



# MOBILE & INDUSTRIAL HYDRAULIC CONTROLS

*Simplify the Complex*

# About GS Global Resources

**GS Global Resources** is the foremost machine performance resource trusted by OEMs who demand competitive advantage from every solution.



**Performance** Our integrated application solutions perform for the life of the machine, and for the lives of the people who touch it. At GS Global Resources, the leading engineering minds in hydraulic, electronic, mechanical and software applications simplify the complex. We use innovative, reliable technologies to speed solutions to market. And, whether reacting to market forces or changing markets altogether, GS Global Resources is essential to achieving total machine performance.



**Profitability** Our customers profit from continuous technology and innovation transfer through a single point of accountability. In other words, the engineer entrusted with your satisfaction is solely judged by your success.

**Pragmatic** Renowned as problem solvers by our customers, GS Global Resources delivers rare technical talent, value-driven inspiration and a pragmatic approach to winning in fiercely competitive markets. From system and component design to production and market support, GS Global Resources helps OEMs interpret, adapt and adopt technology.



**Talent** Most OEMs discover GS Global Resources through our customers, who also required more performance from their mobile and industrial machines. What they find is a team of dedicated, long-term, invested employees. Regardless of role, all of us are engaged in meaningful, satisfying careers designed to deliver customer efficiency, effectiveness and profitability throughout the value chain.

**Confidence** In fact, it's all about the talent and the execution. Our customers tell us they enjoy the confidence instilled by our hardworking, intelligent, respectful and thoughtful team. All GS Global Resources team members understand and commit to their role in delivering quality solutions where fluid power and electronic control converge. These include speed to market, improved safety, higher productivity, greater predictability and improved efficiency.



**Value** Because of our people and because of our relentless pursuit of ideas that matter, GS Global Resources customers recognize we deliver value like nobody else. Our talent, scalability and flexibility are beyond compare when it comes to understanding and overcoming challenges faced by OEMs. Frankly, it's why they have selected GS Global Resources for more than 40 years.

**Commitment** If OEMs find a comprehensive resource—where the complex simplifies, where peace of mind and mutual respect grow relationships, where competitive advantage and machine performance improve every time—there's only one place to get it. That's at GS Global Resources:  
*Foremost in machine performance for life*

# Affiliations & Allied Manufacturers

## Affiliations



ASSOCIATION OF  
EQUIPMENT MANUFACTURERS



## Allied Manufacturers



Visit our website for a full listing  
[www.gsglobalresources.com](http://www.gsglobalresources.com) or  
[www.gsgr.com](http://www.gsgr.com)

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To simplify your hydraulic system design and specification process, we've assembled our hydraulics product catalog systematically. We've also included select images to showcase some of our engineered solutions. For more information about our innovative solutions and integrated products, please visit our website [gsglobalresources.com](http://gsglobalresources.com).



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# Engineered Solutions – Filtration

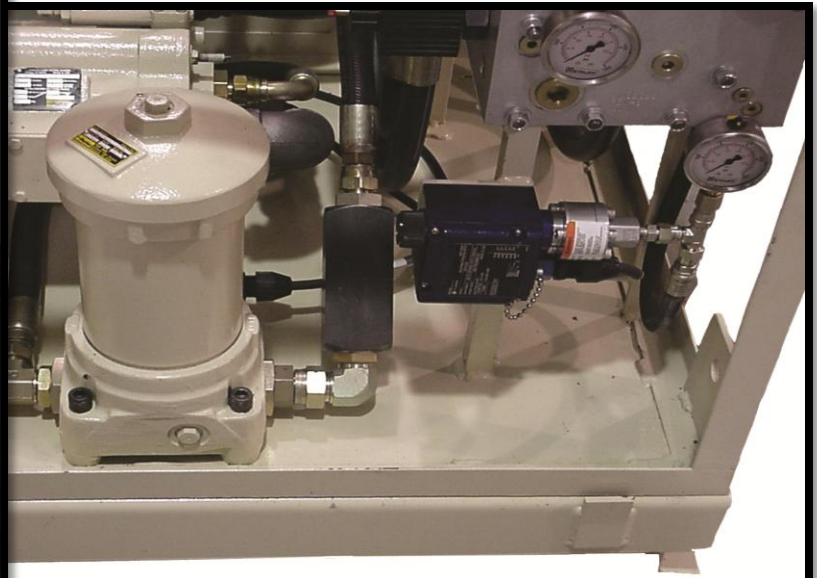
The best designed components and the most carefully thought out circuits require clean fluid to achieve optimum performance. GS Global Resources extends operation of OEM systems by introducing contamination management systems that minimize particulate concentration.

- To act as a heat transfer medium
- To act as a medium for energy transmission
- To lubricate internal moving parts of hydraulic components
- To seal clearances between close fitting - moving parts

**Lubrication**



**High Pressure**



**Mobile**



**High Flow**

**Improving System Efficiency Before a Problem Is Detected**

Sophisticated, high-level preventative maintenance systems designed to improve efficiency and reliability, improving your equipment up time.

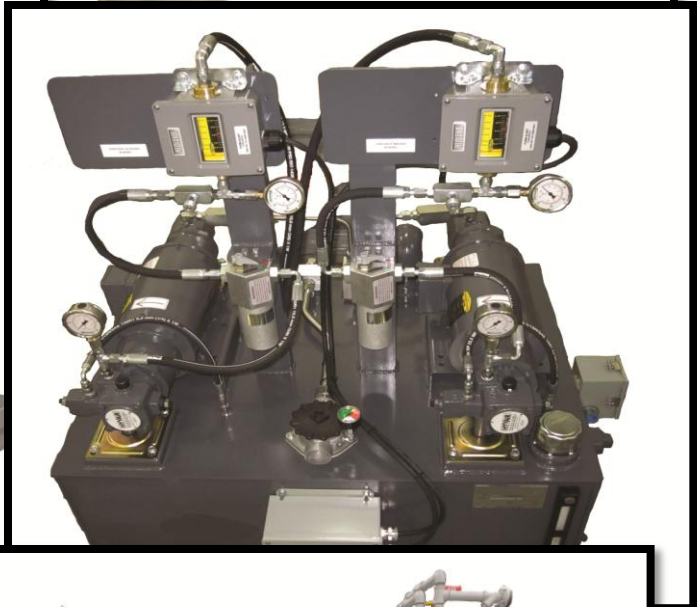
# Engineered Solutions – Lubrication

Leading OEMs around the world depend on GS Global Resources for custom lubrication solutions and a wide array of standard components.

**When Compared To a Typical Hydraulic Filter on the Return Line, Lubrication System Filters on Average Are More Robust**

## Lubrication System Filtration

Lubrication is the process of reducing friction between moving surfaces which are in contact. Lubrication is a very important function of hydraulic fluid. Without lubrication, friction would cause system components to wear excessively and excessive heat to be generated.



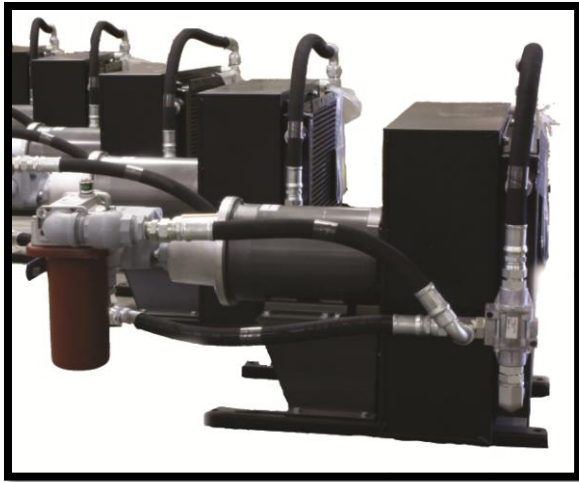
Engineering expertise in lubrication systems enables us to take a systems approach to a complete design solution.

# Engineered Solutions - Cooling

Inefficiency in the form of heat can be expected in all hydraulic systems. GS Global Resources integrates products and engineered cooler solutions for industrial, mobile and power generation applications around the world.

**Engineered Designs Configured To Optimize Performance and Reliability**

**Offline Cooling & Filtration**



**Severe Duty Chillers**



**Wind Turbine Electrical Cooling**



**Heavy Duty Mining**



- Air Cooling (fluid is pumped through tubes to which fins are attached)
- Liquid Cooling (water, basically consists of a bundle of tubes encased in a metal shell)
- Shell-and-tube (heat exchanger)

- Customized
- Flexible
- Standard
- ...all easily integrated into your system or machinery needs

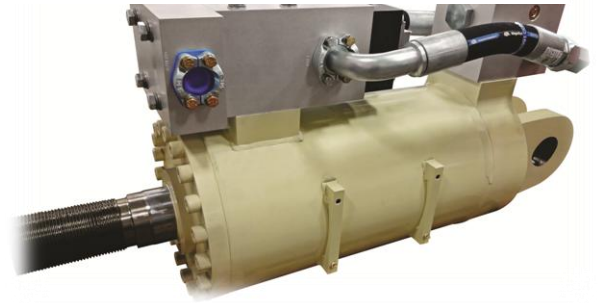
**High Performance - With Best-In-Class Heat Transfer Results**  
**Highest Quality - With Noise-Optimized Models Available**

# Engineered Solutions Cylinders & Rotary Actuators

GS Global Resources can integrate the optimal hydraulic cylinder into your application, converting hydraulic working energy into straight-line mechanical motion. The design of the hydraulic cylinder is based on the work that it will perform.

