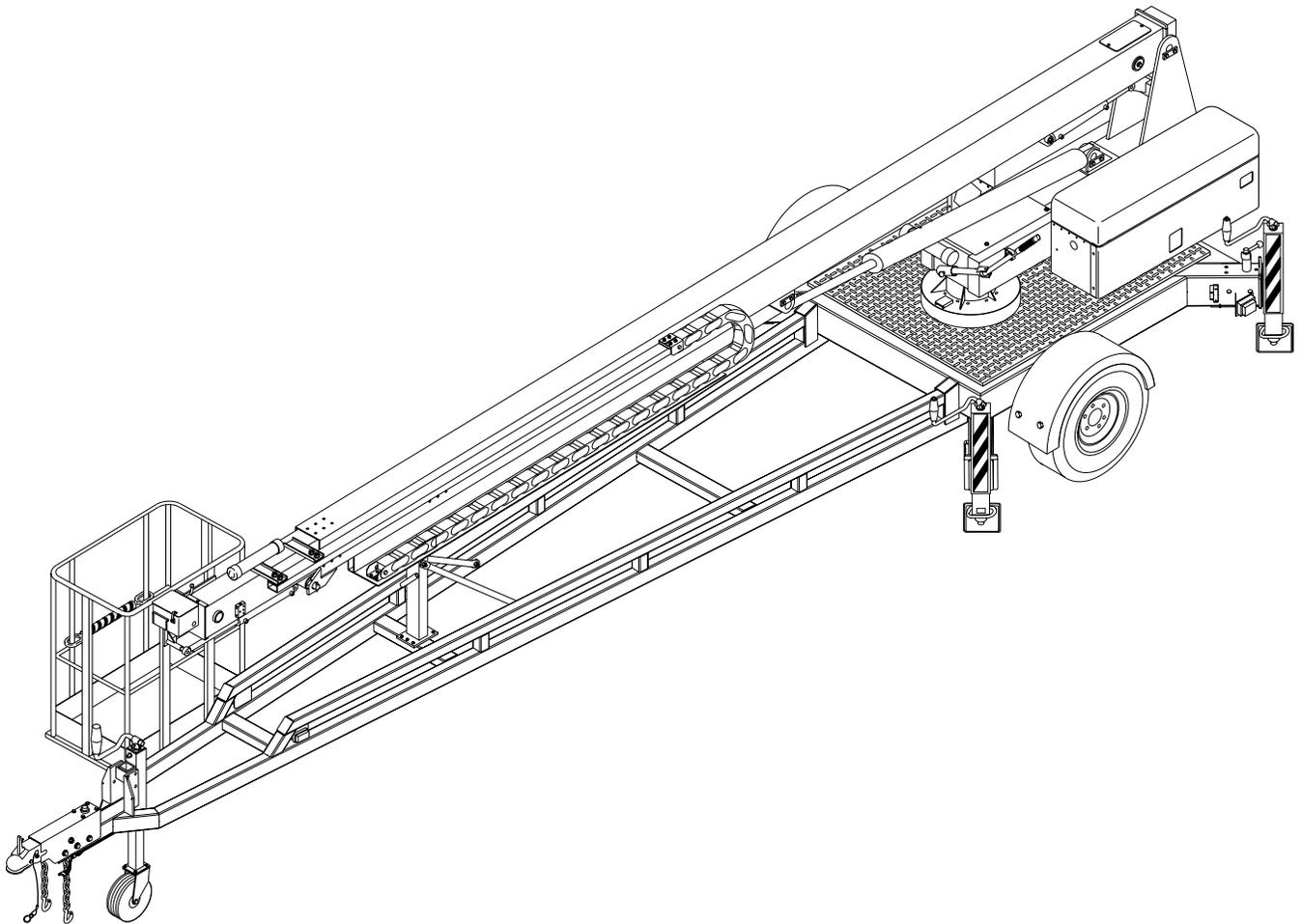


XLB-4232 DC

Hydraulic Boom Lift



BOOM PERSONNEL LIFT

This equipment is designed and manufactured in compliance with the duties, responsibilities, and standards set forth for manufacturers in the ANSI 92.2 standard in effect at the time of manufacture.

This equipment will meet or exceed applicable OSHA codes and ANSI A92.2 standards when used in accordance with sections 7, 8, 9, 10 & 11 of ANSI A92.2 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 that govern the safe operation of this equipment.

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1

Safety

1-1 INTRODUCTION

Familiarity and proper training are required for the safe operation of mechanical equipment. Equipment operated improperly or by untrained personnel can be dangerous. Read the operating instructions in this manual and become familiar with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the machine. The use of intelligence and common sense in the operation of mechanical equipment is the best practice in any safety policy. Be professional and always observe the safety procedures set forth in this manual.

All OSHA, ANSI, state, and local codes and regulations pertaining to this equipment should be obtained, read, and thoroughly understood before attempting to operate 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 operate this equipment in areas where the equipment or user may come in contact with a 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 to alert Bil-Jax customers 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 Bil-Jax equipment only.

For any questions concerning the safe use of this equipment, call 419.445.9675 before operating.

Safety Notes

This manual contains DANGERS, WARNINGS, CAUTIONS, and NOTES that must be followed to prevent the possibility of improper service, damage to the equipment, or personal injury.

DANGER

Dangers warn of equipment operation near electrical power lines that could lead to personal injury or death.

WARNING

Warnings describe conditions or practices that could lead to personal injury or death.

CAUTION

Cautions provide information important to prevent errors that could damage machine or components.

NOTE: Notes contain additional information important to a procedure.

1-2 BEFORE OPERATION

Ensure the following general safety precautions are followed before operating the XLB-4232 DC Boom Lift.

- ALWAYS survey the usage area for potential hazards such as untamped 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 operating area.
- ALWAYS read, understand, and follow the procedures in this manual before attempting to operate equipment.
- ALWAYS inspect the equipment for damaged or worn parts. Check for cracked welds, hydraulic leaks, damaged wiring, loose wire connectors, damaged outriggers, low tire pressure, uneven tire wear, or tire damage. Also check for any improper operation. NEVER operate equipment if damaged in any way. Improperly operating equipment must be repaired before using.
- ALWAYS wear proper clothing for the job. Wear protective equipment as required by federal, state, or local regulations. The operator MUST wear a safety harness and lanyard.
- ALWAYS locate, read, and follow all directions and warnings displayed on the equipment.
- ALWAYS inspect the equipment for “DO NOT USE” tags. NEVER use equipment tagged in this way until all repairs are made and all “DO NOT USE” tags are removed by authorized maintenance personnel.
- ALWAYS make sure the basket and outrigger shoes are free of mud, grease, or other slippery material to reduce the possibility of slipping.
- NEVER allow improperly trained personnel to operate this equipment. Only trained and authorized personnel shall be allowed to operate this equipment.
- NEVER 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.
- NEVER modify, alter, or change the equipment in any way that would affect its original design or operation in any way.
- NEVER operate this equipment in ways for which it is not intended.

1-3 DURING OPERATION

Ensure the following general safety precautions are followed during the operation of the XLB-4232 DC Boom Lift.

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. Operator must maintain safe clearances at all times (10 feet minimum) 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.

Refer to Table 1-1 for minimum safe approach distances between machine and electrical power lines.

Table 1-1. Minimum Safe Approach Distances

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

- ALWAYS position lift far enough away from power sources to ensure that no part of the lift can accidentally reach into an unsafe area. This includes full extension of the boom through 360 degrees rotation.
- ALWAYS operate only on a firm and level surface. NEVER use on surfaces that do not support the equipment with its rated load capacity and the resulting force exerted on the outriggers during boom extension and rotation.
- ALWAYS keep yourself and all personnel away from potential pinch or shear points.
- ALWAYS report any misuse of equipment to the proper authorities. Horseplay is prohibited.
- ALWAYS maintain good footing on the work platform. NEVER wear slippery soled shoes.
- ALWAYS make certain all personnel are clear and there are no obstructions before repositioning basket.
- ALWAYS cordon off area around the outriggers to keep personnel and other equipment away from it while in use.
- ALWAYS stay clear of wires, cables, and other overhead obstructions.
- ALWAYS engage the boom travel locking pin before towing the trailer.

- NEVER allow electrode contact with any part of the basket if welding is being performed from the platform.
- NEVER use without the outriggers fully extended, locked, and firmly based. When on soft surfaces, ALWAYS use outrigger base plates.
- NEVER override or by-pass manufacturer's safety devices.
- NEVER attach a safety harness to an adjacent structure, pole, or equipment while working from the boom platform.
- NEVER release outrigger locks or move unit with a person or materials on board.
- NEVER release the outriggers or move the trailer with the boom extended.
- NEVER stand or sit on cage bars. Work only within the work cage and do not lean out over the cage to perform work.
- NEVER attempt to increase working height with boxes, ladders, or other means.
- NEVER operate this equipment when exposed to high winds, thunderstorms, ice, or any other weather conditions that would compromise operator safety.
- NEVER allow ropes, electric cords, hoses, etc. to become entangled in the equipment when the basket is being raised or lowered.
- NEVER exceed manufacturer's load limits or use the lift as a crane for lifting heavy materials. Make sure all tools and equipment are safely stowed.
- NEVER exceed load ratings by transferring loads to the basket at elevated heights.
- NEVER use cage to carry materials and never allow overhang of materials when raising or lowering the basket.
- NEVER push or pull with the boom or basket and NEVER use the boom to lift any part of the trailer.
- NEVER use the boom or basket to place a "dead man" load against any structure, materials, or equipment.
- NEVER climb up or down boom.
- NEVER leave the keys in the boom lift while unattended or not in use.

1-4 MAINTENANCE SAFETY

Ensure the following safety precautions are observed whenever maintenance is performed on the XLB-4232 DC Boom Lift.

General Maintenance

- ALWAYS perform maintenance procedures according to manufacturer's requirements. NEVER short change maintenance procedures.
- ALWAYS check hydraulic system. Make sure all lines, connectors, and fittings are tight and in good condition.
- ALWAYS turn the MASTER POWER switch OFF before connecting or disconnecting wiring to or from valve solenoids or other load devices.
- ALWAYS disconnect power to the hydraulic pump drive motor before making electrical checks of the hydraulic valves.
- ALWAYS keep all mechanisms properly adjusted and lubricated according to maintenance schedule and manufacturer's specifications.
- ALWAYS perform a function check of operating controls before each use and after repairs have been made.
- ALWAYS locate and protect against possible pinch points prior to performing maintenance and repairs.
- ALWAYS use factory-approved parts to repair or maintain this equipment. If this equipment is rebuilt, retesting is required in accordance with factory instructions.
- NEVER allow water or foreign particles into the DC electric motor housing. Ingestion of water or foreign particles may cause serious damage to the motor. If the motor gets wet, oven dry the motor to remove all moisture before operating; consult motor manufacturer for drying instructions.
- NEVER test or operate the hydraulic components when another person is near the equipment.
- NEVER add unauthorized fluids to the hydraulic system or battery. Check original manufacturer specifications.
- NEVER exceed the manufacturer's recommended relief valve settings.
- NEVER touch or allow metal tools to contact static discharge sensitive electronic components. ALWAYS use static discharge prevention mats and grounding devices when handling electronic components.
- NEVER tamper with cylinder counter balance valves. Contact the Bil-Jax Service Department at 419.445.9675 if the cylinder counter balance valves need adjusting.
- NEVER attempt repairs you do not understand. Consult manufacturer if you have any questions regarding proper maintenance, specifications, or repair.

Battery Maintenance

Ensure the following general safety precautions are followed whenever performing battery maintenance on the XLB-4232 DC Boom Lift.

- ALWAYS 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.
- ALWAYS avoid contact with battery acid. Battery acid causes serious burns. Avoid contact with skin or eyes. If accidental contact occurs, flush with water and consult a physician immediately.
- ALWAYS disconnect ground cable first when removing battery.
- ALWAYS connect ground cable last when installing battery.
- ALWAYS charge batteries in open, well-ventilated areas.
- NEVER smoke when servicing battery.
- NEVER allow batteries to overcharge and boil.
- NEVER short across battery posts to check for current. NEVER break a live circuit at battery.
- NEVER jump start other vehicles using boom lift battery.

1-5 DAMAGED EQUIPMENT POLICY

Safety Statement

At Bil-Jax, we are dedicated to the safety of all users of our products. Therefore, all Bil-Jax 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 Bil-Jax lift is involved in an incident that 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 Bil-Jax 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), Bil-Jax requires that the lift be returned to our facility at 125 Taylor Parkway, Archbold, Ohio, for reconditioning. If you have any questions concerning what constitutes structural damage, please call the Bil-Jax Service Department at 419.445.9675.

Damage Repair Notice

There may be occasions when a Bil-Jax 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 Bil-Jax of these non-maintenance repairs and request a repair form to be filled out and returned to Bil-Jax.

2

Introduction

2-1 GENERAL DESCRIPTION

The XLB-4232 DC Boom Lift is designed and manufactured for positioning personnel with their tools and equipment at overhead work locations. The rated work basket load capacity is 300 lbs. for the XLB-4232. Basket elevation is by two hydraulic cylinders acting on the boom sections. A hydraulic powered motor and worm gear rotates the boom 360° around a vertical axis. The hydraulic power unit includes a reservoir, pump, and control valves.

On the battery powered (DC Model) boom lift, dual 24 Volt, 39 Amp, one horsepower, DC electric motors drive the hydraulic pump. The DC motor is powered by four 6 Volt DC, 245 Amp-hour, deep charge batteries connected in series. A 40 amp, automatic, on-board battery charger is provided for recharging the batteries at the end of each work period.

Two control panels use directional selector switches and hydraulic valves to control the direction and speed of boom lift and rotation. One set of operator controls is provided for ground operation and another set is provided for operation from the basket. Elevation and rotation controls are operational only when the moving boom section is within a programmed safe operating zone. Only one boom motion is permitted at a time, and only as long as the boom is within the safe operating zone. When a selected boom motion reaches a safe operating limit, the motion ceases and another motion must be selected within the safe operating zone.

Outrigger and wheel position interlock safety switches prevent lifting operations until the four outriggers are properly deployed and the full weight of the boom lift is loaded onto the outriggers.

Boom elevation speeds are selected from low to high by a toggle switch. A hydraulic hose failure at either retract-cylinder port will cause a velocity fuse to close and stop the return oil flow. It is strongly recommended that no one adjust or tamper with these safety devices. If service is required, please notify Bil-Jax for detailed instructions.

Emergency lowering of the basket is by a manual valve on the base of the lift cylinder. Pushing in and turning 1/4 turn manually retracts the upper boom lift cylinder. The boom may need to be manually rotated to a clear area before lowering.

The boom lift cylinders will not rust or corrode during storage since the cylinder rod is fully immersed in oil. It is important that the cylinder rods be kept clean and undamaged for the protection of the cylinder head packings.

3

Operation

3-1 OPERATOR CONTROLS

The XLB-4232 DC Boom Lift is equipped with multiple operator controls. Electrical boom lift and rotation control panels are located at ground level and in the basket. Manual boom rotation and lowering controls are at the ground level.

Battery ON/OFF Switch

A battery ON/OFF switch (Figure 3-1) is mounted on the front end of the hydraulic power compartment. Turn the switch to the ON position to turn battery power on to the boom lift electrical system. Turn the switch to the OFF position to conserve battery power when the lift is not in use.

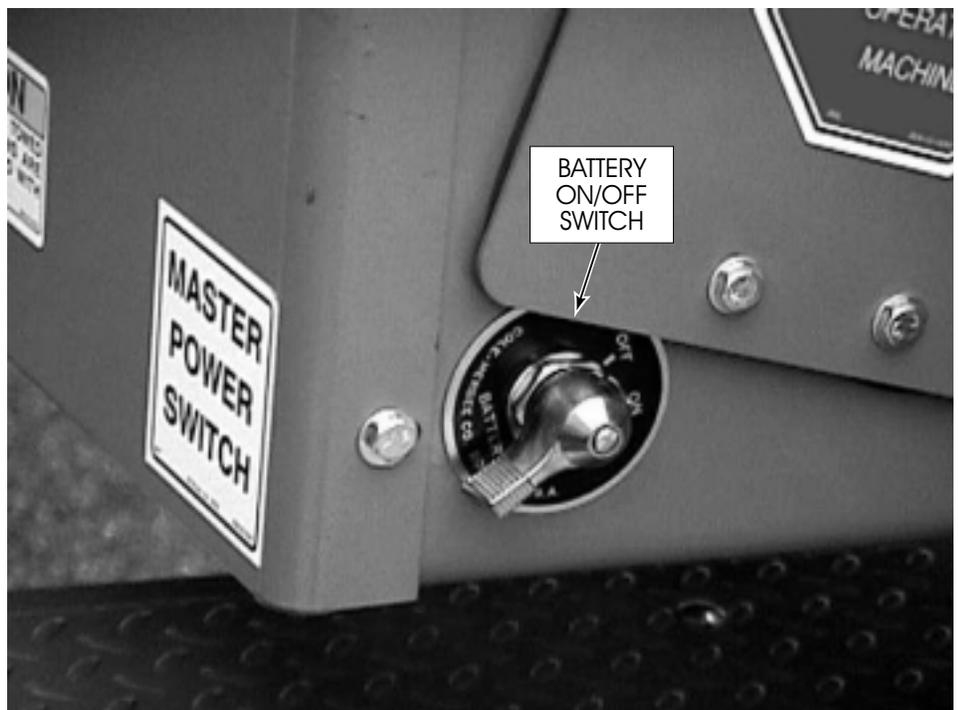


Figure 3-1. Battery ON/OFF Switch

Lower Control Panel

The lower control panel (Figure 3-2) is located on the side of the hydraulic power compartment. The following controls and indicators are on the lower control panel.



Figure 3-2. Lower Control Panel (DC Model)

EMERGENCY STOP Pushbutton

When pressed, the EMERGENCY STOP pushbutton disconnects electrical power to the upper and lower control panels. The EMERGENCY STOP pushbutton should only be pressed to immediately stop all boom motion. To resume control, pull to disengage the emergency stop switch contacts.

BOOM UP/DOWN Selector Switch

Holding the BOOM UP/DOWN selector switch in the UP position enables the boom to rise. Holding the selector switch in the DOWN position enables the boom to descend. The up or down boom motion continues until the selector switch is released, or the boom reaches a hard stop or a safe travel limit.

UPPER/OFF/LOWER Controls Selector Switch

The UPPER/OFF/LOWER controls selector switch enables boom lift control from either the lower control panel or the work platform. When operating the boom lift from ground level, hold the switch in the LOWER position while simultaneously selecting a motion function.

BOOM IN/OUT Selector Switch

Holding the BOOM IN/OUT selector switch in the OUT position extends the boom out. Holding the selector switch in the IN position retracts the boom. The in or out boom motion continues until the selector switch is released, or the boom reaches a hard stop or a safe travel limit.

BOOM FAST/SLOW Selector Switch

The BOOM FAST/SLOW selector switch controls the speed of the selected boom motion. Generally, the switch is set on FAST to position the boom in the general proximity of the work area. Then, the switch is set on SLOW to fine tune the position of the boom to get closer to the work area.

ROTATION CW/CCW Selector Switch

Holding the ROTATION CW/CCW selector switch in the CW position enables the boom to rotate in the clockwise direction. Holding the selector switch in the CCW position enables the boom to rotate in the counterclockwise direction.

OUTRIGGERS Indicator

The OUTRIGGERS indicator lights up when the boom outriggers are properly deployed and the boom weight is removed from the trailer axle.

Upper Control Panel

The upper control panel (Figure 3-3) is mounted in the work basket. The following controls and indicators are available on the upper control panel.



Figure 3-3. Upper Control Panel (DC Model)

BUCKET TILT COMPENSATOR Switch (DC Model Only)

A BUCKET TILT COMPENSATOR switch allows for slight adjustment to the level of the work basket. Adjustment is limited to 3 degrees in either direction.

Battery Charge Indicator (DC model only)

Indicator LEDs light up to indicate the level of charge remaining in the batteries. Lighted green LEDs indicate a good charge level. Lighted yellow LEDs indicate the need for charging soon. Lighted red LEDs warn that the battery charge level is low; boom operations should be halted until the batteries are recharged.

BOOM FAST/SLOW Selector Switch

The BOOM FAST/SLOW selector switch controls the speed of the selected boom motion. Generally, the switch is set on FAST to position the boom in the general proximity of the work area. Then, the switch is set on SLOW to fine tune the position of the boom to get closer to the work area.

EMERGENCY STOP Pushbutton

When pressed, the EMERGENCY STOP pushbutton disconnects electrical power to the upper and lower control panels. The EMERGENCY STOP pushbutton should only be pressed to immediately stop all boom motion. To resume control, pull to disengage the emergency stop switch contacts.

UPPER CONTROLS ON/OFF Deadman Switch

The UPPER CONTROLS ON/OFF deadman switch must be held in the ON position simultaneously with any other boom motion function. This prevents accidental movement of the work basket.

ROTATION CW/CCW Selector Switch

Holding the ROTATION CW/CCW selector switch in the CW position enables the boom to rotate in the clockwise direction. Holding the selector switch in the CCW position enables the boom to rotate in the counterclockwise direction.

BOOM IN/OUT Selector Switch

Holding the BOOM IN/OUT selector switch in the OUT position extends the boom out. Holding the selector switch in the IN position retracts the boom. The in or out boom motion continues until the selector switch is released, or the boom reaches a hard stop or a safe travel limit.

BOOM UP/DOWN Selector Switch

Holding the BOOM UP/DOWN selector switch in the UP position enables the boom to rise. Holding the selector switch in the DOWN position enables the boom to descend. The up or down boom motion continues until the selector switch is released, or the boom reaches a hard stop or a safe travel limit.

3-2 NORMAL OPERATING PROCEDURE

Perform the following procedures to operate the XLB-4232 DC Boom Lift.

1. Read and follow all safety precautions contained in Section 1 and all responsibilities outlined in the ANSI A92.2 reprint contained in Section 7 of this 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 operate the lift if such hazards exist.
3. Check the tow trailer and boom lift for damaged or worn parts. Repair or replace parts as necessary. Do not use a damaged boom lift.
4. Lower the trailer tongue jack and unhitch the trailer from the tow vehicle. The trailer must be unhitched before the outriggers are deployed.
5. Deploy the boom lift outriggers as follows:
 - a. Lift up on the locking pin and slide each outrigger out from the trailer frame. Slide the outriggers out until the locking pins engage again.
 - b. Pull out the quick-adjust jack pins and lower the jack feet. With the jack feet near the ground, reinstall the jack pins at the lowest available setting.
 - c. Turn the BATTERY ON/OFF switch to the ON position. Lift the bubble level cover plate in front of the boom rotation housing (slew ring housing).
 - d. Jack up the outriggers to evenly raise the trailer; refer to the bubble level. Raise the boom lift evenly until at least one trailer wheel is off the ground and all outrigger LED's are lit.
 - e. Flip outrigger jack handles over to keep them from being damaged by falling objects or bent by lowering the boom onto them.

NOTE: An axle position switch will prevent boom operation if at least one wheel is not lifted off the ground. The load of the boom lift must be placed on the outriggers to enable power.

