June 20, 2014

OIL HOUND SS

OWNERS MANUAL

June 20, 2014

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INTRODUCTION

This manual primarily addresses the Oil Hound SS (stainless steel) system. It is the latest Oil Hound model where all internal parts exposed to recovered fluids is either constructed of stainless steel or powder coated to prevent corrosion. The Oil Hound configuration most commonly used is a trailer mounted system. This manual will primarily address this configuration. Skid and chassis mounted configurations will be quite similar; however special consideration should be given to adapting alignment and leveling procedures to meet requirements.

GETTING STARTED

Aligning with the Well Bore

Alignment of the Oil Hound Unit is critical. The hole on the underside of the unit through which the rope travels is known as the "well head flange". The well head flange must be placed in absolute alignment with well head of the well bore. (Improper alignment will result in damage to the load cell and unnecessary wear and tear on the rope, the bucket and other component parts of the unit.)

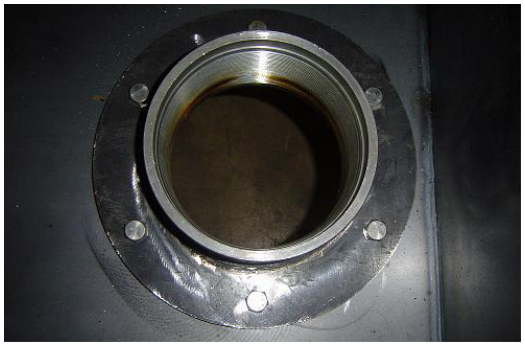


Figure 1 Well Head Flange

The first concern when aligning with the well bore is Forward-Back alignment. This is controlled solely by backing up to the well. Left-Right alignment is not critical at this point if your Oil Hound is equipped with an alignment jack (Figure 2 below). Once the Forward-Back alignment is established, it is a simple matter to align the Left-Right position with the alignment jack. The alignment jack allows for approximately ±6 inches of adjustment.

If your unit is not equipped with the alignment jack both Forward-Back and Left-Right alignment must be considered at the same time. It is a slightly more difficult procedure but it gets easier with a little practice.

NOTE

The best method of checking alignment is by sighting from the top through the wellhead flange to the top of the well bore.

Figure 2 Oil Hound Rear View with Leveling Jacks

Leveling the Oil Hound

Proper leveling of the Oil Hound is critical. The mobile Oil Hound mounted on a trailer is equipped with a three-point leveling system. The first point is the jack on the trailer tongue. The other two are mounted at the rear on either side of the trailer.

WARNING

Improper leveling can result in damage to the load cell and unnecessary wear and tear to the rope, the bucket and other component parts of the unit.

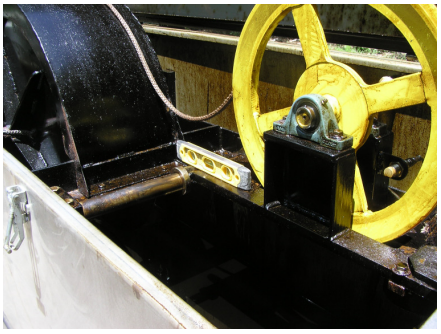


Figure 3 Level on Swing Arm

Place the bullet level supplied with the Oil Hound on the swing arm facing initially forward and back. Adjust the forward jack for a level or slightly nose high attitude. Next, turn the level 90 ° and after placing blocks under the side jacks, adjust them for a level indication. Repeat both Front-Back and Left-Right adjustments until the system is leveled in all directions.

Power Requirements

To prevent potential damage to the electrical components:

a. When utilizing power from a power line, prior to energizing the unit, a licensed electrician must confirm that the power source provides consistent power without voltage fluctuations. Electric service should consist of a 4 conductor wire as follows.

