

*The Intelligent Sprayer*  
**COMMANDER**



4500 / 5500 / 7000 / 8500 / 10000





# The intelligent sprayer COMMANDER

4500 / 5500 / 7000 / 8500 / 10000



## Concept

Farming practices are constantly changing. Farmers are met with a daily challenge to improve capacity and reduce operating costs. To help you to meet this challenge HARDI has developed the COMMANDER trailed sprayers.

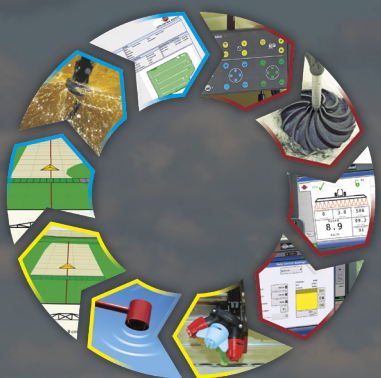
The COMMANDER is designed to meet the demands of the modern professional farmer world-wide. This generation of sprayers is designed to lead the way in capacity, reliability, safety, optimization, ease of operation and precision.

The COMMANDER is a high end performer designed for continuous use by demanding operators.

An example of the functional design is the logical layout of the left hand side of the sprayer, where all primary operations are located.

Take a closer look at some of the features making the COMMANDER the best choice on the market for trailed sprayers.





### Intelligent spraying – Fields ahead

The SprayCircle outlines the elements when preparing, spraying and finishing a spray job, and how the intelligent features of the COMMANDER, the HC 8600 and HC 9600 assist the operator.



### TWIN FORCE

TWIN – Make money on your spraying budget. The world's best application system will help you saving up to 30% of your chemical costs, and with higher spraying speed and lower drift you can boost your capacity up to 100%. The TWIN system will enlarge your spray window to be able to spray in more windy conditions making the job easier for you.



### DynamicFluid4 liquid system

The DynamicFluid4 liquid system of the COMMANDER sets new standards for precision and capacity. A technology based on 4 sensors built into the fluid system is feeding the spray computer with data needed to make the optimal regulation.



### “Touch the future” with integrated electronics – HC 8600 and HC 9600

The HC 8600 and HC 9600 controller offer growers a powerful, full-featured precision farming tool for guidance, data logging, application report generation, automated steering etc.

### SPECIFICATIONS

- › **Tank Gallons:** 1200, 1600, 2000, 2250, 2600
- › **Controller:** HC 8600, HC 9600 or ISOBUS
- › **TurboFiller:** Integrated working table, high capacity
- › **Liquid system:** DynamicFluid4 – shorter response time and more precise application in the field
- › **Tracking:** SafeTrack (optional)
- › **Axle:** Adjustable 60" - 90" or Fixed 120"
- › **Booms:**
  - DELTA FORCE: For higher speeds and greater performance 120 ft - 132 ft
  - TWIN FORCE: Air-assisted booms available from 80 ft - 120 ft
  - TERRA FORCE: Heavy-duty, high performance, AutoTerrain, Boom options of 120 ft or 132 ft

- › Capacity
- › Reliability
- › Safety
- › Optimization
- › Precision



# SafeTrack

## SafeTrack

The HARDI SafeTrack is available as an option on the COMMANDER (4500, 5500, 7000). This revolutionary design merges the benefits from other traditional systems into one high performance system. With the HARDI SafeTrack you do not have to choose between either tight turning radius or stability.

This ensures a minimum of crop damage combined with safe and user-friendly operation. A computer constantly monitors forward speed and turning radius to make sure that the correction made by the tracking system is as safe as possible.

