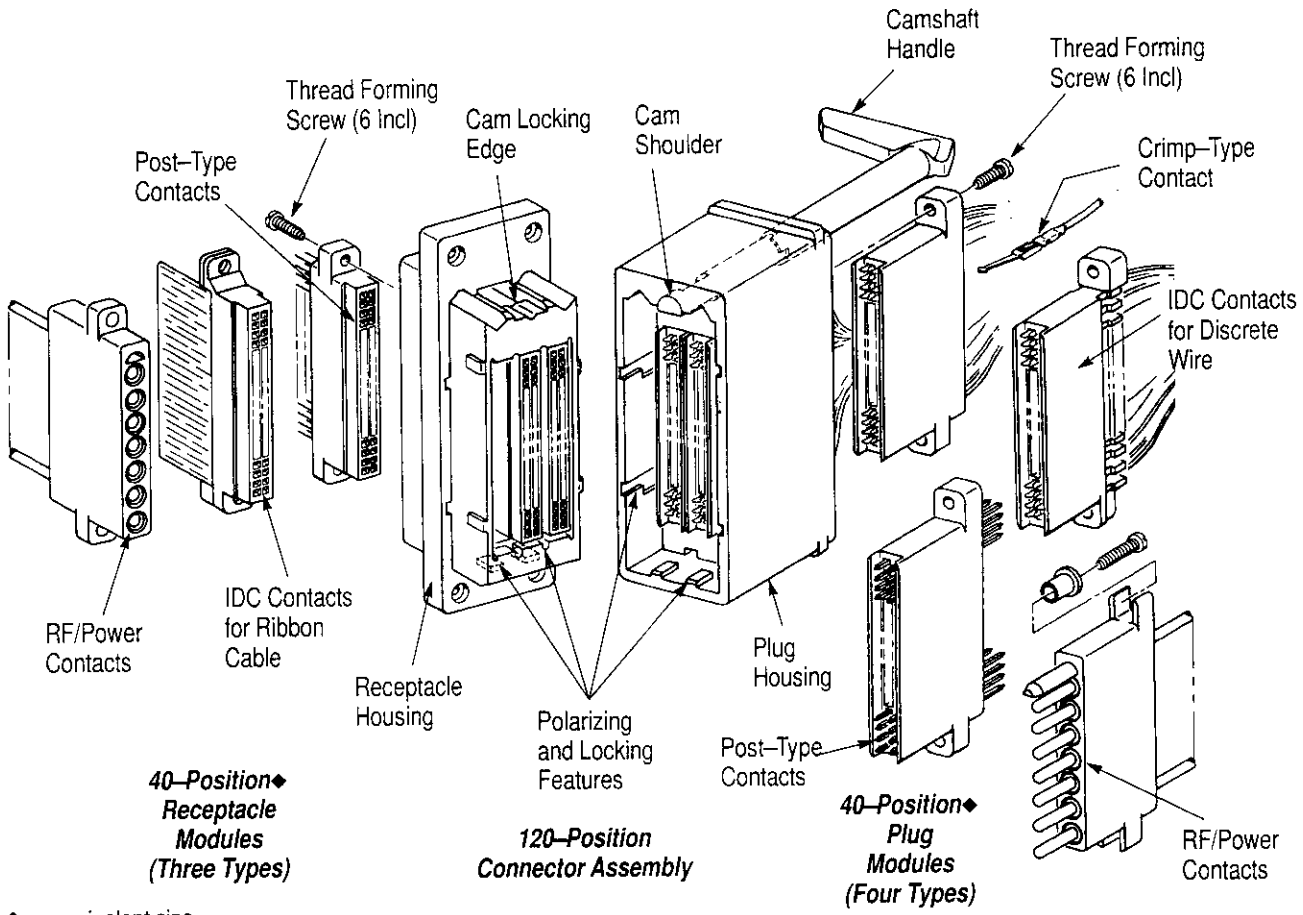
AMP

CR Series Standard Zero–Entry–Force 120–Position Connectors



◆ or equivalent size

CONNECTOR ASSEMBLY							ACCESSORIES
120–POSITION HOUSING		MODULE OPTIONS		CONTACTS			STRAIN RELIEF
STYLE	PART NUMBER	TYPE	PART NUMBER	LP	STRIP	DESCRIPTION	PART NO./CA–DIA RNG
PLUG	206527–1 (W/Standard Camshaft)	CRIMP	206541–1	66555–3 66750–3	–2 –2	SGL 28–24 AWG SGL 24–20 AWG	206540–2 / .400 – .600 206540–1 / .750 – 1.00
		IDC	206573–1	PRELOADED		SGL 28–26 AWG	
	207921–1 (W/Short–Handle Camshaft)	POST	206735–2 206735–3	PRELOADED PRELOADED		.026 x .270 .026 x .340	207080–1/FLAT CABLE
		RF/PWR	211978–2	UNASSEMBLED		See Catalog●	
RCPT	206536–1	POST	206542–1 207173–1 206396–1	PRELOADED PRELOADED PRELOADED		$.025^2$ x .250 $.025^2$ x .550 $.025^2$ x .770	
		IDC	208498–1	PRELOADED		Ribbon Cable	
		RF/PWR	211979–2	UNASSEMBLED		See Catalog●	

● Catalog 82157

Figure 1

1. INTRODUCTION

This instruction sheet covers the assembly procedures for AMP* Cammed Rectangular (CR) 120–position standard connectors shown in Figure 1. Read these instructions and other references carefully before assembling the connectors. Reasons for reissue are provided in Section 10, REVISION SUMMARY.

NOTE *Measurements are in metric units [followed by U.S. customary units in brackets].*

2. DESCRIPTION (Figure 1)

Each connector assembly consists of a plug housing, a camshaft, and a receptacle housing. Each plug housing holds three 40–position or equivalent–size plug modules. A standard camshaft with a 21.3 mm [.84–in.] handle is included in plug housing kits for modules with crimp type or insulation displacement contacts (IDC) for discrete wire. A short–handled (11.4 mm [.45–in.]) camshaft is used with plug housings loaded with posted modules for wrap–type applications or flat cable interconnections.

Plug module choices include: crimp–contact modules, assembled by the customer; preloaded IDC modules for unstripped single wire; preloaded posted modules with .66 mm [.026 in.] formed or .64 mm [.025 in.] solid posts; and RF/power modules (7 position), assembled by the customer.

