MINING MARKET

ENABLING MORE EFFICIENT MACHINES

CHALLENGE:

A mining equipment manufacturer was searching for a modern electrically powered steering solution that would simplify design, satisfy end customer safety requirements and improve operator comfort. The design engineers honed in on the elimination of hydraulics from the operator cab to significantly decrease the noise level.

SOLUTION:

At the core of Parker's advanced steering solutions is the steer-by-wire (SBW) workflow valve, SBW110, which provides precise and responsive steering control based on the operator's input, all in one compact solution.

BENEFITS:

Parker's next-generation steer-by-wire system meets safety standards, operates more efficiently with fewer moving parts to maintain and operates with less operator effort in a more spacious, quieter cab. It is powerful enough to handle mining equipment that operates in tough terrain and has superior energy efficiency and precision compared to conventional hydraulic systems.

PARKER HAS DEVELOPED A NEXT GENERATION STEER-BY-WIRE SOLUTION FOR OFF ROAD EQUIPMENT.

Safe operation and operator comfort are key in mining equipment. Advanced steering design is one way to improve ergonomics, safety and provide more precise control of machinery. Off-road vehicle steering is traditionally operated by a mechanical system that is powered by hydraulics. The steering gear is physically connected to a steering wheel and the hydraulic power is generated by a hydraulic actuator that assists in the turning of the gear. This traditional system is noisy, takes up a lot of space and requires regular maintenance of the hydraulic system for optimal performance. There is little flexibility to adjust machine steering to adapt to current working conditions.

A SBW solution removes the hydraulics from the machine's cab, making it a quieter, more spacious area. More importantly, it allows for a minimized steering wheel or joystick device and gives the operator improved machine control as well as intelligent steering parameter settings based on vehicle speed for example.

The mining OEM was seeking a SBW solution that would meet steering requirements outlined in ISO 5010, which specifically addresses mechanical and ergonomic hazards as well as hazards due to maintenance, the control system and the traveling machine.

Parker engineers developed the SBW110, a next-generation SBW system, that outputs steering

movements directly to the wheels of the vehicle using a joystick and electronic controllers. The valve can be mounted to a steering control unit in an electrohydraulic (EH) steering configuration or mounted to a secondary EH valve or manifold in an SBW configuration. The versatility of this valve also enables OEMs to specify an SBW system for one piece of equipment and an EH system for another without major changes in architecture. The controllers ensure safety functions: maintained steering or no unintended steering.

The system can also be fitted with sensors for advanced condition monitoring. The SBW110 design handles single faults with kept functionality and independent hydraulic circuit control with dual controllers. IQAN-MC41FS controllers are SIL2 safety-certified controllers programmed with IQANdesign, which is a high-level graphical design tool that simplifies application development for your mobile machine and reduces development time.

Parker's SBW solution creates a safer, more ergonomic and more efficient machine that is enabled for the future.

Learn more by visiting our Steer-by-Wire dedicated landing page.

Value to OEM:

Space and design options: Minimizes the use of hydraulics within the cab and eliminates steering column with smaller steering input devices such as a joystick or electric steering wheel

Scalable and modular:
Fits many different applications

Compatible with enhanced technology:
SBW is a prerequisite for autonomous machinery

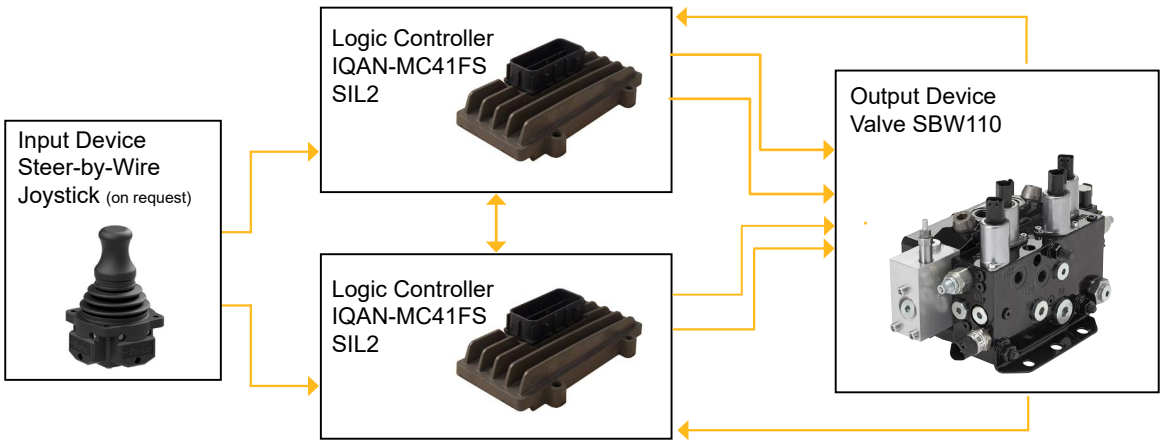
Value to Equipment User:

Improved functional safety:
Enhances stability control and braking distance

Increased productivity:
Precise steering movements that deliver smoother, more productive results

Enhanced operator experience:
Reduces cabin noise, operator fatigue and heat output as well as improves visibility and ergonomic design with customizable driver controls

> "We leverage our application understanding with component and systems knowledge to develop solutions based on performance needs."
>
> Mark Schoessler, Parker Mobile Solutions Engineering Manager



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