

Rerailing equipment instruction manual

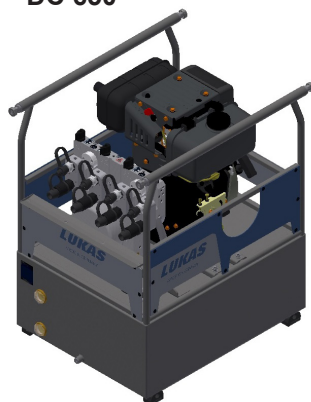
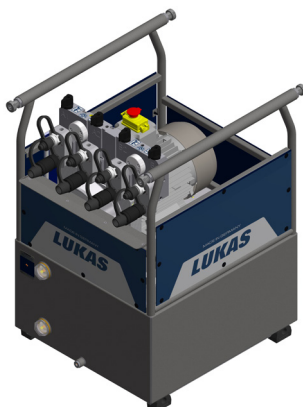
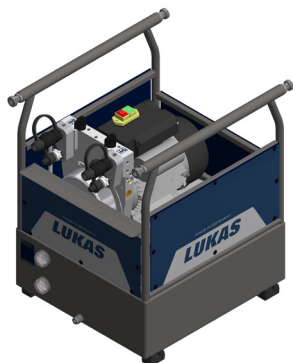


Hydraulic power unit GC/PC/DC 650

GC 650



DC 650



PC 650




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1. Danger classifications

We differentiate between various different categories of safety instructions. The table shown below provides an overview of the assignment of symbols (pictograms) and signal words to the specific danger and the possible consequences.

Pictogram	Damage / injury to	Keyword	Definition	Consequences
	Persons	DANGER!	Immediate danger	Death or severe injury
		WARNING!	Potentially dangerous situation	Potential death or serious injury
		CAUTION!	Less dangerous situation	Minor or slight injury
	Property	ATTENTION!	Risk of damage to property/ environment	Damage to the equipment, damage to the environment, damage to surroundings
	-	NOTE	Handling tips and other important/ useful information and advice	No injury/damage to persons/ environment/ device



Wear protective clothing



Wear a safety helmet



Wear face protection



Wear ear protection



Wear protective gloves



Wear protective footwear



Proper recycling



Protect the environment



Read and follow the instruction manual

2. Product safety

LUKAS products are developed and manufactured to ensure the best performance and quality when used as intended.

The safety of the operator is the most important consideration in product design. Furthermore, the instruction manual is intended to help you use LUKAS products safely.

In addition to the safety instructions in this instruction manual, all generally applicable, statutory and other binding national and international accident prevention regulations must be observed and operators must be instructed accordingly!

The equipment may only be operated by persons with appropriate training in the safety aspects of such equipment, otherwise, there is a risk of injury.

We would like to point out to all users that they should carefully read the instruction manual before they use the equipment, and follow the instructions it contains carefully.

We further recommend that you have a qualified trainer show you how to use the product.



WARNING / CAUTION!

The operating instructions for the hoses, accessories and connected devices must also be observed!

























Even if you have already received instructions on how to use the equipment you should still read through the following safety instructions again.

























WARNING / CAUTION!

Make sure that the accessories used and the connected devices are suitable for the max. operating pressure!

	<p>Please ensure that no body parts or clothing are caught between the visibly moving parts of the devices.</p>	<p>Immediately report any changes that occur (including changes in operating behavior) to the appropriate persons/ departments! If necessary, the equipment is to be shut down immediately and secured!</p>	
	<p>Wear protective clothing, safety helmet, face protection, ear protection, protective gloves and protective footwear.</p>	<p>Inspect the device before and after use for visible defects or damage.</p>	
 	<p>Working under suspended loads is not permitted where such loads are being lifted only by means of hydraulic devices. If working under a suspended load is unavoidable, suitable mechanical supports are also required.</p>	<p>All lines, hoses and screw connections must be checked for leaks and externally visible damage. These must be repaired immediately! Escaping hydraulic fluid can cause injuries and fires.</p>	

	<p>In the event of malfunction, immediately deactivate the device and secure it. Repair the fault immediately (or have it repaired).</p>	<p>Do not carry out any changes (additions or conversions) to the equipment without obtaining the prior approval of LUKAS.</p>	
 	<p>Observe all safety and danger information on the equipment and in the instruction manual.</p>	<p>All safety and danger instructions on the equipment must always be complete and in a legible condition.</p>	
 	<p>Make sure that all device safety covers are present and in proper condition.</p>	<p>Any mode of operation that compromises the safety and/or stability of the device is forbidden!</p>	 
 	<p>Safety devices must never be disabled!</p>	<p>The maximum permissible operating pressure marked on the device must not be exceeded.</p>	
	<p>Before switching on/starting up the device and during its operation, make sure that this will not pose any danger to personnel.</p>	<p>Observe all intervals for recurring tests and/or inspections that are prescribed or stated in the instruction manual.</p>	
 	<p>When working close to live components and cables, suitable measures must be taken to avoid current transfers or high-voltage transfers to the equipment.</p>	<p>Only genuine LUKAS accessories and spare parts are to be used for repairs.</p> <p>Please ensure that you do not become entangled in hoses or cable loops and trip when working with or transporting the device.</p>	 
 	<p>The build-up of static charges and therefore possible sparking must be avoided when handling the device.</p>	<p>Do not touch the motor or exhaust system when working with combustion motor pumps, as there is a risk of burns.</p>	
 	<p>Motor pumps must not be operated in potentially explosive areas!</p>	<p>Internal combustion motors must not be operated in enclosed spaces, as there is a risk of poisoning and/or suffocation.</p>	

 	<p>If fuel is spilled on combustion motors, it must be completely removed before starting the motor.</p>	<p>Refueling while operating a combustion motor is strictly prohibited!</p>	 
 	<p>Keep combustion motors and their fuel away from ignition sources, otherwise there is a risk of explosion.</p>	<p>Replace all damaged electrical components (e.g. charred cables, etc.) immediately or have them replaced!</p>	 
 	<p>To avoid fire hazard, ensure sufficient ventilation when operating combustion motors and maintain a safety distance of at least 1m (39.4 in.) from walls and other shielding.</p>	<p>Damage to the electrical components may only be repaired by a trained electrician, observing all applicable national and international safety guidelines and regulations.</p>	
 	<p>Ensure that combustion motor pumps are always placed on a horizontal surface that is as level as possible so that no fuel can leak.</p>	<p>When setting up the power unit, ensure that it is not affected by extremely high temperatures.</p>	
 	<p>The equipment is filled with hydraulic fluid. This hydraulic fluid can be detrimental to health if it is swallowed or its vapor is inhaled. Direct contact with the skin must be avoided for the same reason. Also, when handling hydraulic fluid, note that it can negatively affect biological systems.</p>	<p>When working with or storing the equipment, ensure that the function and the safety of the equipment are not impaired by the effects of severe external temperatures and that the equipment is not damaged in any way. Please note that the equipment can also heat up over a long period of use.</p>	
	<p>Make sure that there is adequate lighting while working.</p>	<p>Before transporting the equipment, always ensure that the accessories are positioned in such a way that they cannot cause an accident.</p>	
	<p>Always keep this instruction manual easily accessible at the place of operation.</p>	<p>Ensure proper disposal of all dismantled parts, hydraulic fluid residues, oil residues and packaging materials!</p>	 

In addition to the safety instructions in this instruction manual, all generally applicable, statutory and other binding national and international accident prevention regulations must be observed and operators must be instructed accordingly!

WARNING / CAUTION / ATTENTION!

This device is intended **exclusively** for the purpose described **in the instruction manual (see chapter "Proper use")**. Any other use is **not in accordance with its proper use**. The manufacturer/supplier is not liable for any damage resulting from improper use. The user bears sole responsibility for such use. Proper use includes observance of the instruction manual and compliance with the inspection and maintenance conditions.



Never work in a fatigued or intoxicated state!



WARNING / CAUTION / ATTENTION!

Should you nevertheless injure yourself on the hydraulic power unit, clean the wound immediately and consult a doctor to have it treated!



If you get hydraulic fluid in your eye, immediately rinse it several times with clear, clean water and consult a doctor!

If you swallow hydraulic fluid, you should also consult a doctor!

3. Proper use

LUKAS hydraulic power units are specially designed to supply LUKAS rerailing equipment with hydraulic fluid and pressure. LUKAS rerailing equipment, such as a traversing unit or one or more hydraulic cylinders, are used for uprighting and rerailing rail vehicles.

They can be used to supply pressure or fluid to rerailing devices from other manufacturers, but must be technically tested and approved by LUKAS in each individual case.

These power units were not designed for operation **without hoses or devices** (operating time without hoses or devices < 15 minutes).

The power unit type groups GC 650, PC 650 and DC 650 were developed for rerailing systems and for use in combination with the control desk.

When carrying out any work with the power units described here, make sure that persons in the working environment, whether involved or uninvolved, are not endangered by the connected hoses and devices during the lifting operation.



WARNING / CAUTION / ATTENTION!

Always observe the safety information in this instruction manual with regard to the site and method of installation!



LUKAS power units of type GC, PC and DC 650 are **not** explosion-proof!

Accessories and spare parts for the hydraulic power units are available from your authorized LUKAS dealer!



ATTENTION!

When selecting the devices to be connected, please note that the maximum possible effective volume of the hydraulic fluid is limited.

The sum of the max. required quantity of oil (hydraulic fluid) of all the connected devices must not exceed the maximum possible effective volume of the hydraulic unit!

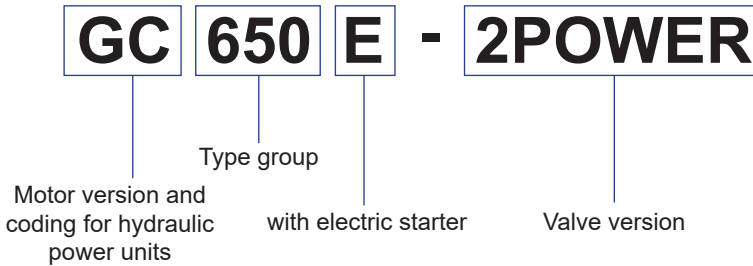


NOTE:

Always register your hydraulic power unit on the LUKAS Hydraulik GmbH website. This is the only way to guarantee extended warranty cover.

Before using third-party couplings, you must always contact LUKAS or an authorized dealer.

