AMP INCORPORATED
Harrisburg, Pa. 17105

AMP* MINIATURE RECTANGULAR II (MR II) CONNECTORS

Instruction Sheet
IS 3231
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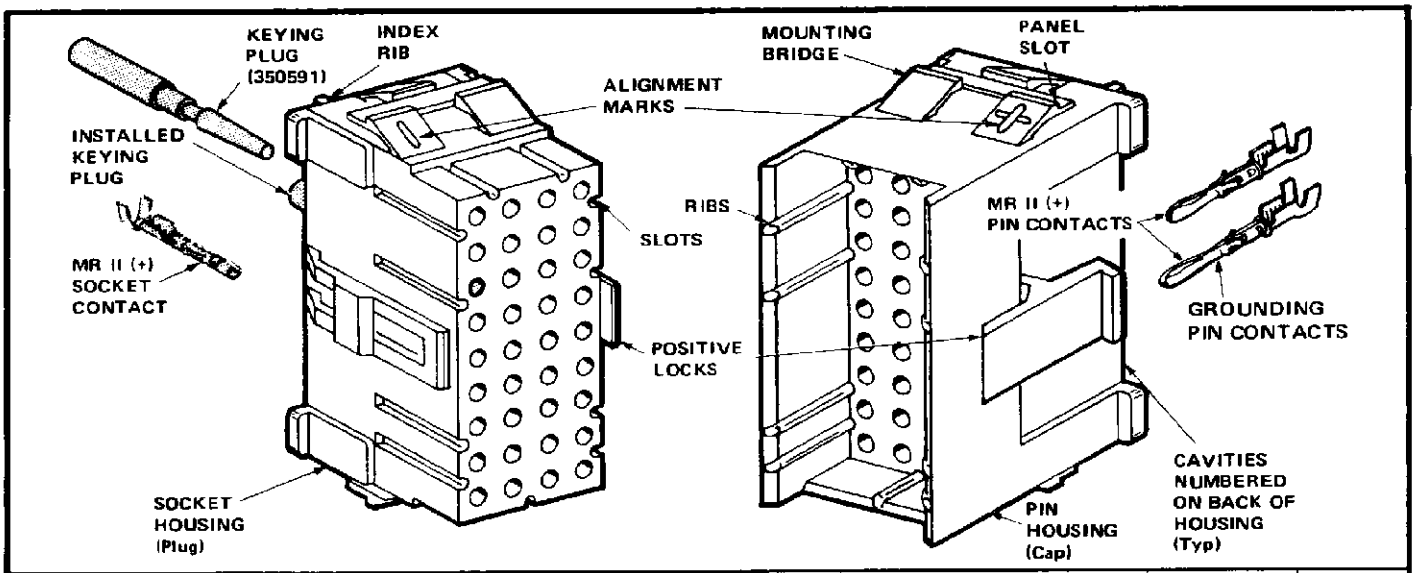
CUSTOMER HOTLINE 1 800 722-1111



NO. OF CKT POSN	HOUSING NUMBER		STRAIN RELIEF CLAMP	COMMONING BAR			WIRE		CONTACT			APPLICATOR	HAND TOOLS (INSTR SHEETS)
	PIN (CAP) HOUSING	SOCKET (PLUG) HOUSING		2 CKT	3 CKT	4 CKT	SIZE (AWG)	INSUL DIA	TYPE	STRIP	LP		
2	640507	640517	NA	350020	NA	NA	26	.050	PIN	350967	640545	466351	90325
3	640508	640518	NA		350021	NA	to	to	SKT	641294	641300	(AI 8040)	(IS 7748)
4	640509	640519	NA		NA	NA	18	.115	PIN**	350969	640580		
6	640510	640520	350373		350021	NA	26	.025	PIN	350968	640579	466352	90326
9	640511	640521	350522			NA	to	to	SKT	350696	350697	(AI 8040)	(IS 7749)
12	640512	640522	350374			350022	24	.050					
15	640513	640523	350523										
20	640514	640524	480634										
24	640515	640525	350524										
36	640516	640526	480594										

**-GROUNDING PIN
NA-NOT APPLICABLE

Fig. 1

1. INTRODUCTION

This instruction sheet covers the assembly procedures and accessory applications for the AMP Miniature Rectangular II (MR II) Connectors listed in Figure 1. Read these instructions, and those referenced, before assembling the connector.

2. DESCRIPTION

A basic connector assembly consists of a pin housing (cap) and a socket housing (plug) having an identical number of circuit positions. The housings can be used for panel mounting or free hanging applications and are fully polarized for proper engagement. The positive lock feature prevents accidental disengagement. Note that the locks on either connector half can be depressed to disengage the connector.

Housings are available with 2 through 36 circuit positions (see chart in Figure 1). Each contact cavity is numbered on the BACK of the plug and cap housings to provide circuit identification. Note that the number 1 cavity also features an index rib for easy identification and alignment.

