

POP[®]

POP NUT[™] Tool

PNT800A

Maintenance Manual



**Emhart[®]
Teknologies**
POP NUT[™]

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Contents

Introduction.....	3
Safety Instructions.....	5
Specifications	6
Tool Parts.....	7
Packaged Accessories.....	7
Tool Set Up.....	8
Stroke Adjustment	9
Basic Tool Operation	14
PNT800A Diagram	18
Parts List	20
Maintenance and Testing.....	22
Troubleshooting.....	28
Safety Data.....	30
EC Declaration of Conformity	31

Introduction

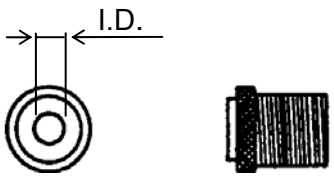
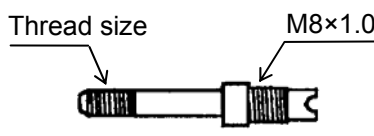
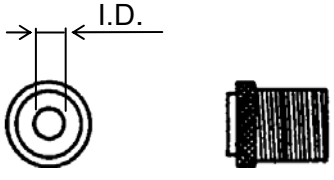
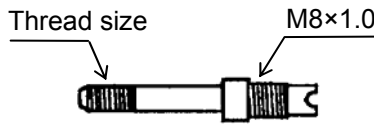
The PNT800A is a small, lightweight tool for installing POP® brand POP NUT™ blind rivet nuts and other blind threaded inserts. It is driven by compressed air.

Table 2-1 lists the POP NUT blind rivet nuts that can be fastened using this tool. The Nosepiece and Mandrel must be changed to fit some sizes of POP Nut. (See table 2-2)

Table 2-1 Tool capacity

POP NUT Type	Material	Thread Size					
		M3	M4	M5	M6	M8	M10
		6-32	8-32	10-24 / 10-32	1/4-20	5/16-18	3/8-16
Standard nut	Steel	✓	✓	✓	✓	✓	✓
	Aluminum	✓	✓	✓	✓	✓	✓
	Stainless	✓	✓	✓	✓	✓	/
Closed End nut	Steel	✓	✓	✓	✓	✓	✓
	Aluminum	✓	✓	✓	✓	✓	✓
	Stainless	✓	✓	✓	✓	✓	/
Hexagonal nut	Steel	✓	✓	✓	✓	✓	/
	Aluminum	/	✓	✓	✓	✓	/
Square nut	Steel	/	✓	✓	✓	✓	/
Knurled nut	Steel	/	✓	✓	✓	✓	/

Table 2-2

Thick Wall POP NUT Thread size	POP NUT Tool Part No.	Flat Nosepiece		Mandrel	
					
		Part No.	I.D.	Part No.	Thread size
M3×0.5	PNT800A-3	PNT600-02-3	Φ 4.0	PNT600-01-3	M3×0.5
M4×0.7	PNT800A-4	PNT600-02-4	Φ 4.5	PNT600-01-4	M4×0.7
M5×0.8	PNT800A-5	PNT600-02-5	Φ 5.1	PNT600-01-5P	M5×0.8
M6×1.0	PNT800A-6	PNT600-02-6	Φ 6.1	PNT600-01-6P	M6×1.0
M8×1.25	PNT800A-8	PNT600-02-8	Φ 8.1	PNT600-01-8	M8×1.25
M10×1.5	PNT800A-10	PNT600-02-10	Φ 10.1	PNT600-01-10A	M10×1.5
M4,M5,M6 set	PNT800A				
6 – 32	PNT800A-632R	PNT600-02-632	Φ 3.6	PNT600-01-632	6 – 32
8 – 32	PNT800A-832R	PNT600-02-832	Φ 4.3	PNT600-01-832	8 – 32
10 – 24	PNT800A-1024R	PNT600-02-5	Φ 5.1	PNT600-01-1024	10 – 24
10 – 24	PNT800A-1032R	PNT600-02-5	Φ 5.1	PNT600-01-1032	10 – 32
¼ - 20	PNT800A-420R	PNT600-02-420	Φ 6.5	PNT600-01-420	¼ - 20
5/16 – 18	PNT800A-518R	PNT600-02-8	Φ 8.1	PNT600-01-518R	5/16 – 18
3/8 – 16	PNT800A-616R	PNT600-02-10	Φ 10.1	PNT600-01-616R	3/8 – 16
Thin Wall TK, TL & TH POP NUT Thread size	POP NUT Tool Part No.	Piloted Nosepiece		Mandrel	
					
		Part No.	I.D.	Part No.	Thread size
6 – 32	PNT800A-632P	PNT600-02-3P	Φ 3.6	PNT600-01-632	6 – 32
8 – 32	PNT800A-832P	PNT600-02-4P	Φ 4.3	PNT600-01-832	8 – 32
10 – 24	PNT800A-1024P	PNT600-02-5P	Φ 5.1	PNT600-01-1024	10 – 24
10 – 24	PNT800A-1032P	PNT600-02-5P	Φ 5.1	PNT600-01-1032	10 – 32
¼ - 20	PNT800A-420P	PNT600-02-420P	Φ 6.5	PNT600-01-420	¼ - 20
5/16 – 18	PNT800A-518P	PNT600-02-8P	Φ 8.1	PNT600-01-518	5/16 – 18
3/8 – 16	PNT800A-616P	PNT600-02-10P	Φ 10.1	PNT600-01-616	3/8 – 16
M4×0.7	PNT800A-4P	PNT600-02-4P	Φ 4.3	PNT600-01-4P	M4×0.7
M5×0.8	PNT800A-5P	PNT600-02-5P	Φ 5.1	PNT600-01-5P	M5×0.8
M6×1.0	PNT800A-6P	PNT600-02-6P	Φ 6.1	PNT600-01-6P	M6×1.0
M8×1.25	PNT800A-8P	PNT600-02-8P	Φ 8.1	PNT600-01-8P	M8×1.25
M10×1.5	PNT800A-10P	PNT600-02-10P	Φ 10.1	PNT600-01-10P	M10×1.5

* Refer to the Maintenance and Testing section for details of Nosepiece and Mandrel replacement.



Safety Instructions



TO INSURE PROPER FUNCTIONING AND SAFE OPERATION READ THIS MANUAL CAREFULLY BEFORE SETTING UP OR OPERATING THE **POP NUT** SERIES TOOLS

DEFINITIONS:

- **CAUTION!** – Failure to observe this precaution could result in physical damage or minor injury.
- **WARNING!** – Failure to observe this precaution could result in physical damage, serious injury or even death.

CAUTION!

1. DO NOT use this tool in a manner other than that recommended by Emhart Teknologies.
2. DO NOT modify the tool in any way. Modification will void any applicable warranties and could result in damage to the tool or physical injury to the user.
3. Disconnect air supply when adjusting, servicing or removing any part of the tool.
4. Trained personnel must perform tool repair and/or maintenance at prescribed intervals.
5. Only use genuine Emhart Teknologies parts for tool maintenance and repair.
6. Do not operate the tool with the Nose Housing removed.
7. Keep fingers away from the front of the tool when connecting the air supply or using the tool.
8. Do not attempt to turn the Mandrel when the air supply is connected.
9. Keep hair, fingers and loose clothing away from moving parts of the tool.
10. Do not direct tool exhaust towards anyone. The tool uses lubricated air and may eject oil mist or debris.
11. Do not use organic solvents to clean the tool, this can damage the tool.
12. Wash hands thoroughly if exposed to hydraulic fluid or lubricant.

WARNING!

1. DO NOT exceed the maximum recommended air pressure of 0.6 MPa (87 psi / 6.0 bar).
2. DO NOT point the tool at anyone when in use.
3. Always wear safety rated eye protection when using or when near a tool in use.
4. Inspect the tool and connections for damage, worn or loose parts before connecting to the air supply. If damaged, stop use immediately and have the tool repaired or replaced.
5. This tool is not designed for use in explosive atmospheres.

Specifications

Table 3-1

Feature	Specification
Weight	1.68 kg (3.7 lbs)
Overall length	288 mm (11.3 in)
Overall height	263 mm (10.4 in)
Tool Stroke	1.3 - 6.3 mm (0.05 - 0.248 in)
Pulling Force	23.4 kN @ 5.0 bar (5260 lbf @ 72.5 psi)
Compressed air pressure required	0.5 - 0.6MPa (5 - 6 bar) (72.5 - 87 psi)
Hydraulic Oil	See Table 3-2 Specified Hydraulic Oils
Setting capacity	See table 2-2
Tool Noise Level	72.7 dB(A)
Tool Vibration Level	0.92 m/s ² / 2.5 m/s ² > 24hrs (EAV)

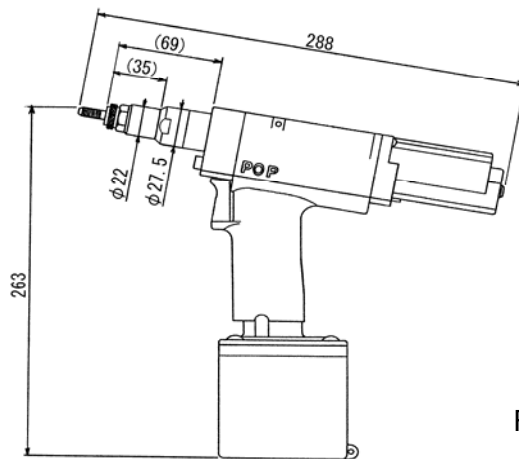


Figure 3-1

Hydraulic oil

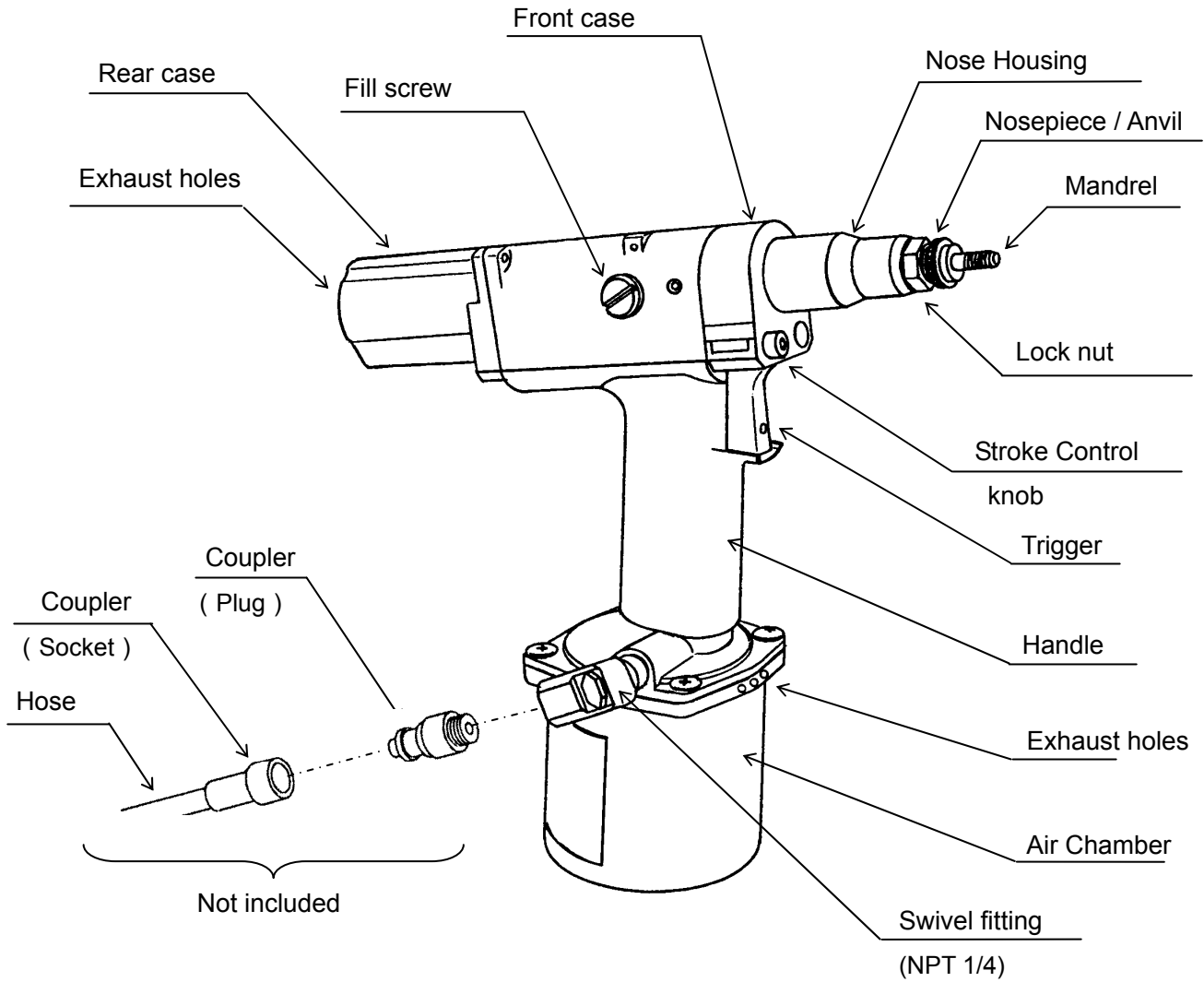
Use only Emhart Teknologies specified hydraulic oils as shown in Tabel 3-2.

