Car-O-Liner Power Unit

T601, T602, T603, T604, T605

Instruction Manual

(44352, rev 0) **2011-11, EN**

CAR-O-LINER®

Foreword

The Car-O-Liner T600 range Power Unit is used to operate Car-O-Liner Speed, Bench Rack and Mark 6 lifting platforms and benches. All other use of the equipment, or use which is contrary to the instructions given in this manual, can cause personal injury and/or machine damage.

Car-O-Liner AB can in no way be held responsible for intentional or unintentional damage, and consequent unlimited loss of profit, loss of income, loss of business opportunity, loss of use or other similar nuisance, irrespective of how this has arisen, that originates from incorrect use of this equipment or its use in a manner not intended.

Warranty

Car-O-Liner AB offers a one-year guarantee from the date of delivery. This guarantee covers material defects and assumes normal care and maintenance.

The guarantee assumes that:

- the equipment is correctly installed and inspected in accordance with current local regulations.
- the equipment has not been altered or rebuilt without approval from Car-O-Liner AB.
- the power unit is being used only together with a Car-O-Liner Lifting unit, e.g. lifting platform or bench.
- genuine Car-O-Liner spare parts are used in any repairs.
- maintenance has been carried out according to the instructions in this manual.

All claims on warranty must verify that the fault has occurred within the guarantee period, plus that the unit has been used within its operating range as stated in the specifications. All claims must include the product type and article number. This data is to be found stamped on the name plate, refer to Section *1.3 Marking* for location.

Note

This instruction manual gives advice as well as instructions for installation, operation, maintenance and trouble shooting.

IMPORTANT! Read this manual carefully to become familiar with the proper operation of the Power Unit. It is recommended that you use your authorized Car-O-Liner Distributor for maintaining and servicing your products. Never perform repairs, adjustments or any other work on the products which may result in personal injury and damage to the product.

Your Car-O-Liner Distributor employs factory trained technicians and is focused on offering you the best overall experience with your new Car-O-Liner product. Additionally your authorized Car-O-Liner Distributor is prepared to make sure that any revisions or upgrades, as required by Car-O-Liner, will be performed on your product.

The photographs and drawings in this manual are intended only to be illustrative and do not necessarily show the design of the equipment available on the market at any given time. The equipment is intended for use in accordance with current trade practice and appropriate safety regulations. The equipment illustrated in the manual may be changed without prior notice.

The contents in this publication can be changed without prior notice.

Conformity with directives and standards

The T600 range Power Unit is designed and distributed by Car-O-Liner AB, which is an ISO 9001:2008 and ISO 14001:2004 accredited organisation.

Below an example of how the EC Declaration of Conformity for the T600 range Power Unit is outlined.

A signed and dated copy of the EC Declaration of Conformity, including serial number, is included in the documentation for the T600 range Power Unit. Please contact your distributor if you need a new copy of the Declaration of Conformity.

Mini Power Systems

ORIGINAL

Declaration of incorporation of partly completed machinery

Manufacturer: MPS Mini Power Systems AB
Åsboholmsgatan 16
504 51 Borås

assure hereby that the partly completed machine

Type: Hydraulic Power Pack
Model:
Serial number(s):

is manufactured in conformity with EN ISO 12100-1:2003, EN ISO 12100-2:2003, EN-982:1996+A1:2008 according to the condition in;

Machinery Directive	2006/42/EG
Low Voltage Directive	2006/95/EG

and furthermore declares that it is not allowed to put machinery into service until the machinery into which it is to be incorporated or of which it is to be a component has been found and declared to be in conformity with directive 2006/42/EG and with national implementing legislation, i.e as a whole, including the machinery referred to in this declaration.

(Place and date of issue)

(Name, title and signature of auth. issuer)

Contents

1. Introduction

1.1 Applications

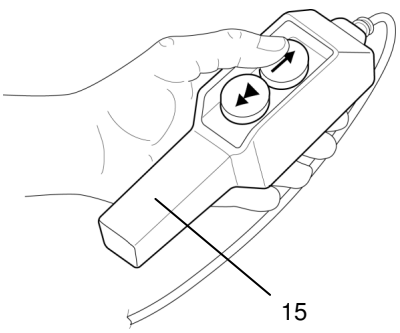
The Car-O-Liner Power Unit is designed for the Car-O-Liner benches and lifting platforms. The Power Unit supplies the necessary hydraulic and air pressure to operate the benches or the lifting platforms.

1.2 Power Unit

Hydraulic power to a Car-O-Liner lifting platform or a bench is supplied from a Power Unit (pump unit), which basically consists of a hydraulic manifold [1], an electric motor [2] and an hydraulic oil tank [12]. The pump operates only when the lift is being raised. When the pump stops, the lift stops and maintains its height due to a non-return valve built into the pump. The pump is also fitted with a lowering valve [13].

The Power Unit also has a compartment for electrical components [6] and a connected hand control [15].

1. Hydraulic manifold
2. Electric motor
3. Lifting handles
4. Emergency stop push button
5. Pneumatic solenoid valve
6. Electrical component housing
7. Level switch inlet (Speed)
8. Hand control cable inlet
9. Mains supply
10. Hydraulic and pneumatic hose outlet (wall mounted)
11. Hydraulic and pneumatic hose outlet (mobille use)
12. Oil tank
13. Lowering valve
14. Pneumatic Air inlet (mobile use)
15. Hand control



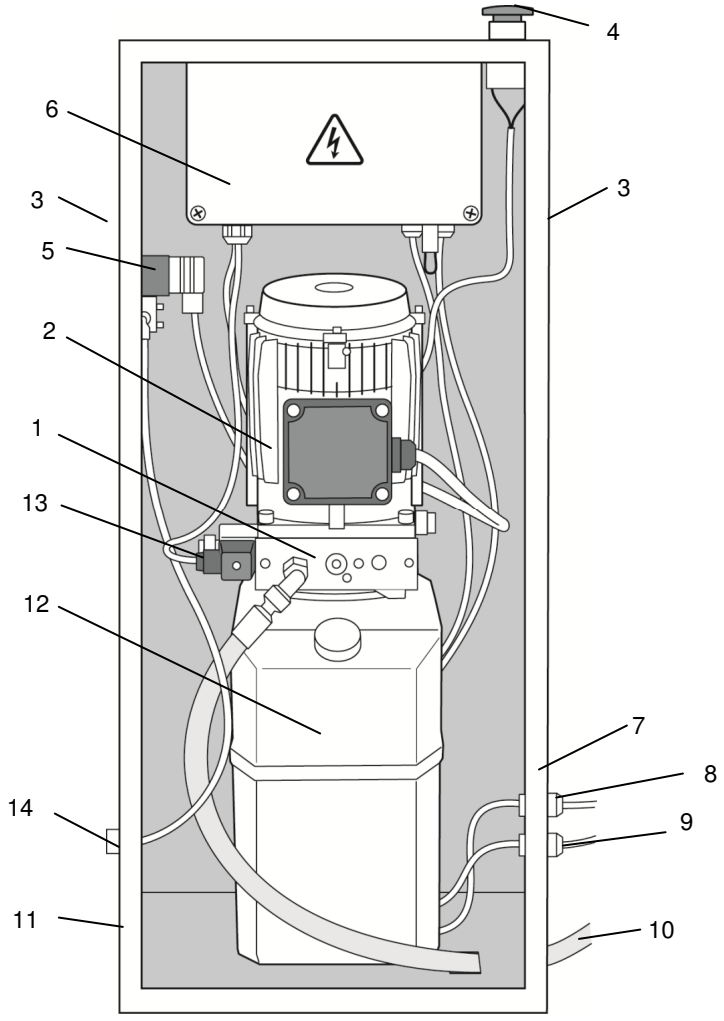


Figure 1.1 The Car-O-Liner Power Unit.

1.3 Marking

The name plate is placed on the right hand side of the Power Unit.

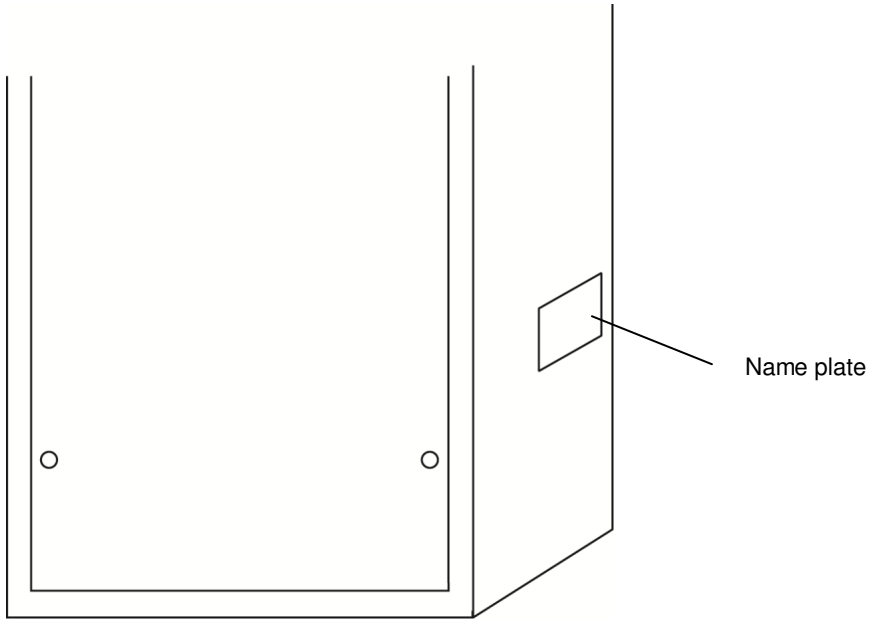


Figure 1.2 The name plate on the right hand side of the Power Unit

1.4 Hydraulic flow chart

1. Hydraulic pump
2. Electric motor
3. Start up valve (only on single phase)
4. Lowering valve with manual emergency function
5. Pressure regulating valve
6. Hydraulic hose
7. Hose rupture valve (Speed)
8. Hydraulic cylinder
9. Non-return valve
10. Flow regulating valve

