

# SANDEL®

## COMPONENT MAINTENANCE MANUAL FOR SANDEL SN4500 Primary Navigation Display

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## REVISION SHEET

REV	Date	Pages	Para.	DESCRIPTION OF CHANGES
D	March 4, 2014	4-6 11-12	3. 5.	A/R 1405: Added Section 3.1, LCD Panel Dust Removal Procedure A/R 1391: Added Section 5, procedure for installing shorter Encoder Knobs.
C	Jul 14, 2008	3-6	4.	A/R 1020: Added procedure for changing window
B	Mar 27, 2007	3	2.	Added software release via Service Bulletins
A	Nov 29, 2006	All	All	A/R 867: Initial Release

## 1. APPLICABILITY

This document is applicable to maintenance for continued airworthiness of Sandel SN4500 Primary Navigation display:

Unit part number: SN4500-xxx, Software revision 1.00 or later

## 2. UPLOADING SYSTEM SOFTWARE AND DATABASES

System software is released via a Service Information Letter (SIL) or via a Service Bulletin (SB) posted on the Sandel website. The SIL or SB contains links to the software and the related software installation files necessary to load the software. Database updates are available for purchase via the Sandel website. The database information site also contains up-to-date links to database download instructions.

The SIL's, SB's and Database update information can be found at: [www.sandel.com](http://www.sandel.com) under "Support".

## 3. OTHER MAINTENANCE

### 3.1. LCD Panel Dust Removal Procedure

The SN4500 draws unfiltered air from the environment for cooling. During normal operation, dust can enter the interior of the SN4500. If dust collects on the surface of the LCD Panels, it can show up as colored spots (red, green, or blue) on the display. This procedure details the necessary steps to remove accumulated dust from the LCD Panels.

#### Tools required

#2 Phillips head screwdriver

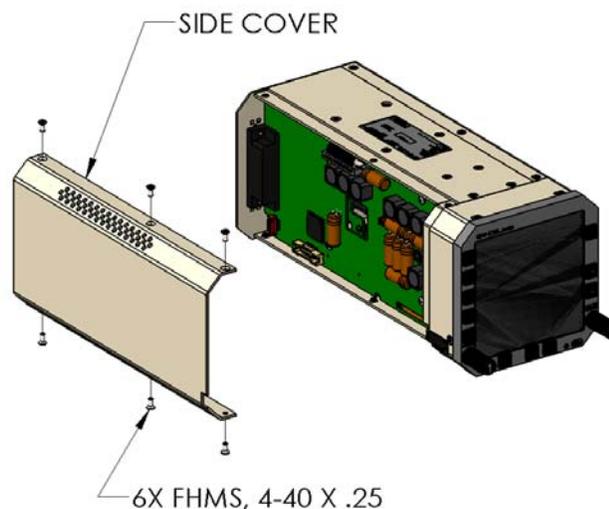
Spray Duster, Dry Filtered Compressed Air @ 40 PSI Max (or equivalent).

#### **Procedure Notes:**

- A. Read through entire procedure first to familiarize yourself with the part terminology and assembly sequence.
- B. Perform this operation in a clean environment to prevent damage to/foreign object contamination of open unit.
- C. Electrostatic Discharge (ESD) control practices must be observed when performing this procedure.
- D. If using an Aerosol Spray Duster, do not shake, tilt, or invert can, or else product may be dispensed in liquid form.
- E. Compressed air used for this procedure shall be dried and filtered and limited to 40 PSI Max.

