

Pneumatic Driving Machine

Type 6 1015 0010

Tech. Doc. No. 615



Illustration can differ from the original.

Operation and Maintenance Manual

TECHNICAL SPECIFICATION

			6 1015 0010		
Operating pressure (Flow pressure)	p	bar	6		
Performance	P	kW	0,7		
Speed (loaded)	n loaded	1/min	20		
Speed (idle)	n idle	1/min	40		
Driving torque	Mt	Nm	280		
Tool holder (inner diameter)		mm	20		
Rotation direction (see fig.)			left		
Air consumption	V	m ³ / min	1.3		
Air connection		outside	R 3/8"		
ID of hose (minimum)		mm	13		
Weight		kg	4.95		
Noise (average 1 m distance)		dB(A)	80.5		

Operation instruction

Contains basic information regarding pneumatic machines, maintenance instructions, wear and tear, as well as disassembly and re-assembly.

Spare parts documentation

Consists of parts lists and sectional drawings.

Supplement

Maintenance of pneumatic tools

Hints for oiler setting.

SAFETY INSTRUCTIONS

1. Wear goggles (Risk of injury by swirling of dust particles).
2. Wear protective gloves (cuts by sharp-edged work pieces).
3. Wear protective clothing.
4. Ensure that you maintain a good footing and proper balance at all times..
5. Never work under the influence of alcohol, drugs or stronger medication.
6. After use, disconnect the machine from the compressed air line (avoidance of unintentional machine start).
7. Follow the general current and appropriate **Accident Prevention and Safety Procedures**.
8. In explosive surroundings avoid sparks which can be produced by the drill.
In this case rinse, resp. cool the material and drill with water.

OPERATION INSTRUCTION

General

The performance and pull-through force of this machine are designed for the drilling and milling of steel and cast iron. Freehand drilling and milling can only be performed for tools up to 100 mm in diameter. For tools with larger diameters, always work with a dead stop and ensure against rotation of the machine (danger of injury).

Drilling/ Milling

- Check the oil level. If necessary, add oil to fill up the oiler.
- Attach desired tool to the machine.
- Centre the machine on a suitable support, if working with a tool having a diameter of more than 100 mm.
- Prevent the machine from rotating upwards (do not hold by hand), if working with a tool having a diameter of greater than 100 mm. See the section entitled „USE“.
- Connect the compressed air hose (blowing out of the hose before connecting is recommended in order to remove contaminants).
- Open the valve and begin the drilling or milling operation.
(The rpm's can be regulated by opening of the valve to different degrees).

After finishing the operation

- Close the valve.
- Turn off the compressed air and disconnect the compressed air hose.
- Take the machine out of the square holding.
- Remove the tool.
- Clean the tool holder seat.
- Check the oiler.

Use

Intended Use

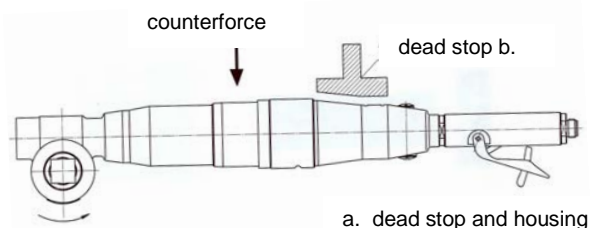
The machine serves as a drive for drilling tools during the boring of pipes. The machine is guided by hand. When working with drilling or milling tools with diameters of more than 100 mm, the machine must continually contact a fixed dead stop in order for the torque to be transmitted to the machine.

Any use which deviates from the instructions mentioned in this guide qualifies as unintended use.

Unintended use

Working without a dead stop when using tools with diameters bigger than 100 mm.

Use the machine as a drive for lifting goods or people. Working without using personal safety protective measures.



DANGER ZONES

Operating conditions / Life phase	Normal function	Malfunction	Misuse	Expected use
Transport	Transport of the machine in an inoperable condition	Machine is dropped	Transport of the machine in an operable condition	Unknown
Start-up	Inserting the machine into the drill stand provided	Unknown	Drilling without using the drill stand	Unknown
Operation	Machine runs only when valve is open	Machine runs unintentionally	Valve is blocked while open	Unknown
	Machine moves the tool	Tool is blocked	Unknown	Unknown
Maintenance	Regular changing of vanes			
	Operation on a service unit	Breakdown of machine	Unknown	Unknown

MAINTENANCE AND ASSEMBLY INSTRUCTIONS

Service life and performance of this machine are decisively determined by

a) the air purity

Before connecting the compressed air supply to the machine, blow out the air hose. If rust is able to build up and water is able to condense in the compressed air supply line, place dirt and water precipitation filters at the air inlet.