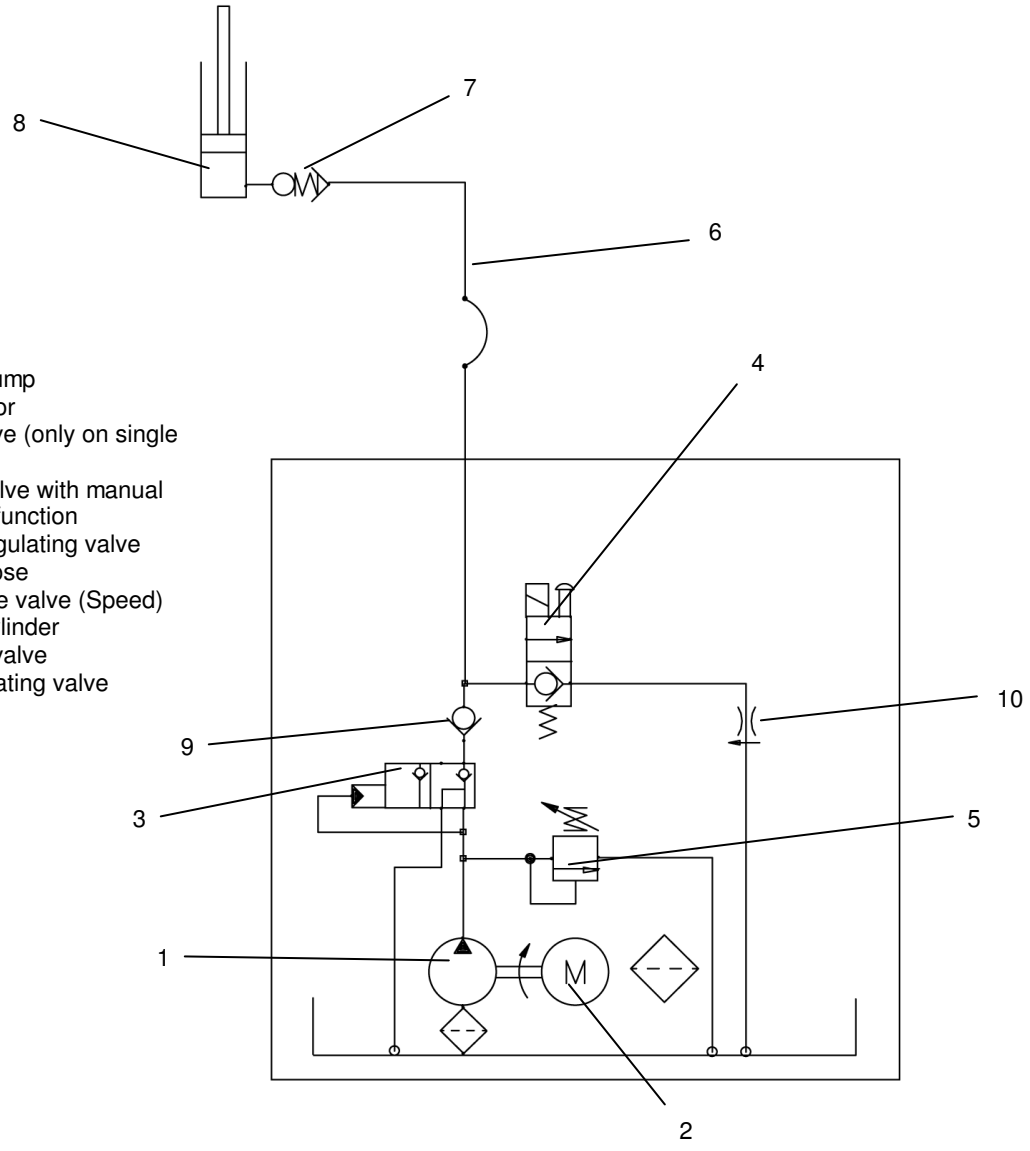


Figure 1.3 Hydraulic flow chart

1.5 Electrical diagrams

1.5.1 Electrical supply

The electrical equipment is delivered for any of the following voltages:

- 110 V, 60 Hz, single-phase
- 200 V, 50 Hz, 3-phase
- 230 V, 50 Hz, 3-phase
- 220 V, 60 Hz, single-phase
- 400 V, 50 Hz, 3-phase

WARNING! All electrical connections must be carried out by authorized personnel. Risk for electric shock.

1.5.2 Electrical diagram for 110 and 220V AC, single-phase

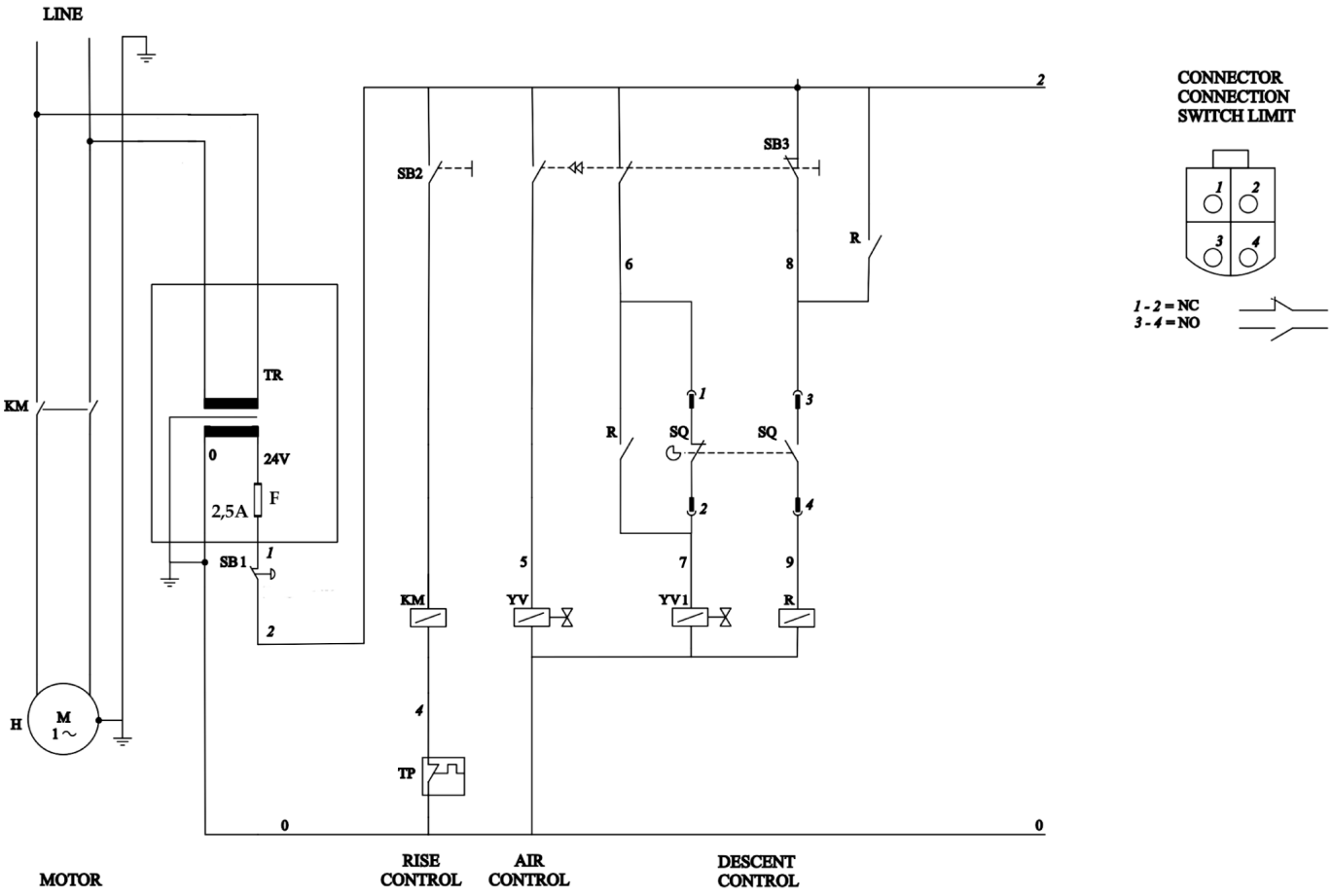


Figure 1.4 Electrical diagram

SB1 Emergency stop button

SB2 Up button on hand control unit

SB3 Down button on hand control unit

KM Contactor

TR Transformer

F Fuse 2,5A/250V (glass tube fuse)

SQ Limit switch at lifting platform (drawliner height)

