The “GAS BAILER VALVE”
Prevent GAS LOCK & Reduce Gas Interference in SUCKER ROD PUMPS
Increase Production & Extend Pump Life

Benefits of the Gas Bailer

• Increase pump efficiencies and increased production.

• Pump below a packer.

• Decrease power costs. Operating the pump in a gas locked condition wastes energy. The pump is reciprocated but no fluid is lifted.

• Eliminate tagging bottom - saves on man hours and increases pump life.

• Increase Valve Life. Violent impacting of balls against seats and cages due to high energy release of gas associated with tapping is eliminated.

• Increase Rod & Tubing life - rod slap associated with tagging bottom can shorten rod and tubing life.

• No mechanical devices or finger type ball openers used which can break, or cause premature valve failure.

Use of the GAS BAILER, will reduce gas interference and positively eliminate gas-locking on the down hole rod pump. Acting as a mini-compressor, it will pump free gas, as well as oil, water, or foam on each and every stroke.

The Gas Bailer is attached to the bottom of the standard pump traveling valve replacing the seat plug. The frictional force between the outside of the drag plunger and the inside of the pump barrel causes the Gas Bailer Valve to open and close.

Patent Pending

For more information call Don Conn at Conn Pumps off: (403) 262-5151 Cell: (403) 620-8181 or donconn@connpumps.com
GAS BAILER INSTALLED IN SUCKER ROD PUMP

- **Pump Barrel**
- **Top Plunger Adapter**
- **Standard Spray or Pressure Actuated Plunger**
- **Normal Traveling Valve**
- **Ported Mandrel** – manufactured from 316 Stainless Steel for long life in corrosive environments.
- **Gas Bailer Valve** - threads into bottom of traveling valve, replaces seat plug.
- **Drag Plunger** – frictional drag between the inside of the pump barrel and the outside of the drag plunger causes it to move up or down depending on whether the pump is in an up or down stroke. On the up stroke the drag plunger seals against the ported mandrel seat. On the down stroke the top of the drag plunger seals against the matching top end of the ported mandrel. The four ports at the bottom of the mandrel are opened & fluid or gassy oil enters. The Drag Plunger is made of 316 Stainless Steel, for long life in corrosive environments, with a spray metal coating.
- **Drag Plunger seat** - Stellite coated for long life.
- **Four fluid entry ports** at bottom of mandrel.
- **Ported Mandrel seat** - Stellite coated for long life.
- **Standing Valve**
How the Gas Bailer Valve works to fix gas interference.
Conn Gas Bailer Valve - Normal pump operation – no gas present

During the upstroke, both the normal standard traveling valve and GAS BAILER VALVE close. The hydrostatic weight of the fluid to surface above the traveling valve causes the ball to drop or close the standard traveling valve.

The friction or drag created as a result of the close tolerances between inside of the pump barrel and the outside of the drag plunger causes the angled and Stellite hardened surface at the lower end of the drag plunger seat to close & seal against the matching, top end of the equally hardened & lapped ported mandrel seat.

The standing valve opens, and formation pressure forces oil and gas into the pump barrel below the GAS BAILER VALVE.

During the normal downstroke, as the plunger and GAS BAILER VALVE travels downwards the standing valve closes, and as liquids cannot be compressed, the oil is forced up through the GAS BAILER VALVE to the standard traveling valve and it opens as a result of the following.

The frictional force or drag created as a result of the close tolerances between inside of the pump barrel and the outside of the drag plunger causes it to move up and seal against the top larger OD 45 degraded angular portion of the ported mandrel.

This opens the 4 port area at the lower end of the ported mandrel.

Oil then is forced into the ports and up through the inside of the ported mandrel and in and past the standard traveling valve, up the inside of the standard spray metal or PA plunger and out the top plunger adapter and into the tubing.
Gas or Gassy Oil Enters the Pump

During the upstroke, both the normal standard traveling valve and GAS BAILER valve close. The hydrostatic weight of the fluid to surface above the traveling valve causes the ball to drop or close the standard traveling valve.

