



EFFECTIVE DATE: 10/10/2022

SUBJECT: CCK-1865 363i-FP Install (CC363i Fixed Pitch Variant)

MODELS AFFECTED: All CCK-1865 aircraft

COMPLIANCE TIME: *COMPLIANCE IS OPTIONAL. This retrofit is optional and is left to the sole discretion of the owner / operator / builder of the Experimental Amateur-Built aircraft*

PURPOSE: *To provide instructions for the installation of CC363i fixed pitch variant power plant on CCK-1865*

PARTS LIST: See Appendix A

INSTRUCTIONS:

1. Read all instructions before beginning any work
2. Collect required tools and materials
3. Perform work as laid out in this document
4. Return materials that will no longer be needed to Cub Crafters per RMA if applicable
5. Make a logbook entry stating that the CC363i-FP power plant was installed in accordance with CK-SI003 Rev NC
6. Update weight and balance as described in Section 13 of the service instruction

If you are no longer in possession of this aircraft, please forward this information to the present owner/ operator and notify Cub Crafters, Inc. of the address of the current owner to:

Cub Crafters, Inc.
1918 S. 16th Avenue
Yakima, WA 98903.
1-877-484-7865 or 1-509-248-9491
support@cubcrafters.com

Please include the aircraft registration number, serial number, current name and address of the owner and/or operator.

INTRODUCTION

This service instruction outlines the process required to install the powerplant on the Fixed Pitch 363i variant of the EX2. All of the assembly instructions, figures, images, parts lists etc. are based around the installation of the CC363i-FP engine onto an aircraft configured with the either Executive Glass Touch, or World VFR instrument panel.

It is important that you read the entire service instruction before starting work, then read each sub-section again as those components are fit and installed. If you are intending to customize the installation at all, read this entire service instruction anyway, as it will provide context for component interactions. Seemingly subtle alterations may result in significant functional disconnects or fit problems.

Note: This service instruction has been written with references to both EX2 and EX3 manuals. Please ensure that you have the following documents available to complete this instruction:

1. CCEX-002 Rev 2.00 or higher, Fuselage Manual, EX2
2. CCEX-005 Rev 2.00 or higher, Assemblies Manual, EX2
3. CCEX-016 Rev 1.12 or higher, Executive Glass Touch Panel, EX2
4. CK-KM303 Rev A or higher, Firewall Forward Manual, EX3
5. CK-KM308 Rev B or higher, Finish Manual, EX3

When referencing figures and information in these manuals and other resources, keep in mind that there are differences between those installations and the 363i-FP installation that may not be reflected in the manuals being referenced.

Comparison Between Engine Models		
Engine:	CC340	CC363i-FP
Power:	180 HP	186 HP
Weight:	268.9 lbs	272.1 lbs
Fuel Delivery:	Carbureted	Fuel Injected
Induction:	Naturally aspirated	Naturally aspirated
Ignition:	Capacitor discharge ignition	Capacitor discharge ignition

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SECTION 1 - Bootcowl Modifications

IMPORTANT: It is best to complete this Service Instruction prior to installation of the bootcowl and windshield.

This service instruction involves modification to the bootcowl, and replaces many firewall-mounted components. Attempting to complete these steps once the bootcowl is fastened in place will be very difficult. If the bootcowl and windshield have already been installed, it is recommended that they be removed before completing this service instruction.

Note: If firewall forward components for the CC340 have previously been installed some of them will need to be removed. Before beginning the following steps, remove primer and lines, fuel lines, and cabin heat box, oil pressure sensor, and all firewall grommets. The gascolator may remain as previously installed, with primer port plug installed as shown later in this step.

Add Defrost Duct

- Using template CK-SI003-001 and SK25008-001 for reference, cut two slots in the top surface of the boot cowl where defrost vents will be installed. A Dremel Tool with a cut off wheel and a rotary bit works well for this task. It is best to place masking tape over the area being worked on to prevent accidental nicks and scratches to the top of the boot cowl.
- Once the holes have been cut, debur and smooth edges as needed.
- Place SK25008-001 under the newly cut vents and match drill the six Ø.159 inch mounting holes.
- Permanently install SK25008-001 onto the boot using 6X MS35214-25 screws from the top, sandwiching 2X SK53002-001 mesh screens between the lower surface of the bootcowl and the composite duct assembly. Finished product shown in Figure 1.
- Connect ducting as shown in Figure 2.

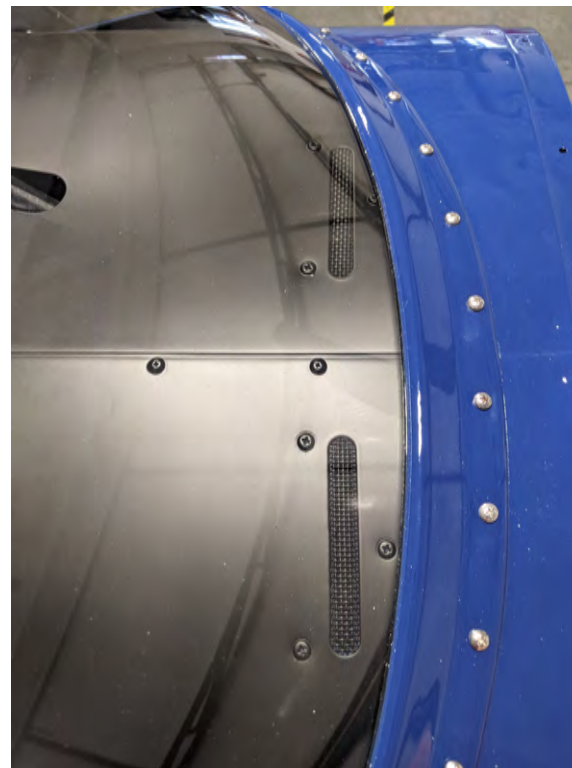


Figure 1 - Defrost Vents
Top View

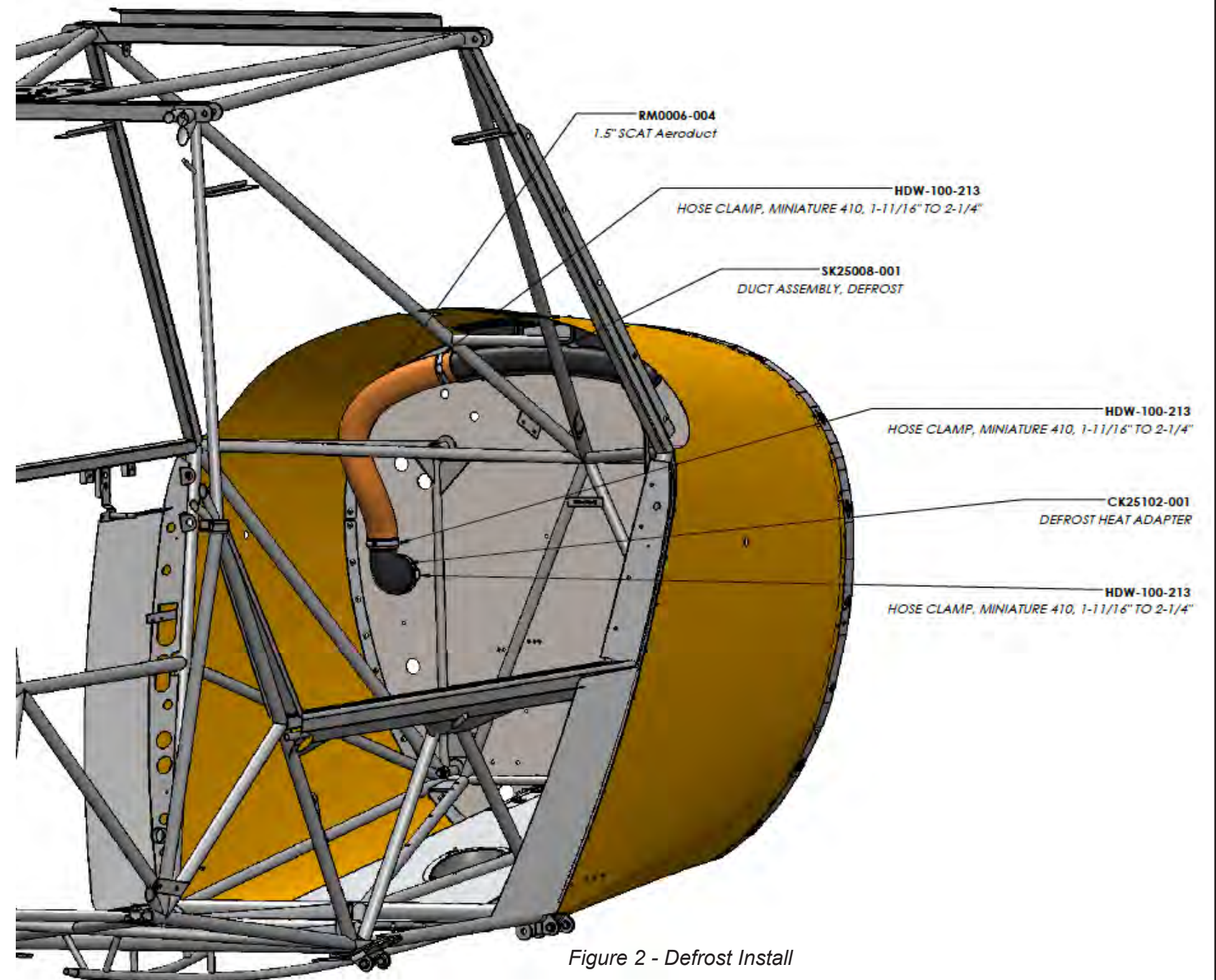


Figure 2 - Defrost Install

SECTION 2 - Firewall Modifications

As compared to the CC340, the 363i-FP installation requires additional firewall mounted components. Holes must therefore be added for mounting these components as well as for updated cabin heat box and defrost ducting.

Use template CK-SI003-002 to mark the locations of new holes to be drilled through the firewall. Where possible, it is recommended to use components to help maintain hole spacing between sets of holes (for example, use the fuel pump to confirm holes A1-A4 are appropriately spaced).

Note: For expanding hole H3 from the existing hole to match the template, a pair of hand operated sheet metal nibblers work well.

Caution: Some of the holes that must be added are aligned with fuselage tubes. Be sure to avoid any damage to these tubes when drilling through the firewall.

