

**WOSS 560/5**

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**British Railways Board**

Director of Mechanical and Electrical Engineering

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**Crimping Tools**

WORKSHOP OVERHAUL STANDARD SPECIFICATION



REVISION RECORD

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

LOCOMOTIVES DMU's

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

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

EMU's

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

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 DESO	X
Mk 3a	X
Mk 3b	X
Mk 3 (HST)	X
Mk 3 SLE and SLEP	X
Non Passenger	X

# WORKSHOP OVERHAUL STANDARD SPECIFICATION 560/5

## CRIMPING TOOLS

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### INTRODUCTION

Repair and testing of crimping tools to this specification is to be carried out periodically, or if a crimped joint is found to be defective (see WOSS 560/4 Section 2). A record of each tool is to be kept detailing the date of examination, any defects found and action taken. The periodicity of examinations is to be based upon the frequency of tool use and the rate at which defects arise.

Tools which are found to be defective after repair and testing to this specification are to be sent to the following repair franchisees:

Ampliversal and G. Corner tools: British Rail Engineering Ltd,  
Holgate Road, York YO2 4DJ.

Erma tools: Erma Ltd,  
No 1 Stores, 152 Mount Pleasant,  
Alperton, Wembley HA0 1RS.

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REFERENCE DOCUMENTS

WOSS 501/1 Hot Water and Detergent Cleaning.  
WOSS 560/4 Crimped Joints for Cables.

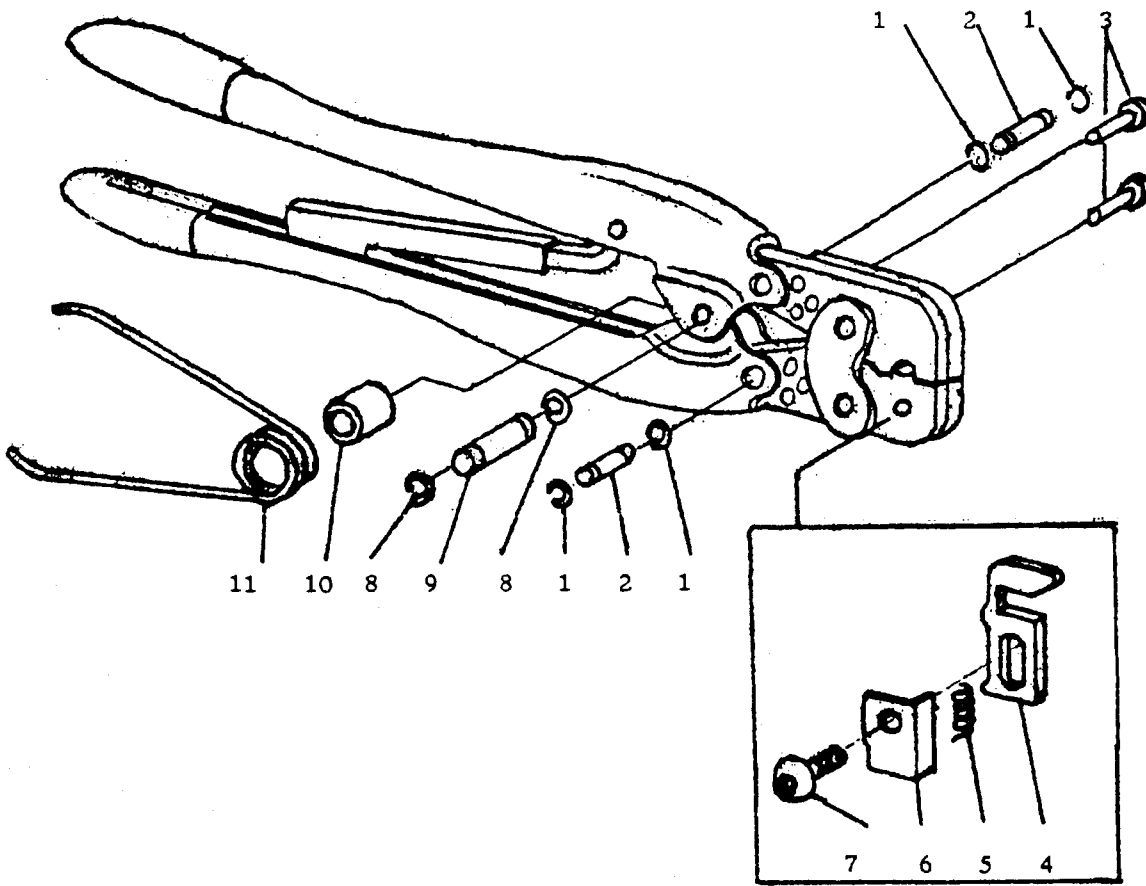
TOOLS AND MATERIALS	BR Cat No.
Lubricating Oil	27/20550 or 23240
Hydraulic Fluid	27/12920

SECTION 1 - REPAIR PROCEDURE (Figs 1-7)

1. Clean the tool in accordance with WOSS 501/1. Alternatively solvent may be used. Scrape off any impacted dirt from the die nests and die mating surfaces.
2. Examine the dies for chipped or flattened areas, cracks or pits. Reject the tool if any are present.
3. Renew any missing, fractured, worn or bent pins and retaining rings. See Figures 1-7 for spare parts. Do not attempt to change other parts. Reject the tool if the pin holes are worn.
4. Lightly oil the pivot pins and bearing surfaces. On tools fitted with a ratchet, open the handles fully and lubricate the exposed interior bar of the ratchet. Check that the ratchet does not release before the dies are fully bottomed.
5. Hand Hydraulic Tools
  - 5.1 Invert the tool and clamp the yoke in a soft-jawed vice with the handles vertical.
  - 5.2 Close the valve if necessary, pump the handles until the pressure releases and check for leaks. If the filler plug is leaking note the O ring (26) for renewal. Reject the tool if other leaks are evident.
  - 5.3 Close the handles and clip them together. Release the pressure and remove the filler plug.
  - 5.4 If the hydraulic fluid is below the bottom of the filler plug thread, proceed as follows.