1) 120 volts from L1 to neutral
2) 120 volts from L2 to neutral
3) Neutral (grounded)
4) Ground

This will allow for a grounded "clean" 240 volt service.

b. When utilizing power from a generator, the operator must confirm that the generator has fuel sufficient to run an entire cycle.

c. When utilizing power from a generator, prior to starting or stopping the generator, the operator must confirm that all electrical breakers to the Oil Hound Unit are in the off position ensuring that all electrical power to the unit is turned off.

The unit should be grounded from your power source to electrical panel and the unit body should be grounded per diagrams below.

Figure 4 Grounding Buss

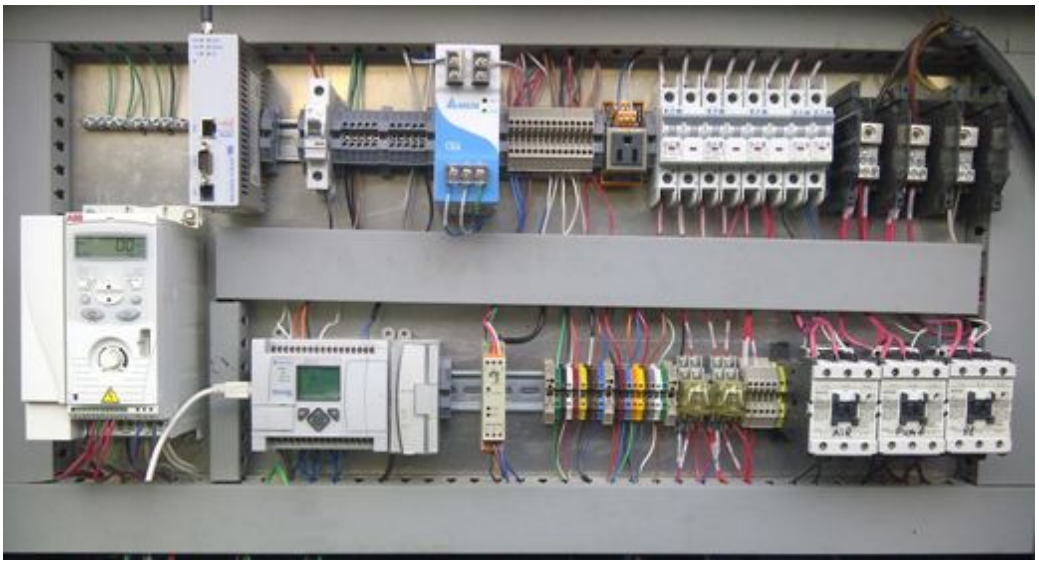
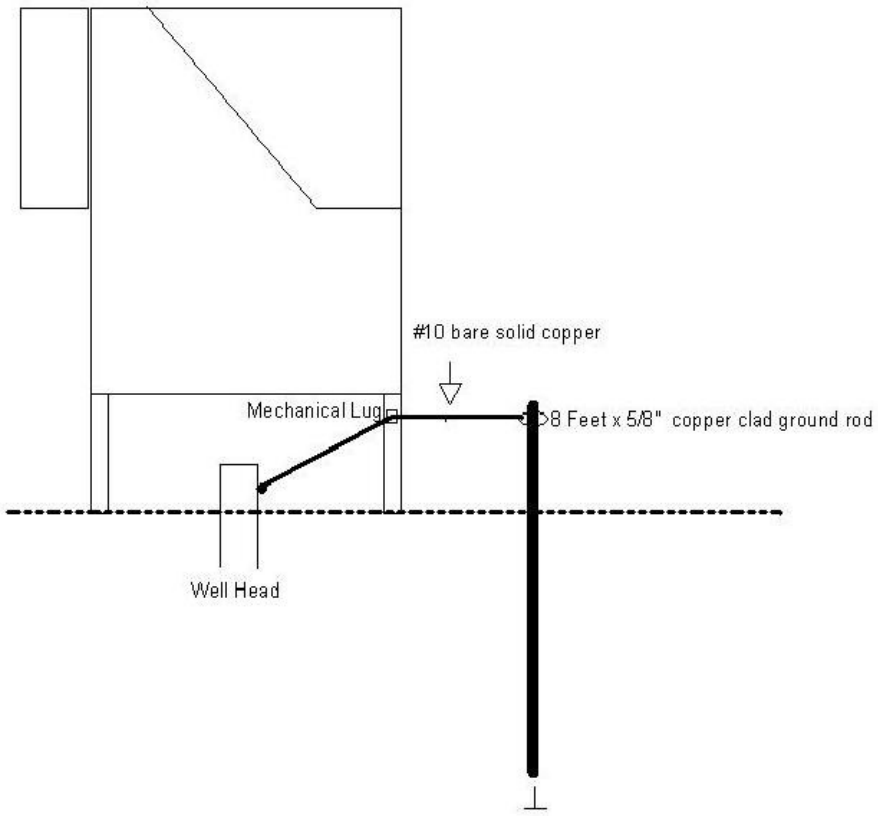


