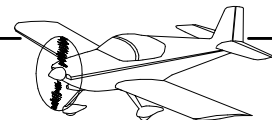


***REVISION DESCRIPTION:***

**Page 31B-01 REV 4:** Removed illustration of ES RS 49-496

**Page 31B-10 REV 1:** Replaced all Figures and Steps

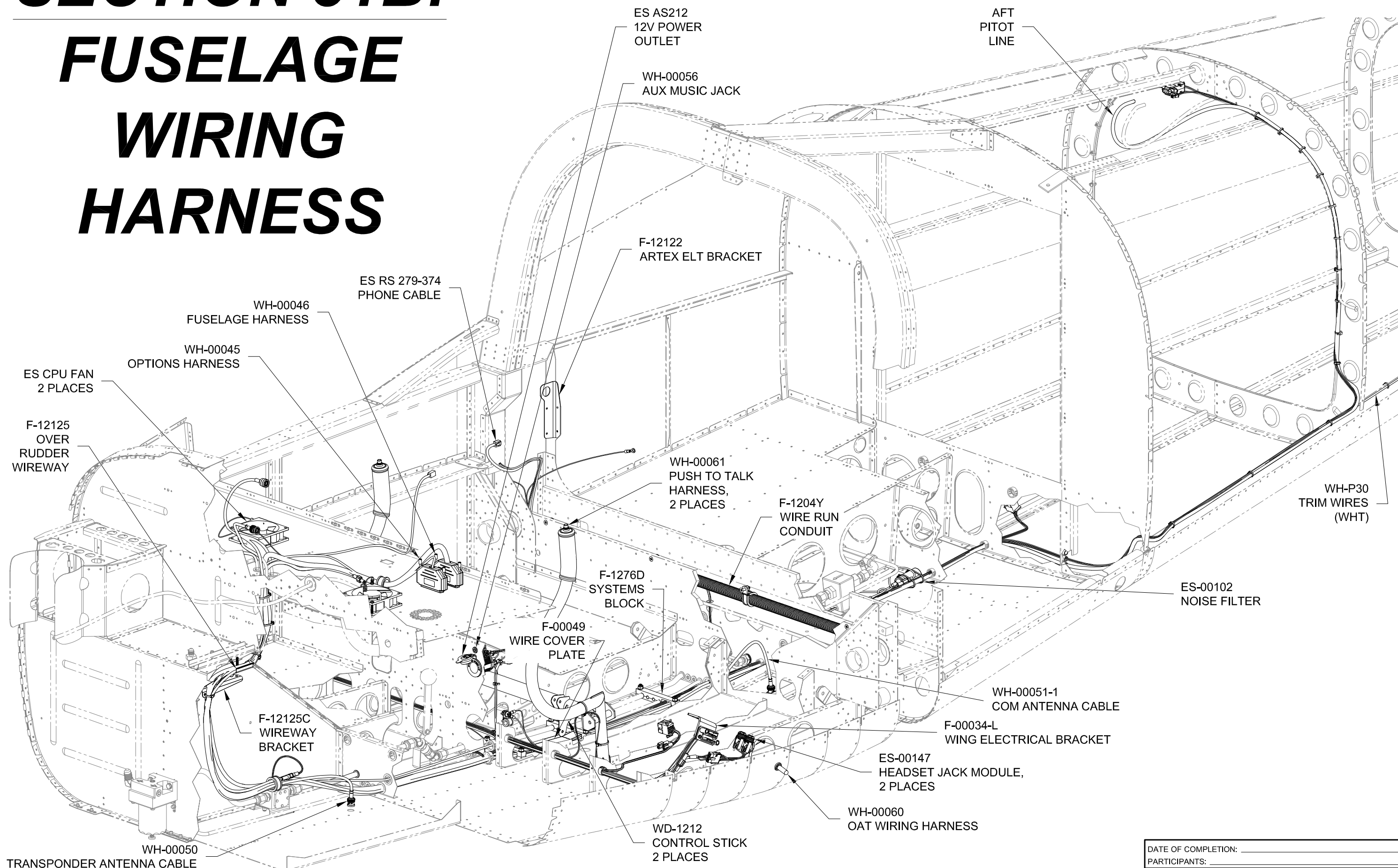


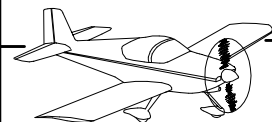
# SECTION 31B:

## FUSELAGE

## WIRING

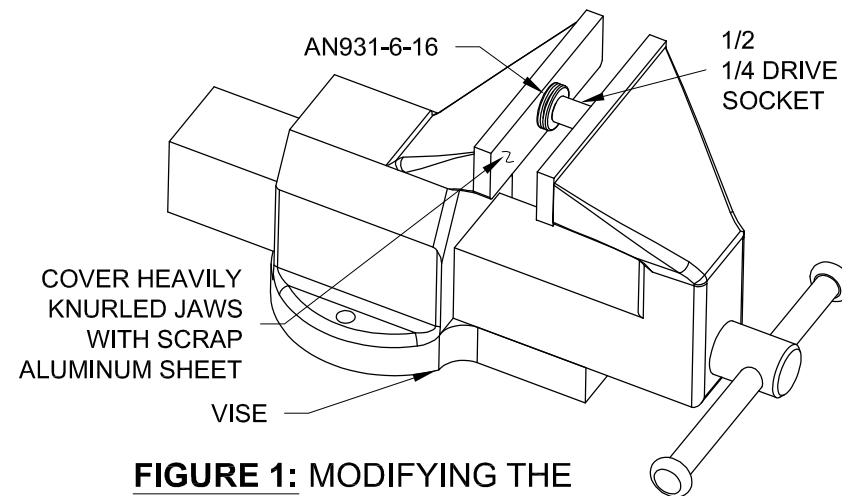
## HARNESS





Step 1: Modify a grommet to be used for firewall penetration. Using a socket and a vise, squeeze the grommet until the socket shears through the grommet (this will be accompanied by a distinct crunching sound). See Figure 1.

Step 2: Insert the modified rubber grommet made in Step 1 into the F-1201A Firewall Upper penetration location.



**FIGURE 1: MODIFYING THE FIREWALL GROMMET**

**NOTE:** Look at Figure 3 to determine the type of fuel flow transducer supplied in your kit, then complete the appropriate Step 3.

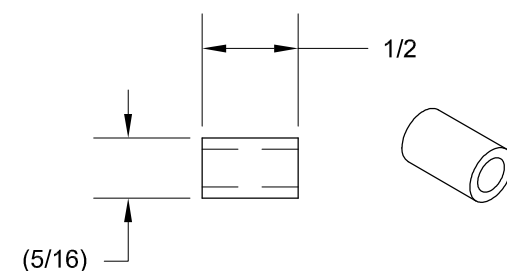
Step 3 (IE DYNON FF-1 (FT-60)): Remove the forward most bolt holding the FT-60 Fuel Flow Transducer.

Final-Drill 1/4 the cushioned clamp called out in Figure 3 then slide it over the bolt and reinstall the bolt.

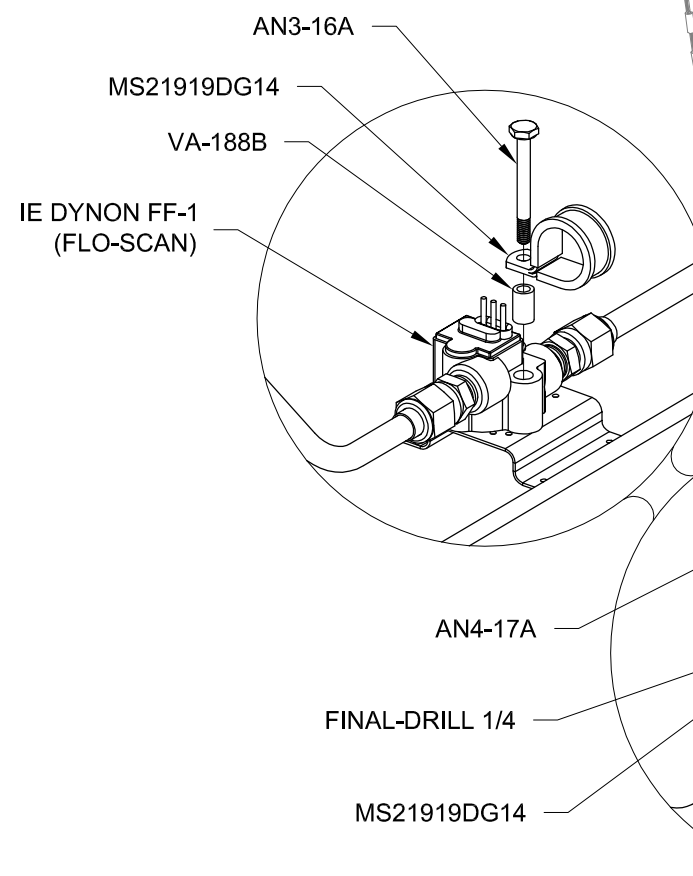
Step 3 (IE DYNON FF-1 (Flo-Scan)): Remove the inboard most bolt.

Make the VA-188B Standoff from AT6-058X5/16 as shown in Figure 2.

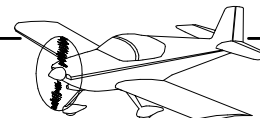
Install the standoff and a cushioned clamp on the FLO-SCAN Fuel Flow Transducer using the hardware called out in Figure 3.



**FIGURE 2: VA-188B**



**FIGURE 3: FUEL FLOW WIRE HARNESS CLAMP**



**NOTE:** The intent of this section is to install all of the wires that will eventually integrate with components supplied in the avionics kit or optional kits such as Lighting or Autopilot. Even if not installing optional systems route the wires so that in the future these systems may easily be added.

**NOTE:** When routing wires in this section between the region over the rudder pedals and the snap bushings in the F-1202B Panel Base check that the wires will easily fit through the notch in the forward edge of the F-1230 Tunnel Cover.

**Step 1:** Cut a 36 inch length of DUCT NT 5/8 to make the F-1204Y Wire Run Conduit.

Cut a 7/16 diameter hole in the wire run conduit for the wires coming from the top center of the F-1204 Center Section Assembly (see Figure 1).

To help pull wires through later, add one string going from the hole to the left end of the conduit, one from the hole to the right end and one going from one end to the other. Leave enough excess string that when the conduit is installed the string will hang down below the bottom of the airplane. When pulling a wire with a string add a new string for future use.

**Step 2:** Using the clamps and hardware called out in the detail view in the right side of Figure 1 install the F-1204Y Wire Run Conduit. Center the wire run conduit about the centerline of the aircraft with the hole cut in Step 1 over the snap bushing in the F-1204 Center Section Assembly.

**NOTE:** When routing cables and wires some snap bushings may need to be removed and the wire or cable passed through the hole. Slit the snap bushing, place it over the cable then insert the bushing back into the hole.

**NOTE:** Route each wire individually within a harness all the way through the described path. This will help prevent a knotted mess that will cause jams at the snap bushings.

**Step 3:** Find the narrow red band of heat shrink on the WH-00051-1 Com Antenna Cable, WH-00050 Transponder Antenna Cable and WH-00095 ADS-B Antenna Cable. The ends of the cables closest to the red band will be above the F-1202B Panel Base.

Route the ends of the cables furthest away from the red bands down through separate snap bushings in the panel base.

Align the red bands with the panel base. This will set the amount of cable to be left above the panel base. This concept will be used on other harnesses as well.

Loosen the bolts holding the rudder pedals, lowering them slightly to allow room for a BNC connector to pass between the pedals and the firewall.

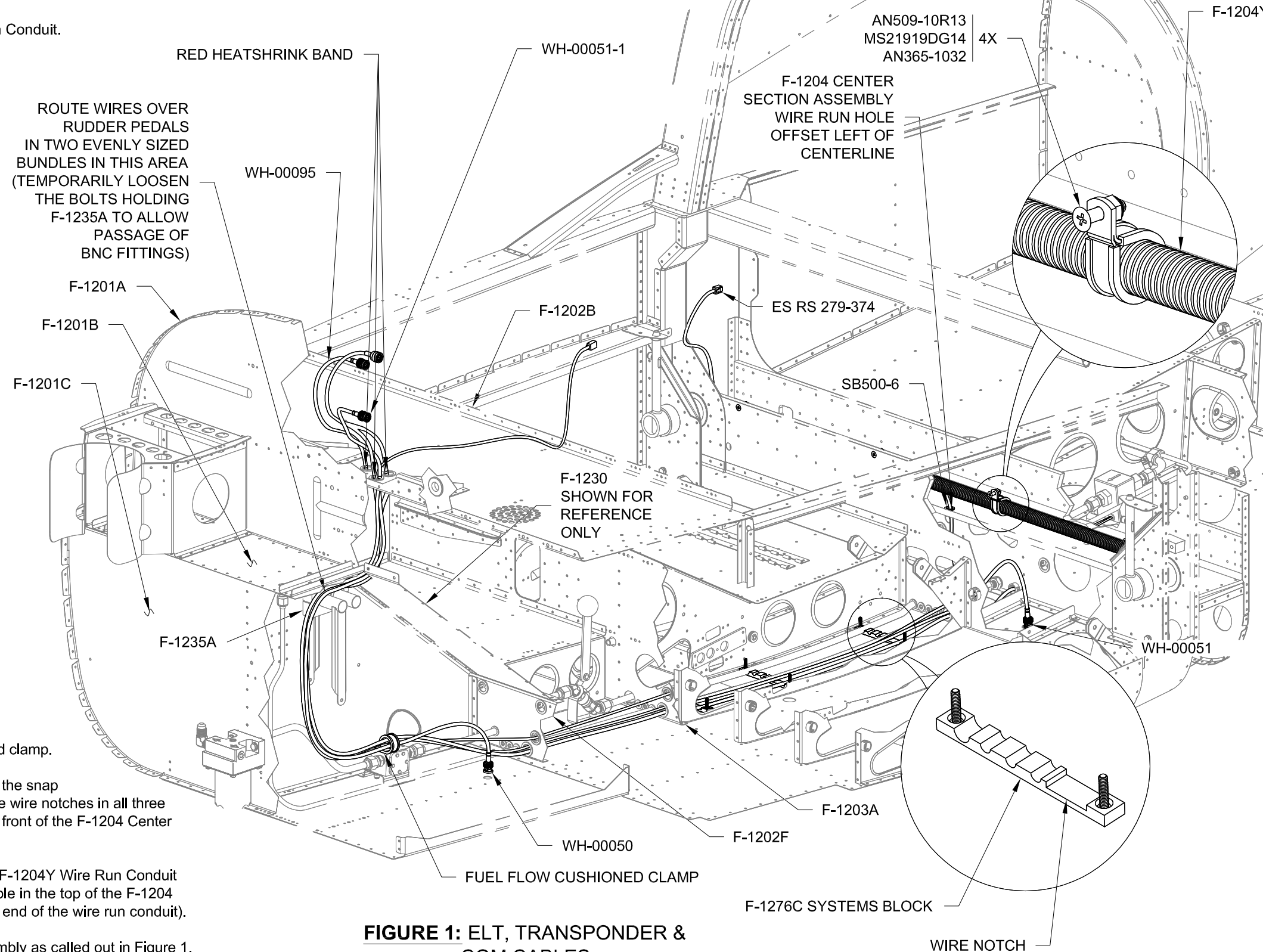
Route the cables over the rudder pedals, and through the fuel flow cushioned clamp.

Continue to route the com antenna cable and ADS-B antenna cable through the snap bushings in the F-1202F and F-1203A Bulkheads. Lay the cables through the wire notches in all three F-1276C System Blocks. Route the cables through the snap bushings in the front of the F-1204 Center Section Assembly.

**Step 4:** Route the ES RS 279-374 Phone Cable through the right end of the F-1204Y Wire Run Conduit (Use one of the strings installed in Step 1) then down through the wire run hole in the top of the F-1204 Center Section Assembly (16 inches should remain protruding from the right end of the wire run conduit).

Slit then insert a snap bushing in the top of the F-1204 Center Section Assembly as called out in Figure 1.

Route the cable forward through the same route used by the WH-00051-1 Com Antenna Cable.



**FIGURE 1: ELT, TRANSPONDER & COM CABLES**





**CAUTION:** When inserting connectors into a connector body check that the connector is fully retained with a gentle tug.

Step 1: Find the WH-P30 Trim Wires in the tailcone area. See Page 10-08.

Route the trim wires forward following the main wire run through the fuselage then up through the F-1202B Panel Base. See the overall view on Page 31B-01.

Step 2: Apply +12V to one WH-P30 (WHT) wire and GND to the other WH-P30 (WHT) wire to determine which combination causes the trim tab to move up.

Label the end of the wire to which +12V was applied "TAB UP".

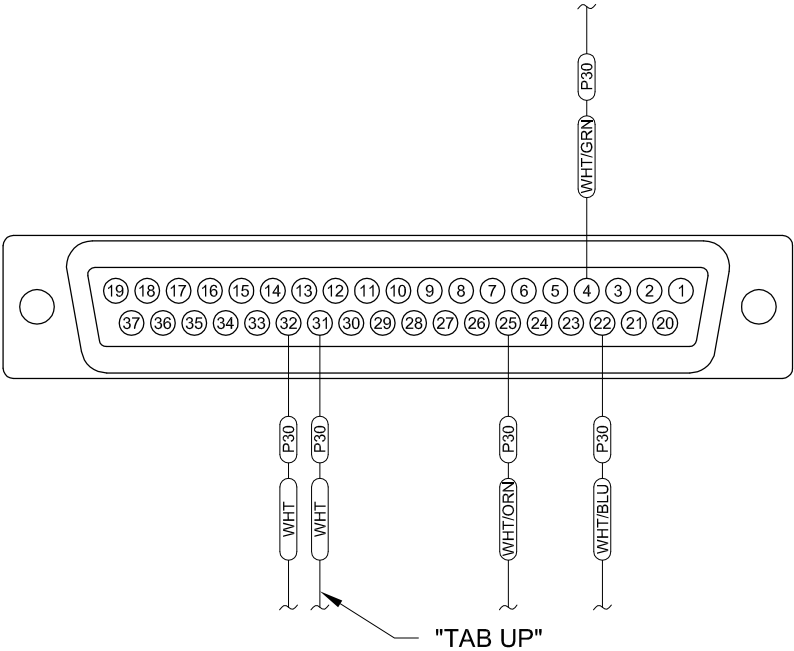
Insert the wire labeled "TAB UP" through the heat shrink on the WH-00046 Fuselage Wiring Harness and into the 37-pin d-sub Pin 31 as shown in Figure 1.

Insert the remaining (WHT) wire through the heat shrink and into the 37-pin d-sub Pin 32 as shown in Figure 1.

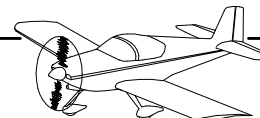
Step 3: Insert the WH-P30 (WHT/GRN), WH-P30 (WHT/ORN) and WH-P30 (WHT/BLU) wires through the heat shrink on the WH-00046 Fuselage Wiring Harness and into the 37-pin d-sub positions shown in Figure 1.

Step 4: Slide the heat shrink supplied with the WH-00046 Fuselage Wiring Harness up the wires until its length is centered about the exit of the backshell then activate the heat shrink.

Install the d-sub backshell and label supplied in the bag with the fuselage wiring harness.



**FIGURE 1: INSTALLING PITCH TRIM WIRES  
IN THE FUSELAGE WIRING HARNESS  
D-SUB CONNECTOR  
(VIEW FROM WIRE INSERTION SIDE)**



**NOTE:** For the remainder of this section previously routed wires may not be shown for clarity.

**Step 1:** Cut the black and red wires on the ES CPU FAN's to four inches long. Strip the ends of both the black and red wires coming from both ES CPU FAN's.

Crimp ring terminals to the ends of the black wires as shown in Figure 1.

Crimp spade connectors to the ends of the red wires as shown in Figure 1.

**CAUTION:** Do not over tighten the screws holding the ES CPU FANS. This can bend and then break the attach ears on the fans!

**WARNING:** Connecting the wires on the ES CPU FANS incorrectly will cause permanent damage.

**Step 2:** Install both ES CPU FAN's per the hardware call-outs in Figure 1 with the left fan blowing down and the right fan blowing up. The ground ring terminal goes underneath the head of one of the screws that hold the fans in place. Check the flow direction (if not indicated by an arrow on the side of the fan) by hooking the red wire to the positive terminal on a 12 volt battery and touching the black to the negative battery terminal.

**Step 3:** Beginning with the longest wires, route all wires in the WH-00046 Fuselage Wiring Harness down through the forward most snap bushing in the center forward region of the F-1202B Panel Base except the WH-P388 (WHT/RED) and WH-P389 (WHT/RED) (fan power) wires.