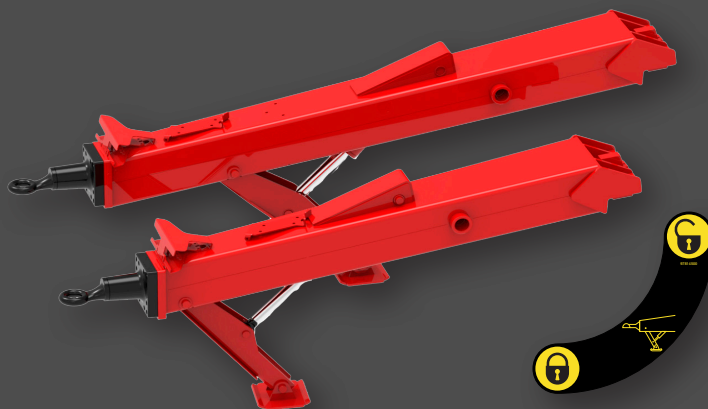
SafeTrack ensures that the boom is always 100% perpendicular to the crop rows. This ensures perfect application when turning at the end of the fields.



## Extended Drawbar

The drawbar of the 5500 and 7000 has a hydraulic support leg as standard and is driven by a separate hydraulic outlet on the tractor. This ensures easy and safe attachment of the sprayer.

For the 120' TWIN Force boom on the 5500 and 7000, an extended drawbar is required and included as a standard feature.



## Safe in all conditions

If the tractor driver tries to do a 90° turn at for example 9 mph, the SafeTrack system automatically computes the data and straightens up the trailer to prevent tipping over.

The unique geometry in the SafeTrack concept, with trapeze arms, gives a turning radius down to 20 ft (depending on tank size).

In transport mode, the SafeTrack function automatically locks in straight ahead position.



# WorkZone

The COMMANDER has a WorkZone where all primary functions are placed in an easy to reach position. Everything you need to operate the sprayer is available in this area, and everything is designed to be simple and logical to understand and operate. The large safety locker is placed right over the WorkZone along with the clean water tank.

## SmartValve

All primary functions needed to operate the sprayer when filling or cleaning are located in the center of the WorkZone. The logically placed handles with easy to read icons make the system very easy to operate. This greatly reduces the start-up and operation time of the sprayer.

## QuickFill

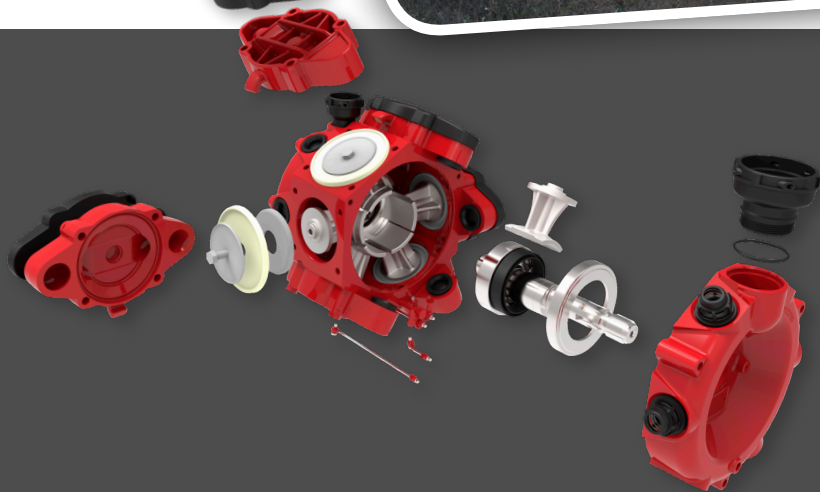
Two QuickFill Banjo ports are provided for filling the sprayer main tank as well as the rinse tank

## TurboFiller

The HARDI TurboFiller is developed to handle large quantities of powders and liquids. Its high capacity is achieved through a combination of high vacuum and liquid rotation produced by a TurboDeflector inside the hopper.

## High mixing capacity

Liquid at high pressure is being used to create a powerful rotation of the liquid inside the hopper. This movement gives the effect that all powder or liquid chemicals are mixed before they are sucked into the sprayer.



## HARDI 464 Pump

To meet the requirements of bigger sprayers and to improve lifetime, we have introduced the HARDI 464 pump. A reduction in pressure drop has been avoided by improving the flow in the diaphragm valve covers.

To ease service, we have integrated lifting hooks while moving two greasing points to the front, also making easier lubrication of the front and the rear of the pump. The casted con-rod support ring has also been redesigned for improved mechanical lifetime.

The most visible change is the new covers designed to protect the pump from mud and water getting into the system.

