

OWNER'S MANUAL

HYDRAULIC DRUM STALKER MODEL HDC-450-60 / 72 / 84 / 96

Contents

Warnings and Safety Instructions	1	Foot Pump Troubleshooting Guide	9
Receiving Instructions	1	Foot Pump Speed Selection	9
Loading Instructions	2	Hydraulic Drum Stacker/Boom	
Operating Instructions	2	Exploded Parts Drawing	10
Rack Specifications	3	Parts List	11
Periodic Maintenance Instructions	4	Cradle Assembly Exploded parts Drawing	12
Hydraulic Operation	5-6	Parts List For Cradle Assembly	13
Hydraulic Schematic	6	Warning Label Identifications	14
Foot Pump Exploded Parts Drawing	7	Material Safety Data Sheets	15-16
Foot Pump Operating Instructions	7	Limited Warranty/Service Record	17
Parts List For Foot Pump	8	Material Handling Problem Solvers	18
Air Bleed Procedure	8		

WARNINGS & SAFETY INSTRUCTIONS

Read owner's manual completely before operating unit!

- * Remove drum & disconnect power before working on unit.
- * Do not stand below any part of a raised drum stalker or drum when unit is running.
- * Stand clear of drum while operating the hand crank or chain crank.
- * Use only maintenance parts supplied or approved by the manufacturer.
- * Do not change pressure relief valve setting.
- * Never operate stacker/rotator unless you are watching it.
- * Never exceed maximum capacity of 800 pounds for FULL drum: or 500 pounds for HALF-FULL drum.
- * Load drum at the center of the cradle.
- * Consult factory for uneven loading.
- * Do not continue to pump on the foot pump pedal if the cradle is not raising.
- * Do not use brake fluids or jack oils. Use AW-32 hydraulic oil or equivalent.
- * Consult factory if adding or performing any modifications to the original equipment.
- * Make sure all operator safety labels are in place (p.14).

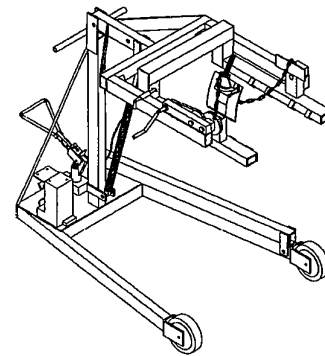
RECEIVING INSTRUCTIONS

Every unit is thoroughly tested and inspected prior to shipment. However, it is possible that the unit may incur damage during transit. If you see damage when unloading make a note of it on the SHIPPER RECEIVER.

Remove all packing and strapping material, inspect for damage. IF DAMAGE IS EVIDENT, FILE A CLAIM WITH THE CARRIER IMMEDIATELY! Also, check the unit size, type of power unit, etc., to ensure the unit is correct for the intended application.

MODEL NUMBER AND CAPACITY

The model number, serial number and capacity is inscribed on the nameplate. Please remember to include these numbers in any correspondence with your dealer or the factory.



**HYDRAULIC DRUM STALKER
HDC-450 SERIES**

LOADING INSTRUCTIONS

The load capacity rating as inscribed on the nameplate of your unit designates the net capacity, assuming the cradle is aligned at the center of the drum. This capacity must never be exceeded, as permanent damage or injury may result.

OPERATING INSTRUCTIONS

DRUM STACKER

Remove Hydraulic Drum Stacker (HDC-450), from the crate. Check carefully for damage and report any damage immediately. When using the Hydraulic Drum Stacker, you can either lift up the drum horizontally or vertically.

Horizontal drum position

For horizontal drum position, lower the cradle near floor position until you can slide in the cradle along the side of the drum. Open carrier cradle full width and hook cradle chain on stud. Move the unit in until the end of the cradle touch the end of the drum. Lock drum in place by clinching chain with ratchet tightener.

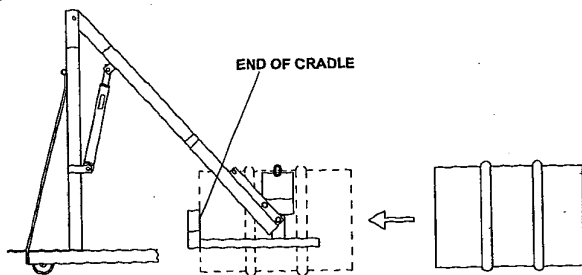


Figure 1

Vertical drum position

For vertical drum position, rotate the cradle to vertical position and lower the cradle until the end of the cradle is the same height as the top of the drum. Open carrier cradle full width and hook cradle chain on stud. Move the unit in until the side of the drum touches the cradle. Once again, lock drum in place by clinching chain with ratchet tightener.

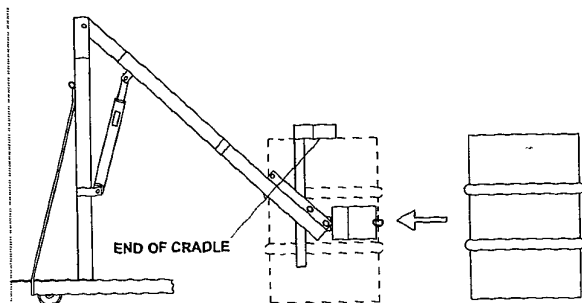


Figure 2

In both situations, raise the cradle until the drum is 3 - 4 inches above the ground before moving. It is recommended, but not required, the drum to be moved in a VERTICAL position. Remove control chain from box and place end of loop near operator. When stacking, rotate drum to the HORIZONTAL position.

Always stay clear of moving parts. The cradle will rise as the foot pedal is pumped. Depressing the release lever will lower the cradle at a control rate of descent.

In the event the unit is overloaded, the relief valve will open because of excessive pressure build up, and oil will bypass into the reservoir.

To rotate drum:

Pull on chain, rotating drum to horizontal position for stacking. For best control of drum rotating angle, pay out one side of the loop while pulling in the other.

**** For model HDC-450-60, the drum is rotated using a hand crank instead of chain crank.**

**** When elevation is not required, transport the drum in the lowered position.**

BOOM

The HDC-450 series may also be used as a hoist using the boom supplied with unit. The boom is stored conveniently on one of the lower straddle legs. Simply remove the 3/4" diameter pin from carriage and position boom on top of carriage, align holes and replace pin and clip. Lifting capacity for boom at hook position is 800 pounds. This capacity and load center must never be exceeded.

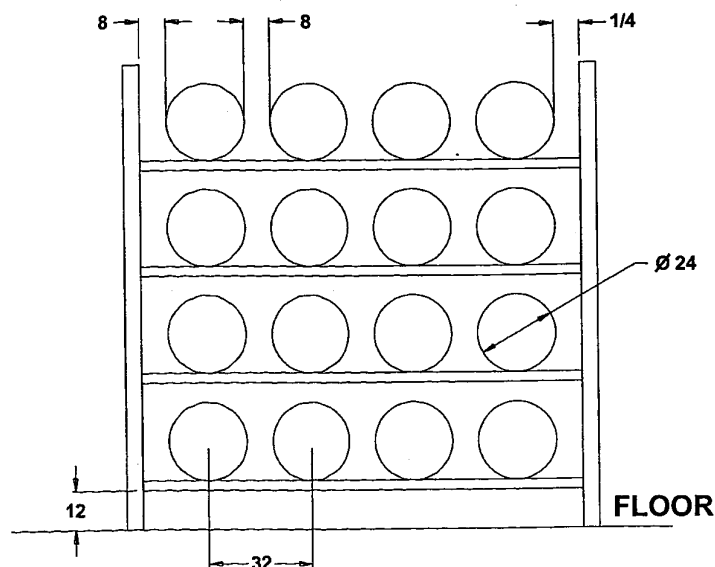
Ordering Replacement or Extra Parts

Our company takes pride in using the finest available parts for our equipment. We are not responsible for equipment failure resulting from the use of unapproved replacement parts. To order replacement or extra parts for your equipment contact Customer Service at the factory. In any correspondence with the factory please include the **Serial Number** which is inscribed on the nameplate of the piece of equipment. Use only the part numbers provided in this Owner's Manual. When ordering parts for AC power units please indicate the motor phase and voltage that the equipment is operating on.

