OPTIMUM®
MASCHINEN - GERMANY

Operating manual

Version 1.6.4

Metal band saw

○ OPTIsaw® S 181

3300181

○ OPTIsaw® S 181G

3300182

Table of contents

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Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.
Keep these operating instructions in a safe place nearby the machine.

Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.
Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved!

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.

Optimum Maschinen Germany GmbH

Dr.- Robert - Pfleger - Str. 26

D-96103 Hallstadt

Mail: info@optimum-maschinen.de

Internet: www.optimum-maschinen.com

1 Safety

Glossary of symbols

☞	gives further advice
➜	calls on you to act
❍	enumerations

This part of the operating instructions

- ❍ explains the meaning and use of the warning notices included in these operating instructions,
- ❍ defines the intended use of the metal band saw ,
- ❍ points out the dangers that might arise for you or others if these instructions are not observed,
- ❍ informs you about how to avoid dangers.

In addition to these operation instructions, please observe

- ❍ the applicable laws and regulations,
- ❍ the legal regulations for accident prevention,
- ❍ the prohibition, warning and mandatory signs as well as the warning notes on the metal band saw.

European standards must be kept during installation, operation, maintenance and repair of the metal band saw.

If European standards are not applied at the national legislation of the country of destination, the specific applicable regulations of each country are to be observed.

If required it is necessary to take the corresponding measures to comply with the country-specific regulations before commissioning the metal band saw.

Always keep this documentation close to the metal band saw.

INFORMATION

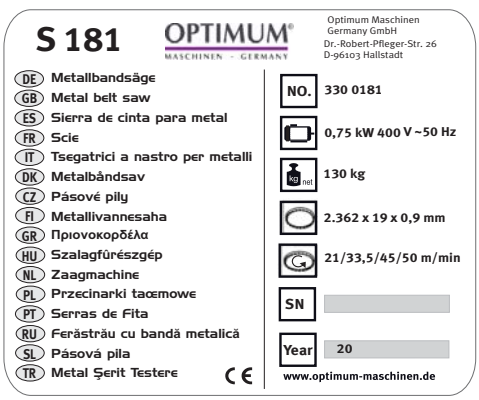
If you are unable to solve a problem using these operating instructions, please contact us for advice:

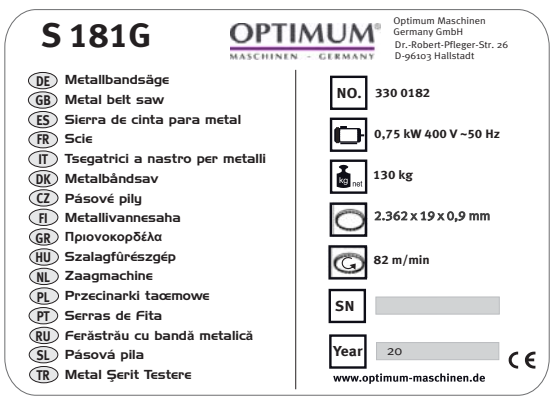
Optimum Maschinen Germany GmbH
Dr. Robert-Pfleger-Str. 26

D- 96103 Hallstadt

Email: info@optimum-maschinen.de

1.1 Rating plates





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1.2 Safety instructions (warning notes)

1.2.1 Classification of hazards

We classify the safety warnings into various levels. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Ideogram	Warning alert	Definition / consequence
	**DANGER!**	Threatening danger that will cause serious injury or death to people.
	WARNING!	A danger that might cause severe injury to the personnel or can lead to death.
	CAUTION!	Danger or unsafe procedure that might cause injury to people or damage to property.
	**ATTENTION!**	Situation that could cause damage to the machine and product and other types of damage. No risk of injury to people.
	**INFORMATION**	Application tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram by

general danger — by a warning of — injury of hands, — hazardous electrical voltage, — or — rotating parts.

1.2.2 Other pictograms

Warning danger of slipping!

Warning risk of stumbling!

Warning hot surface!

Warning biological hazard!

Warning of automatic start-up!

Warning tilting danger!

Warning of suspended loads!

Activation forbidden!

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Read the operating instructions before commissioning!

Disconnect the mains plug!

Use protective glasses!

Use protective gloves!

Use protective boots!

Use protective suit!

Use ear protection!

Protect the environment!

Contact address

1.3 Intended use

Use

WARNING!

In the event of improper use, the metal band saw

- **will endanger personnel,**
- **the machine and other material property of the operating company will be endangered,**
- **the correct function of the machine may be affected.**

The machine is designed and manufactured to be used in environments where there is no potential danger of explosion.

The machine is designed and manufactured to saw cold metal, cast material and plastics or other material that are not health hazardous and do not generate dust.

The metal band saw must not be used on wood.

The pieces to be cut must be of a shape that will allow them to be securely attached in the workholder vice and ensure that the piece does not come loose when it is being sawed.

The metal band saw must only be installed and operated in a dry and ventilated place.

If the metal band saw is used in any way other than described above, modified without authorization of Optimum Maschinen Germany GmbH, then the metal band saw is being used improperly.

Operations not in accordance with intended use!

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee or CE conformity will expire due to any constructive technical or procedural changes which had not been performed by the company Optimum Maschinen Germany GmbH.

It is also part of intended use that you

- observe the limits of the metal band saw,
- the operating manual is observed,
- the inspection and maintenance instructions are observed.

☞ Technical data on page 14

The decisive factor for achieving efficient cutting and the necessary angular tolerance is the correct choice of parameters such as the saw blade, feed, cutting pressure, cutting speed and cooling agent.

WARNING!

Heaviest injuries due improper use.

It is forbidden to make any modifications or alternations to the operation values of the metal band saw ! They could endanger the staff and cause damage to the metal band saw.

1.4 Possible dangers caused by the metal band saw

The metal band saw has undergone a safety inspection (analysis of danger with assessment of risks). It has been designed and built on the basis of this analysis using the latest technological advances.

Nevertheless, there is a residual risk as the metal band saw operates with

- electrical voltage and currents,
- an revolting saw band.

We have used construction resources and safety techniques to minimize the health risk to personnel resulting from these hazards.

If the metal band saw is used and maintained by the staff who are not duly qualified, there may be a risk resulting from incorrect or unsuitable maintenance of the metal band saw.

INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

- be duly qualified,
- strictly follow these operating instructions.

Always disconnect the metal band saw if cleaning or maintenance work is being carried out.

WARNING!

The metal band saw may only be used with the safety devices activated.

Disconnect the metal band saw immediately whenever you detect a failure in the safety devices or when they are not mounted!

All additional devices installed by the operator have to be equipped with the prescribed safety devices.

This is your responsibility being the operating company!

☞ Safety devices on page 10

1.5 Qualification of personnel

1.5.1 Target group

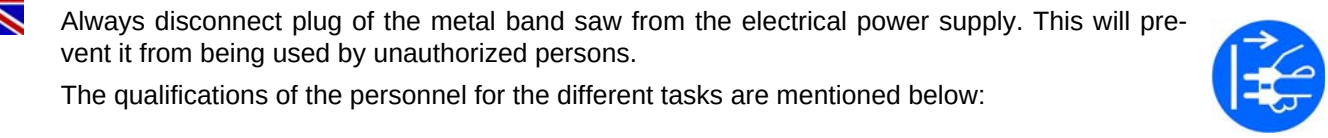
This manual is addressed to

- the operating companies,
- the operators,
- the personnel for maintenance works.

Therefore, the warning notes refer to both operation and maintenance of the metal band saw.

Determine clearly and explicitly who will be responsible for the different activities on the machine (operation, maintenance and repair).

Unclear responsibilities constitute a safety risk!



Always disconnect plug of the metal band saw from the electrical power supply. This will prevent it from being used by unauthorized persons.

The qualifications of the personnel for the different tasks are mentioned below:

Operator

The operator is instructed by the operating company about the assigned tasks and possible risks in case of improper behaviour. Any tasks which need to be performed beyond the operation in the standard mode must only be performed by the operator if it is indicated in these instructions and if the operating company expressively commissioned the operator.

Electrical specialist

Due to his professional training, knowledge and experience as well as his knowledge of respective standards and regulations the electrical specialist is able to perform works on the electrical system and to recognise and avoid any possible dangers himself.

The electrical specialist is specially trained for the working environment in which he is working and knows the relevant standards and regulations.

Qualified personnel

Due to their professional training, knowledge and experience as well as their knowledge of relevant regulations the qualified personnel is able to perform the assigned tasks and to recognise and avoid any possible dangers themselves.

Instructed person

Instructed personnel were instructed by the operating company about the assigned tasks and any possible risks in case of improper behaviour.

1.5.2 Authorized personnel

WARNING!

Inappropriate operation and maintenance of the metal band saw constitutes a danger for the staff, objects and the environment.

Only authorized staff may operate the metal band saw !

Persons authorized to operate and maintain should be trained technical personnel and instructed by the ones who are working for the operating company and for the manufacturer.

The operating company must

Obligations of the operating company

- train the personnel,
- instruct the personnel in regular intervals (at least once a year) on
  - all safety standards that apply to the machine,
  - the operation,
  - accredited technical guidelines,
- check personnel‘s state of knowledge,
- document the trainings/instructions,
- require personnel to confirm participation in training/instructions by means of a signature,
- check whether the personnel is working safety- and risk-conscious and observe the operating instructions.

The operator must

Obligations of the operator

- have obtained a training regarding the handling of the metal band saw,
- know the function and mode of action,
- before taking the machine in operation
  - have read and understood the operating manual,
  - be familiar with all safety devices and instructions.

For work on the following parts there are additional requirements:

- Electric components or operating materials:
  Must only be performed by a qualified electrician or person working under the instructions and supervision of a qualified electrician.

  Before starting work on electrical parts or operating agents, following measures are to be performed in the following order.
- disconnect all poles
- Secure against switching on.
- Check if the machine is zero potential.

1.6 Safety measures during operation

CAUTION!

Risk due to inhaling of health hazardous dusts and mist.

Dependent on the material which need to be processed and the used auxiliaries dusts and mist may be caused which might impair you health.

Make sure that the generated health hazardous dusts and mist are safely sucked off at the point of origin and is dissipated or filtered from the working area. To do so, use a suitable extraction unit.

1.7 Safety devices

Use the metal band saw saw only with properly functioning safety devices.

Stop the metal band saw immediately if there is a failure on the safety device or if it is not functioning for any reason.

It is your responsibility!

If a safety device has been activated or has failed, the metal band saw must only be used if you

- have removed the cause of the failure,
- have verified that there is no danger resulting for the personnel or objects.

WARNING!

If you bypass, remove or override a safety device in any other way, you are endangering yourself and other persons working on the metal band saw. The possible consequences are:

- **injuries due to components or parts of components flying off at high speed,**
- **contact with rotating and revolting parts,**
- **a fatal electrocution,**

The metal band saw includes the following safety devices:

- emergency stop button,
- Protective cover for the V-belts on the metal band saw S181,
- Saw blade casing with protective cover at the rear.

WARNING!

The separating protective equipment which are made available and delivered together with the machine are designed to reduce the risk of workpieces or fractions of them which being expelled, but not to remove them completely. Always work carefully and observe the limit values of your chipping process.

1.7.1 Saw arch

The saw arch of the metal band saw is fitted with a protective cover firmly screwed laterally. The protective cover protects the belt guide pulleys and the rotating saw belt.

Close and mount all protective covers before restarting the metal band saw.

WARNING!

Danger of injury! The teeth of the saw belt are sharp. Take thorough care when removing the rear cover to change the saw belt.

1.8 Prohibition, warning and mandatory signs

INFORMATION

All warning signs must be legible. Check them regularly.

1.9 Safety check

➜ Check the metal band saw at least once per shift. Inform the person responsible immediately of any damage, defect or change in the operating function.

➜ Check all safety devices

- ❍ at the beginning of each shift (with the machine stopped),
- ❍ once a week (with the machine in operation),
- ❍ after every maintenance and repair work.

➜ Check that prohibition, warning and information signs and the labels on the metal band saw

- ❍ are legible (clean them, if necessary),
- ❍ are complete.

INFORMATION

Use the following table in order to organize the checks.

General check		
Equipment	**Check**	**OK**
Protective covers	Mounted, firmly bolted and not damaged	
Signs, Markings	Installed and legible	
Date:	**checked by (signature):**	

Functional check		
Equipment	**Check**	**OK**
emergency stop button	When the EMERGENCY STOP push button is activated, the metal band saw must switch off.	
Date:	**checked by (signature):**	

1.10 Individual protection gear

For certain work individual protection gear as protective equipment. This includes:

- Safety helmet,
- protective glasses or face guard,
- protective gloves,
- safety shoes with steel toe caps,
- ear protection.

Before starting work, make sure that the prescribed individual protective equipment is available in the workplace.

CAUTION!

Dirty or contaminated personnel protective equipment can cause diseases.

Clean your individual protection gear

- **after each use,**
- **regularly, at least once a week.**

Individual protection gear for special work

Protect your face and eyes: Wear a safety helmet with facial protection when performing works where your face and eyes are exposed to hazards.

Use protective gloves when handling pieces with sharp edges.

Use safety shoes when you assemble, disassemble or transport heavy components.

1.11 Safety during operation

We specially point out the specific dangers when working with and on the metal band saw.

WARNING!

Before switching on the metal band saw make sure that there are

- **no dangers generated for persons,**
- **no objects are damaged.**

Avoid any risky working practices:

➜ Make sure that nobody is endangered by your work.

➜ The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.

➜ Do not work on the metal band saw, if your concentration is reduced, for example, because you are taking medication.

➜ Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company.

➜ Stay at the metal band saw until all movements have come to a complete standstill.

➜ Use the prescribed personnel protective equipment. Make sure to wear a well-fitting work suit and, if necessary, a hairnet.

➜ Inform the supervisor about all endangerments or errors.

1.12 Safety during maintenance

Inform the operators on time of any maintenance and repair work.

Report and document any changes

Report all safety relevant changes and performance details of the metal band saw. Document all changes, have the operating instructions updated accordingly and train machine operators.

1.12.1 Disconnecting and securing the metal band saw

➜ Turn off the main plug before starting any maintenance or repair work.

➜ Attach a warning sign on the machine.

1.12.2 Using lifting equipment

WARNING!

The use of unstable lifting and load suspension gear that might break under load can cause severe injuries or even death.

Check that the lifting and load suspension gear devices

- **they have sufficient load carrying**
- **and that it is in perfect condition.**

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.

Never walk under suspended loads!

1.12.3 Mechanical maintenance work

Remove or install protection safety devices before starting any maintenance work and re-install them once the work has been completed.This includes:

- Covers,
- Safety indications and warning signs,
- earth (ground) connections.

If you remove protection or safety devices, refit them immediately after completing the work.

Check if they are working properly!

1.13 Accident report

Inform your superiors and Optimum Maschinen Germany GmbH immediately in the event of accidents, possible sources of danger and any actions which almost led to an accident (near misses).

There are many possible causes for "near misses".

The sooner they are notified, the faster the causes can be eliminated.

INFORMATION

We point out the specific dangers when performing works with and on the metal band saw when describing such works.

1.14 Electrical system

Have the machine and/or the electrical equipment checked regularly, at least every six months.

Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency.

Disconnect the metal band saw immediately if there is a malfunction in the power supply !

☞ Maintenance on page 29

2 Technical data

The following information are the dimensions and indications of weight and the manufacturer‘s approved machine data.

