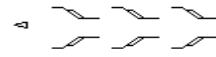


*These products are patented  
and/or have patents pending.*

# OPERATION MANUAL AND PARTS LIST **ZL31** SERIES TOOLS

SECTION	CONTENTS	PAGE
1	<b>SAFETY INSTRUCTIONS</b>	2-3
2	<b>SPECIFICATIONS</b>	4
3	<b>OPERATING INSTRUCTIONS</b>	5-7
4	<b>MAINTENANCE</b>	8
5	<b>ADJUSTMENTS</b>	8
6	<b>REPLACEMENT OF PARTS</b>	8-13
7	<b>DIAGRAM</b>	14
8	<b>PARTS LIST</b>	15-17

# 1. SAFETY INSTRUCTIONS



## READ ALL INSTRUCTIONS BEFORE OPERATING TOOLS

*Congratulations on your purchase of the world's finest steel strapping tool. In order to insure years of problem free performance operators of this tool must be familiar with all safety, operational, and maintenance procedures contained in this manual.*

### 1. Safety Glasses

- Wear safety glasses with side shields or safety goggles when operating tool.

### 2. Gloves

- Wear gloves when handling strapping or when operating tool to prevent possible cuts and scratches.

### 3. Safety Shoes

- Wear safety shoes to protect feet from injury.

### 4. Training

- Only trained personnel should operate these tools. It is imperative that the entire contents of the tool manual are fully read and understood. Personnel are to be given a full and complete demonstration.

### 5. Maintenance

- Inspect tool daily to insure correct operation. Loose, worn or damaged parts must be serviced immediately as required. Never operate the tool if a part is worn or broken as this will only further damage the tool and may result in injury.

### 6. Strap Breakage

- Excessive tensioning may cause strap breakage. When tensioning strapping, always stand to one side of the strap. If it breaks you will not be in its direct path.
- If the load has sharp corners always use edge protectors.

### 7. Strap Cutting

- Only use strap cutters approved to cut strapping within your specifications. When cutting strapping always stand to one side of the strap being cut, pressing the strap against the package above the cutter, making sure the strapping rebounds away from you.


### 8. Maintain Stability

- Always maintain proper footing and balance when operating the tool to prevent a fall or injury.
- Never operate the tool while in an awkward position or in such a manner that a hand could slip resulting in a loss of balance.

## 9. Maintain Safety Perimeter

- Always maintain a clear and uncluttered work area.
- When using tool other people should remain at a safe distance to avoid possible injury.

## 10. Tool Alterations

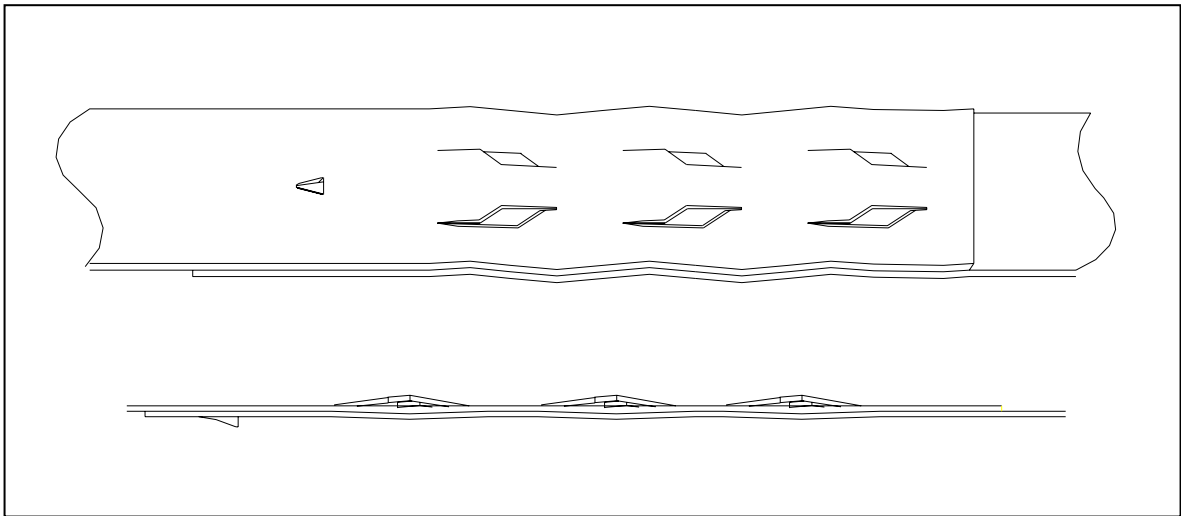
- Never alter any tool. Do not add extensions to lengthen the handles as this could damage the tool and is unsafe.
- Only use genuine  parts, including all fasteners and bearings as they are custom made for extreme use conditions.

## 11. Strapping

- Use only new strapping within specifications for the tool. Using old, damaged, or incorrect strapping may result in strap breakage and damage to the tool.
- When dispensing strapping use a specifically designed strap dispenser. When not in use, tuck strap end back into dispenser.

## 12. Ensure a Correct Sealless Joint is Formed

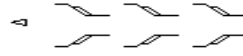
- Regularly inspect the sealless joint, it must conform to the illustration below.



- A correct sealless joint is formed when the upper strap is sheared clean and the knife does not leave scratch marks on the lower strap. Approximately one thickness of strap must show in the interlock.
- The sealless joint is too deep if the lower strap is scratched by the knife. The sealless joint is not deep enough if the upper strap is not sheared clean. In both these instances the sealing depth must be adjusted following instructions on page 8.
- Never attempt to make a sealless joint without having the straps under full tension.
- If the sealless joint does not appear properly formed it must be cut off and reapplied. Check the tool for correct operation, as well as loose, worn, or damaged parts and service immediately.
- **Never handle or ship any load with sealless joints which do not appear properly formed. Incorrectly formed sealless joints may not secure the load. This could result in serious injury.**

# ZL31

## 2. SPECIFICATIONS



<i>Weight</i>	11 lbs.	(5.0 kg.)
<i>Base Length</i>	4.2"	(105 mm)
<i>Base Width</i>	2.4"	(60 mm)
<i>Height</i>	4.2"	(105 mm)

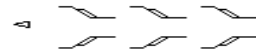
### Strapping Specifications

This tool is designed for use with regular duty steel strapping (107,000 psi / 750 N/mm<sup>2</sup>) to high tensile steel strapping (156,000 psi / 1100 N/mm<sup>2</sup>).

