

APPLICATION SPECIFICATION

ECONOSEAL 3 LOW CURRENT

SCOPE

This specification covers the assembly of the tabs and receptacles into their respective housings and the crimping requirements of these contacts.

Please note, this specification covers a sealed system and an unsealed system.

GENERAL

The Econoseal 3 Low Current system uses .070" (1.8mm) series tabs and receptacles. These contacts are suitable for thin walled cables from 0.5 to 1.5mm², and also 2.0mm² where larger cables are necessary to reduce volt drop.

For the sealed connector requirements, each cable is inserted into a discrete cable seal prior to being crimped into the contact. The insulation barrel is crimped so that the cable seal is gripped sufficiently to stop any movement of the seal on the cable.

For the unsealed connector requirements, discrete cable seals are not required. The cables are crimped in the normal way.

Please note that these tabs and receptacles are only suitable for single cables, whether seals are required or not, with the exception of a special requirement for the tab. This special requirement is for 2 x 0.5mm² cables, unsealed, to be crimped.

There is no requirement for double cables to be crimped into the receptacle.

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	C	Updated ECN S0003	RS	30/8/89			
B	Updated ECN S0001	RS	8/8/89	ORIG. DATE 30.5.89	LOC	NO	REV
A	Sheet 6 Modified (Clarified Ins Sizes for Seals)	RS	8/6/89	APP B. JONES			
0	Release for Prod	RS	26/5/89	SHEET	TITLE APPLICATION SPECIFICATION ECONOSEAL 3 LOW CURRENT		
1	Tentative	RS	5/4/89	1 OF 22			
DIST	REVISION RECORD		APP	DATE			

The insulation barrel is crimped with an 'O' crimper when discrete cable seals are used. The insulation barrel is crimped with an 'OL' (Over-lap) crimper when single cables are used, without seals.

For the special requirement of 2 x 0.5mm² cables an 'F' crimper should be used. (Double cables cannot be sealed).

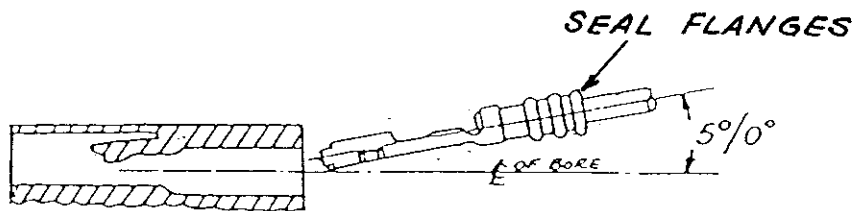
For sealed connectors, the receptacle half is an assembly that comprises a receptacle housing and a peripheral seal, which seals the interface between tab and receptacle housing. These assemblies have unique part numbers. The receptacle housing part numbers used in these assemblies are common for sealed or unsealed applications. The tab housing part numbers are common for sealed or unsealed applications.

For unsealed connectors, peripheral and cable seals are not required.

Contacts (tabs or receptacles - with or without seals) are inserted into the housings, which have a "resin" lance in each cavity that retains the contact.

Please note that it may be necessary, when hand inserting terminated contacts (sealed or unsealed), to support the smaller cables (0.5mm² to 1.0mm²), with a suitable tool such as smooth-jawed pliers to prevent buckling of the cable. For automatic assembly the insertion tool may have to grip the cable in the same area, just behind the seal or the insulation barrel.

For ease of insertion of contact into cavity, the angle of entry shall be 5°/0° to the centre line of the bore.



Please Note:

All sealing flanges of the cable seal shall be contained within the bore of the housing, but, it is acceptable if the end flange protrudes from the bore although NOT preferable.

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When all contacts are in their correct position within the cavities, a secondary locking component (anti-backout), can be inserted and "clicked" into position. If the contacts are not in their correct position, difficulty will be experienced when inserting the anti-backout. This must be investigated. The cause, apart from obviously damaged parts, will be that the contacts are not quite fully inserted, and it will be seen that the resin lance is in an upwards deflected position. The back end of the insulation barrel or the seal may or may not be protruding beyond the back of the cavity.

If the anti-backout "clicks" home, there may still be a problem with under insertion of the contact, but this will be obvious because the contact or seal will be protruding from the back of the cavity.

The problem of contacts not being positioned correctly will be obviated by automatic assembly of the contacts. The assembly equipment must be capable of inserting the contacts and testing that they are correctly retained, by pulling back on the cable with a small force, not exceeding 10 Newtons.

The secondary locking component (anti-backout) can also be inserted automatically. It is inserted into the front of the housing and ensures that the "resin" lances are fully locked behind the contacts, giving added security to the retention of the contacts. In addition, it helps to align the tabs and receptacle when mating connector halves.

A flat faced tool, that is suitably shaped, may be used to push on the rim of the "cup" shaped tab housing anti-backout, when inserting it into the tab housing. Care must be taken not to damage tabs. Likewise, any flat faced tool of suitable size may be used when inserting the receptacle housing anti-backout.