Use of any other oil could reduce the tool performace or even damage the tool..

Table 3-2 Specified hydraulic oils

Company name	Product name
Mobile	Mobile DTE26
Shell	Shell Telus Oil C68
Idemitsu	Daphne Hydro 68A
Cosmo	Cosmo Olpas 68
Esso	Telesso 68
Nisseki	FBK RO68
Mitsubishi	Diamond Lube RO68 (N)

Tool Parts



Packaged Accessories

Part No.	Item	Qty
PNT800A-T	PNT800A POP NUT Tool	1
PNT600-132	Hook	1
PNT600-133	Hex wrench 1.5 mm	1
DPN907-006	Cap screw M4 X 20	1
DPN277-179	POP NUT Mandrel Release	1
FG2245	Operating Instructions	1
FG2244	Maintenance Manual	1
FG2222	Warranty Card	1

Tool Set Up

1. Check that the correct Nosepiece and Mandrel are fitted for the POP Nut.
Adjust the protruding length of the Mandrel. (Refer to “Maintenance and Testing” section B).
2. The thread type of the compressed air supply coupling is NPT 1/4.
Connect a joint or coupler of thread type NPT 1/4 to supply compressed air.
(The Coupler and Joint are not provided.)
3. An air filter, regulator and lubricator should be fitted in the air line between the compressor and the tool, within 3m (6 ft) of the tool. Adjust the supply pressure and the drip volume of the lubricator oil.
 - Compressed air pressure: 0.5-0.6 MPa. (72.5-87 psi)
 - Oil drip volume from the lubricator: 1-2 drops/ 20 nuts fastened

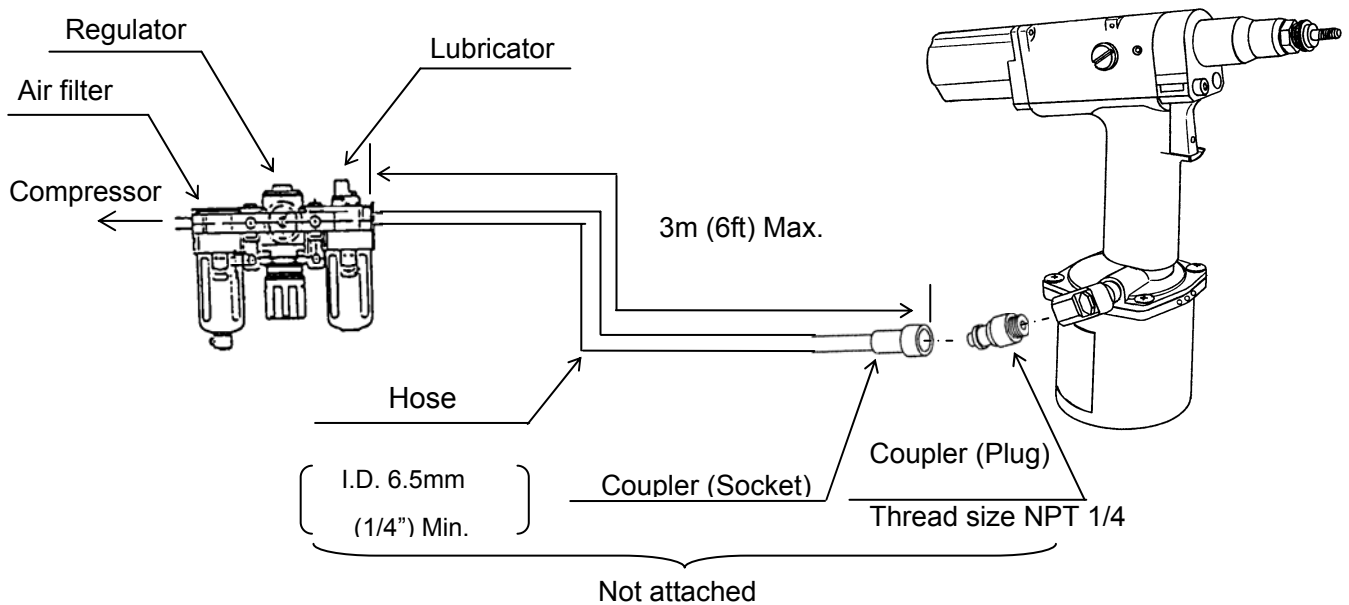


Figure 4-1

WARNING!



Use an air hose with a rating of 1.0 MPa (145 psi / 10 bar) or greater maximum ordinary operating pressure. Also make sure the hose material is suitable for the operating environment (i.e. oil proof, wear and abrasion resistance etc.).

*For details, refer to a hose manufacturer's catalog.

Stroke Adjustment

- Adjust the stroke length according to POP Nut size and the thickness of work piece.
- Make sure the tool has a consistent and adequate air supply.
- Note: The stroke may increase or decrease due to changes in air pressure [~ 0.1 mm (0.004 in) per 0.1 MPa (15 psi)]

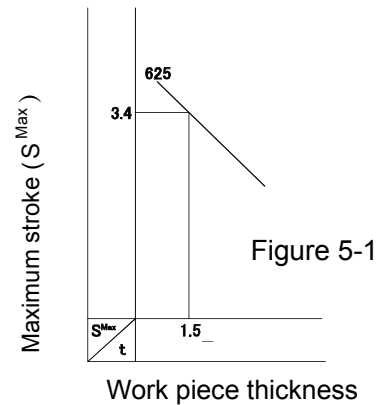
PROCEDURE

1. Determine required stroke

Find Maximum Stroke (S^{\max}), Minimum Stroke (S^{\min}) and Stroke (E), based on the POP Nut and work piece thickness from Table 5-5 "POP Nut Stroke Formulas" and Table 5-6 "S max vs. t Graph."

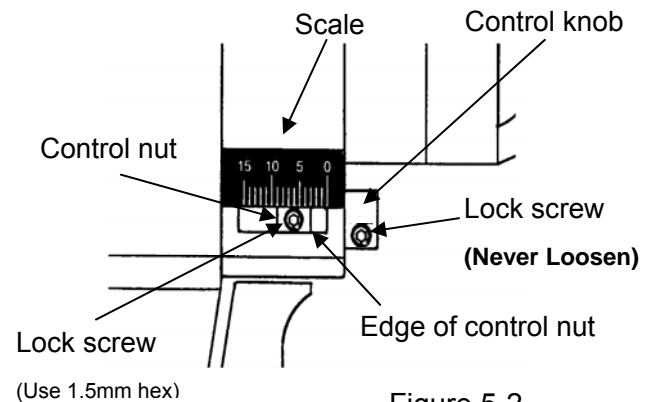
Example:

POP Nut: SPH625
 Work piece thickness: 1.5mm
 $S^{\max} = 3.4$ from formula or graph
 $S^{\min} = 3.0$ ($S^{\max} - 0.4$) from formula
 $E = 3.6$ ($S^{\max} + 0.2$) from formula
 Proper stroke: 3.0 ~ 3.4 ($S^{\min} \sim S^{\max}$)



2. Stroke Adjustment

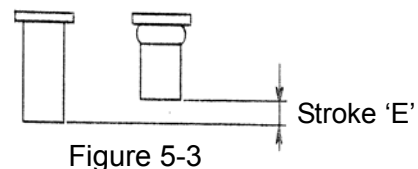
a) Loosen the M3 lock screw on the control nut using a 1.5mm hexagonal wrench. Adjust stroke by turning control knob clockwise to decrease and anti-clockwise to increase stroke. Stroke, E is indicated by the right edge of control nut. Tighten the lock screw (Figure 5-2). Note: **Never** loosen the lock screw on the control knob, as this will disturb the stroke.



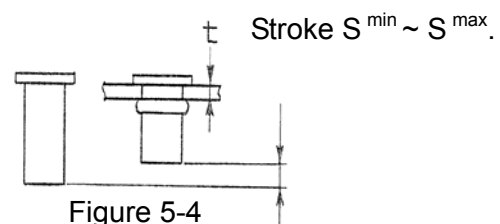
b) Set a POP Nut and measure the stroke with calipers etc. to check the stroke setting 'E'.

Re-adjust the stroke according to (a) so that the stroke is $E \pm 0.1$ mm. (Figure 5-3).

Note: Using the control knob, adjustments equal to 0.2mm per quarter turn can be made.



c) Set a POP Nut using work piece or the test piece, and check that the stroke is between S^{\min} and S^{\max} . Re-adjust the stroke as necessary. (Figure 5-4)



3. Confirm the Stroke

Confirm stroke (S^{max} , S^{min} , E) corresponding to the POP Nut and the work piece thickness used.

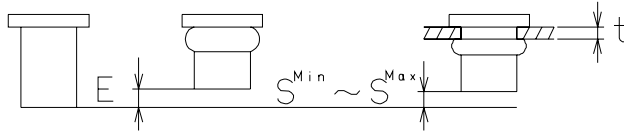


Table 5-5 POP NUT™ Stroke Formulas - Thick Wall Only

*Thread size	Maximum stroke S^{max}	Minimum stroke S^{min}	Stroke without work piece E
M3×0.5	$1.2 + (N - t)$ mm	$S^{max} - 0.2$	$S^{max} + 0.1$
M4×0.7	$1.6 + (N - t)$ mm	$S^{max} - 0.3$	$S^{max} + 0.1$
M5×0.8	$2.0 + (N - t)$ mm	$S^{max} - 0.3$	$S^{max} + 0.1$
M6×1.0	$2.4 + (N - t)$ mm	$S^{max} - 0.4$	$S^{max} + 0.2$
M8×1.25RLT *	$2.4 + (N - t)$ mm	$S^{max} - 0.4$	$S^{max} + 0.2$
M8×1.25	$2.8 + (N - t)$ mm	$S^{max} - 0.4$	$S^{max} + 0.2$
M10×1.5	$3.0 + (N - t)$ mm	$S^{max} - 0.4$	$S^{max} + 0.2$

Where:

t : workpiece thickness

N : 1/10 of the last two digit of the part number

(Example)

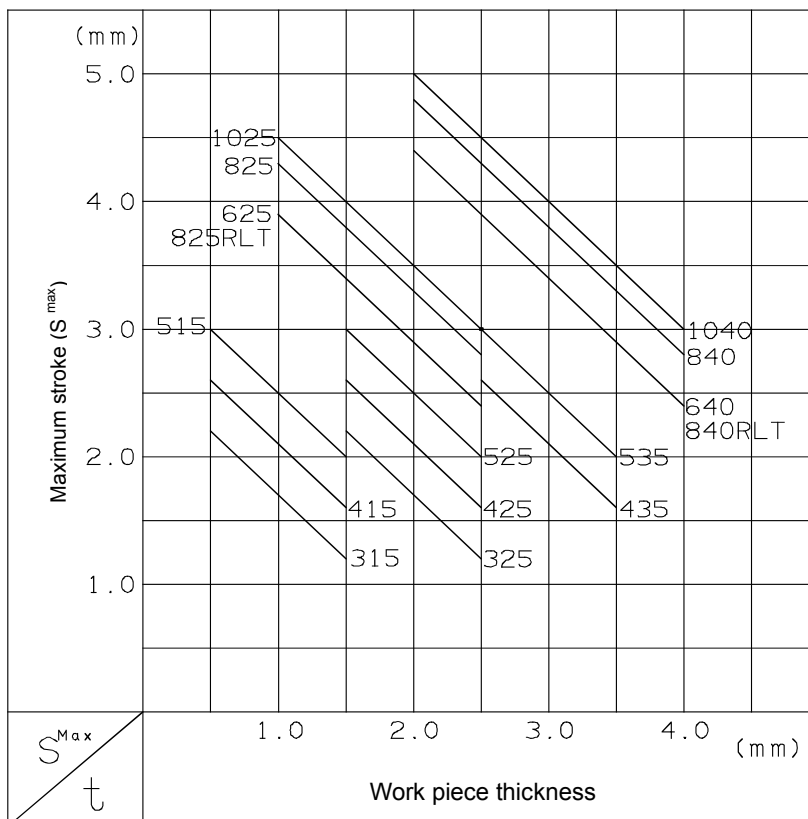
625 : $25/10=2.5$

(*) M8×1.25RLT shows M8 steel knurled types.

