Major Design Flaw

Found in the standard API down hole rod pumps

The standard API down hole rod pump has been around for more than one hundred years. This research and the following studies will point out this design flaw that has plagued the oil industry for all those years.

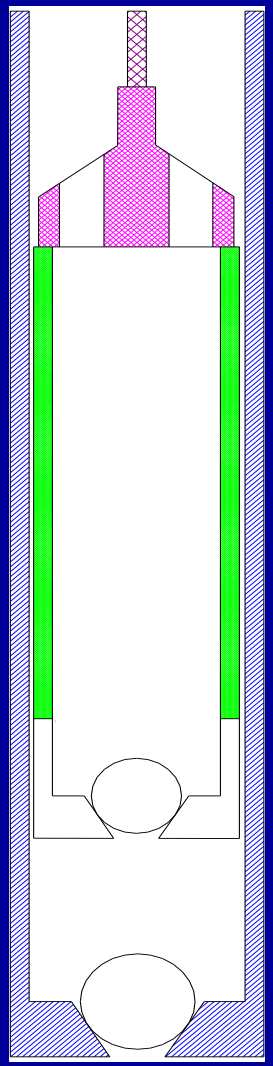
This design flaw has cut drastically into the performance and longevity of these pump to stay in the ground. It has created numerous and unnecessary well pulling and pump repairs.

This is a plunger out of standard API pump that was pumping sand & other solids. Notice the severe grooving. This grooving will cause the pump to lose pump efficiency
and eventually
FAIL

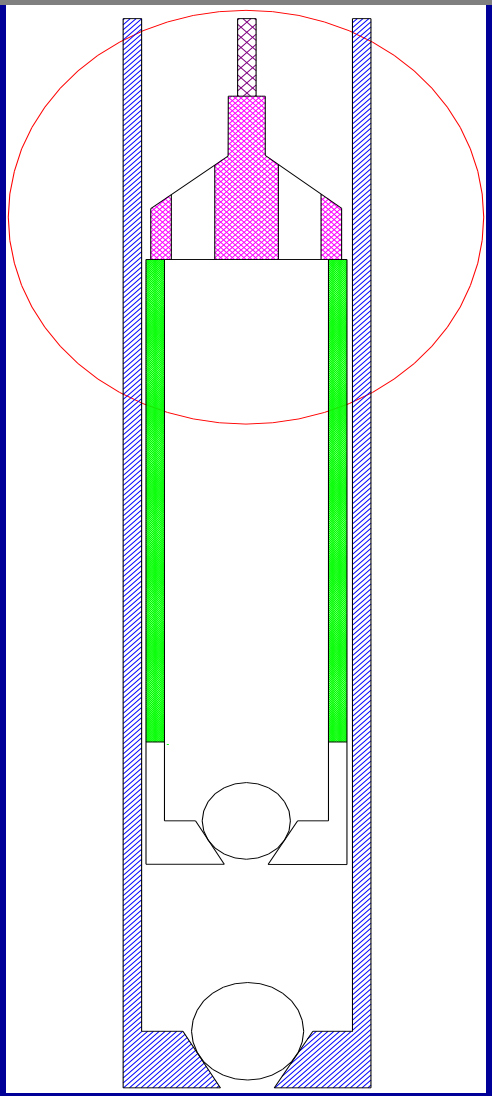
Lets look at a diagram of a Rod Pump with a

Conventional API Plunger

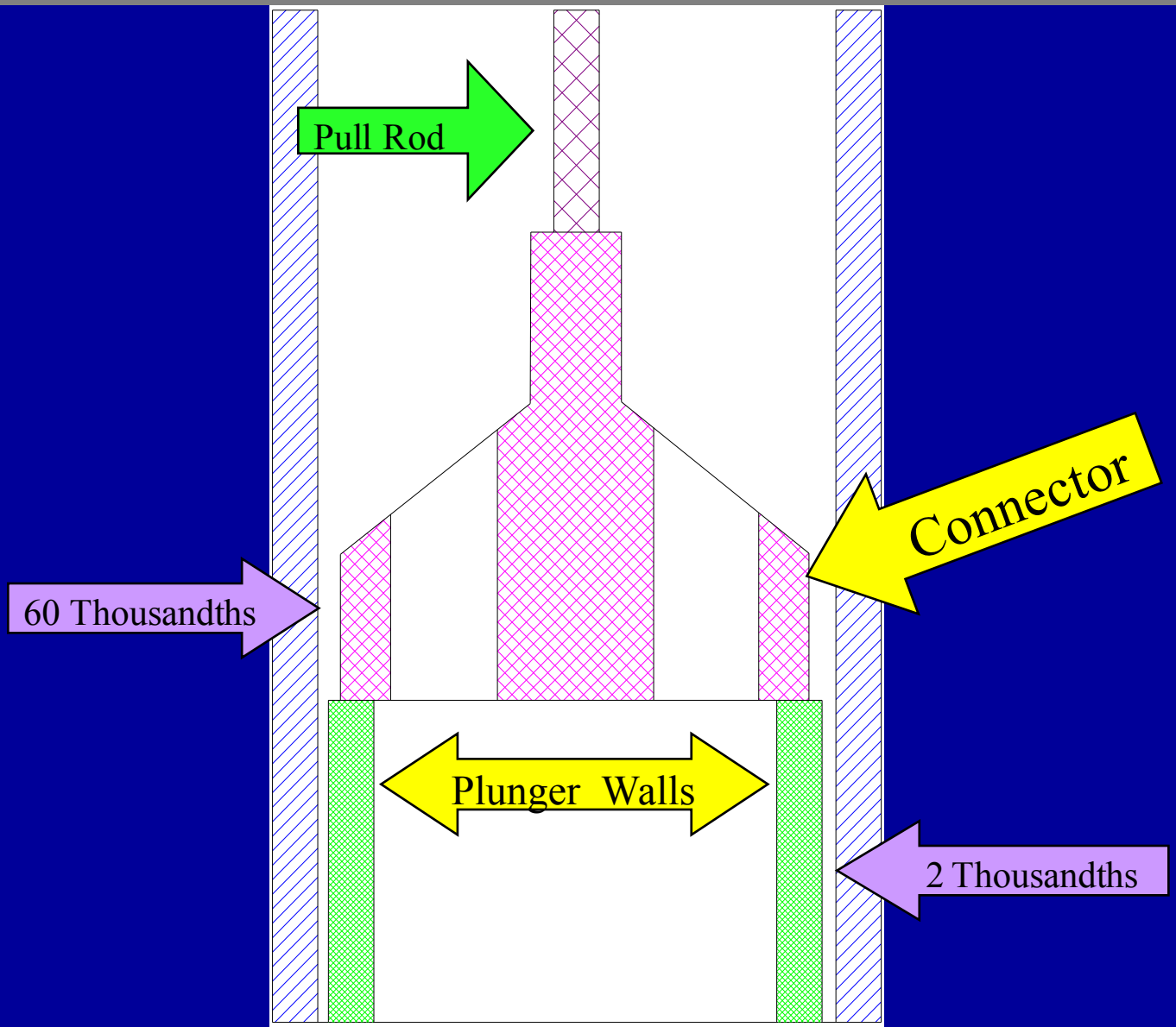
and see if we can find the problem.