#### **Step 1. Remove Left Hand Side Cover:**

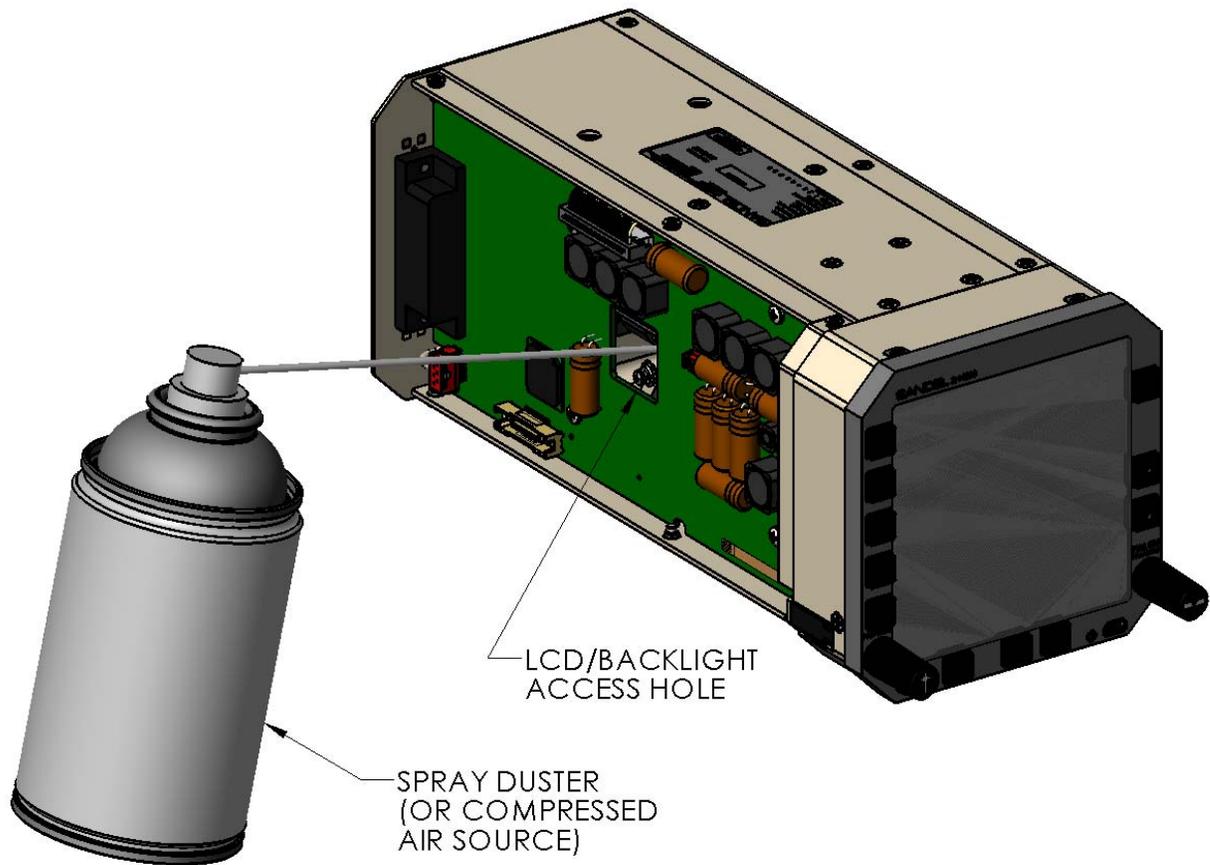
1. Unscrew and remove 6 ea Flat Head Machine Screw, 4-40 X .25 retaining Left Hand Side Cover from SN4500.
2. Remove Left Hand Side Cover from SN4500. Use caution when handling open unit to prevent damage to cables, connectors, and sensitive electronic components that will be exposed during the balance of this operation.



