Product guide

# SARITOR

## 4000 · 5000

HARDI

The Sprayer

# Product guide

Content



HIN MARKETING
-02-2014

# Unique summary description


A new generation of SARITOR with 4WD hydrostatic transmission delivers power, performance and application precision from pump to nozzle.

SARITOR sets new standards in row-crop and broad acre spraying and is HARDI-build from the ground up offering 1100 or 1300 gallon capacity with 88 to 132 ft. TERRA FORCE booms.

SARITOR provides the highest level of operator efficiency, comfort and control. The spacious cab offers an uninterrupted view of the crop to the front and sides, even with the booms folded. The SARITOR with infinitely variable four-wheel drive hydrostatic transmission delivers power, performance and the traction to stay on top and in front of the spray program.

Crop clearance is 54 inches and track width hydraulically adjusted from 120 to 157.5 inches providing a large stable platform for boom stability.

Four ride level air bag suspension elements and hydraulic shock absorbers provide smooth spray performance and exceptional operator comfort.

A sturdy hydraulic fold down ladder and wide walkway with safety hand rails allows easy access to the cab. The cab is large, spacious and uncluttered with generous room for the operator and trainer.

The cab is quiet enough to hold mobile phone conversation and the ride is comfortable. Visibility in all directions is exceptional for this level of sprayer.

The joystick hydrostatic control and SprayCenter are attached to and move in unison with the driver's seat. The HC 9500 and engine management displays are ideally located to the right of the drivers forward view, but within easy reach.

The SprayCenter switching is logically placed and grouped for easy fingertip operation. It is illuminated for night use.

The SARITOR's fluid system delivers the target rate without lag whether sections are switched on or off, changing speed or turning in or out of headlands.

Advanced fluid dynamics and rate control processes are employed to deliver fast response and accurate target rate application.

This Product guide provides a marketing tool that concentrates more on technical information than normal brochure material.

Confidential

This is your personal sample of the SARITOR Product guide and should be used as your personal sales tool - please treat it confidentially.

Date: _____

Signature: _____

# The Sprayer



## Spraying efficiency

**Built to spray** user friendly, excellent spray application

**1100 or 1300 gal** integrated tank and chassis, fully draining, easy cleaned

**High capacity** simple and reliable fluid system Up to 170 gal/min

**Easy control** of engine revs & fluid system from cab or ground, easy flush with low residual volume

**135 gal rinse tank** to flush and clean fluid system

**TurboFiller** allows fast efficient chemical mixing and transfer

**High clearance** Elevated visibility & minimizes crop damage

**AutoSectionControl** Save chemicals by minimizing over spray

**TERRA FORCE** boom 88, 90, 100, 120 & 132 ft.

**AutoTerrain** boom stability and boom auto height control system (std)

**HARDI nozzles** for precise application

**FastFill** for quick, efficient loading of Main Tank

## Operation & Performance

**Engine power** through large HP with high torque

**Hydrostatic 4WD** transmission, electronic management, smooth operation & optimized fuel consumption

**Cruise control** set-and-forget spraying speed

**Air bag suspension** ride level air compensation

**Cab** view to the boom and field is excellent

**Track width** hydraulically adjustable from 120 to 157.5 inches

**Traction control** power to pull uphill or down

**Wet disc brakes** In wheel hub are long life and maintenance free

**Anti-Slip** traction control system

**Controls** for engine & fluid controlled from ground

**Mudguards** keep the sprayer clean

**Easy service** access to all fluid system, engine and transmission components

**Fluid system** allows user to flush and clean from the cab and the ground

**Access** via ladder and platform provides wide safe, access to the cab and inspection platform

## Comfort

**Cab** is spacious, uncluttered, comfortable, with wide windshield, uninterrupted visibility, low noise, unprecedented spraying control

**Seat** fully adjustable high back, air suspension seat with full width instructor's seat

**Platform** provides wide, easy cab & tanks access

**Climate control** AC set-and-forget

**Single terminal** multi-function application control

**Safety** carbon and dust filtration

**Pneumatic suspension** for smooth operator ride and better boom performance

**TERRA FORCE boom** rear-mounted for better road vision and reduced contamination of the sprayer

## Quality & reliability

**35 years specialist experience** with reliable choice of components

**High quality chassis** designed to flex

**Heavy duty** construction is robust and reliable

**Cummins engine** has world-wide service network

**Transmission** Danfoss low maintenance hydrostatic 4WD

**"Run-dry" HARDI centrifugal pump** can run dry without damage

**TERRA FORCE** truss boom construction

**Surface treatment** with high quality finish

**Service** through trained service technicians

**High resale value.** HARDI sprayers return higher second hand market values

# Key points

**High performance**
4WD hydrostatic Danfoss H1 Transmission delivers a new level of performance with reduced fuel consumption and high operator comfort

SARITOR has integrated 1100 or 1300 gallon tank, chassis and high volume fluid system.

It is operator friendly, reliable and built for performance. The fluid system is controlled from both the cab and from the ground. Ground clearance is 54 inches and the track width is adjustable from 120 to 157.5 inches.

**Cab, platform & ride**
Four ride-level air bag suspension elements and hydraulic shock absorbers provide smooth spray performance and exceptional operator comfort. A sturdy hydraulic fold down ladder and wide walkway with safety hand rails allows easy access to the cab.

The cab is generous and uncluttered with ample room for the operator and instructor. Visibility in all directions is exceptional.

**DynamicFluid4 liquid system**
A powerful preemptive application rate control system meets the demands of modern precision farming practices. High speed spraying with regular changes in forward speed, auto section control and variable rate application are challenges easily managed by DynamicFluid4

Flow, pressure and pump rpm are monitored and with advanced algorithms the pump speed is varied through proportional hydraulic to deliver preemptive rate control capability.

Traditionally fluid systems start regulating after the nozzles are turned on then chase the rate. DynamicFluid4 holds the target rate whether sections are switched on or off, changing speed or turning in or out of headlands.

**Boom performance**
The TERRA FORCE (steel) booms with AutoTerrain are built strong utilizing three dimensional truss construction for high performance and are available in sizes 88 to 132 ft.

AutoTerrain is a preemptive stability and auto height control system that deals with the cause of boom movement and enables a lower boom height and provides better drift control.

**WorkZone**
The WorkZone console provides switching for electric motor drive valves that control main or rinse tank, venturi, pump on/off, tank rinse nozzles, boom nozzles, engine rpm and agitation. An LED identifies which valve is in operation.

**Electronic tank gauge**
A load cell transducer in the sump of the tank provides accurate in cab read out of the tank volume.

**Pump**
The HARDI branded centrifugal pump combines the Ace MAX series features and OasisTM WetSeal technology. The WetSeal isolates the seals from the pumped chemicals, fertilizer and abrasive materials preventing premature and run dry failure.

**TurboFiller**
Loading chemicals is safe and easy with the high capacity TurboFiller. Fixed to a parallelogram suspension arm the TurboFiller is lowered into position to provide waist high access to the hopper. The TurboDeflector in the bottom of the hopper generates the vortex mixing action. The lid has a dust proof seal and the operating controls are positioned on the left side of the hopper.

**Integrated electronics**
Everything you need is at your fingertips. All managed through the HC 9500 12.1" display, SprayCenter console and multi-function joystick provides the highest level of performance and application precision. The HC 9500 split screen provides guidance mapping, auto steer, auto section, application rate, tank content, boom height, spray records, field notes and variable rate application.

**Hydrostatic drive & cruise control**
A fully integrated Danfoss hydrostatic 4WD transmission, powered by a Cummins QSB 6.7 l 275 hp (205 kW) engine is capable of 33 mph. The 4WD hydrostatic transmission technology optimizes performance providing speed, torque and progressive acceleration. When cruise control is selected, the power and bias to maintain the operating speed is automatically managed.

# Core strength



Domex steel 10 mm thick

Yield 700 Mpa

229 mm cross section

12 degree flex end to end

Flexible, light weight

The chassis is made from high tensile steel (DOMEX® Swedish steel) to provide low weight, strength and flexibility. The U shape chassis rails with bolted cross members is a technology derived from the heavy vehicles industry and offers incredible flexibility.

HARDI utilizes this modern chassis assembling technique to maximise performance, comfort and ride at high speeds on road and in the field.

All the main components like engine, main tank, rinsing tank, pump etc, have been placed to optimize the weight distribution between the front and rear axles.

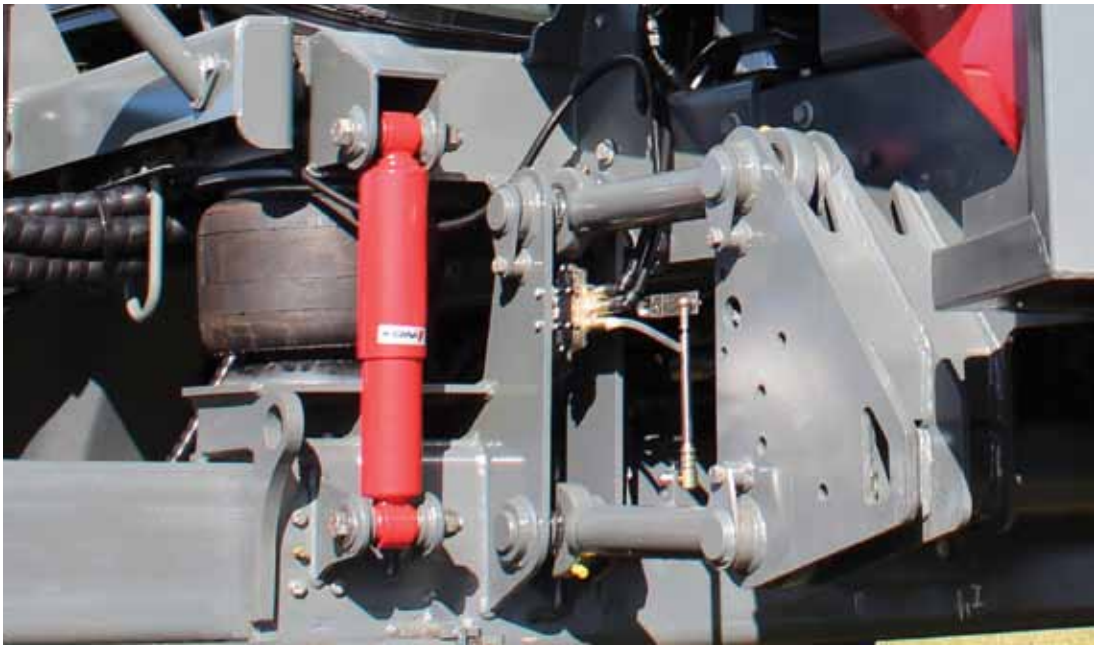
The depth of the chassis rails provides secure attachment of the suspension elements, hydraulic components and routing for hydraulic hoses, fluid hoses and electrical.

# Performance

| SARITOR | |
|---|---|
| Capacity | 1100 / 1300 gallon |
| Boom | 88 ft., 90 ft., 100 ft., 120 ft. and 132 ft. |
| Engine | Cummins 275 Hp (205 kW) |
| Standard wheel | 380/90 R50 |
| Hydraulic pump | Danfoss 2 x 115 cc |
| Wheel motors | Danfoss H1 110 cc |
| Brake system | Internal wet disc brakes |
| Track width inches | 120 – 157.5 hydraulically adjustable |
| Ground clearance | 54” - 380/90 R50 |
| Max forward speed | 33 mph |

# Suspension

- Smooth ride
- Air bag suspension
- Ride level control
- Heavy duty shock absorbers
- Trailing arm axles design
- On board Cummins air compressor
- Anti-sway torsion control



Auto level air ride suspension combined with the flexible high strength chassis delivers an enviable ride for the operator.

The on board Cummins compressor provides ample air capacity for reliable performance.

Firestone air springs in conjunction with Koni shock absorbers matched to the front and rear axles gives reliable ride and comfort in all types of conditions

**Front axle suspension**
Independent ride level air bag suspension with two heavy duty shock absorbers provides exceptional ride and performance.

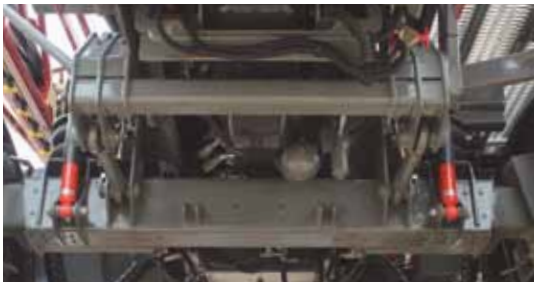
The trailing parallelogram link arm suspended front axle is allowed to oscillate through radial bushings while a panard rod maintains front axle alignment.

**Rear axle suspension**
The heavy duty trailing link-arm suspended rear axle is equipped with independent air bag suspension for smooth ride and performance.

A panard rod in conjunction with urethane-bushed parallelogram link arms maintain axle alignment delivering positive horsepower displacement to the ground .

A heavy duty anti-sway torsion bar reduces the chassis roll for exceptional boom stability.

Two heavy duty shock absorbers reduce shock transfer improving boom ride and operator comfort.



# Axle track width



Independent on-the-go track adjustment

120 to 157.5 in track adjustable (tire 380/90 R50)

Mechanical stops can be set

Increases stability

Better boom performance

Quick and easy hydraulic track width adjustment for on road transport or in field operation.

**On-the-go adjustment**
Individual 120 to 157.5 inch adjustable axles suits a variety of row crop applications and provides enhancing boom stability.

**Low maintenance**
Twelve hardened poly-slide pads per axle provide easy maintenance and secure smooth axle adjustments from narrow to wide track settings.

**Powerful**
A hydraulic cylinder is protected inside each axle and provides smooth and immediate adjustment.

**Independent**
There are four separate switches to control each axle to independently adjust wheel track to the crop, reduce soil compaction and dust generation.

Track width adjustment is undertaken while the SARITOR is slowly moving and mechanical stops can be set to limit travel.

**Mudguards 150º**
These move in and out with the axles, protecting the sprayer chassis and tank from splash and stones (standard width 20”).

**Track width link to tire size**

| Tire size | Minimum (in) | Maximum (in) |
|---|---|---|
| 380/90 R50 | 118.1 | 157.5 |
| 480/90 R50 | 118 | 157.3 |
| 520/85 R46 | 120.3 | 159.7 |

# Tires and mudguards

The SARITOR is available with a variety of tire options for various field and road conditions

380/90 R50 std.

Optional tires:

480/90 R50
520/85 R46

SARITOR 5000 has 380/90 R50" tires giving 54 inches of crop clearance.

Optional tire sizes for SARITOR:

-480/90 R50
-520/85 R46

**Mudguards 150º**
Mudguards and mud flaps protect the machine from dirt and debris in all field and road conditions. Standard width 20 inches

Mudguards are fixed to the wheel drive housing so they follow the wheels during the track width adjustment or steering.

They are easy to clean. Rear mudguards incorporate rear traffic lighting and over-width sign.

## Tire sizes & ground clearance

**Weight full in transport 5000 - 120' TERRA FORCE – total 41,967 lb – front 18,154 lb – rear 23,813 lb**

| Tire size | Diameter inches | Width mm | Width inches | Ground clearance in | Rolling circ. in. | Max. load cap. lb 30 mph | Min to max track inches | Rim offset inches |
|---|---|---|---|---|---|---|---|---|
| 380/90 R50 | 76.3 | 381 | 15 | 55.6 | 230 | 11,700 | 118.1 - 157.5 | 0 |
| 480/90 R50 | 80.7 | 483 | 19 | 55.6 | 243 | 11,400 | 118 - 157.3 | 0 |
| 520/85 R46 | 83.3 | 516 | 20.3 | 56 | 249 | 12,790 | 120.3 - 159.7 | - 3.5 |

*The named brands and types of tires are the standard specifications and can be changed without notice.*

# 4-wheel drive / 2 wheel steering



- 4 wheel drive
- Hydrostatic transmission
- Intelligent electronics
- Optimized torque
- Orbital steering
- Designed for auto steering

The 4WD hydrostatic transmission is optimized for electric-hydraulic control and is coupled to intelligent electronics using the Danfoss graphics terminal DP 250 (3.8” LCD).

The intelligent electronics is integrated into the Cummins “CAN” communication platform to ensure the engine power is optimized to the wheel motor torque which delivers smooth performance.

The transmission micro controller measures the speed in each wheel motor 86 times per revolution to optimize drive torque and to minimize slippage.

In field-mode the system manages the pump displacement and individual wheel motor output based on the conditions, gradients and load.

The wheel motor output is matched to the engine torque, optimizing fuel efficiency and the transmission operating pressure.

**The Danfoss electronic orbital**
Finger-tip light steering system. Designed for auto steering the steerind cylinders have built in phasing.

The steering cylinders are well protected behind the axle beams, but are within easy access for service and lubrication

"Pumps Danfoss H1 115 cc (x2) Motors Danfoss H1 110 cc (x4)"

# Turning circle

Turning circle
67 ft. with widest tires

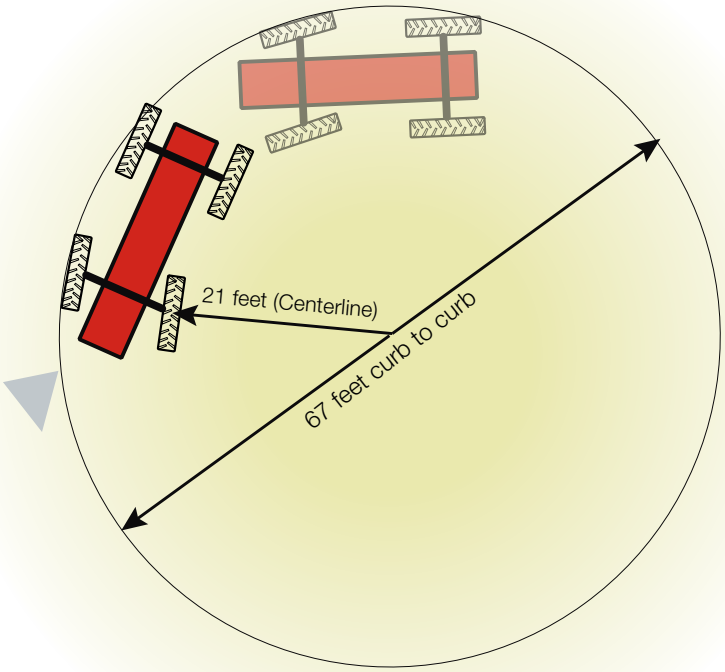
Turning radius
21 ft.

