Application Note 5317

AEAT-601x/901x Magnetic Encoder Components Kit Assembly Guidelines

Description

The objective of this note is to provide a step-by-step manual assembly guide for the alignment and installation of the Broadcom® AEAT-601x/901x magnetic encoder to a motor shaft.

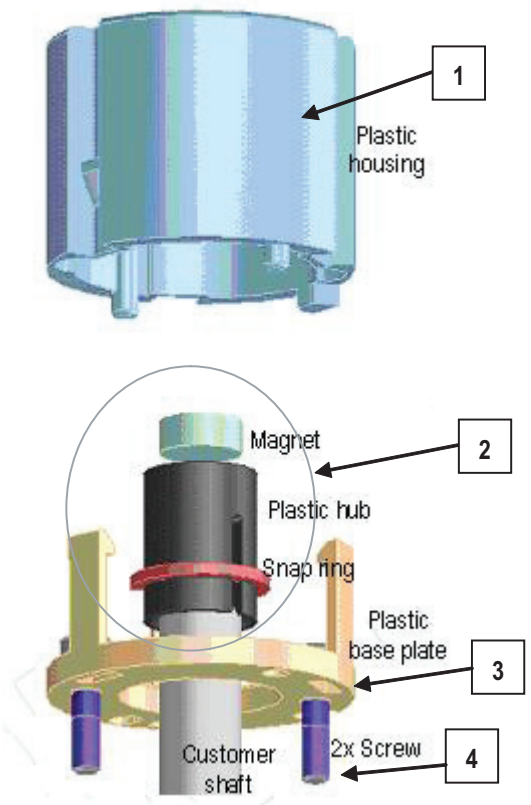
In this release only a 6-mm shaft is supported. Other shaft diameter sizes of 2 mm, 4 mm, 8 mm, and 10 mm may be introduced in future product releases.

List of Components

A total of four components are supplied in the magnetic encoder components kit; see Figure 1.

1. Plastic housing
   - Pre-assembled with PCB glued to the housing
2. Magnet, plastic hub, and snap ring
   - Supplied pre-assembled as one unit
3. Plastic base plate
4. 2 pieces M2 x 0.4 x 8 screw
   - Socket head cap screw, head Ø 3.8 mm ± 0.18 mm

Figure 1: Expanded View of Components

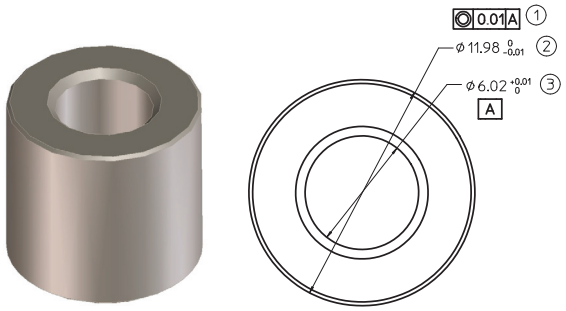


Alignment Tool Set (Ordered Separately: Part Number HEDS-8934)

The alignment tool set is ordered separately and includes a centering jig and a gap plate.

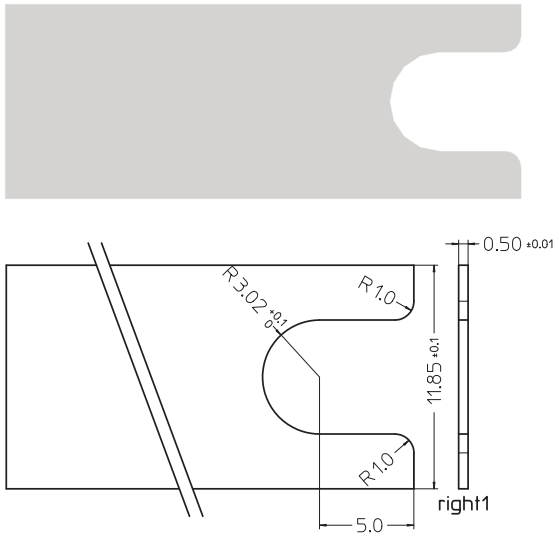
1. The plastic base plate centering jig is used to center the plastic base plate to the customer shaft.