- Self-priming
- Able to run dry without damage
- Easy to service
- Grease-lubricated crankcase





# DynamicFluid4

## The fluid system

### Dynamic fluid system based on 4-sensor technology

The COMMANDER fluid system is developed to obtain shorter response time and thereby more precise application in the field.

Powerful tractors with clutch free gear shift and CVT transmissions have given new driving patterns with more variance in the speed and faster acceleration, factors which together with the GPS controlled section control is challenging for the performance of any liquid system.

In a traditional fluid system the regulation is made on feedback from what is already "historical" data. For example the RPM is

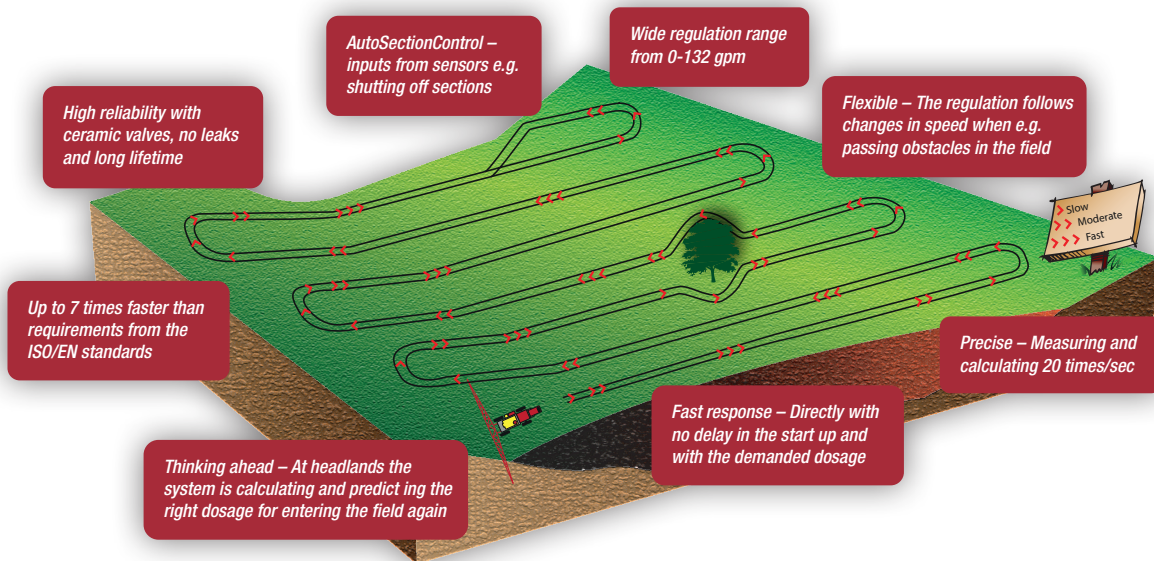
increased, and shortly after the flow will be too high at the nozzle. When that is measured, the spray computer will regulate the pressure down again but in the meanwhile the application rate has been too high.

The DynamicFluid4 system will calculate the consequences of the increased RPM and make the regulation instantly. The DynamicFluid4 property of pro-acting is based on 4 sensors in the fluid system measuring RPM, position of regulation valves, flow and pressure. Combined with a specific new software and a new, unique ceramic regulation valve, DynamicFluid4 is offering

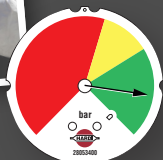
precision in the application rate giving the best performance available on the market.

### Stability and safety

The sensors of DynamicFluid4 each have their individual task, but they will also work as back up for each other, and the regulation will always continue. Regulation can be done manually.



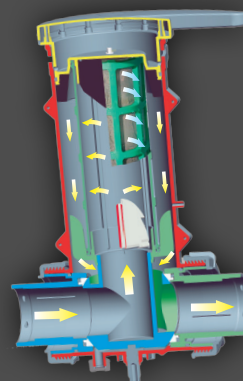
The COMMANDER filter system consists of the exclusive HARDI EasyClean filter and CycloneFilter.



### EasyClean filter

The EasyClean filter is a high capacity suction filter. The condition of the filter can be constantly monitored via a SafeSpray vacuum gauge.

