

# POP<sup>®</sup>

## INSTRUCTION MANUAL

### ProSet<sup>®</sup> 1600 Series

#### Pneumatic Blind Rivet Tool



上海徽宇电子科技有限公司

Shanghai Huiyu Electronic Technology Co., Ltd.

# Contents

Introduction.....	2
Safety Instructions.....	3
Specifications.....	4
Packaged Accessories.....	4
Tool Requirements.....	4
ProSet® 1600 Tool Dimensions .....	5
Common Nosepieces .....	6
Basic Tool Operation .....	6
Front End Service.....	7
Mandrel Collection System (MCS) – ProSet® 1600 MCS.....	8
Cleaning the Collector Silencer .....	8
Tool Assembly Torque Requirements.....	9
ProSet® 1600/1600MCS Diagram.....	10
Parts List.....	12
Hydraulic Oil Charging Procedure.....	14
Maintenance.....	15
Safety Data.....	16
Troubleshooting.....	17
EC Declaration of Conformity.....	18

# Introduction

POP® ProSet® 1600 tools are light weight Air/Hydraulic rivet setting tools recommended for use with genuine POP® Brand Rivets per following chart:

Rivet Type	Material (Body – Mandrel)	Rivet Diameter		
		3/32" (*) [2.4 mm]	1/8" [3.0 - 3.2 mm]	5/32" [4.0 mm]
<b>Open End &amp; MultiGrip</b>	Al – Al	✓	✓	✓
	Al – St / SS	✓	✓	✓
	St – St	✓	✓	✓ (†)
	SS – SS; NC – St /SS	✓	✓	
<b>Closed End</b>	Al – Al	✓	✓	✓
	Al – St / SS; Cu – St	✓	✓	✓ (♦)
	St – St	✓	✓	
	SS – SS	✓	✓	
<b>LSR Rivets</b>	Al – Al	✓	✓	✓
<b>HR™ Rivets</b>	St – St	✓	✓	
<b>T - Rivet</b>	Al – St	✓	✓	✓
<b>Self Plugger</b>	St – St	✓	✓	

*Al: Aluminum, St: Steel, SS: Stainless Steel, Cu: Cooper, NC: Nickel Copper*

(\*) Use FAN239-176 Jaw pusher set up.

(†) Exclude MultiGrip

(♦) Set air pressure at 90 psi (6.2 bar).



## Safety Instructions



TO INSURE PROPER FUNCTIONING AND SAFE OPERATION READ THIS MANUAL CAREFULLY BEFORE SETTING UP OR OPERATING THE POP® ProSet™ 1600 SERIES TOOLS

1. **DO NOT** use this tool in a manner other than that recommended by Emhart Teknologies.
2. Always wear eye protection when using or when near a tool that is in use.
3. This tool is **NOT** designed for use in explosive atmospheres.
4. Inspect tool for damage before connecting to air supply including all air connections.
5. Trained personnel must perform tool repair and/or maintenance at the prescribed intervals.
6. Disconnect the air supply when adjusting, servicing or removing any part of the tool.
7. Keep fingers off the trigger when connecting the air supply or if the air supply fails.
8. Keep fingers away from the front of the tool when connecting the air supply or setting rivets.
9. **DO NOT** point the tool at anyone.
10. **DO NOT** operate tool with the nose housing removed.
11. **DO NOT** operate tool without the Deflector or Collector.
12. **DO NOT** modify the tool in any way. Modification will make void any applicable warranties and could result in damage to the tool or physical injury to the user.
13. **DO NOT** look into the tool from the front or the back during use or when connected to air supply.
14. The operating pressure must not exceed 100 psi (6.9 bar).
15. **DO NOT** direct tool exhaust towards anyone.
16. Wash hands if exposed to hydraulic fluid or lubricant.
17. Keep hair, fingers and loose clothing away from moving parts of the tool.
18. Emhart Teknologies recommends the use of Hearing protection when operating this tool.

# Specifications

	ProSet® 1600	ProSet® 1600MCS
<b>Weight</b>	2.15 lbs. (0.98 kg)	2.30 lbs. (1.05 kg)
<b>Length</b>	10.83" (275 mm)	10.71" (272 mm)
<b>Height</b>	8.94" (227 mm)	8.94" (227 mm)
<b>Stroke</b>	0.71" (18 mm)	0.71" (18 mm)
<b>Air Consumption</b>	0.043 cu. ft. per rivet (1.22 ℓ per rivet)	2.47 scfm (max.) (70 ℓ/min (max.))
<b>Pulling Force</b>	1090 lbs. @ 90 psi (4850 N @ 0.62 MPa)	
<b>Noise Level*</b>	$L_{Aeq,T} = 80.2 \text{ dB(A)}$ , $L_{WA} = 85.0 \text{ dB(A)}$ , $L_{Peak} = 110.4 \text{ dB(C)}$	
<b>Vibration Level</b>	0.54 m/s <sup>2</sup> , Time to 2.5 m/s <sup>2</sup> > 24hrs (EAV)	

\*Note: Emhart Technologies recommends the use of Hearing Protection when operating this tool

## Packaged Accessories

Qty	Item	PROSET1600	PROSET1600MCS	Part No.
1	ProSet® 1600 Rivet Tool	✓	✓	-
1	Operating Instructions	✓	✓	P449
1	Maintenance Manual	✓	✓	P513
1	Nosepiece for 3 size open end rivets	✓	✓	PRN314
1	Nosepiece for 4 size open end rivets	Installed	Installed	PRN414
1	Nosepiece for 5 size open end rivets	✓	✓	PRN514
1	Jaw Pusher (Assy.) for 3/32" rivets	✓	✓	FAN239-176
1	Air Line Assembly	✓	✓	FAN239-157
1	4 mm Hex. Socket Screw Key	✓	✓	DPN239-139
1	Warranty Card	✓	✓	FG2184

