

STRONGWAY™

1-TON ENGINE HOIST **OWNER'S MANUAL**



WARNING:

Read carefully and understand all **ASSEMBLY AND OPERATION INSTRUCTIONS** before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Item# 114940

Thank you very much for choosing a STRONGWAY product! For future reference, please complete the owner's record below:

Model: _____ Purchase Date: _____

Save the receipt, warranty and these instructions. It is important that you read the entire manual to become familiar with this product before you begin using it.

This machine is designed for certain applications only. The distributor cannot be responsible for issues arising from modification. We strongly recommend this machine not be modified and/or used for any application other than that for which it was designed. If you have any questions relative to a particular application, DO NOT use the machine until you have first contacted the distributor to determine if it can or should be performed on the product.

For technical questions please call **1-800-222-5381**.

GENERAL SAFETY RULES



WARNING: Read and understand all instructions. Failure to follow all instructions listed below may result in serious injury.



CAUTION: Do not allow persons to operate or assemble this Hydraulic Engine Crane until they have read this manual and have developed a thorough understanding of how the Hydraulic Engine Crane works.



WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur. It must be understood by the operator that common sense and caution are factors that cannot be built into this product, but must be supplied by the operator.

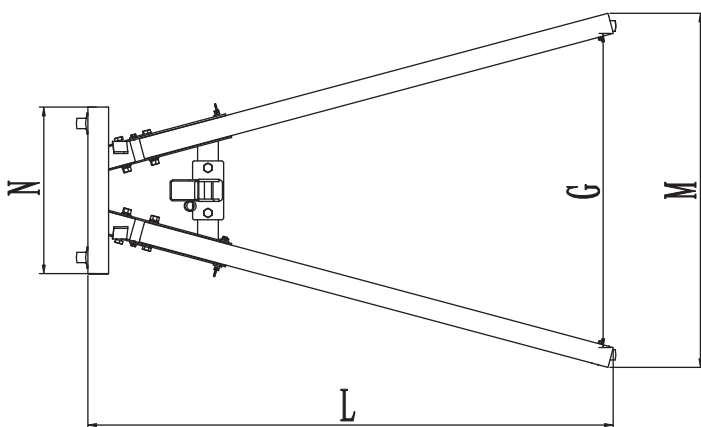
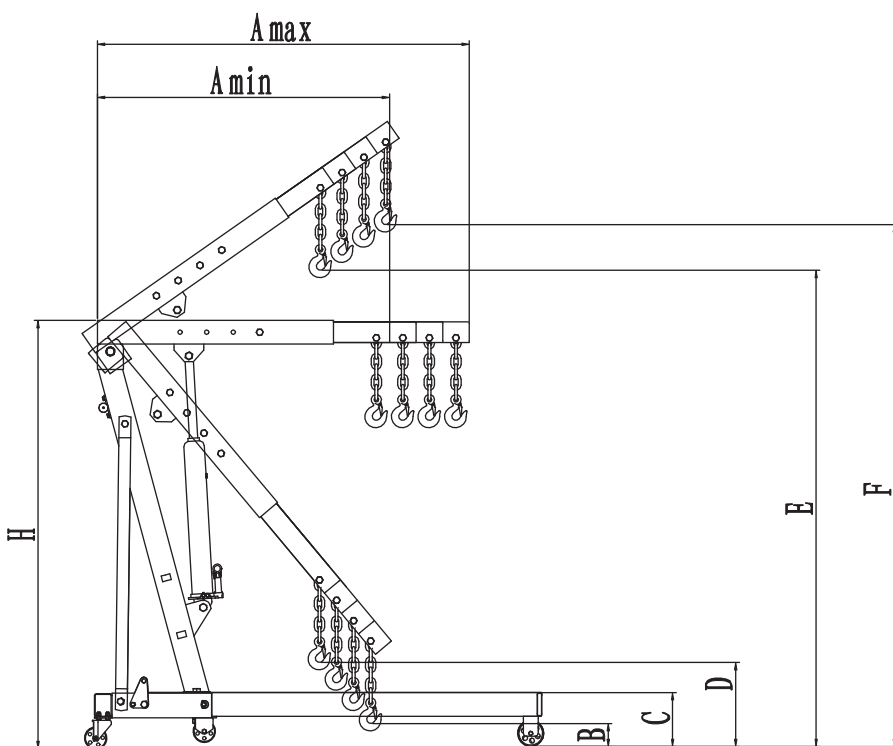
SAVE THESE INSTRUCTIONS

INTENDED USE

This Hydraulic Engine Crane is specially designed to raise, lower and transport engines, differentials, transmissions, and other heavy loads with minimal effort. Tested for reliability and safety to meet ASME PALD standards.

TECHNICAL SPECIFICATIONS

A min	38.98 in.
A max	49.61 in.
B	2.95 in.
C	7.28 in.
D	12.99 in.
E	69.69 in.
F	76.77 in.
G	36.22 in.
H	57.09 in.
L	59.65 in.
M	41.34 in.
N	18.90 in.



IMPORTANT SAFETY CONSIDERATIONS

HYDRAULIC ENGINE CRANE USE AND CARE

- **Do not modify the Hydraulic Engine Crane in any way.** Unauthorized modification may impair the function and/or safety and could affect the life of the equipment. There are specific applications for which the **Hydraulic Engine Crane** was designed.
- **Always check of damaged or worn out parts before using the Hydraulic Engine Crane.** Broken parts will affect the **Hydraulic Engine Crane** operation. Replace or repair damaged or worn parts immediately.
- **Store idle Hydraulic Engine Crane.** When **Hydraulic Engine Crane** is not in use, store it in a secure place out of the reach of children. Inspect it for good working condition prior to storage and before re-use.
- **Not for use by children** or people with reduced mental capacity.
- **Do not use under the influence of drugs or alcohol.**
- **Ensure children and other bystanders** are kept at a safe distance when using crane.

INSPECTION

- Inspect the crane carefully before each use. Ensure the crane is not damaged, excessively worn, or missing parts.
- Do not use the crane unless it is properly lubricated.
- Using a crane that is not in good clean working condition or properly lubricated may cause serious injury.
- Inspect the work area before each use. Make sure it is free and clear of any potential hazards.



WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur. It must be understood by the operator that common sense and caution are factors that cannot be built into this product, but must be supplied by the operator.



GENERAL SAFETY INSTRUCTIONS

- **Position the Crane**

Position the crane to only lift on the areas of the vehicle as specified by the vehicle manufacturer.

- **Do Not Overload Crane**

Do not overload this crane beyond its rated capacity. Overloading this crane beyond its rated capacity can cause damage to or failure of the crane.

- **Always Use on Hard Level Surfaces**

This crane is designed only for use on hard level surfaces capable of sustaining the load. Use on unstable or other possible loss of load.

- **Chock and Block (Stabilize)**

Apply parking brake in vehicle before operating crane.

A chock is a wedge for steadying an object and holding it motionless, or for preventing the movement of a wheel chock the wheel opposite the end being lifted.

- **Center Load before lifting.**

Off-center loads and loads lifted when the crane is not level can cause loss of load or damage to the crane.

- **Do not raise or lower the vehicle unless tools, materials and people are clear.**

When the lift is being lowered, make sure everyone is standing at least six feet away. Be sure there are no tools or equipment left under or around the crane before lowering.

- **Always lower the Crane slowly.**

- **DO NOT USE THE CRANE TO SUPPORT OR STABILIZE A LOAD.**

Using the crane to support or stabilize a load may result in unexpected movement and result in serious injury, being crushed and death. Always securely chock and block (stabilize) the load to be lifted. Never place any part of the body under a raised load without properly chocking and supporting the load.

- **Wear ANSI-approved safety glasses and heavy duty work gloves during use.**

- **Do not adjust the safety valve.**

- **Stay alert. Use caution and common sense when operating crane.** Do not use a crane when tired, incoherent, dizzy, under the use or drugs or alcohol.

Training

Read this manual before use. Do not allow anyone who has not read this manual, and/or does not understand the requirements, use the crane.

Spectators

Do not allow bystanders around the crane or under the load supported only by the crane. Do not allow anyone in the vehicle while the crane is in use. Keep all bystanders away from vehicle when in use.

