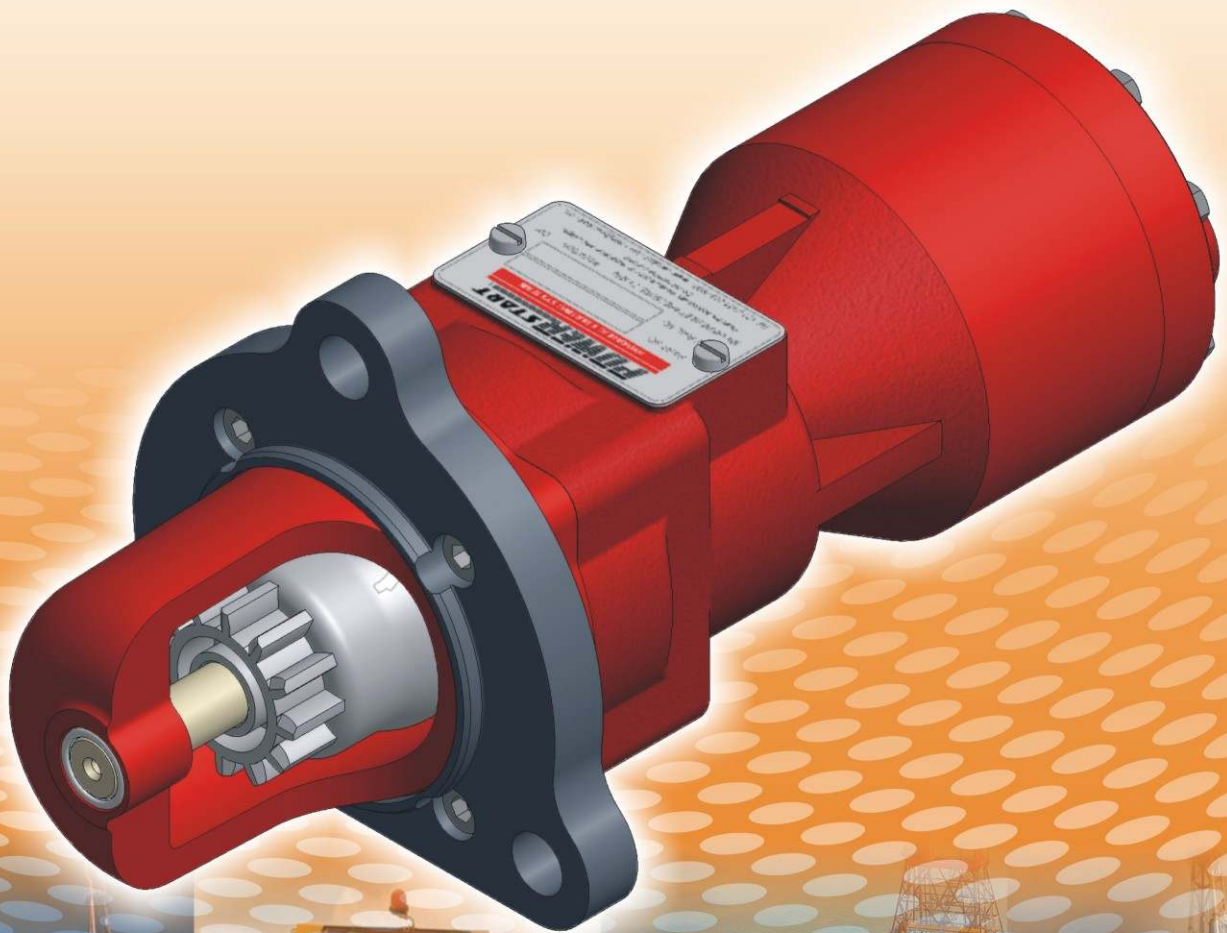


POWER START®

STARTING SYSTEMS

**The ORIGINAL cast iron
hydraulic starter
for diesel engines**

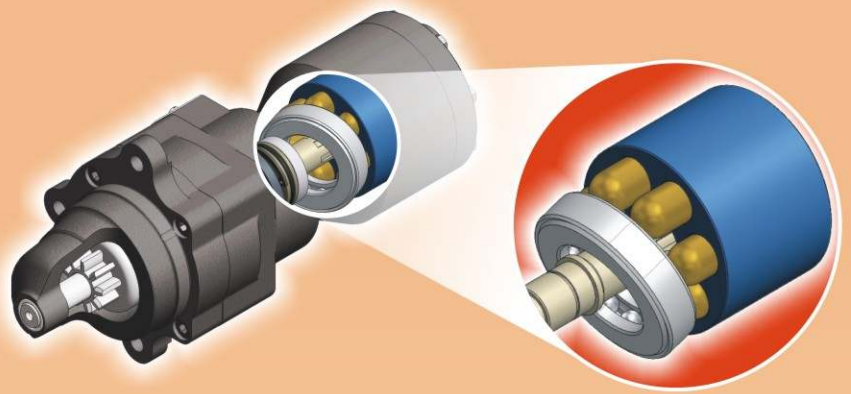


How does it work?

