



BEACON INDUSTRIES, INC.

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St. Louis, MO 63128-2247 USA

OFFICE: 314-487-7600 FAX: 314-487-0100

OWNER'S MANUAL

SKID TILTER - BTM SERIES

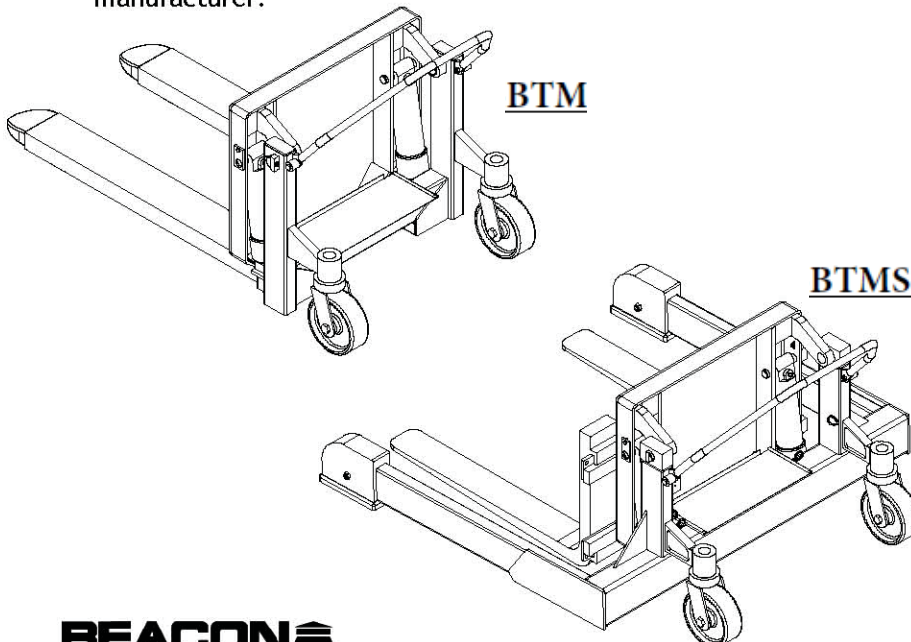
Serial number _____

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WARNINGS AND SAFETY INSTRUCTIONS

Ensure that all employees understand and follow the following.

- Read and understand the owner's manual before using or servicing the TiltMaster.
- For battery powered units, review the additional warnings included in the "Operation Instructions" section of the manual.
- Watch the container carefully when the tilter is in operation.
- Have the caster lock engaged solidly when the tilter is in operation.
- Verify that the container (not just the pallet) is fully back against the fork carriage before tilting.
- Be alert to the possibility of parts falling from the container when it is being tilted.
- Before transporting the container, raise the forks slightly.
- The load must be removed and the forks fully lowered before any work is performed on the hydraulic system.
- Do not use the TiltMaster if damage or unusual noise is observed.
- Do not perform any modifications to the TiltMaster without the manufacturer's approval. Failure to receive authorization for changes to the equipment could void the warranty.
- Maintenance and repairs are to be done only by personnel qualified to perform the required work.
- Do not use brake fluid or jack oils in the hydraulic system. If oil is needed, use an anti-wear hydraulic oil with a viscosity grade of 150 SUS at 100° F, (ISO 32 cSt @ 40° C), or Dexron transmission fluid.
- Ensure that safety and warning labels stay in place and are legible.
- Use only replacement parts either supplied or approved by the manufacturer.



WHEN ORDERING

REPLACEMENT PARTS:

We take pride in using quality parts on the equipment we manufacture. We are not responsible for equipment problems resulting from the use of unapproved replacement parts.

To order replacement or spare parts for this equipment, contact the manufacturer.

In any communication with the manufacturer please be prepared to provide the machine's serial number, which is indicated on the machine dataplate.

RECEIVING INSTRUCTIONS

Every unit is thoroughly tested and inspected prior to shipment. However, it is possible that the unit could incur damage during transit.

Inspect the unit closely when it arrives. *If you see evidence of damage or rough handling to either the packaging or to the product when it is being unloaded, immediately make a note of it on the Bill Of Lading!*

It is important that you remove the product's packaging upon its arrival to ensure that there is no concealed damage or to enable a timely claim with the carrier for freight damage.

Also verify that the product and its specifications are as ordered.



OPERATION INSTRUCTIONS - BTM-BTMS SERIES

- *Ensure that all employees involved in the operation of the TiltMaster model box/basket rotator understand and follow these instructions!*

The standard model TiltMaster is suitable for use indoors in most industrial locations. It is intended to be used to transport, lift and rotate rigid, sturdy tote boxes or baskets containing non-hazardous materials so that they can be gradually, manually unloaded. The model TM is intended for use only with open-bottom pallets or skids. The model TMS can be used with either open- or closed-bottom pallets.

Loading:

The load rating, in pounds, is shown on the machine dataplate located on the top of the fork carriage. It indicates the net capacity of the tilter, based on loads having a center of gravity not exceeding 20" horizontally and 20" vertically. The load must be evenly distributed across both of the lifting forks.

Warning: Do not exceed the load ratings stated above. Injury to personnel or permanent damage to the machine could result from exceeding the listed capacity.

Warning: Tilting any load exceeding the 20" center of gravity rating (either horizontally or vertically) can potentially cause the TiltMaster to become unstable and tip over.

Caution: Do not drop loads onto the TiltMaster's forks. Shock loads to the carriage can cause premature wear and damage to the structure and its parts.

Note: The addition of any ancillary equipment to the TiltMaster by third parties must be taken into account when determining the maximum centers of gravity and working load that can be placed on the fork carriage.

To load the TiltMaster, fully lower the fork carriage. Push the tilter's forks under the skid or container, or place the skid or container on the forks with a fork truck, until the skid or container is back against the carriage. The forks can be raised slightly to lift them off of the load rollers, and the load can be moved to the work location.

Operation:

When the TiltMaster is in the desired location, depress the pedal on the side of each swivel caster to prevent the tilter from rolling during its operation.

Warning: Do not tilt loads more than two inches off the floor without the caster brakes properly engaged, to prevent the unit from rolling.

Warning: Keep personnel clear of the machine when it is in operation.

Warning: Loads in containers can shift quickly when tilted. Always have an effective escape route for personnel to be able to avoid being trapped or injured in the event there is an unexpected movement of the material or the machine.

Caution: Always carefully watch the TiltMaster and any load on it when it is in operation.

Warning: Be certain no part of any person or object is under the forks or fork carriage before lowering the unit.

The TiltMaster is furnished with a constant-pressure (dead-man style) pushbutton control.

Press the "UP" pushbutton to turn on the power unit to rotate the forks upward. The forks will rotate only while the control is pressed. Upon releasing the control, the forks will stop and hold position.

Pressing the "DOWN" pushbutton energizes the lowering valve to allow the forks to rotate downward by gravity (the motor does not run). Again, releasing the control will stop the forks' movement, and the unit will hold its position.

Caution: Never use the tilter if any damage or unusual noise is observed, if it is in need of repairs, or if it seems to be malfunctioning. Notify your supervisor or maintenance personnel if you notice anything out of the ordinary.

On DC-powered units, attempting to raise the carriage when the battery is low will cause the motor relay protection to prevent the motor's operation. Adequate battery voltage is indicated by a green LED on the motor relay. See the next page for more notes regarding operation of battery-powered units.

Ensure that all safety and warning labels stay in place and are legible. Refer to the labels page in this manual.

ADDITIONAL INSTRUCTIONS FOR BATTERY-POWERED UNITS

Note: If this product has the 24V powered traction-drive option, consult that option's information for more specific details regarding the batteries and battery charger.

Warning!