HOLE	COMPONENT	DIAMETER (inches)
A1	Fuel Pump	.170
A2		
A3		
A4		
B1	Cabin Heat Box	.150
B2		
B3		
B4		
B5		
C1	Splash Guard	.170
C2		
D1	Fuel Filter	.170
D2		
E1	Fuel Pump Splash Shield Bracket	.170
E2		
E3		
F1	Cable routing fixtures	.201
F2		
F3		
F4		
F5		
F6		
F7		
G1	Starter Wire	.880
H1	Aux Heat	.150
H2		
H3		

Table 1

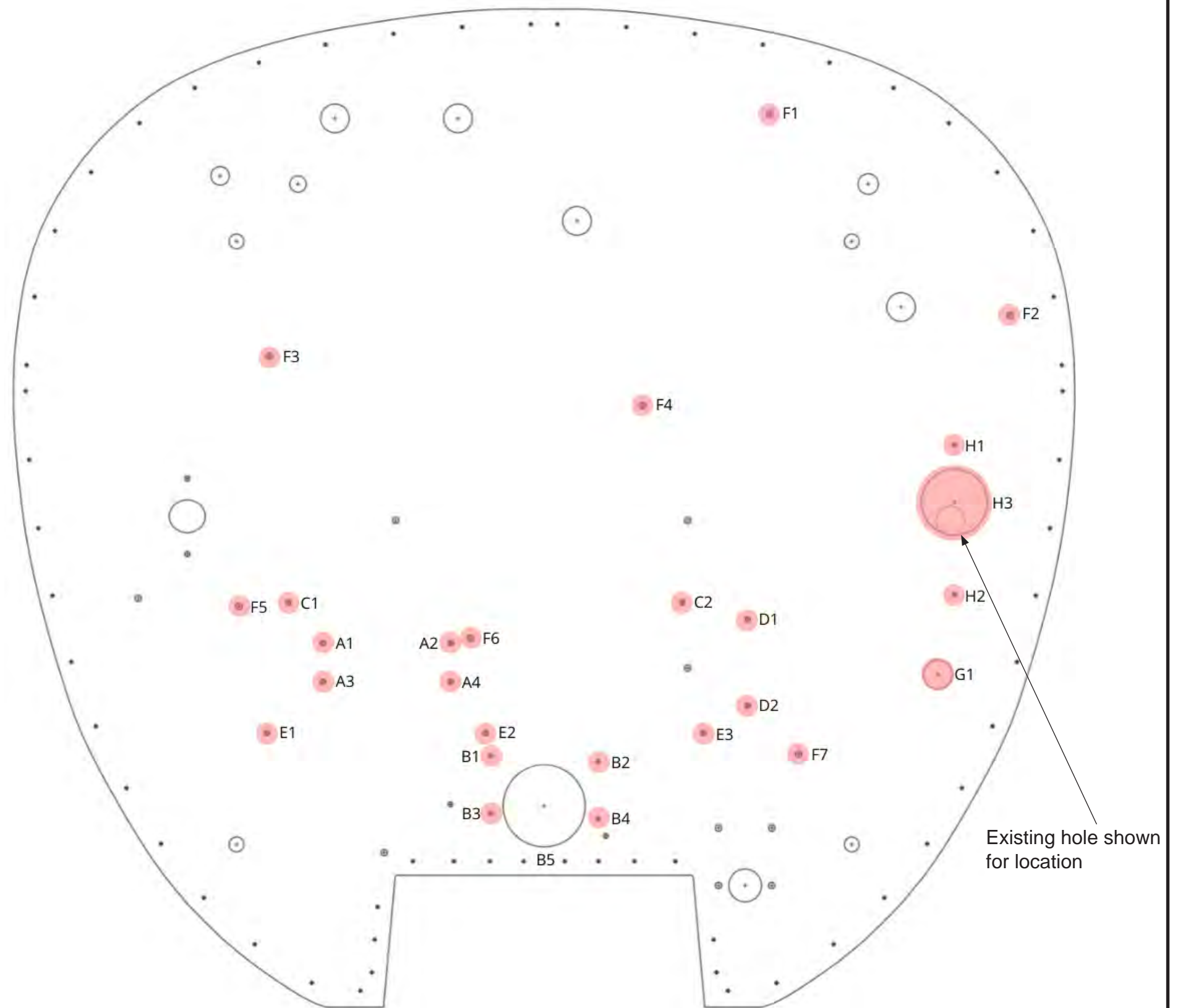


Figure 3 - Firewall Modifications
Front View

SECTION 2 - Firewall Modifications, Continued

Install firewall hardware and components as shown in Figures 4 through 12.

All hardware is intended to be installed through the firewall insulation except where noted.

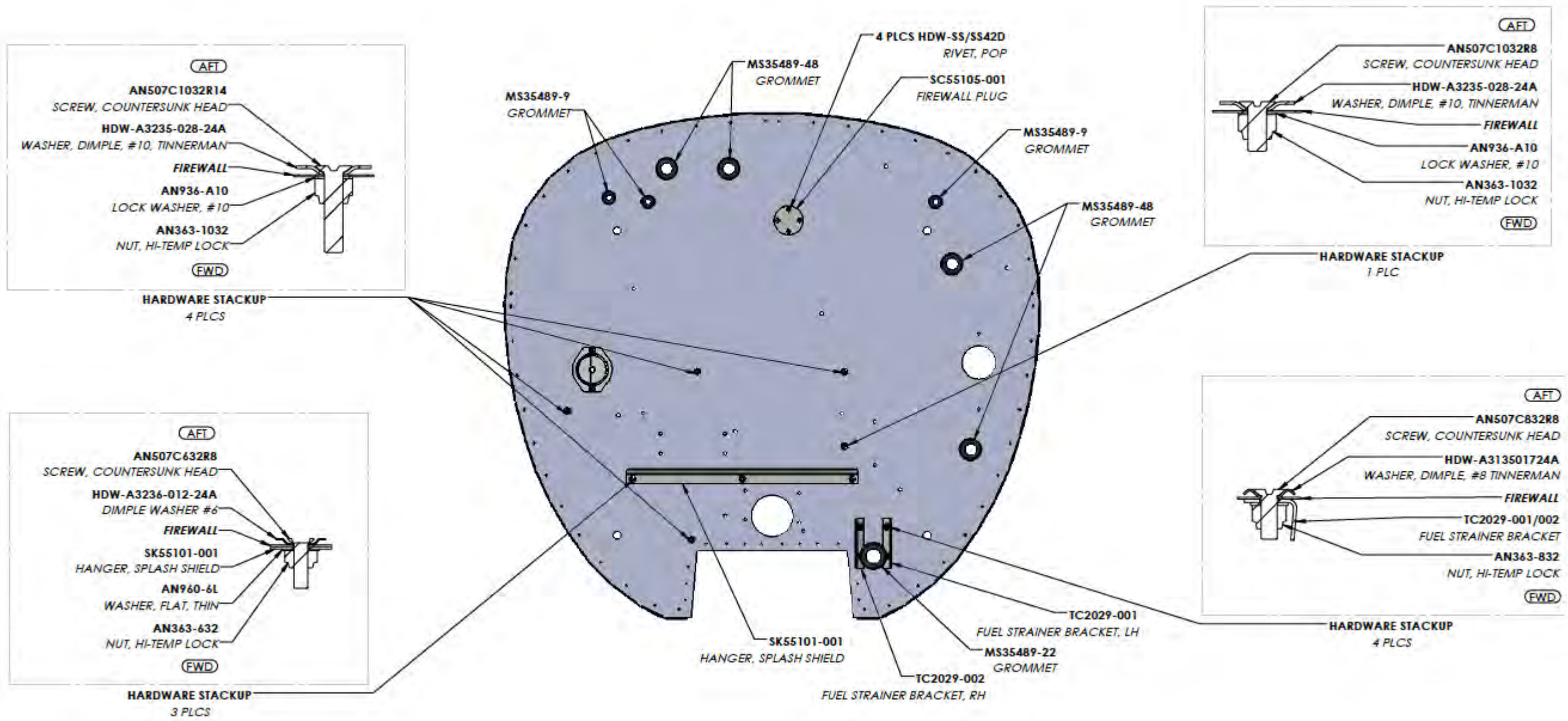
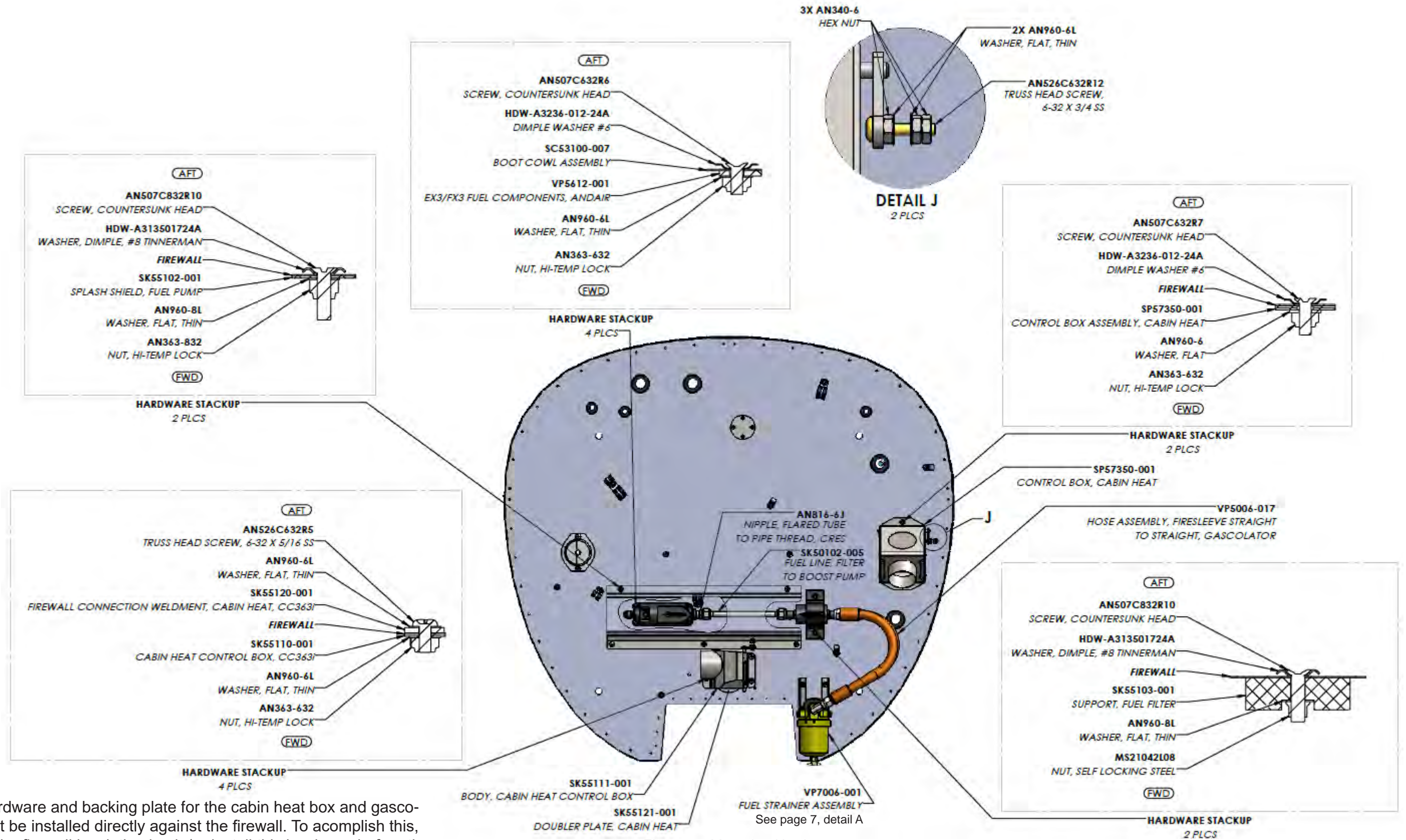


Figure 4 - Grommet and Hardware Locations Front View

SECTION 2 - Firewall Modifications, Continued



Note: Hardware and backing plate for the cabin heat box and gascolator must be installed directly against the firewall. To accomplish this, peel the the firewall insulation back (or install this hardware before the insulation has been glued in place) as needed to install these parts.

