



MACHFORCE

TERMINATION INSTRUCTIONS

Revision 6



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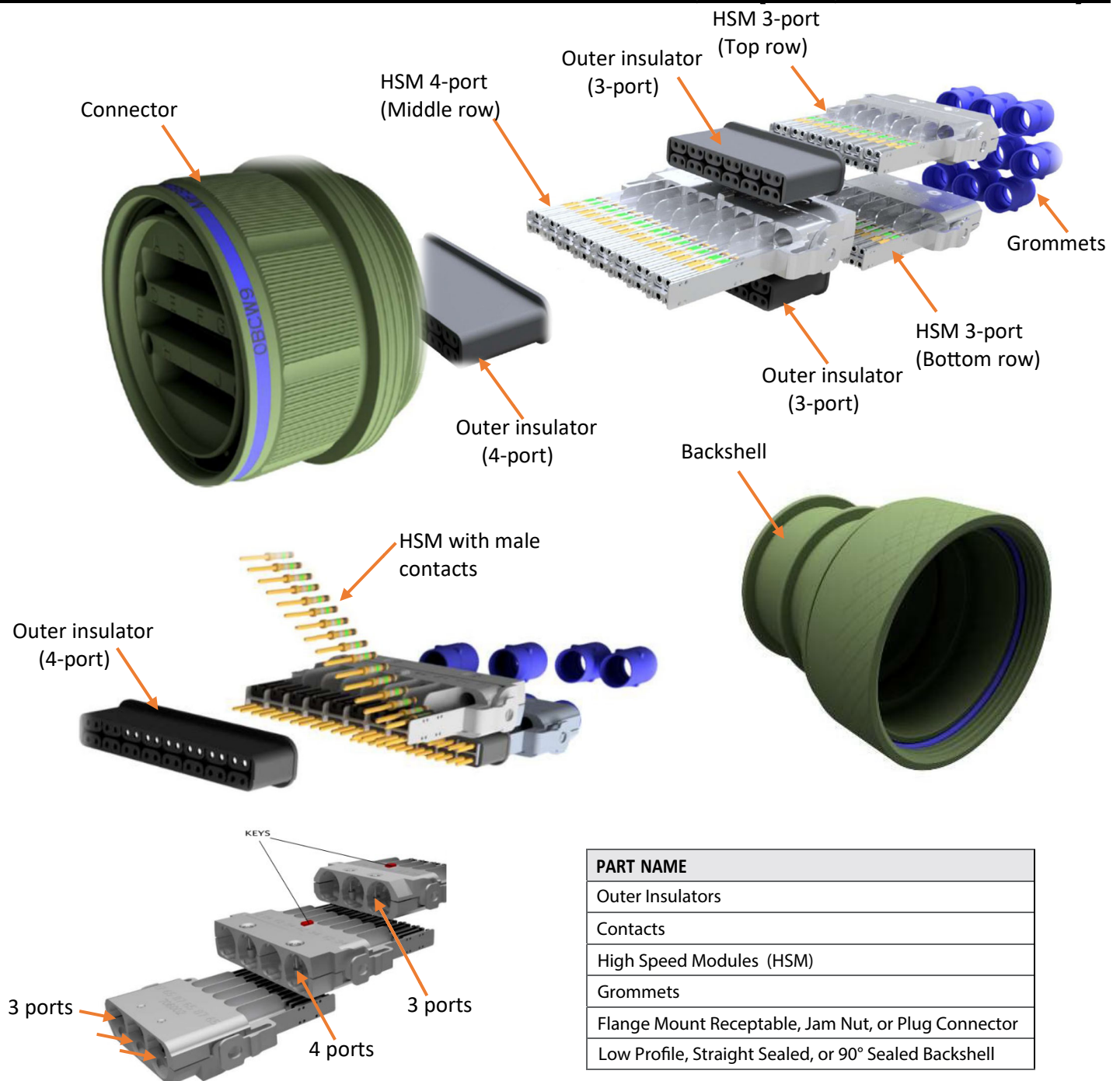
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RECOMMENDED TOOLING

1. Crimp Tool, M22520/2-01
2. Positioner, M22520/2-06
3. Positioner, M22520/2-09
4. Tweezers
5. Small Scissors
6. Needle Nose Pliers
7. Calipers 12"
8. Picking Tool
9. Allen Key 0.05"
10. Small Flush Cut Wire Cutter
11. Ideal 55-1773 Ergo-Elite Stripmaster, or Equivalent
12. Razorblade
13. Isopropyl Alcohol (Used Only With Sealing Backshells)
14. P-80 Emulsion Temporary Assembly Lubricant, or Equivalent

