Installation Steps

Need to add steps on how to run electric to well from disconnect.

1 Install the casing adaptor by placing the adaptor on top of the casing. Use four 5/8 inch bolts and nuts to install the adaptor by tightening bolts and nuts.

Mounting frame:

2 Screw the casing flange to the casing adaptor. Make sure to add never seize to the threads of the casing adaptor.

3 Bolt mount frame to casing flange with 4½ inches by 2½ inches (or possibly 3 and 3½ inches) bolts and nuts and lock washers.

4 Set pan on the mounting frame. Install a temporary bolt at head hole with ¼ by ¾ inch bolt with flat washer.

5 Install the arm with three, 3/8 inch by 1¼ inches bolts. Snug the bolts. Do not over tighten the bolts. Remove the temporary bolt.

6 Install legs in front of the machine. Place the pipe on the feet placed on the ground. Tighten the bolts on the leg holders.

7 Level the bailer using the bolts holding the mounting frame to the casing flange.

8 Place cable guide in the top of the head. Bolt the discharge plate down with four, one half inch by 3/4 inch bolts. Make sure all holes are visible. Place the head in the large hole. Make sure the head moves freely.

9 Install the 5/16 inch by 3/4 inch bolt and 5/16 inch nut in the bent portion of the discarge plate. Tighten.

10 Drill a 1/4 inch hole for the proximity bracket. Drill it 12 3/4 inches from the front outside edge of the pan and 6 1/2 inches from the right side of the pan.

11 Use a 1/4 inch bolt and nut to install the proximity bracket.

12 Remove temp bolts installed at step 3.

13 Tighten arm bolts.

Plumbing:

14 Use Teflon tape on every fitting

15 Install 1 inch close nipples on the top and bottom of the closest one inch collar to the arm.

16 Install a 1 inch by 1/4 inch bushing into each side of tee. You will need two bushings.

17 Install the bull plug onto the bottom tee. Switch where the top bushing and the bull plug are installed in a full-time build.

18 Install a 1 inch nipple into the side of the top tee.

19 Install the 1 inch check valve with the **arrow pointing towards** the tee.

20 Install 1 inch by 1/4 inch reducing bushing into the check valve.

21 Install 1/4" nipple into the reducing bushing.

22 Install a 1/4 inch tee on the 1/4 inch nipple. Make sure the top of the tee is pointing up.

23 Install 1/4" NPT by 3/8" push lock air fittings.

24 Install push lock air fitting into 1/4" collars in pan.

25 Install the 1/4 inch NPT by 3/8 Inch and 1/8 Inch NPT by 3/8 inch push lock fitting onto the head.

Gear Box and Motor Instalation (found in plumbing video)

26 Install gear box using 4 1/2" x 2" bolts with 1/2" self-locking nuts.

27 Put antiseize in the gearbox keyhole.

28 Install the motor, lining the motor shaft key with the keyhole in the gearbox. Use four 3/8 inch by 3/4 inch bolts to lock the motor in place.

29 Install the reel with marking hole lining up with key on the shaft. Drive the reel with a hammer until it reaches the maximum depth.

Assemble count wheel assembly:

30 Install drill hole for count sensor. 3/8" centered to lane hole in middle and the side.

31 Place two 5/8 inch hardened steel washers into the wheel.

32 Place the bearing into the wheel. Press the bearing until it fits tightly against the washers.

33 Install the bearing retainer snap ring using snap ring pliers.

34 Slide the cable shield onto the count well shaft.

35 Install the small set screw into the cable shield.

36 Place count wheel assembly into the arm.

37 Tighten the set screws onto the count wheel assembly.

See either the Full-time Electrical Installation or Part-time Electrical Installation Guide for the next part of the instalation.
Come back to this guide once you finish the electrical installation.