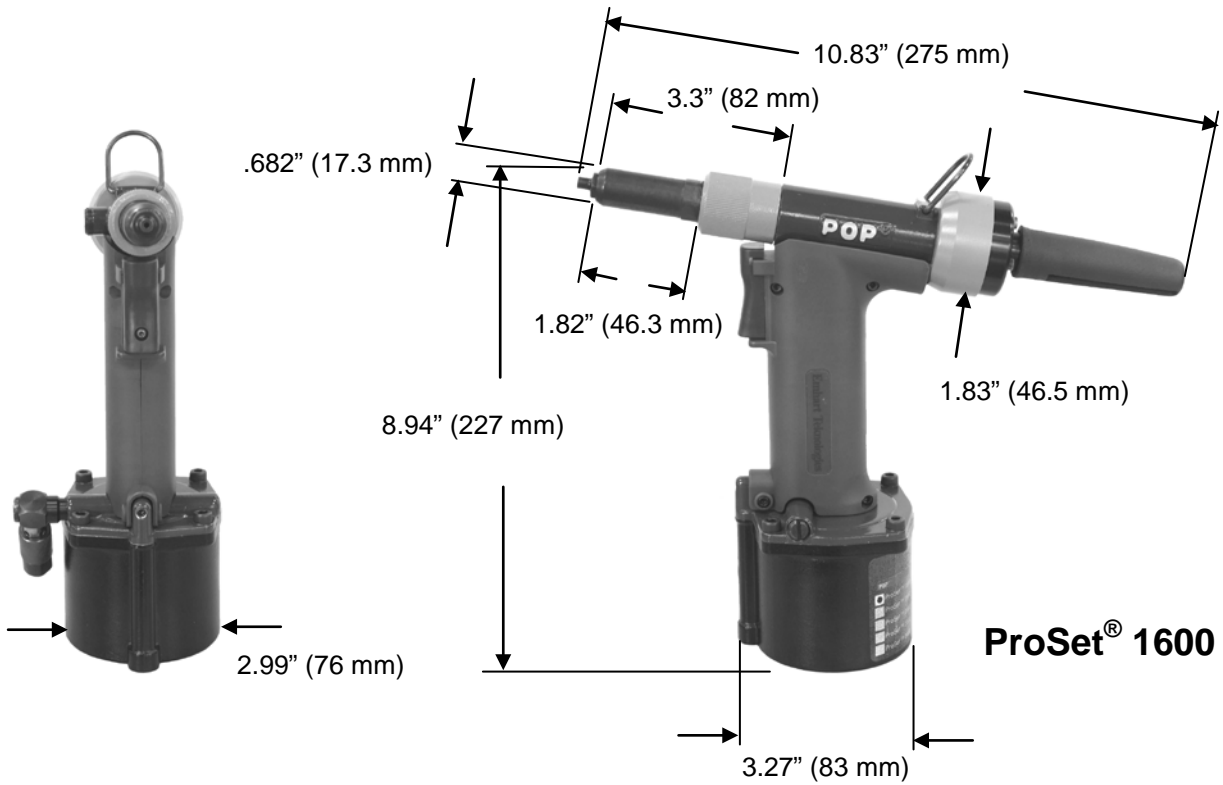
## Tool Requirements

Air supply *	6 scfm (150 ℓ/min) Minimum
Recommended Operating Pressure	72.5-90 psi (0.5-0.62 MPa) dry, filtered
Maximum Operating Pressure	100 psi (0.69 MPa) dry, filtered
Hydraulic Oil **	POP® p/n: PRG540-130 [1 qt. (.945 ml)]
Jaw Lubricant **	POP® p/n: PRG510-130 [6 oz. (177 ml)]
Seal Lubricant **	POP® p/n: PSA075508P [1 ¾ oz. (54 g)]

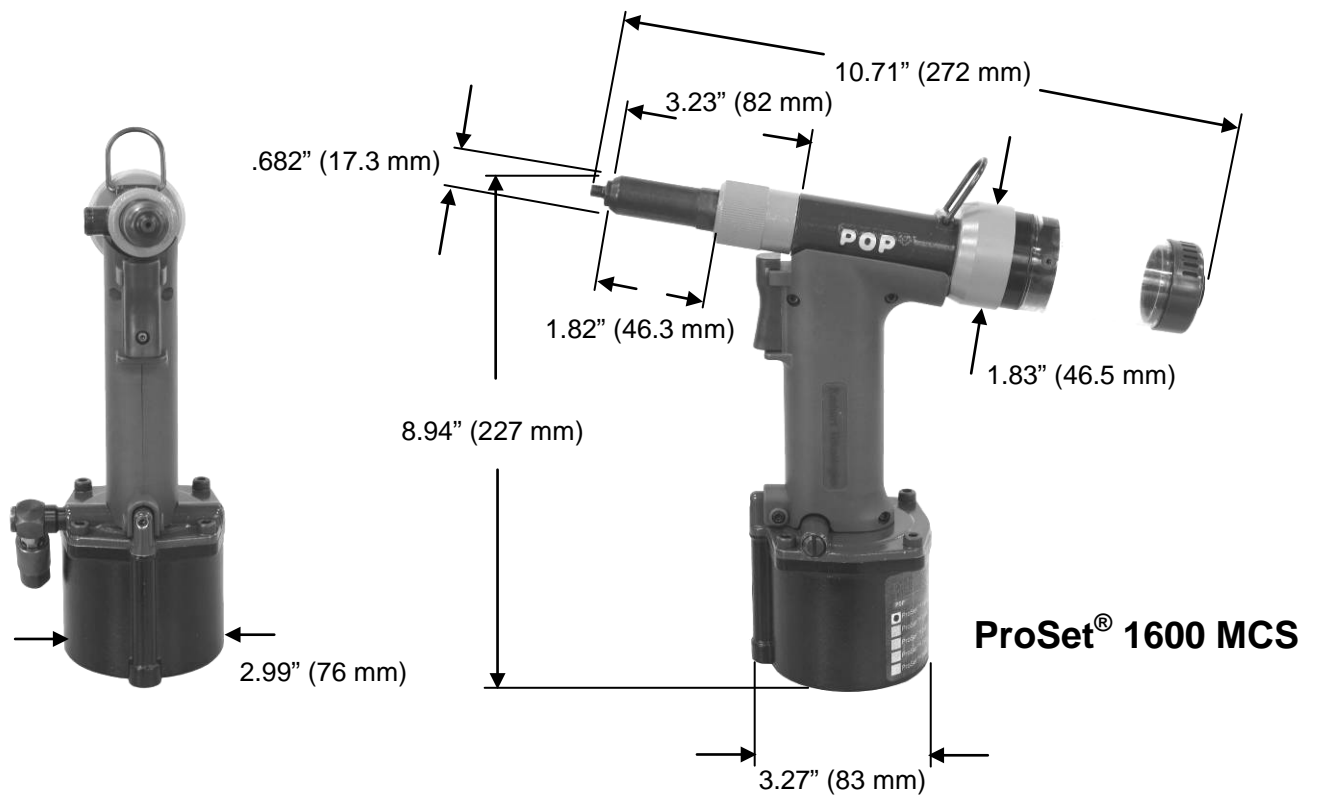
(\*) Note: For best results and long service life, use dry, filtered air supply.

