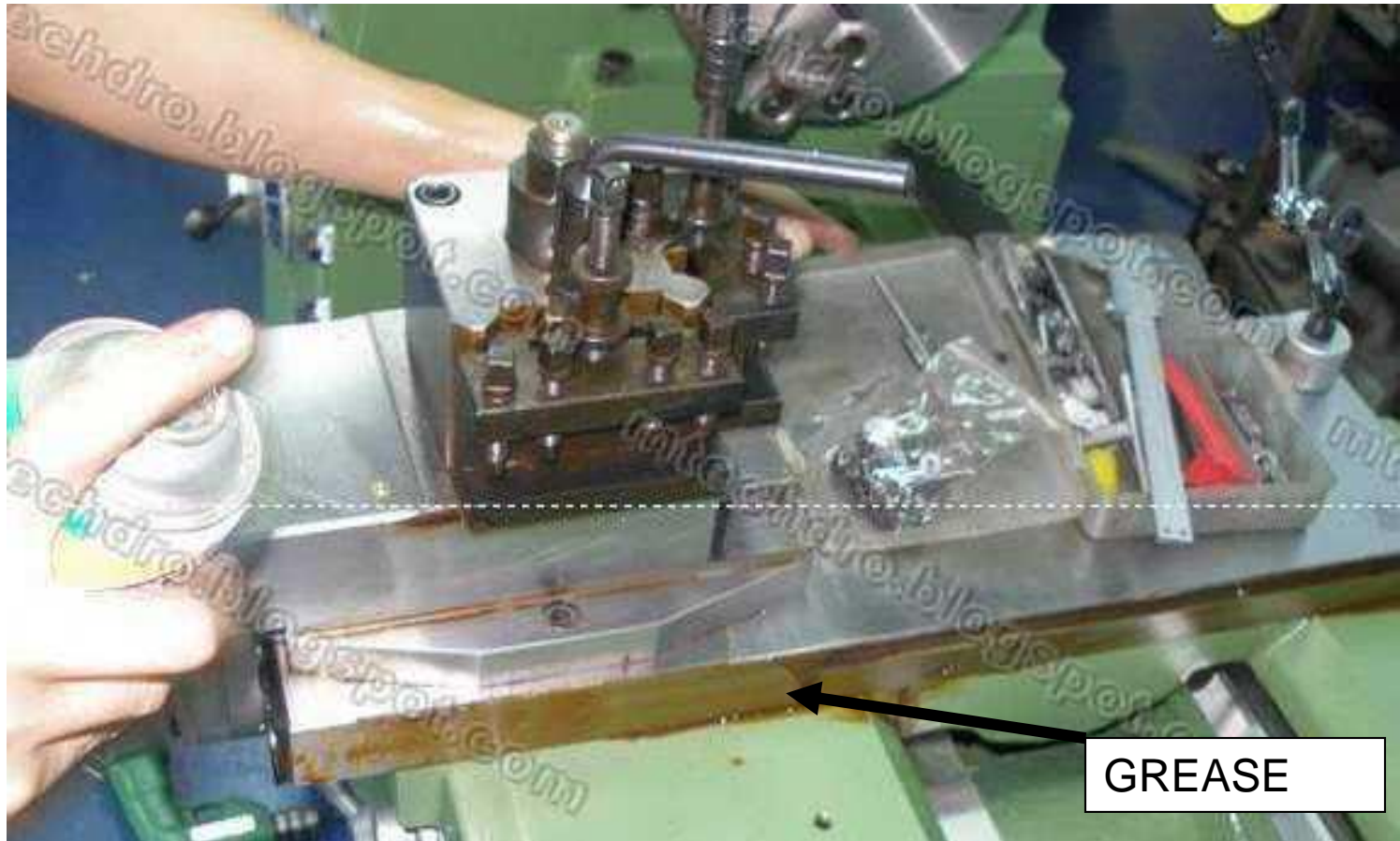


Loosen the 3 screws

X3. Rotate the Tool post away



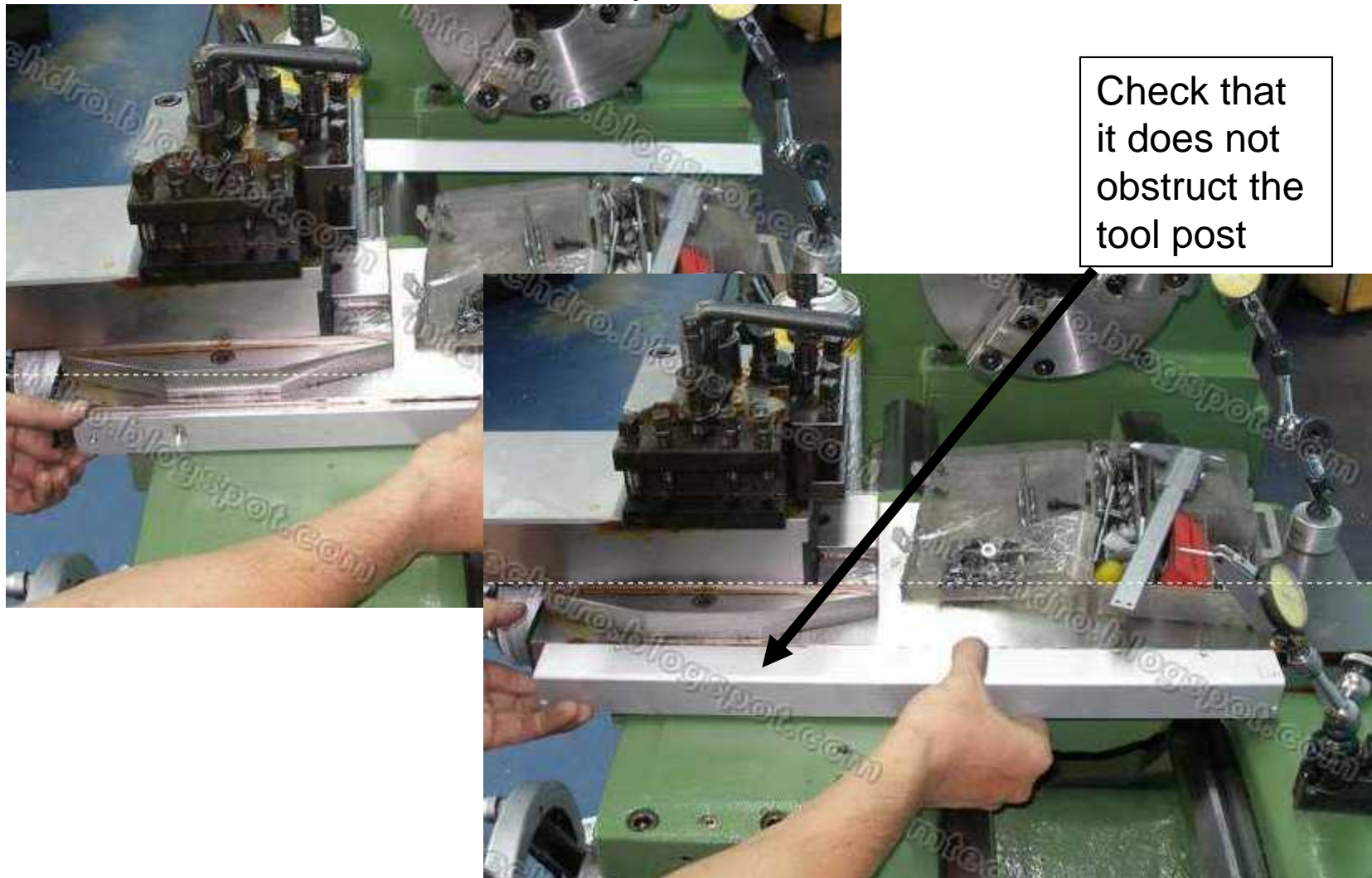
X4. Remove the gease if they are present (especially in new machine)



X5. Unscrew 4 screws to remove cover from X mounting bar (if available)



