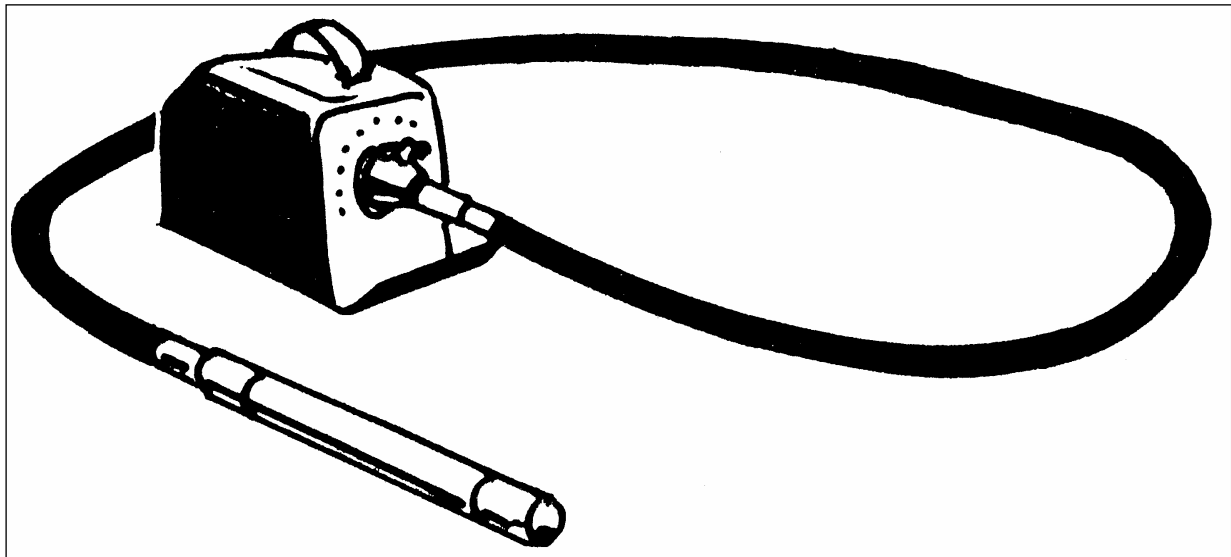


OPERATION AND PARTS MANUAL

CONCRETE VIBRATOR TYPE BV



Lievers B.V. Holland

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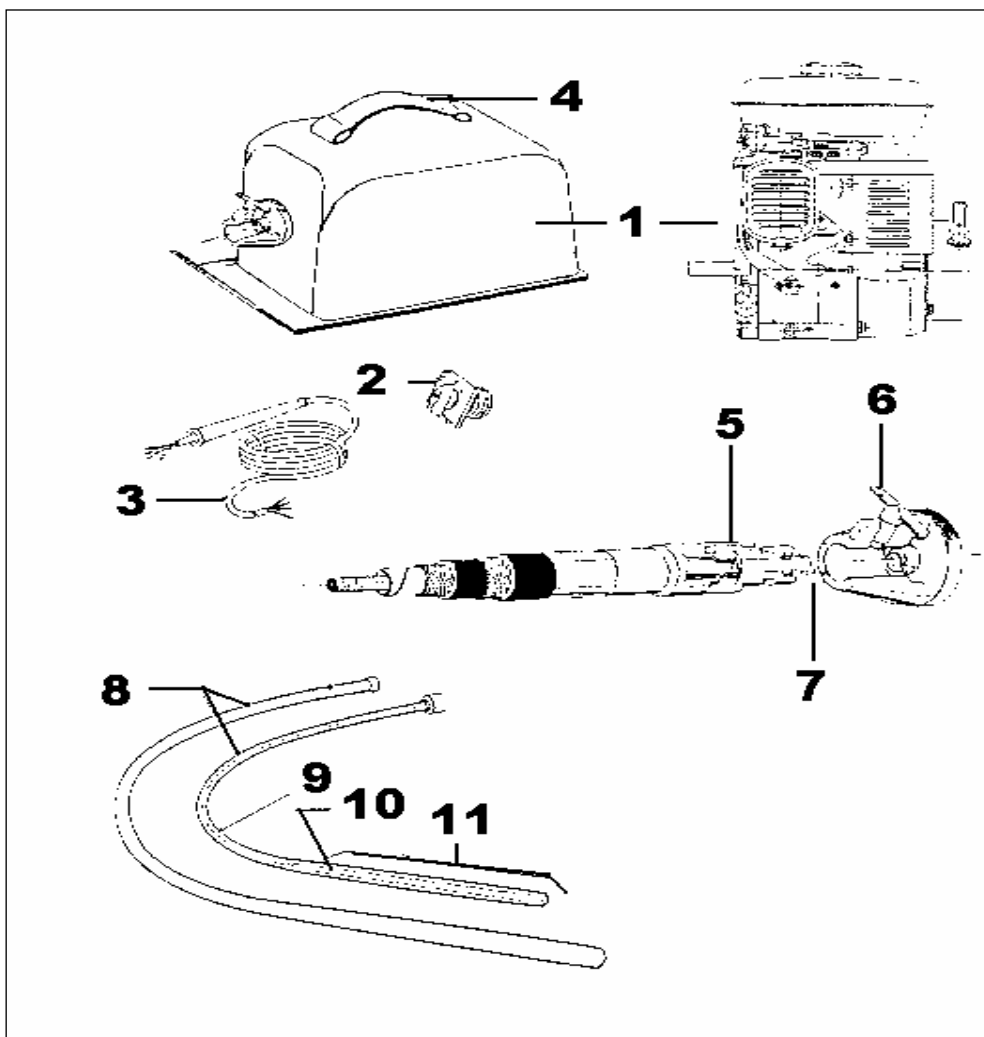


Figure 1

View of the most important components

- | | |
|-------------------------------|------------------|
| 1 Drive-unit electric version | 9 Flexible shaft |
| 2 Drive-unit petrol version | 10 Pendulum |
| 3 Supply cable | 11 Pokerhead |
| 4 Switch | |
| 5 Carrying handle | |
| 6 Locking bolt | |
| 7 Coupling | |
| 8 Flexible drive | |

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BV Operation manual

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I How to use this manual

This manual has been written to help you operate and service the Poker-vibrator safely. This manual is intended for dealers and operators of the Poker-vibrator.

