HorizOn

OPERATOR'S MANUAL

SANDS AGRICULTURAL MACHINERY Ltd
Main Road, Brunstead,
Stalham, Norwich, Norfolk NR12 9ER
Tel: 01692 580522
Fax: 01692 580961
Email: sales@samltd.co.uk
Website: www.samltd.co.uk

Ver 4.8.2

INTRODUCTION

Thank you for choosing a new SAM Horizon Crop Sprayer for your future spraying needs.

We urge you to read and fully understand this manual and keep it handy at all times as it could avoid mistakes, frustration and excessive down time.

The Manual is divided into several sections. It is intended to cater for the Farm Maintenance Engineer as well as the Spray Operator and these people must decide which sections of the manual are relevant to them.

Please ensure that the following details are completed when the machine is commissioned, as this information will be required when ordering spare parts.

SAM Serial No: ..... **Cab No: .....**

Commissioning Date: .....

Sands Agricultural Machinery Ltd (SAM) may be contacted as follows:

Telephone:	01692 580522	Fax:	01692 580961
Email:	sales@samltd.co.uk	Web Site:	www.samltd.co.uk

DELIVERY

Upon receipt of the sprayer, please check for transport damage. Check all major fixings at this time and at frequent periodic intervals thereafter.

CONDITIONS OF SUPPLY

Sands Agricultural Machinery Ltd cannot be held responsible for injury or damage arising from incorrect handling, usage or storage of this sprayer.

The Customer will become wholly responsible for items or build specifications outside our normal conditions of supply.

WARRANTY

Sands Agricultural Machinery Ltd warrants all its products for a period of 1 year or 800 hours from the date of delivery. Free of charge replacement by post will only be accepted if the failed component(s) are returned, adequately packed and protected, in a representative condition. Any damage not attributed to the failure will be charged. Engine and transmission warranties are extended by their individual manufacturers – consult SAM for details.

SAM Ltd reserves the right to charge for fair 'wear and tear' on selected items. Unusual working practices should also be avoided as these often contribute to a shorter working life on associated components.

It is the Company's policy to continually improve and update it's products and SAM Ltd, therefore, reserve the right to alter specifications and design without notice.

CONTENTS

CONTENTS Cont.....

SECTION 1

SAFETY

GENERAL SAFETY

1. This machine must only be used for the purpose for which it was intended i.e. crop spraying.

2. It is against the law for anybody to operate a machine that they do not understand. Please read this handbook carefully before attempting to operate the sprayer.

3. In order to comply with the Health and Safety at Work Act, the sprayer must be thoroughly washed and decontaminated before any person may be permitted to carry out repairs or adjustments.

4. Be aware of the COSHH Regulations and comply with them at all times.

5. Always wear protective clothing when working with chemicals.

6. Always read the label on the chemical container carefully.

7. The machine must not be used for spraying sulphuric acid unless it has been modified for this purpose.

8. Never operate the sprayer until all guards are in place.

9. Never start the machine until all personnel are clear.

10. Never perform maintenance or repair work while the machine is running. If you are working on a part of the machine not visible from the cab, remove the ignition key.

11. Never work under the machine when it is standing on a jack unless it is properly supported.

12. Extra care should be taken when working on steep hills, as is normal practice with any high clearance tractor. Beware of 'soft spots' and 'pot holes'. Never spray across a dangerously steep hill and never spray across a steep hill with the uppermost boom folded. Wider wheel settings aid stability.

13. Ensure that any replaced component, hose or fitting is of the same specification as that originally fitted. All hydraulic hoses carry an identification number.

14. If frost is expected, anti-freeze should be pumped through the complete spraying system and/or drain down.

15. Before going onto the road, check brakes, lights, indicators and tyre pressures. Ensure 4WS is disengaged (4WS Indicators are extinguished on Over Head Control Panel and Vehicle is in 'Road Mode').

16. Extra care should be taken when servicing the battery (always isolate first). The sulphuric acid contained within the battery can cause severe burns as well as explosive gases. Keep cigarettes and sparks away.

17. This machine contains an air reservoir with a maximum pressure rating of 10 bar. The reservoir should be checked on an annual basis by a recognised inspector.

18. As with any high clearance machine with a high centre of gravity, the stability of that machine is directly related to its wheel track width. As tractors have grown in size, their ability to achieve narrow track widths has diminished. Like the tractor, the sprayer track width should also reflect this philosophy.

    A 'risk assessment' and 'duty of care' is part of modern farming life and the farmer/contractor has a legal responsibility to consider the sprayer track width in relation to stability in order to achieve a safe working environment.

19. Before any spraying operation and prior to field entry, the spray operator should commence a mental risk assessment of the area. All risks, however minor, should be recorded in some way for later reference by any operator.

    Notable risks should include water courses, footpaths, local housing, gradients, pylons and poles, power cables, adjoining crops, wind direction etc.

20. An Emergency Hammer is provided within the Cab to smash any window to act as an emergency exit. The hammer blow should be directed at the corner of the window. The right hand door can also be used as an emergency escape route.

SAFETY CRITICAL ITEMS

The braking and steering systems fitted on the sprayer are both safety critical services. These systems should be thoroughly inspected at least every 250 hours and should coincide with the hydraulic filter changes.

The two braking systems fitted (Primary and Parking) require only a visual inspection around the wheel motors. The multi-disc parking brake fitted to each rear wheel motor should be inspected for back plate spring integrity and oil leaks from this area.

The steering system consists of several components, all of which should be checked for tightness, in particular the fixings of the ball joint tapers plus the split pin, the ball joint, track rod, lock nut and the steering cylinder.

In the case of adjustable axles, the track rod-adjusting bolt and axle clamp should be checked. Axle adjustment is covered in the following pages of this instruction book but we should emphasise that both front and rear axle fixings should be re-checked for tightness after a few hours work. A weekly visual inspection should also be initiated.

Finally, it would be prudent to check for fatigue marking in highly stressed areas and associated components, on a regular basis. Should any item give cause for concern then contact SAM Ltd immediately.

SAFETY FIRST

All agricultural equipment can be hazardous. When a SAM sprayer is correctly operated and properly maintained, it is a safe machine to work with, but when it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

In this handbook and on the machine you will find warning messages. Read and understand them. They tell you of potential hazards and how to avoid them. If you do not fully understand the warning messages, ask your employer or SAM Ltd to explain them.

However, safety is not just a matter of responding to the warnings. All the time you are working on or with the machine, you must be thinking what hazards there might be and how to avoid them.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything.

Remember

BE CAREFUL
BE ALERT
BE SAFE

SAFETY CHECK LIST - GENERAL SAFETY

As well as the warnings in this chapter, specific warnings are given throughout the book. This section is designed to give a safety code for use of the machine generally and for operation and maintenance practices.

! WARNING
Handbook

You and others can be injured if you operate or maintain the machine without first studying this handbook. Read the safety instructions before operating the machine. If you do not understand anything, ask your employer or SAM Ltd to explain it. Keep this handbook clean and in good condition. Do not operate the machine without a handbook in the cab, or if there is anything you do not understand.

! CAUTION
Regulations

Obey all laws and local regulations that affect you and your machine. Ignorance of the law is no defence

! WARNING
Decals

You can be injured if you do not obey the decal safety instructions. Keep decals clean. Replace unreadable or missing decals with new ones before operating the machine. Make sure replacement parts include warning decals where necessary.

! WARNING
Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or whilst operating the machine. Be aware of medicines that can cause drowsiness or affect your ability to control the machine.

! WARNING
Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job.

! DANGER
Parking

Do not leave the driving seat under any circumstances unless the parking brake is **ON**.

! WARNING
Machine Condition

A defective machine can injure you or others. Do not operate a machine that is defective or has missing parts. Make sure the maintenance procedures in this handbook are completed before using the machine.

! WARNING
Controls

Keep the machine controls clean and dry. Your hands and feet could slide off slippery controls. If that happens you will lose control of the machine.

! WARNING
Machine Limits

Operating the machine beyond its design limits can damage the machine and can also be dangerous. Do not operate the machine outside its limits. Do not try to upgrade the machine performance with unapproved modifications.

SAFETY CHECK LIST Cont.....

! WARNING
Visibility

Accidents can be caused by working in poor visibility. Keep windows clean and use your lights to improve visibility.

! WARNING
Exhaust Gases

Breathing the machine exhaust gases can harm and possibly kill you. Do not operate the machine in closed spaces without making sure there is good ventilation. If you begin to feel drowsy, stop the machine at once. Get out of the cab into fresh air.

! WARNING
Noise Level in Cab

With cab door closed and at working speeds, the sound pressure level measured at the driver's ear is around 72 dB (A).

! WARNING
Repairs

Do not try to do repairs or any other type of maintenance work you do not understand. Contact SAM Ltd or get the work done by a specialist engineer.

! WARNING
Communications

Bad communications can cause accidents. If two or more people are working on the machine, make sure each is aware of what the others are doing. Before starting the engine, make sure the others are clear of the danger areas; examples of danger areas are: the rotating shafts and belts on the engine, the booms, and anywhere beneath or behind the machine. People can be killed or injured if these precautions are not taken.

! WARNING
Soft Ground

A machine can sink into soft ground. Never work under a machine on soft ground.

! WARNING
Jacking

A machine can roll off jacks and crush you unless the wheels have been chocked. Always chock the wheels at the opposite end of the machine to that which is to be jacked. Do not work underneath a machine supported only by jacks. Always support a jacked-up machine on axle stands before working underneath it.

! WARNING
Electrical Circuits

Understand the electrical circuit before connecting or disconnecting any electrical component. A wrong connection can cause injury and/or damage.

! WARNING
Hydraulic Fluid

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs hydraulic fluid. If hydraulic fluid penetrates your skin, seek medical help quickly.

SAFETY CHECK LIST Cont.....

! WARNING
Hydraulic Hoses

Damaged hoses can cause fatal accidents. Inspect the hoses regularly for:

Damaged end fittings
Chafed outer covers
Ballooned outer covers
Kinked or crushed hoses
Embedded armouring in outer covers
Displaced end fittings.

! WARNING
Rams / Cylinders

The efficiency of the rams will be affected if they are not kept free of solidified dirt. Clean dirt from around the rams regularly. When leaving or parking the machine, close all rams if possible to reduce the risk of weather corrosion.

! WARNING
Fires

If your machine is equipped with a fire extinguisher, make sure it is checked regularly. Keep it in the operator's cab until you need to use it.

Do not use water to put out a machine fire, you could spread an oil fire or get a shock from an electrical fire. Use carbon dioxide, dry chemical or foam extinguishers. Contact your nearest fire department as quickly as possible.

Firefighters should use self-contained breathing apparatus.

! WARNING
Modifications and Welding

Non-approved modifications can cause injury and damage. Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. On no account weld or drill the chassis structure. Contact SAM Ltd before modifying the machine.

! WARNING
Metal Splinters

You can be injured by flying metal splinters when driving metal pins in or out. Use a soft-faced hammer or drift to remove and fit metal pins. Always wear safety glasses.

! WARNING
Cleaning

Cleaning metal parts with incorrect solvents can cause corrosion. Use only recommended cleaning agents and solvents.

! WARNING
'O' rings, Seals and Gaskets

Badly fitted, damaged or rotted 'O' rings, seals and gaskets can cause leakages and possible accidents. Renew whenever disturbed unless otherwise instructed. Do not use Trichloroethane or paint thinners near 'O' rings and seals.

SAFETY CHECK LIST Cont.....

! WARNING
Fluoroelastomeric Materials

Certain seals and gaskets (e.g. crankshaft oil seal) on SAM machines contain fluoroelastomeric materials such as Viton, Fluorel and Technoflon. Fluoroelastomeric materials subject to high temperatures can produce highly corrosive hydrofluoric acid. **THIS ACID CAN SEVERELY BURN.**

New fluoroelastomeric components at ambient temperature require no special safety precautions.

Used fluoroelastomeric components whose temperatures have not exceeded 300C require no special safety precautions. If evidence of decomposition (e.g. charring) is found, refer to the next paragraph for safety instructions. **DO NOT TOUCH COMPONENT OR SURROUNDING AREA.**

Used fluoroelastomeric components subjected to temperatures greater than 300C (e.g. engine fire) must be treated using the following safety procedure. Make sure that heavy-duty gloves and special safety glasses are worn:

- Ensure that components have cooled then remove and place in plastic bags.
- Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.
- Thoroughly wash contaminated area with detergent and water.
- Contain all removed items/materials, gloves etc used in this operation in sealed plastic bags and dispose of in accordance with Local Authority Regulations.

  DO NOT BURN FLUOROELASTOMERIC MATERIALS.

If contamination of skin or eyes occurs, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 16-60 minutes. Get medical attention immediately.

SAFETY CHECK LIST - SAFETY DECALS

! WARNING

Decals on the machine warn you of particular hazards. Each decal is attached close to a part of the machine where there is a possible hazard. Read and make sure you understand the safety message before you work with or on that part of the machine.

Keep all decals clean and readable. Replace lost or damaged decals.

! WARNING

If you need eyeglasses for reading, make sure you wear them when reading the safety decals. Decals are strategically placed around the machine to remind you of possible hazards. Do not over-stretch or place yourself in dangerous positions to read the decals.

WARNING – POWER LINES!!

DANGER OF DEATH – Stay away from power lines while folding booms

In the unlikely event of any part of the machine touching a power line:

STAY IN THE CAB
DON'T PANIC
TRY TO DRIVE CLEAR
WARN OTHERS TO STAY WELL CLEAR

If this is not possible or the machine catches fire

JUMP WELL CLEAR – DON'T CLIMB DOWN – the metalwork of the machine may be live

NEVER TOUCH THE MACHINE ONCE YOU ARE ON THE GROUND

RUN WELL CLEAR WITH LEAPING STRIDES

STAY WELL CLEAR, WIRES MAY RE-ENERGISE WITHOUT WARNING

KEEP EVERYONE AWAY AND CALL YOUR LOCAL ELECTRICITY SUPPLIER ON:

Tel: .....

DO'S & DON'T'S

DON'T

1. Don't put chemical in a dry Tank.
2. Don't leave water or chemical solution in the Tank for long periods of time e.g. overnight.
3. Don't weld on the machine without first disconnecting the Battery.
4. Don't drive the machine while folding or unfolding the Booms.
5. Don't drive the machine with unsupported folded Booms.
6. Don't spray in high winds
7. Don't use incorrect or dirty oil in the machine.
8. Don't fold the Spray Booms under or near power lines.
9. Don't put incomplete or incompatible chemicals in the same Tank mix – check with your agronomist.

DO

1. Do study the chemical manufacturer's recommendations.
2. Do check Nozzle output and pattern frequently.
3. Do take adequate precautions when frost is expected.
4. Do check forward speed at regular intervals
5. Do wear protective clothing (THIS IS LAW).
6. Do check for Boom 'overlap'.
7. Do check for correct Boom height, especially in crops of varying heights.
8. Do study this manual carefully - preventative maintenance is cheaper than compulsory maintenance.
9. Do contact SAM Ltd if there is any query on the control or operation of the machine.

SECTION 2

MACHINE CONTROLS

2.1 4000, 4000E, 5500 & 6000 MACHINES

2.2 3000, 3000E & 3500 MACHINE

STEERING COLUMN

2.1-1

ARMREST CONTROL CONSOLE

The Armrest Control Console contains all the essential controls for the machine, which include Transmission Joystick, Boom Incline and Contour Switches, Boom Fold Switches, Engine Throttle and Chassis / Spray Control Buttons.

If Field Mode is selected, moving the Joystick forward will drive the machine forward. The further forward the Joystick is pushed, the faster the machine will travel but is limited by the set Engine RPM.

If Road Mode is selected the engine RPM remains at idle until the Joystick is moved (or the optional Travel Pedal is pressed). On a 4000 sprayer the engine RPM increases and the machine will pull away with the wheel motors in half displacement until the maximum speed of 40kph is reached. A 5500 sprayer automatically changes displacement until the maximum speed is reached.

If the joystick is returned to neutral, the sprayer will stop. The quicker the Joystick is moved, the quicker the response, whether it be acceleration or braking. Care must be taken not to induce skidding by moving the Joystick too rapidly.

If greater braking is required, than the joystick provides, then the Brake Pedal can be depressed (if fitted). This will provide braking torque on the front wheels (Horizon 4000) or all four wheels (Horizon 5500) as well as the hydrostatic braking. After using the foot brake, the Joystick must be returned to the corresponding braked speed before the machine will accelerate.

Moving the joystick backwards drives the machine in reverse and the same rules apply.

If the optional Travel Pedal is fitted and selected, then the joystick has to be moved fully forward or backward in the first instance in order to dictate the direction of travel.

The engine can only be started with the joystick in neutral.

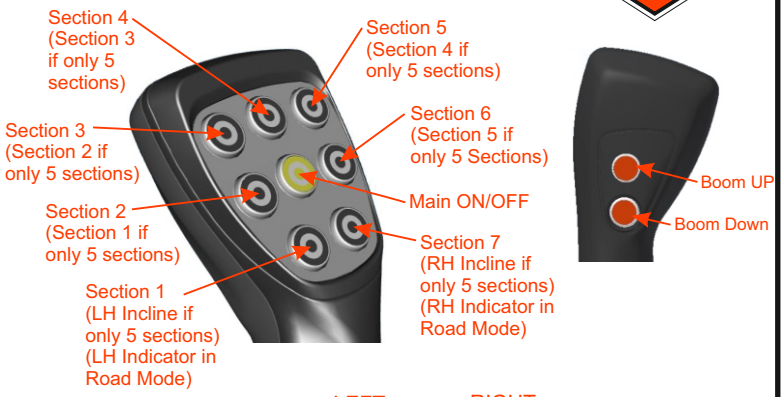
2.1-2

ARMREST CONTROL CONSOLE Cont.....

The 8 buttons on the front face of the Joystick are Spray Boom Nozzle Sections. Buttons are active when they are illuminated Green / Blue. On the rear face are 2 more Buttons, which control the Height of the Boom Assembly.

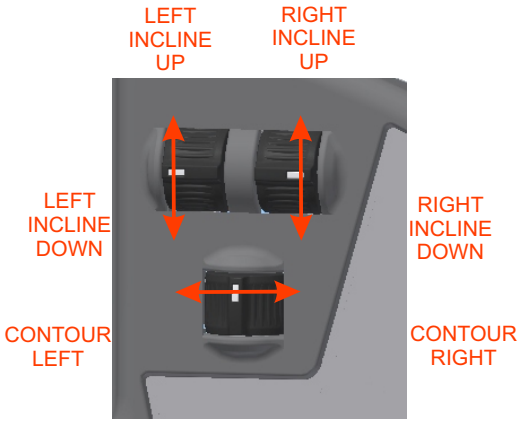
The centre Joystick button is the Main Spray (master) On/Off control.

When in Road Mode Section 1 becomes the Left Hand Indicator and Section 7 becomes the Right Hand Indicator. They are not self cancelling.