To remove the contacts from the housings, the anti-backouts must first be removed.

To remove the tab housing anti-backout, a small screwdriver shall be inserted into the slot(s) in the side of the anti-backout in order to lever it out (maximum width of screwdriver blade to be 3mm).

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The receptacle housing anti-backout shall be removed by gently easing the flange of the anti-backout out of the housing with a small screwdriver (maximum width of screwdriver blade to be 3mm).

With the anti-backouts removed, the tabs and receptacles can be extracted by using Tool, PN 345338-1, to lift the resin lance clear of the contacts. (SEE FIGURE 1)

When extracting the receptacle, the tip of the tool should be carefully run across the top of the receptacle until stopped by the resin lance. The handle of the tool should then be pushed downwards until it is horizontal. (The shoulders on the tool act as a pivot point on the housing rails). This action will raise the resin lance, enabling the receptacle to be extracted.

When extracting the tab, the same tool can be used to LIFT the resin lance, but, in this case, the tool is not pushed downwards, but lifted.

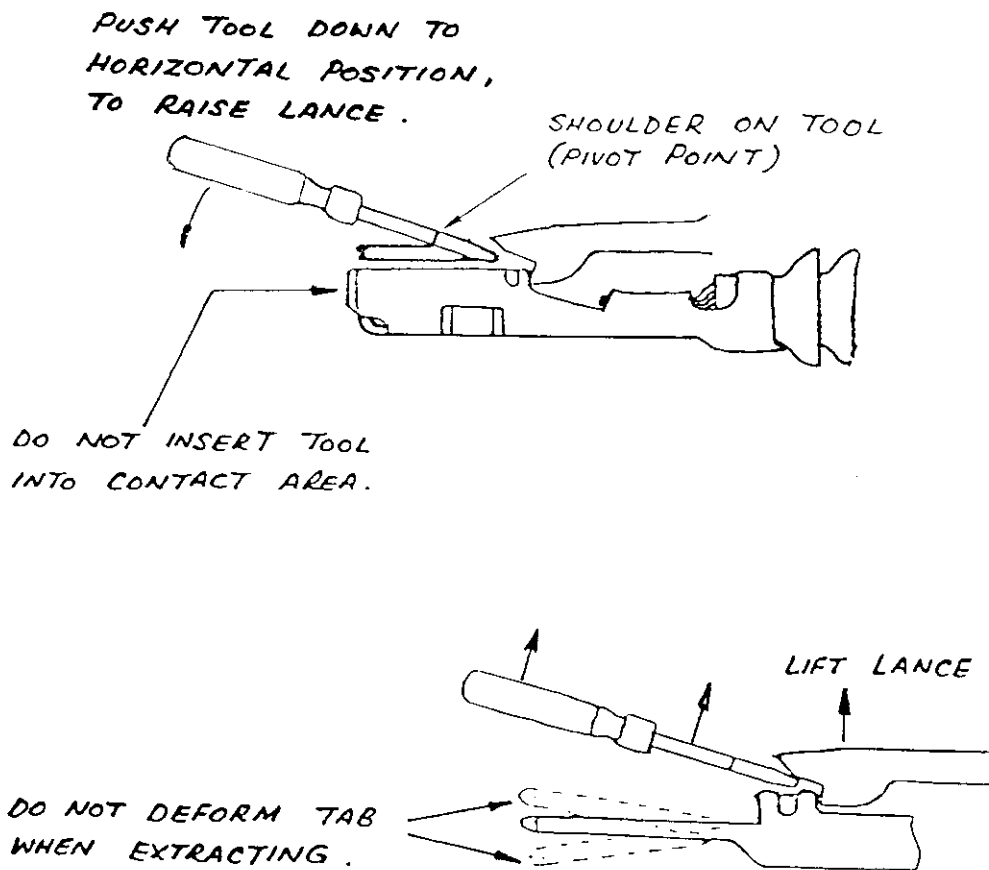


FIGURE 1

The following Part Numbers shall be governed under this specification:-

2 Way Rec. Hsg. Assy.	(with seal)	344276
3 Way Rec. Hsg. Assy.	(with seal)	344273
4 Way Rec. Hsg. Assy.	(with seal)	344270
6 Way Rec. Hsg. Assy.	(with seal)	344267
13 Way Rec. Hsg. Assy.	(with seal)	344263
2 Way Rec. Hsg.	(without seal)	344275
3 Way Rec. Hsg.	(without seal)	344272
4 Way Rec. Hsg.	(without seal)	344269
6 Way Rec. Hsg.	(without seal)	344266
13 Way Rec. Hsg.	(without seal)	344262
2 Way Tab Hsg.		344274
3 Way Tab Hsg.		344271
4 Way Tab Hsg.		344268
6 Way Tab Hsg.		344265
13 Way Tab Hsg.		344260
*6 Way Tab Hsg.	(flanged)	344325
**6 Way Tab Hsg.	(Panel Mount)	346030
2 Way Rec. Hsg. Anti-backout		345254-1
3 Way Rec. Hsg. Anti-backout		345256-1
4 Way Rec. Hsg. Anti-backout		345258-1
6 Way Rec. Hsg. Anti-backout		345260-1
13 Way Rec. Hsg. Anti-backout		344264-1
2 Way Tab Hsg. Anti-backout		345253-1
3 Way Tab Hsg. Anti-backout		345255-1
4 Way Tab Hsg. Anti-backout		345257-1
6 Way Tab Hsg. Anti-backout		345259-1
13 Way Tab Hsg. Anti-backout		344261-1

* The 6 Way Tab Housing, 344325, uses the above anti-backout 345259-1. Please note that this tab housing is for use on a stepper motor and mates with sealed receptacle housing 344267, which uses anti-backout 345260-1.