- ! Working with or near lead acid batteries is dangerous. Batteries contain sulfuric acid and produce explosive gases. A battery explosion could result in loss of eyesight or serious burns.
- ! Do not smoke or allow a spark or flame near batteries. Charge batteries in locations that are clean, dry, and well ventilated. Do not lay tools or anything metallic on top of any battery. All repairs to a battery must be made by experienced and qualified personnel.
- ! When working with batteries, remove personal items such as rings, bracelets, necklaces, and watches. Batteries can produce enough energy to weld jewelry to metal, causing a severe burn.
- ! Always have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- ! Operating the battery with a low battery voltage can cause premature motor contact failure.
- ! Do not expose the tilter or charger to rain or adverse conditions.
- ! Replace defective cords or wires immediately.
- ! Check the battery's water level frequently.

Battery Charger Operating Instructions

Never operate the charger with either of the cables coiled. Operating a battery charger with the cord either coiled or wrapped around itself could cause the cord to overheat, melt, and cause a short-circuit or a fire.

Connection: the ribbed wire of the charger's output cord must be connected to the battery's negative (-) terminal. The non-ribbed wire (with words printed on it) must be connected to the battery's positive (+) terminal.

When properly connected, the charger will indicate the status of its output:

Flashing green LED - the charger is not seeing a good connection to the battery.

Solid yellow LED - the charger is providing charging current to the battery.

Solid green LED - the charger is maintaining a fully charged battery.

Plug the charger into a standard 115V receptacle. If an extension cord must be used, keep it as short as possible.

Caution: Remember to unplug the charger before moving the equipment. Failure to do so could cause damage to cords, receptacles, and other equipment.

The battery charger can be left connected to the battery indefinitely without risk of harming the battery.

Troubleshooting:

If the unit does not operate, check all of the wiring connections to make sure they're both mechanically and electrically sound - specifically at the battery, the motor, and at any location a wire is connected to the chassis. Also, make sure the quick-connect plug on the end of the pendant control cord is plugged in correctly (if applicable).

A fully charged lead acid battery in good condition at room temperature should read 12.65 volts. At 11.9 volts it is considered to be fully discharged and in need of charging. When checking battery voltage, wait at least 1/2 hour after the charger has been turned off before checking the battery's voltage.

If the batteries don't seem to be taking a charge, check the charger's 115V supply circuit and the charger's output with a voltmeter. If all check okay, confirm the battery's state of charge using a hydrometer or a voltmeter.

ROUTINE MAINTENANCE AND SAFETY CHECKS - BTM-BTMS SERIES

- *Care should be taken to identify all potential hazards and comply with applicable safety procedures before beginning work.*
- *The load must be removed and the forks fully lowered before any work is performed on the hydraulic system.*
- *Only qualified individuals trained to understand mechanical devices and their associated electrical and hydraulic circuits should attempt troubleshooting and repair of this equipment*

(A) Before each use inspect for the following:

- 1.) Frayed wires
- 2.) Oil leaks
- 3.) Pinched or chafed hoses
- 4.) Damage or structural deformation to the structural members, the cylinder brackets, etc.
- 5.) Unusual noise or binding, or evidence thereof.
- 6.) Proper functioning of the locking caster (to prevent wheel rotation).
- 7.) Proper functioning of all limits.

(B) In addition to the above, inspect monthly for:

- 1.) The oil level. Oil should be 1" to 1½" below the reservoir's fill hole with the forks fully lowered.
- 2.) Worn or damaged hydraulic hoses and electrical wires.
- 3.) Pivot point wear at the hinge pins and cylinder ends.
- 4.) Intact pin and clevis retaining rings and / or fasteners.
- 5.) Looseness, wear, or damage to the casters' bearings, mounting hardware, locking mechanism, or surface material.
- 6.) Proper water level in the battery. (DC units.)
- 7.) Unusual noises.
- 8.) Information and warning labels being in place and in good condition.
- 9.) The need to clean off dirt and debris.

(C) Yearly inspection

The oil should be changed if the oil darkens, becomes gritty, or turns a milky color (indicating the presence of water). Replace with an anti-wear hydraulic oil with a viscosity grade of 150 SUS at 100°F, (ISO 32 @ 40°C). Ex: AW 32 or HO 150 hydraulic fluid, or Dexron transmission fluid.

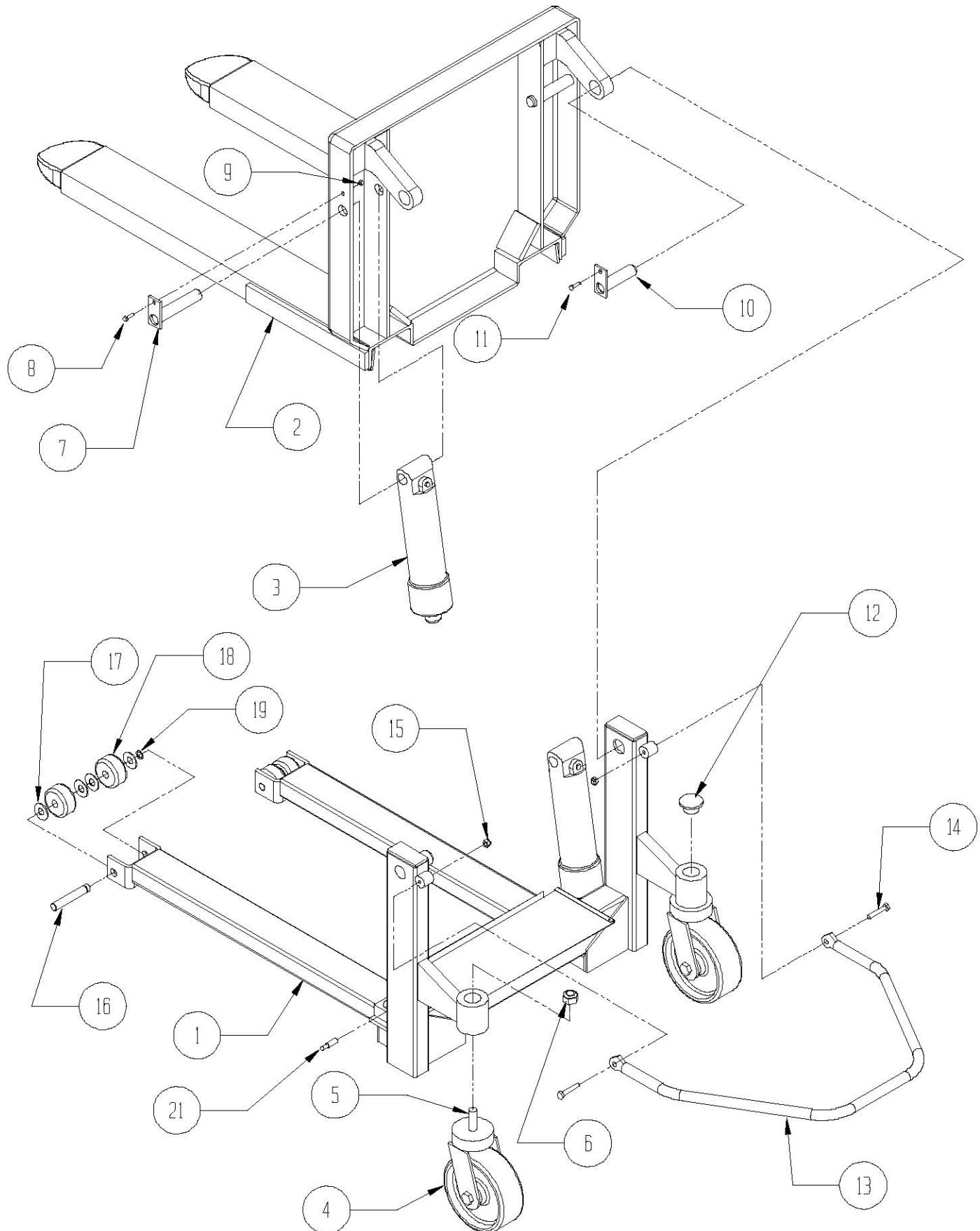
Ordering replacement parts:

We take pride in using quality parts on the equipment we manufacture. We are not responsible for equipment problems resulting from the use of unapproved replacement parts.

