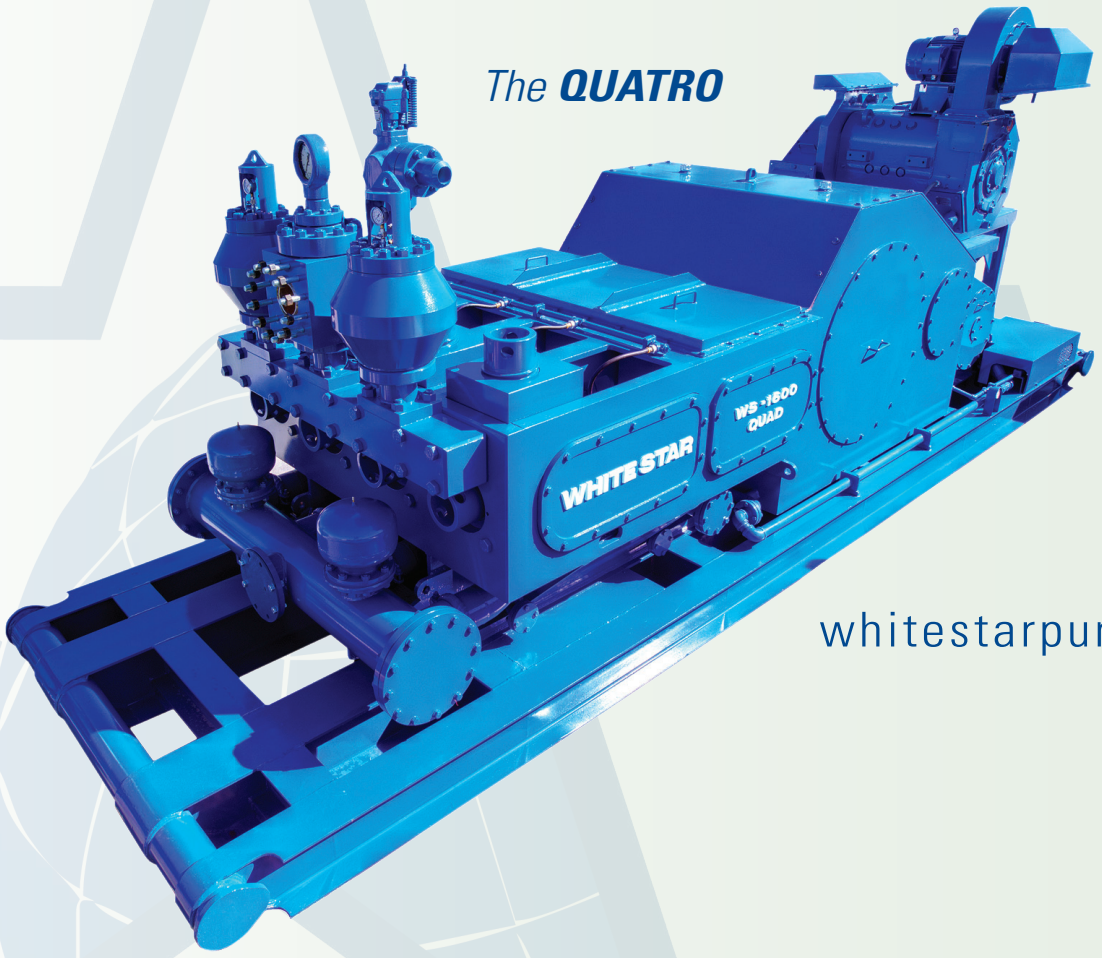
WHITE STAR
Pump Company™

setting new standards

The ***QUATRO***

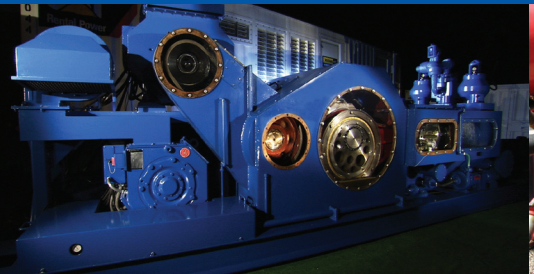


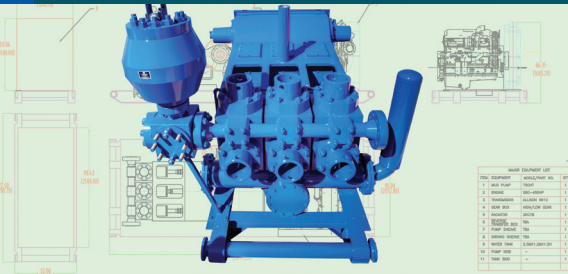
whitestarpump.com

PUMP SOLUTIONS FOR TODAY'S DRILLING ENVIRONMENT

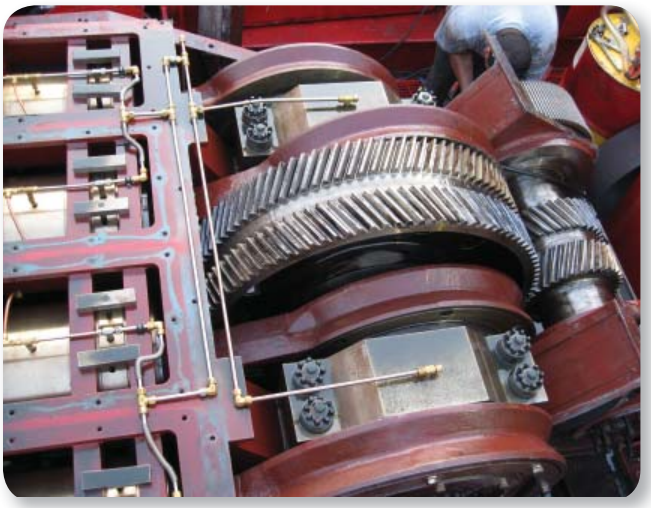
MUD PUMPS

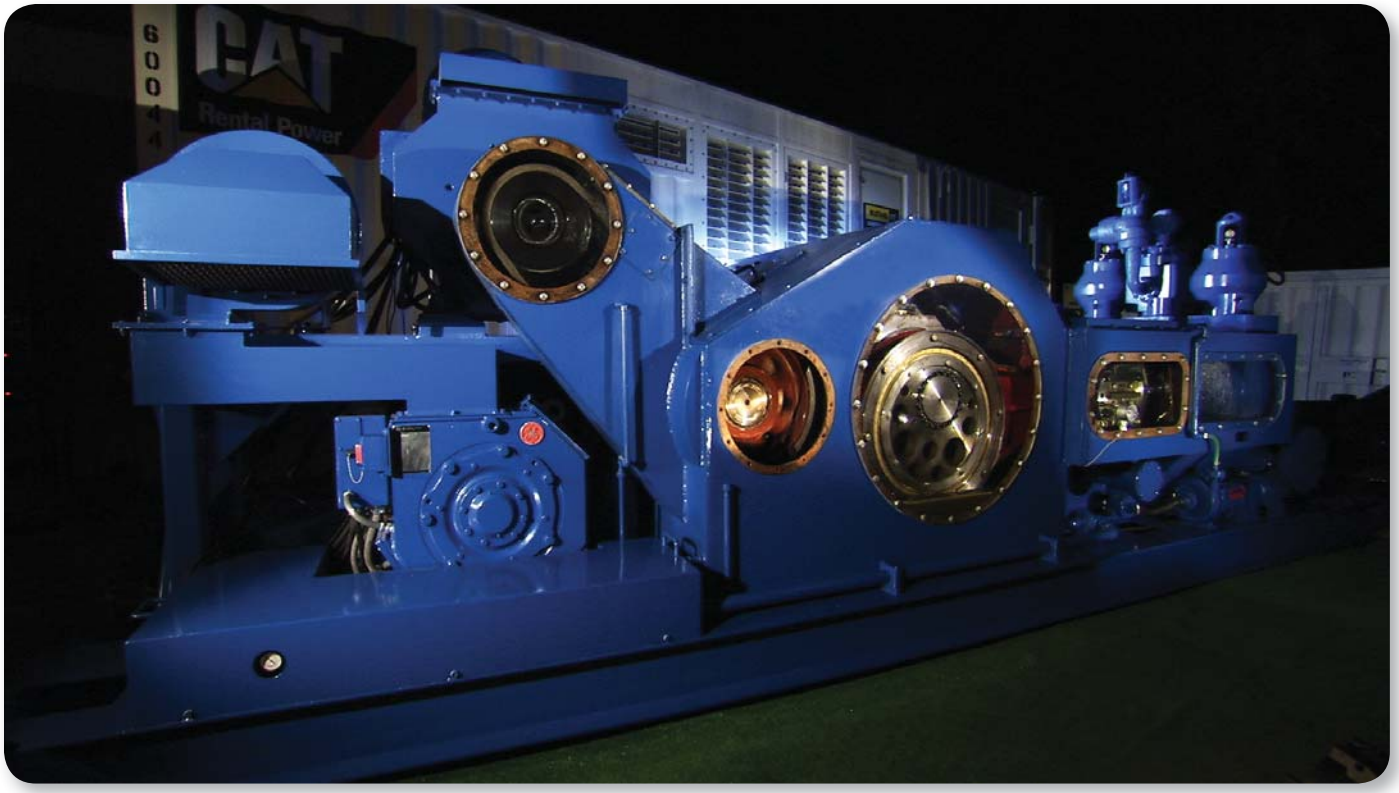
PARTS & SERVICE





Contents



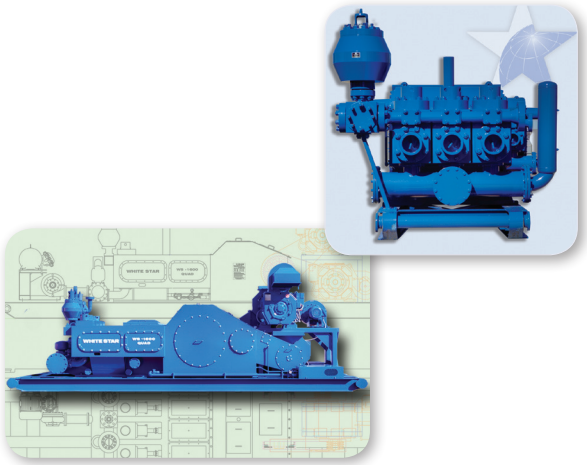


About

White Star Pump has been providing mud pumps and after-sales replacement parts for Ideco pumps worldwide since 2002. Serving oil and gas drilling contractors with distinction, in both offshore and on-land rig environments, has been our hallmark. With an increasing number of low-cost, inferior mud pumps permeating today's market, our industry-proven solutions not only meet, but exceed contractors' operational requirements. White Star is committed to delivering superior products at a competitive price, emphasizing quality, design, delivery, and service.

White Star has taken mud pump technology to a new level unseen in the oil and gas industry. With the introduction of the *Quatro*, a high-Performance quadraplex pump boasting up to 1597 GPM, we are providing the smallest and lightest pump available in today's market.

With this unprecedented, space-efficient design, White Star has launched a new self-powered, hydraulically unitized trailer-mounted model of the Quatro that requires no rig power. This highly mobile unit serves as a perfect emergency back-up or supplementary pump on critical well sections.



Trailerized version of the Quatro

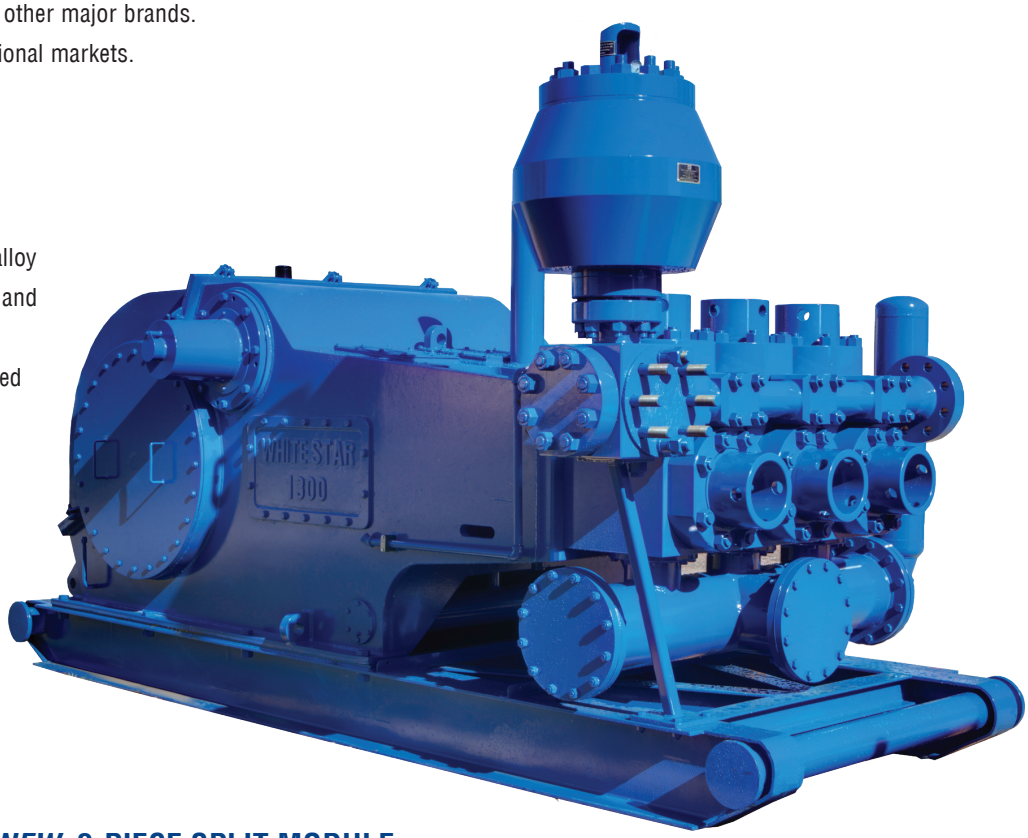
Company snapshot

Headquarters: Waller, Texas (Just outside of Houston)
Year of incorporation: 2002
Ownership: Private
Product line: Triplex and Quadraplex mud pumps
Applications: Onshore and offshore drilling
Production plants: Houston and Edmonton
Auxiliary products: Mud pump parts, Ideco-interchangeable
Services: Pre-sales consultation, mud pump unitization, field service, and rebuilds
Geographical coverage: Worldwide

Triplex Drilling Mud Pumps

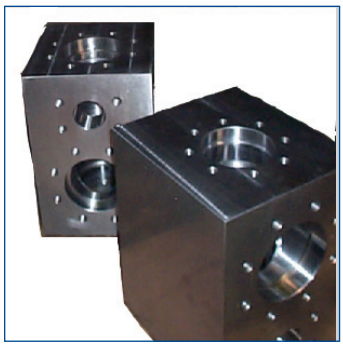
Available in the following hp models:
1300 &1600

White Star mud pumps are designed and manufactured to achieve the highest precision and deliver maximum performance and efficiency. White Star triplex mud pumps are compatible with other major brands. Expendables are available in domestic and international markets.