Figure 5 - Mounting Hardware
Front View

SECTION 2 - Firewall Modifications, Continued

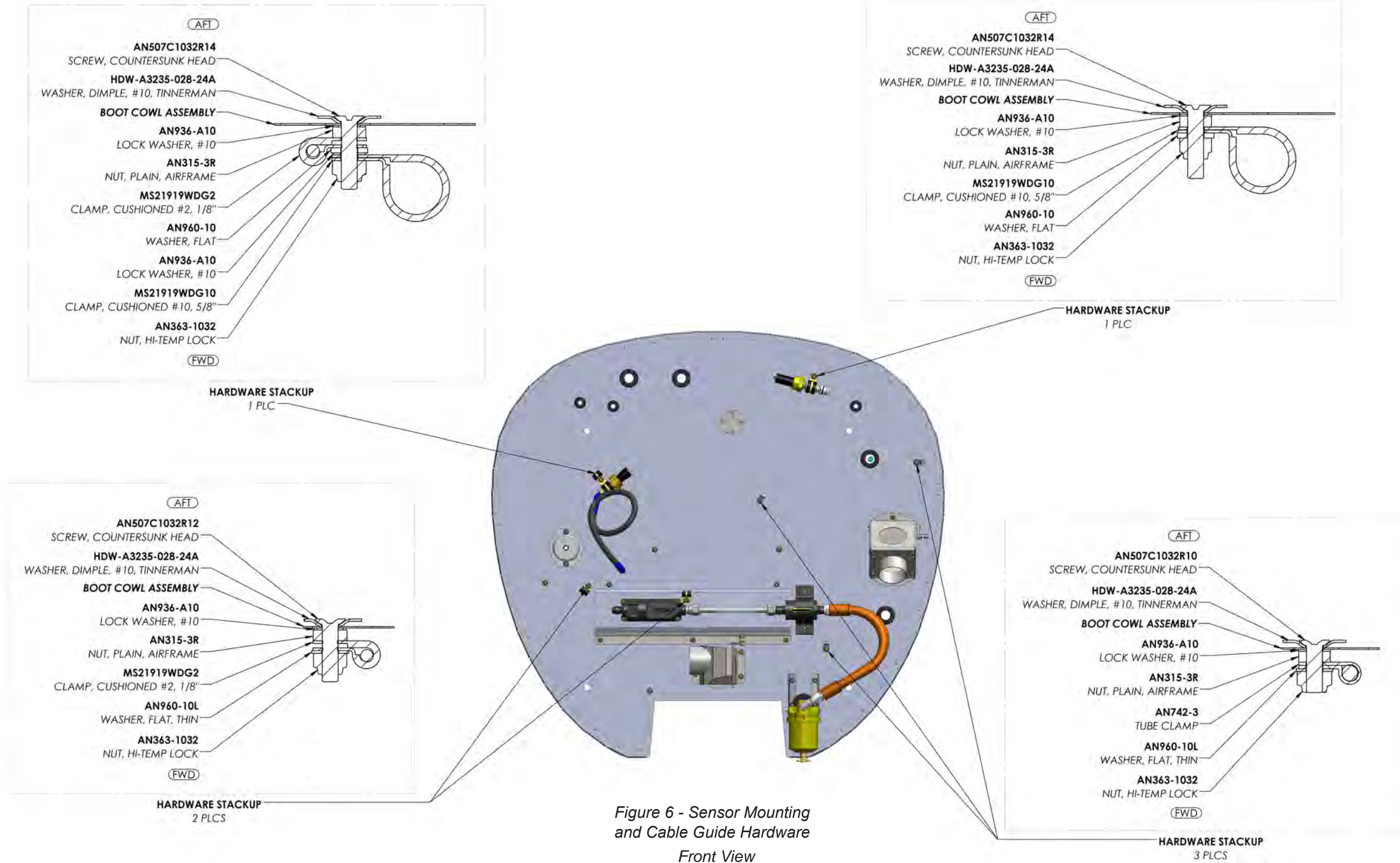


Figure 6 - Sensor Mounting and Cable Guide Hardware Front View

SECTION 2 - Firewall Modifications, Continued

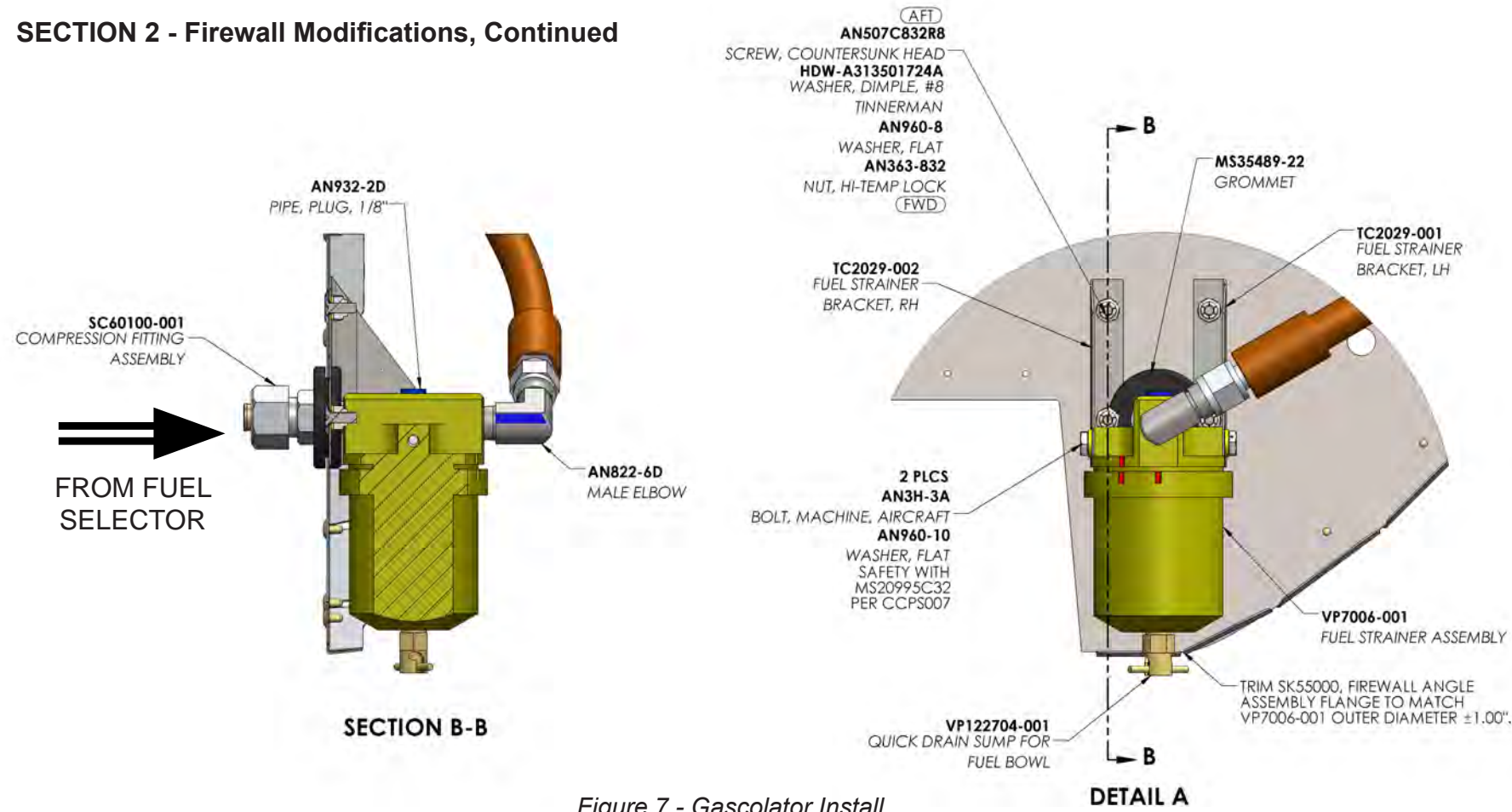


Figure 7 - Gascolator Install

Gascolator install identical to instructions in CK-KM308, and CCEX-002 except that primer line / fittings must be removed and replaced with a plug as shown in SECTION B-B. If these parts have already been installed, then install the plug in place of the primer lines and proceed, all other hardware is shown here for reference.

Ensure that both heat box flappers close as shown in Figures 8 and 9.

