Start Up Instructions for:

INJP014

Injection Pump

ADESCO.LLC
January 21, 2011

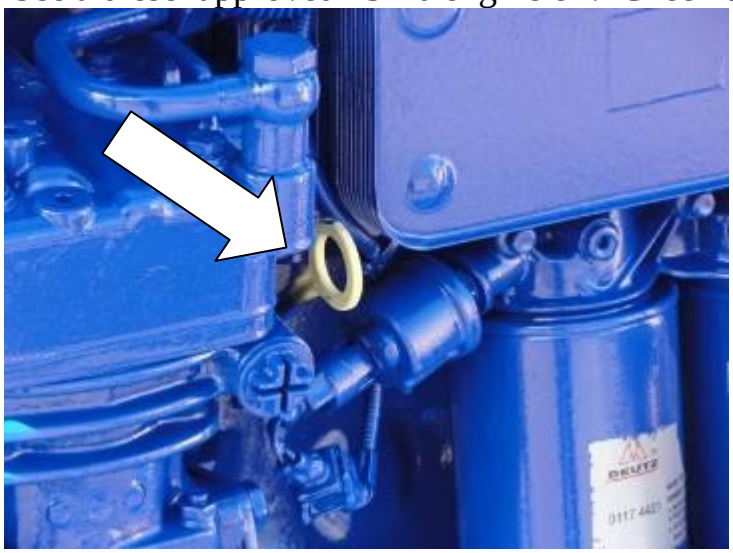
Starting Instructions - Extremely important, if not followed, package *can and/or will be damaged*. Package should be set on a level ground, no exception.

Perform walk around from the same place every time

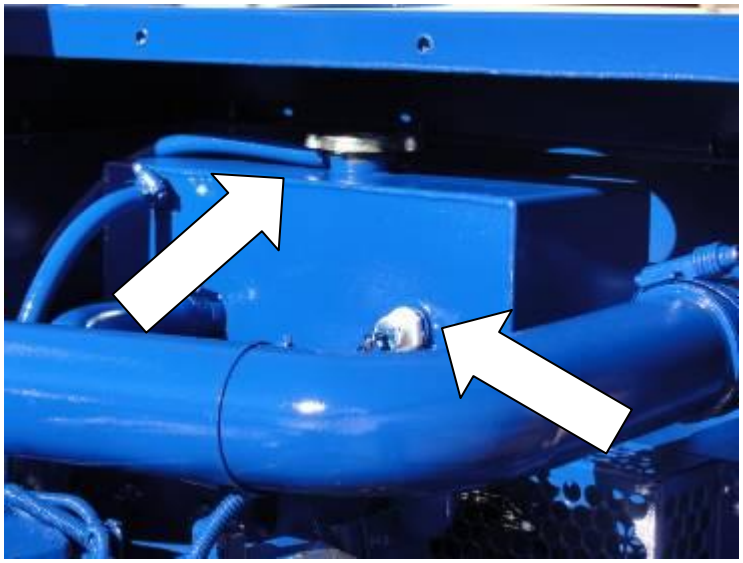
Check Fluids daily:

Engine oil, Coolant Level, Air Cleaner, Check Radiator for Obstructions, check transmission, (use a small instrument to check level, should be just below the plug), check Kerr pump cat eye for proper level, should be in the middle of the cat eye, check for other damages or obstructions.

Check oil level. Use a diesel approved 15-40 engine oil. Check daily.

