



# 176 AUTO-RATE INJECTION PUMP AND CONTROL SYSTEM

PRODUCT INFORMATION

# THE LIQUID SYSTEMS APPROACH

Liquid Systems has over 45 years of direct involvement in research, design and manufacture of agricultural machinery.

At Liquid Systems, we strongly believe in building reliable, accurate, durable products that provide the best end-user experience delivering optimum results and peace of mind to the customer.

We know that when planting a crop, our customer's time is too important to spend dealing with the pitfalls of second rate equipment. That's why we build quality products that work reliably under the most extreme conditions from day one and for many years after.

A key part of our Quality Management System is our 8 point factory wet testing process that ensures every system is in full working order when it leaves our factory. This ensures trouble free installation and commissioning.



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# 176 OVERVIEW

The 176 Auto-rate Injection Pump and Control System represents the ultimate refinement of Liquid Systems' liquid fertilizer rate control systems. The quality of our systems has evolved through ten years of real world, on-farm experience in liquid injection design and development.

The 176 has been custom built to complement and enhance the John Deere 1910 Commodity Air Cart to provide the best control system for liquid fertilizer injection, integrating with John Deere GreenStar™.

Paired with a Liquid Systems 'Stacker' distribution system, the 176 provides the most reliable, accurate, flexible & controllable liquid injection system on the market today.

## ADVANTAGES OVER GROUND DRIVE

The Liquid Systems 176 module with a Stacker distribution system will give you the edge over currently available ground drive systems with:

- Complete system performance monitoring
- Static run capability for testing and trouble shooting
- Precision stream control with minimal lag time for start-up and shut-off
- More precise rate control
- On-the-go rate changing
- Mapping based variable rate control
- Tank Agitation

## UNPRECEDENTED FLEXIBILITY



# FEATURES

## COMPLETE PACKAGE

The 176 is provided as a complete ready to assemble package for the 1910 Commodity Air Cart. The kit contains every component required to install the system on a tow-behind or tow-between cart, plumb the central bin for liquid and integrate to a GreenStar™ display via a standard GreenStar™ Rate Controller. Paired with a Liquid Systems Stacker distribution system, the 176 provides a complete package for implementing precision liquid control on the 1910 Commodity Air Cart.

## DURABILITY

The 176 is built from quality components made of robust materials such as stainless steel, glass reinforced polypropylene, polyester, PEI and PVC that are capable of handling highly aggressive products whilst operating under extremely harsh climatic conditions. Built-in fail safe mechanisms protect the system from operator errors and external faults.

## RELIABILITY

Liquid Systems uses high quality TeeJet, Banjo and LQS custom made components to ensure rock-solid reliability of the 176. The system design incorporates many features that enhance overall reliability. Each unit is factory Wet-Tested to ensure customers are up and running from day one. The 176 is the ultimate in reliability, giving your customers peace of mind.

## ACCURACY AND VERSATILITY

Using state of the art TeeJet electric ball valves and flowmeter, the 176 valve set provides top of the range accuracy and responsiveness over a broad range of application rates, row spacings, number of rows and ground speed. Paired with a Liquid Systems Stacker distribution system, the 176 delivers liquid accurately, precisely and with even distribution to each row.

## GREENSTAR™ INTEGRATION

The 176 is designed for integration with the John Deere GreenStar™ Display via a GreenStar™ Rate Controller. With GreenStar™, control of liquid application rate is at your fingertips or can be automated using mapping-based variable rate control. Easily monitor system status and progress of the liquid fertilizer application program on the GreenStar™ Display. Display and Rate Controller must be purchased separately from John Deere.

## SAFETY

Operator safety is enhanced with safety features such as:

- Pressure relief valve that eliminates pressure spikes from the system.
- Fresh water hand wash facility.
- Tank overflow collection and drainage.

## EASE OF USE

We've made the 176 simple to operate and maintain:

- The central fill station makes tank refilling a breeze.
- Fascia mounted source and function selector valves.
- Sliding pivot mounting for easy service access to the rear of the pump & control module.
- Camlock couplings and labelling for all hose connections.