Note: Motors, cylinders, and pumps can vary by model. Consult the manufacturer to determine the exact part numbers for these items.

To order replacement or spare parts for this equipment, contact the manufacturer.

In any communication with the manufacturer, please be prepared to provide the machine's serial number, which is indicated on the machine dataplate.

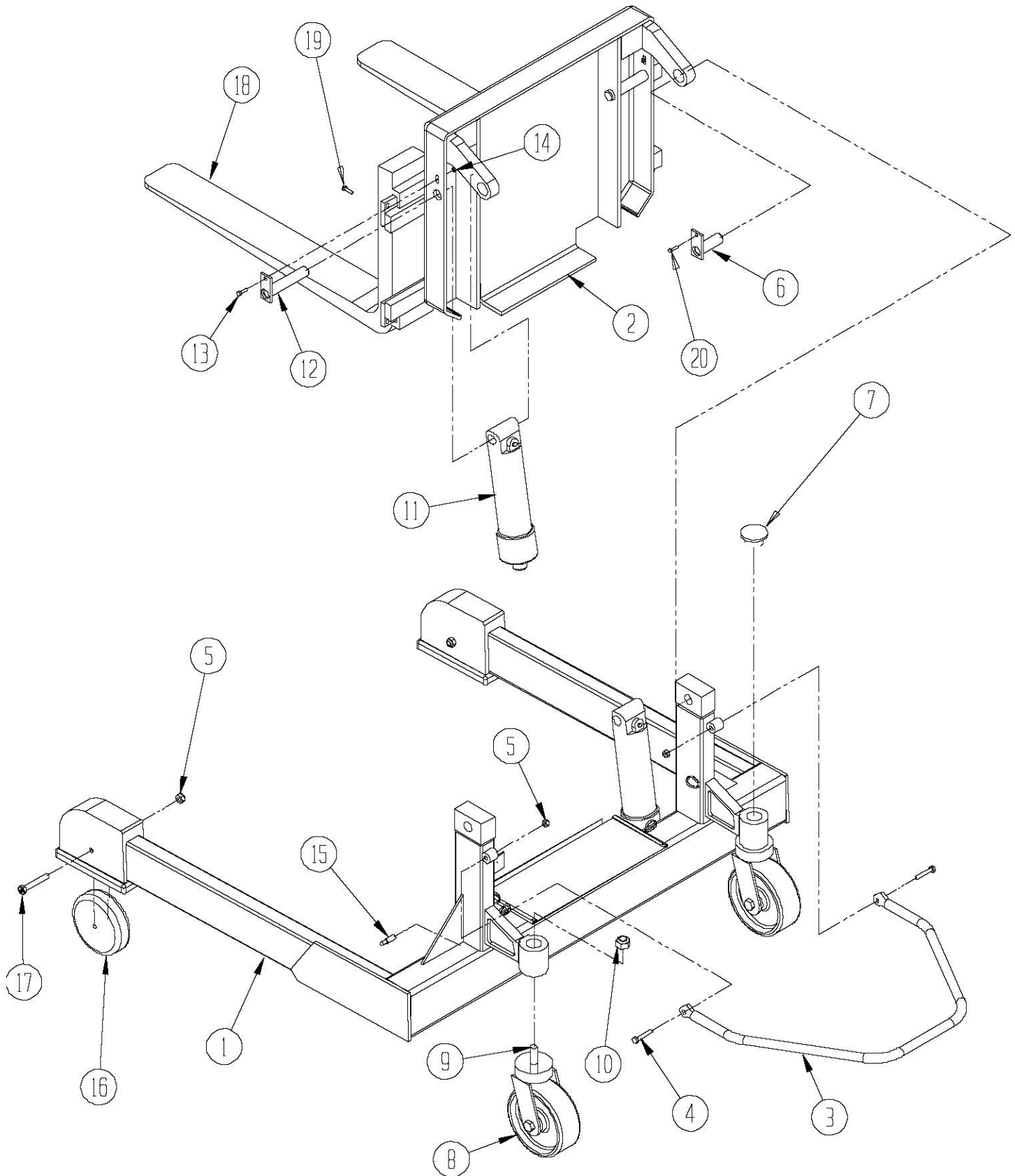
EXPLODED STRUCTURAL PARTS VIEW - BTM SERIES

BILL OF MATERIALS - BTM SERIES

Item #:	Description	Part number	Qty.
1	Frame weldment	38-514-033	1
2	Deck weldment	38-513-006	1
3	Cylinder, 3" x 10", TM-60	99-021-901	2
	Cylinder, 2½" x 10", TM-40	99-021-906	2
	Cylinder, 2" x 10", TM-20	99-021-914	2
4	Caster, Ø8" x 3" phenolic, swivel	PH-8/3-S-SWB-NTP	2
5	Bolt, ¾"-10 x 3½" long	A/L	2
6	Nylock nut, ¾"-10	A/L	2
7	Cylinder pin weldment	38-612-003	2
8	Bolt, ¼"-20 x 1" long	A/L	2
9	Nut, ¼"-20	A/L	2
10	Hinge pin weldment, Ø1 1/8" x 4"	38-612-004	2
11	Screw, self-tapping, 5/16" x ¾" long	A/L	2
12	Cap, plastic, black	99-024-003	2
13	Push handle	38-525-001	1
14	Bolt, 3/8"-16 x 2¼" long	A/L	2
15	Nylock nut, 3/8"-16	A/L	2
16	Roller pin, Ø¾" x 4¾" long	38-112-014	2
17	Flat washer, ¾" ID	A/L	8
18	Wheel, Ø3" x 1½" wide phenolic	PH-3/1.5	4
19	Snap ring, external, ¾"	A/L	2
20	Limit switch, roller arm	01-022-001	1
21	Bolt, cylinder retaining, ½"-13 x 2" long	01-118-001	2