Figure 2: Centering Jig



2. A gap plate with a U-shaped end is used to set the magnet height to the IC on the PCB.

Figure 3: Gap Plate

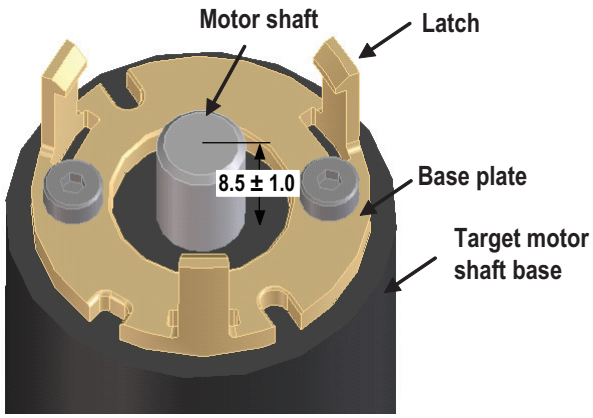


Encoder to Motor Installation Procedure

This installation procedure details the step-by-step manual assembly process for the alignment and installation of the AEAT-601x/901x magnetic encoder to a motor shaft, and uses the optional alignment tool set, HEDS-8934.

1. Insert the two screws into the plastic base plate.
2. Place the plastic base plate over the motor shaft and partially screw down the base plate to the target motor.
   – Do not tighten the screws yet. The base plate must be still loose on the motor to accommodate the centering jig.

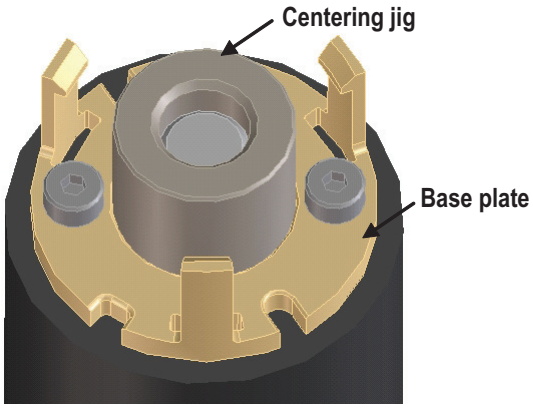
Figure 4: Base Plate and Target Motor Shaft Base



CAUTION! For optimal performance, do not subject the three latches to more than 1.5-mm outward bending. Excessive outward bending affects the latch-to-plastic housing grip effectiveness.

3. Place the centering jig onto the target shaft and ensure that the outer diameter of the centering jig sits inside the inner hole of the plastic base plate; see Figure 5.
4. Once the centering jig is sitting inside the plastic base plate hole, tighten both screws. Use a screw tightening torque of 0.6 in/lb (0.7 kgf/cm).

Figure 5: Centering Jig

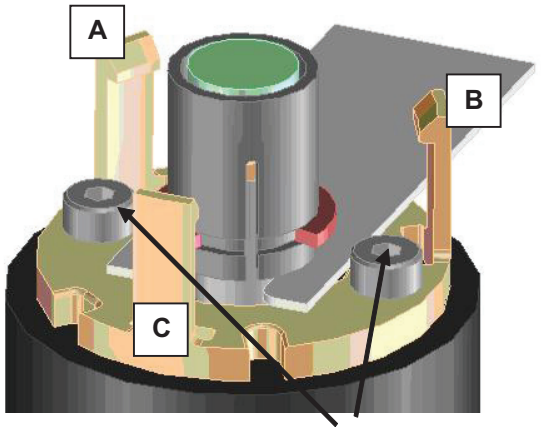


5. Remove the centering jig once both screws are tightened accordingly.

6. Place the U-end of the gap-setting plate onto the motor shaft between latch A and latch B, with latch C in front. The plate must sit flatly on the plastic base plate.
7. With the gap-setting plate still pressed onto the shaft, press-fit the magnet and hub assembly all the way down onto the shaft, until till the hub touches the gap-setting plate.

CAUTION! For optimal performance, fit the magnet and hub assembly ONE time only. Do not remove and reassemble these components.