** The 6 way tab housing, 346030, uses the above anti-backout 345259-1. Please note that this tab housing is for use on a sealed headlamp, and therefore includes a gasket seal. This part mates with sealed receptacle housing 344267, which uses anti-backout 345260-1.

.070" Series Rec.	(0.2 to 0.5mm ²)	345808-1	(171630-1)
.070" Series Tab	(0.2 to 0.5mm ²)	345809-1	(171631-1)
.070" Series Rec.	(0.75 to 2.0mm ²)	345806-1	(171662-1)
.070" Series Tab	(0.75 to 2.0mm ²)	345807-1	(171661-1)

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Please note that 2.0mm² cable, used only to reduce voltage drop, may also be crimped into the above contacts. These contacts are suitable for use with single thin walled non-irradiated cables, as specified in BLS.62.21.688 Issue No.1, and may be used for sealed or unsealed applications. Double cable application of 2 x 0.5mm² may also be crimped in the above tab, 345807-1 (special requirement). Double cable applications cannot be sealed.

The above contacts are Tin Plated.

*** Wire Seal for 0.5 to 1.5mm² cable - 172746-1
**** Wire Seal for 2.0mm² cable - 172888-2
Blanking plug - 172748-2

*** Please note that seal PN. 172746-1 is suitable for cables with insulation diameters of 1.6mm minimum and upto, and including 2.4mm.

**** The seal PN. 172888-2 is only suitable for cables with insulation diameters of above 2.4mm and upto a maximum of 2.7mm.

Blanking plug, 172748-2, must be used for blanking off cavities, in sealed connectors, where they are not fully loaded.

These plugs can also be assembled automatically.

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This specification also governs the Wire-to-Board (Econoseal 3 Low Current) sealed connector system.

Part Numbers are as follows:-

36 Way Header	344108-1
18 Way Header	344103-1

(Both headers have inmoulded tabs).

36 Way Rec. Hsg. Assy. (with seal)	344111-1
18 Way Rec. Hsg. Assy. (with seal).	344106-1

36 Way Rec. Hsg. Anti-backout	344112-1
18 Way Tab Hsg. Anti-backout	344107-1

.070" Series Rec. (0.5 to 2.0mm ²)	344113-1
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Please Note: This receptacle is similar to 345806-1, but has modified internal beams, which reduce the insertion force of the receptacle onto the header tabs. It also is gold plated on the contact areas. Apart from these differences, this receptacle can be used with the same cables (including 0.5mm²) and seals as 345806-1.

The blanking plug, 172748-2, shall also be used to blank off unused cavities in the receptacle housing. Anti-backouts and receptacles can be removed from the receptacle housing using the same method as previously stated for wire-to-wire connectors.

N.B. UNDER NO CIRCUMSTANCES MUST TIN PLATED RECEPTACLES BE USED FOR THIS WIRE-TO-BOARD SYSTEM.

