

INSTRUCTION MANUAL  
&  
SPARE PART LIST

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**LW 230 ES**  
***SILENT***

**&**

**LW 280 ES**  
***SILENT***





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**LW 230 ES & LW 280 ES**  
**- SILENT -**

Technical Data	LW 230 ES	LW 280 ES
Delivery Capacity:	230 l/min / 7.99 cfm	280 l/min / 9.89 cfm
Max. Working Pressure:	350 bar / 5,076 psi	350 bar / 5,076 psi
Compressor RPM:	1060 min <sup>-1</sup>	1300 min <sup>-1</sup>
Number of Cylinders:	3	3
Drive Motor RPM:	2890 min <sup>-1</sup>	2890 min <sup>-1</sup>
Power Output:	5.5 kW	7.5 kW
Main Voltage: <i>(Special Windings on Request)</i>	400 V / 3-Phases / 50 Hz	400 V / 3-Phases / 50 Hz
Noise Level:	61 dB(A)	62 dB(A)
Dimensions:		
Depth:	900 mm <i>(incl. Filterhousing: 1030 mm)</i>	900 mm <i>(incl. Filterhousing: 1030 mm)</i>
Width:	760 mm	760 mm
Height:	1630 mm	1630 mm
Weight:	ca. 245 kgs	ca. 245 kgs

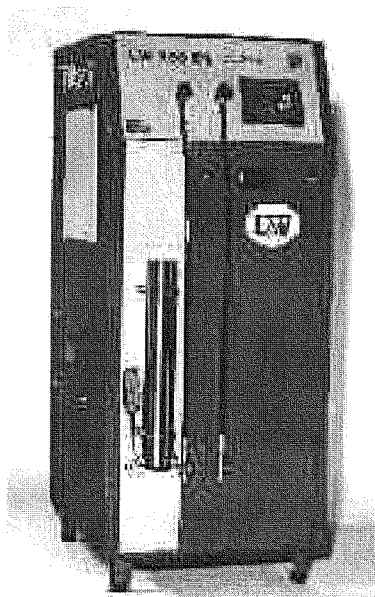


## S P E C I F I C A T I O N

- Automatic Dewatering System
- Automatic End-Pressure Stop
- Start-Stop Operation (*incl. adjustable pressure ranges*)
- All-electrical Computer Control System LW ECC
- Start / Delta Start
- Emergency Stop Switch
- Pressure Maintaining / Non-Return Valve
- Stainless Steel Water Separators
- High Pressure Filter Housing mounted on Front Side
- 2 Cooling Fans
- Automatic Pressure Release after switching off Unit
- Plastic coated Steel Housing
- Filling devices: depends on customer requirements
- Compact Dimensions

Breathing Air Quality according to:

**DIN 3188 - EN 12021 - ISO 2533 - BS 4001 & BS 4275**



**LW 230 ES Silent**

**LW 280 ES Silent**

## S A F E T Y P R E C A U T I O N S



## General Notice

This instruction manual contains the operation and maintenance procedures necessary to safely run your L&W compressor. We strongly recommend to read this manual thoroughly prior to operation and follow all the safety precautions precisely. Damage resulting from any deviation from these instructions is excluded from warranty and liability for this product. Be sure to pay attention to the following points:

- Fill only tanks with a valid hydrostatic test date
- Never exceed the working-pressure rating indicated on the tank
- Do proper maintenance to the filtration system
- Avoid contaminated air to reach the air intake
- Do not exceed maximum operation temperatures

## Safety Precautions

- Read the operation manual of your compressor carefully
- Allow only qualified personell to run the compressor
- Do not place any objects on compressor while in operation
- Make sure no person or object can accidentally touch any moving parts while running
- Take care that the intake-air is pure and free of toxic gases
- All work on compressor must be carried out while compressor is plugged off and depressurized
- Check unit regularly for air- & oil leaks
- Never weld damaged high-pressure tubes
- Filling-hoses must be in perfect condition; special attention should be paid to the connecting fittings
- Always disconnect power-cable prior to any work  
(unit can start automatically in "automatic mode"!)
- Do not touch any highly temperated compressor parts while doing maintenance work. Wait till unit is cooled down.



## Installation

The compressor should only be connected by a qualified electrician.  
Use a 16 Ampere plug for installation.

### NOTE:

Check direction of rotation immediately after the first start. If it is wrong the pistons may cease due to lack of lubrication! Furthermore the unit would not be cooled properly. When facing the front of the compressor - direction of rotation should be clockwise (open front door and check additional fan).

Always ensure good room ventilation and pure intake air!

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Breathing Air Compressor  
LW 230 ES Silent & LW 280 ES Silent



F U N C T I O N   A N D   O P E R A T I O N

Electronic Drive Motor

Compressor units can be delivered with various drive motors depending on customer requirements. Standard specification is:  
5,5 kW(LW 230 ES Silent) / 7,5 kW (LW 280 ES Silent)  
400 V / 3-Phases / 50 Hz, rpm 2890 min<sup>-1</sup>. - *special windings on request* -

*How to tension the V-belts*

Attention: Always disconnect main plug before starting any maintenance work  
(Compressor can start automatically if in automatic mode!!)

- Stop compressor & disconnect main plug
- Remove front door
- Loose the 4 screws of fan sheet / frame
- Remove back door of compressor cabinet
- Loose nuts of motor flange (*use 17mm spanner*)
- Loose lower motor tensioning bolt
- Adjust upper motor tensioning bolt till correct V-belt tension is achieved
- Screw in lower tensioning bolt till motor is back in horizontal position
- Tighten nuts of motor flange
- Check tension of V-belts (*readjust if necessary*)
- Close back door of cabinet
- Readjust fan sheet - *make sure that additional fan does not touch the fan housing*  
- and tighten the 4 screws

ATTENTION:

Unsufficient V-belt tension leads to higher vibrations and increases the noise level while running. Replace faulty V-belts immediatly.

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## Automatic Dump System

LW 230 ES Silent & LW 280 ES Silent compressors come as standard with an auto dump system. Two solenoids open and drain three condensate separators (about every 15 minutes). We recommend the use of a 20 litre container to collect all condensate. It can then be disposed of like discarded oil. The drain noise is kept to a minimum with a silencer.

## Intake Filter

A micro filter cartridge is used as an air intake filter. We recommend to replace it every 100 working hours (*depends on pollution*) but at least every two years. A dirty, contaminated filter restricts the airflow, reduces the compressors capacity and causes overheating.

## Cylinder Heads and Valves

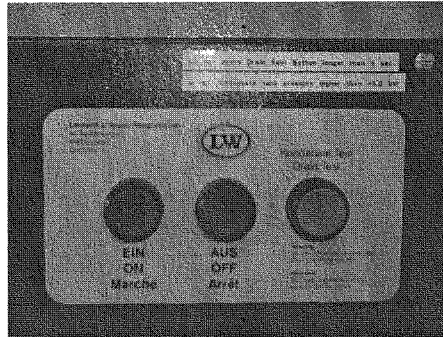
Inlet and outlet valves are located inside the cylinder heads. The inlet valve opens on the down stroke. The outlet valve opens on the upstroke. All valves should be replaced after 6000 working hours due to normal wear and tear. To replace valves the cylinder heads have to be removed. All three valves are combined valves. Inlet and outlet valves form one unit. The first stage valve is of plate valve design. The second & third stage valves use a spring operated piston inside a brass cylinder, sealing is done by alloy-ring & cap. To change valves no special tools are required (*2<sup>nd</sup> & 3<sup>rd</sup> stage valves have a M6 thread in the body centre, use a bolt to pull out*)

## Lubrication

The crankshaft & 1<sup>st</sup> stage cylinder are lubricated by oil splash. 2<sup>nd</sup> & 3<sup>rd</sup> stage cylinders are lubricated by mechanical oil pump. 1.8 litre of synthetic compressor oil (order no. L&W 9001) is required for an oil change.

**NOTE:** Oil level should be at least at middle of oil level dip stick (*non-running machine*) - located on the crankcase

## Starting the Compressor for the first Time



Start / Stop Keys & Condensate Drain Test Button (non-ECC system)

- Place the compressor in a distance of at least 50 cm to any walls (air temperature max. +40°C)
- Check compressor oil level
- Check if gas filter cartridge is in place
- Make sure all filling valves are closed (if attached)
- Start compressor by green push button (Standard Version)
- Check direction of rotation - immediately after the 1<sup>st</sup> start
- Run compressor to max. pressure
- Check if end-pressure switch works at max. pressure
- Check compressor unit for air leaks
- Check auto dump valves for function by pushing the blue push button on the dash panel (standard version)
- Turn off compressor by red push button (Standard Version)
- Release pressure by filling valves

## Safety Valves

Every pressure-stage is equipped with its own safety valve. They protect the unit from over -pressure / load. Safety valves are adjusted to:

- 1<sup>st</sup> Stage: 8 bar**
- 2<sup>nd</sup> Stage: 60 bar**
- 3<sup>rd</sup> Stage: final pressure**

If a safety valve blows it usually indicates problems with either inlet or outlet valve of the following stage.

**NOTE: A faulty safety valve has to be replaced immediatly!**





## Oil / Water Separator

Oil / water separators (condensate separators) are fitted after every compression stage which were automatically drained every 15 minutes [by solenoids (auto dumps)]. Integrated sinter filters protect the compressor system from unwanted deposits. We recommend to clean the separator bodys & replace the sinter filters (plus required O-rings) every 1000 working hours.

## Final Air Purifier (Mole Carbon Filter)

The mole carbon filter housing is mounted to the front side of the compressor cabinet *capacity: 1.7 litre, P<sub>max</sub>: 350 bar*. Inside the filter housing a jet blows air to the housing body. Oil and water mist condenses and flows to the bottom of the housing. Air then flows through the mole carbon filter cartridge, which purifies the air from moisture and odours.

See chart for intervals:

LW 230 ES Silent	1.7 ltr. Housing:	every 71 hours	(@ +20 °C)
	2.3 ltr. Housing:	every 96 hours	(@ +20 °C)
LW 280 ES Silent	1.7 ltr. Housing:	every 57 hours	(@ +20 °C)
	2.3 ltr. Housing:	every 77 hours	(@ +20 °C)

Furthermore the filterlife strongly depends on humidity and air temperature. Cartridges are vacuum packed. We recommend to open them just before they will be fitted to the compressor, as they could be saturated with moisture just being exposed to high humidity. To change the filter cartridge stop the compressor. It will then automatically release all remaining air pressure. This can take up to two minutes. Once the unit is depressurized the filter housing cap can be unscrewed with the T-shaped filter tool delivered with the compressor. If any pressure remains in the housing, it will be almost impossible to open the filter housing cap. The filter itself can also be unscrewed with the filter tool to be replaced by a new one. Screw cap on hand tight.

## Pressure Maintaining / Non Return Valve

A pressure maintaining / non-return valve is fitted after the mole carbon filter housing. It makes sure that all air leaving the filter system has at least 160 bar - optimising the effectiveness of the filter.

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## Maintenance

Compressor oil level has to be checked daily.

### **Compressor oil change intervals:**

1<sup>st</sup> oil change after 25 working hours

2<sup>nd</sup> oil change after 75 working hours

and subsequently every 200 working hours - but at least once a year -

Only use synthetic compressor oil (order number LW 9001).

About 1.8 litre of oil is required for an oil change.