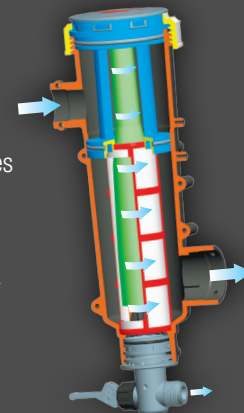
This ensures that the filter is cleaned when needed and only when needed. When cleaning the filter, all you have to do is to twist the lid 90°. This will close a main tank valve in the bottom of the filter and open the filter for inspection.



### CycloneFilter

The CycloneFilter is on the pressure side and is a unique self-cleaning filter with a high-speed cyclone action that increases the cleaning capacity of the filter significantly.

In addition, the CycloneFilter has a unique boost function allowing the filter to be flushed when needed.





# Controllers

## Full control



## "Touch the Future" with integrated electronics

### HC8600 & HC9600

The HC8600 / HC9600 controller provides growers a powerful, full-featured precision farming tool for guidance, data logging, application report generation etc.

## HC 8600 and HC 9600

The complete integration of all important information on one work screen is a highly demanded criterion for most farmers. The HC 8600 and HC 9600 have multicolor HD touch screens that are very easy to operate while providing an optimal overview for maximum control of the spray job.

### Integrated electronics

From the working screen the driver can operate AutoHeight, AutoSectionControl as well as guidance and application rate. The view can be switched between 2D and 3D when guidance is active. The HC 9600 is able to divide the information with split screen for a better overview.

### Data management and data transfer

The HC 8600 and HC 9600 have USB ports and WiFi adapter as standard, allowing data to be exchanged. This simplifies application reporting, providing an easy way to generate detailed application reports for governmental record keeping. Reports provide location, product information, applied totals, field areas, applied maps and field boundaries. The data can be transferred to different farm management software.

The HC 9600 automatically creates an application report in a pdf-format which can be saved, emailed or printed. For this no additional software is required.

Basic information about weather, soil conditions, products, etc. can be added.

### Universal Terminal

The HC 8600 and HC 9600 displays are designed to meet the ISO 11783 ISOBUS Universal Terminal standard.



Feature	HC 8600	HC 9600
Screen dimensions	8.4" (21.3 cm)	12.1" (30.7 cm)
Number of registers	No limit	No limit
Maximum number of distribution valves	13	13
Alpha-numeric keyboard	●	●
ISOBUS Universal Terminal	●	●
USB port	1 x USB	2 x USB
AutoSectionControl	●	●
Guidance	●	●
Coverage Mapping	●	●
Data Logging	●	●
Variable Rate Application	●	●
Smart Report™	N/A	●
Boom Height Control	○	○
AutoSteer Control	○	○
OptRx® Crop Sensors	N/A	○
Camera Support	○	○



### ISOBUS terminal

The HARDI COMMANDER can be operated with a universal ISOBUS terminal. The customer can order the COMMANDER and use the intelligent functions like AutoSection Control direct from his own ISOBUS terminal if supported.

To make the complex sprayer operation easier, the proven HARDI JoyStick will be delivered with the COMMANDER sprayer.



# Boom management systems

AutoHeight and AutoTerrain

## The HARDI AutoHeight and AutoTerrain systems will automatically control the boom

This makes the job much easier for the driver, and the result will be a better spray application.

The system is known for the following features:

- Robust and precise ultrasonic sensors
- Option to choose between soil, crop or hybrid mode
- Proportional valve for smooth movements (AutoHeight, AutoTerrain)
- Tilt and height correction (AutoHeight, AutoTerrain)

AutoTerrain works and reacts on both boom movements and twisting forces on the boom. This allows the system to be proactive and react on the cause more than on the symptom.



AutoHeight	AutoTerrain
Boom height	Boom height
Hydraulic Slant <i>(only on the 120')</i>	Hydraulic slant
Individual tilt of boom wings	Individual tilt of boom wings
Negative tilt (120ft Twin , Delta Force-all sizes)	Negative tilt
3 or 5 ultrasonic sensors	3 or 5 ultrasonic sensors
2 roll sensors on the center	1 linear roll sensor on the center
2 temperature controlled proportional valves	3 temperature controlled proportional valves
<b>DELTA FORCE</b> <b>TWIN FORCE 80'-120'</b>	<b>TERRA FORCE</b>



Negative tilt for superb boom stability



# TERRA FORCE boom

*strength, performance and capacity*

## **TERRA FORCE**

The TERRA FORCE boom is offering outstanding strength, performance and capacity. A 3-dimensional boom structure with a layout for only pushing and pulling forces secures optimal strength.

