



# USER INSTRUCTIONS FOR OPERATION & MAINTENANCE

## P330

### Pneumatic / Hydraulic Installation Tool



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## **BOLLHOFF Inc. MODEL P330 Hydro-Pneumatic Blind Rivet Nut and Stud Installation Tool**

### **INTRODUCTION**

This brochure covers the use and maintenance of the Bollhoff Inc. model P330 spin-pull-spin blind rivet nut and stud installation tool. This tool is capable of placing Bollhoff Rivkle brand blind rivet nuts in sizes from M3 metric - #6 unified, up to M12 metric – ½” unified; as well as blind rivet nuts of other suppliers. The specific capabilities of this tool, when used with other suppliers’ inserts, should be discussed with the Bollhoff technical sales department.

The P330, with a minimal amount of care, if kept clean, lubricated and operated properly for the size inserts being installed, will provide many years of service.

The basic function of this tool can be best understood by realizing it is capable of two separate operations – spinning and pulling.

The spinning is performed by the P330 in both a forward motion, to mount the unplaced rivet nut onto the threads of the drive mandrel, and a reverse spin to disengage the drive mandrel from the installed insert.

Once the tool has been properly set, installation of the blind rivet nut is accomplished by – forward spin to mount the insert onto the tool, pullback to cause the insert to upset – reverse spin to disengage the tool from the installed insert.

The forward spinning operation of the tool is automatically started when pressure is applied to the drive mandrel. By holding the insert with its head toward the nosepiece or anvil of the tool and applying pressure on the mandrel, the forward spin begins, mounting the insert on the tool. The forward spin will stop when the insert meets the face of the nosepiece or anvil.

By pulling down on the bottom half of the “rocker” trigger, the pull stroke is performed.

By depressing the top half of the rocker trigger, the reverse spin begins to disengage the tool from the installed insert.

The P330 delivers a constant pulling force, or traction power, which at 85 psi. air pressure, is 5000 pounds of force. The proper installation of any size blind rivet nut is thereby accomplished by a strict control of the stroke distance of the tool – the distance the tool will pull back on the mandrel. It is extremely important that this stroke distance be properly set during the initial setup of the tool prior to beginning any installation of any size blind rivet nut. The pulling force or traction power of this tool is capable of damaging the threads of the insert, or even stripping the threads of small inserts, if not properly set.

## **SPECIFICATIONS – P330 TOOL**

**Capacity**            **RIVKLE M3 to M12 or #6 to 1/2" in steel, aluminum or brass.**

**RIVKLE M3 to M10 or #6 to 3/8" in stainless steel.**

**Operating pressure**

**Normal range 70 to 100 psi. (5 to 7 bar)**

**Weight**            **6.2 pounds (2.8 kg)**

**Installation rate**

**Up to 15 inserts per minute.**

**Height**            **10 1/4" (260 mm)**

**Length**            **11 3/4" (300 mm) without mandrel**

## **CAUTION – DISCONNECT THE AIR SUPPLY FROM THE TOOL BEFORE MAKING ANY ADJUSTMENTS !**

The P330 should be operated with filtered, lubricated air from 70 to 100 psi (5 – 7 bar).

In setting the P330 tool, there are three critical aspects to consider:

1. **Check the size.** Ensure the correct mandrel (#25) and anvil (#23) are installed on the tool for the insert being installed.
2. **Set the anvil position.** Make sure the anvil (#23) is properly set to ensure the correct length of mandrel extends from the anvil for the specific size RIVKLE being used.
3. **Set the stroke distance.** The correct stroke distance must be set on the tool, taking into consideration the specific RIVKLE being installed and total material thickness it is being installed into. It is very important to ensure that RIVKLE blind rivet nuts are properly installed and also to avoid damage to the insert from over stroking the tool.

For the setup of the P330, a 19mm open end wrench or spanner as well as a 6mm pin punch are required. A combination tool is included with the P330 for setup and for changing the mandrel and anvil.

Assuming the P330 has the proper size anvil and mandrel installed, the tool must be properly set up for installation of the specific size RIVKLE being used, by first adjusting the anvil position.

### **SETTING THE ANVIL POSITION**

For open end RIVKLE inserts, the anvil (#23) should be set so that when the RIVKLE being used is threaded onto the mandrel, the face of the anvil is flush against the head of the insert and the end of the mandrel is flush with the shank end of the RIVKLE.