M4, M5 and M6 steel knurled types have the same stroke as standard types.

Table 5-6 S^{max} vs. t (Maximum stroke - Work piece thickness) graph

Thick wall POP Nuts



Use the formula of stroke for POP Nuts that are not indicated in $S^{max} - t$ graph.

Example:
POP NUT No.

6 2 5

Maximum thickness: 2.5mm
Thread size: M6×1.0

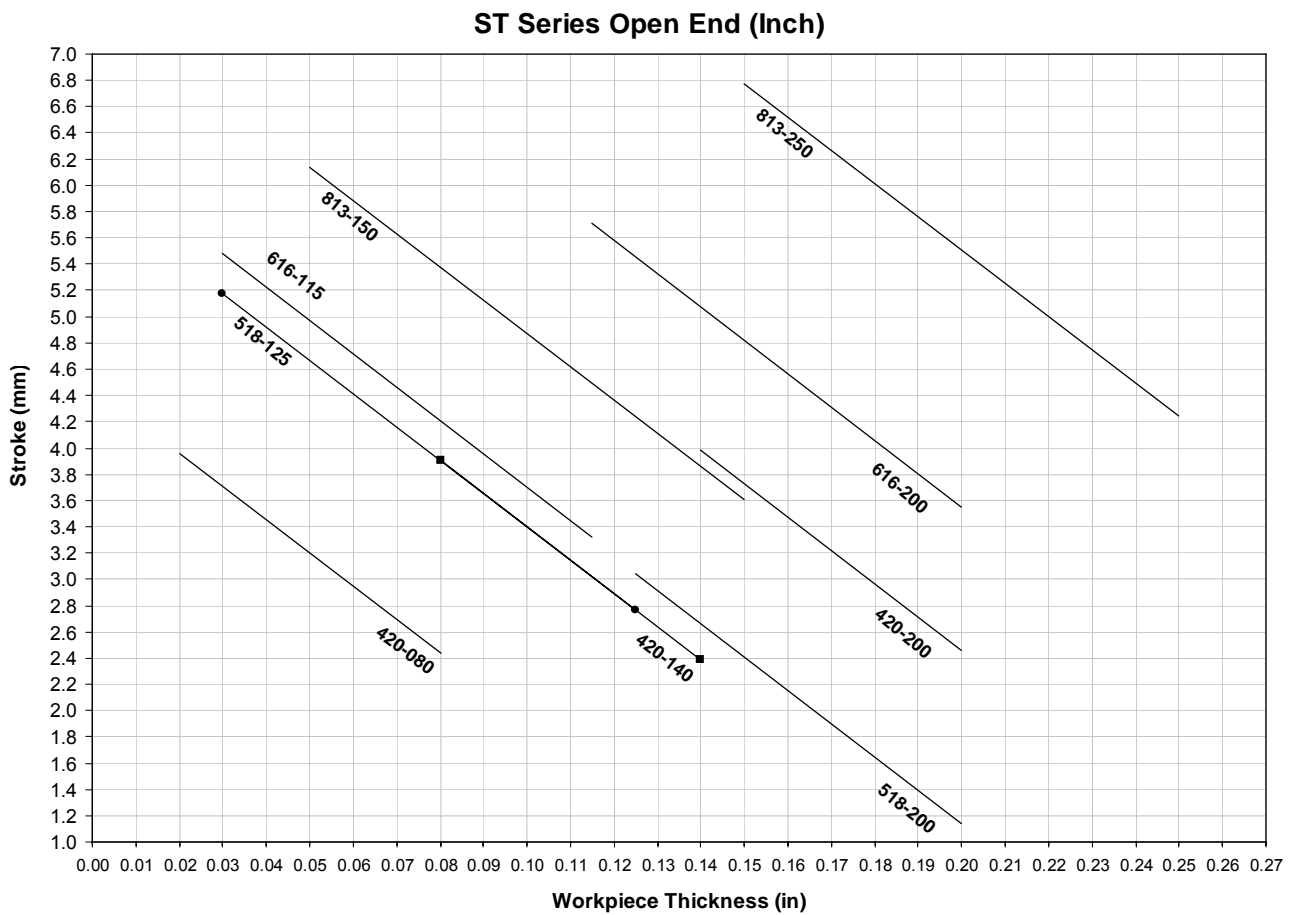
Thin wall POP Nuts

For thin wall POP NUT rivet nuts use below charts to determine the required stroke.

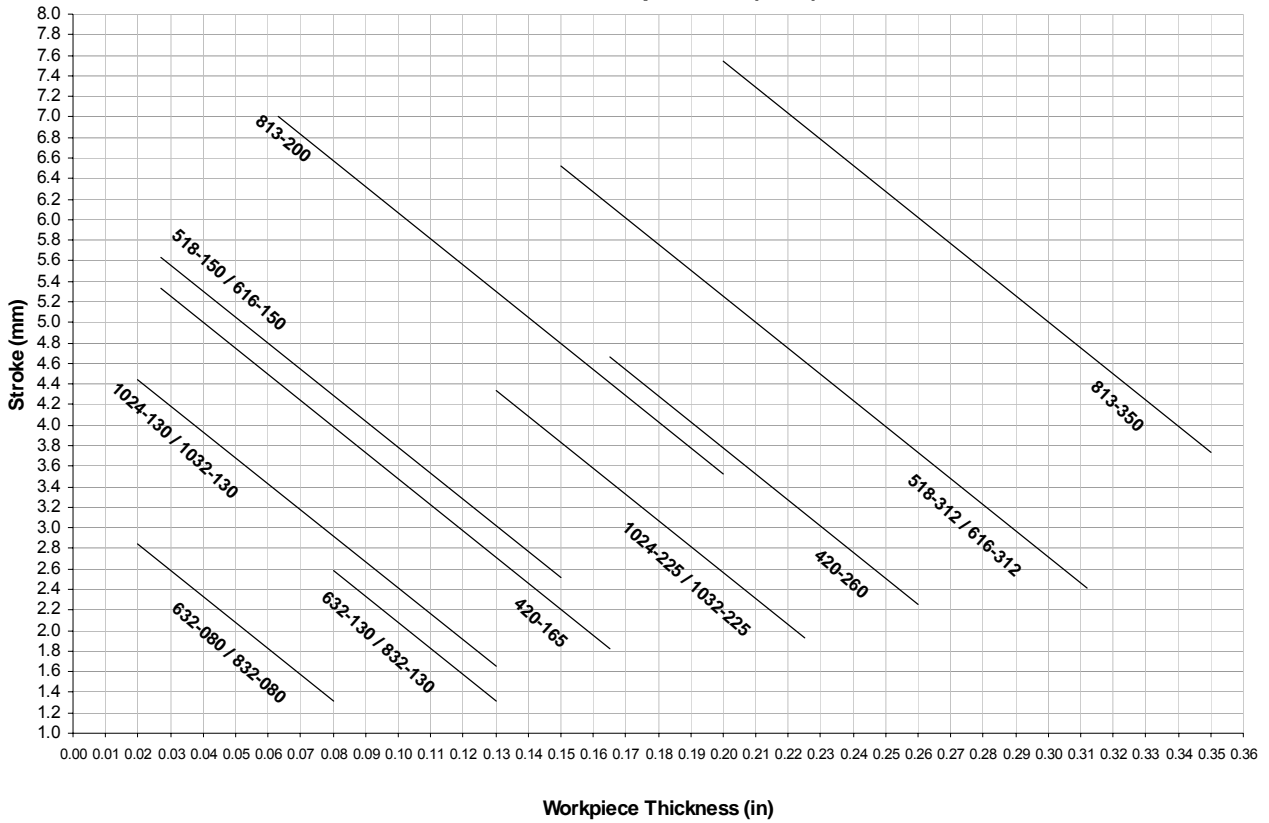
Select the chart depending on the POP NUT type (TK/TL, TH or ST), and measurement system (inch or metric). At the bottom axis of the chart locate the thickness of the work piece, find the line based on the thread size and max. grip of the POP NUT to be used; on the left axis read the required stroke and set it up on the tool.

i.e.

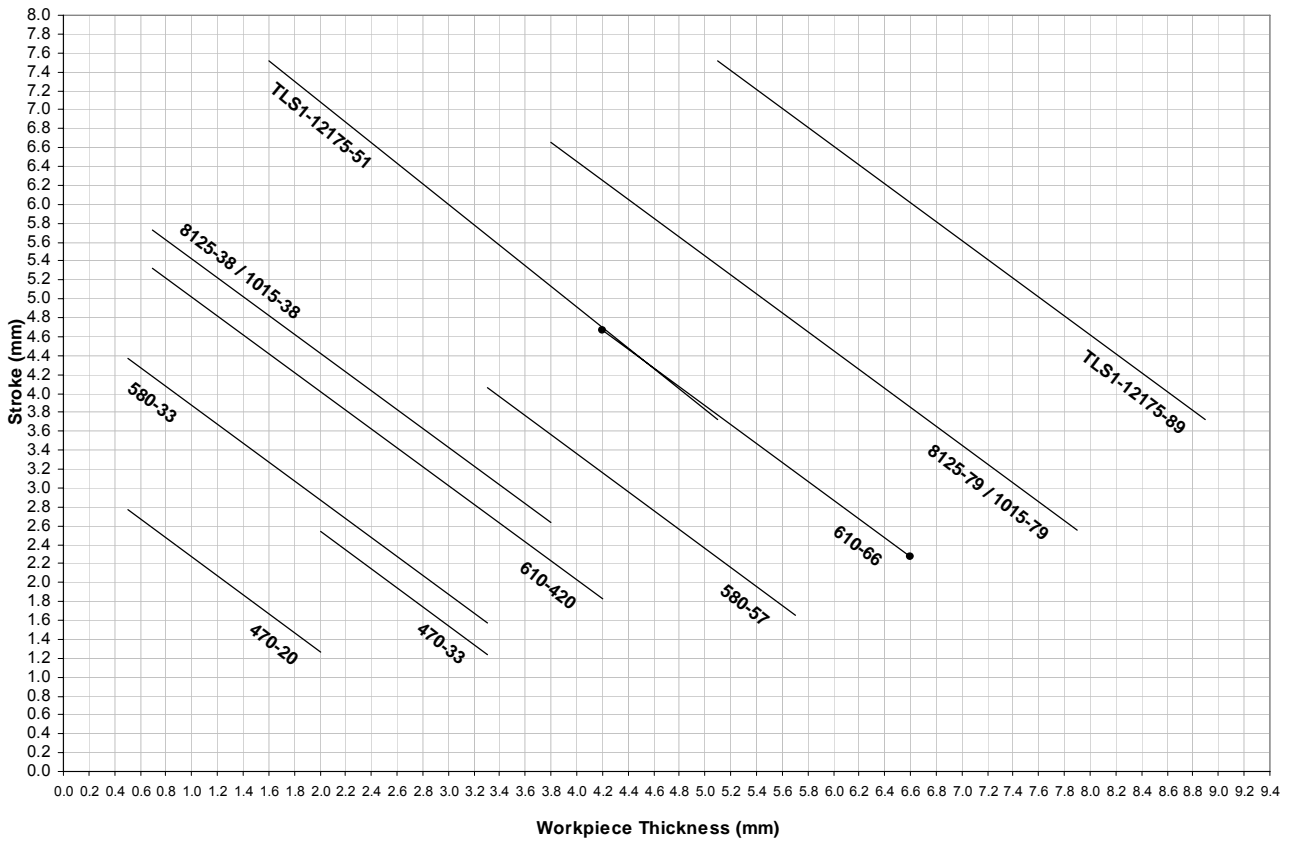
- POP NUT part number: STS1-420-140
- Work piece thickness = 0.100"
- Line: 420-140
- => Stroke: 3.4 mm