## Benefits

- Custom cylinders for custom solutions
- Innovative designs
- Lasting performance
- Latest generation solutions
- Lower operating costs
- Reliability & cost optimized
- Standard to high pressure cylinder
- Synchronization
- With position feedback



Hydraulic Lift



Rigging/Lifting Systems



Rear Steer Control Rotary Actuator



Our integrated hydraulic cylinders combine a pump, motor, line-mounted valves or manifolds, hoses, fittings and a reservoir into one assembly giving, OEMs a self-contained custom plug & play package for easy installation and reductions of potential leak points.

# Engineered Solutions – Gear Boxes & Brakes

GS Global Resources' combinations of planetary drives with electric or hydraulic motors give OEMs and the end user the most dependable and efficient solutions in industrial and mobile applications.

## Ideal Solutions for Severe Duty Applications



Mobile and Industrial Applications

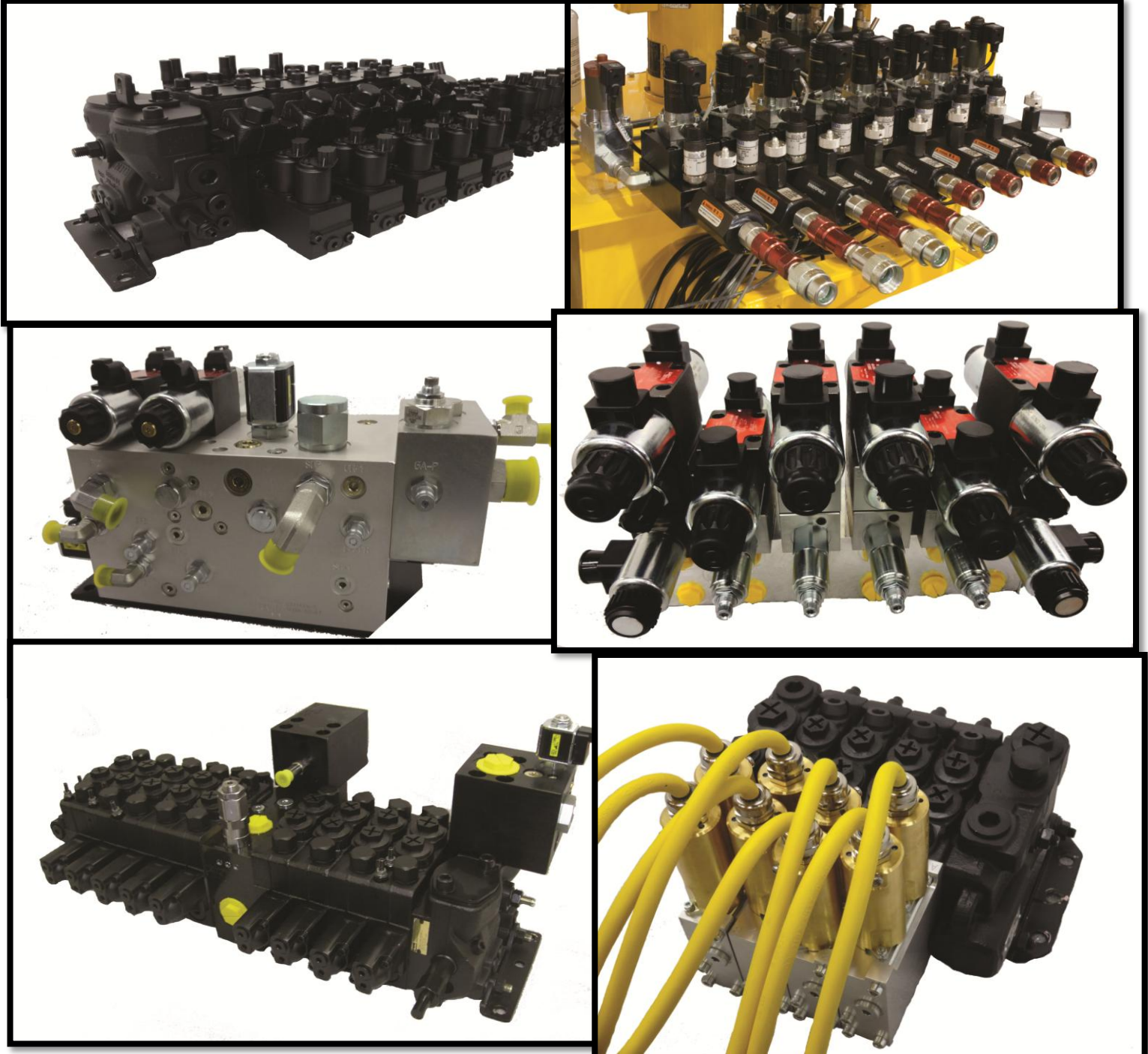
Performance and Reliability

# Engineered Solutions - Valves

Early engagement in our customers design projects, saves our OEM customers time, money, and provides insights upfront to maximize overall design value.

## Hydraulic Valves for Industrial & Mobile Applications

- Improved machine performance, such as fuel efficiency, reduction of heat and low cost solutions
- Integrated total electronic control into an easy-to-use operator interface
- Low-cost solutions
- Moving OEM machines to next generation machines



Designed for rapid changes in hydraulic mobile technology, OEMs achieve significant advantage by ensuring their machines are ready to run, around the world.

# Engineered Solutions - Manifolds

GS Global Resources deep understanding of manifold design leads to innovative, reliable, and essential competitive advantage for OEMs.

## Benefits

- Consolidated control of the hydraulic system
- Ease of plumbing

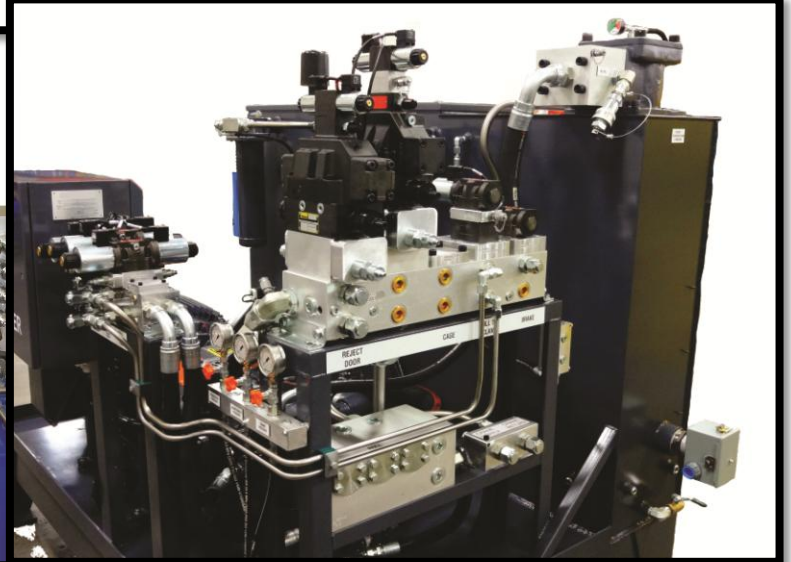
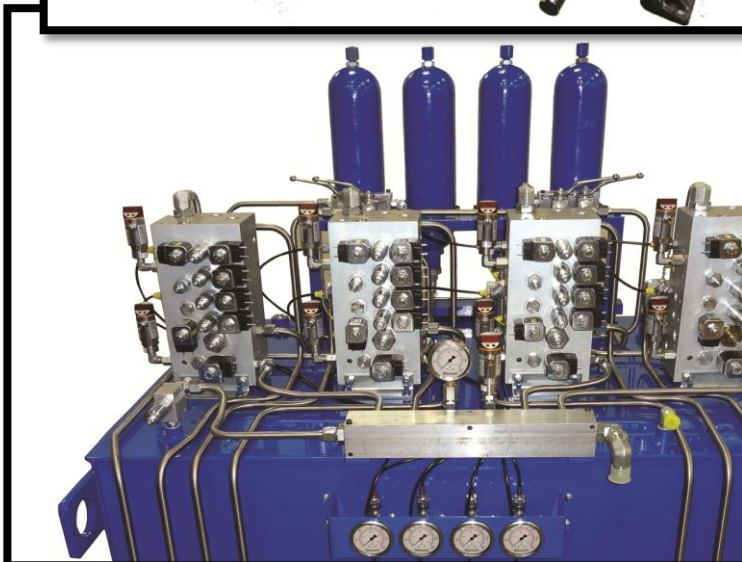
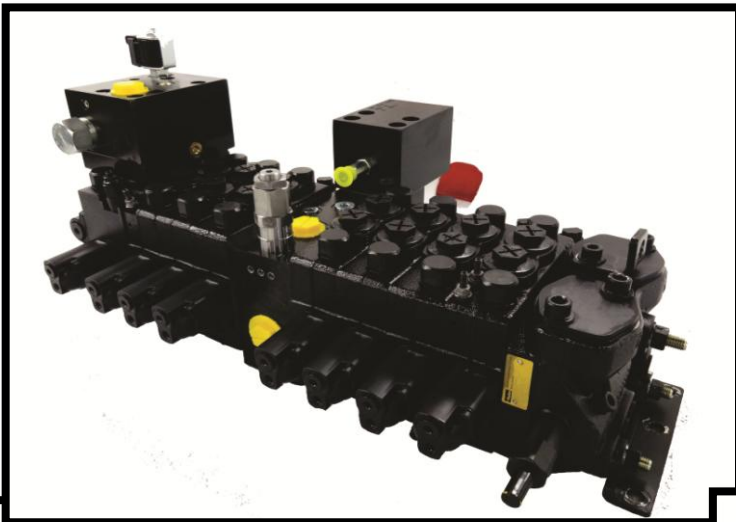
## Reducing

