
OPERATION & MAINTENANCE MANUAL



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Wagon: ADF

VRS-051945-010C - Operation and Maintenance Manual

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2 INTRODUCTION

The ARTC ballast wagon operation is controlled using an air over hydraulic control system. This system utilizes the pneumatic main reservoir system on-board the wagon. The hydraulics either operated by PLC control or manual override. The PLC is remotely controlled by a handheld remote.

Ensure pre-start checks have been completed prior to operation of the Ballast Wagon (Section 6)

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

When operating ballast wagon in manual override/emergency only turn on the pneumatic isolation switch. If the control system isolator is on and the remote is connected to the PLC the auto door close function will override the manual operation.

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

3 BALLAST WAGON OPERATION

During normal operation of the ballast doors, the main reservoir must be fully charged with a good constant air supply of between 550kPa and 800kPa to operate correctly. Note: Air supply is controlled by the locomotive driver and should always be requested to increase to the high end of this range.

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.

The door functions are operated hydraulically, powered by an air over hydraulic pump.

The doors may be operated remotely or manually when pressure is supplied to the air over hydraulic pump.

**NOTE: Prior to start ensure the wagon System Isolator is ON (On all wagons in the rake see figure 2.0)
Only one of the two isolators per wagon need to be selected in the On position.
After use ensure both system isolators are off.**

