

# TYPE K-AGG-02

Motor unit



Art.Nr.: 10042079

13-06-2016 | Version 1.1 | EN

Kugelmann Maschinenbau e.K.  
Gewerbepark 1-5  
87675 Rettenbach a.A.  
GERMANY

www.kugelmann.com  
office@kugelmann.com  
+49 (0) 8860 | 9190-0

\*

Kugelmann Maschinenbau is a family-run Allgäu business with its main emphasis and tradition in municipal technology. With passion, we manufacture reliable and pioneering machines - we love what we do.

## Copyrights and trademarks

© Kugelmann Maschinenbau e.K.

Gewerbepark 1-5

87675 Rettenbach a.A. (Germany)

Tel.: +49 (0) 8860 / 9190-0

Fax: +49 (0) 8860 / 9190-19

Mail: office@kugelmann.com

Web: www.kugelmann.com

All company names and designations used in this manual may also be registered trademarks of the respective manufacturing companies and shall not be used commercially or otherwise. Errors and omissions excepted.

All rights reserved. No part of this manual shall be reproduced or copied in any form (printing, photocopying, storing or distribution in electronic form) without prior written consent of Kugelmann Maschinenbau e.K.

We are constantly developing our products to offer our customers maximum convenience. Therefore, we ask for your understanding that the manual can deviate from the product in some regards.

## 2 Content

- 1 Title..... 1**
- 2 Content.....3**
- 3 General information.....5**
  - 3.1 Identification of motor unit..... 5
  - 3.2 Service information..... 6
  - 3.3 EC Declaration of Conformity in terms of the EC Machinery Directive 2006/42/EC..... 7
- 4 Operating instructions..... 8**
  - 4.1 Target group..... 8
  - 4.2 Use..... 8
  - 4.3 Conventions used..... 9
  - 4.4 Change history..... 9
- 5 General description..... 10**
  - 5.1 Parts..... 11
  - 5.2 Designated use..... 12
  - 5.3 Obvious misuse..... 12
- 6 Safety instructions..... 13**
  - 6.1 General safety instructions..... 13
  - 6.2 Special safety instructions..... 15
  - 6.3 Transport..... 16
  - 6.4 Operation..... 16
  - 6.5 Maintenance and inspection..... 18
  - 6.6 Designation..... 22
- 7 Commissioning..... 24**
  - 7.1 Fixture..... 24
  - 7.2 Wiring diagram of hydraulic system..... 25
  - 7.3 Filling of hydraulic oil..... 27

|   |           |
|---|-----------|
| <b>8 Instruction manual.....</b>                          | <b>28</b> |
| 8.1 Starting the motor unit.....                          | 28        |
| 8.2 Theft protection.....                                 | 31        |
| 8.3 Remote control (optional).....                        | 33        |
| 8.3.1 With K-Tronic.....                                  | 34        |
| 8.3.2 Without K-Tronic.....                               | 34        |
| <b>9 Maintenance.....</b>                                 | <b>35</b> |
| 9.1 Maintenance intervals.....                            | 35        |
| 9.2 Wear parts.....                                       | 37        |
| 9.3 Change of hydraulic oil and hydraulic oil filter..... | 38        |
| 9.4 Safety.....   | 40        |
| <b>10 Transport.....</b>                                  | <b>41</b> |
| <b>11 Storage.....</b>                                    | <b>42</b> |
| <b>12 Hints relating to assembly and disassembly.....</b> | <b>43</b> |
| <b>13 Disconnecting the system.....</b>                   | <b>44</b> |
| <b>14 Technical Data.....</b>                             | <b>45</b> |
| <b>15 Tightening torques.....</b>                         | <b>46</b> |
| <b>Warranty.....</b>                                      | <b>47</b> |

### 3 General information

This chapter gives you information on the following:

- Chapter 3.1 "Identification of motor unit", page 5
- Chapter 3.2 "Service information", page 6
- Chapter 3.3 "EC Declaration of Conformity in terms of the EC Machinery Directive 2006/42/EC", page 7

#### 3.1 Identification of motor unit



Nr.: DO1101

CE

Type / type:

Fabr.-Nr. / serial no.:

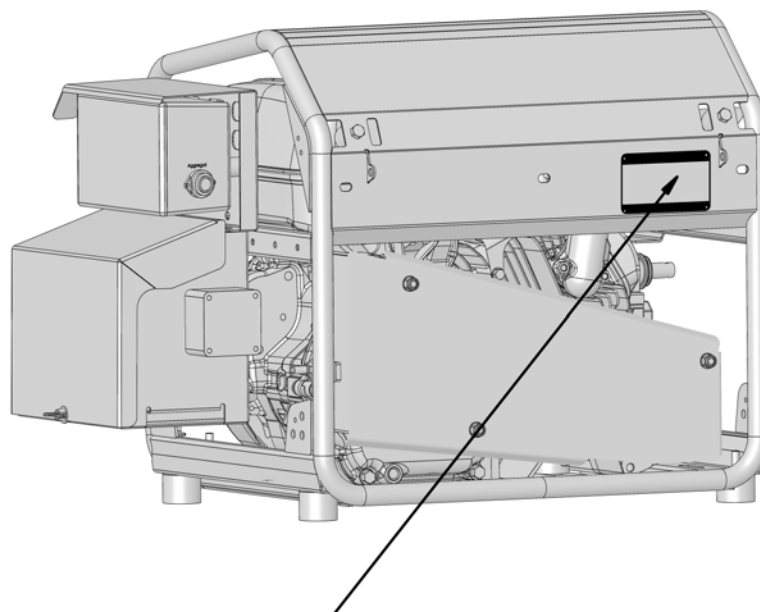
Art. / code:

Baujahr / YOM:

www.kugelmann.com  
D-87675 Rettenbach a. A. Made in Germany

kugelmann\*

The type plate refers to device type, serial number, article number, year of construction and manufacturer.



You will find the type plate here.

## **3.2 Service information**

Customer service:

Tel.: +49 (0) 8860 / 9190-90

Fax: +49 (0) 8860 / 9190-49

E-Mail: [service@kugelmann.com](mailto:service@kugelmann.com)

### 3.3 EC Declaration of Conformity in terms of the EC Machinery Directive 2006/42/EC



We herewith declare that the machine designated below complies with the relevant essential health and safety requirements of the respective EC Directives as well as with the standards, guidelines and other regulations mentioned below due to its design and construction, and in the version supplied by us.

If the machine is modified without our consent, this declaration shall cease to apply.

Designation: Motor unit

Machine type: K-AGG-02

Relevant EC machinery directives:

**EN standards:**

EN ISO 12100-1, EN ISO 12100-2, EN ISO 4254-1

**EMC standards:**

72/245/EG in version 2005/83/EG

Rettenbach a.A., June 2016

Josef Kugelmann

## 4 Operating instructions

This chapter gives you information on the following:

- Chapter 4.1 "*Target group*", page 8
- Chapter 4.2 "*Use*", page 8
- Chapter 4.3 "*Conventions used*", page 9
- Chapter 4.4 "*Change history*", page 9

### 4.1 Target group

These operating instructions are intended for skilled persons who are responsible for the following work at the motor unit:

- Commissioning
- Control
- Operation
- Use
- Maintenance

At least once a year, all personnel must be trained in the operation of the motor unit in accordance with the guidelines of the business liability insurance. The use of the motor unit by untrained or unauthorized persons is prohibited.