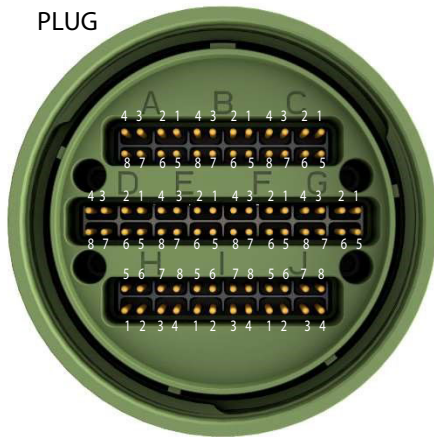
CONNECTOR ASSEMBLY OVERVIEW/ INVENTORY LIST

(SIZE 25 PLUG SHOWN)

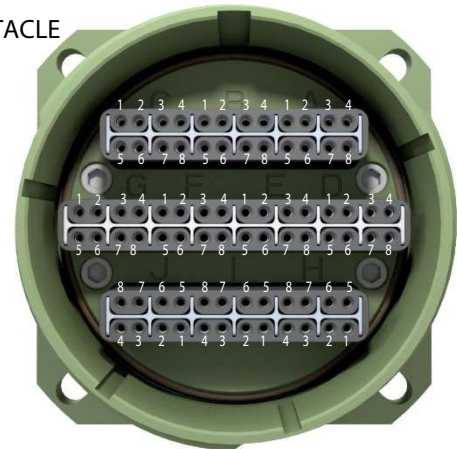


HIGH SPEED MODULE CONTACT CONFIGURATION (Size 25)

PLUG

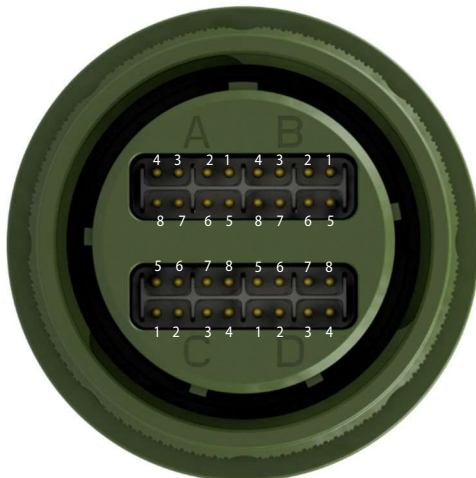


RECEPTACLE



HIGH SPEED MODULE CONTACT CONFIGURATION (Size 17)

PLUG

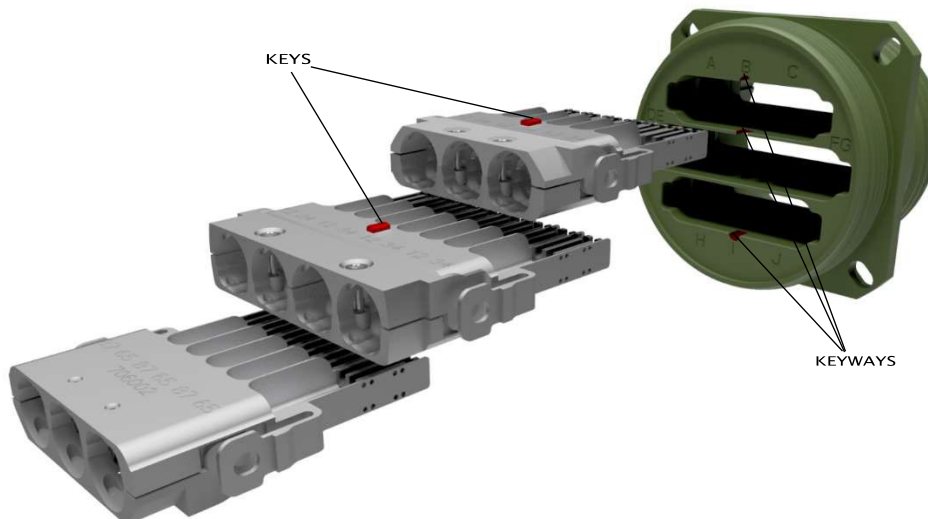


RECEPTACLE



STEP 1: CUT CABLES AND INSTALL BACKSHELL

- Cut cables to application length. Leave 1" additional length.
- Align the cables for each of the High Speed Modules (HSMs) according to the correct key arrangement. The HSM(s) at the top will be inserted with the key (highlighted in red below) facing upwards and the HSM on the bottom will be inserted with the key facing downwards, to align with the corresponding keyways.