The manual is divided into six chapters, so that you can easily find the information you require.

The position and description of the most important parts of the Poker-vibrator can be found on the backside of the cover.

FOREWORD

- 1 **The introduction** gives information about the Poker-vibrator and describes how you can safely operate the Poker-vibrator.
- 2 **Operation instructions**, instruct you how you must use the Poker-vibrator.
- 3 **Trouble-shooting**, contains a list of malfunctions which helps you to locate problems and how to solve them.
- 4 **Maintenance and repair**, give information about how to service the Poker-vibrator and how to order spare parts.
- 5 **Environment**, gives instructions on how to handle the recycling of the discarded apparatus in an environmentally friendly way.
- 6 **Guarantee**, consists of guarantee provisions and the guarantee certificate.
- 7 **Registers**, contain a numbered list of all figures and tables.

Directives with regard to the notations.

Text in this manual to which special attention must be paid are shown in the following way:

TIP: Gives the operator suggestions and advice as to how to carry out a certain procedure easier or in a handier way.

ATTENTION: A remark with supplementary information, which brings possible problems to the operator's attention.

CAREFUL: The product can be at risk. The Poker-vibrator will be damaged if procedures are not carried out in the correct way.

WARNING: Injury to the operator or damage to the Poker-vibrator. The procedures must be carried out correctly and carefully.

DANGER : The life of the operator can be at risk.
--

Suggestions to improve the Poker-vibrator and/or this manual are very welcome. Please send them to:

Bouwmachinefabriek Lievers b.v.
P.O. Box 103
3640 AC Mijdrecht The Netherlands.

|| GENERAL SAFETY-ASPECTS

All Lievers equipment have been tested in accordance with the strict international safety standards. This section contains general advice and apply to several machines mentioned in this paragraph.

- Ensure that you are qualified (familiar with the contents of this manual), to operate and carry out light maintenance-work to the machine when you are operating the machine for the first time.
- Wear safety shoes with extra protection (steel caps and anti-slip soles)
- Wear a safety helmet,safety glasses, anti vibration working gloves with Gelfôm, which do not conduct electricity and protective clothing.
- Ensure, that all symbols on the machine, can always be clearly read.
- Do not leave any tools or parts lying around on the work floor, as this can cause accidents.
- Watch where you are going, the ground can be slippery.
- Take care that you do not injure yourself on objects, such as scaffolding and reinforcement materials, which can be found directly or indirectly in the working area.
- Be careful when lifting and carrying the Pokervibrator.Do not bend forwards when picking up the apparatus, but bend your knees.Ensure that the working area is within your reach, sothat you do not have to bend forward.
- When cleaning the machine, ensure that no water or cleaning detergents get into the motorhousing.
- When the machine is not being used for longer periods of time, then it must be stored in a dry and clean area.
- Do not only pay attention to your own safety, but also to that of your colleagues.

Regular maintenance of the machine promotes safe operation.

The following safety-aspects specifically apply to those Lievers products which are equipped with an electrical drive unit.

- Place the wires between the electrical source and the work place in such a way, that they cannot be damaged and your colleagues cannot trip over them.
- Do not use the machine in an explosion endangered area.
- Check that the electrical source complies with the local valid regulations.Use earthed extension leads, when it is necessary to use extension leads.
- Use an electrical source which is provided with an earth leakage switch or attach a safety transformer between the electrical mains and the machine.
- Ensure that the wall socket and possible connections between the extension leads are protected against dampness.
- Do not pull the plug out of the wall socket or extension lead by its lead.
- Regularly check the connections of the supply-cable to the switch.
- Check the feeder cable's outercasing and if in use extension lead's outercasing before you connect the machine to the electrical mains.The outercasing may not be damaged.Replace the cable if you cannot read the marks on the outercasing anymore.
- Check the machine's cable-connections before you connect the machine to the electrical mains. The cables must be properly connected.
- Switch off the machine, when the electrical power cuts off.This prevents the machine from starting suddenly when the electrical power comes on again.

BV Operation manual

- Disconnect the electrical supply to the machine, before you start to clean or maintain the machine.
- Ensure that the ventilation slots of the machine are free from dirt and moisture.

The following safety-aspects specifically apply to those Lievers products which are equipped with a petrol-engine.

- Do not use the Pokervibrator with petrol-engine indoors or in poorly ventilated places, such as pits etc.
- Make sure that there is sufficient ventilation in spaces which are surrounded by walls. Never inhale exhaust gasses, they can damage your health and that of your colleagues.
- To avoid getting an electric shock, do not touch the high-tension cable or spark plug cap while the engine is running.
- Check for fuel leaks before running the machine.
- Do wear anti vibration working-gloves with Gelfôm, safety glasses and protecting clothing during refueling.
- Make sure that there is sufficient ventilation during refueling.
- Refueling of fuel is only allowed after the engine has been cooled off sufficiently.
- Refueling of fuel , while the engine is hot, might lead to a very dangerous situation.