4. Power unit label



Valve version:

- 1POWER = single-flow operation
- 2POWER = simultaneous operation
- 4POWER = four-flow operation

Engine version:

- PC = electric motor (operation with power supply)
- GC = gasoline motor
- DC = diesel motor

5. Functional description

5.1 General

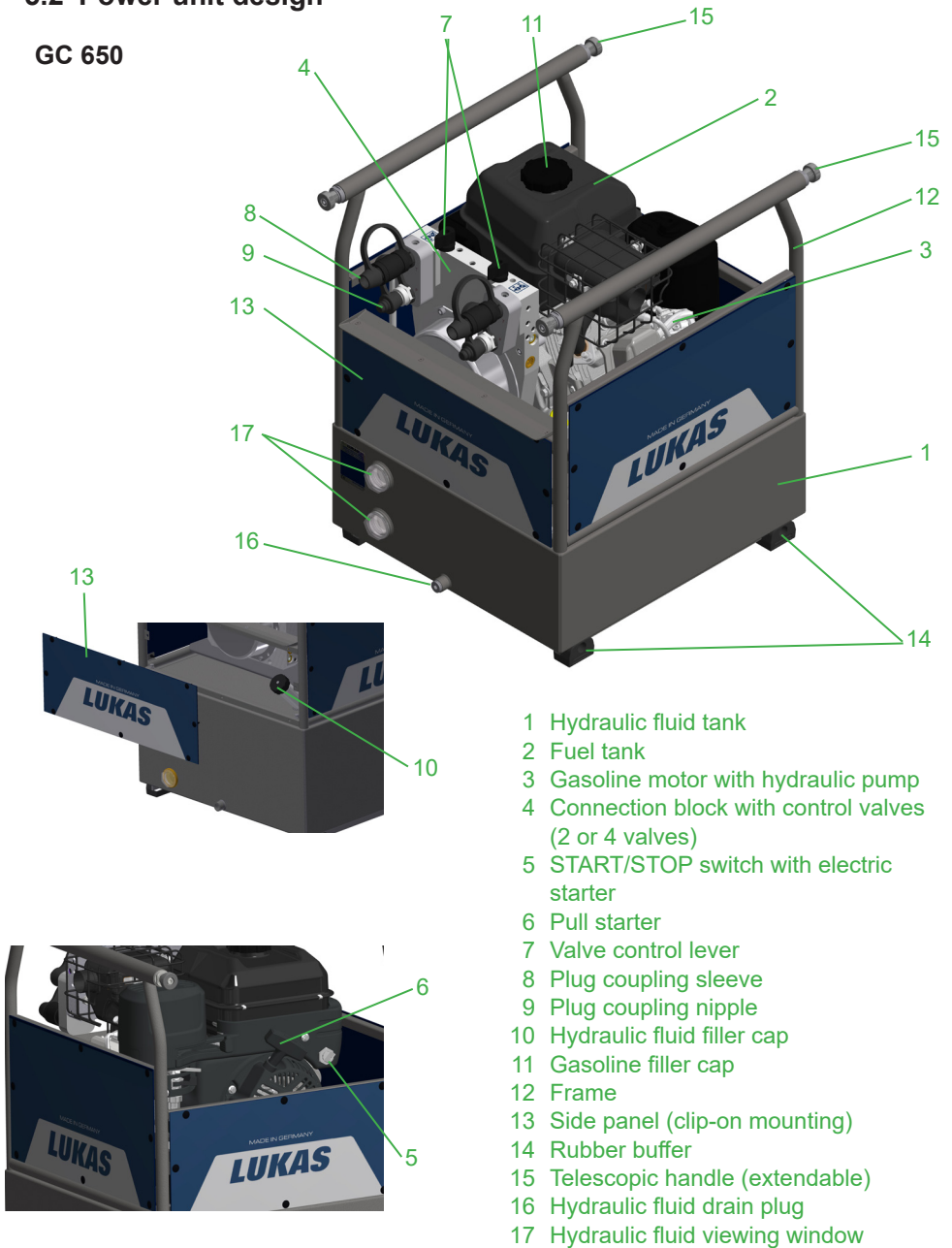
In every LUKAS hydraulic power unit, there is a hydraulic pump that is always operated by a motor (gasoline, diesel or electric motor).

This pump delivers the hydraulic fluid from the tank to the connected equipment and builds up the hydraulic pressure.

The fluid distribution is then controlled via the valves.

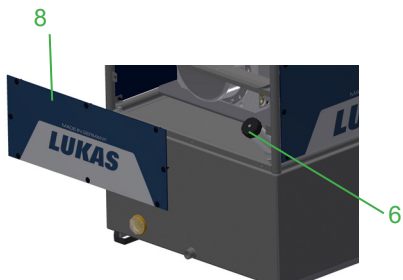
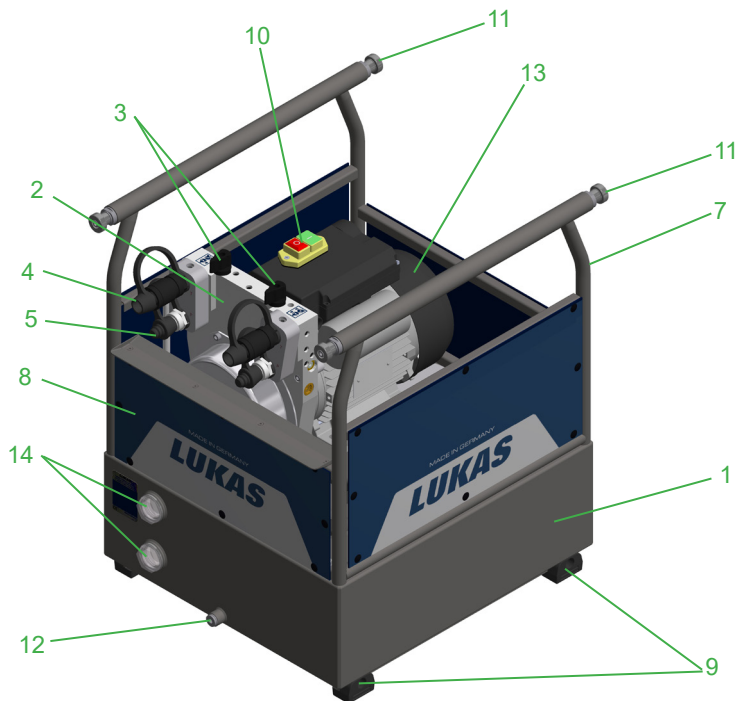
5.2 Power unit design

GC 650



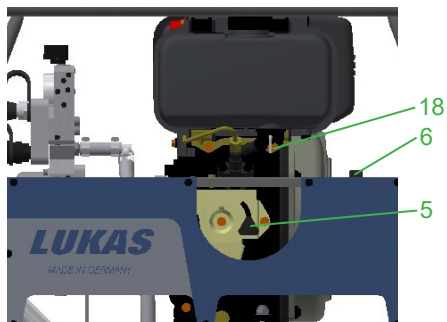
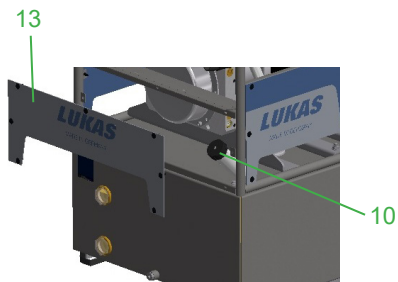
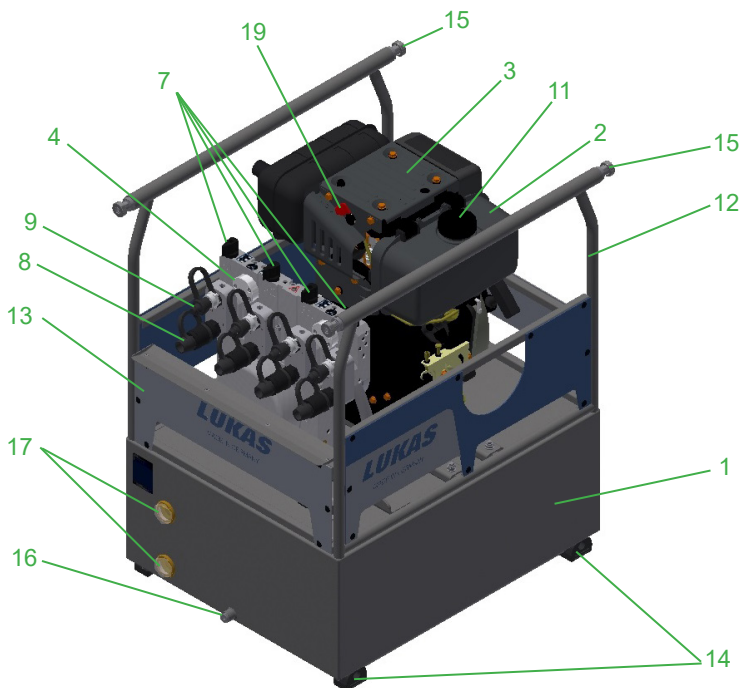
- 1 Hydraulic fluid tank
- 2 Fuel tank
- 3 Gasoline motor with hydraulic pump
- 4 Connection block with control valves (2 or 4 valves)
- 5 START/STOP switch with electric starter
- 6 Pull starter
- 7 Valve control lever
- 8 Plug coupling sleeve
- 9 Plug coupling nipple
- 10 Hydraulic fluid filler cap
- 11 Gasoline filler cap
- 12 Frame
- 13 Side panel (clip-on mounting)
- 14 Rubber buffer
- 15 Telescopic handle (extendable)
- 16 Hydraulic fluid drain plug
- 17 Hydraulic fluid viewing window

PC 650



- 1 Hydraulic fluid tank
- 2 Connection block with control valves (2 or 4 valves)
- 3 Valve control lever
- 4 Plug coupling sleeve
- 5 Plug coupling nipple
- 6 Hydraulic fluid filler cap
- 7 Frame
- 8 Side panel (clip-on mounting)
- 9 Rubber buffer
- 10 ON - OFF switch for electric motor
- 11 Telescopic handle (extendable)
- 12 Hydraulic fluid drain plug
- 13 Electric motor with hydraulic pump
- 14 Hydraulic fluid viewing window

DC 650



- 1 Hydraulic fluid tank
- 2 Diesel tank
- 3 Diesel motor with hydraulic pump
- 4 Connection block with 4 control valves
- 5 Speed adjustment
- 6 Pull starter
- 7 Valve control lever
- 8 Plug coupling sleeve
- 9 Plug coupling nipple
- 10 Hydraulic fluid filler cap
- 11 Diesel filler cap
- 12 Frame
- 13 Side panel (clip-on mounting)
- 14 Rubber buffer
- 15 Telescopic handle (extendable)
- 16 Hydraulic fluid drain plug
- 17 Hydraulic fluid viewing window
- 18 Fuel tap
- 19 Decompression valve

5.3 Engine versions



WARNING / CAUTION / ATTENTION!

For all motor versions, please also observe the separate instruction manual of the respective motor manufacturer.

5.3.1 Electric motor

These hydraulic power units are equipped with an electric motor. The electric motor is operated with electricity from the power supply or with electricity generated by generators. When operating with generators, care must be taken to ensure that there are no voltage fluctuations, as these have a direct influence on the delivery rate and stability of the hydraulic power unit.

The possible operating voltage, the current frequency and the required current intensity can be found in the chapter "Technical Data".



NOTE:

If a very long power supply cable is used, the voltage supply to the motor may be lower due to cable resistance. This also reduces the power of the motor.

5.3.2 Gasoline motor

These hydraulic power units are equipped with a combustion motor that runs on "gasoline". In addition to the pull starter, the power units can also be equipped with an electric starter (optional).



NOTE:

It is important that you fully observe all safety regulations, operating, maintenance and storage instructions in the separate motor manual, as these are not affected by the adjustments made by LUKAS.

The starter battery is automatically recharged by the integrated generator during motor operation. If the battery has discharged due to longer storage time, you should start the power unit with the pull starter. The battery will then be automatically recharged.

