

# Lift Gate Hydraulic Power Unit

## MANUAL



**ATTENTION!** Before operating the hydraulic power unit, it is essential to review all the recommendations provided in this manual. The manufacturer is not responsible for any damage caused by improper operation or modifications to the hydraulic power unit.

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## A1 MANUFACTURER

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## A2 OVERVIEW

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This manual is intended for users of hydraulic lift gate power unit. It contains essential information for assembly, initial startup, operation, maintenance, and safe usage of the hydraulic power unit.

The manual has been compiled with the experience and expertise of the manufacturing company and its specialists in mind. Special attention should be given to the safety precautions outlined in this document when working with the equipment.

Any operations requiring the disassembly and assembly of the power unit or electrical components must be carried out by qualified and authorized personnel only. Repairs and adjustments not covered in this manual should not be attempted.

## A3 PRODUCT CLAIMS

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In the event of a technical issue, please contact the Magister Hydraulics technical department at **info@magisterhyd.com**. You can reach us by email or phone regarding your claim. To assist you more effectively, please provide the following information:

- Power unit code (found on the label located on the oil tank)
- Operating voltage and frequency
- Operating pressure
- Pump displacement
- Production date
- Detailed description of the issue
- Operating hours of the power unit

## A4 LABELING

The technical information for the power unit, including motor power, pump displacement, oil tank size, and other specifications, is available on the label located on the oil tank.

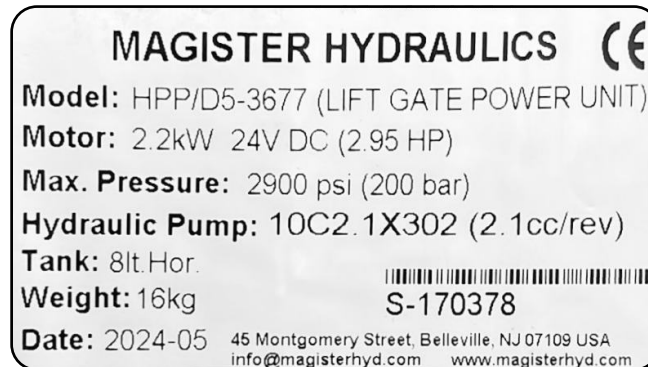


Photo 1. Power Unit Label

## A5 APPLICATIONS

The hydraulic power unit is designed for integration into lift gate systems that use two single-acting cylinders. It is compact and includes two double-lock, normally closed cartridge valves. The central manifold features a normally closed lowering valve for retraction.

Key features include:

- Designed for systems with two single-acting cylinders
- Integrated normally closed lowering valve and flow control valve



## A6 PRODUCTION CONDITIONS AND REQUIREMENTS

The hydraulic power unit is designed for use in both covered environments and open areas, with an ambient temperature range of -13°F to +122°F and air humidity up to 80%.

## A7 TECHNICAL SPECIFICATION

The power units are designed and built to provide flow rates ranging from 0.20 GPM to 7.13 GPM, depending on the selected electric motor (ranging from 0.37 kW to 4 kW) and hydraulic pump (ranging from 0.3 ci/rev to 0.55 ci/rev). The working pressure ranges from 580 to 3191 PSI, depending on the size of the selected components.

### A8 NOISE SPECIFICATIONS

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The hydraulic power unit operates at a noise level not exceeding 85 dB, in compliance with EN 60034-9.

### A9 OPERATING FLUID

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The oil tank must be filled with new, filtered, mineral-based fluid that meets ISO 6743/4 standards. Use hydraulic oils with a mineral or synthetic base and a viscosity range of 15 to 68 cSt at a temperature of 104°F. The hydraulic fluid may vary based on operating conditions. Do not use motor oil, diesel fuel, or water as fluid in the system. The filtration class must be -9 according to NAS 1638.

The hydraulic fluid should be replaced every 6 months or 1 year, depending on the usage and application. (After the initial 100 operating hours, it is recommended to replace it every 3,000 hours.) The suction filter should also be cleaned. If the fluid level drops, additional oil should be added.



### B1 SAFETY GUIDELINES

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To operate the hydraulic power unit, only personnel familiar with the safety protocols for electrical equipment and systems operating under pressure should be allowed.