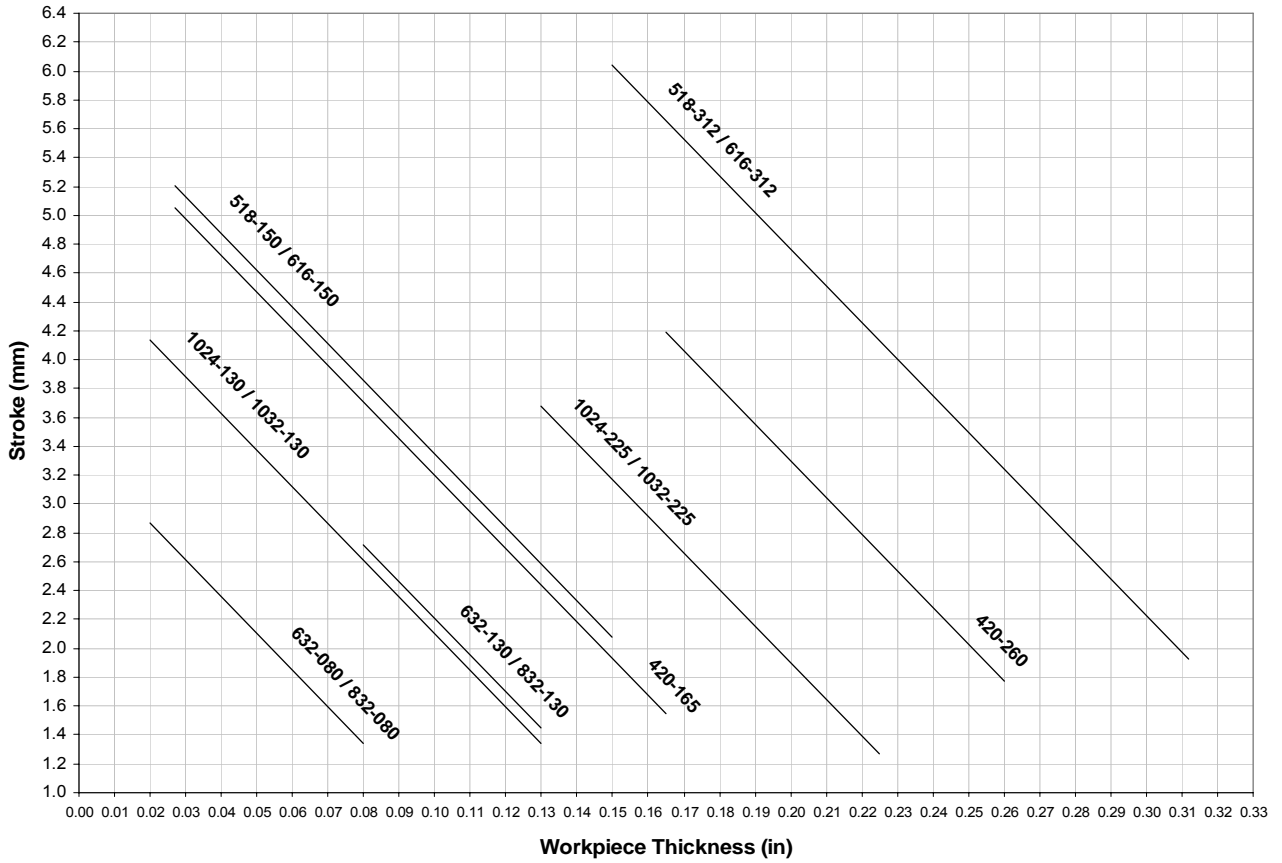
TK /TL Series Open End (Inch)



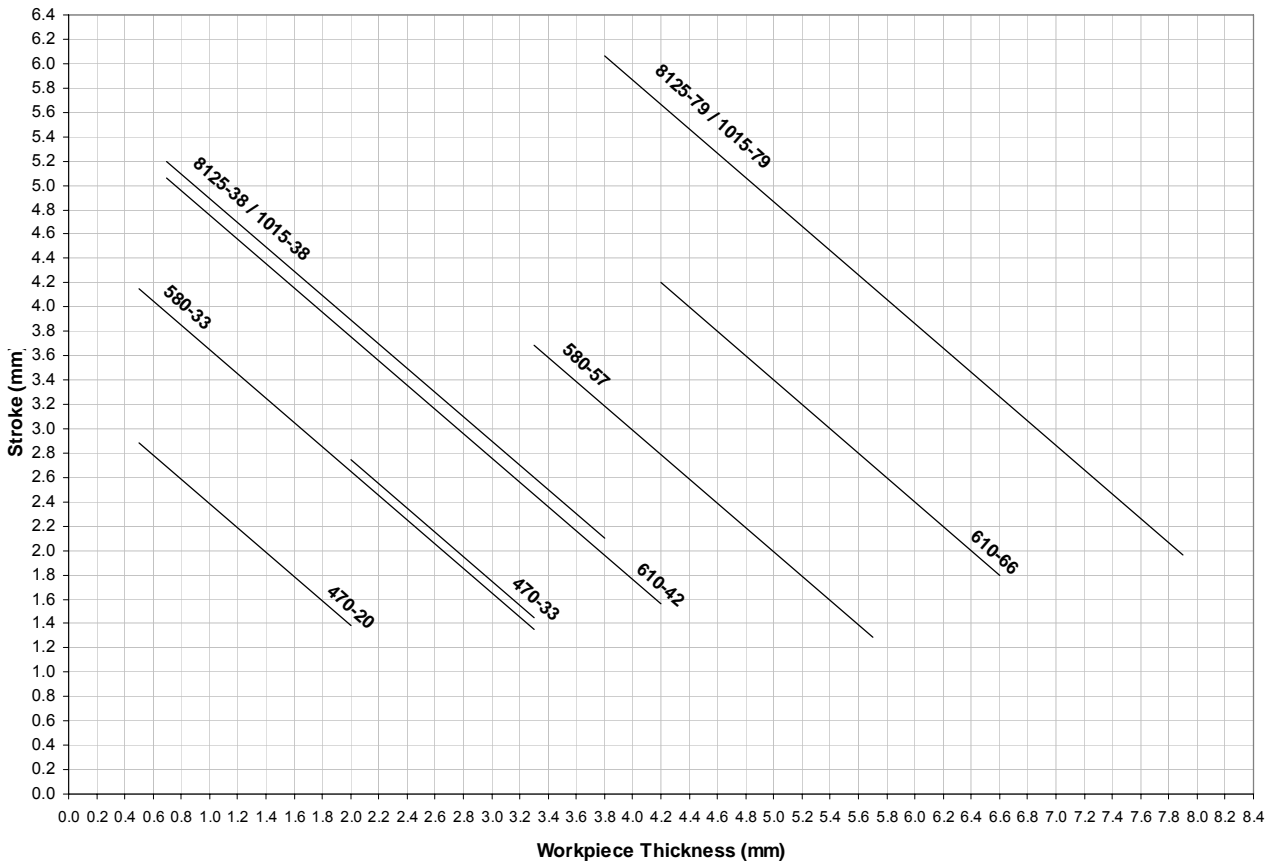
TK /TL Series Open End (Metric)



TH Series Open End (Inch)



TH Series Open End (Metric)



Basic Tool Operation

Before setting POP Nuts with this tool, refer to the "Tool Set Up" section.

1. Loading the POP Nut on the tool

Hold the POP Nut and thread it 1/4 turn onto the Mandrel. Press the POP Nut against the Mandrel and the Mandrel will spin, automatically threading on the POP Nut. The Mandrel will stop spinning once the POP Nut fully threaded and the flange contacts the nosepiece.

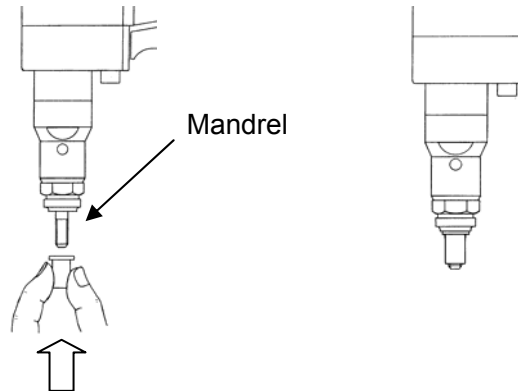


Figure 6-1

Note: Keep pushing the POP Nut onto the Mandrel until the clockwise rotation of the Mandrel automatically stops.

If the POP Nut is not fully threaded, the setting stroke will be shortened by the gap between the head of the POP Nut and the nosepiece.

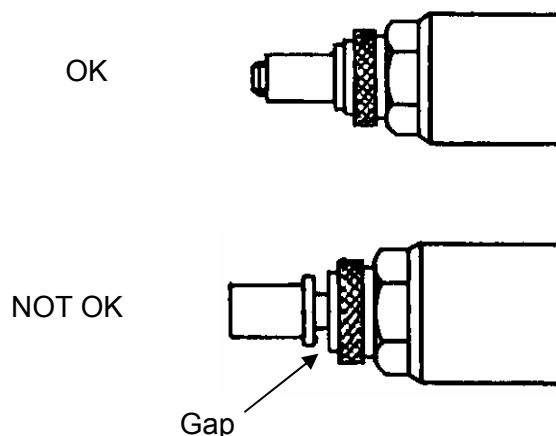


Figure 6-2

2. Setting the POP Nut and removing the Tool

Push the POP Nut perpendicularly into the hole of the base material and pull the trigger (Figure 6-3). Keeping the trigger depressed until the Mandrel reverses direction and unthreads from the installed POP Nut

Once the POP Nut is installed the tool Mandrel will automatically reverse rotation to unthread from the POP Nut (Figure 6-4).

CAUTION!

DO NOT “double stroke” the trigger. Double stroking or trying to set a POP Nut after it has been partially set can result in damage to the application, the POP Nut and or the tool. When setting a POP Nut, you must hold the trigger until the Mandrel completely unthreads from the nut.

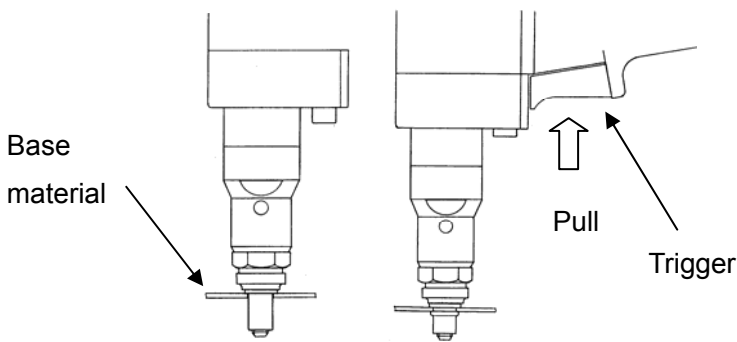


Figure 6-3

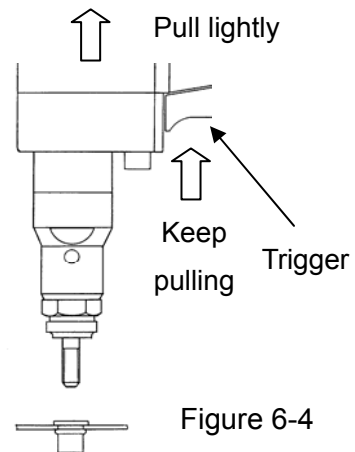


Figure 6-4

Note:

- (1) Fit the flange of the POP Nut flat against the base material.