High performing yaw dampening: Hydro-pneumatic dampers combined with 4 polyurethane dampers give stability and minimum stress when turning and also for acceleration and deceleration. Partial fold is an option which secures optimal performance and flexibility. TERRA FORCE is available from 120'-132'.

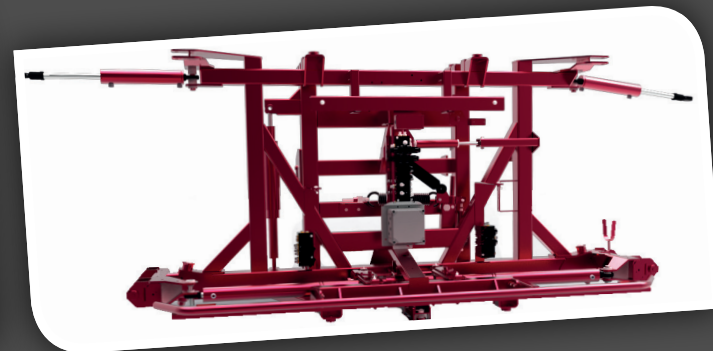
TERRA FORCE booms are available on COMMANDER 5500, 7000, 8500 and 10000.



## **Unique HARDO boom management systems**

**AutoTerrain** is an automatic boom management system which works and reacts on both boom movements and twisting forces on the boom. This allows the AutoTerrain to be proactive and react on the cause more than on the symptom.

- ▶ Partial fold and tilt suspension are options which secure optimal performance and flexibility.
- ▶ High performance yaw dampening is supplied by a double acting hydraulic damper.
- ▶ Wide Paralift is hydraulically suspended.







# TWIN boom

*World's best application system*

## 3rd generation HARDI TWIN – the ultimate in capacity, weather independence and application technology

### The biggest challenge when spraying is timing, due to weather conditions

Let's take control. With the HARDI TWIN directed air system, air will help you control the wind. You are in control of the speed and angle of that air giving you the possibility of covering the whole plant, from top to bottom.

### The ideal high capacity solution

Spray drift from conventional sprayers can be so strong that the operator has to stop before having the spray job done. With efficient drift control it is much easier for the operator to be able to spray the entire field.

Under most conditions the farmers get at least twice as many hours for a safe and efficient spray job with the TWIN sprayer compared to conventional spraying.

The TWIN FORCE is available in sizes from 80' to 120'.

### Up to 100% more spray capacity

Timing is everything! The results show that during Spring 2015 the wind conditions for conventional spraying only allowed 31 days of spraying whilst using a TWIN Force you could have gained over 45 extra days suitable for spraying. At the same time you can spray faster and have less filling time from reduced water consumption, due to more accurate placement.

Increased spray opportunities, reduced drift, reduced chemical usage, accurate placement, faster spraying speed, result in an improved bottom line for producers.

### Save up to 30% on chemicals

Many trials throughout the years have shown a better chemical efficacy using TWIN. Proper placement gives the producer the opportunity to adjust the chemical dose, and in some markets we see up to a 30% reduction in chemicals consumption at the farm through the season to get the desired control.

### TWIN ADVANTAGES:

- Reduced drift
- Save up to 30% in chemicals
- Better penetration in the crop
- Improved spraying economy
- Lower water consumption
- Higher capacity
- More than 30 years' experience in TWIN
- Negative tilt for superb boom stability (*available on 120ft*)
- Hydraulic AntiYaw dampening for precise application
- New folding system and extensive use of aluminium in the outer wings provide higher durability and lower weight
- Easy handling with AutoHeight sensors

### Make money on your spraying budget ...

Insert your input numbers at [www.hardi-twin.com](http://www.hardi-twin.com), and it will show you just how much money you can make on your spraying budget.