(\*\*) Note: See lubricant safety information.

# ProSet® 1600 Tool Dimensions



**ProSet® 1600**



**ProSet® 1600 MCS**

## Common Nosepieces

Rivet Diameter	Open End	Closed End		HR Rivets		Jaw Pusher
		Steel Mandrel	Aluminum Mandrel	Aluminum Body	Steel Body	
2.0 mm	PRN214	-	-	-	-	FAN239-176* (PRG402-02 - JAWS)
3/32" (2.4 mm)	PRN314*	-	-	-	-	FAN239-176*
1/8" (3.2 mm) or 7/64" (2.8 mm)	PRN414*	PRN424	PRN434	PRN414*	PRN4HR	DPN239-144*
5/32" (4.0 mm)	PRN514*	PRN524	PRN534	PRN514*	-	

\* Included with the tool

Use FAN239-176 instead of DPN239-144 (installed) when using 3/32" (2.4mm) or smaller diameter rivets.

## Basic Tool Operation

**Before operating the tool check the following:**

- Inspect tool for damage or leaking oil – **do not use tool if it is damaged or leaking oil.**
- Check that correct nosepiece is fitted and tightened to 60 - 65 in-lbs [6.8 – 7.3 N-m] torque.
- Check that the nose housing nut (8) is tight – hand tighten only.
- Connect tool to air supply – see air supply requirements (page 4).
- Fit Mandrel Collector (96) – (MCS tool only).
- Open air supply valve by Sliding red OS Sleeve (93) on side of tool (see note below).
- Insert rivet into nosepiece.
- Position rivet in work piece.
- Pull trigger to set rivet.
- Release trigger – if equipped, MCS suction will draw mandrel into the collector.

**! Note: The ProSet® 1600 has an OS (Open-Shut) Valve for switching the air supply ON and OFF to save air when the tool is not in use.**

**Air Supply ON:** Open OS Valve by sliding OS Sleeve in the direction shown (up).

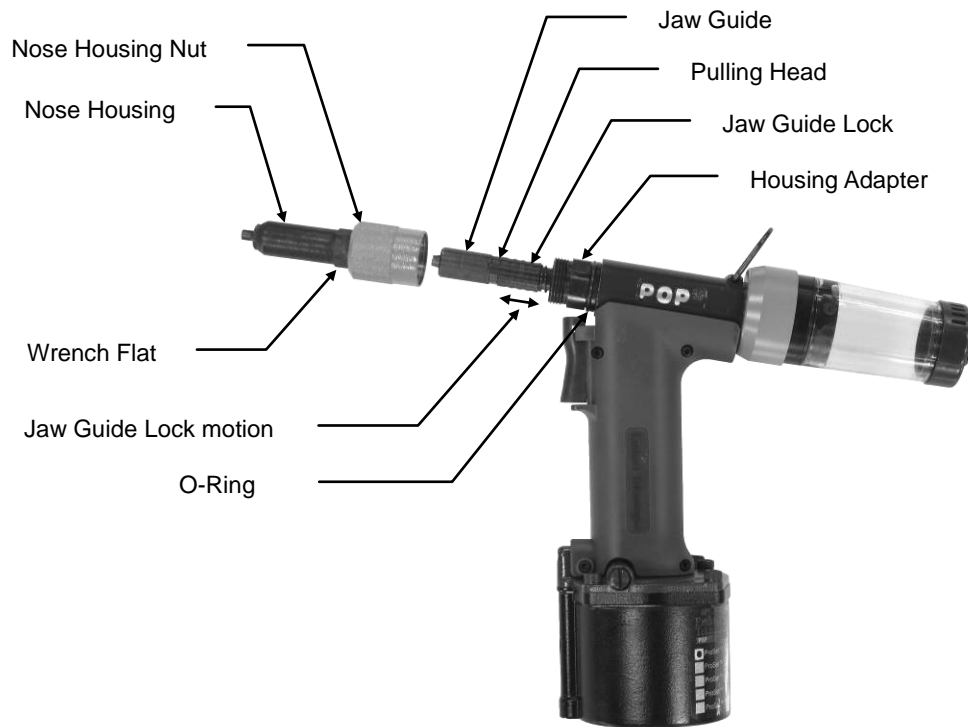
OS Sleeve



**Air Supply OFF:** Close OS Valve by sliding OS Sleeve in the direction shown (down).



## Front End Service



For optimum tool performance, Front-End Service should be performed regularly as per the “Preventative Maintenance Schedule”.

**! Note: UNPLUG AIR SUPPLY while servicing front-end to avoid INJURY.**

### 1. REMOVE NOSE HOUSING:

Unscrew the Nose Housing Nut by hand and slide Nose Housing off the tool.

### 2. REMOVE JAW GUIDE TO ACCESS JAWS AND INTERNAL PARTS:

Pull back the Jaw Guide Lock to disengage the Jaw Guide Lock Teeth and unscrew and remove the Jaw Guide.

