Introduction to Plunger Lift

“Optimizing Plunger Lifted Wells by Acoustically Tracing the Plunger Fall”, Rowlan, McCoy, Podio, Hein, SWPSC 2001

“Plunger Lift Analysis, Troubleshooting, and Optimization”, Rowlan, McCoy, Podio, Canadian Petroleum Society 2007-159

“Modified Foss and Gaul Model Accurately Predicts Plunger Rise Velocity”, Rowlan, Lea, McCoy, SPE120636, 2009

“Measured Plunger Fall Velocity Used to Calibrate New Fall Velocity Model”, Rowlan, McCoy, Lea, Nadkrynechny, Cepuch SPE164495

O. Lynn Rowlan
Echometer Company
5001 Ditto Lane
Wichita Falls TX 76302, U.S.A.

Phone: (940) 767-4334 Ext. 115
Fax: (940) 723-7507

Web: www.echometer.com
E-mail: Lynn@Echometer.com
Plunger Lift is a very economical Artificial Lift Method:

- Low initial investment
- Low recurring/maintenance cost
- Rig not required for installation
- Plunger lift costs do not increase with well depth

Uses well’s pressure (Energy) to remove liquid loading

- Requires no outside energy source, if gas rate sufficient
- During Shut-in Period pressure must buildup to required minimum

Plunger Application

- Primarily used for Dewatering gas wells
- Superior Method to handle gassy wells
- Keeps tubing cleaned of paraffin deposits

Plunger Lift can be used to produce well to depletion; but other methods such as casing plunger and beam lift can pull the well to lower pressures.
1st Step is to Shoot Fluid Levels to Alert You to What is Downhole

@ 4750’ Tight Spot in Tubing

@ 5050’ 1/8” Hole in Tubing
**Controller:** Electronic-based system with control parameters to determine under what conditions to exert control by opening/closing the motor valve

**Transducer:** Electronic device that emits an electronic signal to be converted within controller to engineering units

**Motor Valve:** Diaphragm-operated device controlled by controller to open/close sales/tank line

**Lubricator/Catcher:** Uppermost stopping point for plunger; acts as shock absorber; catcher is mechanical device that locks plunger in lubricator for removal and for inspection

**Arrival Sensor:** Magnetic device strapped around lubricator to detect plunger arrivals... Vibration sensors have been used

**Bumper Spring:** Shock absorber at plunger’s deepest stopping point

**Plunger:** Pig-type device that provides a seal between gas and liquid inside tubing to deliver fluid and gases to surface with differential pressure. The plunger travels entire length of tubing from catcher to bumper spring.
Low Cost Plunger Well Parts List

Note: Master valve & lubricator catcher assembly must be the appropriate size ID for the size tubing installed in the well. Changes in ID through the tubing, master valve, and lubricator/catcher should be negligible.

Flanged master valves are recommended to eliminate potential of valve breakage.

<table>
<thead>
<tr>
<th>Key</th>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>plunger</td>
<td>1</td>
</tr>
<tr>
<td>AD</td>
<td>Bottom hole bumper spring assembly</td>
<td>1</td>
</tr>
<tr>
<td>AE</td>
<td>Seating nipple</td>
<td>1</td>
</tr>
<tr>
<td>BB</td>
<td>2” x 1” swedge</td>
<td>1</td>
</tr>
<tr>
<td>CC</td>
<td>Pressure control (fisher wizard?)</td>
<td>1</td>
</tr>
<tr>
<td>DD</td>
<td>Murphy Switch/High line delay</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Lubricator/catcher assembly</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Kimray Motor Valve</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>Auto-cycle controller</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>2” x 8” nipple</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>2” TEE</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>1” ball valve</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>2” x necessary length nipple</td>
<td>1</td>
</tr>
<tr>
<td>H</td>
<td>2” ball valve</td>
<td>1</td>
</tr>
<tr>
<td>I</td>
<td>flanged master valve</td>
<td>1</td>
</tr>
<tr>
<td>J</td>
<td>1/4” x 2” pipe nipple</td>
<td>1</td>
</tr>
<tr>
<td>K</td>
<td>2” bull plug with 1/2” tap</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>press. Gauge or gauge tap w/tee</td>
<td>1</td>
</tr>
<tr>
<td>M</td>
<td>press. Gauge or gauge tap</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>Kimray (meco) 664s regulator</td>
<td>1</td>
</tr>
<tr>
<td>O</td>
<td>Fisher 51R Regulator</td>
<td>1</td>
</tr>
<tr>
<td>P</td>
<td>Drip pot</td>
<td>1</td>
</tr>
<tr>
<td>Q</td>
<td>1/2” x 2” pipe nipple</td>
<td>1</td>
</tr>
<tr>
<td>R</td>
<td>1/2” TEE</td>
<td>1</td>
</tr>
<tr>
<td>S</td>
<td>1/2” valve (fully opening)</td>
<td>1</td>
</tr>
<tr>
<td>T</td>
<td>1/2” pressure gauge or gauge tap</td>
<td>1</td>
</tr>
<tr>
<td>U</td>
<td>1/4” valve</td>
<td>1</td>
</tr>
<tr>
<td>V</td>
<td>~15 feet: 1/4” SS Tubing &amp; fittings</td>
<td>1</td>
</tr>
</tbody>
</table>