Wheel base
168 inches

The SARITOR is ideal in broad acre and row crop applications. With a turning circle of 67 feet curb to curb (turning radius 21 feet) the SARITOR is designed to have the best turning radius possible to prevent crop damage in the headlands.

The turning radius of 21 feet is measured to the center of the inner wheel at 120 in. track width.

The wheel base of the SARITOR is 168 inches ensuring a stable platform when spraying in rough terrain.



# Weight distribution



**Optimum weight distribution**
It is important to have an optimum weight distribution with a full tank as well as an empty tank.

The mass of the main tank, rinse tank and fuel tank are variable. They are located within the wheel base in order to keep the center of gravity low and the balance of the machine as stable as possible while spraying or in transport

**Center of gravity**
All tanks are set low in the chassis to help keep the center of gravity as low as possible.

All the components have been specifically distributed in order to optimize traction and reduce soil compaction.

For road transport the distribution of weight is important and it takes into account the load index rating of the tires for sustained high speed driving with a full tank.

In the field the rear axle carries a heavier load. This gives a better performance even under difficult soft and wet conditions.

Optimum weight distribution

Low center of gravity

Tires are load rated

| Weight with full tank | SARITOR 4000 TERRA FORCE 120’ | SARITOR 5000 TERRA FORCE 120’ |
|---|---|---|
| Total weight (full), lbs | 39,465 | 41,967 |
| Axle load front, lbs - % | 16,970 - 43 % | 18,154 - 43 % |
| Axle load rear, lbs - % | 122,495 - 57 %% | 23,813 - 57 % |
| Axle load front boom unfolded, lbs - % | 13,418 - 34 %% | 14,269 - 34 % |
| Axle load rear boom unfolded, lbs - % | 26,047 - 66 %% | 27698 - 66 % |

# ParaLift

Flexible height adjustment:
96.5 inches with 380/90 R50 tires

ParaLift width:
47 inches


**HARDI ParaLift ensures high clearance above any crops**
The long lift arms allow for flexibility in height adjustment. The height range is 8 to 98 inches depending on the tire option fitted.

**Wide attachment to the boom suspension ensures high performance and stability of the boom**
The outer dimension of the ParaLift is 47 inches ensuring a stable attachment of the boom.

**Plunge cylinders** lift the boom fast and with ease. Nitrogen accumulators are used for boom suspension.

**Hydraulic transport lock**
Hydraulic cylinder locks on the ParaLift are engaged automatically when the boom is folded. This ensures the boom is secure and hydraulic lift cylinders are not under load or damaged during road transport.

The locks also ensure the exact transport position is obtained every time the boom is folded.

**Easy service**
The HARDI ParaLift is easy to service and lubricate.

# Surface treatment



**Material:**
UV protected

13 steps of cleaning, degreasing and preparation

Hardening at 200 C° for one hour

Will last at least 1000 hours in salt fog test, without any corrosion

The chassis and all other steel components have received anti-corrosive treatment before the application of a high quality paint finish.

This treatment provides outstanding protection against corrosion from both chemicals and harsh weather conditions.

The high-technology surface treatment including a pre-treatment to protect the metal surface is applied to all major components.

Together with the Delta/Magni treatment of nuts, bolts and other items, we supply high corrosion protection of our products.

The chassis, the boom and all other steel parts have been pre-treated which is then followed by a high-quality paint finish.

# Access to engine

Engine cover opens with a hydraulic hand pump

Easy access to check fluid levels and engine components

**Easy accessibility to the engine and components**
Service and maintenance of the SARITOR self-propelled sprayer is easy and practical.

Oil change is required every 250 working hours.

Engine cover opens by a hydraulic hand pump, giving easy access to main engine components.

Checking and maintaining oil level and various filters is easily done.

There is also easy accessibility to the fuel tank on the right side of the sprayer. The SARITOR fuel tank capacity is 145 gallons.

**Hood**
The engine cover seals around the radiator to enhance air flow through the radiator which optimizes the cooling process.

**Firewall**
A fire wall between the engine and the cab reduces engine noise transfer to the cab.

# Engine components



Access to the cooling package

Air conditioning condenser swings out for service

Access to the air filter for easy cleaning

Access to the battery

**Radiator**
Designed to operate in an ambient temperature of 118° F.

The three vertical radiator sections are of a heavy duty steel construction:
- Engine cooling
- Air to Air turbo after cooling
- Hydrostatic transmission oil cooling

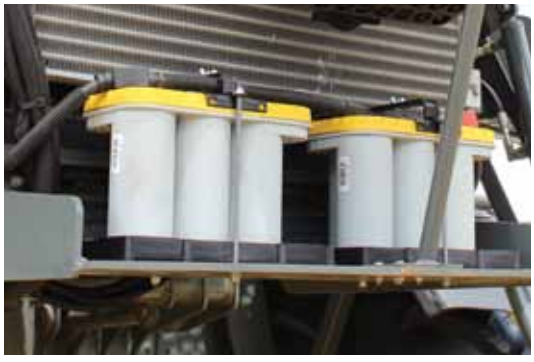
Radiators have a high flow core design to minimize blockage.

The cooling system has a heavy duty aluminium expansion tank.

**Viscous fan**
A 28 inch diameter fan with viscous fluid coupling clutch partially disengages when the engine is cool or at normal operating temperature saving engine horse power.

The fan draws air through the cooling fins which provides more consistent air distribution.

**Condenser Air Conditioner**
Swings out for cleaning the radiator from dust accumulation.



**Batteries**
12-Volt OPTIMA Spiral CELL deep cycle sealed lead acid batteries are an excellent power source for heavy duty engine starting and deep cycle applications.
They last up to twice as long as traditional batteries, are spill proof and heat resistant.

**Air Cleaner**
Air filter has power core technology to protect the engine. The straight through fluted design is three times more efficient than average conventional pleated filters.
With pre-cleaner and drop tube the dual dry element air cleaner is easy to service.

# Engine

Cummins QSB 6.7 liter engine,

Tier III compliant Turbocharged,
Air to air after cooling

275 hp @ 2500 rpm (205kW)
730 lb-ft @ 1500 rpm

23,200 psi injection pressure

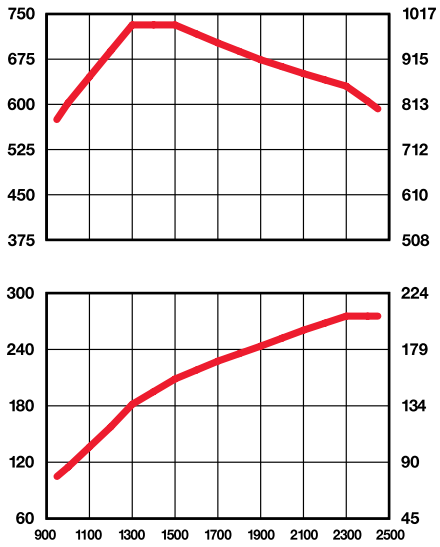
Fuel efficient

Two-stage dual filtration

Direct-coupled compressor,

Fuel tank, 145 gallon


**275 HP/205 KW @ 2500 rpm**
**730 LB-FT/990 N.m @ 1500 rpm**




The new Tier 3 compliant Cummins QSB6.7 engine takes you to a whole new level of power, versatility and emissions control. Achieving Tier 3/Stage IIIA compliance with in-cylinder technology that maintains a compact, simple and cost-effective engine.

The QSB6.7 offers major enhancements that makes the SARITOR work harder, smarter, quieter and longer…every time.

The engine is power rated to 275 hp (205 kW) with charge air cooling and turbo charging for strong performance.

**Features:**
Full Authority Electronic Control generates the most efficient use of power from fuel used based on driving technique and loads. Provides seamless integration with other components, advanced diagnostics, plus a complete set of programming options.

High-Pressure Common-Rail fuel system generates 23,200 psi injection pressures which translates to refined and rapid power delivery.

Centered Injectors with Symmetrical Piston Bowls improves airflow and even fuel dispersion for increased power, improved transient response and reduced fuel consumption.

Holset Waste gated Turbocharger with air to air after cooling develops 730 lb-ft of torque at 1500 rpm.

Two-Stage Dual Fuel Filtration provides balanced particle separation to maximize fuel filter life and protect vital fuel system components.

Parent Bore Cylinder Block designed for reduced noise and increased durability.

Directed Piston Cooling for lower piston temperatures and longer life.

Wider Camshaft Lobes and Larger Tappet Wear Surface - Enhance durability and reliability

Low engine noise output because of the engine design and its components.

Direct-coupled air compressor.

Fuel consumption is 8 to 10.5 gallons per hour depending on field and work conditions. Fuel tank capacity 145 gallons

World wide CUMMINS warranty applies and it can be extended to 3 or 5 years subject to CUMMINS warranty extension program.

**Maintenance Intervals:**
QSB engines are designed to run up to 500 hours between scheduled fuel and oil filter changes (250 hrs. for the first one).

**Warranty:**
World wide CUMMINS warranty comes with a full 2-year/2,000-hour warranty that covers all Cummins branded components, including electronics such as starters and alternators. It can be extended to 3 or 5 years subject to CUMMINS warranty extension program.

# Transmission


Intelligent design

Enhanced performance

Greater efficiency

Improved fuel economy

More power to the ground



**4WD hydrostatic transmission**
Designed for intelligent self-propelled sprayer drive management, the Danfoss H1 Transmission delivers a new level of performance with reduced fuel consumption and high operator comfort.

Danfoss H1 transmission pumps minimize control and charge pump losses, which maximizes available engine power.

In addition the Danfoss H1 bent axis wheel motors offer significant overall efficiency and an extremely low pressure drop within the fluid reservoirs of the motor

- Enhancing performance
- Improving fuel economy
- Providing power savings

The Danfoss H1 control offers precision and consistent performance of intelligent electronics combined with complete drive system functionality.

The controller provides “watch dog” capability and real time fault monitoring of the electronic hardware.

The micro controller is pre programed with 4 different operator selectable modes to vary the drive behavior to meet the application requirement.

The Danfoss Graphics Terminal DP250 is a high resolution display. It combines machine control and diagnostics in one integrated operating system connecting the interactive control of pumps, motors, joystick, engine and sensors etc.


# Transmission

Danfoss H1 Transmission

Two H1 pumps are grouped together

Four H1 Bent Axis wheel motors

Pumps and wheel motors are variable displacement

Minimum flow loses

Reduced heat load



The Danfoss H1 Transmission Pumps are axial piston type with variable displacement.

The Danfoss H1 bent axis wheel motors are axial piston variable displacement. They are highly efficient, offer extended reliability and have proven performance.

The system is optimized for electric hydraulic control and is coupled to intelligent electronics using the Danfoss graphics terminal DP 250.

The intelligent electronics is integrated on the Cummins “CAN” communication platform to ensure the engine power is optimized to the wheel motor torque which delivers smooth performance.

The micro controller measures the speed in each wheel motor 86 times per revolution to optimize drive torque and to minimize slippage.

In ‘field mode’ the system manages the pump displacement and individual wheel motor output relative to the conditions, gradients and load.

The wheel motor output is matched to the engine torque optimizing fuel efficiency and the transmission operating pressure.

The Danfoss graphical display terminal features: Anti-spin – where the wheel motors are monitored and controlled individually.

Normal mode – axle pairs are controlled

Power, normal and comfort modes – are selectable and determine the behavior, speed and the displacement of pumps and wheel motors.

Road mode – the operator selects the foot control accelerator pedal instead of the hand control joystick.

Alarms are displayed at the push of a button for both engine and transmission.

Display outputs are user defined and can show speed, % Hp used, engine oil pressure, voltage, turbo pressure, fuel, fuel consumption and water temperature etc.

The hydraulic capacity is 42 gallons with a 21 gallon oil reservoir in the circuit.

The transmission is designed to operate at ambient temperature up to 118º F/48º C.

The first and second H1 pumps each have their own suction filter.

# Wheel Drives



Planetary Wheel Drive Hub

Internal Parking Brakes,

Internal wet disc brakes front

Low maintenance

25:1 gear ratio, excellent torque

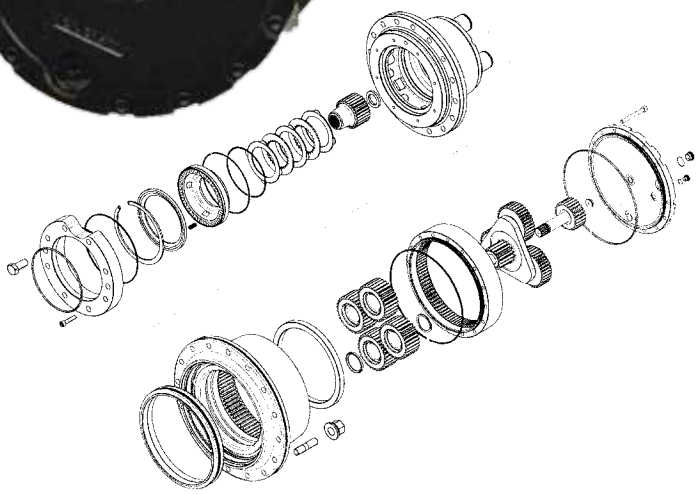
Higher road speeds, 0 to 33 mph

Heavy duty application

**BONFIGLIOLI Wheel Drives**
With rugged design, high torque and high load capacity, Bonfiglioli wheel drives are perfectly tailored and unrivalled in the industry.

Designed to suit Danfoss H1 high speed variable displacement wheel motors.

Features
- Compact design
- 25/1 reduction drive
- 12 x 22 mm studs front and rear
- ISO wheel flange mount
- Rotating housing flange
- Rugged design
- Max allowable torque up to 16,964 lb./ft. Max torque on SARITOR: 12,760 lb./ft.
- High torque up to 22,127 lb./ft.
- Mechanical Lifetime Seals
- Park Brake oil covered wet disc (spring applied hydraulic release)
- Brakes dynamic operated wet discs in the front hubs
- Service intervals 500 hours



**Brakes**
Internal wet discs provide ultimate braking. The brakes are operated hydraulically, both as a progressive service brake and a fail-safe parking brake. The self-contained design eliminates component wear and performance degradation due to external contamination typically found in traditional drum brake designs. Maintenance of brake shoes and pads are also eliminated. The brakes are controlled by a foot pedal in the cab.

# Engine and Transmission Display

- Color display
- International symbols
- Total integration of drive management
- Engine control for performance
- 4 wheel traction control
- Tuning on the go
- 33 transmission error codes
- 28 engine error codes
- Hour meter
- Set rpm and speed
- Indicates park brake, fuel level, RPM & Temp


A High resolution multi-functional display terminal for both control of operation of engine, transmission and operator selected control choices. System can be set for metric or imperial display.

It displays a series of engine, transmission and sprayer status in graphics or digital form. Furthermore a 'fault display terminal' stores and displays various error codes.

1. Display Status of selected functions

2. Tachometer

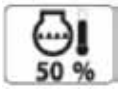
3. Selectable display of engine and transmission settings

4. Buttons to control selection and control of functions and codes

5. Horizontal Menu

6. Vertical Menu

## Selectable displays



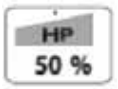
Engine temp 0 to 100%

Engine oil pressure

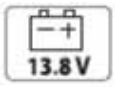
Turbocharger pressure

Transmission pressure

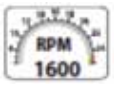
Fuel consumption



Engine power



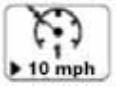
Battery charge voltage



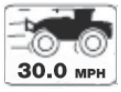
Engine revs


Engine preheat

Set engine revs



Set speed - field mode



Set road speed

Engine error codes

Transmission error codes

## Function displays

Transmission mode

Transmission mode

Transmission mode

Anti-slip off

Anti-slip on

## Priority alarm displays

Engine overheating

Turbocharger pressure

Engine oil pressure

Engine alarm detected

## Secondary alarm displays

High transmission temp

Low transmission temp

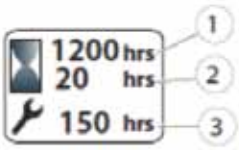
Engine alarm

## Setable service reminders


Level one service


Level two service

## The hour meter display shows:




1. Total operating hours
2. Partial set timer
3. Hours to next service

# Hydrostatic Drive

Fuel saving

Road transport

Cruise control

**No-Spin manages:**

- Engine RPM in road transport
- Flow of hydrostatic pump
- Automatic switching the displacement of the hydraulics motor while driving

**3 drive modes:**
Comfort/Normal/Power are available for the operator to customize the transmission.

- Better control of speed and cruise control
- Reduced fuel consumption
- AntiStall, anti over rpm when breaking
- Low noise level in the cab
- Higher work speed
- Improved driving performance
- Better longevity of hydrostatic transmission components
- Permanent control with electronics management

The H1 transmissions anti-stall and bias control is managed through the microcontroller. When the engine is in stall conditions, the wheel motors are scaled back to reduce their power output.

Selectable bias control provides the operator with more power to either the front or rear wheel motors by scaling back the power to the non-selected motors.

'Front Bias' is used downhill, 'Rear Bias' is used uphill and is typically selected in steep wet conditions. Rear Bias is also used in road mode where most of the pumps displacement is directed to the rear wheel motors.

# Transmission selection

Park

Rabbit / Road position

Turtle / Field position

Climbing

Descending

Rotary switch easy to operate

Switching under load

Optimum transmission



The 4WD hydrostatic No-Spin Danfoss technology optimises performance providing speed, torque and progressive acceleration. Combined they deliver maximum fuel effiiciency.

