Dynamic performance.
Empowered by Eaton.

WORK » PROPEL » STEERING » AUXILIARY
There’s a movement in the market toward smarter machines. As customer needs and requirements become increasingly complex, OEMs are turning to experienced partners for fully engineered sub-systems that support and streamline their development process. And no partner is more qualified and capable than Eaton.

Our application engineers and systems experts approach sub-systems differently, considering complex system dynamics, machine requirements and regulations before the design process even begins. We’ll work with you to define your wants and needs today while identifying your goals for tomorrow – empowering you to keep pace with industry demand for better, smarter machines.

The Eaton difference

People
Our cross-functional team of experts has extensive system design experience across a variety of applications and markets.

Processes
Our collaborative design methodology is flexible and responsive, enabling us to function as an extension of your design and development team.

Products
Our comprehensive portfolio of power and motion control, fluid conveyance and filtration products is optimized to work together to deliver consistent performance and drive superior reliability.
Fully engineered sub-systems with significant bottom-line benefits

✚ Faster time to market
Our team knows Eaton products, knows hydraulics and knows the industry better than anyone, enabling us to specify, design, test and deliver an entire sub-system quickly and efficiently – reducing total machine time to market.

✚ Less supplier risk
We stand behind the performance of our engineered solutions and are committed to identifying and resolving any issues in a timely manner – preventing the finger-pointing that can come with multiple component suppliers.

✚ Improved system efficiency
Our experts will make sure every component is optimally sized, tuned and configured to use the installed power most effectively – eliminating system instability and reducing unnecessary heat generation.

✚ Lower overhead costs
Investing in experienced staff and advanced technology platforms is costly. When you partner with Eaton, you can build smarter machines without the added capital expense burden.

As a power management company, we engineer solutions that dynamically balance power generation with power consumption to deliver repeatable power management and control.
Dynamic flow sharing. Extraordinary stability.

Mobile machines that have multiple services operating simultaneously need a work circuit that can optimize flow sharing with a high degree of precision independent of the load. Our development experts will work with you to understand your machine’s duty cycles so we can engineer a work solution that delivers greater productivity without compromising stability.
Benefits

Optimized machine performance
- Our work solutions modulate flow across multiple functions to provide prioritized hydraulic power where needed.

Improved stability
- High-performance control features ensure predictable and repeatable function speed, thus enabling incomparable hydraulic and overall machine stability.

Precise control
- Our work solutions can be designed to meter low flow without causing restriction when operating at full service speed, enabling operators to raise and lower heavy loads with extreme precision without the tradeoff of heat generation.
Dynamic torque delivery. Unparalleled efficiency.

Machine operators are no longer willing to accept trade-offs between speed, gradeability and precise control. A propel solution is expected to deliver high levels of speed, torque and driveline efficiency under extreme operating conditions. Our development experts will work with you to engineer a propel solution that delivers torque efficiently at all speeds, for improved machine control, better productivity and longer system life.

Benefits

**Enhanced productivity**

- Our propel solutions adjust automatically to changing terrain, ensuring continuous, uninterrupted torque delivery.

**Less heat generation**

- A broad portfolio of corresponding products allows us to engineer a propel solution that not only offers excellent performance across all operating conditions, but also works efficiently at high speeds, reducing heat generation and extending system life.

**Extensive control flexibility**

- Hardware and software controls designed specifically for key applications enable greatly reduced development and commission time.
Engineered Propel Solutions

EXAMPLE
Medium-pressure propel solution

SERIES 2 PUMP
DURAFORCE HMV
COUPLINGS
FITTINGS
ADAPTERS

EXAMPLE
High-pressure propel solution

72400 PUMP
HP30 MOTOR
COUPLINGS
FITTINGS
ADAPTERS

HP50 MOTOR
HFX CONTROLLER
TD3200 2-WAY REMOTE CONTROL
FC500 PREMIUM SPIRAL HOSE
GH493 PREMIUM SPIRAL HOSE

EC600 PREMIUM SPIRAL HOSE
FILTRATION SOLUTION
VFX DISPLAY

SERIES 2 PUMP
DURAFORCE HMV
COUPLINGS
FITTINGS
ADAPTERS
Dynamic response. Unprecedented control.

