WOSS 560/4

British Railways Board

Director of Mechanical and Electrical Engineering

Crimped Joints for Cables

WORKSHOP OVERHAUL STANDARD SPECIFICATION

WOSS 560/4

REVISION RECORD

This Specification will be updated when necessary by the issue of amended pages accompanied by revision letters. The amended or additional part of re-issued pages will be marked with a vertical black line.

If you consider that an amendment is necessary, complete BR Form 14298 and pass it to the local BRB Resident Engineer or Area Quality Engineer. Submission of a form does not authorise the proposed amendments.

Revision No.	Re-issued Page Nos	Date	Inserted by
1	Contents	Apr 86	

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First published - June 1985

Should any query arise regarding the contents of this document telephone 0332 42442 Ext. 3516, BR Code is 056 3516, or write to the above address.

This Specification applies to equipment fitted to the vehicles indicated 'X' below.

LOCOMOTIVES

03	X
08	X
09	X
20	X
25	X
26	X
27	X
31	X
33	X
37	X
43	X
45	X
47	X
50	X
56	X
58	X

73	X
81	X
85	X
86	X
87	X
88	X
89	X
91	X

DMU's

101	X
104	X
107	X
108	X
110	X
111	X
114	X
115	X
116	X
117	X
118	X
119	X
121	X
122	X
128	X
140	X
141	X
142	X
143	X
150	X
151	X

302	X
303	X
304	X
305	X
307	X
308	X
309	X
310	X
311	X
312	X
313	X
314	X
315	X
317	X
318	X
319	X

504	X
507	X
508	X

EMU's

411	X
412	X
413	X
414	X
415	X
416	X
419	X
421	X
422	X
427	X
432	X
455	X

485	X
486	X
487	X
488	X
489	X

DEMU's

201	X
202	X
203	X
204	X
205	X
207	X

COACHING STOCK

Mk 1	X
Mk 2, 2a-c	X
Mk 2d-e	X
Mk 2f	X
Mk 2 DBSO	X
Mk 3a	X
Mk 3b	X
Mk 3 (HST)	X
Mk 3 SLE and SLEP	X
Non Passenger	X

10/85

WORKSHOP OVERHAUL STANDARD SPECIFICATION 560/4

CRIMPED JOINTS FOR CABLES

CONTENTS

INTRODUCTION

1. This specification details the procedure for applying crimped terminals to cables used on traction and rolling stock.

2. Crimps are to be selected from the following ranges:

   2.1 Standard or ring tongue terminals and splices : Tables 3-5.

   2.2 Restricted Entry PIDG terminals for electronic equipment cables: Table 6.

   2.3 Faston receptacles and Tabs: Table 7.

   2.4 Multi-pole circular connector terminals : Table 9.

   2.5 Ferrules for terminating the screen of screened cables : Table 8.

   2.6 Terminals for high temperature situations : Table 10.

   Contractors without access to the BR Catalogue are referred to Table 13 for manufacturers' part numbers.

REFERENCE DOCUMENTS

BR Drawing No. B3-A3-9008898 Terminals for Cables 37/0.2 to 80/0.4 mm
BR Drawing No. B3-A3-9008961 Terminals for Cables 80/0.4 to 276/0.4 mm
BR Drawing No. B3-A3-9008962 Terminals for Cables 396/0.4 to 2013/0.5 mm
BR Drawing No. B3-AO-9008963 Terminals for Cables 19/0.15 to 37/0.4 mm
BR Drawing No. B3-A3-9008964 Terminals for the Screen of Screened Cables

TOOLS AND MATERIALS

Crimping Tools/Dies as specified in Tables 1-10.
Terminals or Splices as specified in Tables 1-10.
Cable Strippers as specified.
Hydraulic fluid BR Cat 27/12920

SECTION 1 - CRIMPING PROCEDURE

1. Identification of Wire Size

1.1 Identify the cable to be crimped in Table 1 (metric) or Table 2 (imperial) and note the wire size and crimp table number.

2. Tool and Terminal Selection

2.1 Refer to the Table number given in Tables 1 or 2 and identify the required tool and terminal or splice according to the wire size and stud size.

3. Preparation of Tool

3.1 Hand Ratchet PIDG Tools (Figures 2 and 3) and Faston Tools (Figure 8).

3.1.1 Set the insulation crimping adjustment pin(s) to the No. 3 (loose) position.

3.1.2 Fit a terminal into the crimping tool. See Tables 3, 6 or 7 for crimp details.

3.1.3 Insert a piece of unstripped cable into the insulation portion of the terminal barrel.

3.1.4 Crimp the cable and remove the cable and terminal from the tool.

3.1.5 Check the insulation support by bending the cable back and forth once. If the insulation barrel of the crimp does not retain a grip on the cable discard the crimp and repeat paras 3.1.2 - 3.1.4 with the insulation crimping adjustment pins(s) in the No. 2 position. If still unsatisfactory repeat paras 3.1.2 - 3.1.4 with the pins(s) in the No. 1 (tight) position. If still unsatisfactory change the tool.

3.2 Hand Hydraulic PIDG Tools (Figure 4)

3.2.1 Remove the latch pin and open the yoke.

3.2.2 Check that the dies have the correct colour code as shown in Table 3. If not proceed as follows:-

3.2.2.1 Loosen the yoke set screw and remove the stationary die.

3.2.2.2 Close the valve (if necessary) by turning the reservoir handle clockwise. Advance the ram until the set screw is visible.

3.2.2.3 Release the set screw in the ram and remove the moving die.

3.2.2.4 Loosen the socket head cap screws on the dies to be fitted.

3.2.2.5 Fit the dies and tighten the two set screws, in the ram and the yoke.

3.2.2.6 Open the valve by turning the reservoir handle anti-clockwise by 1/4 turn or lifting the release lever.

3.2.3 Close the yoke and insert the latch pin.

3.2.4 Loosen the socket head cap screws and push the pin key in. This sets the insulation crimp to the 'loose' setting.

3.2.5 Press and hold the insulation die against the pin key and tighten the socket head cap screws.

3.2.6 Repeat 3.2.3-3.2.4 for other die.

3.2.7 Place a terminal in the dies as shown in Figure 4. Advance the ram until the terminal is held in position.

3.2.8 Fit an unstripped length of cable into the insulation barrel portion of the terminal.

3.2.9 Crimp the cable and remove the cable and terminal from the tool.

3.2.10 Check the insulation support by bending the cable back and forth once. If the insulation barrel of the terminal does not retain a grip on the cable (which will pull out) reset the insulation crimp to 'medium' (pin key in central position) and repeat test. If still unsatisfactory reset insulation crimp to 'tight' (pin key fully out) and repeat test. If still unsatisfactory change the tool.

3.3 Hand Hydraulic Indenter Tool (Figure 6)

3.3.1 Press the latch and open the crimping head.

3.3.2 Pull back the nest lock lever and rotate the thumb knob until the correct size nest is in position. The nest is identified by a wire size stamp.

3.3.3 Release the nest lock lever and check that the nest is locked in position.

3.3.4 Close the crimping head.

3.4 Hydraulic Tool (Figure 7)

3.4.1 Check that the crimping head, pump and hose are securely connected. If they are loose or have been disturbed, check the hydraulic fluid level and top up if lower than the bottom of the filler plug thread.

3.4.2 Check that the correct code dies for the wire size (see Table 5) are fitted with the code letters opposite each other . If incorrect remove the two split pins, withdraw the dies, fit the correct dies and refit the split pins.

3.5 Hand Ratchet Termashield Tool (Figure 9)

3.5.1 Check that the correct colour code dies are fitted. (See Table 8). To change the dies proceed as follows:-

3.5.1.1 Remove the female die retaining pin.

3.5.1.2 Close handles until male die retaining screw is visible.

3.5.1.3 Turn the male die retaining screw until the screw slot is vertical.

3.5.1.4 Slide both dies upwards and remove the female die from the top of the tool. Remove the male die.

3.5.1.5 Fit the correct colour code dies in reverse order ensuring that the colour coded grooves are at the front. Fit the female die retaining pin and turn the male die retaining screw until the screw slot is horizontal.

4. Stripping of Insulation/Sheath

4.1 Cut the cable to the required length.

4.2 Faston Terminals

4.2.1 Place an insulating boot (if required) over the cable.

4.3 Unscreened Cables

4.3.1 Obtain the stripping length from the appropriate Table (Tables 3-7 and 9).

4.3.2 Strip the insulation as follows:-

Wire Sizes 26-16 : Stripping Tool 39/63643
Wire Sizes 14-10 : Stripping Tool 39/63642
Cables 37/0.2, 37/0.4 : Stripping Tool 39/63687
using the correct nest in the blade.

Use a knife for other sizes, taking care not to cut any conductors.

4.3.3 Remove any wrapping tape and/or identification cotton from the stripped conductors.

4.4 Screened Cables (Figure 9)

4.4.1 Strip back the outer sheath to give the desired length of centre core plus 10-15 mm.

4.4.2 Cut round the screen to leave the desired length of centre core using sharp wire cutters or nail scissors.

4.4.3 Push the screen back slightly and bell the end out.

4.4.4 Strip the insulation from the screen tail by 10-15 mm.

4.4.5 Remove any identification cotton or filler cores.

5. Crimping

5.1 Select the required terminal from the appropriate Table.

5.2 Hand Ratchet Tools for PIDG (Figures 2 and 3).

5.2.1 Close the handles until the ratchet releases then open the handles.

5.2.2 Place the terminal in the appropriate crimping die with the terminal barrel touching the locator.

5.2.3 Close the handles until the terminal is held in place.

5.2.4 Insert the stripped cable fully into the terminal barrel ensuring that no strands are excluded.

5.2.5 Close the handles until the ratchet releases.

5.2.6 Open the handles and remove the crimped cable and terminal.

5.3 Hand Hydraulic PIDG Tools (Figure 4)

5.3.1 Remove the latch pin and open the yoke.

5.3.2 Place the terminal in the dies with the brazed seam of the terminal barrel facing the moving die and against the stop plate.