2.1 Electrical connection	S181	S181G
Total connected load	3 x 400 V; 50 Hz; 0.75 KW	
permitted voltage tolerance	380 V - 420 V	

2.2 General	S181	S181G
Cutting angle adjustment	using the adjustable jaws on the vice	
Saw belt guide	inversion pulleys supported on ball bearings	
Raising the saw arch	manually	
Feed	The descent speed can be adjusted using a hydraulic cylinder with continuous advance	
Tension of the saw blade	Manually using the hand wheel	
Loading height vise	560mm	

2.3 Dimensions	S181	S181G
Length [mm]	1295	1275
Height [mm]	1060	1100
Height of work area [mm]	1650	1650
Width without material stop [mm]	450	450
Width with material stop [mm]	600	720
Total weight [kg]	130	130
Dimensions of saw blade [mm]	2362 x 19 x 0.9	

2.4 Speed of saw belt	S181	S181G
	by means of V-belt pulleys	by means of gear shifting mechanism
[m/min]	21 | 33.5 | 45 | 50	45 | 67 | 77

2.5 Environmental conditions	S181	S181G
Temperature	5-35 °C	
Humidity	25 - 80 %	

2.6 Operating material	S181	S181G
Hydraulic cylinder	Hydraulic oil, viscosity 32 - 46 as per DIN 51519, HLP Quality	
Spindle of the machine vice	commercial slide bearing grease	
Helical gear	Mobil 629	

2.6 Operating material	S181	S181G
Slide bearing	commercial slide bearing grease	
Coolant equipment	Commercial lubricating and cooling agent	

2.7 Coolant pump	S181	S181G
Power	230 V ; 50 Hz; 90 W	
Speed [min^{-1}]	2850	
Tank capacity [liter]	11	

2.8 Emissions

The generation of noise emitted by the metal band saw is 73 dB(A). If the metal band saw is installed in an area where various machines are in operation, the noise exposure (immission) on the operator of the metal band saw at the working place may exceed 80 dB(A).

INFORMATION

This numerical value was measured on a new machine under proper operating conditions. Depending on the age respectively on the wear of the machine it is possible that the noise behaviour of the machine changes. Furthermore, the factor of the noise emission is also depending on manufacturing influencing factors, e.g. speed, material and clamping conditions.

INFORMATION

The mentioned numerical value is the emission level and not necessarily a safe working level.

Though there is a dependency between the degree of the noise emission and the degree of the noise disturbance it is not possible to use it reliably to determine if further precaution measures are required or not.

The following factors influence the actual degree of the noise exposure of the operator:

- Characteristics of the working area, e.g. size or damping behaviour**,**
- Other noise sources, e.g. the number of machines,
- Other processes taking place in the proximity and the period of time during which the operator is exposed to the noise.

Furthermore, it is possible that the admissible exposure level might be different from country to country due to national regulations. This information about the noise emission shall allow the operator of the machine to more easily evaluate the endangering and risks.

CAUTION!

Depending on the overall noise exposure and the basic limit values the machine operators must wear an appropriate hearing protection.

We generally recommend to use a noise protection and a hearing protection.

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3 Delivery, interdepartmental transport, assembly and commissioning

3.1 Notes on transport, installation, commissioning

Improper transport, installation and commissioning is liable to accidents and can cause damage or malfunctions to the machine for which we do not assume any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck or a crane to the installation site.

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.

Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.

3.1.1 General risks during internal transport

WARNING: TILTING DANGER!

The machine may be lifted unsecured by a maximum of 2 cm.

Employees must be outside the danger zone, i.e. the reach of the load.

Warn employees and advise them of the hazard.

Machines may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and faults.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of interdepartmental transport is therefore essential.

3.2 Scope of delivery

INFORMATION

The metal band saw is delivered pre-assembled.

When the metal band saw is delivered, please check immediately that it has not been damaged during transport. Also check that no fastening screws have come loose.

- Metal band saw
- Bimetallic saw belt
- 2 x Wheels, split pins, washers, wheel axle
- 1 x Transport handle
- 1 x Foot
- Coolant equipment
- Material stop
- Instruction manual

3.3 Storage

ATTENTION!

In case of wrong and improper storage components might get damaged and destroyed.

Store packed and unpacked parts only under the intended environmental conditions ☞ Environmental conditions on page 14

Consult Optimum Maschinen Germany GmbH if the metal band saw and accessories are stored for more than three months or are stored under different environmental conditions than those given here.

3.4 Installation and assembly

3.4.1 Requirements regarding the installation site

Organize the working area around the metal band saw according to the local safety regulations ☞ Dimensions on page 14.

The working area for operating, maintenance and repair must not be hindered.

INFORMATION

The mains plug of the metal band saw must be freely accessible.

3.5 Assembly

CAUTION!

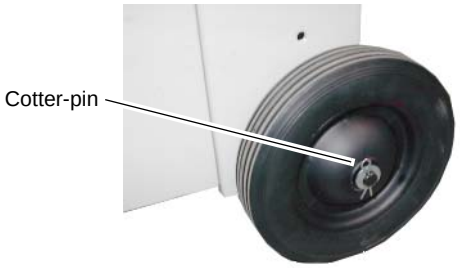
Danger of crushing and overturning. Proceed with caution during the work described below.

3.5.1 Wheels

➜ Place wooden chocks beneath the lower frame for fitting the wheels. Make sure the metal band saw is located on a sturdy base.

➜ Pass the axle through the bore holes in the lower frame.

➜ Position the wheels onto the axles and attach them in place using cotter-pins.



Img.3-1: Wheel

3.5.2 Machine stand and transport handle

➜ Fit the transport handle and the machine stand with the assembling auxiliaries supplied.

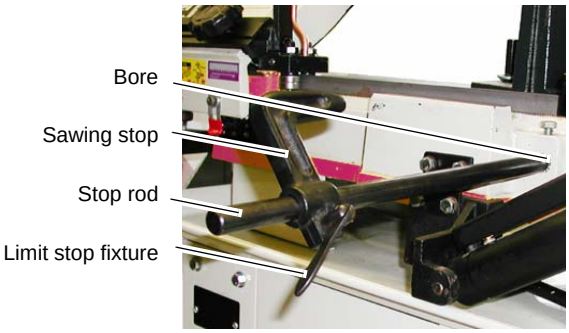
Img.3-2: Machine stand and transport handle

3.5.3 Material stop

➜ Position the stop rod in the hole and immobilise it with the lock screw.

➜ Push the saw stop onto the stop rod.

➜ Lock the saw stop using the limit stop fixture.



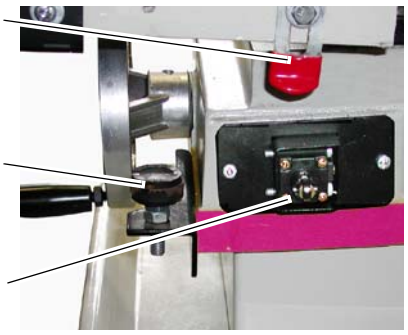
Img.3-3: Material stop

3.5.4 Transportation lock

➜ Remove the transport lock.

➜ Replace the transport lock with the end stop buffer supplied with the machine for the saw arch.

➜ Adjust the end stop buffer so that the end stop switch lug hits the end stop switch when finishing the sawing process.



Img.3-4: End stop buffer

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3.6 First commissioning

ATTENTION!

Before commissioning the machine check all screws, fixtures resp. safety devices and tighten up the screws if necessary!

WARNING!

When first commissioning the metal band saw by inexperienced staff you endanger people and the machine.

We do not take any liability for damages caused by incorrectly performed commissioning.

3.7 Checks

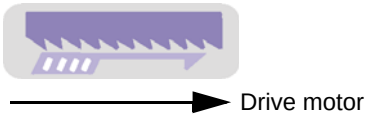
Perform the following checks.

CAUTION!

Danger of cutting, perform the works described hereunder with care. Use the prescribed protective equipment.

3.7.1 Direction of the saw teeth

➜ Check the direction of the saw teeth. The saw teeth have to point to the drive engine.

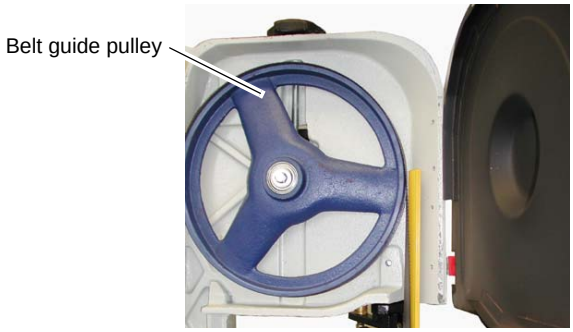


Img. 3-5: Indicating label

3.7.2 Inspecting the belt guide pulleys

➜ Check if the saw belt is mounted correctly onto the belt guide pulleys.

☞ Aligning the saw belt on page 36

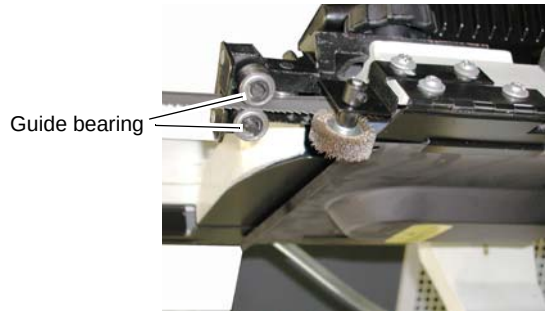


Img. 3-6: Belt guide pulley

3.7.3 Saw belt guide bearings

➜ Check that the saw belt fits snugly inside the guide bearings.

☞ Adjusting the belt guide bearings on page 32



Img. 3-7: Blade guide bearings

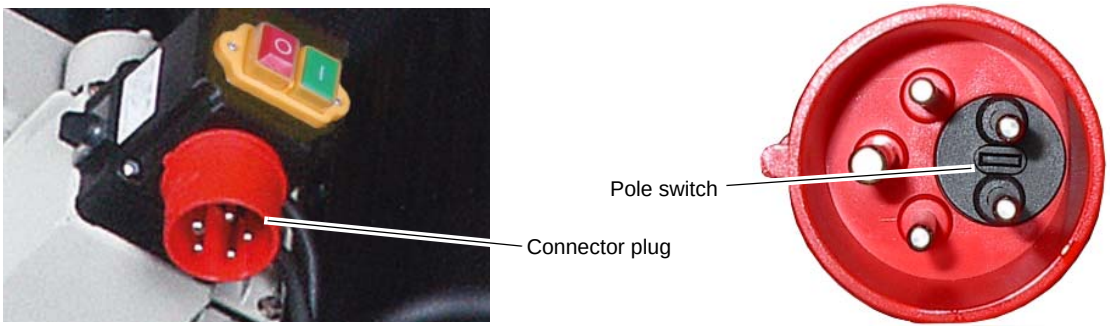
3.7.4 Tension of the saw blade

➜ Check the tension of the saw belt. The correct saw belt tension is achieved, when you can move the saw belt with a power of about 50 N in the middle by 3mm. ☞ Setting the tension in the saw belt on page 31

3.7.5 Power supply

Connect a CEE-400V-16A plug.

Modify the polarity at the terminal counter of the combined switch/plug with a screwdriver if the direction of the saw belt is wrong.



Img.3-8: Switch / plug combination

ATTENTION!

Imperatively make sure that all 3 phases (L1, L2, L3) are correctly connected.

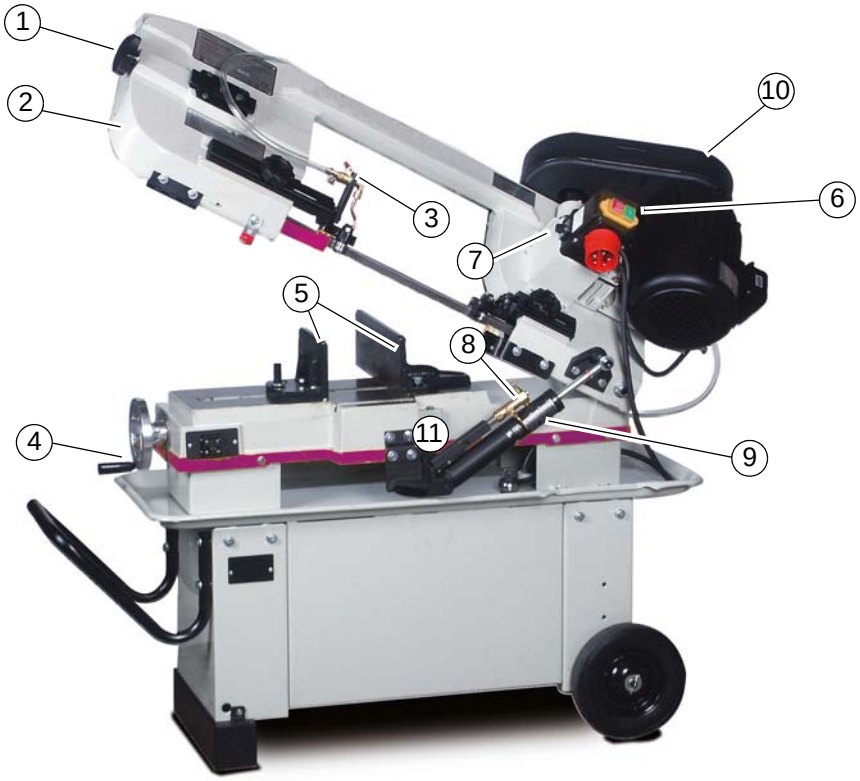
Most motor defects result of wrong connections. For instance if a motor phase is not correctly clamped or connected to the neutral conductor (N).
Effects may be as follows:

- **The motor is getting hot very rapidly.**
- **Increased motor noises.**
- **The motor has no power.**

The guarantee will become null and void if the machine is wrongly connected.

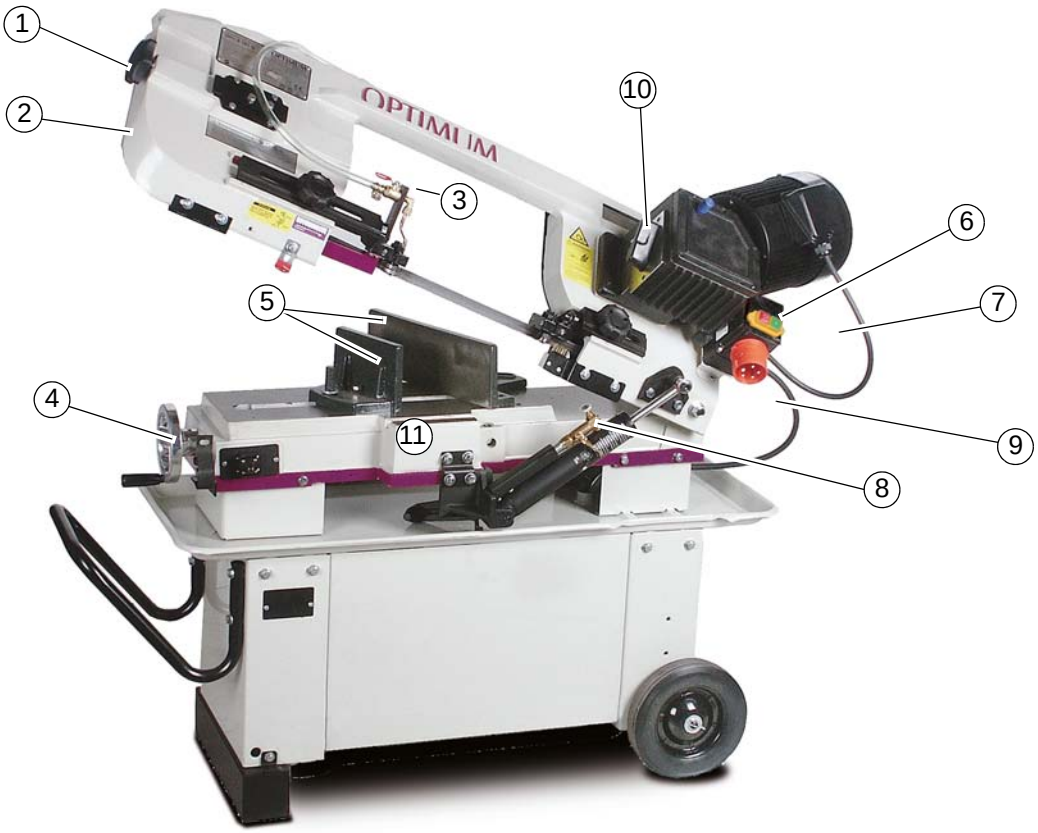
4 Operation

4.1 Control and indicating elements S181



Pos.	Designation	Pos.	Designation
1	Tension of the saw blade	6	ON / OFF switch
2	Saw arch	7	ON / OFF switch for coolant pump
3	Coolant hose and adjusting valve	8	Feed regulation valve
4	Handwheel machine vice	9	Hydraulic cylinder
5	Swivelling clamping jaws	10	Protective cover of the V-belts
11	Material stop		

4.2 Control and indicating elements S181G



Pos.	Designation	Pos.	Designation
1	Tension of the saw blade	6	ON / OFF switch
2	Saw arch	7	ON / OFF switch for coolant pump
3	Coolant hose and adjusting valve	8	Feed regulation valve
4	Handwheel machine vice	9	Hydraulic cylinder
5	Swivelling clamping jaws	10	Gear
11	Material stop		

4.3 Safety

Use the metal band saw saw only under the following conditions:

- The metal band saw is in proper working order.
- The metal band saw is used as prescribed.
- The operating manual is followed.
- All safety devices are installed and activated.

