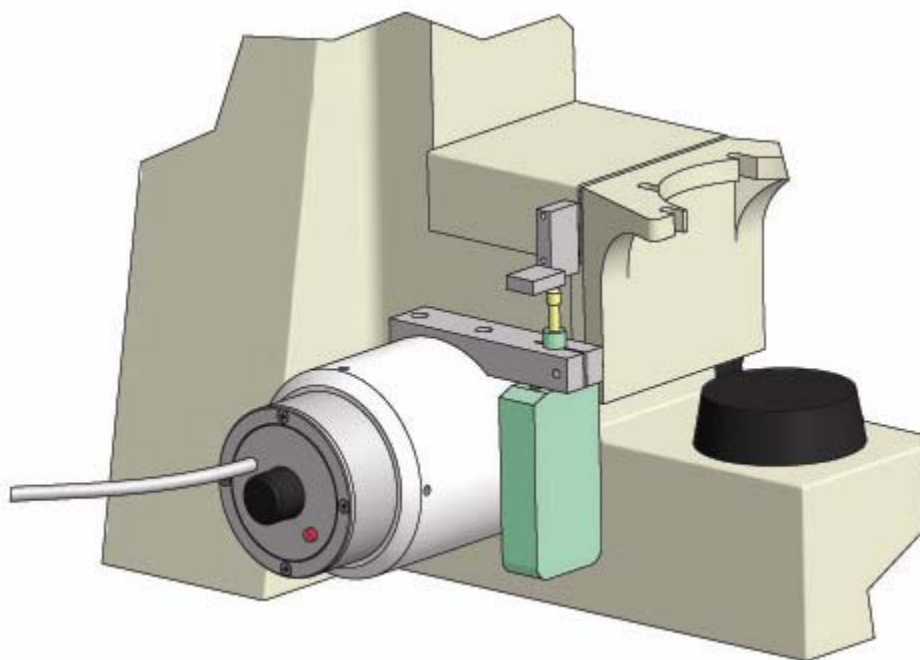


LEP Focus Drive Installation Instructions for the Zeiss Axio Line



The 99A40x & 96A40x Focus Drive installation applies to the following Zeiss microscopes:

Model	Focus Motor	Focus Collar	Linear Encoder Bracket
Axioplan	99A408, 96A408	74-F001360	99A454
Axioplan II	99A408, 96A408	74-F001360	99A459
Axiophot	99A408, 96A408	74-F001360	99A454
Axiophot II	99A408, 96A408	74-F001360	99A459
Axiotech	99A408, 96A408	74-F001360	NA
Axiovert 100	99A408, 96A408	74-F001360	99A451
Axiovert 135	99A408, 96A408	74-F001360	99A451
Axiovert 200	99A409, 96A409	74-F001362	99A458
Axioskop	99A408, 96A408	74-F001360	99A452
Axioskop II	99A409, 96A409	74-F001362	99A450
Axioskop 40	99A408, 96A408	74-F001360	99A469



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1.0 LEP Focus Drive Installation



NOTICE:

Only a qualified technician should attempt this installation. It involves some minor disassembly of critical mechanical components. If you are not familiar with this type mechanical assembly do not attempt this installation, consult your local microscope representative.

1.1 Introduction:

The LEP focus drive has been designed to easily integrate with various microscopes using a universal mounting adapter and a microscope specific focus collar. This focus drive provides a resolution of .05 micron and repeatability of .1 microns with an overall accuracy of .2 microns over a 12 mm range utilizing a linear encoder which easily mounts to the microscope body of the Zeiss Axio Line microscopes.

This manual illustrates the installation of the 9xA409 focus drive and 99A450 linear encoder bracket with the Zeiss Axioskop 2 microscope. All other installations to Zeiss microscopes are similar to the Axioskop 2 installation. See the Limit Switch/Linear Encoder Installation Manual 90M032 for more reference.

