

TELEHANDLER SYSTEMS



VERSATILE TELEHANDLERS

Telescopic material handlers are a mainstay of the construction site, the commercial farm, and industrial applications as well. These machines move heavy materials safely, accurately, and quickly, and are agile on rough, muddy, and uneven terrain. With versatile attachments like buckets and specialized grapples telehandlers can be adapted to a wide range of tasks.

In a crowded market, capacity and reach aren't enough to make machines stand out against the competition. Productivity is key. Qualities like performance, speed, safety, and operator comfort separate the best-in-class machines. For buyers today, who may own and operate a single machine, or own a fleet of telehandlers, serviceability and versatility are definite concerns. And every class of machines has its niche in terms of cost and duty cycle.

There are many opportunities for OEMs to improve the control, efficiency, and serviceability of telehandlers through the use of compact and efficient hydraulic cartridge valves. And HydraForce leads the way in providing new solutions to the many challenges vehicle designers face. Our broad range of valves covers the spectrum of hydraulic functions and our creative team of application engineers and product developers are available to adapt any technology to the specific performance requirements of your application. ***It's what we do every day.***

EVERYTHING BETWEEN PUMP AND TANK

With our range of valves and compact manifolds, HydraForce can address all telehandler systems and subsystems with configurations that meet your unique performance requirements.

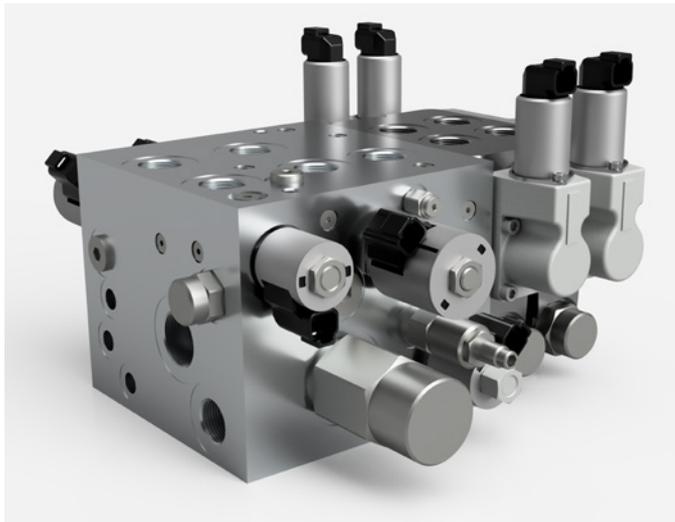
We offer optimized solutions for:

- Main directional control
- Priority circuits
- 2-wheel/4-wheel/crab steering
- Brake release, differential lock, and floating axle lock
- Outriggers
- Chassis leveling and suspension
- Boom suspension
- Auxiliary functions
- Fan drive
- Transmission shift/clutch controls
- EN15000 control directive



Elevating
your vehicle
to the future of
hydraulic
controls

MAIN DIRECTIONAL CONTROL VALVE



Benefits

- Independent meter-in of A and B ports
- Meter-out at the cylinder
- Fast response
- Energy savings compared to pilot operated controls
- Post-compensated flow-sharing
- Optimized flow ratings
- Lower pressure drop in return line
- Zero leakage

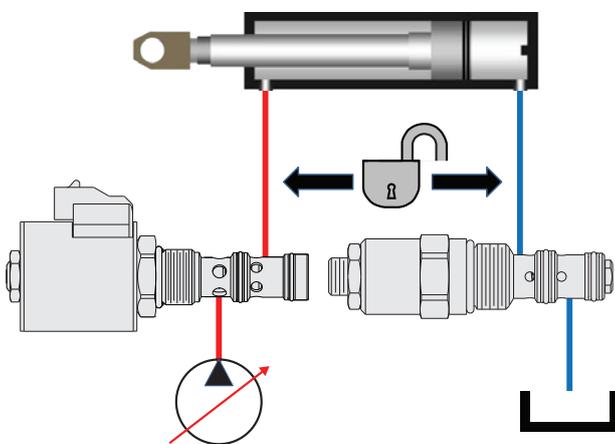
Spool valve technology constrains your hydraulic system to one size of spool even though the flow demands may vary greatly from one function to the next. Metering characteristics are also locked in regardless of whether a cylinder is extending or retracting. This creates a particular challenge for operators and drives designers into performance compromises.

