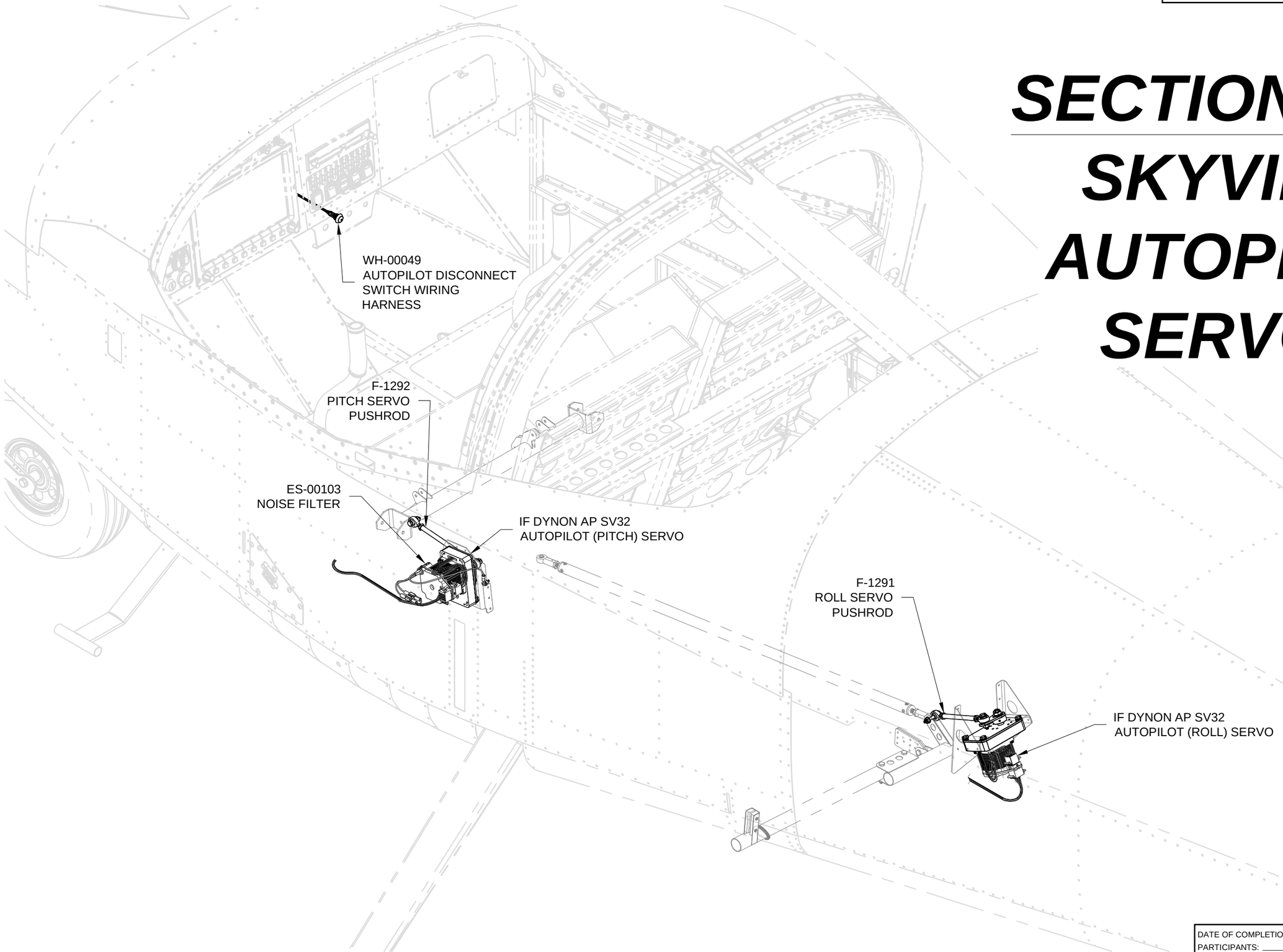
SECTION 44A:
SKYVIEW AUTOPILOT SERVOS



DATE OF COMPLETION: _____
PARTICIPANTS: _____

Step 1: Cut the F-1291 Roll Servo Pushrod and the F-1292 Pitch Servo Pushrod from AT6-058X5/16 Tube. Drill and tap the ends of each pushrod. See Figure 1.

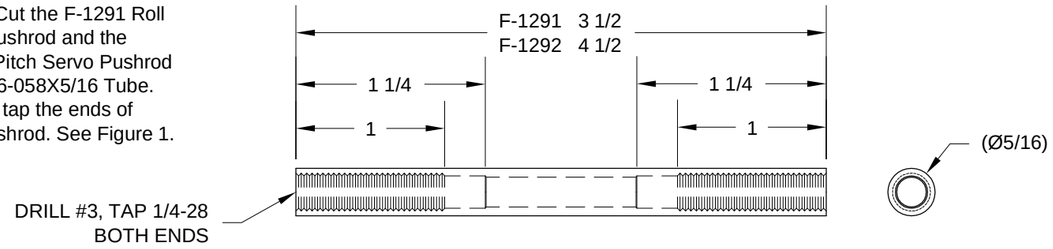


FIGURE 1: MAKING THE PUSHROD TUBES

Step 2: Assemble the F-1291 Roll Servo Pushrod and hardware as shown in Figure 2 to make the Roll Servo Pushrod Assembly.