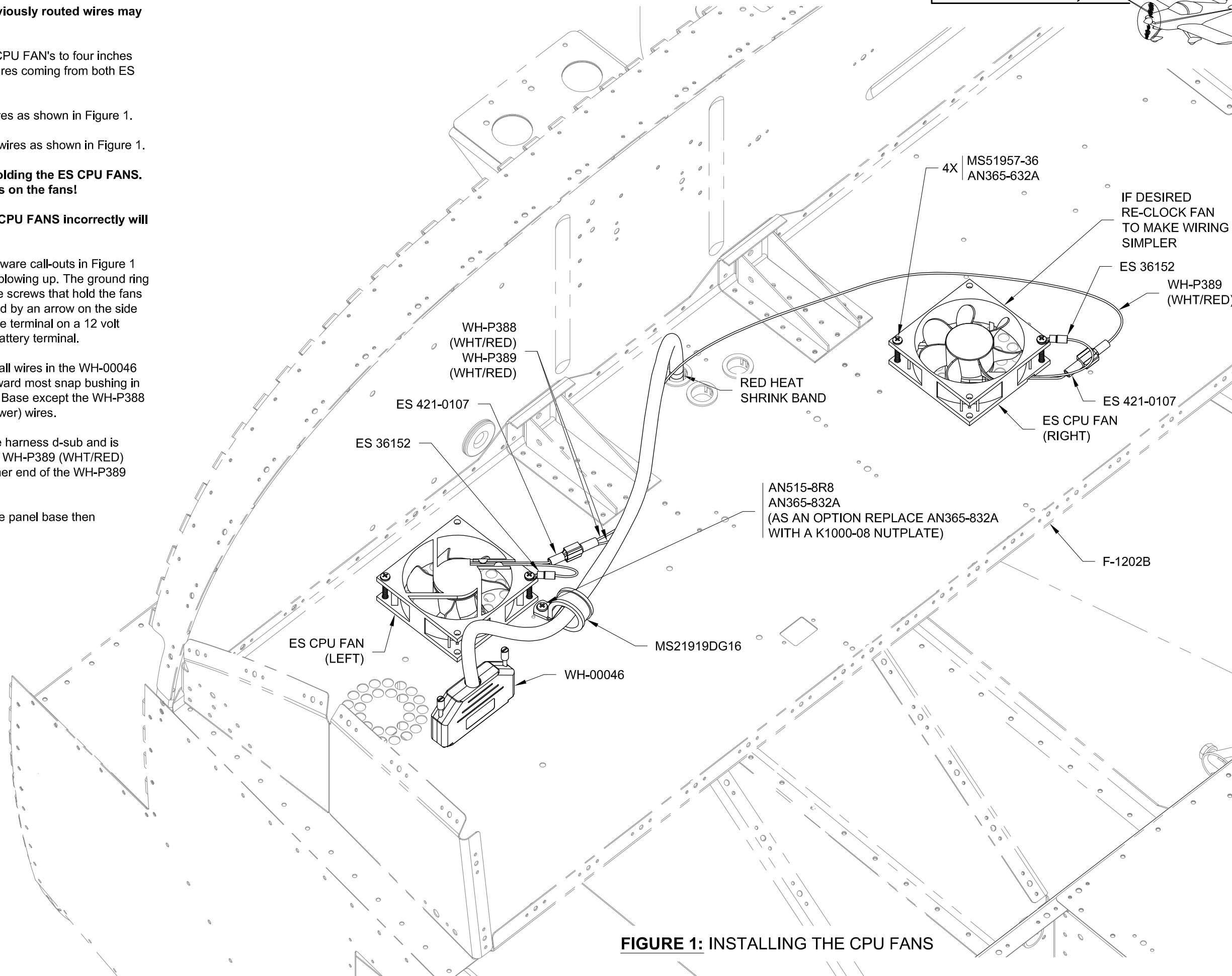
The WH-P388 (WHT/RED) wire comes from the harness d-sub and is double crimped into a spade connector with the WH-P389 (WHT/RED) wire. A spade connector is crimped onto the other end of the WH-P389 (WHT/RED) wire.

Align the narrow band of red heat shrink with the panel base then tape the harness down to maintain its position.

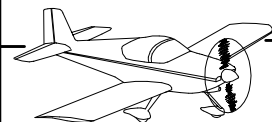
**Step 4:** Add a cushioned clamp around the WH-00046 Fuselage Wiring Harness just aft of the left ES CPU FAN as shown in Figure 1. Loosely install the screw for adding more cables later.

**Step 5:** Route the WH-P388 (WHT/RED) and WH-P389 (WHT/RED) Fan Power Wires to each ES CPU FAN as shown in Figure 1.

Attach the spade connectors on these wires to the spade connectors on the RED wires coming from the ES CPU FANS's.



**FIGURE 1: INSTALLING THE CPU FANS**



**CAUTION:** Do not shorten any wires when finishing connections on wires that are part of the Fuselage or Optional wire harnesses. This could result in some wires being too short after completing the final dressing/tie wrapping of the harnesses along its full length.

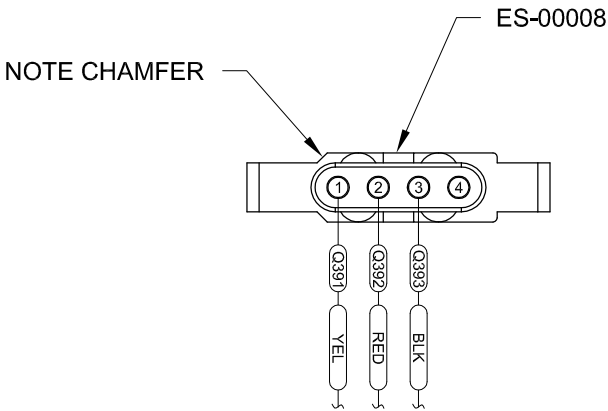
**Step 1:** Route the WH-00046 Fuselage Wiring Harness through the fuel flow cushioned clamp.

Separate out the the twisted wires WH-Q391 (YEL), WH-Q392 (RED) and WH-Q393 (BLK) from the WH-00046 Fuselage Wiring Harness.

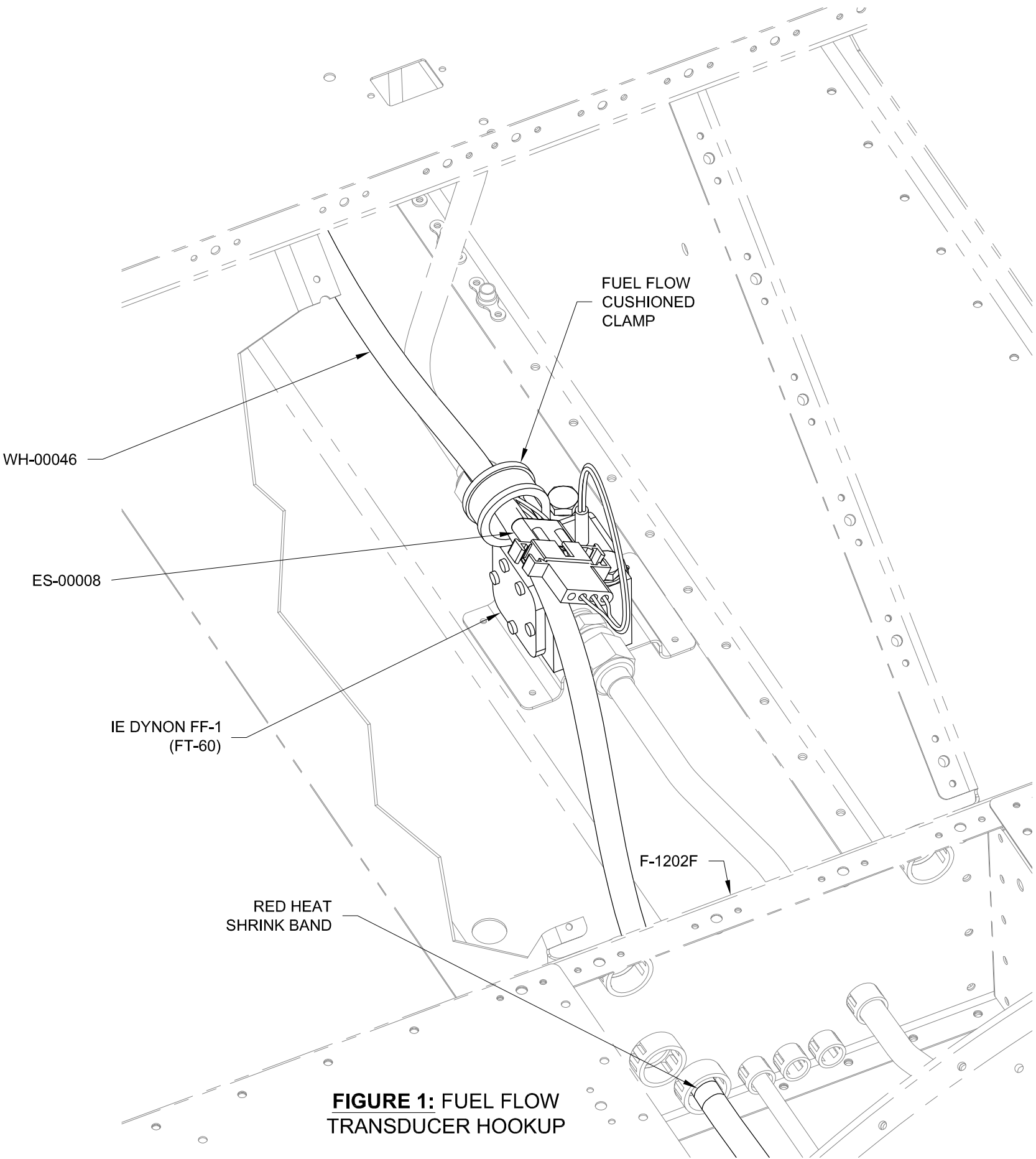
Route the remaining fuselage wiring harness through the snap bushings in the F-1202F and F-1203A Bulkheads shown in Figure 1. Align the red band of heat shrink around the harness with the web of the F-1202F bulkhead. Temporarily tape the harness to prevent ts movement relative to the bulkhead.

**Step 2:** Insert the Molex pins on the twisted wires WH-Q391 (YEL), WH-Q392 (RED) and WH-Q393 (BLK) into a ES-00008 Molex Plug, 4 Position as shown in Figure 2.

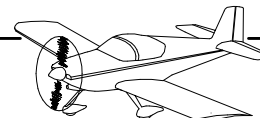
**Step 3:** Insert the Molex connector on the end of the IE DYNON FF-1 Fuel Flow Transducer wires into the ES-00008 Molex Plug, 4 Position connector coming from the WH-00046 Fuselage Wiring Harness. See Figure 1.



**FIGURE 2: FUEL FLOW  
TRANSDUCER HOOKUP  
CONNECTOR SCHEMATIC  
(VIEW FROM WIRE INSERTION SIDE)**



**FIGURE 1: FUEL FLOW  
TRANSDUCER HOOKUP**



**NOTE:** When installing wire pins into Micro-Fit connectors, the pin will only fully insert and lock in one orientation. If it fails to insert, rotate 90 degrees and try again. Note the orientation when it properly inserts and position all subsequent pins the same. Lightly pull test each wire after insertion to verify it has hooked into the connector body.

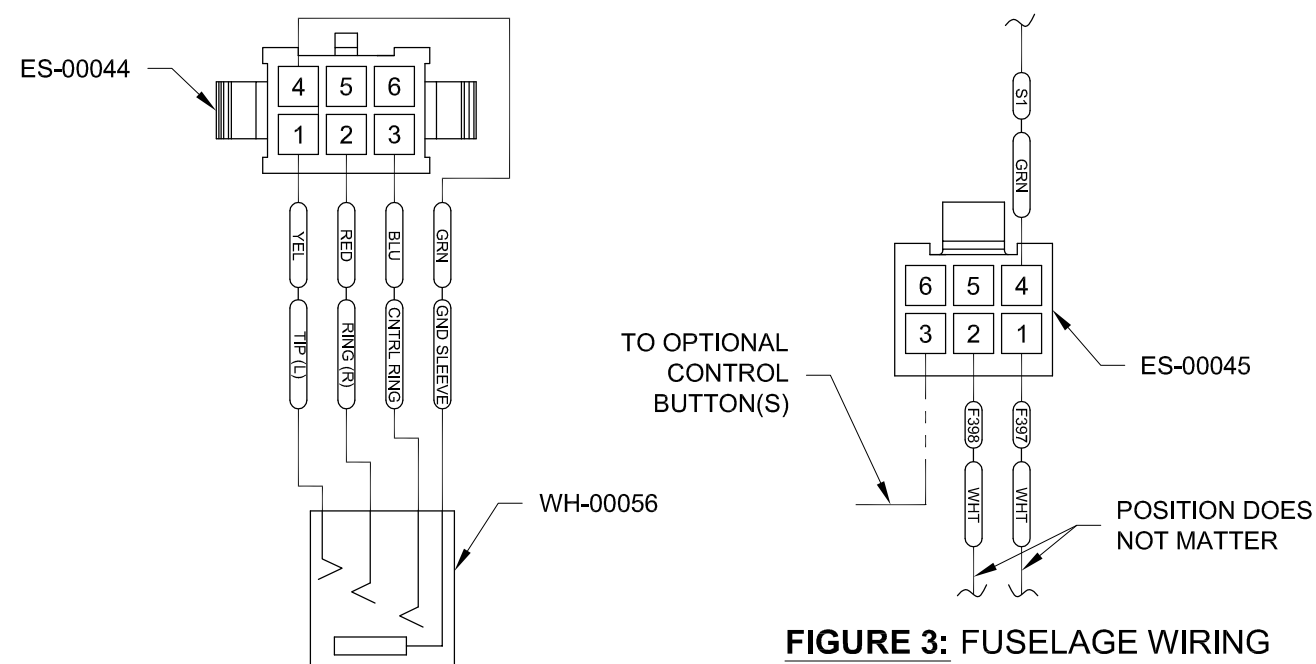
**Step 1:** Install the WH-00056 Aux Music Jack to the F-1203A Bulkhead as shown in Figure 1. The jack fits very snugly and will be difficult to press in.

Insert the pins on the wires coming from the aux music jack into an ES-00044 Molex Plug, 6 Position Micro Fit connector as shown in Figure 2.

**Step 2:** Separate the WH-F397 (WHT) and WH-F398 (WHT) Aux 1 Music Wires coming from the WH-00046 Fuselage Wiring Harness.

Insert these wires and the GRN shield coming from them into an ES-00045 Molex Receptacle, 6 Position Micro Fit connector as shown in Figure 3.

**Step 3:** Connect the receptacle coming from the WH-00056 Aux Music Jack to the corresponding plug coming from the WH-00046 Fuselage Wiring Harness.



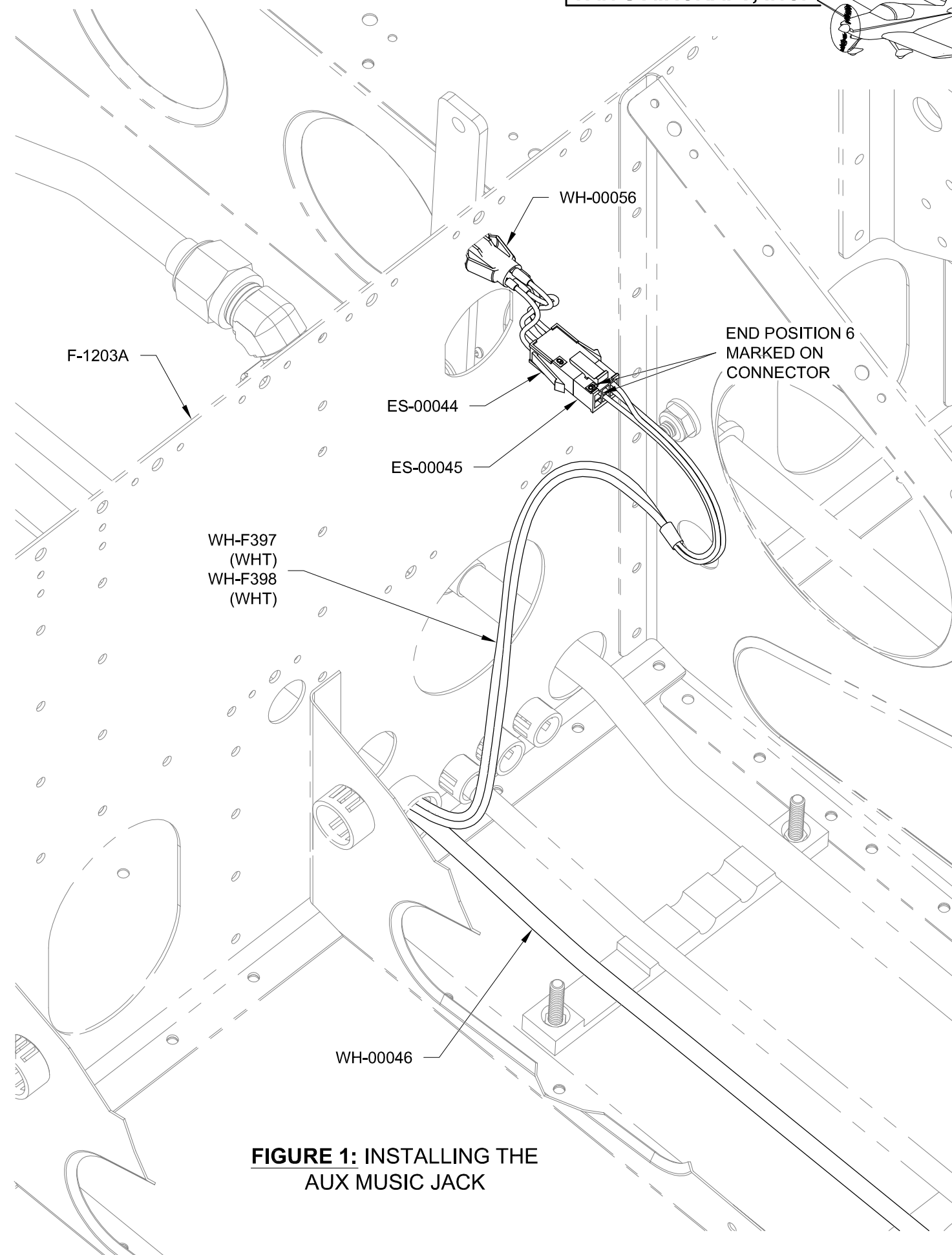
**FIGURE 2: AUX MUSIC JACK CONNECTOR SCHEMATIC**  
(VIEW FROM WIRE INSERTION SIDE)

**FIGURE 3: FUSELAGE WIRING HARNESS CONNECTOR SCHEMATIC**  
(VIEW FROM WIRE INSERTION SIDE)

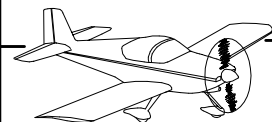
**NOTE:** As an option a switch to remotely control a device may be connected to the WH-00056 Aux Music Jack. The control button(s) should not be placed in a location to be confused with another switch (for example the push to talk switch or the autopilot disconnect switch).

The aux music jack is a TRRS (Tip Ring Ring Sleeve) jack. See Figure 2 for a definition of each position on the plug. The Tip and the ring next to it are for the Left and Right audio channels. The remaining ring and the sleeve are used for audio ground and control of the device. Depending on the device (for example Blackberry devices are opposite of Apple devices) the control or ground line may be either the sleeve or the ring. Figures 2 and 3 show the setup for an Apple device.

Find information on how your specific device may be controlled with a TRRS jack. Due to the large number of available devices Van's will not be able to provide further technical guidance than the information presented on this page. Van's will not be responsible for use of any device in a way that would distract the pilot or otherwise compromise the flight safety of the aircraft.



**FIGURE 1: INSTALLING THE AUX MUSIC JACK**



Step 1: Find the WH-F396 (BRN/YEL) Stall Warn Wire and route it through the snap bushings in all the F-1215 Seat Ribs on the left side of the aircraft.

Install the stall warning wire into the ES-00077 Floating 8 Pos Connector Female as shown in Figure 2.

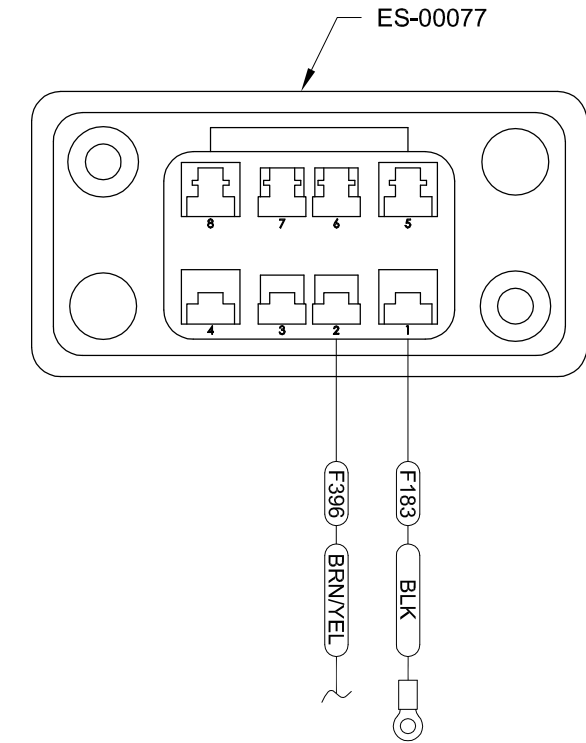
Step 2: Find the two loose WH-F183 (BLK) Wing Ground Wires that were supplied in the package with the WH-00046 Fuselage Wiring Harness.

Attach each wire to the inboard most set of seat ribs using the hardware shown in Figure 1. Do not fully tighten the hardware at this time.

