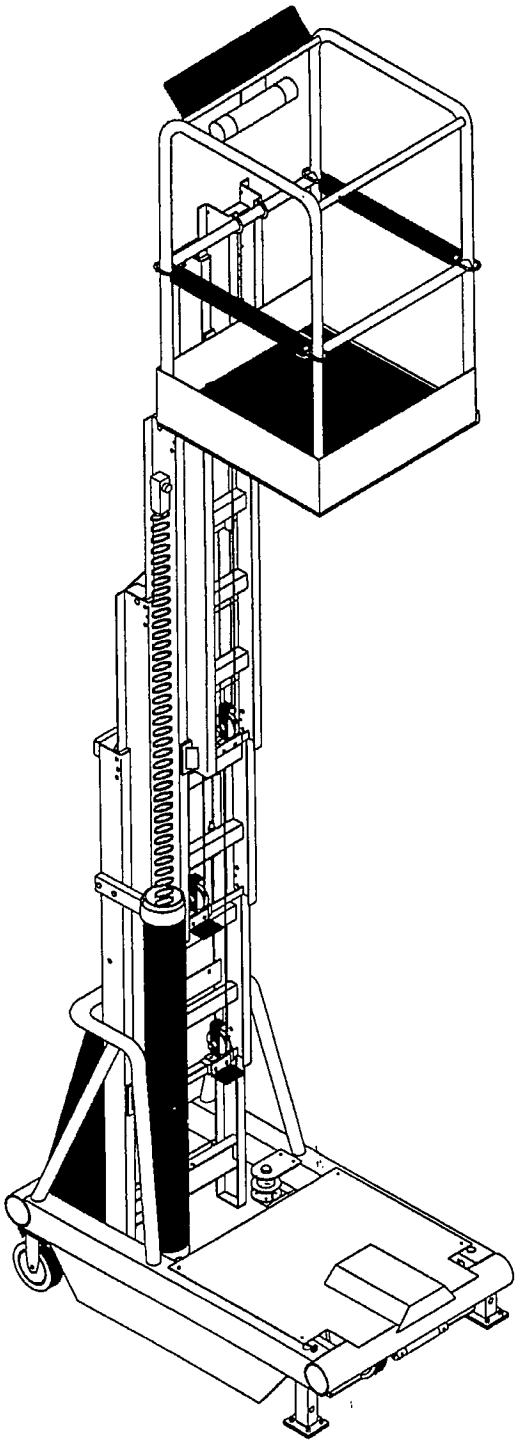
BIL-JAX®

tom...C.A.T. 24DC



Operation & Maintenance Manual

B33-01-0046-03

125 Taylor Parkway • Archbold, OH 43502
Ph 800-537-0540 • Fax 419-445-0367

Telescopic Personnel Lifts

This equipment is designed and manufactured in compliance with the duties, responsibilities and standards set forth for manufacturers in the ANSI A92.3 standard in effect at the time of manufacture.

This equipment will meet or exceed applicable OSHA codes and ANSI A92.3 standards when used in accordance with sections 5,6,7,8,9 and 10 of ANSI A92.3 and all manufacturer's recommendations.

It is the responsibility of the user of this equipment to follow all applicable ANSI, OSHA, Federal, State and local codes and regulations which govern the safe operation of this equipment.

Table of Contents

Service Check List For tom...C.A.T. 24
Daily / Weekly

	Service	Suggested Period *
1.	Check if Operation Manual is located in manual tube.	D
2.	Check chain assemblies for split leaves, loose pins, excessive wear, or elongation.	D
3.	Check battery electrolyte level (DC only).	D
4.	Check and re-tighten all nuts and bolts.	D
5.	Check cage attachment and that the cage entrance midrail slides freely.	D
6.	Check to be sure guide blocks and their path of movement is clean and lightly lubricated with a silicone lubricant.	D
7.	Check level sensor.	D
8.	Check to see that all decals are present.	D
9.	Check all functions at both lower and upper control boxes.	D
10.	Check for wear on chain sheaves, including where it rotates around the sheave axle.	W
11.	Lubricate chains with 40W oil.	W
12.	Check casters for wear on axles and swivel raceways. Also be sure that wheels are not cracked or excessively worn.	W

* D = Daily, W = Weekly, M = Monthly, 6 = 6 Months, 12 = 12 Months, 48 = 48 months

Daily/Weekly Log Sheet For Service Check List

Instructions on how to use log sheets: Complete the suggested daily/weekly service checks. Upon completion of the service checks, the inspector (person doing the inspections) should circle the service checks that were completed and then initial and date when inspection was completed.

NOTE: A "Workday" is any day that the lift is in use.

Contact the factory at 800-527-5333 when in need of extra log sheets.

Service Checks	Inspector/Date
1 2 3 4 5 6 7 8 9 10 11 12	

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Service Check List For tom...C.A.T. 24
Monthly / Yearly

Service	Suggested Period *
13. Check normally open (N.O.) valve. (See page 19)	M
14. Clean battery terminals.	M
15. Lubricate caster swivels and axles.	6
16. Grease adjusting foot pads.	6
17. Check operation of manual emergency lowering valve.	M
18. Check battery cables and wiring for loose connections or damaged wires.	6
19. Replace hydraulic oil.	12
20. Check for mast sway.	12
21. Load test with 350#.	12
22. Replace all chains.	48

* D = Daily, W = Weekly, M = Monthly, 6 = 6 Months, 12 = 12 Months, 48 = 48 months

Monthly/Yearly Log Sheet For Service Check List

Instructions on how to use log sheets: Complete the suggested monthly/yearly service checks. Upon completion of the service checks, the inspector (person doing the inspections) should circle the service checks that were completed and then initial and data when inspection was completed.

Service Checks	Inspector/Date
13 14 15 16 17 18 19 20 21 22	

tom...C.A.T. 24 Lift

Model No. **tom...C.A.T. 24** Serial No. _____

Manufactured By:
Bil-Jax, Inc.
125 Taylor Parkway
Archbold, OH 43502 U.S.A.
Phone (419) 445-8915

SPECIFICATIONS:

Rated Platform Load: 350# Total Including Operator (1 Person + Tools Not To Exceed 350lbs.)
159 kg Total Including Operator (1 Person + Tools Not To Exceed 159kg)

Extended Platform Height:	23'-8" (7.21m)
Retracted Platform Height:	1'-4" (.41m)
Platform Dimensions:	26" x 26" (.66m x .66m)
OVERALL DIMENSIONS:	35 x 55 x 77 (.89m x 1.40m x 1.96m)
Gross Shipping Weight:	1446# (656kg)
Hydraulic System Pressure:	3200 PSI
Maximum Noise Level:	75 dB
Power Source:	DC - Two-6V Batteries wired in series to equal 12V. AC - 110/220Volt 50/60 HZ Motor on Pump **NOTE: AC UNITS ARE TO BE OPERATED WITH NO MORE THAN OR NO LIGHTER THAN 100' OF 14-3 WIRE.**

WARRANTY:

Bil-Jax, Inc. warrants its telescopic stockpicker lifts for one year from the date of delivery against all defects of material and workmanship, provided the unit is operated and maintained in compliance with Bil-Jax's operating and maintenance instructions. Bil-Jax will, at its option, repair and replace any unit or components part which fails to function properly in normal use.

This warranty does not apply if the lift and/or its component parts have been altered, changed or repaired without the consent of Bil-Jax or by anyone other than Bil-Jax or its factory trained personnel, nor if the lift and/or its components have been subjected to misuse, negligence, accident or any conditions deemed other than those considered as occurring during normal use.

Components not manufactured by Bil-Jax are covered by their respective manufacturers warranties. A list of those components and their warranteis is available upon written request to Bil-Jax, Inc.

Bil-Jax, Inc. shall not, in any event, be liable for the cost of any special, indirect or consequential damages to anyone, product or thing. This warranty is in lieu of all other warranties expressed or implied. We neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale, rental or use of this product.

Operation Instructions For tom...C.A.T. 24

1. Read and follow safety precautions and all responsibilities sections set forth in the operators manual.

2. Position the lift at the work area. Make sure the lift is on a firm and level surface and that there are no potential hazards such as overhead obstructions or electrically charged conductors. **DO NOT** use the lift where such hazards exist.

3. Check the lift for damaged or worn parts and repair or replace as necessary.

4. Check to be sure that the cage is properly attached to the lift. (There should be two U-bolts holding the midrail to the mast and two hex bolts through the floor of the platform and fastened to the mast.)

5. Activate the master power switch (located on the side of the main mast), and then depress the "WHEEL UP" button (located on the lower control box) which will raise the caster located under the cage, allowing the base to set firmly on the two foot pads.

6. Check the bubble level located on the base below the lower control box, the lift must be level before operating.

NOTE: Should to lift need to be leveled, adjust the two leveling pads located under the cage, while referencing the bubble level on the base.

7. Once the lift is level and setting firmly on the two leveling pads and the green "Wheel Up" button is lit, raise the empty platform to the height at which you intend to work by turning the selector switch to the "UP" function. Check again to be sure that the platform's path of travel is free from obstructions and reposition the lift as necessary. **DO NOT** use if the lift is not operating properly.

8. Again, check to see that the lift is positioned properly on the two foot pads, and the "WHEEL UP" button is lit. Enter the cage and make sure the cage entrance midrail drops into its proper position.

9. The lift is now ready for operation. While holding the "ON" button, select the desired function: "UP" or "DOWN." The platform will raise or lower respectively. The emergency stop deactivates the control circuit only.

NOTE: Should the platform continue to raise after the "UP" button is released, push the "ON" button and the "DOWN" button simultaneously, and the platform should stop or lower. Also, the lift is equipped with a Level Sensor that will prevent the lift from raising only if the lift is at a slope greater than 1 degree. The green "WHEEL UP" button will no longer light until the lift is re-leveled. (If the lift becomes unlevel while operating, lower the platform and properly re-level the lift (Step 6).

Description of Operation

The **tom...C.A.T. 24** is designed and manufactured for use as an elevating work platform to raise personnel, along with their tools and necessary materials, to job sites situated directly above the platform area. The lift has a maximum capacity of 350 lbs. which is designed to raise 1 person plus tools to the desired work height. The lift is equipped with two control box assemblies, one is located at the base of the lift for operation at ground level and one is located in the platform for lifting and lowering operations. The DC pump motor unit is powered by two 190 amp hour, 6 volt, wet cell deep cycle batteries wired in series to make a 12 volt power source. A 25 amp automatic battery charger is included for recharging the batteries at the end of the day.

Elevating the platform is performed by means of a 1-1/2" diameter hydraulic displacement type cylinder operated at the touch of a button. The lower telescoping section is pushed vertically upwards by the cylinder while the upper sections are raised by mechanical motion advantage accomplished through four sets of chains and sheaves. Consequently, the platform is raised five inches for each one inch of cylinder extension. Platform descent is also commanded by means of push buttons.

Safe use of this equipment is assured by proper operation, inspection, and maintenance procedures as set forth in this Manual. Dependability is also ensured by proper maintenance and replacement of the chains, sheaves, and sheave pins and the proper installation of the flow restrictor valve. (See the Maintenance sections of this Manual.) This nonadjustable flow restrictor valve controls and fixes the rate of platform descent whether empty or fully loaded to approximately 1.25 feet per second. A hydraulic hose failure will result in the same rate of descent and not in free fall when the restrictor valve is installed properly. Precautions should also be taken to ensure that the paths along which the slide blocks move are kept clean and lightly lubricated with a dry type silicone lubricant.

Emergency lowering of the platform is accomplished by means of a manual control valve located on the hydraulic manifold block assembly, next to the pump/motor unit. To lower the platform, remove the rear plastic housing cover, locate the emergency lowering valve and turn the red knob located on the hydraulic manifold block assembly counterclockwise until the platform begins to descend.

tom...C.A.T. Safety Instructions

The operation of any work platform is subject to certain hazards which cannot be protected against by mechanical means, but only by the diligent exercise of intelligence and common sense. Safety for yourself and your fellow workers is *YOUR RESPONSIBILITY*, since any piece of equipment is only as safe as the PERSON USING IT makes it. You are the only part of the machine which can think. Be a PROFESSIONAL and follow these safety rules exactly.

BEFORE USE

Survey the job site for potential hazards such as untampered earth fills, unlevel surfaces, overhead obstructions, and electrically charged conductors or wires. Be aware of any potential hazards and always consider what could happen. Watch for moving vehicles in the area of use.

Before Use (continued)

Read and understand the manufacturer's operating manual. Make sure you have a complete understanding of all operating and safety instructions provided.

Only trained and authorized personnel shall be allowed to operate this equipment.

Inspect the equipment for damaged or worn parts. Also check for cracked welds, hydraulic leaks, damaged wiring, loose wire connectors, or damaged casters. Also, check for any improper operation. **DO NOT** use if damaged in any way. Improperly operating equipment must be repaired before using.

DO NOT operate this equipment if you are under the influence of alcohol or drugs or if you feel ill, dizzy, or unsteady in any way. Operators must be physically fit, thoroughly trained, and not easily excitable.

Wear proper clothing for the job. Wear personnel protective equipment as required by federal, state, or local regulations.

Locate, read, and follow all directions and warnings displayed on the equipment.

Inspect the equipment for any "DO NOT USE" tags placed on the equipment by maintenance personnel.

DO NOT use any equipment tagged in this way until repairs are made and all tags are removed by authorized maintenance personnel.

Make sure the platform and your shoes are free of mud, grease, or other foreign material. This will reduce the possibility of slipping.

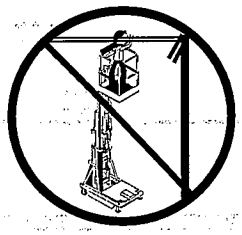
During Use

!DANGER! This machine is not insulated for use near electrical power lines and **DOES NOT** provide protection from contact with or close proximity to any electrically charged conductor. User must maintain safe clearances at all times (minimum of 10 feet) and always allow for platform movement such as wind induced sway. Always contact the power company before performing work near power lines. Assume every line is hot. Remember, power lines can be blown by the wind!

VOLTAGE RANGE (Phase to Phase)	MINIMUM SAFE APPROACH DISTANCE (Feet)	(Meters)
0 to 300V	AVOID CONTACT	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

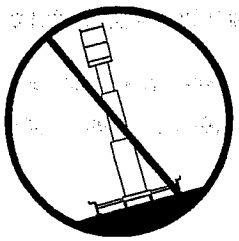
During Use (continued)

DO NOT modify, alter, or change the equipment in any way that would affect its original design or operation.



DO NOT use this equipment in ways for which it is not intended.

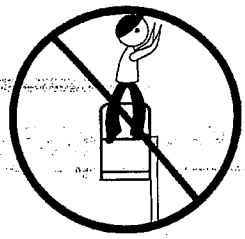
Position lift far enough away from power sources to ensure that no part of the lift can accidentally reach into an unsafe area.



DO NOT override or by-pass manufacturer's safety devices.

Operate only on a firm and level surface. **DO NOT** use on surfaces which will not support the weight of the equipment combined with the rated load of the machine during use.

DO NOT use without entry bar in place.



DO NOT move unit with a person or materials on board.

DO NOT stand or sit on guard rails. Work only within the platform guard rail area and do not lean out over guard rails to perform work.

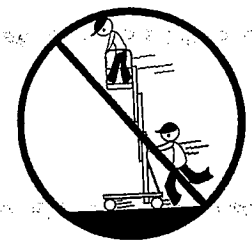
DO NOT attempt to increase working height with boxes, ladders, or other means.

DO NOT use this equipment when exposed to high winds, thunderstorms, ice, or any other weather condition that would compromise the safety of the operator.

DO NOT climb up or down masts.

DO NOT allow ropes, electric cords, hoses, etc. to become entangled in the equipment when the platform is being raised or lowered.

DO NOT use the work platform as a "dead man" in performing work operations which produce excessive horizontal force.



Keep yourself and all personnel away from potential pinch or shear points.

Horseplay is prohibited - Report any misuse of equipment to the proper authorities.

Always maintain good footing on the platform - do not wear slippery soled shoes.

DO NOT exceed manufacturer's platform load limits and make sure all toolsand equipment are evenly distributed over the entire platform.

Always make certain all personnel are clear and there are no obstructions before repositioning platform.

If welding is performed by a worker from the platform, do not allow electrode contact with any part of the platform.

During Use (continued)

DO NOT exceed platform load ratings by transferring loads to platform at elevated heights.

Cordon off area around the base to keep personnel and other equipment away from it while in use.

DO NOT use guard rails to carry materials and do not allow overhang of materials when elevating or lowering platform.

Stay clear of wires, cables, and other overhead obstructions.

Always disconnect power at Master Power Switch and remove key when not in use to guard against unauthorized use.

Maintenance Safety

Maintenance shall be performed according to manufacturer's requirements. **DO NOT** short change maintenance.

DO NOT add incorrect fluids to the hydraulic system or battery. Check manufacturer's specifications.

Pressurized hydraulic oil can cause injury. Check to make sure all lines, connectors, and fittings are tight and in good condition.

DO NOT exceed the manufacturer's recommended relief valve settings.

DO NOT attempt repairs you do not understand - consult manufacturer if you have any questions regarding proper maintenance, specifications, or repair.

Keep all mechanisms properly adjusted and lubricated according to maintenance schedule and manufacturer's specifications.

Always perform a function check on operating controls before each use and after repairs have been made.

Locate and protect against possible pinch points prior to performing maintenance repairs.

Use only factory approved parts to repair or maintain this equipment. If this equipment is rebuilt, testing is required in accordance with factory instructions.

Battery Maintenance Safety

Check battery acid level daily.

Always wear safety glasses when working near battery.

DO NOT smoke when servicing battery.

Battery Maintenance Safety (continued)

Contact with battery acid causes serious burns. Avoid contact with skin or eyes. If accidental contact occurs, flush with water and consult a physician immediately.

Hydrogen and oxygen gases are produced during normal battery operation. This gas mixture can explode. **DO NOT** allow flames or sparks near batteries.

DO NOT allow batteries to overcharge and boil.

DO NOT short cross battery posts to check for current. **DO NOT** break a live circuit at battery.

DO NOT charge batteries except in open, well ventilated areas.

When removing battery, always disconnect ground cable first.

DO NOT jump start other vehicles using lift battery.

NOTE: All OSHA, ANSI, state and local codes and regulations pertaining to this equipment should be obtained, read, and thoroughly understood before attempting to use this equipment. Persons under the influence of drugs, alcohol, or prescription medication should not be on or near this equipment. Common sense should be implemented at all times during the use of this equipment. **DO NOT USE THIS EQUIPMENT IN AREAS WHERE EQUIPMENT OR USER MAY COME IN CONTACT WITH LIVE POWER SOURCE.**

THE INFORMATION CONTAINED HEREIN IS NOT TO BE CONSIDERED AS LEGAL ADVICE AND IS INTENDED FOR INFORMATIONAL PURPOSES ONLY. This information is offered so as to alert customers of Workforce Products to procedures that may be of concern to them.

This information is not intended to be all inclusive and is to be followed in the use of ***WORKFORCE*** equipment only.

For any questions concerning the safe use of this equipment, call 419-445-9675 before using.

Maintenance

INSPECTION: It is extremely important that a complete inspection is made each day to ensure the operators' safety.

1. Inspect daily, tightening if loose and replacing if worn or damaged, all fasteners, pins, etc, including but not limited to the following:

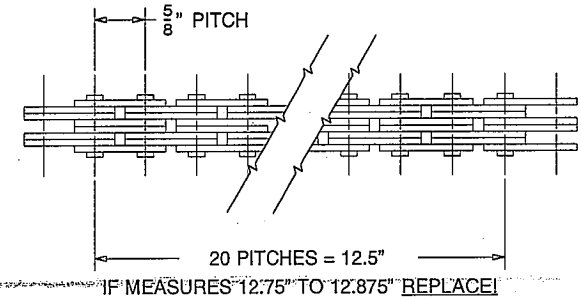
    a. Chains and locknuts per #2 below.
    b. Cylinder mounting bolts and locknuts.
    c. Chain sheaves, sheave pin and cotter pin.
    d. Platform fastening bolts and locknuts.
    e. Plastic slide blocks and mounting screws.

Maintenance (continued)

2. Inspect all chains for damage daily. Look for signs of wear, split leaves, loose pins, clevis damage, elongation, etc. Replace any chain which is damaged in any way or which has elongated more than 3%. The chain assemblies may be ordered from your dealer or the factory direct. Do not use a unit on which any chain assembly is in need of replacement.

NOTE: We recommend that chains be replaced every four years unless damage or wear requires replacement at a lesser interval.