Machine manufacturers want steering systems that are accurate and repeatable, while operators want a smoother, more responsive experience. Our development experts will work with you to engineer a steering solution that leverages innovation such as steer-by-wire, electrohydraulic steering, or the rugged, extreme-duty performance of our world-class orbitrols.

Benefits

**Reduced noise**
- In-cab noise and sound quality improvements can be achieved by removing hydraulic products.

**Greater flexibility**
- We can help enhance in-cab ergonomics and provide a better experience with a distributed hydraulics approach.

**Intelligent steering functions**
- We can help implement parametric steering, auto-guidance systems and joystick control.
Engineered Steering Solutions

**EXAMPLE**
Traditional steering solution

**EXAMPLE**
Electrohydraulic solution

**EXAMPLE**
Steer-by-wire solution

- **STEERING WHEEL**
- **STEERING COLUMN**
- **SCU/ORBITROL**
- **CONNECTORS**
- **VFX DISPLAY**
- **SIL2 SAFETY CONTROLLER**
- **ELECTROHYDRAULIC STEER VALVE**
- **SENSOR + FEEDBACK**
- **JOYSTICK**
- **GH781 PREMIUM 2-WIRE BRAIDED HYDRAULIC HOSE**
- **X20 SERIES - 420 PUMP**
- **GH781 PREMIUM 2-WIRE BRAIDED HYDRAULIC HOSE**

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Steer-by-wire solution

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Dynamic power management.
Ultimate productivity.

Machines today are expected to be more versatile than ever, accommodating more attachments in more environments and conditions. Our development experts will work with you to engineer an appropriately sized auxiliary solution that uses the installed power as economically as possible without sacrificing performance – enabling your customers to get more done while wasting less energy.
Benefits

**Optimized performance & flexibility**
- Our auxiliary solutions enable operators to effortlessly switch between different functions with a high level of control performance and precision.

**Less heat generation**
- Our auxiliary solutions are designed to allow the system to run as cool as possible in all environments and applications – making it easier and safer when de-coupling attachments.

**Superior durability**
- Eaton products and solutions are engineered to endure the toughest conditions on the planet, significantly reducing downtime and increasing overall productivity.

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EXAMPLE

Auxiliary solution

- 2K SERIES MOTOR
- HP30 MOTOR
- FILTRATION SOLUTION
- SCREW IN CARTRIDGE VALVES
- COUPLINGS
- GH781 PREMIUM SPIRAL HOSE
- GH493 PREMIUM SPIRAL HOSE
- ADAPTERS
- FITTINGS
- HFX CONTROLLER

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A development process that’s highly consultative and uncommonly collaborative

1. Requirements
We’ll collaborate with you to outline key operator and machine requirements. Our experts will also analyze historical duty cycle data and review relevant market data and trends.

2. Concept
Our team will then engage the appropriate Eaton experts for a collaborative session where we work with you to identify several potential solutions.

3. Simulation
Using sophisticated modeling tools, we’ll simulate each solution to understand the tradeoffs. Next, we’ll optimize our models, then present the best option for your application.

4. Prototype
We’ll produce a hardware prototype based on the optimized model and apply the software interface (if applicable) before putting the prototype on a test stand.

5. Validation
Our team will then execute a series of verification and validation tests to ensure the prototype meets your established requirements before moving into sub-system development.

6. Tuning
We’ll calibrate and commission the final Eaton sub-system solution on-site to ensure each product is performing optimally in the context of the larger machine.

7. Training
Our experts are available to train your team on sub-system operation and how to troubleshoot common concerns and issues, either on-site or at one of our global training facilities.

Get started today
To learn more about Eaton Engineered Solutions, visit eaton.com/engineeredsolutions