### **The mole carbon filter cartridge has to be changed regularly**

*(see change of mole carbon filter cartridge)*

- Check connections for leaks every 20 working hours
- Change inlet air filter every 100 working hours
- Open & clean condensation separators (first and second stage) every 1000 working hours
- Replace inlet / outlet valves every 1500 working hours

## Trouble Shooting

### **Compressor does not reach end-pressure**

- Check for air leaks on pipe connections, solenoids & heat exchangers

*Replace seals or tighten connections*

- Check safety valves for air leaks

*Replace immediately*

### **Delivery capacity is decreasing**

- V-belt tension incorrect: *Adjust or replace*
- Inlet air filter dirty: *Replace*
- Inlet / outlet valves leaking: *Clean or replace*
- Pistons, piston rings and / or cylinders worn: *Replace faulty parts*



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### Blowing safety valve of 1<sup>st</sup> / 2<sup>nd</sup> stage

- Inlet or outlet valve of the following stage is faulty: *Clean or replace*  
***Do never attempt to adjust or repair safety valves!***

### Oil smell in the air

- Mole carbon filter cartridge is saturated: *Replace immediately*
- Use of wrong type of oil: It is important to use synthetic compressor oil

### Compressor runs too hot

- Poor room ventilation: *Room temperature should not exceed 40 °C*
- Cooling air in-/outlet is restricted
- Air intake filter is dirty: *Replace*
- Intake hose is too long or too small in diameter
- Faulty inlet / outlet valves: *Clean or replace*
- Wrong direction of rotation

### Conservation of Compressor

If the compressor will not be used for a long period of time the following steps should be carried out:

- Run compressor for about 10 to 15 minutes
- Open filling valves and let compressor run for another five minutes
- Turn compressor off - *Auto dumps will automatically release condensate* -
- Close all filling valves
- Open the mole carbon filter housing. Lubricate thread with Vaseline and close the housing (used filter cartridge can remain inside)
- Compressor should be stored dry & dust free



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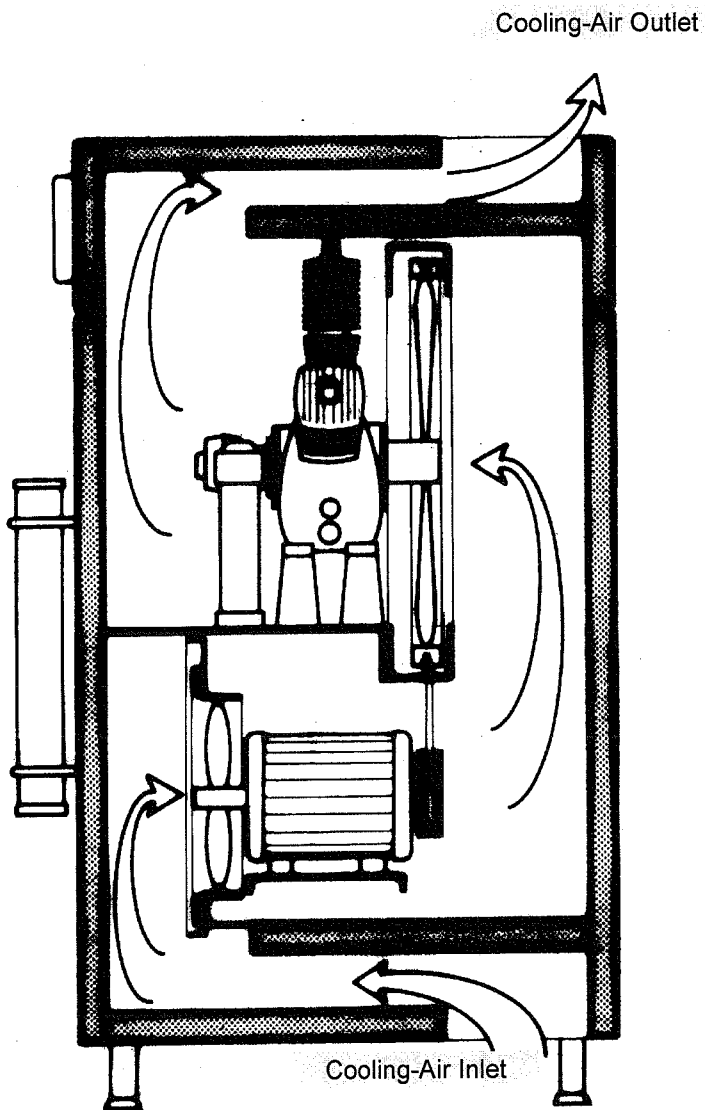
### Re-starting the compressor (*after conservation*)

Before re-starting the compressor the following steps should be carried out:

- Change oil (if the compressor was out of use for more than 12 months)
- Check air intake filter
- Replace the mole carbon filter cartridge
- Check oil level
- Start compressor by green push botton
- Run the compressor with open filling valves for 5 minutes
- Close filling valves
- Drive compressor up to 200 bar and check connections for leaks
- Drive compressor to final pressure
- Check if end pressure switch is working



Cooling-Air Flow Scheme  
LW 230 ES Silent & LW 280 ES Silent

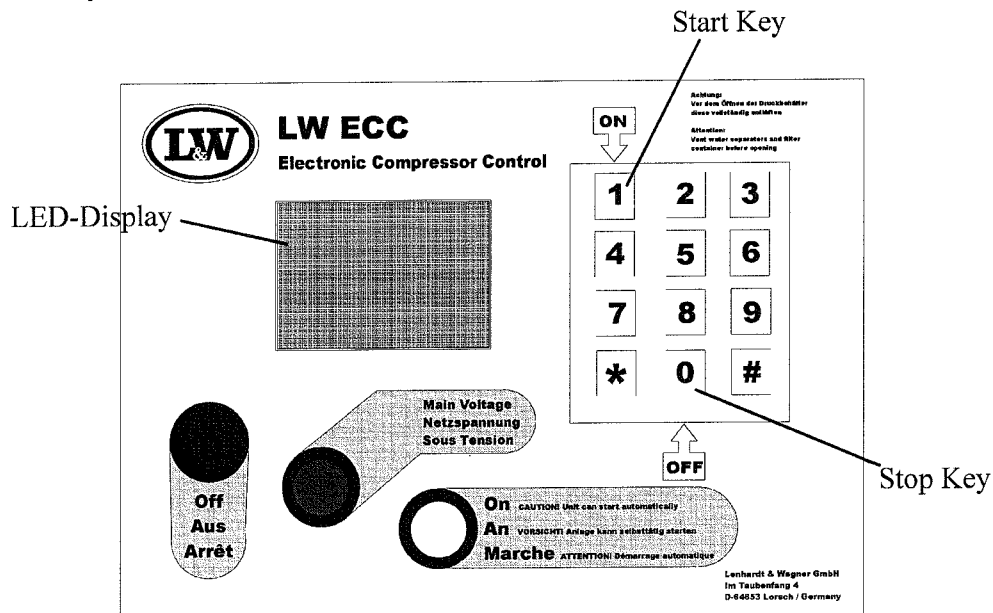


## ELECTRONIC COMPRESSOR CONTROL LW ECC

LW 230 ES Silent & LW 280 ES Silent compressors are equipped with the all-electrical, computer supported control system LW ECC. It is very easy to operate and allows multiple & individual settings.

### Compressor Control System LW ECC

- Graphic capable LCD-Display with Keys
- Automatic- & Semi-Automatic Operation Mode
- Automatic Dump System
- Integrated Counter for Operation Hours
- Maintenance Intervals automatically displayed
- Spare Part Numbers automatically displayed
- Fully adjustable Pressure Ranges
- Easy to operate Menu
- Faults will be displayed
- Check of End-pressure Safety Valve possible
- Remote Controlled Maintenance / Fault Analysis by Modem possible
- Extentable by additional Modules (external Filling Panel)



Immediately after connecting the compressor, the ECC-display shows the following main menu:

**MAIN MENU**

Charging	0 min	<i>Present filling time in minutes</i>
Total	0,0 h	<i>total operation hours</i>
<b>Start : 1</b>	<b>Stop : 0</b>	<i>Key 1 to start compressor / Key 0 to stop compressor</i>
Help: *	OFF	<i>* Key leads to submenus      Current Operation State = Off</i>
End Press.	<b>0</b> bar	<i>Present Filling Pressure</i>

The following keys are activated in this menu:

<i>Key</i>	<i>Function</i>
1	<b>Start</b> - Starts the compressor (any time)
0	<b>Stop</b> - Stops the compressor (any time)
*	<b>Leads to the submenus</b>

After typing \*key the following menu appears:

**SELECTION MENU****M100**

<b>Selection:</b>		
2	Readings	<i>Key 2 lead to submenu "Readings"</i>
3	Settings	<i>Key 3 lead to submenu "Settings"</i>
4	Test	<i>Key 4 lead to submenu "Test"</i>
5	Statistics	<i>Key 5 lead to submenu "Statistics"</i>
6	Maintenance	<i>Key 6 lead to submenu "Maintenance"</i>
7	Operation Mode	<i>Key 7 lead to submenu "Operation Mode"</i>
(M100)	Return : #	<i>Key # leads back to "Mainmenu"</i>

[(M100) tells that you are presently on menu page 100]

**Remark:**

Beside the listed numbers, keys 1 + 0 are always activated to start / stop the compressor unit



## READINGS MENU

M200

Readings:	
2	End Pressure
3	Press. Stage 1
4	Press. Stage 2
5	Temperature A
6	Temperature B
9	Close
(M200)	Return : #

*Key 2 shows the current filling pressure*

*Key 3 shows the current pressure of the 1<sup>st</sup> stage\**

*Key 4 shows the current pressure of the 2<sup>nd</sup> stage\**

*Key 5 shows the current temperature of the 3<sup>rd</sup> stage\**

*Key 6 shows the current temperature inside the cabinet\**

*Key 9 lead back to "Selection Menu"*

*Key # leads back to "Mainmenu"*

*\* = Option*

[(M200) tells that you are presently on menu page 200]

## SETTINGS MENU

M300

Settings:	
2	Stop Pressure
3	Restart Pressure
9	Close
(M300)	Return : #

*Key 2 leads to submenu "Set Stop Pressure"*

*Key 3 leads to submenu "Set Restart Pressure"*

*Key 9 leads to submenu "Selection"*

*Key # leads back to "Mainmenu"*

**Remark:**

Restart pressure is only valid if compressors runs in automatic mode (see M700)



**Set Stop Pressure****M320**

**Set**  
**Stop Pressure:**

Actual: 330 bar  
 7 New Value:  
 >> XXX bar  
 (050, , 333)  
 8 Confirm  
 (M320) Return: #

*Current stop pressure*  
*Key 7 if stop pressure should be changed*  
*XXX indicates modified stop pressure*  
*Chooseable pressure range for stop pressure*  
*Key 8 confirms new stop pressure*  
*Key # leads back to "Mainmenu"*

**Set Restart Pressure****M330***[only valid if compressor runs in automatic mode (M700)]*

**Set**  
**Restart Pressure:**

Actual: 180 bar  
 7 New Value:  
 >> XXX bar  
 (030, , 310)  
 8 Confirm  
 (M330) Return: #

*Current restart pressure*  
*Key 7 if restart pressure should be changed*  
*XXX indicates modified stop pressure*  
*Chooseable pressure range for restart pressure*  
*Key 8 confirms new restart pressure*  
*Key # leads back to "Mainmenu"*

**Remark:**

Restart pressure must be at least 20 bar lower than current stop pressure



## TEST MENU

M400

Test:	
2	Solenoids
3	Safety Valve
4	Test Stop
9	Close
(M400)	Return : #

*Key 2 leads to submenu "Test Solenoids"*

*Key 3 leads to submenu "Test Safety Valve"*

*Key 4 leads to submenu "Test Stop without Venting"*

*Key 9 leads back to submenu "Selection"*

*Key # leads back to "Mainmenu"*

## Test Solenoids

M420

Test Solenoids:	
3	open
7	close
9	Close
(M420)	Return : #

*Key 3 opens solenoids*

*Key 7 closes solenoids*

*Key 9 leads back to submenu "Test"*

*Key # leads back to "Mainmenu"*

**Remark:**

This menu can not be left when solenoids are open (*reclose first by key 7*)



## Test Safety Valve

M430

**Test  
Safety Valve:**

Close Filling  
Valves !

5 Start                      0 Stop  
9 Close  
(M430) Return : #

*Key 5 to start test                      Key 0 to stop test*  
*Key 9 leads back to submenu "Test"*  
*Key # leads back to "Mainmenu"*

**Remark:**

Please close all filling valves /-panels before the test start. Compressor will run up to its maximum pressure, which is limited by the end-pressure safety valve. It will not stop at "Stop Pressure" (see menu M320).

## Test Stop

M440

**Test Stop  
without Venting:**

5     Stop  
6     Vent  
Pressure        188  
                      bar

9     Close  
(M440) Return : #

*Key 5 stops compressor during run*  
*Key 6 vents compressor after test is finished*  
*Shows current filling pressure*

*Key 9 leads back to submenu "Test"*  
*Key # leads back to "Mainmenu"*

**Remark:**

This test can only be carried out after compressor has been started (key 1). The main reason for it is to check the unit for air leaks

## STATISTICS MENU

M500

Statistics	
Operation Hours:	15,2 h
Start Cycles:	48
Max Press	338 bar
9 Close	
(M500) Return : #	

*Total operation hours of compressor unit*

*Total number of compressor starts*

*Maximum working pressure of unit (set by safety valve test)*

*Key 9 leads back to submenu "Selection"*

*Key # leads back to "Mainmenu"*

**Remark:**

Key 5 in this menu shows the version of the ECC software installed (M505)

## MAINTENANCE MENU

M600

Remaining Hours:	
Oil Change	14 h
Sinter Filt	989 h
Silencer	4989 h
Valves	5989 h
8 Change done	
9 Close	
(M600) Return : #	

*Shows remaining hours of the components listed on left hand side (next oil change in 14 hours, ...)*

*Key 8 leads to submenu "Receipt Maintenance"*

*Key 9 leads back to submenu "Selection"*

*Key # leads back to "Mainmenu"*

**Remark:**

System will display a message when any of the listed parts should be replaced, plus in addition the matching L&W spare part numbers.