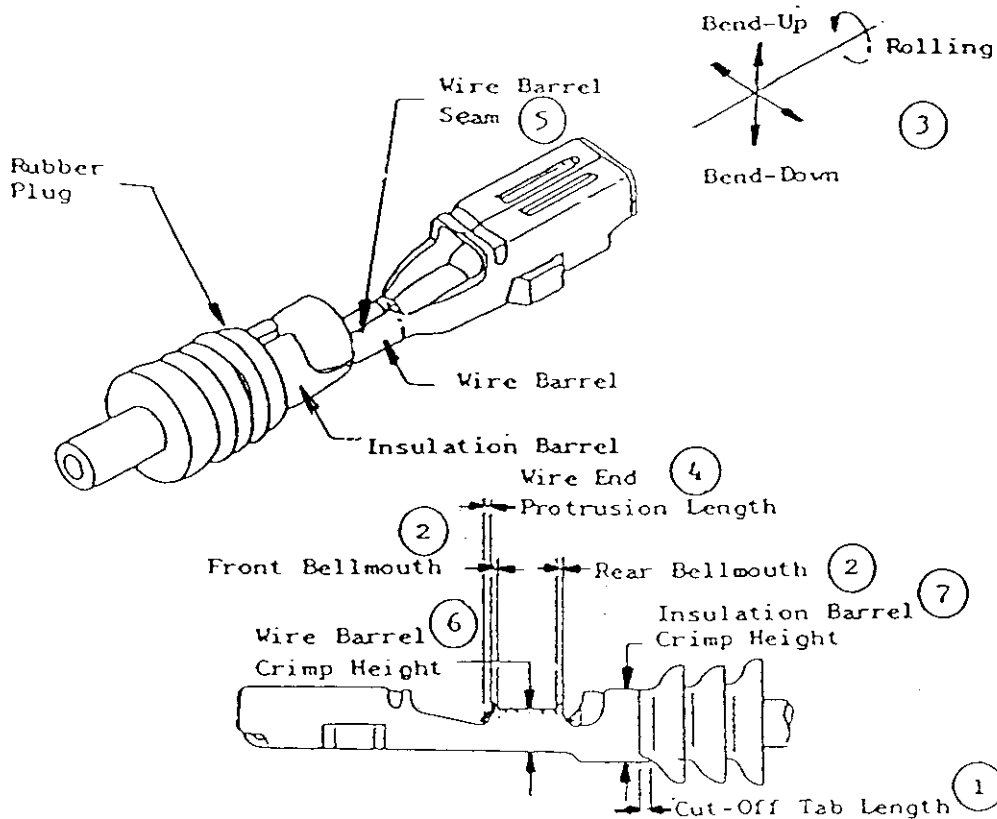
LIKewise, GOLD PLATED RECEPTACLES MUST NOT BE USED ON THE WIRE-TO-WIRE SYSTEM.

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1. CRIMPING

The following information contains nomenclature, crimping conditions, crimp data for mini-applicators and handtools, installation of rubber seals on cables, correction or replacement of parts and checks.

1.1 NOMENCLATURE



Note: Nomenclature is the same for tab or receptacle, and for sealed or unsealed terminations.

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2. CRIMPING CONDITIONS

Refer to nomenclature (Clause 1.1.)

1. Cut-off tab length 0.5mm max.

2. Front bellmouth 0.3mm max.
Rear bellmouth 0.2 to 0.6mm

3. Bend up 1° max.
Bend down 3° max.
Twisting 5° max.
Rolling 5° max.

4. Cable end protrusion
length (brush length) 0 to 1.0mm

5. Insulation stripping
length 4.0 to 4.5mm

6. Wire barrel seam must be neatly closed.

7. Wire barrel flash 0.25 max.

8. Cable strands and insulation must be visible
in the transition area (between wire and
insulation barrel), for cables crimped without
seals.

3. CRIMP DATA

- 3.1 For applicator crimping of tabs and receptacles with seals see Figures 5, 6 and 9.
- 3.2 For applicator crimping of tabs and receptacles without seals see Figures 7, 8 and 10.
- 3.3 For handtool crimping of tabs and receptacles with seals see Figures 5 and 6.
- 3.4 For handtool crimping of tabs and receptacles without seals see Figures 7 and 8.

NOTES:

- a. Handtools are not available for double cable applications.
- b. To assist insertion of cables into the cable seals, an "attaching jig" shall be used, Part No. 753812-2 (AMP Japan). See Fig. 11.
- c. For automatic assembly of seal onto cable a S.C.A.T. machine may be used.

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4. INSTALLATION OF RUBBER SEAL ON THE CABLE

When the rubber seal is installed on the cable, the end of the cable insulation shall ideally be positioned +1,0 to -0,5mm from the edge of the rubber seal, as shown in Figure 2. This length is common to tabs and receptacles regardless of cable size, and is intended for reference only. The position of the crimped seal, shown in figure 4, must be maintained and over-rides the dimension in figure 2.

NOTE: Seals are supplied lubricated. This lubrication must not be removed.