1.2 Components:

The LEP focus drive system on a Zeiss Microscope should be comprised of the following components:

- Focus Motor (9xA40x)
- Focus motor and microscope specific collar (74-F00136x)
- Encoder mounting bracket/actuator assembly (99A4xx)
- Linear encoder with 15 pin gender changer connector
- Coupling and mounting hardware package

1.3 Tools needed:

In order to install the LEP P/N: 9xA40x focus drive and 99A4xx encoder bracket, the following tools are required:

- 1.27mm, 1.5mm, 2.0 mm and 2.5 mm hex wrenches
- Philips Head screwdriver

2.0 Focus Motor Installation (with 74-F001360 Focus Collar)

2.1 Before installing the focus drive:

Zeiss Models:

Axioplan & II
Axiophot & II
Axiotech
Axiovert 100 & 135
Axioskop & 40

- 1 Using a 1.27 mm hex wrench, loosen the locking set screw of the fine focus knob on the appropriate side of the microscope. (see table below) Remove the fine focus knob which exposes the course knob nut. Remove both the nut and the course knob.

Zeiss Models	Microscope Side
Axiophot & II	Left
Axioplan & II	Left
Axiotech	Left
Axiovert 100 & 135	Right
Axioskop	Left
Axioskop 40	Right

- 2 A black cap with five socket head screws should be exposed. Three of the screws are 120 degrees apart and two are 180 degrees apart. Using a 2.5 mm hex wrench, only remove the three screws which are 120 degrees apart. (See Figure 1 for reference)

2.2 Installing the focus drive:



The focus motor assembly is shipped partially assembled. Before installation, loosen the five set screws in the outer housing - separate the focus collar and the focus motor from the housing. (Use Figure 3 for reference)

- 1 Install the 3 mm collar and the 3 mm coupler onto the fine focus shaft of the microscope. Align one of the locking set screws on the 3mm coupler with the flat on the fine focus shaft and tighten both set screws using a 1.27 mm hex wrench. Now attach the white nylon coupler to the 3mm coupler.
- 2 Attach the focus collar (p/n: 74-F001360) to the black focus cap on the microscope using three M3x22 socket head screws and tighten using a 2.5 mm hex wrench. (Use Figure 1 for reference)



Figure 1

- 3 Slide the outer housing of the focus drive assembly over the focus collar and alternately tighten the three set screws using a 2mm hex wrench.
- 4 Adjust the fine focus knob on the opposite side of the microscope such that the white nylon coupling will align properly with the motor coupling. Slide the focus motor housing into the outer housing until the focus motor is coupled with the fine focus shaft. To verify alignment, turn the fine focus knob and ensure the knob on the end of the motor shaft rotates accordingly. Tighten the two motor clamping setscrews with a 2 mm hex wrench. (Use Figure 2 for reference)

REF	P/N	DESCRIPTION	QTY
1	74-F001038	MOTOR KNOB	1
2	73-SA00400	MOTOR ASSEMBLY	1
3	74-T301-5MM	5MM COUPLER	1
4	74-A201-1	NYLON COUPLER	1
5	74-T301-5	1/4" COUPLER	1
6	74-F001201	OUTER HOUSING	1
7	74-F0013xx	FOCUS COLLAR	1

