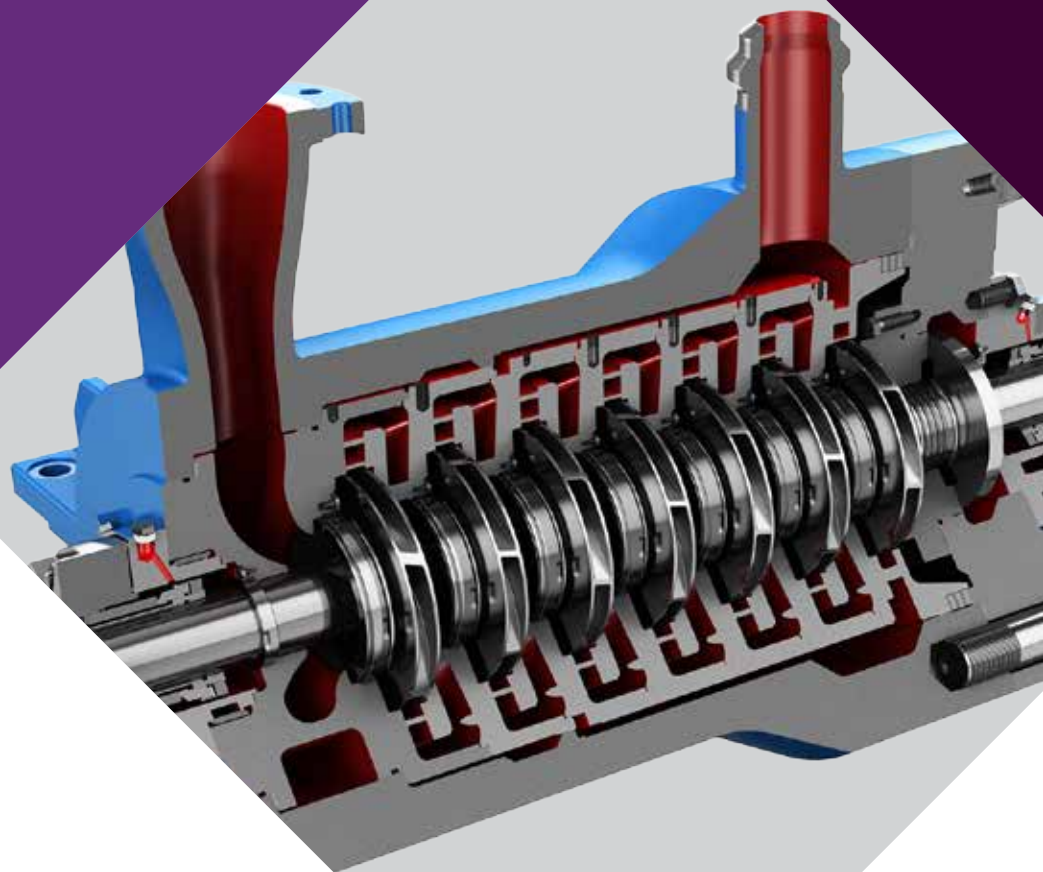




PRX-CBS

Cartridge Parts Replacement
and Upgrades



ITT

ENGINEERED FOR LIFE

Proven API Leadership

Reliability has no quitting time

Building on over 160 years of Goulds Pumps and Bornemann experience, PRO Services provides an array of services focussed on reducing equipment total cost of ownership (TCO) and increasing plant output, including predictive monitoring, maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps. PRO Services can typically return savings of up to 25 percent annually.

Addressing Needs

Depending on the issues and level of service needed, PRO Services will tailor solutions to fit your needs. We have the experts to get the job done right.

Complete API Offering

- Over 20,000 units installed
- Over 3,000 between bearing pumps installed
- 40+ years of API expertise

Global Coverage

ITT Goulds Pumps has the global coverage needed to serve multi-national companies in any region.

Industry Leading Hydraulic Coverage

- We offer extensive coverage to meet your process needs.
- Better hydraulic fits can mean improved efficiency and long-term reliability and parts life.