Well sketch, not to scale or correct proportion.
New Technology for Analyzing Plunger Lift

Equipment on Well
PLUNGER LIFT SURVEY ANSWERS THE FOLLOWING WELL PERFORMANCE QUESTIONS:

- Where is the plunger? Surface? In or above the liquid? On Bottom?
- What is the depth to the top of the liquid in the Tubing?
- What is the producing and Static BHP?
- Is liquid in the casing annulus above the tubing intake?
- What are the casing and tubing pressures during the operational cycle?
- Does tubing gas/liquid pressure push liquid out of tubing?
- What is the maximum production rate available from the well?
- What is the gas flow rate? From Formation? Annulus? Flowline?
- What is the gas gravity?
- Are there restrictions to plunger fall in the tubing?
PLUNGER OPERATION CYCLE

Record High Speed Acoustic, Tubing & Casing Pressure

[A] Valve Closes, Shut-in Begins and Tubing Pressure Starts Increasing

1. Plunger hits Liquid
2. Plunger on Bottom

[B] Valve Opens, Unloading Begins

3. Liquid Arrives, Tubing Pressure at Minimum
4. Plunger Arrives, After-flow begins Tubing Pressure Maximum Spike

[C] Valve Closes, Cycle Repeats

Graph showing Casing Pressure, Acoustic Signal, and Tubing Pressure.

Graph timeline:
- 09:21:26 AM to 09:43:40 AM: Casing Pressure increases.
- 10:05:53 AM to 10:28:06 AM: Tubing Pressure shows a maximum spike.

Legend:
- Blue line: Casing Pressure
- Green line: Tubing Pressure
- Red line: Tubing Acoustic Signal
What does a Plunger Controller Control?

1. **Off Time (Length of Shut-in)**
   - Elapsed time valve is closed (No Sales)
   - Maximum allowed time, or required casing pressure build up

2. **On Time (Length of Flow)**
   - Elapsed time valve is open (Gas sold)
   - Liquid is Unloaded from well
   - Gas is produced and well loads up with next liquid slug

Plunger Controller acts as an on/off switch for Control Motor Valve.
Control Options: Elapsed Time, Pressure Differential, Pressure Set Point, Load Factor, Flow Rate, Plunger Speed And/OR Foss and Gaul

- **Manual On/Off Timer**
  - Controls based on preset times to close or open valve
  - Set times are usually conservative
  - Controller doesn’t automatically adjust as well conditions change
  - Operator makes adjustment to adjust on and off times

- **Automated On/Off based on Plunger Speed**
  - Easiest to use in wells with packers
  - Makes automatic adjustments based on plunger arrival time
  - Can make proportional adjustments
  - Less time consuming for operators

- **Combination Automated On/Off plus Pressure Monitoring**
  - Monitors flow rates, pressure differential, and plunger speed
  - Afterflow determined by comparing current flow rate to critical rate
  - Shut in time determined by monitoring casing, tubing, or line and when pressures sufficient, based on calculations, well is allowed to open

Controller should help maximize production.
Conventional Plunger Cycle

Plunger lift operation cycle can be divided into three parts:

1) **Shut-in**: Surface valve closed, flow shut-in, plunger falls down the tubing. Goal of the operator or controller is to try to achieve Shut-in of the well for the shortest amount of time possible, but long enough for plunger to reach bottom. And long enough for the pressure to build high enough to bring the plunger back to surface.