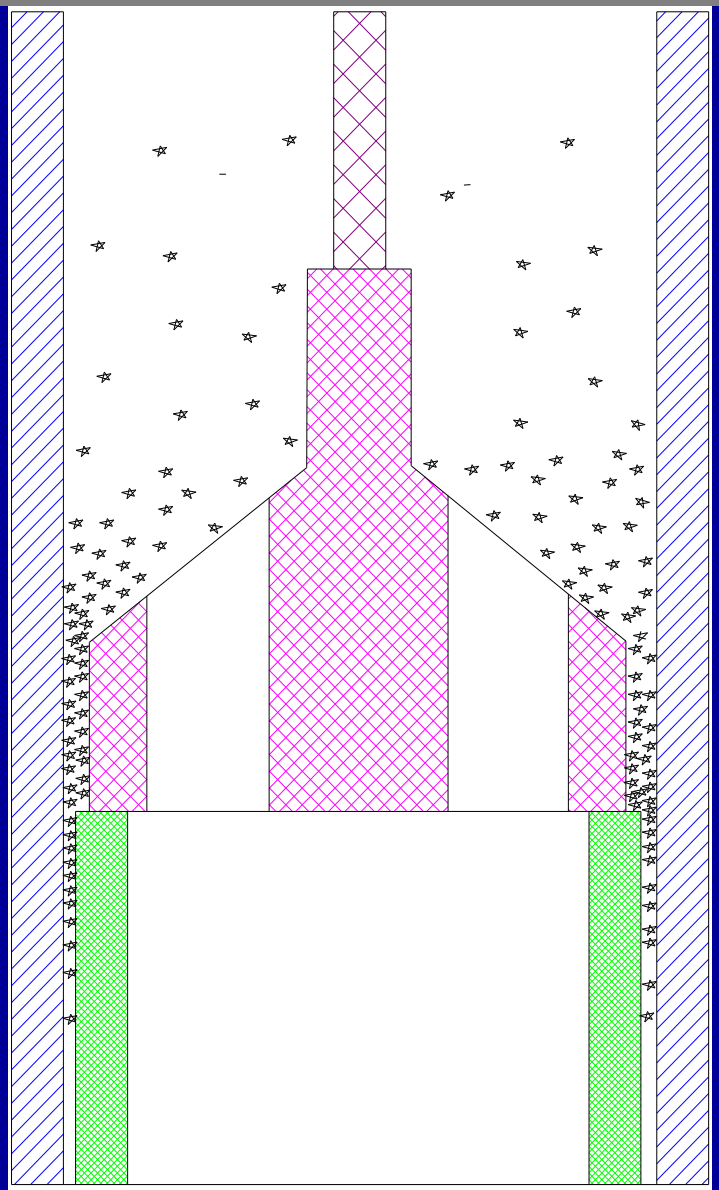
Lets focus our attention to the upper portion of this pump



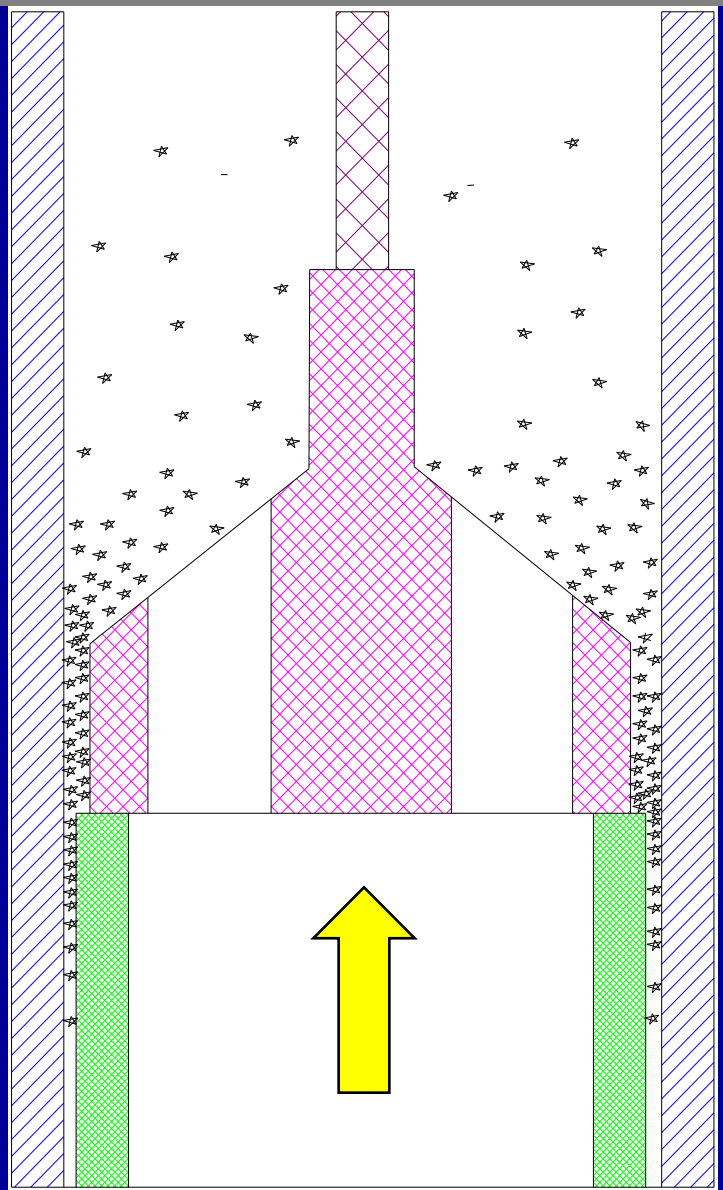
Notice the connector at the top of the plunger in green. The connector is .060 thousandths smaller in out side diameter than the plunger which is .002 thousandths in out side diameter.