Inspection

Inspect the crane carefully before each use. Ensure the crane is not damaged, excessively worn, or missing parts. -Do not use the crane unless it is properly lubricated. -Using a crane that is not in good clean working condition or properly lubricated may cause serious injury.

Additional Notes:

Save the receipt, warranty and these instructions.

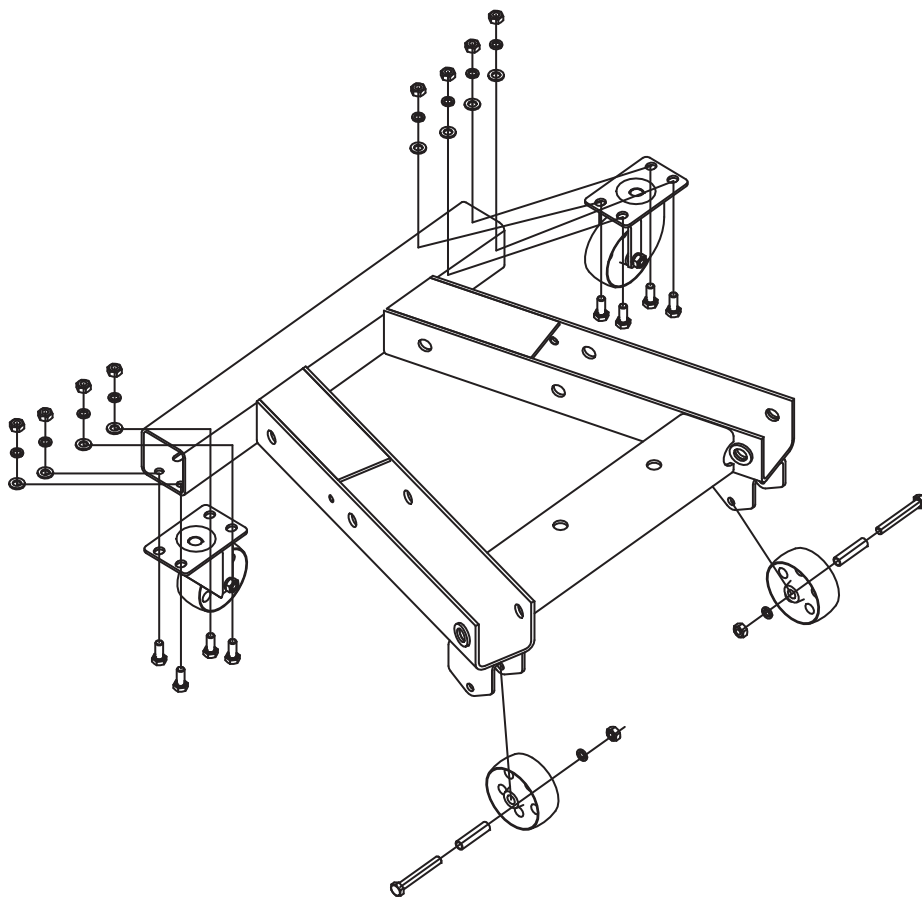
Do not modify the crane in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment. There are specific applications for which the crane was designed.

Always check for damaged or worn out parts before using the crane. Broken parts will affect the equipment operation. Replace or repair damaged or worn parts immediately.

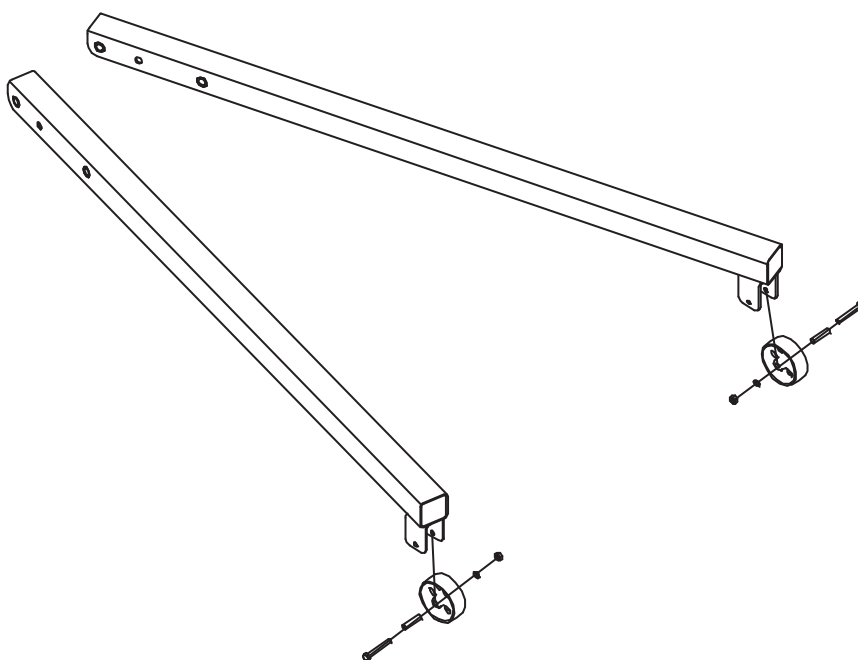
When crane is not in use, store it in a secure place out of the reach of children. Inspect it for good working condition prior to storage and before re-use.

ASSEMBLY

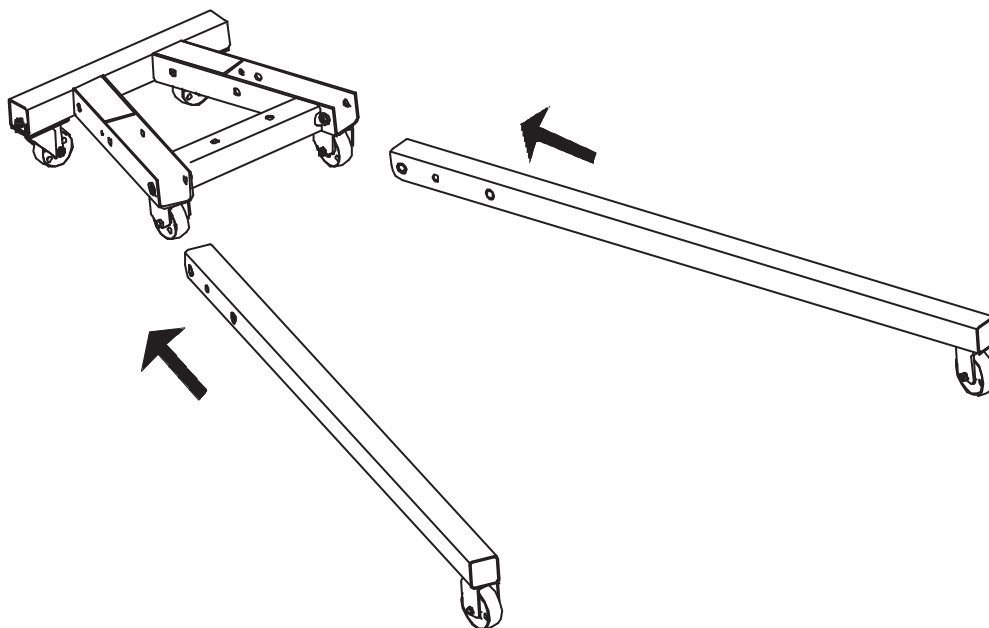
Fasten the two rear caster wheels on the base structure with bolts, washers, spring washers and nuts (Face bolts up when installing). Fasten the smaller two wheels on the base structure with bolts, bushings, spring washers and nuts.



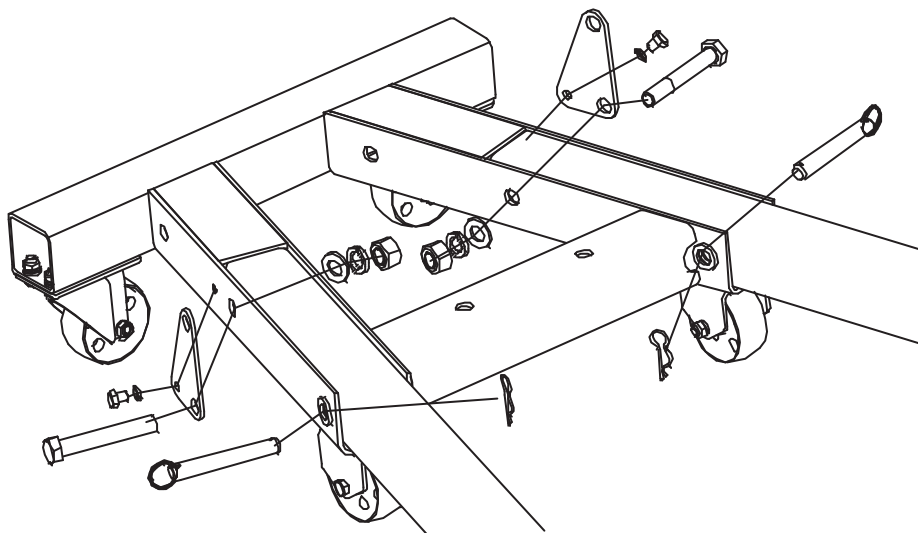
2. Fasten the remaining larger two wheels on the front legs with bolts, bushings, spring washers and nuts.