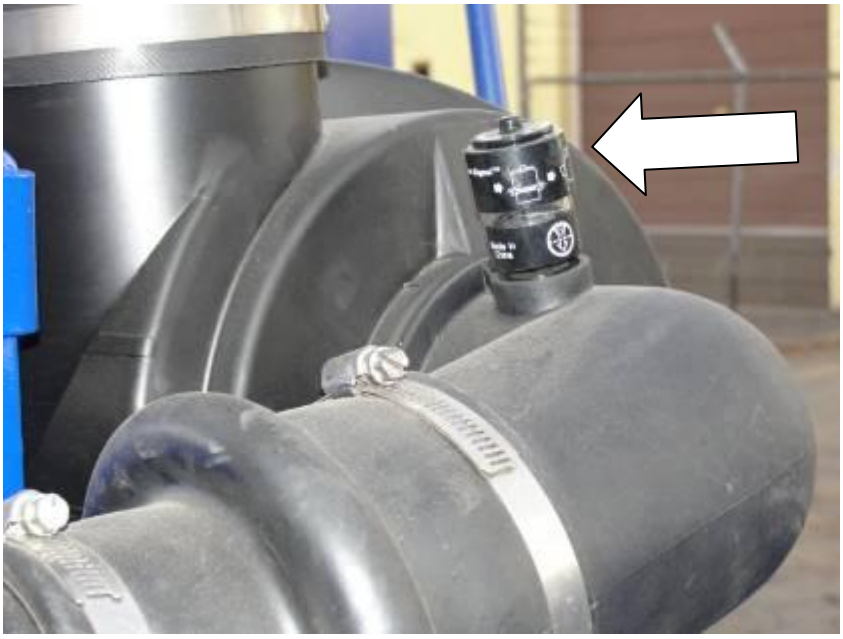


Check coolant level. Use a diesel approved coolant. Check daily and only when the unit is cold. Severe burns can occur if checked hot.

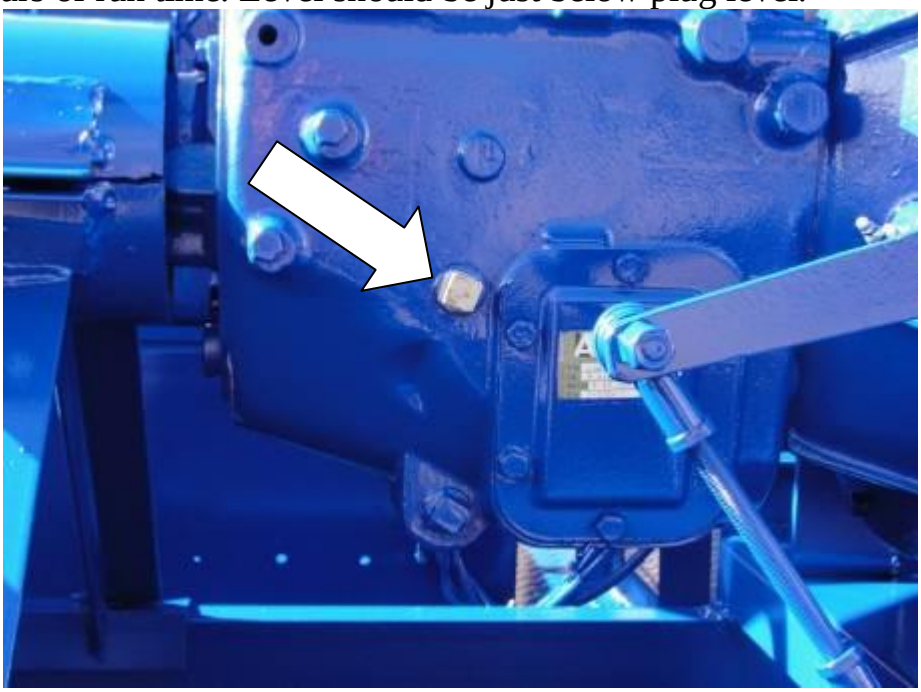


Notice - sensor is a low coolant shutdown. Unit will shut down the engine if loss of coolant.

Check daily. Replace air filter when indicator is in the red.

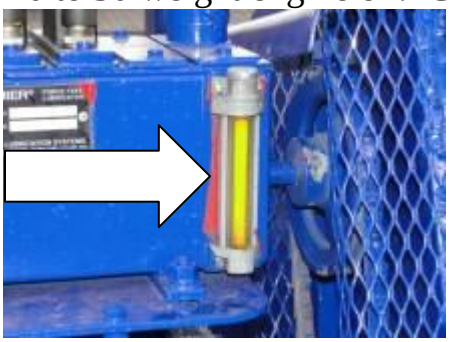


Check transmission oil level. Use a synthetic 80-90 weight oil. Check every 500 hours of run time. Level should be just below plug level.