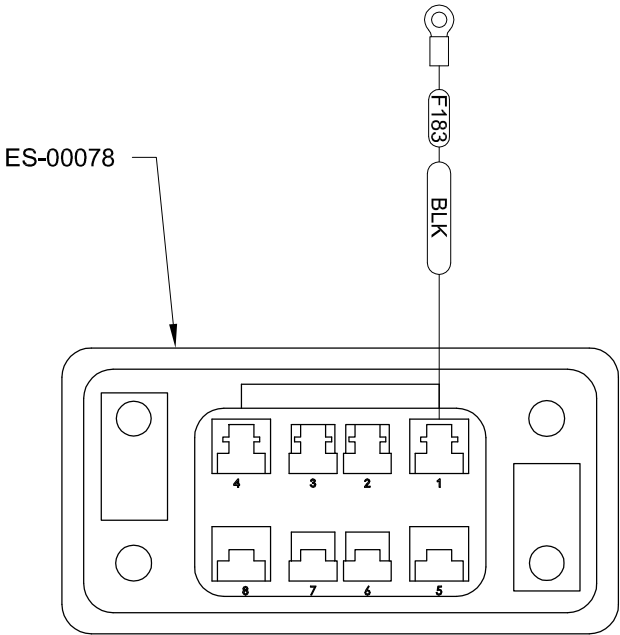
Route both wing ground wires outboard through the snap bushings in the F-1215 Seat Ribs on each side of the aircraft.

Attach one of the wires to the ES-00077 Floating 8 Pos Connector Female on the left side of the aircraft as shown in Figure 2.

Attach the remaining wire to a ES-00078 Floating 8 Pos Connector Male on the right side of the fuselage as shown in Figure 3.



**FIGURE 2: LEFT FUSELAGE  
CONNECTOR FEMALE**  
(VIEW FROM WIRE INSERTION SIDE)



**FIGURE 3: RIGHT FUSELAGE  
CONNECTOR MALE**  
(VIEW FROM WIRE INSERTION SIDE)

AN525-10R10  
MS21919DG6  
NAS1149F0332P  
MS21083-N3

2X

WH-F183  
(BLK)

WH-F396  
(BRN/YEL)

**FIGURE 1: INSTALLING  
GROUND WIRES**



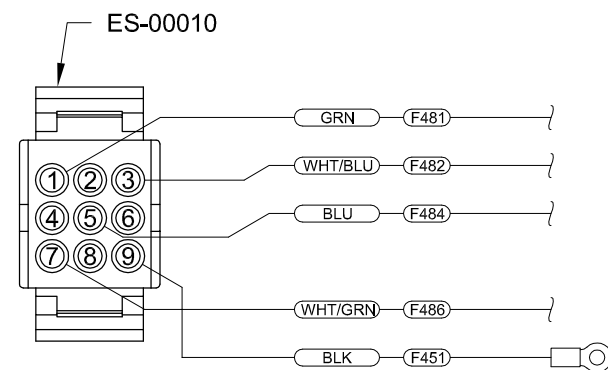
Step 1: Find two twisted pair of wires WH-F481 (GRN) WH-F484 (BLU) and WH-F486 (WHT/GRN) WH-F482 (WHT/BLU) for the autopilot pitch servo terminated in Molex style connectors. Route these wires through the snap bushings in the three most inboard F-1215 Seat Ribs. See Figure 1.

Insert the wires into a ES-00010 Molex Plug, 9 Position as shown in Figure 2.

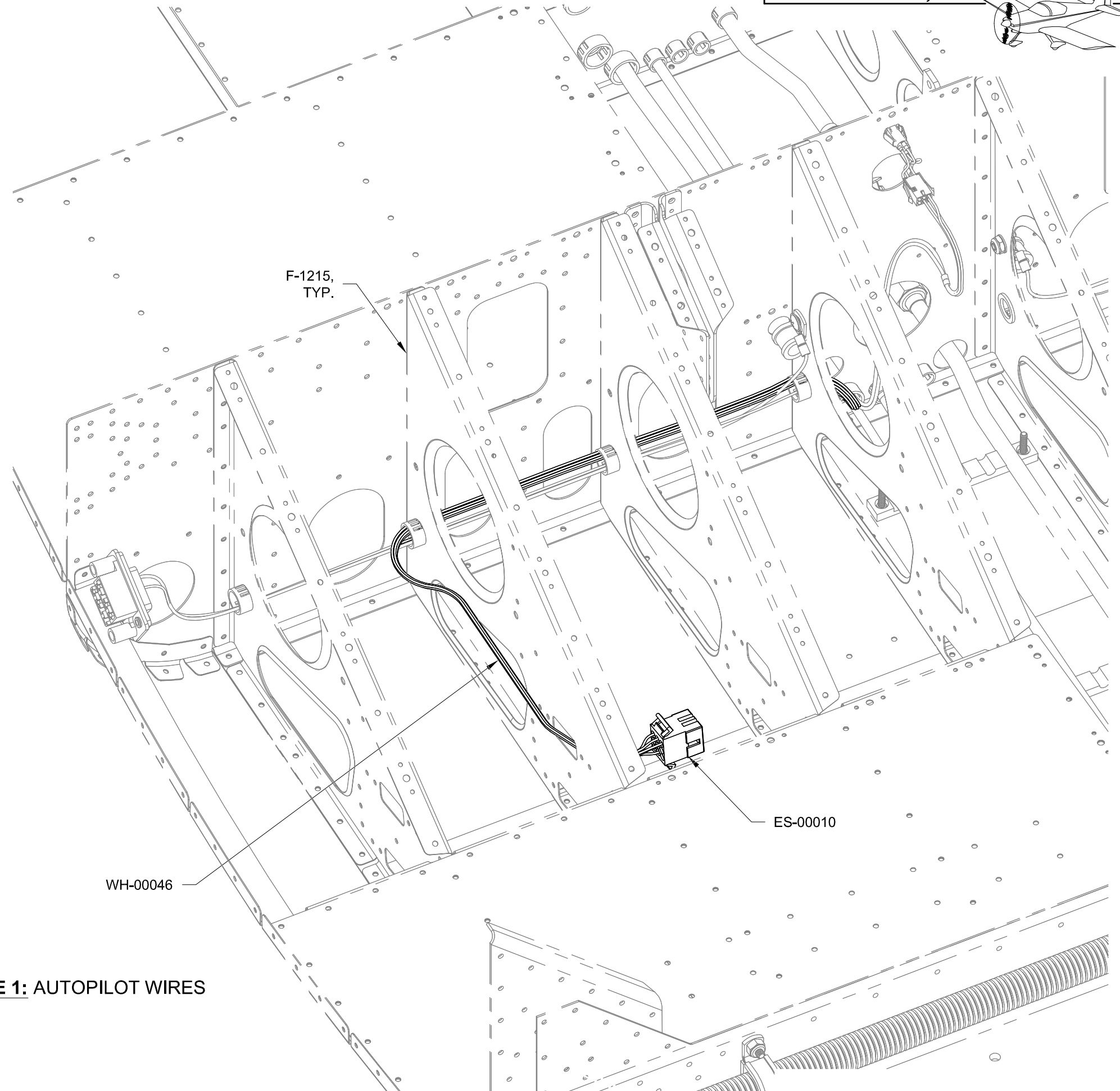
Step 2: Find the loose WH-F451 (BLK) Ground Wire that was supplied in the package with the WH-00046 Fuselage Wiring Harness, that has a Molex style connector on one end and a ring terminal on the other end.

Insert the WH-F451 (BLK) into the ES-00010 Molex Plug, 9 Position as shown in Figure 2.

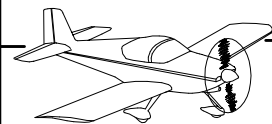
This wire is intended for an autopilot servo ground. If not installing the optional autopilot kit tie-wrap this wire to other wires at this time.



**FIGURE 2: CONNECTION TO PITCH SERVO**  
(VIEW FROM WIRE INSERTION SIDE)



**FIGURE 1: AUTOPILOT WIRES**



Step 1: Find the WH-F50 (BRN/BLU) Spar Pin Wire and route it up through the F-1204Y Wire Run Conduit and out the left end.

Step 2: Install snap bushings in the F-1204C-L & -R Fwd Bulkhead Sides and F-1204B-L & -R Aft Bulkhead Sides as shown in Figure 1.

Step 3: Choose one of the two WH-00120 Spar Pin Switch Harness (here after refereed to as the spar pin switches) Trim one of the two wires back to 4 1/2 inches in length. Strip the ends of both wires coming from each switch. Crimp a ring terminal to the 4 1/2 inch long wire as called out in Figure 3.

Step 4: Locate the F-00104 Spar Pin Switch Plates and install the spar pin switches into the slots using the hardware that comes with the spar pin switches. Using the hardware called out in Figure 2 and Figure 3 attach the spar pin switch plates to the outboard face of the flange on the F-1248-L & -R Arm Rests (attach the ring terminal from Step 2 at the same time). Route the single wire coming from the spar pin switch on the right side of the aircraft and both wires on the left side of the aircraft through the snap bushings installed in Step 1. Crimp on butt splices to the switch wires as shown in Figure 1.

Step 5: Fully insert the spar pins with the retaining screw facing inboard and snap the left WD-1217C Fuselage Pin Stopper into the F-1248B Fuselage Pin Latch.

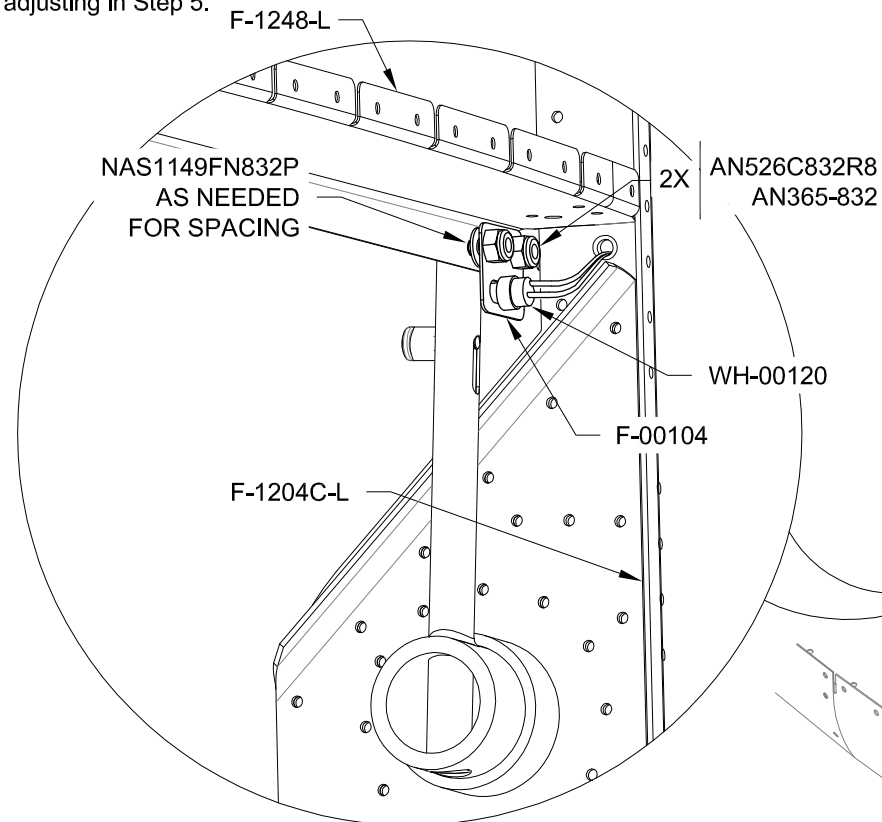
Adjust a spar pin switch fore and aft by loosening the spar pin switch in the slot of the spar pin switch plate and sliding the switch in the slot until the plunger in the switch is lined up with the handle of the spar pin.

Adjust a spar pin switch outboard by installing extra washers between the spar pin switch plate and the flange of the corresponding F-1248 Arm Rest. Use as many washers as needed so that the switch is fully depressed when the fuselage pin is in its installed position with the fuselage pin stopper engaged in the fuselage pin latch.

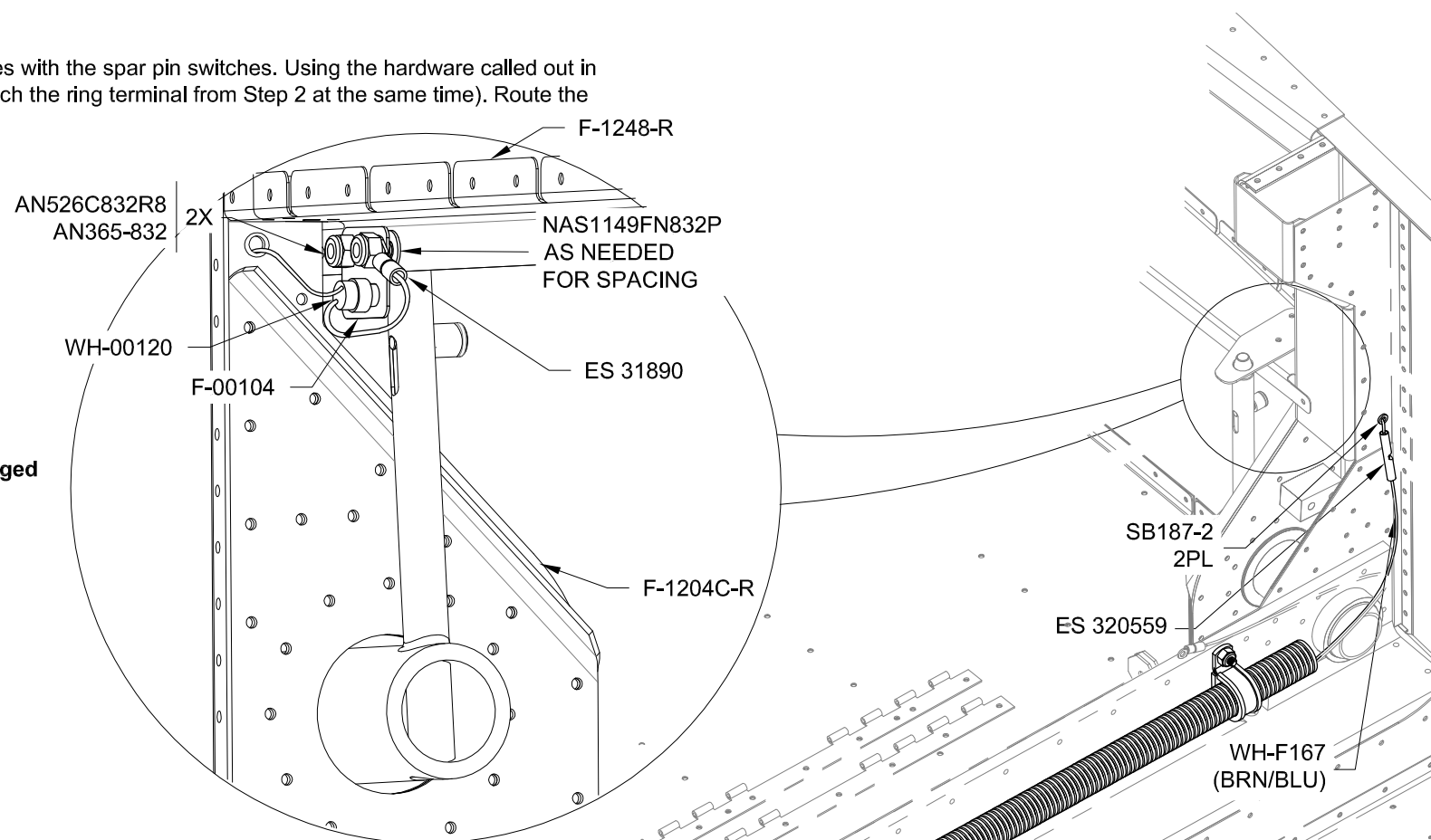
**WARNING:** Ensure that the spar pin switch is activated by the fuselage pin only when the fuselage pin stopper is engaged in the fuselage pin latch.

Step 6: Find the WH-F167 (BRN/BLU) Spar Pin Interconnect Wire (included with the WH-00046 Fuselage Wiring Harness) 42 inches long then strip both ends. Crimp one end to the butt splice installed in Step 3 on the right spar pin switch, route through the F-1204Y Wire Run Conduit and crimp the other end to one of the butt splices installed in Step 3 on the left spar pin switch. Crimp the remaining butt splice on the left spar pin switch to the WH-F50 (BRN/BLU) Spar Pin Wire.

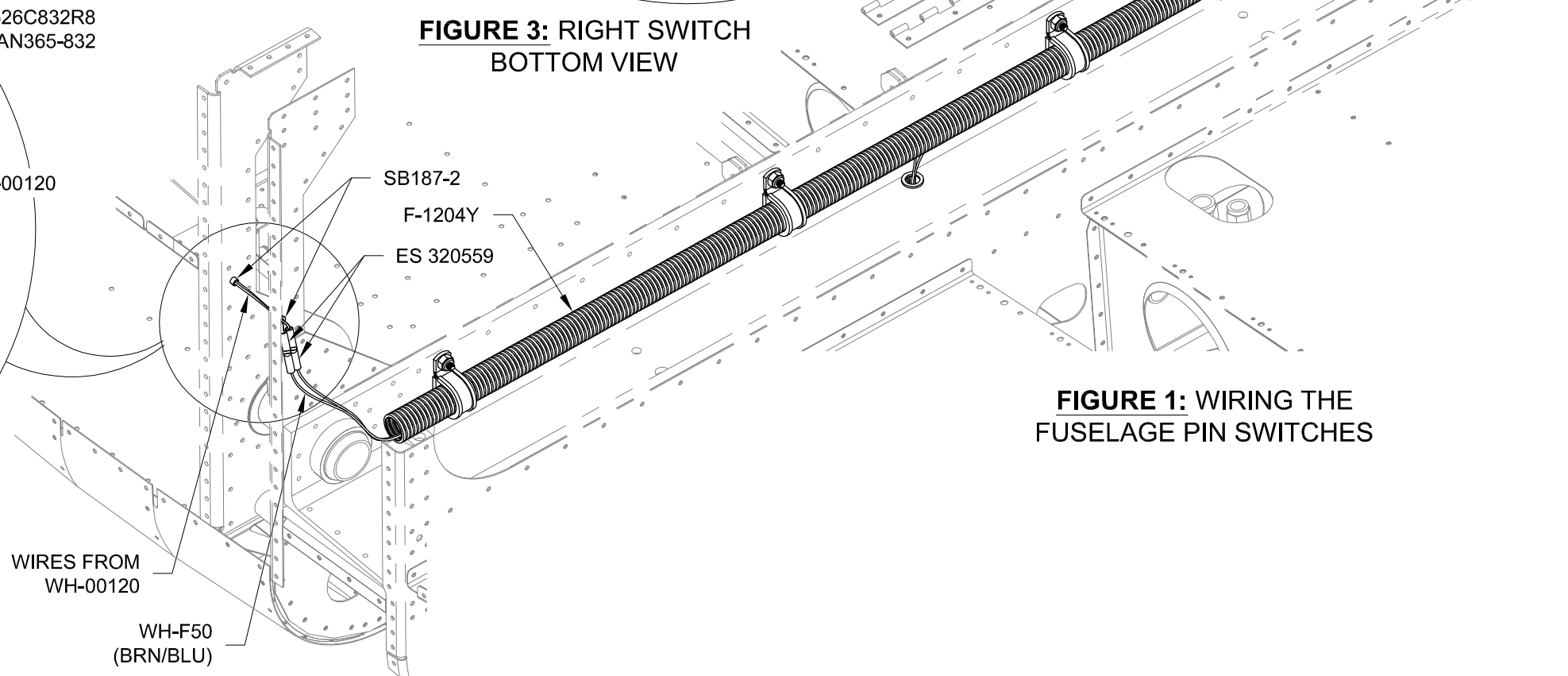
Step 7: Double check that hardware installed in Step 4 is tight if altered when adjusting in Step 5.



**FIGURE 2: LEFT SWITCH  
BOTTOM VIEW**



**FIGURE 3: RIGHT SWITCH  
BOTTOM VIEW**



**FIGURE 1: WIRING THE  
FUSELAGE PIN SWITCHES**





**Step 1:** Lay the remaining WH-00046 Fuselage Wiring Harness wires through the wire notches in all three F-1276C System Blocks then route through the forward snap bushing in the F-1204 Center Section Assembly as shown in Figure 1.

**Step 2:** Double check that the narrow band of red heat shrink band on the WH-00046 Fuselage Wiring Harness is still even with the F-1202F Bulkhead.

Dress out all of the wiring and add tie-wraps as needed to keep the harness neatly bundled.

**Step 3:** Find the WH-Q428 (ORN/BRN) Fuel Level Wire, WH-F395 (GRY/PRP) GPS Data Out Wire, WH-P325 (WHT/RED) ELT Power Wire, and the WH-W1114 (WHT) Canopy Latch Switch Terminal Wire.

Route these wires up through the top snap bushing in the F-1204 Center Section Assembly, then into the F-1204Y Wire Run Conduit and out the right end (use the string installed previously, remember to add a new string as you pull the wires through).

Strip the end of the fuel level wire and crimp on a ring terminal per the call-out in Figure 1.

**Step 4:** Cut two short lengths of heat shrink from the ES HST 3/16X1' Heat Shrink.

Cover the ends of the WH-F395 (GRY/PRP) GPS Data Out Wire, WH-P325 (WHT/RED) ELT Power Wire..