Energy is stored in the form of hydraulic oil under pressure inside the piston accumulator. The oil is released either via a foot operated or solenoid operated start valve. Once released, the oil travels to the starter motor, which engages with the engine ring gear and begins to crank the engine. Once the engine has reached firing speed, the pinion gear is automatically kicked back by the ring gear.

The recharging of the system can be done manually by means of a hand operated pump, electrically by means of a hydraulic pump or even through the host machine's onboard hydraulics if applicable.

With a range of 3 different physical sizes and 6 different starter displacements, engines as small as single cylinder water pumps and as large as 16 cylinder, 80 litre earth moving machinery power plants can be started.



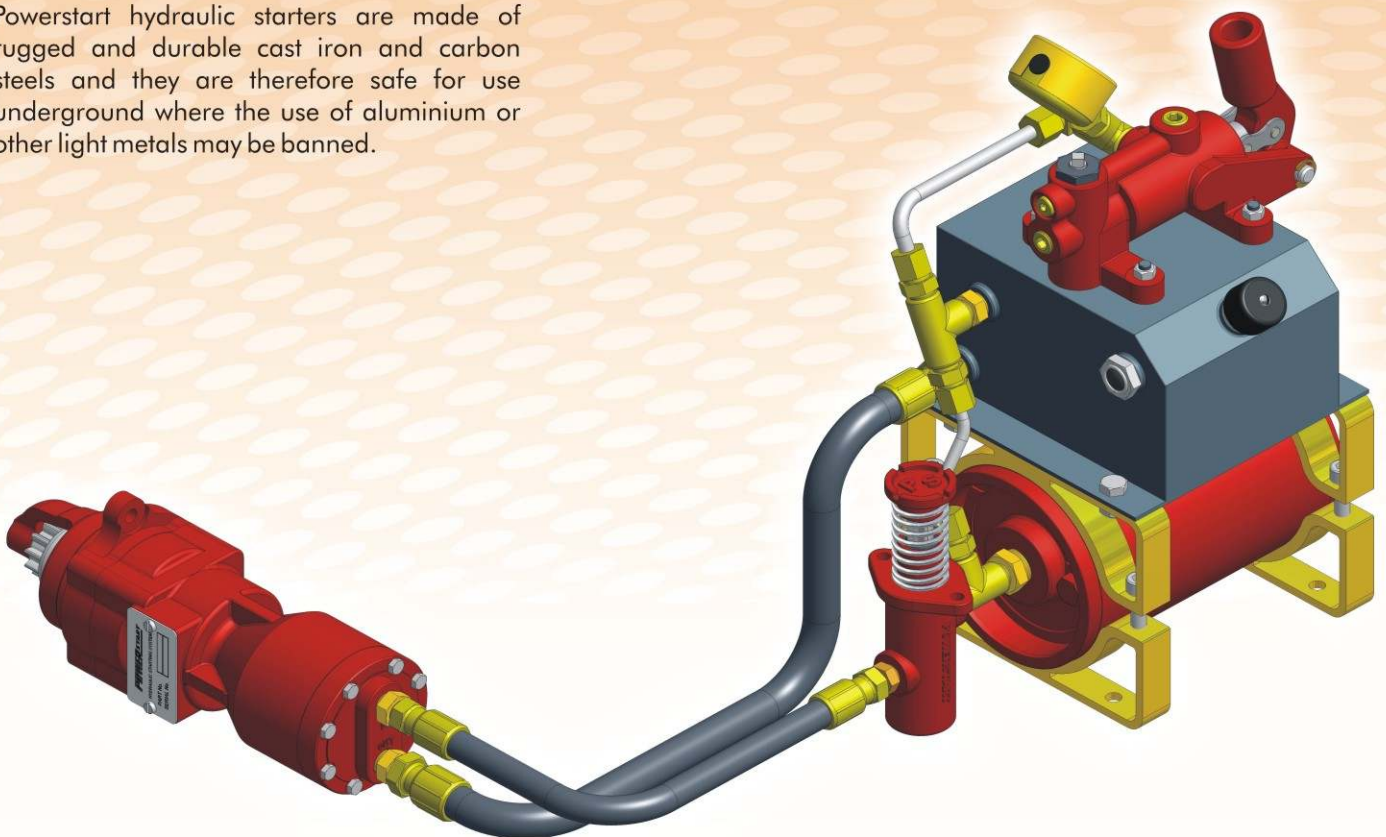
Making Installation Easier

Powerstart hydraulic starting systems can be purchased pre-assembled as mini-pak systems. These can be ordered with a variety of starters and accumulator sizes and they arrive completely assembled, piped and tested along with hoses and fittings so that all that is required is the fitting of the starter motor onto the engine and the fixing of the starting pack to any suitable surface.

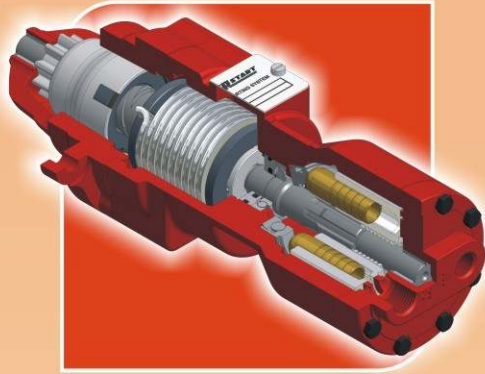