## QUICK CLEAN UP

An operator can select fresh water and purge functions to perform in-field fresh water purging of the pump & control module and the distribution system. Alternatively, a fresh water purge can be performed manually via the external flush port.



# SPECIFICATIONS

## JOHN DEERE 1910 COMMODITY AIR CART FIT

The 176 Module and 200L Flush Tank come mounted on a 4.0mm stainless steel chassis that is fitted to the cart on powder coated bearers securely fastened by "U" bolts.

The chassis features a sliding pivot rail that allows the pump and control module to be pulled out at right angles to the chassis providing easy access for servicing.

**QUICKER, MORE EVEN EMERGENCE. GREATER EFFICIENCY IN APPLICATION AND USE OF LIQUID FERTILIZER. REDUCED INPUT COSTS. EASY HANDLING. UNPRECEDENTED FLEXIBILITY.**

## TANK KIT

The 176 tank kit provides all hoses, tank fittings and components to plumb the center tank on the 1910 Commodity Cart for liquid fertilizer application with the 176 module.

## 200L FLUSH TANK

The 200L (53 US Gal) flush tank holds fresh water for in-the-field system purging and hand washing.

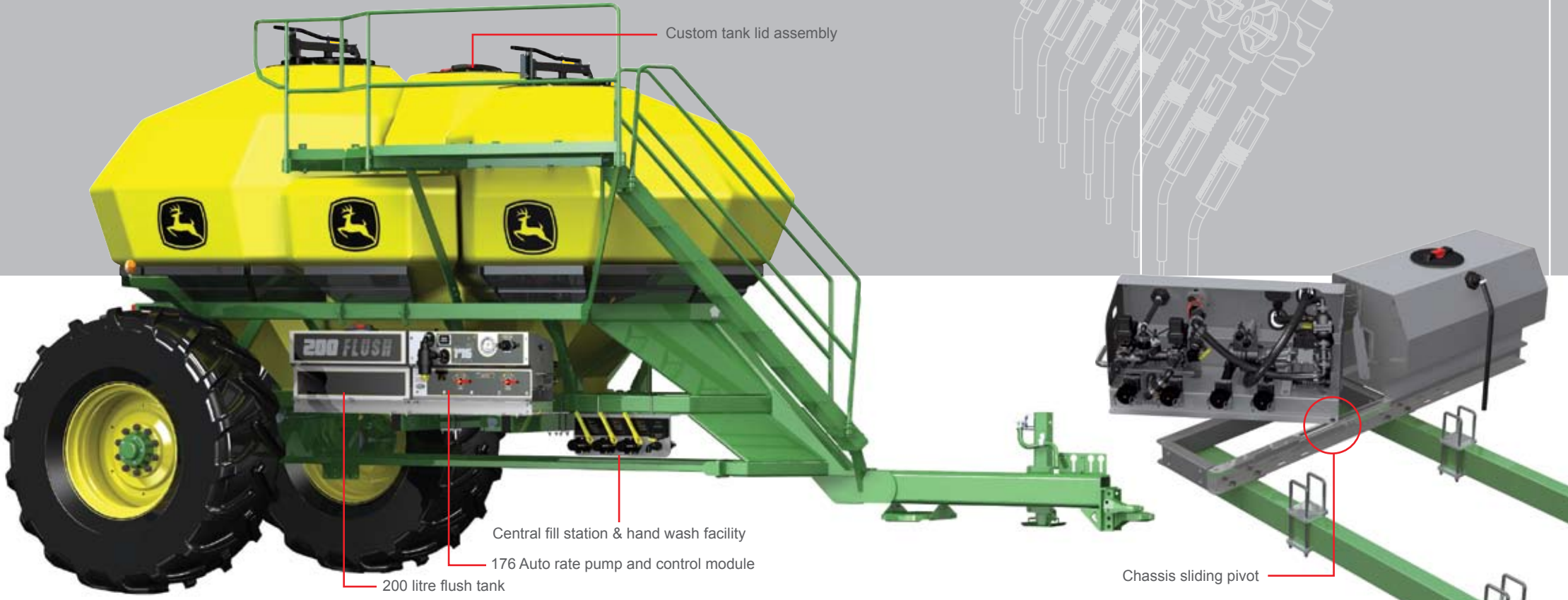
## FILTRATION

The 176 pump and valve set are protected by a fascia mounted 32 mesh suction filter.