6. Remove the pin keeper and transport pin that secures the boom to the trailer frame. Stow the transport pin in its storage tube.
7. Unlock and open the base controls door.
8. Toggle the UPPER/OFF/LOWER controls switch to the LOWER position.
9. Use the lower control panel to operate the lift controls. Raise, lower, extend, and rotate the boom in slow speed to get familiar with the controls. Learn to smoothly start and stop the boom lift.
10. To place the basket at an easier entry height:
 - a. Raise the boom clear of its support post by holding the controls selector switch to LOWER position and also activating the UP function.
 - b. Rotate the boom clockwise from its transport position by holding the controls selector switch to LOWER position and also activate CW function. Rotate until there is clearance between the support post and the boom.
 - c. Lower the boom until the basket just touches the ground by holding the controls selector switch to LOWER position and also activate the DOWN function.
11. Switch the controls selector switch to UPPER controls. Control of the boom is now directed to the basket control panel.

12. Raise the safety bar and enter the basket. Put on the safety harness and attach the lanyard to the basket railing.
13. The lift is now ready for operation from the basket. Operate in slow speed to get familiar with the controls. The UPPER CONTROLS ON/OFF deadman switch must be held in the ON position simultaneously with any other boom motion function.
14. Should the basket become tilted out of the normal vertical axis, adjustment can be made using the BUCKET TILT COMPENSATOR switch. This function is protected with a 3 degree limit safety switch in either direction.
15. Monitor the BATTERY CHARGE INDICATOR during operation and charge the batteries as necessary. (See Section 3-5)

3-3 EMERGENCY LOWERING

The XLB-4232 DC Boom Lift is equipped with a manual emergency lowering valve that can lower the basket in case of a power failure or an emergency situation. The emergency lowering valve is located at the base of the lift cylinder.

Before lowering, it may be necessary to manually rotate the boom if it is over hanging an obstruction. See the following section for this procedure.

To lower the work basket, push and turn the knurled knob counter-clockwise to desired speed of descent (Figure 3-4). After lowering, press and turn the knob clockwise to close the valve.

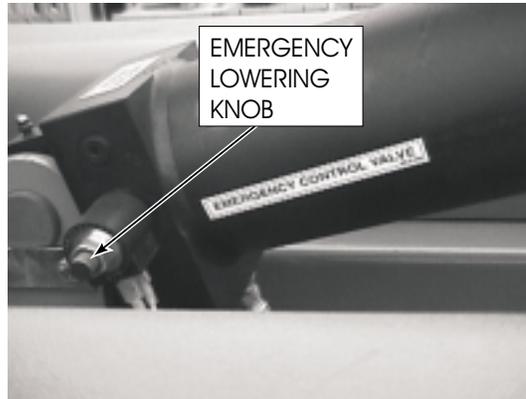


Figure 3-4. Emergency Lowering Valve

3-4 MANUAL BOOM ROTATION

The boom lift is equipped with an emergency rotation handle (crank) that can be used to rotate the boom in case of a power failure or other emergency situation.

Use the following procedure to manually rotate the boom:

1. Loosen the crank stowage tube thumbscrew (Figure 3-5).
2. Remove the crank.
3. Install the crank on the hex end of the worm gear drive screw as shown.
4. Turn the crank handle to rotate the boom.

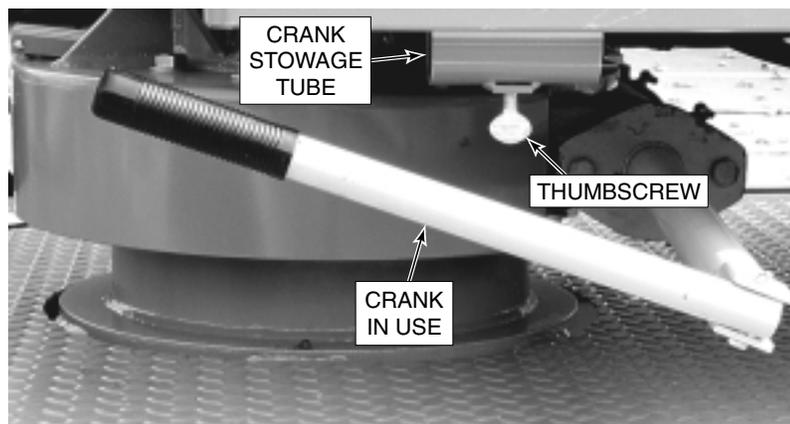


Figure 3-5. Boom Rotation

3-5 BATTERY RECHARGE (DC MODEL ONLY)

The DC boom lift batteries should be recharged after each 8-hour work shift or more often if needed. When the boom lift is not in use, the batteries should be recharged at least once per week.

The normal charge time is 10 to 12 hours. If the battery charge is extremely low, a full recharge may take up to 24 hours.

Recharge the DC boom lift batteries as follows:

⚠ WARNING

Recharge the batteries in a well ventilated area only. Do not charge batteries near fire, flame, or other ignition sources. Batteries being charged may emit highly explosive hydrogen gas. Failure to properly ventilate the charge gases may result in serious injury or death.

1. Move the boom lift to a well ventilated area with direct access to a grounded 120 VAC electrical outlet. Make sure the recharge area is not near fire, flame or other ignition sources.
2. Turn the BATTERY ON/OFF switch to the OFF position.
3. Plug a short, heavy-duty power cord into the battery charger receptacle on the front of the battery compartment. The recommended power cord should be an 12 AWG multi-strand, grounded cord no longer than 20 feet (6 meters).

NOTE: Using an underrated or long power cord will reduce the output of the battery charger, resulting in longer charge time.

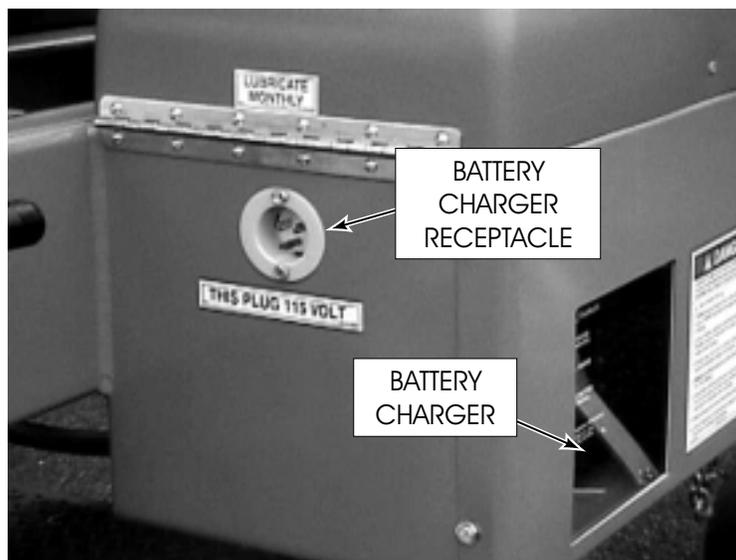


Figure 3-6. Battery Charger and Receptacle

4. Plug the power cord into a grounded 120 VAC receptacle. Verify that the red ON-CHARGING indicator LED lights up on the battery charger.

5. To determine the charge rate at any time during the charge cycle, observe the DC ammeter (Figure 3-7). The ammeter needle moves to the right at the start of the charge cycle. As the battery charge rises, the needle moves farther left.

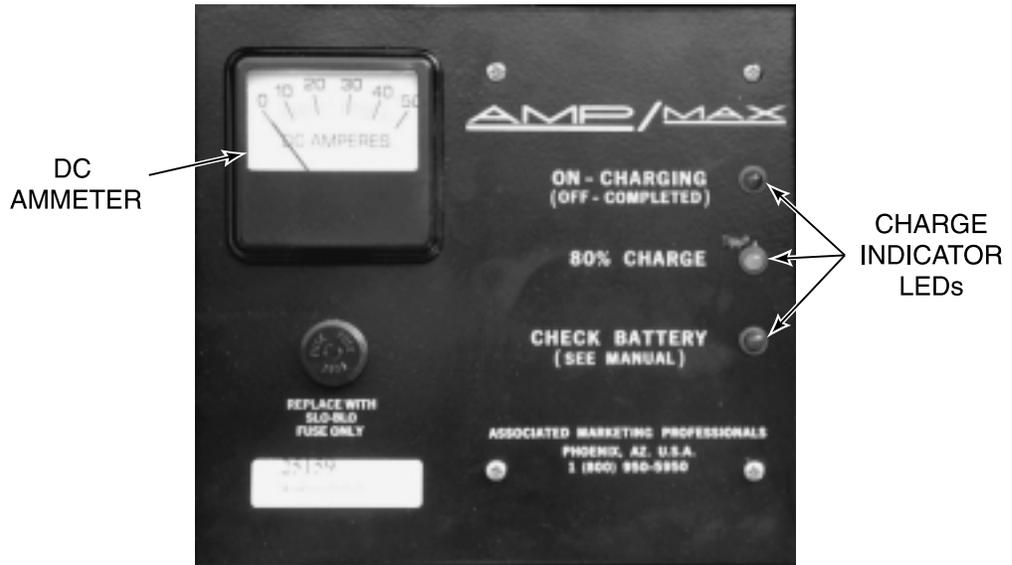


Figure 3-7. Battery Charger

⚠ CAUTION

Always remember to unplug the battery charger power cord before moving the boom lift. Failure to unplug the power cord will cause damage to the equipment.

6. Inspect the charge indicator LEDs near the end of the expected charge cycle. If all indicator LEDs are off, the battery is fully charged. (The DC ammeter needle should point to the left.)

NOTE: The yellow 80% CHARGE indicator lights up when the battery voltage is nearing full charge. At full charge (3-1/2 hours after the 80% CHARGE indicator lights up), the charger turns off.

If the battery voltage does not reach the 80% CHARGE level in 14 hours, the charger turns off and the red CHECK BATTERY indicator LED lights up. This prevents extended charging of a faulty battery.

7. Unplug the power cord from the 120 VAC receptacle and the charger receptacle. Properly store the power cord for next use.

3-6 BOOM LIFT TRANSPORT

The boom lift trailer is a single axle trailer fitted with a two-inch ball hitch, surge brakes, breakaway safety cable, safety chains, brake lights, and side marker lights. Proper boom lift transport requires the correct hookup and inspection of these trailer components before towing. Use the following procedures to hitch, tow, and back the boom lift trailer:

Trailer Hitching

Trailer hitching requires a second person to give tow vehicle backing instructions.

1. Back the tow vehicle to the trailer. Verify that the ball and hitch are in line and that the trailer hitch will clear the ball. Jack up the tongue as needed.
2. Align the ball and hitch. Wrap and fasten the breakaway safety cable around the ball hitch (Figure 3-8).

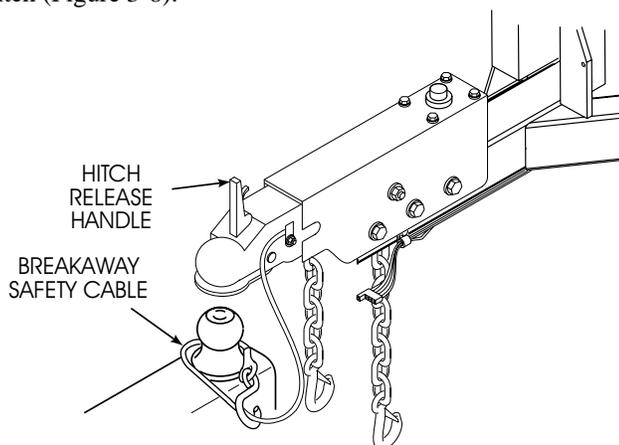


Figure 3-8. Breakaway Safety Cable

3. Hold ball hitch release lever open and lower the hitch onto the ball. Let go of the release lever to secure the ball.
4. Crank the jack down to check for secure coupling. If jacking will raise the tow vehicle bumper two or three inches, the ball hitch coupling is secure.
5. Pull the pin keeper and pivot locking pin, raise the jack to the travel position as shown in Figure 3-9, and reinstall the pivot locking pin and pin keeper.

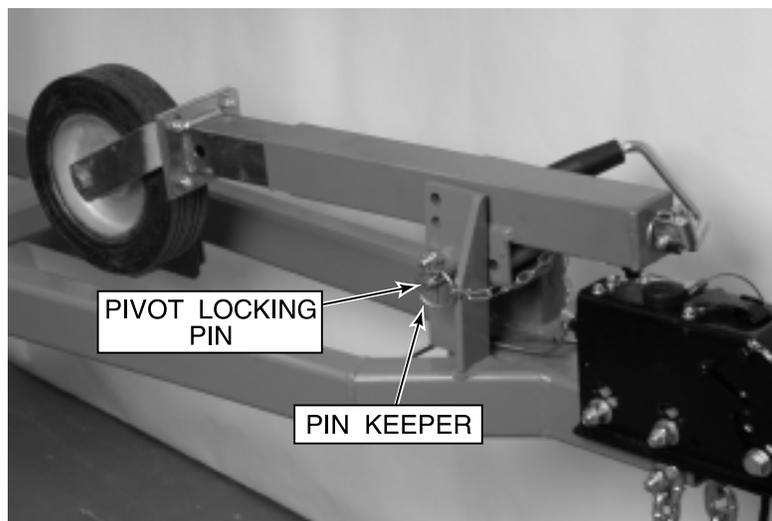


Figure 3-9. Jack Travel Position

! CAUTION

Always cross and attach the safety chains before towing. Failure to attach safety chains properly will allow tongue to drop in case of ball hitch failure, resulting in serious damage to the trailer and equipment.

6. Attach the trailer safety chains to the tow vehicle. Make sure the chains cross under the trailer tongue as shown in (Figure 3-10). If needed, cross the chains over then under the tow bar to prevent dragging.

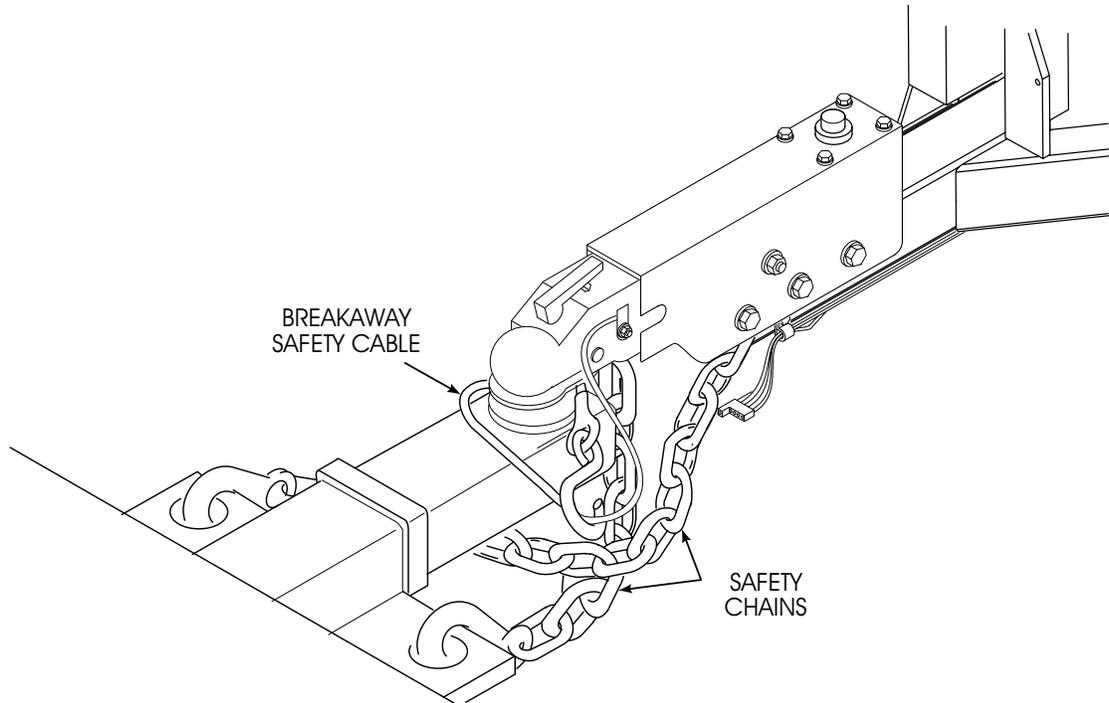


Figure 3-10. Trailer Hitching Checkpoints

7. Connect the trailer lights to the tow vehicle power plug.
8. Before towing the trailer, check the following and make all necessary adjustments, corrections, or repairs:
 - a. Check that trailer jack and outriggers are locked in travel positions.
 - b. Verify that the transport pin secures the lower boom to the trailer frame. If the boom is not secured, install the transport pin and pin keeper at this time.
 - c. Verify that all onboard equipment is secured.
 - d. Check that the BATTERY ON/OFF switch is in the OFF position.
 - e. Verify that trailer brake lights and marker lights work properly.
 - f. Check that the trailer tires are evenly inflated and not low on air.

 **WARNING**

Improper tightening of boom lift trailer wheel nuts can cause wheel lugs to shear, causing serious injury or damage to equipment. Check and maintain the proper wheel nut torque according to the maintenance instructions in this manual.

Periodically check the wheel nut torque according to the instructions in Section 4-2 of this manual. More frequent torque checks are required when a wheel is recently installed.

After towing, while the trailer wheels are elevated for boom lift operation, check for loose wheels and for wheel lug wear indications. If a loose wheel mounting is indicated, remove and inspect the wheel lugs for damage. Do not tow the boom lift with worn or damaged wheel lugs.

4

Maintenance

4-1 SCHEDULED SERVICE CHECKS

Daily/Weekly Service Checks

Perform the following daily/weekly service checks as listed in Table 4-1.

Table 4-1. Daily/Weekly Service Checks

Service Check	Daily before use	Weekly
Check battery electrolyte level. If battery charge is low, add water to bring electrolyte just above plates. If batteries are fully charged, raise electrolyte to full mark in each cell.	✓	
Check and retighten all nuts and bolts.	✓	
Check that cage gate is secure.	✓	
Check to see that all decals are present.	✓	
Check that controls and indicators on upper and lower control panels operate properly.	✓	
Check/add hydraulic oil.	✓	
Check trailer tires for proper inflation. When cold, tires should be inflated to 65 psi.		✓
Check trailer running lights for proper operation.		✓
Check trailer hitch components for damage and proper operation. Refer to Trailer Hitching in paragraph 3-6.		✓
Check electrical wiring for cuts, loose terminals, broken wires, chaffing, corrosion, or other damage. Repair all damage, remove corrosion, and seal exposed connections.		✓
Use small diameter probe to check upper control box drain holes for clogging. If clogged, open box and remove debris.		✓
Lubricate grease fittings labeled LUBRICATE WEEKLY with NLGI Grade 2 multi-purpose grease.		✓
Check trailer and boom lift for missing or loose hardware. Replace or tighten missing or loose hardware as needed.		✓

Monthly Service Checks

Perform the following monthly service checks as listed in Table 4-2.

Table 4-2. Monthly Service Checks

Service Check	Every month	Every 6 months	Every 12 months
Clean battery terminals and check battery charger operation.	✓		
Check operation of manual emergency lowering valve.	✓		
Check wheel nut torque per paragraph 4-2.	✓		
Check for excess wear, free play, or binding in outrigger screws. Replace damaged parts.	✓		
Lubricate power compartment hinges and latches with light weight machine oil.	✓		
Lubricate grease fittings labeled LUBRICATE MONTHLY per paragraph 4-3.2.	✓		
Lubricate trailer tongue jack (2 places) with NLGI Grade 2 multi-purpose grease.	✓		
Lubricate grease fittings labeled LUBRICATE SEMI-ANNUALLY per paragraph 4-3.3.		✓	
Lubricate wheel bearings per paragraph 4-3.4.		✓	
Check battery cables and wiring for loose connections and damaged wires.		✓	
Check outrigger bushings and replace if necessary per paragraph 4-5.		✓	
Replace hydraulic oil and oil filter.			✓
Check boom pivot points for bearing wear. Replace worn or damaged bearings.			✓
Check slew bearing for wear or damage; torque bearing bolts to 200 lb-ft (271 N·m).			✓
Inspect and adjust trailer brakes.			✓
Load test boom with 300 pounds.			✓

4-2 WHEEL NUT TORQUE REQUIREMENTS

It is very important to apply and maintain the correct wheel nut torque on the boom lift trailer. The wheel nuts must be evenly tightened to the following specified torque increments whenever a trailer wheel is removed and installed. Use the following tightening procedure:

1. Evenly tighten the wheel lug nuts to 25 lb-ft (34 N·m) in the tightening sequence shown in Figure 4-1.

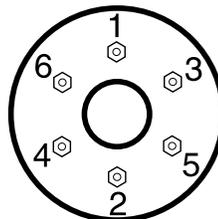


Figure 4-1. Wheel Nut Tightening Sequence

2. Evenly tighten the wheel lug nuts to 60 lb-ft (81.4 N·m) using the nut tightening sequence shown.
3. Evenly tighten the wheel lug nuts to 100 lb-ft (135.6 N·m) using the nut tightening sequence shown.

4-3 LUBRICATION

Lubrication makes operation of the XLB-4232 DC Boom Lift more efficient and extends the equipment life. Use the following procedures to lubricate the boom lift components.

1. Lubricate trailer and outrigger jack posts and all grease fittings labeled **LUBRICATE WEEKLY** with NLGI Grade 2 multi-purpose grease.
2. Lubricate all **LUBRICATE MONTHLY** grease fittings with NLGI Grade 2 multi-purpose grease. Wipe off dirt and grease residue. Add approximately ½ ounce of fresh grease to each fitting. See Figure 4-2 for grease fitting locations.

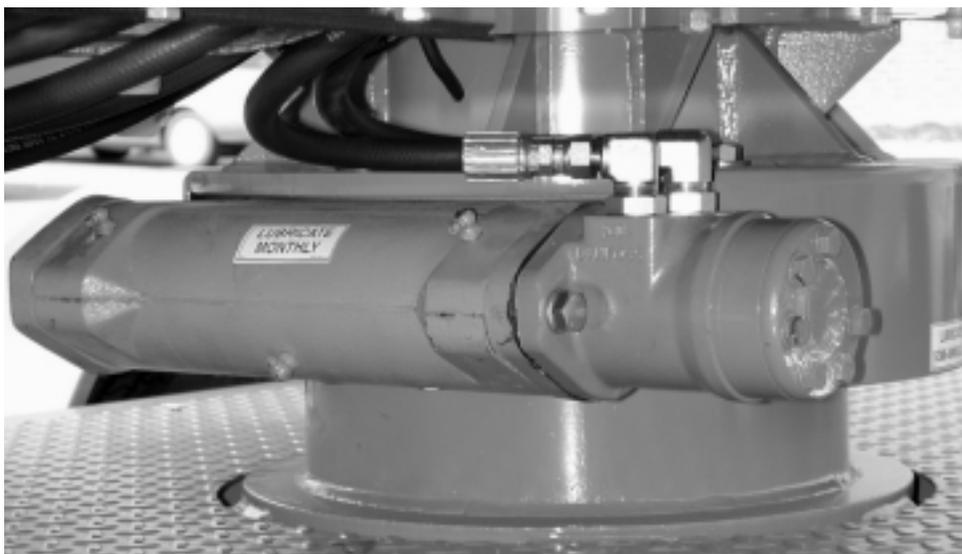


Figure 4-2. Lubricate Monthly

3. Lubricate the slew ring bearing grease fitting labeled LUBRICATE SEMI-ANNUALLY with NLGI Grade 2 multi-purpose grease. Wipe off dirt and grease residue. Rotate the boom and add approximately ½ ounce of grease to each bearing quadrant. See Figure 4-3 for the location of the slew ring bearing grease fitting.