ELONGATION INSPECTION FOR AL-544 LEAF CHAIN



Adjust the lift chains weekly as follows:
Raise the platform to the maximum extended height and then lower it while someone checks to see that all sheaves are turning and checks for chain damage or wear as described above. After completely lowering the platform, remove the large mast cover. Adjust the chains until they are just snug against the retainer. Do not over tighten the chains so as to raise the platform from its resting position. Make sure the hex lockouts are turned onto the threaded clevis ends with at least 1/8" of the end extending through the nut. Replace any locknut which does not stay in position during use. Replace mast cover.

3. Inspect all mast sections daily to make sure that they are free of dirt or other foreign material which would in any way restrict the free movement of the glide blocks.

4. Be sure that all decals are completely readable and the maintenance/operation manual is attached to the lift.

5. Annually check for wear on slide blocks and replace or retighten as necessary. The blocks should be adjusted so that air gap between the guide blocks and the mast is removed. This is accomplished by first backing out the slotted hex head screws and, using an allen wrench, turn the set screws in (clockwise). This will push the block in against the next mast.

DO NOT OVER TIGHTEN.

After adjustments are made, fully extend the lift from the ground, without load in the platform. If you can lower the platform without stopping and there is no airgap between the guide blocks and the mast, then the blocks are properly adjusted.

NOTE: If at any time there appears to be excessive mast sway, it may indicate that the blocks may need to be adjusted as described above.

Maintenance (continued)

raceways and that the wheels are not cracked or excessively worn.

LUBRICATION: Minor Lubrication will make the operation of the **tom...C.A.T.** Lift more efficient and extends its usual life.

1. Oil all chains by brush or other effective means with 40W oil weekly or as needed.

2. Grease caster axles and swivel raceways semiannually.

3. Grease adjusting foot pads semiannually.

IMPORTANT: The plastic slide blocks in the mast are made of a bearing material which has a high degree of lubricity and need only be kept clean. However, precautions should also be taken to be sure that the paths along which the blocks move are kept clean and lightly lubricated with a dry type silicon lubricant.

HYDRAULICS: It is important to maintain the hydraulic system as necessitated by amount of use and the environment in which the lift is used. Constant attention to keeping the oil clean and the reservoir properly filled will help prevent possible damage to the system.

1. Check the hose assembly and fittings for leakage or damage daily. Tighten or replace when necessary to prevent hydraulic oil loss.

2. The reservoir should be filled to within 1/2" of the top with the platform in its lowest position. The lift is shipped from the factory with Energol HLP-HD46 (BP Oil), a high grade, non-foaming hydraulic oil designed for temperatures as low as -20 degrees Fahrenheit. If not available, use Dextron Automatic Transmission Fluid Type A for temperatures as low as -40 degrees Fahrenheit. If not available, a good grade SAE 10W Hydraulic Oil may be used where the minimum climatic temperature is above 32 degrees Fahrenheit. SAE 5W Hydraulic Oil may be used where temperatures are as low as 0 degrees Fahrenheit. **Do not mix different hydraulic oils.**

3. Delayed response or sporadic action may indicate a presence of air in the cylinder. To bleed air from the system, with the reservoir full of fluid, fully extend the unit. Lower the unit to allow the oil with entrapped air to return to the reservoir, being careful as to not overflow it. Let the unit set while the air escapes the fluid and then repeat if necessary. Each time the platform is lowered, refill the reservoir to prevent pumping more air into the cylinder.

4. Clean the reservoir sump strainer and replace the hydraulic oil at least once a year or whenever it should become contaminated.

5. To reset the pressure relief valve, install a 4,000 PSI gauge into the main 3/8" pressure port in the pump unit (the hydraulic hose must first be disconnected). Remove the hex cover from the relief valve screw and adjust the screw until maximum pressure of 3,200 PSI is obtained. If no gauge is available, place 350# on the platform and adjust the screw so that the load can just be lifted without bypassing oil.

Maintenance (continued)

CAUTION: Do not adjust the pressure relief valve higher than **3,200** PSI since possible over loading could occur.

7. Should it ever be necessary to remove the flow restrictor valve, it is of utmost importance that it be properly installed. The valve will be marked in one of two ways: either with an arrow or with the word "IN". The end of the valve marked "IN" must be towards the cylinder port, or on the valve with an arrow; the arrow must point away from the cylinder port. Only a 1/4" NPT hydraulic elbow should be connected between the cylinder port and the end of the flow regulator. Improper installation will permit widely varying rates of descent and would result in near free fall in case of hose failure.

ELECTRICAL: The electrical system is relatively simple, but regular maintenance is necessary to keep it working properly.

1. Check all electrical wires for cuts, broken wires, potential short circuits, etc., daily.

2. The electric system is designed to provide power for a normal work shift. However, the charge life of the battery pack depends on machine usage. Plan your work to prevent unnecessary use of electrical power.

Since batteries are the power source for the machine, proper battery care cannot be overemphasized. Recharge batteries after each work shift. When the machine is not being used, batteries should be charged at least once a week.

The normal charging time should be 10 to 12 hours. If batteries are extremely low, charging time may be as long as 24 hours. Charge batteries as follows:

A. Connect an extension cord from a 110V AC 60 Hz outlet to the flush mount receptacle, located above the Master Power Disconnect. The extension cord to be used must be kept as short and as large as possible. A small long cord will decrease the output of the charger due to the voltage drop in the line; this will increase the charge back time.

B. If there is power in the line, the "on-charging" red LED light will light indicating charge current is flowing, and the ammeter will show the rate of charge.

C. Once the battery voltage reaches a predetermined level programmed in the electronic control, the "80% Charge" yellow LED will turn on.

D. 3-1/2 hours after the yellow light goes on, the charge will be completed and the charger will automatically shut-off. At this time, all the LED's will turn off.

NOTE: If the battery voltage does not reach the 80% level in 14 hours, the charger will shut off and the "check battery" red LED light will turn on. This is to avoid prolonged charging of a defective battery that will not properly recharge.

E. Remember to unplug the charger before moving the lift. Failure to do so could cause damage to cords, receptacle, and other equipment.

Maintenance (continued)

CAUTION: Before making or breaking connections between charger and battery, always remove the power cord from the 110 volt AC outlet. Always check the battery electrolyte level and add water after charging the battery. For more information, refer to the instructions supplied with the battery charger.

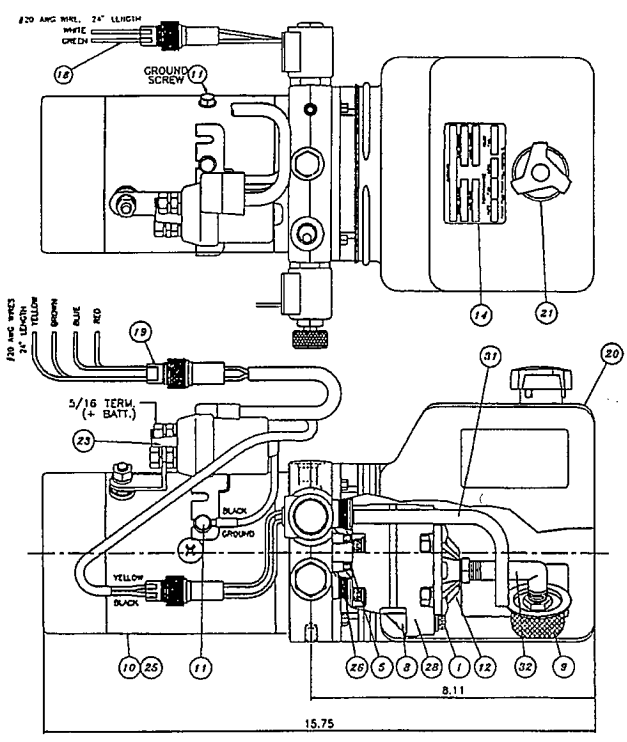
3. Clean battery terminals monthly. Remove the cables from the battery, clean the battery posts and cable ends to shiny metal, and replace. Always connect the insulated cable from the starter solenoid to the positive post. Lube the outside of the connections with petroleum jelly or grease.

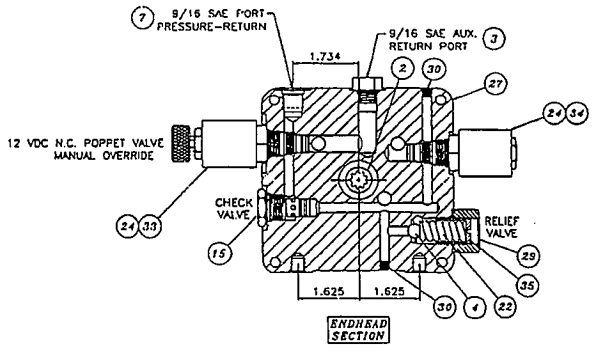
4. Procedure for checking the operation of Normally Open (N.O.) raise valve:

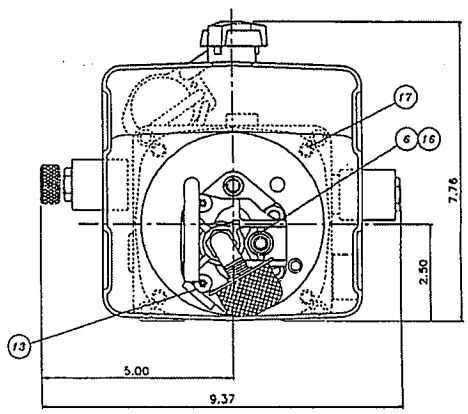
A. Disconnect the jumper wire running from the start solenoid to the N.O. valve.
B. Once the jumper wire is disconnected, activate the "up" function, which causes the motor to run.

NOTE: The platform should not raise, but if the platform begins to raise, the N.O. valve must be cleaned or replaced.

C. Reconnect the jumper wire upon determining that the N.O. valve is properly functioning.







A thorough inspection must be made at least once each year or after approximately each 500 hours of operation. Complete checks should be made on all items listed in the Maintenance Section of this Manual, and necessary adjustments and repairs should be made. In addition to this annual inspection and service, we recommend that all lift chains be replaced every four years.

Trouble Shooting Guide

1. Green "Wheel-Up" button will not light.

Cause

A. The base is not set firmly on foot pads.
B. Low voltage.
C. Burned out bulb.
D. The lift is out of level.
E. Broken or loose wire.

Solution

A. Activate "Wheel-Up" button raising the front caster. This allows the lift to set firmly on the foot pads.
B. Recharge or replace the battery if it can be determined that there are bad cells.
C. Replace bulb.
D. Level the lift with the two adjusting foot pads or relocate lift to a level surface.
E. Repair or replace loose or broken wire.

2. After depressing the "up" switch, the motor runs, but the unit will not lift a load.

Cause

A. There is more than 350 lbs. on platform.
B. N.O. (Normally Open) valve is not being energized.
C. Emergency down valve is open.
D. Mast sections are dirty.

Solution

A. Lift capacity is 350 lbs.
B. Check for voltage at the N.O. valve, no voltage = loose or broken wire; voltage = is it enough voltage to activate the coil? Could be a battery with low voltage or a defective coil. Repair or replace depending upon findings. Repair or replace, depending upon findings.
C. Close emergency down valve.
D. Clean and lubricate masts with a dry silicone.

3. Masts have excessive sway when fully extended.

Cause

Plastic slide blocks are out of adjustment.

Solution

See Maintenance Section on how to adjust plastic guide blocks.

Trouble Shooting Guide (continued)

4. Pump/motor will not run when "up" is activated.

Cause

A. "Emergency Stop" button is activated (pushed in).
B. Green "Wheel-Up" button is not lit.
C. Motor start relay is not activating.
D. Motor start relay is activating, but motor does not.
E. Low Voltage

Solution

A. De-Activate by turning the "Emergency Stop" button counterclockwise.
B. See #1.
C. Is there voltage at the white wire on the motor start relay? If yes, replace a defective motor start relay. If no, check for loose or broken wire. Repair or replace.
D. Is the hydraulic gear pump tied up, preventing the motor from turning? If yes, replace the pump. If no, check motor, may need to be replaced.
E. Recharge or replace the battery.

5. When the master power disconnect is activated, the motor runs without the "up" button being activated.

Cause

A. An electrical short in electrical system.
B. Motor start relay is activated (stuck in the "on" position).

Solution

A. Repair or replace any loose or broken wire.
B. Replace defective motor start relay.

6. Hydraulic cylinder leaks at the gland nut.

Cause

A. Loose gland nut.
B. Bad seals.

Solution

A. Tighten gland nut.
B. Replace seals in hydraulic cylinder. (See Page 46)

Decals for Replacement Ordering

WARNING

Moving telescopic masts will create pinch points. Keep fingers, hands, arms and feet clear of all telescopic mast sections at all times.

FFRFC © Bil-Jax, Inc. 2005 B06-00-0009

B06-00-0009

MASTER POWER SWITCH

RFT © Bil-Jax, Inc. 2005 B06-00-0041

B06-00-0041

CHECK LEVEL WITH CAGE FULLY DOWN

MAX

MIN

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GFR B06-00-0289

B06-00-0289

DANGER

FAILURE TO FOLLOW THESE BATTERY AND CHARGER SAFETY RULES WILL CAUSE SERIOUS INJURY OR DEATH.

ELECTROCUTION HAZARDS

Risk of Electric Shock

- DO NOT expose batteries or charger to water and/or rain.
- DO NOT use frayed or damaged electric cords when charging.
- Connect input cord only to properly grounded three wire outlet with specified voltage and frequency.

BURN HAZARDS

- Batteries contain acid. Always wear protective eyewear, face shield and protective clothing when working on or near battery.

EXPLOSION HAZARDS

- DO NOT contact battery terminals or cable clamps with tools that may cause sparks.
- During charging, explosive oxyhydrogen gas is generated.
- DO NOT smoke or allow open fire, sparks, or embers near battery when charging.

COMPONENT DAMAGE HAZARDS

- Keep terminals and terminal connections clean.
- Batteries must be charged using rated voltage noted on serial plate.
- Consult Operators Manual and Parts and Service Manual for additional information on battery maintenance.

RBATTA © Bil-Jax, Inc. 2005 B06-00-0034

B06-00-0034

OPERATION AND SERVICE MANUAL INSIDE

COFC © Bil-Jax, Inc. 2004 B06-00-0192

B06-00-0192

WARNING

FAILURE TO COMPLY WITH THE FOLLOWING MAINTENANCE REQUIREMENTS COULD RESULT IN SERIOUS INJURY OR DEATH

- Follow complete maintenance schedule outlined in Owner's Manual and Section 6 of the ANSI standard reprinted in the Owner's Manual.
- Inspect all chain assemblies, fasteners, pins, and related parts daily for wear, damage, proper tightness, and function. Replace according to Owner's Manual recommendations.
- Do not overtighten slide blocks.
- Slide block paths must be kept clean – free of dirt, grease, and other foreign material.
- DO NOT use grease, oil, or any similar lubricant on masts or slide blocks. For additional lubrication, use dry silicone *only*.

CFTCOFO © Bil-Jax, Inc. 2004 B06-00-0138

B06-00-0138

BIL-JAX®

B06-00-0161

WARNING

- **Level machine before use.**
- **Failure to level this machine could result in serious injury or death!**
- **If unit becomes out of level, machine will not lift and the green "up" button at the lower control box will not illuminate.**

FFR © bil-jax, inc. 2003 B06-00-0291

B06-00-0291

DANGER

IT IS UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 10 FEET OF HIGH VOLTAGE LINES OF 50,000 VOLTS OR LESS.

For safe clearance of lines in excess of 50,000 volts, see owners manual.

This machine is NOT insulated. Do not use within 10 ft. of power lines or other electrically charged sources. This machine DOES NOT provide protection for personnel from contact with or close proximity to any live electrical power source and should be considered energized by all personnel coming in contact with machine.

CFTRFC © Bil-Jax, Inc. 2005 B06-00-0146

B06-00-0146

CAUTION

This machine is designed and manufactured in compliance with the ANSI 92.3 standard in force on the date of manufacture. Dealers, owners, users, operators, lessors, and lessees are responsible for inspection, maintenance, training, and operation as required by A92.3 and the owners manual.

Alterations, modifications, or changes to this machine without the written authorization of Bil-Jax, Inc. as well as any unauthorized adjustment of valves, disabling or by-passing of safety devices or the improper use of this machine shall exempt Bil-Jax, Inc. from any liability for any resulting injuries or damage.

RFC © Bil-Jax, Inc. 2005 B06-00-0175

B06-00-0175

EMERGENCY LOWERING

TURN RED KNOB COUNTER CLOCKWISE TO LOWER

CCFA B06-00-0286

B06-00-0286

Decals for Replacement Ordering

WARNING

STAY CLEAR
WHILE RAISING
OR LOWERING

CCFO B06-00-0225

B06-00-0225

WARNING

- Do not operate this machine unless you have read and understood all decals on this machine as well as the complete owner's manual.
- Be sure cage is securely fastened to lift by means of 2 U-bolts at mid-rail and 2 hex bolts through the floor of the platform.
- Keep hands and feet inside the cage and clear of telescoping sections during operation.
- Do not lean out over guard rails or attempt to perform work outside the guard rail area.
- Maintain a 10' minimum distance from energized power lines.

FFR © Bil-Jax, Inc. 2005 B06-00-0292

B06-00-0292

MAXIMUM CAPACITY

350 LBS. OR 1 OCCUPANT PLUS 170 LBS.

FFR © Bil-Jax, Inc. 2004 B06-00-0293

B06-00-0293

WARNING

OPERATION INSTRUCTIONS
FOR tom...C.A.T. MODELS

1) Read and follow safety precautions and all responsibilities sections as set forth in the operators manual.
2) Position the lift at the work area. Make sure the lift is on a firm and level surface and that there are no potential hazards such as overhead obstructions or electrically charged conductors. DO NOT use the lift where such hazards exist.
3) Check the machine for damage or worn parts and repair or replace as necessary.
4) Check to be sure that the cage is properly attached to the lift. (There should be two (2) u-bolts holding the midrail to the mast and two (2) hex bolts through the floor of the platform and fastened to the mast.)
5) From the lower control box, depress the green "wheel up" button which will raise the caster located under the cage, allowing the lift to drop firmly onto the two (2) foot pads. When properly positioned, the green "wheel up" button will light. NOTE: If the green "wheel up" button does not light, level the machine by adjusting the two leveling pads located under the cage while referencing the bubble level on the base.
6) Raise the empty platform to the height at which you intend to work by turning the selection switch to the "up" function. Check again to be sure that the platform's path of travel is free from obstructions and reposition the lift as necessary. DO NOT use if lift is not operating properly.
7) Again check to see that the lift is positioned properly on the two (2) foot pads and the "wheel up" button is lit (Step 5). Enter the cage and make sure the cage entrance midrail drops into its proper position.
8) The machine is now ready for operation. Depress the "on" push button and while holding it down, depress the desired function "up" or "down". The platform will raise or lower respectively. The emergency stop deactivates the control circuit only. NOTE: Should the platform continue to raise after the "up" button is released, push the "on" button and "down" button simultaneously and the platform should stop or lower.

FFR © Bil-Jax, Inc. 2005 B06-00-0294

B06-00-0294

DANGER

FAILURE TO COMPLY WITH THE FOLLOWING SAFETY INSTRUCTIONS OR ANY OTHER IMPROPER USE OF THIS EQUIPMENT WILL RESULT IN SERIOUS INJURY OR DEATH.

BEFORE USE

- Operator must read and understand owners manual and all decals on machine before operating. It is your responsibility to comply with all warnings and instructions.
- Survey the job site for all potential hazards.
- Inspect unit for damaged parts. DO NOT operate until all damaged parts have been replaced and all maintenance has been performed as outlined in owners manual.
- Never Take Chances—DO NOT use the machine if you are under the influence of drugs, or alcohol, or if you feel dizzy, ill, or unsteady in any way.
- Operate on firm and level surface only.
- Cordon off area around base to keep personnel and other equipment away from unit while in use.

DURING USE

- DO NOT use where lift can come into contact with overhead obstructions such as electric wire, cables, ropes, overhangs, etc.
- DO NOT use boxes, ladders, scaffolding, fork lifts, planking, or other means to increase working height.
- DO NOT use lift if exposed to wind, rain, snow, or ice.
- DO NOT exceed rated load capacity of platform.
- DO NOT exert horizontal force to the platform while performing work.
- DO NOT use in areas where there are cranes or other moving vehicles.
- DO NOT stand or sit on guard railing.
- DO NOT lean out over guard rails or attempt to perform work outside the guard rail area.
- DO NOT use without entry bar in place.
- Stay clear of all moving parts and keep all personnel clear while raising and lowering platform.
- DO NOT allow ropes, electric cords, hoses, etc. to become entangled in the lift while platform is being raised or lowered.
- DO NOT modify lift or bypass safety devices.
- DO NOT move lift with a person or material on board.
- DO NOT climb up or down mast.
- Plug in charger at end of each day.