Explanation of the used safety symbols

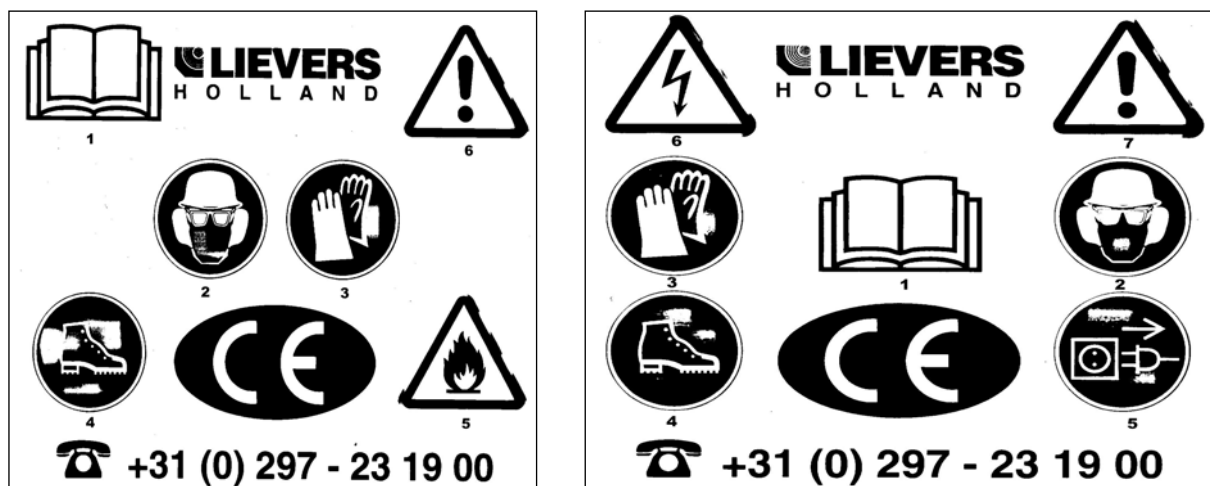


Figure 1.0 Safety symbols

1 Read the instructionbook

2 Safety glasses, safety helmet and ear protection compulsory.

3 Anti vibration working gloves with GELFÔM compulsory.

4 Safety shoes with extra protection compulsory.

5 Dangerous electrical voltage/ Inflammable material

6 Dangerous voltage/ Be careful!

7 Be careful!

It is strictly forbidden to refuel :

- * in the direct vicinity of open fire or other flammable materials,
- * while smoking cigarettes etc.
- * in explosion endangered spaces.

TIP: If the safety aspects are not clear to you, then please contact the manufacturer for further information.

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BV Operation manual

1 INTRODUCTION

This manual has been written to help you operate and service the Pokervibrator safely. This manual is intended for dealers and operators of the Pokervibrator.

1.1 WHAT IS A POKERVIBRATOR ?

A Pokervibrator is an apparatus with a vibrating poker, which compacts concrete. The concrete Poker-vibrator type BV consists of an electrical drive-unit built in a shock-proof plastic motor housing and a flexible drive hose with a quick action connector and poker head. The flexible drive hose is connected to the electrical drive unit by means of a quick action coupling.

1.2 OPERATION

The driving shaft of the drive-unit drives the flexible shaft. The flexible drive shaft drives the pendulum inside the poker head and creates an excentrical movement, thus creating 12.000 vibrations p/min. The 12.000

Vibrations of the poker head consolidates the freshly poured concrete by sticking the poker head inside the concrete. Normally the BV poker head covers and vibrates a working area of around 60 to 80 cms in diam.withing 10 to 20 seconds. Then start to vibrate the next concrete-area.

1.3 Technical Data Poker-Vibrators type BV

For technical data also see type plate on drive-unit

Dimensions electric drive-unit		Dimensions petrol engine	
Length	440 mm		430 mm
Width	210 mm		420 mm
Height	250 mm		430 mm
Electric motor type BV-400		Electric motor type BV-230	
Capacity	1.1 Kw		0.75 Kw
Rpm	3000 r/min		3000 r/min
Voltage	400 VAC 3 phase 50Hz		230 VAC 1 phase 50Hz
Current consumption	2,6 Amp		5.1 Amp
Weight without poker	6 kg		16 kg
Sealing	IP 54		Idem
Insulation (motor)	Class I		Idem
Insulation poker	insulated coupling		Idem
Execution	carryable		Idem
Petrol engine Robin			
Type	EY 15 D	Rpm	3200 r/min
capacity	2.65 Kw (3.5 HP)	Weight without poker	24 Kg
Sealing	IP 54	Execution	carryable
Insulation (poker)	insulated coupling	Fuel	unleaded

Diameter poker (mm)	Amplitude (mm)	Vibrations (min)	Centr.force (N)
28	0.8	12000	2500
38	1.0	12000	3900
45	1.5	12000	4500
60	3.0	12000	6500
Diameter poker (mm)	Weight / Length 4. 5 m 6. 5 m 10 m (kg) (kg) (kg)		
28	9	12.5	19
38	13	18	27
45	14	18	28
60	16	21	30

Table 1.0 View of the poker-schedule

1.4 Specific safety instructions

This section contains specific safety instructions which specifically apply to the Pokervibrator.

- It is very important , that you follow these instructions carefully.
- Regular servicing is a must, as it promotes safety while operating the Pokervibrator.
- Do read the safety instruction carefully.
- It is not allowed to clean the Pokervibrator with a high pressure cleaner. Please read chapter 4, maintenance and repair carefully.
- Before you connect the Pokervibrator to the mains voltage, ensure that the mains voltage correspond with the technical specifications of the rating plate. (Electrical execution only)
- Ensure that you are familiar with the current regulations for plug and cable connections.
- During movement of the Pokervibrator by means of a crane, it is not allowed to attach the hoisting rope to the handle and the carrying frame of the Pokervibrator.
- Remember that any kind of manipulation and repair to the Pokervibrator are strictly reserved to authorized personel only.

Tip: ask the manufacturer for advise, if you have any questions about these instructions.

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2 Operation instructions

This chapter describes how to use the poker-vibrators type BV.

Tip: For the location and description of the poker-vibrator's parts, which are mentioned in the text, we refer to the illustration 1 on the back of the cover.

2.1 Operation and application of the poker-vibrator

This section describes how and when you use the poker-vibrator.

Careful: read the general- and specific safety-instructions before you switch on the poker-vibrator.

Switching on the poker-vibrator, compacting the concrete and switching off the poker-vibrator.