## Receipt Maintenance

M680

Receipt Maintenance	
2	Oil Change
3	Sinter Filters
4	Silencer
5	Valves
9	Close
(M680)	Return : #

*Key 2 receipts oil change*

*Key 3 receipts change of sinter filters*

*Key 4 receipts change of silencer*

*Key 5 receipts change of valves*

*Key 9 leads back to submenu "Remaining Hours"*

*Key # leads back to "Mainmenu"*

Display confirms any reset of "Remaining Hours" with the following message:

Receipt Maintenance	
Operation Hours Meter Set!	
9	Close
(M680)	Return : #

*Key 9 leads back to submenu "Remaining Hours"*

*Key # leads back to "Mainmenu"*



## OPERATION MODE MENU

M700

Operation Mode:	
2	Automatic
3	<b>Semi- Automatic</b>
4	Top Up
5	Language
9	Close
(M700)	Return : #

*Key 2 activates automatic mode (storage tanks)*

*Key 3 activates semi-automatic mode*

*Key 4 activates top up mode (option)*

*Key 5 leads to "Language Menu"*

*Key 9 leads back to submenu "Selection"*

*Key # leads back to "Mainmenu"*

**Remark:**

Current modes are displayed in bolt letters

## Attention:

Compressor can start automatically in automatic mode (depending on restart pressure, see M330).

Never work on a unit which is connected to main voltage

## HAZARD:

Remove main plug before doing any maintenance work

## Language Menu

M704

Language:	
2	German
3	English
4	French
5	Italian
6	
7	
(M704)	Return : #

*Key 2 activates german language*

*Key 3 activates english language*

*Key 4 activates french language*

*Key 5 activates italian language*

*Key 6 leads back to submenu "Operation Mode"*

*Key 7 leads back to submenu "Operation Mode"*

*Key # leads back to "Mainmenu"*



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## Warranty

### Twelve Months Limited Warranty

Important:

For warranty claims this Warranty Registration form must be presented

**L&W** compressors are warranted against defects in workmanship and materials for a period of twelve months after purchase by the original owner, provided the compressor is run with synthetic compressor oil - subject to and in accordance with the terms and conditions set forth below:

This warranty does not cover damage to the product resulting from improper useage, improper maintenance, neglect of care, alteration or unauthorised repair. The warranty will automatically become void if proper preventive maintenance procedures have not been followed as outlined in the operations manual for this product.

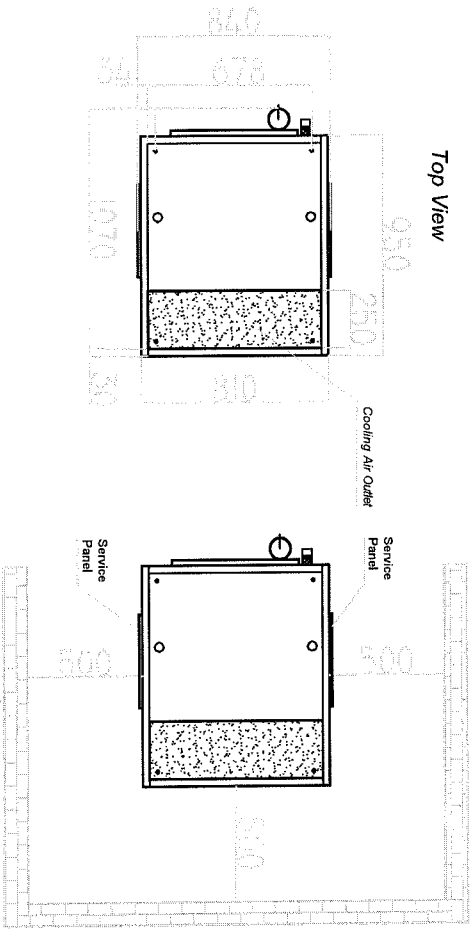
If a claim under this warranty appears to be necessary, return the product, freight repaid, to your **L&W** dealer. Include your name, address and warranty registration. The claim will be honoured and the product repaired at no charge and returned in what your **L&W** dealer determines a reasonable amont of time, provided all necessary parts are in stock. All repairs not covered under the terms of this warranty will be made at the owners expense.

This warranty is non-transferable from the original owner.

The warranty will be extended for the time the product has been in warranty repair. This warranty and operation manual should be kept with the compressor at all times.

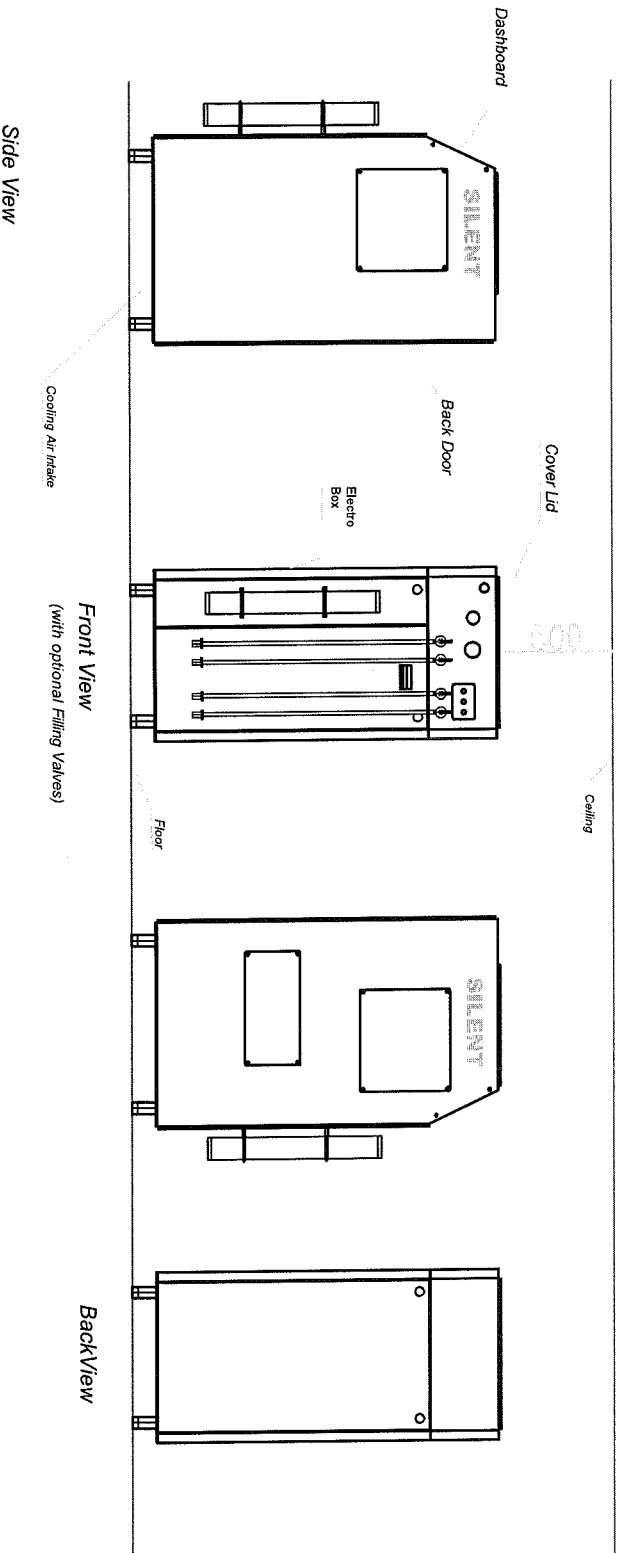


# Installation **LW 230 ES Silent** / **LW 280 ES Silent**



**Remark:**  
Main power cable and high pressure outlet hose come in/out through air intake channel

**Required cooling air flow**  
LW 230 ES: 1,650 m<sup>3</sup>/h  
LW 280 ES: 2,250 m<sup>3</sup>/h  
Operation temperature: +5°C < + 50°C








## MAINTENANCE LIST      LW 230 ES & LW 280 ES

Maintenance Work	Intervals	Qty.	Order No.
Replace Filter Cartridge <i>Filter Capacity 1.7 ltr.:</i>	LW 230 ES: every 71 working hours (@ +20 °C) LW 280 ES: every 57 working hours (@ +20 °C)	1	LW 300/450 8005
Check Oil Level	once a day (before 1 <sup>st</sup> Start)		
Oil Change	1 <sup>st</sup> Oil change after 25 working hours (in total) 2 <sup>nd</sup> Oil change after 75 working hours (in total) 3 <sup>rd</sup> Oil change after 275 working hours (in total) thereafter every further 200 working hours - but at least once a year	1800 ml per Fill	LW 300/450 9001
Replace Air Intake Cartridge	depends on pollution - but at least every two years	1	LW 300/450 7017
Check V-Belt Tension	every 50 working hours	2	
Replace Valves 1 <sup>st</sup> Stage 2 <sup>nd</sup> Stage 3 <sup>rd</sup> Stage	every 1500 working hours	1 1 1	LW 260 0092 LW 260 0084 LW 260 0064

# MAINTENANCE LIST

## LW 230 ES & LW 280 ES

Maintenance Work	Intervals	Qty.	Order No.
Check Pressure Maintaining- / Non Return Valve	every 200 working hours		
Check Safety Devices	at least once a year This should only be done by professional engineers		
Check Pressure Pipes for Air Leaks	every 200 working hours		
Clean Pressure Pipes	depends on pollution - but at least every two years		
Check Condition of Filling Hoses	once a day (before the 1 <sup>st</sup> fill)		
Replace Sinter Filter of Condensate Valve	1 <sup>st</sup> change after 1000 working hours thereafter every 2000 working hours	1	LW 300/450 2011 b
Clean Oil-/Water Separators	every 1000 working hours - but at least once a year		
Replace Sinter Filters of Water Separators 1 <sup>st</sup> Stage 2 <sup>nd</sup> Stage 3 <sup>rd</sup> Stage	every 1000 working hours every 1000 working hours every 1000 working hours	1 1 1	LW 260 0121 LW 260 0121 LW 300/450 10004
Replace Silencer	every 500 Working Hours	1	LW 300/450 2014
Check / Retorque Connections & Bolts	after 15 working hours - thereafter every 500 working hours		

**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

Qty.	Description	Order No.	Comments
2	Filling Connector DIN 200 bar	4044	
2	Hand Wheel 200 bar - Black	4045	
2	Hand Wheel 300 bar - Red	4046	
2	Filling Connector DIN 300 bar	4048	
1	Safety Valve 225 bar <i>(with test certificate and TÜV)</i>	4052	
1	Safety Valve 330 bar <i>(with test certificate and TÜV)</i>	4053	
1	Sinter Filter for Condensation Valve	4200	
8	Washer	LW 160/190 276	
4	Washer	LW 160/190 276	
1	Side Cover left	LW 260 0001	
1	Side Cover right	LW 260 0002	
2	Service Access Panel	LW 260 0003	
1	Switch Box Cover	LW 260 0004	
1	Top Cover	LW 260 0005	
1	Rear Access Door	LW 260 0006	
1	Rear Housing Panel	LW 260 0007	
1	Strengtheners for Rear Housing Panel	LW 260 0008	
1	Front Instrument Panel	LW 260 0009	
1	Strengtheners for Front Instrument Panel	LW 260 0010	
1	Front Access Door	LW 260 0011	
1	Hand Hold	LW 260 0012	
1	Mounting Clip	LW 260 0013	
1	Front Plate	LW 260 0014	
1	Strengtheners for Front Plate	LW 260 0015	
1	Base Plate	LW 260 0016	
4	Shock Absorber	LW 260 0017	
1	Cooling Fan Plate	LW 260 0018	
1	Main Frame	LW 260 0019	
6	Catch & Lock complete	LW 260 0020	
1	Upper Floor	LW 260 0021	
1	Lower Floor	LW 260 0022	
1	Insulation Side Cover left	LW 260 0023	
1	Insulation Side Cover Right	LW 260 0024	
1	Insulation Top Cover	LW 260 0025	
1	Insulation Rear Access Door	LW 260 0026	
1	Insulation Rear Housing Panel	LW 260 0027	
1	Insulation Front Instrument Panel	LW 260 0028	
1	Insulation Front Access Door	LW 260 0029	
1	Insulation Front Plate	LW 260 0030	
2	Insulation Service Access Panel	LW 260 0031	