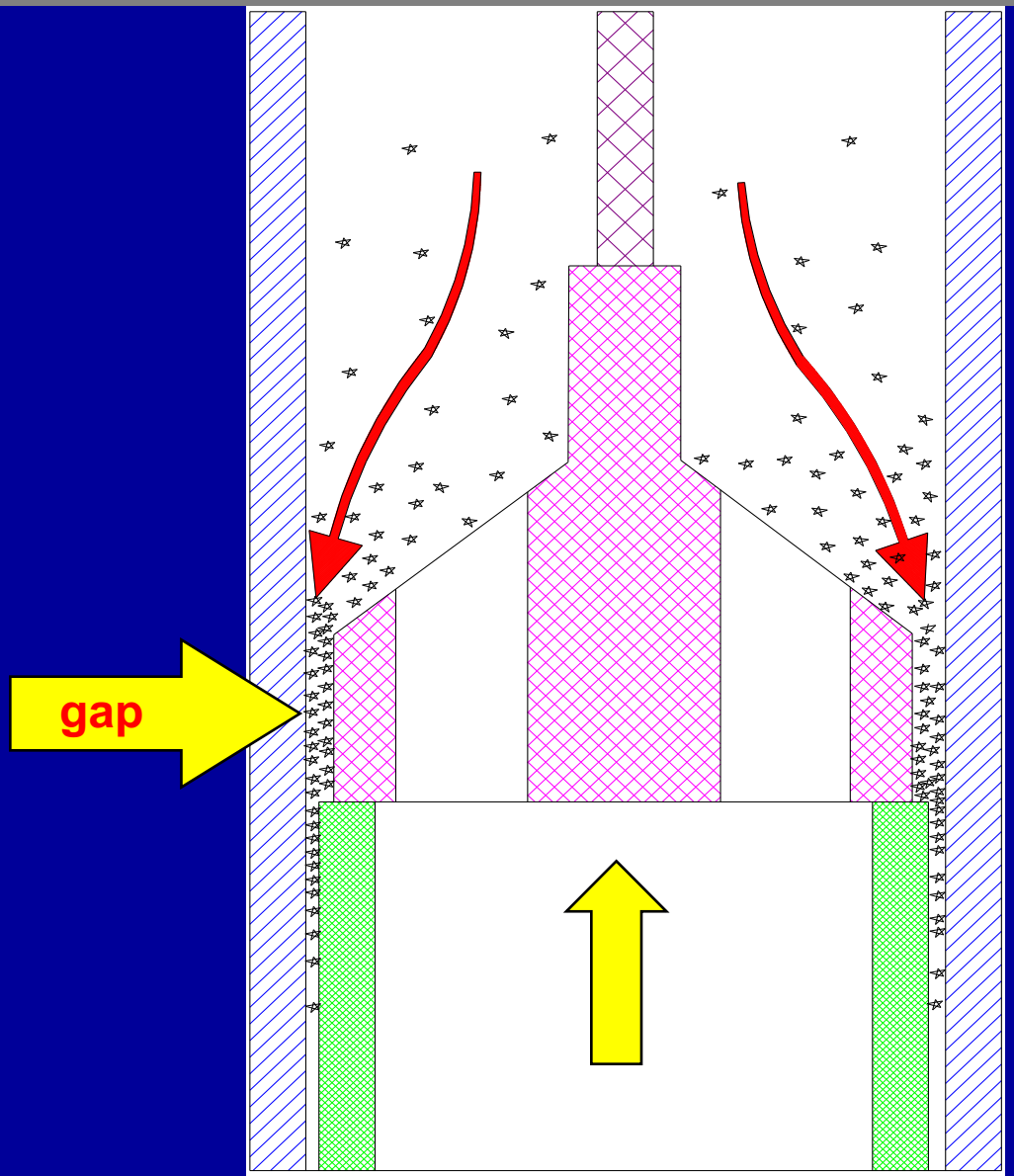
When you have formation sand, frac sand or any other types of solids entrained in the produced fluid, then you have a potential problem.



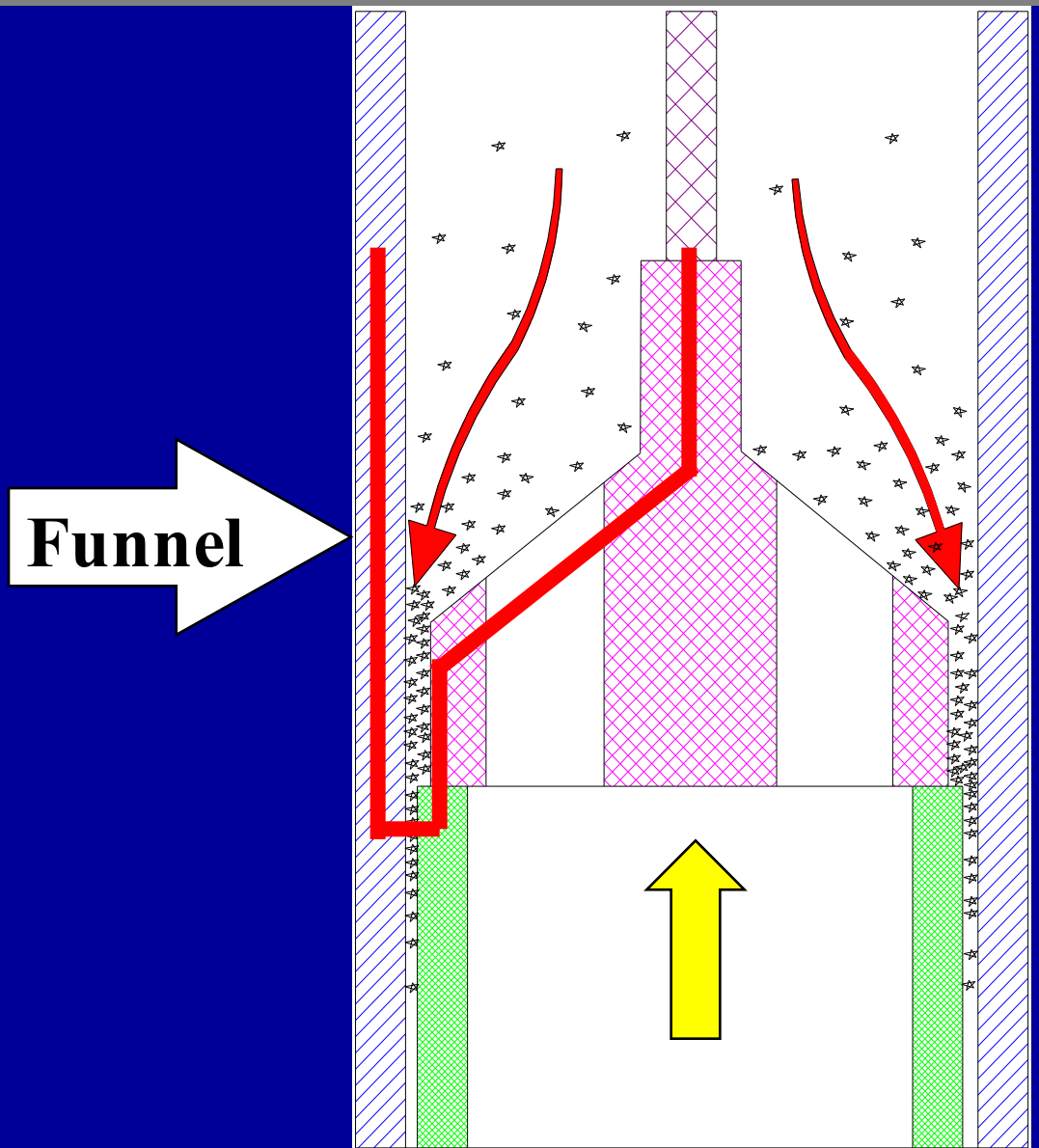
As the plunger starts it upward motion.



Notice how the sand is forced downward and outward into the gap between the plunger connecter OD and the pump barrel wall ID.