- 1 Ensure that the supplied voltage from the main-circuit correspond with the poker-vibrator's technical data.
- 2 Ensure that the poker-vibrator's diameter corresponds with the consistency of the concrete.
- 3 Check that the switch is in the OFF position.
- 4 Put the plug of the supply-cable in the socket of the main-circuit.
- 5 Place the poker-vibrator in the direct vicinity of where you are going to compact concrete.
- 6 Put the switch in the ON, (I) position.
- 7 Stick the vibrating pokerhead into the concrete and allow the vibrator to vibrate for 3 to 4 seconds in one place in the concrete, before moving it to the next spot. Repeat this procedure every 50 cms. until you have compacted the concrete completely. *(depending on the concrete's consistency).

When work is done

Put the switch in the OFF position and pull the supply-cable's plug out of the socket.

Loosen the locking bolt in the connector and pull the flexible drive hose out of the motor-connector.

Clean the poker-vibrator and flexible drive hose as described in chapter 4 „maintenance and repair”.

After use, place the poker-vibrator on a dry and stable surface.

Application examples

The distance between two vibration places and the vibration time in one place, depend on the thickness of the concrete layer and the composition of the concrete.

The following points are for guidance.

Floors:

- 1 Stick the poker-vibrator slowly into the concrete (vibration time approx. 3 to 4 seconds).
- 2 Pull the poker-vibrator slowly out of the concrete and repeat procedure 1 each 50cms.

Walls and columns:

- 1 Pour concrete to approx. 100 cms.
- 2 Lower the poker-vibrator into the formwork.
- 3 Pull the poker-vibrator slowly out of the concrete and move it to the next spot.
- 4 Now ready for the following pour of approx. 100 cms. of concrete

3 Trouble shooting

If the poker-vibrator is not operating properly then one or more of the following problems could be the cause.

Problem poker-vibrator with electric drive-unit

Problem:The activated poker-vibrator trips out regularly (thermal relay).

Cause:

The drive-unit is overloaded because the flexible drive hose is jammed between the reinforcement.

Solution:

Make sure that the flexible drive hose does not get jammed between the reinforcement. Stop the operation and try to remove the flexible drive hose from the reinforcement (carefully).

Tip: allow the thermal overload switch to cool off for approx. 5 min. before reactivating the poker-vibrator.

Problem:The activated drive-unit switches off regularly.

Cause:

The drive-unit is overloaded due to insufficient current supply.

Solution:

Check the current supply to the drive-unit (2-phase run). Check the plug connections for faults. When using extension cables, check the length. The extension cable should not exceed 25 mtr. Cable for 3 Phase 400V./50 Hz. : 4 x 2.5 mm².

Problem: Poker-vibrator does not vibrate properly.

Cause:

The inside of the poker head's tip and pendulum are, due to grease or oil polluted.

Solution:

Take the poker head apart and remove the flexible shaft and the pendulum. Degrease those parts together with the inside of the rubber hose very thoroughly. After degreasing, the only part that needs to be greased is the flexible shaft. Use the manufacturers recommended grease only. Type of grease: 2- HT Grease EP 2 or an equivalent. Grease is included in the delivery.

Careful: Faults of frequency occurende are:

- break in the supply cable,**
- incorrect plug connections**
- insufficient maintenance.**

Tip: Please contact the manufacturer if problems occur which are not mentioned in the list or if a mentioned problem is not solved by the solutions in the list.

4 Maintenance and repair

4.1 Maintenance

Although the Poker-Vibrator has a few moving parts, regular maintenance promotes a long and trouble-free life.

Warning!: Do not clean the Poker-Vibrator with a high pressure cleaner.

Tip: remove concrete remnants from the drive-unit and flexible drive hose before they harden out. Concrete remnants could easily injure the operator.

4.2 Cleaning and servicing of the Poker-Vibrator. electric version.

Warning: disconnect the electrical supply to the Poker-Vibrator before you carry out any maintenance activities to this machine.

During concrete compaction the Poker-Vibrator, switch and supply cable will become dirty. Periodical maintenance is vital to the safe and efficient operation of the machine. It is therefore highly recommended to clean the Poker-Vibrator daily with water and a cleaning detergent, that does not affect the Poker-Vibrator's material.

In order to achieve a maximum cooling effect, the drive-unit must stay free from dirt and grease. Make sure that the switch and plug connections stay clean from dirt, grease and concrete. Check them at the end of each working day. If necessary clean them with a brush or a damp cloth.

If the Poker-Vibrator is not used for a long period of time, store it in a clean, dry and dustfree place.

4.4 Cleaning and servicing of the flexible drive hose.

During concrete compaction the poker will become dirty. It is therefore highly recommended to clean the poker daily with water and a cleaning detergent, that does not affect the poker's material.

Warning: DO NOT LUBRICATE THE PENDULUM AND THE POKERHEAD.

The flexible shaft inside the flexible drive hose is already durably greased by the manufacturer.