### 4.2 Use

These operating instructions contain all necessary data and information for a secure control, operation and maintenance of the motor unit.

Make sure that all persons responsible for operation or maintenance of the motor unit or persons working in the immediate environment of the machine are familiar with the operating and maintenance instructions as well as the safety information in this manual.





These operating instructions are part of the product and have to be kept in a safe place. In case of resale or transfer of the machine to third parties, these operating instructions have to be included.

All information, illustrations and technical data correspond to the technical state at the time of printing. Subject to technical modifications.



## 4.3 Conventions used

This manual uses the following typographic conventions:

| Symbol  | Signal word | Meaning  |
|---|-------------|--|
|  | Danger      | Indicates an imminent dangerous situation, which - in case of non-observance of the safety instructions - will entail death or grievous bodily harm.         |
|  | Warning     | Indicates a possibly dangerous situation, which - in case of non-observance of the safety instructions - may entail death or grievous bodily harm.           |
|  | Caution     | Indicates a possibly dangerous situation, which - in case of non-observance of the safety instructions - may result in minor injuries or damage to property. |
|  | Notice      | Contains useful information with respect to proper handling of the machine.  |

## 4.4 Change history

| Date       | Version | Change        |
|------------|---------|---------------|
| 13-06-2016 | 1.1     | First edition |

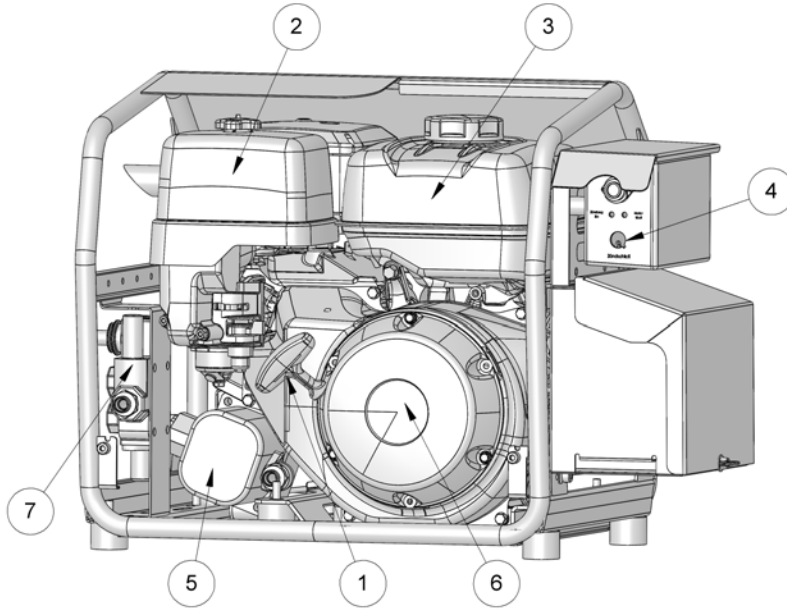
## **5 General description**

This chapter gives you information on the following:

- Chapter 5.1 "*Parts*", page 11
- Chapter 5.2 "*Designated use*", page 12
- Chapter 5.3 "*Obvious misuse*", page 12

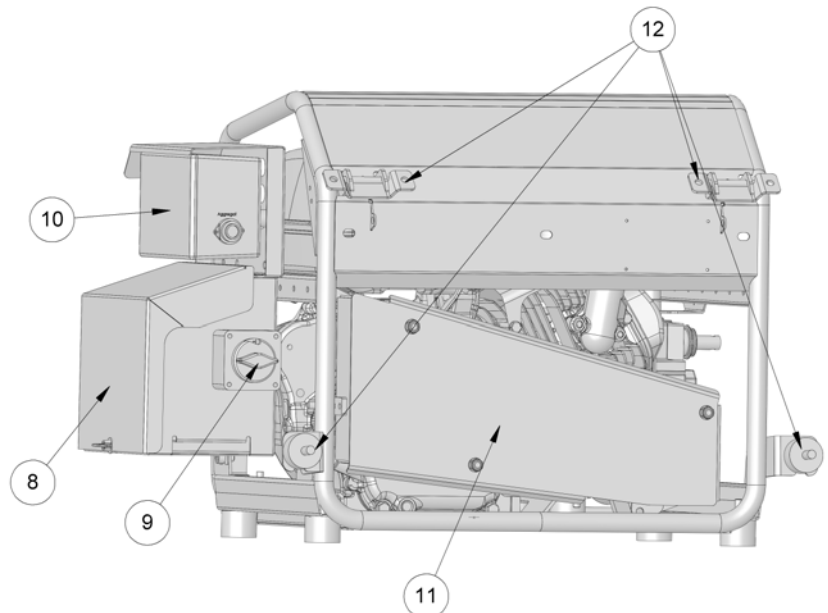
## 5.1 Parts

Please see the following illustrations for parts of the motor unit:



| Pos.: | Component:          |
|-------|---------------------|
| 1     | Manual pull starter |
| 2     | Air filter          |
| 3     | Fuel tank           |
| 4     | Ignition lock       |
| 5     | Hydraulic pump      |
| 6     | Combustion engine   |
| 7     | Switching valve     |

| Pos.: | Component:                    |
|-------|-------------------------------|
| 8     | Battery box                   |
| 9     | Master switch                 |
| 10    | Start electronics             |
| 11    | V-belt covering               |
| 12    | Attachment and lashing points |



## 5.2 Designated use

The motor unit is designed exclusively for conventional use on roads, for park maintenance and for usual winter service work on roads, ways and squares.

Fix the motor unit only at the attachment and lashing points provided for this purpose (see Chapter 5.1 "Parts", page 11).

Any kind of use that deviates from the procedure set forth herein is considered contrary to its designated use. The operator of the motor unit is liable for any damages arising from such action.

Use, maintenance and reconditioning of the unit may only be carried out by trained and skilled personnel.

Operating the plant within the limits of its designated use also involves

- observing the instructions set forth in the operating manual as well as all other enclosed documentation.
- road traffic regulations
- the relevant accident prevention regulations.
- the generally recognized rules relating to technical safety requirements and occupational health.

## 5.3 Obvious misuse

The motor unit is designed for winter maintenance service. The use of the unit in summer is subject to approval of Kugelmann.

The motor unit is designed for the use on roads and must not be used on slopes like e.g. on ski pistes.

## 6 Safety instructions

This chapter gives you information on the following:

- Chapter 6.1 "General safety instructions", page 13
- Chapter 6.2 "Special safety instructions", page 15
- Chapter 6.3 "Transport", page 16
- Chapter 6.4 "Operation", page 16
- Chapter 6.5 "Maintenance and inspection", page 18
- Chapter 6.6 "Designation", page 22

### 6.1 General safety instructions

---



#### **warning**

Non-observance of guidelines.

Risk of serious injury or death.