Tie-wrap both wires to the ES RS 279-374 Phone Cable (not shown in Figure 1, see Page 31B-03) and coil for future use.

**Step 5:** Route the WH-00095 ADS-B Antenna Cable aft through the snap bushings in the F-1206A and F-1207B Bulkheads.

**Step 6:** Route the remaining wires of the WH-00046 Fuselage Wiring Harness through the aft snap bushing in the back of the F-1204 Center Section Assembly and then aft through the F-1206A and F-1207B Bulkheads. Leave them laying loose in the tailcone area.

**Step 7:** Remove the left bolt holding down the fuel pump. Final-drill 1/4 the cushioned clamp called out in Figure 1. Slip the clamp around the wires and onto the bolt, slip the ring terminal from the black ground wire coming from the fuel pump over the bolt, then reinsert the bolt.

**Step 8:** Route the WH-P390 (RED) Fuel Pump Wire through the cushioned clamp.

Strip the end of the wire then crimp on a spade connector as shown in Figure 1.

WH-F395  
(GRY/PRP)  
WH-P325  
(WHT/RED)  
(COVER ENDS  
IN HEAT SHRINK)

WH-W1114  
(WHT)  
(LEAVE  
UNCOVERED)

ES 421-0107

WH-P390  
(RED)

FUEL PUMP BOLT

FUEL PUMP  
GROUND RING  
TERMINAL

WH-Q428  
(ORN/BRN)

F-1207B

WH-00095

F-1206A

MS21919DG10

ES 36154

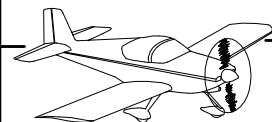
F-1204 CENTER  
SECTION ASSEMBLY  
UPPER SNAP BUSHING

F-1276C

F-1204Y

WH-00046

**FIGURE 1: FUEL PUMP, FUEL  
LEVEL AND ELT WIRES**



**Step 1:** Purchase a set of Ø7/8 handle bar grips from a local bike shop. Remove the plug from the end and install the grips over the end of the WD-1212 Control Sticks. See Figure 1.

**Step 2:** Drill Ø1/4 a hole in the center of the handle bar grip plug. Remove the grip switch cover from the switch on each WH-00061 Push To Talk Harness and screw the switch into the plug from the bottom. Screw the cover back onto the switch.

**Step 3:** Starting at the top of the WD-1212 Control Sticks thread the WH-00061 Push To Talk Harnesses through and out the bottom of the control sticks. Loop the wires up and tie wrap them to the shank and the bottom of the gooseneck on the control sticks as shown in Figure 1.

**Step 4:** Temporarily install the WD-1212 Control Sticks as shown in Figure 2 by sliding a bushing into the stick and then using a bolt to attach the stick to the WD-1210 Control Column. See the applicable steps on Page 32-05.

**Step 5:** Route the WH-00061 Push To Talk Harnesses through the snap bushing in the F-1215 Seat Ribs just inboard of the WD-1212 Control Sticks.

**Step 6:** Strip the end of each WH-F83 (BLK) PTT Ground Wire in the WH-00061 Push To Talk Harness then crimp on ring terminals as called out in Figure 1.

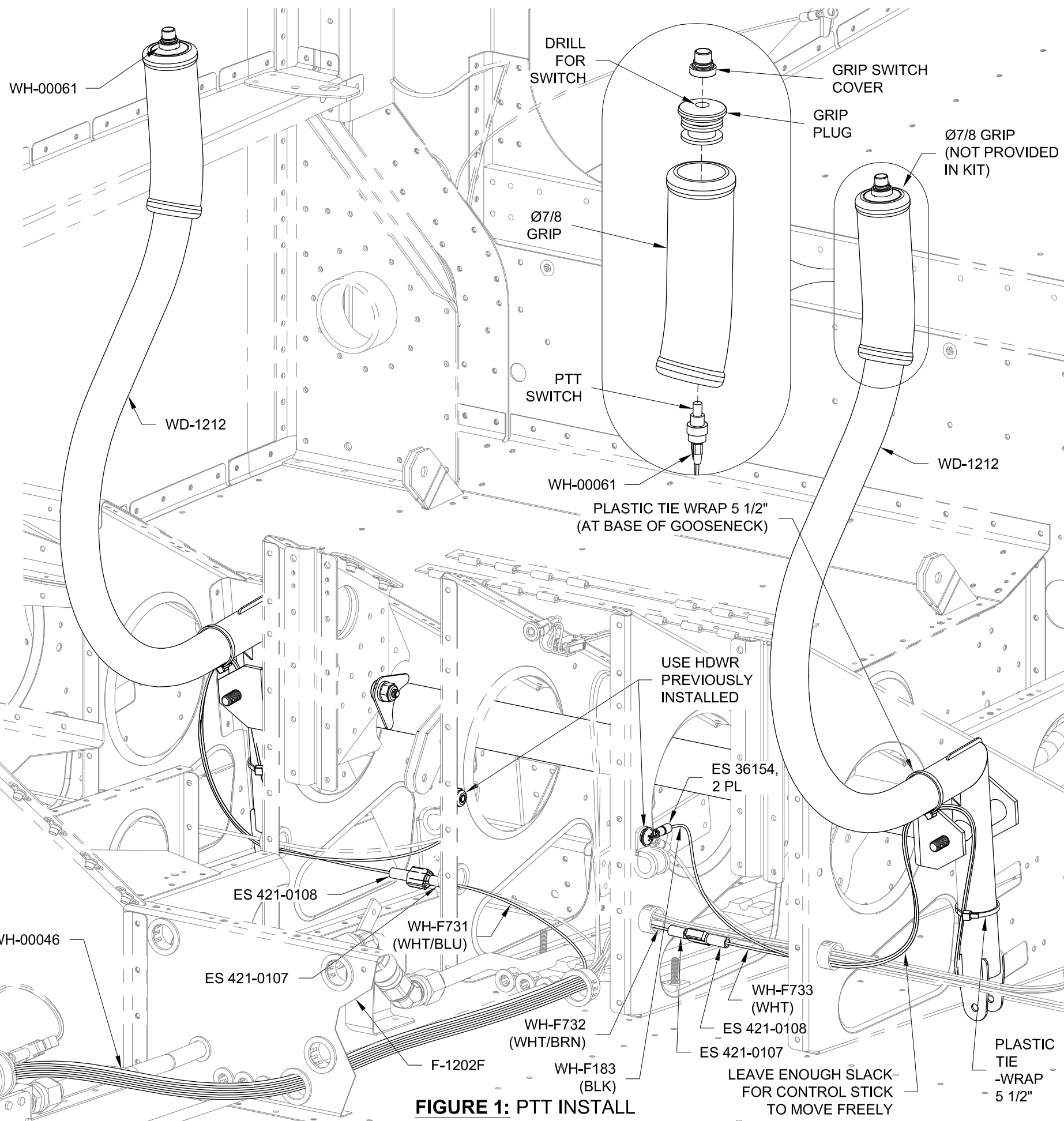
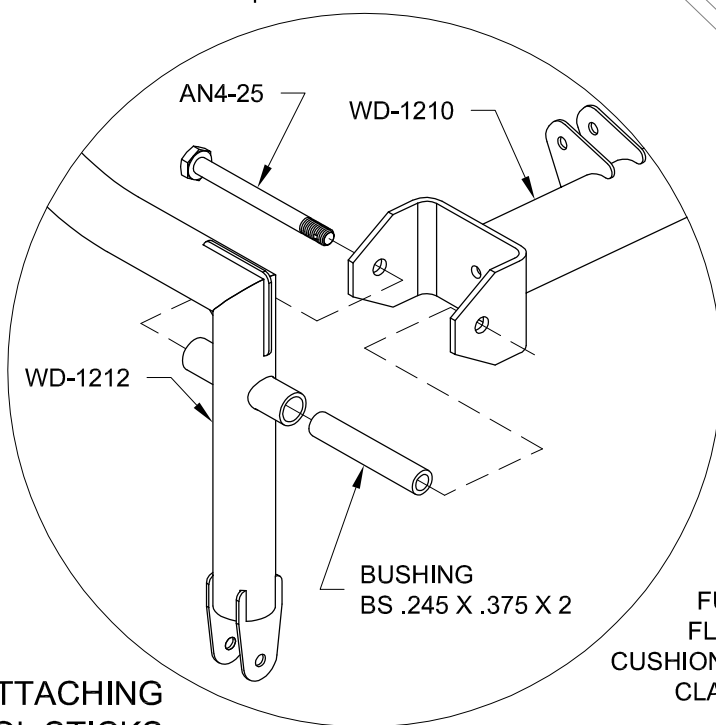
On the left and right side of the aircraft use the hardware called out in Figure 1 to attach the ring terminals and the ring terminals from the WH-F183 (BLK) Wing Ground Wires to the most inboard F-1215 Seat Rib (remove any primer or paint that would prevent the terminal from grounding). Leave the hardware loose for further installations.

**Step 7:** Find the WH-F731 (WHT/BLU) and WH-F732 (WHT/BRN) wires coming from the WH-00046 Fuselage Wiring Harness and strip the ends then crimp on spade connectors as called out in Figure 1.

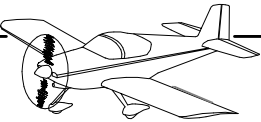
**Step 8:** Find the WH-F733 (WHT) wires coming from the WH-00061 Push To Talk Harnesses, strip the ends and crimp on spade connectors as called out in Figure 1.

Connect these wires to the wires from Step 7.

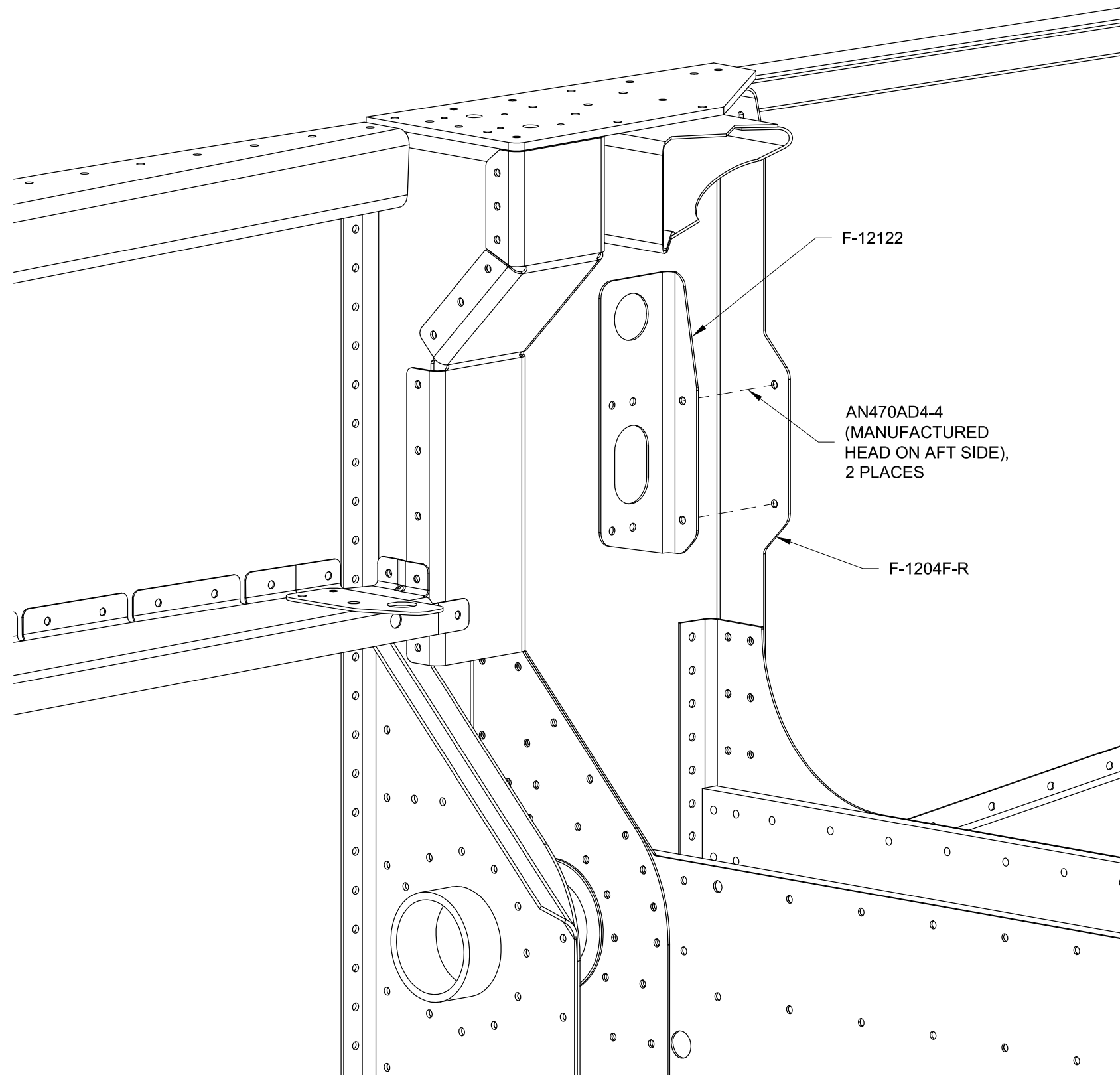
**FIGURE 2: ATTACHING THE CONTROL STICKS**



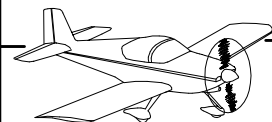
**FIGURE 1: PTT INSTALL**



Step 1: Rivet the F-12122 ELT Angle to the F-1204F-R Aft Side Bulkhead as shown in Figure 1.

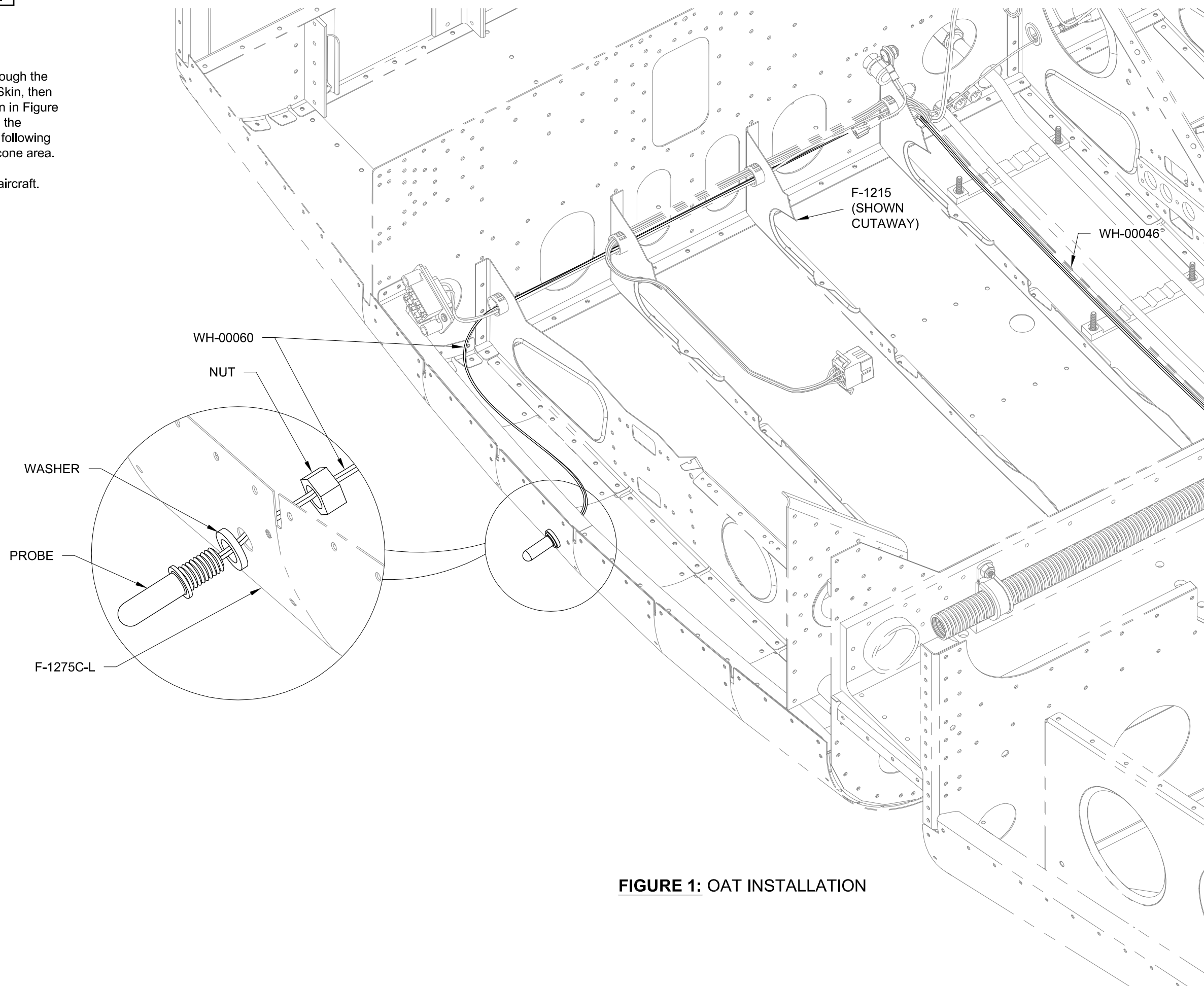


**FIGURE 1:** INSTALLING THE ELT BRACKET



Step 1: Feed the WH-00060 OAT Wiring Harness through the washer, the hole in the F-1275C-L Fuselage Corner Skin, then through the mounting nut for the OAT probe as shown in Figure 1. Route the wires back through the snap bushings in the F-1215 Seat Ribs to the center of the aircraft then aft following the WH-00046 Fuselage Wiring Harness into the tailcone area.

Step 2: Final install the OAT probe to the side of the aircraft.



**FIGURE 1: OAT INSTALLATION**



**Step 1:** Route the WH-00045 Options Wiring Harness down through the aft snap bushing in the F-1202B Panel Base. Align the narrow band of red heatshrink with the panel base. See Figure 1.

Route the harness through the cushioned clamp near the left ES CPU FAN then tape the harness in place.

**NOTE:** Route each wire individually within a harness all the way through the described path. This will help prevent a knotted mess that will cause jams at the snap bushings.

**Step 2:** Route the WH-00045 Options Wiring Harness over the rudder pedals and through the fuel flow cushioned clamp and through the upper snap bushings in the F-1202F Bulkhead. Center the band of red heat shrink on the F-1202F Bulkhead. See Figure 1.

**Step 3:** Separate out the twisted wires WH-F429 (GRN) and F430 (BLU), the twisted wires WH-431 (WHT/BLU) and WH-432 (WHT/GRN) and the WH-F696 (WHT/BLK), WH-L435 (YEL/PRP) and WH-L436 (YEL/GRN) wires.

Separate out the longer WH-F454 (ORN/YEL) wire from the shorter WH-F483 (ORN/YEL) wire.

Separate out the longer WH-P455 (RED) wire from the shorter WH-P485 (RED) wire.

Route these wires through the lower snap bushing in the F-1203A Bulkhead. Lay the wires in the wire notches in all three F-1276C System Blocks then route through the snap bushings in the F-1204 Center Section Assembly.

Route the remaining wires from the WH-00045 Options Wiring Harness through the upper snap bushing in the F-1203A Bulkhead.

**Step 4:** Separate out the WH-L456 (YEL/RED) and WH-L458 (YEL/RED) Nav Power Wires, WH-L457 (WHT/YEL) and WH-459 (WHT/YEL) Strobe Power Wires.

The WH-L458 (YEL/RED) and WH-L459 (WHT/YEL) wires are longer. Route these wires to the right side of the aircraft through the snap bushings in the F-1215 Seat Ribs. Route the two shorter wires to the left side of the aircraft.

**Step 5:** Separate out the WH-L73 (YEL) Landing Light Pulse Wire and WH-L437 (YEL/BLU) Landing Light Steady Power Wire and route them through the snap bushings in the seat ribs on the right side of the aircraft.

**Step 6:** Separate out the RZ441 (WHT) Co-Pilot Headset Wires, RZ442 (WHT) Pilot Headset Wires, WH-P600 (ORN/BLK) and WH-P601 (ORN/BLK) Audio Power Wires.

