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# SERVICE INFORMATION LETTER

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SIL T-061  
Revision 2  
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- DATE: August 7, 2017
1. SUBJECT: Fuel Quantity Transmitter Upgrade
  2. MODEL: 480 and 480B
  3. EFFECTIVITY: Aircraft Equipped with Aerotech Fuel Cells  
(480/480B: S/N 5014-5197)
  4. REFERENCE: Enstrom TH-28/480 Series Illustrated Parts Catalog, Rev. 10 or Later Revision
  5. BACKGROUND:

Enstrom helicopters configured with Fuel Quantity Transmitter, P/N ECD4037-( ), may upgrade to the newer version, P/N ECD4092-1, by incorporating kit P/N 4230008. This upgrade may be required if the original fuel quantity transmitter, P/N ECD4037-( ), needs replacement.

The kit includes the fuel quantity transmitter, fuel quantity indicator, wire assemblies, and associated parts to complete the installation.

This Service Information Letter (SIL) is intended to make operators aware that the fuel quantity transmitter kit, P/N 4230008, is available and to provide instructions to perform the installation.

Revision 2 removes the option of modifying and installing the existing cover and clarifies the instructions for installations configured with the Ultra Electronics Flightline Systems (Ultra) brand indicator.

6. COMPLIANCE:

At owner/operator option, or if the original fuel quantity transmitter, P/N ECD4037-( ), requires replacement, install kit P/N 4230008 in accordance with paragraph 6.1.

Enstrom Conversion Kit P/N 4230008 is comprised of two conversion kit configurations, 4230008-1 and 4230008-5. Select the conversion kit configuration based on the part number of the fuel quantity indicator that is currently installed in the aircraft. (Refer to paragraph 7.) The part number of the fuel quantity indicator is located on the nameplate affixed to the indicator. The part number will be ECD4038-3 or ECD4038-5. If the indicator is identified as ECD4048-5, accomplish SDB T-059 before proceeding.

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**NOTES:** Refer to Enstrom kit drawing 4230008 for installation detail.

All installation hardware is supplied with the kit, unless otherwise noted.

Safety wire and cotter pin requirements shall meet the standard acceptable practices defined in Enstrom Document 28-SP-102 (28-SP-102 is included with the kit).

Standard torque requirements shall meet the standard acceptable practices defined in AC43.13-1B, and Enstrom Document 28-SP-103 (28-SP-103 is included with the kit).

All electrical attachments, cable installation and supports for routing shall meet the standard acceptable practices defined in AC43.13-1B, AC21.99, and Enstrom Document 28-SP-133 (28-SP-133 is included with the kit).

Paint/painting is the installer's responsibility.

The 4230008-3 kit provides detail for modifying the foam baffle installation to facilitate installation of the new fuel probe. This modification is only required if there is insufficient clearance with the foam baffles when installing the new fuel quantity transmitter.

Burnishing is the process of removing paint from an area and applying Alodine/Kopr Shield to exposed area to prevent corrosion. This creates an electrically bonded surface. The electrical bond between all burnished surfaces is very important for all resistance checks to be within limits.

- 6.1 Disconnect the battery. (Refer to MM, Para. 6-28.)
- 6.2 Defuel the aircraft. (Refer to MM, Para. 4-5.)
- 6.3 Remove the upper plenum/air inlet. (Refer to MM, Para. 13-28.)
- 6.4 Remove the fuel quantity transmitter cover. (Refer to Drawing No. 4230008, Sheet 2, Zone B-4.) Retain the screws. Discard the cover and gasket.

**NOTE:** When separating the fuel cell skin from the cell structure, note that the fuel cell skin includes a doubler bonded to the inside of the fuel cell cover. When removing the fuel cell skin, the skin and doubler is removed as one assembly.

- 6.5 Remove the R/H fuel cell skin. (Refer to MM, Para. 8-14.)
- 6.6 Cut the old fuel quantity transmitter wiring harness plug. Remove hardware and discard. (See Figure 1.)