**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

Qty.	Description	Order No.	Comments
1	Insulation Upper Floor	LW 260 0032	
1	Insulation Lower Floor	LW 260 0033	
1	Insulation Main Frame	LW 260 0034	
2	V Drive Belt	LW 260 0035	
1	Bolt	LW 260 0036	
1	Locking Washer	LW 260 0037	
1	Prime Mover Pulley Wheel	LW 260 0038	
1	Prime Mover 7,5 kW (LW 280 ES)	LW 260 0040	
1	Prime Mover 5,5 kW (LW 230 ES)	LW 260 0041	
4	Dome Headed Bolt	LW 260 0042	
2	Tensioning screws	LW 260 0043	
1	Flywheel	LW 260 0044	
11	Ventilator Blade	LW 260 0045	
1	Mounting Ring	LW 260 0046	
1	Oil Pump Cover	LW 260 0047	
1	Shaft Seal Ring	LW 260 0048	
1	Pump Drive	LW 260 0049	
2	Roller	LW 260 0050	
1	Pump Cover	LW 260 0051	
1	O-Ring	LW 260 0052	
1	Bearing Flange	LW 260 0053	
1	O-Ring	LW 260 0054	
2	Main Bearing	LW 260 0055	
1	Spacer	LW 260 0056	
1	Woodruff Key Crankshaft	LW 260 0057	
1	Crankshaft	LW 260 0058	
3	Big End Bearing	LW 260 0059	
1	Thrust Washer	LW 260 0060	
1	Circlip	LW 260 0061	
12	Cylinder head Bolt	LW 260 0062	
1	Cylinder Head, 3 <sup>rd</sup> Stage	LW 260 0063	
1	Valve Assembly, 3 <sup>rd</sup> Stage complete	LW 260 0064	
1	Cylinder, 3 <sup>rd</sup> Stage	LW 260 0065	
2	O-Ring	LW 260 0066	
2	Guide Cylinder, 3 <sup>rd</sup> Stage	LW 260 0067	
2	O-Ring	LW 260 0068	
1	Piston Ring Set, 3 <sup>rd</sup> Stage	LW 260 0069	
1	Piston, 3 <sup>rd</sup> Stage	LW 260 0070	
4	Circlip	LW 260 0071	
1	Guide Piston	LW 260 0072	
1	Circlip	LW 260 0073	
2	Small End Bearing	LW 260 0074	
2	Piston Pin	LW 260 0075	

**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

Qty.	Description	Order No.	Comments
2	Connecting Rod, 2 <sup>nd</sup> & 3 <sup>rd</sup> Stage	LW 260 0076	
1	Crankcase	LW 260 0077	
1	Seal	LW 260 0078	
1	Crank Case Cover	LW 260 0079	
1	O-Ring	LW 260 0080	
1	Piston, 2 <sup>nd</sup> Stage	LW 260 0081	
1	Piston Ring Set 2 <sup>nd</sup> Stage complete	LW 260 0082	
1	Cylinder, 2 <sup>nd</sup> Stage	LW 260 0083	
1	Valve Assembly, 2 <sup>nd</sup> Stage complete	LW 260 0084	
1	Cylinder head, 2 <sup>nd</sup> Stage	LW 260 0085	
1	Connecting Rod, 1 <sup>st</sup> Stage	LW 260 0086	
1	Small End Bearing	LW 260 0087	
1	Piston, 1 <sup>st</sup> Stage	LW 260 0088	
1	O-Ring	LW 260 0089	
1	Cylinder, 1 <sup>st</sup> Stage	LW 260 0090	
8	Screw	LW 260 0091	
4	Screw	LW 260 0091	
1	Valve Assembly, 1 <sup>st</sup> Stage complete	LW 260 0092	
4	90° Connection	LW 260 0093	
4	Sealing ring	LW 260 0094	
4	Nut	LW 260 0095	
1	Connection pipe	LW 260 0096	
1	Connection pipe	LW 260 0097	
5	90° Connection	LW 260 0098	
14	Sealing ring	LW 260 0099	
12	Nut	LW 260 0100	
1	T-Piece	LW 260 0101	
1	Connection	LW 260 0102	
1	Oil Pressure Feed 2 <sup>nd</sup> Stage	LW 260 0103	
1	Oil Pressure Feed 3 <sup>rd</sup> Stage	LW 260 0104	
1	Oil Pump supply pipe	LW 260 0105	
1	Cooling Spiral 1 <sup>st</sup> Stage	LW 260 0106	
1	Cooling Spiral 2 <sup>nd</sup> Stage	LW 260 0107	
1	Cooling Spiral 3 <sup>rd</sup> Stage	LW 260 0108	
3	Cooling Spiral Mount	LW 260 0109	
3	Cooling Spiral Mount	LW 260 0110	
6	Cooling Spiral Mount	LW 260 0111	
6	Cooling Spiral Clamp	LW 260 0112	
8	Bolt	LW 260 0113	
4	Bolt	LW 260 0114	
1	Hose, Crank Case Breather	LW 260 0115	
1	Oil Filling Cap	LW 260 0116	

**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

Qty.	Description	Order No.	Comments
1	Pressure Relief Valve, 2 <sup>nd</sup> Stage - 60 bar	LW 260 0117	
2	Sinter Filter Housing	LW 260 0118	
2	O-Ring Guide	LW 260 0119	
2	O-Ring, Sinter Filter	LW 260 0120	
2	Sinter Filter (incl. O-Ring Sinter Filter)	LW 260 0121	
2	Clamp	LW 260 0122	
2	Water Separator	LW 260 0123	
2	Plug	LW 260 0124	
1	90° Connection	LW 260 0125	
2	Nut	LW 260 0126	
1	Condensation Drain Pipe 2 <sup>nd</sup> Stage	LW 260 0127	
1	Condensation Connecting Pipe	LW 260 0128	
1	T-Piece	LW 260 0129	
1	Magnet Valve 2 <sup>nd</sup> Stage	LW 260 0130	
2	90° Connection for Hose	LW 260 0131	
1	Condensation Drain Hose, 1 <sup>st</sup> Stage	LW 260 0132	
1	Cooling Spiral	LW 260 0133	
1	Mounting Bracket	LW 260 0134	
1	Mounting Plate	LW 260 0135	
1	Mounting Block for Safety Valve w/o cert. 3/8"	LW 260 0136	
1	Mounting Block for Safety Valve with cert.	LW 260 0137	
2	High Pressure Hose	LW 260 0138	
1	Condensation Drain Hose, 2 <sup>nd</sup> & 3 <sup>rd</sup> Stages	LW 260 0139	
1	Condensation Drain Hose	LW 260 0140	
1	Pipe	LW 260 0141	
1	Reducer	LW 260 0142	
1	Pipe	LW 260 0143	
2	Lever Filling Valve complete	LW 260 0144	
2	Mounting Nut Filling Valve	LW 260 0145	
1	Pressure Sensor	LW 260 0146	
1	Crush Washer	LW 260 0147	
1	Pressure Sensor Connection	LW 260 0148	
1	Pipe	LW 260 0149	
1	Bulk Head Connection	LW 260 0150	
1	Pipe	LW 260 0151	
1	Pipe	LW 260 0152	
11	Screw	LW 260 0153	
8	Screw	LW 260 0154	
8	Screw	LW 260 0155	

**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

Qty.	Description	Order No.	Comments
2	Connection	LW 260 0156	
8	Screw	LW 260 0157	
2	T-Piece	LW 260 0158	
1	Crank Case Breather	LW 260 0159	
2	Bolt	LW 260 0160	
1	Seal, Safety Valve w/o cert.	LW 260 0161	
11	Washer	LW 260 0162	
1	ECC Display Unit, complete	LW 260 0167	
1	O-Ring	LW 260 0168	
2	High Pressure Filling Hose	LW 260 0169	
1	Seal	LW 260 0170	
1	Union Condensation Valve	LW 260 0171	
4	Washer	LW 260 0171	
2	Nut	LW 260 0172	
2	Screw	LW 260 0173	
2	Screw	LW 260 0174	
1	O-Ring	LW 260 0189	
1	O-Ring	LW 260 0190	
3	Nut	LW 260 0191	
3	Lamp Holder	LW 260 0192	
1	LED White	LW 260 0193	
1	LED Glass Yellow	LW 260 0194	
1	LED Glass Red	LW 260 0195	
1	Lamp Glass White	LW 260 0196	
1	Lamp Glass Yellow	LW 260 0197	
1	Lamp Glass Red	LW 260 0198	
4	Screw	LW 300/450 0155	
1	Sinter Filter	LW 300/450 10004	
1	Magnet Valve 1 <sup>st</sup> Stage	LW 300/450 2009	
1	Condensation Bleed Off Valve	LW 300/450 2011	
1	Repair Kit for Condensation Valve	LW 300/450 2011a	
1	Silencer	LW 300/450 2014	
1	Oil/Water Separator 2 <sup>nd</sup> /3 <sup>rd</sup> Stage	LW 300/450 2015	
1	Inlet Flange	LW 300/450 3000	
4	90° Connection	LW 300/450 3001	
1	Reducer	LW 300/450 3002	
3	Connection	LW 300/450 3004	
3	90° Connection	LW 300/450 3010	
2	Double Nipple	LW 300/450 3013	
1	Hose Connection	LW 300/450 3015	
1	Connections	LW 300/450 3022	
4	Nut M8	LW 300/450 6005	
14	Nut M10	LW 300/450 6006	

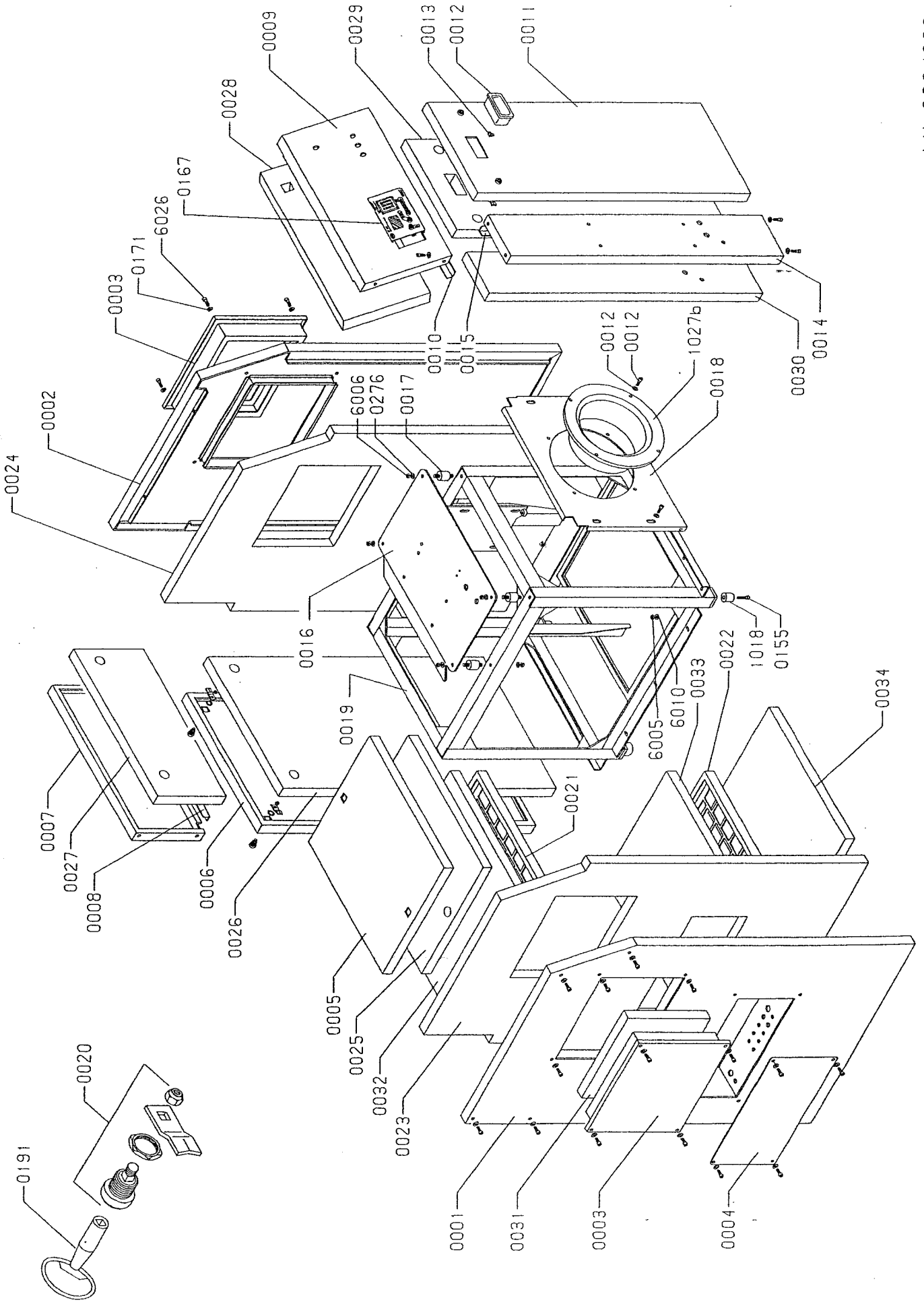
**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