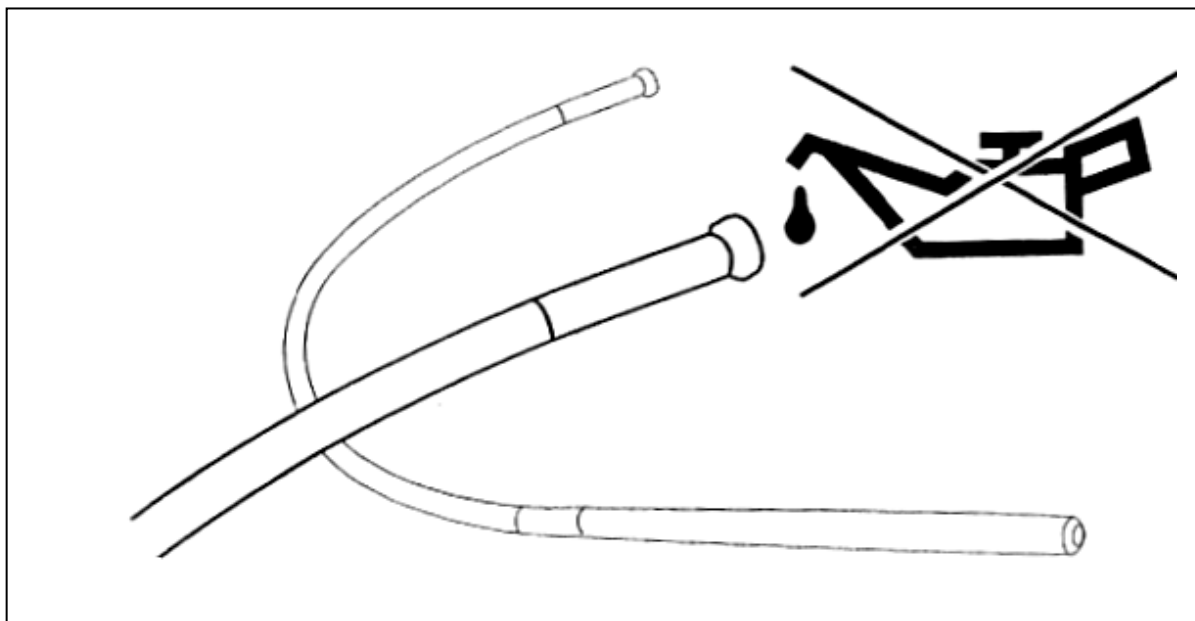


Figure 4 DO NOT LUBRICATE !!

4.5 Spare parts

It is not strictly necessary to keep spare parts on stock. However, subjoined you will find our suggestion for a couple of spare parts you might need to replace in the future.

Order number	Description	Number	Operation life
1200000011	Drive plate	1	6 – 12 months
1200000009	Lockpin	1	6 – 12 „
1201666007	Locking bolt	1	6 – 12 „

Table 4 Spare parts to keep in stock.

Tip: When ordering parts, fill in the order form accurately.

When ordering parts please state the following information:

- Type of Poker-Vibrator.
- Year of construction.
- Order number plus description of the part.
- The required quantity.
- The dispatch address and dispatch mode.

Lievers B.V. declines all responsibility for the supply of incorrect spares due to incomplete or unclear requests.

5 ENVIRONMENT

5.1 Safe disposal

Instructions for the protection of the environment.
The old machine contains valuable materials. Take the discarded apparatus and accessories to the nearest official collection point.

5.2 Construction material

The machine is manufactured from the following materials:

Location	Material
Rotor	Aluminium
Housing electric motor	Aluminium
Motorconnector	Steel
Rotor-shaft	Steel 37
Bottom plate	”
Flexible shaft	”
Various parts hose	”
Stator	Copper
Stator	Steel
Flexible hose	Rubber
Cable	”
Hose Hoseconnectors	Steel
Insulation-disc	Delrin

Table 5 used construction material



6 GUARANTEE

6.1 Guarantee provision

All damages to parts of the Poker-Vibrator which occur within 12 months from the date of purchase and are recognized as possessing manufacturing defects, will be replaced by the manufacturer as soon as possible.

The manufacturer declines all responsibility for damages caused by misuse, incorrect connections, improper installation and maintenance and alterations that have been carried out to the Poker-Vibrator.

Guarantee is not applicable either if:

- the ventilation slots are not cleaned regularly,
- unqualified personnel (not familiar with the contents of this operation manual) have assembled or dismantled the Poker-Vibrator.
- original Lievers parts have not been assembled,
- the Poker-Vibrator has been stored in a damp environment.
- the Poker-Vibrator has been cleaned with a high pressure cleaner or by water jet under high pressure.
- the machine has been connected to a wrong voltage.
- the guarantee is valid for 12 months from the date of purchase.

6.2 Guarantee-certificate

Type Poker-Vibrator, Nr.....

Purchase date :.....

Manufacturer:
Bouwmachinefabriek Lievers B.V.
Address: Grootmijdrechtstraat 68
3641RW Mijdrecht
The Netherlands.

**C.1 EC- Declaration of agreement for machinery
Directive 98/37/EC , Annexe II,under A**

Manufacturer: Bouwmachinefabriek Lievers b.v.
Address: Groot Mijdrechtstraat 68, 3641 RW Mijdrecht
Country: The Netherlands
Hereby declares that,;

The poker vibrator type BV

- complies with the regulation for the regulations for the Machine Directive 98/37/EC as last modified
- Complies with the following harmonized standards:
EN 60204-1 (1993)
EN 60034-5 (1988)
EEC 89/336
EN 50144-1 (1988)
EN 60034-1

Done at Mijdrecht, 21.08.2004

Handtekening:



J.F. Lievers

A.1 Product specifications

System process	Concrete compaction.
Process	Generating mechanical vibrations via electric motor or petrol-engine.
Noise production	In open air max. 70-95 dB (A) depending on Diam/length poker
Vibr.acceleration *	>2,5 m/s ² WORKING GLOVES WITH GELFÔM COMPULSORY
Maintenance	Cleaner; water (brush)
Power consumption	See technical specifications
Working area	<ul style="list-style-type: none"> • Portable execution ▪ Total incl.vibrating system 200 x 200 cms.
System mass	Drive-unit with electric motor: 16 Kg. Flexible drive hose 4.5 mtr.: 15 Kg.