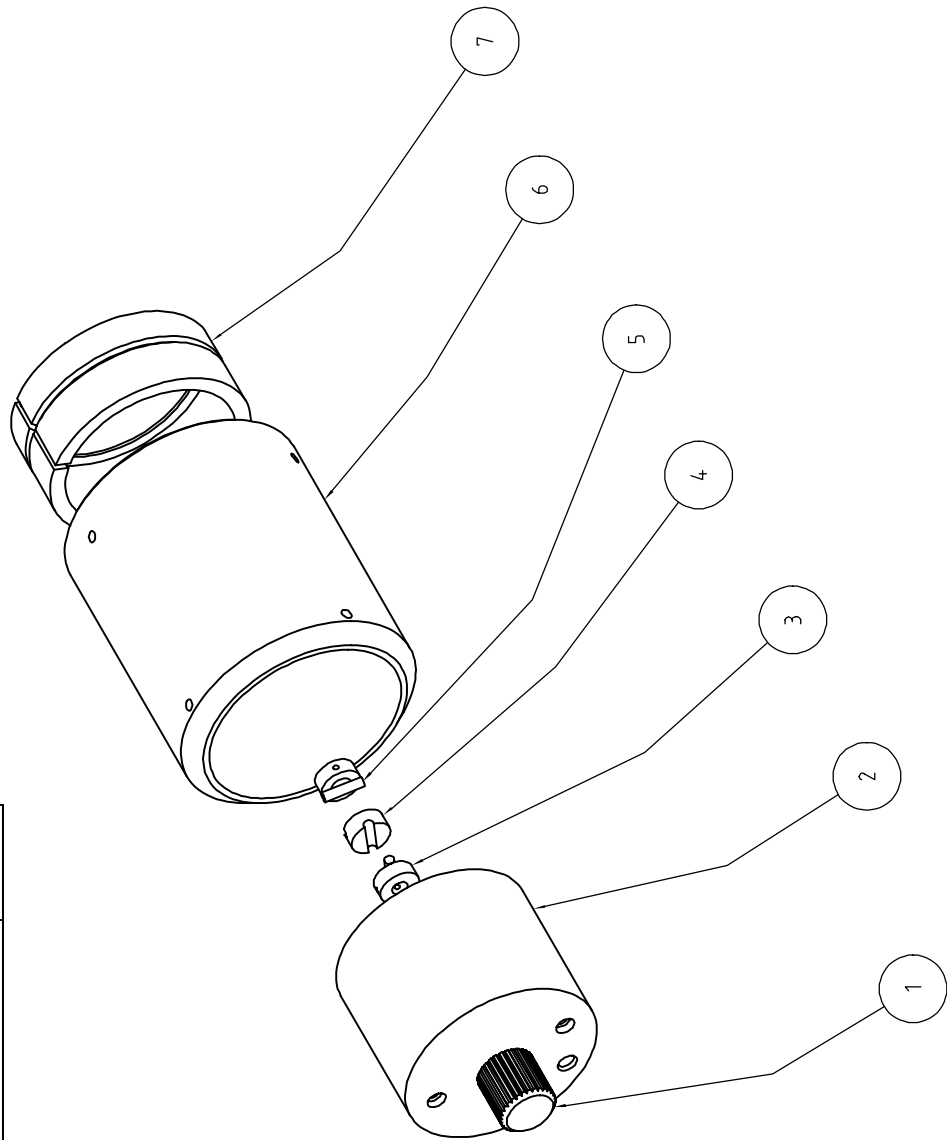


Figure 2

3.0 Focus Motor Installation (with 74-F001362 Focus Collar)

3.1 Before installing the focus drive:

Zeiss Models:

Axiovert 200

Axioskop II

- 1 Using a 1.5 mm hex wrench, loosen the locking set screw of the fine focus knob on the appropriate side of the microscope. (see table below) Remove the fine focus knob which exposes three socket head screws holding the coarse focus knob in place.

Zeiss Models	Microscope Side
Axiovert 200	Left
Axioskop II	Right

- 2 Using a 2.0 mm hex wrench, remove the three coarse focus retaining screws followed by the coarse focus knob itself.



