



# Blender Pump

**12 x 12 - 15**

## Operational Manual



## Introduction

This manual contains instructions for the installation and operation of a Frac Pump Parts 12 X 12 - 15 Blender Pump. As pump service conditions and specifications vary considerably, this manual cannot cover every possible situation. It is hoped that the information included will serve as a guide. In the event questions arise, or start-up problems occur, it is recommended that you contact the Frac Pump Parts salesperson in your area or call Frac Pump Parts at **(775)-557-8677**.

There are many special considerations and principals of correct pump installation and operation for the 12 x 12 – 15 Blender pump design which, if followed, will enhance the performance of the pump. This document will deal with general recommendations for improved performance in oilfield applications.

## Pumps Features

- Stainless-Steel Impeller
- Thicker Stainless-Steel Wear Ring Cast Directly into Impeller
- Sealed Bearings
- S2 Hydraulic Motor Adapter *available on request*

## General Instructions

- Operate the pump only in the performance range for which is was designed.
- **Maximum RPM Allowed:** 1250 RPM
- **It is absolutely essential that the rotation of the motor is checked before connecting the shaft coupling.**
- Secure the pump in an accessible place as close to the liquid being pumped as possible.
- A complete serial number record of every pump is maintained at Frac Pump Parts. Information requested can be more quickly and accurately furnished if the size and serial number of the pump is given with your request.
- For any additional information not provided in this instruction manual, contact us:
  - (775)-557-8677
  - [fracpumpparts@gmail.com](mailto:fracpumpparts@gmail.com)

# Preparation for Operation

*Check the following items before starting the pump:*

## Installation

- Level mounting is essential for proper operation.
- If possible, pump should be located below the level of the liquid to eliminate the necessity of priming.

## Pump Base Plate

- The pump's base plate should be clean and flat and able to support all eight points in a level position.

## Coupling Alignment

- **Alignment of couplings must not be attempted until the base is in position and mounting bolts have been tightened.**
- Good service life of the pump/driver depends upon good alignment throughout the coupling.
- Poor alignment may cause failure of the coupling, pump and/or motor bearings of either shaft.

## Piping (General)

- Piping must not be connected to the pump until the pump hold-down bolts have been tightened. **Max 200 ft/lbs of force.**
- Piping should be anchored independently of the pump. Pipe companion flanges should line up naturally with pump flanges. **Do not draw or pull the pipe to the pump with flange bolts.**

## Piping (Suction)

- Properly selected and installed suction piping is extremely important to eliminate vibration and cavitation in the pump. Vibration can cause issues with the mechanical seal or bearings.
- The suction line should be equal to (or larger) than the pump suction.

- The capacity of a centrifugal pump should never be adjusted by throttling the suction line.
- A positive shut-off valve (to cause minimum turbulence) should be installed in the suction line to permit the closing of the line and removal of the pump for inspection and maintenance.
- The suction line should be designed to eliminate any air pockets. The piping should gradually slope downwards to the source of supply to eliminate air pockets.
- The suction line should have a straight section into the pump of a length equivalent to at least two (2) times its diameter, i.e., four-inch (4) suction eight-inch (8) straight run.
- For temporary hook-up where flexible hose is used, a non-collapsing hose is essential since the suction line pressure is often below atmospheric pressure. A collapsing suction line will result in below average or complete loss of flow.

### **Piping (Discharge)**

- A positive shut-off valve should be located in the discharge piping to permit inspection of the pump.
- All piping should be independently supported and accurately aligned. The pump must not support the weight of the pipe or compensate for misalignment.
- If operating conditions are not known with sufficient accuracy, it will be necessary to provide a throttle valve in the discharge line to ensure that the pump operates at the design point.
- If the pump is connected to a pressure system, it is important to install a check valve between the pump discharge and the throttling valve. The check valve will prevent back flow through the pump. Back flow may cause the impeller to become loose on the shaft, which would likely result in mechanical damage and fluid leakage.