**Park**
- When in park all wheel motors are in mechanical lock
- When a transmission mode is selected from park, the access ladder is automatically raised

**Rabbit / Road position**
- When rabbit is selected the hydrostatic transmission adjusts the 4 wheel motors bias to enable the SARITOR to reach the maximum road speed of 33 mph.
- Engine rpm is adjusted by the electronics automatically in line with power required to deliver the desired forward speed.
- The Danfoss transmission computes the best combination of torque and rpm to have the least fuel consumption

**Turtle / Field position**
- When turtle is selected the hydrostatic transmission starts the wheel motors in full displacement for maximum torque in field
- The engine rpm is set by the operator to maintain a constant speed.
- The operator selects the forward speed by adjusting the cruise control in the cab
- The operator can then push the joystick fully forward and the sprayer will stay at the speed set from the cruise control
- The cruise control function will adapt to field conditions and try to keep the sprayer at the same speed set by the operator

The speed in turtle mode is between 0 and 18.5 mph

**Climbing**
- In climbing mode the transmission is set to high torque at the rear and low at the front to give maximum traction.

**Descending**
- In descending mode the transmission is set to high torque at the front and low at the rear to give maximum descent control.

**Anti-Stall or over speed engine rpm**
- The Danfos transmission has a built-in safety system to prevent the engine stalling if the power demanded by the transmission is higher than can be provided by the engine.
- When using the transmission to decelerate or for braking there is built in safety to protect the engine from over reving.
- The transmission is monitored by pressure sensors at all times.

# Access and platform

Easy access

No contact with the boom

Height of platform from the ground: 88 in with 380/90 R50 tires

7 steps to platform
Step width 15 in
Step depth 8 in

Platform width:
21.5 in at narrowest
36 in at widest

Platform length 138 in

Wide door access

Adjustable steering column

Easy access to the platform and cab is via the front facing heavy duty ladder. It automatically folds up out of the way when the transmission is engaged and folds down when the transmission park is selected.

The platform height above the ground on standard tire equipped SARITOR's is 88". The ladder has 6 x 15 inch wide steps 8 inches deep to provide safe sturdy access to the platform and cab. The first step off the ground is 22 inches.

The wide platform provides safe access to the cab with no risk of contamination from the boom. The platform is 21.5 inches wide at its narrowest point, 36 inches at its widest and 138 inches long.

The cab boasts wide door entry and the steering column is adjustable at 3 points. Two are articulation points and one is the steering wheel height which is adjusted to suit individual needs.

Battery isolator switch is turned on when entering the SARITOR. An LED indicates the power is activated. The LED is also a button when pressed turns the lights on for night access.

# The cab



The large cab is uncluttered and offers top level comfort. It is quiet and provides excellent operator visibility.

Climate control air conditioning with 10 air outlets provides set-and-forget operation and gives maximum operator comfort levels. A dust and carbon filter ensures good air quality circulation.

The use of large full length curved glass panels with narrow pillars provide unobstructed view to the boom and the field for total control during spraying.

Tinted safety glass, front sun visor and two rear pull down blinds minimizes glare into the cab.

The forward sloping hood enhances the field of view for road transport and a reversing camera is standard.

The instructor's seat is large and comfortable, and can fold up and out of the way.

An AM/FM radio CD player with AUX input delivers quality sound.

Low noise level

Excellent visibility

Active carbon filter

Climate control air conditioning.

Air suspended seat

Joystick

Inside dimension:
Width: 67 in
Height: 62 in
Maximum length: 65 in

Climate control with 15 settings & fault diagnostics

AM/FM radio CD player with AUX input

# Cab environment

Quality drivers seat:
Comfortable
Fully adjustable

Adjustable steering column

Secondary controls: above the operators head

A comfortable, high quality driver's seat with air-ride suspension is fully adjustable and provides exceptional operator comfort The seat can be adjusted for weight, height, lumbar, back, leg and motion.

The joystick hydrostatic control and SprayCenter are attached to and move in unison with the driver's seat. The HC 9500 and engine management displays are ideally located.

The SprayCenter switching is logically placed, grouped for easy fingertip operation and is illuminated for night use.

Turning indicators, driving lights, high/low beam and hazard light selection are on the Steering column.

In-cab storage is included in the arm rest console, drawer under the seat and pocket behind the seat for the operators manual.

Secondary control switch functions are grouped on the console just above the operator's head. Windscreen wipers, work lights and rotary beacon are controlled here.

# Set to spray



Everything you need is at your finger tip. All managed through the HC 9500 information and application control terminal and SprayCenter control console.

The joystick combines the hydrostatic drive and vital spraying control functions. Forward, reverse and braking is operated by pushing forward or pulling back on the control lever. Spray on/off, section control, boom height and wing tilt functions are also managed from the joy stick.

All the secondary control functions are managed from the SprayCenter.

Fluid system selection switches for pump on/off, nozzle pressure, auto rate control, end nozzle, agitation, main and rinse tank are logically placed and easily operated.

Hydrostatic forward speed, bias selector and engine revs can be manually selected. Cruise control automatically manages the power and bias to maintain the operating speed selected. On-the-go hydraulic track width adjustment, dynamic boom control, pendulum lock and fold function switches are here.

The arm rest SprayCenter console can also be adjusted forward and rear to suit individual arm length and joystick operation position and comfort.

HC 9500 controller delivers the highest level of performance and application precision. The HC 9500 all-in-one split screen terminal provides for guidance mapping, AutoSteer option, auto section, application rate, tank content, boom height, dual boom, spray records, field notes, variable rate application and more.

Finger tip control

**Joystick:**
Hydrostatic drive
Forward & reverse
Spray on/off
Section control
Boom height
Wing tilts

**SprayCenter:**
Pump on/off
Nozzle pressure
Auto rate control
End nozzles
Agitation control
Main & Rinse tank

**Hydraulic control:**
Transmission
Bias selection
Track width adjust
Boom fold functions

**HC 9500**
Rate control
Mapping
Auto Steer (option)
AutoSection Control
AutoTerrain
Spray records

# WorkZone

WorkZone cover

Cover provides protection

FastFill coupling

TurboFiller

Locker

A WorkZone cover, supported by a gas strut, protects the WorkZone and doubles to provide operator protection for when the boom is folded and you are standing under the nozzles.

A 2 or 3 inch fast fill coupling and ball valve is lowered to enable easy hose connection. A FastFill filter is standard with hydraulic drive banjo transfer pump optional.

The main and flush tank drain valves double as fill valves and can be used when batch loading and water-filling is done simultaneously.

A locker is used to store chemical handling safety equipment and an 8 gallon clean water tank provides ample water for personal hygiene.

# Fluid system

- Easy to operate
- Multifunction
- Convenient location
- User-friendly icons

The WorkZone console provides switching for electric motor drive valves that control main or rinse tank, Venturi, pump on/off, tank rinse nozzles, boom nozzle, engine rpm and agitation. An LED identifies which valve is in operation.

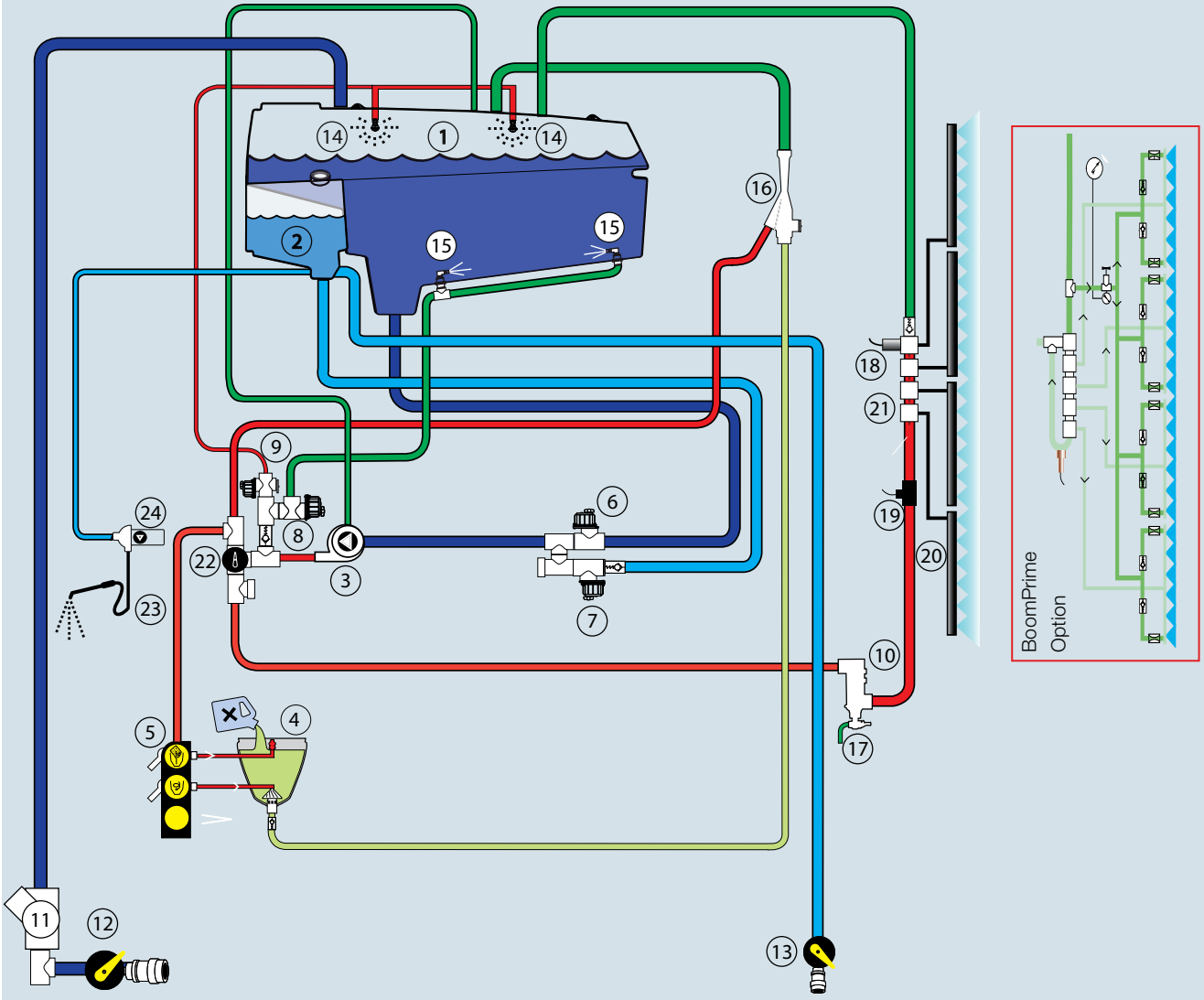
Lowering the TurboFiller into the operating position is made easy with a spring-loaded drop down bracket that automatically locks for transport.

A 60S hand gun run by a flowjet pump connected to the rinse tank is used to clean up around the work zone.

The cyclone delivery filter is set to self-clean or can be manually purged.

# Liquid diagram

## SARITOR 5000 FLUID SYSTEM




| | | | |
|---|---|---|---|
| 1 | Main Tank | 13 | Rinse Tank Fill Valve |
| 2 | Rinse Tank | 14 | Rinse Nozzles |
| 3 | Main Fluid Pump | 15 | Agitation Nozzles |
| 4 | Turbo Filler Tank | 16 | Ejector |
| 5 | Turbo Filler controls | 17 | Filter Bypass Return |
| 6 | Main Tank Valve | 18 | Pressure Sensor |
| 7 | Rinse Tank Valve | 19 | Flow Meter |
| 8 | Agitation Valve | 20 | Spray Boom |
| 9 | Rinse Nozzle Valve | 21 | Section Valves |
| 10 | Cyclone Filter | 22 | Chemfiller Valve |
| 11 | Filling Filter | 23 | Wash Down Hose |
| 12 | Main Tank Fill Valve | 24 | Flow Jet Pump |

- Suction Fluid Rinse Tank
- Suction Fluid Main Tank
- Bypass Fluid Low Pressure
- Chemical Fluid Suction
- Pressure Fluid

# Main tank / RinseTank




Main tank volume:
1100 / 1300 gallons

RinseTank volume
158.5 gallons

Material
UV protected
Polyethylene

Chemical resistant

Material thickness
(minimum) 10 mm

Tank level sensor

**Low center of gravity**
The tank is low profile with a deep sump to provide a lowest possible center of gravity. It is positioned between the axles for best weight distribution.

**Efficient agitation**
The tank shape is designed for effective agitation, with no hidden corners.

**Deep central tank sump**
The tank completely empties even on slopes up to 10 degrees – uphill or downhill.

**Tank rinsing nozzles**
100% of the tank can be reached by the rinsing nozzles. The absence of sharp corners prevents sedimentation.

**Easy to clean outside**
The smooth surface of the polyethylene tank and radius corners makes for easy cleaning.

**RinseTank**
The RinseTank is integrated in the main tank and chassis and has a capacity of 158.5 gallons providing adequate liquid for both inside and outside cleaning. The RinseTank can easily be filled from the ground.

**Electronic tank gauge**
A load cell transducer in the sump of the tank provides accurate in-cab read out of the tank volume.

*Main tank level sensor*

*In cab tank content display*

# Pump

**Pump:**
Up to 170 gpm
(see chart below)

Up to 160 psi max pressure
(see chart below)

Can run dry without damage

Stainless steel wet end

Stainless steel impeller

S93 suction
S67 discharge

Easy to service

**Hydralic motor:**
High quality Mazzotti

Case drain

Rated to 4000 psi

The SARITOR DynamicFluid4 fluid system is driven by a high performance Run-Dry centrifugal pump capable of up to 170 gpm and a operating pressure range up to 160 psi. (see chart below)

The HARDI branded centrifugal pump combines the Ace MAX series features and OasisTM WetSeal technology.

The WetSeal isolates the seals from the pumped chemicals, fertilizer and abrasive materials preventing premature and run dry failure.

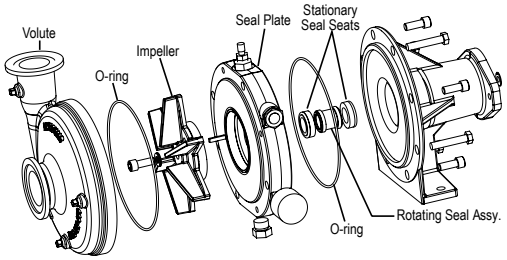
The impeller design provides high, consistent pressure over the entire flow range. The wet end of the pump is stainless steel providing high corrosion resistance.

Compatible with the HARDI manifold system the suction is S93 and discharge is S67.

The pump can run at low rpm with high reliability and uses oversize bearings

The hydraulic motor is of high quality construction, has a case drain and is rated to 4000 psi oil pressure.

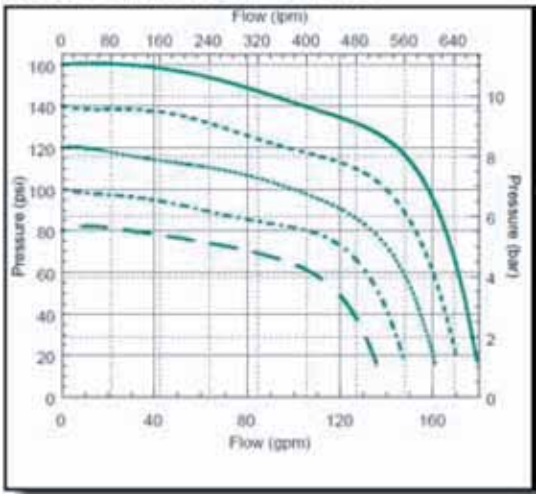
The SARITOR DynamicFluid4 fluid system utilizes the Run-Dry centrifugal pump for flow regulation and rate control. A hydraulic command valve with built in pressure filter with proportional solenoid controls the pump speed required to deliver the application rate.




The proportional solenoid with inductive positioning transducer and metering orifice used to set the pump speed is highly accurate, smooth but incredibly fast. Each time all the nozzles are in the off state the proportional valve is re-calibrated maintaining the highest rate control accuracy.

Pressure, flow, pump speed, forward speed, boom sections and application rate is monitored and processed using advanced computations. The DynamicFluid 4 processor analysis the spraying data 20 times a second and provides preemptive rate control capability, altering the pump speed with pin-point precision.