## CENTRAL FILL STATION

The cart mounted central fill station provides:

- 2" ports with camlock couplings for filling product tank and clean water tank
- product tank vent and overflow
- hand wash facility



# SPECIFICATIONS

## THE LQS ENHANCED PUMP

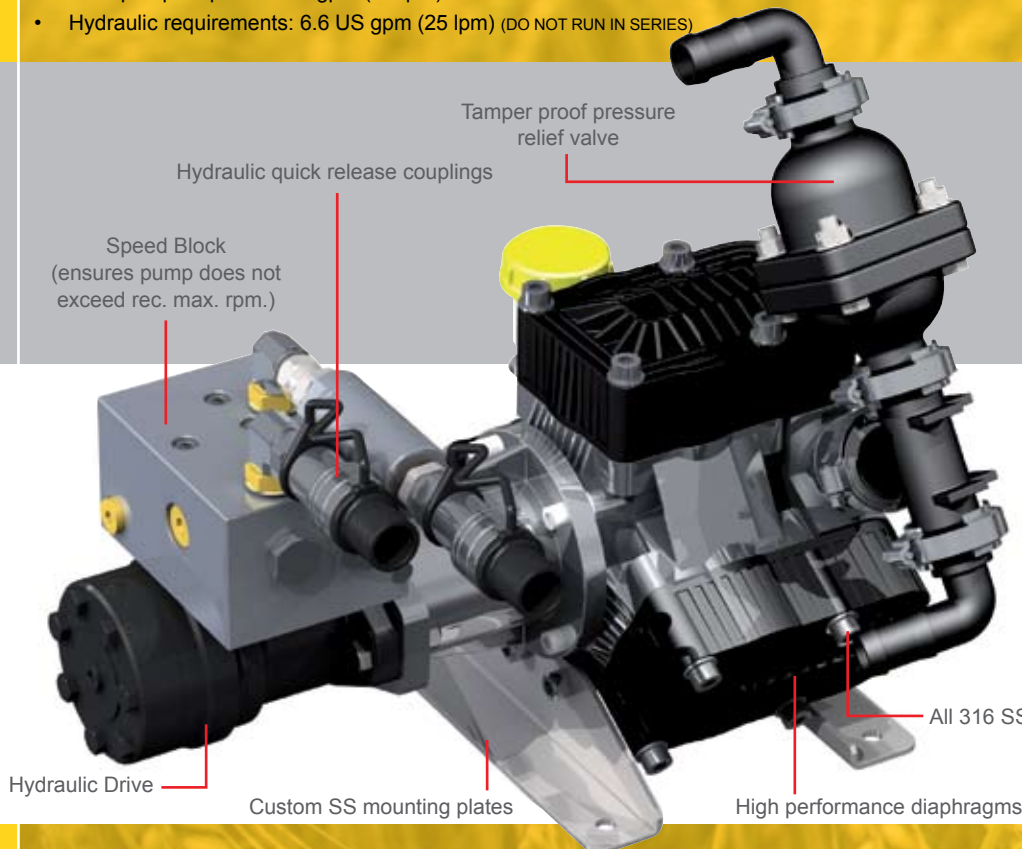
The 176 incorporates a custom built Bertolini 2073 piston diaphragm pump capable of delivering up to 20 US gpm of liquid. The 2073 is a robust chemical resistant pump that we have enhanced to deal with the demands of liquid fertilizer injection.

