

# Nikon Microphot FXA or Microphot SA Z-Drive Installation Procedure

This procedure steps you through the installation and alignment of the ASI motor drive onto the Microphot FXA or SA microscope.

## The following tools are required for this procedure

- Small Phillips screwdriver
- Medium Phillips screwdriver
- Medium slotted screwdriver
- 1.5mm hex wrench (provided)
- 7/64" hex wrench (provided)
- 5/32" (or 4mm) hex wrench (provided)
- 3/16" nut driver

## Motor Drive Installation

### Please note:

The ASI drive has been designed to drive the fine focus shaft of your microscope. The FXA and SA microscopes are specified at 100 microns per 360 degrees rotation of the fine focus shaft and the ASI drive was designed to this specification. However, this does vary slightly from microscope to microscope and in empirical testing we have found that one micron displayed on the controller actually results in 1.56 microns of movement at the stage. For precise measuring applications we recommend that you calibrate your microscope by focusing on the top and bottom of a known material such as a fluorescent bead and identifying the actual correction factor for your microscope.

The ASI Z-axis drive attaches and drives the fine focus shaft of the microscope. The drive assembly is secured to the microscope via a custom ASI backplate that mounts to the microscope utilizing the four pre-tapped holes that secured the original backplate. Precise alignment of the ASI drive onto the fine focus shaft of the microscope is accomplished through a triple axis sliding adjustment bar. Installing the ASI drive assembly involves six steps:



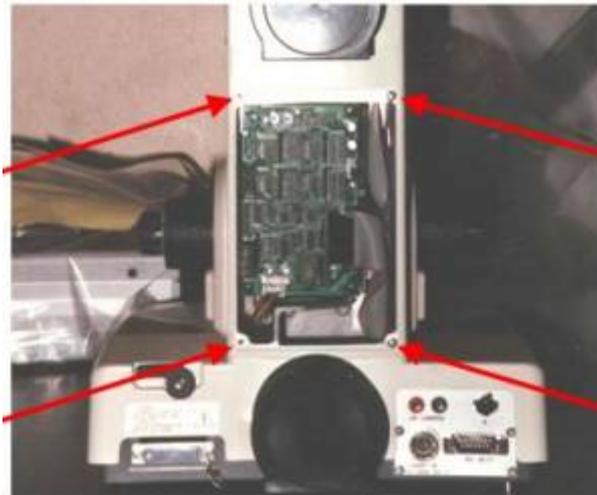
Note: the terms left and right refer to the sides of the microscope as viewed from the front of the microscope and assemblies.

## Step 1 - Removing the UV and tungsten lamp housing and accessories and

## **gaining access to the rear of the microscope**

Remove the tungsten and UV lamp housings as outlined in the microscope's manual. Turn the microscope so access to the rear of the unit can be easily obtained.

### **Step 2 - Removing the original backplate and installing the custom ASI backplate**



Remove the original backplate by removing the four Phillips head screws that secure it to the microscope. Locate the custom ASI backplate shipped with the ASI motor drive components and install it in place of the backplate just removed. Orient the ASI backplate so that the extension protrudes from the bottom right. Use the longer 3x12mm screws provided with the ASI backplate to secure it to the microscope.

### **Step 3 - Removing the left fine-focus knob (which is located on the right when viewing the microscope from the rear) and installing the ASI motor assembly**



On the Microphot FXA remove the left fine focus knob by loosening the 1.5 hex head set screw that secures it to the fine focus shaft and pull the knob straight off of the shaft.

On the Microphot SA the fine focus knob is removed by first removing the rubber boot over the fine focus knob. The rubber boot will pull straight off the focus knob. Once the rubber boot is removed, remove the small slotted nut that secures the fine focus knob to the fine focus shaft and pull the knob straight off of the shaft. Care should be taken not to turn the fine focus knob while pulling it off of the shaft.

Once the fine focus knob has been removed check to insure that no washers have come off with the fine focus knob. If any have, install them back onto the microscope.