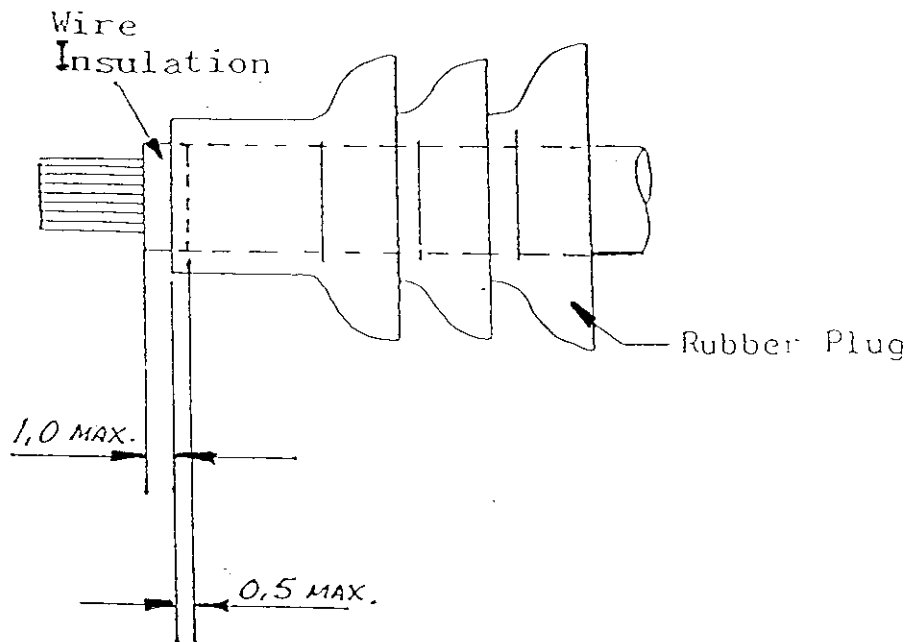


FIGURE 2 (REF. ONLY)

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5. CORRECTION OR REPLACEMENT OF PARTS

When defects and/or improper applications are found on parts to be installed, as shown in Figure 3, rework to reform properly, or replace with new part.

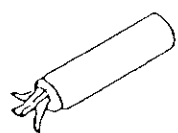
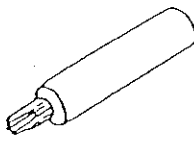
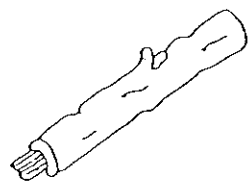
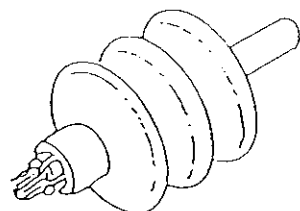
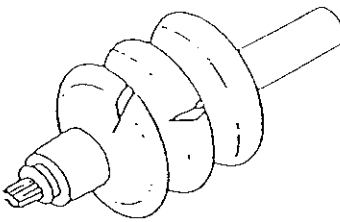
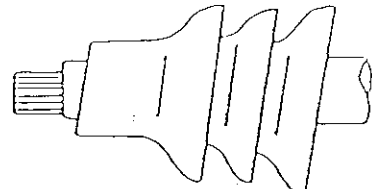
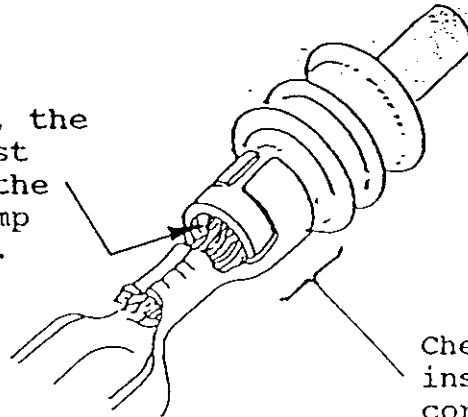
 <p>The end of the cut wire shall appear neat without disorder and bend of stranded conductor.</p>	 <p>The conductor shall be free from nick, cut and scrape.</p>	 <p>The wire insulation must have intact and smooth surface in a round form without damage, groove or recessed surface.</p>
 <p>The end of the wire shall be straight without bend and disorder after it passed through the rubber plug. The bent wire shall be checked out.</p>	 <p>The flanges of the rubber plug shall be free from cut and damage. Any plug having such defects shall be discarded, and replaced with new part.</p>	 <p>Installation of rubber plug shall be done straight and evenly. If flanges are in tilt condition, the plug must be corrected so that flanges are perpendicular to contact axis.</p>

FIGURE 3

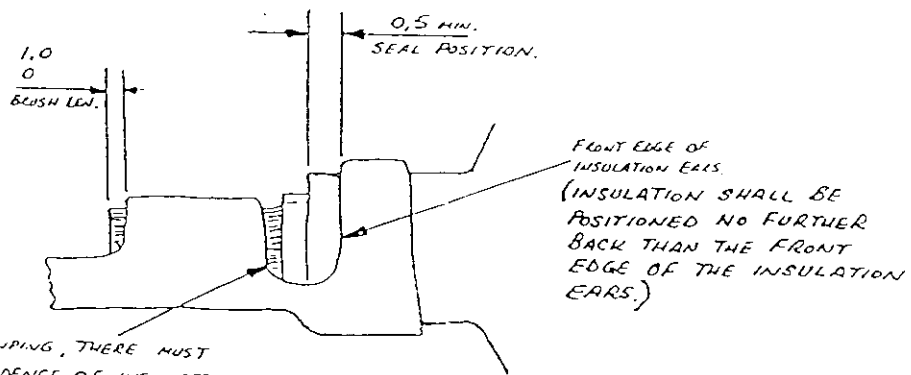
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5.1 After crimping, that part of the insulation of the cable that is inside the seal shall be in good condition. Check by visual inspection in the transition area (between wire and insulation barrel), as indicated in Figure 4.