Figure 4-3. Lubricate Semi-Annually

16. Determine whether the boom lift is equipped with an Al-Ko axle (hex tube) or Dexter axle (square tube). Lubricate the boom lift axle per the applicable procedure in step 5 or 6.
17. Clean and repack Al-Ko axle wheel bearings according to the following general instructions:
 - a. Use the outriggers to raise the trailer wheels.
 - b. Remove the spindle caps, cotter pins, spindle nuts, washers, outer wheel bearings, and wheels. Remove inner wheel bearings.
 - c. Clean wheel bearings, bearing races, and spindle with solvent and lint-free cleaning cloths.
 - d. Repack inner and outer wheel bearings with a reputable NLGI Grade 2 polyurea type, lithium-based, high-temperature, wheel bearing grease (minimum 440°F dropping point).
 - e. Apply a thin film of grease to the bearing races and spindles.
 - f. At each wheel, install inner bearing, wheel, outer bearing, washer, and spindle nut. Turn wheel and tighten spindle nut until wheel hub binds.
 - g. Hold the wheel stationary and loosen the spindle nut. Finger tighten the spindle nut, then back off as needed to align the cotter pin hole. The wheel should be free to spin without binding or excess free play.
 - h. Install cotter pin and spindle cap.

18. Lubricate a Dexter axle according to the following procedure:
 - a. Remove the rubber plug to expose the grease fitting.
 - b. Grease the bearings with an NLGI Grade 2 polyurea type, lithium-based, high-temperature, wheel bearing grease (minimum 440°F dropping point). Rotate the hub while applying grease. Rotate the hub while applying grease.
 - c. Continue to apply fresh grease until all the old grease is purged. When new grease starts to flow from the front bearing, remove the grease gun. Remove the excess grease and reinstall the rubber plug.

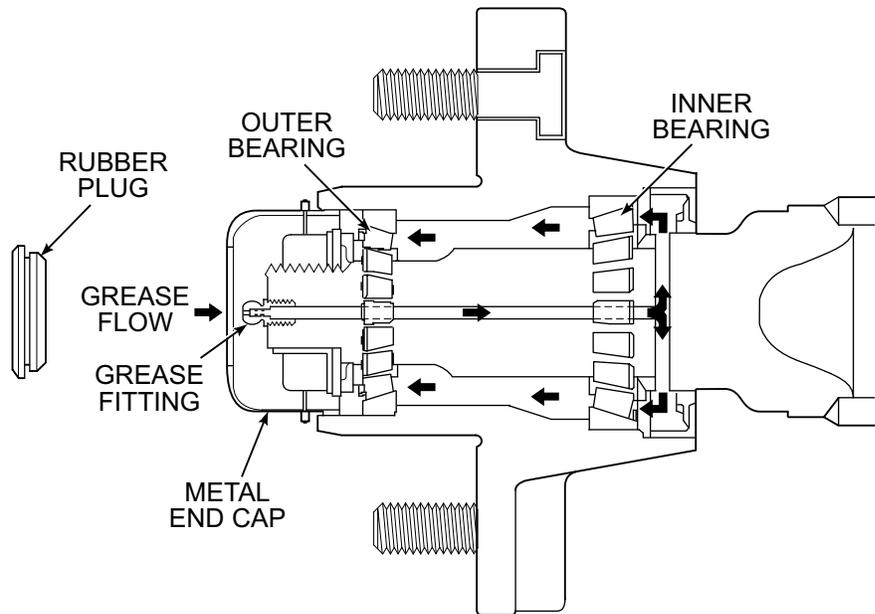


Figure 4-4. Lubrication of Dexter Axles

19. When installing the hub of a Dexter axle or if a wheel bearing adjustment is necessary, use the following instructions:
 - a. Install the inner bearing, wheel, outer bearing, washer, and spindle nut. While rotating the hub, tighten the spindle nut to 50 lb-ft.
 - b. Hold the hub stationary and loosen the spindle nut. Finger tighten the spindle nut, then back off the nut to align the cotter key hole. The wheel hub should be free to spin without binding or excess free play.
 - c. Install the locking tang and end cap.
 - d. Lubricate the bearings according to the instructions in step 6.

4-4 HYDRAULIC SYSTEM

Hydraulic system maintenance varies with equipment use and the environment in which the boom lift is used. Constant attention to keep the oil clean and the reservoir properly filled will help prevent possible damage to the system. Hydraulic diagrams are provided at the end of this section for general reference.

Hydraulic System Inspection

Check the hydraulic hose and fittings for leaks and damage daily. Tighten or replace as necessary to prevent hydraulic oil loss.

Fluid Check and Replacement

The oil level sight gage should be checked with the boom down and the trailer on a level surface. The reservoir is originally filled with AW-46, a high-grade, non-foaming hydraulic oil designed for temperatures as low as -20°F (-33°C).

Use Dextron Automatic Transmission Fluid Type A for low temperatures reaching -40°F (-40°C). If either oil is not available, a good grade SAE 10W hydraulic oil may be used where the low temperature is above 32°F (0°C). SAE 5W hydraulic oil may be used where low temperatures reaching 0°F (-18°C).

Do not mix hydraulic oils. Clean the reservoir sump strainer and replace the hydraulic oil once a year or whenever the oil becomes contaminated.

Air Bleeding

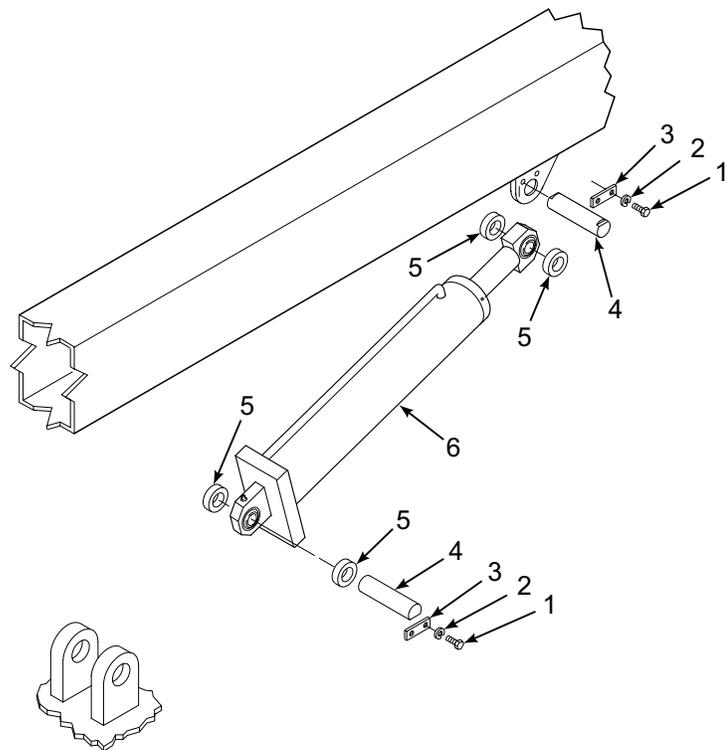
Delayed response or sporadic boom lift motions may indicate air in the lift cylinders. Use the following procedure to bleed entrapped air from the hydraulic system.

1. Fill the reservoir with the proper hydraulic fluid. Replace, but do not tighten the reservoir fill cap.
2. Fully raise and lower the boom to return oil with entrapped air to the reservoir.
3. Allow several minutes for air to escape the reservoir oil.
4. Repeat steps 1 through 3 as needed. Add oil slowly and only when the boom is lowered to prevent adding more air to the system.

Hydraulic Cylinder Repair

Cylinder Removal and Installation

1. Lower boom onto travel support, turn off the main power switch, and remove the PLATFORM/OFF/GROUND key.
2. Support lift cylinder with wood shoring between cylinder and boom. Secure both ends of lower boom lift cylinder with lifting straps and overhead lifting device. Support upper boom lift cylinder with padded lift truck forks.
3. Place absorbent drip cloths below cylinder ports. Remove hydraulic hoses from lift cylinder. Elevate hoses above hydraulic reservoir and protect exposed hose fittings and cylinder ports with protective caps.
4. Refer to Figure 4-5. Remove screws (1), lock washers (2), and locking plate (3) from elevated end of cylinder (6).



- | | |
|------------------|--------------|
| 1. Screws | 4. Pivot Pin |
| 2. Lock Washers | 5. Spacer |
| 3. Locking Plate | 6. Cylinder |

Figure 4-5. Hydraulic Cylinder Removal

5. Using a pry bar and shoring, unweight the cylinder end. Remove pivot pin (4) and spacers (5).
6. Lower the free end of cylinder (6) onto support shoring or a lifting strap.
7. Repeat steps 4 through 6 at the opposite end of the cylinder.
8. Lift the lower end of the cylinder from its pivot block. Use an overhead lifting device and lifting straps and/or a lift truck to remove the cylinder.
9. After repairing the hydraulic cylinder, reinstall the cylinder in the reverse order of removal.
10. Power up the hydraulic system and check for leakage. Tighten hydraulic fittings as needed.
11. Bleed entrapped air from the hydraulic cylinder according to instructions in paragraph 4-4.

Cylinder Disassembly and Inspection

Perform the following procedure to disassemble the upper or lower hydraulic lift cylinder. Whenever the hydraulic cylinder is disassembled, all seals must be replaced. Refer to replacement seal kit, Figure 6-3 or 6-4.

1. Check bearings (1, Figure 4-6) for wear and excess play. Replace bearings if necessary.
2. Unscrew headstock (2) and slide cylinder rod (3) from housing (4).
3. Remove slotted nut (5) and piston (6). Remove and discard wear ring (7), o-rings (8 and 9). Remove sleeve (10).

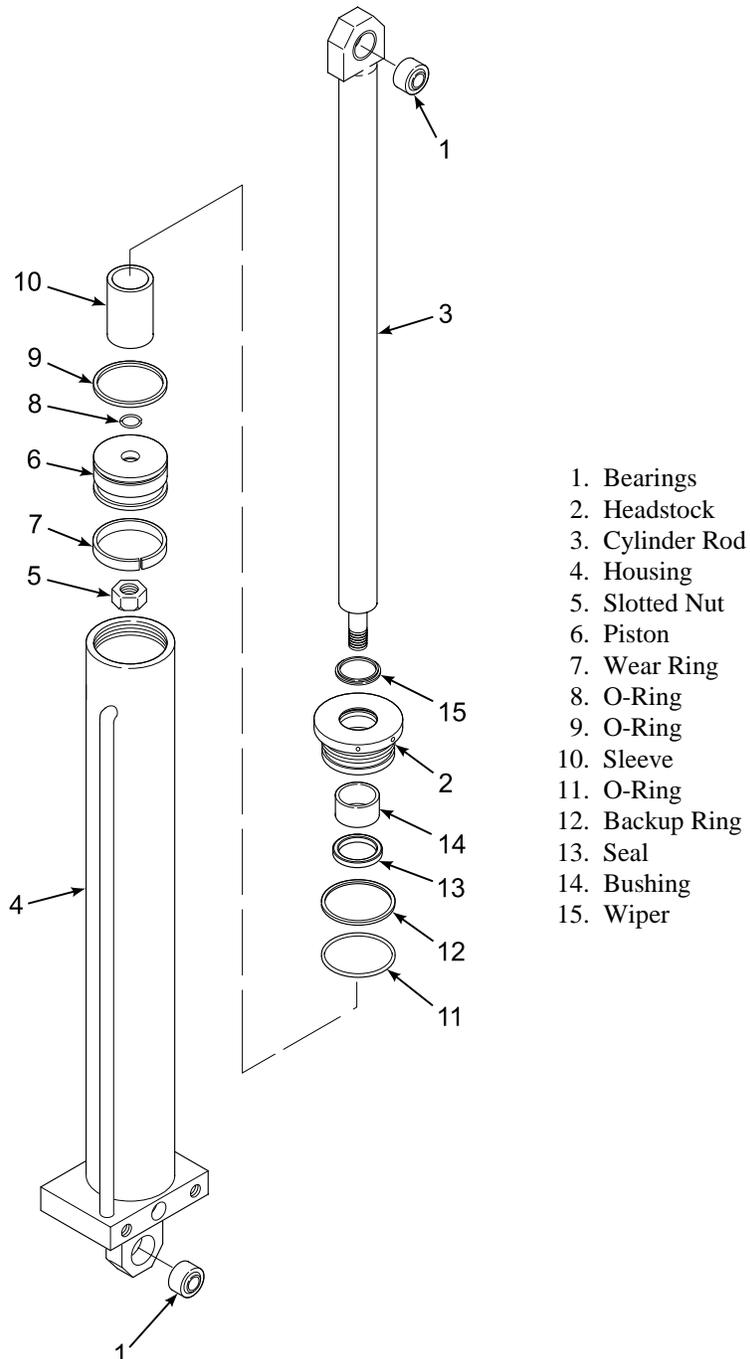


Figure 4-6. Hydraulic Cylinder Repair

4. Remove headstock (2). Remove and discard o-ring (11), backup ring (12), and seal (13). Remove bushing (14) and wiper (15). Discard wiper.
5. Inspect the cylinder rod (3) for scratches or pits. Pitting in the base metal is not acceptable. Wear indications that catch the fingernail, but do not extend into the base metal nor extend more than 1/2 inch along the rod length are acceptable if they will not cut the seal material. The chromium plating must not be worn through. Replace the cylinder rod if not acceptable by these inspection criteria.
6. Inspect the headstock (2). Check the inside bore for scratches; deep scratches or cracks are unacceptable. Check the bore for polished wear surfaces. Polishing indicates uneven loading. Check the bore for out-of-roundness. If the bore is more than 0.007 inch out-of-round, replace the head. Seal groove damage is unacceptable. Replace the headstock if these conditions are not met.
7. Inspect piston (6). Check the outside surface for scratches; deep scratches are unacceptable. Check the outside surface for polished wear surfaces. If polishing is noticed, check the piston for out-of-roundness. If out-of roundness exceeds 0.007 inch, replace the piston. Seal groove damage is unacceptable. Replace the piston if these conditions are not met.
8. Inspect cylinder housing (4) for scratches or pits. Pits or scratches that are deep enough to catch the fingernail are not acceptable. Scratches that catch the fingernail, but extend less than 1/2 inch along the tube length, are acceptable providing they are not sharp enough to cut the seals. Replace the cylinder tube if these conditions are not met.

Cylinder Assembly

1. Lubricate headstock (2, Figure 4-6), wiper (15), seal (13), backup ring (12), and o-ring (11) with hydraulic fluid.
2. Twist seal (13) into a 'C' shape and seat it in mating groove of headstock (2).
3. Seat wiper (15), backup ring (12), and o-ring (11) in mating groove of headstock (2). Make sure the back-up ring is installed above the o-ring. Use brass tools or plastic tools to avoid seal groove damage during installation. Scratching the seal grooves may cause by-pass leakage. Allow the assembled headstock to sit one hour for the seals to regain their original shape.
4. Lubricate piston (6) and o-rings (8 and 9) with hydraulic fluid.
5. Install wear ring (7). Allow the assembled cylinder head to sit one hour for the seals to regain their original shape.
6. Thoroughly rinse the inside of cylinder housing (4) with a high-pressure rinse and wipe with lint free cleaning cloths.
7. Install the headstock (2), bushing (14), stop sleeve (10), piston (6) and nut (5) onto the cylinder rod (3). Tighten the nut from 100 to 120 lb-ft (136 to 162 N·m).
8. Apply anti-seize to the headstock threads and installed o-ring (11).
9. Coat the cylinder rod with hydraulic fluid and insert the rod into the cylinder housing. When inserting headstock (2) make sure that static o-ring (11) does not extrude from the o-ring groove. Be careful not to nick the seals as they enter the cylinder housing.
10. Screw headstock into the cylinder housing and tighten for a snug fit of the wiper (15) on the cylinder rod (3).
11. Press in new bearings (1).

4-5 ADJUSTING AXLE POSITION SWITCHES

The axle position switches are set up to detect when the boom lift load is transferred from the trailer wheels to the outriggers. After the first 100 miles of road travel the axle torque arms wear in. Torque arm wear-in causes the wheels to ride higher in relation to the trailer frame. Following wear-in, the axle position switches need to be readjusted. Use the following procedure to readjust the axle position switches:

1. Deploy the outriggers and raise the trailer wheels off the ground. The wheels should spin freely.
2. Loosen the switch bracket, Figure 4-7.
3. Adjust the switch position to where the roller just touches the upper edge of the torque arm. Tighten the switch bracket.
4. Repeat the adjustment procedure for the axle position switch at the opposite wheel.

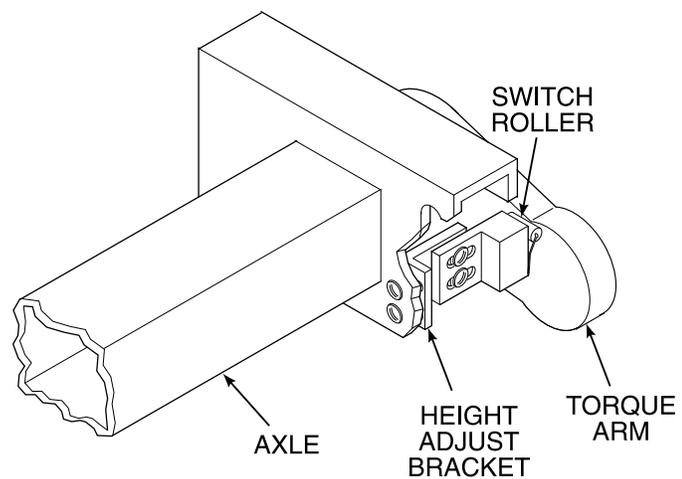


Figure 4-7. Adjusting Axle Position Switches

4-6 TROUBLESHOOTING

Table 4-3. Troubleshooting Chart

Problem	Cause	Correction
1. Outriggers indicator lamp will not light up.	<ul style="list-style-type: none"> a. Master power switch turned off. b. Emergency stop or power button engaged (pushed in). c. All outriggers not deployed. d. At least one wheel not raised. 	<ul style="list-style-type: none"> a. Turn on master power switch. b. Rotate emergency stop buttons clockwise to disengage. c. Deploy all outriggers. d. Raise at least one wheel off the ground.
2. Boom UP/DOWN and ROTATION functions do not work.	<ul style="list-style-type: none"> a. Master power switch turned off. b. Low battery power. c. Boom lift is out of level. d. Emergency stop or power button engaged (pushed in). e. Battery ground or in-series cable loose. f. All outriggers not deployed g. At least one wheel is not raised. h. Battery cable or equipment ground lead loose or corroded. i. Hydraulic pump not pumping. 	<ul style="list-style-type: none"> a. Turn on master power switch. b. Check battery charge LEDs on upper control panel. Recharge batteries if yellow or red LED is lighted. c. Level boom lift with outrigger jacks. d. Rotate emergency stop button clockwise to disengage. e. Check for and repair loose battery connections or ground fault. f. Check outrigger display. Lower outrigger jacks to engage switches. g. Check outrigger display. Raise at least one wheel off the ground. h. Clean and reconnect loose or corroded battery cable or ground lead. i. Check pump motor operation; repair or replace if not running. Check gear pump; replace if hot to touch.
3. Single boom lift or rotation function does not work.	<ul style="list-style-type: none"> a. Loose wiring connector. b. Valve solenoid not operating properly. c. System interlock fault. d. Broken or loose wire. 	<ul style="list-style-type: none"> a. Check wiring terminals in control box and at valve manifold; repair loose wiring terminal. b. Swab out valve solenoids and recheck function; replace solenoid if faulty. c. Check display for system status. Correct indicated fault conditions. d. Repair or replace wire.
4. Boom lift and rotate functions do not operate properly.	<ul style="list-style-type: none"> a. Valve solenoid not operating properly. b. Loose solenoid wiring. 	<ul style="list-style-type: none"> a. Swab out valve solenoids and recheck function; replace solenoid if faulty. b. Check wiring terminals in control box and at valve manifold; repair loose wiring terminal.

Table 4-3. Troubleshooting Chart, Continued

Problem	Cause	Correction
5. Boom lift and rotate functions operate intermittently.	a. Loose connection. b. Loose connector at valve coil.	a. Reconnect wiring. b. Check wiring connection to valve coil; repair loose wiring.

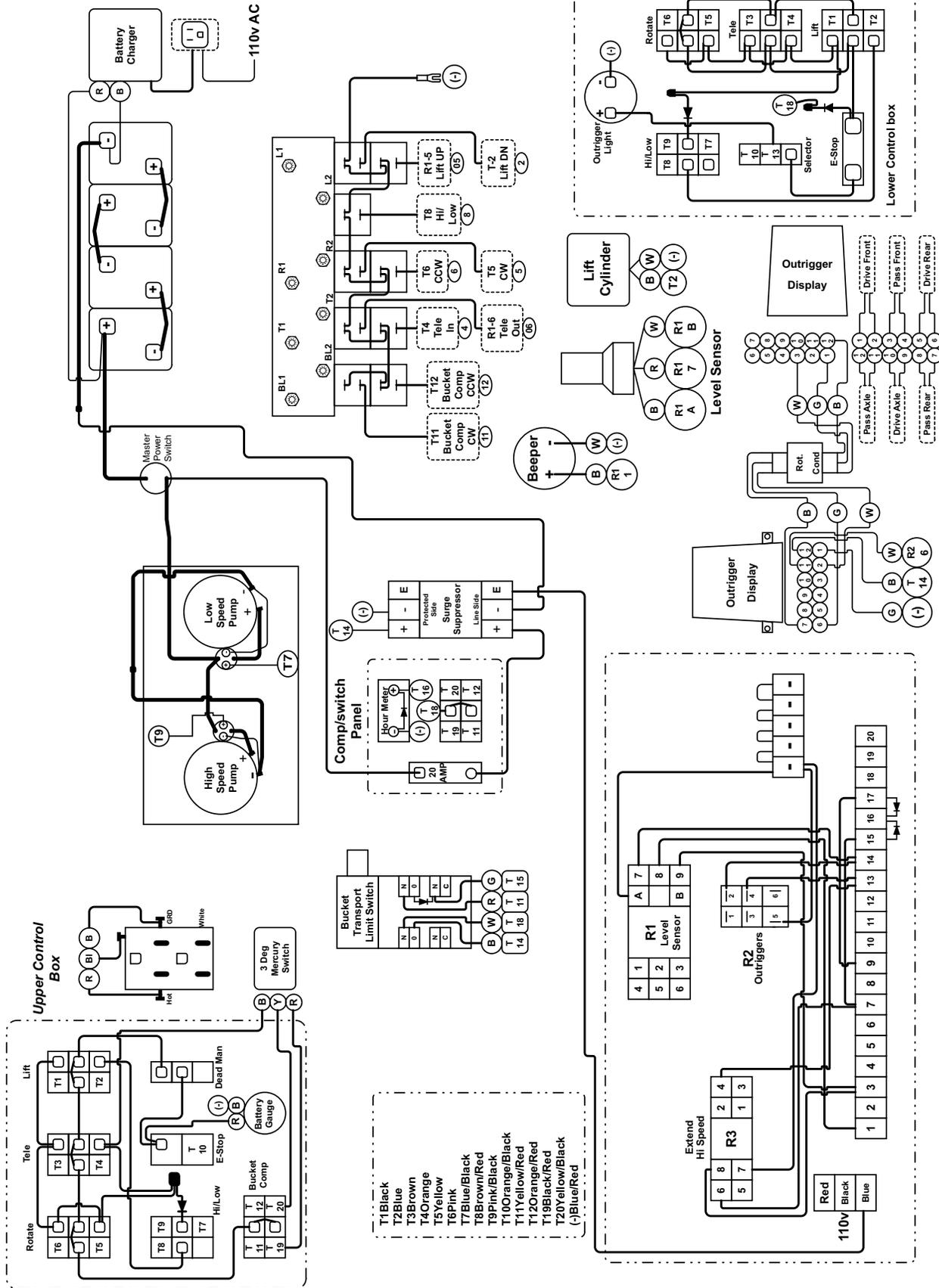


Figure 4-8. Electrical Layout

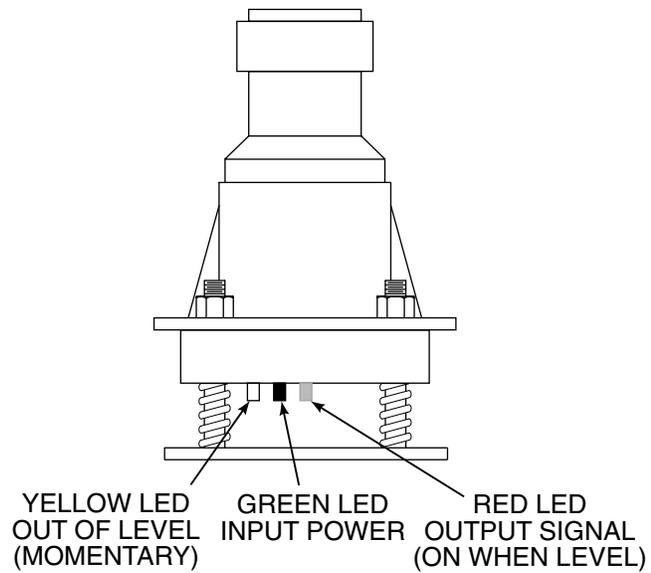


Figure 4-9. Level Sensor

Table 4-4. Level Sensor LEDs

Color	Description
Yellow	Boom lift out of level. Signals alarm after 2 second delay.
Green	Boom lift power is on.
Red	Boom lift level. Goes out after time delay.