C. Arrange the cables according to the colored wire orientation for the pin or socket termination.

Pin-Socket Configuration

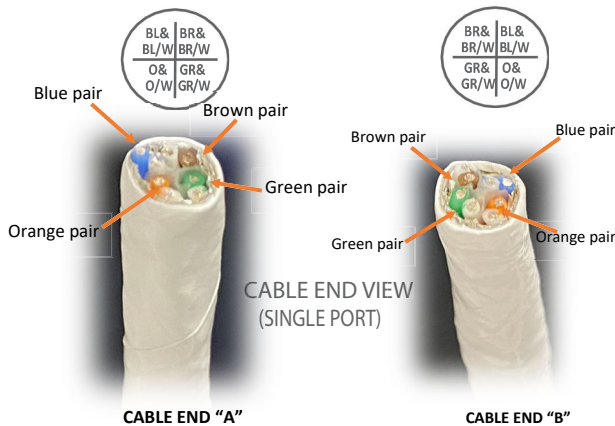
PIN END	WIRE PAIR COLOR	SOCKET END
1	Brown/White	1
2	Brown	2
3	Blue/White	3
4	Blue	4
5	Green/White	5
6	Green	6
7	Orange/White	7
8	Orange	8

Pin-Pin Configuration

PIN END	WIRE PAIR COLOR	PIN END
1	Brown/White	3
2	Brown	4
3	Blue/White	1
4	Blue	2
5	Green/White	7
6	Green	8
7	Orange/White	5
8	Orange	6

Socket-Socket Configuration

SOCKET END	WIRE PAIR COLOR	SOCKET END
3	Brown/White	1
4	Brown	2
1	Blue/White	3
2	Blue	4
7	Green/White	5
8	Green	6
5	Orange/White	7
6	Orange	8



PINOUT "A"	
Brown/White	1
Brown	2
Blue/White	3
Blue	4
Green/White	5
Green	6
Orange/White	7
Orange	8

PINOUT "B"	
Brown/White	3
Brown	4
Blue/White	1
Blue	2
Green/White	7
Green	8
Orange/White	5
Orange	6

For pinout "A", install pins on End "A" and install sockets on End "B".
For pinout "B", install sockets on End "A" and install pins on End "B".

D. If using a backshell without sealing, feed the cable through the backshell before prepping the cables.

E. If using a backshell with sealing, feed the cables through the backshell first, then through the seal, before prepping the cables.

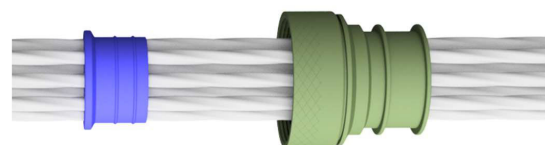
If using a 90° sealing backshell, feed the cables through the saddle clamp first, then the seal, and through the backshell last, before prepping the cables.

NOTE: Apply Isopropyl Alcohol on the cables and seal holes to help slide the seal.

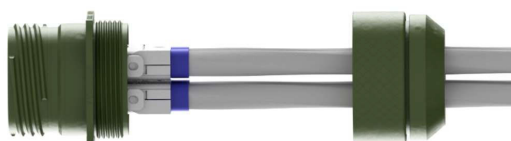
CAUTION: Some cable jackets may be abraded by the interior corners or threads of the backshells, leading to cosmetic or structural damage. Take care, especially on the 90° to help the cables pass through the backshell.



Size 25 Backshell without sealing



Size 25 Backshell with sealing



Size 17 Backshell without sealing



Size 17 Backshell with sealing



Size 17 90° Backshell with sealing

Tools Needed: Razor, Calipers, Wire Snips, Tweezers, Small Scissors

STEP 2: BUILD CABLE ASSEMBLIES

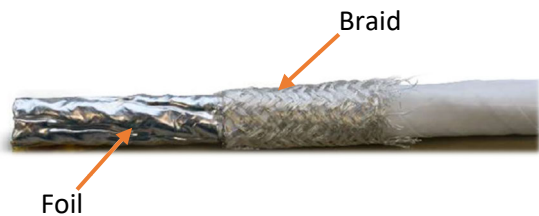
- A. Slide on necessary labels. Insert each cable into a grommet from the thick wall side. Use #703010 for 26AWG cable and #703007 for 24AWG cable.