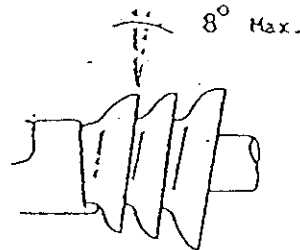
After crimping, the rubber seal must protrude from the insulation crimp without damage.



Check to see if the insulation is in the correct position.



NOTE: AFTER CRIMPING, THERE MUST BE NO EVIDENCE OF INSULATION OR RUBBER IN THE WIRE CRIMP.



Rubber plug shall be inserted evenly not being in tilt condition.

FIGURE 4

5.2. Crimped contacts should appear as illustrated in Clause 1.1. (Nomenclature).

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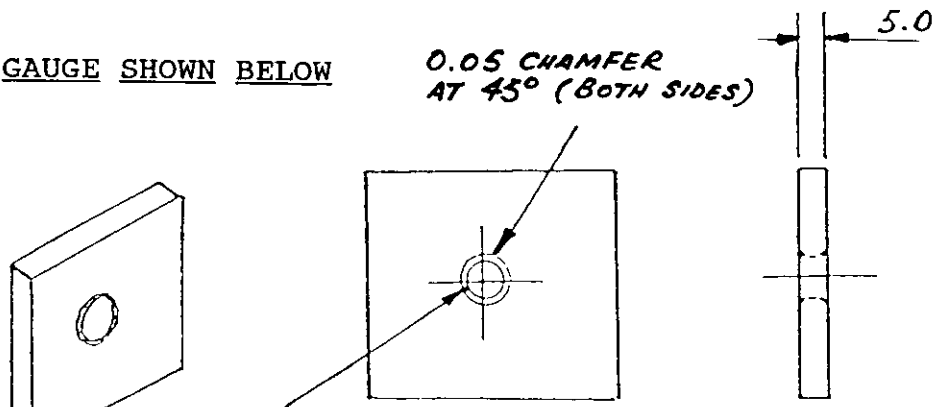
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5.3 Retention of seals, by insulation crimp

USE GAUGE SHOWN BELOW



3.9 DIA. HOLE FOR CABLES UP TO 1.5 mm².
4.1 DIA. HOLE FOR 2.0 mm² CABLE.

Pass crimped tab or receptacle through the hole, so that seal stops against face of gauge.

Then pull on the contact, straight and steadily, and measure the force to either,

- (a) Pull the seal through the hole without damage.
- (b) Wholly or partially dislodge the seal from the insulation crimp.
- (c) Tear seal.

This should not take place at a force of less than 10 Newtons, (this value is tentative - and a statistically based test is to be done).

NOTE: This test is destructive.

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6. OVERLAP CRIMPING

For overlap crimping of tabs and receptacles see Crimp Inspection Sheet G.B. 3005, for additional information, but only refer to that part of the sheet that concerns single cable. The insulation crimp form for double cable shall be 'F' crimp. (Cables side-by-side).

7. APPLICABLE CABLES AND TENSILE STRENGTH

Wire Size mm ² (Nominal)	Dia. of Insulation mm	Tensile (N)
0.5	1.6 to 1.8	65 min.
0.75	1.9 max	85 min.
1.0	2.1 max	105 min.
1.5	2.4 max	160 min.
2.0	2.7 max	160 min.

8. ADDITIONAL INFORMATION

APPLICABLE CONTACTS			
STRIP ITEMS		LOOSE PIECE	SEALED OR UNSEALED APPLICATIONS
G.B.	JAPANESE	G.B.	
345807-1 345806-1	171661-1 171662-1	345148-1 345150-1	SEALED
345807-1 345806-1	171661-1 171662-1	345149-1 345151-1	UNSEALED
345809-1 345808-1	171631-1 171630-1	345951-1 345949-1	SEALED
345809-1 345808-1	171631-1 171630-1	345952-1 345950-1	UNSEALED

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Part Number	Wire Size mm ²	Insulation Diameter mm	Wire Barrel Crimp			Insulation Barrel Crimp			Log No.
			Height ±.05	Width (Ref)	Type Crimper / Anvil	Height (Ref)	Width (Ref)	Type Crimper / Anvil	
345807-1 (171661-1)	1.5	2.3 - 2.4	1.57	2.29	F	3.6	3.7	0	0
	1.0	2.0 - 2.1	1.37	2.29	F	3.4	3.7	0	0
	0.75	1.85 - 1.9	1.30	2.29	F	3.3	3.7	0	0
	0.5	1.6 - 1.8	1.19	2.29	F	3.2	3.7	0	0
345806-1 (171662-1) AND/OR 344113-1	1.5	2.3 - 2.4	1.5	2.29	F	3.6	3.7	0	0
	1.0	2.0 - 2.1	1.32	2.29	F	3.3	3.7	0	0
	0.75	1.85 - 1.9	1.22	2.29	F	3.2	3.7	0	0
	0.5	1.6 - 1.8	1.14	2.29	F	3.1	3.7	0	0