- Potential for leakage
- Size, weight & cost
- The amount of hoses & fittings required



**We Work Close With Our Customers  
From Concept to Production Launch**

**Designed and Built to Each Customer's Specific  
Application**



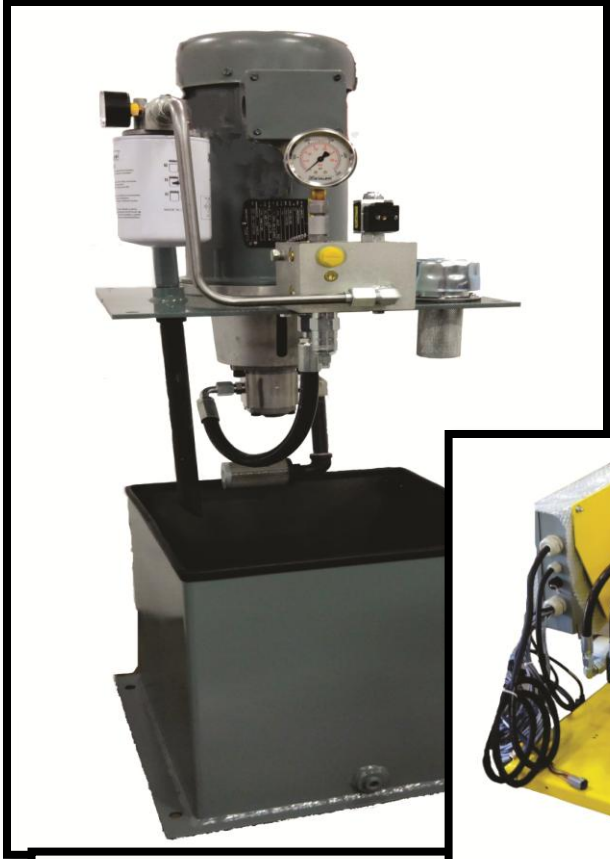
From system and component design to production and market support, GS Global Resources helps OEMs interpret, adapt and adopt technology.

- Bill of materials
- Hydraulic circuit simulations
- Graphic arts
- Sound documentation (assembly schematics, drawings, 3D, CAD model)

# Engineered Solutions – Hydraulic Power Units

Hydraulic Power Units are the main driving component of hydraulic systems. GS Global Resources works with OEMs on mechanical characteristics and specifications to design and engineer the right power unit for the application.

## Small – Medium Power Units



- Filtration
- Motors
- Oil cooling
- Pumps
- Reservoir
- ...all of the necessary valving and manifolds



Designed, engineered and manufactured, in close cooperation with our customers, meeting the requirements of repeated use of powerful and directional force.

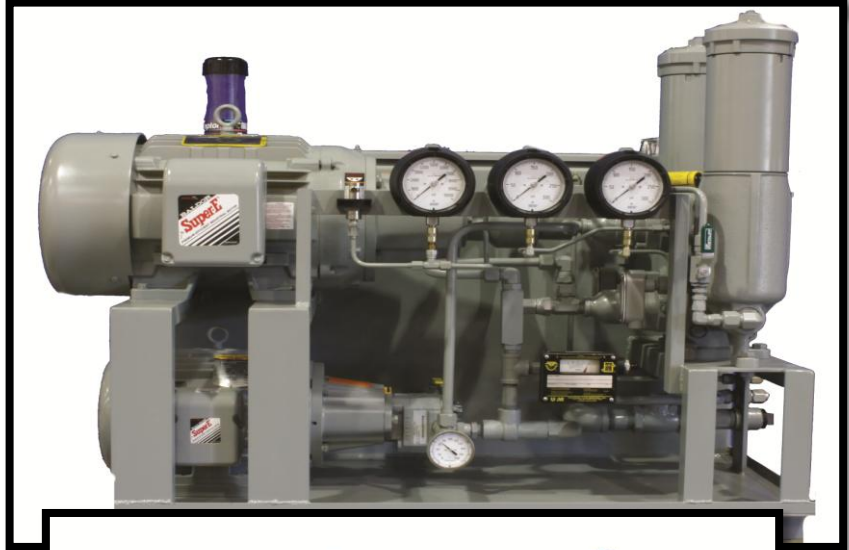
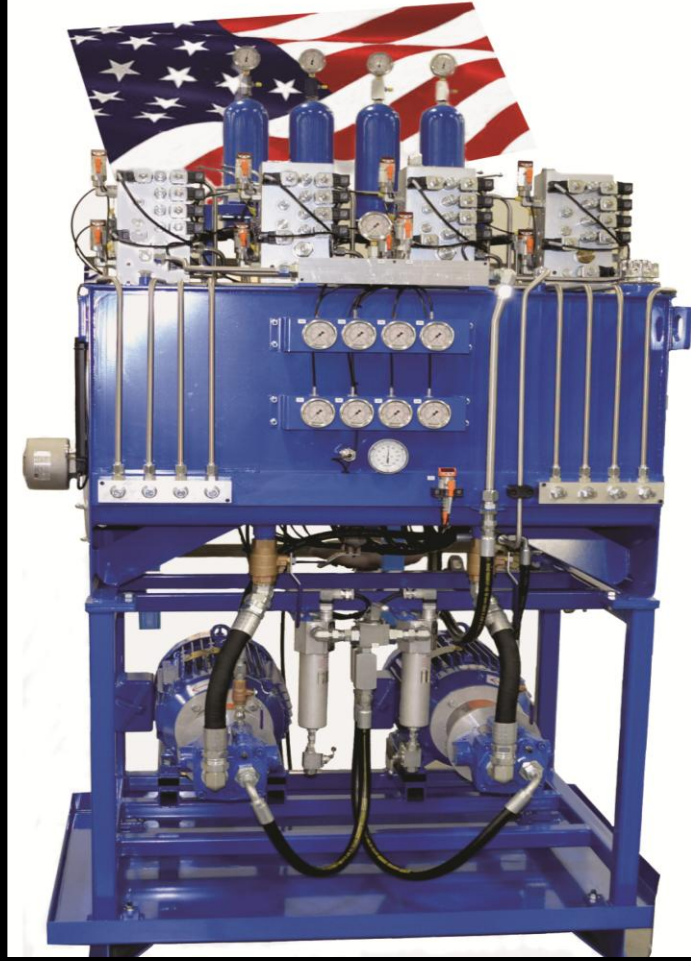
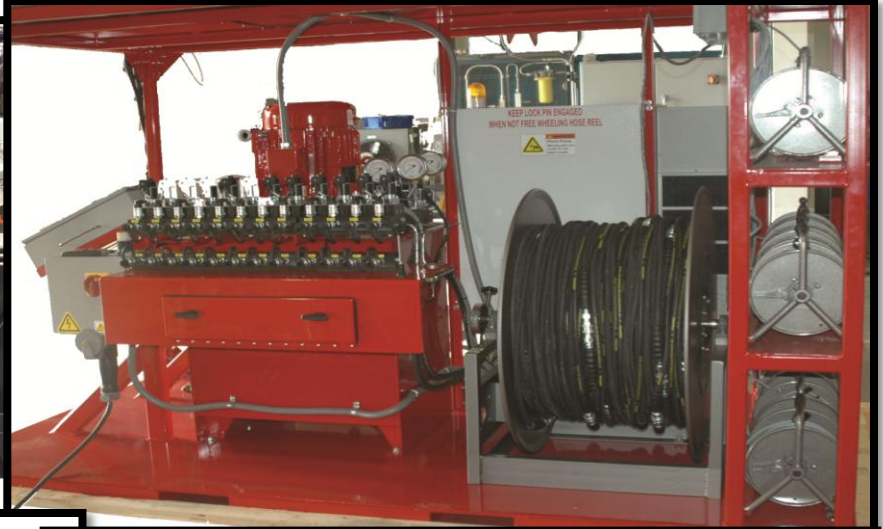
- 2D and 3D drawings
- Design process
- Special fluids
- Top or side mounted pumps
- Unique environmental conditions
- Vertical and in-tank mounting configurations

# Engineered Solutions – Hydraulic Power Units

Our certified fluid specialists and engineers work with OEMs to design the right Hydraulic Power Unit (HPU) specific to your application.