B SIDE

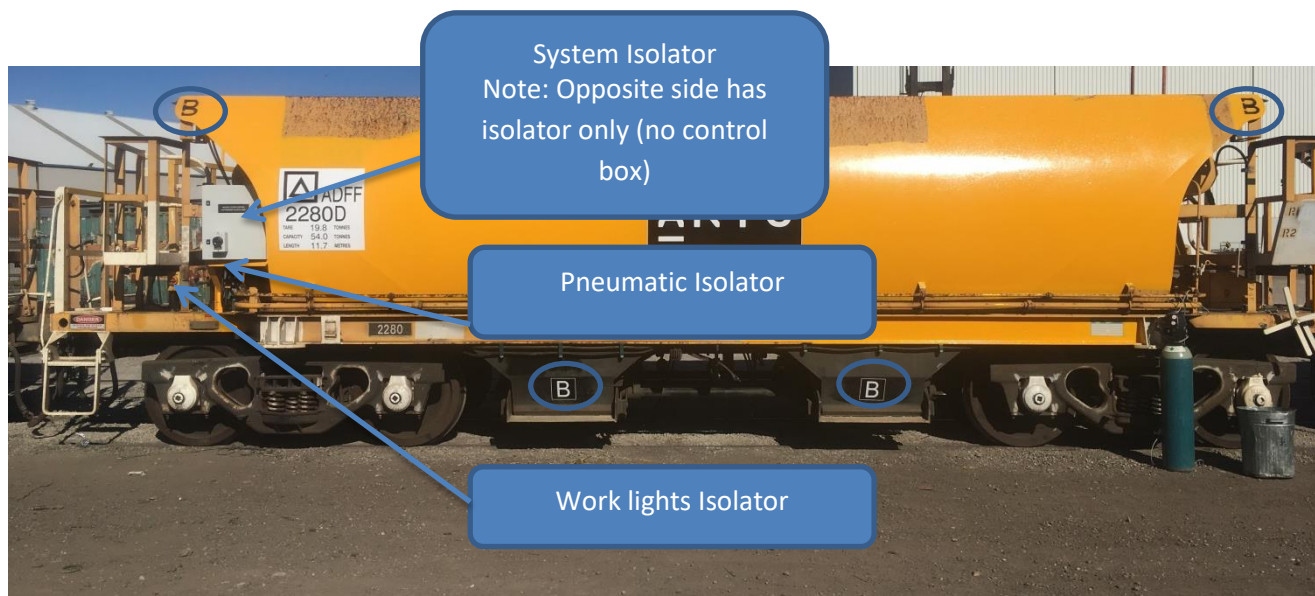


Figure 2.0

Note the 4 locations to identify B side

A SIDE



Figure 2.0A

Note the 4 locations to identify A side

3.1 Remote Operation

Refer to figure 2.1 & 2.2

1. Prior to start ensure the wagon System Isolator and Pneumatic Isolator is ON (On all wagons in the rake see figure 2.0) [the lighting isolator may also be required to be turned on for night work]
Only one of the two isolators per wagon need to be selected in the On position.
After use ensure both system isolators are off.
2. Then turn the remote on by rotating the round black knob. The remote on/off knob is located on the right hand side off the remote. The remote light on the front face will illuminate.(see figure 2.1)
3. Ensure the emergency stop button is released and the word STOP is not on the screen.
4. Use the three off wagon select toggles to select the ballast wagon [silver toggles centre off remote see figure 2.2] (last 3 digits of wagon number). Eg. ADFF2975 remote I.D will be 975.
5. Press and hold the Confirm Login button to confirm the wagon number. **Note: Hold the button in until the remote has connected. All three wagon I/D numbers will flash on screen for visual confirmation. Once flashing has ceased the login is confirmed.**
6. Press the Wagon Connect button on the left to connect the remote to the wagon. The remote connection light under the remote on light will illuminate.
7. To operate the ballast doors the Deadman on the right hand side of the remote must be pressed whilst operating the door toggles. Refer to figure 2.1 for DEADMAN.
NOTE: the doors are marked 'A' 'Centre' & 'B' Push forward to open pull back to close.
8. During operation if the system pressure drops below 450kpa the auto door close function will activate disabling the remote functions. Once system pressure has been restored above 550 kPa the remote will be timed out for 50 sec before returning to normal operation.
9. When the E/Stop is pressed all functions are disabled and air supply is isolated from the pneumatic motor. To reconnect to the wagon Please repeat steps 3-6.
NOTE: In order to operate the wagon after the E/Stop has been pressed the remote must be reconnected to the wagon.
If the remote goes out of range of wagon the connection will be lost (wagon connect light will drop out) when back in range the connect wagon button will need to be pressed.
If the Doors are in the open position at the time the E/stop is pressed the door will remain open as the air/over hydraulic pump has no air supply to generate pressure.
10. **Once operation of the selected Ballast wagon is completed ensure all doors are closed.**
11. To select the next wagon repeat the remote operation process. Please revert back to step 3-6.