The units comprise of an accumulator, oil reservoir, relief valve, pressure gauge, hand pump, foot valve, starter motor and hoses and fittings.

The Original Cast Iron Hydraulic Starter

Powerstart hydraulic starters are made of rugged and durable cast iron and carbon steels and they are therefore safe for use underground where the use of aluminium or other light metals may be banned.



The Starter Motor



Is operated by the hydraulic oil under pressure.

- Made of rugged cast iron
- Lightweight yet aluminium free
- Models cover a torque range from 30Nm to over 200Nm

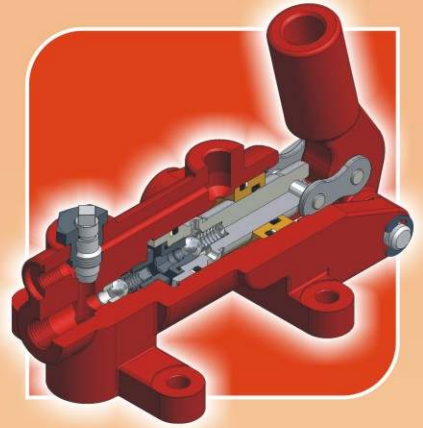
The Piston Accumulator



Stores the hydraulic oil under pressure provided by nitrogen gas.

- Made of certified seamless hydraulic tube for total safety
- End cap retention design prevents disassembly when pressurised
- Conforms to PD5500:2006 and is Lloyd's certified
- Tamper resistant charge valve

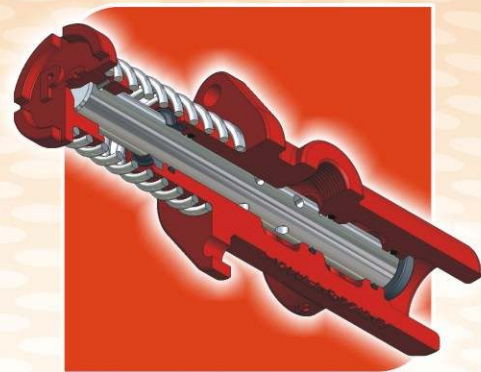
The Hand Pump



Provides a means of pumping up the system manually in the event of a total loss of pressure.

- Cast iron construction
- Hardened and ground stainless steel piston for greater corrosion resistance
- Double acting system pumps on both strokes for quicker recharging
- Removable handle

The Foot Valve



Offers an economical and reliable method of controlling a hydraulic starter system.