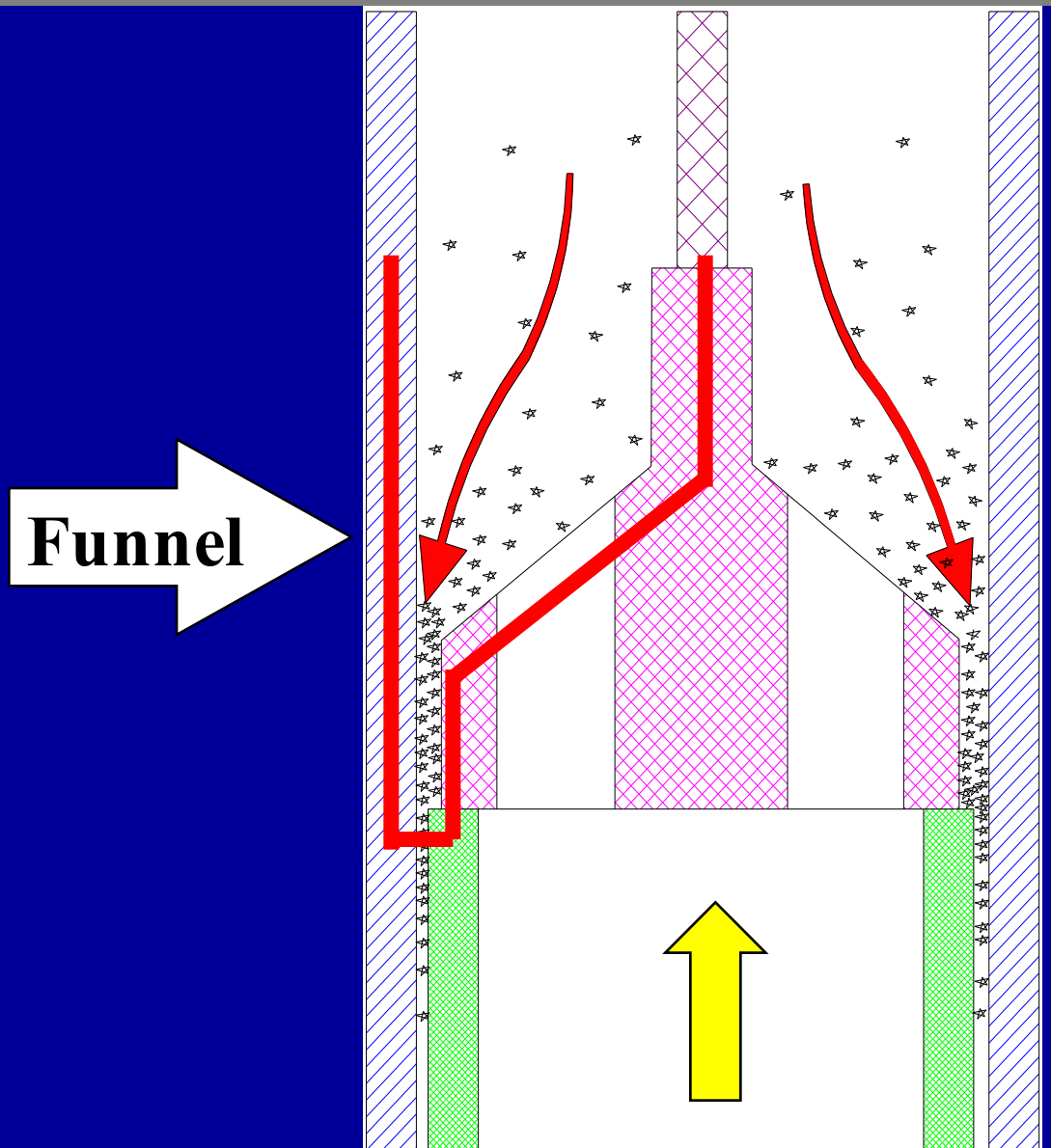


Notice the shape that is formed between the plunger connecter and the pump barrel wall. Doesn't that remind you of a giant funnel? Well, that is exactly what is happening.