The HydraForce main directional control frees you from these compromises. This solution offers **independent metering** allowing optimum performance extending or retracting. And you can size each function appropriately for the flow range needed, improving control response and hysteresis. Post-compensated flow sharing lets operators lower and retract simultaneously, or lift and extend with regeneration. **Faster cycle time equals more productivity.**

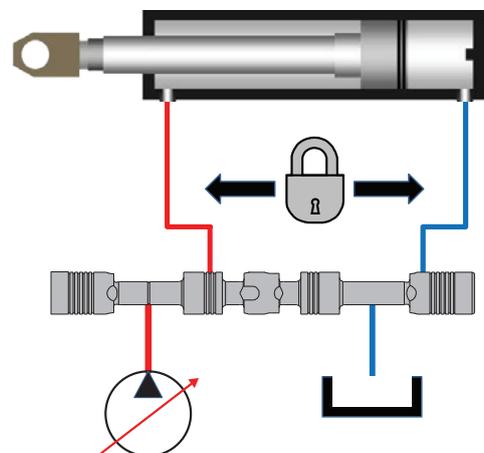
The HydraForce manifold is a hybrid type that combines spool valve technology for tilt and auxiliary control with the patent-pending bridge circuit powered by the **latest technology** HSPEC pressure-compensated proportional flow control valves for boom and telescope functions. This configuration combines the benefit of fully independent A/B metering with a **post-compensated** load sensing network.

Combine this system with a HydraForce electronic control unit, or CAN enabled ExDR valve drivers to **build the ideal main control** for your telehandler applications. You can **easily tune the performance** of each function, and respond to any number of operating conditions making **compliance to directives** such as EN15000 easy. You can even offer **selectable performance modes** to adapt the machine to high performance for skilled operators or optimize controllability for occasional users.