Safety Instructions for the Operator

- 1.) The HDC-450 series has a **MAXIMUM CAPACITY RATING** of 800 pounds **FULL**, and 500 pounds **HALF-FULL**, and is intended for lifting, moving, and stacking 55 GALLON steel drums. Do not exceed these ratings as the unsafe condition that may result could cause damage or excessive wear, or make the unit awkward to handle.
- 2.) Always load the unit properly. Make sure the end/top of the drum is touching the end of the cradle.
- 3.) When operating, loading, unloading, or maintaining your drum stacker, always use care and good judgement have good footing and a firm hold. Keep hands and loose clothing etc., away from all moving parts. Never allow anyone to be below any part of a raised drum stacker, drum, or boom. Please read all instruction **THOROUGHLY** before attempting to operate your new drum stacker.
- 4.) Do not allow drum to impact on floor, ground, or dumping station etc., or there may be damage.
- 5.) Never use the unit if the cradle is in need of repairs or in the case of a malfunction.
- 6.) Notify your maintenance personnel or supervisor in case you notice anything out of the ordinary, such as binding, odd noises, appearance of oil, etc.
- 7.) Do not continue to pump on the foot pedal if the cradle is not raising. The foot pump may be permanently damaged. Relieve system pressure by depressing the release lever.
- 8.) It is recommended, but not required, the drum to be moved in a **VERTICAL** position. When stacking, rotate the drum to **HORIZONTAL** position.

RACK SPECIFICATIONS FOR THE HORIZONTAL DRUM STACKER (HDC-450 SERIES)



PERIODIC MAINTENANCE INSTRUCTIONS



BE SURE ALL POWER IS OFF BEFORE ATTEMPTING TO WORK ON THIS EQUIPMENT!
CAUTION: SERVICE WORK SHOULD BE PERFORMED ONLY BY TRAINED & QUALIFIED PERSONNEL

(A) Before Each Use Check For The Following

- 1.) Oil leaks.
- 2.) Worn or damaged hose.
- 3.) Structural deformation of cradle or frame.
- 4.) Unusual noise or binding.
- 5.) Check casters for proper operation.

Do not use if there are any of the above!

(B) Monthly Inspections

- 1.) Check oil level. Oil should be 1" to 1 1/2" below the top of the tank with the cradle in the fully lowered position. Add as necessary.
- 2.) Check for oil leaks.
- 3.) Check for worn or damaged hose.
- 4.) Check clevis and pivot points for wear.
- 5.) Periodically inspect all moving parts, framework, and contact areas for sign of wears, fatigue or loosening.
Tighten, adjust or replace parts as necessary to prevent failure and maintain proper function.
- 6.) Check oil cradle hinges, ratchet, pawl, chain and other moving parts periodically.
- 7.) Lubricate gear-train once a month with a good grade lubricant.
There are three grease fittings on the gear block, and one grease fitting in the idler bearing block.
- 8.) Check for unusual noise.
- 9.) Clean off dirt and debris.
- 10.) Make sure all warning labels are in place and in good condition (p.14).

(C) Yearly Inspection

Hydraulic oil should be changed at least once a year, or sooner if the oil darkens or becomes gritty. Flush reservoir before refilling. Presence of water is indicated if the oil turns milky. Recommended oil: AW-32 Hydraulic fluid or equal.

All maintenance work must be performed by qualified personnel with training in the repair of electrical and hydraulic components

HYDRAULIC OPERATION

When the operator wants to operate the unit, he/she depresses the "UP" button. This starts the electric motor which turns the hydraulic pump. Oil from the reservoir is drawn in through the suction filter and into the pump. The pump delivers the pressurized oil through the check valve before entering the cylinders.

The function of the check valve is to allow the oil to flow in one direction, i.e. towards the cylinders. It also prevents the flow of oil back into the pump circuit when the pump stops running. This holds the oil in the cylinder and maintains the desired elevation.

If the load is excessive, and the "UP" button is still depressed, pressure will build up in the circuit between the pump and the cylinders. This forces the "ball" or "poppet" in the relief valve to unseat allowing the pump flow to return to the inlet, thereby preventing hydraulic or structural damage.

When the operator wants to lower the unit, he depresses the "DOWN" button. This energizes the down solenoid valve. (In the event of power outage, the cradle can be lowered using the manual release on top of the valve stem.) The poppet in the solenoid valve is unseated and oil now returns from the cylinders through the return screen solenoid valve, flow control valve, oil return/intake hose, filter, and into the reservoir.

The pressure compensated flow control valve controls the lowering speed of the table. It is preset and cannot be changed. Releasing the "DOWN" button will de-energize the solenoid, closing the valve poppet. This prevents the oil from returning to the reservoir and the cylinders will stop retracting. The unit is now maintained at that particular elevation.

Cartridge valve maintenance

The lowering valve, as discussed above, is of cartridge construction and is basically maintenance-free. If there is a faulty operation, check troubleshooting Section. To clean the cartridge valve, follow this procedure:

- 1.) **WARNING:** Lower the unit completely or install the maintenance safety bar(s) before removing cartridge valve.
- 2.) Use a sharp object and push the valve stem's poppet in from the bottom to open the valve.
- 3.) Repeat several times while valve is immersed in kerosene or mineral spirits. Blow dry.
- 4.) Blow compressed air through the valve while holding open as described in step 2.
- 5.) Inspect the "O" rings and the teflon extrusion washer.
- 6.) Reinstall. The valve should be tightened to approximately 30 ft. lbs.

Velocity fuse operation

There is a brass velocity fuse with a stainless steel spring in the base of each cylinder. In the event of hydraulic hose or fitting failure, the cradle starts to lower at a fast rate. As soon as the descent speed exceeds the fuse's preset speed, the velocity fuse will shut off the oil flow and the cradle will remain nearly stationary until pressure is re-applied (after repairs are done). This safety feature reduces the possibility of accidental personal injury or damage to the unit or its loads. If air is introduced into the system, the velocity fuse can lock up even though no failure has occurred. To reset the velocity fuse just activate pump by depressing the "UP" button. Remove the load and follow the cylinder air bleed procedures on page 6.