- Please observe the regulations relating to accident prevention.
  - Please observe the generally applicable safety regulations, industrial standards and medical guidelines.
  - Please observe the road transport guidelines.
  - Please pay attention to the general advice in these operating instructions.
- 



#### **warning**

Damaged hydraulic lines.

Risk of serious injury.

- Damaged hydraulic lines must be replaced immediately!
  - After 6 years at the latest, replace hydraulic lines even if they are not damaged!
-

**caution**

First commissioning without instruction.

Risk of injury or property damage.

- First commissioning of the motor unit must be accomplished by employees of the dealer, the manufacturer or a representative of our works!
- 

**caution**

Wrong position of center of gravity.

Danger of property damage.

- When mounting the motor unit, please make sure that the center of gravity is correctly placed on the carrier vehicle!
- 

**caution**

Commissioning without making sure that the machine is in perfect technical condition.

Risk of injury or property damage.

- Check all important parts before commissioning!
  - Check all safety-related protection devices before commissioning!
  - If applicable, please change damaged parts!
- 

**caution**

Improper handling of motor unit.

Risk of injury or property damage.

- Before operating the motor unit, please study these operating instructions carefully.
  - Please use the unit only for the intended purpose.
  - Do only use original parts and accessories.
  - Do not make any unauthorized changes to the unit.
-

**caution**

Changes at motor unit.

Impairment of functionality and danger of property damage.

- Do not make any changes at the motor unit!
- 

## 6.2 Special safety instructions

---

**warning**

Starting movement of the spreading disc or conveyor screw when connecting the hydraulic lines.

Risk of serious injury.

- Connect hydraulic lines only if the hydraulic cycle is depressurised, the motor is switched off and the ignition key is removed!
- 

**caution**

The hydraulic system is under high pressure.

Leaking hydraulic fluid can pass through the skin.

- If any hydraulic fluid that leaks out passes through the skin, seek medical advice immediately.
- 

**caution**

Working at motor unit with motor unit switched on.

Risk of injury from running machine parts.

- Switch off the motor before opening the tarpaulin cover.
  - Set main switch to *Off* and disconnect battery and remote control before starting to work at the motor unit.
  - Check whether all protective devices are installed and in proper condition.
-

## 6.3 Transport

---



### **warning**

Improper transport of motor unit.

Risk of injury or property damage.

- During loading and unloading, do not mount the motor unit at the motor.
  - During loading and unloading, please mount the motor unit at the frame.
  - Never stay under the motor unit during loading and unloading.
  - Always transport the motor unit horizontally.
- 

## 6.4 Operation

---



### **danger**

Carriage of persons on the motor unit.

Risk of serious injury or death.

- Do not carry persons on the motor unit.
- 



### **warning**

Overload or possible tilting of the carrier vehicle.

Risk of injury, death or damage to property.

- Please observe axle load limits and admissible overall weight!
- 



### **warning**

Changed handling and braking behavior.

Risk of serious injury or death.

- Please adjust your driving behavior to the dimensions and the additional weight of the spreader.
  - Adjust the driving speed to the snow conditions as well as to road and traffic environment.
-



**caution**

Unprotected operation of motor unit.

Risk of injury or property damage.

- Use the motor unit only if protective covers and V-belt covers are mounted.
- 

**caution**

Parts continue to run.

Risk of injury.

- Please wait until all parts stand still and disconnect hydraulic lines before performing any work at the motor unit!
- 

**caution**

Improper filling of spreader.

Damage of motor unit due to spreading material.

- Switch off the motor unit and close the tarpaulin cover before filling the spreader with spreading material.
- 

**caution**

Heat at motor.

Risk of injury or property damage.

- Do not touch any hot components.
  - Do not touch any rotating parts.
- 

**caution**

Carriage of goods on the motor unit.

Danger of property damage.

- Do not carry any goods on the spreader!
-

**caution**

Non-observance of regulations for operating attachments on public roads.

Risk of injury or property damage.

- Follow the pertinent rules and regulations of the information sheet for attachments (Gazette of the Federal Ministry of Transport 1990, page 562).
  - Take measures to compensate limitations of the field of vision.
- 

**caution**

Operating the motor unit in the event of malfunctions.

Risk of injury or property damage.

- In the event of malfunction, please stop the motor unit immediately.
  - Resolve the error immediately or ask a workshop.
- 

**caution**

Placing the motor unit in an unprotected area.

Risk of injury or property damage.

- Never place the motor unit in a highly frequented area or an area accessible to children!
- 

## 6.5 Maintenance and inspection

---

**warning**

Non-observance of safety regulations.

Risk of serious injury or death.

- Comply with the safety regulations during all maintenance work.
- 

**warning**

Electric shocks during maintenance work.

Risk of serious injury or death.

- Interrupt power supply before executing work at an electrical device!
-

**warning**

Damaged hydraulic lines.

Risk of serious injury

- Damaged hydraulic lines must be replaced immediately.
  - After 6 years at the latest, replace hydraulic lines even if they are not damaged.
- 

**caution**

Contact with hydraulic oil.

Risk of damage to health.

- Avoid direct contact with skin. Wear protective clothing, especially impervious gloves.
  - Wear protective goggles. If hydraulic oil gets into your eyes, consult a physician immediately.
  - Never use oil or lubricants to clean your hands.
  - Change dirty or oily clothes as soon as possible!
- 

**caution**

Contamination of hydraulic hoses.

Damage at motor unit.

- When inserting the hydraulic hoses, please make sure that those are free of dirt and chips.
- 

**caution**

Metal parts on the battery.

Risk of short circuit.

- Do not place any metal parts as e.g. tools on the battery.
- 

**caution**

Non-observance of maintenance intervals.

Risk of injury or property damage.

- Please pay attention to the prescribed maintenance intervals!
-

**caution**

Use of wrong spare parts.

Risk of injury or property damage.

- Do only use original parts for repair work!
- 

**caution**

Maintenance work without necessary technical knowledge or appropriate tooling.

Risk of injury or property damage.

- Only carry out maintenance work if you have the necessary expertise as well as suitable tools!
- 

**caution**

Cleaning with high-pressure cleaner.

Danger of property damage.

- Do not clean bearings, plastic parts, electronic parts and hydraulic lines with a high-pressure cleaner!
- 

**caution**

Cleaning of metallic surfaces.

Risk of material damage due to detergents.

- Do not use aggressive detergents!
- 

**caution**

Welding operations at the electric cable system.

Danger of property damage.

- Separate the battery connection before executing any welding operations at the motor unit!
-

**caution**

Loose bolted/screw connections.

Danger of property damage.

- Retighten loose bolted connections after repair and maintenance work!
- 







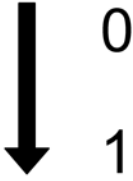
**caution**

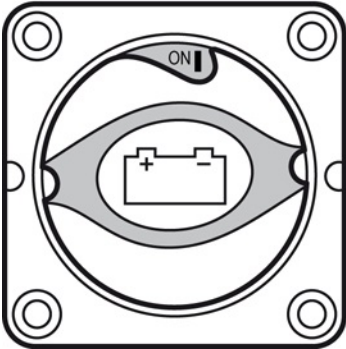
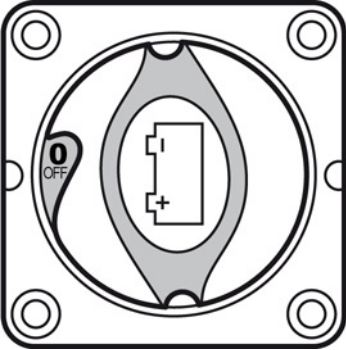
Tightening torque at screws too high.

