

CONN POS 15-44	TYPE OF CONN	W/O BUSHINGS		WITH BUSHINGS		CONN POS 62-104	TYPE OF CONN	W/O BUSHINGS		WITH BUSHINGS	
		TE P/N †	MIL P/N ‡	TE P/N †	MIL P/N ‡			TE P/N †	MIL P/N ‡	TE P/N †	MIL P/N ‡
15	Rcpt	204500-1	2-286	204524-1	2-297	62	Rcpt	204506-1	2-289	204530-1	2-300
		204512-2	2-11	204536-2	2-28			204518-2	2-14	204542-2	2-31
		204512-3	2-17	---	---			204518-3	2-20	---	---
	Plug	204501-1	4-264	204525-1	---		Plug	204507-1	4-267	204531-1	---
		204513-2	4-11	204537-2	---			204519-2	4-14	204543-2	---
		204513-3	4-17	---	---			204519-3	4-20	---	---
26	Rcpt	204502-1	2-287	204526-1	2-298	78	Rcpt	204508-1	2-290	204532-1	2-301
		204514-2	2-12	204538-2	2-29			204520-2	2-15	204544-2	2-32
		204514-3	2-18	---	---			204520-3	2-21	---	---
	Plug	204503-1	4-265	204527-1	---		Plug	204509-1	4-268	204533-1	---
		204503-2	4-12	204539-2	---			204521-2	4-15	204545-2	---
		204515-3	4-18	---	---			204521-3	4-21	---	---
44	Rcpt	204504-1	2-288	204528-1	2-299	104	Rcpt	204510-1	2-291	204534-1	2-302
		204516-2	2-13	204540-2	2-30			204522-2	2-16	204546-2	2-33
		204516-3	2-19	---	---			204522-3	2-22	---	---
	Plug	204505-1	4-266	204529-1	---		Plug	204511-1	4-269	204535-1	---
		204517-2	4-13	204541-2	---			204523-2	4-16	204547-2	---
		204517-3	4-19	---	---			204523-3	4-22	---	---

† These part numbers include the various assemblies that are available. Ex: 15 position without bushings: 204500-1 = receptacle only; 204512-2 = receptacle with sockets; 204512-3 = receptacle with insertion/extraction tool and sockets.

‡ Suffix to M24308. Ex: 15 position receptacle only, without bushings. M24308/2-286

Figure 1

1. INTRODUCTION

This instruction sheet covers the AMPLIMITE High Density 22 (HD-22) Series 90 Connectors, applicable contacts, and assembly procedures.

Read these instructions, and those referenced for specific applications, before starting.



All dimensions are in metric units [with U.S. customary dimensions in brackets]. Figures and illustrations are for reference only and are not drawn to scale.

Reason for revision is given in Section 6, REVISION SUMMARY.

## 2. DESCRIPTION

These connectors have been designed in accordance with military specification MIL-C-24308. They have cadmium plated steel shells which feature a keystone design for polarization. Each shell houses a one-piece thermoplastic insert containing metal contact retention springs. Refer to the table in Figure 1 for the various connector assemblies that are available with or without floating bushings.

The connectors are designed for REAR insertion and extraction of size 22 screw machine contacts. The contact cavities are identified on the FRONT and BACK to provide circuit identification.