AUTOMATIC MACHINE WIRE CRIMP DIMENSIONS (FOR USE WITH WIRE SEAL)

** SEE FIGURE 9

* SEE FIGURE 9

Part Number (LOOSE PIECE)	Wire Size mm ²	Insulation Diameter mm	Wire Barrel Crimp			Insulation Barrel Crimp			Hand Tool Part No.
			Height ±.05	Width (Ref)	Type Crimper / Anvil	Height (Ref)	Width (Ref)	Type Crimper / Anvil	
345148-1	1.0	2.0 - 2.1	1.40	2.29	F	3.1	3.7	0	525317-2
	0.75	1.85 - 1.9							
345951-1	0.5	1.6 - 1.8	1.19	1.57	F	2.9	3.4	0	525317-6
345150-1	1.0	2.0 - 2.1	1.37	2.29	F	3.1	3.7	0	525317-2
	0.75	1.85 - 1.9							
345949-1	0.5	1.6 - 1.8	1.14	1.57	F	2.9	3.4	0	525317-6

HAND TOOL WIRE CRIMP DIMENSIONS (FOR USE WITH WIRE SEAL)

FIGURE 5

Part Number	Wire Size mm ²	Insulation Diameter mm	Wire Barrel Crimp			Insulation Barrel Crimp			Log No.
			Height ±.05	Width (Ref)	Type Crimper Anvil	Height (Ref)	Width (Ref)	Type Crimper Anvil	
345807-1 (171661-1)	2.0	2.7 max	1.75	2.29	F	3.6	3.7	0	0
345806-1 (171662-1) AND/OR 344113-1	2.0	2.7 max	1.70	2.29	F	3.6	3.7	0	0

AUTOMATIC MACHINE WIRE CRIMP DIMENSIONS (FOR USE WITH WIRE SEAL)

Part Number (Loose Piece)	Wire Size	Insulation Diameter	Wire Barrel Crimp			Insulation Barrel Crimp			Hand Tool Part No.
			Height ±.05	Width (Ref)	Type Crimper Anvil	Height (Ref)	Width (Ref)	Type Crimper Anvil	
345148-1	2.0	2.7 MAX	1.73	2.29	F	3.5	3.7	0	525317-4
	1.5	2.3 - 2.4							
345150-1	2.0	2.7 MAX	1.65	2.29	F	3.5	3.7	0	525317-4
	1.5	2.3 - 2.4							

HANDTOOL WIRE CRIMP DIMENSIONS (FOR USE WITH WIRE SEAL)
FIGURE 6



Part Number	Wire Size mm ²	Insulation Diameter mm	Wire Barrel Crimp			Insulation Barrel Crimp			Log No.
			Height ±0.5	Width (Ref)	Type Crimper Anvil	Height (Ref)	Width (Ref)	Type Crimper Anvil	
345807-1 (171661-1)	1.5	2.3 - 2.4	1.57	2.29	F	2.70	4.06	SP.F	0
	1.0	2.0 - 2.1	1.37	2.29	F	2.45	4.06	SP.F	0
	0.75	1.85 - 1.9	1.30	2.29	F	2.40	4.06	SP.F	0
	0.5	1.6 - 1.8	1.19	2.29	F	2.35	4.06	SP.F	0
345806-1 (171662-1)	1.5	2.3 - 2.4	1.5	2.29	F	2.65	4.06	SP.F	0
	1.0	2.0 - 2.1	1.32	2.29	F	2.40	4.06	SP.F	0
	0.75	1.85 - 1.9	1.22	2.29	F	2.35	4.06	SP.F	0
	0.5	1.6 - 1.8	1.14	2.29	F	2.30	4.06	SP.F	0

AUTOMATIC MACHINE WIRE CRIMP DIMENSIONS (NO CABLE SEAL)

*See Figure 10 **See Figure 10

Part Number (Loose Piece)	Wire Size mm ²	Insulation Diameter mm	Wire Barrel Crimp			Insulation Barrel Crimp			Hand Tool Part No.	
			Height ±0.5	Width (Ref)	Type Crimper Anvil	Height (Ref)	Width (Ref)	Type Crimper Anvil		
345149-1	1.0	2.0 - 2.1	1.40	2.29	F	2.4	4.06	SP.F	0	525317-1
	0.75	1.85 - 1.9								
345952-1	0.5	1.6 - 1.8	1.19	1.57	F	2.4	3.56	SCROLL	0	525317-5
345151-1	1.0	2.0 - 2.1	1.37	2.29	F	2.4	4.06	SP.F	0	525317-1
	0.75	1.85 - 1.9								
345950-1	0.5	1.6 - 1.8	1.14	1.57	F	2.4	3.56	SCROLL	0	525317-5