FLAPPER FLUSH AGAINST TUBE WHEN CLOSED

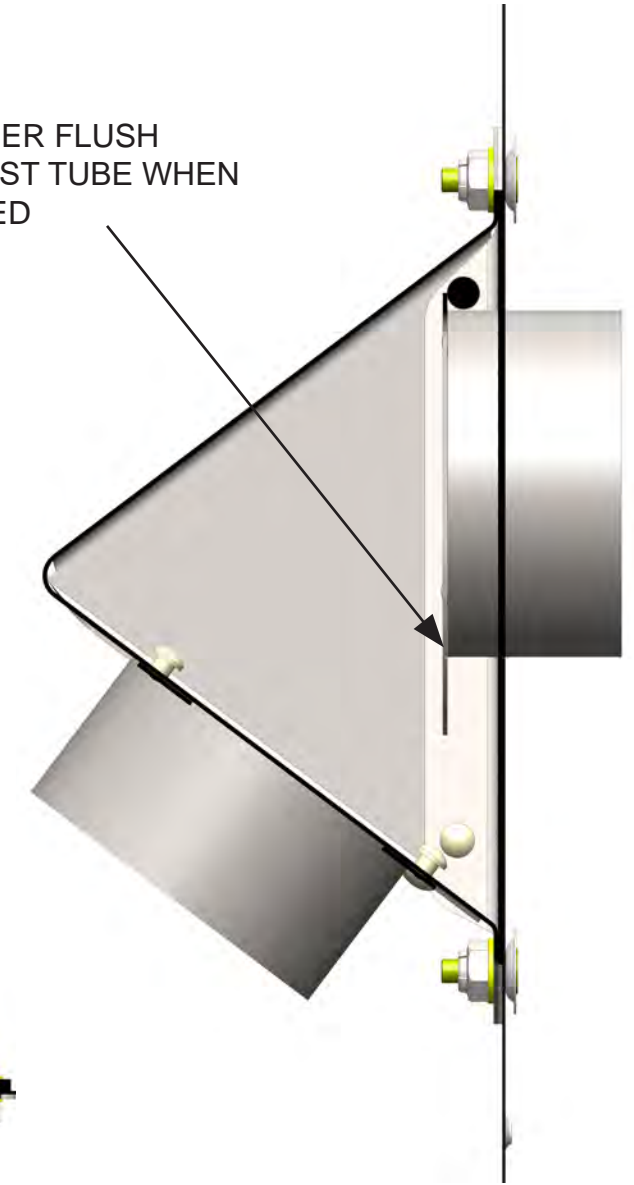


Figure 8 - Aux Heat Box

FLAPPER FLUSH AGAINST TUBE WHEN CLOSED

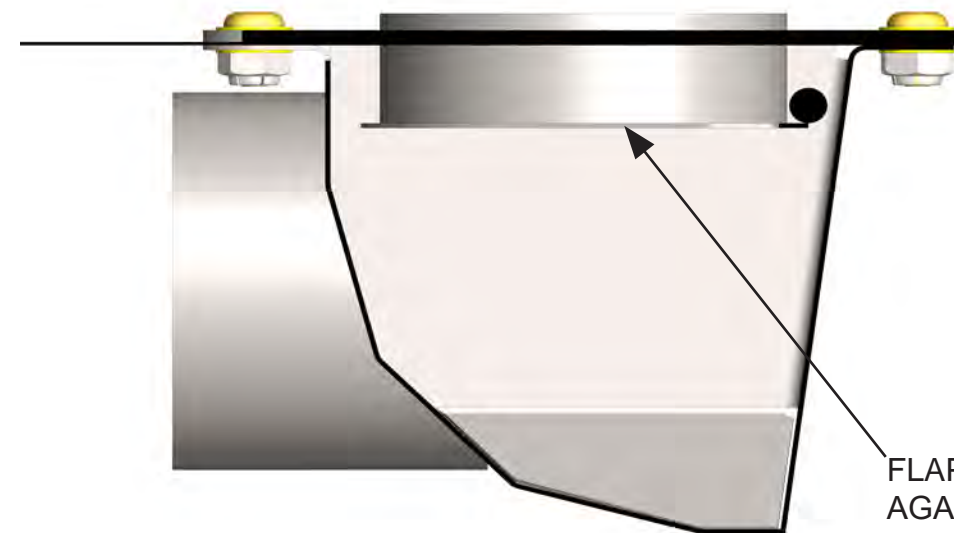
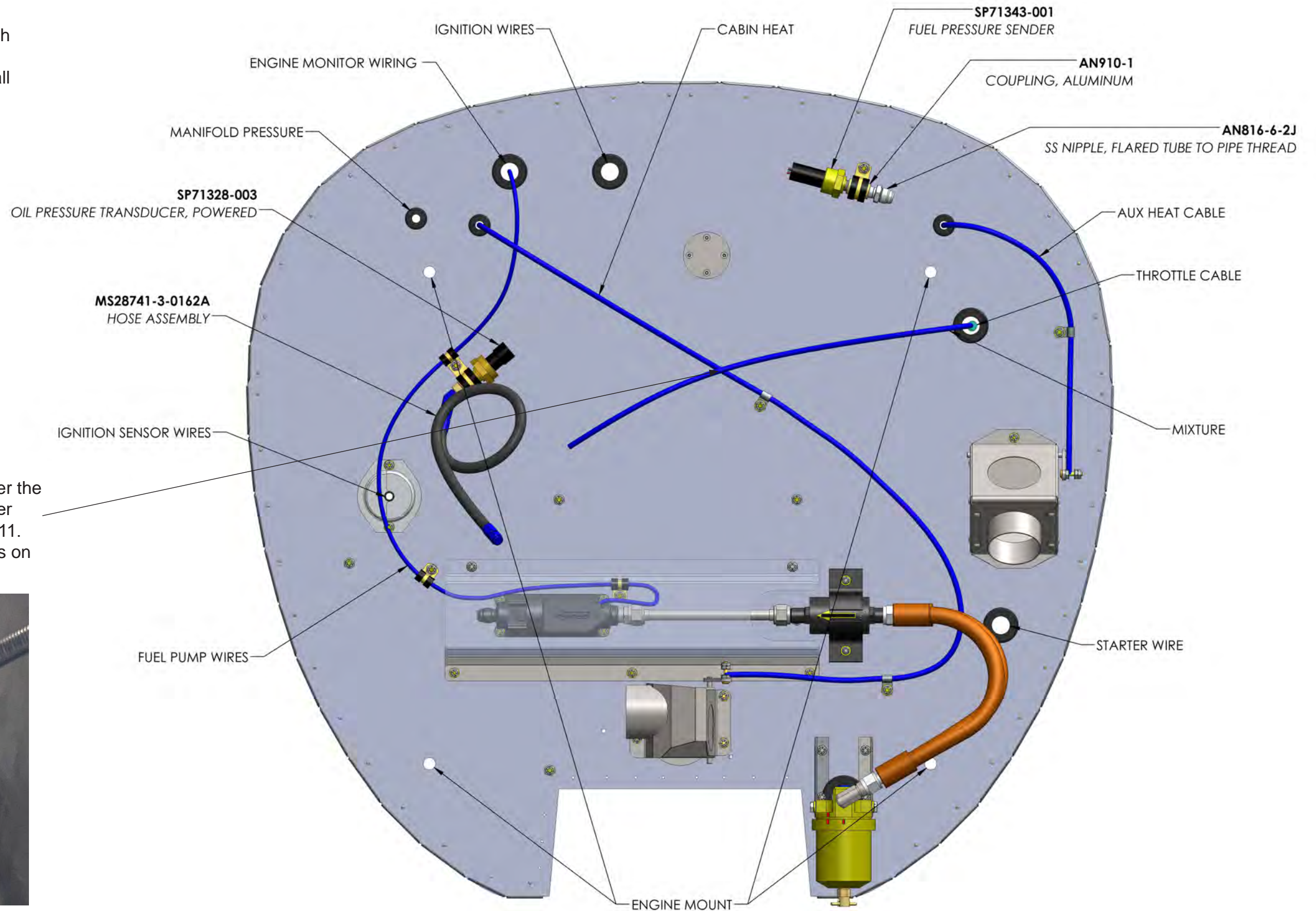


Figure 9 - Cabin Heat Box

SECTION 2 - Firewall Modifications, Continued

Pass all wires and control cables through the firewall grommets as shown. Where guide hardware is attached to the firewall the intended route for those cables and wires are shown.



Where the mixture cable crosses over the cabin heat, fix the two cables together using a standoff as shown in Figure 11. See CCEX-002 Section 14 for details on standoff.

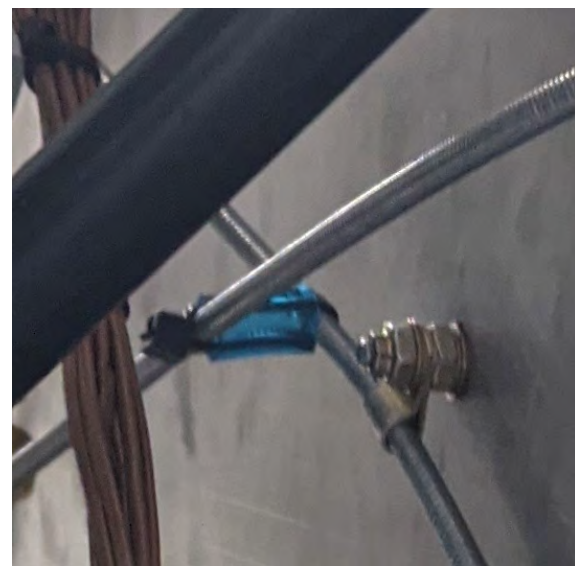
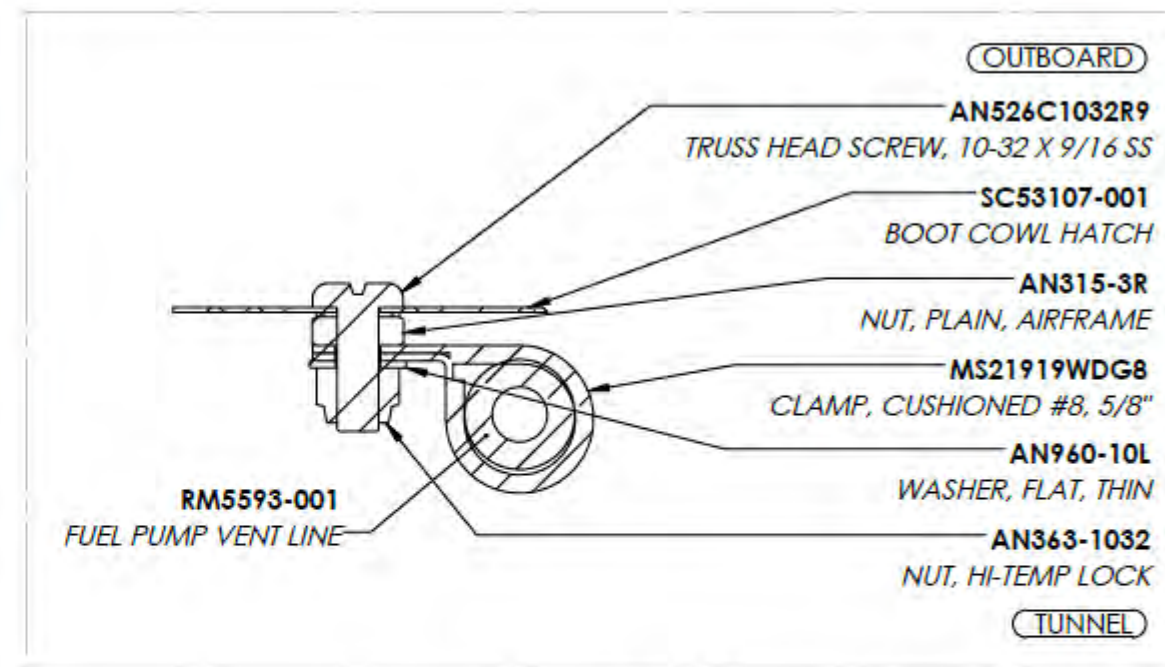
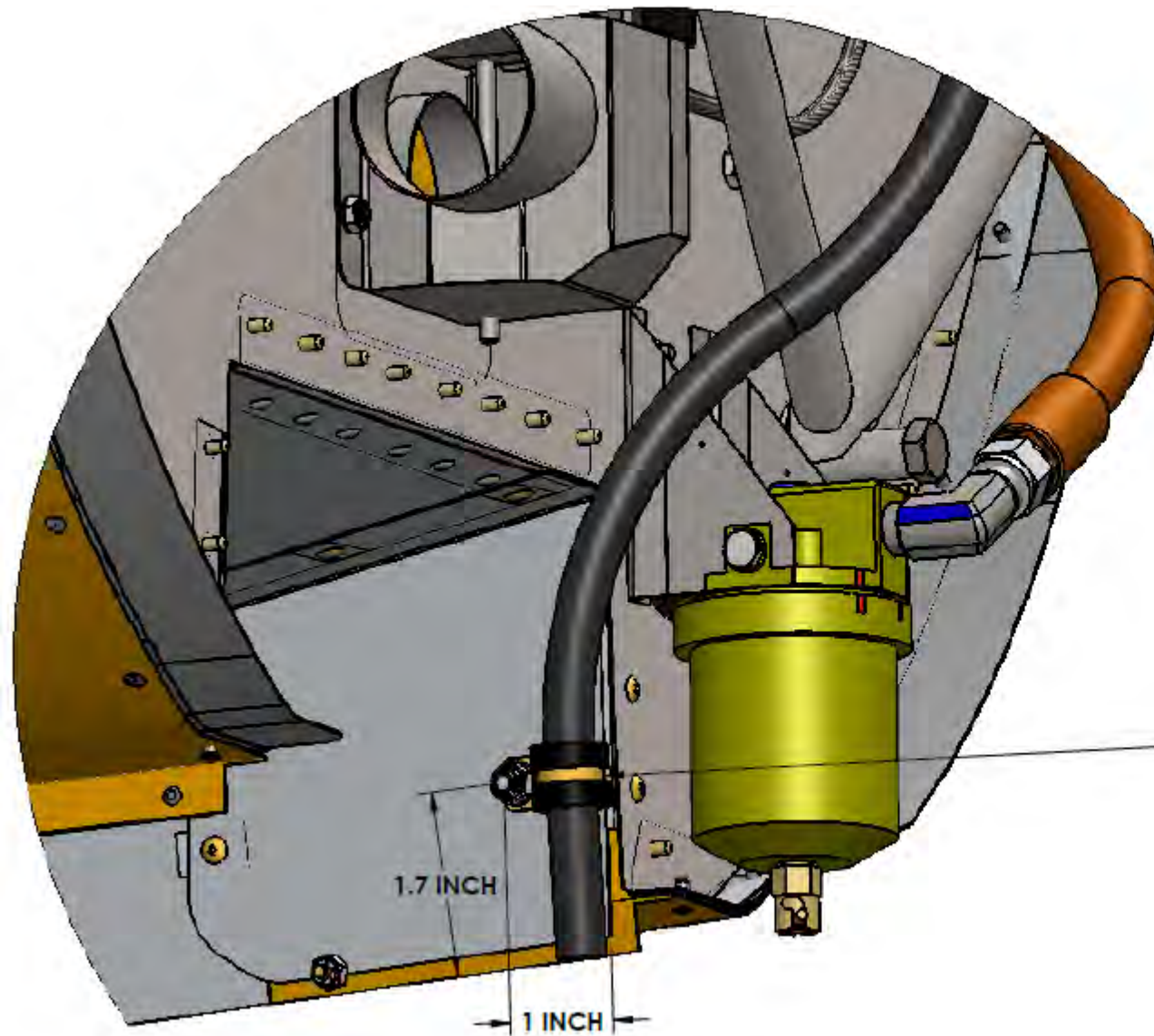