5.3.3 Close the yoke and insert the latch pin.

5.3.4 Close the valve if necessary and pump the handle until the terminal is held in place.

5.3.5 Insert the stripped cable fully into the terminal barrel ensuring that no strands are excluded.

5.3.6 Pump the handle until the pressure releases. Do not open the handles more than 90°.

5.3.7 Open the hydraulic valve by lifting the release lever or by turning the reservoir handle 1/4 turn clockwise (whichever is fitted) until the ram is retracted fully.

5.3.8 Withdraw the latch pin, open the yoke and remove the crimped cable and terminal.

5.4 Hand Indenter Tool (Figure 5)

5.4.1 Close the tool handles until the ratchet releases then open the handles.

5.4.2 Place the 12-10 terminal in the 12-10 crimping jaws with the brazed seam on the barrel towards the indenter.

5.4.3 Close the handles until the terminal is held in place.

5.4.4 Insert the stripped cable fully into the terminal barrel ensuring that no strands are excluded.

5.4.5 Close the handles until the ratchet releases.

5.4.6 Open the handles and remove the crimped cable and terminal.

5.5 Hand Hydraulic Indenter Tool (Figure 6)

5.5.1 Place the terminal centrally in the nest with the brazed seam of the terminal barrel facing the indenter.

5.5.2 Close the valve by turning it or the reservoir handle clockwise (whichever is fitted).

5.5.3 Pump the handle until the terminal is held in place.

5.5.4 Insert the stripped cable fully into the terminal barrel ensuring that no strands are excluded.

5.5.5 Pump the handle until the pressure releases. Do not open the handles by more than 90°.

5.5.6 Open the valve by lifting the release lever or turning the reservoir handle 1/4 turn clockwise (whichever is fitted) until the ram retracts fully.

5.5.7 Press the latch, open the head and remove the crimped cable and terminal

5.6 Hydraulic Tool (Figure 7)

5.6.1 Place the terminal barrel centrally between the dies and with the tongue parallel with the dies.

5.6.2 Advance the ram until the terminal is held in place.

5.6.3 Insert the stripped cable fully into the terminal barrel ensuring that no strands are excluded. Slide in any packing wire(s) indicated in Table 2, cut to the cable stripping length.

5.6.4 Advance the ram until the pressure relief valve opens and the die faces meet (denoted by a relaxation in pressure).

5.6.5 Retard the ram and remove the crimped cable and terminal.

5.6.6 The palm of the crimp may be bent once to facilitate connection within the tolerances given in Figure 1.

5.7 Faston Tools (Figure 8)

5.7.1 Close the handles until the ratchet releases then open the handles.

5.7.2 Place the terminal in the appropriate crimping jaw with the open part facing the indenter (the indenter has the jaw identification stamped above it) and the end of the insulation barrel flush with the edge of the jaw.

5.7.3 Close the handles until the terminal is held in place squarely and symmetrically.

5.7.4 Insert the stripped cable into the terminal barrel ensuring no strands are excluded.

5.7.5 Close the handles until the ratchet releases.

5.7.6 Open the handles and remove the crimped cable and terminal.

5.8 Termashield Tool (Figure 9)

5.8.1 Slide the ferrule over the centre core allowing the screen to pass around and over the support sleeve. Ensure that the screen is visible through the screen inspection hole.

5.8.2 Insert the screen tail into the ferrule until it touches the back (this can be seen through the screen tail inspection hole). Check that the screen tail insulation is clear of the ferrule skirt.

5.8.3 Close the tool handles until the ratchet releases then open the handles.

5.8.4 Holding the tool with the colour coded grooves to the front, place the ferrule, cable and screen tail assembly into the dies fully. Align the screen tail inspection hole with the colour coded grooves.

5.8.5 Close the handles until the ratchet releases.

5.8.6 Open the handles and remove the crimped assembly.

5.8.7 Check that the screen and the screen tail are still in position by viewing through the inspection holes. Reterminate if defective.

5.8.8 Slide the insulating cap over the ferrule until the locking tabs engage behind the ferrule skirt.

5.9 Multi-pole Circular Connector Terminal Tool (Figure 10)

5.9.1 Close the tool handles until the ratchet releases then open the handles.

5.9.2 Select a male or female contact positioner as required (Table 9).

5.9.3 Fit the contact positioner as follows:

5.9.3.1 Slide down the catch behind the die.

5.9.3.2 Pull down the spring-loaded catch on the die handle.

5.9.3.3 Fit the contact positioner into the 'D' recess behind the die.

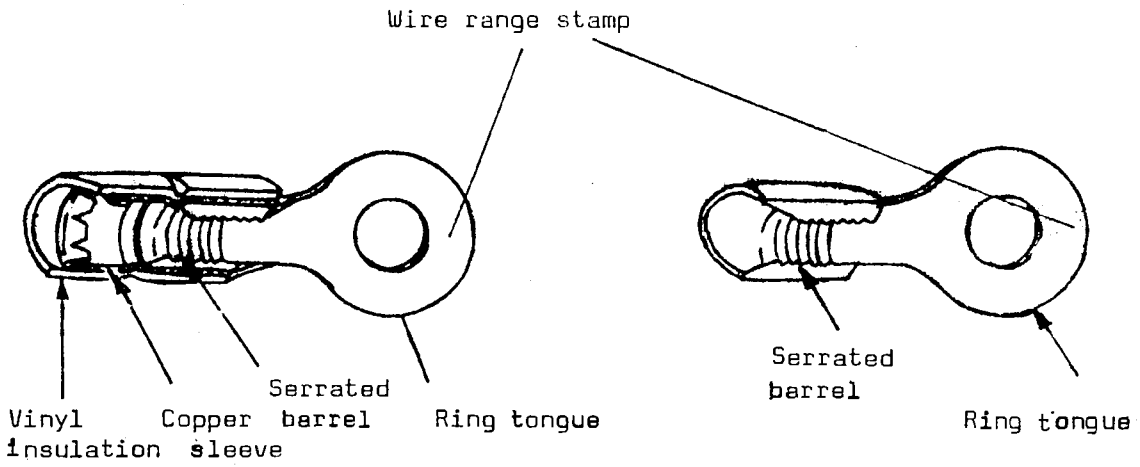
5.9.3.4 Release the spring-loaded catch. Slide up the catch behind the die ensuring that it covers the 'D' section of the contact positioner.

5.9.4 Fit the wire into the contact using a crimp barrel adaptor if indicated in Table 9.

5.9.5 Push the contact through the die and into the contact positioner.

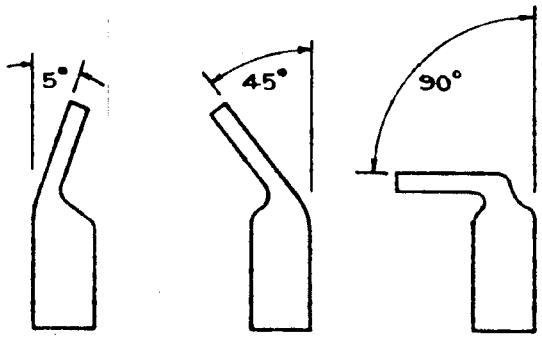
5.9.6 Close the handles until the ratchet releases.

5.9.7 Open the handles and remove the crimped cable and contact assembly.



Typical PIDG Terminal

Typical Non-Insulated Terminal



Uninsulated Hexagonal Grip Terminals

Note: 5^{o} and 90^{o} types can be bent $\pm$ 15^{o} from nominal
45^{o} types can be bent $\pm$ 30^{o} from nominal.