RIGHT HAND VIEW



Figure 2.1

TOP VIEW

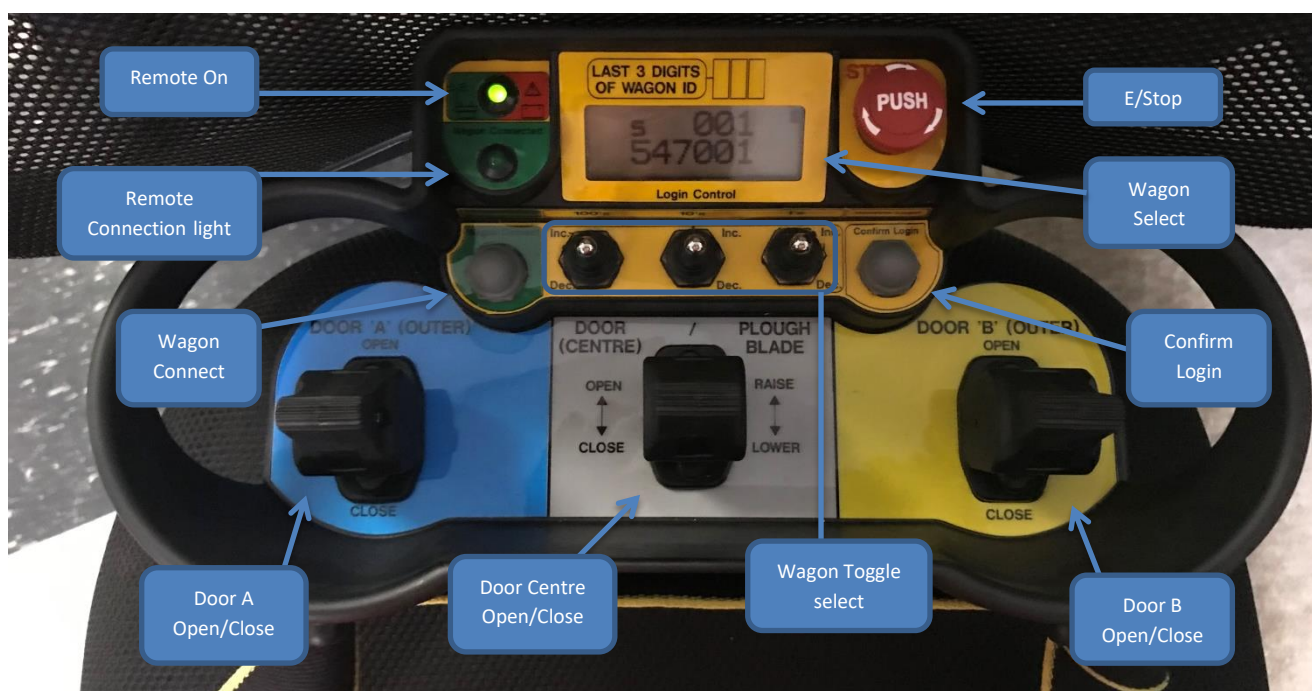


Figure 2.2

3.2 Manual Operation

NOTE: Manual operation is for emergency situations only. For when remote operations are lost.

1. Prior to start ensure the wagon System Isolator is OFF and Pneumatic isolator in ON (On all wagons in the rake see figure 2.0)
Only one of the two isolators per wagon need to be selected in the On position.
After use ensure that both system isolators are off.
2. The ballast wagons can be operated manually directly from the DCV, located on the A end, end deck. Please refer to Figure 2.3. The reasons for this may be as follows:
 - A. No power available
 - B. The electrical system is malfunctioning.
 - C. Remotes working
3. Turn the Manual operation valve clockwise 90 degrees to supply air to the pneumatic motor(you will need to lift the lock tab to allow rotation).
Refer to figure 2.3, decal will show the correct valve position.
Note - When not using the DCV manually always return the valve to the remote position.
4. All three doors now can be operated using the DCV manual levers. For direction please follow decal.
5. If the remote is connected and the system pressure drops below the low threshold the auto door close function will activate overriding the manual operation. Once the auto door cycle has completed manual operation will be restored. This can be avoided by completing step 1 correctly.