Figure 11 - Standoff

Figure 10 - Cable and Wire Routing Front View

To support the fuel pump breather line (installed later), install the following hardware in the bootcowl hatch. This panel is located on the left side of the tunnel under the bootcowl. Note that a Ø.190 hole must be drilled in the location indicated for this hardware stackup.



HARDWARE STACKUP
1 PLC

Figure 12 - Vent Line Support
View From Front Right

SECTION 3 - Panel Modifications

The instrument panel requires a few changes to incorporate the CC363i-FP. If your aircraft differs from the panel configurations described below then modify these instructions accordingly.

EXECUTIVE GLASS TOUCH

The changes that must be made to the front of the panel are as follows:

- Remove primer and plug hole in panel
- Replace carb heat knob with aux heat / defrost
- Move COM and XPDR breakers to the right and install Aux Fuel pump placard, switch and breaker

See Figure 13 for all part numbers and locations.



Figure 13 - Instrument Panel, Executive Glass

SECTION 3 - Panel Modifications, Continued

WORLD VFR

The changes that must be made to the front of the panel are as follows:

- Remove primer. The new placard will cover the primer hole
- Replace carb heat knob with aux heat / defrost
- Install Aux Fuel pump switch and breaker.

See Figure 14 for all part numbers and locations.

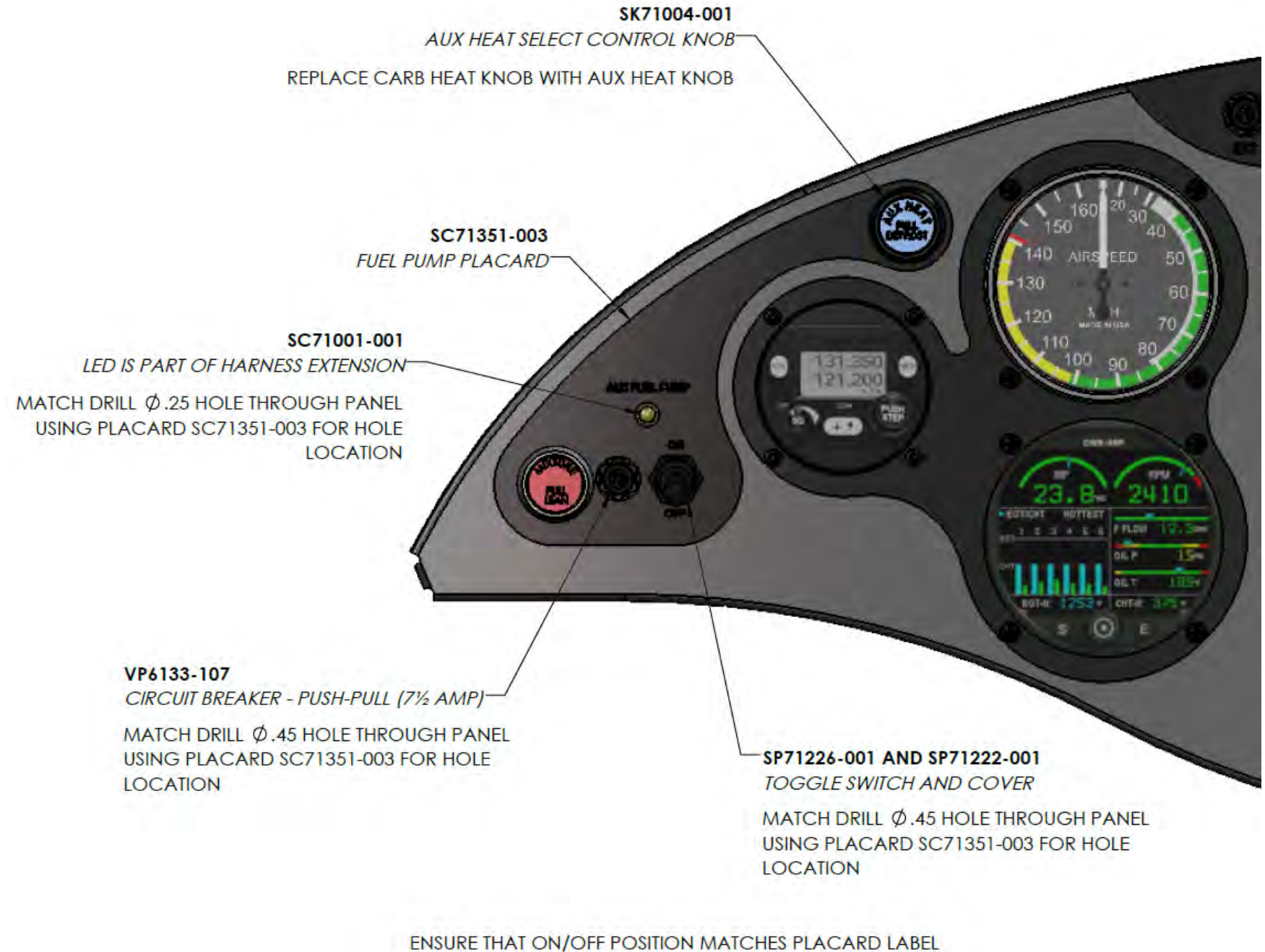


Figure 14 - Instrument panel, World VFR

SECTION 4 - Throttle Mechanism Changes

A slightly longer throttle throw is required for the 363i-FP than the CC340. To achieve this, both the forward and aft throttle quadrant assemblies described in Section 5 of the EX2 assemblies manual (CCEX-005) must be modified as shown in Figures 15 and 16.

