

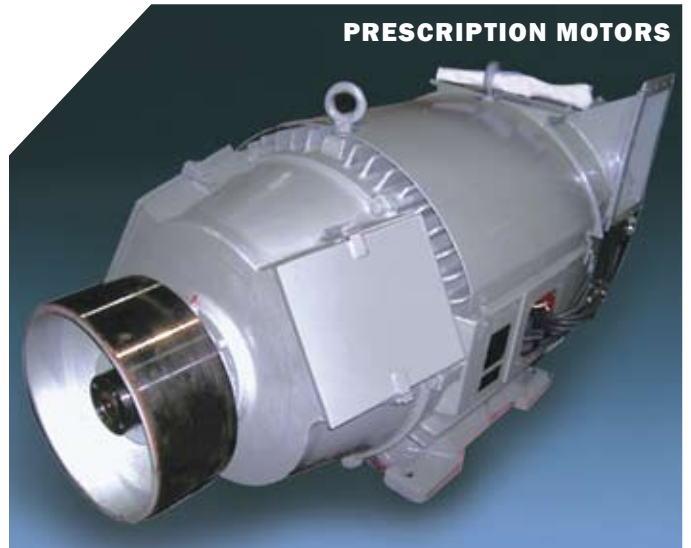
P&H PRESCRIPTION PARTS™

Our knowledge sets us apart

**PRESCRIPTION
GEAR SETS**



PRESCRIPTION MOTORS



PRESCRIPTION WHEELS



WORLD CLASS EQUIPMENT RELIABILITY

P&H PRESCRIPTION PARTS™

are custom engineered and designed to meet or surpass the OEM requirements as originally supplied with the crane. These parts incorporate knowledge gained from over 125 years in the crane industry.

Typical improvements include changes to the material, design and/or manufacturing process which can improve performance and the overall life-span of the part. These enhancements may also be applied to the entire assembly, enabling the crane to run more efficiently while extending the life of the crane.

Complementing the broad array of services and products available through Konecranes, P&H Prescription Parts solutions can be found for many chronic crane conditions.

Rather than focusing on a single part, we consider the entire crane, and how the improved part impacts its related components. We provide an integrated state-of-the-art design, utilizing:

- ▶ Design improvements
- ▶ Material improvements
- ▶ Manufacturing process improvements
- ▶ Analysis of an assembly versus a single part
- ▶ Increased life-span of the part
- ▶ Extended parts warranty of 2 years vs. the industry standard of 1 year or less.
- ▶ Experience – Crane manufacturer for over 125 years and built over 40,000 Cranes
- ▶ On-site Engineering / Analysis



PRESCRIPTION WHEELS® AND WHEEL ASSEMBLIES

PRESCRIPTION WHEELS

Problem – Excessive bridge binding or crane skew can lead to flange and rail wear, broken axles, damaged wheel assembly components, broken rail clips or failed building tie backs.

Solution - As a crane manufacturer, not just a parts supplier, we use a systematic approach to resolve these types of issues. For over 20 years we have successfully applied our patented Prescription Wheel® in a wide variety of applications. This unique design uses an altered wheel material and a redesigned tread which incorporates a steering flange. We can also analyze wheel alignment and/or rail alignment using state-of-the-art, digital and laser measuring equipment.

Problem – Excessive wheel wear on one side, leading to inconsistent drive wheel diameters and crane skewing.

Solution - This special wheel, made from an alloy rather than ordinary carbon steel, incorporates a greater depth of heat treat penetration than standard case hardened designs. The wheel tread of the P&H 60+ wheel, (Figure 1), is specified on the top surface to be 57-62 Rockwell C to effectively maintain critical driver diameter match. This solution is the industry standard for challenging applications and has proven to be successful in the vast majority of installations.

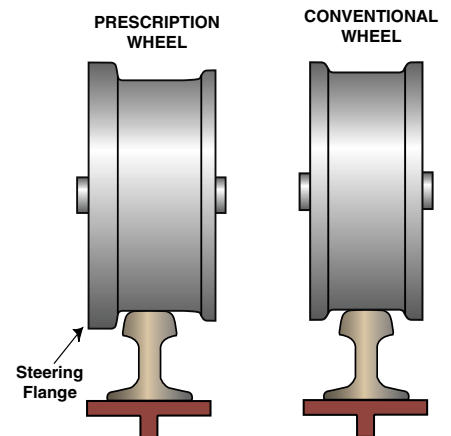
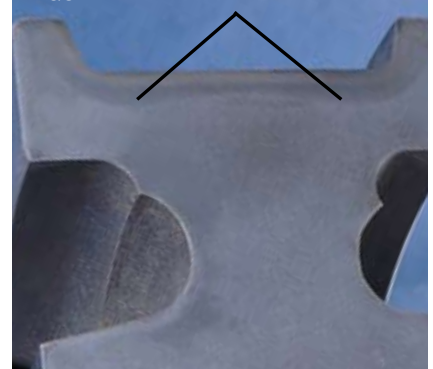


FIGURE 1: HEAT TREATED AREA:



PRESCRIPTION WHEEL ASSEMBLIES

Problem – Broken axles or failed gearing.