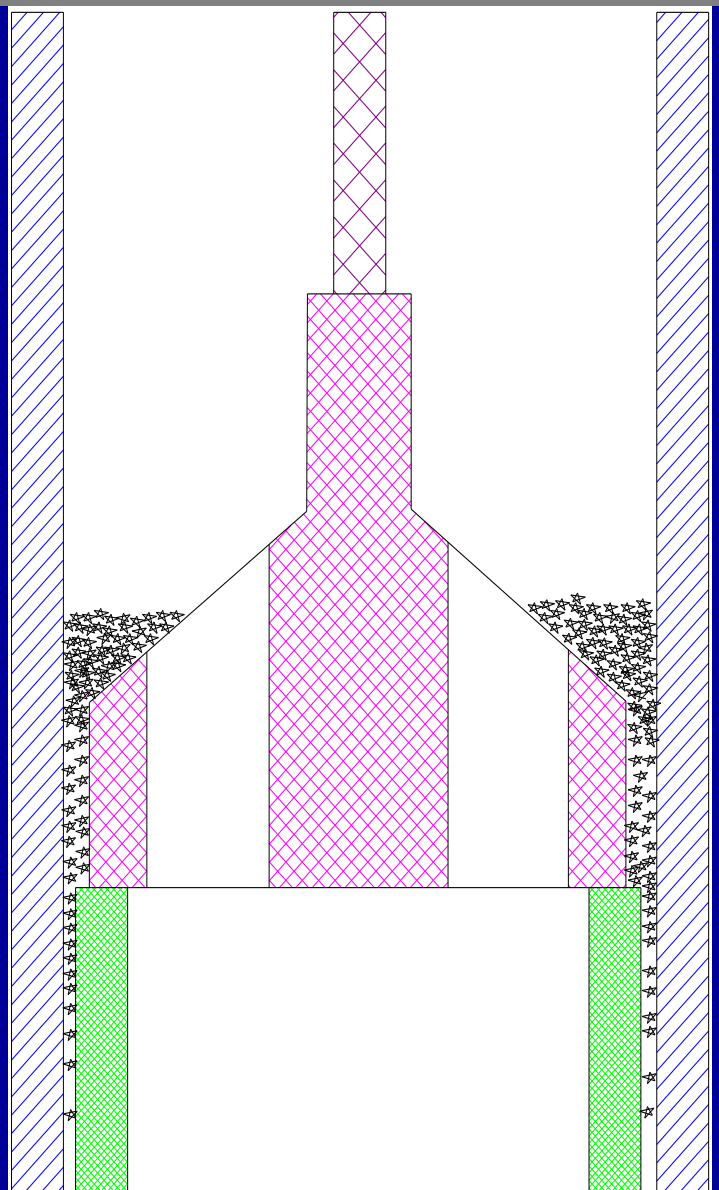


The sand is being funneled down into the gap

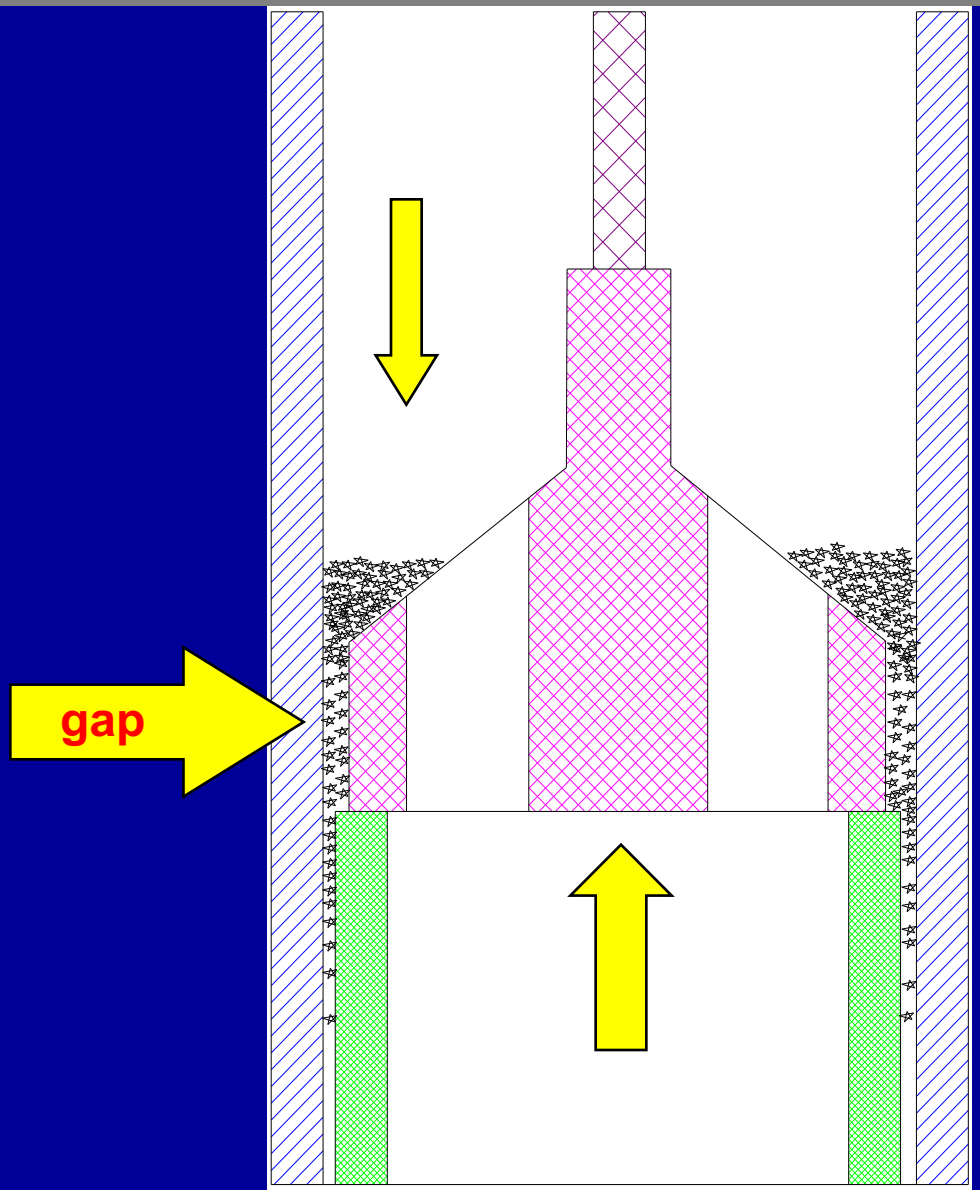
We call this the **FUNNEL EFFECT**



Now, lets take a look at what happens when the well is shut down even for the shortest period of time. Sand will settle out of solution and fall on top of the plunger connecter and into the **gap**

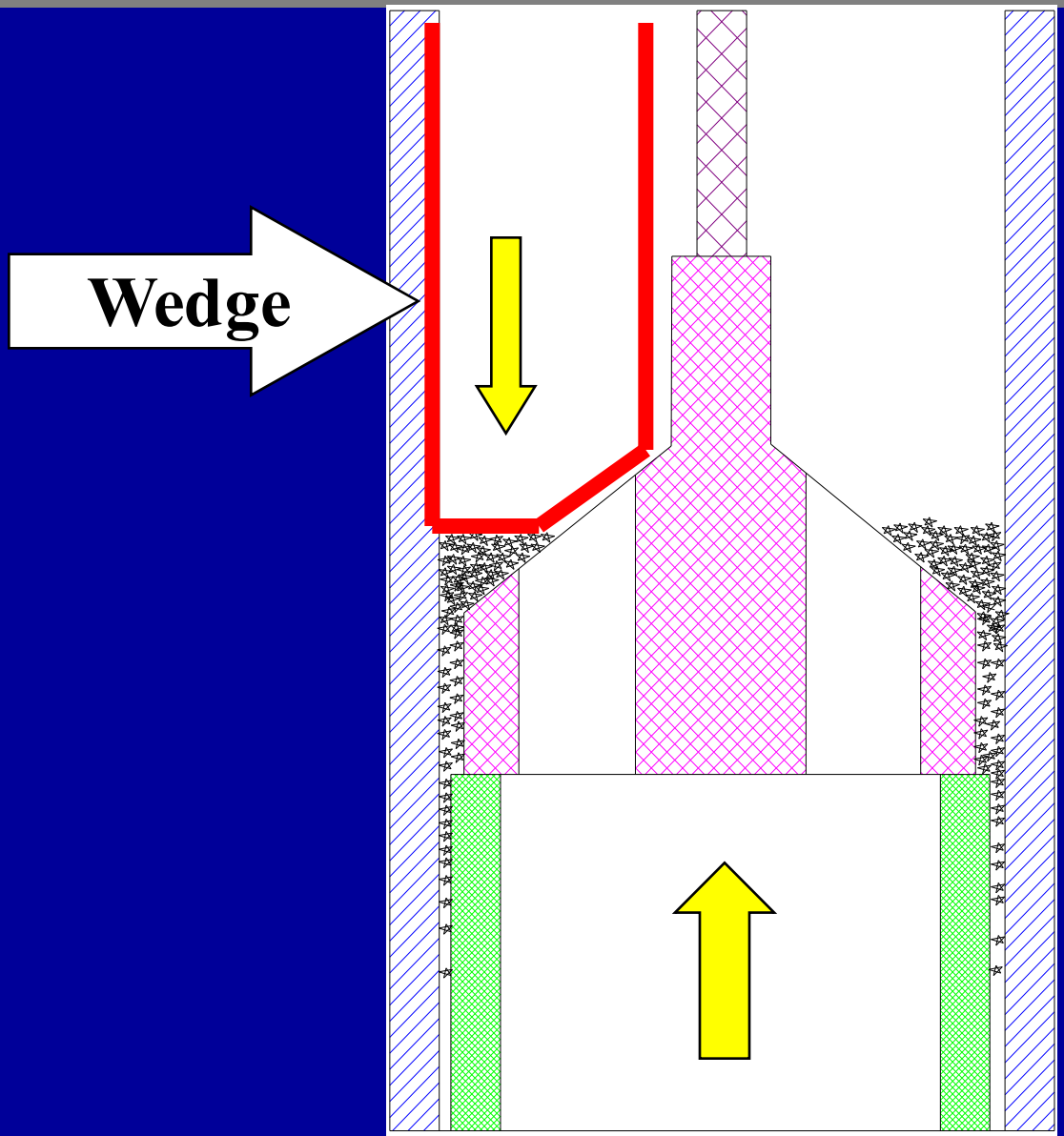


As the plunger *tries* to start back up, the sand is wedged in the **gap** between the plunger connecter and the pump barrel wall.