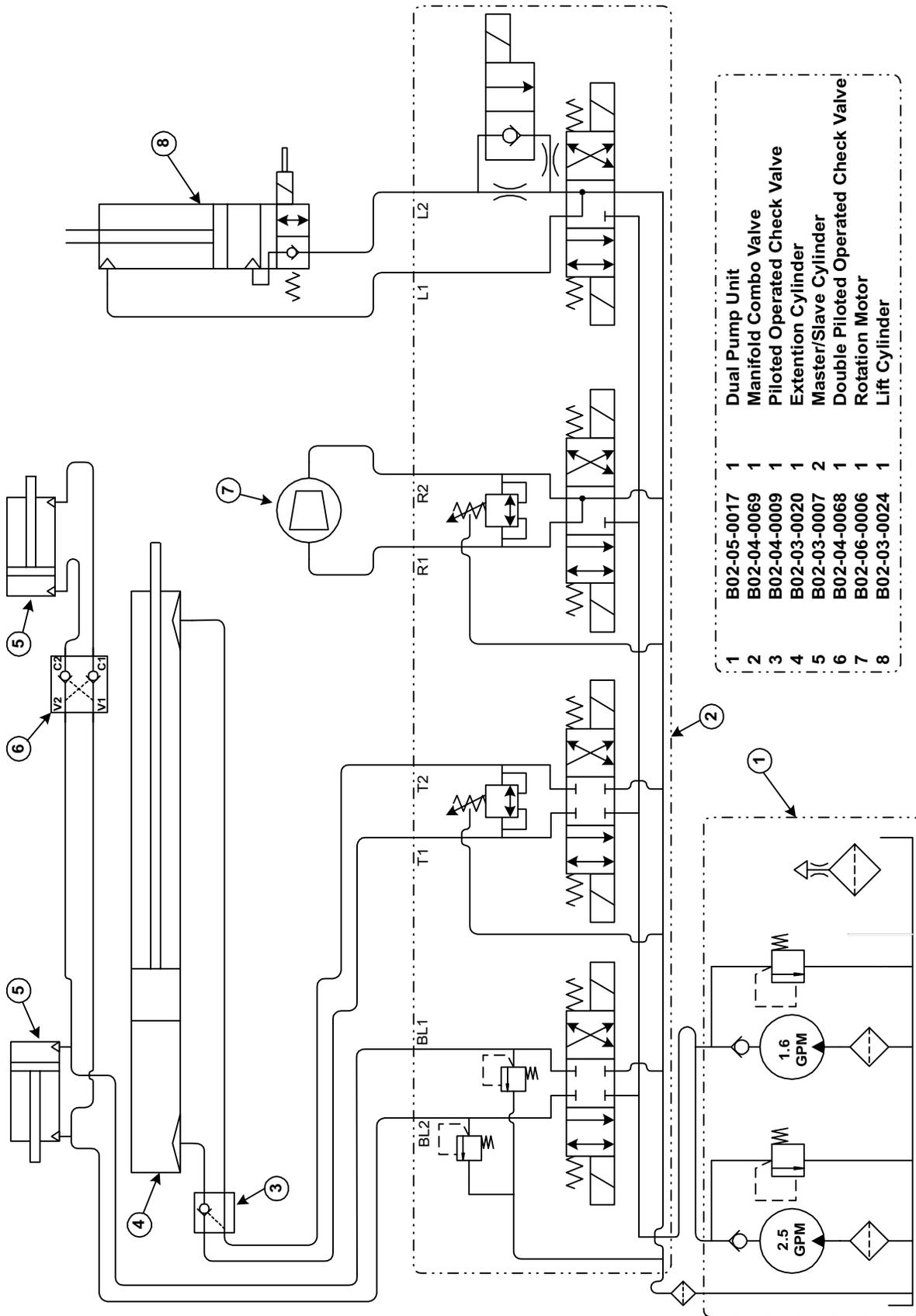


Figure 4-10. DC Model Hydraulic Diagram

4-7 MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET FOR LEAD ACID BATTERIES, WET, FILLED WITH ACID

SECTION I: GENERAL INFORMATION					
Manufacturer's Name:	Crown Battery Mfg. Company	EMERGENCY NO: 800 487-2879			
Street Address:	1445 Majestic Drive	OR 800 OIL-TANK			
City, State, Zip	Fremont, Ohio 43420	REVISION DATE: 5/18/2000			
Phone Number:	419 334-7181				
SECTION II: MATERIAL IDENTIFICATION AND INFORMATION					
COMPONENTS	PERCENT	OSHA PEL	ACGIH TLV	OTHER LIMITS	CAS NUMBER
Hazardous Components					
1% or greater					
Carcinogens 0.01% or greater					
METALLIC LEAD METAL	25.5%	0.05 mg/m3	0.05 mg/m3	NONE	7439-92-1
LEAD SULFATES	18.2%	0.05 mg/m3	0.05 mg/m3	NONE	7439-92-1
LEAD OXIDES	18.0%	0.05 mg/m3	0.05 mg/m3	NONE	7439-92-1
POLYPROPYLENE CASE MTL	6.4%				
SEPARATORS	3.5%				
SULFURIC ACID (H2SO4)	5.2%	1.0 mg/m3	1.0 mg/m3	NONE	7664-93-9
WATER	19.2%				
REGULATORY INFORMATION: Those ingredients listed above are not subject to the reporting requirements of 313 of Title III of the Superfund Amendments and Reauthorization Act. The items are covered in an exemption as a "Manufactured Article". 372.30(b)					
SECTION III: PHYSICAL / CHEMICAL CHARACTERISTICS					
Boiling Point	Approximately 203F	Vapor Density:	Greater Than 1		
Vapor Pressure	14 @ 37% @ 80 F	Melting Point:	-36 F to -10.6 F		
Solubility in Water	100%	Water Reactive:	Yes, Produces Heat		
Specific Gravity	1.245 - 1.295 Battery Electrolyte				
Appearance & Odor	Clear Liquid with Sharp Pungent Odor				
SECTION IV: FIRE AND EXPLOSION HAZARD DATA:					
Flash Point: Not Combustible					
Auto Ignition Temperature N/A		Flammability Limits in Air % by Volume:		N/A	
Extinguishing Media: Dry Chemical Carbon Dioxide, Water Fog, Water					
<u>Special Fire Fighting Procedures:</u> Sulfuric Acid Fumes, Sulfur Dioxide Gas or Carbon Monoxide may be released when acid decomposes. Wear NIOSH approved self-contained breathing apparatus.					
<u>Unusual Hazards:</u> Water applied to sulfuric acid generates heat and causes acid to splatter. Wear full-cover acid resistant clothing. Sulfuric acid reacts violently with metals, nitrates, chlorates, carbides, fulminates, picrates and other organic materials. Reacts with most metals to yield explosive/flammable hydrogen gas. This reaction is intensified when sulfuric acid is diluted with water to form battery electrolyte.					

MATERIAL SAFETY DATA SHEET

1-SITE SPECIFIC INFORMATION: AW-46 HYDRAULIC OIL

2-GENERAL INFORMATION TRADE NAME: AW-46 HYDRAULIC OIL
 EMERGENCY TELEPHONE NUMBERS: (517) 849-2144
 CHEMICAL FAMILY: LUBRICATING OIL
 CAS NUMBER: MIXTURE: ISSUE DATE 12/15/96
 HAZARDOUS INGREDIENTS:

CONTAINS NO INGREDIENTS NOW KNOWN TO BE HAZARDOUS AS DEFINED IN OSHA 29 CFR 1910.1000 AND OSHA 29 CFR 1910.1200.

HEALTH HAZARD DATA THRESHHOLD LIMIT VALUE: 5mg/m3 AS OIL MIST 8 hr, TWA
 PRIMARY ROUTES OF ENTRY: INHALATION, SKIN ABRASION AND INGESTION.
 CARCINOGENIC: NO
 SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED: NO ADVERSE EFFECTS EXPECTED.
 EYES: FLUSH WITH WATER FOR 15 MINUTES SKIN: WASH THOROUGHLY WITH WARM SOAPY WATER.
 INGESTION: DO NOT INDUCE VOMITTING-SEEK MEDICAL ATTENTION.
 MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NONE KNOWN
 AIR EXPOSURE LIMITS: P.E.L. NOT ESTABLISHED T.L.V.5mg/m3 OSHA 29 CFR 1910.1000
 HEALTH: 1FIRE: 1SPECIFIC: XREACTIVITY: 0

PHYSICAL DATA: BOILING POINT: 400+ DEG F. VAPOR PRESSURE (PSIA): N/A
 SPECIFIC GRAVITY (H2O=1): 0.87 SOLUBILITY IN WATER: NEGLIGIBLE
 PH OF CONCENTRATE: N/A
 APPEARANCE AND ODOR: PALE YELLOW, PETROLEUM ODOR

FIRE AND EXPLOSION HAZARD DATAFLASH POINT(METHOD USED): 425 DEG F.
 FLAMMABLE LIMITS: NOT DETERMINED LEL: N/AUEL: N/A
 EXTINGUISHING MEDIA: SAND, DRY CHEMICAL, FOAM, CO2. TREAT AS CLASS B FIRE.
 UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

REACTIVIYY DATA STABILITY: STABLE CONDITIONS TO AVOID: AVOID EXTREMES OF HEAT.
 INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZING MATERIALS.
 HAZARDOUS DECOMPOSITION PRODUCTS: INCOMPLETE COMBUSTION MAY CAUSE CARBON OXIDES.
 HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SPILL OR LEAK PROCEDURES: STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED. DIKE AND ABSORB ON INERT MATERIAL. FOLLOW ALL LOCAL, STATE, AND FEDERAL REGULATIONS FOR DISPOSAL OF COLLECTED MATERIAL.

PAGE 2

SPECIAL PROTECTION INFORMATION RESPIRATORY PROTECTION (SPECIFIC TYPE)
NONE REQUIRED
VENTILATION: NORMAL LOCAL EXHAUST: NORMAL
MECHANICAL EXHAUST (GENERAL) X
PROTECTIVE GLOVES: OIL IMPERVIOUS GLOVES RECOMMENDED
EYE PROTECTION: SAFETY GLASSES RECOMMENDED
OTHER PROTECTIVE EQUIPMENT: NONE REQUIRED

SPECIAL INSTRUCTIONS SPECIAL LABELLING INSTRUCTIONS: NOT REQUIRED
SPECIAL PACKAGING RECOMMENDATIONS: NONE
HANDLING AND STORAGE RECOMMENDATIONS: DO NOT CUT OR WELD ON EMPTY
CONTAINERS, AVOID EXTREMES OF COLD OR HEAT. STORE IN CLEAN DRY AREA.

DISCLAIMER: THE INFORMATION CONTAINED HEREIN HAS BEEN COMPILED FROM SOURCES
CONSIDERED TO BE DEPENDABLE AND IS ACCURATE TO THE BEST OF THE SELLERS
KNOWLEDGE. THE SELLER MAKES NO WARRANTY WHATSOEVER, EXPRESSED, IMPLIED OR OF
MERCHANTABILITY REGARDING THE ACCURACY OF SUCH DATA OR THE RESULTS TO
BE OBTAINED FROM THE USE THEREOF.

5

Replacement Decals

Refer to Table 5-1 and Figures 5-1 through 5-6 for descriptions and locations of decals on the XLB-4232 DC Boom Lift.

Table 5-1. Replacement Decals, DC Model

Decal No.	Description of Decal	Qty	Decal No.	Description of Decal	Qty
B06-00-0006	EMERGENCY CONTROL VALVE	1	B06-00-0145	DANGER: BOOM SAFETY INSTRUCTIONS	2
B06-00-0015	MAXIMUM CAPACITY...300 LBS. OR 1 OCCUPANT...	2	B06-00-0146	DANGER: HIGH VOLTAGE OPERATION – LARGE LABEL	1
B06-00-0033	CAUTION: THIS UNIT SHALL ONLY BE TOWED WHEN...	2	B06-00-0151	DANGER: 110 VOLT	1
B06-00-0034	DANGER: ...DURING CHARGING, EXPLOSIVE OXYHYDROGEN GAS...	1	B06-00-0161B	BIL-JAX TRANSFER, BLACK	2
B06-00-0036	LUBRICATE WEEKLY	13	B06-00-0161Y	BIL-JAX TRANSFER, YELLOW	1
B06-00-0037	LUBRICATE SEMI-ANNUALLY	1	B06-00-0167	Caution Tape, Black and Yellow	35'6"
B06-00-0041	MASTER POWER SWITCH	1	B06-00-0173	SAFETY HARNESS LANYARD ATTACHMENT POINT	1
B06-00-0058	SAFETY TREAD	1	B06-00-0189	WARNING: LEVEL MACHINE BEFORE USE...	1
B06-00-0060	STOP...READ OPERATING...	2	B06-00-0192	OPERATION AND SERVICE MANUAL INSIDE	1
B06-00-0062	THIS PLUG 115 VOLT	2	B06-00-0225	WARNING: STAY CLEAR WHILE RAISING ...	1
B06-00-0068	THE HYDRAULIC SYSTEM...	1	B06-00-0261	CAUTION: ANSI DECAL	1
B06-00-0114	XLB-4232 (TRANSFER)	2	B06-00-0266	SAFETY STRIPE-YELLOW (TRANSFER)	1
B06-00-0115	1500 WATT LOAD LIMIT	1	B06-00-0268	EMERGENCY ROTATION HANDLE	1
B06-00-0116	OPERATE WITH FULLY CHARGED BATTERIES...	1	B06-00-0272	CAUTION ROTATE BUCKET	2
B06-00-0117	BUCKET TILT COMPENSATOR	2	B06-00-0276	BASE CONTROLS	1
B06-00-0118	BUCKET CONTROLS	1	B06-00-0290	ATTENTION: DC MOTOR FAILURE WARNING	1
B06-00-0129	OIL LEVEL – TRANSPORT POSITION	1	B06-00-0359	SERIAL NO. TAG (NOT AVAILABLE AS A REPLACEMENT ITEM)	1
B06-00-0130	LUBRICATE MONTHLY	10			
B06-00-0139	DANGER: BEFORE USING: EXTEND, LOCK, STABILIZE...	5			
B06-00-0144	XLB-4232 SPECIFICATIONS	2			

⚠ DANGER BEFORE USING: EXTEND, LOCK, STABILIZE
OUTRIGGERS; AND LEVEL MACHINE.

⚠ DANGER

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

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

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

!! ATTENTION !!

To prevent premature motor failure, it is imperative that the fiberglass cover be kept in the closed position to protect against direct contact with any foreign particles and/or moisture. Should the hydraulic power unit need to be cleaned, it is very important to cover or shield the motor. The DC motor must not come into direct contact with foreign particles and/or moisture. See Operator's Manual for details.

OPERATION AND SERVICE MANUAL INSIDE

EMERGENCY ROTATION HANDLE

THIS PLUG 115 VOLT

⚠ CAUTION

This machine is designed and manufactured in compliance with the ANSI A92.2 standard in force on the date of manufacture. Dealers, owners, users, operators, lessors, and lessees are responsible for inspection, maintenance, training, and operation as required by A92.2 and the owners manual.

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

⚠ CAUTION

THIS UNIT SHALL ONLY BE TOWED WHEN ALL BOOM SECTIONS ARE FULLY DOWN AND LOCKED WITH TRANSPORT SAFETY PINS.

MAXIMUM CAPACITY

300 LBS. OR 1 OCCUPANT PLUS 120 LBS.

WORKFORCE

WORKFORCE

SAFETY HARNESS LANYARD ATTACHMENT POINT

XLB-4232

⚠ DANGER

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

BEFORE USE:

- Operator must read and understand, operate manual and all decals on machine before operating. It is operator's responsibility to comply with all warnings and instructions.
- Survey the job site and identify all potential hazards.
- Inspect lift for proper maintenance and any damaged or worn components. DO NOT operate until proper maintenance has been performed and all damaged or worn parts have been replaced. See owner's manual for proper maintenance procedures.
- NEVER TAKE CHANCES—DO NOT use this lift if you are under the influence of drugs or alcohol, or if you feel dizzy, or unsteady on your feet.
- OPERATE ON FIRM AND LEVEL SURFACE ONLY—do not use on loose gravel or other soft surfaces, the large outrigger support pads should be added to the base of the outriggers. Additional base support may be necessary on unevenly soft footing.
- Extend, lock, and stabilize all four outriggers.
- Level the machine when raising, lowering, tilting, or in a rest position and the necessary outrigger adjustment should be made to level machine before continuing.
- All occupants must wear full body harness and lanyard.
- Check safety devices daily before use—see owners manual for proper check procedures.
- When working on electric lines, wiring and batteries must be set up in accordance with all local, state, and federal code.
- Condition of area around base to keep personnel and other equipment away from unit while in use.

WARNING:

- To avoid hand injuries, always keep hands inside basket area during boom movement.
- Do not use electrical lift outriggers fully extended, basket raised.
- DO NOT release casters with boom extended or operator in basket.
- DO NOT move or reposition boom while operator occupies basket.
- DO NOT use when exposed to high winds, rain, snow, or ice.

DO NOT use when lift operator can come in contact with overhead obstructions such as electric wires, cables, rods, chimneys, etc.

- DO NOT operate without full body harness and lanyard in use by all basket occupants.
- DO NOT stand or sit on guard rails or top edge of basket.
- DO NOT use top edge of basket to perform work.
- DO NOT use boom, ladder, scaffolding, or any other means to increase working height.
- DO NOT climb up or down boom.
- DO NOT extend over the capacity.
- DO NOT allow ropes, electric cords, hoses, etc. to become entangled in the lift while platform is being raised or lowered.
- DO NOT throw, when in proper safety device.
- DO NOT use basket extension for dumping or pouring.
- DO NOT use basket extension for carrying loads to the platform while elevated.
- DO NOT use as a crane for lifting materials.
- DO NOT have the reaction wheel unbraked.
- DO NOT use as a crane for lifting materials.
- Plug charger in at the end of each day.
- When using the one-step lift power cord plugged into the base of the unit, care must be taken to ensure that it is not damaged or worn during use.
- DO NOT allow flames, sparks, or embers near batteries and DO NOT smoke near batteries. Batteries produce a hydrogen, oxygen gas mixture which can explode.

OWNERS & OPERATORS ARE RESPONSIBLE FOR INSPECTION, MAINTENANCE, TRAINING, AND OPERATIONS AS REQUIRED IN THE OWNER'S MANUAL.

WORKFORCE

IF YOU HAVE NOT BEEN PROVIDED WITH SAFETY LITERATURE, OR FOR ANY QUESTIONS CONCERNING THE SAFE USE OF THIS EQUIPMENT, CALL 484-944-5625.

LUBRICATE MONTHLY

LUBRICATE WEEKLY

LUBRICATE SEMI-ANNUALLY

⚠ DANGER

110 VOLT

EMERGENCY CONTROL VALVE

Figure 5-1. Replacement Decals, Sheet 1 of 3

⚠ DANGER

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

- Risk of Electric Shock ⚡
DO NOT expose charger to rain, power wash detergents or spray - **DO NOT** use frayed or damaged electric cords when charging.
- During charging, explosive oxyhydrogen gas is generated. **DO NOT** smoke or allow open fire, sparks, or embers near battery when charging.
- Connect input cord only to properly grounded three wire outlet with specified voltage and frequency.
- **Always** wear safety goggles and face shield when working on or near battery.
- Check battery acid level at the start of each day. If acid does not cover the plates, add only enough distilled or demineralized water to completely cover the plates.
- Keep terminals and terminal connections clean.
- Consult Operation and Maintenance Manual for additional information on battery maintenance.

RIR/OFG

B06-00-0034

**MASTER
POWER
SWITCH**

RFT B06-00-0041

B06-00-0041

STOP

**READ OPERATING
INSTRUCTIONS BEFORE
OPERATING
MACHINE**

RIL B06-00-0060

B06-00-0060

⚠ WARNING

**STAY CLEAR
WHILE RAISING
OR LOWERING**

CCFO B06-00-0225

B06-00-0225

XLB-4232 SPECIFICATIONS

CAPACITY	300 LB.
MAXIMUM PLATFORM HEIGHT	35 FT. 5 IN.
WORK HEIGHT	42 FT.
POWER SOURCE	24V DC BATTERY

CFT/OFG © Bil-Jax, Inc. 2004 B06-00-0144

B06-00-0144

**TRANSPORT
POSITION**

MAX

MIN

RIF B06-00-0129

B06-00-0129

BUCKET TILT

CCW CW

COMPENSATOR

AJF © Bil-Jax, Inc. 2004 B06-00-0117

B06-00-0117



B06-00-0266

⚠ CAUTION

Right-hand cornering is limited due to bucket position.

Rotate bucket to transport position before towing.

© Bil-Jax, Inc. 2004 COFG B06-00-0272

B06-00-0272

⚠ WARNING

- Level machine before use.
- Failure to level this machine could result in serious injury or death!

LFC B06-00-0189

B06-00-0189

OPERATE WITH FULLY CHARGED BATTERIES

REDUCED ELECTRICAL COMPONENT LIFE MAY RESULT IF OPERATED WHEN BATTERY CONDITION IS BELOW YELLOW LINE INDICATOR.