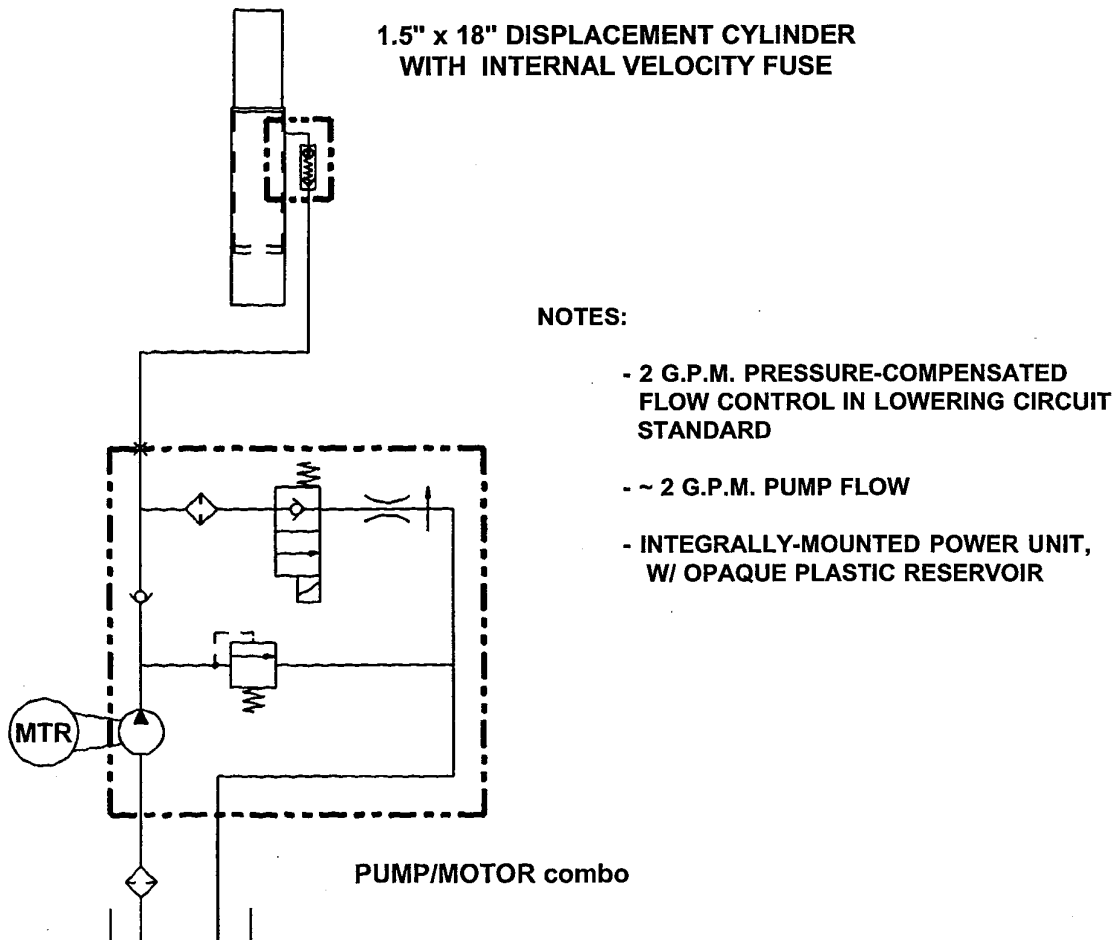
Air bleed procedure

If your unit descends very slowly or will not descend at all, air could be trapped in the hydraulic circuit and must be "bled" from the system. The Hydraulic Drum Stacker (HDC-450 Series) utilizes a "bleeder" fitting at the end of the cylinder near the cross tube. If you experience the above, follow these directions.

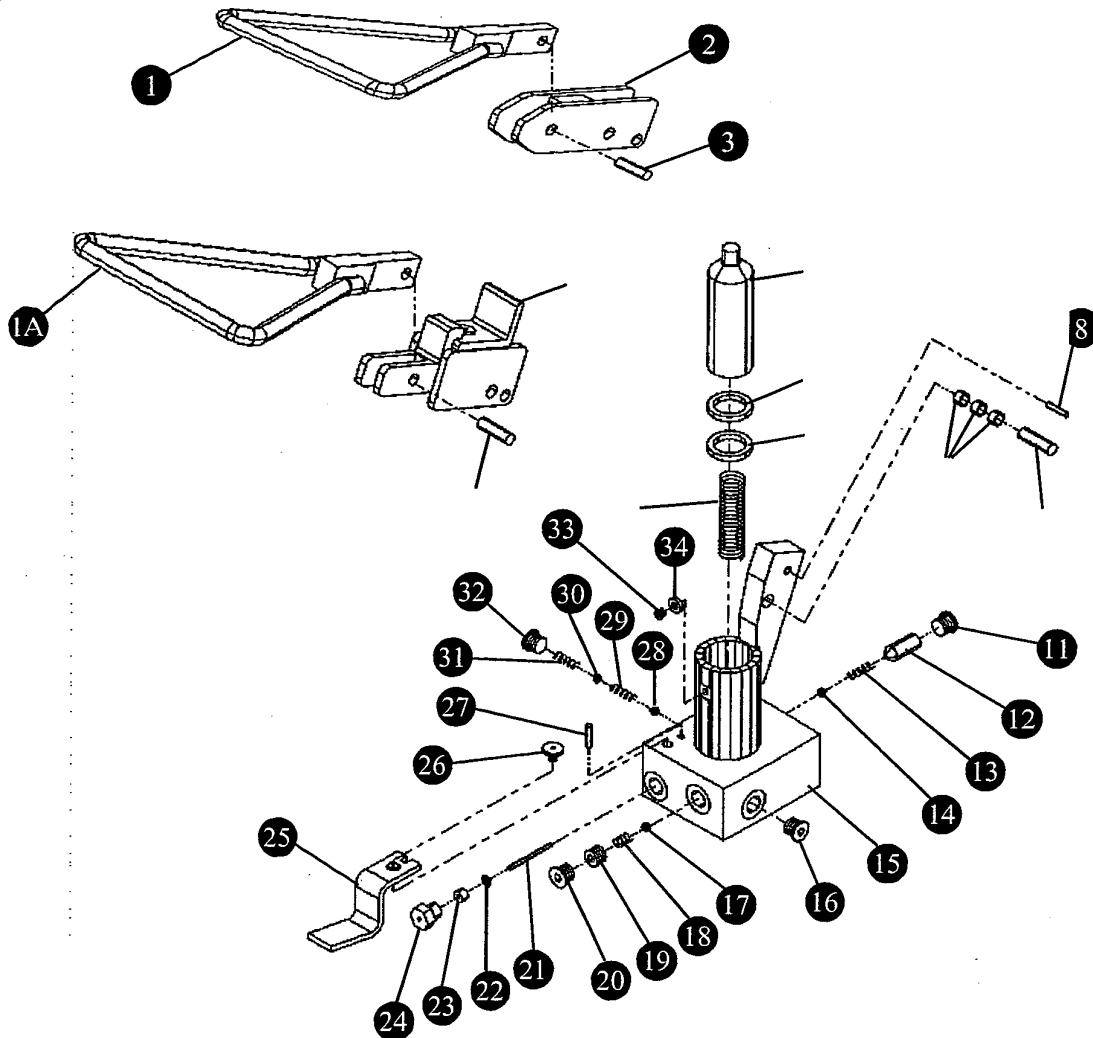
- 1.) Remove the drum from the cradle.
- 2.) Raise the unit.
- 3.) If available, place a 1/4" plastic hose over the cylinder bleeder screw.
- 4.) Loosen the bleeder screw at the top of the cylinder approximately 1/4 to 1/2 turn to allow trapped air to escape.
- 5.) When the cylinder is free of air, tighten the bleeder screw and remove the plastic hose.

Air can also become trapped in the foot pump. Please refer to page 8 for the foot pump air bleed procedure.

HYDRAULIC SCHEMATIC



Parts Diagram for Single and Two-Speed Hydraulic Foot Pumps



Operating Instructions

Features:

Your new lift equipment has been supplied with an exclusive single-speed or two-speed foot pump. The internal features of your pump include a primary pressure relief, pressure compensated return flow control valve, and an integrated lowering valve. Replaceable bushings, valve components, and seals have been utilized in the construction of the pump in the event that replacements are necessary.