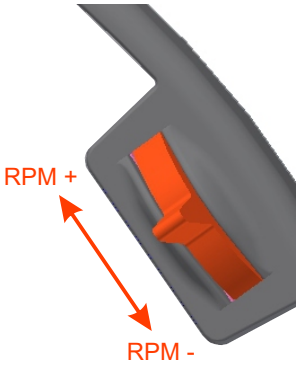
The Boom Incline switches (where fitted) are a roller type switch. Moving the switches forwards, inclines the boom UP. Moving the switches rearwards, inclines the boom DOWN.

The Contour Switch (where fitted) is a roller type switch. Moving the switch to the left, contours the boom to the LEFT. Moving the switch to the right, contours the boom to the RIGHT. If no switch is fitted and while Field Mode is selected, Section 1 becomes Left Contour and Section 7 becomes Right Contour.



The Engine Throttle control is a rotary wheel, which when moved in the forward direction, the Engine RPM is increased. When moved in the rearward direction the Engine RPM is decreased. The rotary wheel will remain in the position it was left in, except in the case of the Horizon 5500. In this case the rotary wheel will return to the central position because it operates in a momentary fashion. When moved in the forward / rearward direction momentarily, the rpm will increase / decrease in according steps, if held in position the RPM will change more rapidly.

The Engine Throttle will only operate while in Field Mode, as when in Road Mode the RPM is controlled via the Joystick / Travel Pedal.
If the Engine Throttle was not at idle before switching to Road Mode, when switching back to Field Mode the Engine Speed will return to the original RPM.

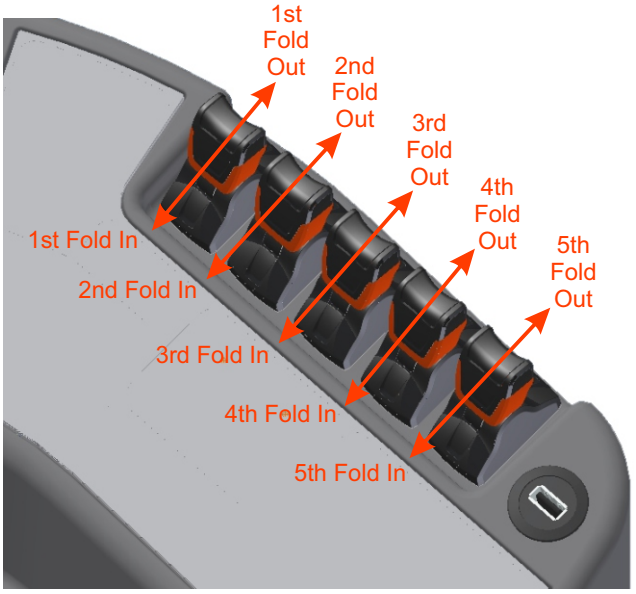


The Boom Fold Switches are a lever type switch. When they are moved to the left (towards the operator) the Boom section will fold IN. When moved to the right (away from the operator) the Boom section will fold OUT.

1st fold = Main Section (12m)
2nd fold = Mid Section (24m)
3rd fold = End Section (30/32/36m)
4th fold = Hydraulic Flip (24-28m, 30-32m, 36-40m)

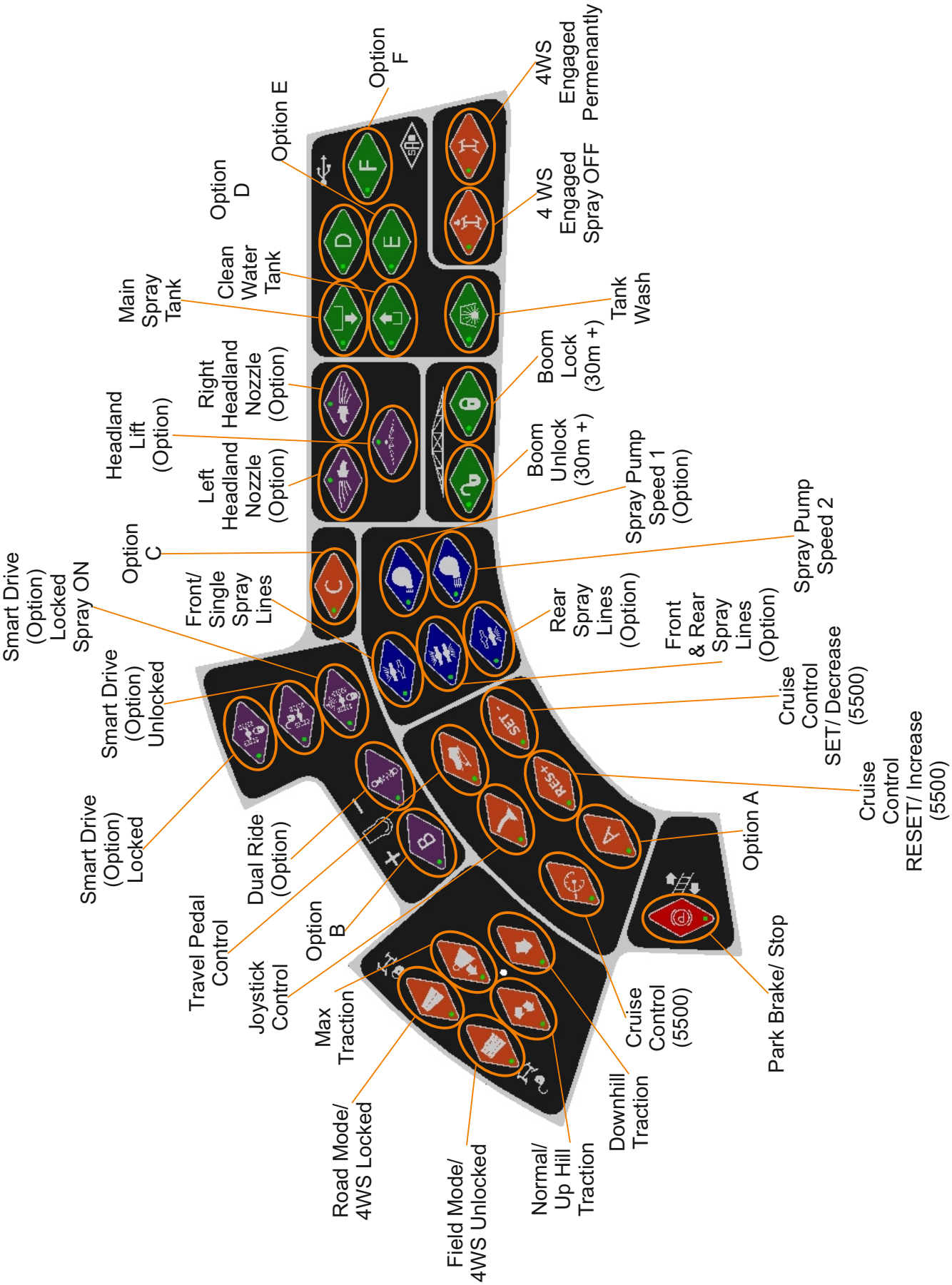
3rd fold when a 24m Independent Fold Boom is fitted = Left Hand Independent.
4th fold when a 24m Independent Fold Boom is fitted = Right Hand Independent.

4th fold when a 30-36m Independent Fold Boom is fitted = Left Hand Independent.
5th fold when a 30-36m Independent Fold Boom is fitted = Right Hand Independent.



2.1-3

ARMREST CONTROL CONSOLE Cont.....



2.1-4

ARMREST CONTROL CONSOLE Cont.....

Park Brake / Step - Applying the Park Brake also lowers the Step.

If the Park Brake is not applied before attempting to leave the Cab, injury may result!
Remember that removing the Park Brake will raise the Step - ENSURE that the Step area is clear before removing / applying the Park Brake!

Field Mode / 4 Wheel Steer Unlocked - For normal field work, it also unlocks the 4WS system allowing the operator to engage 4WS by either pressing the 4WS Foot Switch, or the 4WS Engaged Spray OFF or 4WS Engaged Permanently.

Normal / Uphill Traction - For flat land, steep uphill and moderate downhill spraying. Gives best overall performance.

Remember: if the machine will not climb the hill in Normal / Uphill, never attempt to descend the hill.

Downhill Traction - For descending a steep hill when traction is marginal. If Normal / Uphill is being used and the rear wheels begin to skip, Downhill may be selected on the move.

Maximum Traction - all wheel motors with full power capability – generally only suitable on flat land.

Road Mode / 4 Wheel Steer Locked- For driving on highways, maximum speed but with reduced motor torque. Also locks the 4WS system (once the rear wheels have straightened up) to prevent 4WS use. **Ensure that the 4WS system is disengaged before entering a public highway.**

The vehicle has a permanent four-wheel drive system but this is only relevant when all wheels can provide tractive effort.

Cruise Control - Activates Cruise Control, only available on the Horizon 5500 Sprayers.

Set / Decrease - will SET the speed at which the Sprayer is travelling as the cruise speed. Once set the speed can be increased or decreased by momentary operation of Reset / - or Set / + buttons (approx 0.5km/h each time). Pressing the button again will decrease the vehicle speed by a predetermined amount.
Pressing the Brake Pedal or turning off Cruise Control will cancel Cruise Control.

Reset / Increase - will RESET the cruise control to the previous cruise speed. Pressing the button again will increase the vehicle speed by a predetermined amount.

Joystick Control - when in Road mode the forward/ reverse speed is controlled by the Joystick.

Travel Pedal Control - when in Road mode the forward / reverse speed is controlled by the Travel Pedal.

Smart Drive System (Smart Drive Locked, Unlocked & Locked With Spray ON) - Smart Drive is an Anti Slip Transmission System that ensure all wheels provide traction with out slipping in adverse conditions.
Locked provides Anti Slip permanently, Unlocked provides no Anti Slip and Locked with Spray ON provide Anti Slip only when the Main Spray ON/OFF is ON.
Smart Drive faults are indicated by the flashing of either of the status LED's depending which button is selected.

Dual Ride - Provides a softer front suspension ride.

Forward Spray Nozzles - selects the forward Spray Nozzles (turret outlet) of the Duo-React Nozzles Bodies.

Rearward Spray Nozzles - selects the rearward Spray Nozzles (single outlet) of the Duo-React Nozzle Bodies.

Forward & Rearward Spray Nozzles - selects both the forward & rearward Spray Nozzles of the Duo-React Nozzles Bodies.

Pump Speed 1 - Slower Spray Pump speed for dual speed pumps (if fitted). Not in use if single speed pump is fitted.

ARMREST CONTROL CONSOLE Cont.....

Pump Speed 2 - Fastest Spray Pump speed for dual speed pumps (if fitted). Only speed if single speed pump is fitted.

Back Frame Lock (30m +) - Locks the Back Frame horizontal to the chassis. Press this button before folding and unfolding the Spray Booms. Failure to Lock the Back Frame before folding / unfolding the Spray booms could result in damage to the Spray Booms / surrounding areas. (On 30m booms and above).

Back Frame Unlock (30m +) - Unlocks the Back Frame. Press this button after unfolding the Spray Booms, before crop spraying and once the Spray Boom is folded into the boom rests. (On 30m booms and above).

The Back Frame Unlock / Lock has a 12 second delay built into it which ensures the Lock has time to fully operate.

Left Hand Headland Nozzle - Controls the Headland Nozzle (when fitted) on the Left Hand Spray Boom.

Right Hand Headland Nozzle - Controls the Headland Nozzle (when fitted) on the Right Hand Spray Boom.

Headland Lift - Controls the Headland Lift (when fitted), when the Main Spray ON/OFF is switched OFF, the Spray Boom will automatically rise up. When the Main Spray ON/OFF is switch ON, the Spray Boom will return to the previous spraying height.

Main Spray Tank - Selects the Main Chemical Tank to spray from.

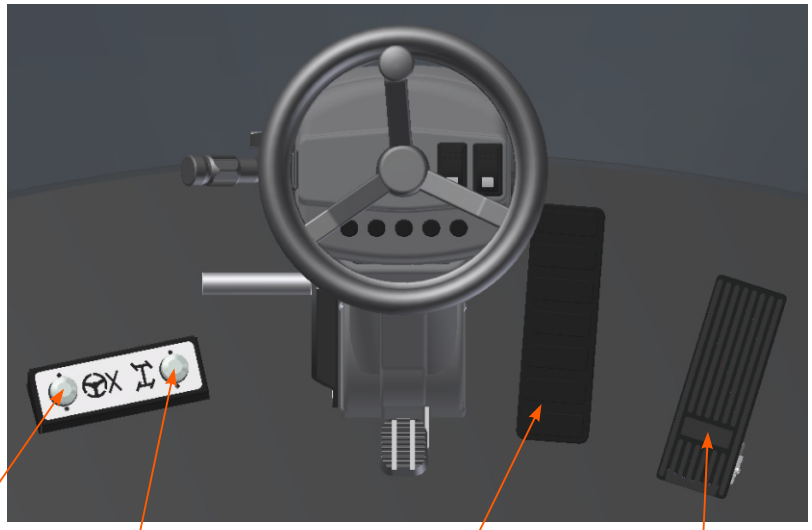
Clean Water Tank - Selects the Clean Water Tank to wash the Spray System & Main Spray Tank from.

Tank Wash - Selects the Main Tank Wash Nozzles.

4WS Engaged Spray OFF - While Field Mode is selected, 4 Wheel Steering is engaged when the Main Spray ON/OFF is OFF (without the need to press the Foot Switch).

4WS Engaged Permanently - While Field Mode is selected, 4 Wheel Steering is engaged permanently (without the need to press the Foot Switch).

FLOOR



OVERHEAD

The Overhead Instrument Panel is the location for the Wing Mirror Adjustment Control, Overhead Control Panel, Blue Tooth Radio / CD Player, Climate Control System Panel, Cabin Air Quality Indicator & Electronic Dash Display.

Blue Tooth Radio / CD Player
(Connected to USB on Armrest Console - REAR USB INPUT must be selected)

Climate Control System Panel

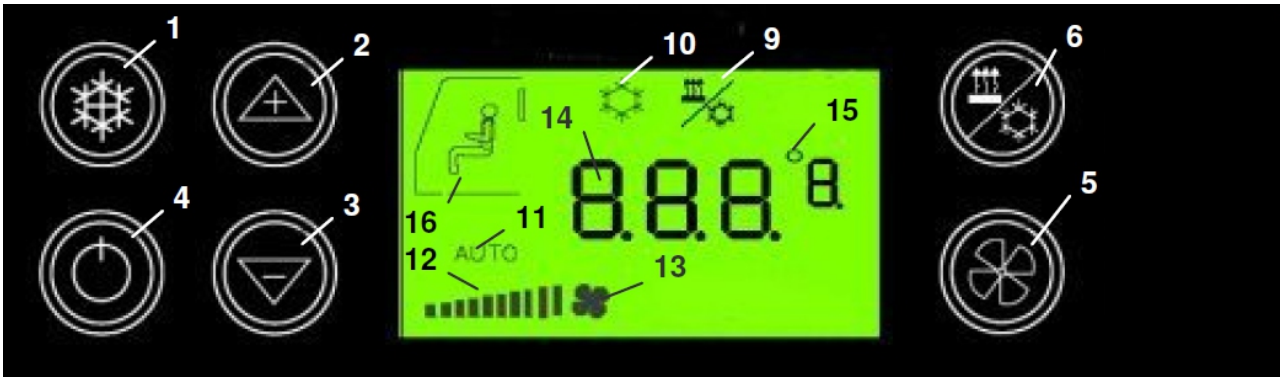
Cabin Air Quality Indicator
(if illuminated, with doors shut, the filter may need be replaced - refer to page 45)

Wing Mirror Adjustment Control

Overhead Control Panel

Electronic Dash Display

OVERHEAD - CLIMATE CONTROL



1 Button for switch ON/OFF the Air Conditioning operation.
2 Button for increasing the cabin Temperature.
3 Button for decreasing the cabin Temperature.
4 Button for switching ON/OFF the control unit.
5 Shift-Button for Fan Speed Manual / Automatic.
6 Button for switching Reheat Function ON/OFF.
9 Symbol indicates Reheat Function is active.
10 Symbol indicates Air Conditioning is active.
11 Symbol indicates Fully Automatic Mode is active.
12 Bar display indicates actual Fan Speed during Manual Mode.
13 Symbol indicates Fan Speed during Manual Mode.
14 4 Digit, 7 Segment display indicating Temperature Value / Error Code.
15 Symbol indicates the Temperature Unit (Celsius / Fahrenheit).
16 Symbol indicates the Operator Cabin.