All failures should be eliminated immediately. Stop the machine immediately in the event of any abnormality in operation and make sure it cannot be started-up accidentally or without authorisation.

Notify the person responsible immediately of any modification.

☞ Safety during operation on page 12

S181_S181G_GB_4.fm

4.4 Inserting the workpiece

➜ Raise the saw arch.

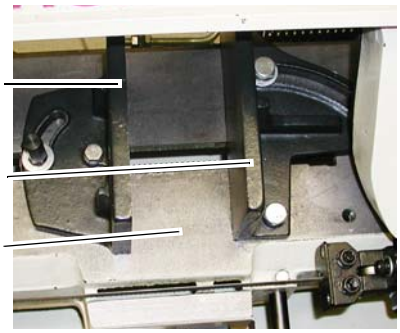
➜ Place the closing tap in vertical position to secure the arch in a given position.

Img. 4-1: Hydraulic feed

➜ Place the piece to be cut in the workholder vice.

ATTENTION!

Danger of overturning of the metal band saw. Support long work pieces before pushing the piece to be cut into the workholder vice.



Img. 4-2: Machine vice

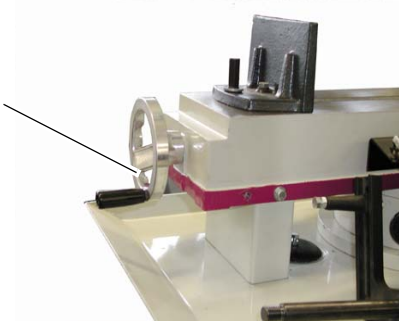
WARNING!

Disconnect the metal band saw from the mains if you are making angular modifications to the clamping jaws or increasing the holding capacity of the machine vice.

For angular cuts, the clamping jaws on the machine vice can be adjusted with a continuous advance to a maximum of 45°.

Img. 4-3: Angular cut

➜ Secure the workpiece between the clamping jaws by turning the handwheel.



Img. 4-4: Handwheel

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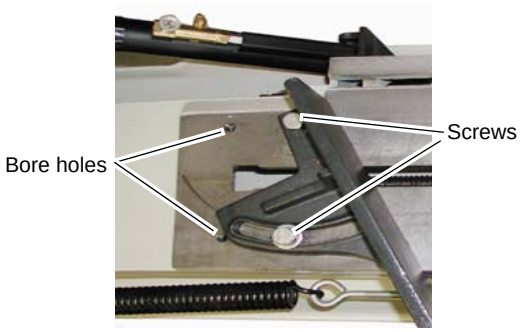
4.4.1 Increasing the holding capacity

➜ Disconnect the metal band saw from the power supply.

➜ Unscrew the bolts on the rear clamping jaw.

➜ Set the clamping jaw at a greater distance in the holes provided.

➜ Retighten the clamping jaw.



Img.4-5: Rear clamping jaw

ATTENTION!

Re-tighten the clamping jaws after any change in the angle or position.

4.5 Adjusting the saw belt guide

Change the position of the saw belt guidance depending on the size of the pieces to be cut.

➜ Loosen the setscrews.

➜ Adjust the saw belt guidance close to the workpiece without influencing or hindering the sawing procedure.

➜ Re-tighten the set screw.

Img.4-6: Setscrews

ATTENTION!

An unnecessarily wide space between the work piece and the saw belt guide, in combination with a high feed rate very quickly causes the saw belt to wear down.

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4.6 Speed of saw belt

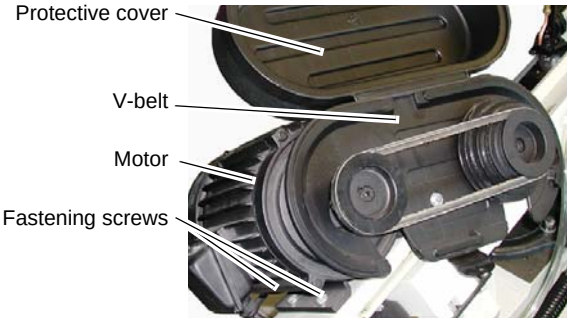
4.6.1 Adjusting the speed of the saw belt - S181

WARNING!

Do not open the protective cover until you have disconnected the metal band saw from the power supply.

Close and screw down the protective cover after any adjustment to the saw belt speed.

➜ Disconnect the metal band saw from the power supply.



Img.4-7: Speed of saw belt

➜ Loosen the fastening screws on the motor plate until you can move it to reduce the tension in the Vbelt.

➜ Place the V-belt in the required position on the pulleys.

➜ Tighten the V-belt by moving the motor back.

➜ Check the tension in the V-belt. The tension in the V-belt is correct if you can push it approximately 1cm with your finger.

➜ Re-tighten the fastening screws of the motor plate and connect the metal band saw to the power supply.

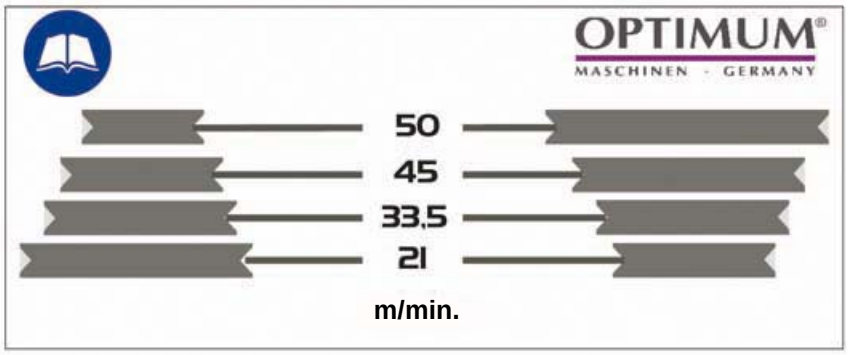
➜ Close and screw down the protective cover.

ATTENTION!

Make sure the V-belts have the right tension.

Too heavy or too low tension of the belt can cause damage.

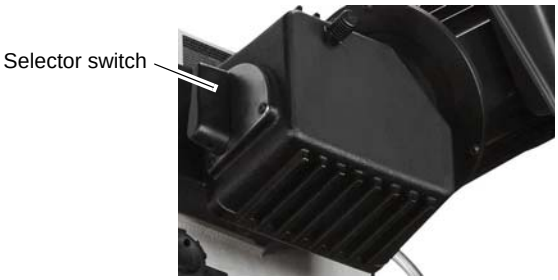
4.6.2 Speed table S181



4.6.3 Adjusting the speed of the saw belt - S181G

Selector switch

➜ Choose the speed level by means of the selector switch.



Img. 4-8: Selector switch

4.7 Saw belt speeds

Guidelines values for cutting speeds [m / min] :

Material	[m / min]	Material	[m / min]	Material	[m / min]	Material	[m / min]
Tool steel	21 - 45	Medium to high alloy carbon steels	33, 5 - 65	Low-alloy carbon steel	45 - 65	Aluminium	50 - 77
Chrome-nickel steel		Hard brass		Soft brass		Plastic	
High-grade steel		Bronze					

4.8 Coolant equipment

WARNING!

Ejection and overflowing of coolants and lubricants. Make sure you do not get the cooling lubricants on the floor. Spilled on the floor cooling agents must be removed immediately.

ATTENTION!

Failure of the pump in case of dry running. The pump is lubricated by the coolant. Do not start up the pump without cooling agent.

INFORMATION

Use as cooling agents a water soluble, ecologically harmless sawing emulsion, which they can refer in the specialized trade. Make sure that the cooling agent is properly retrieved.

Respect the environment when disposing of any lubricants and coolants.

Follow the manufacturer’s disposal instructions.

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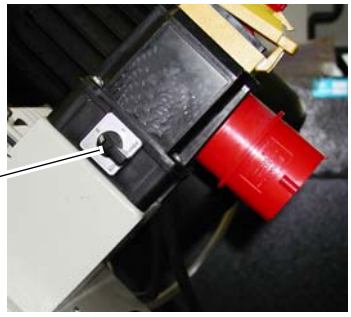
➜ Switch on the cooling units by pressing the switch.



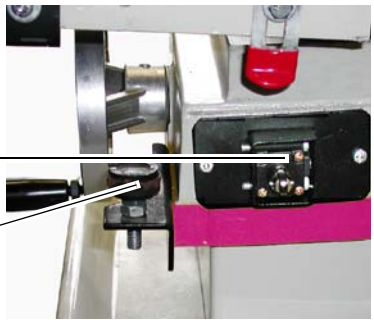
Img. 4-9: Switch cooling unit

4.9 Starting the metal band saw

➜ Start the metal band saw by pressing the green button.

4.9.1 End stop switch

The end stop switch disconnects the metal band saw in the bottom position.



Img. 4-10: End stop switch

4.10 Hydraulic feed

➜ Adjust the down speed of the saw arch with the feed regulation valve.

➜ Open the stop cock.

The belt saw automatically switch off when you reach your end position.

Follow the same steps in reverse order to remove the work piece from the vice.

Img. 4-11: Hydraulic feed

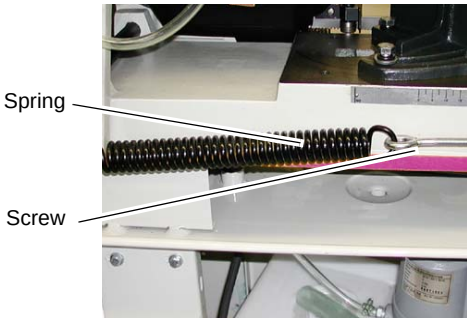
EMPIRICAL RULE !

The finer the tooth spacing and/or the thinner or smaller the work piece, the lower the feed should be.

4.10.1 Saw arch pressure

The pressure of the saw arch is regulated by means of a spring. A coil spring compensates for the force.

If the pressure of the saw arch is badly set, it can case curved cuts, breakage of teeth, deformation, and breakage of the belt guide pulleys.



Img.4-12: Spring

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5 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

of the metal band saw.

ATTENTION !

Properly performed regular maintenance is an essential prerequisite for

- **operational safety,**
- **failure-free operation,**
- **long service life of the metal band saw and**
- **the quality of the products which you manufacture.**

Installations and equipment from other manufacturers must also be in good order and condition.

ENVIRONMENTAL PROTECTION

Make sure that the coolant lubricants and oils are not split on the floor.

Clean up any spilt liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current legal requirements on the environment.

Collect leakages

Do not re-introduce liquids split outside the system during repair or as a result of leakage from the reserve tank:collect them in a collecting container to be disposed of.

Disposal

Never dump oil or other substances which are harmful for the environment in water inlets, rivers or channels.

Used oils must be delivered to a collection centre. Consult your supervisor if you do not know where the collection centre is.

5.1 Safety

WARNING!

Incorrect maintenance and repair works may lead to very serious injuries to personnel working on the machine and damages to the machine. Only qualified staff should carry out maintenance and repair works on the machine.

5.1.1 Preparation

WARNING!

Only carry out work on the metal band saw if it has been disconnected from the mains power supply.

☞ Disconnecting and securing the metal band saw on page 13

➜ Attach a warning sign.

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5.1.2 Restarting

➜ Before restarting run a safety check.

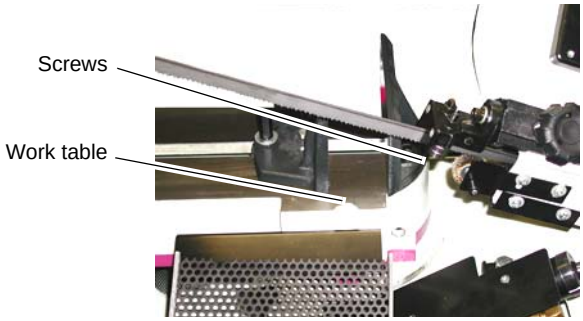
☞ Safety check on page 11

WARNING!

Before starting the metal band saw you must be sure that
- ❍ **no dangers generated for persons,**
- ❍ **the metal band saw is not damaged.**

5.2 Inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. For this reason, all the intervals are only valid for the authorised conditions.

Interval / When	Where?	What?	How?
as required	Saw belt guide	**Adjusting the saw belt guide with respect to the work table**	➜ Place a angular measure with 90° in the work-holder vice and compare the position. ➜ Using the angular measure, check whether the saw belt is parallel to the angle. ➜ Loosen the screws on the saw belt guide if the angle is incorrect and adjust the saw belt guide accordingly. **INFORMATION** **Check the adjustment with a thin test cut.**  Img.5-1: Saw belt guide

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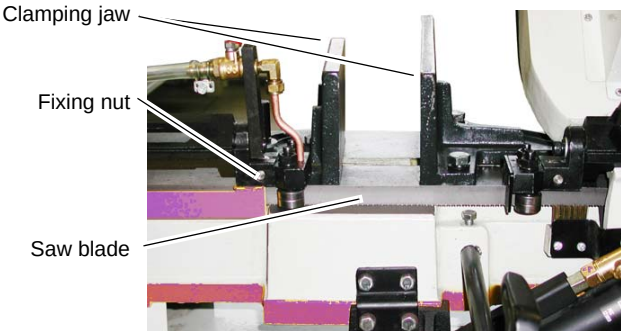
Interval / When	Where?	What?	How?
as required	Machine vice	**Adjusting the position of the clamps with respect to the saw belt**	➜ Place a angular measure in the clamping jaw to be adjusted. ➜ Check the required angle between clamp and saw blade. ➜ Loosen the fixing nut on the clamp in question if the angle is incorrect and adjust the clamp accordingly.  Img.5-2: Clamping jaw
As required and after changing the saw belt	Saw arch	**Setting the tension in the saw belt**	➜ Turn the handwheel clockwise to increase the tension in the saw blade. ➜ The correct saw belt tension is achieved, when you can move the saw belt with a power of about 50 N in the middle by 3mm.  Img.5-3: Tension of the saw blade **INFORMATION** **Do not strain the saw blade more than necessary. The saw blade could be overstretched and become warped.**