Receptacle housings are designed for panel mounting. Each receptacle housing holds three 40–position (or equivalent size) receptacle modules. Receptacle module choices include: preloaded posted modules with .025[2] solid posts in three lengths; preloaded IDC contacts for flat ribbon cable; and RF/power modules (7 position), assembled by the customer.

The connectors feature polarizing ribs and slots for proper mating. By rotating the camshaft 90° (1/4 turn), the circuits are activated and the connectors are locked together. The locking action results from the cam shoulder engaging the cam locking edge and the locking ridges entering the locking recesses. Accessories include keying plugs, shield and strain relief kits, and module covers.

3. CONTACT APPLICATIONS

3.1. Crimp–Type Contacts

CR crimp–type contacts are available in loose piece form (LP) for hand crimping or reeled in strips for machine terminations, for two wire size ranges: 28 to 24 AWG crimped with AMP Hand Tool 90309–1 (refer to instruction sheet 408–7674), and 24 to 20 AWG crimped with AMP Hand Tool 90416–1 (refer to instruction sheet 408–9137). Contact AMP Engineering for semi–automatic and automatic machines for different production levels.

3.2. IDC Contacts for Discrete Wire

Insulation displacement contacts for discrete wire are preloaded in plug modules only, and accept unstripped 26 to 28 solid or 28 AWG 7–strand single wire. The maximum insulation diameter is 1.25 mm [.049 in.]. Protective covers (two required) must be ordered separately. Modules can be mass terminated with the CHAMPOMATOR* Insertion Machine or AMP/MT–1 Butterfly Tool 91114–1, or terminated (single leads) with AMP Hand Tool 91119–1 (refer to instruction sheet 408–7784). Note that crimp–type contacts are normally used for replacement contacts in IDC plug modules.

