
OPERATION & MAINTENANCE MANUAL



Manufactured by
GH VARLEY PTY LTD
Varley Services
29 Elizabeth Street
Carrington, NSW 2294
www.varleygroup.com

Wagon: ADPF 2001A

VRS-051954-010A - Operation and Maintenance Manual

1 Contents

2 INTRODUCTION	2
3 PLOUGH OPERATION	2
3.1 REMOTE OPERATION.....	3
3.2 MANUAL OPERATION.....	4
3.3 MANUAL OPERATION WITH HAND PUMP SUPPLY.....	6
4 PLOUGH PLAY OUT	7
5 CONTROL SYSTEM	11
6 PRE- START	13
7 MAINTENANCE SCHEDULE	14
8 MAINTENANCE CONSUMABLES.	14
9 FAULT FINDING	15

2 INTRODUCTION

The ARTC ballast plough wagon plough operation is controlled using an air over hydraulic control system. This system utilizes the pneumatic main reservoir system on-board the wagon.

The system maintains a manual positive mechanical locking system for when the plough is in the up/travel position and also has a manually operated hydraulic override system installed to enable the plough to be lifted into the up/travel position in the event of a hydraulic pump failure. Each plough is controlled individually via the control stations and all operations at the control station will only affect the plough on that end of the wagon to which you are facing.

Ensure pre-start checks have been completed prior to operation of the plough blade system



WARNING: THE HYDRAULIC SYSTEM CONTAINS HYDRAULIC OIL WHICH OPERATES UNDER HIGH PRESSURE AND CAN BE VERY HOT (UP TO 80 DEGREES C) CAUTION MUST BE TAKEN WHEN OPERATING OR PERFORMING MAINTENANCE ON OR AROUND THE HYDRAULIC SYSTEM

NOTE: ENSURE ALL PNEUMATIC PRESSURE IS DRAINED FROM THE SYSTEM BEFORE ANY MAINTENANCE IS UNDERTAKEN

3 PLOUGH OPERATION

During normal operation of the plough blades the main reservoir must be fully charged with air and must have a good constant air supply of between 550kPa and 800kPa to operate correctly.

The steps below list the operational sequence that must be followed in order to ensure the operation is safe and there is no injury to personnel or damage to equipment during operation.

All operations on the plough are hydraulically driven that is the plough up/down and the plough locks lock/unlock.

The plough may be operated remotely or manually when pressure is supplied from the air over hydraulic pump. Also, if there's no air supply or the hydraulic pump is u/s, pressure can be supplied from the hand pump



3.1 Remote Operation

Refer to figure 2.1 & 2.2

1. First turn the remote on. The remote on/off is located in the right hand side off the remote. Ensure the E/Stop is out. The remote light on the front face will illuminate.
2. Use the **three off toggles** to select the plough wagon (**last 3 digits of wagon number**).
3. Press the **Login** select button to confirm the wagon number.
4. Press the **Login** button on the left to connect the remote to the wagon. The remote connection light under the remote on light will illuminate.
5. **When the E/Stop is pressed all functions are disabled and air supply is isolated from the pneumatic motor. If the Plough is in the automatic locking sequence when the E/Stop is pressed the locks must be engaged manually be for the remote can reactivated the PLC. Please refer to remote operation section 2.2.**
6. To operate the plough blade the deadman on the right hand side of the remote must be **pressed** simultaneously as the plough Raise/Lower toggle.
7. **Note – When lowering the plough blade to the desired position please do not continue to drive the blade until the cylinder dead heads. As this action will void the application of the spring mechanism which protects the cylinder from shock loads.**