## 3. CRIMPING PROCEDURES

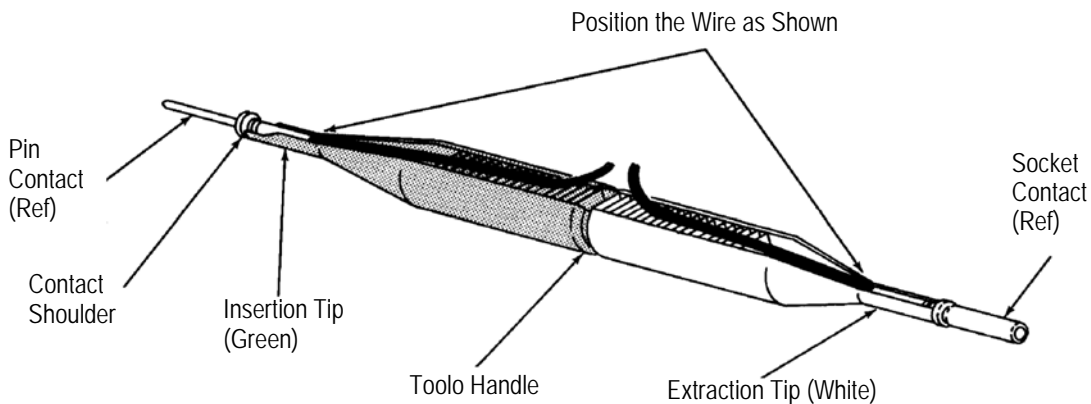
Refer to the table in Figure 2, and then select the wire (stranded only) of the specified size and insulation diameter. Strip the wire to the length indicated. Do NOT cut or nick the wire strands.

### 3.1. Hand Tool Application

The hand tool M22520/2-01, with applicable positioner, is recommended for crimping the loose piece contacts listed in the table in Figure 2. Note that the positioner is determined by the type of contact, and the selector setting is determined by the wire size being used. Refer to Instruction Sheet 408-7516 for addresses of the various tool manufacturers and a complete listing of tools, positioners, and turret heads for TE screw machine contacts.

### 3.2. Auto-Machine Applications

The AMP-TAPETRONIC Stripper/Crimper Machine 599406-7 is recommended for crimping the tape-mounted contacts listed in the table in Figure 2. Refer to Customer Manual 409-5253 packaged with the machine for the proper crimping procedures.



WIRE SIZE, AWG	INSUL DIA	WIRE STRIP LENGTH	CONTACT NUMBER		HAND TOOL M22520/2-01			POWER UNIT†	INSERTION/EXTRACTION TOOL
			LOOSE PIECE	TAPE MOUNTED	POSITIONER	WIRE SIZE AWG	SEL POSN		
28-22	1.37 [.054] Max.	3.96 [.156]	SOCKET 204351-1	SOCKET 204351-2 PIN 204370-5	SOCKET M22520/2-06 PIN M22520/2-09	28	1	599406-7	91067-1 M81969/1-04
			M39029/ 57-354 PIN			26	2		
			204370-2			24	3		
			M39029/ 58-360			22	4		

† AMP-TAPETRONIC\* Machine

Figure 2

## 4. INSERTION AND EXTRACTION PROCEDURES

Pin contacts must be inserted into the plug half and mating socket contacts must be inserted into the receptacle half of the connector. Notice that each row of cavities is numbered. Make certain the cavities of

the receptacle half are mirror image of the plug half before inserting the contacts. If all cavities are not used, the contacts should be distributed evenly throughout the connector.

The Insertion/Extraction Tool 91067-1 is recommended for inserting and extracting both pin and socket contacts. Refer to Instruction Sheet 408-7508 packaged with the tool for the specific procedures.

**General Procedures:**

**4.1. Insertion**

1. Position the wire of the contact in the green tip. Make certain the tool tip butts against the shoulder of the contact as shown in Figure 2.
2. Align the contact with the connector cavity and push it straight in until it bottoms in the cavity.
3. Remove the tool and pull back lightly on the wire to make sure the contact is locked in the cavity.

**4.2. Extraction**

1. Position the wire of the contact in the white tip as indicated in Figure 2.
2. Align the tool tip with the connector cavity and push it straight in until it bottoms in the cavity.

3. Press the wire against the tool handle and pull back to extract the contact. The contact will come out easily.

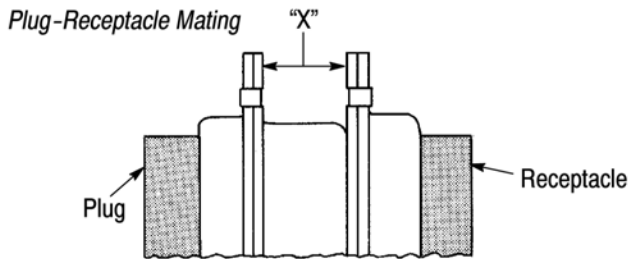
**5. PANEL CUTOUT**

These connectors are designed for rack and panel applications. TE recommends that you mount the plug half to the panel and install the receptacle half in the rack. Notice the clearance required to ensure fully mated connector halves. Refer to Figure 3.