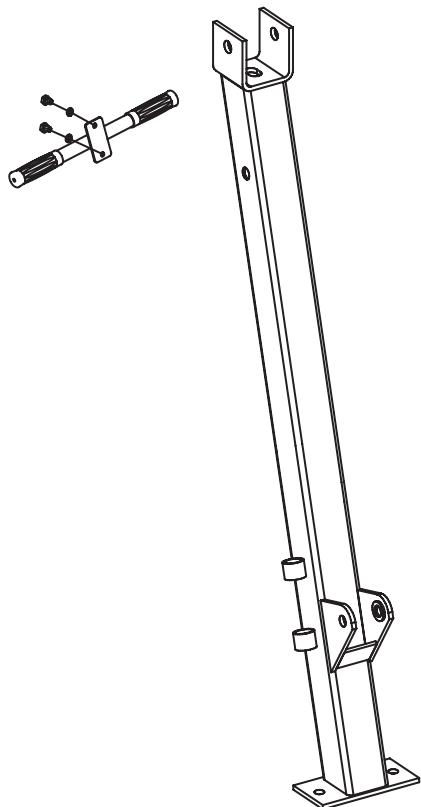
3. Slide the legs into front of the base. Keep the two front wheels parallel during assembling.



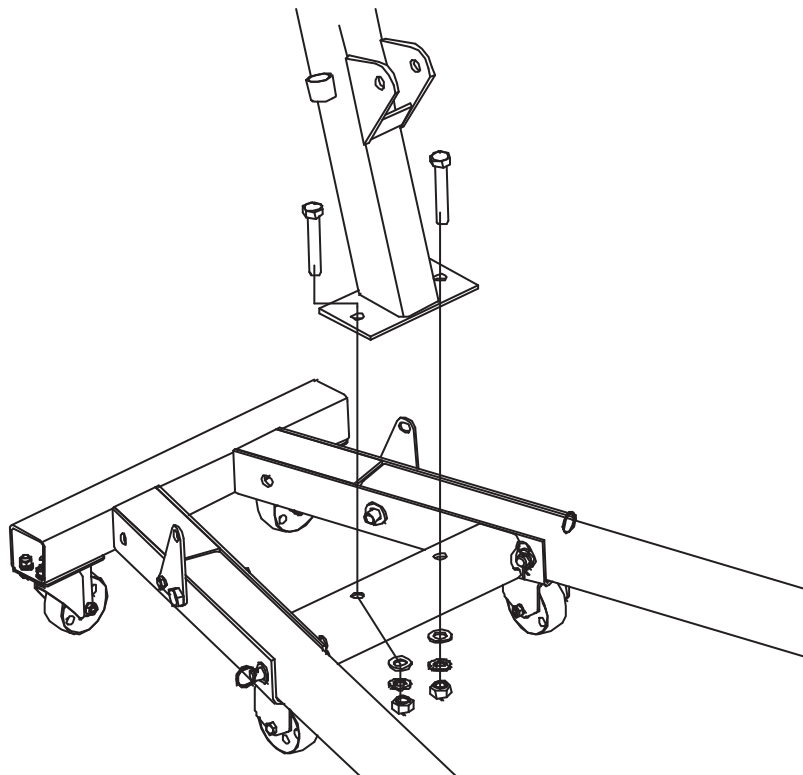
4. Fasten the guide plates , to the base frame and front legs with bolts, washers, spring washers and nuts. Lift one side of the base to align the hole on the frame to the hole on front leg, then insert the Ring Pins into the hole, and insert the Cotter-Pin into the hole of the Ring Pins.



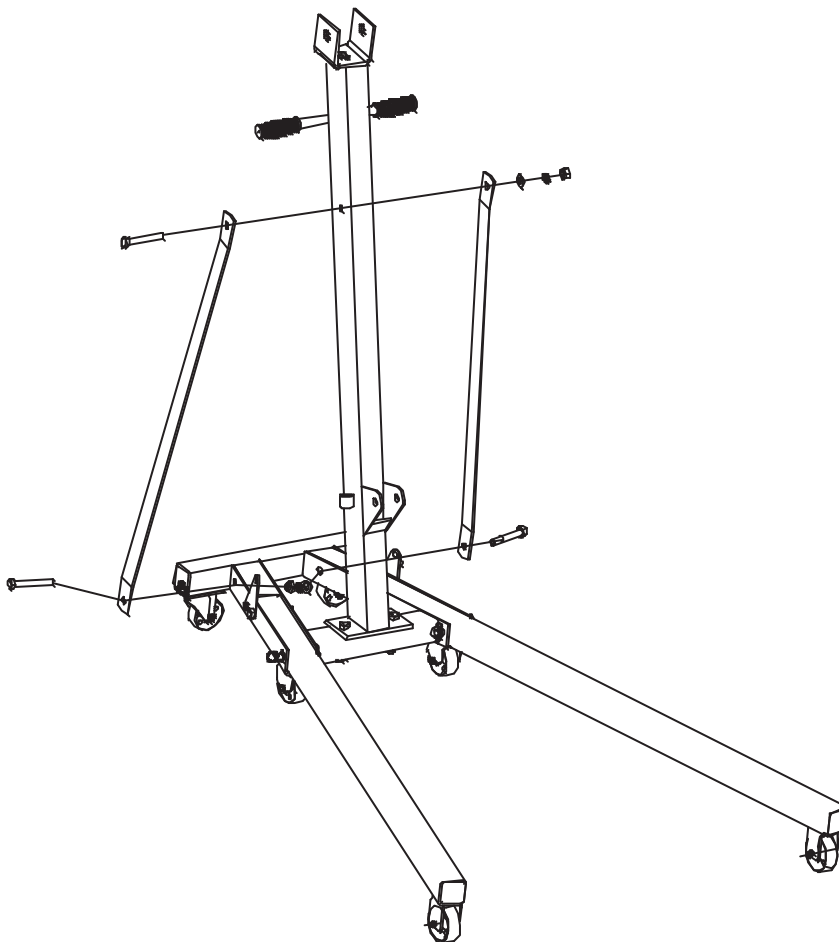
5. Use Bolts and Spring Washers to fasten the Handle to the Post .



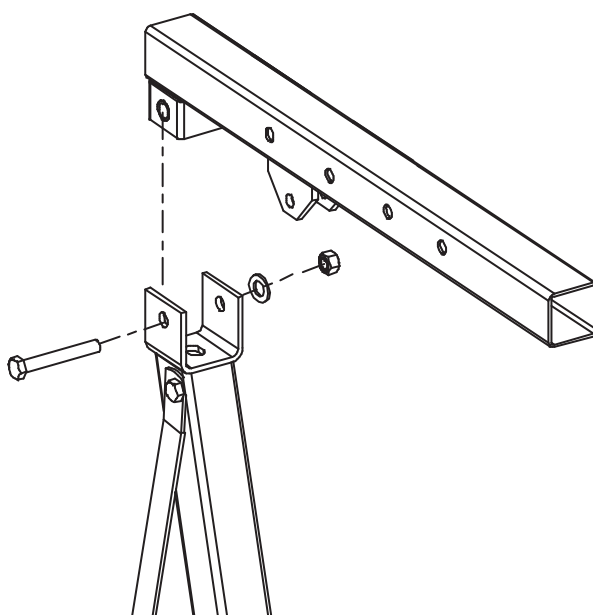
6. Use two Bolts, washers, Spring Washers and Nuts to connect the bottom of the Post to the Base Frame. Do not tighten the nuts.