Figure 2.1

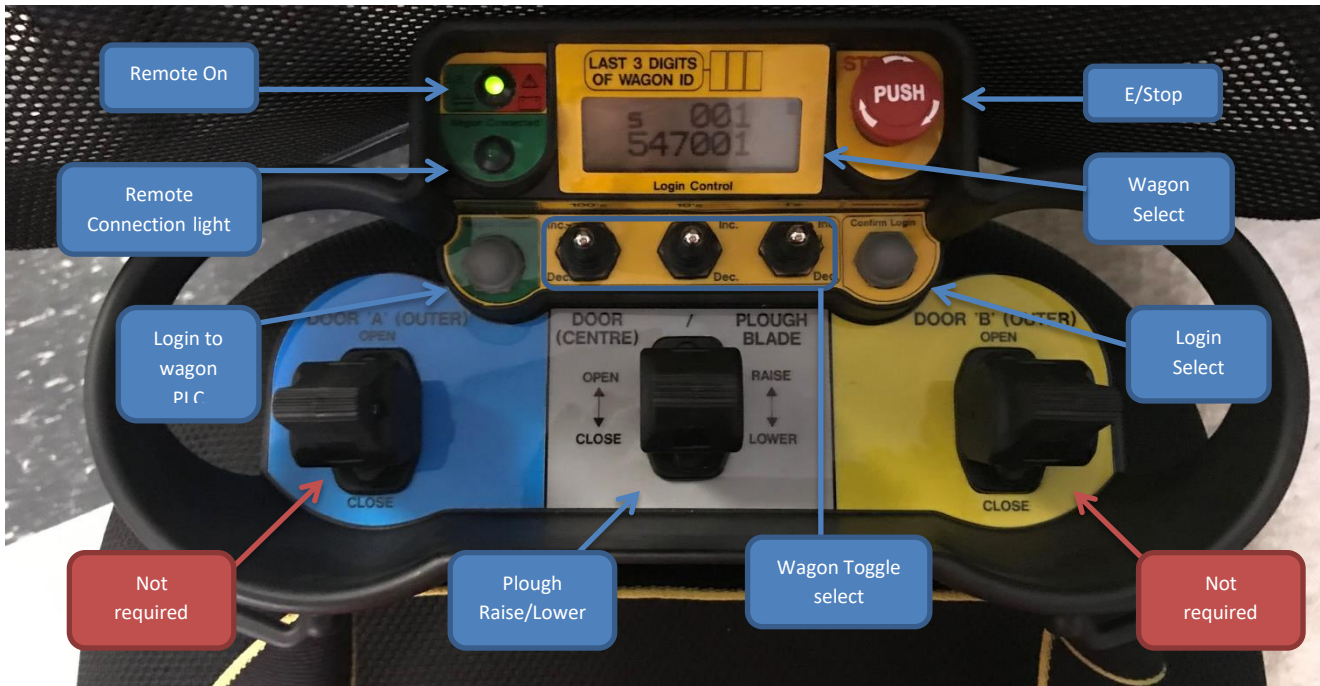


Figure 2.2

3.2 Manual Operation

1. The plough may also be operated manual directly from the DCV located on the control post. Please refer to Figure 2.3. The reasons for this may be as follows:
 - A. No power available
 - B. The Plc is malfunctioning
 - C. To reset the locks (if required) after the E/Stop has been pressed. Please refer to section 2.1
2. The pneumatic lever essentially has **two** functions. It acts as a deadman and allows air flow to the pneumatic motor to drive the hydraulic pump. This has to be operated when manual operation is required.
3. The plough locks must be disengaged before lowering the plough blade. This is **down** by holding the **deadman on** and operating the lock lever as per decal. While ever the plough is in the home position the locks must be engaged.
4. Once the locks are disengaged the plough blade is free to operate.
Note – When lowering the plough blade to the desired position please do not continue to drive the blade until the cylinder dead heads. As this action will void the application of the spring mechanism which protects the cylinder from shock loads.