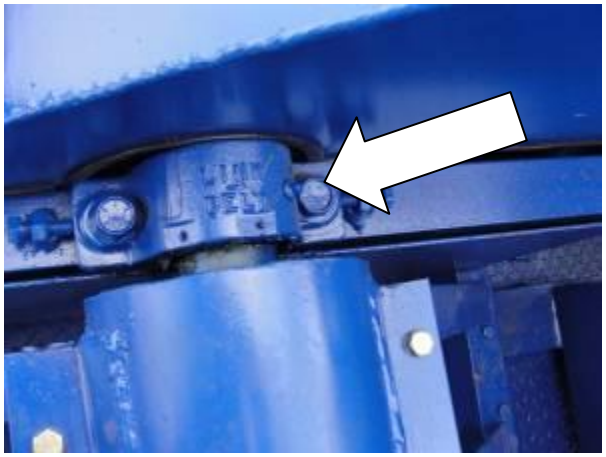


Check pump oil level. Use a synthetic 80-90 weight oil. Check daily. If checking while running the level should be just below the middle of the cat eye.

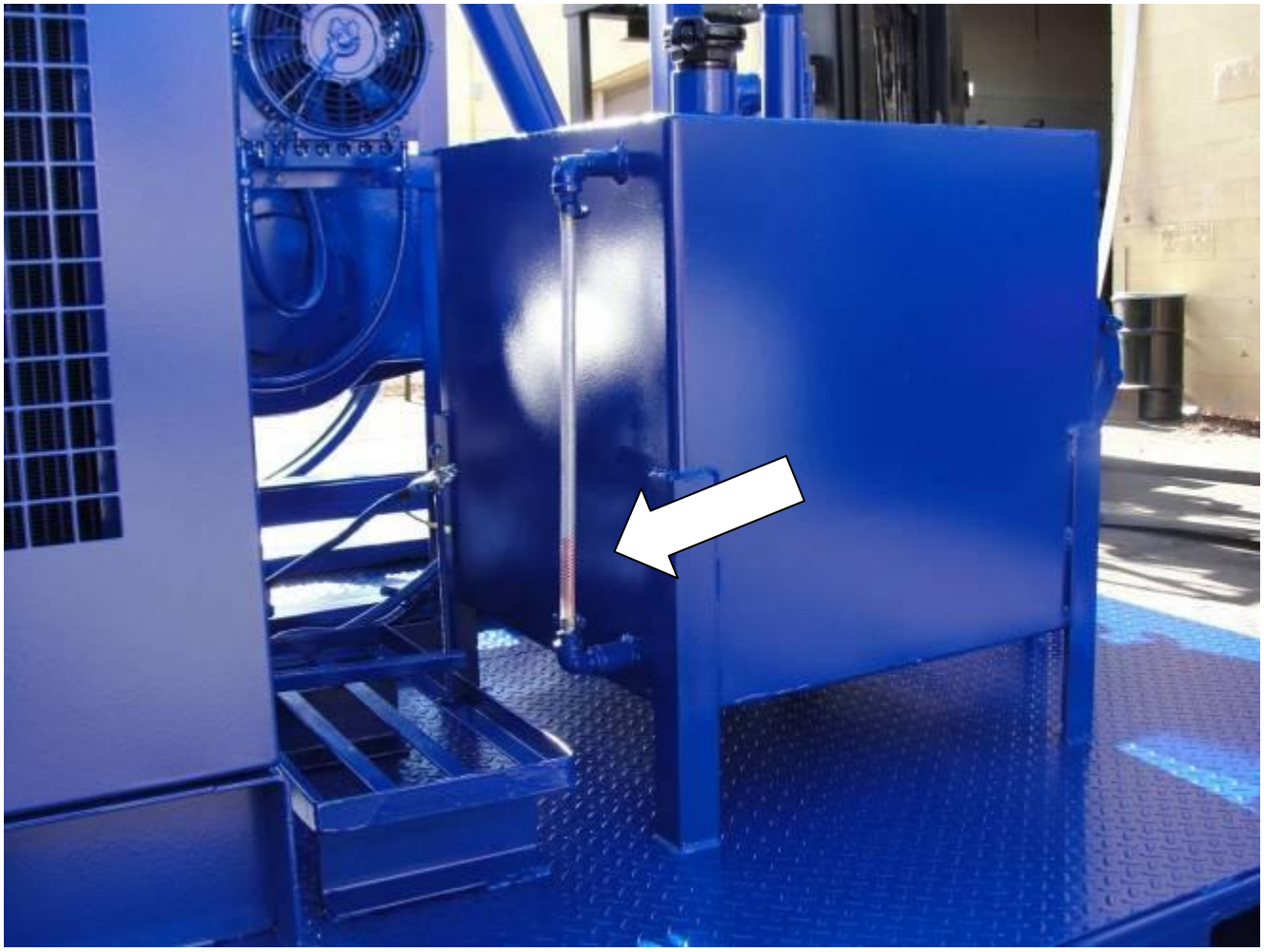
Check oil level. Use a 10 to 30 weight engine oil. Check daily**.**