### **Mechanical Seals**

- To properly prepare the seal for operation, various cooling and flushing flows may have to be connected. Liquid from an outside source may be required. Connect necessary cooling and flushing flows to seal prior to pump usage.
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## Start-Up

1. Pump rotates freely by hand.
2. Coupling is aligned.
3. Oiler is full and oil level is correct in the bearings and seals.
4. Suction valve is fully open.
5. Pump and suction line are full of fluid.
6. Discharge valve is slightly open.

## Operation\Priming

- Vent air from suction line and fill with liquid
- Start pump with discharge valve cracked open
- After discharge pressure stabilizes, gradually open discharge valve to required position
- If flow is lost, close discharge valve and wait a few seconds for discharge pressure to build
- Continuous issues with flow indicates an improper selection or installation •  
Running the pump too long with improper prime may destroy pump

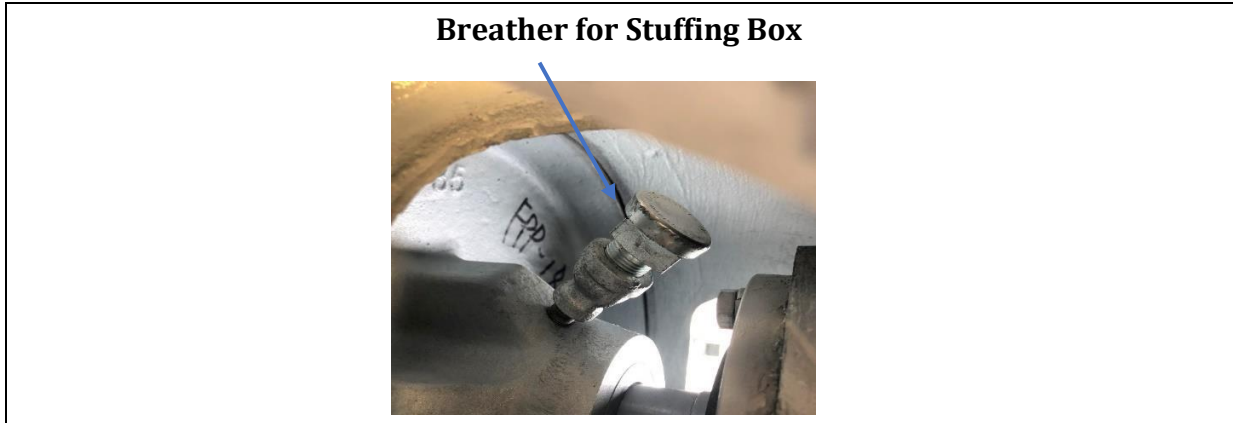
***Do not run pump with suction and discharge valves closed***

## Pump Records


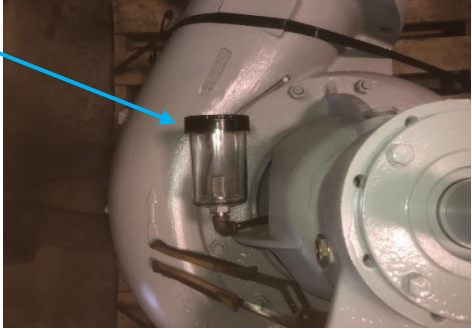
- Maintain data cards or pump records whenever possible:
  1. Pump size and serial number
  2. Motor horsepower and speed of operation
  3. Service conditions
  4. Frequency of operation
  5. Record of maintenance, including parts usage and general condition of pump

## Lubrication

- Sealed for life bearings do not require oil.
- To cool the mechanical seal, fill bottle oiler with SAE 30 Non Detergent oil.



