

INSTRUCTION MANUAL PRG 511 Pneumatic POP[®] Rivetool



Emhart
POP[®]

SECTION I — GENERAL INFORMATION

The PRG 511 is a Pneumatic Tool suitable for setting all Rivets with a break load up to 1,000 pounds and is equipped to handle various Nosepieces. See Table 1 for specific sizes available. The main castings are made of high tensile aluminum, and replacement parts are interchangeable.

PRG 511 WILL SET ONLY THE "POP" RIVETS LISTED IN THIS CHART

RIVET	MANDREL	3/32	7/64	1/8	5/32	3/16
OPEN END RIVETS						
alum.	alum.	•		•	•	•
alum.	steel	•		•	•	•
steel	steel	•		•	•	•
monel	steel		•	•		
stainless	stainless			•		
CLOSED END RIVETS						
alum.	alum.			•	•	•
alum.	steel			•		

Table 1 NOSEPIECE NUMBERS			
RIVET DIA.	OPEN END	CLOSED END STEEL MANDREL	CLOSED END ALUM. MANDREL
3/32	PRN-314		
1/8 or 7/64	PRN-414	PRN-424	PRN-434
5/32	PRN-514		PRN-534
3/16	PRN-614		PRN-634

DATA	
Weight of Tool	4 lbs.
Centerline of Nosepiece to Top of Tool	9/16"
Length Including Deflector	11½"
Length With Deflector Collapsed	9"
Length of Stroke	5/8"
Air Pressure	85 P.S.I.
(WARNING — Do Not Exceed 85 P.S.I. Air Pressure)	

Table 2 ACCEPTABLE EQUIVALENTS OF RECOMMENDED GREASE, LUBRIPLATE 130AA
ESTAN 1 — HUMBLE OIL & REFINING COMPANY
UNEDO 1 — SHELL OIL COMPANY
SUN C-891T GREASE — SUN OIL COMPANY
ALASTAC #10 — TIDEWATER OIL COMPANY

SECTION II — OPERATION

The following description gives a brief summary of the events that occur when the Trigger is depressed.

1. When Trigger PRG 510-35 is squeezed, Valve Tube PRG 510-37 moves down with Valve Ring Seal PRG 510-107, allowing air to flow to top of Piston PRG 510-43.
2. The air then sets the Piston in motion downward, pulling the Piston Rod PRG 510-41+ with it.
3. This causes the Bell Cranks PRG 510-45 to pivot and the Pulling Head PRG 510-48 to move rearward.

4. As this occurs, Jaws PRG 402-8A grip the mandrel of Rivet and pull until Rivet is set.

5. When the Trigger is released, the Valve Tube and Valve Ring Seal move up, shutting off the air supply. The air then exhausts out through the Valve Tube.

6. The Piston Rod Return Spring PRG 510-124 returns the Piston and the Jaw Guide PRH 820-11A to their normal positions, allowing the Jaws to open and release the spent mandrel.

SECTION III — CARE AND MAINTENANCE

A. GENERAL

For best results and longer life a regular service procedure should be established and maintained.

The following points should be checked on a regular maintenance basis.

1. Clean Jaws PRG 402-8A, Jaw Guide PRH 820-11A, and Jaw Pusher PRG 520-33 by the following procedure:
 - a. Remove Nose Housing PRG 511-052 along with Nosepiece.

b. Remove Jaw Guide PRH 820-11A, Jaws PRG 402-8A, and Jaw Pusher PRG 520-33.

c. Clean Jaw Guide and Jaw Pusher. Clean serrations in Jaw Teeth with a wire brush.

d. Apply a thin coat of lubricant to the outside of the Jaw Guide and Jaw Pusher. Also, apply a thin coat of lubricant to the conical surfaces of the Jaws.

e. Reassemble and cycle tool a few times to check operation.