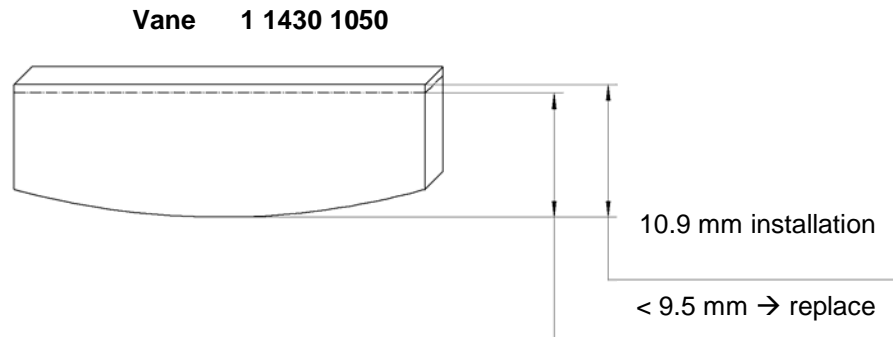
b) the lubrication conditions and maintenance

The distance between the machine and the oiler should not be more than 5 m. The oiler, which is found in the motor housing, should therefore always be checked to determine the oil level. The oiler should be adjusted so that 2-5 drops are dispersed per m³/min of air consumption. Resin- and acid-free lubricating oils SAE 5 W – SAE 10 should always be used. Viscous oils cause sticking of the vanes and thereby impair the start-up and performance of the motor. Through optimal lubrication, the service life will be multiplied. Please take note of the supplement

Maintenance of pneumatic tools

Sealed and greased ball bearings must not be washed out and the machine must generally never be rinsed with petroleum or similar cleaning fluids. After ending the drilling or milling operation, rinse the machine with thin oil or use other measures to ensure against corrosion. Clean the filters at the air inlet regularly. In winter and in case of very humid compressed air, antifreeze lubricants,

such as **BP-Energol AX 10**, **Killfrost** or **Komranol N 74**, should be used. Parts exposed to wear - especially the vanes - should be regularly changed. They are considered to be worn when the width is less than 9.5 mm.



We recommend reapplication of the grease in the planetary gear and in the worm gear after 300 hours of operation. Use only special gear grease. The rolling bearings must be thoroughly cleaned and filled with new bearing grease after approximately 900 hours of operation. In order to avoid excessive heating of the bearing, the space between the inner and outer rings should only be filled with grease until about 1/3 full.

The correct amount of grease is very important with respect to achieving good lubrication and minimal heating.

Grease (resin- and acid-free)	Multipurpose grease for rolling and sliding bearings and for gears	Special grease for worm gears
Designation according to DIN 51502	KL 2k	G 00 h
Consistency class DIN 51818	2	00
Saponification additive	lithium	sodium
Drop point	185°C	145°C
Walk penetration	265 – 295	400 – 410
Temperature range	-25°C to +125°C	-25°C to +100 °C

Disassembly and re-assembly

The disassembly and the re-assembly should only be performed with assistance of sectional drawings.

Disassembly

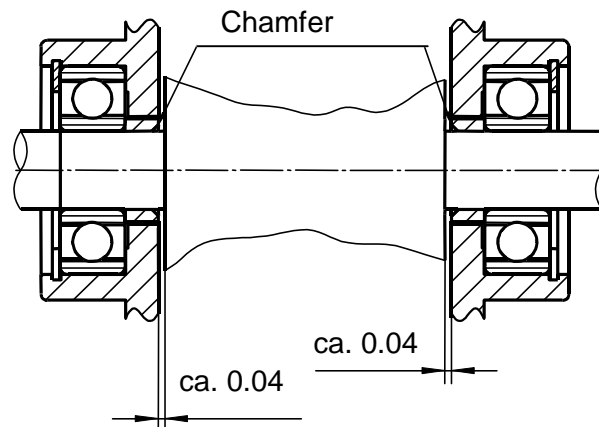
Remove lever valve with oiler from the motor housing. Screw out nipple with screen item 103, take out pressure spring item 107 and ball item 106. Remove pin item 108, take away valve lever item 104 and pull valve pin item 102 out of the sealing seat. Loosen completely the planetary gear with angle gear from the motor. For this purpose, screw the gear housing item 25 out of the gear connection item 16. After screwing-off the gear connection item 16 and pulling-off the exhaust ring item 19, pull out the inner motor parts and continue disassembling. Loosen the locking screws items 61 and 63. Only screw out adjusting screw item 2, if necessary. Separate the worm gear completely from the gear housing item 25. Screw off bearing cover item 50 (attention! Is screwed-in with Loctite-screw locking), Loosen locking ring item 49, remove bearing item 48 and worm item 47 with worm wheel item 46 from the gear housing item 40. Press out anti-friction bearings item 41 and 43. Press planetary gear parts out of the gear housing item 25 resp. loosen by slight pushing of the front side on a wooden support and pull it out. Continue disassembling the gear parts. All parts, especially the vanes item 9 have to be checked with regard to wear and tear and damages

Re-assembly

The re-assembly is performed basically in the opposite order as the disassembly.

Ensure that the motor is precisely aligned. The clearance between the rotor item 8 and the end plates items 3 and 10 should be at the front and at the back 0.04 mm (see fig. 2). The chamfers in the spacer rings items 13 and 21 must point to the rotor centre. The cylinder bushing has to be correctly oriented before being inserted.

Fig. 2:



The position of the lever valve can be determined with the help of the adjusting shims item 22.

For all repairs, use ORIGINAL SPARE PARTS only.

Check after re-assembly				
			6 1015 0010	
Operating pressure (flow pressure)	p	bar	6	
Speed (idle)	n idle	1/min	39-45	
Air consumption (idle)	V	m ³ /min	1,3-1,45	
Noise (1 m distance)	ca.	dB(A)	86-90	
Temperature increase at drive (worm wheel)	Max. 60° after 3 min.			