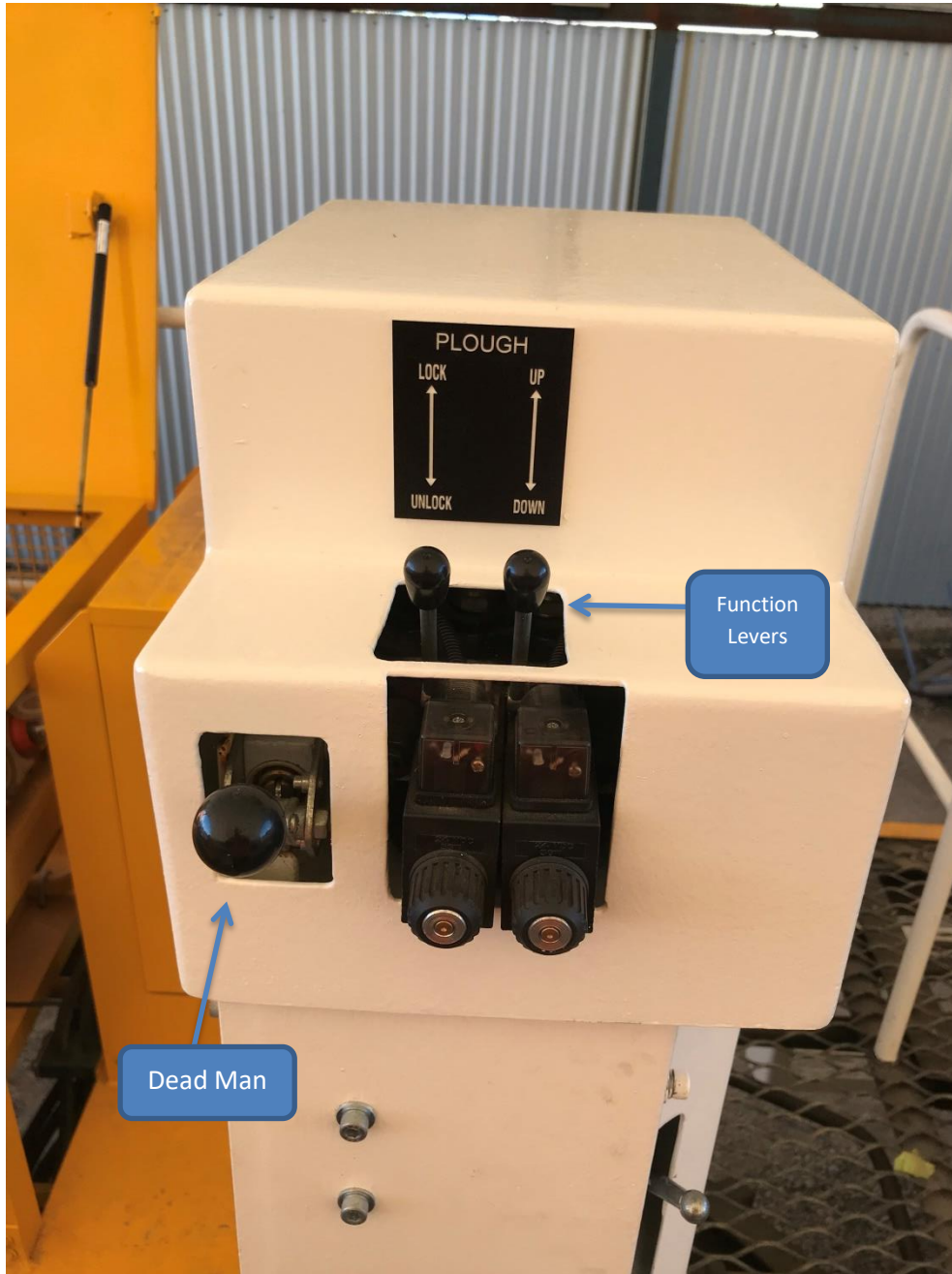


Figure 2.3

3.3 Manual Operation with Hand pump supply

1. To operate the plough using the manual hand pump.
 2. First the manual override lever has to be positioned ON.
 3. Ensure the pump release is closed.
 4. While holding the desired function pump the hand pump to supply pressure to the DCV.
- Note – This is a lengthy process and ideally it's a two man job.