2. Make certain that the Jaw Guide, Nose Housing, and Nosepiece are securely fastened.
3. About every 100,000 cycles, the three bearings in the Bell Crank and the associated Pins should be liberally relubricated with Lubriplate 130AA or equivalent.
 - a. Remove Housing Cap PRG 511-076.
 - b. With small brush, force new grease between Bell Cranks PRG 510-45 and Piston Rod PRG 510-41+ so that it will work onto Piston Rod Fulcrum PRG 510-113.
 - c. With air pressure on tool, use tape or rubber band to hold Trigger PRG 510-35 in pulling position. Remove Fulcrum Retaining Ring PRG 510-122, Bell Crank Fulcrum PRG 510-126 and the two Outer Bell Crank Bushings PRG 510-46. Use brush to force new grease through holes in Housing to work around Bell Cranks and Center Bell Crank Bushing PRG 510-47. Wipe some grease onto Outer Bushings and Fulcrum Pin and reassemble.
 - d. Similarly to b. above, force new grease between Bell Cranks and Pulling Head Fulcrum PRG 510-49.
 - e. Release Trigger and reassemble Housing Cap.
4. Under normal working conditions, foreign matter may accumulate in the Jaw Pulling mechanism, hindering its normal operation. To prevent this build-up and to lubricate the pulling mechanism, the following procedure is recommended. NO disassembly of the tool is required.

- a. Clear tool of spent mandrels.
- b. Dip Nose Housing 1½" into Jaw Lube PRG 510-130.
- c. While immersed, cycle tool several times, pausing between cycles.
- d. Remove tool, wipe outer surface clean.
- e. For alternate method, see Section III A 1, 2. Use only recommended lubricant or equivalent.

B. AIR HOSE REPLACEMENT

In the event the Air Line PRG 540-39 is crushed or damaged in some manner, it may be repaired or replaced, depending on the amount of damage, by using the following procedure:

1. Remove Air Line Clamp PRG 540-45 by cutting or deforming the ears which project on either side. In doing this, the Clamp will be permanently damaged, and for this purpose two extra Clamps are included on the Air Line.
2. Remove faulty Air Line from Hose Adapter PRG 510-58 and insert new or repaired Air Line.
3. Tighten new Clamp by squeezing with pliers both ears on either side of Clamp.

NOTE

Insertion of new Air Line may be facilitated by dipping end of Air Line into hot water to make it more flexible.

SECTION IV — DISASSEMBLY AND ASSEMBLY

A. GENERAL

In assembling or disassembling this tool, care should be taken that foreign matter does not get into the tool.

When ordering replacement parts, order by part number shown on Page No. 7.

CAUTION

Shut off air supply to the tool before proceeding with any assembly or disassembly procedures.

B. AIR PISTON AND AIR PISTON SEAL

1. Disassembly

- a. Unscrew nine Base Screws PRG 510-116, and remove Washers PRP-101.
- b. Remove Base PRG 510-33, being careful not to lose Base Air Seal "O" Ring PRG 510-107.
- c. Remove Piston Bumper PRG 510-54.
- d. Unscrew Piston Rod Screw PRG 510-102. Tip to one side to facilitate removal of Piston PRG 510-43, Washer PRG 510-103 and Washer PRG 510-110.

- e. Remove Piston Seal PRG 510-44.

2. Assembly

- a. Attach Piston Seal PRG 510-44 to Piston PRG 510-43.
- b. Apply light grease to Seal and insert assembly into bottom of Housing. Be sure flat side of Piston is facing the bottom of the tool.
- c. Secure Piston with Screw PRG 510-102 and Washers PRG 510-103 and PRG 510-110.
- d. Insert Piston Bumper PRG 510-54 into Housing.
- e. Apply a light coating of grease to Base Air Seal PRG 510-107 so as to retain it in the Base PRG 510-33.
- f. Attach Base PRG 510-33 to Housing with nine Screws PRG 510-116 and Washers PRP-101.

C. TRIGGER ASSEMBLY

1. Disassembly

- a. Remove Trigger Fulcrum Pin PRG 510-120.
- b. Remove Trigger and Trigger Lever from Housing.
- c. Remove Trigger Pin PRG 510-118 from Trigger PRG 510-35 and Trigger Lever PRG 510-36A.

2. Assembly

- a. Attach Trigger PRG 510-35 and Trigger Lever PRG 510-36A with Trigger Pin PRG 510-118.
- b. Insert Trigger assembly into Housing and locate hole in Trigger Lever relative to fulcrum hole in Housing by holding up to light and orienting with a rod, such as mandrel of $\frac{3}{16}$ " "POP" Rivet.
- c. Drive Trigger Fulcrum Pin PRG 510-120 into Housing and carefully through holes in Trigger Lever, using above rod to maintain alignment.

