

Double Deck

Operation and Maintenance Manual

Electrical

Revision	Date	Author	Release notes
1	13/10/2017	A Mitchell	First Release

Scope of document

This document is designed to provide a basic level of instruction into the correct operation of the hydraulic lifting system from the perspective of the electrical system.

Basic fault finding and maintenance instructions are also provided, but this is a guide and not a concise, all cases, document.

No account is given of the hydraulic elements, as these are covered in a separate document.

The suspension is also not covered in this document.

Safety Notes

Please observe the following safety notes when using, working with or maintaining the hydraulic lifting deck's electrical system.

- The system is designed to work at 24v – do not use consistently higher or lower voltage.
- The system is designed to work with DC power – do not use any other current profiles.
- Always ensure the deck can be observed when raising or lowering, either by direct vision of the operator, or by a dedicated backup person.
- Keep clear of moving parts.
- Never enter the trailer whilst the deck is in motion.
- Never enter under the deck if the flags are not in position and the deck above them.
- Always isolate the electrical power before repairing or carrying out maintenance on the trailer. This is especially important when welding as failure to do so can destroy the PLC.

Introduction

The Aspoeck / Montracon hydraulic lifting deck uses a PLC controlled, 24v DC electrical system to operate the deck in normal usage.

Detailed below are the common interfaces and elements with which users should be familiar:

Power supply

Power is provided via 'Anderson' type connectors.



Switches

Switches, which can be found on the rear panel, are standard mechanical momentary type. The Blue switch is the 'Up' and the Green switch is the 'Down'.



Additional 'over ride' switches also exist on the front of the PLC box, but these are not for use in standard practice and should only be used by trained maintenance staff:



Safety Lamp



The safety lamp illuminates when the deck is in the 'roof' position, and the Flags are fully deployed. Note, if the lamp is not illuminated, one should not enter under the deck as one or more locks may not be deployed. If this is the case attempt to lift the deck again to clear the locks. Failing that, consult a service agent as there may be a faulty component.

Buzzer and Alarm

An alarm and beacon are mounted on the vehicle and will activate whenever the motor or the switches are pressed.

In addition to these common user interfaces, advanced or maintenance level users should be aware of the following elements.

Power Supply

The power supply from the Anderson connectors is routed via inline mega fuse holders.



The power then enters the hydraulic enclosure and terminates on the motor studs.

Cables with inline automotive fuse holders then connect to the electrical enclosure.

Power Pack

The 'brain' of the system is the PLC (programmable logic controller).

The PLC has an LED in the top left corner that illuminates green and flashes at a rate of approx. one per second.

Any other flash rate or colour indicates a problem:

Rapid Green Flashing = Likely overload / Short circuit – PLC has entered protection mode. The fault should be ID'd and corrected as a matter of urgency.

Red Solid = PLC has been rendered inoperative and will not work again.



The PLC's inputs and outputs can, with care, be tested via a multi meter. Please note, a diagnostic voltage of 3v is present on some of the outputs even when not 'active'.

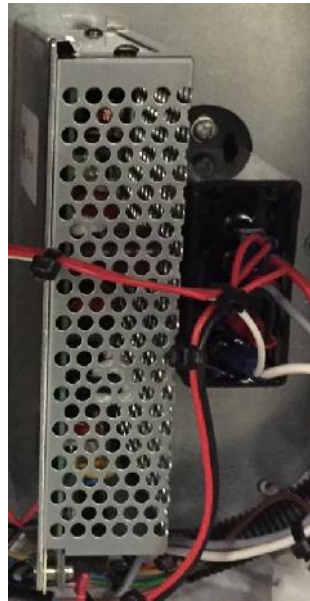
On the PLC, pins labelled VBBS are low power +24v outputs, and GND are earth points, although typically there is only enough power from these feeds for sensors.