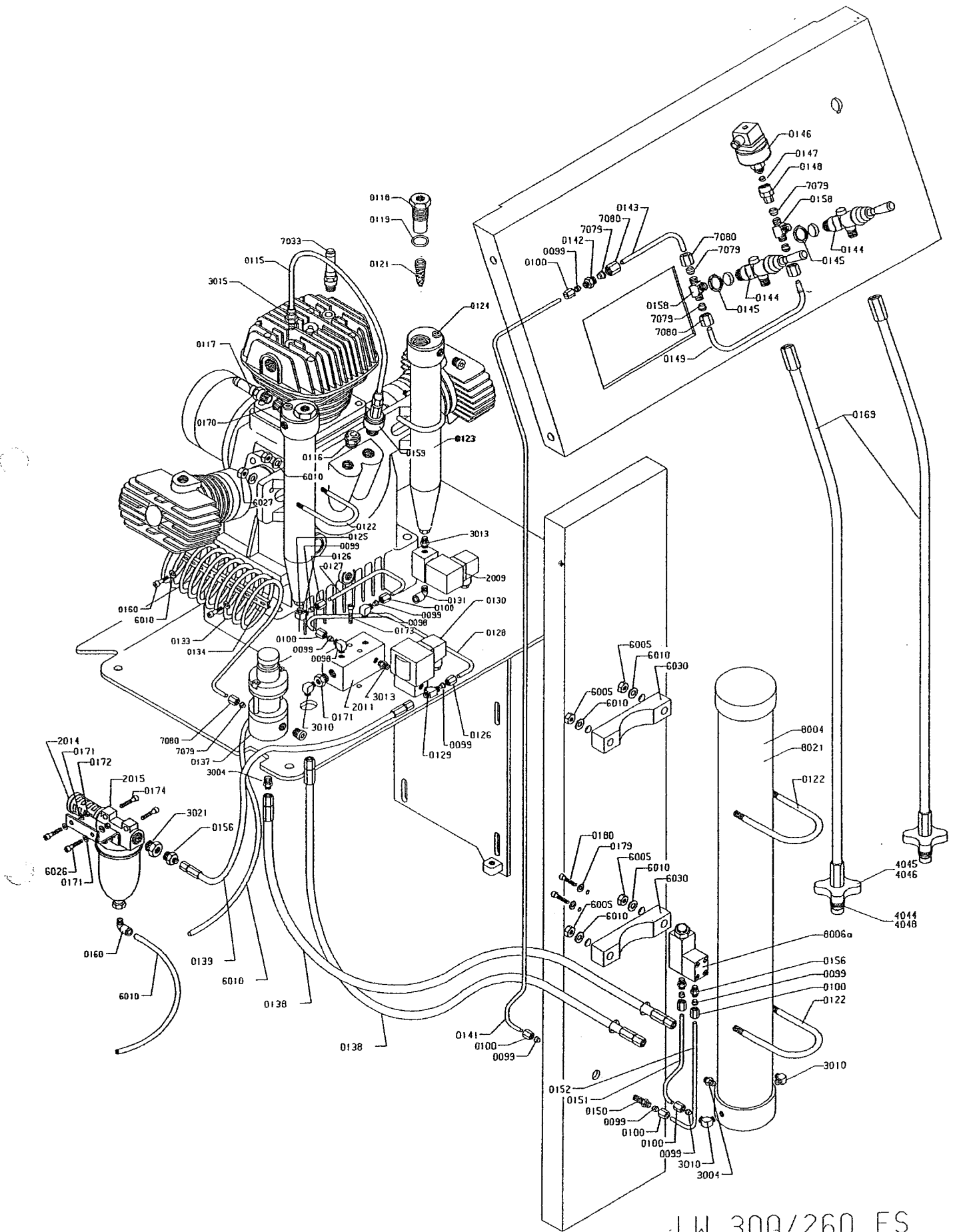
Qty.	Description	Order No.	Comments
28	<b>Washer</b>	LW 300/450 6010	
2	<b>Clamp</b>	LW 300/450 6021	
6	<b>Lock Nut</b>	LW 300/450 6027	
2	<b>Mounting Block, Filter Housing</b>	LW 300/450 6030	
1	<b>Safety Valve 225 bar (without test certificate)</b>	LW 300/450 7007	
1	<b>Safety Valve 330 bar (without test certificate)</b>	LW 300/450 7008	
1	<b>Inlet Filter Housing, complete.</b>	LW 300/450 7016	
1	<b>Clamp</b>	LW 300/450 7016a	
1	<b>Inlet Filter Cover</b>	LW 300/450 7016b	
1	<b>Inlet Filter Cartridge</b>	LW 300/450 7017	
1	<b>Oil Level Glass</b>	LW 300/450 7021	
2	<b>Circlip</b>	LW 300/450 7026a	
1	<b>Piston Pin</b>	LW 300/450 7026b	
1	<b>Piston Ring Set, 1<sup>st</sup> Stage complete</b>	LW 300/450 7027	
1	<b>Copper Seal, 1<sup>st</sup> Stage Valve</b>	LW 300/450 7030a	
1	<b>Upper Gasket, Valve 1<sup>st</sup> Stage</b>	LW 300/450 7030b	
1	<b>Cylinder Head, 1<sup>st</sup> Stage</b>	LW 300/450 7031	
1	<b>Pressure relief Valve 1<sup>st</sup> Stage</b>	LW 300/450 7033	
4	<b>Cylinder Head Bolt</b>	LW 300/450 7045	
16	<b>Lock Washer</b>	LW 300/450 7047	
11	<b>Sealing ring</b>	LW 300/450 7079	
11	<b>Nut</b>	LW 300/450 7080	
4	<b>Sealing ring</b>	LW 300/450 7083	
4	<b>Nut</b>	LW 300/450 7084	
4	<b>Screw</b>	LW 300/450 7087	
1	<b>Filter Housing 1,7 Itr., P<sub>max</sub>: 350 bar</b>	LW 300/450 8004	
1	<b>Pressure Maintaining &amp; Non Return Valve</b>	LW 300/450 8006a	
1	<b>Filter Housing 2,3 Itr., P<sub>max</sub>: 350 bar</b>	LW 300/450 8021	
2	<b>Key</b>	LW 300/450ES 0191	
4	<b>Foot</b>	LW 300/450ES 1018	
1	<b>Cooling Fan Fairing</b>	LW 300/450ES 1027b	
1	<b>90° Connection</b>	LW 300/450ES 3005	
1	<b>Hose Connection</b>	LW 300/450ES 3015	
4	<b>Nut M8</b>	LW 300/450ES 6005	
4	<b>Washer</b>	LW 300/450ES 6010	
4	<b>Washer</b>	LW 300/450ES 6010	
4	<b>Washer</b>	LW 300/450ES 6010	
1	<b>Connection</b>	LW 300/450ES 7067	
1	<b>Oil Drain Hose</b>	LW 300/450ES 7068	
1	<b>Plug</b>	LW 300/450ES 7069	



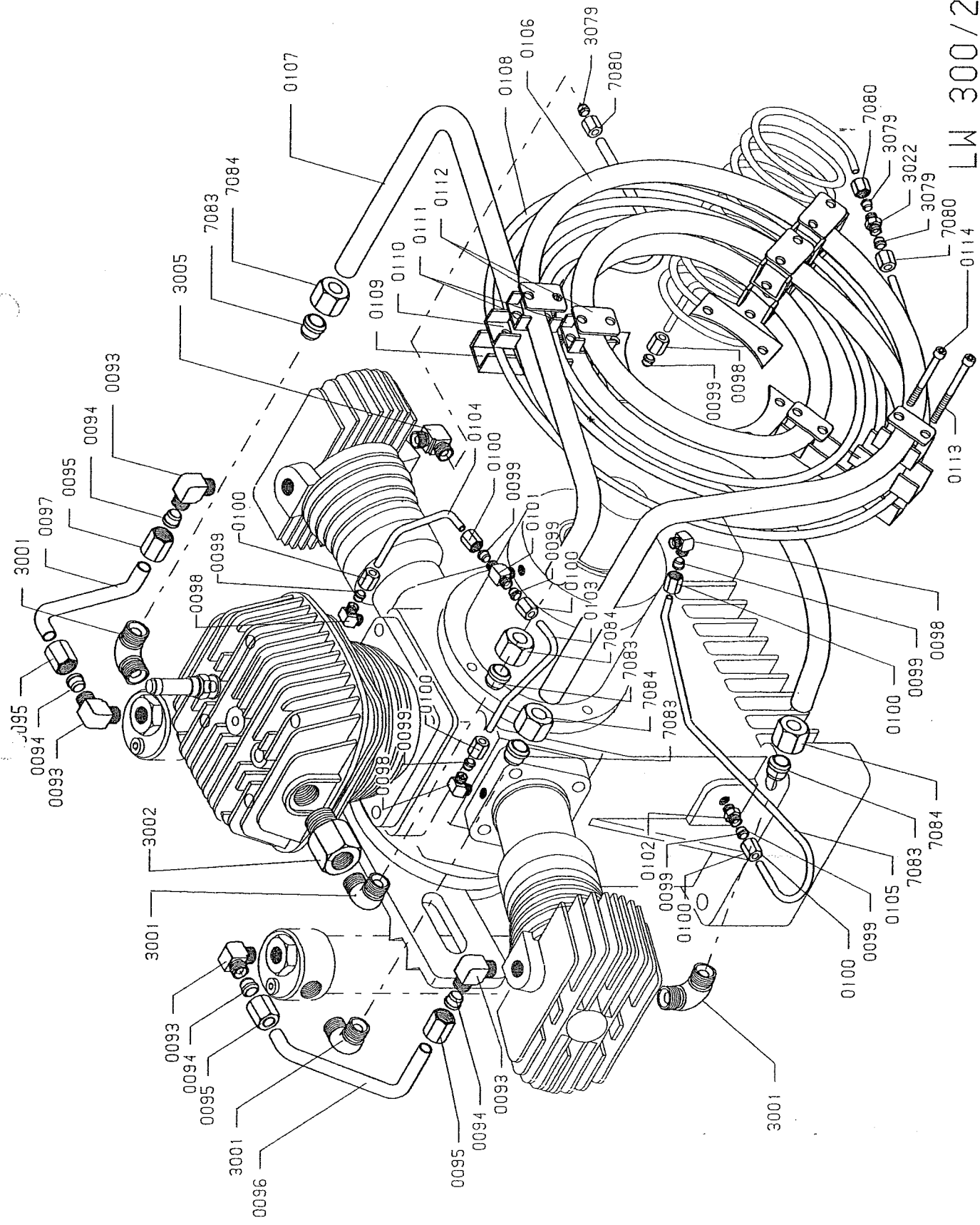
**SPARE PARTS LIST****LW 230 ES / LW 280 ES**

Qty.	Description	Order No.	Comments
1	<b>Woodruff Key</b>	LW 300/450ES 7074	
1	<b>Fan</b>	LW 300/450ES 7085	
1	<b>Fan Flange</b>	LW 300/450ES 7086	
1	<b>Grub Screw</b>	LW 300/450ES 7088	
4	<b>Connection</b>	LW 450 3016	
2	<b>Mounting Screws</b>	LW 450 6026	