Figure 1 - Details of Terminals

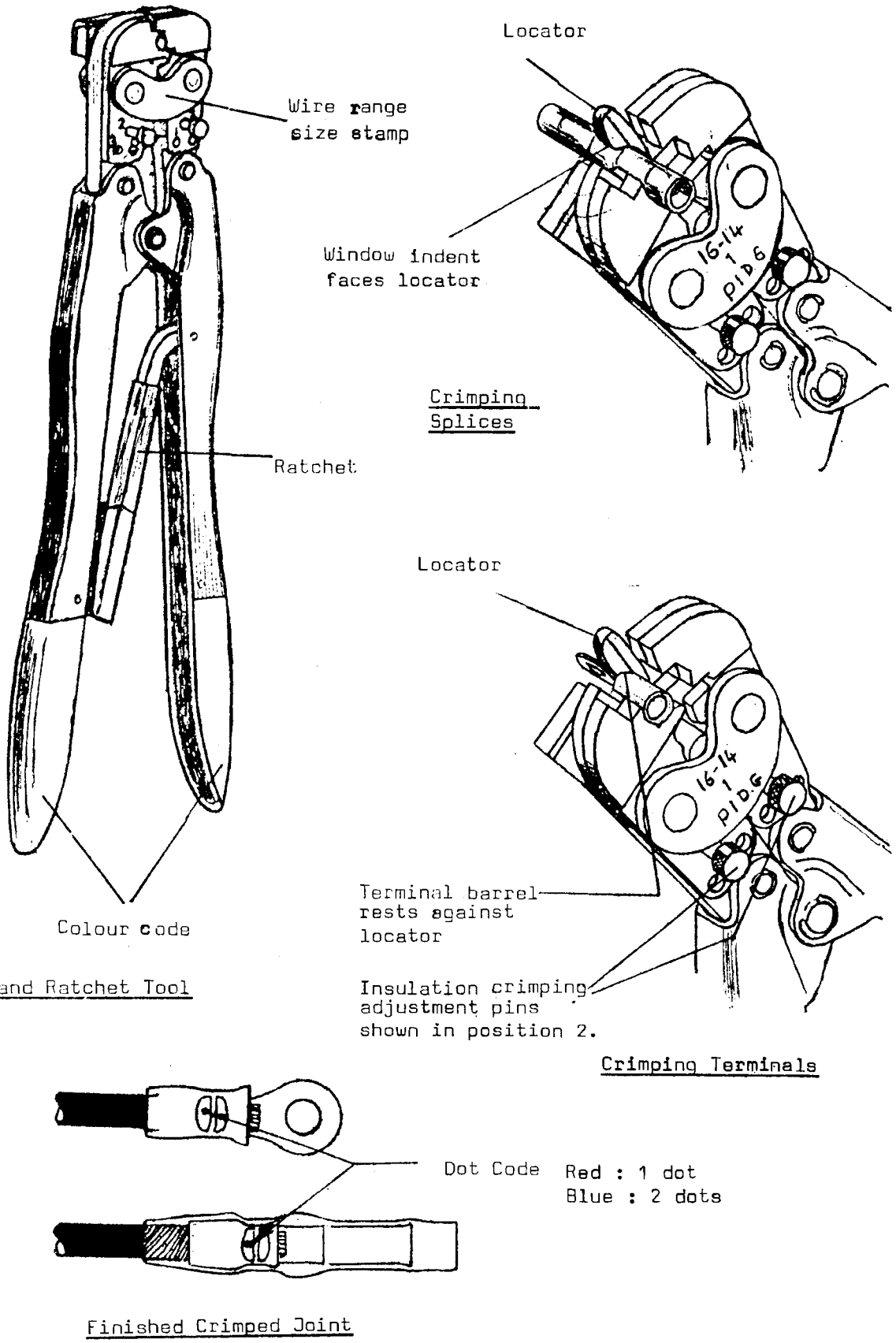
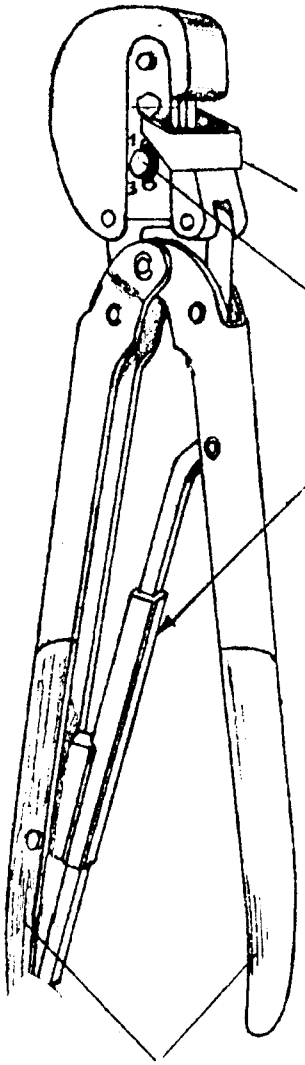
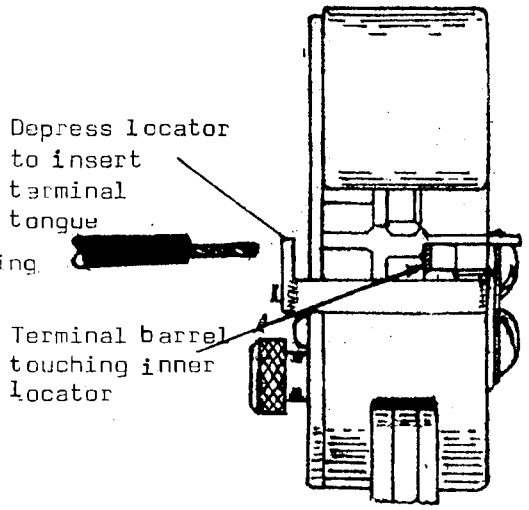


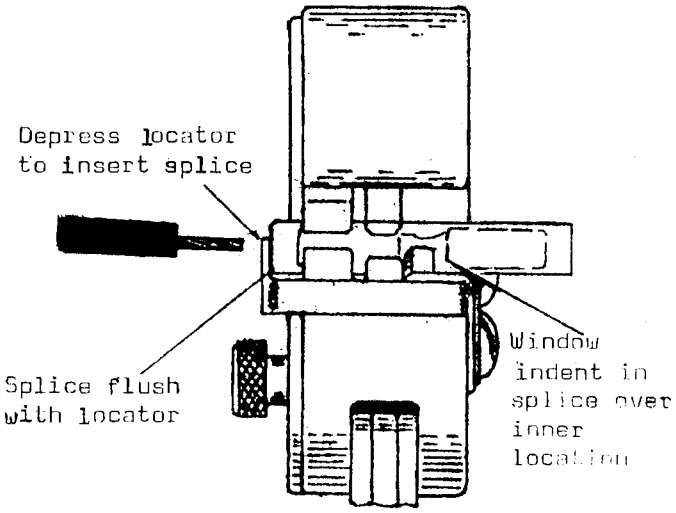
Figure 2 - Hand Ratchet PIDG Tools : BR Cat No. 39/8123 & 8126



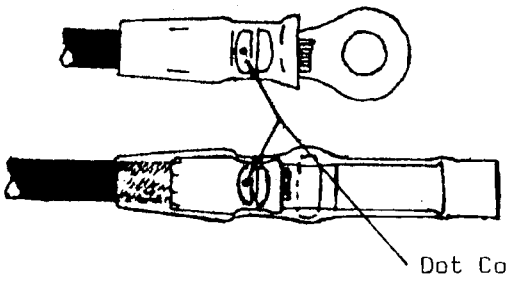
Hand Ratchet Tool



Crimping Terminals



Crimping Splices



Finished Crimped Joints

Figure 3 - Hand Ratchet PIDG Tools : BR Cat No. 39/8127 & 8146

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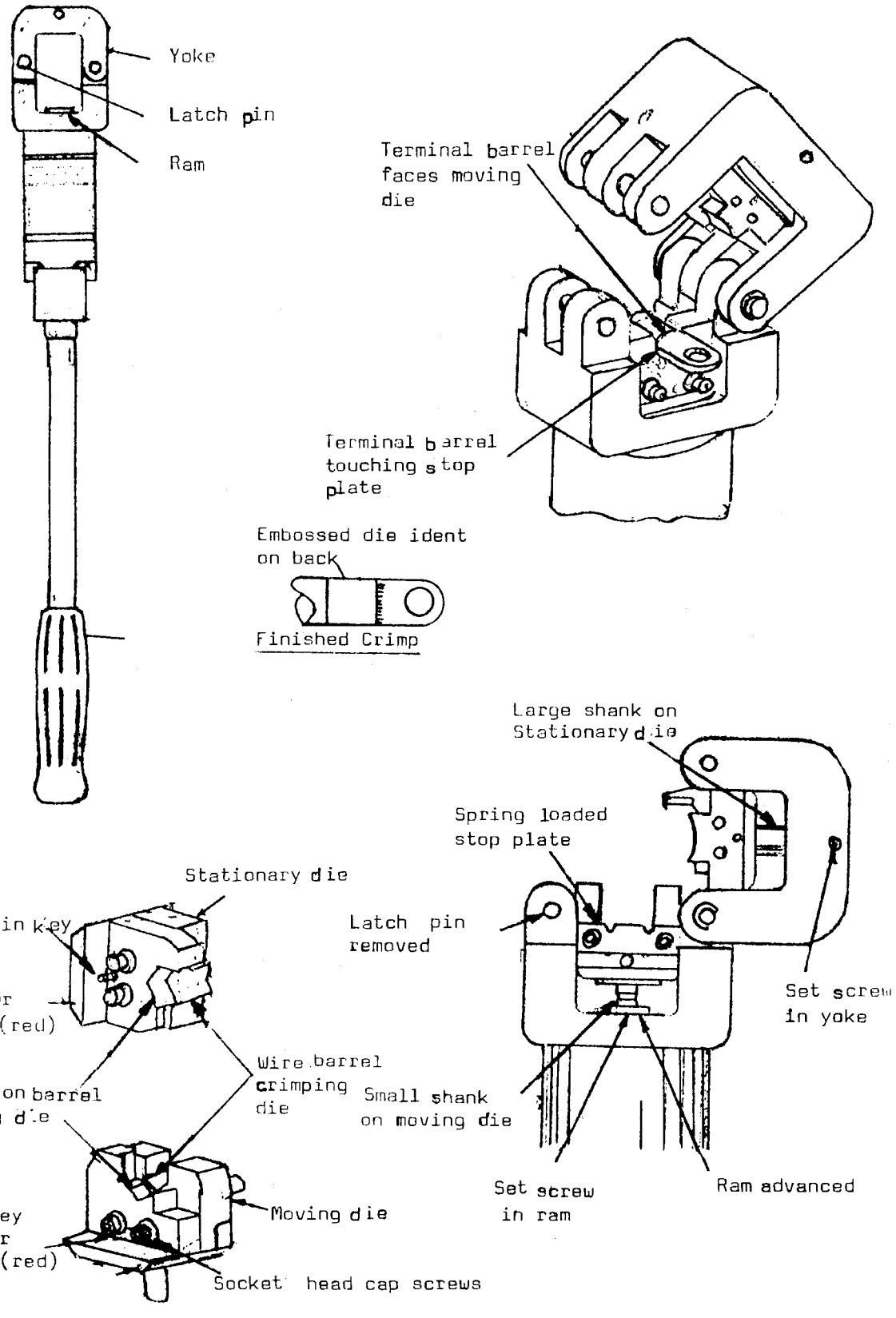
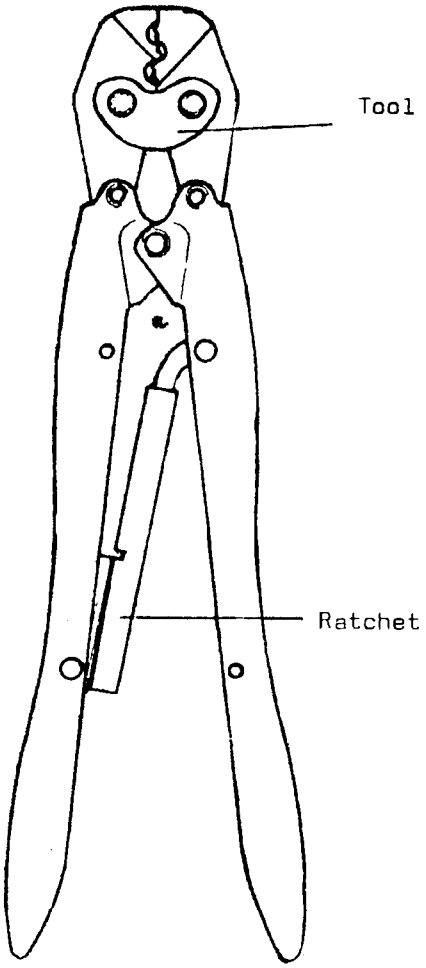
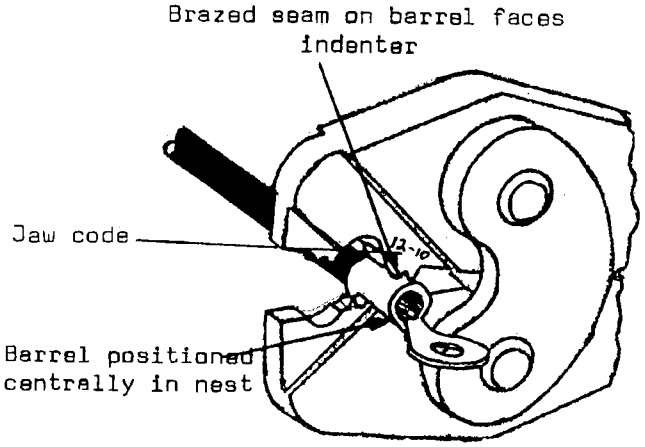
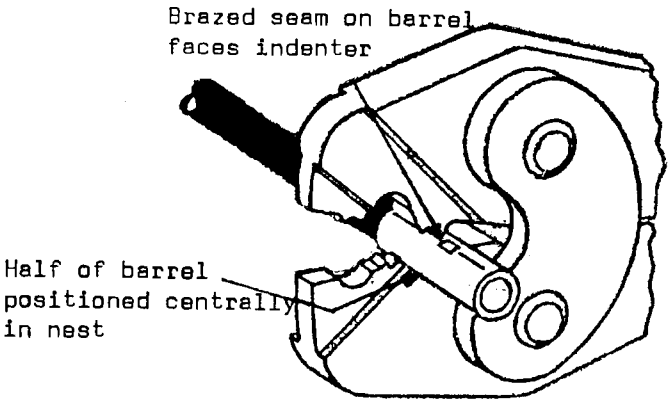