OVERHEAD CONTROL PANEL

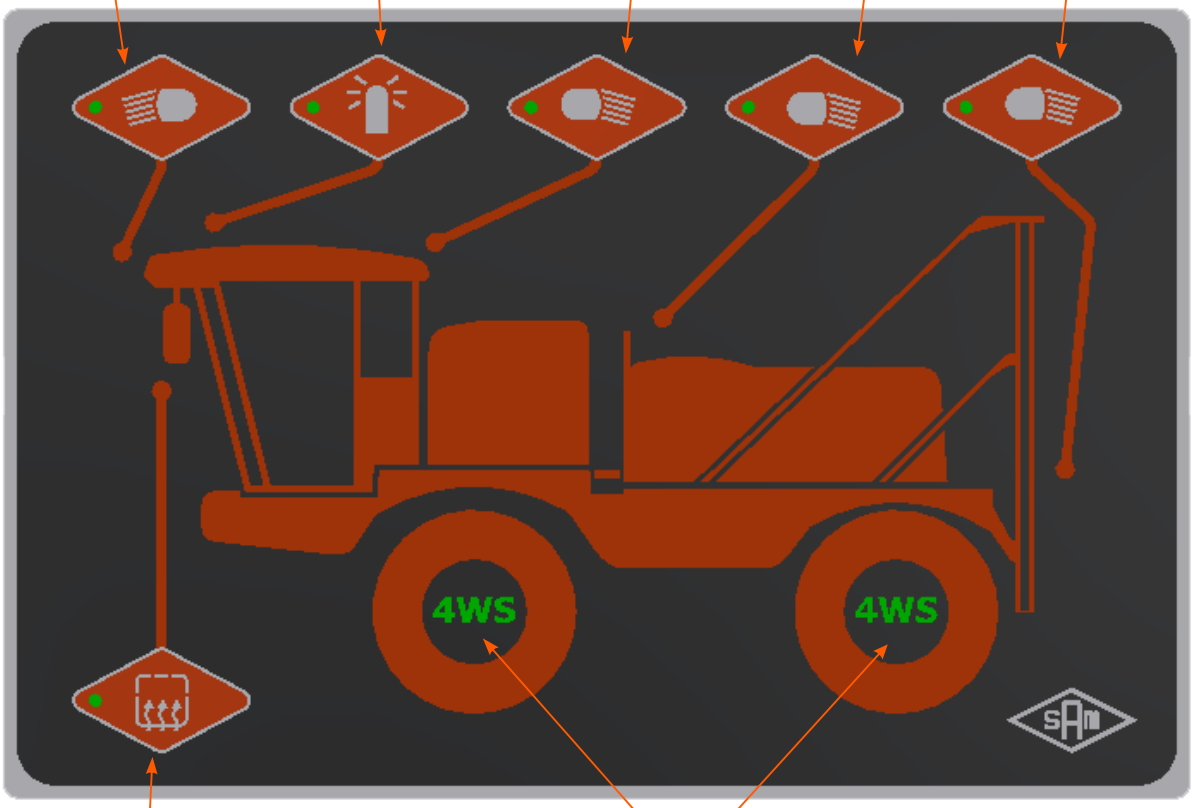
Front Cab Working Lights
(Can be left on after switching Ignition off and will automatically switch off after 5mins or if Battery voltage drops below a set point to ensure the engine can still be started

Warning Beacons
Automatically switch on when in Road Mode

Rear Cab Working Lights
(Can be left on after switching Ignition off and will automatically switch off after 5mins or if Battery voltage drops below a set point to ensure the engine can still be started. Automatically switch off in Road Mode

Boom Rest Working Lights

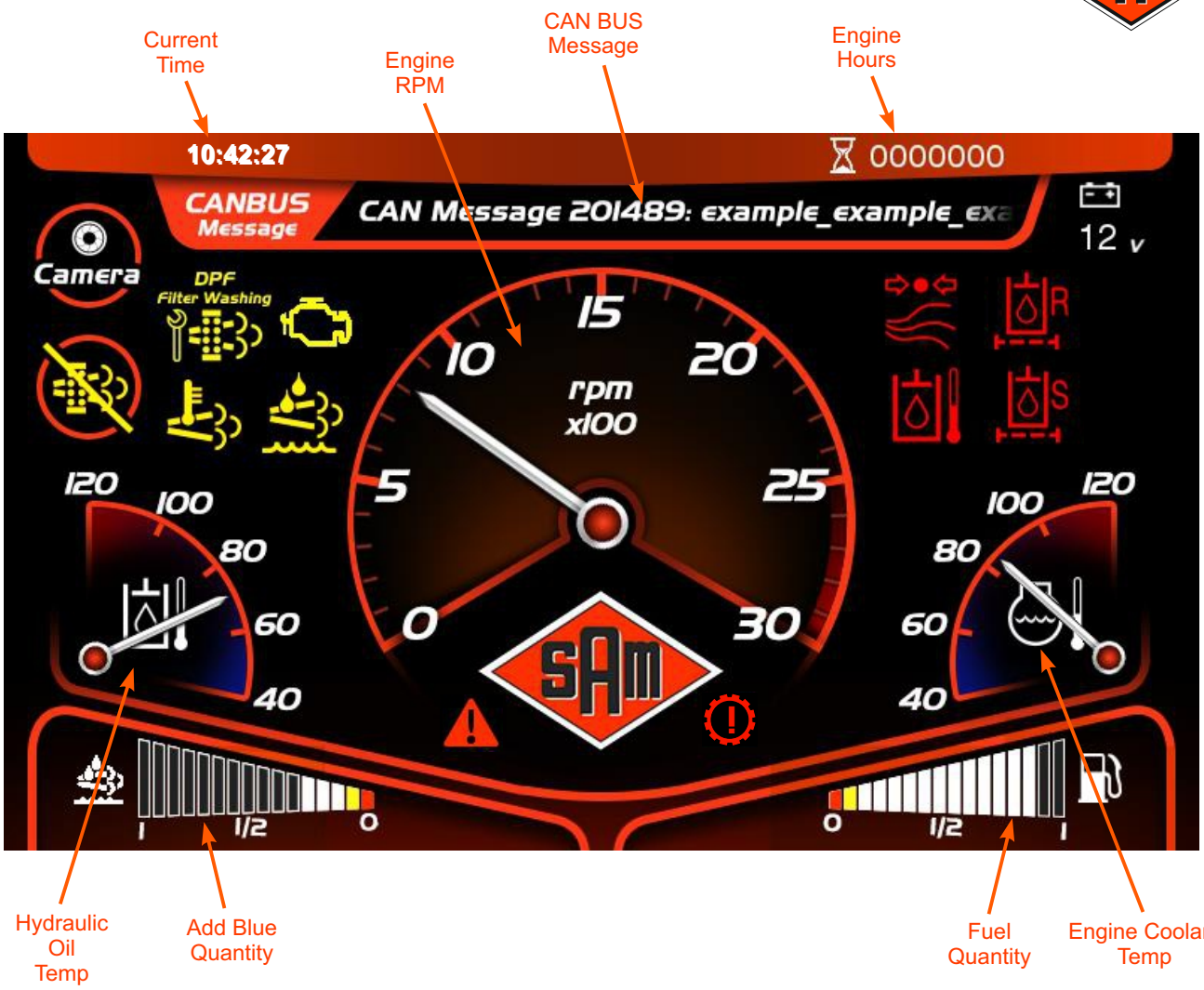
Boom Working Lights



Heated Mirrors
(Automatically switch off after 10mins)

4WS Engaged Indicators
(Illuminated when rear wheels are **NOT** straight)

OVERHEAD ELECTRONIC DASH DISPLAY



Pressing the illuminated button to the left will switch to Rear View Camera. (Press again to switch back to Dash View. Automatically Switches to Camera view when reversing & Camera is fitted.

When Illuminated & Flashing, press the illuminated button to the left to Start DPF Regeneration Process. Sprayer must be in Neutral with Park Brake applied. It is suggested that Regeneration is only allowed to take place with Sprayer in a safe location. Sprayer **MUST NOT** be used while regeneration is in progress. Regeneration requests should not be ignored, if delayed too long, Deutz Engine warranty will be void. Regeneration can be paused if required by pressing again. Refer to Deutz Manual.

DPF (Diesel Particulate Filter) must be replaced - Please contact SAM.

DPF Temperature Warning / DPF is regenerating.

Engine Fault. Read Fault Codes displayed at top of screen and contact SAM.

EAT Fault. Read Fault Codes displayed at top of screen and contact SAM.

Fault Warning. Read Fault Codes displayed at top of screen and contact SAM.

Hydraulic Oil Temperature too High.

Transmission System:
Brake Pedal Assist Pressure Low (Horizon 4000).

Transmission System:
Poclain Error (Horizon 4000 & 5500).

Transmission System:
Anti Slip Active (Horizon 5500 & 4000 fitted with Smart Drive).

Hydraulic Suction Filter & O Ring must be replaced.

Vehicle Air Pressure too Low.

Hydraulic Return Filter & O Ring must be replaced.

2.1-9

OVERHEAD ELECTRONIC DASH DISPLAY

The warning screen below will be displayed if 'Low Engine Oil Pressure' 'High Engine Coolant Temperature' or 'High Engine Boost Temperature' errors occur. If this screen is displayed, **STOP** the engine **IMMEDIATELY!** Do not attempt to use the sprayer until the cause has been found and rectified otherwise serious engine damage may result.

Setting the clock:

With the ignition on, press and hole the top right hand two buttons until the display changes to 'RTC Setting'
Use the 'Up/Down' buttons to highlight the desired parameter to change.
Press the 'Centre' button of the direction buttons to select the parameter.
Press the 'Up/Down' direction buttons to change the value to new value.
Press the 'Centre' button to confirm the change.
Use the Up/Down button to move to the next desired parameter to change and repeat the process.
Once all changes have been made, press the 'Set' button, then press the 'Exit' button.

2.1-10

4 WHEEL STEER (4WS)

The 4WS system is for part-time operation only and is used to produce tight turns with the least crop damage, when required.

The system may be selected at any time (while Field Mode is selected) by depressing the Foot Switch and holding it depressed. However, the rear axle will not engage until the front axle is straight. This may be when travelling straight in a tram line or when the front axle is being steered and passes through centre. When the rear axle begins to move the 4WS Indicators on the Over Head Control Panel will illuminate. The 4WS indicators remain illuminated when ever the rear axle is **not** aligned straight.

The Foot Switch may be released when the rear axle begins to steer, and the axle will continue to steer, until it once again straightens up, at which point it will remain straight until the Switch is depressed again.

The operator should wait for the Air Pressure system to be fully charged (warning symbol on Electronic Dash to be extinguished) before attempting to use the 4WS system.

In short, the rear axle will only engage when the front axle is straight, and will only disengage when it is itself straight.

Two other 4WS modes are available - 4WS engaged with Spray OFF and 4WS Permanent.

4WS with Spray OFF engages the 4WS system without the use of the Foot Switch, when the Main Spray ON/OFF is OFF (useful for when turning at headlands).

4WS Permanent engages the 4WS system all the time, without the use of the Foot Switch. Care must be taken to disengage the 4WS system when it is no longer required.

As above, either of these modes will not engage unless the front axle is straight or disengage unless the rear axle is straight.

Leakage within the steering system is corrected every time the rear axle disengages.

BEWARE: There are a number of situations in which 4WS should **NOT** be used. They are as follows:

1. On side slopes when any 'crabbing' will be amplified by the steering rear axle.
2. When turning on steep hills where the rear end inertia could turn the machine over.
3. In potato rows where the rear wheels will try and climb the balks.
4. On any field spraying where rear axle movement is amplified by the boom thus causing an overlap/underlap situation at the boom tips.
5. Never engage 4WS at speeds over 15 km/h. 4WS can not be engaged while in Road Mode because not only is it illegal, but is also extremely dangerous.

If the Air System fails, the machine will automatically revert to two-wheel steer, but the rear axle will remain at the angle at which the air pressure was lost.

If the machine is parked with 4WS engaged, and air pressure is lost, the machine will 'crab', until air pressure is re-instated and so the steering wheel should not turned until this has occurred.

Should the steering be turned to the extent that the rear wheels can no longer be straightened (due to air pressure loss) the following operation will re-set the rear wheels

The rear wheels should be locked by pressing and holding the ‘4WS Permanent’ button for 5 seconds (it will begin to flash). The front wheels should then be turned to a similar, opposite angle (as in 4WS).

Then press and hold the ‘4WS Permanent’ button again (until it stops flashing), the rear wheels may be turned in conjunction with the front wheels back to the centre line where the system will re-align itself.

Section 2-2
MACHINE CONTROLS 3000, 3000E & 3500 - Cabin

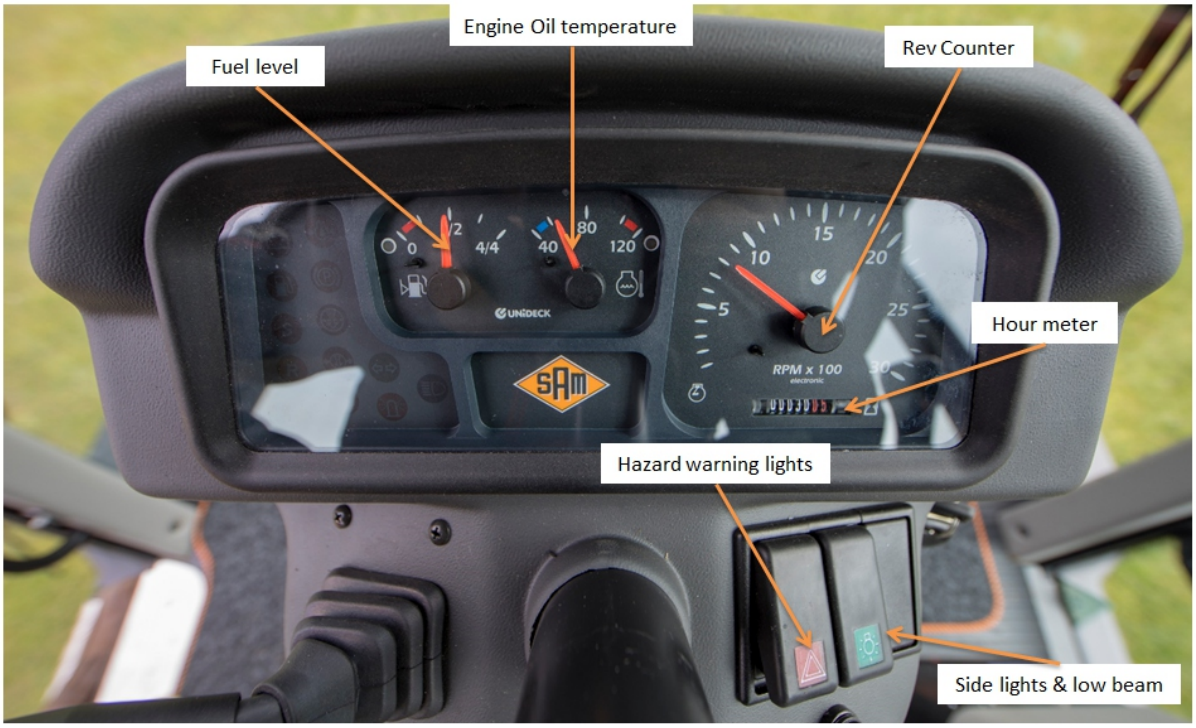
The Horizon 3000, 3000E & 3500 Cabin is different to the remainder of the other Horizon machines.

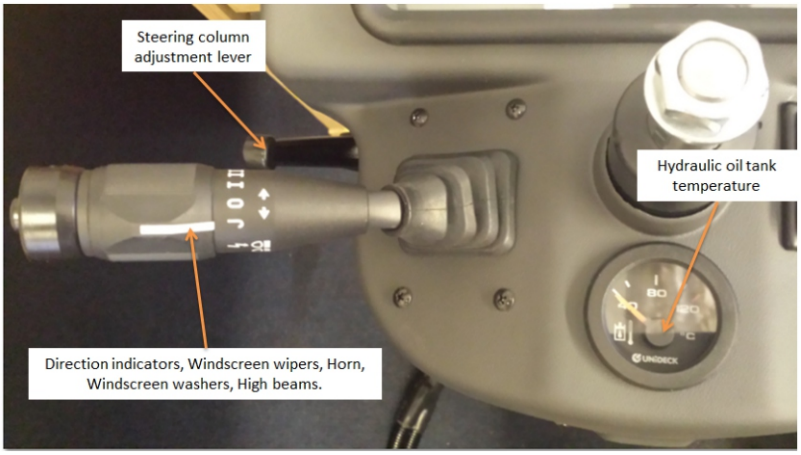
This Section is only to identify any differences in Cabin layout -

The main components are identified above and then explained in further details on the subsequent pages.

Steering Column - 2.2-2
Armrest Controls - 2.2.-3
Joystick - 2.2.-4
Overhead Console - 2.2-5

MACHINE CONTROLS 3000, 3000E, 3500
Steering Column





The pictures above show the layout of the dash and steering column controls as presented to the driver of the Horizon 3000, 3000E & 3500 machine.

The steering column is adjustable for both rake and reach.

The fuses attached to the steering column are described in Section 6.2 of this manual.

The ignition key will start and stop the engine.

Warning light cluster.

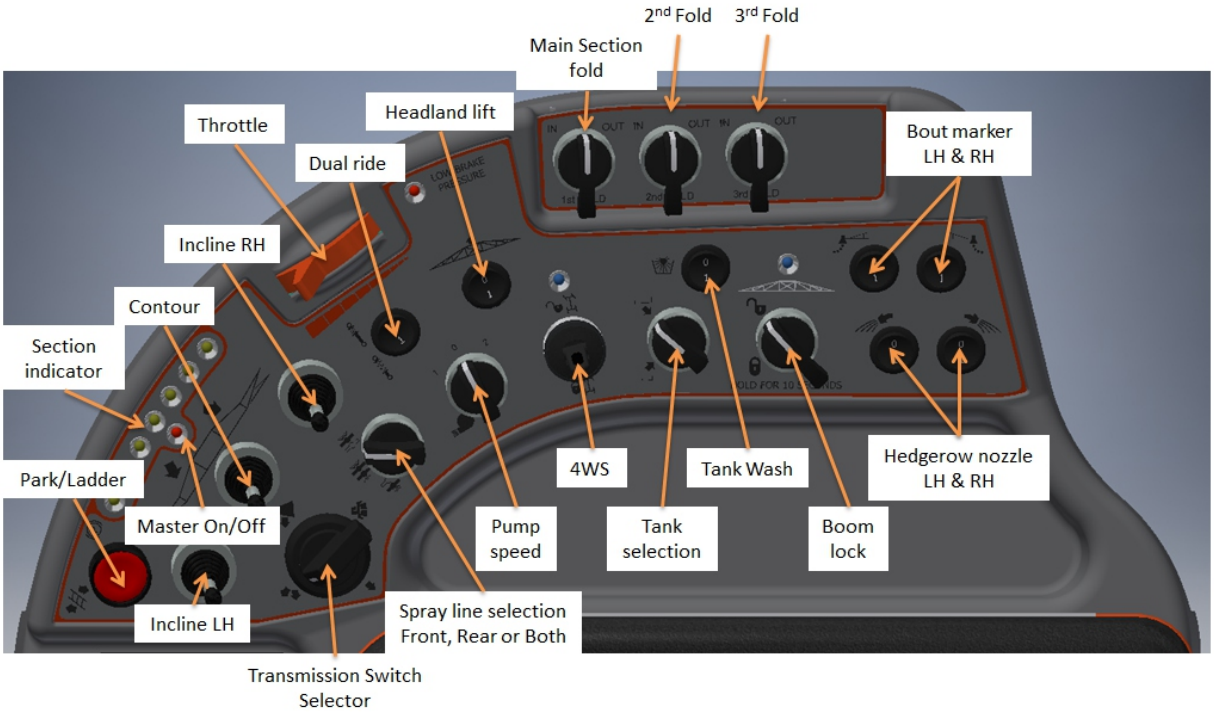
Left Column, top to bottom.
Battery - Low fuel - Suction filters - Return filters - Blank.

Second Column, top to bottom.
Oil pressure - Park brake - Air filter - Air pressure - Blank (but will illuminate for 2 secs with ign on)

Third Column, top to bottom.
Turn - beacon.

Fourth Column.
Main beam.

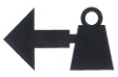
MACHINE CONTROLS 3000, 3000E & 3500
Armrest Control console



Transmission Switch Selector.