To ensure the safe operation of the hydraulic power unit, the following guidelines must be adhered to:

- The power unit should not be operated with a replacement cap on the motor terminal connection box, nor with connectors on the solenoid valve coils that differ from the original ones used in the power unit.
- Connections must be made by a qualified electrician. During installation, the direction of the electric motor's rotation should be verified. When viewed from the motor shaft, the motor should rotate counterclockwise.
- Hydraulic connections must be made carefully. The manifold includes two outlet ports that need to be connected to the actuators in the system.
- The selection of piping should match the system's pressure and flow rate requirements.
- Tube connectors must be securely fastened to prevent any fluid leakage on external surfaces. Appropriate sealing components should be used.
- Replacing the air breather with a plug is not allowed.
- Adjusting the pressure relief valve to a higher pressure setting is prohibited.
- The power unit must be securely mounted to a base or stable frame.
- The power unit should not be used in explosive or combustible environments.
- Insufficient oil levels may cause damage to the hydraulic pump.
- Only insulated cables should be used for electrical connections.
- The power unit assembly should not be performed in a wet environment.
- The positive (+) and negative (-) terminals of the DC motor should not make contact with each other.
- The cable ends of the DC motor must be properly insulated.
- The DC motor should not operate without the starter installed.
- Oil tanks are equipped with red-colored breathers. Blind plugs should never be installed on these breathers.
- Hose diameters must be properly sized to avoid restriction.



### C1 MAIN PARTS

The power unit consists of the following main components:

- Electric motor
- Central manifold
- Hydraulic gear pump
- Oil tank
- Suction filter
- Valve group

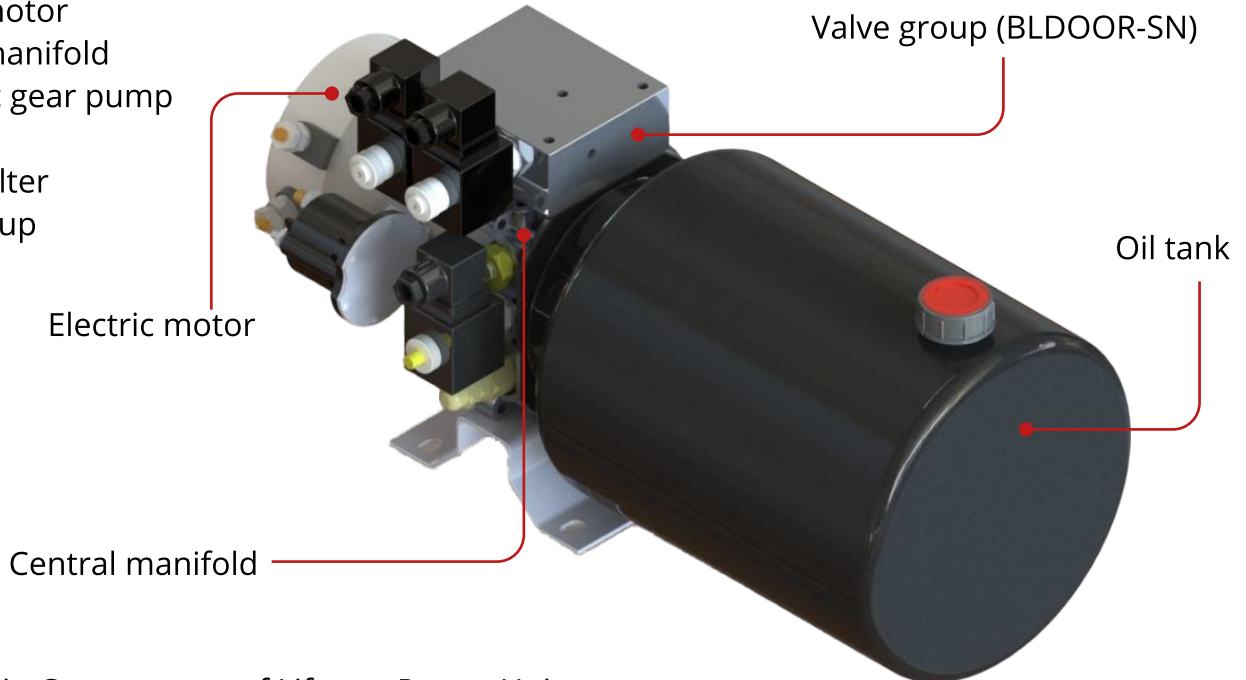


Photo 2. Main Components of Liftgate Power Unit

When the power to the electric motor is turned on, it drives the gear pump. The pump draws the working fluid from the tank and directs it to the central manifold, which then sends it to the system's actuators. The output ports of the BLDOOR-SN block must be connected to the ports of a single-acting cylinder.