<i>Model Number</i>	<i>Strap Width</i>	<i>Strap Thickness</i>
ZL31-1	3/4" (19 mm)	.025" - .031" (0.635 mm - 0.80 mm)

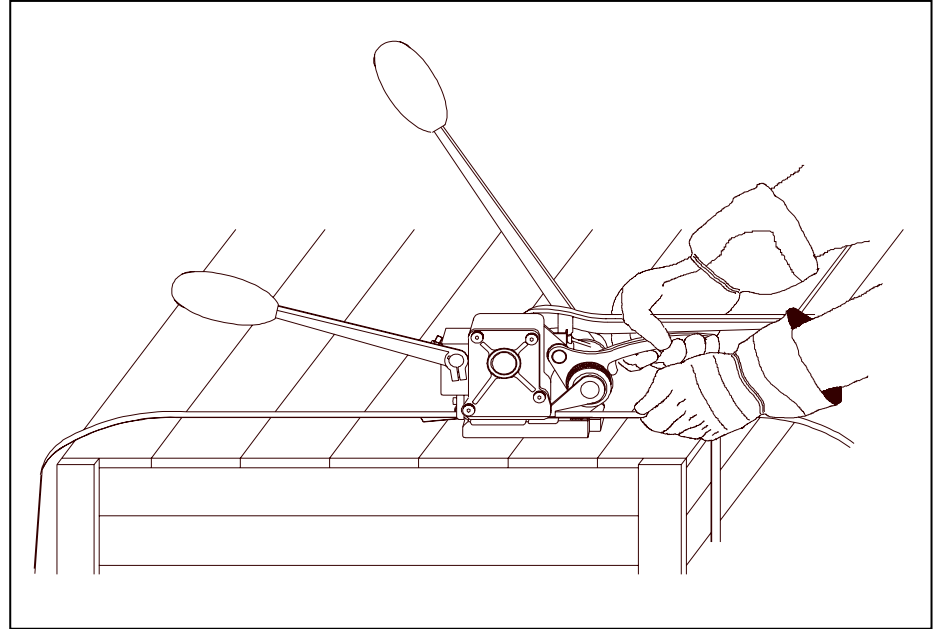
**THIS TOOL IS NOT DESIGNED TO BE USED WITH STRAPPING BELOW .025" (0.635 mm) THICKNESS OR ABOVE .031" (0.80 mm) THICKNESS.**

### 3. OPERATING INSTRUCTIONS



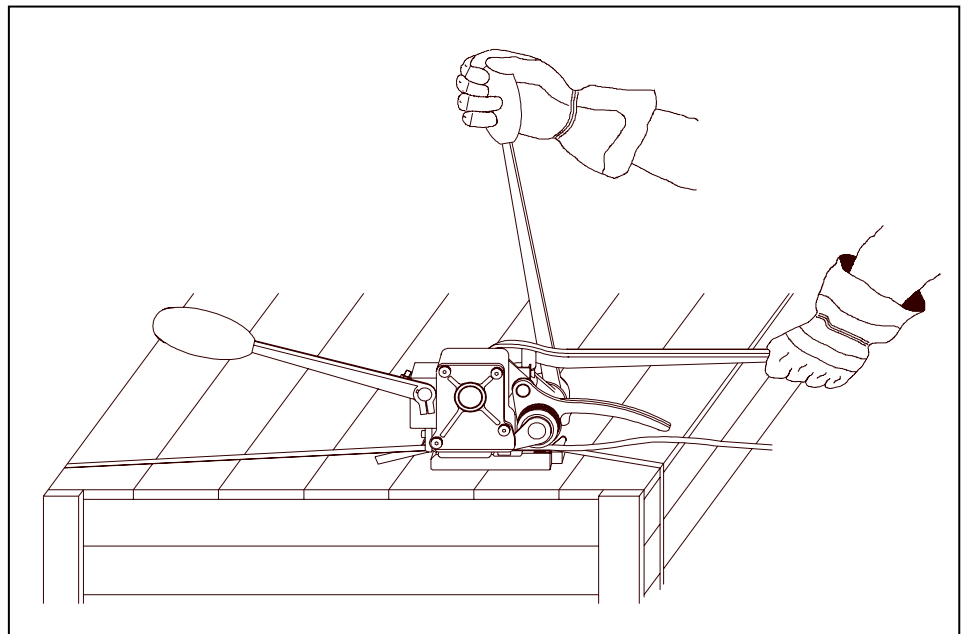
#### A

- Place strapping tightly around package and hold in place with left hand. Make sure lever ZL is in fully open position as shown in diagram.
- Take tool with right hand and pull the feedwheel lever towards the sealing lever.
- Insert both portions of the strap with left hand into the sealing section.
- Release the feedwheel lever and make certain both straps are fully seated in and against the strap stop front and the strap stop rear as well as held firmly in place by the strap guide. If not, this may result in permanent damage to the feedwheel in the form of flat spots.