3.3. IDC Contacts for Ribbon Cable

CR ribbon cable contacts are preloaded in receptacle modules that accept 26 to 28 AWG solid or 28 AWG 7–strand ribbon cable. Note the following features:

- Contacts cannot be replaced
- Acceptable cable thickness is .89 ± .13 mm [.035 ± .005 in.]
- Module covers are provided and are latched during the termination process

Refer to instruction sheet 408–6699 for setup and mass termination procedures using AMP Tooling Assembly 128000–1.

3.4. Posted Contacts

Posted contacts can be terminated by standard wrap–type methods, by soldering, or by mating with an appropriate .254 x .254–mm [.100 x .100–in.] receptacle connector, such as AMP–LATCH* Novo, AMPMODU* Mod IV, or others. Plug modules are preloaded with .66 mm [.026–in.] formed posts (6.86 or 8.64 mm [.270 or .340 in.] in length). Receptacle modules are preloaded with .64 mm [.025 in.] solid posts in three lengths: 6.35 mm [.250 in.], 13.97 mm [.550 in.], or 19.56 mm [.770 in.].

NOTE *Posted contacts are replaceable in plug connectors only.*

3.5. RF/Power Contacts

A variety of AMP contacts is used in 7–position plug and receptacle modules for power or RF connections: Type I (size 12) contacts for 18 to 12 AWG, miniature COAXICON* contacts for coaxial cable, and contacts for twisted pairs and shielded cable, crimped by hand or pneumatic tools. Note that power/RF modules are always placed at end (A or C) positions and never in the middle (B) position of the connector. Refer to the CR catalog or contact AMP Engineering for contact and tooling information.

3.6. Contact Replacement (Figure 2)

AMP Extraction Tool 91111–1 is used to remove replaceable CR contacts from 40–position Plug modules: crimp type, posted plug, and IDC contacts for discrete wire. Refer to instruction sheet 408–7679 for contact removal procedures.

Replaceable plug contacts can be inserted into modules by hand. Align and insert the contact from the rear face of the module until the locking lance is latched on the catch in the cavity. For fragile wires or large bundles that hamper insertion by hand, use AMP Insertion Tool 91002 (refer to instruction sheet 408–7347).