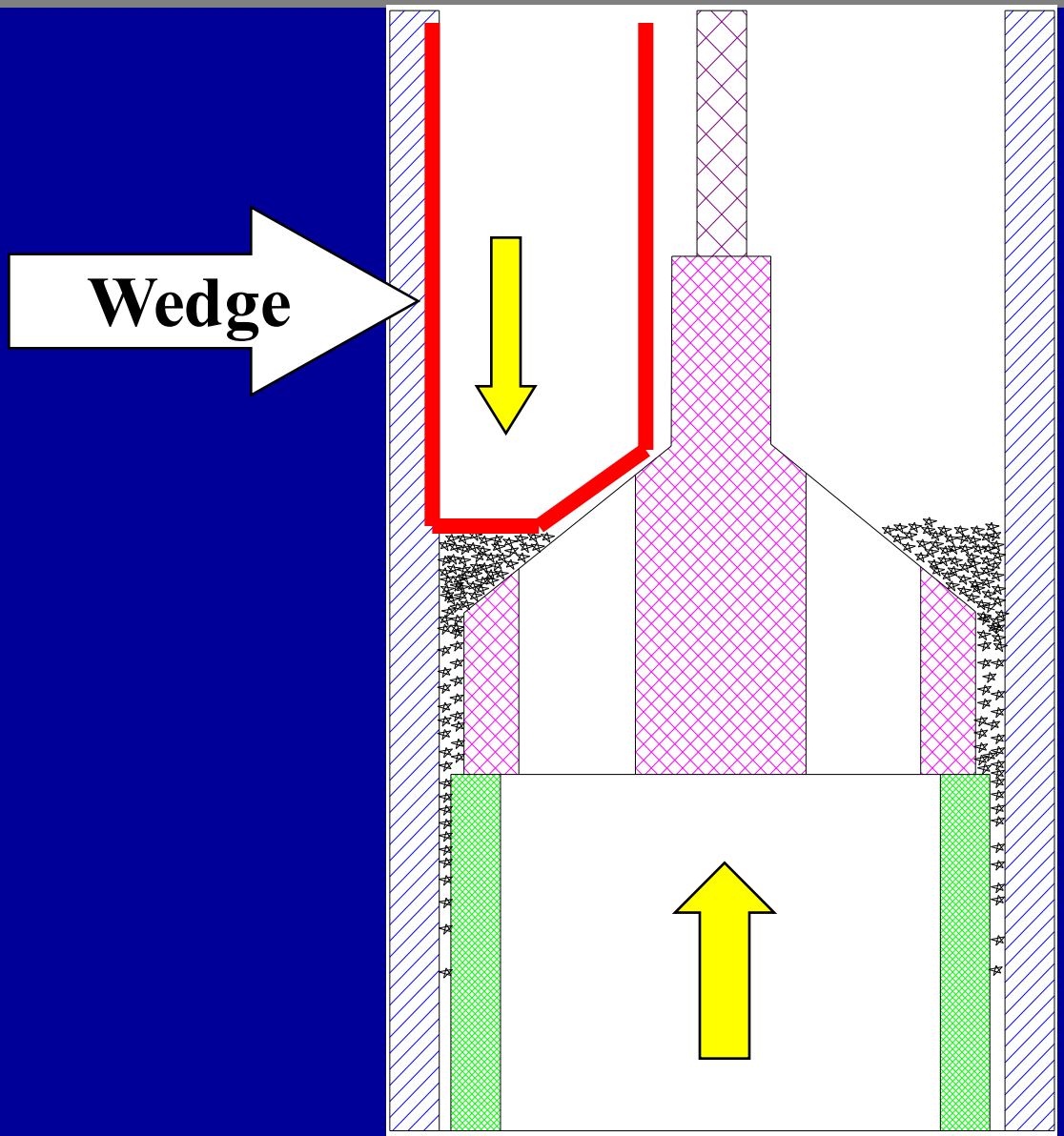


Again, notice the shape that is formed between the plunger connector and the pump barrel wall. We call this the

WEDGE EFFECT



The plunger is now stuck in the pump barrel. Even if the pumping unit had the power to pull the plunger loose, the plunger and the pump barrel will be severally grooved.



Now that we have discovered the two major problems with the standard API down hole rod pump is the

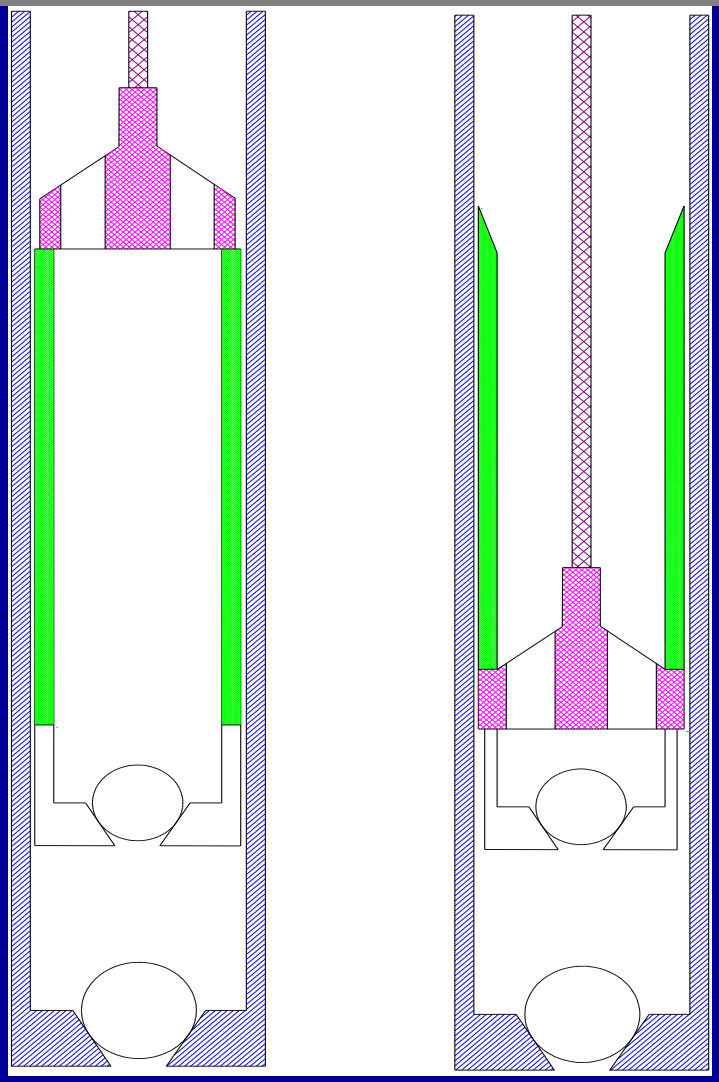
Funnel Effect and Wedge Effect.

The Funnel Effect and the Wedge Effect are created by the **GAP** between the plunger connector and the pump barrel wall. If we could remove the **GAP,** both of these conditions will go away.

What if we connected the valve rod to the bottom of the plunger rather than the top. Would that eliminated the **GAP** ?????

