

# UNDERGROUND ROCK DRILL

*'Narrow Vein Rock Tools'*



## SERVICE INSTRUCTIONS AND SPARE PARTS LIST

**MODELS:**

**SIG.au PLB 291 DI**



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## SAFETY PRECAUTIONS



The safety precautions listed in the manual are intended to alert operator and helpers to the possible physical dangers inherent in the various stages of operating and/or maintaining equipment of this kind. All personnel involved in operating and/or maintaining this equipment must read and thoroughly understand the operating instructions before attempting to operate, or perform maintenance on the drill machine. Non-authorized, or untrained personnel must not under any circumstances attempt to operate or maintain the machine.

- During Operation of the drill, safety shoes, safety glasses, ear protection and safety helmet are to be worn,
- Exposure to excessive noise can lead to hearing deficiency. APPROPRIATE ear protection must always be worn.
- Distraction increases danger of accident.
- Only on actual operation of drill should the operating handle be touched.
- When working with the drill, sure and firm footing is necessary.
- The drill should not be brought near to the face.
- Never place the drill on your foot.
- Never point the drill at co-workers or yourself.
- The drill should never be put into operation if it is lying on the ground or if it is not held securely in working position.
- Compressed air is dangerous! Never point a connected compressed air hose at co-workers or yourself. Avoid the habit of blowing your clothes free of dust with compressed air.
- Be sure that all hose connections are tight and sealed. A loose hose not only causes loss of air; danger exists that it comes completely off the drill, whips around injuring the operators and others in the area. Secure hoses with safety cables or ropes to prevent danger of injury in case a hose gets broken.
- Never disconnect a pressurized air hose: First shut off air from the compressor and bleed the drill.
- The drill should only be operated with a specially suitable inserted drill rod. Operate with sufficient pressure, avoid recoils. When the machine is under pressure, oilers may not be filled up and tools may not be exchanged.
- The drill should always be held with both hands during operation.
- The operator must have a firm footing. If possible the operator's feet should be so placed out of the falling range of the drill, but without the danger of losing balance. In the case of breakage of drill rod, there is danger of sudden falling of drill with protruding and broken drill rod part.
- Never operate drill astride, I.E., with one leg over the handle. In the case of breakage of the inserted drill rod, serious injuries can result.
- Ensure that no cables, pipes and the like are in area of drill operation (electric, gas, water, telephone).
- In the event of drill contacting unknown objects during operation, switch off drill immediately. Identification of object should be carried out by careful uncovering with shovel, not with the drill.
- In case a cleaning solvent is used for cleaning drill parts, make sure that this meets the current safety and health regulations and that it is used in a well-ventilated area.



## TECHNICAL DATA/RATINGS

*Carefully memorize this tool's operation and maintenance instructions.*

	<b>PLB-29DI</b>	<b>PLB-29K</b>
<b><i>DIMENSIONS</i></b>		
Weight	30Kg	30Kg
Length	690mm	690mm
Piston diam.	90mm	90mm
Piston stroke	65mm	65mm
<b><i>DRIVE</i></b>		
Impact rate	2700BPM	2700BPM
Optimal air pressure	5-6Bar	5-6Bar
Air Consumption	5.3m <sup>3</sup> /min at 6Bar	5.3m <sup>3</sup> /min at 6Bar

### ***FLUSHING WATER***

Water pressure: **Always at least 0.5 bar LESS than actual air pressure**

Water flow: **9 Litres/min with 2.4 long drill rod**

### ***Characteristics***

Rotation: **Left (Counter clockwise)**

Exhaust Silencer: **Integrated into hammer housing**

Tool Insert: **22 x 108mm (7/8" x 4 1/4")**

**25 x 108mm (1" x 4 1/4" ) – alternative**

### ***Hoses***

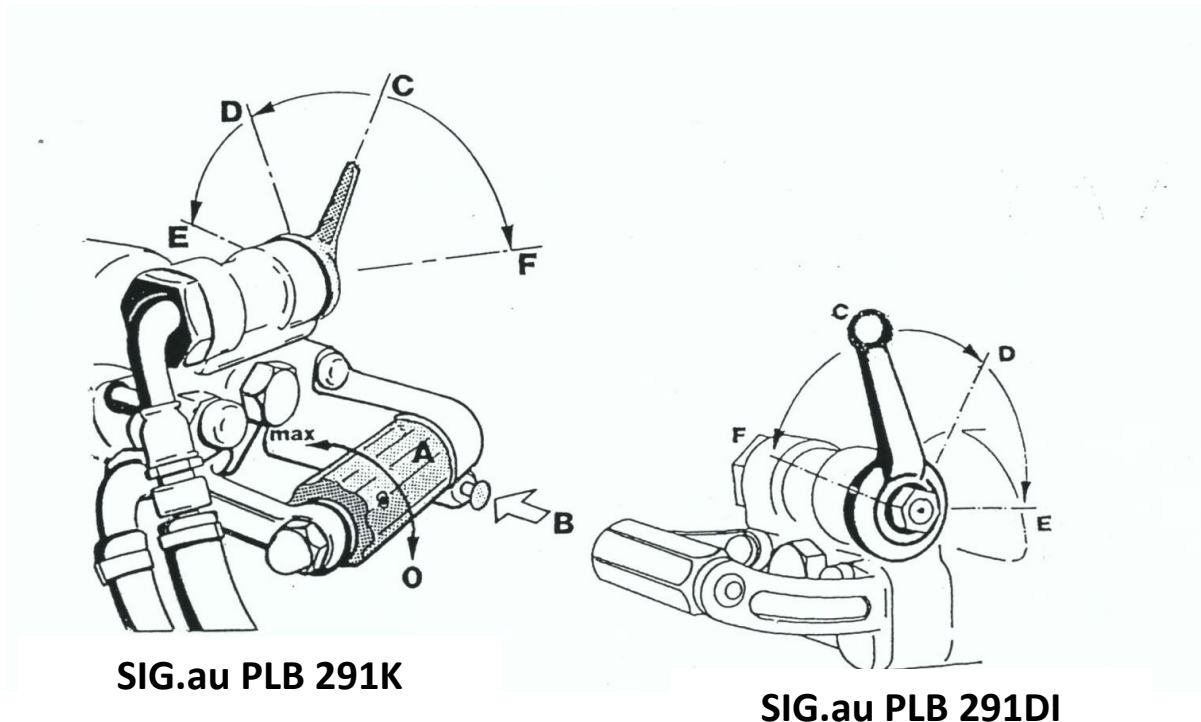
Air Hose: **25mm (1")**

Water Hose: **13mm (1/2")**

## OPERATION

### 1. Control Elements

- A. Turning Handle for leg extension (SIG.au PLB-29K only)
- B. Push button for leg retraction (SIG.au PLB-29K only)
- C. Air pressure is shut off
- D. Water flushing is ON  
Reduced air pressure is ON (spot drilling)
- E. Full air pressure is ON
- F. Blow out of drill hole is ON



### 2. Compressed air and flushing water

Compressed air is to be CLEAN and DRY

Inner DIAMETER OF AIR HOSES to be 25mm or 1"

Air hoses are to be BLOWN OUT BEFORE CONNECTION to the drill hammer

Inner DIAMETER OF WATER HOSES to be 13mm or ½"

Water hoses are to be FLUSHED OUT BEFORE CONNECTION to the drill

Water pressure ALWAYS TO BE AT LEAST 0.5 Bar LESS than air pressure

### 3. Lubrication

When drilling, ALWAYS have the automatic oil feeder PLO 20 or a POB 15 fitted to the air pressure line. (The closer the device is to the hammer, the safer it works).