OWNERS AND OPERATORS ARE RESPONSIBLE FOR INSPECTION, MAINTENANCE, TRAINING AND OPERATION AS REQUIRED BY THE OWNERS MANUAL AND THE ANSI B.20 STANDARD (IN EFFECT AT DATE OF MANUFACTURE).

If you have not been provided with safety literature, or for any questions concerning the safe use of this equipment, call 419-445-8915.

BIL-JAX

FFR © Bil-Jax, Inc. 2005 B06-00-0295

B06-00-0295

Battery Charger Receptacle 115V

CTFR © Bil-Jax, Inc. 2005 B06-00-0296

B06-00-0296

CTFR B06-00-0297

Forklift Pockets

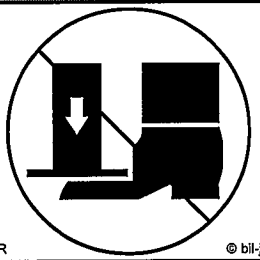
© Bil-Jax, Inc. 2004

B06-00-0297

tom...C.A.T. 24

B06-00-0301

WARNING



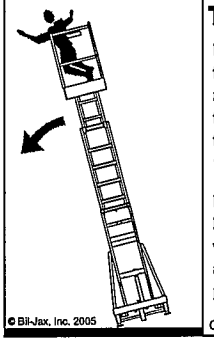
Stand clear when lowering lift onto the foot pads as required for proper operation.

Contact with foot pads will cause serious crushing injury.

COFR © bil-jax, inc. 2003 B06-00-0306

B06-00-0306

WARNING



Tip Over Hazard

Battery weight is critical for lift stability. This lift must be equipped with two batteries having a total minimum weight of 130 lbs.

DO NOT replace with batteries of lessor weight. Use only Bil-Jax authorized replacement parts.

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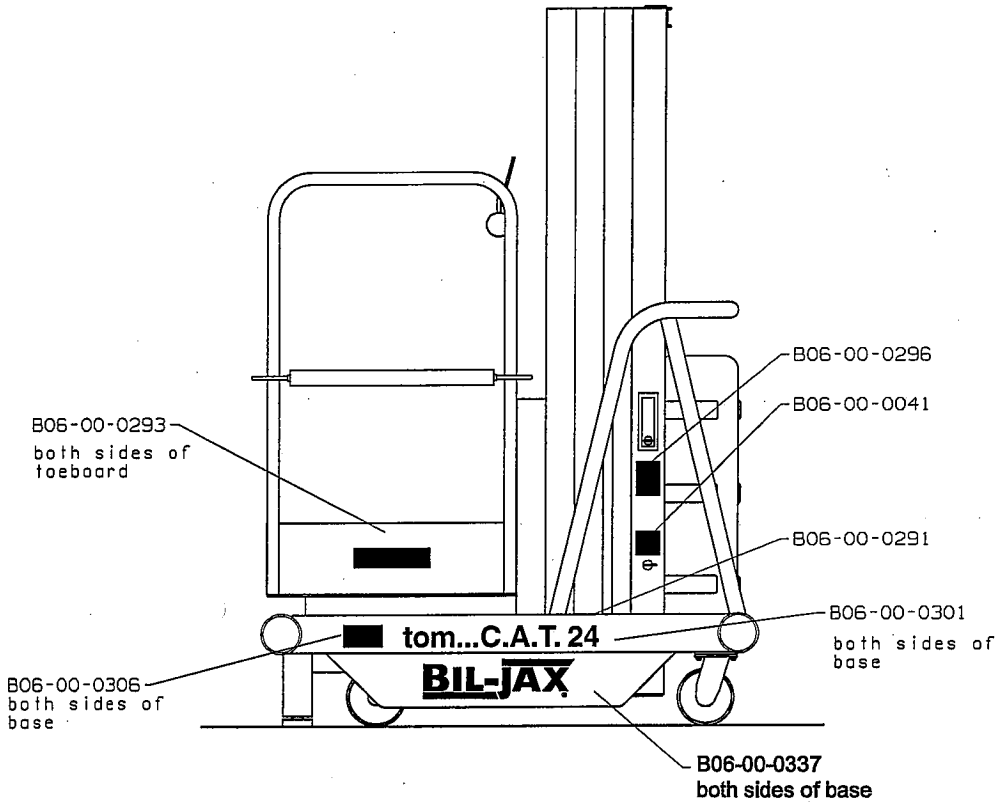
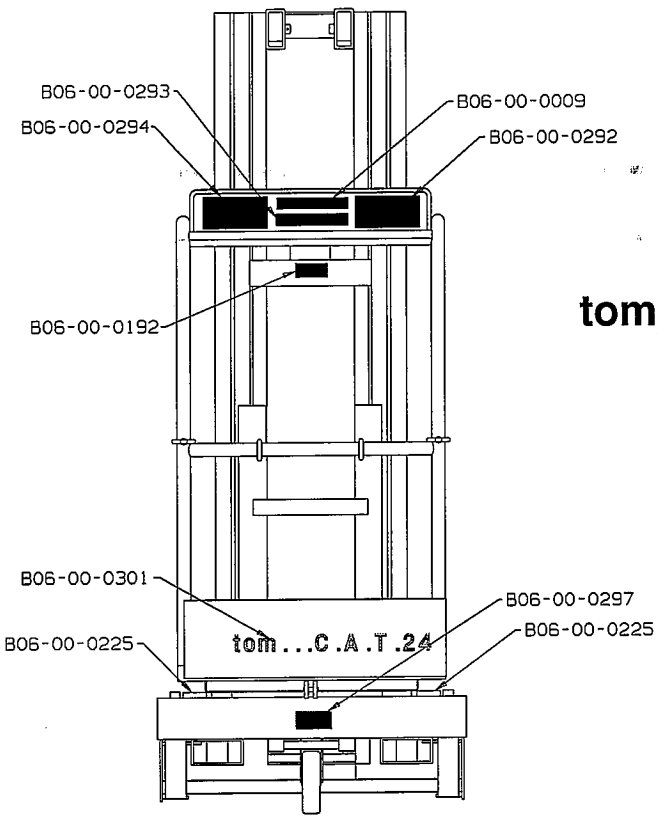
B06-00-0320

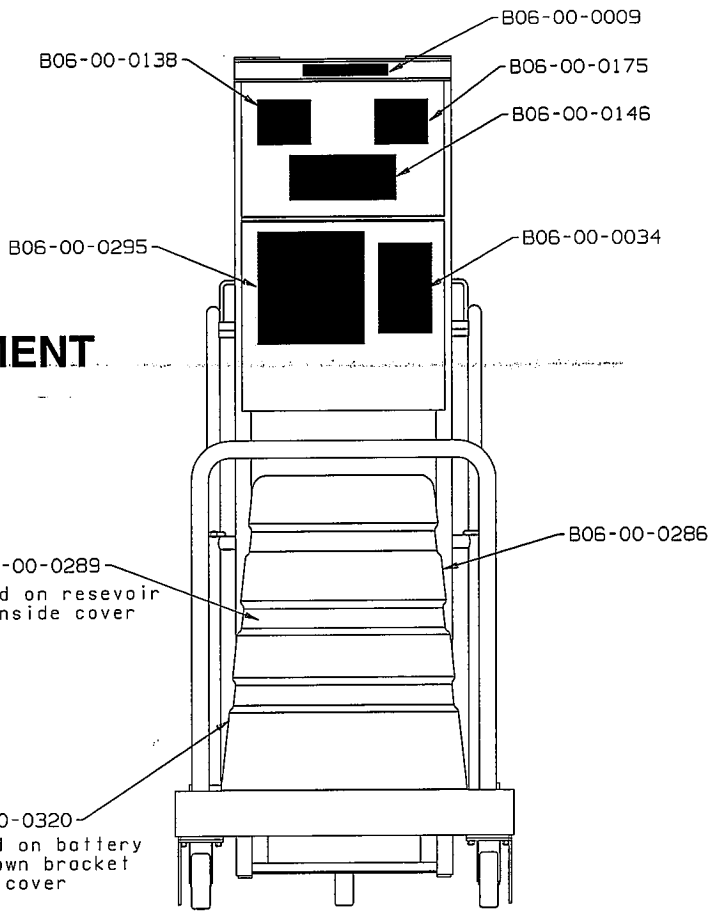
tom...C.A.T. 24 DECAL PLACEMENT
Side View



PART NO.	DESCRIPTION	QTY.
B06-00-0009	WARNING MOVING MASTS...	2
B06-00-0034	DANGER...DURING CHARGING...	1
B06-00-0041	MASTER PWR. SWITCH	1
B06-00-0138	WARNING...(MAIN)	1
B06-00-0146	DANGER...(ELECTRICITY)	1
B06-00-0175	CAUTION...THIS MACHINE...92.3...	1
B06-00-0192	OPER. & SERV. MANUAL	1
B06-00-0225	WARNING STAY CLEAR...	2
B06-00-0286	EMERGENCY LOWERING	1
B06-00-0289	CHECK LEVEL	1
B06-00-0291	WARNING-LEVEL MACHINE...	1
B06-00-0292	WARNING...(DECAL FOR CAGE)	1
B06-00-0293	MAXIMUM CAPACITY...350LBS. ...	3
B06-00-0294	WARNING...OPERATION INSTRUCTIONS...	1
B06-00-0295	DANGER...MAIN WARNING DECAL	1
B06-00-0296	BATTERY CHARGER RECEPTACLE...	1
B06-00-0297	FORKLIFT POCKETS	1
B06-00-0301	tom...C.A.T. 24	3
B06-00-0306	WARNING...STAND CLEAR	2
B06-00-0320	WARNING...BATTERY WEIGHT TIP OVER	1
B06-00-0161	BIL-JAX - TRANSFER	2
B06-01-0024	DECAL SET (INCLUDES ALL ABOVE DECALS)	1

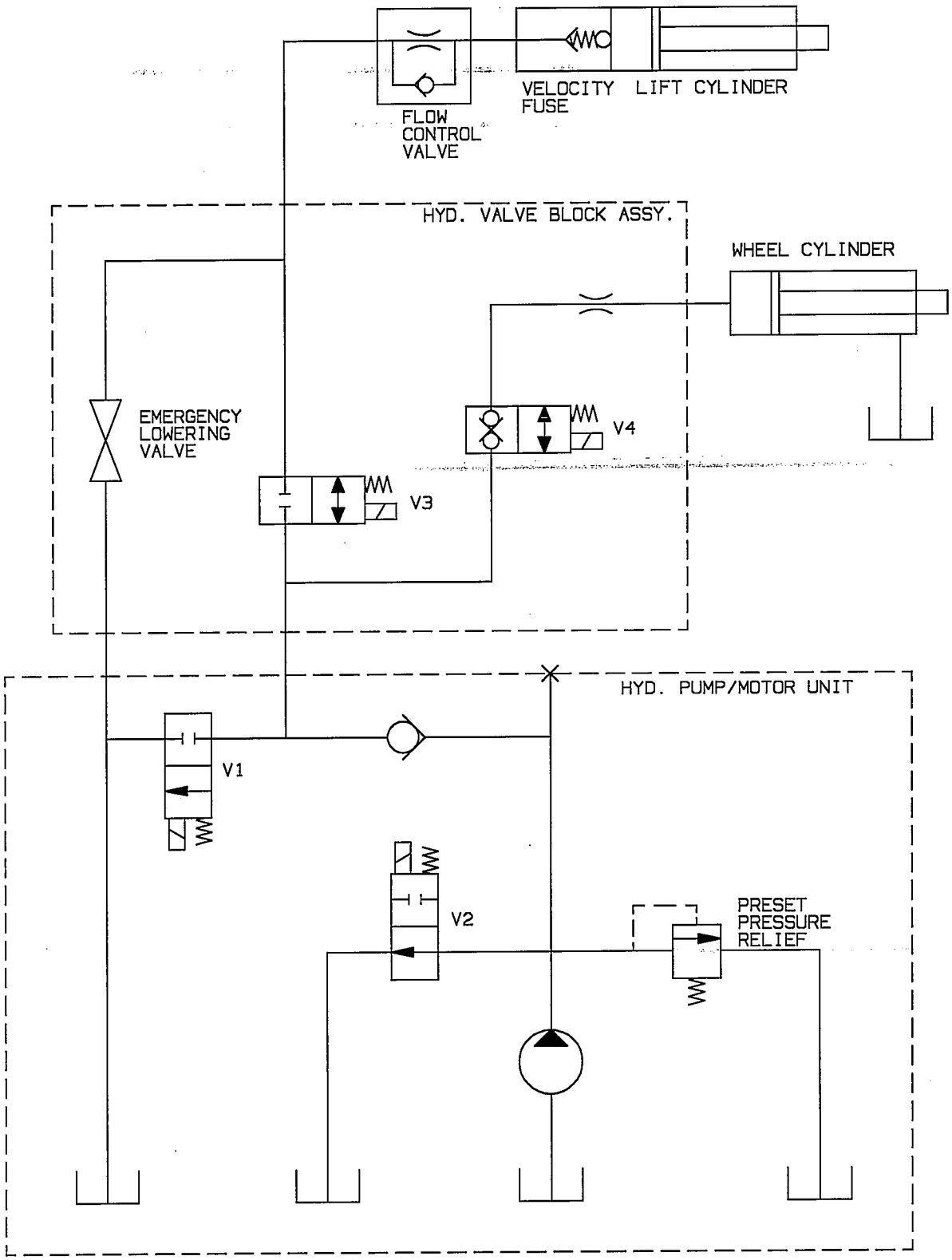


tom...C.A.T. 24 DECAL PLACEMENT
Front View



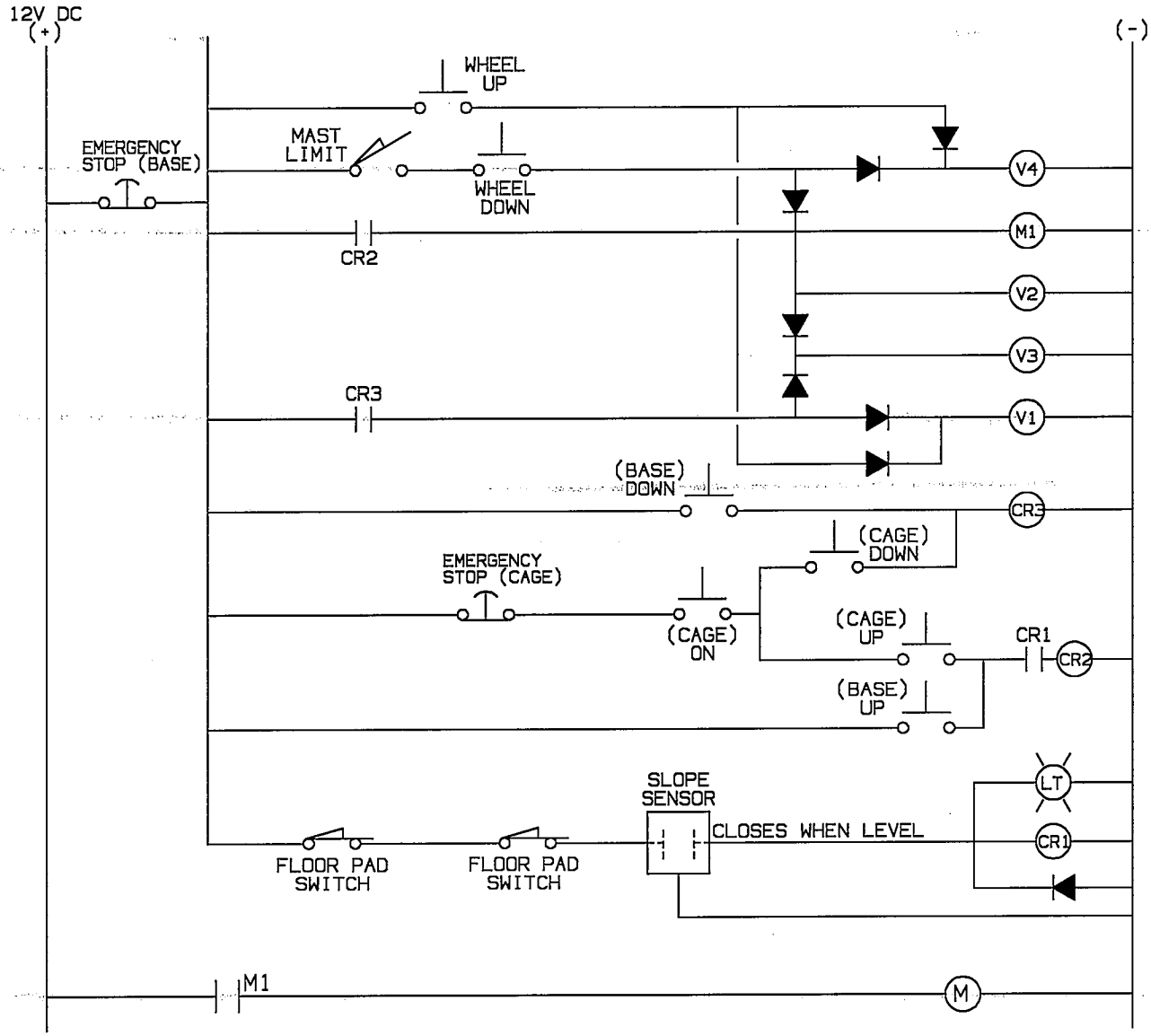
tom...C.A.T. 24 DECAL PLACEMENT
Back View

Hydraulic Schematic



V1 = N.C. (NORMALLY CLOSED) SOLENOID VALVE
V2 = N.O. (NORMALLY OPEN) SOLENOID VALVE
V3 = RAISE/LOWER SOLENOID VALVE
V4 = WHEEL RAISE/LOWER SOLENOID VALVE

Electrical Schematic



CR1 = CONTROL RELAY #1
CR2 = CONTROL RELAY #2
CR3 = CONTROL RELAY #3
LT = GREEN LIGHT

M = MOTOR
M1 = MOTOR START RELAY
V1 = N.C. (NORMALLY CLOSED) SOLENOID VALVE
V2 = N.O. (NORMALLY OPEN) SOLENOID VALVE
V3 = RAISE/LOWER SOLENOID VALVE
V4 = WHEEL RAISE/LOWER SOLENOID VALVE