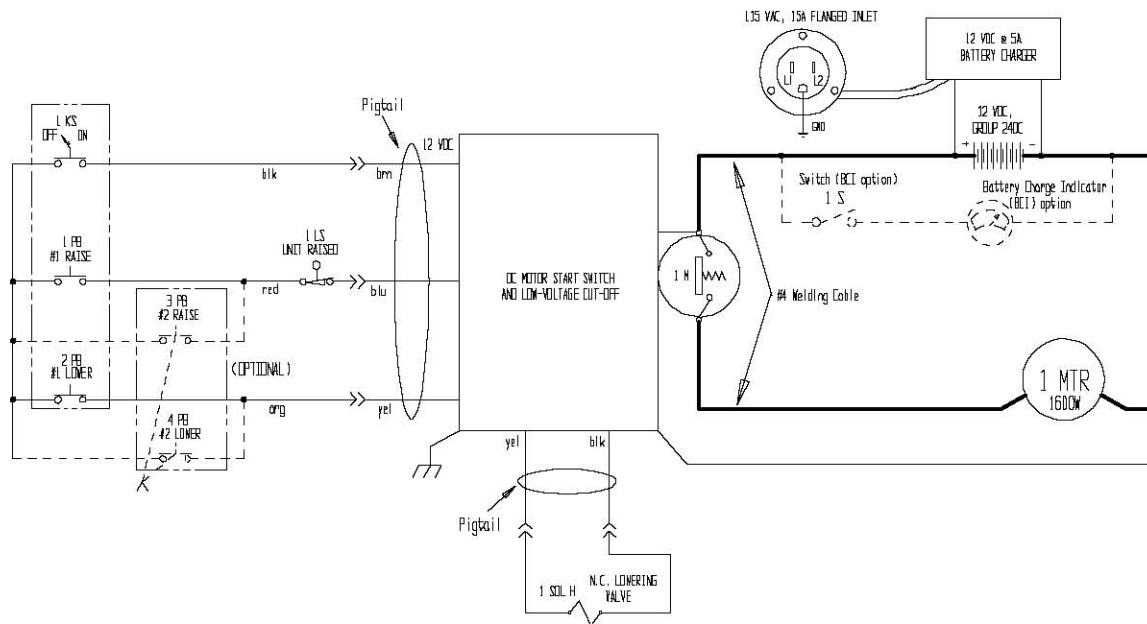
BILL OF MATERIALS - BTMS SERIES

Item #:	Description	Part number	Qty.
1	Frame weldment	38-514-034	1
2	Deck weldment	38-513-008	1
3	Handle assembly weldment	38-525-001	1
4	Bolt, ½"-13 x 2¼" long	A/L	2
5	Nylock nut, ½"-13	A/L	4
6	Hinge pin weldment, Ø1 1/8" x 4" long	05-112-003	2
7	Cap, plastic, black	99-024-003	2
8	Stem caster, Ø8" x 3" wide phenolic swivel	PH-8/3-S-SWB-NTP	2
9	Bolt, ¾"-10 x 3¼" long	A/L	2
10	Lock nut, ¾"-10	A/L	2
11	Cylinder, 2" x 10", TMS-20	99-021-914	2
	Cylinder, 2½" x 10", TMS-40	99-021-906	2
	Cylinder, 3" x 10", TMS-60	99-021-901	2
12	Cylinder pin weldment	38-612-003	2
13	Bolt, ¼"-20 x 1" long	A/L	2
14	Nut, ¼"-20	A/L	2
15	Bolt, cylinder retaining, ½"-13 x 2" long	01-118-001	2
16	Wheel, Ø8" x 2" wide phenolic	PH-8/2-W	2
17	Bolt, w/ grease zirk, ½"-13 x 3½" long	ZA2	2
18	Class II lifting fork, 36" long	15-028-007	2
19	Bolt, 3/8"-16 x 1" long, w/ 3/8"-16 lock nut	A/L	2
20	Screw, self-tapping, 5/16" x ¾" long	A/L	2
21	Limit switch, roller arm (not shown)	01-022-001	1

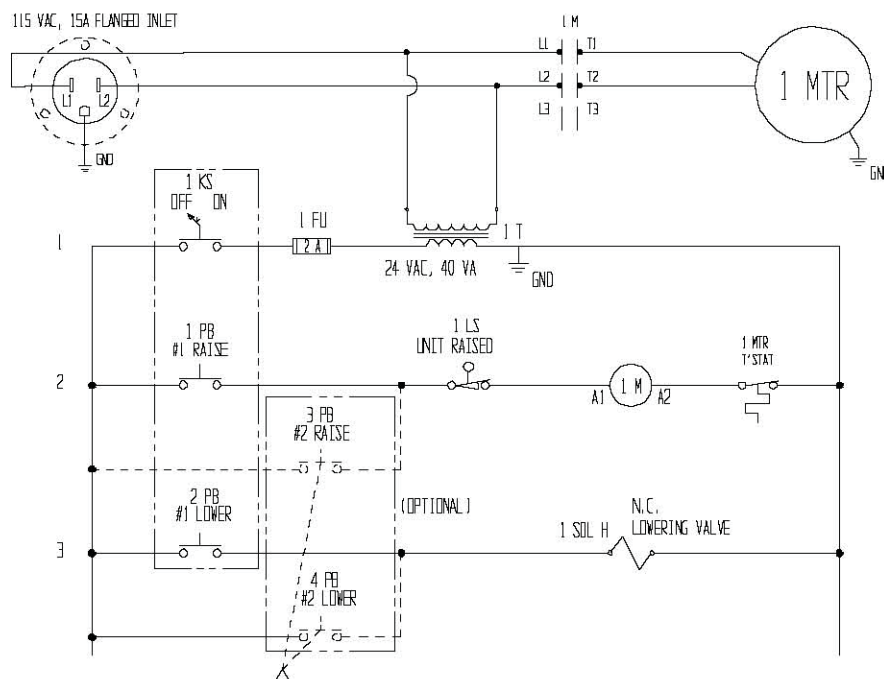
EXPLODED STRUCTURAL PARTS VIEW - BTM-BTMS SERIES

ELECTRICAL DIAGRAMS -- MODULAR POWER UNITS

- **Warning:** Care should be taken to identify all potential hazards and comply with applicable safety procedures before beginning work. Fully lower or secure the forks, and ensure that all system pressure and power have been removed, before attempting to work on the electrical or hydraulic systems.
- Fully lower the forks before beginning any inspections or work on the unit.
- Only qualified individuals trained to understand mechanical devices and their associated electrical and hydraulic circuits should attempt troubleshooting and repair of this equipment



OVERCURRENT & SHORT-CIRCUIT PROTECTION, AND DISCONNECT, ARE TO BE PROVIDED BY THE END-USER PER THE NEC (NFPA 70) AND LOCAL CODES.



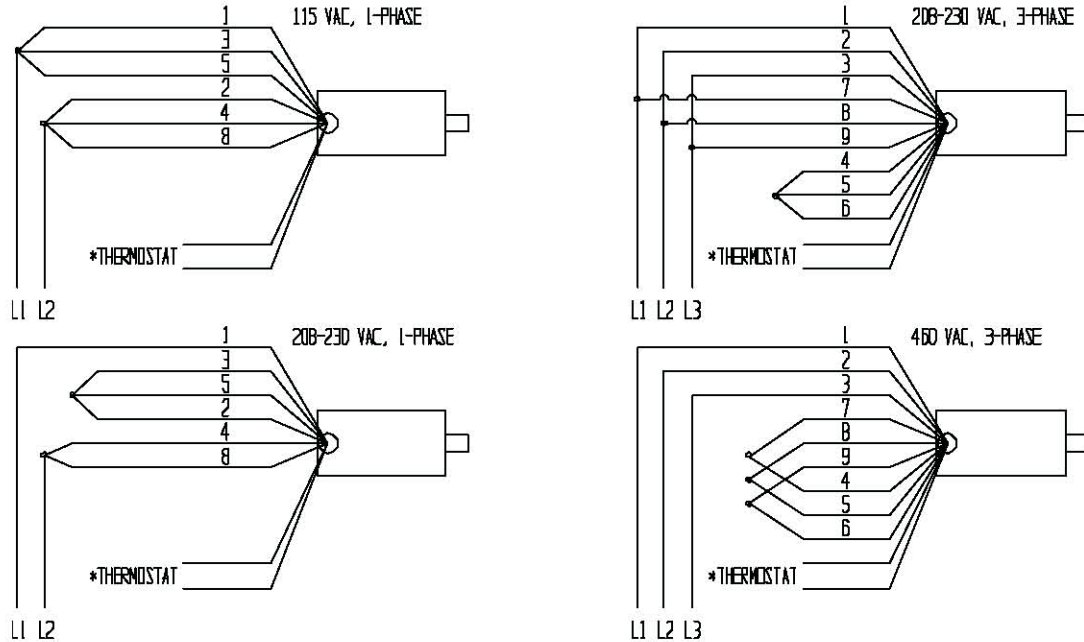
BE SURE ALL POWER IS OFF BEFORE ATTEMPTING TO WORK ON THIS EQUIPMENT!