If the battery is still not charged after approx. half an hour of motor operation, this could be due to the following causes:

- The contacts (connection plugs) have come loose and must be reconnected.
- The battery is defective and must be replaced.
- The generator or motor is damaged. In this case contact LUKAS customer service directly.

5.3.3 Diesel motor

These hydraulic power units are equipped with an internal combustion motor that runs on "diesel".



NOTE:

It is important that you fully observe all safety regulations, operating, maintenance and storage instructions in the separate motor manual, as these are not affected by the adjustments made by LUKAS.

5.4 Valve versions

The valves are always permanently installed in a connection block. This block is directly integrated into the hydraulic power unit. The hose lines (pressure and return flow) are both connected to the connection block. The power units are equipped with either a 1POWER, 2POWER or 4POWER connection block.

The hoses or devices are always connected to the connection block with plug couplings.

5.4.1 Control valve "Single-flow operation" (1POWER)

A double-acting hydraulic device can be connected to this valve. Two switching options are available. With this shift lever, the connection can be pressurized or depressurized.

5.4.1 Control valve "dual flow operation" (2POWER)

Two double-acting hydraulic devices can be connected to this valve. With this valve you can operate two devices simultaneously and independently of each other.

Two switching options are available. With the two shift levers, the individual connections can be pressurized or depressurized.

5.4.2 Control valve "Four-flow operation" (4POWER)

Four double-acting hydraulic devices can be connected to this valve. With this valve you can operate four devices simultaneously and independently of each other.

Four switching options are available. With the four shift levers, the individual connections can be pressurized or depressurized.



ATTENTION!

When operating several rerailing devices with one power unit, ensure that the usable hydraulic fluid quantity in the fluid tank is greater than the maximum possible oil quantity (hydraulic fluid) of all of the connected rerailing devices together! With regard to the hydraulic fluid tank, a distinction is made between filling and usable quantity.

5.5 Pumps

LUKAS hydraulic power units are equipped with a single-flow, dual-flow or four-flow pump, depending on the type. The pumps are permanently connected to the connection block.

Two-flow pump for operation with 2POWER valve

Four-flow pump for operation with 4POWER valve

The pumps used are always equipped with two pressure stages per pump flow, one low-pressure and one high-pressure stage.

Low pressure stage (LP) = up to 14 MPa*

*) 1 MPa = 10 bar

High pressure stage (HP) = up to 53 MPa*

The changeover from low pressure to high pressure takes place automatically in the pump. The maximum pressure is limited by a pressure relief valve.



WARNING / CAUTION / ATTENTION!



For safety reasons, the pressure setting on this valve must **not** be adjusted (without direct approval from LUKAS)!

5.6 Frame with side parts

All hydraulic power units described here are enclosed in a frame.

The frame and the side parts serve to protect the power unit against external influences (e.g. dirt, damage etc.) and also to transport the device by the frame itself or the carrying handles.

5.7 Connection to the control desk

Connection to the rerailing devices is established exclusively via the control desk - either via the connecting hoses that are permanently installed on the control desk, or via additional extension hose pairs, if the power unit is not placed directly under the control desk. Extension hose pairs are available in different lengths.

If required, the individual hose lines can be marked additionally with colored snap rings to make it easier to assign the hose lines.

(For more detailed information, please refer to the LUKAS range of accessories or contact your LUKAS dealer.)

6. Connecting hose lines / devices



ATTENTION!

When connecting the hose lines, always make sure that the connection components are clean. If necessary, clean them beforehand!



NOTE:

Before connecting or disconnecting hose lines to or from the hydraulic power unit, ensure that the power unit is switched off, or that a power unit with electric motor (PC 650) is disconnected from the power supply (pull out power supply plug)! This is an increased safety measure to completely exclude possible movement of the devices.



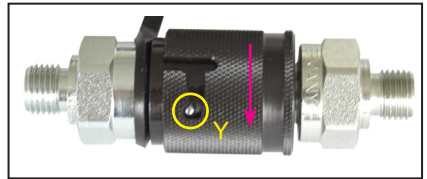
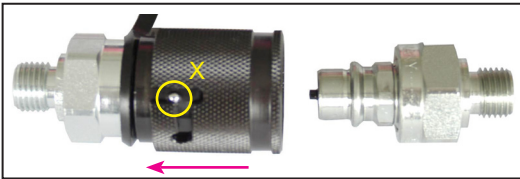
WARNING / CAUTION / ATTENTION!

Before connecting the device ensure that **all** components used are designed for the **maximum operating pressure of the hydraulic unit!** In case of doubt, you **must consult LUKAS directly** before connecting the devices!



Coupling the plug couplings

The hydraulic hoses are connected to the hydraulic pump via plug coupling halves (sleeve and nipple) whereby confusion is eliminated.



Before coupling, remove dust protection caps, then pull back and hold the locking sleeve of the coupling sleeve (position X). Push nipple and coupling sleeve together and release the locking sleeve. Finally, turn the locking sleeve to position Y. The connection is now established and secured. Uncoupling is carried out in the reverse order.



ATTENTION!

Always connect **the return line** first (tank line - marked T on the pump block) and then the supply line (pressure line - marked P on the pump block)! When disconnecting the connection you should always disconnect **the supply line** (pressure line) first and then the return line!



NOTE:

Coupling is only possible when the hoses are **depressurized**.

The dust protection caps supplied must be replaced to protect against soiling.



WARNING / CAUTION / ATTENTION!

Some of the plug couplings have special functions and must therefore **not be unscrewed** from the hose lines and/or **interchanged!**



7. Setting up and commissioning

7.1 Setting up



WARNING / CAUTION / ATTENTION!



Due to possible sparking, combustion motor power units and electric power units must not be used in an explosive environment. In closed rooms, the use of power units with combustion motors is prohibited, as there is a risk of poisoning and suffocation!

The power unit should be set up in a suitable location (safe location / level surface / sufficient distance from vehicles, loads, ignition sources etc.).

LUKAS power units work perfectly up to an inclination of 10°. However, to ensure maximum safety and function, they should ideally be operated in a horizontal position.

7.2 Commissioning



NOTE:

Before commissioning or after longer storage periods, the starter battery (if present) must first be connected and the motor oil level checked in the case of power units with a combustion motor! If necessary, top up the motor oil!

For safety reasons, LUKAS power units are shipped without motor oil, hydraulic fluid and fuel!

For commissioning, proceed as follows:

1. First, you must check the fluid levels of the power unit.

You can see the hydraulic fluid level from the outside through the circular inspection windows at the top and bottom of the tank. Hydraulic fluid should be visible in the upper window of the hydraulic tank. Place the power unit horizontally and on a level surface so that you can read the exact fluid levels or fill the tank.



ATTENTION!

Be sure not to mix up the fuel and hydraulic fluid tanks when filling the tanks, this can cause damage to the power unit!

Gasoline tanks can be filled up to the lower edge of the fuel tank filler neck. However, no more than three liters of gasoline should be filled (correspondingly less if the power unit is tilted).

Diesel tanks may only be filled to the red filler ring in the tank filter.

2. In the case of hydraulic power units with an electric motor, the power supply plug must now be connected to the power supply.
3. The hydraulic unit should then be bled. Set all control valve levers to neutral position (see chapter "Operation"). The actual bleeding of the hydraulic power units is then carried out in various ways depending on the drive motor:

A) *Gasoline motor:*

- Remove the plug connector from the spark plug (on the rear of the power unit).
- Turn the motor over slowly several times with the starter cord.
- Then reinsert the plug connector.

- b) *Diesel motor:*
 - Set the speed governor upwards to STOP.
 - Turn the decompression valve to the right.
 - Turn the motor over slowly several times with the starter cord.
- c) *Electric motor (power supply operation):*
 - Start the motor and switch it off after about 15 seconds, repeat this procedure several times. (Before switching on again, the motor must have come to a standstill!)

This procedure allows the pump to suck in slowly and bleed in the process. The hydraulic fluid tank is equipped with an automatic bleeding device so that no further bleeding is necessary.

4. Check the fluid levels in the tanks again. If necessary, fill up to the respective liquid level.

8. Operation



ATTENTION!

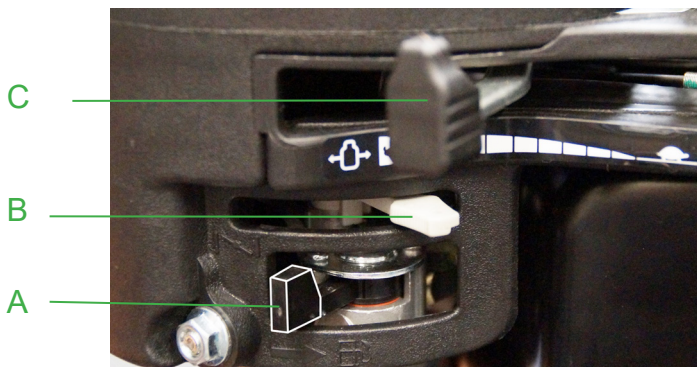
The control levers of the hydraulic units should always be switched to neutral position **before starting the motor**, in order to avoid possible movements of connected hydraulic devices for safety reasons.

8.1 Starting the motors

8.1.1 Gasoline motors

Before starting combustion motors, check that the fuel tank is full and that the motor oil level is within the permissible tolerances. If necessary, top up with the appropriate fluid (see also the instruction manual of the motor manufacturer included in the scope of delivery).

Procedure for starting the motor:



1. Open gasoline tap "A": Push the lever to the right until it stops.
2. Push CHOKE lever "B" to the left until the stop if the motor is cold, and to the right if the motor is warm or the ambient temperature is high.
3. Push throttle lever "C" to the left until it stops.

Starting with electric starter:

4. Turn start key to the "START" position. As soon as the motor is running, turn the key to the "RUN" position.
5. After 20 to 30 seconds of warm-up, push choke lever "B" to the right as far as it will go.



Start with pull starter:

4. Turn start key to the "RUN" position.
5. Pull the handle of the pull starter slowly over the compression point (resistance is felt). Let it return to its original position and pull through quickly.
6. Return the pull starter handle to its starting position by hand.
7. After 20 to 30 seconds of warm-up, push choke lever "B" to the right as far as it will go.



NOTE:

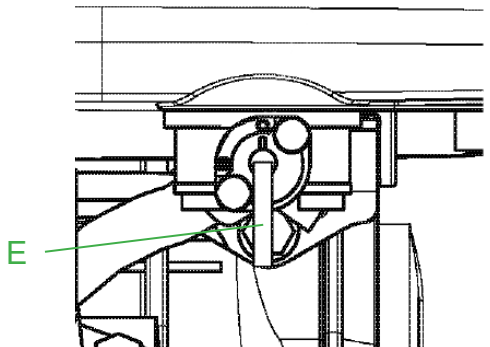
If the motor does not start, after several attempts, push choke lever "B" to the right as far as it will go and repeat the starting procedure.

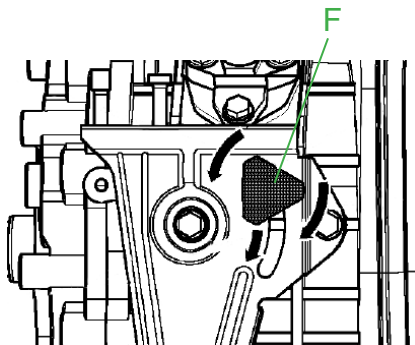
8.1.2 Diesel motors

Before starting combustion motors, check that the fuel tank is full and that the motor oil level is within the permissible tolerances. If necessary, top up with the appropriate fluid (see also the instruction manual of the motor manufacturer included in the scope of delivery).