Adjustment procedure

1. **Disconnect the air supply from the tool.**
2. Screw the anvil lock nut fully onto the anvil.
3. Screw the anvil and lock nut onto the nose piece as far as it will go.
4. By hand, thread the open end of the RIVKLE onto the mandrel until all threads are engaged and the end of the mandrel is flush with the shank end of the RIVKLE.
5. Hold the RIVKLE to prevent turning and begin unscrewing the anvil until the face of the anvil contacts the head of the RIVKLE.
6. Hold the anvil in this position while tightening the lock nut against the nose piece. Torque lock nut to 7 foot/lbs. (10 NM).

NOTE: For closed end RIVKLE, at step 4 above, thread the RIVKLE fully onto the mandrel until the threads bottom out, then loosen one turn.

## Adjusting the stroke distance

To determine the proper stroke distance required for a correct installation of RIVKLE blind rivet nuts, refer to the Bollhoff catalog page for the specific RIVKLE being installed. Note the “S” dimension reference (if indicated as a range, use the minimum) for the size being installed, as well as the maximum grip capacity of that specific RIVKLE.

Measure the total thickness of the material into which the RIVKLE is being installed.

**STROKE DISTANCE IS DETERMINED BY THE FORMULA:**

***STROKE DISTANCE = “S” (min.) + (maximum grip – material thickness) .***

EXAMPLE: An M6 RIVKLE # 2330-1060-030, is being installed into a steel sheet 1.5 mm thick. The “S” dimension for this size RIVKLE is indicated as a range of 2.2 – 4.7mm; therefore we use the “S” minimum of 2.2 mm. The maximum grip of this RIVKLE is 3.0 mm and the actual material thickness is 1.5 mm. Applying these figures to the formula, we can calculate the proper stroke distance:

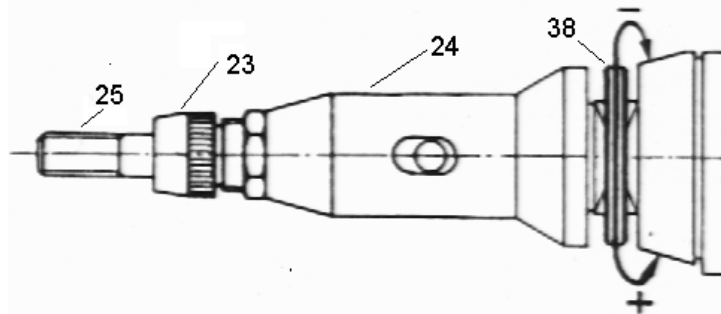
**Stroke = “S” (min) + (Max grip – material thickness)**

**Stroke = 2.2 + (3.0 - 1.5 )**

**Using the above example, the result is 3.7 mm stroke distance.**

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## Adjusting the stroke distance



- 1. DISCONNECT THE AIR SUPPLY FROM THE TOOL.**
2. Set the anvil position first (see previous page).
3. Hold the adjusting ring (#38) and unscrew the nose piece (#24) a few turns.
4. Turn the adjusting ring (#38) counter clockwise, toward the (-) minus direction until it stops. The stroke distance of the tool is now set at zero.
5. Increase the stroke distance setting by rotating the adjusting ring in the (+) plus direction.  
NOTE: ONE REVOLUTION OF THE ADJUSTING RING EQUALS 1.5MM (.060") OF STROKE DISTANCE ADJUSTMENT.
6. To test the stroke distance setting on the tool, measure an unplaced RIVKLE from the flat of the head to the end of the shank. Mount the RIVKLE on the tool and upset the insert. Remove the upset RIVKLE from the tool and measure it again, from the head to the end

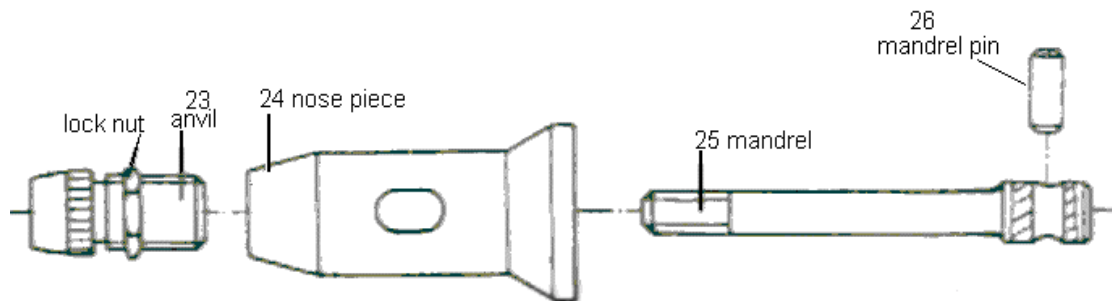
of the shank. The difference in the overall length, before upset and after, is the present stroke setting of the tool.