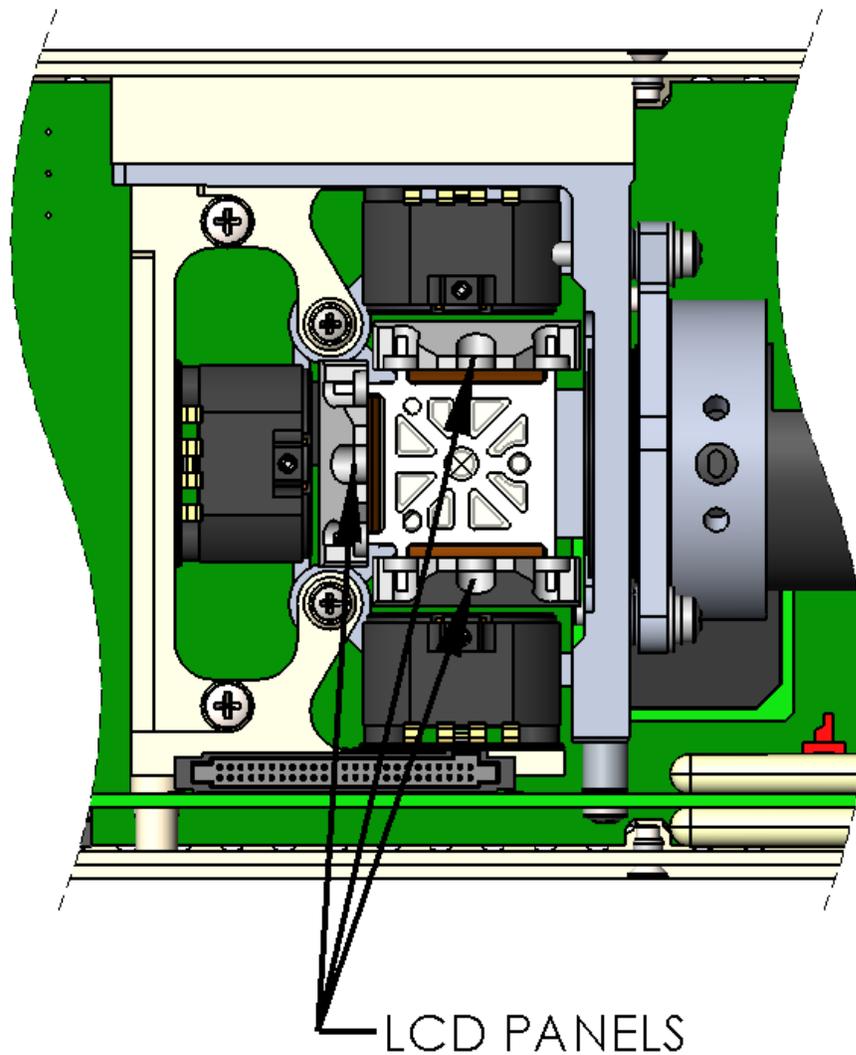
**Figure 1. Side Cover Removal**

## Step 2. Remove Dust From LCD Panels

1. Direct nozzle of Spray Duster or Compressed Air Source into LCD/Backlight Access Hole in exposed circuit board. If needed, use plastic extension tube on Spray Duster/compressed Air Source. Do not insert metallic objects into interior of unit.
2. Direct flow from Spray Duster/Compressed Air Source onto LCD Panels to blow loose dust from LCD Panels. Note: There are 3 LCD Panels in units. Ensure thorough dust removal from all 3 panels.



**Figure 2. Blow Dust From LCD Panels**



**Figure 3. LCD Panel Arrangement**  
**(obstructing components removed for clarity)**

**Step 3. Re-install Side Cover:**

1. Upon completion of dust removal operation, reinstall Side Cover (See Figure 1).
2. Secure side cover using 6 ea 4-40 X .25 Flat Head Machine Screws. Ensure screws are fully seated. Torque Screws to 6 +/- 1 in-lb.

**Step 4. Verify installation:**

1. Ensure Side Cover is properly installed and that all fasteners are properly installed and torqued.
2. Install unit into aircraft and perform functional test.
3. Inspect unit for original condition. Stubborn accumulations that aren't removable using the above procedure may require return to Sandel for further remediation.

## 4. FIELD REPAIR

Window replacement is the only authorized in-field repair allowed on the SN4500 per the following procedure. Replacement display windows, Sandel part number 61152 may be ordered from Sandel.

### Tools required

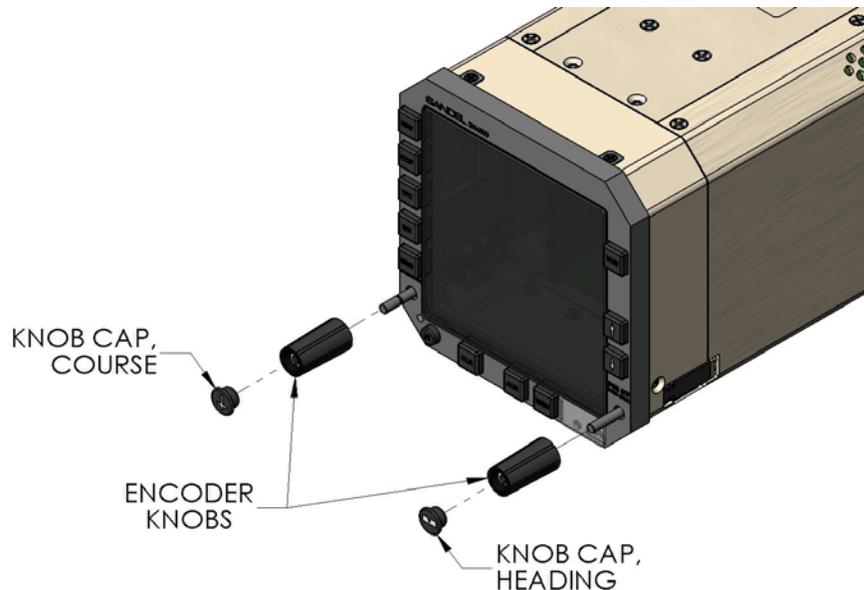
Small flat blade screwdriver

#1 Phillips head screwdriver

**Important!** Read through entire procedure first to familiarize yourself with the part terminology and assembly sequence. Perform replacement in a clean environment.