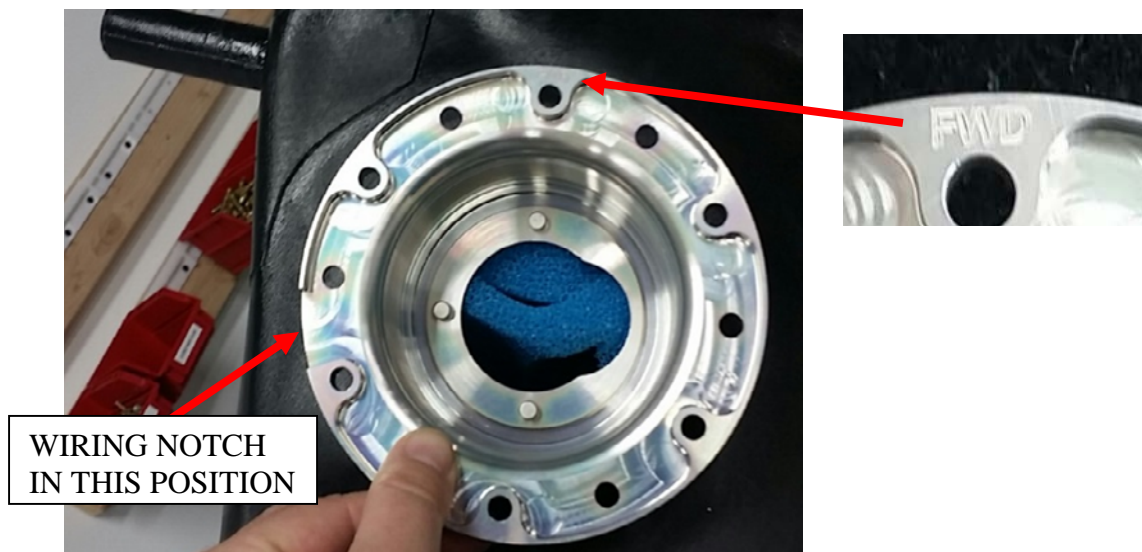
**NOTE:** Retain the old probe, flanged mount plate, and spacers to determine weight calculation.

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- 6.7 Remove the fuel quantity transmitter from fuel bladder. (Contact Product Support about quantity transmitter credit.) Record weight.
- 6.8 Remove the fuel quantity transmitter flanged mount plate assembly, gasket, spacers, and associated hardware from the bladder. (Refer to Drawing No. 4230008, Sheet 2, Detail A.) Record the weight of the flanged mount plate, then discard.
- 6.9 Place gasket (P/N ECD4049-13) over the hole in the R/H fuel bladder and align holes. (Refer to Drawing No. 4230008, Sheet 4, Detail E and Detail X.)
- 6.10 Install the flange cup assembly (P/N 4122084-1) on the bladder as shown in Figure 2. Take note of the required orientation for proper installation.



*Figure 1. Wiring Cutting Location*



*Figure 2. Flange Cup Assembly*

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6.11 Install six bolts (P/N NAS6604H2) and six washers (P/N NAS1149F0432P) and torque to 30 in-lbs/3.4 Nm. (Refer to Drawing No. 4230008, Sheet 4, Zone A-4, Detail X.)

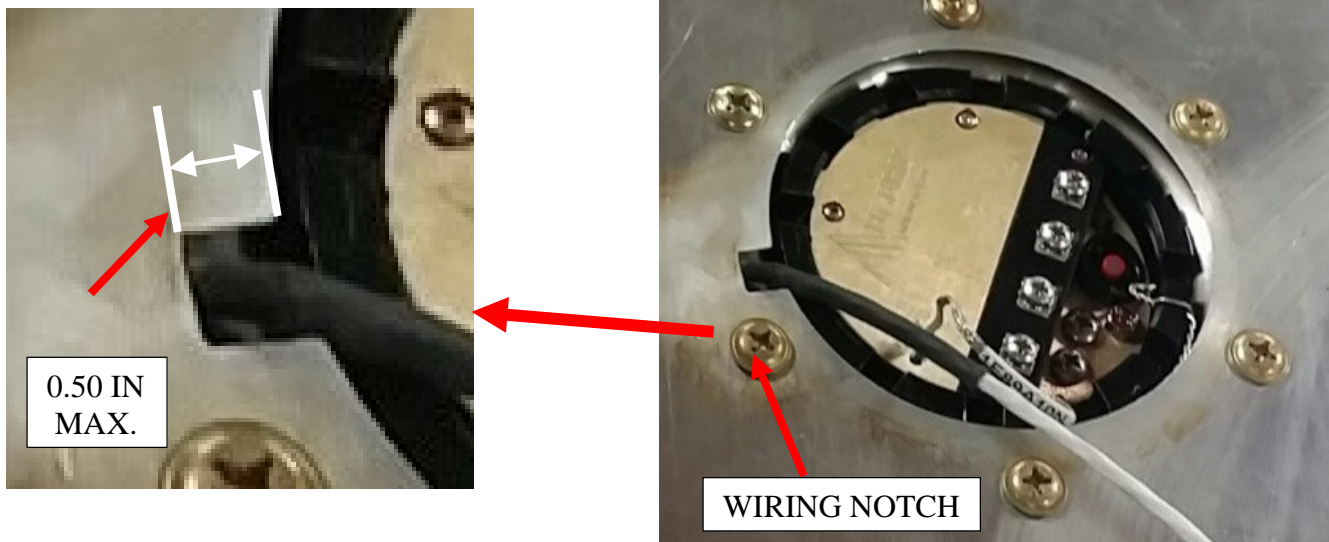
**NOTE:** To assist with the fuel quantity transmitter installation, a clean broom handle or PVC pipe may be used to help align the foam baffles. Take extra care not to damage the foam baffles while installing the transmitter.