TROUBLESHOOTING

	PROBLEM	CAUSE	SOLUTION
a	Machine doesn't start up	<ul style="list-style-type: none"> > Not connected to compressed air > Rotor has been rusted by humidity > Vanes are jammed (worn) > Gearing is blocked 	<ul style="list-style-type: none"> > Connect and open the compressed air line > Dismantle and clean the motor; check the service unit to see if it is functioning > Dismantle and clean the motor; replace worn parts. > Dismantle and clean the gearing; change worn parts
b	Valve lever / shaft is jammed	<ul style="list-style-type: none"> > Valve contaminated 	<ul style="list-style-type: none"> > Screw off the connection fitting; clean the spring, ball, seal and shaft
c	Machine is rotating too slowly	<ul style="list-style-type: none"> > Operating pressure is too low > Rotor is rubbing against the end plate / cylinder bushing > Gear parts are worn down 	<ul style="list-style-type: none"> > Increase the operating pressure on the machine to 6 bar > Dismantle and clean the motor; replace worn parts and align the motor again > Dismantle and clean the gearing; replace worn or damaged parts
d	Motor seizes up / jammed	<ul style="list-style-type: none"> > Vanes are worn or broken; broken parts are jammed between the rotor and the cylinder bushing > No lubrication – ball bearings were running dry; rotor was rubbing against the end plates > Coarse dirt particles in the motor compartment between the rotor and the cylinder bushing 	<ul style="list-style-type: none"> > Dismantle and clean the motor; replace worn parts and align the motor again > Dismantle and clean the motor; replace worn parts > Dismantle and clean the motor; replace worn parts and align the motor again
e	Gear makes loud noises	<ul style="list-style-type: none"> > Needle cages are defective > Gear teeth are chattering > Ball bearings are defective 	<ul style="list-style-type: none"> > Dismantle and clean the gearing; replace worn or damaged parts

Spare Parts List

Description: Pneumatic Driving Machine		Part and drawing number: 6 1015 0010
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Item	Qty.	Description	Part and drawing no.	Remarks
	1	Motor	3 6339 1000	item 1-19, 61-64
	1	Gearbox	3 6339 4000	item 25-37
	1	Output unit, assy.	3 6339 7000	item 40-50
	1	Lever throttle	9 2002 0120	Item 101-109 (60)
22	1	Compensating ring	9 3326 1380	
	1	Compensating ring	9 3326 1390	
	1	Compensating ring	9 3326 1400	