The four driving modes are:

1. Road - maximum speed but with reduced motor torque.



2. Maximum Tractive effort - all wheel motors with full power capability - generally only Suitable on flat land.

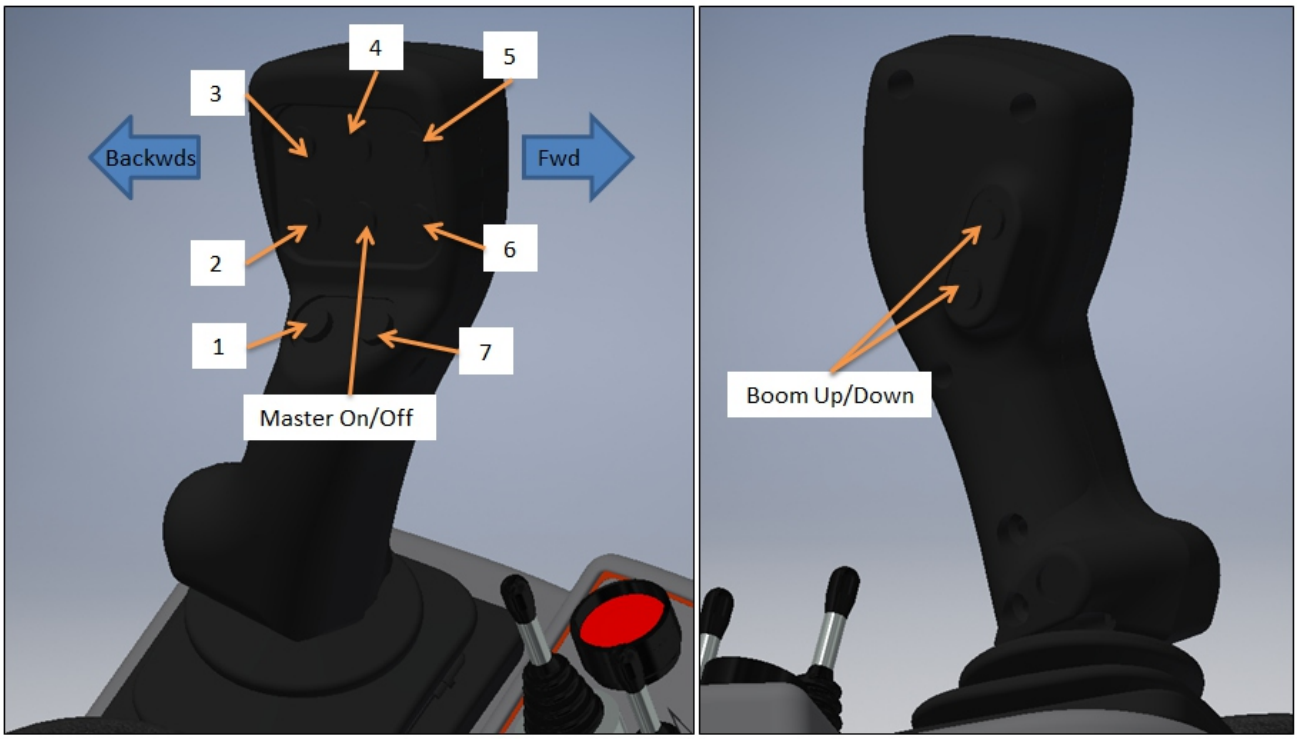
3. Conventional Spraying - used for flat land, steep uphill and moderate downhill spraying. gives best overall performance.

4. Steep downhill - this mode provides the best control when descending a steep hill when traction is marginal. If mode 3 is being used and the rear wheels begin to skip, mode 4 may be selected on the move.

Remember: if the machine will not climb the hill in Mode 3, never attempt to descend the hill

The vehicle has a permanent four-wheel drive system but this is only relevant when all wheels can provide tractive effort.

MACHINE CONTROLS 3000, 3000E & 3500
Transmission Control Joystick



The right hand armrest contains all the essential controls for the machine. The most obvious being the transmission control joystick.

This joystick is locked in neutral until unlocked by moving the joystick to the left against the detent. The joystick is connected by cable to the pump 'swash plate' control system. Pushing the joystick forward will drive the machine forward. The further forward the joystick is pushed, the faster the machine will travel.

If the joystick is returned to neutral then the machine will stop. The quicker the joystick is moved, the quicker the response, whether it be acceleration or braking. Care must be taken not to induce skidding by moving the lever to rapidly.

Moving the joystick further to the left against the detent enables the joystick to move backwards.

Moving the joystick backwards drives the machine backwards and the same rules apply.

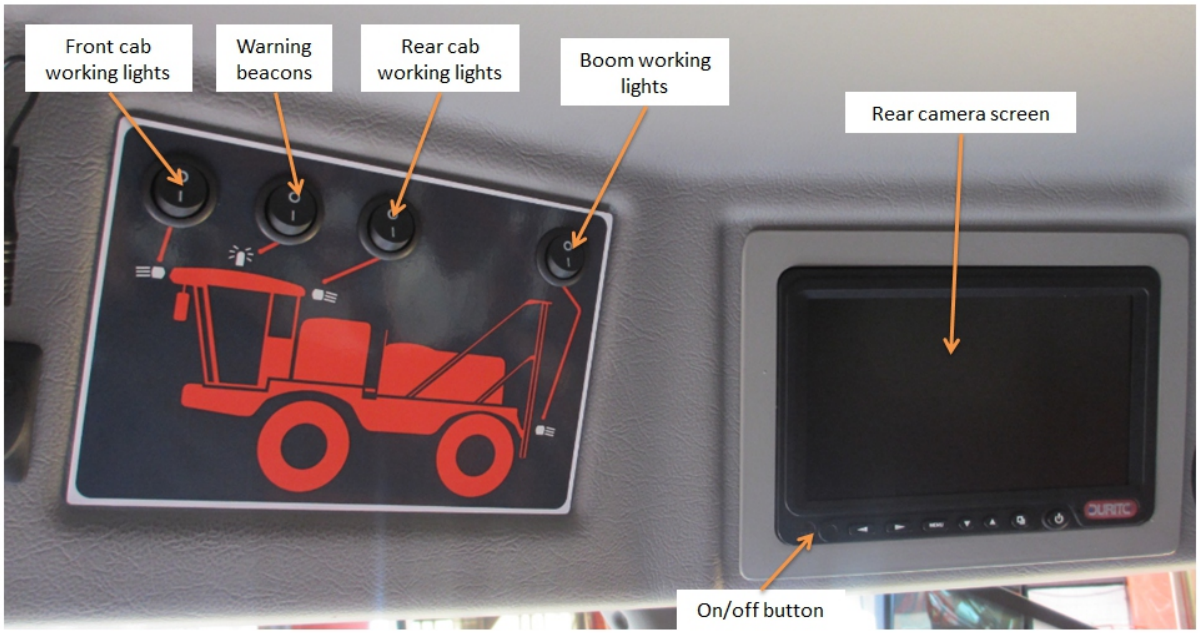
The engine can only be started with the joystick in neutral.

Positioned around the face of the joystick is an arc of buttons. Each button controls a spray line. The top centre button represents the centre (back frame) spray line. Seven section spray lines are a standard build on SAM machines although four, five and six sections can be accommodated.

The centre joystick button is the master ON/OFF control. When the machine is being calibrated in the yard, this control must be 'on' to generate spray pressure but the spray lines may be turned 'off' to prevent loss of chemical.

On the rear of the joystick are two further buttons. These are used to raise and lower the boom.

MACHINE CONTROLS 3000, 3000E & 3500
Overhead console



The above picture shows the two overhead control panels, the radio and climate control panels are exactly the same as other Horizon machines.

The left panel identifies the four switches which operate the front/rear cab working lights, the warning beacons and the boom working lights.

The right panel identifies the Rear camera screen which comes into operation when the ignition is on and the screen on/off button is pressed.

SECTION 3

MECHANICAL COMPONENTS

POWER UNIT

All SAM Sprayers are powered by Deutz water-cooled industrial diesel engines. These engines meet all current E.U. Emission Standards. Power ratings are matched to the gross weight of each machine plus any extra demand required (e.g. air stream fan).

Two engines cover the Horizon range of SAM Sprayers which are:

Horizon 3000, 3000E, 3500 -	TCD6.1	140Kw (188HP)
Horizon 4000, 4000E -	TCD6.1	160Kw (212HP)
Horizon 5500, 6000 -	TCD6.1	180Kw (242HP)

These are DIN rated outputs and will be approximately 15% more powerful than similar SAE-J rated engines.

This digital engine has been filled with a high quality, fully synthetic oil approved by Deutz. Any oil used in this engine must be fully synthetic to the same specification. Please refer to the Deutz Operating Manual for oil specification or contact SAM.

The first Oil & Filter changes are due at 500 Hours.

The radiator header tank is fitted with a level sensor and may produce a low coolant level during the first few hours of work as the engine cooling system expels air and absorbs water. Check levels and top up as necessary. The radiator Header Tank is located on top of the engine and accessible without removing guards. **CAUTION-** risk of scolding when removing the tank cap!

Behind the left hand Guard are two belts. The wide poly 'V' belt drives the fan, alternator, water pump and diesel pump. The smaller 'V' belt drives the air-conditioning compressor. The condition and tension of these belts should be checked according to the maintenance schedule. If a belt slips, it becomes glazed and will fail to drive correctly, even after it has been correctly re-tensioned. Should this occur then the belt and possibly the pulley will have to be replaced.

From the Left hand side of the machine the dipstick, oil filler cap, oil filter and fuel filters are available for service in accordance with the maintenance schedule. The oil filter is located behind the Guard.

Particular attention should be paid to the ‘cooling pack’ located above the engine. Not only should it be cleaned thoroughly but it should also be 'back blown' to remove any debris wedged between the cooling fins.

The Oil Cooler is thermostatic in operation and will maintain the hydraulic oil temperature above 50C.

It should be noted that hot oil in excess of 80 deg C would severely damage the hydrostatic system causing unnecessary expense. The regularity at which the engine/oil cooler is cleaned will depend entirely on the working conditions. When working in oil seed rape for example, it may need cleaning more than once daily. Only the operator can decide.

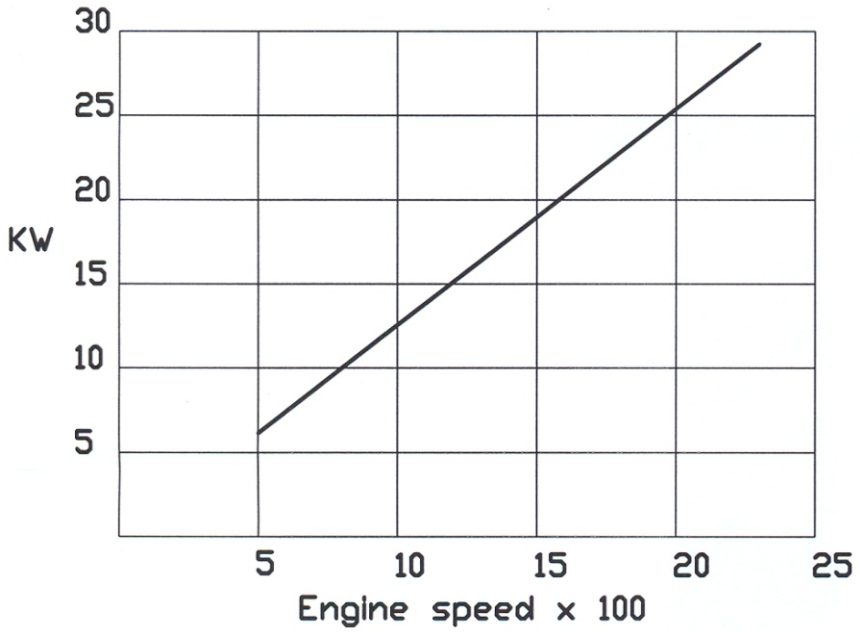
A visual inspection should be carried out daily.

STEERING & SUSPENSION HYDRAULICS

The Steering and Self-Levelling Suspension Systems run from the Load Sense Hydraulic Circuit. The Pressure Relief Valve in the steering unit is pre-set to 170 bar (2450 psi).

AUXILIARY SPRAY PACK HYDRAULICS

A Load Sense Hydraulic Pump is mounted on the end of the main transmission pump. The total capacity of this pump can be used to power rear end implements up to powers shown on the graph below.



Rear end hydraulics on SAM Horizon sprayers are of the 'Load Sensing' type. This advanced system uses a large variable output swash plate pump to produce only the oil that is required for any function. It does not produce any surplus oil and as such produces very little heat. If a second or even third function is operated then the pump will sense the demand requirements and respond to them within milliseconds.

As hydraulic pump output is no longer dependent on engine speed, it means that the spray pump and a quick fill pump can run simultaneously at relatively low engine RPM. Maximum continuous working pressure must not exceed 170 Bar.

Any rear end equipment provided by the customer must be suitable for load sensing closed circuit use.

TRANSMISSION - HYDROSTATIC PUMP

The Transmission pump is mounted directly onto the flywheel end of the engine and turns at engine speed. An electronic signal from the Joystick alters the angle of the 'swash' plate inside the pump, which in turn alters the stroke of the pistons within the pump, and the result is an infinitely variable oil output from a fixed engine speed.

A smaller 'charge' or 'boost' pump is mounted on the end of the main pump; its function is to replace oil to the main pump, which is constantly being lost internally through leakage. It also supplies oil at 30 bar (435 psi) maximum pressure to operate brakes and 2-speed control. Its final duty is to pump oil from the closed loop system through the oil cooler.

The main circuit pressure cut off valve is also contained within the pump and is factory pre-set.

TRANSMISSION - HYDROSTATIC WHEEL MOTOR

A slow speed high torque Wheel Motor is mounted behind each wheel of the machine. Each Motor has numerous pistons operating on numerous cam faces. As such, up to eighty piston strokes are therefore required to turn the wheel once, making slow speed operation extremely smooth and efficient. For 'road' use, half the pistons are neutralised, therefore, for the same amount of oil the wheel will turn twice as fast but with half the power.

The speed of operation depends entirely upon the flow from the pump. Maximum field speed is up to 20kph (12 mph) but like any tractor the slower it travels, the more power it has.

The hydrostatic pump carries out the 'primary' braking function. It will produce braking torque equal to the driving torque, since no freewheel action can occur within a hydrostatic wheel motor.

A mechanical disc brake is an integral part of the wheel motors. This 'secondary' mechanical braking system is for **parking / emergency use only** (unless dynamic brakes are fitted).

Should the Park Brake be operated while the machine is moving, serious damage will result.

These brakes are failsafe in their operation, spring on - pressure off, and are held off with 'boost pump' pressure, as such, they will be automatically applied when the engine is stopped or when 'boost' pressure fails i.e. if a hydraulic hose fails or from lack of oil in the tank.

The permanent 4WD system employed on all SAM sprayers maximises high tractive effort with more than adequate braking ability and a 'torque split' effect by controlling oil flow to the front and rear axles is a standard feature of all Horizon Sprayers.

SMART DRIVE (Electronic Anti-Slip System) - Optional

Working in a similar manner to a vehicle anti-lock braking system. A sensor at each wheel measures the speed of rotation of that wheel via electronic pulses. If one wheel should speed up and exceed the averages of the other three wheels by a pre-determined amount, the oil to that wheel is stopped. The wheel is then allowed to rotate via a modulating valve at the average speed of the other three wheels.

The anti-slip ECU has four LEDs (wheel sensor connections) which should be flashing green (only when moving). A change of colour identifies a fault - contact SAM.

SUSPENSION

A self-levelling suspension system is fitted to the SAM 'Horizon' Sprayers. Normal suspension is provided by hydraulic rams and gas accumulators fitted at each corner of the machine. The accumulator pre-charge has been set at the factory and needs no further adjustments. The pre-charge should be checked by a competent person every 2000 hours.

The rear axle is of the trailing arm type to reduce front end nodding. For safety reasons, it is not independent, therefore the machine will always follow the attitude of the rear axle.

The front axle is free to articulate ensuring that all wheels stay in contact with the ground under normal conditions.

Two leveling valves are fitted to the chassis near each axle. A sensing arm joining each valve to its respective axle determines the correct ride height. Oil is moved 'into' or 'out of' the rams to maintain the same height above the ground whether the tank is full or empty or the booms are open or closed.

The front tripod bearing should be inspected on a regular basis and at least every 250 hours along with the Panhard rod. Weekly greasing is essential. If a knocking sound is heard from underneath the Cab then the front tripod bearing should be replaced IMMEDIATELY !

The only maintenance on the rear being the regular greasing of the swinging arm bushes and the removal of mud and stones, which accumulate on top of the swinging arm frame. Should this accumulation be allowed to dry then the rear suspension system could become inoperative.

TYRES - GENERAL

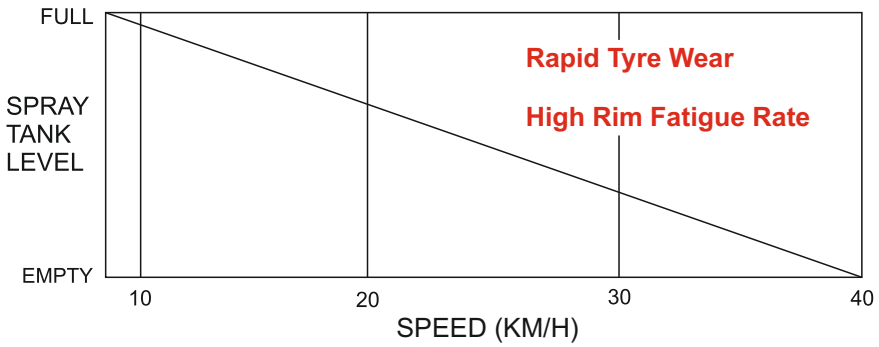
The tyres on a crop sprayer are probably the most abused item on the machine. Because of the 'ever decreasing weight' nature of a crop sprayer, the tyres attract a loading bonus, however, this bonus refers to low speed operations only.

Ensure tyre size i.e. contact area, is suitable for the prevailing conditions. Narrow tyres, very steep slopes and green foliage just **DO NOT MIX**.

High loads and high speeds can cause premature tyre wear not only to the tyre tread but also within the tyre carcass.

Wheel rims and/or centers will also fracture under excess fatigue (i.e. under the above conditions).

Your attention is therefore drawn to the load/speed graph below.



It should be noted that an unusual tyre wear pattern has been identified on sprayers that spend a large amount of time fully laden on the road. One or more tyres will show very heavy wear between the center of the tyre and the outside edge but without the feathered edge normally associated with tracking problems. The cause of this phenomenon is the tyre rolling under the rim during cornering. Whilst the wear rate can never be reduced (see load/speed graph), it can be spread more evenly across the tyre by increasing the tyre pressure by approximately 10 psi.

TYRES - FLOATATION

The range of floatation wheels available for SAM sprayers is vast. SAM would not advocate using pressures in any floatation wheel below 1 Bar (15 psi). The ultra low pressures of bygone years have proved to be of no particular advantage to the soil or the crops. It simply caused the tyres to wear rapidly and increased fuel consumption.

Consult SAM Ltd for further information.

Floatation wheels impose extremely high stresses on all associated components i.e. bearings, axles, kingpins and steering components. A shorter life expectancy on these wearing parts must therefore be expected, especially in the case of bushes.

Any help the operator can give the machine in reducing the stresses caused by floatation wheels: - by not driving on kerbs; by not driving at excessive speeds on ploughed land; by not using excessive acceleration or braking, will extend components' life substantially.