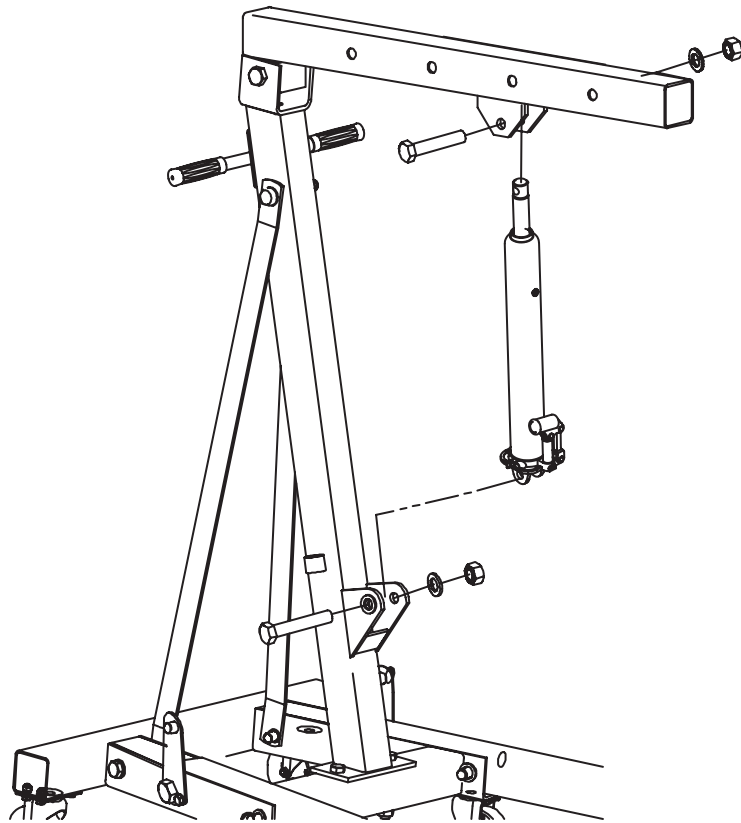
7. Use two Bolts, Washers, Spring washers and Nuts to connect the lower ends of the Supports to the inside of the base. Then use Bolt , Washer ,Spring washers and Nut to connect the top ends of the Supports to the post , check to makesure the nuts were tightened, and tighten the nuts in step 6.



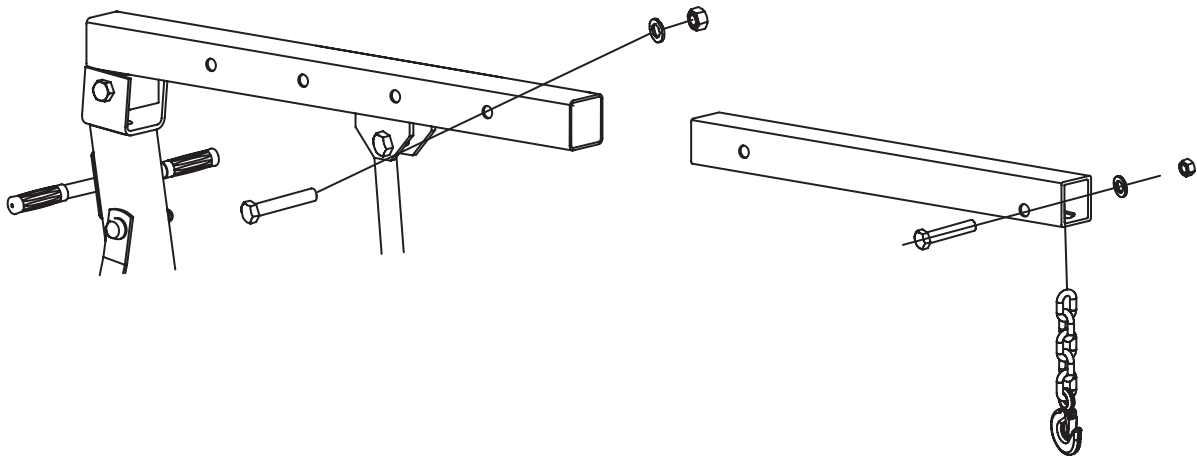
8. Use Bolt , Washer, and Self-locking Nut to attach the Boom to the top of the Post , tighten Nut so that the boom can rotate freely, do not over tightened boom needs to be able to rotate freely.



9. Use Bolt, Washer and Nut to fasten the lower end of the Long Ram to the Post . Then use Bolt, Washer and Nut to fasten the top of the Long Ram to the Boom.



10. Slide the Boom Extension into the Boom and use Bolt, Washer and Nut to secure at the desired load rating. Use Bolt, Washer and Self-locking Nut to attach the Hook and Chain to the end of the Boom Extension. (The boom has four different load ratings; select desired rating before use.)

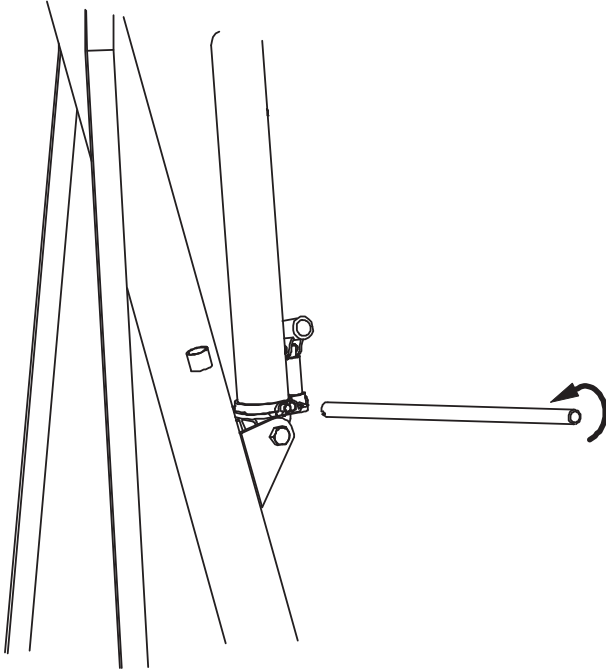


SYSTEM AIR PURGE PROCEDURE

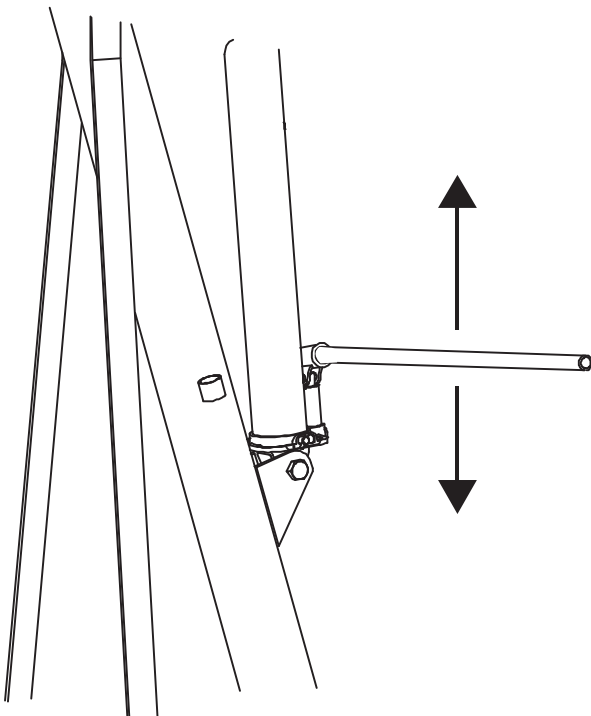
IMPORTANT: BEFORE FIRST USE

Perform the following Air Purge Procedure to remove any air that may have been introduced into the hydraulic system as a result of product shipment and handling. This step is to be completed without any weight on the crane.

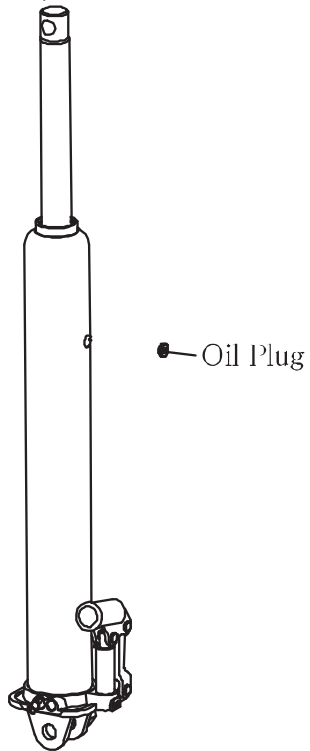
1. Turn release valve counterclockwise on full turn to the open position.