Bridge-Type Circuit

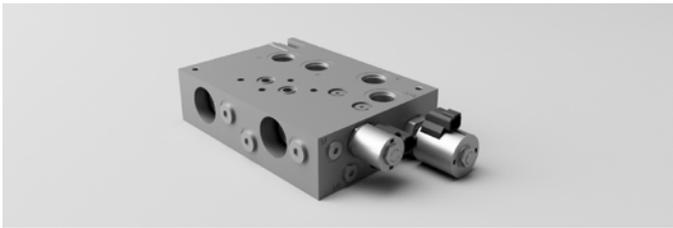


Spool-Type Directional Valve



Break free from the
constraints
of spool valve technology

GRAVITY LOWERING



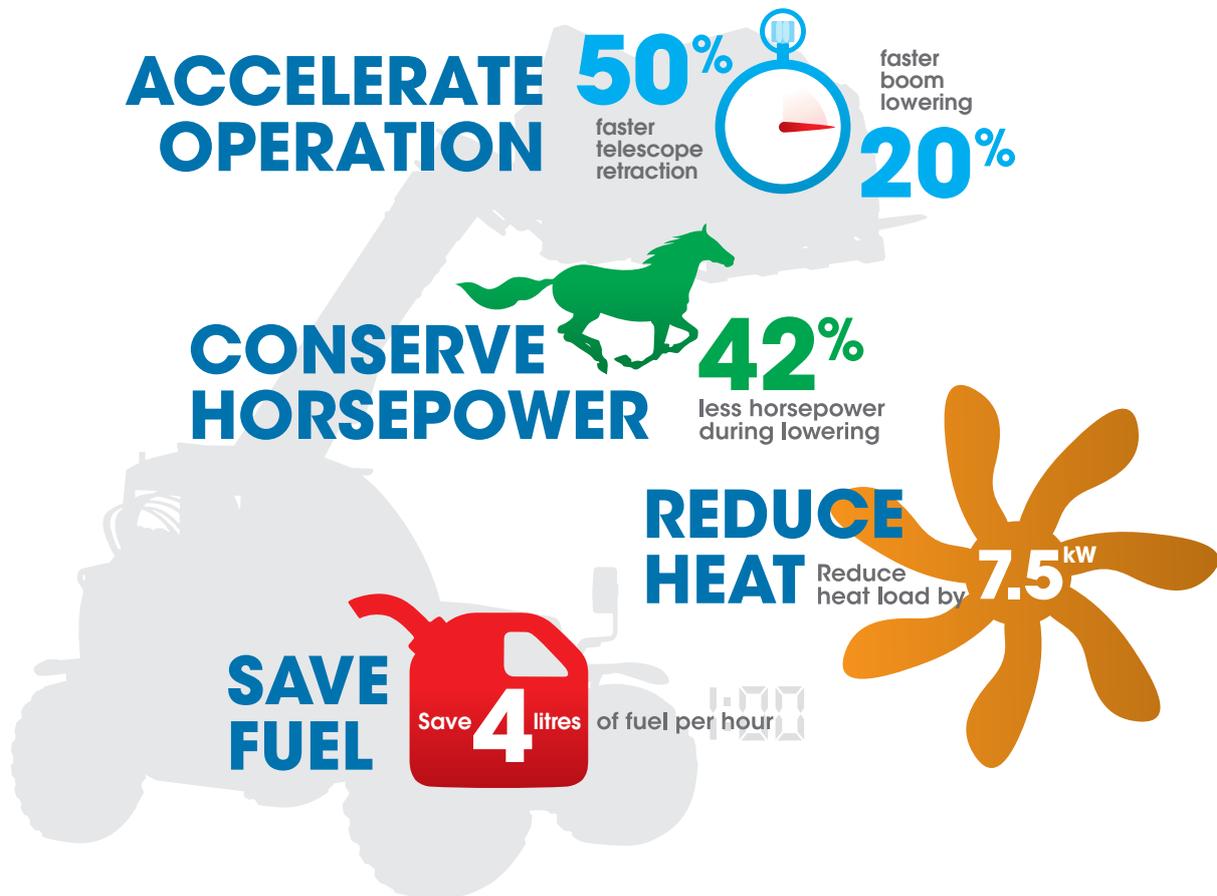
Benefits

- Flange mounted directly on the boom cylinder
- Lower the boom by gravity with or without load
- Smooth controlled lowering
- Meter out at the cylinder
- Return flow directly to reservoir, lower pressure drop
- Fuel savings
- Reduced heat buildup

Loaded or unloaded, the **potential energy** stored in an elevated boom **can work to your advantage**. Why spend precious fuel powering a boom down when you can **let gravity do the work for you**? The HydraForce gravity lowering system for telehandlers makes **no compromise in control or safety**. And you can even apply power when need for operations such as back-grading or scraping when you have a bucket attached. Options are available with or without boom suspension.

Critical performance factors for the boom function are near zero leakage, smooth motion control, and low pressure drop. HydraForce HSPEC valves provide **extremely low leakage** when closed and excellent pressure-compensated flow control for **smooth, regulated lowering** regardless of the load on the forks. In addition, with the patented half-bridge circuit design, return flow passes directly to the reservoir, **reducing the pressure drop** associated with returning through the main control valve. Pump flow is not consumed to retract the cylinder, and without a counterbalance valve, **no pressure is wasted** piloting it to open. This means you now have **extra flow available** for other functions, such as retraction, letting your operators **get the job done faster**. It also means less fuel consumption and less heat buildup in the fluid.