Figure 4 – Hand Hydraulic PIDG Tool : BR Cat. No. 39/8147 and die set 39/8144

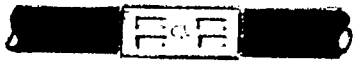




Crimping Terminals



Crimping Splices



Finished crimped joints

Figure 5 - Hand Indenter Tool 39/8133

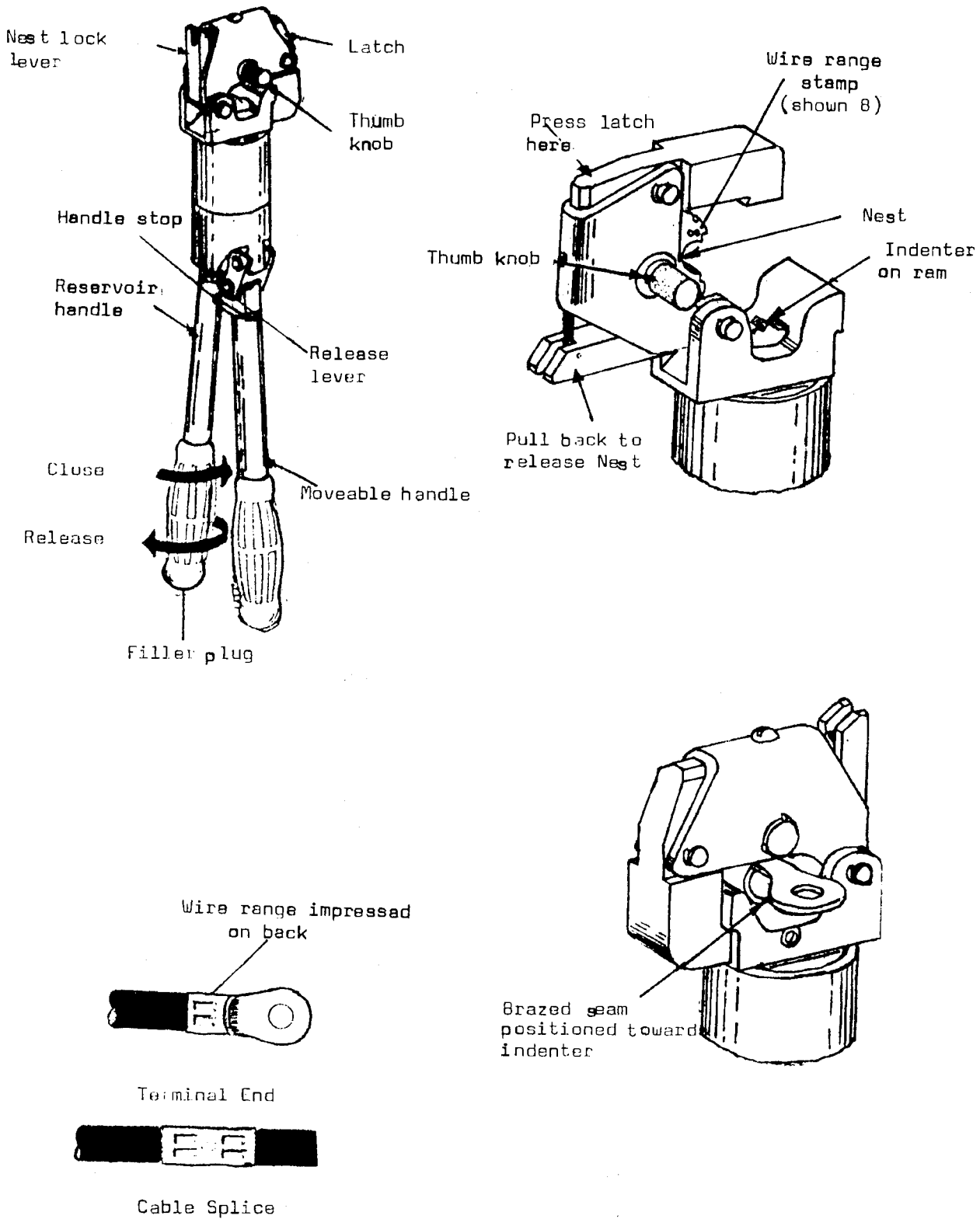


Figure 6 - Hand Hydraulic Indenter Tool 39/8206

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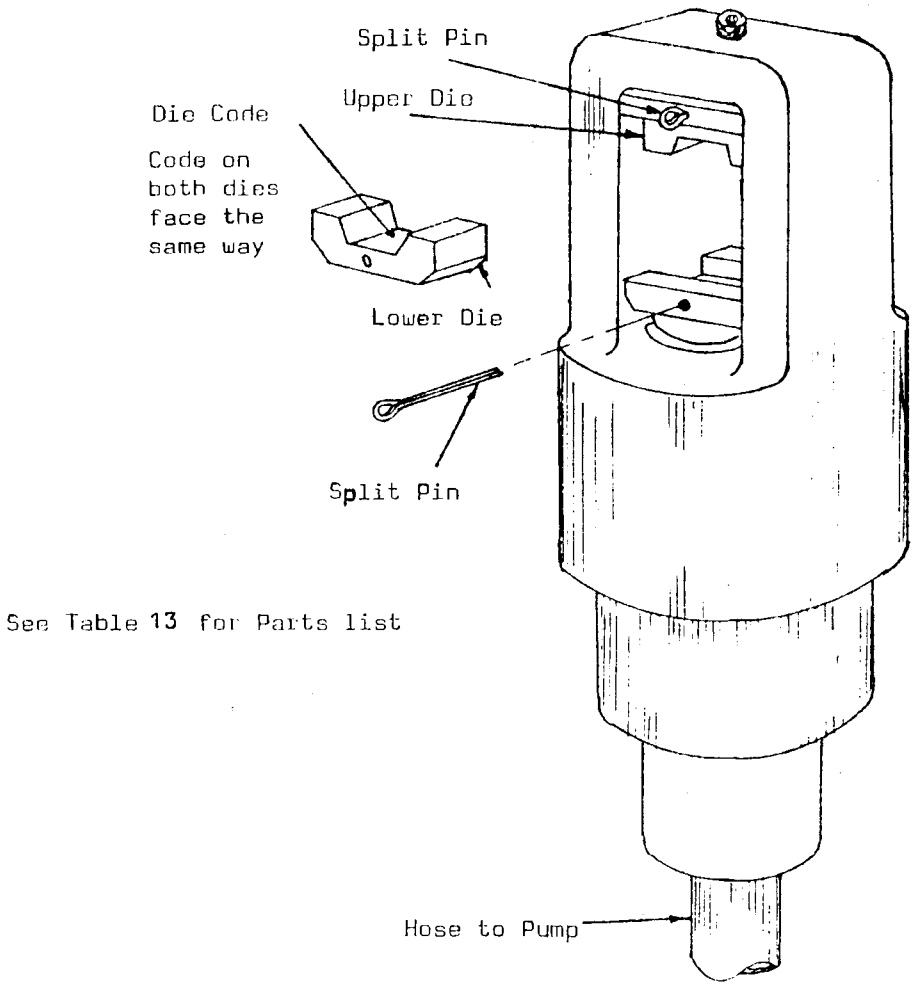