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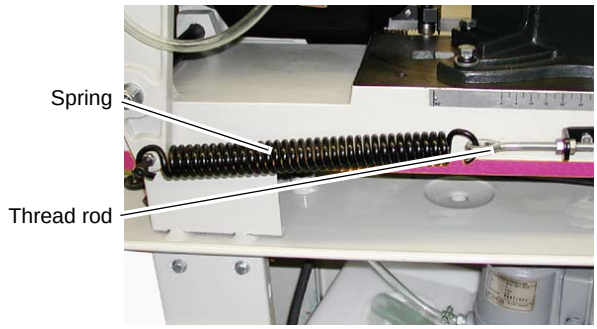
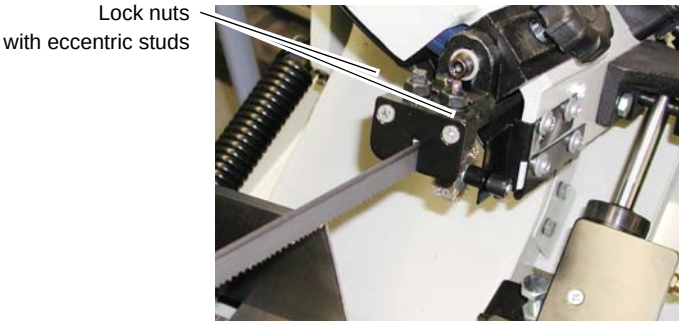
Interval / When	Where?	What?	How?
If dry cuts are occurring, if teeth break out, if the blade guidance rollers are deformed or breaking	Saw arch	**Adjusting of the saw arch pressure**	➜ Place the saw arch in the upper position and close the stop cock on the hydraulic cylinder. ➜ Place a weighing machine in the work-holder vice. ➜ Let the saw arch descend slowly. ➜ Fully open the stop cock on the hydraulic cylinder once the saw belt has made contact with the weighing machine. ➜ The support force of the saw arch on the weighing machine should come to 5 - 6 kg. ➜ If necessary, correct the value by changing the position of the spring using the adjusting screw.  Img.5-4: Saw arch pressure
as required	Saw belt guide	**Adjusting the belt guide bearings**	➜ Place the saw arch in the upper position and close the stop cock on the hydraulic cylinder. ➜ Adjust the belt guide bearing in a way that the saw belt can not be moved back and forth any more, the belt guide bearings can still be turned manually. ➜ Loosen the locknut on the locating screws and turn the locating screws until the distance of the guide bearings has been corrected.  Img.5-5: Saw belt guide bearings **ATTENTION!** **Check that the teeth on the saw belt do not collide with the guide bearings.**

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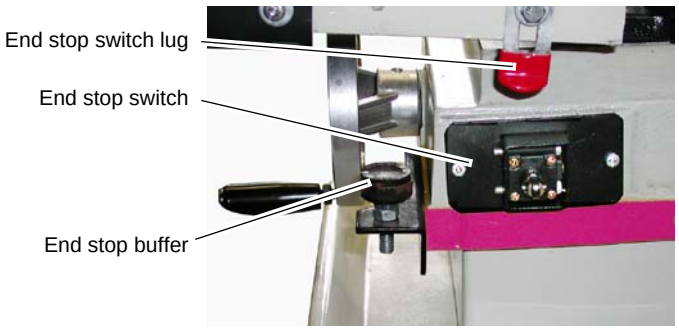
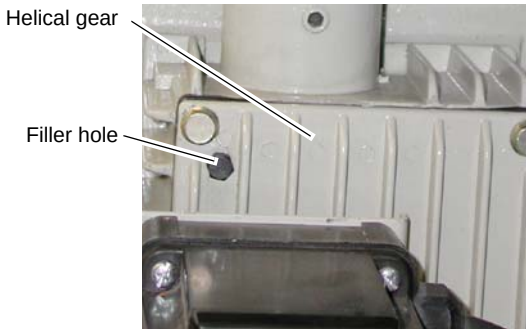
Interval / When	Where?	What?	How?
If the metal band saw continues running after finishing the sawing. If the metal band saw switch off before sawing is terminated.		**Adjusting the end stop switch**	➜ Turn the end stop buffer up or down ➜ or correct the end stop switch lug so that it comes into contact with the end stop switch at the end of the sawing process.  Img.5-6: End stop switch
Start of shift after every maintenance or repair work	metal band saw	☞ Safety check on page 11	
every week	Drive shaft	**Bearing**	Oiling
every six months	**V-belt**	**Visual inspection S181**	**S181** ➜ Check for porosity and wear in the belt
every month	**Worm gear**		**S181** ➜ Check the oil level of the helical gear. **INFORMATION** **During the first few days in service, the helical gear may become quite hot. If the temperature does not exceed 70ºC, no further measures need be taken.** **This running-in process can improve considerably if a little Molykote G-n gear paste is added to the oil in the helical gear before the machine is first used. This reduces wear in the flanks of the teeth and increases the useful service life of the gear.**

Interval / When	Where?	What?	How?
Annually	**Helical gear**	**Oil change S181**	**S181** ➜ Unscrew the oil bleed screw at the bottom of the helical gear. Use an adequate vessel with enough capacity to collect the oil. ➜ Open the filler hole for a better ventilation. ➜ Use viscous gear oil, e.g. Mobil 629  Img.5-7: Helical gear **INFORMATION** **Run the metal band saw a few minutes before you start the oil change. The oil warms up and flows more easily through the outlet.**

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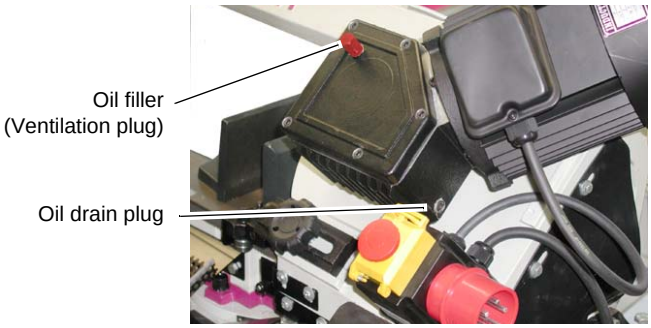
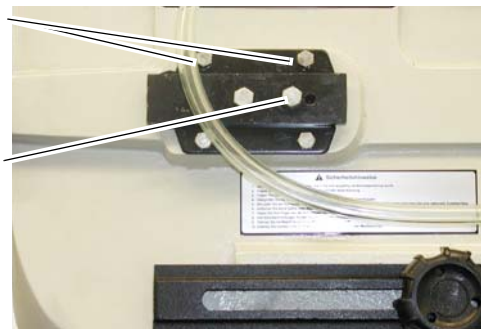
Interval / When	Where?	What?	How?
first after 90 days of commissioning, then every six months	Transmission S181G	**Oil change S181G**	**S181G** ➜ Disconnect the metal band saw from the electrical supply. ➜ Place the saw arch in the upper position and close the stop cock on the hydraulic cylinder. ➜ Place a vessel suitable for collecting the oil and with sufficient capacity beneath the opening of the oil drain plug. ➜ Open the oil drain plug and close the opening again after having drained the oil completely. ➜ Bring the saw arch to horizontal position. ➜ Fill approx. 0.3 litres of gear oil in the oil filler and close the screw fitting.  Img.5-8: Transmission S181G **INFORMATION** **Run the metal band saw a few minutes before you start the oil change. The oil warms up and flows more easily through the outlet.**

S181_S181G_GB_5.fm

Interval / When	Where?	What?	How?
as required	Saw belt	**Aligning the saw belt**	➜ Place the saw arch in the upper position and close the stop cock on the hydraulic cylinder. ➜ Check the tension of the saw belt. ☞ Setting the tension in the saw belt on page 31 ➜ Remove the protective cover from the saw arch. ➜ Activate the metal band saw and check that the saw belt runs correctly through the belt guide pulleys. ➜ Loosen the fastening screws and turn the setscrew while observing how the saw belt runs. ➜ Adjust the setting using the setscrew so that the saw belt passes as snugly as possible through the casing of the saw arch. ➜ Once the adjustments have been completed, the fastening screws must be retightened. Fastening screws Set screw  Img.5-9: Aligning the saw belt **INFORMATION** **You cannot make the alignment with a warped saw belt. Before making the adjustment, change the saw belt.**
as required	Machine vice	**Spindle**	➜ Lubricate the spindle of the work-holder vice

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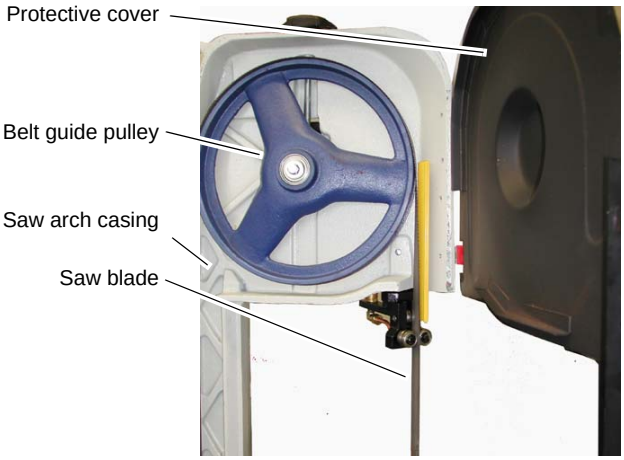
Interval / When	Where?	What?	How?
Depending on wear	Saw arch	**Changing the saw belt**	**ATTENTION!** **This metal band saw is designed to use saw belts with a dimension of 2362 x 19 x 0.9 mm. The use of other saw blades may lead to worse cutting results.** ➜ Place the saw arch in the upper position and close the stop cock on the hydraulic cylinder. ➜ Remove the red guard from the saw belt. ➜ Remove the saw belt brush. ➜ Remove the protective cover from the saw arch. ➜ Loosen the tension of the saw belt by turning the hand wheel anti-clockwise. ☞ Setting the tension in the saw belt on page 31 ➜ Carefully remove the old saw belt. ➜ Fit the new saw blade by inserting it first into the saw belt guide. ➜ Check the running direction and toothing. ☞ Direction of the saw teeth on page 19 ➜ Place the saw belt on the two pulleys so that it is as close as possible to the casing of the saw arch. ➜ Tighten the saw belt. ☞ Setting the tension in the saw belt on page 31 ➜ Run a check as described in ☞ Checks on page 19. ➜ For fitting the components, proceed in reverse order. ➜ Proceed a trial run. ☞ Aligning the saw belt on page 36 ➜ Fit the protective cover on the saw arch.  Img.5-10: Changing the saw belt

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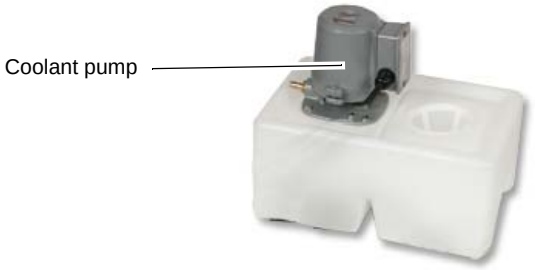
Interval / When	Where?	What?	How?
as required	Coolant equipment	**Coolant pump**	The cooling pump is almost maintenance free. Replace the cooling agent in regular intervals and adapted to the usage. ➜ When using coolants which are leaving remnants it is necessary to rinse the cooling pump.  Img. 5-11: Coolant pump

5.3 Repair

5.3.1 Customer service technician

For any repair work request the assistance of an authorised customer service technician. Contact your specialist dealer if you do not have customer service's information or contact Stürmer Maschinen GmbH in Germany who can provide you with a specialist dealer's contact information. Optionally, the

Stürmer Maschinen GmbH

Dr.-Robert-Pfleger-Str. 26

D- 96103 Hallstadt

can provide a customer service technician, however, the request for a customer service technician can only be made via your specialist dealer.

If the repairs are carried out by qualified technical personnel, they must follow the indications given in these operating instructions.

Optimum Maschinen Germany GmbH accepts no liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe these operating instructions.

For repairs, only use

- faultless and suitable tools,
- original parts or parts from series expressly authorised by Optimum Maschinen Germany GmbH.

6 Ersatzteile - Spare parts

6.1 Ersatzteilbestellung - *Ordering spare parts*

Bitte geben Sie folgendes an - *Please indicate the following :*

- Seriennummer - *Serial No.*
- Maschinenbezeichnung - *Machines name*
- Herstellungsdatum - *Date of manufacture*
- Artikelnummer - *Article no.*

Die Artikelnummer befindet sich in der Ersatzteilliste. *The article no. is located in the spare parts list.* Die Seriennummer befindet sich am Typschild. *The serial no. is on the rating plate.*