[www.hardi-twin.com](http://www.hardi-twin.com)





### TWIN FORCE

Two powerful blower units provide air to the left and right boom sides respectively. The large amount of air produced by the double fans allows for faster application speeds even under very difficult weather conditions. Each blower has an output of 63 mph.

The new generation of Twin Force booms in the 120 ft are available with the negative tilt of the boom wings when used in combination with the AutoTerrain boom management.

Twin Force hydraulic allows a fast tilt reaction which is needed to get a good performance in challenging conditions. Tests have shown that the AutoTerrain solution offers the best possible performance and allows higher operating speeds.

The angling of the air curtain together with the spray swath is a distinctive and important feature of the HARDI TWIN.

This allows for a much more precise application regardless of crop and weather conditions.



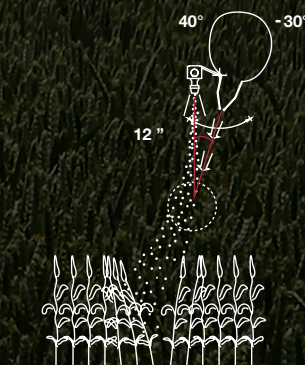
AIR OFF



AIR ON



AIR FLOW CONTROLLED





# DELTA FORCE boom

*Compact in transport — Wide in field*

## **DELTA FORCE is designed to be a large boom.**

The selection of features and the layout of the boom structure are targeted to perform at high driving speed and high performance at boom widths of 90 ft, 120 ft and 132 ft.

The result is a boom with many simple and strong solutions which together give a high-performing and reliable boom with a simple setup, low maintenance and a great design.



### **20 Inch nozzle space**

DELTA FORCE booms are delivered with 20 inch standard nozzle spacing with the option of 15 inch spacing. The 132 ft DELTA FORCE booms are set up with 22" nozzle spacing.

With smaller nozzle space the boom height can be lower, which reduces the potential spray drift. To work with lower boom height the AutoTerrain boom management is the best option.

Another advantage is that smaller nozzle have a smaller droplet size which leads to a better coverage.



### **Carbon-fiber break-away on 132 ft.**

The low weight and the stiffness of carbon-fiber allow a 15ft long break-away compared to the 10 ft aluminum version on the 120ft boom.





### Market's best boom stability

A very advanced, but yet simple center section controls the movements of the DELTA FORCE boom.

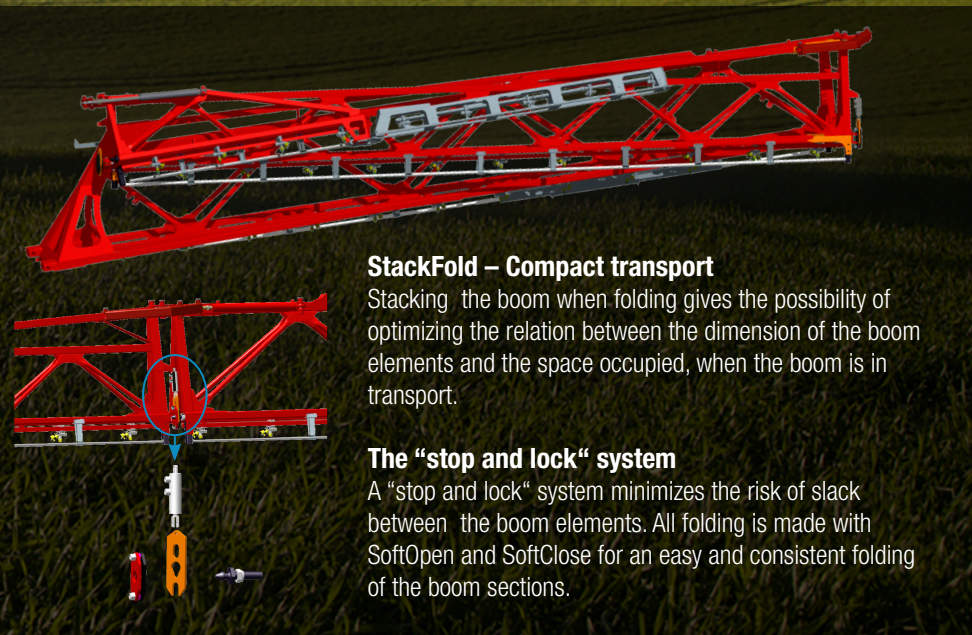
The five pendulum settings allow to adjust the boom performance, either to a pendulum, which follows the sprayer movements, or to follow the level of the terrain.