R Relay

YV1 Pneumatic solenoid valve

YV Lowering valve coil

TP Thermal protection for the motor

1.5.3 Electrical diagram for 200, 230 and 400V AC, 3-phase

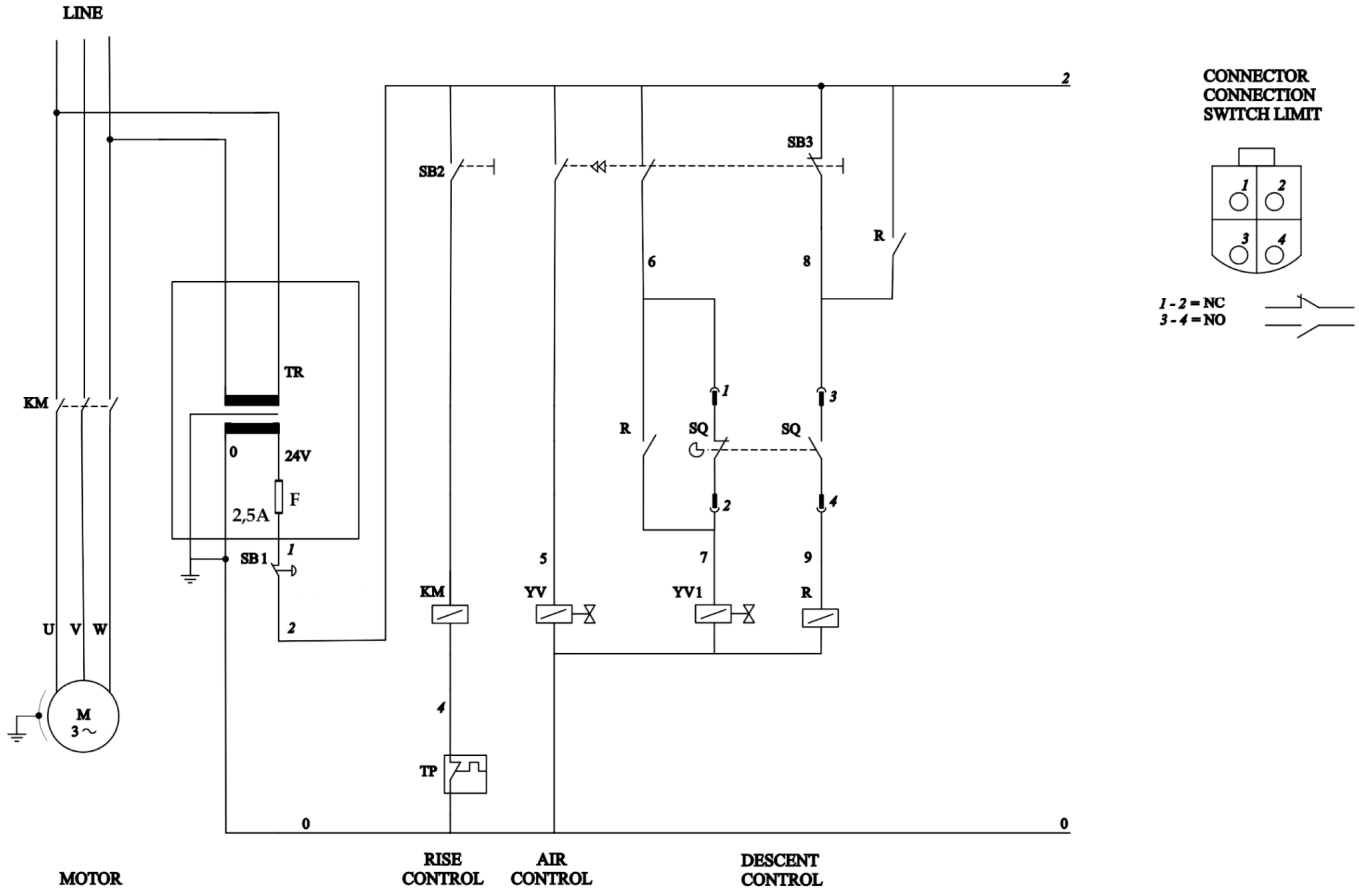


Figure 1.6 Electrical diagram

SB1	Emergency stop button
SB2	Up button on hand control unit
SB3	Down button on hand control unit
KM	Contactor
TR	Transformer
F	Fuse 2,5A/250V (glass tube fuse)
SQ	Limit switch at lifting platform (drawliner height)
R	Relay
YV1	Pneumatic solenoid valve
YV	Lowering valve coil
TP	Thermal protection for the motor

2. Safety

2.1 General

Information given in this manual describes the suggested best working practices and should in no way take precedence over individual responsibilities or local regulations.

Great effort has been placed on the design and manufacture of the Car-O-Liner Power Unit so that it will comply with all applicable safety aspects for this type of equipment. During operation and other work, it is always each individual's responsibility to consider:

- Their own and others' personal safety.
- The safety of the power unit through correct use of the equipment in accordance with the descriptions and instructions given in this manual.

By observing and following the safety precautions, users of the Car-O-Liner Power Unit will ensure safer working conditions for themselves and their fellow workers.

Read the manual carefully for information regarding installation (refer to *Chapter 3*), operation (refer to *Chapter 4*), maintenance (refer to *Chapter 5*) and trouble shooting (refer to *Chapter 6*).

Various warnings and notices are placed beside illustrations and important descriptive texts in this manual. These warnings and notices are important to ensure the safety of the user and others.

Safety signs must also be in place on the equipment. These are intended to warn of hazardous situations or to draw attention to incorrect use of the equipment.

2.2 Warnings and important notices

The following warnings and important notices are used in the instruction manual:

WARNING! (in bold, italic type) is used in this manual to indicate a possible danger that could lead to personal injury. An instruction is normally given, followed by a short explanation plus the possible effect if the instruction is not followed.

IMPORTANT! (in bold, italic type) is used in this manual to indicate practical information. It is also used to indicate a possible danger that could lead to damage to the draw aligner or other equipment and/or cause environmental damage.

Note! (in bold, italic type) is used to accentuate supplementary information that is required for problem-free use or optimal use of the power unit.

2.3 Safety signs

Undamaged safety signs must always be affixed at the indicated places, see *Section 2.3.1*. If any signs are damaged or missing, the user is responsible for their immediate replacement. The safety signs are available as accessories.

The following safety signs can be found on the power unit:

Warning!
It is prohibited to be on the lift during raising or lowering. This label has Part No. 43697

Warning!
Risk for tripping due to loose hoses, etc. This label has Part No. 31892.

A sign with safety rules should be affixed to the hydraulic unit:

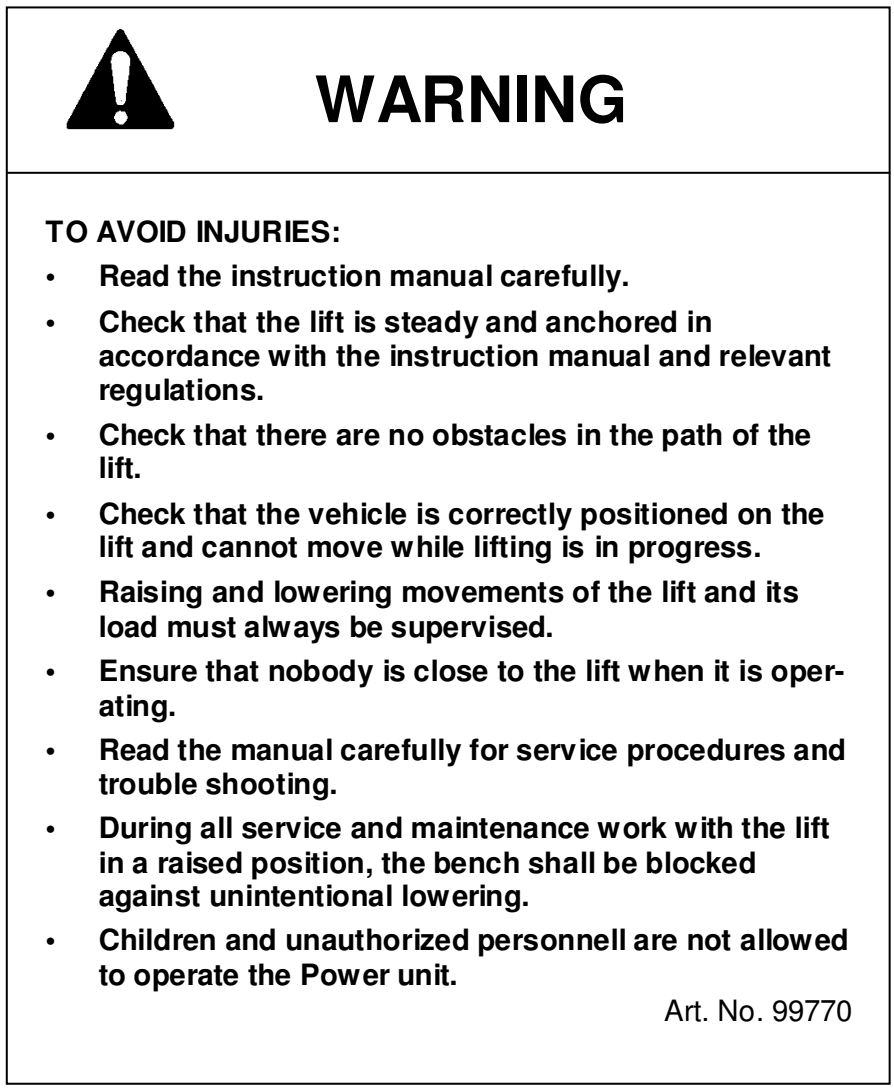


Figure 2.1 Sign with safety rules (English language example)

2.3.1 Placement of safety signs

The safety signs are placed as follows:

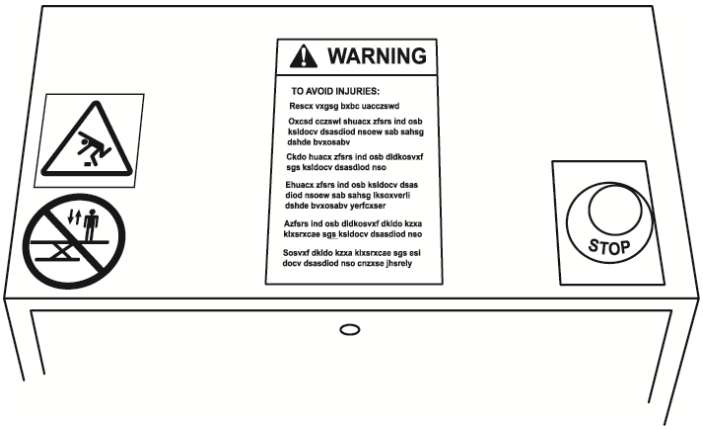


Figure 2.2 Placement of the safety signs

2.4 Safety devices

The Car-O-Liner Power Unit has several safety devices that ensure the safety of the user and the equipment.

The pump has a built-in pressure-regulating valve (5), see Figure 1.3, which prevents overloading. If pressure should become excessive, the pressure-regulating valve shunts oil back to the tank. The valve pressure setting is done at the factory and the valve is sealed. If oil pressure becomes excessive (overloading), the sound of the pump changes markedly.

The hydraulic cylinder has a hose malfunction valve (7), see Figure 1.3, built into the lower end of the cylinder. This valve causes the lift to lock up entirely or sink slowly in the case of a break in the hydraulic hose or other leakage.

The Power Unit has an emergency stop (4), see Figure 1.1. When the user pushes the emergency switch, the Power Unit stops operating.

3. Installation

3.1 General

The Car-O-Liner Power Unit is inspected and checked prior to leaving the factory to guarantee consistent quality and highest possible reliability.

Instructions for installation are provided as follows.

3.2 Unpacking and delivery inspection

As soon as the equipment is delivered, it must be checked for transport damage. If any part is damaged, the Power Unit may not be used until the component is repaired or replaced. Contact your supplier.

Check on the Power Unit name plate that its data corresponds to the equipment ordered . In particular, check that the Power Unit is delivered for the correct electrical supply.

3.3 Installing the Power Unit

WARNING! All electrical connections must be carried out by authorized personnel. Risk for electric shock.