6.2 Hotline Ersatzteile - Spare parts Hotline

+49 (0) 951-96555 -118

ersatzteile@stuermer-maschinen.de

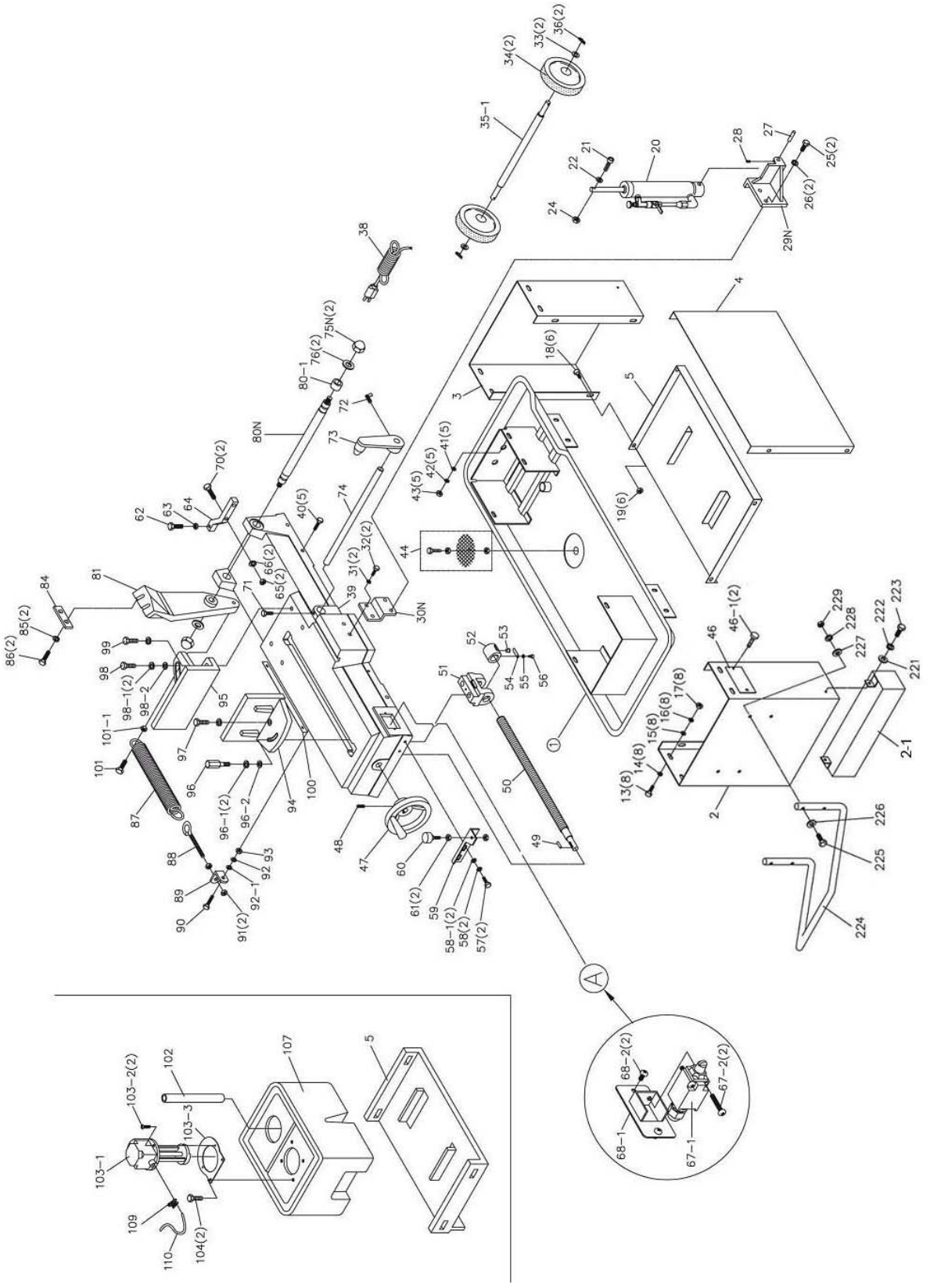
6.3 Service Hotline

+49 (0) 951-96555 -100

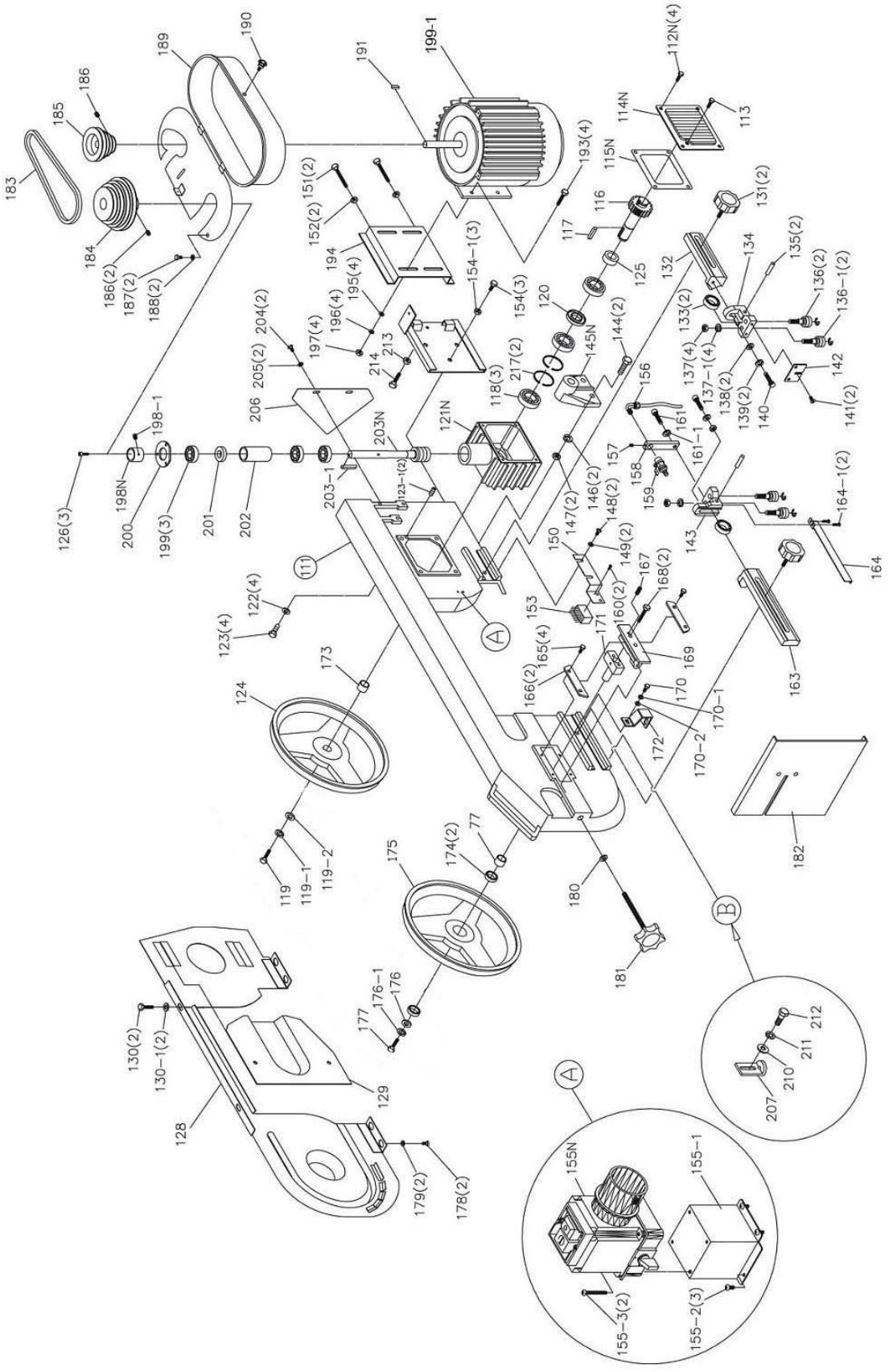
service@stuermer-maschinen.de

6.4 S181 - Ersatzteile - Spare parts

6.4.1 Ersatzteilzeichnung - Explosion drawing 1



6.4.2 Ersatzteilzeichnung - Explosion drawing 2



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6.4.3 Ersatzteilliste - Spare parts list - S181

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Item no.
1	Spänewanne	Chip tray	1		0330018101
2-1	Standfuss	Machine stand	1		033001812-1
3	Seitenteil rechts	Rt. upright	1		
4	Seitenteil vorne	Side panel	1		0330018104
5	Regalfach	Shelf	1		0330018105
13	Sechskantschraube	Hexag. head screw	8	5/16 x 3/4	
14	Federscheibe	Spring washer	8	42491	
15	Scheibe	Washer	8	42491	
16	Federscheibe	Spring washer	8	42491	
17	Mutter	Nut	8	42491	
18	Sechskantschraube	Hexag. head screw	6	5/16 x 1/2	
19	Mutter	Nut	6	42491	
20	Hydraulikzylinder	Cylinder	1		0330018120
21	Inbusschraube	Allen screw	1	M10x40	
22	Scheibe	Washer	1	43315	
23	Federscheibe	Spring washer	1	43315	
24	Mutter	Nut	1	M10	
25	Sechskantschraube	Hexag. head screw	2	3/8 x 1	0330018125
26	Federscheibe	Spring washer	2	43315	
27	Unterstützungsstange	Support rod	1		0330018127
28	Sechskantschraube	Hexag. head screw	1	1/4 x 3/8	
29	Zylinderbefestigung	Cylinder support	1		0330018129
30	Platte	Plate	1		0330018130
33	Scheibe	Washer	4		
34	Rad	Wheel	4	8"	0330018134
35-1	Radachse	Wheel axle	2		0330018135
36	Splint	Split pin	2		
38	Elektrokabel	Electric cord assembly	1		
39	Sägetisch	Work table	1		0330018139
40	Sechskantschraube	Hexag. head screw	5	5/16 x 1	
41	Scheibe	Washer	5	42491	
42	Federscheibe	Spring washer	5	42491	
43	Mutter	Nut	5	42491	
44	Filter	Filter	1		0330018126
45	Sechskantschraube	Hexag. head screw	2	3/16 x 3/8	
46-1	Linsenkopfschraube	Round head screw	1	3/16 x 1/2	
47	Handrad	Hand wheel	1		0330018147
48	Klemmschraube	Set screw	1	5/16 x 3/8	0323953
49	Passfeder	Feather Key	1	5 x 20	042P5520
50	Spindel	Lead screw	1		0330018150
51	Spindelmuttersitz	Nut seat	1		0330018151

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52	Spindelmutter kpl.	ACME nut cpl.	1		0330018152CPL
53	Knopf	Button	1		
54	Halter	Retainer	1		
55	Federscheibe	Spring washer	1	M5	
56	Linsenkopfschraube	Round head screw	1	M5 x 8	
57	Sechskantschraube	Hexag. head screw	2	5/16 x 5/8	
58	Federscheibe	Spring washer	2	42491	
59	Halteplatte	Support plate	1		
60	Stopschraube	Stop screw	1		0330018160
61	Mutter	Nut	1	42491	
62	Sechskantschraube	Hexag. head screw	1	3/8 x 1	
63	Mutter	Nut	1	43315	
64	90° Positionsunterstützung	90° Position support	1		0330018164
65	Mutter	Nut	2	43315	
66	Federscheibe	Spring washer	2	43315	
67-1	Endlagenschalter	End stop switch	1		03300181671
67-2	Linsenkopfschraube	Round Head screw			
68-1	Platte Endlagenschalter	End stop switch plate	1		03300181681
68-2	Linsenkopfschraube	Round Head Screw			
69	Linsenkopfschraube	Round head screw	2	5/32 x 1	
70	Sechskantschraube	Hexag. head screw	2	3/8 x 1 1/2	
71	Sechskantschraube	Hexag. head screw	1	5/16 x 3/4	
72	Flügelschraube	Butterfly screw	1		0330018172
73	Sägeanschlag	Stop support	1		0330018173
74	Stange Sägeanschlag	Work stop rod	1		0330018174
75N	Mutter	Nut	2	43132	
76	Scheibe	Washer	2	43101	
77	Lagerbuchse (Frontseite)	Bearing busher (front)	1		0330018177
78	Gummiformteil	Moulded rubber piece	1		
79	Scheibe	Washer	2	11749	
80N	Welle	Shaft support	1	22 mm	0330018180
81	Gelenkarm	Pivot arm	1		0330018181
84	Platte	Plate	1		
85	Federscheibe	Spring washer	2		
86	Sechskantschraube	Hexag. head screw	2	3/8 x 11/2	
87	Feder	Spring	1		0330018187
88	Hebel für Stellfeder	Lever for adjusting spring	1		0330018188
89	Feder - Haltewinkel	Spring bracket	1		0330018189
90	Sechskantschraube	Hexag. head screw	1	5/16 x 1	
91	Mutter	Nut	2	42491	
92	Federscheibe	Spring washer	1	42491	
93	Mutter	Nut	1	42491	
94	Vordere Abdeckung	Front cover	1		0330018194
95	Rückseitige Abdeckung	Back cover	1		0330018195
96	Schraubstock Schubumkehranlage	Vise thrust shaft	1		0330018196

96-1	Federscheibe	Spring washer	2	43315	
96-2	Scheibe	Washer	2	43315	
97	Sechskantschraube	Hexag. head screw	1	3/8 x 1 1/2	0330018197
98	Sechskantschraube	Hexag. head screw	1	1/2 x 1 1/2	0330018198
98-1	Scheibe	Washer	1	43315	
98-2	Scheibe	Washer		43132	
99	Sechskantschraube	Hexag. head screw	1	3/8 x 1 1/4	0330018199
100	Skala	Scale	1		03300181100
101	Sechskantschraube	Hexag. head screw	1	1/4 x 11/2	
102	Schlauch	Hose	1	1"	03300181102
103-1	Pumpe (Metallgehäuse)	Pump (metal housing)	1		0340305
103-1	Pumpe (Kunststoffgehäuse)	Pump (plastic housing)	1		0340303
103-2	Linsenkopfschraube	Round Head screw			
103-3	Haltewinkel Kühlmittelpumpe	Coolant Pump Bracket			
104	Sechskantschraube	Hexag. head screw	4	1/4 x 1/2	
107	Kühlmittelbehälter	Coolant tank	1		03300181107
108	Fitting	Fitting	1		
109	Schlauchklemme	Hose clamp	1	13 mm	
110	Schlauch	Flexible tube	1	42491	
111	Sägebügel	Saw arch	1		03300181111
112N	Blechschraube	Tapping screw	4	6 x 20	
113	Belüftungsschraube	Vent plug	1		
114N	Getriebegehäuseabdeckung	Gear casing cover	1		03300181114N
115N	Getriebegehäusedichtung	Gear casing gasket	1		03300181115N
116	Schneckenrad	Worm gear	1		03300181116
117	Passfeder	Key	2	6x6x20	042P6620
118	Kugellager	Ball bearing	3	6005	0406005
119	Innensechskantschraube	Hexag. soc. screw	2	3/8 x 1	
119-1	Federscheibe	Spring washer	1	43315	
119-2	Scheibe	Washer	1	3/8 x 35 x 4	
120	Dichtung	Oil seal	1	25.47.7.	04125477
121N	Getriebegehäuse	Gear box	1		03300181121N
121	Getriebe komplett	Gearbox complete	1		03300181121CPL
122	Federscheibe	Spring washer	4	43315	
123	Sechskantschraube	Hexag. head screw	4	5/16 x 1 1/4	
123-1	Justierschraube	Adjusting screw	2	1/4 x 3/8	
124	Hintere Sägebandrolle	Rear rolling pulley	1		03300181124
125	Lagerbuchse	Bearing bushing	1		03300181125
126	Sechskantschraube	Hexag. head screw	3		
128	Rückseitige Sägebandabdeckung	Rear saw cover	1		03300182128
129	Abdeckung Keilriemenscheiben	Pulley cover	1		03300181129
130	Linsenkopfschraube	Round head screw	2		03300181130
131	Griffschraube Einstellung Sägebandführung	Adjustment button	2		03300181131

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132	Rückseitige Sägebandführung	Rear saw belt guide	1		03300181132
133	Führungslager	Guide bearing	2	608 ZZ	040608ZZ
134	Justierbare Rückseite am Sägeband	Rear saw belt adj.	1		03300181134
134-CPL	Sägebandführung komplett	Band guiding complete	1		03300181134CPL
135	Lagerstift	Bearing pin	2		03300181135
136	Bolzen	Bolt	2		03300181136
136-1	Sicherungsring	Center shaft assembly	2		033001811361
137	Mutter	Nut	4	3/8 x 24 UNF	03300181137
138	Scheibe	Washer	2	42491	03300181138
139	Federscheibe	Spring washer	2	42491	03300181139
140	Innensechskantschraube	Hexag. soc. screw	1	5/16 x 1 1/8	03300181140
141	Schraube	Hd. screw	2	1/4 x 1/2	03300181141
142	Vertikale Ausschnitplatte (klein)	Vertical cutting plate (small)	1		03300181142
143	Justierbarer Sägebandsitz (Frontseite)	Adjustable saw belt seat (front)	1		03300181143
143-CPL	Sägebandführung komplett	Band guiding complete	1		03300181143CPL
144	Sechskantschraube	Hexag. head screw	2	3/8 x 1 1/4	
145	Oberer Wagen	Top carriage	1		03300181145
146	Federscheibe	Spring washer	2	43315	
147	Mutter	Nut	2	43315	
148	Linsenkopfschraube	Round-headed screw	2	1/4 x 1/2	
149	Scheibe	Washer	2	43191	
150	Bürstenhalter	Brush-holder	1		03300181150
151	Sechskantschraube	Hexag. head screw	1	5/16 x 2 1/2	
152	Mutter	Nut	1	42491	
153	Bürste	Brush	1		03300181153
154	Sechskantschraube	Hexag. head screw	3	5/16 x 5/8	
155N	Schalter-Stecker Kombination	Magnetic switch	1		03300181155
156	Düse	Nozzle	1		03300181156
157	Klemmschraube	Setscrew	1	1/4 x 1/4	
158	Düsenhalter	Nozzle support	1		03300181158
159	Ventil	Valve	1		03300181159
160	Linsenkopfschraube	Round-headed screw	2	3/16 x 3/8	
161	Innensechskantschraube	Hexag. soc. screw	1	5/16 x 1 1/8	
163	Justierbarer Haltewinkel (Frontseite)	Adjustable bracket (front)	1		03300181163
164	Schutzabdeckung Sägeband	Saw belt protection	1		03300181164
165	Sechskantschraube	Hexag. head screw	4	1/4 x 1/2	
166	verschiebbare Führungsplatte	Sliding guide plate	2		
167	Klemmschraube	Setscrew	1	5/16 x 3/4	
168	Sechskantschraube	Hexag. head screw	2	5/16 x 1 1/2	03300181168
169	Blattspannung gleitender Block	Blade tension sliding block	1		03300181169
170	Sechskantschraube	Hexag. head screw	1	1/4 x 1/2	
171	Block verschiebbare Sägebandführung	Sliding draw block	1		03300181171