Before making the panel cutout, determine the number of positions in the connector and whether the connector has floating bushings. Then, using the clearance dimensions provided in Figure 3, determine whether you are going to FRONT or BACK mount the connector. Now, make a cutout in the panel using the dimensions shown in the table in Figure 3. When mounting the connector to the FRONT of the panel, Tyco Electronics recommends that you remove the material indicated by the dotted lines in Figure 3.

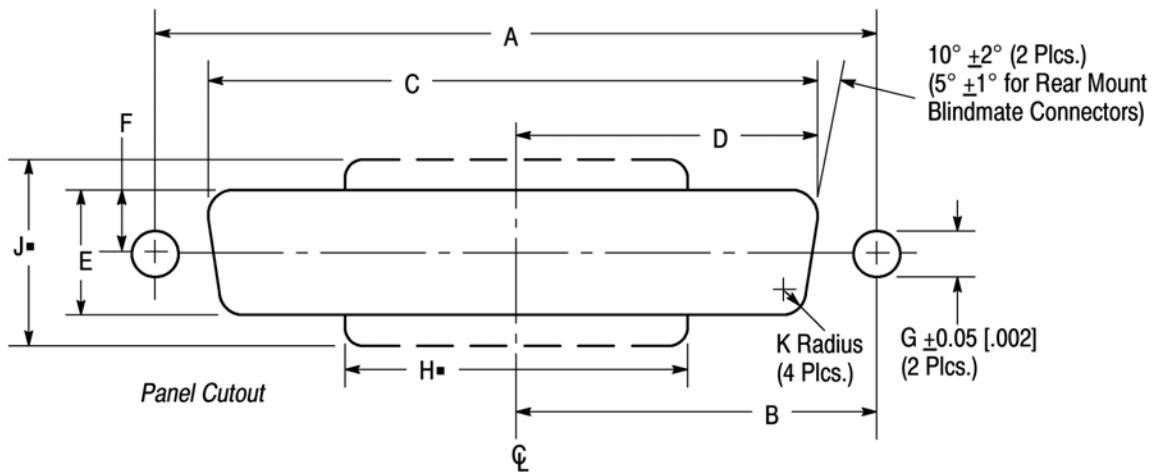
**6. REVISION SUMMARY**

Since the previous release of this document, the new company logo has been applied.



SHELL SIZE	DIMENSION "X"
1, 2	6.35-7.11 [.250-.280]
3, 4, 5, 6	6.12-6.88 [.241-.271]

**NOTE:** The "X" dimension is necessary for full mating of connector halves. This dimension must be taken into consideration when determining the method of mounting, panel thickness, etc.



Panel cutout configuration with these dimensions provides clearance for mounting connectors with cable clamp assemblies.

**NOTE:** When front mounting a MIL-DTL-24308 connector utilizing the tab method of securing shell halves, it is recommended to utilize a 0.81 [.032] thick washer (not supplied) to prevent deformation of the connector flange.

Figure 3 (Cont'd)