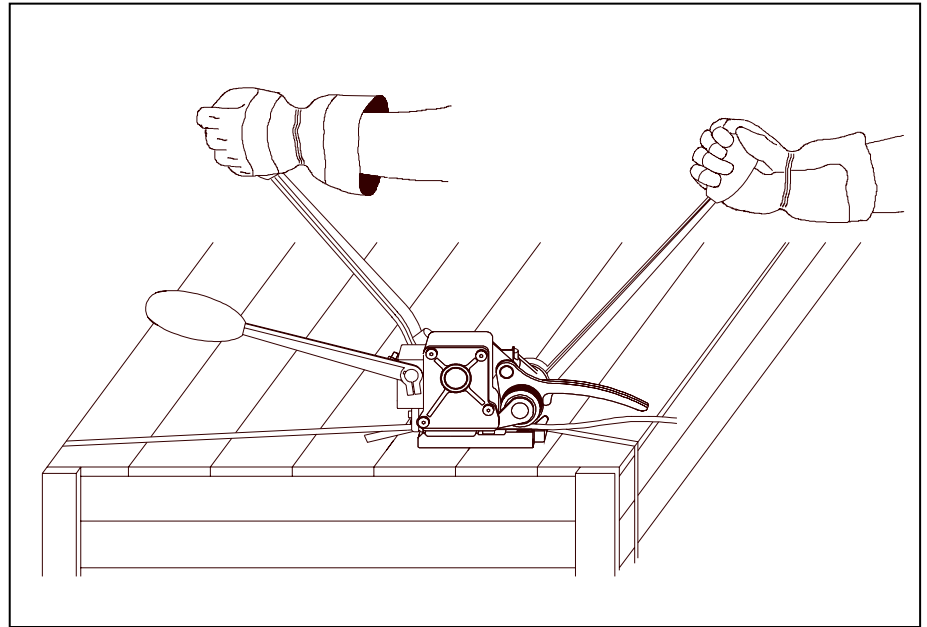
#### B

- Hold tool firmly with left hand on the sealing lever.
- With right hand move the tension lever forwards and backwards until the desired tension is obtained.



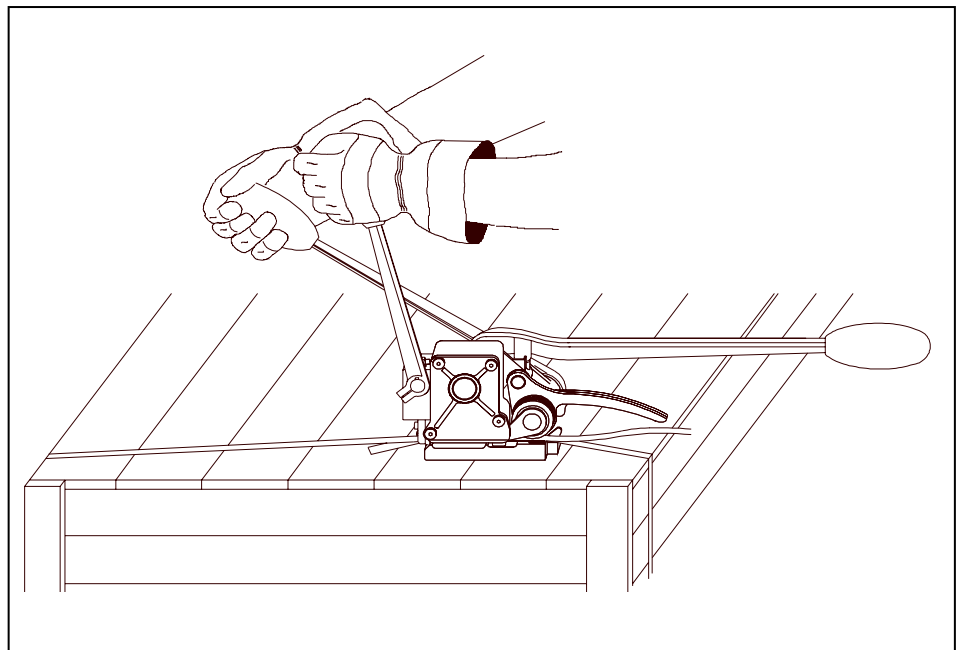
### C

- Place right hand firmly on the tension lever for supporting the tool.
- With left hand push the sealing lever forward until it reaches the stop.



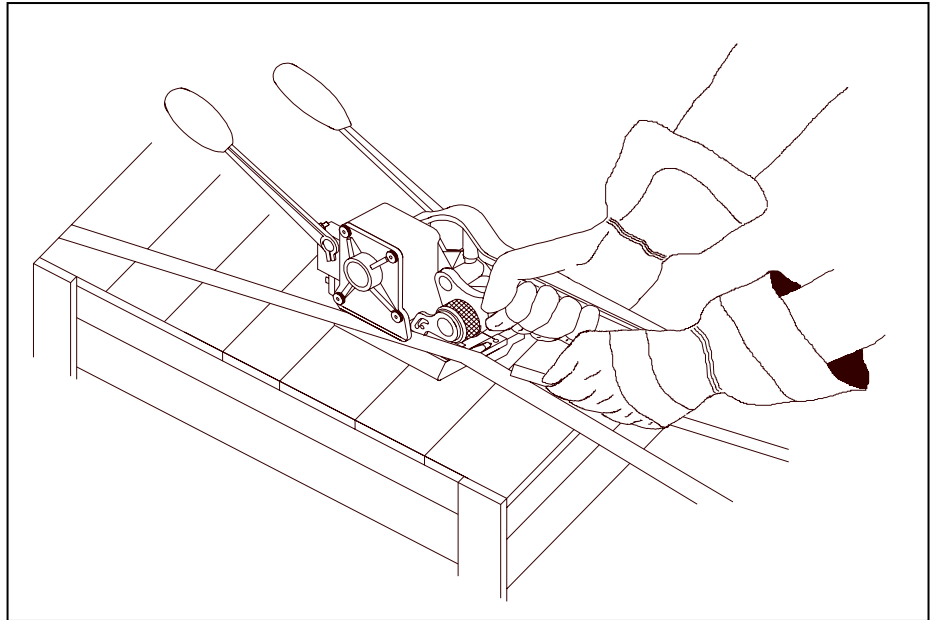
### D

- Move the sealing lever back to its original position.
- Place right hand firmly on the tension lever for supporting the tool.
- With left hand pull lever ZL toward you until it reaches the stop.

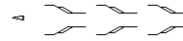


## E

- Move lever ZL back to fully open position as shown in diagram.
- To release the tool, with right hand pull the feedwheel lever towards the sealing lever, pushing the lever to the left away from the sealing section.



