



**Corlift 18-120
Operation Manual**

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Preface

Foreword

The information, specifications and illustrations in this publication are up to date at the time of printing. Our policy is one of continued development and therefore we reserve the right to amend any of the information contained in this manual without prior notice.

Disclaimer

This manual is intended to give our customers basic information regarding the design, installation and operation of the National Oilwell Varco Corlift 18-120. It is not intended to be a complete source of information on these matters. The customer is responsible for using this information in a correct and safe manner. For assistance, contact your nearest National Oilwell Varco representative.

The operation of the Corlift 18-120 unit beyond the parameters outlined in this manual without the manufacturer's approval may be damaging to the equipment and/or personnel in which case National Oilwell Varco cannot accept any responsibility whatsoever and disclaims all liability thereof.

Table of Contents

1.0 System Overview	
1.1 System Overview	1
1.2 Specifications	2
1.3 Corlift 18-120 Overview.....	3
1.4 Control Box Overview.....	4
1.5 Hydraulic Skid Overview	5
1.5.1 Overview	5
1.5.2 Operation.....	6
1.5.3 Safety Features	7
2.0 Assembly and Start-up	
2.1 Mounting Instructions	8
2.2 Corlift 18-120 Start-up Procedure	9
2.2.1 Skid Start-up Procedure	9
2.2.2 Prime Mover Start-up Procedure.....	9
2.2.3 Setting Stroke Length.....	10
2.2.4 Setting Pump Controls.....	11
3.0 Maintenance Procedures	
3.1 Maintenance Schedule.....	13
3.2 Changing Filter Element.....	14
3.3 Changing Hydraulic Oil.....	15
4.0 Corlift 18-120 Parts List	
4.1 Exploded View.....	16
4.2 Parts List	17
4.3 Overall Dimensions	18
5.0 Warranty Statement	19

Corlift 18-120

Chapter 15
System Overview
and Specifications

1.0 System Overview and Specifications

1.1 System Overview

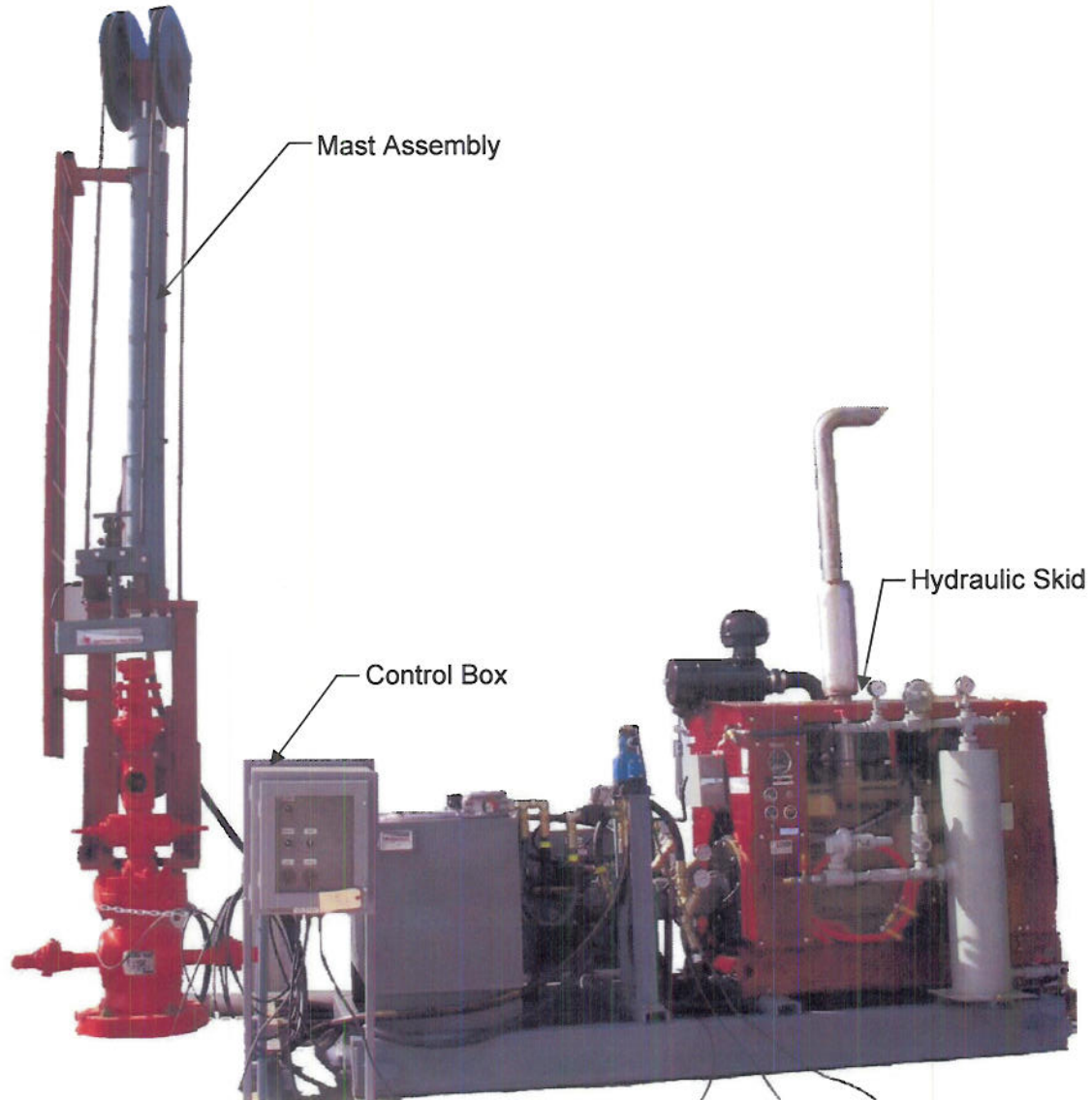


Figure 1

Mast Assembly – The mast assembly of the Corlift 18-120 is the actual stroking portion of the system.