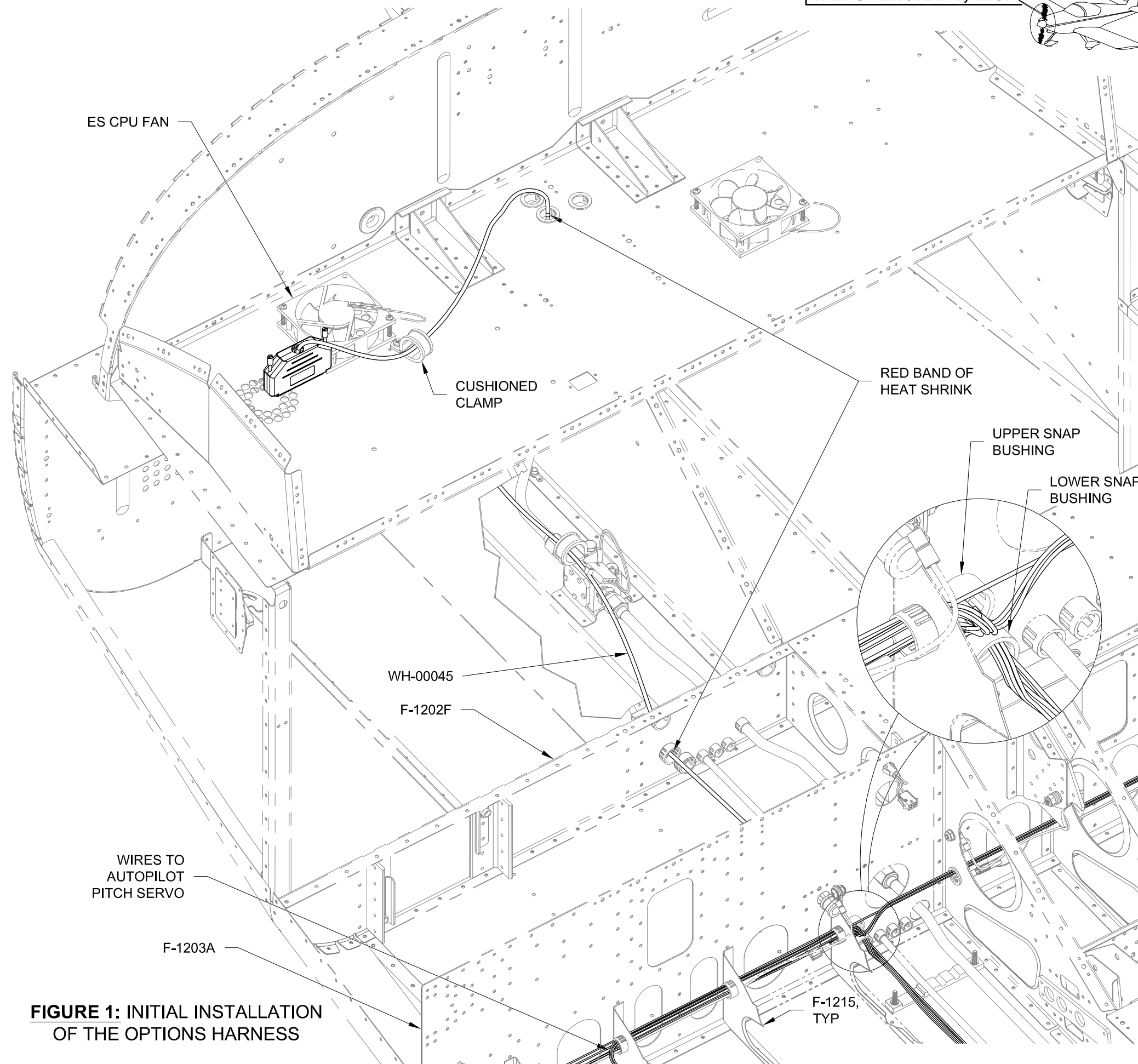
The WH-P601 (ORN/BLK) wire and RZ441 (WHT) wires are longer. Route these wires to the right side of the aircraft through the snap bushings in the F-1215 Seat Ribs. Route the shorter wires to the left side of the aircraft.

**Step 7:** Separate out the WH-F694 (WHT) wire. This wire is 22 AWG. Do not confuse this wire with the WH-P350 (WHT) Power Outlet Wire which is 18 AWG.

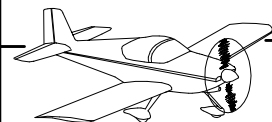
Separate out the WH-P485 (RED), WH-F483 (ORN/YEL) and WH-695 (GRY/PRP) wires.

Route these wires for the autopilot pitch servo through the first three F-1215 Seat Ribs on the left side of the aircraft. See Figure 1.

**Step 8:** Route the WH-L435 (YEL/PRP) and WH-L436 (YEL/GRN) wires to the location of the ELT following the routing of the ES RS 279-374 Phone Cable. See Page 31B-11.



**FIGURE 1: INITIAL INSTALLATION OF THE OPTIONS HARNESS**



**Step 1:** Install the ES-AS212 12 Volt Power Outlet to the F-1203A Bulkhead as shown in Figure 1.

**Step 2:** Find the WH-F54 (WHT) Power Outlet Ground eight inches long included with the WH-00045 Options Wiring Harness.

Install the spade connector to the negative terminal on the back of the ES-AS212 12 Volt Power Outlet.

Connect the ring terminal with the ring terminals on the WH-F183 (BLK) Wing Ground Wire and WH-F83 (BLK) PTT Ground Wire to the most inboard F-1215 Seat Rib as shown in Figure 2.

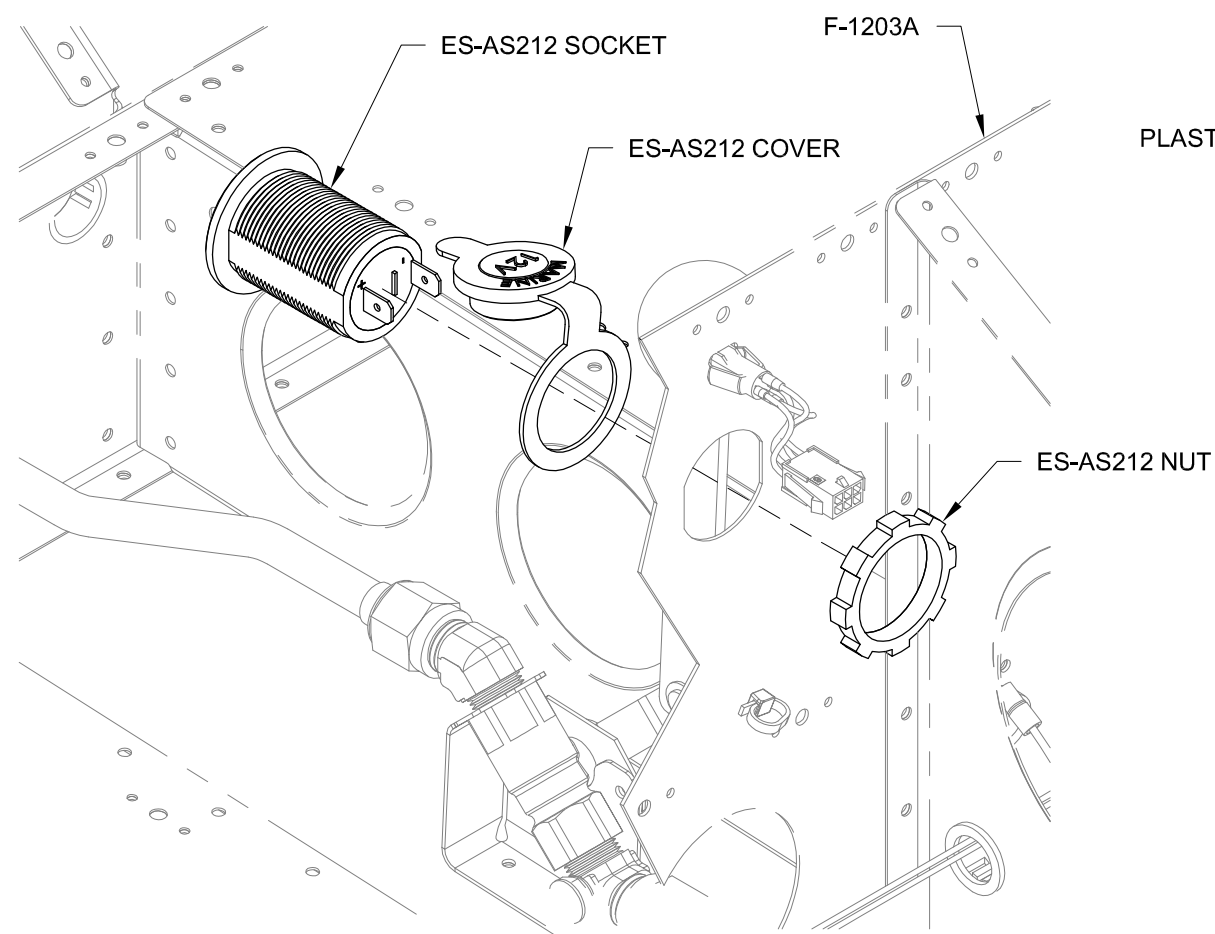
**Step 3:** Separate the WH-P350 (WHT) Power Outlet Wire from the WH-00045 Options Wiring Harness.

Strip the end and crimp on a female spade connector as shown in Figure 2.

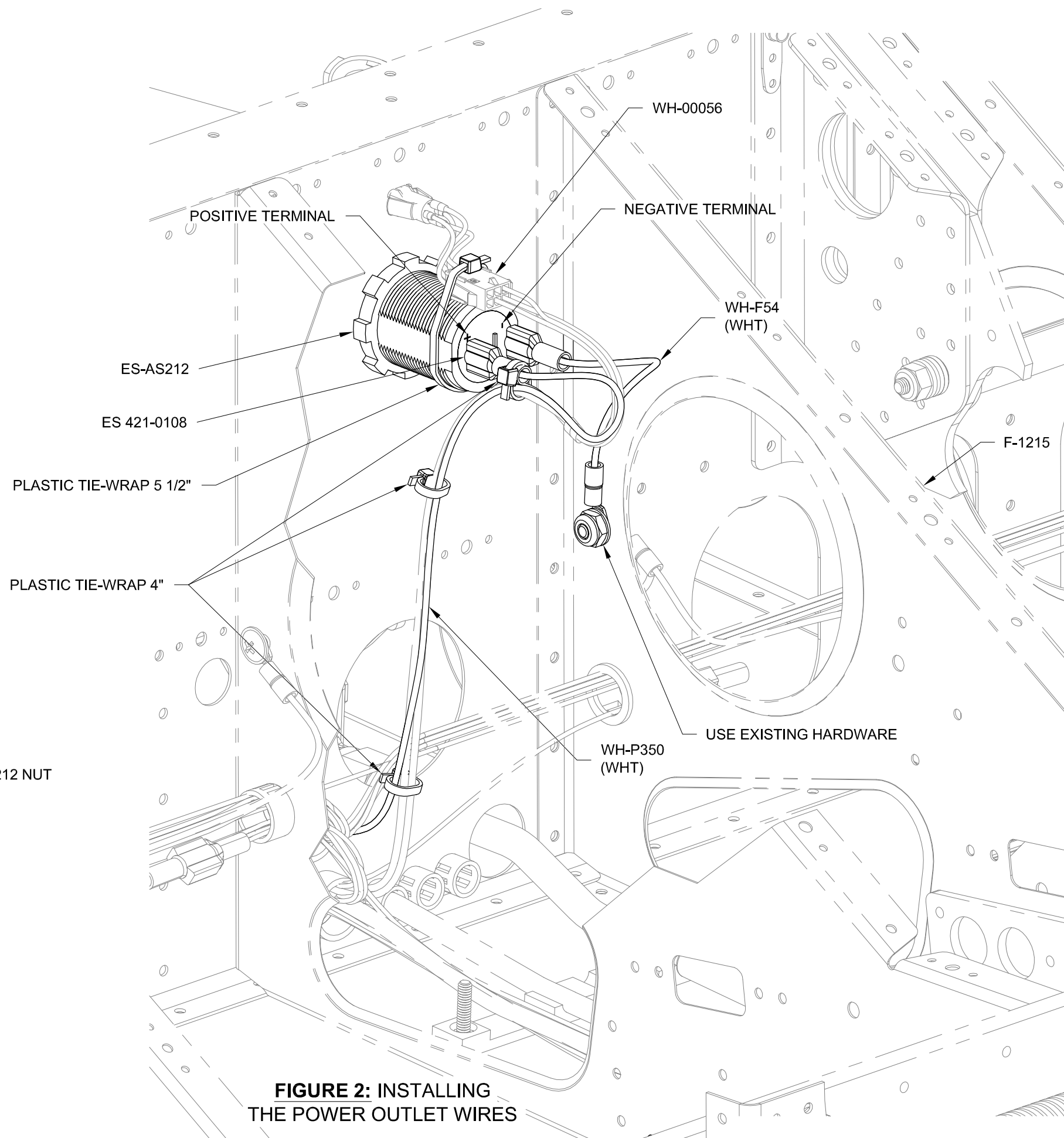
Install the spade connector to the positive terminal on the back of the ES-AS212 12 Volt Power Outlet.

**Step 4:** Tie-Wrap the WH-P350 (WHT) Power Outlet +V Wire, WH-F397 (WHT) and WH-F398 (WHT) Aux 1 Music Wires to the positive terminal spade connector on the ES-AS212 12 Volt Power Outlet as shown in Figure 2. Check that this loop keeps the wires away from the WD-1210 Control Column.

Tie-Wrap the WH-00056 Aux Music Jack connector to the socket of the ES-AS212 12 Volt Power Outlet as shown in Figure 2.



**FIGURE 1: INSTALLING  
THE POWER OUTLET**



**FIGURE 2: INSTALLING  
THE POWER OUTLET WIRES**





Step 1: Insert the RZ441 (WHT) Co-Pilot Headset Wires and WH-P601 (ORN/BLK) Audio Power Wire into a ES-00043 Molex Receptacle, 12 Position Micro-Fit connector as shown in Figure 2.

Insert the RZ442 (WHT) Pilot Headset Wires and WH-P600 (ORN/BLK) Audio Power Wire into a ES-00043 Molex Receptacle, 12 Position Micro-Fit connector.

**NOTE: The WH-P600 (ORN/BLK) and WH-P601 (ORN/BLK) Audio Power Wires may be used to install a powered headset Lemo type connector. At this time no provision has been made for an optional powered head set jack. This may be added by the builder. Please consult your headset manufacturer for further parts and information.**

Step 2: Sand down the upper face of the headset jack stepped isolator washer until the stepped portion is slightly less than the thickness of the F-1226 Seat Ramp Floor.

Step 3: Attach the ES-00147 Headset Jack Modules to the F-1226-L & -R Seat Ramp Floors as shown in Figure 1.

Step 4: Connect the ES-00043 Molex Receptacle, 12 Position Micro-Fit connectors from Step 1 into the corresponding connectors on the ES-00147 Headset Jack Modules.

Step 5: Use a multimeter to check that there is no continuity between the nuts on the headphone and mic jacks and airframe ground.

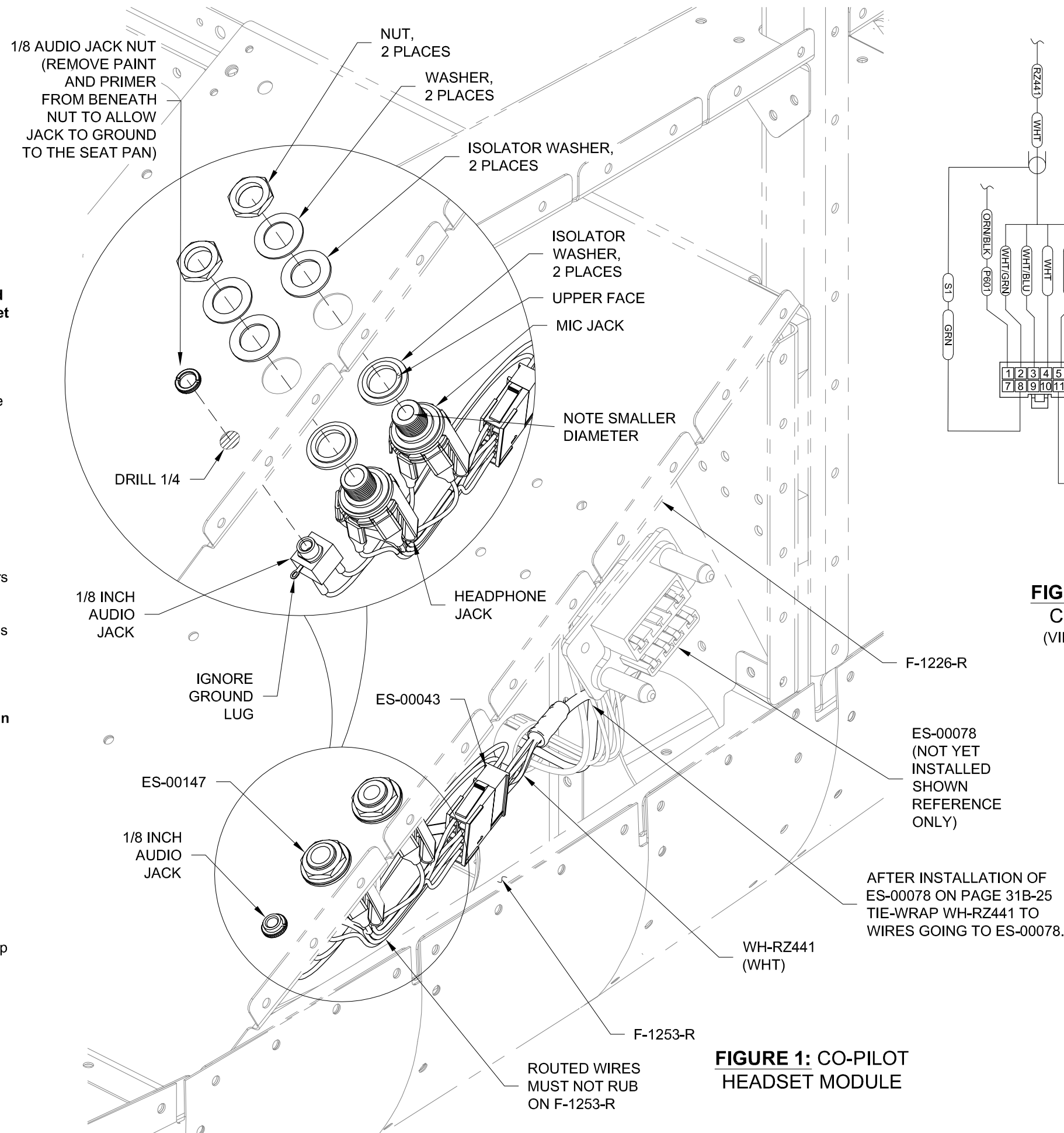
**NOTE: The audio jack and resistors used in the remaining steps on this page are not provided in the kit. Extra Micro-Fit terminals have been provided.**

Step 6 (Optional): If audio output to a video camera is desired add a Ø1/4 hole approximately one inch below the co-pilot headphone jack. See Figure 1.

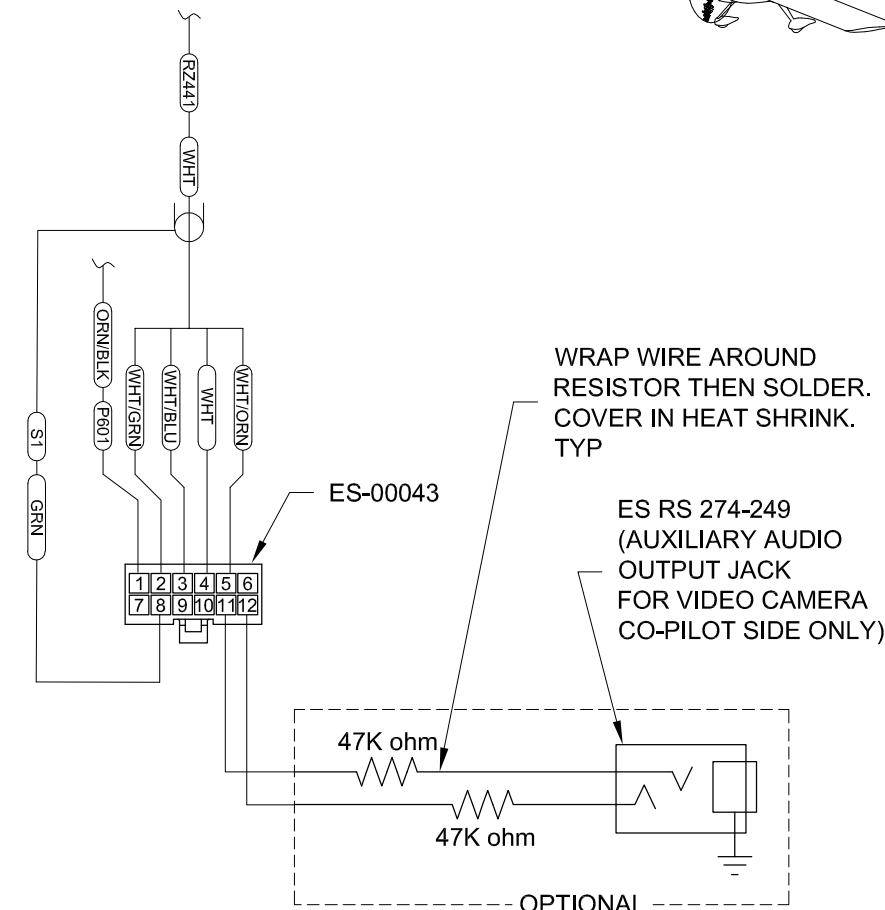
Solder two wires as shown in Figure 2 to the left and right stereo legs on a 1/8 inch audio jack. Cover the soldered connections in heat shrink. Strip the ends of these wires and crimp on ES-00046 Molex Micro-Fit Sockets.

Connect the audio jack to the Ø1/4 hole just made in the seat pan. See Figure 1.

Insert the terminals on these wires into the co-pilot side ES-00043 Molex Receptacle, 12 Position Micro-Fit connector as shown in Figure 2.