Danger of property damage.

- Please use the table for tightening torques when tightening the screws (see Chapter 15. "*Tightening torques*", page 46).
-

## 6.6 Designation

| Marking  | Explanation   |
|--|---|
|  <b>CAUTION</b><br><b>HOT MUFFLER CAN BURN YOU.</b><br>Stay away if engine has been running.  | Do not touch any hot components.  |
|  <b>WARNING</b><br>Gasoline is highly flammable and explosive. Turn engine off and let cool before refueling.<br>The engine emits toxic carbon monoxide. Do not run in an enclosed area.<br>Read Owner's Manual before operation. | Gasoline is highly flammable and explosive. Turn engine off and let it cool down before refueling.<br>The engine emits toxic carbon monoxide. Do not run in an enclosed area.<br>Please read the operating instructions before commissioning. |
|   | Please read the operating instructions before commissioning.  |
|    | The engine emits toxic carbon monoxide. Do not run in an enclosed area.   |
|   | Gasoline is highly flammable and explosive. Turn engine off and let it cool down before refueling.  |
|   | Do not touch any hot components.  |
| <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><b>Motor-Oil</b></p> <p><b>eni i-Sint 5W30</b></p> </div>   | Recommended motor oil:<br>Eni i-Sint 5W - 30  |
|   | 0 = internal hydraulic cycle (initial phase)<br>1 = external hydraulic cycle (operation)  |
| <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><b>Aggregat</b></p> </div>  | Connecting cable to motor (ignition)  |

| Marking  | Explanation  |
|--|--|
| <div style="border: 1px solid black; padding: 5px; text-align: center;">Fernsteuerung</div>  | Connecting cable to remote control (operation from carrier vehicle via control system) |
| <div style="border: 1px solid black; padding: 5px; text-align: center;">Zündung<br/>Ein</div>  | "Ignition ON" = green LED illuminated  |
| <div style="border: 1px solid black; padding: 5px; text-align: center;">Motor<br/>läuft</div>  | "Motor running" = orange LED illuminated   |
| <div style="border: 1px solid black; padding: 5px; text-align: center;">Zündschloß</div>   | Ignition lock  |
|  <p>The diagram shows a square master switch with four mounting holes. The central switch is in the 'ON' position, indicated by a vertical bar and the label 'ON' at the top. A battery symbol is shown in the center of the switch mechanism.</p> | Master switch current supply "ON"  |
|  <p>The diagram shows the same square master switch, but the central switch is in the 'OFF' position, indicated by a horizontal bar and the label 'OFF' on the left. The battery symbol is also present.</p>                                      | Master switch current supply "OFF"   |

## 7 Commissioning

This chapter gives you information on the following:

- Chapter 7.1 "Fixture", page 24
- Chapter 7.2 "Wiring diagram of hydraulic system", page 25
- Chapter 7.3 "Filling of hydraulic oil", page 27

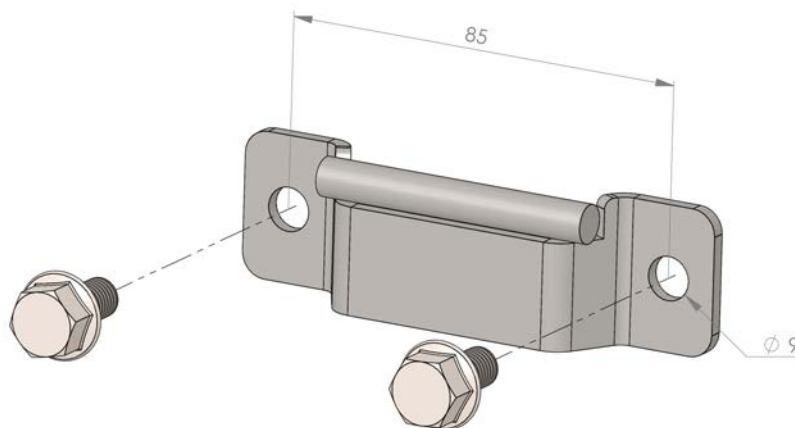


### notice

For details relating to commissioning of combustion engine, please see the enclosed documentation by Honda.

### 7.1 Fixture

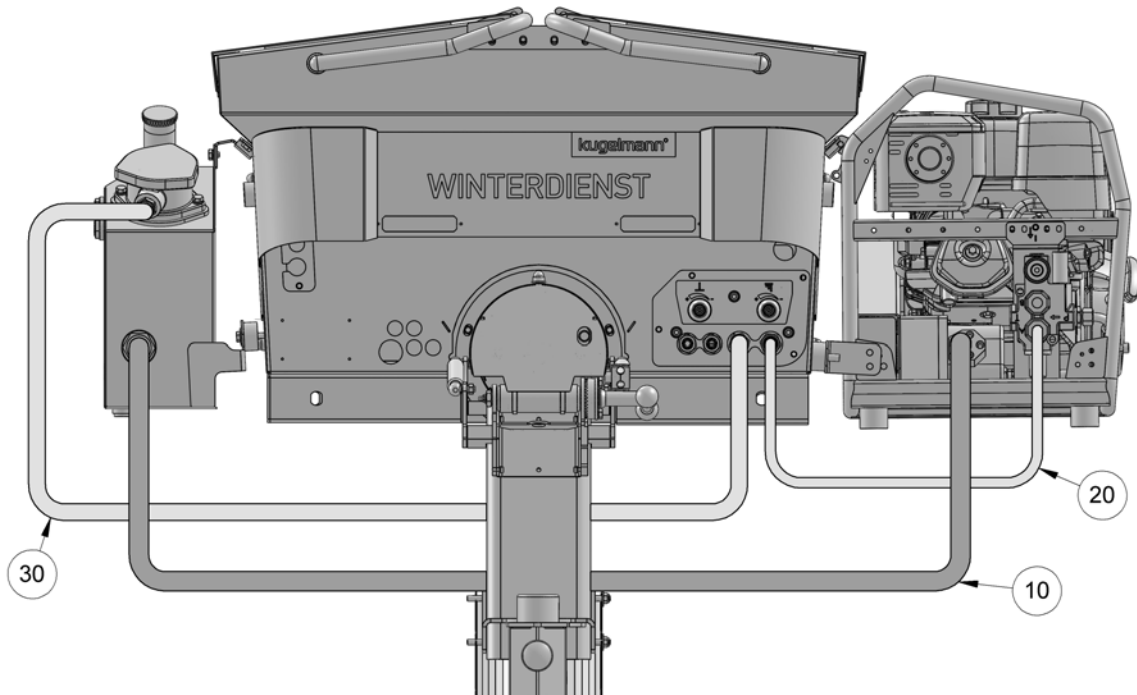
Fixing of the provided suspension lugs as follows:



- 1 Drill two holes with diameter 9 mm at a distance of 85 mm at an appropriate place (alternatively drill holes with diameter 6.8 mm and tap a M8 threaded hole).
- 2 Repeat this procedure for the second lug provided.
- 3 Fix the lugs with two M8 screws each.