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Parts Diagram Section

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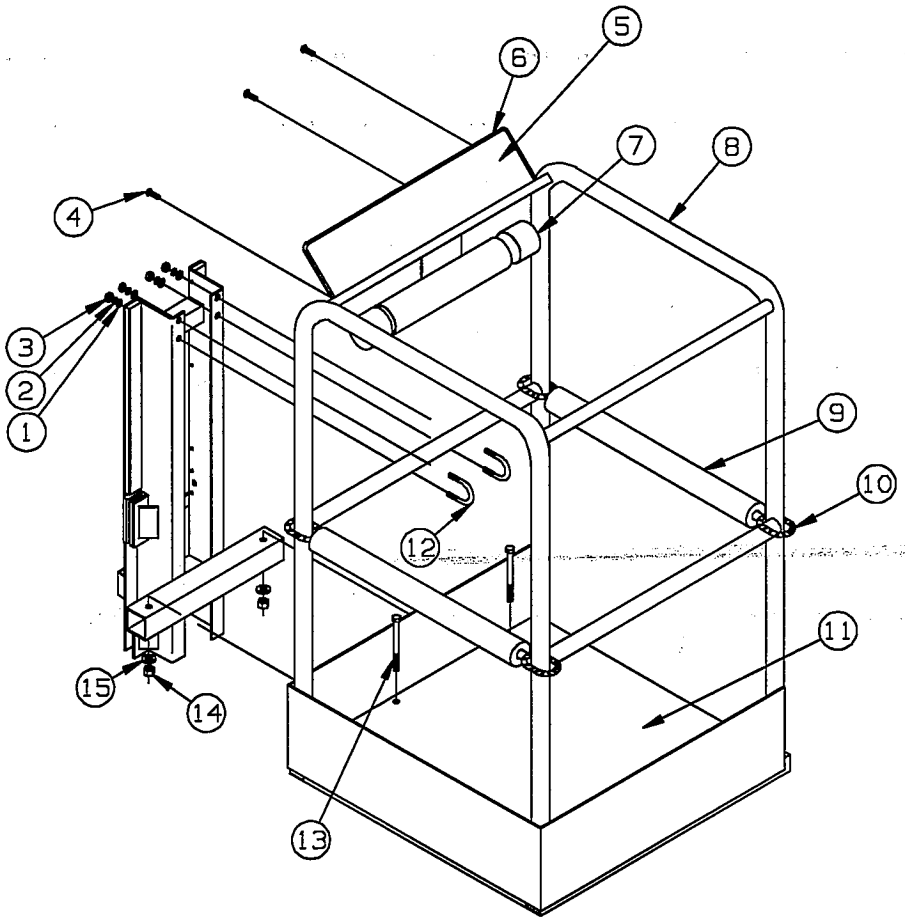
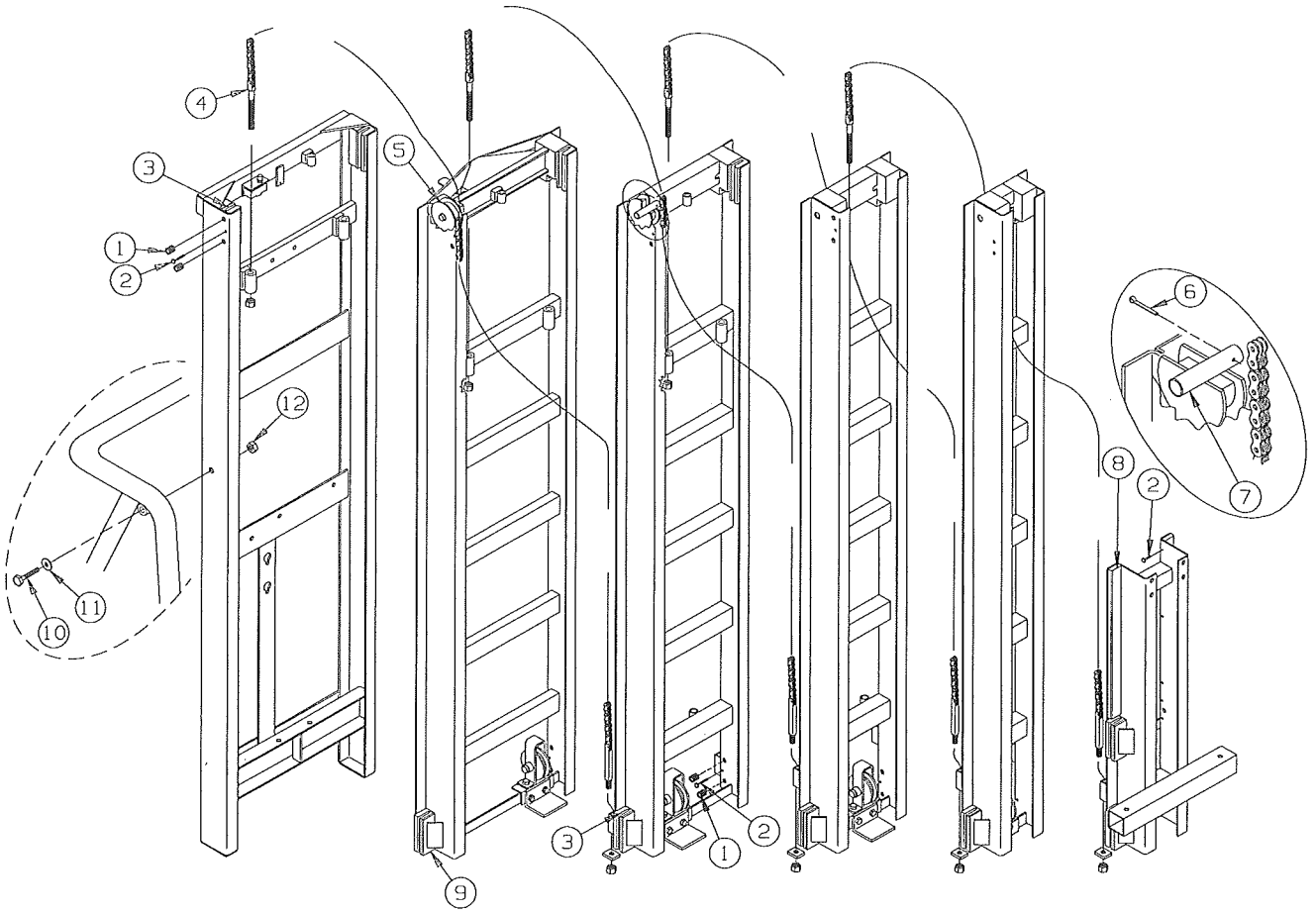
Cage & Cage Mounting Breakdown



ITEM#	PART#	DESCRIPTION	QTY.
1	0090-0420	FLAT WASHER - 5/16"	4
2	0090-0208	LOCK WASHER - 5/16"	4
3	0090-0160	NUT - 5/16"	4
4	0090-0344	SCREW - 10-24 X 1/2"	3
5	B07-05-0006	DECAL PLATE	1
6	B34-00-0005	EDGE TRIM	31.5"
7	B00-00-0014	CAP FOR MANUAL TUBE	2
8	B17-00-0042**	CAGE & PLATFORM WELD'T.	1
9	B05-00-0001	MIDRAIL PAD	2
10	B00-00-0086	MIDRAIL WEAR GUIDE	8.5"
11	B44-00-0010	PLYWOOD FLOOR	1
12	0090-0662	U-BOLT-5/16"-18 X 1-3/8" X 2-3/16"	2
13	0090-0058	BOLT-3/8"-16 X 4"	2
14	0090-0162	NUT - 3/8"	2
15	0090-0210	LOCKWASHER - 3/8"	2

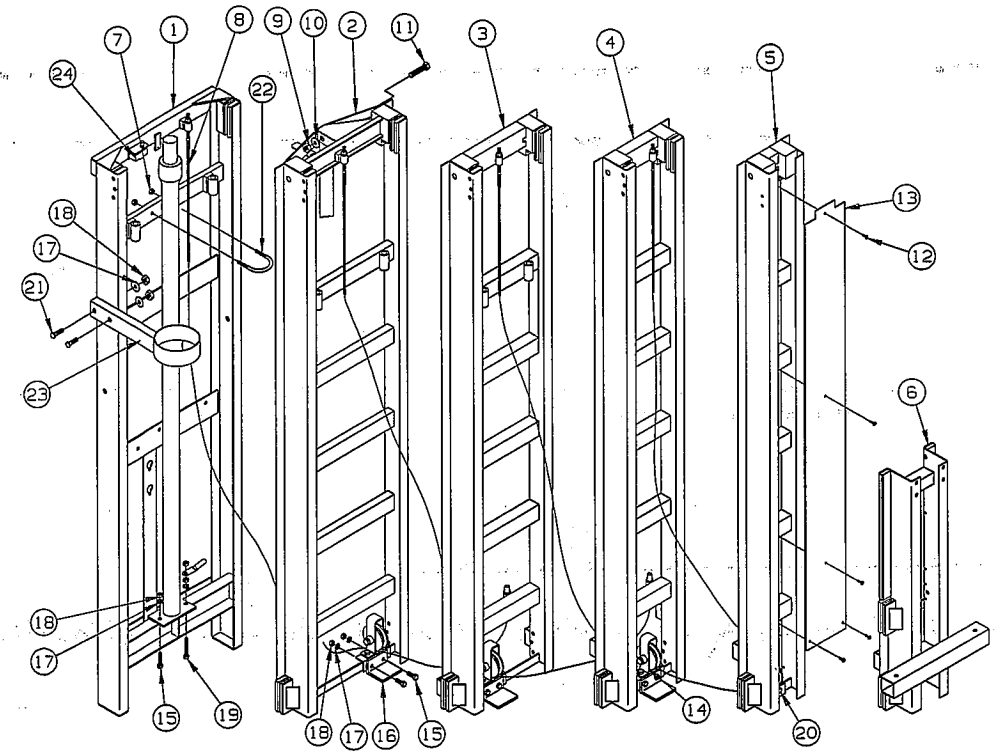
****NOTE: B17-00-0067 CAGE & PLATFORM ASSY. (INCLUDES ITEMS; 5, 6, 7, 8, 9, 10 & 11)**

Lift Chain/Guide Block Breakdown - tom...C.A.T. 24



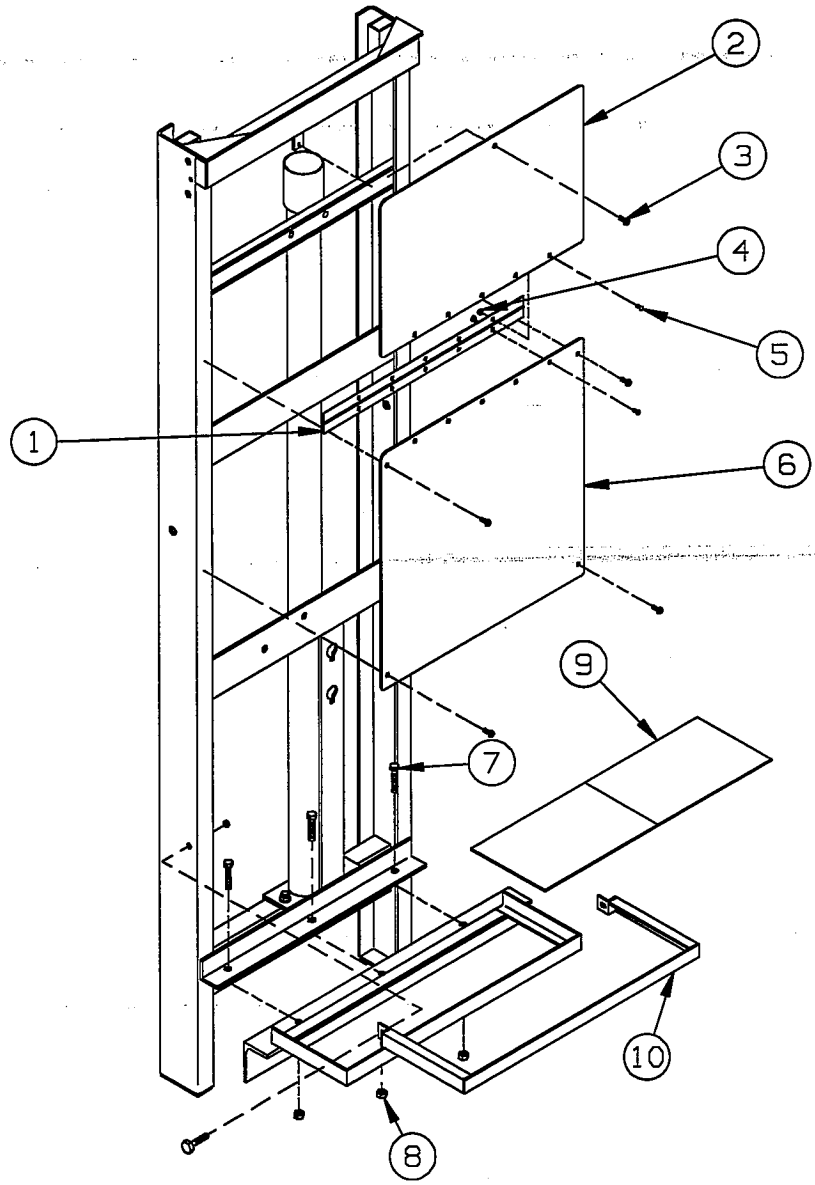
ITEM#	PART#	DESCRIPTION	QTY.
1	0090-0389	SET SCREW- 1/2"-20 X 1/2"	36
2	0090-0403	SCREW- 10-24 X 1"	30
3	B31-00-0009	PLASTIC SLIDE BLOCK	18
4	B03-00-0009	LIFT CHAIN ASSY.	8
5	B26-00-0009	CHAIN SHEAVE	8
6	0090-0770	COTTER PIN	8
7	B36-01-0002	SHEAVE AXLE	8
8	B31-00-0002	PLASTIC SLIDE BLOCK- 16-3/4"	2
9	B31-00-0001	PLASTIC SLIDE BLOCK	2
10	0090-0072	BOLT- 1/2" X 2-3/4"	2
11	0090-0574	WASHER- 1/2"	2
12	0090-0192	NYLON LOCKNUT- 1/2"	2

Mast/Pull Down Cable Breakdown - tom...C.A.T. 24



ITEM#	PART#	DESCRIPTION	QTY.
1	B16-02-0012	BASE MAST SECTION	1
2	B16-02-0013	MAST SECTION #1	1
3	B16-02-0003	MAST SECTION #2	1
4	B16-02-0004	MAST SECTION #3	1
5	B16-02-0005	MAST SECTION #4	1
6	B16-02-0006	MAST SECTION #5	1
7	0090-0185	NYLON LOCKNUT - 5/16"-18	2
8	B40-00-0003	PULL DOWN CABLE ASSY.	4
9	0090-0166	NUT - 1/2"	1
10	0090-0212	LOCKWASHER - 1/2"	1
11	0090-0071	BOLT - 1/2"-13 X 2-1/2"	1
12	0090-0344	SCREW - 10-24 X 1/2"	5
13	B18-00-0048	INTERIOR MAST COVER	1
14	B03-00-0011	PULL DOWN BRACKET ASSY.	4
15	0090-0043	BOLT - 3/8"-16 X 1-1/4"	7
16	B29-00-0033	MAST STOP	3
17	0090-0210	LOCKWASHER - 3/8"	12
18	0090-0162	NUT - 3/8"-16	13
19	0090-0045	BOLT - 3/8"-16 X 1-1/2"	1
20	0090-0042	BOLT - 3/8"-16 X 1"	2
21	0090-0048	BOLT - 3/8"-16 X 2"	2
22	0090-0654	U-BOLT	1
23	B29-00-0105	ELECT. TUBE HOLDER	1
24	B01-03-0009	LIMIT SWITCH	1

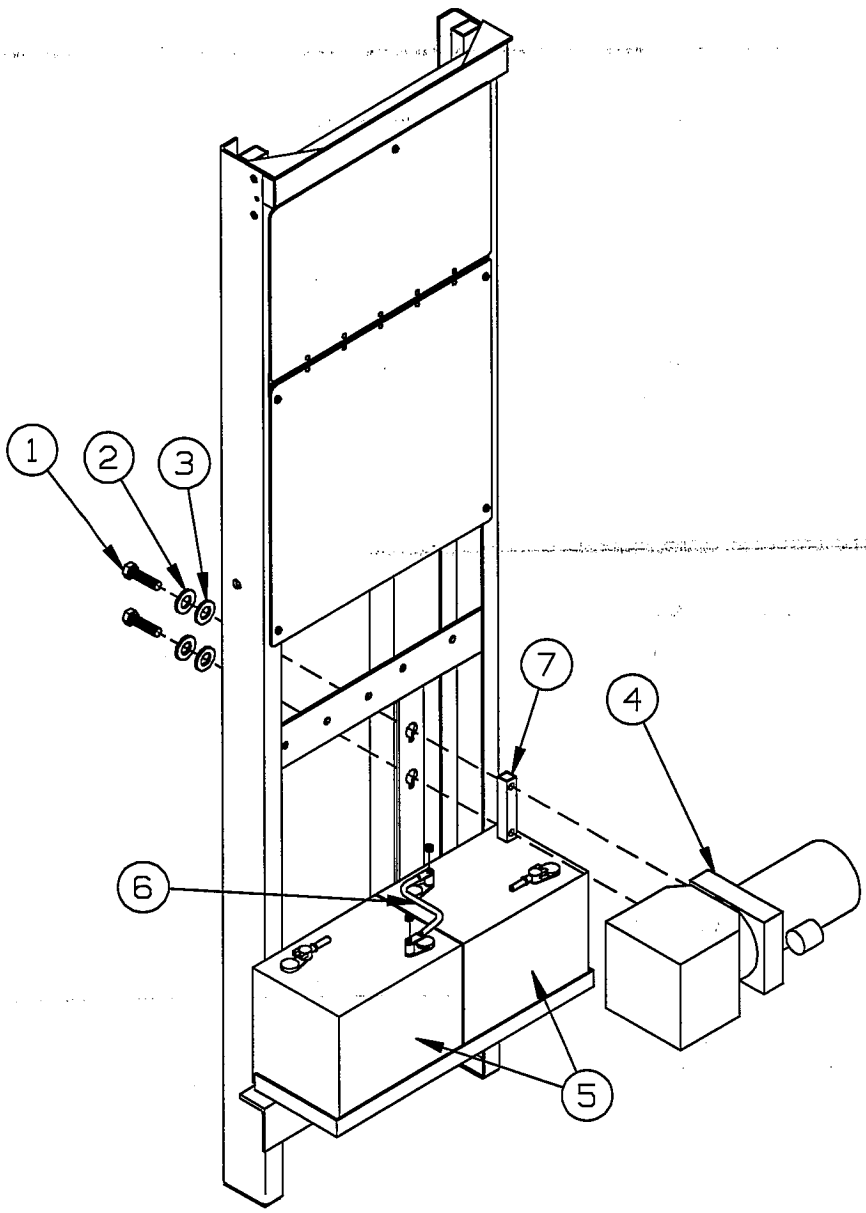
Mast Cover/Base Mast Mounting Breakdown



ITEM#	PART#	DESCRIPTION	QTY.
1	B42-01-1007**	HINGE	1
2	B07-05-0056**	MAST COVER-TOP HALF	1
3	0090-0344	SCREW - #10-24 X 1/2"	5
4	0090-0181**	NYLON LOCKNUT - #8-32	10
5	0090-0226**	BOLT- #8-32 X 5/8"	10
6	B07-05-0057**	MAST COVER-BOTTOM HALF	1
7	0090-0042	BOLT - 3/8"-16 X 1"	3
8	0090-0188	NYLON LOCKNUT - 3/8"	3
9	B00-00-0099	BATTERY PAD	2
10	B29-00-0107	BATTERY HOLDDOWN	1

****B03-00-0093 COMPLETE MAST COVER ASSY. (INCLUDES: 1,2,4,5 & 6)**

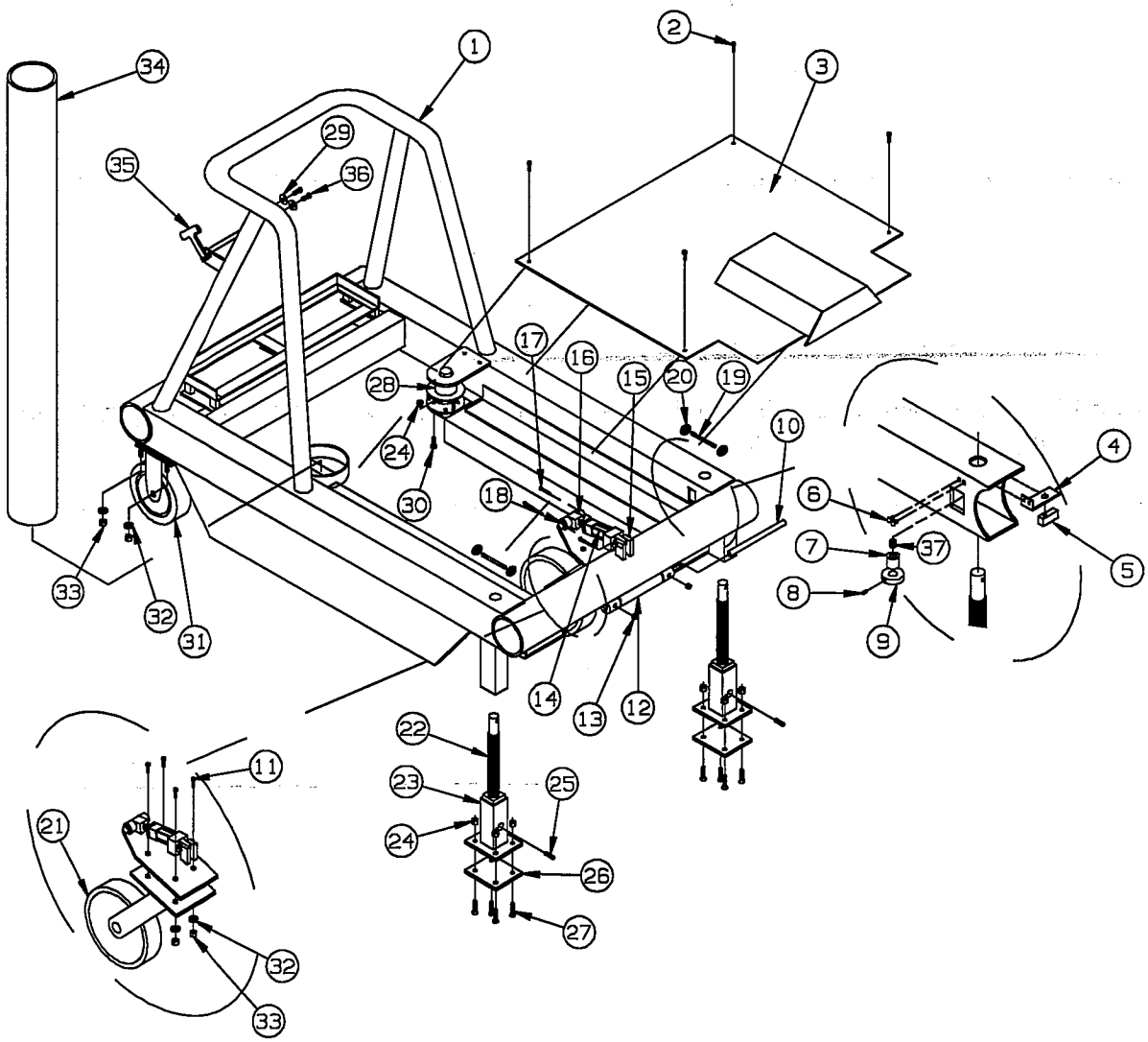
Pump/Motor & Battery Mounting Breakdown



ITEM#	PART#	DESCRIPTION	QTY.
1	0090-0045	BOLT - 3/8"-16 X 1-1/2"	2
2	0090-0210	LOCKWASHER - 3/8"	2
3	0090-0422	FLAT WASHER - 3/8"	2
4	B02-05-0002**	PUMP/MOTOR ASSY.	1
5	B01-04-0001	BATTERY - 6VOLT	2
6	B01-01-0014	BATTERY CABLE - 8"	1
7	B30-00-0018	SPACER	1