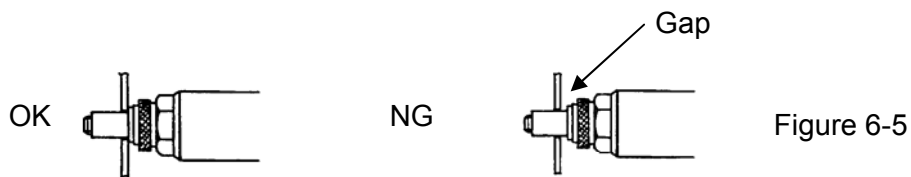


Figure 6-5

- (2) Do not tilt the tool. The tool must be perpendicular to the workpiece.

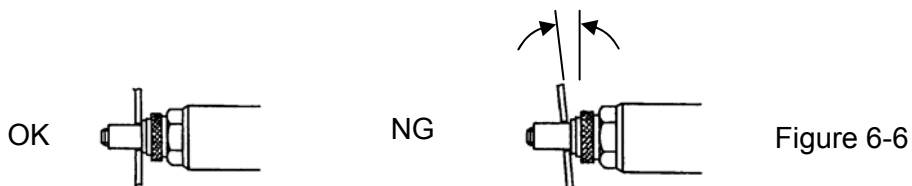


Figure 6-6

3. Stopping the Mandrel's counter-clockwise rotation

Once the tool has unthreaded from the POP Nut, release the trigger to stop the Mandrel from spinning (Figure 6-7).

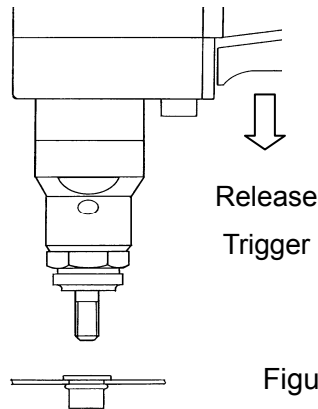


Figure 6-7

4. What to do when the Tool Mandrel is not unthreaded completely

If you let go of the trigger during the installation sequence the tool will recycle and stop unthreading. **DO NOT PULL THE TRIGGER AGAIN.** This will cause the tool to stroke again and strip the POP Nut or break the Mandrel. To unthread the POP Nut, depress the control knob and then press and hold the trigger, this reverses the spin direction of the Mandrel and unthreads the nut. When fully unthreaded release the trigger (Figure 6-8).

If the POP Nut jams and the strength of the air motor is insufficient to unthread the Mandrel:

- a. Disconnect the air supply.
- b. Thread the M4 x20 Cap screw provided with the tool into the hole in the side of the nosehousing (Figure 6-9).
- c. Thread the M4 Cap screw in until it fits snugly against the inner Spin Pull head, locking the rotation of the Mandrel to the tool.
- d. Turn the body of the tool counterclockwise to detach it from the POP Nut (Figure 6-10).

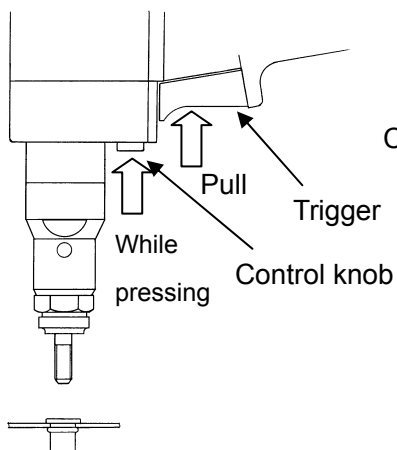


Figure 6-8

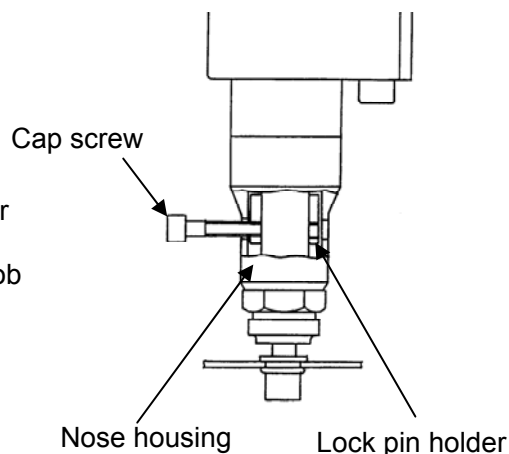


Figure 6-9

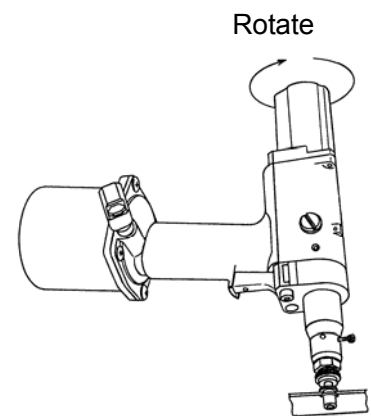


Figure 6-10

5. Regular Mandrel cleaning and lubrication

Clean the Mandrel after every 50 ~ 60 sets. (See Figures 6-11 and 6-12). Over time, metal fragments can stick to the Mandrel and it can run short of lubrication, making it difficult to mount POPNuts smoothly. If you continue to use the tool in this condition, it will become increasingly difficult to mount POP Nuts and the Mandrel and internal parts will wear out prematurely.



Figure 6-11

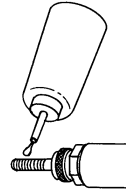
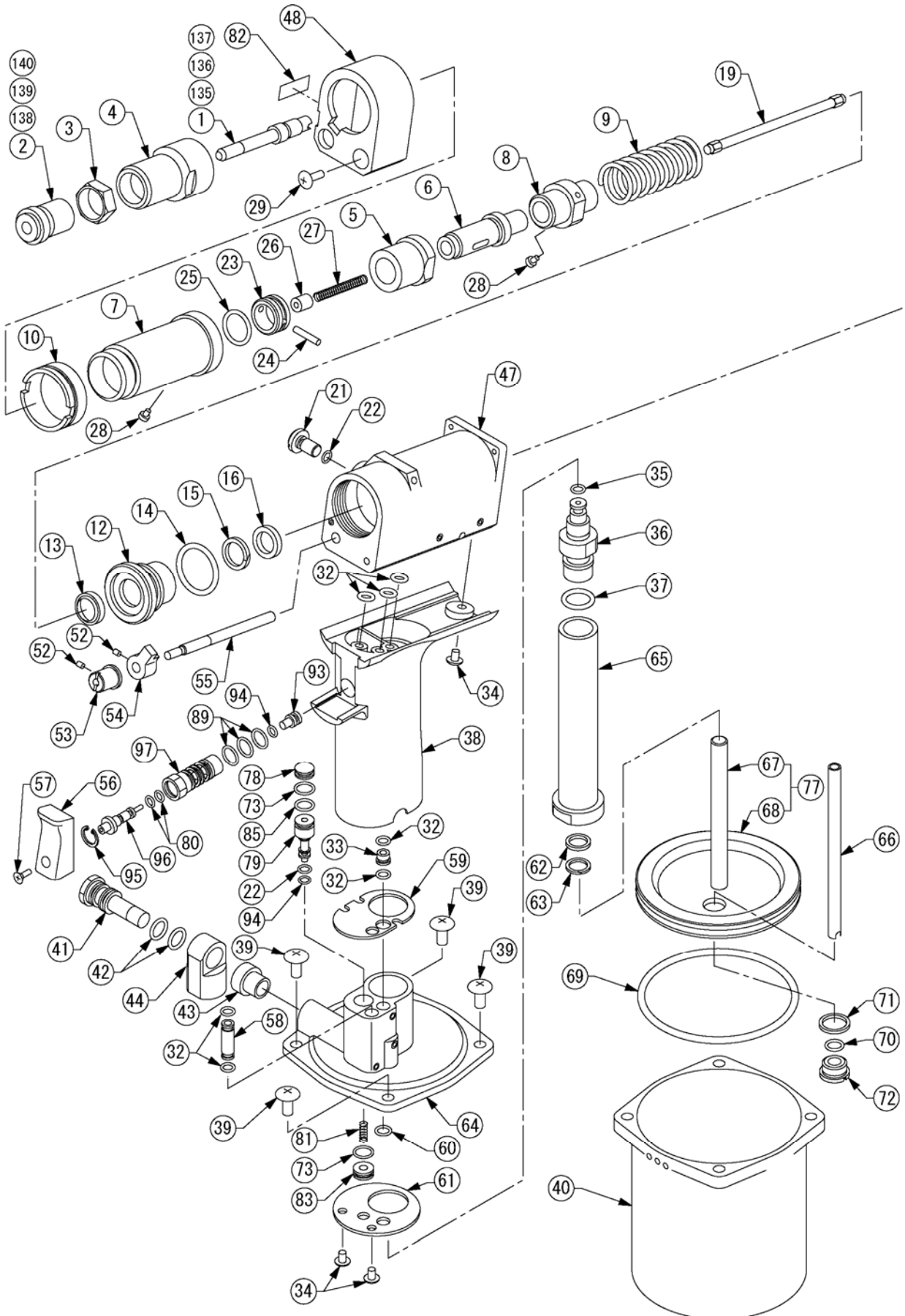
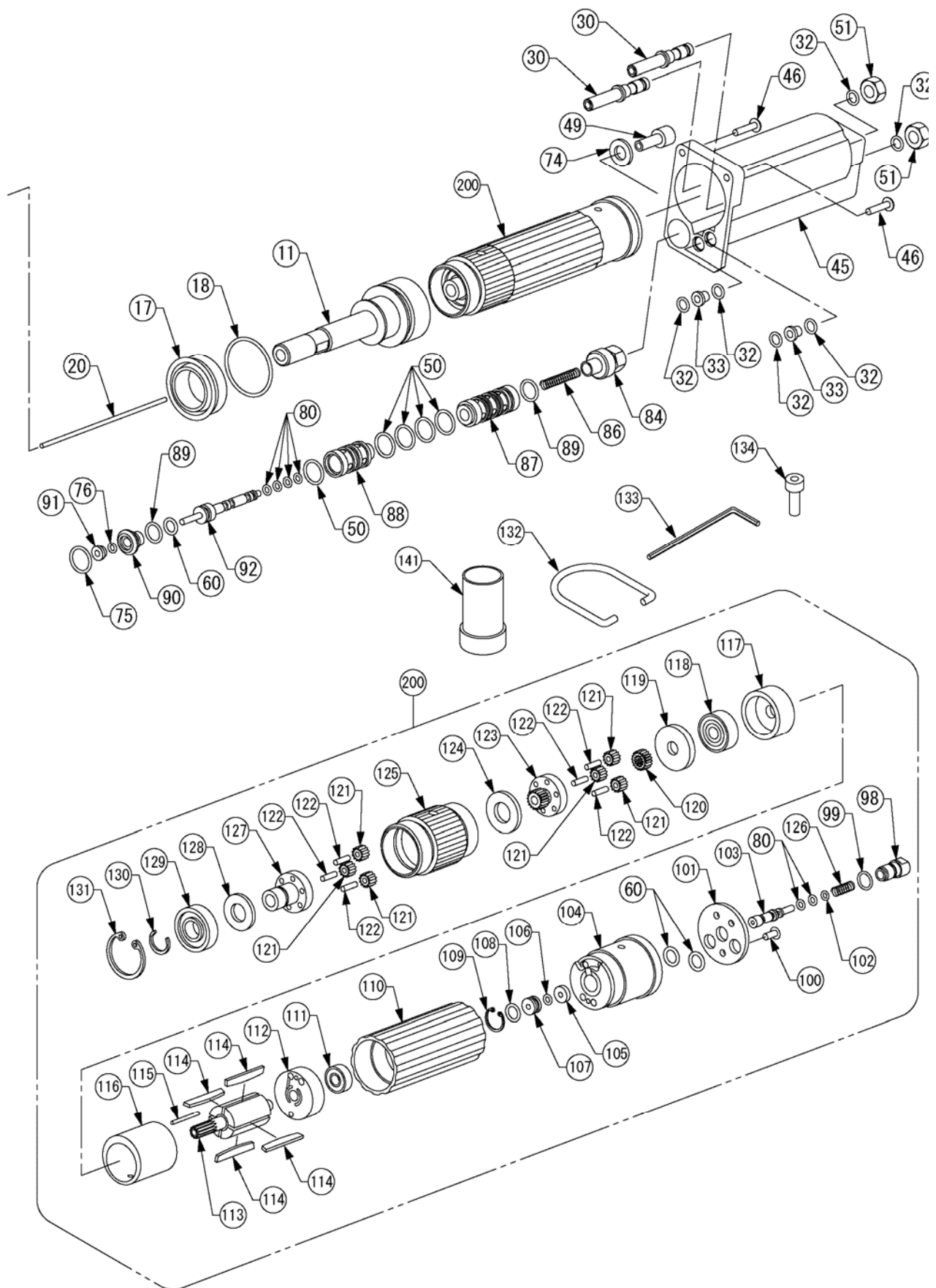