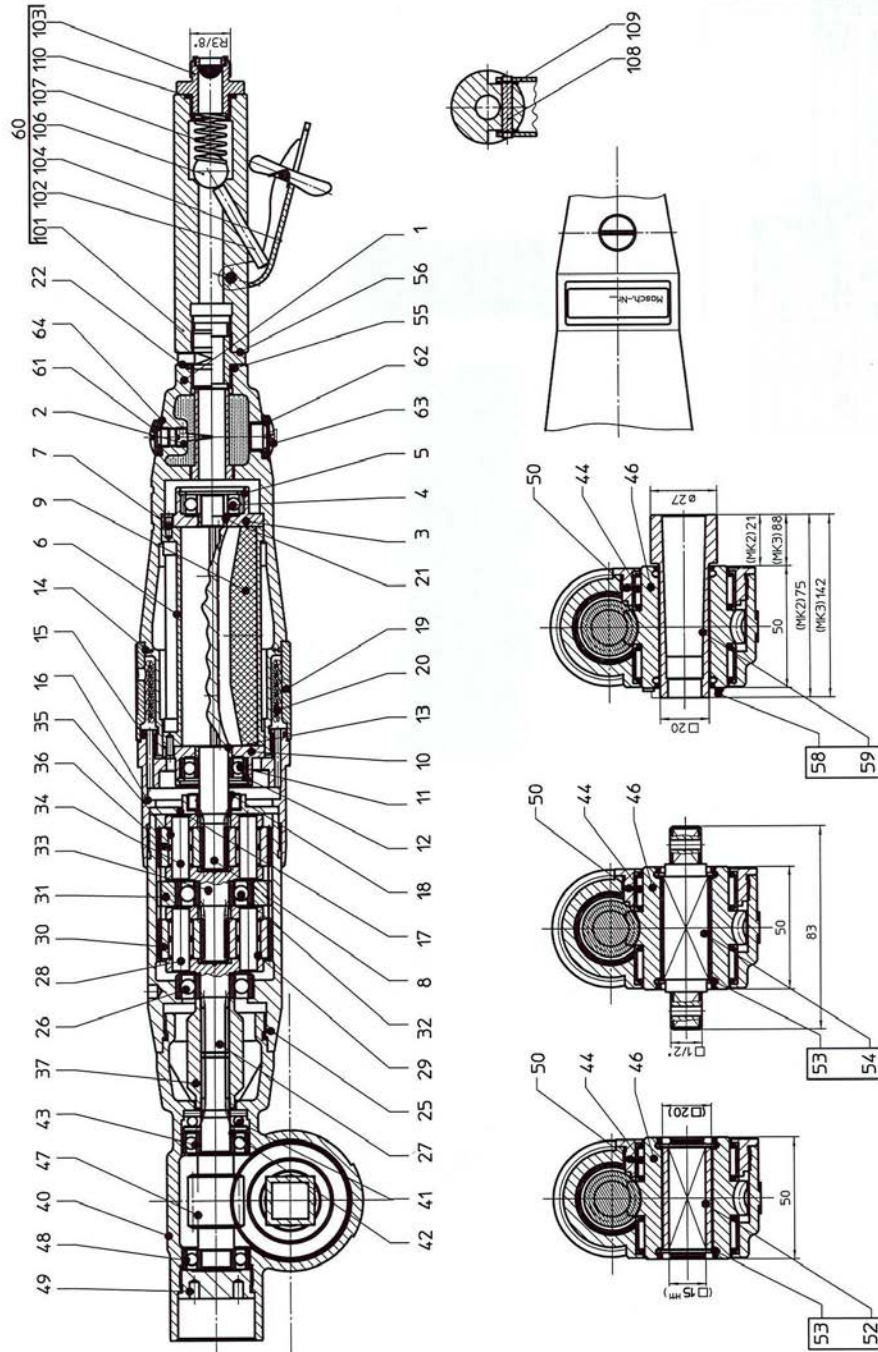
Spare Parts List

Description:

Pneumatic Driving Machine

Part and drawing number:

6 1015 0010



Spare Parts List					
Description: Pneumatic Motor				Part and drawing number: 3 6339 1000	
Item	Qty	Description	Part and drawing no.		Remarks
1	1	Motor housing, assy.	3 6339 1910		
2	1	Adjusting screw	9 1151 9010		
3	1	End plate	3 6341 1110	*	
4	1	Grooved ball bearing	9 1001 0090		
5	1	Snap ring	9 1703 0050		
6	1	Cylinder bushing	1 1430 1020	*	
7	1	Spiral pin	9 1642 0080	*	
8	1	Rotor	3 6349 1030		
9	4	Vane	1 1430 1050		
10	1	End plate	5 1202 1100		
11	1	Grooved ball bearing	9 1003 0020		
12	1	Snap ring	9 1703 0070		
13	1	Spacer ring	5 1202 1080		
14	1	O-ring	9 1901 2070	*	
15	1	O-ring	9 1901 2430	*	
16	1	Gearbox connection	3 6339 1190		
17	1	Intermediate plate	3 6339 4140		
18	1	Shaft seal	9 1905 0030	*	
19	1	Exhaust ring	3 6339 1180		
20	1	Silencer mat	3 6339 1770		
21	1	Spacer ring	3 6341 1080		
55	1	O-ring	9 1901 3270	*	
56	1	Nipple	9 2205 0035		
61	1	Locking screw	9 1150 9070		
62	1	Sealing ring	9 1903 0340	*	
63	1	Locking screw	9 1150 9030		
64	1	Sealing ring	9 1903 0260	*	
		*Wear parts, to be stored in case of			
		continuous use.			

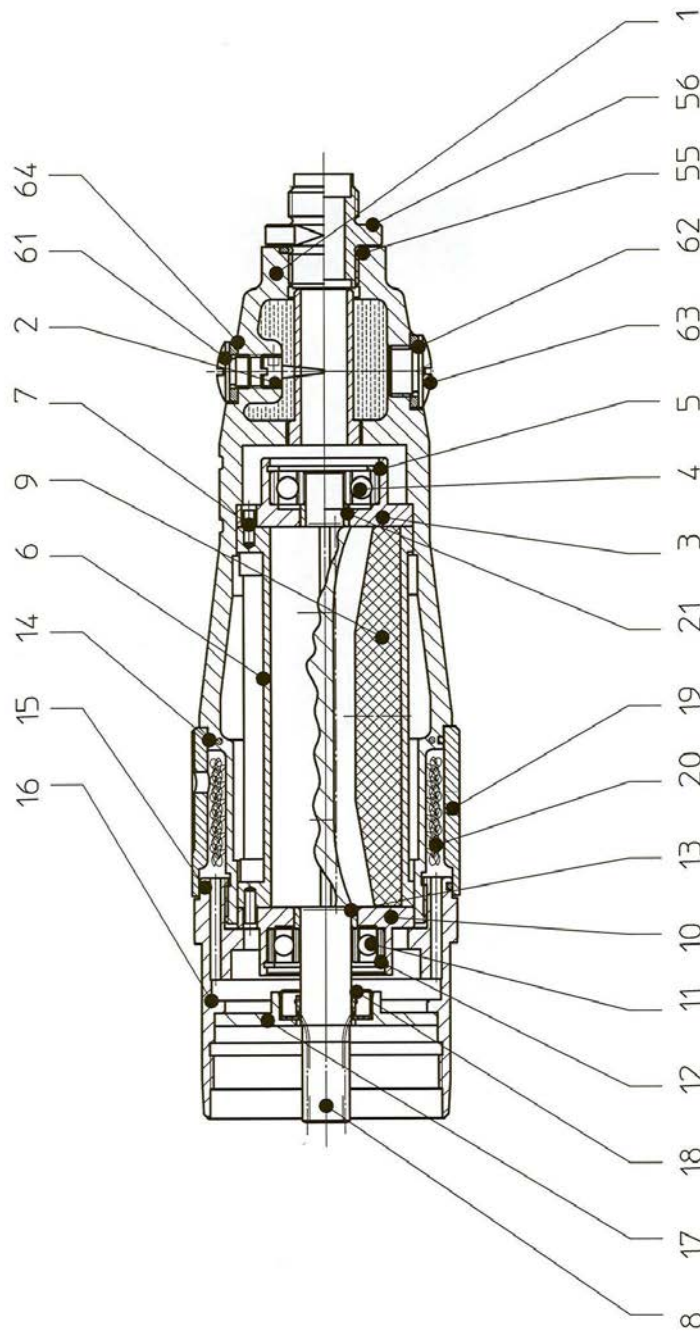
Spare Parts List

Description:

Pneumatic Motor

Part and drawing number:

3 6339 1000



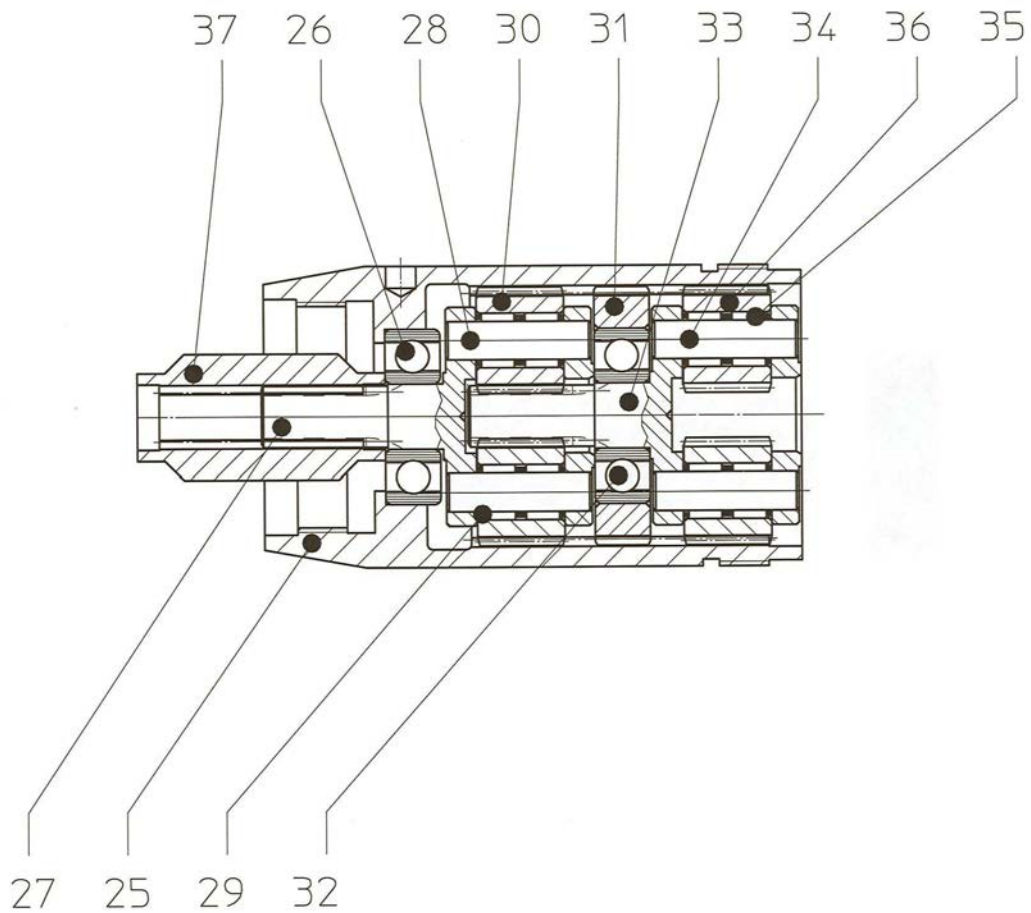
Spare Parts List

Description:

Gearbox

Part and drawing number:

3 6339 4000



Spare Parts List				
Description: Output Unit, Assy.			Part and drawing number: 3 6339 7000	
Item	Qty.	Description	Part and drawing no.	Remarks
40	1	Gearbox housing II	3 6339 4220	
41	1	Axial grooved ball bearing	9 1021 0020	
42	1	Feather key	9 3326 1220	
43	1	Grooved ball bearing	9 1003 0020	
44	2	Needle sleeve	9 1014 0200	*
		* Wear part, to be stored in case of continuous use.		

