



## SUCCESS STORY

# Hydraulic Pump and Motor Combo Packs Power on Rayco Stump Cutter

Parker and Rayco collaborate on the design of a new stump cutter by recommending an alternative to a competitive closed-circuit pump and exceed performance targets

## CHALLENGE

Following new, more stringent Tier IV diesel engine emissions regulations, Rayco, an environmental equipment designer for the tree care and landscape industries, took that as opportunity to develop a more efficient, powerful, and compact stump cutter, the RG165T-R.

In comparison to previous designs that utilized diesel engines, Rayco's new stump cutter is centered around a powerful 165 HP gasoline engine. As a result of the new gasoline design, the equipment's envelope size was reduced and components were eliminated, such as, after treatment systems, diesel exhaust fluid and electronics.

In addition to the robust gasoline engine, the RG 165T-R also packs a closed-circuit hydrostatic cutter wheel drive system that delivers full engine HP to the cutter wheel, completing every job in its path. The initial RG165T-R prototype was created using the Parker Series F12 182cc bent axis motor, along with a competitor's 90cc closed circuit pump. However during initial rounds of testing, the competitor's 90cc closed circuit pump struggled with performance and reliability issues, along with the potential for long lead times.

## SOLUTION

When Rayco reached out to Parker regarding the competitor's closed-circuit pump weaknesses, Parker Hannifin's applications team recommended an alternative - the compact, high-performance C Series 81cc hydrostat piston pump and promptly delivered a unit for testing.

### Market

Mobile - Tree Care & Landscape

### Customer

Rayco, designer and producer of environmental equipment for:

- Tree Care
- Landscape
- Land Clearing
- Right-of-Way Maintenance Industries

### Application

Tree Stump Cutter

### Solution

C Series Pump and F12 Motor



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During subsequent testing of the Parker pump and motor combination, Parker Hydraulic Pump and Power System employees worked with Rayco engineers to dial in the performance. By incorporating two Parker parts, the C Series and F12 motor, Rayco engineers were able to exceed multiple performance targets. These targets included a 20% decrease in heat generation while increasing system efficiency by 10% over alternative test units.

Parker's C Series pump delivered excellent power density and paired perfectly with the 182cc F12 motor. The combination of this pump with the motor, translated into the optimal cutter wheel speed, which increased torque output to the cutter teeth by 10%. Another and unexpected benefit of the Parker system was a tighter radius of the wood chips to the machine, resulting in less operational risk during the stump grinding process.

## RESULTS

Stump cutting presents unique operating scenarios with each cycle. A pump and motor must be able to power through different obstacles at each job site.

Through excellent customer service and technical support, high-quality hydraulic components, and quick, on-time delivery, Parker enabled their customer to develop the new industry-leading stump cutter, The Rayco RG165T-R.

- Exceeded Rayco Engineers performance targets
- Decreased heat generation by **20%**
- Increased system efficiency **10%** from competitor test units
- Increased cutter wheel torque output by **10%**
- Wood chips stayed within a tighter radius to the machine



C-Series Pump



F12 Motor

