



## SUCCESS STORY

# Allied Systems Overhauls Hydraulic System in Pursuit of Maximum Efficiency

Parker Hydraulic Pumps and Motors significantly outperforms all previous models

### CHALLENGE

Allied Systems, a Portland, Oregon-based fabricator of material-handling equipment for the wood products industry, was looking to redesign their hydraulic system for greater efficiency on their New Generation series Wagner L490 Log Stacker. The L490 is a purpose built, 4-wheel drive, 45-ton single pass lifting capacity machine that unloads log trucks, high decks and reclaims logs to and from storage, and loads the infeed at plywood and lumber mills. Before the redesign, the L490 took 18 seconds to lift a 45-ton payload from the ground to the top of its lift height of just over 19 feet. The goal by redesigning the machine was to cut the operation cycle time in half. To achieve the performance improvement, Allied was looking for a complete redesign for the L490's hydraulic system. The equipment's current hydraulic system utilized competitive open center valves, which were continuously open, and fixed displacement pumps that consumed engine horsepower constantly.

### SOLUTION

Working in collaboration with Allied Systems' design engineers, Parker's Global Mobile Systems (GMS), Parker's Hydraulic Pump and Power Systems (HPS), and a Parker Integrator redesigned the L490's hydraulic system with closed-center valves and load sense pumps. As a result of this new hydraulic system design, power is only generated upon system demand, making it more efficient than the previous open valve design paradigm. Additionally, this new hydraulic system design increases the overall fuel efficiency, reducing the cost of ownership and operational costs significantly for the end user.

**Market**  
Forestry

**Customer**  
Allied Systems Company,  
Specialty Material Handling OEM  
with targeted machinery to serve  
the wood-products industry

**Application**  
Log Stacker – Lumber Mill Wood  
Yards / Log Sorting Yards

**Solution**  
Completely “Parkerized” System,  
including: P3 Pumps, Heavy  
Duty Vane Motors - Series M5,  
Mobile Directional Control  
Valves M402LS & K220 LS, IQAN  
Controls/HMI and more.



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The major components of the new L490 design include the following Parker Components:

- P3 Pumps
- M5 Fan Motors
- K220LS and M402LS Valves
- IQAN Controls and Display Electronics

The P3 High Pressure Mobile Pump 145 cc was selected for L490's new hydraulic system over competitors' pumps due to its higher speed, better inlet characteristics, and fewer auxiliary components required. As an example, the P3 excellent inlet characteristics allow for a standard reservoir design, a pressurized breather to reduce air exchange, facilitate venting, and contamination ingress when the fluid level rises or drops while actuating a hydraulic function. Overall, the P3's higher speed rating and excellent inlet conditions add to the complete overall performance of the new L490 design.

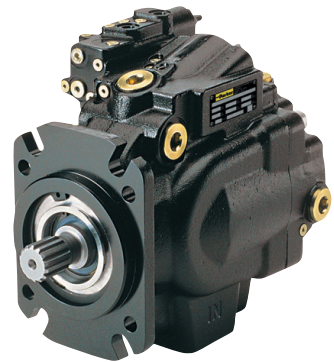
The heavy-duty M5BF Vane motor with its integral valves and a speed sensor for multiple fan drives replaced a vane motor, separate inline valves and an external speed sensor. The added benefits of the integrated M5 fan drive include:

- self-cleaning maintenance by reversing the fan and blowing the dust out
- an integrated system with the valving included, resulting in a more compact, integrated system
- fewer components, providing a more cost-effective solution
- Integrated valving reduces parts counts, assembly labor and has fewer leak points

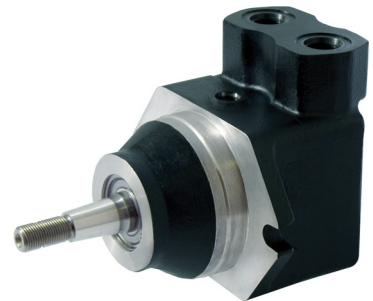
Critical to reaching the desired 2X performance enhancement in operational speed was to increase the system pressure and flow, while reducing the cylinder volume and preserving the ability to lift the same loads. To complement the Allied in-house cylinder design by combining the higher flow and pressures achievable by the Parker P3 pumps, the valve arrangement and sizing changed to accommodate the high demands to hoist and lower log loads.

Combining left and right dedicated hoist valves (M402LS's) that work in concert with a K220LS implement valve, the pre-compensated solution draws only the flow demanded by the operator and builds just enough pressure to meet functional requirements. The net result: an increase in hydraulic efficiency and reduced cycle times. Other benefits of the M402 and K220 include:

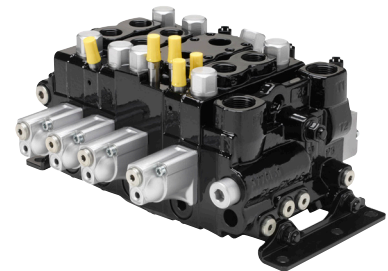
- Application specific standard spools with match flow and function characteristics
- Industry proven durability
- Individual work-port pressure limitation for increased system efficiency
- Combination relief/anti-cavitation cartridges for system protection



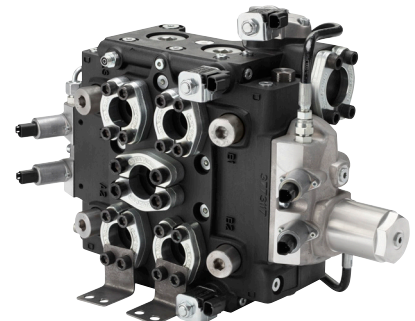
**P3 High Pressure Mobile Pump**



**M5BF Vane Fan Motor**



**K220LS Valve**



**M402LS Valve**



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The operator has a new level of control provided by this system design, which includes variable displacement pumps, proportional valves, and joystick control functions that were previously impossible but are more routinely required today.

For instance, the ability to preset a carriage position provides the operator with greater confidence when removing logs from a truck, establishing a safe travel position, or placing logs in the infeed. In addition, Allied's advanced programming of the MD4 and IQAN control has provided a new level of HMI excellence that Allied customers benefit from every day.

Rounding out the Parker product portfolio on the log stackers is the in-tank filtration, which includes new GLI Filters, Global Core hose, and Parker fittings to connect all the hydraulic components.

Ultimately, the L490's hydraulic system has been completely "Parkerized" with complimentary components delivered from Parker's Motion Systems Group, including Valves, Hose & Fittings, In-Tank Filtration, and IQAN.

## RESULT

With a revised hydraulic system that has twice the hoist speed of the earlier design, Allied Systems was able to significantly reduce cycle times over the previous model L490 by two to one.

In addition, the new hydraulic technology has modernized Allied's legacy design and made it more competitive in the industry by improving speeds, efficiency, and reducing the overall cost of ownership.

Finally, Allied Systems found this hydraulic system design to be so effective that they have implemented it on all their New Generation Wagner Log Stackers, Chip Handling Dozers, and Landfill Compactors.

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**Collaborating with Parker and Western Integrated Technologies on the design at a system level allowed us to dramatically improve machine performance without a significant impact to product cost. ”**

Hitesh K. Patel Vice President of Sales and Marketing, Allied Systems