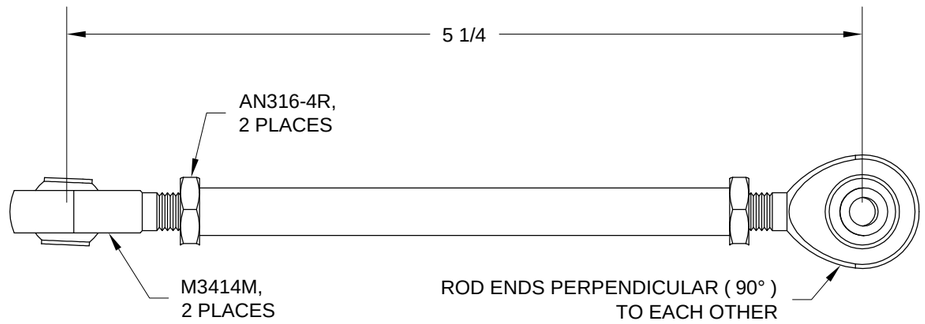


FIGURE 2: ROLL SERVO PUSHROD ASSEMBLY

Step 3: Assemble the F-1292 Pitch Servo Pushrod and hardware as shown in Figure 3 to make the Pitch Servo Pushrod Assembly.

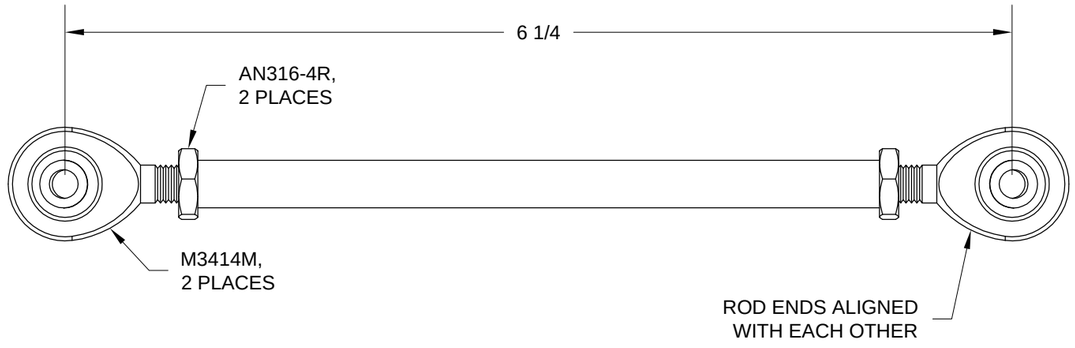


FIGURE 3: PITCH SERVO PUSHROD ASSEMBLY

Step 4: Remove the F-1206E Baggage Cover and F-1207F Baggage Bulkhead Corrugation. See Figure 4.

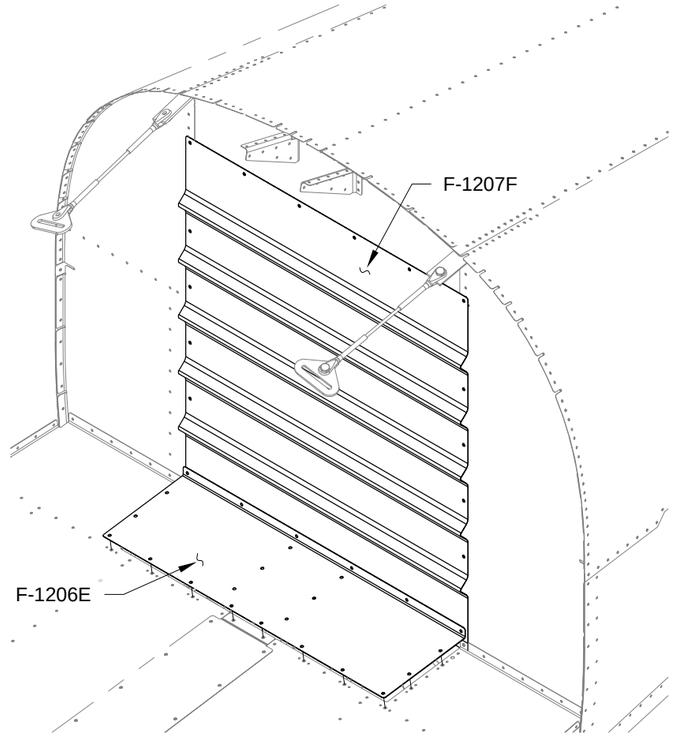


FIGURE 4: REMOVE ACCESS COVERS

Step 5: Remove the F-1227 Seat Ramp Cover. See Figure 5.