**FIGURE 1: CO-PILOT HEADSET MODULE**



**FIGURE 2: HEADSET MODULE CONNECTOR SCHEMATIC (VIEW FROM WIRE INSERTION SIDE)**





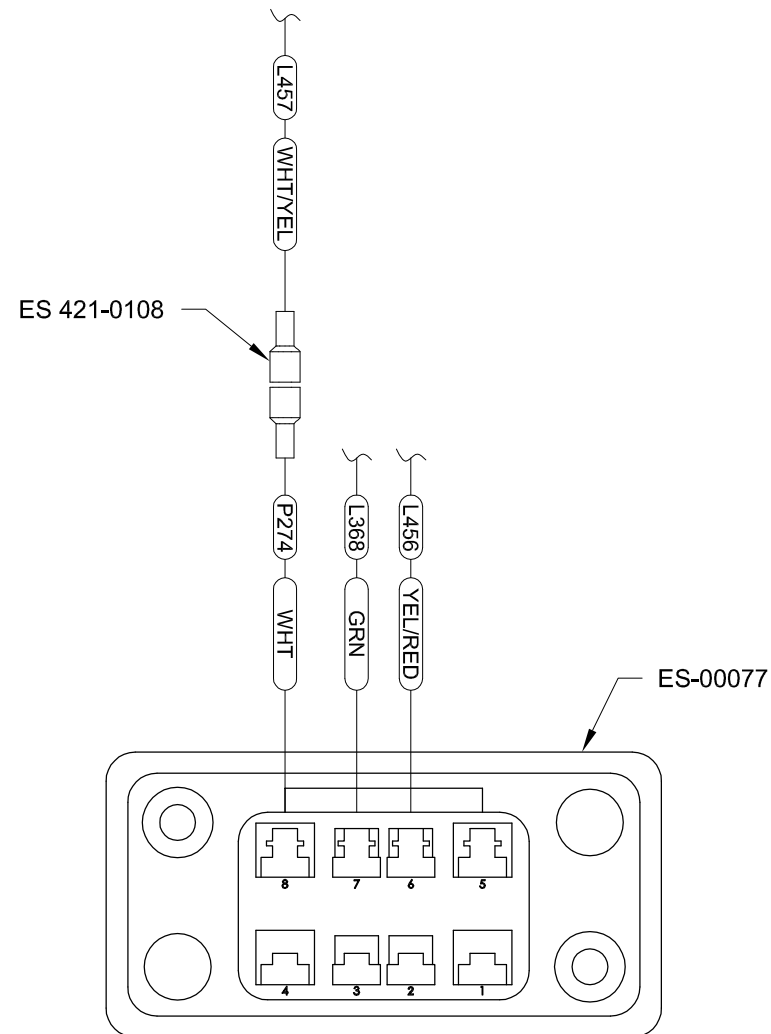
**Step 1:** On the left side of the aircraft insert the WH-P274 (WHT) wire into the ES-00077 Floating 8 Pos Connector Female in the position shown in Figure 1.

**Step 2:** Strip the WH-L457 (WHT/YEL) wire on the left side of the aircraft then crimp a female spade connector as shown in Figure 1. This wire will attach to the noise filter provided in the lighting kit. If not installing a lighting kit at this time connect the spade connector to the connector on the end of the WH-P274 (WHT) wire.

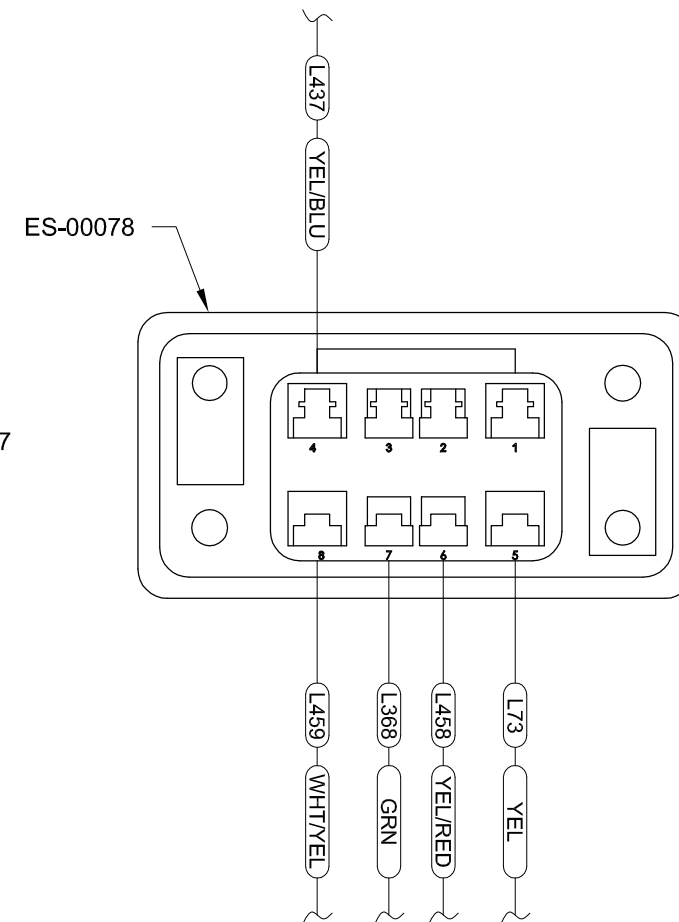
Insert the WH-L456 (YEL/RED) wire on the left side of the fuselage into the ES-00077 Floating 8 Pos Connector Female in the position shown in Figure 1.

Insert the WH-L73 (YEL), WH-L437 (YEL/BLU), WH-L458 (YEL/RED) and WH-L459 (WHT/YEL) wires on the right side of the fuselage into the ES-00078 Floating 8 Pos Connector as shown in Figure 2.

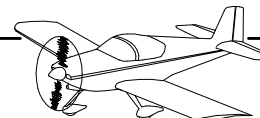
**Step 3:** Find then route the loose WH-L368 (GRN) Sync Wire from the left to right side of the fuselage. Insert each side into the ES-00077 and ES-00078 Floating 8 Pos Connectors as shown in Figure 1 and Figure 2.



**FIGURE 1: LEFT FUSELAGE  
CONNECTOR FEMALE**  
(VIEW FROM WIRE INSERTION SIDE)



**FIGURE 2: RIGHT FUSELAGE  
CONNECTOR MALE**  
(VIEW FROM WIRE INSERTION SIDE)



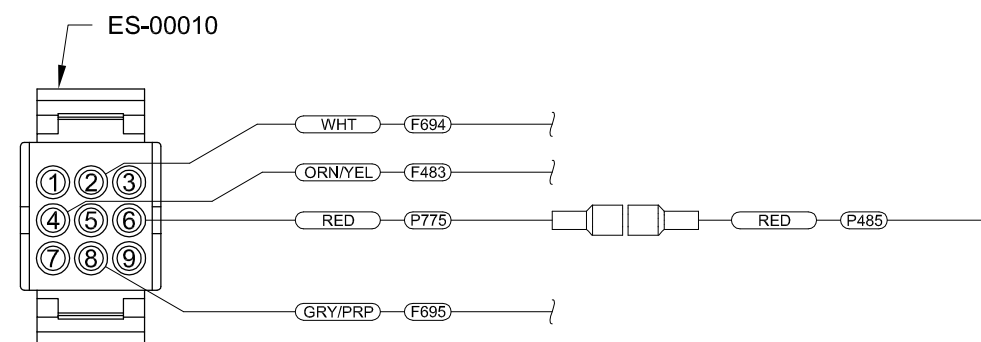
Step 1: Route the WH-F694 (WHT), WH-F483 (ORN/YEL), WH-P485 (RED) and WH-F695 (GRY/PRP) wires through the rectangular hole in the F-1215 Seat Rib as shown in Figures 1 and 2.

Step 2: Insert the WH-P775 (RED) wire into the ES-00010 Molex Plug, 9 Position as shown in Figure 3.

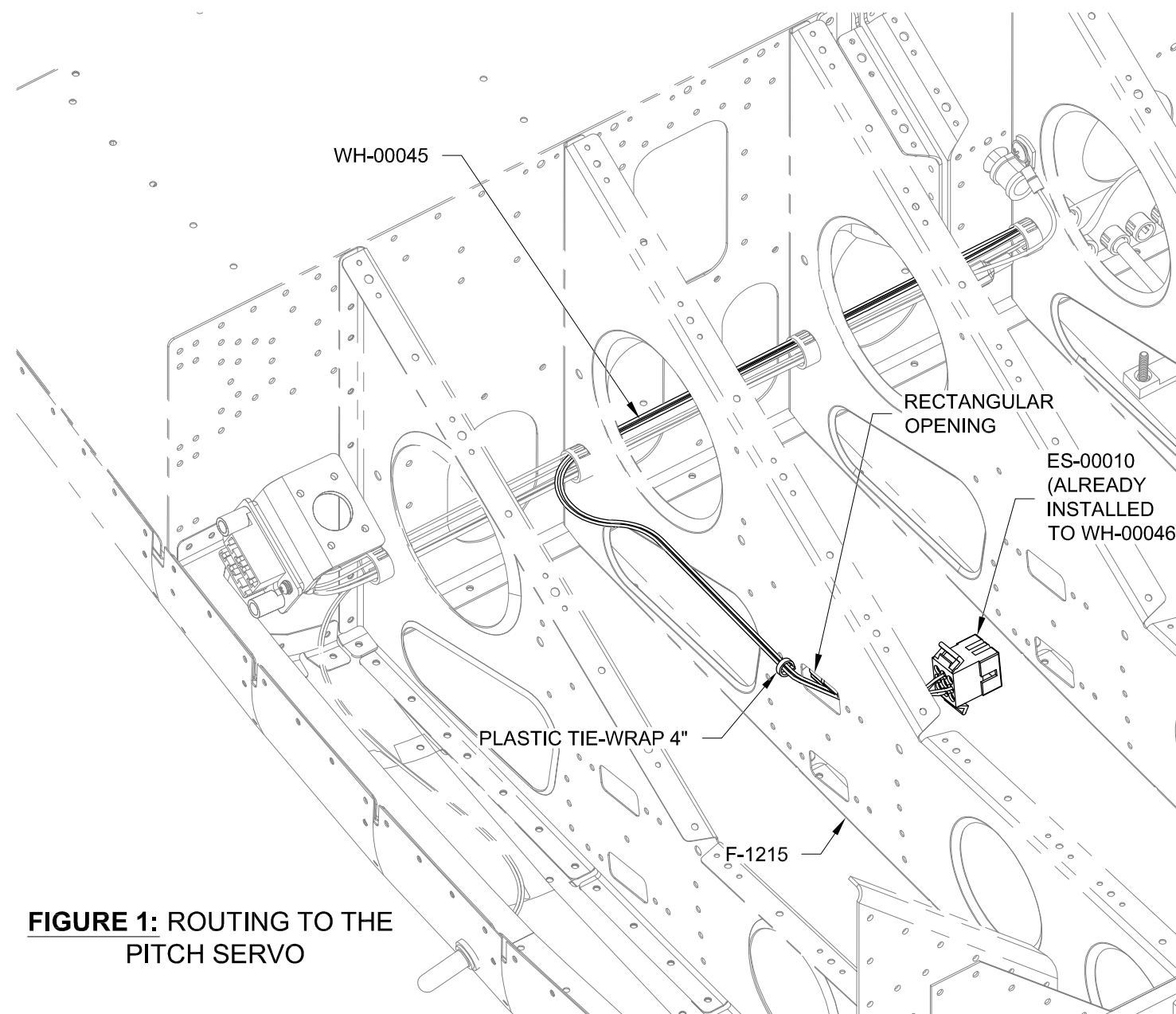
If not installing the autopilot kit at this time connect the spade connector on the end of the WH-P775 (RED) wire to the spade connector on the end of the WH-P485 (RED) wire otherwise follow the instructions supplied with the autopilot kit.

Step 3: Insert the Molex style connectors on the ends of the WH-F694 (WHT), WH-F483 (ORN/YEL) and WH-F695 (GRY/PRP) wires into the ES-00010 Molex Plug, 9 Position as shown in Figure 3.

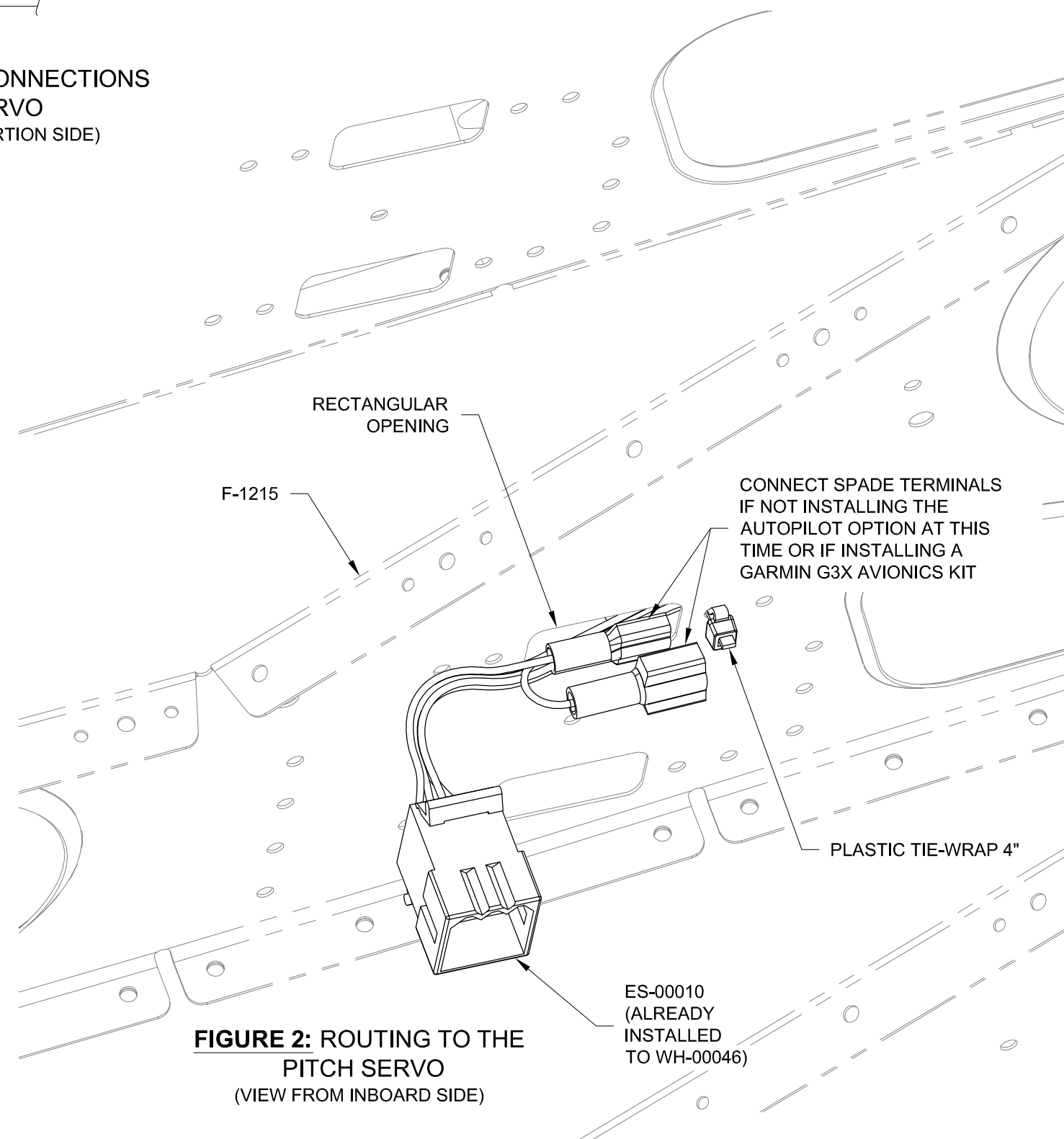
Step 4: Add a tie-wrap in the hole just forward of the rectangular opening that goes around the autopilot pitch servo wires and back through the same hole into itself. If not installing the autopilot kit at this time tie-wrap the ES-00010 Molex Plug, 9 Position to the seat rib in such a way that the servo wires are not rubbing on the rectangular opening in the seat rib.



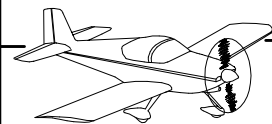
**FIGURE 3: OPTIONS CONNECTIONS TO PITCH SERVO**  
(VIEW FROM WIRE INSERTION SIDE)



**FIGURE 1: ROUTING TO THE PITCH SERVO**



**FIGURE 2: ROUTING TO THE PITCH SERVO**  
(VIEW FROM INBOARD SIDE)



Step 1: Route the twisted wires WH-F429 (GRN) and F430 (BLU), twisted wires WH-431 (WHT/BLU) and WH-432 (WHT/GRN), WH-F696 (WHT/BLK), WH-F454 (ORN/YEL), WH-P455 (RED) wires from Page 31B-15, Step 3 aft into the tailcone area following the routing of the previously routed WH-00046 Fuselage Harness. See Figure 1.

Insert each wire into the specified positions on a ES-00010 Molex Plug 9 Position as shown in Figure 2.

Step 2: Find the WH-F450 (BLK) Ground Wire (included with the WH-00045 Options Wiring Harness) terminated with a Molex open barreled style connector on one end and a ring terminal on the other.

Insert the Molex style connector into the ES-00010 Molex Plug 9 Position from Step 1. See Figure 2.

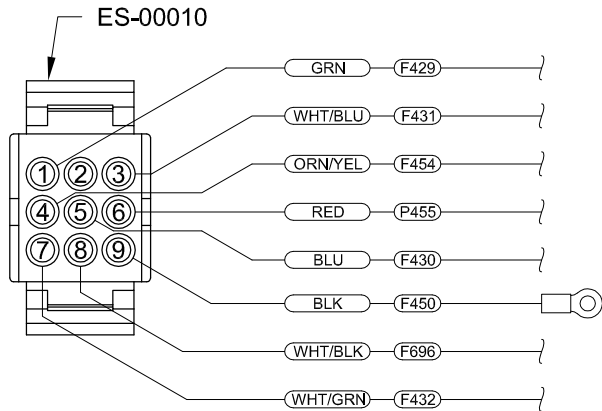
This wire will be used for an autopilot servo ground. If not installing the optional autopilot kit tie-wrap this wire to other wires at this time.

Step 3: Route the WH-00095 ADS-B Antenna Cable aft through the lower snap bushing in the F-1207D-L Bulkhead Channel then aft following the routing of the Aft Pitot Line to the F-1208 Fuselage Frame.

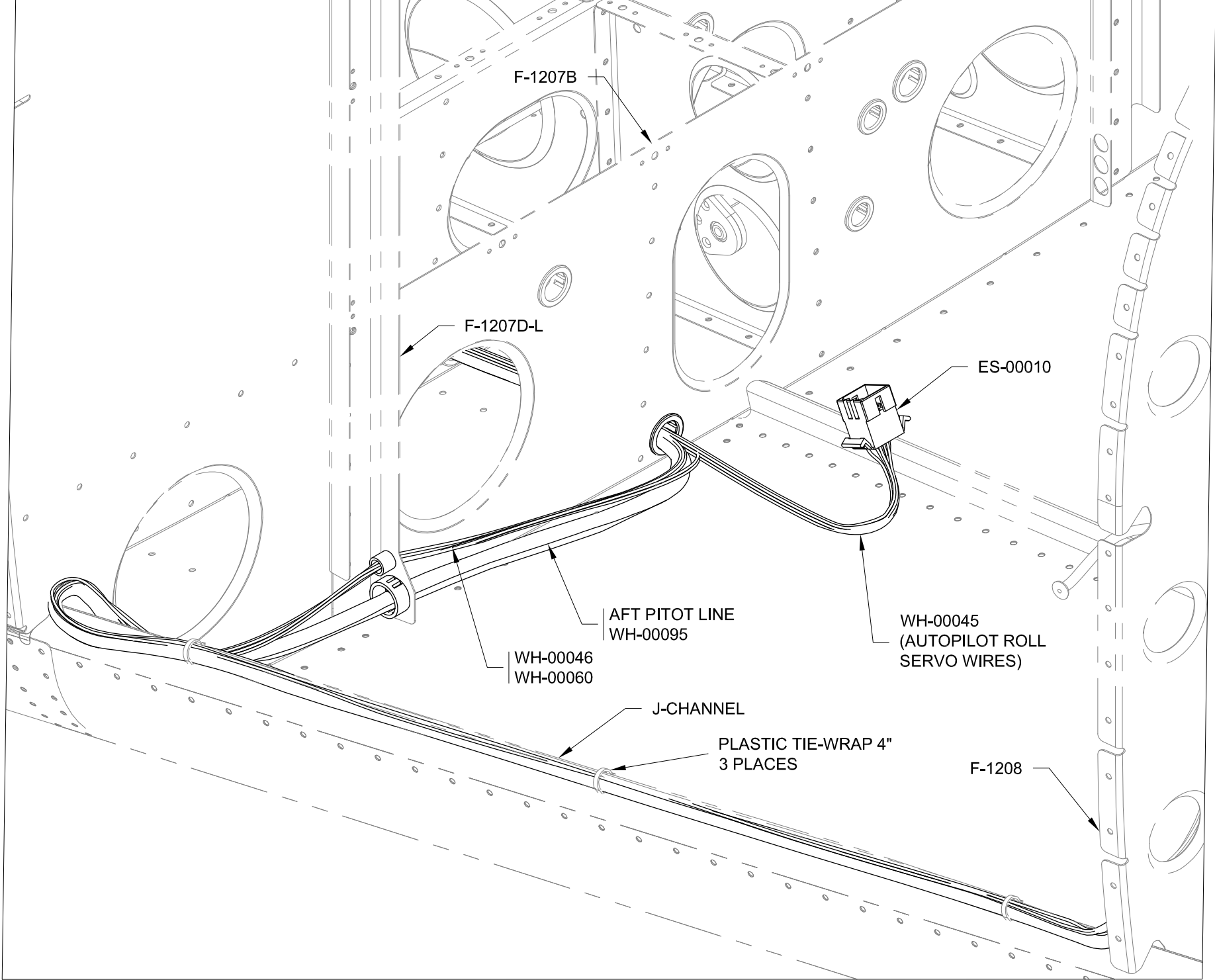
Step 4: Route the Aft Pitot Line forward through a snap bushing in the F-1207D-L Bulkhead Channel then forward through the snap bushing in the F-1207B Baggage Bulkhead.