Figure 6-12

PNT800A Diagram





Parts List

Item	Part No.	Description	Qty
1	PNT600-01-6	Mandrel M6	1
2	PNT600-02-6	Nose Piece M6	1
3	PNT600-03	Lock Nut	1
4	PNT600-04A	Nose Housing	1
5	DPN277-001	Spin Pull Head Case	1
6	DPN277-002	Spin Pull Head	1
7	PNT600-07B	Mast Housing	1
8	DPN277-003	Joint	1
9	DPN901-004	Return Spring	1
10	PNT600-10	Housing Lock	1
11	DPN277-004	Hydraulic Piston	1
12	DPN277-005	Rod Seal Case	1
13	DPN908-009	Scraper	1
14	DPN900-031	O-Ring	1
15	DPN908-010	Back Up Ring	1
16	DPN908-011	Penta Seal	1
17	DPN908-012	Piston Seal	1
18	DPN900-032	O-Ring	1
19	PNT600-19A	Bit	1
20	PNT600-20	Start Bar	1
21	DPN239-047	Fill Screw	1
22	DPN900-033	O-Ring	2
23	DPN277-006	Lock Pin Holder	1
24	DPN277-007	Lock Pin	1
25	DPN900-034	O-Ring	1
26	PNT600-26	Lock Pin Pusher	1
27	DPN901-009	Spring	1
28	DPN907-005	Socket Head Cap Screw	2
29	PNT600-29A	Truss Head Screw	1
30	PNT600-30A	Rear Case Tube	2
32	DPN900-015	O-Ring	13
33	PNT600-33A	Joint Adapter	3
34	PNT600-34	Truss Head Screw	3
35	DPN900-035	O-Ring	1
36	DPN277-008	Sleeve Upper	1
37	DPN900-036	O-Ring	1
38	DPN277-009	Handle	1

Item	Part No.	Description	Qty
39	PNT600-39	Truss Head Screw	4
40	PNT800-02	Chamber	1
41	PNT600-41A	R Joint Adapter	1
42	DPN900-021	O-Ring	2
43	PNT600-43	R Joint Spacer	1
44	PNT600-44B	R Joint	1
45	PNT600-45A	Rear Case	1
46	PNT600-46	Truss Head Screw	2
47	DPN277-010	Handle Upper	1
48	PNT600-48A	Front Case	1
49	PNT600-49	T Valve End Screw	1
50	DPN900-037	O-Ring	5
51	PNT600-51	Hexagon Thin Nut	2
52	DPN905-004	Socket Set Screw	2
53	PNT600-53	Control Knob	1
54	PNT600-54C	Control Nut	1
55	PNT600-55A	T Valve Push Rod	1
56	DPN277-011	Trigger	1
57	DPN277-071	Flat Head Screw M3X8	1
58	PNT600-58	Joint Tube	1
59	PNT600-59A	Assist Plate	1
60	DPN900-006	O-Ring	2
61	PNT800-14	Retainer Plate	1
62	DPN908-003	Penta Seal	1
63	DPN908-013	Back Up Ring	1
64	DPN277-012	Handle Lower	1
65	DPN277-013	Sleeve	1
66	PNT800-05	Tube	1
67	PNT800-06	Ram	1
68	PNT800-13	Air Piston	1
69	DPN900-038	O-Ring	1
70	DPN900-039	O-Ring	1
71	PNT600-71	Washer	1
72	PNT600-72	Tube Seal Case	1
73	DPN900-011	O-Ring	2
74	DPN909-001	SS-Washer	1
75	DPN900-040	O-Ring	1

Item	Part No.	Description	Qty
76	DPN900-023	O-Ring	1
77	FAN277-014	Air Piston Assembly	1
78	PNT800-07A	J Valve Stopper	1
79	PNT800-08A	J Valve Rod	1
80	DPN900-014	O-Ring	6
81	DPN901-010	Spring	1
83	DPN239-065	J Valve Cap	1
84	PNT800-10	T Valve Rear Case	1
85	DPN900-013	O-Ring	1
86	DPN901-011	Spring	1
87	PNT800-11	T Valve Center Case	1
88	PNT800-12	T Valve Front Case	1
89	DPN900-041	O-Ring	5
90	PNT600-90	T Valve Cap	1
91	PNT600-91	T Valve Front Piece	1
92	PNT600-92	T Valve Rod	1
93	PNT600-93	S Valve End	1
94	DPN900-012	O-Ring	2
95	DPN902-001	Retaining Ring	1
96	PNT600-96	S Valve Rod	1
97	PNT600-97B	S Valve Case	1
82	DPN277-176	Scale Label	1
200	PNT600-200	Air Motor	1set
60	DPN900-006	O-Ring	2
80	DPN900-014	O-Ring	2
98	PNT600-98B	M Valve End	1
99	DPN900-042	O-Ring	1
100	DPN277-177	Flat head screw M3×6	1
101	PNT600-101A	Motor Case End Plate	1
102	DPN900-043	O-Ring	1
103	PNT600-103	M Valve Rod	1
104	PNT600-104	Motor Case End	1
105	PNT600-105	Washer	1
106	DPN900-044	O-Ring	1
107	PNT600-107	O-Ring Holder	1
108	DPN900-045	O-Ring	1

Item	Part No.	Description	Qty
109	DPN902-002	Retaining Ring	1
110	PNT600-110	Casing	1
111	PNT600-111	Ball Bearing	1
112	PNT600-112	Rear Plate	1
113	PNT600-113	Rotor	1
114	PNT600-114	Blade	4
115	PNT600-115	Spring Pin	1
116	PNT600-116	Cylinder	1
117	PNT600-117	Front Plate	1
118	PNT600-118	Ball Bearing	1
119	PNT600-119	Spacer	1
120	PNT600-120	Sun Gear	1
121	PNT600-121	Planet Gear	6
122	PNT600-122	Needle Pin	6
123	PNT600-123	Gear Cage & Gear	1
124	PNT600-124	Spacer	1
125	PNT600-125	Internal Gear	1
126	DPN901-012	Spring	1
127	PNT600-127	Gear Cage	1
128	PNT600-128	Spacer	1
129	PNT600-129	Ball Bearing	1
130	DPN902-003	Retaining Ring	1
131	DPN902-004	Retaining Ring	1
Accessories			
132	PNT600-132	Hook	1
133	PNT600-133	HS Screw Key 1.5mm	1
134	DPN907-006	Cap Screw M4X20	1
135	PNT600-01-4	Mandrel M4	1
136	PNT600-01-5	Mandrel M5	1
137	PNT600-01-8	Mandrel M8	1
138	PNT600-02-4	Nose Piece M4	1
139	PNT600-02-5	Nose Piece M5	1
140	PNT600-02-8	Nose Piece M8	1
141	DPN277-179	POP NUT Mandrel Release	1
See table 2-2 for additional Mandrels and Nosepieces			

Maintenance and Testing

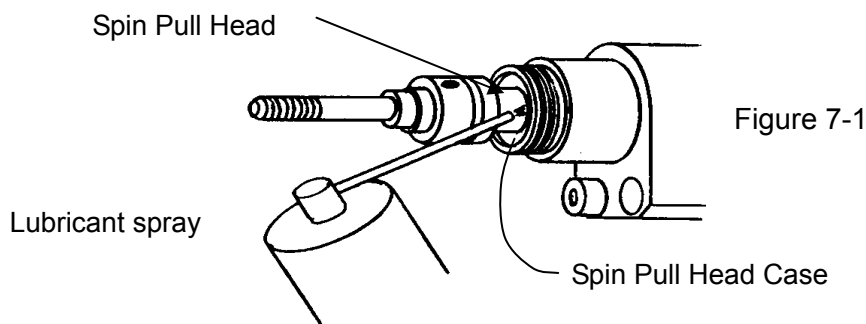
Table 7-1

No.	Item	Purpose
1	Lubricate rotating parts.	<ul style="list-style-type: none"> • To prevent loss of the Mandrel rotation force.
2	Replacement of Mandrel and Nosepiece and adjustment of Mandrel protrusion length.	<ul style="list-style-type: none"> • Replacement and adjustment to change the POP Nuts used. • Replacement and adjustment in case of breakage.
3	Control Nut, T Valve Push Rod replacement.	1. Replacement and adjustment in case of Mandrel breakage.
4	Oil recharge	2. Resetting the pull stroke.

1. Lubricate rotating parts.

After setting approximately 1,000 POP Nuts parts, wear between the Spin-Pull head and the Spin-Pull head case will start to cause heating, drying and rattling. Mandrel rotation will be slower, with less torque.

Follow below procedure (2-A) to remove the Nose Housing and spray lubricant between the Spin Pull Head and the Spin Pull Head Case.

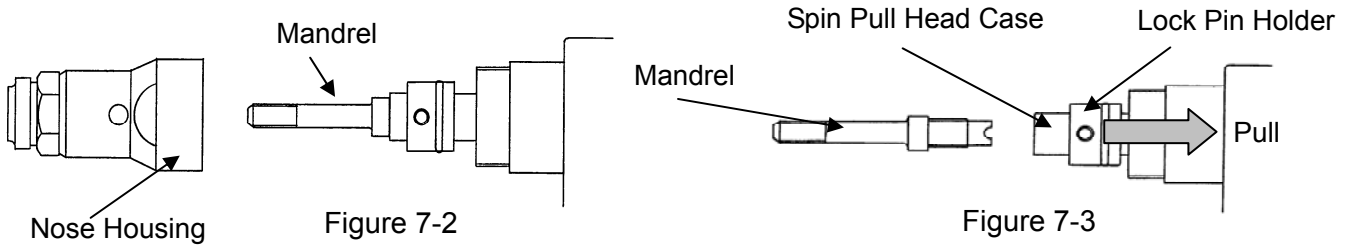


2. Mandrel replacement, Nosepiece replacement and Mandrel protrusion length adjustment.

Use the designated parts to match the POPNut you will be using. (See table 2-2) Replace any parts that are worn or damaged.

A. MANDREL REPLACEMENT

- a) Disconnect the air supply.
- b) Use a 23mm spanner to unscrew and remove the Nose Housing.(See Figure 7-2)
- c) Pull the Lock Pin Holder in with your finger while turning the Mandrel counter clockwise to remove it for replacement.



- d) Pull the Lock Pin Holder in with your finger while you screw the new Mandrel into the Spin Pull Head until it stops. Release the Lock Pin Holder so that it returns to its original position.
- e) If the Lock Pin Holder does not return to its original position, turn the Mandrel counter clockwise until the Lock Pin engages the Mandrel. (See figure 7-3)

B. NOSEPIECE REPLACEMENT, ADJUSTMENT OF THE MANDREL

Protrusion Length Procedure

- a) Disconnect the air supply.
- b) Use a 23mm and a 19mm spanner to loosen the Lock Nut and remove the Nosepiece and the lock nut from the Nose Housing. Change the Nosepiece (Figure 7-4).
- c) Screw the lock nut and Nosepiece into the Nose Housing.