CAUTION: SERVICE WORK SHOULD BE PERFORMED ONLY BY TRAINED & QUALIFIED PERSONNEL

MOTOR & TRANSFORMER CONNECTION DIAGRAMS

CAUTION! *If the motor voltage is changed, the wire on the control transformer's primary wire has to be changed to match the new motor voltage also.*

MOTOR LEAD CONNECTION DIAGRAM FOR ALL
.5HP, .75HP AND 3HP SINGLE-PHASE MOTORS AND FOR
ALL 2HP, 5.5HP, AND 6.5HP THREE-PHASE MOTORS

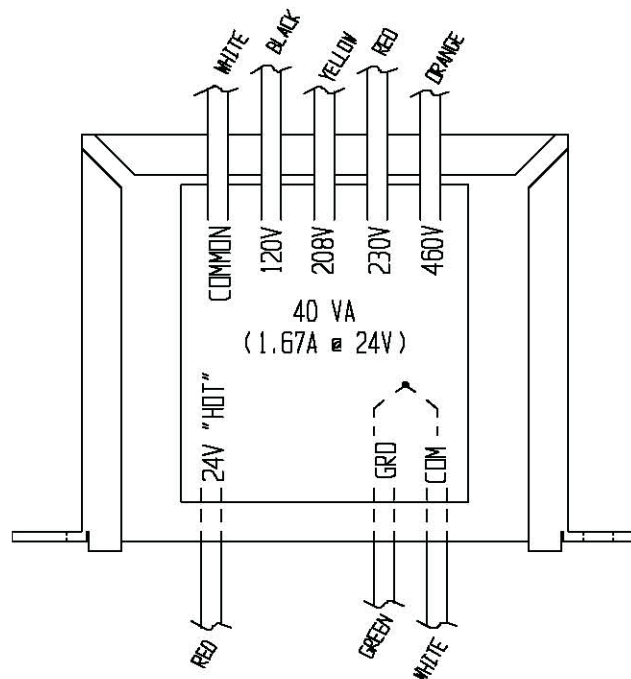


* The two thermostat leads go to: 1) the grounded side of the transformer secondary, and; 2) the motor relay coil, in either order.



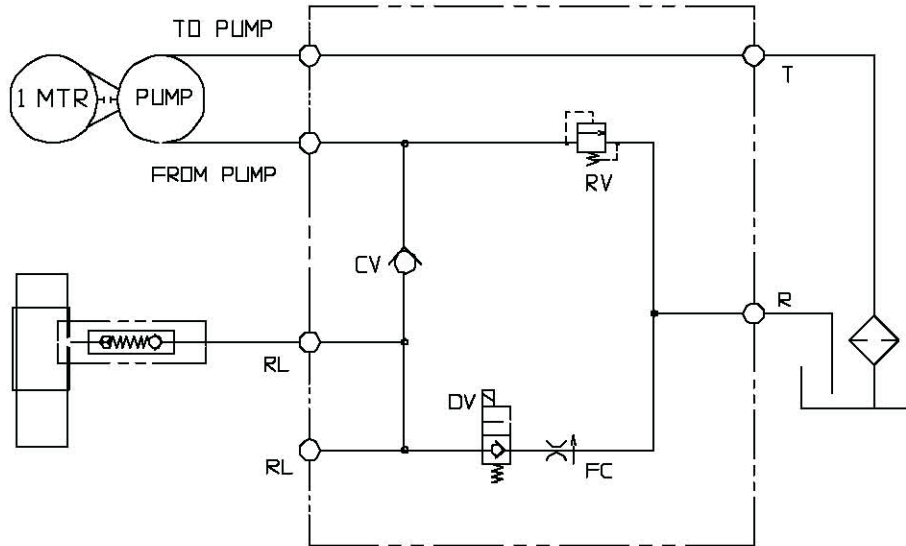
BE SURE ALL POWER IS OFF BEFORE ATTEMPTING TO WORK ON THIS EQUIPMENT!

CAUTION: SERVICE WORK SHOULD BE PERFORMED ONLY BY TRAINED & QUALIFIED PERSONNEL

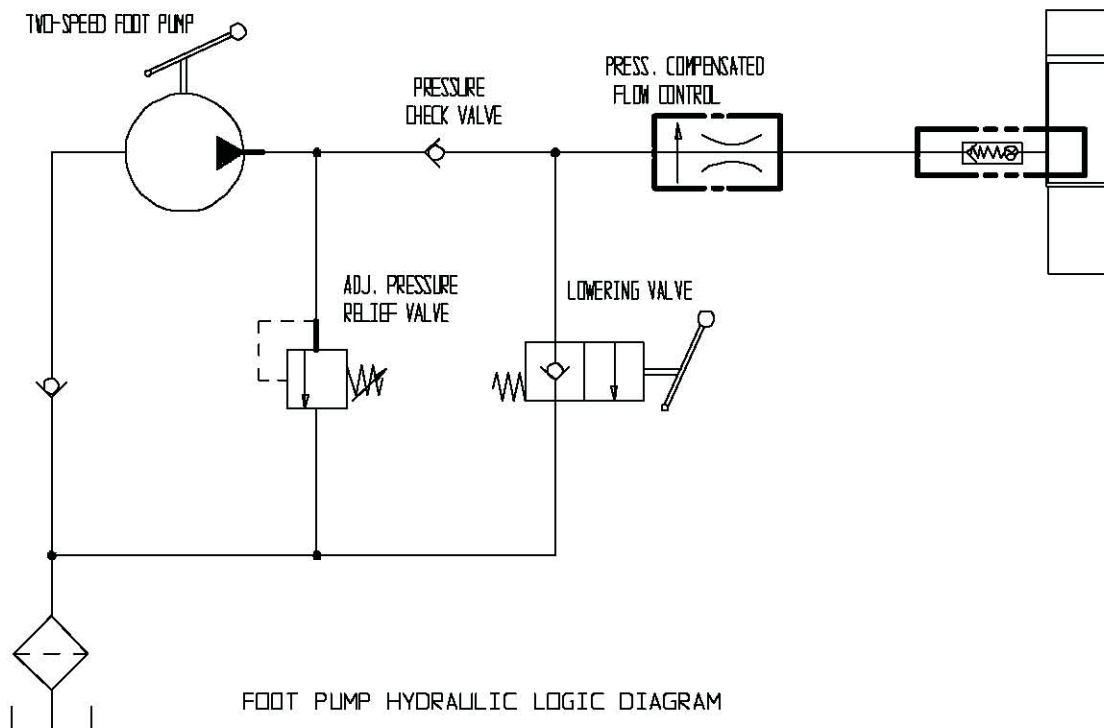


HYDRAULIC DIAGRAM – LIFT-HOLD-LOWER CIRCUITS

- *Warning: Care should be taken to identify all potential hazards and comply with applicable safety procedures before beginning work. Fully lower or secure the forks, and ensure that all system pressure and power have been removed, before attempting to work on the electrical or hydraulic systems.*
- *Fully lower the unit before beginning any inspections or work.*
- *Only qualified individuals trained to understand mechanical devices and their associated electrical and hydraulic circuits should attempt troubleshooting and repair of this equipment*
- *Caution: Do not use brake fluid or jack oils in the hydraulic system. If oil is needed, use an anti-wear hydraulic oil with a viscosity of 150 SUS at 100°F (ISO 32 @ 40°C), or non-synthetic transmission fluid.*



GEAR PUMP HYDRAULIC LOGIC DIAGRAM



FOOT PUMP HYDRAULIC LOGIC DIAGRAM

THE POWER UNIT'S OPERATION - BTM-BTMS

The electric / hydraulic pallet tilter utilizes an electric motor directly coupled to a gear-type hydraulic pump to produce the needed fluid pressure and flow to allow the cylinder(s) to perform the work of tilting a container.

