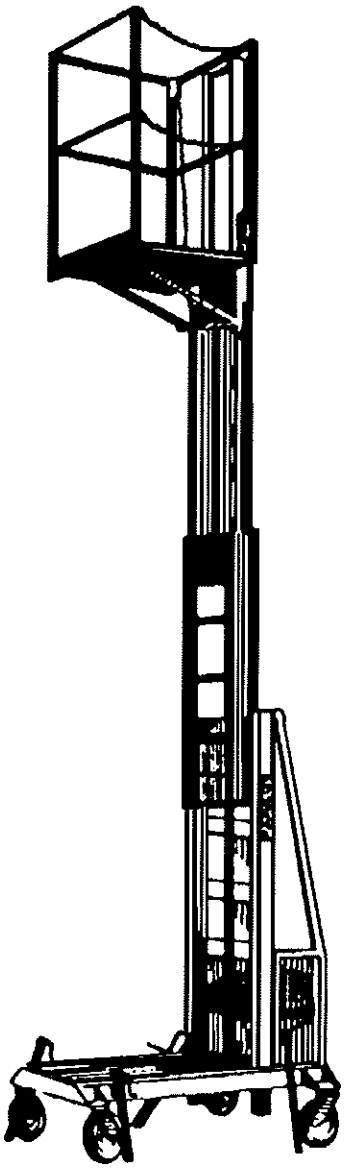
BIL-JAX®

COUGAR LIFT®

ELECTRIC HYDRAULIC LIFT PLATFORM



Operation and Maintenance Manual For Model XLT-1001 DC

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

B33-01-0013-01

TELESCOPIC PERSONNEL LIFTS

This equipment is designed and manufactured in compliance with the duties, responsibilities, and standards set forth for manufacturers in ANSI A92.3-1980.

This equipment will meet or exceed applicable OSHA codes and ANSI A92.3-1980 standards when used in accordance with section 13 of ANSI A92.3-1980 and all other 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.

SERVICE CHECK LIST FOR XLT COUGAR LIFTS

MODEL:

DEALER ADDRESS:

_____

_____

_____

PHONE: _____

SERIAL NO.

CUSTOMER ADDRESS:

_____

_____

_____

PHONE: _____

SERVICE	SUGGESTED PERIOD*	DATE											
Check chain assemblies for split leaves, loose pins, excessive wear, or elongation.	D												
Check battery electrolyte level. (DC Only)	D												
Check outrigger lock pins and cage lock pins.	D												
Check and retighten all nuts and bolts.	D												
Check to see that the cage entrance midrail slides freely.	D												
Check to be sure guide blocks and their path of movement are clean and lightly lubricated with a silicone lubricant.	D												
Check for wear on chain sheaves, including where it rotates around the sheave axle.	W												
Lubricate chains with 4OW oil.	W												
Adjust chains as described on page 14 of manual.	W												
Check casters for wear on axles and swivel raceways also be sure that wheels are not cracked or excessively worn.	W												
Check adjustment of normally open (N.O.) valve.	M												
Lubricate caster swivels and axles.	6												
Lubricate outrigger jack.	6												
Check operation of manual emergency lowering valve.	6												
Check to see that all decals are present and legible (see pages 18-19) and maintenance manual is on machine.	6												
Replace hydraulic oil.	12												
Check mast sway.	12												
Load test with 300# or 400#.	12												
Check for wear on outrigger jack threaded rod.	12												
Replace all chains.	48												

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

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COUGAR LIFT ELECTRIC HYDRAULIC LIFT PLATFORM

Model No. XLT-1001-(DC) (AC) Serial No._____

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

Mailing Address:
Bil-Jax, Inc.
125 Taylor Parkway
Archbold, OH 43502 U.S.A.

SPECIFICATIONS:

Rated Platform Load: 400# Total Including Operator (1 Person + Tools Not To Exceed 400 lbs.)
181 kg Total Including Operator (1 Person + Tools Not To Exceed 181 kg)

Extended Platform Height: 10'-10" (3.3 m)

Retracted Platform Height: 1'-3" (.4 m)

Platform Dimensions: 26" x 38" (.66 x .97 m)

Extended Outrigger Base Area: 3'-7" x 4'-0" (1.1m x 1.2 m)

Ready Retracted Dimensions: 2'-6"w x 4'-8"l x 6'-7"h (.76 x 1.42 x 2m)

Folded Shipping Dimensions: 2'-6"w x 4'-8"l x 6'-7"h (.76 x 1.42 x 2 m)

Gross Shipping Weight: 555# (252 kg)

Full Extension Time: 8 Seconds Empty, 13 Seconds Loaded

Complete Retraction Time: 16 Seconds

Platform Extension Rate: 1.25 feet (.38 m)/Sec. Empty, .77 feet (.23 m)/Sec. Loaded

Hydraulic System Pressure: 1000 PSI Empty, 2400 PSI Loaded

Power Source: DC - 12 Volt Deep Cycle Battery
AC - 110 Volt 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 GROUND ENTRY MODEL XLT-1001

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 plug the control box into the lower receptacle.

4) Check to be sure that the cage is properly attached to the lift. (There should be (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) Then swing out or extend and stabilize all outriggers making sure that they lock into position and that the lift is level. (When the outriggers are properly positioned, the 2 outrigger indicator lamps located in the outrigger indicator box mounted on the base of the lift will light.)

6) Raise the empty platform to the height at which you intend to work. Check again to be sure that the platform's path of travel is free from obstructions and reposition the lift as necessary.

7) Remove the control cord assembly from the base receptacle and plug it into the platform receptacle.

8) Again check to see that all outriggers are properly set (step 5). Enter the cage and make sure the cage entrance midrail drops into its proper position. The lift will not raise unless the green lamps are lit indicating that the outriggers are properly set.

9) The machine is now ready for operation. Depress the "on" push button and while holding it down, turn the selector switch to 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" switch is released, push the "on" switch, select "down" and the platform should stop or lower.

DESCRIPTION OF OPERATION

The Model No. XLT-1001 Cougar Lift 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 maximum platform load is limited to 400# or 1 person + tools (not to exceed 400#). The electric pump motor is powered by a 95 amp hour, 12 volt, wet cell battery. A 15 amp automatic battery charger is included for recharging the battery at the end of each day.

Elevating the platform is performed by means of a 1-1/2" diameter displacement type hydraulic 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 two inches for each one inch of cylinder extension. Platform descent is also commanded by means of a push button.

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 properly installed flow restrictor valve. (See the Maintenance sections of this Manual.) This non-adjustable flow restrictor valve controls and fixes the rate of platform descent whether empty or fully loaded to approximately .9 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 side of the electric pump unit. To lower the platform, pull the lever forward or towards the side of the machine until the platform begins to descend.

Read carefully the following General Safety Instructions before using the Cougar Lift.

VERTICAL TELESCOPIC LIFT SAFETY INSTRUCTIONS

INTRODUCTION

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 jobsite 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.

- 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 and outriggers. 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 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.

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

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

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

- Position lift far enough away from power sources to ensure that no part of the lift can accidently reach into an unsafe area.
- DO NOT use without all outriggers fully extended, locked, and stabilized.
- 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 or the force exerted on the outriggers during use of the lift.
- DO NOT use without entry chain/bar in place.
- DO NOT release outriggers or 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 tools and 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.
- 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 platform.
- Stay clear of wires, cables, and other overhead obstructions.
- Always disconnect power at Master Power Switch and remove key (CAT) or disconnect power at knife switch and lock cover (Cougar) when not in use to guard against unauthorized use.

MAINTENANCE SAFETY

- Maintenance shall be performed according to manufacturers requirements—Do Not short change maintenance.
- DO NOT add incorrect fluids to the hydraulic system or battery. Check manufacturers 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 manufacturers specifications.
- Always perform a function check of operating controls before each use and after repairs have been made.

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

- Use only factory approved parts to reapir or maintain this equipment. If this equipment is rebuild, retesting is required in accordance with factory instructions.

BATTERY MAINTENANCE - (Only on battery powered machines)

- Check battery acid level daily—check battery test indicator for proper state of charge on maintenance free batteries before using lift.

- Always wear safety glasses when working near battery.

- DO NOT smoke when servicing battery.

- 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 across 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.

- When installing battery always connect ground cable last.

- 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, Inc. 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

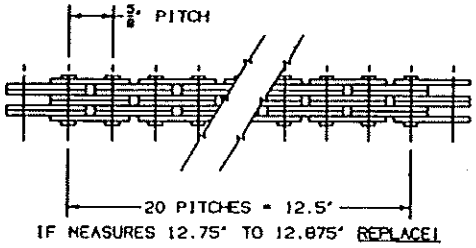
INSPECTION: It is extremely important that a complete inspection is made each day to insure the operator's safety.

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 key.
   d) Platform fastening bolts and locknuts.
   e) Plastic slide blocks and mounting screws.
   f) Outrigger and cage lock pins (Replace bent pins—Do Not attempt to straighten.)

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: Extend all outriggers and base all four leveling screws. 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 that the hex locknuts 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, extend the outriggers and fully extend the lift from the ground, without load in the platform. If the platform: a) lowers without stopping and (b) within the time period shown on Page 7 of this Manual and (c) air gap between the guide blocks and the mast is removed, 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.

6. Check for wear on the outrigger jack screw and nut. If the vertical movement between the jack threads and the nut threads is .025" or greater, replace both the jack and the nut.

7. Check casters to see that there is not excessive wear on the axle, axle bearings or swivel raceways and that the wheels are not cracked or excessively worn.

LUBRICATION: Minor Lubrication will make the operation of the Cougar Lift more efficient and extend its useful life.

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

2. Grease caster axles and swivel raceways semi-annually.

3. Lightly oil or apply a thin coat of grease to the outrigger screw jacks each week.

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 will help prevent possible damage to the system.

1. Check the hose assembly and fittings for leakage or damage each day. 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. Use Dextron Automatic Transmission Fluid Type A for temperatures as low as -40°F. If not available, a good grade SAE 10W Hydraulic Oil may be used where the minimum climatic temperature is above 32°F. SAE 5W Hydraulic Oil may be used where temperatures are as low as 0°F. 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, base all four levelers. Remove the reservoir breather cap, and 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. If the platform will not stay up, it may be necessary to clean the power unit ball check valve or solenoid valve. This can be done by simply holding down both the "up" and the "down" switch simultaneously for approximately 10-15 seconds. It may be necessary to repeat this procedure several times. If this does not remedy the situation, contact your Distributor or Workforce Products for additional information.

6. To reset the pressure relief valve, install a 3,000 PSI gage into the 3/8" NPT pressure port on the pump (use port furthest from emergency down valve). Remove the hex cover from the relief valve screw and adjust the screw until the maximum pressure obtained is 2,400 PSI when the cylinder tops out. If no gage is available, place 400# on the platform and adjust the screw so that the load can just be lifted without bypassing oil.