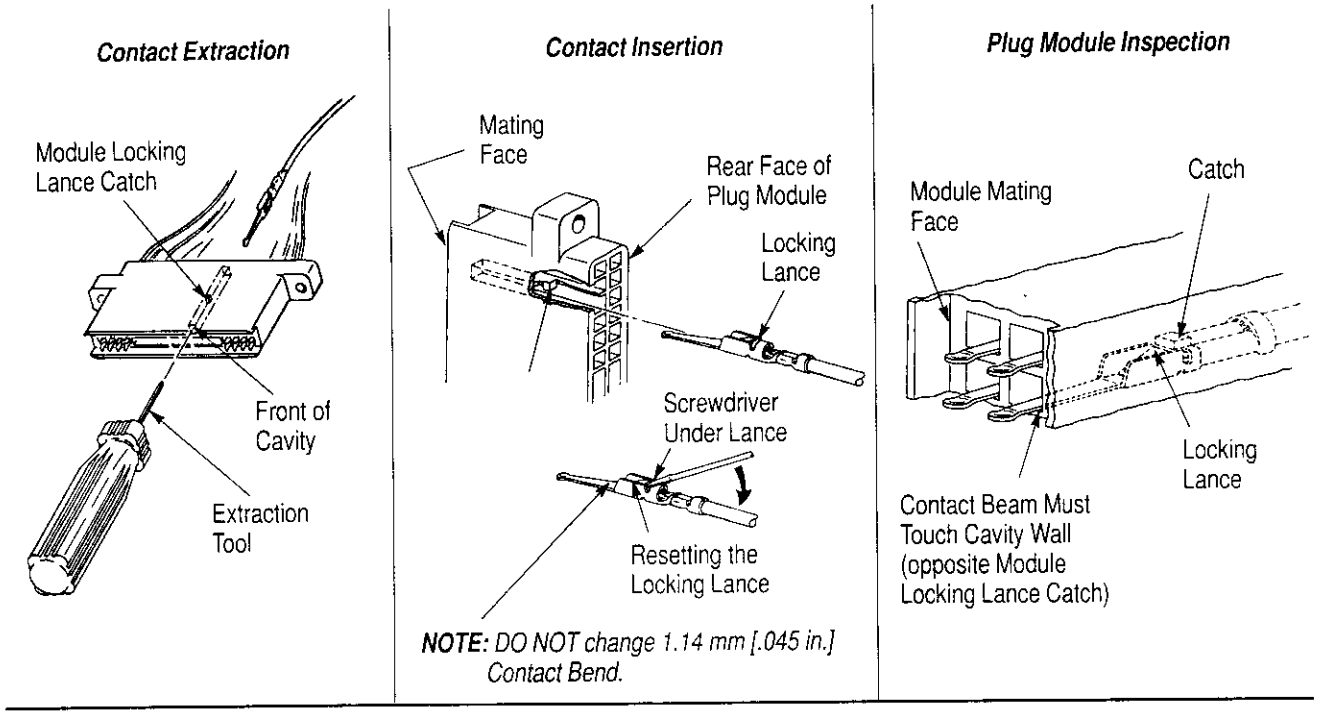


Figure 2

CAUTION *Do not straighten the preformed bend (1.14 mm [.045 in.]) in contact beams during crimping and installation. Make sure that plug contact beams are preloaded against the module cavity wall opposite from the locking lance catch. See Figure 2. If contact beam does not touch cavity wall, replace the contact in order to ensure adequate contact pressure (normal force) when connector cam is actuated.*

Plug module contacts are designed for multiple insertions and extractions. If a contact does not lock on insertion, reset the lance with a screwdriver–type tool. The locking lance should be set level with the sides of the contact, as shown in Figure 2. After insertion, inspect the mating face and make sure that contact beams touch the cavity wall opposite the locking catch.

4. ASSEMBLING CONNECTORS

Each plug and receptacle housing holds three assembled 40–position or equivalent size 7–position modules (plug modules in plug housing and receptacle modules in receptacle housing). Refer to Figure 1.

4.1. Receptacle Connector Assembly

1. Insert three loaded receptacle modules into BACK of receptacle housing.
2. Make sure that module flanges are seated, and that the FRONT of each module is parallel and FLUSH with the front of the housing.
3. Secure modules with six thread–forming screws packaged with assembly.

4.2. Plug Connector Assembly

1. Insert three loaded plug modules into BACK of plug housing, making sure that module flanges are fully seated and that BACK of each plug module is parallel and flush with BACK of plug housing. See Figure 3.

NOTE *When inserting IDC modules into plug housing, gently squeeze the two outside covers to ease entry of the module. Refer to Section 7 for proper cover installation procedure.*

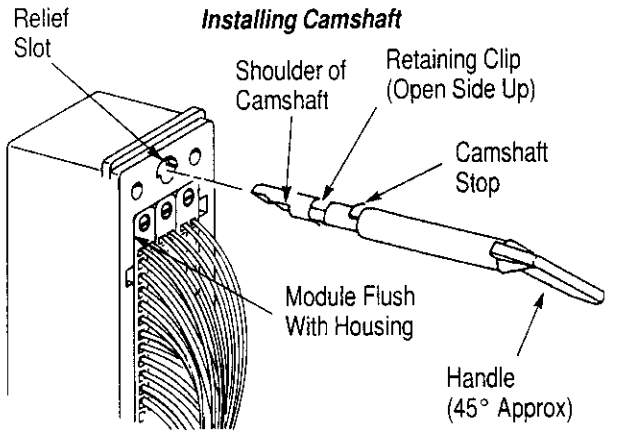


Figure 3

2. Secure modules with six thread–forming screws (supplied with assembly) before installing camshaft (standard or short, depending on application).