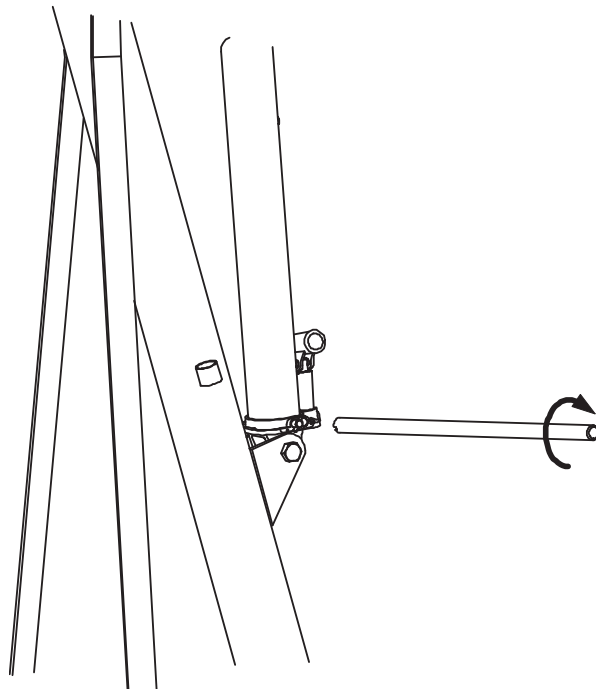
2. Rapidly pump the handle 6-8 times. Leave handle in down position to expose oil fill plug.



3. With a flat blade screwdriver, push the oil fill plug slightly to the side to purge trapped air from system. (Use caution not to tear or puncture the oil plug.)



4. Turn release valve clockwise to the closed position.



5. Crane is now ready for use. Check for proper pump action.

OPERATING INSTRUCTIONS

BEFORE USE

1. Before using this product, read the owner's manual completely and familiarize yourself thoroughly with the product and the hazards associated with its improper use.
2. Perform the air purge procedure. (See previous instructions for system purge procedure.)
3. Check and that the pump operates smoothly before putting into service.
4. Inspect before each use. Do not use if bent, broken or cracked components are noted.

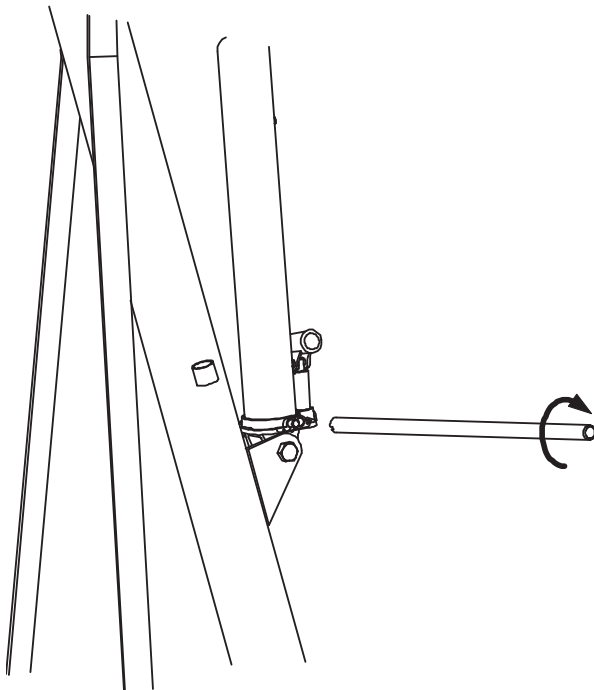


WARNING: THIS LONG RAM IS DESIGNED FOR LIFTING PURPOSES ONLY, NOT FOR SUPPORTING LOADS. DO NOT LOAD BEYOND ITS RATED CAPACITY.

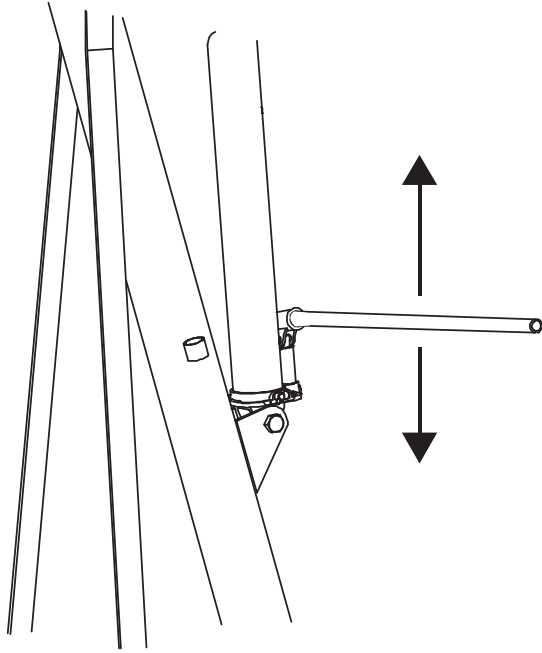
IMPORTANT: It is possible for air to enter the hydraulic system, causing poor lifting performance. Purge any air from the system by fully opening the release valve (turn handle counterclockwise as shown). Then while holding the boom down, operate pump handle rapidly several times.

OPERATION

1. Familiarize yourself with the crane
2. Attach the handle piece, making sure to align with lowering valve, turn **CLOCKWISE** until tight.



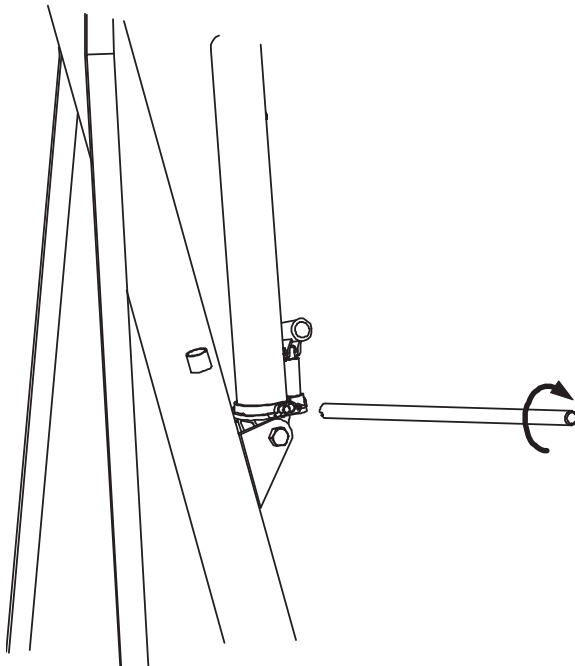
3. Line up the handle to the handle socket located on the side of the long ram, then insert the handle inside the handle socket.



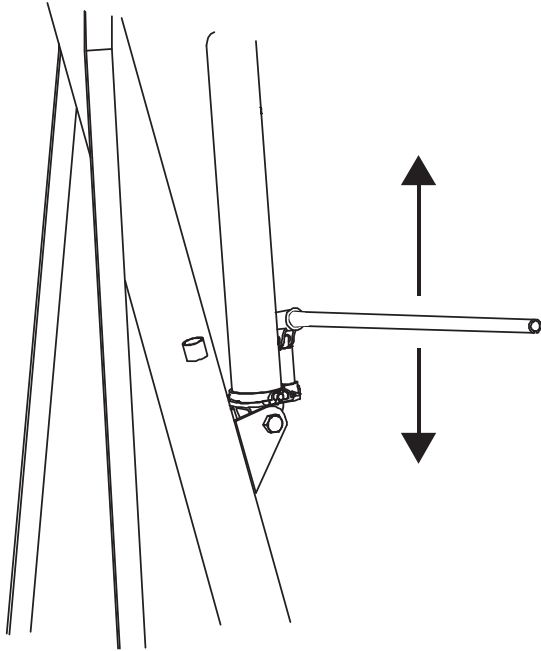
4. Secure the handle in place inside the handle socket. Without any on the crane. Cycle the lift up and down several times to insure the hydraulic system is operating properly. (Perform to the Air Purge Procedure before first use.)