## 4. MAINTENANCE

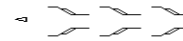


1. Inspect the tool daily for loose, worn, or damaged parts and service immediately as required.
2. Clean the sealing section regularly with compressed air to remove any dust and particles.
3. Lubricate the die (position 18), punch (position 36), and punch ZL (position 31) daily with a thin grade of oil. This will reduce friction and extend the life of the tool as well as the parts.
4. Spray the entire tool daily with a rust preventative, this will prevent any rust formation.

### **TO REMOVE JAMMED STRAPPING FROM SEALING SECTION:**

Remove external retaining ring (position 13), remove extension spring (position 43) only from the side which is hooked around spring tension pin (position 23), remove shaft (position 14), remove feedwheel lever assembly from its position. Then easily remove jammed strapping from sealing section. Re-install feedwheel lever assembly, shaft, extension spring and external retaining ring back into position.

## 5. ADJUSTMENTS



### **TO ADJUST SEALING DEPTH:**

Loosen nut (position 42), adjust hexagon socket set screw (position 59) with a hexagon key, turn counter clockwise to increase sealing depth, or turn clockwise to decrease sealing depth, re-tighten nut.

### **TO ADJUST CLEARANCE BETWEEN THE FEEDWHEEL (POSITION 5) AND GRIPPER (POSITION 37):**

The clearance between the feedwheel and the gripper should be .020" (.51mm). If the clearance is more or less than this, it must be adjusted.

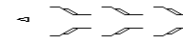
**To reduce the clearance:** loosen nut (position 42A), turn hexagon socket set screw (position 41) counter clockwise with a ball hexagon key, re-tighten nut.


**To increase the clearance:** loosen nut (position 42A), turn hexagon socket set screw (position 41) clockwise with a ball hexagon key, re-tighten nut.

### **TO ADJUST SEALING DEPTH FOR LEVER ZL (POSITION 25):**

Loosen nut (position 27), adjust hexagon socket screw (position 26) with a hexagon key, turn counter clockwise to increase sealing depth, or turn clockwise to decrease sealing depth, re-tighten nut.

## 6. REPLACEMENT OF PARTS



Note: If you are not familiar with the following replacement procedures, please contact your authorized  dealer for a demonstration or for service.

### **TO REPLACE A BEARING OR BUSHING (POSITIONS 6, 9, 10, 30, 33, 60, 65, or 73):**

1. Remove old bearing or bushing by heating the area around the bearing or bushing with a torch to approximately 350°F (175°C). This will release the Loctite\* which is presently around the surface of the bearing or bushing.
2. While hot, push out old bearing or bushing with correct diameter tooling.
3. Clean bearing or bushing seat area (bore) thoroughly to remove old Loctite\* with Loctite\* CHISEL MC FREE. Then clean new bearing or bushing thoroughly with Naptha (camp fuel).
4. Place a thin amount of Loctite\* No. RC603 around bore and bearing or bushing.
5. Press bearing or bushing into place with correct diameter tooling.
6. Let cure for 24 hours before using.
7. Apply a thin layer of new white grease around bearing or bushing contact surface for lubrication.



## TO REPLACE THE FEEDWHEEL (POSITION 5):

1. Remove external retaining ring (position 3).
2. Remove extension spring (position 43) only from the side which is hooked around spring tension pin (position 23).
3. Remove tensioning assembly (consisting of tension lever (position 11) and feedwheel shaft (position 2)).
4. Install new feedwheel with the "→" marking on outside facing the strap guide (position 4), re-install tensioning assembly observing the key way position during assembly.
5. Re-position strap guide onto the protruding feedwheel shaft.
6. Re-install external retaining ring.
7. Re-install extension spring.
8. Before using tool check clearance between the feedwheel and gripper and adjust as required following instructions on page 8.

## TO REPLACE THE GRIPPER (POSITION 37):

Note: The gripper is held in a non-adjustable position with spring tension pin (position 38).

1. To remove gripper, use a drive pin punch matching the diameter of the spring tension pin (position 38) and drive the spring tension pin into the tool base until the gripper comes loose from its position.
2. Remove extension spring (position 43) only from the side which is hooked around spring tension pin (position 23).
3. Remove external retaining ring (position 3).
4. Push out tensioning assembly (consisting of tension lever (position 11) and feedwheel shaft (position 2)) enough to remove feedwheel (position 5) for unobstructed access to gripper.
5. Lift feedwheel lever (position 7) to access gripper.
6. Clean cavity area and add one drop of a thin grade of oil in the cavity.
7. To install new gripper, place the gripper into the cavity of the tool base. Re-install the spring tension pin and drive it into the hole of the tool base until it is flush with the tool base.
8. Before using tool check clearance between the feedwheel and gripper and adjust as required following instructions on page 8.

## TO REPLACE THE KNIFE (POSITION 19):

1. Remove housing cover ZL (position 66) by removing 3 cover screws (position 64) and 1 cover screw - short (position 63).
2. With pliers, pull knife from slot on die and knife block (position 15).
3. Install new knife observing spring tension pin (position 20) aligns with same slot on die and knife block.
4. Make certain that the area is clean and well greased with white grease.
5. Important: Make certain that the roller (position 77) is in its position.
6. Re-install housing cover ZL, then re-install 3 cover screws and 1 cover screw - short (position 63) along with the washers (position 80). **Important: This screw in position 63 must be re-installed in this exact position (lower left hand corner) as it is shorter. It must also sit flush against the housing cover ZL when re-installed.**
7. Perform one seal and check strapping to ensure the cutting depth is correct. The knife depth is correct if the upper strap is sheared clean and the knife does not leave scratch marks on the lower strap. The knife depth is too deep if the lower strap is scratched by the knife. The knife depth is not deep enough if the upper strap is not sheared clean. In both these instances the sealing depth must be adjusted following instructions on page 8.

