



PNEUMATIC ROLLING DRIVE

**OPERATING & MAINTENANCE GUIDE FOR MODELS
720-550, 720/1800, 720/2500**



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GENERAL INFORMATION:

Always read and understand the safety recommendation for the safety before operating this tool.

TECHNICAL DETAILS:

Description	720-550	720-1800	720-2500
Free speed ,RPM	550	1800	2500
Minimum Torque. Nm.	0.266 (2.35.in.Lbs)	0.266 (2.35.in.Lbs)	0.266 (2.35.in.Lbs)
Maximum Torque, Nm.	8.47 (75in.Lbs)	3.05 (27in.Lbs)	0.90 (8in.Lbs)
Air Consumption	480 l/min 17cfm	480 l/min 17cfm	480 l/min 17cfm
Tube Capacity, inch	1/2	3/8	1/4
Dimensions ,mm	230x230x55	230x230x55	230x230x55
Weight (without tube expanders),kg	1.20	1.20	1.20

SAFETY PRECAUTIONS:

Please read and understand the safety precautions and operating instructions before use.

Always wear protective equipment!



EYE AND FACE PROTECTION

CAUTION

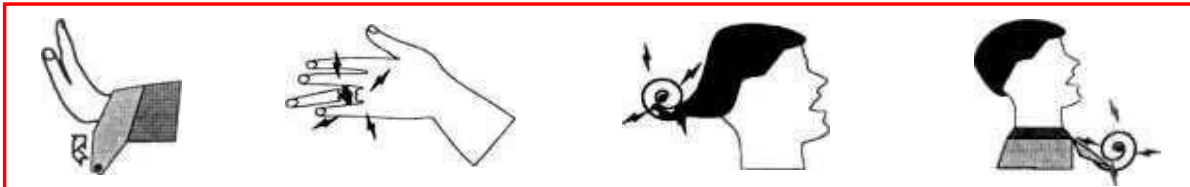
Impact resistance protection is recommended when operating or working near this tool.



HEARING PROTECTION CAUTION

Personal resistance protection must be worn while operating or working near this tool.

Impact resistant eye protectors must be worn while operating or working near this tool. Hearing protection is recommended when working or operating near this tool .Always wear protective Equipment for Eyes and Face protection.

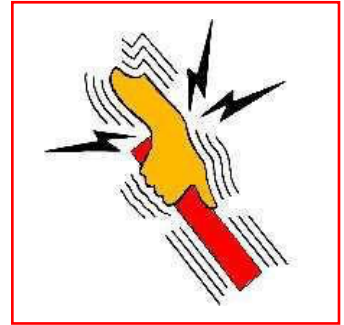


Moving components can entangle and enwrap may cause serious injuries. Never wear loose fitting clothes and gloves, ties or jewelry when working with tools

Reaction Arm/Handles:

Continuous and vibrative working with improper gripping with repetitious, forceful exertions of the hands and arms may cause cumulative trauma disorder. It may develop gradually over periods of months or years.

While operating the tool care should be taken that wrist are maintained in a normal position. Flexed, hyper extended or turned to extreme sides positioning of the wrist may be avoided by proper selection of the tools or changing the work area. Stressful postures should be avoided.



Recommendation for the Safe working:

1. Always maintain the working area clean and dry.
2. Hold the tool with straight and normal wrist position.
3. Hold the tool with minimum hand grip, consistent force with proper control. (Use of a Balancing Arm will always be recommended in such cases.)

Use respirator protection wherever necessary.

During the operation, this tool may produce hazardous fumes, particles or dust which may cause adverse effect on the health. These can be avoided by providing proper ventilation or using a respirator.

Before starting of operation:

- 1) Before starting of tool physically check the tool, coupling and air hoses for any crack or damage. Replace or rectify the same before starting the work.
- 2) Check the throttle for smooth ON and OFF operation by pressing and releasing the throttle before connecting the air supply.
- 3) Clean all the dust and moisture from air hoses.
- 4) Also take care that trigger is not accidentally pressed.
- 5) Operator of this tool should ensure proper and firm balancing of the tool with proper posture. He should be quite alert for the torque reaction in both the directions.
- 6) While working operator should be careful of his hands getting wedged or pinched between the job and the tool.
- 7) Be sure to shut off the air line and drain the air before removing the tool from service or changing the socket.