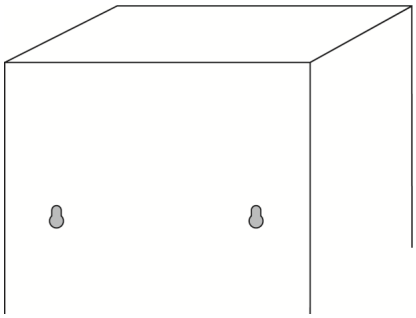
WARNING! Danger of tripping on loose hoses. Risk for injuries.

WARNING! Before raising or lowering the lift, ensure that no one is near the power unit. Risk for crushing injuries.

IMPORTANT! It is the responsibility of the owner to ensure that the equipment has been installed as specified in the instructions provided. It is also the owner's responsibility to ensure that the lift is inspected in accordance with current and local regulations before it is used.

3.3.1 Power Unit placement

The Power Unit can be positioned on the floor as a stand-alone unit or be wall-mounted on a suitable wall adjacent to the lift. If wall-mounted, the unit must not be mounted higher than 1200 mm to make it easy to read the warning signs and reach the emergency stop button.



Rear of Power Unit

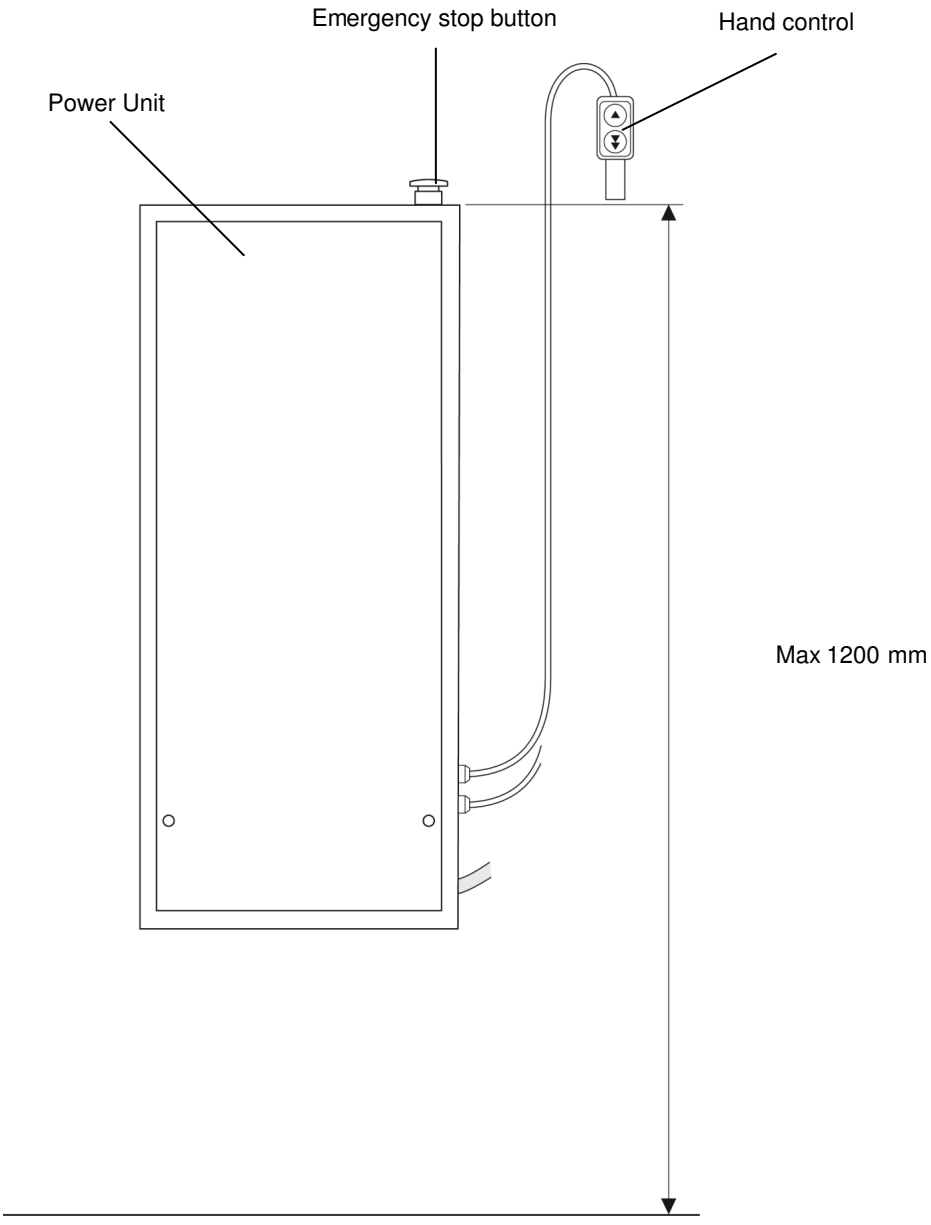


Figure 3.1 Wall-mounting of the Power Unit

3.3.2 Connecting to the main electric supply

WARNING! All electrical connections must be carried out by authorized personnel. Risk for electric shock.

For 110 and 220 V, AC, single-phase connections

The mains electric supply cable, (2-wire and ground), is connected to the power unit prior to delivery. At the other end, the customer must connect a suitable plug for connecting the cable to the mains supply . The mains supply must be fused with a minimum 20 A (30 A is recommended).

Note! The electrical connections are shown in the circuit diagrams in Figure 1.5.

Note! The mains plug is not included with the shipment.

For 200, 230 and 400 V, AC, 3-phase connections

The mains electric supply cable, a 4-lead cable (three phases and ground), is connected to the power unit prior to delivery. At the other end, the customer must connect a suitable plug for connecting the cable to the mains supply . The mains supply must be fused with 16 A fuses.

Note! The electrical connections are shown in the circuit diagrams in Figure 1.6.

Note! Make sure that the electrical supply is protected with a 16 A fuse.

3.3.3 Installation of the hydraulic hose from the lift

The hydraulic hose is included with the lift at delivery.

1 **a: Insert the hydraulic hose through the hole at the bottom of the Power Unit cabinet, see Figure 3.4.**
b: For mobile use, insert the the hydraulic hose through the hole at the left hand side of the Power Unit cabinet.

2 **Connect the hose to the L-coupling. Use a 19 mm key to tighten the coupling.**

3 **Tighten the L-coupling to the hose (see figure 3.3).**

Note! No specified torque is needed.

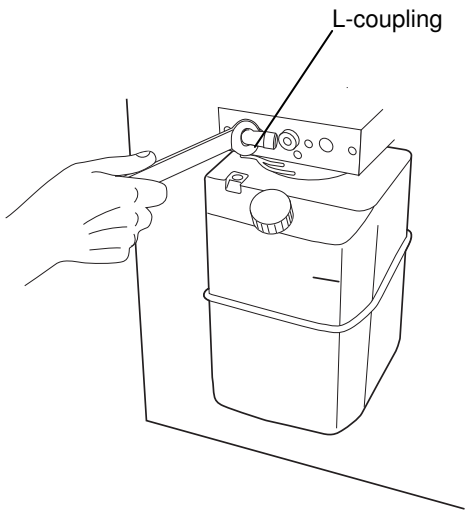


Figure 3.2 Tighten the L-coupling in an appropriate angle.

The hose must be laid in a wide arch to get a suitable radius of curvature:

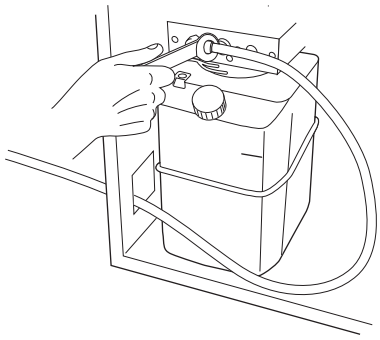


Figure 3.3 Connecting the hydraulic hose to the L-coupling

3.3.4 Installation of pneumatic air

Pneumatic air is used for releasing the mechanical safety lock on the lift. The pneumatic air should have a maximum pressure of 10 bar. 5-7 bar is recommended. Use dry clean air.

1 Connect the air inlet hose to the air inlet connector on the left hand side of the Power Unit cabinet, see Figure 3.4.

2 a: Insert the air outlet hose through the hydraulic hose hole at the bottom of the Power Unit cabinet. b: For mobile use, insert the the air outlet hose through the hydraulic hose hole at the left hand side of the Power Unit cabinet.

3 Connect the outlet hose to the air valve secondary, opposite to AIR IN.

Note! The connectors are the self-holding secure type. Simply push the hoses into them.