172	Haltewinkel	Bracket	1		03300181172
173	Lagerbuchse Rückseite	Bearing bushing rear	1		03300181173
174	Kugellager	Ball bearing	2	6203 ZZ	0406203ZZ
175	Vordere Sägebandrolle	Front rolling pulley	1		03300181175
176	Scheibe	Washer	1	42491	
177	Sechskantschraube	Hexag. head screw	1	5/16 x 3/4	
178	Linsenkopfschraube	Round-headed screw	4	1/4 x 1/2	
179	Scheibe	Washer	4	43191	
180	Scheibe	Washer	1	43315	
181	Griffschraube Sägebandspannung	saw belt adjustable handle	1		03300181181
182	Vertikale Ausschnittplatte	Vertical cutting plate	1		
183	Keilriemen	V-belt	1	3V-270	039ZX26
184	Keilriemenscheibe Schneckenwele	Worm Pulley	1		03300181184
185	Motor - Keilriemenscheibe	Motor Pulley	1		03300181185
186	Klemmschraube	Setscrew	2	5/16 x 3/8	
187	Sechskantschraube	Hexag. head screw	2	1/4 x 1/2	
188	Scheibe	Washer	2	43191	
189	Keilriemengehäuse	Belt casing	1		03300181189
190	Linsenkopfschraube	Round head screw	1		
191	Paßfeder	Key	1	5 mm	042P5530
192	Motor	Motor	1		03300181192
193	Sechskantschraube	Hexag. head screw	4	5/16 x 1	
194	Motorbefestigungsplatte	Motor mount plate	1		03300181194
195	Scheibe	Washer	4	42491	
196	Federscheibe	Spring washer	4	42491	
197	Mutter	Nut	4	42491	
198N	Stopper Schneckenwelle	Worm shaft stopper	1		03300181198
198-1	Klemmschraube	Set screw	1	5/16x1/4	
199	Kugellager	Ball bearing	3	6003	0406003
199-1	Motorlüfterdeckel	Motor fan cover	1		03300181199
200	Blockplatte	Block plate	1		03300181200
201	Öldichtung	Oil seal	1	17.35.8.	04117357
202	Lagerbuchse	Bearing bushing	1		03300181202
203	Schneckenwelle	Worm shaft	1		03300181203
203-1	Paßfeder	Key	1	5x5x50	042P5550
204	Sechskantschraube	Hexag. head screw	2	1/4 x 3/8	
205	Scheibe	Washer	2	43191	
206	Halteplatte	Support plate	1		03300181206
207	Halterung Endlagenschalter	Limit switch rack	1		03300181207
208	Sechskantschraube	Hexag. head screw	1	1/4 x 1/2	
209	Mutter	Nut	1	43191	
210	Scheibe	Washer	2	43191	
211	Federscheibe	Spring washer	1	43191	
212	Sechskantschraube	Hexag. head screw	1	1/4 x 1/2	

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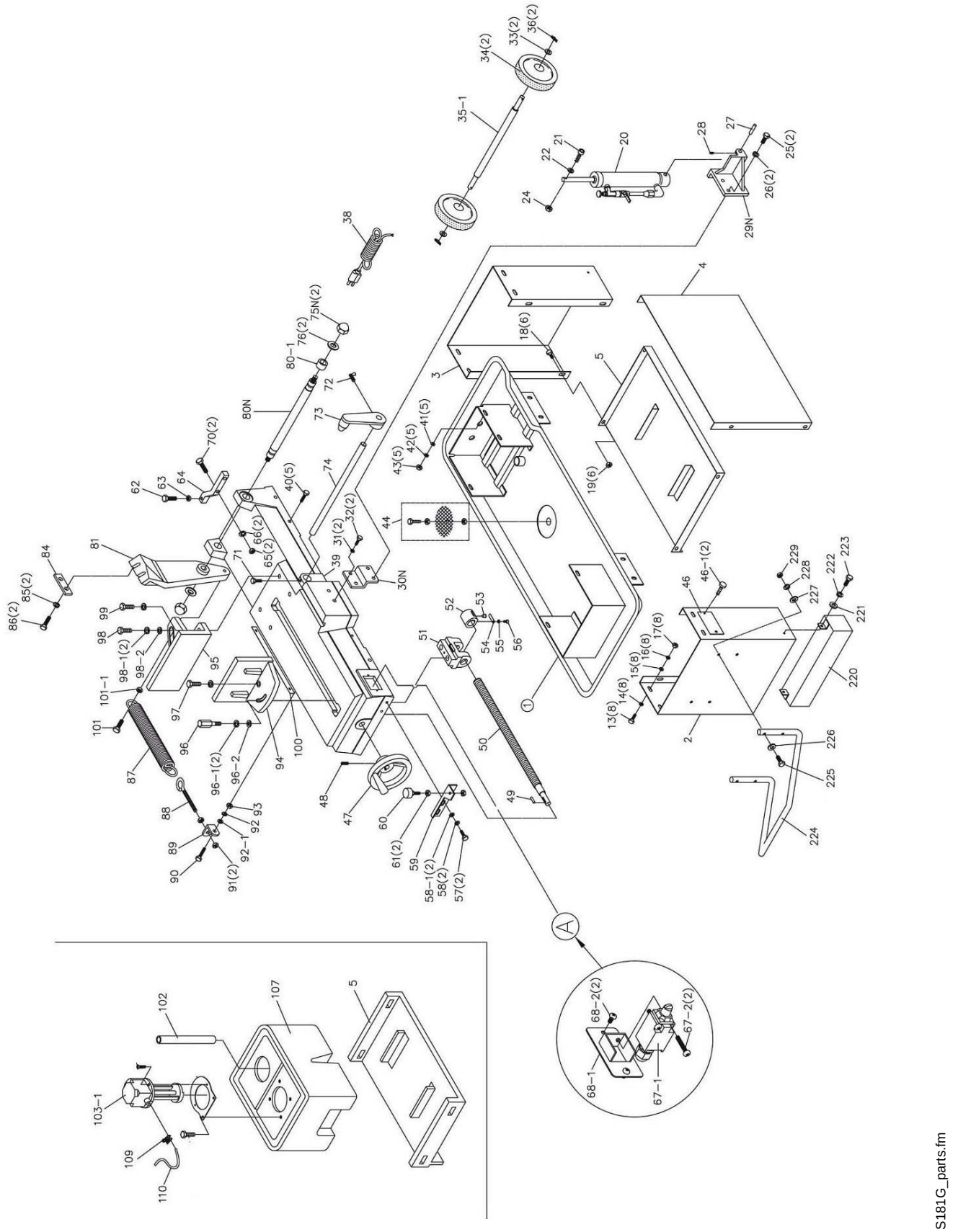
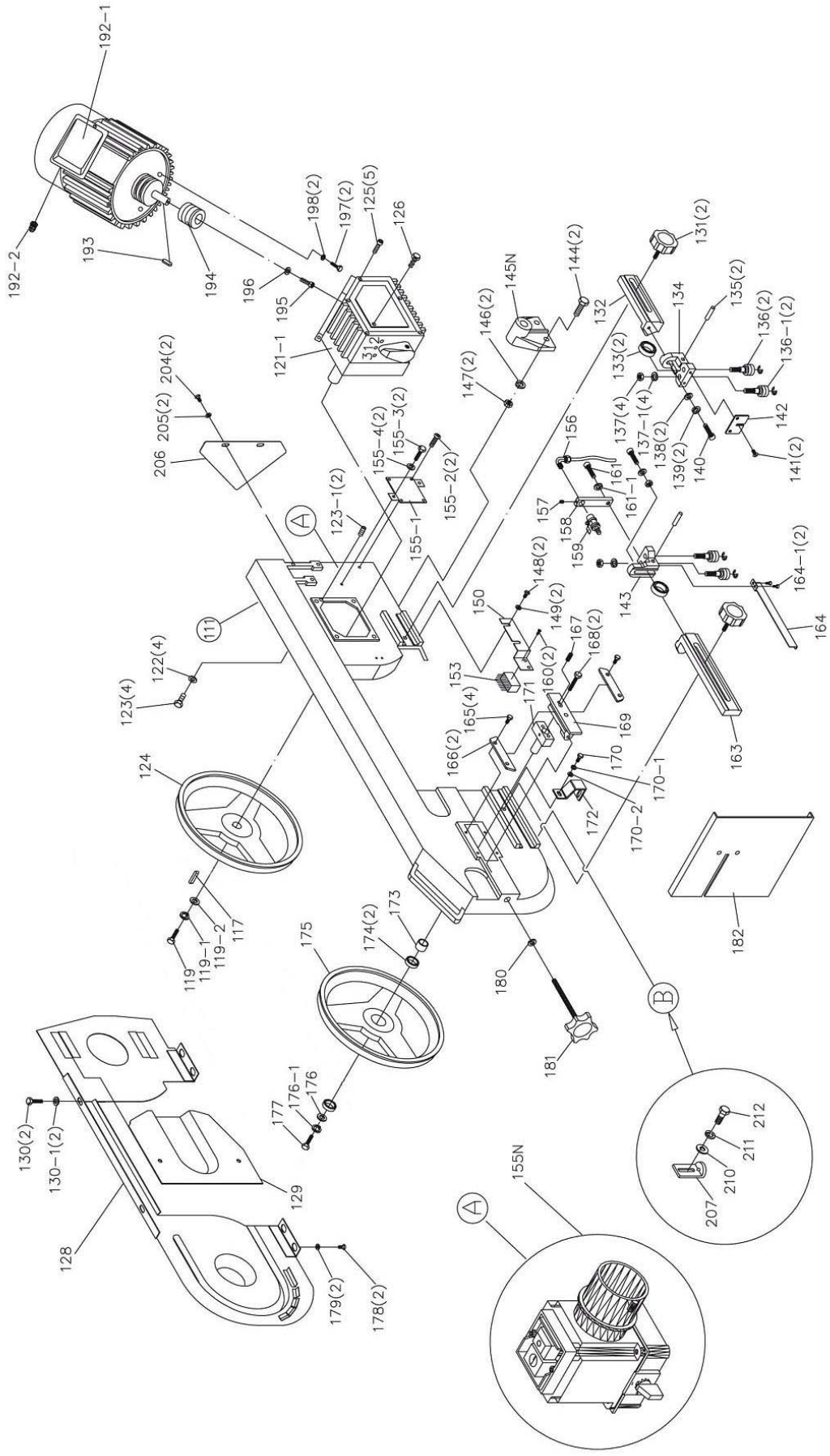
213	Mutter	Nut	1	42491	
214	Sechskantschraube	Hexag. head screw	1	5/16 x 1 1/4	
215	Scheibe	Washer	1	43191	
217	C-Ring	C-ring	2	R47	
218	Sieb	Filter	1		03300181218
221	Scheibe	Washer	2	1/4"	
222	Federring	Lock washer	2	1/4"	
223	Sechskantschraube	Hexagon head cap screw	2	1/4" x 1/2"	
224	Handgriff	Handle	1		
225	Sechskantschraube	Hexagon head cap screw	4	5/16" x 1 1/2"	
226	Scheibe	Washer	4	5/16"	
227	Scheibe	Washer	4	5/16"	
228	Federring	Lock washer	4	5/16"	
229	Mutter	Nut	4	5/16"	
0	Getriebe komplett	Gear complete	1		03300181121CPL
0	Lüfterrad	Motor fan	1		
Ersatzteile ohne Abbildung / Parts without illustration					
	Mikroschalter kpl.	Micro switch cpl.			
	Bandführung kpl.	Belt guide cpl.			03300181134CPL
	Lufterdeckel Motor 190mm	Fan cover 190 mm		ab/from 2001	

6.5 S181 G - Ersatzteile - Spare parts

6.5.1 Ersatzteilzeichnung 1 - Explosion drawing 1



6.5.2 Ersatzteilzeichnung 2 - Explosion drawing 2



6.5.3 Ersatzteilzeichnung Getriebe 712 AGN - Spare parts drawing gear 712 AGN

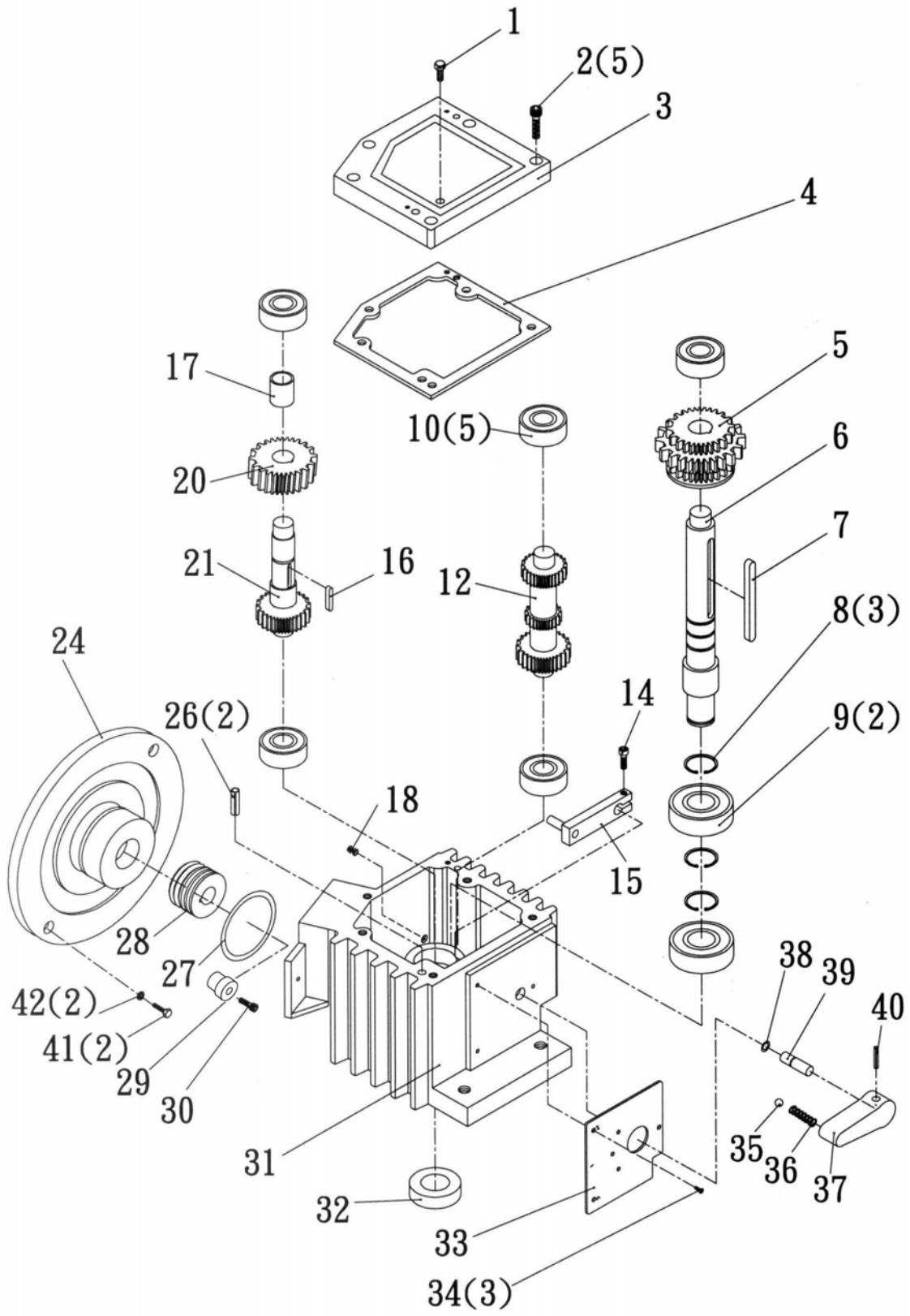


Abb.6-1: Explosionszeichnung Getriebe - Explosion drawing gear: 712AGN second generation

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6.5.4 Ersatzteilzeichnung Getriebe 712 G - Spare parts drawing gear 712 G