Canister instalation:

38 Unroll 10 feet of cable from reel. Run cable through the pulley.
39 Slide cable through head assembly
40 Slide cable through seat nut
41 Strip the coating of the cable off to prepare to install the two grip sleves.
42 Place two copper grips on the cable. Use a crimping tool to crimp the grips.
43 Take the canister and place it in the wellhead. You may need to jiggle it some as you run the canister down. Use the slip to hold the canister for the next steps.
44 Install the three O rings onto the discharge ***nose*** . Screw in the seat nut into the discharge nose.
45 Lower the canister into the hole to the top of the nipple.
46 Place the head on top of the discharge ***nose*** . (5:31) Line up the pulley shaft and tighten the pulley shaft to the arm using the set screws.
47 Use the HMI to roll up the extra cable manually. Place a metal object in front of the home sensor, or it will not move. Remove your slip, and lower the canister down the hole.
48 Line up the head bracket with the home sensor.
49 Insert spacer into the spring. Insert the washer and bolt into the spacer. Place the spacer completely inside the holes in the head assembly. Push down on the spring and tighten the bolt.
50 Line pulley up to the center of the wheel
51 Loosen the set screws keeping the count wheel assembly in place.
Adjust the count wheel assembly until the cable is centered. Tighten the set screws.
You may have to add a shiv under the arm to get the cable to line up properly.

Finish Plumbing:

52 Slide panel into frame to edge of solenoid valve
53 Drill Bracket to match panel mounting holes
54 Fasten panel into place with 1" x 1/4" nuts
55 Install tubing from head to top of flow switch.
56 Install tubing flow switch to front of tee.
57 Install tubing from top of tee to outside collar on pan.
58 Install tubing from inside collar to 1/8" NPT fitting on head.
59 Install 1" straight L's on drain collar in pan and on flange filling
60 Install 1" KC nipples and 1" hose in between L's as straight as possible.
61 Install 3/8" x 1/4" NPT fitting on inside collar on bottom of pan.
62 Install a ball valve in the open 1/4" collar.
63 Install 1/4" x 4" nipple on 1/4" ball valve on outside collar on pan.
64 Install 1/4" x 3/8" air fitting to bottom of ball valve.
65 Install 4" x 3/8" tubing to fitting.
66 Install a 1/4" x 3/8" fitting on incoming and outgoing of solenoid.
Incoming goes on NC. Outgoing goes on CO.
67 Remove the insert in the compressor and install a 3/8 inch by 1/4 inch NPT fitting.
Install the tubing.
68 How you connect the bailer to a flowline is up to you. The instructioons below is only a suggestion.
69 Install a 3/8 inch by 1/4 inch NPT fitting to the bottom of the tee.
Install a 3/8 inch by 1/4 inch NPT fitting at the end of the flowline.
Connect the two NPT fittings with tubing.
Note: You will need to two bushings with a 1/4" hole in each to do this.

Electrical Instalation Proceedure

Electrical (Part time):

1. Install a blue grip in the appropriate one inch collar. Knock out an entrance into the motor and install a blue grip. Install six feet of 18-4 SO Cord. Wire the motor for 220 Volt Three Phase. Instructions to wire the motor are in the motor.
2. Connect TL 30A 3 phase 250V male plug to motor lead
3. Connect plug and cable to solenoid valve using 18-4 SO cord.
4. Eliminate the white wire from the trailer plug.
5. Eliminate white wire on plug.
6. Connect four wire male flat trailer plug to solenoid cord using crimp connectors.
7. Wire green to green 24V signal.
8. Wire black to black 24V signal.
9. Wire brown to red 24V signal.
10. Mount grey adaptor box to arm of bailer with zip screws.
11. Install proximity switches in the count sensor and home proximity sensor places. Which sensor is which is listed on a label on the sensor. The nuts needed for the instalation is located within the grey box. Leave about 3/16 inch clearance
12. Install NPT fittings in the Normally Closed and common openings. Install an NPT fitting in the normally open position. Use self-tapping screws to install the solenoid valve on the arm of the machine. Install NPT fittings into 1/4 inch valve and collar below the autobailer.
13. Run tubing to their proper fittings as shown in the video. The air line should go to normally closed on the solenoid, and from Common to the air intake on the head (the smaller hole).
14. Slide the bracket into square tubing on the opposite side of the reel. Mount the pannel on the bracket.
15. Plug feed from control panel into generator.
16. Connect the motor and solenoid plugs to the respective plugs on the machine.
17. Screw in communication cable into the plug on the grey adaptor box. Line up the pins so it will attach properly.
18. Hook up air line from the air compressor to the machine.