NOTE: SEE FURTHER BREAKDOWN ON PAGE 44 & 45

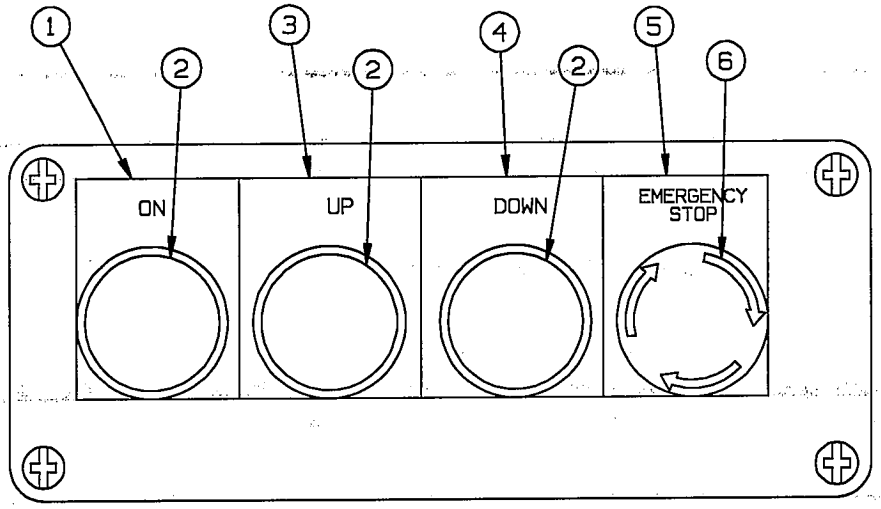
Base Assembly Breakdown

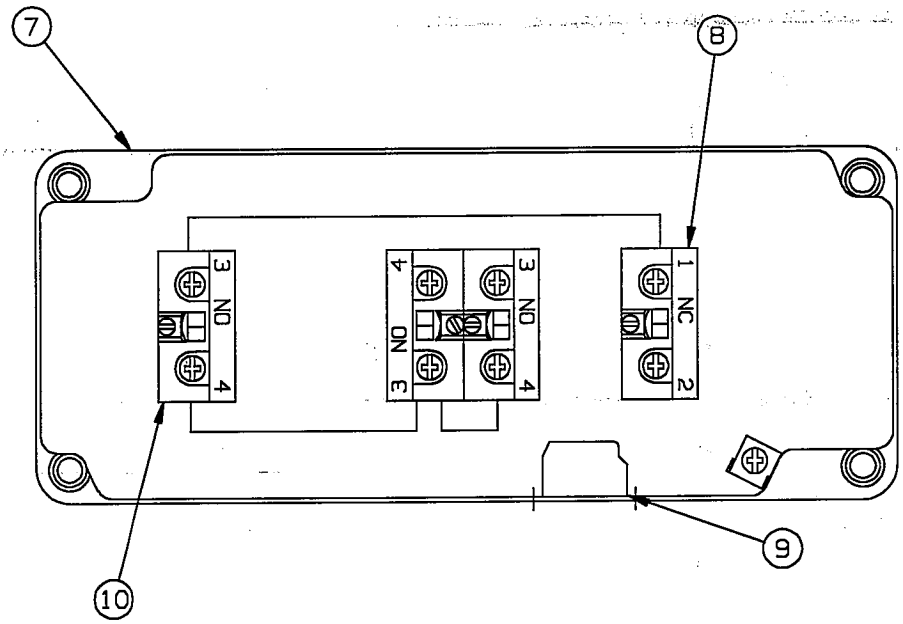


Base Assembly Breakdown Listing

ITEM#	PART#	DESCRIPTION	QTY.
1	B11-01-0052	BASE WELD'T.	1
2	0090-0344	SCREW - #10-24 X 1/2"	4
3	B18-00-0100	COVER	1
4	B29-00-0108	LIMIT SWITCH MOUNTING BRACKET	2
5	B01-03-0009	LIMIT SWITCH	2
6	0090-0231	BOLT -#10-24 X 1/2"	4
7	B30-00-0033	SPACER	2
8	0090-0355	SET SCREW - 1/4"-20	2
9	B07-06-1017	COLLAR	2
10	B36-01-0015	PIN FOR CASTER PLATE	1
11	0090-0042	BOLT - 3/8" X 1"	4
12	B11-01-0072	HINGED CASTER MTG. PLATE	1
13	0090-0355	SET SCREW	2
14	B02-03-0010	HYD. WHEEL CYLINDER	1
15	B36-01-0016	MOUNTING PIN FOR CYLINDER UPPER	1
16	B07-06-5236	ROD END FOR HYD. CYL.	1
17	0090-0147	COTTER PIN	3
18	B36-01-0017	MOUNTING PIN FOR CYLINDER	1
19	B46-00-0017	HANDLE	2
20	B46-00-0008	BALL KNOB	2
21	B08-01-0012	8" CASTER ASSY.	1
22	B23-02-0033	THREADED ROD	2
23	B11-01-0066	FOOT WELD'T.	2
24	0090-0183	NYLON LOCKNUT - 1/4"-20	12
25	0090-0319	ROLL PIN - 1/4" X 1-1/4"	2
26	B23-02-0034	RUBBER FOOT PAD	2
27	0090-0829	SCREW - 1/4"-20 X 1-1/4"	8
28	B01-10-0135	LEVEL SENSOR	1
29	0090-0205	LOCKWASHER - #10	4
30	0090-0005	BOLT -1/4"-20 X 3/4"	4
31	B08-01-0002	8" SWIVEL CASTER ASSY.	2
32	0090-0210	LOCKWASHER - 3/8"	12
33	0090-0162	NUT - 3/8"	12
34	B00-00-0013	PLASTIC ELECTRICAL TUBE	1
35	B42-00-0011	DRAW LATCH	2
36	0090-0236	BOLT - #10-24 X 3/4"	4
37	B39-00-0022	SPRING	2

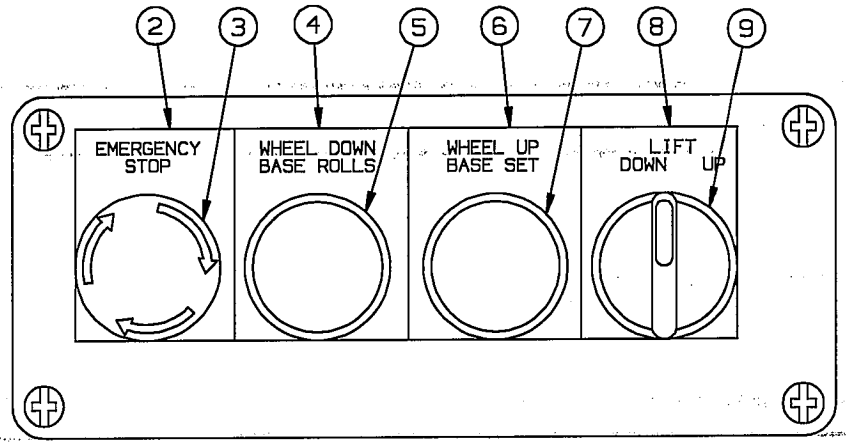
Upper Control Box Breakdown

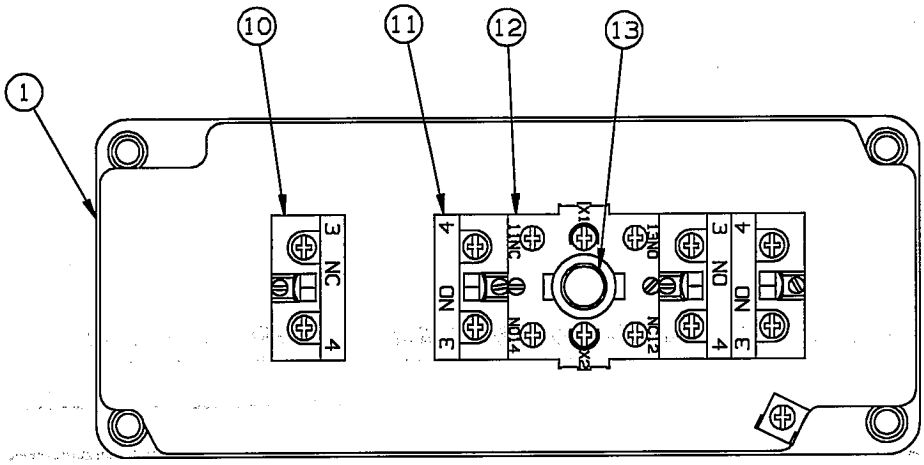




ITEM#	PART#	DESCRIPTION	QTY.
1	B00-00-0015	"ON" LEGEND PLATE	1
2	B01-02-0003	PUSH BUTTON	3
3	B00-00-0090	"UP" LEGEND PLATE	1
4	B00-00-0040	"DOWN" LEGEND PLATE	1
5	B00-00-0017	"EMERGENCY STOP" LEGEND PLATE	1
6	B01-02-0004	EMERGENCY STOP BUTTON	1
7	B19-00-0023	4 POS. CONTROL BOX-ONLY	1
8	B01-02-0006	CONTACT BLOCK N.C.	1
9	B01-09-0027	STRAIN RELIEF BUSHING	1
10	B01-02-0005	CONTACT BLOCK N.O.	5
**	B01-02-0048	CONTROL BOX ASSEMBLY (INCLUDES ITEM# 1-10, EXCEPT 9)	

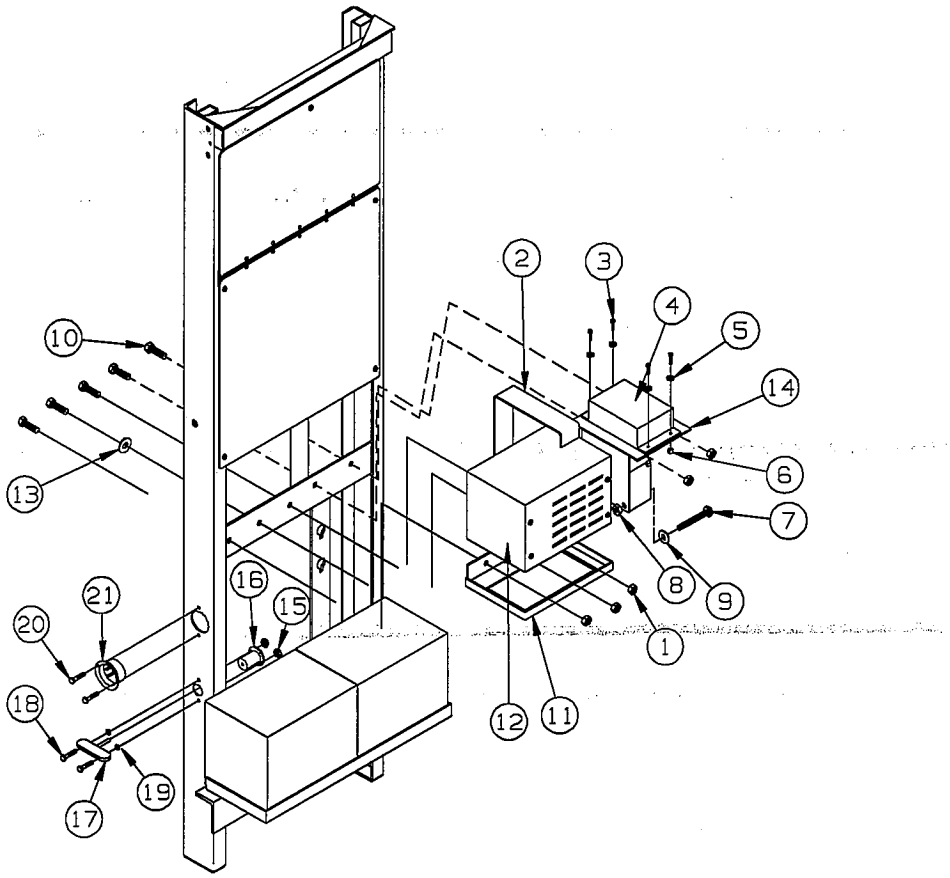
Lower Control Box Breakdown





ITEM#	PART#	DESCRIPTION	QTY.
1	B19-00-0023	4 POS. CONTROL BOX-ONLY	1
2	B00-00-0017	"EMERGENCY STOP" LEGEND PLATE	1
3	B01-02-0004	EMERGENCY STOP BUTTON	1
4	B00-00-0091	"WHEEL DOWN" LEGEND PLATE	1
5	B01-02-0003	PUSH BUTTON	1
6	B00-00-0092	"WHEEL UP" LEGEND PLATE	1
7	B01-02-0028	GREEN PUSH BUTTON	1
8	B00-00-0093	"LIFT-DOWN-UP" LEGEND PLATE	1
9	B01-02-0025	SELECTOR SWITCH	1
10	B01-02-0006	CONTACT BLOCK N.C.	1
11	B01-02-0005	CONTACT BLOCK N.O.	3
12	B01-02-0029	LIGHTED PUSH BUTTON CONTACT	1
13	B01-10-0042	BULB - 12V	1
**	B01-02-0049	CONTROL BOX ASSEMBLY (INCLUDES ITEM# 1-13)	

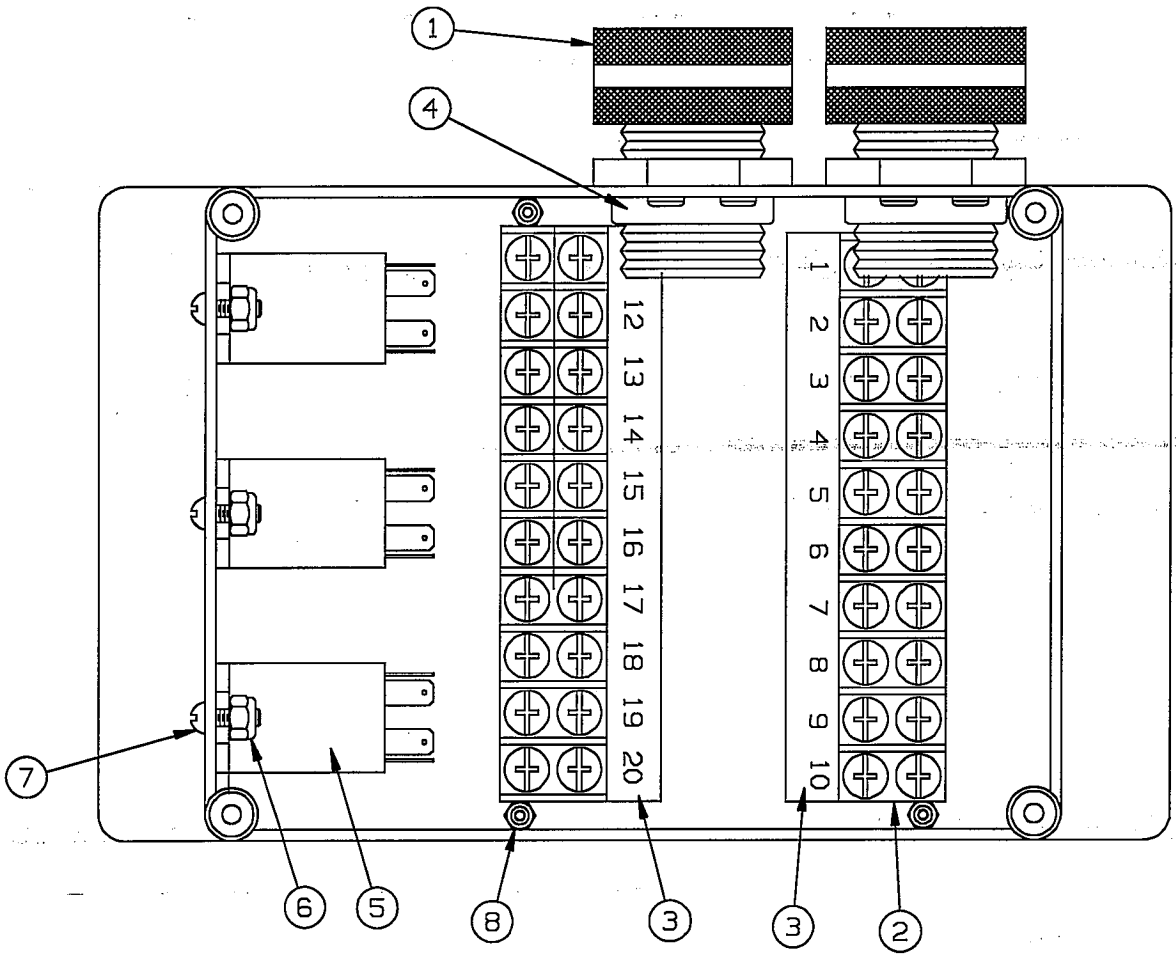
Electric & Hydraulic Component Breakdown



ITEM#	PART#	DESCRIPTION	QTY.
1	0090-0188	NYLON LOCKNUT - 3/8"-16	5
2	B29-00-0101	BATT. CHARGER HOLD DOWN BRKT.	1
3	0090-0232	BOLT - 10-24 X 5/8"	4
4	B19-00-0022 **	ELECTRICAL BOX - ONLY	1
5	0090-0415	FLATWASHER #10	4
6	0090-0182	NYLON LOCKNUT - 10-24	4
7	0090-0456	BOLT - 1/4"-20 X 3"	2
8	0090-0183	NYLON LOCKNUT - 1/4"	2
9	0090-0419	FLAT WASHER - 1/4"	2
10	0090-0042	BOLT - 3/8"-16 X 1"	5
11	B29-00-0100	BATT. CHARGER MTG. BRKT.	1
12	B01-05-0039	BATTERY CHARGER 12V 25AMP	1
13	0090-0422	FLAT WASHER - 3/8"	1
14	B29-00-0102	ELECT. BOX/HYD. BLOCK MTG. BRACKET	1
15	0090-0551	NYLON LOCKNUT	2
16	B01-02-0009	MASTER POWER SWITCH	1
17	B38-00-0002	KEY	1
18	0090-0233	SCREW	2
19	0090-0415	WASHER	2
20	0090-0344	SCREW	2
21	B01-10-0003	FLUSH MOUNT RECEPTACLE-MALE	1

