

2M Series Contacts and Tools

Crimp Contacts

Contact Size	Type	AMPS	Wire Size AWG	Part Number	Color Band		
					1st	2nd	3rd
#23	Pin	5	#22-#28	2M809-001	N/A	N/A	N/A
	Pin		#26-#30	2M809-042*	Blue	N/A	N/A
	Socket		#22-#28	2M809-002	N/A	N/A	N/A
	Socket		#26-#30	2M809-043*	Blue	N/A	N/A
#20HD	Pin	7.5	#20-#24	2M809-204	N/A	N/A	N/A
	Socket		#20-#24	2M809-205	N/A	N/A	N/A
#20	Pin	7.5	#20-#24	M39029/58-363	Orange	Blue	Orange
	Socket		#20-#24	M39029/57-357	Orange	Green	Violet
#16	Pin	13	#16-#20	M39029/58-364	Orange	Blue	Orange
	Socket		#16-#20	M39029/57-358	Orange	Green	Gray
#12	Pin	23	#12-#14	M39029/58-365	Orange	Blue	Green
	Socket		#12-#14	M39029/57-359	Orange	Green	White



*Special order please consult Amphenol-Aerospace for information.

Contact Tools

Contact Size	Crimper	Tooling Part Numbers	
		Positioner	Insertion/ Removal Number
#23	M22520/2-01	K1461-1* (Daniels)	DAK225-22* (Daniels Insertion Only)
			2M809-23R (Removal only)
#20HD	M22520/2-01	2M809-206	2M809-20HDR (Removal only)
#20	M22520/1-01	M22520/1-04	M81969/14-10
#16	M22520/1-01	M22520/1-04	M81969/14-03
#12	M22520/1-01	M22520/1-04	M81969/14-04

*Daniels Manufacturing Co. part number

Crimp Tensile Strength

Contact Size	Wire Gage	Silver or Tin Coated Copper Wire	Nickel Coated Copper Wire
#23, #20HD	#22	12	8
#23, #20HD	#24	8	6
#23	#26	5	3
#23	#28	3	2
#23	#30	1.5	1.5

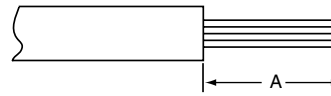
Tensile Strength for size #23 and #20HD only
Values represent minimums and are in pounds

Series 2M Torque Values

Shell Size Series 2M801, 2M803	Shell Size Series 2M805	Coupling Torque				Jam Nut Tightening				Backshell Tightening			
		In-LBs.		N-m		In-LBs.		N-m		In-LBs.		N-m	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
5	-	25	35	2.8	4.0	20	25	2.2	2.8	13	17	1.5	1.9
6	8	35	40	4.0	4.5	20	25	2.2	2.8	18	22	2.0	2.5
7	9	35	40	4.0	4.5	20	25	2.2	2.8	30	40	3.4	4.5
8	10	40	50	4.5	5.7	20	25	2.2	2.8	30	40	3.4	4.5
9	11	40	50	4.5	5.7	20	25	2.2	2.8	35	45	4.0	5.1
10	12	50	60	5.7	6.8	25	30	2.8	3.3	35	45	4.0	5.1
12, 13	15	50	60	5.7	6.8	25	30	2.8	3.3	35	45	4.0	5.1
14, 16	18	55	65	6.2	7.3	25	30	2.8	3.3	35	45	4.0	5.1
15, 17	19	55	65	6.2	7.3	25	30	2.8	3.3	35	45	4.0	5.1
21	23	55	65	6.2	7.3	25	30	2.8	3.3	35	45	4.0	5.1

Wire Stripping

- Strip wire to required length. (See Figure at right). When using hot wire stripping, do not wipe melted insulation material on wire strands; with mechanical strippers do not cut or nick strands.
- See Table 1 for proper finished outside wire dimensions.
- Twist strands together to form a firm bundle.
- Insert stripped wire into contact applying slight pressure until wire insulation butts against wire well. Check inspection hole to see that wire strands are visible. If there are strayed wire strands, entire wire end should be re-twisted. When wire is stripped and properly installed into contact, the next step is to crimp the wire inside the contact by using the proper crimping tool.