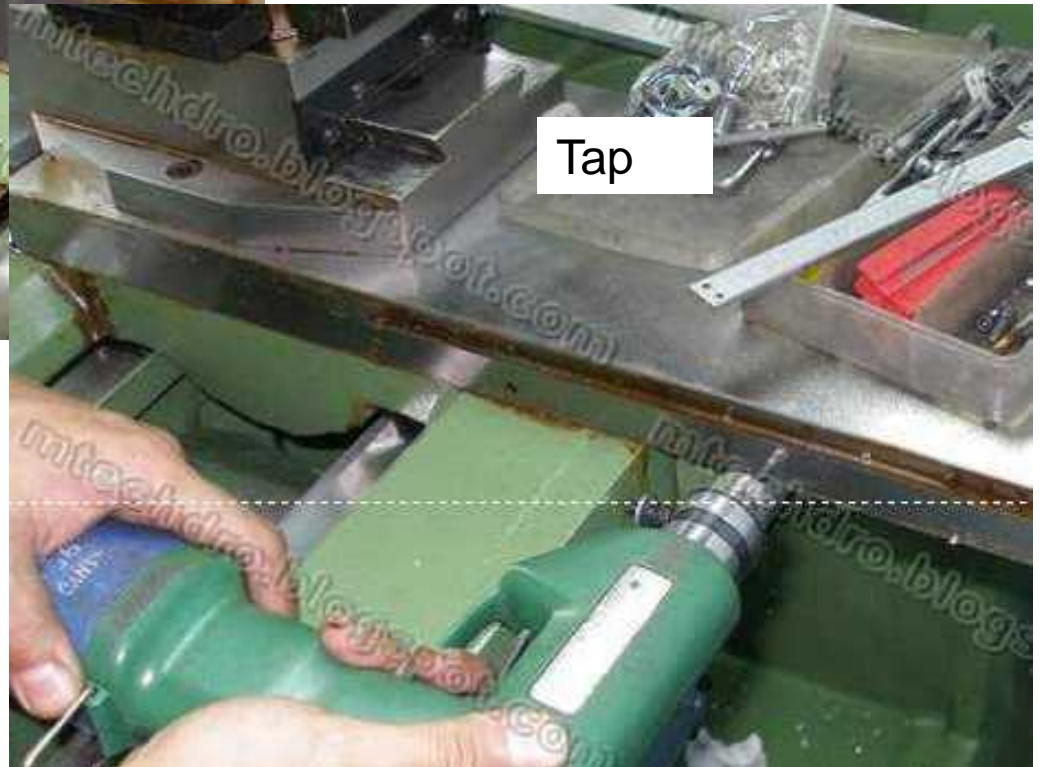
X6. Placed the mounting bar and check with the cover to make sure they are not too tall to obstruct the tool post.



