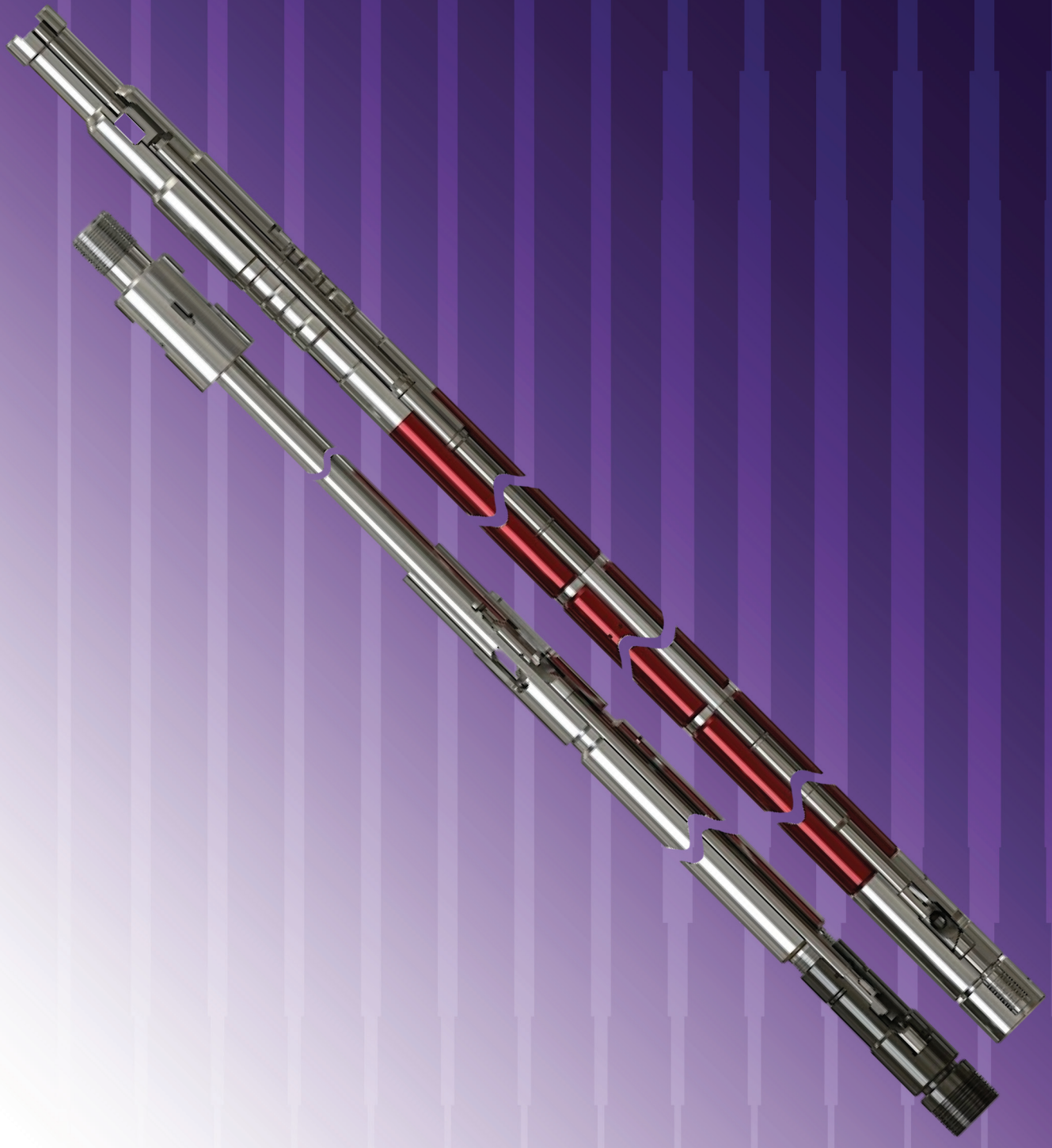
PROLIFT SUBSURFACE ROD PUMPS AND PARTS



Penguin
UPSTREAM TECHNOLOGIES

Prolift Subsurface Rod Pumps and Parts


Prolift
TM
optimal lift solutions

ABOUT PENGUIN PETROLEUM

Penguin's manufacturing facility in India manufactures and supply several products which include Side Pocket Gas Lift Mandrels and Conventional Gas Lift Mandrels, Production Packers including ESP Packers, Bride Plugs, Casing and Tubing Couplings, other tubular accessories, Drill Stem Subs, Subsurface Sucker Rod Pumps, Polished Rod and Sucker Rod Couplings etc.

Additionally, PPSL also manufactures ESP completion accessories like All Cast Cross Coupling Cable Protectors (CCCPs), Mid-Joint Cable Protectors, Control Line/Injection Line Protectors, MLE Clamps, Hydraulic Tubing Drain, ESP Centralizers etc.

Another line of products offered by PPSL consist an extensive range of Cast Steel Thread Protectors with Lifting Bails (CSTPs/Lift Nubbins) ranging from 2-3/8" to 8-5/8" with REG, IF, FH, XH, H-90 and NC connections.

INFRASTRUCTURE : GLOBAL DELIVERY CENTER INDIA

Penguin has a world class manufacturing and service facility located on a 90,000 sq ft plot, off the Mumbai-Pune Expressway, India, where bespoke engineering, manufacturing and other ancillary services are provided to it's customers.

In-house engineering & development – PPSL's engineering and development team consist experienced design engineers supported with most advanced CAD softwares like Solidworks, Siemens NX etc. PPSL's engineering team undertake a host of design and development activities involving preliminary feasibility assessment, establishment of design assumptions, design methodology, performing various stages of design and development for products through detailed design, solid modelling, calculations, 2D drawings and validation testing of products under operating conditions.

The facility is equipped with state-of-the-art machinery, inspection/quality control devices & tooling including well-equipped mechanical and metrology labs, NDT equipment, comprehensive range of Sucker Rod Pump tooling from Gearench/Petol USA, a full range of API work gauges, selected range of master gauges, pressure testing and vacuum testing devices, CNC turning centers, VMCs, Turn Mills, Oil Country mega bore lathes, fully automatic pipe cutting machines, Make-up/Break-out machine (100,000 ft/lbs torque), Honing and Deep hole drilling machines, robotic MIG/TIG welding equipment etc. Extensive range of these equipment and tooling coupled with highly skilled work force enable Penguin to deliver end-to-end solutions relating to it's spectrum of business expertise.

PPSL's design validation/functional test facility for completion tools and accessories is capable of testing downhole tools up to 1,200,000 lbf of bi-directional load, 4 separate or simultaneous channels each of liquid (ISO V3) & nitrogen gas and pressure testing (ISO V 0) up to 20,000 psi to 500 deg. F ambient temperature range.

Metrology Lab – Penguin's metrology lab uses most modern measurement equipment which include hand tools, Calipers, Micrometers, Bore gauges, Thread gauges, CMM (Coordinate Measuring Machine -Mitutoyo CRYSTA APEX S-9106), Contour Measuring Instrument (Mitutoyo Contracer CV 2100) etc. CMM enables us to carry out automated measurement of Cartesian coordinates using touch probes as well as contact scanning probes.

PPSL is also capable of undertaking DIFA (Dismantle, Inspection and Failure Analysis) services as well repair/refurbishment of used sub surface rod pumps.

Our extensive machining capabilities consist precision machined parts with complex shapes, ranging from tiny parts to large components for critical well completion applications, servicing global oil & gas customers and a range of OEMs.

In essence, the Global Delivery Center in India is poised to deliver world class solutions relating to bespoke engineering, precision machining, manufacturing etc.

HSE MANAGEMENT SYSTEM

Penguin has implemented a comprehensive program of safety standards, environmental and occupational standards and procedures which help in increasing its employees' HSE awareness, analyzing all identified hazards and strengthening its preventive maintenance measures. These steps ensure control of emissions and pollution and the efficient use of natural resources by reducing and recycling waste. Penguin continually strives to improve its HSE performance. Its goal is to have a responsible work force with a 100% safety record, zero accidents and zero damage to its equipment and environment.

Penguin has a fully compliant safety and environment management system in conformity with ISO 14001 & 18001.

Prolift™ PUMPS: OVERVIEW - QUALIFICATIONS AND EXPERIENCE

Except certain special applications, majority of sucker rod pumping systems operating all over the world are in conformity with the specifications of American Petroleum Institute (API). API specifications 11AX covers the technical parameters and requirements of subsurface sucker rod pumps and parts. API Spec 11AX standardizes the subsurface pumps and parts for pump bore sizes, dimensional requirements, parts interchangeability, base material requirements and plating / coating properties etc.

PPSL manufacturers subsurface sucker rod pumps and pump parts conforming to requirements of API 11AX under it's brand name Prolift ™. Prolift™ range of subsurface sucker rod pumps are manufactured using advanced technology and state of the art machinery, testing & inspection devices and gauges at their purpose built facility located close to Mumbai in India. The pumps offered are in the range of 1-1/16" to 3-3/4" bore sizes.

PPSL is also capable of designing and manufacturing API & non-API pumps for special applications with exotic metallurgies incorporating customer specified parameters and configurations.

PPSL does not manufacture pumps and pump parts in bulk quantities, rather confines to manufacturing limited quantities for selected customers where the quality of each and every part is carefully monitored, inspected and realized at various stages of manufacturing in full conformity with API requirements and international standards. Our work force is exceptionally skilled with an average 15 to 20 years of experience in machining parts using state of the art CNC machines, inspection/testing devices and API gauges to ensure optimum performance in hostile down hole conditions for the most critical and demanding applications world around.

SUCKER ROD PUMPING
Overview

Sucker rod pumping is one of the oldest and reliable mode of artificial lift globally used for producing oil. Roughly two thirds of the artificially lifted wells around the globe are installed with sucker rod pumps. It is the most economic and mechanically simple artificial lift method with relatively easy availability of required parts and skilled manpower. Rod pumping system is capable of producing a well down to very low pressure to maximize the oil production rate and used in applications involving slim holes, multiple completions, viscous and high temperature fluid production.

The Sucker Rod Pumping System consists essentially of five parts: the prime mover which provides power to the system; the gear reducer which reduces the speed of the prime mover to a suitable pumping speed; the pumping unit which translates the rotating motion of the gear reducer and prime mover into a reciprocating motion; the sucker rod string which is located inside the production tubing which transmits the reciprocating motion of the pumping unit to the subsurface pump; and the subsurface pump.

Advantages and Disadvantages of Rod Pumping System

Rod Pumps can be used to reduce bottomhole pressures to very low levels and offer great flexibility for low-to-medium production rates. They are relatively simple with respect to design, operation and maintenance and can be adapted to a wide range of operating conditions. As stated above, Rod Pumps account for the majority of artificial lift wells and considerd as one of the most well-known and generally understood systems in the field. Surface and downhole equipment can easily be refurbished and tends to have high salvage values.

While they have a very wide range of applications, rod pumping systems are mainly limited to onshore locations due to the weight and space requirements of surface pumping units. Solids production, corrosion and paraffin tendencies, high gas-liquid ratios, wellbore deviation and depth limitations due to sucker rod capabilities have all been seen as problem areas for this lift method, although some of these problems have been alleviated due to improvements in sucker rod metallurgy, the development of long-stroke pumping units and other technological advances.

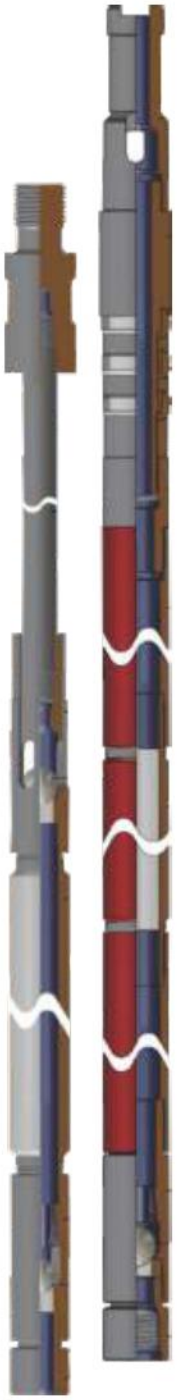
SUB SURFACE SUCKER ROD PUMPS

Sub surface sucker rod pump is one of the elements in sucker rod pumping unit. It works on positive displacement principle and are of cylinder and piston type. It consists of a stationary part, normally the working barrel - the Cylinder - and standing valve attached to barrel. Stationary unit of the pump is either attached to the end of tubing string or inside the tubing by means of proper anchors or hold downs. Traveling part consists of the plunger – the Piston - and traveling valve attached to it. Plunger is connected to the horse head of walking beam by sucker rod string throughout the depth of the well. The ball and seat valve connected to the barrel acts as standing valve or suction valve and the valve connected to the plunger acts as traveling valve or discharge valve. Both the valves act as check valves and their closing and opening during the reciprocating movement of plunger within the barrel brings the displacement of crude oil from subsurface to surface.

The following guidelines are intended for proper selection of different type of API pumps based on the well conditions such as well depth, production rate, viscosity, API Gravity, presence of gas or sand etc.

Types of Sucker Rod Subsurface Pumps

Rod driven pumps could be divided into three basic categories namely (1) Tubing pumps (2) the Rod or Insert pumps and (3) the Casing pumps (a larger version of insert pumps) which are rarely used in the industry. All of these pumps are actuated by a sucker rod string and surface pumping unit and the function of all of these pumps are to admit fluid from the formation into the producing string and to lift the admitted fluid to the surface.



Tubing Pumps (TH)

Working barrel of tubing pump is an integral part of tubing string. It is connected to the bottom of the tubing string and is run to desired depth along with the tubing string.

Relative advantages of Tubing Pumps

- The Largest Barrel sizes - it gives a maximum barrel size in a given tubing size hence the rate of production is high.
- The Strongest - Barrel is an integral part of the tubing string and the plunger is directly connected to the sucker rods, thus it can handle large fluid loads.
- The least expensive - It is relatively less expensive than rod pump due to fewer parts.
- Large Valves - Large valve sizes helps pumping of high viscous crude and results in lowest pressure loss.

Disadvantages of Tubing Pumps

- Repair costs are comparatively high because work over is required to pull the tubing string.
- Poor performance in gas producing wells due to comparatively large dead space between standing valve and traveling valve at the bottom due to standing valve puller assembly.
- Lifting depth limited due to large fluid load associated with large barrel/plunger. At greater depths, the stroke loss is expected due to large tubing or rod stretch.

ROD PUMPS OR INSERT PUMPS (RH)

Rod Pumps (RH - RX - RW)

Rod pumps or Insert pumps are installed inside the tubing and are attached to the tubing system by anchors and thus they can be pulled without disturbing the tubing. It requires only half of the time required to pull the rod pump as opposed to pulling a tubing pump.

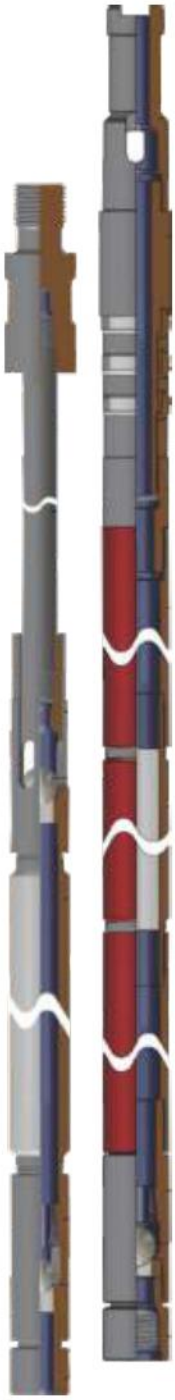
There are different options available due to its wide applications -

Traveling Barrel Rod Pumps - Thin or Heavy Wall (RWT - RHT)

In this type of pump, traveling component is the barrel with its valve, instead of the plunger. The plunger is clamped to the seat by means of a pull tube. Standing and traveling valves are placed in the upper part of the plunger and the barrel respectively.

Advantages

Suitable for sand producing wells because traveling barrel allows the fluid to move until seating nipple which prevents the settling of sand around the pump and traveling valve in the top cage will remain closed when pump off which will also prevent the movement of sand inside the pump.



The sucker rod string directly connects to the barrel top cage which is stronger than the plunger top cage. Better fluid passage due to open type traveling valve and standing valve cages.

Limitations

Fluid flow inside the pull tube causes pressure drop between well bore and pumping chamber which is not good for wells with low static fluid level. In deep wells, if the fluid load is significant, it may cause deformation in the pull tube.

Top Anchor Heavy or Thin Wall Barrel Rod Pumps (RWA - RHA)

In this type of pump, the barrel is stationary and is anchored inside the tubing string using seating nipple. Plunger moves inside the barrel and creates pressure difference to lift the crude oil. Oil is discharged above the anchor and it is useful to prevent the sand deposition inside the pump. These pumps are good for sand producing wells. Thin wall barrels in deep wells may break the barrel due to the large inside pressure in barrels in down stroke.

Bottom Anchor Heavy, Heavy - Wall Box Thread or Thin Wall Barrel Rod Pumps (RWB - RXB - RHB)

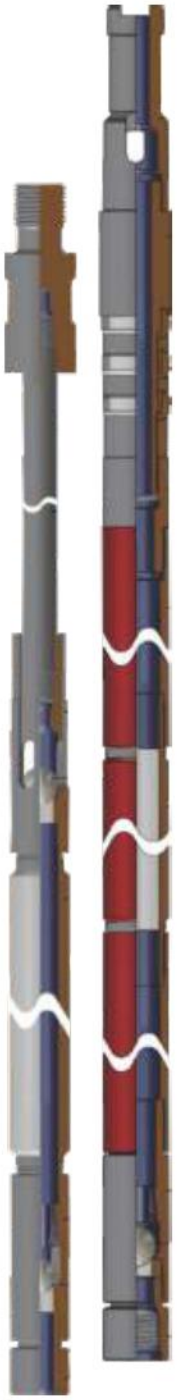
In this type of pump, anchor is under the stationary barrel standing valve. Pressure inside and outside the barrel is equal during down stroke. This makes the pump suitable for deep wells. These pumps are suitable for low dynamic fluid level wells and highly viscous crude due to comparatively large standing valve than other rod pumps.

These pumps are not suitable for sand producing wells as the sand settles between the tubing and barrel from bottom to top of the pump making pump removal impossible. Sometime it is required to pull the tubing string filled with crude to repair or remove the pump.

MATERIAL SELECTION

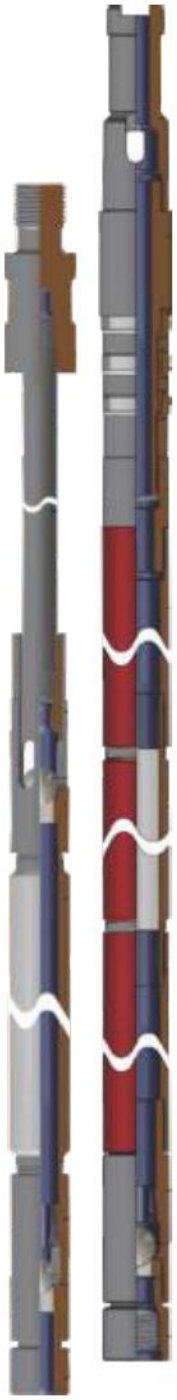
PPSL uses wide variety of material for parts in order to suit the pumps for various well conditions such as corrosion, abrasion etc.

Barrels, Plungers, Ball and Seats

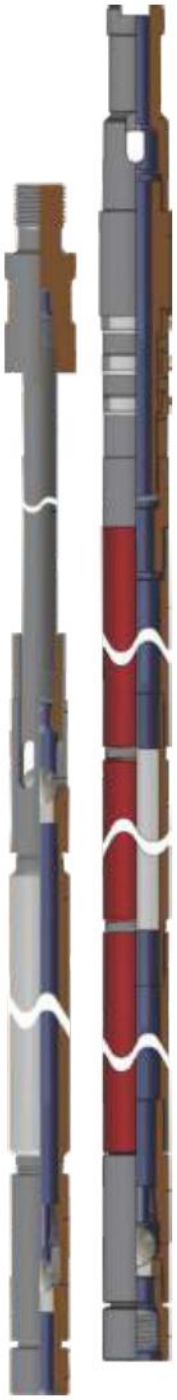


PPSL has the following Barrels, Plungers and Ball and Seat configurations in their product programme:

BARREL						
Plated Barrel						
Sr #	**Material Identification symbol**	**Description**	**Inside surface condition (Coating Requirements)**	**Base core hardness**	**Base Material Minimum yield Strength, ksi**	**Base material**
1	A1	Chrome plate on steel	Min Thickness - 0.003 in. (0.076 mm) Coating Hardness Hv_{100} = 900 - 1160	55-62 HRA	60	AISI 1026
2	A2	Chrome plate on Brass	Min Thickness - 0.003 in. (0.076 mm) Coating Hardness Hv_{100} = 900 - 1160	80-100 HRB	50	Inhibited Admiralty Brass UNS C44300
3	A3	Chrome plate on 4/6 % Cr Steel	Min Thickness - 0.003 in. (0.076 mm) Coating Hardness Hv_{100} = 900 - 1160	55-62 HRA	70	UNS S50100 steel with 4% - 6% chrome
Case Hardened Barrel						
4	B1	Carbonitrided steel	690 Knoop min for 0.005 in. per side with 466 Knoop min. at 0.010 in. per side.	HRC 23 Max	60	AISI 1026
5	B2	Carburized Steel	690 Knoop min for 0.005 in.per side with 466 Knoop min. at 0.010 in. per side.	HRC 23 Max	60	AISI 1018 / AISI 1020
6	B3	Carbonitrided 4/6 Chrome Steel	690 Knoop min for 0.005 in.per side with 466 Knoop min. at 0.010 in. per side.	HRC 23 Max	70	UNS S50100 steel with 4% - 6% chrome
7	B5	Nitrided low alloy steel	690 Knoop min at surface with 466 Knoop min. at 0.005 in. per side.	HRC 23 Max	50	AISI 4140
Note: Specific additional metallurgical requirements could be made available upon customer request.						



PLUNGER						
Spray Metal Coated Plunger						
Sr #	**Material Identification symbol**	**Description**	**External surface condition (Coating Requirements)**	**Base core hardness**	**Base Material Minimum yield Strength, ksi**	**Base material**
1	B1	Spray Metal	Min Thickness - 0.008 in. (0.254 mm) Coating Hardness Hv_{200} = 484 min.	44-62 HRA	40	AISI 1026 AISI 4140 AISI 8620
2	B2	Spray Metal	Min Thickness - 0.008 in. (0.254 mm) Coating Hardness Hv_{200} = 595 min.	44-62 HRA	40	AISI 1026 AISI 4140 AISI 8620
3	B3	Spray Metal with Ni/Cu (Monel) Alloy Ends	Min Thickness - 0.008 in. (0.254 mm) Coating Hardness Hv200 = 595 min.	44-62 HRA	40	AISI 1026 AISI 4140 AISI 8620
4	B4	Spray Metal with Nickel Plated Pin Ends	Min Thickness - 0.008 in. (0.254 mm) Coating Hardness Hv200 = 484 min. Nickel Plating on Pins - 0.0013 In. (0.033 mm) min thickness.	44-62 HRA	40	AISI 1026 AISI 4140 AISI 8620
Plated Plungers						
5	A1	Chrome Plated	Min Thickness - 0.006 in. (0.152 mm) Coating Hardness Hv_{100} = 832 - 1160	55-62 HRA	50	AISI 1026 AISI 4140 AISI 8620
6	A2	Double Chrome Plated	Min Thickness - 0.012 in. (0.305 mm) Coating Hardness Hv_{100} = 832 - 1160	55-62 HRA	50	AISI 1026 AISI 4140 AISI 8620
Note: Specific metallurgical requirements for special applications could be made available upon customer request.						



BALL AND SEAT VALVE				
Sr #	**Material Identification symbol**	**Description**	**Hardness**	**Base material**
1	A1	Stainless steel	Ball = 58-65 HRC Seat = 52-56 HRC	UNS 41000 - UNS 44000
2	B1	Cobalt Alloy, Cast	Ball = 56-63 HRC Seat = 50-56 HRC	Cobalt, Chromium and Tungsten alloy.
3	B2	Cobalt Alloy, Powder Metal	Ball = 53-60 HRC Seat = 51-57 HRC	Cobalt, Chromium and Tungsten alloy.
4	C1	Tungsten Carbide	Ball = 88-89 HRA Seat = 88-89.5 HRA	Tungsten with Cobalt binder.
5	C2	Nickel Carbide	Ball = 89-90.5 HRA Seat = 87.5-89 HRA	Tungsten with Nickel binder.
6	C3	Titanium Carbide	Ball = 89-90.5 HRA Seat = 89-90.5 HRA	Tungsten and Titanium Carbide with Cobalt binder.

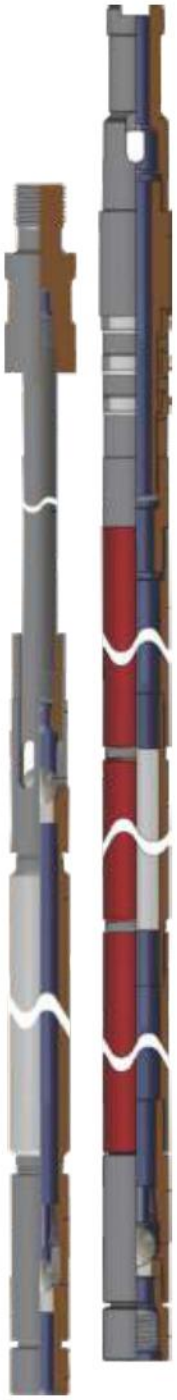
SRP Component parts

PPSL currently manufacturers sucker rod pump component parts of following standard metallurgy, however specific metallurgy requirements for special applications could be supplied upon customer request.

CAGE AND FITTINGS					
Sr #	**Material Identification symbol**	**Description**	**Hardness**	**Minimum Yield Strength, ksi**	**Base material**
1	A1	Steel	55-62 HRA	50	AISI 1026
2	A2	Low alloy steel	55-62 HRA	50	AISI 4140
3	A3	Low alloy steel	55-62 HRA	50	AISI 8620
4	A4	Ni/Cu alloy	52-62 HRA	50	Monel R400
5	A5	Brass	43-55 HRA	40	C360 / C464
6	A6	Stainless Steel	46-62 HRA	35	AISI 316

API Pump Designation

The basic types of pumps and letter designation covered by API specifications are shown below. Complete pump designation include (1) Nominal Tubing Size, (2) Basic Bore Diameter, (3) Type of pump including type of barrel and location and type of seating assembly, (4) Barrel Length, (5) Plunger Length, (6) Length of each extensions when used.

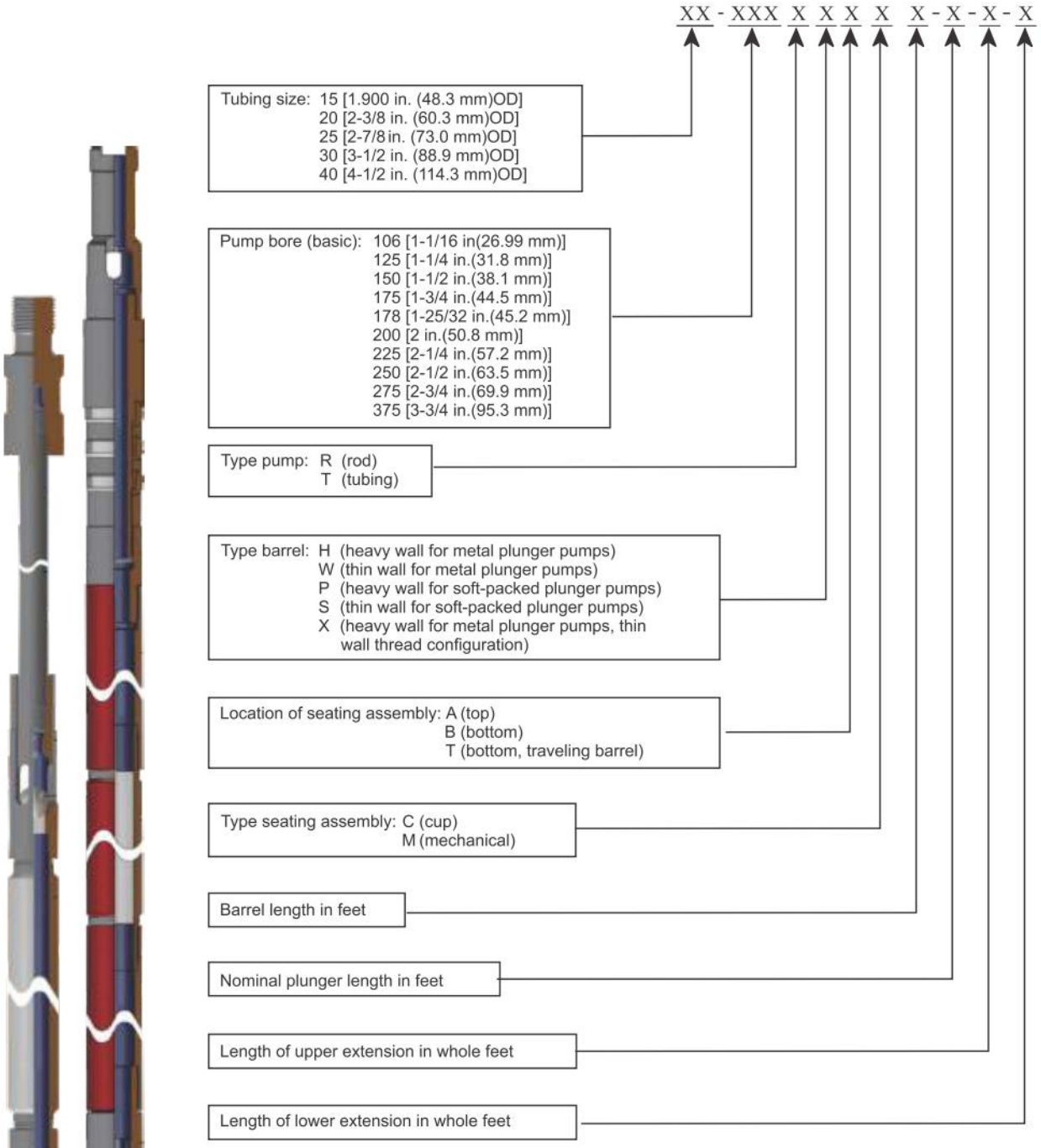


	Letter Designation			
	Metal Plunger Pumps		Soft-Packed Plunger Pumps	
Type of Pump	Heavy-Wall Barrel	Thin-Wall Barrel	Heavy-Wall Barrel	Thin-Wall Barrel
Rod Pumps				
Stationary Barrel, Top Anchor	RHA	RWA	-	RSA
Stationary Barrel, Bottom Anchor	RHB	RWB	-	RSB
Stationary Barrel, Bottom Anchor	RXB	-	-	-
Traveling Barrel, Bottom Anchor	RHT	RWT	-	RST
Tubing Pumps	TH	-	TP	-

Example : A 1-1/4" (31.8 mm) bore rod type pump with a 10 ft (3.048 m) heavy wall barrel, 2 ft (0.610 m) upper extension, 2 ft (0.610 m) lower extension, a 4 ft (1.219 m) plunger and a bottom cup type seating assembly for operation in 2-3/8" (60.3 mm) tubing, would be designated as follows :

20-125-RHBC 10-4-2-2

Complete pump designation system is shown below :



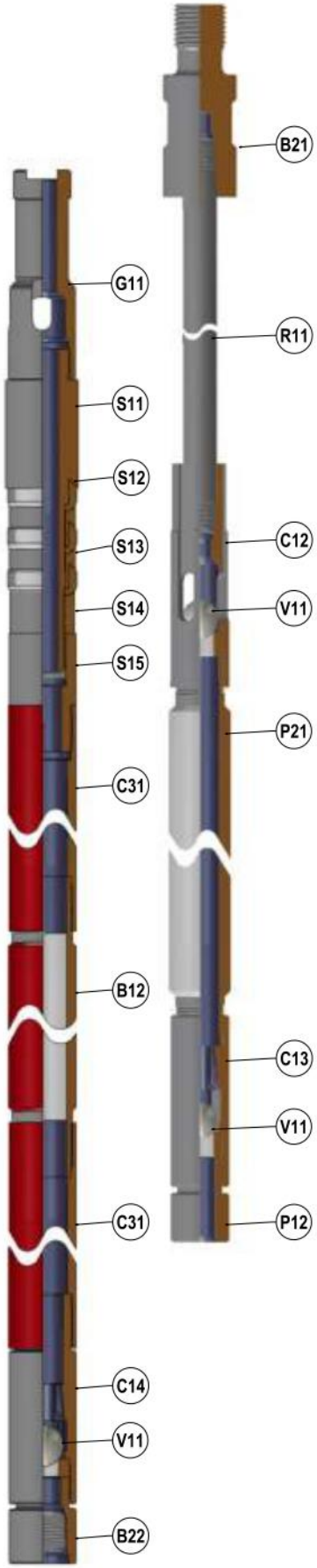
Pump Assemblies

Different type of sucker rod pumps and assemblies using component parts per API 11AX Specification are demonstrated in the following sections.

Sucker rod pumps manufactured by PPSL are in total conformity with the requirements of API 11AX and are functionally tested and certified by appropriate test methods like Pump stroke test, Vacuum Test or Pump Slippage test.

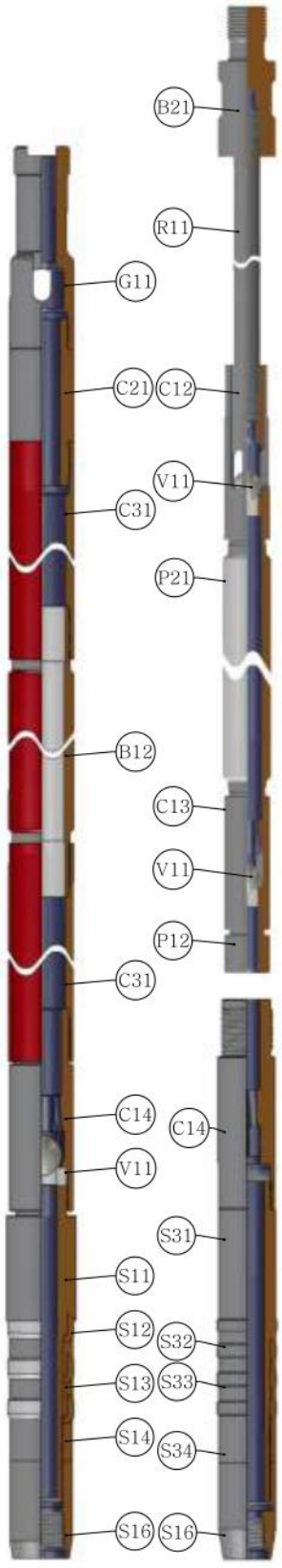
The purpose of this section is to present the various pump assemblies and its component parts supplied by PPSL.

RHA - Rod, Stationary Heavy Wall Barrel, Top Anchor Pump



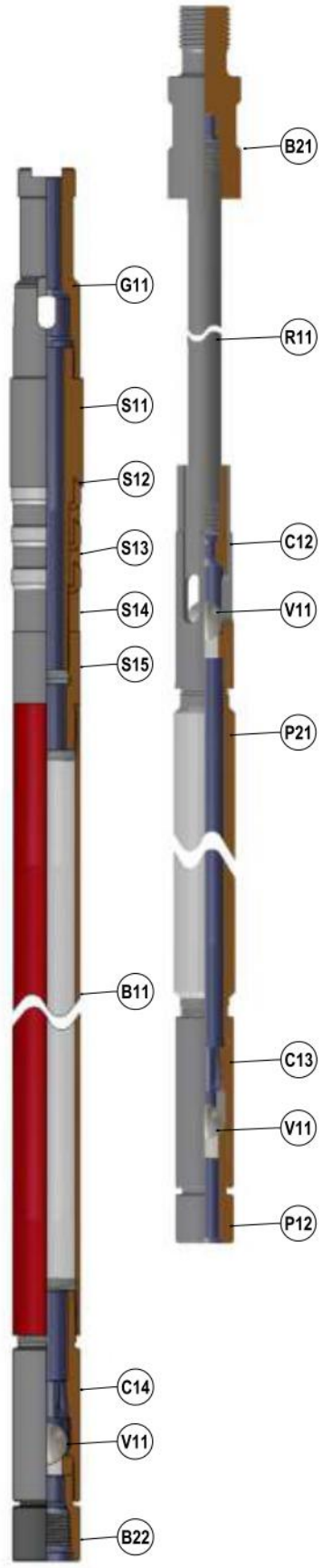
RHA - Rod, Stationary Heavy Wall Barrel, Top Anchor Pump	
Part #	**Description**
B12	Barrel, Heavy Wall
B21	Bushing, Valve Rod
B22	Bushing, Barrel Cage
C12	Cage, Top Plunger
C13	Cage, Closed Plunger
C14	Cage, Closed Barrel
C31	Coupling, Extension
G11	Guide, Valve Rod
P12	Plug, Seat
P21	Plunger, One Piece
R11	Rod, Valve
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S15	Seating Cup Bushing
V11	Valve, Ball and Seat (Traveling & Standing)

RHB - Rod, Stationary Heavy Wall Barrel, Bottom Anchor Pump



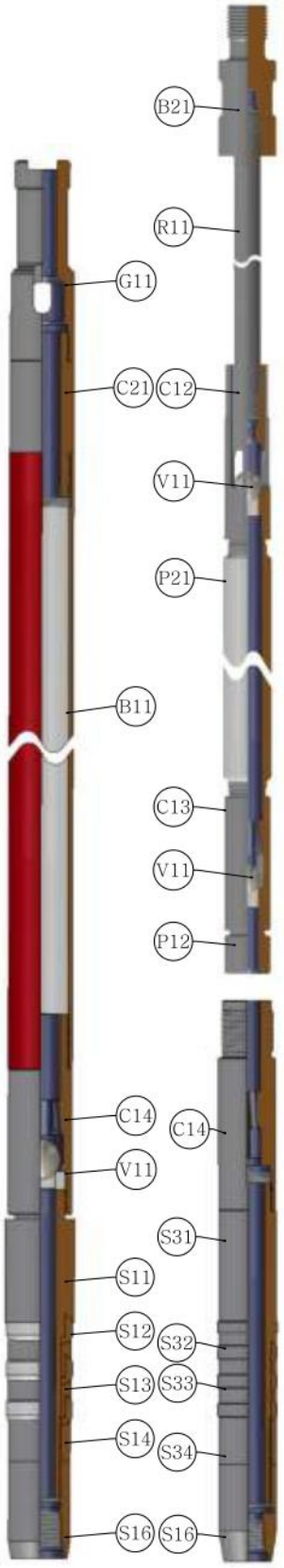
RHB - Rod, Stationary Heavy Wall Barrel, Bottom Anchor Pump	
Part #	**Description**
B12	Barrel, Heavy Wall
B21	Bushing, Valve Rod
C12	Cage, Top Plunger
C13	Cage, Closed Plunger
C14	Cage, Closed Barrel
C21	Connector, Upper Barrel
C31	Coupling, Extension
G11	Guide, Valve Rod
P12	Plug, Seat
P21	Plunger, One Piece
R11	Rod, Valve
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S16	Seating Cup Coupling
S31	Seating Mandrel, Cup (Type O)
S32	Seating Cup (Type O)
S33	Seating Cup Ring (Type O)
S34	Seating Cup Nut (Type O)
V11	Valve, Ball and Seat (Traveling & Standing)

RWA - Rod, Stationary Thin Wall Barrel, Top Anchor Pump



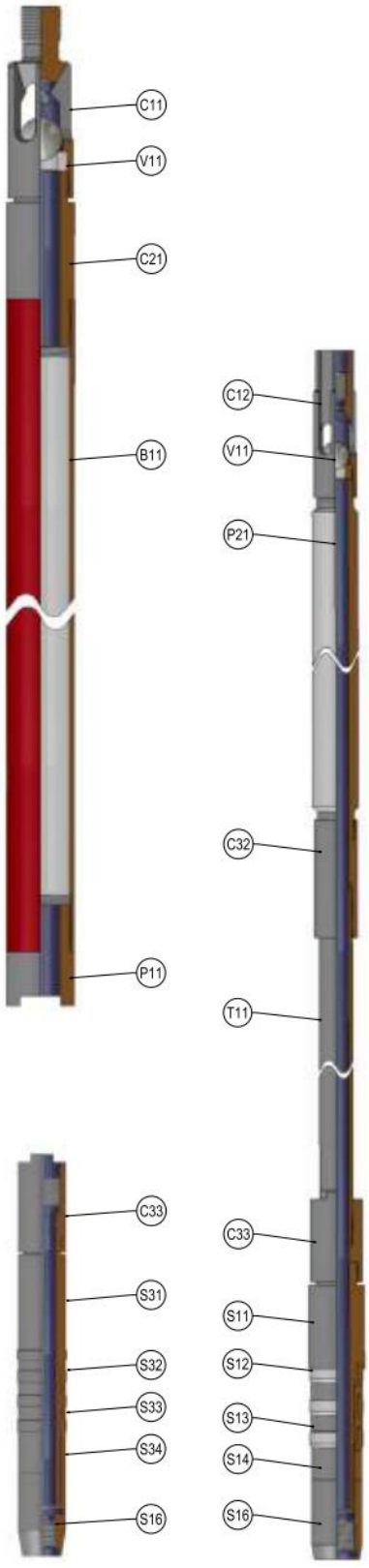
RWA - Rod, Stationary Thin Wall Barrel, Top Anchor Pump	
Part #	**Description**
B11	Barrel, Thin Wall
B21	Bushing, Valve Rod
B22	Bushing, Barrel Cage
C12	Cage, Top Plunger
C13	Cage, Closed Plunger
C14	Cage, Closed Barrel
G11	Guide, Valve Rod
P12	Plug, Seat
P21	Plunger, One Piece
R11	Rod, Valve
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S15	Seating Cup Bushing
V11	Valve, Ball and Seat (Traveling & Standing)

RWB - Rod, Stationary Thin Wall Barrel, Bottom Anchor Pump



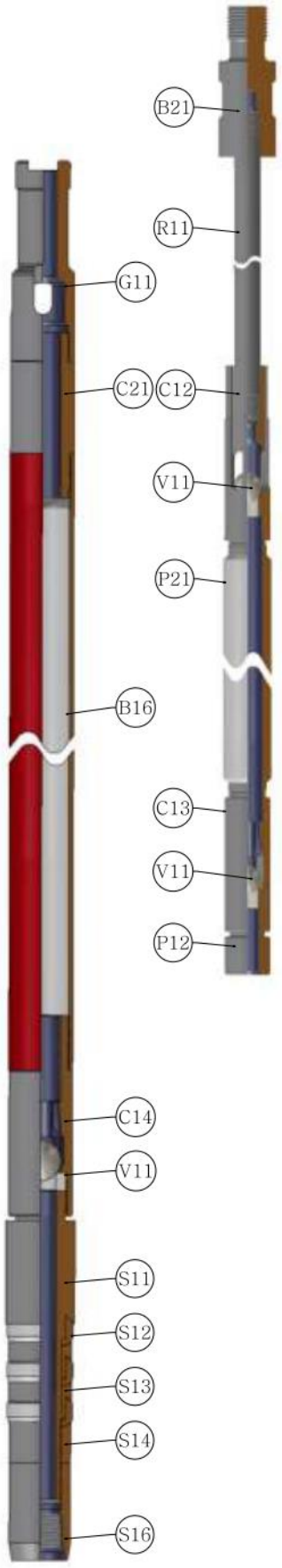
RWB - Rod, Stationary Thin Wall Barrel, Bottom Anchor Pump	
Part #	**Description**
B11	Barrel, Thin Wall
B21	Bushing, Valve Rod
C12	Cage, Top Plunger
C13	Cage, Closed Plunger
C14	Cage, Closed Barrel
C21	Connector, Upper Barrel
G11	Guide, Valve Rod
P12	Plug, Seat
P21	Plunger, One Piece
R11	Rod, Valve
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S16	Seating Cup Coupling
S31	Seating Mandrel, Cup (Type O)
S32	Seating Cup (Type O)
S33	Seating Cup Ring (Type O)
S34	Seating Cup Nut (Type O)
V11	Valve, Ball and Seat (Traveling & Standing)

RWT - Rod, Traveling Thin Wall Barrel, Bottom Anchor Pump



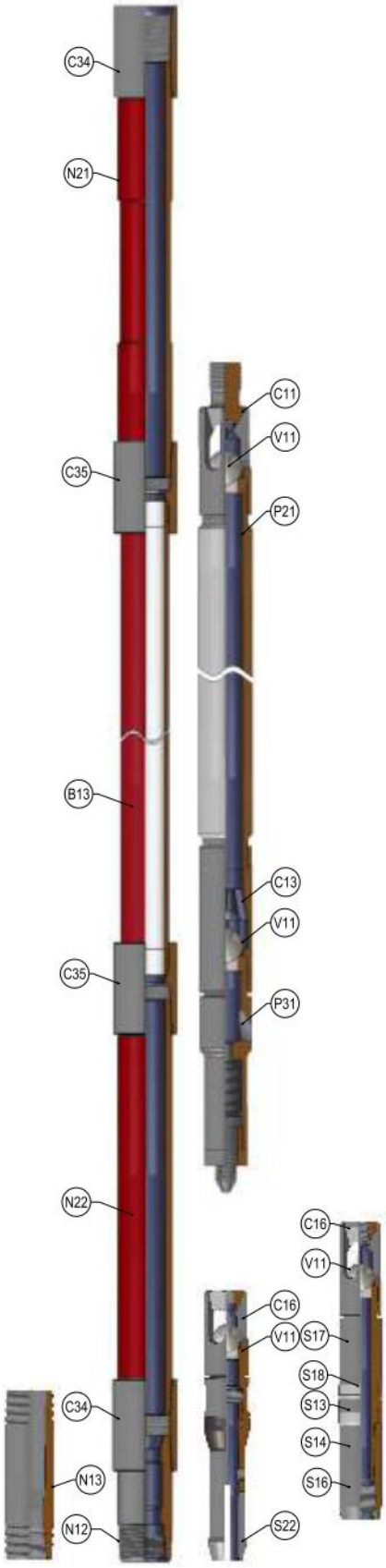
RWT - Rod, Traveling Thin Wall Barrel, Bottom Anchor Pump	
Part #	**Description**
B11	Barrel, Thin Wall
C11	Cage, Top Open
C12	Cage, Top Plunger
C21	Connector, Upper Barrel
C32	Coupling, Pull Tube, Upper
C33	Coupling, Pull Tube, Lower
P11	Plug, Pull
P21	Plunger, One Piece
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S16	Seating Cup Coupling
S31	Seating Mandrel, Cup (Type O)
S32	Seating Cup (Type O)
S33	Seating Cup Ring (Type O)
S34	Seating Cup Nut (Type O)
T11	Tube, Pull
V11	Valve, Ball and Seat (Traveling & Standing)

RXB - Rod, Stationary Heavy Wall Barrel, Bottom Anchor Pump



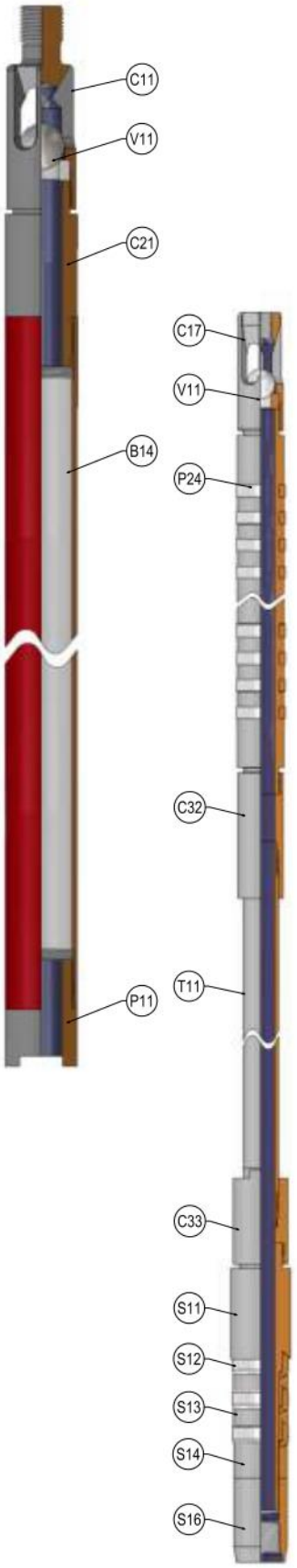
RXB - Rod, Stationary Heavy Wall Barrel, Bottom Anchor Pump	
Part #	**Description**
B16	Barrel, Heavy Wall
B21	Bushing, Valve Rod
C12	Cage, Top Plunger
C13	Cage, Closed Plunger
C14	Cage, Closed Barrel
C21	Connector, Upper Barrel
G11	Guide, Valve Rod
P12	Plug, Seat
P21	Plunger, One Piece
R11	Rod, Valve
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S16	Seating Cup Coupling
V11	Valve, Ball and Seat (Traveling & Standing)

TH - Tubing, Heavy Wall Barrel Pump



TH - Tubing, Heavy Wall Barrel Pump	
Part #	**Description**
B23	Bushing, Optional
B13	Barrel, Heavy Wall
C11	Cage, Top Open
C13	Cage, Closed Plunger
C16	Cage, Standing Valve
C34	Coupling, Tubing
C35	Coupling, Barrel
N12	Nipple, Seating, Mech.
N13	Nipple, Seating
N21	Nipple, Extension, Upper
N22	Nipple, Extension, Lower
P21	Plunger, One Piece
P31	Puller, Standing Valve
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S16	Seating Cup Coupling
S17	Seating Mandrel, Cup (Type HR)
S18	Seating Cup (Type HR)
V11	Valve, Ball and Seat (Traveling & Standing)
S22	Seating assembly, Mechanical bottom lock.
	Optional Plunger Assembly
C15	Cage, Closed, Box Plunger
C22	Connector, Box Plunger
P23	Plunger, Box End

RST - Rod Traveling Thin wall Barrel, Bottom Anchor, Soft Packed plunger pump



RST - Rod Traveling Thin wall Barrel, Bottom Anchor, Soft Packed plunger pump	
Part #	**Description**
B14	Barrel, Soft-Packed Rod Pump
C11	Cage, Top Open
C17	Cage, Top Plunger
C21	Connector, Upper Barrel
C32	Coupling, Pull Tube, Upper
C33	Coupling, Pull Tube, Lower
P11	Plug, Pull
P24	Plunger, Soft-Packed
S11	Seating Mandrel, Cup (Type HR)
S12	Seating Cup (Type HR)
S13	Seating Cup Ring (Type HR)
S14	Seating Cup Nut (Type HR)
S16	Seating Cup Coupling
T11	Tube, Pull
V11	Valve, Ball and Seat (Traveling & Standing)

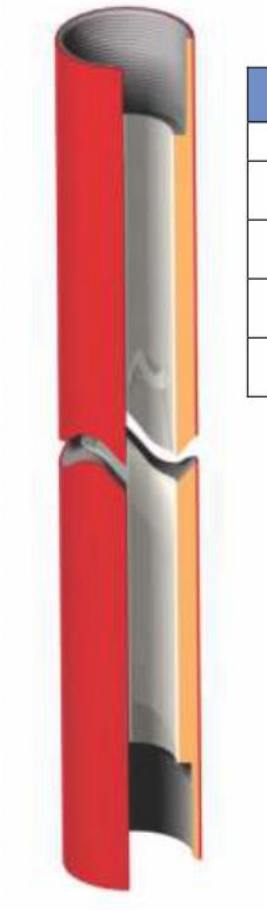
Sucker Rod Pump Component Parts

Sucker rod pump component parts manufactured by PPSL are strictly in conformity to the requirements of API 11AX in terms of dimension, base material, mechanical properties and all other requirements. All the pump parts manufactured by PPSL are interchangeable with any pump assembly designed as per API 11AX specifications.

PPSL adopted the master part numbering system designed by API to maintain easy parts identification and traceability.

Pump parts required to be ordered based on the part numbers provided with each component part and the material identification symbol.

B11 - Barrel, Thin Wall



B11 - Barrel, Thin Wall							
Part Designation	Material						
B11-125	A1	A2	A3	B1	B2	B3	B5
B11-150	A1	A2	A3	B1	B2	B3	B5
B11-200	A1	A2	A3	B1	B2	B3	B5
B11-250	A1	A2	A3	B1	B2	B3	B5

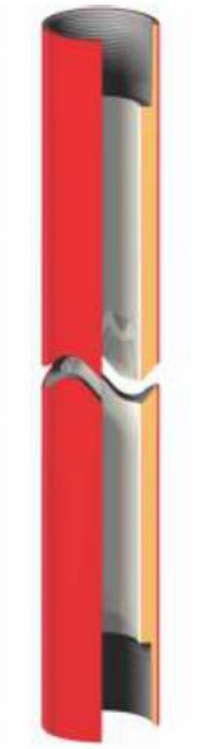
B12 - Barrel, Heavy Wall

B12 - Barrel, Heavy Wall (Rod Pump)							
Part Designation	Material						
B12-106	A1	A2	A3	B1	B2	B3	B5
B12-125	A1	A2	A3	B1	B2	B3	B5
B12-150	A1	A2	A3	B1	B2	B3	B5
B12-175	A1	A2	A3	B1	B2	B3	B5
B12-225	A1	A2	A3	B1	B2	B3	B5

B13 - Barrel, Heavy Wall, Tubing Pump

B13 - Barrel, Heavy Wall, Tubing Pump							
Part Designation	Material						
B13-175	A1	A2	A3	B1	B2	B3	B5
B13-225	A1	A2	A3	B1	B2	B3	B5
B13-275	A1	A2	A3	B1	B2	B3	B5
B13-375	A1	A2	A3	B1	B2	B3	B5

B14 - Barrel, Thin wall (Soft-Packed Rod Pump)

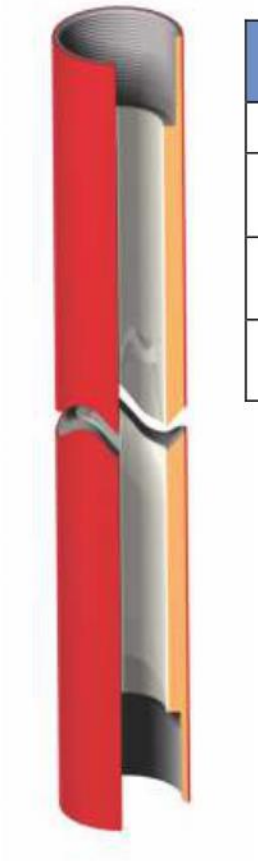


B14 - Barrel, Thin Wall, (Soft -Packed Rod Pumps)							
Part Designation	Material						
B14-125	A1	A2	A3	B1	B2	B3	B5
B14-150	A1	A2	A3	B1	B2	B3	B5
B14-200	A1	A2	A3	B1	B2	B3	B5
B14-250	A1	A2	A3	B1	B2	B3	B5

B15 - Barrel , Heavy Wall (Soft Packed Tubing Pump)

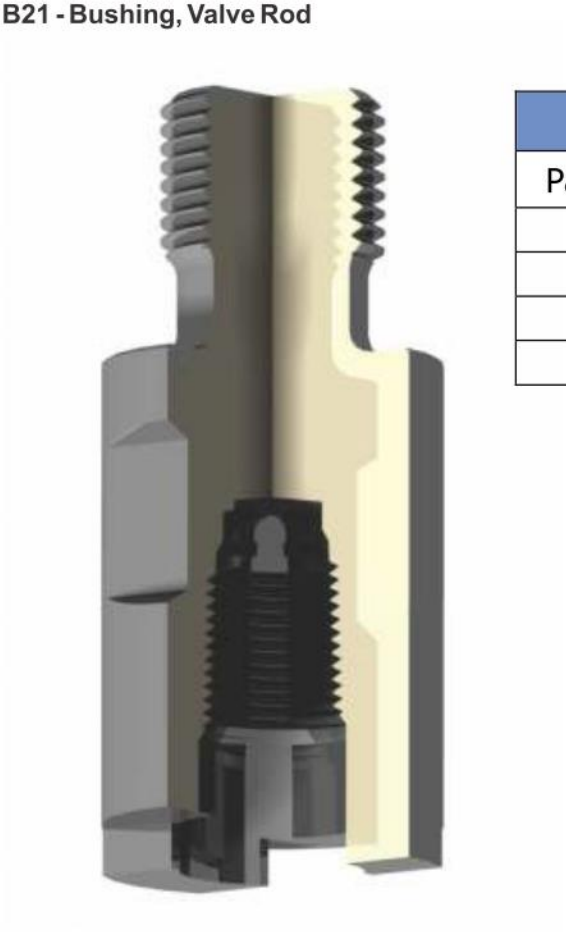
B15 - Barrel, Heavy Wall (Soft Packed Tubing Pump)							
Part Designation	Material						
B15-178	A1	A2	A3	B1	B2	B3	B5
B15-225	A1	A2	A3	B1	B2	B3	B5
B15-275	A1	A2	A3	B1	B2	B3	B5

B16 - Barrel, Heavy Wall (Rod Pumps)



B16 - Barrel, Heavy Wall (Rod Pump)							
Part Designation	Material						
B16-125	A1	A2	A3	B1	B2	B3	B5
B16-150	A1	A2	A3	B1	B2	B3	B5
B16-200	A1	A2	A3	B1	B2	B3	B5

B21 - Bushing, Valve Rod

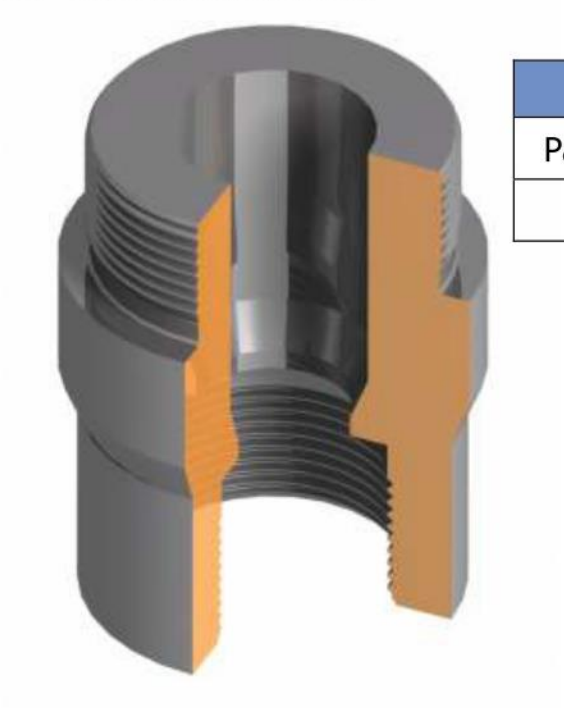


B21- Bushing, Valve Rod						
Part Designation	Material					
B21-15	A1	A2	A3	A4	A5	A6
B21-20	A1	A2	A3	A4	A5	A6
B21-25	A1	A2	A3	A4	A5	A6
B21-30	A1	A2	A3	A4	A5	A6

B22 - Bushing, Seat, Barrel Cage

B22 - Bushing, Seat, Barrel Cage						
Part Designation	Material					
B22-15	A1	A2	A3	A4	A5	A6
B22-20	A1	A2	A3	A4	A5	A6
B22-25	A1	A2	A3	A4	A5	A6
B22-30	A1	A2	A3	A4	A5	A6

B23 - Bushing, Cage to Puller



B23 - Bushing, Cage to Puller						
Part Designation	Material					
B23-40	A1	A2	A3	A4	A5	A6

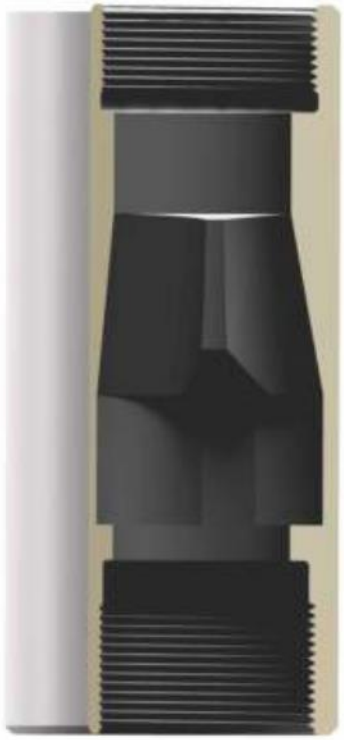
C11 - Cage, Top Open

C11 - Cage, Top Open						
Part Designation	Material					
C11-15	A1	A2	A3	A4	A5	A6
C11-20	A1	A2	A3	A4	A5	A6
C11-25	A1	A2	A3	A4	A5	A6
C11-30	A1	A2	A3	A4	A5	A6
C11-40	A1	A2	A3	A4	A5	A6

C12 - Cage, Top Plunger

C12 - Cage, Top Plunger						
Part Designation	Material					
C12-106	A1	A2	A3	A4	A5	A6
C12-125	A1	A2	A3	A4	A5	A6
C12-150-20	A1	A2	A3	A4	A5	A6
C12-150-25	A1	A2	A3	A4	A5	A6
C12-175	A1	A2	A3	A4	A5	A6
C12-200	A1	A2	A3	A4	A5	A6
C12-225	A1	A2	A3	A4	A5	A6
C12-250	A1	A2	A3	A4	A5	A6

C13 - Cage, Closed, Pin Plunger

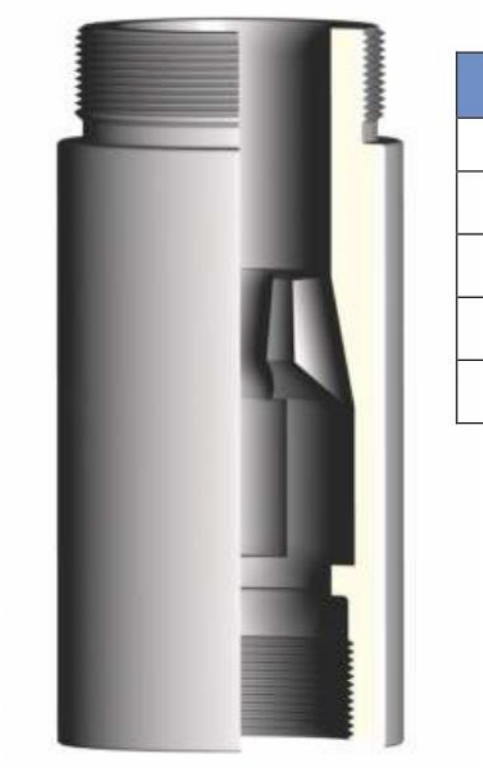


C13 - Cage, Closed, Pin Plunger						
Part Designation	Material					
C13-106	A1	A2	A3	A4	A5	A6
C13-125	A1	A2	A3	A4	A5	A6
C13-150	A1	A2	A3	A4	A5	A6
C13-175	A1	A2	A3	A4	A5	A6
C13-200	A1	A2	A3	A4	A5	A6
C13-225	A1	A2	A3	A4	A5	A6
C13-250	A1	A2	A3	A4	A5	A6
C13-275	A1	A2	A3	A4	A5	A6
C13-375	A1	A2	A3	A4	A5	A6

C14 - Cage, Closed Barrel

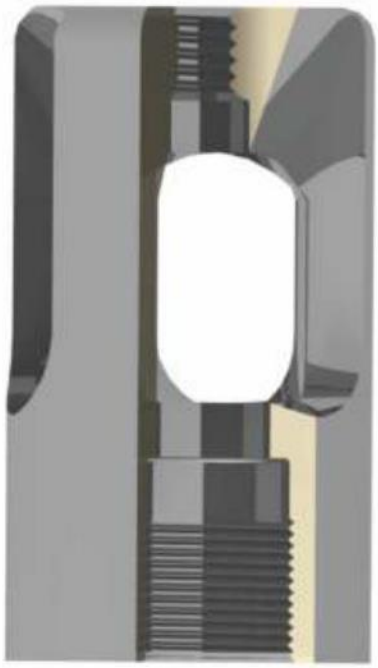
C14 - Cage, Closed Barrel						
Part Designation	Material					
C14-15	A1	A2	A3	A4	A5	A6
C14-20-125	A1	A2	A3	A4	A5	A6
C14-20	A1	A2	A3	A4	A5	A6
C14-25	A1	A2	A3	A4	A5	A6
C14-30	A1	A2	A3	A4	A5	A6

C15 - Cage, Closed, Box Plunger



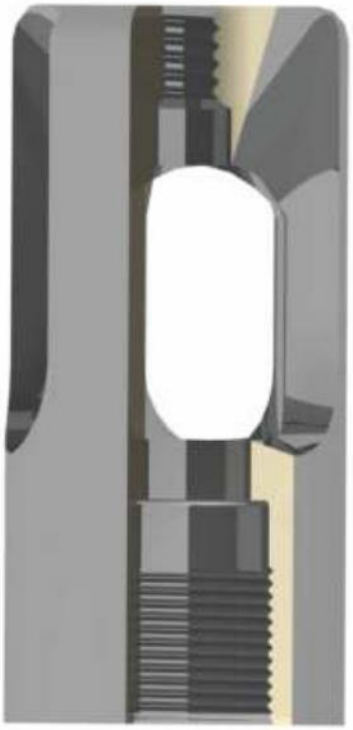
C15 - Cage, Closed, Box Plunger						
Part Designation	Material					
C15-175	A1	A2	A3	A4	A5	A6
C15-225	A1	A2	A3	A4	A5	A6
C15-275	A1	A2	A3	A4	A5	A6
C15-375	A1	A2	A3	A4	A5	A6

C16 - Cage, Standing Valve



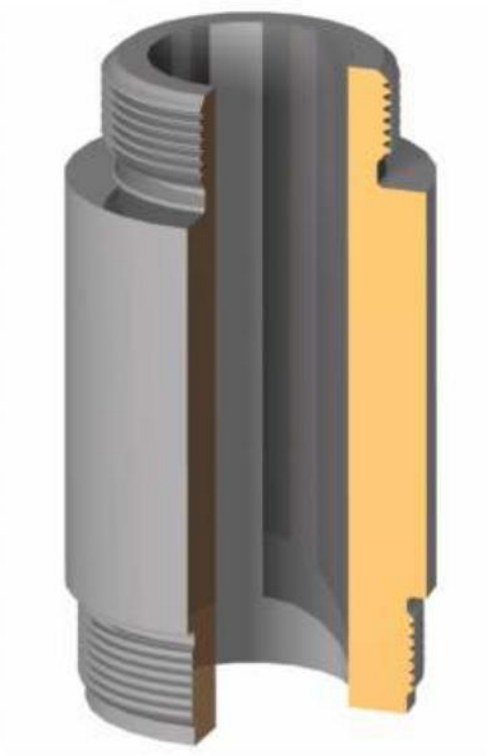
C16 - Cage, Standing Valve						
Part Designation	Material					
C16-175	A1	A2	A3	A4	A5	A6
C16-225	A1	A2	A3	A4	A5	A6
C16-275	A1	A2	A3	A4	A5	A6
C16-375	A1	A2	A3	A4	A5	A6

C17 - Cage, Top Plunger



C17 - Cage, Top Plunger						
Part Designation	Material					
C17-125	A1	A2	A3	A4	A5	A6
C17-150	A1	A2	A3	A4	A5	A6
C17-200	A1	A2	A3	A4	A5	A6
C17-250	A1	A2	A3	A4	A5	A6

C21 - Connector, Upper Barrel

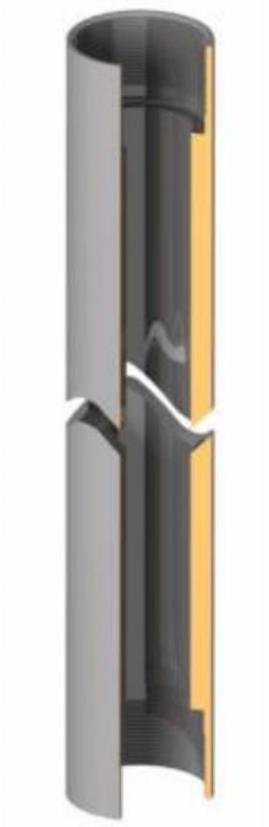


C21 - Connector, Upper Barrel						
Part Designation	Material					
C21-15	A1	A2	A3	A4	A5	A6
C21-20-125	A1	A2	A3	A4	A5	A6
C21-20	A1	A2	A3	A4	A5	A6
C21-25	A1	A2	A3	A4	A5	A6
C21-30	A1	A2	A3	A4	A5	A6

C22 - Connector, Box Plunger

C22 - Connector, Box Plunger						
Part Designation	Material					
C22-175	A1	A2	A3	A4	A5	A6
C22-225	A1	A2	A3	A4	A5	A6
C22-275	A1	A2	A3	A4	A5	A6
C22-375	A1	A2	A3	A4	A5	A6

C31 - Coupling, Extension



C31 - Coupling, Extension						
Part Designation	Material					
C31-106-15	A1	A2	A3	A4	A5	A6
C31-106	A1	A2	A3	A4	A5	A6
C31-125	A1	A2	A3	A4	A5	A6
C31-150	A1	A2	A3	A4	A5	A6
C31-175	A1	A2	A3	A4	A5	A6
C31-225	A1	A2	A3	A4	A5	A6
Standard coupling lengths are 6,12,18,24,36 in. etc. (152.4, 304.8, 457.2, 609.6, 914.4 mm etc)						

C32 - Coupling, Pull Tube, Upper

C32 - Coupling, Pull Tube, Upper						
Part Designation	Material					
C32-125	A1	A2	A3	A4	A5	A6
C32-150	A1	A2	A3	A4	A5	A6
C32-175	A1	A2	A3	A4	A5	A6
C32-200	A1	A2	A3	A4	A5	A6
C32-225	A1	A2	A3	A4	A5	A6
C32-250	A1	A2	A3	A4	A5	A6

C33 - Coupling, Pull Tube, Lower

C33 - Coupling, Pull Tube, Lower						
Part Designation	Material					
C33-125-15	A1	A2	A3	A4	A5	A6
C33-125	A1	A2	A3	A4	A5	A6
C33-150-20	A1	A2	A3	A4	A5	A6
C33-150-25	A1	A2	A3	A4	A5	A6
C33-175	A1	A2	A3	A4	A5	A6
C33-200	A1	A2	A3	A4	A5	A6
C33-225	A1	A2	A3	A4	A5	A6

C34 - Coupling, Tubing

C34 - Coupling, Tubing					
Part Designation	Material				
C34-15	K55	J55	L80	N80	P110
C34-20	K55	J55	L80	N80	P110
C34-25	K55	J55	L80	N80	P110
C34-30	K55	J55	L80	N80	P110
C34-40	K55	J55	L80	N80	P110

C35 - Coupling, Barrel

C35 - Coupling, Barrel						
Part Designation	Material					
C35-20	A1	A2	A3	A4	A5	A6
C35-25	A1	A2	A3	A4	A5	A6
C35-30	A1	A2	A3	A4	A5	A6
C35-40	A1	A2	A3	A4	A5	A6

C36 - Coupling, Barrel, Lower (Soft-Packed Tubing Pump)

C36 - Coupling, Barrel, Lower (Soft-Packed Tubing Pump)						
Part Designation	Material					
C36-20	A1	A2	A3	A4	A5	A6
C36-25	A1	A2	A3	A4	A5	A6
C36-30	A1	A2	A3	A4	A5	A6

C37 - Coupling, Barrel (Soft-Packed Tubing Pump)

C37 - Coupling, Barrel (Soft-Packed Tubing Pump)						
Part Designation	Material					
C37-20	A1	A2	A3	A4	A5	A6
C37-25	A1	A2	A3	A4	A5	A6
C37-30	A1	A2	A3	A4	A5	A6

G11 - Guide, Valve Rod

G11 - Guide, Valve Rod						
Part Designation	Material					
G11-15	A1	A2	A3	A4	A5	A6
G11-20	A1	A2	A3	A4	A5	A6
G11-25	A1	A2	A3	A4	A5	A6
G11-30	A1	A2	A3	A4	A5	A6

N11 - Nipple, Seating, Cup Type

N11 - Nipple, Seating, Cup Type (Rod Pump)						
Part Designation	Material					
N11-15	A1	A2	A3	A4	A5	A6
N11-20	A1	A2	A3	A4	A5	A6
N11-25	A1	A2	A3	A4	A5	A6
N11-30	A1	A2	A3	A4	A5	A6

N12 - Nipple, Seating, Mechanical Bottom

N12 - Nipple, Seating, Mechanical Bottom						
Part Designation	Material					
N12-15	A1	A2	A3	A4	A5	A6
N12-20	A1	A2	A3	A4	A5	A6
N12-25	A1	A2	A3	A4	A5	A6
N12-30	A1	A2	A3	A4	A5	A6
N12-40	A1	A2	A3	A4	A5	A6

N13 - Nipple, Seating, 2 Cup Type (Tubing Pump)

N13 - Nipple, Seating, 2 Cup Type (Tubing Pump)						
Part Designation	Material					
N13-20	A1	A2	A3	A4	A5	A6
N13-25	A1	A2	A3	A4	A5	A6
N13-30	A1	A2	A3	A4	A5	A6

N14 - Nipple, Seating, Mechanical Top Lock

N14 - Nipple, Seating, Mechanical Top Lock						
Part Designation	Material					
N14-20	A1	A2	A3	A4	A5	A6
N14-25	A1	A2	A3	A4	A5	A6
N14-30	A1	A2	A3	A4	A5	A6

N21 - Nipple, Extension, Upper

N21 - Nipple, Extension, Upper						
Part Designation	Material					
N21-20	A1	A2	A3	A4	A5	A6
N21-25	A1	A2	A3	A4	A5	A6
N21-30	A1	A2	A3	A4	A5	A6
N21-40	A1	A2	A3	A4	A5	A6

N22 - Nipple, Extension, Lower

N22 - Nipple, Extension, Lower						
Part Designation	Material					
N22-20	A1	A2	A3	A4	A5	A6
N22-25	A1	A2	A3	A4	A5	A6
N22-30	A1	A2	A3	A4	A5	A6
N22-40	A1	A2	A3	A4	A5	A6

P11 - Plug, Pull

P11 - Plug, Pull						
Part Designation	Material					
P11-125-15	A1	A2	A3	A4	A5	A6
P11-125	A1	A2	A3	A4	A5	A6
P11-150-20	A1	A2	A3	A4	A5	A6
P11-150-25	A1	A2	A3	A4	A5	A6
P11-175	A1	A2	A3	A4	A5	A6
P11-200	A1	A2	A3	A4	A5	A6
P11-225	A1	A2	A3	A4	A5	A6

P12 - Plug, Seat

P12 - Plug Seat						
Part Designation	Material					
P12-106	A1	A2	A3	A4	A5	A6
P12-125	A1	A2	A3	A4	A5	A6
P12-150	A1	A2	A3	A4	A5	A6
P12-175	A1	A2	A3	A4	A5	A6
P12-200	A1	A2	A3	A4	A5	A6
P12-225	A1	A2	A3	A4	A5	A6
P12-250	A1	A2	A3	A4	A5	A6

P21 - Plunger, One Piece

P21 - Plunger, One Piece						
Part Designation	Material					
P21-106	B1	B2	B3	B4	A1	A2
P21-125	B1	B2	B3	B4	A1	A2
P21-150	B1	B2	B3	B4	A1	A2
P21-175	B1	B2	B3	B4	A1	A2
P21-200	B1	B2	B3	B4	A1	A2
P21-225	B1	B2	B3	B4	A1	A2
P21-250	B1	B2	B3	B4	A1	A2
P21-275	B1	B2	B3	B4	A1	A2
P21-375	B1	B2	B3	B4	A1	A2
Specify seal length in whole feet increments [2 ft (0.610 m) min seal length]						

P22 - Plunger, Assembled

P22 - Plunger, Assembled						
Part Designation	Material					
P22-125	B1	B2	B3	B4	A1	A2
P22-150	B1	B2	B3	B4	A1	A2
P22-175	B1	B2	B3	B4	A1	A2
P22-200	B1	B2	B3	B4	A1	A2
P22-225	B1	B2	B3	B4	A1	A2
P22-250	B1	B2	B3	B4	A1	A2
P22-275	B1	B2	B3	B4	A1	A2
Specify seal length in whole feet increments [2 ft (0.610 m) min seal length]						

P23 - Plunger, Box End (Tubing Pump)

P23 - Plunger, Box End (Tubing Pump)						
Part Designation	Material					
P23-175	B1	B2	B3	B4	A1	A2
P23-225	B1	B2	B3	B4	A1	A2
P23-275	B1	B2	B3	B4	A1	A2
P23-375	B1	B2	B3	B4	A1	A2
Specify seal length in whole feet increments [2 ft (0.610 m) min seal length]						

P24 - Plunger, Soft Packed

P24 - Plunger, Soft Packed						
Part Designation	Material					
P24-125	B1	B2	B3	B4	A1	A2
P24-178	B1	B2	B3	B4	A1	A2
P24-200	B1	B2	B3	B4	A1	A2
P24-225	B1	B2	B3	B4	A1	A2
P24-250	B1	B2	B3	B4	A1	A2
P24-275	B1	B2	B3	B4	A1	A2
Specify seal length in whole feet increments [2 ft (0.610 m) min seal length]						

P31 - Puller, Standing Valve

P31 - Puller, Standing Valve						
Part Designation	Material					
P31-175	A1	A2	A3	A4	A5	A6
P31-225	A1	A2	A3	A4	A5	A6
P31-275	A1	A2	A3	A4	A5	A6
P31-375	A1	A2	A3	A4	A5	A6

R11 - Rod, Valve

R11 - Rod, Valve						
Part Designation	Material					
R11-20	A1	A2	A3	A4	A5	A6
R11-25	A1	A2	A3	A4	A5	A6
R11-30	A1	A2	A3	A4	A5	A6

Valve Rod Length PL				
Nominal Barrel Length Minus Nominal Plunger Length	For Pumps Run in 1.900, 2-3/8, and 2-7/8 in. (48.3, 60.3, and 73.0 mm) OD Tubing		For Pumps Run in 3-1/2 in. (88.9 mm) OD Tubing	
Length,ft (m)	Top Anchor, in. (m)	Bottom Anchor, in. (m)	Top Anchor, in. (m)	Bottom Anchor, in. (m)
1(0.305)	13(0.330)	7(0.178)	12(0.305)	6(0.152)
2(0.610)	25(0.635)	19(0.483)	24(0.610)	18(0.457)
3(0.914)	37(0.940)	31(0.787)	36(0.914)	30(0.762)
4(1.219)	49(1.245)	43(1.092)	48(1.219)	42(1.067)
5(1.524)	61(1.549)	55(1.397)	60(1.524)	54(1.372)
6(1.829)	73(1.854)	67(1.702)	72(1.829)	66(1.676)
7(2.134)	85(2.159)	79(2.007)	84(2.134)	78(1.981)
8(2.438)	97(2.464)	91(2.311)	96(2.438)	90(2.286)
9(2.743)	109(2.769)	103(2.616)	108(2.743)	102(2.591)
10(3.048)	121(3.073)	115(2.921)	120(3.048)	114(2.896)
11(3.353)	133(3.378)	127(3.226)	132(3.353)	126(3.200)
12(3.658)	145(3.683)	139(3.531)	144(3.658)	138(3.505)
13(3.962)	157(3.988)	151(3.835)	156(3.962)	150(3.810)
14(4.267)	169(4.293)	163(4.140)	168(4.267)	162(4.115)
15(4.572)	181(4.597)	175(4.445)	180(4.572)	174(4.420)
16(4.877)	193(4.902)	187(4.750)	192(4.877)	186(4.724)
17(5.182)	205(5.207)	199(5.055)	204(5.182)	198(5.029)
18(5.486)	217(5.512)	211(5.359)	216(5.486)	210(5.334)
19(5.791)	229(5.817)	223(5.664)	228(5.791)	222(5.639)
20(6.096)	241(6.121)	235(5.969)	240(6.096)	234(5.944)
21(6.401)	253(6.426)	247(6.274)	252(6.401)	246(6.248)
22(6.706)	265(6.731)	259(6.579)	264(6.706)	258(6.553)
23(7.010)	277(7.036)	271(6.883)	276(7.010)	270(6.858)
24(7.315)	289(7.341)	283(7.188)	288(7.315)	282(7.163)
25(7.620)	301(7.645)	295(7.493)	300(7.620)	294(7.468)
26(7.925)	313(7.950)	307(7.800)	312(7.925)	306(7.772)
27(8.230)	325(8.255)	319(8.103)	324(8.230)	318(8.077)
28(8.534)	337(8.560)	331(8.407)	336(8.534)	330(8.382)
29(8.839)	349(8.865)	343(8.712)	348(8.839)	342(8.687)
30(9.144)	361(9.169)	355(9.017)	360(9.144)	354(8.992)

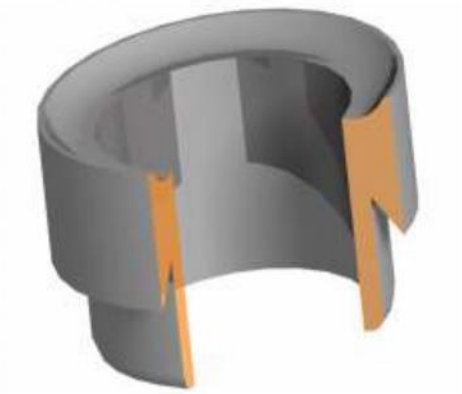
S11 - Seating Mandrel, Cup (Type HR) (Rod Pump and Fittings)

S11 - Seating Mandrel, Cup (Type HR) (Rod Pump and Fittings)						
Part Designation	Material					
S11-20	A1	A2	A3	A4	A5	A6
S11-25	A1	A2	A3	A4	A5	A6
S11-30	A1	A2	A3	A4	A5	A6

S12 - Seating Cup (Type HR) (Rod Pump)

S12 - Seating Cup (Type HR) (Rod Pump)		
Part Designation	Material	
S12-20	Nylon (A1)	Composite (A2)
S12-25	Nylon (A1)	Composite (A2)
S12-30	Nylon (A1)	Composite (A2)

S13 - Seating Cup Ring (Type HR)

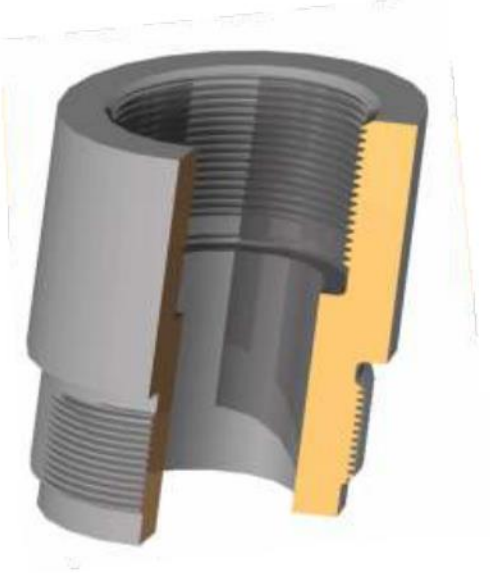


S13 - Seating Cup Ring (Type HR)						
Part Designation	Material					
S13-20	A1	A2	A3	A4	A5	A6
S13-25	A1	A2	A3	A4	A5	A6
S13-30	A1	A2	A3	A4	A5	A6

S14 - Seating Cup Nut (Type HR)

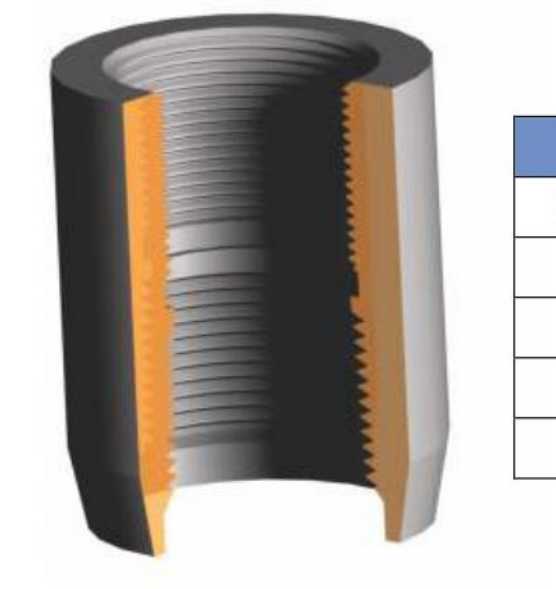
S14 - Seating Cup Nut (Type HR)						
Part Designation	Material					
S14-20	A1	A2	A3	A4	A5	A6
S14-25	A1	A2	A3	A4	A5	A6
S14-30	A1	A2	A3	A4	A5	A6

S15 - Seating Cup Bushing, Top Anchor



S15 - Seating Cup Bushing, Top Anchor						
Part Designation	Material					
S15-20-125	A1	A2	A3	A4	A5	A6
S15-20	A1	A2	A3	A4	A5	A6
S15-25	A1	A2	A3	A4	A5	A6
S15-30	A1	A2	A3	A4	A5	A6

S16 - Seating Coupling, Bottom Anchor



S16 - Seating Coupling, Bottom Anchor						
Part Designation	Material					
S16-15	A1	A2	A3	A4	A5	A6
S16-20	A1	A2	A3	A4	A5	A6
S16-25	A1	A2	A3	A4	A5	A6
S16-30	A1	A2	A3	A4	A5	A6

S17 - Seating Mandrel, Cup (Type HR) (Tubing Pump)

S17 - Seating Mandrel, Cup (Type HR) (Tubing Pump)						
Part Designation	Material					
S17-20	A1	A2	A3	A4	A5	A6
S17-25	A1	A2	A3	A4	A5	A6
S17-30	A1	A2	A3	A4	A5	A6

S18 - Seating Cup (Type HR) (Tubing Pump)

S18 - Seating Cup (Type HR) (Tubing Pump)		
Part Designation	Material	
S18-20	Nylon (A1)	Composite (A2)
S18-25	Nylon (A1)	Composite (A2)
S18-30	Nylon (A1)	Composite (A2)

S19 - Seating, Cup (Type HR) (Soft Packed Tubing Pump)

S19 - Seating Cup (Type HR) (Soft Packed Tubing Pump)		
Part Designation	Material	
S19-25	Nylon (A1)	Composite (A2)
S19-30	Nylon (A1)	Composite (A2)

S21 - Seating Assembly, Mechanical Top Lock

S21 - Seating Assembly, Mechanical Top Lock						
Part Designation	Material					
S21-20-125	A1	A2	A3	A4	A5	A6
S21-20	A1	A2	A3	A4	A5	A6
S21-25	A1	A2	A3	A4	A5	A6
S21-30	A1	A2	A3	A4	A5	A6

S22 - Seating Assembly, Mechanical Bottom Lock

S22 - Seating Assembly, Mechanical Bottom Lock						
Part Designation	Material					
S22-15	A1	A2	A3	A4	A5	A6
S22-20	A1	A2	A3	A4	A5	A6
S22-25	A1	A2	A3	A4	A5	A6
S22-30	A1	A2	A3	A4	A5	A6
S22-40	A1	A2	A3	A4	A5	A6

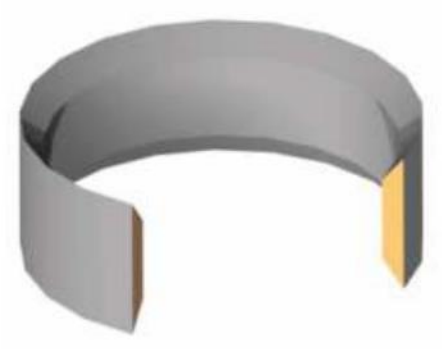
S31 - Seating Mandrel, Cup (Type O)

S31 - Seating Mandrel, Cup (Type O)						
Part Designation	Material					
S31-15	A1	A2	A3	A4	A5	A6

S32 - Seating Cup (Type O)

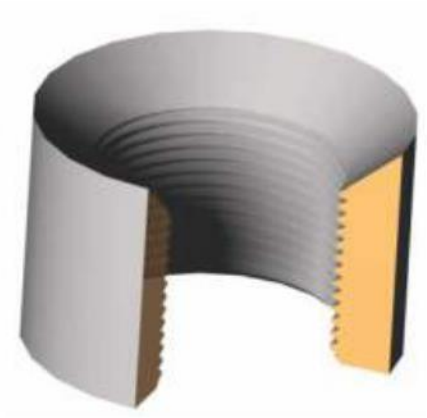
S32 - Seating Cup (Type O)		
Part Designation	Material	
S32-15	Nylon (A1)	Composite (A2)

S33 - Seating Cup Ring (Type O)



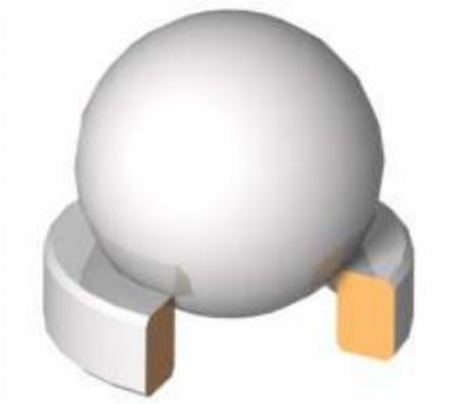
S33 - Seating Cup Ring (Type O)						
Part Designation	Material					
S33-15	A1	A2	A3	A4	A5	A6

S34 - Seating Cup Nut (Type O)



S34 - Seating Cup Nut (Type O)						
Part Designation	Material					
S34-15	A1	A2	A3	A4	A5	A6

V11 - Valve, Ball and Seat



Valve, Ball and Seat						
Part Designation	Material					
V11-106	A1	B1	B2	C1	C2	C3
V11-125	A1	B1	B2	C1	C2	C3
V11-150	A1	B1	B2	C1	C2	C3
V11-175	A1	B1	B2	C1	C2	C3
V11-200	A1	B1	B2	C1	C2	C3
V11-225	A1	B1	B2	C1	C2	C3
V11-250	A1	B1	B2	C1	C2	C3
V11-375	A1	B1	B2	C1	C2	C3

T11 - Tube, Pull

T11 - Tube, Pull						
Part Designation	Material					
T11-125	A1	A2	A3	A4	A5	A6
T11-150	A1	A2	A3	A4	A5	A6
T11-175	A1	A2	A3	A4	A5	A6
T11-200	A1	A2	A3	A4	A5	A6
T11-225 *	A1	A2	A3	A4	A5	A6

Pull Tube Length, PL			
	Actual Length		
Nominal Barrel Length Minus Nominal Plunger Length ft (m)	For 1-1/4 in. (31.8 mm) Bore Pumps in. (m)	For 1-1/2, 1-3/4, and 2 in. (38.1, 44.5, and 50.8 mm) Bore Pumps in. (m)	For 2-1/4 and 2-1/2 in. (57.2 and 63.5 mm) Bore Pumps in. (m)
1(0.305)	—	—	—
2(0.610)	15(0.381)	14(0.356)	12(0.305)
3(0.914)	27(0.686)	26(0.660)	24(0.610)
4(1.219)	39(0.991)	38(0.965)	36(0.914)
5(1.524)	51(1.295)	50(1.270)	48(1.219)
6(1.829)	63(1.600)	62(1.575)	60(1.524)
7(2.134)	75(1.905)	74(1.880)	72(1.829)
8(2.438)	87(2.210)	86(2.184)	84(2.134)
9(2.743)	99(2.515)	98(2.489)	96(2.438)
10(3.048)	111(2.819)	110(2.794)	108(2.743)
11(3.353)	123(3.124)	122(3.099)	120(3.048)
12(3.658)	135(3.429)	134(3.404)	132(3.353)
13(3.962)	147(3.734)	146(3.708)	144(3.658)
14(4.267)	159(4.039)	158(4.013)	156(3.962)
15(4.572)	171(4.343)	170(4.318)	168(4.267)
16(4.877)	183(4.648)	182(4.623)	180(4.572)
17(5.182)	195(4.953)	194(4.928)	192(4.877)
18(5.486)	207(5.258)	206(5.232)	204(5.182)
19(5.791)	219(5.563)	218(5.537)	216(5.486)
20(6.096)	231(5.867)	230(5.842)	228(5.791)
21(6.401)	243(6.172)	242(6.147)	240(6.096)
22(6.706)	255(6.477)	254(6.452)	252(6.401)
23(7.010)	267(6.782)	266(6.756)	264(6.706)
24(7.315)	279(7.087)	278(7.061)	276(7.010)
25(7.620)	291(7.391)	290(7.366)	288(7.315)
26(7.925)	303(7.696)	302(7.671)	300(7.620)
27(8.230)	315(8.001)	314(7.976)	312(7.925)
28(8.534)	327(8.306)	326(8.280)	324(8.230)
29(8.839)	339(8.611)	338(8.585)	336(8.534)
30(9.144)	351(8.915)	350(8.890)	348(8.839)

Note: All dimensions in inches (followed by equivalent in millimetres).
* Used on 2-1/4 in. (57.2 mm) and 2-1/2 in. (63.5 mm) bore pumps.

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PROLIFT SUBSURFACE ROD PUMPS AND PARTS - 2026