CAUTION: Do not adjust the pressure relief valve higher than 2,400 PSI since possible overloading could occur.

7. Should it ever be necessary to remove the flow restrictor valve, it is of utmost importance that it be properly reinstalled. 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 a 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., each day.

2. Charge the batteries daily or after each period of usage. Time for a complete charge on a totally discharged battery is 8-12 hours. The charger will shut off automatically when the batteries have reached full charge.

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.

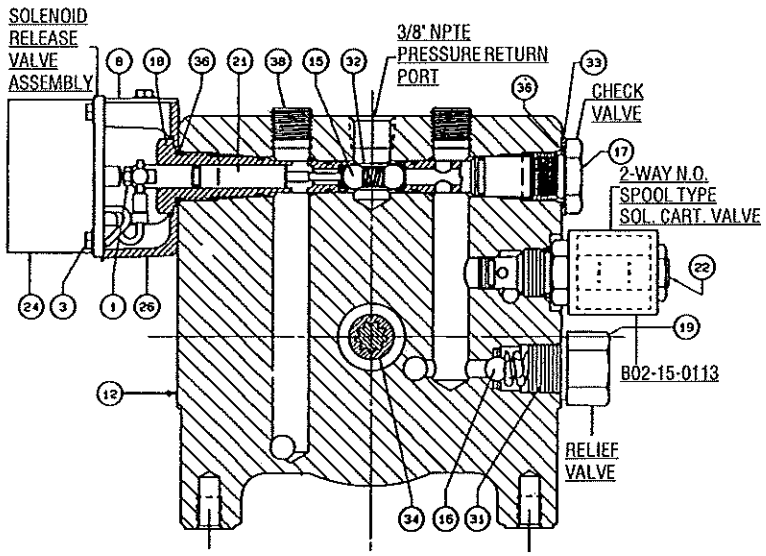
3. Clean battery terminals monthly. Remove the cables from the battery, clean the battery posts and cable ends to shiny metal, and replace. Always connect the insulated cable from the starter solenoid to the positive post. Lube the outside of the connections with petroleum jelly or grease.

4. Procedure for checking adjustment of N.O. 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, causing 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.

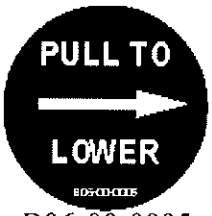
   C.) Re-connect the jumper wire upon determining that the N.O valve is operating properly.



ANNUAL MAINTENANCE

A thorough inspection must be made at least once each year or after approximately each 500 hours of operation. Complete checks should be made of 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.

REPLACEMENT DECALS - ORDER AS NEEDED



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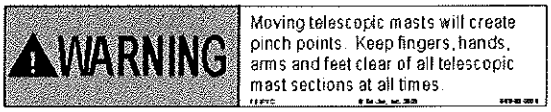

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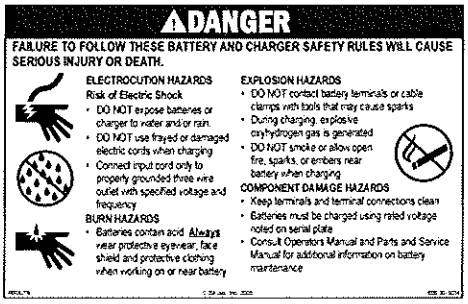

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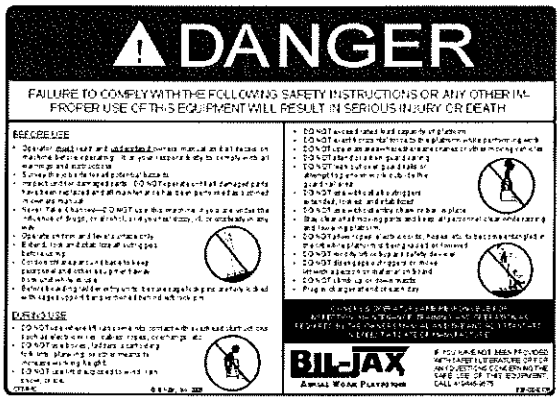

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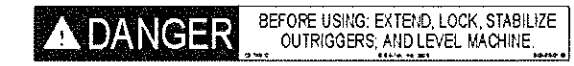

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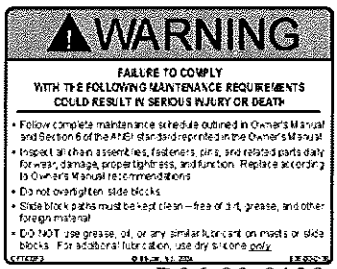

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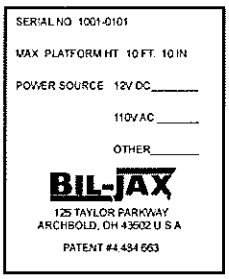

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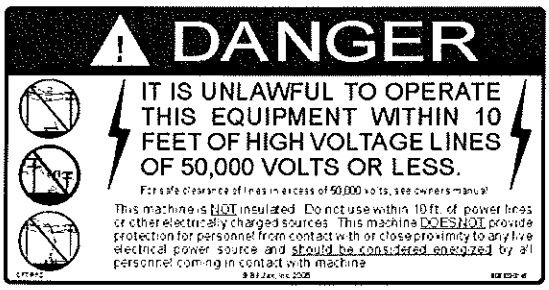

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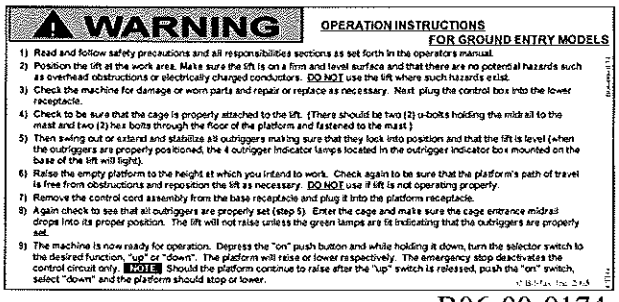

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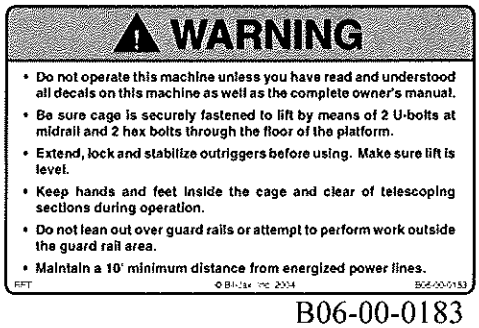

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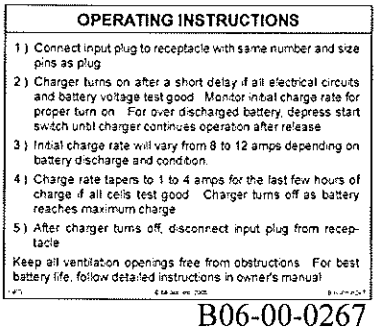

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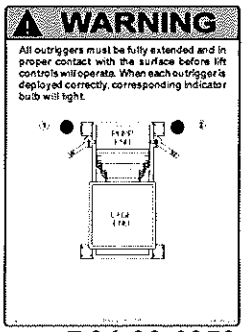

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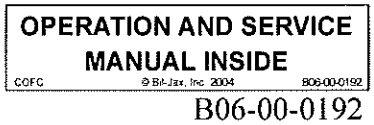

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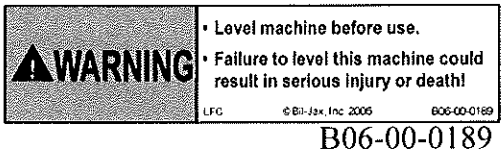
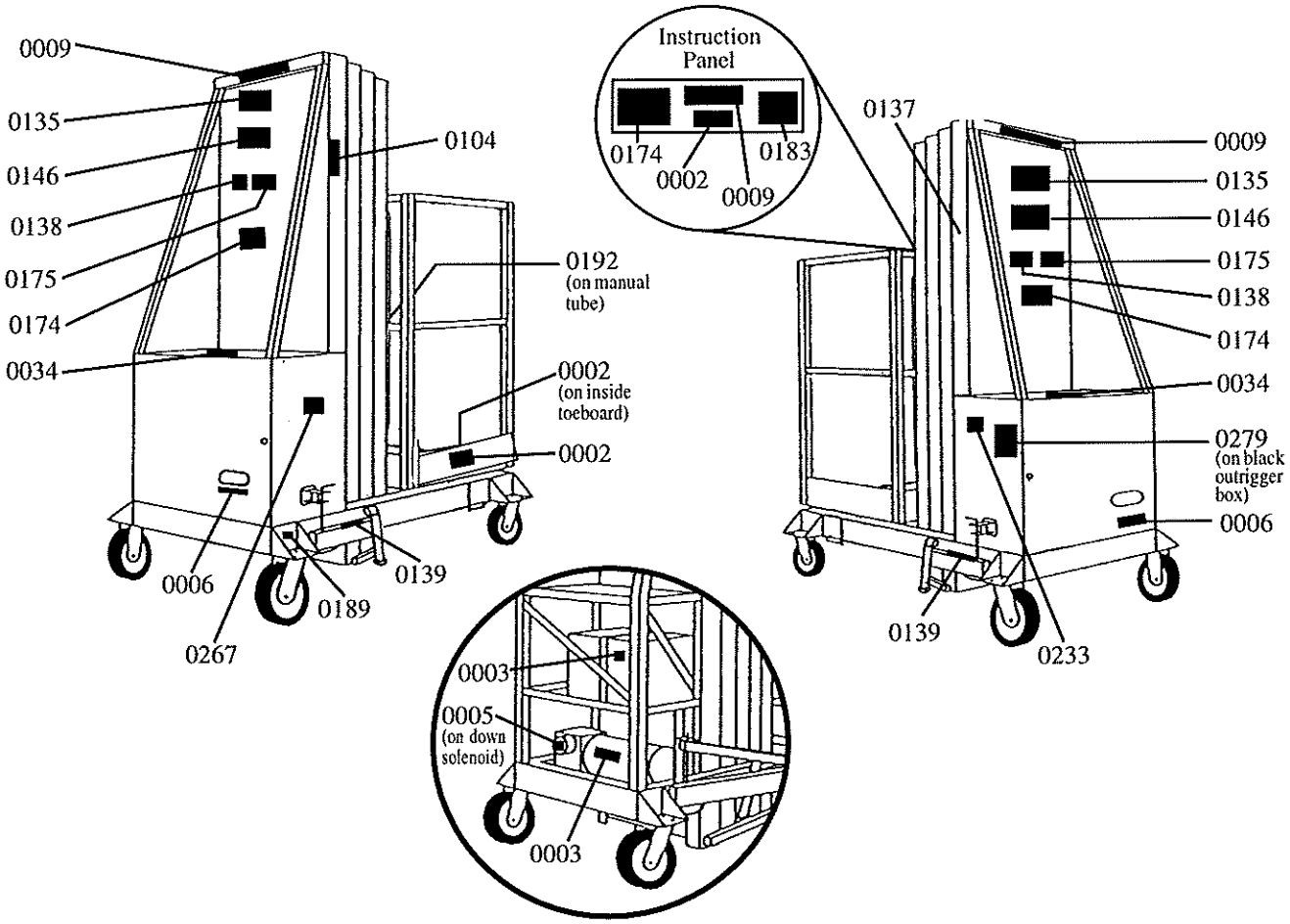