Keying plugs are used in the plug housing to provide connector identification and polarization. Refer to Paragraph 4, KEYING PLUGS.

Commoning bars are used to common adjacent circuits of any row. Refer to Paragraph 5, COMMONING BARS.

A strain relief clamp is used to prevent stress on contacts caused by a large wire bundle. Refer to Paragraph 6, STRAIN RELIEF CLAMP.

A grommet is used with a strain relief clamp when housing is NOT fully loaded and/or wire bundle is small. Refer to Paragraph 7, GROMMET.

3. CONTACTS

Selection–Refer to the chart in Figure 1, and then select the appropriate pin and socket contacts (strip or loose piece) according to the wire size and insulation diameter to be used. Contacts accept either solid or stranded wire. Note that the grounding pin is longer than a standard pin and mates with a standard socket. It is designed for use only as a ground for the connector assembly.

Crimping–Strip form contacts are designed to be crimped with AMP semi-automatic or automatic machines. Consult your local AMP representative for assistance in selecting the machine that will best suit your needs.

Loose piece contacts are designed to be crimped with AMP hand crimping tools listed in Figure 1. Refer to the instruction sheet (IS–see Figure 1) packaged with the tool for specific crimping procedures.

Insertion–Normally an insertion tool is not required for inserting contacts into these housings. However, AMP Insertion Tool 455830-1 is designed to insert contacts crimped to small fragile wire and/or when the wire bundle is too large for hand insertion.

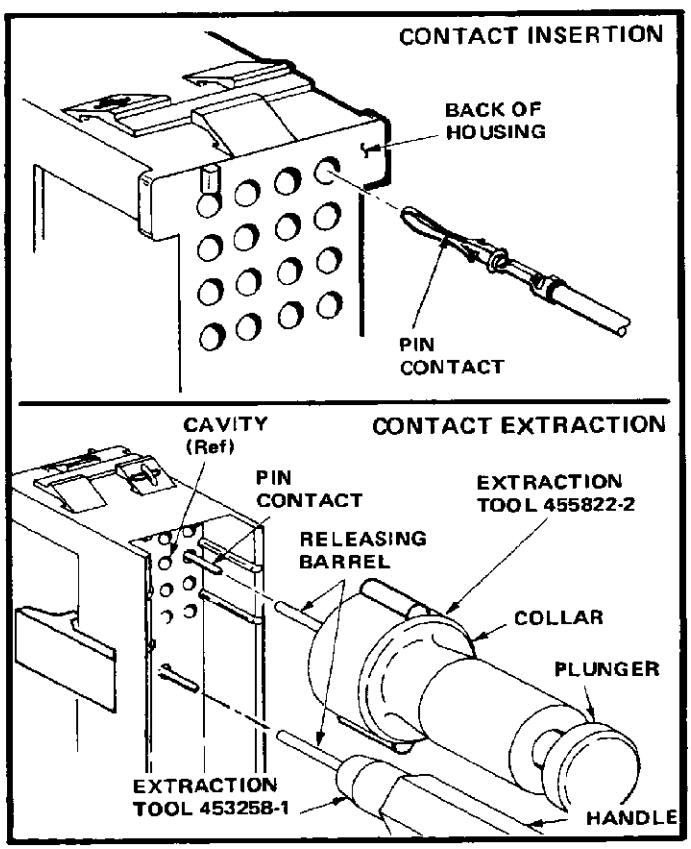


Fig. 2

NOTE *When using grounding pins, install them in the center section of the pin housing. This will insure grounding of the connector assembly before the circuits are activated.*

Insert a contact by aligning it with the desired contact cavity in the BACK (Wire Side) of the housing. Grasp the wire — directly behind the contact insulation barrel — and push the contact straight into the cavity until it bottoms (an audible click). Pull back lightly on the wire to be sure the contact is locked in place.

Extraction–AMP Extraction Tool 455822-2, or 453258-1, is designed for removing both pin and socket contacts from these connectors. Proceed as follows:

1. Grasp wire of contact to be removed. Push contact toward mating face of connector and hold this position. This will disengage contact locking lance from shoulder in cavity.
2. While holding wire, place tool releasing barrel over end of contact and push straight into cavity until it bottoms. The locking lance is now released.
3. Keep releasing barrel firmly bottomed in cavity and depress plunger (handle). Contact will partially eject.
4. Pull contact from BACK of connector and remove tool from cavity.

4. KEYING PLUGS (see Figure 1)

Keying plugs are designed for use only in the plug housing. Install each keying plug as follows:

1. Determine applicable cavity to be keyed. Align tapered end of plug with BACK of cavity.
2. Insert plug straight into cavity until it bottoms — approximately 1/8 in. of plug will protrude from BACK of housing.