Check and grease pillow blocks daily. Only a small amount of grease is needed to be injected into pillow block. Do not over grease. Check daily.



Check fuel fluid lever.



End walk around inspection for pre-startup.

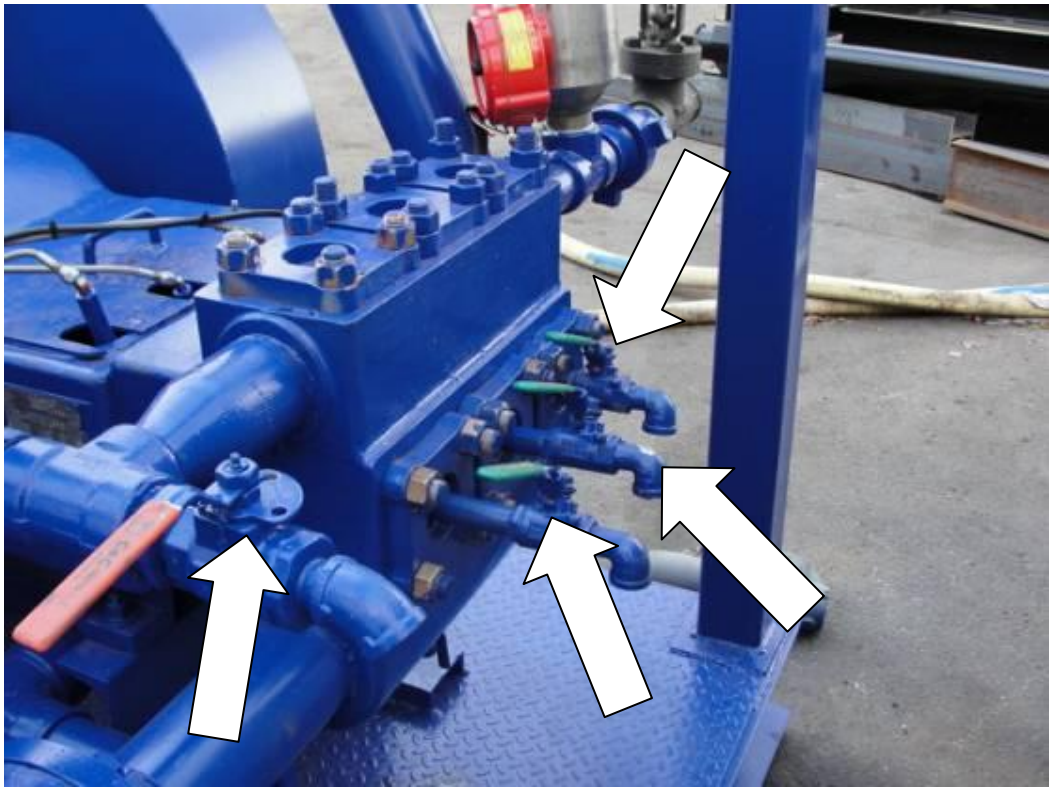
Before Starting Unit.