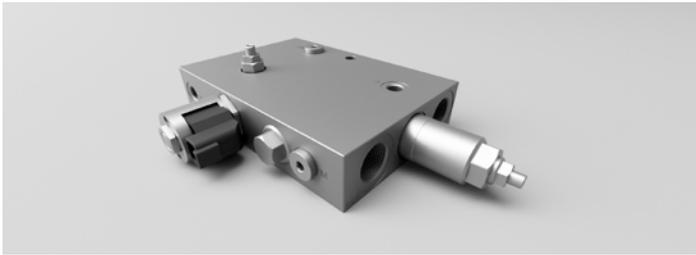
In a real-world application test, the HydraForce gravity lowering system was tested side-by-side with the traditional system, on a production telehandler. After repeated loaded and unloaded cycles, **the laboratory results speak for themselves**:



Increase
productivity

Improve
efficiency

BOOM SUSPENSION



Benefits

- Flange mount directly on boom cylinder
- Compensate for recoil in boom components
- Accommodate changing load conditions
- Compact package / small solenoid valve coil
- Faster, safer travel over rough terrain
- Compatible with motion control or gravity lowering

Controlling the recoil of the boom while traveling over difficult terrain is key to **load stability** and **vehicle safety**. An effective boom suspension system can act to prevent jostling and shifting of the load, and a vehicle with a controlled load is **easier to maneuver** and **safer to operate**. The HydraForce boom suspension system can be **tuned for the dynamics of any vehicle**, and it can operate in conjunction with the gravity lowering system to give you energy savings and a smooth, safe ride.

**GREATER OPERATOR
COMFORT**



**REDUCED
VIBRATION**



**FASTER
TRANSPORT SPEED**



**IMPROVED
WHEEL CONTACT**



MOTION CONTROL



Benefits

- Flange mount directly on the boom cylinder
- Smooth and safe operation
- Reliable load holding
- Prevent jerky movements
- Prevent overrunning load

For systems without gravity lowering, a traditional motion control solution provides **smooth and safe metering** of boom movement. The **reliable** counterbalance valves provide **zero leakage load holding** and prevent uncommanded boom movement. The HydraForce flange-mounted motion control manifold is available with a variety of options for pressure ratios and flow ranges.

Operate with confidence
Smooth and Safe
Fast and efficient

Boom Suspension

Auxiliary Functions

Axle Lock

Outriggers

Gravity
Lowering

4-wheel Steering

MORE FLEXIBILITY

Cartridge valves offer you the most flexibility when designing control systems. HydraForce has the widest range of sizes, operating pressures, function choices, and space-saving multifunction valves.