### Hydraulic AntiYaw

Forces from yaw movements are absorbed by accumulators. The oil system is active and automatically recharged every time the boom is unfolding. The hydraulic AntiYaw is standard on 120 ft to 132 ft. The smaller versions have a mechanical system with rubber dampers as standard.

### AutoTerrain

With 3 sensors on the boom, the distance to the crop is measured several times per second. 3 gyrosensors measures the angle of the boom, the center section and the chassis. AutoTerrain reacts before the boom gets out of balance and the precise steering, gives you the possibility of higher driving speeds. There is also an optional upgrade to 5 sensors with the SevereTerrain feature.



### StackFold – Compact transport

Stacking the boom when folding gives the possibility of optimizing the relation between the dimension of the boom elements and the space occupied, when the boom is in transport.

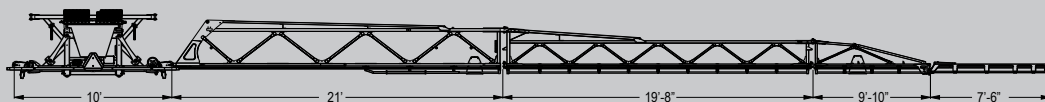
### The “stop and lock” system

A “stop and lock” system minimizes the risk of slack between the boom elements. All folding is made with SoftOpen and SoftClose for an easy and consistent folding of the boom sections.

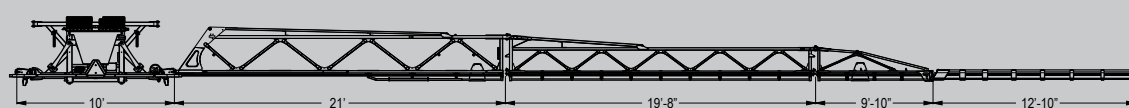
## HARDI DELTA FORCE is available in:

**3-fold: 132/90/52ft, 120/90/52ft**

120' DELTA FORCE



132' DELTA FORCE





# Boom Specifications

The **COMMANDER** is available with booms from 80ft to 132ft. Booms are equipped with trapeze style center, AntiYaw dampening and are fully adjustable to suit both rough and steep terrain.

## DELTA FORCE 90ft and 132ft

DELTA FORCE is designed to be a large boom. The selection of features and the layout of the boom structure is targeted to perform at high driving speed and high performance at boom widths of 90ft and 132ft.

## TERRA FORCE 90ft and 132ft

With the unique boom management system, and a design which in every detail is supporting strength, performance and capacity, the TERRA FORCE boom is offering the outmost among conventional booms.

## TWIN FORCE 80ft to 120ft

The TWIN FORCE boom offers the same strength and durability as the DELTA FORCE boom combined with the advantages of HARDI's unique TWIN air system.

The TWIN system allows for faster spraying speeds, better penetration into difficult crops and spraying when conditions with a conventional sprayer would be marginal. For the 120 ft TWIN FORCE an extended drawbar is available.

# Options



## Duals

Upgrade to 320/90 R50 Duals with either 22" spacers for 88" to 132" or 30" spacers for 60" to 120".



## HC 8600 – HC 9600

The HC 8600 and HC 9600 controllers offer growers a powerful, full-featured precision farming tool.



## FlexCapacity pump system

COMMANDER 5500/7000/8500/10000 can be equipped with a FlexCapacity pump system.



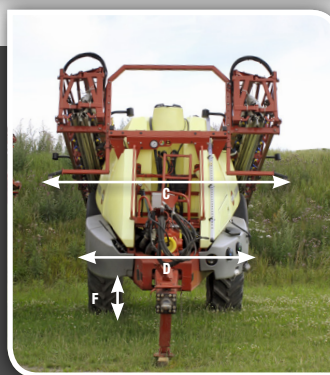
## External cleaning equipment

Spray gun and hose wheel for external cleaning.