See Table 13 for Parts list

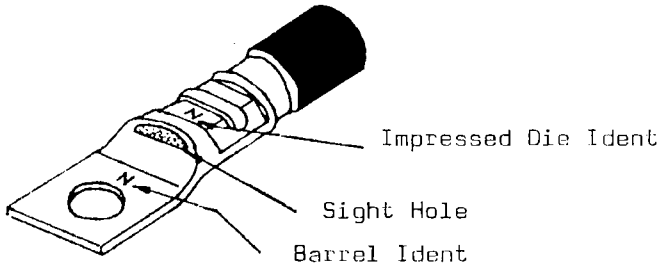

Figure 7 - UHG Hydraulic Tool

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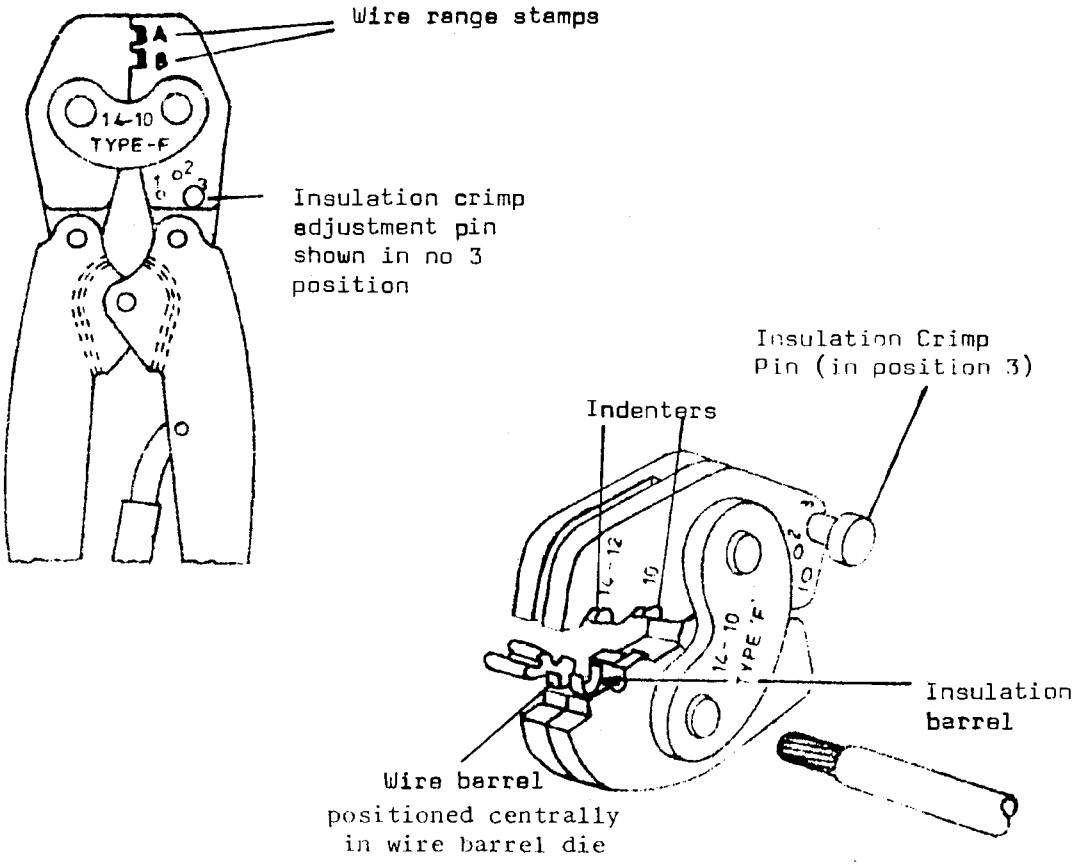

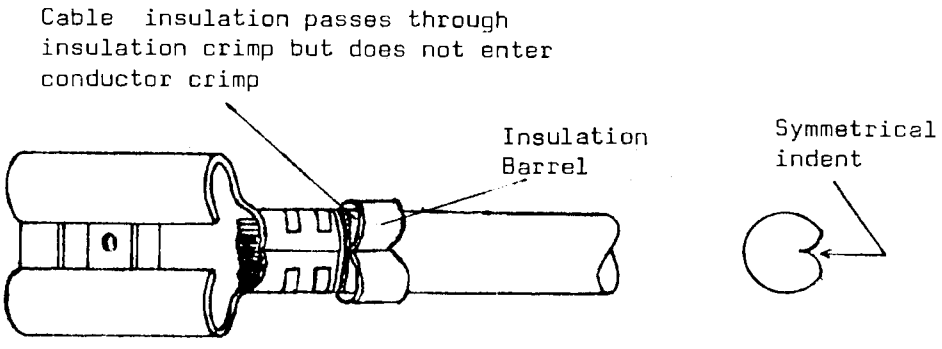

Finished Crimped Joint

Figure 8 - Faston Tool 39/8256, 8258 and 8266

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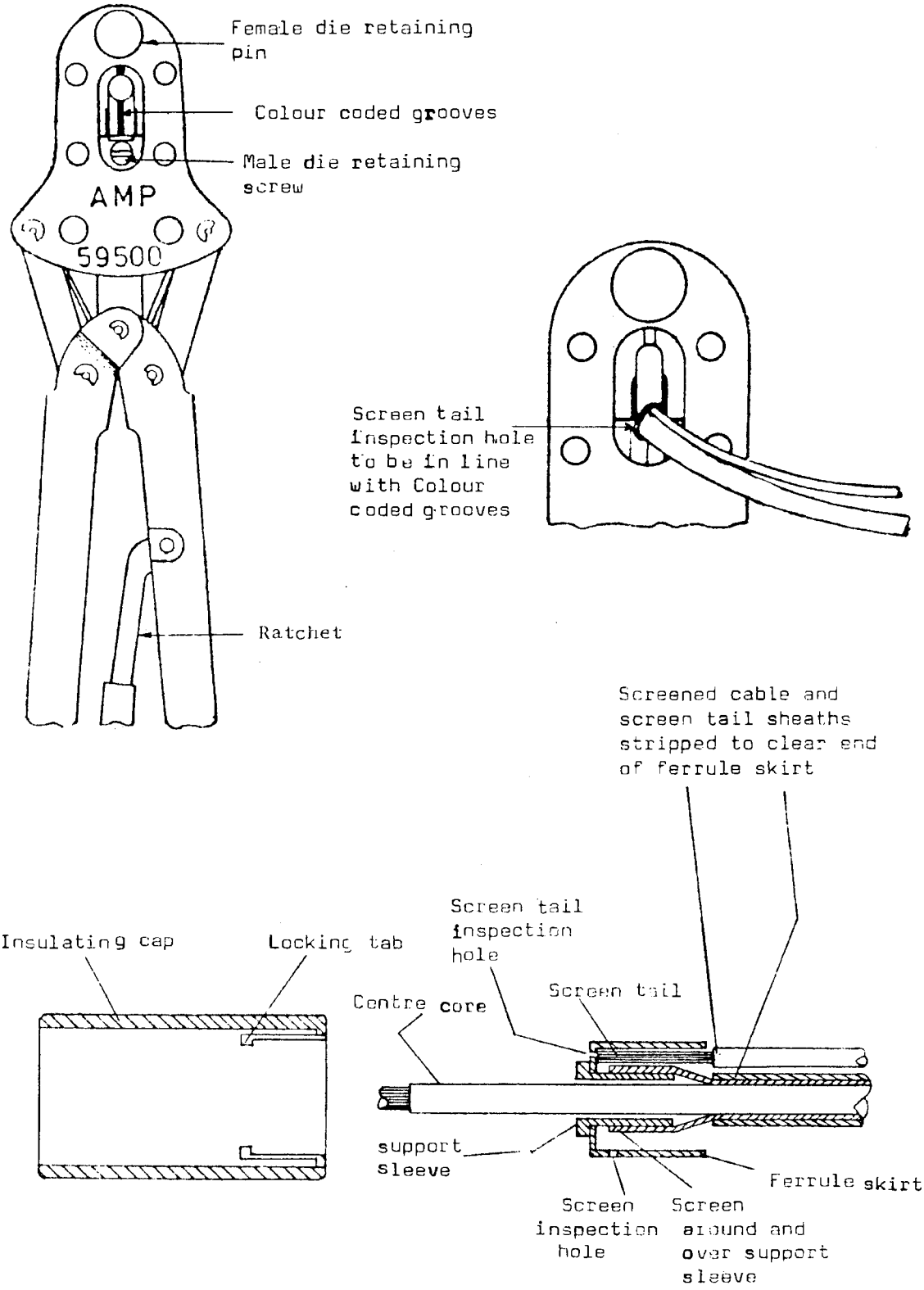