Make Sure that oil shows up at the drill rod shank. The bit flange must be damp with oil. The needed output may be regulated with the adjusting screw at the oil feeder.

**ATTENTION: The oil feeder PLO 20 cuts off the air pressure when its reservoir runs out of oil and/or when the air duct between oil feeder and hammer breaks.**

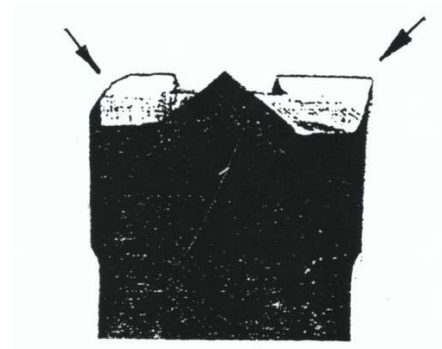
The following oils for drill hammers are recommended:

BRAND	TYPE	AMBIENT TEMPERATURES		
		UNDER 10°C	10°C – 35°C	ABOVE 35°C
TEXACO	RDL	32	100	
SHELL	TORCULA	32	100	150
MOBIL	ALMO	525	527	529

### 4. Drill Rods

#### Rods

Shank ends are to be in good order, clean and not worn or damaged. Percussion faces are to be flat and perpendicular to the rod axis. The flushing duct should not be clogged.



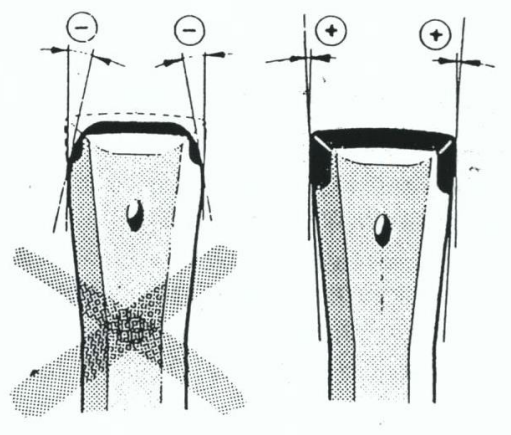
#### Bits

The correct section is to be ground (No cross cones!)  
The flushing duct is not to be clogged.

*For further details, please refer to the manufacturer's instructions*

#### Grinding – CAUTION!

If the cutting edge is ground to a sharp corner like that on the right, it may end up like the broken edge on the left. (See drawing to right)



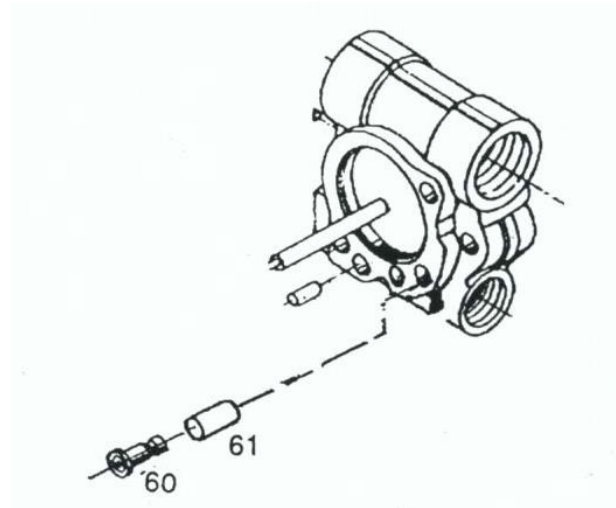
The profile of the cutting head should be wider than the mounting steel to drill a hole with clearance. (See drawing to right)

## Maintenance

The drill hammer is to be disassembled and cleaned periodically. At this opportunity the particular wear parts are to be checked accordingly to chapter 'Components and Servicing Data'.

### Dirt Restrictor

When replacing the dirt restrictor Part 60, care should be taken to insert it with Part 61 as shown. All foreign matter must be removed from the small holes and finally blown out with compressed air.



### Disassembling the hammer

Screw off nuts, Part 13 with wrench B.  
 Push out frame bolts, Part 10.

So far, disassembly should be good enough for current servicing.  
 For directions concerning further disassembly, please refer to  
 'Components and Servicing Data'.

### Cleaning the parts

Carefully wash all parts with kerosene. Blow off residuals with compressed air and, with a clean cloth, wipe the parts dry. After cleaning, coat all the parts with resin-free and acid-free grease.

**EXCEPTION: Do not grease but oil the valve plate, Part 74, the valve chest, Part 72, and valve guide, Part 75.**

### Reassembling the Hammer

Replace all worn O-Rings as necessary,  
 Including control assemblies,  
 If found to be excessively leaking.

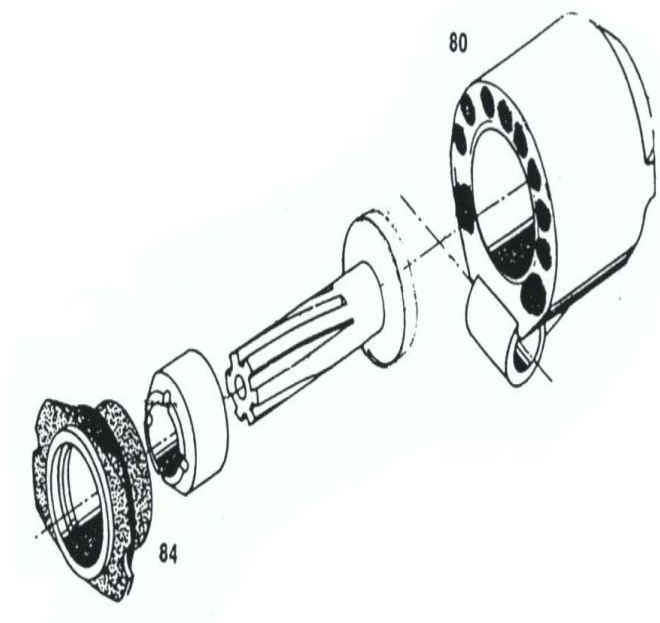
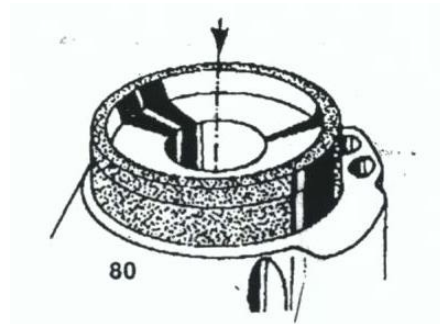
Reassemble the rock drill in accordance  
 With the exploded view. Make sure that the  
 distribution system, Parts 71, 72, 74, 75 & 76  
 are pressed vertically into the housing, Part 80

Take care that the lubrication channel holes  
 In the cylinder washer, Part 84, and the  
 Housing, Part 80, line up.