7. To verify that this setting is correct for the application, install the RIVKLE in a sample sheet of material. Measure the shank length on the back side of the material and compare this to the “L2” dimension noted in the Bollhoff catalog page for this specific insert. Adjust the stroke length as needed to achieve the proper “L2” dimension.

To set up the tool for different RIVKLE diameters, it is necessary to change the anvil and mandrel.

## Changing the Mandrel

1. **MAKE SURE THE AIR SUPPLY IS DISCONNECTED FROM THE TOOL.**
2. Hold the nose piece (#24) of the tool stationary and loosen the anvil lock nut. Remove the anvil & lock nut from the tool.
3. Hold the adjusting ring (#38) stationary. Unscrew and remove the nose piece (#24).
4. Using a pin punch and small hammer, push out the mandrel pin (#26). Be careful not to damage the spring ring (#30). Remove the mandrel from the tool.
5. Slide the new mandrel into position, align the holes and reinstall mandrel pin (#26). The pin is held in place by the spring ring.
6. Reinstall the nose piece (#24).
7. Reset anvil position and stroke setting per previous instructions for the new RIVKLE to be installed.
8. Tighten nose piece to approx. 11 foot pounds (15NM) torque.



## Checking and filling Hydraulic Fluid

**Recommended Oil : Mobil DTE (ISO VG68), Hydrolub 68 Codat or equivalent**

1. DISCONNECT THE AIR SUPPLY FROM THE TOOL.
2. Remove oil fill screw (#31) and vent plug (#60).

3. Retract the air piston in the lower chamber by inserting a heavy wire (coat hanger or similar) into the vent hole and gently press the piston fully down. Or, inject compressed air into the vent hole to move the piston down.
4. Check the oil level in the oil fill hole (#31). Top up as necessary until the oil reaches the bottom of the threaded hole.
5. Reinstall the fill plug and vent cap.
6. Connect air supply and actuate the tool several times.
7. It may be necessary to repeat the above procedure 2 – 3 times to purge all air and allow the oil level to stabilize.

## **Suggested Daily Checklist for Production Use of the P330 Tool**

1. Check the *spin – pull – spin* operations by pressing on the mandrel, then actuating the bottom and top of the rocker trigger, without a RIVKLE on the tool.
2. Check the security of the anvil and nose piece.
3. Thread the RIVKLE onto the tool, check that it threads fully up to the anvil and all threads are engaged.
4. Always hold the tool 90 degrees to the work piece.
5. Lubricate the mandrel after every 300 RIVKLE operations.
6. Never upset the same RIVKLE twice. This may damage the insert or the mandrel.

After use, protect the mandrel by threading on a RIVKLE.

## **Releasing the Mandrel When Locked Into an Installed Insert**

A common problem in the installation of rivet nuts is that the mandrel may become locked into the internal threads of a blind rivet nut. This condition may be caused by the wrong insert being used in an application, the installation tool not being properly set, or if the operator is not installing the insert correctly (not having the insert head resting on the material surface).

With most competitive installation tools, this condition requires a long and difficult process to free the jammed mandrel. Because of the P330's unique design, it is a simple and quick procedure.

Procedure to clear a stuck mandrel:

1. DISCONNECT THE AIR SUPPLY FROM THE TOOL.
2. With the mandrel (#25) locked into the installed threads, turn the tool until the mandrel pin (#26) is visible through one of the cutouts in the nose piece (#24).
3. Use a pin punch to push out the mandrel pin (#26).
4. Unscrew the nose piece from the tool. The tool body is now free from the stuck mandrel.
5. The mandrel can now be removed from the installed insert.