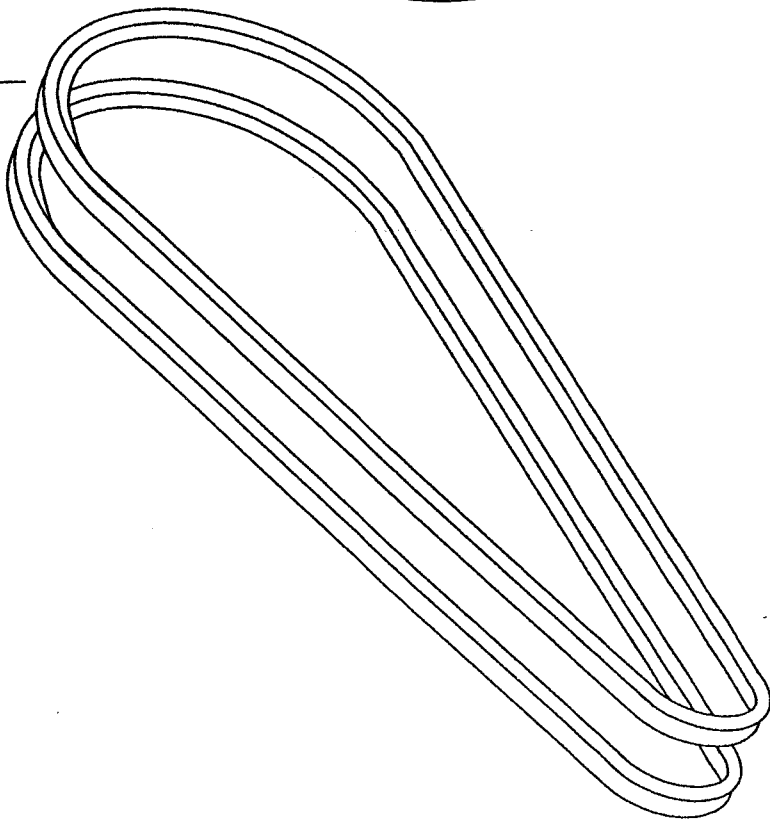


LW 300/260 ES

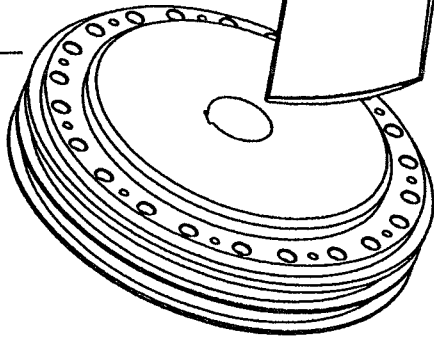


LW 300/260 ES

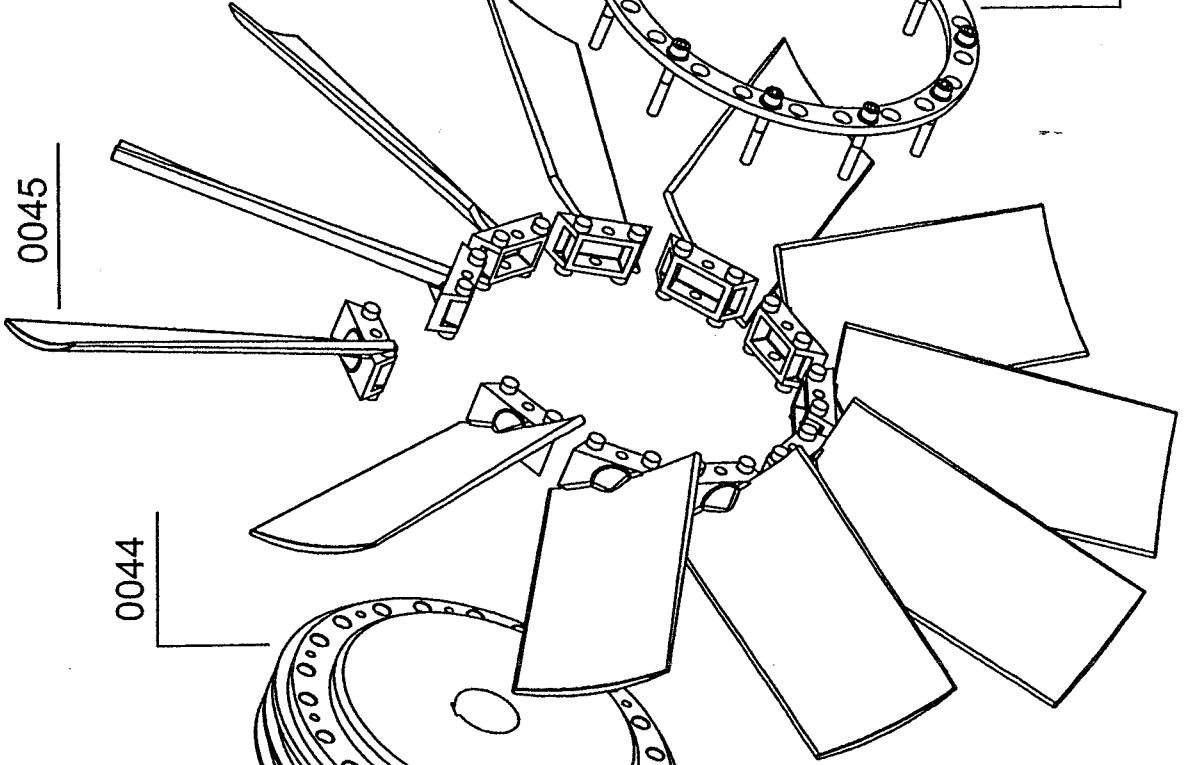
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0044

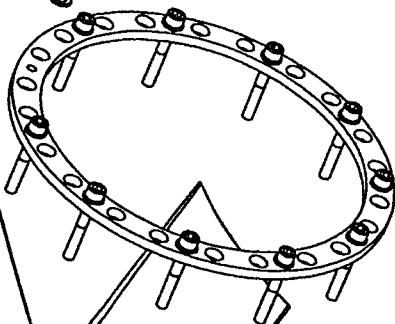


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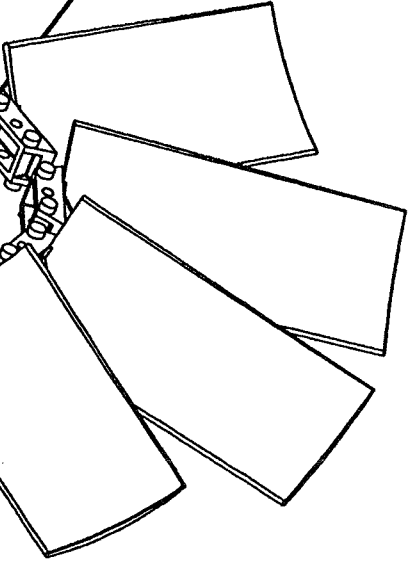


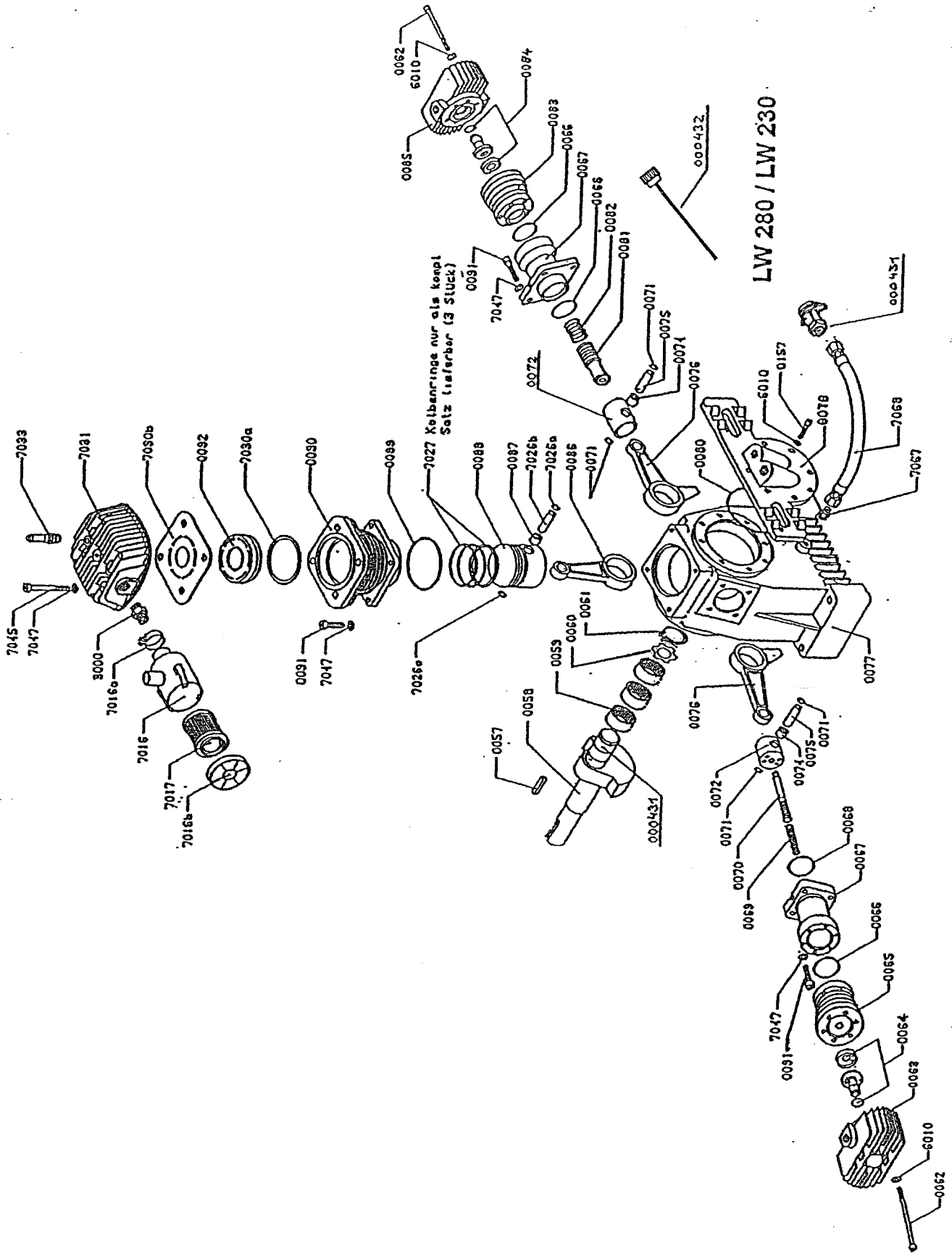
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0153

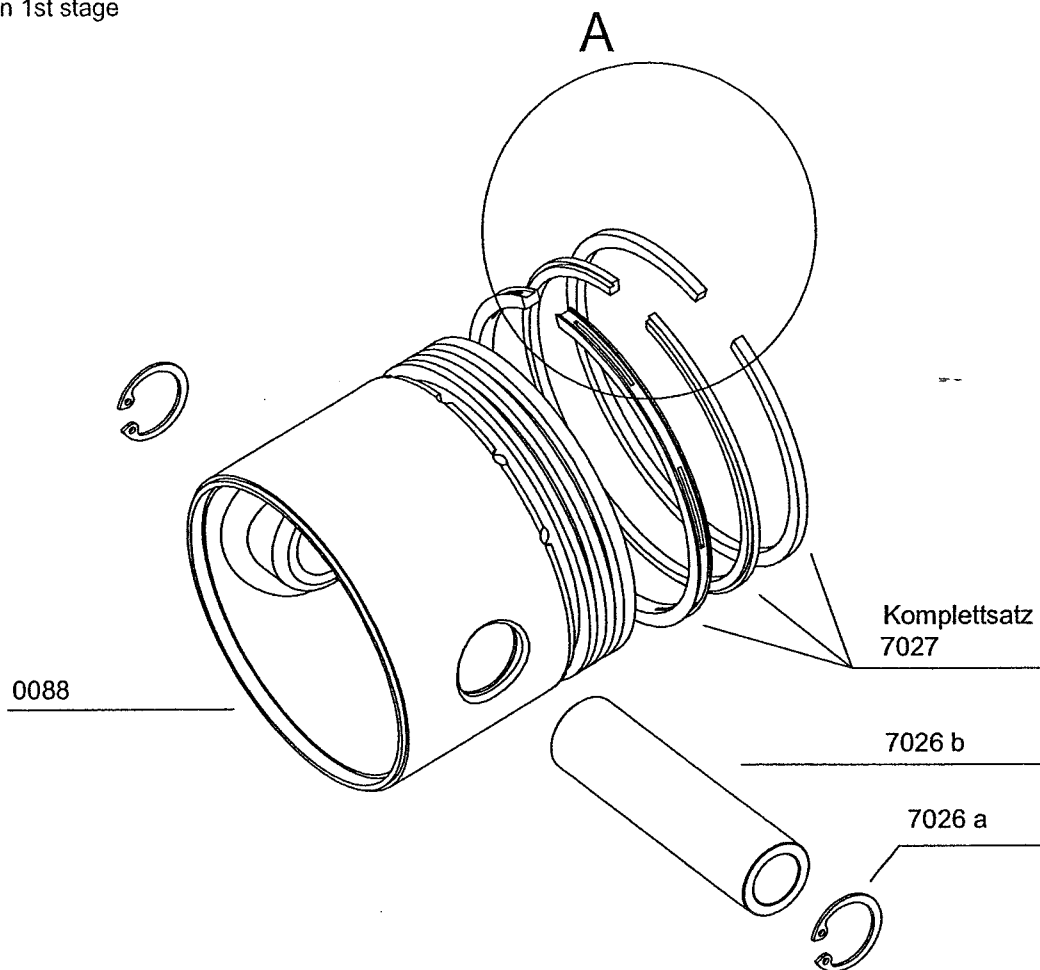


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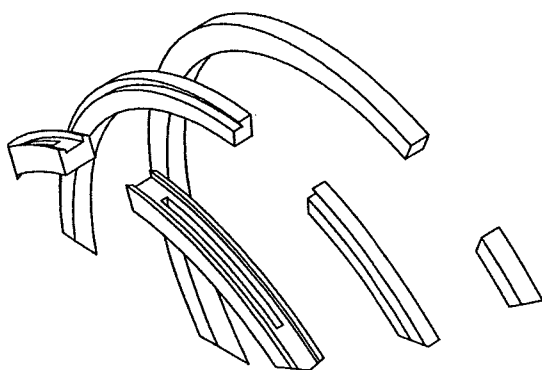