2) **Unloading**: Surface valve open and pressure stored in the casing lifts the accumulated liquid and plunger to the surface.

3) **After-flow**: Surface valve open and well continues to flow after plunger reaches the surface. Plunger held at surface by differential pressure from flow of gas up the tubing. Well is producing gas. Most liquid produced from the formation tends to fall back, accumulating at the bottom of the tubing. The goal of the operator or controller is to Flow the well only until the well begins to load with liquids.

Thanks: Dan Phillips and Scott Listiak
How Does Conventional Plunger Lift Work

[A] Valve Closes, Shut-in Begins and Pressure Starts Increasing

[2] Shut-in Valve Closed, w/ Pressure Increasing

[B] Valve Opens, Unloading Begins


[C] Valve Closes, Cycle Repeats
Pressures During Normal Well Cycle

[A] Valve Closes, Shut-in Begins and Tubing Pressure Starts Increasing

1. Plunger hits Liquid
2. Plunger on Bottom

[B] Valve Opens, Unloading Begins

3. Liquid Arrives, Tubing Pressure at Minimum
4. Plunger Arrives, After-flow begins Tubing Pressure Maximum Spike

[C] Valve Closes, Cycle Repeats

Time - Minutes

Psig

Casing Pressure
Acoustic Signal
Tubing Pressure

CP
TP
LP
Conventional Plunger Cycle

[A] – [B] ~ Shut-in

- Surface valve closes to Shut-in well, when afterflow time period ends or control parameters are met; controller is in off cycle and plunger falls to bumper spring at bottom of well.
- CP pressure builds during fall and build-up period (if needed)

[B] – 4 ~ Unloading

- When surface control parameters are met controller enters on cycle opens valve and exhausts [tubing pressure] TP → LP [line pressure] to create differential pressure across plunger
- Plunger acts as interface between liquid slug CP-TP and higher pressure gas below that drives plunger upward
- CP-LP pressure then lifts liquids and plunger to surface.

4 – [C] ~ Afterflow

- Sensors record plunger’s arrival and afterflow time period starts.
- When afterflow time period ends or control parameters are met; controller returns to off cycle. Back to Shut-in Step (above)).
Plunger Controller acts as an on/off switch to Control Motor Valve.

Off Time (Length of Shut-in)
- Elapsed time surface valve is closed (No Sales)
- Flow shut-in as plunger falls to tubing bottom
- Minimum off time or required casing pressure buildup

Plunger_Normal Cycle

<table>
<thead>
<tr>
<th>Marker</th>
<th>Action</th>
<th>Time (clock)</th>
<th>Tub (psi g)</th>
<th>Cas (psi g)</th>
<th>Acoustic</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Valve Close (Shut-In Begins)</td>
<td>09:12:39 AM</td>
<td>137.4</td>
<td>192.7</td>
<td>-0.005035698</td>
</tr>
<tr>
<td>B</td>
<td>Valve Open (Unloading Begins)</td>
<td>10:19:36 AM</td>
<td>273.0</td>
<td>306.0</td>
<td>0.013272762</td>
</tr>
<tr>
<td>C</td>
<td>Valve Close (Shut-In Begins)</td>
<td>10:42:44 AM</td>
<td>125.1</td>
<td>168.2</td>
<td>-0.010887086</td>
</tr>
</tbody>
</table>
Unloading and After-flow

Surface valve open and stored casing pressure expands to lift the accumulated liquid and plunger to the surface.

On Time (Length of Flow)
- Elapsed time valve is open (Gas sold)
- Liquid is Unloaded from well
- Gas is produced and liquid loading up

Surface valve open, plunger held at surface by differential pressure. Well is selling gas. Most liquid produced tends to fall back, accumulating at the bottom of the tubing.