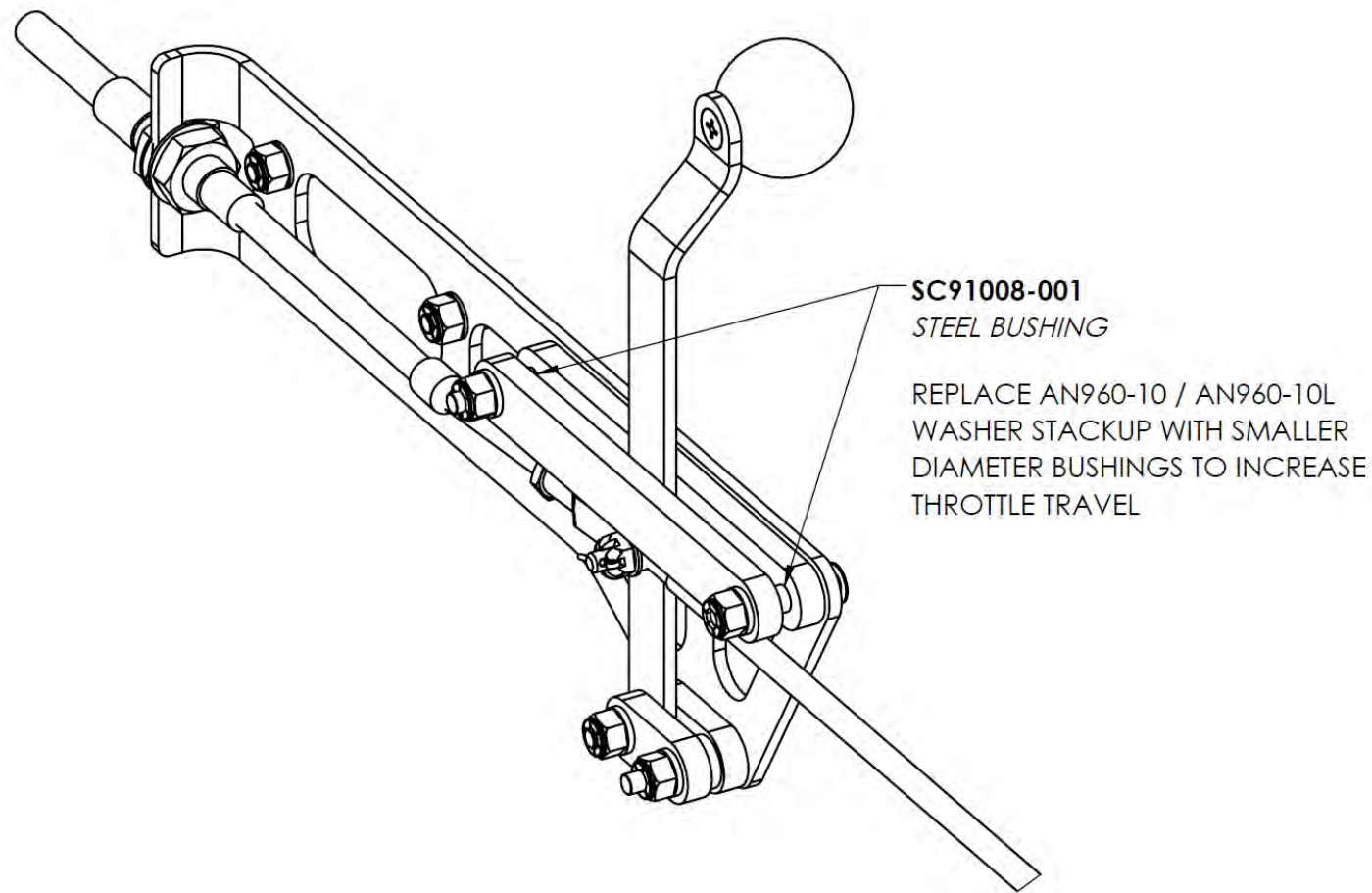


Figure 15 - Forward Throttle

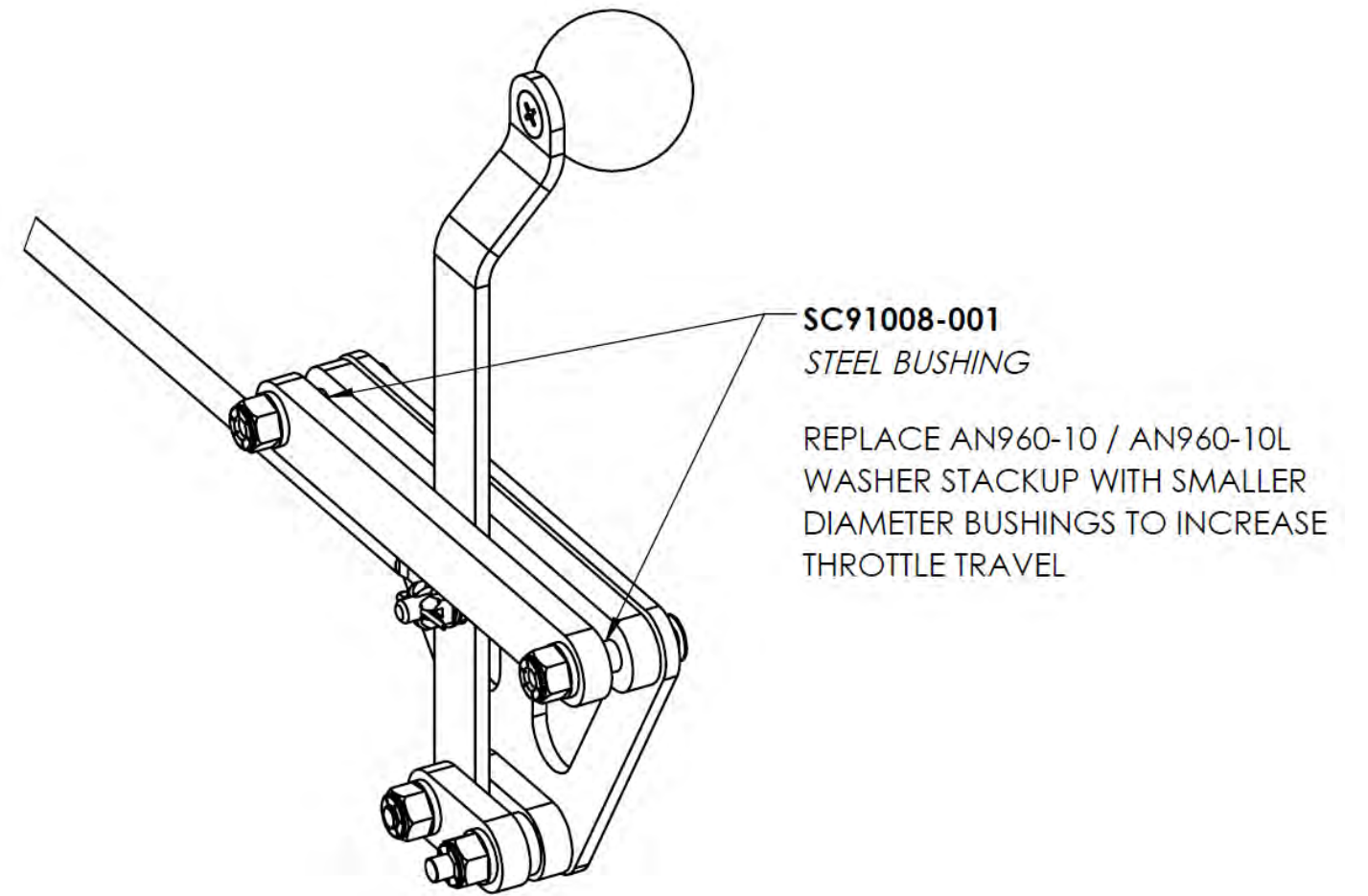


Figure 16 - Aft Throttle

SECTION 5 - Wiring Changes

Behind the panel the following wiring changes must be made:

- The fuel pump breaker and switch must be connected - This new circuit will draw power from the main bus and feed it to the fuel pump through a breaker and switch. The wiring is all included in SC71001-001. Main bus power may be drawn from the top of the EXT or IBBS breaker as shown in Figure 18, and the circuit may be grounded to the fuselage tabs shown in Figure 18.
- Fuel pressure sensor circuit - Connect the three wires contained in GEA35A22-3 (pigtail that is a part of SC71001-001) to connector P243 (which connects to J243 on the GEA24, or SP71320-005) per Table 2. See Figure 19 to help locate the correct plug / jack.

Note: The crankshaft position sensors for the 363i-FP are mounted left and right rather than top and bottom as on the CC340. Connections should be made as described in the Executive Glass Touch Panel manual (CCEX-016), with the left sensor being wired in as the “top” sensor, and the right sensor as the “bottom”.

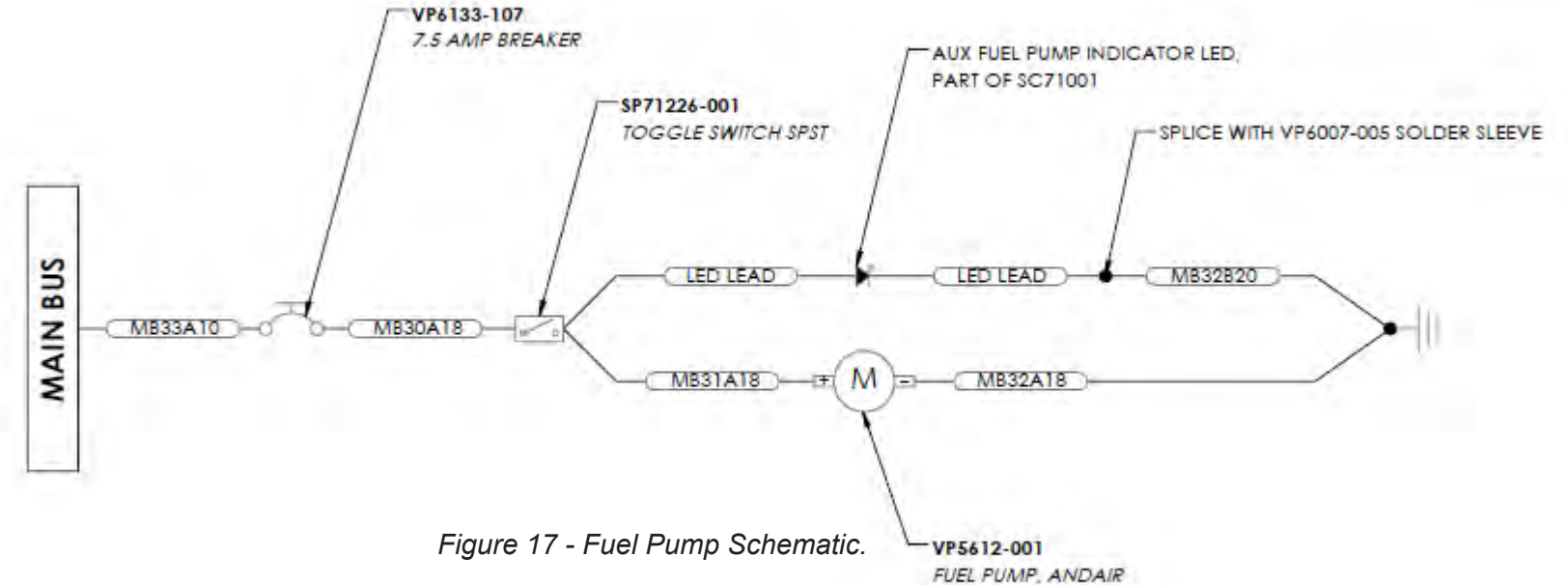


Figure 17 - Fuel Pump Schematic.



Figure 18 - Panel Wiring
Front View

Connect MB33A10 to main bus (copper plate) in this location

Connect MB32B20 and MB32A18 to ground here

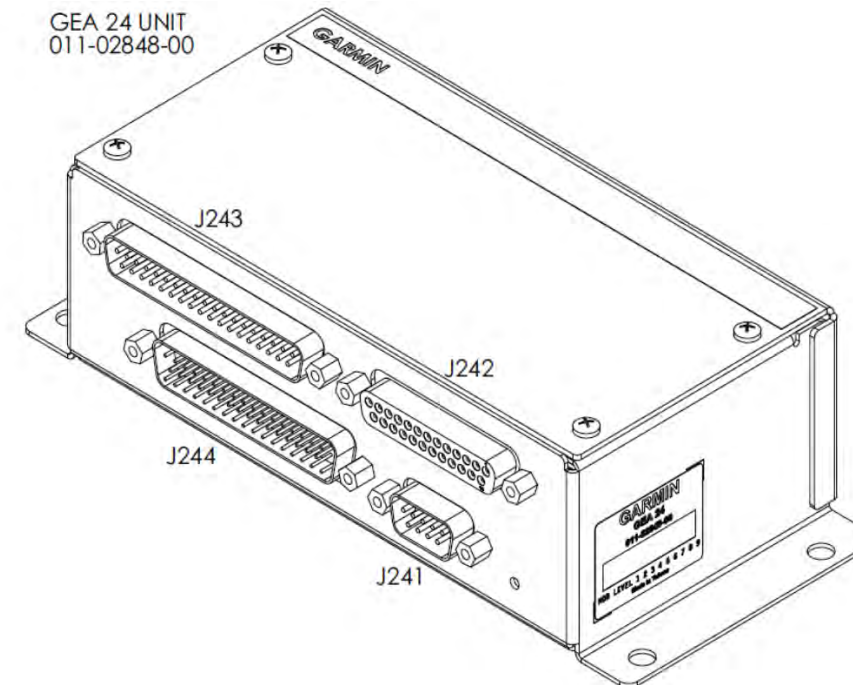


Figure 19 - GEA24

Wire within GEA35A22-3	Pin number within P243
W/BLU	1
W/ORG	2
WHT	4

Table 2 - Fuel Pressure Sensor Wiring

SECTION 6 - Engine Buildup

For engine buildup, the directions given in CK-KM303 Section 2 should be followed. Please note:

- Where the manual is applicable to multiple engines, please reference the Lycoming CC363i (G3X) variation.
- Skip section 2.9 as no governor is present in the 363i-FP. Note that this component will be shown in other photos and should be disregarded.
- Firewall grommet locations / cable routing may vary slightly from those shown in CK-KM303. When this occurs, use the locations shown in Figure 10.
- Spark plug leads should be routed over the top of the engine baffles as shown in Figure 18.