Install the provided M2.5x8 socket head screws (with washers) into the threaded holes used to attach the coarse focus knob; failure to do so may result in Z axis drift. (See Figures 3 and 4 for reference)

- 3 A black cap with five socket head screws should be exposed. Three of the screws are 120 degrees apart and two are 180 degrees apart. Only remove the two screws which are 180 degrees apart. (See Figure 4 for reference)
- 4 Remove the upper two Philips head screws which secure the Z- column cover plate. (See Figure 3 for reference)

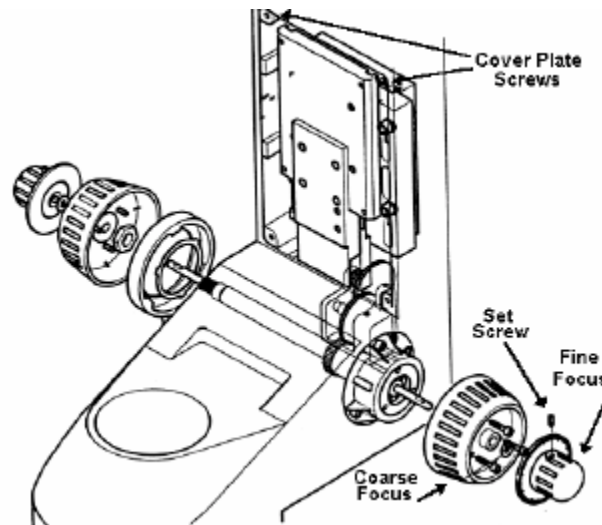


Figure 3

3.2 Installing the focus drive:



The focus motor assembly is shipped partially assembled. Before installation, loosen the five set screws in the outer housing - separate the focus collar and the focus motor from the housing. (Use Figure 3 for reference)

- 1 Install the 3 mm collar and the 4 mm coupler onto the fine focus shaft of the microscope. Align one of the locking set screws on the 4mm coupler with the flat on the fine focus shaft and tighten both set screws using a 1.27 mm hex wrench. Now attach the white nylon coupler to the 4mm coupler.
- 2 Attach the focus collar (p/n: 74-F001362) to the black focus cap on the microscope using two M3x16 socket head screws and tighten using a 2.5 mm hex wrench. (Use Figure 4 for reference)

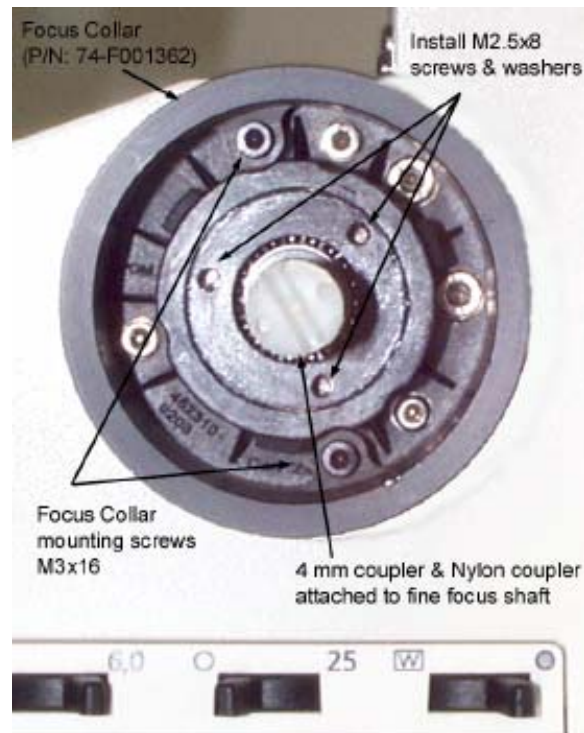


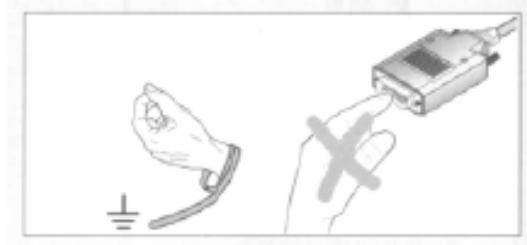
Figure 4

- 3 Slide the outer housing of the focus drive assembly over the focus collar and alternately tighten the three set screws using a 2mm hex wrench.
- 4 Adjust the fine focus knob on the opposite side of the microscope such that the white nylon coupling will align properly with the motor coupling. Slide the focus motor housing into the outer housing until the focus motor is coupled with the fine focus shaft. To verify alignment, turn the fine focus knob and ensure the knob on the end of the motor shaft rotates accordingly. Tighten the two motor clamping setscrews with a 2 mm hex wrench. (Use Figure 2 for reference)