### C2 ELECTRICAL PARTS

The hydraulic power unit is assembled with the following components:

- Electric motor
- 2/2 Double-check, normally closed cartridge valves
- 2/2 Normally closed cartridge valve

The electric motor is available in the following options: 1.6 kW 12 V, 2 kW 12 V, 3 kW 12 V, 2.2 kW 24 V, and 3 kW 24 V.

Solenoid-operated valve coils are compatible with voltages of 12 V, 24 V, or 220 V. The connectors are designed according to DIN 43650 standards.

The operation of the power unit is determined by the machine in which it is integrated. During power unit operation, leakage of working fluid onto external surfaces is not permitted. The power unit is activated when the motor is supplied with the required voltage. Control is achieved through the proper coordination of the motor startup and the solenoid valves.

## SECTION E: ASSEMBLY OF THE POWER UNIT

### E1 WORK AREA REQUIREMENTS

The power unit must be mounted using M10 holes with a mounting bracket beneath the central manifold. The area around the power unit must remain clear, with unobstructed access to the oil filler, valves, and unloading throttle. Power units should not be placed in enclosed spaces that could restrict cooling. Additionally, the power unit must not come into contact with any components that may vibrate or transmit noise.

### E2 TRANSPORTING OF THE HYDRAULIC POWER UNIT

The power unit must be mounted using M10 holes with a mounting bracket beneath the central manifold. The area around the power unit must remain clear, with unobstructed access to the oil filler, valves, and unloading throttle. Power units should not be placed in enclosed spaces that could restrict cooling. Additionally, the power unit must not come into contact with any components that may vibrate or transmit noise.

### E3 POWER UNIT PROTECTION

The hydraulic power unit is removed from the carton. The polyethylene packaging is removed. The safety plugs are replaced on the supply ports.

### E4 CONNECTION PORTS

The BLDOOR-SN block has two outlet ports. The port threads are BSPP 3/8" (for the SAE version, they are 3/4-16 UNF-2B). The maximum tightening torque for the fittings is 65 Nm.

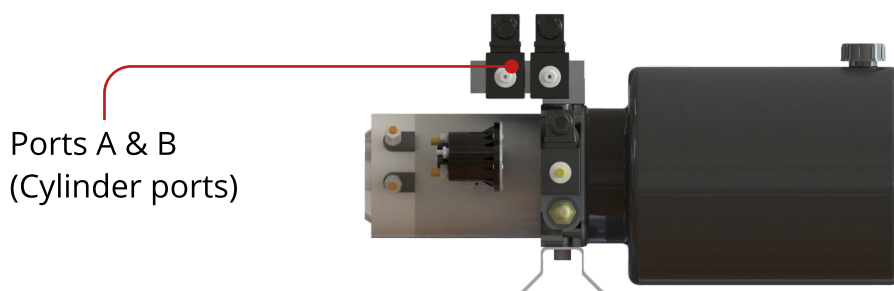


Photo 3. Connection ports valve block



E5 HYDRAULIC SYSTEM CONNECTION

The pipelines from the power unit are connected to the actuators in the system. Hydraulic circuit details and technical information are provided in the technical drawing. After the power unit is fully installed, fill the tank with clean working fluid up to the specified level. Be sure to clean all hydraulic components before assembly. After the initial operation, check the oil level in the tank.

E6 HYDRAULIC SYSTEM CONNECTION

The power unit should be connected to the electrical system by a certified electrician, as safety regulations for working with electrical equipment must be followed. Please consult the manufacturer for the electrical schematic.