B06-00-0189

XLT-1001 DECAL PLACEMENT

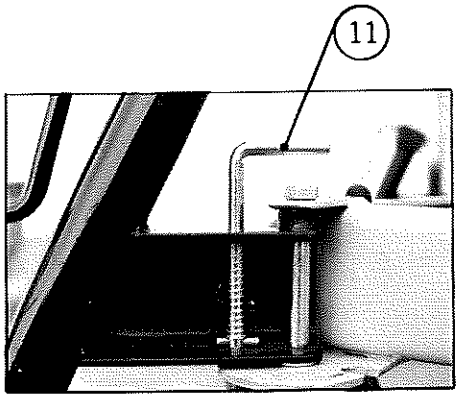


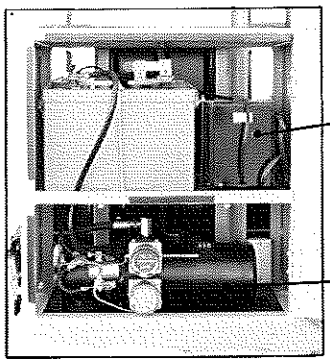
DECAL NO.	DESCRIPTION OF DECAL	NO. DECALS/PIECE
B06-00-0002	MAXIMUM CAPACITY. . .400 LBS. OR 1 OCCUPANT	3
B06-00-0003	WORKFORCE, INC. NO. XXXX (WORKFORCE SERIAL NO. DECAL)	2
B06-00-0005	PULL TO LOWER	1
B06-00-0006	EMERGENCY CONTROL VALVE	1
B06-00-0009	WARNING . . . MOVING TELESCOPIC MASTS WILL CREATE . . .	2
B06-00-0034	DANGER. . .DURING CHARGING, OXYHYDROGEN GAS. . .	1
B06-00-0104	XLT-1001 (TRANSFER TYPE DECAL)	1
B06-00-0135	DANGER . . . MAIN WARNING DECAL FOR COUGARS & CATS	1
B06-00-0137	WORKFORCE (VERTICAL TRANSFER TYPE DECAL)	1
B06-00-0138	WARNING . . . (MAINENTANCE DECAL FOR COUGARS & CATS)	1
B06-00-0139	DANGER . . . BEFORE USING: EXTEND, LOCK & STABILIZE. . .	2
B06-00-0146	DANGER . . . (ELECTRICITY WARNING FOR ALL LIFTS)	1
B06-00-0174	WARNING. . .OPERATION INSTRUCTIONS-GROUND ENTRY	2
B06-00-0175	CAUTION . . . THIS MACHINE DESIGNED . . . 92.3	1
B06-00-0183	WARNING . . . (WARNING DECAL FOR GROUND ENTRY - IN CAGE)	1
B06-00-0189	WARNING . . . LEVEL MACHINE BEFORE USE . . .	1
B06-00-0192	OPERATION & SERVICE MANUAL	1
B06-00-0233	SERIAL NUMBER TAG - XLT-1001	1
B06-00-0267	OPERATING INSTRUCTIONS - CHARGER	1
B06-00-0279	WARNING. . .ALL OUTRIGGERS MUST BE FULLY EXTENDED	1

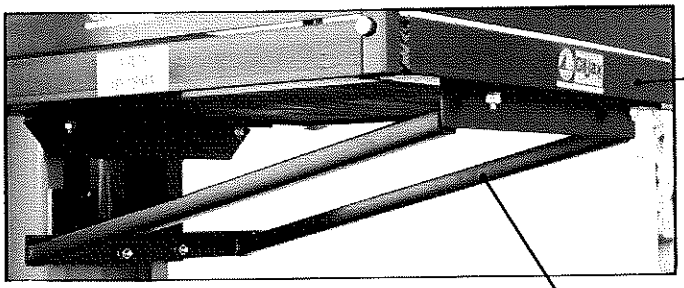
GENERAL ASSEMBLY XLT-1001

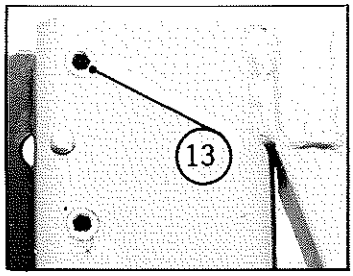
ITEM #	PART #	DESCRIPTION	QTY.
1	**B11-01-0040**	**Base Weldment**	**1**
1a	B44-00-0008	Plywood for Pump Deck	1
1b	B44-00-0009	Plywood for Battery & Charger	1
1c	B31-00-0001	Plastic Slide Block	2
1d	B04-07-0026	#10 x 1" Screw	2
1e	B30-00-0013	Rubber Bumpers	4
2	**B18-00-0007**	**Equipment Housing Cover**	**1**
2a	B18-00-0032	Equipment Housing Door	1
2b	B37-00-0001	Camlock & Keys	2
3	**B18-00-0088**	**Mast Cover**	**1**
3a	B04-04-0005	#10-24 x 1/2" screw	8
4	**B16-01-0031**	**First Mast Section**	**1**
4a	B26-00-0002	Sheave	2
4b	B36-01-0002	Sheave Axle	2
4c	B31-00-0001	Plastic Slide Block	2
4d	B04-07-0026	#10 x 1" Screw	2
4e	B04-07-0011	Cotter Pin	2
5	**B17-00-0061**	**Platform Brace**	**1**
5a	B16-01-0016	Platform Mast Sectiion	1
5b	B31-00-0001	Plastic Slide Block	4
5c	B04-07-0026	#10 X 1" Screw	8
5d		3/8"-16 x 1" Hex Bolt w/Lockwasher & Nut	2
6	**B03-00-0009**	**Chain Assembly**	**2**
6a		3/8"-16 Locknut	2
7	**B17-00-0062**	**Platform**	**1**
7a	B44-00-0019	Plywood	1
7b		3/8"-16 x 1-1/2" Carriage Bolt w/Lockwasher & Nut	4
8	**B17-00-0063**	**Cage**	**1**
8a		3/8"-16 X 1-3/4" Hex Bolt w/Locknut	6
9	**B29-00-0087**	**Electrical Outreach Bracket**	**1**
9a		1/4"-20 x 3/4" Hex Bolt w/Lockwasher & Nut	2
10	**B03-00-0074**	**Outrigger Right**	**1**
10a	B03-00-0075	Outrigger Left	1
10b		1/2"-13 x 5" Grade 5 Hex Bolt w/Locknut	2
11	**B03-00-0004**	**Outrigger Pin Assembly**	**2**
12	**B08-01-0002**	**8" Swivel Caster**	**2**
12a	B08-01-0001	8" Locking Swivel Caster	2
12b		3/8"-16 x 1" Hex Bolt w/Lockwasher & Nut	16
13	**B04-07-0027**	**1/2"-20 x 1/2" Set Screw**	**10**
14		**See Hydraulic System (Pages 22-25)**	
15		**See Electrical System (Pages 26-31)**	