Stripping Dimensions

Wire Size	A
23	.115 (2.92)
20/20HD	.188 (4.77)
16	.188 (4.77)
12	.188 (4.77)

Table 1

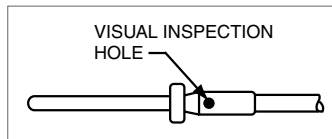
Contact Size	Wire Dimension (inches)**	
	Min.	Max.
10	.135	.162
12	.097	.142
16	.065	.109
20/20HD	.040	.077
23	.025	.048

** Min. diameters to insure moisture proof assembly; max. diameters to permit use of metal removal tools.

Crimping

See table on preceding page for more information on crimp contacts, contact tools, and crimp tensile strength

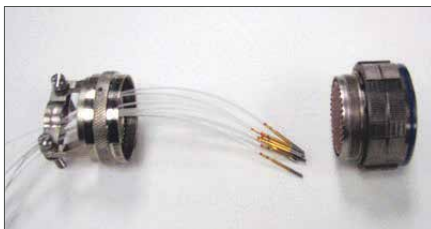
- Insert stripped wire into contact crimp pot. Wire must be visible through inspection hole.
- Using correct crimp tool and locator, cycle the tool once to be sure the indentors are open, insert contact and wire into locator. Squeeze tool handles firmly and completely to insure a proper crimp. The tool will not release unless the crimp indentors in the tool head have been fully actuated.
- Release crimped contact and wire from tool. Be certain the wire is visible through inspection hole in contact.



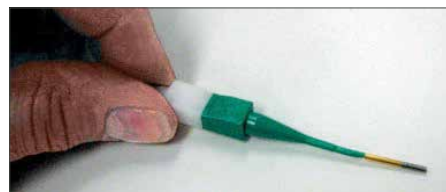
Examples of M22520 Series Crimping Tools:
Shown top: tool used for small size 23 contacts.
Shown bottom: tool used for size 20, 16 or 12 contacts and has a positioner that can be dialed for each contact size.

Contact Insertion

- First remove hardware from the plug and receptacle and slide the hardware over wires in proper sequence.
- Use proper plastic or metal insertion tool for corresponding contact. (Consult Insertion Tool table on preceding page). Slide correct tool (with plastic tool use colored end) over wire insulation and slide forward until tool bottoms against rear contact shoulder.
- Next align the tool and contact up to the properly identified cavity at rear of connector plug. Use firm, even pressure; do not use excessive pressure. It is recommended to start at the center cavity. Contact must be aligned with grommet hole and not inserted at an angle. Push forward until contact is felt to snap into position within insert.



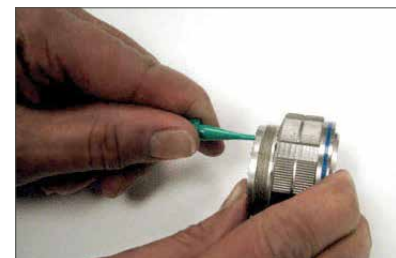
Note: All plastic tools are double-ended. The colored side is the insertion tool and the white side is the removal tool.



Plastic tool with contact in proper position.



Metal tool with contact.



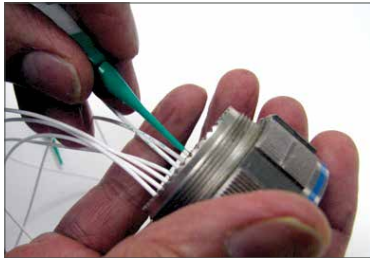
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2M Series

Assembly Instructions

CONTACT INSERTION, CONT.

- Remove tool and pull back lightly on wire, making sure contact stays properly seated and isn't dragged back with the tool. Repeat operation with remainder of contacts to be inserted, beginning with the center cavity and working outward in alternating rows.



CAUTION: when inserting or removing contacts, do not spread or rotate tool tips.

- After all contacts are inserted, fill any empty cavities with wire sealing plugs.



- Reassemble plug or receptacle hardware slide forward and tighten using connector pliers. Connector holding tools are recommended while tightening back accessories. When using strain relief, center wires at bar clamp. Slide clamp grommet into position and tighten clamp bar screws. When tightening screws, pressure should be applied in the same direction that clamp is threaded to rear threads of connector. When not using clamp grommet, build up wire bundle with vinyl tape so clamp bar will maintain pressure on wires.



CONTACT REMOVAL

- Remove hardware from plug or receptacle and slide hardware back along wire bundle.