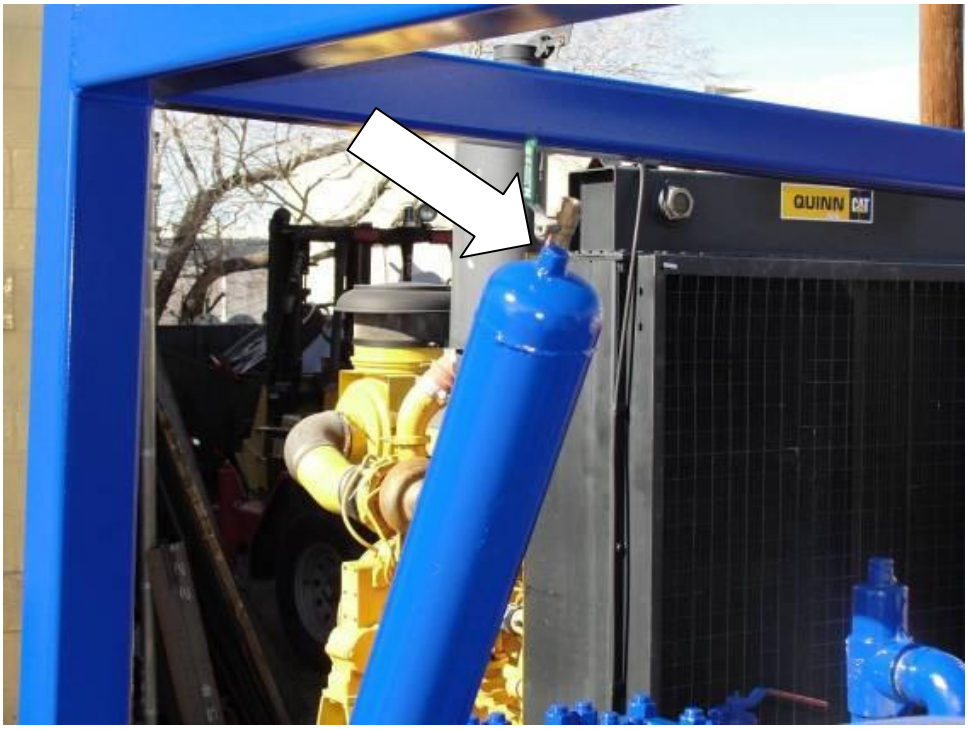
Only trained and experience personnel should operate this piece of machinery. Starting Instructions - Extremely important, if not followed, package *can and/or will be damaged.*

Before starting engine:

1. Perform walk around inspection per above guidelines
2. Ensure transmission is in neutral.

3. Ensure all valves are in the open position: see below:





4. Do one last inspection before starting engine.
5. Start Engine

Turn key to on position. Allow 30 seconds prior to starting to allow glow pugs to heat up.
Start engine. Allow 5 minutes for warm up.
While unit is warming up prepare pump for startup

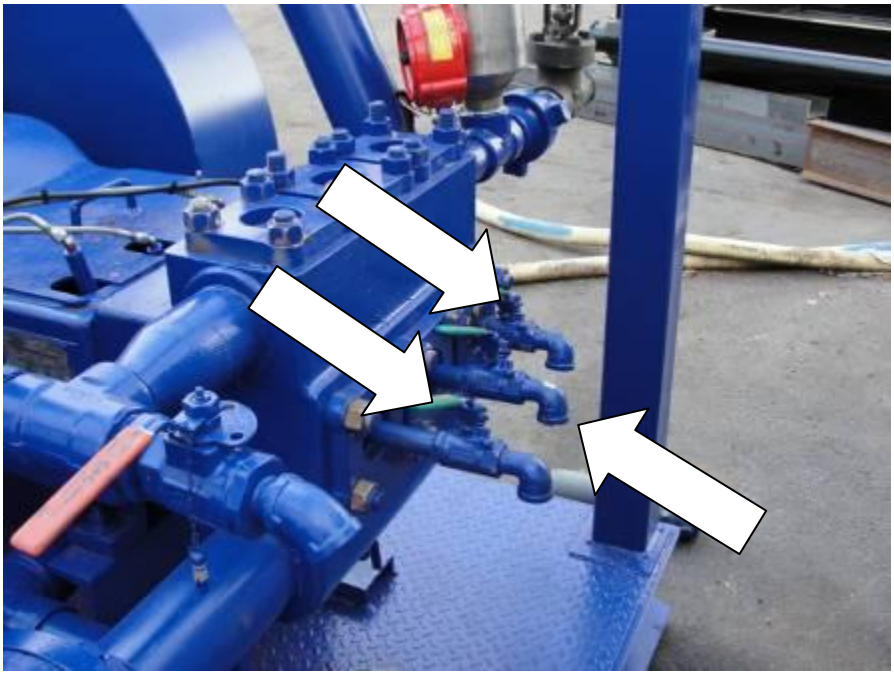
End engine start up section

Preparing pump for start up

This package has been designed around a continuous duty cycle not exceeding 1200 PSI and 145 GPM. The desired speed for optimum running is 3rd gear running at 2500 RPM on the engine.