### We've added:

- high performance diaphragms
- stainless steel fasteners and mounting brackets
- tamper proof pressure relief valve -100psi (7 bar)
- hydraulic motor with flow control block that prevents pump from being driven beyond its maximum specified rpm

### Operational specifications are:

- Max. pump speed: 550rpm
- Max. pump output: 20 US gpm (76 lpm)
- Hydraulic requirements: 6.6 US gpm (25 lpm) (DO NOT RUN IN SERIES)



## GREENSTAR™ COMPATIBLE VALVE SET

The 176 valve set has been designed for the John Deere GreenStar™ System. It integrates with a GreenStar™ Display via a GreenStar™ Rate Controller.

### The valve set includes:

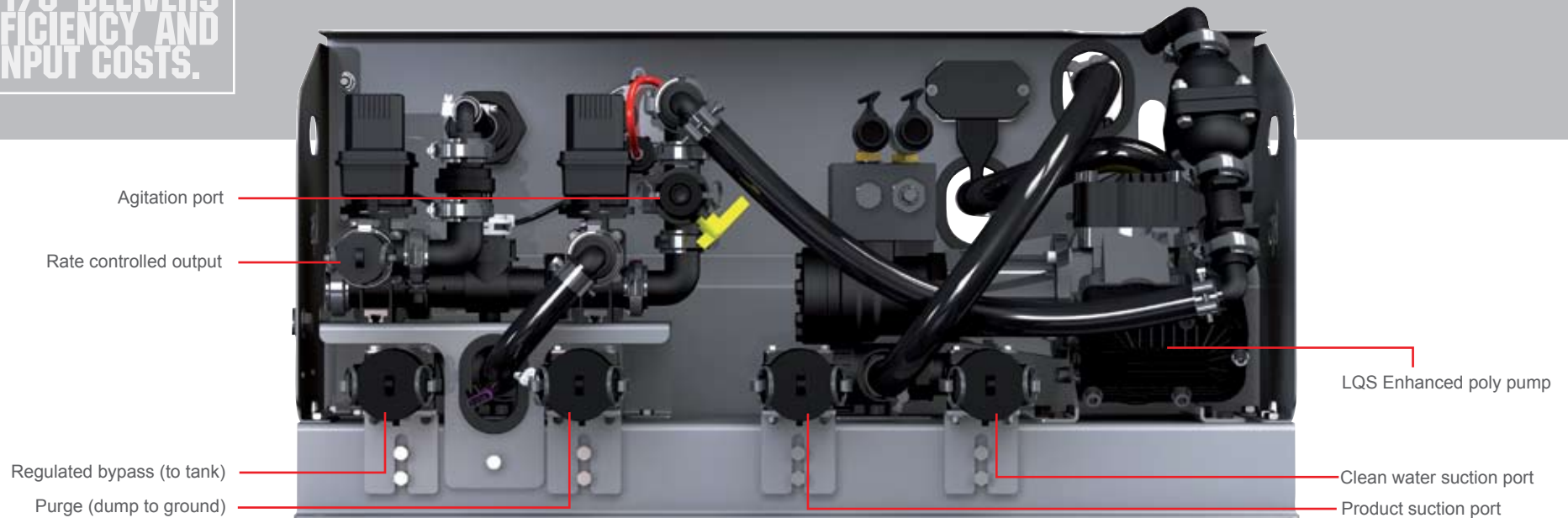
- Custom TeeJet shutoff and regulating valves
- TeeJet 801 Flow Meter accurate from 2 to 60 US gpm
- 232 psi (16 bar) LQS 316 stainless steel pressure gauge for system testing and monitoring
- Adapter harness for connecting the valve set to the GreenStar™ Rate Controller
- Pressure transducer to monitor system pressure on the GreenStar™ Display
- Valve set operating voltage: 12V



# 176 PUMP & CONTROL MODULE



VARIABLE RATE CONTROL WITH THE 176 DELIVERS BETTER EFFICIENCY AND REDUCED INPUT COSTS.





PRECISION LIQUID CONTROL



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