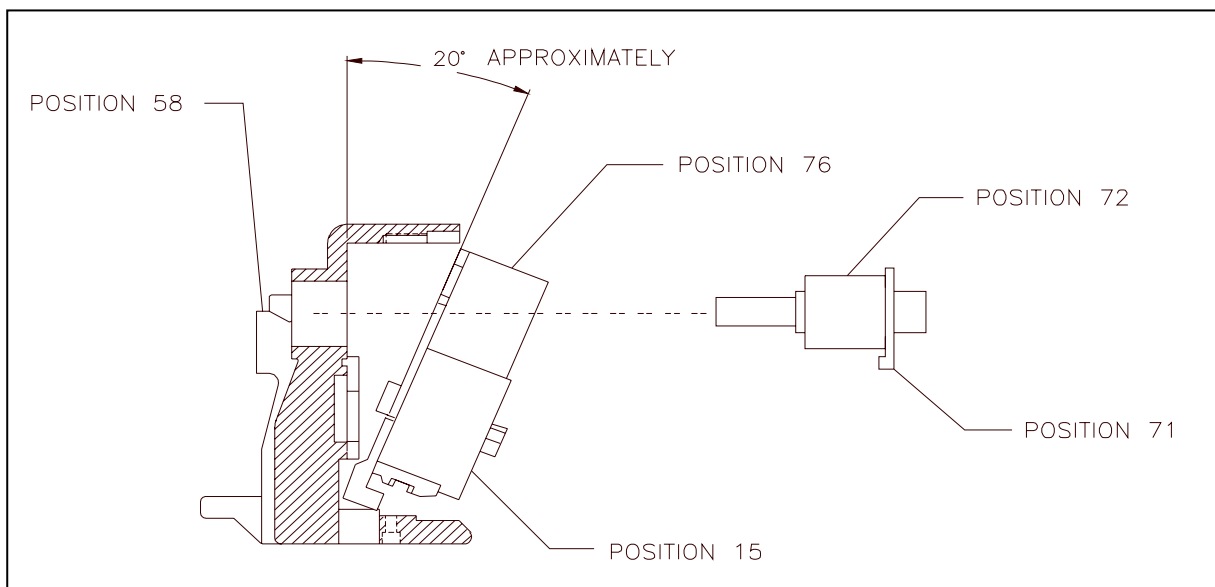
## TO REPLACE THE PUNCH (POSITION 36):

1. Remove 2 cheese head machine screws (position 35A) located on the underside of the housing (position 58).
2. Remove punch, clean area, replace with new punch, then re-install cheese head machine screws with a pin head amount of Loctite\* No. 277 on the thread of each screw.

## TO REPLACE THE DIE (POSITION 18):

1. Remove housing cover ZL (position 66) by removing 3 cover screws (position 64) and 1 cover screw - short (position 63).
2. Remove sealing lever (position 62) by loosening hexagon socket cap screw (position 61).
3. Remove woodruff key (position 1).
4. Remove eccentric shaft (position 72).
5. Remove the total internal assembly by tilting it at a 20° angle (see diagram below) and pull out with pliers by eccentric shaft plunger (position 76), at the same time making sure to hold internal assembly together with other hand, exposing die on the underside of the die and knife block (position 15).
6. Remove 3 cheese head machine screws (position 17).
7. Remove die, clean area, and replace with new die, then re-install cheese head machine screws with a pin head amount of Loctite\* No. 277 on the thread of each screw.
8. To re-install the internal assembly, precisely follow diagrams on page 11 and 12.
9. Re-install the eccentric shaft observing its relative position to the cam (position 45).
10. The cam lever (position 71) must engage with its tip into the cavity of the cam. The components should align together and operate smoothly. Do not force the parts together.
11. Make certain that the area is clean and well greased with white grease.
12. Important: Make certain that the roller (position 77) is in its position.
13. Re-install housing cover ZL, then re-install 3 cover screws and 1 cover screw - short (position 63) along with the washers (position 80). **Important: This screw in position 63 must be re-installed in this exact position (lower left hand corner) as it is shorter. It must also sit flush against the housing cover ZL when re-installed.**
14. Re-install woodruff key and sealing lever.

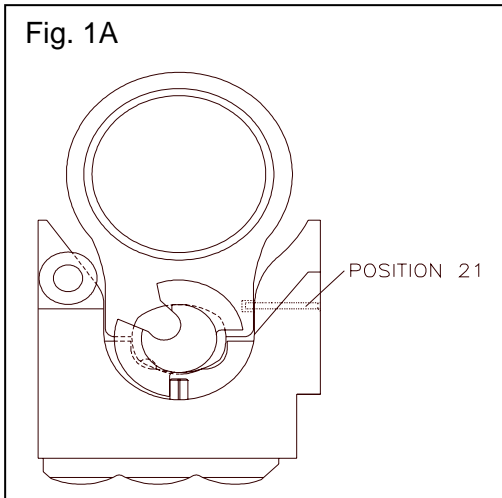
### REMOVAL OF INTERNAL ASSEMBLY ZL31



## INSTALLATION OF INTERNAL ASSEMBLY ZL31 SERIES TOOLS

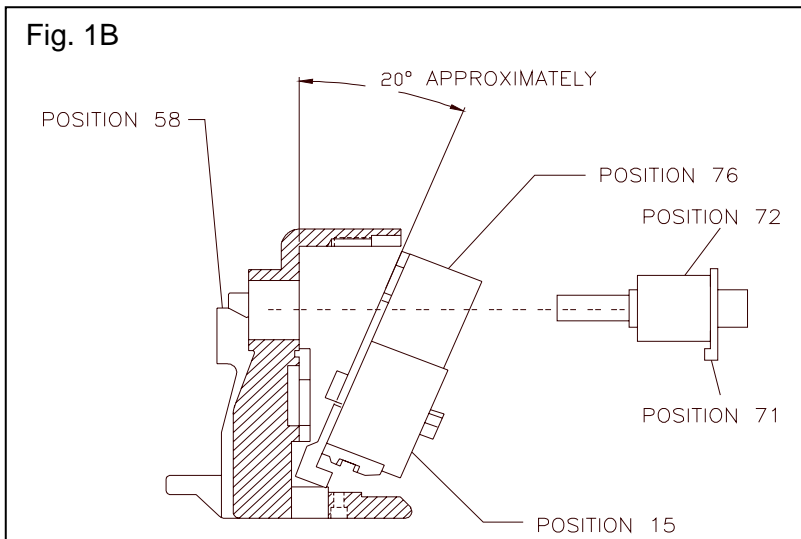
Make certain to follow all instructions precisely or it will result in broken or damaged parts.