- Full functional tested
- Inspected to strict quality standards

## Large Power Units



GS Global Resources customers enjoy a single point of accountability who works with you every step of the way...from concept and design to product launch.

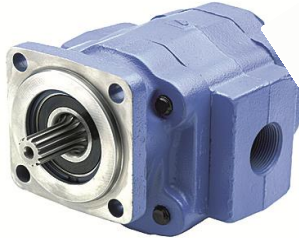
# Hydraulic Pumps

The hydraulic pump is the heart of a hydraulic system, producing the necessary flow for the development of pressure. GS Global Resources offers pumps, motors and transmissions used around the world in a wide variety of global markets.

## Gear Pumps

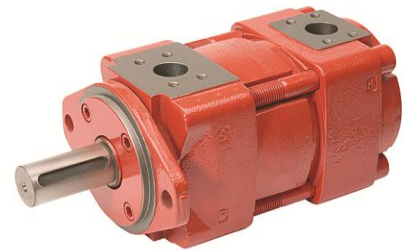
Whether for agricultural, industrial, construction, mining, waste disposal or oil field equipment, gear pumps offer high-quality, high-pressure reliable operation and is the most cost-effective way of generating hydraulic pressure.

- Double gear pumps
- External gear pumps
- Heavy duty gear pumps
- Internal gear pumps
- Multiple-tandem pumps
- Single pump



- Design accommodates a wide variety of materials
- High pressure
- High speed
- No overhung bearing loads
- Quiet operation

**Low Noise and Low Ripple**



**Providing the Flow Needed To Transmit Power from a Prime Mover to a Hydraulic Actuator**

## Gerotor Pumps

Gerotor pumps are a positive displacement pumping unit consisting of just two elements: an inner rotor and an outer rotor. The advantages of the gerotor resides in its simplicity, versatility, performance, and are primarily suitable for clean, low pressure applications such as lubrication systems or hot oil filtration systems, but can also be used in low to moderate pressure hydraulic applications.

- Bi-directional pumps
- Fixed displacement pumps
- High speed, low torque pumps
- Motor with shaft speeds to 5000 RPM pumps
- Motor with shaft speeds to 3500 RPM pumps

**Internal Gear Pumps without the Crescent**



**Quiet Operation, Works Well In Either Direction**



# Hydraulic Pumps

## Vane Pumps

Vane pumps generate a pumping action by causing vanes to track along a ring. The combination of different cartridges in double and triple pumps allows low flow at high pressure (300 bar max.) and high flow at lower pressure. This is a clever way to optimize your circuit design.

- Hybrid pump, piston & vane combination double & triple pumps
- Industrial vane pumps
- Mobile vane pumps
- Rotary vane pumps
- Single/double medium-pressure vane pumps
- Triple pumps
- Vane pump fixed displacement pumps
- Vane pump thru drive pumps

### Each Type of Vane Pumps Offers Its Own Unique Advantage

- Can have one seal or stuffing box
- Can run dry for short periods
- Compensates for wear through vane extension
- Develops good vacuum
- Handles thin liquids at relatively higher pressures
- Sometimes preferred for solvents, LPG

**Can Handle Moderate Viscosity Liquids, and Excel At Handling Low Viscosity Liquids (LP Gas, Propane, Ammonia, Solvents, Alcohol, Fuel Oils, Gasoline and Refrigerant)**



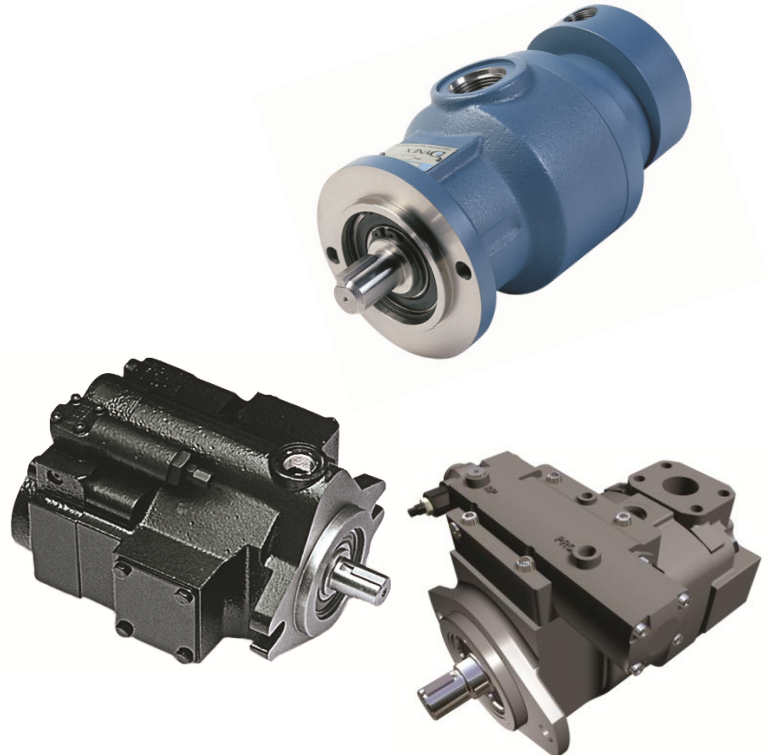
## Piston Pumps

Piston pump controls are integral valves that port flow to a stroking piston in response to a pressure or electronic signal. This results in a variable hydraulic pump that achieves the desired displacement.

**A Piston Pump Is A Type Of Positive Displacement Pump Where The High-Pressure Seal Reciprocates With The Piston. Piston Pumps Can Be Used To Move Liquids or Compress Gases**

- Axial piston pumps
- Bent axis pumps
- Fixed displacement pumps
- High pressure pumps
- Medium pressure industrial pumps
- Medium pressure mobile pumps
- Pressure compensated-load sense, load power pumps
- Limiting pumps
- Variable displacement pumps

- Among the most efficient pump
- Economical
- Excellent solution for many high-pressure hydraulic oil pumping applications
- Exceptional pressure rating
- Industry proven dependability
- Precision control



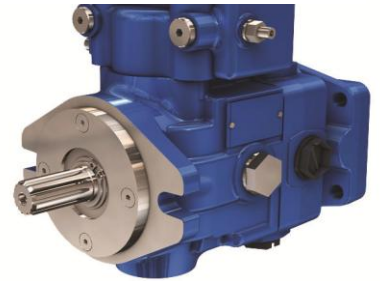
# Hydrostatic Transmissions

Hydrostatic transmissions with fixed or variable hydraulic pumps and fixed or variable motor combinations provide an extended range of motor speeds and torques. Anytime a variable displacement pump or motor is used in a pump-motor circuit, the system is labeled a hydrostatic transmission.

## Small Duty Hydrostatic Transmission

- Fixed displacement
- Radial ball piston
- Variable displacement

Variable displacement axial piston pumps generates a constantly variable flow rate in both directions. It is an axial piston pump with variable displacement and a swash plate design used in closed loop hydrostatic transmissions.



## Medium Duty Hydrostatic Transmission

- Fixed displacement
- Servo controlled
- Variable displacement

**More Propulsion Choices That Handle the Broad Range of Commercial Market Applications**

Robust, industry standard torqmotor, integrated with 14cc and 16cc pumps provides the greatest power for the toughest turf applications.



## Large Frame Hydrostatic Transmission

- Bent axis – fixed displacement
- Bent axis – variable displacement
- Fixed
- Variable displacement

**High Performance, Innovative Solutions Utilizing Hybrid Hydraulic Products**

High efficiency and cost effective method of power transmission for off highway vehicle propulsion systems and other rotary power applications.