6.12 Install Ahlers Fuel Quantity Transmitter (P/N ECD4092-1). (Refer to MM, Para. 10-51.)

6.13 Modify the R/H skin as follows:

- A. Attach the fuel quantity transmitter cover to the skin using the three existing mounting holes.
- B. Drill the three additional 0.281 in/7.1 mm diameter holes in skin.
- C. Remove the cover and retain for step 6.19.M.
- D. Cut a 0.40 in/10.2 mm wide and 0.50 in/12.7 mm max. deep notch in the skin for wiring clearance (notch is to line up with the notch in the flange cup assembly (P/N 4122084-1). Radius the inside and outside corners of the notch. (Refer to Drawing No. 4230008, Sheet 4, Zone B-3, Detail C and also see Figure 3.)

**NOTE:** The shape of the notch is the option of the installer.



*Figure 3. Wiring Notch Location*

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6.14 Modify the electrical system as follows:

**NOTE:** All electrical attachments, cable installation, routing and supports are to meet the standard acceptable practices as defined in Section 8 of AC 43.13-1B.

- A. Drill a 0.144 in/3.7 mm diameter hole in the approximate center of the pylon gusset. Do not drill into the gusset radius. Burnish paint 0.375 inch/10 mm from around the hole. Apply CP8-TB Kopr Shield to the burnished area. (Refer to Drawing No. 4230008, Sheet 4, Zone A-1, Detail F and also see Figure 4.)



*Figure 4. Pylon Gusset Modification (fuel cell structure removed for clarity)*

- B. Remove the instrument panel shroud. (Refer to MM, Para. 7-3.)
- C. Disconnect and remove the existing fuel quantity indicator from the instrument panel. (Refer to MM, Para. 7-11.)
- D. Cut the fuel quantity indicator wiring at the connector (J159 (Ahlers/Horizon/Ultra); J132 (Insko/Modern Instrument)) and discard.
- E. Burnish the inside surface of the instrument panel where the instrument clamp (P/N 2212000) makes contact. Apply Alodine 1132 to the burnished areas. (Refer to Drawing No. 4230008, Sheet 6, Zone B-1, View N and also see Figure 5.)

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*Figure 5. Burnished Panel Area*

- F. Install the fuel quantity indicator (P/N ECD4038-5) provided with the kit. (Refer to MM, Para. 7-14.)

**NOTE:** On earlier aircraft with the low rotor RPM speed amplifier installation, the signal converter must be installed to the inboard side of the gusset.

- G. Position the signal converter (P/N ECD4093-1) on the pilot side instrument panel gusset. Match drill four 0.144 in/3.7 mm diameter holes through the gusset. Burnish both sides of the gusset and both sides of the signal converter around the hole for the grounding wire attachment. Apply CP8-TB Kopr Shield to burnished areas. (Refer to Drawing No. 4230008, Sheet 6, Zone A-4 and also see Figure 6 on Page 7.)