X7. Mark the 2 slot with a scribbler



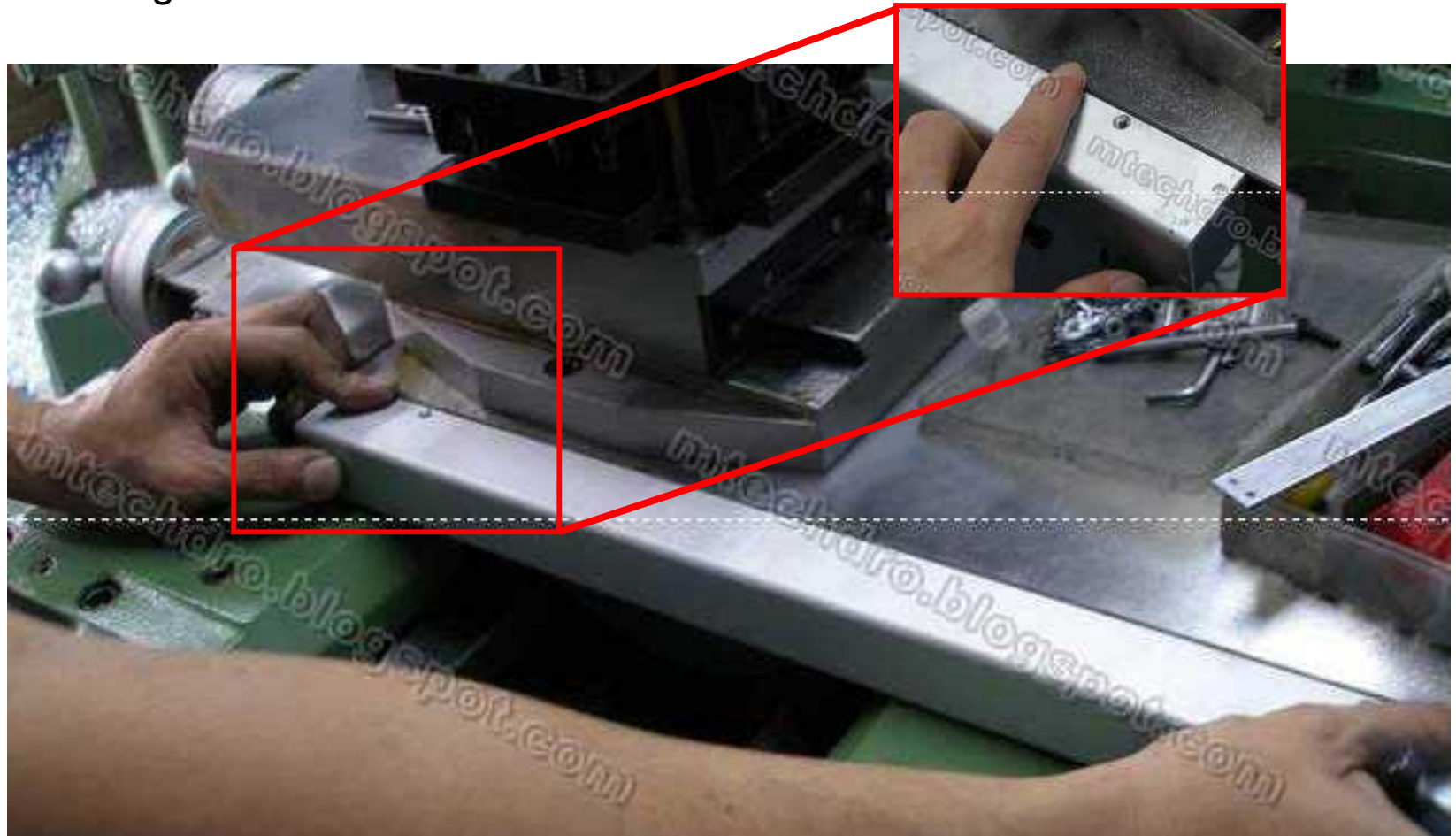
X8. Drill and Tap 2 holes



X9. Tighten the screw lightly, so we can make some adjustment



X10. Mount the cover and check that the height is in-line with the saddle.
Tighten the mount screws.



X11. Remove the screws from the Red plastic, leave behind the long plastic for checking the gap later.