Operating Instructions:

Stay clear of moving parts. The cradle will rise as the foot pedal is pumped. Depressing the release lever will lower the cradle at a controlled rate of descent.

In the event the cradle has been overloaded, the pressure relief valve will open because of excessive pressure build-up in the hydraulic system. Oil will bypass into the reservoir. **Never** increase the pressure relief valve setting more than necessary. **Do not** exceed the rated capacity of your lift equipment.

Two-Speed Selection:

The two-speed hydraulic foot pump offers two "speeds". The low speed produces *low volume/high pressure*. The high speed produces *high volume/low pressure*. The operator has the option of selecting the optimum pump speed for the application at hand. Pump speeds are selected by sliding the "lock collar"(Item # 2 on the parts identification) in or out. An occasional drop of oil will keep the collar working freely.

Parts Identification for Single and Two-Speed Hydraulic Foot Pumps

ITEM NUMBER	DESCRIPTION	PART NUMBER	QUANTITY
1	Assembly, lever delta foot pedal, double speed	01-540-003	1
1A	Assembly, lever delta foot pedal, single speed	01-540-004	1
2	Linkage for single-speed foot pump	NFP-LNK1	1
2A	Linkage for two-speed foot pump	NFP-LNK2	1
3	3/8" x 1-3/4" dia. detent pin	01-130-004	1
3A	3/8" x 1-1/4" dia. detent pin	01-130-005	1
4	Pump plunger	01-041-004	1
<input type="checkbox"/> A 5	Piston wiper seal	550110	1
<input type="checkbox"/> A 6	Piston U-cup seal	532101	1
7	Piston return spring	01-146-004	1
8	1/4" x 1-1/2" spring pin	64251	1
9	3/8" x 1-3/4" dia. Driv-Loc pin	01-130-004	1
10	Sleeve sintered bronze bearing	01-111-038	3
11	Fitting, "O"-ring plug	01-116-007	1
12	Pressure compensated flow control valve	01-127-007	1
13	Release check spring	01-146-002	1
14	5/16" dia. steel ball	01-145-001	1
15	Pump body/manifold	NFP-BDYMAN	1
16	Fitting, "O"-ring plug	01-116-007	1
17	3/8" dia. chrome steel ball	01-145-003	1
18	Pressure relief spring	01-146-005	1
<input type="checkbox"/> A 19	Fitting, pressure adjustment plug	01-116-006	1
20	Fitting, "O"-ring plug	01-116-007	1
21	Release pin	01-112-016	1
<input type="checkbox"/> A 22	Release pin seal retaining ring	565011	1
<input type="checkbox"/> A 23	Release rod U-cup seal	01-144-002	1
24	Fitting, hydraulic plug	01-116-004	1
25	Release lever	01-040-001	1
26	Release lever retaining screw	01-119-001	1
27	3/16" x 1-1/8" spring pin	64134	1
28	5/16" dia. chrome steel ball	01-145-001	1
29	Inlet check spring	01-146-001	1
30	7/16" dia. chrome steel ball	01-145-004	1
31	Outlet check spring	01-146-001	1
32	Fitting, "O"-ring plug	01-116-007	1
33	1/4" -20 x 1/4" socket head cap screw	562008	1
<input type="checkbox"/> A 34	1/4" sealing washer (copper with rolled core)	577004	1
<input type="checkbox"/> A	Foot Pump rebuild kit (includes items 5, 6, 19, 22, 23, & 34)	01-136-403	1

Kit item (included with purchase of kit)

Air Bleed Procedure

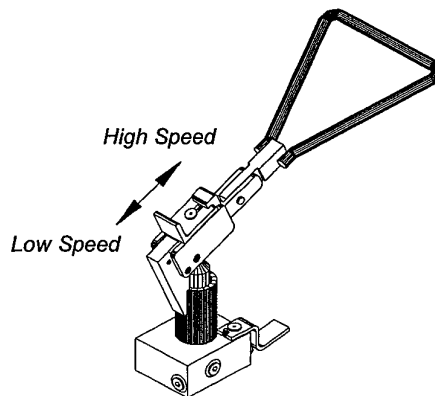
Whether your pump is a new installation, or has been recently serviced, air has likely entered the hydraulic system. The design of this pump includes an "air bleed screw" which will aid in the removal of unwanted air from the foot pump area of the hydraulic system. Use the following steps to remove the air from the system.

- 1) Check all fittings to be sure they are tight. Ensure that the oil is filled to within 1" of the top of the reservoir when the cradle is in the fully lowered position.
- 2) Locate the "air bleed screw" (Item # 34 on the pump body) and loosen approximately 1/2 turn counterclockwise. As soon as you have loosened the screw, slowly depress the foot pedal. This will force the air out of the pump chamber. Before you let the pump pedal return to the "up" or "home" position, tighten the air bleed screw. This will prevent air from re-entering the pump chamber. Repeat the above procedure until the pump chamber is completely filled with oil and a "spongy" feel is no longer present. If the air bleeding procedure has been successful, the feel of the foot pedal will be firm and the complete stroke of the pump will produce fluid flow.

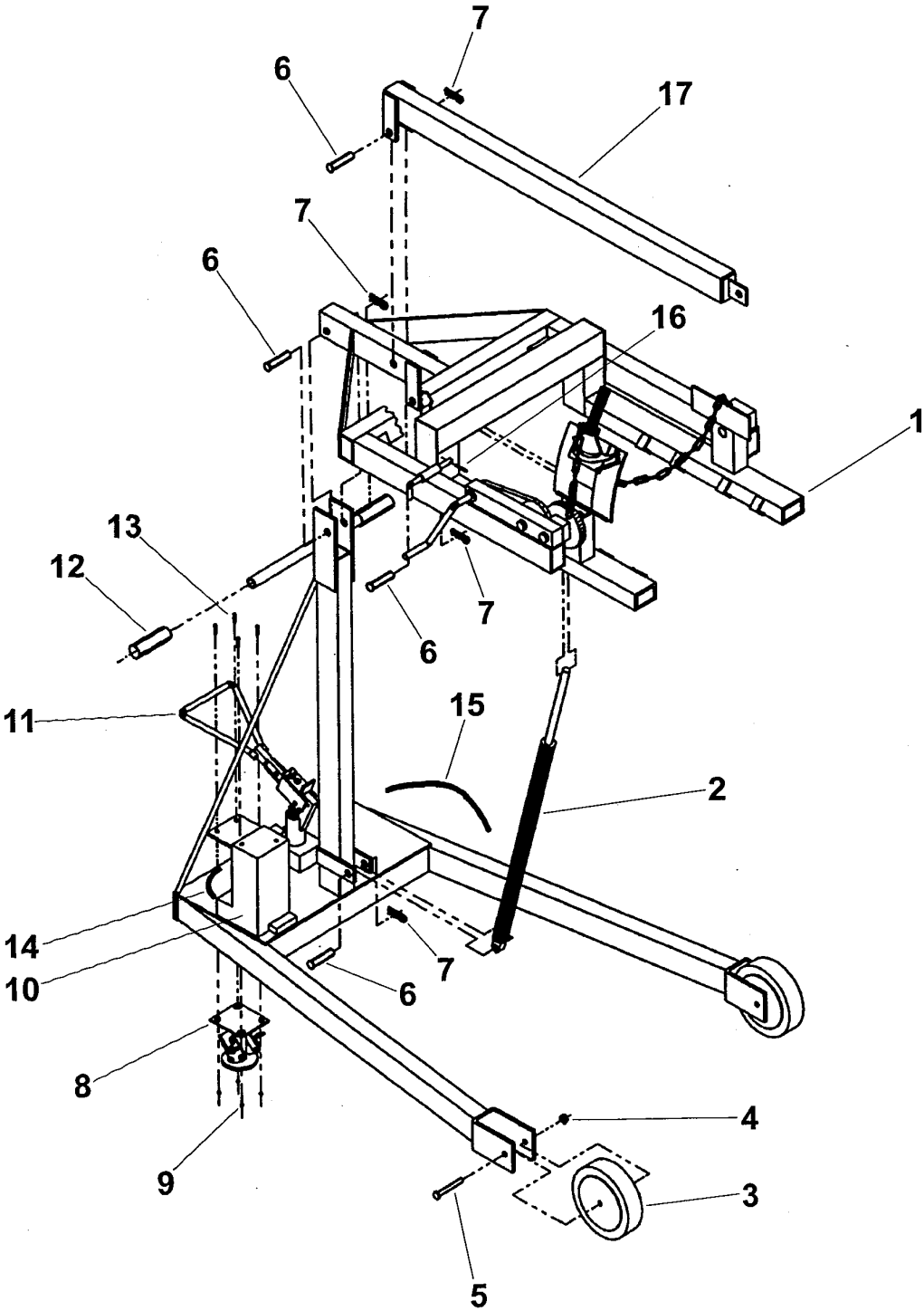
Trouble shooting Guide for Single and Two-speed Hydraulic Foot Pump