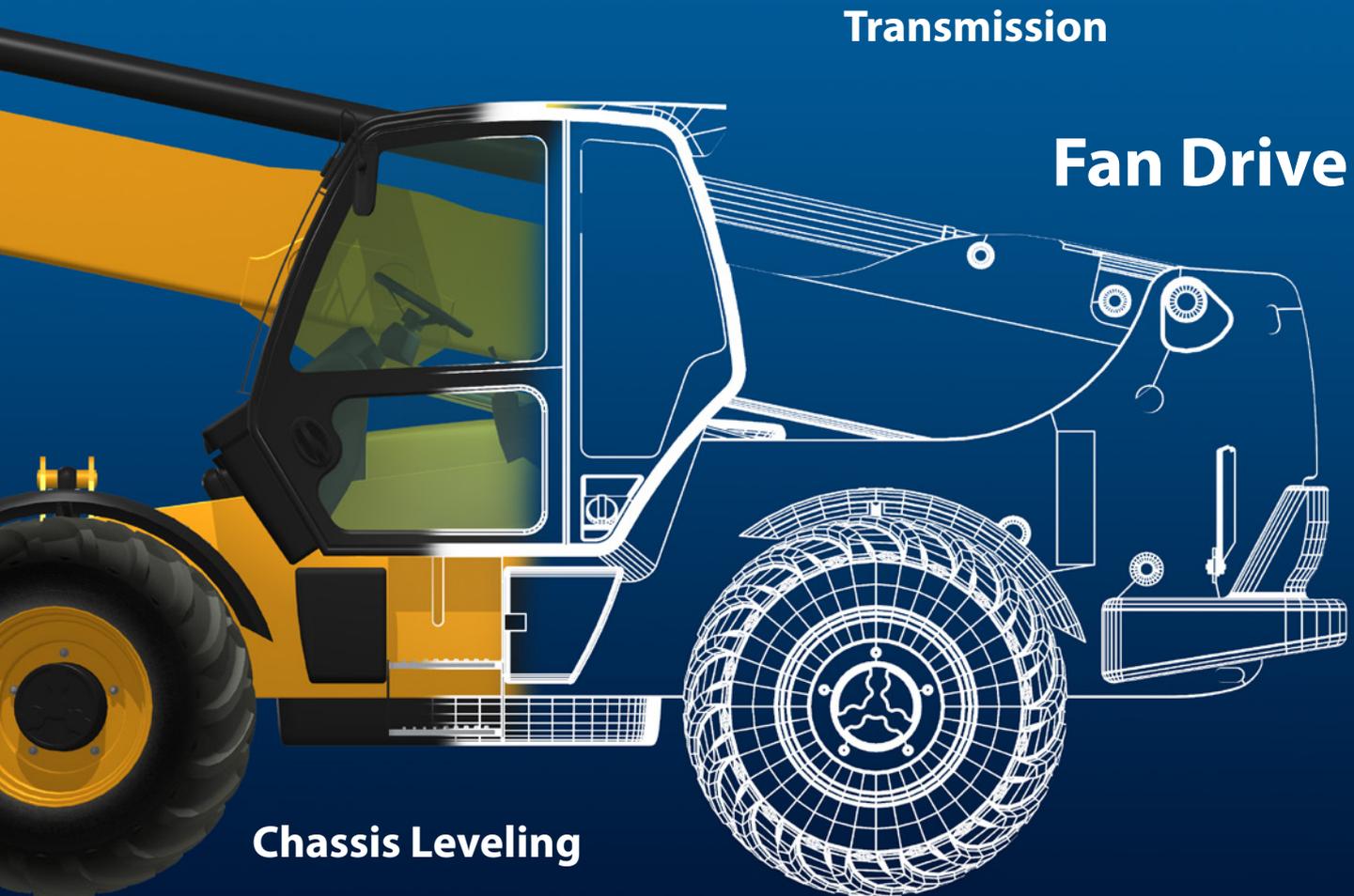
- Independent meter-in of A and B ports
- Meter-out at the cylinder
- Simplify piping
- More valve choices
- Combine or distribute controls

MORE PERFORMANCE

On the jobsite, performance is key. Machines that operate faster without sacrificing safety or accuracy give you the advantage.

- Integrated load sensing
- Flow sharing
- Boom suspension
- Improved boom lowering speed

Main Directional Control Valve



MORE EFFICIENCY

Features like gravity lowering help save fuel, but having the additional flow available for boom retraction also saves time and lets you get to the next job faster.

- Gravity lowering
- Right-sized components
- Flow sharing
- Regenerative boom extension

MORE SERVICEABILITY

For a farmer operating and servicing his own machine, or contractors with an entire fleet of construction equipment, downtime can be a disaster. When service is needed, swapping out a cartridge valve is much faster compared to changing a section of a stack valve.

- Easy swap out of components
- Modular distributed manifolds
- Removable coils
- Simplified plumbing

WHY CONSIDER HYDRAFORCE?



- World's largest privately owned cartridge valve manufacturer focused on EH system controls
- Broadest range of cartridge valves
- Designed EH systems for mobile equipment in every industry



- Free design support
- Simulation software
- Fast prototypes

- All manifolds are end-of-line function tested
- Use of Lean and Six Sigma practices
- Five year warranty on valves and manifolds



- Integrate sensors, fittings, ancillary valves, and other custom components into a single manifold
- Simplified circuit design
- Consolidated or distributed hydraulic systems



RoHS COMPLIANT HydraForce valve and manifold products comply with the European Council and Parliament RoHS directive 2002/95/EC limiting the use of hazardous substances. For all other products, consult factory.