Close high pressure drain valve.

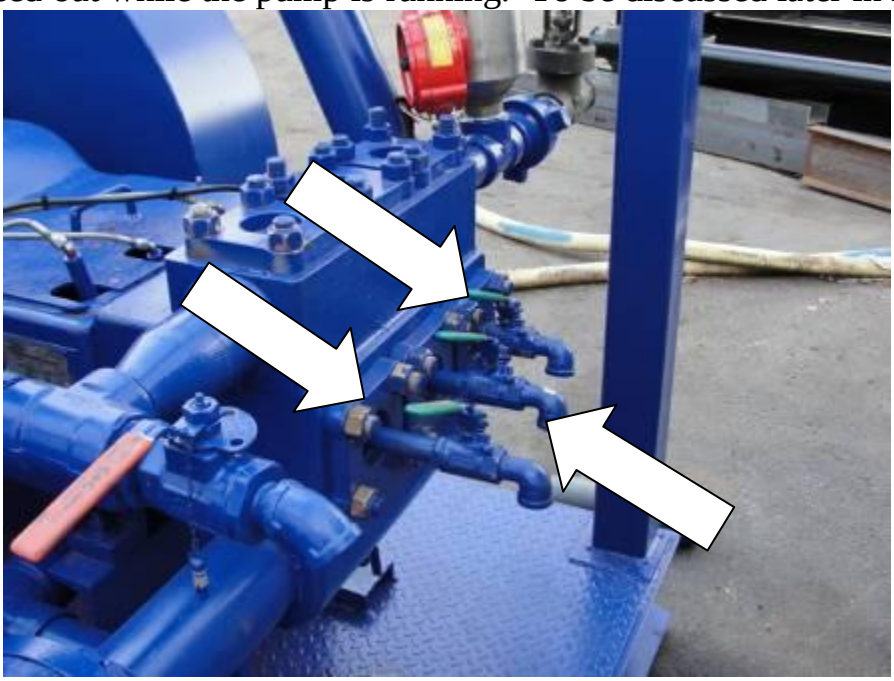
Close high pressure pump air bleed valves. Be sure to purge all air at this point or before closing the valves. Pump cannot purge air out without liquid.



Close low pressure suction stabilizer air bleed valves.

Introduce fluid to be pumped. Bleed off air in suction stabilizer. Once fluid begins to exit, close valve.

Perform the same function on the fluid end valves: Ensure all air has been purged. If air remains in the cylinders this will cause water hammer and will destroy the plungers. Air can also be bleed out while the pump is running. To be discussed later in manual.



Preparing to pump fluid

Ensure main discharge valve on pump is open.

Engage transmission and based on volume and pressure choice your gear. *Never use 1st or 4th Gear. Pump speed will either be to slow causing lack of lubrication or to fast thus over speeding the pump. Your pump have been designed for optimum running speed and life based on 2nd and 3rd gear usage, running engine at max RPM.*

Speed engine up to 1200 rpm, depress clutch lever, put transmission in desired gear (2nd or 3rd only) and slowly release pressure on foot pedal, while at all times watching the pressure gauge.

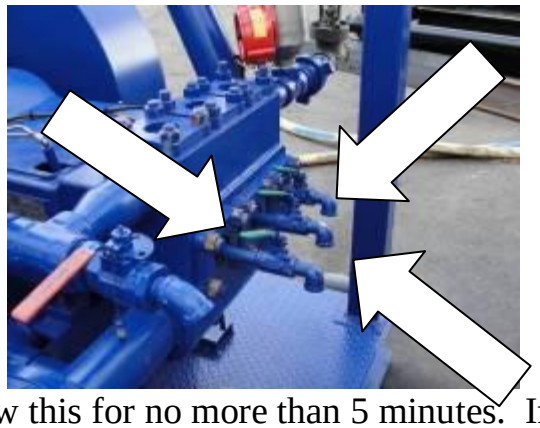
Set pressure gauge high side to max pressure for your site conditions. This will ensure the unit shuts down before it can go high pressure.