If removal is necessary, grip plug with piers and pull straight out BACK of housing.

5. COMMONING BARS

Commoning bars are designed to common 2, 3, or 4 circuits of a vertical or horizontal row. To common more than 4 circuits in a row, or perpendicular rows, bars can be overlapped. Do NOT install more than two commoning bars on a contact.

Insertion–Refer to the chart in Figure 1, and then select the applicable commoning bar(s) according to the number of circuits to be commoned.

1. Place an empty plug housing on a flat surface with FRONT of housing facing UP (see Figure 3).

2. Position bar on applicable socket cavities with raised tines started into cavities.

3. Align polarized cap with plug and insert until housings are fully mated.

4. Pinch locks against housing and remove cap. Check to be sure bar is properly seated in bottom of cap housing.

NOTE *A loaded plug housing can be used to seat the bars, however, caution must be used to prevent marring of plated contacts and/or deformation of the contacts.*

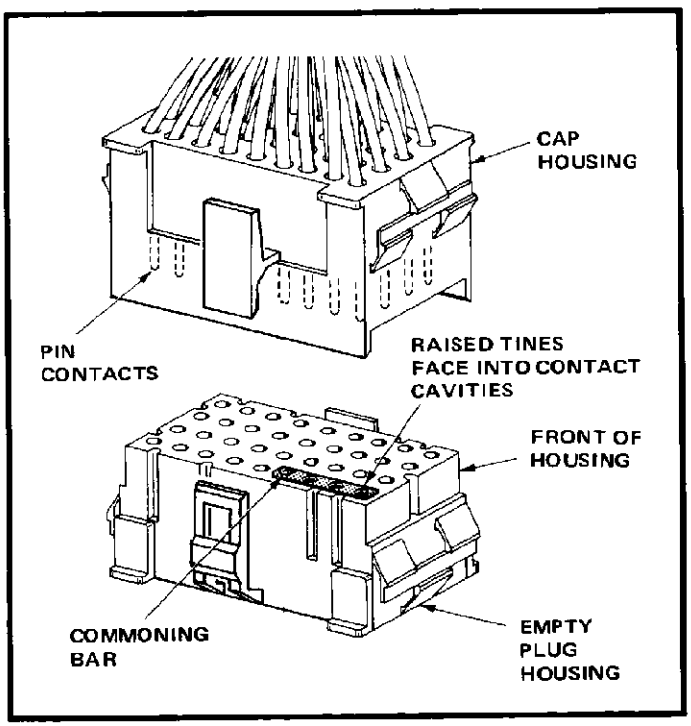


Fig. 3

Extraction–AMP Extraction Tool 457306-1 is designed for removing the commoning bars.

CAUTION *It is recommended that an approved pair of safety glasses be worn when removing commoning bars.*

1. Grasp cap housing firmly. Position hooked tip of tool under commoning bar and between two contacts (see Figure 4).

2. Pry hooked tip upward to loosen coomoning bar from around pin contacts. Repeat this procedure on both sides of all contacts.

3. After commoning bar is loosened from all contacts, position hooked tip between two contacts and pull straight out on tool with a steady even force. If commoning bar does not come out with relative ease, repeat Steps 1 and 2.

CAUTION *If two commoning bars are stacked on one contact, remove the TOP bar first then remove the second bar. Do NOT attempt to remove bars at the same time.*

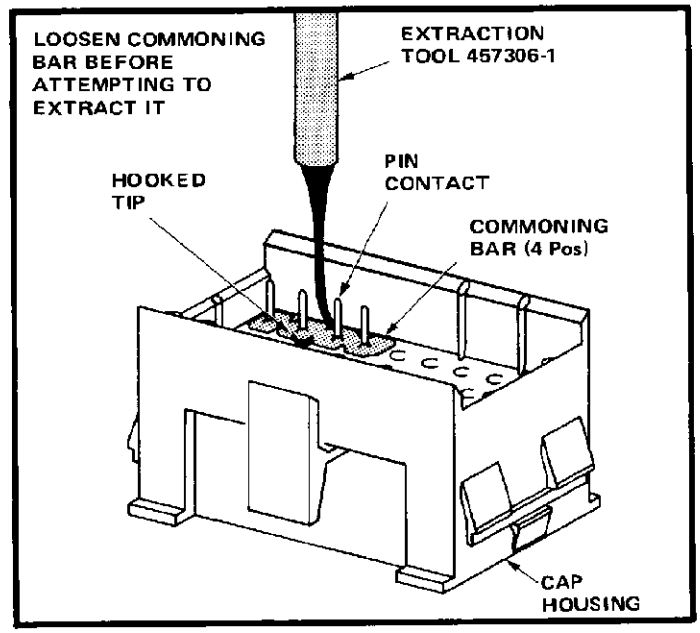


Fig. 4

6. STRAIN RELIEF CLAMP (see Figure 5)

Strain relief clamps are designed for 6 through 36-position plug and/or cap housings. Refer to the chart in Figure 5, and then select the applicable strain relief clamp according to the number of circuit positions in the housing.