Go to Canister Instalation to finish the instalation of the machine. There will be some instructions that are duplicated.

Electrical Instalation Proceedure

Initial Instalation

1 Install Transformer to customer-supplied disconnect

2 Make the connection in the breaker box and ground fault recepticle.
See the videos for details.

Control Panel:

3 Place mounting bracket into the square tubing opposite of the reel. Drill four holes, lining it up by placing the panel on the bracket. Drill four 5/16 inch holes and mount using 1/4 inch bolts and nuts.

4 After Teflon taping the threads and twisting the transducer and wire to the left, screw in the pressure transducer into the bushing located in the one inch tee under the pan.

5 Mount solenoid valve 2 inches back on the bottom of the mounting bracket using zip screws.

6 Wire the plug for solenoid valve using wire from the panel.

7 Drill a 1/4 inch Hole in the Square Tubing. Use a ¼ Inch bolt to secure the tubing to the machine.

Electrical (Full time):

8 Plug the wire into the solenoid valve.

9 Drill a hole into the panel and install blue grip. Electrical tape the white line. Strip and install the line like shown in the video. Run the line to the motor. Unscrew the motor plate and install a blue grip in the knockout. Attach the motor to power as shown.

10 Install two eight amp fuses in the disconnect. Check voltage at the breaker box and the panel.

Install Flow Switch

11 Run proximity sensor wires through the proper collar and blue grip. Install the blue grip. Run the home sensor and the count sensor to their proper places. Install the sensor using the nuts taped inside the panel. Make adjustments to the count sensor as needed by loosening the small set screw and moving the pulley cover. Make adjustments to the home sensor by adjusting the positions of the nuts.

12 Using the HMI, go to the manual control and run the bailer up. If the bailer does not rotate properly, recheck your wiring of the motor, as it may be reversed.

13 Electrical tape the connections for the motor. Screw in the plate after carefully replacing the motor wires.

12 Taking a zip screw and a washer, screw in a bracket in line with the lower bolts holding the gearbox up. Take a second screw and washer and secure the bracket. Repeat the process, installing the second bracket on top of the first bracket. Place the holding bracket around the flow switch. Place the bolt and tighten using the nut to snug. Place the second holding bracket and tighten the nut to snug. Move the flow switch into position and tighten both bolts. Install two ninety-degree NPT fittings into the bushings.

13 Run wire and attach wires to panel using the wire below the panel using crimp connections. Make sure power is off before doing this.

Go to Canister Instalation to finish the instalation of the machine.

Casing Test Procedure

Final Steps:

70 Connect HMI.
71 Go to manual control on home screen.
72 Press the down button and make sure the bailer is moving downhole.
If it is not descending, the motor was wired backwards. Rewire the motor.
73 Press the up button and make sure the bailer seats properly.
If the bailer does not seat properly, check the springs and bolts.
74 Go to screen and pick depth where you suspect the fluid level is.
75 Run test bailer down at 45-50 hz. Check line tension as the bailer descends.
Note any spots where you feel loosening tension.
76 Let bailer rise @60 hz. Check line for fluid level.
If you cannot find the fluid level from the line, rerun deeper.
77 Once you know the fluid level,
Run back to fluid level.
Run bailer up and down in manual mode to try to clean up hole.
78 Bring the bailer back to the surface.
79 Run the test bailer to the perfs.
If the production is from an open hole, set the depth ~20 feet above the open hole.
80 Run the test bailer up and down in the hole above the perfs.
If you run into obstruction above the perfs,
Run the bailer up and down multiple times trying to work you way through the obstruction
If you cannot break through the obstruction,
Note depth and check for clues when the test bailer is pulled.
81 Bring the bailer back to the surface.
If you hit obstruction, skip steps 104 & 105.
82 Run bailer down to TD or PBTD. Note if any obstructions stop bailer before reaching TD
If you run into obstruction aboveTD,
Run the bailer up and down multiple times trying to work you way through the obstruction
If you cannot break through the obstruction,
Note depth and check for clues when the test bailer is pulled.
105 Pull the test bailer out of the hole.
Check bailer for drilling mud, parafin, scale, etc.
106 If you ran into obstructions or issues, communicate findings to buyer. See what the buyer wishes to do.
If the problems are severe enough, you may say that producing this well may be impossible.
107 Lower production bailer assembly into hole (see bailer assembly list)
108 Run bailer down 20 feet as a test. Allow bailer to go through normal load/unload cycle.
109 Check that bailer is unloading by opening test valve.
110 Set depth using fluid level data collected during tests.
111 Run bailer to below fluid level as an initial test.
112 Check that bailer is unloading fluid properly once it returns using the test valve.
If it did not, use troubleshooting techniques to find the issue.
113 If fluid was produced, set depth, time, speed, etc.