#### **Step 4 -Installing the drive onto the fine-focus shaft**



Locate the motor assembly shipped with the ASI motor drive components. Remove the 5/32 Allen head screw from the back of the drive assembly. Loosen but do not remove the y,z adjustment screw located on the side of the motor (as shown in figure 2). When the y,z adjustment screw is loose the motor drive should move freely about in the y and z -axis. Check to insure that the clamp on the hollow end of the drive shaft which protrudes from the black encoder on the inside of the motor assembly is loose. If it is not, loosen it with the 7/64" Allen wrench.

Facing the rear of the microscope, hold the motor assembly in your right hand. Push on the fine focus knob on the other side of the microscope with your left hand to prevent the microscope's fine focus shaft from sliding when you install the drive. Align the x-axis adjustment bar so that the metal lip that is protruding slightly from the rear of the motor drive assembly is aligned with the slot located on the arm extending out from the ASI back plate. Slide the motor drive in towards the microscope while pushing in on the right fine focus knob with your left hand. When the ASI drive shaft is close enough, position the hollow end of the drive shaft protruding from the black encoder over the fine focus shaft on the microscope.



Orient the motor assembly so that the two shafts are aligned, then push the motor assembly onto the

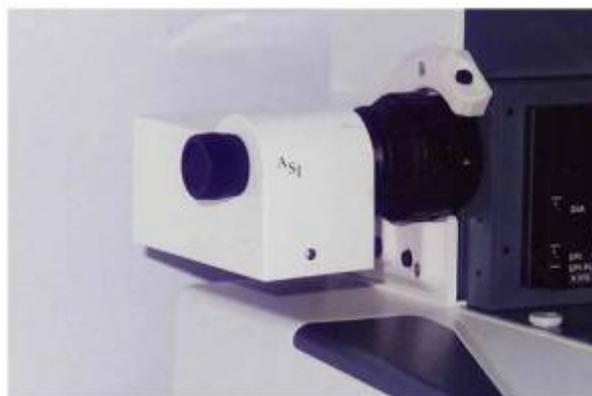
microscope as far as it will go. Insure that you are pushing in on the right fine focus knob while pushing the motor drive onto the microscope. When the hollow ASI drive shaft is completely over the microscope's fine focus shaft the ASI shaft should butt up against the spacing washers located inside of the microscope. While continuing to hold the motor assembly in your right hand, install the 5/32 Allen head x-axis adjustment screw to secure the motor drive onto the backplate (as shown in figure 1). Remove the two 4/40 threaded standoffs and lock washers from the backplate arm and use them to secure the 9 pin D connector in the slot provided.

## Step 5 -Aligning the drive



Carefully position the motor assembly along the y and z axis while rotating the right fine focus knob until minimum drag is felt. Tighten both the x axis and the y,z axis adjustment screws at the position where minimum drag is felt. Push the clamp and o-ring on the ASI drive shaft up against the spacing washers inside of the microscope. Tighten the clamp to secure the ASI drive shaft to the fine focus shaft of the microscope using the 7/64" hex wrench (as shown in figure 3). Recheck for minimum drag on the fine focus shaft by turning the right fine focus shaft. Repeat alignment procedure if necessary. Check to insure that there is no movement when pulling or pushing on the right fine focus knob. If there is any movement the fine focus shaft clamp is loose and the right fine focus knob will have to be pushed in and the clamp securely tightened.

## Step 6 - Installing the cover



Remove the screws from the edges of the drive assembly. Locate the ASI cover plate. Place it in position over the motor drive assembly and secure it with the screws just removed. Place the left fine focus knob over the protruding end of the drive shaft and secure it in place with the original set screw using the 1.5mm hex wrench. Insure that the set screw mates with the flat on the protruding fine focus shaft and that the knob does not rub against the cover.

[nikon](#), [microphot fxa](#), [microphot sa](#), [zdrive](#)

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