Step 1. Remove encoder knobs:

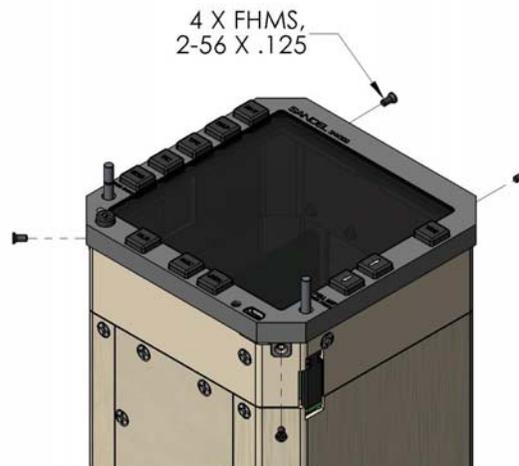
1. Carefully pry heading and course knob caps from encoder knobs using a small, flat blade screw driver or similar.
2. Loosen encoder knob collets using a flat blade screw driver and remove encoder knobs from encoder shafts.



**Figure 1. Encoder knob removal**

## Step 2. Remove bezel retaining screws

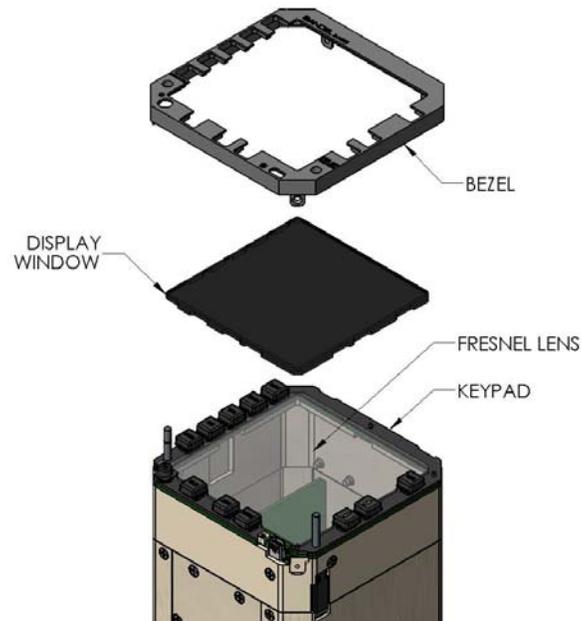
1. Place unit upright on bench.
2. Remove 4 ea flat head machine screws, 2-56 X .125 retaining bezel to actuator housing. Hold bezel in place to prevent shifting of retained components.



**Figure 2. Remove bezel retaining screws**

## Step 3. Remove bezel and window:

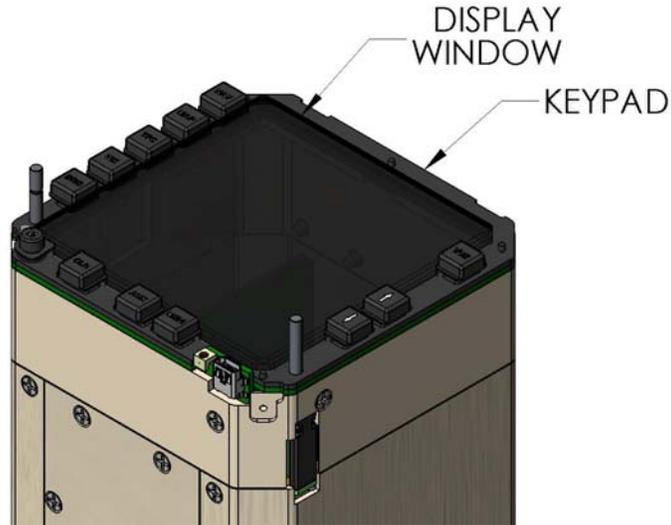
1. Carefully lift bezel from unit while disengaging bezel buttons and rubber keypad from bezel. Do not remove or shift keypad, keypad circuit board, or Fresnel lens.
2. Remove existing window from unit.