Observation	Possible Cause	Remedy	<i>*Refer to exploded view</i>
1.) Cradle does not raise	<ul style="list-style-type: none"> a. Excessive load b. Oil is low c. Pinched hose d. Relief valve set too low 	<ul style="list-style-type: none"> a. Remove part of the load b. Fill oil to within one inch of the top of the reservoir c. Correct as necessary d. Increase only as necessary 	
2.) Foot pedal goes down hard but cradle does not raise	<ul style="list-style-type: none"> a. Particle of dirt under the pressure relief valve b. Particle of dirt under inlet check valve 	<ul style="list-style-type: none"> a. Lower cradle - Disassemble, clean and reassemble pressure relief valve* b. Lower cradle - Disassemble, clean and reassemble inlet check valve* 	
3.) Unit will pump under no load or when rapidly stroked, or pedal will stroke without pumping	<ul style="list-style-type: none"> a. Pump is air locked b. Inlet check valve has foreign material on seat c. Relief setting is out of adjustment d. Foreign material on relief valve seat 	<ul style="list-style-type: none"> a. Bleed air from system inlet b. Remove and clean inlet ball and seat c. Adjust relief setting higher d. Lowering valve has foreign material on the seat or is stuck in the open position 	
4.) Cradle raises when the pump is stroked but lowers on return stroke	<ul style="list-style-type: none"> a. Outlet check is leaking 	<ul style="list-style-type: none"> a. Clean foreign material from ball and seat 	
5.) Cradle raises but takes too much effort	<ul style="list-style-type: none"> a. Change pump displacement speed 	<ul style="list-style-type: none"> a. Slide locking collar back 	
6.) Cradle raises but is too slow	<ul style="list-style-type: none"> a. Change pump displacement speed b. Intake filter clogged c. Foreign material stuck under pressure relief valve or under inlet check valve 	<ul style="list-style-type: none"> a. Slide locking collar forward b. Lower cradle - drain reservoir, clean and flush debris, refill with clean oil c. Lower cradle - Disassemble, clean and reassemble pressure relief valve* 	
7.) Spongy or jerky operation	<ul style="list-style-type: none"> a. Check for foreign material stuck in clevis or pivot points or frame rails b. Oil is low 	<ul style="list-style-type: none"> a. Correct as necessary b. Fill oil to within one inch of the top of the reservoir 	
8.) Cradle lowers too slow	<ul style="list-style-type: none"> a. Pinched hose b. Intake filter clogged c. Foreign material lodged in velocity fuse d. Foreign material lodged in pressure compensated flow control valve 	<ul style="list-style-type: none"> a. Correct as necessary b. Correct as necessary c. Lower cradle - Disassemble, clean and reassemble d. Lower cradle - Disassemble, clean and reassemble pressure relief valve* 	
9.) Cradle lowers too fast	<ul style="list-style-type: none"> a. Foreign material lodged in pressure compensated flow control valve 	<ul style="list-style-type: none"> a. Lower cradle - Disassemble, clean and reassemble pressure relief valve* 	
10.) Cradle raises but does not lower	<ul style="list-style-type: none"> a. Foreign material lodged in pressure compensated flow control valve b. Release pin bent or missing c. Foreign object blocking roller travel d. Velocity fuse is locked 	<ul style="list-style-type: none"> a. Lower cradle - Disassemble, clean and reassemble pressure relief valve* b. Replace as necessary c. Correct as necessary d. Remove air from hydraulic system, to unlock, repressurize system 	