8000 HP / 6000 kW Testing Capability

- Our expanded test facility can test your pump in the most demanding conditions.
- Testing at rated speeds is critical to access the impact of dynamic conditions including vibration.

API Engineering Expertise

- We package engineered pumps to meet your demanding applications – that fully conform to the latest API specifications.
- Engineered Packaging with a wide range of drivers, seals, piping, nozzle conformance, flanges, baseplates and QC testing.
- ITT is a world leader in technology and engineering, including hydraulics, materials science, mechanical design and fluid dynamics.

Repairs & Upgrades

PRO Services facilities (PRO Shops) provide an array of repairs and upgrades services to extend equipment life. Our PRO Shops help customers develop effective maintenance and asset management programs to lower maintenance costs, improve uptime, reduce inventory costs and extend equipment life.



PRX-CBS Parts

Impellers

Description:

- In-line radial type, key driven
- High quality precision castings ensure optimum efficiency and performance



Channel Rings & Last Stage Diffuser

Description:

- Integrated diffusers and channel ring design
- Metal to metal stage casing fits
- High quality precision castings ensure optimum efficiency and performance



Balance Device & Bush

Description:

- Balance drum and bush assembly reduces axial thrust imbalance caused by impellers
- Original engineered clearances maintained giving increased bearing life and smooth operation
- Both flanged and straight drum designs used on CBS pumps



Suction Head

Description:

- Flow passage into 1st stage impeller eye for optimum performance



Discharge Head

Description:

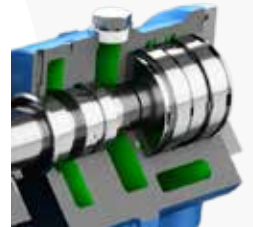
- Pressure boundary component bolted to barrel casing compressing the stack



Bearing Housing Assembly

Description:

- Sleeve type radial bearings and tilting pad thrust bearing or rolling element bearings depending on energy
- Labyrinth oil seals



Shaft

Description:

- Transmits torque from driver through to impellers
- Optimising shaft diameter leads to minimum deflection increasing wear parts, bearing and mechanical seal life



Mechanical Seal

Description:

- Cartridge type mechanical seals are standard



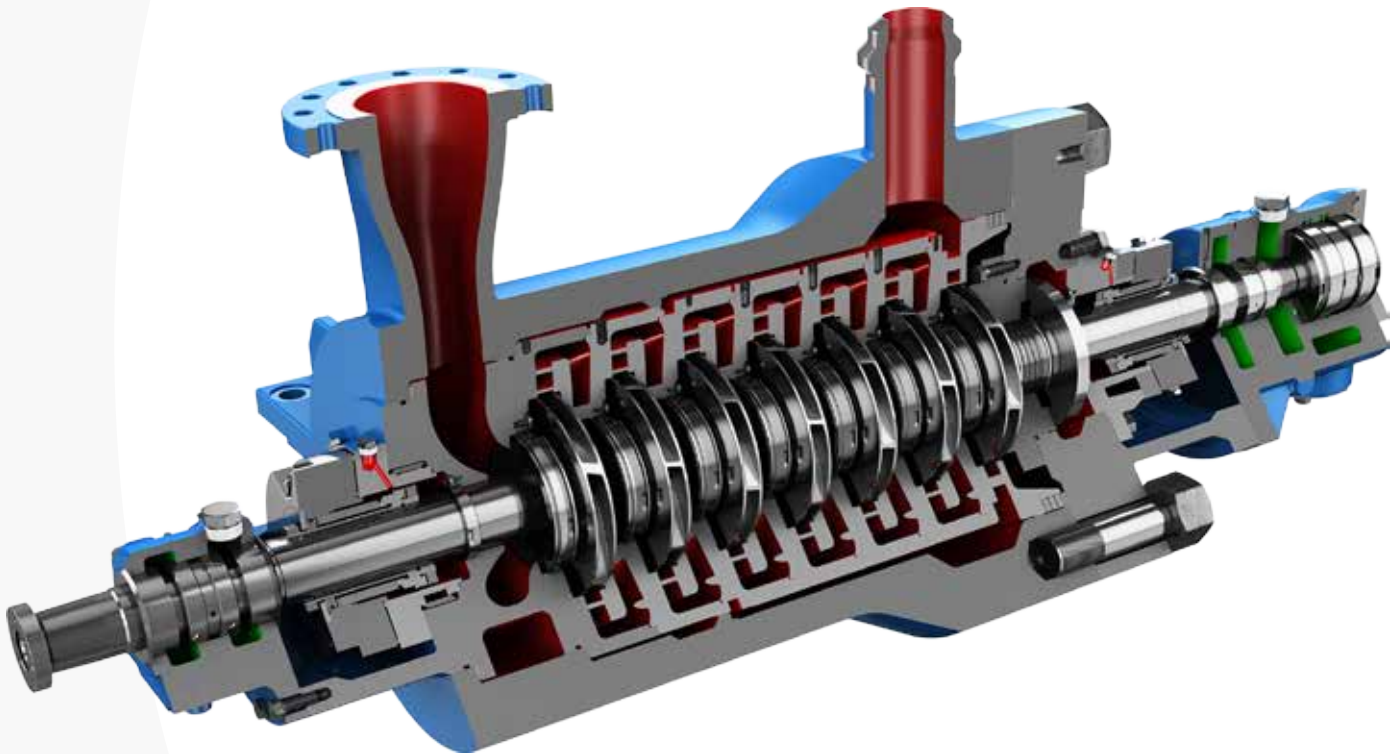
PRX-CBS Cartridge Replacement

OEM replacement parts

- ITT Goulds Pumps owns all original design information
- Ensures exact replication of existing design leading to increased part life through attention to critical tolerances and manufacturing methods

Minimal site disruption

- No requirement to reverse engineer existing pump thus ensuring minimal site disruption and downtime
- Pre-engineered complex castings allows for market leading delivery times.



PRX-CBS Cartridge Upgrades

Impellers



Upgrade Option:

- Original CB pump impellers had loose fit on shaft and extended hubs to locate axially
- Upgrade to have shrink fit impellers providing reduced rotor weight, improved castability, improved tolerance stack-up (eliminates bowing) and better balance repeatability
- Integral wear rings can be upgraded to replaceable wear rings for ease of maintenance

Channel Rings & Last Stage Diffuser



Upgrade Option:

- Stack compression via Bellville washer rather than gasket/shim stack
- Provides more reliable stack compression and reduces assembly/maintenance complexity

Balance Device & Bush



Upgrade Option:

- Change flanged balance drum device to straight drum arrangement
- Improves reliability through removal of axial clearance which can be an area of contact/seizure especially in high frequency start/stop operations

Suction Head



Upgrade Option:

- Replace Suction Ring bushing on double suction pumps with serrated design with shortened running fit
- Reduces risk of seizure due to contact and increases tolerance to suspended solids

Discharge Head

Upgrade Option:

- Replace two part stuffing box with integrated discharge head and seal chamber cover
- Improves rigidity and reduces complexity of maintenance



Bearing Housing Assembly

Upgrade Option:

- 180° bearing housing support bracket upgraded to 360°
- Adds rigidity and increases bearing life



Shaft

Upgrade Option:

- Review and improvement of tolerances and fits latest ITT design standards to improve reliability



Mechanical Seal

Upgrade Option:

- Upgrade to latest edition API 682 seal chamber



PRX-CBS

Benefits of Upgrading your CB Pumps with PRX-CBS

- Increased Reliability
 - Robust design
 - Upgrade to latest edition API mechanical seals, reducing emissions
- Minimal Site Disruption & Reduced installation costs
 - Pipework remains in same position/No driver movement in the majority of cases
- Reduction in Site Inventory & Lead Time

Hydraulic Rerates

Processes often change over time – causing pumps to run far from best efficiency point (BEP) with the associated reduction in reliability (MTBF).

We can perform a “hydraulic rerate” to your existing BB5 pump – moving the BEP to the left without any hydraulic changes. The modified pump's operation is closer to the BEP with increased efficiency and reliability.

Drop-In Replacements

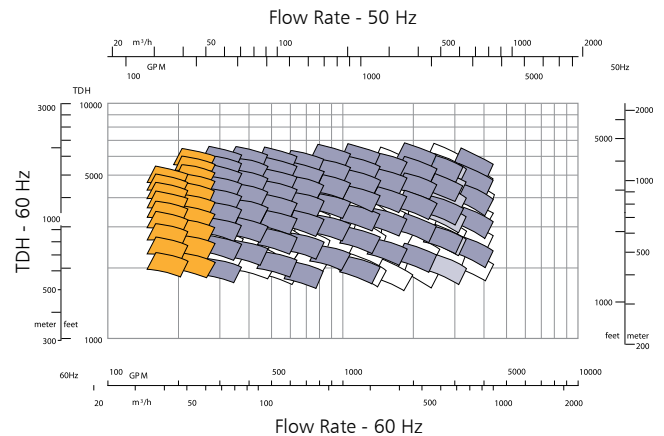
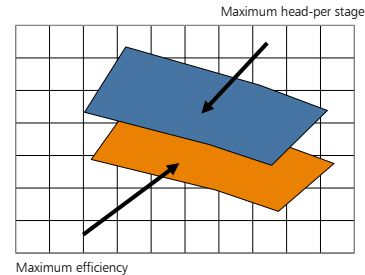
Our drop-in replacements allow you to get a new BB5 pump without replacing your existing piping and baseplate – saving you \$10,000s in site costs while reducing emissions and improving MTBF.

We customize our BB5 casing nozzles and/or foot locations, offering you the best of both worlds – new pump with existing piping and site work.



World Class Hydraulics

There are two sets of curves available. One set is optimized for maximum head-per-stage while a second set is optimized for maximum efficiency.



Engineered Upgrades for All Brands

Older pumps don't comply with the more stringent latest editions of API. This causes many issues ranging from limited use of latest seal designs (API 682), potential seal emissions issues, poor reliability and MTBF, OEM parts becoming obsolete, and more. We perform engineered upgrades to your existing API pump (any brand) – upgrading the power end, casing cover, shaft and seals to the latest API standards.



Upgrades

ITT PRO Services provide upgrades engineering services for a wide range of pumps.

PRX-OH2 Back Pull-out Upgrade

The PRX-OH2 is a back pull-out assembly which provides a complete replacement to your existing equipment while keeping the existing impeller and casing. The replacement scope consists normally of bearing housing assembly, shaft, seal chamber cover with wear ring, throat busing, keys and impeller nut. It is available in 4 API seal chamber sizes (#2/4/6/8) and 3 materials classes (S-6/C-6/A-8).



PRX-VSR Rebowl of Vertically Suspended/Vertical Turbine Pumps

With the aim of being more economical than a complete new pump, rebowling a pump could be the solution for many pump problems with no disturbance to the existing piping and re-using some of the original pump parts such as the discharge head, mounting plate and the driver.



PRX-VMS

The PRX-VMS is a program designed to facilitate upgrading of the seal interface on vertical pumps from packed gland to mechanical seal. The mechanical seal interface used in this upgrade is in accordance with the Goulds Pumps vertical product standards.

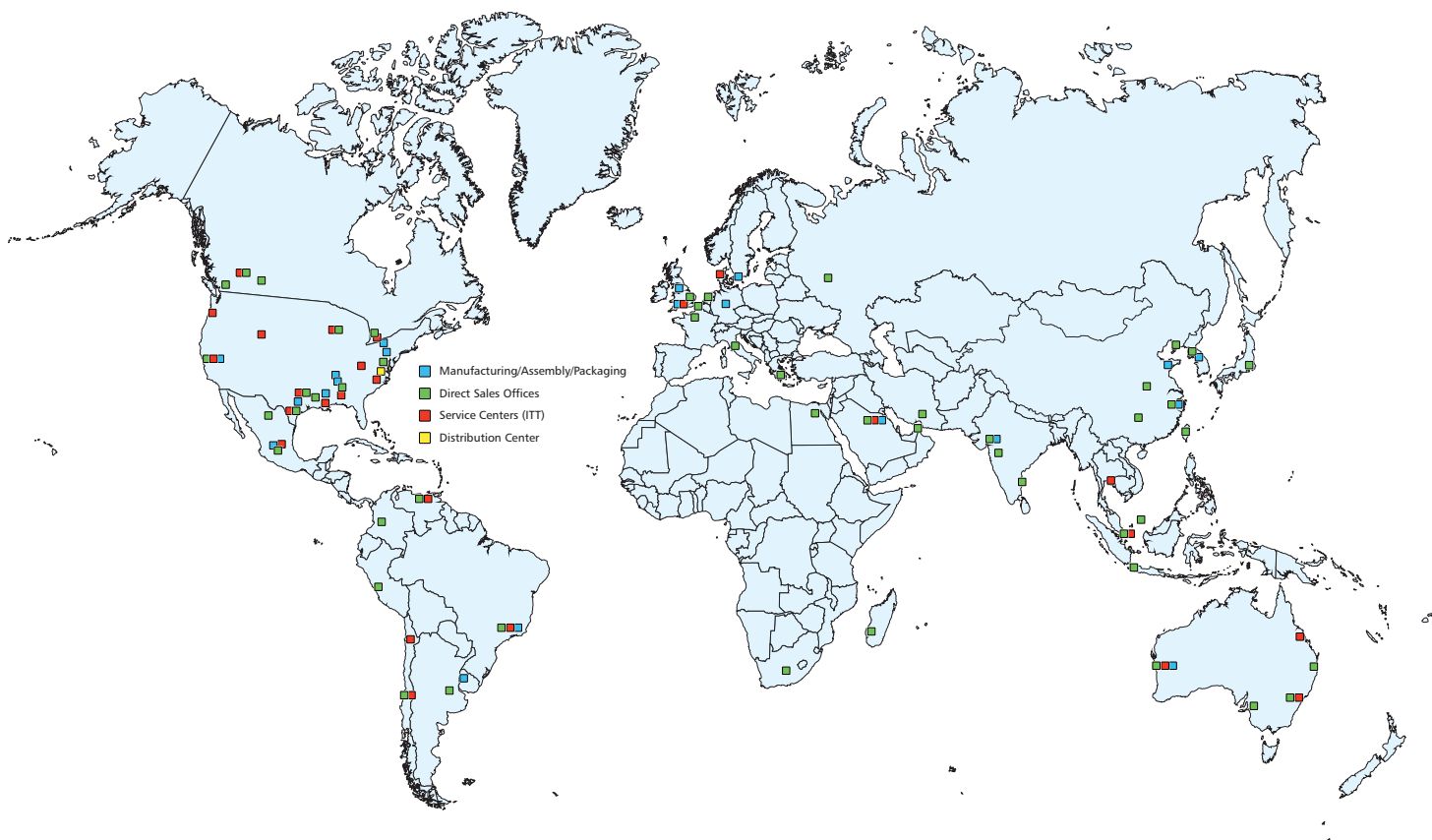


Engineered upgrades

If you have a pump at a critical operation sitting idle because a part just failed and you cannot obtain a replacement because the original equipment manufacturer obsoleted the model. We have a solution for you. With our engineered upgrades, we deliver performance improvements through hydraulic, mechanical and material modifications. And we can deliver it up to twice as fast, from rapid quotation to data acquisition and reengineering to rapid manufacturing.



Wherever you are, we're there too.



Reliability has no quitting time.

Building on over 160 years of Goulds Pumps experience, PRO Services provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including predictive monitoring, maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment.

Your Total Solution For Equipment Life Cycle Optimization