SHELL SIZE (CONTACT POSITIONS)	MOUNTING METHOD		DIMENSIONS									
	FRONT OR REAR PANEL	WITH OR WITHOUT FLOATING BUSHING	A	B	C	D	E	F	G	H*	J*	K
1 (15)	FRONT	WITH	24.99 [.984]	12.5 [.492]	23.01 [.906]	11.51 [.453]	13.84 [.545]	6.93 [.273]	2.24 [.088]	---	---	2.11 [.083]
		WITHOUT			22.2 [.874]	11.1 [.437]	13.03 [.513]	6.53 [.257]	3.05 [.120]	---	---	
	REAR	WITH			21.29 [.838]	10.64 [.419]	12.22 [.481]	6.12 [.241]	2.24 [.088]	8.43 [.332]	16.81 [.662]	3.35 [.132]
		WITHOUT			20.47 [.806]	10.24 [.403]	11.4 [.449]	5.72 [.225]	3.05 [.120]	7.62 [.300]	16 [.630]	
2 (26)	FRONT	WITH	33.32 [1.312]	16.66 [.656]	31.34 [1.234]	15.67 [.617]	13.84 [.545]	6.93 [.273]	2.24 [.088]	---	---	2.11 [.083]
		WITHOUT			30.53 [1.202]	15.27 [.601]	13.03 [.513]	6.53 [.257]	3.05 [.120]	---	---	
	REAR	WITH			29.62 [1.166]	14.81 [.583]	12.22 [.481]	6.12 [.241]	2.24 [.088]	6.64 [.665]	16.81 [.662]	3.35 [.132]
		WITHOUT			28.8 [1.134]	14.4 [.567]	11.4 [.449]	5.72 [.225]	3.05 [.120]	15.82 [.623]	16 [.630]	
3 (44)	FRONT	WITH	47.04 [1.852]	23.52 [.926]	45.09 [1.775]	22.55 [.888]	13.84 [.545]	6.93 [.273]	2.24 [.088]	---	---	2.11 [.083]
		WITHOUT			44.27 [1.743]	22.15 [.872]	13.03 [.513]	6.53 [.257]	3.05 [.120]	---	---	
	REAR	WITH			43.33 [1.706]	21.67 [.853]	12.22 [.481]	6.12 [.241]	2.24 [.088]	30.04 [1.197]	16.81 [.662]	3.35 [.132]
		WITHOUT			42.52 [1.674]	21.26 [.837]	11.4 [.449]	5.72 [.225]	3.05 [.120]	29.59 [1.165]	16 [.630]	
4 (62)	FRONT	WITH	63.5 [2.500]	31.75 [1.250]	61.17 [2.423]	30.78 [1.212]	13.84 [.545]	6.93 [.273]	2.24 [.088]	---	---	2.11 [.083]
		WITHOUT			60.73 [2.391]	30.38 [1.196]	13.03 [.513]	6.53 [.257]	3.05 [.120]	---	---	
	REAR	WITH			59.79 [2.354]	29.9 [1.777]	12.22 [.481]	6.12 [.241]	2.24 [.088]	46.86 [1.845]	16.81 [.662]	3.35 [.132]
		WITHOUT			59.08 [2.326]	29.54 [1.163]	11.4 [.449]	5.72 [.225]	3.05 [.120]	46.05 [1.813]	16 [.630]	
5 (78)	FRONT	WITH	61.11 [2.406]	30.56 [1.203]	59.16 [2.329]	29.59 [1.165]	16.64 [.655]	8.33 [.328]	2.24 [.088]	---	---	2.11 [.083]
		WITHOUT			58.34 [2.297]	29.18 [1.149]	15.82 [.623]	7.92 [.312]	3.05 [.120]	---	---	
	REAR	WITH			57.15 [2.250]	28.58 [1.125]	14.91 [.587]	7.47 [.294]	2.24 [.088]	44.2 [1.740]	19.61 [.772]	3.35 [.132]
		WITHOUT			56.34 [2.218]	28.17 [1.109]	14.1 [.555]	7.06 [.278]	3.05 [.120]	43.38 [1.708]	18.8 [.740]	
6 (104)	FRONT	WITH	63.5 [2.500]	31.75 [1.250]	62.31 [2.453]	31.17 [1.227]	18.21 [.717]	9.12 [.359]	2.24 [.088]	---	---	2.11 [.083]
		WITHOUT			61.49 [2.421]	30.76 [1.211]	17.4 [.685]	8.71 [.343]	3.05 [.120]	---	---	
	REAR	WITH			60.66 [2.388]	30.33 [1.194]	16.61 [.654]	8.31 [.327]	2.24 [.088]	47.64 [1.875]	21.21 [.835]	3.35 [.132]
		WITHOUT			59.84 [2.356]	29.92 [1.179]	5.8 [.622]	7.9 [.311]	3.05 [.120]	46.81 [1.843]	20.4 [.803]	

Figure 3 (End)