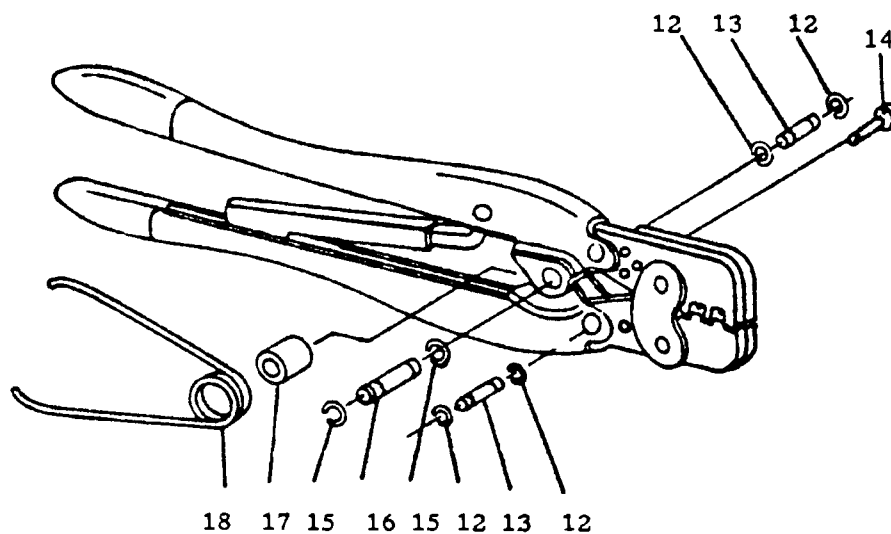
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- 5.4.1 Top up the fluid to the top of the filler plug thread.
- 5.4.2 Close the valve if necessary and pump the handle until the pressure releases.
- 5.4.3 Open the valve and check for bubbles emerging from the hydraulic fluid. If bubbles occur, repeat 5.3.1-5.3.4.
- 5.5 Refit the filler plug using a new O ring if defective.
- 5.6 Remove the tool from the vice.
- 6. Uninsulated Hexagon Grip Tools
  - 6.1 Examine hose and joints for leaks. Renew any defective items. See Table 3 for spares.
  - 6.2 Place the pump with the filler plug uppermost and remove the filler plug.
  - 6.3 Top up the hydraulic fluid if the level is not up to the bottom of the filler plug thread.
  - 6.4 Refit the filler plug.
- 7 PIDG Tools 39/8127 and 8146 (Figure 4)
  - 7.1 Check that the locator moves freely and returns under spring pressure. If defective adjust the number/thickness of shim washers.



<u>Item</u>	<u>Description</u>
1	Retaining Ring, Small
2	Retaining Pin, Small
3	Adjustment Pin
4	Locator
5	Spring
6	Locator Housing
7	Screw
8	Retaining Ring, Large
9	Retaining Pin, Large
10	Collar, Handle
11	Spring, Handle

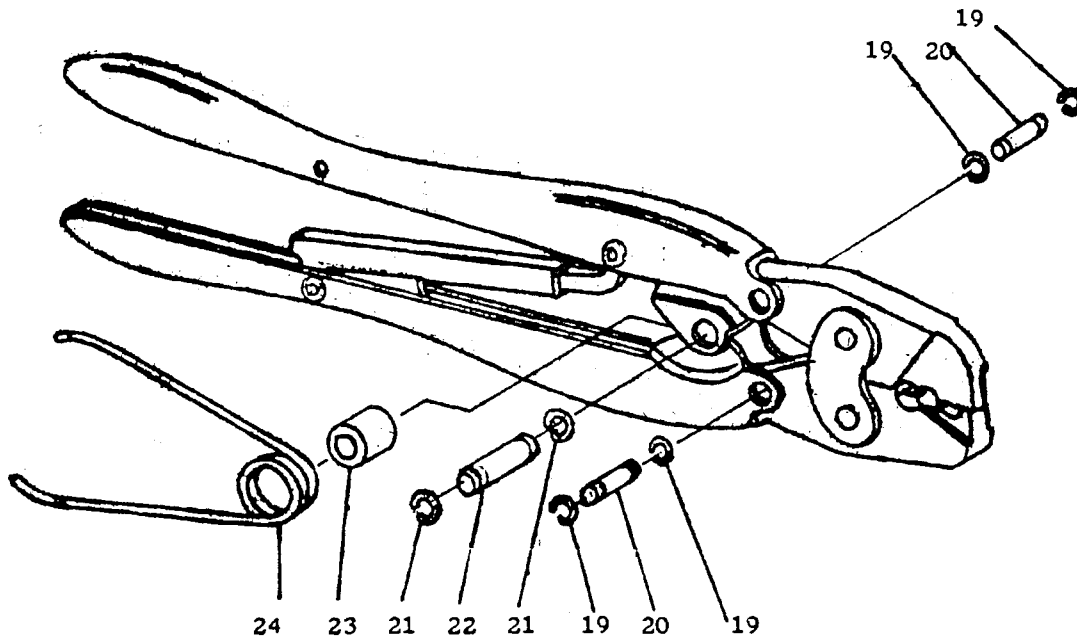
Fig 1 - Hand Ratchet PIDG Tools BR cat Nos. 39/8123 and 8126