Stetup Procedure (Post Installation)

Using the HMI, hit control on the main menu. Hit the cycle set points button. Change the Travel feet to 20, fill seconds to 10, and offload seconds to 10. Hit main, hit control again, and change the Time Between cycles to 1 minute. Start the bailer and monitor the cycle. When the bailer returns to the surface, open the valve and use the test line to see if air is blowing through the line. If not, you will need to check and make sure all the lines have been run properly between the compressor to the solenoid valve.

Showing first is a filled out test form for the well we are currently testing. When doing your initial testing, consider doing it in 500 feet increments. That means you need to change your travel feet to 500 feet. Fill seconds should be 120 seconds initially. Set offload seconds to 240 seconds. Hit the More button and look for Seating Feet Slow Down. Change that value to 12. Run the machine, tapping the line feeling for a hung bailer. If you do not encounter fluid level, run the machine deeper in 500 feet increments. Check for fluid using the test line.

If it takes longer than 240 seconds to unload the canister, increase the offload seconds until the canister unloads before the unload time runs out. Once you have a good unload time, go to Controls and change the time between runs. This may vary between fields, the producing formation, and what you know about the surrounding wells. In general, four hours is a good starting point. Eight hours is chosen in this case due to what we know about the field. Hit Cycle Set Points and make any changes needed. Most likely, you will need to adjust the Offload Seconds. Add 30 to 60 seconds above the unload time shown on the home screen on the HMI. Hit the More button and make any changes need on that screen. You will probably need to change Bucket Vol Barrel SPT. This will allow the machine to properly calculate the production in barrels. You can calculate this by taking the volume of the canister in gallons and divide it by 42. Once you are happy with the values, start the bailer.

The question is, how should this well be pumped

Determine Max machine volume
- Max machine volume = max # of cycles x bailer volume

Determine Max Well Volume
- Pump the well at max depth at 0 hr's between cycles
- The daily volume pumped under these conditions = Max Well Volume

If Max Well Volume < Max Machine Volume
- Est time between cycles
- Run at estimated time
- If daily volume is the same as max well volume
    * Increase the time between cycles
    * Adjust untill ideal time between cycles is determined
- If daily volume is less than max well volume
    * Decrease the time between cycles
    * Adjust untill ideal time between cycles is determined

If Max Well Volume = Max Machine Volume
- Raise the target depth of the bailer, and establish a daily volume
- Continue to raise the target depth of the bailer,
    * Untill the daily volume < Max Well Volume
    * Set target depth to highest point that daily volume = Max Well Volume

Computer Operations

Go to onping.plowtech.com
Log into OnPing
Click on well to the left
Set feet to travel
Set fill time in seconds
Set unload time in seconds
Set minimum unload time
Check alarms
If alarm, go through trouble shooting sequence

The installer will set initial times and depths based on what was seen in the field and experience.
After these initial data points are set, it is up to you to maintain your goals.
What are your goals for the well?
- Skim to stop a plug and produce order
- Produce a low volume well efficently
- Pump your low-volume well down?

Your goals will determine how to set up your autobailer

Initial setup and observations from experience
If the well has been sitting for a while, there will be an oil collum built up in the well.
As you begin producing this oil collum, it will pump down, no matter your goals.
It will eventually pump down to lower, more stable fluid level.
What this level is will depend on the deliverability of the well.
Low volume wells will find its stable fluid level quickly
Higher volume wells will take longer.
This will also tell you if your goal is reasonable.
- Higher volume wells cannot be pumped down.
  - Skiming is the best use in that case.