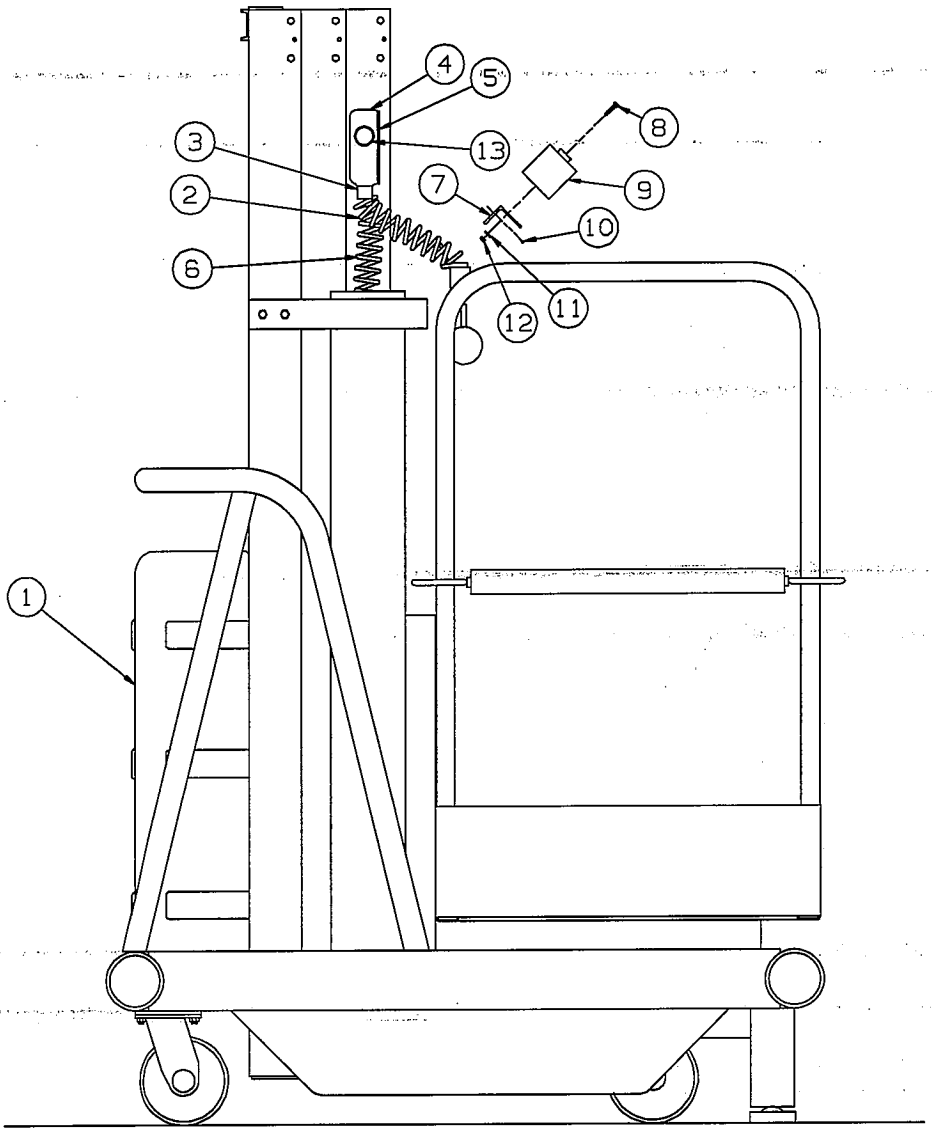
****SEE FURTHER BREAKDOWN PAGE 41**

Electrical Box Breakdown



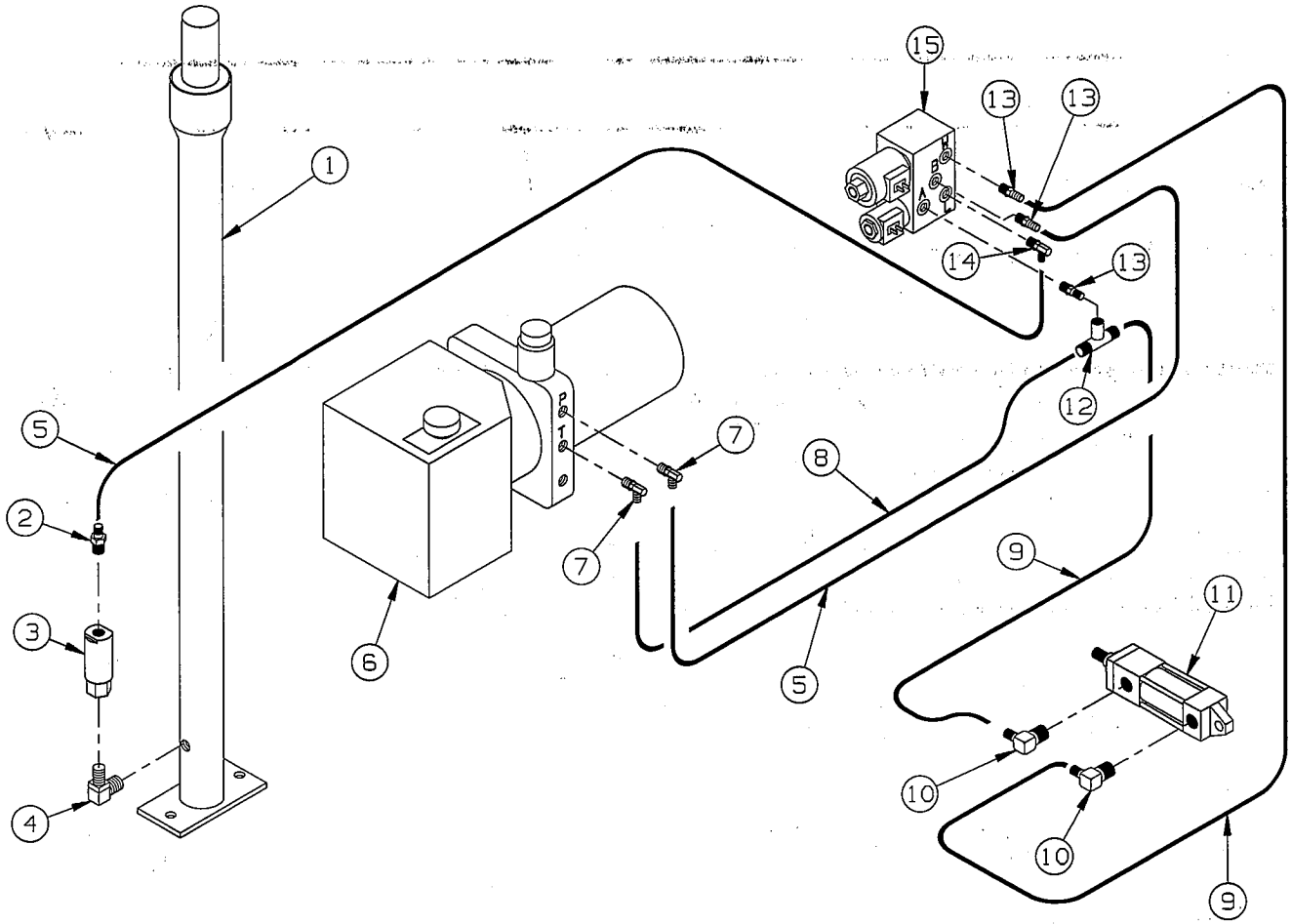
ITEM#	PART#	DESCRIPTION	QTY.
1	B01-09-0020	CORD GRIP - 3/4"	2
2	B01-10-0085	TERMINAL STRIP - 10POS.	2
3	B01-10-0099	TERMINAL NUMBER STRIP	2
4	B01-09-0021	LOCK NUT FOR CORD GRIP - 3/4"	2
5	B01-06-0015	RELAY - 12V	3
6	0090-0180	NYLON LOCKNUT	10
7	0090-0218	BOLT - 6-32 X 1/2"	6
8	0090-0690	BOLT - 6-32 X 5/8"	4

Electrical Cord Breakdown



ITEM#	PART#	DESCRIPTION	QTY.
1	B18-00-0096	REAR COMPONENT COVER	1
2	B01-01-0111	CORD 18-5 X 16"	1
3	B01-09-0029	CORD GRIP	1
4	B01-10-0048	UNILET BOX	1
5	B01-10-0049	COVER FOR UNILET BOX	1
6	B01-01-0046	RETRACTIBLE CORD 18-5	1
7	B29-00-0036	MOUNTING BRACKET FOR CNTRL. BOX	1
8	0090-0232	BOLT - 10-24 X 5/8"	2
9	B19-00-0023	4 POS. CONTROL BOX	1
10	0090-0344	SCREW - 10-24 X 1/2	2
11	0090-0205	LOCKWASHER - #10	2
12	0090-0157	NUT - 10-24	2
13	B01-09-0066	CORD GRIP	1

Hydraulic Diagram

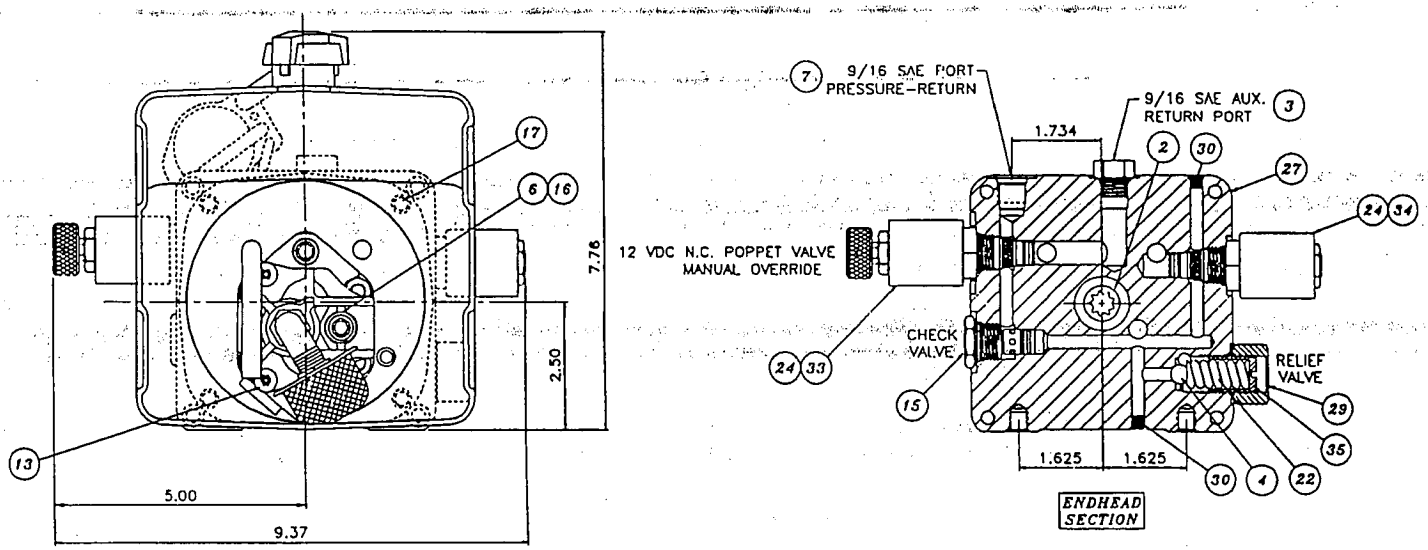


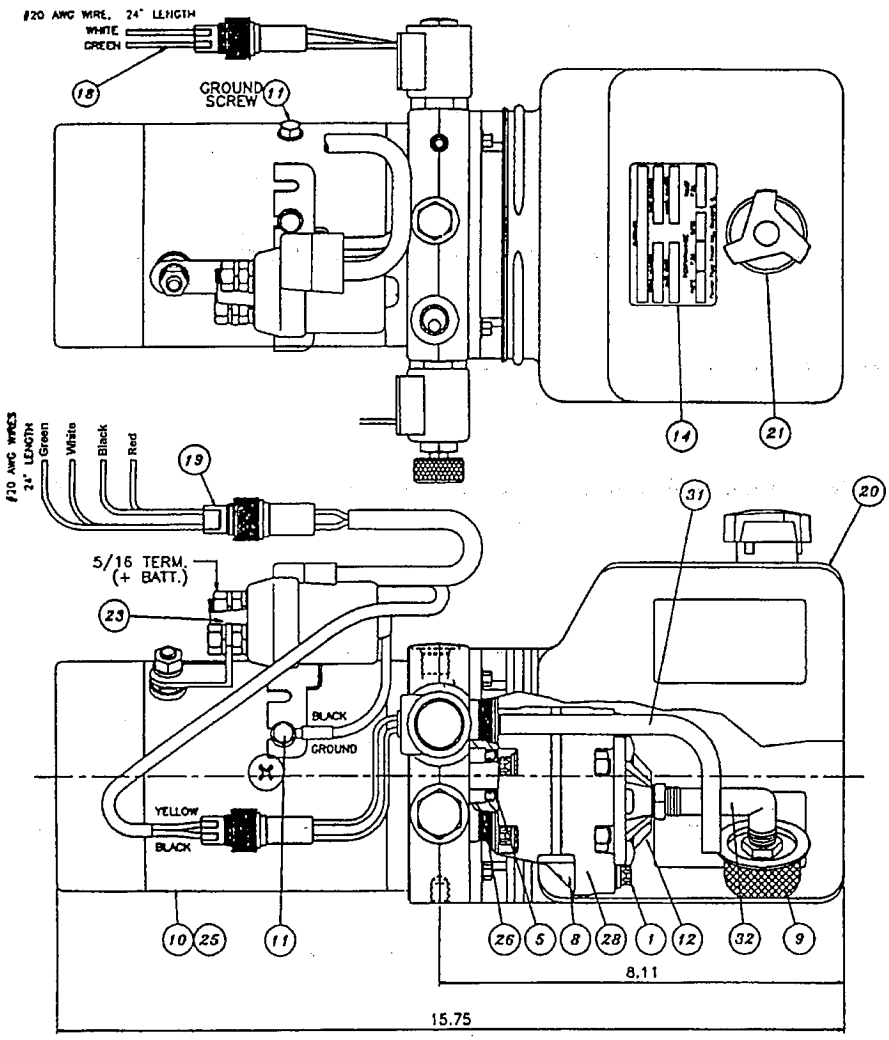
ITEM#	PART#	DESCRIPTION	QTY.
1	B02-03-0002	1.5" DISP. HYD. CYLINDER	1
2	B02-02-0003	FITTING	1
3	B02-04-0002	1.25 FLOW CONTROL	1
4	B02-02-0041	FITTING	1
5	B02-01-0110	22" HYD. HOSE ASSY.	2
6	B02-05-0007	12VDC PUMP/MOTOR ASSY.	1
7	B02-02-0072	FITTING	2
8	B02-01-0116	16" HYDRAULIC HOSE ASSY.	1
9	B02-01-0113	80" HYD. HOSE ASSY.	2
10	B02-02-0001	FITTING	2
11	B02-03-0010	HYD. WHEEL CYL.	1
12	B02-02-0162	TEE FITTING	1
13	B02-02-0163	FITTING	3
14	B02-02-0069	FITTING	1
15	B02-04-0047	HYD. MANIFOLD BLOCK ASSY.	1

Hydraulic Unit Parts Listing

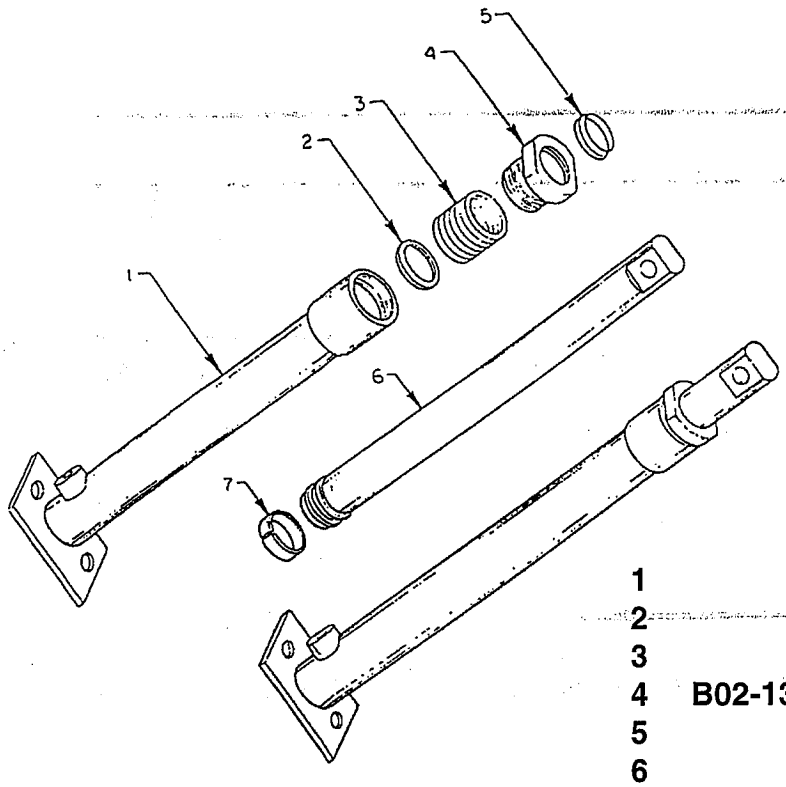
ITEM #	PART #	DESCRIPTION	QTY.
1	B02-15-0088	Bolt 5/16-24 x 2.75 Torx	2
2	B02-15-0119	Coupling SAE 9T-20/40 .26	1
3	B02-15-0195	Plumbing Plug 9/16 SAE	1
4	B02-15-0128	Ball 0.375 Steel G50	1
5	B02-15-0091	Seal Shaft 0.500 x 1.00	1
6	B02-15-0093	Washer 0.338 x 6.25 x .060 S	1
8	B02-15-0061	Plumbing Magnet	1
9	B02-15-0121	Filter 149 Micron 1.50 x 1	1
10	B02-15-0122	Motor DC 12V 1T Std. Duty	1
11	B02-15-0123	Screw Taptite 1/4-20 x .25	3
12	B02-15-0125	Cover suction 3/8 NPT	1
13	B02-15-0126	Screw Taptite M6 x 1 12mm	2
14	B02-15-0102	Nameplate Fenner Serial	1
15	B02-15-0197	Valve Cartridge Check	1
16	B02-15-0198	Bolt 5/16-18 x 1.00 Torx	1
17	B02-15-0199	Bolt #12-24 x .50 Hex Washer	4
18	B02-15-0348	Wiring Assembly 2 Pin (Female)	1
19	B02-15-0346	Wiring Assembly 4 Pin (Male)	1
20	B02-15-0200	Tank Plastic 6.7 OS 07.5"	1
21	B01-15-0201	Breather Plastic	1
22	B02-15-0127	Spring RV 3000-4000 PSI BL	1
23	B02-15-0345	12VDC Smart Start Solenoid	1
24	B02-15-0349	Solenoid Coil 12V DC 2 Pin	1
25	B02-15-0114	1/8 x 1/4 Pin	1
26	B02-15-0073	O-Ring 2-348 Buna	1
27	B02-15-0203	Endhead Finished	1
28	B02-15-0078	Pump Assembly 1.6 Short Spline	1
29	B02-15-0030	Relief Cap Assembly (B-2)	1
30	B02-15-0204	Plumbing Plug 1/16 NPT FLU	2
31	B02-15-0205	3/8 Return Tube 90 Deg Ben	1
32	B02-02-0059	Nylon Ell (X-111)	1
33	B02-15-0350	2 Way N.C. Valve Body	1
34	B02-15-0351	2 Way N.O. Valve Body	1
35	B02-02-0026	Valve Screw Adjustment	1

Hydraulic Unit Parts Breakdown





Lift Cylinder Breakdown



1		Cylinder Jacket
2		Washer
3		Rod Packing
4	B02-13-0031	Gland Nut
5		Rod Wiper
6		Piston Rod
7		Wear Ring
8	B02-13-0001	Seal Repair Kit (Includes items 2, 3, 5, 7)

Repairing Hydraulic Cylinder

1. Be sure cylinder is completely retracted and pressure is released from the system. Disconnect hose line, drain oil, and remove cylinder from the unit.
2. Remove gland nut, washer, and rod packing from the tube cylinder jacket.
3. Clean internal tube and inspect piston rod for gouges, scratches, or wear, and replace if necessary.
4. Place piston rod back into cylinder jacket and insert washer.
5. Grease the rod packing on the inside and outside diameters. Reinstall one ring at a time, making sure each ring lies flat on the ring prior to it. Replace the gland nut complete with a new rod wiper, if worn. Thread it down until it makes contact with the rings.
6. Reinstall the cylinder into the unit and reconnect the hose line.
7. Stoke the cylinder to allow rod packing rings to seat and align, then tighten gland nut an additional 1-1/2 to 2 turns, making sure that the air has been bled from the cylinder. The distance between the top of the threaded collar and the bottom of the large section on the gland nut should be 5/16" to 1/4". **DO NOT OVER TIGHTEN GLAND NUT.**

Damaged Equipment Policy

SAFETY STATEMENT:

At Workforce, we are dedicated to the safety of all users of our products. Therefore, all Workforce lifts are designed, manufactured and tested to comply with current applicable Federal OSHA and ANSI codes and regulations.

DAMAGE POLICY:

There may be occasions when a Workforce lift is involved in an incident which results in structural damage to the lift. This can seriously compromise the ability of the lift to perform in a safe manner. Therefore, whenever a Workforce lift is damaged structurally or when there is the possibility of structural damage (this damage may be internal and is not always visible to the naked eye), Workforce requires that the lift be returned to our facility at 125 Taylor Parkway for reconditioning. If you have any questions concerning what constitutes structural damage, please call the Workforce Service Department at 419-445-9675.

DAMAGE REPAIR NOTICE:

There may be occasions when a Workforce lift is involved in an incident resulting in non-structural damage. When this occurs and repairs are made by the owner or area distributor, please notify Workforce of these non-maintenance repairs and request a repair form to be filled out and returned to Workforce.

The following sections are reprinted from the ANSI A92.3-1990 code in effect at the time of manufacture. Permission to reprint has been granted by the Scaffold Industry Association.