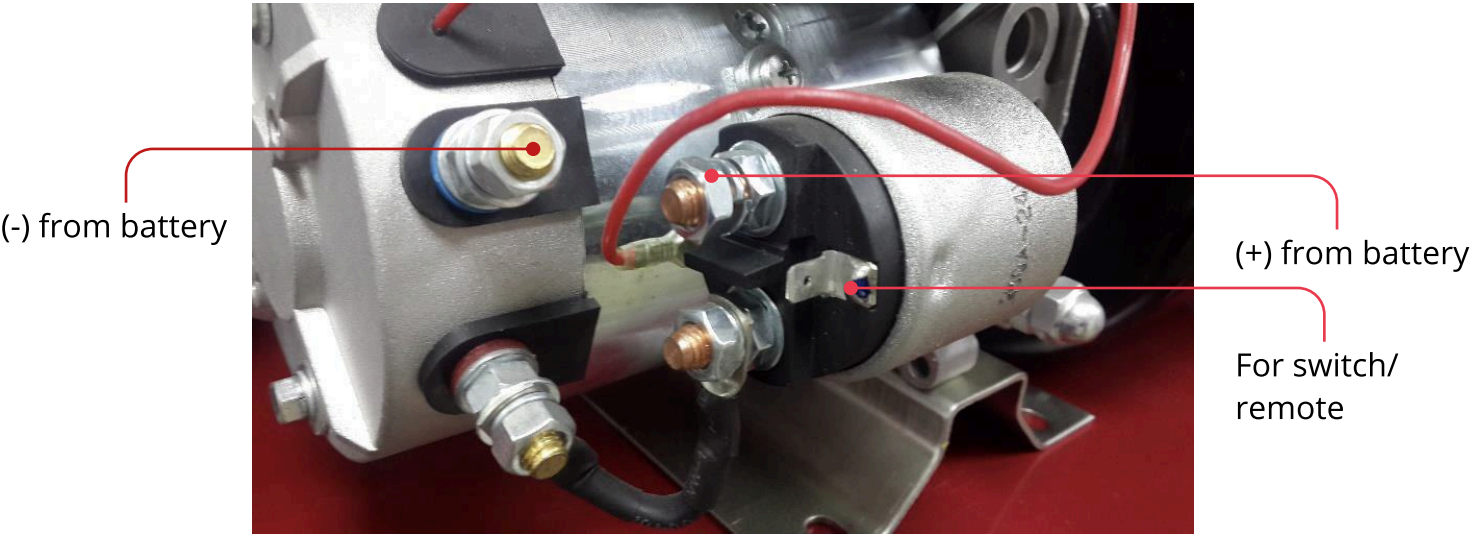
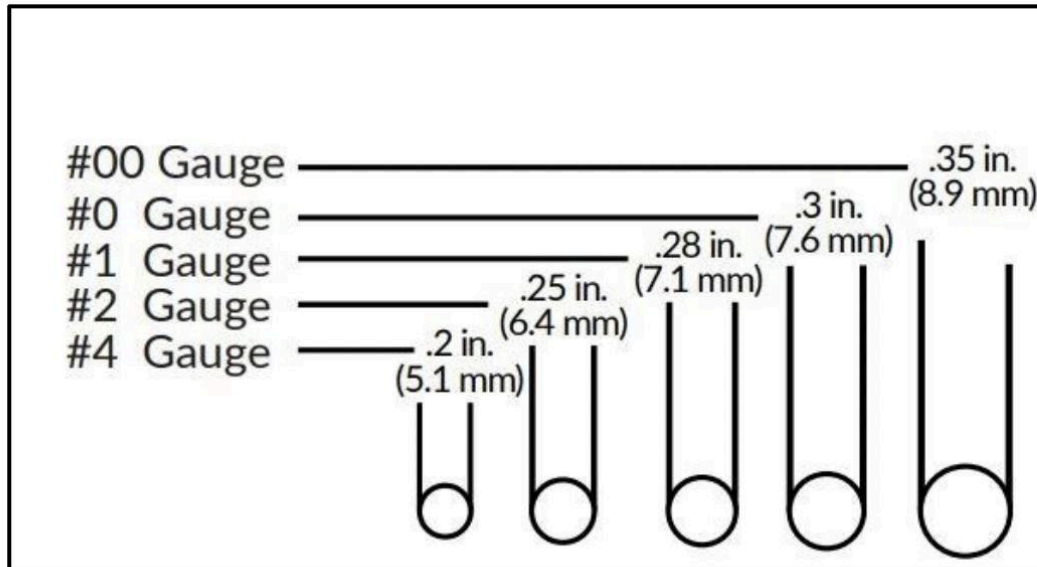


Photo 4. Connection on DC motor

It is important to select the correct cable size when connecting the battery to the hydraulic power unit. Incorrect selection may lead to issues in the electrical circuit. The table below can be used to determine the appropriate cable size.