NOTE *To determine type of camshaft, check type of modules in plug housing. If crimp–type or IDC modules for discrete wire are used, insert the standard camshaft. If post–type modules with flat–cable connectors and flat–cable strain relief (PN 207080–1) are used, insert short–handled camshaft to prevent interference.*

3. Turn the retaining clip on the camshaft so that the open side of the clip is aligned with the camshaft stop. Align the camshaft with the back of the camshaft hole at the top of the plug housing. Notice that the camshaft handle is angled approximately 45° to ensure alignment of the camshaft stop with the relief slot in the housing. See Figure 3.

4. Insert the camshaft straight into the connector until it bottoms; then pull back to make sure it is locked in place. The end of the camshaft should be flush with the housing.

5. The camshaft can be removed from the plug housing by inserting Extraction Tool 447209–1 into the well adjacent to the camshaft on the mating face. This will depress locking tines, allowing the camshaft to be pulled out.

5. KEYING PLUG INSTALLATION (Figure 4)

Keying Plugs 206545–1 can be placed in three different positions in two keying plug holes in each connector. To install, determine keying pattern and align keying plug with keying plug hole in FRONT of connector, as shown in Figure 4. Insert plug straight into hole until it bottoms.

NOTE *Make sure that keying plugs in one connector are rotated 180° from those in the mating connector.*

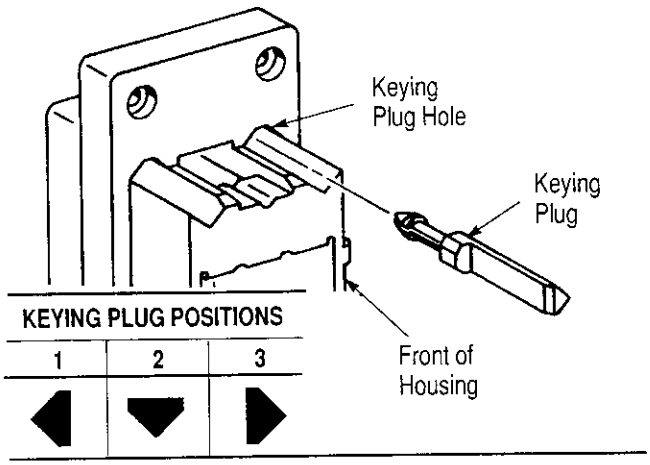


Figure 4

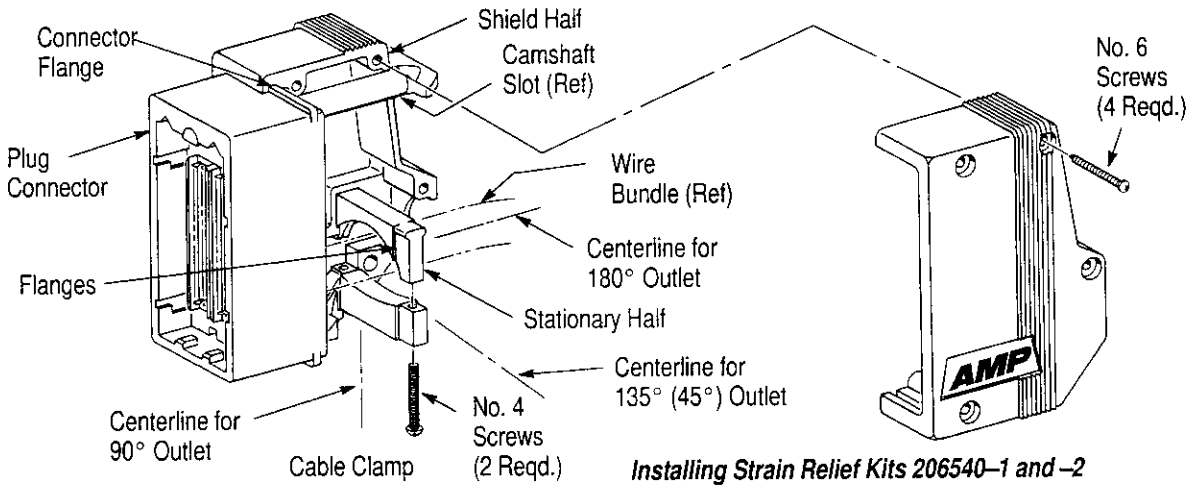
6. ATTACHING SHIELD AND STRAIN RELIEF KITS

Shield and strain relief kits are installed on plug connector assemblies to protect terminated discrete (round) wire or flat ribbon cable connections.