Warranty on component failure, associated with floatation wheels, is severely limited and will only be accepted for a manufacturing defect.

TYRES - CUSTOMER / OPERATOR

Wheels and Tyre Information
With your sprayer are a number of options, which are designed to optimize your sprayers' performance, dependant on your land, terrain, crop and weather conditions.

Using the Sprayer - General Operation
Initial consultation in operations, usage and requirements to decide on you optimised wheel options is important in getting the maximum out of the vehicle, - with a sprayer, there are three main permutations of tyre/wheel equipment.

Standard – for a wide range of uses
Where it is possible to use this fitment all the year round, with good results. The limitations are that it may be too wide for rows or not low pressure in operation.

Low Pressure – for use where minimal damage to the soil is needed
For minimal soil damage, these units are kinder to the land. Different options are available to cater for all operations, though there may be increased width for flotation, traction and operational differences to the standard equipment can arise.

Rowcrop – for row usage where growing crop damage is minimised
These units are designed to run down rows, causing minimal growing crop damage. They may give less stability and traction on the road, as well as limiting operational parameters and a reduction in ability to traverse poor field conditions.

Driving Operation and Care
The sprayer is designed to be filled on site, with maximum load in the field, with travel to and from the farm unladen. Where this is not possible, care must be taken to work within the parameters of the particular tyre option fitted. Where maximum load is needed from farm to field, a compromise in vehicle performance may be necessary.

Driving Technique
When travelling down narrow lanes and roads with drainage cut-outs, or potholed and poor uneven surfaces at higher speeds; care should be taken to avoid impact damage. Where it is known of narrow road sections with holes or bumps, speed should be reduced to minimise problems which could lead to damage and ultimately failure of the components. Generally speaking, the higher the tyre pressure - the more shock load and stress is transferred back through the wheel to the disc because the cushioning suspension effect of a high volume tyre at lower pressure is reduced. This is especially relevant to narrow row-crop tyres that may have a pressure of up to 60 PSI to carry the load.

Damage can manifest in vibration through the vehicle, caused by a distortion of the wheel. Where distortion of the wheel is believed to have occurred or an impact 'bleb' in the tyre is evident - a tyre specialist should be contacted to inspect the damage and advise a remedy.

TYRES - CUSTOMER / OPERATOR Cont.....

Tyre Specifications
The sprayer has options of tyre equipment to maximise the operation of the vehicle for given needs and soil or climate considerations.

The handbook lists the parameters of the fitments, for load speed and pressure.

Tyre Capacities
On the sidewall of the tyre is a rating of the load the tyre will carry at a given speed

For example 142A8 (refer to Page 30 - Load Index Table), 142 corresponds to 2650 Kgs

There is a world standard for carrying capacity, with a main capacity in the description of the size.

There is also an additional marking, usually in a circle called the unique point to give a variation in operational capacity. For example an A8 speed rating is in the normal description, but a B rating is given by the unique point (see below - Speed Index Table).

Speed Symbol	Speed Category (kph)	Speed Symbol	Speed Category
A1	5	J	100
A2	10	K	110
A3	15	L	120
A4	20	M	130
A5	25	N	140
A6	30	P	150
A7	35	Q	160
A8	40	R	170
B	50	S	185
C	60	T	190
D	65	U	200
E	70	H	210
F	80	V	240
G	90	Z	Over 240

Increase and Decrease in Load Capacity

In addition to the unique point, there are variations in capacity of tractor tyres.

There is a bonus in load by going slower, the variations are listed in options.

Normal drive radial tyres have a maximum capacity rated at 1.6bar and 40kph.
Narrow tyres have a maximum capacity rated at 2.4, 3.2 or 3.6bar and 40kph
Latest technology - Flexible sidewall tyres, consult data sheets, SAM or your tyre specialist

TYRES - OPERATING INFORMATION

Cleaning Wheels and Tyres
If a TFR (traffic film remover) is used, it must not be applied neat, and must be diluted to the manufacturer's recommendations – even so, sometimes these can be quite harsh especially when used with a large high pressure industrial pressure washer or steam cleaner.
Steam cleaners and high pressure washing systems should not be directly used on tyres, cleaners can cause premature ageing of tyres and the very high heat that can be generated with modern steam cleaners can soften and lift paint.

Storage
Outside storage will age the tyres, so indoor storage when not in use is advised. If stored outside, cover them or store upright to prevent water pooling in them – if stored upright they should be restrained from falling.

Fitment
Wheel and tyre units are heavy so changing fitment involves moving and lifting heavy weights. This is a 2 person operation, using levers to assist in raising the wheels or using specific lifting cradles. Jacking of the vehicle should also be supported by axle stands where a change of wheels occurs.

TYRES - OPERATING INFORMATION

Tightening of Wheels
The nuts should be tightened in a star order and should be tightened to the specified torque.
After driving about 100M and before placing them under load, re-tighten nuts to specified torque.
Check wheels and nuts after operating sprayer for 3 hours and again after 10 hours.
Check wheels and nuts frequently and keep them tight.

Torque of wheel nuts :

3000L Sprayer with MHP11- Wheel Motors - Studs M20x1.5 - Tightening Torque = 600Nm

3500L Sprayer with MHP11- Wheel Motors - Studs M20x1.5 - Tightening Torque = 600Nm

4000L Sprayer with MS18-P Wheel Motors - Studs M20x1.5 - Tightening Torque = 600Nm

4000L Sprayer with MS18-P with C11-25 Brake Wheel Motors - Studs M22x1.5 - Tightening Torque = 695Nm

4000L Sprayer with MS18-CT Brake (Boosted) Wheel Motors - Studs M22 x 1.5 - Tightening Torque = 695Nm

5500L Sprayer with MS18 & MW24 Wheel Motors - Studs M20x1.5 - Tightening Torque = 600NM

5500L / 6000L MS18 - CT Brake (Boosted) Front & MHP20 Rear - Studs M22 x 1.5 - Tightening Torque = 695Nm

Note: A calibrated torque wrench and pressure gauge is needed to ensure safe operation and optimum vehicle performance.

Pressures
Pressures should be check once a week, but where large temperature changes occur with operations at low pressure – a daily check is advised.

Effects on pressure change by ambient temperature;
For example
A tyre set at 15PSI at 15°C reduces in pressure to 13.4° at 0°C - a 10% drop in inflation pressure

Pressure – CAUTION! The pressurised air in the tyre is dangerous. Explosive separation of a tire and rim parts can cause serious injury or death. Do not attempt to mount a tire without the proper equipment and experience to perform the job.
Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.
When inflating tyres, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tyre assembly.

TYRES - MAINTENANCE & CARE

Check tyres for cuts, bubbles or other damage weekly. Also inspect wheels for deformation/damage.

An expert should always be called in to make a qualified judgement on the tyres and to carry out repairs.

Tyres age as a result of physical and chemical processes and this may impair their performance. Premature aging can be caused by sunlight, chemical contact and running under-inflated.

TYRES - LOAD INDEX TABLE

L1	Kg	L1	Kg	L1	Kg	L1	Kg	L1	Kg	L1	Kg	L1	Kg
0	45	40	140	80	450	120	1400	160	4500	200	14000	240	45000
1	46.5	41	145	81	462	121	1450	161	4625	201	14500	241	46250
2	47.5	42	150	82	475	122	1500	162	4750	202	15000	242	47500
3	48.7	43	155	83	487	123	1550	163	4875	203	15500	243	48750
4	50	44	160	84	500	124	1600	164	5000	204	16000	244	50000
5	51.5	45	165	85	515	125	1650	165	5150	205	16500	245	51500
6	53	46	170	86	530	126	1700	166	5300	206	17000	246	53000
7	54.5	47	175	87	545	127	1750	167	5450	207	17500	247	54500
8	56	48	180	88	560	128	1800	168	5600	208	18000	248	56000
9	58	49	185	89	580	129	1850	169	5800	209	18500	249	58000
10	60	50	190	90	600	130	1900	170	6000	210	19000	250	60000
11	61.5	51	195	91	615	131	1950	171	6150	211	19500	251	61500
12	63	52	200	92	630	132	2000	172	6300	212	20000	252	63000
13	65	53	206	93	650	133	2060	173	6500	213	20600	253	65000
14	67	54	212	94	670	134	2120	174	6700	214	21200	254	67000
15	69	55	218	95	690	135	2180	175	6900	215	21800	255	69000
16	71	56	224	96	710	136	2240	176	7100	216	22400	256	71000
17	73	57	230	97	730	137	2300	177	7300	217	23000	257	73000
18	75	58	236	98	750	138	2360	178	7500	218	23600	258	75000
19	77.5	59	243	99	775	139	2430	179	7750	219	24300	259	77500
20	80	60	250	100	800	140	2500	180	8000	220	25000	260	80000
21	82.5	61	257	101	825	141	2575	181	8250	221	25750	261	82500
22	85	62	265	102	850	142	2650	182	8500	222	26500	262	85000
23	87.5	63	272	103	875	143	2725	183	8756	223	27250	263	87500
24	90	64	280	104	900	144	2800	184	9000	224	28000	264	90000
25	92.5	65	290	105	925	145	2900	185	9250	225	29000	265	92500
26	95	66	300	106	950	146	3000	186	9500	226	30000	266	95000
27	97.5	67	307	107	975	147	3075	187	9750	227	30750	267	97500
28	100	68	315	108	1000	148	3150	188	10000	228	31500	268	100000
29	103	69	325	109	1030	149	3250	189	10300	229	32500	269	103000
30	106	70	335	110	1060	150	3350	190	10600	230	33500	270	106000
31	109	71	345	111	1090	151	3450	191	10900	231	34500	271	109000
32	112	72	355	112	1120	152	3550	192	11200	232	35500	272	112000
33	115	73	365	113	1150	153	3650	193	11500	233	36500	273	115000
34	118	74	375	114	1180	154	3750	194	11800	234	37500	274	118000
35	121	75	387	115	1215	155	3875	195	12150	235	38750	275	121000
36	125	76	400	116	1250	156	4000	196	12500	236	40000	276	125000
37	128	77	412	117	1285	157	4125	197	12850	237	41250	277	128500
38	132	78	425	118	1320	158	4250	198	13200	238	42500	278	132000
39	136	79	437	119	1360	159	4375	199	13600	239	43750	279	136000

DUAL WHEELS

Dual wheels are a poor alternative to flotation wheels. They are less flexible than the single wheel option and transmit very high shock loads into associated components. SAM would suggest a 30% reduction in speed be implemented.

TRACK ADJUSTMENT

All standard sprayers have the same track capability via adjustable axles 1830mm (72”) – 2135mm (84”) in 102mm (4”) increments, i.e. 51mm (2”) per wheel.
Non standard sprayers may have 1730mm (68") – 2030mm (80") adjustable axles.

Note - Track Widths may differ if different wheel rim offsets have been specified, e.g a 68" - 80" axle may achieve 70" - 82" instead.

MANUAL SLIDING AXLES

The engine must be stopped, the **parking brake applied** and the front wheels chocked.

Lift one end of the machine until the tyres are clear of the ground. Loosen the two clamps at either end of the axle beam.

Caution: Ensure the machine is well supported. A single jack under the centre of the axle is not acceptable.

Remove the four bolts in the bottom of the axle beam.

Remove the two track rod adjusting bolts.

In the bottom face of the axle beam are two slots and in each slot is a screwed stop (screwed into the sliding leg). If the stop is allowed to slide from one side of the slot to the other then the movement will be 6” (152mm). This equates to 12” (305mm) over the complete axle. However, if the stop is moved to either of the two other positions within the slot then the movement is reduced to 4” (102mm) or 2” (51mm).

Pull the sliding legs to the required position.

Pull the track rods to the correct position and refit the securing bolts.

Refit and lightly tighten the four screws in the bottom of the axle beam. Lightly re-tighten the clamps at the end of the axle beam. Lower the machine to the ground and fully tighten clamps and fixing screws.

Repeat this exercise on the second axle.

RE-CHECK THE BOLT TENSION AFTER THE FIRST HOUR'S WORK.

HYDRAULIC ADJUST AXLES

The engine must be stopped, the **parking brake applied** and the front wheels chocked.

Lift one end of the machine until the tyres are clear of the ground. Loosen the two clamps at either end of the axle beam.

Caution: Ensure the machine is well supported. A single jack under the centre of the front axle is not acceptable.

Remove the four bolts in the bottom of the axle beam.

Remove the two track rod adjusting bolts.

In the bottom face of the axle beam are two slots and in each slot is a screwed stop (screwed into the sliding leg). If the stop is allowed to slide from one side of the slot to the other then the movement will be 6" (152mm). This equates to 12" (305mm) over the complete axle. However, if the stop is moved to either of the two other positions within the slot then the movement is reduced to 4" (102mm) or 2" (52mm).

On the front axle suspension plate is a hydraulic valve. With the manual handle supplied, raise the valve manual control fully up.

Start the engine and turn the steering wheel in the appropriate direction to slide the axles to the correct position (at the fullest extent of the slot).

Note: It is normal for only one axle leg to move at a time. When the first leg moves to its fullest extent the second leg will start to move providing the steering wheel continues to be turned.

Pull the track rods to the correct position and refit the securing bolts.

Refit and lightly tighten the four screws in the bottom of the axle beam. Lightly re-tighten the clamps at the end of the axle beam. Lower the machine to the ground and fully tighten clamps and fixing screws.

Repeat this exercise on the second axle. When complete, reset the hydraulic valve fully down. This hydraulic valve is fail-safe and will also reset itself when the parking brakes are released.

RE-CHECK THE BOLT TENSION AFTER THE FIRST HOUR'S WORK

HYDRAULIC OIL RESERVOIR

The Hydraulic Oil Reservoir is mounted directly behind the cab.

This fully baffled tank contains approximately 200 litres (45 gallons) of oil, (see lubrication section).

It is this oil, which is the lifeblood of the machine, and, because of this, it must be kept exceptionally clean.

A 'Suction Filter' fitted on the right hand side of the tank top, filters the oil before it enters the 'boost pump'. All return oil, except wheel motor drainage, passes through a 'Return Filter' fitted on the left hand side of the tank top. Wheel motor drain oil passes through a separate magnetic filter located in front of the Compressed Air Tank.

A level gauge is fitted to the left side of the tank, and contains a thermometer.

The oil level must always be between the min/max lines on this level gauge. The oil reservoir temperature should stabilise between 50°C - 80°C.

When topping up the reservoir, use a clean container and the correct grade of oil - **NOT UNIVERSAL TRACTOR OIL.**

If the vehicle Horn sounds and the Electronic Dash Display shows a normal Oil Temperature (below 80°C), STOP IMMEDIATELY and check the Oil Level. A float switch is fitted to the side of the tank which, when the Oil Level drops dangerously low, the vehicle horn will sound. Investigate the cause and fix before continuing. Test Horn Daily.

All filters must be changed after the **first 10 hours** and, thereafter, every 250 hours or when the clogging indicator shows a blockage, whichever comes first.
SAM LTD ONLY RECOMMENDS THE USE OF SAM SUCTION AND RETURN FILTERS.

When changing oil filters, always change the O Ring with the correct one supplied.

A sample of hydraulic oil should be analysed at the beginning of each season to ascertain as to whether the oil should be changed or not. Your oil supplier can usually carry this out.

Water is the usual cause of contamination in hydraulic oil and can normally be traced back to condensation in the oil tank.

If emulsified oil is present, it is instantly recognisable as a milky yellow translucent liquid in the sight gauge. The oil must be changed IMMEDIATELY.

Every time the tank is emptied, the opportunity should be taken to clean the strainers within the tank.

Only 'lint free' cleaning material should be used inside the hydraulic tank.

EXCESSIVE TRANSMISSION OIL TEMPERATURE

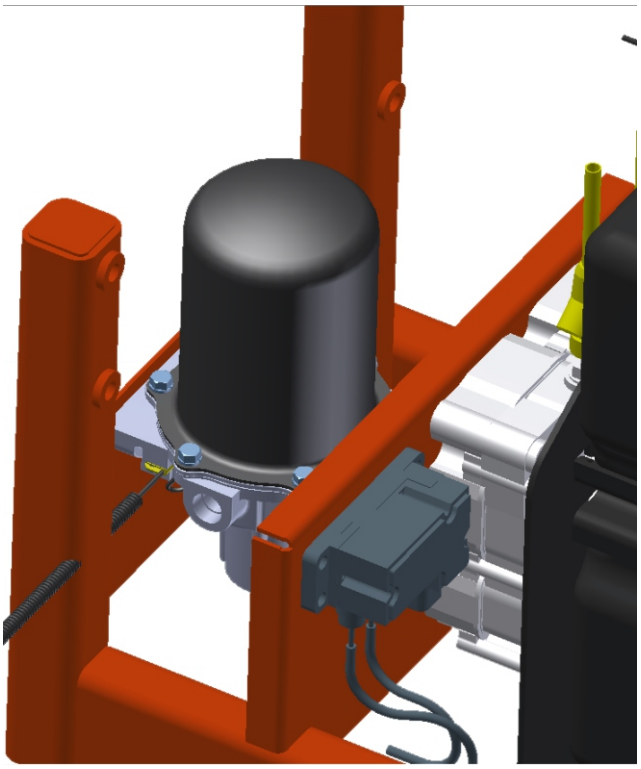
The vehicle Horn will also sound if the Transmission Oil Temperature becomes excessive, which will also be indicated on the Electronic Dash Display (the pointer will be above 80°C and the warning symbol will be illuminated red.

Should the Horn ever sound for this reason, DO NOT STOP, as this will trap the excessively hot oil within the 'closed loop' circuit, simply reduce speed by approximately 25% by pulling back the joystick. The Horn will stop sounding after approximately 5 minutes.

COMPRESSED AIR SYSTEM

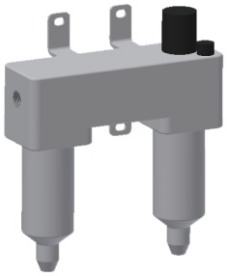
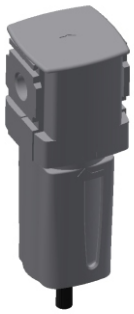
An air compressor mounted directly on the engine provides the air supply for the machine.

An Air Dryer with integral unloader valve is mounted on the Right hand side of the machine, behind the AdBlue Reservoir. This is preset to maintain the air pressure at approximately 8 bar (116 psi). A filter is incorporated within the unit and should be replaced following the maintenance schedule.
The Air reservoir, mounted below the engine, (incorporated within the chassis) should be drained daily.



THE AIR RESERVOIR MUST BE CHECKED ANNUALLY BY A RECOGNISED INSPECTOR.

Air is fed throughout the machine via a filter/lubricator assembly located at the right hand end of the cat walk.