## TROUBLESHOOTING

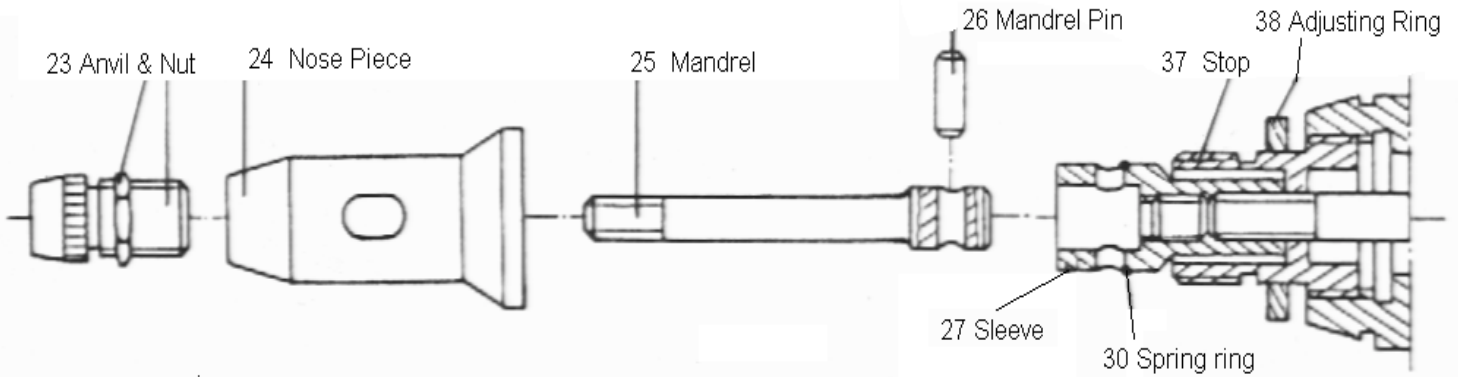
<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Worn mandrel threads	The RIVKLE being used is not correct for the material thickness	Check the grip range of the RIVKLE
Difficult to screw the RIVKLE on and off the mandrel	Too much stroke set on the tool.	Reset stroke distance
	Tool not being held Perpendicular to the the work piece.	Hold the tool 90 degrees to the work piece.
RIVKLE threads damaged	Worn mandrel threads	Replace mandrel
	RIVKLE not completely screwed onto mandrel	Adjust anvil position
	Excessive stroke distance setting	Reset stroke distance
	RIVKLE being used is not compatible with the RIVKLE being used	Check the grip of the RIVKLE