SPEED SELECTION FOR TWO-SPEED HYDRAULIC FOOT PUMP



HDC-450 SERIES HYDRAULIC DRUM CARRIER/ROTATOR



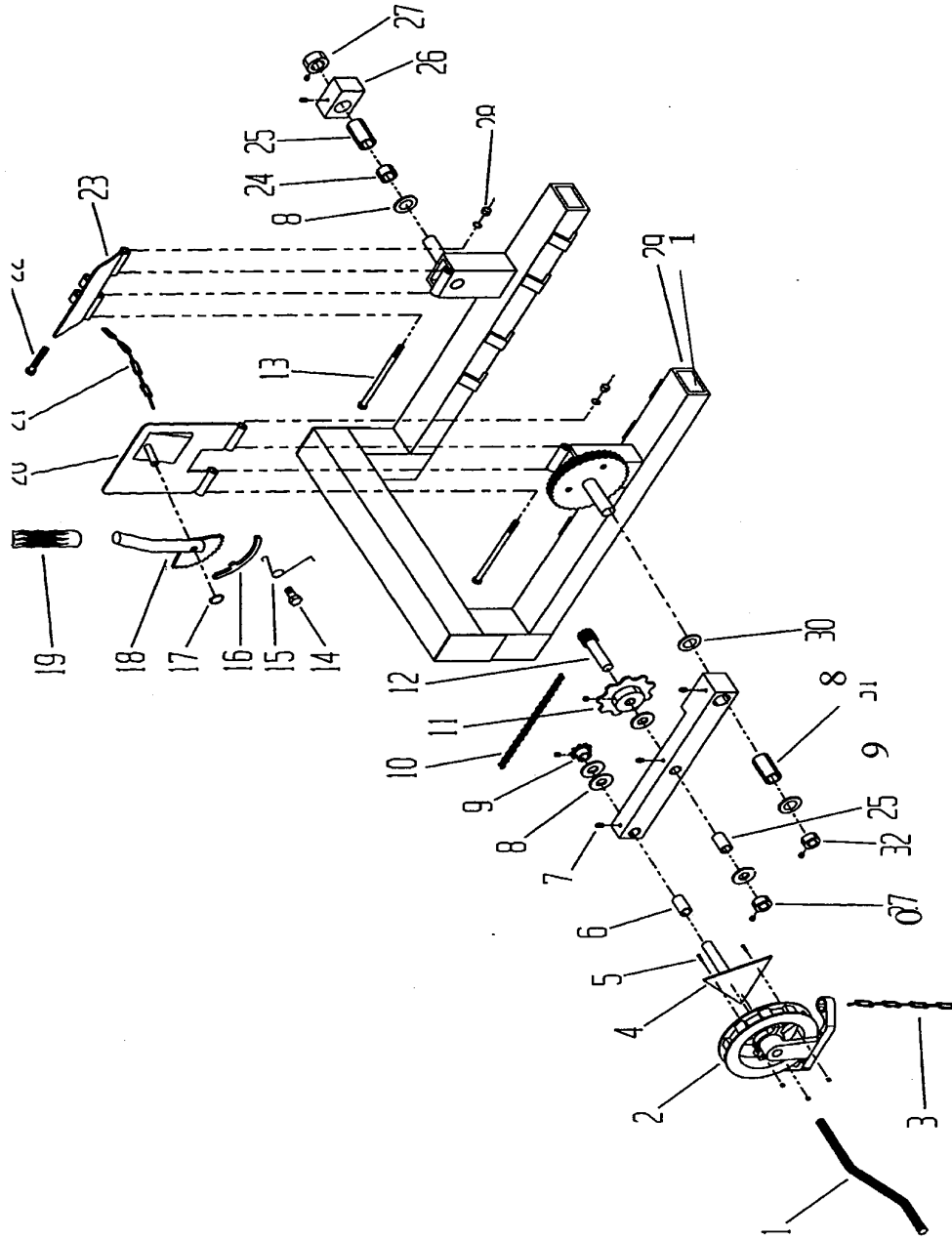
**PARTS IDENTIFICATION
HDC-450 SERIES HYDRAULIC DRUM CARRIER/ROTATOR**

ITEM NO.	DESCRIPTION	PART NO.	QTY
1	HDC cradle ass'y (see pages 6 & 7)	09538005	1
2	Hydraulic cyl., 1-1/2" dia. x 18" [HDC-450-60/72/84]	09021004	1
	Hydraulic cyl., 1-1/2" dia. x 18" [HDC-450-96 only]	09021004	2
3	Wheel, caster	16132036	2
4	Locking hex nut, 1/2"-20	A/L	2
5	Hex head cap screw, 1/2"-20 x 3-1/2"	A/L	2
6	Clevis pin, 3/4" dia. x 3-3/8"	09112006	4
7	Hitch pin clip, # 11 (Fastenal)	45285	4
8	Floor brake	16132080	1
9	Hex nut, 3/8"-16	A/L	4
10	Reservoir	15023001	1
11	Two-speed hydraulic foot pump (see pages 12-13)	250550	1
12	Handle grip	AL	2
13	Hex head cap screw, 3/8"-16 x 1"	A/L	4
14	Reservoir hose	09623001	1
15	Hydraulic hose (HDC-450-60)	09623002	1
	Hydraulic hose (HDC-450-72)	09623003	1
	Hydraulic hose (HDC-450-84)	09623004	1
	Hydraulic hose (HDC-450-96)	09623005	1
16	Spring pin, 3/16" x 1-1/2" (HDC-305-60 only)	A/L	1
17	Boom	09514031	1

A/L Available at local hardware store

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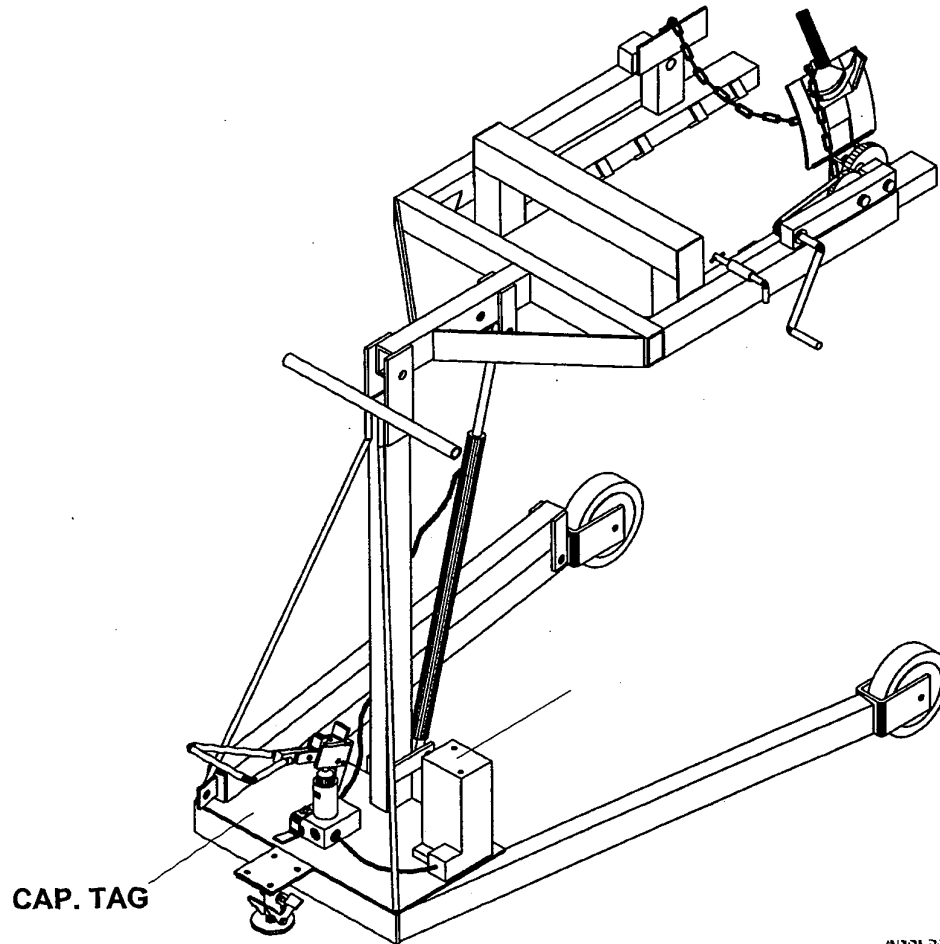


**PARTS DIAGRAM FOR CRADLE ASSEMBLY (DRUM CARRIER/ROTATOR)
HDC-450 SERIES**

ITEM NUMBER	DESCRIPTION	PART NUMBER	QUANTITY
1a	Hand wheel (HDC-450-60 only)	1A-P	1
1	Chain wheel (HDC-450-72/84/96 only)	1-P	1
2	#1/0 Babbitt lock link chain (20") (HDC-450-72/84/96 only)	2-P	1
3	Chain wheel shaft w/triangle & bolts (HDC-450-72/84/96 only)	3-P	1
4	Bolt & nut, 5/16-18 x 1" (HDC-450-72/84/96 only)	35-P	3
5	Bearing, 3/4" ID x 2-1/2"	01111048	1
6	Grease fitting Alemite (1608B)	33-P	4
7	Washer, 3/4" SAE	09113004	5
8	Sprocket (12T # 35)	09042004	1
9	Roller chain (# 35-3/8" pitch)	09042006	1
10	Sprocket (36T # 35)	09042003	1
11	Pinion gear (7T) w/key	09042007	1
12	Hinge pins & nuts	157-P	2
13	Pawl shoulder screw and nut	170-P	1
14	Pawl spring	169-P	1
15	Pawl	168-P	1
16	Snap ring	166-P	1
17	Ratchet	165-P	1
18	Handle grip	136-P	1
19	Pawl & ratchet hinge plate	09516006	1
20	Binder chain	180-P	1
21	Chain bolt & nut (3/8"-16 x 2-1/2" HHMS)	155-P	1
22	Chain hinge plate	09516007	1
23	Spacer (3/4" ID)	20-P	1
24	Bearing (Randall SH186)	7-P	2
25	Bearing block	09113005	1
26	Collar (3/4" ID)	09145001	2
27	Washer & nut	21-P	2
28	Spur gear spacer	09113006	2
29	Bearing, 1" ID x 2-1/2"	01111047	1
30	Collar (1" ID)	09145003	1
31	Cradle assembly for 55 gal. steel drum	09538005	1

WARNING LABEL IDENTIFICATION

MAKE SURE ALL WARNING LABELS ARE IN PLACE!



safety signs or labels should be
ly inspected and cleaned by the
sers as necessary to maintain good
for safe viewing distance ...
10.21
Contact manufacturer for replacement labels.