■ Fluid End

White Star's discharge manifolds are single piece alloy steel forged then machined for maximum strength and life. The fluid end modules are in one or two-piece configurations, using quenched and tempered forged alloy steel material.



NEW: 2-PIECE SPLIT MODULE

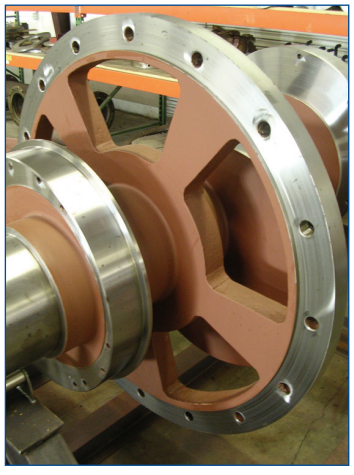
Separate replaceable suction and discharge modules c/w replaceable wear ring for extended module life.

■ Frame and Skid

Pump frames suffer from stress and fatigue cracking at the front-end bulkhead, pinion, crankshaft, and bearing support areas, so White Star has paid particular attention to the strength of the frame and the way it's manufactured. The material is a hot rolled premium steel plate with the longitudinal plates increased in thickness by nearly 1/2" to prevent the frame from "breathing." The White Star frame is machined the full length of the hold down runners at the base on either side. The skid has a fully milled flush run of 1" plate the full length of the pump. When the pump is bolted to the machined skid, the stresses from the front end of the pump are transmitted through the skid. This provides added strength to the frame and a reduction in stress at the high stress points typical of other existing triplex pumps.

■ Crankshaft, Pinion, Bull Gear & Connecting Rods

White Star's crankshaft is manufactured from a forged 4140 material with high nickel content to reduce crack initiation and propagation. It has a high chrome content to prevent corrosion.



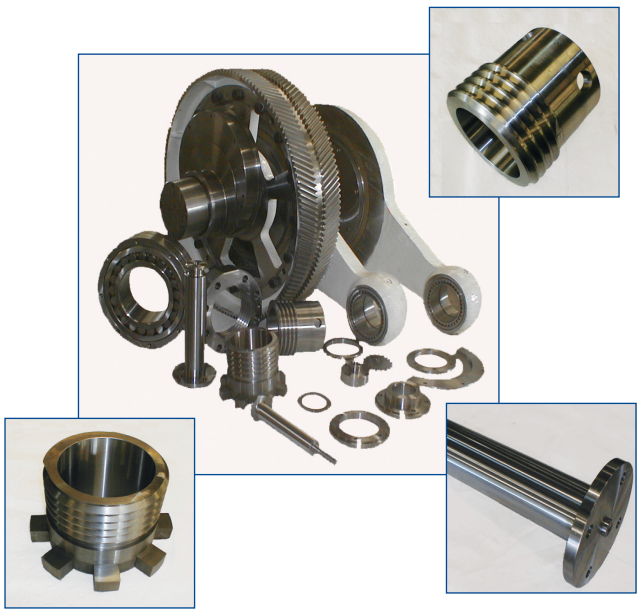
White Star crankshafts are static balanced for smooth operation to reduce noise and vibration, which extends the life of the bearings and crankshaft. The pinion and bull gear are made from similar

material to the crankshaft and with a high precision double helical gear, with less backlash than other available pumps. The precision gears ensure power is transmitted over the full width of the adjacent gears and the decreased backlash prevents the hammering effect, which occurs with speed change. Our connecting rods are made from high specification alloy steel.

White Star connecting rods are machined with great precision to guarantee alignment between the crankshaft and the cross heads.

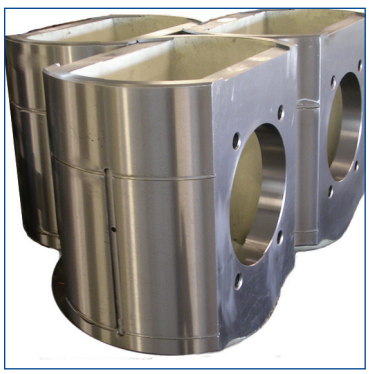
■ Ancillary Parts

The White Star ancillary parts are all considered individually critical to successful pump operation. Whether it's a simple liner nut with a modified acme thread, a plug retainer or an extension rod, they are designed and manufactured to the highest standards.



■ Cross heads and Guides

White Star's cross heads are manufactured from high quality, cast steel and the guides are manufactured from a quality manganese bronze normally used in bearings. This combination of materials provides a low friction interface and generates very little heat, which equates to minimal wear.



■ Pulsation Dampeners

White Star's pulsation dampener, rated at 20 gallons, is made from forged alloy steel. Each dampener is hydrostatically tested to 10,000 psi before shipment. White Star also offers a 10-gallon 7500 WP pulsation dampener for the 7500 PSI triplex fluid end.

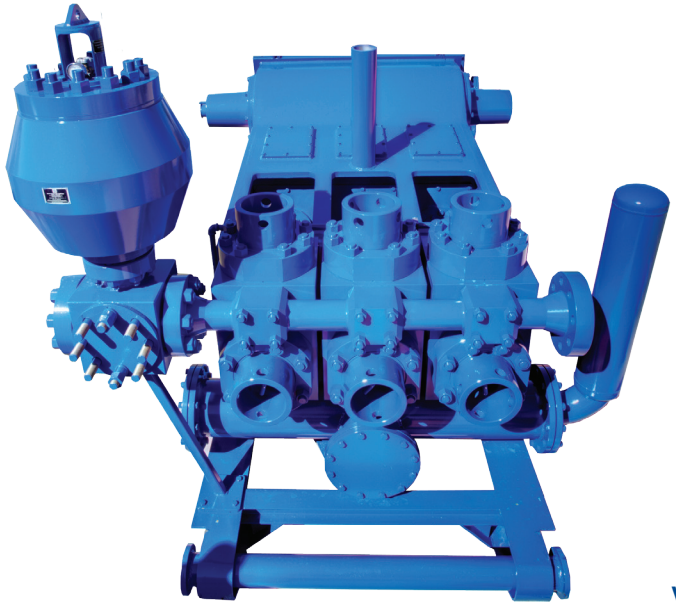
Triplex Performance Charts

Stroke per min.				120	100	80	60
1300 hp	**Hydraulic hp**			1170	975	780	585
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm^2)		**GPM - Gallons per minute** (LPM - Liters per minute)			
		5000 PSI	7500 PSI*				
7.5 (190.5)	6.88 (26.06)	2429 (178)	2429 (178)	826 (3127)	688 (2606)	551 (2085)	413 (1564)
7 (177.8)	6.00 (22.70)	2788 (205)	2788 (205)	720 (2724)	600 (2270)	480 (1816)	360 (1362)
6.5 (165.1)	5.17 (19.57)	3234 (238)	3234 (238)	621 (2349)	517 (1957)	414 (1566)	310 (1174)
6 (152.4)	4.41 (16.68)	3795 (279)	3795 (279)	529 (2001)	441 (1668)	353 (1334)	264 (1001)
5.5 (139.7)	3.70 (14.01)	4516 (332)	4516 (332)	444 (1682)	370 (1401)	296 (1121)	222 (841)
5 (127)	3.06 (11.58)	5000 (367)	5465 (401)	367 (1390)	306 (1158)	245 (927)	184 (695)
4.5 (114.3)	2.48 (9.38)	5000 (367)	6747 (496)	297 (1126)	248 (938)	198 (751)	149 (563)
4 (101.6)	1.96 (7.41)	5000 (367)	7500 (551)	235 (890)	196 (741)	157 (593)	118 (445)

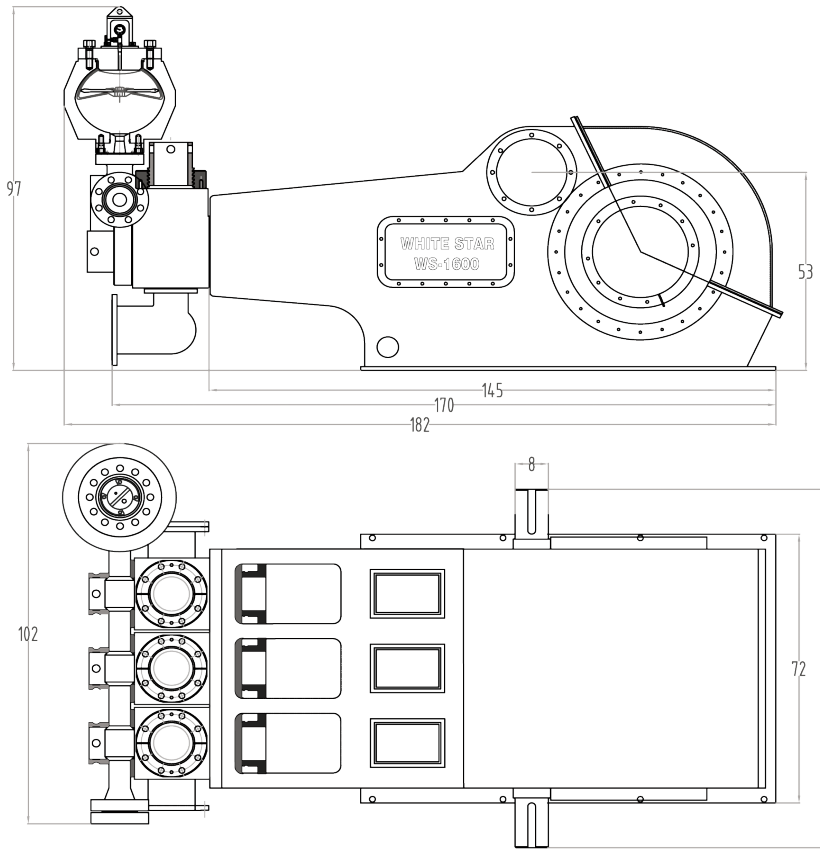
Rated strokes and horsepower 120 SPM @ 1300 Input horsepower. | *With 7500 PSI module
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency. All data subject to change without notification

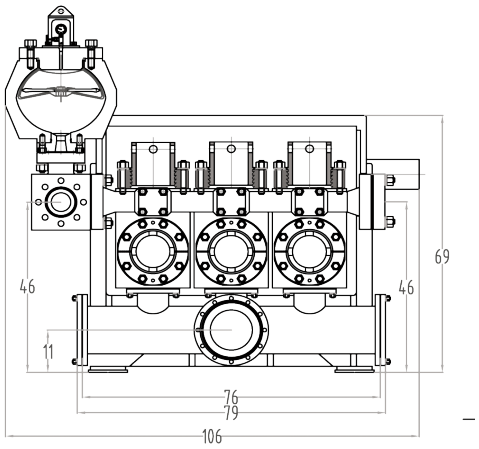
Stroke per min.				120	100	80	60
1600 hp	**Hydraulic hp**			1440	1200	960	720
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm^2)		**GPM - Gallons per minute** (LPM - Liters per minute)			
		5000 PSI	7500 PSI*				
7.5 (190.5)	6.88 (26.06)	2989 (220)	2989 (220)	826 (3127)	688 (2606)	551 (2085)	413 (1564)
7 (177.8)	6.00 (22.70)	3431 (252)	3431 (252)	720 (2724)	600 (2270)	480 (1816)	360 (1362)
6.5 (165.1)	5.17 (19.57)	3979 (292)	3979 (292)	621 (2349)	517 (1957)	414 (1566)	310 (1174)
6 (152.4)	4.41 (16.68)	4670 (343)	4670 (343)	529 (2001)	441 (1668)	353 (1334)	264 (1001)
5.5 (139.7)	3.70 (14.01)	5000 (367)	5558 (408)	444 (1682)	370 (1401)	296 (1121)	222 (841)
5 (127)	3.06 (11.58)	5000 (367)	6725 (494)	367 (1390)	306 (1158)	245 (927)	184 (695)
4.5 (114.3)	2.48 (9.38)	5000 (367)	7500 (551)	297 (1126)	248 (938)	198 (751)	149 (563)
4 (101.6)	1.96 (7.41)	5000 (367)	7500 (551)	235 (890)	196 (741)	157 (593)	118 (445)

Rated strokes and horsepower 120 SPM @ 1600 Input horsepower. | *With 7500 PSI module
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency. All data subject to change without notification



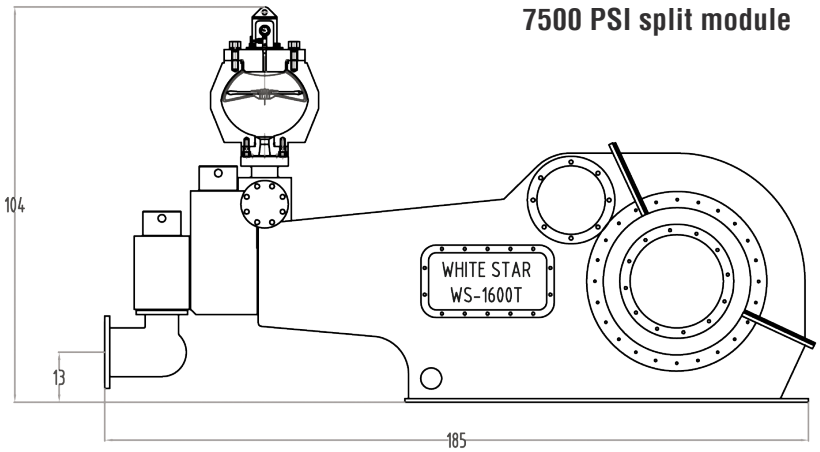
Triplex Schematics

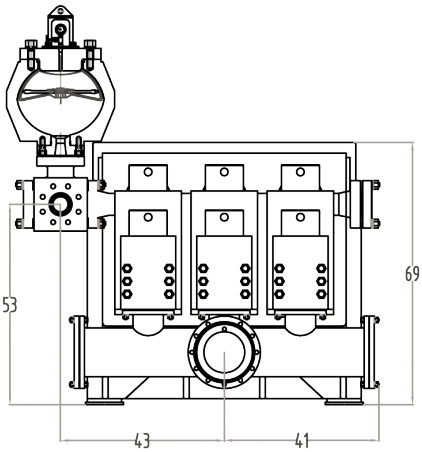


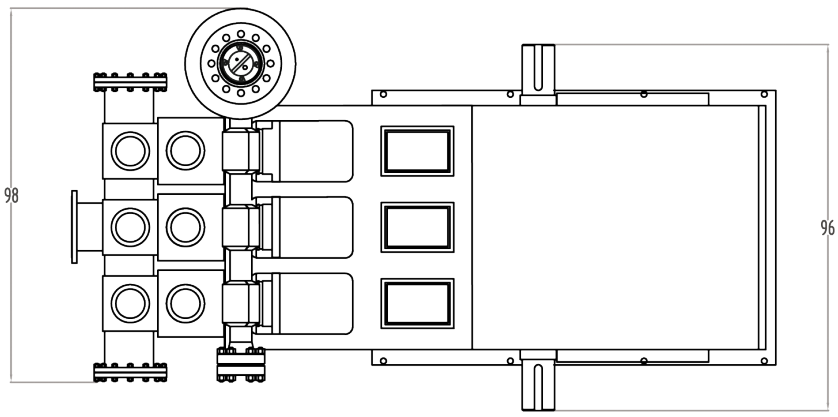


OVERALL DIMENSIONS: 182” X 96” X 97”
TOTAL WEIGHT: 64,000 lbs (29, 029 Kg)