On top of the PLC box, protecting the PLC, are three circuit breakers:



These will not 'auto reset' and, if popped, should be pressed in to reset. Remember, consistent 'popping' is a symptom of a fault, not the cause.

Also inside the enclosure is a DC-DC converter, designed to smooth any small fluctuations in the power supply current, and a load dump module designed to deal with any brief spikes in voltage such as that caused by 'arcing' when connecting the power cables.



Please note, the installation of these devices does not allow poor quality power supply or bad practice with regards to use of the system.

Power is provided to the hydraulic system via solenoid caps.

Each of the solenoid caps has a small led that will illuminate when active.

The exception to this is the Motor which is switched via 6.3mm Spade terminals.

Sensors

Proximity sensors are used to provide two functions on this system – Sensing Flags are retracted and deck raised.

The same sensor type is used for both.



These have an M12 connector in the rear for ease of replacement if damaged. An LED close to the connection will illuminate when the unit is sensing the target object. This can be tested with a small washer or similar if needed.

The range of the sensor is 4mm.

A lock off sensor is in all four columns, with the deck up sensor in the front left of the unit. The photo below shows the sensor detecting the lock off correctly.



Operation

Below is a simplified instruction on how to lower and raise the deck. The instructions below assume that H&S requirements including safe loading and securing of the load, have been observed.

Lowering the deck

Press the down button.

The system will look to establish that all 4 flags are correctly stowed to allow the deck to lower safely, and, if necessary, the flag motors will energise to retract the locks. There is a pause associated with this phase to account for any lag or slowing of the mechanical locks that may occur over time.

After this phase the deck will lower.

When the deck reaches the bottom, it will not stop until the operator removes their fingers from the buttons – this will allow the operator to ensure all 4 corners are fully lowered and reset.

Raising the Deck

Press the up button.

The deck will rise.

Once the 'deck up' sensor has been contacted for a set period, the motor will stop running and the bleeper and beacon will stop. This indicates to the operator that the deck is fully raised.

The operator can then release the up button. This will cause the flags to automatically deploy to the safe position and engage the safety lamp.

The operator should always visually check all four flags are deployed fully and, if not, re-raise the deck accordingly. The photo below shows the flag in the safe position:



Maintenance

The electrical system is designed to be low maintenance; however, the following checks will help prolong the life of the system.

Sensor Calibration

The sensors should be regularly checked to ensure they are correctly calibrated.

Greasing of Anderson connections and mega fuses

Anderson connections and mega fuses, due to their exposed nature, should be regularly greased with a non-petroleum based electrical grease.

Cables

All cables, particularly those based close to moving parts, should be regularly checked for signs of damage and corrosion.

Fault finding

The following is a basic fault finding guide. Please note, if a fuse has blown, sometimes this 'happens', but generally this is a symptom of the fault elsewhere.

Fault	Check	Notes / Observations
Deck will not come down	Check calibration of the lock off sensors	Deck will not drop unless it believes the locks are retracted
	Check switch is operational	Faulty switch
Deck comes down but will not lift	Check switch is operational	Faulty switch
Deck will not Move at all	Check Power supply is at 24v	Possible issue with power supply
	Check fuses	Blown fuse - Symptom not cause
	Check PLC Status indicator	Is PLC functional?
Lock lamp not illuminating	Check calibration of the lock off sensors	Light will not illuminate if the sensor believes the lock to be retracted
	Check calibration of the deck up sensor	Light will not illuminate if the sensor believes the deck to not be fully up
	Check for voltage at the lamp	Lamp may have failed

Spare Parts

The following is a list of parts that have may be required. The list is not exhaustive.

For sourcing of parts, please contact Montracon.

Part Number	Description
75-0211-017	M12 Proxy Switches
UK-12-3950-387-A	Blue Switch
UK-12-3950-397-A	Green Switch
UK-31-6704-067-G	Safety Lamp
UK-42-3944-017-I	Beacon
UK-75-0000-007-A	Beeper