<u>Item</u>	<u>Description</u>
12	Retaining Ring, Small
13	Retaining Pin, Small
14	Adjustment Pin
15	Retaining Ring, Large
16	Retaining Pin, Large
17	Collar, Handle
18	Spring, Handle

Fig 2  
Hand Ratchet Faston Tools BR Cat 39/8256, 8258 and 8266

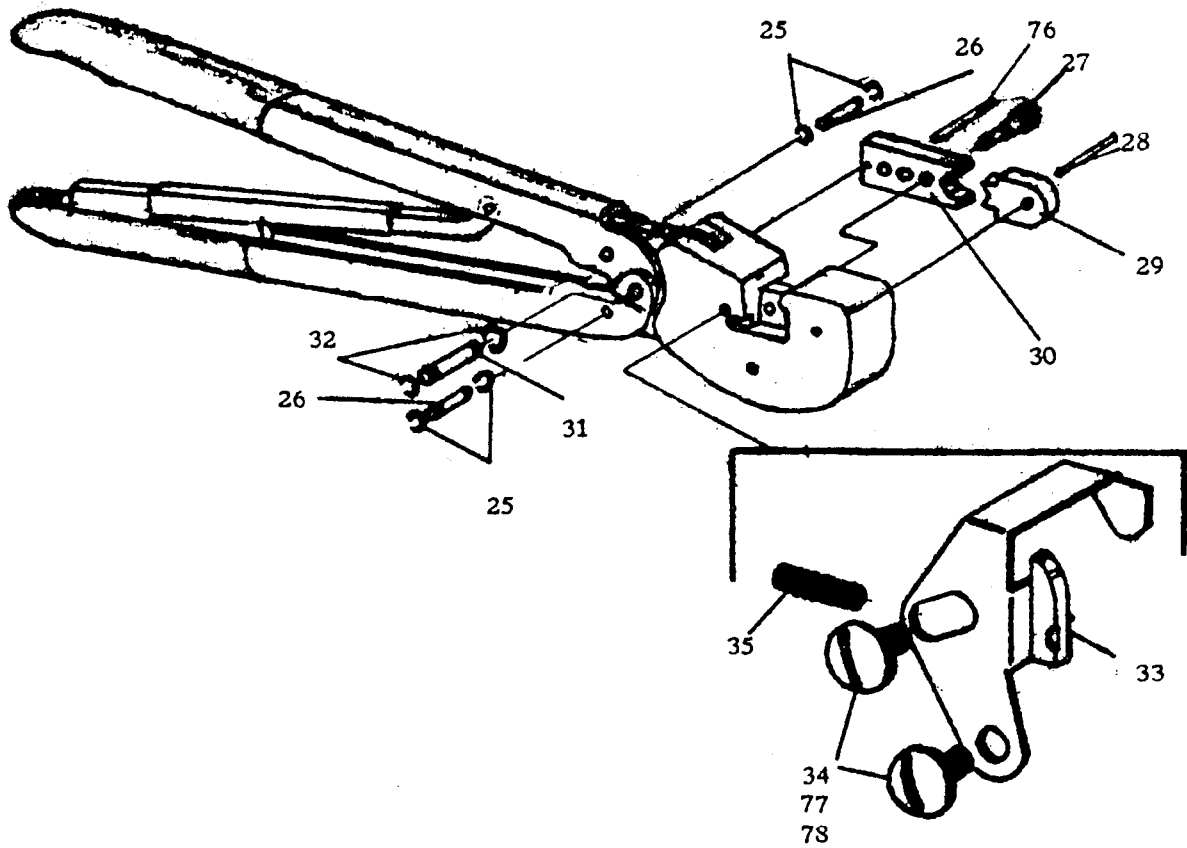




<u>Item</u>	<u>Description</u>
19	Retaining Ring, Small
20	Retaining Pin, Small
21	Retaining Ring, Large
22	Retaining Pin, Large
23	Collar
24	Handle Spring