**Figure 3. Window removal**

Step 4. Install replacement window:

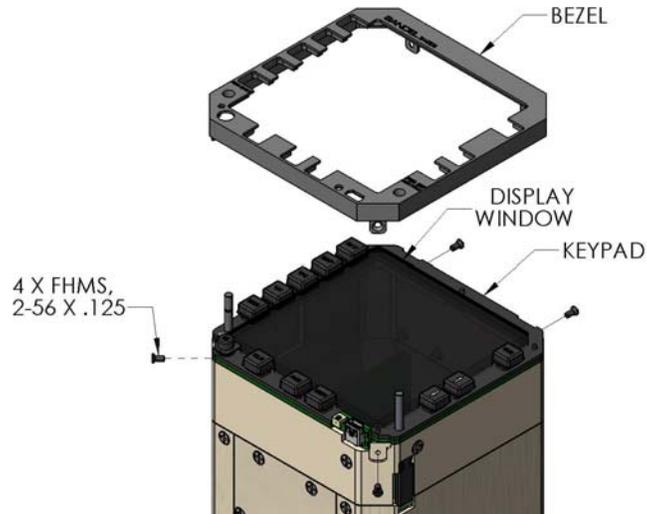
1. Align replacement window to keypad and place onto Fresnel lens of face of unit.
2. Ensure that keypad, keypad circuit board, and Fresnel lens are properly located and have not shifted during procedure.



**Figure 4. Reinstall window**

Step 5. Reinstall bezel:

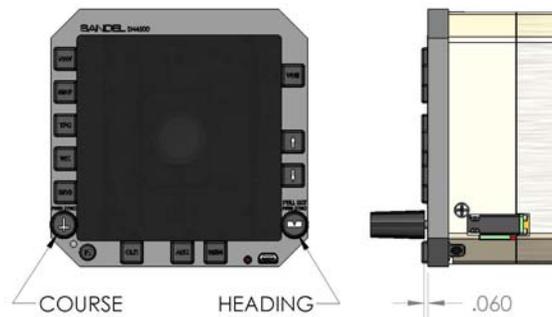
1. Carefully reinstall bezel onto unit actuator housing. Ensure that the machined lip in window engages bezel opening and that bezel fully seats.
2. Reinstall 4 ea flat head machine screws, 2-56 X .125.



**Figure 5. Reinstall Bezel**

## Step 6. Reinstall encoder knobs:

1. Place encoder knobs over encoder shafts.
2. Leave approximately 0.06" (1.5mm) gap between back of encoder knob and face of bezel.
3. Tighten encoder knob collets using flat blade screw driver. Verify knob operation by rotating knob and pushing in knob. Detent in knob push should be detectable and knob should not contact bezel. When depressed, verify gap dimension by slipping a piece of paper between the knob and the bezel (paper is approximately 0.005" [0.1mm]). The paper should fit easily.
4. Reinstall encoder knob caps into encoder knobs. Ensure proper location of heading and course caps.



**Figure 6. Reinstall Encoder Knobs**

## Step 7. Verify installation:

1. Ensure that all affected components are installed.
2. Ensure that bezel retaining screws are securely installed.
3. Ensure that all bezel buttons operate freely, without binding.

## 5. ENCODER KNOB REPLACEMENT

Some SN4500 installations may require the installation of shorter Encoder Knobs to provide additional clearance between SN4500 and aircraft controls or structure. The following procedure details the installation of Tyco Electronics P/N PKG40B-1/8 Knobs onto the SN4500. Tyco Electronics P/N PKG40B-1/8 Knobs may be ordered directly from the component manufacturer.