Figure 5 Electrical Panel



Grounding Rod to body of Oil Hound Unit

The Power Reel

Figure 6 The Power Reel

The Power Reel is used to store, insert and remove the bucket from the well. A foot switch activates a 1 hp 220v motor whose direction is controlled by a FWD/OFF/REV switch on the control box attached to the power reel frame.

Installing the Bucket

Set the switch on the control box to the FORWARD position. Place the bucket guide on the swing arm pivot as shown in Figure 7 below. Using the foot switch, feed the bucket end over the top of the machine laying it into the bucket guide and through the well head flange. Next, carefully feed the bucket foot into the well bore.

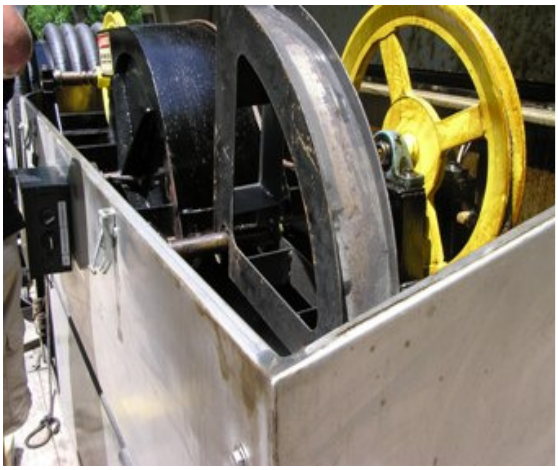


Figure 7 Bucket Guide

Figure 8 Inserting the bucket foot

Often for Permanent of semi-permanent installations, the Well Head Flange to well bore is completely enclosed.

It goes without saying; this type of enclosure must be in place before the bucket is lowered into the well.

Figure 9 Well Head Enclosure

Attaching the Dutchman Tool

At this point, if not already installed, install the Dutchman tool into the threaded hole in the bucket head.

Figure 10 Dutchman Tool

Figure 11 Bucket Head attached to bucket tube

WARNING

Failure to attach the Dutchman tool to the top of the bucket head prior to the placement of the bucket tube into the well head flange could result in loss of the bucket and/or irreparable damage to the oil well.

Figure 12 Bucket and Power Reel

Figure 13 Using the Foot Switch

Continue lowering the bucket into the well until the Dutchman tool engages the Well Head flange in the bottom of the tub. The rope to the power reel can now be removed. Move the Swing Arm assembly into the production position (See Appendix C).

Attaching the Rope

Remove threaded screw from bucket head. Insert rope eye in slot located at the top of bucket head and then replace thread screw as shown below. Note: In the following images, models are used for demonstration purposes.

Figure 14 Rope Eye

Figure 15 Rope Eye inserted into Bucket Head

Figure 16 Bucket Head Screw

Figure 17 Tightening of Bucket Head Screw

WARNING

Failure to properly attach the rope to the top of the bucket prior to the placement of the bucket into the well head flange could result in loss of the bucket and/or irreparable damage to the oil well.