**PERFORMANCE CHART**



# CycloneFilter

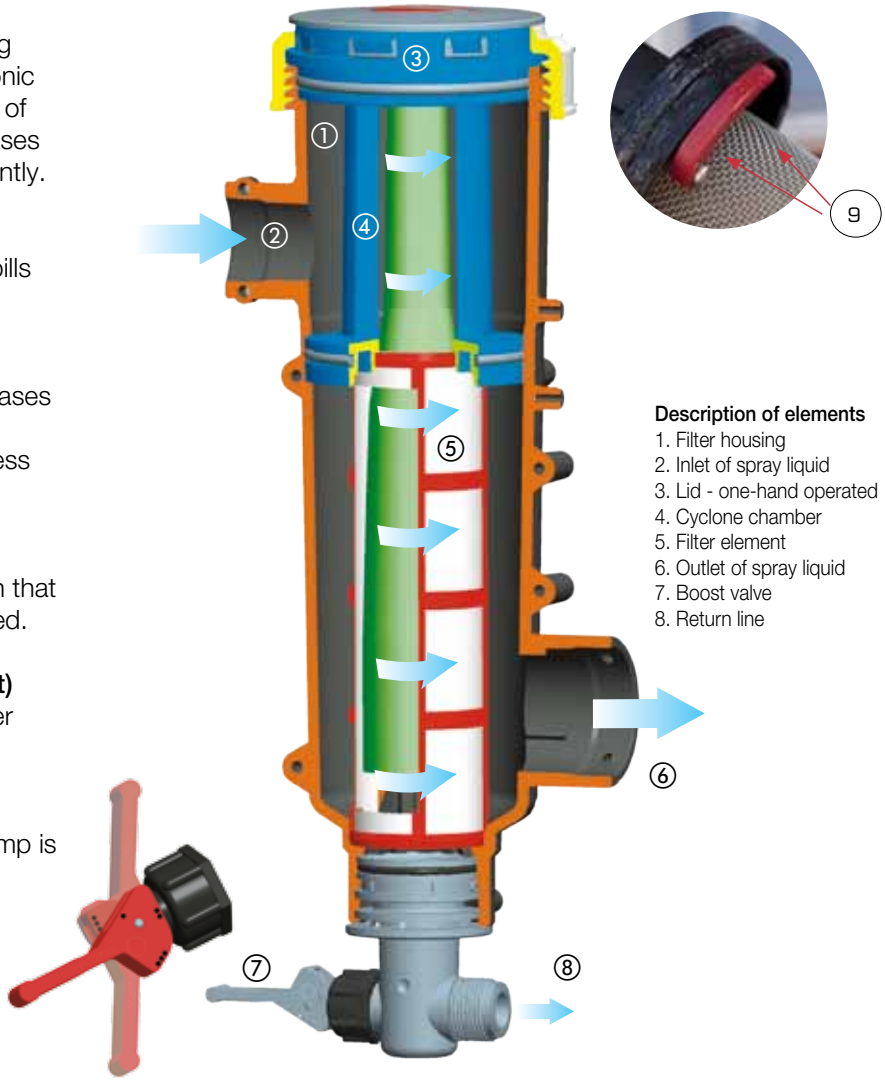
The HARDI CycloneFilter is a self-cleaning pressure filter that uses high-speed cyclonic action to help keep the filter element free of contamination. The cyclone action increases the cleaning capacity of the filter significantly.

**Vertical filter**
The filter is mounted vertically to avoid spills when inspecting the filter.

**The self-cleaning capability**
The cyclone created inside the filter increases the speed of the liquid against the filter screen, thereby increasing the effectiveness of the self-cleaning action.
This ensures fewer stops and reduces pressure loss in the liquid system. The CycloneFilter has a unique boost function that allows the filter to be purged when needed.

**Valve with 3 positions (OFF/ON/Boost)**
The control valve in the bottom of the filter can be positioned in 3 different modes:

(•) Self-cleaning OFF
Used when all the flow from the pump is needed
(••) Self-cleaning ON
(•••) Boost
Used to flush the filter screen




**Description of elements**
1. Filter housing
2. Inlet of spray liquid
3. Lid - one-hand operated
4. Cyclone chamber
5. Filter element
6. Outlet of spray liquid
7. Boost valve
8. Return line

Flow capacity:
105 gpm

Inlet diameter
1½" S67

Outlet diameter
1½" S67

Screen size:
50 mesh
80 mesh std.
100 mesh

# TurboFiller

Filling capacity
liquid up to
33 gpm

Size of hopper
9.5 gallons

TurboDeflector mixing

Container rinsing
nozzle with spike

Loading chemicals is safe and easy with the high capacity TurboFiller. Fixed to a parallelogram suspension arm the TurboFiller is lowered into position to provide waist high access to the hopper. The lid has a dust proof seal and the operating controls are positioned on the left side of the TurboFiller.

**High capacity**
High pressure creates a powerful liquid vortex to thoroughly mix chemicals into solution before they are transferred. A venturi device creates the vacuum suction required for the high capacity transfer. The TurboDeflector in the bottom of the hopper generates the vortex mixing action from the center to the sides and is less likely to be blocked by dumping dry product directly onto the deflector.

**Operating position**
The parallelogram suspension arm is spring-loaded to support the TurboFiller weight and has a transport lock to hold it in the folded position. It is easily lowered into the operating position. The filling position is approximately 10 inches from the ground.

**Easy to operate**
3 valves operate:
- Container rinse
- TurboDeflector ON/OFF
- Vacuum suction ON/OFF

**Vacuum suction capacity**
A large venturi ejector system creates a powerful vacuum to transfer powders and liquid directly into the tank.

**Rotating nozzle**
Used to clean chemical containers and the hopper the rotating nozzle spins under liquid pressure to thoroughly rinse. The nozzle has a spike on to which is used penetrate the seal on most containers.

# EFC boom section valves



Pressure drop at 32 gpm: 23 psi

Manifold diameter: 3/4 inch

Fast nozzle ON/OFF

Easy service

Fast thorough decontamination

Radial sealing

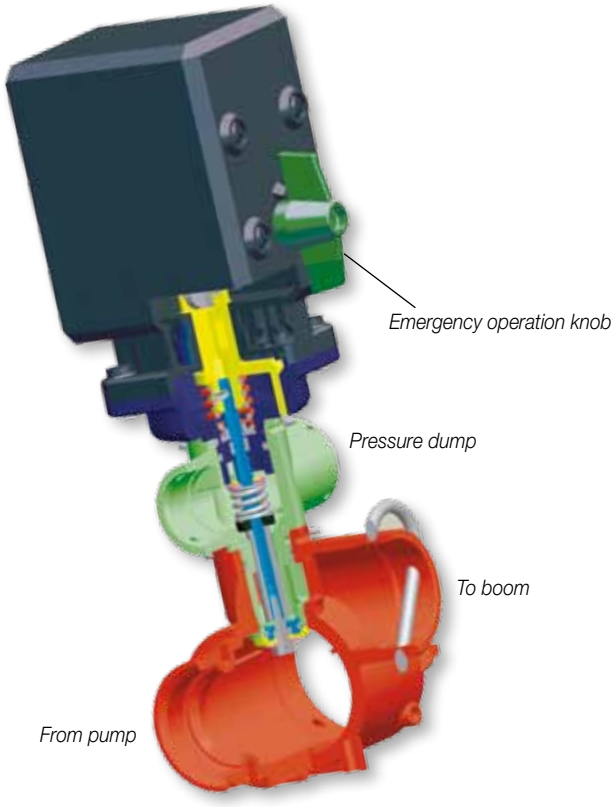
Electric Fast Control (EFC) is a modular manifold boom section control with positive motor drive valves and a pressure dump valve for when all sections are switched to OFF.

The section valves incorporate a pressure dump for when the sections are switched to OFF, the pressure in the line to the nozzles is relieved resulting in instant shut-off of the nozzles. No need for pressure equalisation.

**Faster nozzle OFF**
Incorporated pressure dump insures instant nozzle closure even for the smallest of nozzles.

**Radial seals**
An excellent sealing system, that ensures no leak.

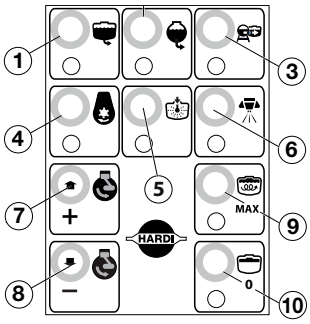
**High capacity**
Larger diameter manifold handles high application rates and wider booms.



# Fluid control

**WorkZone console - ground**
From the ground and through the WorkZone console the following functions can be selected and managed.

A panel of push buttons allows the external control of the main functions of spraying and the engine speed. The commands are grouped together by color to simplify their use. Indicators show the function activation.




1 Suction from main tank ON/OFF
2 Suction from RinseTank ON/OFF
3 Banjo FastFill pump control ON/OFF (option)
4 Spray pump control ON/OFF
5 RinseTank nozzles valve ON/OFF
6 Boom section distribution valves ON/OFF
7 SARITOR engine rpm increase
8 SARITOR engine rpm decrease
9 Agitation increase / maximum
10 Agitation reduction / OFF

An LED identifies which valve is in operation.

The main tank, rinse tank, tank rinse nozzle and agitation valves are electric gear motor driven. The Banjo FastFill and main fluid pumps are activated by electric over hydraulic control. Boom distribution valves are electric gear motor driven and engine revs are controlled by linear actuator.

**Dual control from the cab is also possible**
From the cab through the SprayCenter

console the same function as controlled from the ground can be selected and managed (except the Banjo FastFill pump):

1 Main tank suction source valve ON/OFF
2 Flush tank suction source valve ON/OFF
3 Main fluid pump EOH control ON/OFF
4 RinseTank nozzles valve ON/OFF
5 Boom nozzles ON/OFF
6 SARITOR engine rpm control
7 Agitation min/max control setting

The SprayCenter switching is logically placed, grouped for easy fingertip operation and is illuminated for night use.

In addition the following functions are also operated:

8 Nozzle pressure +/-
9 Auto rate control ON/OFF
10 End nozzle left ON/OFF
11 End nozzle right ON/OFF
12 Boom section valves ON/OFF

# Control valves

Main tank and rinse tank source valves

Filtered FastFill or Banjo filtered FastFill valve

Tank rinse nozzle valve

TurboFiller and boom distribution control valve

Agitation control valve

Rinse Tank fill and drain, Main Tank batch fill and drain valves

**Dual operation:**
-Ground operated WorkZone console
-Cab operated SprayCenter console

LED indicator

Gear motor drive valves

Agitation flow control

Drop-down FastFill

Logical placement of valve positions



**Electric geared motor drive valves**
The main tank, rinse tank and tank rinse nozzles are selected using electric gear motor driven on/off ball valves.

The agitation valve is an electric gear motor driven ball valve and when operated from the workZone console the valve is either at the minimum or maximum flow position.

When AutoAgitation is selected in the HC 9500 menu structure then the agitation valve adjusts the agitation flow rate based on the residual tank volume as measured by the electronic tank gauge

**Manually operated valves**
The FastFill or optional Banjo FastFill valve drops down into position to provide better alignment for hose connection. The filling valve is lever activated on/off.

The TurboFiller & boom distribution control valve directs the fluid pump pressure and flow to operate the TurboFiller for chemical mixing and the venturi for vacuum suction. The venturi vacuum is used for chemical transfer, direct chemical suction and Venturi FastFill.

On/off ball valves are well positioned for Rinse Tank fill and drain, Main Tank batch fill and drain.

# DynamicFluid4 fluid system

Pressure based

Precision rate control

High capacity

Maximum flow:
Up to 170 gpm

**DynamicFluid4 is a powerful and preemptive pressure-based application control system that meets the demanding needs of modern precision farming practices.**

Not only can DynamicFluid4 maintain the target rate through ever changing spraying speeds, but does so with variable rate application and auto boom section control systems being active at the same time.

DynamicFluid4 monitors the pressure, pump speed and flow input data. It uses advanced computer algorithms to vary the pump speed through proportional hydraulic valve control and manages the system pressure to deliver the desired application rate.

Traditional fluid systems only start regulating after the nozzles are turned on then chase the rate. On the other hand DynamicFluid4 holds the target rate whether sections are switched on or off, changing speed, changing rate or turning in or out of headlands.

DynamicFluid4 sets new standards with precise immediate-response rate control. The Fluid system is driven by a high performance, variable speed 170 gpm capable wet seal run-dry centrifugal pump.

Pump pressure and flow is controlled by an infinitely variable proportional hydraulic valve which is up to 20 times faster than conventional flow meter controlled regulation systems.

The on-board computer processes input data including forward speed, target rate and active boom sections in order to manage the pump speed.

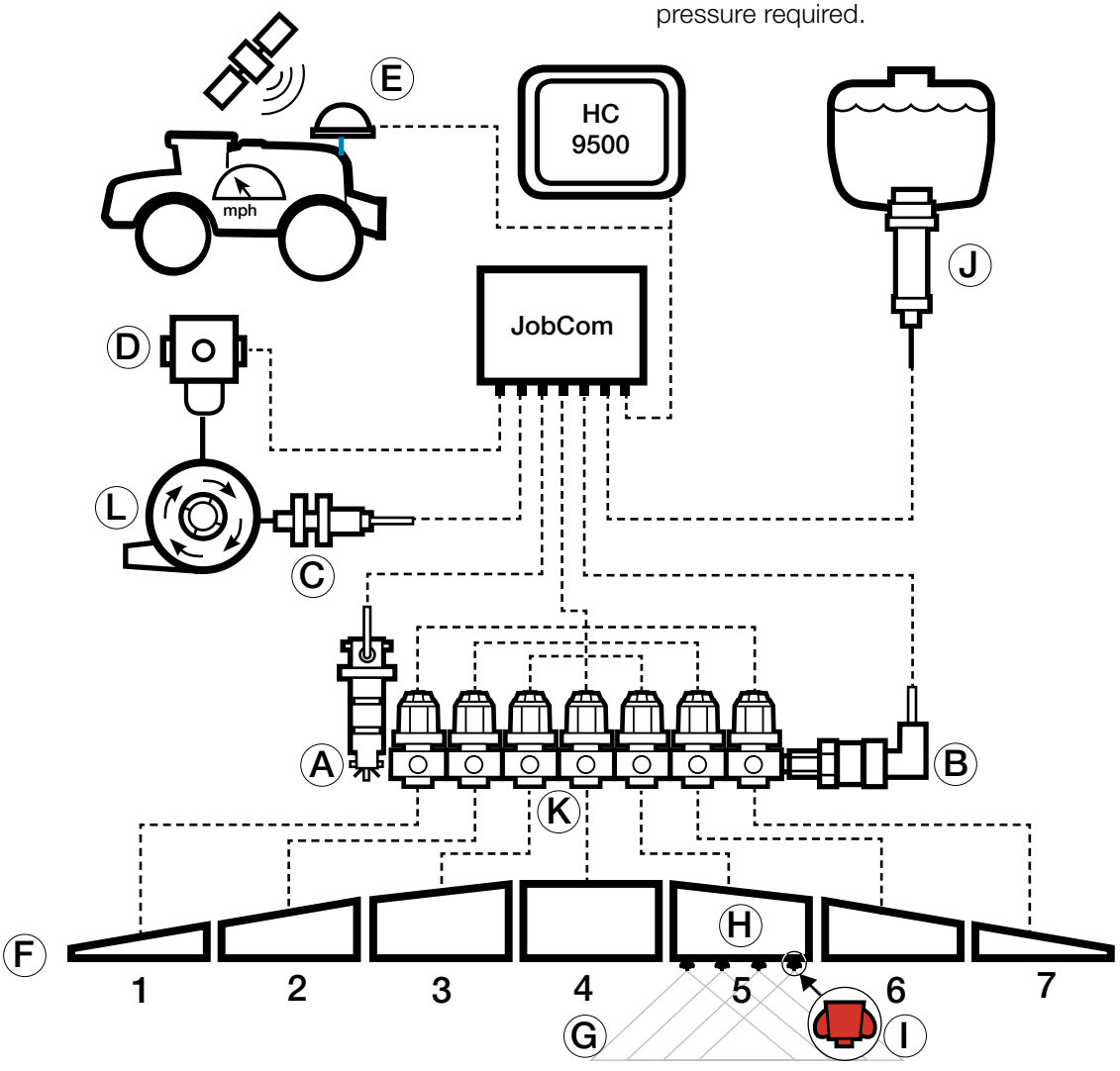
The pump speed is altered with pin-point precision providing smooth, incredibly fast incremental change to keep the pressure at the nozzle accurate.

The flow meter is used to calibrate the fluid system, to verify the flow and work as back up for the pressure transducer. The fluid system can also detect the nozzle size by running a calibration routine using pressure and flow.

The proportional hydraulic valve is re-calibrated every time all of the nozzles are turned off. This maintains precision because the characteristic of the proportional valve will change over time due to oil temperature, valve tolerances and wear.

**DynamicFluid4 command and control**
**How it works:**

1. DynamicFluid4 is a pressure based fluid system (not flow based).
2. Advanced algorithms are used to compute the pressure needed to deliver the programmed application rate.
3. Pressure at the boom is kept accurate by regulating the pump revolutions though proportional hydraulics.
4. Pressure based regulation through proportional hydraulics is running at 20 Hz, which is up to 20 times faster than conventional flow meter regulation systems.
5. The proportional hydraulic control allows for precise incremental rev change.
6. Pressure, flow, tank content, pump rpm, forward speed and active boom sections are all monitored.
7. The target rate is achieved quickly and with high accuracy.
8. The flow meter is used to calibrate the fluid system, to verify the flow and work as back up for the pressure transducer.
9. The fluid system detects the nozzle size by running a calibration routine using pressure and flow.
10. The pressure transducer controls the nozzle pressure and corrects the flow rate at very low flows (potentially 1 nozzle) not possible for a flow meter which stops working at 1.5 gpm. The signal rate is 250 Hz (250 times faster than the flow meter at 1Hz).
11. The system can run on pressure alone if the flow meter has failed.
12. The proportional hydraulic valve is re-calibrated every time all nozzles are off (for example when the sprayer is in the headland). This maintains precision because the characteristic of the proportional valve will change over time due to oil temperature, valve tolerances and wear.
13. DynamicFluid4 is highly accurate, smooth and incredibly fast. The pump only runs at the revs necessary to deliver the spray pressure required.