Monitor the initial settings.
Best number to monitor is Yesterday's Vol
Check number daily against Expected Vol
If the Yesterday's Vol<Expected Vol
- Check the number Last Unload Seconds
- This should have triggered a low flow alarm

Click on Last Unload Seconds and pull up the graph.
Go to the zoom buttons and click on either 5D or 1M
Look for a general decline in unload time
- If there is a decline in unload time
- Add time between cycles and/or lower the bailer.
- Monitor next run remotely and look for an incease in unload time.

If the time is zero

If the time is zero and has stayed zero for more than one cycle
Go through the Low Flow Alarm troublshooting proceedure
- Start at step 4 by going to the well.

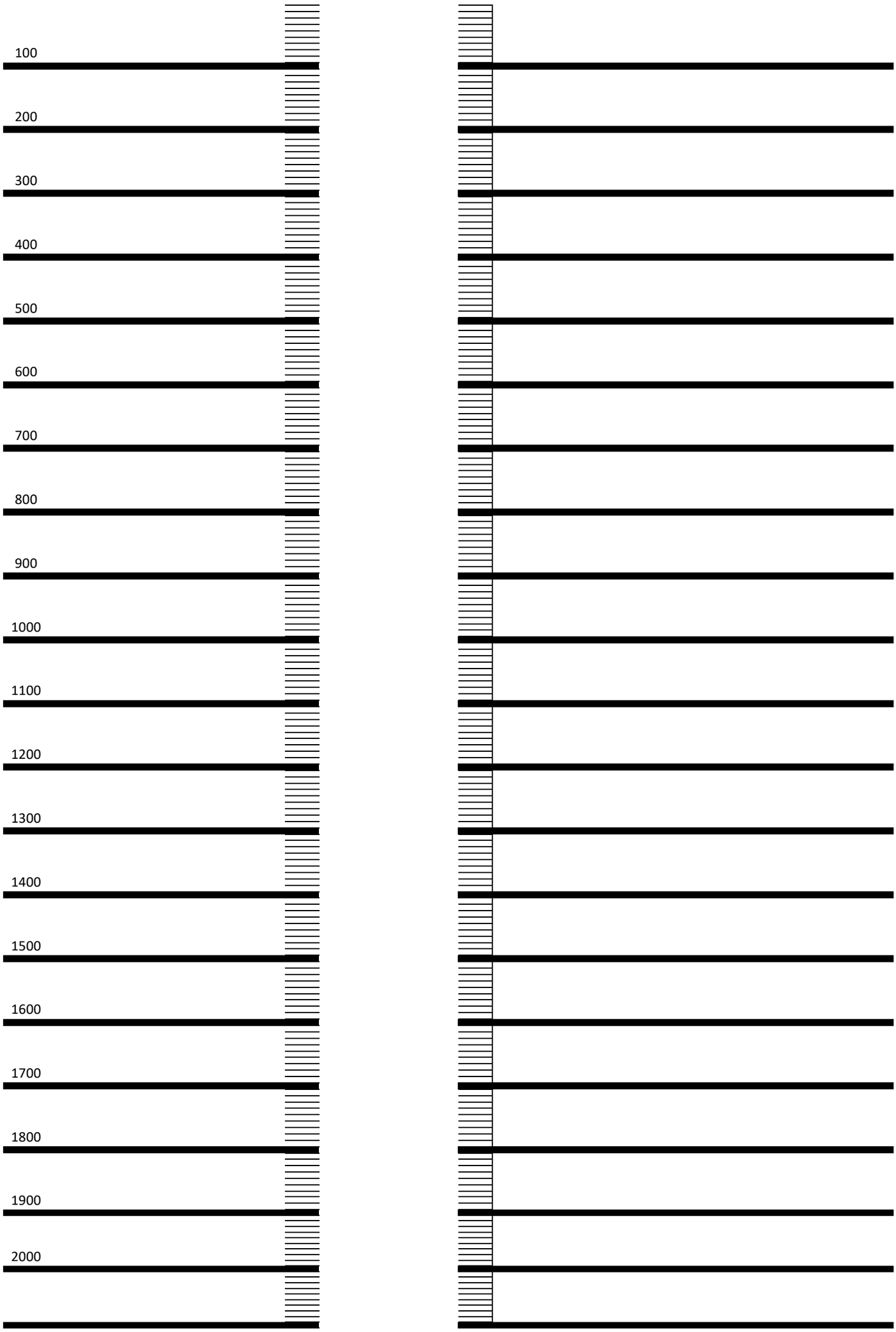
HMI Operations

The installer will set initial times and depths based on what was seen in the field and experience.
After these initial data points are set, it is up to you to maintain your goals.
What are your goals for the well?
- Skim to stop a plug and produce order
  - Produce a low volume well efficently
  - Pump your low-volume well down?

Your goals will determine how to set up your autobailer

Initial setup and observations from experience
If the well has been sitting for a while, there will be an oil collum built up in the well.
As you begin producing this oil collum, it will pump down, no matter your goals.
It will eventually pump down to lower, more stable fluid level.
What this level is will depend on the deliverability of the well.
Low volume wells will continue to pump down if you run the machine hard enough.
Higher volume wells will take longer.
This will also tell you if your goal is reasonable.
- Higher volume wells cannot be pumped down.
  - Skiming is the best use in that case.

Monitor the initial settings
- Go to the well daily and plug in your HMI
- Write down your avaerage unload time daily
- Monitor your average unload time for trends.
- When you start to see your avaerage unload time fall
  - Add time between cycles and/or lower the bailer.
  - You should see an increase in the average unload time.
- If You do not see the increase, clean out the flow switch.
- If your avaerage unload time suddenly goes to zero
  - Go through the Low Flow Alarm troublshooting proceedure
    - Start at step 6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Maintenance

Empty compressor of water once a month.
- Note: May need to empty more often depending on how machine is run.

Inspect rope monthly to make sure coating has not frayed.
Check air lines and flowlines for cracks monthly