Control Box – The control box allows the operator to adjust the stroke speed.

Hydraulic Skid – The hydraulic skid supplies pressurized oil to drive the hydraulic cylinder of the Corlift 18-120.

1.2 Specifications

Max Stroke Length	0-120 in
Max Polish Rod Load ¹	0-18 000 lbs.
Max Stroke Speed ¹	0-7 spm (depending on load)
Polish Rod Size	1 ¼ or 1 ½ in.
Mounting Flange	7 1/16 – 2000psi or 7 1/16 – 3000 psi
Rod Rotator Actuator	Optional

Table 1

1 – Based on 100% efficiencies.

1.4 Control Box Overview

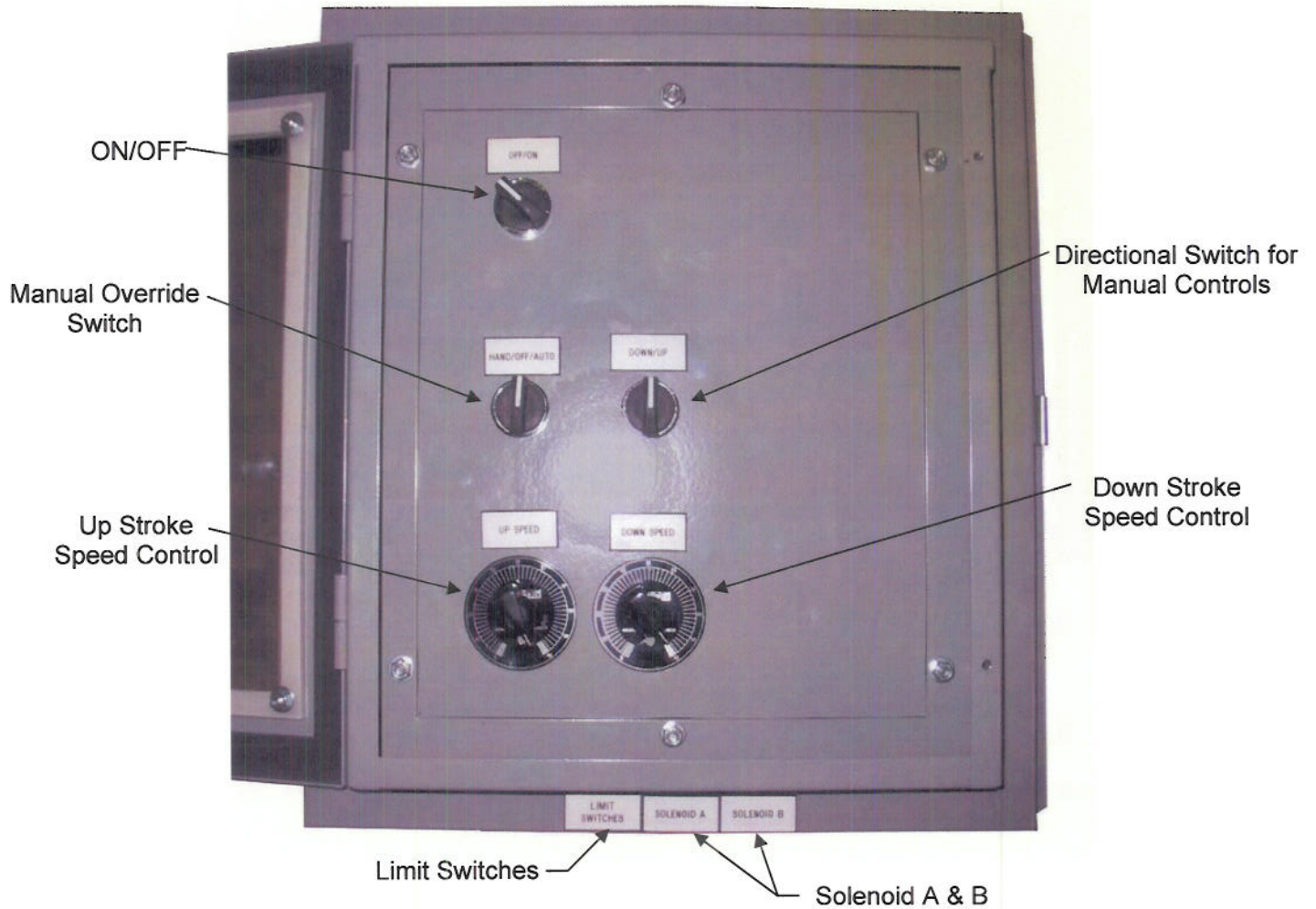


Figure 3

1.5 Hydraulic Skid Overview

1.5.1 Overview

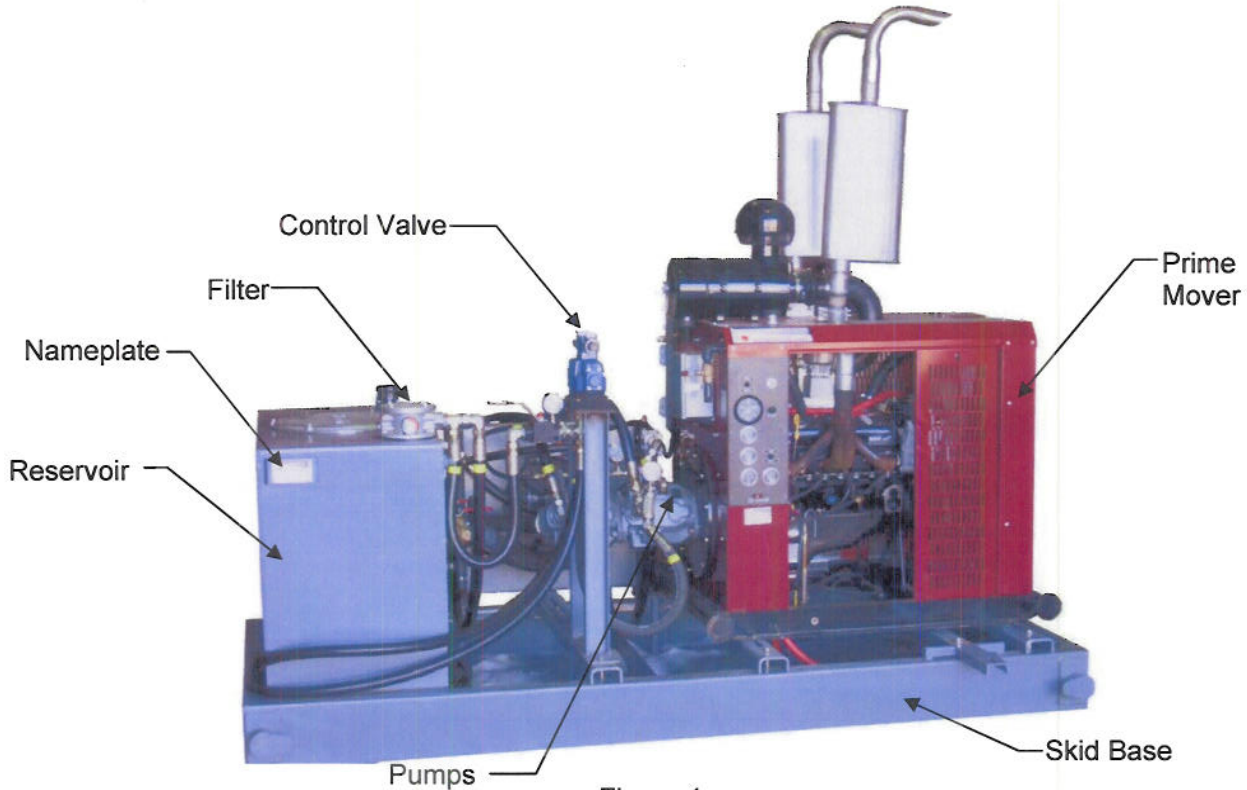


Figure 4

Skid Base – Enclosed bottom to contain any accidental leaks or spills.

Hydraulic Pump – Tandem Rexroth A 10V variable displacement axial piston pumps.

Hydraulic Reservoir – A 400 litre (90 gal) tank provides adequate capacity and cooling for most applications. The skid comes standard with auxiliary oil cooler.

Hydraulic Filter – In-tank filter is capable of filtering particles as small as 5 microns absolute. An easy to read gauge tells you when it's time to change the element.

Prime Mover – Can be Internal Combustion or Electric. (Note: Cummins 5.9L shown)

Nameplate – Shows Model, Serial # and Date of Mfg.