## TROUBLESHOOTING (continued)

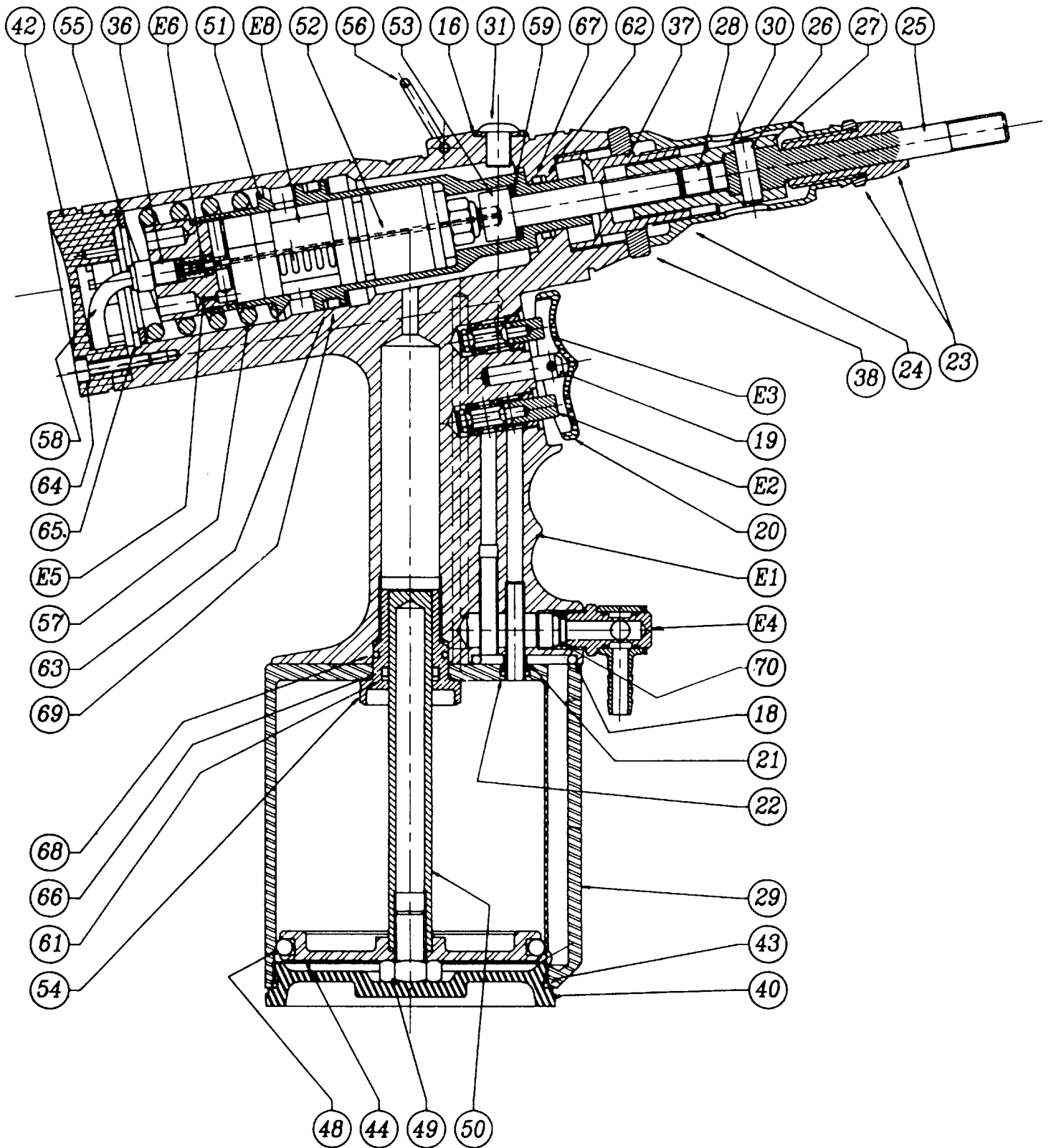
PROBLEM	POSSIBLE CAUSE	REMEDY
RIVKLE spins after installation	RIVKLE being used is not compatible with material thickness	Check the grip range of the RIVKLE
	The head of the RIVKLE is not in contact with the anvil during installation	Ensure the anvil is properly set
	Insufficient stroke setting	Reset stroke distance
	Insufficient air pressure	Check air pressure
	Lack of hydraulic fluid	Add hydraulic fluid
Mandrel becomes jammed in threads of installed RIVKLE **	Incorrect size RIVKLE being used	Use correct size RIVKLE
	Stroke setting incorrect	Reset stroke Distance
	Operator did not have RIVKLE fully inserted into the work piece during installation	Ensure RIVKLE is fully inserted in the hole with its head resting on the surface of the material