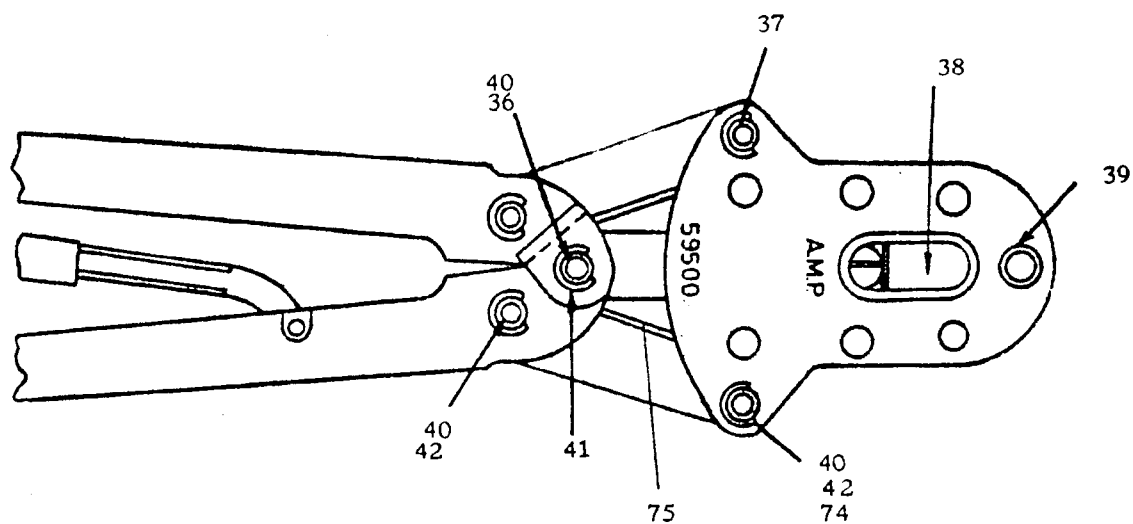
Fig 3 - Hand Ratchet Indenter Hand Tool 39/8133

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<u>Item</u>	<u>Description</u>
25	Retaining Ring, Small
26	Retaining Pin, Small
27	Adjustment Pin
28	Pin
29	Insulation Die (stationary)
30	Insulation Die (moving)
31	Retaining Pin, Large
32	Retaining Ring, Large
33	Locator
34	Screw
35	Spring
76	Pin
77	Shim (if required) 0.005"
78	Shim (if required) 0.003"

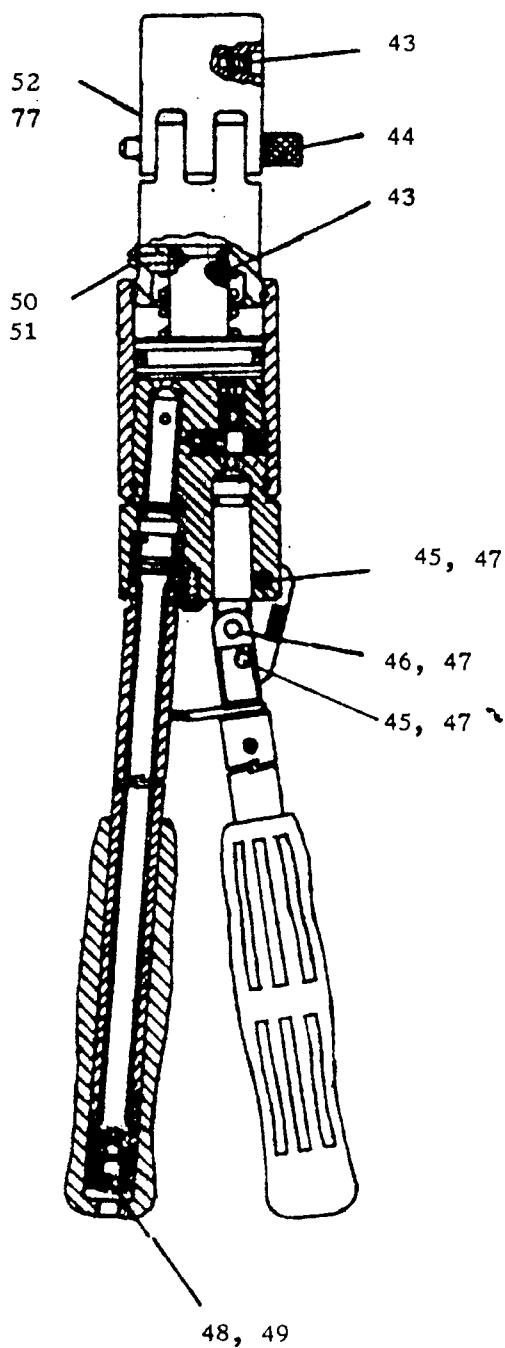
Fig 4 - Hand Ratchet PIDG Tool 39/8127 and 8146



<u>Item</u>	<u>Description</u>
36	Retaining Pin, Large
37	Retaining Pin
38	Die Set
39	Pin Assembly
40	Retaining Ring, Small
41	Retaining Ring, Large
42	Retaining Pin, Small
74	Spacer
75	Spring