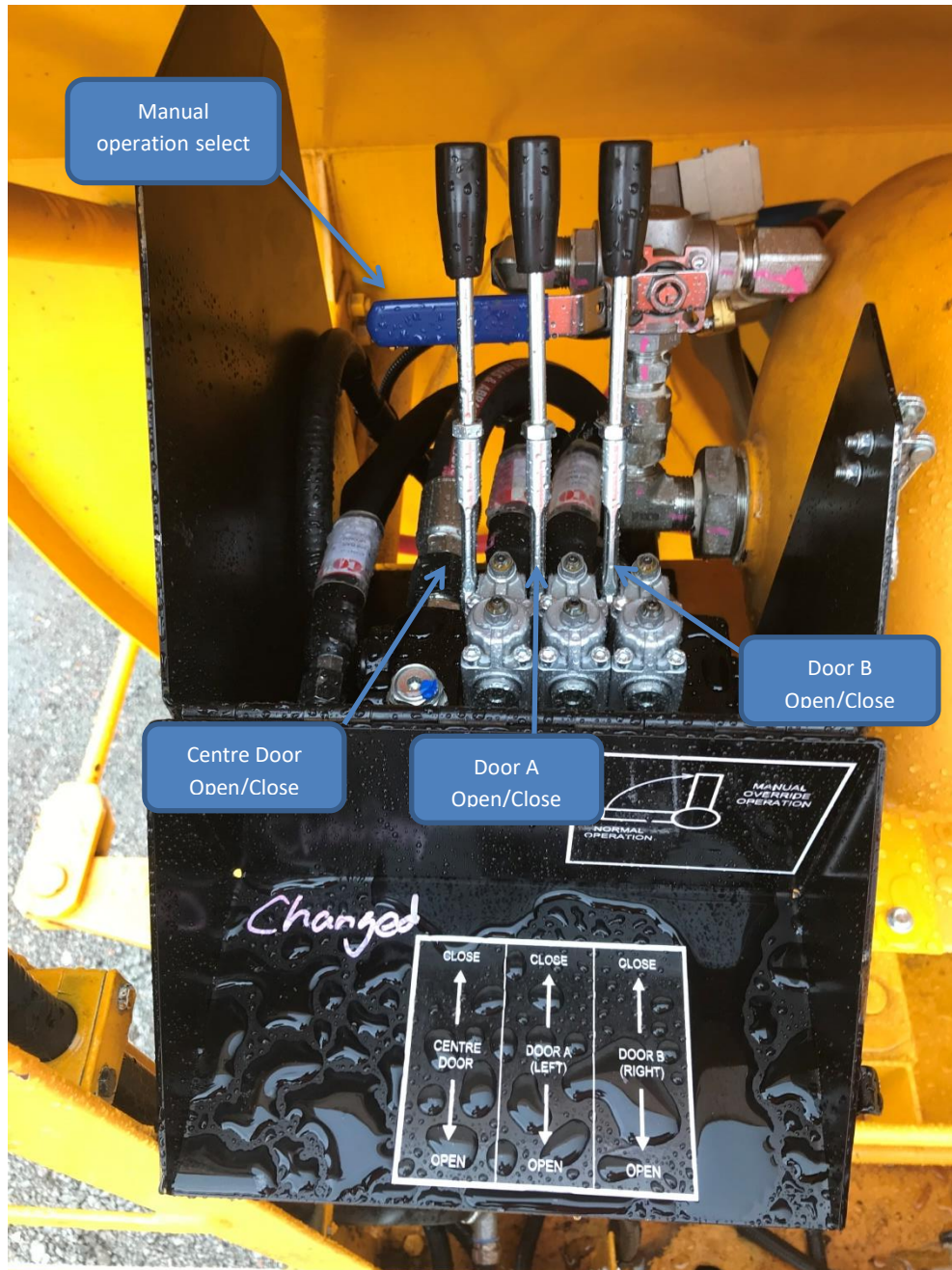


Figure 2.3

4 Ballast Wagon Layout

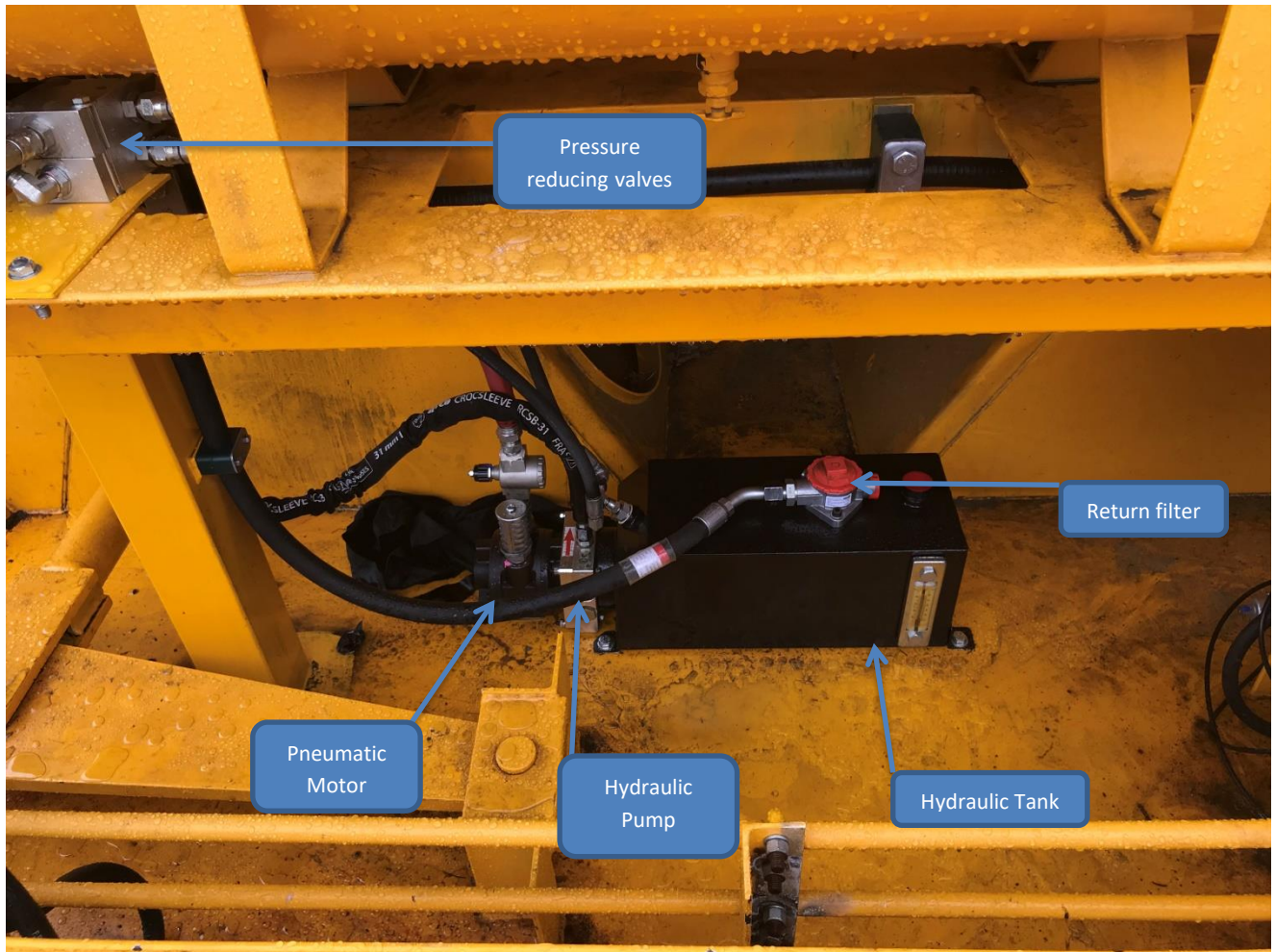


Figure 2.4



Figure 2.5

5 Auto Functions

5.1 Auto Door Close

The wagon doors will automatically close when the rake system pressure drops below 450kpa. The wagon being operated will share the air from the entire rake. This function is electronically controlled from a pressure switch fitted to the system. See figure 2.6.

Note: the wagons will work most efficiently with all pneumatic isolators in the on position provided there are no leaks from the wagons that are turned on. (Suggested not air up/turn on wagons that are leaking air from the system)

Note: the minimum number of pneumatic isolators to be turned on is 6 wagons to operate correctly. This allows enough pneumatic tank volume to not trip the auto close function when supplied with a good constant supply from the locomotive.

5.2 Low pressure lock out

Each wagon is fitted with a lock up valve. The valve is a pneumatic piloted valve that will close off the main air supply when system pressure drops below 300kpa, that is the wagon being operated will isolate itself. This

will enable the air receiver to have enough capacity to close all three doors.



Figure 2.6



Figure 2.7

5.3 Control Cabinet

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 circuit breaker. If this does not resolve the issue contact your Varley representative