NOTE *For optimal performance, strain reliefs are moisturized and should be kept packaged in a sealed bag until they are needed for assembly.*

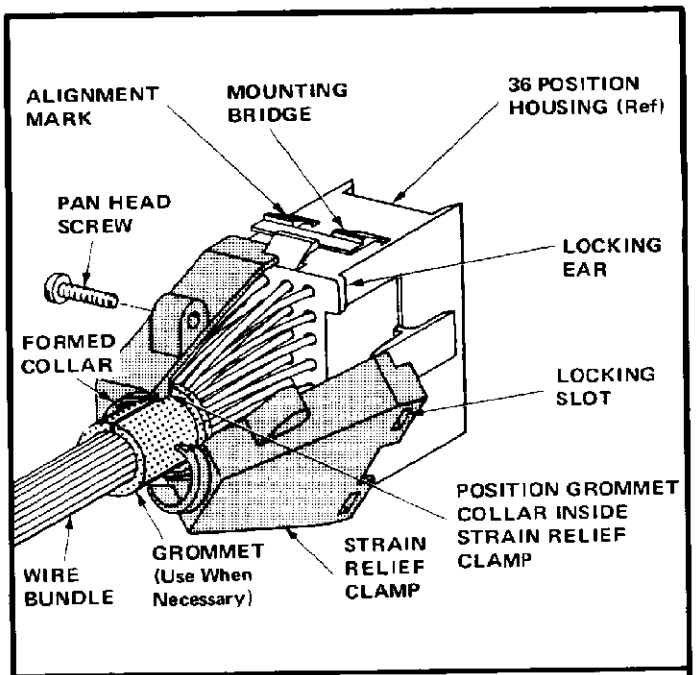
Proceed as follows:

1. Bundle wires together and pull straight back. Grasp bundle approximately two inches from connector.

2. Fit one side of strain relief clamp over connector. Make sure housing locking ears enter locking slots in clamp.

3. While holding clamp half in position, place wire bundle in formed collar of clamp. Hold wire bundle in place and rotate second half of clamp into position. Make sure housing locking ears enter slots in clamp.

CAUTION *Make sure you do NOT defeat the purpose of strain relief devices — always leave some slack wire between the clamp and the back of the housing.*



NO. CIRCUIT POSN	STRAIN RELIEF CLAMP	GROMMET		
		NUMBER	INSIDE DIA	OUTSIDE DIA
6	1-350373-[ ]	350375	.296	.375
		350376	.218	
		350377	.156	
9	1-350522-[ ]	350378	.218	.420
		350379	.250	
		350380	.281	
12	1-350374-[ ]	350378	.218	.420
		350379	.250	
		350380	.281	
15	1-350523-[ ]	350378	.218	.420
		350379	.250	
		350380	.281	
20	1-480634-[ ]	380935	.437	.562
		380936	.375	
		380937	.312	
24	1-350524-[ ]	380935	.437	.562
		380936	.375	
		380937	.312	
36	1-480594-[ ]	380935	.437	.562
		380936	.375	
		380937	.312	

[ ]-SUFFIX DASH NUMBER SIGNIFIES CLAMP COLOR

Fig. 5

4. Secure clamp halves with a No. 6 (3/8 in. long) pan head self-tapping screw.

NOTE *Check to be sure the formed collar is supporting the wires. If not, a grommet should be used to insure strain relief.*

7. GROMMET (see Figure 5)

A grommet is used with the strain relief clamp when the wire bundle is small. The inside diameter of the grommet should be approximately the same as the diameter of the wire bundle. Refer to the chart in Figure 5, and then select the applicable grommet and proceed as follows:

1. Open grommet and position it around wire bundle. Note that grommet collar should face BACK of housing.
2. Locate grommet at approximate location of strain relief clamp formed collar. Position strain relief clamp according to Paragraph 6, Steps 1 and 2.
3. Slide grommet into position. Grommet collar should butt against inside of strain relief clamp. Secure clamp according to Paragraph 6, Steps 4.

8. ENGAGING CONNECTOR HALVES

Check to be sure connector halves have identical number of circuit positions. Note that if keying plugs have been installed in the plug housing, corresponding cavities in the cap housing must be empty.

Make sure polarizing features are properly oriented. Alignment marks on mounting bridges provide visual polarization, and ribs and slots provide proper engagement. Insert cap half straight toward plug half until it bottoms and the positive locks engage.

9. DISENGAGING CONNECTOR HALVES

For panel mounted assemblies, pinch locks against housing that is NOT mounted and pull straight out. For free hanging assemblies, pinch locks on either housing and pull straight out.