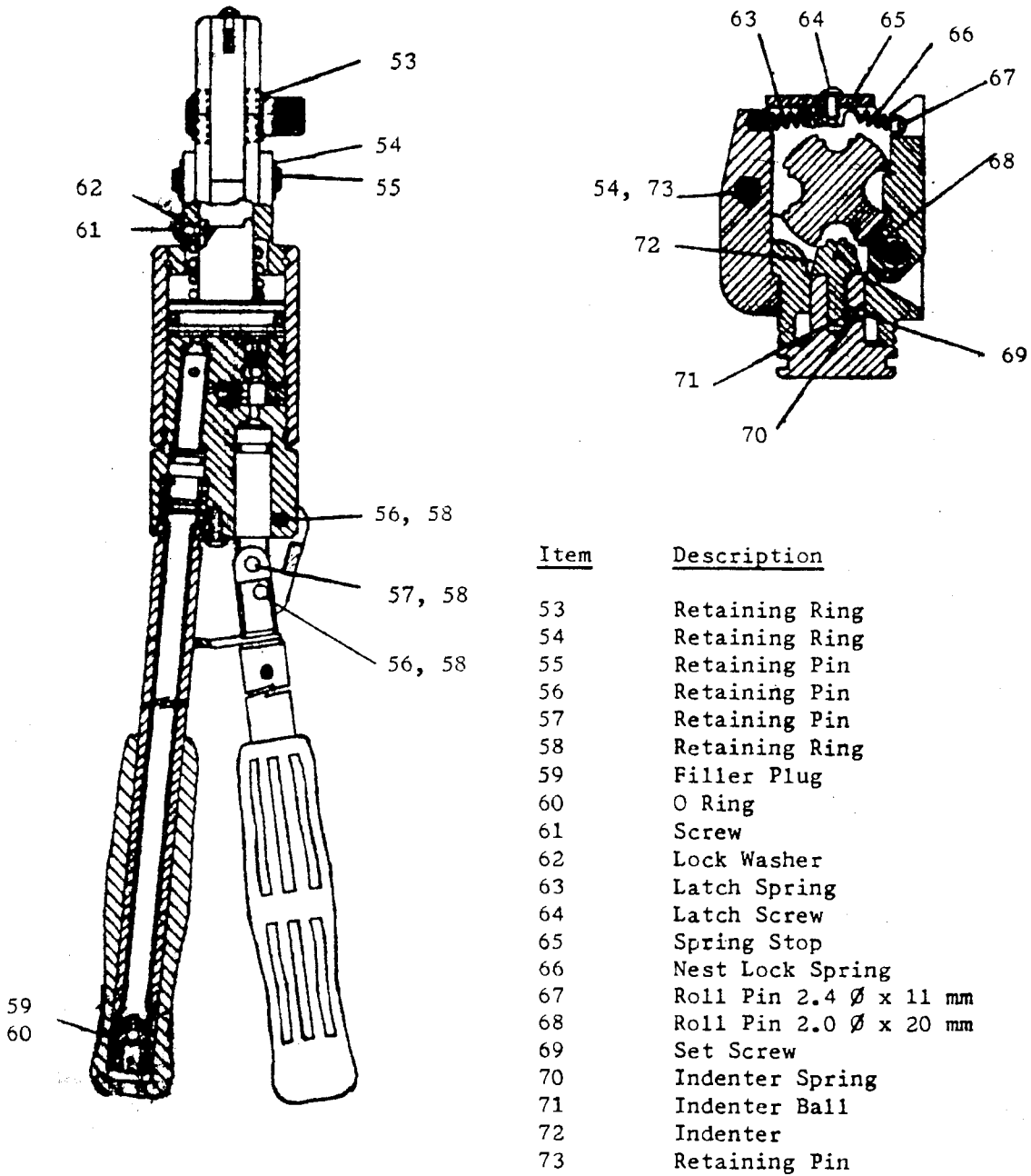
Fig 5 - Hand Ratchet Termashield Tool 39/8288

Issue 1  
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<u>Item</u>	<u>Description</u>
43	Set Screw
44	Latch Pin
45	Retaining Pin
46	Retaining Pin
47	Retaining Ring
48	Filler Plug
49	O Ring
50	Key Screw
51	Lock Washer
52	Retaining Ring, Large
77	Retaining Pin

Fig 6 - Hand Hydraulic PIDG Tool  
39/8147 and 8144 (with Die Set)



<u>Item</u>	<u>Description</u>
53	Retaining Ring
54	Retaining Ring
55	Retaining Pin
56	Retaining Pin
57	Retaining Pin
58	Retaining Ring
59	Filler Plug
60	O Ring
61	Screw
62	Lock Washer
63	Latch Spring
64	Latch Screw
65	Spring Stop
66	Nest Lock Spring
67	Roll Pin 2.4 $\varnothing$ x 11 mm
68	Roll Pin 2.0 $\varnothing$ x 20 mm
69	Set Screw
70	Indenter Spring
71	Indenter Ball
72	Indenter
73	Retaining Pin

Fig 7 - Hand Hydraulic Indenter Tool  
39/8206

SECTION 2 - TEST SPECIFICATION

1. Hand Ratchet PIDG Tools 39/8123, 8126, 8127 and 8146.
  - 1.1 Set the insulation grip pins to the No. 1 position.
  - 1.2 Close the handles fully.
  - 1.3 Using the gauges listed in Section 3 Table 1, check the conductor crimping die and the insulation support die nests. Reject the tool if either nest admits the 'No-Go' or does not admit the 'Go' portion of the appropriate gauge.
2. Hand Ratchet Indenter Tool 39/8133.
  - 2.1 Close the handles fully.
  - 2.2 Using the gauges listed in Table 1, check the die nest. Reject the tool if the nest fully admits the 'No-Go' or does not admit the 'Go' portion of the appropriate gauge.
  - 2.3 Repeat for each die nest.
3. Hand Ratchet Termashield Tool 39/8288 with Dies 39/8289
  - 3.1 Close the handles fully.
  - 3.2 Using the gauge listed in Table 1, check the die nest. Reject the tool if the die nest fully admits the 'No-Go' or does not admit the 'Go' portion of the gauge.
4. Hand Ratchet Faston Tools 39/8256, 8258 and 8266
  - 4.1 Set the insulation grip pins to the No 1 Position.
  - 4.2 Using a piece of lead wire (see Table 4) make a test crimp.
  - 4.2 Measure the crimp height using a vernier. Reject the tool if the crimp dimensions are not as given in Table 4.
  - 4.3 Repeat for each die nest.
5. Hand Hydraulic PIDG and Indenter Tools
  - 5.1 Pump the handles until the pressure releases.
  - 5.2 Using the gauges listed in Table 1, check the die nest. Reject the tool if the die must fully admits the 'No-Go' or does not admit the 'Go' portion of the gauge.
  - 5.3 Repeat for each die nest.