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**Figure 6. Signal Converter Positioning; Outboard Side of Gusset (left) or Inboard Side of Gusset (right)**

- H. Install the signal converter mounting hardware. The hardware consists of four screws (P/N MS35206-227), four washers (P/N NAS1149FN616P), and four nuts (P/N MS21044N06).

**NOTE:** Reserve the aft top hole in the signal converter's installation tab for installing the grounding wire assembly (P/N 4230008-15). (Refer to Drawing No. 4230008, Sheet 5, View J.)

**NOTE:** For Inco or Modern Instrument Indicators, proceed to Step I and skip Step J. For Ahlers, Horizon, or Ultra Indicators, skip Step I and proceed to Step J.

- I. Remove the fuel quantity system wiring/connectors associated with the Inco Indicator (P/N 5707-3069) or the Modern Instrument Indicator (P/N S240-12005) as applicable. (Refer to Page MM 6-97.2, Diagram 6-12, Sheet 3 of 5). Remove the following wiring from the aircraft and discard.

- 1) J132
- 2) 1E61A22N
- 3) 1E60A22N
- 4) 1E58A22
- 5) 1E59A22
- 6) J133
- 7) 1L93A22
- 8) 1L94A22N



- J. Remove the fuel quantity system wiring/connectors associated with the Ahlers Indicator (P/N 263-30006) or the Horizon/Ultra Indicator (P/N 7762-480) as applicable. (Refer to Page MM 6-98, Diagram 6-12, Sheet 4 of 5). Remove the following wiring from the aircraft and discard:

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- 1) J159
- 2) 1E71A22
- 3) 1E61A22N
- 4) 1E60A22N
- 5) 1E58A22
- 6) 1E59A22
- 7) J133
- 8) 1L81A22
- 9) 1L80A22N



- K. Route the new wire assembly (P/N 4230008-13) and harness assembly (P/N 4230008-11) following where the old wires were removed. Start from the instrument panel and work aft. (Refer to Drawing No. 4230008, Sheet 5, Zone B-4, and Sheet 8, Zone A-3,4). Secure the harness assembly in accordance with 28-SP-133 (included with the kit).
- L. If the circuit breaker panel is equipped with a 2 amp FUEL QTY breaker, remove the circuit breaker (Insc0/Modern Instrument system only; Ahlers/Horizon/Ultra systems are already equipped with a one amp breaker). (Refer to MM, Para. 6-18.) Replace with a 1 amp circuit breaker (P/N 7277-5-1). (Refer to Drawing No. 4230008, Sheet 7 and MM, Para. 6-21.) Connect wiring in accordance with Drawing No. 4230008, Sheet 8, Zone A-3.
- M. Test the following:

**NOTE:** Any kinks in the bonding jumper braided wires will cause the resistance check to exceed limits.

- 1) The bonding jumper connection shall not exceed a resistance of 30 milliohms. (Refer to Drawing No. 4230008, Sheet 8, Fuel Quantity System Interface w/ Ahlers Quantity Transmitter & Converter.) Check resistance at:
  - a. Starboard side fuel tank attachment pylon bracket (1E89A19N).
  - b. Port side instrument console gusset (1M109A12N).
- 2) Case bond resistance to the aircraft structure shall not exceed 2.5 milliohms. Resistance shall be less than 2.5 milliohms between the signal converter and the fuel quantity indicator. (Refer to Drawing No. 4230008, Sheet 8, Fuel Quantity System Interface w/ Ahlers Quantity Transmitter & Converter; pay special attention to Case Bonds at Flag Marker 11 and Bonding Jumpers at Flag Marker 12.)
  - a. Signal converter
  - b. Fuel quantity transmitter
  - c. Fuel quantity indicator

6.15 Install the instrument panel shroud. (Refer to MM, Para. 7-6.)

6.16 Install the R/H fuel skin. (Refer to MM, Para 8-15.)



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6.17 Install the upper plenum air inlet. (Refer to MM, Para. 13-31.)

6.18 Install the battery. (Refer to MM, Para. 6-31.)

**CAUTION: Fuel Quantity Transmitter must be calibrated prior to any ground or flight testing. Proceed to step 6.19.**

6.19 Calibrate the fuel quantity transmitter (P/N ECD4092-1) as follows:

- A. Ensure the tank is defueled. (Refer to MM, para. 4-5.)
- B. Level the aircraft. (Refer to MM, para. 4-67.)
- C. Position the aircraft 6° nose down (longitudinally) and level laterally.
- D. Service the fuel system with 0.7 gallons/2.65 L (1.9 gallons/7.2 L of fuel with airframe mounted fuel filter) of fuel from a graduated cylinder and wait 10 minutes. This amount represents an empty tank (unusable fuel).
- E. Apply 28 VDC power to the aircraft. Ensure FUEL QTY and CAUT PNL circuit breakers are set.
- F. Set the Zero Fuel (“Empty”) indication as follows. (Remove the screw to access the adjustment potentiometer; retain for reinstallation.)
  - 1) Push and hold the push button switch. The LED should be off. If not, turn the potentiometer CCW until LED extinguishes.

**NOTE: If the empty adjustment is rotated too far in the CCW position, the LED will illuminate. In the case of over-adjusting, rotate the potentiometer CW until the LED extinguishes.**

- 2) While holding the switch down, adjust the potentiometer CW until the LED just illuminates. Release the switch and the LED will extinguish. The “Empty” has been reset.
- G. Remove aircraft power.
- H. Service the fuel system with the amount of fuel that represents a full tank and wait 10 minutes.
- I. Apply aircraft power.
- J. Set the “Full” Fuel indication as follows. (Remove the screw to access the adjustment potentiometer; retain for reinstallation.)
  - 1) Push and hold the push button switch. The LED may momentarily blink, but must remain off. If not, turn the potentiometer CW until LED extinguishes.

- 2) While holding the switch down, adjust the potentiometer CCW until the LED just illuminates. Release the switch and the LED will extinguish. The "Full" has been reset.
- K. Reinstall the sealing screws over the empty and full adjustment potentiometers.
- L. Perform a bonding check using a milliohm meter. (Clean bonding and grounding surface thoroughly before performing the bonding check.)
- 1) Check the resistance from the mounting flange of the fuel level transmitter to the aircraft ground. Resistance shall be 3.0 milliohms or less.
  - 2) Check the resistance from the converter case to aircraft ground. Resistance shall be 3.0 milliohms or less.
- M. Install the gasket and install the fuel quantity transmitter cover.
- N. Bleed the fuel system in accordance with the Rolls-Royce 250-C20 Operation and Maintenance Manual.

7. PARTS:

- 7.1 Enstrom Conversion Kit P/N 4230008, Revision A or later revision, is comprised of two conversion kit configurations, 4230008-1 and 4230008-5, and one modification kit configuration, 4230008-3.
- A. Select the conversion kit configuration based on the part number of the fuel quantity indicator that is currently installed in the aircraft. The part number of the fuel quantity indicator is located on the nameplate affixed to the indicator. The part number will be either ECD4038-3 or ECD4038-5. Additional detail is provided in the table below.
- B. The 4230008-3 kit provides detail for modifying the foam baffle installation to facilitate installation of the new fuel probe. This modification is only required if there is insufficient clearance with the foam baffles when installing the new fuel quantity transmitter.

Part Number	Description	Quantity
4230008-1	Insko/Modern Gauge (ECD4038-3) Conversion Kit	1
4230008-3	Foam Baffle Modification Kit	1
4230008-5	Ahlers/Horizon/Ultra Gauge (ECD4038-5) Conversion Kit	1
<b>NOTE</b>		
<b>The following parts are not supplied with the kit and must be furnished by the installer.</b>		
Alodine 1132 Touch-N-Prep Pen Corrosion Inhibitor		
CP8-TB Kopr Shield Compound		

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8. SPECIAL TOOLS: N/A
9. MAN-HOURS: Removal/Reinstallation – 10 hours
10. WARRANTY: Per Enstrom Warranty Policy
11. WEIGHT CHANGE:

Use the recorded weight result of the old fuel quantity transmitter and flanged mount plate and the weights of the new components listed in the table below when determining the weight change.

<b>Item</b>	<b>Weight (lbs)</b>	<b>Station (in)</b>
Signal Converter	0.5	65
Fuel Quantity Transmitter	1.2	139
Flanged Cup Assembly	0.5	139
Spanner Nut	0.2	139

12. LOG BOOK ENTRY: As required for maintenance actions
13. REPETITIVE INSPECTIONS: As required in Section 4 of the maintenance manual