### Caution:

The frame-bolt nuts, Part 10,  
 Are to be screwed down alternatively  
 And in an uniform manner.

In the SIG.au PLB-29K and SIG.au PLB-291K  
 models, care is to be taken so not to jam  
 the valve piston, Part 128 inside the handle.



Parts and Maintenance data

1. Handle (SIG.au PLB-29K and SIG.au PLB – 291K models only)

Disassembly

Disassembly the left shaft bolt, Part 10.

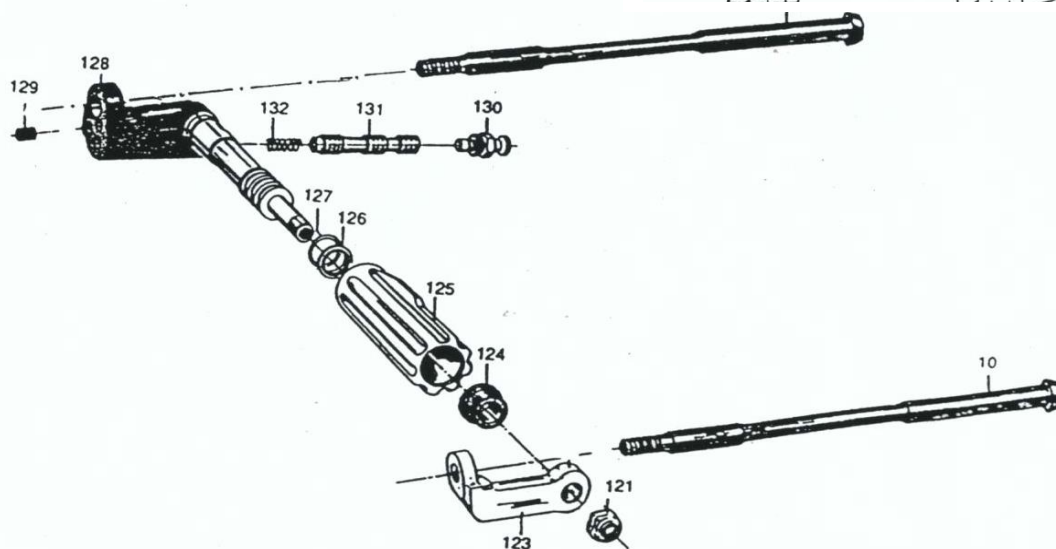
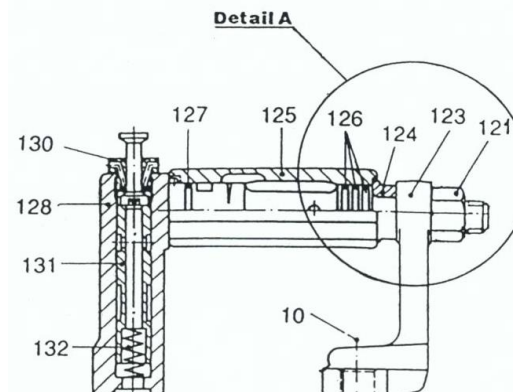
Remove the head screw, Part 121.

Withdraw the left lever, Part 123.

Remove the supporting ring, Part 124.

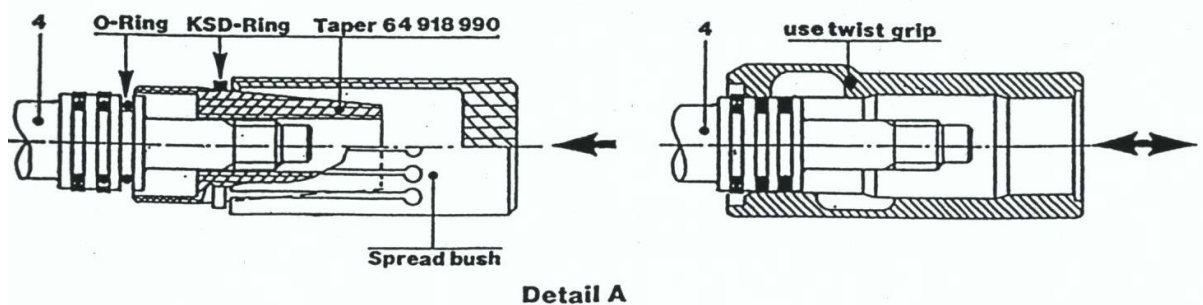
Pull off the twist grip, Part 125, and check the

KSD – sealing rings, Part 126, and O-Rings, Part 127.



Assembly Instructions for KSD-rings

- Assembly tool, “spread bush”, is a self-made item, preferably made of nylon, delrin ore the like.
- Twist grip 126 may be used as a calibrating tool.
- Lubricate KSD-rings with molycote, position O-ring once after the other in grooves via taper guide.
- Add KSD-rings one after the other with aid of spread bush (handle gently)
- To recalibrate KSD-rings, use twist grip 125 in proper manner as shown.



Reassembly in reversed sequence:

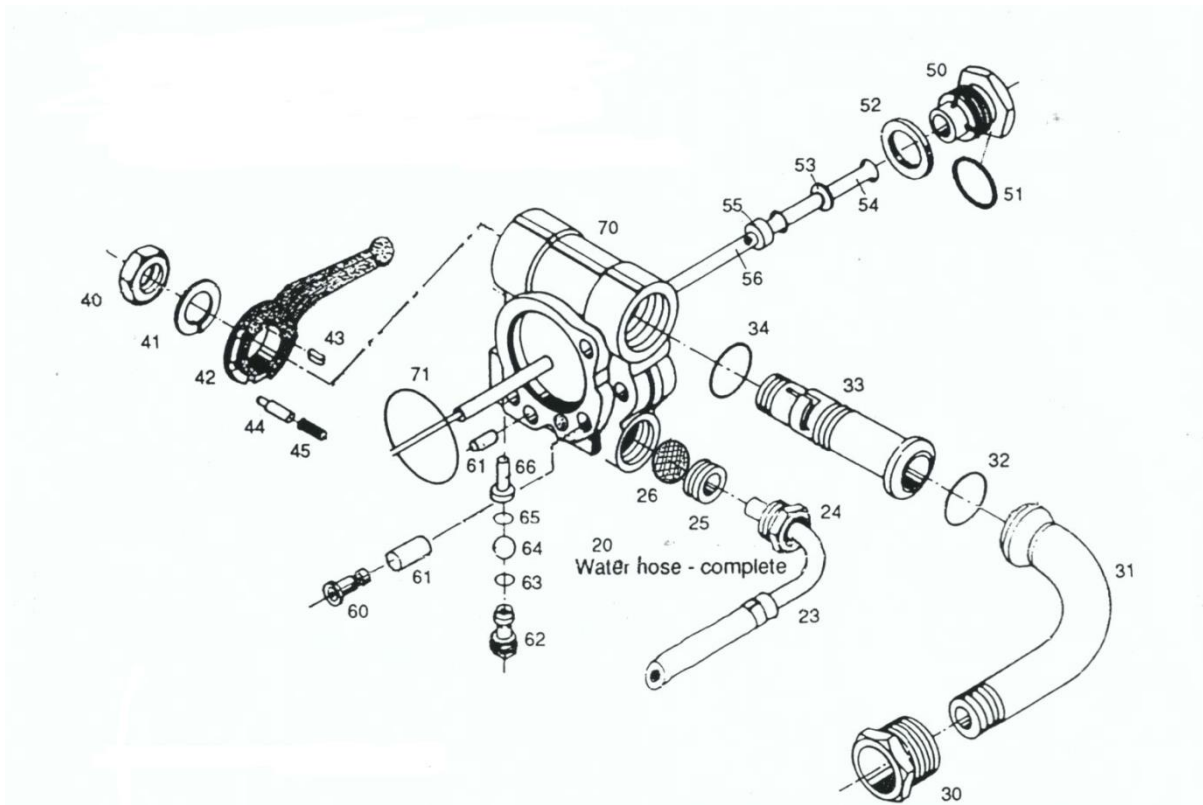
Coat the KSD-rings 6 with MOLYCOTE

**CAUTION:** When mounting the twist grip 125 take care that the cylindrical pin fits into the counter sunk groove (b).

Valve piston – inside handle (Model SIG.au PLB-29K and SIG.au PLB-291K only)

The valve piston, Part 130, may jam because of dirt or incorrect tightening of the side rod, Part 10. Check it for easy movement.

To remove dirt that is causing jamming unscrew nut, Part 130, and remove the valve pin. Clean and lubricate with a light, non-reinous oil before assembly. Tighten side rods, Part 10, evenly to avoid binding.



## 2. Back Head (Handle Part)

The rubber seals must be in order to avoid water penetration inside the hammer. Defective seals must be replaced by new ones, Parts 53 and 55.

### Disassembly

Turn operating lever to position F and then pull off operating lever, Part 42, from valve, Part 33.

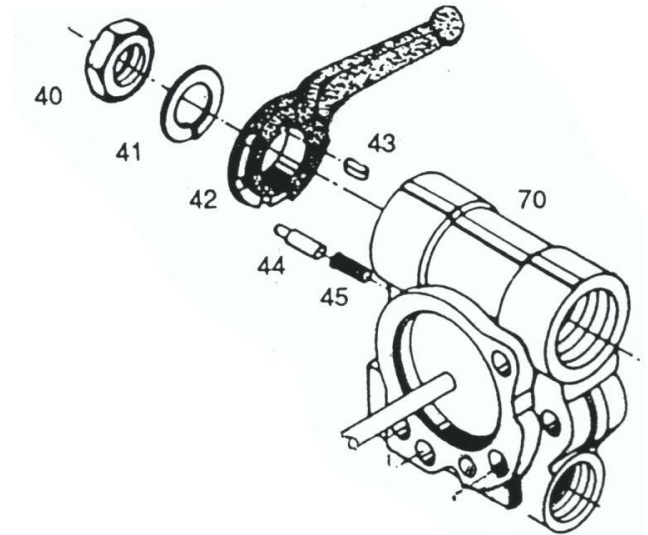
Eject throttle valve, Part 33, on air connection side.

If water emerges at the operating lever, Part 42, then O-ring 65 on valve pin, Part 66, must be replaced.

### 3. Control Lever

Disconnect the control lever from the throttle valve by tapping the Control lever, while it is in the OFF position (C)

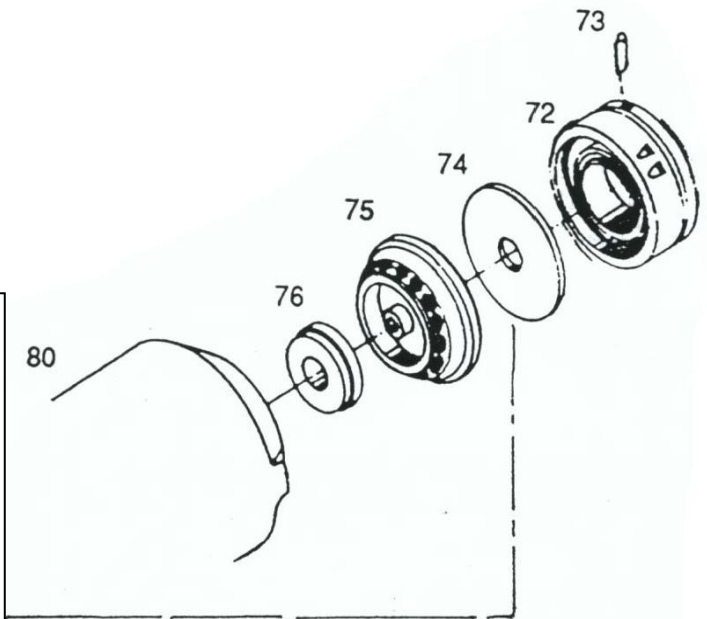
When reassembling the control lever into the housing, Be careful not to jam it.



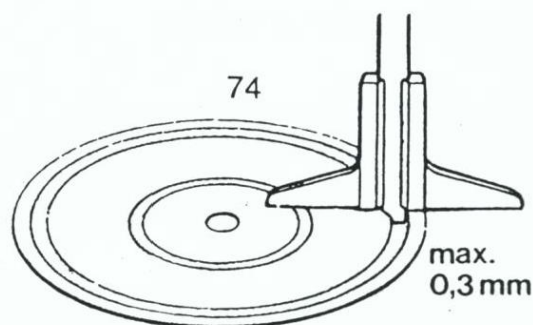
4. Distribution Systems: Standard & High performance  
There is a standard and high performance valve chest assembly. They are recognized by a different diameter of the VALVE PLATE.

The high performance unit fitted to the SIG.au PLB-291K and the SIG.au PLB-291DI models has a small outside and a larger internal diameter valve plate.