## 7.2 Wiring diagram of hydraulic system



Connect the hydraulic lines in the following order:

- 1 Suction line between hydraulic tank and unit (10)
- 2 Return line between spreader and hydraulic tank (30)
- 3 Pressure line between hydraulic unit and spreader (20)



### notice

Make sure that the hydraulic lines are properly installed.

- Consider the laying radii appropriate for the hydraulic lines. Please refer to the assembly instructions of the line manufacturer.
- The hydraulic lines must not be crushed.
- The hydraulic lines must not be placed on moving parts.

**warning**

Starting movement of the spreading disc or conveyor screw when connecting the hydraulic lines.

Risk of serious injury.

- Connect hydraulic lines only if the hydraulic cycle is depressurised, the motor is switched off and the ignition key is removed!
- 

**warning**

Damaged hydraulic lines.

Risk of serious injury.

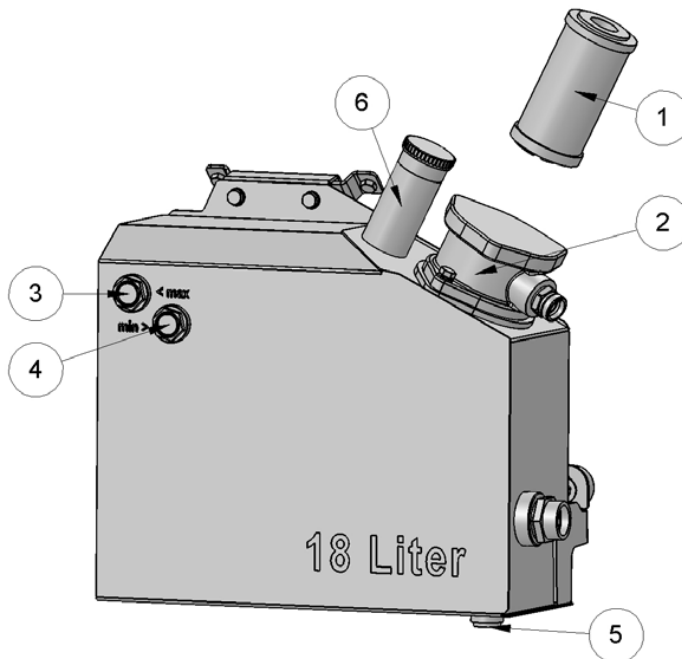
- Damaged hydraulic lines must be replaced immediately!
  - After 6 years at the latest, replace hydraulic lines even if they are not damaged!
-

## 7.3 Filling of hydraulic oil



### notice

Check oil level after first commissioning of unit.



| Pos. | Function               |
|------|------------------------|
| 1    | Oil filter             |
| 2    | Oil filter housing     |
| 3    | Max. oil filling level |
| 4    | Min. oil filling level |
| 5    | Oil draining screw     |
| 6    | Filler neck            |



### notice

Observe max. oil filling level (Pos. 3).

Oil will leak in case of heating.



### notice

- For refilling, only use hydraulic oil HLP 46.
- When refilling, be aware of cleanliness.

## 8 Instruction manual

This chapter gives you information on the following:

- Chapter 8.1 "Starting the motor unit", page 28
- Chapter 8.2 "Theft protection", page 31
- Chapter 8.3 "Remote control (optional)", page 33
- Chapter 8.3.1 "With K-Tronic", page 34
- Chapter 8.3.2 "Without K-Tronic", page 34

### 8.1 Starting the motor unit

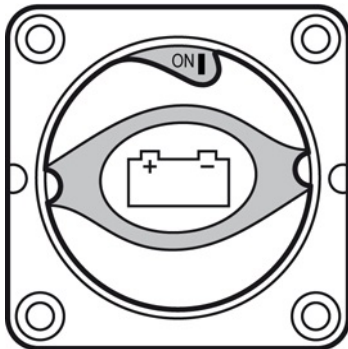
Switch on the motor unit as follows:



#### notice

For details relating to starting of the combustion engine, please see the enclosed documentation by Honda.

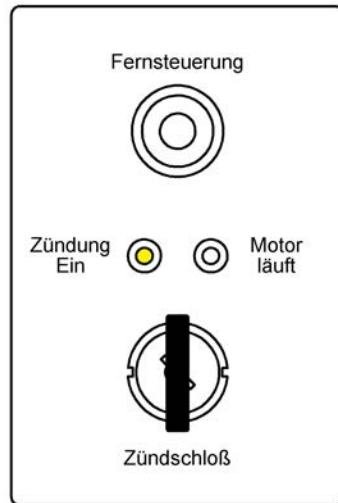
- 1 Set the main switch to *ON*.



You will find the main switch on the rear of the battery box (see Chapter 5.1 "Parts", page 11)

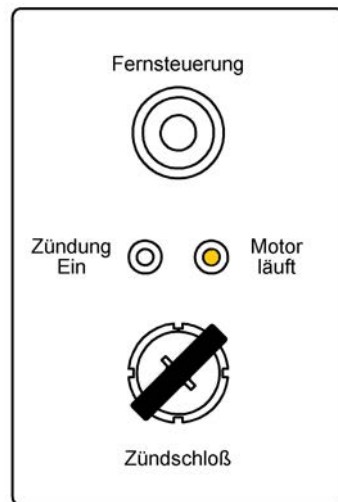
- 2 Switch on ignition as follows:

You will find the ignition on the front of the start electronics (see Chapter 5.1 "Parts", page 11)



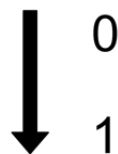
- Turn the ignition key into upright position.
- The yellow LED "Ignition ON" is illuminated.

3 Starting of motor unit:



- Turn and keep the ignition key in turned position until the combustion engine starts up.
- The orange LED "Motor running" is illuminated as soon as the motor operates.
- Release ignition key.

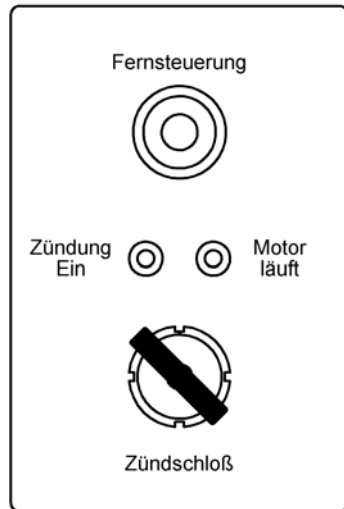
4 Activate the external cycle with the switching valve to supply the spreader with hydraulic oil:



- Press the lever downwards.