Remove the screws



Keep the long plastic for checking gap



X12. Mount the scale with screws

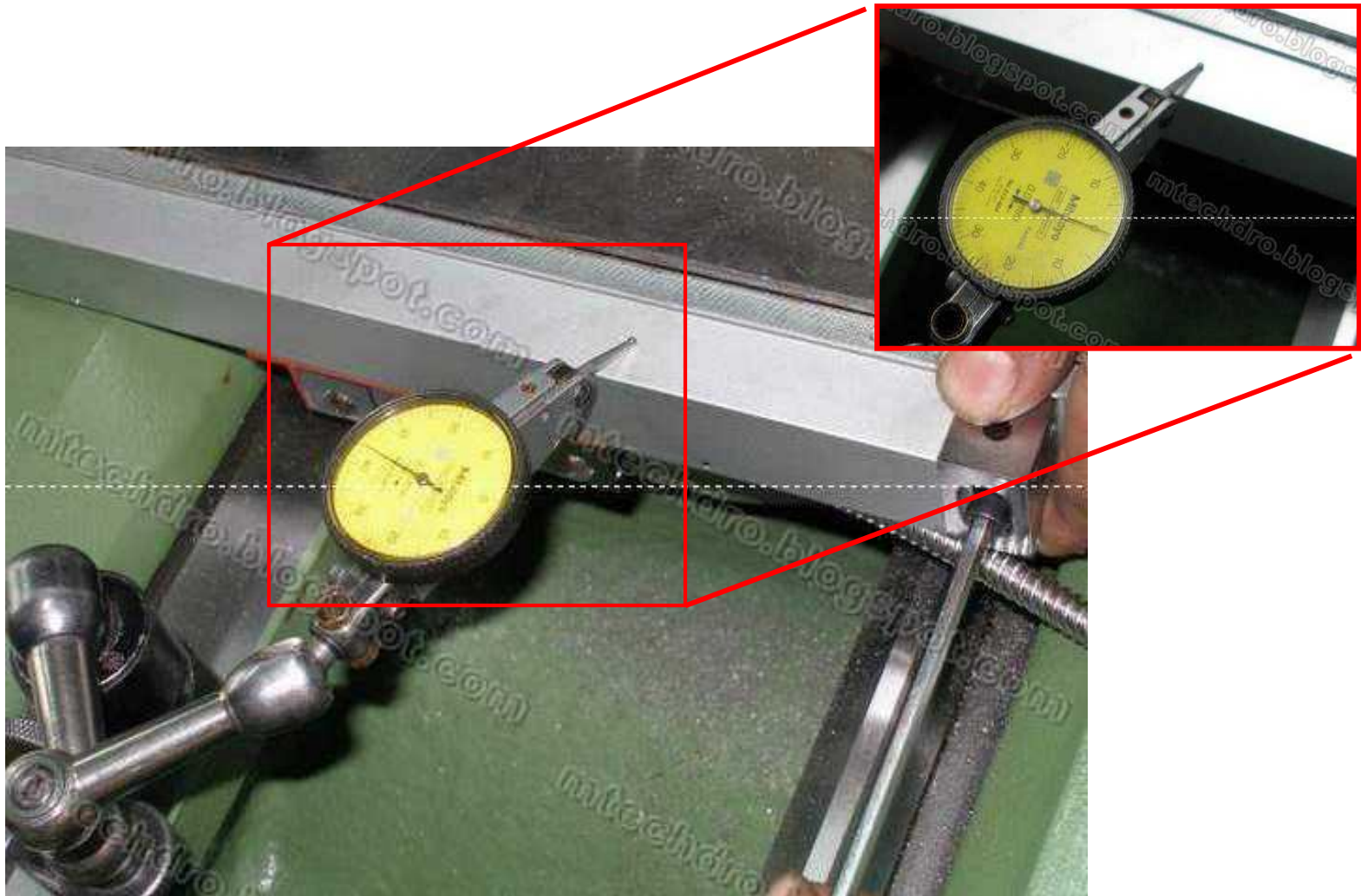


X13. Check the alignment of the scale with a Dial indicator.

Set it to zero at one end and move it to the other end.



X14. Adjust the scale height until the dial indicator is zero.
(Recommended error to be within 0.020mm).



X15. Check and adjust the scale flatness until the dial indicator is zero.
(Recommended error to be within 0.020mm).

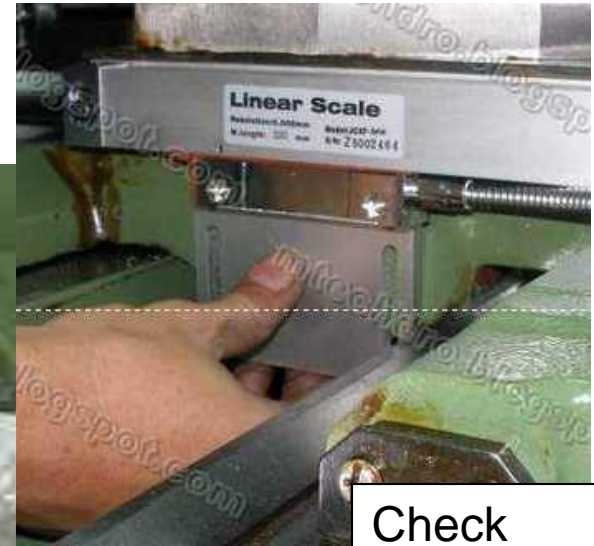


Set dial to zero



Move to the other end

X16. Decide how and where to mount the reader head. Check that it can accommodate the whole transverse length.



X17. Mark the slot position using a scribbler



X18. Drill and Tap 2 holes for the bracket.