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6. Hand Ratchet PIDG Tools 39/8123, 8126, 8127 and 8146; Faston Tools 39/8156, 8258 and 8266; Indenter Tool 39/8133
  - 6.1 Make a test crimp using the largest wire size available (see WOSS 560/4 for list) but maintain the pressure on the handles after the ratchet releases.
  - 6.2 Reject the tool if a 0.08 mm feeler gauge can be inserted between the jaws.
  - 6.3 Release the handles and remove the crimp.
7. Hydraulic UHG Tools.
  - 7.1 Fit size J dies and make a test crimp.
  - 7.2 Check the crimp height using the appropriate 'Go' gauge (Figure 8).

If the gauge will not fit proceed as follows:-

    - 7.2.1 Refit the test crimp in the dies and operate the press.
    - 7.2.2 Measure the gap between the dies. Renew the dies if the gap is less than 0.03 mm. If greater than 0.03 reject the tool complete with pump.
  - 6.3 Repeat 6.1 - 6.2 using the K, L, M, N, O, P, Q and R dies.
7. Circular Connector Tool 39/9366 (Figure 9)
  - 7.1 Using a gauge kit 39/28017 proceed as follows:
  - 7.2 Fit the gauge positioner to the tool.
  - 7.3 Close the handles fully.
  - 7.4 Reject the tool if the dies do not admit the 'Go' or admit the 'No-Go' portion of the gauge.

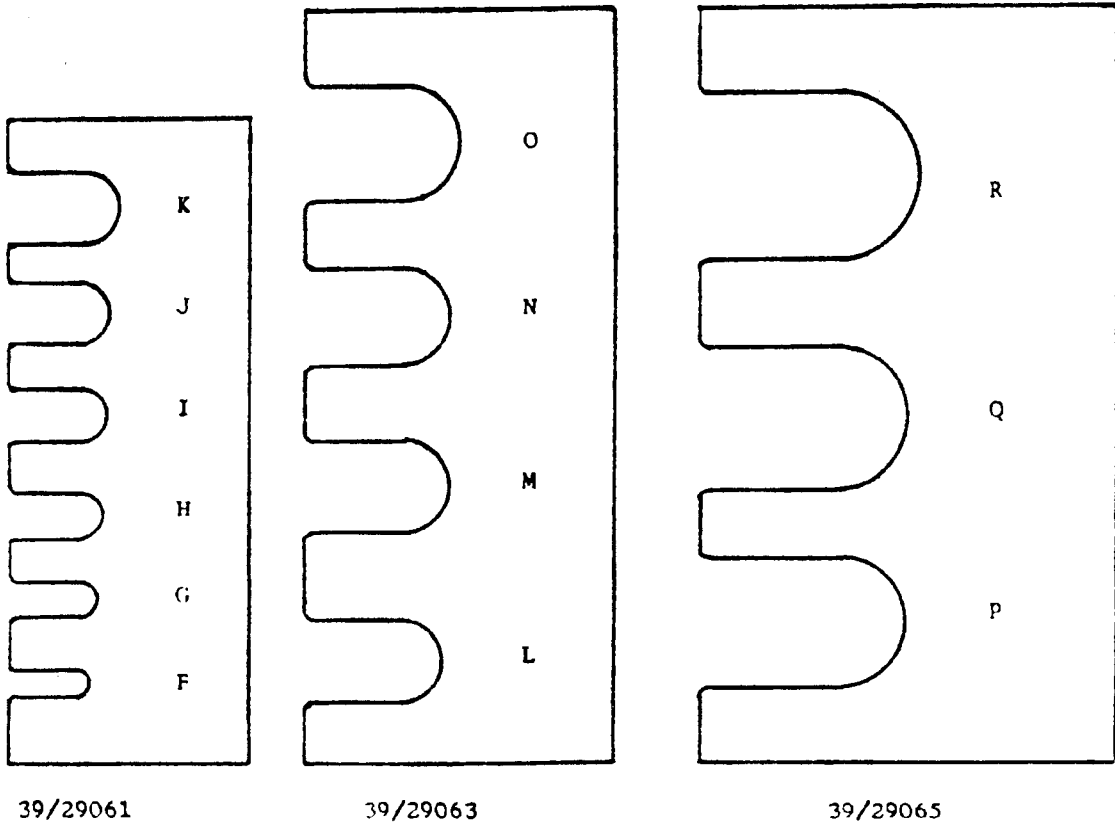
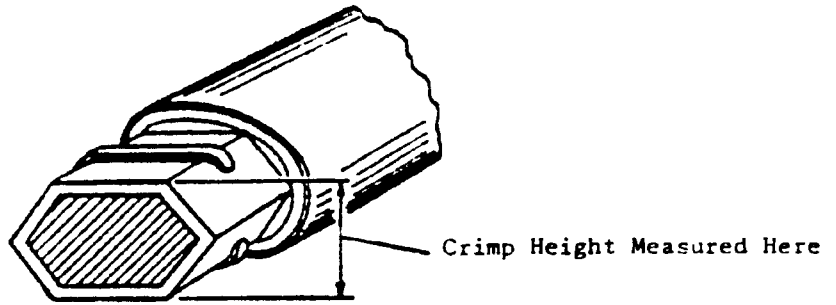