Figure 18 Dutchman attached to Bucket Head sitting on upper side of Well Head Flange

Removing the Dutchman Tool

Connect the HMI (Human Machine Interface) box to the Cannon type connector on the side of the E-STOP box and turn the power button ON. Then navigate to the F5 (Manual) screen..

NOTE

All references to a “Screen” refer to those screens that can be located on the HMI.

Figure 19 F5 Manual Screen

The icons "MANUAL UP" and "MANUAL DOWN" on Screen F5 can be utilized to move the bucket up and down the well bore.

Touch the "MANUAL UP" icon until the Dutchman tool no longer has contact with the well head flange.

Once the Dutchman tool is free from contact with the well head flange, remove the tool and store it in a secure place.

OPERATION

The bucket should ascend and descend with little or no contact between the bucket and the well head fitting or the well head adaptor. Touch the "MANUAL DOWN" icon until the top of the bucket has descended a few feet below the well head fitting or adaptor. Touch the "MANUAL UP" icon until the head of the bucket has cleared the well head fitting. Repeat this procedure several times. If contact is noted between the well head fitting or the well head adaptor, the well head flange is either out of alignment with the well head bore or the well head fitting or adapter do not have an inside bevel of at least sixty degrees. First, determine whether the well head flange is in absolute alignment with the well head bore. The center of the well head flange must reside over the absolute center of the well head bore opening. Placement of the well head flange in absolute alignment with the well head bore opening should remedy the unwanted contact. If contact continues to be noted after absolute alignment is obtained, then the unwanted contact is probably a result of improper or inadequate beveling of the well head fitting or the adapter. If remedial steps are taken and the unwanted contact continues, contact your service representative immediately. Call 870-881-9574.

Determine Bucket Weight

Lower the bucket about 5 feet from the top, then select the F1 MAIN screen.

Figure 20 F1 MAIN Screen

Locate the term “BUCKET WEIGHT”. To the right of the term “BUCKET WEIGHT” you will see a number that will be followed by the term “LBS”. That number will herein be referred to as “the BUCKET WEIGHT NUMBER”. Make a notation of the BUCKET WEIGHT NUMBER as it will be needed in the next two steps.

System Set Points

NOTE

For Oil Hound Systems built after Januaary 2014, see Appendix A for optional automatic Setup instructions for the first 4 set points.

Navigate to the F4 SETPOINTS screen

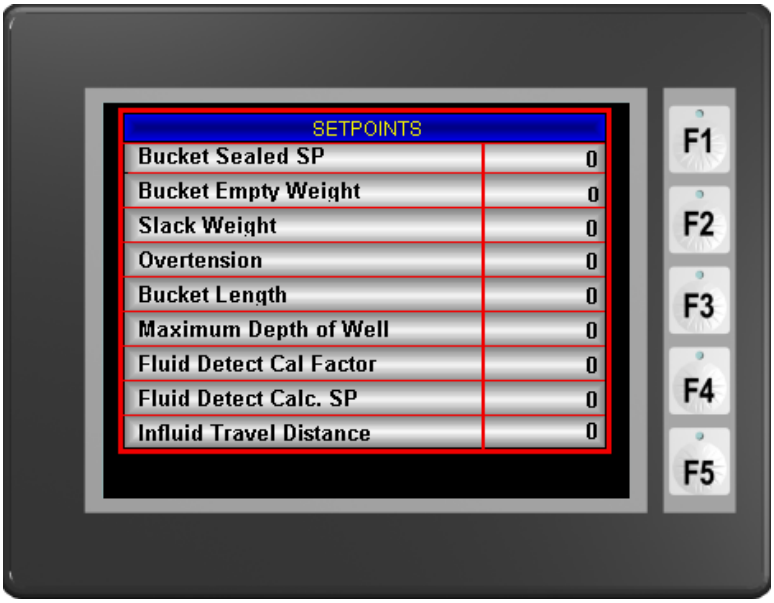


Figure 21 F4 Setpoints

Bucket Sealed SP - The first line after the caption will read “Bailer Sealed SP”. To the far right of the term “Bailer Sealed SP” you will note a number on the screen. That number on the screen must be replaced with a number that you will calculate. To calculate that number, you must subtract 20 from the BUCKET WEIGHT NUMBER that you previously noted.