**DynamicFluid4 application control**

A. Flow

B. Pressure

C. Pump rpm

D. Proportional hydraulics

**Plus**

E. GPS speed input

F. Boom width

G. Number of sections

H. Nozzles per section

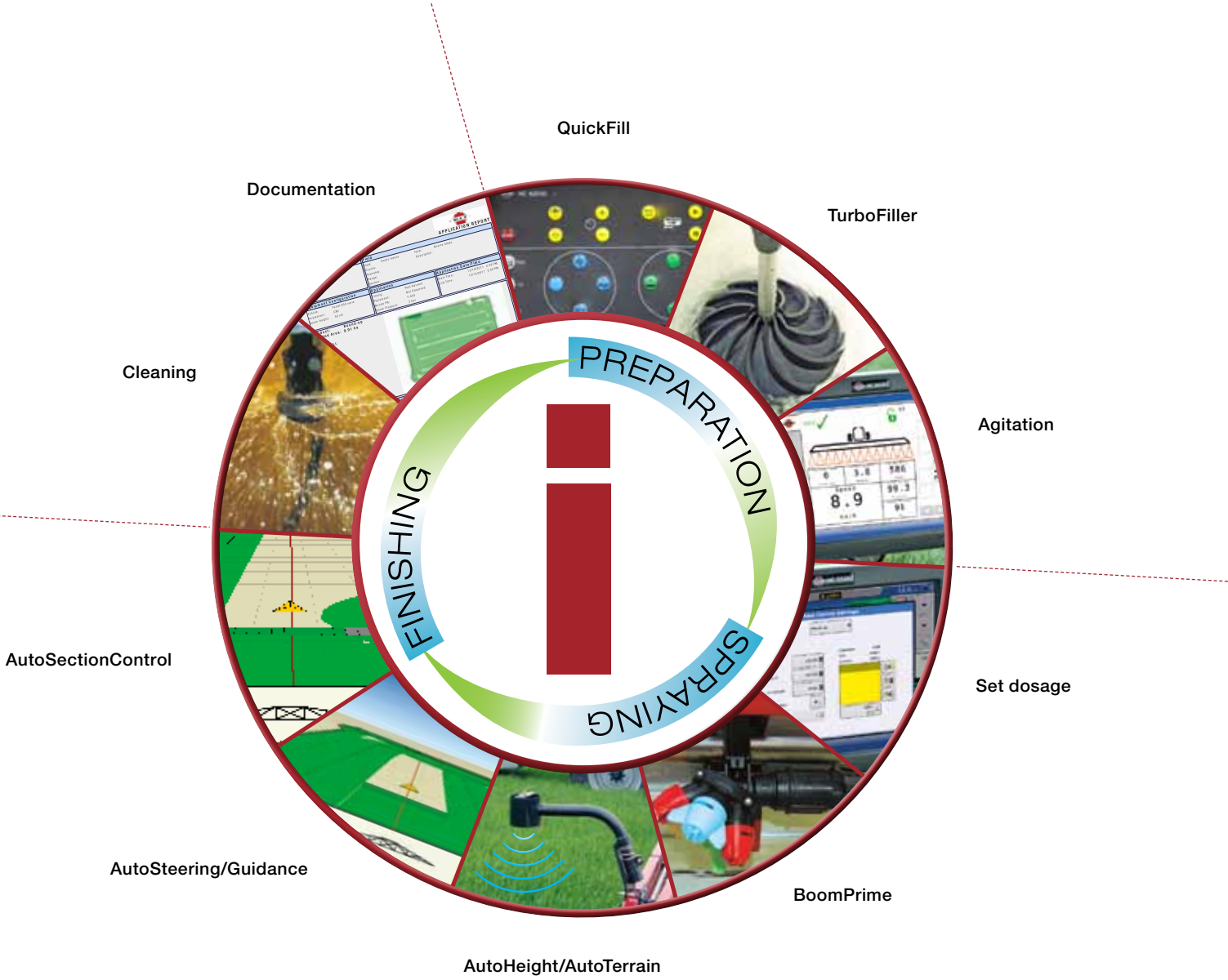
I. Nozzle size

J. Tank volume

K. EFC section valves

L. Pump

# SprayCircle




Modern spraying means effective crop protection in compliance with legal and environmental restrictions. The choice of the right chemical is important, but also the timing and the proper use of the equipment are an important part of the operation. Bigger tanks, wider booms and faster driving speeds provide opportunities for increases in capacity but legal and environmental limitations always need to be considered. Daily working hours with best efficiency demand an intelligent sprayer to avoid costly mistakes.

The SprayCircle outlines the elements when preparing, spraying and finishing a spray job and how the intelligent features of HARDI and the HC 9500 assist the operator. For over 50 years HARDI has been leading in sprayer innovation, and with intelligent features like AutoSectionControl and AutoHeight, the HC 9500 has allowed for integration into one working screen. With the HC 9500, the driver can operate AutoHeight, AutoSectionControl, as well as AutoSteering/Guidance and dosing.

The intelligence features of SARITOR are much more than electronics. All functions involved before, during and after the spraying are optimized to make the operation as easy and efficient as possible to get the best possible result for the professional farmer.


## PREPARATION:

**QuickFill**
- Quick banjo connection
- Optional electronic tank gauge pro vides accurate and precise up to second data
- Accurately monitoring tank fill maxi mizes efficiency when adding chem icals or loading batches to match a specific field.

**TurboFiller**
- Handles large quantities of pow- ders and liquids
- TurboDeflector in bottom rotates fluid
- High vacuum with TurboDeflector creates fast transfer into main tank
- Built-in rinsing system

**Agitation**
- Monitor tank level on HC 8500 / 9500 for adjustment (optional Tank Gauge)
- Adjusting agitation to tank level opti mizes mixing and minimizes foam ing
- Proper agitation minimizes tank esidue due to settling after spray job is completed


## SPRAYING:

**Set dosage**
- 2 fixed application rates can be programmed
- Quick change in gpa steps
- Usages of external dose rates possible

**BoomPrime**
- No untreated areas at start of spray job
- Flushing of boom lines without spraying is possible
- Positive pressure based system to ease trouble-shooting

**AutoHeight/AutoTerrain**
- With the support from the precise HARDI boom management sys- tem, you can choose your active boom height settings on crop or soil level
- The height is measured with 3 or 5 ultrasonic sensors

**AutoSteering/Guidance**
- The display indicates the next wheel tracks
- 5 different driving patterns can be used
- Automatic steering can be ordered as optional with ParaDyme

**AutoSectionControl**
- Product savings of 3% or more are documented
- Operator fatigue is greatly reduced
- Precision shut-off can be individu- ally set up


## FINISHING:

**Cleaning**
- Use the attached clean water to clean the fluid system, boom and rinse the main tank
- Time saved by cleaning the sprayer while still in the field or while trans porting
- Prevent cross contamination be tween chemicals
- Safely transport on the road with a neutralized fluid system

**Documentation**
- USB port for data transfer
- Smart report as PDF
- Real time data-logging
- Transfer to farm management software

# HC 9500 controller

- Guidance mapping
- Auto steer ready
- AutoSection
- Application rate
- Tank content
- AutoTerrain boom height
- Dual boom lines
- Direct injection
- Spray records
- Field notes
- Variable rate application


- Fused power supply for equipment security
- Easy to monitor operation via the built-in status diodes
- High quality waterproof connectors
- No damage from cross polarization

Everything you need is at your fingertips! All managed through the HC 9500 12.1" display, SprayCenter console and multi-function joystick provides the highest level of performance and application precision.

The HC 9500 split screen provides guidance mapping, auto steer, auto section, application rate, tank contents, boom height, dual boom, direct injection, spray records, field notes and variable rate application.

The complete integration of all important information on one work screen is an important criteria.

The joystick combines the hydrostatic drive and vital spraying control functions. Forward, reverse and braking, spray ON/OFF, section control, boom height and wing tilt functions are all managed from the joystick.

The SprayCenter manages all the secondary control functions. The fluid system selection switches for pump ON/OFF, nozzle pressure, auto rate control, end nozzle, agitation, main tank and rinse tank are logically placed and easily operated.

The JobCom computer on the left hand side of the SARITOR contains several printed circuit boards and is the central location for the sprayer electronics. Diagnostic diodes indicate the performance of the JobCom for trouble-shooting.

Sensors with cable protection and high quality connectors provide signal quality for trouble free operation. The flow sensor has a status diode to aid trouble-shooting which flashes indicating correct operation.

# HC 9500 Display structure



- All information on one view
- 3D and 2D option
- Toolboxes can be opened and closed with finger touch

**Status bar**

GPS status, sprayed area, guidance lightbar and driving speed are always on the same spot.

**Mapping toolbox**

Here the guidance system can be controlled, and boundaries can be made.

**Map screen**

Map view can be in 2D or 3D format. Which sections are active, can be seen here at one glance.

**Product toolbox**

Here the dose rate can be controlled.
Flow rate and tank volume are also shown here.


**Task bar**

To the left the main screen buttons are placed and to the right the function buttons.

**AutoTerrain area**

Here all the data of the AutoTerrain are controlled and displayed. The AutoTerrain is on a separate icon in the task bar.

**Sprayer specific part**

Here the operator can see more detailed information about his sprayer. This part is only used in combination with a HARDI sprayer – here information is shown as pressure, tank level from TankGauge.

# Main work screen

- All information on one view
- 3D and 2D option
- Toolboxes can be opened and closed with finger touch


**HC 9500 work screen**

The complete integration of all important information on one work screen is an important criterion. On the HC 9500 work screen the driver can operate Auto-Terrain, AutoSectionControl as well as guidance and dosing. The view can be switched between 2D and 3D.

The operator can select his preferred view. The mapping and product toolbox can be closed and opened by pressing on them.

By pressing the green grid icon on the task bar, the graphic changes between 3D and 2D! In the 2D mode the graphic can be scaled in and out as well.

# VT (Virtual Terminal) – HARDI functions



ISO 11783 ISOBUS

Virtual Terminal standard

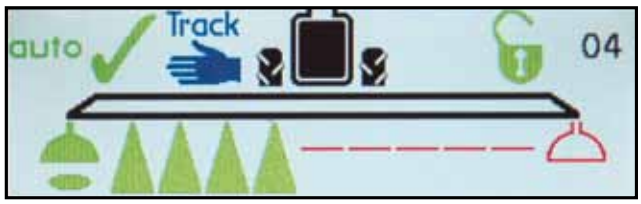
View as on other ISOBUS VT


Operator can personalize the five screen view to his needs

Large clear readout displaying the most important information

Icon bar can show status of the following:

- Volume rate control (auto/manual/ external)
- Status (OK, STOP, WARNING, MESSAGE)
- Tank contents (remaining 80%, 20%, 0%)
- Option A/B (Off, A on, B on, AB on)
- Pendulum (Locked, Unlocked)
- Register number (1 to 99)
- Active boom sections. (On, Standby, Off)
- Foam marker (On, Standby, Off)
- Fence-line nozzle (On, Off)






**Virtual Terminal**

The HC 9500 display is designed to meet the ISO 11783 ISOBUS Virtual Terminal (VT) standard.

Calibration data is typed in via this screen view for the JobCom to receives the necessary sprayer information. Tank size, boom width, boom section width etc.

Spraying information from the VT work screen is written to the main screen during spraying.

The work screen shows the icon bar and the five operator defined windows.

The large window shows the preset, messages and warnings.

The four operator defined windows show the following if the relevant sensors are connected:

- Actual volume rate
- Flow rate
- Actual time
- Work rate
- Actual tank contents
- Actual speed
- Programmed volume rate
- Volume sprayed
- Area covered
- Active boom width
- Spray pressure
- Wind speed and direction*
- Transmission shaft revolutions
- Two frequency/analogue readouts
- Voltmeter

# AutoSectionControl


Product savings of 3% or more are documented

Operator fatigue is greatly reduced especially in odd shaped fields

Precision shut-off can be individually set up

**What is AutoSectionControl?**
AutoSectionControl (ASC) is a fully automatic boom section control system that turns the section valves on and off according to the guidance map of sprayed and unsprayed area.

ASC manages the sections when driving over sprayed ares like into a headland or wedge or around obstacles like trees etc.

**How it works**
ASC is integrated into the HC 9500 as a standard feature and only needs to be connected to a GPS receiver.

When spraying, the sprayed area is recorded as a map. When the boom passes over previously sprayed area ASC turns off the corresponding section valves. And when passing over unsprayed area the ASC turns the section valves on.

Typically headlands are sprayed first so that when the boom passes over the headland the operator can leave it to ASC to turn the section valves on and off.

A free GPS-signal is good enough for a spraying - as nozzles overlap and an accuracy of 12 inches is generally acceptable. More accurate GPS signals can also be used.

The percentage coverage of the section can be set to between 0 and 100% as desired.

Depending on the number of sections, a product saving between 3 and 5% is documented. With more sections, a bigger saving can be achieved.

# Guidance

**Completely integrated guidance**
Stretch working hours and view your field even in darkness with HC 9500 integrated lightbar. Supports multiple guidance patterns and signals – including RTK.

The HC 9500 display features an advanced, integrated guidance system with on-screen lightbar, capable of multiple guidance patterns. So, even if you only want guidance, the HC 9500 gives you that – plus plenty of room to grow.

**SmartPath™ pattern**
Drive one pass through the field, then establish a custom guidance pattern based on your initial pass.

**Integrated lightbar**
On-screen lightbar also includes cross-track error and pass number.

**Perspective view**
Perspective view gives you a view of your field to the horizon – even if it is too dark to see the actual field.

**Pattern control**
Save, load, reset, pause, resume, nudge and shift patterns from the in-cab display.

**Import/export patterns**
Easily load saved patterns to the display or to your precision farming software so you can easily match your path for later field operations.

Full guidance is a standard feature on the HC 9500 (GPS Smart Antenna required)

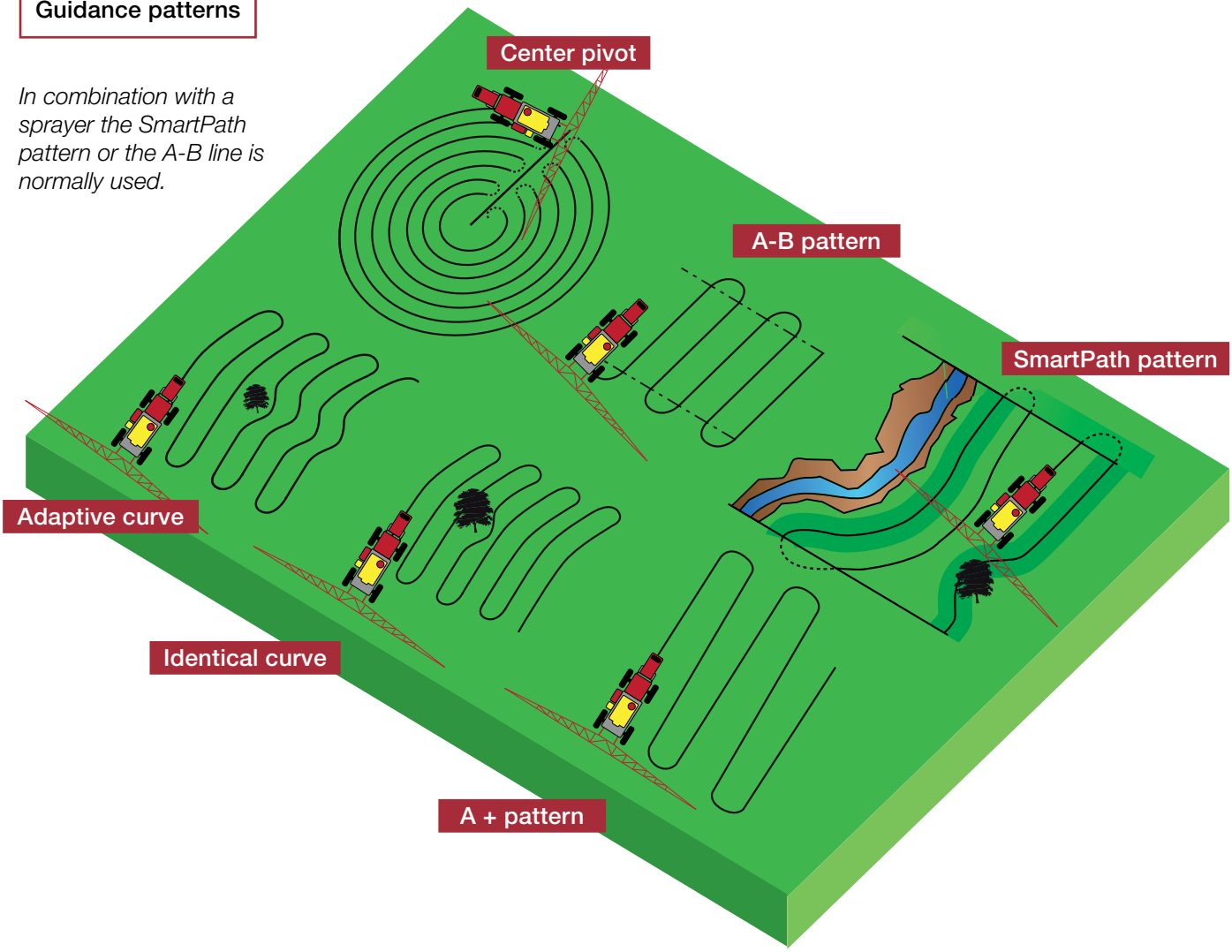
SmartPath Pattern is ideal for spraying

AutoSteering is integrated in the Paradyme system



**Guidance patterns**

*In combination with a sprayer the SmartPath pattern or the A-B line is normally used.*



# GPS receiver

Plug and play solution

**GPS 1600 and GPS 2500**
**The GPS 1600 and GPS 2500 are both all in one antenna/receiver systems. These compact, low-profile units feature fixed or magnetic mounting options and offer an affordable solution for sub-meter accuracy with fast start-up and reacquisition times. The GPS 2500 features a dual frequency receiver making it ideal for operations that require a high level of accuracy in the field.**

- Output simulated radar speed
- Up to 10 Hz output
- Output of NMEA position data to other equipment
- Ideal for AutoSectionControl applications
- e-Dif® technology provides accuracy without the need for a subscription to a differential signal
- Differential correction options include WAAS/EGNOS, mniSTAR HP/XP and VBS. See chart to the right
- GLONASS capable

| Applications | ParaDyme | GPS 1600 | GPS 2500 |
|---|---|---|---|
| Guidance | ■ | ■ | ■ |
| Tillage | ■ | ■ | ■ |
| Harvesting | ■ | ■ | ■ |
| Field Preparation | ■ | ■ | ■ |
| Mapping (point, line, area) | ■ | ■ | ■ |
| Variable Rate Controllers | ■ | ■ | ■ |
| Spreading | ■ | ■ | ■ |
| Spraying | ■ | ■ | ■ |
| Seeding | ■ | ■ | ■ |
| Listing | ■ | | |
| Cultivating | ■ | | |
| Bedding,Ridging | ■ | | |
| Log Hybrid/Variety | ■ | ■ | ■ |
| Strip-Tilling | ■ | | ■ |
| Topographical Mapping | ■ | | |

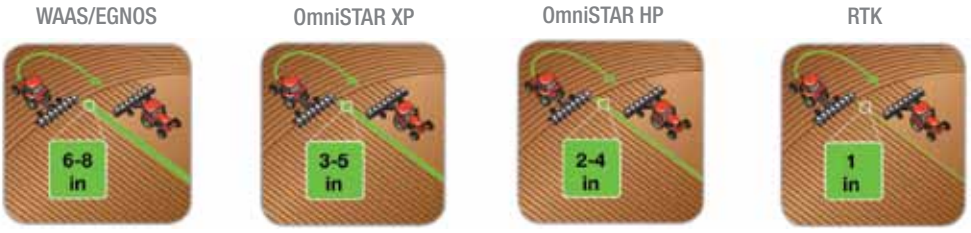
■ e-Dif® technology provides accuracy without the need of a subscription to a differential signal.