\*\*Refer to instructions on previous pages to free the jammed mandrel

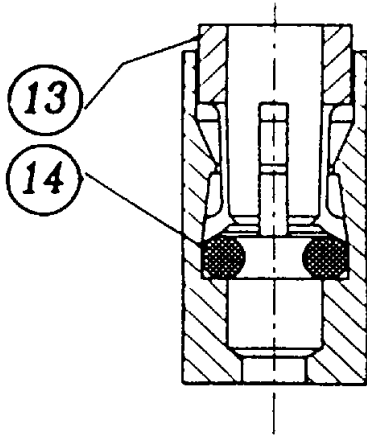


### FRONT END COMPONENT REFERENCE

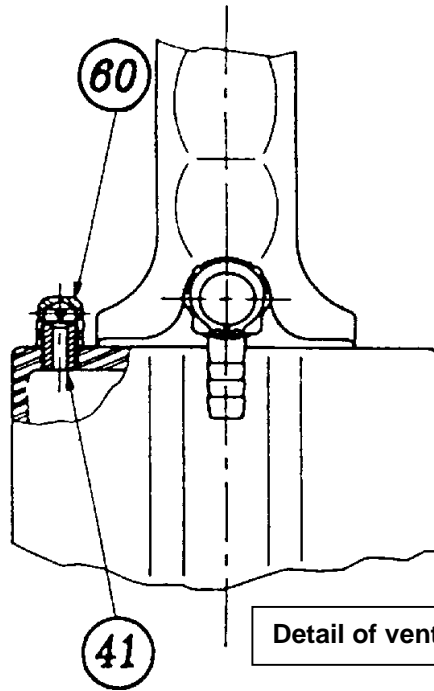
INSERT SIZE	ANVIL PART #	MANDREL PART #
M3	2361-1303-030	2361-1303-020
M4	2361-1304-030	2361-1304-020
M5	2361-1305-030	2361-1305-020
M6	2361-1306-030	2361-1306-020
M8	2361-1308-030	2361-1308-020
M10	2361-1310-030	2361-1310-020
M12	2361-5312-030	2361-5312-020
6-32	2361-1335-030	2361-1367-620
8-32	2361-1368-030	2361-1368-620
10-32	2361-1369-030	2361-1369-720
1/4x20	2361-1374-030	2361-1374-620
5/16x18	2361-1308-030	2361-1376-620
5/16x24	2361-1308-030	2361-1376-720
3/8x16	2361-1377-030	2361-1377-620
3/8x24	2361-1377-030	2361-1377-720
1/2x13	2361-1379-030	2361-1379-020
COMPONENT	DESCRIPTION	PART NUMBER
# 24	Nose piece	2361-5365-014
# 26	Mandrel pin	C2511010100
# 27	Sleeve	2361-5365-015
# 30	Spring ring	C2511010410
# 37	Stop	2361-5365-013
# 38	Adjusting ring	2361-5365-009



See following page for detailed views.



Detail of push / pull valve



Detail of vent pipe and vent cap

## Hydro- Pneumatic installation tool P-330

## Spare part list

No.	Part No.	Description	Qty
13	2361-536-5041	Fast inside connecting tongs	4
14*	2361-536-5121	Fast connecting joint	4
16*	2361-536-5113	BS ring, ID 8 mm	1
18*	2361-536-5106	Feed tank joint	1
19	2361-536-5042	Trigger axle	1
20	2361-536-5023	Trigger	1
21	2361-536-5006	Tank spacer	1
22*	2361-536-5102	Tank return joint	1
23	see table 2.1	Anvil and locknut (see 2.1)	1
24	2361-536-5014	Nose piece	1
25	see table 2.1	Mandrel	1
26*	C-251101-0100	Mandrel drive pin	1
27	2361-5365-015	Sleeve	1
28	C-951015-1010	Bolt M 10x10	1
29	2361-536-5001	Pneumatic	1
30*	C-251101-0410	Spring ring	1
31	2361-526-5116	Bolt M 8x10 ISO 7380	1
36	2361-536-5115	Bolt M 8x8	1
37	2361-536-5013	Travel/Stroke stop	1
38	2361-536-5009	Adjusting ring	1
40	2361-536-5022	Jointless tank plug	1
41	2361-536-5007	Vent	1
42	2361-536-5010	Rear plug	1
43*	2361-536-5109	Tank plug joint	1
44	2361-536-5004	Jointless pneumatic piston	1
48*	2361-536-5108	Pneumatic piston joint	1
49	2361-536-5118	Bolt M 10 DIN 933, galvanized	1
50	2361-536-5003	Emitter piston	1
51	2361-536-5002	Receiver piston	1
52	2361-536-5011	Push-pull rod	1
53	2361-536-5012	Drive shaft	1
54	2361-536-5021	Steady bush	1
55	2361-536-5026	Spring washer	1
56	2361-536-5029	Hook	1
57	2361-536-5030	Spring	1
58*	2361-536-5031	Flexible pipe	2
59*	2361-536-5034	Thrust washer	1
60	2361-536-5035	Vent plug	1
61*	2361-536-5110	Back-up ring	1
62*	2361-536-5111	Back-up ring	1
63*	2361-536-5112	Back-up ring	1
64	2361-536-5114	Bolt M4 x 20	1
65	2361-536-5101	Rear inside circlip	1
66*	2361-536-5103	Dynamic bearing joint	1
67*	2361-536-5104	Front Dynamic joint	1
68*	2361-536-5105	Static bearing joint	1
69*	2361-536-5107	Rear dynamic joint	1
70	2361-536-5119	Air inlet hose	1
E1	2361-536-5802	Body sub-assembly	1
E2*	2361-536-5803	Crimping valve (piston, sleeve, joints)	1
E3*	2361-536-5804	Unscrewing valve (piston, sleeve, joints)	1
E4	2361-536-5805	Complete banjo	1
E5	2361-536-5806	Distributor motor	1
E6*	2361-536-5807	Push-pull valve (piston, sleeve, joints)	1
E8	2361-536-5800	Compressed air motor	1
*	2361-536-5200	Repair case comprised of the parts marked with *	