X19. Mount the block and tighten the screw



X20. Make sure the block does not rub against the moving slide

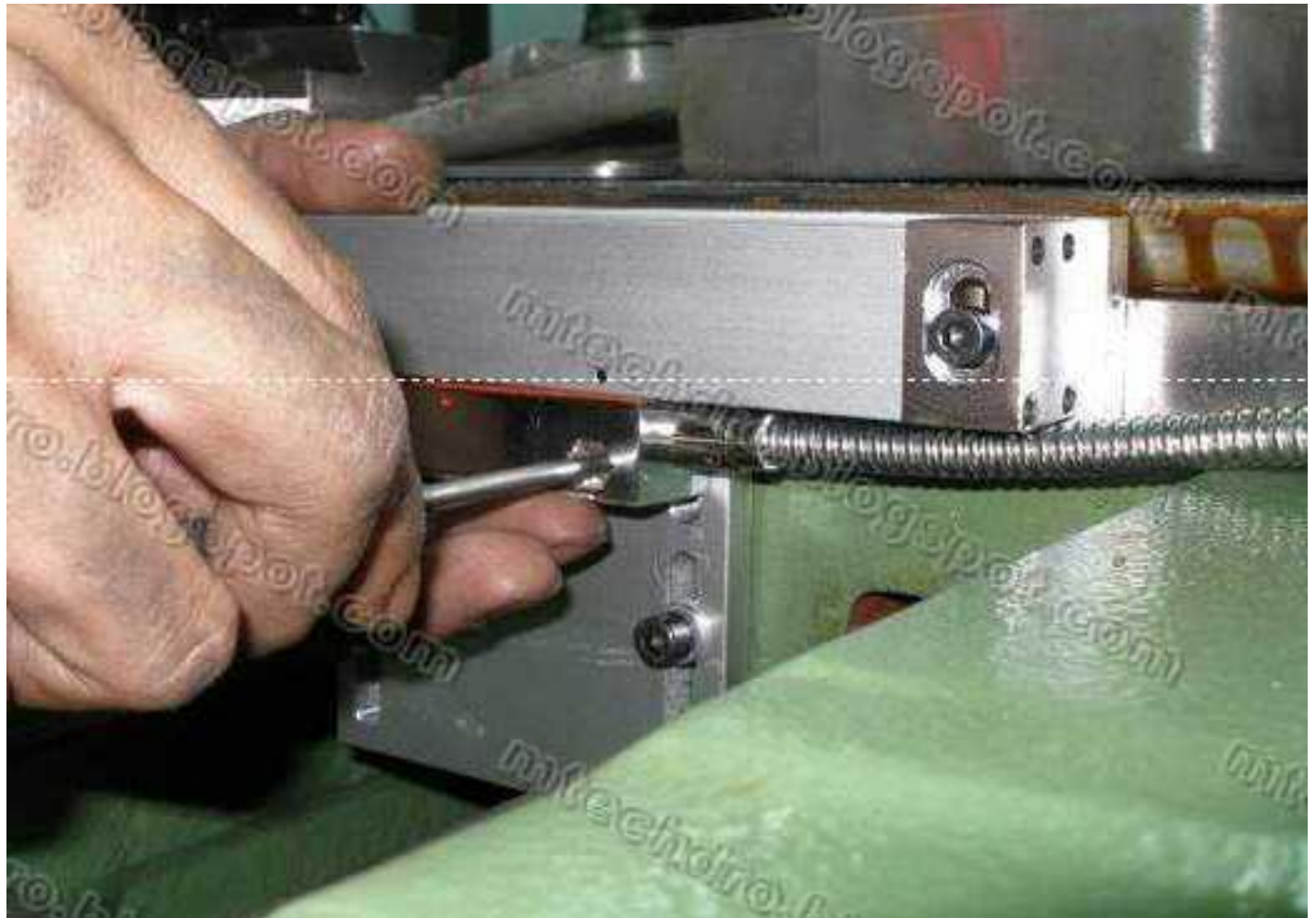


Make sure it does not rub against the slide

X21. If the surface the block is resting is not flat, you must add some pecking/washer to make it flat.



X22. Using the reader head holes as a guide, mark the holes with a scriber



X23. Drill and Tap 2 holes for tightening the reader head.



X24. Mount the reader and tighten the screws



X25. Check that the reader head is in-line with the scale. Use your thumb to feel that it is in-line or not.



X26. If it is not in-line, we have to add shim to make it flat. Check for flatness. Tighten the screws while pushing it upwards against the red plastic. This is to get the gap between reader head and scale correct.



Push upwards and tighten screws



Check flatness



X27. Check the gap, the red plastic must also be able to move in and out without difficulty.



X28. Put some silicon glue on the bar, so that it will make the sealing more resistance to coolant and prolong the working life.



X29. Put the cover and tighten all the 4 screws (shown by arrow)



X30. Drill and Tap hole for holding the cable



X31. Use the cable holder to keep the cable in place



X32. Re-install the lamp and the coolant pipe so that it does not obstruct the scales



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X33. If your lathe has a tail-stock, make a stopper to prevent it from hitting the scale. Drill and Tap a hole in a position that can block the tail-stock



If you have a tailstock, add a screw to protect the scale.



Screw must be longer than the scale height, so it will stop the tail stock from hitting the scale

X34. X scale installation completed

DRO installation



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- D1. Decide where to install the DRO Arm. Adjust the position and mark the 2 holes using a scribe.



Mark the hole using
a scribe

D2. Drill and Tap the 2 mounting holes



D3. Attach the Earth cable to one of the screws. Tighten the 2 screws



D4. Tighten the 4 leveling screws to make sure the Arm is straight.