Remove Jaws, Jaw Pusher, and Jaw Pusher Spring for servicing.

### 3. CLEAN PARTS:

Clean Jaws, Jaw Guide, Jaw Pusher, Spring and thread area of the Pulling Head. Apply Seal Lube to outside surface of Jaws and inside surface of the Jaw Guide.

### 4. REASSEMBLY OF INTERNAL PARTS AND JAW GUIDE:

Place the Jaws into the Jaw Guide and slide the Jaw Pusher Spring and Jaw Pusher into the Pulling Head.

Apply a small amount of Seal lubricant to the Pulling Head threads and Jaw Guide Lock teeth. Screw the Jaw Guide onto the Pulling Head until the teeth on the Jaw Guide Lock stop the Jaw Guide rotating.

Apply Jaw lubricant to the Jaw area by submerging the assembled Jaw Guide into Jaw lube about 1 in. (25mm). Clean off excess Jaw Lube from the outside of the Jaw Guide.

### 5. REINSTALL NOSE HOUSING ASSEMBLY:

Refit the Nose Housing and Hand-tighten the Nose Housing Nut securely against the O-Ring. If the Nut is not tightened sufficiently against the O-Ring there may be a loss of suction.

## Mandrel Collection System (MCS) – ProSet® 1600 MCS

For safety purposes, removing the Collector from the tool automatically turns the MCS suction OFF. Refitting the Collector turns the MCS suction ON.



MCS suction ON



MCS suction OFF

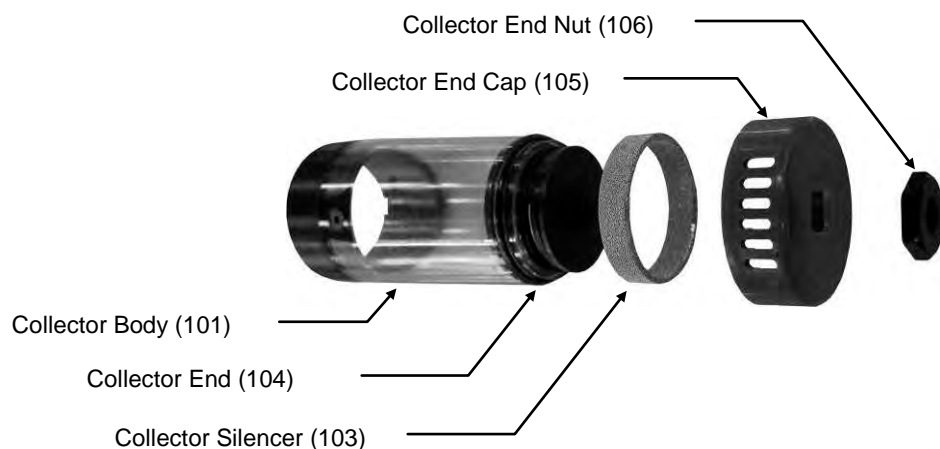
## Cleaning the Collector Silencer

For optimum performance, the Collector Silencer should be cleaned at regular intervals as per the "Preventative Maintenance Schedule".

**! Note: UNPLUG AIR SUPPLY while servicing Collector to avoid INJURY.**

### 1. CLEAN THE COLLECTOR :

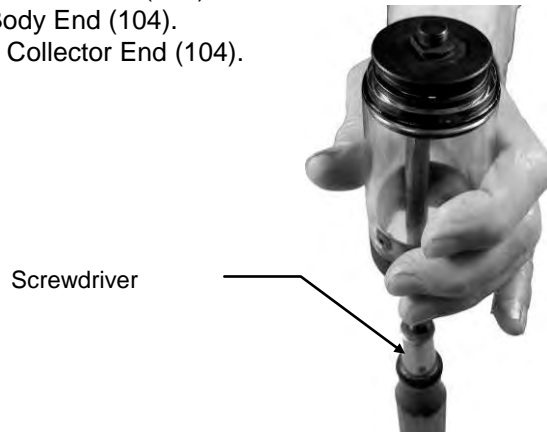
- Remove and empty the Collector (96) by turning counterclockwise.
- Remove the Collector End Nut (106) (17mm wrench) and remove the Collector End Cap (105).
- Remove the Collector Silencer (103).
- Clean and remove debris from all components.





## 2. RE-ASSEMBLE THE COLLECTOR :

- Secure Collector End (104) to Collector Body (101). Use a screwdriver or similar tool to hold the Collector End in place during re-assembly (see picture below).
- Place the Collector Silencer (103) onto the Collector End (104).
- Place Collector End Cap (105) on Collector Body End (104).
- Install and tighten Collector End Nut (106) on Collector End (104).