## Typical Hydrostatic Transmission Applications

- Turf mowers
- Mini loaders
- Drill rigs



**Closed Circuit Design Ideal for Bi-Directional Function and Eliminates Energy Losses Associate with Circuit Valving**

## Individual Preferences

Hydrostatics bring the benefit of dynamic braking which delivers throttle and hydraulic pressure within the system to ease machine stopping. There's no roll back, because the hydrostatic system keeps the machine stationary. All of this can be electronically programmed on the in-cab display monitor to optimize machine operation.

- Decel pedal
- Joystick senility
- Steering modulation

# Hydraulic Motors

Hydraulic motors convert the working energy of a hydraulic system into rotary mechanical energy. A compact, highly efficient hydraulic motor is a key component to a hydraulic drive system.

## Gear & Vane Motors

A gear motor is a positive fixed displacement motor which develops an output torque at its shaft by allowing hydraulic pressure to act on gear teeth. Gear motors are inexpensive, light, compact and easy to maintain. A vane motor is a positive displacement motor which develops an output torque at its shaft by allowing hydraulic pressure to act on vanes which are extended. Vane motors have relatively low torque, high rotation speeds.

- Fan drive systems
- Gear motors
- Tandem motors
- Vane motors

**Typically Used In Simple Rotating Systems**

**High Performance Aluminum Gear Motors**



## Gerotor/Geroler Motors

A gerotor motor is an internal gear motor with an inner drive gear and an outer drive gear which has one more tooth than the inner gear. High volume fluid flow continually washes across splines and seals to extend their life. These high performance and long life motors work well in a reduced space.

- Flange/wheel mount
- High torque
- Low speed
- Optional interval brake

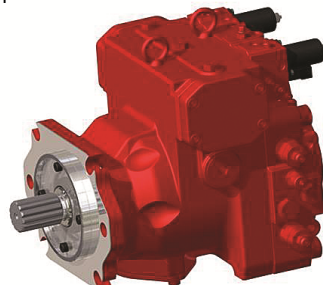
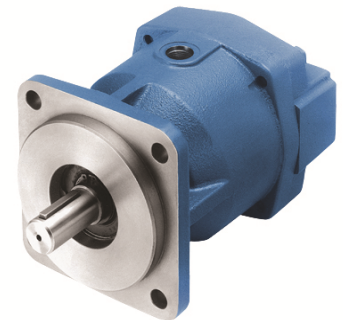
**Perfect Choice for Swing or Travel Power In Construction Machines and Industrial Vehicles**



## Piston Motors

Piston motors are complex but generate significant output. Axial piston versions can reach high speeds with low torque. Hydraulic pressure moves the pistons, which operate via a ball joint connection and a journal. In contrast, radial piston models are low-speed and high-torque, and generally offer significant displacement.

- Bent axis motors
- Dual displacement
- Fixed displacement
- Heavy duty piston
- Medium duty piston
- Multi purpose
- Variable displacement



# Hydraulic Motors

## Radial Piston Motors

Radial Piston motors are hydraulic motors for low speed levels and high turning moments. High flow radial piston motors feature a large displacement for use in heavy-duty applications such as mining, marine, industrial machinery, construction equipment and a wide range of agricultural & forestry. Radial piston motors can operate at pressure up to 5000 psi. They tend to be extremely robust.

- Dual displacement
- Fixed displacement
- High power
- High torque
- Low speed

### Features

- Easy to install
- Flexible design
- High efficiency
- High-performance drive solutions
- High power
- High torque/low speed
- Increased up time
- Low pressure drops even at low speed
- Optimized dimensions
- Optimized operating costs



**Pistons Arranged Perpendicularly To the Crankshaft's Axis. As The Crankshaft Rotates, the Pistons Are Moved Linearly By the Fluid Pressure**



## Multipurpose Cam-lobe radial piston motors for many applications

- Agricultural
- Anti-skid applications either for vehicle drives or to prevent turf damage & handling
- Forestry processor drives
- Mining applications
- Trailer assist drives - on-rail vehicles devices
- Winches

### A range of

- Electro-hydraulic
- Electronic control
- Hydro mechanical
- Positional systems



**High Torque, Low Speed Radial Piston Motors Use Hydrostatic Balancing Techniques To Achieve High Efficiency Combined With Good Breakout Torque And Smooth Running Capability**

## Braking

Hydraulic motors usually have a drain connection for the internal leakage. This means that when the power unit is turned off the hydraulic motor in the drive system will move slowly if an external load is acting on it. For applications, such as a winch or crane with a load that is suspended, there is always a need for a brake or a locking device.

# Hydraulic Valves

Valves are used to control the flow of fluids. Industrial valves provide continuous reliable performance under the most rigorous and demanding operations. Mobile valves meet the special needs of mobile equipment, ensuring mobile operators' hydraulic systems are reliable no matter the machine location.

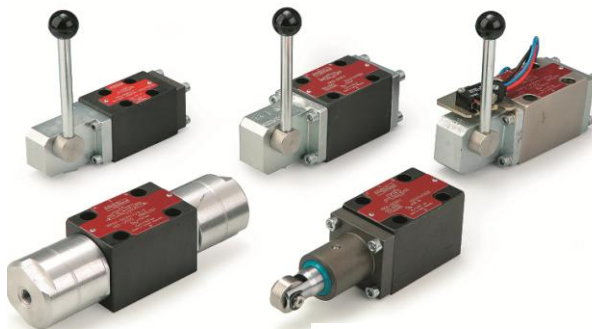
## Cartridge Valves

- Check valves
- Directional control valves
- Electro-proportional valves
- Flow control valves
- Load control valves
- Logic element valves
- Manual valves
- Pressure reducing / Relieving valves
- Shuttle valves
- Solenoid valves



## Industrial Valves

- Din slip-in valves
- Directional control valves (D03, D05, D08)
- Flow control and check valves
- Pressure valves
- Sandwich valves
- Sub plate and manifold



When you want to control fluid flow, pressure, starting, stopping and direction, GS Global Resources valves provide continuous reliable performance even under the most demanding and rigorous conditions.

# Hydraulic Valves

## Sectional Valves

Hydraulic sectional valves, with an adaptable building-block system. GS Global Resources offers high performance valves suitable for high pressure applications with a large application range.



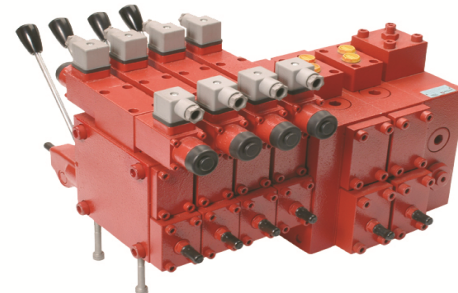
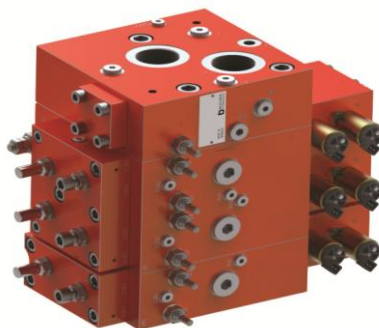
**Flow Sharing During Pump Over Demand Maintains Machine Speed Relationships Productivity**



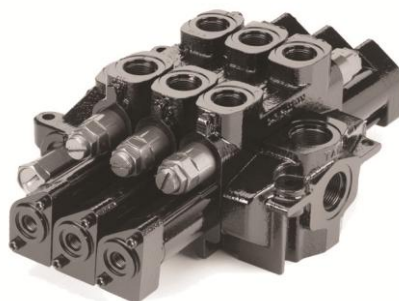
**Exception Size to Pressure Drop Ratio Electro-hydraulic Option Available**



**Flexible Unit Construction. Load Sharing Circuitry, Range Includes Inlet and Intermediate Flow Control Sections with Either Manual or Electro-proportional Operators**



**Sandwich-Design Gives These Valves A Versatile "Building-Block Systems. Assembled Together To Give You a Complete Hydraulic System**



**Can Be Equipped For Manual Operation, Hydraulic Or Electro-Hydraulic Remote Control, Or All Three Together. The Non Compensated Valve is Full Interchangeable with Today's Compensated Products**

## Main advantages of load-sensing pressure-compensated valves that positively impact the performance of your machine

- Flow forces within the valve are more linear versus spool stroke, resulting in lower hysteresis for pilot-operated control valves
- Horsepower consumption is optimized when interfaced with a piston pump
- Lower flow forces translate into higher lever efforts
- Metering is independent of load
- Simultaneous metering is generally unaffected by changes in pressure due to the load changes

# Hydraulic Valves

## Mobile Control Valves

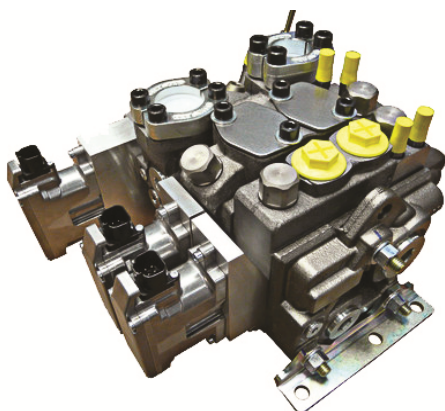
Modular load sensing mobile valves that are designed to be stacked and combined, enabling maximum performance in a unique compact package. You can specify exactly the performance you need, no more and no less. Special Function manifolds can be built in combinations of up to 12 sections.