Operating Instructions:

Product is designed to operate on minimum **95psig(6.5bar)**, maximum **125psig(8.6bar)** air pressure.

NOTE:

Please take note that if air pressure over 100psi(6.8bars) is used it may cause faster tool operation but will also cause to premature wear and tear of tool internal parts. It may also result in breakage of tube expander, mandrel, or rolls.

Tools with clutch mechanism may stall rather than shut-off when adjusted over the maximum power output or if there is a drop in air pressure. Operator must then resist the stall torque until the throttle is released.

Air pressure higher than specified is unnecessary if right tool selection and application is done. Higher pressure may lead to increased load and stresses on the internal part of tool, mandrels, rolls and cage. This may result in premature wear and or breakage.

It is always recommended to install a FRL unit (Filter-Regulator-lubricator) in the air supply line before the tool.

The pneumatic drive works as follows:

To start the drive, push the handle forward. The compressed air is released into the working pocket of the motor and turns the rotor. This rotation is transferred through the torque clutch and the planetary gear to the tube expander fixed on the spindle. When the set torque is reached the clutch stops the motor. To rotate the drive in reverse direction, pull the handle backwards.

Uniform Expansion:

Uniform expansion can be achieved because the torque control unit is an independent section and has no effect of the fluctuation in air pressure. In case the air pressure is low, tool will operate at lower speed and time for expansion will increase.

Tube Rolling Procedure:

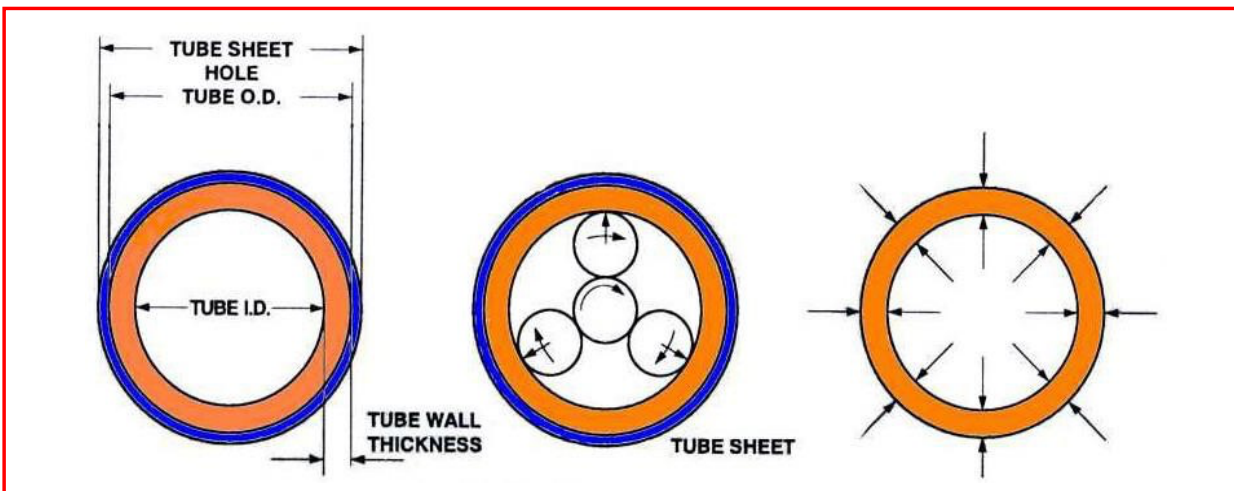
Before starting the actual process of tube rolling in heat exchanger, condenser, or boiler one need to do a trial job with identical condition as that of the actual job. Follow the steps below:

- A. Pick 3 to 5 tubes in the unit to be rolled and measure the dimension of the tube as shown on page4. It is important that the measurements used to calculate in the trial set-up are actual. Never use average dimensions.
- B. After the worksheet is finished, start setting up the torque control motor by test rolling the first of the tubes. The first test roll must be done with the rolling motor set for low torque to avoid over rolling.