Table A.1 Product specification *Max: exposure 2Hr a-day with intervals

A.2 Review of the stickers

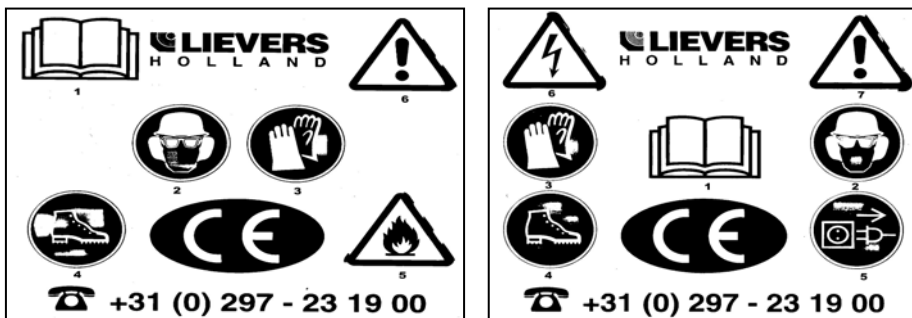
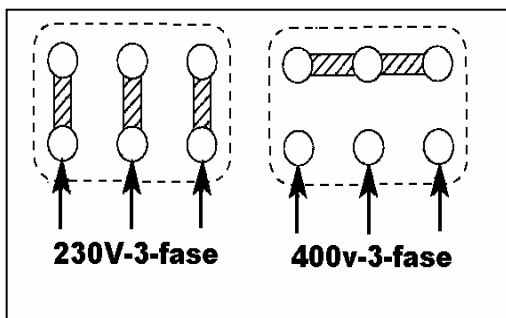
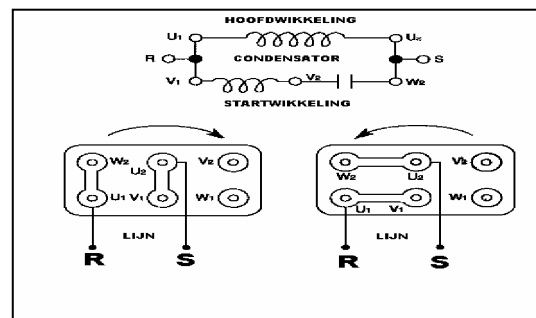


Figure A.2 Review of the stickers

B. 1 Electrical diagram drive-unit



3 Phase 230/400V./50Hz-60Hz



Single-Phase 230v/50-60Hz

Drive-units type BV- 230 & 400

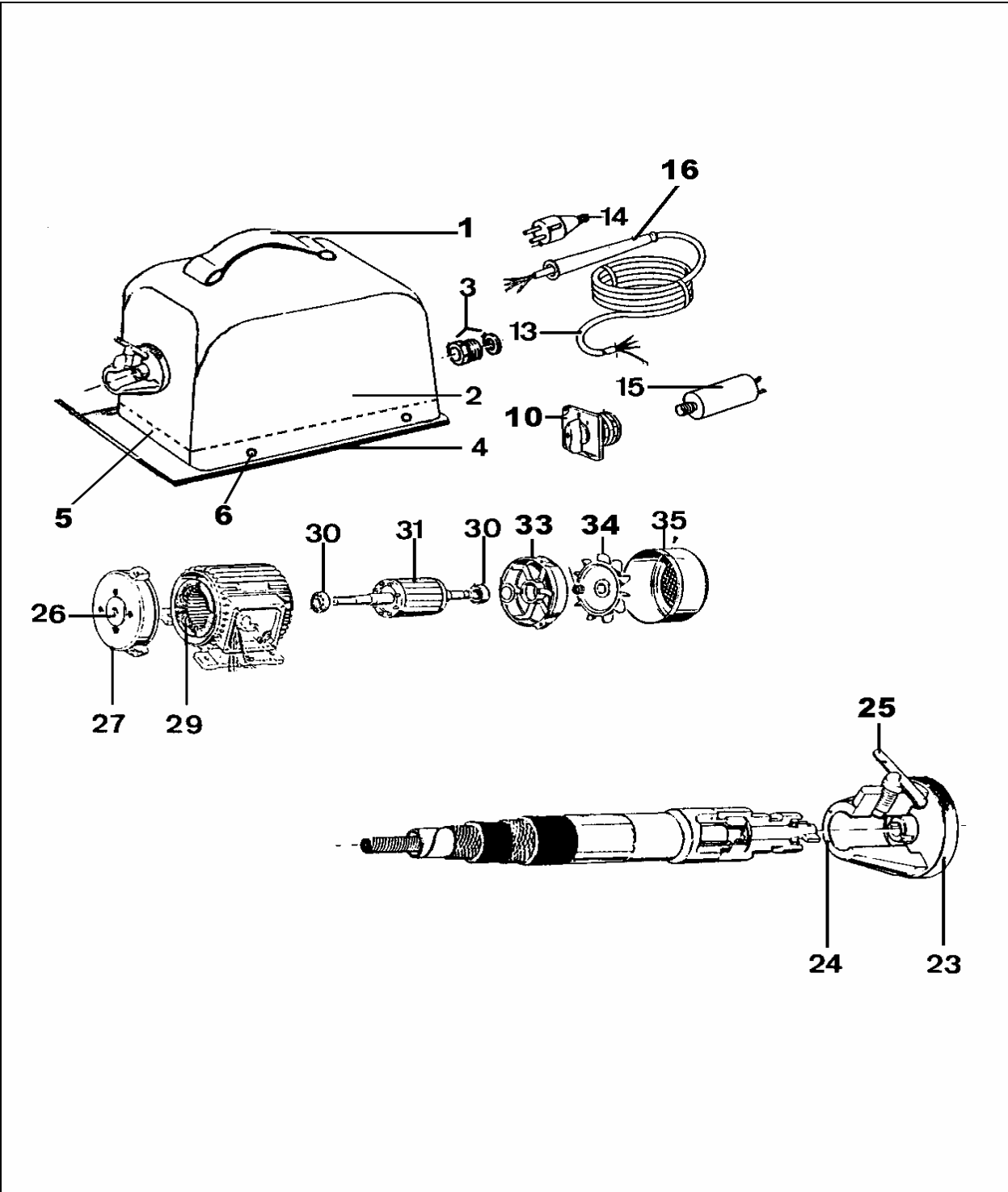


Figure 4.1 Exploded view of the drive-units type BV 230 & 400

Drive-Units Type BV-230 & 400

Index	Part number	Number	Description
1	1201000001	1	Rubber handle with connectors
2	1201000002	1	Plastic motor housing
3	0410	1	Packing box + rubber sleeve pg 21
3A	0411	1	Nut to connect packing box
4	1201000004	1	Base plate (steel)
5	1201000006	1	Base plate (nylon)
6	0237	5	Screw for motor housing
10	1201220010	1	Switch BV-230v-motor 1-phase
„	1201380010	1	Switch BV-400v-motor 3-phase
13	0005	10	Cable 3x2.5mm ² BV-230
„	0002	2	Cable 4x1.5mm ² BV-400
14	0030	1	Plug for BV-230V 1 Phase
„	0032	1	Cee-plug 4 poles 16amp BV-400V
15	1201000015	1	Capacitor BV-230V
23	1201000023	1	Insulation-disc
24	1201000024	1	Motor connector
25	1201000025	1	Locking bolt
26	1201000026	1	Seal
27	1201000027	1	Bearing cover (front)
29	1201220029	1	Motor-stator BV-230 drive-units
„	1201380029	1	Motor-stator BV-400 drive-units
30	1201000030	2	Bearings
31	1201220031	1	Exchangeable rotor for BV-230v drive-unit
„	1201380031	1	„ „ „ for BV-400v drive-unit
33	1201000033	1	Bearing cover (rear side)
34	1201000034	1	Ventilator
35	1201000035	1	Ventilator cap

Table 4.1 Spare part list BV- drive-units.