Step 5: Route the WH-00060 OAT Wiring Harness and WH-00046 Fuselage Wiring Harness through a snap bushing in the F-1207D-L Baggage Bulkhead Channel. See Figure 1.

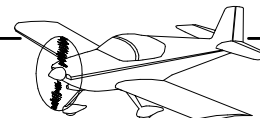
Route the harnesses aft along the skin J-channel shown in Figure 1 to the F-1208 Fuselage Frame.



**FIGURE 2: CONNECTION TO ROLL SERVO**  
(VIEW FROM WIRE INSERTION SIDE)



**FIGURE 1: AUTOPILOT ROLL SERVO WIRES AND AFT PITOT LINE**



**Step 1:** Route the WH-00060 OAT Wiring Harness and WH-00046 Fuselage Wiring Harness up the F-1208 fuselage frame through the previously installed tie-wraps.

Tighten the tie-wraps. See Figure 1.

**Step 2:** Cut a piece of ES HST 3/16X1' Heat Shrink two inches long.

Slip the heat shrink over the ends of the wires coming from the WH-00046 Fuselage Wiring Harness.

Insert the connectors into the ES 205203-3 9-Pin D-Sub Female connector as shown in Figure 2.

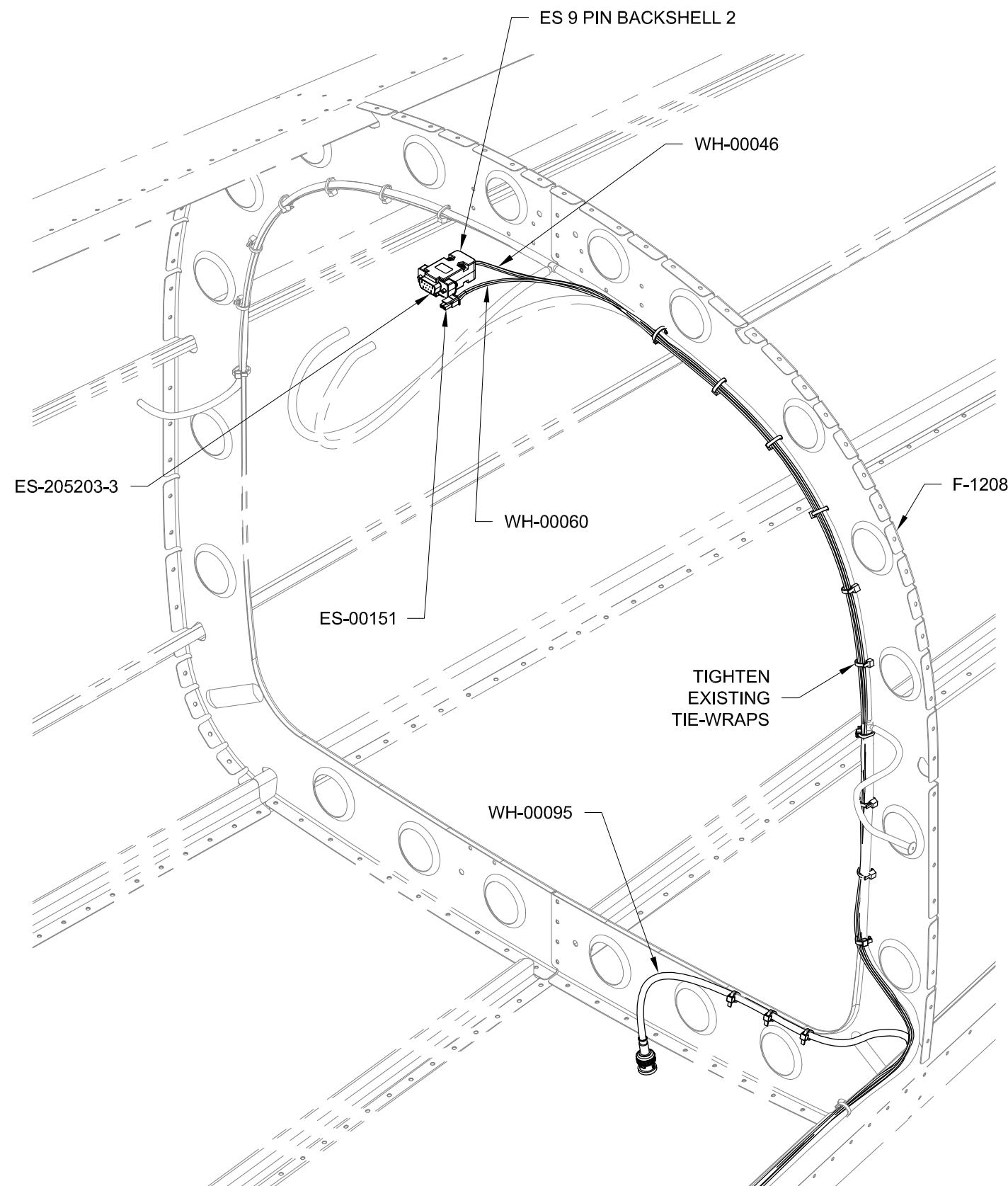
Check with a gentle tug that each wire has snapped into place.

Center the ES HST 3/16 X 2" Heat Shrink around the location where the wires will exit the ES 9 PIN BACKSHELL 2 and activate the heat shrink.

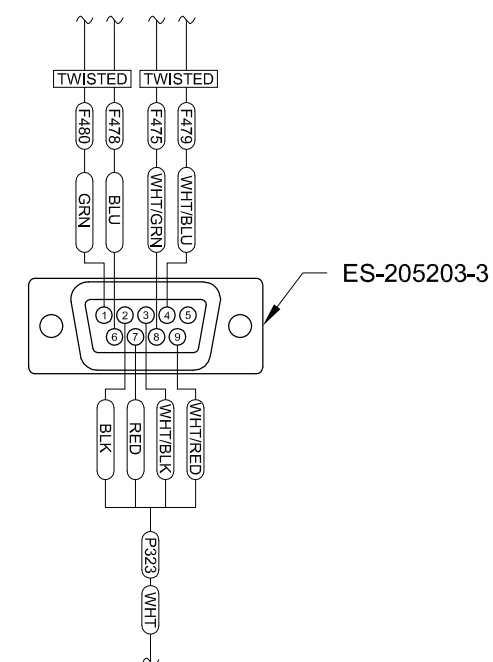
**Step 3:** Install a ES 9 PIN BACKSHELL 2 on the ES 205203-3 9-Pin D-Sub Female connector as shown in Figure 1. This type of backshell is required. Other backshells with long ferrous thumb screws will cause interference with the ADAHRS.

**Step 4:** Insert both (WHT/BLK) wires coming from the WH-00060 OAT Wiring Harness into a ES-00151 2 Position Micro-Fit Molex Receptacle. Position does not matter. See Figure 1.

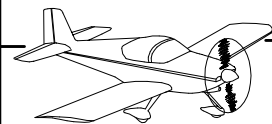
**Step 5:** Tie-wrap the WH-00095 ADS-B Antenna Cable to the F-1208 Fuselage Frame.



**FIGURE 1: TAILCONE ROUTING OF THE FUSELAGE AND OAT HARNESSSES**



**FIGURE 2: INSTALLING PINS INTO THE ADAHRS D-SUB CONNECTOR**  
(VIEW FROM WIRE INSERTION SIDE)  
(SKYVIEW ONLY)



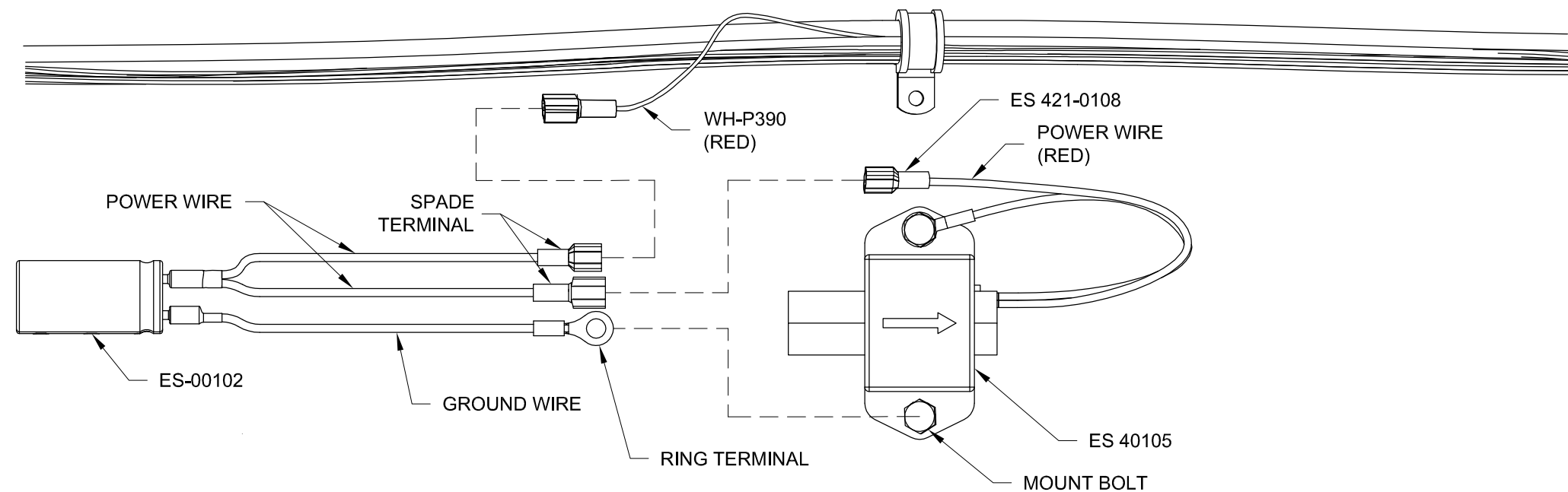
**Step 1:** Crimp a spade connector onto the end of the ES 40105 Fuel Pump power wire (RED) then connect the wire to the appropriate gender spade connector coming from the ES-00102 Noise Filter as shown in Figure 1. Capture the barrel of the spade connector on the fuel pump power wire with the cushioned clamp as shown in Figure 3.

**Step 2:** Connect the remaining spade connector coming from the ES-00102 Noise Filter to the WH-P390 (RED) wire coming from the WH-00046 Fuselage Wiring Harness as shown in Figure 1.

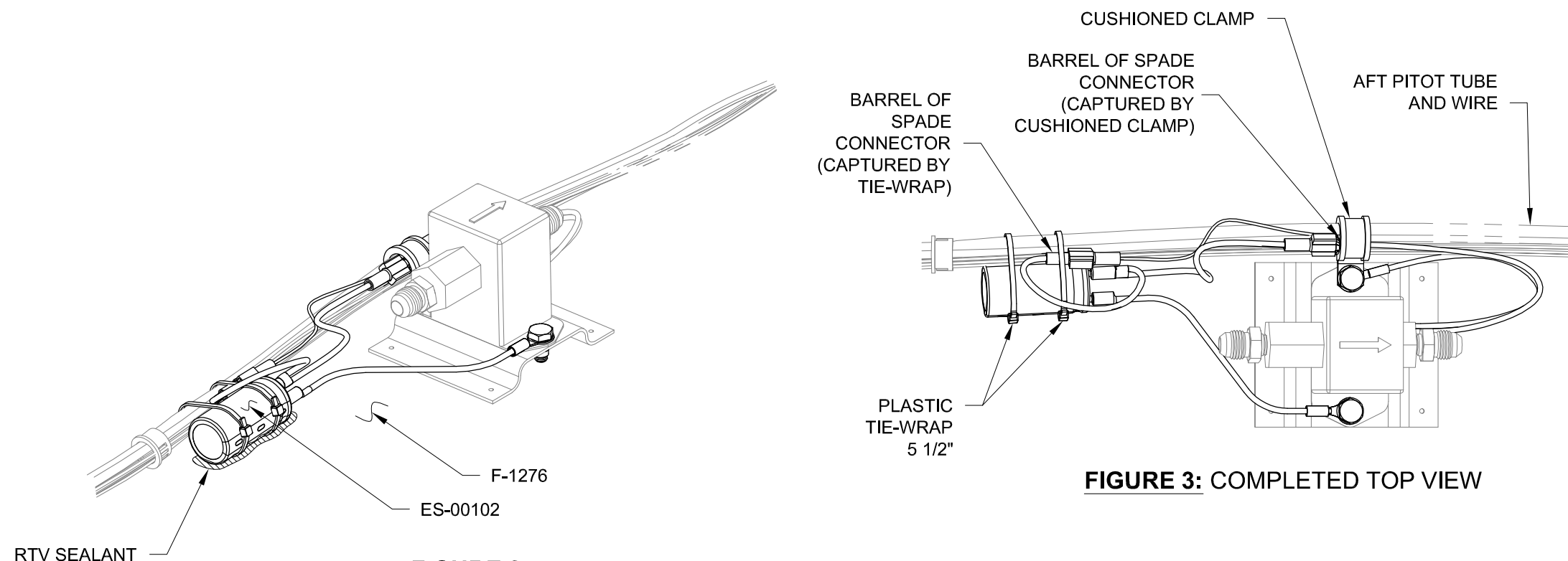
**Step 3:** Remove the right-side mount bolt and washer from the ES 40105 Fuel Pump. Slip the ES-00102 Noise Filter ground wire ring terminal onto the shank of the mount bolt (underneath the washer), then reinstall the mount bolt.

**Step 4:** Secure the body of the ES-00102 Noise Filter to the aft pitot tube and wire bundle using plastic tie wraps. Capture the barrel of the spade connector (connected in Step 2) with one of the plastic tie wraps as shown in Figure 3. Orient the noise filter so that it rests on the F-1276 Bottom Skin.

**Step 5:** Lift the ES-00102 Noise Filter and apply a liberal amount of RTV Sealant to the F-1276 Bottom Skin where the noise filter will rest as shown in Figure 2. Seat the noise filter into the RTV Sealant.

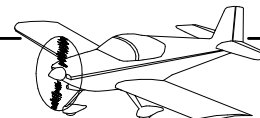


**FIGURE 1:**  
ELECTRICAL CONNECTIONS



**FIGURE 2:**  
MOUNTING

**FIGURE 3:** COMPLETED TOP VIEW



Step 1: Use a bench vice and plastic hammer or hand seamer to bend the small F-00049 Wire Cover Plate flanges as shown in Figure 1.

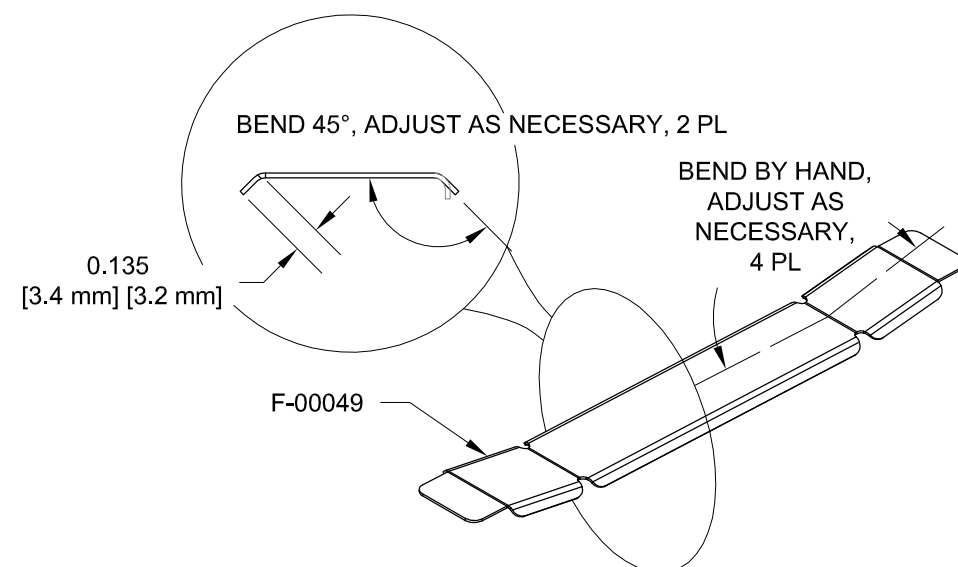
Adjust the small flanges on the wire cover plate so that it does not easily slide through the width of the opening in the F-1276 Systems Block.

Bend the wire cover plate by hand as necessary to cover the wires as shown in Figure 2.

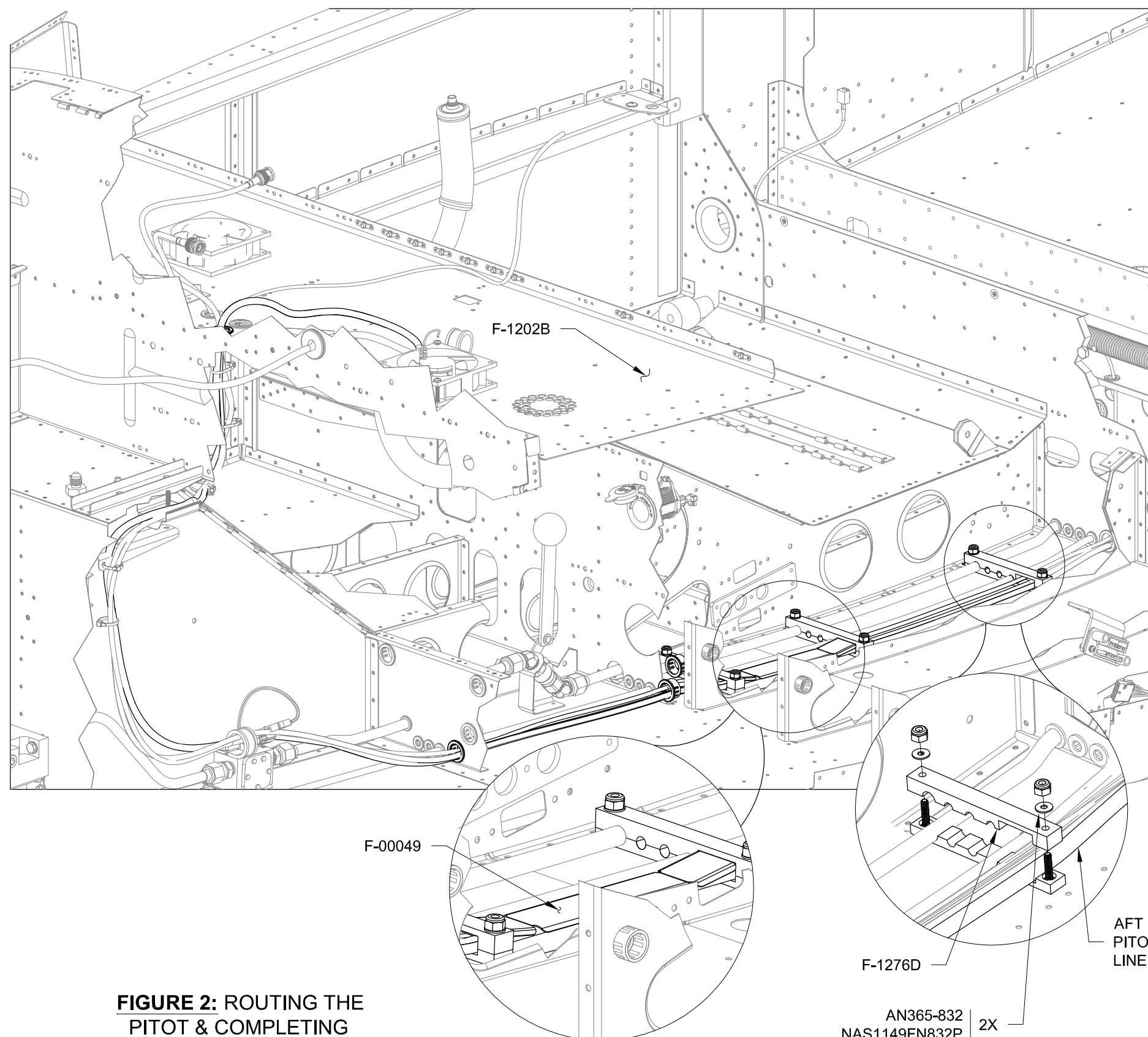
Step 2: Route the Aft Pitot Line forward following the path of the WH-00046 Fuselage Harness and aft through the snap bushing in the F-1202B Panel Base. See Figure 2.