<table>
<thead>
<tr>
<th>Marker</th>
<th>Action</th>
<th>Time (clock)</th>
<th>Tub...(psi (g))</th>
<th>Cas...(psi (g))</th>
<th>Acoustic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plunger Hits Liquid</td>
<td>09:57:50 AM</td>
<td>235.7</td>
<td>273.2</td>
<td>0.001957268</td>
</tr>
<tr>
<td>2</td>
<td>Plunger On Bottom</td>
<td>10:09:36 AM</td>
<td>258.1</td>
<td>290.6</td>
<td>0.003727674</td>
</tr>
<tr>
<td>3</td>
<td>Liquid Arrives</td>
<td>10:29:53 AM</td>
<td>126.3</td>
<td>235.1</td>
<td>0.025217682</td>
</tr>
<tr>
<td>4</td>
<td>Plunger Arrives</td>
<td>10:31:04 AM</td>
<td>204.4</td>
<td>231.4</td>
<td>-0.006651878</td>
</tr>
</tbody>
</table>
Well was in static condition, but pumper opened to sales. Started loaded 470/580.

3 cycles w/ less fluid each cycle. 2nd fall cycle shows good collars in gas and fluid.

New dual pad plunger installation with spring in the nose.
Unloading begins when Controller opens motor valve between tubing and flow line.

- Casing Pressure Decreases
- Tubing Pressure Decreases
- Pressure Spikes when Plunger Arrives
- Differential pressure lifts plunger and liquid slug
- Pressure Increases when Liquid Arrives
- Noisy when Liquid and Plunger Arrive at Surface
- Near Line Pressure

Plunger_Normal Cycle
Operational Benefits of Plunger Tracking

1. Plunger lift program takes the guess work out of setting fall times.

2. Accurate fall time measured from the time the plunger begins fall to the time the plunger hits the seat nipple or bottom hole spring.

3. Increased gas production with less shut-in time.

4. After-flow can be set by monitoring pressure to determine when casing pressure starts to rise then well loading begins. Use Foss & Gaul!

5. Save time by ensuring all plunger runs are made and maximize sales time.
Take Guess Work Out of Setting Shut-in Time

201 Ft/min Gas

38.5 Ft/min Liquid

Plunger Hits Liquid

Plunger on Bottom

Only Shut-in Time Period Shown

<table>
<thead>
<tr>
<th>Marker</th>
<th>Action</th>
<th>Time (min)</th>
<th>Tub (psi)</th>
<th>Gas (psi)</th>
<th>Acoustic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Liquid Arrives</td>
<td>73.047</td>
<td>74.1</td>
<td>528.2</td>
<td>-0.044774562</td>
</tr>
<tr>
<td>2</td>
<td>Plunger Arrives</td>
<td>77.868</td>
<td>293.0</td>
<td>471.5</td>
<td>0.431897640</td>
</tr>
<tr>
<td>3</td>
<td>Plunger Hits Liquid</td>
<td>106.914</td>
<td>434.1</td>
<td>495.7</td>
<td>0.002821300</td>
</tr>
<tr>
<td>4</td>
<td>Plunger On Bottom</td>
<td>116.977</td>
<td>443.9</td>
<td>506.6</td>
<td>0.000317395</td>
</tr>
</tbody>
</table>

Plunger_3CyclesFromStatic
Count Collars for Fall Velocity & Depth

Plunger_Normal Cycle

Selection: 1.000 min

Elapsed Time (min)

**Average Plunger Vel. (gas):** -168.19 ft/min  
**Average Jts/min (gas):** 5.223

**Average Plunger Vel. (Liq.):** -39.18 ft/min  
**Average Jts/min (Liq.):** 1.217
Velocity: Plunger Fall Speed Between Two Consecutive Counted Collars

Plunger Velocity @ Joint 22 equals the change in depth divided by the change in elapsed time.

\[
\text{Velocity} = \frac{D_i - D_{i-1}}{T_i - T_{i-1}} = -231.8 \text{ ft/min}
\]

- \( D_{i-1} = 676.2 \)
- \( D_i = 708.4 \)
- \( T_{i-1} = 5.663 \)
- \( T_i = 5.802 \)
Normal Fall Velocity [During Shut-in]

Click on Any Point

Falling through Gas Gradually Slows from 240 to 135 ft/min

Normal Fall Velocity Profile
1) Tubing is OK
2) Liquid in Bottom

Falling thru Liquid

Faster

Slower
Shut-in Begins When the Flow Line Motor Valve Closes (Flow down flow line stops)

- Casing Pressure Increases
- Uniformly Spaced Tubing Collar Acoustic Reflections
- Quieter when Plunger on Bottom
- Tubing Pressure Increases

Zoom in to 5 minute X-axis Range to see Details
Shut-in Begins When the Flow Line Motor Valve Closes (Flow down flow line stops)