Fig. 1A



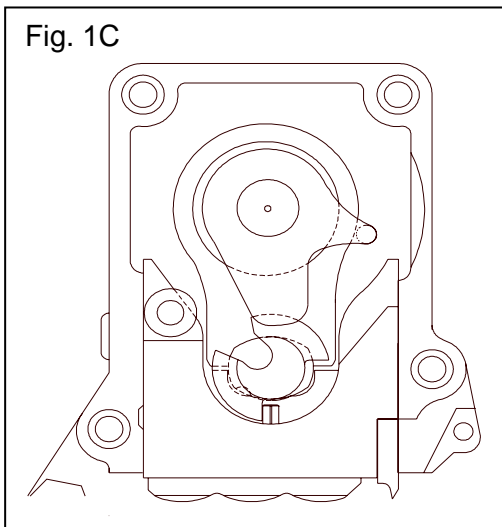
Place the cam as per drawing, with the long width sitting flat in the die and knife block. Add white grease throughout. Then place the eccentric shaft plunger on top of the cam and fasten by pushing the connection pin, position 21, (making sure the groove on this pin is facing the outside of the die and knife block) through hole in die and knife block and into like slot on eccentric shaft plunger.

Fig. 1B



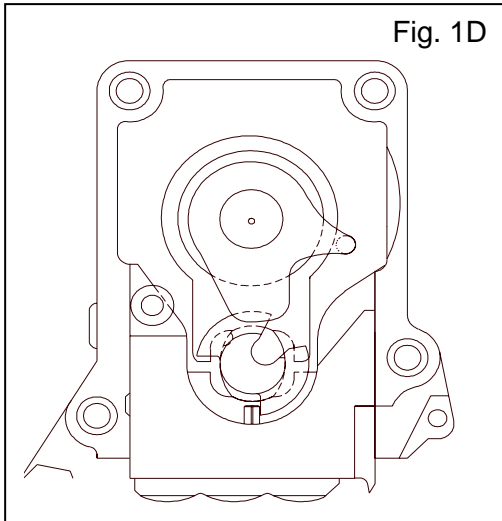
Tilt the internal assembly approximately 20° and place into housing making sure the back up hook is sitting in its slot in the housing.

Fig. 1C

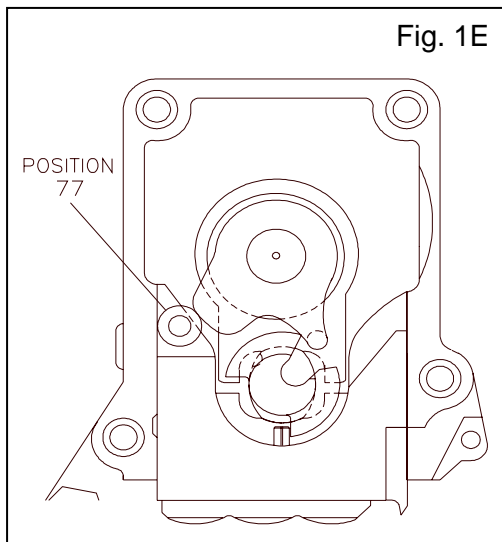


Make sure the cam lever is attached to the eccentric shaft. Then push it through the hole of eccentric shaft plunger and the housing until it is flush.

## INSTALLATION OF INTERNAL ASSEMBLY ZL31 SERIES TOOLS



Turn the cam with pliers in a clockwise direction until it sits in position shown in this drawing.



Turn cam lever in a clockwise direction with fingers until it sits in front of the cavity of the cam.  
**Important: Make certain that the roller (position 77) is in its position.**  
Then install the housing cover and the sealing lever making sure they sit properly and operate smoothly, do not force.

### **TO REPLACE THE LOWER CUTTER ZL31 (POSITION 55):**

1. Remove cheese head machine screw (position 17A) located on the underside of the housing (position 58).
2. With small flathead screwdriver push out lower cutter ZL31 from its position.
3. Install and position new lower cutter ZL31 making sure the thinner end faces toward outside of housing.
4. Re-install cheese head machine screw with a drop of Loctite\* No. 242 on the thread of this screw.