<p><b>SIG.au PLB-29K &amp; SIG.au PLB-29DI:</b> 84mm Outside diameter 18mm Inside diameter</p> <p><b>SIG.au PLB-291K &amp; SIG.au PLB-291DI</b> 70mm Outside diameter 20mm Inside diameter</p>
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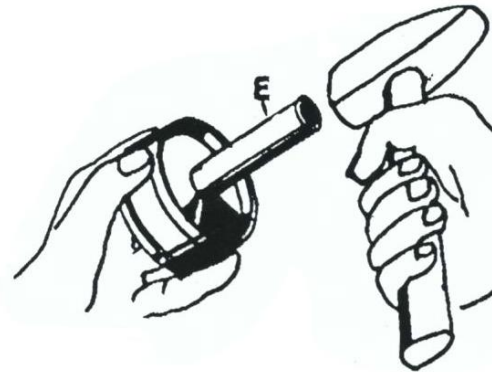
**NOTE:** No separate parts of the valve plate, valve guide or valve chest, Parts 72,74 & 75 are interchangeable.



Disassembly – Distribution System

Loosen the 2 side nuts, Part 13 and separate the housing, Part 80 from the backhead, Part 70.

Press out the control section, Parts 71, 72, 73, 74, 75 & 76, And dismantle with the help of Punch E as per drawing.



Check valve plate, Part 74, for indentations. Max depth not to exceed 0.3mm.

SIG.au PLB-29DI & SIG.au PLB-291DI Models only –

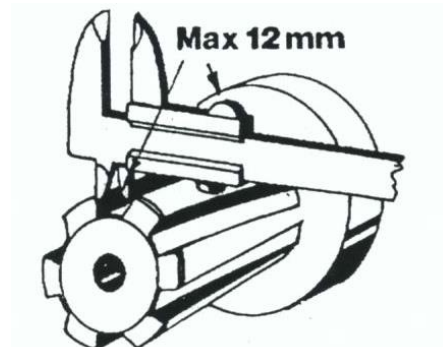
Replace Mounting Bracket Bush, Item 04, when excessively worn.

NOTE:  
To avoid Bush slippage in the bore, do not Apply oil or grease when replacing.



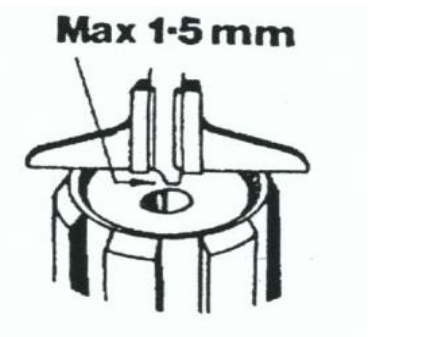
5. Piston

Check guide and spiral flute for wear. Maximum flute width 12mm if worn, Substitute the piston.



Check the piston large diameter for Wear.

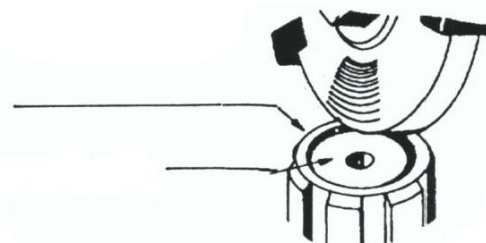
Replacement is recommended when piston Diameter is less than 89.85mm.



Check the percussion face for wear. maximum depth of upset pocket 1.5mm.

The piston may be refaced by grinding.

**CAUTION** If replacing the piston, Grind the **UPLIFTED EDGE ONLY** **DO NOT GRIND THE POCKETED SURFACE**



6. Cylinder Washer Bush (Sealing Bush) P

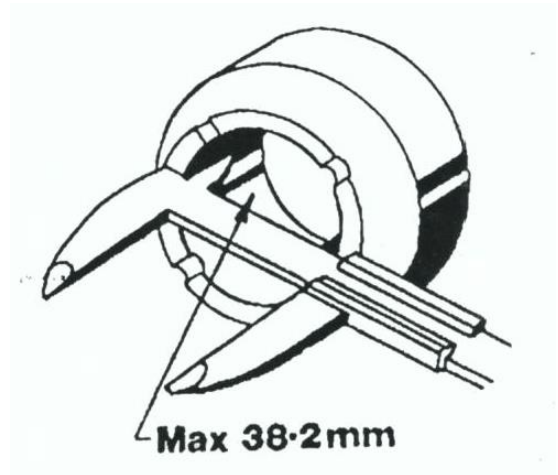
Check inner diameter for wear.  
Maximum inner diameter 38.2mm

If worn, push out sealing bush using a 41.5mm diameter header, (made on site), and a vice.

With the help of an old percussion piston press in a new sealing bush.

**CAUTION**

The inner diameter of the sealing bush must fit over the outer diameter of the piston collar.



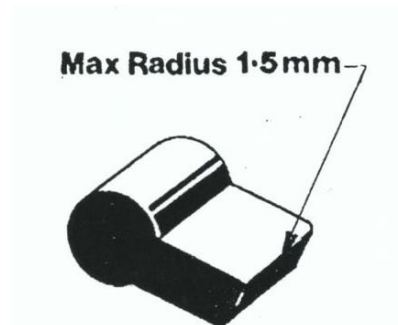
**7. Rotating Mechanisms**

**Detent pawls, Part 96**

Check the edges of the detent pawls for wear.

Maximum radius of wear 1.5mm

If one edge is worn, reverse the pawls. If both edges are worn, replace.



**Detent pawl springs, Part 95**

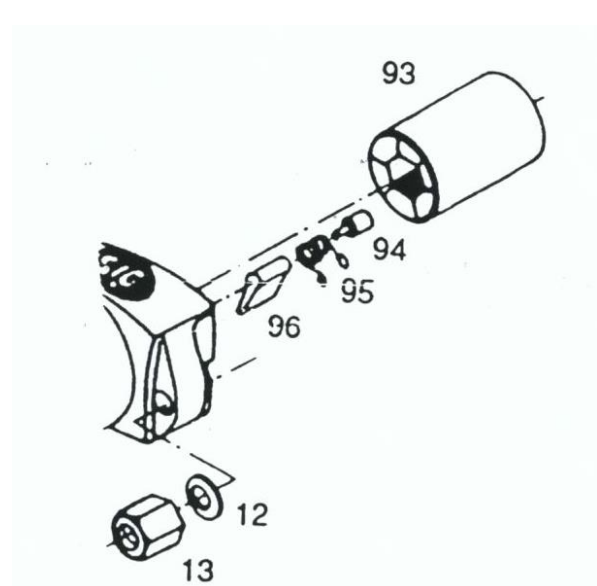
Check the detent pawl springs at regular intervals.

Fatigued or defective springs cause unsuitable rod rotation. Substitute defective springs.