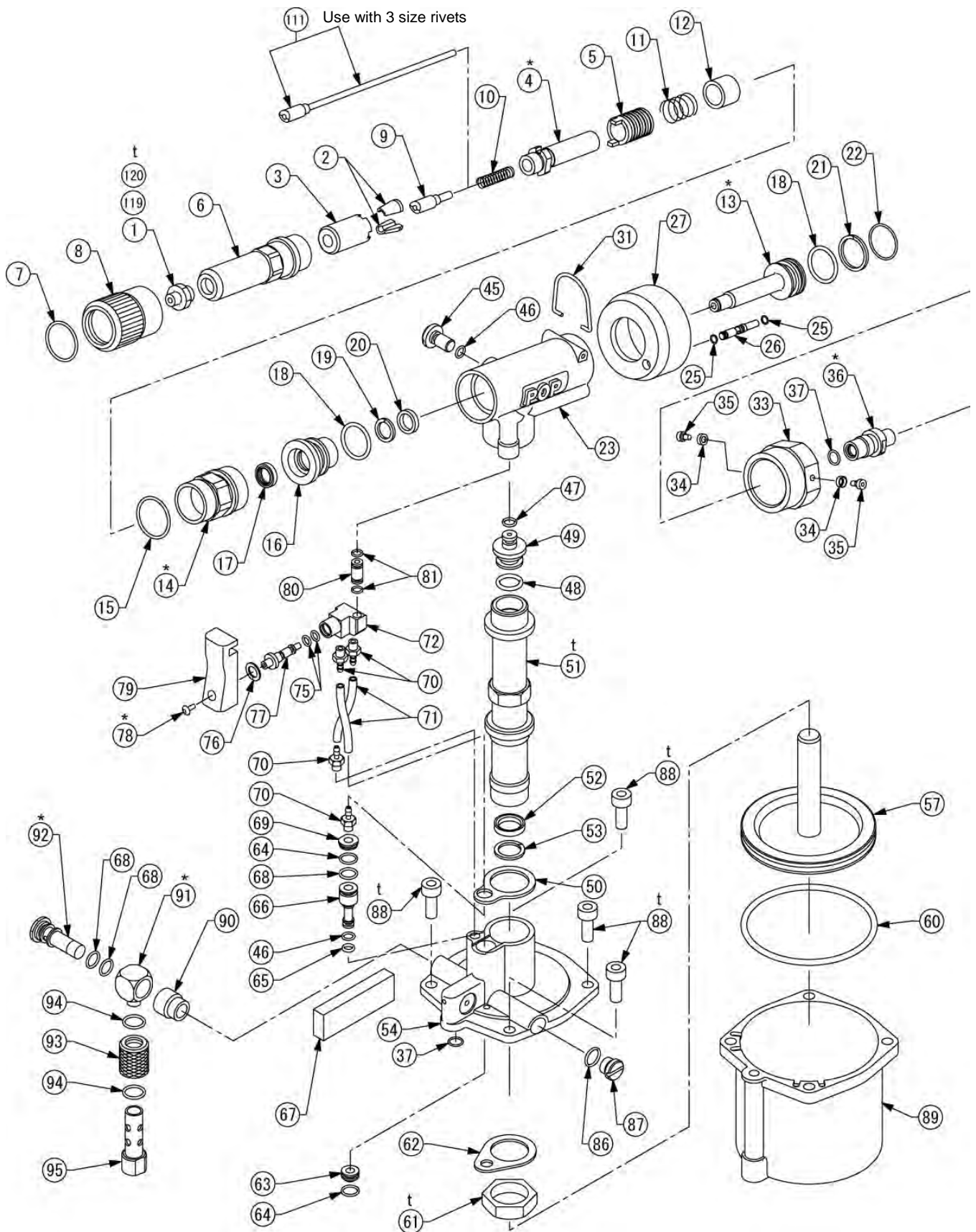


## Tool Assembly Torque Requirements

Item	Part No.	Description	Torque Value
1	PRN414	Nosepiece 4 size	
119	PRN314	Nosepiece 3 size	60 – 65 in-lbs (6.8 – 7.3 N-m)
120	PRN514	Nosepiece 5 size	
51	DPN239-053	Sleeve Lower	35 - 39 ft-lbs (47 - 53 N-m)
61	DPN239-063	Sleeve Lock Nut	31 - 35 ft-lbs (42 - 48 N-m)
88	DPN907-003	Socket Head Cap Screw	46 - 51 in-lbs (5.2 – 5.8 N-m)