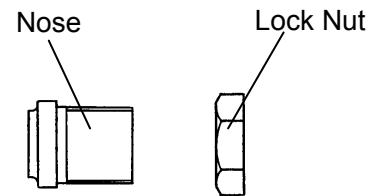
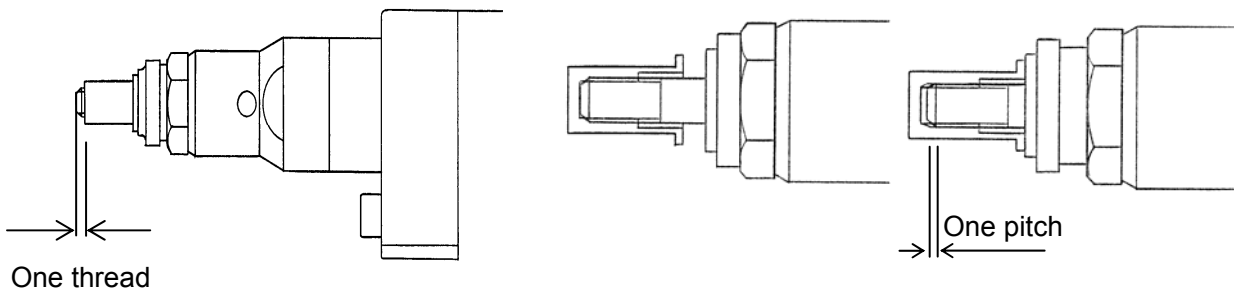


Figure 7-4



Open End POP NUT

Figure 7-5

Close End POP Nut

Figure 7-6

- d) For an Open End POP Nut:
 - Thread the Nosepiece all the way into the Nose housing.
 - Screw the open end POP Nut onto the Mandrel and adjust the Nosepiece so that approximately one thread of the Mandrel screw thread extends beyond the POP Nut (Figure 7-5).
 - Unthread the Nosepiece until it is against the POP Nut flange.
 - Tighten the Nosepiece Lock Nut.
- e) For a Closed End POP Nut:
 - Thread the Nosepiece all the way into the Nose housing.
 - Screw the Closed End POP Nut onto the Mandrel until it stops

- Back off the POP Nut one rotation (one thread pitch) (Figure 7-6).
 - Unthread the Nosepiece until it is against the POP Nut flange.
 - Tighten the Nosepiece Lock Nut.
- f) Screw the Lock Nut and the Nose Housing together to fasten the Nosepiece in place.

3. REPLACEMENT OF THE CONTROL NUT AND THE T-VALVE PUSH ROD

If the Mandrel breaks or the screw thread of a POP Nut is broken due to excessive stroke, the Control Nut and T Valve Push Rod may be damaged or broken.

Procedure

- Disconnect the air supply.
- Use a cross-head screwdriver to remove the truss machine screw and detach the Front Case (Figure 7-7).
- Use the 1.5mm hexagonal wrench (provided) to loosen the lock screw on the control nut and turn the Control Knob counter-clockwise until the Control Nut reaches the end of its travel (Figure 7-8).

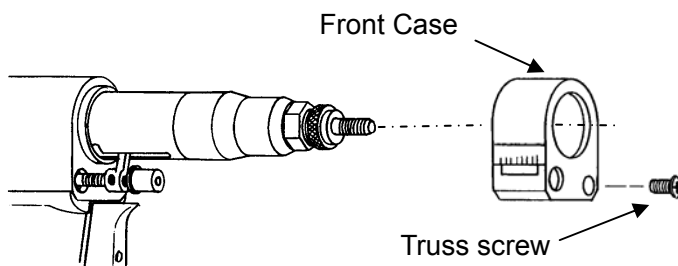


Figure 7-7

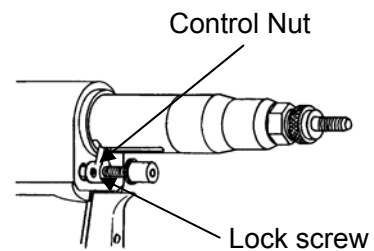


Figure 7-8

- Press the control knob and line up the projection on the Control Nut with the Nose Housing, and then turn the Control Knob counter clockwise to remove the assembly. Remove these parts as an assembly from the body of the tool (Figures 7-9 and 7-10).

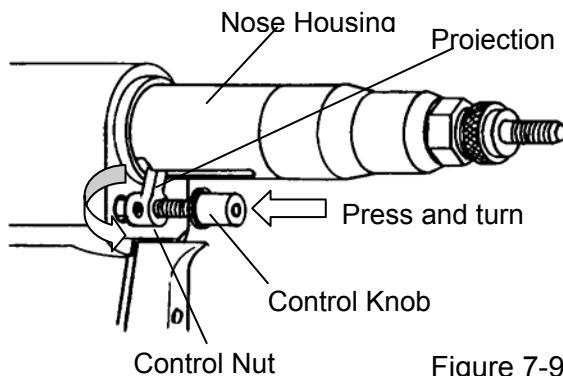


Figure 7-9

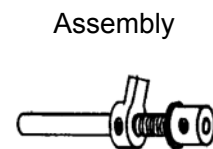


Figure 7-10

- Use the 1.5mm hexagonal wrench to loosen the lock screws of the Control Knob and the Control Nut and remove them from the T Valve Push Rod (Figure 7-11).

- f) Adjust the total length of the assembly to 66 ± 0.1 mm, and tighten the lock screw on the Control Knob. (Figure 7-12)

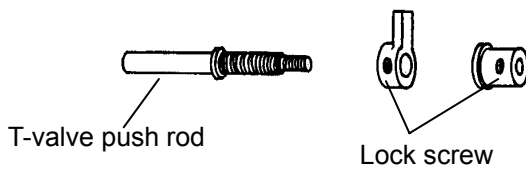


Figure 7-11

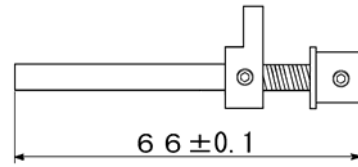


Figure 7-12

- g) Push the assembly into the body of the tool, and reverse the above procedure to reassemble all parts.
- h) Loosen the lock screw on the Control Nut and turn the Control Knob clockwise until the Control Nut stops at the end of its movement, and then tighten the lock screw (Figure 7-13).
- i) Set a POP Nut without work piece, and check the stroke. If the stroke is 1.3mm or less, it is normal (Figure 7-14).

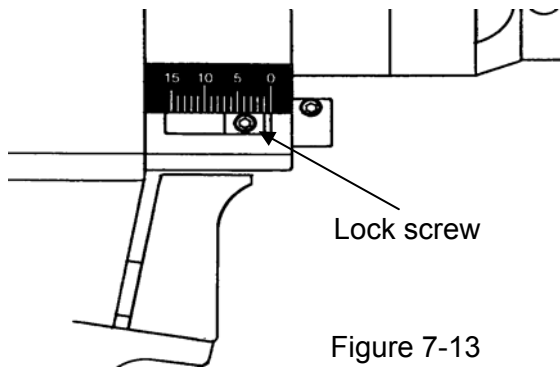


Figure 7-13

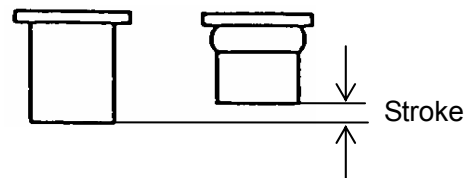


Figure 7-14

Note: When stroke is over (1.3 mm or more), check the assembly length (proper length: 66 ± 0.1), and readjust.

For all other issues - refer to the "Troubleshooting" section.

4. OIL RECHARGING.

If the stroke gets too short due to a lack of hydraulic oil (if a proper setting stroke is not possible, even after stroke adjustment), follow the procedure below to recharge the hydraulic oil.

Note: If the stroke is still inadequate after recharging the oil, the hydraulic seals may need to be replaced. Contact your distributor for tool repair.

Procedure

- Disconnect the air supply.
- Set the position of the Control Nut to approximately 10 mm. (Refer to "Adjustment of stroke")

Note: If Control Nut is not set to around 10 mm, the T Valve and Control Nut could break.

Note: Don't loosen the lock screw of the Control Knob as this would disturb the stroke (Figure 7-14).

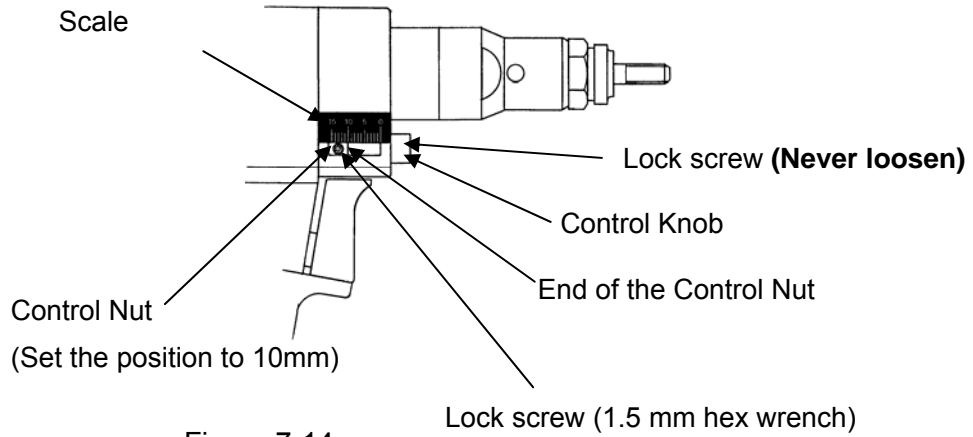


Figure 7-14

- c) Use a cross-head screwdriver to remove the 4 truss machine screws on the Air Chamber (Figure 7-15).
- d) Stand the tool with the Air Chamber uppermost and lift the Air Chamber off. Pull the Air Piston assembly and the Tube out (Figure 7-16).

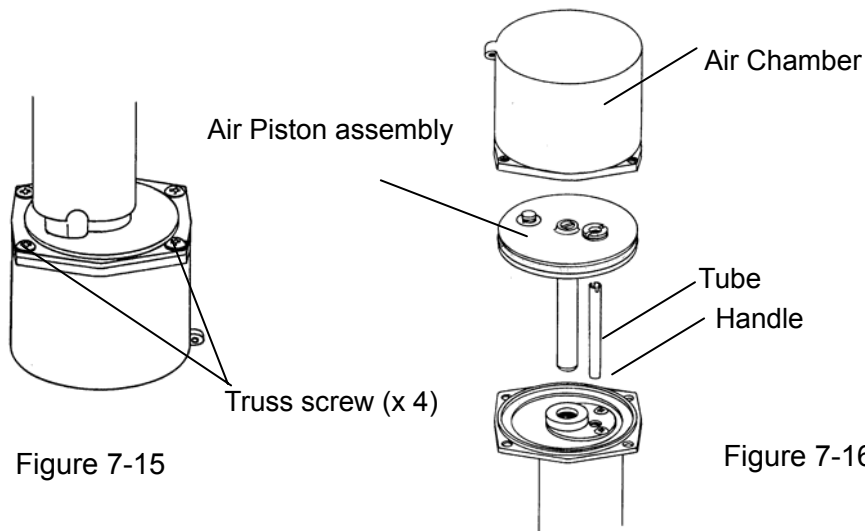


Figure 7-15

Figure 7-16

- e) Dispose of the old hydraulic oil from the handle in a proper waste oil container.
- f) Pour the new hydraulic oil into the bore of the handle (Figure 7-17).
- g) Pour the oil in until its surface is level with the backup ring (Figure 7-18).