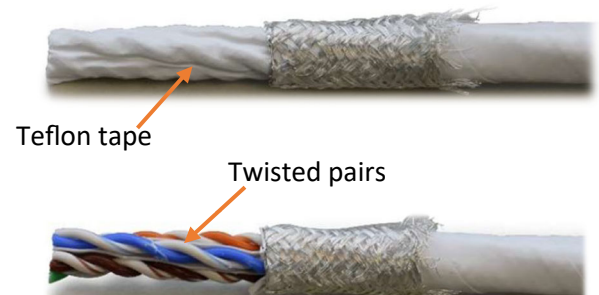
- B. Remove 0.9 inches of cable jacket and markertape.



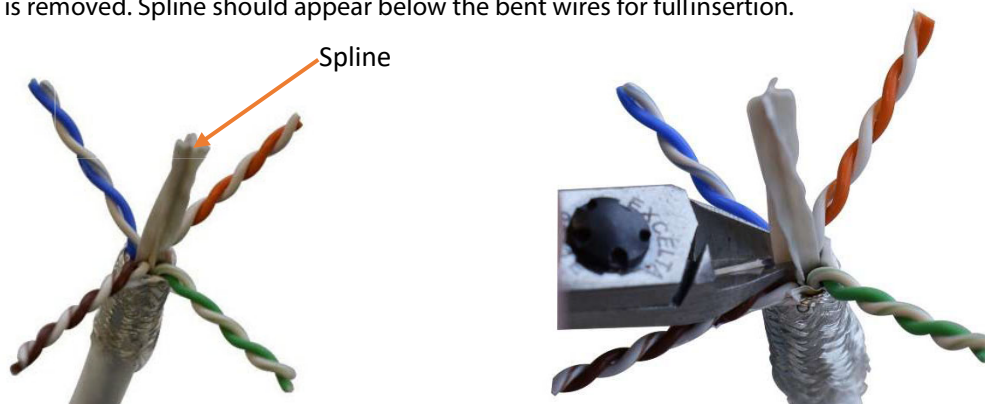
- C. Fold braid back over cable jacket.



- D. Using small scissors or equivalent, remove foil and Teflon tape without damaging the insulation of the twisted pairs.



- E. Bend twisted pairs outwards at 90° to expose the spline spacer. Use a small flush cut wire cutter to cut each vein of the spline until spline is removed. Spline should appear below the bent wires for full insertion.



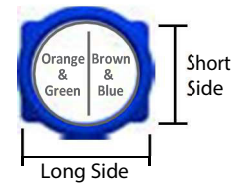


Tools Needed: Picking Tool
Wire Snips
Calipers

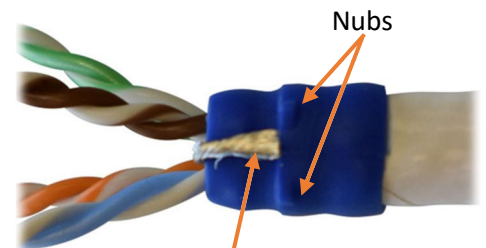
Wire Stripper: Ideal 55-1773 Ergo-Elite Stripmaster, or Equivalent
Crimp Tool: M22520/2-01
Positioner: M22520/2-06 or M22520/2-09 depending on AWG

STEP 2: BUILD CABLE ASSEMBLIES (CONTINUED)

- F. Fold braided shield back over the four twisted pairs.
- G. Rotate grommet to center the short sides over the blue/brown and orange/green twisted pairs. Position grommet 0.79 inches from end of the twisted pairs.
- H. On each side of the cable, gently comb out braids between the blue and brown pairs, and orange and green pairs to the front edge of the grommet. Separate the unbraided strands into two groups - half between the brown and blue twisted pairs, and half between the orange and green twisted pairs.
- I. Twist each of these two groups as shown on the right to hold the strands together.

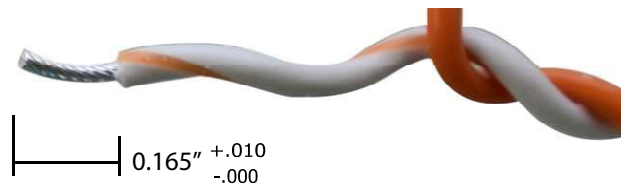


- J. Gently fold the twisted strands back over the grommet. Fold one group of twisted strands between the blue and brown twisted pairs, and the other group of twisted strands between the orange and green twisted pairs. Trim the twisted braid to be flush with the grommet nubs, as shown on the right.



Twisted braid trimmed flush with grommet nubs.