Solution - Expanding the prescription concept throughout the entire wheel assembly offers maximum performance and life expectancy for this critical component of the crane. Examples are alloy steel axles that are heat treated to replace standard, non-heat treated designs. All gear teeth are heat treated to maximize durability and resistance to wear. Tight tolerances, smooth machined surfaces and relatively high press fits are incorporated to significantly reduce the possibility of wheel slippage or movement on the axle.

PRESCRIPTION GEARS™ AND ASSEMBLIES

Problem – Vintage, two-piece pinion gears on shafts with unknown and unseen cumulative stresses can potentially lead to catastrophic failure.

Solution – Utilizing state of the art design methodologies, materials and manufacturing processes, a gearing engineer will redesign the pinion gear and shaft.

In many cases a one piece pinion shaft can provide:

- ▶ Higher strength
- ▶ Improved reliability
- ▶ Trouble free operation

For situations that cannot be converted to a “pinion on shaft design”, improvements in keyway design, surface preparation and heat treatment processes can be used to both reduce fatigue and increase strength.

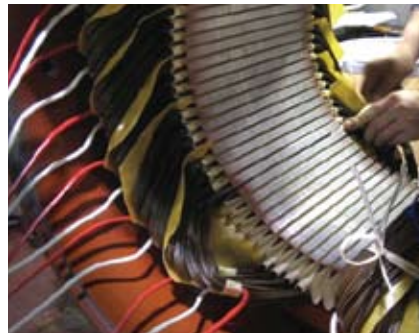


PRESCRIPTION MOTORS™

Problem – Short service life of rebuilt motors due to high utilization and tough environments.

Solution – Beyond the five-times industry average service life of our proprietary motors and rebuilding service, is the unparalleled performance of a P&H Prescription SuperMotor. This motor is uniquely designed to handle continuous duty cycles and brutal environments by incorporating these engineered design solutions:

- ▶ Larger HP blower motors improve perimeter air flow and heat exchange.
- ▶ Larger surface areas and increased iron core mass allow for optimal heat dissipation.
- ▶ Thinner stator and rotor laminations deliver lower eddy currents and create less heat.
- ▶ Additional heat relieving geometries are included in slip ring bearing housing designs.
- ▶ Premium heat resistant materials at critical rotation areas.



MORE P&H PRESCRIPTION PARTS™

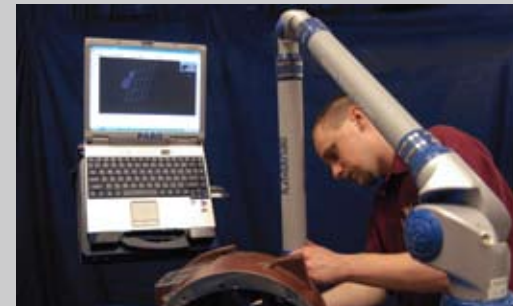
In addition to the categories discussed already, the P&H prescription line also includes:

- ▶ BOTTOM BLOCKS
- ▶ DB™ POWER LIMIT SWITCHES
- ▶ DROP-IN SHAFTS
- ▶ DRUMS
- ▶ GEARBOXES
- ▶ HOOKS
- ▶ MILL-DUTY CONTACTORS
- ▶ SHAFTS

REVERSE ENGINEERING PROCESS

Problem – Replacement parts are hard to find or are obsolete, drawings are unavailable, the OEM is no longer in business, or lead-times are unacceptable.

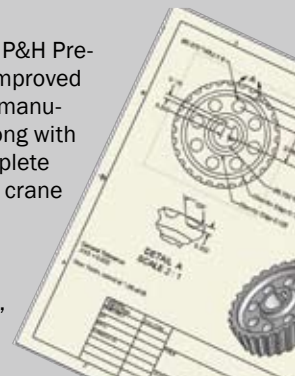
Solution – Through our Reverse Engineering Process (REP), we can supply virtually any crane part. Utilizing the original part, OE drawings, or an on-site evaluation we will design and produce a replacement at or above the original manufacturer's specifications. These components are held to the same high quality standards the industry has come to expect from P&H products.



PRESCRIPTION PARTS™ FOR ALL CRANE BRANDS

We can apply the P&H Prescription process to all brands of cranes whether it's for a Konecranes family brand or one of our competitor's crane parts – not just P&H.

We will apply the same P&H Prescription Techniques: Improved design, materials, and manufacturing processes along with considerations for complete assemblies and overall crane operation to any brand of crane part. They will surpass the design requirements of the OEM, extending the life of the parts, as well as the crane.



Your Local Source for P&H Prescription Parts™:



Morris Material Handling is the original equipment manufacturer of P&H cranes, hoists and replacement parts and is a wholly owned subsidiary of Konecranes Inc. Worldwide, the P&H brand has long been recognized as the symbol of quality, innovation and reliability in the most demanding material handling applications and environments.

Konecranes is a world-leading group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity-enhancing lifting solutions as well as services for lifting equipment and machine tools of all makes.

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