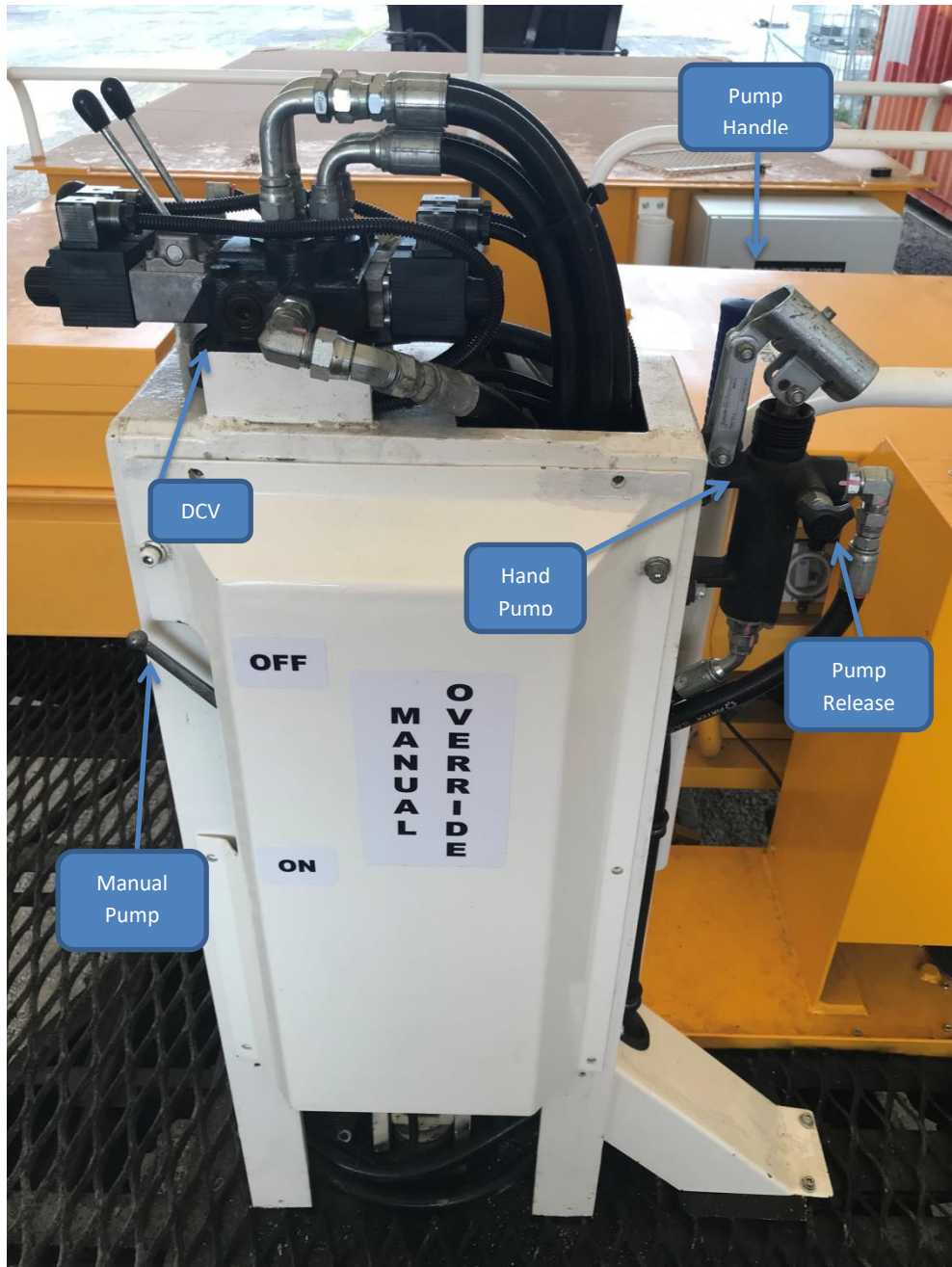


Figure 2.4

4 Plough Play out

1. Figure 3.1 & 3.2 shows the pneumatic layout that controls the pneumatic motor. Please refer to the attached schematic.