A hydraulic manifold houses the hydraulic control components, and is bolted directly onto the gear pump.

The power unit's hydraulic components are all rated for 3,000 psi working pressure.

⇒ Important parts of the power unit include:

- The electric motor operates on 12 VDC deep-cycle battery supply.
- The gear pump. Its shaft is coupled directly to the shaft of the electric motor.
- The check valve. Its purpose is to prevent the backflow of fluid through the pump. In this way it allows the fork carriage to be held at a given elevation indefinitely.
- The pressure relief valve. Its job is to open a path for fluid to flow back to the reservoir in the event that the fluid pressure built up by the pump exceeds 3,000 psi. Thus the system cannot see more than 3,000 psi.
- The lowering solenoid valve. This is an electrically operated cartridge valve. It contains a screen to keep contaminants from entering the valve.
- The pressure-compensated flow control spool. This rests under the lowering valve, and regulates the fluid flow back to the reservoir when the valve opens. It allows the forks to always lower at the same rate regardless of whether there is a load on the fork carriage or not.
- The hydraulic tilt cylinder(s). These are displacement-style cylinders. They have a bleeder valve located at their top end to allow air to be bled from the hydraulic system.
- The safety velocity fuse. This is a device that is installed in the cylinder's hose port. It closes quickly in the event of a catastrophic hose failure to prevent the fork carriage from collapsing down. The forks remain stationary until pressure is reapplied to the system.
- The hydraulic fluid. The system uses HO150 hydraulic fluid. Any anti-wear hydraulic fluid with a viscosity grade of 150 SUS at 100°F (ISO 32 @ 40°C) such as AW-32 or Dexron transmission fluid are acceptable.

When the forks are to be tilted, press the "UP" pushbutton. The motor turns, and in turning it spins the hydraulic gear pump. Oil is drawn from the reservoir through the suction filter and into the pump. The pump pushes the then-pressurized oil through the check valve and out to the tilt cylinder(s).

When the fork carriage is to be lowered, press the "DOWN" pushbutton. The lowering valve opens, bypassing the check valve and allowing the oil in the cylinder(s) to return back to the reservoir through the return hose. The rate at which the fork carriage lowers is regulated by the internal pressure-compensated flow spool.

⇒ In the event that the fork carriage creeps down slowly after releasing the "DOWN" control, it will be necessary to remove the lowering cartridge valve for inspection and cleaning, as follows:

- ◆ Lower the forks until they are fully lowered.
- ◆ Remove any load from the forks.
- ◆ Remove the nut holding the solenoid coil on the valve stem, then remove the coil, and then unscrew the valve from the manifold.
- ◆ Inspect the valve for contaminants, and the valve's o-rings and back-up washers for cuts, tears, or other damage.
- ◆ With the valve immersed in mineral spirits or kerosene, use a thin tool such as a small screwdriver or a small hex wrench to push the poppet in and out several times from the bottom end of the valve. The valve should move freely, about 1/16" from closed to open position. If it sticks in, the valve stem could be bent and will need to be replaced if it doesn't free up after cleaning. Blow the valve off with a compressed-air gun while again pushing the poppet in and out.
- ◆ Inspect the bottom of the manifold's valve cavity for contaminants.
- ◆ Again with the thin tool, press on the middle of the flow control spool located in the bottom of the cavity. It should move down and back up freely.
- ◆ Reinstall the valve into the manifold, tightening the valve with approximately 20 lb-ft of torque.

⇒ If the fork carriage lowers extremely slowly, or not at all, the cylinder's velocity fuse could be closing. This can be caused by air in the hydraulic cylinder(s). To bleed the air from the system:

- ◆ Lower the fork carriage until it is fully lowered.
- ◆ Remove any load from the forks.
- ◆ Hold a rag over the cylinder's bleeder valve (it looks like a grease zirk) and open the valve about 1/2 turn with a 1/4" or 5/16" wrench. Oil and air will sputter from the valve - once no air is observed, close the valve.

MODULAR POWER UNIT PARTS BREAKDOWN -- DC-1

- **Note:** Motors, cylinders, and pumps can vary by model. Consult the manufacturer to determine the exact part numbers for these items.

REV.	ENG #	REV.	ECR #	DATE	REVISIONS	INITIAL
	073003JY-1A					

ITEM	REQ	PART NO.	DESCRIPTION
1	1	4JY1119	BASE
2	1	1212SR	BATTERY CHARGER
3	1	01-033-024	18/3 W4 PIN PLUG
4	4	37927	TINNERMAN CLIP
5	1	99-023-001	RESERVOIR
6	1	99-034-013	BATTERY STRAP
7	1	24DC36	BATTERY
8	1	BV-48	BREATHER
9	1	15-533-013	CABLE, BATTERY 23" BLACK
10	1	15-533-014	CABLE, BATTERY 23" RED
11	2	23305	SHCS UTILITY GRADE
	2	33688	HIGH COLLAR LOCK WASHER
	2	33008	USS FLAT WASHER Z PLATED
12	1	99-135-011	MOTOR, 12VDC
13	1	15-022-004	RELAY, START SOLENOID
14	1	HS64	CLAMP, WORM GEAR
15	1	BG-12V	GAUGE, BATTERY INDICATOR
16	3	ZB2BZ009	BASE, CONTACT BLOCK
17	3	ZB2BE101	CONTACT BLOCK N.O
18	2	ZB2BA2C	OPERTOR, BLACK, NON-ILLUM.
19	1		KEY SWITCH, 2 POSITION
20	1	01-134-007	LEGEND, ON - OFF
21	1	091802JY	FIBERGLASS COVER
22	1	HS52	CLAMP, WORM GEAR
23	1	01-143-906	PUMP
24	1	01-627-010	MANIFOLD ASSM (SEE PAGE 2)
25	2	29201	TPHMS, Z PLATED
26	2	29185	TPHMS, Z PLATED
27	4	23255	SHCS UTILITY GRADE
	4	33687	HIGH COLLAR LOCK WASHER
28	1	152400-03	MOLDED CORD
29	1	150CCTM.OEM	CONNECTOR, CHARGE
30	10"	3MT ST3540	1"HOOK&LOOPPRESS SENSITIVE

REMOVE ALL BURRS AND SHARP EDGES

	.006 TIR	.060 TIR
CONCENTRIC		
ANGLES	+/- .0° 30'	+/- 1° 0'
DECIMALS	X.XXX +/- .005 X.XX +/- .010 X.X +/- .025	+/- .015
FRACTIONS	+/- 1/32	+/- 1/16
TOLERANCE	MACHINE	WELDMENT

BEACON

SCALE: NTS
DATE: 07/30/03

APPROVED BY: _____
 SIGNATURE

DRAWN BY: J.YOUNG
 SIZE: A

DC MODULAR POWER UNIT

MATERIAL:

DRAWING NUMBER: 073003JY-1A

REV:

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MODULAR POWER UNIT PARTS BREAKDOWN -- DC-2

- **Note:** Motors, cylinders, and pumps can vary by model. Consult the manufacturer to determine the exact part numbers for these items.

[illegible]

MODULAR POWER UNIT PARTS BREAKDOWN -- AC-1

- **Note:** Motors, cylinders, and pumps can vary by model. Consult the manufacturer to determine the exact part numbers for these items.