Bucket Empty Weight - The second line on screen F4 will display the term “Bailer Empty Weight”. To the far right of the term “Bailer Empty Weight” you will note a NUMBER. That number must be replaced with a number that you will calculate. To calculate that number, you must add 20 to the BUCKET WEIGHT NUMBER that you previously noted.

Slack Weight SP – This parameter is set to a value that will trigger a system halt should the bucket encounter an obstruction descending the well. Halting the system under these circumstances will prevent rope build-up and coiling down hole. This value is normally set to 90 lbs. or less.

Overtension – This parameter is set to a value that will give a warning should the bucket encounter an obstruction while ascending the well. Exceeding the value will

only display a warning and is usually set to 250 lbs. or higher. This condition is often encountered in thick fluid as the bucket pulls out of the fluid and can be adjusted so that it does not appear. Should a solid obstruction be encountered, the system motor drive (VFD) will trip halting the system at that point. The motor drive will display an error F00001 and can only be reset by cycling the power via CB3,

Bucket Length – this parameter displays the length of the bucket used with the machine, normally 50ft. but can be adjusted for efficient operation.

Maximum Depth of Well – The depth values displayed during operation are for the position of the top of the bucket. Therefore when setting the Maximum Depth of the Well, bucket length must be taken into account.

For instance with a 1500 ft well:

Maximum Depth of Well = Actual Well Depth – Actual Bucket Length
or 1500ft – 50ft = 1450ft

It is usually a good practice to shorten your calculated well depth by a few feet to prevent the system from encountering a Slack Weight condition by tapping the bottom of the well bore or sand fill/trash at the bottom. The Maximum Depth of Well value can also be used to maintain fluid level in a well at some distance above the bottom.

Fluid Detect Cal Factor – The technician handing the initial installation and training will set this value for the conditions in your area. It is related to the specific gravity of the oil to be produced.

Fluid Detect Calc. SP – This parameter is calculated automatically each cycle at 7 – 10ft on descent based on a snapshot of the bucket weight divided by the Fluid Detect Cal Factor then subtracted from the bucket weight. This value is the target weight the system is looking for when the system is seeking the level of the fluid.

Influid Travel Distance – This value is set once it is determined how far the bucket has traveled in fluid before the system determines it is actually in fluid. This value is usually between 6 and 10 feet and is also affected by the specific gravity of the fluid it is submerged in.

Seating the Bucket

Navigate to the F2 Control Screen.

Figure 22 F2 Control Screen

In the middle of the screen you will find six icons that each start with the term “Jog”.

Touch the “Jog Down” icon on the screen. After the bucket has descended for a few feet, touch the “Jog Stop” icon (located between the “Jog Up” and “Jog Down” icons on the right hand side of the screen).

Next touch the “Jog Up” icon on the screen. When the bucket touches or mates with the bucket seal, it should automatically stop. The bucket depth counter should now be set to zero feet. If the bucket does not stop, immediately hit the emergency stop (located on the front of the unit) and then call a Liftek service technician. Call 870-881-9574.

Setting the Timers

Navigate to the F3 Timers screen.

Figure 23: F3 Timers

You will note that the first line under the "TIMERS" caption contains the terms "ACC" and "PRE". "PRE" stands for Preset and "ACC" stands for Accumulated which is the count during the actual timing process. To change any timer. Tap the "PRE" value.