■ Differential correction options include WAAS/EGNOS, OmniSTAR HP/XP/VBS. See chart to the below.

**Use of existing GPS receiver**
If the farmer already has a GPS receiver, this can be used.

| GPS-Differential Correction | ParaDyme | GPS 1600 | GPS 2500 |
|---|---|---|---|
| WAAS/EGNOS | ■ | ■ | ■ |
| GLONASS | ■ | | ■ |
| OmniSTAR XP/HP/VBS | ■ | | ■ |
| RTK by NTRIP or base station | ■ | | |

**GPS Differential Correction**




## Correction Source Specifications:

| Correction Source | Connection Type | Advantages |
|---|---|---|
| RTK | NTRIP, Internal Radio, External Radio | High Accuracy Level, Repeatability |
| OmniSTAR HP | ParaDyme Roof Module GPS Receiver | Real time without the need for local Base Stations |
| OmniSTAR XP | ParaDyme Roof Module GPS Receiver | Real-time differential GPS corrections without the need for local Base Stations.<br>Lower cost that OmniSTAR HP. |
| EGNOS / WAAS | ParaDyme Roof Module GPS Receiver | Real-time accurate |

**ParaDyme - Auto Steer solution**
The ParaDyme is produced by Ag Leader and has plug-and-play compatibility with HC 9500.

HC 9500 and ParaDyme will provide sub-inch auto steer accuracy.

**Remote service**
Help can be requested through the HC 9500 display. Your dealer receives both an email and a text message alerting them to a service request. They can access ParaDyme remotely to diagnose issues in real time while you are still in the cab, and in the field.

**Logic 7D technology**
ParaDyme's dual antenna featuring Logic 7D technology accurately measures vehicle pitch, roll and yaw, guaranteeing accuracy and repeatability even in uneven field conditions. That is the key to accurate vehicle and implement placement. This is the only system that knows both position and heading even when not moving.

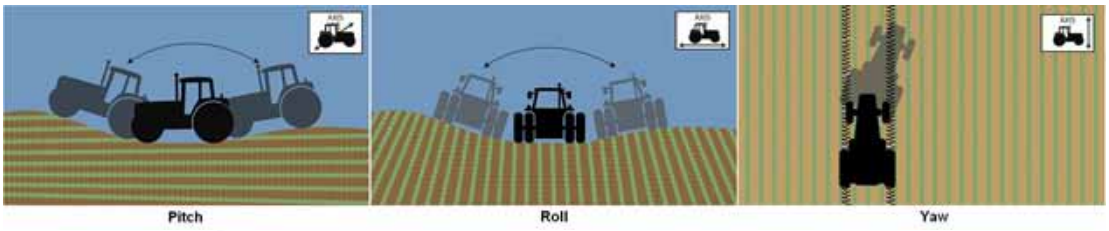

**Built-in cell modem**
Easily access NTRIP and other RTK network. The RTK network access is not offered by HARDI. An RTK base station or access to an existing RTK network must be organized by the local dealer.

**Simple set-up**
The HC 9500 display built-in support and auto-calibration make set-up quickly and easily – even when moving the ParaDyme to another vehicle.

**Advanced guidance patterns**
Support the most common and advanced guidance patterns, including SmartPath

**Tool-free transfer**
Easily transfer the ParaDyme antenna to other vehicles. No tools required.

**Multiple GPS correction signals**
Supports WAAS/EGNOS, OmniStar XP/HP and RTK for rover. The ParaDyme also supports the GLONASS Satellites.




# First set-up

The HC 9500 is a high end terminal and needs input before it can be used as a data management system. Before the work with a HC 9500 can start, the terminal must be configured. By pressing the wrench sign, the configuration layout will be opened.

On the configuration screen 4 areas in the bottom can be selected.

**❶ Configuration setting**
**❷ Farm management setting**
**❸ GPS and steering data**
**❹ General display setting**


**❶ Configuration setting**
In the configuration setting, all tractor and implement data are typed in.

The software guides you through different pages to get all necessary data as boom width, number of sections, section width, GPS receiver position, AutoSectionControl setting etc.

If the terminal should be used on different tractors and implements, all machines must be configured separately. By clicking on the plus icon a new machine is added.

Under Product different chemicals and liquid mixtures can be generated.


Easy to follow the configuration menu

Clear instruction to setup GPS receiver

Farm management can easily import data from the internet

Existing field boundaries can be used

Preset for ParaDyme – easy calibration

Brightness can easily be changed so excellent visibility is given

Speaks 14 different languages

**❶ B. Configuration setting**
When data must be typed in, an alpha / numeric keypad pops up, and information can simply be typed in. The more accurate this job is done, the better is the information in the data management system.


### ❷ Farm management setting

In the **farm management setting** area, information about the grower, the farm and the field can be generated. Data for different seasons and operators are stored and maintained here also. Existing field boundaries can be transferred by a USB stick to the terminal. Also maps from the internet can be uploaded.


### ❸ GPS and steering data

In the GPS and steering area the AutoTracking system ParaDyme can be activated and calibrated. Also information about the GPS receiver is typed in here.


### ❹ General display setting

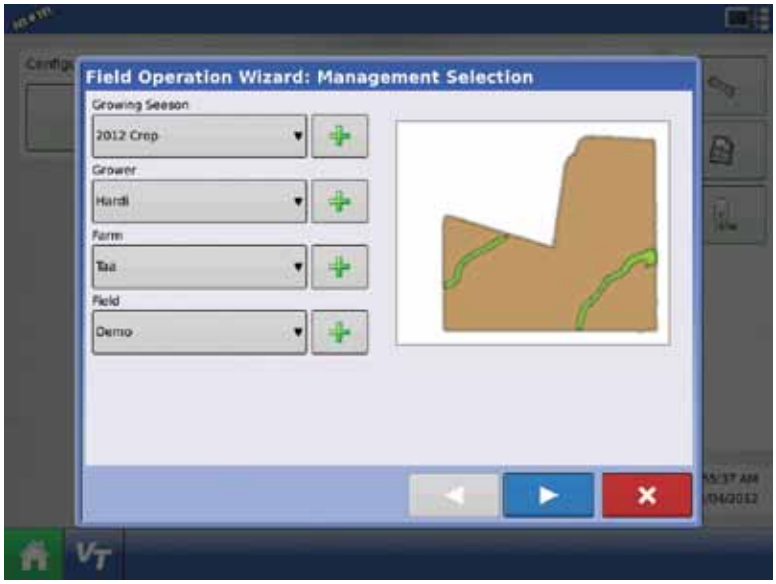
In the area general display setting, the operator can choose between 14 different languages. To change to another language, the HC 9500 has to switch OFF and ON again. Also time and date are set here as well as the screen brightness and the speaker volume.

# Starting a spray job

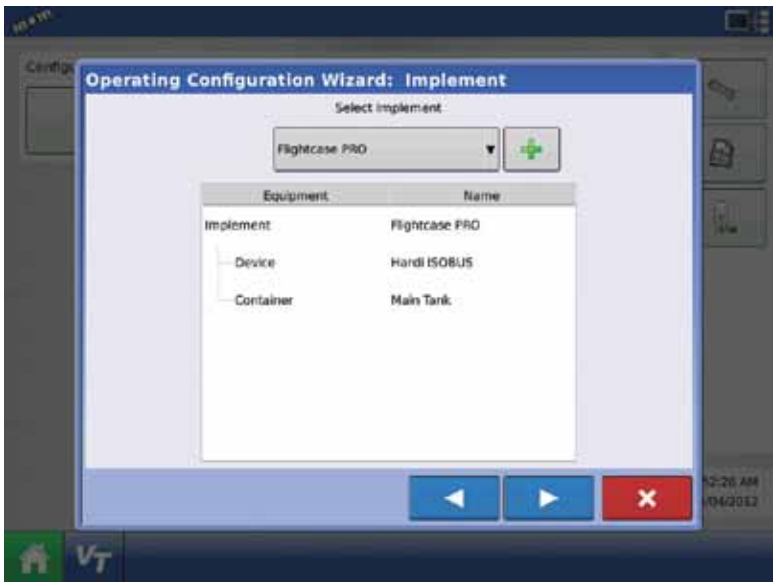
**Run screen operation - Start of spray job**
In order to maintain accurate records the HC 9500 requires spray job information before starting a task. If this information is not entered, the HC 9500 is not able to link specific information with the work associated in the specific field. Following the simple step by step procedures prior to a spray task, the operator is able to access a wide array of information after the spray job is completed.

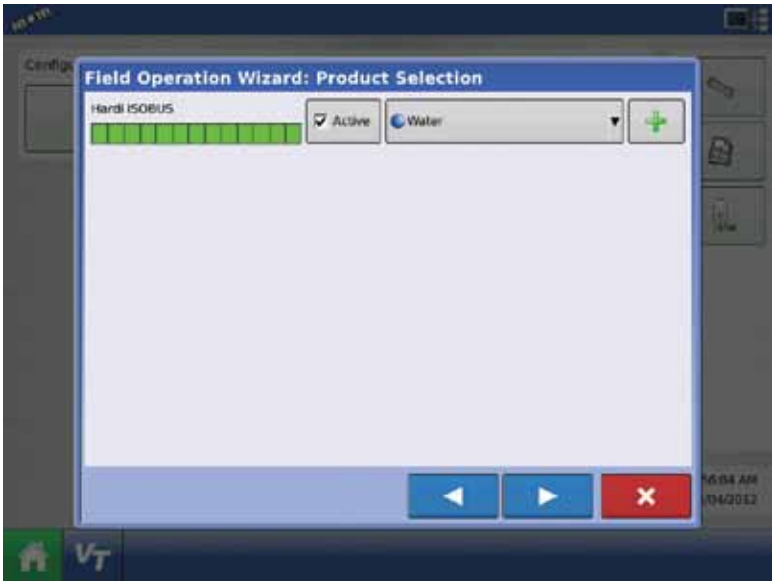
From the home screen a new spray job is started by pressing the **Start Field Operation** button.


❶ On the first screen a field must be chosen either from the data storage or a new one must be generated by pressing the + sign. To go further, the arrow to the right is pressed.

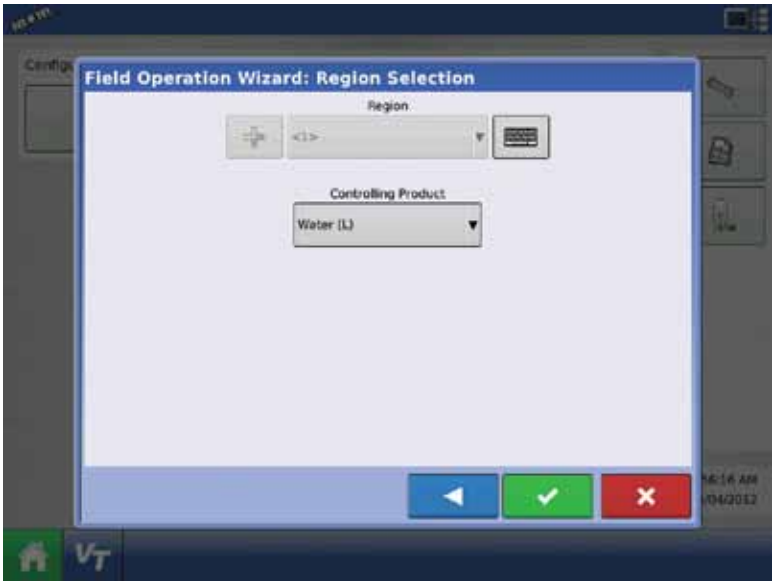


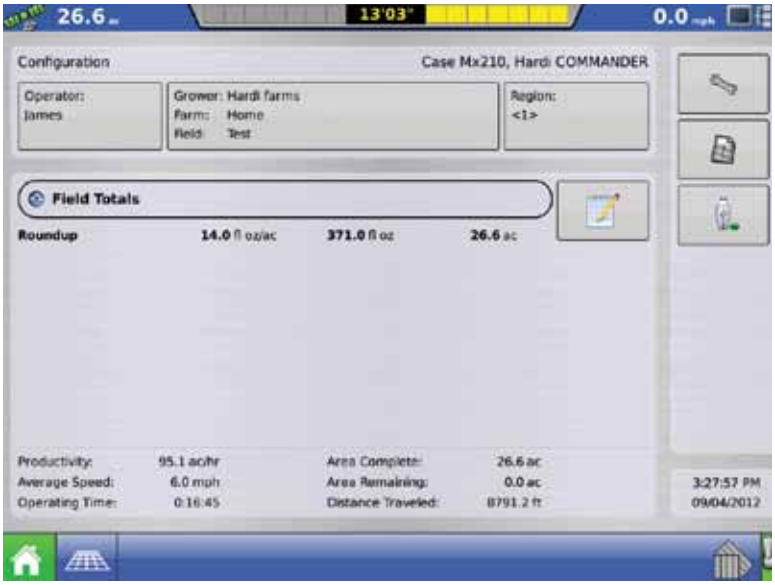

❷ On the next screen the terminal asks for the used implement. Choose one from the list or just press further if the correct machine is shown on the display.






❸ On the next two screens, information about the used chemicals or tank mixtures are asked, so you get the correct data into the reporting system.



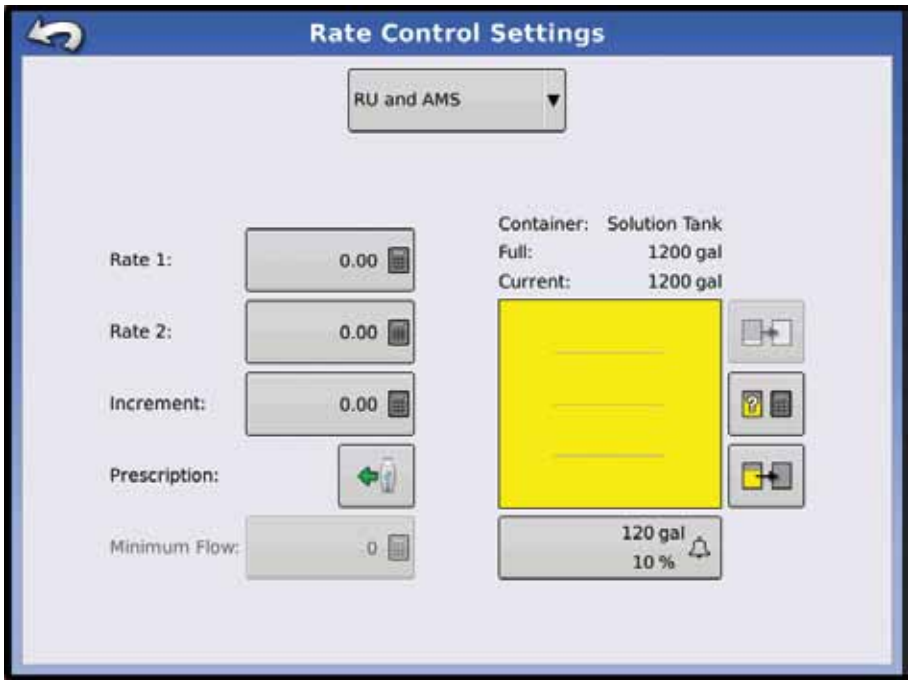

❹ Now press the green box with check mark, and the spray job is loaded into the data base, and the run screen view is now available. The grid sign on the bottom task bar, when selected, will bring up the work screen.

# Set dosage


**2 preset dose rates**

Dose rate steps in fixed gpa

Direct access to tank fill setting


The dosage is set up in the product tab on the main menu. The HC 9500 works as standard with 2 preset dose rates, between this the operator can easily shift by just pressing the button 1 or 2.

The dose rate can also be increased / decreased in fixed steps gpa - the steps can be individually selected.

The product tab window also shows the actual flow, the calculated container volume and the active boom width in feet & inches and percentage.

If the product tab is open, and the wrench button is selected, a sub-menu will be opened. Here different set-ups can be programmed from dose rates, tank volume and increment value step levels. Also, prescription data can be selected and the HC 9500 can load a variable rate map from an external USB stick.

# Data transfer



USB port

Data logging as standard

Transfer to different farm management software

**Data transfer ISOBUS**
The JobCom can store working data from up to 99 different fields, which is the basic possibility of the HC 6100 JobCom. The data can be transferred via an ISOBUS virtual terminal to farm management software. This software is not delivered by HARDI.

If the used ISOBUS terminal has a data management system, the basic data can be used and transferred to farm management software. The HC 6100 JobCom data is not transferred in the ISO-XML file format.

**Data transfer HC 9500**
The HC 9500 has different possibilities to do documentation and data transfer. The documentation part is explained on page 54 in the Product guide as well as in the Application Report which is a standard feature of the HC 9500.

The HC 9500 has a USB port which can be used for data transfer.

**SMS software**
AgLeader also offers a farm management software named SMS software. This is a complex farm management software with a lot of options and functions, including the option to generate A-B guidance lines on the PC or archive guidance lines from the field for future use. This is also the case for import/export guidance lines to and from multiple brands of guidance systems.