Once the pump is running speed up the engine while watching the pressure gauge during the entire process. Volume is determined by the speed of the engine and pressure is determined by site conditions.

Never exceed site condition or pump capabilities.

Once pump is running at desired speed and pressure watch for excessive pulsation. This will be noticed by the gauge needle pulsing more the 100 PSI in either direction. If this occurs the following must be attempted:

1. Open high pressure valves on each cylinder slightly trying to purge air. Perform this only if a charge pump is present pushing 30 PSI or 2 bar on the suction side of the pump. If no charge pump is used do not open these valves. This will cause air to enter the pump.

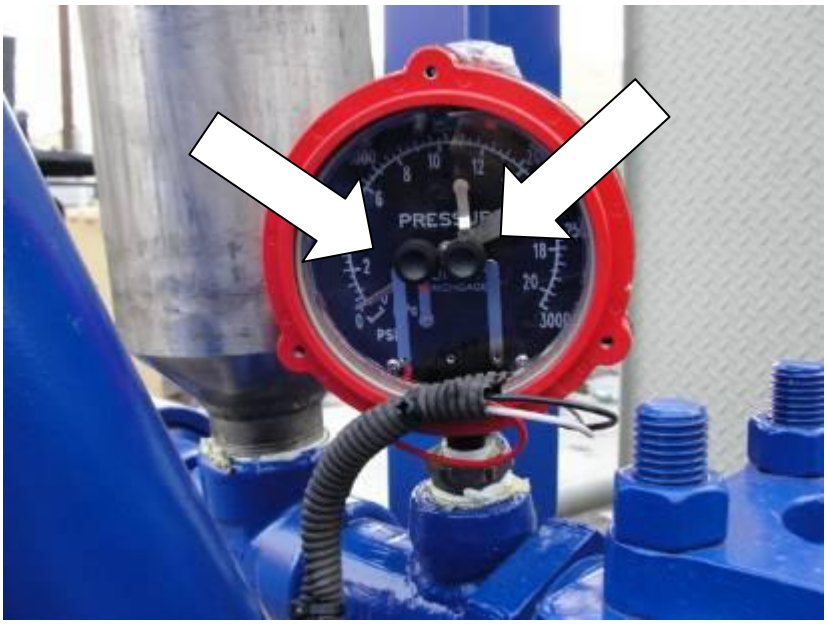


If pulsation continues allow this for no more than 5 minutes. If after 5 minutes you need to shutdown and evaluate the site conditions.

Possible site problems causing pulsation:

1. Suction pipe to small, starving the suction side of the pump.
    a. Install a charge pump to push 30PSI or 2 bar pressure on the suction side of the pump or refer to the Kerr manual for proper installation instructions.
2. Suction side of the pump may have air leaking into system.
3. Suction or discharge are leaking, damaged, or stuck in the open position.
4. Pulsation has been charged to 1000 PSI. Pressure on pump maybe to low to engage the pulsation dampener.
5. Site discharge conditions maybe to low.

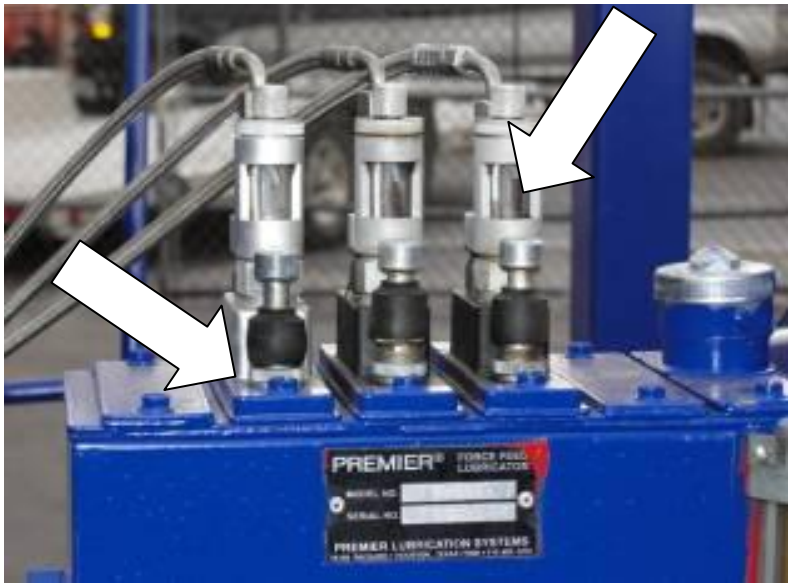
Once the pulsation has calmed down and desired pressure has been obtained set the high and low pressure setting to protect the site and pump.