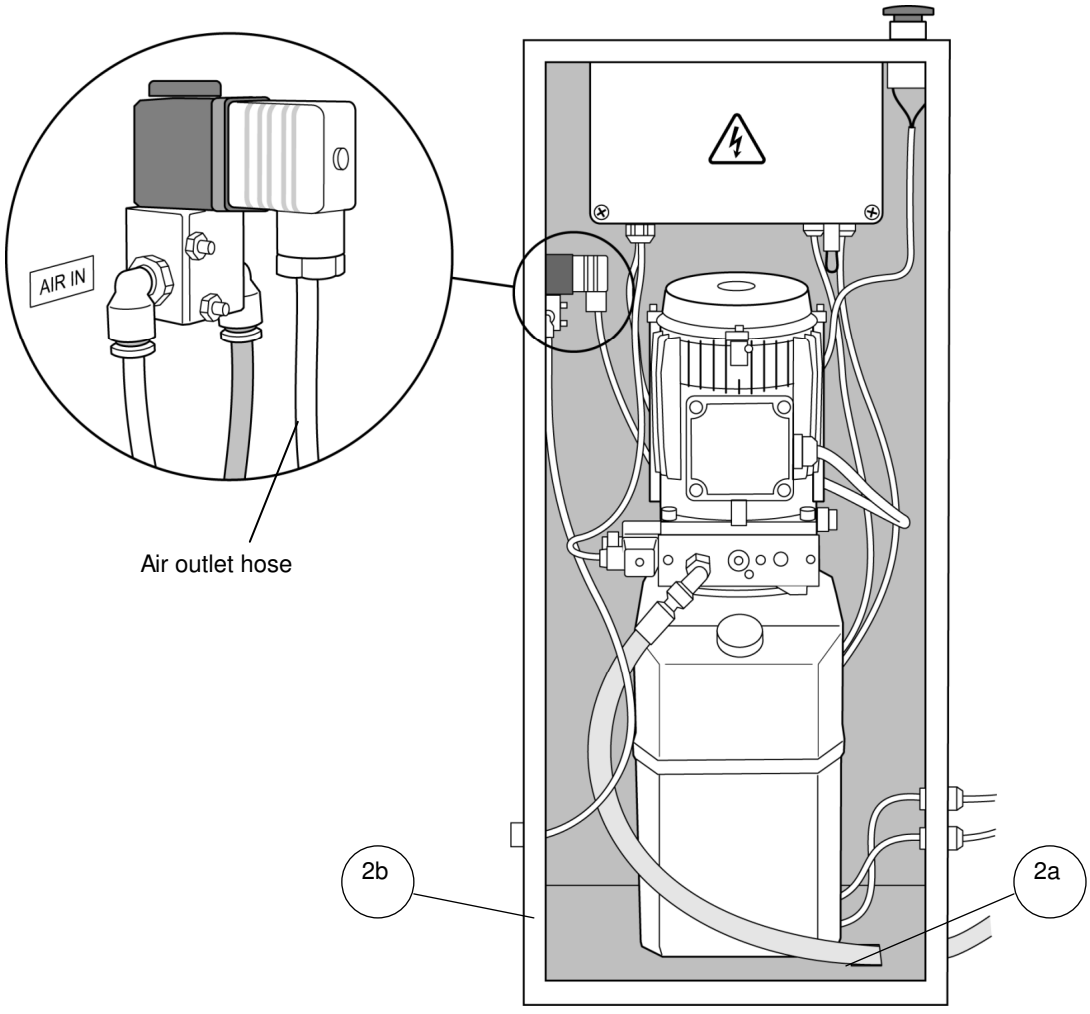


Figure 3.4 Connection of the pneumatic air outlet

3.3.5 Installation of the limit switch cable (Speed Lifting Platform only)

Installation of the limit switch cable is only applicable to the Speed Lifting Platform.

The draw aligner position limit switch should be connected to the electrical component housing in the Power Unit. The cable is included in the lifting platform at delivery and is equipped with a connector.

1 Insert the cable with the connector through the hydraulic hose hole at the bottom of the Power Unit cabinet.

2 Disconnect the jumping connector from the electrical component housing.

3 Connect the cable with the connector to the electrical component housing.

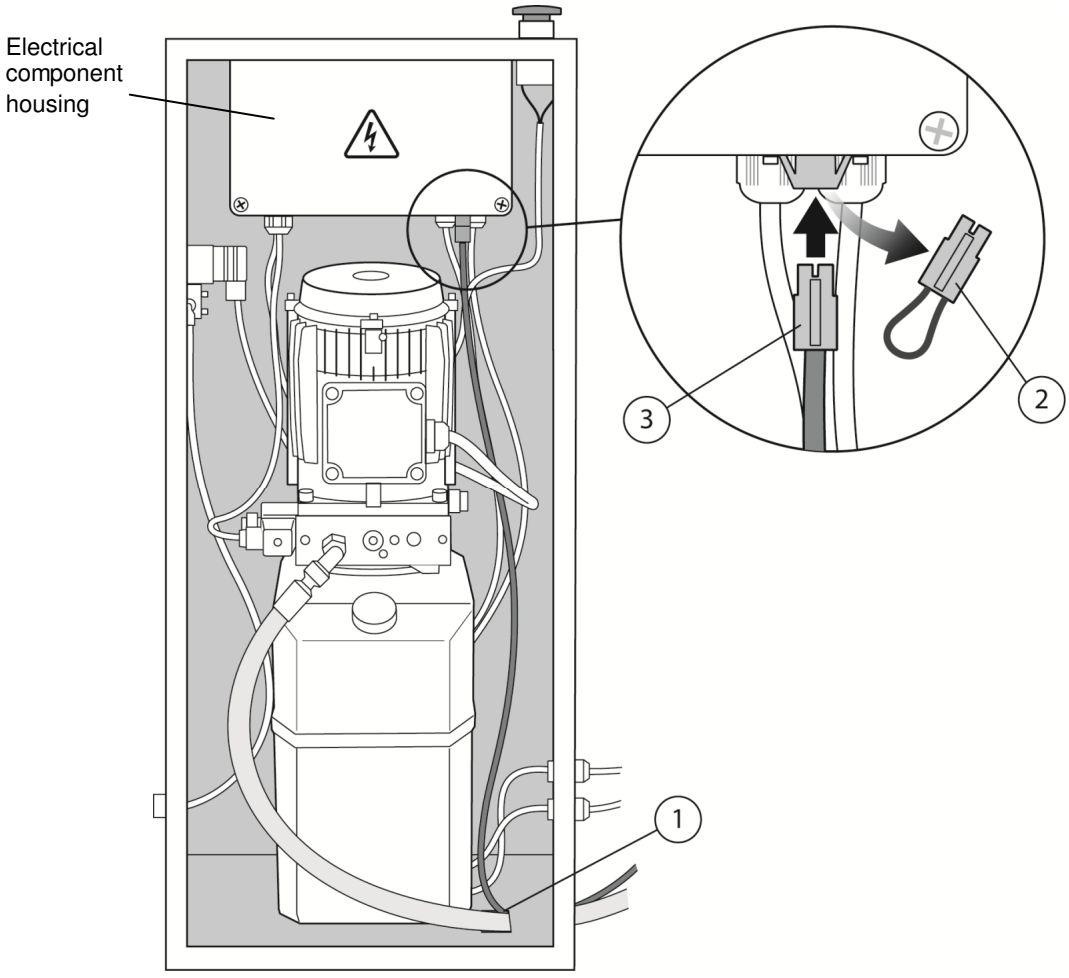


Figure 3.5 Connection of the cable from the draw aligner position limit switch.

3.3.6 Filling with hydraulic oil

Before starting the Power Unit, the oil tank must be filled. The viscosity must be Class 32, but can be oil from different manufacturers.

Note! 10 liters of hydraulic oil are included with the Power Unit delivery .

1 Loosen the oil tank top plug.

2 Fill with oil to the mark on the tank.

Note! We recommend using an oil can with a spout to avoid oil spillage which can make future maintenance more difficult.

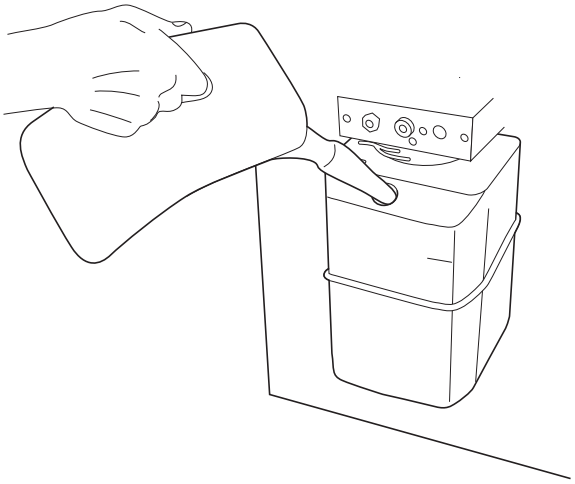


Figure 3.6 Filling with oil

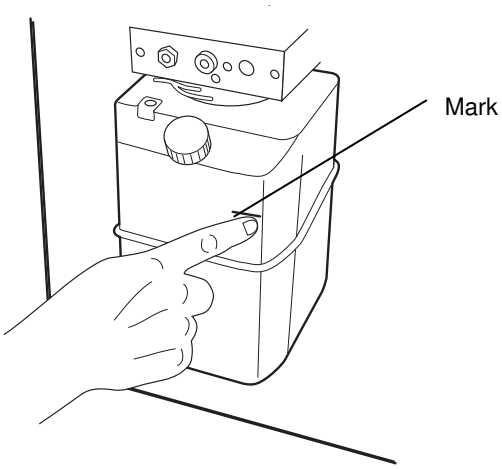


Figure 3.7 Normal level in oil tank

3.4 Commissioning

Before the Power Unit is powered, check that the installation is correct and complete.

Also check that the lifting table is ready for commissioning.

1 Plug in to the mains supply.

2 Use the Hand Control and raise and lower the lift a few times. Check that the latch on the mechanical safety lock falls easily into the tracks.

Note! If the lifting table doesn't raise or lower properly, the probable reason is that the hydraulic pump motor phase order is incorrect and the motor turns in wrong direction. If so, the phases must be changed in the mains socket, which is provided by the user.

Note! You must *not* change the phase order in the Power Unit.

3 If the pump motor is still not running, check in the electrical connection box mounted on the pump motor that the motor is connected for the right supply voltage.

After successful commissioning, the Power Unit's front door must be assembled.

4. Operation

4.1 General

IMPORTANT! It is the responsibility of the owner to ensure that the equipment has been installed as specified in the instructions provided. It is also the owner's responsibility to ensure that the lift is inspected in accordance with current and local regulations before it is used.

IMPORTANT! The Power Unit may not be operated by children or unauthirized personnell.

The Car-O-Liner Power Unit is inspected and checked prior to leaving the factory to guarantee consistent quality and maximum reliability.

The Power Unit is used for raising or lowering the Car-O-Liner Lifting unit, e.g. a lifting platform or a bench. The Power Unit operates the lifting unit in different modes:

- Raising or lowering the lifting unit to a desired working height
- Lowering the lift to draw aligner height
- Lowering the lift to rest position

When the Power Unit stops operating, the lift stops and maintains its height due to a non-return valve built into the hydraulic pump in the Power Unit. When the lift is to be lowered to the mechanical safety lock range, the safety lock must be released. Press the up button to lift the platform a couple of centimeters and then press the down button fully down, to lift the safety lock.