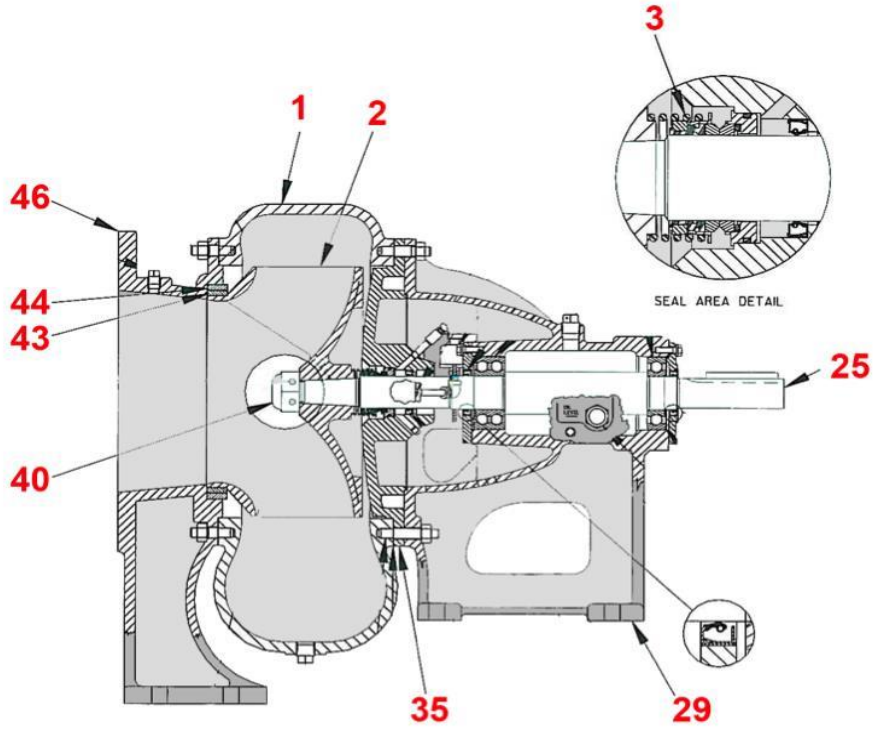
## How to Fill Bottle Oiler

<p style="text-align: center;"><b>Unscrew Bottle Cap</b> <i>Unscrew in counter-clockwise direction.</i></p>  <p>A photograph of a clear plastic bottle with a black cap, sitting on a white surface. A blue arrow points from the text above to the cap.</p>	<p style="text-align: center;"><b>Fill Bottle with Oil</b> <i>FPP uses SAE 30 weight non-detergent oil.</i></p>  <p>A photograph of the bottle being inserted into a stuffing box on a pump. A blue arrow points from the text above to the bottle.</p>
<p style="text-align: center;"><b>Allow Oil to Drain into Seal Plate Naturally</b> <i>Interference may damage the pump.</i></p>	<p style="text-align: center;"><b>Screw Cap Back on Bottle</b></p>