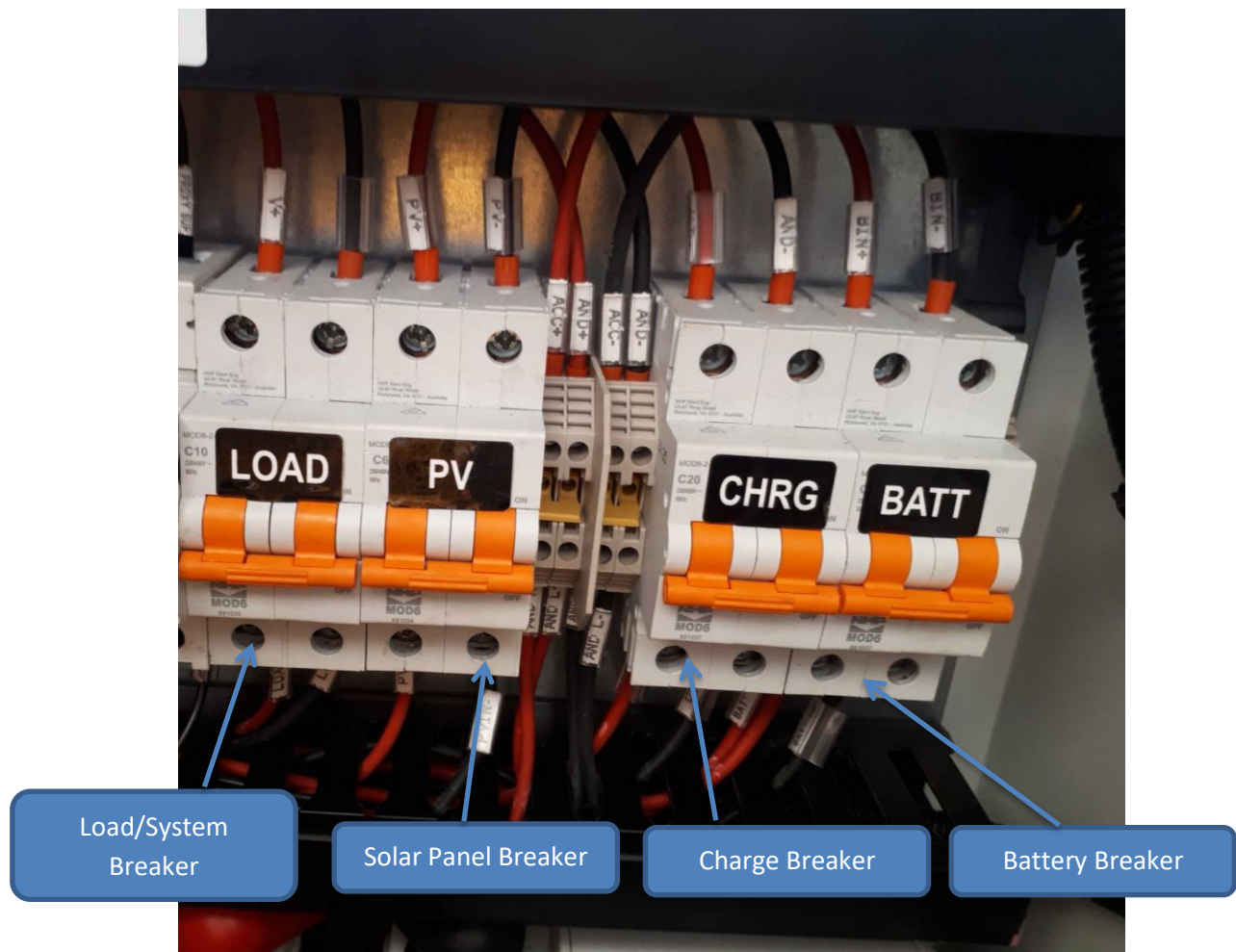


Figure 2.8

6 Pre- Start

Pre-Start Inspection Checklist

Wagon No.	
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Date	
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No.	Item	Pass/Fail	Rectified	Sign
1	Ensure Remote battery is fully charged			
4	Ensure water separators is not full			
5	Ensure Pneumatic oil feed has oil- Add if required			
6	Ensure hydraulic tank has oil – Add if required			
7	Ensure Systems isolators are turned on all wagons See figure 2.0			

7 Maintenance Schedule

Maintenance schedule		Service Interval				
Item	Measure(s)	Weekly	3 Monthly	6 Monthly	Once yearly	Completed
Hydraulics	Check for hydraulic leaks and loose hoses	X				
	Check Hydraulic oil is correct add if required (32 Grade)	X				
	Replace return filter			X		
	Change Hydraulic oil (32 grade)				X	
Pneumatics	Empty water from water traps	X				
	Fill pneumatic motor oil feed	X				
	Inspect functionality of the pneumatic silencer (By operating the wagon door. @ 800kpa the door should take 5-7 sec to open)		X			
	Replace pneumatic Silencer				X	
Electrical	Gently clean the solar panel with soapy water	X				

8 Maintenance Consumables

1. Hydraulic oil – 32 grade.
2. Pneumatic lubricator oil – Tool Oil ISO 22 grade
3. Hydraulic return filter – P/N P3 0510-51
4. Pneumatic silencer- P/N 820-005

9 Fault Finding

Fault	Possible remedy
1. Manual functions are not working	No Air –confirm by operating manual air valve
	Confirm hydraulic pump is operational by operating the manual valve
	Exhaust is blocked
2. Ballast wagon not operating	Ensure enough air supply pressure is greater than 550kPa
3. 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. If not check to see if remote batteries are fully charged See figure 2.2
	Have the doors automatically closed due to low pressure? If so the remote will be disabled until a pressure of above 450kpa has been reached for at least 50secs.
	No Air – confirm by operating manual air valve
4. Remote not working	Check battery is charged
	Check on off
	Emergency stop button has been pressed
	Out of range
	Wagon connect button needs to be pressed
	Wagon system isolator is in the Off position
	Battery for the PLC is flat