NOTE *Refer to instruction sheet 408–6783 concerning assembly procedures for CR Series Metal–Shielded 120–position Connectors.*

6.1. Strain Relief Kits for Discrete Wire (Figure 5)

Strain relief connector kits for crimp–type or IDC plug modules for discrete wire are available for two wire bundle diameters: 206540–1 for 19.1 to 25.4 mm [.750 to 1.00 in.], and –2 for 10.2 to 15.2 mm [.400 to .600 in.] diameters. Each kit includes two shield halves with four No. 6 thread–forming screws, and a two–piece cable clamp with two No. 4 thread–forming screws. The cable clamp can be placed in any of three positions within the shield to provide a 90°, 135°, or 180° cable exit. After selecting the proper kit for the wire bundle size, refer to Figure 5 and proceed as follows:



Installing Strain Relief Kits 206540–1 and –2

Figure 5

Installing Strain Relief Kit 207080–1

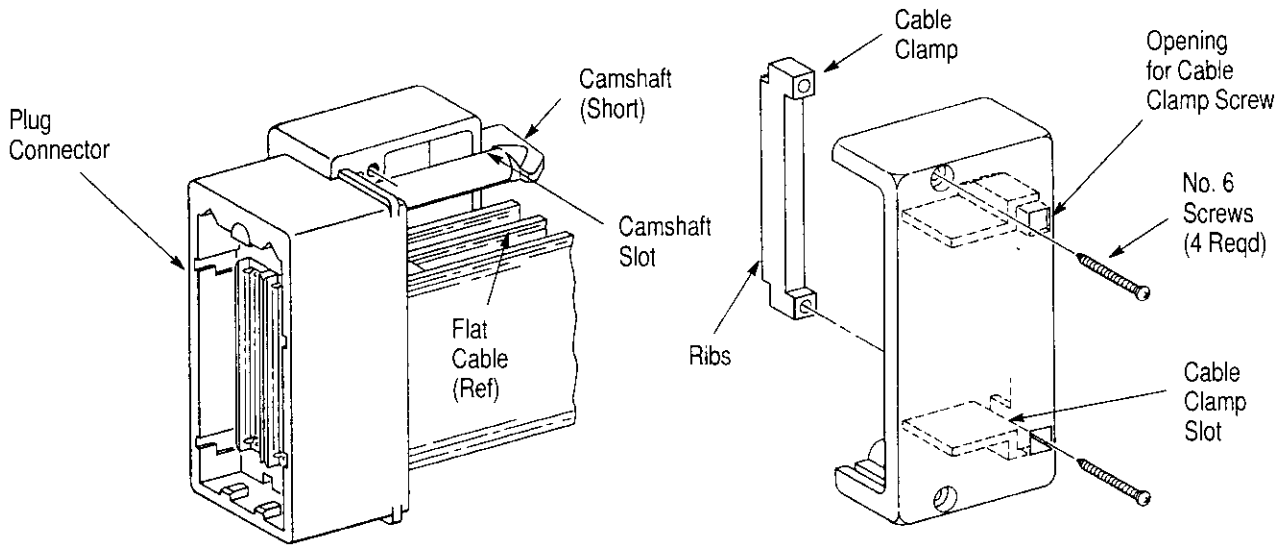


Figure 6

1. Install both halves of cable clamp on wire bundle. Start two No. 4 screws into clamp halves to temporarily hold them together.

2. Slide shield half onto connector, placing camshaft slot against camshaft.

3. Determine required cable exit (90°, 135°, or 180°). Insert stationary half of cable clamp into desired track of shield half.

4. Slide remaining shield half onto connector and simultaneously guide the cable clamp into appropriate track. Secure shield halves with four No. 6 screws.