### **TO REPLACE THE ZL PUNCH (POSITION 31):**

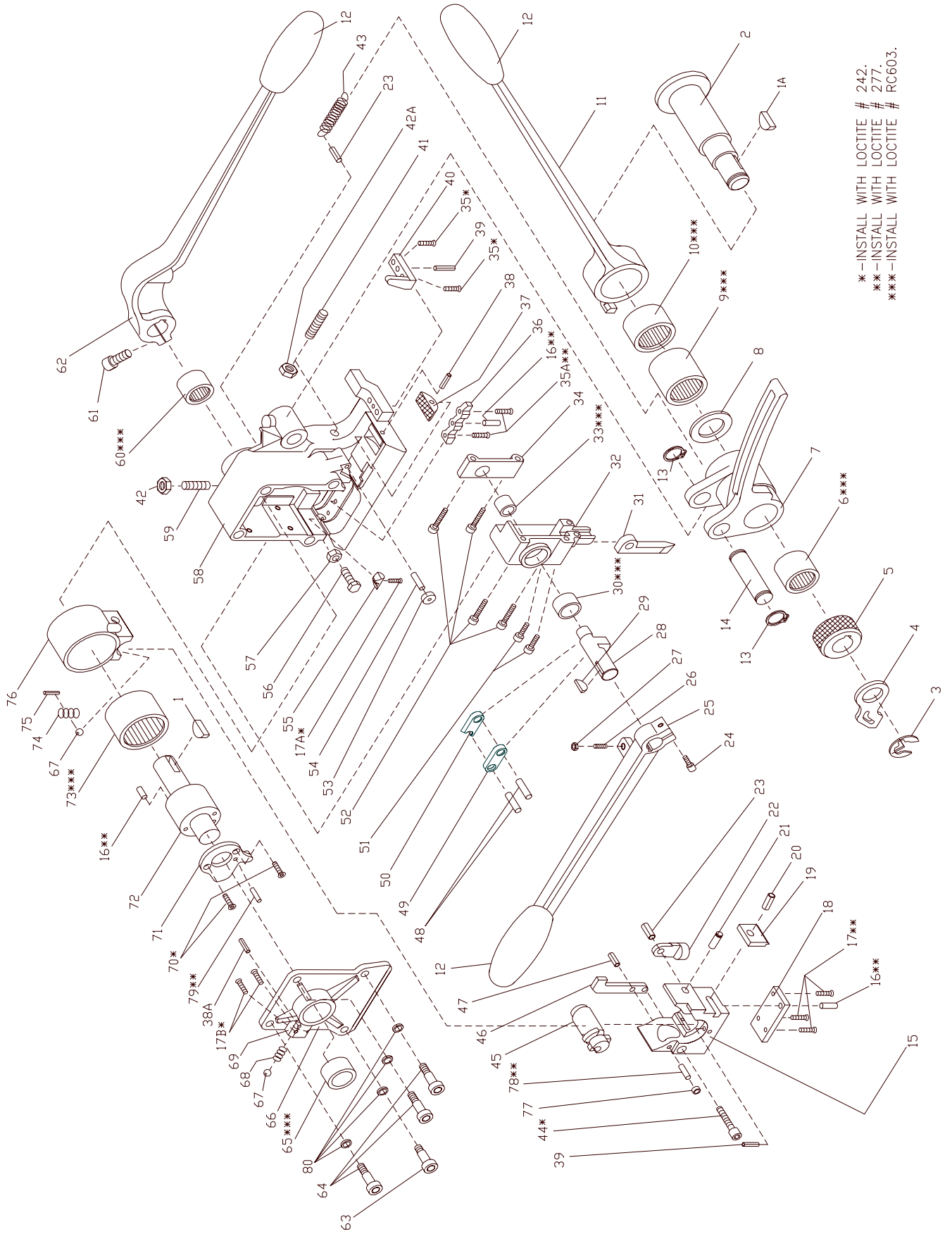
1. Remove lever ZL (position 25) by loosening hexagon socket cap screw (position 24).
2. Remove woodruff key (position 29).
3. Remove lock housing assembly ZL by removing 4 hexagon socket cap screws (position 52) and 2 hexagon socket cap screws (position 51).
4. Remove lock housing cover ZL (position 34).
5. Remove open link ZL (position 50) and link pin (position 48).
6. Remove ZL punch, replace with new ZL punch, then re-install link pin and open link ZL.
7. Make certain that the area is clean and well greased with white grease. Attach lock housing cover ZL. Then re-attach lock housing assembly ZL to front of housing (position 58).
8. Perform one seal and check ZL lock joint to ensure depth is correct. Refer to page 3 "Ensure a correct sealless joint is formed" to determine correct depth. If depth for ZL lock joint is not correct the sealing depth for lever ZL must be adjusted following instructions on page 8.

### **TO REPLACE THE COMPRESSION SPRING (POSITION 68) AND BALL (POSITION 67):**

1. Remove housing cover ZL (position 66) by removing 3 cover screws (position 64) and 1 cover screw - short (position 63).
2. Remove spring holder ZL (position 69) by removing 2 cheese head machine screws (position 17B) from the inside of housing cover ZL.
3. Remove compression spring, then ball and replace with new in this order.
4. Re-install spring holder ZL to housing cover ZL with cheese head machine screws with a drop of Loctite\* No. 242 on the thread of each screw.
5. Important: Make certain that the roller (position 77) is in its position.
6. Re-install housing cover ZL, then re-install 3 cover screws and 1 cover screw - short (position 63) along with the washers (position 80). **Important: This screw in position 63 must be re-installed in this exact position (lower left hand corner) as it is shorter. It must also sit flush against the housing cover ZL when re-installed.**
7. Re-install woodruff key and lever ZL.

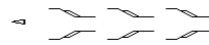
\*Loctite is a registered trademark of the Loctite Corporation.

# 7. ZL31 DIAGRAM



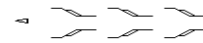
\* -INSTALL WITH LOCTITE # 242.  
 \*\* -INSTALL WITH LOCTITE # 277.  
 \*\*\* -INSTALL WITH LOCTITE # RC603.

## 8. ZL31 PARTS LIST



<i>POSITION</i>	<i>PART NO.</i>	<i>PART NAME</i>	<i>PARTS PER TOOL</i>
1, 1A	ZR-0001	WOODRUFF KEY	2
2	ZR-0002	FEEDWHEEL SHAFT	1
3	ZR-0003	EXTERNAL RETAINING RING	1
4	ZR-0006	STRAP GUIDE 3/4" (19mm)	1
5	ZR-0074	FEEDWHEEL 31	1
6	ZR-0008	ROLLER BEARING	1
7	ZR-0009	FEEDWHEEL LEVER	1
8	ZR-0010	WASHER	1
9	ZR-0011	ROLLER CLUTCH AND BEARING ASSEMBLY	1
10	ZR-0012	ROLLER CLUTCH	1
11	ZR-0013	TENSION LEVER	1
12	ZR-0014	HANDLE	3
13	ZR-0025	EXTERNAL RETAINING RING	2
14	ZR-0026	SHAFT	1
15	ZR-0067	DIE AND KNIFE BLOCK 31 (INCLUDES ZR-0034, ZR-0077)	1
16	ZR-0016	DOWEL PIN	3
17, 17A, 17B	ZR-0017	CHEESE HEAD MACHINE SCREW	6
18	ZR-0068	DIE 31	1
19	ZR-0069	KNIFE 31 (INCLUDES ZR-0021)	1
20	ZR-0021	SPRING TENSION PIN	1
21	ZR-0022	CONNECTION PIN	1
22	ZR-0023	BACK UP HOOK	1
23	ZR-0024	SPRING TENSION PIN	2
24	ZR-0203	HEXAGON SOCKET CAP SCREW	1
25	ZR-0200	LEVER ZL	1
26	ZR-0206	HEXAGON SOCKET SET SCREW	1
27	ZR-0208	NUT	1
28	ZR-0207	ECCENTRIC SHAFT ZL	1
29	ZR-0213	WOODRUFF KEY	1
30	ZR-0214	BRONZE BUSHING	1
31	ZR-0212	ZL PUNCH	1
32	ZR-0209	LOCK HOUSING ZL	1