D. VALVE ASSEMBLY

1. Disassembly

- a. Remove Base and Piston per Section IV, Paragraph B1.
- b. Remove Valve Plate PRG 510-39 + by removing two Valve Plate Screws PRG 510-115 and two Lock Washers PRG 510-111.
- c. Withdraw Valve Assembly from Housing.
- d. Using Truarc Pliers, remove Valve Ring Seal Retainers PRG 510-122 from each end of Valve Tube PRG 510-37.
- e. Remove Valve Tube Cap PRG 510-112, Valve Tube Seal PRG 520-60, Valve Seat Seal PRG 510-106, Valve Ring Seal Washer PRG 510-109, Valve Ring Seal PRG 510-107, Valve Seat PRG 510-38, and remaining Valve Ring Seal Retainer PRG 510-122 from Valve Tube.

2. Assembly

- a. Attach Valve Ring Seal Retainer PRG 510-122 to upper end of Valve Tube PRG 510-37.
- b. Position Valve Tube Cap PRG 510-112, Valve Tube Seal PRG 520-60, middle Valve Ring Seal Retainers PRG 510-122, Valve Seat Seal PRG 510-106, and Valve Seat PRG 510-38 on Valve Tube PRG 510-37.
- c. Position Valve Ring Seal PRG 510-107 and Valve Ring Seal Washer PRG 510-109 on Valve Tube PRG 510-37 and retain in place with third Valve Ring Seal Retainer PRG 510-122.
- d. Lubricate Valve Seats lightly with recommended Lubricant and insert Valve Assembly into Housing.
- e. Retain in place with Valve Plate PRG 510 - 39 + and two Screws PRG 510-115 and two Lock Washers PRG 510-111.
- f. Assemble Piston as per Section IV, Paragraph B2.

E. JAWS, JAW PUSHER, JAW GUIDE, JAW PUSHER SPRING TUBE, AND JAW PUSHER SPRING

1. Disassembly

- a. Remove Nose Housing PRG 511-052 and Nosepiece.
- b. Remove Jaw Guide PRH 820-11A.
- c. Remove Jaws PRG 402-8A, Jaw Pusher PRG 520-33, Jaw Pusher Spring Tube PRG 511-010 and Jaw Pusher Spring PRG 510-123.

2. Assembly

- a. Lightly lubricate outside of Jaw Pusher Spring PRG 510-123 and insert into Pulling Head Adaptor PRG 511-022.
- b. Insert Jaw Pusher Spring Tube PRG 511-010 into end of Jaw Pusher Spring.

NOTE

Jaw Pusher Spring Tube PRG 511-010 must be removed when using $\frac{5}{32}$ " or $\frac{3}{16}$ " diameter Rivets.

- c. Lightly lubricate conical surface of Jaws PRG 402-8A and drop Jaws in place in Jaw Guide PRH 820-11A.
- d. Lightly lubricate outside of Jaw Pusher PRG 520-33 and drop in place in Jaw Guide and attach to Pulling Head Adaptor PRG 511-022.
- e. Attach Nose Housing PRG 511-052 and Nosepiece to Tool Housing PRG 510-31.

F. PULLING HEAD, PULLING HEAD ADAPTOR, PISTON ROD AND RETURN SPRING

1. Disassembly

- a. Remove Housing Cap PRG 511-076 by removing two Housing Cap Screws PRG 510-117.
- b. Remove Nosepiece and screw in a $\frac{3}{8}$ - 24 screw (approx. 1" long) in place of Nosepiece until Pulling Head mechanism is moved rearward approximately $\frac{5}{8}$ " (16MM) exposing wrench flats on Mandrel Guide.
- c. Loosen, but do not remove Mandrel Guide PRG 511-051 as Mandrel Tube PRG 511-050 will fly out under spring pressure. Remove $\frac{3}{8}$ - 24 Screw.
- d. Remove Jaw Assembly as per Section IV, Paragraph E1.
- e. Remove Pulling Head Adaptor PRG 511-022.
- f. Remove Air Piston as per Section IV, Paragraph B1.
- g. Remove Mandrel Guide PRG 511-051.
- h. Remove Fulcrum Retaining Ring PRG 510-122. Place screwdriver blade under lip of PRG 510-31 Housing and press down on top of Piston Rod PRG 510-41 + and remove Bell Crank Fulcrum PRG 510-126. If tension has not been released sufficiently to remove Bell Crank Fulcrum, rotate screwdriver blade 90° and follow same procedure.
- i. Relieve pressure and remove Piston Rod Fulcrum PRG 510-113.
- j. Remove Outer Bell Crank Bushings PRG 510-46.
- k. Rotate Piston Rod PRG 510-41 + so that Roll Pin is centered between Bell Cranks PRG 510-45 and remove.
- l. Remove Spring Cap PRG 510-42 and remove Piston Rod Return Spring PRG 510-124.
- m. Lift rear ends of Bell Cranks PRG 510-45 and draw them and Pulling Head Assembly up and to the back to remove from Housing.
- n. Remove the Spring Washer PRG 510-105 and Center Bell Crank Bushing PRG 510-47 from the Housing.

- o. Remove two Bell Cranks PRG 510-45 from Pulling Head Fulcrum PRG 510-49.
- p. Remove Mandrel Tube PRG 511-050 and Pulling Head Fulcrum PRG 510-49 from Pulling Head PRG 510-48.
- q. Remove Valve Plate as per Section IV, Paragraph D 1b.
- r. Remove Piston Rod Seal PRG 510-114 and Piston Rod Seal Washer PRG 510-104.

2. Assembly

NOTE

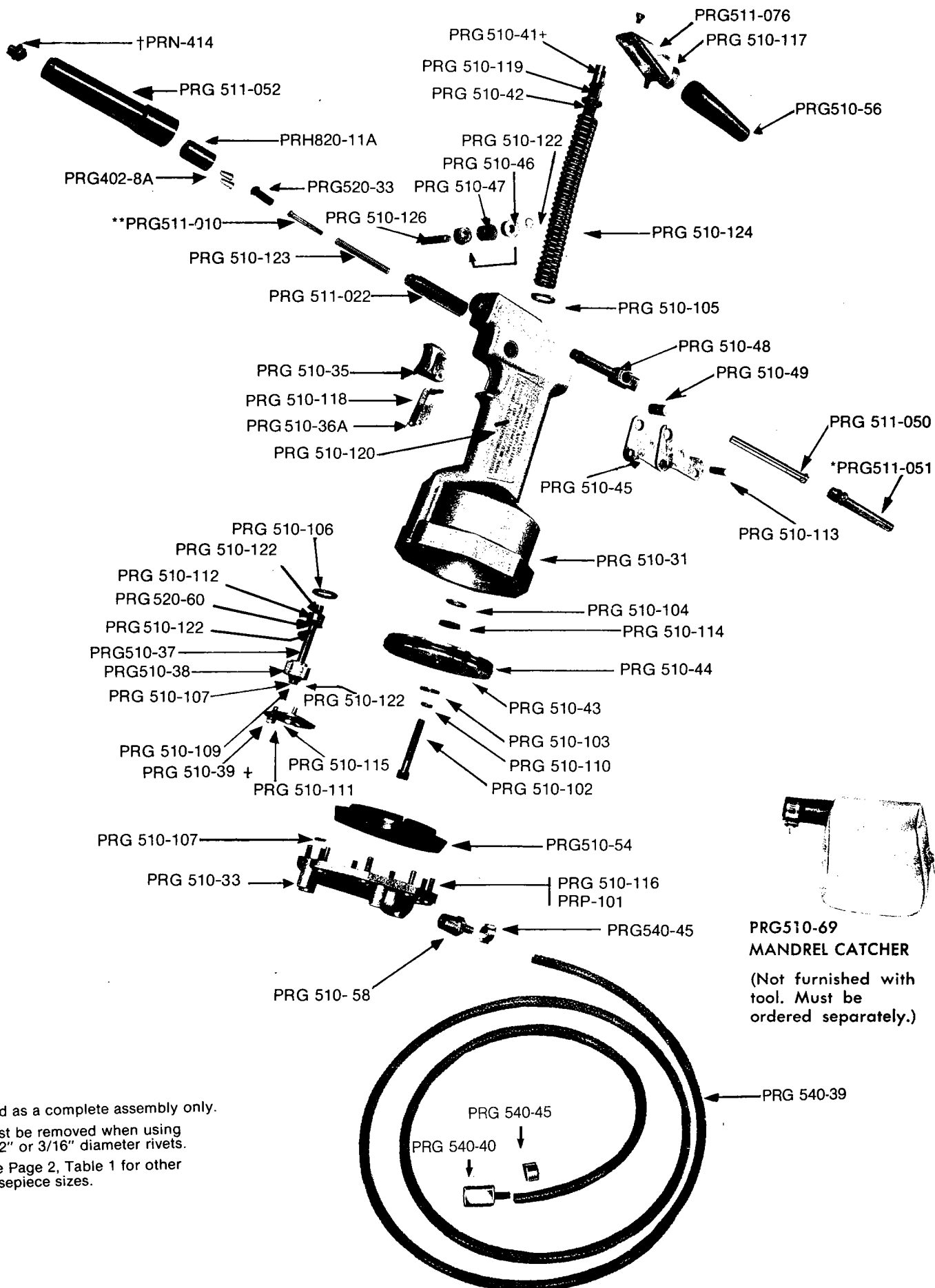
All bearing and pivot points should be lightly lubricated with recommended lubricant or equivalent.

- a. Insert Pulling Head Fulcrum PRG 510-49 into Pulling Head PRG 510-48.
- b. Insert Mandrel Tube PRG 511-050 into bore of Pulling Head and through Pulling Head Fulcrum.
- c. Attach the Bell Cranks PRG 510-45 to the Pulling Head Fulcrum.
- d. Place the Spring Washer PRG 510-105 at the bottom of the bore in the Housing.
- e. Position Center Bell Crank Bushing PRG 510-47 into Housing.
- f. Insert Pulling Head Assembly into Housing.
- g. Insert Piston Rod Return Spring PRG 510-124 into the Housing on top of the Spring Washer PRG 510-105.
- h. Insert the Spring Cap PRG 510-42 into the Piston Rod Return Spring PRG 510-124.

- i. Insert the Piston Rod PRG 510-41 + through the Spring Cap PRG 510-42 and Piston Rod Return Spring PRG 510-124.
- j. Align the fulcrum holes in the Piston Rod and the Bell Cranks and insert the Piston Rod Fulcrum PRG 510-113.
- k. With screwdriver blade push down on Piston Rod PRG 510-41 + as far as it will go, place one outer Bell Crank Bushing PRG 510-46 over Bell Crank Fulcrum PRG 510-126 and insert through the Housing and lower holes of the Bell Cranks.
- l. Insert the second outer Bell Crank Bushing PRG 510-46 into the other side of the Housing and retain with the Fulcrum Retaining Ring PRG 510-122.
- m. Hand tighten Mandrel Guide PRG 511-051 into rear of Pulling Head.
- n. Insert Piston Rod Seal Washer PRG 510-104 and Piston Rod Seal PRG 510-114 over end of Piston Rod PRG 510-41 + .
- o. Reassemble Valve Plate as per Section IV, Paragraph D 2e.
- p. Reassemble Air Piston as per Section IV, Paragraph B2.
- q. Attach Pulling Head Adaptor PRG 511-022.
- r. Reassemble Jaw Assembly as per Section IV, Paragraph E2.
- s. Attach tool to Air Line and cycle. Hold Trigger and tighten Mandrel Guide PRG 511-051.
- t. Place Housing Cap PRG 511-076 on Housing and secure with two Housing Cap Screws PRG 510-117.

SECTION V – TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Jaws Slipping on Mandrels	Dirt in Jaw Teeth Worn Jaw Teeth Fatigued Jaw Pusher Spring Loose Jaw Guide	Clean Jaws—See Section III A11 Replace Jaws—See Section III A1 Replace—See Section III A1 Tighten
Jaws Fail to Open	Nosepiece or Nose Housing Loose Jaws Sticking Dirt Packed Toward Front of Nose Housing	Tighten Lubricate—See Section III A4 OR Clean—See Section III A1
Slow Pulling Action	Air Line or Air Passage Plugged Insufficient Air Pressure Worn Piston Seal Damaged Air Valve Dirt in Restrictor Hole of Piston Bumper Foreign Material Inside Housing	Repair—See Section III B Check Air Supply Replace—See Section IV B Replace—See Section IV D Clean—See Section IV B Clean—See Section IV F

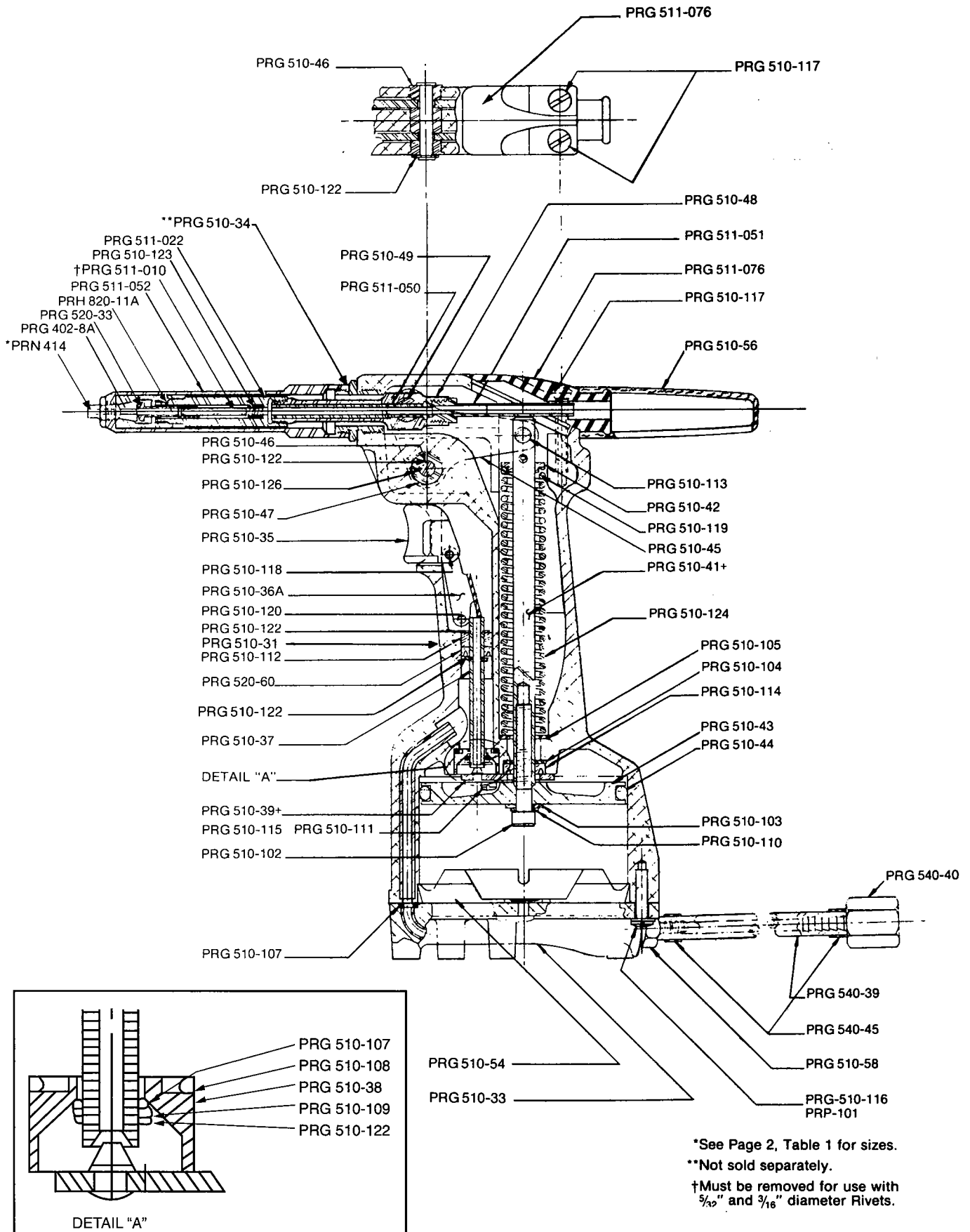


**PRG510-69
MANDREL CATCHER**
(Not furnished with
tool. Must be
ordered separately.)

*Sold as a complete assembly only.
**Must be removed when using
5/32" or 3/16" diameter rivets.
†See Page 2, Table 1 for other
Nosepiece sizes.