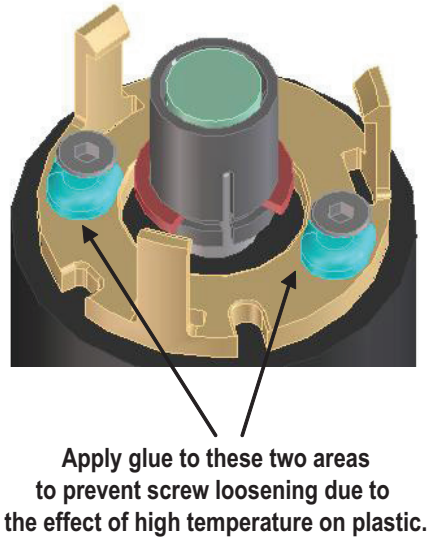
Figure 6: Positioning for Magnet and Hub Press-Fit



8. Remove the gap plate.
9. Due to the properties of plastic softness at high temperatures, apply glue to the screw-plastic interface to prevent screw loosening. Glue may be applied to the underside of the plastic base plate when deemed appropriate by the end user. For optimal results, the gluing surface has to be free from contamination, i.e. grease.

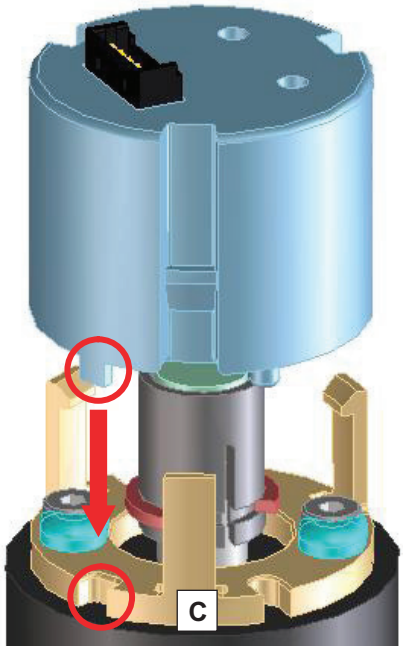
NOTE: Use a high-temperature rated adhesive, such as Hernon Ultra Poxy 317.

Figure 7: Glue Prevents Screw Loosening



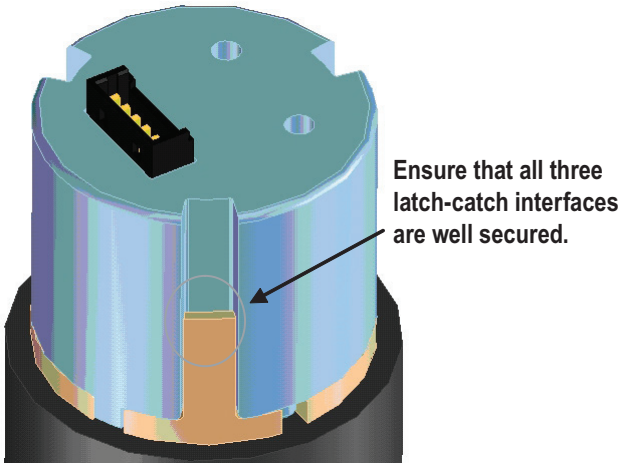
10. With the latch marked C positioned in front, and with the screws positioned on the left and right, assemble the plastic housing to the base plate.
    - Use the rectangular protrusion on the plastic housing and the matching slot in the base plate as guides; see the circled region and arrow indicator in Figure 8.
    - Press-fit the combination downward with a force of 4 kgf, without tilt.

Figure 8: Align the Housing and Base Plate



11. Check that the three latch-catch interfaces are secured; see Figure 9.

Figure 9: Secure Latch-Catch Interfaces



CAUTION! For optimal performance, the base plate and plastic housing assembly are recommended for a ONE time assembly process only. A removal and reassembly process should be avoided, due to the potential weakness of the latch after reassembly.

Optional Female Connectors

For interface purposes, the following female connectors may be used with the AEAT-601x/901x series magnetic encoders.

Manufacturer	Part Number[a]	Notes
Joint Tech Electronic Ind	A1250H-05P	Temperature range –25°C ~ 85°C
Molex	51021-0500/50079	Temperature range –40°C ~ 85°C

a. Customers/users are encourage to evaluate the connectors and other connectors that fit their application.