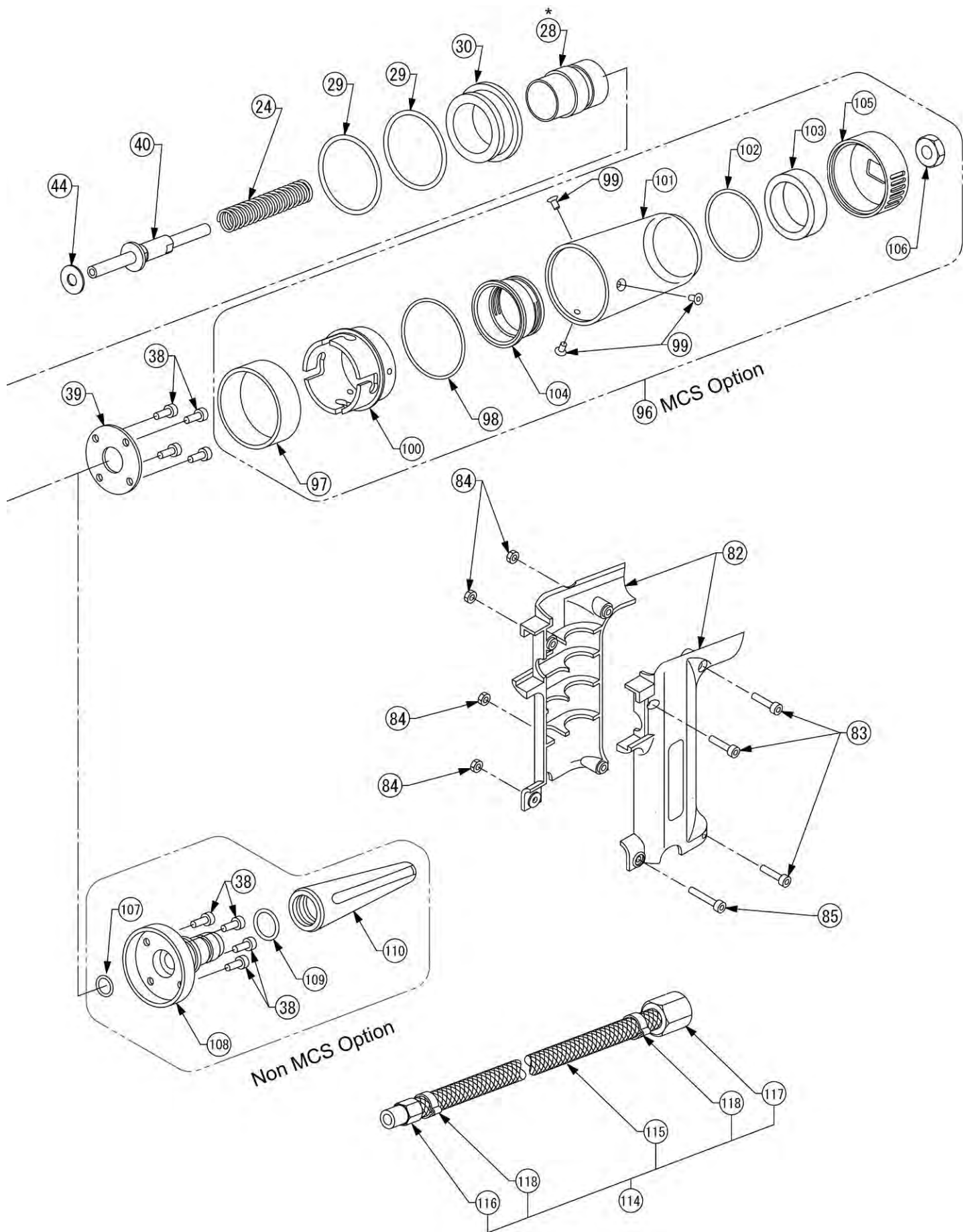
See exploded Tool Diagram

# ProSet<sup>®</sup> 1600/1600MCS Diagram



(\*) These items require Loctite<sup>®</sup> 242 adhesive.

(†) These items have a specific tightening torque as indicated in the "Tool Assembly Torque Requirements" table.



# Parts List

Item	Part No.	Description	1600	1600 MCS	Item	Part No.	Description	1600	1600 MCS
1	PRN414	Nosepiece 4 size	1	1	64	DPN900-011	O-Ring	2	2
2	PRG402-8A	Jaws	1set(2)	1set(2)	65	DPN900-012	O-Ring	1	1
3	DPN239-006	Jaw Guide	1	1	66	DPN239-068	J Valve Rod	1	1
4	DPN239-007	Pulling Head	1	1	67	DPN239-069	EXT Silencer	1	1
5	DPN239-008	Jaw Guide Lock	1	1	68	DPN900-013	O-Ring	3	3
6	DPN239-009	Nose Housing	1	1	69	DPN239-071	Valve Stopper	1	1
7	DPN900-001	O-Ring	1	1	70	DPN239-120	Fitting	4	4
8	DPN239-011	Nose Housing Nut	1	1	71	DPN239-121	Air Tube	2	2
9	DPN239-144	Jaw Pusher	1	1	72	FAN239-074	S.V Case Assembly	1	1
10	DPN901-001	Jaw Pusher Spring	1	1	75	DPN900-014	O-Ring	2	2
11	DPN901-002	Spring	1	1	76	DPN902-001	Retaining Ring	1	1
12	DPN239-018	Spring Receiver	1	1	77	DPN239-078	S Valve Rod	1	1
13	DPN239-019	Hydraulic Piston	1	1	78	DPN906-001	Button Hd Cap Screw	1	1
14	DPN239-020	Housing Adapter	1	1	79	DPN239-150	Trigger	1	1
15	DPN900-002	O-Ring	1	1	80	DPN239-083	Connect Tube	1	1
16	DPN239-022	Rod Seal Case	1	1	81	DPN900-015	O-Ring	2	2
17	DPN908-001	Scraper	1	1	82	DPN239-151	Handle Assembly	1	1
18	DPN900-003	O-Ring	2	2	83	DPN907-001	Socket Hd Cap Screw	3	3
19	DPN908-002	B.U-Ring	1	1	84	DPN239-086	Hexagon Nut	4	4
20	DPN908-003	Penta Seal	1	1	85	DPN907-004	Socket Hd Cap Screw	1	1
21	DPN908-004	B.U-Ring	1	1	86	DPN900-016	O-Ring	1	1
22	DPN900-004	O-Ring	1	1	87	DPN239-089	Plug	1	1
23	DPN239-029	Handle Upper	1	1	88	DPN907-003	Socket Hd Cap Screw	4	4
24	DPN901-003	Return Spring	1	1	89	DPN239-091	Chamber	1	1
25	DPN900-005	O-Ring	2	2	90	DPN239-126	R Joint Spacer	1	1
26	DPN239-111	MCS Valve Rod	1	1	91	DPN239-093	R Joint	1	1
27	DPN239-112	MCS Cap	1	1	92	DPN239-127	R Joint Adapter	1	1
28	DPN239-034	End Cap Adapter	1	1	93	DPN239-095	O S Slider	1	1
29	DPN900-019	O-Ring	2	2	94	DPN900-017	O-Ring	2	2
30	DPN239-036	Slider	1	1	95	DPN239-097	O S Joint	1	1
31	DPN239-181	Hook	1	1	96	FAN239-166	Collector Assembly	-	1
33	DPN239-153	End Cap	1	1	97	DPN239-098	Collector Lock Collar	-	1
34	DPN239-116	Collar	2	2	98	DPN900-018	O-Ring	-	1
35	DPN239-154	Collar Screw	2	2	99	DPN903-001	Flat Head Cap Screw	-	3
36	DPN239-118	Ejector Guide	1	1	100	DPN239-155	Collector Lock	-	1
37	DPN900-006	O-Ring	2	2	101	DPN239-130	Collector Body	-	1
38	DPN907-002	Socket Hd Cap Screw	4	4	102	DPN900-020	O-Ring	-	1
39	DPN239-119	End Cap Plate	-	1	103	DPN239-168	Collector Silencer	-	1
40	FAN239-043	Ejector Assembly	1	1	104	DPN239-156	Collector End	-	1
44	DPN239-108	Packing	1	1	105	DPN239-167	Collector End Cap	-	1
45	DPN239-047	Fill Screw	1	1	106	DPN239-152	Collector End Nut	-	1
46	DPN900-007	O-Ring	2	2	107	DPN900-021	O-Ring	1	-
47	DPN900-008	O-Ring	1	1	108	DPN239-163	Deflector Adapter	1	-
48	DPN900-009	O-Ring	1	1	109	DPN900-022	O-Ring	1	-
49	DPN239-147	Sleeve Upper	1	1	110	PRG510-56	Deflector	1	-
50	DPN239-052	Upper Plate	1	1	111	FAN239-176	Jaw Pusher Assy	1	1
51	DPN239-053	Sleeve Lower	1	1	114	FAN239-157	Air Line Assembly	1	1
52	DPN908-005	Penta Seal	1	1	115	DPN239-158	Air Line	1	1
53	DPN908-006	B.U-Ring	1	1	116	DPN239-159	Air Line Fitting	1	1
54	FAN239-148	Handle Lower Assy	1	1	117	DPN239-160	Hose Female Fitting	1	1
57	FAN239-059	Air Piston Assembly	1	1	118	PRG540-45	O-Clamp (0911)	2	2
60	DPN900-010	O-Ring	1	1	119	PRN314	Nosepiece 3 size	1	1
61	DPN239-063	Sleeve Lock Nut	1	1	120	PRN514	Nosepiece 5 size	1	1
62	DPN239-064	Bottom Plate	1	1	NS	DPN239-139	HS Screw key - M4	1	1
63	DPN239-065	J Valve Cap	1	1					