D5. Attach the swivel arm to the base



D6. Tighten the DRO to the base plate with the 4 screws



D7. Adjust the tilting angle and tighten the screw



D8. Tighten all the screws on the arm



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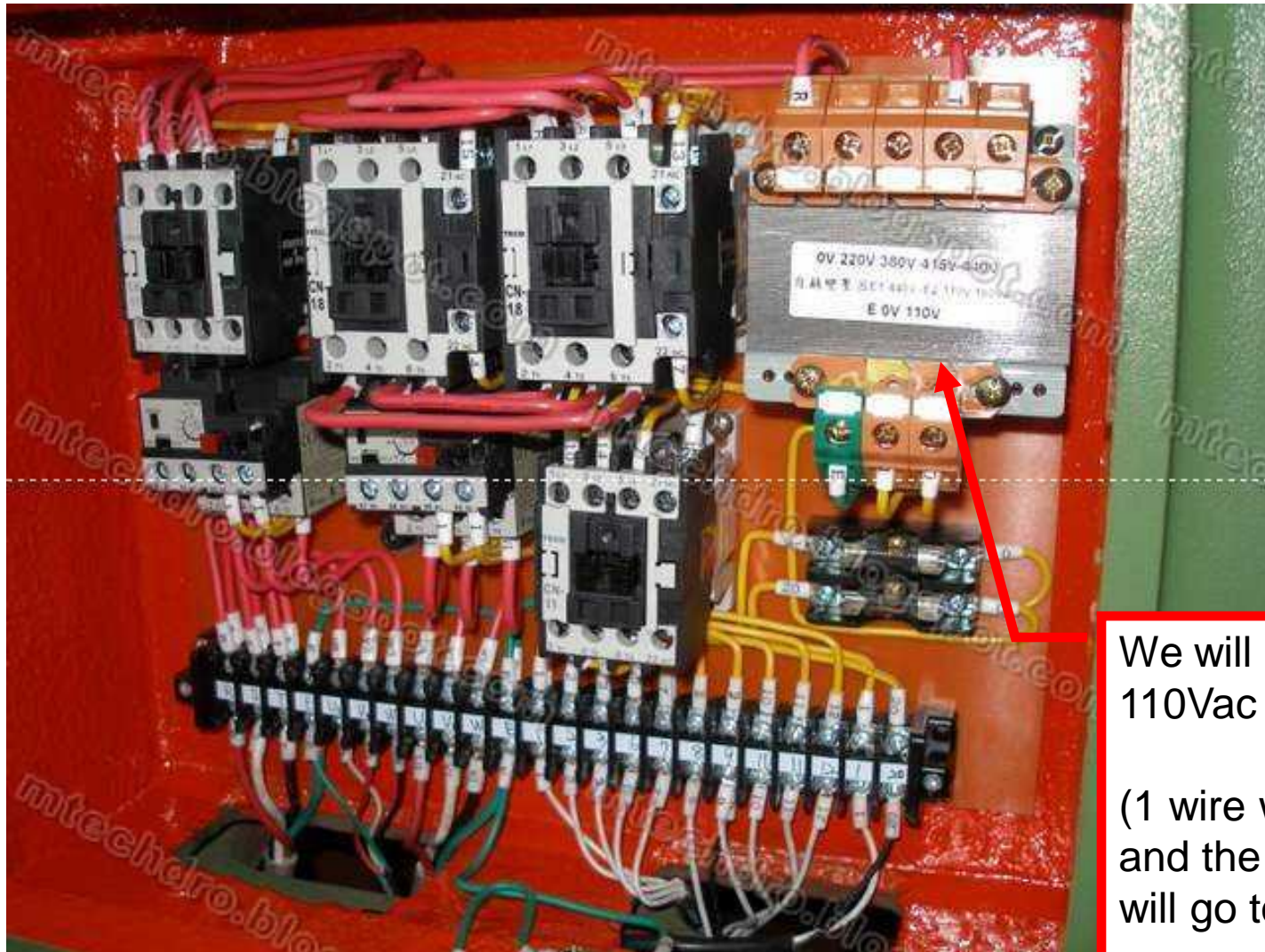
D9. Attach the other end of the Earth cable to the DRO



D10. The mTECH DRO accept 100~240Vac and there are normally 2 ways to connect the power to the DRO.

- a) If there is a power socket on your machine, you can plug in directly.
- b) If there is NO power socket, you need to check if the electrical cabinet has any suitable source of electric supply. (Normally, we can get it from the transformer.)
- c) You can also connect it to any external power source independent of the machine. (e.g. your wall socket).

D11. Check if the electric supply on the transformer is suitable.



We will connect to 110Vac
(1 wire will go 110V and the other wire will go to 0V)

- D12. Drill a hole for the power cable. Pull the power cable through. Add a cable-tie, so that it will prevent the cable from being pulled.