18-21 meter	#1	#00			
15-18 meter	#2	#0	#0		
12-15 meter	#2	#1	#0	#00	
9-12 meter	#4	#1	#0	#00	#00
6-9 meter	#4	#2	#1	#0	#00
3-6 meter	#4	#2	#1	#0	#00
0-3 meter	#4	#2	#1	#0	#00
	0-100 amp	100-150 amp	150-200 amp	200-250 amp	250-300 amp



**Insulation not included.**

## SECTION F: MAINTENANCE OF THE HYDRAULIC POWER UNIT

### F1 POWER UNIT CLEANING

The power unit should be cleaned using a textile cloth without any cleaning agents or solvents. The cloth should not leave any fibers on the treated surfaces. Once a year, it is necessary to change the oil and flush the tank. The oil change process is as follows:

- Relieve the pressure in the system.
- Disconnect the power unit from the electrical system.
- Disassemble the pipelines. Unscrew the bolts securing the power unit to the base.
- Position the power unit vertically on the tank and remove the fixing screws.
- Remove the electric motor, central manifold, and pump from the power unit. Drain the old oil and clean the internal surface of the tank. Clean the suction filter as well.

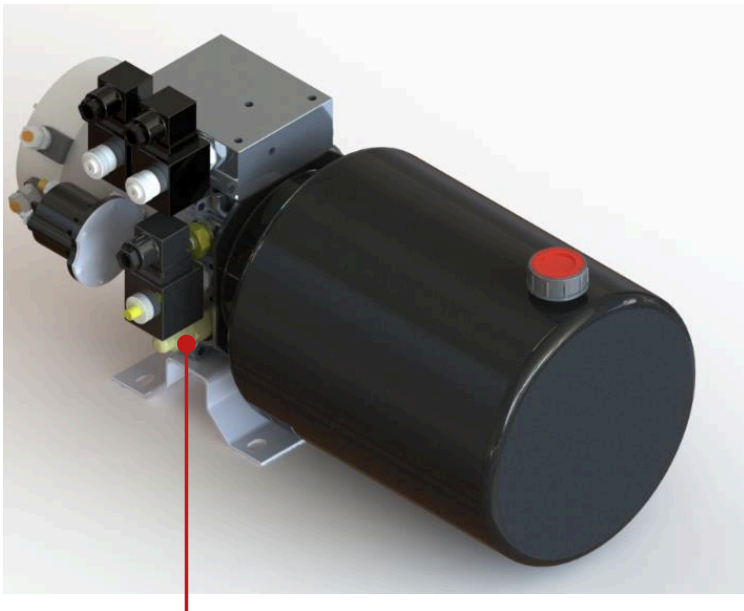
After cleaning, reattach the electric motor and central manifold to the tank, and secure them with the fixing screws and bracket. Reinstall the power pack in its operational position. Refill the tank with the working fluid to the specified level. Ensure the air breather is securely closed. Reassemble the pipelines and reconnect the power unit to the electrical system according to its intended application.

**Contaminated oil significantly reduces the lifespan of the power unit.**

## F2 PRESSURE ADJUSTMENT

The pressure adjustment in the hydraulic power unit is made using a pressure relief valve integrated into the main manifold. The adjustment process is as follows:

1. A pressure gauge is installed at port "P".
2. The nut on the adjusting screw is loosened.
3. The adjusting screw is unscrewed fully.
4. The hydraulic power is turned on, and the adjusting screw is turned (clockwise to increase pressure, counterclockwise to decrease pressure) until the desired pressure is reached.
5. The nut is then tightened to secure the setting.