Purge Timer - The first line on this screen contains the term "Purge Timer". Locate the number which is located to the far right of the term "Purge Timer" and under the heading "PRE". Replace that number with the number "60". (The Purge Timer number is the number of seconds that the compressor will take at the end of a cycle to remove fluids from the bucket.) Monitor the process to determine whether the 60 seconds is the proper amount of time required to totally purge the fluids from the bucket. The specific gravity of the oil will influence the amount of time required to purge fluid from the bucket. The 60 second interval should be adjusted upward or downward to the approximate amount of time required to fit the purging procedure.

Top Cycle Delay Timer – This timer determines the time delay after the purge and before the bucket descends on the next cycle. This variable is set to 5 seconds at the factory. Its primary purpose is to slow the process if for instance an operator wanted to maintain a specific fluid level in the well by allowing the fluid level to recover over the course of a few hours. The maximum value for the variable is 32767 seconds or about 9 hours.

Bottom Cycle Delay Timer – This timer determines the time spent at the bottom of the fill cycle before it begins to return. This value in seconds is set to 5 at the factory and can be adjusted to allow for thick fluids when the bucket does not fill completely. This variable can also be used in addition to the Top Cycle Delay to slow the operation of the Oilhound. The Maximum value for this variable is also 32767 seconds.

Cycle Start

Although the production cycle can e started and stopped fro the F2 Control screen, normal system monitoring is visible on the F1 Main screen,

Figure 24: F1 Main Screen

To the right and toward the center of the screen, you will note the caption "CYCLE START/STOP". Immediately below that caption you will note icons that are captioned "ON" and "STOP".

Touch the "ON" icon. The compressor should engage and run until the Purge Timer "ACC" value equals the "PRE" value (F3 – Timers). When the compressor stops running, the bucket should descend automatically into the well bore. If it does not descend, call a Liftek service technician. Call 870-881-9574.

The initial descent will occur at medium speed during a LEARN CYCLE. Once fluid is detected, the bucket will slow and continue to descend until the entire bucket is immersed into the fluid. (Note: Using Screen F4, the service technician will have previously preset the bucket length at the time of installation and training.)

The bucket tube will automatically fill with fluid that is located within the well bore as it descends. The "BOTTOM DELAY" setpoint can be adjusted to assure the bucket fills when producing particularly thick fluids. Once the bucket is full, it will automatically begin its ascent to the surface at high speed. Prior to reaching the bucket seal, the bucket will slow and gently mate with the bucket seal. The air compressor will activate automatically and the fluid will be purged from the bucket. Once empty, the bucket will automatically descend into the well bore at high speed to refill. When the bucket reaches a depth for 20 feet above the last fluid level detected, it will slow to medium speed searching for the new fluid level and the previous cycle will repeat.

AUTO RESTART – Enabling the Auto Restart allows the system to automatically restart in learn mode, should main power be removed during a cycle,. This means the bucket will return to the home position at slow speed, dock and go through a purge cycle before starting down on the next cycle. Without AUTO RESTART enabled, when power returns the system will remain at it's last position.

MAINTENANCE

Daily Maintenance

1. Examine the rope for frayed or worn areas.
2. Examine the level of the oil in the lead screw reservoir and replenish as needed:
3. Use hydraulic oil in the warmer seasons.
4. Use light weight synthetic oil in the colder seasons.
5. Examine oil level in the air compressor. Replenish the oil as needed with non-detergent 30 weight oil. Replace used oil with a non-detergent 30 weight oil following not more than every 1000 hours of usage.
6. Examine the cooling filter in the control panel for cleanliness. If the filter is dirty, clean if possible. If cleaning does not free the filter of contaminants, replace the filter.

Weekly Maintenance

7. Examine the eye of the rope for frayed or worn areas.
8. Examine the V belt connected to the 1HP motor and air compressor for tightness.

Monthly Maintenance

9. Examine the collection tube for wear and tear on a systematic and timely basis (at least monthly). Note: If wear is noted, contact your Liftek service representative. Call 870-881-9574.