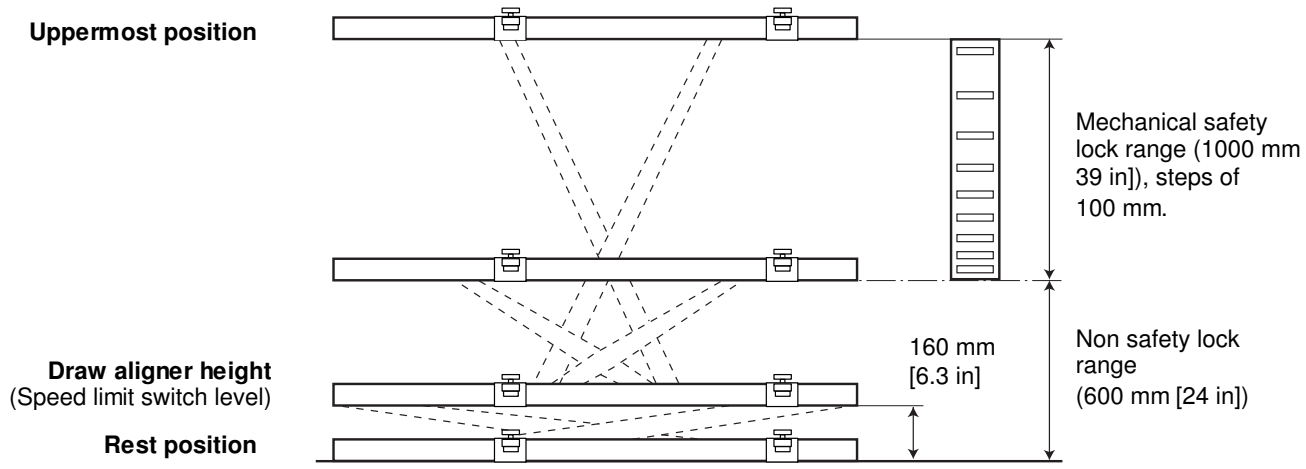


Figure 4.1 Principle for raising and lowering the lift

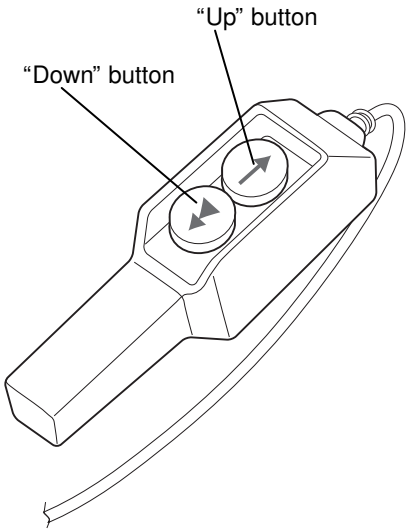
4.2 Raising the lifting unit

WARNING! Before raising or lowering the lift, ensure that no one is near the lifting platform. Risk for crushing injuries.

IMPORTANT! Make sure there are no objects obstructing the movement of the lift.

IMPORTANT! Always keep a careful watch on the lift and its load when raising and lowering.

Raise the lifting unit as follows:



1 **Make sure that the emergency stop is released, refer to *section 4.5.2*.**

2 **Push the “Up” button (single arrow) to raise the lift. Keep the button pushed in until the lift reaches the desired height.**

3 **Release the “Up” button when the lift has reached the desired height.**

Note! The power unit only operates when the "Up" button is pushed in. As soon as the button is released, the power unit stops operating.

4.3 Lowering the lifting unit

WARNING! Before raising or lowering the lift, ensure that no one is near the lifting platform. Risk for crushing injuries.

IMPORTANT! Make sure there are no objects obstructing the movement of the lift.

IMPORTANT! Always keep a careful watch on the lift and its load when raising and lowering.

4.3.1 Lowering the lifting unit to desired working height

Lower the lifting unit as follows:

1 **Make sure that the emergency stop is released, refer to *section 4.5.2*.**

If the lift has stopped at a mechanical safety lock position, it must be released from the safety lock before lowering:

2 **Push the "Up" button to raise the lift a couple of centimeters. This releases the mechanical safety lock.**

Once the mechanical safety lock has been released, lower the lift as follows:

3 **Push the "Down" button (double arrow) all the way in to lower the lift. Keep the button pushed in until the lift reaches the desired height. (By pushing the "Down" button half way in, the lift stops at the nearest safety lock position.)**

4 **Release the "Down" button when the lift has reached the desired height.**

Note! The power unit only operates when the button is pushed in. As soon as the button is released, the power unit stops operating.

4.3.2 Lowering the lift to draw aligner height

Lower the lift to the draw aligner height, without stopping at the nearest mechanical safety lock, as follows:

1 Make sure that the emergency stop is released, refer to *section 4.5.2*.

2 Push the "Down" button all the way in to lower the lift. Keep the button pushed in until the lift automatically stops at draw aligner height (Bench Rack and Mark 6).

3 Release the "Down" button when the lift has stopped.

Note! The power unit only operates when the button is pushed in.
As soon as the button is released, the power unit stops operating.

4.3.3 Lowering the lift to drive on and rest position (Speed only)

Note! Lowering to rest position only applies to the Speed Lifting Platform. For Bench Rack and Mark 6, please refer to separate instruction manuals.

Lower the lift to the rest position, which is its lowest position, as follows:

1 Make sure that the emergency stop is released, refer to *section 4.5.2*.

If the lift is above draw aligner height:

2 Push the "Down" button until the lift automatically stops at draw aligner height.

3 Release the "Down" button.

When the lift is at draw aligner height:

4 Push the "Down" button all the way in until the lift automatically stops at the rest position.

5 Release the "Down" button when the lift has stopped automatically.

Note! The power unit only operates when the button is pushed in.
As soon as the button is released, the power unit stops operating.

WARNING! Risk for crushing injuries.

4.4 Emergency lowering

Emergency lowering can be affected by means of the lowering valve. To perform emergency lowering you must disengage the safety latch manually with a brace.

WARNING! Do not stay under the platform, risk of personal injury.

1 **Remove the plastic cap.**

2 **Carefully unscrew the knurled locknut a couple of turns, counter clokwise, to open the valve. This will lower the lift.**

3 **When the lift has been lowered, close the valve by turning the knurled locknut clockwise a couple of turns.**

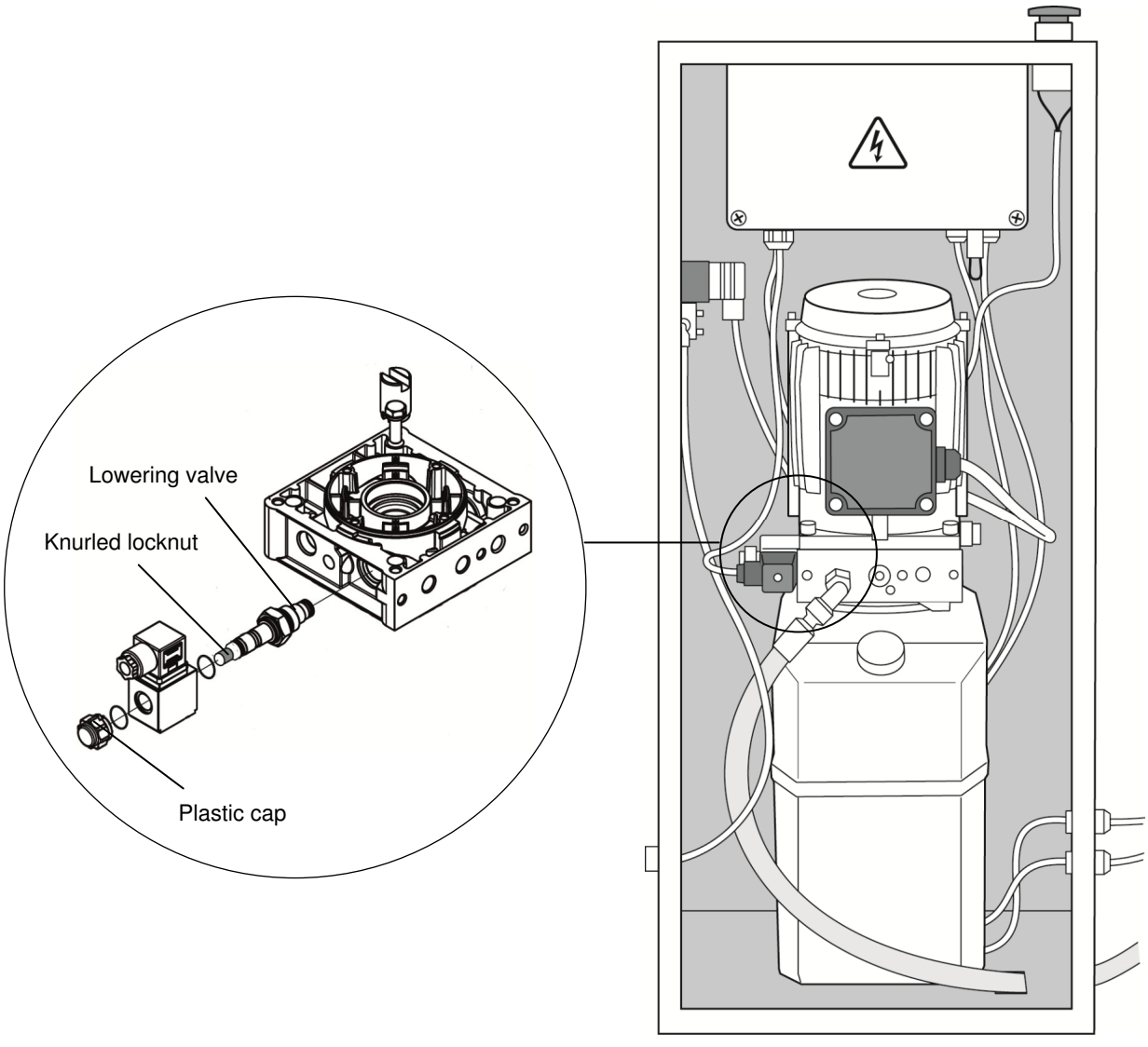


Figure 4.2 Lowering valve

4.5 Emergency stop

In an emergency or if an accident occurs, the Power Unit can be stopped operating by using the emergency stop. Do as follows to emergency stop the Power Unit.