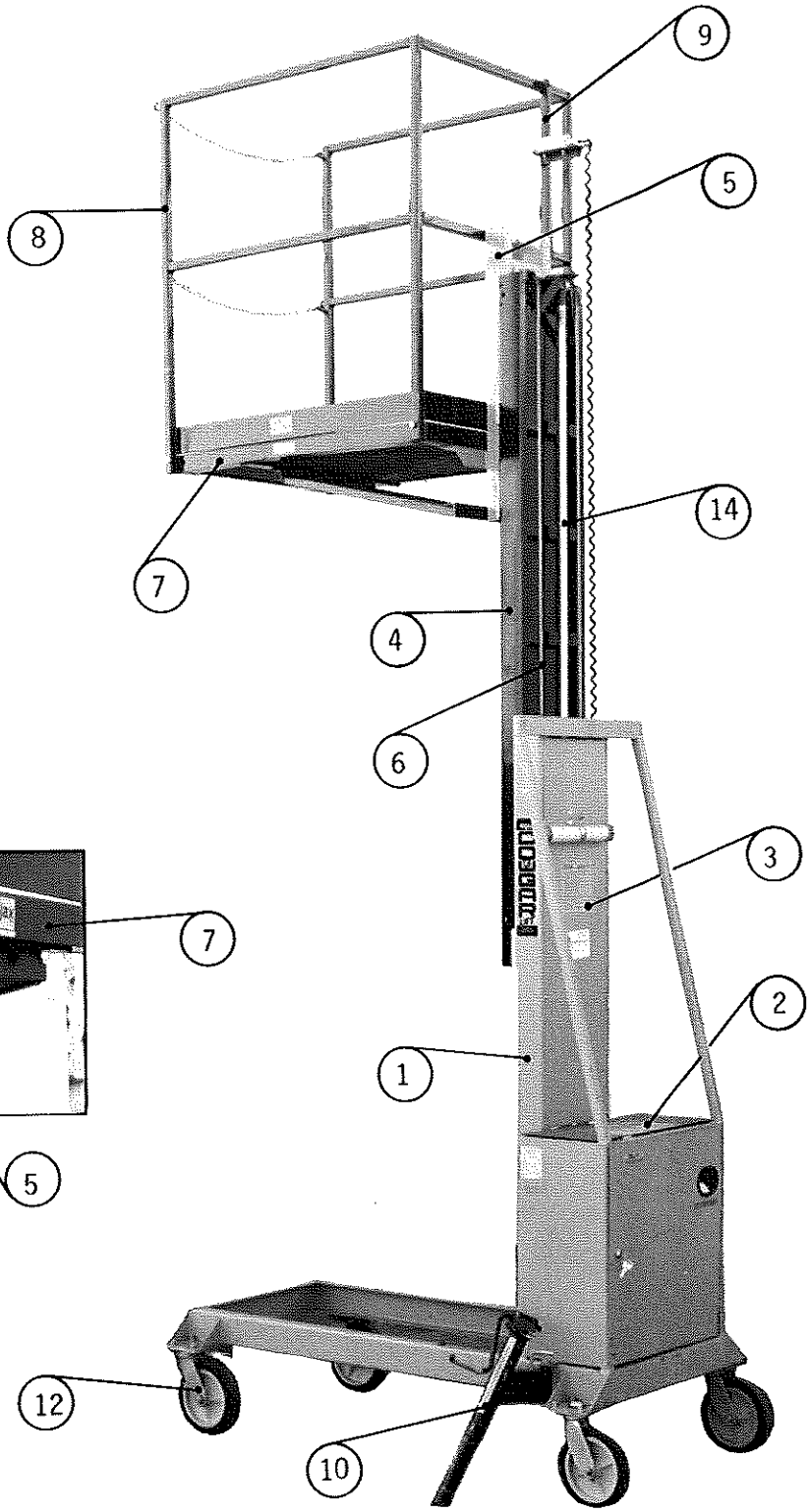
GENERAL ASSEMBLY 1001 PHOTO











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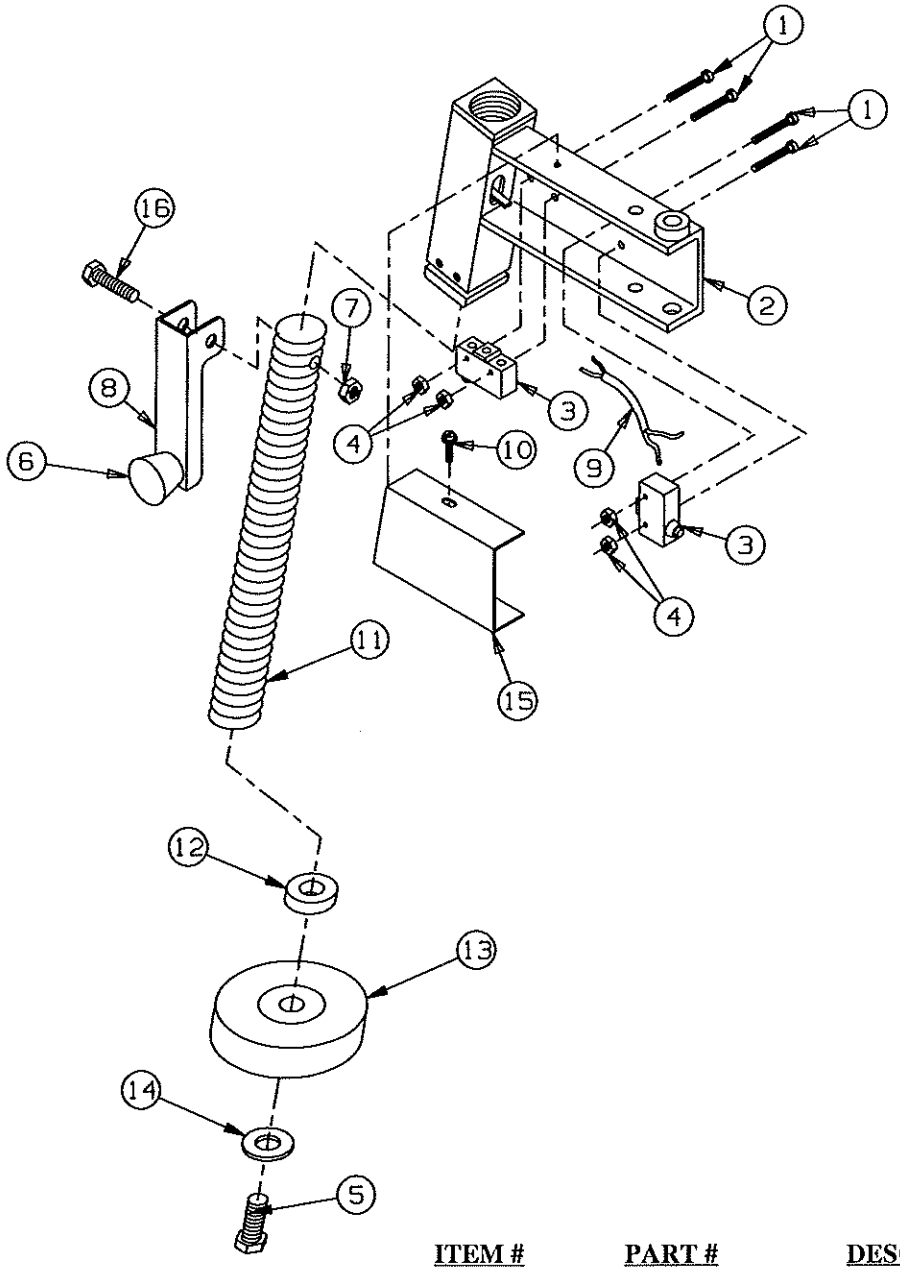
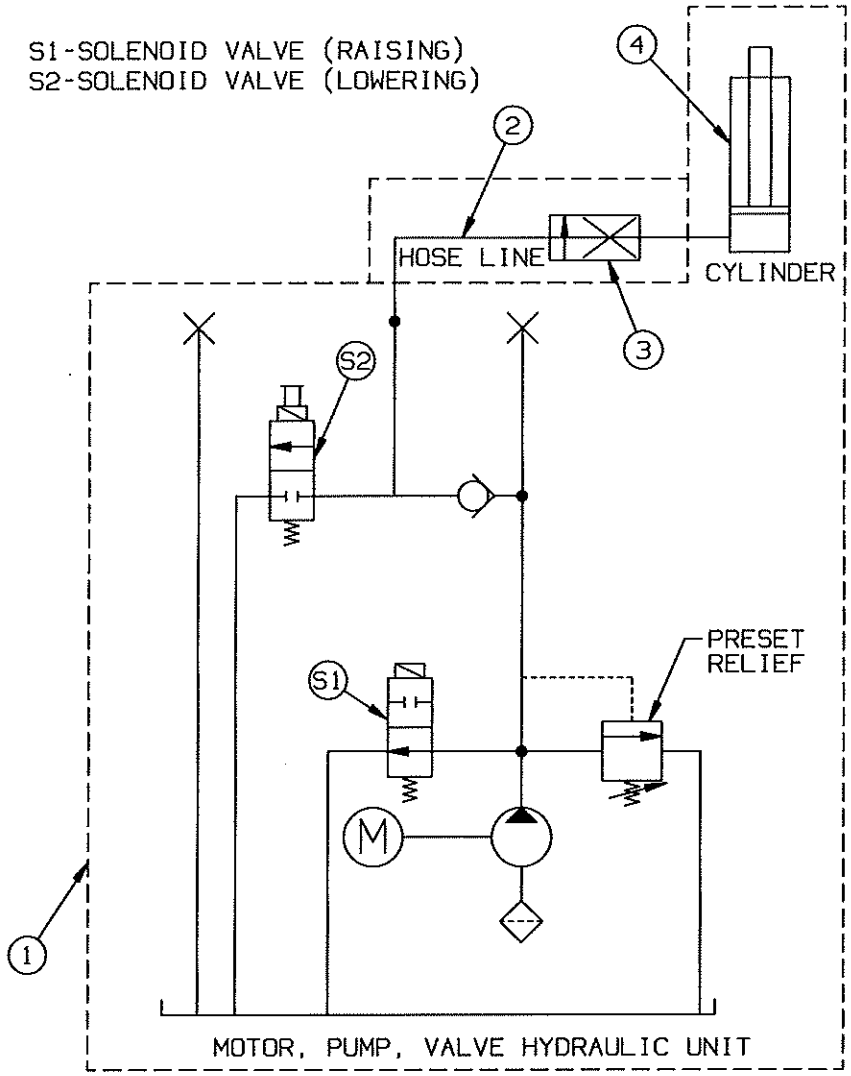
SHORT OUTRIGGER ASSEMBLY



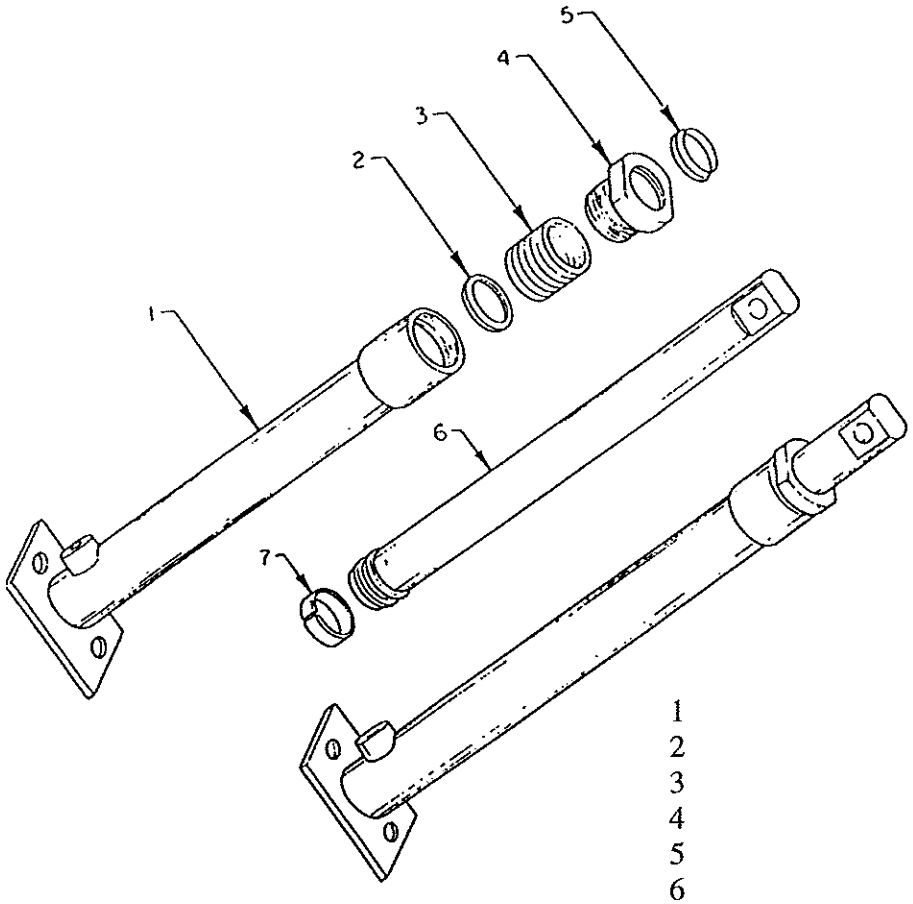
ITEM #	PART #	DESCRIPTION	QTY.
1	B04-04-2111	6-32 Machine Screw	4
2	B23-01-0053	Right Outrigger Weldment	
2	B23-01-0054	Left Outrigger Weldment	
3	B01-03-0013	Limit Switch	2
4	B04-04-2611	6-32 Lock Nut	4
5	B04-05-3509	3/8" - 16 Hex Bolt	1
6	B46-00-0010	Plastic Knob	1
7	B04-02-3002	3/8" Lock Nut	1
8	B46-00-0009	Outrigger Handle	1
9		Wire	1
10	B04-04-0005	Self Thread Screw	1
11	B23-02-0014	Outrigger Screw	1
12	B04-06-0007	Bronze Washer	1
13	B23-02-0011	Rubber Floor Pad	1
14	B04-06-0017	3/8" Flat Washer	1
15	B18-00-0081	Left Switch Cover	
15	B18-00-0082	Right Switch Cover	
16	B04-05-3511	3/8" - 16 Hex Bolt	1