Measure the tube I.D. after rolling if more expansion is needed increase the torque setting on the control and roll the second tube. Check the finished I.D. This step may have to be repeated on tube 3 by this time, the torque setting should be corrected.

- C. Roll tubes 4 and 5 to double check the set-up. These tubes should measure as calculated within the allowable tolerance given by the designer.
- D. The rolling control is now set and ready to roll tubes in the unit. The use of the torque control system will ensure the uniform expansion of all tubes.

Calculating % of Expansion:



Tube Sheet Hole (measure) h

Tube O.D. (measure) b

Clearance $c = h - b$

Tube I.D. (measure) d

Wall Thickness $w = b - d$

5% Wall Reduction $f = (0.05 \times w)$

Finished I.D. $g = (c + d + f)$

Example:

3/4in(19.0mm) O.D. x 14-gauge tubes

Recommended Expansion:	.008in(.20mm)
Tube sheet hole:	.760in(19.3mm)

Therefore, expand as follows:

Tube I.D before expanding	.584in(14.8mm)
Recommended expanding.	.008in(.20mm)
Clearance between tube and tube sheet hole.	.010in(.25mm)
Finish I.D	.602in(15.2mm)

IMPORTANT NOTE:

TO ENSURE THE BEST TOOL LIFE AND THE HIGHEST QUALITY TUBE-TO-TUBESHEET-CONTACT, PERIODIC CLEANING OF THE EXPANDER IS NECESSARY. PROPER LUBRICATION OF THE ROLL MANDREL AND THRUST BEARING IS A MUST!

LUBRICATION OF THE TUBE EXPANDERS:

We recommend using a quality lubricator, LUBEONE for Tube expansion. This is a water-soluble lubricant. It is available in tube and containers of various sizes. Please contact USA Industries for more details at (800) 456-8721.

LUBRICATION:

We recommend using a lubricator within 15 to 20 ft of supply line. Lubricator setting should be at 8-10 drops of oil per minute.

Gear section of tool should be greased once in four weeks. Do not over lubricate as the grease may enter the motor section which may result in sluggish operation.

SERVICE INSTRUCTION:

For better performance and long life of tool it is always recommended to service and adjusted the tool periodically. The mechanism of the tool is highly reliable but in case if accurate torque cannot be maintained, check the shut-Off trip mechanism as given below.