### Tools required

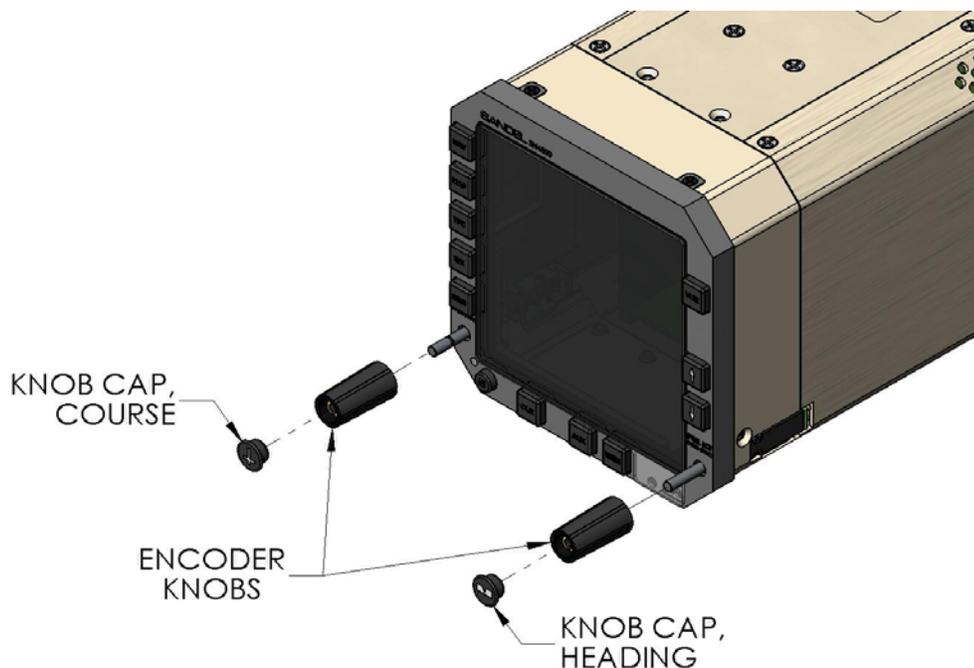
Small flat blade screwdriver

3/32" Hex Wrench

**Important!** Read through entire procedure first to familiarize yourself with the part terminology and assembly sequence. Perform replacement in a clean environment.

Step 1. Remove standard Encoder Knobs:

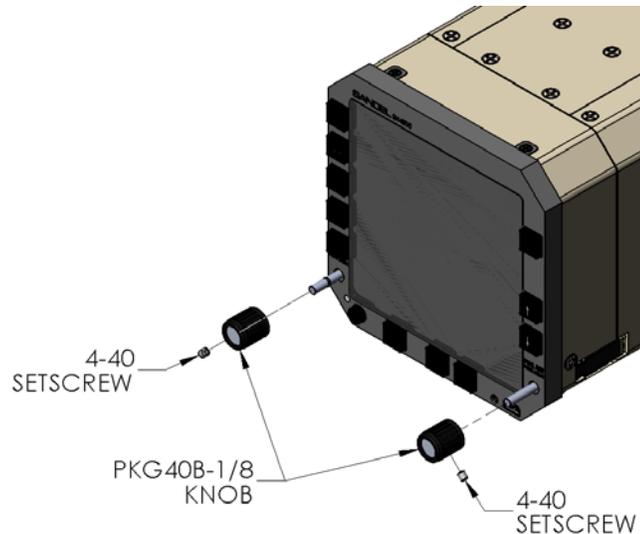
1. Carefully pry Heading and Course Knob Caps from Encoder Knobs using a small, flat blade screw driver or similar.
2. Loosen Encoder Knob collets using a flat blade screw driver and remove Encoder Knobs from encoder shafts.



**Figure 7. Encoder knob removal**

## Step 2. Install Encoder Knobs:

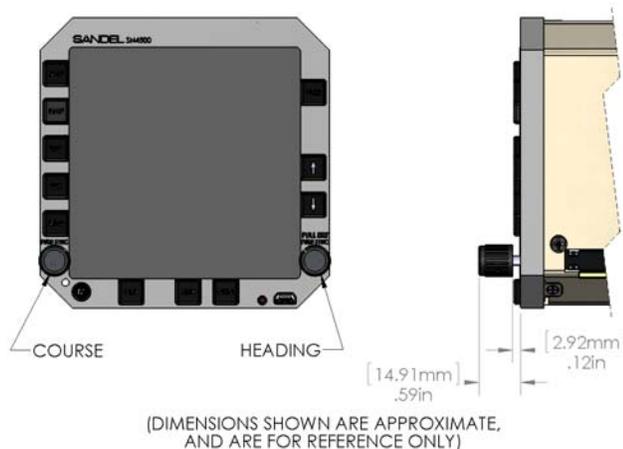
1. Place Tyco P/N PKG40B-1/8 Encoder Knobs over Encoder Shafts. It may be necessary to loosen #4-40 setscrew in Knob to allow for installation on Encoder Shaft.
2. Leave approximately 0.06" (1.5mm) gap between back of encoder knob and face of bezel.
3. Fully seat Knobs onto Encoder Shafts and tighten Knob setscrews using a 3/32" Hex Wrench. Verify knob operation by rotating knob and pushing in knob. Detent in knob push should be detectable and knob should not contact bezel.



**Figure 8. Reinstall Encoder Knobs**

## Step 3. Verify installation:

1. Ensure Encoder Knobs are fully seated onto Encoder Shafts.
2. Ensure that Encoders operate freely, without binding, and that Knobs don't contact face of bezel when pushed.



**Figure 9. PKG40B-1/8 Encoder Knobs Installed**