Ab Baujahr 09 / 2015

From year of manufacturing 09/ 2015

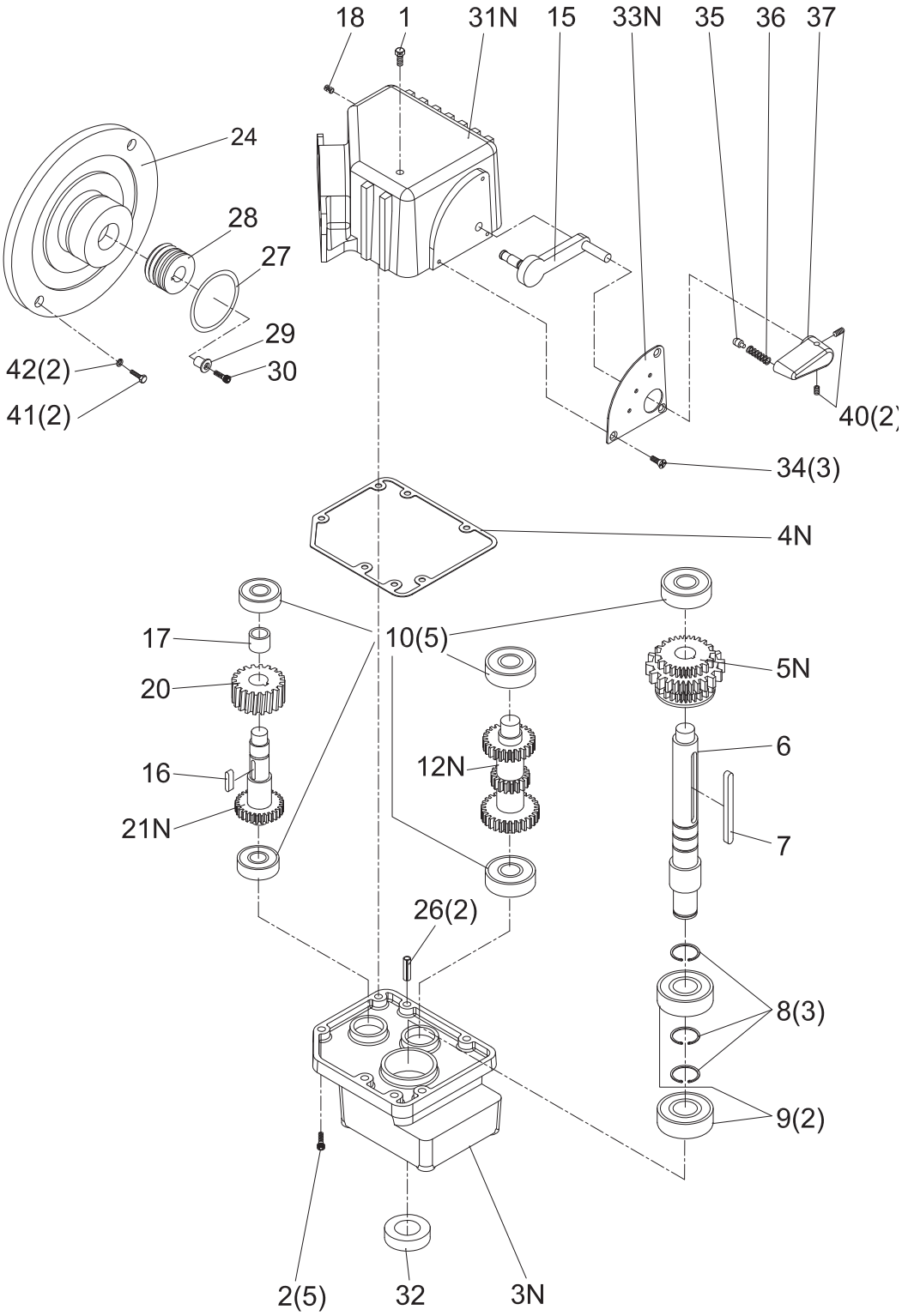

Abb. 6-2: Explosionszeichnung Getriebe - Explosion drawing gear: 712 fifth generation

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6.5.5 Ersatzteilliste - Spare parts list - S181G

Ersatzteilliste 1 und 2 - Spare parts list 1 and 2					
Pos.	Bezeichnung	Designation	Menge	Größe	Art.Nr.
			Qty.	Size	Item no.
1	Spänewanne	Chip sump	1		0330018101
2	Seitenteil links	Left side panel	1		
3	Seitenteil rechts	Right side panel	1	1/4"	
4	Seitenteil vorne	Front side panel			0330018104
5	Regalfach	Rack compartment	1		0330018105
13	Sechskantschraube	Hexagon head cap screw	8	5/16x3/4"	
14	Federring	Lock washer	8	5/16"	
15	Scheibe	Washer	8	5/16"	
16	Federring	Lock washer	8	5/16"	
17	Mutter	Nut	8	5/16"	
18	Sechskantschraube	Hexagon head cap screw	6	5/16x1/2	
19	Mutter	Nut	6	5/16"	
20	Hydraulikzylinder	Hydraulic cylinder	1		0330018120
21	Inbusschraube	Allen screw	1	M10x40	
22	Scheibe	Washer	1	3/8"	
23	Federring	Lock washer	1	3/8"	
24	Mutter	Nut	1	M10	
25	Sechskantschraube	Hexagon head cap screw	2	3/8 x 1"	0330018125
26	Federring	Lock washer	2	3/8"	
27	Haltestift	Retention pin	1		0330018127
28	Sechskantschraube	Hexagon head cap screw	1	1/4 x 3/8"	
29	Halterung	Base plate	1		0330018129
30	Platte	Plate	1		0330018130
31	Scheibe	Washer	2		
32	Schraube	Screw	2		
33	Scheibe	Washer	4	1/2" x 28	
34	Rad	Wheel	2	8"	0330018134
35-1	Radachse	Axletree	2		0330018135
36	Sicherungsstift	Locking pin	4		
38	Kabel/Stecker	Cable/plug	1		
39	Arbeitstisch	Working table	1		0330018139
40	Sechskantschraube	Hexagon head cap screw	5	5/16x1"	
41	Scheibe	Washer	5	42491	
42	Federring	Lock washer	5	42491	
43	Mutter	Nut	5	42491	
44	Siebblech	Sheet metal sieve	1		0330018126
45	Sechskantschraube	Hexagon head cap screw	2	3/16x3/8	
46	Schalterkasten	Switch box	1		
47	Handrad	Handwheel	1		03300182147
48	Stiftschraube	Stud bolt	1	5/16x3/8"	

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49	Passfeder	Feather key	1	5 x 20	042P5520
50	Spindel	Threaded rod for saw belt tension	1		0330018150
51	Spindelmuttersitz	Spindle nut seat	1		0330018151
52	Spindelmutter	Spindle nut	1		0330018152CPL
53	Knopf	Button	1		
54	Unterlage	Base			
55	Federring	Lock washer	1	5/16"	
56	Senkkopfschraube	Countersunk head screw	1	M5 x 8	
57	Sechskantschraube	Hexagon head cap screw	2	5/16x 5/8"	
58	Federring	Lock washer	2	5/16"	
59	Befestigungswinkel	Angle bracket	1		
60	Stopschraube	End stop buffer	1		0330018160
61	Mutter	Nut	1	5/16"	
62	Sechskantschraube	Hexagon head cap screw	1	3/8 x 1"	
63	Mutter	Nut	1	43315	
64	90° Befestigungsbügel	90° fastening bow	1		0330018164
65	Mutter	Nut	2	43315	
66	Federring	Lock washer	2	43315	
67	Endschalter	Stop switch	1		03300181671
68	Platte Endschalter	Stop switch plate	1		03300181681
70	Sechskantschraube	Hexagon head cap screw	2	3/8x11/2	
71	Sechskantschraube	Hexagon head cap screw	1	5/16x3/8	
72	Flügelschraube	Wing screw	1		0330018172
73	Sägeanschlag	Saw stop	1		0330018173
74	Stange Sägeanschlag	Saw stop rod	1		0330018174
75N	Hutmutter	Cap nut	2	43132	
76	Scheibe	Washer	2	43132	
78	Gummiabdeckung	Rubber cover	1		
80N	Welle	Shaft	1	22 mm	0330018180N
81	Sägearmbügel	Saw arm yoke	1		0330018181
84	Platte	Plate	1		
85	Federring	Lock washer	2	3/8"	
86	Sechskantschraube	Hexagon head cap screw	2	3/8x1 1/2"	
87	Zugfeder	Spring	1		0330018187
88	Gewindestange Einstellung Federkraft	Threaded rod for adjusting spring force	1		03300182188
89	Federhalter	Spring holder	1		0330018189
90	Sechskantschraube	Hexagon head cap screw	1	5/16x1"	
91	Mutter	Nut	2	3/8"	
92	Federring	Lock washer	1	42491	
93	Mutter	Nut	1	42491	
94	vorderer Schraubstockbacken	Front vice jaw	1		0330018194
95	hinterer Schraubstockbacken	Rear vice jaw	1		0330018195
96	Schraube	Vice spindle	1		0330018196
96-1	Federring	Lock washer	2	3/8"	
96-2	Scheibe	Washer	1	3/8"	

97	Sechskantschraube	Hexagon head cap screw	2	3/8 x 1 1/2"	0330018197
98	Sechskantschraube	Hexagon head cap screw	2	1/2 x 1 1/2"	0330018198
98-1	Federring	Lock washer	2	3/8"	
98-2	Scheibe	Washer	1	3/8"	
99	Sechskantschraube	Hexagon head cap screw	1	1/2 x 1 1/4"	0330018199
100	Skala	Scale	1		03300181100
101	Inbusschraube	Allen screw	1	3/8 x1 3/4"	
102	Schlauch	Flexible tube	1	1"	03300181102
103	Kühlmittelpumpe (Metallgehäuse)	Coolant pump (Metal housing)	1		0340305
103	Kühlmittelpumpe (Kunststoffgehäuse)	Coolant pump (plastic housing)	1		0340303
104	Sechskantschraube	Hexagon head cap screw	2	1/4x1/2"	
107	Kühlmitteltank	Coolant tank	1		03300181107
108	Schlaucfitting	Tube fitting	1		
109	Schlauchschelle	Hose clamp	1	13mm	
110	Schlauch	Hose	1	5/16"	
111	Sägebügel	Saw arch	1		03300182111
119	Sechskantschraube	Hexagon head cap screw	1	3/8 x 1"	
119-1	Federring	Lock washer	1		
119-2	Scheibe	Washer	1	3/8 x 35 x 4	
121-1	Getriebe	Gear	1	712AGN	
121-1	Getriebe	Gear	1	5th generation from manufacturing 10/2015	03300182G31CPL
122	Federring	Lock washer	4	42491	
123	Sechskantschraube	Hexagon head cap screw	4	5/16x1 1/4"	
123-1	Stellschraube	Set screw	2	1/4 x 3/8"	
124	hintere Sägebandführungsrolle	Rear saw belt guide pulley	1		03300181124
125	Inbusschraube	Allen screw	5	6x20 mm	
126	Getriebe - Belüftungsschraube	Gear ventilation plug	1		03300182G01
128	hintere Schutzabdekkung Sägeband	Rear protective cover of saw belt	1		03300182128
129	Schutzabdeckung Sägebandführungsrolle	Protective cover of saw belt guide pulley	1		
130	Linsenkopfschraube	Tallow-drop screw	2		03300181130
131	Griffschraube verstellbare Sägebandführung	Knurled screw for adjustable saw belt guide	2		03300181131
132	hintere Führungsschiene Sägebandführung	Rear guide rail for saw belt guide	1		03300181132
133	Kugellager	Ball bearing	2	608 ZZ	040608ZZ
134	Lagerbock Führungsrollen Sägeband hinten	Rear bracket for saw belt guide pulleys	1		03300181134
135	Passstift	Alignment pin	1		03300181135
136	Bolzen Führungslager	Bolt of guide bearing	2		03300181136
136-1	Sicherungssring	Retaining ring	2		033001811361
137	Mutter	Nut	4	3/8x24 UNF	03300181137
138	Scheibe	Washer	4	5/16"	03300181138
139	Federring	Lock washer	2	5/16"	03300181139
140	Inbusschraube (Innensechskantschraube)	Allen screw (hexagon socket screw)	2	5/16x1"	03300181140
141	Schraube	Screw	1	1/4x1/2"	03300181141
142	Vertikale Platte Lagerbock Führungsrolle	Vertical plate of bracket for guide pulley	1		03300181142

143	Lagerbock Führungsrollen Sägeband vorne	Front bracket for saw belt guide pulleys	1		03300181143
143-CPL	linke Sägebandführung komplett	left blade guide complete	1		03300181143CPL
144	Sechskantschraube	Hexagon head cap screw	1	3/8x 1 1/4"	
145	Befestigungsbügel	Fastening bow	1		03300181145
146	Federscheibe	Spring washer	1	3/8"	
147	Mutter	Nut	2	3/8"	
148	Linsenkopfschraube	Tallow-drop screw	2	1/4 x 1/2"	
149	Scheibe	Washer	2	1/4"	
150	Bürstenhalter	Brush holder	1		03300181150
153	Bürste	Brush	1		03300181153
155	Schalter- Steckerkombination	Switch-plug combination	1		03300181155
156	Winkelverschraubung Kühlmittel	Elbow union for coolant	1		03300181156
157	Stiftschraube	Stud bolt	1	1/4x1/4"	
158	Ventilhalter	Valve holder	1		03300181158
159	Kühlmittelventil	Coolant valve	1		03300181159
160	Linsenkopfschraube	Tallow-drop screw	2	3/16 x 3/8"	
161	Innensechskantschraube	Allen screw	1	5/16x 1 1/8"	
163	vordere Führungsschiene Sägebandführung	Front guide rail of saw belt guide	1		03300181163
164	Schutzabdeckung Sägeband	Protective cover of saw belt	1		03300181164
165	Sechskantschraube	Hexagon head cap screw	4	1/4 x 1/2"	
166	verschiebbare Führungsplatte	Movable guide plate	2		
167	Stiftschraube	Stud bolt	1	5/16 x3/4"	
168	Sechskantschraube	Hexagon head cap screw	2	5/16x1 1/2"	03300181168
169	verschiebbarer Führungsblock Sägebandspannung	Movable guide block for saw belt tension	1		03300181169
170	Sechskantschraube	Hexagon head cap screw	1	1/4x 1/2"	
171	Gleitstück	Sliding block	1		03300181171
173	Lagerbuchse	Bearing bush	1		03300181173
174	Kugellager	Ball bearing	2	6203 ZZ	0406203ZZ
175	Bandführungsrolle vorne	Front belt guide pulley	1		03300181175
176	Scheibe	Washer	1	5/16"	
177	Sechskantschraube	Hexagon head cap screw	1	5/16x 3/4"	
178	Linsenkopfschraube	Tallow-drop screw	4	1/4x1/2"	
179	Scheibe	Washer	4	1/4"	
180	Scheibe	Washer	1	3/8"	
181	Griffschraube Sägebandspannung	Knurled screw for saw belt tension	1		03300181181
182	vertikale Schnittplatte	Vertical cutting plate	1		
192-1	Motor	Motor	1		033001821921
192-2	Kabeltülle (PG-Verschraubung)	Cable bushing (PG-screwed connection)	1		
193	Passfeder	Feather key	1	5 mm	042P5530
194	Zahnwelle	Splined shaft	1		03300182G28
195	Innensechskantschraube	Allen screw	1	M6 x 20	
196	Scheibe	Washer	1		
204	Sechskantschraube	Hexagon head cap screw	2	1/4x1/2"	
205	Scheibe	Washer	2	1/4"	

