



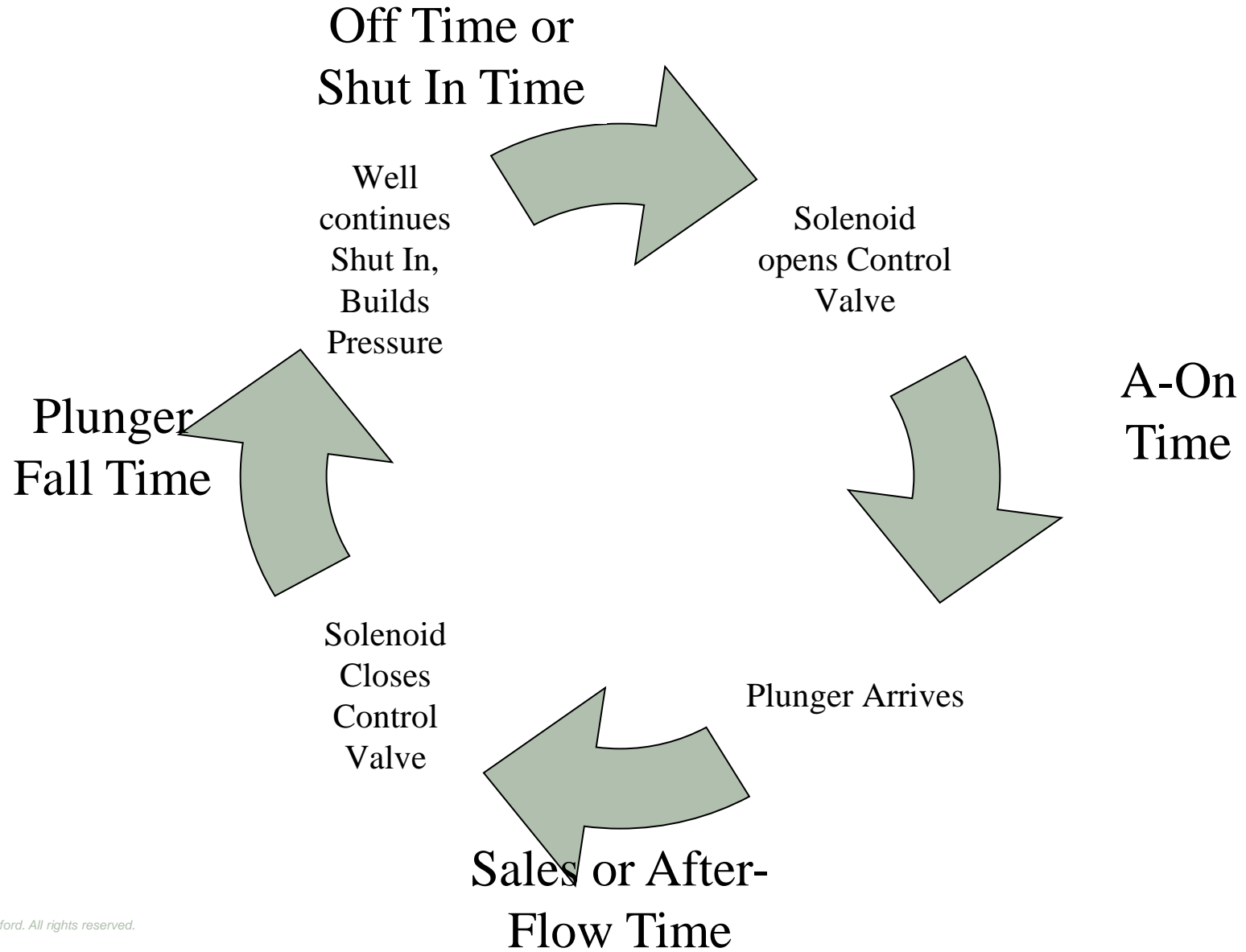
# Before we start... Understand the Challenges

- A single Plunger Lift solution does not solve every production problem and prevents venting.
- Changes in reservoir characteristics over time will affect production and the type of solution deployed.
- Requires continuous attention to maintain and optimize; may often be labor intensive for the “life of the well”.
- Others...





# Normal Cycle with Plunger Arrival





# Normal Plunger Cycle without Plunger Arrival

Off Time or  
Shut In Time

Well  
continues  
Shut In,  
Builds  
Pressure

Solenoid  
opens  
Control  
Valve

A-On  
Time

Plunger  
Fall Time

Solenoid  
Closes  
Control  
Valve

**No Plunger  
Arrival**

Plunger  
Arrives

B or Vent  
Valve Opens

Sales or After-  
Flow Time

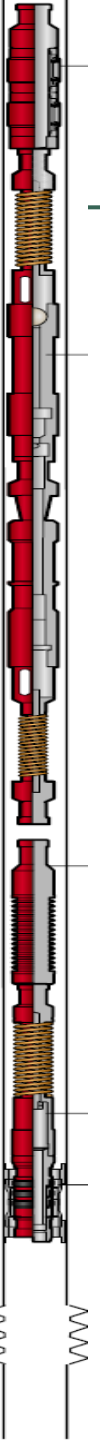


# Multi-Staged Plunger Lift Method



- Primarily used in wells that have GLR's below what is necessary to lift a conventional plunger
- Used in wells that are currently on Conventional Plunger Lift that require venting to surface the plunger
- Field Trials indicate that it decreases lift gas by 1-3 mcf per Barrel.
- Wells that have previously been considered Rod Pump Candidates.

**This device is landed at various intervals in the well in order to isolate the chambers.**





# Intelligence to Reduce Methane Emissions



- Mandatory Shut In – Well Recovery
  - Initiates after plunger non-arrival
  - Allows the well to build excess energy for next cycle to insure plunger arrival without venting
- Short Cycle – Auto Recovery
  - Initiates immediately after Mandatory Shut In – Well Recovery
  - Shuts the well in upon plunger arrival for a programmable number of cycles before resuming normal operation.
- Gas Injection/Assist Operation
  - Used during Gas Assisted Plunger Lift method to apply injection gas as needed
- Hi-Line Shutdown
  - Monitors line pressure for fluctuations that will prevent successful plunger arrival
- Foss and Gaul Control
- Load Factor Control