RAISING THE CRANE

1. Block the vehicle's wheels for lifting stability. Secure the load to prevent inadvertent shifting and movement
2. Position the crane near desired lift point.
3. Set the Parking Brake in the vehicle.
4. Close the release valve by turning it clockwise until it is firmly closed.



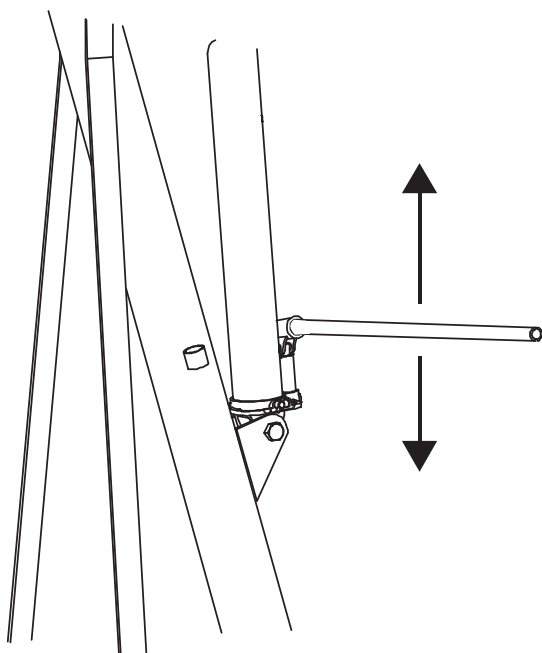
5. Before raising the load double check and verify the load is centered and also has full contact with the lifting point.
6. Pump handle to lift load. Continue to pump the long ram handle to raise the load to the desired height. After lifting, support the load appropriately.



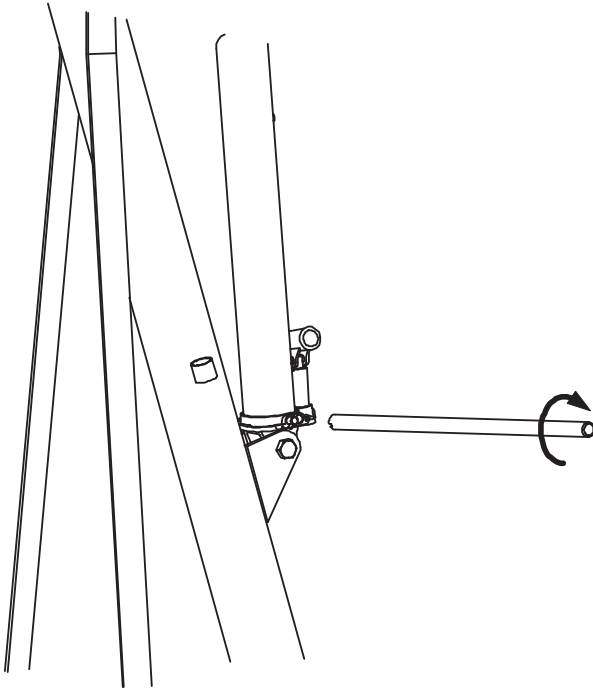
CAUTION: NEVER WIRE, CLAMP OR OTHERWISE DISABLE THE LIFT CONTROL VALVE TO FUNCTION BY ANY MEANS OTHER THAN BY USING THE OPERATOR'S HAND. USE THE HANDLE PROVIDED WITH THIS PRODUCT OR AN AUTHORIZED REPLACEMENT HANDLE TO ENSURE PROPER RELEASE VALVE OPERATION. DO NOT USE EXTENSIONS ON ANY AIR HOSE OR ON THE OPERATING HANDLE.

LOWERING THE CRANE

1. Raise load high enough to allow for clearance.



2. Grasp the handle firmly with both hands. Securely hold on to the long ram handle so your hands do not slip and ensure the release valve does not rapidly lower.
3. Carefully open the Release Valve by slowly turning the handle counterclockwise. (Do not allow bystanders around the crane or under the load when lowering the crane.)



4. After removing crane from the load, lower to lowest resting position to reduce exposure to rust and contamination.



WARNING: USE EXTREME CAUTION WHEN LOWERING THE CRANE. THE LONG RAM HANDLE MAY TURN RAPIDLY. OPENING THE RELEASE VALVE TOO FAST CAN CAUSE THE CRANE TO LOWER RAPIDLY. FAILURE TO HEED THESE WARNINGS COULD CAUSE SERIOUS INJURY OR DEATH.

MAINTENANCE INSTRUCTIONS

If you use and maintain your equipment properly, it will give you many years of service. Follow the maintenance instructions carefully to keep your equipment in good working condition. Never perform any maintenance on the equipment while it is under a load.

Inspection

You should inspect the product for damage, wear, broken or missing parts (e.g.: pins) and that all components function before each use. Follow lubrication and storage instructions for optimum product performance.

Binding

If the product binds while under a load, use equipment with equal or a larger load capacity to lower the load safely to the ground. After un-binding; clean, lubricate and test that equipment is working properly. Rusty components, dirt, or worn parts can be causes of binding. Clean and lubricate the equipment as indicated in the lubrication section. Test the equipment by lifting without a load. If the binding continues contact Customer Service.

Cleaning

If the moving parts of the equipment are obstructed, use cleaning solvent or another good degreaser to clean the equipment. Remove any existing rust, with a penetrating lubricant.

Lubrication

This equipment will not operate safely without proper lubrication. Using the equipment without proper lubrication will result in poor performance and damage to the equipment. Some parts in this equipment are not self-lubricating inspect the equipment before use and lubricate when necessary. After cleaning, lubricate the equipment using light penetrating oil, lubricating spray.

Use a good lubricant on all moving parts.

For light duty applications, use lubrication once a month.

For heavy and constant application, weekly lubrication is recommended.

NEVER USE SANDPAPER OR ABRASIVE MATERIAL ON THESE SURFACES!

Rust Prevention:

Check rams and pump plungers on the power unit assemblies daily for any signs of rust or corrosion.

Without a load, lift the equipment as high as it goes and look under and behind the lifting points. If signs of rust are visible, clean as needed.

How the Long Ram Operates

With release valve closed, an upward stroke of the long ram handle draws oil from the reservoir tank into the plunger cavity. Hydraulic pressure holds the valve closed, which keeps the oil in the plunger cavity. A downward stroke of the long ram handle releases oil into the cylinder, which forces the ram out. This raises the hydraulic ram. When the ram reaches maximum extension, oil is bypassed back into the reservoir to prevent an over extended ram stroke and possible damage to the long ram.

Opening the release valve allows oil to flow back into reservoir. This releases hydraulic pressure on the ram, which results in lowering the hydraulic ram.

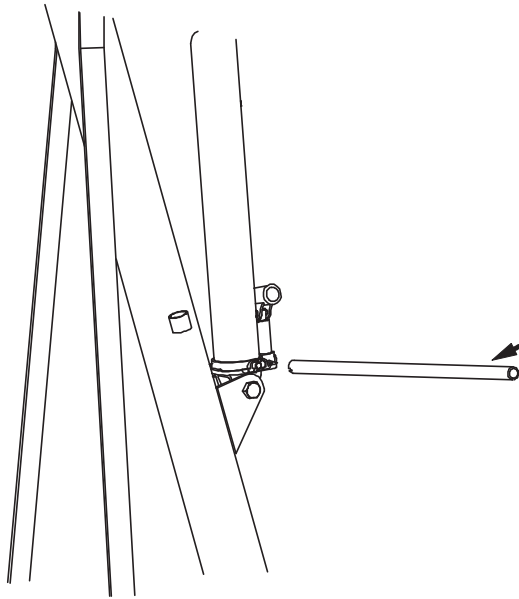
Storing the Crane

1. Lower the Lifting Arm.
2. Place the handle in the upright position.
3. Store in a dry location, recommended indoors.

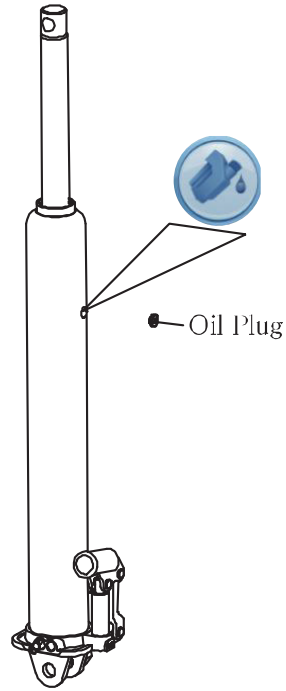
Note: If the crane is stored outdoors, be sure to lubricate all parts before and after use to ensure the crane stays in good working condition.