REV.	DATE	BY	REVISIONS	INITIAL
073003JY-2A				

ITEM	REQ	PART NO.	DESCRIPTION
1	1	4JY1119	BASE
2	1		ELECTRIC BOX (SEE PAGE 2)
3	1	21-034-005	AC ADAPTER PLUG
4	4	37927	TINNERMAN CLIP
5	1	99-023-001	RESERVOIR
6	1		MOTOR BRACE
7	4	23255	SHCS UTILITY GRADE
	4	33687	HIGH COLLAR LOCK WASHER
8	1	BV-48	BREATHER
9	2	29185	TPHMS, Z PLATED
10	2	29201	TPHMS, Z PLATED
11	2	23305	SHCS UTILITY GRADE
	2	33688	HIGH COLLAR LOCK WASHER
	2	33008	USS FLAT WASHER Z PLATED
12	1	01-627-010	MANIFOLD ASSM (SEE PAGE 2)
13	1	01-143-906	PUMP
14	1	HS52	CLAMP, WORM GEAR
15	1	091802JY	FIBERGLASS COVER
16	3	ZB2BZ009	BASE, CONTACT BLOCK
17	3	ZB2BE101	CONTACT BLOCK N.O.
18	2	ZB2BA2C	OPERATOR, BLACK, NON-ILLUM.
19	1	ZB2BG4C	SWITCH, KEY, 2 POSITION
20	1	01-134-007	LEGEND, ON - OFF
21	1	99-135-003	MOTOR, ELECTRIC, 1PH
22	6	11005	HHCS, Z PLATED
	6	33004	USS FLAT WASHER, Z PLATED
	6	33618	LOCK WASHER, Z PLATED
	6	36102	HEX NUT, Z PLATED

REMOVE ALL BUBBS AND SHARP EDGES

	.006 TIR	.040 TIR
CONCENTRIC		
ANGLES	+/- .0150"	+/- .170"
DECIMALS	xxx +/- .005 xxx +/- .010 xx +/- .025	+/- .015
FRACTIONS	+/- 1/32	+/- 1/16
TOLERANCE	MACHINE	WELDMENT

BEACON

SCALE: NTS
 DATE: 07/30/03

APPROVED BY: _____
 SIZE: A

DRAWN BY: J. YOUNG

AC MODULAR POWER UNIT

MATERIAL:

DRAWING NUMBER:
073003JY-2A

REV:

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MODULAR POWER UNIT PARTS BREAKDOWN -- AC-2

- **Note:** Motors, cylinders, and pumps can vary by model. Consult the manufacturer to determine the exact part numbers for these items.

REV.	DWG. #	REV.	ECR #	DATE	REVISIONS	INITIAL
	073003JY-2B					

ITEM	REQ	PART NO.	DESCRIPTION
1	4	71616	TSHMS. SS
2	1	01-129-001	TRANSFORMER
3	1	132560	CONTACTOR, MOTOR
4	4	27531	PHSMS. Z PLATED
5	4	32028	HWH TEK DRILL & TAP
6	3"	TB-TRACK	RAIL, DIN
7	1	01-029-006	JUNCTION BOX
8	1	AB66JP	PANEL, JUNCTION BOX
9	4	C500	CONNECTOR, ROMEX, 2 SCREW
10	1	01-127-010	MANIFOLD
11	1	6801-06-06-NOW	MJ-MAORB 90 DEG.
12	1	99-153-011	VALVE, CHECK
13	1	568-015-BN70	O-RING
14	1	568-011-BN70	O-RING
15	1	99-153-015	VALVE, CARTRIDGE, NC
16	1	99-034-008	COIL, 24V AC
17	1	99-153-006	VALVE, PRESSURE RELIEF
18	1	568-334-BN70	O-RING
19	1	99-531-005	FILTER
20	1	99-153-038	FLOW CONTROL, 1.0 GPM

REMOVE ALL BURRS AND SHARP EDGES		
CONCENTRIC	.006 TIR	.060 TIR
ANGLES	+/- .0° 30'	+/- 1° 0'
DECIMALS	xxx +/- .005	
	xxx +/- .010	
	xx +/- .025	+/- .015
FRACTIONS	+/- 1/32	+/- 1/16
TOLERANCE	MACHINE	WELDMENT

BEACON

SCALE: NTS

DATE: 07/03/03

APPROVED BY: _____

DRAWN BY: J. YOUNG

SIZE: A

AC MODULAR POWER UNIT

MATERIAL: _____

DRAWING NUMBER: 073003JY-2B

REV: _____

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TROUBLESHOOTING GUIDE - BTM-BTMS SERIES

Before performing any task, always lower the carriage fully to the floor and disconnect the power supply.

Consult the manufacturer for problems not addressed below.

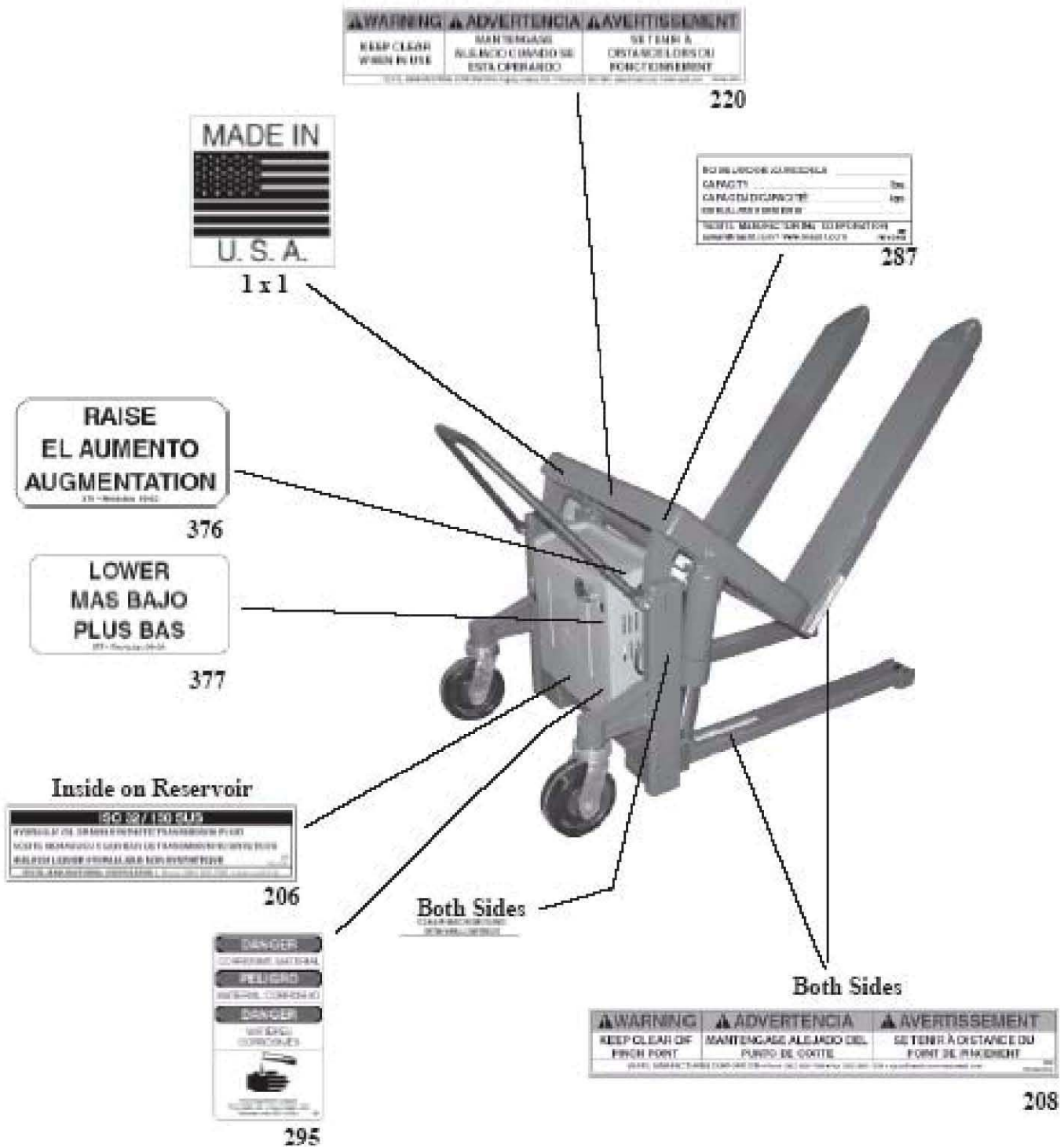
* Check the DC notes page for troubleshooting other problems specific to battery-powered units.

