

# Technical Bulletin 511

## 121 Installation Instructions

### IMPORTANT NOTE: MOTOR SHAFT ENDPLAY AND RADIAL RUNOUT (TIR) SPECIFICATIONS

The maximum recommended motor axial endplay is  $\pm 0.025\text{mm}$  for up to 1250 PPR, and  $\pm 0.12\text{mm}$  for greater than 1250 PPR. Maximum recommended radial shaft runout is 0.05mm for all resolutions.

### INSPECTION AND PREPARATION

Closely inspect the motor shaft to make sure that it is the correct size and free from all burrs and aberrations.

### INSTALLATION (Also view the Installation Video at [www.encoder.com/model121.htm](http://www.encoder.com/model121.htm))

#### STEP 1

Remove the shipping sticker.

Applying pressure only to the hollow end of the encoder hub, slide the Model 121 encoder over the motor shaft until the base plate of the encoder rests firmly against the motor face.

**CAUTION: DO NOT USE UNDO FORCE. The encoder should slide easily onto the motor shaft or correct alignment may be compromised.**

For longer shafts that extend through the encoder, a special tool is available from Encoder Products. This tool makes it easier to apply pressure only to the encoder hub.



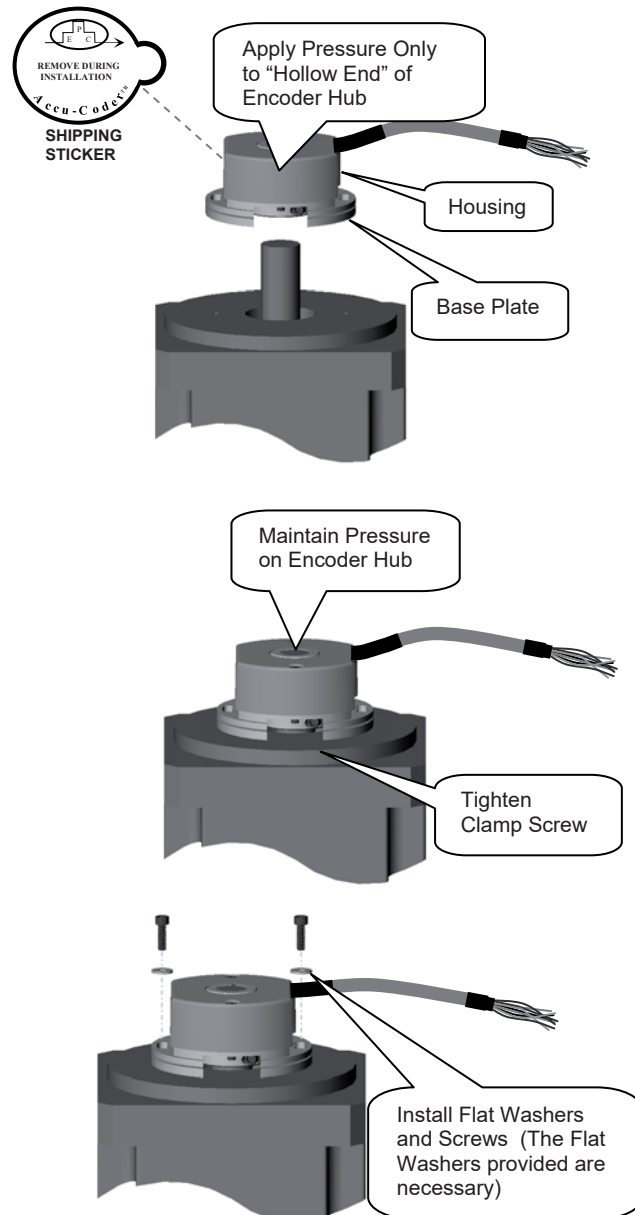
#### STEP 2

While maintaining a light but firm pressure (approx. 2-3 lb.) on the back of the encoder hub, securely tighten the socket head screw in the clamping collar using a 5/64" hex wrench. (Suggested torque range 0.81 N-m to 1.12 N-m)

**CAUTION: While completing steps 2 and 3 make sure the cable does not apply any force or load to the encoder or correct alignment may be compromised.**

#### STEP 3

Install two screws (4-40 or M3 maximum) with the flat washers provided through the holes in the encoder base. Tighten each mounting screw  $\frac{1}{2}$  turn alternating between both screws until tight. (Suggested torque of approx. 1.12 N-m) For additional security, a drop of Loctite 222 can be added to the threads of the screws.



### • REMOVAL

#### STEP 1

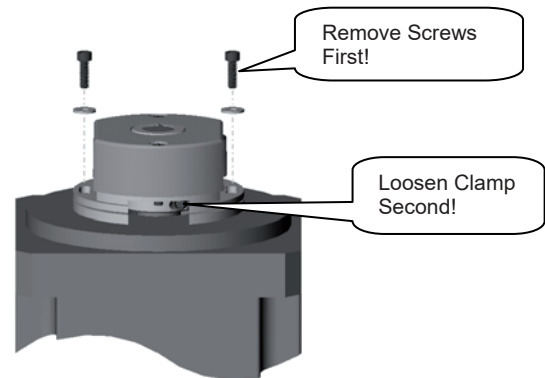
Remove the mounting screws and washers.

#### STEP 2

Loosen the socket head screw in the clamping collar and slide the encoder off the motor shaft by pulling on the encoder housing.

#### STEP 3

Place the original packing sticker or a piece of tape back over the encoder hub and housing to protect the encoder's optics during handling.



### • REFERENCE ALIGNMENT

On non-commutated units, the reference will occur when the mark on the end of the hub is pointing towards the cover screw as shown (note position of cable).

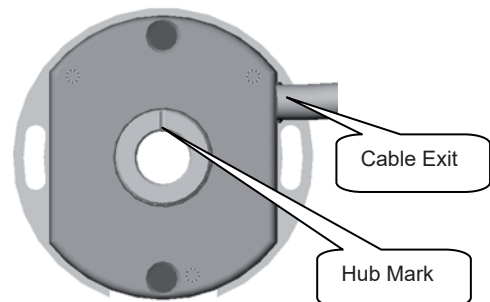
### • COMMUTATION ALIGNMENT

#### STEP 1

Lock the motor electrically at the positive transition of the  $V_{12}$  winding.

#### STEP 2

Align encoder hub so that the mark is pointing towards the cover screw as shown (note the position relative to the cable). In this position, the U output is in transition, V output is at low logic level, and W output is at high logic level. Maintain this alignment throughout **STEP 3**.



#### STEP 3

Perform **STEP 1** and **2** of **INSTALLATION**. At this point the U output transition roughly coincides with the  $V_{12}$  winding transition.

#### STEP 4

To fine-tune the alignment, select an appropriate method to identify the U output transition point, then rotate the body of the encoder until the U output transitions. Rotate the encoder body in the opposite direction until the U output transitions again. Rotate the body of the encoder to the midpoint of these two positions and perform **STEP 3** of **INSTALLATION**.