Procedure for starting the motor:

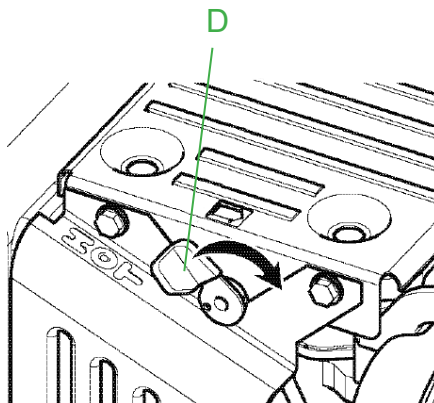
1. Open fuel tap "E": Set the lever vertically downwards.





2. Loosen the rotary handle on the speed governor "F" counter-clockwise and push the speed governor down as far as it will go.
3. Tighten the rotary handle hand-tight in clockwise direction.

4. Pull the handle of the pull starter slowly over the compression point (resistance is felt). Allow it to return to its original position.
5. Turn decompression valve "D" to the right.
6. Pull the handle of the pull starter firmly and quickly.
7. Return the pull starter handle to its starting position by hand.
8. Loosen the rotary handle on the speed governor after 20 to 30 seconds of warming up and set the desired speed.
9. Tighten the rotary handle hand-tight in clockwise direction.



NOTE:

If the motor does not start after several attempts, repeat the above procedure with the speed governor in the middle position.

8.1.3 Electric motors

Before starting an electric motor, check that all electrical connections and cables are in good condition. Only then should you connect the mains cable (for motors with mains power supply) to the power socket.

Start the motor by pressing the ON/OFF switch on the power unit.



ATTENTION!

Electric motors require a very high starting current for a short time. Therefore, when using a generator, check that the generator can run at the appropriate current level.

The power supply must be fused with at least 25 A.

8.2 Stopping the motors



WARNING / CAUTION!

Never touch hot motor parts, this could lead to severe burns.

8.2.1 Gasoline motors

The motor of the power unit stops automatically when the fuel tank is empty. However, you should avoid this and switch it off beforehand to prevent the carburetor from running dry.

To stop the motor manually, the following procedure is necessary:

Motor stop sequence:

1. Check that all connected devices are in their home position (initial position).
2. Set the levers of the control valves to neutral position (unpressurized).
3. Turn start key to the "STOP" position.
4. Close the gasoline tap: Push the lever to the left until it stops.



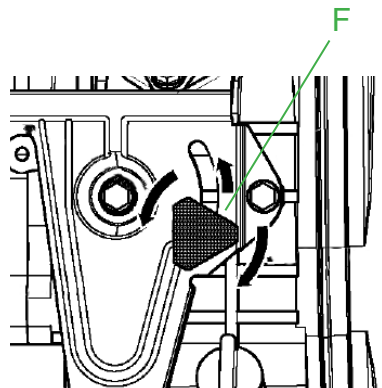
8.2.2 Diesel motor

The motor of the power unit stops automatically when the fuel tank is empty. However, you should avoid this and switch it off beforehand. If the tank has been run dry, the fuel system must be bled.

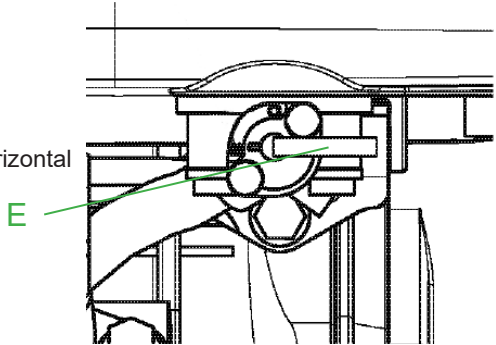
To stop the motor manually, the following procedure is necessary:

Motor stop sequence:

1. Check that all connected devices are in their home position (initial position).
2. Set the levers of the control valves to neutral position (unpressurized).
3. Loosen the rotary handle on the speed governor "F" in an anti-clockwise direction and push the speed governor upwards as far as it will go.
4. Tighten the rotary handle hand-tight in clockwise direction.



5. Close fuel tap "E": Set lever to horizontal position.



8.2.2 Electric motors

Set the levers of the control valves to neutral position (unpressurized).

Press the OFF switch on the electric motor to stop the motor.

If the motor is switched off, the output of the connected hydraulic pump also stops.



ATTENTION!

Wait at least 3 seconds before restarting the motor to prevent damage to the device.

8.3 Refilling with fuel (*only for combustion motors*)

The motor must be switched off when topping up with fuel!

Procedure:

1. Open the filler cap of the fuel tank.



WARNING / CAUTION / ATTENTION!

Take care not to spill fuel! Especially hot motor parts must not come into contact with fuel, otherwise there is a risk of fire!



If fuel is spilled accidentally, it must be wiped up immediately with a suitable, absorbent cloth. Make sure that you do not burn yourself on any of the hot motor parts! The cloth used must then be cleaned or disposed of in accordance with the applicable regulations and guidelines!

2. Gasoline tank: Fill the tank with fuel to the maximum level (lower edge of the fuel tank filler neck).
Diesel tank: Fill the tank up to the red filler ring in the tank filter.
3. Close the fuel tank properly with the filler cap.

8.4 Controlling the valves



ATTENTION!

The control levers of the hydraulic power units should always be shifted to neutral position (unpressurized) **before starting the motor** to avoid possible unintended movements of connected hydraulic devices.

8.4.1 Control valve "Single-flow operation" (1POWER) (not DC 650)

There is one lever on the connection block of this valve.
This lever is assigned to the pressure connection. Shifting the lever controls the pressurization of the pressure line ("↓⊕") or depressurizes the connection ("⊗↻").



NOTE:

All shift levers must always be pushed right up to the end stop.

8.4.2 Control valve "dual-flow operation" (2POWER) (not DC 650)

There are two levers on the connection block of this valve.
Each of the two small levers is assigned to a pressure connection. Shifting the respective lever, controls the pressurization of the corresponding pressure line ("↓⊕") or depressurizes the connection ("⊗↻").



NOTE:

All shift levers must always be pushed right up to the end stop.

8.4.2 Control valve "four-flow operation" (4POWER)

There are four levers on the connection block of this valve.
Each of the four small levers is assigned to a pressure connection. Shifting the respective lever, controls the pressurization of the corresponding pressure line ("↓⊕") or depressurizes the connection ("⊗↻").



NOTE:

All shift levers must always be pushed right up to the end stop.

9. Dismantling the equipment / deactivation following operation

After finishing the work, and before stopping the power unit, return all connected devices to the home position (storage position). Then you can switch off the power unit motor and, if an electric motor is used, disconnect it from the power supply.



WARNING for power units with combustion motors!

Check that the throttle lever is in the "STOP" position or that the key switch is set to "STOP" and remains there, in order to prevent the power unit from starting unintentionally!

Couplings:



ATTENTION!

Before uncoupling the hose lines, the operating pressure in the system must be released.

When the rerailing work is finished, the operating pressure of the equipment/ system must be released.

If the connected hose lines are to be disconnected during shutdown, uncouple the couplings as described in the chapter "Connecting hose lines". Then put the dust protection caps back on the plug couplings.

Clean any coarse soiling from the hydraulic power unit before storing it. If the power unit is to be stored for a longer period of time, clean the outside of the power unit completely and oil the mechanically moving parts.

You should also remove any fuel from the tank and disconnect and/or remove the starter battery in the case of power units with combustion motors.

Avoid storing the hydraulic power units in a damp environment.

In addition, observe the instructions in the separate hose line instruction manual.



CAUTION!

Depending on the size and weight of the hydraulic power unit, several people may be required to transport it to the storage location.

10. Tests

Hydraulic power units are subject to very high mechanical loads. For this reason, a visual inspection must be carried out after each use, but at least once every six months. In this way, signs of wear can be detected in good time and damage to the power unit can be avoided by replacing these wear parts. In addition, check regularly whether all fixing bolts are tightened (observe any tightening torques as well).

Every 3 years, or if there are doubts about safety or reliability, an additional functional check must be carried out (complying with the applicable national and international regulations regarding the maintenance intervals of hydraulic equipment).



ATTENTION!

Clean any soiling from the device before checking!



WARNING / CAUTION / ATTENTION!

An appropriate workshop and personal protective equipment is absolutely necessary when carrying out inspection, maintenance and repair work, (if necessary, use shielding).



10.1 Recommended inspection intervals

10.1.1 Visual inspection

A visual inspection must be carried out after each use or once every six months.

10.1.2 Functional test

Operating time per day	Functional test
up to 1 hour	1 x per annum
up to 8 hours	1 x per quarter
up to 24 hours	1 x per month

Over and above these inspection intervals, a functional test should be carried out if:

- *the power unit is making unusual noises,*
- *there is reasonable suspicion of internal damage to the power unit.*

If the above-mentioned noises or abnormalities occur several times within one month or if the maximum pressure is not reached during the functional test, you must contact LUKAS Customer Service immediately. The contact details can be found in the chapter "Troubleshooting".

10.2 Hydraulic power units with combustion motors

Visual Inspection

Hydraulic power units

- All hydraulic connections still firmly connected.
- General tightness, no leaks present (existing sweat oils have no influence on the function).
- Damage to the motor, connection blocks, frame or side parts detectable.
- Damage to the hydraulic system and/or fuel tank detectable.
- Side panels present and firmly mounted.
- Type plate, all operating signs, information signs, labels and warning notices present and legible.
- All covers (e.g. muffler cover) present and undamaged.
- All heat protection mats on the tanks present and undamaged.
- Minimum distance of 10 mm between the tanks and the hot parts of the motor.
- All liquid levels within the specified tolerances.
- Extendable carrying handles undamaged and functional.
- Couplings easy to couple.
- Dust protection caps present.

Gasoline motor

- Starter/starters in proper condition and undamaged.
- Electrical cable in proper condition and undamaged.
- Electric starter battery in proper condition and undamaged.
- All necessary accessories (such as spark plug, spark plug wrench and fuel canister) available.

Diesel motor

- All necessary accessories (e.g. fuel canister) available.

Functional test

- No unusual noises.
- Starter functional.
- Motor switch functional.
- Tests for maximum load (connect to the control desk and pressurize with valve lever (no device needs to be connected to the control desk) until max. operating pressure is reached - readout via pressure gage on the control desk).

10.3 Hydraulic power units with electric motors

Visual Inspection

Hydraulic power units

- All hydraulic connections still firmly connected.
- General tightness, no leaks present (existing sweat oils have no influence on the function).
- Damage to the motor, the valve blocks or the housing detectable.
- Side panels present and firmly mounted.
- Type plate, all operating signs, information signs, labels and warning notices present and legible.
- All covers (e.g. fan cover) present and undamaged.
- All liquid levels within the specified tolerances.
- ON/OFF switch in proper condition and undamaged.
- Couplings easy to couple.
- Dust protection caps present.
- All electrical attachments (such as cables and plugs) present and undamaged.
- Extendable carrying handles undamaged and functional.