To Add Oil:

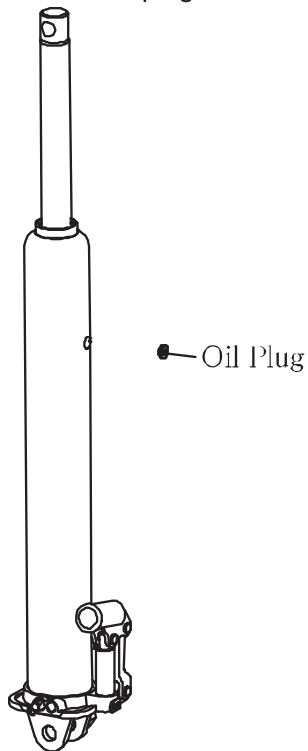
1. Open the Release Valve by slowly turning the handle counterclockwise and lower ram to it's lowest position.



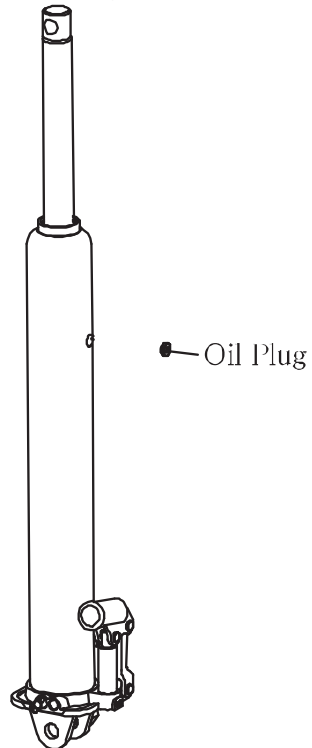
3. With long ram in the vertical position Fill the oil case until oil level is just beneath the lower rim of the oil fill hole.



2. Remove the oil plug.



4. Replace oil plug.

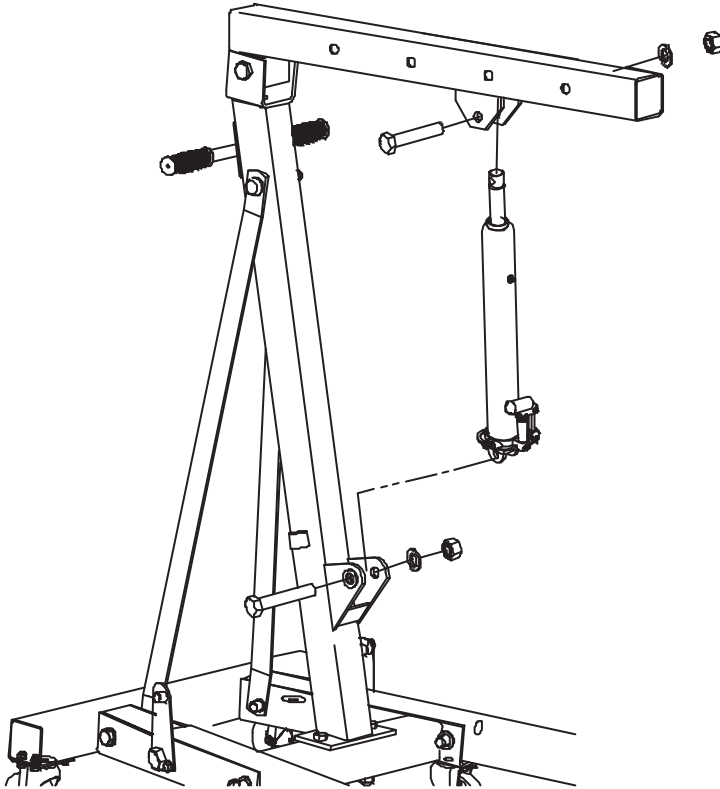


5. Perform the Air Purge Procedure.
*SEE ASSEMBLY IMAGE FOR OIL RESEVOIR LOCATION.

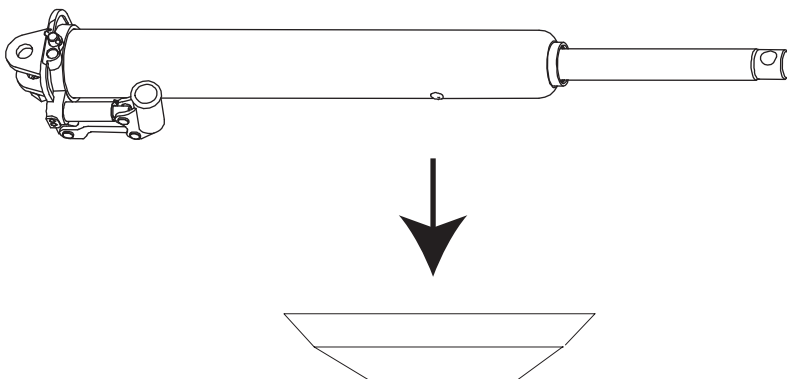
To Replace Oil:

1. Open the Release Valve by slowly turning the handle counterclockwise and lower ram to it's lowest position.
2. Unscrew and remove bolts and nuts as show in image below and remove the long ram.
Remove the long ram.

Note: Use caution when removing long ram.

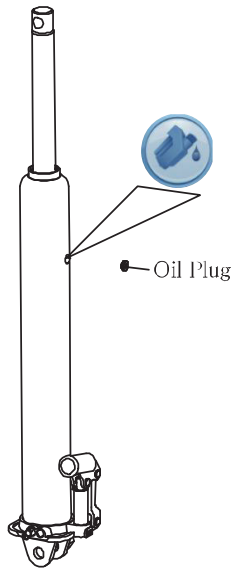


3. Remove the oil fill plug.
4. Turn the long ram on its side to drain old oil from the oil fill hole.



5. Position the long on level ground in the vertical position and keep hydraulic ram in the lowered position.
6. Fill the oil case until oil level is just beneath the lower rim.

KEEP DIRT AND OTHER MATERIAL CLEAR WHEN POURING.



7. Replace oil plug.
8. Re-Install long ram into frame. (See Step 2 and 3.)
9. Tighten Hardware Removed.
10. Perform the Air Purge Procedure.



ADDITIONAL WARNINGS:

- DO NOT USE MOTOR OIL IN THE CRANE.
- ONLY USE ANTI-FOAMING JACK OIL.
- ALWAYS USE A GOOD GRADE HYDRAULIC JACK OIL.
- DO NOT USE HYDRAULIC BRAKE FLUID, ALCOHOL, GLYCERINE, DETERGENT, MOTOR OIL OR DIRTY OIL.
- USE OF A NON-RECOMMENDED FLUID CAN CAUSE DAMAGE TO A CRANE.
- AVOID MIXING DIFFERENT TYPES OF FLUID AND NEVER USE BRAKE FLUID, TURBINE OIL, TRANSMISSION FLUID, MOTOR OIL OR GLYCERIN. IMPROPER FLUID CAN CAUSE PREMATURE FAILURE OF THE CRANE AND THE POTENTIAL FOR SUDDEN AND IMMEDIATE LOSS OF LOAD.
- DISPOSE OF HYDRAULIC FLUID IN ACCORDANCE WITH LOCAL REGULATIONS.