Petrol engine drive-unit for BV Poker-Vibrator

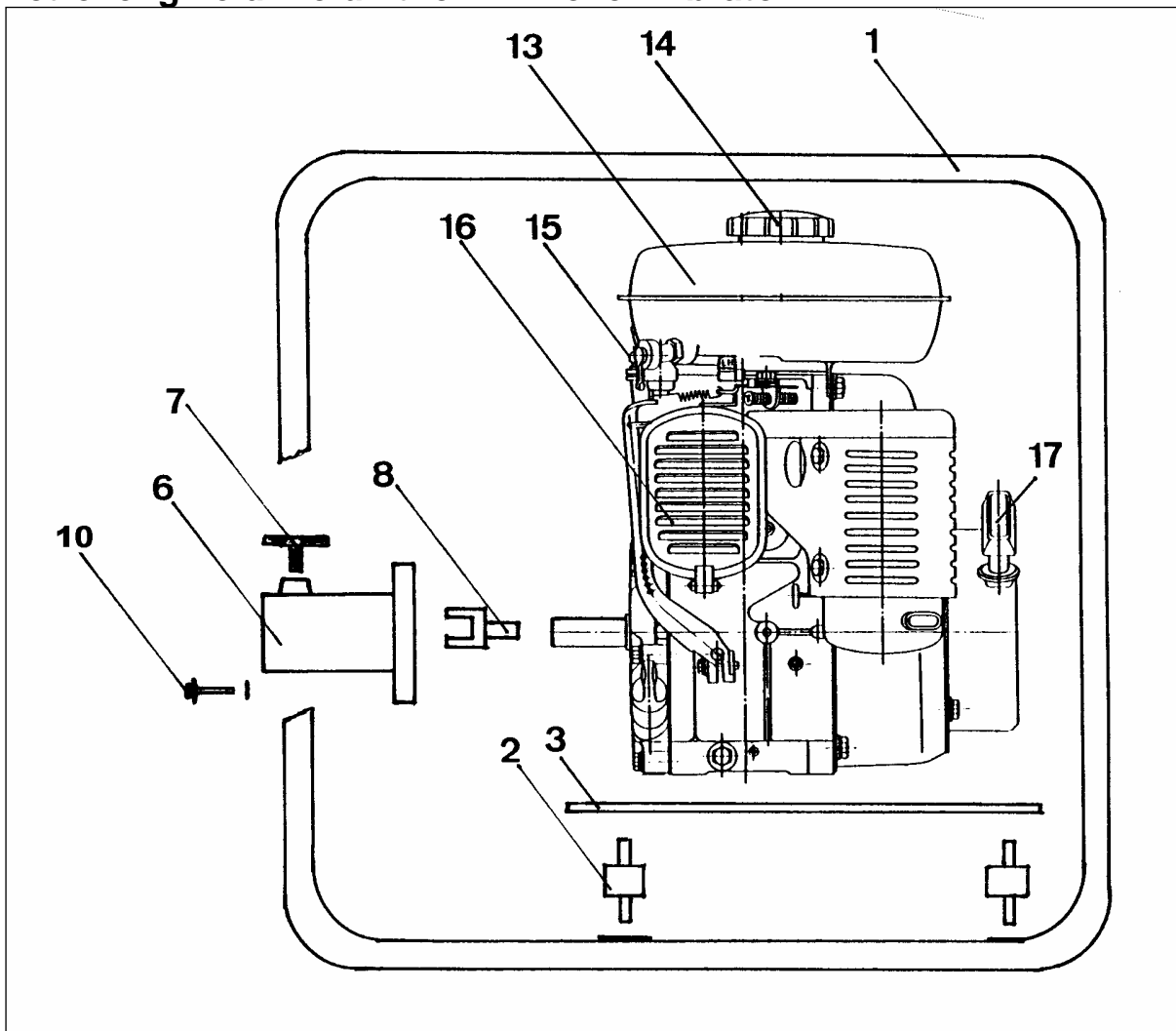


Figure 4.2 Spare parts for Petrol Drive-unit.

Spare-parts Petrol Engine Drive-unit

Index	Partnumber	Qty.	Description
1	1201666001	1	Steel carriage frame
2	0060	4	Silencer
3	1201666003	1	Engine mountingplate
4	0171	8	Retaining ring
5	0155	8	Washer
6	1201666006	1	Engine connection
7	1201000025	1	Lock bolt
8	1201666008	1	Connection shaft
9	1201666009	1	Mounting plate
10	0111	4	Bolt
11		8	Nut
13	0078	1	Petrol Engine
14	1201666014	1	Tankcap
15	1201666015	1	Fuelcock
16	1201666016	1	Airfilter
17	1201666017	1	Recoil starter complete