D13. **Power OFF the machine.** Then connect the cables. (the black cable to 110V and the white cable to 0V). It is advisable to connect the green cable to Earth/Ground.



D14. Connect the Power cable, Scales connector and Earth cable.



- D15. Power on and check that the DRO is ok.
Check that Scales are reading correctly.



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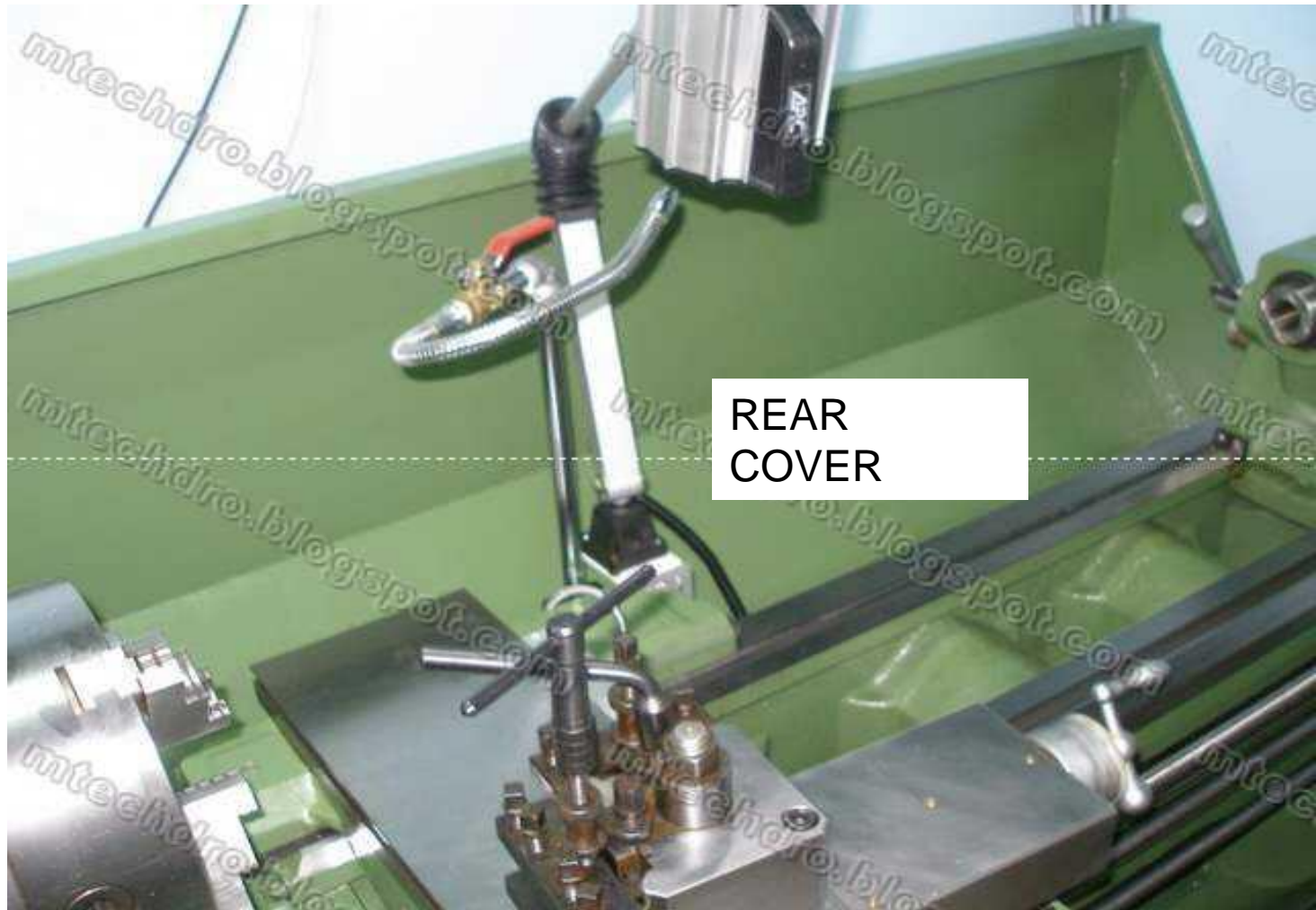
the cable-ties provided. (DRO side)



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D17. Install the rear cover



D18. Lock the Tool post in place



D19. Installation is completed. Give yourself a pat on the shoulder.
Any questions/doubts, please email info@thedrostore.com
We are always glad to be of service to you. Cheers.