7500 PSI split module







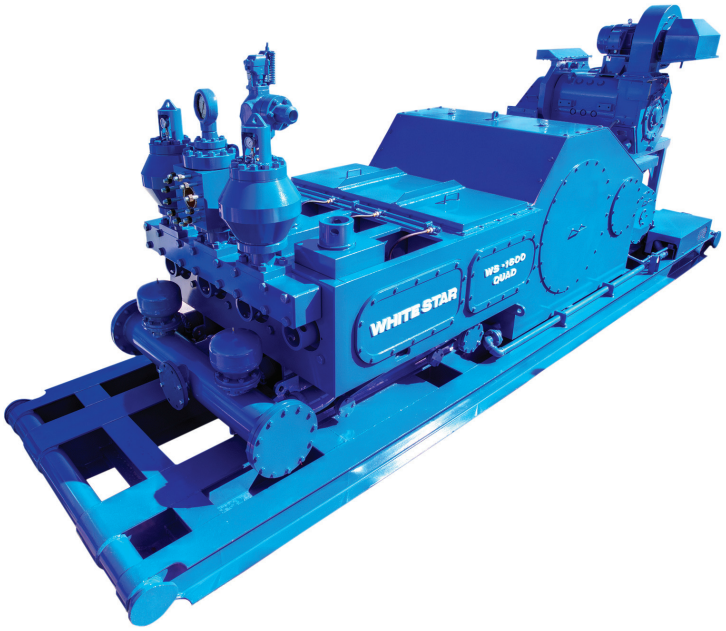
OVERALL DIMENSIONS: 185” X 96” X 104”
TOTAL WEIGHT: 65,293 lbs (29,616 Kg)

Quatro Quadraplex Mud Pump

See informative videos at whitestarpump.com/videos

Designed for Demanding Drilling Today, and into the Future.

Field proven since its introduction in 2006, the White Star Quatro™ 4-piston quadraplex mud pump represents a quantum improvement over conventional triplex mud pumps. Consider the inherent flaws in triplex mud pumps – wide, heavy designs that are expensive to transport; crankshaft and bearing failure leading to costly rebuilds; high-vibration operation; limited flow rates and pressure capabilities; and short product life cycles. The advanced Quatro goes beyond the limitations of triplex pumps, delivering reliable high-flow, high-pressure pumping performance that meets the needs of drilling operations, today and long into the future.

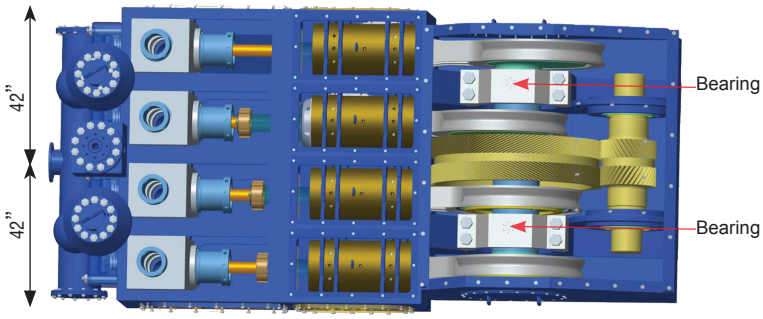


■ Overview

- New "Quatro X"
- Standard 7500 PSI rating above 1600hp
- Smoothest discharge in the industry
- Easy 45-minute fluid module replacement in the field
- Only 84" wide and easily fits on standard width trailer
- Fully assembled crankshaft with no cast or welds
- **Pump house**:
  Up to 2450 hp electric and 1600 hp mechanical, 24" walk around and under 100,000 lbs

■ Innovative Design

The transition from a "triplex" to "quadraplex" naturally balances the pump. The fourth cylinder improves crankshaft timing, which means a smoother running pump with less vibration. The innovative and compact frame is designed to efficiently carry load forces directly to the "double roller" bearing. The modern bearing placement between cylinders reduces load and flexing of the frame and crankshaft, improving bearing, crankshaft and gear life.



■ Fully Assembled Crankshaft

Fully machined and assembled crankshaft. No castings or welding. Shortest distance between cylinder and bearing of any mud pump. Virtually eliminates crankshaft flex.

■ Offshore

The 2450 hp Quatro's compact unitizations weigh 25- 50% less than a triplex 2200 hp pump and requires 50% less pump room space. The Quatro: a better pump in half the space.

■ Quality Construction

The Quatro boasts a quality workmanship that is second to none, with all components manufactured from the highest grade materials. All parts and components have mill cert traceability and go through a rigorous three-step quality assurance and quality control screening.

■ Industry Leading Flow Rates

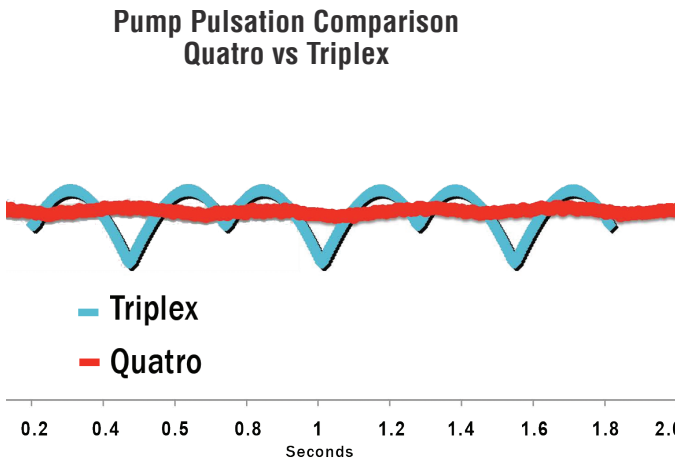
The QuatroX achieves a 1597 GPM continuous duty flow rate at industry standard piston speeds and without over-running the pump.

■ Revolutionary Fluid End Modules

The Quatro's fluid modules sitting inside the frame are in a class of their own. The innovative seal assemblies and revolutionary module mounting system, with only six bolts to remove, reduces module changes from hours to just minutes . . . it's all about up time!

Near Zero Pulse. Better MWD

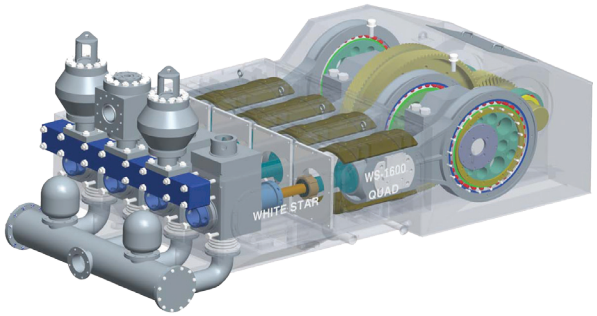
The Quatro's unique placement of pulsation dampeners removes the pulse before it arrives at the strainer cross and escapes downhole. This means near zero-pulse discharge and the lowest levels of vibration and mud noise, for exceptional MWD performance.



Quadraplex actual real-time data ref test Houston May 30th, 2009

The Quatro's almost pulse-free discharge is shown in red, overlaid against the typical theoretical discharge pulse and vibration of a triplex pump shown in blue. The Quatro's discharge data, obtained by the proprietary White Star Smart Safety Alarm System's Data Acquisition Sensors, further illustrates this pump's ultra smooth flow. To witness the Quatro's almost perfect discharge, visit whitestarpump.com/1800 or contact White Star to schedule a live demonstration.

For more on mud pump pulses, please read a recent article in Upstream Pumping Solutions magazine (Fall 2010): "Anatomy of a Mud Pump Pulse"

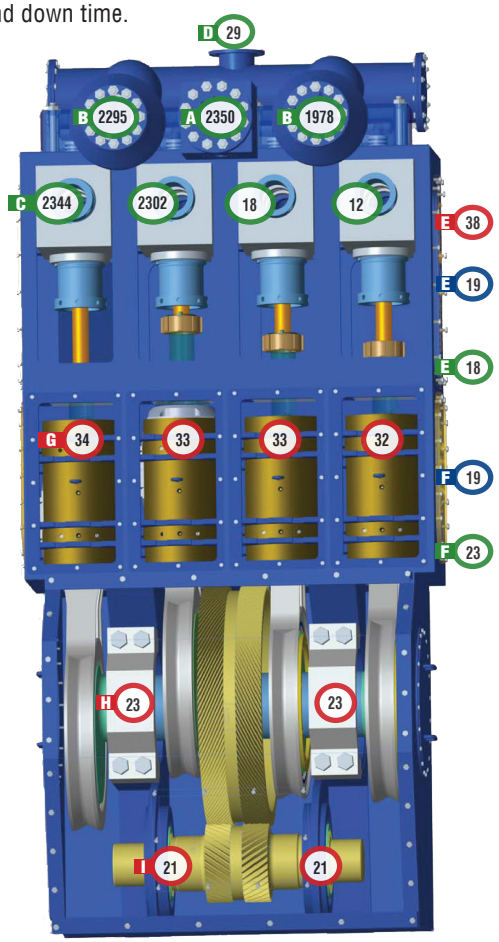


More information on the science and field experience behind the advanced features of the Quatro can be found at **whitestarpump.com** or by speaking directly with your local White Star Pump Company agent.

Real Time Monitoring that Reduces Downtime and Costs.

The WSP "Pump System Monitor"

Designed to detect and warn the operator of problems and maintenance issues in real-time, both locally and remotely. The WSP's proprietary data system allows the operator to closely monitor all aspects of the mud pump system. The data acquisition sensors will detect deviations from normal operating conditions and alert the operator long before they are perceivable by humans, thus creating a larger time window for preventing critical failures. Sensing whether the top or bottom valve in a particular cylinder is starting to leak or stick with 100% accuracy, the Pump System Monitor will reduce guesswork and down time.



A. Discharge pressure (PSI)
B. Pulsation dampener pressure (PSI)
C. Fluid module pressure (PSI)
D. Intake pressure (PSI)
E. Liner rinse pressure (PSI), flow (GPM), and temperature (Celsius)
F. Oil lube pressure (PSI) and flow (GPM)
G. Cross head and guide temperature (Celsius)
H. Bearing temperature (Celsius)
I. Pinion bearing temperature (Celsius)

Warranty

-Field commissioning at no additional cost
-10 year limited warranty against manufacturers defect

■ Unique Bearing Placement for Long Life.

The Quatro's radically different placement of the bearings along structural panels inside the pump, and between the cylinders, also delivers a number of key advantages:

- Reduced peak bearing load
- Reduced crankshaft loading
- Extended bearing life
- Reduced pump vibration
- A more stable, structurally supported crankshaft

■ Lighter Weight. Smaller Footprint.

The Quatro features a unique, 4-piston design, and is much lighter and more compact than any standard mud pump. It features an 82" fully unitized width, compared to a triplex, pump, which can be 140" wide. It offers a 1597 GPM flow rate and can handle pressures up to 10,000 psi, meeting the requirements of even the most demanding drilling operations. And the Quatro's fluid modules can be replaced in as little as 23 minutes – that's 15 times faster than with conventional triplex mud pumps.

The Quatro™ Quadraplex Mud Pump is Available in 1300, 1600, 2000 & 2450 HP Models at up to 10,000 psi

■ Worm Drive Option Adds Simplicity and Reliability.

The White Star Quatro™ is available with an ultra-efficient worm drive option, which provides for an extremely simple design and adds to the durability and reliability of the pump. This unique worm drive option eliminates the need for many moving parts often required in pump unitization, such as belts, chains, reduction gearing, right-angle drives, and more. Because worm drive will not work on 3-piston machines, you won't find this cost-saving feature on any triplex mud pump, anywhere. It is only available on advanced Quatro quadraplex 4-piston mud pumps.

■ HalfDrive™ 2-Cylinder Shut Down System Saves Fuel.

An optional 2-cylinder shut down system, which can reduce pump discharge by 50%, is also available on all Quatro mud pumps. This HalfDrive™ option eliminates the need for a costly gearbox in mechanical drive systems, and can reduce flow rates while still maintaining proper engine RPMs.

■ Reduced Peak Bearing Load For Extended Pump Life.

The Quatro reduces peak bearing load by as much as 40.3% compared to triplex mud pumps. How? On the Quatro, bearings are located along structural panels inside the pump, between each pair of pistons. This unique configuration provides up to three times fewer stress cycles on the crankshaft and reduces loads on the bearings for extended crankshaft and bearing life and longer intervals between rebuilds.

■ No Lower Overall Cost of Ownership. Anywhere.

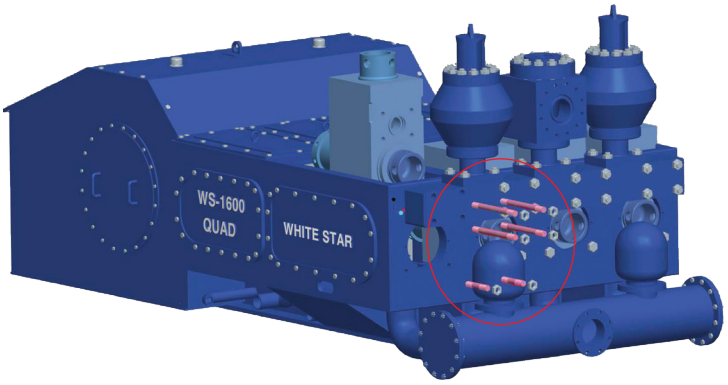
The Quatro not only performs on the rig, it performs on the bottom line, delivering reduced downtime, and faster, more efficient drilling performance. You won't find a high-performance mud pump that offers a lower overall life cycle cost. No matter where you look.

Fluid Module Replacement: Quatro vs Triplex

See video of 24 minute module change-out
whitestarpump.com/videos

Quatro Mud Pump

The fastest module change-out in the industry - only 45 minutes!



Only six main bolts (see diagram above) have to be removed, which require a mere 400ft-lbs of torque or one hit with a hammer wrench to loosen. After removing the module, the new module is then inserted with perfect alignment, thanks to its self-aligning feature unique only to the Quatro mud pump. Having the Quatro's fluid module sit inside the frame rather than bolted to it reduces the likelihood of a costly and time-consuming washout.

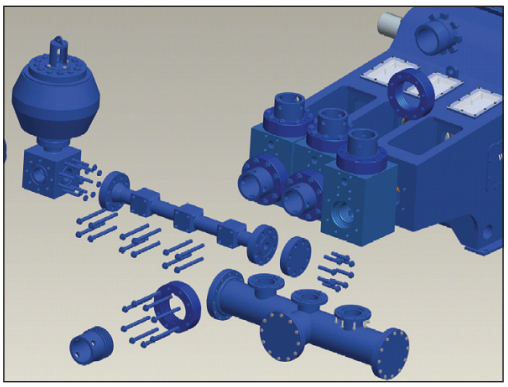
With the Quatro's unique frame design the piston pushes the module into the frame rather than away from it, as would be the case with a triplex pump. As a result, the Quatro's robust frame carries 100% of the load, whereas a triplex relies on numerous studs that can ultimately stretch, causing a washout and possible down time.

Unlike triplex pumps, the Quatro doesn't use compression seals and only uses seal assemblies between the modules and strainer cross, further reducing costly washouts.

- No studs to hammer
- No rings in the module bay
- No shims
- No compression seals

Triplex Mud Pump

Change-out: 8-16 hours



Removing the module on a triplex is notoriously long and arduous, requiring at least two men and 8 -16 hours to complete. As seen in diagram 2, the following must be removed to execute a proper change-out:

- Liner
- Main nuts on the retaining ring inside the bay
- Discharge manifold and pulsation dampener
- Strainer cross

The reset relief valve is disconnected and the suction manifold unbolted from underneath all three fluid modules and dropped to the deck.

Using bars and hammers, the fluid module is then extracted together with long studs through the main bulkhead of the pump.

See video explanation at:
www.whitestarpump.com/videos

Quatro 750/800 Performance Charts & Specifications

Stroke per min.			180	140	100	60
750 hp	**Hydraulic hp**		675	525	375	225
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm²)	**GPM - Gallons per minute** (LPM - Liters per minute)			
6 (152.4)	3.92 (14.83)	1641 (121)	705 (2669)	548 (2076)	392 (1483)	235 (890)
5 (127)	2.72 (10.30)	2363 (174)	490 (1853	381 (1441)	272 (1030)	163 (618)
4 (101.6)	1.74 (6.59)	3692 (271)	313 (1186)	244 (922)	174 (659)	104 (359)
3.5 (88.9)	1.33 (5.04)	5000 (367)	240 (908)	187 (706)	133 (504)	80 (303)

Rated strokes and horsepower 180 SPM @ 750 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

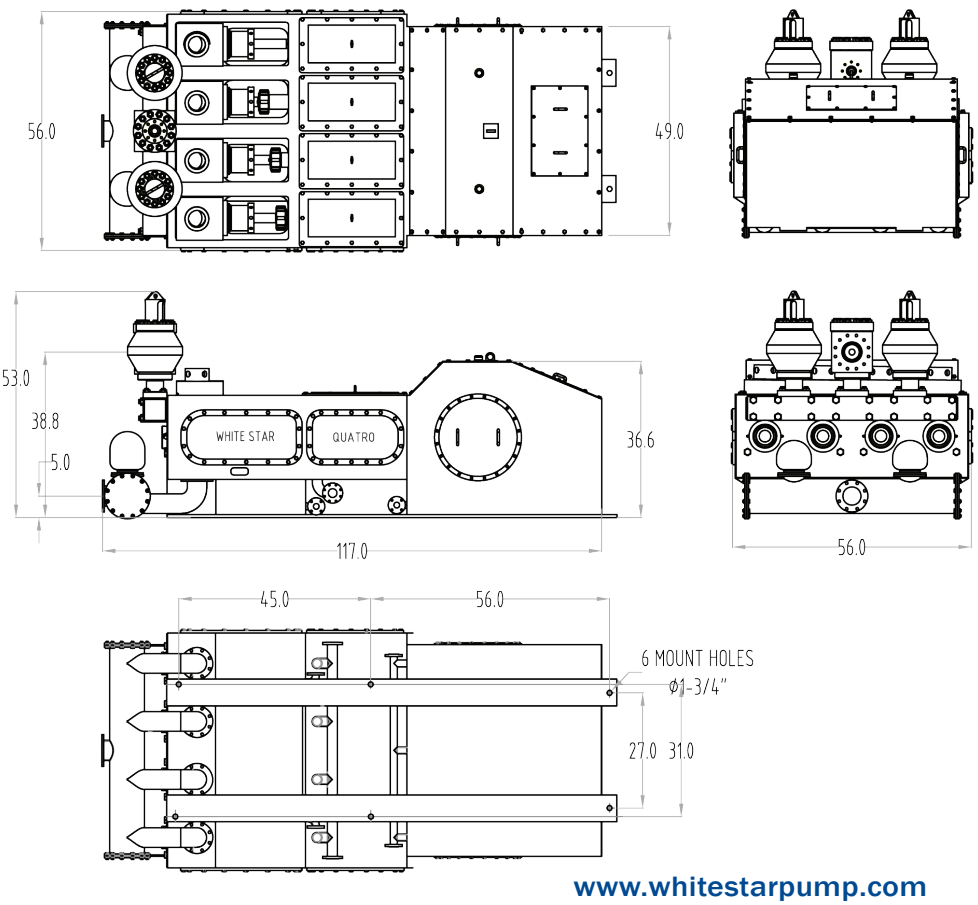
800 hp	Hydraulic hp		720	560	400	240
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm²)	**GPM - Gallons per minute** (LPM - Liters per minute)			
6 (152.4)	3.92 (14.83)	1751 (129)	705 (2669)	548 (2076)	392 (1483)	235 (890)
5 (127)	2.72 (10.30)	2521 (185)	490 (1853)	381 (1441)	272 (1030)	163 (618)
4 (101.6)	1.74 (6.59)	3939 (289)	313 (1186)	244 (922)	174 (659)	104 (395)
3.5 (88.9)	1.33 (5.04)	5000 (367)	240 (908)	187 (706)	133 (504)	80 (303)

Rated strokes and horsepower 180 SPM @ 800 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

Max input hp	750/800
Pump speed	180 SPM
Stroke length	8" (203.2 mm)
Max. piston size	6" (152 mm)
Min. piston size	3.5" (88.9 mm)
Fluid end working pressure	5000 PSI (34.47 Mpa)
Max. flow rate	705 GPM (2,668 LPM)
Width	56" (1,422 mm)
Length	117" (2,971 mm)
Height	53" (1,346 mm)
Weight ready to run	27,560 lbs (12,501 kg)

Schematics

Total weight: 27,560 lbs (21,300 Kg)



Quatro L1200 hp Performance Charts & Specifications

Stroke per min.			180	120	80	40
L 1200 hp	**Hydraulic hp**		1080	720	480	240
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm^2)	**GPM - Gallons per minute** (LPM - Liters per minute)			
7 (177.8)	5.33 (20.18)	1929 (142)	960 (3632)	640 (2421)	426 (1614)	213 (807)
6.5 (165.1)	4.60 (17.40	2238 (164)	827 (3132)	552 (2088)	368 (1392)	184 (696)
6 (152.4)	3.92 (14.83)	2626 (193)	705 (2669)	470 (1779)	313 (1186)	157 (593)
5.5 (139.7)	3.29 (12.46)	3125 (230)	592 (2242)	395 (1495)	263 (997)	132 (498)
5 (127)	2.72 (10.30)	3782 (278)	490 (1853)	326 (1235)	218 (824)	109 (412)
4.5 (114.3	2.20 (8.34)	4669 (343)	397 (1501)	264 (1001)	176 (667)	88 (334)
4 (101.6)	1.74 (6.59)	5000 (367)	313 (1186)	209 (791)	139 (527)	70 (264)

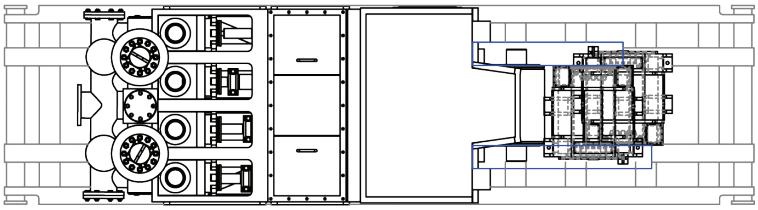
Rated strokes and horsepower 180 SPM @ 1200 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

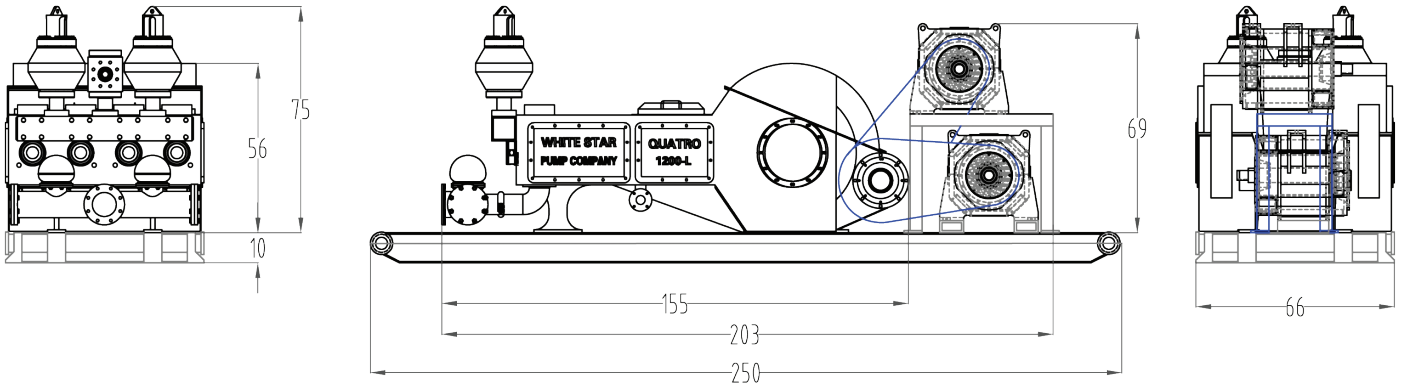
Max input hp	1200
Pump speed	180 SPM
Stroke length	8" (203.2 mm)
Max. piston size	7" (177.8 mm)
Min. piston size	4" (101.6 mm)
Fluid end working pressure	5000 PSI (34.4 Mpa)
Max. flow rate	960 GPM (3632 LPM)
Width	66" (1,676 mm)
Length	155" (3,937 mm)
Height	75" (1,905 mm)
Complete pump weight	27,750 lbs (12,587 Kg)
Fluid module removal	25 min

*with following fluid end parts removed :suction manifold, discharge manifold with pulsation dampeners still attached (if preferred), modules, liners and pistons.
Removal and re-install time: 4-5 hours

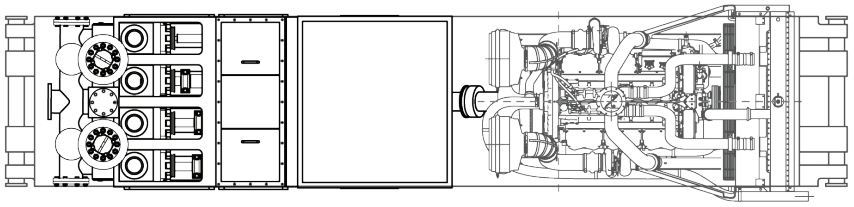
Quatro “Lightweight” L1200 hp Schematics

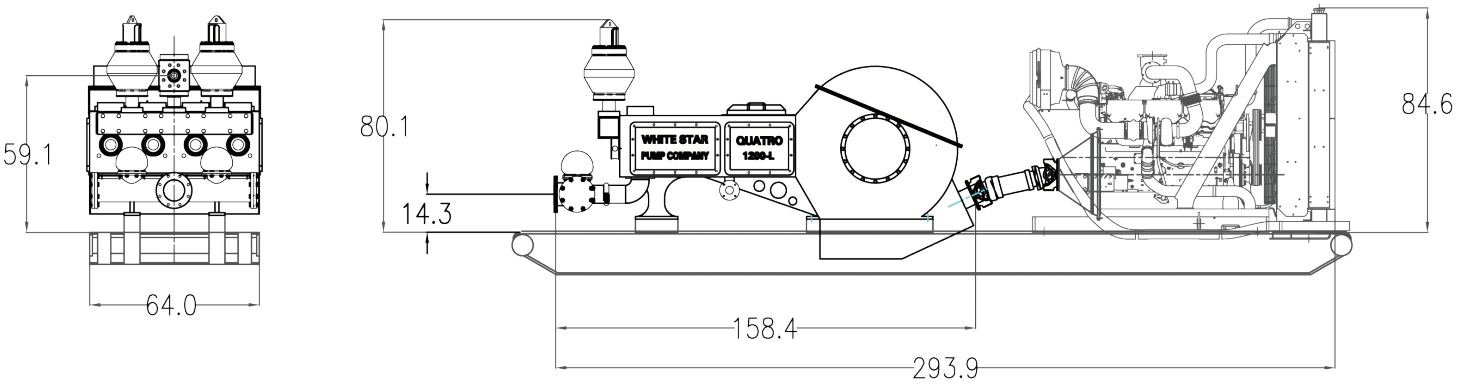
Quatro L 1200 AC rear mount



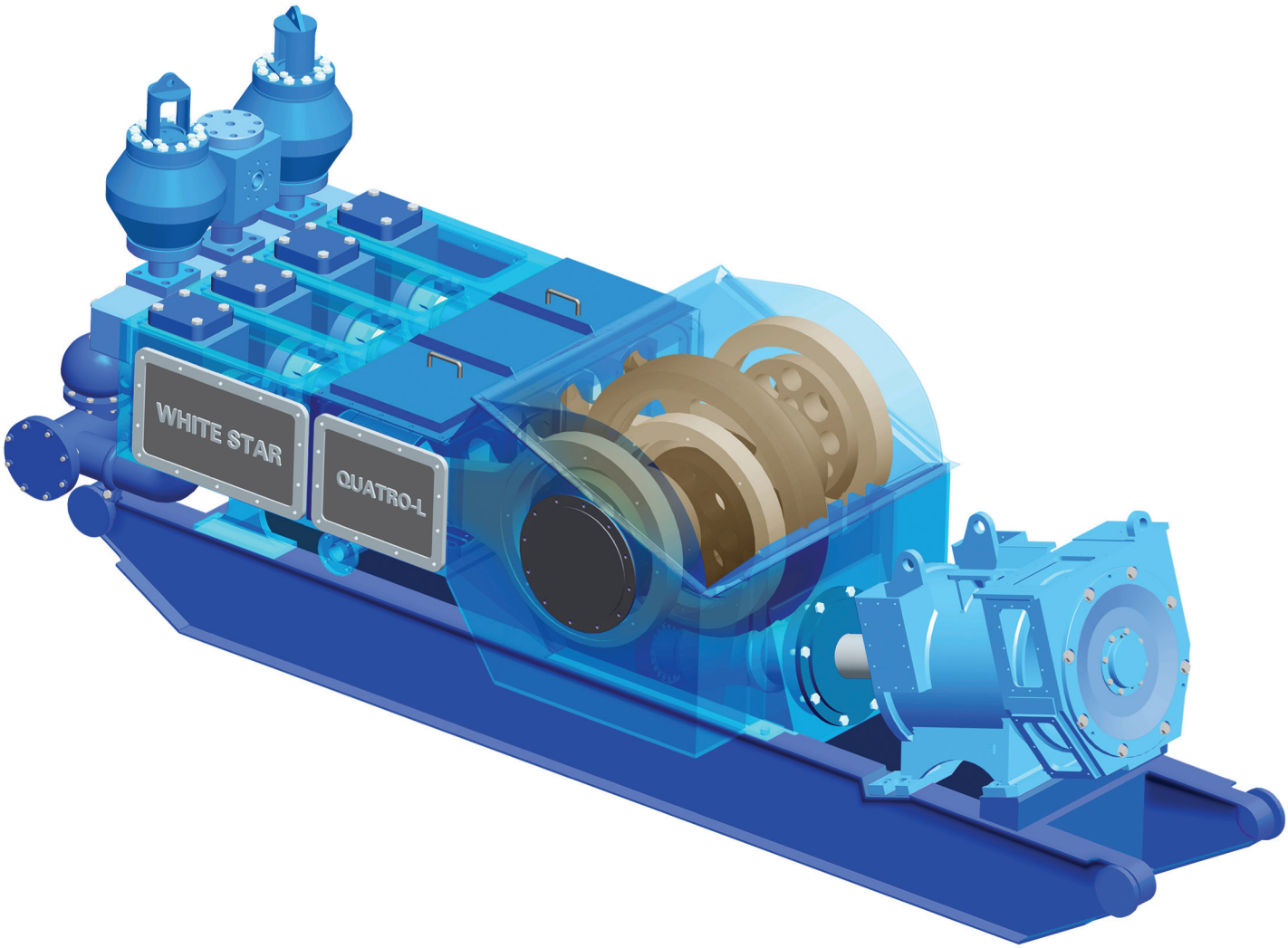


Quatro 1200L Worm -C32





Quatro “Lightweight” 1200L 3D

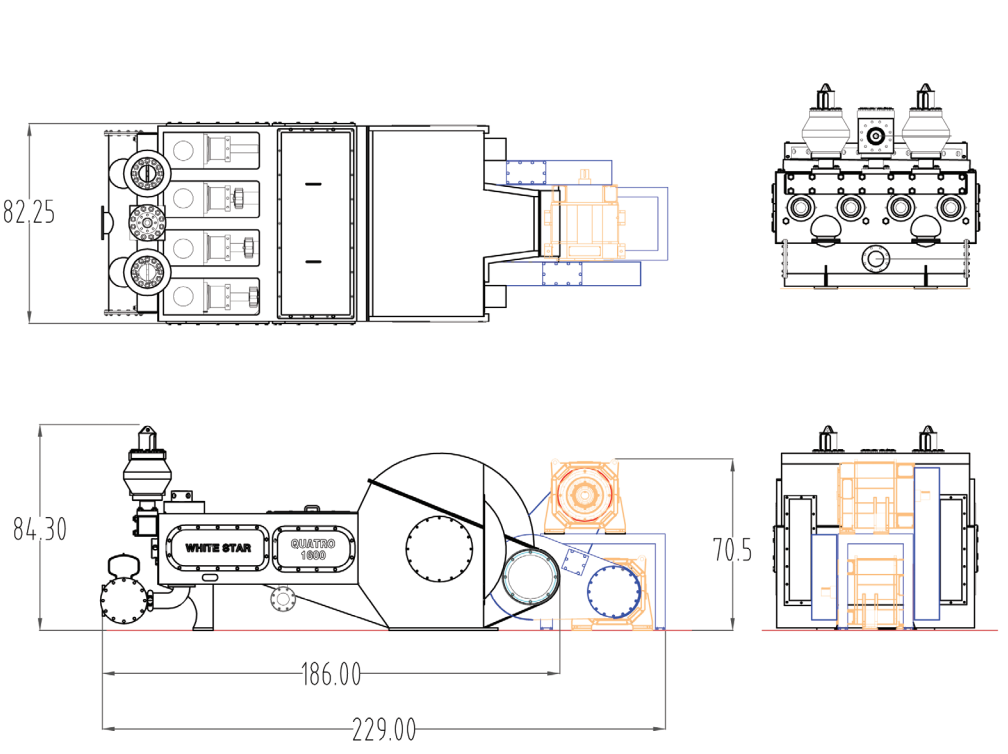


Quatro “Lightweight” L1600 hp Performance Chart

Stroke per min.			145	120	90	50
L 1600 hp	**Hydraulic hp**		1440	1192	894	497
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm²)	**GPM - Gallons per minute** (LPM - Liters per minute)			
7.5 (190.5)	7.65 (28.96)	2225 (163)	1109 (4199)	918 (3475)	688 (2606)	382 (1448)
7 (177.8)	6.66 (25.22)	2554 (188)	966 (3657)	800 (3027)	600 (2270)	333 (1261)
6.5 (127)	5.75 (21.75)	2962 (218)	833 (3154)	690 (2610)	517 (1957)	287 (1087)
6 (152.4)	4.90 (18.53)	3477 (255)	710 (2687)	588 (2224)	441 (1668)	245 (927)
5.5 (139.7)	4.11 (15.57)	4138 (304)	597 (2258)	494 (1869)	370 (1401)	206 (779)
5 (127)	3.40 (12.87)	5006 (368)	493 (1866)	408 (1544)	306 (1158)	170 (643)
4.5 (114.3	2.75 (10.42)	6181 (454)	399 (1511)	330 (1251)	248 (938)	138 (521)
4 (101.6)	2.18 (8.24)	7500 (551)	316 (1194)	261 (988)	196 (741)	109 (412)

Rated strokes and horsepower 145 SPM @ 1600 Input horsepower. Liners available in 1/2” sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

Max input hp	**1600**
Pump speed	145 SPM
Stroke length	10” (254 mm)
Max. piston size	7.5” (190.5 mm)
Min. piston size	4” (101.6 mm)
Fluid end working pressure	7500 PSI (51.71 Mpa)
Max. flow rate	1109 GPM (4199 LPM)
Width	84” (2,133 mm)
Length	186” (4,724 mm)
Height	84.5" (2,146.3 mm)
Complete pump weight	39,650 lbs (17,984 Kg)
Unitized weight	49,850 lbs (22,611 Kg)

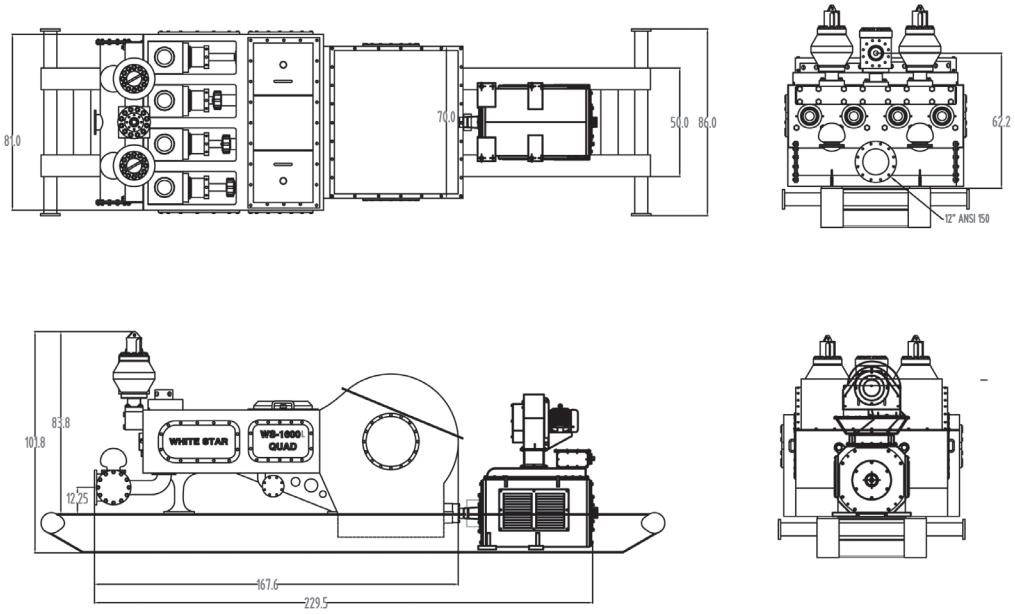


Quatro “Lightweight” L1600 hp Worm Drive Performance Chart

Stroke per min.			145	120	90	50
L 1600 hp	**Hydraulic hp**		1440	1192	894	497
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm^2)	**GPM - Gallons per minute** (LPM - Liters per minute)			
7.5 (190.5)	7.65 (28.96)	2225 (163)	1109 (4199)	918 (3475)	688 (2606)	382 (1448)
7 (177.8)	6.66 (25.22)	2554 (188)	966 (3657)	800 (3027)	600 (2270)	333 (1261)
6.5 (127)	5.75 (21.75)	2962 (218)	833 (3154)	690 (2610)	517 (1957)	287 (1087)
6 (152.4)	4.90 (18.53)	3477 (255)	710 (2687)	588 (2224)	441 (1668)	245 (927)
5.5 (139.7)	4.11 (15.57)	4138 (304)	597 (2258)	494 (1869)	370 (1401)	206 (779)
5 (127)	3.40 (12.87)	5006 (368)	493 (1866)	408 (1544)	306 (1158)	170 (643)

Rated strokes and horsepower 145 SPM @ 1600 Input horsepower. Liners available in 1/2” sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

Max input hp	**1600**
Pump speed	145 SPM
Stroke length	10” (254 mm)
Max. piston size	7.5” (190.5 mm)
Min. piston size	4” (101.6 mm)
Fluid end working pressure	5000 PSI (34.4 Mpa)
Max. flow rate	1109 GPM (4199 LPM)
Width	84” (2,133 mm)
Length	186” (4,724 mm)
Height	84.5" (2,146.3 mm)
Complete pump weight	39,650 lbs (17,984 Kg)
Unitized weight	49,850 lbs (22,611 Kg)



Quatro 1600/1800 hp Performance Charts

Stroke per min.			145	120	90	50
1600 hp	**Hydraulic hp**		1440	1192	894	497
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm^2)	**GPM - Gallons per minute** (LPM - Liters per minute)			
7.5 (190.5)	7.65 (28.96)	2225 (163)	1109 (4199)	918 (3475)	688 (2606)	382 (1448)
7 (177.8)	6.66 (25.22)	2554 (188)	966 (3658)	799 (3031)	599 (2268)	333 (1261)
6 (152.4)	4.90 (18.53)	3477 (255)	710 (2687)	588 (2224)	441 (1665)	245 (927)
5 (127)	3.40 (12.87)	5006 (368)	493 (1866)	408 (1544)	305 (1158)	170 (643)
4 (101.6)	2.18 (8.24)	7500 (551)	316 (1194)	261 (988)	196 (741)	109 (412)

Rated strokes and horsepower 145 SPM @ 1600 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

1800 hp	**Hydraulic hp**		1620	1341	1006	559
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm^2)	**GPM - Gallons per minute** (LPM - Liters per minute)			
9* (228.6)	11.02 (41.70)	1739 (128)	1597 (6046)	1310 (4953)	991 (3753)	551 (2085)
8* (203.2)	8.70 (32.94)	2220 (162)	1262 (4777)	1044 (3947)	783 (2965)	435 (1647)
7.5 (190.5)	7.65 (28.96)	2503 (184)	1109 (4199)	901(3411)	693 (2623)	382 (1448)
7 (177.8)	6.66 (25.22)	2874 (211)	966 (3657)	799 (3031)	599 (2268)	333 (1261)
6 (152.4)	4.90 (18.53)	3912 (287)	710 (2687)	587 (2200)	441 (1665)	245 (927)
5 (127)	3.40 (12.87)	5633 (414)	493 (1866)	407 (1540)	305 (1158)	170 (643)
4 (101.6)	2.18 (8.24)	7500 (551)	316 (1194)	260 (986)	196 (741)	109 (412)

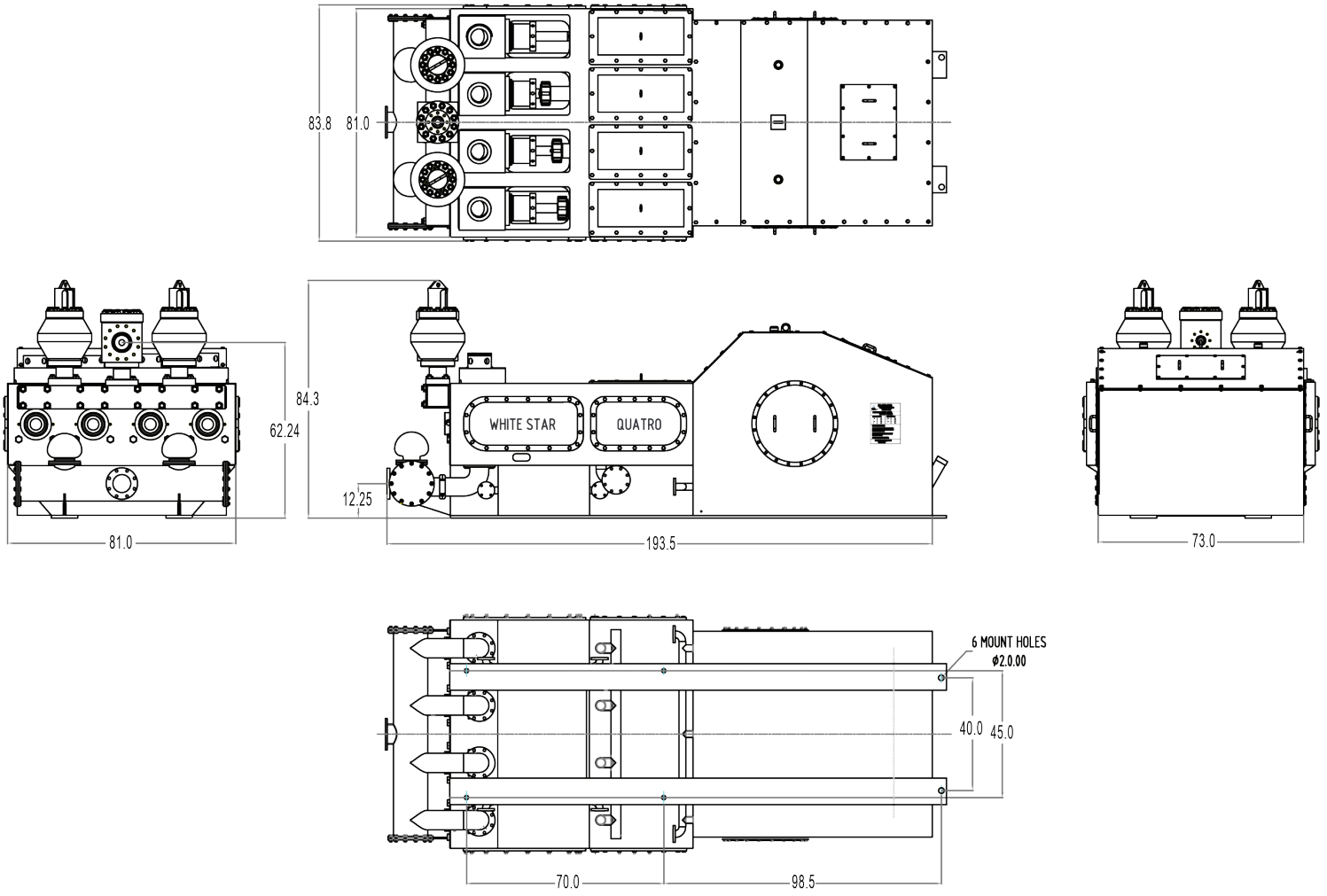
*Only available with the "X" module. Rated strokes and horsepower 145 SPM @ 1800 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

Quatro 1600-1800 hp Specifications and Schematics

Max input HP	1600 /1800
Pump speed	145 SPM
Stroke length	10” (254 mm)
Maximum piston size	9” (228.6 mm)
Minimum piston size	4” (101.6 mm)
Fluid end working pressure	7500 PSI (51.71 Mpa)
Max. flow rate	1109 GPM (4199 LPM)
Width	84" (2,133 mm)
Length	193” (4,902.2 mm)
Height	84.5” (2,146.3 mm)
Weight ready-to-run	53,500 lbs (24,267 Kg)

Schematics

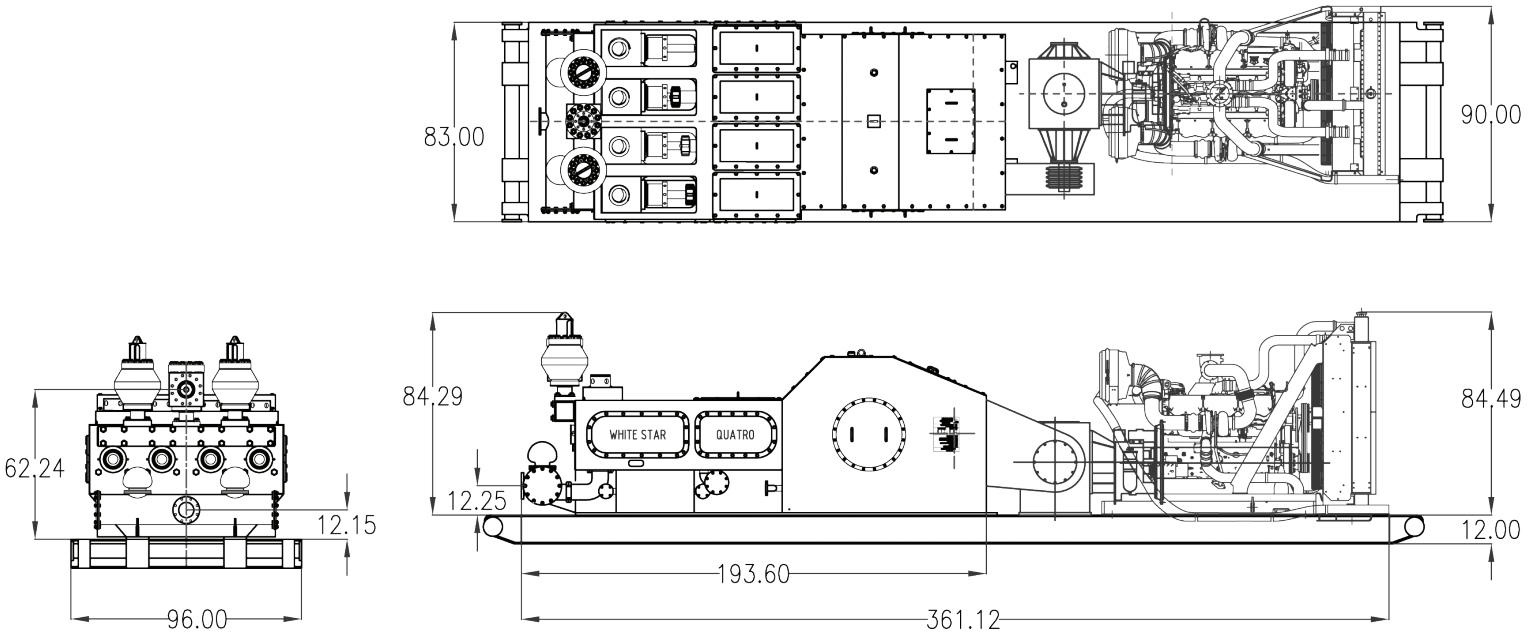
Total weight: 53,500 lbs (24,267 Kg)



Quatro 1600/1800 hp Schematics

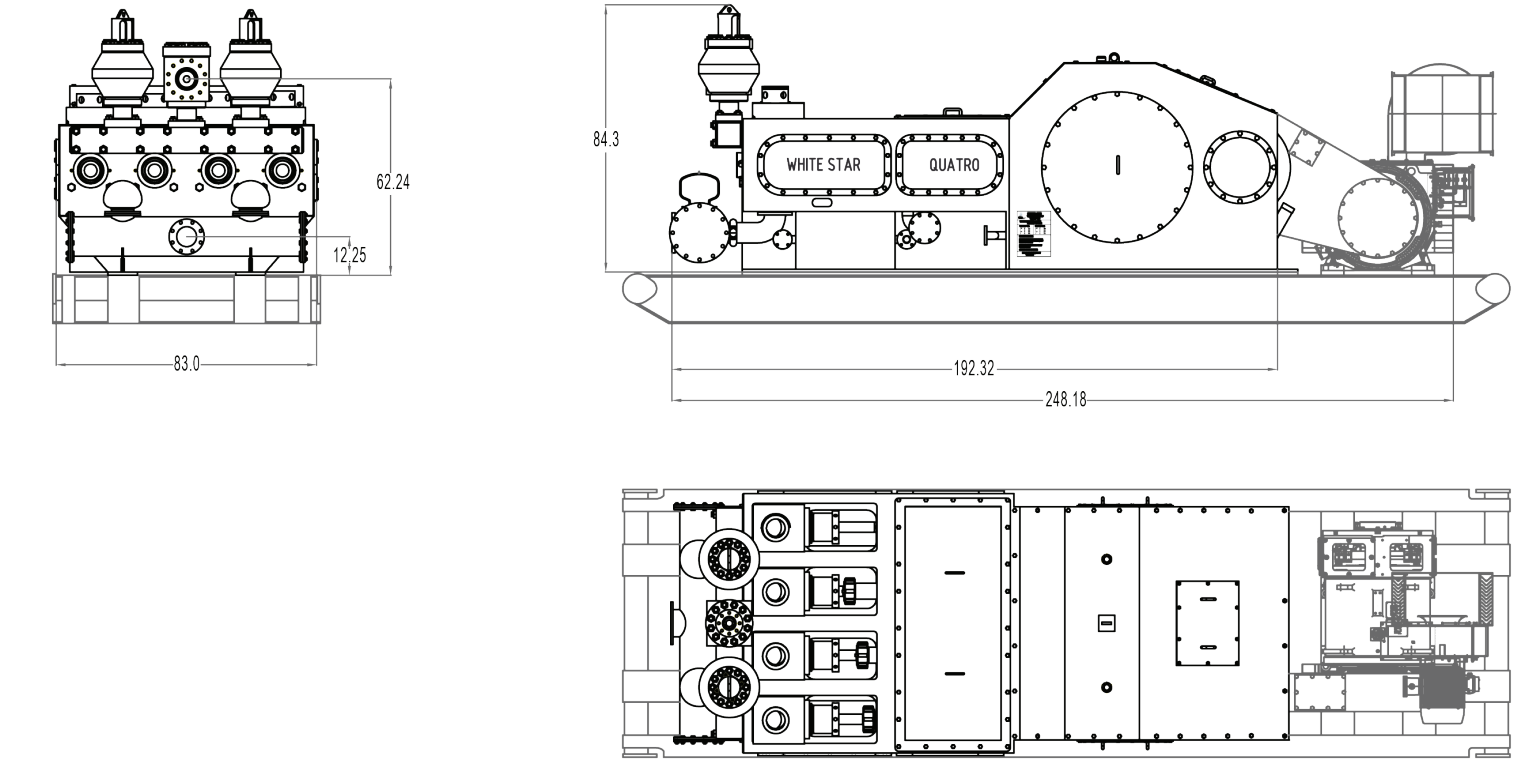
Quatro 1300 hp CAT C32 right angle box

Weight unitized without skid: 63,200 lbs (28,667 Kg)



Quatro 1600 hp GE 29 rear mount

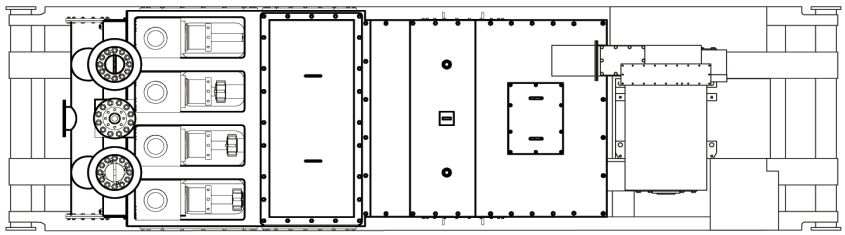
Weight unitized without skid: 64,000 lbs (20,029 Kg)

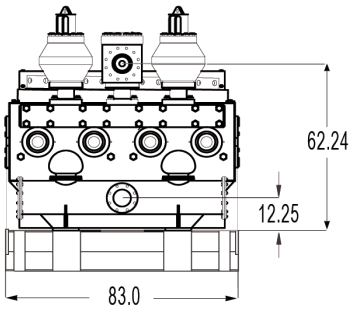


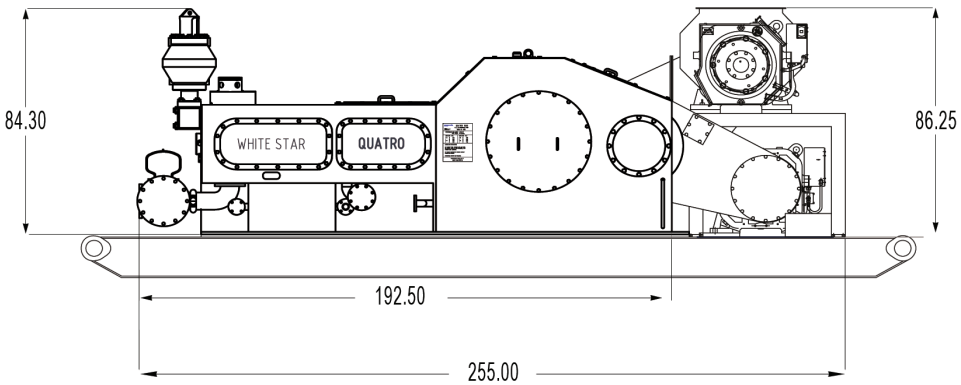
Quatro 1800 hp Schematics

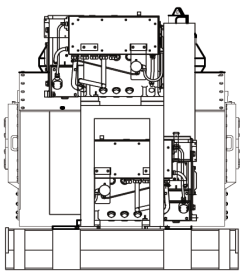
Quatro 1800 hp (2) GE 752's rear mount

Weight with skid: 87,500 lbs (39,689 Kg)



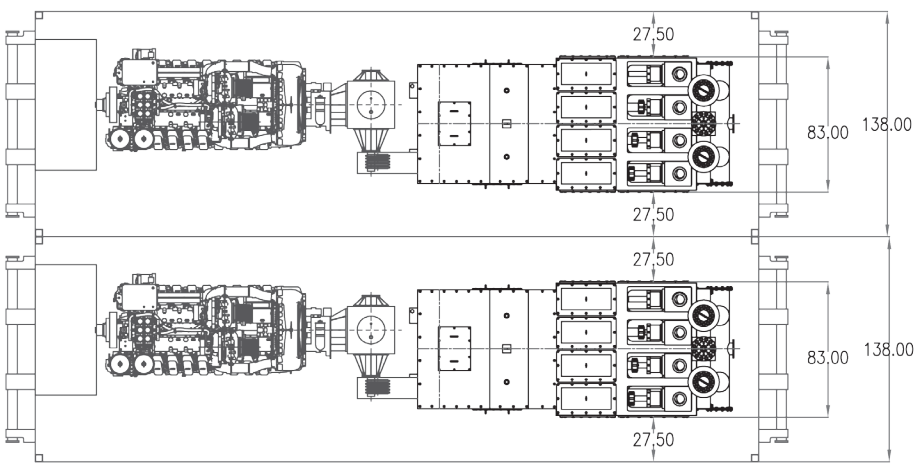


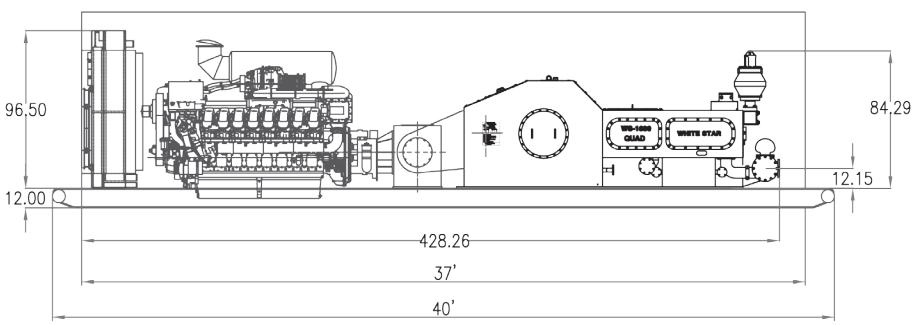


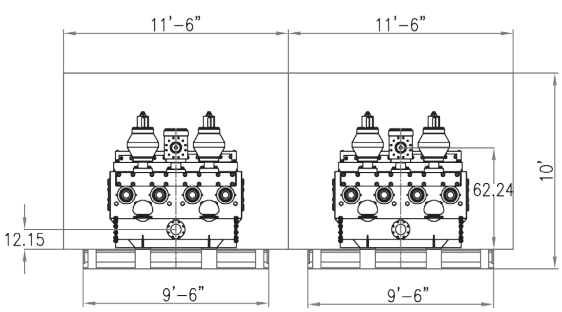


Quatro 1800 hp pump house- Detroit 12V4000 right angle box

Unitized weight without house & skid: 73,644 lbs (33,404 Kg)



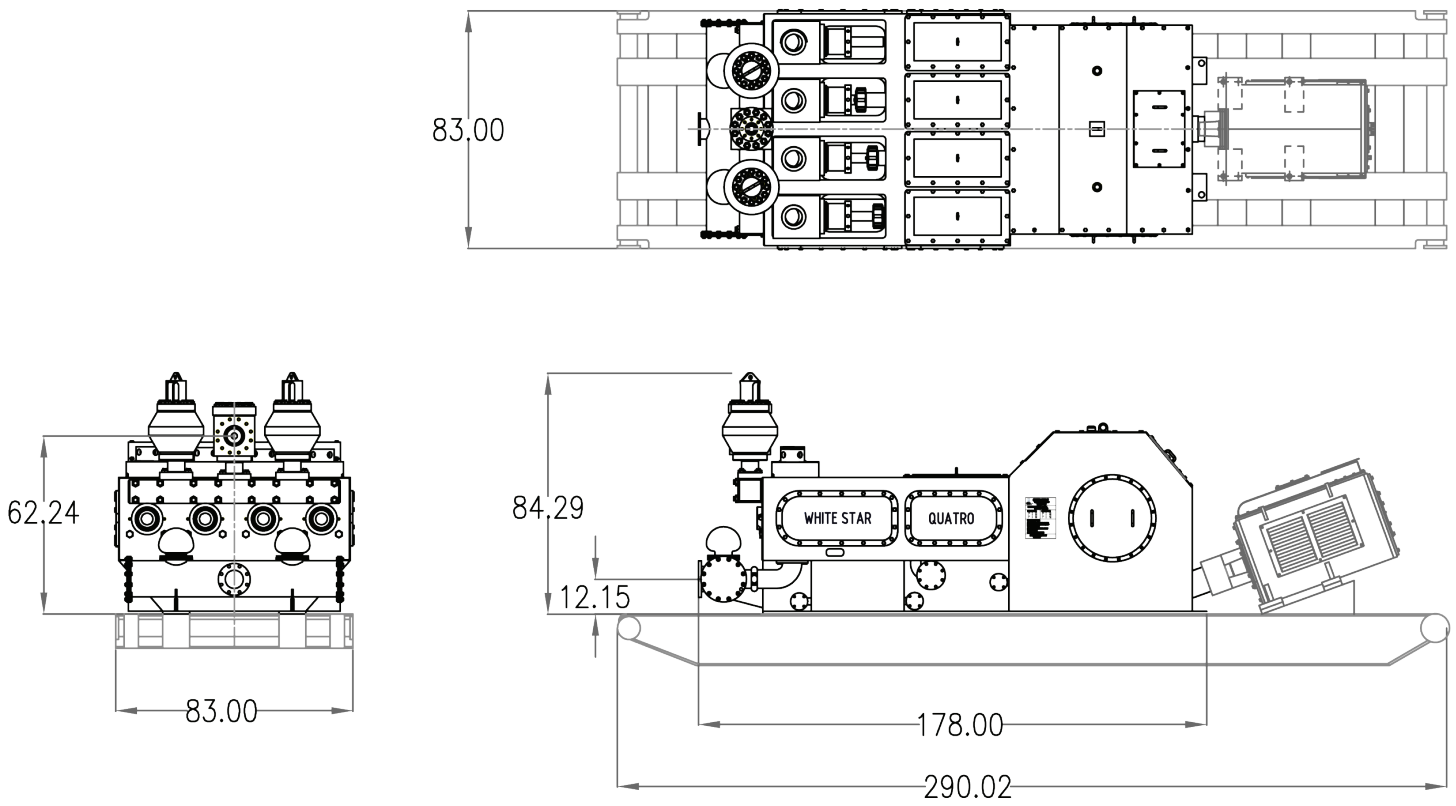




Quatro 1800 hp Schematics

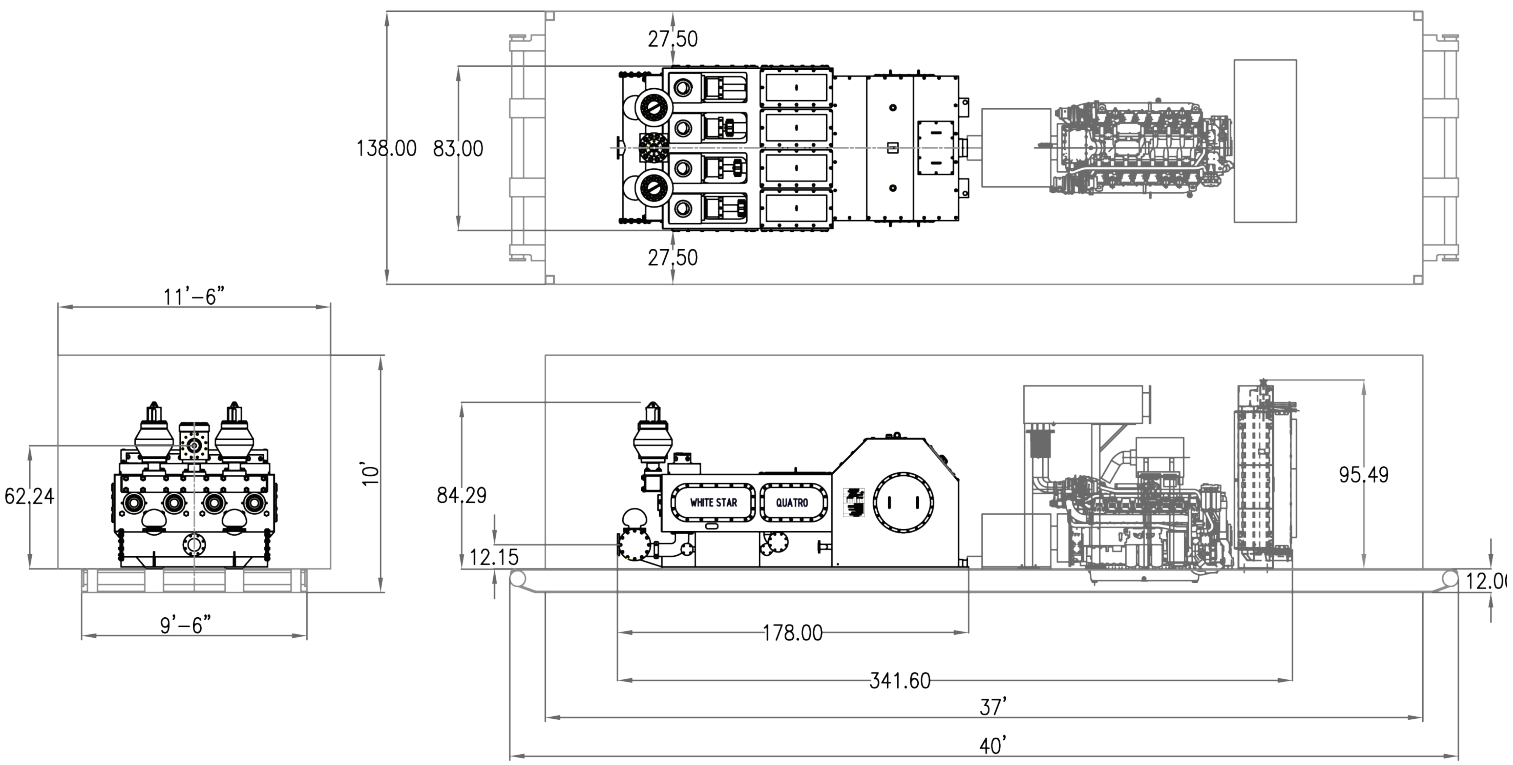
Quatro 1800 hp worm drive - Joliet HTM 1800

Weight without skid: 73,900 lbs (33,520 Kg)



Quatro 1800 hp worm drive - pump house -Detroit 12V4000

Weight without house & skid: 86,600 lbs (39,281 Kg)



Note: Available skid mounted without pump house

Quatro 2200/2450 hp Performance Charts

Stroke per min.			145	120	90	50
2200 hp	**Hydraulic hp**		1980	1638	1229	683
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm²)	**GPM - Gallons per minute** (LPM - Liters per minute)			
9* (228.6)	11.02 (41.70)	2124 (149)	1597 (6046)	1322 (5003)	991 (3753)	551 (2085)
8* (203.2)	8.70 (32.94)	2689 (198)	1262 (4777)	1044 (3953)	783 (2965)	435 (1647)
7.5 (190.5)	7.65 (28.96)	3059 (225)	1109 (4198)	918 (3475)	688 (2606)	382 (1448)
7 (177.8)	6.66 (25.22)	3512 (258)	966 (3657)	800 (3027)	600 (2270)	333 (1261)
6 (152.4)	4.90 (18.53)	4780 (351)	710 (2687)	588 (2244)	441 (1668)	245 (927)
5 (127)	3.40 (12.87)	6883 (506)	493 (1866)	408 (1544)	305 (1158)	170 (643)
4 (101.6)	2.18 (8.24)	7500 (551)	316 (1194)	261 (988)	196 (741)	109 (412)

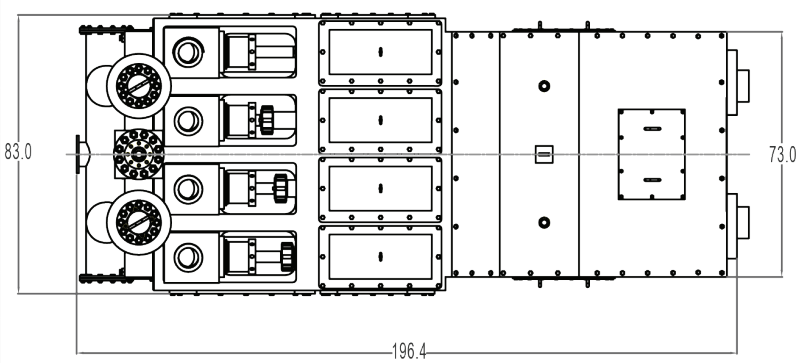
*Only available with the "X" module. Rated strokes and horsepower 145 SPM @ 2200 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

2450 hp	**Hydraulic hp**		2205	1825	1368	760
Liner size in. (mm)	**Gal/stk** (Liters/stk)	**Max discharge pressure PSI** (kg/cm²)	**GPM - Gallons per minute** (LPM - Liters per minute)			
9* (228.6)	11.02 (41.70)	2366 (174)	1597 (6046)	1322 (5003)	991 (3753)	551 (2085)
8* (203.2)	8.70 (32.94)	2994 (220)	1262 (4777)	1044 (3953)	783 (2965)	435 (1647)
7.5 (190.5)	7.65 (28.96)	3407 (250)	1109 (4198)	918 (3475)	688 (2606)	382 (1448)
7 (177.8)	6.66 (25.22)	3911 (287)	966 (3657)	800 (3027)	600 (2270)	333 (1261)
6 (152.4)	4.90 (18.53)	5323 (391)	710 (2687)	588 (2244)	441 (1668)	245 (927)
5 (127)	3.40 (12.87)	7500 (563)	493 (1866)	408 (1544)	305 (1158)	170 (643)
4 (101.6)	2.18 (8.24)	7500 (551)	316 (1194)	261 (988)	196 (741)	109 (412)

*Only available with the "X" module. Rated strokes and horsepower 145 SPM @ 2450 Input horsepower. Liners available in 1/2" sizes.
Hydraulic horsepower & flow rate based upon 90% mechanical efficiency and 100% volumetric efficiency.
All data subject to change without notification

Max input hp	**2200/2450**
Maximum piston size	9" (228.6 mm)
Minimum piston size	4" (101.6 mm)
Fluid end working pressure	7500 PSI (51.71 Mpa)
Pump speed	145 SPM
Stroke length	10" (254 mm)
Max. flow rate	1597 GPM (6046 LPM)
Width	83.5" (2,121 mm)
Length	196.5" (4,991 mm)
Height	84.5" (2,146.3 mm)
Weight (ready-to-run) 2200	66,500 lbs (30,163 Kg)
Weight (ready-to-run) 2450	73,500 lbs (33,339 Kg)

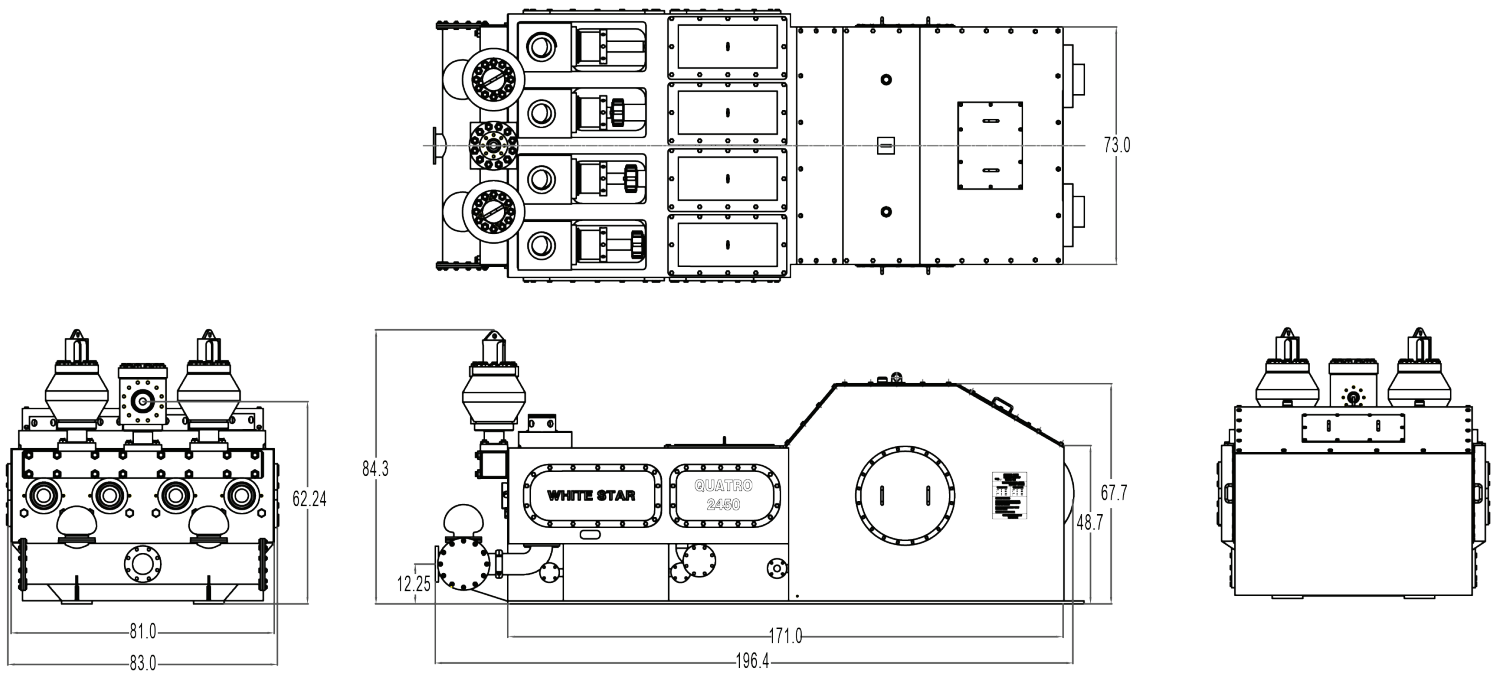
Schematics



Quatro 2200/2450 hp Specifications and Schematics

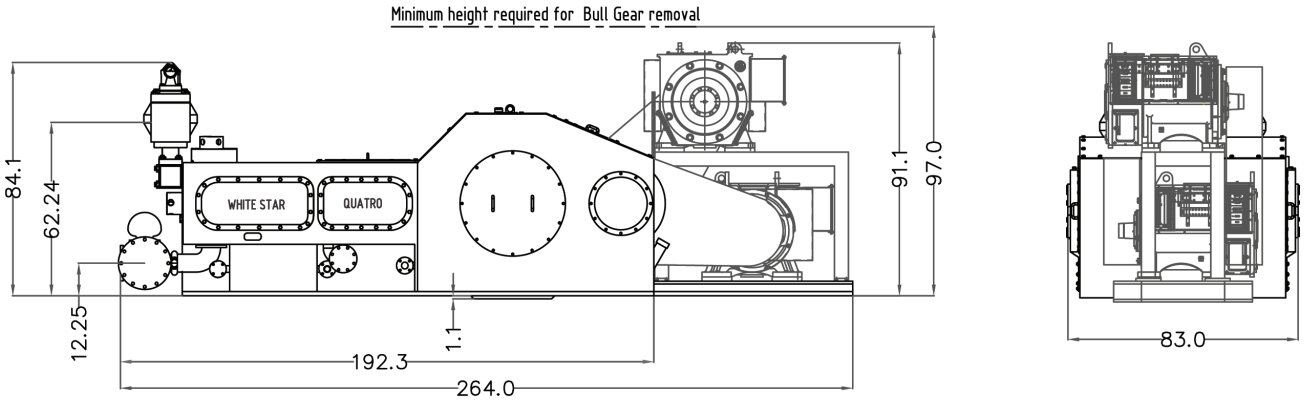
Dimensions

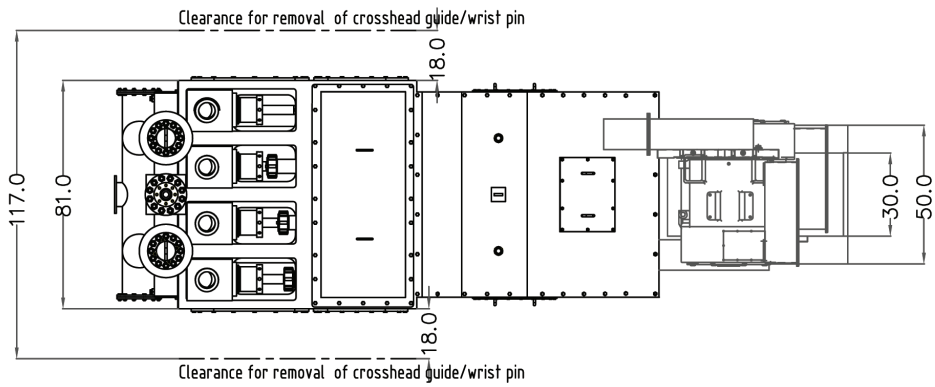
Total weight: 66,500 lbs (30,227 Kg)



Quatro 2450 hp (2) GE 752's rear mount with rebuild clearance

Total weight unitized: 83,770 lbs (37,997 Kg)

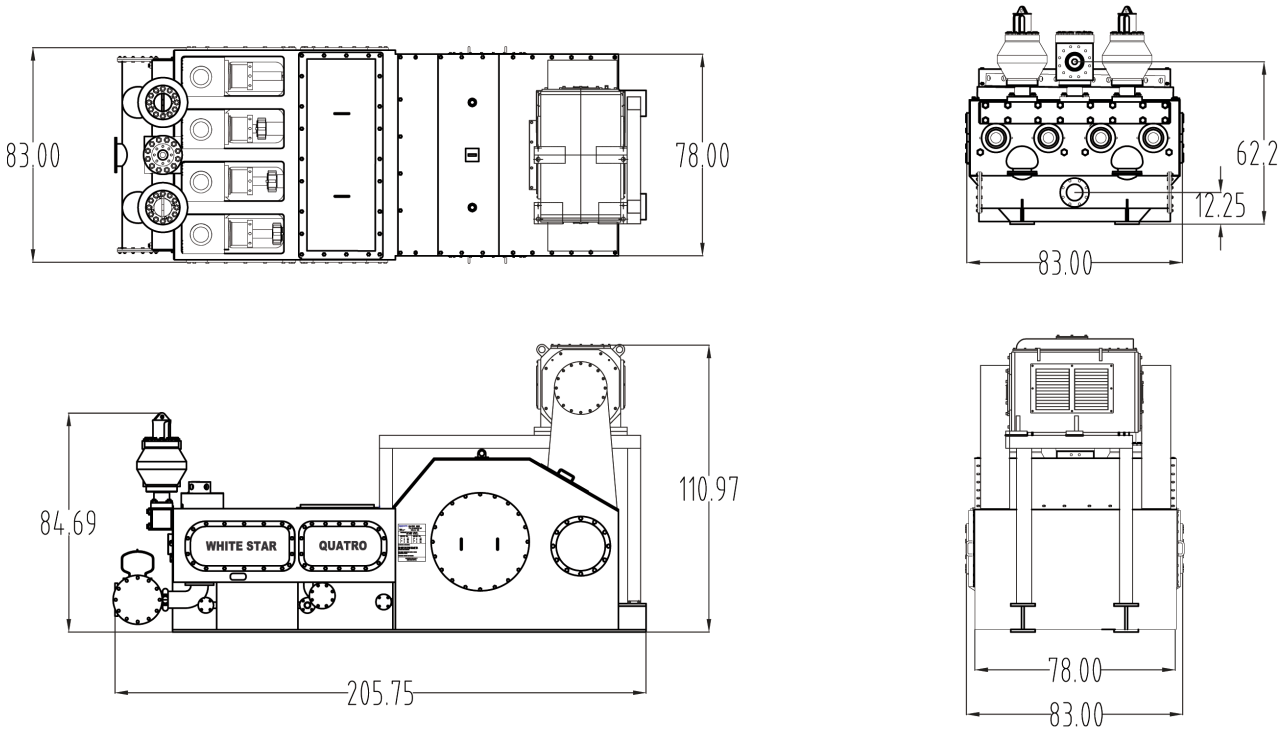




Quatro 2200/2450 hp Schematics

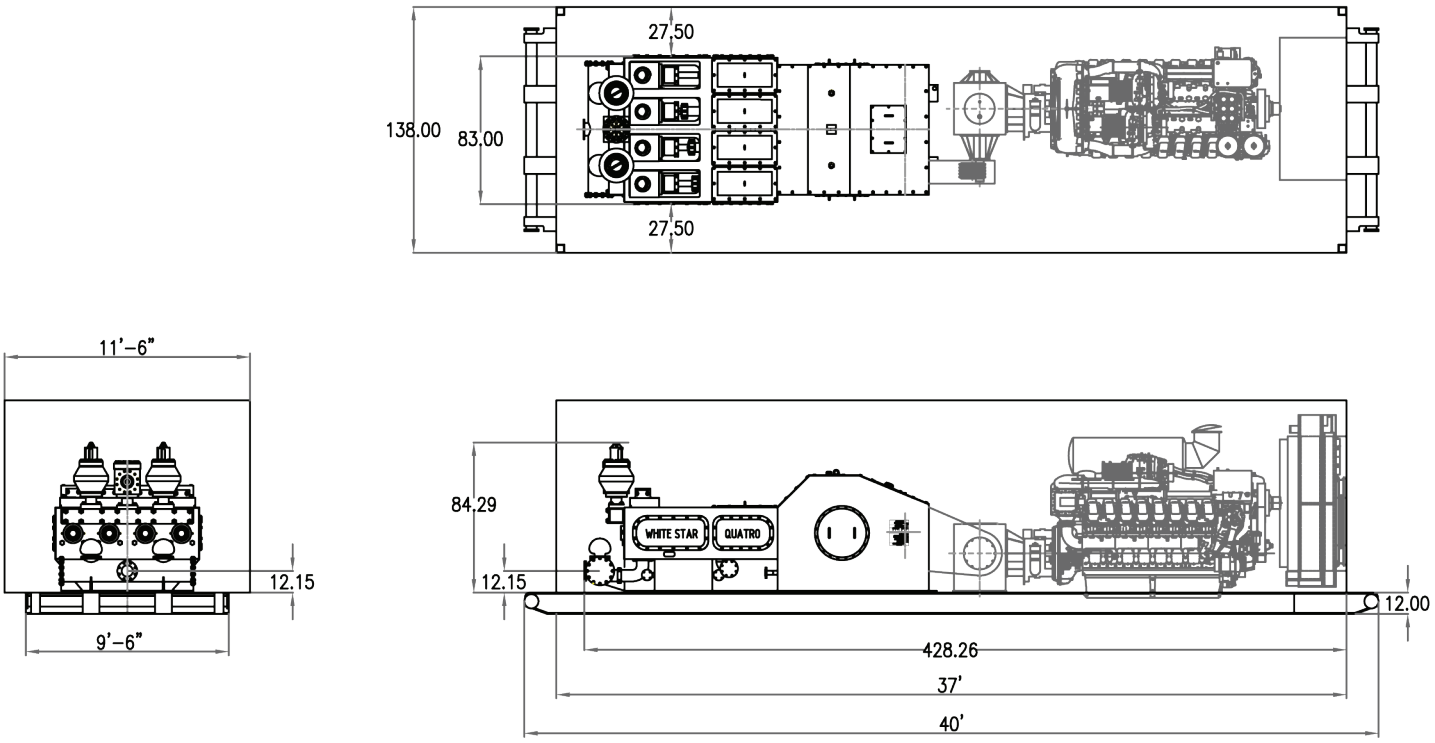
Quatro 2450 hp (1) 2000 hp electric-top mount

Total unitized weight: 73,204 lbs (33,204 Kg)



Quatro 2450 hp pump house-Detroit 16V4000 right angle box

Weight without house and skid: 83,500 lbs (38,691 Kg)



Parts and Service

■ Unitization

-Skid or trailer mounting
-White Star, Ideco, or other pumps
-With customer or White Star furnished parts

■ Ideco Replacement Parts

Whether it's a simple liner nut with a modified acme thread, a plug retainer, a pinion gear or an extension rod, White Star's Ideco-replaceable mud pump parts are designed and manufactured to the highest standards of quality and performance.

■ Commissioning

-Field commissioning and start-up (included with purchase price)
-Commission other manufacturer's pumps
-Field service work on White Star, Ideco, or quality North American pumps

■ Rebuild

Complete rebuilding services on White Star or other pumps
Contact White Star for more information.

■ Data Package

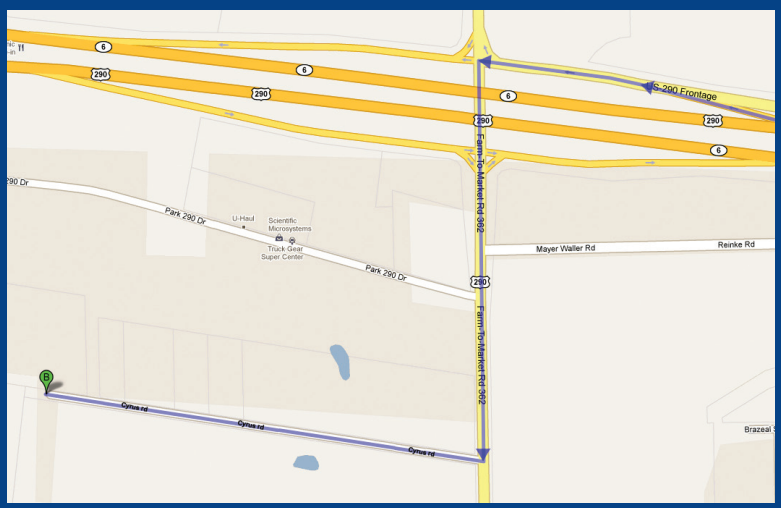
White Star's safety alarm system will detect abnormal mud pump behaviors and warn the operator that there is a potential problem that needs their attention. It is the operator's responsibility to investigate the problem. The White Star safety alarm system is a warning system for the pump operator and will not stop pump operations. The Data Package can be monitored remotely.

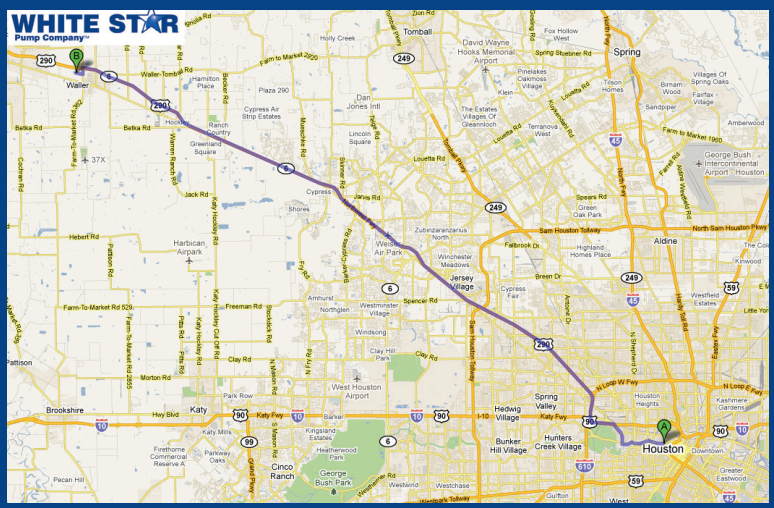
■ Trade in and Upgrade to New Equipment

White Star facilitates the purchase of White Star Quatro and Triplex pumps by accepting qualified North American pumps as trade in on new equipment.

WHITE STAR
Pump Company™

- Quatro mud pumps
- Triplex mud pumps
- Unitization services
- Ideco replacement parts
- Field service and commissioning





1-US 290 W to Austin
2-Exit FM 362
3-Left on FM 362
4-Right on Cyrus Rd
5-Straight ahead to White Star Pump company

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