SECTION VI — LIST OF PARTS

PRG 510 NO.	PRG 511 and MISC. NO.	QTY.	PRG 510 NO.	PRG 511 and MISC. NO.	QTY.
HOUSING AND TRIGGER PARTS					
PRG 510-31		1	PRG 510-54	Piston Bumper	1
††PRG 510-34		1	PRG 510-107	Base Air Seal	1
PRG 510-35		1	PRG 510-33	Base	1
PRG 510-36A		1	PRG 510-116	Base Screw	9
PRG 510-118		1		PRP 101 Base Screw Washer	9
PRG 510-120		1		PRG 540-39 Air Line — 7' Long	1
				PRG 540-45 Air Line "O" Clamp	2
			PRG 510-58	Hose Adapter — ¼" N.P.T.	1
				PRG 540-40 Hose Female Fitting — ¼" N.P.T.	1
VALVE PARTS			JAW PULLING MECHANISM PARTS		
PRG 510-37		1	PRG 510-123	Jaw Pusher Spring	1
PRG 510-112		1		PRG 520-33 Jaw Pusher	1
	PRG 520-60	1		PRG 402-8A Jaw	2
PRG 510-38		1		PRH 820-11A Jaw Guide	1
PRG 510-106		1		PRG 511-052 Nose Housing	1
PRG 510-107		1		**PRG 511-010 Jaw Pusher Spring Tube	1
PRG 510-109		1			
PRG 510-122		3			
PISTON ROD AND PULLING HEAD PARTS					
PRG 510-39+		1	PRN 314 Nosepiece, 3/32" Open End Rivets		
PRG 510-115		2	PRN 414 Nosepiece, 1/8" and 7/64" Open End Rivets		
PRG 510-111		2	PRN 514 Nosepiece, 5/32" Open End Rivets		
PRG 510-41+		1	PRN 614 Nosepiece, 3/16" Open End Rivets		
PRG 510-119		1	PRN 424 Nosepiece, 1/8" Closed End Rivets with Steel Mandrels		
PRG 510-124		1	PRN 434 Nosepiece, 1/8" Closed End Rivets with Aluminum Mandrels		
PRG 510-42		1	PRN 534 Nosepiece, 5/32" Closed End Rivets with Aluminum Mandrels		
PRG 510-105		1	PRN 634 Nosepiece, 3/16" Closed End Rivets with Aluminum Mandrels		
PRG 510-48		1			
	PRG 511-022	1			
PRG 510-49		1			
	PRG 511-050	1			
	*PRG 511-051	1			
PRG 510-45		2			
PRG 510-47		1			
PRG 510-46		2			
PRG 510-126		1			
PRG 510-122		1			
PRG 510-113		1			
PISTON AND BASE PARTS			HOUSING CAP PARTS		
PRG 510-104		1	PRG 511-076	Housing Cap	1
PRG 510-114		1	PRG 510-117	Housing Cap Screw	2
PRG 510-43		1	PRG 510-56	Housing Cap Deflector	1
PRG 510-44		1	†PRG 510-69	Mandrel Catcher	1
PRG 510-103		1			
PRG 510-110		1			
PRG 510-102		1			
			ASSEMBLY TOOLS		
			PRG 510-125	Piston Rod Screw Wrench, 3/16" Allen	1
			*Sold as a complete assembly only.		
			**Must be removed when using 5/32" or 3/16" Diameter Rivets.		
			†Not furnished with tool. Must be ordered separately.		
			††Not sold separately.		



*See Page 2, Table 1 for sizes.

**Not sold separately.

†Must be removed for use with $\frac{3}{32}$ " and $\frac{3}{16}$ " diameter Rivets.

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