Pick Beginning of Shut-in When Tubing Pressure Just Starts to Increase
0.3 Min of Pressure & Acoustic Data Shows 0.2 psi Pressure Wave Created at Collar # 112

Acoustic Signal Show Plunger Fall Past 111th and 112th Tubing Collar

Use Magnifying Glass to Zoom in on Axis From 40.554 to 0.3 mins

3584 Ft Deep

C111

C112

0.2 PSI
Minimize Unnecessary Shut-in Time

Zoom in on Axis From 40.554 to 13 mins

201 Ft/min Gas

Plunger Hits Liquid

38.5 Ft/min Liquid

See Plunger Arrive at Bottom

Plunger_3CyclesFromStatic
Gas Properties Determined by Fall

Acoustic Velocity: 1364.53 ft/sec

Gas Specific Gravity 0.65400 (Air = 1)
Troubleshooting by Tracking Plungers

1. Find holes in tubing of Gas wells or Plunger Lift wells by monitoring tubing and casing pressure while using acoustic to determine depth as plunger is falling.

2. Releasing plunger from the lubricator catcher, causes 2 to 3 psi drop in the tubing pressure as differential pressure is used to support plunger while falling.

3. Tubing pressure will increase by 2 to 3 psi, when plunger falls by a hole or stops. There “may” be a decrease in casing pressure.

4. Collars can be counted from the time the plunger starts falling to the time the pressure increases.

5. Procedure determines depth to stuck plunger or hole.
When Shut-in Begins the Tubing Pressure Drops as Plunger Starts to Fall

Pressure Drop = Weight / Area

Pressure Drop = 2.4 psi

Plunger weight (8 lbs) / Area of 2-3/8"
Pressure Drop = Weight / Area

Plunger weight (8 lbs) / Area of 2-3/8"

Shut-in Begins and Tubing Pressure Instantly Drops as Plunger Starts to Fall

Weight Supported by Flowing Gas

Pressure Drop

Tubing Held Weight Released from Catcher

Pressure Drop

2.286  2.459  2.633

0.415  0.762  1.109  1.457
Tubing & Casing Pressure React to Plunger Falling in Well

- Tubing Pressure Increase & Casing Pressure Drops when Plunger on Bottom
- ~3 psi Drop when Plunger Released from Catcher
- ~2 psi Liquid in Tubing
- Plunger Weight Remains
- ~2 psi Liquid in Tubing

Selection: 39.000 min
Tubing Pressure Change Helps to Identify Downhole Problems

Plunger falls Past Hole at 1800 feet and Pressure from Casing Flows Into Tubing

~ 3 psi Drop when Released from Catcher

Hole in Tubing

Rapid Tubing Pressure Increase if Plunger has Sudden Stop

Plunger Suddenly Stopped 51 Joints above Bottom
Hole in Tubing

1) Hole was 156 jts from surface or 5054' based on 32.4' joint lengths

2) Hole measured with micrometer to be 0.160” by 0.125”.
Analysis Plots Shows Depth to Hole

Hole in Tubing @ 8520 ft
Tubing Depth = 8940 ft
Gas Flow Rates During Cycle

Gas Volumes Calculated Using:
1) Depth to Plunger
2) Gas Free Liquid
3) Tubing Pressure
4) Casing Pressure
5) Tubing Length
6) Tubing & Casing Sizes

Gas Volume Flows From Formation During Entire Cycle

Gas Volume Down Flow Line - Valve Open
Know Where the Plunger Is

1. Plunger Lift Tracking increases safety of plunger lift operations by knowing where the plunger is in the tubing.

2. If a plunger is not going to bottom and the well is pressured up, then the plunger could surface dry at a very high velocity.

3. High Velocity Can damage equipment!

4. Arrival at high velocity can cause equipment damage and could result in exceeding the mechanical integrity limits of the lubricator
Steps to Track a Plunger Using Wireless & TAM

- Wireless Gas Gun on Tubing
- Pressure Sensor on Casing

[Wireless Gas Gun] OR [Pressure Sensor]
1. Click “Pick Well” and Double Click Well name for the well where data is to be acquired.