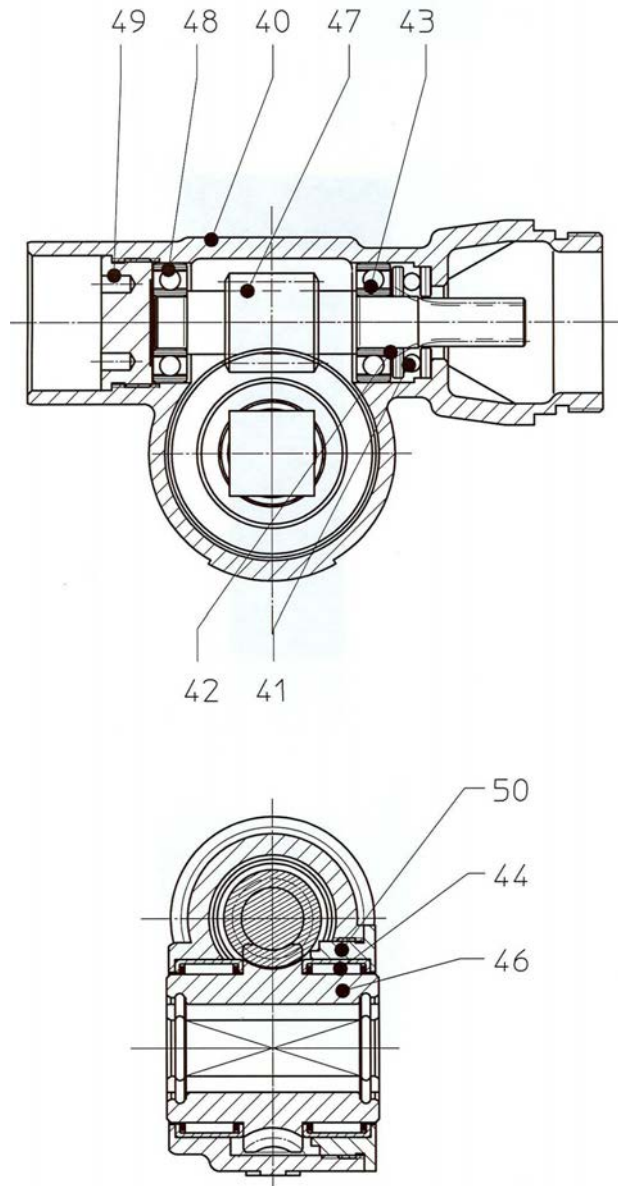
Spare Parts List

Description:

Output Unit, Assy.

Part and drawing number:

3 6339 7000



Spare Parts List

Description:

Part and drawing number:

for 6 1015 0010

On special request: Accessories for output available, e.g. for inner square, outer square or morse taper

Item	Qty.	Description	Part and drawing no.	Remarks
	1	Reducing sleeve, assy. 15 / 20	6 1015 7910	item 52 + 53
52	1	Sleeve, square	3 6339 4150	
53	2	Circlip	9 1705 0120	
		or		
	1	Reducing sleeve, assy. 12 / 20	6 1017 4910	item 52 + 53
52	1	Sleeve, square	6 1017 4250	
53	2	Circlip	9 1705 0120	
	1	Output square 12,7 (1/2") kpl.	3 6339 4910	item 53 + 54
53	2	Circlip	9 1705 0120	
54	1	Output square 1/2"	6 1015 7020	
		or		
	1	Output square 19 (3/4") kpl.	6 1015 7030	item 53 + 54
53	2	Circlip	9 1702 0320	
54	1	Output square 1/2"	6 1015 7039	
	1	Output square, assy. MK2 Assy. *	6 1015 7920	item 58 + 59
58	1	Circlip	9 1702 0240	
59	1	Output sleeve MK2	5 1015 7050	
		or		
	1	Output square, assy. MK3 Assy. *	6 1015 7930	item 58 + 59
58	1	Circlip	9 1702 0240	
59	1	Output sleeve MK3	5 1015 7050	
	*	ATTENTION! Axial forces cannot be transmitted.		
		Additional accessories for output on request		