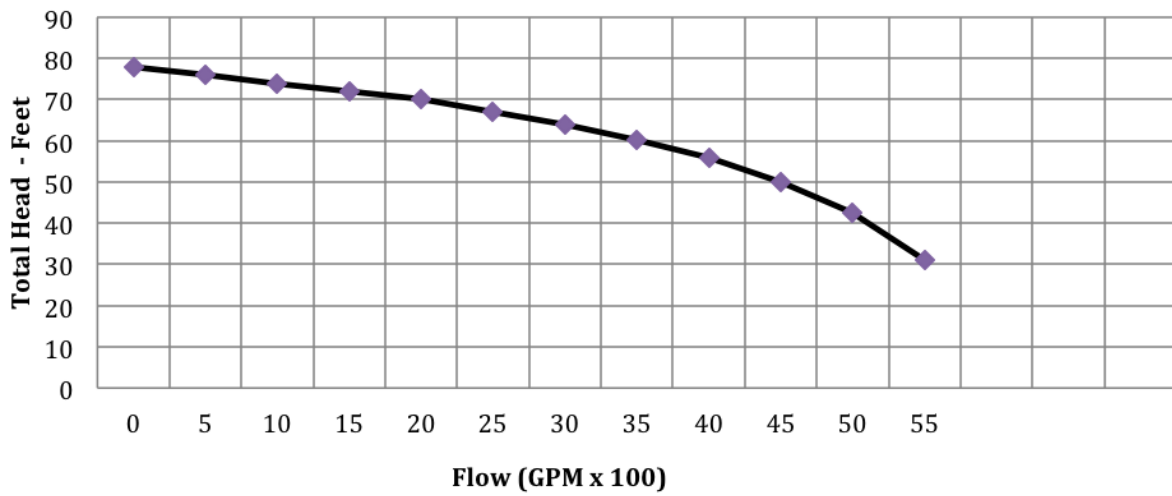
# 12x12 Pump Item List

(Image on Next Page)

Item #	Description	Item #	Description
03-01	Pump Casing	03-28	Bearing Cavity Drain Plug
03-02	Impeller	03-29	Pedestal Body
03-03	Seal Assembly	03-30	Bearing Cap Gasket
03-04	Stud	03-31	Bearing Cap
03-05	Hex Nut	03-32	Slinger Ring
03-06	Air Vent	03-33	Oil Seal
03-07	Pipe Nipple	03-34	Seal Cavity Drain Plug
03-08	Reducing Coupling	03-35	Seal Plate
03-09	Bottle Oiler	03-36	Casing Gasket
03-10	Pipe Elbow	03-39	Casing Drain Plug
03-11	Pipe Nipple	03-40	Shaft Nut
03-12	Cap Screw	03-41	Allen Head Set Screw
03-13	Hex Head Cap Screw	03-44	Case Ring
03-14	Lock Washer	03-45	Pipe Plug
03-15	Oil Seal	03-46	Suction Head
03-16	Outboard Bearing	03-50	Woodruff Key
03-17	Vented Plug (Breather Vent)	03-51	Pipe Plug
03-18	Inboard Ball Bearing	03-55	S2 Adapter
03-19	Bearing Cap Gasket	03-56	B-B Adapter for Suction End
03-20	Bearing Cap	03-57	B-B Adapter Bolts
03-24	Shaft Key	03-58	B-B Adapter Bolt Washers
03-25	Impeller Shaft	03-60	S2 Specific Bolt
03-26	Bearing Shim Set	03-61	S2 Specific Lock Washer
03-27	Sight Gauge		



### Hydraulic Coverage 12 x 12 - 14 7/8 1000 RPM with Clear Water





# 12x12 Pump Troubleshooting

Causes	Noticing Vibrations	No Flow	Limited Flow	Insufficient Pressure	Excessive Power Required	Intermittent Flow	Short Bearing Life
Pump not primed		X	X				
Speed Too Low			X	X			
Speed Too High					X		X
Excessive Discharge Head		X	X				
Insufficient NPSH	X	X	X			X	
Impeller Clogged		X	X			X	
Wrong Direction of Rotation			X	X			
Plugged Suction or Discharge Line	X	X	X				
Foot valve or Suction Line Not Immersed Deep Enough		X	X			X	
Impeller Damaged		X	X	X			
Shaft Packing / Seal Defective			X	X			
Impeller Diameter Too Small			X	X			
Impeller Diameter Too Large					X		
Excessive Amount of Air or Gas in Liquid				X		X	X
Total Head Lower than Design					X		
Specific Gravity or Viscosity Too High			X		X		X
Bent Shaft	X				X		X
Improper Electric Motor Winding or Voltage					X		
Rotating Elements Bind	X				X		X
Leaky Suction Line or Shaft Seal		X	X			X	
Misalignment	X				X		X
Bearings Worn	X						X
Impeller Out of Balance	X						X
Suction or Discharge Piping Not Anchored	X						
Improper Foundation	X						
Insufficient Discharge Head (excessive flow)	X			X	X	X	X
Improper Lubricant or Level							X