Control Valve – Proportional Directional Pilot Operated Control Valve

1.5.2 Operation

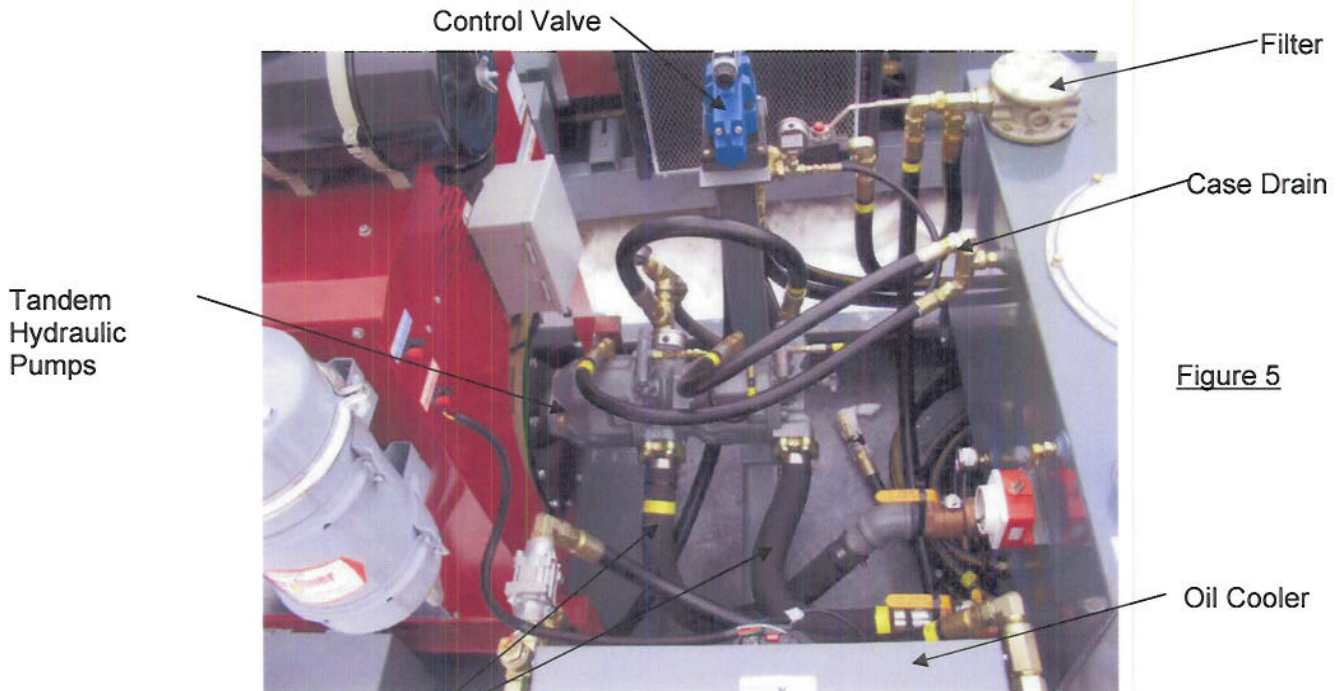


Figure 5



Figure 6

The hydraulic skid unit supplies pressurized oil to drive the hydraulic cylinder of the Corlift 18-120. The prime mover is directly coupled to the hydraulic pump, which draws fresh oil from the reservoir and discharges it out the pressure line to the control valve. The oil is then sent to the hydraulic cylinder to apply force, after which it is circulated back to the reservoir.

1.5.3 Safety Features

The hydraulic system contains three separate safety features to protect your equipment. Refer to Figure 2.

1. Reservoir Low Level – The Low Level switch senses the oil level in the reservoir and shuts down the prime mover if the level drops below the minimum level, thereby preventing damage to the pump.
2. Reservoir High Temperature – The high temperature switch senses the temperature of the oil in the reservoir and shuts down the prime mover if it exceeds the maximum preset temperature. This prevents oil viscosity breakdown, which in turn prevents damage to the hydraulic components. The maximum temperature is preset at the factory to 80° C (175° F). Depending on the prime mover set-up, this will either be located on the engine control panel or directly on the reservoir.
3. High Pressure Limit – The hydraulic pump is internally set to a maximum discharge pressure. So as not to exceed the maximum system pressure, it is factory preset to 2700 psi (18 600 kpa).



Corlift 18-120

**Chapter 2.0
Assembly and Start-up**

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2.0 Assembly and Start-up

2.1 Mounting Instructions

1. Remove stud #1 and replace with an extra long stud (included).
2. Replace nuts on extra long stud and re-torque, leaving extra sticking up.
3. Repeat steps 2 & 3 until studs #2, #4, #5, #7 & #8 have been switched out (Figure 8).
4. Position Corlift 18-120 base over extra long studs.
5. Fasten down with extra set of nuts (included).
6. Position adjustable support clamp and tighten.
7. Connect cable from junction box on the frame to Limit Switches port on the control box.
8. Connect the cables from the control valve on the skid (Figure 9) to the Solenoid A & B ports on the control box.
9. Connect hydraulic hoses.
10. Position rod clamp on polished rod.
11. Secure bridle block on polished rod below the clamp.