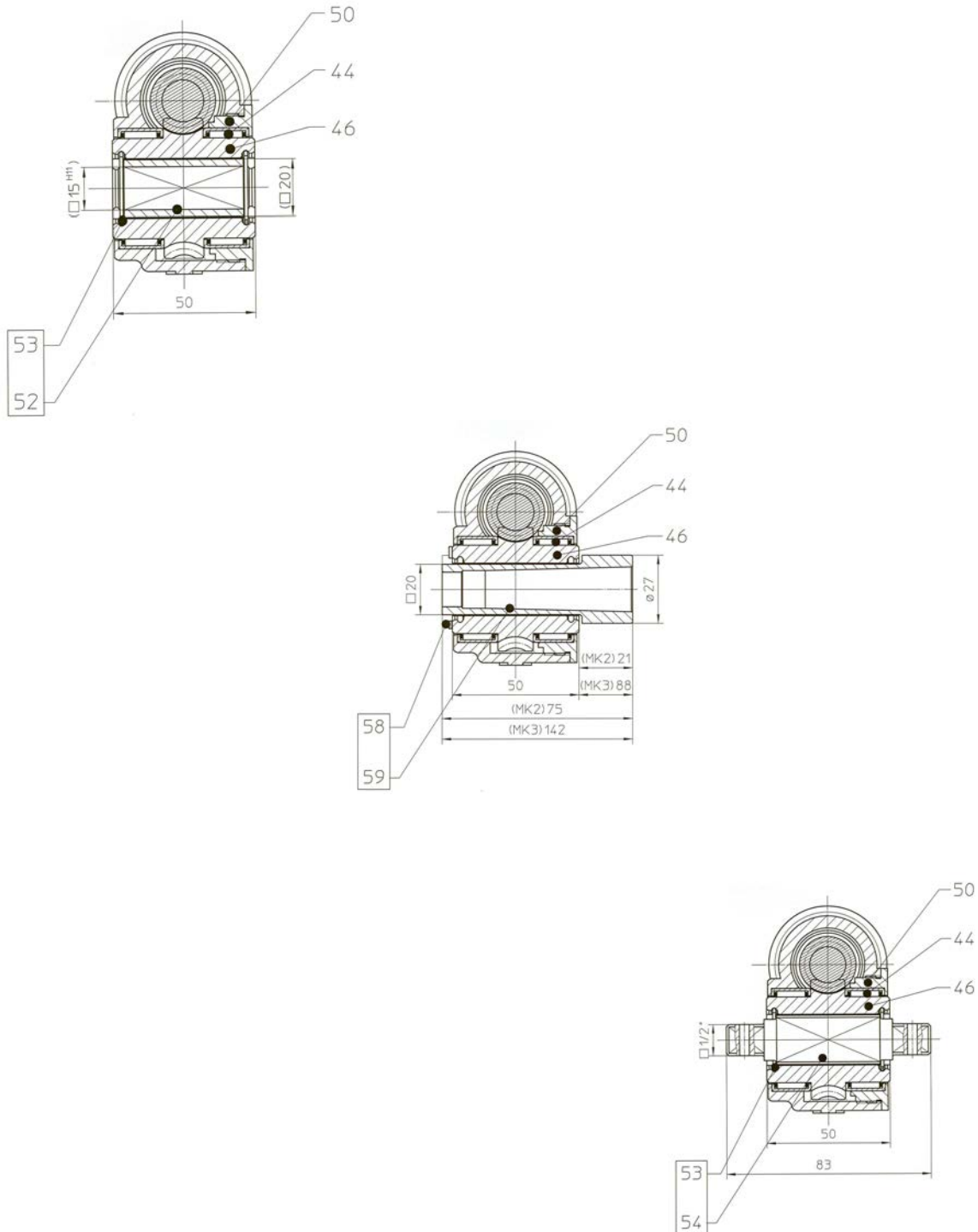
Spare Parts List

Description:

On special request: Accessories for output available, e.g. for inner square, outer square or morse taper

Part and drawing number:

for 6 1015 0010



Spare Parts List

Description:	Part and drawing number:
Lever valve with safety catch	9 2002 0120

Item	Qty.	Description	Part and drawing no.		Remarks
101	1	Valve housing	2 1402 3010		
102	1	Valve pin	9 1637 2120		
103	1	Nipple, assy. with screen	9 2205 0030		
104	1	Valve catch, assy.	1 5060 3930		
106	1	Plastic ball	9 1018 0150	*	
107	1	Pressure spring	9 1803 0240		
108	1	Rivet pin	9 1611 0030		
109	2	Washer	9 3302 0150		
110	1	O-ring	9 1901 3090	*	

*Wear parts, to be stored in case of continuous use.

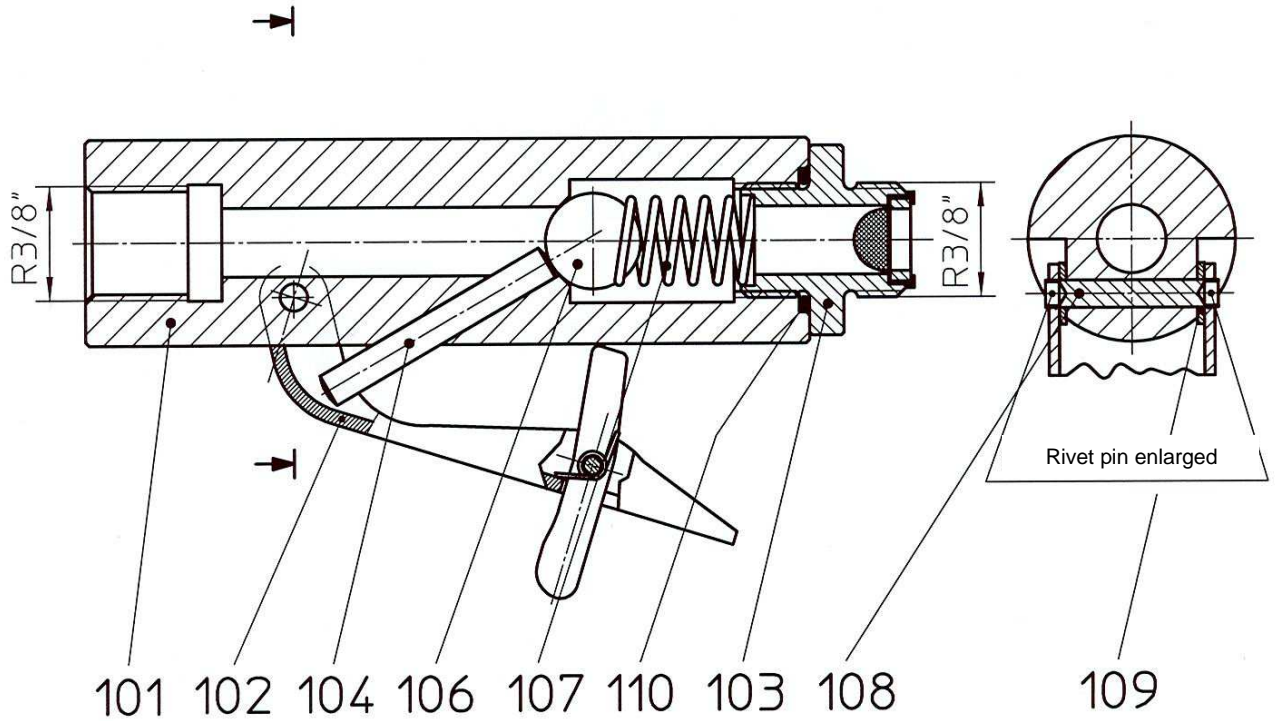
Spare Parts List

Description:

Lever valve with safety catch

Part and drawing number:

9 2002 0120



MAINTENANCE OF PNEUMATIC TOOLS

Only proper maintenance can ensure constant performance, reduction in wear and thus, a decrease in operating costs and an increase in service life.