With lubricator	Without lubricator
SAM Ltd recommends the use of 'Tellus 37' lubricant in the lubricator bowl. It is impossible for SAM Ltd to satisfactorily adjust the lubrication rate. The operator must regulate this himself over several weeks. Oil usage should be in the region of one bowl every 500 to 600 hours. 	Due to a recent product development, the system now does not require a lubricator as pneumatic components are now self lubricating. In this case, the operator will find only a filter and water trap. 

SECTION 4

SPRAYING COMPONENTS

SPRAY TANK

The heavy-duty baffled fibreglass tank has a nominal capacity of between 4000 litres (880 gallons) and 5500 litres (1210 gallons) depending on specification and is suitable for all agrochemicals.

The charging hole in the top of the tank holds a large capacity filter basket.
The tank lid is fitted with a breather but if filling is being carried out with a high capacity pump, it is advisable to remove this lid to prevent excessive pressure build up in the tank.

SIGHT GAUGE

The Sight Gauge fitted is usually of the 'float and weight' type. The float is retained in the tank on a stainless steel guide and is attached to the weight retained within a transparent tube normally fixed to the boom rest or roger rail.

The top half of the Sight Gauge is visible from the driver's seat and provides a visual indication of when the tank is nearing empty. Because the float is located close to the center of the tank, an extremely accurate reading of tank contents is provided at all times.

ROTARY TAPS

At the rear left-hand corner of the sprayer are two rotary taps. The tap labeled 'suction' dictates where the spray pump will suck its water from. This may be from the Main Spray Tank, the Clean Water Tank or from an outside source, “self fill”. The final position (unmarked) on this tap will isolate the main filter.

The 'pressure' tap dictates where the spray pump will transfer its water to. This may be 'spray' for normal use, washing or agitation; 'Hopper Venturi' so that the induction hopper will operate or 'Pump Out' to transfer surplus liquid into a holding tank. The protective cap on the 'pump out' outlet should be removed prior to selecting this position.

Also mounted in the rotary tap panel are additional switches for use while the machine is stationary.

Boom lift & lower switches are provided to make easier the removal of the induction hopper from the stowed position.

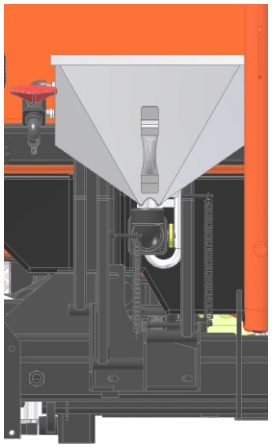
Spray pump Speed 1 & 2 switches are also provided for easier control of the induction hopper, self fill or pump out facility.

Additional switches may also be fitted for various options, not only here but in other locations around the sprayer e.g. Quick Fill Pump, Pressure Washer, Induction Hopper Light.

SUCTION FILTER

A large capacity suction filter is fitted on the left-hand side of the machine behind the rear wheels. The 30-mesh element should be cleaned frequently to eliminate pump cavitation and loss of spraying pressure. The filter is fitted in the suction line between the rotary 'suction' tap and the pump. The rotary 'suction' tap may be turned to the ‘unmarked’ position to isolate liquid flow to the filter.

CHEMICAL INDUCTION HOPPER



This hopper is normally stowed at the rear of the machine alongside the spray pump and is of the Venturi type.

The booms should be lifted to enable the hopper to swing out and down to the working position.

Select Venturi position on the rotary 'pressure' tap. Select wash down ring on front left hand side of hopper, add chemical. Suction is controlled by a 2-way tap mounted at the bottom end of the hopper. The two-way tap should be closed after each induction process. Failure to close this tap will cause severe frothing within the spray tank as air is inducted through the Venturi.

To wash out chemical containers, select can wash position with 3-way tap on left-hand side of hopper. Wash out containers. Please ensure correct disposal of containers.

If a two speed spray pump is fitted, either speed will operate the Venturi but the fast speed will give the greater performance.

Ensure suction tap is fully closed and rotary 'pressure' tap is in spray position after use.

SPRAY PUMP

As standard on a 24m sprayer a hydraulically driven 300L/min 5 cylinder Immovilli pump is fitted. Providing the engine revs are at 1000 rpm or above, the spray pump will turn at approximately 540 rpm. This speed is automatically maintained irrespective of engine speed above 1000 rpm.

An optional ‘dual speed’ Immovilli 400L/min pump is available for applying higher rates on the 24m booms and is standard on all booms over this width. Speed 1 gives an output of 275L/min (375 RPM). Speed 2 gives the full output from the pump.

The majority of conventional spraying may be carried out at the slower pump speed with a corresponding increase in pump life.

When ‘self-filling’ there will be little increase in the fill speed on speed 2 compared to speed 1 due to limitations of the fittings and suction hose lengths.

SPRAY LINE STRAINER

This extra fine mesh filter is fitted directly before the boom manifold and is particularly useful for low volume work where crystallising chemical presents a problem.

Two elements are supplied - blue 50 mesh for conventional 200L/ha outputs. A finer red 80-mesh element for low volume work. The element may be removed for high output rates.

The tap fitted to the strainer bowl is used for flushing the filter clean. It should be used at least daily and before every change of chemical.

Please dispose of the flushing’s in an environmentally friendly manner

PRIME & PURGE SYSTEM

The system uses mini air valves on the nozzle bodies. The mini air valves will open under air pressure thus allowing the nozzle to spray, and close under spring pressure thus preventing any further passage of liquid to the nozzle.

During a 'Spray Off' situation, as in headland turns, filling, field entry etc., residual pumping pressure (approximately ½ Bar) is used to circulate liquid through the spray lines and back to tank via the purge line. No liquid is lost through the nozzles because, during 'spray off', the mini valves on the nozzle bodies are closed. Chemical is being continually agitated and cycled i.e. tank, pump, spray line, tank. All air will be purged from the spray lines and there will be no chemical 'hot spots'.

When 'Spray On' is selected, the spray pressure will instantly increase. The mini valves will open so that spraying starts and the purge valve closes so that no liquid returns to the tank via the spray line. 'Spray Off' reverses the process and instantly washes any accumulated material back to the tank.

NOTE: On 3 fold booms, Pump Speed 2 is better suited to produce effective priming and purging.

NOZZLE BODIES

The standard Nozzle Body fitted to Horizon sprayers is the Hypro Duo-React Twin Valve. This body allows fitment of up to four nozzles in the forward nozzle position (selectable by rotating the 4 way turret) and a single in the rearward position.

This body allows for two different sizes of liquid fertiliser nozzles for a wider range of application rates, operating each singly or both together. The single rearward outlet provides a suitable place for dribble bars or fertiliser caps.

SPRAY LINES

A single stainless steel ¾" Sprayline is a standard fit to all Horizon models. Each complete boom is normally fitted with seven Sprayline sections all controllable from the cab and each section is fitted with a 'Duo-React' nozzle body at ½m spacing.

The spray nozzles will normally be ISO colour coded with outputs to suit.

A 'Top Hat' filter is fitted above every spray tip. Please ensure the flow rate through the 'top hat' filter is adequate for the tip size.

CLEAN WATER TANK

A Clean Water Tank is fitted at the rear of the spray pack below the Main Spray Tank. It should be filled with clean water from a hose pipe via a Q/R coupling at the rear left-hand side of the machine. A simple 2-way tap controls water into the tank. Despite a large breather, this tank could be damaged if filling is carried out using a high capacity pump. There is sufficient water in this tank to enable the largest SAM Spray Tank to be washed with 10 litres of water for every square meter of tank surface area. A sight gauge is fitted to this tank.

MAIN ON / OFF VALVE

Situated at the rear of the Main Spray Tank on top of the manifold assembly. It is pneumatically operated in two directions and controls the flow of water to the tank.

When the valve is open (Spray Off) the water being pumped to the manifold takes the easiest route through the valve and back to the tank.

When the valve is closed (Spray On), the water is pressurised and so travels to the booms
This valve is fitted with a dual O-ring sealing system. If one of these O-rings should fail, liquid will be seen to leak out of the valve body from the drain hole. A seal kit is available. It is advisable that this valve be serviced prior to each spraying season simply by stripping it and lubricating the shaft and seals with petroleum jelly.

GULLWING SPRAY BOOMS

The SAM Gullwing folding boom of up to 36 metres in width is based on the well-proven space frame construction.

The folding mechanism is in-cab controlled with two Finger Tip switches (booms up to 24m) or three Finger Tip switches for booms larger than 24m

After lifting the boom clear of its rest, both main sections may be opened to 12m. Both sides may then be opened to their maximum. Folding 'in' is the reverse. If a Variable Geometry boom (Incline boom) is fitted then ensure that the V/G is lowered fully before folding in.

When Spraying at 24m with a 3 fold boom, ensure that the Boom Lock is UNLOCKED otherwise damage to the boom may result.

Occasionally independent end fold switches are provided when requested.

Never fold any boom section until the mating section has fully completed its total movement.

A 2-way breakback, usually of 2 metres in length, is incorporated at each boom end. Maintenance spent in this area is time well spent.

Single boom working is not possible with this boom although the boom may be used quite happily at 12 metres.

This boom normally has a 7 section shut off. Hydraulic, mechanical and pneumatic locking mechanisms are used to ensure boom integrity and safety.

The anti-yaw mechanism on this boom is based on rubber buffers OR a specialised hydraulic system. No adjustments are necessary in this area.

Boom straightness affects boom ride and as such, boom straightness should be checked following the Maintenance Schedule. Adjustment is simple –with the main sections fully open, loosen the hydraulic ram end and turn the ram shaft in the appropriate direction. Tighten the ram end.

Adjustment should be made to the V/G retaining chain if the boom is not horizontal when in the V/G is in the fully lowered position. This should take place according to the Maintenance Schedule.

BOOMS SHOULD NEVER BE FOLDED WHILE THE MACHINE IS MOVING.

It is extremely difficult to remove every trace of air from a hydraulic circuit. Every effort is made during manufacture to remove this air from the hydraulic system but with up to 13 cylinders on a boom, it is inevitable that air will become entrapped occasionally.

The procedure for bleeding is simple and as follows:

Start engine and run at 1000 rpm.

Simply loosening the hydraulic fittings and pressurizing the appropriate circuit may accomplish the bleeding of the boom fold cylinders.

It may be necessary to bleed the boom circuits more than once during the first few weeks of use.

The SAM boom suspension system is one of the finest in production with a hydraulic accumulator eliminating vertical shock loads. A short pendulum with gimbal capability stops tractor roll being transmitted to the boom.

Damping is provided with conventional shock absorbers. Anti-yaw is a standard fitment.

The boom can be contoured, inclined, raised/ lowered and folded hydraulically all from the driver's seat by electronic control.

The hydraulic spool fitted in the lift/lower section of the hydraulic valve bank is restricted in one direction. This valve will control the speed of descent of the booms, it will not affect the lifting speed. This valve is pre-set during manufacture and should not be adjusted.

GULLWING SPRAY BOOMS - 36M & 40M Supplement

A 36 metre Gullwing Spray Boom is capable of spraying at 24 metres and 12 metres.

Never fold a boom over 24m without the boom first being locked! Prior to any folding operation it would be advisable to momentarily select the opposite folding direction in order to release the load from the boom locks.

Periodic “loading” of the boom rams during spraying would be an advantage to boom integrity.

A 40 metre Gullwing Spray Boom uses all the components of the 36m boom but with a vertical folding 2m extension fitted between the break-back fixing plates.

Care

Extra care should be taken to prevent stress damage on this boom.

Although the boom is 50% wider than a conventional 24 metre boom, its stress factor increases by 225% for any similar operation.

The boom will be damaged by rapid acceleration, rapid deceleration and rapid turns.

All driver actions should be gentle and controlled. High constant spraying speeds will not damage the boom.

Care should be taken when folding a 40m boom. The boom should be lowered to it’s lowest position prior to vertically folding the 2m ends.

BOOM LOCK

All booms wider than 24m will have a boom lock fitted as standard. Generally, this is a horizontal ram on the bottom of the Backframe which will push the boom level to the machine. This ensures the boom will fold correctly especially if folding is taking place on a side slope.

The boom should be unlocked after unfolding prior to any spraying and locked prior to any folding.

The control for this function is fitted on the armrest. It consists of 2 push button switches. Indicator’s within the switches will indicate the Boom Lock status.

Occasionally the boom lock will be two hydraulic rams taking the place of conventional shock absorbers. In this case the boom should be leveled prior to locking before the folding takes place.

In all cases the boom must be unlocked before use.

VARIABLE GEOMETRY (INCLINE) - Optional

This feature allows each boom to be inclined upwards by approximately 10° from the 12m hinge and can improve spraying in valleys or on undulating land. Raising one or both booms will not normally affect the boom ride **but they should be lowered to their rest position prior to folding.**

HEADLAND CONTROL - Optional

When engaged, headland control automatically raises the boom away from the crop every time 'spray off' is operated. This removes the risk of expensive boom damage during particularly awkward headland turns. It is also one important function (boom lift) which the operator no longer has to worry about. As soon as 'spray on' is selected, the boom immediately drops to its previous spraying position.

The initial boom working height should be set with both 'headland control' and 'spray on' selected but without selecting any spray lines.

AUTOMATIC SPRAY CONTROL

All SAM machines are fitted with an Auto Spray Control System. Several different types of systems are used depending on the application and customer choice. A full set of operating instructions for the system fitted are provided.

DUAL RIDE - Optional

The operator has the choice of using the excellent hydro-pneumatic vehicle suspension system fitted to every SAM Sprayer or, at a flick of a switch, experience a far softer ride on the front suspension.

The difference between the two ride modes can only be appreciated on a rough field where the front axle has to work harder. Very little difference will be noticed on the road where axle movement is minimal.

DE-MOUNT - Optional

One person in a matter of minutes may easily de-mount the spray/spreader packs normally carried on the rear end of the vehicle.

With the engine stopped and parking brake applied, release the two bolts at the front of the spray pack. Release the rear-locking bolts and withdraw them as far as possible. Uncouple the pneumatic plugs on the right hand side of the machine behind the engine plus any electrical connections and also the hydraulic lines.

THESE HYDRAULIC PIPES MUST BE RE-CONNECTED TO EACH OTHER.

With the four jacking legs positioned at each corner of the spray pack, lift the pack until the Tank Drain Tap and Clean Water Tank clear the chassis. Drive forward slowly until the spray/spreader pack is left free standing.

Remounting is the reverse of the above.

NOTE: The support legs are not intended to take end thrust. If the machine and the spray/spreader pack are not correctly aligned when remounting, damage could occur to the legs.

BEWARE! When the spray pack or any other implement is removed, the power unit will become extremely front end heavy.

The power unit must never be driven in a de-mounted state except to manoeuvre to the next implement pack, which should be parked alongside.

For safety and to prevent both rear wheels lifting:

1. Only de-mount on a flat hard pad.

2. Never leave the power unit in a de-mounted state.

3. Never exceed 5 km/h (3 mph) when de-mounted.

4. Be extremely careful when stopping and reversing.

5. NEVER take the power unit on the public highway in a de-mounted state.

Any rear end equipment fitted by the customer MUST conform to the normal axle weight distribution. You are strongly advised to contact Sands Agricultural Machinery Ltd prior to any rear end implement adaptations.

In order for customers to conform with weight distribution requirements on additional rear end equipment, all additional de-mount chassis supplied by SAM Ltd have the capability of accepting up to 18 large (50kg) Ford front end weights.

SECTION 5

SPRAYING

FILLING THE SPRAY TANK

WITHOUT SELF FILL ATTACHMENT

1. Fill the tank with a minimum of 100 litres (20 gallons) of clean water through the charging hole filter basket.

2. Ensure the rotary 'Suction' tap is positioned to 'Spray Tank' and the rotary 'Pressure' tap should be positioned to 'Spray'.

3. With the engine running at 1000 rpm, engage the Spray Pump but with all other controls in the 'off' position.

4. Pour in the recommended quantity of chemical after relating the area to be sprayed with the tank size. The addition of chemical may be through the top charging hole or into the induction hopper.

5. Top up the tank with clean water, washing surplus chemical through the filter basket.

6. Allow the solution to circulate for a few minutes before attempting to spray.

WITH SELF FILL ATTACHMENT

1. Connect the suction hose to the 'self fill' inlet below the rotary taps.
   The other end of the hose should be placed in to / connected to a suitable water supply.

2. Position the rotary 'Suction' tap to 'Self Fill' and the 'Pressure' tap to Spray

3. With the engine running at 1000 rpm, engage the spray pump but with all other controls in the 'off' position.

4. When there is at least 100 litres (20 gallons) of water in the tank, pour in the recommended quantity of chemical after relating the area to be sprayed with the tank size. The addition of chemical may be through the top charging hole or into the induction hopper.

5. Continue filling with water until the tank is full, then:

6. Turn the rotary 'Suction' tap to the 'Spray Tank' position and disconnect the suction fill hose.

7. Allow the solution to circulate a few minutes before attempting to spray.

WASHING OUT THE SPRAY TANK

A Tank Washing facility is installed which enables the **EMPTY** tank and booms to be flushed with clean water prior to leaving the field.

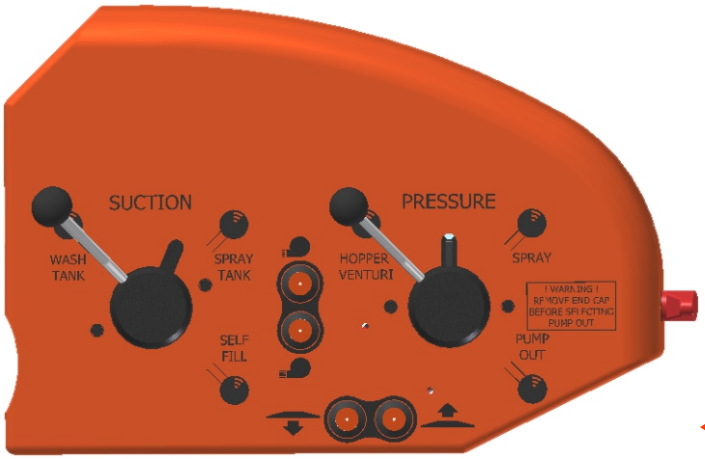
Tank washing can be accomplished in two ways - either from the operators seat or the rear left of the sprayer. If a 'double' wash is preferred (where by half the clean water is washed through in one operation and then the remaining half washed through in a second operation, then they will need to be performed from the rear of the sprayer so that the Clean Water Tank sight gauge is visible.