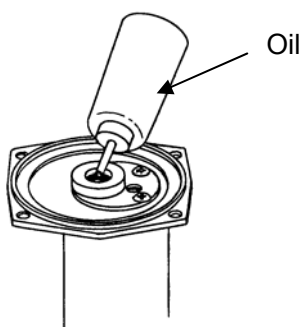


Figure 7-17

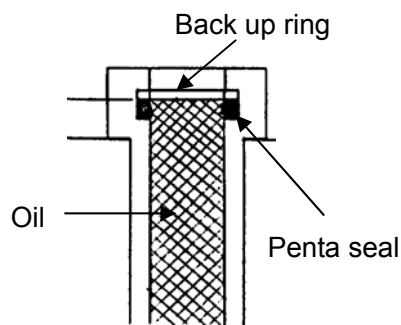


Figure 7-18

Push the Air Piston assembly in and move it back and forth slowly by hand five or six times (Figure 7-19), then pull it back out again. Check the oil level. If the oil level has fallen or air bubbles are present, let the air settle out and repeat steps (g) and (h).



Figure 7-19

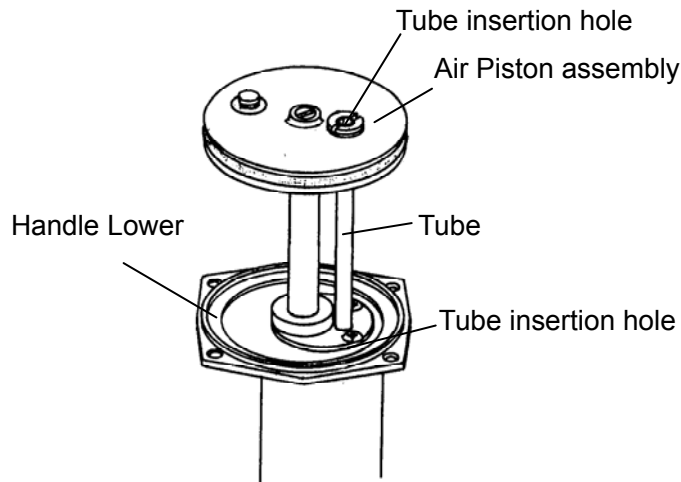


Figure 7-20

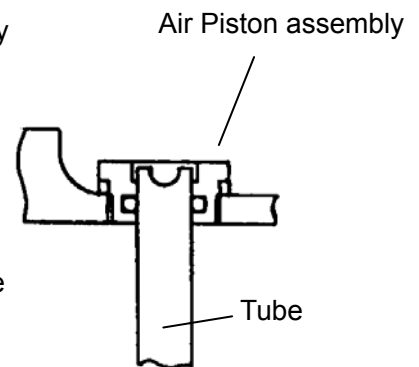


Figure 7-21

- h) After replacement of the hydraulic oil, line up the Air Piston assembly and the tube insertion hole in the handle lower and push the tube into place (Figure 7-20).
- i) Pass the Tube into the tube insertion holes in the Air Piston assembly and the Handle Lower (Figure 7-21).
- j) Replace the Air Chamber and the four (4) truss machine screws on the Air Chamber.
- k) Turn the tool over so that the fill screw is uppermost. Use a straight screwdriver to unscrew the fill screw to let any excess oil and air (bubbles) escape. Once the hydraulic oil stops coming out, tighten the fill screw (Figure 7-22).
- l) Finally, adjust the setting stroke correctly for desired POP Nut (Refer to the "Stroke Adjustment" section).

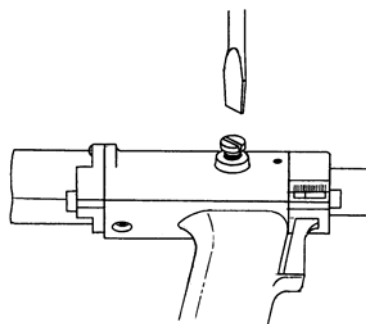


Figure 7-22

Troubleshooting

If you are unable to fix the tool after reviewing this manual and the troubleshooting section, contact your distributor or Emhart Technologies for repair.

Problem	Cause	Action	Section
Cannot thread the POP Nut onto the tool Mandrel	1. Parts are not correct. The Mandrel and Nosepiece are not the correct ones for the POP Nut used.	<ul style="list-style-type: none"> Change to the correct parts for the POP Nut you are using. 	Maintenance and Testing subsection 2
	2. Mandrel threads are damaged.	<ul style="list-style-type: none"> Replace the Mandrel 	Maintenance and Testing subsection 2
	3. Metal chips are jammed in Mandrel's threads.	<ul style="list-style-type: none"> Clean the screw threads of the Mandrel and lubricate with oil. 	Operation subsection 5
No forward or reverse rotation of the Mandrel. (Slow rotation)	4. Low air pressure.	<ul style="list-style-type: none"> Adjust the pressure of the compressed air supply. 	Tool Setup
	5. Insufficient Lubricant.	<ul style="list-style-type: none"> Adjust the Lubricator drip rate. 	Tool Setup
	6. Insufficient Lubricant in the rotating parts.	<ul style="list-style-type: none"> Lubrication spray for rotating parts. 	Maintenance and Testing subsection 1
	7. The position of the Control Knob is not correct.	<ul style="list-style-type: none"> Adjust the total length of the Control Knob assembly. 	Maintenance and Testing subsection 3
	8. The Control Nut and T-Valve Push Rod are damaged.	<ul style="list-style-type: none"> Replace the damaged parts. 	Maintenance and Testing subsection 3
The Mandrel cannot unthread of a POP Nut	9. After the stroke, the tool is pressed against workpiece.	<ul style="list-style-type: none"> Pull the Nut tool lightly while detaching. 	Operation subsection 2
	10. The POP Nut's threads have been damaged by over-stroke.	<ul style="list-style-type: none"> Adjust the stroke correctly. 	Stoke Adjustment
Unthreading sequence stopped during automatic reverse.	11. Mandrel threads are damaged.	<ul style="list-style-type: none"> Replace the Mandrel to new one. 	Maintenance and Testing subsection 2
	12. Trigger was released while detaching the tool (before unthreading was complete).	<ul style="list-style-type: none"> Follow proper operating procedure. Refer to the POP Nut Tool detachment procedure. 	Operation subsection 2
The reverse rotation of the Mandrel doesn't stop.	13. The position of the Control Knob is not correct.	<ul style="list-style-type: none"> Adjust the total length of the Control Knob assembly. 	Maintenance and Testing subsection 3
The stroke is incomplete.	14. Low air pressure.	<ul style="list-style-type: none"> Adjust the pressure of the compressed air supply. 	Tool Setup
	15. Too little hydraulic oil.	<ul style="list-style-type: none"> Recharge hydraulic oil. 	Maintenance and Testing subsection 4

Problem	Cause	Action	Section
The Mandrel is damaged, and/or broken.	16. Life of the Mandrel	<ul style="list-style-type: none"> Replace the Mandrel. 	Maintenance and Testing subsection 2
	17. Attempted double setting of POP Nut.	<ul style="list-style-type: none"> Operate correctly. 	Operation
		<ul style="list-style-type: none"> Replace the damaged parts. 	Maintenance and Testing subsection 2
	18. The stroke is excessive.	<ul style="list-style-type: none"> Adjust the stroke correctly. 	Stoke Adjustment
		<ul style="list-style-type: none"> Replace the damaged parts. 	Maintenance and Testing subsection 2
19. Control nut and T-Valve Push Rod are broken.	<ul style="list-style-type: none"> Replace the damaged parts. 	Maintenance and Testing subsection 3	
20. Tool is not perpendicular to the workpiece.	<ul style="list-style-type: none"> Operate correctly. 	Operation	
	<ul style="list-style-type: none"> Replace the damaged parts 	Maintenance and Testing subsection 2	
The setting stroke is short. (The tool automatically reverse rotates)	21. The stroke is misadjusted.	<ul style="list-style-type: none"> Adjust the stroke correctly. 	Stroke Adjustment
	22. Too much hydraulic oil or air is mixed in hydraulic oil.	<ul style="list-style-type: none"> Recharge the hydraulic oil. 	Maintenance and Testing subsection 4
The setting stroke is short. (The tool does not reverse rotate automatically.)	23. Low air pressure.	<ul style="list-style-type: none"> Adjust the pressure of the compressed air supply. 	Tool Setup
	24. Too little hydraulic oil or air is mixed in hydraulic oil.	<ul style="list-style-type: none"> Replace the hydraulic oil. 	Maintenance and Testing subsection 4
It cannot be adjusted to a correct stroke.	25. Too little hydraulic oil.	<ul style="list-style-type: none"> Replace the hydraulic oil. 	Maintenance and Testing subsection 4
	26. Too much hydraulic oil or air is mixed in hydraulic oil.	<ul style="list-style-type: none"> Replace the hydraulic oil. 	Maintenance and Testing subsection 4
	27. Control Nut and T-Valve Push Rod are broken.	<ul style="list-style-type: none"> Replace the damaged parts. 	Maintenance and Testing subsection 3
	28. The position of Control knob is not correct.	<ul style="list-style-type: none"> Adjust the total length of the Control Knob assembly. 	Maintenance and Testing subsection 3

Safety Data

SEAL LUBE (P/N: PSA075508P)

LUBRIPLATE® 130-AA

Manufactured by:
Fiske Brothers Refining Co.
Phone: (419) 691-2491
Emergency: (800) 255-3924

ALVANIA® EP Grease 1

Prod Code: 71124
Manufactured by:
Shell Oil Products
Phone: (877) 276-7285
MSDS#: 57072E-5

First Aid:

SKIN:

Remove any contaminated clothing and wash with soap and warm water. If injected by high pressure under skin, regardless of the appearance of its size, contact a physician IMMEDIATELY.

Delay may cause loss of affected part of body.

INGESTION:

Call a physician immediately. Do not induce vomiting.

EYES:

Flush with clear water for 15 minutes or until irritation subsides. If irritation persists, consult a physician.

Fire:

FLASH POINT: COC- 400°F

Cool exposed containers with water.

Use foam, dry chemical, carbon dioxide or water spray.

Environment:

WASTE DISPOSAL:

Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste disposal facility or site.

SPILLAGE:

Scrape up grease, wash remainder with suitable petroleum solvent or add absorbent.

Handling/ Storage:

Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants.

Lubriplate® is a registered trademark of Fiske Brothers Refining Company.

Please refer to the actual MSDS for complete safety and handling information. These can be obtained from the point of purchase.

HYDRAULIC OIL (P/N: PRG540-130)

MOBIL DTE 26

Manufactured By:
ExxonMobil Corporation
Emergency Phone: (609) 737-4411
MSDS Fax on Demand:
(613) 228-1467 MSDS # 602649-00

Shell TELLUS 68

Manufactured By:
SOPUS Products
Health Information: (877) 504-9351
MSDS Assistance:
(877) 276-7285 MSDS # 402288L-0

Distributed By:

Emhart Teknologies
Phone: (203) 924-9341

First Aid:

SKIN:

Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention.

INGESTION:

Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention.

EYES:

Flush with water. If irritation occurs, get medical attention.

Fire:

FLASH POINT: 390°F/198.9°C

Material will float and can be re-ignited on the surface of water. Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO₂) to extinguish flames. Do not use a direct stream of water.

Environment:

SPILLAGE:

Soak up residue with an absorbent such as clay, sand or other suitable material. Place in a non-leaking container and seal tightly for proper disposal.

Handling:

Wash with soap and water before eating, drinking, smoking, applying cosmetics or using toilet. Properly dispose of leather articles such as shoes or belts that cannot be decontaminated. Use in a well ventilated area.

Storage:

Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

EC Declaration of Conformity

We, Emhart Technologies

Tucker Fasteners Limited
Birmingham B42 1BP
United Kingdom.

Declare that:

PNT800A

Conforms to the following standards:

EN 292 part 1 and part 2
ISO 3744
ISO prEN 792 part 1
EN ISO 4871

ISO prEN 15744
EN 28662 - 1
EN 12096

Following the provisions of the Machine Directive 98/37/EEC which replaces Directive 89/392/EEC and its amending Directives 91/368/EEC, 93/44/EEC and 93/68/EEC.



Signed: _____
Eymard Chitty, Vice President, R&D

Birmingham
October, 2006



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