HYDRAULIC SYSTEM



ITEM #	PART #	DESCRIPTION	QTY.
1	B02-05-0002	Motor-Pump Hydraulic Unit (Breakdown pages 29 & 30)	1
		3/8"-16 x 3/4" Hex Bolt w/ Flat Washer & Lockwasher	2
	B02-02-0040	3/8" NPT to 1/4" NPTS Street Elbow	1
2	B02-01-0001	1/4" Flared End Hose Assembly x 15"	1
	B02-02-0042	1/4" NPT to 1/4" NPTS Street Elbow	1
3	B02-04-0001	*Flow Regulator	1
	B02-02-0041	1/4" NPT Double Male Elbow	1
4	B02-03-0001	1" Diameter Displacement Cylinder	1
		3/8"-16 x 1" Hex Bolt, Lockwasher, & Hex Nut	2
		1/2" x 1-5/16" Flat Head Rivet	1
		5/16" x 1-3/4" x 2-1/4" U-Bolt, Lockwasher & Nuts	1
		1/8" x 1" Cotter Pin	1

* Flow Regulator must be installed with end marked IN towards cylinder port, or on the valve with an arrow, the arrow must point away from the cylinder port with only a 1/4" NPT Hydraulic 90° elbow between the cylinder and the restrictor valve.



1		Cylinder Jacket
2		Washer
3		Rod Packing
4		Gland Nut
5		Rod Wiper
6		Piston Rod
7		Wear Ring
8	B02-13-0002	Seal Repair Kit

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.

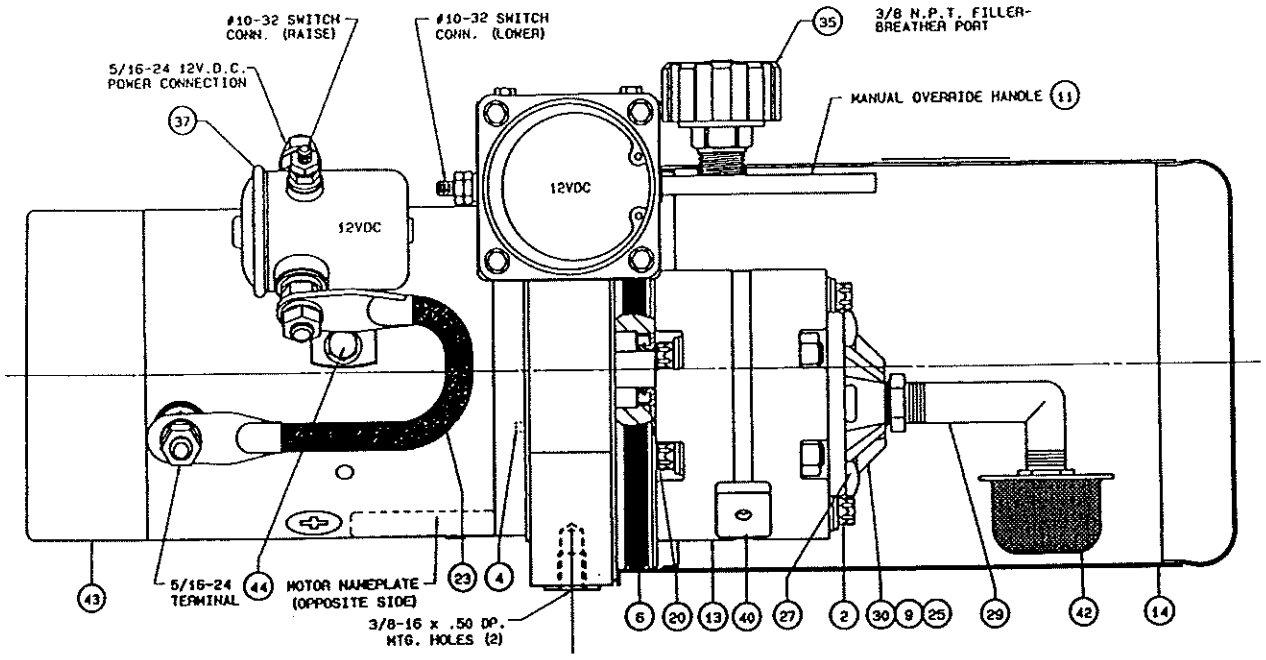
4. Place piston rod back into cylinder jacket and insert washer.

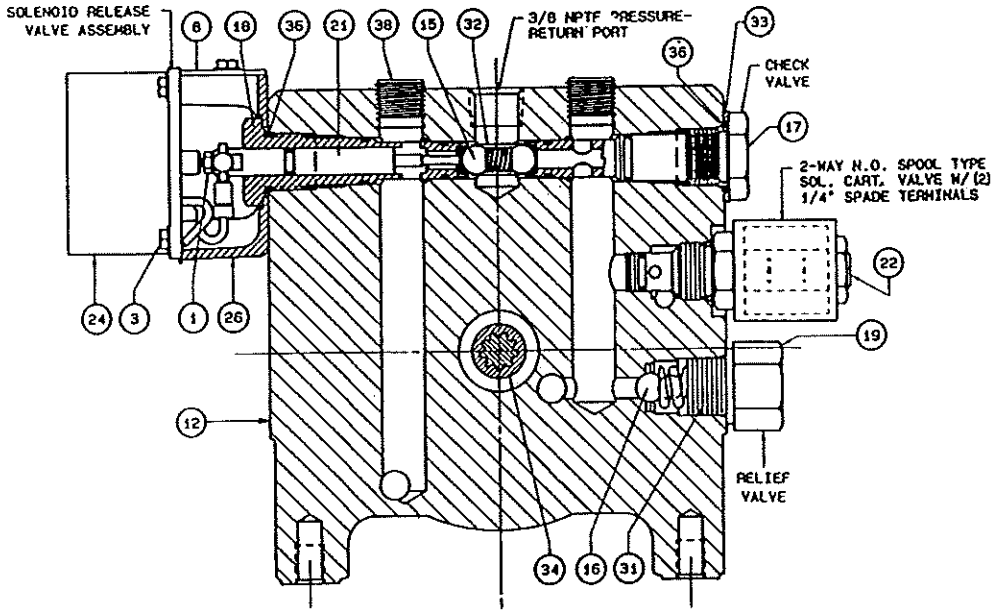
5. Grease the rod packing on the inside and outside diameters. Reinstall one ring at a time making sure each ring lies flat on the ring prior to it. Replace the gland nut complete with a new rod wiper if worn. Thread it down until it makes contact with the rings.

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.