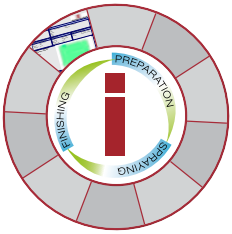
This also allows using the collected data further in other programs.

**Free introduction to SMS**
AgLeader offers free monthly online sessions to help you understand how to use the key tools provided in the SMS Basic, Advanced and Mobile software. Visit www.sms.agleader.com to register to attend.

**Data transfer from HC 9500 to other farm management software**
The HC 9500 stores data in a specific AgLeader file format which can be used by different farm management software solutions, as for example Claas Agrosystems. If a specific farm management software is used and the customer needs a connection to this, the local product management has to contact HARDI to help with the communication between AgLeader and the farm management software supplier.

The HC 9500 will not log data in the ISOXML file format, and neither will the SMS desktop software export logged data in this format. SMS can read ISOXML log data, and we can export set-up cards in the ISOXML format.

# Documentation




## Data logging

The HC 9500 automatically records application activities, including applied areas, product volume and more. The information can easily be downloaded into SMS software for analysis. Using the information can help accurately calculate input needs for the following year.

Documentation always needs a minimum of basic data and new information from the actual spray job. The HC 9500 asks for information before the spray job can be started as this is the best time to remember what the actual task is. If no information is given before the job, data are required later to create a report!

- Automatic data logging
- Transfer to farm management software

INTEGRA
APPLICATION REPORT

**Grower**
Test
2202 S. Riverside Dr.
Ames, IA 50010
515-232-5363

**Field**
Field: Test
County: Story
Township:
Range:
Section:
Farm: Test
Description:

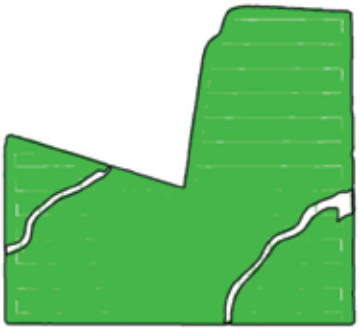
**Equipment Configuration**
Vehicle: HARDI SARITOR 5000
Implement:
Boom Height: 36 in

**Application**
Timing: Post Emerge
Placement: Surface Broadcast
Nozzle PN: F-05 Brown
Boom Pressure: 41 PSI

**Application Date/Time**
Start Time: 05/03/2011 4:37 PM
End Time: 05/03/2011 7:59 PM

**Product:** Water
**Applied Area:** 98.91 ac

Rate (gal):
24.9 +
18.7 - 24.9
12.5 - 18.7
6.2 - 12.5
0 - 6.2



Total Field Area: 96.59 ac

N

**Crop**
Crop: Canola
Growth Stage: Early Bud

**Restrictions**
Crop Rotation Restrictions: No
Restricted Entry Interval (REI): Not Observed

**Target Pests**
Broadleaf Not Observed
Not Observed Not Observed

**Product Summary**

| Name | Manufacturer | EPA # | RUP | Amount | Average Rate |
|---|---|---|---|---|---|
| Water | | | No | 1374.58 gal | 15.92 gal/ac |

**Operator/Supervisor Information**

Signature

Operator: Bill Smith License:
Operator: License:
Supervisor: License:

Test_ HARDI SARITOR 5000 , DirectLiquid_0000003e_110503.pdf Page 1 of 2

### Application report

The HC 9500 Application Report is a standard feature. This simple application report provides an easy way to generate detailed reports for governmental record keeping.

Reports provide location, product information, applied totals, field areas, applied maps and field boundaries. Enter basic information about weather, soil conditions, products used, etc.

Basic data will be created and kept as a standard protocol for easily populating the next report. The possibility of creating an annual report by field or entire farm also exists.

Automatic creation of PDF reports that can be saved on a USB stick and transferred to a computer for storage, email or print. This feature requires no additional software as the Smart Report is fully integrated in the system.

| REGION SUMMARY | | |
|---|---|---|
| **Item** | **Region 1** | **Region 2** |
| Region Name | <1> | |
| Operator Name | Bill Smith | |
| **Application Details** | | |
| Area | 98.91 ac | |
| Water Amount | 1374.58 gal | |
| Application Start Time | 05/03/2011 4:37 PM | |
| Application End Time | 05/03/2011 7:59 PM | |
| **Soil Conditions** | | |
| Soil Temperature | 60 ° F | |
| Soil Moisture Level | Optimal | |
| Soil Condition | Medium | |
| Crop Residue Level | Low | |
| Tillage Type | Conventional | |
| **Environmental** | | |
| Air Temperature | 75 ° F | |
| Wind Speed | 6 mph | |
| Wind Direction (From) | SE | |
| Sky Condition | Partly Sunny | |
| Humidity | 25 % | |
| **Additional Information** | | |
| Memo | | |

- Easy report system
- Simple possibility of data transfer
- No additional software required

# TERRA FORCE boom

**TERRA FORCE boom:**

88'- 4 to 8 Section
22" Nozzle Spacing

90'- 6 to 9 section
20" Nozzle Spacing

100'- 6 to 10 section
20" Nozzle Spacing

120'- 8 to 12 section
20" Nozzle Spacing

132'- 6 to 12 section
22" Nozzle Spacing

Built strong utilizing heavy duty three dimensional truss construction for high performance and is available in sizes 88, 90, 100, 120 and 132 feet.

The TERRA FORCE truss boom design is able to withstand incredible yaw forces created during cornering, accelerating, braking and auto steering. These forces are absorbed through a hydraulic dampened parallelogram suspension system.
With on-the-go stability control the dynamic boom center can be set from the cab to suit the operating condition.

When the boom is open the wing locks provide a positive locking mechanism ensuring the wings perform as one.

# Nozzle holder and boom tubes

The TERRA FORCE boom is standard equipped with triplet nozzle holders to enable nozzle changes by simply rotating the assembly.

Optional Pentalet nozzle bodies are also available

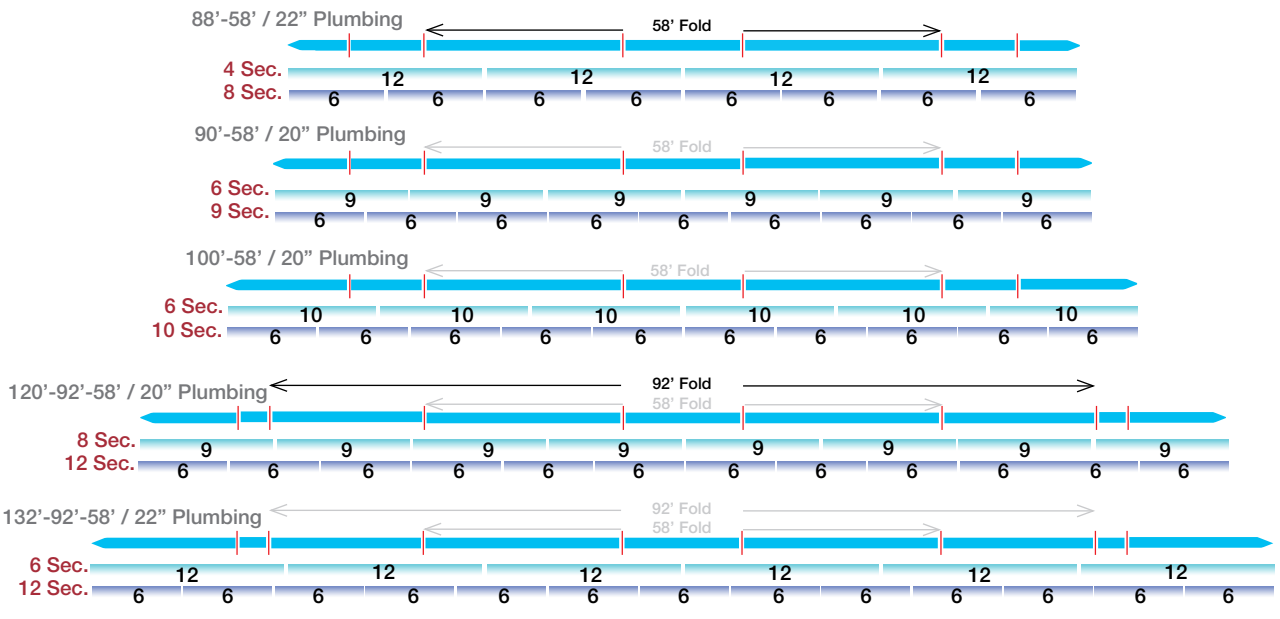
Ensuring fast and simple changes between nozzle rates and/or spray pattern

TERRA FORCE boom has stainless steel boom spraying tubes

The TERRA FORCE boom is designed to reduce turbulence over and around the nozzle. A continuous mounting rail provides variable nozzle position mounting and easily accommodates 10” nozzle spacing.

The boom is supported by a wide Paralift which enhances stability and is hydraulically dampened for smooth ride and performance.

Individual wing tilt is standard and they incorporate shock absorber elements to provide individual wing suspension. Optional Boom Prime allows the boom to be primed with chemical before spraying is started or flushed.

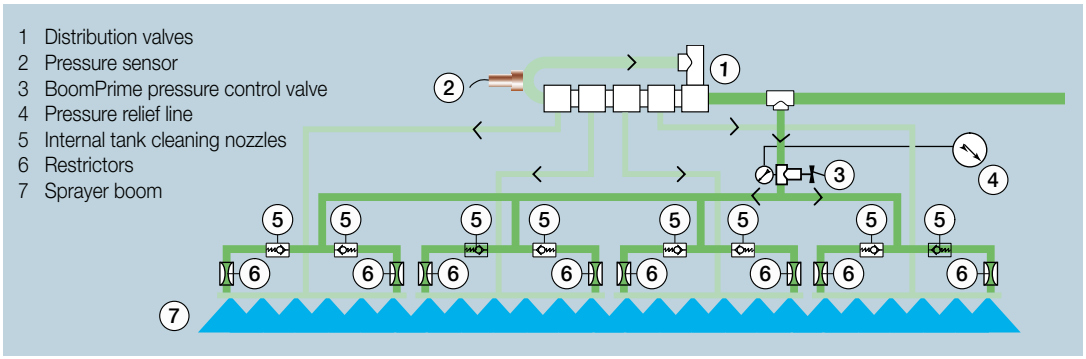


# BoomPrime

No untreated areas at start of spray job

No pesticide sedimentation in the spray lines

Positive pressure-based system to ease trouble-shooting




The optional BoomPrime is a low pressure circulation system for HARDI booms. The spray liquid can circulate to the nozzles before the actual spraying starts. It prevents sedimentation and permits flushing of the boom lines without spraying onto the ground.

This is a much simpler and less vulnerable system compared to a vacuum-based system. Leaks in a vacuum system are difficult to locate and even the slightest leak will cause problems.

There will still be liquid running through the boom tubes when the distribution valves are closed. A pressure valve in front of the boom sections ensures that the pressure in the sections will be not higher than 10 psi., so the non-drip valves will not open.

# TERRA FORCE boom wings



- 3-dimensonnal boom structure
- High performing yaw dampening

**TERRA FORCE**
Heavy duty three dimensional truss boom design is able to withstand incredible yaw forces created during cornering, accelerating, braking and auto steering.

When the boom is open the wing locks provide a positive locking mechanism ensuring the wings perform as one.

The TERRA FORCE boom is designed to reduce turbulence over and around the nozzle.

# AutoTerrain Center

- Wide ParaLift
- Nitrogen dampened
- AutoTerrain stability & height control
- Individual wing tilt suspension
- Yaw damping

**AutoTerrain center**
The TERRA FORCE booms are supported by a wide ParaLift which enhances the stability of the boom and is hydraulically dampened for smooth ride and performance.

Individual positive and negative wing tilt are standard and incorporates nitrogen accumulators for individual wing suspension.

The AutoTerrain center is a Pendulum type specifically designed for stability and auto height control.

AutoTerrain is a computer controlled preemptive boom stability & auto height control system which maintains the correct relationship and height of the boom to the different field conditions.

AutoTerrain uses highly tuned computer controlled proportional electric-hydraulics and ultrasonic sensors to help spray more safely, protects the boom from ground strikes and prevents incorrect spray height.

**Yaw damping**
The Yaw dampening is through a nitrogen accumulated plunge cylinder in the end of the fold cylinders which absorbs the energy from the boom to stabilize yaw movement.

The boom wings move backward and forward through breaking, acceleration and steering.

The more aggressive Yaw movement is caused by sudden changes in direction.

# AutoTerrain


- Maintains set boom height
- Follows the ground contour
- Preemptive stability & height control
- Monitors roll
- Sprays more safely
- No need for boom wheels



AutoTerrain sets new standards in wide boom performance. AutoTerrain maintains a lower boom height and provides better drift control.

AutoTerrain maintains the set boom height following the ground like a magnet regardless of the terrain it travels across.

AutoTerrain is a preemptive stability and auto height control system that deals with the cause of boom movement.

AutoTerrain seamlessly monitors roll through the center, and the height of the boom off the ground 10 times every second. When change is detected AutoTerrain simultaneously corrects the boom's position relative to the ground contour by angling it the through the center pendulum.

AutoTerrain helps to spray more safely, protecting the boom from ground strikes, and preventing incorrect spray height while increasing productivity through wide boom performance.

**Roll and height sensors**
AutoTerrain monitors roll and height sensors 10 times every second, simultaneously correcting boom position relative to the ground contour by angling it through the center pendulum.

No need for boom wheels, no need to be constantly on the wing tilts - ground strikes will be history!

**AutoTerrain benefits**
- Better boom stability
- Constant and uniform boom height
- Lower boom height
- Better drift control
- Minimize risk of boom damage
- Reduced down time due to breakage
- Less dependence on operator control
- Cuts operator fatigue
- Greater productivity
- Less wear and tear

**AutoTerrain consists of:**
- 3 precise ultrasonic height sensors
- Choice of soil, Hybrid or crop mode
- Active roll ultrasonic sensor & cylinder
- Proportional hydraulics

**HC 9500**
The HC 9500 display supports AutoTerrain.

# AutoTerrain

**Active Roll**
AutoTerrain seamlessly monitors roll through the center, and the height of the boom off the ground 10 times every second. When change is detected AutoTerrain simultaneously corrects the boom's position relative to the ground contour by angling it through the center pendulum.

**Active Roll Cylinder**
Boom roll is proportionally controlled with wing tilt functions. This provides an active isolation between the boom and sprayer, and therefore increases reaction speed.

**Ultrasonic Sensors**
These rugged aluminum sensors are designed for trouble free use and can sense changes in height to the nearest half inch (1 cm).

**Auto Terrain Software**
Automatically maintains a preset height above the ground or crop, depending on the mode selected: Soil Mode / Crop Mode/ Hybrid mode.
Controls all geometries of the boom.
Communicates hydraulic valve activity (up or down ).
May be overridden using existing in-cab controls.
Indicates whether the system is in 'Automatic' or 'Manual' mode.
Adjusts your spray nozzle height on-the-go with the push of a button.
Shows the height of the nozzles tips from either the top of the crop or the soil.
Quick and easy to use with automated setup and user-friendly Interface.

Active roll, sensor, suspension and cylinder

**AutoTerrain**

4 std. & 6 optional ultrasonic sensors with integrated micro processors

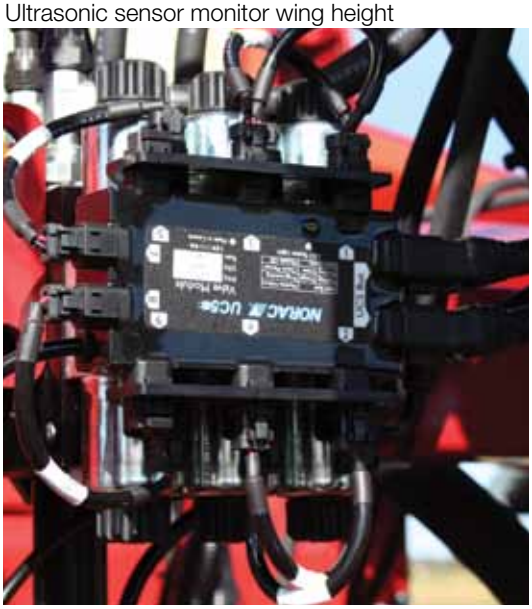
Monitors, dampens & corrects roll

Monitors temperature & recalibrates the proportional valves

Ultrasonic sensor monitor wing height

Ultasonic sensor monitor center height

**AutoTerrain components**
Seamless integration and communication between AutoTerrain components provide preemptive stability and height control



Proportional hydraulic control valves

# Electric Fence line end-nozzle

**End nozzle kit**
Ideal for spraying fence-lines. The HC 9500 registers the increased width and flow.

End nozzle controls are integrated in the soft keys.

# ParaDyme

**ParaDyme - Auto Steer solution**
The ParaDyme is produced by Ag Leader and has plug-and-play compatibility with HC 9500.

HC 9500 and ParaDyme will provide sub-inch auto steer accuracy.


# AgCam Remote Camera

AgCam Remote mount camera (Includes 50' Cable) 83360303

The AgCam rear view camera system is the most durable, reliable and easy to install camera available on the market today

# Richway Direct Injection Foam marker

High output, direct injection foam marking system for high speed spraying with large size booms (Flush tank required as water source)

# Pentalet nozzle bodies

Optional on the TERRA FORCE boom are the Pentalet nozzle holders that hold up to 5 nozzles to enable nozzle changes by simply rotating the assembly.

# Working Lights

**Work lighting**
The SARITOR has as an option 2 rear facing HID work lights.

**Underboom lighting**
The SARITOR has as an option 4 underboom work lights.

# Nozzles

### HARDI ISO – Standard-Flat Fan nozzle ( F )

These produce a fine to medium spray quality providing excellent distribution and coverage of the target surface in ideal conditions. However fine droplets are prone to produce off target drift in unfavorable conditions. Ideal for use with Twin System air assisted sprayers.