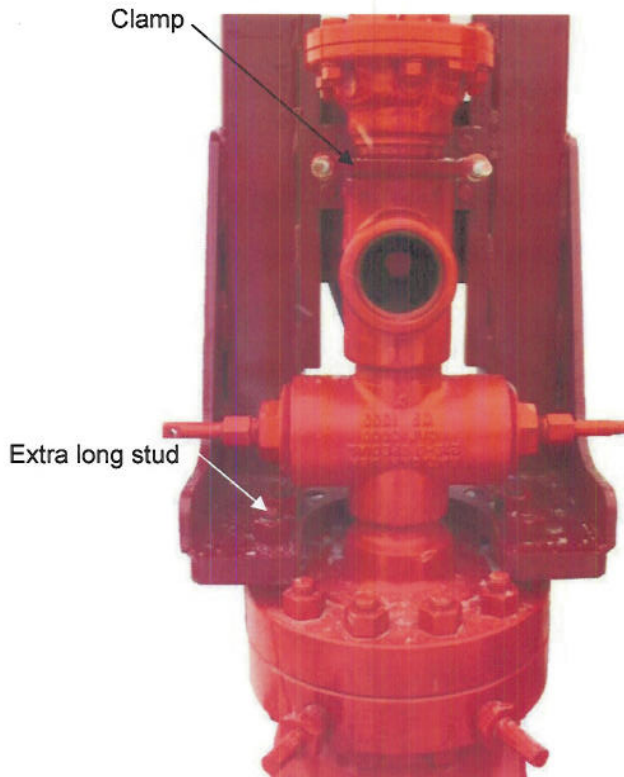


Figure 7

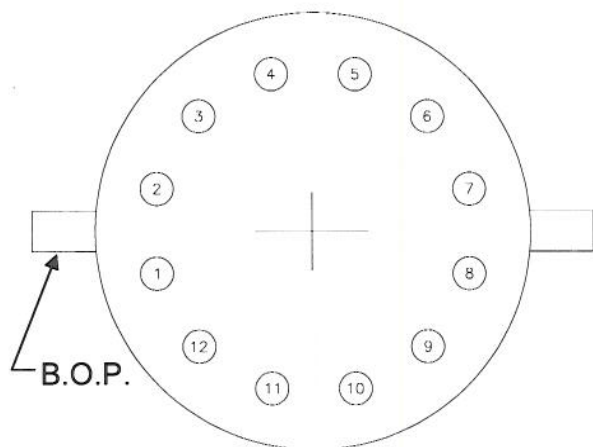


Figure 8

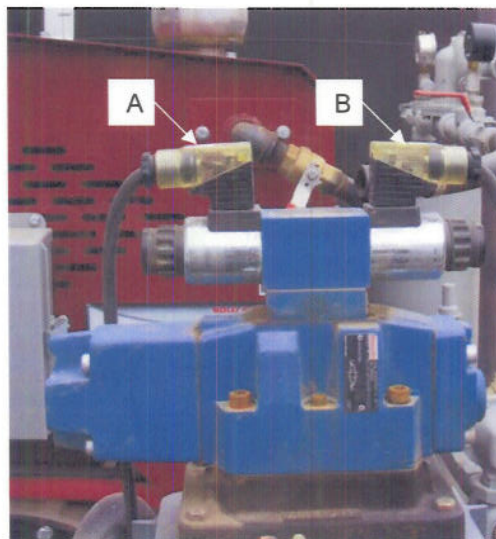


Figure 9

2.2 Corlift 18-120 Start-up Procedure (see Figure 3)

1. Re-check all connections.
2. Start skid (Follow general skid start up procedures below).
3. Turn control box power on.
4. Switch Manual Override Switch to Hand.
5. Using Manual control position the cylinder at the top of the desired stroke.
6. Set the top proximity switch.
7. Lower the cylinder to the bottom of the desired stroke.
8. Set the bottom proximity switch.
9. Position the cylinder about mid-stroke.
10. Switch manual override switch to Auto. The cylinder should lower to the bottom of the set point and proceed to reciprocate between the set points.
11. While unit is pumping turn speed dials to desired stroke speed.
12. Check for leaks.

