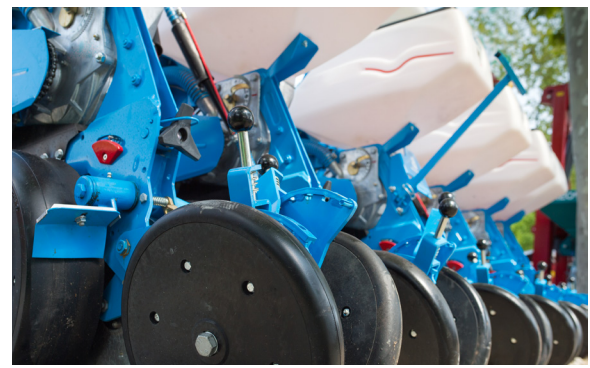


Hydraulic Driven Compressors

Planter Equipment OEM Enhances Seed Placement with Increased Air Flow Capabilities

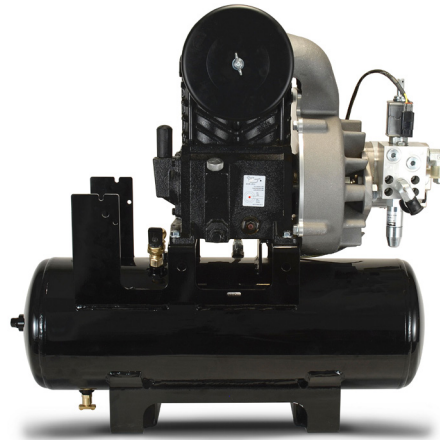


The Challenge

In the agricultural industry, pneumatics is used for many activities such as tire inflation systems, planter row cleaner and closer systems, air suspension and sprayer systems, air tools, and air brakes.

The heart of any pneumatic system is the air compressor in planters. Compressors are essential to pneumatic downforce systems as well as provide air for row cleaners and closers systems. The amount of air required is directly correlated to increased downforce control speeds. Increasing the speed of the downforce control requires more air. However, many OEMs utilize small electric compressors, which struggle to provide enough air that is needed to make fast downforce adjustments. An alternative option is to utilize the hydraulic power available on the planter (from the tractor) to get more air flow by powering a larger compressor.

OEMs are continuously looking for design enhancements to improve yields for their customers. A key value to this OEM was the development of an integrated and compact compressor solution. In regards to performance, the OEM wanted to increase pneumatic flow (power) to adjust pneumatic systems faster. Furthermore, in cases where vehicles do not have a compressor system, the OEM needed a solution to add air onto their vehicle, so they can now use pneumatic systems for various functions. With this engineering challenge, the OEM approached Parker's engineering team to design, develop, assemble and test a complete compressor unit.



The Parker Approach

In an effort to improve pneumatic downforce systems, more pneumatic flow is needed. A hydraulic driven compressor system takes hydraulic energy available on the vehicle and drives a large compressor (pump) to get eight times more flow than electric compressors.

With the need to increase speed, it is especially important that compressors inflate or deflate air bags or pneumatic cylinders at a speed that matches soil conditions. It is precisely on the subject of engineering expertise that Parker's hydraulic compressor technology for planters offered the best solution for this particular OEM when compared to the competition.

From proof of concept to product development and full verification testing, Parker led the engineering efforts, closely with the OEM's engineering and testing teams. Parker's extensive engineering experience in product development reduced the burden of the OEM as well as reduced the OEM's costs and resources needed to develop a customized hydraulic driven compressor for their planting equipment.

The OEM's needs were clear - create a more efficient hydraulically driven compressor system with improved air flow to meet planter

seed requirements and specifications. In addition to these requirements, the OEM's compressed project timeline meant that project management accuracy and commitment were essential for the success of this project.

By partnering with this OEM and their customers, Parker was able to quickly develop a proof of concept and a prototype within a couple of weeks. Parker developed a compact direct drive solution between the Parker hydraulics gear motor and the pneumatic pump. The development of this "plug and play" solution enables the operator to set the row-unit target pressure functions (row unit downforce, row cleaner downforce/upforce and row closer downforce) directly from the cab of the tractor. With a larger compressor, planters can maintain or adjust pneumatic system pressures accordingly, achieving precise soil penetration, and consistent planting depth. Furthermore, the increased air flow from the compressor allows for active control, where the planter is controlling downforce based on closed loop control from a load sensor on the row unit. This eliminated the need for the operator to make constant manual adjustments as field conditions changed.



ENGINEERING YOUR SUCCESS.