### HARDI ISO – LowDrift-Flat Fan nozzle ( LD )

LowDrift nozzles are fitted with a pre-orifice restrictor to create a pressure drop within the nozzle so that the final outlet orifice produces larger and slower moving droplets. This makes the droplets less sensitive to wind, reducing drift by up to 50% compared to Standard Flat Fan nozzles.

### HARDI ISO MINIDRIFT – Air Inclusion nozzle ( MD )

Used for drift reduction. A venturi air inlet between the pre-orifice and the outlet orifice creates a negative pressure in the nozzle which causes air to flow in through the side holes. The air and spray liquid generates larger droplets making them less sensitive to wind, reducing drift by up to 75% over Standard Flat Fan nozzles.

### HARDI ISO MINIDRIFT DUO – Air Inclusion nozzle ( MDD )

MINIDRIFT DUO nozzles can be used for spraying under sub-optimal conditions for drift reduction. MINIDRIFT DUO air inclusion nozzles offer droplet spectrums from medium to very coarse. They are used for drift reduction without compromising coverage and deposition on leaves.

## Nozzle size and application rate

### Durable Syntal

| ISO code & color | psi | gal/ min | gallons per acre at mph 6 | 7 | 8 | 10 | 12 | 14 | 16 | 18 | Standard Flat Fan | LowDrift | MINIDRIFT | MINIDRIFT DUO | INJET | QUINTASTREAM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0075 Pink | 20 | 0.053 | 2.6 | 2.3 | 2.0 | 1.6 | 1.3 | 1.1 | 1.0 | 0.9 | ✓ | | | | | |
| | 30 | 0.065 | 3.2 | 2.8 | 2.4 | 1.9 | 1.6 | 1.4 | 1.2 | 1.1 | | | | | | |
| | 40 | 0.075 | 4.2 | 3.2 | 2.8 | 2.2 | 1.9 | 1.6 | 1.4 | 1.2 | | | | | | |
| | 50 | 0.084 | 4.5 | 3.6 | 3.1 | 2.7 | 2.3 | 1.8 | 1.6 | 1.4 | | | | | | |
| 01 Orange | 20 | 0.071 | 3.5 | 3.0 | 2.6 | 2.1 | 1.8 | 1.5 | 1.3 | 1.2 | ✓ | ✓ | | | ✓ | |
| | 30 | 0.087 | 4.3 | 3.7 | 3.2 | 2.6 | 2.1 | 1.8 | 1.6 | 1.4 | | | | | | |
| | 40 | 0.100 | 5.0 | 4.2 | 3.7 | 3.0 | 2.5 | 2.1 | 1.9 | 1.7 | | | | | | |
| | 50 | 0.112 | 5.5 | 4.7 | 4.2 | 3.3 | 2.8 | 2.4 | 2.1 | 1.8 | | | | | | |
| 015 Green | 20 | 0.106 | 5.3 | 4.5 | 3.9 | 3.2 | 2.6 | 2.3 | 2.0 | 1.8 | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | 30 | 0.130 | 6.4 | 5.5 | 4.8 | 3.9 | 3.2 | 2.8 | 2.4 | 2.1 | | | | | | |
| | 40 | 0.150 | 7.4 | 6.4 | 5.6 | 4.5 | 3.7 | 3.2 | 2.8 | 2.5 | | | | | | |
| | 50 | 0.168 | 8.3 | 7.1 | 6.2 | 5.0 | 4.2 | 3.6 | 3.1 | 2.8 | | | | | | |
| | 60 | 0.184 | 9.1 | 7.8 | 6.8 | 5.5 | 4.5 | 3.9 | 3.4 | 3.0 | | | | | | |
| | 70 | 0.198 | 9.8 | 8.4 | 7.4 | 5.9 | 4.9 | 4.2 | 3.7 | 3.3 | | | | | | |
| 02 Yellow | 20 | 0.144 | 7.0 | 6.0 | 5.3 | 4.2 | 3.5 | 3.0 | 2.6 | 2.3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 30 | 0.173 | 8.6 | 7.3 | 6.4 | 5.1 | 4.3 | 3.7 | 3.2 | 2.9 | | | | | | |
| | 40 | 0.200 | 9.9 | 8.5 | 7.4 | 5.9 | 5.0 | 4.2 | 3.7 | 3.3 | | | | | | |
| | 50 | 0.224 | 11.1 | 9.5 | 8.3 | 6.6 | 5.5 | 4.7 | 4.2 | 3.7 | | | | | | |
| | 60 | 0.245 | 12.1 | 10.4 | 9.1 | 7.3 | 6.1 | 5.2 | 4.5 | 4.0 | | | | | | |
| | 70 | 0.265 | 13.1 | 11.2 | 9.8 | 7.9 | 6.5 | 5.6 | 4.9 | 4.4 | | | | | | |
| 025 Lilac | 20 | 0.177 | 8.8 | 7.5 | 6.6 | 5.3 | 4.4 | 3.8 | 3.3 | 2.9 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | 30 | 0.217 | 10.7 | 9.2 | 8.0 | 6.4 | 5.4 | 4.6 | 4.0 | 3.6 | | | | | | |
| | 40 | 0.250 | 12.4 | 10.6 | 9.3 | 7.4 | 6.2 | 5.3 | 4.6 | 4.1 | | | | | | |
| | 50 | 0.280 | 13.8 | 11.9 | 10.4 | 8.3 | 6.9 | 5.9 | 5.2 | 4.6 | | | | | | |
| | 60 | 0.306 | 15.2 | 13.0 | 11.4 | 9.1 | 7.6 | 6.5 | 5.7 | 5.1 | | | | | | |
| | 70 | 0.331 | 16.4 | 14.0 | 12.3 | 9.8 | 8.2 | 7.0 | 6.1 | 5.5 | | | | | | |
| 03 Blue | 20 | 0.212 | 10.5 | 9.0 | 7.9 | 6.3 | 5.3 | 4.5 | 3.9 | 3.5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 30 | 0.260 | 12.9 | 11.0 | 9.6 | 7.7 | 6.4 | 5.5 | 4.8 | 4.3 | | | | | | |
| | 40 | 0.300 | 14.9 | 12.7 | 11.1 | 8.9 | 7.4 | 6.4 | 5.6 | 5.0 | | | | | | |
| | 50 | 0.335 | 16.6 | 14.2 | 12.5 | 10.0 | 8.3 | 7.1 | 6.2 | 5.5 | | | | | | |
| | 60 | 0.367 | 18.2 | 15.6 | 13.6 | 10.9 | 9.1 | 7.8 | 6.8 | 6.1 | | | | | | |
| | 70 | 0.397 | 19.6 | 16.8 | 14.7 | 11.8 | 9.8 | 8.4 | 7.4 | 6.5 | | | | | | |
| 04 Red | 20 | 0.283 | 14.0 | 12.0 | 10.5 | 8.4 | 7.0 | 6.0 | 5.3 | 4.7 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 30 | 0.346 | 17.1 | 14.7 | 12.9 | 10.3 | 8.6 | 7.3 | 6.4 | 5.7 | | | | | | |
| | 40 | 0.400 | 19.8 | 17.0 | 14.9 | 11.9 | 9.9 | 8.5 | 7.4 | 6.6 | | | | | | |
| | 50 | 0.447 | 22.1 | 19.0 | 16.6 | 13.3 | 11.1 | 9.5 | 8.3 | 7.4 | | | | | | |
| | 60 | 0.490 | 24.2 | 20.8 | 18.2 | 14.5 | 12.1 | 10.4 | 9.1 | 8.1 | | | | | | |
| | 70 | 0.529 | 26.2 | 22.5 | 19.6 | 15.7 | 13.1 | 11.2 | 9.8 | 8.7 | | | | | | |
| 05 Brown | 20 | 0.354 | 17.5 | 15.0 | 13.1 | 10.5 | 8.8 | 7.5 | 6.6 | 5.8 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 30 | 0.433 | 21.4 | 18.4 | 16.1 | 12.9 | 10.7 | 9.2 | 8.0 | 7.1 | | | | | | |
| | 40 | 0.500 | 24.8 | 21.2 | 18.6 | 14.9 | 12.4 | 10.6 | 9.3 | 8.3 | | | | | | |
| | 50 | 0.559 | 27.7 | 23.7 | 20.8 | 16.6 | 13.8 | 11.9 | 10.4 | 9.2 | | | | | | |
| | 60 | 0.612 | 30.3 | 26.0 | 22.7 | 18.2 | 15.2 | 13.0 | 11.4 | 10.1 | | | | | | |
| | 70 | 0.661 | 32.7 | 28.1 | 24.6 | 19.6 | 16.4 | 14.0 | 12.3 | 10.9 | | | | | | |
| 06 Grey | 20 | 0.424 | 21.0 | 18.0 | 15.8 | 12.6 | 10.5 | 9.0 | 7.9 | 7.0 | ✓ | | | | ✓ | ✓ |
| | 30 | 0.520 | 25.7 | 22.0 | 19.3 | 15.4 | 12.9 | 11.0 | 9.6 | 8.6 | | | | | | |
| | 40 | 0.600 | 29.7 | 25.5 | 22.3 | 17.8 | 14.9 | 12.7 | 11.1 | 9.9 | | | | | | |
| | 50 | 0.671 | 33.2 | 28.5 | 24.9 | 19.9 | 16.6 | 14.2 | 12.5 | 11.1 | | | | | | |
| 08 White | 20 | 0.566 | 28.0 | 24.0 | 21.0 | 16.8 | 14.0 | 12.0 | 10.5 | 9.3 | ✓ | | | | ✓ | ✓ |
| | 30 | 0.693 | 34.3 | 29.4 | 25.7 | 20.6 | 17.1 | 14.7 | 12.9 | 11.4 | | | | | | |
| | 40 | 0.800 | 39.6 | 33.9 | 29.7 | 23.8 | 19.8 | 17.0 | 14.9 | 13.2 | | | | | | |
| | 50 | 0.894 | 44.3 | 37.9 | 33.2 | 26.6 | 22.1 | 19.0 | 16.6 | 14.8 | | | | | | |
| 10 Lt Blue | 20 | 0.707 | 35.0 | 30.0 | 26.3 | 21.0 | 17.5 | 15.0 | 13.1 | 11.7 | ✓ | | | | | ✓ |
| | 30 | 0.866 | 42.9 | 36.7 | 32.2 | 25.7 | 21.4 | 18.4 | 16.1 | 14.3 | | | | | | |
| | 40 | 1.000 | 49.5 | 42.4 | 37.1 | 29.7 | 24.8 | 21.2 | 18.6 | 16.5 | | | | | | |
| | 50 | 1.118 | 55.3 | 47.4 | 41.5 | 33.2 | 27.7 | 23.7 | 20.8 | 18.4 | | | | | | |
| 15 Lt Green | 20 | 1.061 | 52.5 | 45.0 | 39.4 | 31.5 | 26.3 | 22.5 | 19.7 | 17.5 | | | | | | ✓ |
| | 30 | 1.299 | 64.3 | 55.1 | 48.2 | 38.6 | 32.2 | 27.6 | 24.1 | 21.4 | | | | | | |
| | 40 | 1.500 | 74.3 | 63.6 | 55.7 | 44.6 | 37.1 | 31.8 | 27.8 | 24.8 | | | | | | |
| | 50 | 1.677 | 83.0 | 71.2 | 62.3 | 49.8 | 41.5 | 35.6 | 31.1 | 27.7 | | | | | | |

### HARDI INJET – Air Inclusion nozzle ( INJET )

INJET air inclusion nozzles are used for drift management when spraying in sub-optimal conditions cannot be avoided. They have a venturi air inlet between the pre-orifice and the outlet orifice. Very large and slow moving droplets are produced with air inclusion. This makes them less sensitive to wind reducing drift by up to 75% over Standard Fat Fan nozzles.

### HARDI QUINTASTREAM 5-hole nozzle ( Q )

Designed for application of liquid fertilizer. The patented QUINTASTREAM nozzle ensures optimum distribution with overlap. Fertilizer is applied in solid streams, minimizing the risk of phytotoxicity. Five [5] streams of liquid are distributed at different angles and flows. Highest flow is from the middle stream and lowest in the outer overlapping streams. Boom height 14-40 inches, however this system tolerates boom and ground undulations without affecting the quality of distribution.

## Nozzle size and spray quality

**Durable Syntal**

| | | | | | | |
|---|---|---|---|---|---|---|
| 0075 Pink | F | – | – | – | – | – |
| 01 Orange | F | M | – | – | VC | – |
| 015 Green | F | M | M | – | VC | Stream |
| 02 Yellow | F | M | C | M | VC | Stream |
| 025 Lilac | M | M | C | C | VC | – |
| 03 Blue | M | C | C | C | VC | Stream |
| 04 Red | M | C | VC | C | VC | Stream |
| 05 Brown | M | C | VC | C | VC | Stream |
| 06 Grey | C | – | – | – | VC | Stream |
| 08 White | C | – | – | – | VC | Stream |
| 10 Lt Blue | VC | – | – | – | – | Stream |
| 15 Lt Green | – | – | – | – | – | Stream |

**Spray quality:** F = Fine, M = Medium, C = Coarse, VC = Very coarse, S = Solid stream
**Pressure range:** For F, LD, MD, MDD and Q is 1.5 to 5 bar (20 to 40 psi recommended) and for INJET 40 to 120 psi (60 to 100 psi recommended)

# Specifications



| | | |
|---|---|---|
| **Tank size, gal** | | **1100 (4000) 1300 (5000)** |
| Boom, ft. | | 88 to 132 ft. TERRA FORCE |
| Control | | HC 9500 |
| Seat capacity | | 1 + 1 instructor's seat |
| Transmission | | Danfoss H1 transmission |
| Speed and torque | | Variable speed with bias power to front or rear |
| Drive | | 4 wheel drive |
| Suspension | | Air bag |
| Fuel Type | | Diesel |
| Emissions rating | | Tier III |
| **Weight** | | |
| Dry weight, lb. | | 30,250 - (5000 with 120' TERRAFORCE boom) |
| **Dimensions** | | |
| Wheel base, in | **E** | 168 |
| Length, in | **A** | 374 |
| Width, in | **C** | 138 at Mudguards |
| Width, in | **C** | 169.5 |
| Height, in | **B** | 156.5 |
| Track, in | **D** | 120 to 157.5 hydraulic adjustable on 380/90 R50 |
| Clearance, in | **F** | 54 |
| Turning Circle, ft. (curb to curb) | | 67 |
| **Engine** | | |
| Make | | Cummins |
| Engine location | | Front |
| Configuration | | Straight Inline |
| Engine size, l | | 6.7 |
| Engine code | | QSB6.7 |
| Cylinders | | 6 |
| Power, HP | | 275 |
| Torque, lb./ft. | | 730 |
| Induction system | | Turbo charged and charge air cooled |
| Fuel type | | Diesel |
| Fuel tank, gal | | 145 |
| Fuel delivery | | Direct injection |
| Method of delivery | | High-Pressure Common-Rail Injection |
| Fuel consumption, gal/hr. | | 8 to 10.5 |
| **Steering** | | |
| Description | | Two wheel Orbital power steering |

# Standard/Optional features



## Standard features:

1300 (5000) 1100 (4000) capacity
158.5 gal. RinseTank & rinse nozzles
8 gal. Hand wash tank
AutoTerrain
ParaLift boom height control
4 section boom distribution (88')
6 section boom distribution (90')
6 section boom distribution (100')
8 section boom distribution (120')
6 section boom distribution (132')
25 mm boom plumbing
275 hp Cummins engine
4 WD hydrostatic transmission
Cruise control
Optima Spiral Cell batteries
2 wheel steer & auto steer ready
120 to 157.5 inch hydraulic track width
Air bag suspension
54" under axle clearance
Mudguards & mud flaps
19 cubic ft. storage locker
HC 9500 controller with AutoSectionControl
Electronic TankGauge sensor
Reversing camera
SprayCenter control
Wide ladder and platform
Hydraulic fold down ladder
Climate control
AM/FM radio with CD player sound system
WetSeal run-dry centrifugal pump with up to 170 gpm.
TurboFiller induction 33 gal/min.
Boom line filters

## Options available:

AutoTerrain 6 sensor upgrade
AutoSteer
88, 90, 100, 120, & 132 ft. TERRA FORCE booms
BoomPrime recirculation
Solenoid fence line nozzles
ParaDyme steering
480/90 R50" tires
520/85 R46" tires
AgCam Remote Cameras
8 section boom distribution (88')
9 section boom distribution (90')
10 section boom distribution (100')
12 section boom distribution (120')
12 section boom distribution (132')

# HARDI Service

**Service**

HARDI machinery is serviced by a grid of specially educated service technicians. HARDI is aware of the importance of supplying knowledge to the buyers along with the sprayers. This increases the value of the sprayer for the end-user. To emphasize HARDI's investment in spreading know-how about the technical and application aspects of the sprayers, HARDI founded the "HARDI Academy" in 2004. HARDI Academy offers a wide range of courses, from 1st level technician to high specialist level. The strategy followed is still that of heavily investing in educating our dealers and their customers.

**Extensive user manuals**

Along with the HARDI Sprayer is an extensive user manual, instructing the user in all relevant matters to get the most of the new machine. The manual covers all light service issues, and user instructions for the entire machine, including the electronic and computing devices.

**Spare parts**

Availability of spare parts is a crucial issue to secure the reliability of the HARDI sprayer. Some parts are wearing parts, which need to be replaced as a consequence of using the sprayer. Other parts are suddenly needed due to collisions and other acute mishaps.

The spare parts stock carried by any HARDI distributor is backed up by central spare parts stocks, carrying all fast and most slow moving parts. This chain of supply secures a smooth and reliable service to HARDI machines worldwide. HARDI spare parts are available all over the world, and most areas are covered within 24 hours. Find the complete HARDI spare parts catalog on: www.hardi-us.com.

Original HARDI spare parts are, of course, manufactured under the same strict tolerances and quality demands as the complete machines. This goes for wearing parts, that are mostly easily replaced, as well as the complex hydraulic and mechanical parts.

HARDI

The Sprayer