- Cast iron construction
- Hardened and ground stainless steel spool for greater corrosion resistance
- Front wiper and extended neck for greater spool service life

Accessories

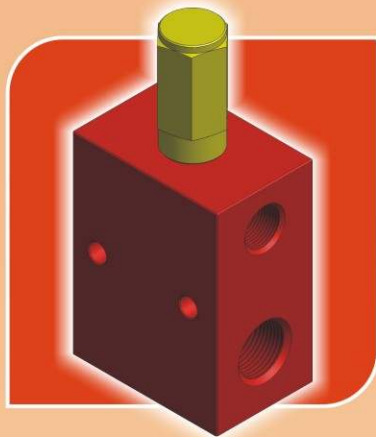


A wide range of accessories is available to complete any starting system. These include:

- Accumulator brackets
- Pressure gauges
- Accumulator recharging kits
- Pre-charge test kits
- Solenoid valves
- Explosion proof solenoids



The Safety Relief Valve



Prevents over-pressurisation of the system

- All steel construction
- Zero internal leakage
- Cartridge can be easily changed

The High Pressure Filter



Prevents dirt contaminating the starting system

- All steel construction
- Bypass valve to prevent element collapse when blocked.
- 40 Micron filtration

The Unloading Valve



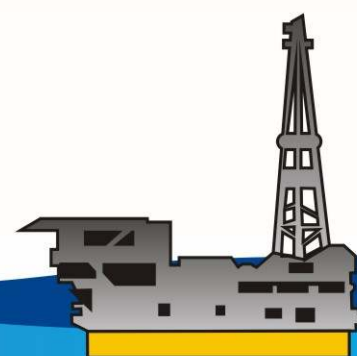
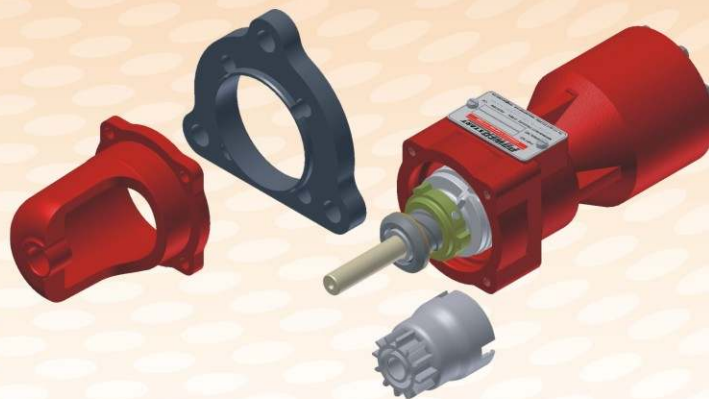
Automatically unloads a pump without causing heat build-up

- All steel construction
- Zero internal leakage
- Available with internal or external drain for power beyond applications
- Cartridge can be easily changed

A Modular Concept of Starter Motor

Powerstart hydraulic starters feature a modular construction. This means that the flanges and pinions can be easily interchanged and as a result the number of possible starter combinations is literally limitless.

As a result of this, new applications can be developed in hours and a finished product can be supplied in a matter of days.



Why Powerstart hydraulic starting?

Powerworks and Powerstart have been synonymous with reliable alternative starting for over three decades. Our success can be attributed to a total dedication to satisfying the needs of the customer in record-breaking time, thus providing first-class service to support our first-class products. We differ from most manufacturers in that our experience includes installing and repairing starting systems, thus giving us first hand knowledge of real world applications and problems.

Powerstart hydraulic starters offer many advantages over electric starting which may vary depending on applications and environments:

- Powerstart hydraulic starters require no electricity and therefore are non-sparking and this makes them ideal for flameproof applications.
- Powerstart hydraulic starters offer more power and torque per kilogram than electric starters. The entire starting system is far lighter than an electric starter with its heavy batteries.
- Powerstart hydraulic starters are totally sealed and are therefore immune to contaminants such as coal dust, corrosive salt spray or any other harsh environmental conditions. Furthermore, all moving parts are submerged in oil.
- Powerstart hydraulic starters offer faster cranking than electric starters. This means higher compression, in turn raising combustion temperatures and improving starting ability.
- Total recharge time is greatly reduced. It would take minutes to charge an accumulator compared with the hours required to fully recharge a bank of batteries.
- All Powerstart hydraulic starters can be fitted with optional beryllium copper pinions for non-sparking applications.
- Hydraulic starting systems can be recharged manually via an optional hand pump. This offers true "black start" capability. No other system can be manually charged.
- Powerstart hydraulic starting systems offer nearly indefinite energy storage. Provided there are no leaks, the system can remain fully charged and ready. Batteries will only hold their charge for a limited period of time.
- Powerstart hydraulic starting systems are unaffected by temperature extremes. As long as the correct viscosity oil is used, temperatures can go well below freezing point.
- Powerstart hydraulic starters operate without batteries and therefore the problems normally associated with maintenance and theft are eliminated.

Typical layout of a hydraulic starting system