- Mobile load-sense directional control valves
- Mobile open-center directional control valves
- Mobile remote control solutions

**Proven Performers Increasing  
Your Uptime Giving You  
Improved Productivity**



**Each Valve Section Can Be Optimized For  
Its Particular Function in the Machinery**



**On Board Electronics and a Spool Position Sensor  
Allowing the Flow to Be Calibrated Against a  
Factory Command**



## Directional Valve Control for Mobile Machines

- Cranes
- Excavators
- Forklift Trucks
- Harvesters

**Work Sections with Pressure  
limiting (feed reducers) can be  
configured So That they also  
limit The Pressures to Any  
Downstream Sections**

**Pre-compensation  
with Flow-Sharing**

**Save up to  
30 %  
on fuel**

**Can Be Configured  
Either As Pressure-  
Compensated Load-  
Sense (PCLS) Or As  
Load-Sense (L.S.)**

**Excellent Simultaneous  
Operating Characteristics,  
Enabling Several Machine  
Functions to Be Operated  
Responsively At the Same  
Time, Regardless Of the Size  
on Individual Loads**

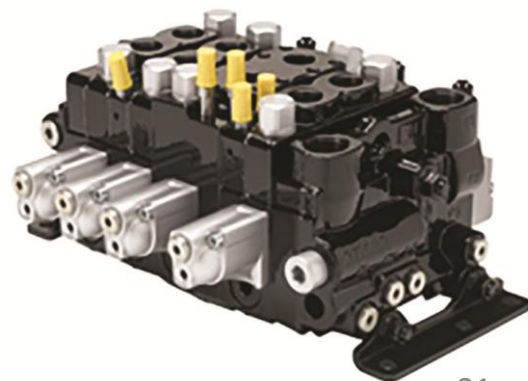
## Load sensing systems, LS

In the load sensing system both pressure and flow are modulated to match immediate needs from the consumers, with a pressure level corresponding to the heaviest



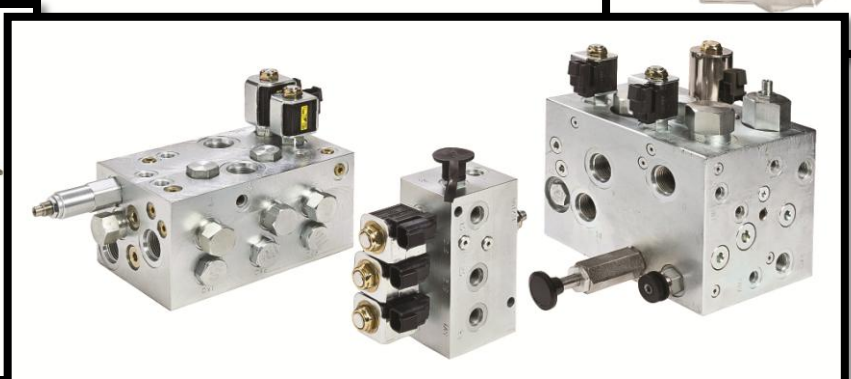
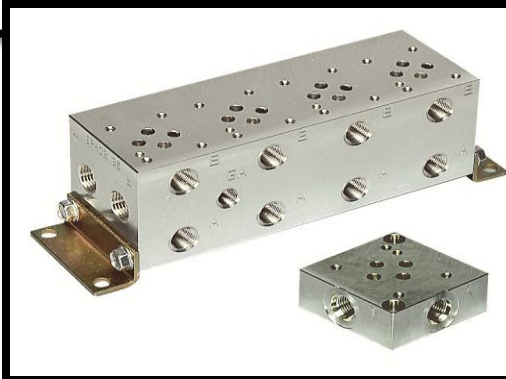
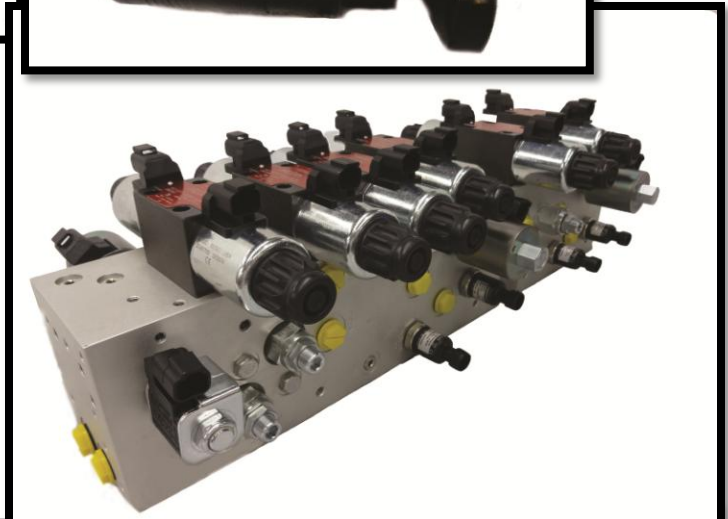
## More Productivity with Enhanced Control

- Flexible installation
- Flow-sharing technology
- Fuel savings
- Individual port pressure limiting
- Selectable novice/expert control
- Steady speed control



# Hydraulic Manifolds

From Standard to Custom



Our Engineering Expertise Achieves What Seems To Be the Impossible

# Hydraulic Gear Boxes & Brakes

## Mobile and Industrial Equipment Solutions

GS Global Resources provides power transmission solutions utilizing gear drive and brake products. In combining planetary drives with electric or hydraulic motors we give OEMs the most dependable and efficient solutions in swing, drive and lift applications.



**Used Wherever Efficiency & High Reduction Ratios Are Needed In a Small Space**

### Gear Drives

- Shaft output
- Spindle output
- Wheel

### Brakes

- Hydraulically released
- Multiple disc
- Spring applied



**Swing Drives with Integrated Motor for Hydraulic Excavators**

### Series: PMTE

- 6 to 50 tons
- Gearboxes from 10,000 Nm – 60,000 Nm
- Hydraulic axial piston motors from 55cc to 180cc
- Features brake valves & special swing control shock-less valves

To aid in the selection of the proper gearbox, we work with the OEM to calculate the data representative of their operating conditions under multiple duty cycle scenarios.

## Track Drives



### Series: PMC

- Travel drive for tracked / crawler applications
- Available ratios; 67-169, 56-125, 55-135, 63-120, 55-135, 60-162, 65-183
- Max. output torque; 20000, 30000, 40000, 45000, 55000, 62000, 90000
- Max. input speed; 3000, 3500

## Wheel Drives



### Series: PMR

- Travel drives for wheeled applications
- Available ratios; 19-51, 22-34, 67-168
- Max. output torque; 7800, 12500, 20000
- Max. input speed; 3500, 5000, 3500



### Series: 2000

- Multi-purpose gearboxes
- One piece cast iron case max strength precise positioning of internal components
- Ratios from 1:1 to 2.78 as multiplier or as reducer
- Power up to 202 kW at 540 min-1
- Power up to 331 kW at 1000 min-1



### Series: 2001

- Typical applications: flail mowers, stalk shredders
- One piece cast iron case
- Flail ratios from 1:1,93 to 1:5,33 as multiplier or as reducer
- Power up to 147 kW at 540 min-1



### Special Application Gearboxes

Design and production capacity available for mobile machines and industrial applications.



**Solutions for the Food & Beverage Industry**

### Series: AsepticDrive

A synchronous motor whose basic design dispenses with a fan and cooling ribs. Can be easily fitted onto any gear in the BG, BF, BK or BS series catering to a majority of design requirements.

# Hydraulic Cylinders & Rotary Actuators

Hydraulic cylinder solutions designed to OEMs specific industry and application needs.