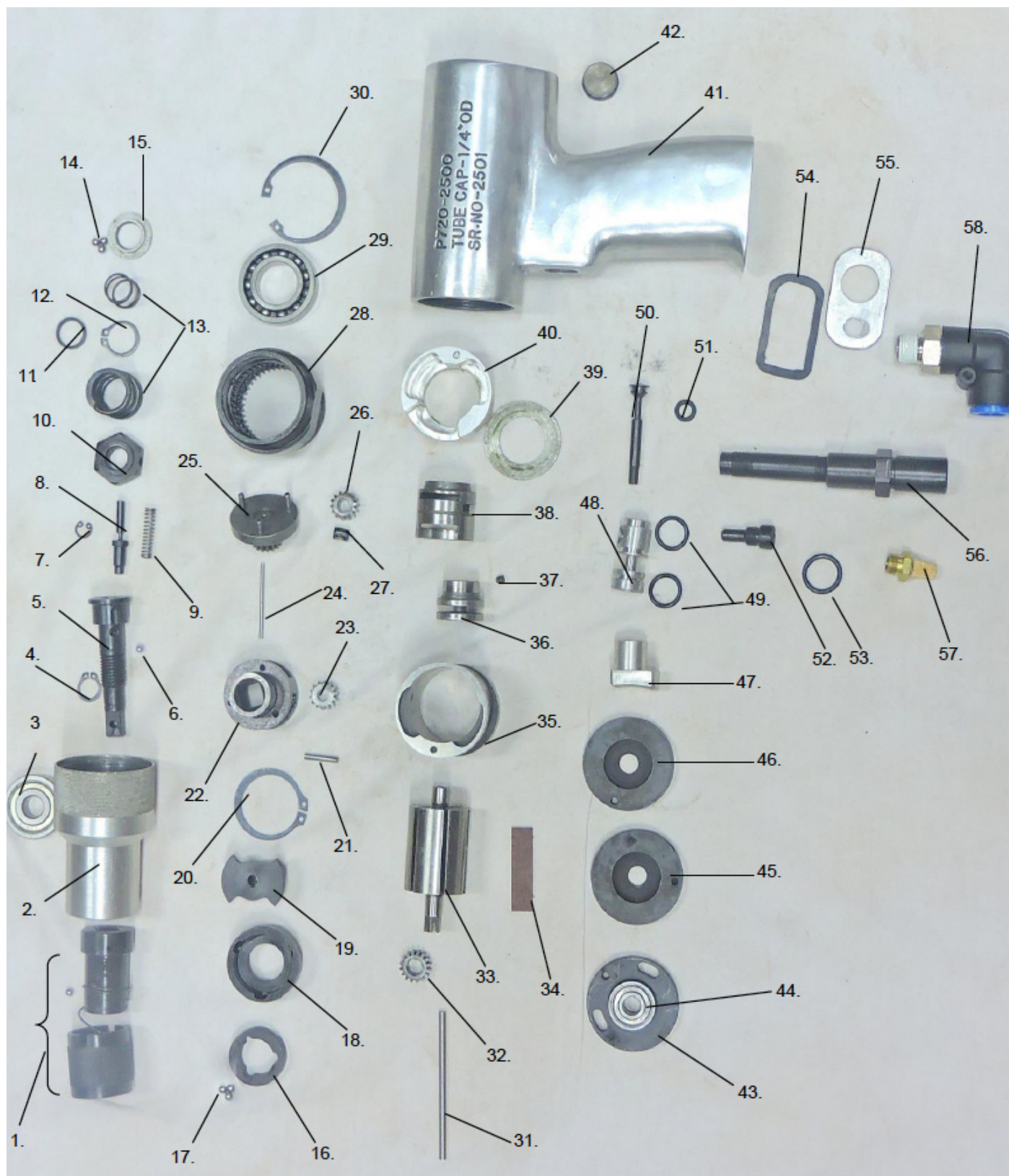
WARNING: MAKE SURE THAT AIR SUPPLY IS DISCONNECTED FROM TOOL PRIOR TO DISASSEMBLY.

To disassemble the motor section, follow the steps below,

Hold the end of the drive spider of the motor and pull gears section from the machine. Slide motor section from the unit. Disassemble the motor section and check for any wear or damage in cylinder liner. Examine the motor blades for damage. If require replace the old blades.

Cylinder should be installed on the end plate, check whether the blades are properly placed. Install the front bearing support (53). Carefully Slide the motor section in its place. Drop the dowel pin which is at the rear end of the cylinder into the locating hole at the bottom of the case. The gear section of the 550RPM tool is made up of standard two- stage planetary system and disassembly and reassembly of the unit is very simple for checking the gears slide the rears from the gear case. Clean, inspect, re-grease and reinstall in the gear case. Slide gear case into the housing and install dowel pin (39).

Exploded View:



PART LIST:

Sr. No.	Parts Name	Qty	720-550 Part No.	Qty	720-1800 Part No.	Qty	720-2500 Part No.
1.	Quick change chuck	1	P 720-1	1	P 720-1	1	P 720-1
2.	Cam case	1	P 720-2	1	P 720-2	1	P 720-2
3.	Bearing	1	P-R8-ZZ	1	P-R8-ZZ	1	P-R8-ZZ
4.	Circlip	1	P 720-4	1	P 720-4	1	P 720-4
5.	Drive shaft	1	P 720-5	1	P 720-5	1	P 720-5
6.	Steel ball	2	P 720-6-3	2	P 720-6-3	2	P 720-6-3
7.	Criclip	1	P 720-7	1	P 720-7	1	P 720-7
8.	Plunger	1	P 720-8	1	P 720-8	1	P 720-8
9.	Trip spring	1	P 720-9	1	P 720-9	1	P 720-9
10.	Lock nut	1	P 720-10	1	P 720-10	1	P 720-10
11.	Trip washer	1	P 720-11	1	P 720-11	1	P 720-11
12.	Circlip	1	P 720-12	1	P 720-12	1	P 720-12
13.	Spring	1	P 720-13	1	P 720-13	1	P 720-13
14.	Steel ball	6	P 720-14-4	6	P 720-14-4	6	P 720-14-4
15.	Spring Guide	1	P 720-15	1	P 720-15	1	P 720-15
16.	Cam	1	P 720-16	1	P 720-16	1	P 720-16
17.	Steel ball	3	P 720-17-3/16	3	P 720-17-3/16	2	P 720-17-3/16
18.	Opersting cam	1	P 720-18	1	P 720-18	1	P 720-18
19.	3/8" Square	1	P 720-19	1	P 720-19	1	P 720-19
20.	Circlip	1	P 720-20	1	P 720-20	1	P 720-20
21.	Solid pin	6	P 3 X 15	6	P 3 X 15	6	P 3 X 15
22.	Spider 2nd stage	1	P 720-22	1	P 720-22	1	P 720-22
23.	Planet gear 2nd stage	3	P 720-23	3	P 720-23	3	P 720-23
24.	Trip pin-1	1	P 720-24	1	P 720-24	1	P 720-24
25.	Spider 1st stage	1	P 720-25	1	P 720-25	1	P 720-25
26.	Planet gear 1st stage	3	P 720-26	-	-	-	-
27.	Brass bush bearing	6	P 720-27	3	P 720-27	3	P 720-27
28.	Gear box	1	P 720-28	1	P 720-28	1	P 720-28

PART LIST:

Sr. No.	Parts Name	Qty.	720-550 Part No.	Qty.	720-1800 Part No.	Qty.	720-2500 Part No.
29.	Bearing	1	P-6904	1	P-6904	1	P-6904
30.	Circlip	1	P 720-30	1	P 720-30	1	P 720-30
31.	Trip pin-2	1	P 720-31	1	P 720-31	1	P 720-31
32.	Sun gear (hex. female)	1	P 720-32	-	-	-	-
33.	Rotor	1	P 720-33	1	P 720-33	1	P 720-33
34.	Rotor blade	6	P 720-34	6	P 720-34	6	P 720-34
35.	Liner	1	P 720-35	1	P 720-35	1	P 720-35
36.	Spacer valve	1	P 720-36	1	P 720-36	1	P 720-36
37.	Grub screw	1	P- 4X4	1	P- 4X4	1	P- 4X4
38.	Motor spacer	1	P 720-38	1	P 720-38	1	P 720-38
39.	Large washer	1	P 720-39	1	P 720-39	1	P 720-39
40.	Aluminum Bush	1	P 720-40	1	P 720-40	1	P 720-40
41.	Body	1	P 720-41	1	P 720-41	1	P 720-41
42.	Plug	1	P 720-42	1	P 720-42	1	P 720-42
43.	Lower plate	1	P 720-43	1	P 720-43	1	P 720-43
44.	Bearing	1	P-608-ZZ	1	P 720-1	1	P 720-1
45.	Upper plate-1	1	P 720-45	1	P 720-2	1	P 720-2
46.	Upper plate-2	1	P 720-46	1	P-R8-ZZ	1	P-R8-ZZ
47.	Aluminum knob	1	P 720-47	1	P 720-4	1	P 720-4
48.	Aluminum valve	1	P 720-48	1	P 720-5	1	P 720-5
49.	" O" Ring	2	P 720-49	2	P 720-6-3	2	P 720-6-3
50.	Lever pin	1	P 720-50	1	P 720-7	1	P 720-7
51.	" O "Ring	1	P 720-51	1	P 720-8	1	P 720-8
52.	Nipple	1	P 720-52	1	P 720-9	1	P 720-9
53.	" O "Ring	1	P 720-53	1	P 720-10	1	P 720-10
54.	Oil seal	1	P 720-54	1	P 720-11	1	P 720-11
55.	Aluminum cover	1	P 720-55	1	P 720-12	1	P 720-12
56.	Pipe nipple	1	P 720-56	1	P 720-13	1	P 720-13
57.	Silencer	1	P 720-57	6	P 720-14-4	6	P 720-14-4
58.	Push fitting	1	P 720-58	1	P 720-15	1	P 720-15

Pneumatic Rolling Drive working Sample:



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