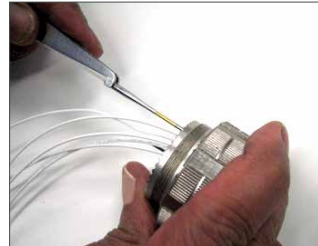


- Use proper plastic or metal removal tool for corresponding contact. Slide correct size tool over wire insulation.



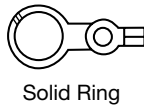
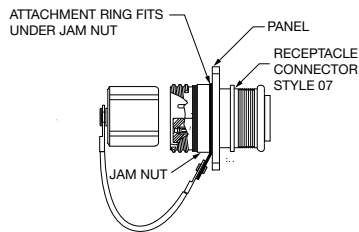
Use white end of plastic tool for removal of contacts.

- Insert plastic or metal removal tool into contact cavity until tool tips enter rear grommet and come to a positive stop. Hold tool tip firmly against positive stop on contact shoulder. Grip wire and simultaneously remove tool and contact. (On occasion, it may be necessary to remove tool, rotate 90° and reinsert.)

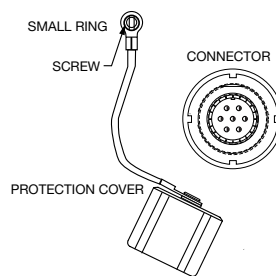


Removal of contacts with metal tool.

CAP ATTACHMENT TO JAM NUT RECEPTACLE

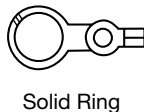
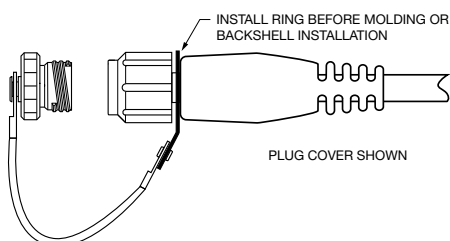


CAP ATTACHMENT TO PANEL

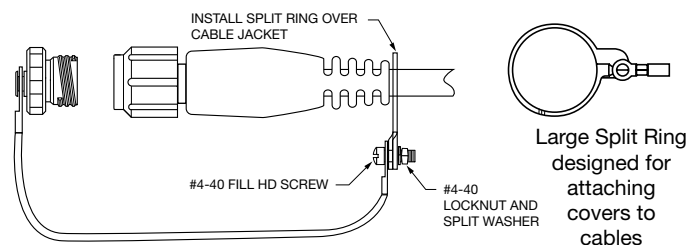


Small Ring for Attaching Receptacle Covers to a Panel with a Screw

CAP ATTACHMENT TO CABLE ASSEMBLY



REMOVABLE CAP ATTACHMENT TO CABLE



Large Split Ring designed for attaching covers to cables

2M Series Contacts and Tools

Grommet Sealing Plugs, Spanner Tool & Holding Tool



Grommet Sealing Plugs

Size	Color	Part Number	Military Part Number
#23	Black	2M809-155	MS27488-22-2
#20	Red	2M859-012	MS27488-20-2
#16	Green	2M859-013	MS27488-16-2
#12	Orange	2M859-014	MS27488-12-2

Spanner Tool for Tightening Series 2M Jam Nuts

Shell Size	Holding Tool Part Number (Add P or R)				
	Series 2M801	Series 2M803	Series 2M804 Style 07	Series 2M804 Style 00	Series 2M805
5	2M600-146-02	2M600-137-05	2M600-146-03	2M600-147-05	
6	2M600-146-03	2M600-137-06	2M600-146-04	2M600-147-06	
7	2M600-146-05	2M600-137-07	2M600-146-06	2M600-147-07	
8	2M600-146-05	2M600-137-08	2M600-146-06	2M600-147-07	2M600-154-08
9	2M600-146-06	2M600-137-09	2M600-146-07	2M600-147-09	2M600-154-09
10	2M600-146-07	2M600-137-10	2M600-146-08	2M600-147-10	2M600-154-09
11					2M600-154-11
12		2M600-137-12	2M600-141-10	2M600-147-12	2M600-154-12
13	2M600-146-10				
14		2M600-137-14	2M600-141-12	2M600-147-14	
15		2M600-137-15	2M600-141-13	2M600-147-15	2M600-154-15
16	2M600-146-13				
17	2M600-146-14				
18					2M600-154-18
19					2M600-154-19
21	2M600-146-17				
23					2M600-154-23