Fig 8 - Gauges for UHG Crimps



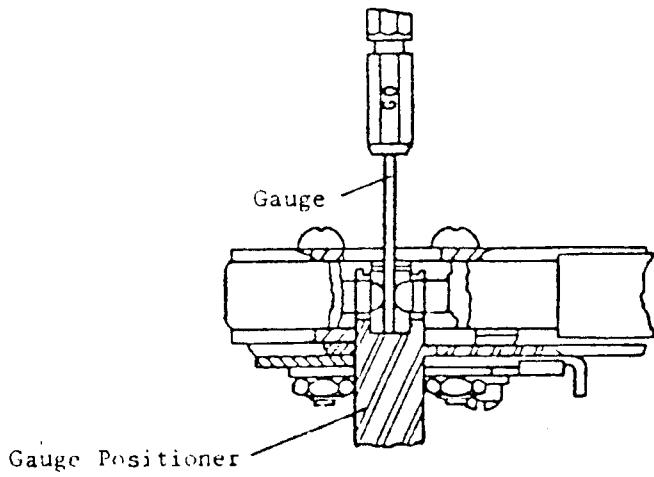
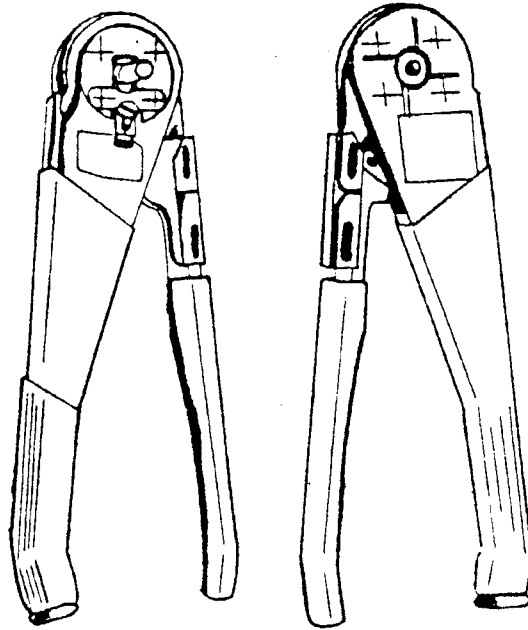


Fig 9 - Circular Connector Tool 39/9366

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SECTION 3 - TECHNICAL DATA

Table 1 - Gauges for Hand Tools

Tool	Crimping Die		Insulation Grip
	Gauge	Wire Size	
39/8126	39/29013 574917	22-16 (red)	39/28019 575909-3
39/8123	39/29016 574916	16-14 (blue)	39/28020 575909-4
39/8127	39/29022 574915	16-14HD (black)	39/28021 575909-6
39/8146	39/29022 574915	12-10 (yellow)	39/28021 575909-6
39/8133	39/29026 575944	22-16	-
	39/29027 575944-1	16-14	-
	39/29028 575944-2	12-10	-
39/8206	39/29034 576707-1	8	-
	39/29037 576706-2	6	-
	39/29040 576706-3	4	-
	39/29043 576706-4	2	-
39/8147 with dies 8144	39/29031 576792	8 (red)	39/28018 525174-1
39/8288 with dies 39/8289	39/28022 2-525171-8		-

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Table 2 - Parts List for Ampliveral Tools

Item Fig 1	Amp Cat 47387			Amp Cat 525690 47386			Amp Cat 525691		
	BR Cat 39/8123			BR Cat 39/8126			BR Cat 39/8123		
	BR Cat (39/)	Amp Cat	Qty	BR Cat (39/)	Amp Cat	Qty	BR Cat (39/)	Amp Cat	Qty
1	8283	21045-3	4	47010	525108(1)	4	47010	525108	4
2	8267	300432	2	8267	300432	2	8267	300432	2
3	8251	39207	2	8251	39207	2	8251	39207	2
4	34013	302992	1	34008	525682-1	1	34013	302992	1
5	8303	301201	1	8303	301201(2)	1	8303	301201	1
6	8237	302994	1	8237	302994	1	8237	302994	1
7	8293	9-305927-1	1	8293	9-305927-1	1	8293	9-305927-1	1
8	8284	21045-6	2	47011	525108-1(3)	2	47011	525108-1	2
9	8268	300449	1	8268	300449	1	8268	300449	1
10	8236	39366	1	8236	39366	1	8236	39366	1
11	8306	39364	1	8306	39364	1	8306	39364	1

Notes

- (1) 21045-3 (39/8283) on tool 47386.
- (2) 302993 (39/8246) on tool 47386.
- (3) 21045-6 (39/8284) on tool 47386.