Figure 9 Termashield Tool 39/8288 and Die Set 39/8289

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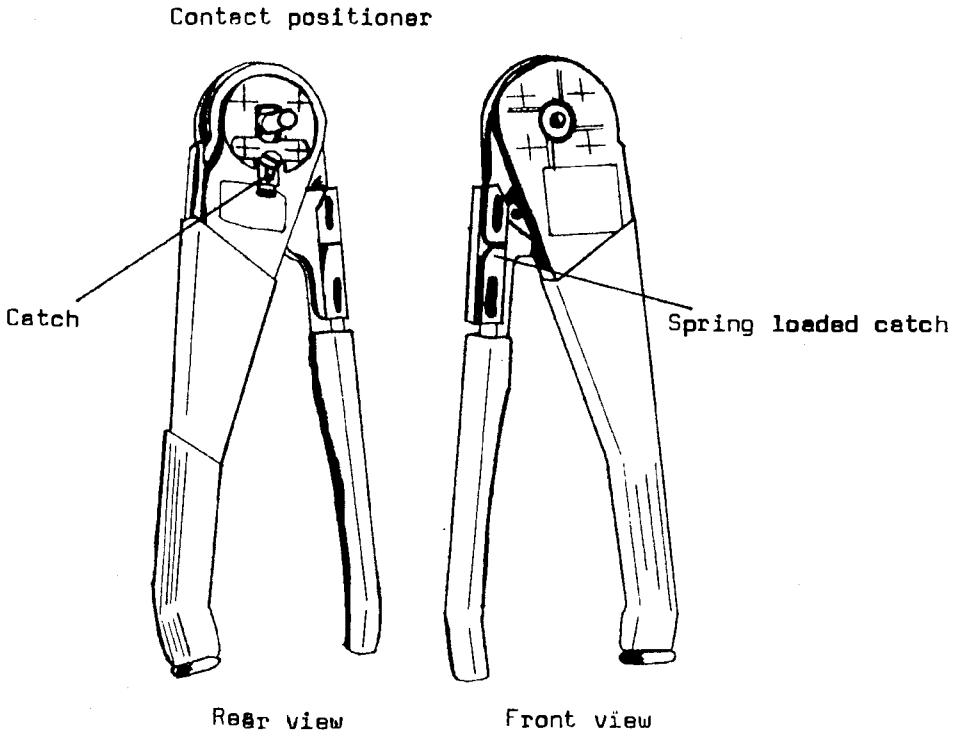


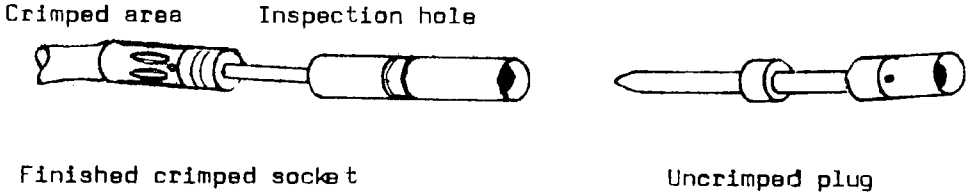
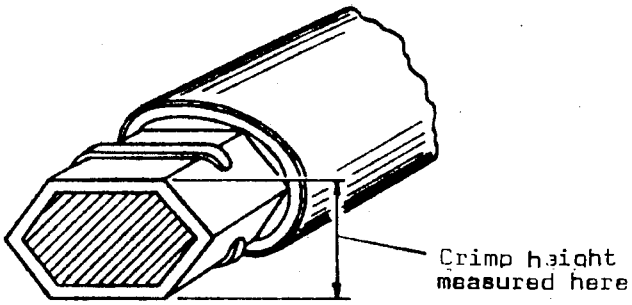


Figure 10 - Circular Connector Tool 39/8366



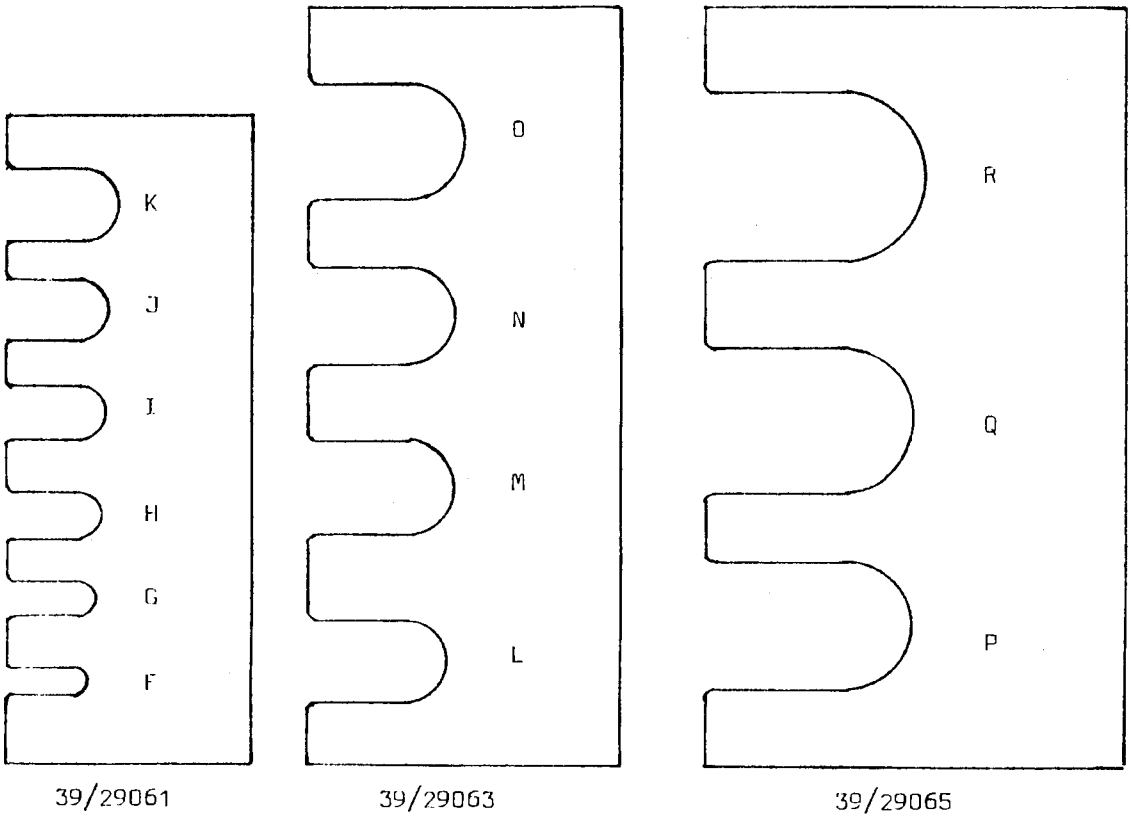


Figure 11 - Go Gauges for Uninsulated Hexagon Grip Crimps

SECTION 2 - TEST SPECIFICATION

The following checks are to be carried out as follows:

Small batches - 100% inspection
Large batches -in accordance with BS 6001.

1. Check that the correct size terminal has been used for the wire size. See Tables 1-10.

2. Check that the correct die code has been impressed on the crimp. See Figures 2-6 and Table 11.

3. Tongued Terminals

   3.1 Check that the correct stud size has been fitted.

   3.2 Check that the conductors protrude past the crimped area but do not foul the termination.

4 Splices

   4.1 Check that all conductors protrude into the window.

5. Uninsulated Hexagon Grip Terminals (Figure 9)

   5.1 Check the crimp height with the appropriate go gauge.

6. Faston Terminals (Figure 8)

   6.1 Check that the bared conductors are visible either side of the wire barrel area.

   6.2 Check that the crimp is axially symmetrical.

   6.3 Check that the insulation protrudes past the insulation barrel.

SECTION 3 - TECHNICAL DATA

Table 1 - Wire Sizes and Crimp Ranges for Metric Cables

Cable Cat No. (6/)	Conductors No. (mm)	Wire Size	Crimp Range Table No.	Cable Voltage Range (V)	Cable Type
112001 112002 112010-19 112054* 146703* 151785* 152503*	19/0.15	22	6	600	Cables for Electronic Equipment to TDE/74/P/74
112005-6 112020 112021* 112022-29 112031* 112061* 12070-72 146700* 150782* 151790* 152002* 152505*	19/0.2	20		1000	
112030 112032-39 112041 112057* 146707* 152507*	19/0.3	16			
112040 112042-49 112050	37/0.4	10			

* See TDE77/R/34 for screen termination.

Cable Cat No. (6/)	Conductors No. (mm)	Wire Size	Crimp Range Table No.	Cable Voltage Range (V)	Cable Type
110950	37/0.2	16-14(1)	3	1900-3300	Metric Cables to TDE76/P/16
110960	37/0.25	16-14 HD(2)			
110970	37/0.3				
110980	37/0.4	12-10			
110990	61/0.4	8			
111000	80/0.4 (3)				
111010	126/0.4	6	4		
111020	196/0.4	4			
111030	276/0.4	2			
111040	396/0.4	J	5		
111050	360/0.5	K			
111060	475/0.5	L			
111070	608/0.5	M			
111080	756/0.5	N			
111090	925/0.5	O			
111100	1221/0.5	P			
111110	1525/0.5	Q			
111120	2013/0.5	R			
101365 101366 141005 150325 152040	32/0.2	16-14	3 or 7	300/500	Metric BRB/ LAMA cables to RIA Recs 7 & 11
101600 101602 141228 156250		16-14HD		300/500	
104800 104801	30/0.25			600/1000	

(1) 22-16 may be used if there are space restrictions.
(2) Use 16-14 if cable will not be supported within 15 mm of terminal.
(3) Table 4 may also be used.