- K. Untwist the wire pairs by 0.5 inches to prepare enough space to strip and crimp the wires.
- L. Use an Ideal 55-1773 Ergo-Elite Stripmaster with adjustable wire stop (or equivalent) set to 0.165 inches to strip the wires. Strip one wire and one pair at a time.



- M. Using M22520/2-01, adjust the setting for the cable AWG. Use the correct positioner for the contact. Crimp contacts with the hand tool. After crimping, ensure the insulation is flush with the contact and the wire is visible through the inspection hole.

M22520/2-01 Tool Settings

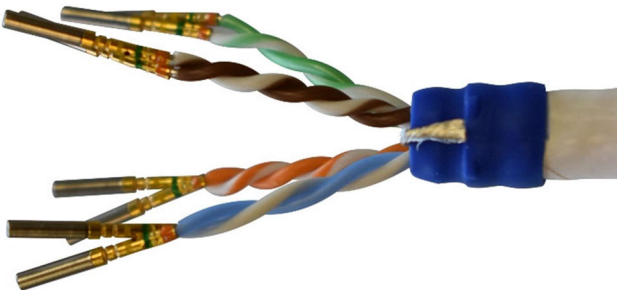
CABLE AWG	SETTING
24	3
26	2

Positioner Part Number

CONTACT	PART NUMBER
Socket	M22520/2-06
Pin	M22520/2-09



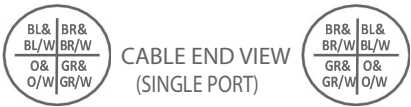
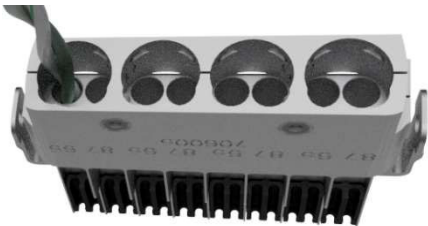
- N. Re-twist the wire pairs back to their original orientation.
- O. Repeat Steps A-N for all the cables.



STEP 3: ASSEMBLE HIGH SPEED MODULE (HSM)

Tools Needed: Tweezers

- A. For each of the High Speed Modules (HSM), insert each set of contacts into the high speed module grooves using the orientation already determined during Step 1.C. Pull the contacts through the end of the HSM by hand and use tweezers to pull the contacts up to the black insulators.



Pin-Socket Configuration

PIN END	WIRE PAIR COLOR	SOCKET END
1	Brown/White	1
2	Brown	2
3	Blue/White	3
4	Blue	4
5	Green/White	5
6	Green	6
7	Orange/White	7
8	Orange	8

Pin-Pin Configuration

PIN END	WIRE PAIR COLOR	PIN END
1	Brown/White	3
2	Brown	4
3	Blue/White	1
4	Blue	2
5	Green/White	7
6	Green	8
7	Orange/White	5
8	Orange	6

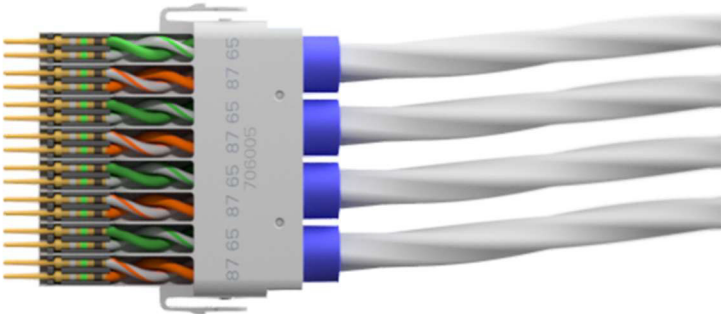
Socket-Socket Configuration

SOCKET END	WIRE PAIR COLOR	SOCKET END
3	Brown/White	1
4	Brown	2
1	Blue/White	3
2	Blue	4
7	Green/White	5
8	Green	6
5	Orange/White	7
6	Orange	8

- B. Ensure the colored wires correspond correctly with the above configuration guide. Snap the contacts into the grooves of the black inner insulator.