Pressure relief valve

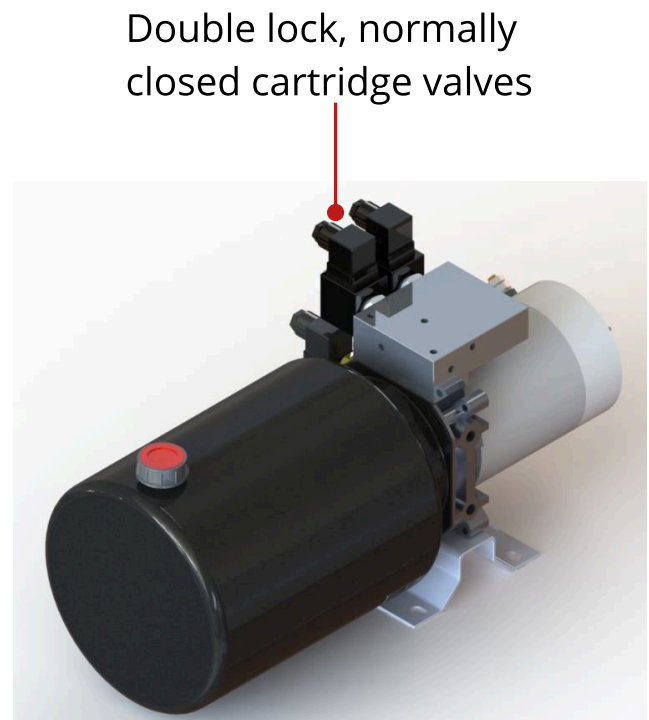


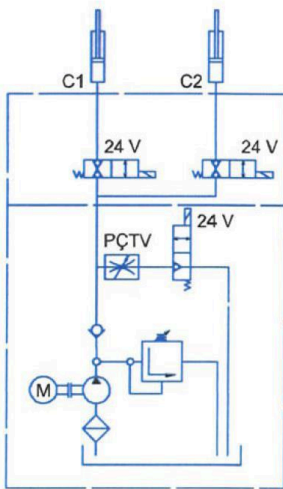
Photo 5-6. Pressure relief valve and double lock, normally closed cartridge valves

The factory settings of the power units typically meet the requirements for most field applications. Users should exercise caution when resetting the settings on the manifold. Ensure that the lock nut on the pressure relief valve is properly tightened. The adjustment screw should be turned clockwise to increase the pressure setting or counterclockwise to decrease it.

**Warning: Do not exceed the maximum working pressure specified in the technical drawing.**

## Hydraulic Scheme

Output ports are 3/4-16 UNF-2B



M: Electric motor  
X: Energized

	Electric motor (M)	S1	S2	S3
Cylinder 1 extend	X	X		
Cylinder 1 retract		X		X
Cylinder 2 extend	X		X	
Cylinder 2 retract			X	X

Table 1. Operating the power unit

## Features:

Designed for systems with two single-acting cylinders

Integrates a normally closed lowering valve and a pressure-compensated flow control valve.

## F3 TROUBLESHOOTING

PROBLEM	REASONS	METHOD OF ELIMINATION
Not sufficient pressure	<ul style="list-style-type: none"> <li>Lack of oil inside the tank</li> <li>Damaged pressure relief valve</li> <li>Damaged solenoid operated valve</li> <li>Damaged Hydraulic pump</li> <li>Filter pipe type is incorrect</li> <li>Filter is blocked</li> <li>Air on suction line</li> <li>Contamination</li> </ul>	<ul style="list-style-type: none"> <li>The oil is filled up</li> <li>Readjustment of the relief valve</li> <li>Replacement</li> <li>Replacement</li> <li>Replacement</li> <li>Replacement</li> <li>Elimination of the air</li> </ul>
No pressure	<ul style="list-style-type: none"> <li>Gear pump doesn't operate properly</li> <li>Electric wiring is wrong</li> </ul>	<ul style="list-style-type: none"> <li>Repair or replacement</li> <li>Make sure correct rotation</li> <li>Check wiring</li> </ul>
Electric motor runs but no pressure	<ul style="list-style-type: none"> <li>Gear pump doesn't prime</li> </ul>	<ul style="list-style-type: none"> <li>Disassemble pressure relief valve, run the unit for a few seconds until oil comes from the port, re-assemble the pressure relief valve</li> </ul>
Non-performance of the function	<ul style="list-style-type: none"> <li>Damaged solenoid valve</li> <li>Damaged check valve</li> <li>Damaged pressure relief valve</li> <li>Damaged hydraulic pump</li> </ul>	<ul style="list-style-type: none"> <li>Replacement</li> </ul>
Load doesn't stay in place	<ul style="list-style-type: none"> <li>Check valve problem</li> <li>Cylinder internal leak</li> </ul>	<ul style="list-style-type: none"> <li>Disassemble check valve clean the cavity with brake cleaner and use air pressure to remove contaminants/debris and replace check valve</li> <li>Repair/inspect the cylinder/seals</li> </ul>

The manufacturer guarantees that the product complies with the applicable standards and technical documentation, and that its functionality during operation is in accordance with the current manual.

Please don't remove the product label from the oil tank while the warranty is valid.  
The warranty lasts for 12 months from the Order date.

The manufacturer will be responsible for addressing any defects caused by its fault.  
The warranty will be void if the user performs unauthorized repairs or fails to follow the instructions outlined in this manual.

Warranty services will be provided at the manufacturer's facility or through an authorized service provider.



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