Cable Cat No.	Conductors No. (mm)	Wire Size	Crimp Range Table No.	Cable Voltage Range (V)	Cable Type
6/101900 6/101901 6/101930* 6/154220 6/155020	50/0.25(4)	16-14 HD	3 OR	300/500	
6/105192 6/152480 6/153145		14-10	7	600/1000	
6/100153	19/0.335	16-14	10		Nickel plated cable to BS G-210 type C
22/42347	10/0.019	16-14	10		Nickel wire to BS 3075
6/121350	50/0.25	12-10	4	1900/3300	
6/102200 6/102201	56/0.3	12-10	3	300/500	Metric BRB LAMA Cables to RIA Recs 7 & 11
6/105600				600/1000	
6/102400 6/102401	84/0.3	12-10		300/500	
6/105950				600/1000 P	
6/142155				600/1000	
6/102800 6/102801	80.0.4	8		300/500	
6/106870				600/1000	
6/121400				1900/3300P	
6/103030 6/103031	126/0.4	6	4	300/500	
6/108155 6/151375				600/1000	
6/121680				1900/3300	
6/108500	196/0.4	4		600/1000 P	
6/108504				300/500 P	
6/108790	276/0.4	2		600/1000 P	
6/188800				300/500 P	

P - Protected Installation.
* - See Also Table 8 For Screen termination.
(4) Note that wire size for Faston terminals is different to PIDG.

Table 1 (Cont'd)

Cable Cat No. (6/)	Conductors No. (mm)	Wire Size	Crimp Range Table No.	Cable Voltage Range (V)	Cable Type
108790 (5)	276/0.4	2	4	600/1000 P	
188800				300/500 P	
109028	396/0.4	J		600/1000 P	
109040				600/1000 E	
109330				600/1000 P	
109346	360/0.5	K		1900/3300P	
122505				1900/3300E	Metric BRB
109580				600/1000P	LAMA cables
109585	475/0.5	L		1900/3300P	to RIA Recs
122810		L(6)		1900/3300E	7 & 11
109680				600/1000 P	
109685	608/0.5	M		1900/3300P	
123105				1900/3300E	
109900			5	600/1000P	
109990	756/0.5	N		1900/3300P	
123295				1900/3300E	
110200				600/1000P	
110205	925/0.5	O		1900/3300P	
143455				600/1000E	
110380				600/1000P	
110385	1221/0.5	P		600/1000E	
123805				1900/3300E	
110450	1525/0.5	Q		1900/3300P	
123965				1900/3300E	
110510	2013/0.5	R		1900/3300P	
124155				1900/3300E	

P = Protected Installation
E = Exposed Installation

(5) Class 86/1, 87/0 and 87/1 transformer primary return and earth cables are to be terminated as follows:

1. Strip insulation 22-23 mm
2. Fit a 22 mm length of 12 mm o.d. copper tube over the bared conductors.
3. Fit a size K terminal in accordance with Table 5.

(6) Use wire size K for 19.05 Ø thimbles for ETH end boxes.

Table 2 - Wire Sizes and Crimp Ranges for Imperial Cables

Cable BR Cat (6/)	Conductors No. (mm)	Wire Size	Crimp Range Table No.	Cable Voltage Range (V)	Cable Type
5942	7/0.018	22-16	3 or 7	250/440	Imperial BRB/LAMA cables to RIA Recs 7 & 11
4944					
5937	16/0.012		3		
49145	28/0.012	16-14 HD			
5935				660/1100	
5936			3 or 7	250/440	
5952					
5941-2	7/0.029	12-10	3	250/440	
5943					
70135					
70550					
6253				660/1100	
5945	19/0.018			250/440	
5949				660/1100	
6600	110/0.0076			250	
6605					
5934	97/0.012	8		250/440	
5971				660/1100	
5969				1900/3300	
5938	60/0.018	8	4	250/440	
5939					
5947				660/1100	
5961				1900/3300	
5948	91/0.018	6		660/1100	
5962				1900/3300	
69385	296/0.0076			660	
5946	117/0.018	4		6600/1100	
5963				1900/3300	
5951	163/0.018	2		660/1100	
5964				1900/3300	
5955	248/0.018			660/1100	
5966				1900/3300	

Table 2 (Cont'd)

Cable BR Cat (6/)	Conductors No. (mm)	Wire Size	Crimp Range Table No.	Cable Voltage Range (V)	Cable Type
5956	416/0.018	K	5	660/1100	Imperial LAMA Cables to TDE76/P/40
5978				1900/3300	
4600				1900/3300F	
5950	160/0.029			660/1000	
5965					
5957	610/0.018	M + 2 packing wires(1)		1900/3300	
5983				1900/3300F	
4605				660/1100	
5954	235/0.029			1900/3300	
5967				660/1100	
5958	810/0.018	N + 3 packing wires(1)		660/1100	
5990				660/1100	
6140				660/1100	
4610				660/1100	
5959	312/0.029			1900/3300	
5970					
4574	392/0.029	O		660/1100	
5975				1900/3300	
4575	1017/0.018			660/1100F	
4615				1900/3300F	
4577	481/0.029	P + 3 packing wires(1)		660/1100	
5980				1900/3300	
4580	1248/0.018			660/1100F	
4620				1900/3300F	
4582	646/0.029	Q + 3 packing wires(1)		660/1100	
5984				1900/3300	
4585	1677/0.018			660/1100F	
4625				1900/3300F	
5985	792/0.029	Q		1900/3300	
4590	2057/0.018			660/1100F	
4630				1900/3300F	
5995	940/0.029	R		1900/3300	
4612				1900/3300F	

F = Flexible
(1) Packing wire 1.8 mm dia: BR cat 22/17302 or 17362.

Table 3 - PIDG Terminals

Wire Size	22-16	16-14	16-14 HD	12-10	8
Tool Colour Code	Red	Blue	Black and Yellow	Black and Yellow	Red die set
Tool BR Cat	39/8126	39/8123	39/8127	39/8127	39/8147 (1)
Cable Stripping Length (mm)					
Ring Tongue	5-6	5-6	6-7	6-7	8-9
Splice	6-7	6-7	8-9	8-9	10-11
BR Cat Nos For Stud Sizes (54/)					
M3 6BA	119375	119360 (3)	119565	119536	
M4 4BA	119381	119362	119566	119403	119380
M5 2BA	119387	119364	119567	119457	119576
M6 0BA	119391	119369 (4)	119568	119537	119577
M8 5/16"	119343	119377	119570	119538	119578
M10 3/8"	119349	119378	119572	119552	119395
M12 1/2"		119379	119574	119540	119579
Splices (5)	119352 (2)	119478 (2,6)	(6)	119442 (2)	
Wire Pin	119342	119344		119345	
Shur Plug		17208(7)			
Shur Receptacle		17469(7)			

(1) Use Die 39/8144
(2) See Table 7 for Faston tabs and receptacles.
(3) Use 54/119361 if a narrower palm is required.
(4) Use 54/119366 if a shorter, wider palm is required.
(5) Only to be used in accordance with WOSS 560/3.
(6) Cables to BR Cat 6/101600 and 101901 may exceed the i.d. of the splice insulation, in which case Faston terminals are to be used (see Note 2).
(7) Remove locator from tool when crimping these items.

Table 4 - Indenter Terminals

Wire Size	12-10	8	6	4	2
Tool BR Cat	39/8133	39/8206	39/8206	39/8206	39/8206
Cable Stripping Length (mm)	6-7	8-9	9-10	11-12	13-14
BR Cat Nos. for Stud Sizes (54/)					
M5 2BA	119410	119415	119449		
M6 0BA	119418	119420	119455	119472	119492
M8 5/16"	119426	119423	119460	119476	119496
M10 3/8"	119407	119409	119463	119482	119501
M12 1/2"	119432	119431	119466	119486	119506
M16 5/8"		119438	119469	119488	119509
M20 3/4"					119512
Splices (1)	119215	119219	119223	119225	119229

(1) Only to be used in accordance with WOSS 560/3.

Table 5 - Uninsulated Hexagon Grip Terminals

Wire Size		J	K	L	M	N	O	P	Q	R
Die BR Cat (39/)		8177	8178	8179	8180	8181	1882	8183	8184	8186
Cable Stripping Length (mm)		23-24	23-24	27-28	27-28	27-28	31-32	31-32	37-38	37-38
BR Cat Nos for Stud Sizes (54/)										
M4	5°	120300	120400	120500	120600	120700	120800	120900	121000	121100
	45°	120302	120402	120502	120602	120702	120802			
	90°	120304	120404	120504		120704	120804			121104
M8	5°	120310	120410	120510	120610					
	45°		120412							
	90°		120414							
M10	5°	120320	120420	120520	120620	120710	120810	120910	121010	121110
	45°	120322	120422			120712			121002	
	90°	120324	120424	120524	120624	120714	120814		121004	
M12	5°	120330	120430	120530	120630	120720	120820	120920	121020	121120
	45°		120432	120532		120722	120822	120922	121022	
	90°	120334	120434	120534	120634	120724	120824	120924	121024	121124
M14	5°	120340	120440	120540	120640	120730	120830			
	45°		120442		120642					
M16	5°	120350	120450	120550	120650	120740	120840	120940	121040	121140
	45°		120452	120552			120842			
	90°	120354	120454						121044	
M18	5°				120660		120850			
	45°									121152
	90°						120854		121054	
M20	5°			120570	120670	120760	120860	120960	121060	121160
	45°								121062	121162
	90°						120864			
M23	5°									121170
M27	5°					120770				

Cont'd ..