Step 3: Install the three F-1276D Systems Blocks and the F-00049 Wire Cover Plate using the hardware called out in Figure 2.

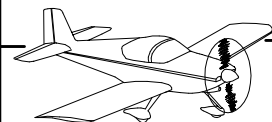
Adjust the wire cover plate as necessary to avoid rubbing on adjacent parts.



**FIGURE 1: BENDING WIRE COVER PLATE**



**FIGURE 2: ROUTING THE PITOT & COMPLETING THE SYSTEMS BLOCKS**



Step 1: Tap 8-32 the four holes in the F-00034-L & -R Wing Electrical Brackets as shown in Figure 1.

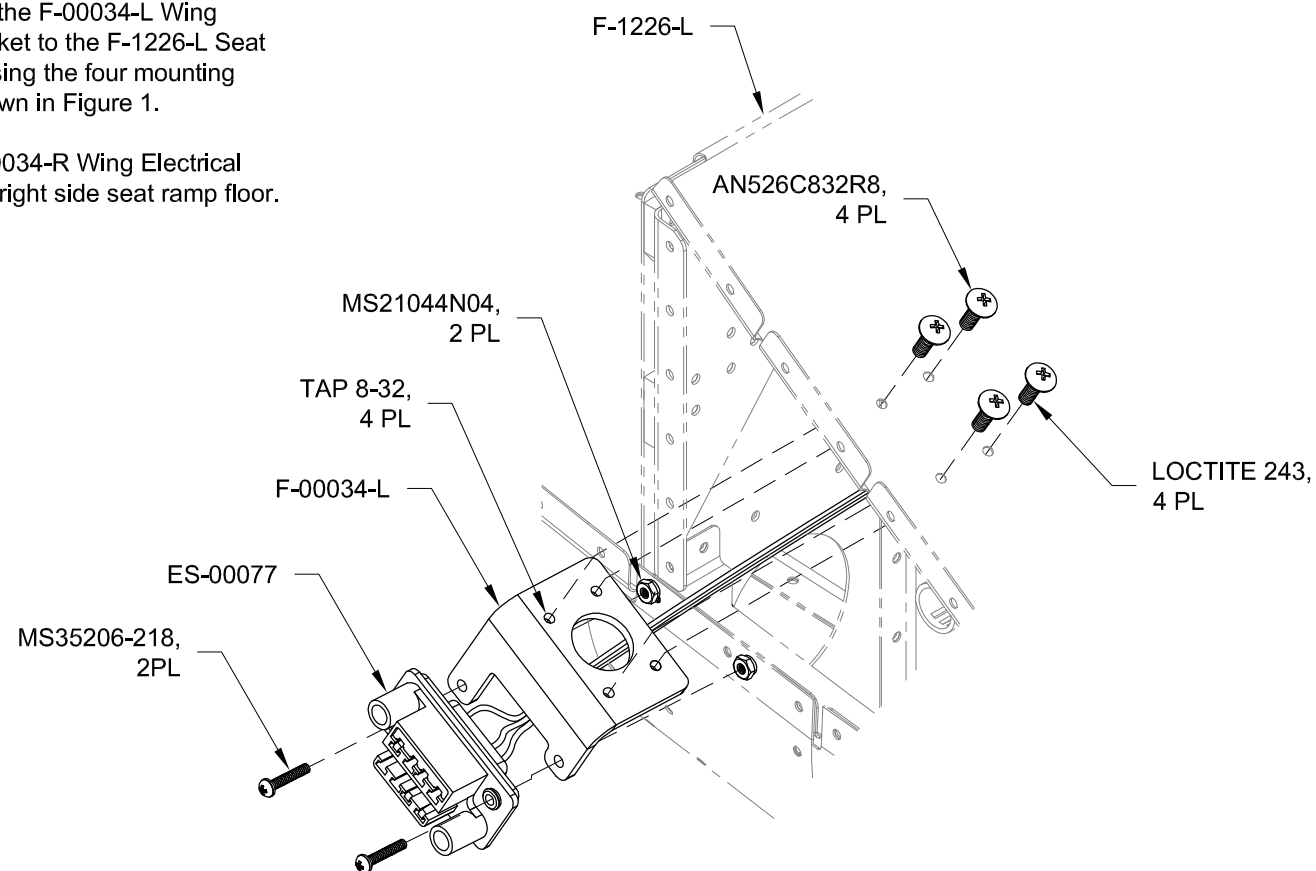
Step 2: Tie-wrap and secure all wires going to the ES-00077 and ES-00078 Floating 8 Pos Connectors and ES-00147 Headset Modules. See Page 31B-17.

Step 3: Install the ES-00077 Floating 8 Pos Connector Female to the F-00034-L Wing Electrical Bracket using the hardware shown in Figure 1.

Install the ES-00078 Floating 8 Pos Connector Male to the F-00034-R Wing Electrical Bracket.

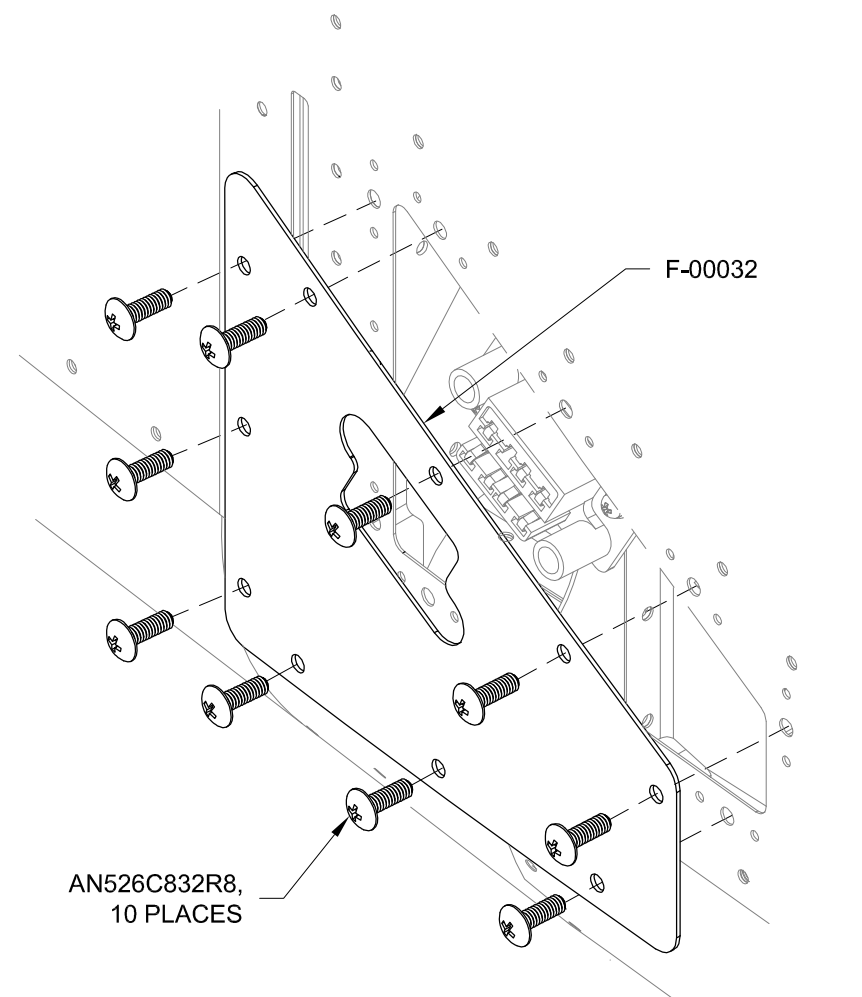
Step 4: Install the F-00034-L Wing Electrical Bracket to the F-1226-L Seat Ramp Floor using the four mounting screws as shown in Figure 1.

Install the F-00034-R Wing Electrical Bracket to the right side seat ramp floor.



**FIGURE 1: LEFT SEAT PAN ASSEMBLY VIEW**

Step 5: Install an F-00032 Fuselage Side Cover on each side of the aircraft. See Figure 2.



**FIGURE 2: LEFT SIDE COVER ASSEMBLY VIEW**

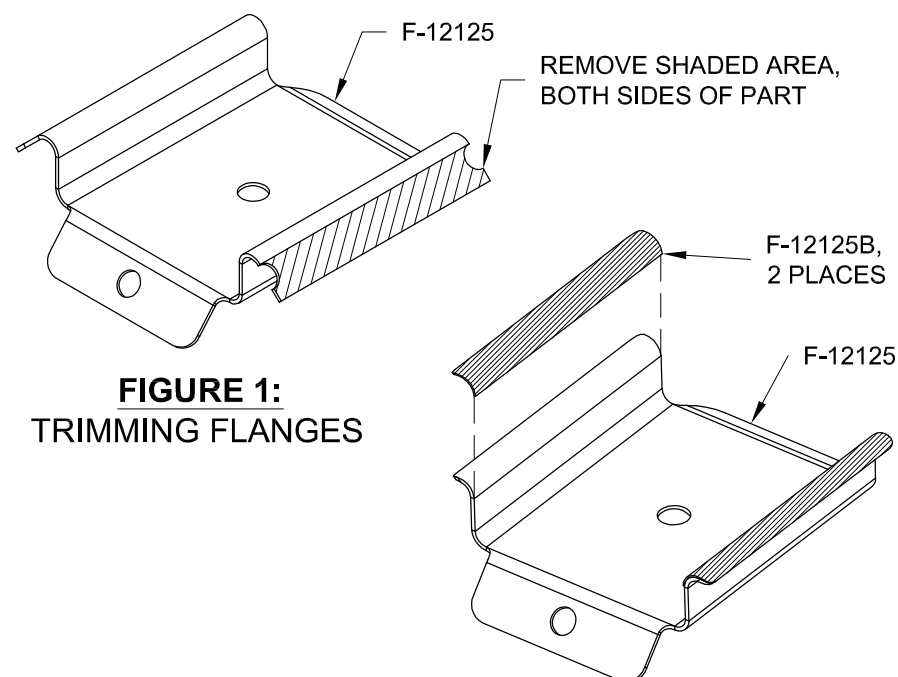




Step 1: Trim the flanges of the F-12125 Over Rudder Wireway as shown in Figure 1.

Step 2: Make two F-12125B Wireway Foam Strips from FOAM 1/16 X 1/4 V1110.

Adhere the wireway foam strips to the top edges of the F-12125 Over Rudder Wireway as shown in Figure 2.



**FIGURE 1:**  
TRIMMING FLANGES

**FIGURE 2:** FOAM STRIPS

Step 3: Install the the F-12125 Over Rudder Wireway just left of the F-1235A Inbd Rudder Pedal Block as shown in Figure 3. Do not over tighten the screw!

Step 4: Remove the two bolts and washers holding the F-1235A Inbd Rudder Pedal Block halves together.

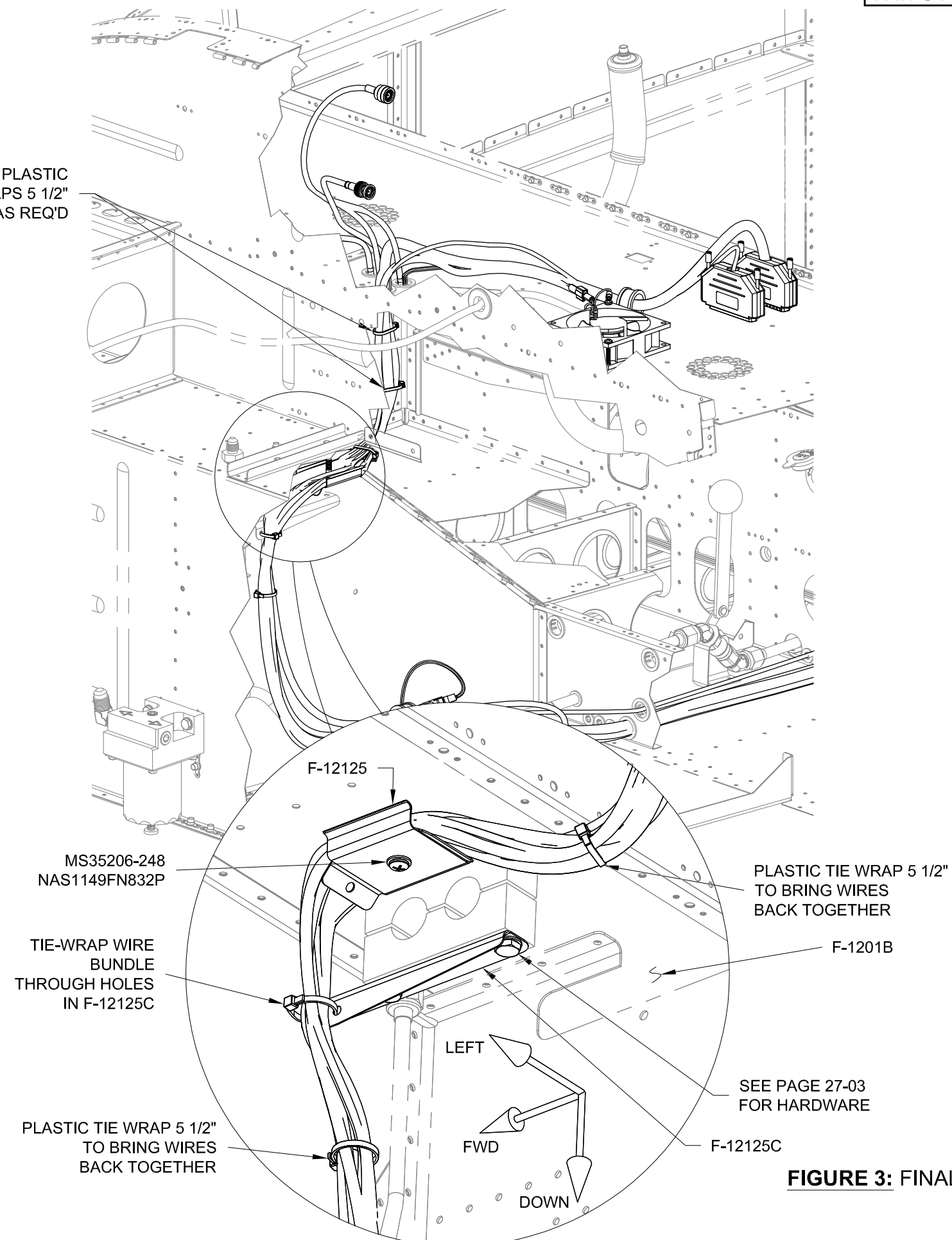
Slide the bolts through the holes in the F-12125C Wireway Bracket flange then reinstall them as shown on Page 27-03, Figure 3.

Tie-wrap the main wire bundle to the wireway bracket.

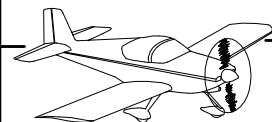
Step 5: Remove any temporary tape used in this section.

Tie-Wrap the wiring harnesses as required throughout the fuselage.

ADD PLASTIC  
TIE WRAPS 5 1/2"  
AS REQ'D



**FIGURE 3:** FINAL TASKS



**Step 1:** Drill #12 a hole in the bottom of the Roll Bar Assembly at the location shown in Figure 1.

**Step 2:** Insert a snap bushing into the hole just made in the bottom of the Roll Bar Assembly as shown in Figure 1. The flange of the bushing will need to be trimmed away to allow the bushing to fit between the F-1231A-AR & FR Roll Bar Frames and fully snap in place.

**Step 3:** Use a step drill to enlarge the #30 hole in the F-1205B Roll Bar Attach Plate to  $\varnothing 3/8$ . The hole will need to be enlarged from the bottom side.

**Step 4:** Insert a snap bushing into the hole just made in the F-1205B Roll Bar Attach Plate as shown in Figure 1.

**Step 5:** Uncoil the WH-L435 (YEL/PRP) Cockpit Light Power Wire, WH-L436 (YEL/GRN) Cockpit Ground Wire, and WH-W1114 (WHT) Canopy Latch Switch Terminal Wire that were stowed near the ELT earlier in this section.

**Step 6:** Slide all three wires through the snap bushing in the F-1205B Roll Bar Attach Plate.

**Step 7:** Fabricate the F-12126 Wire Tube by cutting a 30 inch long piece of PT-035X1/4 plastic tube.

Slide the wire tube over the WH-L435 (YEL/PRP) Cockpit Light Power Wire, WH-L436 (YEL/GRN) Cockpit Ground Wire, and WH-W1114 Canopy Latch Switch Terminal Wire.

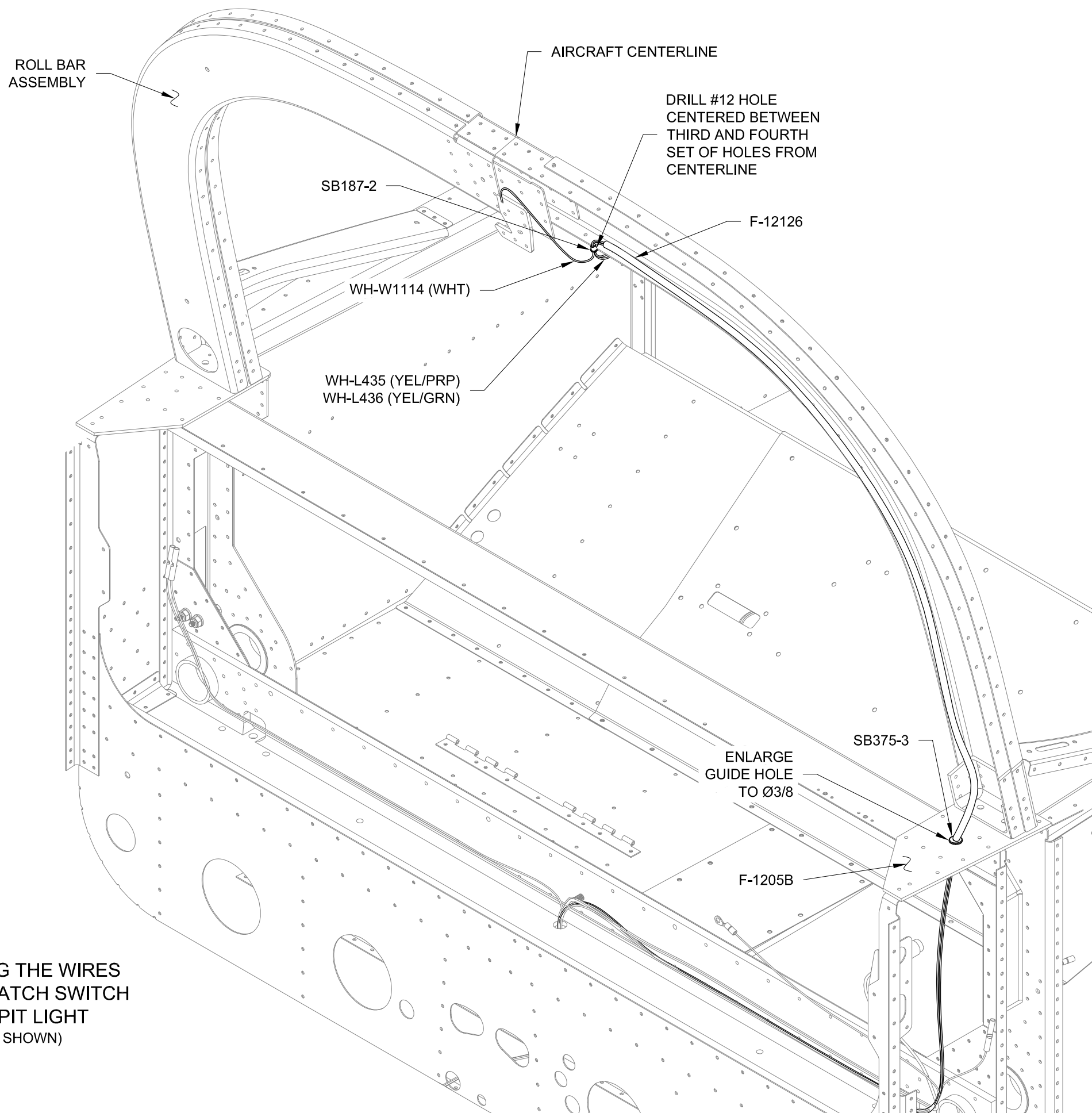
**Step 8:** Tape the end of a piece of safety wire to cover any sharp edges.

Route the safety wire through the #12 hole made in Step 1 and down through the Roll Bar Assembly to the large hole on the aft side as shown in Figure 1.

**Step 9:** Tape the end of the safety wire to the WH-L435 (YEL/PRP) Cockpit Light Power Wire, WH-L436 (YEL/GRN) Cockpit Ground Wire, WH-W1114 Canopy Latch Switch Terminal Wire, and the wire tube.

Use the safety wire to pull the three wires and the wire tube up into the roll bar assembly. Stop when the three wires have exited the #12 hole as shown in Figure 1. Remove the safety wire.

**Step 10:** Attach the ends of the WH-L435 (YEL/PRP) Cockpit Light Power Wire, WH-L436 (YEL/GRN) Cockpit Ground Wire, and WH-W1114 Canopy Latch Switch Terminal Wire to the Roll Bar Assembly with a piece of tape, or equivalent.



**FIGURE 1: ROUTING THE WIRES  
FOR THE CANOPY LATCH SWITCH  
AND THE COCKPIT LIGHT  
(F-1231A-AR NOT SHOWN)**