B06-00-0116

B06-00-0116

**THE HYDRAULIC SYSTEM OF
THIS MACHINE IS DESIGNED TO USE
ENERGOL HLP-46 HYDRAULIC OIL**

OII B06-00-0068

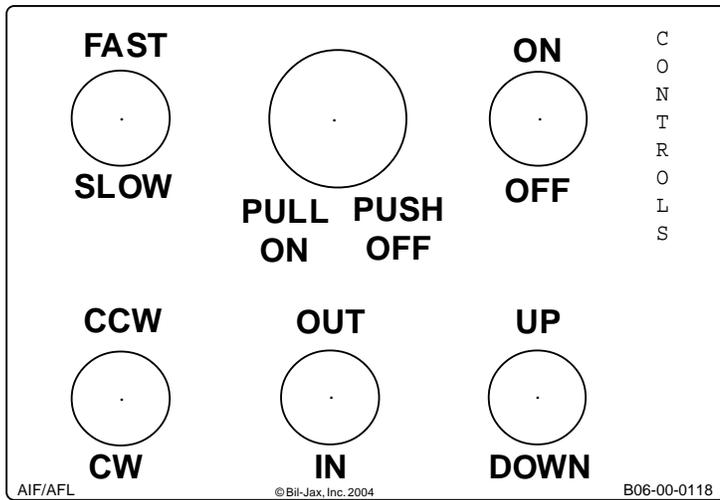
B06-00-0068

- Use only tools equipped with 3 prong grounded plug.
- 1500 Watt maximum load.
- 15 Amp maximum circuit.

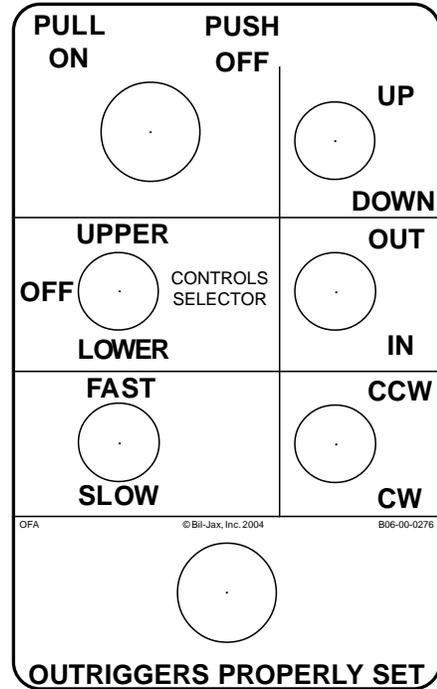
AJF/RFC B06-00-0115

B06-00-0115

Figure 5-1. Replacement Decals, Sheet 2 of 3



B06-00-0118



B06-00-0276



B06-00-0359



B06-00-0167

Figure 5-1. Replacement Decals, Sheet 3 of 3

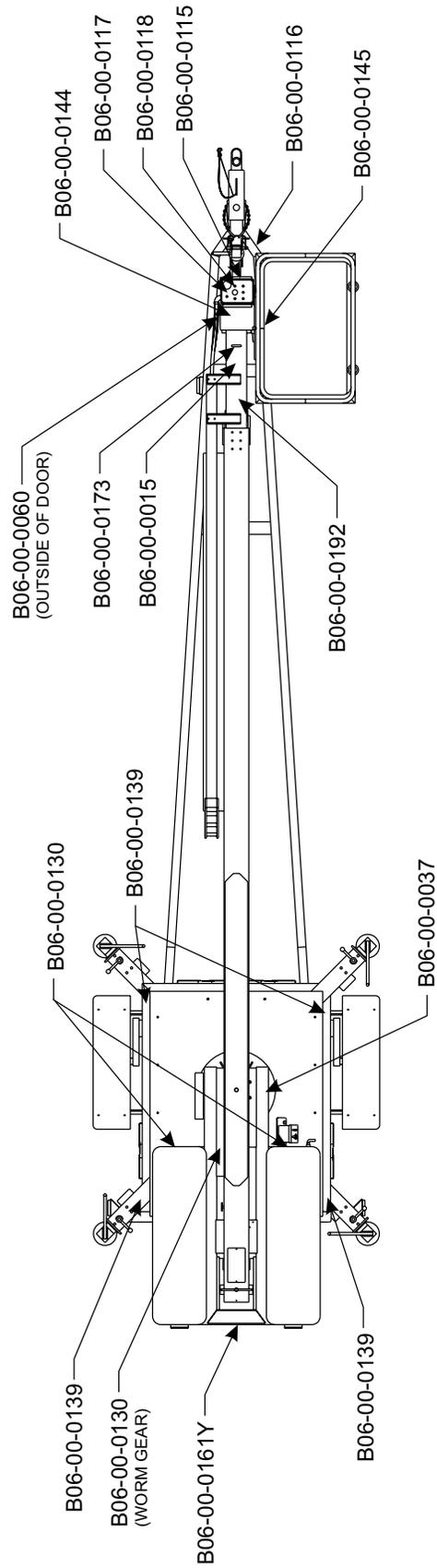


Figure 5-2. Decal Locations, Top View

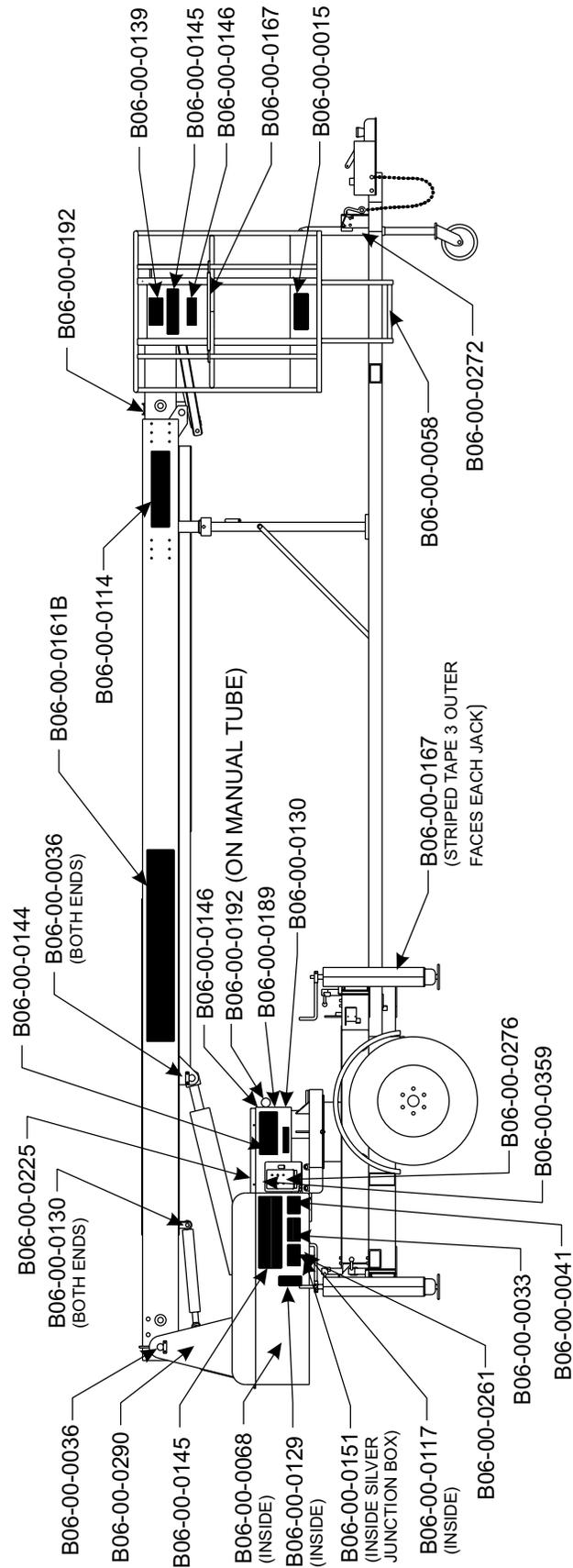


Figure 5-3. Decal Locations, Passenger Side

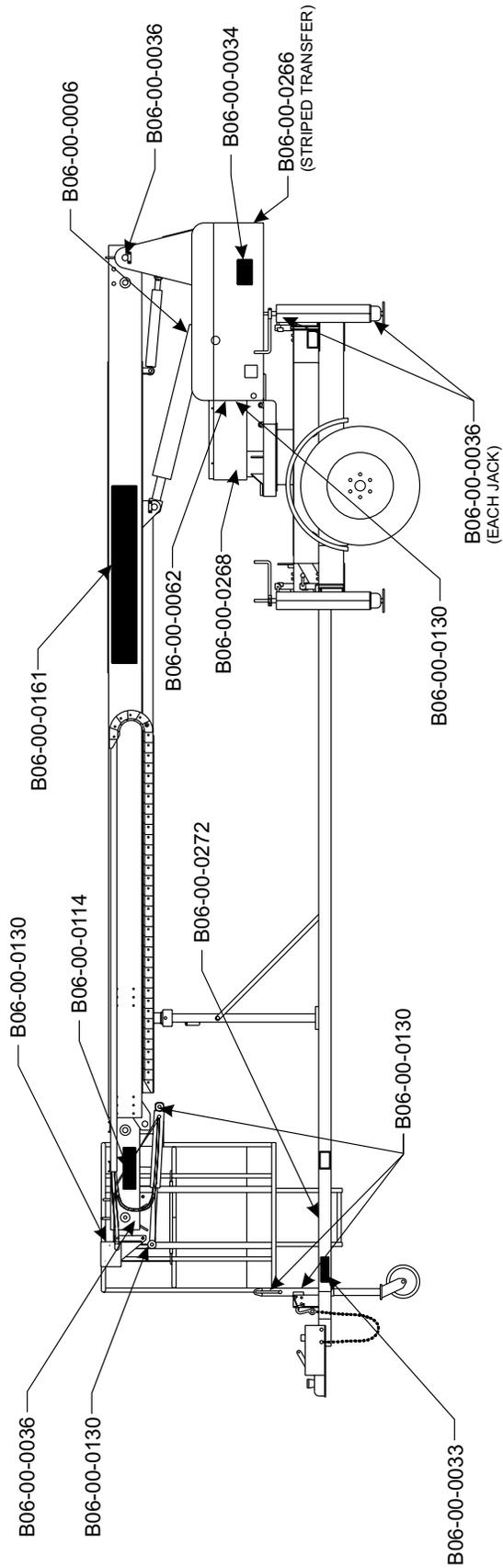


Figure 5-4. Decal Locations, Driver Side

6

Parts List

6-1 UPPER BOOM PARTS LIST

Refer to Table 6-1 for the upper boom parts list.

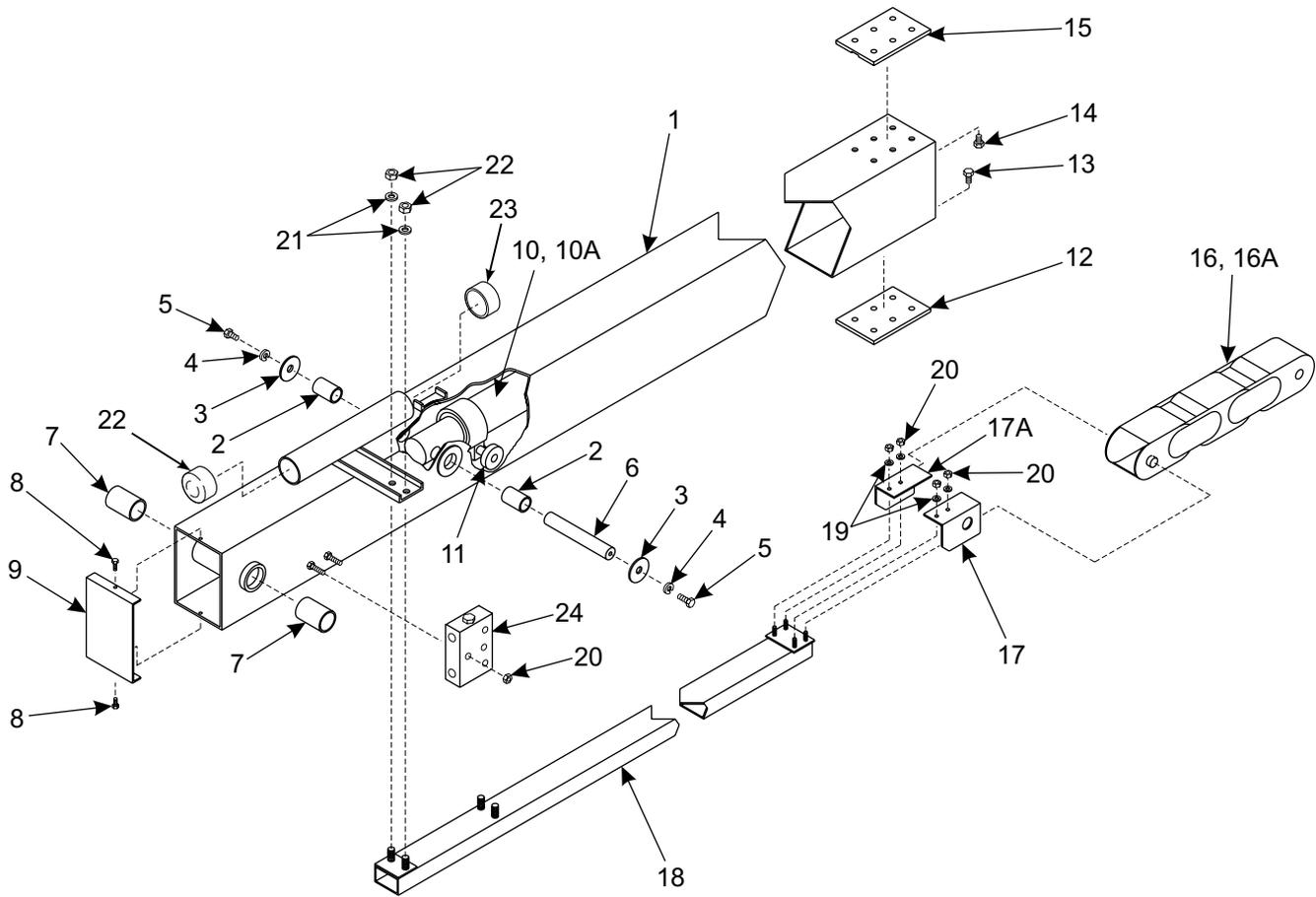


Figure 6-1. Upper Boom

Table 6-1. Upper Boom Parts List

Item No.	Part No.	Description	Qty
1	B14-00-0002	Boom, Upper	1
2	B30-00-0004	Spacer, Extension Cylinder, Ram End	2
3	B04-06-0001	Washer, Flat, 2 in. OD	2
4	0090-0210	Washer, Lock, Split, 3/8 in.	2
5	0090-0480	Screw, Cap, 3/8-16 x 1 in. w/Loctite Patch	2
6	B36-01-0004	Pin, Extension Cylinder, Ram End	1
7	B25-00-0003	Bushing, Bronze, 1-1/2 in. ID	2
8	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	2
9	B18-00-0017	End Cover, Upper Boom	1
10	B02-03-0020	Cylinder, Boom Extension, 2-1/2 in. Bore x 168 in. Stroke	1
10A	B02-13-0098	Kit, Seal Replacement, Extension Cylinder	1
11	B25-00-0002	Roller Bearing, 1-3/4 in. OD	2
12	B31-00-0007	Shim, Bottom	1
13	0090-0509	Screw, Cap, Nylon, 3/8-16 x 3/8 in.	6
14	0090-0510	Screw, Cap, Nylon, 3/8-16 x 1/2 in.	6
15	B31-00-0005	Shim, Top	1
16	B00-00-0031	Cable Track, 41 Link w/Mounting Brackets	1
16A	B00-00-0074	Link, Replacement, Cable Track	
17	B29-00-0165-1	Bracket, Cable Track, Driven, Left Hand	1
17A	B29-00-0165-2	Bracket, Cable Track, Driven, Right Hand	1
18	B29-00-0012	Carrier Tube Arm	1
19	0090-0419	Washer, Flat, 1/4 in.	4
20	0090-0183	Nut, Nylon Lock, 1/4-20	6
21	0090-0422	Washer, Flat, 3/8 in.	4
22	0090-0188	Nut, Nylon Lock, 3/8-16	4
23	B00-00-0014	Cap, Black Plastic	2
24	B02-04-0068	Valve, P.O. Check	1

6-2 LOWER BOOM PARTS LIST

Refer to Table 6-2 for the lower boom parts list.

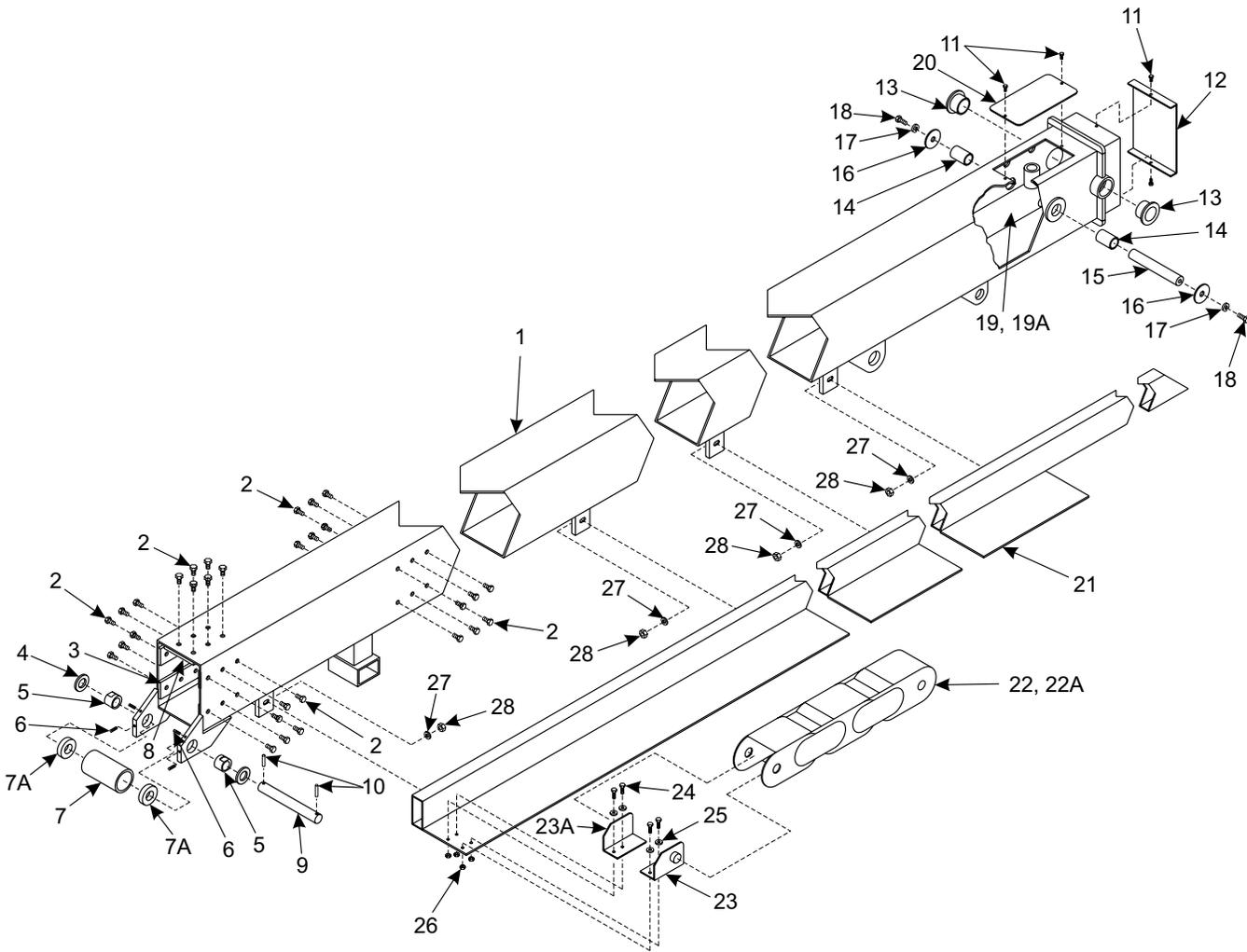


Figure 6-2. Lower Boom

Table 6-2. Lower Boom Parts List

Item No.	Part No.	Description	Qty
1	B14-00-0001	Boom, Lower	1
2	0090-0510	Screw, Cap, Nylon, 3/8-16 x 1/2 in.	30
3	B31-00-0004	Shim, Side	4
4	0090-0429	Washer, Flat, 1 in.	2
5	B30-00-0003	Cam, Support Roller	2
6	0090-0363	Screw, Set, Socket, 1/4-20 x 3/4 in.	4
7	B25-00-0001	Roller, Boom Support	1
7A	B25-00-0021	Bearing, Replacement	2
8	B31-00-0005	Shim, Top	1
9	B36-01-0006	Axle, Boom Support Roller	1
10	0090-0320	Pin, Roll, 1/4 x 1-1/2 in.	2
11	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	4
12	B18-00-0015	End Cover, Lower Boom	1
13	B25-00-0023	Bushing, Bronze, 1.5 in. ID	2
14	B30-00-0001	Spacer, Extension Cylinder, Dead End	2
15	B36-01-0003	Pin, Extension Cylinder, Dead End	1
16	B04-06-0001	Washer, Flat, 2 in. OD	2
17	0090-0210	Washer, Lock, Split, 3/8 in.	2
18	0090-0480	Screw, Cap, 3/8-16 x 1 in. w/Loctite Patch	2
19	B02-03-0020	Cylinder, Boom Extension, 2-1/2 in. Bore x 168 in. Stroke	1
19A	B02-13-0098	Kit, Seal Replacement, Extension Cylinder	1
20	B18-00-0016	Cover, Top, Lower Boom	1
21	B29-00-0009	Carrier Tube	1
22	B00-00-0031	Cable Track, 41 Link w/Mounting Brackets	1
22A	B00-00-0074	Link, Replacement, Cable Track	
23	B29-00-0166-1	Bracket, Cable Track, Fixed, Left Hand	1
23A	B29-00-0166-2	Bracket, Cable Track, Fixed, Right Hand	1
24	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	4
25	0090-0419	Washer, Flat, 1/4 in.	4
26	0090-0183	Nut, Nylon Lock, 1/4-20	4
27	0090-0422	Washer, Flat, 3/8 in.	4
28	0090-0188	Nut, Nylon Lock, 3/8-16	4

6-3 TURNTABLE PARTS LIST

Refer to Table 6-3 for the turntable parts list.

