



Seal-Less Discharge Pump

14 x 12 - 22 EXP

Operational Manual



Introduction

This manual contains instructions for the installation and operation of a Frac Pump Parts 14 X 12 - 22 EXP 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 14 x 12 – 22 EXP 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

- No Mechanical Seal
- High Chrome Material
- Dry-Run Capable *for short periods of time*
- Fits Into 14 x 12 - 22 Footprint
- Large Shaft and Large Bearings

General Instructions

- **Maximum RPM Allowed:** 1500 RPM
- (With the large shaft and bearings used in this pump, the above limitations must be observed in order to control bearing operating temperature. Operate the pump only in the performance range for which it was designed.)
- **It is absolutely essential that the rotation of the motor is checked before connecting the shaft coupling.**
- 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

Preparation for Operation

Check the following items before starting the pump:

Pump Base Plate

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

Coupling Alignment

- 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 packing, mechanical seal and/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 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 (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 beneath the shaft sleeve.

Start-Up

1. Pump rotates freely by hand
2. Coupling is aligned
3. Pump's auto-greaser and trailer's auto-lube system are installed.
4. Suction valve is fully open
5. Pump and suction line is 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 (Lip Seals)

- Bearings and lip seals are pre-lubricated and hand packed full of grease before leaving Frac Pump Parts
- When pump is in regular duty, the bearings and lip seals should be re-lubricated at regular intervals for maximum bearing life, and lip seals efficiency
- The bearings and lip seals are lubricated with Mystic JT6 Hi-Temp grease
- An auto-luber is provided (temporarily attached) to pump. The auto-luber must be installed before pump is placed into service.

Auto-Luber



Auto-Luber



Check Grease Levels Daily



Install Luber in Plug



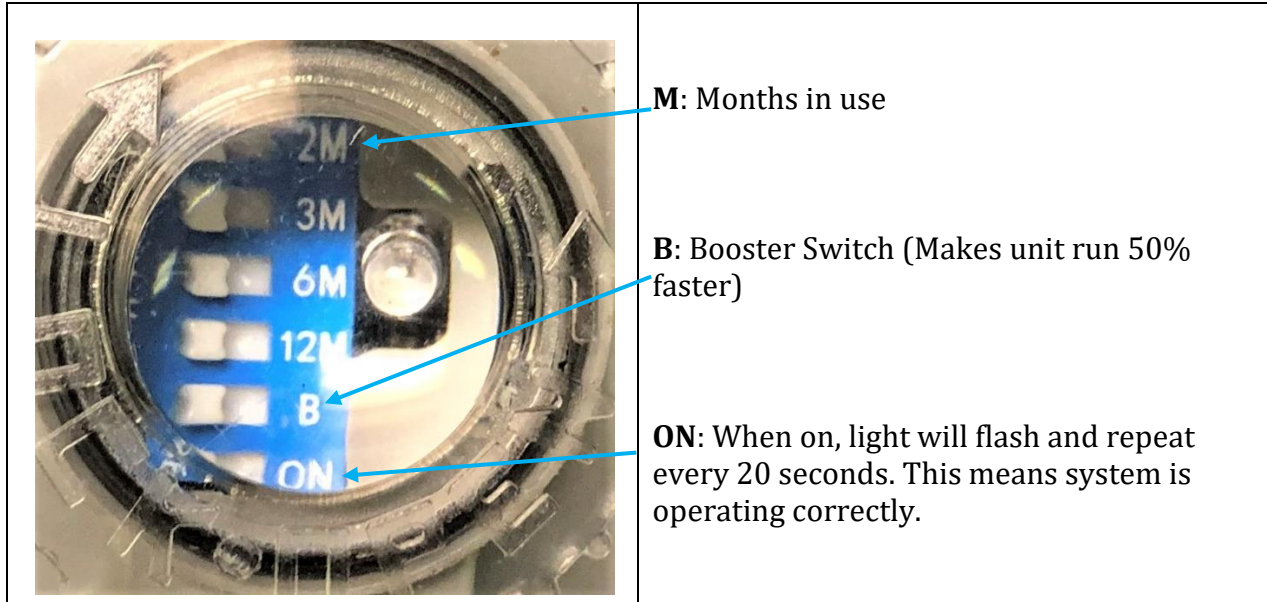
Install Luber Hand Tight (clockwise)



Remove Switch Cap



Wait 30 seconds after removing switch cap before setting any switches to allow the battery chamber to properly vent.