200 Hours Unit Operation Maintenance

1. Grease all pillow block bearings with high value lithium based grease.
2. Grease swing arm with high value lithium based grease.

1000 Hours Unit Operation Maintenance

1. Examine the worm gear screw every 1000 running hours. If wear is excessive, contact your Liftek service provider. Call 870-881-9574.

The unit has certain electrical or mechanical parts that were purchased from separate manufacturers. Those parts include electrical motors, a brake, a gear box, a compressor and a discharge pump. The manufacturers of those parts have supplied basic instructions concerning their products. Liftek has included those instructions for reference. Please refer to instructions for answers to any maintenance issues.

APPENDIX A – Auto Setup

For Oil Hound models manufactured after January 2014, the first 4 steps of the setup procedure on a new well have been automated. From the F5 – Manual screen, access the Calibration Screen by tapping the Cal Screen Button. Note the Auto Setup requires the bucket to be at a depth of 5 feet. The Bucket must be empty. Under those conditions, the Auto Setup button is pressed the first 5 values on the F4 – Setpoints screen will be set to default values. All of these vzlues can be adjusted for convenience.

Figure 25: F5 MANUAL Screen

Figure 26: CALIBRATION Screen

APPENDIX B – System Codes

System Status Codes

SYSTEM SHUTDOWN	Message displayed when Cycle Stop button pressed or any of the following faults halts the system.	System Halts?
Bailer UP Purging	Bucket is home/docked and purging	NO
Bailer Down	Bucket is descending	NO
Bailer Entering Fluid	Bucket has found the fluid level	NO
Level Control	Not Implemented	NO
Bailer Home	Bucket is rising	NO
Bailer Purge Weight	FAULT: Bucket starts decent but has not completely emptied. Can be caused by Bucket Empty Weight SP set too low.	YES
Over Tension	FAULT: Upon ascent, the bucket encounters an obstruction that causes and indicated weight to be in access of that set for the Over Tension set point on the F4 – Settings screen.	NO
Slack Weight	FAULT: Upon decent, the bucket encounters and obstruction that causes the indicated weight to drop below that set for the Slack Weight set point on the F4 – Settings screen. The system stops until the weight condition is corrected. It is common the see the system start and stop repeatedly when entering thick fluids and adjusting the Slack Weight setpoint lower can correct the condition.	YES

System Mode Codes

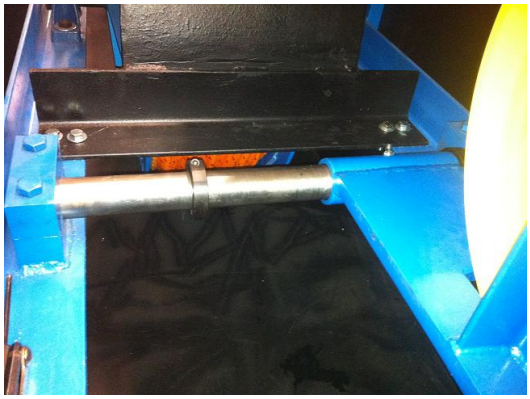
SYSTEM HALTED	Message displayed when Cycle Stop button pressed or any of the Status faults above halt the system.	System Halts?
FIND HOME	The Bucket is returning to the home position.	
LEARN CYCLE	First cycle to find fluid operates slower than normal	
IN FLUID START	Point at which the bucket detects fluid	YES
AUTO CYCLE	Automatic repetitive operation	NO

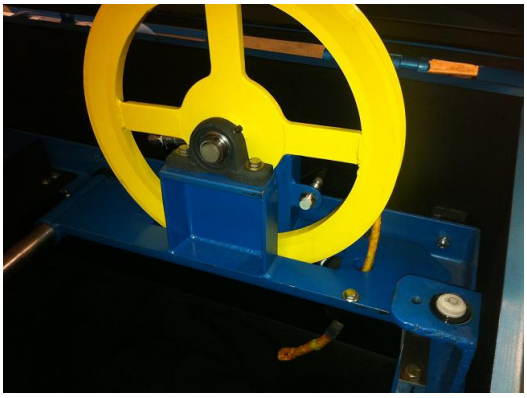
APPENDIX C – Swing Arm Positions

Preparing the Swing Arm Assembly for Transport

Transporting the Swing Arm in it's production position resting on the loadcell can result in damage to the loadcell. Loadcells can measure heavy weights but cannot tolerate shock.