Optional Parts and Kits are also available separately.

Part No.		Description	
PRN214		Nose piece for 2.0 mm rivet (Micro Rivets)	
PRG402-02		Jaws for 2.0 mm rivet (Micro Rivets)	
DPN239-110		17mm Hex. Socket screw key for End	
<b>FAN239-174</b>		<b>ProSet® 1600 Front End Extension Kit – 5” [127mm] length</b> <b>Contains:</b>	
2	PRG402-8A	Jaws	1
3	DPN239-006	Jaw Guide	1
5	DPN239-008	Jaw Guide Lock	1
7	DPN900-001	O-Ring	1
8	DPN239-011	Nose Housing Nut	1
9	DPN239-144	Jaw Pusher	1
10	DPN901-001	Jaw Pusher Spring	1
11	DPN901-002	Spring	1
DPN239-169		Nose Housing	1
DPN239-170		Pulling Head Extension	1
DPN239-171		Pulling Head Joint	1
FAN239-172		Jaw Pusher (Assembly)	1
<b>FAN239-175</b>		<b>ProSet® 1600/1600MCS Seal Kit</b> <b>Contains:</b>	
7	DPN900-001	O-Ring	1
15	DPN900-002	O-Ring	1
18	DPN900-003	O-Ring	2
22	DPN900-004	O-Ring	1
25	DPN900-005	O-Ring	2

Part No.		Description	
37	DPN900-006	O-Ring	2
46	DPN900-007	O-Ring	1
60	DPN900-010	O-Ring	1
68	DPN900-013	O-Ring	2
94	DPN900-017	O-Ring	2
17	DPN908-001	Scraper	1
19	DPN908-002	B.U-Ring	1
20	DPN908-003	Penta Seal	1
21	DPN908-004	B.U-Ring	1
52	DPN908-005	Penta Seal	1
53	DPN908-006	B.U-Ring	1
<b>FA203-408</b>		<b>ProSet® 1600 Adaptor Kit for MCS5000 (remote MCS)</b> <b>Contains:</b>	
MCS5000-78		Adapter Cap	1
MCS5000-81		Strain Relief	1
PRT5250-24		Tapered Bushing	1
PRT5250-26		Tapered Bushing	1
PRT5250-98		Fitting for 5 size rivets	1
PRT5250-99		Fitting for 4 size rivets	1
<b>FAN239-177</b>		<b>ProSet® 1600 MCS Retrofit Kit</b> <b>Contains:</b>	
39	DPN239-119	End Cap Plate	1
96	FAN239-166	Collector Assembly	1
<b>RP4-486</b>		<b>RP4/RP5 Receptacle</b>	

# Hydraulic Oil Charging Procedure

**! IMPORTANT. TOOL MUST BE DISCONNECTED FROM THE AIR SUPPLY. USE ONLY APPROVED HYDRAULIC OIL SPECIFIED IN THIS MANUAL.**

1. Disconnect from air supply.
2. Remove Nose Housing (6) and Collector (96).
3. Remove four Socket Head Cap Screws (88) using 4mm Hex-Key wrench (accessory). (Fig. 1)
4. Turn tool upside down and remove Chamber (89). Then pull out Air Piston Assembly (57). (Fig. 2)
5. Drain the oil from the tool into a waste oil container.
6. Clean the dirt off the Air Piston Assembly (57) and inner Chamber (89) with a clean rag. Apply a thin layer of Seal lubricant to inner Chamber.
7. Loosen Jaw Guide (3) approximately 3 full turns or a 0.12" (3mm) gap and loosen Fill Screw (45) approximately 3 - 3½ full turns or a 0.14" (3.6mm) gap (Fig. 3).
8. Secure the tool upside down again and pour hydraulic oil into Sleeve Lower (51) to the level of the Backup Ring (white part) (53). (Fig. 4)
9. Push Air Piston Assembly (57) into Sleeve Lower (51) to half-way point so that dirty hydraulic oil and air bubbles will come out from the loosened Fill Screw (45). Hold Air Piston Assembly until no more oil or bubbles come out. (Fig. 5)
10. Loosely tighten Fill Screw (45) and pull out Air Piston Assembly (57).
11. Pour more hydraulic oil into Sleeve Lower (51) to the level of the Backup Ring and push Air Piston Assembly (57) into Sleeve Lower (51). Push Air Piston inwards then outwards 5-6 times in a slow, constant motion. Then pull it out and check for bubbles rising to the oil surface. If there are still bubbles, repeat the procedure until there are no more bubbles (Fig. 6). It may be necessary to repeat this procedure 2-3 times to bleed all bubbles from the oil. If after 3 attempts there are still bubbles in the oil, go back to No.5 and start again by draining the hydraulic oil.