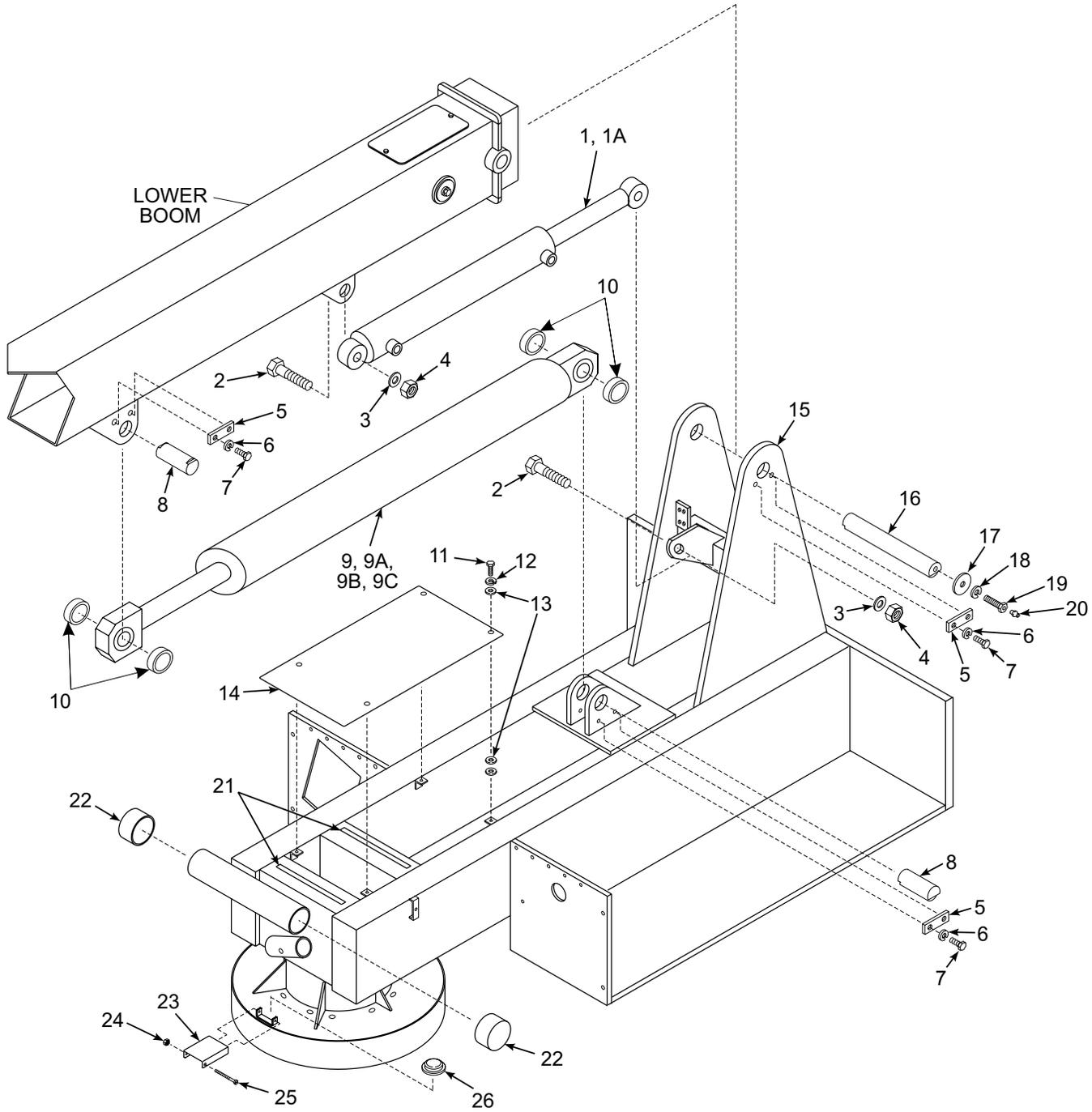


Figure 6-3. Turntable

Table 6-3. Turntable Parts List

Item No.	Part No.	Description	Qty
1	B02-03-0007	Cylinder, Master Leveling, 2 in. Bore x 13-1/4 in. Stroke	1
1A	B02-13-0037	Kit, Seal Replacement, Leveling Cylinder	1
2	0090-0103	Screw, Cap, 3/4-10 x 2-1/2 in.	2
3	0090-0428	Washer, Flat, 3/4 in.	2
4	0090-0195	Nut, Hex, Nylon Lock, 3/4-10	2
5	B29-00-0005	Plate, Pin	6
6	0090-0208	Washer, Lock, Split, 5/16 in.	12
7	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	12
8	B36-01-0005	Pin, Lift Cylinder	2
9	B02-03-0024	Cylinder, Boom Lift, 4 in. Bore x 31 in. Stroke	1
9A	B02-13-0124	Kit, Seal Replacement, Lift Cylinder	1
9B	B02-14-0061	Valve, NC Cartridge	1
9C	B01-08-0001	Coil, 24V	1
10	B30-00-0002	Spacer, Lift Cylinder	4
11	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	4
12	0090-0206	Washer, Lock, Split, 1/4 in.	4
13	0090-0419	Washer, Flat, 1/4 in.	12
14	B18-00-0083	Cover, Turntable	1
15	B11-03-0002	Turntable Weldment	1
16	B36-01-0007	Pin, Lower Boom Pivot	1
17	B04-06-0001	Washer, Flat, 2 in. OD	2
18	0090-0210	Washer, Lock, Split, 3/8 in.	2
19	B04-05-0001	Screw, Cap, 3/8-16 x 1 in. Drilled for Zerk	2
20	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	2
21	B05-00-0005	Tape, Foam Adhesive Back, 3/16 x 1/4 in.	66 in.
22	B00-00-0014	Cap, Black Plastic	2
23	B18-00-0021	Cover, Bubble Level	1
24	0090-0181	Nut, Hex, Nylon Lock, #8-32	1
25	0090-0710	Screw, Machine, #8-32 x 2-3/4 in.	1
26	B00-00-0001	Level, Bubble	1

6-4 DC MODEL BATTERY COMPARTMENT PARTS LIST

Refer to Table 6-4 for the DC model boom lift battery compartment parts list.

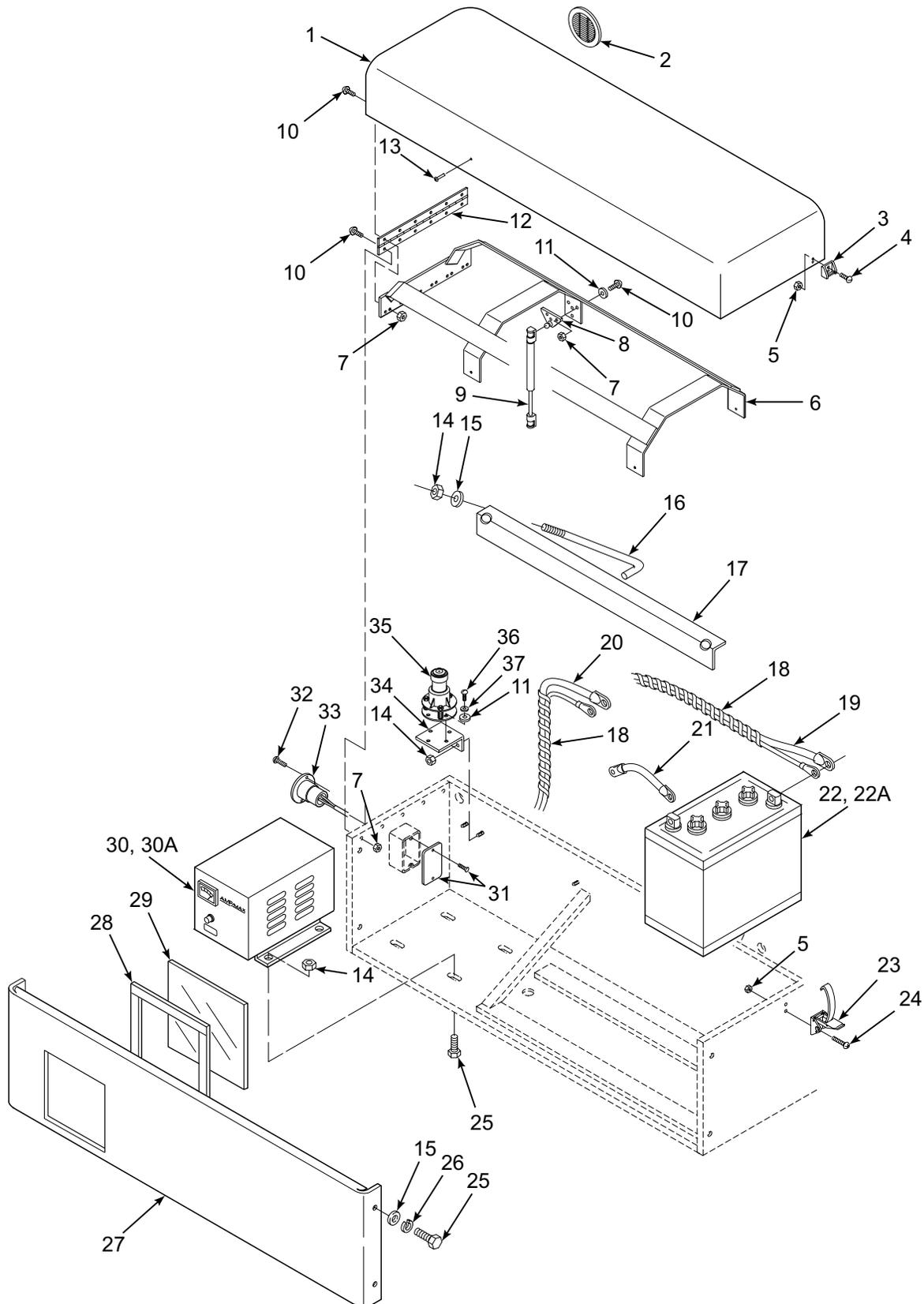


Figure 6-4. DC Model Battery Compartment

Table 6-4. DC Model Battery Compartment Parts List

Item No.	Part No.	Description	Qty
1	B18-00-0014	Lid, Compartment Cover	1
2	B18-00-0135	Vent Louver, 2-1/2 in.	4
3	B42-00-0006	Clip, Latch	1
4	0090-0225	Screw, Machine, #8-32 x 1/2 in.	1
5	0090-0181	Nut, Hex, Nylon Lock, #8-32	3
6	B18-00-0132	Frame, Compartment Cover	1
7	0090-0182	Nut, Hex, Nylon Lock, #10-24	15
8	B29-00-0073	Bracket, Ball Mounting	1
9	B39-00-0034	Spring, Gas	1
10	0090-0232	Screw, Machine, #10-24 x 5/8 in.	15
11	0090-0415	Washer, Flat, #10	7
12	B42-01-1002	Hinge	1
13	0090-0684	Rivet, Pop, 3/16 x 1/2 in.	3
14	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	8
15	0090-0419	Washer, Flat, 1/4 in.	6
16	B04-07-0005	Rod, Threaded, Battery Retaining, 1/4 in.	2
17	B29-00-0017	Retainer Angle, Battery	1
18	B05-04-0001	Wrap, Spiral Black, 3/8 x 0.27 in.	
19	B01-01-0028	Cable, Battery, 2 Ga. x 33 in.	1
20	B01-01-0012	Cable, Battery, 2 Ga. x 45 in.	1
21	B01-01-0014	Cable, Battery, 2 Ga. x 8 in.	3
22	B01-04-0003	Battery, 6 Volt DC, 250 Amp	4
22A	B01-04-0009	Battery, Dry Cell, 6 Volt DC	4
23	B42-00-0005	Latch, Lid	1
24	0090-0814	Screw, Machine, #8-32 x 7/8 in.	2
25	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	8
26	0090-0206	Washer, Lock, Split, 1/4 in.	4
27	B18-00-0010	Cover, Side	1
28	B05-00-0007	Tape, Foam Adhesive Back, 1/16 x 1/2 in.	32 in.
29	B18-00-0018	Plexiglass, 1/8 in. x 8 in. x 8 in.	1
30	B01-05-0006	Charger, Battery, 40 Amp, 110 Volt AC, 60 Hz	1
30A	B01-05-0027	Charger, Battery, 40 Amp, 220 Volt AC, 50 Hz	1
31	B18-00-0026	Cover	1
32	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	2
33	B01-10-0003	Receptacle, Flush Mount	1
34	B29-00-0021	Bracket, Level Sensor Mounting	1
35	B01-10-0016	Sensor, Slope, 3°, 0.5 Second Delay	1
36	0090-0231	Screw, Machine, #10-24 x 1/2 in.	4
37	0090-0205	Washer, Lock, #10	4

6-5 DC MODEL POWER COMPARTMENT PARTS LIST

Refer to Table 6-5 for the DC model power compartment parts list.

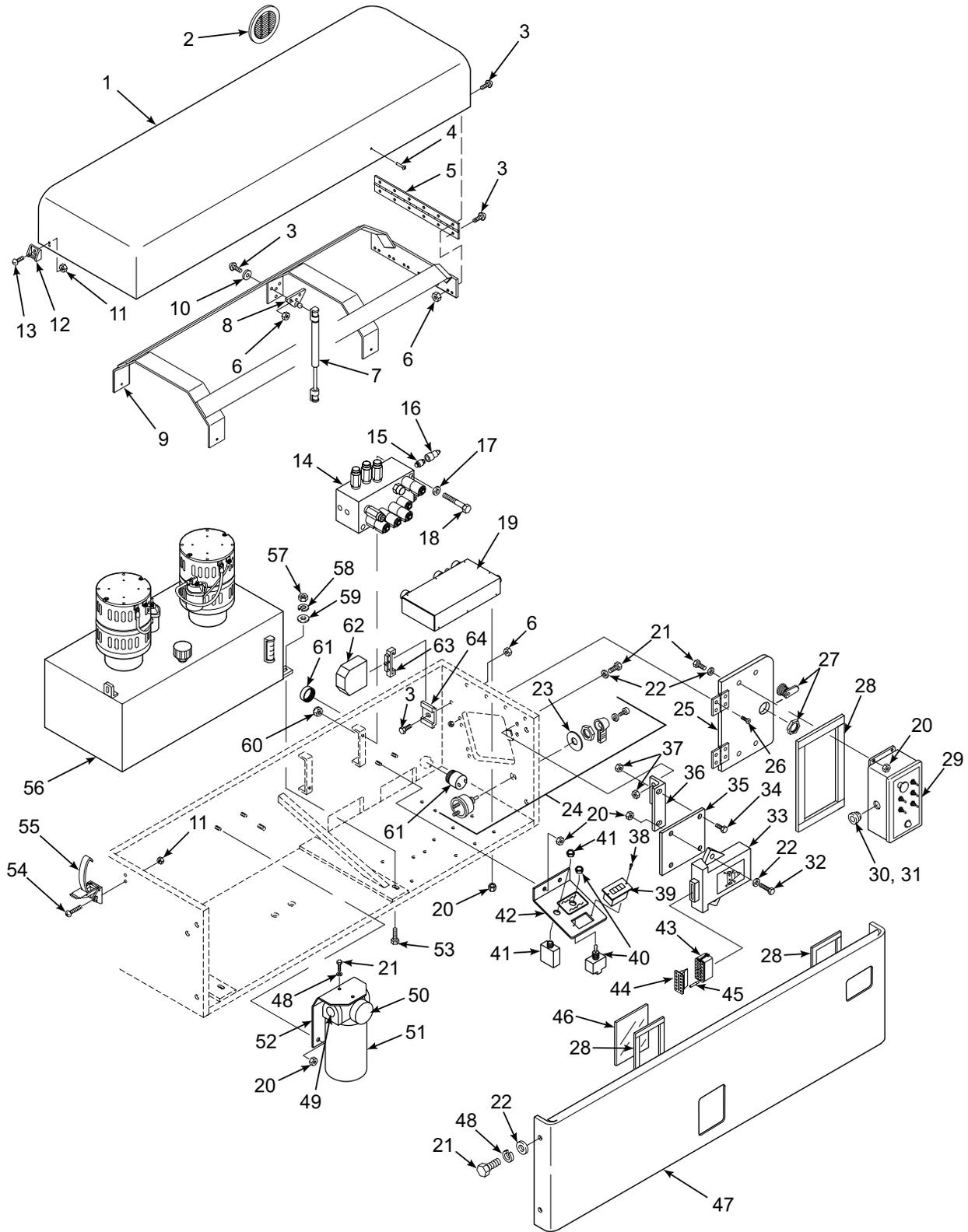


Figure 6-5. DC Model Power Compartment

Table 6-5. DC Model Power Compartment Parts List

Item No.	Part No.	Description	Qty
1	B18-00-0013	Lid, Compartment Cover	1
2	B18-00-0135	Vent, Louver, 2-1/2 in.	2
3	0090-0232	Screw, Machine, #10-24 x 5/8 in.	16
4	0090-0684	Rivet, Pop, 3/16 x 1/2 in.	3
5	B42-01-1002	Hinge	1
6	0090-0182	Nut, Hex, Nylon Lock, #10-24	16
7	B39-00-0034	Spring, Gas	1
8	B29-00-0073	Bracket, Ball Mounting	1
9	B18-00-0132	Frame, Compartment Cover	1
10	0090-0415	Washer, Flat, #10	5
11	0090-0181	Nut, Hex, Nylon Lock, #8-32	3
12	B42-00-0006	Clip, Latch	1
13	0090-0225	Screw, Machine, #8-32 x 1/2 in.	1
14	B02-04-0069	Valve, Combination, 24 Volt (for component parts see page 6-40)	1
15	B02-02-0196	Fitting, Hex Nipple, 4 ORM-2 NPTM	1
16	B02-02-0018	Fitting, Quick Connect Male	1
17	0090-0420	Washer, Flat, 5/16 in.	2
18	0090-0879	Screw, Cap, 5/16-18 x 4 in.	2
19	B19-00-0007	Terminal Enclosure w/Cover (for component parts see pages 6-14, 15)	1
20	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	14
21	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	12
22	0090-0419	Washer, Flat, 1/4 in.	10
23	B00-00-0112	Faceplate, Master Power Switch	1
24	B01-02-0060	Switch, Master Power	1
25	B18-00-0011	Door, Lower Control Box	1
26	0090-0235	Screw, Machine, Flat Head, 10-24 x 3/4 in.	4
27	B37-00-0002	Lock w/Key (Key only B38-00-0003)	1
28	B05-00-0007	Tape, Foam Adhesive Back, 1/16 x 1/2 in.	Roll
29	B19-00-0009	Lower Control Box Assembly (for component parts see pages 6-39)	1
30	B01-09-0029	Cord Grip, 1/2 in.	1
31	B04-07-0030	Plastic Nut, 1/2 in. Cord Grip	1
32	0090-0007	Screw, Cap, 1/4-20 x 1-1/4 in.	2

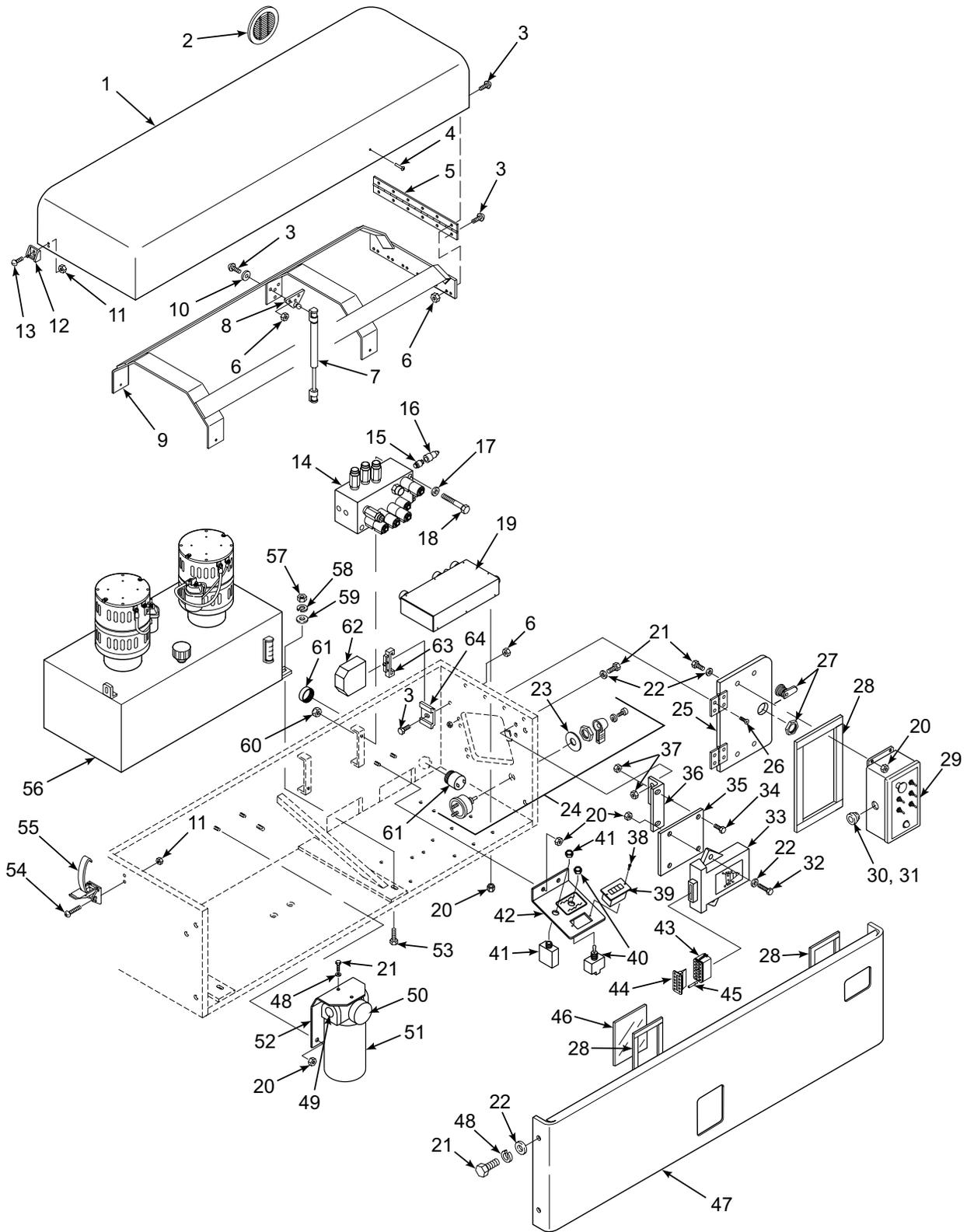


Figure 6-5. DC Model Power Compartment

Table 6-5. DC Model Power Compartment Parts List, Continued

Item No.	Part No.	Description	Qty
33	B01-10-0271	Display, Outrigger /Axle	1
34	0090-0001	Screw, Cap, 1/4-20 x 1/2 in.	2
35	B07-06-5589	Plate, Outrigger /Axle Display	1
36	B29-00-0152	Bracket, Outrigger /Axle Display	1
37	0090-0834	Nut, Jam, Nylon Lock, 1/4-20	4
38	0090-0627	Screw, Thread Cutting, #4-40 x 1/2 in.	2
39	B01-10-0007	Hourmeter	1
40	B01-02-0010	Switch, Toggle, Tilt	1
41	B01-10-0008	Circuit Breaker, 20 Amp	1
42	B29-00-0018	Bracket, Switch-Fuse-Hour Meter	1
43	B01-09-0105	Connector, 12 Pin, Outrigger Display	1
44	B01-09-0107	Insert, 12 Pin, Outrigger Display	1
45	B01-09-0108	Pin, Outrigger Display	6
46	B18-00-0019	Plexiglass, 1/8 in. x 4 in. x 6 in.	1
47	B18-00-0009	Cover, Control Side	1
48	0090-0206	Washer, Lock, Split, 1/4 in.	6
49	B02-00-0003	Assembly, Return Filter (includes head and items 50-51)	1
50	B02-00-0004	Indicator	1
51	B02-00-0005	Element, Filter	1
52	B29-00-0016	Bracket, Oil Filter	1
53	0090-0042	Screw, Cap, 3/8-16 x 1-1/2 in.	2
54	0090-0814	Screw, Machine, #8-32 x 7/8 in.	2
55	B42-00-0005	Latch, Lid	1
56	B02-05-0017	Pump and Motor Assembly (for component parts see pages 6-44, 45)	1
57	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	2
58	0090-0210	Washer, Lock, Split, 3/8 in.	2
59	0090-0422	Washer, Flat, 3/8 in.	2
60	0090-0185	Nut, Hex, Nylon Lock, 5/16-18	2
61	B01-10-0002	Beeper	1
62	B01-10-0258	Surge Suppressor, 24VDC	1
63	B01-10-0260	End Clip	1
64	B01-10-0261	Din Rail	1

6-6 TERMINAL ENCLOSURE PARTS LIST

Refer to Table 6-6 for the terminal enclosure parts list.