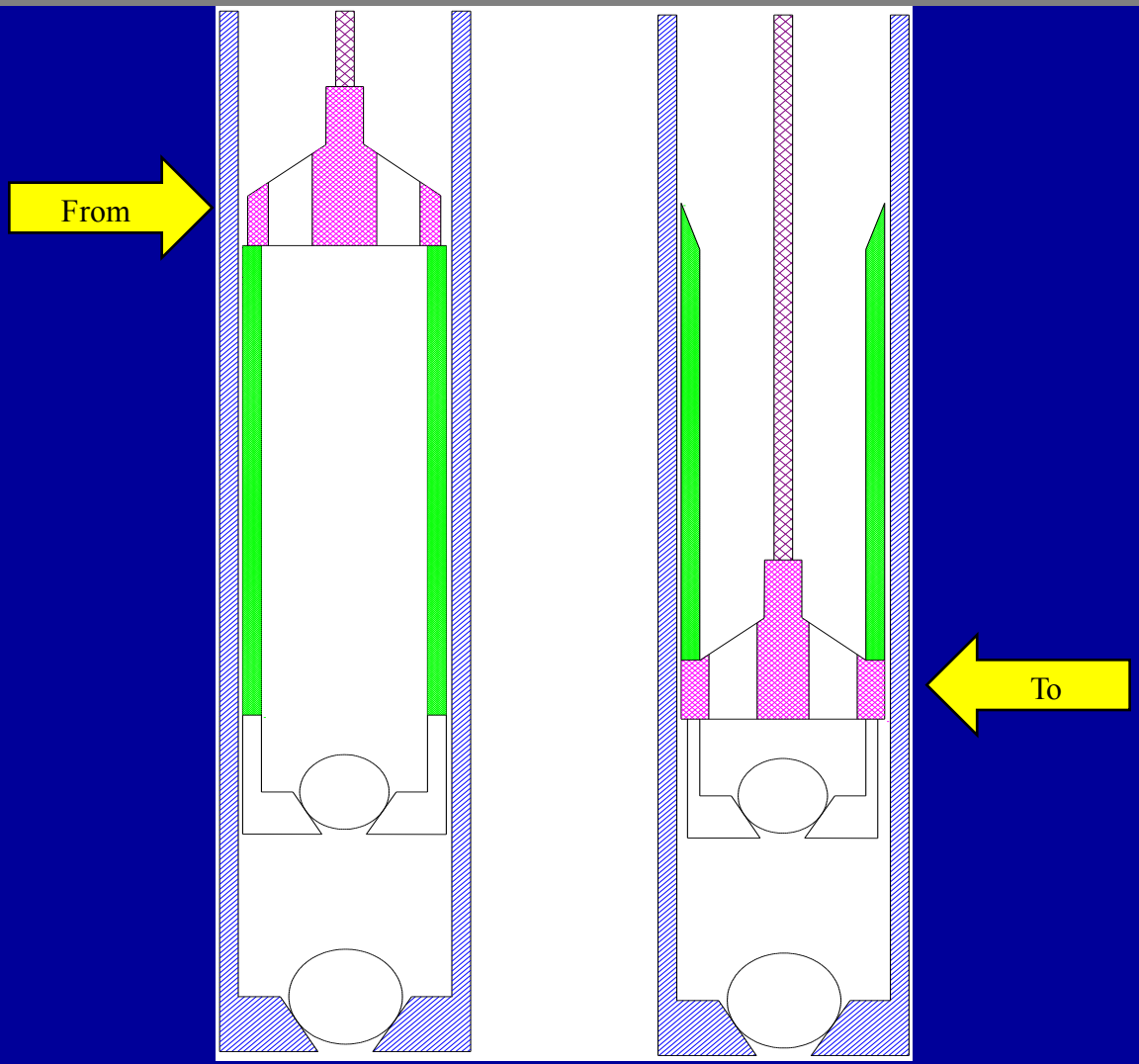
Lets see !

On the left is the standard API pump with the top connector.
On the right is the FARR pump with the connector on bottom.
Lets compare these two pumps.

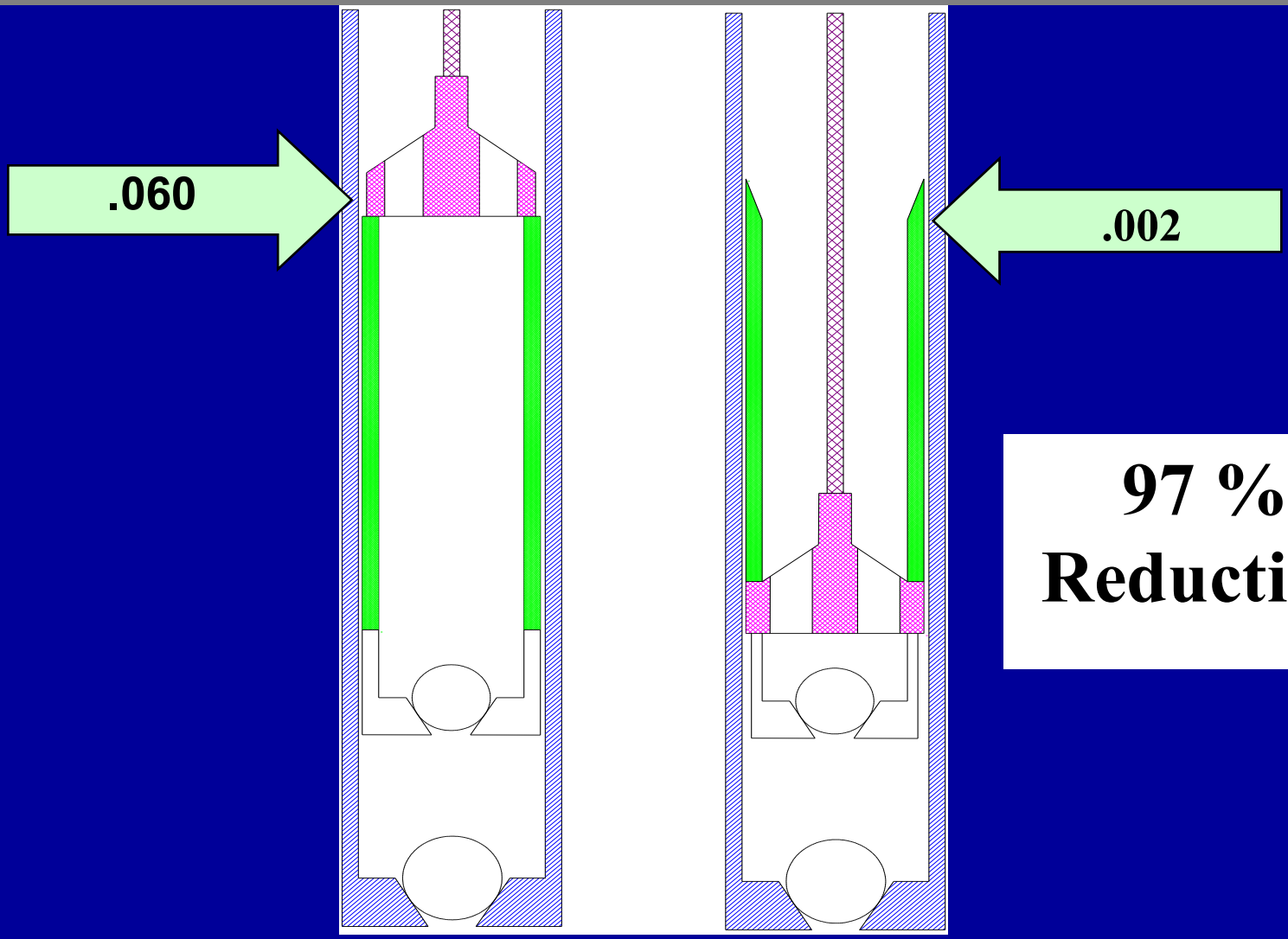


Conventional **"FARR"**

By moving the connector from the top to the bottom, we have moved the **GAP** to the bottom as well and now the **GAP** is irrelevant.