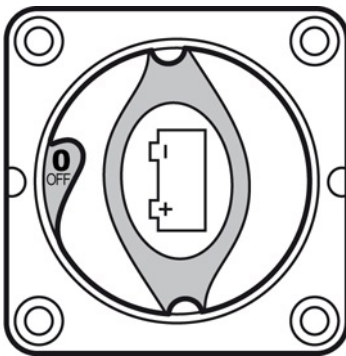
Switch off the motor unit as follows:

1



- Turn the ignition key all the way to the left.
- Both LEDs go out.

2 Set the main switch to *OFF*.

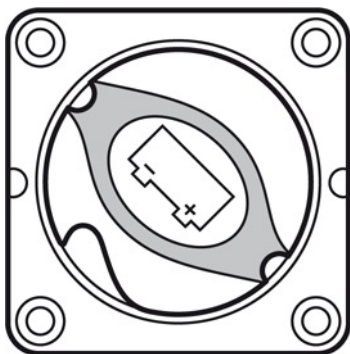


## 8.2 Theft protection

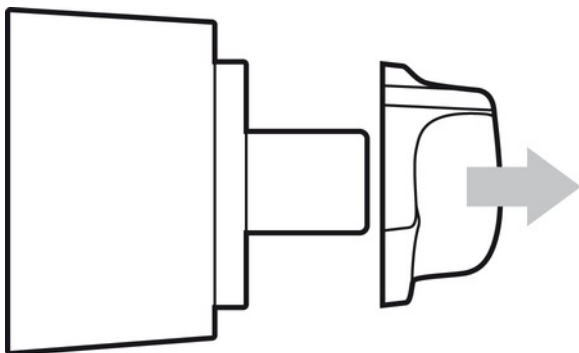
In order to prevent unauthorized persons from starting the motor unit, you can remove the main switch and ignition key after switching off.

Remove the main switch as follows:

- 1 Turn the main switch anti-clockwise until it abuts.

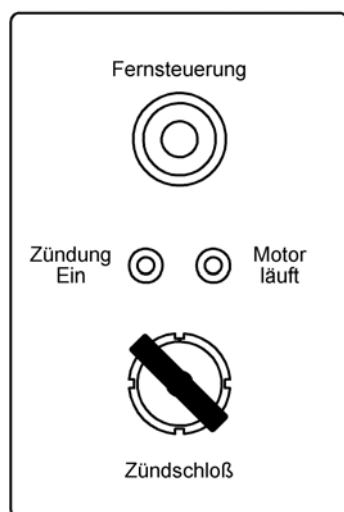


- 2 Remove the main switch.



Remove the ignition key as follows:

- 1 Turn the ignition key anti-clockwise until it abuts and remove it.



The motor unit cannot be started anymore.

To start the motor unit once again, place the main switch at its proper position, set the switch to *ON* and insert the ignition key into the ignition lock.



## 8.3 Remote control (optional)

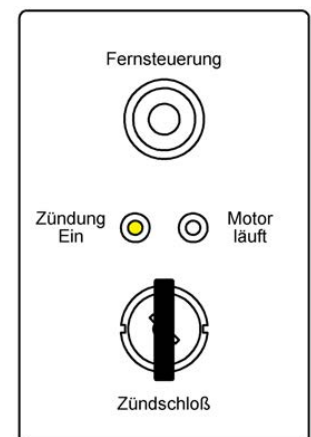
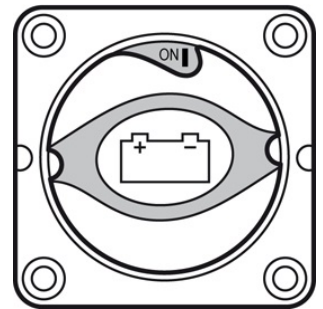
The motor unit can be started from the driver's cab.



### notice

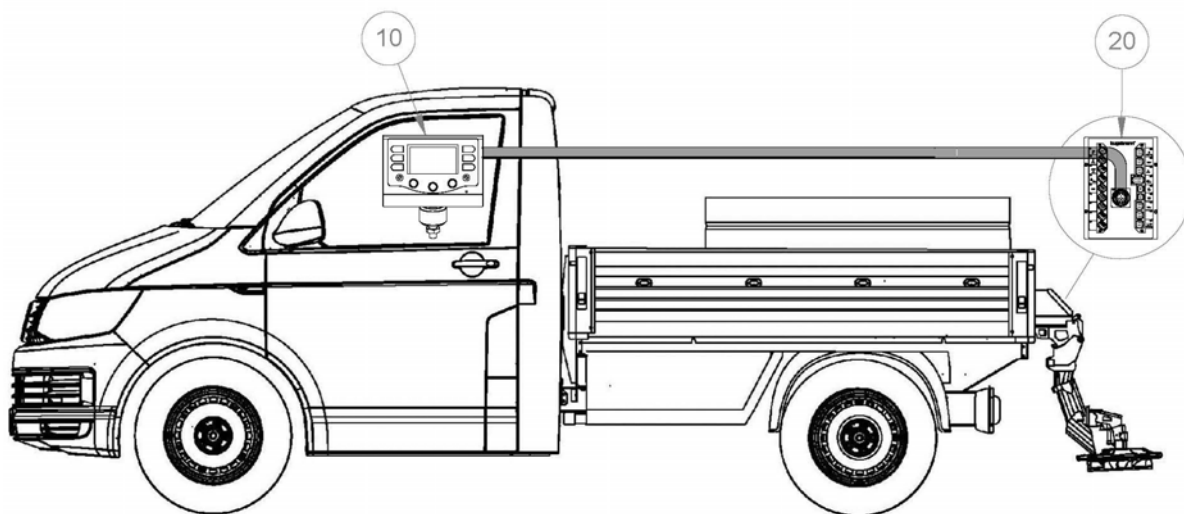
This only works if the following conditions are fulfilled:

- The main switch must be set to *ON* .
- Fuel tap lever must be set to "ON" (see operating instructions *Honda Motor*)
- The ignition key must be switched to "Ignition ON" (yellow LED is illuminated)
- The motor must be warm.



**8.3.1 With K-Tronic**

The remote control consists of Master (Pos. 10) and Slave (Pos. 20).

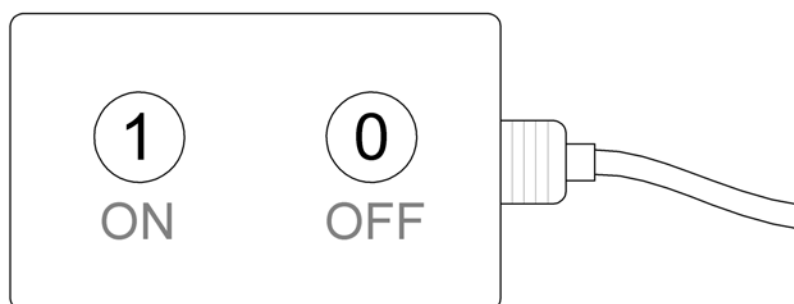


**notice**

For details on the operation of the control system K-Tronic, please see operating instructions K-Tronic.

**8.3.2 Without K-Tronic**

Without K-Tronic control system, starting and switching off the motor unit works according to the above-mentioned conditions with this control system.