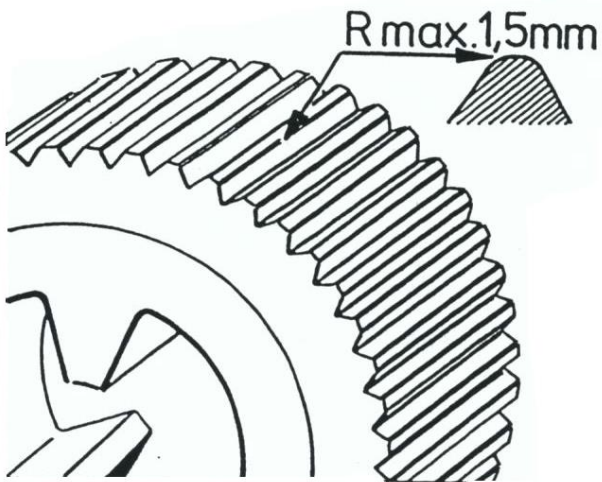
**Pawl plunger, Part 94**

Maximum acceptable wear of Plunger keys 1.5mm.

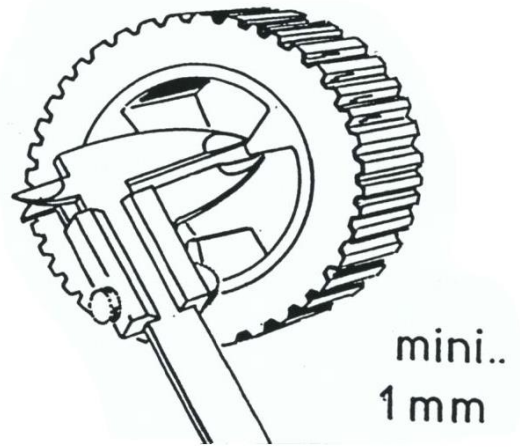
If possible, replace the pawl plunger.



**Ratchet Ring, Part 90**



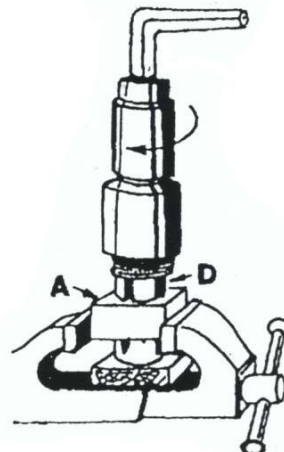
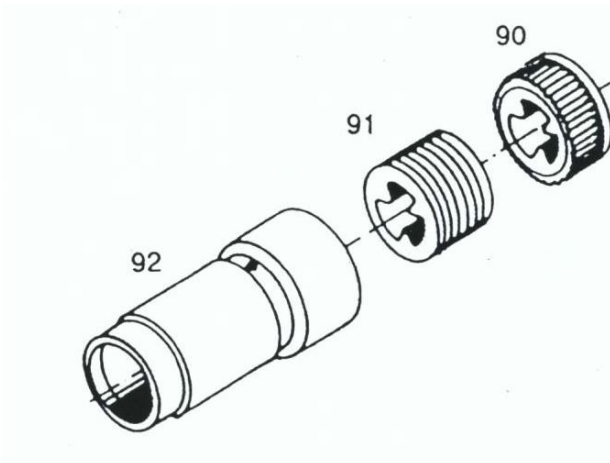
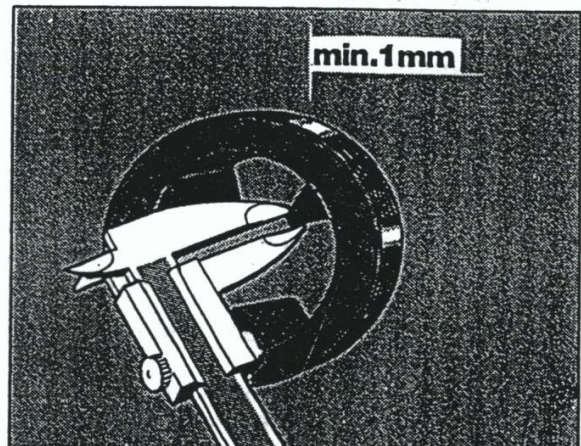
Maximum wear on edge:  
Radius 1.5mm  
After this limit, replace  
ratchet ring.



Minimum twist spline width: 1mm  
after this limit, replace ratchet ring.

**Chuck Nut, Part 91**

Wear on splines:  
min. spline width 1mm  
If less than 1mm,  
Replace guide bush.



**CAUTION!**  
Left-Handed thread

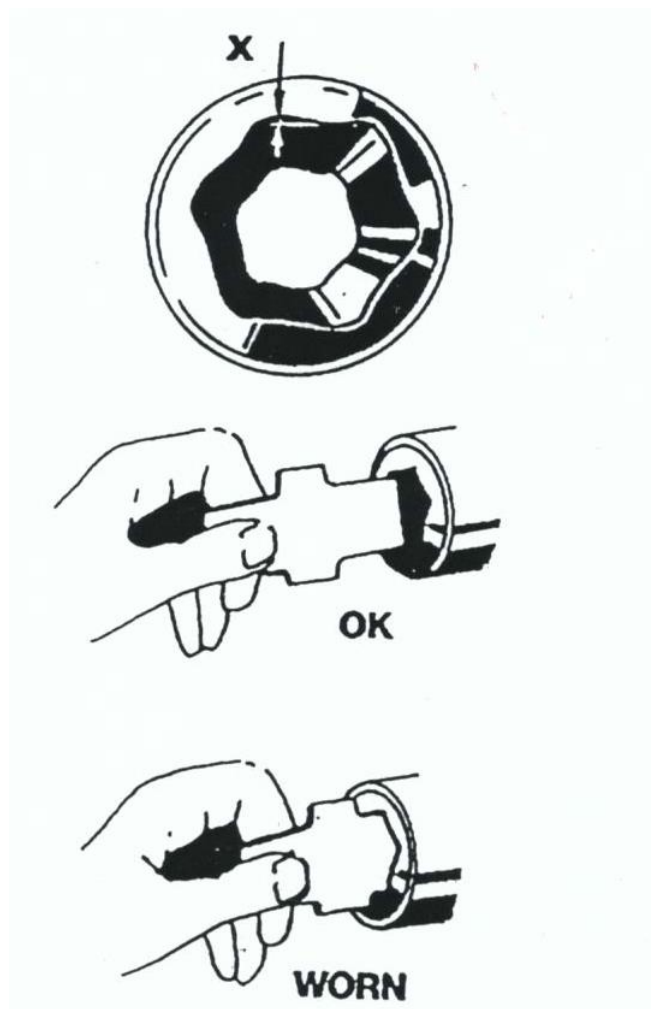
### 8. Chuck insert (drill socket), Part 93

At regular periods, check the inner hexagon for face wear.  
To do so, use the wear gauge.

Broken pistons and/or drill rods may be  
The consequence of worn out drill sockets.

**To Test:**

1. Find the point of greatest wear 'X'
2. Using a hexagonal gauge insert it at  
This point
3. If the gauge goes in, right to the stop,  
Change the chuck insert.