Check NPT connections for problems monthly
Clean flow switch monthly.
- Note: May need to clean more often depending on well conditions.

Clean off home sensor monthly
Use electrical cleaner or carburetor cleaner
Check Gear Oil in Gearbox

Trouble Shooting

- Low Volume
- Flow Switch Failure
- Compressor Failure
- Hole in Bailer
- Count Sensor Failure
- Home Sensor Failure
- Low Pressure
- High Pressure
- Over Current
- Over Voltage
- Motor Over Current

Common Issues caught before alarms

NPT fitting failure
  Most often cause by someone yanking tubing out improperly
  Replace fitting with a new fitting of proper size
Compressor full of water
  Empty compressor using valve in the back
Nick in rope
  Often happenens if rope is thrown from pulley. Can also happen due to normal wear.
  Cut line past nick and reattach to canister
  If too much line is cut, replace the reel.
Cracks or holes in air lines or flow lines
  Replace line. Much less common since we began using UV resistant tubing

Motor Over Current Alarm

Alarm email.
Check alarm on website.
Reset alarm.
If alarm does not clear, you must go to well to check.
If the bailer looks to be at the surface
  Attach HMI to bailer and try to move bailer down manually
    If bailer will not move, take bolts off of head assembly
    Manually move bailer down.
    Reattach the bolts and test head assembly manually
If the bailer is not at the surface.
Manually move the bailer up and down and try to free bailer.
    If bailer cannot be raised to surface due to an obstruction
    Go to the stuck bailer trouble shooting document below.

Count Sensor Alarm

Alarm email.
Check alarm on website.
If this alarm also has a low voltage alarm associated with it
  Clear the alarm remotely
  If the alarms come back
    Check the electrical coming into the machine
    Note: It could be anywhere, including the line running to the wellsite
If the alarm is triggered alone
  Go to well and check.
  Check to see if line has been thrown from pulley.
  If line is thrown, place line back on pulley
    Check line to make sure it has not been damaged
    If the line has been damaged
      Cut the line and reattach the line to the canister if you do not lose too much line
      If too much line was damaged or it was damaged further along the line
        Replace the reel.
If line is not thrown, check the pulley assembly

Run bailer up and down, in manual mode if you need to.
If bearing failed, replace bearing.
If clip failed replace clip
If pulley assembly failed, replace assembly.