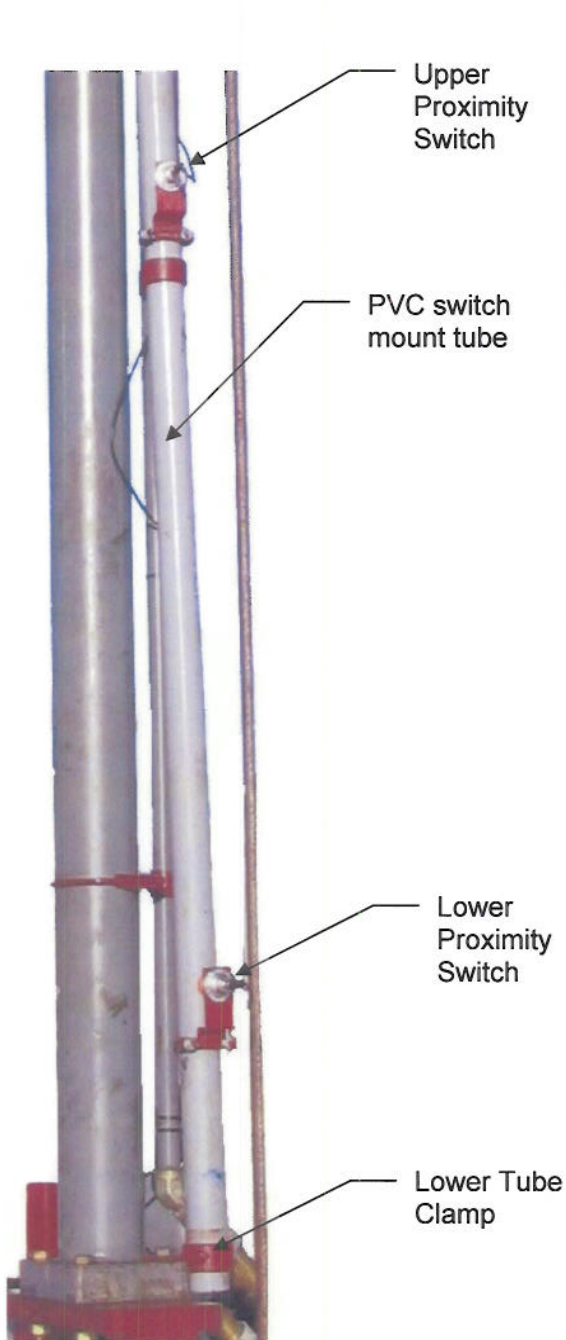
2.2.1 Skid Start-up Procedure

1. Check the oil level in the Hydraulic Reservoir. The level should be visible in the top tube. Top up with Nemco HVI 36 if necessary.
2. Start the prime mover. (See below)
Note: If the system is cold, let the hydraulic oil circulate till warm, system will automatically circulate if control box is in the off position.
3. Check for any unusual noises or vibrations coming from the unit.

2.2.2 Prime Mover Start-up Procedure

1. Check the Engine Oil Level. Oil should be visible in the upper half of the sightglass. Top up if needed.
2. Check coolant level. Top up if needed.
3. Set on/off switch to ON.
4. Open the Gas valve. Ensure you have the minimum fuel requirements.
5. If equipped with an electric carburetor, set RUN/IDLE switch to IDLE. If equipped with a mechanical governor, turn throttle adjustment clockwise to set the engine speed to idle.
6. Push in and hold the Murphy Override switch.
7. Push the button and start the engine.
8. Once the Oil Pressure is above 100 kPa, release the Murphy Override switch.
9. Allow unit to warm up to normal operating temperature.
10. If equipped with an electronic carburetor, set to RUN/Idle switch to RUN. If equipped with a mechanical governor, turn the throttle adjustment counter clockwise to set the desired speed.
11. Check the unit for any unusual noises or vibrations.

2.2.3 Setting the Stroke Length



Switch distance to stroke ratio is 2:1. ie Moving switches 1" changes the stroke of the polished rod by 2".

To Lengthen Stroke

1. Loosen lower tube clamp on PVC tubing.
2. Move entire tube up $\frac{1}{2}$ desired length.
3. Retighten clamp on tubing.
4. Move lower proximity switch down the same amount that tubing was raised.

To Shorten Stroke Length

1. Loosen clamp on PVC tubing.
2. Move entire tube down $\frac{1}{2}$ desired length.
3. Retighten clamp on tubing.
4. Move lower proximity switch up the same amount that tubing was lowered.

Figure 10

2.2.4 Setting the Pump Controls

The pumps are factory pre-set and should not need to be adjusted under normal conditions. However, certain conditions may arise when the pumps will need to be set. Follow the procedures described below to ensure the pump controls are set properly. It is a good idea to have some wiping rags or other absorbent material on hand as the pump will leak hydraulic oil during this operation.

1. Remove cap nut on #1 & #2 load sense controller with a 17 mm (11/16) wrench (see Figure 11).
2. Loosen lock nut with a 17 mm (11/16) wrench and with a 3 mm hex key, turn the adjusting screw counter-clockwise until it turns easily by hand (see Figure 12 & 13).
3. Remove cap nut on #1 & #2 pressure compensator with a 17 mm (11/16) wrench and loosen lock nut.
4. Start the pump.
5. Using a 3 mm hex key turn the adjustment screw on the #1 & #2 counter-clockwise until they are easily adjusted by hand (see Figure 13).
6. Slowly turn the #1 adjustment screw clockwise until the main pressure gauge reads 2100 psi (see Figure 15).
7. Slowly turn #2 adjustment screw clockwise until the main pressure gauge increases from 2100 to 2200, then slowly turn screw back counter-clockwise until the pressure reads 2100 again.
8. Tighten lock nuts and replace cap nuts on pressure compensators.
9. With a T-handle hex key, manually actuate the control valve (see Figure 14). The main pressure gauge should drop to 0 psi (see Figure 15).
10. With the control valve actuated, use a 3 mm hex key and turn the adjustment screw on #1 load sense controller until the main pressure reads 400 psi.
11. Repeat step 10 on #2 load sense control until the main pressure gauge increases from 400 to 450 then slowly turn screw back counter-clockwise until the pressure returns to 400.
12. Tighten lock nuts and replace cap nuts.