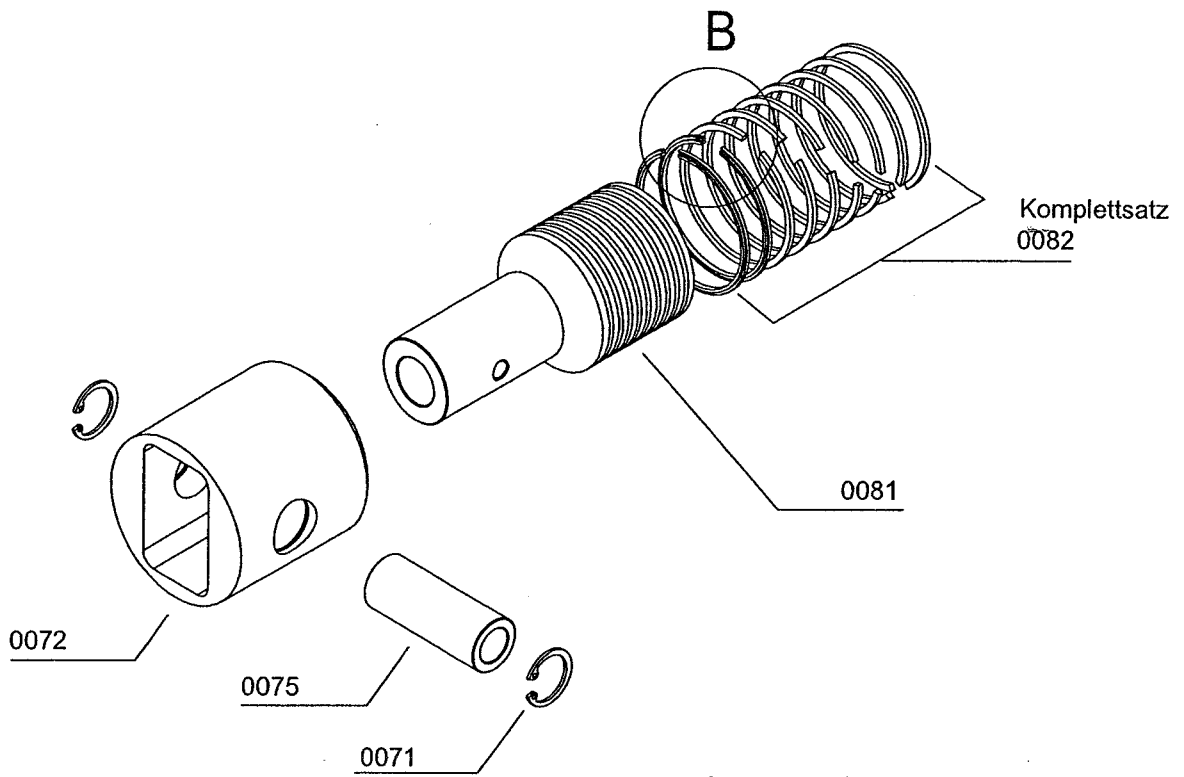
Kompressor L&W 280  
Baugruppe: Kolben St. 1  
Assembly: Piston 1st stage



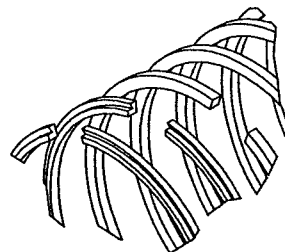
A (1:1)



Kompressor L&W 280  
Baugruppe: Kolben St. 2  
Assembly: Piston 2nd stage

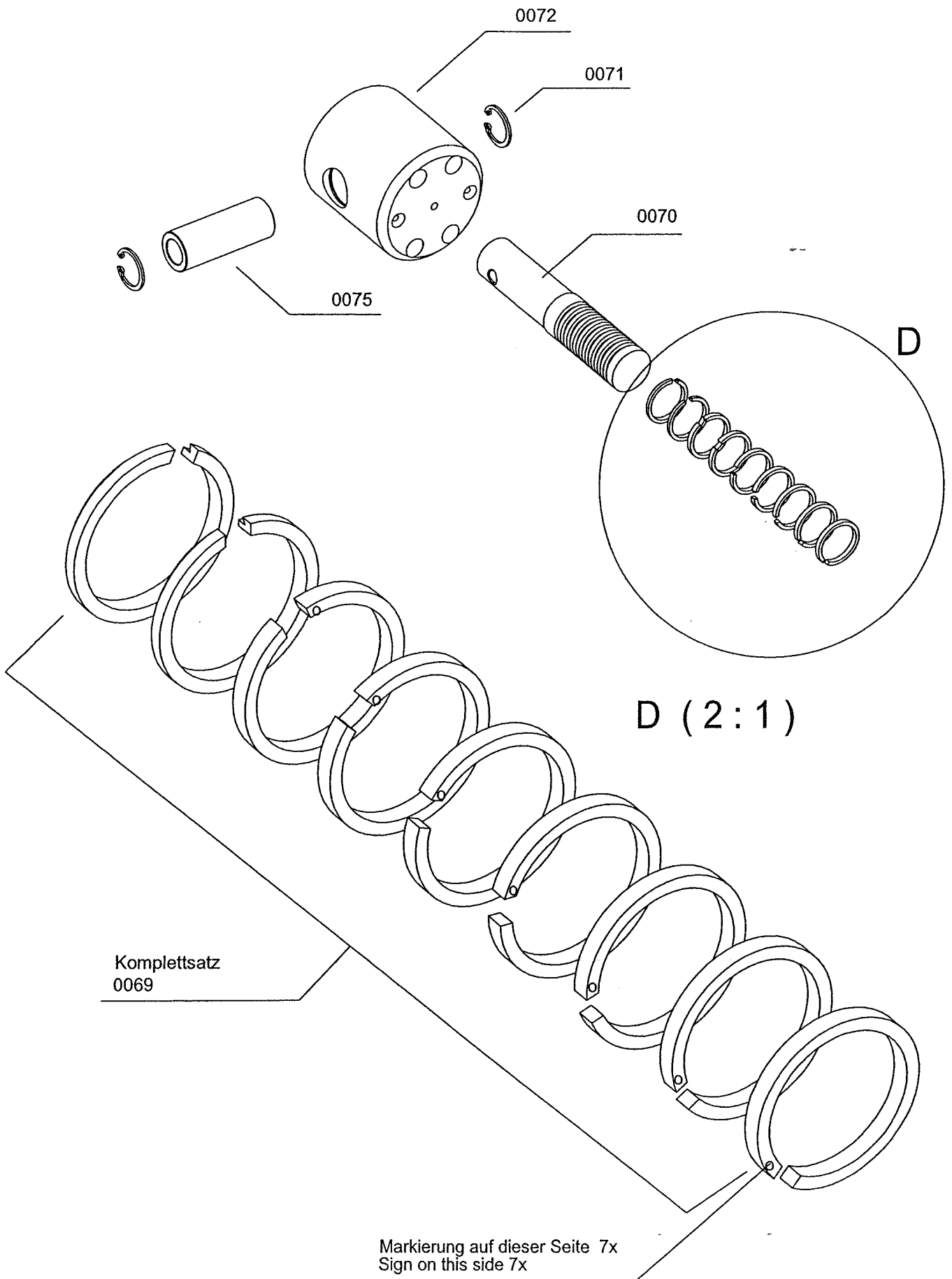


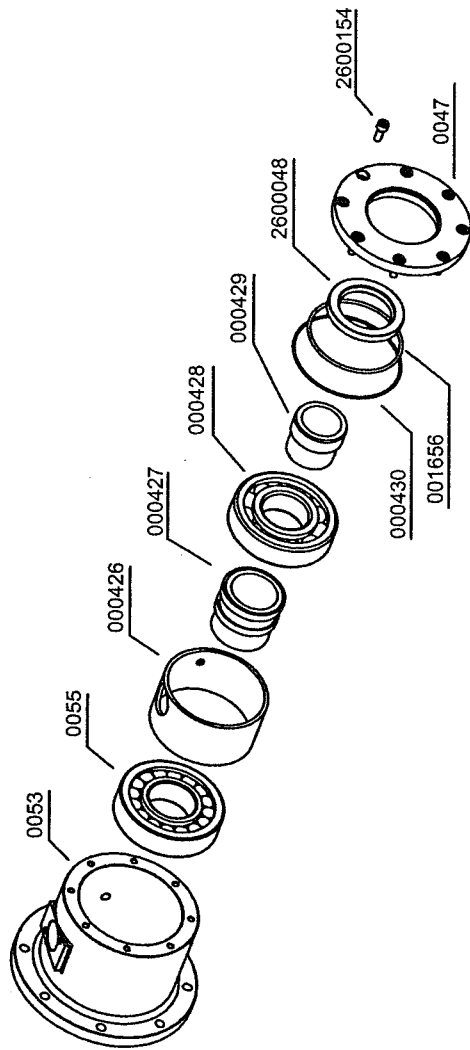
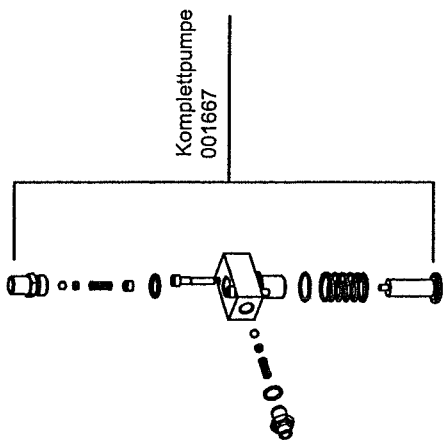
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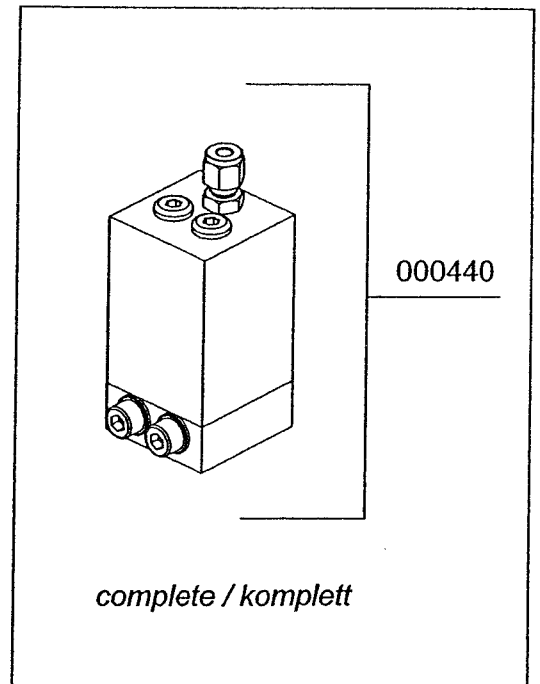
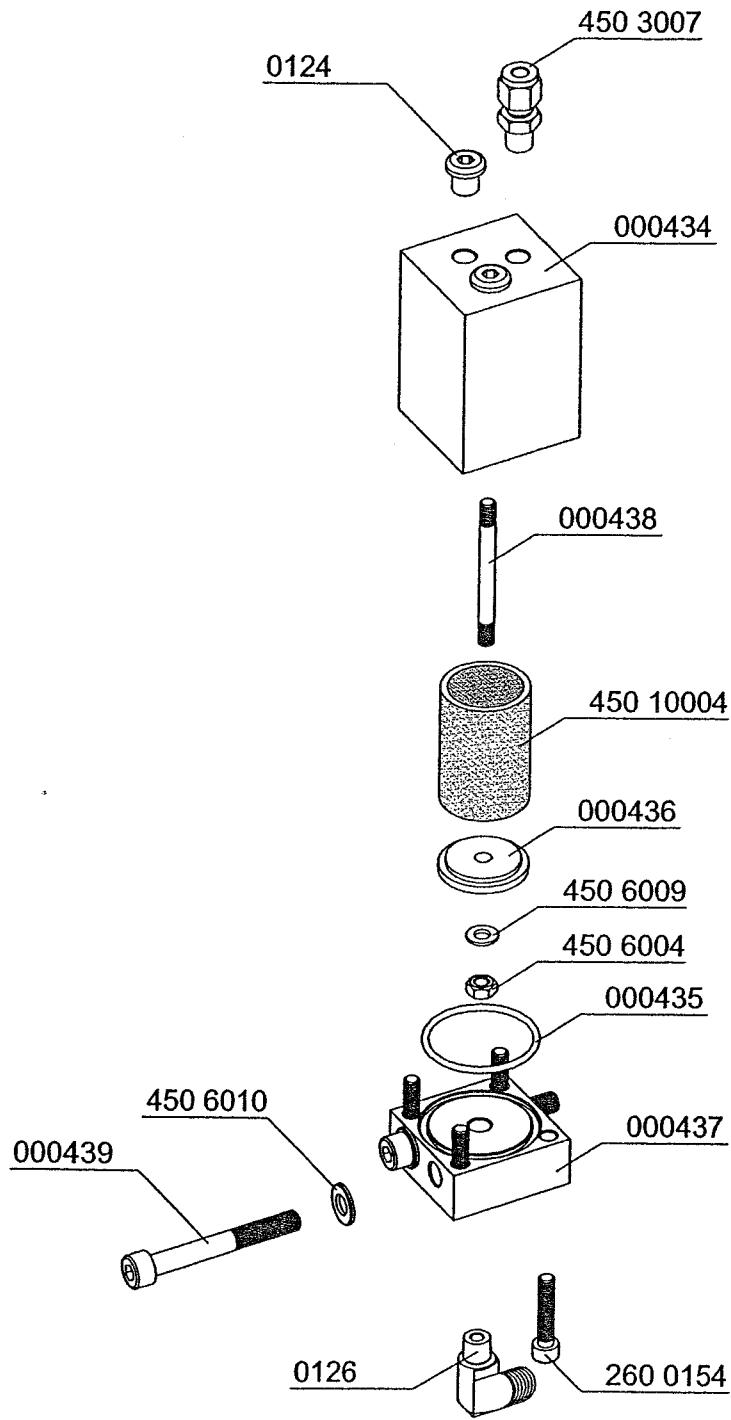