1. Remove Compression spring and spring cap (store in electrical box for travel)
2. Loosen the split collar located on swing arm shaft that is located toward the back part of unit. Slide the split collar toward the back of the unit until it makes contact with the interframe. Note that the split collar located at the front of the unit will remain stationary.
3. Raise swing arm assembly to alleviate all weight off the load cell.
4. Slide swing arm assembly toward the back of the unit until it makes contact with the split collar previously moved.
5. Secure swing arm assembly to interframe in a manner that will not allow movement during transport.

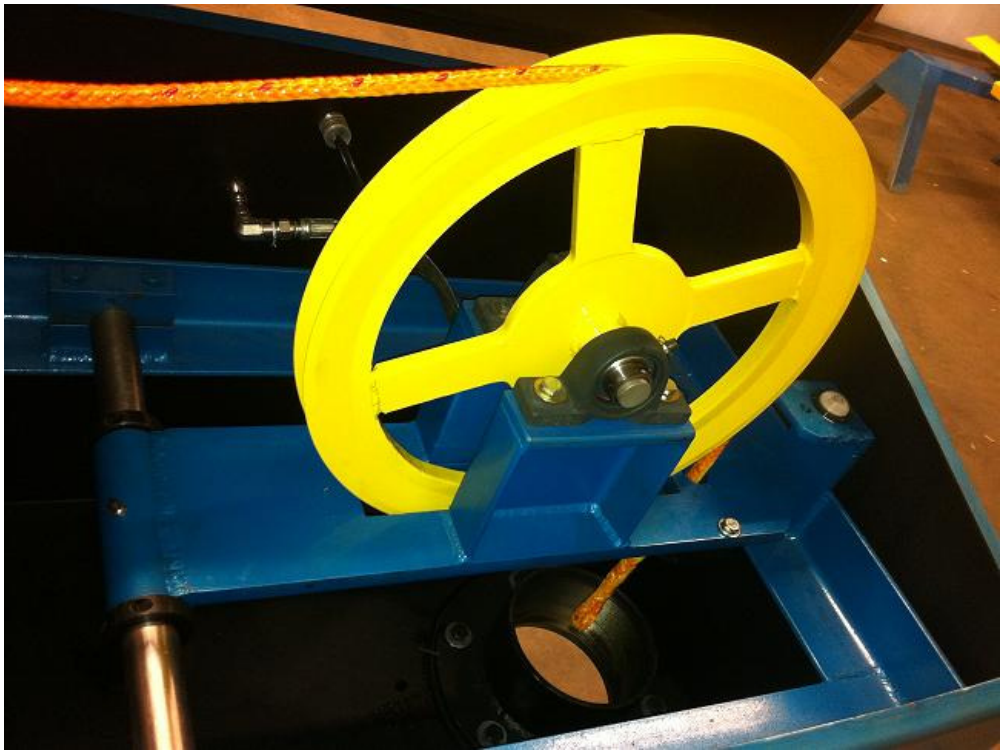




Swing Arm Assembly ready to transport

Preparing the Swing Arm Assembly for Use

1. Unsecure swing arm assembly from interframe.
2. Slide swing arm assembly toward the center of the unit until it is centered under the spring support and resting on the load cell measuring bolt.
3. Slide split collars on either side of the assembly pivot shaft until they make contact with the assembly.
4. Tighten split collars allowing approximately 1/16” gap.



Swing Arm Assembly ready for Producrtion