## 9 Maintenance

This chapter gives you information on the following:

- Chapter 9.1 "Maintenance intervals", page 35
- Chapter 9.2 "Wear parts", page 37
- Chapter 9.3 "Change of hydraulic oil and hydraulic oil filter", page 38
- Chapter 9.4 "Safety", page 40

### 9.1 Maintenance intervals



#### notice

For the maintenance schedule of the combustion engine, please see the enclosed operating instructions by Honda.

In order to ensure proper operation of the motor unit, please carry out the following maintenance work in the indicated time intervals:

| Interval                  | Work   |
|---------------------------|--|
| Before each use           | <ul style="list-style-type: none"> <li>• Visual inspection of the whole motor unit.</li> <li>• Oil level check of hydraulic tank.</li> <li>• Check hydraulic lines.</li> </ul>   |
| Weekly                    | <ul style="list-style-type: none"> <li>• Check V-belts for cracks.</li> <li>• Check hydraulic oil filter and replace it, if necessary.</li> <li>• Check wear parts (see Chapter 9.2 "Wear parts", page 37).</li> </ul> |
| After 500 operating hours | <ul style="list-style-type: none"> <li>• Change of hydraulic oil.</li> <li>• Change of hydraulic oil filter.</li> </ul>  |



#### warning

Electric shocks during maintenance work.

Risk of serious injury or death.

- Interrupt power supply before executing work at an electrical device!

**warning**

Draining oil during maintenance work.

Risk of serious injury or death.

- Interrupt the hydraulic supply and make sure that the hydraulic cycle is depressurised before working at a hydraulic device!
- 

**caution**

Non-observance of maintenance intervals.

Risk of injury or property damage.

- Please pay attention to the prescribed maintenance intervals!
- 

**caution**

Maintenance work without necessary technical knowledge or appropriate tooling.

Risk of injury or property damage.

- Only carry out maintenance work if you have the necessary expertise as well as suitable tools!
- 

**caution**

Tightening of screw connections.

Danger of property damage.

- When tightening screw connections, always use the prescribed tightening torque (see Chapter 15. "*Tightening torques*", page 46)!
-

## 9.2 Wear parts

---



### notice

Wear parts are:

- V-belt
  - Rubber stops
  - Protective hoses and collars
  - Tarpaulin cover with tightening strap
  - Hydraulic hoses (replace every 6 years or if damaged!)
  - Hydraulic pump and outboard bearing
  - Hydraulic oil filter
  - Hydraulic oil
  - Edge guard
  - Battery
- 



### notice

For information on wear parts of the combustion engine, please see the enclosed operating instructions by Honda.

---



### caution

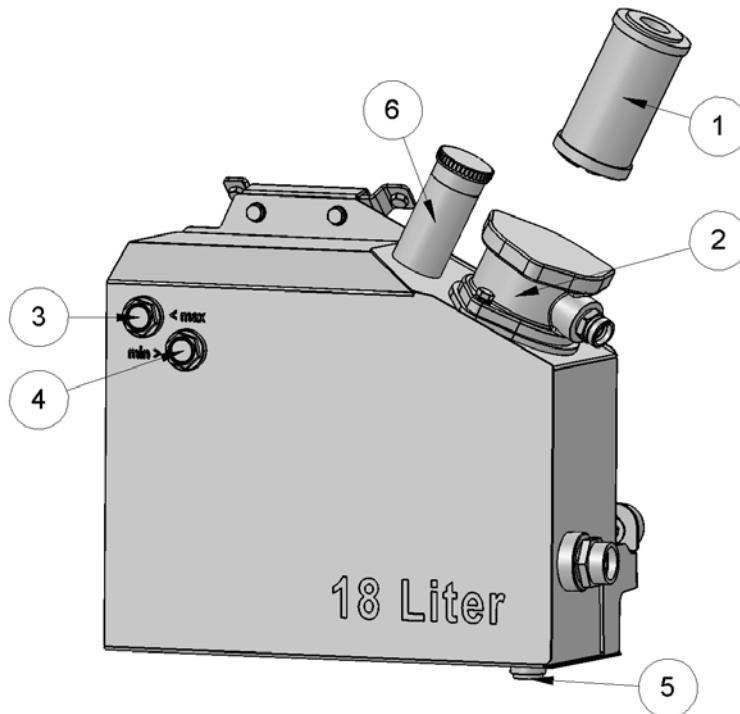
Use of wrong spare parts.

Risk of injury or property damage.

- Do only use original parts for repair work!
-

## 9.3 Change of hydraulic oil and hydraulic oil filter

Change of hydraulic oil and hydraulic oil filter as follows:



| Pos. | Function               |
|------|------------------------|
| 1    | Oil filter             |
| 2    | Oil filter housing     |
| 3    | Max. oil filling level |
| 4    | Min. oil filling level |
| 5    | Oil draining screw     |
| 6    | Filler neck            |

- 1 Open oil draining screw (Pos. 5)
- 2 Collect the oil in an appropriate vessel.
- 3 Slacken three screws at the lid of the oil filter housing (Pos. 2)
- 4 Remove the old oil filter (Pos. 1) and dispose of properly.
- 5 Insert the new oil filter and screw the lid of the oil filter housing (Pos. 2) onto it.
- 6 Screw the oil draining screw (Pos. 5) into the tank and tighten it.
- 7 Fill hydraulic oil (HLP 46) into the tank via filler neck (Pos. 6) (oil level should be between at least (Pos. 4) and max. (Pos. 3)).
- 8 Filling volume: 18 l

**caution**

Carelessness when handling oil or lubricants.

Risk of injury.

- Avoid skin contact with oil and lubricants!
  - Protect your skin with skin-protection lotion or oil-resistant gloves!
  - Never use oil or lubricants to clean your hands!
  - Change dirty or oily clothes as soon as possible!
  - Wear protective goggles. If oil gets into your eyes, consult a physician immediately.
- 

**caution**

Use of wrong spare parts.

Risk of injury or property damage.

- Do only use original parts for repair work!
- 

**caution**

Maintenance work without necessary technical knowledge or appropriate tooling.

Risk of injury or property damage.

- Only carry out maintenance work if you have the necessary expertise as well as suitable tools!
-

## 9.4 Safety

During cleaning and maintenance work, please pay attention to the following:

- Make sure that all hydraulic lines are depressurised.
- Switch off the motor of the motor unit and remove the ignition key.
- Disconnect the hydraulic and electrical connection.
- When tightening screw connections, always use the prescribed tightening torques (see Chapter 15. *"Tightening torques"*, page 46).
- Please observe the safety instructions for maintenance (see Chapter 6.5 *"Maintenance and inspection"*, page 18).



## 10 Transport

This chapter informs you on necessary precautions that have to be taken when transporting the motor unit.



### **warning**

Improper transport of motor unit.

Risk of injury or property damage.

- For transport of the motor unit at the spreader, use only the correct attachment and lashing points provided at the motor unit (see Chapter 5.1 "Parts", page 11)!
  - Make sure that the motor unit does not slip or fall over during transport!
  - During loading and unloading, do not mount the motor unit at the combustion engine!
  - Never stay under the motor unit during loading and unloading!
-

## 11 Storage

This chapter informs you on necessary precautions that have to be taken when putting the motor unit into stock.