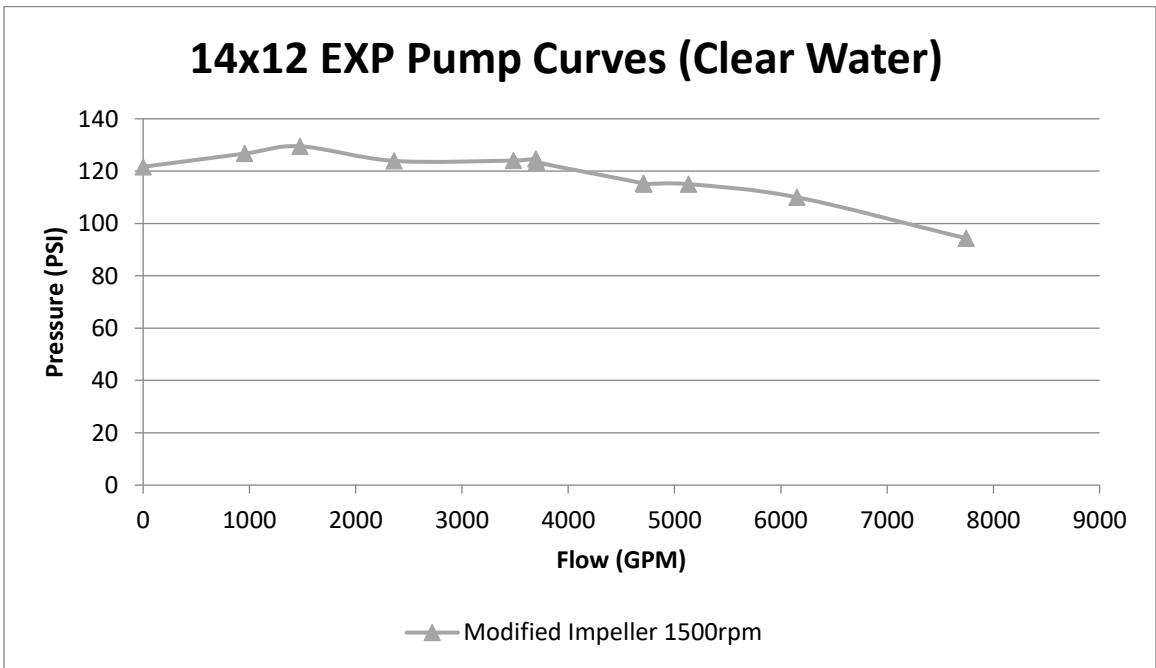
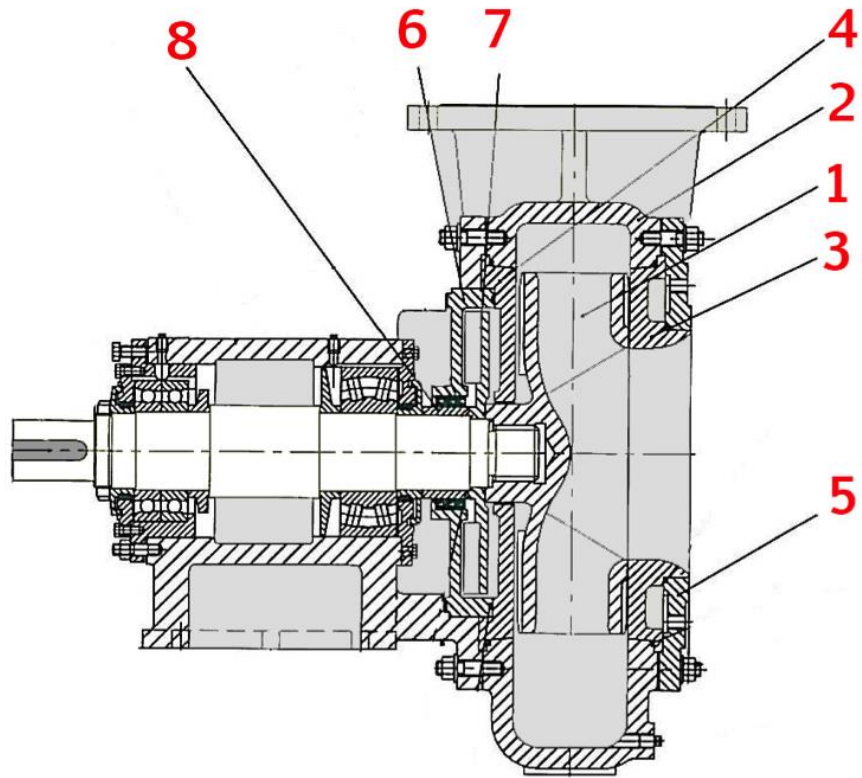


The bearings and lip seals should be re-lubricated at regular intervals for maximum equipment life. The grease used is Mystic JT6 Hi-Temp grease.

14x12 EXP Item List

(Image on Next Page)

Item #	Description	Item #	Description
05-01	Impeller	05-29	Shaft
05-02	Casing / Frame Plate	05-30	Bearing Housing
05-03	Throat Bushing	05-31	Bearing Cap (Outboard)
05-04	Back Liner	05-32	Labyrinth Seal (Outboard)
05-05	Cover Plate	05-33	Bearing Cap (Inboard)
05-06	Expeller Ring	05-34	Labyrinth Seal (Inboard)
05-07	Expeller	05-35	Grease Shield (Inboard)
05-08	Shaft Sleeve	05-36	Grease Shield (Outboard)
05-09	O-Ring (Expeller)	05-37	Bearing Lock Nut
05-10	Shaft Key	05-38	Cylindrical Roller Bearing (Outboard)
05-11	Stud (Casing)	05-39	Thrust Bearing (Inboard)
05-12	Nut (Casing)	05-40	Cap Screw (Bearing Cap)
05-13	Flat Washer (Casing)	05-41	Stud (Bearing Housing)
05-14	Lip Seal	05-42	Nut (Bearing Housing)
05-15	Lantern Ring	05-43	Cap Screw (Bearing Housing)
05-16	Stud (Throat Bushing)	05-44	Gasket (Bearing Housing)
05-17	Nut (Throat Bushing & Back Liner)	05-45	Bearing Adjusting Gasket (PVC)
05-18	Flat Washer (Throat Bushing/Back Liner)	05-46	Pipe Plug (Bearing Housing)
05-19	O-Ring (Throat Bushing)	05-47	O-Ring (Bearing Housing)
05-20	O-Ring (Casing)	05-48	Bearing Adjusting Gasket (Copper)
05-21	O-Ring (Expeller Ring)	05-49	Pipe Nipple (Expeller Ring)
05-22	O-Ring (Shaft Sleeve)	05-50	Reducer (Pipe Nipple)
05-23	Pipe Plug (Casing)	05-51	Coupling Hub (Style 2)
05-24	Automatic Greaser	05-51B	Coupling Hub (Style 1)
05-25	Stud (Back Liner)	05-51C	Coupling Hub (Style 3)
05-28	Bearing Frame	05-59	Coupling Set Screw



14x12 EXP 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