1

USE AW-32 HYDRAULIC
OIL OR
EQUIVALENT
T & S EQUIPMENT CO: 219-665-9521

MATERIAL SAFETY DATA SHEET

DR. LUBRICANTS, INC.

24 HOUR EMERGENCY ASSISTANCE
(219) 485-0118

GENERAL MSDS ASSISTANCE
(219) 484-0301

CODE: 0

HAZARD RATING> LEAST-0 SLIGHT-1 MODERATE-2 HIGH-3 EXTREME-4

DR. LUBRICANTS, INC.
4611 NEWAYGO ROAD, SUITE D
FORT WAYNE, IN 46808

DATE: 03/15/96

TELEPHONE NUMBER (219) 484-0301

SECTION I - PRODUCTION IDENTIFICATION

PRODUCT: HO 150

SECTION II - COMPOSITION AND HAZARDOUS INFORMATION*

CHEMICAL NAME	CAS NUMBER	WEIGHT PERCENT IS LESS THAN	OCCUPATIONAL EXPOSURE LIMITS (TLV-TWA) (TLV-STEL)
PETROLEUM HYDROCARBON	64742-54-7	98.0	10MG/M3 IN AIR

* ITEMS NOT SHOWN ARE NOT LISTED IN THE OSHA - T.S.C.A HAZARDOUS CHEMICALS LISTING.

SECTION III - PHYSICAL DATA

BOILING RANGE	NA	VAPOR	NA
ODOR	PETROLEUM ODOR	EVAPORATION RATE	NA
APPEARANCE	AMBER LIQUID	SOLUBILITY	INSOLUBLE
VOLATILE BY WEIGHT	<0.1%	PRODUCT DENSITY	0.865-0.895
VOLATILE BY VOLUME	<0.1%		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION	NA	FLASH POINT (CLEVELAND OPEN CUP)	>360F LEL: NA UEL: NA
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DOT - NOT REGULATED

EXTINGUISHING MEDIA: CARBON DIOXIDE, DRY CHEMICAL, FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS: DO NOT DIRECT A SOLID STREAM OF WATER ONTO BURNING PRODUCT. THIS MAY CAUSE SPREADING AND INCREASE FIRES INTENSITY. COMBUSTION MAY PRODUCE: OXIDES OF CARBON, AND INCOMPLETELY BURNED HYDROCARBONS IN THE FORM OF FUMES AND SMOKE.

SPECIAL FIREFIGHTING PROCEDURES: WEARING A SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVER EXPOSURE: MAY CAUSE MILD EYE IRRITATION AND REDNESS. PROLONGED OR REPEATED EXPOSURE TO THE SKIN MAY RESULT IN LOSS OF NATURAL OILS ACCOMPANIED BY DRYNESS, CRACKING AND DERMATITIS. INGESTION MAY RESULT IN NAUSEA, DIARRHEA AND GASTROINTESTINAL IRRITATION, OVEREXPOSURE TO MIST MAY CAUSE UPPER RESPIRATORY TRACT IRRITATION AND DIFFICULTY BREATHING.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: NON KNOWN.

PRIMARY ROUTE(S) OF ENTRY: DERMAL INHALATION INGESTION.

EMERGENCY AND FIRST AID PROCEDURES: IN CASE OF EYE CONTACT IMMEDIATELY FLUSH EYES WITH CLEAN WATER FOR AT LEAST 15 MINUTES. IF EYE IRRITATION PERSISTS, CONTACT A PHYSICIAN. IN CASE OF PROLONGED SKIN CONTACT, REMOVE ANY CONTAMINATED CLOTHING AND RINSE SKIN THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. IF SKIN IRRITATION PERSISTS, CONTACT A PHYSICIAN. IN CASE OF OVEREXPOSURE TO MIST, REMOVE VICTIM TO FRESH AIR: IF BREATHING IS DIFFICULT ADMINISTER OXYGEN: AND CONTACT A PHYSICIAN IMMEDIATELY, IF PRODUCT IS INGESTED DO NOT INDUCE VOMITING: GIVE TWO GLASSES OF WATER AND CONTACT A PHYSICIAN.

SECTION VI - REACTIVITY DATA

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS. HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS. HAZARDOUS DECOMPOSITION PRODUCTS: THERMAL DECOMPOSITION MAY RESULT IN THE FORMATION OF: OXIDES OF CARBON, AND INCOMPLETELY BURNED HYDROCARBONS IN THE FORM OF FUMES AND SMOKE.

CONDITIONS TO AVOID: AVOID CONTACT WITH STRONG OXIDIZING AND REDUCING AGENTS AND STRONG ALKLI.
INCOMPATIBILITY: AVOID CONTACT WITH STRONG OXIDIZING AND REDUCING AGENTS AND STRONG ALKLI.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED FOR SMALL SPILLS: SOAK UP SPILL WITH ABSORBENT MATERIAL. FOR LARGE SPILLS: DIKE SPILL AND PUMP INTO DRUMS FOR PROPER DISPOSAL.

WASTE DISPOSAL METHOD: DISPOSE OF IN ACCORDANCE WITH ALL LOCAL STATE AND FEDERAL REGULATIONS.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: NORMALLY NOT REQUIRED, HOWEVER, WHEN THE TLV IS EXCEEDED WEAR THE APPROPRIATE MSHA/NIOSH APPROVED RESPIRATOR.

VENTILATION: PROVIDE ADEQUATE VENTILATION (SUCH AS MECHANICAL OR LOCAL) TO ASSURE TLV IS NOT EXCEEDED.

PROTECTIVE GLOVES: NORMAL NOT REQUIRED, HOWEVER, IF HANDS ARE FREQUENTLY IN FLUID WEAR OIL AND CHEMICAL IMPERVIOUS GLOVES.

EYE PROTECTION: SAFETY GLASSES REQUIRED FOR NORMAL USAGE, WEAR CHEMICAL GOGGLES WHEN EXCESSIVE SPLASHING MAY OCCUR.

OTHER PROTECTIVE EQUIPMENT: NORMALLY NOT REQUIRED, HOWEVER, WHEN REPEATED CONTACT OCCURS WEAR IMPERVIOUS CLOTHING AND BOOTS.

HYGIENIC PRACTICES: FOLLOW STANDARD INDUSTRIAL HYGIENE PRACTICES. LAUNDRY ANY CONTAMINATED CLOTHING BEFORE REUSE.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: DO NOT STORE IN THE PRESENCE OF HEAT, SPARKS, FLAME OR ANY OTHER SOURCES OF IGNITION.