### notice

- Always store the motor unit in mounting position.
  - Always store the motor unit refueled.
  - Always store the motor unit in a dry place.
  - Check the oil level before storage. Make sure that the oil tank is filled.
  - Cover the tail pipe to protect the motor unit from impurities.
  - If you disconnect the hydraulic hoses, close the ends with sealing plugs.
  - Clean the interior of the motor unit thoroughly.
  - After cleaning, seal the motor unit inside and outside with a suitable spray wax (e.g. Valvoline Tectyl ML).
-

## 12 Hints relating to assembly and disassembly

This chapter informs you on necessary precautions that have to be taken when assembling or disassembling the motor unit.



### **notice**

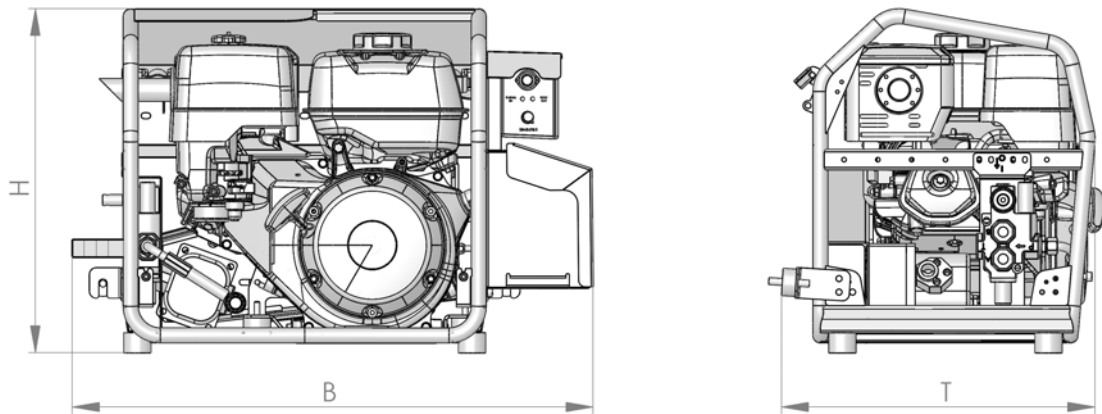
Make sure that the hydraulic hoses are properly installed.

- Consider the laying radii appropriate for the hose. Please refer to the assembly instructions of the hose manufacturer.
  - The hoses must not be crushed.
  - The hoses must not be placed on moving parts.
-

## **13 Disconnecting the system**

The motor unit must be disposed of in accordance with local or state regulations. Depending on material, dispose of parts with residual waste or hazardous waste or recycle. Kugelmann takes no responsibility for disposal.

## 14 Technical Data



|  |   |
|--|---|
| <b>General:</b>  |   |
| Weight:  | 80 kg   |
| Dimensions (H x W x D):  | 770 x 510 x 450 mm                              |
| <b>Engine type:</b>  |   |
| Motor:   | Honda GX 390<br>Single-cylinder 4-stroke engine |
| Engine power:  | 8.7 kW at 3600 rpm.                             |
| Fuel:  | Unleaded petrol                                 |
| Volume of fuel tank:   | 6.1 l   |
| Please see enclosed Honda operating instructions for further information on the motor.   |   |
| <b>Hydraulic system:</b>   |   |
| Volume flow:   | 20 l/min at a motor speed of 2600 r.p.m.        |
| Max. pressure:   | 170 bar   |
| Hydraulic oil:   | HLP 46  |
| <b>Electrical installation:</b>  |   |
| Battery:   | 12 V - 30/60 Ah                                 |
| <b>Ambient conditions and limits for operation</b>   |   |
| The motor unit is designed for the operation at an external temperature of up to -25°C. If you would like to operate the motor unit at an external temperature of under -25°C, please contact us in advance. |   |

# 15 Tightening torques

## Shaft screws stainless steel

- Metric standard thread
- Property class 70
- $\mu = 0.12$  (Anti-seize paste)

| Thread                 | M5 | M6 | M8 | M10 | M12 | M14 | M16 |
|------------------------|----|----|----|-----|-----|-----|-----|
| Tightening torque [Nm] | 4  | 7  | 16 | 33  | 56  | 93  | 136 |

## Shaft screws steel

- metric standard thread
- zinc-plated
- Property class 8.8 and 10.9
- $\mu = 0.14$  (unlubricated)

| Thread                      | M5 | M6 | M8 | M10 | M12 | M14 | M16 |
|-----------------------------|----|----|----|-----|-----|-----|-----|
| Tightening torque [Nm] 8.8  | 6  | 10 | 25 | 50  | 85  | 140 | 210 |
| Tightening torque [Nm] 10.9 | 9  | 15 | 35 | 75  | 130 | 200 | 310 |

## Shaft screws steel

- metric standard thread
- Zinc-flake coated
- Property class 8.8 and 10.9
- $\mu = 0.12$  (unlubricated)

| Thread                      | M5 | M6 | M8 | M10 | M12 | M14 | M16 |
|-----------------------------|----|----|----|-----|-----|-----|-----|
| Tightening torque [Nm] 8.8  | 6  | 9  | 24 | 48  | 84  | 133 | 205 |
| Tightening torque [Nm] 10.9 | 8  | 14 | 34 | 70  | 120 | 180 | 280 |

# Warranty

Kugelmann Maschinenbau e.K., 87675 Rettenbach a.A., warrants its machines to be free from defects in material and workmanship and undertakes to replace free of charge all parts ex works which have been purchased by relevant Kugelmann dealers and have been acknowledged as defective after having been checked by Kugelmann. The warranty expressly given shall be limited to a period of 12 months from the date of delivery of the machine to purchaser. All further claims by the customer shall be excluded.

Wear parts are excluded from warranty.

The manufacturer takes no responsibility for third-party products not produced at the works of Kugelmann. Our liability shall be limited to the assignment of claims that we are entitled against the supplier. No warranty will be given for machines purchased second-hand or used and modified or converted machines.



## notice

Please make sure that you fill in your warranty card and send it back to the manufacturer immediately. Claims have to be notified with a warranty claim in writing after their occurrence without undue delay (after 30 days at the latest).

----- ✂

|                                    |                              |
|------------------------------------|------------------------------|
| <i>Company</i>                     | Device type: .....           |
| <i>Kugelmann Maschinenbau e.K.</i> | Serial number: .....         |
| <i>Gewerbepark 1-5</i>             | Vehicle identification ..... |
|                                    | number:                      |
| <i>87675 Rettenbach a.A.</i>       | Year of construction: .....  |
| <i>Germany</i>                     | Address of dealer:           |
|                                    | .....                        |
|                                    | .....                        |
|                                    | .....                        |
|                                    | Address of user/owner:       |
|                                    | .....                        |
|                                    | .....                        |
|                                    | .....                        |

I have read the operating instructions.  
Signature of user: .....

The warranty card has to be sent directly to the manufacturer.  
ATTENTION: Warranty claims are only accepted with the warranty card of Kugelmann Maschinenbau e.K.