Figure 3.1

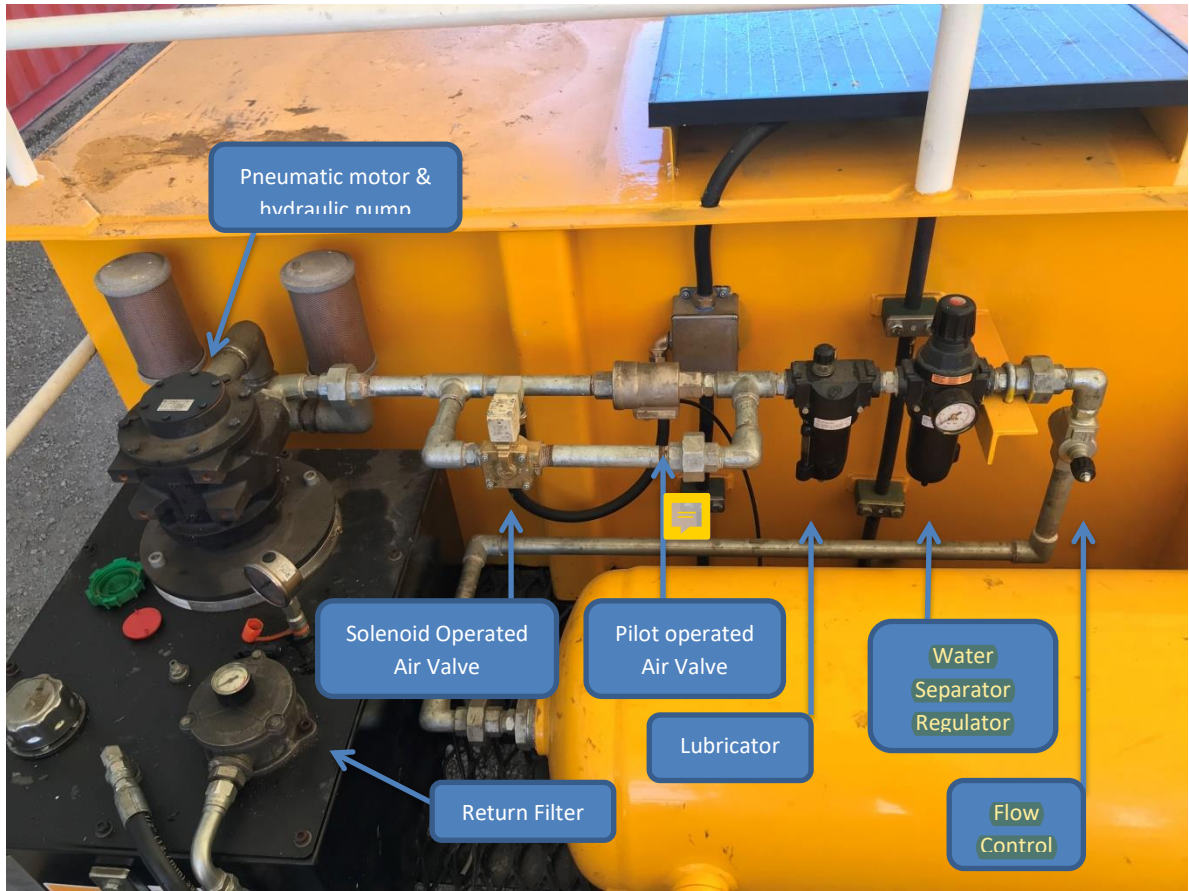


Figure 3.2

2. The location for the remote battery chargers is located in the tool box. Please see figure 3.3

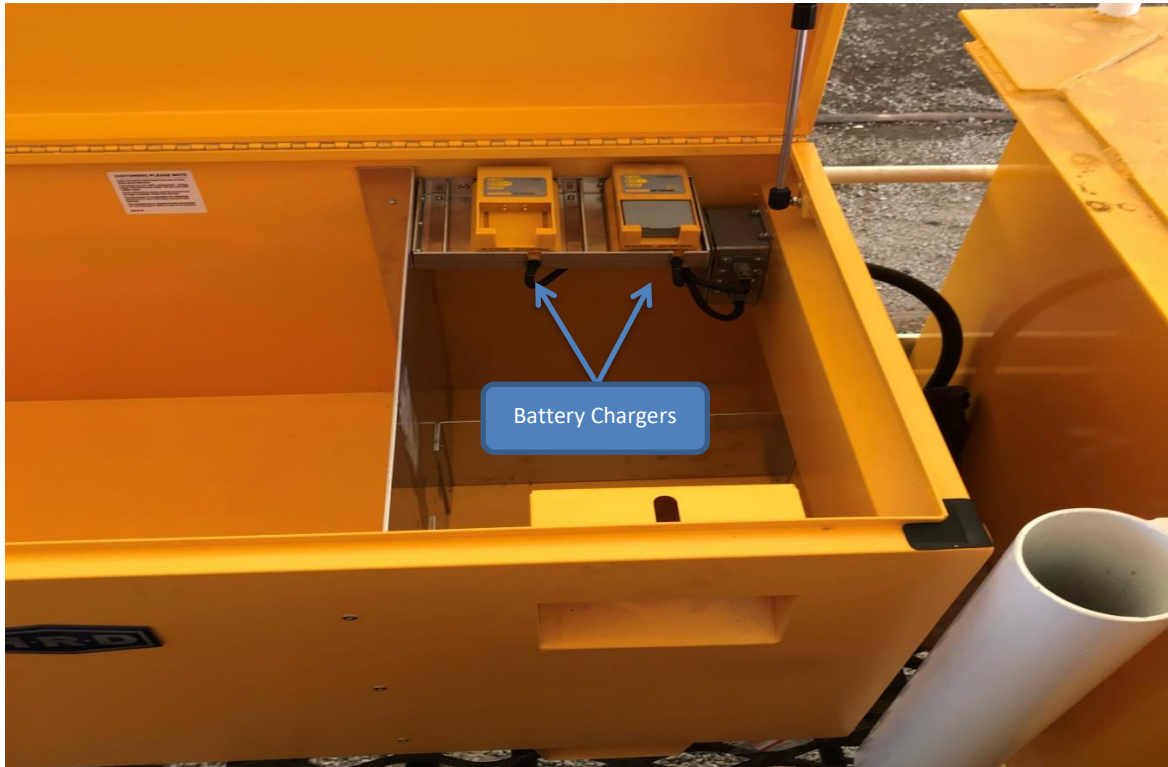



Figure 3.3