4.5.1 Triggering the emergency stop

Trigger the emergency stop as follows:

1 **Push down the emergency stop button. Once the emergency stop is triggered, the Power Unit stops operating.**

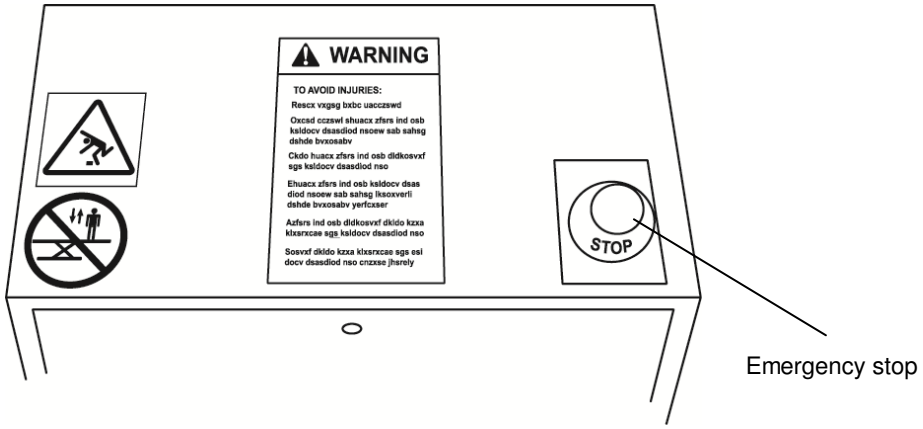


Figure 4.3 Emergency stop push button

4.5.2 Releasing the emergency stop

Release the emergency stop as follows:

1 **Turn the emergency stop knob counter-clockwise until it is released. Once the emergency stop is released, the Power Unit works again.**

5. Maintenance

WARNING! During all service and maintenance work with the lift in a raised position, the bench must be blocked against unintentional lowering. Risk for crushing injuries.

WARNING! Observe high standards of cleanliness when working with the hydraulic equipment. Dirt in the hydraulic oil can result in breakdowns.

5.1 Monthly inspection

The Power Unit and the lift should be inspected at least once a month in regard to the following:

1 **The safety latch should fall easily into the tracks. Clean and oil all moving parts. Grease all shafts fitted with lubricating nipples.**

2 **Make sure that the hydraulic and air hoses are positioned properly and are in good condition.**

3 **Ensure that no articulated shafts or locking screws have become loose. Correct as necessary.**

4 **Check for oil leakage at cylinders and power unit. Correct as necessary.**

5 **Check the level in the hydraulic oil tank. Top up as necessary. The oil must have a viscosity as stated in *Chapter 8, "Technical specifications"*.**

6 **Check the warning signs and replace damaged ones. Affix a new sign if one is missing.**

6. Trouble shooting

6.1 General

The trouble shooting instructions in this chapter will help you to quickly find and correct the most common faults that may occur when using the Car-O-Liner Power unit.

WARNING! All electrical connections must be carried out by authorized personnel. Risk for electrical shock.

IMPORTANT! Observe high standards of cleanliness when working with the hydraulic equipment. Dirt in the hydraulic oil can result in breakdown and subsequent loss of revenue.

6.2 Fault-tracing tables

The following fault-tracing tables are useful when tracing a fault on the power unit. The tables are organized according to the following errors:

- The lift cannot be raised
- The lift drops
- The lift cannot be lowered

The tables list the most common faults and their possible causes. There may be additional faults and possible causes that are not listed in these tables.

6.2.1 The lift cannot be raised

Fault		Possible cause	Solution
1	**The motor is not running**	Phase down	Check that the hydraulic pump motor has voltage on all phases.
		Tripped or defective fuse	Check fuse.
		Voltage drop or wrong voltage	Check voltage and ensure that the motor and electrical component housing are connected for the proper voltage.
		Contactor faulty	Check contactor and contactor coil. Replace any defective parts.
		Fault in control circuit	Check the fuse and the control circuit. Replace or repair any faulty parts.

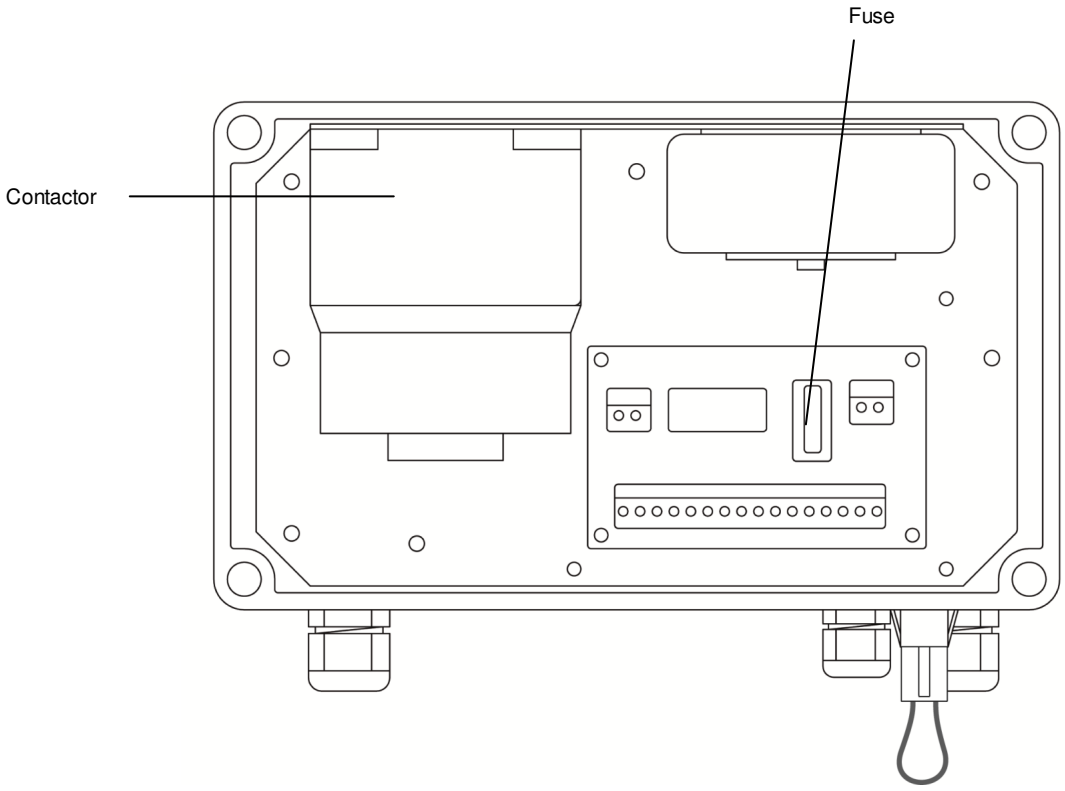


Figure 6.1 Checking the fuse for the control circuit

Fault		Possible cause	Solution
2	**The motor runs, but the lift cannot be raised.**	Excessive load on the lift	Check the actual load on the lift
		Motor running in wrong direction	Change the phase order at the mains connection. Check the motor's direction of rotation.
		Low oil level	Check oil level. Top up as necessary. For recommended oil type, refer to Section 8 ""Technical specifications""
		Oil leak	Check hoses and connections. Replace any damaged parts.
		Dirt in the lowering valve	*Please contact your distributor for technical support.*
		Defective lowering valve.	The lowering valve has jammed in the open position. Replace the valve.
		Defective pressure regulating valve	Connect a pressure gauge to the hydraulic hose and check the pressure. It should be between 200 and 210 bar (2,900 and 3,100 PSI). The pressure is set at the factory. If it is incorrect, contact your supplier.
		Defective pump	Replace pump.

6.2.2 The lift drops

Fault		Possible cause	Solution
1	**The lowering valve leaks**	Dirt in valve	*Please contact your distributor for technical support.*
2	**Oil leak**	Hose or connection leaking	Check hoses and connections for leakage. Replace defective parts. Change oil.
3	**Oil leak in cylinder.**	Gaskets worn	*Please contact your distributor for technical support.*
4	**Non-return valve in pump defective or leaking**	Non-return valve defective	*Please contact your distributor for technical support.*

6.2.3 The lift cannot be lowered

Fault		Possible cause	Solution
1	**Lowering valve fails to open**	No current to solenoid coil	Check voltage at coil. It should be 24 V AC. Perform trouble shooting according to the electrical diagram in Chapter 1.
		Valve clogged with dirt	*Please contact your distributor for technical support.*
		Valve sticks	Replace valve and change oil
2	**Mechanical safety lock jammed**	Safety latch is stiff or sticking	Ensure lock mounting locates properly into the locking tracks. See Instructions for the lift.
		Pneumatic cylinder does not lift the latch from the track	Make sure that air is supplied to the pneumatic cylinder and that the air valve is supplied with 24 V AC. Ensure that the air hose is not pinched or blocked.
3	**Jumping connector not connected**	Connector missing or cable not connected (Speed)	Plug in the connector or the cable

7. Dismantling and salvage

7.1 General

IMPORTANT! For the sake of the environment, dismantle the equipment in an environmentally friendly way.

To limit the stress on the environment and its natural resources, recycle the different parts of the Car-O-Liner Power Unit.

7.2 Mechanical components

If the mechanical components in the Power Unit are to be dismantled or scrapped, the oil in the cylinder, pump and hose must be drained off.

The mechanical components should then be separated for material recycling and the used oil must be sent for destruction or recovery.

7.3 Other

The electrical components, plastic hoses, steel and aluminium should be separated for material recycling.

8. Technical specifications

Total weight of Power Unit		44 kg	97 lbs
Motor output		1.85 kW	
Supply voltage		110 or 220 V, single-phase, 60 Hz 200 V, 230 V or 400 V 3-phase, 50 Hz	
Current (voltage)	110 V 200 V 220 V 400 V	17 A 9,25 A 8,4 A 4,6 A	
Control voltage		24 V AC / 2 A (110 V, 220 V mains supply) 24 V AC / 2 A (200-400 V mains supply)	
Sound level		Below 70 dB (A)	
Operating oil pressure (set by manufacturer)		max 210 bar	max 3,050 PSI
Operating air pressure, maximum		10 bar	200 PSI
Pump capacity, flow		5,3L/min	5,3L/min
Required hydraulic oil viscosity		Class 32 ASTM D445 ISO3448	
Oil tank capacity		8 liters	2.1 gallon

9. Spare parts

The spare parts required for maintaining the Car-O-Liner Power unit are listed in this chapter.

For other spare parts and questions about repair of the Power Unit, please contact the service department at Car-O-Liner AB.

Note! Use only genuine Car-O-Liner spare parts in any repairs.