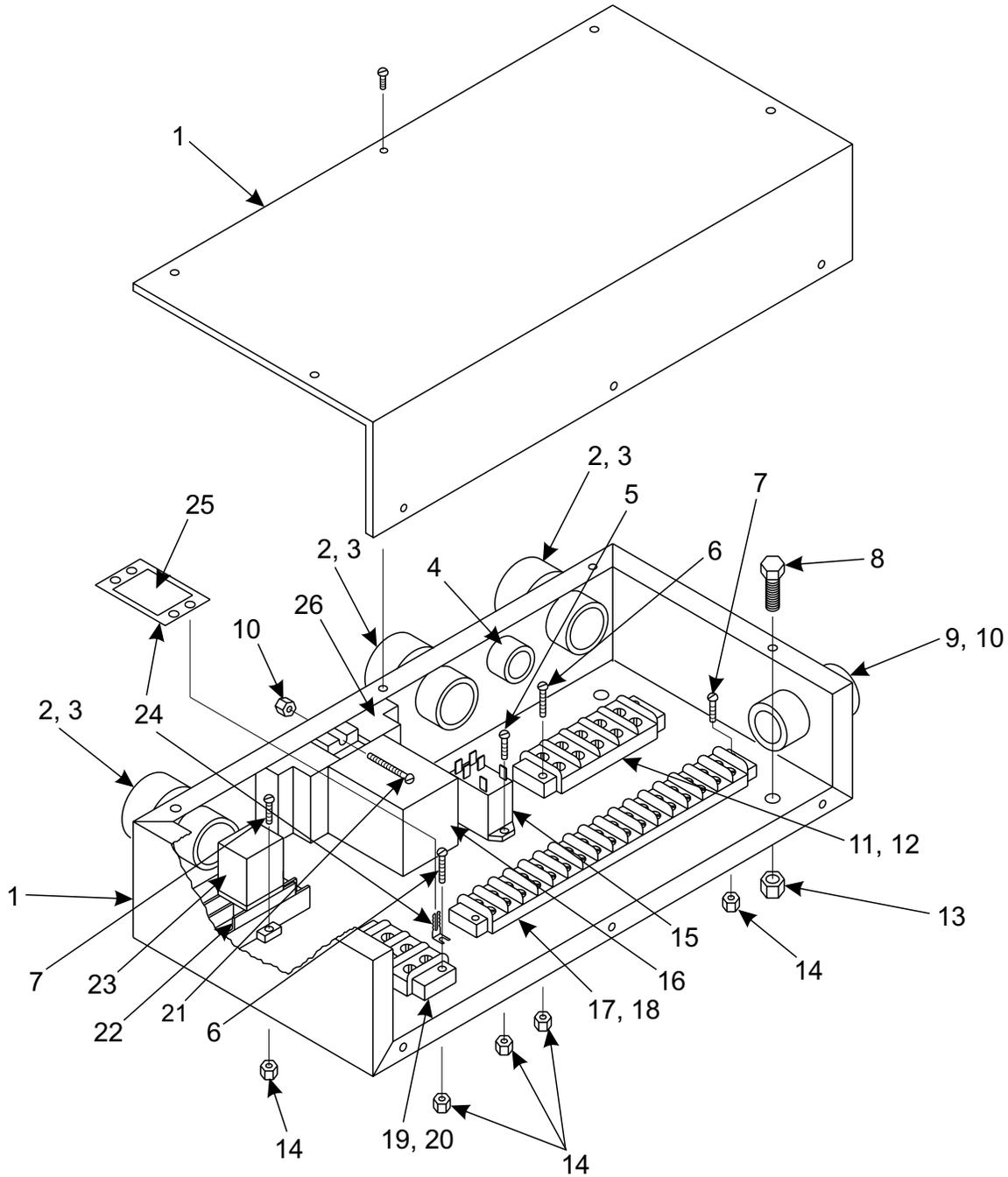


Figure 6-6. Terminal Enclosure

Table 6-6. Terminal Enclosure Parts List

Item No.	Part No.	Description	Qty
1	B19-00-0007	Terminal Enclosure w/Cover	1
2	B01-09-0020	Cord Grip, 3/4 in.	3
3	B01-09-0021	Plastic Nut, 3/4 in. Cord Grip	3
4	B00-00-0102	Plug, Plastic	1
5	0090-0708	Screw, Machine, #6-32 x 3/8 in.	2
6	0090-0690	Screw, Machine, #6-32 x 5/8 in.	5
7	0090-0218	Screw, Machine, #6-32 x 1/2 in.	3
8	0090-0688	Screw, Cap, 1/4-20 x 1 in.	4
9	B01-09-0029	Cord Grip, 1/2 in.	1
10	B04-07-0030	Plastic Nut, 1/2 in. Cord Grip	1
11	B01-10-0090	Marker, 5 Position Terminal Strip	1
12	B01-10-0030	Terminal Strip, 5 Position	1
13	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	4
14	0090-0180	Nut, Hex, Nylon Lock, #6-32	12
15	B01-06-0028	Relay, 24VDC, Quick Connect	1
16	B01-06-0013	Relay, 24VDC	1
17	B01-10-0089	Marker, 20 Position Terminal Strip	1
18	B01-10-0029	Terminal Strip, 20 Position	1
19	B01-10-0091	Marker, 3 Position Terminal Strip	1
20	B01-10-0031	Terminal Strip, 3 Position	1
21	0090-0220	Screw, Machine, #6-32 x 1 in.	2
22	B01-06-0007	Socket, Snap Mount Screw Terminal	1
23	B01-06-0008	Relay, 24VDC, Blade Terminal	1
24	B01-10-0032	Cover w/Latches	1
25	B06-00-0151	Decal, Danger 110V	1
26	B01-06-0012	Socket, 24V Relay	1

6-7 FRAME AND ROTATION UNIT LIST

Refer to Table 6-7 for the frame and rotation unit parts list.

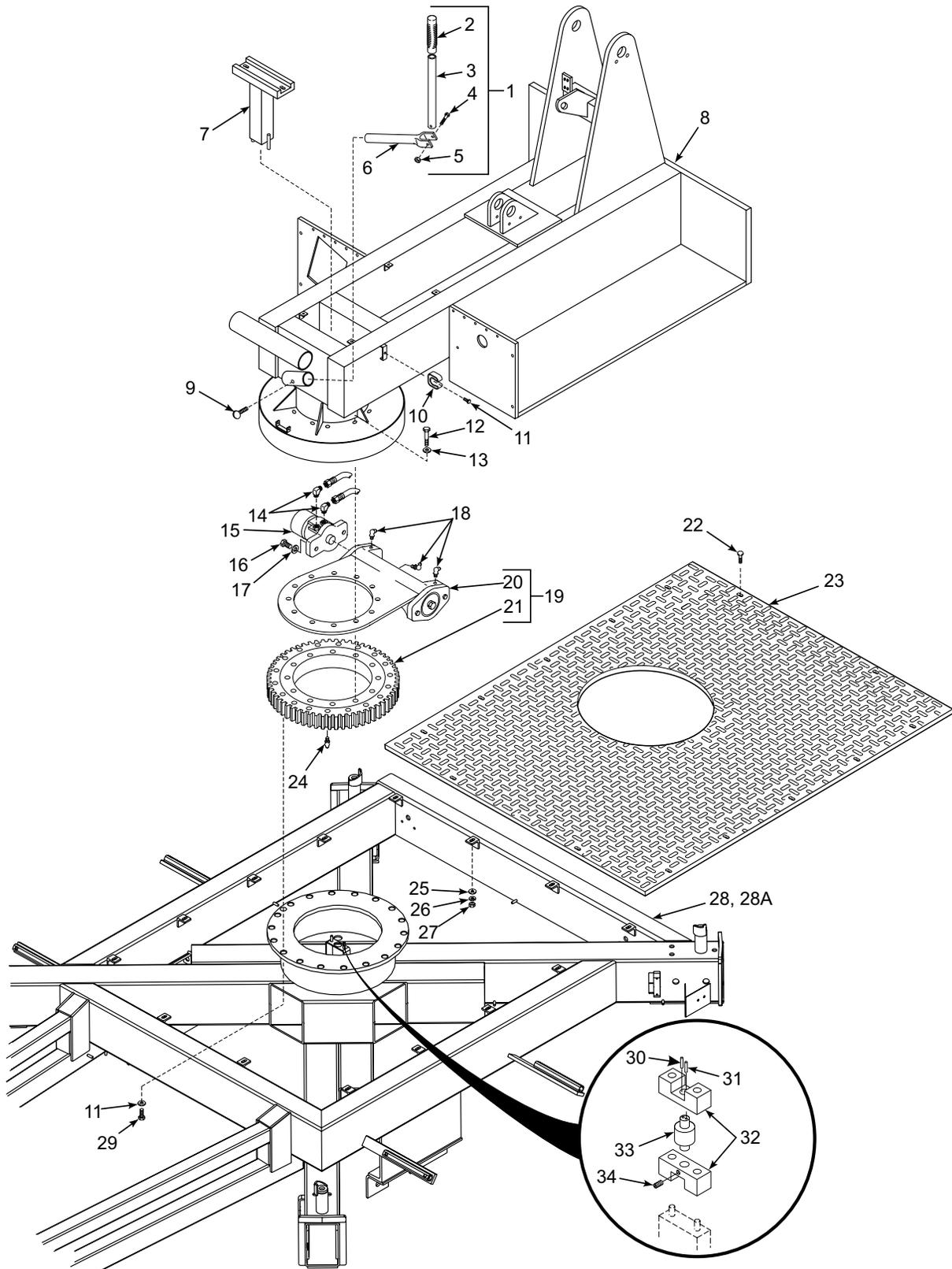


Figure 6-7. Frame and Rotation Unit

Table 6-7. Frame and Rotation Unit Parts List

Item No.	Part No.	Description	Qty
1	B03-00-0078	Handle Assembly, Manual Rotation (includes items 54 through 59)	1
2	B11-03-0018	Tube, Manual Boom Rotation	1
3	0090-0834	Nut, Nylon Lock, 1/4-20	1
4	0090-0011	Screw, Cap, 1/4-20 x 1-3/4 in.	1
5	B07-10-1042	Handle, Manual Boom Rotation	1
6	B46-00-0018	Grip, Rubber	1
7	B11-03-0015	Bracket, Upper Rotary Contact	1
8	B11-03-0002	Turntable Weldment	1
9	0090-0409	Screw, Thumb, 3/8-16 x 3/4 in.	1
10	B04-07-0062	Clip, Gripper	1
11	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	1
12	0090-0643	Screw, Cap, 5/8-11 x 2-3/4 in.	12
13	0090-0612	Washer, Flat, 5/8 in.	30
14	B02-02-0025	Fitting, 90° Elbow	2
15	B02-06-0006	Motor, Hydraulic	1
16	0090-0461	Screw, Cap, 1/2-13 x 2 in.	2
17	0090-0212	Washer, Lock, Split, 1/2 in.	2
18	B00-00-0106	Fitting, Grease, 90°	3
19	B13-00-0006	Slew Ring Assembly (includes items 20 and 21)	1
20	B13-00-0001	Ring, Worm Gear	1
21	B25-00-0031	Slew Ring	1
22	0090-0127	Bolt, Carriage, 5/16-18 x 1 in.	14
23	B07-04-1001	Plate, Tread	1
24	B00-00-0061	Fitting, Grease, 1/8 in. NPT Straight	1
25	0090-0420	Washer, Flat, 5/16 in.	14
26	0090-0208	Washer, Lock, Split, 5/16 in.	14
27	0090-0160	Nut, Hex, 5/16-18	14
28	B12-00-0089	Trailer Weldment (accommodates later model trailer axle and jack)	1
28A	B12-00-0002	Trailer Weldment (accommodates early model trailer axle and jack)	1
29	0090-0633	Screw, Cap, 5/8-11 x 1-1/2 in.	18
30	B01-09-0103	Spade, Female, .110 in.	4
31	B01-09-0095	Spade, Female, 1/4 in.	2
32	B00-00-0060	Support, Rotary Conductor	2
33	B01-10-0219	Conductor, Rotary	1
34	0090-0355	Screw, Set, 1/4-20 x 1/4 in.	2

6-8 HITCH AND JACK ASSEMBLY PARTS LIST

Refer to Table 6-8 for the hitch and jack assembly parts list.

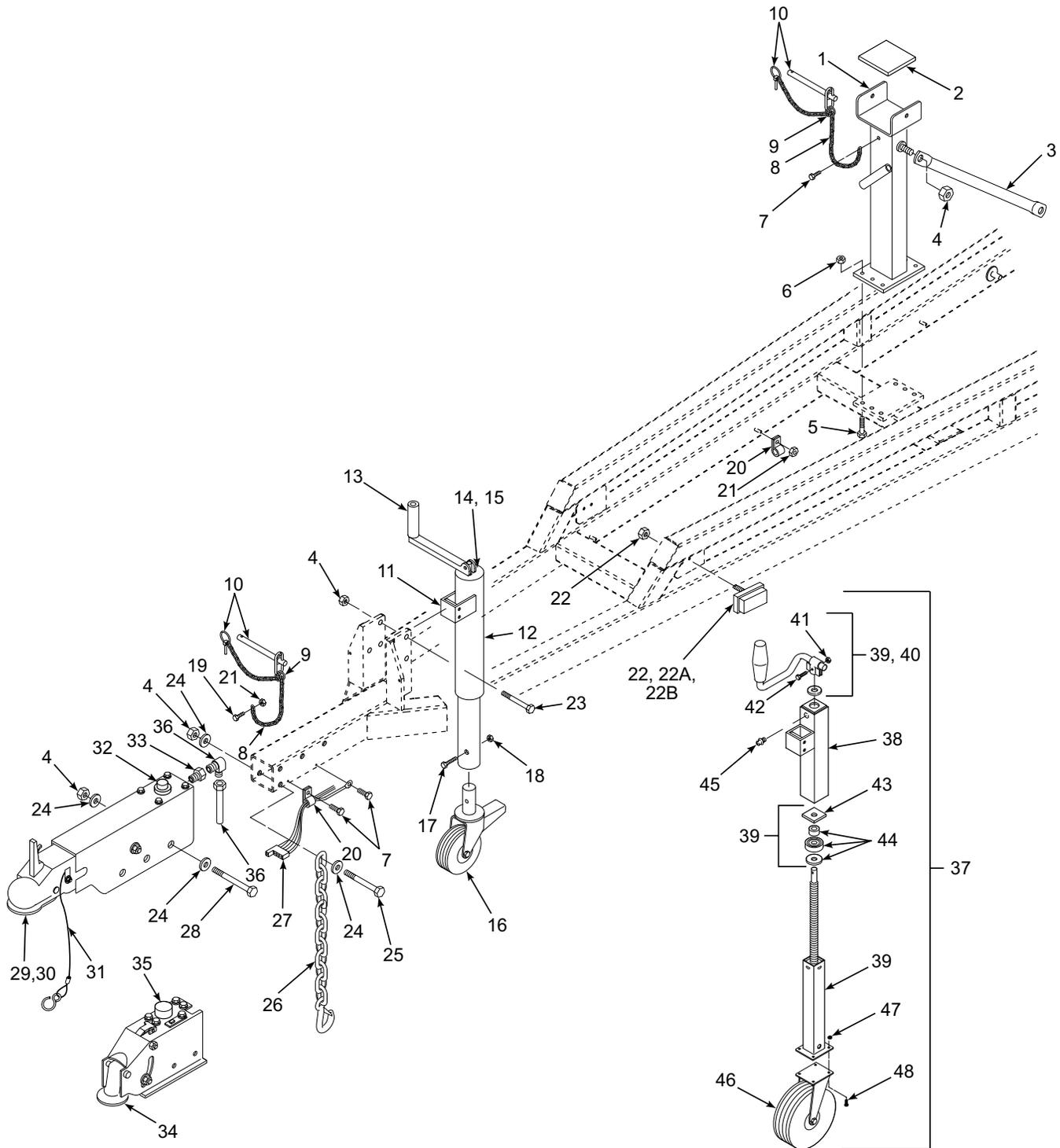


Figure 6-8. Hitch and Jack Assembly

Table 6-8. Hitch and Jack Assembly Parts List

Item No.	Part No.	Description	Qty
1	B29-00-0010	Post, Support	1
2	B30-00-0009	Pad, Rubber	1
3	B28-00-0011	Brace, Support Post	2
4	0090-0192	Nut, Hex, Nylon Lock, 1/2-13	9
5	0090-0045	Screw, Cap, 3/8-16 x 1-1/2 in.	6
6	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	6
7	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	3
8	B40-00-0012	Chain, #3 x 10 in.	2
9	0090-0552	Ring, Key	2
10	B36-00-0033	Pin, Transport Safety	2
11	B03-00-0021	Assembly, Jack, Early Version (includes items 12-18)	1
12	B23-02-0039	Weldment, Jack (includes items 13-15)	1
13	B22-00-0002	Handle, Jack	1
14	B18-00-0001	Cover, Gear w/Clip	1
15	B22-00-0001	Bevel Gear Kit	1
16	0029-952	Caster Assembly	1
17	0090-0050	Screw, Cap, 3/8-16 x 2 1/2 in.	1
18	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	1
19	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	1
20	B04-07-0032	Clamp, Cable/Hose, DG 6	5
21	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	9
22	B01-10-0021	Marker, Side, Amber	2
22A	B01-10-0066	Lens, Replacement	2
22B	B01-10-0068	Bulb, Side Marker	2
23	0090-0712	Screw, Cap, 1/2-13 x 4-3/4 in.	1

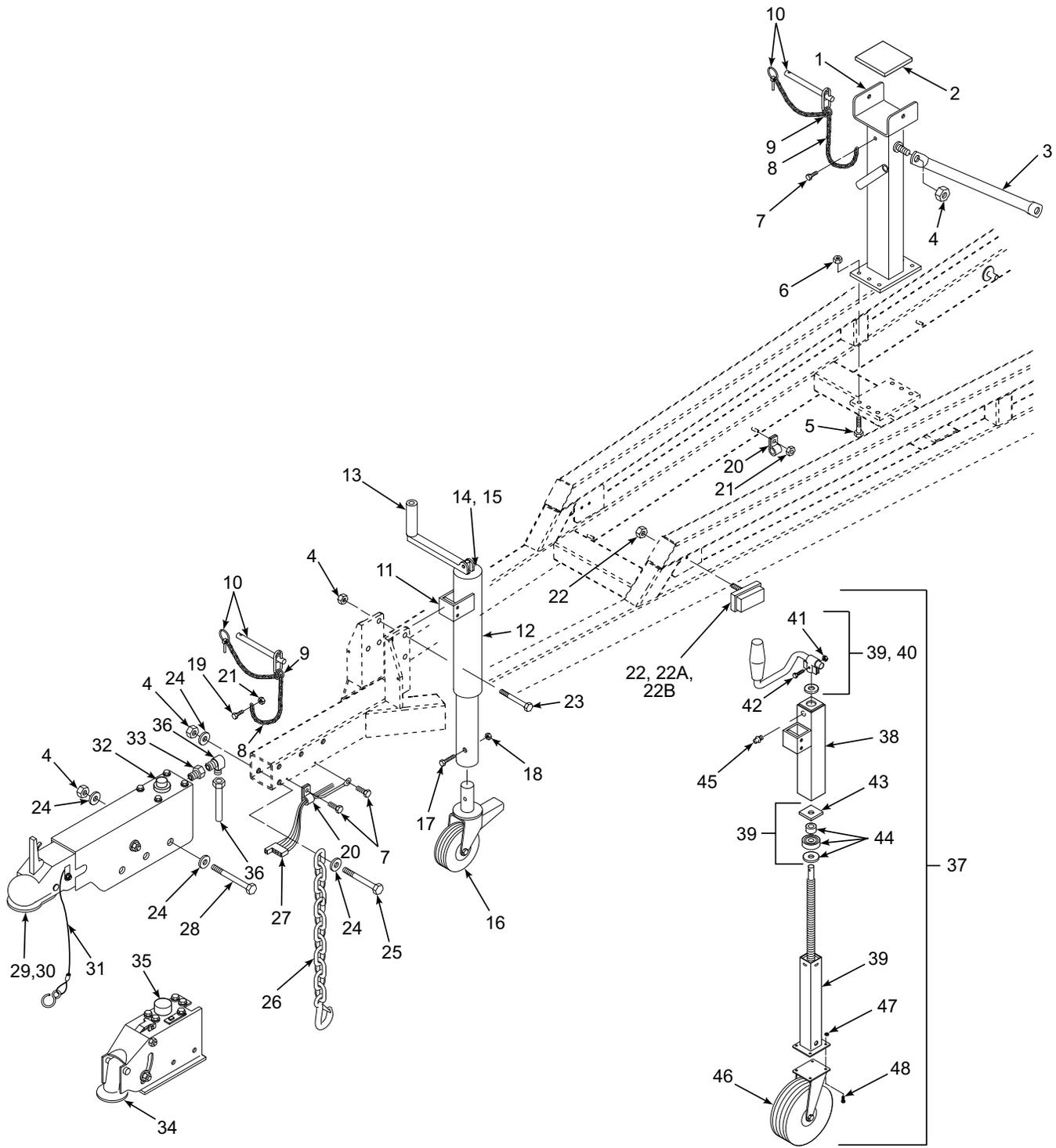


Figure 6-8. Hitch and Jack Assembly

Table 6-8. Hitch and Jack Assembly Parts List, Continued

Item No.	Part No.	Description	Qty
24	0090-0574	Washer, Flat, 1/2 in.	8
25	0090-0081	Screw, Cap, 1/2-13 x 5 in.	1
26	B03-00-0017	Chain, Safety	2
27	B01-01-0121	Harness, Tail Light	1
28	0090-0080	Screw, Cap, 1/2-13 x 4-1/2 in.	3
29	B12-00-0169	Hitch, Tow (includes items 30-33)	1
30	B12-00-0182	Clamp Kit, 2 in. Ball	1
31	B12-00-0181	Push Rod w/Breakaway Cable	1
32	B12-00-0180	Cap, Replacement	1
33	B02-02-0227	Fitting, Brake Line Adapter	1
34	B12-00-0013	Hitch, Tow, Early Version (includes item 35)	1
35	B12-00-0033	Cap, Replacement, Early Version Hitch	1
36	B21-00-0001	Kit, Brake Line	1
37	B03-00-0105	Assembly, Jack (includes items 38-48)	1
38	B23-02-0058	Weldment, Outer Jack Tube	1
39	B23-02-0057	Assembly, Inner Jack Tube (includes items 40-44)	1
40	B46-00-0028	Kit, Handle Replacement (includes items 41 and 42)	1
41	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	1
42	0090-0007	Screw, Cap, 1/4-20 x 1-1/4 in.	1
43	B04-06-0030	Washer, 2.18 in. Square	1
44	B25-00-0068	Bearing Assembly	1
45	B00-00-0085	Fitting, Grease, 1/4-28	1
46	B03-00-0148	Caster Assembly	1
47	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	4
48	0090-0042	Screw, Cap, 3/8-16 x 1 in.	4

6-9 SQUARE TUBE AXLE AND WHEEL ASSEMBLY PARTS LIST

Refer to Table 6-9 for the square tube axle and wheel assembly parts list.