Our pneumatic tools are equipped for an operating pressure of 6 bar. A regulator setting for an operating pressure of 4 bar is possible as well as expedient for grinding machines with a built-in regulator, so as to take full advantage of the speed prescribed for the corresponding grinding wheels.

Pneumatic tools should not run empty, because this results in heat and higher wear. The compressed air should be clean and dry. This is guaranteed by a proper pneumatic system. Blow through the pneumatic hose before connecting it. For the economical use of pneumatic tools, the prescribed air quantities are necessary, i.e., the line, armatures and hoses must have the required cross sections so that the flow pressure remains constant. Proper lubrication is a must; for this reason, our pneumatic tools usually have built-in oilers, which are located between the inlet valve and the motor, and which function in any position. In smaller and lighter hand tools, these oilers must often be left out, because the machines would then be too heavy and not easy to manage. In such cases, lubrication must be carried out by service units or by manual hose oilers. We recommend service units for permanently installed workplaces

(see accessories list). However, where longer hose lines are necessary, line oilers built into the hose lines are more effective. The distance between the tool and oiler should not be more than 5 m.

Most of pneumatic tools have located at the connection a lined-up screen, which is to be regularly checked and cleaned.

After ending a working task, the machines are to be flushed with a thin oil, or protected some other way against corrosion.

Visible grease nipples are provided for regular lubrication of the gears with a grease gun. Note the following for grease lubrication: Every 60 hours of operation check striking mechanism, friction bearings and antifriction bearings; if necessary, grease them. Every 300 hours of operation grease the gears and antifriction bearings anew. In the case of impact wrenches, use a grease gun to grease the anvil guide before beginning daily work or every 6 to 8 hours. All inner parts must be lubricated before storing for longer periods of time in order to prevent rusting. It is recommend to check the vanes and bearings at regular intervals. Store pneumatic tools in dry rooms only.

Lubricating oils to be used:
Generally SAE 5 W to SAE 10

For gearless impact wrenches and small grinders, only SAE 5 W

For damp compressed air, oils are to be used that take up water (without losing the lubricating effect) and that contain anticorrosive additives. At lower temperatures (especially for work outside) it may be necessary to use an antifreeze lubricant (e.g., Kilfrost, BP Energol AX 10, Kompranol N 74).

For saw-chain lubrication on chain saws:

Machine oil **with adhesive additive**, viscosity c ST 49 - 55' (6.5 - 7.5 E) / 50° C

Greases (free of resins and acids)

Multi-purpose greases for antifriction and friction bearings and gears

Special greases for high-speed miter gears

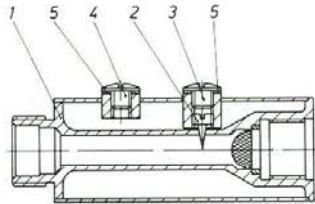
Designation in accordance with DIN 51502
Consistency class (DIN 51818)
Saponification type
Dripping point
Worked penetration
Temperature range

KL 2 K
2
lithium
185° C
265 to 295
-25° C to 125° C

G 00 h
00
sodium
145° C
400 to 410
-25° C to + 100° C



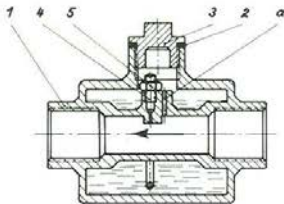
OILER TYPES USED ON OR WITH OUR TOOLS



Oiler to mount on the machine or connect in the hose line

Setting the oiler: The adjustment screw (Item 2) is visible after removing the screw plug (Item 3). The oil supply is decreased by tightening the screw, and by loosening the screw, more oil gets into the machine. In most cases it is sufficient to tighten or loosen the screw by 1/4 or 1/2 of a turn. When plugged, clean borehole (dia. 2 mm) with wire.

Correct setting: When under pressure and with the filler screw (Item 4) open, the oil must bubble slightly. The filling lasts for approx. 8 operating hours.

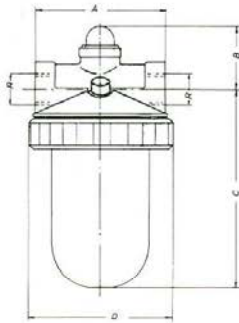


Line oiler

For stationary pneumatic machines and motors, the lubrication is carried out by lined-up oilers for horizontal or vertical installation.

Setting of oilers: Shut off air supply. Open plug (Item 3). Loosen visible lock nut (Item 5) with a socket wrench. Using a screw driver turn back the tightened screw plug (Item 4) by 1/4 to 1/2 of a turn and then lock again. No oil is to get into the borehole "a" when filling. Close plug (Item 3) and open the air supply.

Correct setting: A piece of paper held for a short time in front of the outlet must be coated with oil without drops forming.



Transparent oiler

For installing in permanently equipped workplaces.
(especially for type using service units — see accessories list)

The transparent supply containers allow for good checking as well as for good setting possibility by means of a screw driver via a set screw with visible dripping. (The set screw is above the lateral thread connection — turning to the right for less oil; turning to the left for more oil). The setting (2 to 5 drops per m³/min air consumption) is to be carried out when air is flowing through, i.e., when the machine is running.



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