Connector Holding Tool for Tightening Backshells Accessories

Shell Size	Holding Tool Part Number (Add P or R)				
	Series 2M801	Series 2M803	Series 2M804	Series 2M804	Series 2M805
5	2M600MM005-05	• 2M600-140-5	* 2M600-141-5	×	
6	2M600MM005-06	• 2M600-140-6	* 2M600-141-6	×	
7	2M600MM005-07	• 2M600-140-7	* 2M600-141-7	×	
8	2M600MM005-08	• 2M600-140-8	* 2M600-141-8	×	2M600-155-8
9	2M600MM005-06	• 2M600-140-9	* 2M600-141-9	×	2M600-155-9
10	2M600MM005-10	2M600-140-10	2M600-141-10	×	2M600-155-10
11					2M600-155-11
12		2M600-140-12	* 2M600-141-12	×	2M600-155-12
13	2M600MM005-13	•			
14		2M600-140-14	* 2M600-141-14	×	
15		2M600-140-15	* 2M600-141-15	×	2M600-155-15
16	2M600MM005-16	•			
17	2M600MM005-17	•			
18					2M600-155-18
19					2M600-155-19
21	2M600MM005-21	•			
23					2M600-155-23



• Add P for Plug holder or R for receptacle holder, followed by polarizing position (N, X, Y, Z)

* Add P for Plug holder or R for Receptacle holder, followed by polarizing position (A, B, C, D).

× Add P for Plug holder or R for Receptacle holder.

2M Series Contacts and Tools

Micro Band Shield Termination Tool

Micro Band Shield Termination System:

Micro Band Termination: For assembling cables to overmolded style 2M connectors or backshells, the Micro Band System offers quick termination of cable shields and flexibility to be utilized on a wide range of parts with just one band size. These rugged straps have passed numerous hazardous environmental testing, including shock and vibration. Approved for use in military and aerospace applications.

MATERIALS:

Micro Band Installation Tool. Use with .120" (3.05 mm) wide bands. 6.75 inches (172 mm.) length, 1.2 pounds (0.6 Kg.)

Micro Band, .120" (3.05 mm) wide. Available in two lengths, flat or pre-coiled. Stainless steel.



Description	Part Number
Micro Band Installation Tool	2M600-061

Length		Part Number	Accommodates Diameter	
inch	mm		Flat	
8.125	206.38	2M600-057	.88	22.35
14.250	361.95	2M600-083	1.88	47.75

Micro Band Shield Termination Instructions:

1. Prepare cable braid for termination process (Figure 1).
2. Push braid forward over adapter retention lip to the adapter incline point (or .4" [10.2mm] minimum braid length). Milk braid as required to remove slack and ensure a snug fit around the shield termination area (Figure 2).
3. Prepare the band in the following manner: **IMPORTANT:** Due to connector/adaptor circumference, it may be necessary to prepare the band around the cable or retention area.
 - A. Roll band through the buckle slot twice. (Band must be double-coiled!)
 - B. Pull on band until mark () is within approximately .250 inch (6.4mm) of buckle slot (Figure 3). The band may be tightened further if desired.

NOTE: Prepared band should have this (▷) mark visible approximately where shown in Figure 3.

Shield Termination Clamping Process (Figures 4 thru 8)

NOTE: To free tool handles, squeeze handles together and move holding clips to center of tool.

4. Squeeze gray gripper release lever and insert band into the front end opening of the tool. (Circular portion of looped band must always face downward.)

5. Aligning the band and tool with the shield termination area, squeeze blue pull-up handle repeatedly in full strokes until it locks against tool body. (This indicates the band is compressed to the tool precalibrated tension.)
NOTE: To loosen or remove band before locking and cut-off, squeeze gray grip per release lever on tool and pull band out. To loosen or remove band after blue pull-up handle locks against tool body, squeeze pull-up handle and push tension release lever on top of tool forward. Let tension handle return to original position and use the gripper release lever to remove band.
6. Complete the clamping process by squeezing the black cut-off handle to form lock and trim excess band. To remove excess band from tool, squeeze gray gripper release handle, pull out and dispose. Inspect shield termination.