HYDRAULIC UNIT PARTS BREAKDOWN

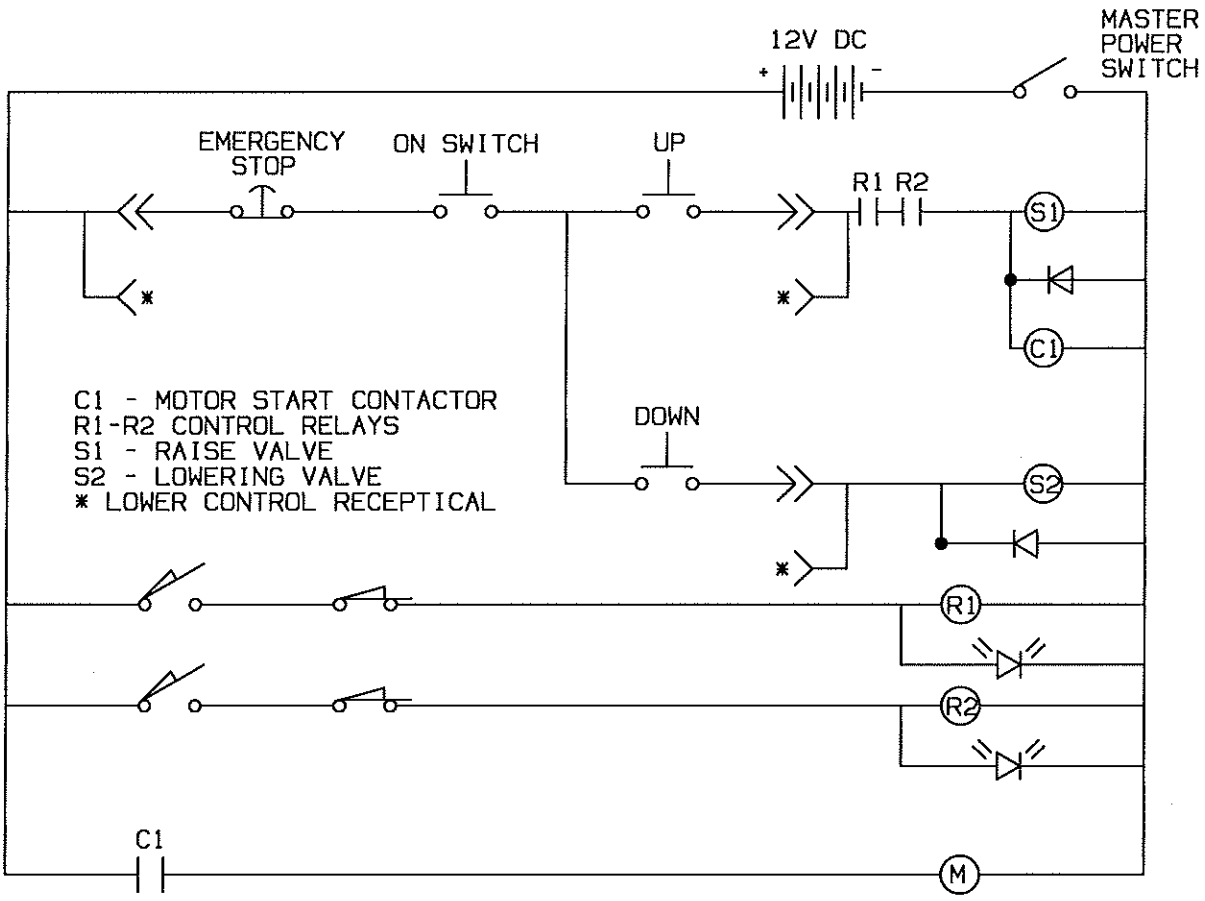




1001 POWER UNIT PARTS LIST

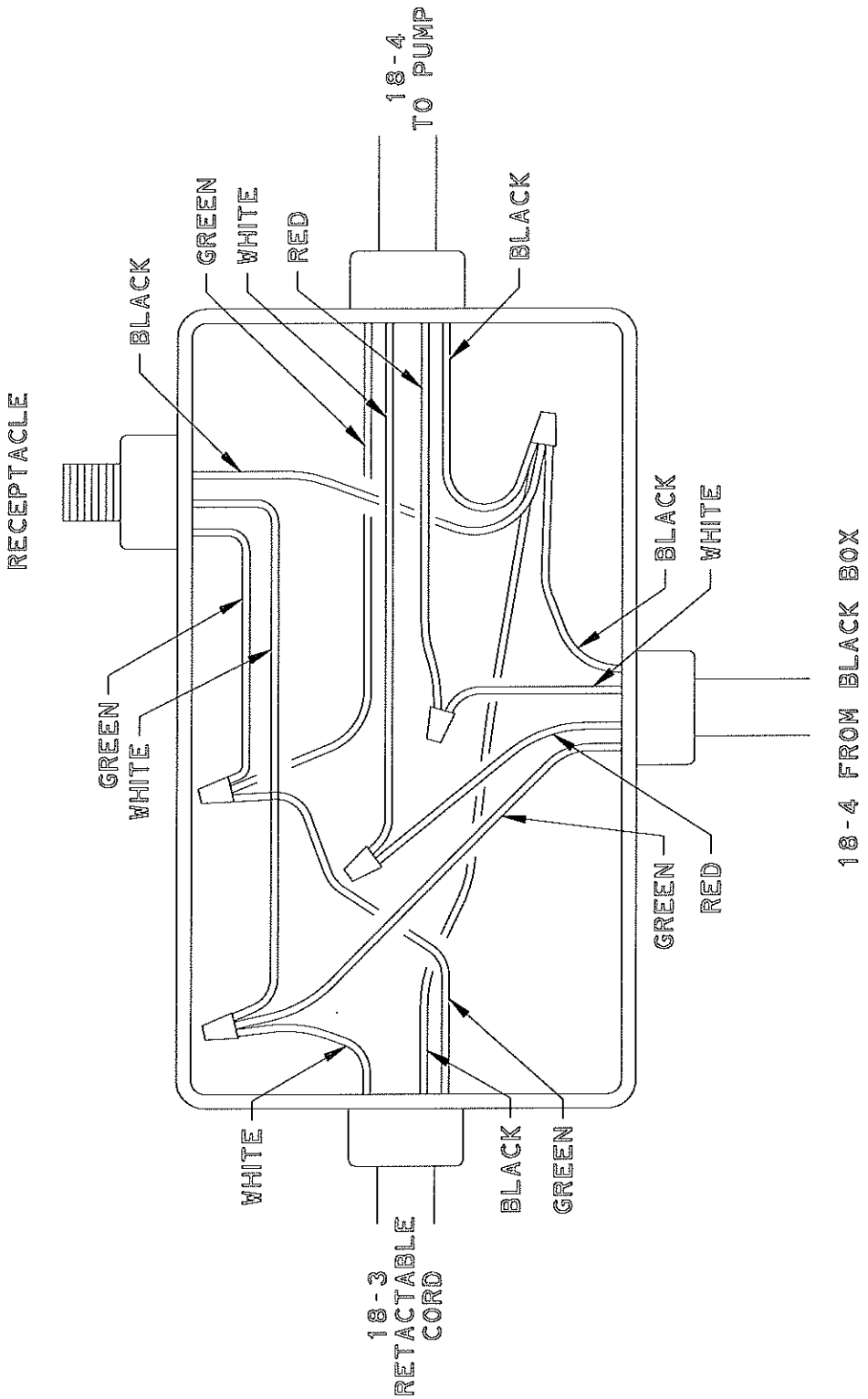
ITEM #	PART #	DESCRIPTION	QTY.
1	B02-15-0003	Adjusting Screw	1
2	B02-15-0088	Bolt 5/16-24 x 2.75	2
3	B02-15-0043	8-32 x .50 Screw	6
4	B02-15-0114	1/8 x 1/4 Pin	1
6	B02-15-0006	0-Ring	1
8	B02-15-0106	Solenoid Bracket Cover	1
9	B02-15-0090	Screw 5/16-18 x 1	1
11	B02-15-0115	Manual Release Rod	1
12	B02-15-0116	Endhead	1
13	B02-15-0078	Pump Assembly	1
14	B02-15-0117	Reservior	1
15	B02-15-0013	Spring & Ball (Check)	1
16	B02-15-0014	Spring & Ball Assembly (Relief)	1
17	B02-15-0015	Check Cap Assembly	1
18	B02-15-0118	Release Valve Assembly	1
19	B02-15-0030	Relief Cap Assembly	1
20	B02-15-0091	Seal Shaft	1
21	B02-15-0018	Release Stem Assembly	1
22	B02-15-0113	12VDC N.O. Spool Cart. Valve	1
23	B01-15-0124	Electric Terminal Strap	1
24	B02-15-0020	Solenoid Assembly	1
25	B02-15-0093	Washer	1
26	B02-15-0022	Solenoid Mounting Bracket Assembly	1
27	B02-15-0126	Screw M6-1 x 12mm	2
29	B02-15-0059	Nylon Ell	1
30	B02-15-0125	Cover Suction	1
31	B02-15-0026	Adjusting Screw	1
32	B02-15-0027	Spring Retainer	1
33	B02-15-0028	Seal Ring	1
34	B02-15-0119	Coupling	1
35	B02-15-0052	Breather Plastic 3/8NPT	1
36	B02-15-0046	O-Ring	2
37	B02-15-0120	Solenoid Start DC12	1
38	B02-15-0097	Plumbing Plug 3/8 NPT	2
40	B02-15-0061	Plumbing Magnet	1
42	B02-15-0121	Filter	1
43	B02-15-0122	Motor DC 12V	1
44	B02-15-0123	Screw 1/4-20 x .25	2

ELECTRICAL SYSTEM

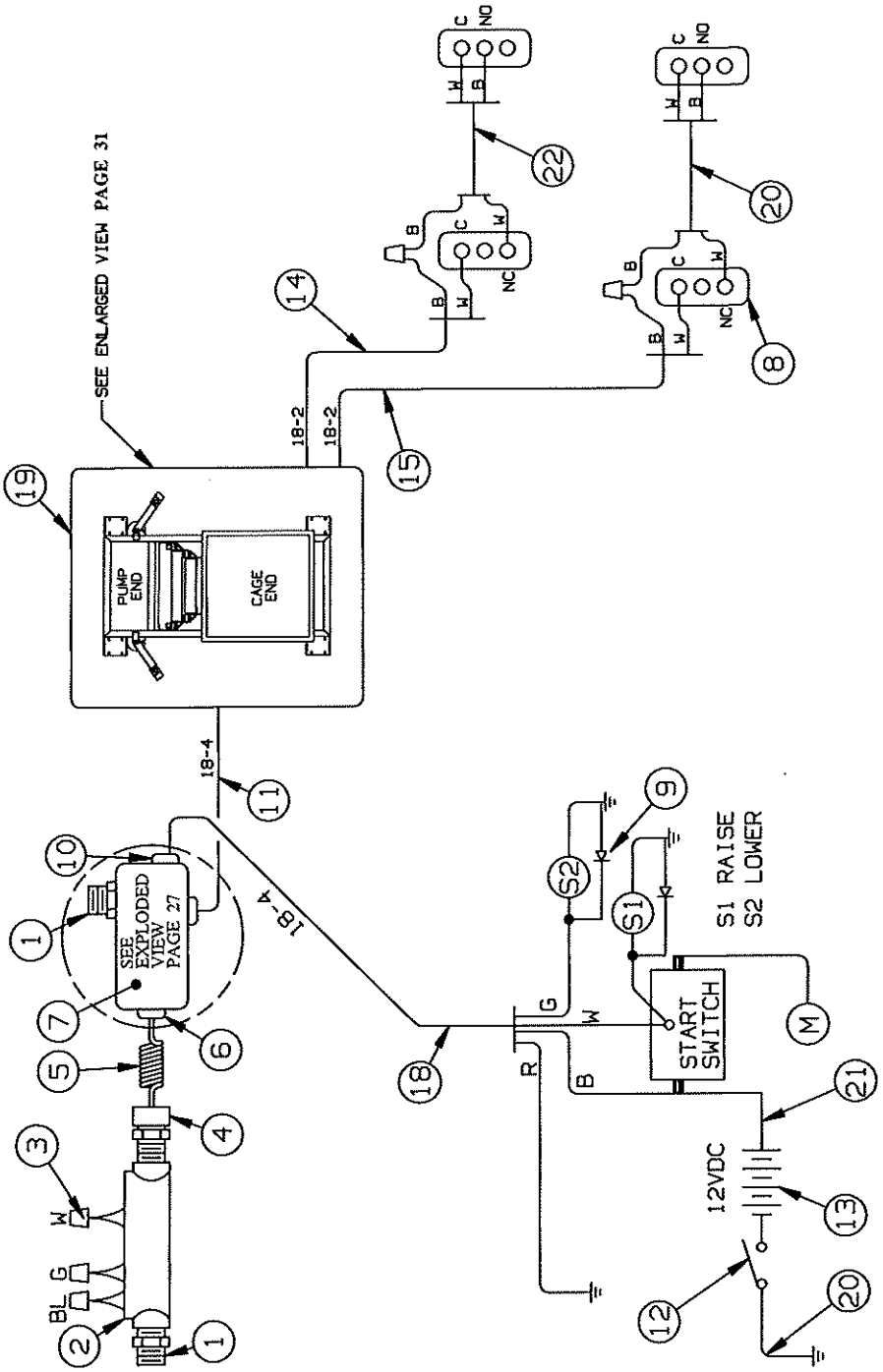


PART#	DESCRIPTION	QTY.
B04-07-0003	Battery Hold Down Rod	2
B29-00-0001	Battery Hold Down Strap	1
	1/4" S.A.E. Flatwasher	2
	1/4"-20 Hex Lockut	
B01-05-0022	15 Amp Battery Charger - 12 Volt	1
B04-07-0028	#10 x 1/2" Hex Slotted Head Screw	4
B03-00-0014	2-1/4" Dia. Electrical Tube Assembly	1