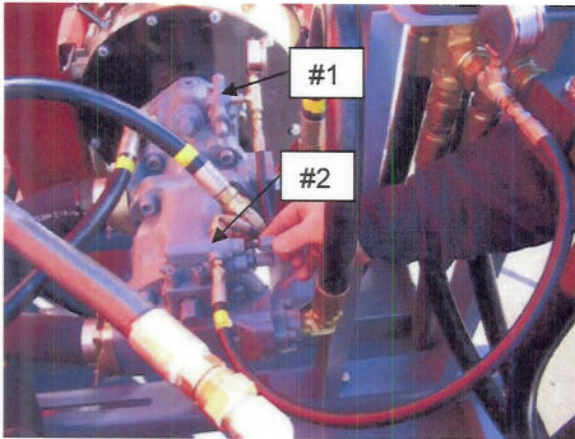


Figure 11



Figure 12

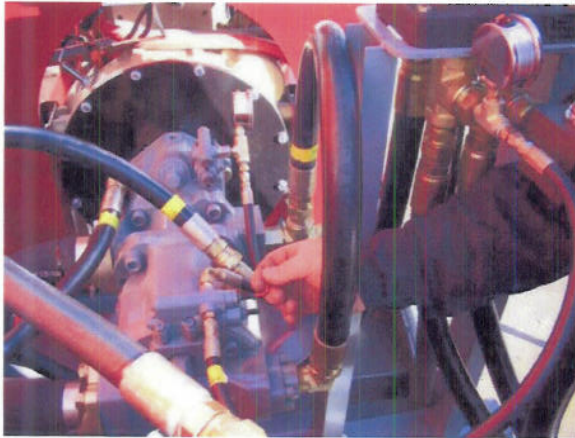


Figure 13

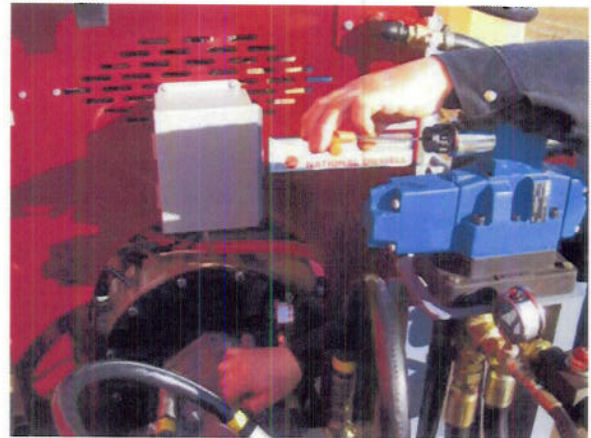


Figure 14

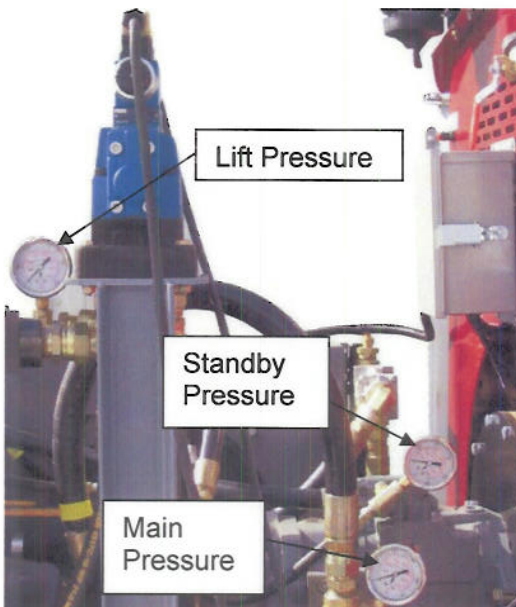


Figure 15

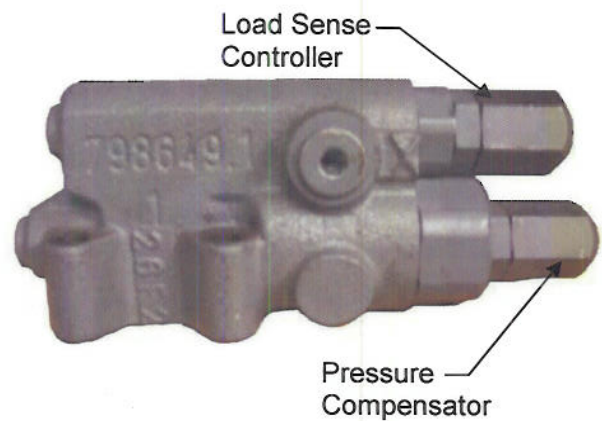


Figure 16



Corlift 18-120

**Chapter 3.0
Maintenance Procedures**

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3.0 Maintenance Procedures

3.1 Maintenance Schedule

Calendar months or Hours of operation	Daily 24	Weekly 150	Monthly 700	Bi-annually 4000	Annually
Grease Cables ¹			x		
Inspect cables for wickers or wear	x				
Inspect Bearings		x			
Inspect Nylatron sheaves for cracks or wear			x		
Inspect hydraulic cylinder for leaks		x			
Inspect hydraulic fittings for leaks		x			
Inspect proximity sensors and wires		x			
Check for rough turn around motion		x			
Inspect frame bolt & well head mounting bolts				x	
Change Hydraulic Filter ²					x
Change Hydraulic Oil ³					x

Table 2

1. To grease cables, find an old glove. Once you have the glove on, take a handful of grease and squeeze the grease into the cables. The more grease that can be squeezed into the cable the better. The entire length of cable should be greased.
2. Filter is equipped with a gauge. More frequent changes may be required as gauge indicates.
3. Annual oil sampling is recommended. Less frequent oil change intervals may be possible

- ***For engine maintenance schedule see Hydraulic Wellhead Drive & Skid Manual.***

3.2 Changing Filter Element

1. Remove the 4 bolts from the filter lid with a ½" wrench.
2. Remove lid and filter element. (Figure 17)
3. Install the new element, ensuring it seats properly in the bottom of the canister. (Figure 18)
4. Replace the filter lid and bolts.