Functional test

- No unusual noises.
- Tests for maximum load (connect to the control desk and pressurize with valve lever (no device needs to be connected to the control desk) until max. operating pressure is reached - pressure reading via pressure gage on the control desk).

10.4 Hoses (optional extension hose pairs)

Visual Inspection

Extension Hoses

- Visual inspection for damage, cracks and leaks.
- Check for age of hoses (replace after 10 years at the latest).
- Hose connection fittings with couplings for extension hoses firmly connected and without leaks.
- Couplings easy to couple.
- Dust protection caps present.

Also observe the instructions in the separate hose line instruction manual.

11. Maintenance and repair

11.1 General information

LUKAS hydraulic power units type DC, GC and PC 650 have a complex structure, therefore the required maintenance effort is low. No special training is required for the general **maintenance work**, but knowledge of the function of the power units, the legal safety regulations and the handling of the required tools is a basic requirement.



ATTENTION!

Never use unnecessary force during maintenance work, as this could damage the power unit components or impair operational safety.

For safety reasons, **repair work** on the hydraulic power unit may only be carried out by the power unit manufacturer or by personnel specially trained by the power unit manufacturer and by authorized LUKAS dealers.



WARNING / CAUTION / ATTENTION!

Protective clothing must always be worn during maintenance and repair work, as the power units may be under pressure even when not in operation.

During work, ensure that all components are kept particularly clean, as soiling can damage the power unit!



ATTENTION!

As LUKAS hydraulic power units are designed for maximum performance, only components which are listed in the spare parts lists of the corresponding power unit may be replaced.

Other power unit components may only be replaced if:

- you have taken part in a corresponding LUKAS service training course.
- you have the express permission of the LUKAS Customer Service (following application, assessment for granting permission - assessment necessary in each individual case!).

When cleaning the devices, do not use any cleaning agents whose pH value is outside the range of 5 - 8!



ATTENTION!

Ensure that no operating fluids can escape during repair work on power units with combustion motors!

11.2 Maintenance work on the hydraulic power unit

11.2.1 Care instructions

From time to time, clean the outside of the device (**not the electrical contacts**) and rub the metallic surfaces (**not the electrical contacts**) with a suitable agent to protect against corrosion.

(In case of doubt, contact your authorized LUKAS dealer or LUKAS directly!)

11.2.2 Function and load test

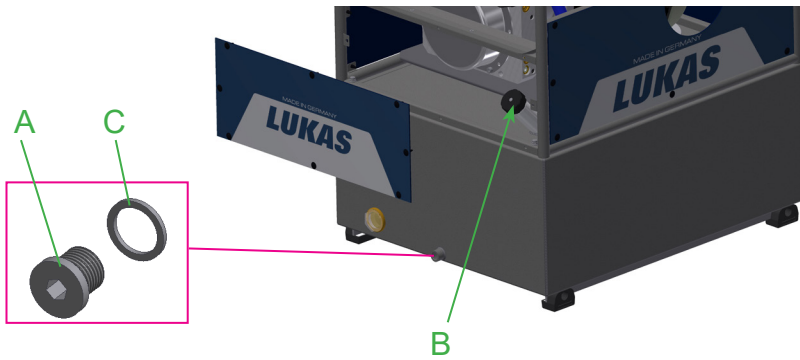
If there are any doubts about safety or reliability, an additional function and load test must be carried out.

11.2.3 Changing the hydraulic fluid

- The motor must be switched off or the power unit must be disconnected from the power supply!
- Renew the hydraulic fluid after approx. 200 operations, but after three years at the latest.
- The fluid change should be carried out at operating temperature.
- The old hydraulic fluid must be disposed of properly.

Procedure for changing the hydraulic fluid:

1. Switch off the motor or disconnect a power unit with an electric motor from the power supply. Place the power unit on a raised surface so that you can easily reach the drain plug for the hydraulic fluid.
2. Place a suitable drip tray under the drain plug "A" or the hydraulic oil drain opening into which this is screwed.
3. Remove the side paneling to access the hydraulic oil tank cap. Open the filler cap "B", remove the drain plug "A" and the sealing ring "C" and let the hydraulic fluid run into the drip tray.



4. Reassemble components "A" and "C" in reverse order.
5. Fill the new hydraulic fluid into the tank through the filler neck and then close the neck again with the filler cap "B".
6. Finally, the power unit must be bled again as described in the chapter "Commissioning".

11.2.4 Changing labels

All damaged and/or illegible labels (safety instructions, type plate etc.) must be replaced.

Procedure:

1. Remove damaged and/or illegible labels.
2. Clean surfaces with industrial alcohol.
3. Affix new labels.

Take care to affix the labels in the correct positions. If this is no longer known, you should contact your authorized LUKAS dealer or LUKAS directly.

11.3 Maintenance work on the power unit with combustion motor

(Please also observe the separate instructions of the respective motor manufacturer)

*After every **50 operating hours**, you must carry out the following maintenance measures:*

- Wash the air filter element. Shorten the maintenance interval when using in dirty or dusty environments.
- Gasoline motor: Check spark plug and clean if necessary.

*After every **100 operating hours**, you must carry out the following maintenance measures:*

- Change motor oil. Shorten the maintenance interval when using in dirty or dusty environments.

*After every **200 operating hours**, you must carry out the following maintenance measures:*

- Gasoline motor: Adjust spark plug electrode gap.
- Clean fuel filter.

*After every **500 operating hours**, you must carry out the following maintenance measures:*

- Replace air filter element.
- Gasoline motor: Replace spark plug.
- Gasoline motor: Clean or adjust carburetor, valve clearance, valve seat and cylinder head.
- Diesel motor: Have the valve clearance, valve seat and cylinder head cleaned or adjusted by Customer Service.

*After every **1000 operating hours** or **every 2 years** you must carry out the following maintenance measures:*

- Gasoline motor: Check the starter.
- Inspect the motor for damage.
- Replace the fuel line.



NOTE:

The first motor oil change must be made after 20 working hours. The following oil changes after every 100 hours.

For gasoline motors, use a commercially available, size 16 mm articulated spark plug wrench to remove the spark plug. Using a straight / rigid spark plug wrench would damage or break off the spark plug!

Also observe the separately supplied instruction manual of the motor manufacturer!

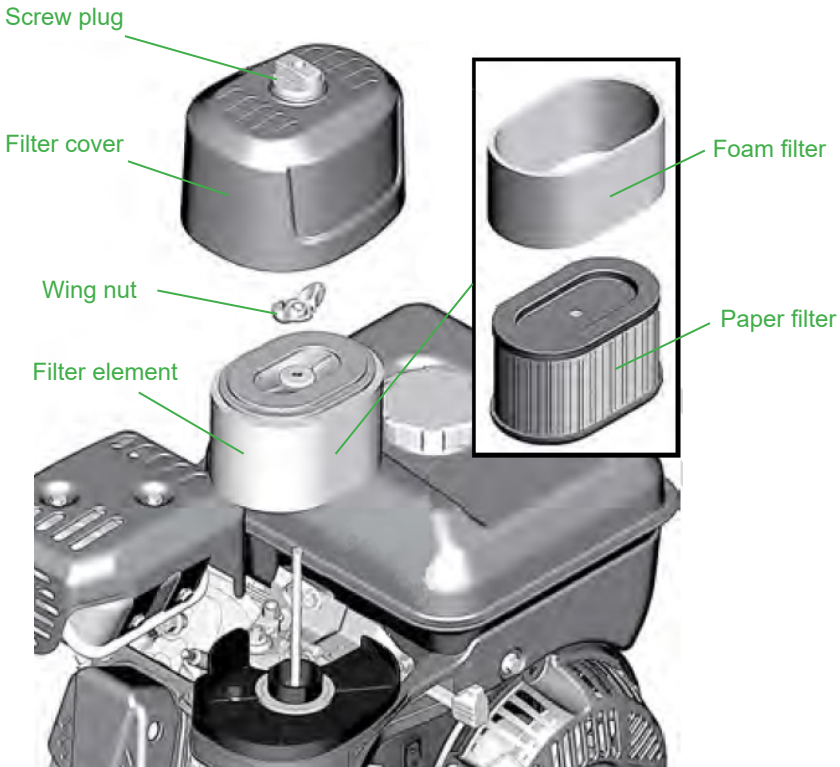
11.3.1 Changing and cleaning the air filter on gasoline motors

It is very important to keep the air filter in good condition.

Incorrect installation, incorrect maintenance or unsuitable filter inserts will cause damage and wear to the motor. Always keep the air filter element clean.

Procedure:

1. Open the screw plug on the filter cover in an anti-clockwise direction and remove the filter cover.
2. Unscrew the wing nut on the filter element anticlockwise and remove it together with the filter element.
3. Carefully remove the foam filter from the filter element. Wash the foam filter with clean water. Remove as much water as possible by squeezing the insert and dry the insert.
4. To clean the paper filter, carefully tap it to loosen dirt and blow off the dust. Never use oil! Replace filter if necessary.
5. Finally, reinstall the filters.
6. Tighten the wing nut and screw plug hand-tight.



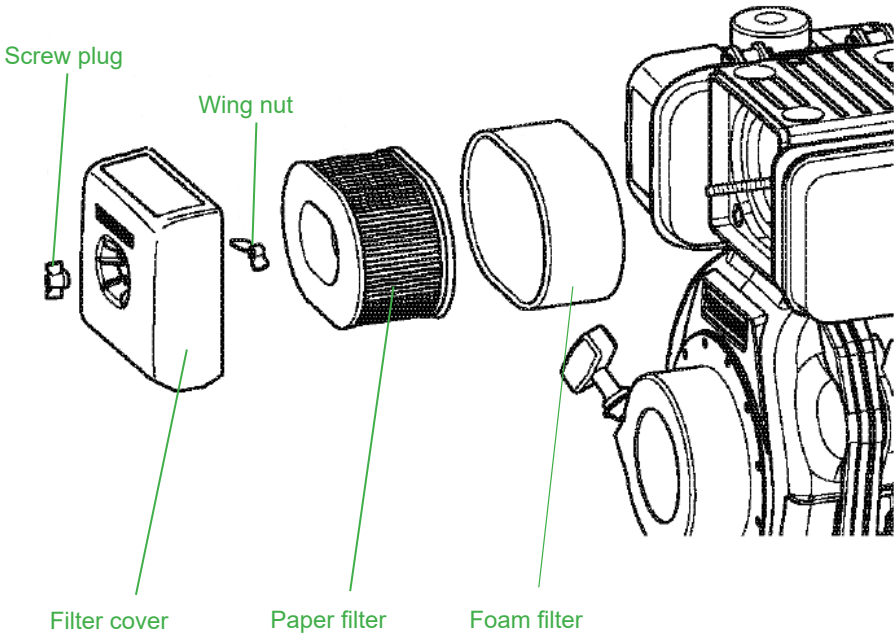
11.3.2 Changing and cleaning the air filter on diesel motors

It is very important to keep the air filter in good condition.

Incorrect installation, incorrect maintenance or unsuitable filter inserts will cause damage and wear to the motor. Always keep the air filter element clean.