## 9. Cylinder Liner Replacement

In order to maintain good air compression, it is important to check the cylinder liner bore for wear, cracks, corroded and pitted surface. If replacement is required proceed as follows:

- Use safety glasses and leather gloves to avoid injury. Place the housing vertically on the top of the open bench vice or lock the housing hard on the side of the vice on the pivoting eye section.
- As the grub screw, which locates cylinder liner, is secured with “Loctite”, it is not required to extract it from the housing when the cylinder liner requires replacement.
- Ensure that cylinder liner can be gently knocked out from the housing.
- Rapidly apply heat externally all over the alloy section for several minutes by moving the oxygen torch tip approximately 50mm away from the housing. Heat all over quickly so as to create thermal expansion on the housing. **DO NOT APPLY ANY HEAT TO THE CYLINDER LINER BOAR!**

### **CAUTION!**

Apply only 100 – 125 degree heat to the housing. Do not apply excessive heat as this will cause the alloy to lose its heat treated properties. This can be checked either by quick hand touch or by applying a drop of water on the alloy housing. Knock out the cylinder liner with a hammer and drift.

Inspect the surface and quickly clean if required. Re-lock the housing eye now in a vertical position. Align the locating groove on the cylinder liner with the grub screw end which protrudes in the bore, quickly slide the housing in the position and push the liner fully to the spigot end.

**\*NOTE\*** *This procedure should be completed quickly in order to ensure that the heat from the housing will not transfer to the liner and cause it to jam before it is located fully in the position. Allow to cool in air before assembling the drill. Ensure that there are no burrs or sharp points inside the cylinder bore in order to avoid irreparable damage on the piston.*

### Replacement of chuck insert

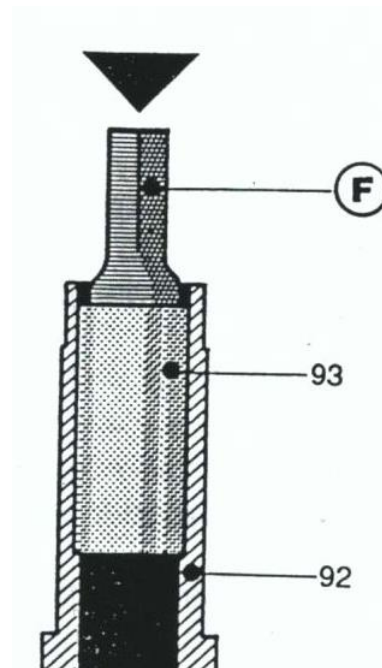
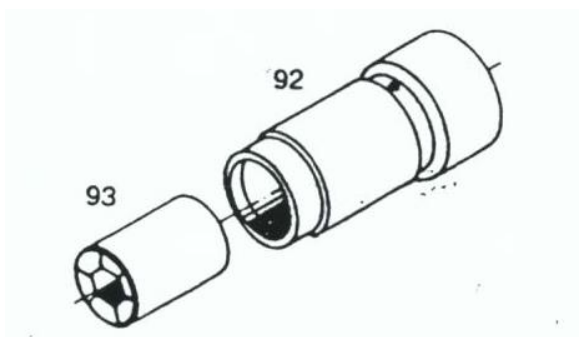
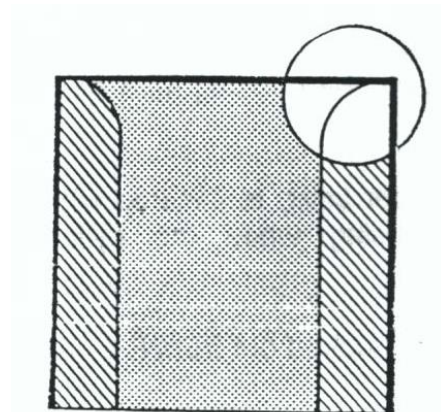
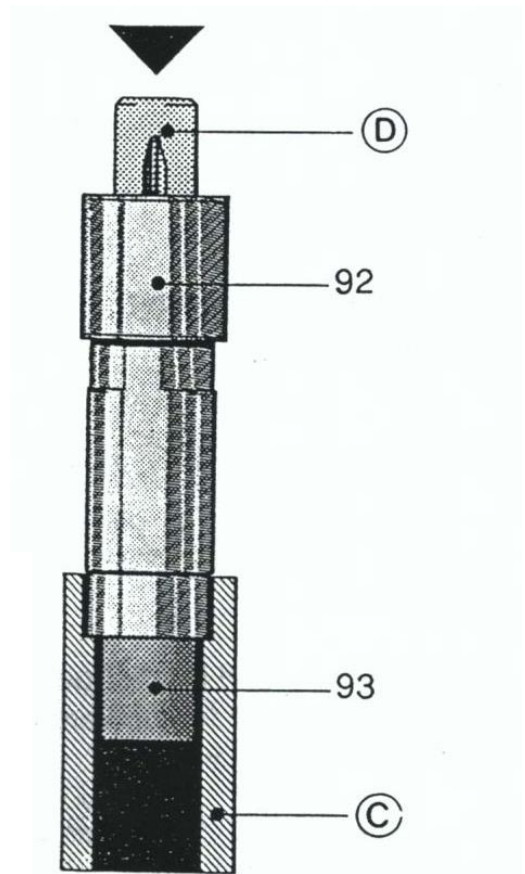
**NOTE:** Where possible, use a hydraulic press when changing the chuck insert.

**CAUTION!** If the chuck insert and chuck nut have to be changed at the same time, it is preferable to change the chuck nut first, as the old chuck insert forms a better support than the new one.

1. Position the chuck, Part 92, in dismantling sleeve C.
2. Tap out the old chuck insert, part 93, using dismantling drive D.
3. Tap new chuck insert gently and Perpendicularly into position