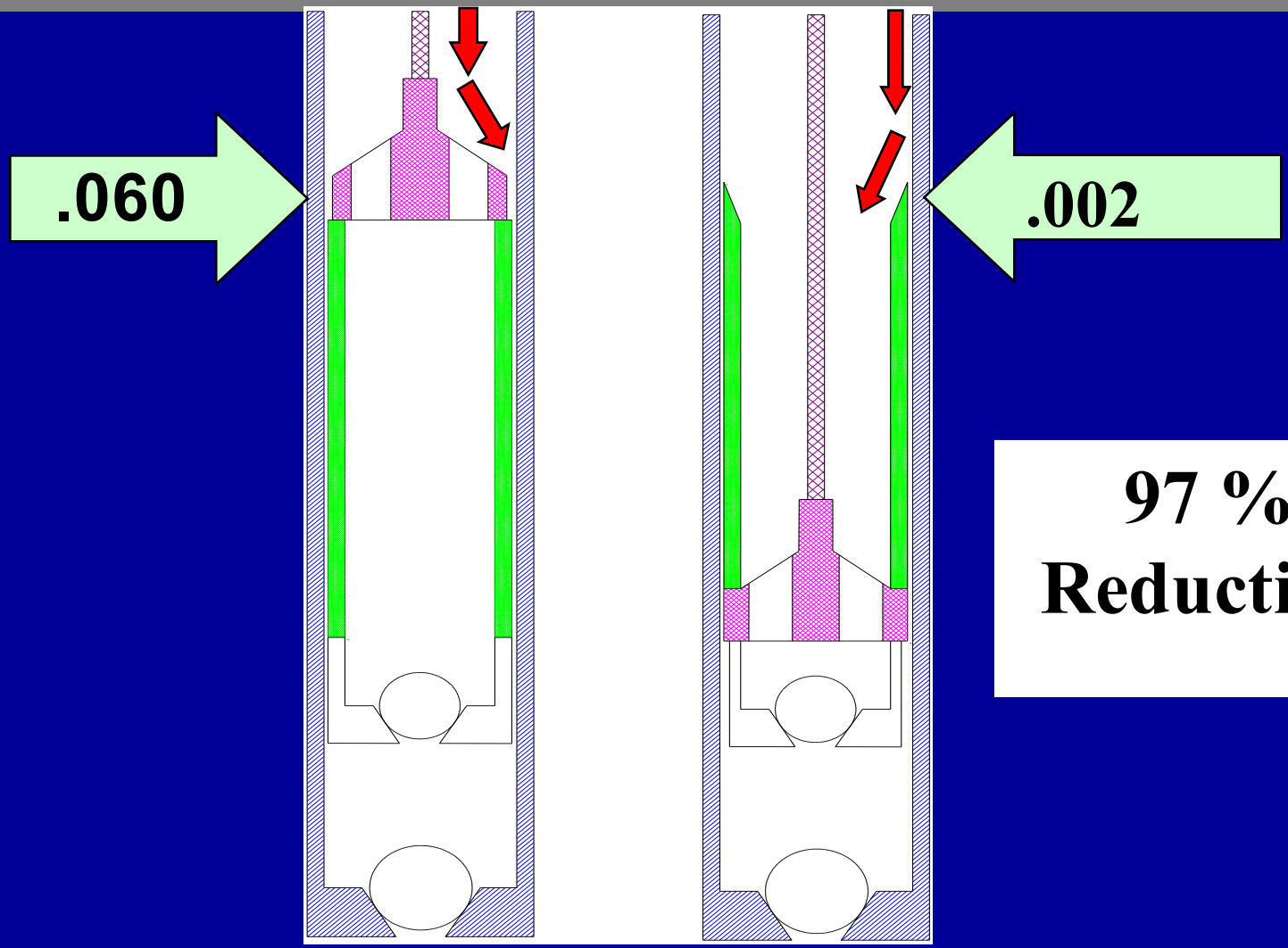


The .060 thousandth **GAP** at the top has now been reduced **97%** down to a .002 thousandth.



97 % Reduction

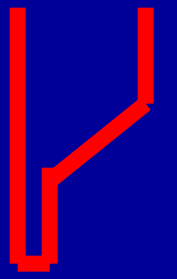
By tapering the FARR plunger inward at the top, we are now forcing solid inward as opposed too outward like the API plunger does. Now **97%** less solids get between the two metal surfaces.



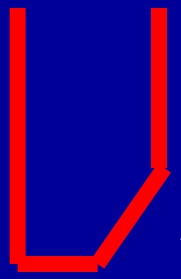
97 % Reduction

By FARR

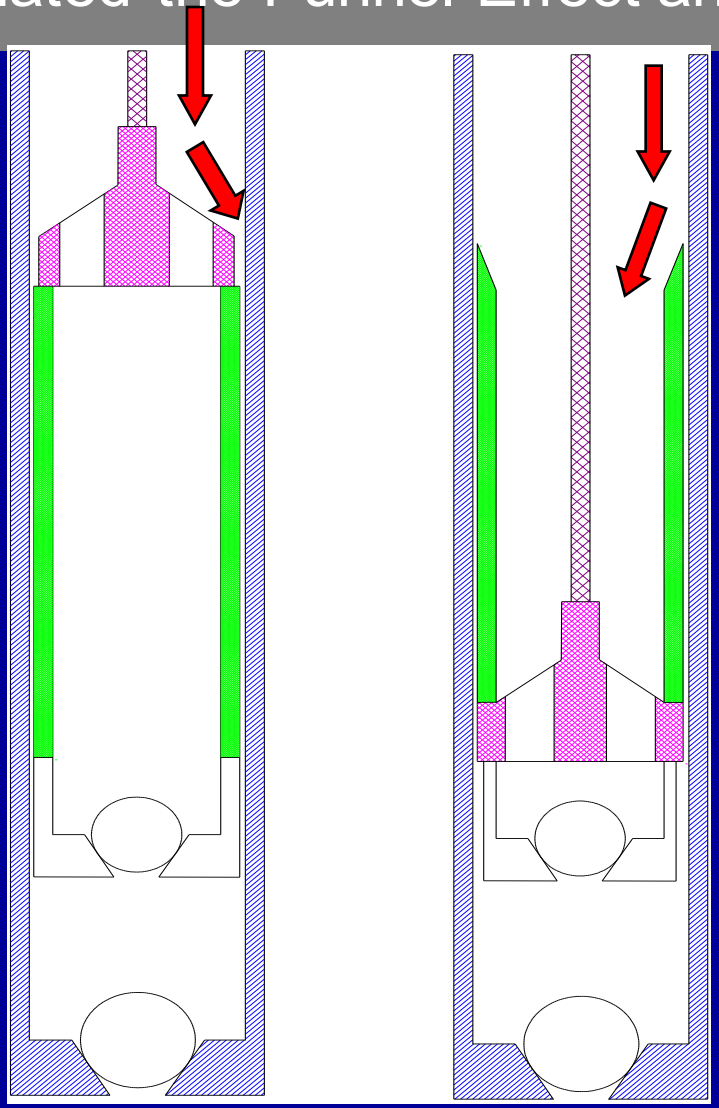
We have now eliminated the Funnel Effect and the Wedge Effect.



Funnel Effect



Wedge Effect



Conventional **“FARR”**

Conclusion

BY MAKING ONE *SMALL* CHANGE TO YOUR STANDARD API DOWN HOLE ROD PUMPS, YOU WILL:

MAXIMIZE PRODUCTION AND EFFICIENCY

MINIMIZE HEALTH, SAFETY, & ENVIRONMENTAL RISKS

INCREASE PUMP RUN LIFE

Reduce well pulling

Reduce pump repairs

Save thousands of $dollars$ in the long run