WIRING DIAGRAM FOR JUNCTION BOX ON DC LIFTS



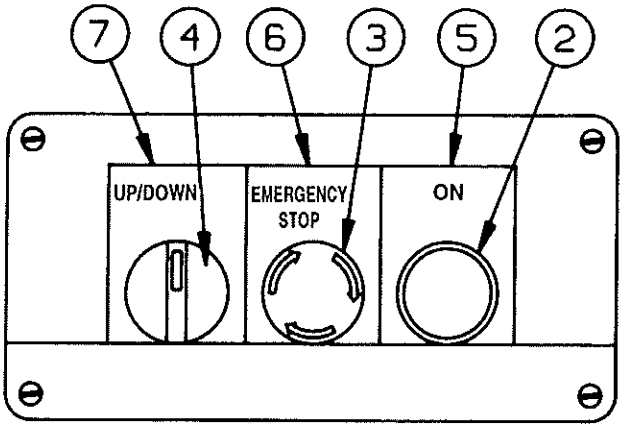
DC - WIRING DIAGRAM

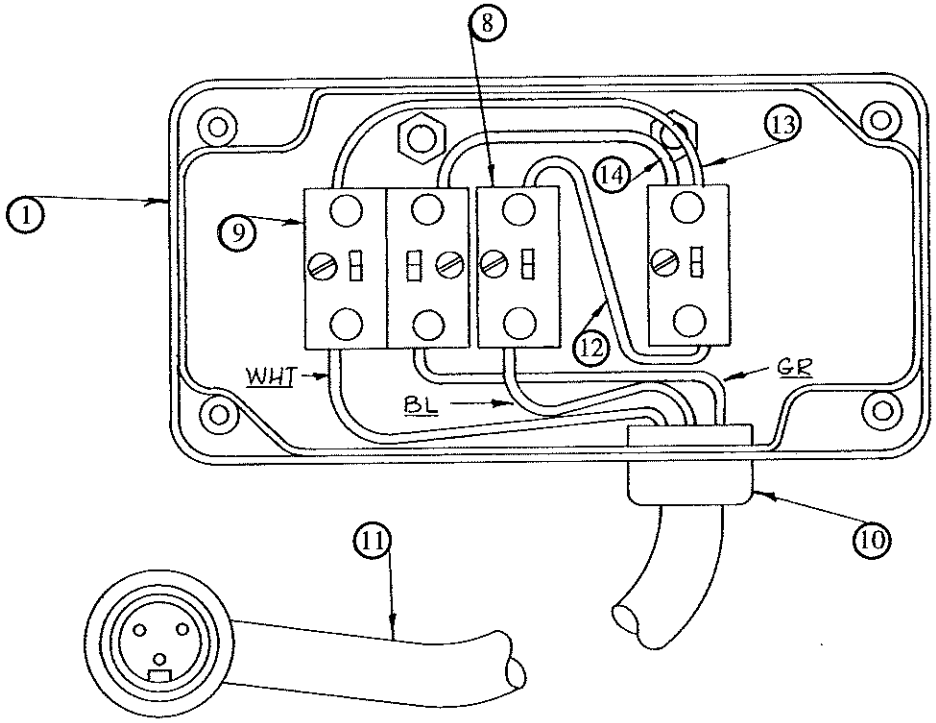


DC - WIRING PARTS LIST

ITEM #	PART #	DESCRIPTION	QTY.
1	**B01-10-0001**	**3 Conductor Receptacle**	**2**
1a	B04-07-0012	Drive Lock Nut	1
2	**B01-10-0047**	**Unilet Box**	**1**
2a	B01-10-0049	Unilet Cover	1
2b		10-24 x 3/4" Bolts w/Lockwashers & Nuts	2
3	**B01-09-0005**	**Wire Nut**	**7**
3a	B01-09-0042	Wire Nuts	3
4	**B01-09-0029**	**Threaded Cord Grip**	**1**
5	**B01-01-0002**	**16/3 Retractile Cord**	**1**
5a	B00-00-0007	Plastic Tube	1
5b	B00-00-0008	Plastic Plug for Tube	1
5c	B04-08-0002	Pop Rivets	2
5d	B29-00-0049	Mounting Brackets for Tube	2
5e	B04-04-0005	10-24 x 1/2" Self Threading Screw	2
6	**B01-09-0003**	**Cord Grips**	**2**
7	**B18-00-0026**	**Handy Box Cover**	**1**
8	**B01-03-0019**	**Switch**	**4**
8a	B04-04-2105	Bolts #6 x 3/4"	16
8b	B04-01-2002	#6 Locknuts	16
8c	B04-06-1002	#6 Flat Washers	16
9	**B01-10-0064**	**Diode**	**2**
10	**B01-09-0027**	**Cord Grips**	**1**
11	**B01-01-0068**	**18-4 x 66" w/Wire Ends**	**1**
12	**B01-02-0001**	**Battery Disconnect**	**1**
13	**B01-04-0002**	**Battery 12v DC 27 DCM**	**1**
14	**B01-01-0069**	**18-2 Wire Assembly 60" Long**	**1**
15	**B01-01-0070**	**18-2 Wire Assembly 88" Long**	**1**
18	**B01-01-0073**	**18-4 Wire 25" Long**	**1**
19	**B19-00-0018**	**Black Box**	**1**
19a	B19-00-0017	Lid w/Mtg. Screws	1
19b	B04-04-2103	Bolts #6 x 1/2"	8
19c	B04-01-2002	#6 Lock Nuts	8
19d	B01-06-0015	12v DC Relays	4
19e	B01-09-0029	Cord Grips	5
19f	B01-10-0101	Green Indicator Lights	4
19g	B04-04-4105	Bolts #10 x 3/4	4
19h	B04-01-4002	#10 Locknuts	4
19i	B04-06-1004	#10 Flat Washers	4
19j	B04-07-0038	Plastic Locknut for 19e	5
20	**B01-01-0074**	**18-2 Wire 30" Long**	**2**
21	**B01-01-0005**	**22" Battery Lead**	**1**

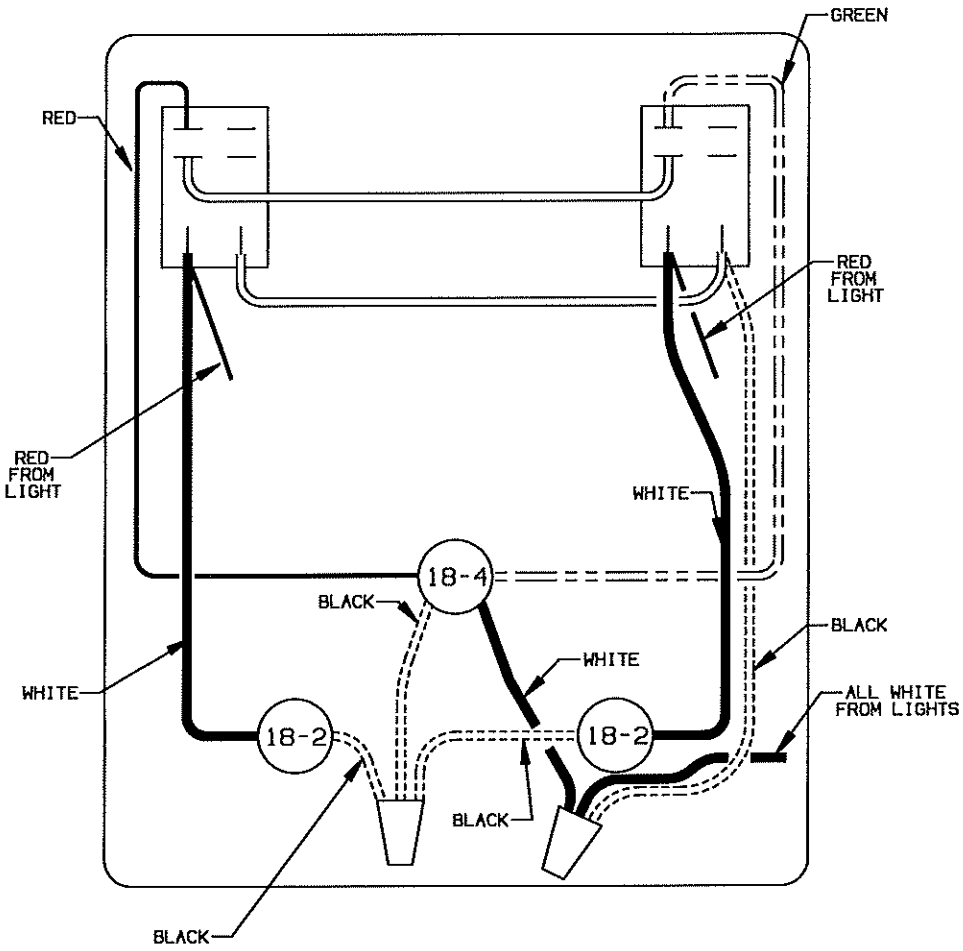
CONTROL ASSEMBLY





ITEM #	PART #	DESCRIPTION	QTY.
1	B19-00-0001	3 Switch Box w/Cover	1
2	B01-02-0003	Push Button	1
3	B01-02-0004	"Emergency Stop" Button	1
4	B01-02-0025	Selector Switch	1
5	B00-00-0015	"On" Plate	1
6	B00-00-0017	"Emergency Stop" Plate	1
7	B00-00-0016	"Up-O-Down" Plate	1
8	B01-02-0006	Contact Block N.C.	1
9	B01-02-0005	Contact Block N.O.	3
10	B01-09-0003	Strain Relief Bushing	1
11	B01-01-0003	Control Cord	1
12	B01-01-0042	16 Ga. x 2 3/4" Wire	1
13	B01-01-0043	16 Ga. x 3 3/4" Wire	1
14	B01-01-0042	16 Ga. x 2 3/4" Wire	1

OUTRIGGER INDICATOR BOX WIRING



GREEN
BLACK
RED
WHITE

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 595 E. Lugbill Rd. 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 reapirs 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.

8.8.3 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.

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

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

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

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

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

8.8.9 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.