Table 5 - Continued

Wire Size	J	K	L	M	N	O	R
Die BR Cat (39/)	8177	8178	8179	8180	8181	1882	8186
Cable Stripping Length (mm)	23-24	23-24	27-28	27-28	27-28	31-32	37-38
Splices (54/)	103496	103501	103506	103515	103520	103510	
Terminals with 2 stud holes (54/) 22 mm pitch M8					120707		
M10					120716	120813	
25.4 mm pitch M10							121116
32 mm pitch M10		120476					
63.5 mm pitch M16							121145
Thimbles 18.5 Ø 54 mm long			17946				
19.05 Ø 54 mm long		120470					
73 mm long		120475					
25.4 Ø 69 mm long		17945	17947				

Table 6 - Restricted Entry PIDG Terminals

Wire Size		22-20	16	10
Tool Colour Code		Red	Blue	Yellow & Black
Tool BR Cat		39/8126	39/8123	39/8127
Cable Stripping Length (mm)		6-7	6-7	9-10
Crimp Sleeve Colour		Red	Blue	Yellow
Crimp Band Colour		Red	Blue	Brown
BR Cat Nos for Stud Sizes (54/)	M3	119521	119520	
	M4	119522	119532	119542
	M5	119523	119533	119543
	M6	119524	119534	119544

Table 7 - Faston Terminals

Wire Size	22-18		16-14		14-10
Cable Max O.D. (mm)	1.9	3.0	3.15	3.68	4.1
Tool BR Cat	39/8266	39/8256	39/8256	39/8256	39/8258
Tool Jaw	A	A	B	B	14-12
Cable Stripping length (mm)	6-7	6-7	6-7	6-7	7-8
BR Cat Nos(54/) for: Receptacle	119417	119419	119422	119422	119434
Receptacle Insulator	119459	119459	119459	119459	119459
Tab		119474	119446	119446	
Tab Insulator		119461	119461	119461	
Socket contact for fluorescent tube	119025				

Table 8 - Termashield Terminals

No. and dia of Wires	50/0.25
Nominal CSA (mm)	2.5
No. of Cores	1
Tool BR Cat	39/8288
Die Insert BR Cat	39/8289
Colour Code	Tin
Termashield Pack BR Cat	54/119505

Table 9 - Multi-pole Circular Connector Pins

Wire Size	16S	22	20	16	12
Crimp Barrel Adaptor (64/)		2137	2138		2298
Contact Wire Size	16S		16		12
Cable Stripping Length (mm)	6-7		6-7		8-9
Tool BR Cat (39/)	8366		8366		8366
Male Contact Positioner (39/) Female Contact Positioner (39/)	10875 10876		10873 10874		10878 10877
Male Contact (64/)	2108		2103		2295
Female Contact (64/)	2109		2104		2296

Table 10 High Temperature Rated Terminals

Wire Size	16-14	16-14
Tool BR Cat	39/19197	39/8256
Cable Stripping Length (mm)	5-6	6-7
BR Cat Nos for Stud Sizes (54/)		
M3.5	119590	-
M4	119591	-
M5	119593	-
M6	119592	-
Splice	119650	-
Faston Receptacle	-	73145
Faston Piggy-back	-	73150

Table 11 - Die Codes

Wire Size	Impressed Code
22-16	1 dot
16-14	2 dots
16-14HD	1 dot
12-10	1 dot
8	8
6	6
4	4
2	2
J	J
K	K
L	L
M	M
N	N
O	O
P	P
Q	Q
R	R

Table 12 - Tool Part Numbers

11.1 Stripping Tools

39/63642	Hellermann Ideal Stripmaster H35/13
39/63643	Hellermann Ideal Stripmaster H35/14
39/63687	Hellermann Ideal Stripmaster H35/5 with L4421 blade
39/63682	Hellermann Ideal Stripmaster H35/2
39/63684	Hellermann Ideal Stripmaster H35/1

11.2 Crimping Tools

39/8123	Amp 47387 or 525691
39/8126	Amp 47386 or 525690
39/8127	Amp 59239-4
39/8133	Amp 49935 or 525693
39/8144	Amp 48752-1 (die for 39/8147)
39/8146	Amp 59287
39/8147	Amp 69061
39/8206	Amp 69062
39/8256	Amp 575046-1
39/8258	Amp 90120
39/8266	Amp 90166-1
39/8288	Amp 59500
39/8289	Amp 45239-2
39/9366	Erma-Buchanan MS3191A
39/19197	Amp 46447

See Table 14 for Uninsulated Hexagon Grip Tools.

Table 13 - Crimp Part Numbers

BR Cat (54/)	Amp Part No.
17208	342168-1
17469	165400-1
73145	42468-1
73150	151937-9
119025	151359-1
119215	32151
119219	36906
119223	36886
119225	320238
119229	322246
119342	165142
119343	31895
119344	165046
119345	165049
119349	150072-1
119352	320559
119360	322234
119362	31902
119364	130094
119366	35274
119369	31906
119377	31907
119378	31909
119379	328850
119380	330600
119381	31886
119387	130008
119391	130046
119395	322004
119403	32543
119407	160038
119409	160056
119410	130191
119415	160013
119417	42731-2
119418	33458
119419	41969-2
119420	33461
119422	41729-2
119423	33462
119426	33459
119431	35664
119432	35135
119434	41829-1
119438	35665
119442	320570
119446	60006-2
119449	130552
119455	33465
119457	130167
119459	2-180930-5

BR Cat (54/)	Amp Part No.
119460	33466
119461	735093
119463	160032
119466	36808
119469	36809
119472	33469
119474	60141-2
119476	33470
119478	320562
119482	160075
119486	35668
119488	35669
119492	320138
119496	35183
119501	160002
119505	330293
119506	35185
119509	320754
119512	320756
119520	2-320561-3
119521	51863-3
119522	1-320551-3
119523	2-36153-4
119524	2-320571-4
119532	1-51864-0
119533	51864-7
119534	2-320563-3
119536	32542
119537	32545
119538	32546
119540	331468
119542	2-320568-3
119543	2-36161-4
119544	2-320569-6
119552	160138
119565	342060
119566	342061
119567	342062
119568	342063
119570	342064
119572	342065
119574	342066
119576	322128
119577	321669
119578	322003
119579	328463
119590	322805
119591	322694
119592	322733
119593	322695
119650	323794

Table 13 (Contd)

BR Cat (54/)	G Corner Part no
103496	LJ
103501	LK
103506	LL
103510	LO
103515	LM
103520	LN
120270	D116
120274	3D116
120300	DJ4
120302	2DJ4
120304	3DJ4
120310	DJ8
120320	DJ10
120322	2DJ10
120324	3DJ10
120330	WJ12
120334	3WJ12
120340	WJ14
120350	WJ16
120354	3WJ16
120400	DK4
120402	2DK4
120404	3DK4
120410	DK8
120412	2DK8
120414	3DK8
120420	DK10
120422	2DK10
120424	3DK10
120430	DK12
120432	2DK12
120434	3DK12
120440	DK14
120442	2DK14

BR Cat (54/)	G Corner Part no
120450	WK16
120452	2WK16
120454	3WK16
120470	TK/13-1
120475	TK/13-2
120476	DK10 3210
120500	DL4
120502	2DL4
120504	3DL4
120510	DL8
120502	DL10
120524	3DL10
120530	DL12
120532	2DL12
120534	3DL12
120540	DL14
120550	WL16
120552	2WL16
120570	WL20
120600	DM4
120602	2DM4
120610	DM8
120620	DM10
120624	3DM10
120630	DM12
120634	3DM12
120640	DM14
120642	2DM14
120650	DM16
120660	WM18
120670	WM20
120700	DN4
120702	2DN4

Table 13 (Cont'd)

BR Cat (54/)	G. Corner Part No.
120704	3DN4
120707	DN8/22/8
120710	DN10
120712	2DN10
120714	3DN10
120716	DN/2H/10
120720	DN12
120722	2DN12
120724	3DN12
120730	DN14
120740	DN16
120760	WN20
120770	WN27
120800	DO4
120802	2DO4
120804	3DO4
120810	DO10
120813	DO/2H/10
120814	3DO10
120820	DO12
120822	2DO12
120824	3DO12
120830	DO14
120832	2DO14
120834	3DO14
120840	DO16
120842	2DO16
120850	DO18
120854	3DO18
120860	DO20
120864	3DO20

BR Cat (54/)	G. Corner Part No.
120870	DO16
120900	DP4
120910	DP10
120920	DP12
120922	2DP12
120924	3DP12
120940	DP16
120960	DP20
121000	DQ4
121010	DQ10
121020	DQ12
121022	2DQ12
121024	3DQ12
121040	DQ16
121044	3DQ16
121054	3DQ18
121060	DQ20
121062	2DQ20
121100	DR4
121104	3DR4
121110	DR10
121116	DR/2H/10
121120	DR12
121124	3DR12
121140	DR16
121145	DR/2H/16
121152	2DR18
121160	DR20
121162	2DR20
121170	DR23

Table 14 - Uninsulated Hexagon Grip Tools

Item	BR Cat (39/)	G. Corner Cat
Press Max Size K	8316	K/12P
Press Max Size O	8317	O/25P
Press Max Size R	8318	R/35P
Pump, Hand Operated	43256	JHP
Pump, Foot Operated	8322	FHP
Pump, Air Operated	8323	LAHP
Pump, Electrically Operated	8326	EHP
Die J	8177	J
Die K	8178	K
Die L	8179	L
Die M	8180	M
Die N	8181	N
Die O	8182	O
Die P	8183	P
Die Q	8184	Q
Die R	8186	R
Hose with Connectors 2 m	8238	BO/500/2
Hose with Connectors 3 m	8239	BO/500/3
Hose Connector, Female	8098	BO/127
Hose Connector, Male	8099	BO/128
Top Die Holder, Max Size L	8231	TOPDH/L/12P
Top Die Holder, Max Size O	8232	TOPDH/O/25P
Top Die Holder, Max Size R	8233	TOPDH/R/35P
Bottom Die Holder, Max Size L	8266	BTMDH/L/12P
Bottom Die Holder, Max Size O	8227	BTMDH/O/25P
Bottom Die Holder, Max Size R	8228	BTMDH/R/35P