Procedure:

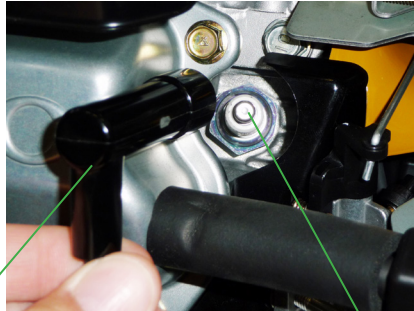
1. Open the screw plug on the filter cover in an anti-clockwise direction and remove the filter cover.
2. Unscrew the wing nut on the filter element anticlockwise and remove it together with the filter element.
3. Carefully remove the foam filter from the filter element. Wash the foam filter with clean water. Remove as much water as possible by squeezing the insert and dry the insert.
4. To clean the paper filter, carefully tap it to loosen dirt and blow off the dust. Never use oil! Replace filter if necessary.
5. Finally, reinstall the filters.
6. Tighten the wing nut and screw plug hand-tight.



11.3.2 Changing, cleaning and adjusting the spark plug on gasoline motors

Procedure:

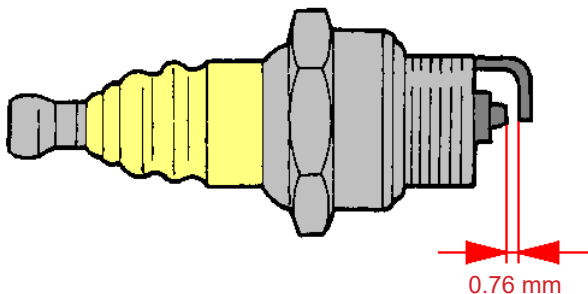
1. Remove the right-hand side panel of the hydraulic power unit by loosening the fixing clips.
2. Remove the spark plug connector. The plug is very tight, but it is only plugged in. When loosening it, however, make sure that you do not tilt the plug or put lateral pressure on the spark plug. In the worst case, this could destroy the spark plug and result in a costly repair.
3. Unscrew the spark plug from the motor using a size 16 mm articulated spark plug wrench.



Spark plug
connector

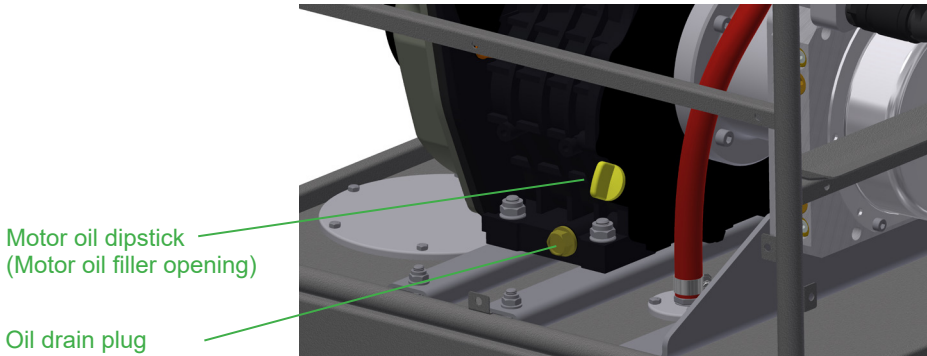
Spark plug

4. If the spark plug is soiled with soot, you must remove this with a spark plug cleaning agent or a brush. If the spark plug is irreparably damaged (e.g. by electrode burn off or deformation), replace it with a new one.
5. Adjust the distance between the electrodes to 0.76 mm.
6. Finally, reinstall the spark plug.



11.3.3 Changing motor oil and motor oil filter

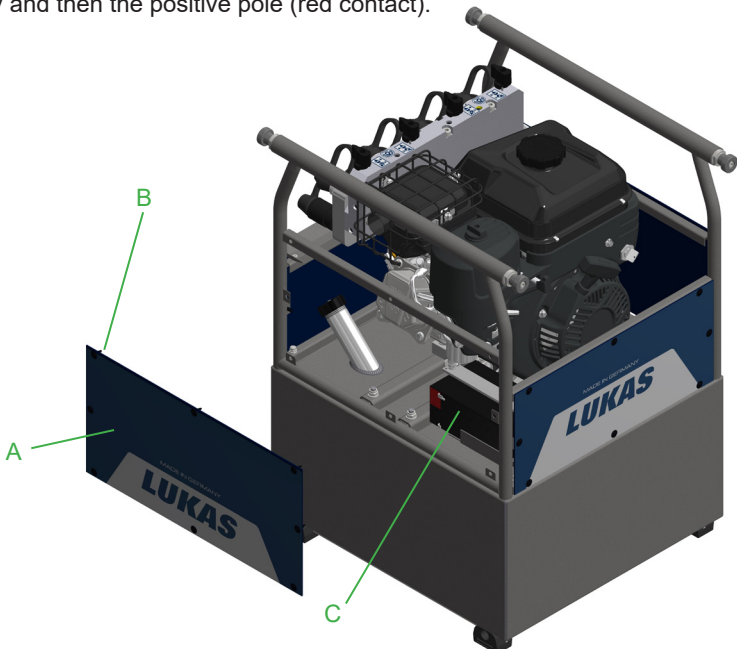
The procedure for changing the motor oil and the motor oil filter can be found in the separate instruction manual of the motor manufacturer. In order to drain the motor oil, the hydraulic tank of the power unit must first be removed. See the corresponding LUKAS spare parts list.

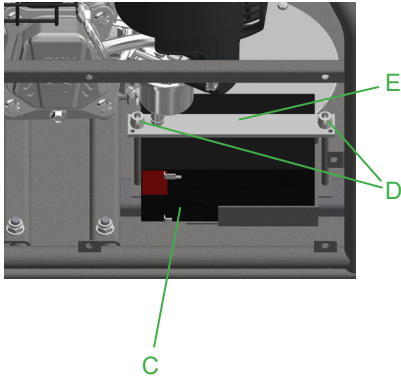


11.3.4 External charging or replacement of the starter battery in gasoline motors

Procedure:

1. Remove the left-hand side panel "A" of the hydraulic power unit by loosening the fixing clips "B".
2. Now you can see the starter battery "C". First, disconnect the negative pole (black contact) of the battery and then the positive pole (red contact).





3. If you want to charge the starter battery with an external charger, this must now be connected. *(Please refer to the instruction manual of the charger used)*

If the battery is defective, it must be replaced. To do this, loosen the screws "D" on the mounting plate "E" and remove the plate. Remove the battery. Make sure when inserting the battery that it is fitted correctly (see illustration on the left). The battery is then reinstalled in the reverse order.

11.4 Couplings



WARNING / CAUTION / ATTENTION!

The repairing of couplings is not permitted! They must be replaced by LUKAS original parts!

The plug couplings must be replaced if:

- external damage is present,
- locking device does not work,
- hydraulic fluid permanently escapes in the coupled and/or uncoupled state.

Procedure for couplings on the valve block:

1. First, empty the hydraulic tank as described in the chapter "Changing the hydraulic fluid".
2. Unscrew coupling half (nipple and/or sleeve).
3. Remove coupling part(s).
4. Screw new coupling part(s) into the valve block.
5. Tighten the coupling part(s) with a torque of $M_A = 35 \text{ Nm}$.
6. Finally, refill the hydraulic fluid tank and bleed the power unit.

12. Troubleshooting

In the case of faults directly affecting the motor, please observe the separate instruction manual of the motor manufacturer.

Fault	Check	Cause	Remedy
Electric motor does not start after the switch has been actuated or does not produce full power.	Check the connection cable of the electric motor.	Power cable not connected.	Connect the power cable correctly.
		Defect in the connection cable.	Shutdown immediately and have repaired by authorized dealers, motor manufacturers or by LUKAS directly.
	Extension cable or cable drum being used?	Cable not completely unrolled.	Unroll power cable completely.
		Line loss of the extension cable or cable drums too high (electrical resistance).	Use another suitable extension cable or cable drum.
	Electric motor connected to a suitable battery?	Battery dead.	Charge battery.
		Electric motor not suitable for battery operation.	Connect the motor to another, suitable power supply.
	Electrical power supply fuse was triggered.	Power supply not suitable for electric motor.	Connect the motor to another, suitable power supply.
		Electrical power supply fuse was triggered although power supply is suitable for the operation of the motor.	Fuse too low, use another fuse.
	Are all valves switched to depressurized (home position)?	Electric motor defective or overloaded due to another defect in the power unit.	Shutdown immediately and have repaired by authorized dealers, motor manufacturers or by LUKAS directly.

Fault	Check	Cause	Remedy
Internal combustion motor does not start.	Check fuel quantity in the tank.	Fuel tank empty.	Top up fuel.
	Electric starter present?	Electric starter battery dead.	Charge the electric starter battery or use pull starter.
	Check fuel line.	Defect in the fuel line.	Shutdown immediately and have repaired by authorized dealers, motor manufacturers or by LUKAS directly.
	Check starter button and motor switch.	Starter button or pull starter not actuated.	Operate starter button or pull starter.
		Motor switch not set to choke.	Set motor switch to choke.
	Is the hydraulic power unit or motor suitable for the working environment?	Ambient temperature too low.	For remedy, see separate instruction manual of the motor manufacturer.
			Use other hydraulic or operating fluids that are suitable for the corresponding ambient temperatures (see chapter "Technical data").
			Use another, more suitable hydraulic power unit.
	Check air filter.	Air filter dirty.	Have the motor adjusted to the operating altitude of the hydraulic power unit by an authorized dealer, motor manufacturer or LUKAS directly (only if the unit is frequently used at this altitude).
			Clean or replace air filter.
Are all valves switched to depressurized (home position)?	Internal combustion motor defective or overloaded due to another defect in the power unit.	Have repaired by authorized dealers, motor manufacturers or LUKAS directly.	

Fault	Check	Cause	Remedy
Motor runs, but connected device does not move when valve is actuated.	Check hose line.	Hose line not properly connected or damaged.	Check connection of the hose line and reconnect if necessary.
	Check shift position of the valve levers on the pump block of the hydraulic power unit.	Valve not switched to pressurization of the supply line.	Switch valve to supply line pressurization.
		Pump unit defective.	Have repaired by authorized dealers or LUKAS directly.
	Connect another device and check that it works when actuated.	The previously connected device is defective.	For remedy, see instruction manual of the connected device.
		Plug coupling sleeve defective.	Replace the plug coupling sleeve.
Connected device does not move when the valve is actuated, moves only very slowly or unevenly.	Connect another device and check whether it works when actuated.	The previously connected device is defective.	For remedy, see instruction manual of the connected device.
	Check shift position of the valve levers on the pump block of the hydraulic power unit.	Power unit pressure relief still active (unpressurized circulation).	Check the shift positions of the valve lever(s) and shift again if necessary (up to end position).
		Pump unit defective.	Have repaired by authorized dealers or LUKAS directly.
		Air in the hydraulic system.	Bleed the hydraulic system.
		Coupling sleeve defective.	Replace coupling sleeve.