Customer Outcome

Being a compact, integrated “plug and play” solution, not only reduced the OEM’s up-front design investment but also reduced assembly and test times when integrating it onto the equipment during production. A few mounting bolts, pneumatic and electric connections and the OEM was up and running with almost ZERO assembly and test hours by the OEM. Furthermore, the valve manifold systems that Parker developed enhanced air system control functions such as pneumatic downforce, cleaners and closers. It was clear during our conversations, the OEM saw a tremendous value in Parker’s extensive lab testing facilities, which ensured this compressor system met and exceeded their performance expectations.

Since Parker’s hydraulic driven compressor has been in the field for many years now, customers with active pneumatic downforce systems are seeing an increase in equipment efficiency, performance and crop yields, along with the reduced stress and workload on equipment operators.

“We were so impressed with Parker’s use of Quality Function Deployment (QFD) tools as well as their Program Management to meet our rigorous time line with a product that exceeded expectations.”

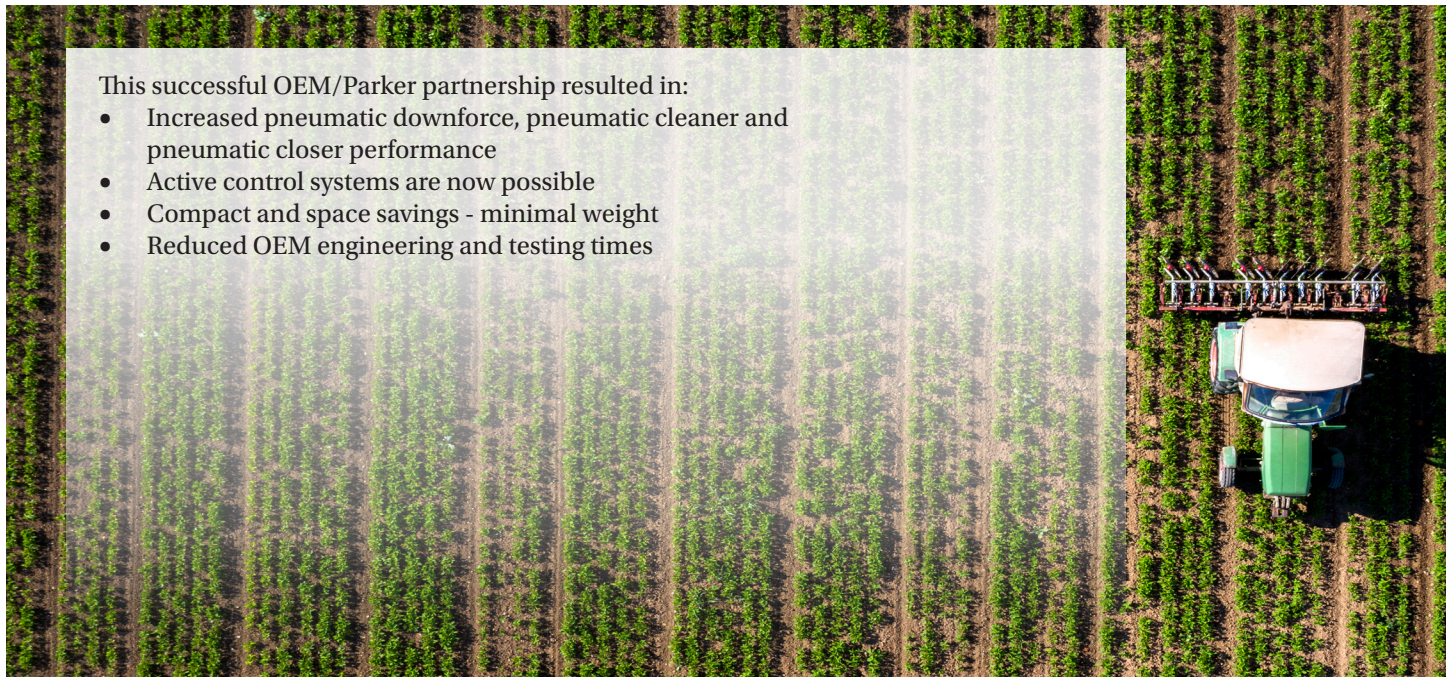
- **Business Development Manager**

“Together with Parker, we have created a high performance air compressor with fast inflation times for our customers, which further enhances our precision planting initiatives.”

- **Sales Manager**

This successful OEM/Parker partnership resulted in:

- Increased pneumatic downforce, pneumatic cleaner and pneumatic closer performance
- Active control systems are now possible
- Compact and space savings - minimal weight
- Reduced OEM engineering and testing times



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