Figure 17



Figure 18

3.3 Changing Hydraulic Oil

1. Obtain a container(s) large enough to hold the contents of the Hydraulic Reservoir. (Approx. 400 litres)
2. Using the Drain Valve, drain the oil into the containers (Figure 19).
3. Remove the Tank Cover using a ½" wrench.
4. Clean out the bottom of the tank. Most of the heavy contaminants will have settled to the bottom of the tank and need to be wiped out with a rag.
5. Close the Drain Valve.
6. Fill the tank with recommended oil.
7. Replace the Tank Cover. Ensure the gasket area is clean and the gasket is in place.



Figure 19

4.0 Corlift 18-120 Parts List

Exploded View



Corlift 18-120

**Chapter 4.0
Corlift 18-120 Parts List**

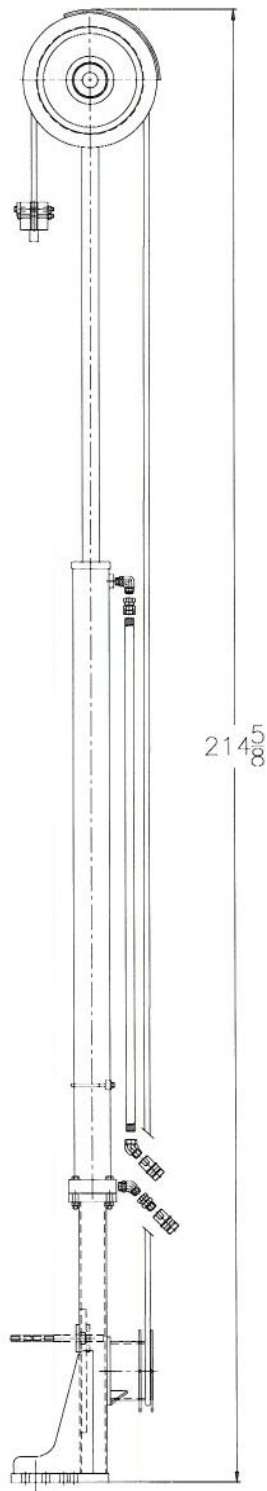
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4.2 Parts List (See Figure 19)

Item	Part Number	Description
1	HJ-1	Frame
2	HJ-2	Sheave
3	HJ-4	Sheave Mount
4	HJ-8	Sheave Shaft
5	HJ-27	Sheave Guard
6	HJ-12	Guard Mount
7	HJ-13	Bridle Block
8	HJ-14	Bridle Block Gate
9	HJ-3	Support Clamp
10	HJ-5	Support Mount
11	HJ-6	Support Back
12	HJ-15	Switcher
13	HJ-16	Switch Bracket
14	HJ-25	Pipe Mount
15	PS-38	Proximity Switch
16	PS-39	Junction Box
17	HJ-24K	Hydraulic Fittings Kit
18	HJ-7	Hydraulic Cylinder
19	HJ-9	¾" Wire Rope
20	BS-88	Ball Bearing
21	FI-53	Snap Ring
22	HJ-18	Switch Tube
23	HJ-20	Switcher Cable
24	PS-46	Control Box Stand
25	HJ-21	Stud
26	HJ-22	Heavy Hex Nut
27	HF-468	Pipe
28		Shackle
29		Cable Clamp
30		Clamp Bolt
31	FI-54	External Snap Ring
32	HJ-28	Sheave Sleeve
33	HJ-31	Top Tube Mount
34	HJ-32	Bottom Tube Mount

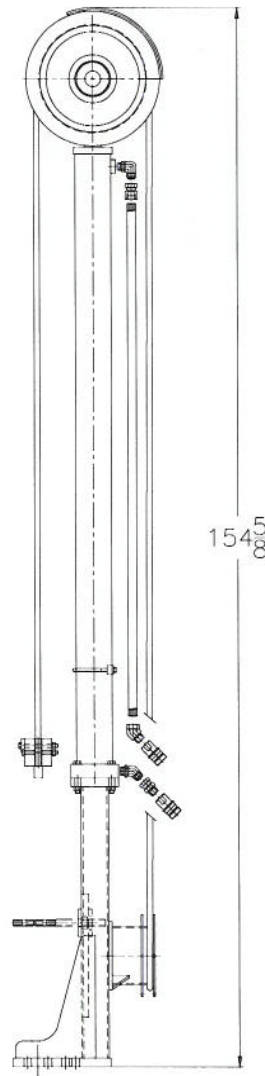
Table 3

4.3 Overall Dimensions



Top of Stroke

Figure 21



Bottom of Stroke

Figure 22

5.0 Warranty Statement

Corlift 18-120

National Oilwell Varco hereby warrants all new Corlift 18-120 units, excluding externally manufactured components for 12 months covering parts and labor for repairs that result from defects in material or workmanship. Warranty covering externally manufactured components will fall under external manufacturer's warranty. This warranty is extended to first end user only. Warranty covering Integral and Retrofit stuffing box is 3 months covering parts and labor for repairs that result from defects in material or workmanship. Warranty does not include abrasion damage. In no event will National Oilwell Varco be liable for incidental, consequential, special, indirect or other damages of any nature.



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**Chapter 5.0
Warranty Statement**

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Notes

Notes

Store Locations



To locate your nearest National Oilwell Varco location, visit www.natoil.com.

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