HAND TOOL WIRE CRIMP DIMENSIONS (NO CABLE SEAL)

FIGURE 7

Part Number	Wire Size mm ²	Insulation Diameter mm	Wire Barrel Crimp			Insulation Barrel Crimp			Log No.	
			Height ±.05	Width (Ref)	Type Crimper	Type Anvil	Height (Ref)	Width (Ref)		Type Crimper
345807-1 (171661-1)	0.5 + 0.5	*1.7 + 1.7	1.37	2.29	F	F	2.18	4.06	F	F
345807-1 (171661-1)	2.0	2.7 max	1.75	2.29	F	F	3.0	4.06	SP.F	0
345806-1 (171662-1)	2.0	2.7 max	1.70	2.29	F	F	3.0	4.06	SP.F	0

* 0.5mm² CABLE HAS INSULATION O/D.I.A. OF 1.6 TO 1.8MM. AUTOMATIC MACHINE WIRE CRIMP DIMENSIONS (NO CABLE SEAL)

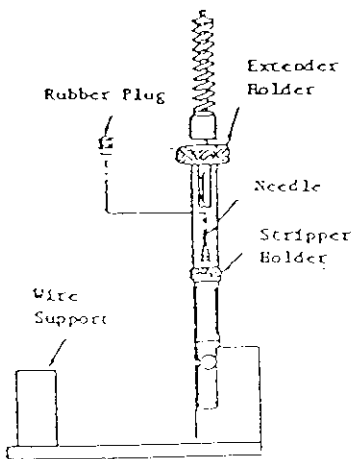
Part Number (Loose Piece)	Wire Size	Insulation Diameter	Wire Barrel Crimp			Insulation Barrel Crimp			Hand Tool Part No.		
			Height ±.05	Width (Ref)	Type Crimper	Type Anvil	Height (Ref)	Width (Ref)		Type Crimper	Type Anvil
345149-1	2.0	2.7 max	1.73	2.29	F	F	2.65	4.06	SP.F	0	525317-3
	1.5	2.3 - 2.4									
345151-1	2.0	2.7 max	1.65	2.29	F	F	2.65	4.06	SP.F	0	525317-3
	1.5	2.3 - 2.4									

HAND TOOL WIRE CRIMP DIMENSIONS (NO CABLE SEAL)

FIGURE 8

Application of Attaching Jig

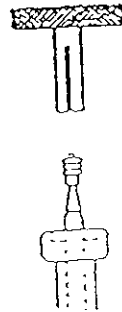
1



Hold the stripper holder, and return the needle to the initial position.

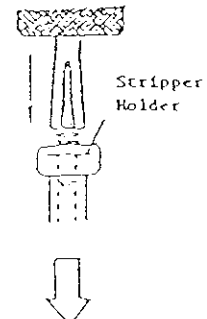
2

Attach the rubber plug to the needle in direction shown.



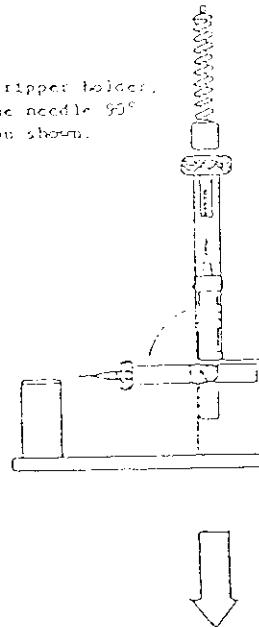
3

Lower the extender holder until the rubber plug contacts the stripper holder.

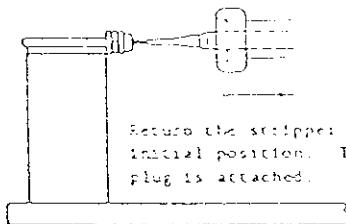


4

Hold the stripper holder, and turn the needle 90° in direction shown.

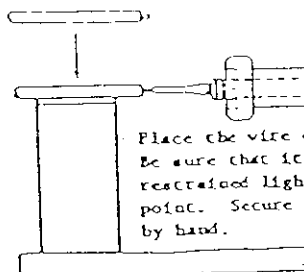


7



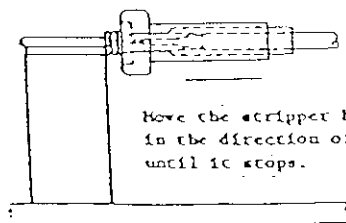
Return the stripper holder to the initial position. The rubber plug is attached.

5



Place the wire on the wire support. Be sure that the stripped end is restrained lightly to the needle point. Secure the wire in position by hand.

6



Move the stripper holder quickly in the direction of the wire until it stops.

FIGURE 11