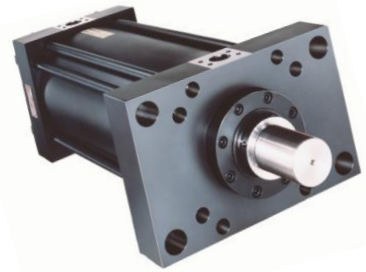
## Industrial Cylinder

- Compact hydraulic cylinders
- Electro-hydraulic cylinders
- ISO hydraulic cylinders
- Mill hydraulic cylinders
- Roundline hydraulic cylinders (repairable welded)
- Stainless steel hydraulic cylinders
- Tie rod cylinders



**Highly Engineered, Quality Cylinders  
Configurable to Provide Quick Delivery**

**Proven To Be the Most Reliable and Cost Effective  
Cylinders Available Today**



**Standard Build to Custom Engineered  
Mobile Hydraulic Cylinders**

## Mobile Cylinder

- Double-acting telescopic cylinders
- High production – custom cylinders
- Hydraulic ram cylinders
- Low production – custom cylinders
- Single-acting telescopic cylinders
- Welded cylinders



**Tapered Roller Bearing  
Chrome Alloy Steel Pinion and Rack Gears**

## Hydraulic Rotary Actuators

- Compact electro-hydraulic actuator
- Hydraulic rotary actuator
- Hydraulic vane rotary actuator
- Light duty hydraulic rack & pinion rotary actuator



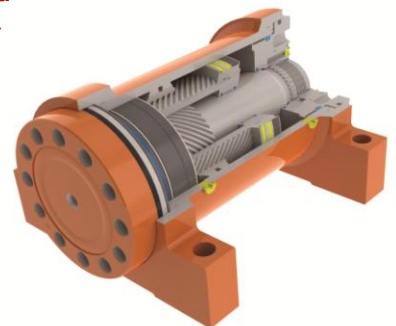
## Features

- Heavy load-carrying capacity
- High torque output to 740,000in.-lbs (83,520 Nm)
- High shock resistance
- Ultra compact configurations
- Zero leakage, drift-free positioning

## Advantages

- Backdrives in overload conditions
- Drift free positioning
- Durable
- Powerful (high torque / high bearing)
- Streamline design
- Ultra compact

**Powered Hinge Rotary Actuator. Designed to  
Replace Multiple Components and Function as a  
Rotating Device, Mounting Bracket and Bearing,  
All-in-one**



# Hydraulic Power Units

GS Global Resources designs, sizes & manufactures the right Power Unit to your specific application needs...saving you money over the life of your equipment.

## Mini/Subcompact Power Units

- AC power units

### Capabilities

- D03 pad or standard P & T ports...contact us for full details
- Flow Rat 3gpm
- Motors up to 3Hp
- Pressure to 3000 psi
- ...contact us for full details



**Providing OEMs with Cost -Effective Engineered Solutions That Are Flexible, Fast and Provide Easy Integrated Solutions**



## Compact Power Units

- Compact AC power units
- Compact DC power units
- Mobile power units

### Capabilities

- D03 & D05 directional valves & stack mount control modules...and more
- Electric motors from 0.5Hp to 20Hp
- Flow rates from 0.25 gpm to 15 gpm
- Press balanced, pressure compensated & fixed clearance pump options
- Pressures to 4000 psi
- Several voltages & frequencies



## Small Industrial 1-15HP

- Horizontal
- JIC
- L-shape
- Other configurations
- Overhead
- Vertical

### Capabilities

- Cost efficiency
- Designed & engineered to your specific application
- Documentation
- High density of power transition
- Modern tools – CAD, 2-D and 3-D
- Quality
- Reliability
- Safety



# Hydraulic Power Units

## Large Power Units

Whatever the industry or the application, GS Global Resources designs and manufactures hydraulic power unit systems that range in size from small power-packs to complex 1000 gallon systems.



**GS Global Resources' Power Units Are Supplied To OEMs for New Equipment As Well As an Upgrade or Retrofit to an Existing System**

## Lubrication Systems designed for grease, oil and mist applications

- Performance
- Long-term reliability
- State-of-the-art technology



# Accumulators

Accumulators provide an affordable means of enhancing the performance of a hydraulic system. Accumulators can increase efficiency, provide smoother, more reliable operation, and store emergency power in case of electrical failure.

## Bladder

A bladder accumulator consists of a synthetic rubber bladder inside a metal shell; the bladder contains the gas. As fluid enters the shell, gas in the bladder is compressed. Gas pressure decreases as fluid flows from the shell. When all liquid has been discharged, gas pressure attempts to push the bladder through the outlet. But, as the bladder contracts the poppet valve at the outlet, flow from the accumulator is automatically shut off.

**Excellent Gas and Fluid Separation Ensuring Dependable Performance, Maximum Efficiency, and Long Service Life**

- Bottom repairable
- Gas bottle
- High flow
- Medium flow
- Shell, bladder and oil
- Top repairable
- Transfer barrier
- Absorbs hydraulic shocks
- Compensates for leakage
- Highly contaminant tolerant
- Improves system efficiency
- Supplements pump flow
- Supplies power in emergency



## Diaphragm

Enhancing driver and vehicle comfort in agricultural, forestry, construction and public works sectors with flexibility of driving at record speeds while enhancing machinery longevity. These gas loaded diaphragm accumulators enable a large quantity of energy to be stored in an extremely compact form. This enables a liquid under pressure to be accumulated, stored and recovered at any time.

**Improving Driver Comfort and Immediate Response Times When Driving Over Obstacles**

- Capacities from .075 to 2.80 liters
- Compact and lightweight
- Durable metric gas valve
- Nitrile & hydrin diaphragms
- Non repairable
- Operating pressures to 330 bar



## Piston

A piston type accumulator consists of a cylinder body and moveable piston with resilient seals. Gas occupies the volume above the piston and is compressed as the cylinder body is charged with fluid.

**Suitable For Storing Energy under Pressure, Absorbing Hydraulic Shocks, and Dampening Pump Pulsation and Flow Fluctuations**

- Repairable & Non repairable hydraulic piston accumulators
- Non standard design pressure accumulators
- Serviceable threaded end construction
- 3000 PSI
- 4000 PSI
- 5000 PSI
- 2" thru 12" bores
- V-o-ring piston seals

**The Simple, Compact, Cylindrical Design Ensures Dependable Performance, Maximum Efficiency and Long Service Life**



# Coolers

GS Global Resources offers a broad range of standard air-cooled and shell & tube oil coolers for mobile and industrial applications, providing custom solutions for diesel engine cooling.

## Oil and Charge Air Coolers into One Package

### Air-Industrial coolers

- AC Fan driven
- Electric motor drive large
- Electric motor drive small
- External bypass option
- Gear, lube, process cooling
- Hydraulic circuits
- Marine transmissions
- Torque converters



**Brazed Aluminum Construction Provides the Best Heat Transfer Per Given Envelope Size While Minimizing Pressure Drop**

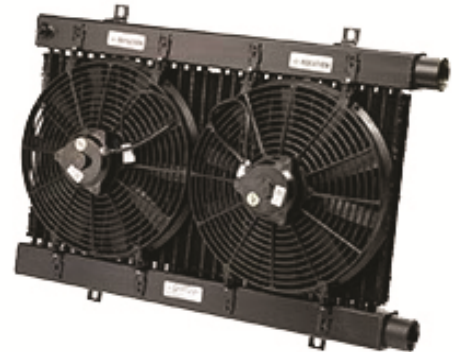
**Available In Various Sizes with Electric or Hydraulic Motor Options**



### Air Mobile Coolers

- Aluminum fins
- Brazed aluminum construction
- Carbon steel
- Copper
- DC or hydraulic fan driven
- Low, moderate & high flows
- Stainless construction
- Steel fins

## Also Known As Fin Fan Heat Exchangers



### Options Available

- Built-in relief bypass
- Connection sizes/locations
- Corrosion resistant
- Custom sizes/mounting brackets
- Marine coating
- Steel components

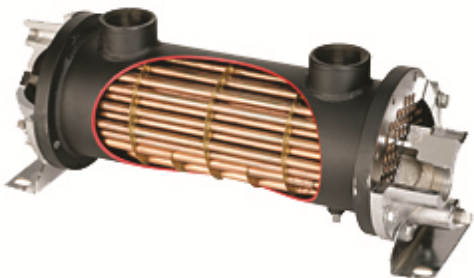
## Applications Where Water Is Not Available

### Fluid Cooling Water Cooled Products

- Flat plate
- Shell & tube



**Ideal for Independent Cooling System Oils**



**Copper and Steel Construction**



# Filtration

Over 90 percent of all hydraulic system failures are caused by contamination in the fluid. Even when no immediate failures occur, high contamination levels can sharply decrease operating efficiency.

## Filter Carts

Portable filter carts are ideal to pre filter and transfer fluids into reservoirs, or to clean up existing systems.

- Air powered mobile filtration systems
- Kidney loop systems
- Mobile filtration systems

Compact, self-contained filtration systems equipped with high efficiency, high capacity elements capable of removing particulate contamination and/or water...

- Convenient
- Economic
- Quick



## Fluid Condition Monitoring

- Dewatering units
- Flow monitoring systems
- Flow rate displays
- Fluid analysis
- Laser particle counter
- Laser particle monitors
- Offline systems
- Oil sampling and analysis
- Particle counter



## Don't Let Contamination Create a Crisis

- Condition monitoring
- Cooling systems
- Filtration



Contamination management pertains to the analysis and optimization of processes with regard to the cleanliness of components, systems and the purity of the fluids used.