Home Sensor Alarm

Alarm email.
Check alarm on website.
Reset alarm.
If alarm triggered and it keeps triggering after being cleared
Go to well and check
If it has been below freezing, spray defrost spray on home sensor
If the sensor is too far away from the sensor nut
Adjust the sensor to a closer distance.
Remove nut and add a small washer to nut if necessary

Low Flow Alarm

1 Alarm email.
2 Check alarm on website.
3 Check unload times on the website. (if available)
If unload times are unusually low, lower bailer depth and/or add time and monitor the next run.
If this fails, go to step 5.
4 If you do not have the website.
Go to well. Hook up HMI.
Lower bailer depth and monitor next run.
If lowering the bailer depth fails, go to step 6.
5 If problem continues, go to well.
6 Check that the compressor has pressure on it.
If there is no pressure, check and see if the compressor is on.
If the compressor is on and there is no pressure
Check if the electric plug has been tripped.
If the plug is not tripped, check if the breaker was tripped.
If the breaker is not tripped, check the disconnect and fuses.
7 If the disconnect and fuses are OK, replace the compressor.
Note: If there is no power making it to the disconnect,
Get an electrician to check the line,
8 If there is pressure on the compressor,
Check if the compressor is full of water (use the valve in the back)
9 If it is not full of water, clean out the flow switch.
Open the top of the switch (and bottom if necessary) and clean out switch.
Test the switch after cleaning.
10 If it is not the switch, check the solenoid valve.
11 If the solenoid valve is OK, pull the bailer.
12 If the canister has a hole, replace the canister
13 If there is no obvious hole in the bailer,
Check the rings on the discarge hose on top. Replace any bad rings.
If the rings look OK.
Unscrew the top of the bailer and
Check for mud in bailer, plugged air tube, etc.
14 Replace the bailer.

Lost Communications Alarm

Alarm email.
Check alarm on website.
Check with field personnel as to whether power has been cut off.
If power has been cut off at disconnect, have personnel restore power.
If there is an issue with your electric company, report issue.
Wait for the electric company to restore power.
If there is power to the panel
Restart the modem.

Low Pressure Alarm

Alarm email.
Check alarm on website.
Go to location and check flowline.
If flowline does not have a hole, check the check valve.
If check valve is OK, pull the bucket.
Replace the bucket.

Over Current Alarm

Alarm email.
Check alarm on website.
Reset Alarm.
If Alarm does not reset, check on bailer
If canister is stuck, see stuck canister proceedure below.

Over Voltage Alarm

Alarm email.
Check alarm on website.
Reset Alarm.
Can occur with over current alarm.

High Pressure Alarm

Alarm email.
Check alarm on website.
Go out to well and check flowline.
If flowline is plugged, take steps needed to fix issue.
If flowline is not plugged, check the sensor. Replace sensor.

Stuck Canister (Parafin)

Normally associated with a Motor Over Current alarm below the surface.
Using the HMI, manually move the canister up and down at different speeds and try to free the canister.
If that does not work, pour ~10 gallons of acid down the wellbore
Let the acid sit for at least 24 hours before trying again
If the acid does not work, pour 10 gallons of xylene down the hole
Note: The xylene may damage the coating of the line. It may also damage the canister.
Let the xylene sit for at least 24 hours before trying again
If the line coating is damaged, the line may break when when you try to free the canister.
If xylene does not work, use the pulling tool
Cut the line and attach the line to the back of a truck
Slowly tighten the line and begin carefully pulling on the line

Autobailer Install Checklist

Well ID: **Date:**

Pre Install

Max Bailer Target Depth:

	Y	N	N/a	Explain
- All parts are in the truck before leaving				
- Hose bailer setup in truck				
- Throw acid and soap sticks down the hole				
- Bring small level to help level arm.				
- Make sure flowline is available to connect to.				

During Install

	Y	N	N/a	Explain
- Run trash bailer				
- Run bailer slowly to max target depth				
- Level bailer to line (line in middle of the hole)				
- Bailer is run to cleanout hole.				

Max Tested Depth:

After Install

	Y	N	N/a	Explain
- Tag and mark old equipment				
- Setup On Ping				