# Technical Specifications

Model/Tank, gal.	4500 (1,200 gal)	5500 (1,600 gal)	7000 ( 2,000 gal)	8500 (2,250 gal)	10000 (2,600 gal)
Pumps, type – gpm	464-89/464H-85	464H-85/2x464-178	464H-85/2x464-178	464H-85/2x464-178	464H-85/2x464-178
Booms	TWIN 80ft-120ft DELTA FORCE 120ft & 132ft	TWIN 80ft-120ft TERRA FORCE 120ft & 132ft DELTA FORCE 120ft & 132ft	TWIN 80ft-120ft TERRA FORCE 120ft & 132ft DELTA FORCE 88ft & 132ft	TERRA FORCE 120-132ft	TERRA FORCE 120-132ft
Hydraulic Suspension	Optional	Standard	Standard	Standard	Standard
Suspended drawbar	-	Standard	Standard	Standard	Standard
RinseTank (gal)	132	132	132	193	193
Total height - B	13ft (320/90R46)	12.5ft (320/90R50)	12.5ft (380/105R50)	12ft (380/105R50)	12ft (380/105R50)
Total length - A	25.5 ft	28 ft	28 ft	29 ft	29 ft
Length draw to axel - E	208 inches	238 inches	238 inches	238 inches	238 inches
Turning radius SafeTrack	20 ft	30 ft	30 ft	N/A	N/A
Track width - D	60-90 inches(Opt.HC Fixed 120") 22" Duals Width - 88-132"	60-90 inches(Opt.HC Fixed 120") 22" Duals Width - 88-132"	63-90 inches (Opt.HC Fixed 120") 22" Duals Width - 88-132"	72-90 inches (Opt.HC Fixed 120") (Opt. 88" or 120" Fixed axle)	72-90 inches (Opt.HC Fixed 120") (Opt. 88" or 120" Fixed axle)
Width DELTA FORCE - C	10 ft	10 ft	10 ft	N/A	N/A
Width TWIN FORCE - C	10 ft	10 ft	10 ft	N/A	N/A
Width TERRA FORCE - C	-	10 ft	10 ft	11.6 ft	11.6 ft
Clearance - F	31 inches (320/90R46)	30 inches (320/90R50)	30 inches (380/105R50)	31 inches (380/105R50)	31 inches (380/105R50)
Weight total (empty tank)	11,373 lbs.	14,614 lbs.	15,763 lbs.		
Hydraulic suspension	Optional	Standard	Standard		
Suspended drawbar	-	Standard	Standard		







Davenport,  
USA



Nørre Alslev,  
Denmark



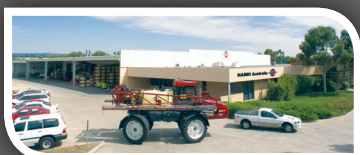
Lleida,  
Spain



Savigny,  
France



Beaurainville,  
France



Adelaide,  
Australia

# HARDI

## The Sprayer

### HARDI INTERNATIONAL A/S

is an international group whose basic idea is to satisfy the user's requirements for quality products which ensure efficient, punctual and precise application of crop protection products. Our world-wide distribution and sales network comprise more than 100 countries where we are represented by importers, agents and sales subsidiaries. These are situated in Sweden, Norway, Denmark, the UK, France, Spain, North America, Germany and Australia.

Since 1957 HARDI has committed to the ever-increasing demands for efficient and precise plant protection. HARDI is the trendsetter within application of crop protection products. To achieve this position continued developments and innovation are essential. HARDI is committed to the long term future of plant protection.

### Testing procedures

Sprayers leaving HARDI North America are tested according to the strictest quality standards.

The staff of the assembly line is accredited to match the demands from both NSTS (National Sprayer Testing Scheme), UK and JKI (Julius Kühn Institut), Germany. This ensures that the highest quality sprayers are delivered to farmers.



### Superb surface treatment

The high-technology surface treatment contains 13 treatments, including a pre-treatment and powder coat painting of all major components.

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



## HARDI NORTH AMERICA

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#SprayHARDI