Fig. 1

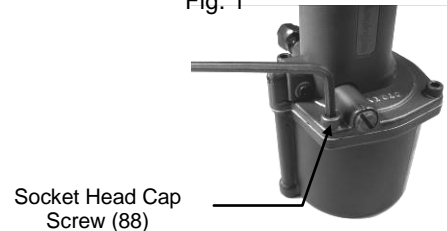


Fig. 2



Fig. 3

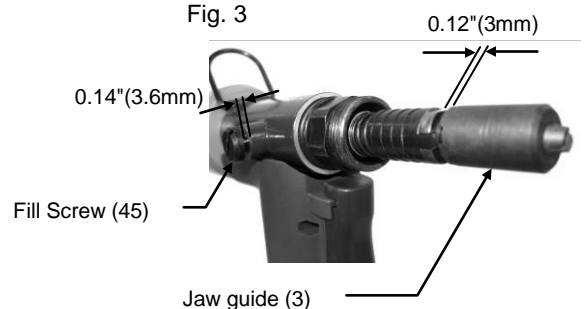


Fig. 4



Fig. 5

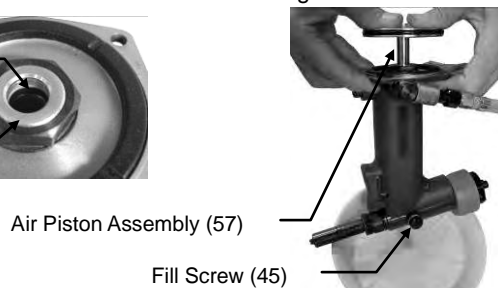
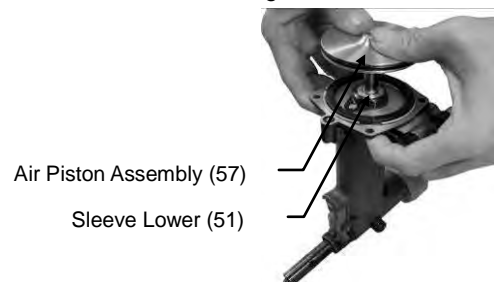


Fig. 6



12. When there are no more bubbles in the oil, top off the hydraulic oil in the Sleeve Lower (51) to the level of the Backup Ring (53).
13. Make sure the Jaw Guide (3) is loose (see Step 7). Push the Air Piston Assembly (57) into the Sleeve Lower (51) to the half-way point. While holding the Air Piston at the half-way point, replace the Nose Housing and hand tighten.
14. With a clean rag, wipe off any oil on the Air Piston Assembly (57), Handle Lower Assembly (54), and Sleeve Lower (51). Put Chamber (89) over Air Piston Assembly (57) then turn the tool upright and tighten the four Socket Head Cap Screws (88) to a Torque of 46 - 51 in-lbs (5.2 – 5.8 N-m).
15. Remove the Nose Housing (6), and tighten the Jaw Guide (3) by hand until it stops.
16. Loosen the Fill Screw (45) approximately 3 - 3½ full turns or a 0.14"(3.6mm) gap to allow excess hydraulic oil and bubbles to escape. When no more oil comes out, tighten the Fill Screw (Fig. 7).
17. Wipe off any dirt and oil on the tool.
18. Replace the Nose Housing (6) and Collector (96).

Fig. 7



**Note: During assembly and disassembly, do not allow any metal swarf or dirt into the Hydraulic Oil and inner Chamber.**

## Maintenance

Preventative Maintenance Schedule		
Item	Action	Frequency
Clean and lubricate Front End of tool	See "Front End Service"	1 x per day or 5,000 rivet settings.
Inspect jaws	Look for broken jaws and damage or wear on jaw teeth.	During "Front End Service" or when jaws slip on mandrel.
Collector	Empty Collector	When the quantity of stored spent Mandrels starts to interfere with mandrels entering the Collector. (Storage quantity depends on rivet – approx. 75-90 5/32" (4.0mm) rivets).
	Clean Collector Silencer	Once a week or when MCS suction will not pull spent mandrels into the Collector.

**Note: Only use Emhart specified greases and lubricants**

# Troubleshooting

Symptom	Probable Cause	Remedy
TOOL FAILS TO OPERATE	Tool not connected to air supply. OS Valve is in "OFF" position. Insufficient air pressure. Air pressure is too high. Tool is low on hydraulic fluid.	Connect to recommended air supply source. Slide OS Valve to ON position. Adjust air supply pressure. Adjust air supply pressure. Service tool by qualified service personnel.
TOOL NOT RETURNING	Possible jam due to debris in Nose Housing.	Perform "Front End Service" and check for debris or damage.
TOOL LOSING STROKE	Tool low on hydraulic fluid.	Service tool by qualified service personnel.
JAWS SLIPPING ON MANDRELS	Jaws dirty or need lubrication. Jaws worn.	Clean and lube jaws. Replace jaws.
JAWS FAIL TO OPEN	Dirty Nose Housing, Jaws or Jaw Guide.  Nose Housing loose. Excess hydraulic oil in tool.	Perform "Front End Service" and clean inside of Nose Housing. Tighten Nose Housing. Service tool by qualified service personnel.
MANDREL STICKING IN JAWS	Jaws dirty or need lubrication.	Perform "Front End Service" to clean and lubricate Jaws.
RIVET FAILS TO INSERT INTO NOSEPIECE	Incorrect nosepiece. Shear ring stuck in hole of nosepiece.	Install correct nosepiece. Remove shear ring, check for the correct Nosepiece and review application parameters to ensure proper riveting.
RIVET MANDREL DOES NOT BREAK	Rivet not fully set. Mandrel break load requirement too high. Insufficient air pressure.	Repeat stroke required, or change rivet. Upgrade tool. Adjust air supply pressure to recommended level.
MCS NOT WORKING	Tool not connected to air supply. Collector not tight or missing. Mandrel path blocked.	Connect to recommended air supply source. Check Collector. Clear mandrel path.
LOW VACUUM	Dirty Silencer. Collector is full of mandrels. Insufficient air pressure.	Clean or change Silencer. Discard the mandrels. Adjust air supply pressure.