STORE AWAY FROM STRONG OXIDIZING AGENTS. EMPTY DRUMS MAY CONTAIN PRODUCT RESIDUES. ALL SAFETY PRECAUTIONS TAKEN WHEN HANDLING THIS PRODUCT SHOULD BE TAKEN WHEN HANDLING EMPTY DRUMS AND CONTAINERS.

OTHER PRECAUTIONS: NONE

SECTION X - HMIS/NFPA RATINGS

HMIS: HEALTH: 0	FLAMMABILITY: 1	REACTIVITY: 0	PERSONAL PROTECTION: B
NFPA: HEALTH: 0	FLAMMABILITY: 1	REACTIVITY: 0	SPECIFIC HAZARD: B

SECTION XI - OTHER REGULATORY INFORMATION

DOT HAZARDOUS NATURAL DESCRIPTION: NONE

THE INFORMATION CONTAINED HEREIN IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE. HOWEVER, SINCE THE CONDITIONS OF HANDLING AND USE ARE BEYOND OUR CONTROL, WE MAKE NO GUARANTEE OF RESULTS, AND ASSUME NO LIABILITY FOR DAMAGES INCURRED BY USE OF THIS MATERIAL. IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

TYPICAL PROPERTIES

	TEST METHOD	
API GRAVITY @ 60F	D-287	
VISCOSITY SUS @ 100F: SEC	D-2161	
VISCOSITY cSt @ 100F: SEC	D-445	
VISCOSITY INDEX	D-2270	
COLOR	D-1500	

	GRADE		GRADE	
	150	200	300	500
API GRAVITY @ 60F	30-33	28-31.5	29-31	28-30
VISCOSITY SUS @ 100F: SEC	149-182	214-262	317-389	468-575
VISCOSITY cSt @ 100F: SEC	28.8-35.2	41.4-50.6	61.2-74.8	90-110
VISCOSITY INDEX (MIN)	95 MIN	95 MIN	95 MIN	95 MIN
COLOR (MAX)	2	3	3	3
FLASH POINT F (MIN)	380+410		420+440+	
POUR POINT C (MAX) (F)	-20 (0)	-20 (0)	-20 (0)	-10 (15)

LIMITED WARRANTY

ONE YEAR LIMITED WARRANTY. The manufacturer warrants for the original purchaser against defects in materials and workmanship under normal use one year after date of purchase. (Not to exceed 15 months after date of manufacture.) Any part which is determined by the manufacturer to be defective in material or workmanship and returned to the factory, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at our option. Labor costs for warranty repairs and/or modifications are not covered unless done at manufacturer's facilities. Any modifications performed without written approval of the manufacturer may void warranty. This limited warranty gives purchaser specific legal rights which vary from state to state.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, the manufacturer's liability for consequential and incidental damages is expressly disclaimed. The manufacturer's liability in any event is limited to, and shall not exceed, the purchase price paid. Misuse or modification may void warranty.

WARRANTY DISCLAIMER. Our company has made a diligent effort to illustrate and describe the products shown accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

The provisions of the warranty shall be construed and enforced in accordance with the UNIFORM COMMERCIAL CODE and laws as enacted in the State of Indiana.

DISPOSITION. Our company will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within the Limited Warranty. Warranty claims must be made in writing within said year.

SERVICE RECORD

DATE OF SERVICE: ____/____/____
WORK DONE BY: _____
SERVICE PERFORMED: _____

DATE OF SERVICE: ____/____/____
WORK DONE BY: _____
SERVICE PERFORMED: _____

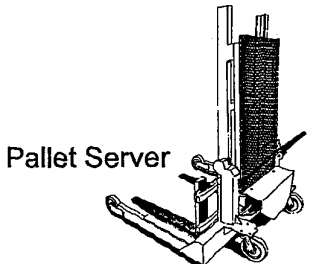
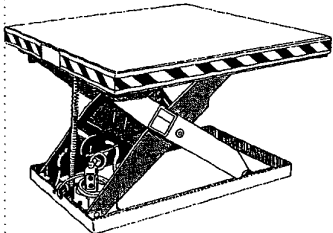
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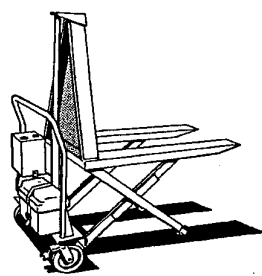
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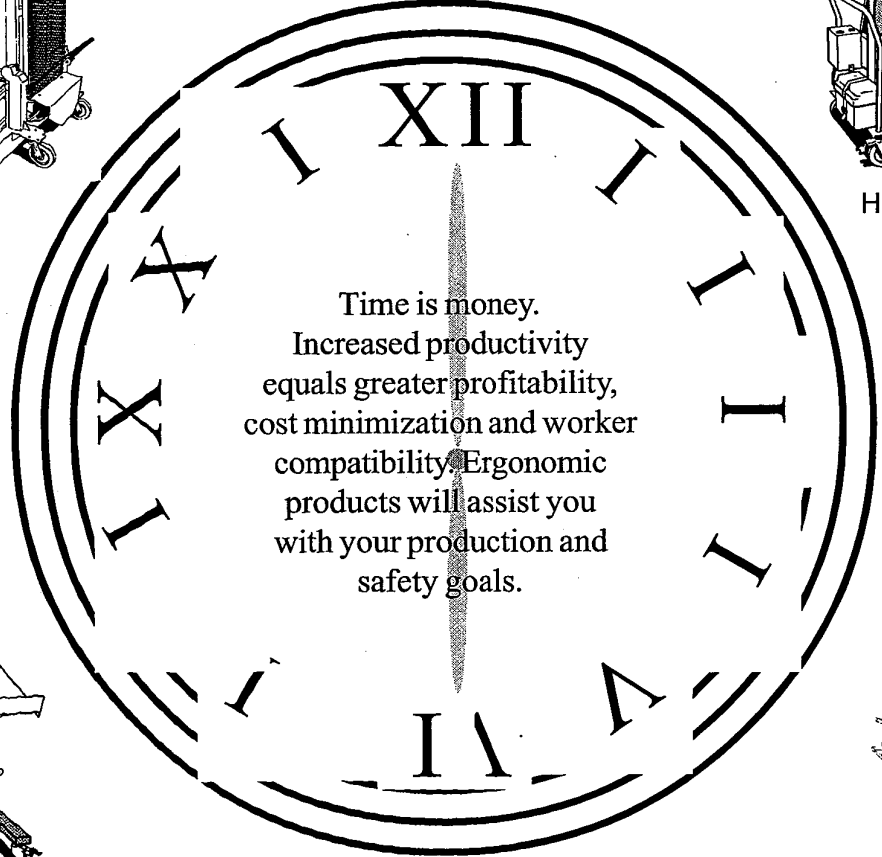
Material Handling Problem Solvers



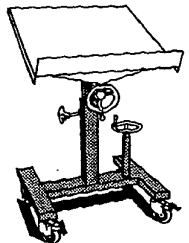
Pallet Server



High Rise Lift



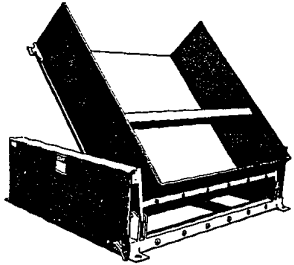
Time is money.
Increased productivity
equals greater profitability,
cost minimization and worker
compatibility. Ergonomic
products will assist you
with your production and
safety goals.



Mobile Lift & Tilt
Work Stand



45° Container Tilter



Ground Lift Tilter