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
Power unit doesn't run when "UP" button is pressed.	No supply voltage (AC). Upper-travel limit switch is engaged or bad. Bad connection in control circuit. No control voltage (AC). Bad motor relay coil. Battery voltage low (DC).	Test with meter. Check fuses, breakers, and overloads to determine the cause. Inspect and test switch. Replace if bad. Test all of circuit with meter. Check for 24 VAC at control transformer's secondary; replace fuse if blown. Test with meter; replace if bad. Test with meter. Charge battery if low (is motor relay LED on?) Verify motor shaft rotates CCW. Consult factory for replacement. Ensure reservoir is filled. Same as above.
Motor runs properly, carriage doesn't raise. Motor and pump not noisy.	Motor rotation is wrong (AC). Pump has failed. Fluid level is low.	
Motor or control enclosure hums, chatters, or buzzes, or some type of squeal can be heard; the carriage does not move, or the carriage moves only slowly.	See second item above, for when carriage doesn't raise. Excess voltage drop to motor, due to power wire size too small, wire run too long, or incoming voltage too low (AC). Motor is "single-phasing" (AC). Pressure relief opening at full pressure.	Check power installation for adequacy. Check incoming voltage <i>while motor is running</i> . Correct problem found. Determine cause of loss of voltage on one phase; correct. Check for structural damage or binding of the scissor legs, etc. Check for carriage overload condition.
	Contamination holding open the lowering valve or the check valve.	Remove and inspect. Clean per instructions in this manual.
Carriage raises, then drifts down.	See last paragraph, above.	Same as above.
Carriage lowers too quickly.	See above. Flow control spool is stuck.	Same as above. See below.
Carriage lowers too slowly.	Flow control spool is stuck. Pinched hose.	Remove plug from FC port; push on flow spool to ensure it is fully pressed into the cavity. Check pressure, supply, and return hoses for kinks. Same as for jerky carriage motion.
	Velocity fuse locking (carriage only slowly creeps down). Velocity fuse locking. Control transformer (AC). No supply voltage (AC).	Same as for jerky carriage motion. Test with meter; replace if bad. Check for 24 VAC at secondary; replace fuse if blown.
Carriage won't lower.	Valve solenoid is bad. Bad connection in control circuit. Physical blockage of the structure.	Check with multimeter on diode-check function. (Reading for ohms will not provide an accurate test of the coil.) Test all of circuit with meter. Inspect for foreign material or objects blocking the carriage.
	Solenoid valve or suction hose screen plugged.	Remove and inspect. Clean per instructions in this manual.
Spongy or jerky carriage motion.	Excessive air in the hydraulic cylinders.	Bleed air per procedure described in this manual.

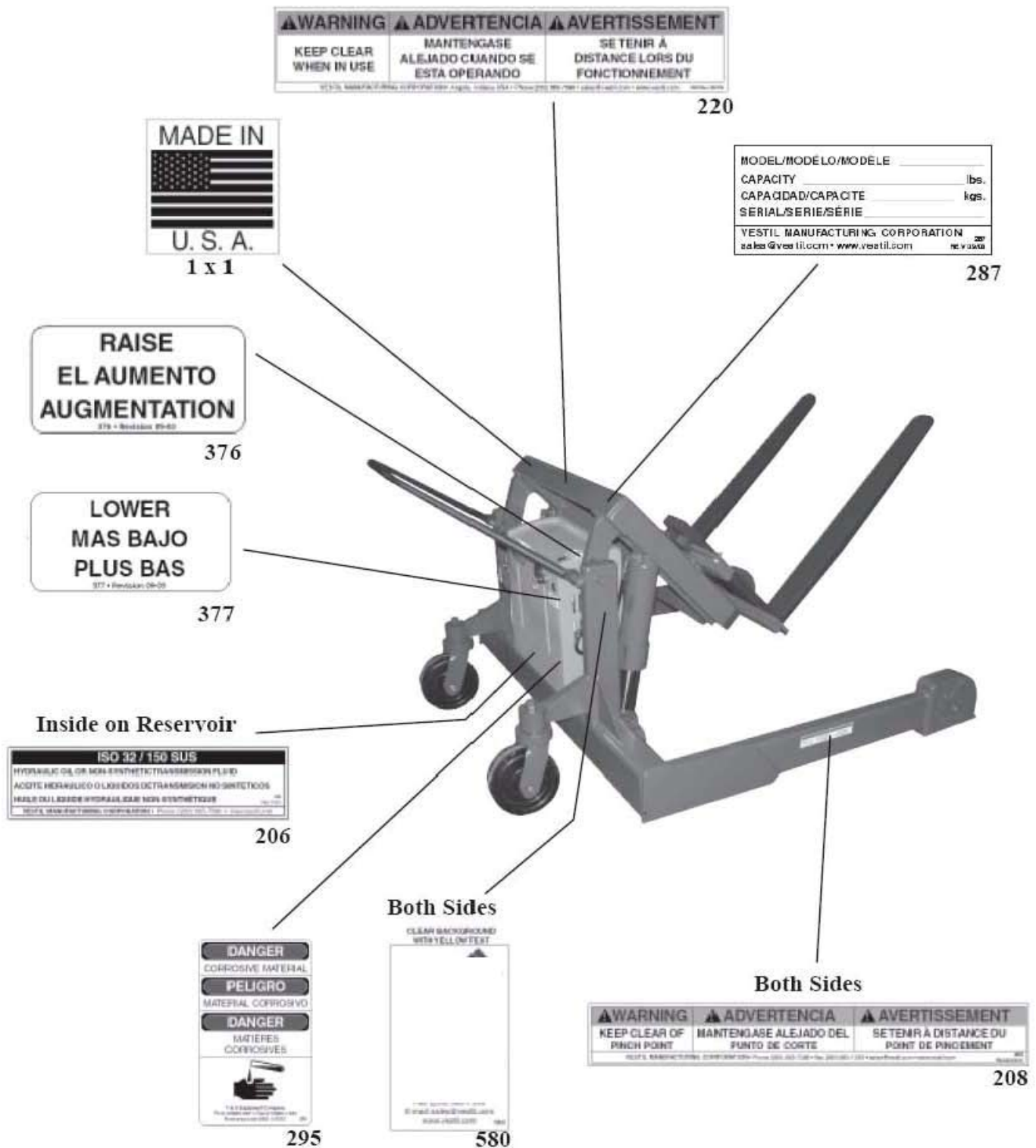
SAFETY LABEL IDENTIFICATION

* Product safety signs or labels should be periodically inspected and cleaned by the product users as necessary to maintain good legibility for safe viewing distance -- ANSI 535.4 (10.21). Contact the manufacturer for replacement labels.

Model BTM



MODEL BTMS



POWERED PRODUCTS' 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 shipment (not to exceed 15 months after date of manufacture). Any part that is determined by the manufacturer to be defective in material or workmanship and returned to the manufacturer, 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 or pre-approved in advance by the manufacturer. 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.

All specifications are subject to change without notice.

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 does not cover labor or consequential damages including, but not limited to, business interruption costs, lost profits, or lost business opportunities.

WARRANTY DISCLAIMER

The manufacturer has made a diligent effort to accurately illustrate and describe their products. 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 that proves to be defective within the Limited Warranty Period. Warranty claims must be made in writing within said year.