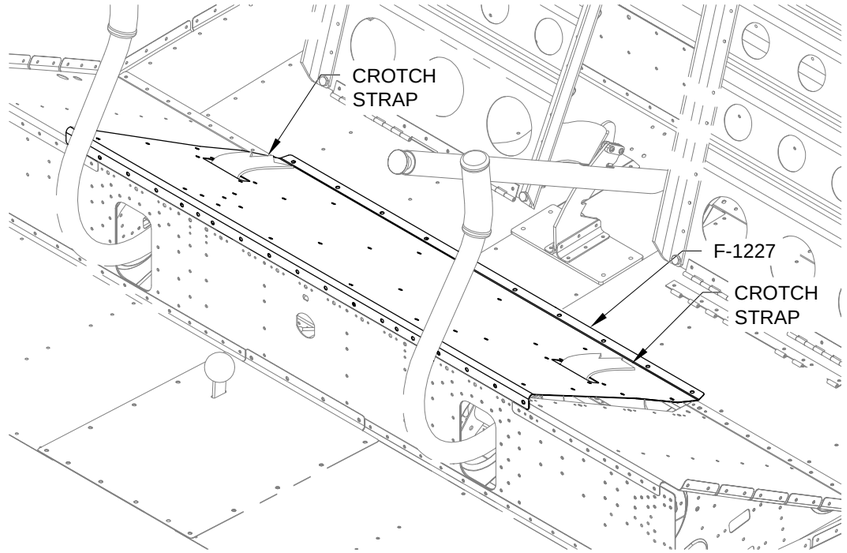


FIGURE 5: REMOVING THE SEAT RAMP COVER

Step 1: Cut all the wires coming from both IF DYNON AP SV32 Autopilot Servos to be 7 inches long.

NOTE: See chapter 5W Open Barrel Crimp. For a good example of an open barrel crimp see the WH-00045 Options Harness.

Step 2: Strip the ends of all the wires coming from both IF DYNON AP SV32 Autopilot Servos and crimp an ES-00006 Molex Socket, .093" (18-22) onto the end of each wire.

Step 3: Insert the wires from each IF DYNON AP SV32 Autopilot Servo into an ES-00009 Molex Receptacle, 9 Position (.093" Sockets) as shown in Figure 1. Numbers identifying the wire positions are molded into the back of the connector.

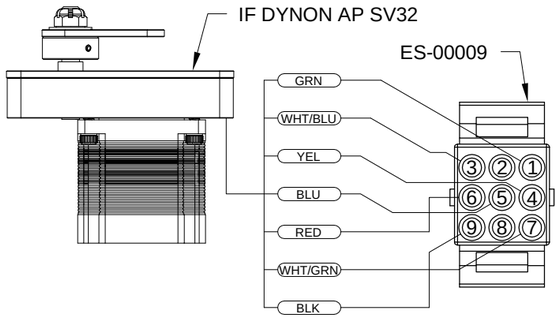


FIGURE 1: SERVO CONNECTIONS

Step 4: Connect the Roll Servo Pushrod Assembly to the IF DYNON AP SV32 Autopilot Servo as shown in Figure 2.

Step 5: Mate the Molex connector on the IF DYNON AP SV32 Autopilot Servo to the Molex connector on the WH-00045 Options Harness as shown in Figure 2.

If your aircraft does not have a Molex connector on the autopilot servo wires go to Page 44A-06, Step 1 for instructions to reconfigure your harness to mate to the servo Molex connector.

Step 6: Bolt the IF DYNON AP SV32 Autopilot Servo to the F-1286B-L & -R Servo Angles using Loctite 242 or equivalent medium thread locker. Place the ring terminal on the WH-F450 (BLK) under the head of one of the aft bolts. See Figure 2.

Step 7: Install a tie-wrap around the IF DYNON AP SV32 Autopilot Servo to secure the Molex connectors as shown in Figure 2.

Step 8: Remove the hardware holding the left Flaperon Pushrod Assembly to the WD-1215-L Flaperon Torque Arm.

Step 9: Using new hardware provided, attach the Roll Servo Pushrod Assembly and Flaperon Pushrod Assembly to the WD-1215-L Flaperon Torque Arm. See Figure 2.

Step 10: Reinstall the bolt and nut used to attach the right Flaperon Pushrod Assembly to the WD-1215-R Flaperon Torque Arm for the orientation shown in Figure 2.

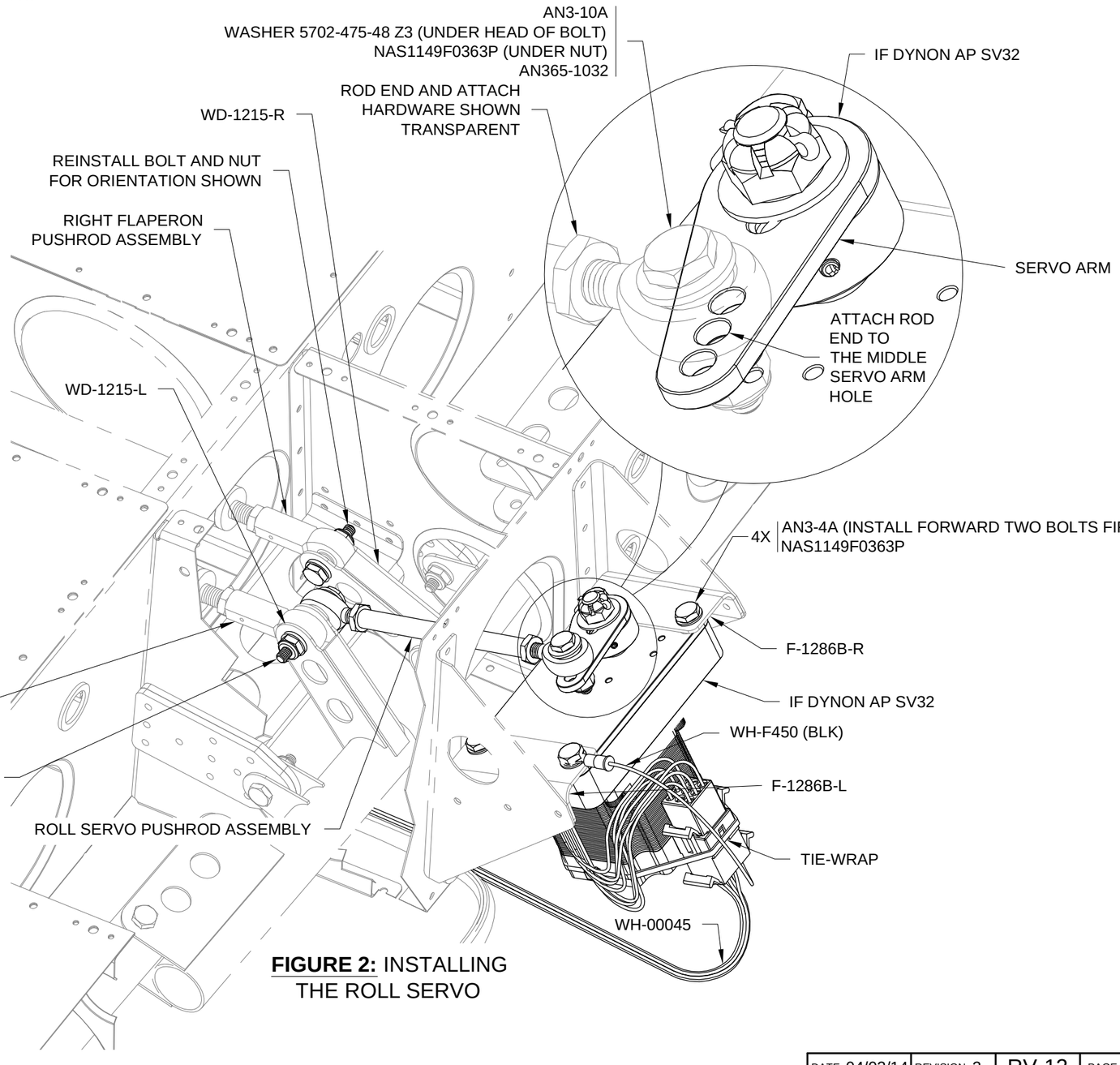


FIGURE 2: INSTALLING THE ROLL SERVO

Step 1: Insert the bolt that will attach the Pitch Servo Pushrod Assembly to the arm of the IF DYNON AP SV32 Autopilot Servo.

Step 2: Attach the autopilot servo to the F-1215-R Seat Rib and F-1269 Servo Doubler using the hardware called out in Figure 1 and Loctite 242 or equivalent medium thread locker.

Step 3: Connect the Pitch Servo Pushrod Assembly to the tab on the WD-1210 Control Column and the IF DYNON AP SV32 Autopilot Servo arm. See Figure 1.

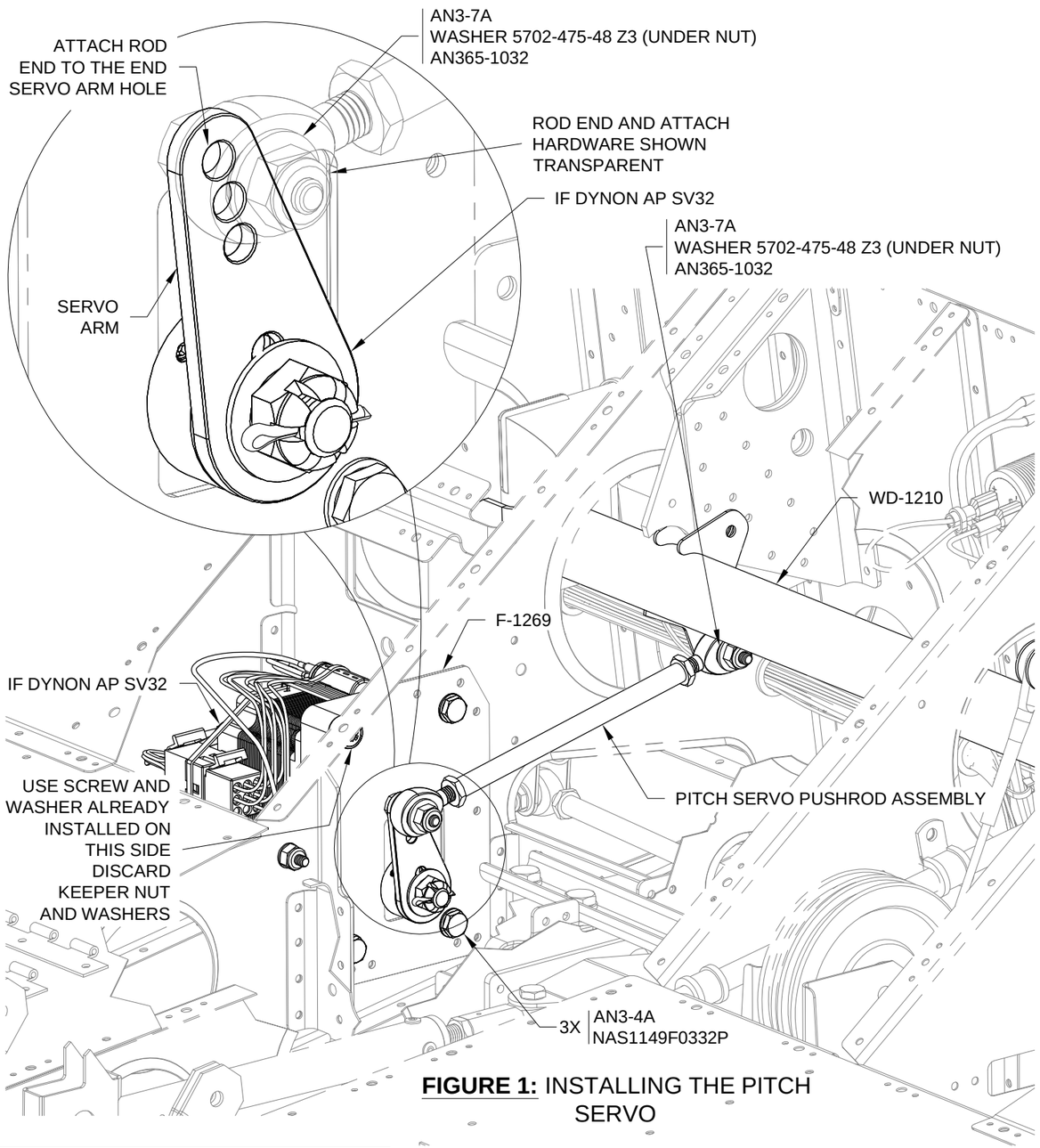


FIGURE 1: INSTALLING THE PITCH SERVO

Step 4: Connect the spade terminal on the red wire coming from the Molex connector mating to the IF DYNON AP SV32 Autopilot Servo with the appropriate gender spade connector coming from the ES-00103 Noise Filter. See Figures 2 and 3.

Connect the spade terminal on the red wire coming from the WH-0045 Options Harness to the remaining spade connector on the noise filter.

Connect the ring terminals on the noise filter ground wire and WH-F451 (BLK) to the F-1215-R Seat Rib. See Figures 2 and 3.

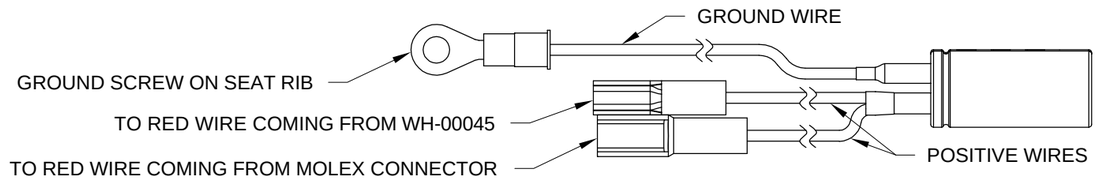


FIGURE 2: NOISE FILTER DETAIL

Step 5: Mate the Molex connector on the IF DYNON AP SV32 Autopilot Servo to the Molex connector on the WH-00045 Options Harness and WH-00046 Fuselage Harness as shown in Figures 1 and 3.

If your aircraft does not have a Molex connector on the autopilot servo wires go to Page 44A-06, Step 4 for instructions to reconfigure your harness to mate to the servo Molex connector.

Step 6: Install a tie-wrap around the IF DYNON AP SV32 Autopilot Servo to secure the Molex connectors and ES-00103 Noise Filter as shown in Figures 1 and 3. Tie-wrap wires as required to prevent wires from chafing.

WARNING: WHEN FINISHED INSTALLING THE AUTOPILOT SERVOS, MOVE THE CONTROL STICK THROUGHOUT ITS ENTIRE RANGE OF TRAVEL MANY TIMES (WITH FLAPS UP AND WITH FLAPS DOWN) TO CHECK FOR AN OVER-CENTER CONDITION OF THE AUTOPILOT SERVOS (A CONDITION WHERE THE SERVO ARM AND PUSHROD BECOME CLOSE TO PARALLEL AND THE CONTROL SYSTEM LOCKS).

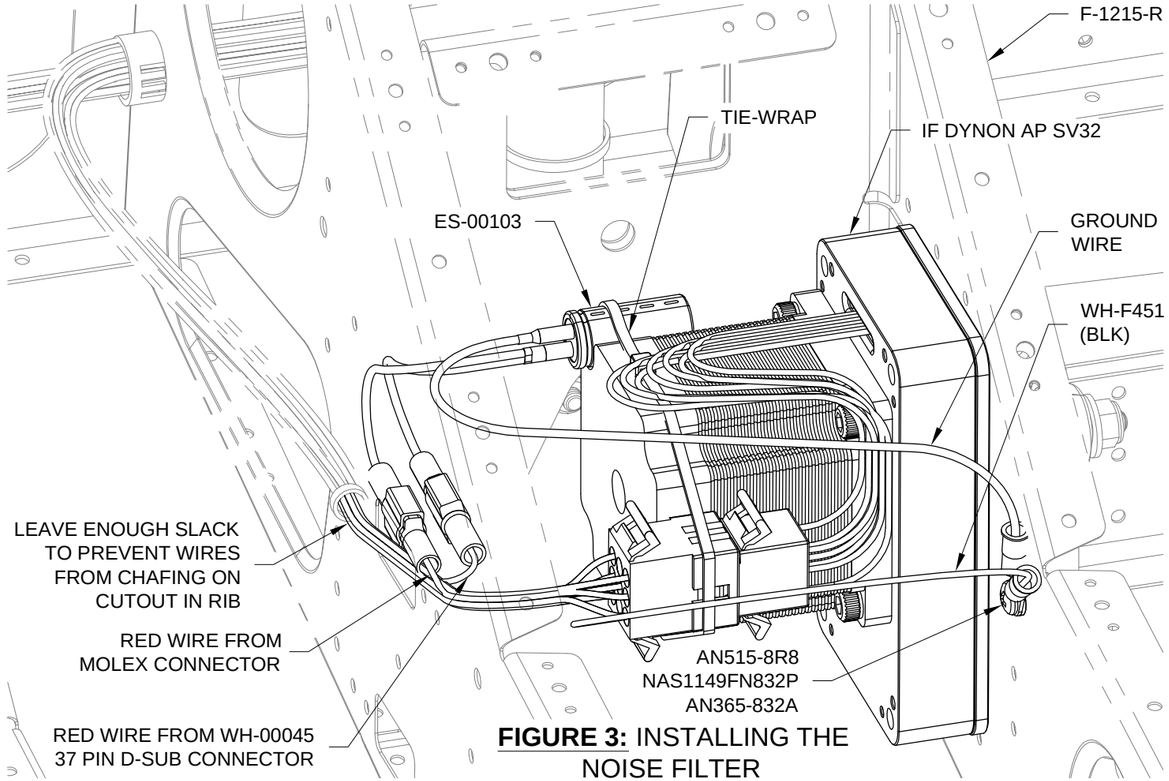


FIGURE 3: INSTALLING THE NOISE FILTER

Step 1: Re-install the F-1227 Seat Ramp Cover, F-1206E Baggage Cover and F-1207F Baggage Bulkhead Corrugation.

Step 2: Use a step-drill to enlarge the existing pilot hole in the F-00023 SV Inst Panel SL-40 to 1/2 inch diameter.

Deburr the hole.

Step 3: Install the WH-00049 Autopilot Disconnect Switch Wiring Harness into the F-00023 SV Inst Panel SL-40 as shown in Figure 1.

Insert the pins on the end of the autopilot disconnect switch wiring harness into a ES-00008 Molex Plug as shown in Figure 2.

Insert the ES-00007 Molex Receptacle into the Molex plug as shown in Figure 1.

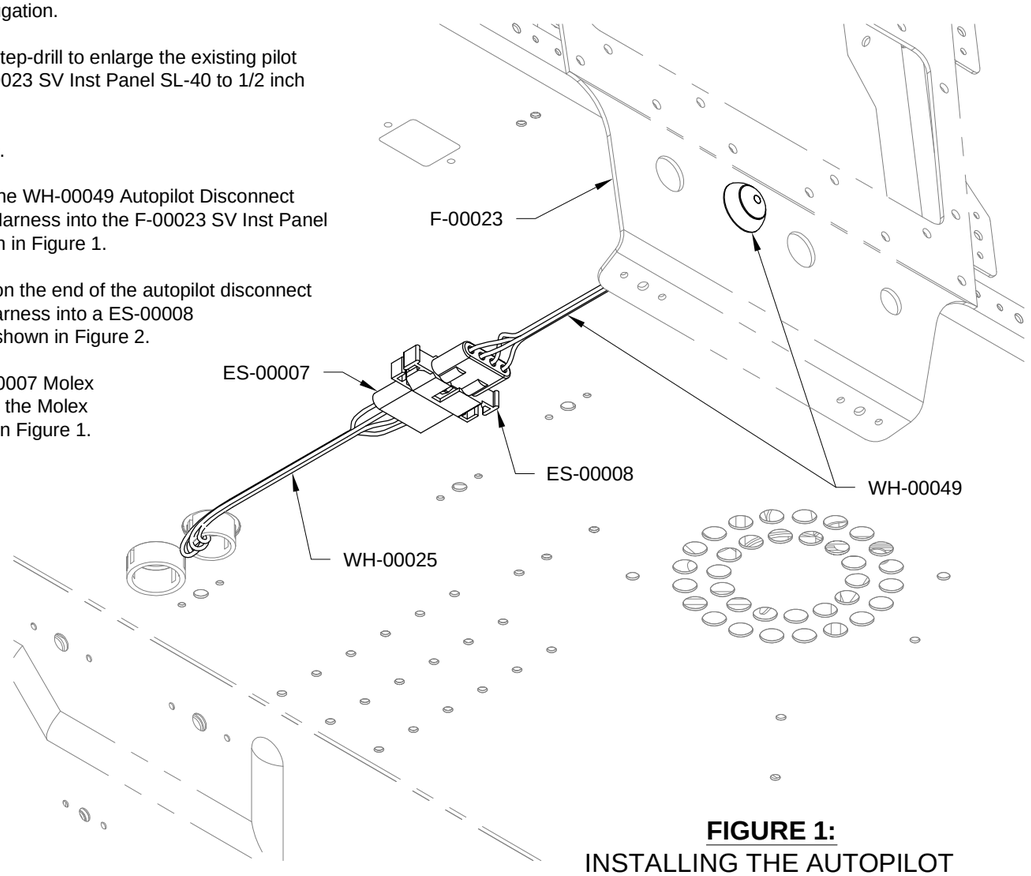


FIGURE 1:
INSTALLING THE AUTOPILOT DISCONNECT SWITCH

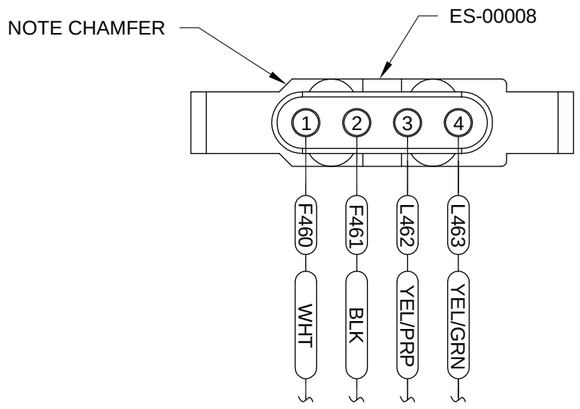


FIGURE 2: AUTOPILOT DISCONNECT DIAGRAM
(VIEW FROM WIRE INSERTION SIDE)

Step 4: Navigate to the Van's Aircraft web site downloads page. Download and install the latest SkyView Software and Settings on both screens (this will also install the latest firmware).

Download and install from the same location the RV-12 autopilot pre-sets file.

Check the setup menu to confirm that the latest firmware is installed on both screens if applicable (the firmware level is also visible during the boot sequence).

Finish the installation per the instructions in the SkyView System Installation Guide. See the Dynon web site.

Step 5: Download the latest RV-12 overall Electrical Schematic from the Van's Aircraft web site.

NOTE: Any weight and balance information recorded for the aircraft must be updated. Depending on the state of your kit some steps may not be applicable.

Step 6: In the RV-12 Maintenance Manual (MM) "INSTALLED EQUIPMENT LIST" table, add "DYNON AUTOPILOT SERVO" to the "ITEM" column. On the same line add a checkmark to the "INSTALLED" column.

Enter 4.6 lb for "Weight", 101.5 in for "Location/Arm" and 467 in-lb "Moment" onto the same line as "DYNON AUTOPILOT SERVO".

NOTE: Steps 7-9 on this page are only applicable if a final weight and balance as specified in the PAP has been completed.

Step 7: In the RV-12 Pilot Operating Handbook (POH) "YOUR AIRPLANE" table, enter the new total values for the arm, weight, and moment of the installed equipment.

Step 8: In the RV-12 POH "YOUR AIRPLANE" table, recalculate and enter new values for the Empty Weight, Empty Moment, and Empty Arm.

Step 9: Make an entry, as calculated in the previous step, on the WEIGHT AND BALANCE RECORD page of the RV-12 Maintenance Manual as follows:

As of this date: ___/___/___ the following values represent current Weight and Balance calculations resulting from the installation of the Dynon Autopilot Servo Optional Kit.

Revised Empty Weight: _____ lbs
Revised Empty Moment: _____ in-lbs
Revised Empty Arm: _____ in

Signed: _____

NOTE: The remaining steps on this page are only applicable for aircraft which have passed a final airworthiness inspection.

Step 10 (ELSA): Make an appropriate entry in the airframe logbook. See example below:

Installed the DYNON AUTOPILOT SERVO option in accordance with Van's Aircraft KAI Section 44A and confirmed proper operation.

Signature _____ Certificate # _____

Step 10 (SLSA): Complete the notification N 16-10-11 (available from the Van's Aircraft web site) corresponding to the DYNON AUTOPILOT SERVO installation.

Step 11: Section complete.

NOTE: This page applies to kits with a date of purchase of the empennage, wing, fuselage or finish kit prior to September 2011.

Step 1: Cut the spade connectors off the ends of the seven WH-B170 Autopilot Harness wires. (These spade connectors were installed per Page 31-09, Step 11.)

NOTE: See chapter 5W Open Barrel Crimp.

Step 2: Strip the ends of the seven WH-B170 Autopilot Harness wires and crimp an ES-00005 Molex Pin, .093" (18-22) onto the end of each wire.

Step 3: Insert the seven WH-B170 Autopilot Harness wires into an ES-00010 Molex Plug, 9 Position as shown in Figure 1. Numbers identifying the wire positions are molded into the back of the connector.

Continue the installation process by returning to Page 44A-03, Step 6.

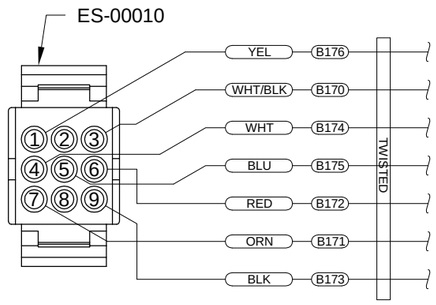


FIGURE 1: WH-B170 CONNECTION TO ROLL SERVO

NOTE: DO NOT cut the male spade connector off the red WH-RV12-OPTIONAL harness and WH-B170 Autopilot Harness wires.

Step 4: Cut the four female spade connectors off the ends of the WH-RV12-OPTIONAL harness wires and WH-B170 Autopilot Harness wires. (Each spade connector is crimped onto two wires. These spade connectors were installed per Page 31-09, Step 8.)

Cut the male spade connector off the ORN WH-RV12-OPTIONAL harness and WH-B170 Autopilot Harness wires.

Cut the male spade connector off the WHT/BLK WH-RV12-OPTIONAL harness and WH-B170 Autopilot Harness wires.

NOTE: See chapter 5W Open Barrel Crimp.

Step 5: Strip the ends of the twelve WH-RV12-OPTIONAL/WH-B170 Autopilot Harness wires. Twist together the stripped ends of each pair of like colored wire and crimp an ES-00003 Molex Pin, .093" (14-20) onto the end of each wire pair.

Step 6: Insert the six WH-RV12-OPTIONAL/WH-B170 Autopilot Harness wire pairs into an ES-00010 Molex Plug, 9 Position as shown in Figure 2. Numbers identifying the wire positions are molded into the back of the connector.

Step 7: Cut a piece of 22 gauge wire 3 1/2 inches long.

Strip one end and crimp on an ES-00005 Molex Pin, .093" (18-22).

Strip the other end and crimp on an ES 421-108 Female Spade Connector.

Insert the Molex pin end of the wire into position 6 of the ES-00010 Molex Plug, 9 Position as shown in Figure 2.

Continue the installation process by returning to Page 44A-04, Step 6.

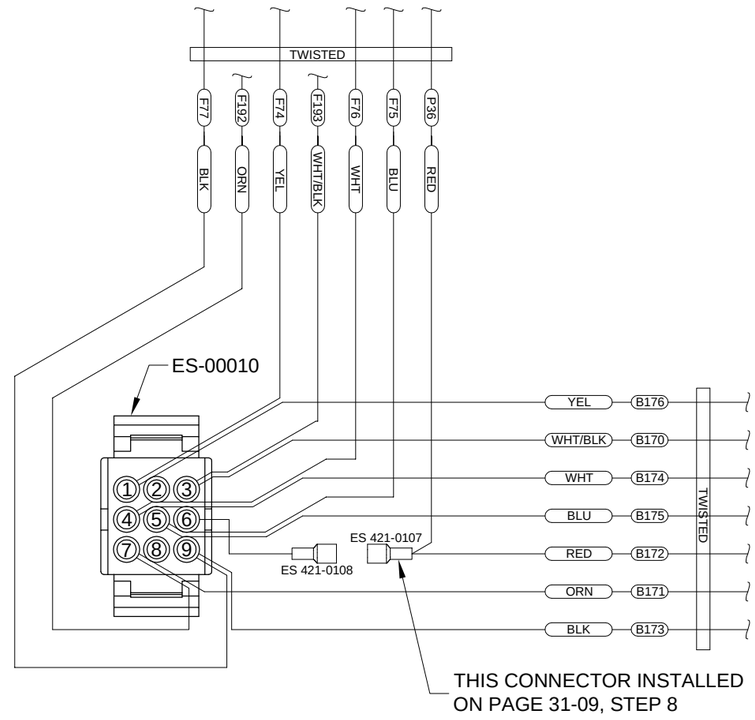


FIGURE 2: WH-RV12-OPTIONAL & WH-B170 CONNECTION TO PITCH SERVO