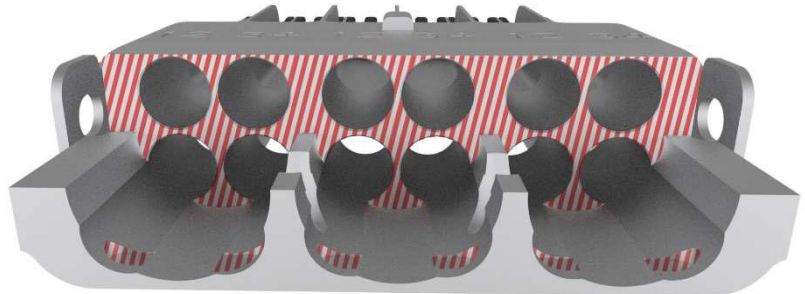
CAUTION: The contacts must be fully seated and tight. If not properly aligned, damage will occur when mating.



Fully Seated Pins

STEP 3: ASSEMBLE HIGH SPEED MODULE (CONTINUED)

- C. Verify that the grommets are flush with the face of the HSM, highlighted in red.
- D. Ensure grommet nubs are in place in the notches, highlighted in red, and close the HSM clamp.



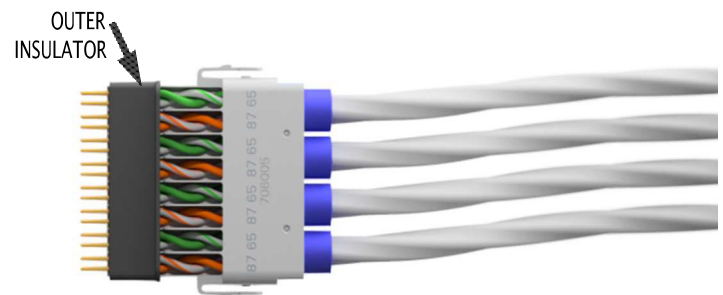
(Cables not shown for clarity)

- E. Tighten the two screws, highlighted in red, to 1 ± 0.1 in-lb to secure the clamp. Alternate tightening each screw partially so the clamp compresses evenly.



(Cables not shown for clarity)

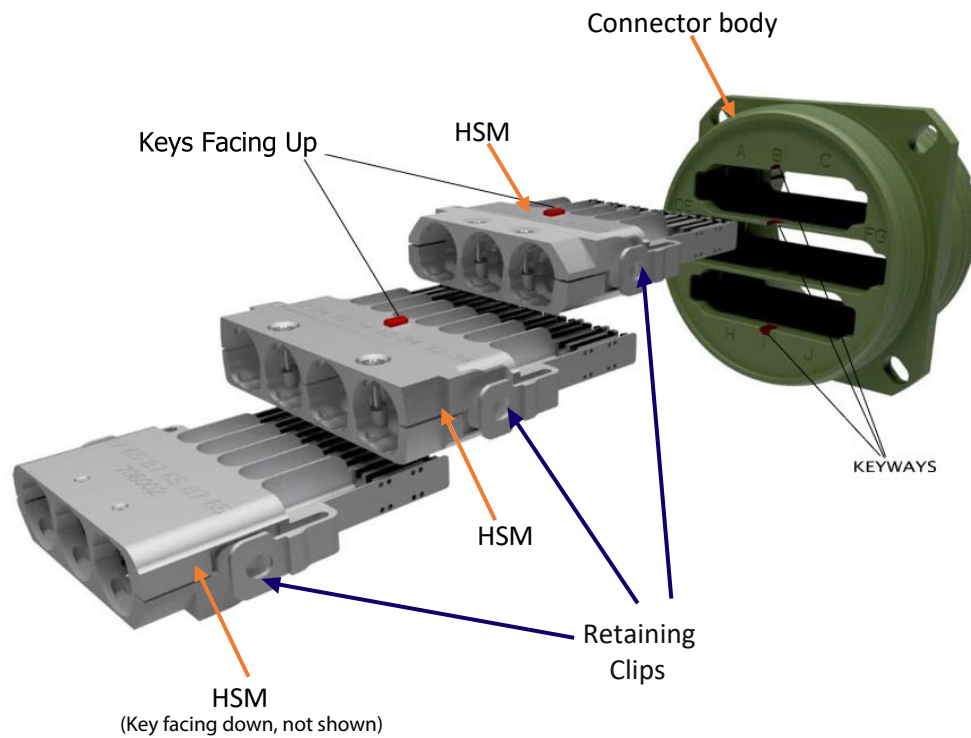
- F. Slide outer insulator over HSM contacts.



- G. Repeat steps A-F to assemble the other HSMs.

STEP 4: ASSEMBLE CONNECTOR

- A. Align the HSM locating key (highlighted in red) with the connector body keyways in each HSM slot. To correctly align the keys, insert the top HSM(s) with the key facing upwards and insert the bottom HSM with the key facing downwards.



(Outer insulators & cables not shown for clarity)

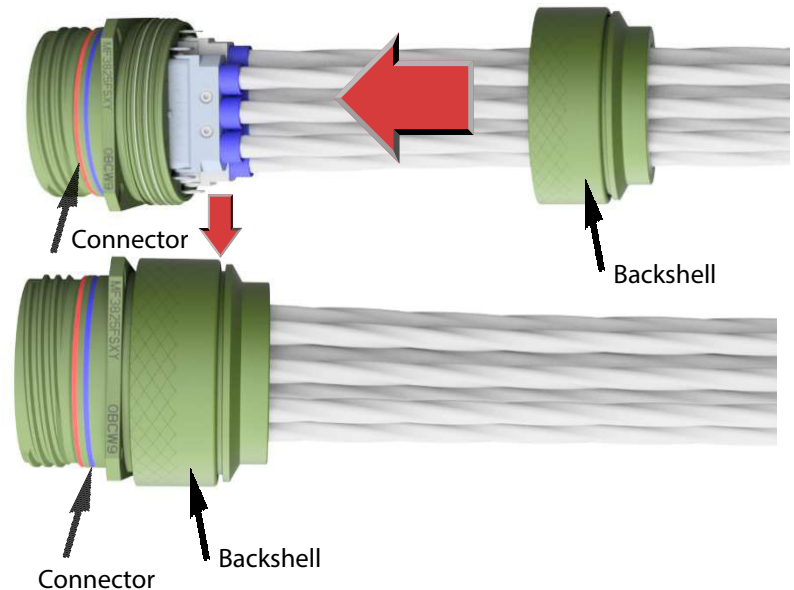
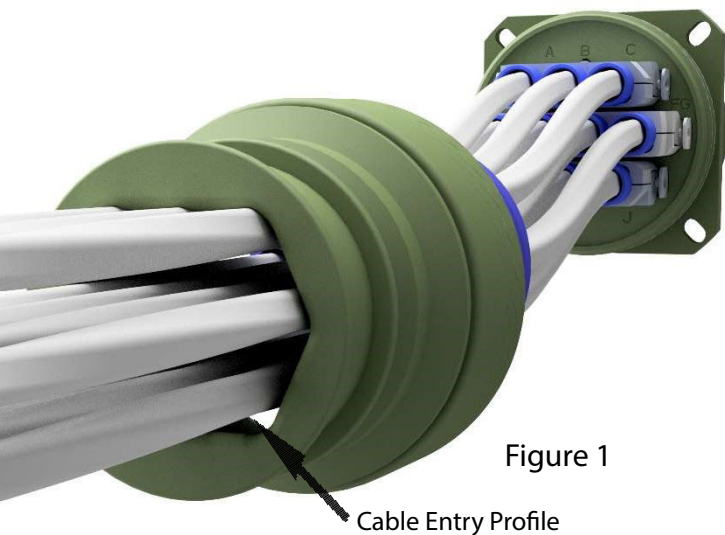
- B. Insert the HSMs into the connector body until both retaining clips snap fully into place.

Tools Needed: Torque Wrench & P-80 Lubricant

STEP 5: FINISH BACKSHELL INSTALL

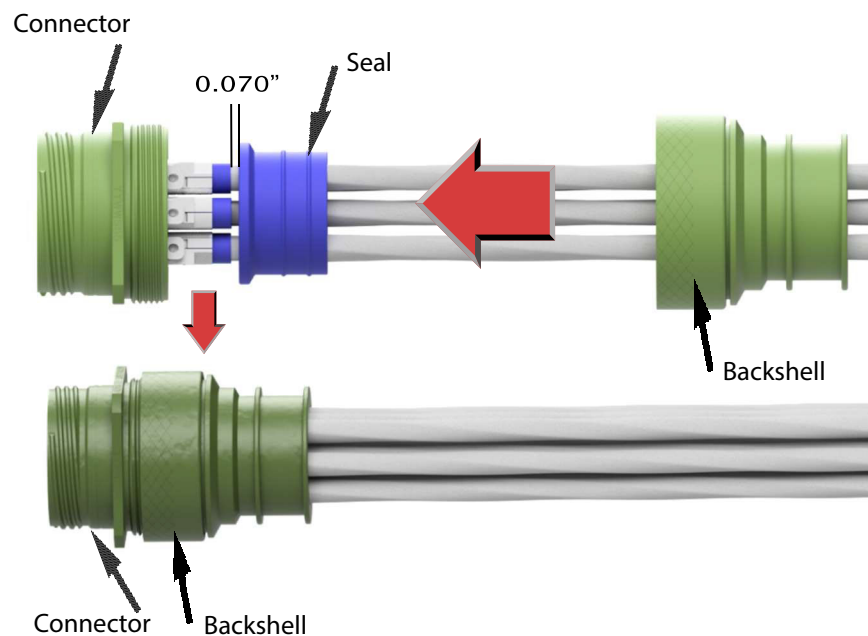
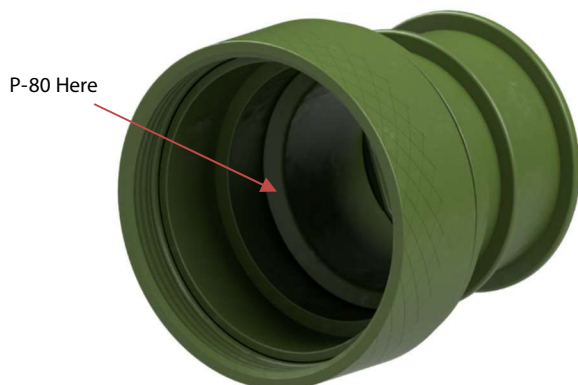
Low Profile Backshells

- A. Slide the backshell up to the connector. Tighten on the backshell until seated and torque to 112 ± 10 in-lbs for the Size 17, or 180 ± 18 in-lbs for Size 25. To mate correctly, the cable profile entry at the back must match the cable layout. The Size 25 is shown as an example, see Figure 1.



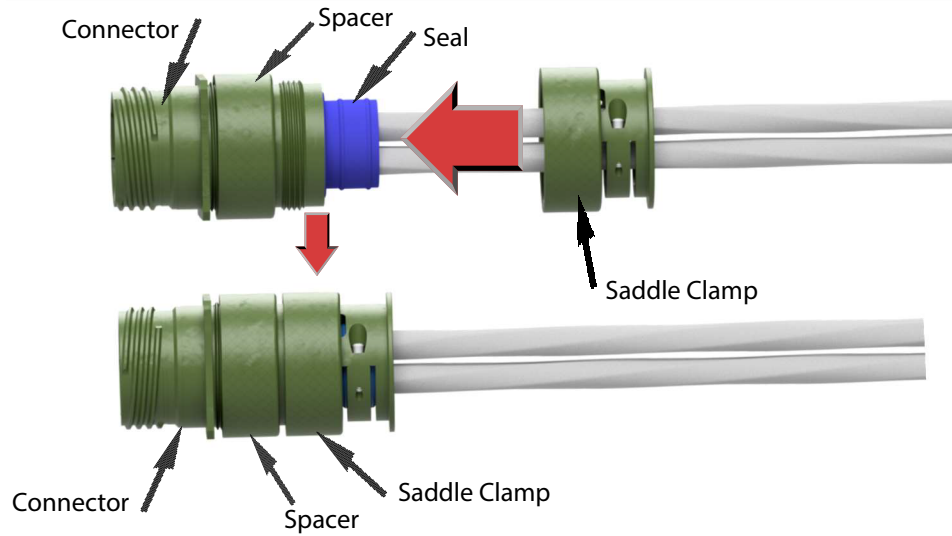
Standard Sealed Backshells

- B. Apply the Isopropyl alcohol to the cables and slide the seal up the cables until 0.070 ± 0.010 " from the grommets. Apply P-80 lubricant or equivalent around the inner-most chamfer of the backshell, detailed below. Slide the backshell over the seal until fully seated and aligned. Screw the backshell onto the connector body until seated and torque to 180 ± 18 in-lbs.



Straight Sealed Backshells

C. Slide the spacer portion of the backshell up the cables and tighten the coupling nut to 112 ± 10 in-lbs. Slide the seal up to fully seat against the spacer, using Isopropyl Alcohol on the cables if necessary. Slide the saddle clamp portion up, slide over the seal, and tighten down to 70 ± 10 in-lbs. Finally, alternate tightening the saddle clamp screws down to 2.5 ± 0.25 in-lbs.



90° Sealed Backshells

D. Slide the angled portion of the backshell up the cables, being careful not to scrape or cut the cables. Tighten the coupling nut to 112 ± 10 in-lbs. Slide the seal up to fully seat against the spacer, using Isopropyl Alcohol if necessary. Slide the saddle clamp portion up, slide over the seal and tighten down to 112 ± 10 in-lbs. Finally, alternate tightening the saddle clamp screws down to 2.5 ± 0.25 in-lbs.