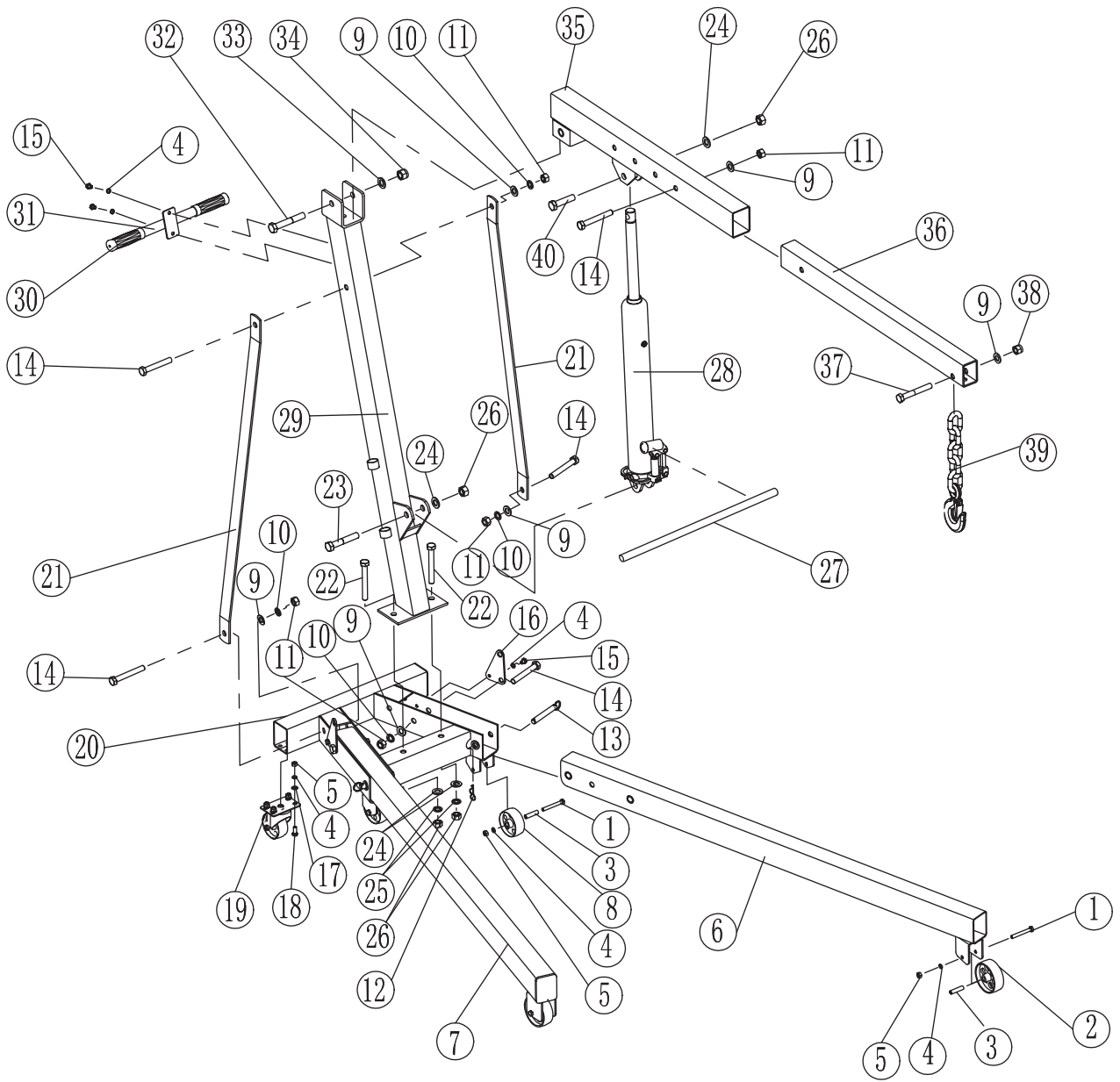
Additional Lubrication:

1. Periodically check the pump piston and ram for signs of rust or corrosion. Clean as needed and wipe with an oil cloth. NEVER USE SANDPAPER OR ABRASIVE MATERIAL ON THESE SURFACES!
2. When not in use, store the Crane with pump piston and ram fully retracted.

TROUBLESHOOTING

WILL NOT LIFT LOAD	WILL NOT HOLD LOAD	WILL NOT LOWER	POOR LIFTING	WILL NOT LIFT TO FULL EXTENSION	CAUSES AND SOLUTIONS
X	X		X		Release valve is not completely closed (Turn handle clockwise).
X					Weight Capacity Exceeded.
X			X		Air is in the hydraulics. Purge air from system.
X	X		X	X	Low oil level. Add oil as required.
		X			Oil reservoir is overfilled: Drain excessive oil. Lubricate moving parts.
		X			Long Ram is binding or foreign obstruction
X	X		X		Power unit malfunctioning. Replace the power unit.

ASSEMBLY DIAGRAM



ASSEMBLY PARTS LIST

Ref.	Description	QTY
1	Bolt M8x65(8.8)	4
2	Front wheel	2
3	Bushing	4
4	Spring washer 8	16
5	Nut M8	12
6	Left leg	1
7	Right leg	1
8	Caster for center	2
9	Washer 14	7
10	Spring washer 14	5
11	Nut M14	6
12	R-pin	2
13	Ring pin	2
14	Bolt M14x95	6
15	Bolt M8x10	4
16	Dead plate	2
17	Washer 8	8
18	Bolt M8x20	8
19	3" caster	2
20	Base assmebly	1

Ref.	Description	QTY
21	Support	2
22	Bolt M16x110	2
23	Bolt M16x90	1
24	Washer 16	4
25	Spring washer 16	2
26	Nut M16	4
27	Jack handle	1
28	Jack	1
29	Post	1
30	Handle cover	2
31	Handle	1
32	Bolt M18x110	1
33	Washer 18	1
34	Self-locking Nut M18	1
35	Boom	1
36	Boom extension	1
37	Bolt M14x70(8.8)	1
38	Self-locking Nut M14	1
39	Hook and chain	1
40	Bolt M16x80	1

Safe Operating Temperature is between 40°F – 105°F (4°C - 41°C)

REPLACEMENT PARTS

For replacement parts Customer Service at **1-800-222-5381**. Not all equipment components are available for replacement; illustrations provided are a convenient reference of location and position in the assembly sequence. When ordering parts the following will be required: Model Number, Serial Number and Description.

The distributor reserves the rights to make design changes and or improvements to product lines and manuals without notice.

For replacement parts and technical questions, please call 1-800-222-5381.

LIMITED ONE YEAR WARRANTY

Limited Warranty

Northern Tool and Equipment Company, Inc. ("We" or "Us") warrants to the original purchaser only ("You" or "Your") that the STRONGWAY product purchased will be free from material defects in both materials and workmanship, normal wear and tear excepted, for a period of one year from date of purchase. The foregoing warranty is valid only if the installation and use of the product is strictly in accordance with product instructions. There are no other warranties, express or implied, including the warranty of merchantability or fitness for a particular purpose. If the product does not comply with this limited warranty, Your sole and exclusive remedy is that We will, at our sole option and within a commercially reasonable time, either replace the product without charge to You or refund the purchase price (less shipping). This limited warranty is not transferable.

Limitations on the Warranty

This limited warranty does not cover: (a) normal wear and tear; (b) damage through abuse, neglect, misuse, or as a result of any accident or in any other manner; (c) damage from misapplication, overloading, or improper installation; (d) improper maintenance and repair; and (e) product alteration in any manner by anyone other than Us, with the sole exception of alterations made pursuant to product instructions and in a workmanlike manner.

Obligations of Purchaser

You must retain Your product purchase receipt to verify date of purchase and that You are the original purchaser. To make a warranty claim, contact Us at 1-800-222-5381, identify the product by make and model number, and follow the claim instructions that will be provided. The product and the purchase receipt must be provided to Us in order to process Your warranty claim. Any returned product that is replaced or refunded by Us becomes our property. You will be responsible for return shipping costs or costs related to Your return visit to a retail store.

Remedy Limits

Product replacement or a refund of the purchase price is Your sole remedy under this limited warranty or any other warranty related to the product. We shall not be liable for: service or labor charges or damage to Your trailer incurred in removing or replacing the product; any damages, including, without limitation, damages to tangible personal property or personal injury, related to Your improper use, installation, or maintenance of the product; or any indirect, incidental or consequential damages of any kind for any reason.

Assumption of Risk

You acknowledge and agree that any use of the product for any purpose other than the specified use(s) stated in the product instructions is at Your own risk.

Governing Law

This limited warranty gives You specific legal rights, and You also may have other rights, which vary from state to state. Some states do not allow limitations or exclusions on implied warranties or incidental or consequential damages, so the above limitations may not apply to You. This limited warranty is governed by the laws of the State of Minnesota, without regard to rules pertaining to conflicts of law. The state courts located in Dakota County, Minnesota shall have exclusive jurisdiction for any disputes relating to this warranty.

STRONGWAY™

Distributed by

Northern Tool + Equipment Co., Inc.

Burnsville, Minnesota 55306

NorthernTool.com

Made in China