5. Responsibilities of Dealers

5.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, applications, and operation consistent with all data available regarding the parameters intended use and expected environment shall be applied in the training of operators, in maintenance, application, and operation of the aerial platform with due consideration of the knowledge that the unit will be carrying personnel.

5.2 Manuals. Dealers shall keep and maintain copy(ies) of the operating and maintenance manual(s) required in 4.17. Copy(ies) of operating manual(s) shall be provided upon each rental or lease delivery. Copy(ies) of operating and maintenance manual(s) shall be provided upon each sale delivery. The operating manual(s) shall be stored in the location required by 4.18. These manual(s) are considered an integral part of the aerial platform and are vital to communicate necessary safety information to users and operators.

5.3 Predelivery Preparation. Aerial platforms shall be inspected, serviced, and adjusted to manufacturer's requirements prior to each delivery by sale, lease, or rental.

5.4 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable: (1) All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means. (2) Powerplant stopped and starting means rendered inoperative (3) Platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components (5) Safety props or latches installed where applicable as described by the manufacturer.

5.5 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

5.6 Training. Whenever a dealer directs or authorizes an individual to operate an aerial platform, the dealer shall ensure that the individual has been trained under the direction of a qualified person in accordance with the manufacturer's operating and maintenance manual and requirements listed in Section 8 before operating the aerial platform.

5.6.1 Training on Delivery. Manufacturer's operating instruction and required training on the proper use and operation of the aerial platform shall be provided upon each delivery, by sale, lease, or rental.

5.7 Operation. When a dealer operates an aerial platform in sales demonstrations or for other beneficial use, the dealer shall assume the responsibilities of users as specified in Section 7 and the operating personnel shall assume the responsibilities of operators as specified in Section 8 of this standard.

5.8 Assistance to Owners and Users. If a dealer is unable to answer an owner's or user's question relating to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the dealer shall obtain the proper information from the manufacturer and provide that information to the owner or user.

5.9 Record Retention. Dealer(s) shall retain the following records for at least 3 years: (1) Name and address of the purchaser of each aerial platform by serial number and the date of delivery (2) Records of the person(s) trained upon each delivery of an aerial platform (3) Records of the predelivery preparation performed prior to each delivery.

5.10 Modifications. Modifications or alterations of aerial platforms shall be made only with prior written permission of the manufacturer.

5.11 Manufacturer's Safety Bulletins. The dealer shall comply with safety-related bulletins as received from the manufacturer.

6. Responsibilities of Owners

6.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of the responsibilities of owners with due consideration of knowledge that the unit will be carrying personnel.

6.2 Manuals. Owners shall keep and maintain copy(ies) of the operating and maintenance manual(s) required in 4.17 of this standard. Copy(ies) of operating manual(s) shall be provided upon each rental or lease delivery. Copy(ies) of operating and maintenance manuals(s) shall be provided upon each sale delivery. The operating manual(s) shall be stored in the location required in 4.18 of this standard. These manual(s) are considered an integral part of the aerial platform and are vital to communicate necessary safety information to users and operators.

6.3 Maintenance. The owner of an aerial platform shall arrange that the maintenance specified in this standard is properly performed on a timely basis. The owner shall establish a preventive maintenance program in accordance with the manufacturer's recommendations and based on the environment and severity of use of the aerial platform. The owner shall arrange that frequent and annual inspections are performed. All malfunctions and problems noted shall be corrected before the aerial platform is returned to service.

6.4 Frequent Inspection. The owner of an aerial platform shall cause a frequent inspection to be performed on an aerial platform: (1) That has been in service for 3 months or 150 hours, whichever comes first (2) That has been out of service for a period longer than 3 months.
The inspection shall be made by a person qualified as a mechanic on the specific make and model of the aerial platform. The inspection shall include all items specified by the manufacturer for a frequent inspection and shall include, but not be limited to, the following: (3) All functions and their controls for speed(s), smoothness, and limits of motion (4) Emergency lowering means (5) All chain and cable mechanisms for adjustment and worn or damaged parts (6) All emergency and safety devices (7) Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant, as specified by the manufacturer (8) Visual inspection of structural components and other critical components, such as fasteners, pins, shafts, and locking devices (9) Placards, warnings, and control markings (10) Items specified by the manufacturer (11) Correction of all malfunctions and problems identified and further inspection, if necessary.

6.5 Annual Inspection. The owner of an aerial platform shall cause an annual inspection to be performed on the aerial platform no later than 13 months from the date of the prior annual inspection. The inspection shall be made by a person qualified as a mechanic on the specific make and model of the aerial platform. The inspection shall include all items specified by the manufacturer for an annual inspection.

6.6 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable: (1) All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means (2) Powerplant stopped and starting means rendered inoperative (3) Platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components (5) Safety props or latches installed where applicable as described by the manufacturer.

6.7 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

6.8 Maintenance Training. The owners shall train their maintenance personnel in inspection and maintenance of the aerial platform in accordance with 6.3, 6.4, 6.5, 6.6, 6.7 and 6.9 of this standard, and with the manufacturer's recommendations.

6.9 Operator Training. An owner who directs or authorizes an individual to operate an aerial platform shall ensure that the individual has been trained in accordance with the manufacturer's operating manual, and requirements listed in Section 8 of this standard before operating the aerial platform. Manufacturer's operating instruction and required training on the proper use and operation of the aerial platform shall be provided upon each delivery, by sale, lease, or rental.

6.10 Operation. When an owner operates an aerial platform, the owner shall have the responsibilities of users as specified in Section 7 of this standard, and the operating personnel shall have responsibilities of operators as specified in Section 8 of this standard.

6.11 Assistance to Users and Operators. If an owner is unable to answer a user's or operator's questions related to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the owner shall obtain the proper information from the dealer or manufacturer and provide that information to user or operator.

6.12 Record Retention. The owner shall retain the following records for at least 3 years: (1) Name and address of the purchaser of each aerial platform by serial number and date of delivery (2) Records of the person(s) trained upon each delivery of an aerial platform (3) Written records of the frequent and annual inspections performed by the owner. The record shall include deficiencies found, corrective action, and identification of the person(s) performing the inspection and repairs (4) Records of the predelivery preparation performed prior to each delivery.

6.13 Modifications. The owner shall not modify or concur in modifications or alteration to the aerial platform without the modifications being approved and certified in writing by the manufacturer.

6.14 Manufacturer's Safety Bulletins. The owner shall comply with safety-related bulletins as received from the manufacturer or dealer.

7. Responsibilities of Users.

7.1 Basic Principles. The information in this standard must be supplemented by good job management, safety control, and the application of sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment. Since the user has direct control over the application and operation of aerial platforms, conformance with good safety practices in this area is the responsibility of the user and the operating personnel, including the operator. Decisions on the use and operation of the aerial platform must always be made with due consideration for the fact that the machine will be carrying personnel whose safety is dependent on those decisions.

7.2 Manuals. Users shall keep and maintain copy(ies) of the operating and maintenance manual(s) required in 4.17

of this standard. The operating manual(s) shall be stored in the location required in 4.18 of this standard. These manuals are considered an integral part of the aerial platform and are vital to communication of necessary safety information to users and operators.

7.3 Inspection and Maintenance. Users shall inspect and maintain the aerial platform as required to ensure proper operation. The frequency of inspection and maintenance shall be determined by the manufacturer's recommendation and be compatible with operating conditions and the severity of the operating environment. Aerial platforms that are not in proper operating condition shall be immediately removed from service until repaired. Repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

7.3.1 Frequent Inspection. An inspection as outlined in 6.4 of this standard shall be conducted.

7.3.2 Annual Inspection. An inspection as outlined in 6.5 of this standard shall be conducted.

7.3.3 Prestart Inspection. Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and function test including but not limited to the following: (1) Operating and emergency controls (2) Safety devices (3) Personal protective devices, including fall protection (4) Air, hydraulic and fuel system leaks (5) Cables and wiring harness (6) Loose or missing parts (7) Tires and wheels (8) Placards, warnings, and control markings (9) Outriggers, stabilizers, and other structures (10) Guardrail system (11) Items specified by the manufacturer.

7.3.4 Maintenance Safety Precautions. Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable: (1) All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means (2) Powerplant stopped and starting means rendered inoperative (3) Platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping (4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components (5) Safety props or latches installed where applicable as described by the manufacturer (6) Precautions specified by the manufacturer.

7.4 Replacement Parts. When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

7.5 Maintenance Training. The user shall train the maintenance personnel in inspection and maintenance of the aerial platform in accordance with 7.3, 7.4, and 7.6 of this standard and with the manufacturer's recommendations.

7.6 Operator Training. Whenever a user directs or authorizes an individual to operate an aerial platform, the user shall ensure that the individual has been trained in accordance with the manufacturer's operation and maintenance manual, the user's work instructions, and the requirements listed in Section 8 of this standard before operating the aerial platform.

7.6.1 Model Training. The user shall be responsible for the operator being trained on the model of the aerial platform to be operated. Such training shall be in an area free of obstructions, under the direction of a qualified person for a time sufficient to determine that the trainee displays proficiency in knowledge and actual operation of the aerial platform. Only properly trained and authorized personnel shall be permitted to operate the aerial platform.

7.6.2 Trainees Training Record. A record of the trainee's aerial platform instruction shall be maintained by the user for at least 3 years.

7.7 Before Operation. Before authorizing an operator to operate an aerial platform, the user shall ensure that the operator has: (1) Been instructed by a qualified person in the intended purpose and function of each control (2) Read and understood the manufacturer's operating instructions and user's safety rules, or been trained by a qualified person on the contents of the manufacturer's operating instructions and user's safety rules (3) Understood by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the aerial platform (4) Determine that the purpose for which the aerial platform is to be used is within the scope of the intended applications defined by the manufacturer (5) Been provided with approved fall protection devices and other safety gear for all personnel on the platform (see 4.9.5).

7.8 Work Place Inspection. Before the aerial platform is used and during use, the user shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to: (1) Drop-offs or holes (2) Bumps and floor obstructions (3) Debris (4) Overhead obstructions and high voltage conductors (5) Hazardous locations (6) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations (7) Wind and weather conditions (8) Other possible unsafe conditions (9) Presence of unauthorized persons.

7.9 During Operation. The aerial platform shall be used in accordance with this standard. The user shall direct the operator to ensure the following before each elevation of the platform: (1) That the aerial platform is operated on a surface within the limits specified by the manufacturer (2) That the outriggers, stabilizers, extendable axles, or other stabilizing methods are used as required by the manufacturer (3) That guardrails are installed and access gates or openings are closed per manufacturer's instructions (4) That the load and its distribution on the platform and any platform extension are in accordance with the manufacturer's rated capacity for that specific configuration (5) That there is adequate clearance from overhead obstructions (6) That the minimum safe approach distances (MSAD) to energized power lines and parts, as listed in Table One are maintained. See Figure 2 for examples of safe operating procedures (7) That the precautions defined in 7.3.3, 7.6, 7.7, 7.8, 7.9, 7.10 and 7.11 of this standard are followed during operation of the aerial platform.

7.10 Determination of Hazardous Locations. It shall be the responsibility of the user to determine the hazard classification of any particular atmosphere or location according to ANSI/NFPA 505-1987. Aerial platforms operated in hazardous locations shall be approved in accordance with, and of the type required, by ANSI/NFPA 505-1987.

7.11 Warnings and Instruction. The user shall direct his operating personnel and supervise the work to ensure operation in compliance with the requirements in 7.11.1 through 7.11.14.

7.11.1 Personnel Footing. Personnel shall maintain a firm footing on the platform floor while working thereon. Use of planks, ladders, or any other device on the aerial platform for achieving additional height or reach shall be prohibited.

7.11.2 Other Moving Equipment. When other moving equipment or vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped-off areas, flashing lights, and barricades shall be used.

7.11.3 Reporting Problems or Malfunctions. The operator shall immediately report to the supervisor any problems or malfunctions that become evident during operation. Any problems or malfunctions that affect the safety or operations shall be repaired prior to continued use of the aerial platform.

7.11.4 Altering Safety Devices. Altering or disabling of interlocks or other safety devices shall be prohibited.

7.11.5 Entanglement. Care shall be taken to prevent rope, electric cords, hoses, etc., from becoming entangled in the aerial platform.

7.11.6 Capacity Limitation. Aerial platform rated capacities shall not be exceeded when loads are transferred to the platform at any height.

7.11.7 Work Area. The operator shall ensure that the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.

7.11.8 Fueling. The engine shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

7.11.9 Battery Charging. Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

7.11.10 Platform Positioning. The aerial platform shall not be positioned against another object to steady the platform.

7.11.11 Misuse as a Crane. The aerial platform shall not be used as a crane.

7.11.12 Operating Areas. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment, unless the application is approved in writing by the manufacturer.

7.11.13 Travel Conditions. Under all travel conditions, the operator shall limit travel speed according to conditions of ground surface, congestion, visibility, slope, locations of personnel, and other factors causing hazards of collision or injury to personnel.

7.11.14 Unauthorized Use. Means shall be used to protect against use by unauthorized person(s).

7.12 Operation of the Aerial Platform. If a user is also the operator of an aerial platform, the user shall have the responsibilities of operators specified in Section 8 of this standard as well as responsibilities of users as specified in Section 7 of this standard.

7.13 Assistance to Operator. If a user is unable to answer any operator's questions relating to rated capacity, intended use, maintenance, condition, or safety of operation of the aerial platform, the user shall obtain the proper information from the dealer, owner, or manufacturer and provide that information to the operator before use of the aerial platform in the application of concern.

7.14 Shutdown of Aerial Platform. The user shall authorize and direct the operating personnel to cease operation of the aerial platform in case of any suspected malfunctions of the aerial platform, or any hazard or potentially unsafe condition that may be encountered, and to request further information as to safe operation from the owner, dealer, or manufacturer before further operation of the aerial platform.

7.15 Record Retention. The user shall retain the following records for at least 3 years: (1) Records of the operator(s) trained on each model of an aerial platform (2) Written records of the frequent and annual inspections shall be kept by the user when performing the inspections. The records shall include the date of inspection, any deficiencies found, the corrective action recommended and identification of the person(s) performing the inspection (3) Written records of all repairs accomplished on the aerial platform, including the date of any such repair, a description of the work accomplished, and the identification of the person(s) performing the repair.

7.16 Modifications. A user shall not modify or concur in modification of an aerial platform without the specific written approval of the manufacturer of the aerial platform.

7.17 Manufacturer's Safety Bulletins. The user shall comply with safety-related bulletins as received from the manufacturer, dealer, or owner.

8. Responsibilities of Operators

8.1 Basic Principles. The information in this standard shall be supplemented by good judgment, safety control, and caution in evaluating each situation. Since the operator is in direct control of the aerial platform, conformance with good safety practices in this area is the responsibility of the operator. The operator shall make decisions on the use and operation of the aerial platform with due consideration for the fact that his or her own safety as well as the safety of other personnel on the platform is dependent on those decisions.

8.2 Manuals. The operator shall be aware that the operating safety manuals, including the manual that defines the responsibilities of dealers, owners, lessors, lessees, users, and operators are stored on the aerial platform and the location where they are stored. The operator shall be familiar with the manuals stored on the aerial platform and consult them when questions arise with respect to the aerial platform.

8.3 Prestart Inspection. Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and functional test including but not limited to the following: (1) Operating and emergency controls (2) Safety devices (3) Personal protective devices, including fall protection (4) Air, hydraulic, and fuel system leaks (5) Cables and wiring harness (6) Loose or missing parts (7) Tires and wheels (8) Placards, warnings, and control markings (9) Outriggers, stabilizers, and other structures (10) Guardrail system (11) Items specified by the manufacturer.

8.4 Problems or Malfunctions. Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.

8.5 Training. The operator shall have been trained either on the same model of aerial platform or one having operating characteristics and controls consistent with the one to be used during actual work site operation. The operator trainee shall operate the aerial platform in an area free of obstructions under the direction of the qualified person for a time sufficient to determine that the trainee displays proficiency in knowledge and actual operation of the aerial platform. Only properly trained and authorized personnel shall be permitted to operate the aerial platform.

8.6 Before Operation. Before being authorized to operate the aerial platform, the operator shall have: (1) Been instructed by a qualified person in the intended purpose and function of each of the controls (2) Read and understood the manufacturer's/owner's operating instructions and safety rules, or been trained by a qualified person on the contents of the manufacturer's/owner's operating instructions and safety rules (3) Understood by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the aerial platform.

8.7 Workplace Inspection. Before the aerial platform is used and during use, the operator shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to: (1) Drop-offs or holes (2) Bumps and floor obstructions (3) Debris (4) Overhead obstructions and high voltage conductors (5) Hazardous locations (6) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating

configurations (7) Wind and weather conditions (8) Other possible unsafe conditions.

8.8 During Operation. The aerial platform shall be used in accordance with this standard. The operator shall ensure the following before each elevation of the platform: (1) That the aerial platform is operated on a surface within the limits specified by the manufacturer (2) That the outriggers, stabilizers, extendable axles, or other stability enhancing means are used as required by the manufacturer (3) That the guardrails are installed and access gates or openings are closed per manufacturer's instructions (4) That the load and its distribution on the platform and any platform extensions are in accordance with the manufacturer's rated capacity for that specific configuration (5) That there is adequate clearance from overhead obstructions (6) That the minimum safe approach distances (MSAD) to energized power lines and parts, as listed in Table One, are maintained. See Figure 2 for examples of safe operating procedures (7) That he or she and all other personnel on the platform are wearing fall protection devices and other safety gear as required at all times (see 4.9.5).

8.9 Determination of Hazardous Locations. It shall be the responsibility of the user to determine the hazard classification of any particular atmosphere or location according to ANSI/NFPA 505.

8.9.1 Hazardous Location Operating Requirements. Aerial platforms operated in hazardous locations shall be approved and of the type required by ANSI/NFPA 505.

8.10 Warnings and Instructions. The operator and other personnel on the platform shall comply with the requirements in 8.10.1 through 8.10.17.

8.10.1 Personnel Footing. Personnel shall maintain a firm footing on the platform floor while working thereon. Use of planks, ladders, or any other devices on the aerial platform for achieving additional height or reach shall be prohibited.

8.10.2 Other Moving Equipment. When other moving equipment or vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped off areas, flashing lights, and barricades shall be used.

8.10.3 Reporting Problems or Malfunctions. The operator shall immediately report to a supervisor any problems or malfunctions that become evident during operation. Any problems or malfunctions that affect the safety of operation shall be repaired prior to continued use of the aerial platform.

8.10.4 Reporting Potential Hazardous Locations. The operator shall immediately report to a supervisor any potential hazardous locations (environment) that become evident during operation.

8.10.5 Altering Safety Devices. Altering or disabling of interlocks or other safety devices shall be prohibited.

8.10.6 Entanglement. Care shall be taken to prevent rope, electric cords, hoses, etc., from becoming entangled in the aerial platform.

8.10.7 Capacity Limitation. Aerial-platform rated capacities shall not be exceeded when loads are transferred to the platform at any heights

8.10.8 Work Area. The operator shall ensure that the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.

8.10.9 Fueling. The engine shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

8.10.10 Battery Charging. Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

8.10.11 Platform Positioning. The aerial platform shall not be positioned against another object to steady the platform.

8.10.12 Misuse as a Crane. The aerial platform shall not be used as a crane.

8.10.13 Operating Areas. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment, unless the application is approved in writing by the manufacturer.

8.10.14 Travel Conditions. Under all travel conditions, the operator shall limit travel speed according to conditions of ground surface, congestion, visibility, slope, location of personnel, and other factors causing hazards of collision or injury to personnel.

8.10.15 Unauthorized Use. Means shall be used to protect against use by unauthorized person(s).

8.10.16 Misuse as a Jack. The platform of the aerial platform shall not be used to jack the wheels off the ground unless the machine is designed for that purpose by the manufacturer.

8.10.17 Snagged Platform. If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structure or other obstacles such that control reversal does not free the platform, all personnel shall be removed from the platform before attempts are made to free the platform using ground controls.

8.11 Assistance to Operator. If an operator encounters any suspected malfunction of the aerial platform, or any hazard or potentially unsafe condition relating to capacity, the operator shall cease operation of the aerial platform and request further information as to safe operation from management, or from the owner, dealer, or manufacturer, before further operation of the aerial platform.

8.12 Modifications. An operator shall not modify or concur in modification of an aerial platform without the specific written approval of the manufacturer of the aerial platform.

9. Responsibilities of Lessors

9.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of responsibilities of lessors with due consideration of the knowledge that the unit shall be carrying personnel.

9.2 Lessor. A lessor is a person(s) or entity who leases, rents, loans, or otherwise provides an aerial platform to another party for the beneficial use of that party (the user). A lessor may also be a dealer, owner, lessee, user, or operator.