Item Fig 2	BR Cat (39/)	Amp Cat	Quantity
12	8283	21045-3	4
13	8267	300432	2
14	8251	39207	1
15	8284	21045-6	2
16	8268	300449	1
17	8236	39366	1
18	8306	39364	1
Tool Complete	8256	575046-1	-
Tool Complete	8258	90120	-
Tool Complete	8266	90166-1	-

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Item Fig 3	Catalogue Numbers				Quantity
	Amp Cat 49935		Amp Cat 525693		
	BR (39/)	Amp	BR (39/)	Amp	
19	8283	20145-3	47010	525108	4
20	8267	300432	8267	300432	2
21	8284	21045-6	47011	525108-1	2
22	8268	300449	8268	300449	1
23	8236	39366	8236	39366	1
24	8306	39364	8306	39364	1
Tool Complete	8133	49935	8133	525693	-

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Item Fig 4	BR Cat 39/8127			BR Cat 39/8146		
	BR (39/)	Amp	Qty	BR (39/)	Amp	Qty
25	8283	21045-3	4	8283	21045-3	4
26	8115	300388	2	8115	300388	2
27	8117	303848-2	1	8117	303848-2	1
28	40011	5-21028-7	1	40011	5-20128-7	1
29	13018	306106-2	1	13019	45891-8	1
30	13022	306107-2	1	13021	45888-7	1
31	8116	300389	1	8116	300389	1
32	8284	21045-6	2	8284	21045-6	2
33	8248	306110-9	1	8249	306110-4	1
34	8294	6-306131-4	2	8294	6-306131-4	2
35	52043	7-59683-6	1	52043	7-59683-6	1
76	40127	21028-4	1	40131	21028-5	1
77	52047	301185	as req	-	-	-
78	52048	301185-1	as req	-	-	-
Tool Complete	8127	59239-4	-	8146	59287-4	-

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Item Fig 5	Catalogue Numbers		Quantity
	BR (39/)	Amp	
36	8116	300389	1
37	40016	305135	2
38	8289	45239-2	1
39	40013	305024-3	1
40	8283	21045-3	8
41	8284	21045-6	2
42	8115	300388	2
74	52044	305316	2
75	52045	305051	2
Tool Complete	8288	59500	-

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Item Fig 6	Catalogue Numbers		Quantity
	BR (39/)	Amp	
43	8296	4-21012-0	2
44	8252	306209-1	1
45	8269	7-59558-1	2
46	8270	7-59558-2	1
47	8286	1-21046-3	6
48	8278	307117-1	1
49	8287	21086-5	1
50	8243	7-305927-6	1
51	8312	21025-4	1
52	8284	21045-6	2
77	8273	301744	1
Tool Complete	8147	69061	-



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Item Fig 7	Catalogue Numbers		Quantity
	BR (39/)	Amp	
53	8281	1-21045-3	2
54	8282	21045-8	4
55	8271	301710	1
56	8269	7-59558-1	2
57	8270	7-59558-2	1
58	8286	1-21046-3	6
59	8278	307117-1	1
60	8287	21086-5	1
61	8291	4-305927-0	1
62	8312	21025-4	1
63	8301	301712	1
64	8292	2-305927-5	1
65	8308	304028	1
66	8307	304029	1
67	8277	3-21028-5	1
68 *	8276	2-21028-4	1
69	8297	7-306105-5	1
70	8302	3-23147-2	1
71	8234	23241-1	1
72	8241	47322	1
73	8272	301707	1
Tool Complete	8206	69062	-

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Table 3 - Spares List for UHG Tools and Gauges

Item	Catalogue Number	
	BR (39/)	G. Corner
Press (max size K)	8316	K/12P
Press (max size O)	8317	O/25P
Press (max size R)	8318	R/35P
Hand Operated Pump	8321	JHP
Foot Operated Pump	8322	FHP
Air Operated Pump	8323	LAHP
Electrically Operated Pump	8326	EHP
J die (Pair)	8177	J
K die (Pair)	8178	K
L die (Pair)	8179	L
M die (Pair)	8180	M
N die (Pair)	8181	N
O die (Pair)	8182	O
P die (Pair)	8183	P
Q die (Pair)	8184	Q
R die (Pair)	8186	R
Hose 2 m	8238	BO/500/2
Hose 3 m	8239	BO/500/3
Hose Connector, Female	8098	BO/127
Hose Connector, Male	8099	BO/128

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Table 3 - Spares List for UHG Tools and Gauges (Cont'd)

Item	Catalogue Number	
	BR (39/)	G. Corner
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)	8226	BTMDH/L/12P
Bottom Die Holder (max size O)	8227	BTMDH/O/25P
Bottom Die Holder (max size R)	8228	BTMDH/R/35P
Combination Go Gauge IJK	29061	
Combination Go Gauge LMNO	29063	
Combination Go Gauge PQR	26065	

Table 4 Faston Tools Test Data

Tool (39/)	Jaw		Lead Wire		Crimp Height (mm)	
	Size	Letter	Dia.	BR Cat	Wire	Ins Grip
8256	22-18	A	1/8"	22/27774	1.22-1.32	2.87-3.10
	16-14	B	3/16"	22/27773	1.57-1.68	3.38-3.58
8258	14-12		1/4"	22/16961	1.83-1.96	3.80-4.32
	10				2.51-2.62	3.80-4.32
8266	22-18	A	1/8"	22/27774	1.17-1.27	1.78-2.29
	22-18	B			1.17-1.27	2.82-3.33