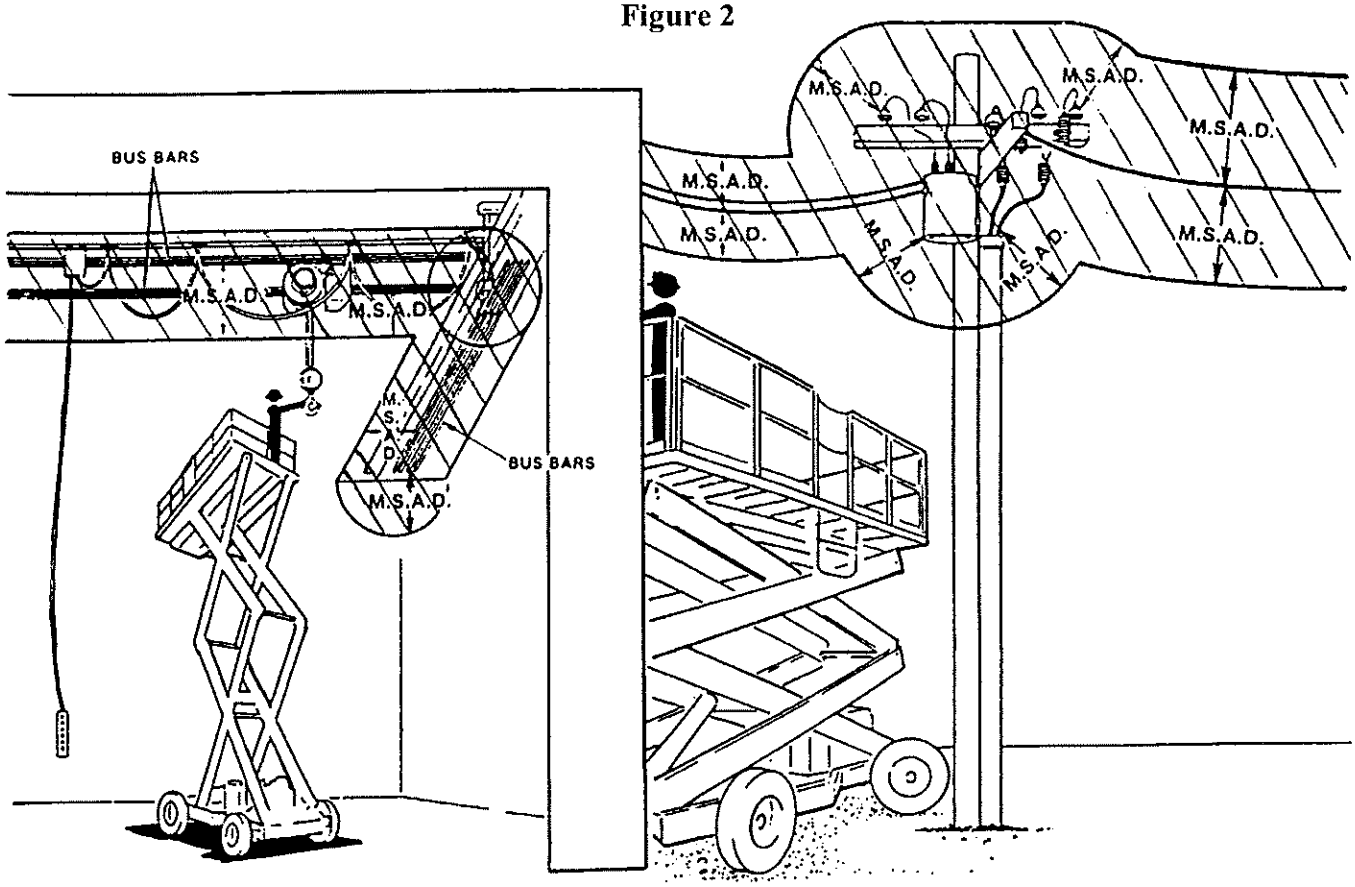
10.2.1 Lessee as a Dealer. When a lessee uses the aerial platform as a dealer, the lessee shall have the responsibilities of dealers as specified in Section 5 of this standard.

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.

Figure 2



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

DOUGLAS
Battery Manufacturing Co.

Material Safety Data Sheet

LEAD / ACID BATTERY

Manufacturer's Name	Douglas Battery Manufacturing Co.	Emergency Telephone No.	1-800-368-4527
Address	500 Battery Drive, Winston-Salem, NC 27107	Other Information Calls	919-788-7561
Signature of Person Responsible for Preparation	Jonathan F. Hale	Date Prepared	10/1/85

SECTION 1 – IDENTITY

Common Name: (used on label) (Trade Name & Synonyms): Lead/Acid Storage Battery

Chemical Name	Lead/Acid Storage Battery	Chemical Family	Toxic Material Corrosive Material
Formula	Lead/Acid		

SECTION 2 – HAZARDOUS INGREDIENTS

Principal Hazardous Component(s) (chemical & common name(s))	%	Threshold Limit Value (units)
Lead/Lead Oxide/Lead Sulphate	60%	0.05 mg/m^3
Antimony	1 – 5%	0.5 mg/m^3
Arsenic	< 1%	0.01 mg/m^3
Sulfuric Acid	10 – 30%	1.0 mg/m^3

SECTION 3 – PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data) Hydrogen

Boiling Point	N/A				
Percent Volatile by Volume (%)	N/A	Vapor Density	lighter than air	Evaporation Rate	N/A
Solubility in Water	None			Reactivity in Water	None
Appearance and Odor	None				

Flash Point	N/A	Flammable Limits In Air % by Volume	Lower 4.0	Upper 74.2	Extinguisher Media	Halon, dry chemical	Auto-Ignition Temperature	N/A

Special Fire Fighting Procedures: Halon or dry chemical

Unusual Fire and Explosion Hazards: Hydrogen gas and sulfuric acid vapors are generated upon overcharge. Ventilate charging areas as per ACGIH Industrial Ventilation A Manual of Recommended Practice and National Fire Code, 1980 Vol. 1, P. 12, B-9, 10.

SECTION 4 – PHYSICAL HAZARDS

Stability: Unstable ☐ Stable ☐ — Conditions to Avoid: Avoid overcharging and smoking, or sparks near battery surface.

Incompatability (Materials to Avoid): Sparks, Open flames.

Hazardous Decomposition Products: An explosive hydrogen/oxygen mixture within the battery may occur during charging.

SECTION 5 – HEALTH HAZARDS

Threshold Limit Value: Permissible exposure limit – Acid mist. 1.0 mg/m^3 (milligram per cu. meter)

Signs and Symptoms of Exposure: 1. Acute Overexposure: No possibility of overexposure to lead, etc. unless

2. Chronic Overexposure: battery is destroyed.

Medical Conditions Generally Aggravated by Exposure: Sulfuric acid mist causes coughing and will burn eyes and skin.

Chemical Listed as Carcinogen or Potential Carcinogen: N/A — National Toxicology Program: Yes ☐ No ☒ — I.A.R.C. Monographs: Yes ☐ No ☒ — OSHA: Yes ☐ No ☒

Emergency and First Aid Procedures: Sulfuric Acid Mist

1. Inhalation: Move to Ventilated Area
2. Eyes: Wash the eyes with copious quantities of running water for 15 minutes.
3. Skin: Flush area with plentiful amounts of running water.
4. Ingestion: Wash out mouth with running water. Give milk to drink. Do not induce vomiting. Call Physician.

SECTION 6 – SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Sulfuric Acid Mist – half mask with dust and acid mist filter.

Ventilation: Change air every 15 min. — Local Exhaust: No — Mechanical (General): N/A

Protective Gloves: Rubber Gloves — Eye Protection: Goggles or face shield.

Other Protective Clothing or Equipment: Rubber or plastic apron.

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL / LEAK PROCEDURES

Precautions to be Taken in Handling and Storage: Keep away from flames during and immediately after charge.

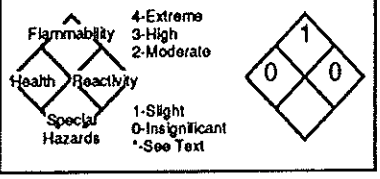
Other Precautions: Avoid prolonged overcharge.

Steps to be Taken in Case Material is Released or Spilled: Wash with water or neutralize with sodium carbonate or bicarbonate.

Waste Disposal Methods: Neutralize with sodium carbonate or bicarbonate.

BP OIL

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA FIRE HAZARD SYMBOL*
BP America (In Ohio): 800-362-8059 (Outside Ohio): 800-321-8642 CHEMTREC Assist: 800-424-9300	216-586-6499	
MSDS Number > **1312**		

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

PRODUCT IDENTIFICATION

TRADE NAME:
ENERGOL HLP-HD 46

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
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

REACTIVITY STABLE

PRODUCT HEALTH HAZARD INFORMATION

INGESTION:
PRACTICALLY NON-TOXIC. Estimated rat oral LD50 = >5 gm/kg. Aspiration into lungs may cause pneumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea.

SKIN:
PRACTICALLY NON-TOXIC. Estimated rabbit dermal LD50 = >2 gm/kg. 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:

NOTE: This product has not been tested as a whole for all potential health effects. It may have other health hazards related to its components. See "Ingredient/Health Hazards" for additional information.

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 immediately. 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, armcovers, 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: PALE YELLOW TO LIGHT ORANGE CLEAR LIQUID WITH A MODERATE PETROLEUM ODOR.

FIRE AND EXPLOSION DATA

FLASH POINT: 204.00 C (400 F) COC
AUTOIGNITION TEMPERATURE: ND
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: ND UPPER: ND

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.

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

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:
Combustion may produce CO, CO2 and reactive hydrocarbons. May also produce NOx and SOx. A trace of hydrogen sulfide may be produced from thermal decomposition.

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 advise 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: X Fire Hazard: - Pressure Hazard: - Reactivity Hazard: -

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ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION:

There may be specific regulations at the local, regional or state level that pertain to this material.

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE:

Avoid extremes of temperature in 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.

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

TRANSPORTATION REQUIREMENTS

D.O.T. HAZARD CLASS (49 CFR 172.101): NA

D.O.T. PROPER SHIPPING NAME (49 CFR 172.101): NA

D.O.T. LABELS REQUIRED (49 CFR 172.101): NA

D.O.T. PLACARDS REQUIRED: NA

BILL OF LADING DESCRIPTION: LUBRICATING OIL (MOTOR), PETROLEUM LUBRICATING OIL (RAIL)

UN/NA CODE: NA

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REFERENCE
Distillates (petroleum), solvent refined light paraffinic	64741-89-5	0-55	5 mg/M3 TLV; 10 mg/M3 STEL (ACGIH 1988-89) for mineral oil mists 5 mg/M3 PEL (OSHA) for mineral oil mists
Health Hazards: Orally - practically non-toxic. Aspiration hazard. Dermally - practically non-toxic. Skin - slightly irritating. Eye - slightly irritating. May cause respiratory tract irritation. The International Agency for Research on Cancer (IARC), in its review of a large body of literature, has determined that there is "no evidence that severely solvent-refined oils are carcinogenic to experimental animals."			
Distillates (petroleum), solvent refined heavy paraffinic	64741-88-4	40-99	5 mg/M3 TLV; 10 mg/M3 STEL (ACGIH 1988-89) for mineral oil mists 5 mg/M3 PEL (OSHA) for mineral oil mists
Health Hazards: Orally - practically non-toxic. Possible aspiration hazard (depending on viscosity). Dermally - practically non-toxic. Skin - slightly irritating. Eye - slightly irritating. May cause respiratory tract irritation. The International Agency for Research on Cancer (IARC), in its review of a large body of literature, has determined that there is "no evidence that severely solvent-refined oils are carcinogenic to experimental animals".			
Remaining components not determined hazardous and/or hazardous components present at less than 1.0% (0.1% for carcinogens).	NA	Trace	NA

REVISION DATE: 26-apr-1989 REPLACES SHEETS DATED: 23-jan-1989
COMPLETED BY: BP America Product Safety & Toxicology Department

ND = No Data
NA = Not Applicable