Fault	Check	Cause	Remedy
Connected device / equipment does not reach its end position.	Check the hydraulic fluid quantity in the hydraulic tank.	Insufficient fluid level in the hydraulic tank.	Fill hydraulic fluid up to max. level. <i>Attention! Before refilling, return the connected device to the home position!</i>
		Usable hydraulic fluid quantity of the power unit insufficient.	Use another device with a required quantity below the maximum effective quantity of the power unit.
Connected device / equipment does not achieve its force-related performance data.		Max. permissible operating pressure of the pump is not reached.	Have the pressure relief valve reset or replaced by an authorized dealer or LUKAS directly.
		Pump block defective.	Have repaired by authorized dealers or LUKAS directly.
		Connected device defective.	For remedy, see instruction manual of the connected device.

Fault	Check	Cause	Remedy
During the functional test: A pressure gage coupled between the power unit and the hydraulic power unit does not indicate the maximum operating pressure of the power unit.	Check the data of the connected device.	The operating pressure of the connected device is locked internally.	No repair or troubleshooting necessary.
		Connected device defective.	Please refer to the separate instruction manual of the connected device.
		Hydraulic power unit defective.	Have repaired by authorized dealers or LUKAS directly.
Fluid leak from the hydraulic fluid tank.	Connected device is not yet in the home position and liquid is leaking from the filler plug?	The maximum filling quantity of the tank has been exceeded due to the return of hydraulic fluid from the power unit.	Lower the level in the hydraulic fluid tank to the "Minimum" mark (lower window), move the power unit to the home position and then top up the fluid level to "Maximum" (upper window).
	Fluid leak at another location?	Leak from tank, lines or seals.	Replace defective components or have them repaired by authorized dealers or LUKAS directly.
Liquid leak between motor and pressure flange.		Radial shaft seal on the drive shaft defective.	Have repaired by authorized dealers or LUKAS directly.
Hydraulic fluid milky, cloudy.		Water or condensate in the system.	Change the hydraulic fluid immediately.
Hose lines frequently cannot be coupled.		Hydraulic fluid not adapted to the application situation.	Hydraulic fluid must be replaced (see chapter "Hydraulic fluid recommendation").
		Coupling defective.	Coupling must be replaced immediately.
Leak at the couplings.		Coupling defective.	Coupling must be replaced immediately.
Liquid leak at the hoses or bindings.		Leak, possible damage.	Replace hoses.
Damage to the surface of the hoses.		Mechanical damage or contact with aggressive media.	Replace hoses.

Contact an authorized LUKAS dealer or the LUKAS Customer Service Department directly if the malfunctions cannot be rectified!

The address for the LUKAS Customer Service department is:

LUKAS Hydraulik GmbH

A unit of the IDEX Corporation

Weinstrasse 39, D-91058 Erlangen, Germany

Tel.: (+49) 09131 / 698 - 348

Fax.: (+49) 09131 / 698 - 353

www.lukas.com

13. Technical data

Since all values are subject to tolerances, minor differences may occur between the data on your equipment and the data in the following tables!

The values may also differ because of reading inaccuracies and/or tolerances in the measuring equipment used.



NOTE:

The following tables contain only the most important technical data.

Further information about your device is available directly from LUKAS on request.

13.1 GC 650E-1POWER

Device type		GC 650E-1POWER	Unit	Note
Item number		70-10-85CN		
Dimensions	L x W x H	534 x 456 x 612 21.0 x 18.0 x 24.1	mm in.	
Operating pressure	Max.	53 7700	MPa psi	
Transport volume	High pressure	1.8 0.48	l/min gpm	
Changeover pressure		14 2000	MPa psi	From low to high pressure
Transport volume	Low pressure	6.5 1.72	l/min gpm	
Motor	Performance	4.8	kW	Gasoline, 4-stroke
Idle speed		3570	rpm	
Hydraulic fluid volume	Max.	25 / 20 6.6 / 5.3	L gal.	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 -4 ... 131	°C °F	
Weight		77 170	kg lbs.	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		
Gasoline volume		3 0.8	L gal.	4-stroke gasoline motor

1) HP = high pressure

2) LP = low pressure

3) 1MPa = 10 bar

13.2 GC 650E-2POWER

Device type		GC 650E- 2POWER	Unit	Note
Item number		70-10-55		
Dimensions	L x W x H	534 x 456 x 612 <i>21.0 x 18.0 x 24.1</i>	mm <i>in.</i>	
Operating pressure	Max.	53 <i>7700</i>	MPa <i>psi</i>	
Transport volume	High pressure	2 x 1.0 <i>2 x 0.26</i>	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 <i>2000</i>	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	2 x 3.5 <i>2 x 0.92</i>	l/min <i>gpm</i>	Simultaneous
Motor	Performance	4.8	kW	Gasoline, 4-stroke
Idle speed		<i>3570</i>	<i>rpm</i>	
Hydraulic fluid volume	Max.	25 / 20 <i>6.6 / 5.3</i>	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 <i>-4 ... 131</i>	°C °F	
Weight		78 <i>172</i>	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		
Gasoline volume		3 <i>0.8</i>	L <i>gal.</i>	4-stroke gasoline motor

¹⁾ HP = high pressure

²⁾ LP = low pressure

³⁾ 1MPa = 10 bar

Device type		GC 650E- 2POWER	Unit	Note
Item number		70-10-55 CN		
Dimensions	L x W x H	534 x 456 x 612 <i>21.0 x 18.0 x 24.1</i>	mm <i>in.</i>	
Operating pressure	Max.	53 <i>7700</i>	MPa <i>psi</i>	
Transport volume	High pressure	2 x 1.0 <i>2 x 0.26</i>	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 <i>2000</i>	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	2 x 3.5 <i>2 x 0.92</i>	l/min <i>gpm</i>	Simultaneous
Motor	Performance	4.8	kW	Gasoline, 4-stroke
Idle speed		<i>3570</i>	<i>rpm</i>	
Hydraulic fluid volume	Max.	25 / 20 <i>6.6 / 5.3</i>	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 <i>-4 ... 131</i>	°C °F	
Weight		78 <i>172</i>	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		
Gasoline volume		3 <i>0.8</i>	L <i>gal.</i>	4-stroke gasoline motor

1) HP = high pressure

2) LP = low pressure

3) 1MPa = 10 bar

13.3 GC 650E-4POWER

Device type		GC 650E-4POWER	Unit	Note
Item number		70-10-65		
Dimensions	L x W x H	534 x 456 x 692 <i>21.0 x 18.0 x 27.2</i>	mm <i>in.</i>	
Operating pressure	Max.	53 <i>7700</i>	MPa <i>psi</i>	
Transport volume	High pressure	4 x 0.7 <i>4 x 0.18</i>	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 <i>2000</i>	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	4 x 2.6 <i>4 x 0.69</i>	l/min <i>gpm</i>	Simultaneous
Motor	Performance	4.8	kW	Gasoline, 4-stroke
Idle speed		<i>3600</i>	<i>rpm</i>	
Hydraulic fluid volume	Max.	45 / 40 <i>11.9 / 10.6</i>	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 <i>-4 ... 131</i>	°C <i>°F</i>	
Weight		102 <i>225</i>	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		
Gasoline volume		3 <i>0.8</i>	L <i>gal.</i>	4-stroke gasoline motor

1) HP = high pressure

2) LP = low pressure

3) 1MPa = 10 bar

Device type		GC 650E-4POWER	Unit	Note
Item number		70-10-65 CN		
Dimensions	L x W x H	534 x 456 x 692 21.0 x 18.0 x 27.2	mm <i>in.</i>	
Operating pressure	Max.	53 7700	MPa <i>psi</i>	
Transport volume	High pressure	4 x 0.7 4 x 0.18	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 2000	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	4 x 2.6 4 x 0.69	l/min <i>gpm</i>	Simultaneous
Motor	Performance	4.8	kW	Gasoline, 4-stroke
Idle speed		3600	<i>rpm</i>	
Hydraulic fluid volume	Max.	45 / 40 11.9 / 10.6	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 -4 ... 131	°C °F	
Weight		102 225	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		
Gasoline volume		3 0.8	L <i>gal.</i>	4-stroke gasoline motor

1) HP = high pressure

2) LP = low pressure

3) 1MPa = 10 bar

13.4 PC 650-2POWER

Device type		PC 650-2POWER	Unit	Note
Item number		70-10-50		
Dimensions	L x W x H	534 x 456 x 612 <i>21.0 x 18.0 x 24.1</i>	mm <i>in.</i>	
Operating pressure	Max.	53 <i>7700</i>	MPa <i>psi</i>	
Transport volume	High pressure	2 x 0.7 <i>2 x 0.18</i>	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 <i>2000</i>	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	2 x 2.6 <i>2 x 0.69</i>	l/min <i>gpm</i>	Simultaneous
Motor	Performance	2.2 (230/50)	kW (VAC/Hz)	Single phase
Idle speed		<i>2940</i>	<i>rpm</i>	
Hydraulic fluid volume	Max.	27.5 / 23 <i>7.3 / 6.1</i>	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 <i>-4 ... 131</i>	°C °F	
Weight		76 <i>168</i>	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		

¹⁾ HP = high pressure

²⁾ LP = low pressure

³⁾ 1MPa = 10 bar

13.5 PC 650-4POWER

Device type		PC 650-4POWER	Unit	Note
Item number		70-10-60		
Dimensions	L x W x H	537 x 456 x 692 <i>21.1 x 18.0 x 27.2</i>	mm <i>in.</i>	
Operating pressure	Max.	53 <i>7700</i>	MPa <i>psi</i>	
Transport volume	High pressure	4 x 0.6 <i>4 x 0.16</i>	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 <i>2000</i>	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	4 x 2.2 <i>4 x 0.58</i>	l/min <i>gpm</i>	Simultaneous
Motor	Performance	3.5(400/ 50)	kW (VAC/Hz)	Threephase
Idle speed		2980	rpm	
Hydraulic fluid volume	Max.	45 / 40 <i>11.9 / 10.6</i>	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 <i>-4 ... 131</i>	°C °F	
Weight		99 <i>218</i>	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		

¹⁾ HP = high pressure

²⁾ LP = low pressure

³⁾ 1MPa = 10 bar

Device type		PC 650-4POWER	Unit	Note
Item number		70-10-61		
Dimensions	L x W x H	537 x 456 x 692 <i>21.1 x 18.0 x 27.2</i>	mm <i>in.</i>	
Operating pressure	Max.	53 <i>7700</i>	MPa <i>psi</i>	
Transport volume	High pressure	4 x 0.6 <i>4 x 0.16</i>	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 <i>2000</i>	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	4 x 2.2 <i>4 x 0.58</i>	l/min <i>gpm</i>	Simultaneous
Motor	Performance	3.5(380/ 60)	kW (VAC/Hz)	Threephase
Idle speed		2980	rpm	
Hydraulic fluid volume	Max.	45 / 40 <i>11.9 / 10.6</i>	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		-20 ... +55 <i>-4 ... 131</i>	°C °F	
Weight		99 <i>218</i>	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		