# Filtration

## Hydraulic Filters & Elements

- Element technology
  - High pressure filters
  - Low pressure/return filters
  - Medium pressure filters
  - Pressure filters
  - Return line filters
  - Tank-mounted return line filters
- 
- Compressor lube oil
  - Hydrostatic drive charge pumps
  - Injection molding
  - Machine tools
  - Mobile equipment
  - Offline filter loops
  - Oil patch drilling equipment
  - Pilot lines for servo controls

**Non Metallic, Lightweight Elements for Easier Servicing**

**The Function of a Filter Is To Clean Oil, but the Purpose Is To Reduce Operating Costs**



**Most Machine and Hydraulic Component Manufacturers Specify a Target ISO Cleanliness Level to Equipment in Order Achieve Optimal Performance Standards**



**Base Ported**



**Contamination Loading In A Filter Element Is The Process Of Blocking The Pores Throughout The Element. An Element Loading With Contamination Will Continue To Increase In Pressure Differential Until the Element Is Replaced, the Bypass Valve Opens, or the Element Fails**



Installed in the return line, on top of or within the oil tank, filtering the hydraulic oil before it flows back into the reservoir.

# Filtration

## Stand-Alone Filtration

- Air cooled offline fluid conditioning systems
- Mobile filtration systems
- Water cooled offline fluid conditioning systems

## Compact, Self-Contained Filtration System

## Real Time Monitoring - ISO Cleanliness Classes

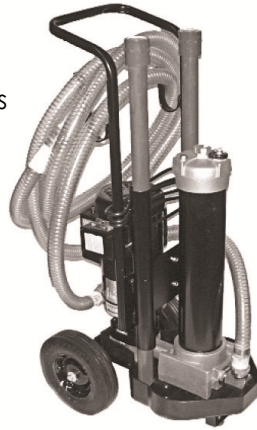
## Water Filtration

- Desiccant breathers
- Dewatering units
- Water removable elements

## Applications

- Industrial / aerospace
- Paper mills
- Power generation
- Steel mills

## Kidney Loop Filter



## Portable Purification Systems



## Dehydrator – Mass Transfer to Remove both Free and Dissolved Water from Oil...As Well As Dissolved Gases Versions



## Accessories

- Breathers
- Differential pressure switch
- Filter dirt alarm
- Gauges
- Oil sight glasses
- Reservoir accessories
- Suction strainers
- Test point systems
- ... And more



# Accessories

## Breathers

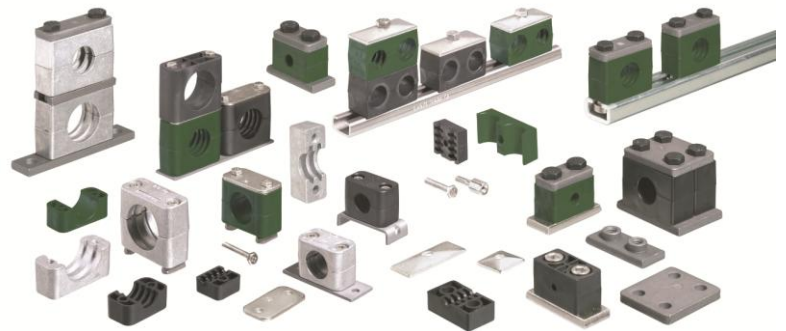
- Breather adaptor with filler port
- Desiccant air breather
- Giant air breathers
- Metal filler breathers
- Plastic filler breathers
- Side mounting brackets for filler breathers
- Tank filler breather adaptors
- Threaded breather adaptor



## Clamps

- Construction clamps
- Cushion clamps
- Cylinder supply line clamps
- Flat-steel and round-steel u-bolt clamps
- Hi-clean series clamps
- Light, standard, heavy clamps
- Metal saddles and clamps
- Special clamps
- Twin series clamps

**Quick and Easy Hose Installations  
As Well As a Cleaned Distinct Pipe  
Layout**



## Gauges

- Analog pressure gauge kit
- Digital pressure gauges
- Fluid level sight gauges
- Glycerin filled gauges
- Pressure gauges
- Pressure test boxes with gauges
- Temperature gauges
- Test gauges



# Accessories

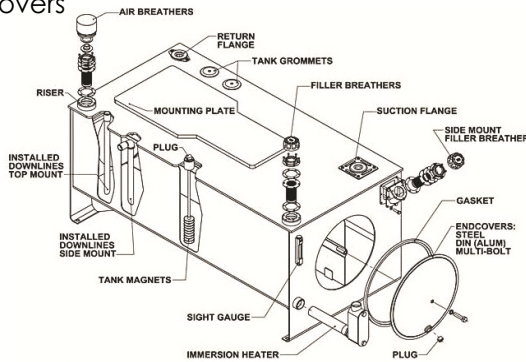
## Hydraulic Accessories

- Accumulator charging kits
- Diffusers
- Filler breather adaptors
- Fluid connectors – SAE flanges
- Heaters, in-tank
- Hose cleaning systems
- Pump motor adaptors
- Return line bushings
- SAE half coupling weld adaptor
- SAE port flanges
- Side mounting brackets for filler breathers
- Suction flanges
- Suction strainers
- Test points
- Tubing & hose cleaning



## Reservoir Accessories

- Access covers (cleanout covers)
- Baffle adaptors for reservoir end covers
- Baffle mount, steel w/flow restrictors
- Reservoir end covers
- Tank covers



## Sensor – Switches

- Flow indicators
- Flow monitoring system
- Flow rate displays
- Level temperature switch
- Level temperature switch display
- Pressure switch
- Pressure switch and transmitter
- Pressure transmitter
- Temperature transmitter
- Thermo switches



**GS Global Resources Industrial and Mobile Sensors Make It Possible To Continuously Monitor and Control OEM Machines and Machine Processes**

# Meet E-Force by GS Global Resources



## Control What's Next with E-Force by GS Global Resources

E-Force is an elite engineering team within GS Global Resources. These are the industry's leading engineering minds for solving problems at the intersection of fluid power and electronic control. And they only tackle the most difficult mobile and industrial machine challenges. Working alongside OEM engineering and sales teams, E-Force offers rare expertise gained from countless OEM application assignments around the world.

Through a highly selective process, E-Force advances an OEM's ability to profit from the convergence of hydraulic, electronic, mechanical and software applications. E-Force provides the best-of-the-best in advanced prototype development guidance for mobile and industrial machines. When you engage E-Force, you enter a relationship designed to continuously transfer technology and innovation to your team.

E-Force stands ready to educate OEMs on how to approach mobile and industrial machine applications. Pragmatic, market-leading concepts drive their recommendations. From system and component design to production and market support, E-Force now provides OEMs access to rare, globally-tested engineering talent.

When you engage E-Force, you will experience a comprehensive approach to simplify the complex. You will experience a team dedicated to delivering competitive advantage. And, you will experience a team committed to delivering machine performance improvement every time.

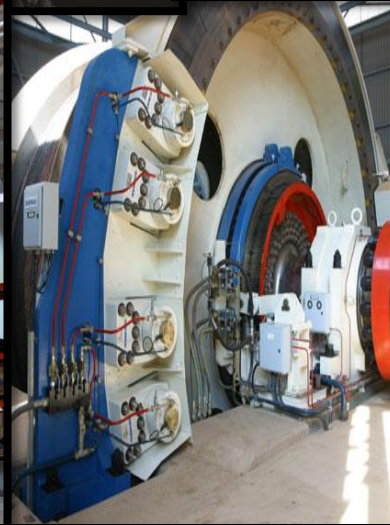
E-Force exists solely to provide advanced insight into the toughest OEM challenges. Whatever the challenge, E-Force delivers integrated application solutions that perform for the life of the machine, and for the lives of the people who touch it.

To access the world's leading engineering minds in fluid power and electronic control, contact us at [engineeredolutions@gsgr.com](mailto:engineeredolutions@gsgr.com)

# Engineered Solutions

Latest hydraulics that improve manufacturers productivity while increasing their uptime.

Intelligent hydraulics that advance machine automation.



# ABOUT GS GLOBAL RESOURCES

GS Global Resources is the foremost machine performance resource. We are trusted by the world's most recognizable OEMs who demand competitive advantage from every solution. Our integrated application solutions perform for the life of the machine, and for the lives of the people who touch it.

From system and component design to production and market support, GS Global Resources helps OEMs interpret, adapt and adopt technology.

Our leading engineering minds in hydraulic, electronic, mechanical and software applications simplify the complex. We use innovative, reliable technologies to speed solutions to market. And, whether reacting to market forces or changing markets altogether, GS Global Resources is essential to achieving total machine performance.

## CONTACT

Please visit [GSGlobalResources.com](http://GSGlobalResources.com) or contact us directly for more information. Our dedicated team of long-term, invested employees looks forward to working with you.

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