Performing Tank Wash from the rear of the sprayer:
Ensure the Automatic Spray Control is in 'manual mode', set the Main Spray on/off control to OFF and the spray pump to Pump Speed 2.
At the rear left of the sprayer, set the rotary 'suction' tap to wash tank and the 'pressure' tap to 'spray'. The clean water will be transferred into the Main Tank. On completion of the transfer rotate the suction tap to 'Spray Tank'.
If performing a 'double wash' rotate the suction tap back to 'Spray Tank' when the Clean Water Tank sight gauge shows 'half'.
Press the 'Tank Wash' button on the Armrest Control Console.
Manually increase the spray pressure of the Spray Control system (close the Butterfly Valve) until approx 4Bar is reached.
The Main Spray Tank and Spraylines are now being washed. When you are satisfied that the Tank and Spraylines are clean, reduce the pressure to zero and switch of the Tank Wash button.
Now switch on all the Boom Sections and the Main On/Off to ON. Also remember to select 'Forward Spray Nozzles or 'Both Forward & Rearward Spray Nozzles' (depending on the nozzle body fitted) to ensure all nozzles are washed.
Again increase the spray pressure manually to approx 4Bar - **great care should be taken not to over pressure the system!**
When Tank Washing is complete, reduce the spray pressure back to zero and switch off the Main On/Off, Spray Pump, Boom Sections etc.

Performing Tank Wash from the operators seat:
Ensure the Automatic Spray Control is in 'manual mode', set the Main Spray on/off control to OFF and the spray pump to Pump Speed 2.
Press the 'Clean Water Tank' button on the Armrest Control Console. The clean water will be transferred into the Main Tank. On completion of the transfer press the 'Main Spray Tank' button..
Press the 'Tank Wash' button.
Manually increase the spray pressure of the Spray Control system (close the Butterfly Valve) until approx 4Bar is reached.
The Main Spray Tank and Spraylines are now being washed. When you are satisfied that the Tank and Spraylines are clean, reduce the pressure to zero and switch of the Tank Wash button.
Now switch on all the Boom Sections and the Main On/Off to ON. Also remember to select 'Forward Spray Nozzles' or 'Both Forward & Rearward Spray Nozzles' (depending on the nozzle body fitted) to ensure all nozzles are washed.
Again increase the spray pressure manually to approx 4Bar - **great care should be taken not to over pressure the system!**
When Tank Washing is complete, reduce the spray pressure back to zero and switch off the Main On/Off, Spray Pump, Boom Sections etc.

The spraying system can now be considered 98% clean and will require only a quick flush through on returning to the yard.

Clean and replace the suction filter element.



5-2

PESTICIDE SPRAYING & THE ENVIRONMENT

Used correctly, pesticides do not pose any more of a threat than many other modern inventions. Used incorrectly or thoughtlessly then problems may occur.

As commercial users of pesticides, the following points should be observed as guidelines on the safe use of pesticides.

People living close to the intended area of pesticide operation should be advised so that they can take necessary action to prevent pets and livestock from straying into treated areas.

Where there are risks to grazing animals, the period over which they must be kept away from the treated area, as indicated on the product label, should be observed.

Do not spray hedge bottoms.

Do not spray pesticides near ditches, rivers, lakes or other watercourses.

Never empty tank or spray container washing's, surplus diluted tank contents or concentrated product into any waterway or drained area.

Never dispose of empty containers in ponds or other watercourses.

Do not fill spray tanks from watercourses without a suction fill non-return valve, which will prevent siphoning back of pesticide into the watercourse.

Select products that are specific to the pest or weed to be controlled.

Consider not treating boom width or part of boom width closest to boundary.

SPRAY DRIFT is the most common culprit in reported incidents of pesticides misuse. Drift is related to:

Spray quality

Wind velocity at spray nozzle height

Boom height

Stability of local atmospheric conditions

The following actions should be observed:

Listen to the weather forecast particularly wind speed and direction. The Met Office gives this as 'force' measured at 10m from the ground. Wind speed at boom height, the critical drift figure, will be roughly half this.

The safest conditions in which to spray is a steady force 2 light breeze blowing away from susceptible crops, open water or neighbours land.

Keep spray boom as low as possible, consistent with an even spray pattern.

Match spray quality to conditions - small drops are more likely to be caught by the wind.

If conditions are unsuitable or unpredictable, do not spray.

The Food and Environment Protection Act 1985 stipulates that users shall take all reasonable precautions to protect the health of human beings, creatures and plants, to safeguard the environment and, in particular, to avoid pollution to water.

PESTICIDE SPRAYING - FIELD CRAFT

Before any spraying takes place, check the following:

Is the pesticide the correct one for the crop?

Is the dose, volume or both correct?

Is the weather suitable at present and going to remain so? (You do not want half a tank of pesticide left should it rain.)

Ensure the wind speed and direction will not blow any drift to other crops, waterways, private gardens or members of the public.

If the above criteria are satisfactory, the following should be observed:

Always use acceptable methods of swathe matching (tramlines, marker pegs etc.)

Before starting to spray, correctly calibrate the machine.

Set the boom to the correct height. Spray fans or cones from alternate nozzles should just overlap above the target.

Spray round the headlands and reverse into the corners.

Spray the longest side first, if possible. If not, spray so that the wind takes the spray away from your spraying direction.

Whilst spraying keep a constant look out for blocked nozzles and a change in wind speed, direction etc.

USEFUL INFORMATION - PESTICIDE USE

The following website address is the official HSE website for Pesticides. It is recommended to visit and understand the information provided - http://www.pesticides.gov.uk/guidance/industries/pesticides

The following publications are recommended as useful references in the field of pesticides use.

Health and Safety Executive Booklets

- Crop Spraying AS6: Poisonous Chemicals on the Farm HS (G)2
- Prevention of Accidents AS12: Storage of Pesticides on the Farm As18
- Department of the Environment, Food and Rural Affairs: Guidelines for Applying Crop Protection Chemicals - Booklet 2272 published by HMSO
- Department of the Environment, Food and Rural Affairs: Guidelines for the Disposal of Unwanted Pesticides and Containers on Farms and Holdings published by DEFRA
- The UK Pesticide Guide (Annual) published by CAB/BCPC
- Revised Draft Code of Practice for the Agricultural & Commercial Horticultural Use of Pesticides published by DEFRA

Agricultural Training Board (ATB) Leaflets

- Controlling Weeds, Pests and Diseases in Crops
- Crop Spraying - Trainee Guide 3000-7/80 M9D2
- Preparing Field Crop Sprayers - Trainee Guide 1000-7/87 M9D1

Control of Substances Hazardous to Health Regulations 1988 Leaflets

- Introducing Assessment IND(G)64(L)
- Introducing COSHH IND(G)65(L)
- Hazard and Risk Explained IND(G)67(L)

SECTION 6

6.1 MAINTENANCE

6.2 Fuses for 3000, 3000E & 3500 Machine

CHECKS / SERVICE INTERVALS

To retain SAM, Deutz and Poclain warranty all original replacement parts must be used.
All Parts can be obtained from SAM, see back cover for Contact Details.

Item	SAM Part No.	After 1st Days Work - Check	Daily - Check	Weekly	Every 250 Hours - Check	Every 250 Hours - Replace	Every 500 Hours or 12 Months - Replace	Every 1000 Hours - Replace	12 Months - Check	Every 1500 Hours - Check	Every 2000 Hours - Replace -Request	24 Months - Replace
Wheel Nut Torque Settings (340ft/lbs)		◆	◆									
Axles Bolts + Track Rod Bolts		◆			◆							
Boom Alignment		◆			◆							
Boom Rests		◆			◆							
Main Fold Cylinder Lock Nuts		◆										
Drain Air System Reservoir			◆									
Tyre Pressures			◆									
Braking System					◆							
Steering System					◆							
Front Tripod Kyte + Panhard Rod					◆							
Grease All Points (excl Suction & Pressure Taps)				◆								
Grease Suction & Pressure Taps (1 pump from gun)									◆			
All Spray Pack Hydraulic Pressures										◆		
Hydraulic Suction Filter	10200					◆						
Hydraulic Return Filter	10201					◆						

CHECKS / SERVICE INTERVALS

To retain SAM, Deutz and Poclain warranty all original replacement parts must be used. All Parts can be obtained from SAM, see front for Contact details.

Item	SAM Part No.	After 1st Days Work - Check	Daily - Check	Weekly	Every 250 Hours - Check	Every 250 Hours - Replace	Every 500 Hours or 12 Months - Replace	Every 1000 Hours - Replace	12 Months - Check	Every 1500 Hours - Check	Every 2000 Hours - Replace - Request	24 Months - Replace
Deutz Engine Service											◆	
Power Unit Diesel Fuel Pre-Filter	04504438							◆				
Power Unit Diesel Fuel Filter (2x required)	1182672 (x2)							◆				
Power Unit Oil + Oil Filter	SAM 10W/40 Low SAPS 10536						◆					
Power Unit Outer Air Filter - Inner Filter	10325 10326							◆				
Cab Air Filter + Wash Internal Filter	10545					◆						
Air System Lubricator Oil + Dryer Filter	1794 (1L) or Tellus 37		◆				◆					
Spray Nozzle Diaphrams	5865036 For FS only Not DR						◆					
Fold Cylinder End Bushes									◆			
Boom Locks									◆			
Power Unit Alternator / Fan Belt	01183382								◆		◆	
Power Unit Air Conditioning Belt	01180468								◆		◆	
Hydraulic Oil	SAM 10532										◆	
Power Unit Coolant	SAM 10537											◆
Air Conditioning Gas Quantity - 1300grams of R134A												

6.1-2

CAB CLEAN AIR FILTER REPLACEMENT

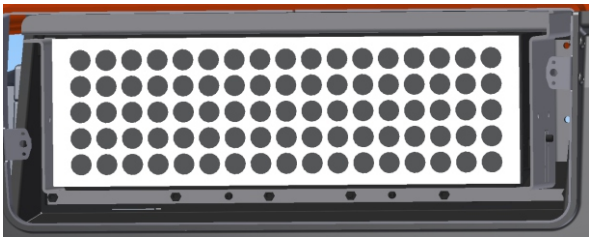
The Cab Clean Air Filter (Category 4 Compliant) is located above the entrance door to the Cab.

It is vitally important to replace the filter every 250 Hours or when the Air Qaulity indicator (located within the roof lining) is illuminated (with doors closed), which ever comes first. Failure to adhere to the schedule could result in serious health problems.

To replace the filter perform the following steps **(ensure suitable Personal Protection Equipment is worn!)**:

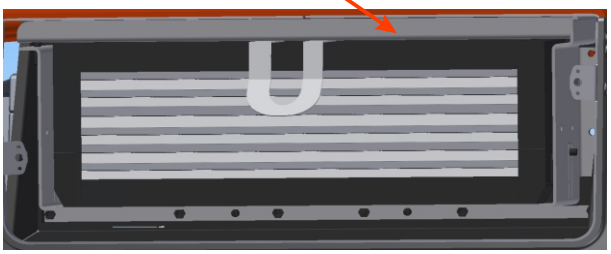
Loosen the two air filter Outer Cover retaining screws (1/4 turn) and lift away the cover.

Remove the Perforated Retaining Grid (it simply un-clips from around the edges)



Remove the Dust Filter from the front of the Filter assembly and thoroughly clean it.

Swing out the Top Retaining Bar and then lift and remove the old Filter. Dispose of contaminated filter responsibly!



Fit the new filter in place ensuring the handle and pleats face out, ensuring the filter is located properly, swing the Top Retaining Bar fully home.

Refit the CLEAN and DRY Dust Filter.
Refit the Perforated Retaining Grid ensuring it is secured at the edges.
Replace the Outer Cover, simply pressing the retaining screws home (no need to turn).

Remove the Interior Air Filter Panel and thoroughly clean the Dust Filter.
Replace the CLEAN and DRY Dust Filter and then replace the Panel.

SETTINGS / SPECIFICATIONS / RATINGS

Steering Unit Pressure Relief	170 Bar (2450 psi)
Hydrostatic Pump Pressure Relief	420 Bar (6100 psi)
Boost Pump Working Pressure	30 Bar (435 psi)
Auxiliary Spray - Pack Hydraulic Pressure	170 Bar (2450 psi) - (Maximum Continuous)

Wheel Nut Torque Settings

3000L MHP11 (Boosted) Studs M20 x 1.5	600Nm (443lbs.Ft)
3500L MHP11 (Boosted) Studs M20 x 1.5	600Nm (443lbs.Ft)
4000L MS18-P Studs M20 x 1.5	600Nm (443lbs.Ft)
4000L MS18-P C11-25 Brakes Studs M22 x 1.5	695Nm (513lbs.Ft)
4000L MS18 - CT Brake (Boosted) Studs M22 x 1.5	695Nm (513lbs.Ft)
5500L MS18 & MW24 Studs M20 x 1.5	600Nm (443lbs.Ft)
5500L / 6000L MS18 - CT Brake (Boosted) & MHP20 Studs M22 x 1.5	695Nm (513lbs.Ft)

Horizon 3000, 4000, 5500 & 6000 - Tyre Pressures (popular sizes / pressures)

Tyre Size (metric)	Tyre Size (Imperial)	Pressure (Bar)	Pressure (PSI)
380/85 R34 (3000/4000)	14.9 x 34	2.0	29
420/85 R34 (5500/6000)	16.9 x 34	2.0	29

Tyre Size (metric)	Pressure (Bar)	Pressure (PSI)
600/60 R30 (3000)	1.0	15
VF600/60 R30 (4000)	1.6	23
VF600/60 R34 (5500/6000)	1.6	23
710/55 R30 (5500/6000)	1.9	28

The tyre pressures above are for guide purposes only, Please contact your local Michelin representative for specific advice:-
Chris Eakin - NI & ROI:- 07968 307674
Tony Powell: - 07890 251075
Phil Barker:- 07968 318015
Ian Whitwell:- 07973 811339
Robert Shaw:- 07967 475724
Tom Saunders:- 07973 811713

Driving Operation and Care,
The sprayer is designed to be filled on site, with maximum load in the field, with travel to and from the farm unladen. Where this is not possible, care must be taken to work within the parameters of the particular tyre option fitted. Where maximum load is needed from farm to field, a compromise in vehicle performance may be necessary.

Bulbs

Bulb Location	Volts	Watts	E.C.E No.
High Beams	12V	55W	H7
Low Beams	12V	55W	H7
Day Running Lights (LED)	12V	-	-
Front Side Lights (LED)	12V	-	-
Front Indicators (LED)	12V	-	-
Side Repeaters (LED)	12V	-	-
Roof Work Lights (HID 6000K)	12V	35W	H3
Roof Beacons	12V	55W	H1
Rear Tail Lights (LED)	12V	-	-
Rear Brake Lights (LED)	12V	-	-
Rear Indicators (LED)	12V	-	-

LUBRICATION

GREASE - the following items should be regularly lubricated with a **lithium** based gun grease. A sodium-based grease is water-soluble and could be washed away by rain / cleaning down, whereas a lithium-based grease is not.

Boom pendulum	Break-Back
Boom hinges	Front axle tripod bearing
Rear axle	Front axle
Ram clevis pin	Roger rail roller pins
Boom adjusters	Cylinder ball ends

The 'Suction' and 'Pressure' rotary taps should be lubricated with just 'ONE' pump of a **silicon** based gun grease 'ONCE' per year. Over lubrication of these taps will destroy the seals and render the taps inoperable.

LUBRICATING OIL - An SAE 30-grade mineral oil should be used to lubricate:

Imovilli Spray pumps

LUBRICATING OIL - Shell Tellus 37 Oil should be used to lubricate:

Air system (also see section on Air System)

ENGINE - Please refer to the Deutz Operating Manual for lubrication information.

HYDRAULIC OIL - Only a good quality hydraulic oil type HV46 that conforms to AFNOR NF 48600 or ISO 3448 - CETOP RP 75 is suitable.

ANY OTHER GRADE OR SPECIFICATION OF OIL WILL CAUSE SERIOUS DAMAGE TO THE TRANSMISSION SYSTEM.
A Universal oil is NOT ACCEPTABLE.

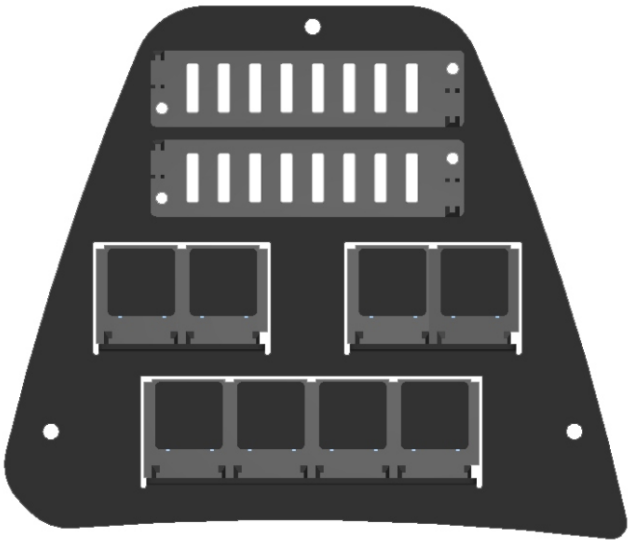
SAM Ltd cannot emphasize enough how important it is to use the correct grade of hydraulic oil (HV46) in the machine.

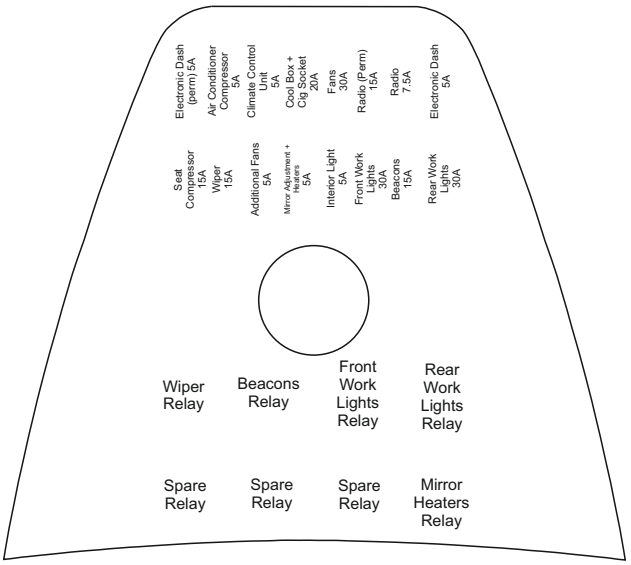
This machine was supplied filled with a high quality HV46 oil.

Many oil companies now run a regular testing service for their customers and we, as a company, would advocate its use. We would recommend an oil sample be taken from the tank – not drain oil from the filters during the filter change operation – analysed and the findings noted. Potential failures could then be identified at an early stage.