9.2.1 Lessor as a Dealer. When a lessor uses the aerial platform as a dealer, the lessor shall have the responsibilities of dealers as specified in Section 5 of this standard.

9.2.2 Lessor as an Owner. When a lessor uses the aerial platform as an owner, the lessor shall have responsibilities of owners as specified in Section 6 of this standard.

9.2.3 Lessor as a User. When a lessor uses the aerial platform as a user, the lessor shall have the responsibilities of operators as specified in Section 8 of this standard.

10. Responsibilities of Lessees

10.1 Basic Principles. Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use, and expected environment, shall be applied in the performance of responsibilities of lessees with due consideration of the knowledge that the aerial platform carries personnel.

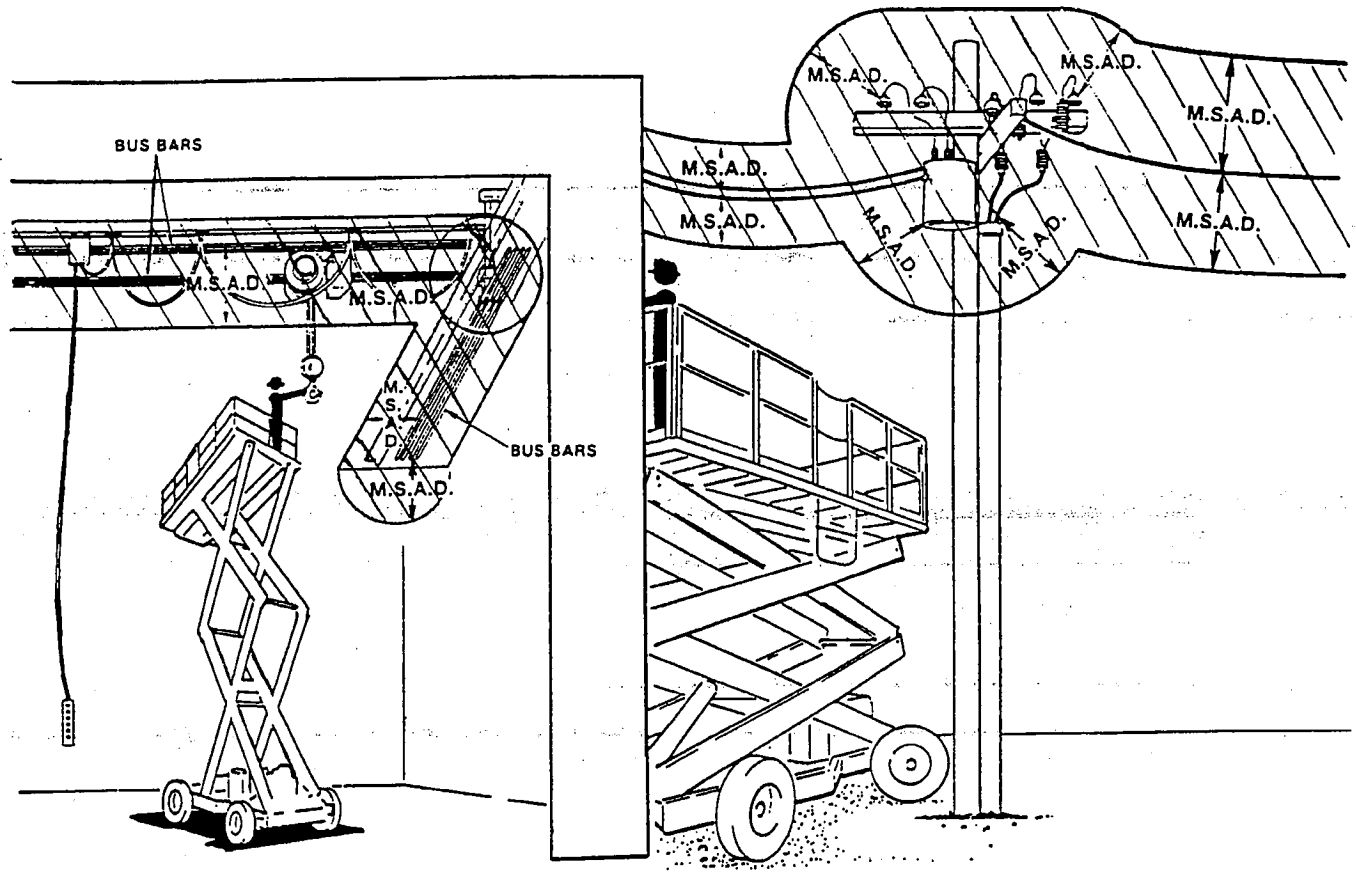
10.2 Lessee. A lessee is a person(s) or entity to whom an aerial platform is provided by lease, rental, loan, or other arrangement. A lessee may also be a user or operator.

10.2.1 Lessee as a Dealer. When a lessee uses the aerial platform as a dealer, the lessee shall have the responsibilities of dealers as specified in Section 5 of this standard.

10.2.2 Lessee as an Owner. When a lessee uses the aerial platform as an owner, the lessee shall have the responsibilities of owners as specified in Section 6 of this standard.

10.2.3 Lessee as a User. When a lessee uses the aerial platform as a user, the lessee shall have the responsibilities of users as specified in Section 7 of this standard.

10.2.4 Lessee as an Operator. When a lessee uses the aerial platform as an operator, the lessee shall have the responsibilities of operators as specified in Section 8 of this standard.



M.S.A.D. = MINIMUM SAFE APPROACH DISTANCE (SEE TABLE BELOW)

DENOTES PROHIBITED ZONE

DANGER:
- **DO NOT ALLOW MACHINE, PERSONNEL OR CONDUCTIVE MATERIALS INSIDE PROHIBITED ZONE.**
- **MAINTAIN M.S.A.D. FROM ALL ENERGIZED LINES AND PARTS AS WELL AS THOSE SHOWN.**
- **ASSUME ALL ELECTRICAL PARTS AND WIRES ARE ENERGIZED UNLESS KNOWN OTHERWISE.**

CAUTION:
- **DIAGRAMS SHOWN ARE ONLY FOR PURPOSES OF ILLUSTRATING M.S.A.D. WORK POSITIONS, NOT ALL WORK POSITIONS.**

Table 1

Minimum Safe Approach Distance (M.S.A.D.)
to energized (exposed or insulated) power lines and parts.

VOLTAGE RANGE (Phase to Phase)	MINIMUM SAFE APPROACH DISTANCE (Feet)	(Meters)
0 to 300V	AVOID CONTACT	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

MATERIAL SAFETY DATA SHEET

Date of Last Revision 03/21/1991

I. Manufacturer:

TROJAN BATTERY COMPANY
12380 CLARK STREET
SANTA FE SPRINGS, CA 90670

OR

TROJAN BATTERY COMPANY
5194 MINOLA DRIVE
LITHONIA, GA 33038

Emergency Phone Number: 1-800-424-9300

II. **Product Identity:** Automotive, commercial, and industrial lead acid batteries are supplied. During maintenance and/or operation exposure to hazards may occur due to exposure to battery acid and/or their vapors, lead, antimony, arsenic, tin and/or their compounds from batteries. Also, during operation and/or charging of batteries hydrogen gas is produced which is flammable and explosive.

III. **Hazardous Ingredients:**

	Common Name	Chemical Name	Chemical Identity	CAS NO.
1.	Battery Acid Electrolyte	Sulfuric Acid	30-38% Sulfuric Acid in water	7664-93-9

OSHA PEL	NOISH 10-hr. TWA	IDLH	ACG/ATLV	CARCINOGEN
lmg/M^3	I mg/M^3	80 mg/M^3	none	no

	Common Name	Chemical Name	Chemical Identity	CAS NO.
2.	Lead	Lead	94-97% lead alloy	7439-92-1

OSHA PEL	ACGIH	TLV/STL	OTHER	CARCINOGEN
50 µg/M^3	0.15mg./M^3	none	30 µg/M^3 Action Level	no

	Common Name	Chemical Name	Chemical Identity	CAS NO.
3.	Antimony	Antimony	2-6% Antimony in lead alloy	440-36-0

OSHA	ACGIH	TLV/STL	CARCINOGEN
0.5 mg/M^3	0.5 mg/M^3	none	no

	Common Name	Chemical Name	Chemical Identity	CAS NO.
4.	Arsenic	Arsenic	0.25% in lead alloy	7440-38-2

OSHA	ACGIH	TLV/STL	CARCINOGEN
10 µg/M^3	0.2mg/M^3	none	yes

	Common Name	Chemical Name	Chemical Identity	CAS NO.
5.	Tin	Tin	0.3% Tin in lead alloy	7440-31-5

OSHA PEL	ACGIH	TLVSTL	OTHER	CARCINOGEN
2mg/M³	2mg/M³	none	5mg/M³ action level	No

III. Chemical and Physical Characteristics

1. 30-38% Sulfuric Acid in water

   1.240 to 1.280 specific gravity at 80° F
   100% soluble in water
   Colorless, odorless liquid
   Boiling point 230° F
   Non Flammable

2. Lead Alloy and Compounds

   Specific gravity 9.38 to 11.34
   Solubility in water is negligible (less than 0.1%)
   Grayish-white to dark brown, silvery metal with no odor, solid
   Melting range 620° to 1630° F
   Non Flammable

IV. Health Hazards

1. 30-38% Sulfuric Acid in water and fumes

   Contact causes severe burns to all tissue. Ingestion causes severe burns and ulceration. Inhalation causes severe respiratory irritation and may aggravate other respiratory conditions.

2. Lead Alloy and Compounds

   Product is a solid mass and warnings are based on inhalation of dust or transfer of materials to mouth from hands during eating, smoking or other activities that might involve ingesting the dust. Exposure may cause lassitude, weight loss, constipation, anemia, nausea, vomiting, paralysis, and central nervous system depression.

V. First Aid

1. Sulfuric Acid is a very strong acid which can severely burn skin and eyes and may be fatal if swallowed. The most important first aid measure for acid exposure is the immediate application of a large quantity of running water. Contaminated clothing should be removed under running water and the application of water continued until all traces of acid have been washed away. Get medical assistance immediately.

   For eye contact wash with large amounts of running water. Remove any contact lenses. Hold eye lids open and wash all surfaces of eyes and lids. Get medical assistance immediately.

   For ingestion **do not** induce vomiting. Drink as much milk or water as possible without vomiting. Get medical assistance immediately.

2. For Lead Alloy and Compounds Exposure

   Wash any skin exposure with soap and water.
   For eye exposure flush thoroughly with water for 15 minutes.
   For ingestion get medical assistance immediately.

VI. Physical Hazards

1. Acid may escape from batteries during charging at high temperatures or if broken or turned over. Avoid overcharging and high temperatures during operations or storage. Handle carefully to avoid damaging or turning batteries over.

   Hydrogen gas is formed during charging of batteries and by the action of sulfuric acid on most metals. Hydrogen gas is flammable and highly explosive.

2. Lead Alloys and Compounds

   Greatest exposure comes from dust in air and on hands when cleaning battery posts and if any internal solid materials are exposed if the battery is opened or broken.

VII. Fire and Explosive Hazards

Sulfuric Acid and lead alloy and compounds are not combustible. Use water, carbon dioxide or dry chemical on fires in the area.

VIII. Safety Precautions

Store batteries in a well ventilated, cool area. Handle carefully to avoid damaging or turning batteries over. When moving, connecting, disconnecting or maintaining batteries, or cleaning up acid spills, safety glasses, acid resistant gloves and full coverage acid resistant clothing must be worn. All acid must be neutralized immediately by covering with baking soda (sodium bicarbonate) or soda ash (sodium carbonate) and then rinsing with water. When brushing battery posts or handling solids from inside a battery dust masks, approved for lead dust, safety glasses, gloves and apron must be worn.

IX. Special Precautions

To avoid hydrogen fires or explosions, keep all sources of ignition away from batteries.

For example: Open flames as lighted matches or lighters; glowing materials as cigarettes or other hot objects; sparks or arcs as when connecting cables or wires to batteries or other electrical sources when circuits are not open, or shorting batteries or cables with metal tools.

Any broken or opened batteries must be placed in sealed plastic containers that will not leak acid or solid materials and delivered to a battery recycler.

BP OIL

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE		GENERAL ASSISTANCE	NFPA FIRE HAZARD	
BP America (In Ohio):	800-362-8059	216-441-8106	Flammability:	1
(Outside Ohio):	800-321-8642		Health:	1
CHEMTREC Assist:	800-424-9300		Reactivity:	0
			Spl. Hazards:	

MSDS Number> 1312 Version # : 2

MANUFACTURER: BP Oil Company
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375

PRODUCT IDENTIFICATION

TRADE NAME: ENERGOL HLP-HD 46
DATE: 07-07-93

CAS NUMBER: MIXTURE
SYNONYM(S): LUBRICATING OIL; HYDRAULIC OIL
CHEMICAL FAMILY: HYDROCARBON
MOLECULAR FORMULA: MIXTURE
MOLECULAR WEIGHT: ND
PRODUCT CODE: P 3399/3409
HIERARCHY: 050.060

PRODUCT HAZARD SUMMARY

HEALTH: POSSIBLE ASPIRATION HAZARD IF SWALLOWED -- CAN ENTER LUNGS AND CAUSE DAMAGE -- MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

REACTIVITY: STABLE

PRODUCT HEALTH HAZARD INFORMATION

INGESTION:
Aspiration into lungs may cause pneumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, and diarrhea.

SKIN:
SLIGHTLY IRRITATING. Repeated or prolonged contact may result in defatting, oil acne, redness, itching, inflammation, cracking and possible secondary infection. Contact with heated material may cause thermal burns. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Injury may not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful (see Notes to Physician section).

EYE:
SLIGHTLY IRRITATING. Contact with heated material may cause thermal burns.

INHALATION:
May cause respiratory tract irritation. Exposure to high concentrations of dense oil mists may lead to oil pneumonia.

SPECIAL TOXIC EFFECTS:
IARC has determined that there is inadequate evidence for the carcinogenicity of highly-refined oils in humans and experimental animals. (IARC Class -- 3).

FIRST AID

INGESTION:
DO NOT INDUCE VOMITING BECAUSE OF DANGER OF ASPIRATING LIQUID INTO LUNGS. If spontaneous vomiting occurs, monitor for breathing difficulty. Get immediate medical attention.

SKIN CONTACT:
Remove contaminated clothing and launder before reuse. Wash area of contact thoroughly with soap and water. Get medical attention if irritation persists. Thermal burns require immediate medical attention. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Get immediate medical attention.

EYE CONTACT:
Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists. Thermal burns require immediate medical attention.

INHALATION:
Remove affected person from source of exposure. Get medical attention if irritation persists.

NOTES TO PHYSICIAN

Aspiration of medium viscosity petroleum hydrocarbons may cause severe pneumonitis (oil pneumonia). Vomiting should not be induced. In unconscious victims, use of an endotracheal tube should be considered if gastric lavage is undertaken. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

PERSONAL PROTECTION INFORMATION

EYE PROTECTION:
Avoid eye contact with this material. Wear safety glasses or chemical goggles. Provide an eyewash station in the work area.

SKIN PROTECTION:
Avoid skin contact. When working with this substance, wear appropriate chemical protective gloves. Depending upon conditions of use, additional protection may be necessary such as face shield, apron, arm covers, etc.

RESPIRATORY PROTECTION:
If exposure limits are exceeded or if irritation is experienced, NIOSH approved respiratory protection should be worn. Ventilation and other forms of engineering controls are often the preferred means for controlling chemical exposures. Respiratory protection may be needed for non-routine or emergency situations.

PHYSICAL PROPERTIES

BOILING POINT:	>343.3 C (650 F)
SPECIFIC GRAVITY:	0.87 @ 60 F
MELTING POINT:	NA
% VOLATILE:	NEGLIGIBLE
VAPOR PRESSURE:	NEGLIGIBLE
EVAPORATION RATE:	(WATER=1) VERY SLOW
VAPOR DENSITY (AIR=1):	HEAVIER
VISCOSITY:	222.0 SUS @ 100 F
% SOLUBILITY IN WATER:	NEGLIGIBLE
POUR POINT:	-29.0 C (-20 F)
pH:	ND
APPEARANCE/ODOR:	LIQUID

FIRE AND EXPLOSION DATA

FLASH POINT: 207.200 C (405 F)
AUTOIGNITION TEMPERATURE: ND
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: NA
FLAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: NA

BASIC FIREFIGHTING PROCEDURES:
Use water spray, dry chemical, foam or carbon dioxide to extinguish fire. Water or foam may cause frothing, with further application leading to boilover. Use a water spray to cool fire-exposed containers, structures and to protect personnel. Use water to flush spills away from sources of ignition. Do not flush down public sewers or other drainage systems.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Combustible at high temperatures. Irritating or toxic substances may be emitted upon thermal decomposition. Exposed firefighters should wear MSHA/NIOSH approved self-contained breathing apparatus with full face mask and full protective equipment.

REACTIVITY DATA

STABILITY/INCOMPATIBILITY:
Stable under normal conditions of use. Avoid contact with strong oxidizers.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:
Combustion may produce oxides of carbon, sulfur, phosphorus and reactive hydrocarbons.

ENVIRONMENTAL INFORMATION

SPILL OR RELEASE TO THE ENVIRONMENT:
If your facility or operation has an "Oil or Hazardous Substance Contingency Plan," activate its procedures.

-- Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material.

-- For technical advice and assistance related to chemicals, contact CHEMTREC (800/424-9300) and your local fire department.

-- Notify the National Response Center, if required.

Emergency Action:
Keep unnecessary people away. Keep ignition sources out of area.

Spill or Leak Procedure:
Stop leak if you can do it without risk. Small Spills: Take up with sand or other noncombustible absorbent material or other sorbent known to be compatible, then flush area with water. Large Spills: Dike far ahead of spill for later disposal.

Notification:
Any spill or release or substantial threat of release, of this material to navigable water (virtually any surface water) sufficient to cause a visible sheen upon the water must be reported immediately to the National Response Center (800/424-8802), as required by U.S. Federal Law. Failure to report may result in substantial civil and criminal penalties.

WASTE DISPOSAL:
This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be hazardous if it is considered toxic, corrosive, ignitable, or reactive according to Federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed with or comes in contact with a hazardous waste. If such contact or mixing may have occurred, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations at 40 CFR 262, 263, and 264 apply.

The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations.

SARA TITLE III INFORMATION:
Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):
Immediate Hazard:
Delayed Hazard:
Fire Hazard:
Pressure Hazard:
Reactivity Hazard:

ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION:
There may be specific regulations at the local, regional, or state level that pertain to this material.

REGULATORY INFORMATION

All components of this product are listed on the TSCA inventory.

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE:
Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Do not store in unlabeled containers. Do not eat, drink or smoke in areas of use or storage.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Remove contaminated clothing and clean before reuse. Wash thoroughly after work using soap and water.

EMPTY CONTAINERS:
Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose containers unless adequate precautions are taken against these hazards.

TRANSPORTATION REQUIREMENTS (DOMESTIC LAND)

D.O.T. PROPER SHIPPING NAME (49 CFR 172.101):	PETROLEUM OIL, N.O.I.B.N.
D.O.T. HAZARD CLASS (49 CFR 172.101):	NR
UN/NA CODE (49 CFR 172.101):	NR
PACKING GROUP (49 CFR 172.101):	NR
BILL OF LADING DESCRIPTION (49 CFR 172.101):	PETROLEUM OIL, N.O.I.B.N.
D.O.T. LABELS REQUIRED (49 CFR 172.101):	NR
D.O.T. PLACARDS REQUIRED (49 CFR 172.101):	NR

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REFERENCE
Distillates, Hydrotreated heavy paraffinic	64742-54-7	70-85	5mg/M3 TLV; 10mg/m3 STEL (ACGIH) for oil mists, mineral 5mg/m3 PEL (OSHA) for oil mist, mineral 5mg/m3 TWA; 10mg/m3 STEL (NIOSH) for oil mist, mineral

WASTE DISPOSAL:

Solvent dewaxed distillate heavy paraffinic	64742-65-0	10-25	5mg/m3 TLV; 10mg/m3 STEL (ACGIH) for oil mists, mineral 5mg/m3 PEL (OSHA) for oil mist, mineral 5mg/m3 TWA; 10mg/m3 STEL (NIOSH) for oil mist, mineral

The OSHA Permissible Exposure Limits listed above were prompted by OSHA in 1989. This standard was vacated by the U.S. Court of Appeals of the Eleventh Circuit. Exposure limits defined in specific chemical standards found in 29 CFR 1910.1001-1048 are not covered by this ruling and are still enforceable.

REVISION DATE: 07-07-1993
REPLACES SHEET DATED: 02-11-1990
COMPLETED BY: BP OIL HSEQ DEPARTMENT

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

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