The friction or drag created as a result of the close tolerances between inside of the pump barrel and the outside of the drag plunger causes the angled and Stellite hardened surface at the lower end of the drag plunger seat to close & seal against the matching, top end of the equally hardened & lapped ported mandrel seat.

The standing valve opens, and formation pressure forces gas and or gassy oil into pump barrel below the GAS BAILER valve.

During the downstroke, as the standard spray or PA plunger and the GAS BAILER valve (attached to the bottom of the traveling valve) moves downwards the standing valve closes, however unlike normal operation with straight fluids, which cannot be compressed, the traveling valve will not open, but stays closed, as a result of compressible gas or gassy liquids.

The frictional force or drag created as a result of the close tolerances between inside of the pump barrel and the outside of the drag plunger causes it to move up and seal against the top larger OD 45 degreed angular portion of the ported mandrel.

This opens the 4 port area at the lower end of the ported mandrel, however since the traveling valve is closed there is nowhere for the gas or gassy fluid to go and it remains in the area between the standing valve and the traveling valve, being compressed relative to how far down the plunger has gone down. Ideally closed spacing is desirable where the lower end of the sliding sleeve seat cap comes as close to possible to the top of the standing valve.

The pump with the GAS BAILER valve will continue to stroke under this condition where the traveling valve remains closed however the GAS BAILER valve, due to the friction of the drag plunger in the pump barrel, will continue to open and close with each stroke drawing more and more gas or gassy fluids into the pump or area between the standing valve and the traveling valve building pressure with each stroke.
Gas Interference – normal pump would gas lock while Conn Gas Bailer Valve corrects Gas Lock

Pump is still temporarily gas locked, during the upstroke, the normal standard traveling valve is still closed from the previous downstroke due to the hydrostatic weight of the fluid to surface above the traveling valve.

The friction or drag created as a result of the close tolerances between inside of the pump barrel and the outside of the drag plunger causes the angled and Stellite hardened surface at the lower end of the drag plunger seat to close & seal against the matching, top end of the equally hardened & lapped ported mandrel seat.

The standing valve opens, and formation pressure forces more gas and or gassy oil into pump barrel below the GAS BAILER valve.

A pump without the Conn Gas Bailer may stay in this state or until someone “Taps Bottom” which can cause premature pump failure.

The pump with the GAS BAILER valve will continue to stroke under this condition where the traveling valve remains closed however the GAS BAILER valve, due to the friction of the drag plunger in the pump barrel, will continue to open and close with each stroke drawing more and more gas or gassy fluids into the pump or area between the standing valve and the traveling valve until such point where the pressure in the pump exceeds the hydrostatic of the column of fluid above, and the traveling valve opens.

Within a few strokes the GAS BAILER valve has corrected the gas locked condition and normal pumping resumes. This may happen a few or many times in the course of a day but does so when required to overcome gas locking.

There are no mechanical devices or finger type ball openers used to kick/move the traveling valve ball which are in action 100% of the time whether the pump is gas locked or not and will be striking the ball when there may be no need. This action of hitting on every stroke may cause ball damage, premature valve failure, and rod shock. During rod shock the rods may swing and beat up the tubing.
History behind the Development of the Gas Bailer

The Gas Bailer is a collaboration between the inventor, Randy Downing of Texas, and the owner of the technology, Conn Pumps of Calgary. Randy Downing has been in the sucker rod pump business for over 30 years and has one patent to his name in addition to this one for the Gas Bailer.

A world patent for the Gas Bailer was filed and the patent is pending.

The first Gas Bailer was run in an Eagle Ford Shale well for Chesapeake Energy in March of 2013.

Since then Gas Bailers have been installed in wells in the Eagle Ford Shale for other companies such as Exco, EP Energy, Cheyenne, Cabot, and Bridger.

Gas Bailer have also been installed in wells in the Permian Basin for Conoco, Laredo, and ACS.

Other Gas Bailers are being run in Utah for companies such as Citation, Ultra, and Crescent Point.

As of March, 2015, a total of 975 Gas Bailers have been run in wells in the USA since March 2013.