2. Use Create… to create a New Well if one does not exist.

3. Be sure to enter at least: daily production rates, tubing & casing sizes, average joint length, tubing & S/N depth and formation depths.
1. Select PLIFT
2. Click “Start Acquisition”
Identify Sensors

Select Sensors:

Tubing:
- WRFG 201
- Acquire Acoustic
- Acquire Pressure

Casing:
- Optional

Optional:
- Modify...

Optional Sensor Attached to: Sales Line, Separator, or Other

Identify Wireless Gas Gun Attached to Tubing

Identify Wireless Gas Gun or Pressure Transducer Attached to Casing

Optional Sensor Attached to: Sales Line, Separator, or Other
Obtain Zero Offset on Pressure Transducer

1. Click "Setup Hardware"
2. Click "Details"
3. Click "Get New Offset" Button
4. Click Button Twice to use New Offset Shown

Last Offset: -0.3 psi (g)
Last Offset: October 07, 2016

New Offset: -0.3 psi (g)
Temperature (degF): 73.5
Confirm Each Sensor Attached to Tubing/Casing/Optional with Preview

For high fall speed plungers increase the default 30 Hz sample rate to 120 Hz.

Tubing Pressure Plot Increases when Valve Opened

Casing Pressure Values OK?

***Not Saving Data***
Must Stop Preview To Begin Acquiring Plunger Lift Data

Tap “F10” or Click Start Acquisition Button
Real Time Data is displayed in Lower right-hand box. The Real Time Data is copied to the lower left-hand and upper graphs when the default Delta Time Axis time period elapses (Set at 60 seconds).

**All Acoustic Data Recorded Since Test Began**

**Previous 60 Sec Data**

**Real Time Data**
Begin Acquisition one minute+ before opening/closing of motor valve

Note: Recording of the incoming data on the hard drive begins after clicking on the Start Acquiring button. Recording continues until the Stop Acquiring button is clicked.

During acquisition
Expand for Details
Switch back & forth between displays of the Tubing, Casing & Acoustics Data
During the Shut-in time period while the plunger is falling, monitor the graphics on the Tubing, Casing and Acoustics Expanded View.

Count collar kicks/minute on the Acoustic tab to estimate a plunger fall rate. A plunger tends to slow down while falling to bottom, if tubing pressure increases Gas Density.

Estimate time for plunger to bottom: If initial fall velocity is near 7 jts/min, then use 6 jts/min with 296 joints in well [296/6] to estimate 49 minutes for plunger to reach bottom.
Click Annotate button to identify Key Events during Acquisition

Tubing Pressure Plot Decreases when Motor Valve Opens to Unload Well

Pressure 169.91 psi
1. Zoom in on the graph to view Key Event and drag marker to the time an event occurred.
2. Click Add button
3. Select the appropriate Event Description From Dropdown list.
4. If the specific event is not listed, then select Comment and type in your remark.
5. Click Done button, to accept annotation.
At ANY TIME during acquisition the user may view all the data that has been recorded from the beginning of the test by clicking the Annotate Button. Changing Scroll Bar will ZOOM into the graph and aid in identifying specific events taking place during the plunger lift cycle, such as the exact time when the motor valve opens or closes, plunger starts to fall or gets stuck in the tubing, plunger reaches liquid or bottom, etc. Annotate from Field View shows all Traces.
Click on the Stop button to terminate recording of plunger lift data. Click on Yes to Confirm.

Acquire one or more cycles from valve open to next time valve opens or from valve close to close.

Comment/Description of the test should be entered
Plunger Lift Data is Saved Every 5 Minutes to the Hard Disk. Max of 5 minutes Lost If Sensor Stops or TAM Prematurely Terminates.
Internal Lithium Batteries Acquire Data Continuously for Approximately 12 hrs

External Battery Can Significantly Extend Recording Time

Protect Wireless Sensors With a Weather Proof Covering
For Long Term Acquisition Protect Laptop and Base Station from Elements, Damage, & Theft

Deep Cycle Battery with Auto Adapter Keeps Laptop and Base Station Powered

USB Fan Dissipates Heat Generated by Laptop
Tracking Plunger Benefits

1. Tracking system minimizes the need for wire line.

2. A plunger can be dropped and tracked to the seat nipple or collar stop. The collars can be counted to be sure the plunger is at the seat nipple or bottom hole spring.

3. Save time by quickly identifying holes and eliminating the need to drop standing valve and pressure testing tubing before you pull it.

4. Quickly identify a spring or plunger that is not going to bottom.