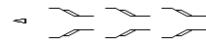
## 8. ZL31 PARTS LIST



<i>POSITION</i>	<i>PART NO.</i>	<i>PART NAME</i>	<i>PARTS PER TOOL</i>
33	ZR-0215	BRONZE BUSHING	1
34	ZR-0217	LOCK HOUSING COVER ZL	1
35, 35A	ZR-0033	CHEESE HEAD MACHINE SCREW	4
36	ZR-0071	PUNCH 31	1
37	ZR-0031	GRIPPER	1
38, 38A	ZR-0032	SPRING TENSION PIN	2
39	ZR-0034	SPRING TENSION PIN	2
40	ZR-0037	STRAP STOP FRONT 3/4" (19mm)	1
41	ZR-0038	HEXAGON SOCKET SET SCREW	1
42, 42A	ZR-0039	NUT	2
43	ZR-0040	EXTENSION SPRING	1
44	ZR-0041	HEXAGON SOCKET CAP SCREW	1
45	ZR-0042	CAM	1
46	ZR-0045	DIE BLOCK BACK UP	1
47	ZR-0046	SPRING TENSION PIN	1
48	ZR-0216	LINK PIN	2
49	ZR-0210	CLOSED LINK ZL	1
50	ZR-0211	OPEN LINK ZL	1
51	ZR-0220	HEXAGON SOCKET CAP SCREW	2
52	ZR-0221	HEXAGON SOCKET CAP SCREW	4
53	ZR-0047	SPACER	1
54	ZR-0048	PIN	1
55	ZR-0202	LOWER CUTTER ZL31	1
56	ZR-0051	STRAP STOP REAR 3/4" (19mm)	1
57	ZR-0052	NUT	1
58	ZR-0219	HOUSING ZL31	1
59	ZR-0054	HEXAGON SOCKET SET SCREW	1
60	ZR-0055	ROLLER BEARING	1
61	ZR-0056	HEXAGON SOCKET CAP SCREW	1
62	ZR-0057	SEALING LEVER	1
63	ZR-0343	COVER SCREW - SHORT	1



## 8. ZL31 PARTS LIST









<i>POSITION</i>	<i>PART NO.</i>	<i>PART NAME</i>	<i>PARTS PER TOOL</i>
64	ZR-0338	COVER SCREW	3
65	ZR-0059	ROLLER BEARING	1
66	ZR-0204	HOUSING COVER ZL	1
67	ZR-0043	BALL	2
68	ZR-0224	COMPRESSION SPRING	1
69	ZR-0205	SPRING HOLDER ZL	1
70	ZR-0061	CHEESE HEAD MACHINE SCREW	2
71	ZR-0078	CAM LEVER (INCLUDES ZR-0028)	1
72	ZR-0063A	ECCENTRIC SHAFT 31 (INCLUDES ZR-0016)	1
73	ZR-0064	ROLLER BEARING	1
74	ZR-0044	COMPRESSION SPRING	1
75	ZR-0075	SPRING TENSION PIN	1
76	ZR-0065	ECCENTRIC SHAFT PLUNGER (INCLUDES ZR-0043, ZR-0044, ZR-0064, ZR-0075)	1
77	ZR-0076	ROLLER	1
78	ZR-0077	ROLLER PIN	1
79	ZR-0028	DOWEL PIN	1
80	ZR-0339	WASHER	4
—	ZR-0226	OPERATION MANUAL AND PARTS LIST FOR ZL31 SERIES TOOLS.	1





# CERTIFICATE OF WARRANTY

Z.R. TOOL INC. referred to as  hereby warrants its tools as follows:

1. If any part of this tool fails due to poor workmanship or material within 90 days from the date of purchase, that part will be exchanged or repaired at no charge.  
 may replace any tool or part with a new or comparable tool or part. Any warranty-repaired item will continue to carry the warranty for the balance of the time remaining on the initial 90-day warranty in addition to time that the item was away for repair.
2. In the event of any warranty claim, all tools or parts must be returned F.O.B. . After analysis,  will determine warranty entitlement. All tools or parts returned require an assigned return authorization number, which may be obtained from . This number is to be labelled clearly on all goods returning.
3. This warranty is valid only with a receipt or invoice stating the purchaser's name and address, model number, serial number and date of purchase.
4.  reserves the right to substitute new and improved tools or parts at any time.

This warranty does not apply to tools or parts that have been damaged due to accident, abuse, natural or personal disaster, improper use, improper or lack of maintenance, improper replacement of parts, any naturally wearing parts, use of any parts other than genuine  parts, tampering or removal of identification nameplate, any unauthorized alterations, repairs or modifications, or using the tool for any application for which it was not sold.

In no event will  or its authorized dealers be liable to any purchaser for lost revenue, lost wages, lost savings, or any other incidental or consequential damages arising from the purchase, use, or inability to use this product, even if  or its authorized dealers have been advised of the possibility of such damages.

**MODEL NUMBER** \_\_\_\_\_

**SERIAL NUMBER** \_\_\_\_\_

**DATE PURCHASED** \_\_\_\_\_

AUTHORIZED DEALER: