



Partners in Fluid Power Engineering and Manufacturing Solutions!

Power Dynamics Innovations

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www.marinewinches.com

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Power Dynamics Innovations LLC

Partners in Engineering and Manufacturing Solutions



POWER DYNAMICS INNOVATIONS LLC was established with the asset purchase of Power Dynamics LLC in June 2015 by Carl Liberty. For the past ten years Carl has been the Vice President of Operations for Power Dynamics LLC and has played an integral part in building PDI's position as an industry leader in the Fluid Power Industry.

Located within the **John C. Stennis Space Center** in **Southeast Mississippi**, a team of 56 full time employees provide worldwide **engineering and manufacturing solutions** to the **fluid power industry**.

As a private company, located within NASA's Stennis Space Center complex, Power Dynamics Innovations (PDI) follows **NASA's strict safety and security standards**. Stennis and its private sector partners rank as one of the nation's top places to work according to a Partnerships for Public Service (PPS) survey.

FLUID POWER INDUSTRY LEADER

Power Dynamics Innovations **engineering and manufacturing expertise** is known and respected throughout the fluid power industry. Key to PDI's success has been our team of dedicated employees providing successful fluid power solutions for over thirty years. PDI stands today as a leader in the industry, engineering **custom hydraulic power units (HPUs)**, **winch and pipeline tensioning equipment** along with **horizontal directional drilling units (HDDs)**, as well as providing **worldwide repair and maintenance field service**.



PDI's team of professionals understands the challenges of the diverse and ever-changing needs of our customers. As aging equipment infrastructures deteriorate, the repair and / or rebuilding might be the best "Cost Effective Solution" extending the life cycle of the equipment. As PDI began modifying and repairing other manufacture's HDD's in 2012, customers began to request new units that could be customized in a way that made them Simple, Reliable and Easy to Maintain. PDI has since developed a line of HDD drilling solutions available from 500,000 to 1,000,000 pounds of pull-back. With PDI's on-site service and maintenance options, clients experience minimal equipment downtime.



In addition to offering custom design, PDI also manufactures a wide range of fluid power light duty and heavy duty equipment, including its own line of **50, 80, and 100 KIP track-type tensioners, endo and stern rollers, conveyor systems, coil tubing reels, tensioner laydown winches and electronic control systems.**

To better serve our customers, PDI has developed a **twelve step manufacturing process** aimed at improving efficiency while insuring quality. An expert team of engineers provides superior design. Skilled craftsmen implement the design. Utilizing up-to-date computer technology, engineering drawings and job files that are readily available, assures little interruption in production. PDI's integrated manufacturing system works to provide customers with **safety, high performance, and cost effectiveness.**



The full service **PDI facility** encompasses **51,000 square feet** housing offices, warehouse, machine shop, fabrication, assembly and service areas. From design to delivery, the Southeast Mississippi plant is designed to provide quality products to meet our customers' needs.

Building reliable and cost effective custom equipment has been PDI's expertise for over 30 years. We appreciate our customers and their continued trust in PDI. We are proud to help them find solutions to complex problems and to extend their own capabilities. The creation of our engineering and manufacturing division grew out of our client's needs and we are proud to continue to meet those needs.



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PDI FLUID POWER INDUSTRY LEADERS PROVIDING



DYNAMIC POWER™ Engineered Solutions for
**WINCHES - HYDRAULIC and ELECTRICAL
POWERED** PAGE 5
QUALITY ... Designed ... Engineered ... Crafted!



DYNAMIC POWER™ Engineered Solutions for
HYDRAULIC POWER UNITS PAGE 7
DIESEL AND ELECTRIC HPU'S UP TO 1200 HP
And **Hydraulic Piping Systems**
DURABILITY ... that Stands the Test of Time!



DYNAMIC POWER™ Engineered Solutions for
LINEAR PIPE TENSIONERS PAGE 9
50, 80, 100 & 200 KIP PIPE TENSIONERS
DEPENDABLE ... Power Dynamics Innovations!



DYNAMIC POWER™ Engineered Solutions for
PIPE HANDLING EQUIPMENT PAGE 11
Partners in Fluid Power Engineering and Manufacturing Solutions!



DYNAMIC POWER™ Engineered Solutions for
PLC CONTROLS PAGE 12
FLUID POWER INDUSTRY LEADERS SINCE 1984!



DYNAMIC POWER™ Engineered Solutions for
MAXI HDD DRILLING RIGS PAGE 13
**500K, 750K & 1M RIGS FOR THE LARGE-DIAMETER HDD
DRILLING MARKET**



DYNAMIC POWER™ Engineered Solutions for
**SPECIAL ENGINEERING AND
CONSTRUCTION PROJECTS** PAGE 16

Power Dynamics Innovations
DYNAMIC POWER™,
 Designed, Engineered and
 Manufactured Products



PDI has the ability to custom fabricate equipment and systems to suit our client's needs. We have an experienced pool of fabricators, machinists and welders to complete jobs on time to meet critical deadlines. PDI specializes in providing high quality, close tolerance custom metal fabrication, certified welding and precision

machining to a broad spectrum of industries. With diverse equipment and highly skilled, certified fabricators, Power Dynamics Innovations has the capability to produce anything from small machine parts to large weldments, using a variety of alloys.



PDI's team of Fluid Power Engineers design our systems for precision and control utilizing SolidWorks, AutoCad, Nastran and other advanced art software programs. We incorporate state-of-the-art technology in our hydraulic systems with the latest in programmable controllers and input/output devices providing improved controllability, reliability, efficiency and safety. Our engineers are experts in comprehensive modeling, simulation and designing of hydraulic components and systems. We provide guidance for designing new or refurbishing existing hydraulic systems along with providing failure and contamination control analysis.

Power Dynamics Innovations On-site Testing Resources include:

- | | | |
|-----------------------------|------------------------------|-----------------------------|
| 150 HP Hydraulic Test Stand | 50HP Hydraulic Test Stands | HYD Winch Test Stand |
| Winch Testing to 75 Tons | Hydro Testing | Single Line Pull Testing |
| Double Line Pull Testing | Flushing Equipment | Tension Performance Testing |
| Thrust & Pullback Testing | Fluid Particle Count Testing | 20Ft Cylinder Hone Table |

Power Dynamics Innovations On-site Equipment Resources include:

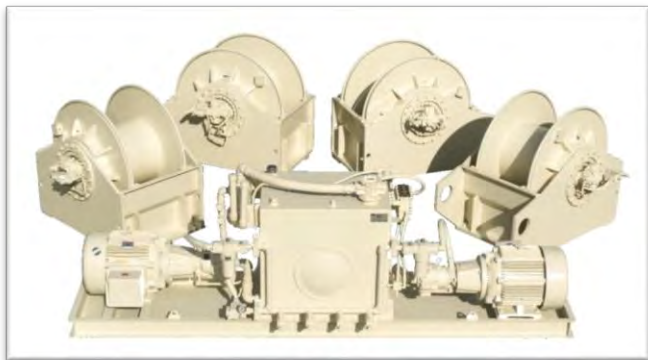
- | | | |
|------------------------------|----------------------|-------------------------------|
| Overhead Cranes 3 to 30 Tons | 18 Ton Cherry Picker | JLG Man Lift |
| CNC Burn Table, Plasma/Oxy | Welding Equipment | Milling Centers |
| Lathes and Presses | Pipe Threaders | Sand Blasting and Paint Booth |

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Power Dynamics Innovations

DYNAMIC POWER™

HYDRAULIC / ELECTRIC POWERED WINCHES

PDI designs, engineers and manufactures new Standard and / or Custom Winches, with or without HPU packages. We have a standard line of winch sizes, but can also custom design and fabricate winches to suit our client's requirements (capacity, line pull, configuration, etc.). These winches can be hydraulically, electrically or mechanically driven.

PDI can re-manufacture "older winches" to meet the needs of our clients, converting old "out of service" winches into productive assets. Our experienced team of specialists can re-power and/or overhaul your existing winches to extend the life of your investment. We can tear down and repair/replace/upgrade components, improve lubrication and return your older equipment to like new condition.

Power Dynamics Innovations is uniquely suited to upgrade and / or refurbish your existing winches. Our design and engineering staff has developed an international reputation for innovative upgrades on major winch manufacturer's equipment, providing precision component designs, robust assemblies and rugged products. Additionally our engineering staff conducts comprehensive testing to assure all products and components perform to client's specifications.

Our technicians, fabricators and machinists can refurbish your present equipment, extending their service life for the harsh offshore environment.

In addition to being a major manufacturer and re-conditioner of **HYDRAULIC POWERED WINCHES**, PDI maintains a service department to repair and troubleshoot client's component systems, such as winches, gear drives, pumps, motors, tensioners, hydraulic power units, etc. We have experienced service technicians and sales professionals available 24 hours a day, 7 days a week to meet our client's critical needs worldwide.

Installation and setup of PDI designed and manufactured systems and components are very important to our client's needs. Power Dynamics Innovations can supply technical assistance and service technicians to insure a trouble-free installation and can provide training to our client's operators and support personnel. We can also provide extensive support after the sale at our customer's jobsite anywhere in the world.



We build the world's best winches, not simply by meeting industry standards, but by setting the Standard.



New Electric/Hydraulic Winch Package Equipped with Remanufactured Lantec Model 1200 Hydraulic Winch.

This package was equipped for our client with a new KYB single speed hydraulic drive motor, two band type parking brakes that are spring applied, hydraulically released, winch planetary gear train fully internal to the winch and enclosed in a sealed gear oil bath. The Winch can spool 2500 Ft. of 1 inch wire rope and has a bare drum line pull of 54,000 lbs. @ 28 feet per minute and a full drum line pull of 35,700 lbs. @ 46 feet per minute. Winch has a remanufactured hydraulically driven level wind assembly that is manually controlled from the

operator control console. The **Hydraulic Power Unit** is a 50 HP, 1800 RPM, 60 HZ, 460 VAC, 3 Phase, TEFC, C-Face powering a Sauer Danfoss Series 90-130 hydrostatic pump for main winch power and a through drive arrangement powering a pressure compensated pump for brake release and level-wind control. All are mounted on the “new” winch skid with a drip pan. The Unit is equipped with a carbon steel hydraulic reservoir with charge, pressure and return filtration with an electric driven oil cooler wired into the starter box. Start and stop controls are on the panel door.

Controls

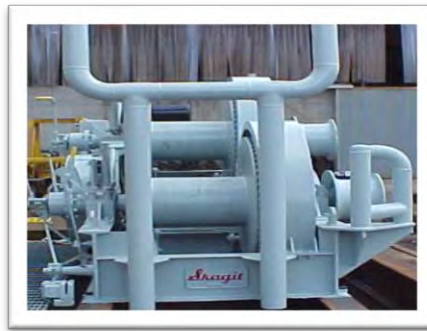
The stainless steel operator control console contains a joystick for winch power up and down. A closed loop hydrostatic pump provides hydrostatic braking within movement of the joystick. Additional controls on the console are park brake on/off, levelwind right and left and E-Stop. Console has a protective cover for when the unit is not in use. An adjustable operator seat is mounted on the skid. For operator safety, pipe frame structure with expanded metal guard is installed forward of the operator console. A two speed motor function could be added; this option would allow the winch motor to be shifted to accomplish twice the line speed and half the line pull. A removable Lexan Polycarbonate enclosure with steel angle iron framing to cover the complete package is another option along with providing 2000 ft. of 1 inch diameter. Non-Rotating Bridon Dyform 34 with an open spelter socket, installed under tension on the winch drum.

PDI can re-manufacture your “older winches” converting old “out of service” winches into productive assets like the units shown below.

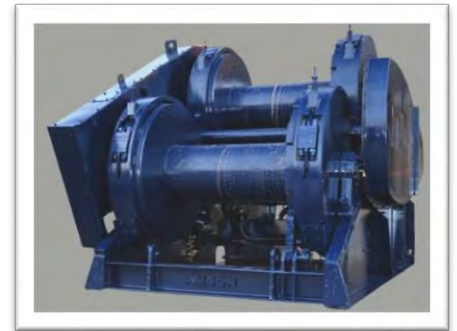
Refurbished Manitowoc 390



Refurbished Skagit



Refurbished Amcon



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Power Dynamics Innovations

DYNAMIC POWER™

HYDRAULIC POWER UNITS

PDI Engineered Hydraulic Power Units provide a reliable high efficiency and long life power source for an extensive range of hydraulic requirements. From Large Complex Hydraulic Systems to Simple Pump / Motor Units, these systems deliver maximum power output in a robust and compact design for both electric and diesel powered operations.

DUAL 200 HP HPU PERFORMANCE SPECIFICATIONS

Height:	98"
Width:	107"
Length:	109 1/2"
Weight:	13,560 LBS (Wet)
Oil Capacity:	300 GAL.
Prime Mover:	(2) 200 HP 1800 RPM Electric Motors
Required Cooling Water:	50 GPM

Standard features include hydraulic reservoir, suction and return filter, heavy-duty pump, hydraulic cooler, pressure-control valves, pressure gauges, circuit breakers and start/stop controls engineered to client's specifications.



DUAL 150 HP 80 KIP TENSIONER HPU PERFORMANCE SPECIFICATIONS

Length:	91 1/16"
Width:	91 1/16"
Height:	98 3/16"
Weight:	14,200 lbs.
Oil Capacity:	300 gal.



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Power Dynamics Innovations Engineered Hydraulic Power Units deliver filtered high and low pressure hydraulic fluids and are designed as open framework or fully enclosed. HPUs are comprised of supply/return reservoir with case drain connection, dual electrically driven hydraulic pumps, accumulators, filters and associated control and instrumentation.

The complexity or simplicity of the Hydraulic Power Unit is purely down to the client's request based on the requirements of the project. PDI can offer a fully standalone autonomous power unit, whereby all control and instrumentation devices are terminated within a Programmable Logic Controller (PLC). This allows fully automatic control of the system or allows it to be coupled together with communication links to a Master Control System for operation control and monitoring.

These systems can be built strictly in accordance with client specifications or PDI can offer a fully functional design specification in the absence of any specific requirements. This will be detailed by our team of engineers while working directly with the client, ensuring the best possible technical and commercial solution.

Power Dynamics Innovations has expanded our capabilities to include hydraulic piping systems. Our expertise includes: design services based on fluid power design standards, shop and field fabrication, site installation, hydro-testing, flushing and qualification of completed product. Our knowledge of manufacturing hydraulic equipment fully qualifies us in the practices and procedures needed to produce reliable hydraulic systems to meet our client's needs.



Power Dynamics Innovations

DYNAMIC POWER™

LINEAR PIPE TENSIONER

Equipment



Quality Crafted in PDI's full Service Design and Manufacturing Center located within Stennis Space Center Mississippi.

50 KIP, 80 KIP, 100 KIP and 200 KIP PIPE TENSIONERS can be designed, engineered and manufactured to Clients performance specifications.



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Pipe lay track tensioner designs date back to the late 1960s when track machines first started replacing the original wheel designs. Tensioners are the key element of pipe lay systems and are used onboard pipe lay vessels to keep tension on the pipeline while it is being lowered onto the seabed.

PDI designed, engineered and manufactured tensioner products offer significant improvements in productivity and safety while achieving maximum work flow efficiency. PDI Tensioners are custom built to our client's needs and performance specifications.

50 KIP LINEAR PIPE TENSIONER - PERFORMANCE SPECIFICATION

Design Type:	Vertical Enclosed
Maximum Linear Tension:	50,000 lbs.
Maximum Lay Speed:	0-80 feet per minute recovery & 0-75 feet per minute pay out
Number of Tracks:	2
Pipe Size Range:	2 – 24 inches (2 3/8- 24 inches includes coating)
Nominal Tensioner Opening:	30 inches wide x 36 inches high
Pipe Contact Length:	120 inches
Maximum Clamp:	80,000 lbs.
Maximum Clamp per Foot:	12,800 lbs. per foot
Pipe B.O.P.:	58 15/16 inches
Controls:	Electronic Digital
Operation Weight:	28,000 lbs.
Height:	141 1/4 inches (11 feet- 9 1/4 inches)
Width:	91 3/16 inches (7 feet-7 3/16 inches)
Length:	180 inches (15 feet)

Track tensioners have two vertically or horizontally opposed tracks that squeeze the pipe to generate the necessary traction for linear pull while achieving an equal circumferential squeeze on the pipe. PDI tensioners employ Electrical - Hydraulic power with PD controller by which the tension in the pipe can be controlled even when the vessel is subject to motions.

100 KIP LINEAR PIPE TENSIONER - PERFORMANCE SPECIFICATION

Design Type:	Vertical Enclosed
Maximum Linear Tension:	100,000 lbs.
Maximum Lay Speed:	0-80 feet per minute recovery & 0-90 feet per minute pay-out
Number of Tracks:	2
Pipe Size Range:	4 – 40 inches (40 inches includes coating)
Nominal Tensioner Opening:	56 inches wide x 56 inches high
Pipe Contact Length:	150 inches
Maximum Clamp:	200,000 lbs.
Maximum Clamp per Foot:	16,000 lbs. per foot
Pipe B.O.P.:	56 15/16 inches
Controls:	Electronic Digital
Operation Weight:	55,090 lbs.
Height:	173 9/16 inches (14 feet-5 9/16 inches)
Width:	103 1/4 inches (8 feet-7 1/4 inches)
Length:	245 7/16 inches (20 feet -5 7/16inches)

Along with tensioners and their control systems, PDI offers a full turnkey package of handling equipment that includes HPUs, pipe handling equipment, line-up systems, pipe transfer carts and winches. In addition, our Engineers are continuously researching new techniques and applications to offer our clients the most efficient equipment in the market.



Power Dynamics Innovations

DYNAMIC POWER™

PIPE HANDLING

EQUIPMENT

PDI designs, engineers and manufactures pipe handling equipment for pipe lay vessels, control cabs, workstations and more. Our expertise includes knowledge of pipe laying processes for a large variety of clients and barges.

Our experience allows us to optimize the complete pipe laying process for both existing and newly built barges. We start by setting up a 3D model of the complete production facility and by simulating all production steps, including all related equipment. Based on this simulation, all process equipment can be developed to achieve maximum work flow efficiency under safe working conditions. Our equipment offers a significant improvement in productivity and safety by moving floor hands out of harm's way. Mechanizing the pipe handling process improves efficiency and operating consistency. Our products include:

Traverse Pipe Conveyor
Endo Conveyor Roller Hydraulic Elevated / Hydraulic Powered
Endo Conveyor Roller Manual Elevated / Hydraulic Powered
Endo Conveyor Roller Hydraulic Elevated / No Power
Endo Conveyor Roller Manually Elevated / No Power
Transport Carts
Five Axis Line-Up Modules
Adjustable Height Pipe Rollers
Adjustable Height Pipe Support Half Track

In addition to pipe laying production handling equipment, PDI has successfully designed and delivered stand-alone equipment varying from handling and lifting equipment to a variety of winch systems with custom equipped HPUs and controls.

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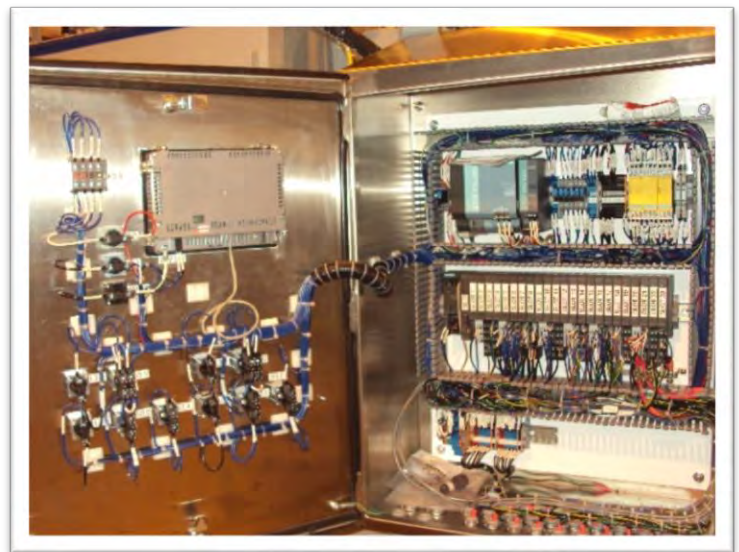
PLC CONTROLS

PDI offers a complete line of Automation and Process Control Systems. From Dual and Triple Winch Control Systems and Hydraulic Power Units to Linear Pipe Tensioners and HDD Drilling Rigs, PLC controlled, hardwired or wireless, including remote service and monitoring communication capabilities. PDI can design, engineer and

manufacture a complete solution. If you are planning a new control system or upgrade of an existing system, PDI is the answer.

PDI is the complete System Integrator with knowledge and expertise to incorporate all of today's complex components into your Process Control System design. PDI is the complete Automation answer whether you need constant tension control or a SCADA (Supervisory Control and Data Acquisition) system for your production platform.

PDI believes that in today's global market, equipment design should be dependable, upgradeable, safe and should provide user-friendly operation. So whether you need to upgrade an old control console to an HMI (Human Machine Interface) or a new RMHS (Robotic Material Handling System), PDI can deliver a complete solution.



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Power Dynamics Innovations

DYNAMIC POWER™

500K, 750K and 1M HDD Rigs



As aging underground infrastructures deteriorates, repair and rebuilding requires equipment that creates as little disruption and environmental damage as possible. **Horizontal Directional Drilling Rigs (HDD)** can lessen that impact. These HDD Drilling solutions are available from 500,000 to 1,000,000 pounds of pull back.

Building time proven, reliable and cost effective custom equipment has been PDI's expertise for over 30 years.

500K DRILLING RIG

DIMENSIONS (TRANSPORT)

- Curb Weight: Approx. 70,000 lbs.
- Length: 45 ft.
- Width: 8 ft. 6 inches
- Suspension: 60,000 lb. dual axle
- Drill Rack Angle: 8 - 12 degrees

FRONT BREAKOUT VISE

- Max clamp force: 452,395 -lbs.
- Max rotating force: 150,000 -lbs.
- Three to Six Jaw Clamp
- Travel = 72"

HDD 500K POWER SOURCE

- Engine: Caterpillar C-27
- Gross horsepower (max): 800 HP
- Max Engine Speed: 2100 rpm
- EPA Certification Family: Tier 2
- Fuel Type: Diesel
- Fuel Capacity: up to 1150 Gal
- Weight: 30,700 lbs. (No Fuel)
- Weight: 38,800 lbs. (Full Fuel)
- Hydraulic Tank Capacity: 450 Gal.
- Length: 20 ft. Width: 6.33 ft. Height: 10 ft.

OPERATIONAL

- Max Thrust: 500,000 lbs.
- Max Pullback: 500,000 lbs.
- Max Spindle Torque: 50,000 -lbs.
- Max Spindle Speed: 68 rpm.
- Max Carriage Speed: 70 ft. /min

REAR BREAKOUT VISE

- Max clamp force: 301,593 -lbs.
- OPTIONAL: FRONT DEADMAN**
- LARGE: 16' long x 5' wide x 2' high



500K HDD HYDRAULIC SYSTEM

Pumps

- 2 Rotary Pumps, 3 Travel pumps
- 1 Vise pump, load sensing control
- 1 Dedicated rotary flush pump
- 1 Dedicated kidney loop pump

Thrust/Pullback Circuit

- Hydraulic Pumps: 3 - Danfoss Series 90
- Travel Motors: 2 - Hagglunds CA-100
- Planetary gears: 6" tall x 15" OD
- Gearboxes: 2 -Seimens (Flender)P1HA14

Rotation Circuit

- Hydraulic pumps: 2- Danfoss Series 90
- Hydraulic motor: 1-Hagglunds CA-210

Auxiliary Circuits

Heat Exchanger / Cooler

- Vise pump (PFC-LS):1- 45 Series Danfoss
- Cold oil 60 psi w/bypass

Filtration Components

- 5-25 micron charge pump filters
- 10-10 micron high pressure filters
- 1-25 micron flush filter, vise high pressure filter, vise return filter and kidney loop filter

Hydraulic Reservoir

- 375 to 450 gal capacity, in tank filtration, hot-oil sump to separate hot and cool oil and three (3) suction strainers with shutoffs.

Hydraulic Quick Disconnects

- Parker/Snap-Tite



HDD 500K BREAKOUT SYSTEM

UPPER VISE- Dual-cylinder design, 8 inch, integrated into Carriage to reduce breakout time.

LOWER VISE- Three cylinder design – 8 inch, 8.75" inside diameter opening, Travel = 6 ft.

BACK GEAR ASSEMBLY- Double beam construction.

REAR SUPPORT PAD – 16 feet long x 7 feet 10 inches wide x 8 inches high.

FRONT DEADMAN - SMALL- 9 feet 6 inches Long X 5 feet Wide X 8 inches High.

HDD 500K DRILLING CONTROL CAB

Length: 10' Width: 8' Height: 8'4"

Weight: 7020 lbs.

Three windows with steel protective panels.

High-density foam insulation with Climate Controlled A/C and Heat.

Pressure Gauges: Push, Pull and Vise Makeup, 5000 psi each, Mud Gauge -2800 psi.

Sundstrand Pump Controllers.

Torque limiter adjustment for thrust, pull back, rotary and vise-makeup.

Electrical Distribution Panel with Circuit Breakers.



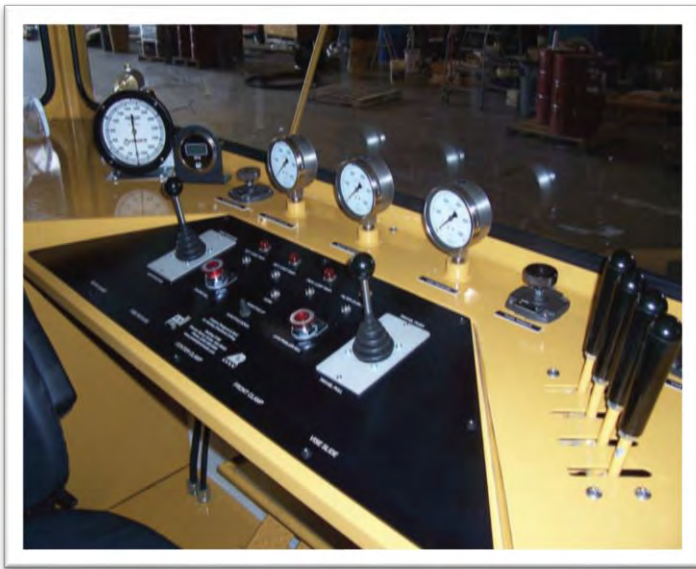
Engine emergency shutdown switches and joystick kill switches.

5 bank Hlave Valve Body

4 bank Hlave Valve Body

Control Kill Safety Switches

PDI continues to believe our client's success is paramount to our continuing business relationships and provides maintenance and repair services for our clients HDD Equipment, regardless of the manufacturer. Power Dynamics Innovations has thrived on decades of our client's continued desire to use PDI as an extension of their own capabilities in providing solutions for complex problems.



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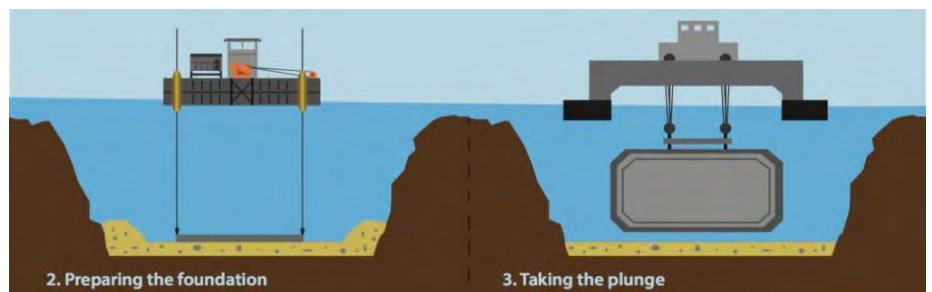
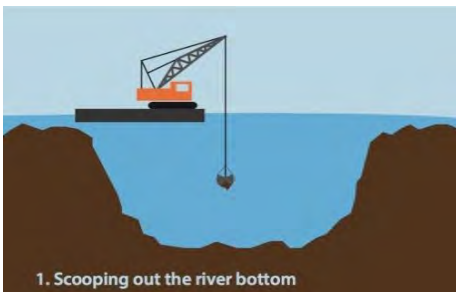
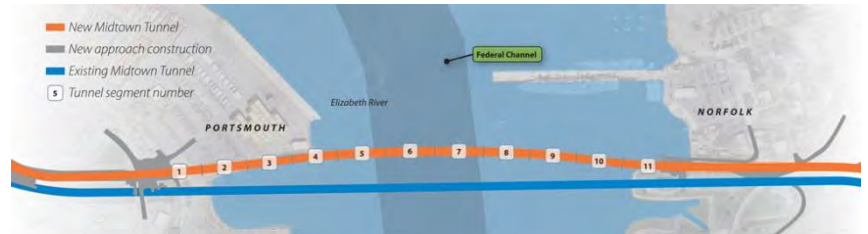
Special Engineering and Construction Projects

SKW Constructors (a Skanska, Kiewit, and Weeks Marine Joint Venture) is the design-build contractor for the **Elizabeth River Tunnels (ERT) Project**. The Project is technically challenging and the new Midtown Tunnel must be built under an active waterway and federal channel. Power Dynamics has been contracted by our Client SKW to provide Fluid Power Engineering and Design on key pieces of the Hydraulic Systems to meet these technical challenges. PDI was also contracted to manufacture these key system components.

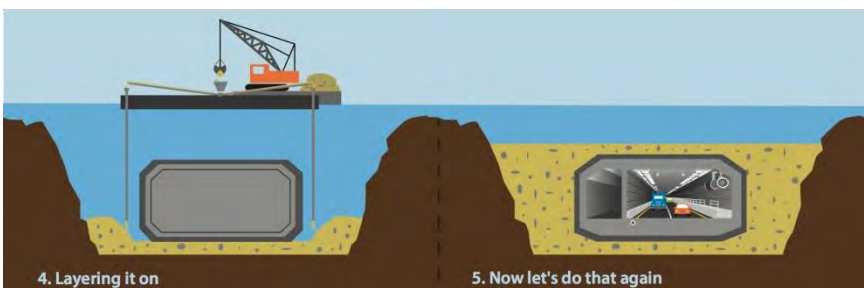
The **Elizabeth River Tunnels (ERT) Project** was named the #1 Road Project in North America in 2014 by Roads & Bridges magazine. The magazine highlighted ERT's commitment to quality construction of the new Midtown Tunnel, which will carry two lanes of westbound traffic from Norfolk to Portsmouth. The Project's Design-Build partner, SKW Constructors, a Skanska, Kiewit, Weeks Joint Venture (JV), was recognized for the successful implementation of the Project's more challenging and complex elements.

Midtown Tunnel

The existing US 58 Midtown Tunnel is the most heavily traveled two-lane road east of the Mississippi. Since it opened in 1952, population has increased nearly 70% and tunnel usage by 600%. A second tunnel is being built to relieve congestion and improve safety by eliminating bi-directional traffic in the existing Midtown Tunnel. The new Midtown Tunnel will increase capacity and reduce congestion on US 58 between Norfolk and Portsmouth. PDI provided key components including the Raker Pile Driving System, the Screed Barge and Backfill Barge Hydraulic and Control Systems and the Lay Barge Winch Refurbishment and New



Control Systems. PDI also updated the Hydraulic Piping Systems and provided Containerized Climate Controlled Operation Control Structures. (Copyright Graphics used with the permission of ERT)



Learn about the ERT Project at www.midowntunnel.org
 We invite you to experience the PDI difference; call us today!

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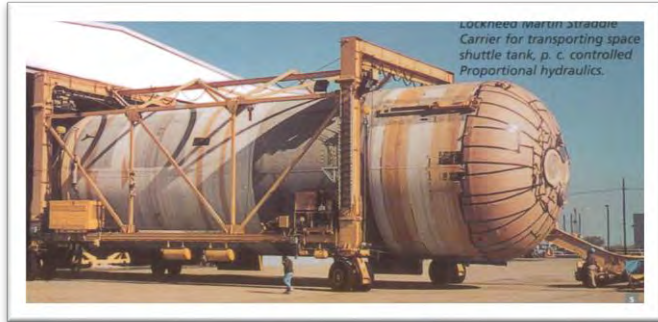
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In The News

For over Three Decades

PDI has been featured in numerous publications as a leader in the Fluid Power Industry. Making headlines early in PDI history was the contract award from Lockheed Martin for the “Straddle Carrier” for transporting the Space Shuttle Tanks.



In 2014 PDI was featured in two publications with articles in *Manufacturing Today* and *Trenchless Technology*.

The *Manufacturing Today* article featured a picture of the United States Navy’s “Lighter Amphibious Re-Supply Cargo Vessel (LARC-V). Forty three of these vessels were re-manufactured by PDI and can travel on land as well in water. These same vessels were used to help victims of Hurricane “Super Storm Sandy”.



Navy personnel helped to bail out flooded homes in Belle Harbor, Queens, in what residents said was the first help they’d gotten from the federal government since “Super Storm Sandy” hit. Several vehicles were unloaded onto the beach from a large landing craft, including two amphibious vehicles known as LARCs.

POWER DYNAMICS LLC

www.powerdynamicsllc.com / HQ: Stennis Space Center, Miss. / Employees: 56 / Carl Liberty, VP of operations: "There's very few companies out there that can actually manufacture what we produce."



POWERFUL PLAYER

POWER DYNAMICS LLC STRIVES TO BE A LEADER IN ITS MARKET BY REMAINING DIVERSE IN ITS WORK. BY ALAN DORICH



After three decades, Power Dynamics LLC stands as an equipment manufacturer whose talents are nearly unrivaled, Vice President of Operations Carl Liberty says. "There's very few companies out there that can actually manufacture what we produce," he declares.

Headquartered at the Stennis Space Center in Mississippi, Power Dynamics manufactures a wide range of equipment, including hydraulic power units, PLC control systems, hydraulic winches, hydraulic systems, custom hydraulic cylinders, pipe-handling equipment, pipeline tension machines, and horizontal directional drilling units and associated equipment.

Owner Bob Hancock founded the company in 1984 as a hydraulics and pneumatics distributor.

Over time, "We changed to manufacturing because our customers needed us to fill a void," Hancock recalls. "They wanted us to build the whole piece of equipment."

The company does not stop there. Power Dynamics also provides repair and maintenance services for its clients' equipment. "We're very diversified," he says, noting that its customer base also has changed over the years.

Power Dynamics originally focused on serving the offshore oil industry. But in the past five years, "We've de-

icated [ourselves] more towards custom-manufactured, land-based construction equipment," Liberty says.

Today, Power Dynamics employs a staff of 56 and serves firms such as Helix, SKW (a joint venture between Skanska, Kiewit and Weeks Marine Inc.), Prysmian, Bisso Marine, Titan Salvage, WA Chester (a division of PEPCO), U.S. Army Corps of Engineers, U.S. Navy, Cal Dive and Chet Morrison Contractors. It expects sales of \$15 million as it celebrates its 30th anniversary this year, Hancock says. "As far as businesses go, that's a pretty good accomplishment," he says.

One of the keys to Power Dynamics' success has been its diversity, Hancock

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says. "The offshore oil industry is up and down like a rollercoaster," he says.

But the land-based market looks strong, thanks to pipeline and fracking projects and the development of natural gas production. Additionally, "This country is going to see a lot of infrastructure work with bridges and tunnels," he says. "We think we can be a major player in these projects."

RAMPING UP

Power Dynamics recently reorganized its manufacturing operations under Liberty's leadership. These initiatives included placing all of its job files and engineering drawings into a single searchable computer system, Hancock says.

This has made many of Power Dynamics' operations nearly paperless. "For the most part, we have got PC terminals around the plant," Liberty says. "As an example, if someone's in the fabrication shop and they want to pull up a drawing and review it, they have full access to job files and can possibly locate the information without stopping production or interrupting the engineering, purchasing or receiving departments to find an answer. This increases production considerably."

"We've never had [a system] before where everything flows to one job folder," Hancock says. "Carl has really brought us into the next stage where we could become a \$25 to \$30 million company."

Liberty's initiatives also included a 12-step manufacturing process that helps improve efficiency at every step, but is not based on lean manufacturing, Hancock says. While lean manufacturing focuses on manufacturing the same product over and over again, "We're building custom equipment," he says. "Every project is different."

"Our equipment is hand-built," Liberty adds. "There's no automated assembly lines or anything like that [here]. It's built by craftsmen with their hands who know what they're doing."

UP TO STANDARD

With its location at the Stennis Space Center, Power Dynamics has to follow NASA's safety standards, which are stricter than OSHA's, Hancock says. "We like it," he says. "It's a great facility."

Power Dynamics constantly focuses on safety improvements to make sure it passes regular examinations, Hancock says. For instance, "NASA checks our eye wash locations every other week, and they check our fire extinguishers every month," he says.

"If we have a paint booth door open [during a check], they write us up," he says. "[But] it's been good for us. It's made us a better company."

Since the 2010 Gulf oil spill, Power Dynamics' oil clients have become more cautious, as well, Liberty adds. Often, if the company sends an associate to a site, they need to carry a card that tells all the safety training the person has had. "We have to meet all the offshore and inland construction requirements," he says.

FILLING THE NEED

Power Dynamics wants to become a \$20 million business, but that is largely dependent on the economy, Hancock admits. In addition to strong inland activity, its clients are taking on more work in the Gulf of Mexico.

The aging infrastructure of countries will continue to add to Power Dynamics' business, Liberty says. "The pipeline industry is saying, 'We need [to be not so complacent],'" he says. "Because of what happened with BP, people are now looking closer at pipelines and the equipment needed to build them."

"The success of Power Dynamics is based on its customers that continue to come back; its hardworking dedicated employees; and its network of vendors that assist us [to] fulfill the needs of our clients," he adds. **mt**

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The [Trenchless Technologies](#) article announced “There is a new player in the Horizontal Directional Drilling (HDD) industry.” PDI now manufactures Maxi Size HDD Rigs.

In 2012 PDI started repairing HDD products manufactured by Vermeer, American Auger and other manufacturers and found our clients wanted us to consider building new Maxi units. They wanted custom built HDD rigs that were simple, reliable and easy to maintain.



Also in 2012, working with WA Chester, PDI designed and built an underground cable pulling unit. The pulling unit features a traction winch and storage reel combination that can pull a constant 50,000 lbs. over a length of 6500 ft. of 1-1/8 wire rope. The primary purpose of the unit is to pull three conductors of high voltage power cable simultaneously through a single pipe duct underground. The operator’s cab contains a custom built processor that monitors load, speed and length monitoring system as well as a portable control console that allows the operator to perform critical operations out of the cab or while observing conditions in the man hole.

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Power Dynamics LLC Now Manufactures Maxi Size HDD Rigs

BY ADMIN ON SEPTEMBER 19, 2014
BUSINESS PEOPLE, DIRECTIONAL DRILLING, HORIZONTAL DIRECTIONAL DRILLING

There's a new player in the horizontal directional drilling (HDD) industry, a company that believes it can carve out a strong niche for itself within the competitive maxi rig manufacturing market.

Power Dynamics LLC, based in Stennis Space Center, Miss., has joined the ranks of HDD rig manufacturers and plans to concentrate its efforts on custom-building maxi size rigs that range from 100,000 to 1 million lbs. of pullback. With its history grounded in the oil and gas industry and hydraulically-powered equipment, company officials believe they can offer HDD contractors an alternative to the rigs that are already in the fleets of the larger manufacturers.

Power Dynamics joins new HDD rig makers The Toro Co. and McCloskey International, both of which have made acquisitions over the last two years to sell HDD rigs — a sign that the HDD market is finding its footing once again.

“We believe the market for land-based pipe lay equipment will continue to grow as the gas and oil industry grows and the need for infrastructure improvements increases throughout the country. This is the kind of work that Power Dynamics does best,” says Power Dynamics owner and president Robert Hancock. “We started repairing HDD units [in 2012] and found that our customers were asking us to consider building new units. They wanted custom-built HDD units that were simple, reliable and easy to maintain. Building ‘custom equipment’ has been our expertise for over 30 years.”

Power Dynamics has been in business for 30 years, primarily focused on the design and manufacturing of custom hydraulic machinery. The company specializes in offshore pipeline equipment such as tensioners, pipe handling equipment, marine winches, and special-application machinery. However, the BP oil spill in 2010 changed the course of Power Dynamics business plan, forcing it look at other possible avenues for revenue. HDD was a perfect fit and complement to its oil and gas manufacturing base.

“Every five years a small business has to re-invent itself,” Hancock says. “HDD was the re-invention that we started two years ago.

“The Gulf of Mexico was completely shut down and every customer that we had that worked in the Gulf of Mexico was affected,” Hancock says. “For two years, we had absolutely no business down there... We definitely needed to diversify and [HDD] was an easy transition to make because the equipment is a lot like the equipment we build now.”

With all of its experience in the oil and gas market, Power Dynamics turned to the HDD market, saying it is a seamless extension of what they already do. “It was a natural transition to go from the offshore pipe installation to onshore HDD installation,” Hancock says. “We were easily able to diversify to HDD projects because of our strong engineering and hydraulic power experience.”

In 2012, the company began repairing HDD rigs, mainly structural repairs to the units owned by some of the better known large project HDD contractors. “We’ve rebuilt pumps, motors, pinion gears, cylinders, gearbox



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and valves,” says Power Dynamics director of government projects Percy Freeman, P.E.

“That’s why we knew that we could build one from scratch — because we have built every component on several rigs.”

Among the repairs that the company does are: fabrication and installation of rig jack-up systems for 500,000- and 1 million-lb rigs; design of a super-charged hydraulic system capable of absorbing harmonic shocks; design of an auxiliary pullback attachment; design, fabrication and installation of improved hose carriers; troubleshooting of control systems; design, fabrication, and installation of an improved manifold system for hose carrier; and design and manufacture of various HDD rig components.

Hancock also brought on board Richard Wilke, a well-respected consultant in the HDD industry who has worked for Cherrington Corp. and the former Horizontal Rig & Equipment (HRE). Wilke’s HDD expertise, along with offshore veteran John Holland’s knowledge of repairs give Power Dynamics a great foundation to manufacture new rigs, he says. “[Richard Wilke] is extremely well known and I would venture to guess that every HDD operator in the country has used or has known him over the last 20 years,” Hancock says. “Both [men] have years of HDD design, manufacturing and operation in their background.”

Also critical to the company’s success in HDD is its executive vice president Carl Liberty, who is in charge of operations and is an integral part in building the units. Power Dynamics’ forte is custom building and repairing, something not all rig manufacturers offer, company officials say. “We will compete on our service and to the manufacturing of customized machines,” Hancock says.

Giving Them What They Want

Power Dynamics says it produces equipment that its customers want, and in the case of HDD rigs, one specific area that they want improved upon is control systems. Customers have voiced that they are looking for a more simplified approach.

“Our control systems are designed for ease of operation and have received positive feedback from our clients,” Hancock says. “Along with improved filtration systems, rugged, durable construction and simplified operator controls, our rigs are designed to minimize maintenance needs. As a further service to our customers, we have developed a remote access troubleshooting program, which allows us to identify problems and minimize downtime.”

Power Dynamics’ first manufactured rig — 500,000 lbs of pullback — just came off the assembly line for Harding Directional Drilling, which the contractor worked closely with the manufacturer to design and build. The plan is to custom-build five or six rigs a year. Noting that price is always a selling factor, Hancock says strictly custom-built rigs are not cheap to build but he is not worried. He says the market is looking for custom-built machinery and customers are willing to pay for what they want. “Custom equipment can add up but we can still be competitive and give the customers what they want,” Hancock says.

Hancock sees the HDD market continuing to grow in the coming years both in the pipeline and underground infrastructure sectors. “There are really two areas you can go with these machines, the infrastructure and all the natural gas and shale plays,” he says. “We are seeing improvements happening all over the country in addressing our aging infrastructure systems. I expect the HDD business to continue to be very good, especially on the [maxi]rig side, driven primarily by the need for more and more pipelines to move oil and gas from the onshore fields to markets.”



Power Dynamics Innovations LLC

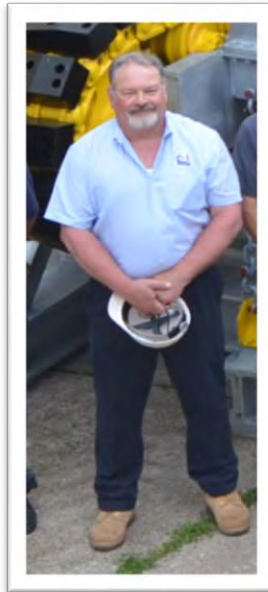
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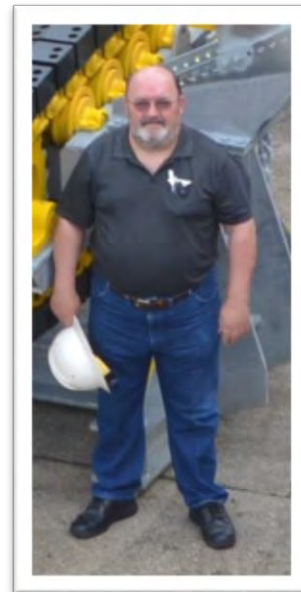
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