3. The generator is located in the caged area. The generator powers the lights only. The solar secondary panel powers the generator battery only. The primary panel supplies power to the plc and remote battery chargers located at the other end. Please refer to Figure 3.4



Figure 3.

4. The emergency brake dump is located on the hand rail. 

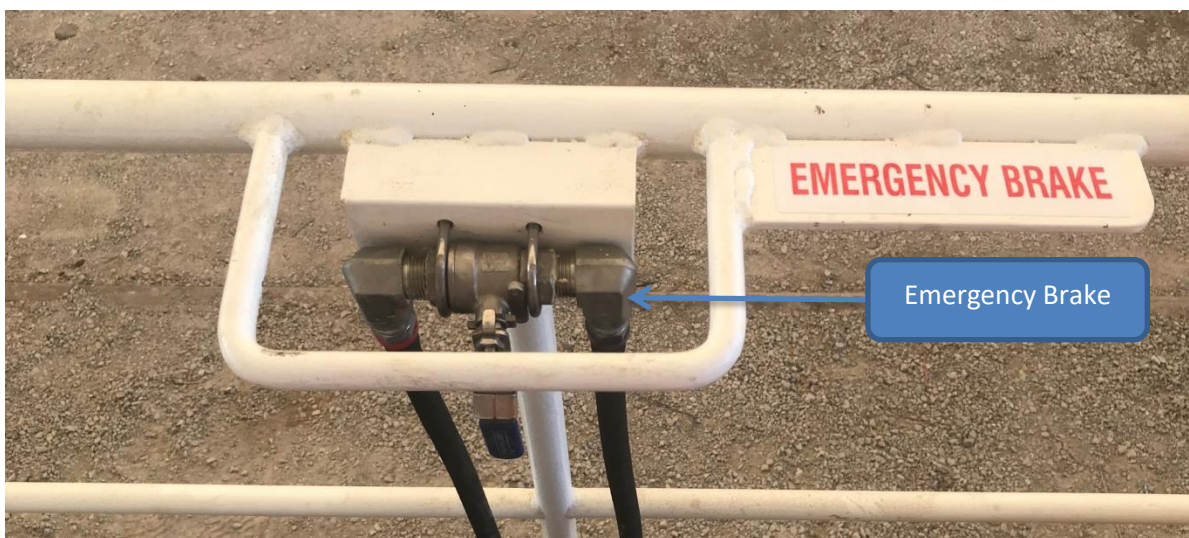
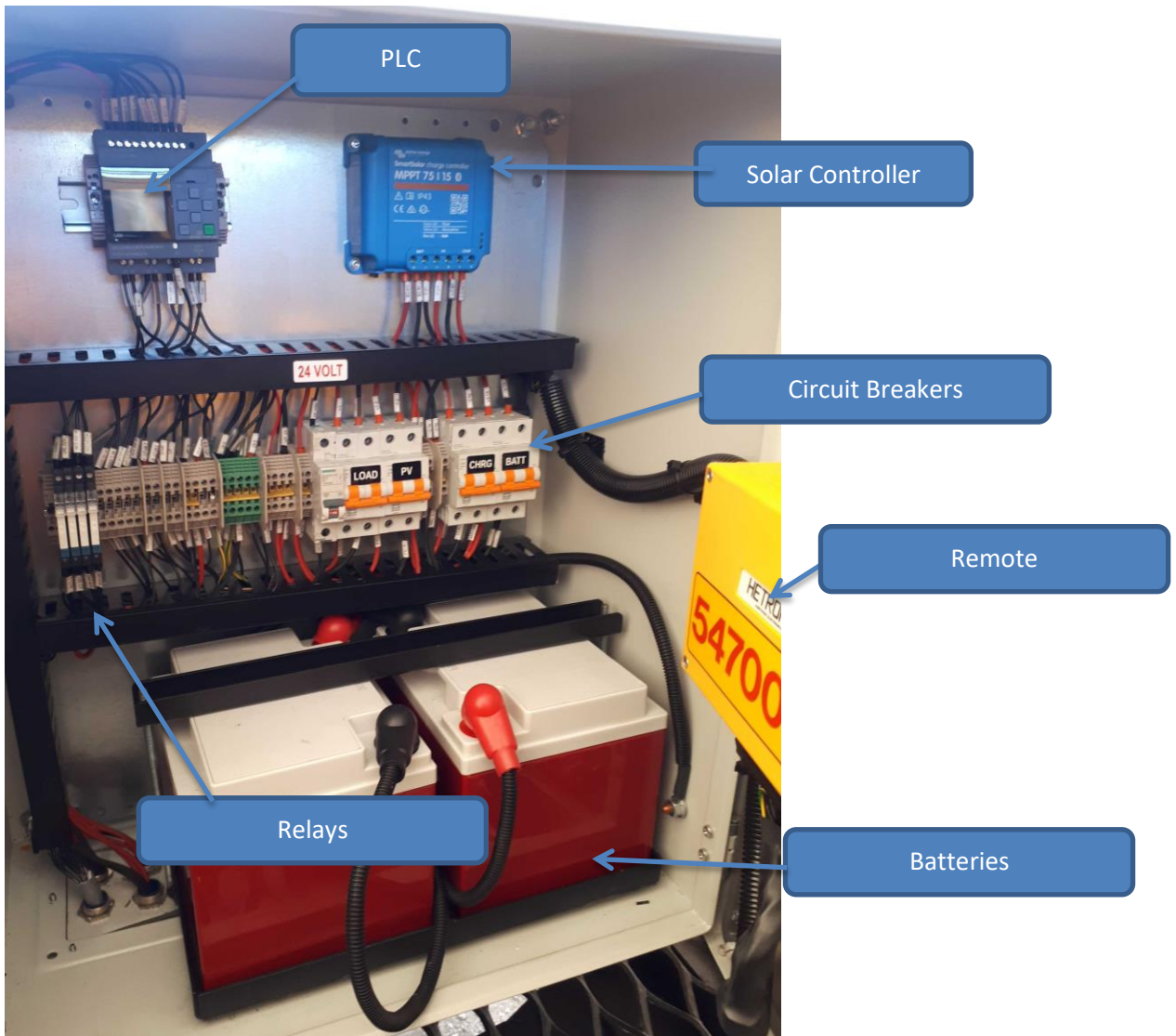