4.0 Installing the Linear Encoder



It is imperative the linear encoder is attached to the LEP controller using the supplied gender changer - failure to do so may result in significant damage to the linear encoder. Also, ensure you follow proper ESD precautions:



- 1 The encoder mounting brackets are designed to mount to the microscope frame. Install the 9xA421 encoder into the clamping bracket; tighten the clamping screw with a 2.5 mm hex wrench.
- 2 Mount the encoder/encoder bracket assembly to the microscope using the provided hardware. (See Figure 5)
- 3 Attach the encoder plunger actuator block to the rear of stage carrier. Tighten the two set screws on the top of the actuator block and the single set screw on the bottom. When installed properly, the actuator block will contact the encoder plunger as the stage travels in the Z direction. (See Figures 6 and 7)



Figure 5



Figure 6

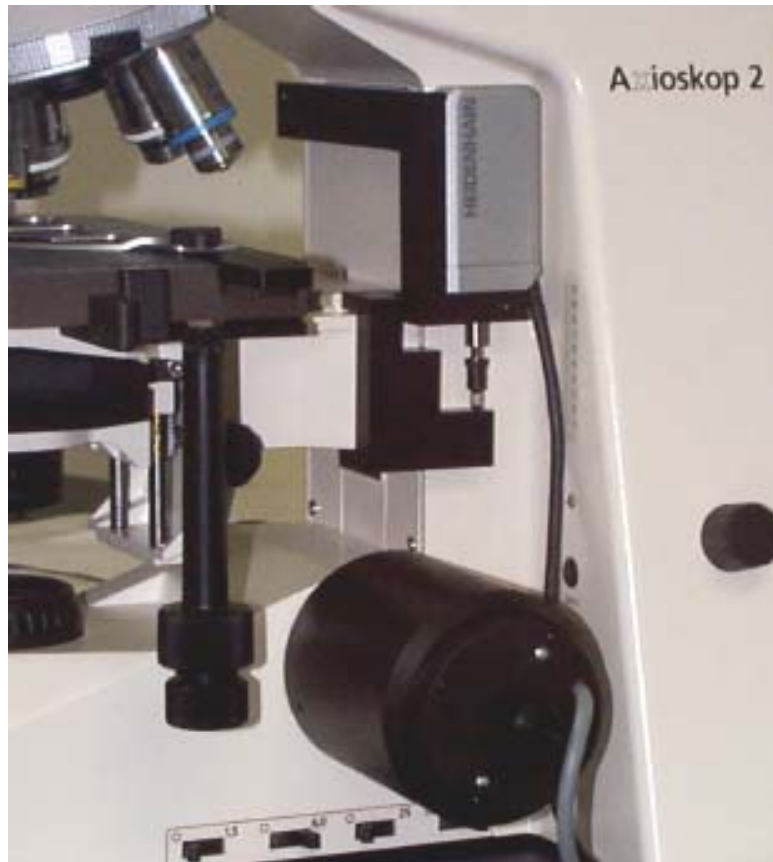


Figure 7

5.0 Connections

- 1 Connect the 15 pin linear encoder cable (with gender changer) to the 15-pin male connector at the rear of the controller labeled ENCODER
- 2 Connect the 15 pin connector from the focus motor to the rear of the controller labeled STEP-FOC MOTOR.

6.0 Final Notes

Manual coarse focusing of the system is still available, however use of the joystick or software control is recommended for optimum performance. The red button on the focus motor disables motor power at the microscope for manual movement. To activate power, simply press the red button or continue to use the joystick/software control.



Refer to your controller configuration manual for details on enabling encoder feedback and customizing the operation of your motor controller/driver.

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