This package has been designed around a continuous duty cycle not exceeding 1200 PSI and 145 GPM. The desired speed for optimum running is 3rd gear running at 2500 RPM on the engine.

Plunger Oiling System

This pump has been equipped with an automatic plunger oiling system. The site glass should show no less than 6 drops per minute per plunger application.
To adjust the flow rate loosen the set nut and to increase flow screw the mechanism out and to decrease flow screw the mechanism in.



Plunger lubrication. The plunger packing should leak at least one drop per second. Liquid should look like a white sludge. This is a combination of oil and water.

Shutdown procedures

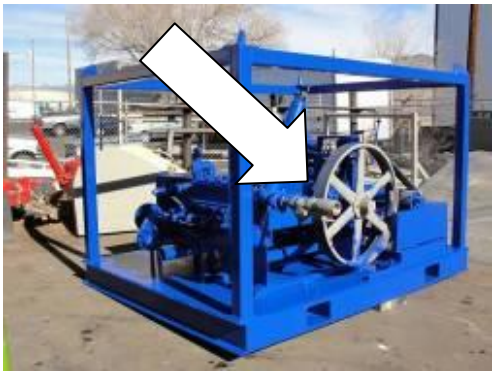
When pumping is coming to an end adjust the low pressure shutdown to less than zero. If this is not performed the unit will shut down on low pressure. This can cause damage to the engine and pump.

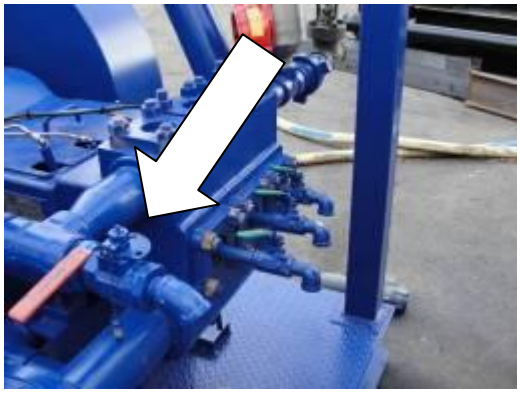
After the low shutdown has been adjusted on the Murphy Gauge begin to idle down the engine to 1000 rpm**.**

Disengage the transmission and allow the engine to cool down for at least 5 minutes. This allows the turbo to cool down.
Turn engine off.

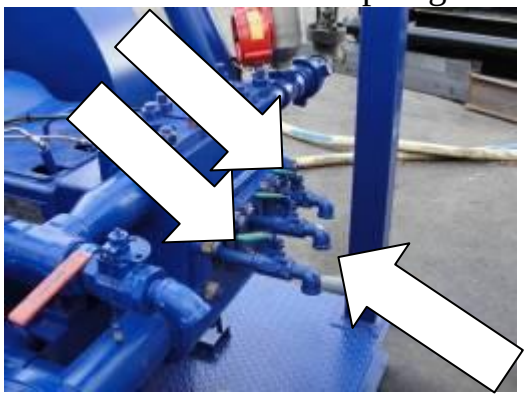
At this point shut the suction side valve or supply line valve. (Not provided in this application)

Walk around and close the high pressure discharge valve.
Open the high pressure relief valve





Open the high pressure valves to drain fluid out of plunger stuffing boxes.



Once all high pressure valves have been opened, start engine, run up to 2000 RPM, engage transmission into 3rd gear, release clutch pedal slowly and allowing pump to run for 30 seconds to push fluids out of stuffing box cavity. If shutting down unit permanently, disconnect discharge hose and perform the same function.

Once unit has been decommissioned, disconnect the battery and remove the starting keys.

End of startup instructions.

Customer is responsible for all damages to package due to lack of following the above instructions.