1) HP = high pressure

2) LP = low pressure

3) 1MPa = 10 bar

13.6 DC 650-4POWER

Device type		DC 650-4POWER	Unit	Note
Item number		70-10-70		
Dimensions	L x W x H	674 x 524 x 783 26.5 x 20.6 x 30.8	mm <i>in.</i>	
Operating pressure	Max.	53 7700	MPa <i>psi</i>	
Transport volume	High pressure	4 x 0.7 4 x 0.18	l/min <i>gpm</i>	Simultaneous
Changeover pressure		14 2000	MPa <i>psi</i>	From low to high pressure
Transport volume	Low pressure	4 x 2.6 4 x 0.69	l/min <i>gpm</i>	Simultaneous
Motor	Performance	4.8	kW	Diesel motor
Idle speed		3800	rpm	
Hydraulic fluid volume	Max.	45 / 40 11.9 / 10.6	L <i>gal.</i>	Fill/usable quantity, horizontal
Ambient temperature		0 ... +55 32 ... 131	°C °F	
Weight		132 291	kg <i>lbs.</i>	Incl. hydraulic fluid
Hydraulic fluid specification		HM 10 ISO 6743-4		
Diesel volume		2.5 0.66	L <i>gal.</i>	Diesel motor

1) HP = high pressure

2) LP = low pressure

3) 1MPa = 10 bar

13.7 Noise emission from the power units

Device type	Sound power level (LWA)	
	Idle	Full load
GC 650E-1POWER	99	103
GC 650E- 2POWER	99	103
GC 650E-4POWER	105	105
PC 650-2POWER	91	96
PC 650-4POWER	90	97
DC 650-4POWER	106	106

13.8 Spark plug (gasoline motor)

Spark plug type: QC12YC (Champion)

13.9 Spark plug wrench

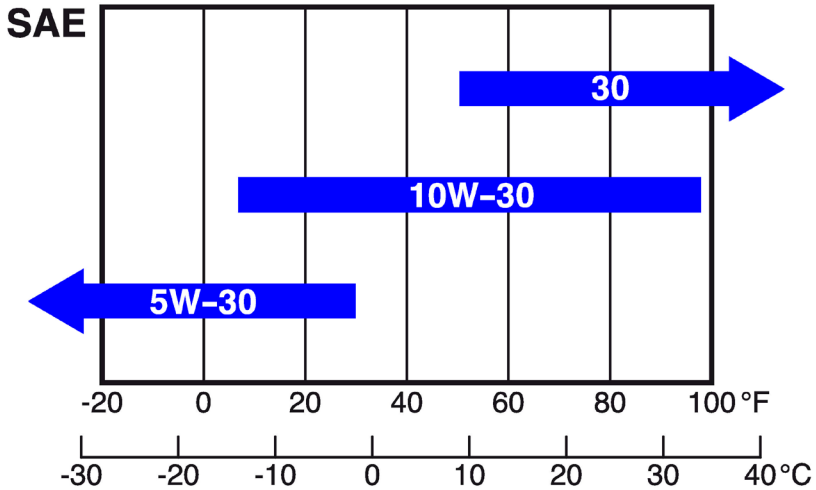
Articulated spark plug wrench, size16 mm

13.10 Fuel

Fuel: Unleaded gasoline
ROZ 91 to ROZ 98
max allowed bioethanol content: 10%

Fuel: Diesel (DIN EN 590-96, ISO 8217 DMX)
Cetane number > 45%
max allowed sulfur content: 0.05%
max. 7% bio-diesel

13.11 Motor oil



13.12 Hydraulic fluid recommendation

Oil for LUKAS hydraulic devices, mineral oil DIN ISO 6743-4 and others

	Oil temperature range	Oil designation	Viscosity class	Note
A	-20 +55 °C	HM 10	VG 10	

	Oil temperature range	Oil designation	Viscosity class	Note
A	-4.0 +131 °F	HM 10	VG 10	

Recommended viscosity range: 10...200 mm²/s (10...200 cSt.)

Delivered with HM 10 DIN ISO 6743-4.



ATTENTION!

Before using hydraulic fluids from other manufacturers, it is essential that you contact your authorized LUKAS dealer or LUKAS directly.

13.13 Operating and storage temperature range

Operating temperature for DC	[°C] / [°F]	0 ... +55	32 ... +131
Operating temperature for GC and PC	[°C] / [°F]	-20 ... +45	-4 ... +131
Storage temperature (device not in operation)	[°C] / [°F]	-30 ... +60	-22 ... +140

14. EC declarations of conformity



Lukas Hydraulik GmbH
Weinstraße 39,
91058 Erlangen
Deutschland




Dinglee, LUKAS, Hurst, Vetter

IDEX Europe GmbH
Weinstraße 39,
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Deutschland

de	EG-Konformitätserklärung		Hiernit erklären wir, dass die bezeichneten Geräte in der von uns gelieferten Ausführung den aufgeführten Bestimmungen und den sie umsetzenden nationalen Rechtsvorschriften entsprechen.
	Aggregat	Artikelnummer	
en	EC Declaration of Conformity		We hereby declare that the described devices in the format supplied by us conform to the specified conditions and the implementing national regulations.
	Power unit	Item number	
fr	Déclaration CE de conformité		Nous déclarons par la présente que les appareils décrits dans la version livrée sont conformes aux dispositions mentionnées et aux législations nationales qui les mettent en œuvre.
	Groupe	Réf. Article	
es	Declaración de conformidad CE		Con la presente declaramos que los equipos mencionados cumplen, en la versión por nosotros suministrada, las disposiciones señaladas y las normativas legales aplicables.
	Unidad	Número del artículo	
pt	Declaração de conformidade CE		Pela presente declaramos que os dispositivos indicados no modelo por nós fornecido cumprem as normas e os regulamentos legais nacionais que os implementam.
	Módulo hidráulico	Artigo n.º	
it	Dichiarazione di conformità CE		Con la presente dichiariamo che le apparecchiature designate, nella configurazione da noi fornita, sono conformi alle disposizioni riportate e alle norme attuative nazionali.
	Gruppo	Codice articolo	
nl	EU-conformiteitsverklaring		Hierbij verklaren wij dat de aangeduide apparaten in de door ons geleverde uitvoering in overeenstemming zijn met de vermelde bepalingen en de nationale wettelijke bepalingen ter implementatie daarvan.
	aggregaat	Item nummer	
da	EF-overensstemmelseserklæring		Vi erklærer hermed, at de betegnede produkter i den af os leverede udførelser er i overensstemmelse med de anførte bestemmelser og disses implementering i national lovgivning.
	Aggregat	Varenummer	
sv	EG-försäkran om överensstämmelse		Härmed försäkrar vi att de angivna redskapen i det av oss levererade tillståndet uppfyller angivna föreskrifter och de harmoniserade nationella föreskrifterna.
	aggregat	Artikelnummer	
fi	EY-vaatimustenmukaisuusvakuutus		Vakuutamme, että kuvutatut laitteet toimittaminamme versioina vastaavat luettuja määräyksiä ja niiden voimaansattamiseksi annettuja kansallisia säännöksiä.
	aggregaatti	Tuotenumero	
el	Δήλωση συμμόρφωσης EK		Δια του παρόντος δηλώνουμε, ότι οι αναφερόμενες συσκευές πληρούν στην παραδοθείσα από εμάς έκδοση τις προβλεπόμενες προδιαγραφές και ανταποκρίνονται στην εθνική νομοθεσία.
	Συγκρότημα	Κωδικός είδους	
pl	Deklaracja zgodności WE		Niniejszym deklarujemy, że wymienione urządzenia w dostarczonej przez nas wersji spełniają wymienione regulacje oraz wdrażające je krajowe przepisy prawne.
	Aggregat	Numer artykułu	
cs	Prohlášení o shodě ES		Tímto prohlašujeme, že označené přístroje v námi dodávaném provedení vyhovují uvedeným ustanovením a národním právním předpisům, kterými se tato ustanovení provádějí.
	Agregát	Číslo artiklu	
sk	ES vyhlásenie o zhode		Týmto vyhlasujeme, že popísané zariadenia v nami dodanom vyhotovení vyhovujú uvedeným ustanoveniam aplikovaným vnútroštátnymi právnymi predpismi.
	Hydraulické čerpadlo	Číslo výrobku	
hu	EK-megfelelősségi nyilatkozat		Ezennel kijelentjük, hogy a megnevezett készülékek az általunk szállított kivitelben megfelelnek a felsorolt rendelkezéseknek és az azokat megvalósító nemzeti jogi előírásoknak.
	Aggregát	Cikkszám	

Seite/Page 1von/of2

ro	Declarație de conformitate CE Agregat	Număr articol	Declarăm prin prezenta că aparatele menționate, în varianta livrată de noi, respectă reglementările specificate și prevederile legale naționale în care sunt transpuse.
bg	ЕО декларация за съответствие Хидравличен агрегат	Артикулен номер	С настоящото декларираме, че посочените устройства във версията, предоставена от нас, отговарят на изброените разпоредби и на приложимото национално законодателство.
sl	Izjava o skladnosti ES Agregat	Številka artikla	Izjavljamo, da označene naprave v izvedbah, ki jih dajemo v promet, izpolnjujejo navedena določila in veljavne nacionalne zakonske predpise.
hr	Izjava o skladnosti za EZ-u Agregat	Broj stavke	Izjavljujemo da su navedeni uređaji u verziji koju dostavljamo u skladu s navedenim propisima i nacionalnim propisima koji se primjenjuju.
et	EÜ vastavusdeklaratsioon Agregaat	Artikli number	Käesolevaga deklareerime, et meie teostusega nimetatud seadmed vastavad loetletud määrustele ja nende siseriiklikult kohandatud õigusnormidele.
lv	EK atbilstības deklarācija agregāts	Preces numurs	Ar šo paziņojam, ka minētās ierīces mūsu piegādātajā komplektācijā atbilst uzskaitītajiem noteikumiem un tiem atbilstošajiem nacionālajiem tiesību aktiem.
lt	EB atitikties deklaracija Agregatas	Prekės kodas	Šiuo deklaruojame, kad nurodyti, mūsų pristatytos modifikacijos įtaisai atitinka nurodytas nuostatas ir jas įgyvendinančius nacionalinius teisės aktus.
ga	Dearbhú Comhréireachta AE Aonad hidráilach	Uimhir an earra	Dearbháimid leis seo go gcloíonn na gléasanna a dtugtar tuairisc orthu san fhormáid ina soláthraímid iad leis na coinníollacha sonraíthe agus na rialacháin náisiúnta cur chun feidhme.
mt	Dikjarazzjoni ta' Konformità tal-KE Unità idrawlika awżiljari	Numru tal-oġġett	B'dan id-dokument ahna niddikjaraw li l-verżjoni kkonsejnta tat-tagħmir indikat tikkonforma mad-dispożizzjonijiet elenkati u mar-regolamenti nazzjonali li jimplimentawhom.
	PC 650-2POWER PC 650-4POWER PC 650-4POWER 380V60Hz GC 650E-2POWER GC 650E-4POWER DC 650-4POWER	70-10-50 70-10-60 70-10-61 70-10-55 70-10-65 70-10-70	2006/42/EG  LUKAS Hydraulik GmbH Weinstraße 39, 91058 Erlangen Deutschland
			LUKAS Hydraulik GmbH, 91058 Erlangen, Germany Erlangen, 24.02.2021

15. Notes



WARNING / CAUTION / ATTENTION!



Before connecting devices ensure that **all components used** are suitable for the **maximum operating pressure of the hydraulic power unit!**
In case of doubt, you **must consult LUKAS directly** before connecting the devices!



Please duly dispose of all packaging materials and removed items.

LUKAS Hydraulik GmbH

A unit of the IDEX Corporation

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