206	Befestigungsplatte	Fixing plate	1		03300181206
207	Endschalterfahne	End stop switch lug	1		03300181207
211	Federring	Lock washer	1	1/4"	
212	Sechskantschraube	Hexagon head cap screw	1	1/4x1/2"	
213	Mutter	Nut	1	1/4"	
214	Sechskantschraube	Hexagon head cap screw	1	1/4x1/2"	
215	Scheibe	Washer	1	1/4"	
220	Standfuss	Machine stand	1		0330018121
221	Scheibe	Washer	2	1/4"	
222	Federring	Lock washer	2	1/4"	
223	Sechskantschraube	Hexagon head cap screw	2	1/4" x 1/2"	
224	Handgriff	Handle	1		
225	Sechskantschraube	Hexagon head cap screw	4	5/16" x 1 1/2"	
226	Scheibe	Washer	4	5/16"	
227	Scheibe	Washer	4	5/16"	
228	Federring	Lock washer	4	5/16"	
229	Mutter	Nut	4	5/16"	
Ersatzteile ohne Abbildung / Parts without illustration					
0	Bandführung kpl.	Belt guide cpl.			03300181134CPL
0	Lüfterdeckel Motor 175mm	Fan cover 175 mm		bis/to 2001	
0	Lüfterdeckel Motor 190mm	Fan cover 190 mm		ab/from 2001	03300182199
0	Lüfterrad	Fan			0330018300
Ersatzteilliste Getriebe 712 AGN - Spare parts list gear 712 AGN					
Pos.	**Bezeichnung**	**Designation**	**Menge**	**Größe**	**Art.Nr.**
			Qty.	**Size**	**Item no.**
1	Be- und Entlüftungsschraube Getriebe	Vent Bolt	1		03300182G01
2	Inbusschraube	Hex. Soc. Cap Screw	5	M6x20	
3	Getriebedeckel	Gear Box Cover	1		03300182G03
4	Dichtung Getriebedeckel	Gasket	1		03300182G04
5	Zahnradkombination	Drive Gear Assembly	1	Ab Bj. 2001	03300182G05
5A	Zahnradkombination	Drive Gear Assembly	1	Bis Bj. 2001	03300182G05A
6	Getriebewelle	Drive Shaft	1		03300182G06
7	Passfeder	Key	1	5x80	03300182G07
8	Sicherungsring	C-Ring	3	S25	042SR25W
9	Rillenkugellager	Ball Bearing	2	6205	0406205
10	Rillenkugellager	Ball Bearing	5	6201	0406201
12	Verzahnte Abgangswelle Getriebe	Transfer gears assembly	1		03300182G12
14	Inbusschraube	Hex. Soc. Cap Screw	1	M5x15	
15	Einstellbare Klammer	Adjustable bracket	1		
16	Passfeder	Key	1	6x18	03300182G16
17	Hülse	Bushing	1		
18	Ölablassschraube	Drain Plug	1		
20	Schneckenrad	Worm Gear	1		
21	Verzahnte Eingangsswelle Getriebe	Input gears	1		03300182G21CPL
24	Motorflansch	Motor flange	1		03300182G24

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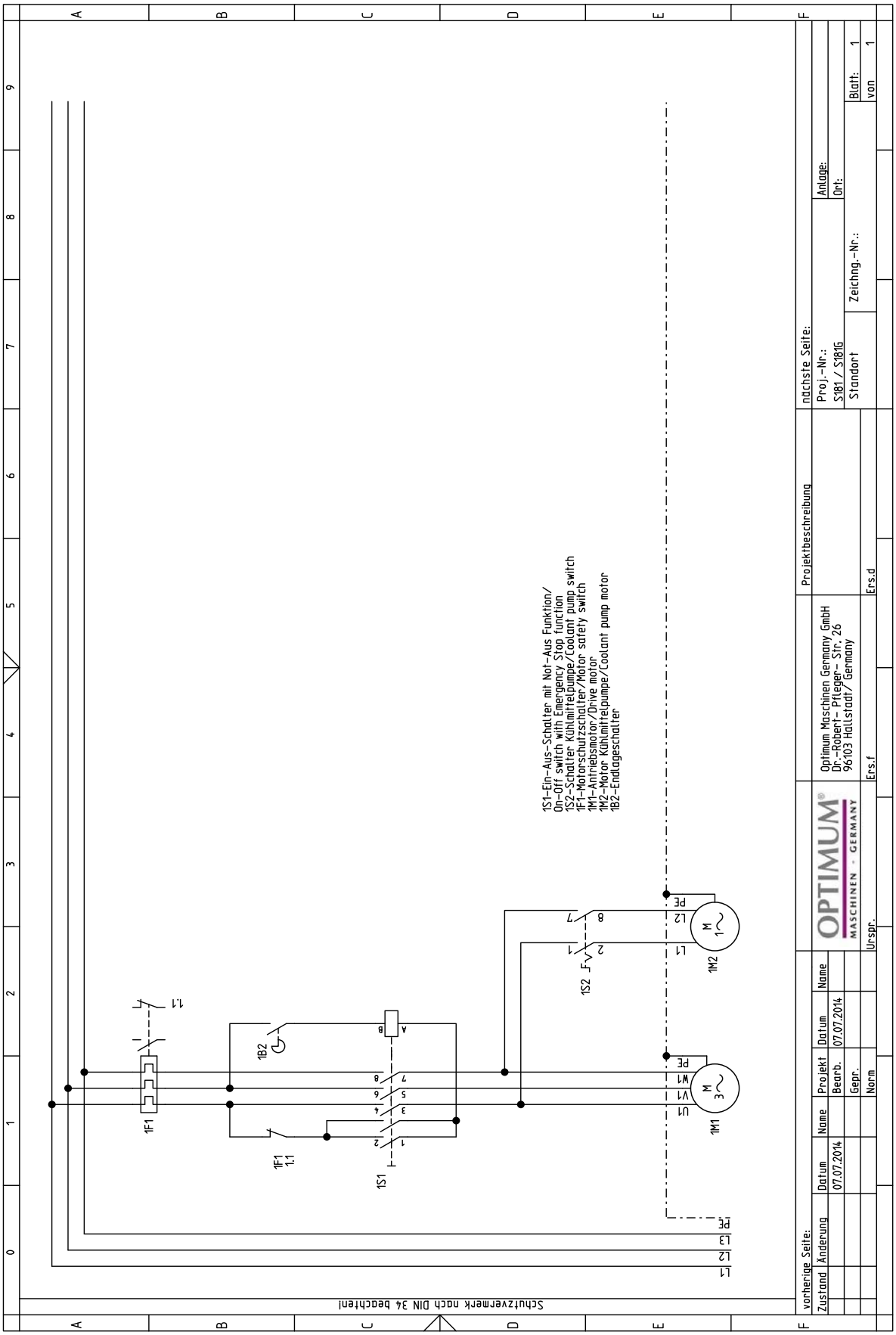
26	Passstift	Set Pin	2	6x15	
27	O-Ring	O-Ring	1	G60	03300182G27
28	Schneckenwelle	Worm Shaft	1		03300182G28
29	Buchse	Bushing	1		03300182G29
30	Inbusschraube	Hex. Soc. Cap Screw	1	M6x20	
31	Getriebegehäuse	Gear Box	1		03300182G31
32	Dichtring	Oil Seal	1	30x42x7	04130427
33	Rastplatte Getriebewahlhebel	Indicator Plate	1		
34	Senkkopfschraube	Flat Head Screw	3	M4x8	
35	Stahlkugel	Steel Ball	1	43191	03300182G35
36	Feder	Compression Spring	1	43191	03300182G36
37	Getriebewahlhebel	Plastic Handle	1		03300182G37
38	O-Ring	O-Ring	1	7x1.5	
39	Welle Getriebewahlhebel	Axle	1		
40	Passstift	Set Pin	1	3x20	
41	Sechskantschraube	Hex. Head Screw	2	M8x20	
42	Federscheibe	Spring Washer	2	M8	
0	Getriebe kpl.	Gear box cpl.			03300182G31CPL
0	Welle kpl.	Shaft cpl.			

6.6 Schaltplan - Wiring diagram



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7 Malfunctions

7.1 Malfunctions on the metal band saw

Malfunction	Cause/ possible effects	Solution
Saw motor overloading	• Suction of motor cooling air hindered • Motor not correctly fixed • Power unit for saw blade not properly fixed	• Check and clean • Requires technical service! Have the machine repaired in the workshop
Cooling agent feed not working	• Cooling agent tank empty • Cooling agent tap locked • Cooling agent tap blocked • Cooling agent duct bent or blocked • Air in the system, e.g. after refilling • Pump doesn't work	• Fill • Open • Clean • Check and clean • Bleed by briefly withdrawing the pressure hose • Start pump
The saw belt stops when sawing, but the motor operates	• Insufficient saw belt tension • V-belt tension	• Check saw belt • Check tension of V-belt
Short life of saw belt (Teeth blunt)	• Quality of saw belt not suitable for this material • An incorrect tooth spacing causes breakage of teeth (the broken tooth in the workpiece blunts the other teeth) • Missing cooling • Cutting speed to high • Feed too high	• Saw belt of higher quality (bimetallic blade) • Select correct tooth pitch • Use coolant equipment • Reduce cutting speed • Reduce feed
Breakage of tooth	• The chip space in the saw belt is overcharged, tooth pitch incorrect	• Use saw belt with a different tooth pitch or reduce feed
Breakage of the saw blade	• Tension in the saw belt too high or too low • Saw belt defective • Saw belt guide adjusted incorrectly	• Check tension of saw belt • Replacing • Adjust blade guide correctly
Twisted cut (saw blade deviating)	• Distance between guide and work-piece too high • Saw belt blunt • Too low saw blade tension • Feed too high • Cutting pressure too high • Saw blade defective (irregular set) • Wrong saw belt guidance	• Bring the guide as close to the work-piece as possible • Replace • Tighten correctly • Reduce • Reduce • Replace • Readjust
Cut not rectangular but parallel	• Material does not rest on both vice jaws • metal band saw not adjusted to 90^0	• Insert material properly • Adjust clamps correctly

8 Appendix

8.1 Copyright

8.2 Terminology/Glossary

Term	Explanation
Workpiece	Material to be cut
Blade guide pulley	Pulley through which the saw blade passes in the saw arch
Saw arch	Housing with protective cover for the saw blade
Material stop	Position for multiple cuts Sawing stop
Hydraulic cylinder	Hydraulic lowering cylinder Hydraulic feed
Feed regulation valve	Valve on the hydraulic cylinder
Protective cover of the V-belts	Covering cap of the pulley
Protective cover saw arch	Cover on the rear of the saw arch
Blade guide bearings	Rollers between which the saw blade passes Guide bearing
Saw belt guide	Blade guide bearings
Saw blade brush	Device for scraping off impurities Saw blade cleaning brush
Clamping jaw	Strip terminal on the machine vice
Machine vice	Clamping device for the workpiece
Worm gear	Reduction gear from drive motor to the V-belt pulley
Drive motor	Engine

8.3 Change information operating manual

Chapter	Short note	new version number
all	EC declaration	1.6.0
	Combining of S181 + S181G	1.6.0
S181G parts	new gear type, 712 SG (from 09 / 2015)	1.6.1
CE	EMC 2014/30/EU ; LVD 2014/35/EU	1.6.2
CE	new Type C standard	1.6.3
3	Interdepartmental transport	1.6.4

8.4 Liability claims for defects / warranty

Beside the legal liability claims for defects of the customer towards the seller the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or had been promised in the frame of a single contractual agreement.

- The processing of the liability claims or of the warranty is performed as chosen by OPTIMUM GmbH either directly or through one of its dealers.
  Any defective products or components of such products will either be repaired or replaced by components which are free from defects. The property of replaced products or components passes on to OPTIMUM Maschinen Germany GmbH.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting of the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual is disregarded.
  - Inattentive or incorrect handling and use of improper equipment.
  - Non-authorized modifications and repairs.
  - Insufficient installation and safeguarding of the machine
  - Disregarding the installation requirements and conditions of use.
  - Atmospheric discharges, overvoltage and lightning strokes as well as chemical influences.
- The following items are as well not subject to the liability or warranty claims:
  - Wearing parts and components which are subject to a standard wear as intended such as e.g. V-belts, ball bearings, illuminants, filters, sealings, etc.
  - Non reproducible software errors
- Any services which OPTIMUM GmbH or one of its agents performs in order to fulfill in the frame of an additional guarantee are neither an acceptance of the defects nor an acceptance of its obligation to compensate. Such services do neither delay nor interrupt the warranty period.
- Place of jurisdiction among traders is Bamberg.
- If one of the above mentioned agreements is totally or partially inefficient and/or null, it is considered as agreed what is closest to the will of the warrantor and which remains in the framework of the limits of liability and warranty which are predefined by this contract.

8.5 Note regarding disposal / options to reuse:

Please dispose of your device environmentally friendly by disposing of scrap in a professional way.

Please neither throw away the packaging nor the used machine later on, but dispose of them according to the guidelines established by your city council/municipality or by the corresponding waste management enterprise.

8.5.1 Decommissioning

CAUTION!

Used devices need to be decommissioned in a professional way in order to avoid later misuses and endangerment of the environment or persons.

- **Pull off the mains plug.**
- **Cut the connection cable.**
- **Remove all environmentally hazardous operating fluids from the used device.**
- **If applicable remove batteries and accumulators.**
- **Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.**
- **Supply the machine components and operating fluids to the provided disposal routes.**

8.5.2 Disposal of the packaging of new devices

All used packaging materials and packaging aids of the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are forwarded to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow a direct reuse.

8.5.3 Disposing of the old device

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices include lots of reusable materials as well as environmentally hazardous components. Account for separate and professional disposal of the component parts. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.

8.5.4 Disposal of electrical and electronic components

Please make sure that the electrical components are disposed of professionally and according to the legal regulations.

The device includes electric and electronic components and must not be disposed of with the rubbish. According to the European directive 2011/65/EU regarding electrical and electronic used devices and the execution of national rights used electrical tools and electrical machines need to be collected separately and be supplied to an environmentally compatible reuse.

Being the machine operator you should obtain information regarding the authorized collection or disposal system which applies for your company.

Please make sure that the batteries and/or accumulators are disposed of in a professional way according to the legal regulations. Please only throw discharged batteries in the collection boxes in shops or at municipal waste management companies.

8.5.5 Disposal of lubricants and coolants

ATTENTION!

Please imperatively make sure to dispose of the used coolant and lubricants in an environmentally compatible way. Observe the disposal notes of your municipal waste management companies.

INFORMATION

Used coolant emulsions and oils should not be mixed up since it is only possible to reuse used oils which had not been mixed up without pre-treatment.

The disposal notes for the used lubricants are made available by the manufacturer of the lubricants. If necessary, request the product-specific data sheets.

8.6 Disposal via municipal collection

Disposal of used electrical and electronic components
(Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

The sign on the product or on its packing indicates that the product must not be handles as common household waist, but that is needs to be delivered to a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the health of your fellow men. The environment and the health are endangered by incorrect disposal. Recycling of material will help to reduce the consumption of raw materials. Your District Office, the municipal waste collection station or the shop where you have bought the product will inform you about the recycling of this product.

8.7 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could send us the following information:

- Modified settings
- Any experiences with the lathe which might be important for other users
- Recurring failures

Optimum Maschinen Germany GmbH
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D-96103 Hallstadt

Fax +49 (0) 951 - 96 555 - 888
Email: info@optimum-maschinen.de

OPTIMUM®
MASCHINEN - GERMANY

EC Declaration of Conformity

in accordance with the Machinery Directive 2006/42/EC Annex II 1.A

The manufacturer / distributor Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26
D - 96103 Hallstadt

hereby declares that the following product

Product designation: metal band saw

Type designation: S181

S181G

fulfills all the relevant provisions of the directive specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

Description:

Hand controlled metal band saw

The following other EU Directives have been applied:

EMC Directive 2014/30/EC ; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

The following harmonized standards were applied:

EN ISO 16093:2017-10 - Machine tools - Safety - Sawing machines for cold metal

EN 60204-1:2014 - Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN 13849-1:2015 - Safety of machinery - Safety related parts of controls - Part 1: General design principles

EN 13849-2:2012 - Safety of machinery - Safety related parts of controls - Part 2: Validation

EN ISO 12100:2013 - Safety of machinery - General principles for design - Risk assessment and risk reduction

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800

Kilian Stürmer (CEO, General Manager)
Hallstadt, 2018-07-09

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