Figure 20 - CK-KM303

Section 7 - Engine Baffle Installation

The baffle system for the 363i-FP should be installed using the same techniques detailed in CK-KM303, Section 3, and the videos / photos located in Section 8 of that manual. The aft baffles (SK52006-001, SK52007-001, and SK52008-001) are identical to those detailed in the above manual. The side and forward baffles fit differently and have different part numbers and hardware. Please reference Figure 21 for part numbers and positioning. Hardware should match that described in CK-KM303.

Note: Additional resources may be found in CK-KM303, Section 8.

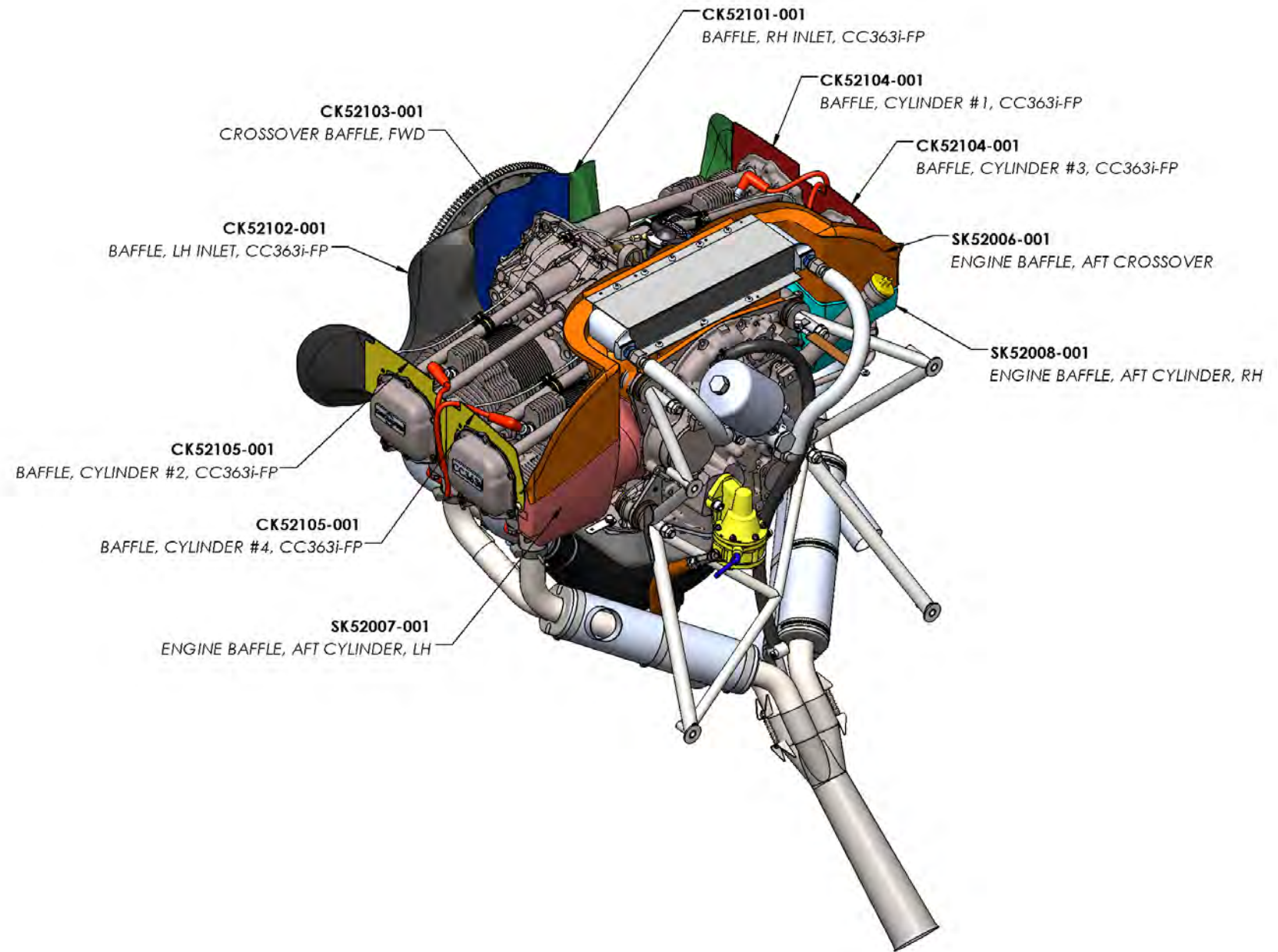


Figure 21 - Baffle Locations

Section 7 - Engine Baffle Installation, Baffle Seals

Once the composite baffles are installed, the baffle seals should be added in the locations indicated in Figure 22. Install should be performed using the same techniques indicated in CK-KM303, Section 3. For the CC363i-FP, the baffle seal material should be cut to approximately the correct shape for you. However, since all baffle installs and cowl fitment will vary, expect to trim where needed.

Figure 22 shows a detailed view of the plug lead passthrough. The composite baffles and seals should be trimmed as necessary to prevent spark plug wires from rubbing. Mirror installation on the other side.

Note: It is recommended to fit the cowl (Section 12) and trim the baffles to a final shape before installing baffle seals.

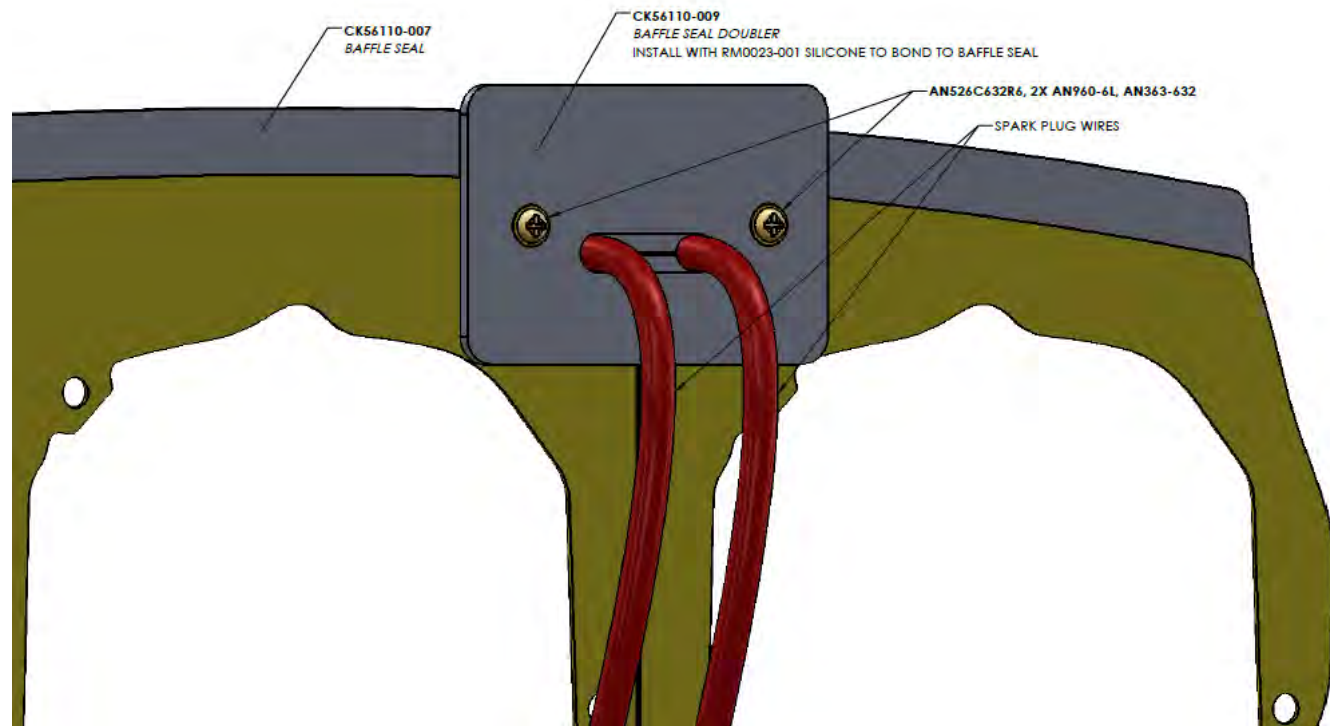


Figure 22 - Baffle Seal Doublers

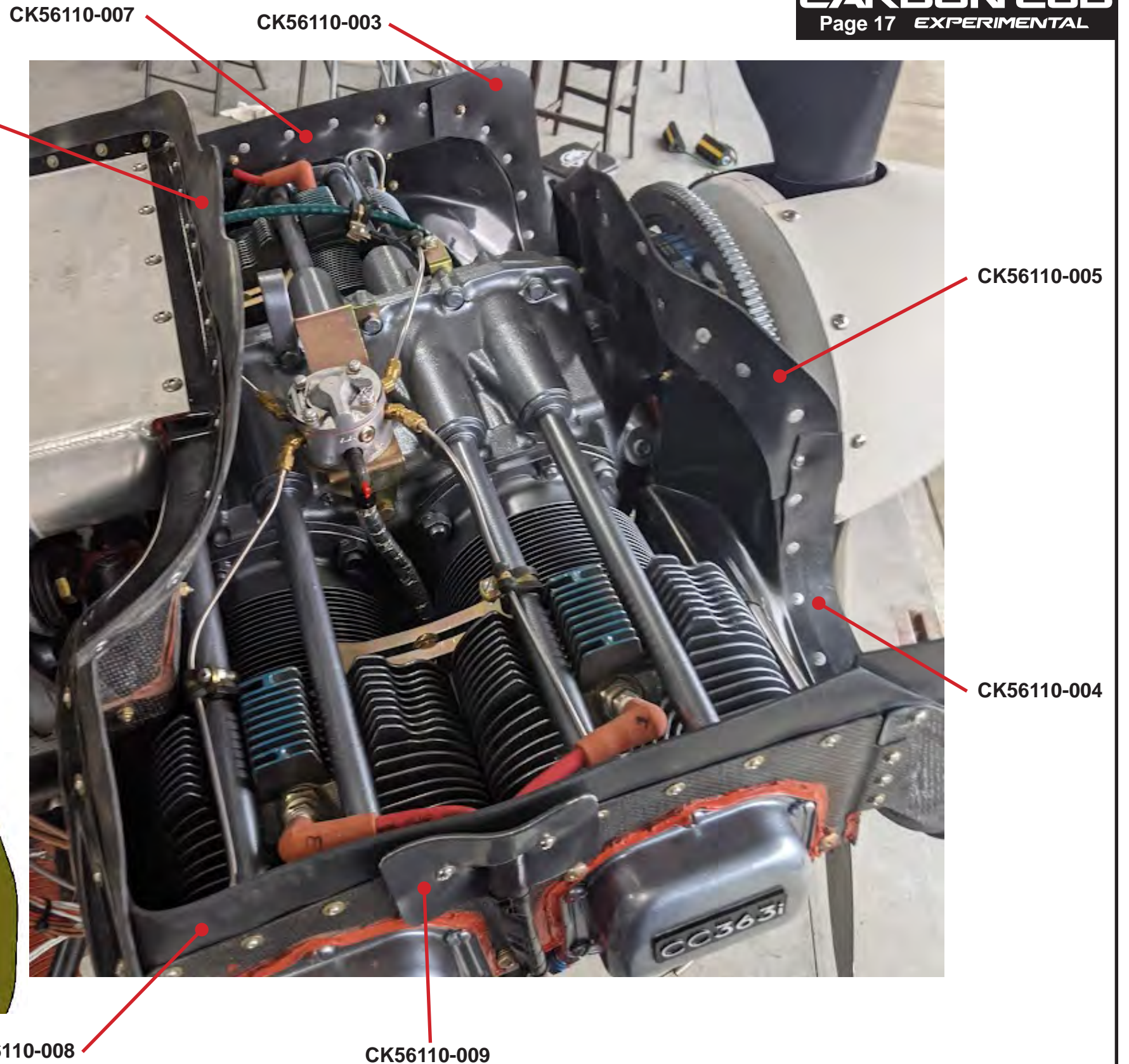


Figure 23 - Baffle Seal Locations

SECTION 8 - Engine Mounting

Note: If the bootcowl was removed to gain access for previous steps, ensure that it is properly re-installed at this time.