5. Grasp wire bundle and push a small amount of wire back into the shield to relieve strain on contacts. Alternate tightening cable clamp screws.

6.2. Strain Relief Kit for Posted Plug Modules with Flat Cable Connectors (Figure 6)

Use Kit 207080–1 to protect plug housings (with short–handled camshaft) loaded with posted modules and plug–on, flat–cable connectors, and to provide strain relief for ribbon cable. After installing flat cable connectors onto module posts, refer to Figure 6 and proceed as follows:

1. Insert camshaft straight into connector camshaft hole until it bottoms. End of camshaft should be flush with FRONT of connector.

2. Slide shield half (without cable clamp slot) onto plug connector. Place camshaft slot against camshaft.

3. Insert cable clamp into slot provided in second shield half. Make sure that ribs on cable clamp are facing flat cable.

4. Slide second shield half onto plug connector and simultaneously guide flat cable through cable outlet. Secure shield halves with two No. 6 thread–forming screws (four supplied in kit).

5. Start remaining two No. 6 screws into cable clamp through openings in shield half. Alternate tightening cable clamp screws until cable clamp holds flat cable securely.

7. INSTALLING IDC MODULE COVERS (Figure 7)

Module covers are designed to protect wire terminations in IDC plug modules for discrete wire. Covers (two required) must be ordered separately and installed before inserting modules into plug housing. To install, align grooved side of covers with grooves on each side of the module. Slide cover over contacts until flush at both ends.

8. PANEL MOUNTING (Figure 8)

Receptacle connectors are designed for mounting to the front of a panel. Refer to the dimensions provided in Figure 8 to make the panel cutout. Then mount the connector with four No. 4 screws, lockwashers, and nuts.

NOTE *The layout in Figure 8 applies to standard receptacle connectors listed in Figure 1. For other versions, refer to appropriate AMP Customer Drawings or consult your local AMP representative.*

Installing Module Covers

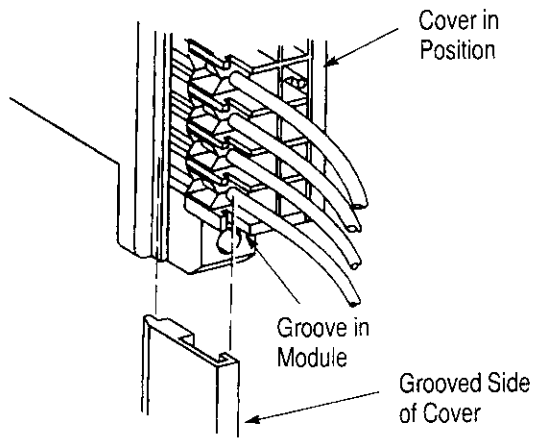


Figure 7

Receptacle Panel Cutout Dimensions

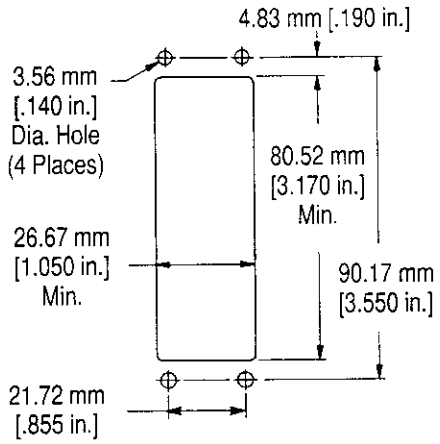


Figure 8

9. ENGAGING/DISENGAGING CONNECTORS

To engage mating connectors, align polarizing ribs with polarizing slots. Push plug onto receptacle and rotate camshaft handle CLOCKWISE 1/4 turn to fully mate and lock connectors.

To disengage connectors, rotate camshaft handle COUNTERCLOCKWISE 1/4 turn and pull plug from receptacle.

10. REVISION SUMMARY

Since the previous release, the following changes and additions were made to this document:

Per EC 0990–0026–96:

- Deleted obsolete connectors and accessories
- Included new plug design using new camshaft shown in Figure 3
- Added metric units
- Updated format
- Added revision summary