Table 4.2 Spare parts Petrol Drive-unit for BV Poker Vibrator

Flexible drive hoses type BV

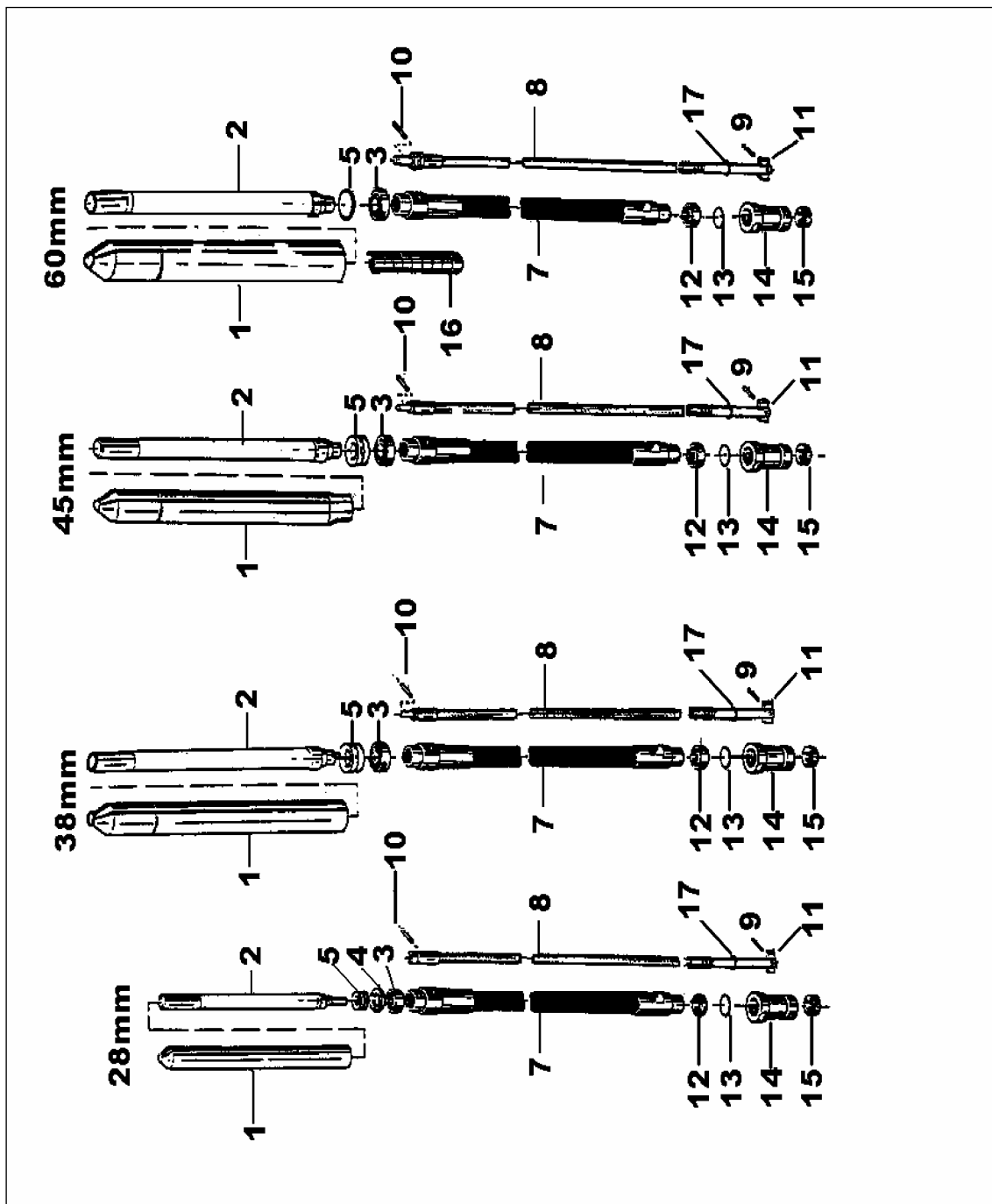


Figure 4.3 Exploded view of the flexible drive hoses type BV

Flexible drive hoses type BV

Index	Part number	Number	Description
1	1100280001	1	Pokerhead 28mm
	1100380001	1	Pokerhead 38mm
	1100450001	1	Pokerhead 45mm
	1100600001	1	Pokerhead 60mm
2	1100280002	1	Pendulum 28mm
	1100380002	1	Idem, 38mm
	1100450002	1	Idem, 45mm
	1100600002	1	Idem, 60mm
3	1100280003	1	Bearing 28mm
	1100340003	1	Idem, 38&45mm
	1200600003	1	Idem, 60mm
4	1100280004	1	Seal 28mm
5	1100280005	4	Spring sourcer 28mm
	1100340005	4	Idem, 38&45mm
	1200600005	4	Idem, 60mm
7	1200280457	1	Rubberhose 4.5metr 28mm
	1200280657	1	'''' 6.5 ''''''
	1200281057	1	'''' 10 ''''''
	1200380457	1	'''' 4.5metr 38&45mm
	1200380657	1	'''' 6.5 ''''
	1200381057	1	'''' 10 ''''
	1200600457	1	'''' 4.5 metr 60mm
	1200600657	1	'''' 6.5 ''''''
	1200601057	1	'''' 10 ''''''
	8	1200280408	1
1200280608		1	'''' 6.5 ''''
1200281008		1	'''' 10 ''''
1200380408		1	Flexible-shaft 4.5 metr 38&45mm
1200380608		1	'''' 6.5 ''''
1200381057		1	'''' 10 ''''
9	1200000009	1	Taper bush
10	1200000010	1	Idem
11	1200000011	1	Drive-plate
12	1200000012	1	Bearing in connector
13	1200000013	1	O-ring
14	1200000014	1	Connector (front part)
15	1200000015	1	Seal

Figure 4.4 Spare parts of the flexible drive hoses

Illustration register

- 0.1 View of the most important components
- 1.0 Safety symbols

- 4.0 Cleaning and servicing the flexible drive hose
- 4.1 Exploded view of the electric drive-unit BV 400V. 50 Hz.
- 4.3 Exploded view of the electric drive hoses type BV

- A.2 Review of the stickers

- B.1 Electrical diagram BV – 400V.

Table register

- 1.0 Review flexible pokers schedule

- 4.0 Spare parts on stock
- 4.1 Spare parts list electric drive unit BV 400V. 50Hz.
- 4.4 Spare parts flexible drive hose type BV

- 5.0 Used construction material

- A.1 Product specifications