For mounting the engine to the airframe, please refer to CK-KM303 Section 4.

SECTION 9 - Exhaust Installation

For exhaust system installation, please refer to CK-KM303 Section 5.

SECTION 10 - Control Cables and Ducting

For control cable & duct connections, the CC363i-FP installation should follow that described in CK-KM303 Section 6 where possible. Please note the following deviations from those instructions:

- The throttle cable must be replaced with a longer version. If you have already installed throttle cable SP58011-003, remove it and use the SP58011-009 cable instead. Note that the throttle cable must pass through two of the engine baffles that are detailed in Section 10, so it may be preferable to wait to fully install the throttle cable until the engine baffle installation is complete.
- No propeller control exists, so instructions pertaining to the Propeller Control Cable should be skipped.
- Cabin heat and aux heat cables should be routed as shown in Figure 10 and mounted using hardware shown in Figure 6.

Note that there are differences in firewall penetration locations for some cables and ducts and therefore your installation may vary from the images in CK-KM303 slightly.

SECTION 11 - Plumbing Connections

For plumbing connections, please refer to CK-KM303 Section 7 for all connections other than Manifold Pressure (MAP) line. For the CC363i-FP install, connect whatever MAP line is detailed in the manual for your chosen instrument panel directly to the port on the #3 cylinder through the firewall grommet specified in Figure 10.

SECTION 12 - Cowl Fitment

The engine cowl should be assembled and fit to the aircraft following sections 4-24 through 4-26 from CK-KM308 for guidance. Note that your cowl will not exactly match those shown in the manual, however the process and fastener placement should be similar. Use Figure 24 for part and fastener location. Install cowl flaps such that they open and close as desired using the hardware shown in Figure 25.

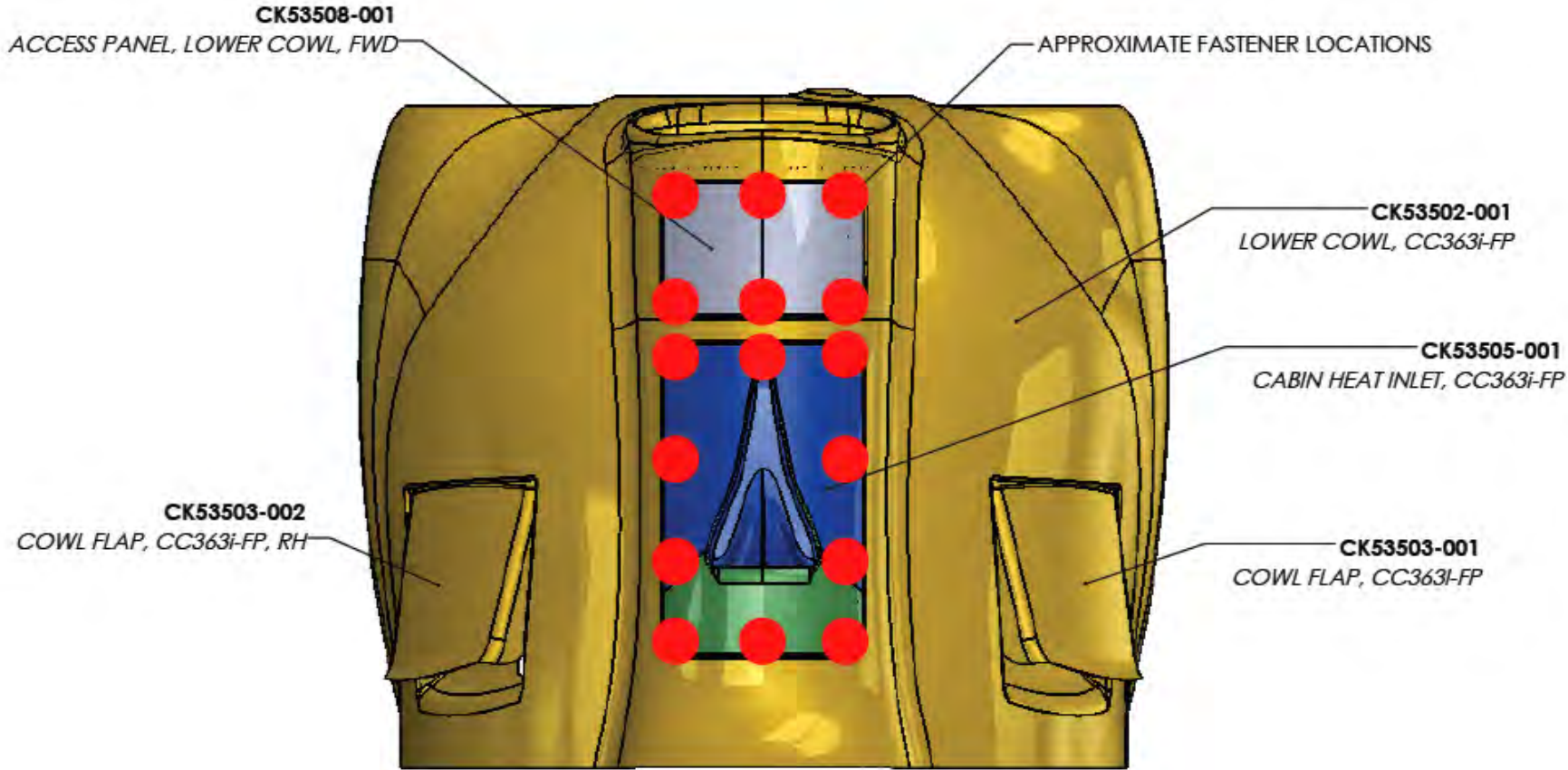


Figure 24 - Cowl Assembly
Bottom View

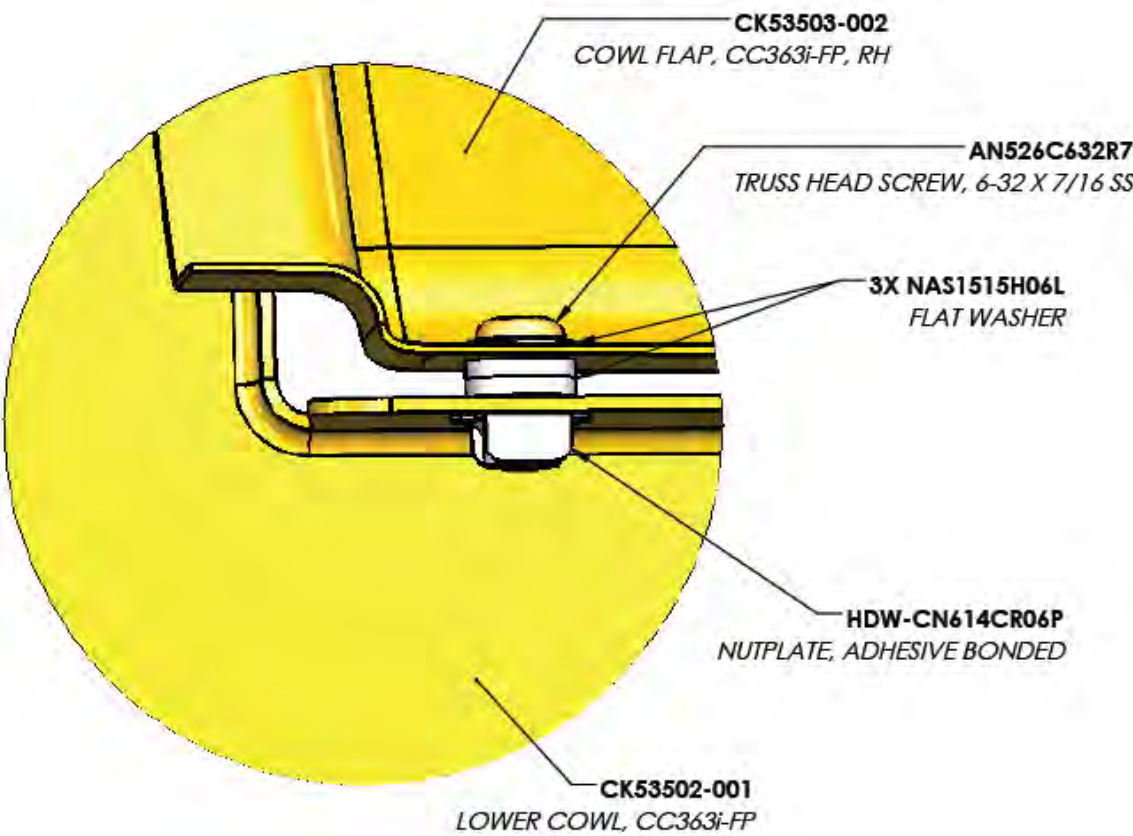


Figure 25 - X4 Cowl Flap Hinge

SECTION 13 - Clean-Up & Additional Resources

Propeller Installation - Propeller install should be completed per the manufacturer's instructions for your propeller selection. Spinner part numbers and installation will vary with propeller choice.

Images and Additional Resources - CubCrafters has stored a selection of images in Dropbox folders that will show further detail on the relationship of cables, baffling, wire harness etc.

- Specific to 363i-FP install: [363i-FP Dropbox Folder](#).
- EX3 Resources: [EX3 Dropbox Folder](#). Note that these images are of the constant speed variant of the 363i installed on an EX3, and therefore some variation should be expected in your installation.

Ignition Coil Wire Assembly - CubCrafters has created a [VIDEO](#) that will take you through the steps of assembling the connectors onto the ends of the ignition coil wires prior to connecting them to the coils on the engine.

Engine Documents - Lycoming has released critical documents pertaining to liability, warranty, break-in procedures, operation, and maintenance of the CC363i-FP engine: 60294-7 Lycoming Overhaul Manual, and 60297-12 are provided as reference in the Dropbox and are available on the Lycoming website. Additional paperwork will be included with your CC363i-FP, including copies of applicable informational Service Instructions.

B&C BC700 Oil Filter Adapter - The 90° oil filter adapter is built and sold by B&C Specialties. Complete installation details can be found in [FK502-xx](#).

Aircraft Log - Make logbook entry stating CC363i-FP power plant was installed and CK-SI003 Rev NC was complied with.

Weight and Balance - Aircraft weight and CG should be re-established if this service instruction is performed on a previously completed aircraft. The operations described in this service instruction may significantly alter the empty weight and CG. Refer to the aircraft POH, Section 6 for further detail.