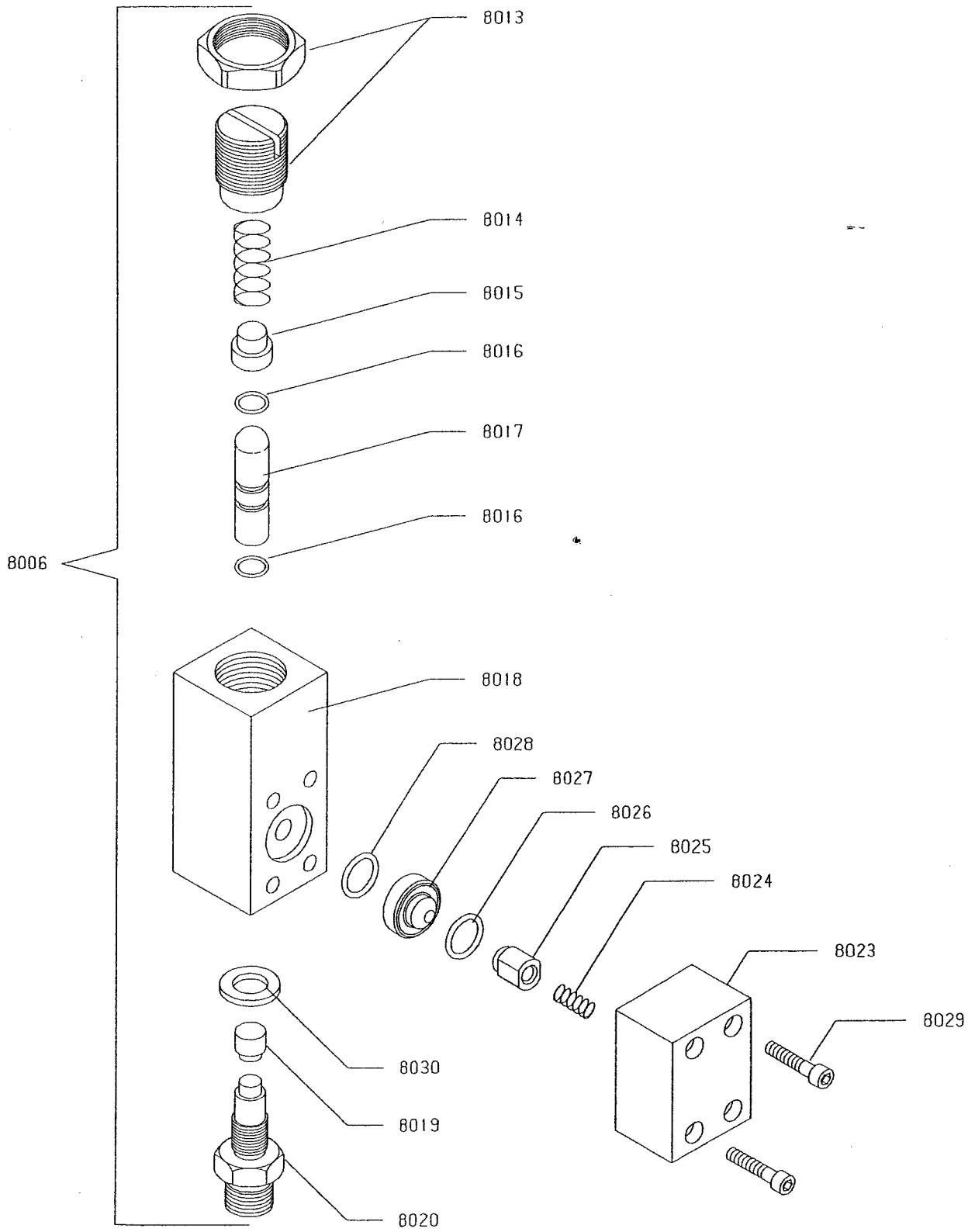
Kompressor L&W 280  
Baugruppe: Kolben St. 3  
Assembly: Piston 3rd stage

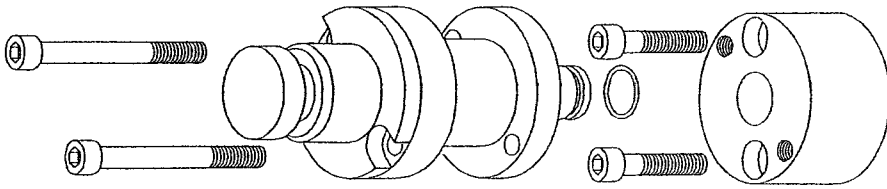




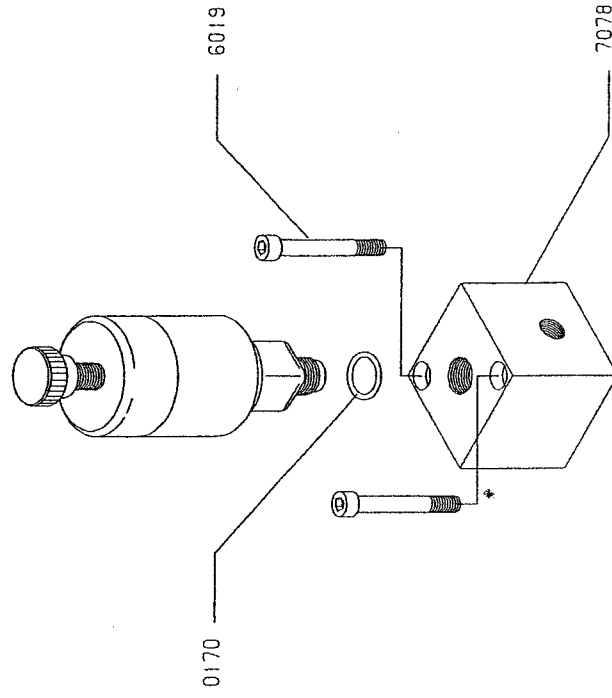


**Oilfilter Assembly**  
**Zusammenbau Ölfilter**

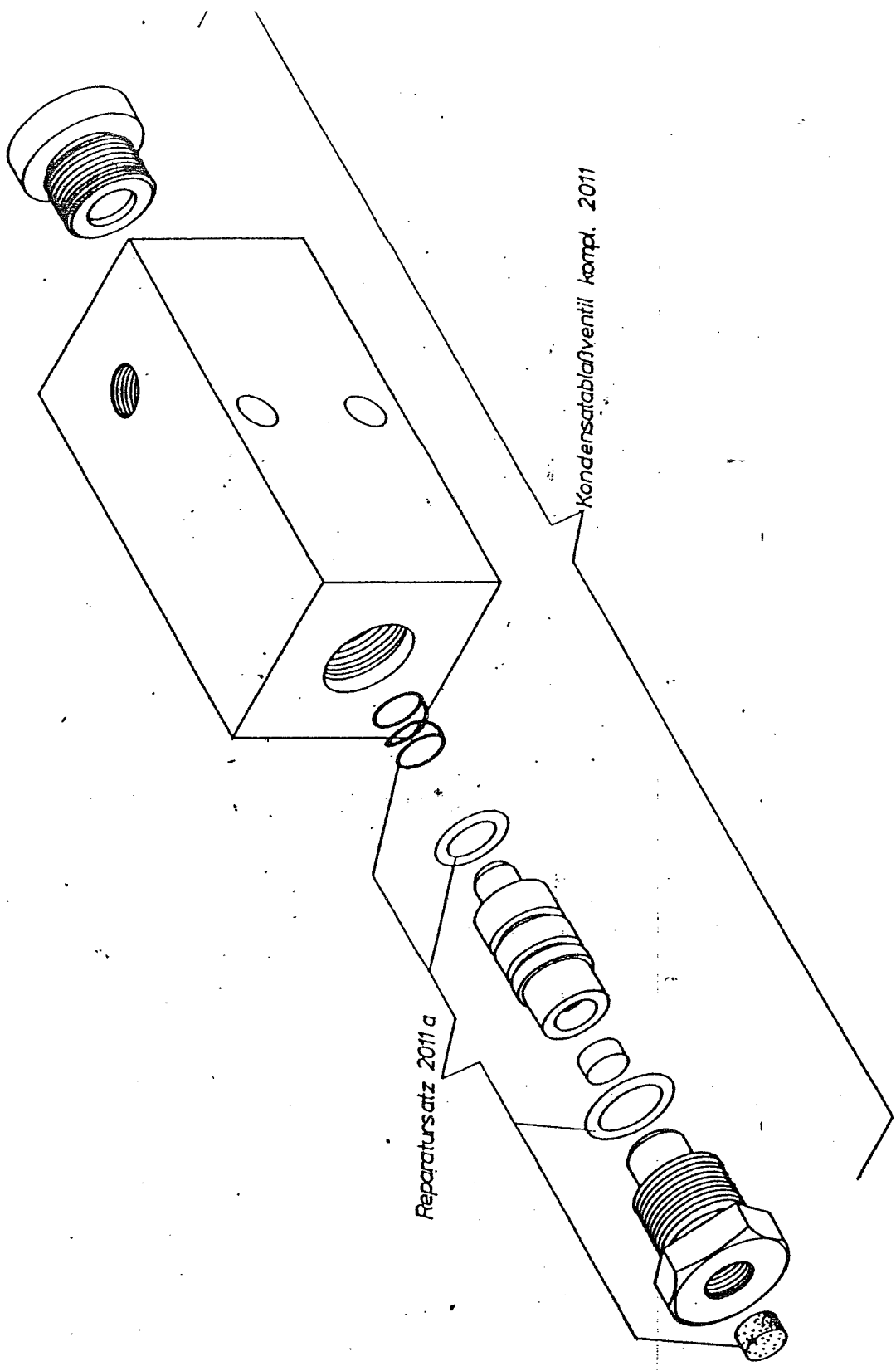




225 bar 4052  
330 bar 4053



225 bar 7007  
330 bar 7008



Kondensatablaßventil kompl. 2011

Reparatursatz 2011 a