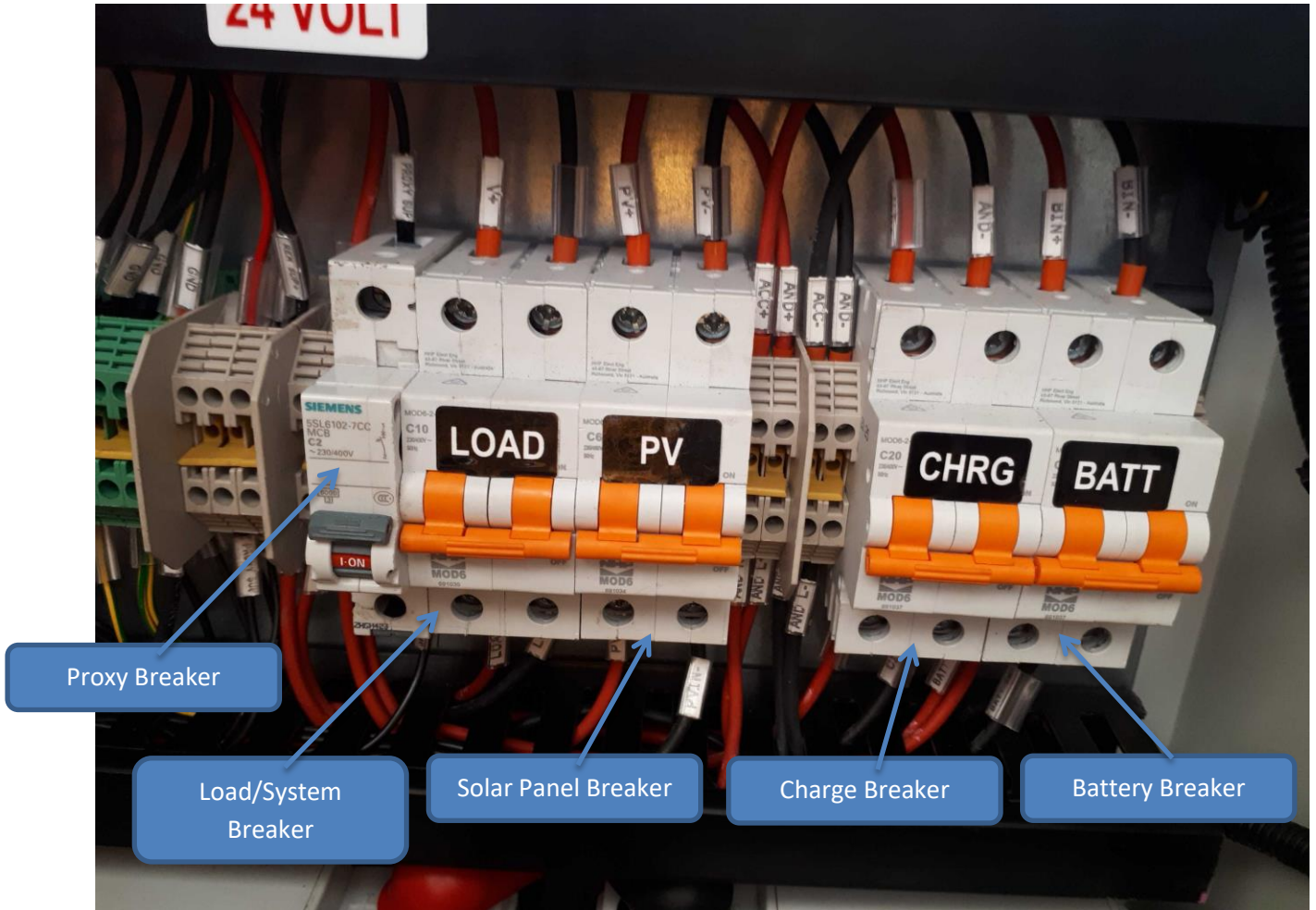
Figure 3.5

5 Control System

The figure below shows the internals of the Control Cabinet. This should only be opened by an authorised technician.



Should the system stop working and the fault finding procedures have been followed in Section 9 then check the breakers. Confirm there are no crushed cables or debris in the charge ports. If clear reset breaker. If this does not resolve the issue contact your [Varley representative](#)



6 Pre- Start

Pre-Start Inspection Checklist

Wagon No.	
-----------	--

Date	
------	--

No.	Item	Pass/Fail	Rectified	Sign
1	Ensure Remote battery is fully charged			
2	Ensure Generator has fuel			
3	Check oil level in generator			
4	Ensure both water separators are not full			
5	Ensure Pneumatic oil feed has oil			
6	Ensure hydraulic tank has oil			
7	Ensure isolators are turned on			

7 Maintenance Schedule

Maintenance schedule		Service Interval			
Item	Measure(s)	Weekly	6 Monthly	Once yearly	Completed
Hydraulics	Check for hydraulic leaks and loose hoses	X			
	Check Hydraulic oil fill if required	X			
	Replace return filter		X		
	Change Hydraulic oil (68 grade)			X	
Generator	Fill Generator with fuel	X			
	Check oil level	X			
	Replace engine oil			X	
	Replace air filter			X	
Pneumatics	Empty water from water traps	X			
	Fill pneumatic motor oil feed	X			
Electrical	Gently clean the solar panel with soapy water	X			

8 Maintenance consumables.

1. Hydraulic oil – 68 grade.
2. Pneumatic motor lubrication oil – Tool Oil iso 22 grade
3. Hydraulic return filter – P/N TIE-08-010

9 Fault Finding

Fault	Possible remedy
1. Manual functions are not working	No Air –check pressure gauge at the air receiver Ensure isolation valve is open
	Confirm the pilot control valve is working – Operate the Deadman
	Confirm hydraulic pump is operational by operating the deadman and plough lock
2. Remote functions are not working	Confirm Control isolators are in the on position
	Ensure the remote is connected to the wagon the connection light should be illuminated. See figure 2.2
	Confirm the plough locks are either fully engaged or in the home position. Home position is up and locked
	No Air –check pressure gauge at the air receiver Ensure isolation valve is open