Position	Quantity	Part No.	Object
1	1	44233	F1,Glass fuse tube, 2,5A/250V
	1	44234	Transformer 110/220V,
2	1	44235	Transformer 230/400V
3	1	44236	Contactor
4	1	44237	PCB board
5	1	44238	Jumper connector
6	1	44239	Hand control
7	1	44240	Cable for hand control
8	1	44241	Hand control with cable, complete

Table 9.1 Spare parts for Main electric supply

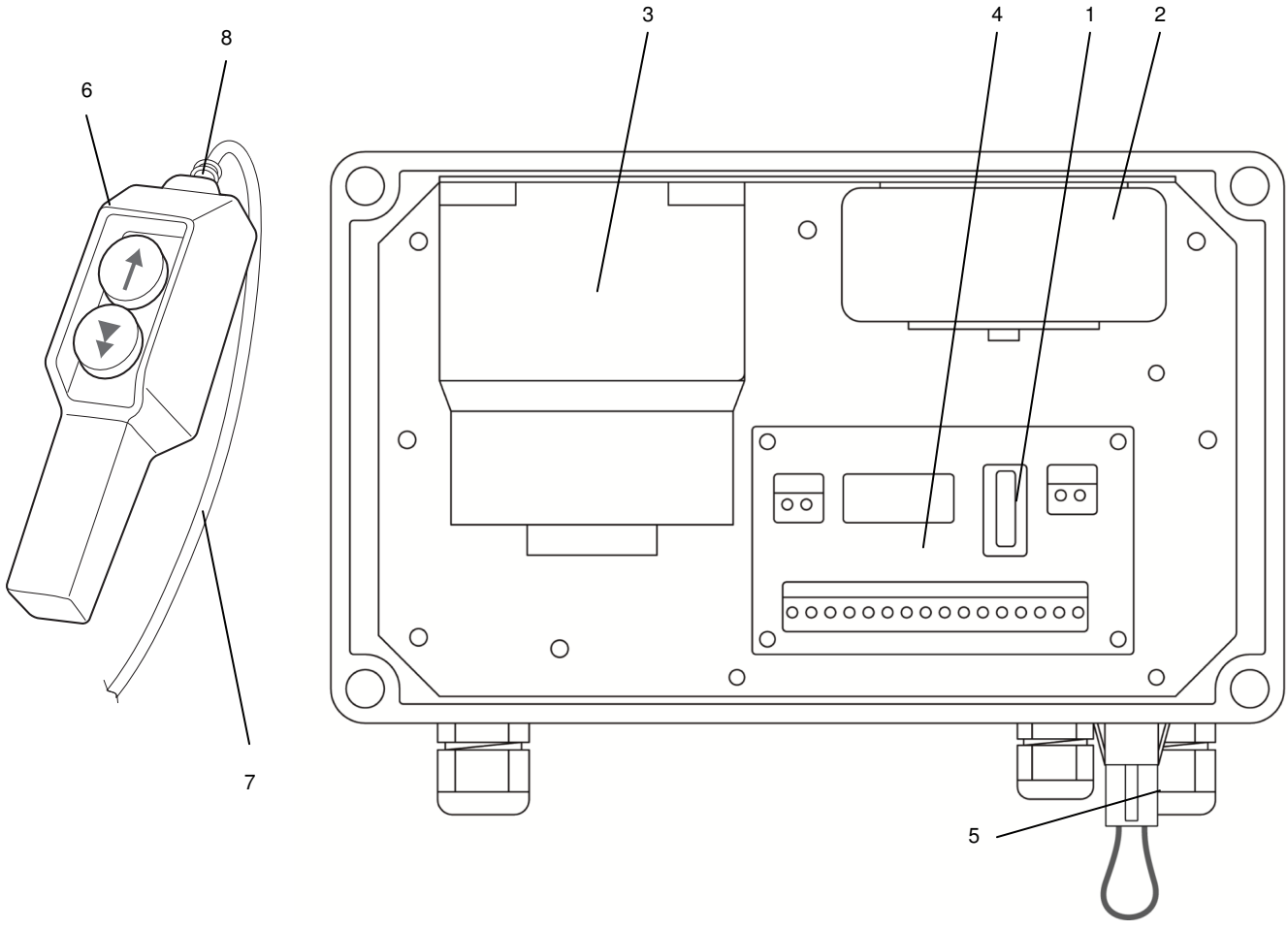


Figure 9.1 Main electric supply.

Position	Quantity	Part No.	Object
1	1	44242	Pressure regulating Valve
2	1	44243	Non-return Valve
3	1	44244	Flow control Valve
4a	1	44245	Hydraulic pump, single phase
4b	1	44246	Hydraulic pump, 3 phase
5	1	44247	Start-up Valve (Single phase only)
6	1	33985	Lowering valve
7	1	33945	Coil S2-CE 24V-50/60 Hz
8	1	44248	Electric motor, single-phase 110V 60Hz **(T604**)
8	1	44249	Electric motor, single-phase 220V 60Hz (**T605**)
9	1	44250	Electric motor, 3-phase 230V/400V 50Hz (**T601** and **T603**)
9	1	44251	Electric motor, 3-phase 200V 50Hz (**T602**)
10	1	33124	Oil tank, 8 litres (2.1 gallons)
	1	30774	Hydraulic oil [10 liters (1.3 gallons)]
	1	44252	Pneumatic solenoid valve (see page 8)
	1	44253	Emergency stop (see page 8)
	1	43697	Safety sign “Prohibited to be on the lift during raising...” (see page 15)
	1	31892	Safety sign “Risk for tripping” (see page 15)

Table 9.2 Spare parts for hydraulic pump including oil tank

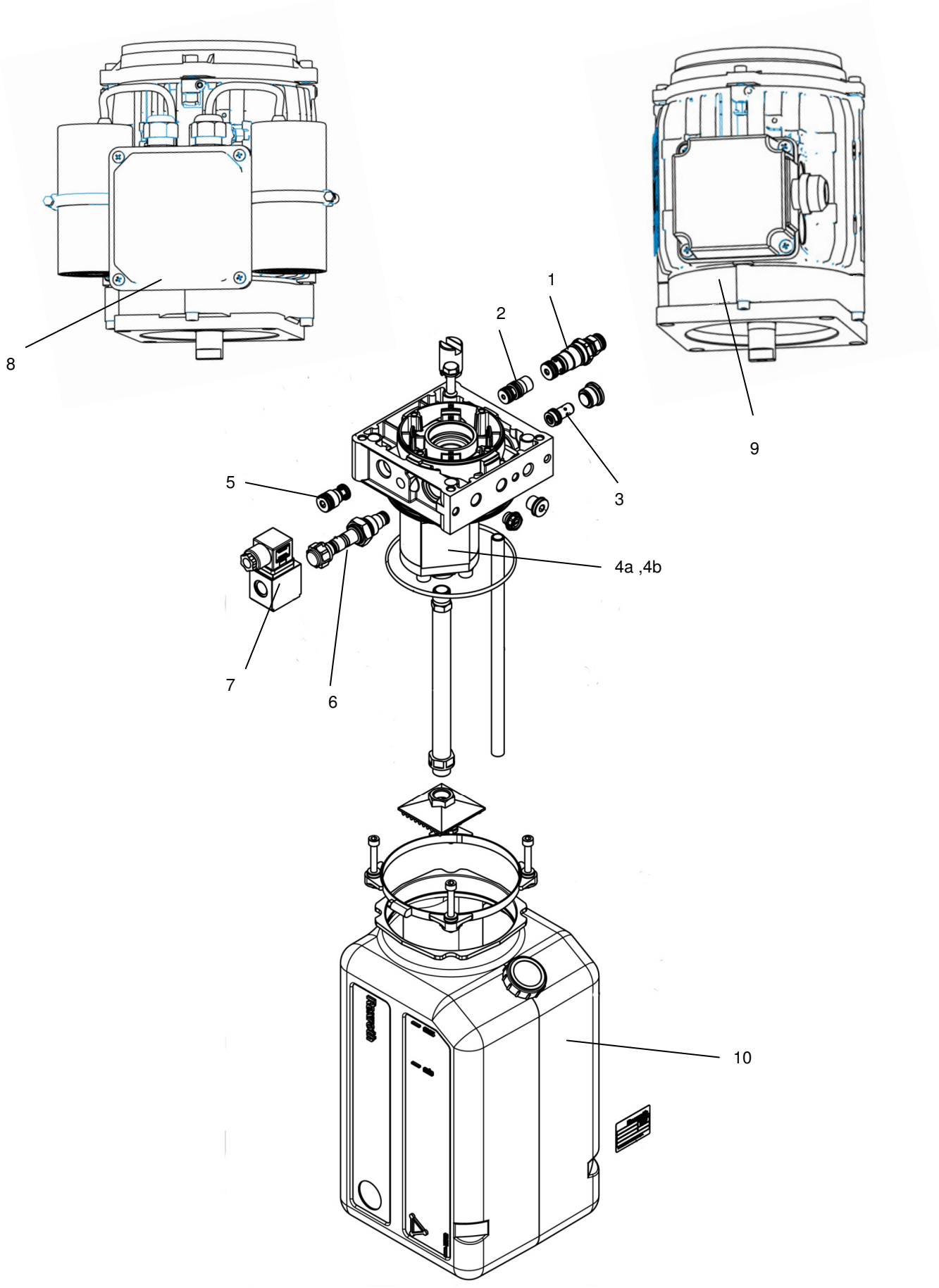


Figure 9.2 Hydraulic oil pump including oil tank

Car-O-Liner® is together with Josam part of the Alignment Systems Group. Car-O-Liner developed collision repairs systems for cars and light trucks, while Josam is focusing on heavy-duty vehicles. The Alignment Systems Head Quarter and Car-O-Liner Head Quarter are located in Gothenburg, Sweden. Our main factory is based Kungsör, Sweden. Car-O-Liner runs operations of its own in Sweden, Norway, USA, UK, France, Germany and China and sells through local distributors in more than 70 countries.

Car-O-Liner products are well known for their high quality, advanced technology and ergonomic design. According to our customers, Car-O-Liner's collision repair equipment is the best made, the easiest to learn, the simplest to use and the most productive. With Car-O-Liner equipment in your shop, your customers - the vehicle owners and insurance companies - will experience safety and complete satisfaction from your work. Car-O-Liner has everything you need to reduce cycle times and increase profits.

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