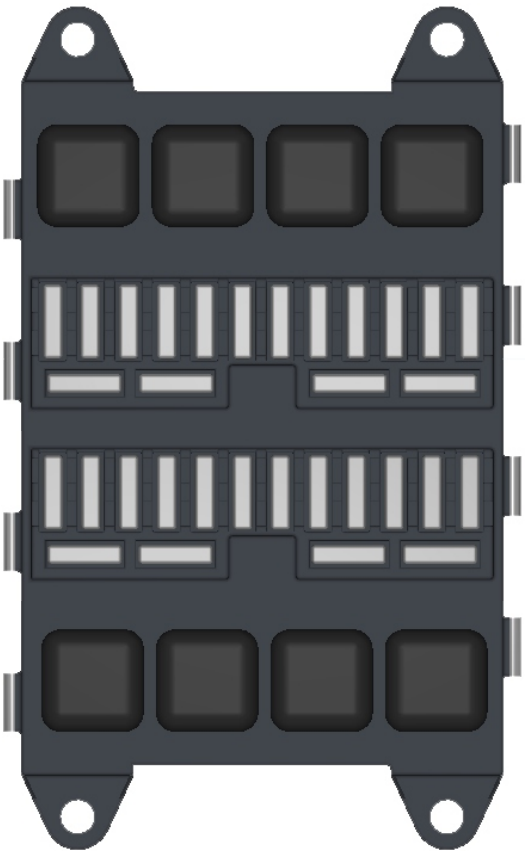
FUSES & RELAYS

Over Head Compartment





Right Hand Lower Compartment



HORN RELAY

DUAL RIDE VALVE RELAY

SPRAY CONTROLLER TIMER RELAY

4WS VALVE RELAY

REVERSE LIGHTS 5A
OPT. FLOW METER 7.5A
OPT. BOUT MARKER 5A
4WS SENSOR 2A
POCLAIN ECU 25A
ARM REST CONSOLE 5A
DUAL RIDE 5A
4WS VALVE 5A
STOP/BRAKE LIGHTS 5A
DAY RUNNING LIGHTS 3A
4WS SENSORS 2A
HORN 7.5A

SPRAY CONTROLLER SECONDARY 5A (PERM)
ARM REST CONSOLE 5A (PERM)
BOOM LEVELLING 15A (PERM)
SPRAY CONTROLLER PRIMARY 25A (PERM)

SIDE LIGHTS 3A (PERM)
HAZARDS 10A (PERM)
DEUTZ ENGINE ECU 30A (PERM)
STEERING COLUMN 5A (PERM)
DIPPED BEAMS 10A
WIPERS 10A
HORN & WASHERS 10A
MAIN BEAMS 10A
UREA TANK 5A
UREA TANK 15A
EGR 5A
NOX SENSORS 15A

L/R INDICATORS 10A
OPT. GEO STEER 5A
OPT. SIMPLE WASH DOWN 15A
OPT. STOCKS (SINGLE 20A)

L/H INDICATOR JOYSTICK RELAY

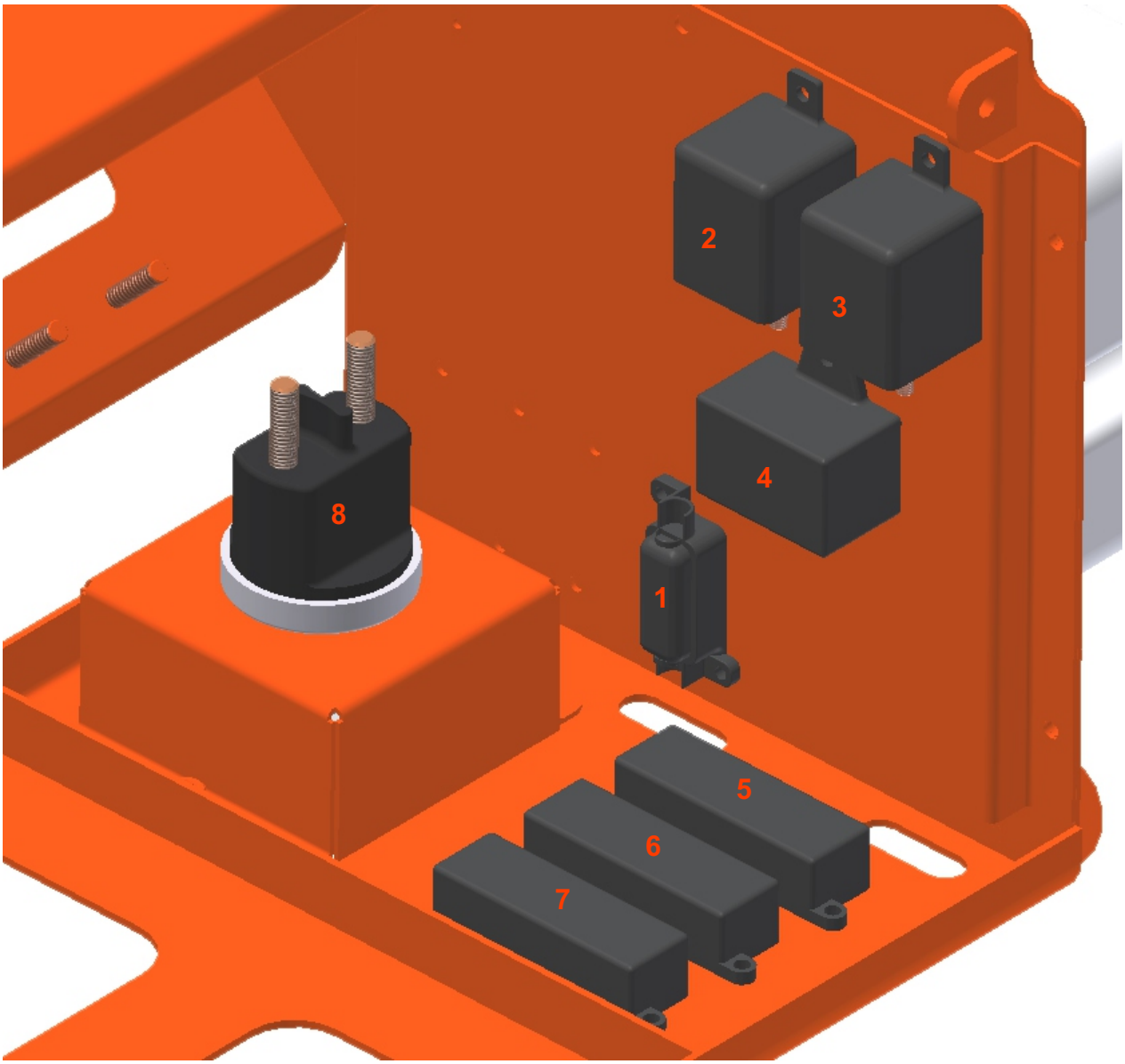
R/H INDICATOR JOYSTICK RELAY

HYD SLIDING AXLES STEERING CUT OFF RELAY

DEUTZ NEUTRAL START RELAY

FUSES & RELAYS Cont.....

Battery Compartment



1. 30A FUSE - Eat System
2. RELAY - Cab Supply (Ignition)
3. RELAY - Rear End Supply (Ignition)
4. Connection Terminal Box
5. 125A FUSE - Cab Supply (Ignition)
6. 125A FUSE - Cab Supply (Perm)
7. 125A FUSE - Rear End Supply (Ignition)
8. Battery Isolator

TROUBLE SHOOTING / FAULT FINDING

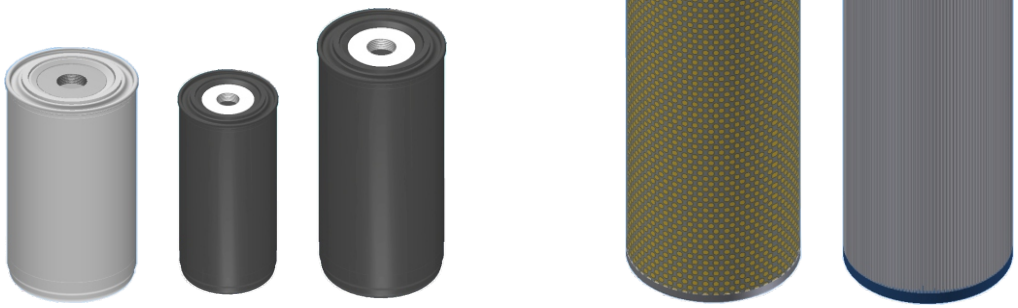
Listed below are a number of common sprayer faults with their 'causes' and 'cures'. We hope these cures will assist you in maintaining your sprayer in a good working condition.

FAULT	CAUSE	CURE
Loss of / No Spray Pressure.	Blocked Main Filter Or Blocked Pressure Filter.	Check / clean Filters.
Spray Pressure will not regulate.	Spray Manifold Pressure Sensor faulty.	Check / replace Sensor.
Fine Foam in Spray Tank.	Air leak in Suction side plumbing.	Check / repair leaks.
Course Foam in Spray Tank.	Excessive agitation during filling.	Reduce agitation.
Streaks in spray fans or cones.	Partially blocked or worn Nozzles.	Check / clean / replace Nozzles.
Narrow spray fans / cones.	Spray Pressure too low.	Adjust Pressure correctly.
Rear end Hydraulics will not function.	Pressure Relief Valve open / Load Sense System fault / CANBUS fault / rear power loss.	Check Relief Valve / Load Sense System Fault - contact SAM / CANBUS Fault - contact SAM / Rear power loss - check relay & fuse, (refer to page 51). If fuse blown investigate & fix cause.
Booms will not fold / unfold.	Boom Locks jammed / Control relay or fuse fault.	Free Boom Locks, clean & readjust / Control relay or fuse fault - contact SAM.
Individual or group of rear end Hydraulics will not operate.	Control relay or fuse fault.	Control relay or fuse fault - contact SAM
Vehicle Horn Sounds without pressing button on Column Stalk	Hydraulic Oil Temperature too high / Hydraulic Oil Level too low (refer to page 33).	Allow to cool by reducing load, check & clean cooling pack / check for leaks & top up to recommended level.
Knocking sound from underneath Cab.	Worn Front Axle Tripod Bearing.	**REPLACE IMMEDIATELY !!** - DO NOT continue to use Sprayer until it has been replaced!

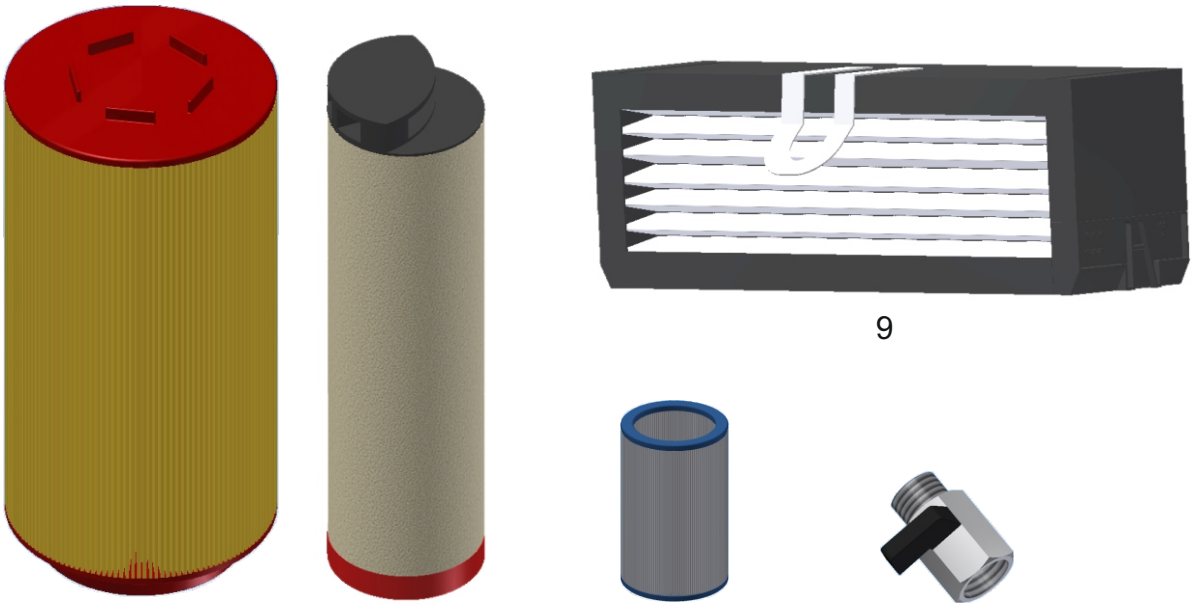
TROUBLE SHOOTING / FAULT FINDING - ENGINE FAULT CODES

FAULT	CAUSE	CURE
SPN: 97 FMI: 12	Water in Fuel	Replace Diesel Pre Filter, Fuel Filters, Drain Tank & Replace with Fresh Fuel
SPN: 523919 FMI: 2	Air Filter Blocked	Clean Housing, Replace Outer Air Filter, Replace Inner Filter.
SPN: 111 FMI: 1	Low Coolant Level	Check / Repair Leaks & Top up to correct Level. If no Leaks found contact SAM / Deutz.
SPN: 3520 FMI: 2	Add Blue Quality Low	Drain Add Blue Tank & refill with |Deutz Specification Urea.
SPN: 3520 FMI: 2	Add Blue Quality Low	Drain Add Blue Tank & refill with |Deutz Specification Urea.
SPN: 524141 FMI: 7	Engine Shut Off Demand Ignored	This Error is usually accompanies another Active Fault. Fixing the Active Fault will solve this Error.

SPARE PARTS REFERENCE -
CAB / POWER UNIT / HYDRAULIC / AIR



1 2 3 4 5 6



7 8 9 10 11

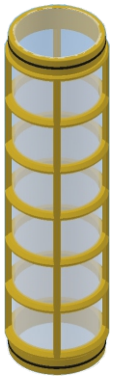
1	Power Unit Diesel Fuel Pre-Filter	04504438
2	Power Unit Diesel Fuel Filter	10192 (2x Required)
3	Power Unit Oil Filter	01183574
4		
5	Hydraulic Oil Suction Filter	10200
6	Hydraulic Oil Return Filter	10201
7	Power Unit Outer Air Filter	04193517
8	Power Unit Inner Air Filter	02243946
9	Cab Clean Air Carbon Filter	10363
10	Air Dryer Filter	10379
11	Air Reservoir Drain Tap	04910413

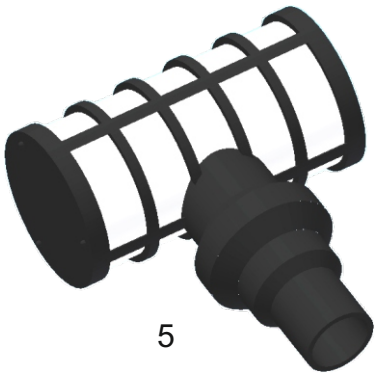
SPARE PARTS REFERENCE - SPRAY PACK

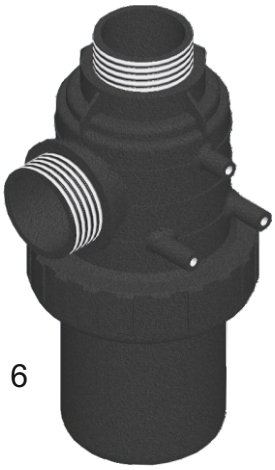

1


2


3


4


5

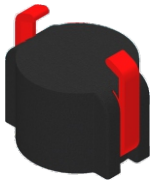

6


8


10


11


12

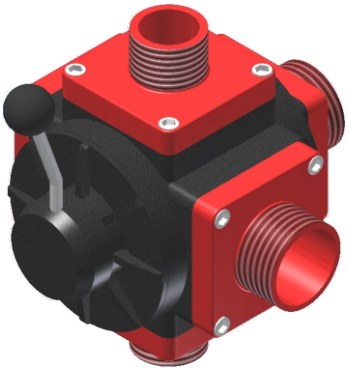

13


7


9

1	Main Filter 50 Mesh	317003030
2	Main Filter 32 Mesh	49A628BK
3	Pressure Filter 50 Mesh	21A63150
4	Pressure Filter 80 Mesh	21A63180
5	Self-Fill Pipe Filter c/w Non-Return Valve	0825A369
6	Main Filter Assembly	317082
7	O-Ring Main Filter	4900A519
8	Pressure Filter Assembly	20NF62550
9	O-Ring Pressure Filter	21G10090
10	End Cap (Snaplock)	02200P20
11	Hose Tail (Snaplock)	02200C20
12	End Cap (Hiplock)	Z00CAP
13	Hose Tail (Hiplock)	200C

SPARE PARTS REFERENCE -
SPRAY PACK Cont.....



1 & 2

3

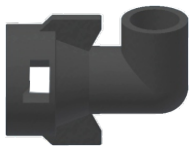
4

5

6,7,8 & 9

10 & 11

12



13

14

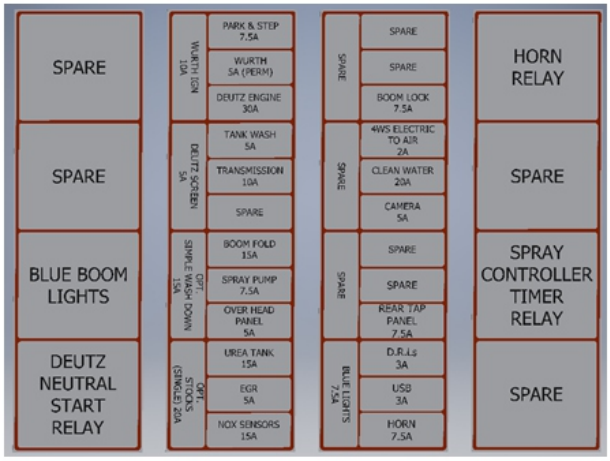
15

1	2" Rotary Tap (Pressure)	1003
2	2" Rotary Tap (Suction)	1021
3	Mixing Bowl Tap	VSMT200
4	Main ON / OFF Valve	43SAM112
5	Boom Section ON / OFF	43SAM34
6	3/4" Triplet Nozzle Body (complete)	401255424510
7	3/4" Single Nozzle Body (complete)	402CR103
8	3/4" Quad Nozzle Body(complete)	4064757F
9	3/4" Quin Nozzle Body (complete)	4064957F
10	ISO Fan Cap Seal	CP19438-EPR
11	Flow Stop Diaphragm	5865036
12	ISO Fan Cap	CP25611-1-NY
13	End Cap (Sprayline)	01402909
14	Flow Stop c/w Diaphragm	424510
15	3/4" Duo-React Nozzle Body (complete)	42141503V

FUSES - 3000 MACHINE

SPARE	WIPER MOTOR 15A	HORN / WASH WIPE 10A	SPARE
INDICATORS 10A	SPARE	SPARE	ROOF IGNITION 15A
BRAKE LIGHTS 1 A	CAB MAIN IGNITION 15A	SPARE	INSTRUMENT CLUSTER 10A

Steering Column Fuse Box



Cab Fuse Box
Right hand lower compartment

SPARE	SPARE
DIPPED BEAM 10A	MAIN BEAM 10A
SIDE LIGHTS 7.5A	ILLUMINATION 7.5A

Steering Column Fuse Box, Lower

Specialist Suppliers of Agricultural Sprayers, Service and Parts

SANDS AGRICULTURAL MACHINERY Ltd
Main Road, Brunstead,
Stalham, Norwich, Norfolk NR12 9ER
Tel: 01692 580522
Fax: 01692 580961
Email: sales@samltd.co.uk
Website: www.samltd.co.uk