**NOTE: The radius at the collar must point outwards**

4. Use a press to force the chuck insert Up to the stop using a cut off drill steel as a driver.



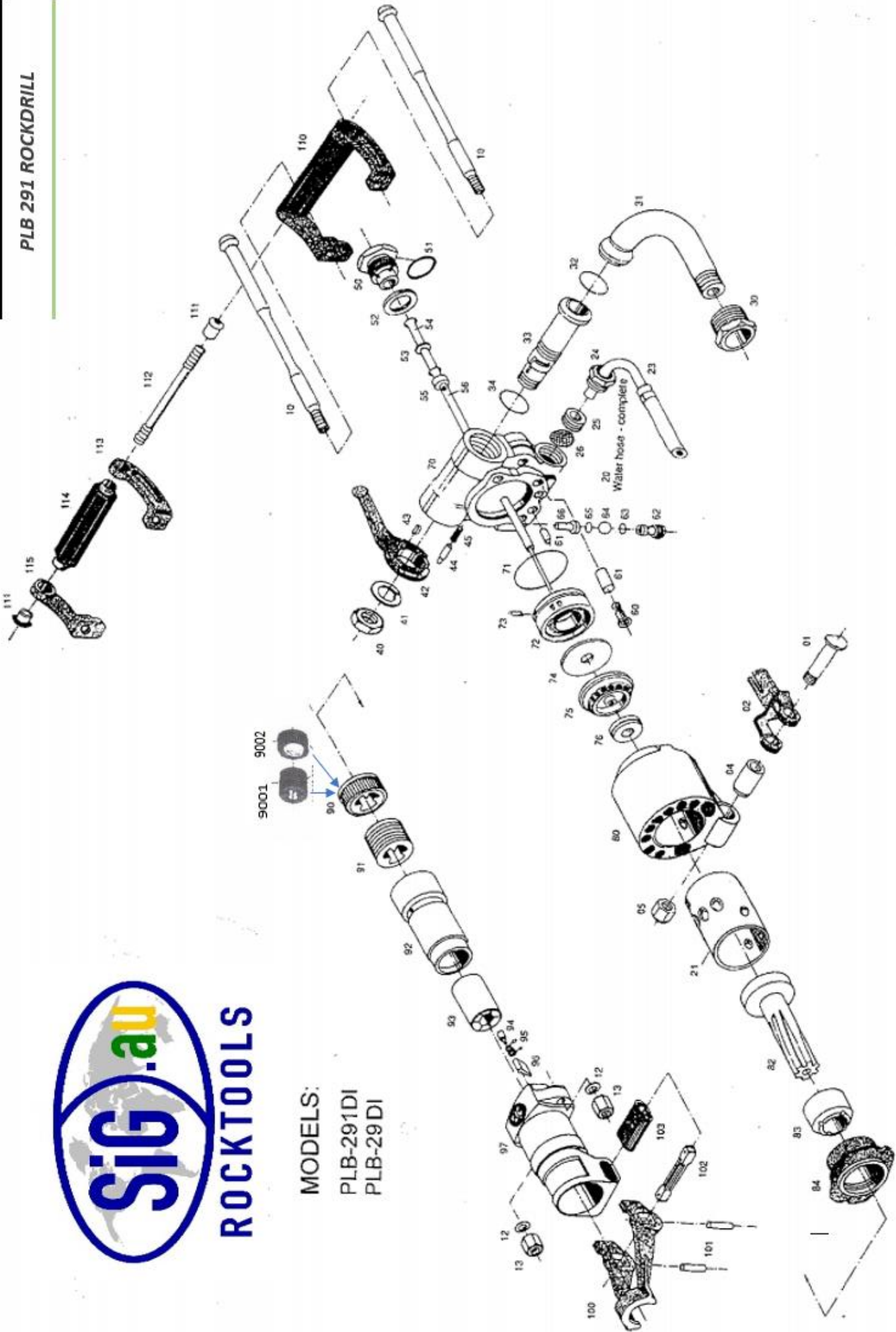
**NOTE:** To avoid risk of chuck insert slippage in the chuck bore, do not apply oil or grease when replacing.

**SIG.au PLB 29 Rockdrill Parts List**

<b>ITEM</b>	<b>QTY</b>	<b>DESCRIPTION</b>	<b>PART NUMBER</b>
1	1	Mounting Bracket Bolt	64 000 111
2	1	Mounting Bracket Assembly (Inc 1 & 5) For 360 <sup>0</sup> rotation of airleg assembly	64 000 103
4	1	Bush	64 000 140
5	1	Nut	64 000 120
10	2	Side Rod Bolt	64 262 380
12	2	Spring Washer	64 255 460
13	2	Side Rod Nut	64 255 451
20	1	Water Hose Inc. 21, 22, 23, 24, 25 & 26	64 258 401
21	1	Cylinder Liner	64 263 340
23	1	Gooseneck swivel – water	64 255 120
24	1	Connection Nipple – water	64 255 110
25	1	Rubber Ring	64 255 130
26	1	Strainer	64 259 730
30	1	Connection Nipple – air	64 258 060
31	1	Gooseneck Swivel – air	64 262 210
32	1	O’ring	64 996 170
33	1	Throttle Valve	64 262 030
34	1	O’ring	64 996 330
40	1	Hexagonal Nut	64 992 070
41	1	Spring Washer	64 994 270
42	1	Operating Lever	64 258 041
43	1	Laid in Spring Key	64 257 040
44	1	Latch or Index Pin	64 256 291
45	1	Pressure Spring for Latch Pin	64 256 300
50	1	Plug	64 258 080
51	1	O’ring	64 979 300
52	1	Copper Gasket Seal	64 258 090
53	1	Rubber Seal	64 255 170
54	1	Water Tube	64 248 082
55	1	Gasket Seal	64 262 410
56	1	Flush Water Tube Sleeve	64 262 401
60	1	Dirt Restrictor	64 263 231
61	4	Rubber Seal	64 262 200
62	1	Water Valve Screw Includes Part 63	64 262 060
63	1	O’ring	64 996 240
64	1	Water Valve Ball	64 259 080
65	1	O’ring	64 996 500
66	1	Water Valve Pin Includes Part 65	64 259 102
70	1	Backhead	64 262 020
71	1	O’ring	64 996 290

72	1	Valve Chest	64 263 260
73	1	Cylindrical Pin	64 258 130
74	1	Valve Plate	64 244 320
75	1	Valve Guide	64 263 270
76	1	Damper Ring	64 914 091
80	1	Housing, Silenced	64 263 173
82	1	Piston	64 262 364
83	1	Cylinder Washer Bush	64 262 350
84	1	Cylinder Washer	64 262 120
90	1	Ratchet Ring Complete	64 262 332
9001	1	Rifle Nut/Ratchet Bush	64 262 333
9002	1	Ratchet Ring	64 262 340
91	1	Chuck Nut	64 262 320
92	1	Chuck	64 262 280
93	1	Chuck Insert 7/8" x 108mm	64 262 300
94	4	Pawl Plunger	64 258 352
95	4	Pawl Spring – Stainless	64 258 344
96	4	Pawl	64 257 111
97	1	Front Head	64 262 270
100	1	Steel Retainer 7/8" x 108mm	64 261 100
101	2	Heavy Type Dowel Pin	64 995 770
102	1	Steel Retaining Bolt	64 261 090
103	1	Rubber Mounting	64 262 220
110	1	D-Handle Complete	64 000 162
111	2	Nuts for Connection Stud	64 000 030
112	1	Connection Stud of D-Handle assembly	64 000 020
113	1	Left Hand Side of D-Handle assembly	64 000 210
114	1	Hand Grip of D-Handle assembly	64 000 240
115	1	Right Hand Side of D-Handle assembly	64 000 220
		OPTIONS	
93	1	Chuck Insert 1" x 108mm	64 262 310
100	1	Steel Retainer 1" x 108mm	64 261 130

PLB 291 ROCKDRILL



**ROCKTOOLS**

MODELS:  
PLB-291DI  
PLB-29DI