

FAA STC ST03006CH | EASA STC 10044973

Installation of a CMC Dual Class 3 Electronic Flight Bag (EFB) System on Boeing 737 Series Aircraft

OVERVIEW

- » FAA STC ST03006CH
- » European Aviation Safety Agency (EASA) 10044973

Governs the installation of a CMC Electronics Inc. Pilotview® Class 3 Electronic Flight Bag (EFB) system in accordance with Electronic Cable Specialists (ECS) master data list ECS-209302.

YOUR NEEDS

Incorporation of STC ST03006CH will satisfy your needs to install dual EFB equipment onto EFB system provisions that were previously installed in accordance with FAA STC ST02992CH.

YOUR BENEFITS

When combined with the previously installed provisions, the CMC Electronics Inc. Pilotview® Class 3 EFB system provides flight crews the ability to interact with electronic maps, charts, and manuals in lieu of accessing standard paper documentation. System installation will reduce materials costs and aircraft weight without compromising ergonomic concerns.

STC AIRCRAFT EFFECTIVITY

Boeing 737-600/-700/-700C/-800/-900/-900ER series aircraft

STC CONFIGURATIONS & LIMITATIONS

- » **Configuration 1:** Dual CMC Class 3 EFB system installation

STC Limitations: Requires prior or concurrent installation of the dual EFB system wiring provisions, enhanced switching module unit (ESMU), and power converter mounting provisions installation under a separate approval. Reference STC ST02992CH.

PRODUCT DESCRIPTION

This installation consists of installing ADS-B system provisions, including wire harnesses, coaxial cables, equipment trays, antenna structural provisions, and antennas on Boeing 757 aircraft. Additionally, the existing ATCRBS transponders are replaced with either Collins Mode-S transponders or Honeywell Mode-S transponders.

Electrical changes include installation of the following:

- » Harnesses for interconnection of the provisioned Link and Display Processor Unit (LDPU), a Cockpit Display of Traffic Information (CDTI) display and control panel, and a VHF Data Link (VDL) Mode 4 radio transceiver.
- » Data Bus wiring from the existing right and left air data computers to the provisioned LDPU and from the existing left flight management computer to the provisioned LDPU and CDTI display.
- » Wiring for the audio output is added between the existing audio warning unit and provisioned LDPU.
- » Data bus wiring from the existing left radar altimeter and left IRS to the provisioned LDPU. Wiring for discrete signals from the existing EGPWS to the provisioned LDPU.
- » Antenna coaxial cables from the provisioned LDPU to the upper and lower UAT, upper and lower 1090 antennas, and upper GPS antenna. Antenna coax from the provisioned VDL-M4 to the upper VDL-M4 (VHF) antenna.
- » Antenna coaxial cable from the transponder antenna coax switch to the upper Mode-S antenna.

Mechanical changes include installation of the following:

- » 4 MCU Mode-S tray for the right & left Mode-S transponders
- » 6 MCU LDPU tray
- » 3 MCU VDL-M4 tray
- » Upper & lower 1090 MHz antennas
- » Upper GPS antenna
- » Upper & lower Universal Access Transceiver (UAT) antennas
- » Upper VHF antenna

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PRODUCT DESCRIPTION

Configuration 1: Dual CMC class 3 EFB system installation.

The CMC Electronics Inc. Pilotview® EFB is a Class 3 system. The unit is designed to be an open architecture system hosting Type A, Type B, and Type C (airport moving map display) software applications. The installation is configured to support a “user friendly” pilot interface system that has been refined from various airline focus groups.

For this project, the CMC Electronics Inc. Pilotview® EFB system consists of the following:

- » **Electronic Display Unit (EDU):** A battery-powered Pentium class tablet computer. It contains a touch-sensitive active matrix liquid crystal display (AMLCD), surrounded by a set of software definable keys. The EDU also contains a central processing unit, random access memory, batteries, and mass storage for applications and data. The built-in user interfaces are a PCMCIA expansion slot and two USB sockets. There is also a dedicated interface plug that connects the EDU to the remote ESMU. The EDU is powered by a 1.8 amp hour lithium ion battery pack. It can also operate from aircraft power, in which case, the EDU battery will recharge automatically. The EDU does not have any operational software installed. The EDU will only have embedded firmware installed. The EDU has two internal fans and requires no external cooling.
- » **EDU Mounting Bracket Assembly:** Secures the EDU to installed EFB mounting provisions and provides the electrical connections to the EDU.
- » **Enhanced Switching Module Unit (ESMU):** Provides aircraft 429, Ethernet and discrete signal processing and interface to the EDU. The ESMU accepts 28 VDC power from the power converter and supplies the EDU with a regulated 18.0 VDC output. The ESMU does not have any operational software installed. The ESMU will only have embedded firmware installed.
- » **Power Converter:** Converter converts aircraft 115 VAC 400 Hz to 28 VDC to power the EFB system. The 28 VDC power is provided to the ESMU. The power converter does not have any operational software or embedded firmware installed. The EDUs will be mounted in the left and right sliding windows. The ESMUs and power converters will be installed to mounting provisions located in the captain's and first officer's flight bag stowage area.

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INSTALLATION OVERVIEW

As stated previously, the installed CMC dual EFB system consists of two EDUs, two ESMUs, two EDU mount assemblies (which includes Interface I/O cables), and two power converters. A general description of the installation follows and is illustrated in Figure A1:

- » Captain's window: Install EDU, EDU mounting assembly and associated mounting provisions.
- » First officer's window: Install EDU, EDU mounting assembly and associated mounting provisions.
- » Install captain's ESMU and power converters into existing mounting provisions.
- » Install first officer's ESMU and power converters into existing mounting provisions.
- » Remove INOP placards from captain's and first officer's EFB power switch panels.
- » Connect previously capped and stowed power wires to the 115 VAC transfer bus terminal strips.
- » Connect previously capped and stowed 5 VAC and bright/dim/test power wires.
- » Connect previously capped and stowed ARINC 429 data bus wiring for the captain's and first officer's ESMU.
- » INOP placards will be removed from the data load port, and captain's and first officer's sidewall disconnect connectors.
- » A molded "bump-out" section will be added to the quarter sill lining on captain's and first officer's sidewalls.
- » Install 'Caution' placards for armrest operation on the captain's and first officer's sliding windows.

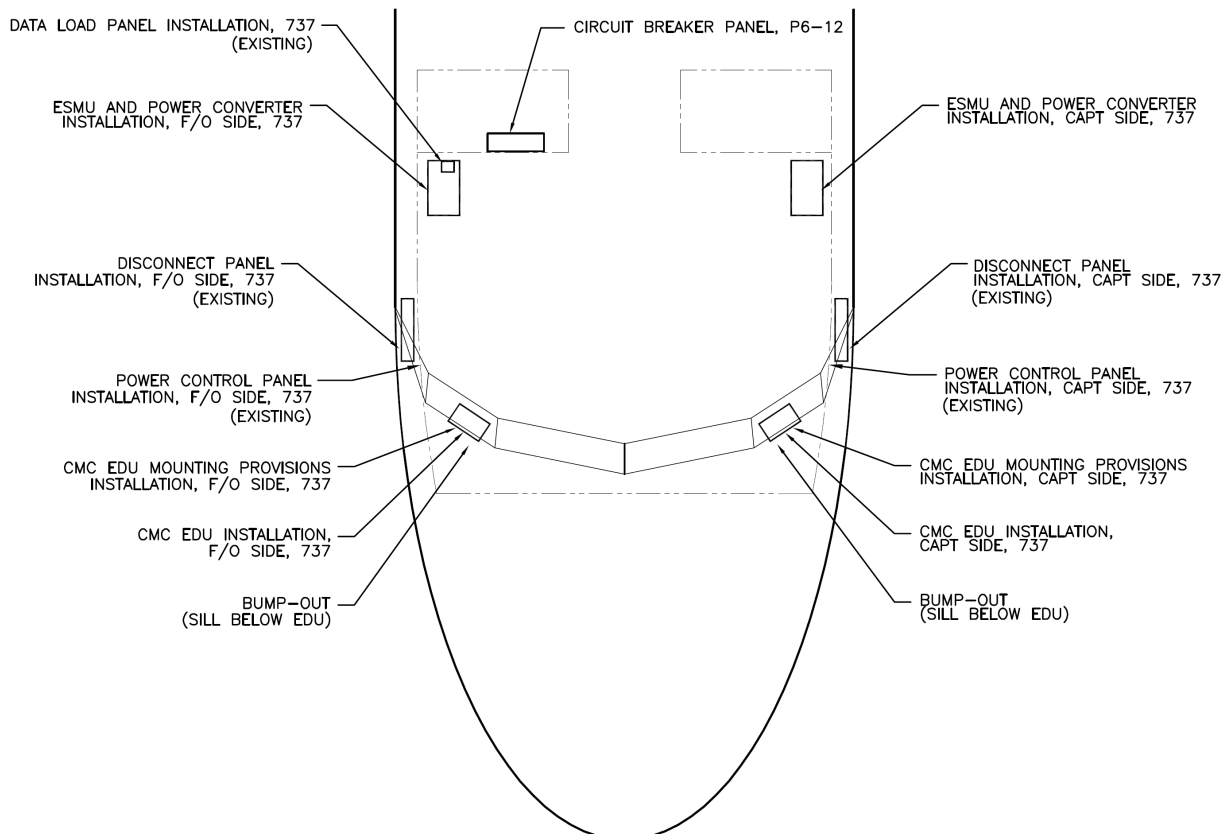


Figure 1:
Installation Overview

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MECHANICAL CHANGES

- » Modify the existing captain's side sliding window to replace the existing window trim and add new mounting brackets under the window trim that attach to the window frame. Add 'Caution' placards regarding armrest operation after EFB installation. See Figure B1. The modification to the first officer's sliding window will be a mirror image of the captain's sliding window.

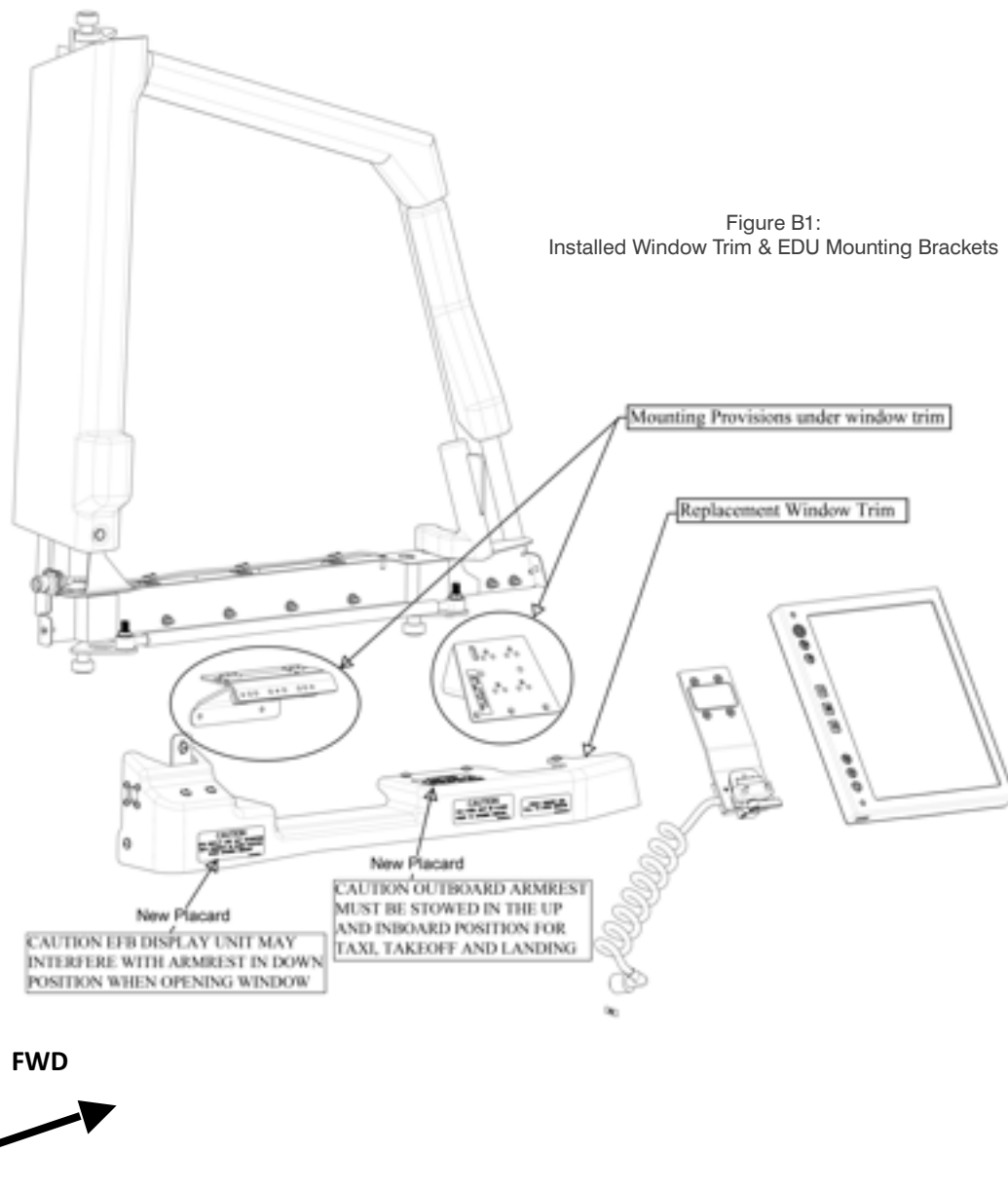


Figure B1:
Installed Window Trim & EDU Mounting Brackets

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- » The new EDU mounting brackets (Figure B1) are designed to hold an EDU mount assembly in a fixed location on the sliding window. The EDU then is docked in the EDU mount assembly. Refer to Figure B2 for details. The first officer's installation is a mirror image. Once installed, the EDU is not removable by the flight crew; it is only removable by maintenance personnel using tools.

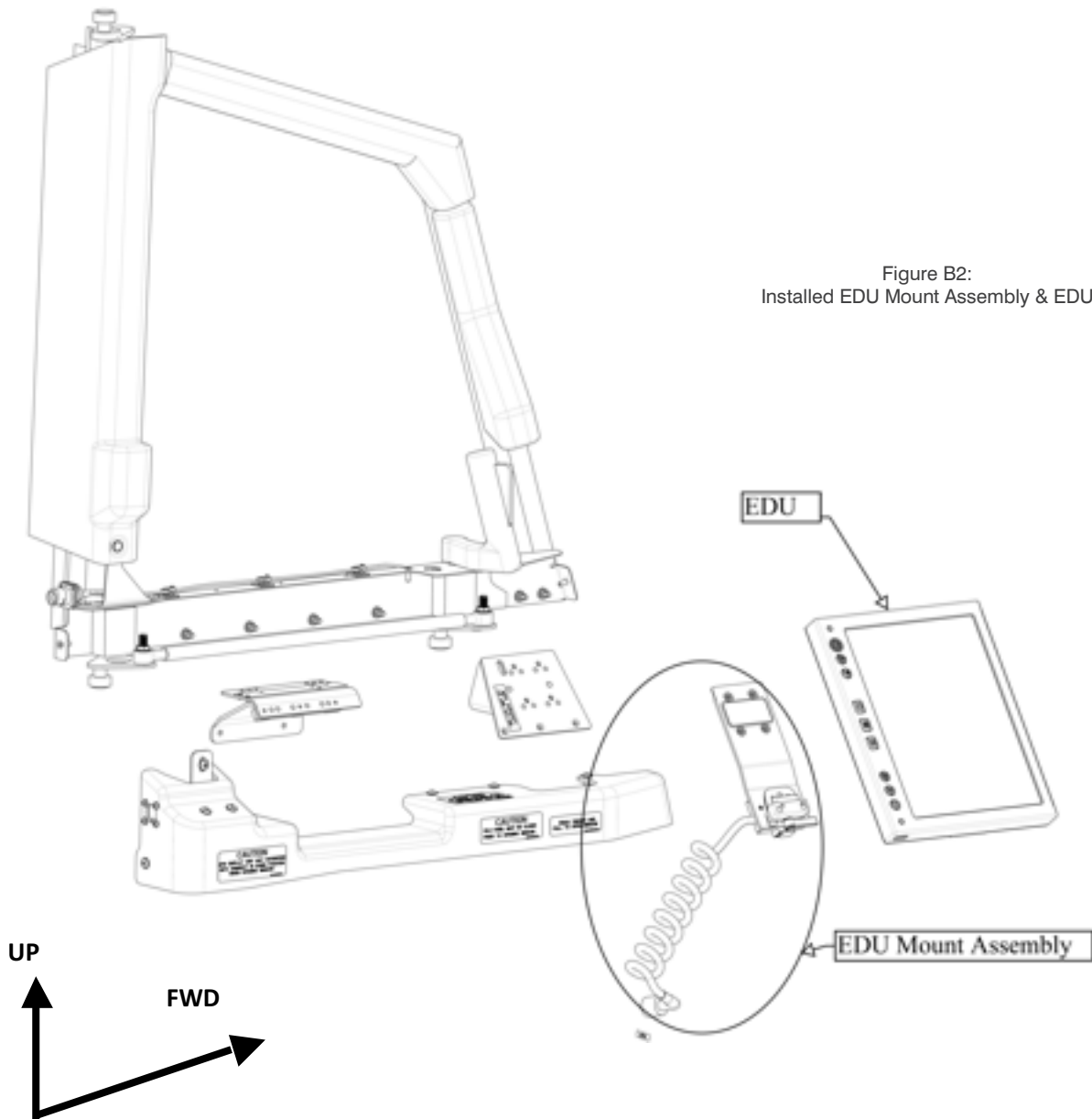


Figure B2:
Installed EDU Mount Assembly & EDU

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- » The connector protective cover and INOP placard on the captain's EDU sidewall disconnect will be removed for activation and the EDU mount assembly coiled cord will be connected. See Figure B3. The first officer's installation is a mirror image.

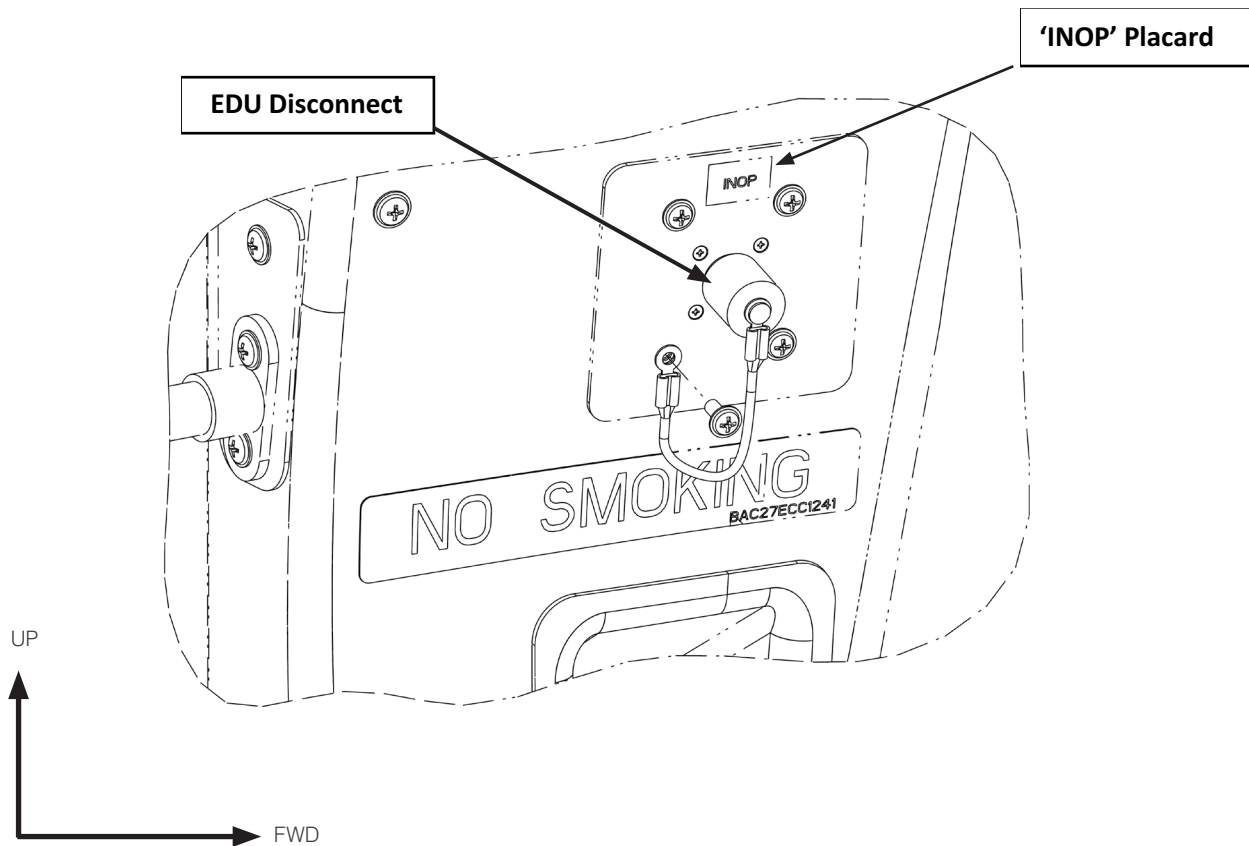


Figure B3:
Captain's EFB Power Control Panel Installation
(First Officer's Side is a Mirror Image)

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- » Remove the existing 'INOP' placard from the captain's EFB power control panel. See Figure B4. The first officer's installation is a mirror image.

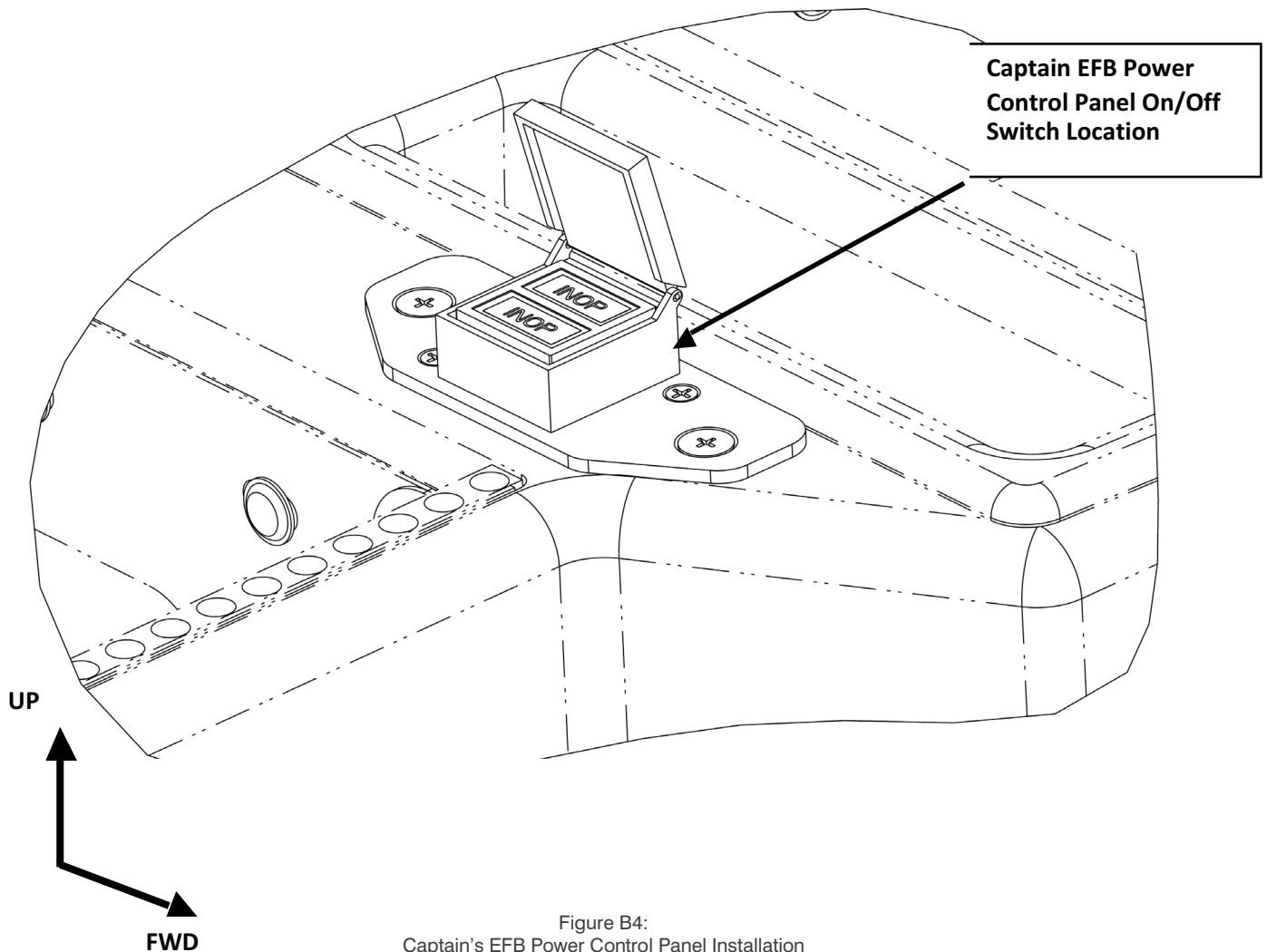


Figure B4:
Captain's EFB Power Control Panel Installation
(First Officer's Side is a Mirror Image)

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- » The captain's ESMU and power converter will be mounted to the existing ESMU/PC mounting bracket located on the aft side of the captain's flight bag storage area. See Figure B5. For ESMU/PC unit location, refer to Figure B8.

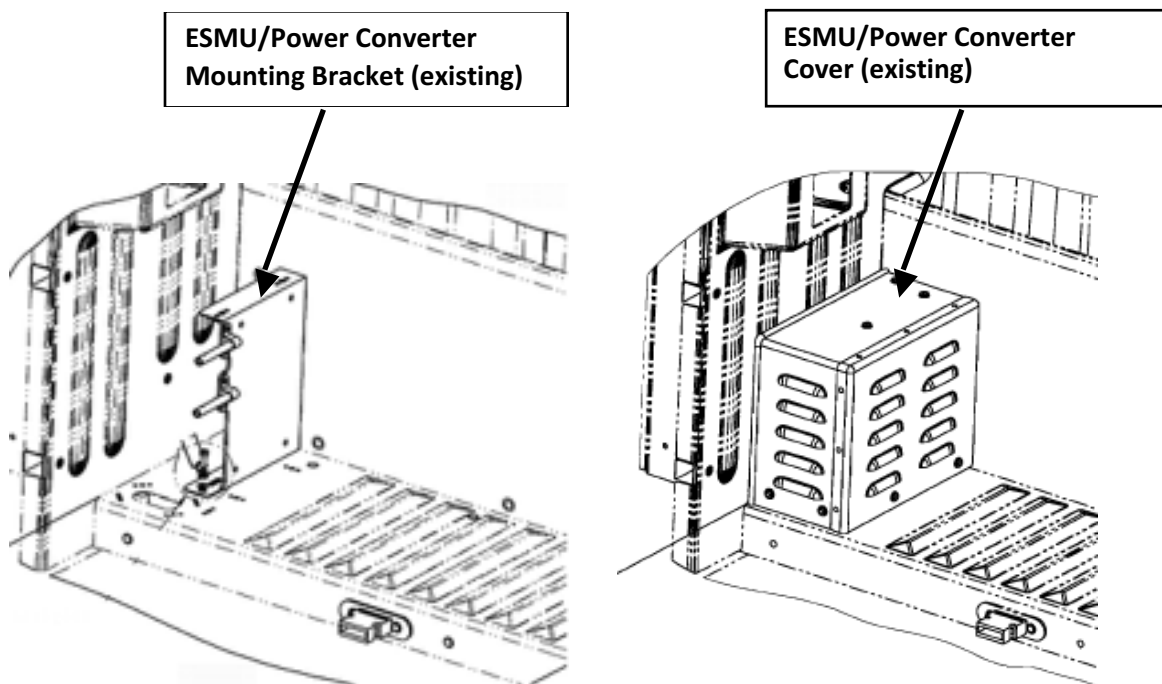


Figure B5:
ESMU & Power Converter Mounting Bracket & Cover Captain's Side

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» The first officer's ESMU and power converter will be mounted on the existing ESMU/PC mounting bracket and is located on the aft side of the first officer's flight bag stowage area. See Figure B6. For ESMU/PC unit location, refer to Figure B8.

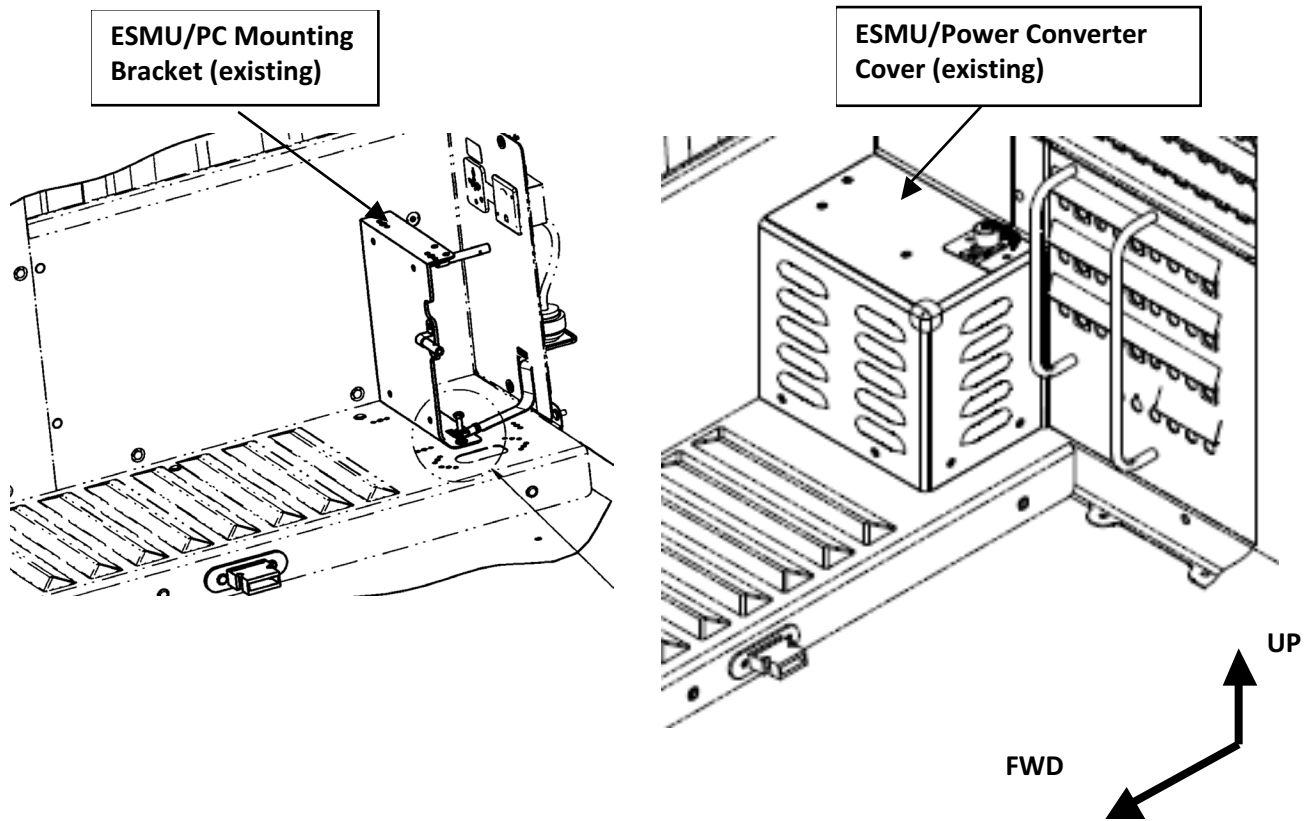


Figure B6:
ESMU/PC Mounting Bracket & ESMU/Power Converter Cover Captain's Side

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» The data load port "INOP" placard will be removed. See Figure B7.

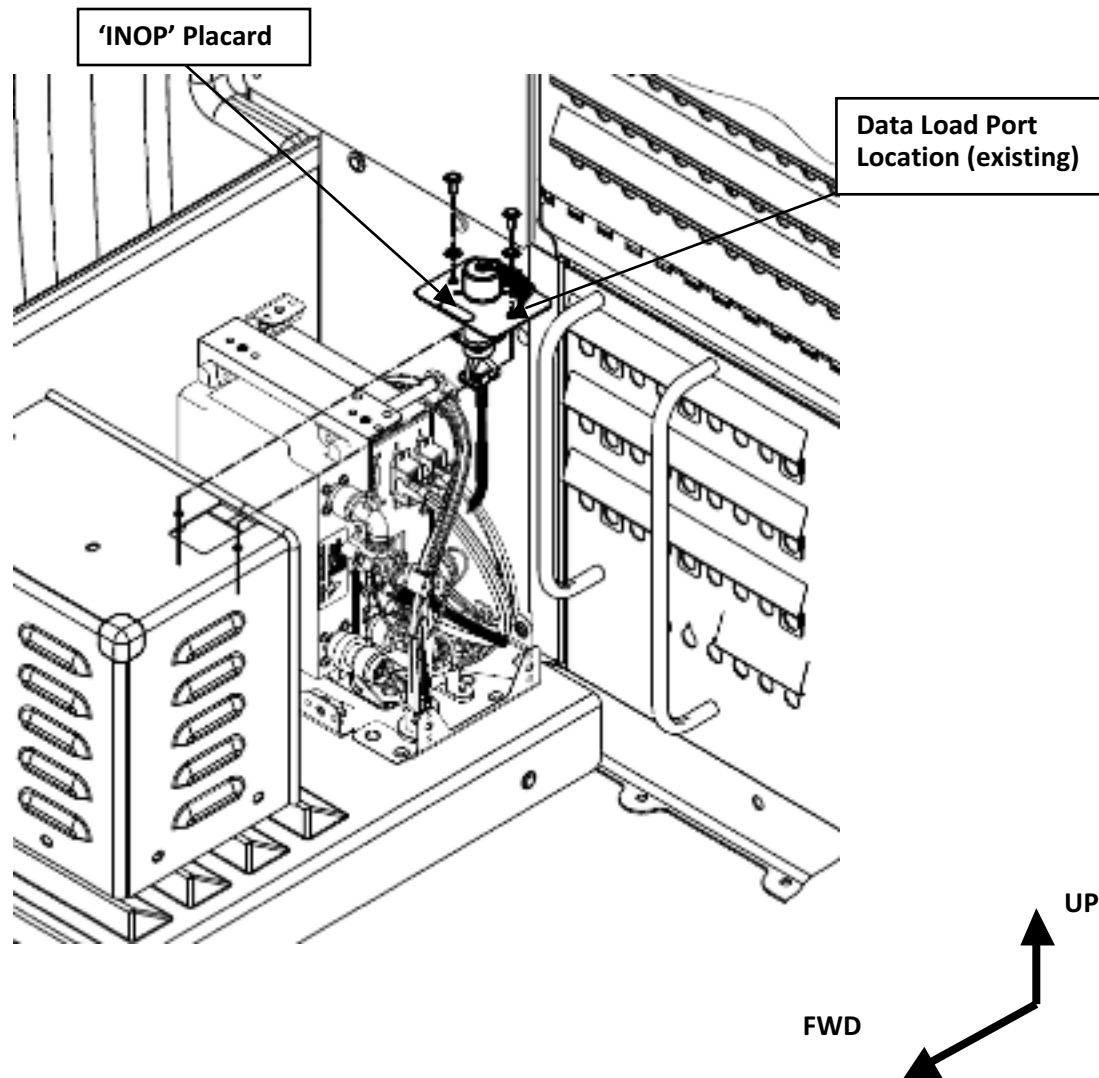


Figure B7:
Data Load Port First Officer's Side

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- » The unit location is a mirror image for the captain's side. The ESMU and power converter installation on the existing mounting bracket is shown on Figure B8. The unit location is a mirror image for the captain's side.

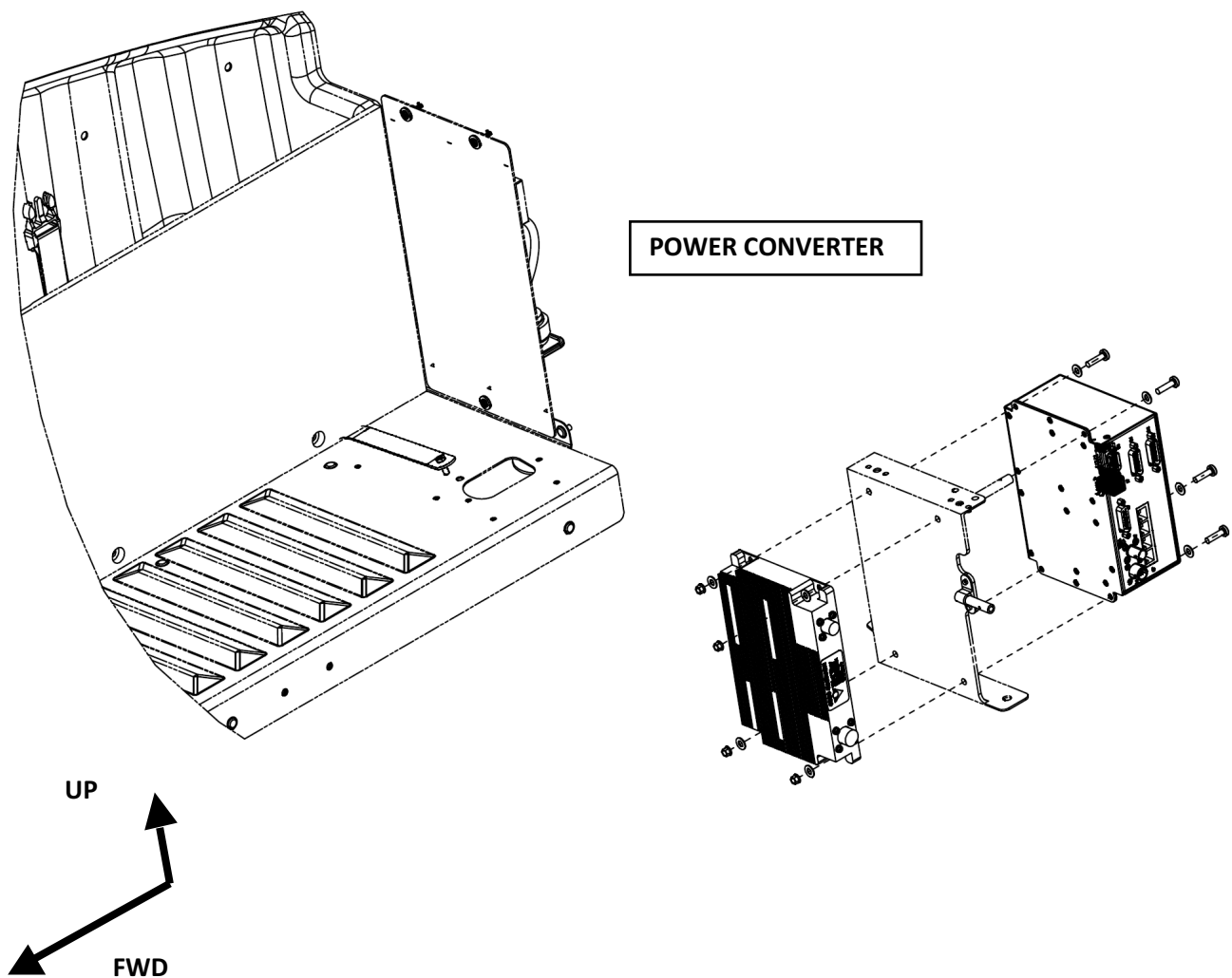


Figure B8:
ESMU & Power Converter Mounting to Bracket

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- » There will be a molded “bump-out” section added to the quarter sill lining on the captain's and first officer's side of the aircraft (see Figure B9). This addition will prevent the EDU corner from interfering with the oxygen mask donning operation.

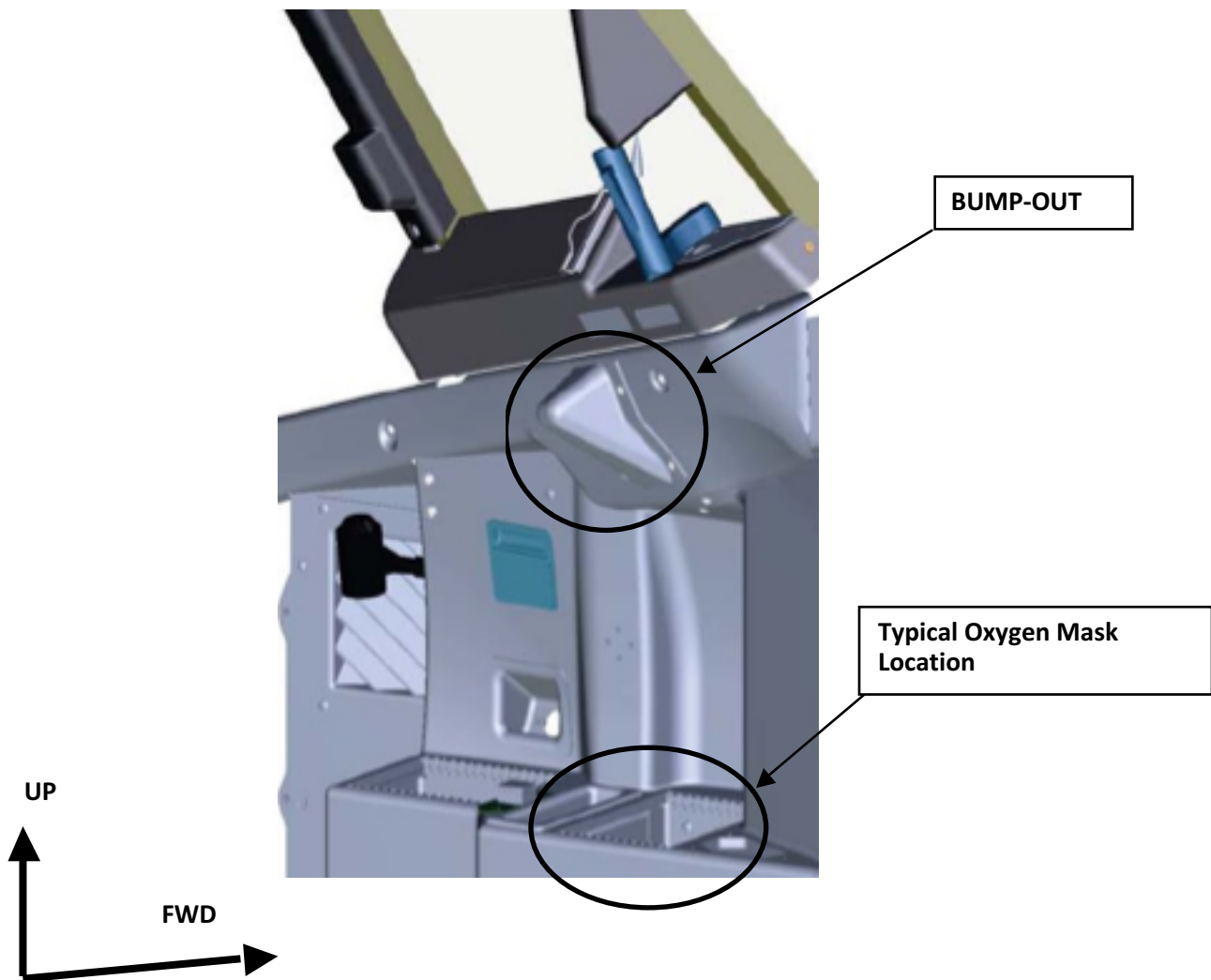


Figure B9:
Sidewall “Bump-Out” Captain’s Side
(First Officer’s Side is Mirror Image)

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ELECTRICAL CHANGES

The following electrical changes are made for Configuration 1. See block diagram Figure C1.

- » At the P6-12 circuit breaker panel, the previously installed collars and INOP placards for the captain's and first officer's EFB circuit breakers will be removed and the CAPT EFB and F/O EFB placards will be installed. The two previously capped and stowed 115 VAC power wires will be connected to the 115 VAC transfer bus terminal strips.
- » The previously coiled and stowed EFB power control panel connectors, installed by the provisions STC, will be connected to the control panel at locations in the captain's and first officer's sidewalls.
- » The captain's ESMU and power converter wire harnesses, installed by the provisions STC, will be connected to the ESMU and power converter.
- » The first officer's ESMU and power converter wire harnesses, installed by the provisions STC, will be connected to the ESMU and power converter.
- » The coiled and stowed captain's ESMU ARINC 429 data bus input wires will be terminated to existing terminal blocks or connectors that will provide interfaces to multiple mode receiver (MMR-1), flight management computers (FMC-1 and FMC-2), air data internal reference unit (ADIRU-1), display electronics unit (DEU-1). The coiled and stowed aircraft communications addressing and reporting system (ACARS) communications management unit (CMU), and printer ARINC 429 data bus input and output wires will remain coiled and stowed as provisions.
- » The coiled and stowed first officer's ESMU ARINC 429 data bus input wires will be terminated to existing terminal blocks or connectors that will provide interfaces to MMR-2, FMC-1, FMC-2, ADIRU-2, DEU 2 and ACARS CMU. The coiled and stowed ACARS CMU and printer ARINC 429 data bus input and output wires will remain coiled and stowed as provisions.
- » The Ethernet provisions wiring for the flight deck electronic video surveillance system (FDEVSS) will remain capped and stowed.

Figure C1:
EFB System Block Diagram