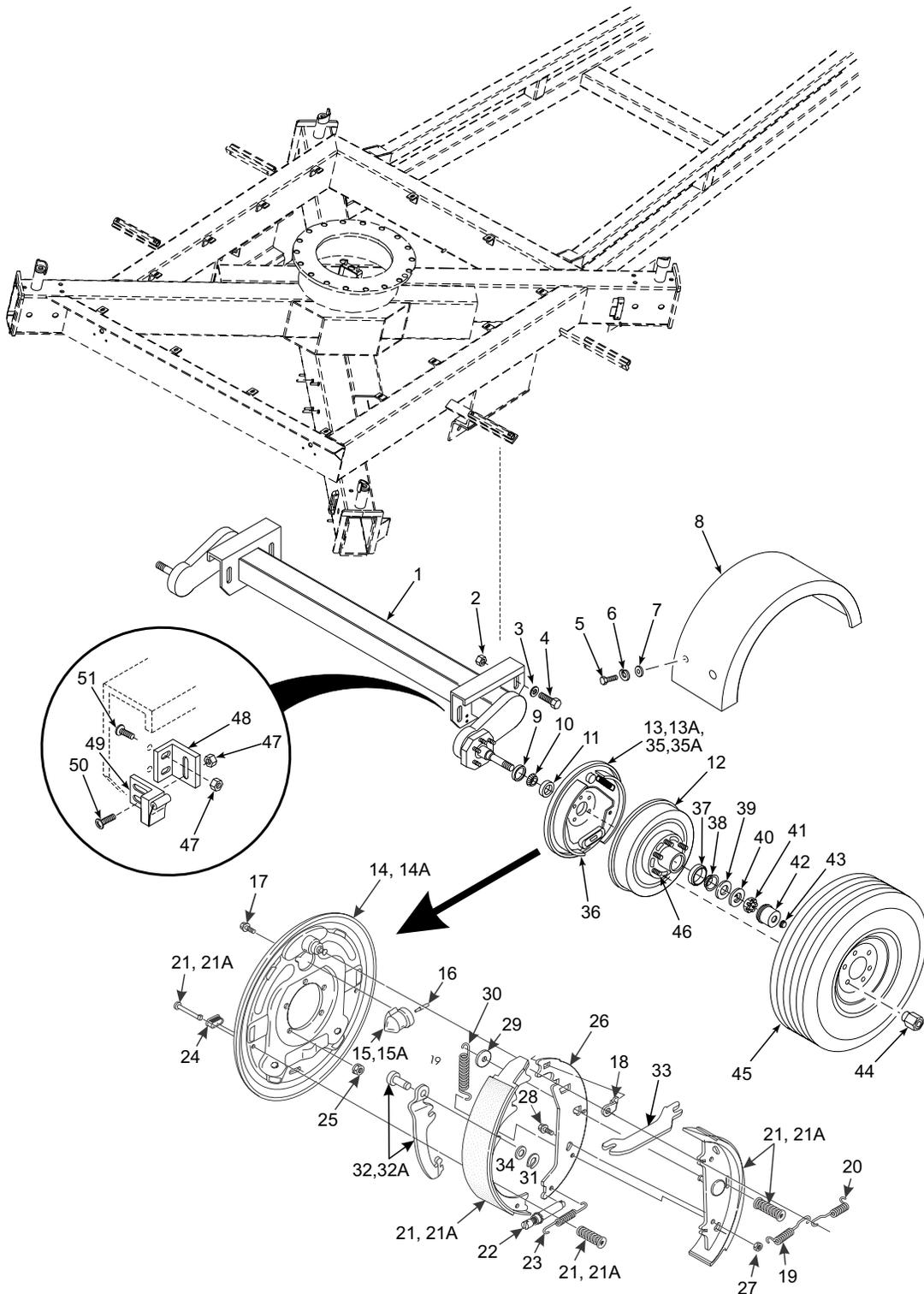


Figure 6-9. Square Tube Axle and Wheel Assembly

Table 6-9. Square Tube Axle and Wheel Assembly Parts List

Item No.	Part No.	Description	Qty
1	B10-00-0041	Axle, Square Tube	1
2	0090-0938	Nut, Hex, Lock, 5/8-18	4
3	0090-0612	Washer, Flat 5/8 in.	4
4	0090-0937	Screw, Cap, 5/8-18 x 1-1/2 in.	4
5	0090-0032	Screw, Cap, 5/16-18 x 1-1/2 in.	8
6	0090-0208	Washer, Lock, 5/16 in.	8
7	0090-0420	Washer, Flat, 5/16 in.	8
8	B12-00-0010	Fender	2
9	B10-00-0052	Seal, Grease	2
10	B10-00-0053	Cone, Inner Bearing	2
11	B10-00-0055	Cup, Inner Bearing	2
12	B10-00-0049	Assembly, Wheel Hub (includes bearings, grease seal, and studs)	2
13	B10-00-0043	Brake Assembly, Right Hand, Hydraulic (includes items 14, 15, 16-20, 21, 22-31, 32, 33 & 34)	1
13A	B10-00-0042	Brake Assembly, Left Hand, Hydraulic (includes items 14A, 15A, 16-20, 21A, 22-31, 32A, 33 & 34)	1
14	B10-00-0088	Backing Plate Assembly, Right Hand	1
14A	B10-00-0087	Backing Plate Assembly, Left Hand	1
15	B10-00-0090	Cylinder, Uni-Servo, Right Hand	1
15A	B10-00-0089	Cylinder, Uni-Servo, Left Hand	1
16	B10-00-0091	Push Rod, Cylinder	1
17	B10-00-0092	Screw/Washer Assembly	2
18	B10-00-0093	Travel Link	1
19	B10-00-0094	Spring, Retractor	1
20	B10-00-0095	Spring, Shoe Lever Return	1
21	B10-00-0048	Kit, Hydraulic Brake Shoe/Lining, Right Hand	1
21A	B10-00-0047	Kit, Hydraulic Brake Shoe/Lining, Left Hand	1
22	B10-00-0096	Adjuster Assembly	1
23	B10-00-0097	Spring, Adjusting Screw	1
24	B10-00-0098	Plug, Adjuster Slot	1
25	B10-00-0099	Nut/Washer Assembly	5
26	B10-00-0100	Shoe Lever	1
27	B10-00-0101	Nut, Lock	1
28	B10-00-0102	Screw	1
29	B10-00-0103	Washer	1

Items 14-34 are for hydraulic surge brakes only.

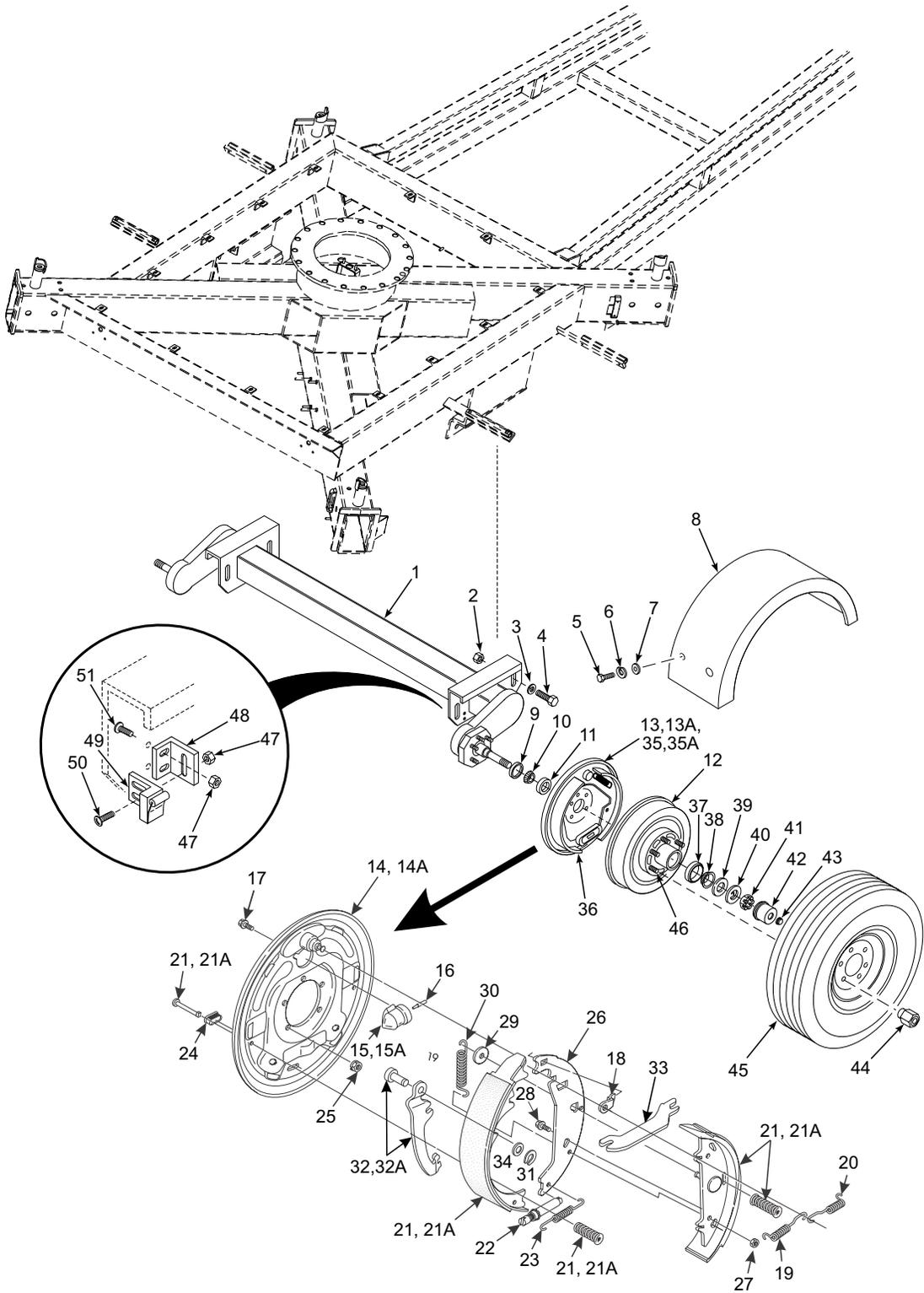


Figure 6-9. Square Tube Axle and Wheel Assembly

Table 6-9. Square Tube Axle and Wheel Assembly Parts List, Continued

Item No.	Part No.	Description	Qty
30	B10-00-0104	Spring, Primary Shoe Return	1
31	B10-00-0105	Retainer	1
32	B10-00-0108	Parking Lever & Pin, Right Hand	1
32A	B10-00-0107	Parking Lever & Pin, Left Hand	1
33	B10-00-0106	Strut, Parking Brake	1
34	B10-00-0109	Washer	1
*35	B10-00-0044	Brake Assembly, Right Hand, Electric (includes item 36, Not Illustrated)	1
*35A	B10-00-0045	Brake Assembly, Left Hand, Electric (includes item 36, Not Illustrated)	1
*36	B10-00-0046	Kit, Electric Brake Shoe/Lining (Not Illustrated)	2
37	B10-00-0056	Cup, Outer Bearing	2
38	B10-00-0054	Cone, Outer Bearing	2
39	B10-00-0059	Washer, Spindle	2
40	B10-00-0051	Washer, Tang, EZ Lube	2
41	B10-00-0060	Nut, Spindle, EZ Lube	2
42	B10-00-0057	Cap, Grease, EZ Lube	2
43	B10-00-0058	Plug, Rubber, EZ Lube Grease Cap	2
44	0090-0624	Nut, Wheel Lug, 1/2-20	12
45	B08-02-0003	Tire, ST225/75D-15	2
46	B10-00-0050	Stud, Wheel, 1/2-20	12
47	0090-0182	Nut, Hex, Nylon Lock, #10-24	8
48	B07-01-1081	Bracket, Limit Switch	2
49	B01-02-0075	Switch, Limit, Axle Position	2
50	0090-0232	Screw, Machine, #10-24 x 5/8 in.	4
51	0090-0236	Screw, Machine	4

Items 14-34 are for hydraulic surge brakes only.

*Optional equipment on original boom lift order only.

6-10 HEX TUBE AXLE AND WHEEL ASSEMBLY PARTS LIST

Refer to Table 6-10 for the early version axle and wheel assembly parts list.

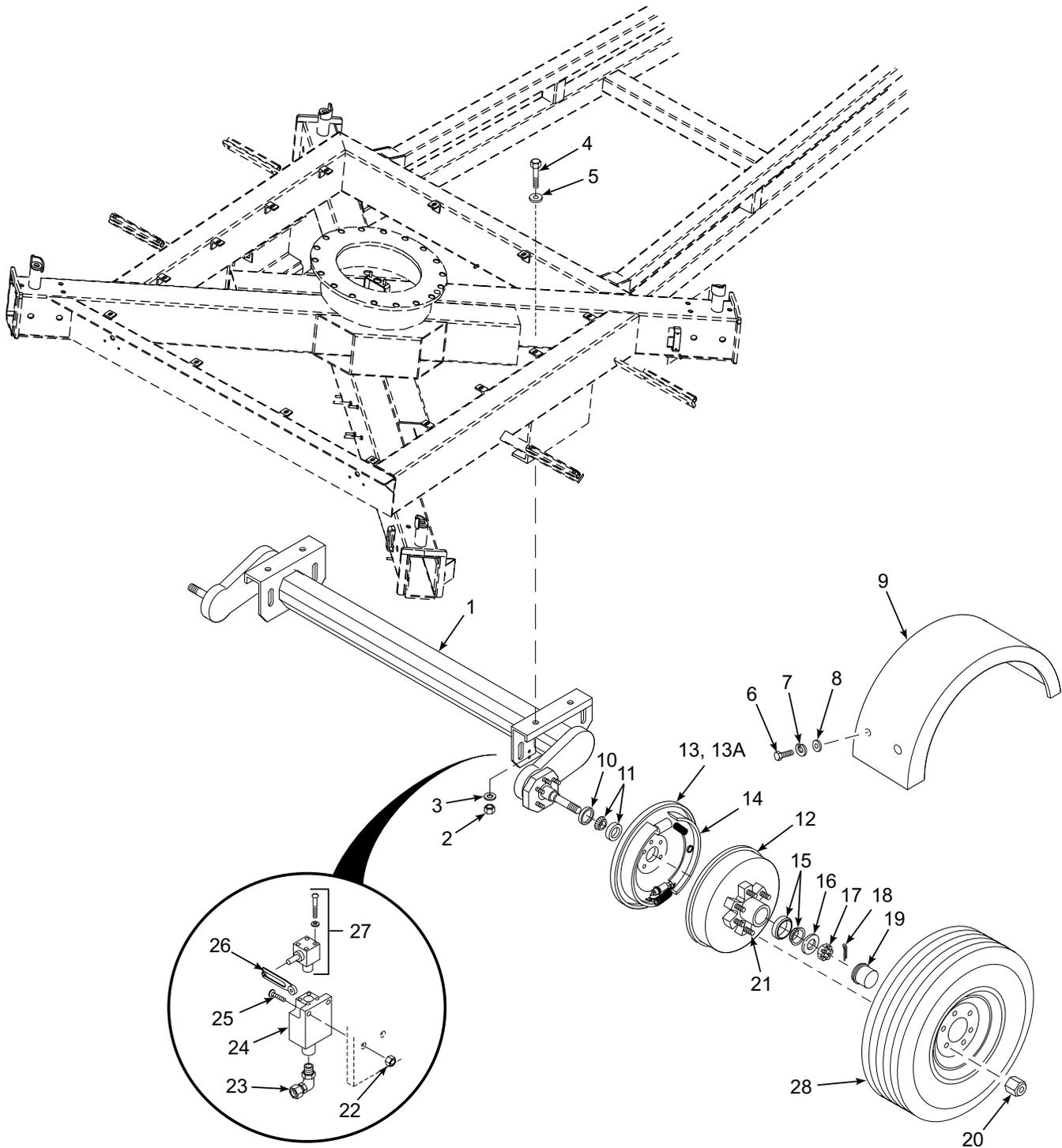


Figure 6-10. Hex Tube Axle and Wheel Assembly

Table 6-10. Hex Tube Axle and Wheel Assembly Parts List

Item No.	Part No.	Description	Qty
1	Not Procurable	Axle, Hex Tube	1
2	0090-0192	Nut, Lock, 1/2-13	4
3	0090-0574	Washer, Flat 1/2 in.	8
4	0090-0461	Screw, Cap, 1/2-13 x 2 in.	4
5	0090-0648	Washer, Bevel, 1/2 in.	4
6	0090-0032	Screw, Cap, 5/16-18 x 1-1/2 in.	8
7	0090-0208	Washer, Lock, 5/16 in.	8
8	0090-0420	Washer, Flat, 5/16 in.	8
9	B12-00-0010	Fender	2
10	B32-00-0014	Seal, Grease	2
11	B25-00-0060	Assembly, Inner Bearing	
12	B12-00-0071	Assembly, Wheel Hub (Includes bearings, grease seal, and studs)	2
13	B10-00-0031	Brake Assembly, Left Hand, Hydraulic	1
13A	B10-00-0030	Brake Assembly, Right Hand, Hydraulic	1
14	B10-00-0016	Brakes Pads, Set (left and right wheel)	1
15	B25-00-0061	Assembly, Outer Bearing	2
16	B10-00-0059	Washer, Spindle	2
17	0090-0880	Nut, Spindle	2
18	0090-0881	Pin, Cotter, 5/32 x 2 in.	2
19	B32-00-0013	Cap, Dust	2
20	0090-0624	Nut, Wheel Lug, 1/2-20	12
21	B04-07-0107	Stud, Wheel, 1/2-20 x 2-1/2 in.	12
22	0090-0182	Nut, Hex, Nylon Lock, #10-24	8
23	B01-09-0051	Fitting, Cable Grip, 90°, 1/2 in.	2
24	B01-03-0006	Switch Body, Limit, Axle Position	2
25	0090-0236	Screw, Machine, #10-24 x 3/4 in.	4
26	B01-03-0014	Actuator, Limit Switch	2
27	B01-03-0007	Head, Limit Switch	2
28	B08-02-0003	Tire, ST225/75D-15	2

6-11 TAIL LIGHTS AND OUTRIGGER DISPLAY TRANSMITTER BOX PARTS LIST

Refer to Table 6-11 for the tail lights and outrigger display transmitter box parts list.

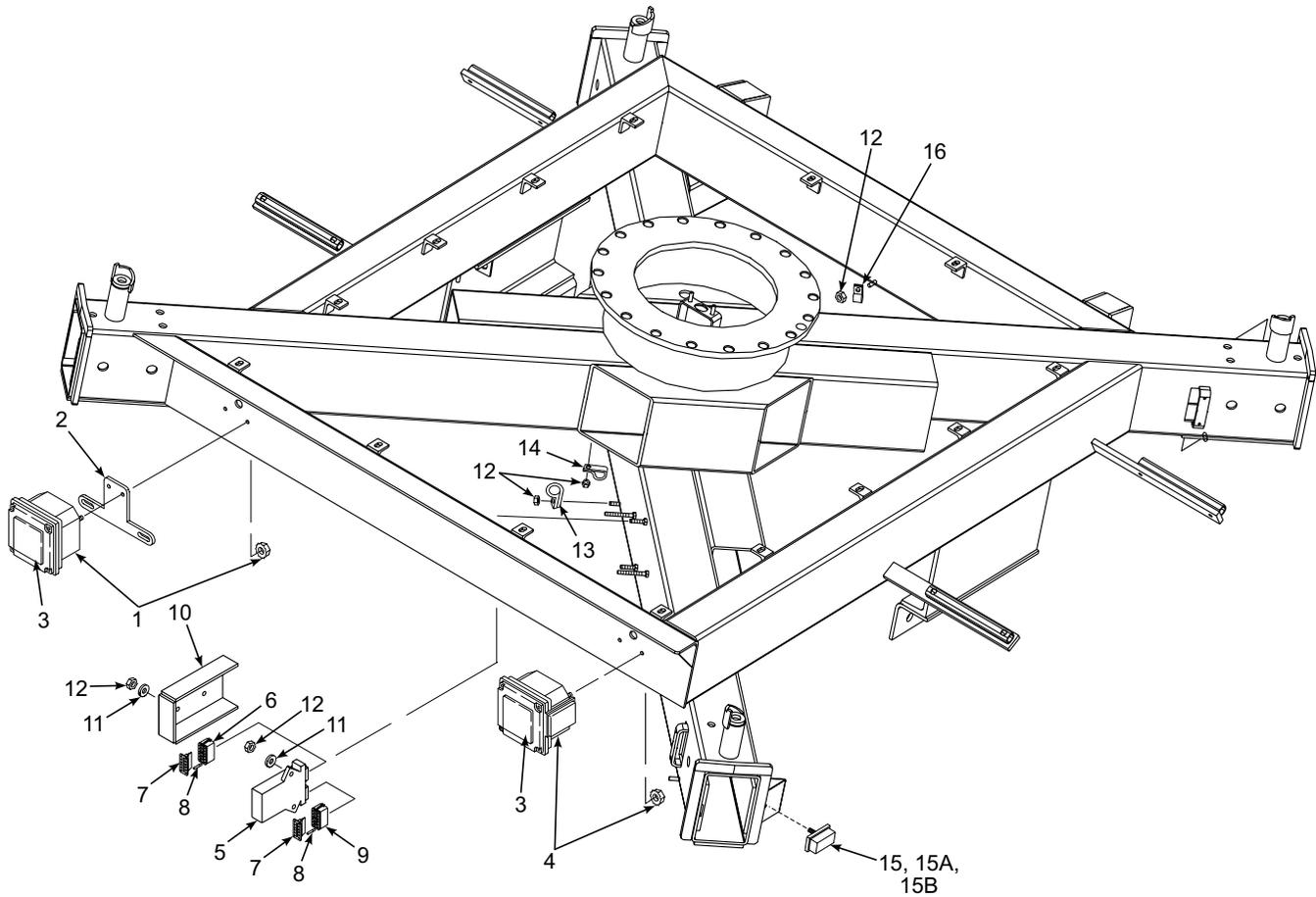


Figure 6-11. Tail Lights and Outrigger Display Transmitter Box

Table 6-11. Tail Lights and Outrigger Display Transmitter Box Parts List

Item No.	Part No.	Description	Qty
1	B01-10-0024	Tail Light Assembly, Left	1
2	B29-00-0037	Bracket, License Plate Mounting	1
3	B01-10-0069	Lens, Replacement	2
4	B01-10-0023	Tail Light Assembly, Right	1
5	B01-10-0270	Transmitter, Outrigger Display	1
6	B01-09-0105	Connector, 12 Pin, Outrigger Display, Gray	1
7	B01-09-0107	Insert, 12 Pin, Outrigger Display	2
8	B01-09-0108	Pin, Outrigger Display (3 in gray connector, 12 in black connector)	15
9	B01-09-0106	Connector, 12 Pin, Outrigger Display, Black	1
10	B18-00-0153	Cover, Outrigger Display Transmitter	1
11	0090-0419	Washer, Flat, 1/4 in.	4
12	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	8
13	B04-07-0035	Clamp, Cable/Hose, DG 14	1
14	B04-07-0034	Clamp, Cable/Hose, DG 12	1
15	B01-10-0022	Marker, Side, Red	2
15A	B01-10-0067	Lens, Replacement	2
15B	B01-10-0068	Bulb, Side Marker	2
16	B04-07-0032	Clamp, Cable/Hose, DG 6	2

6-12 RIGHT FRONT/LEFT REAR OUTRIGGERS PARTS LIST

Refer to Table 6-12 for the right front/left rear outriggers parts list.

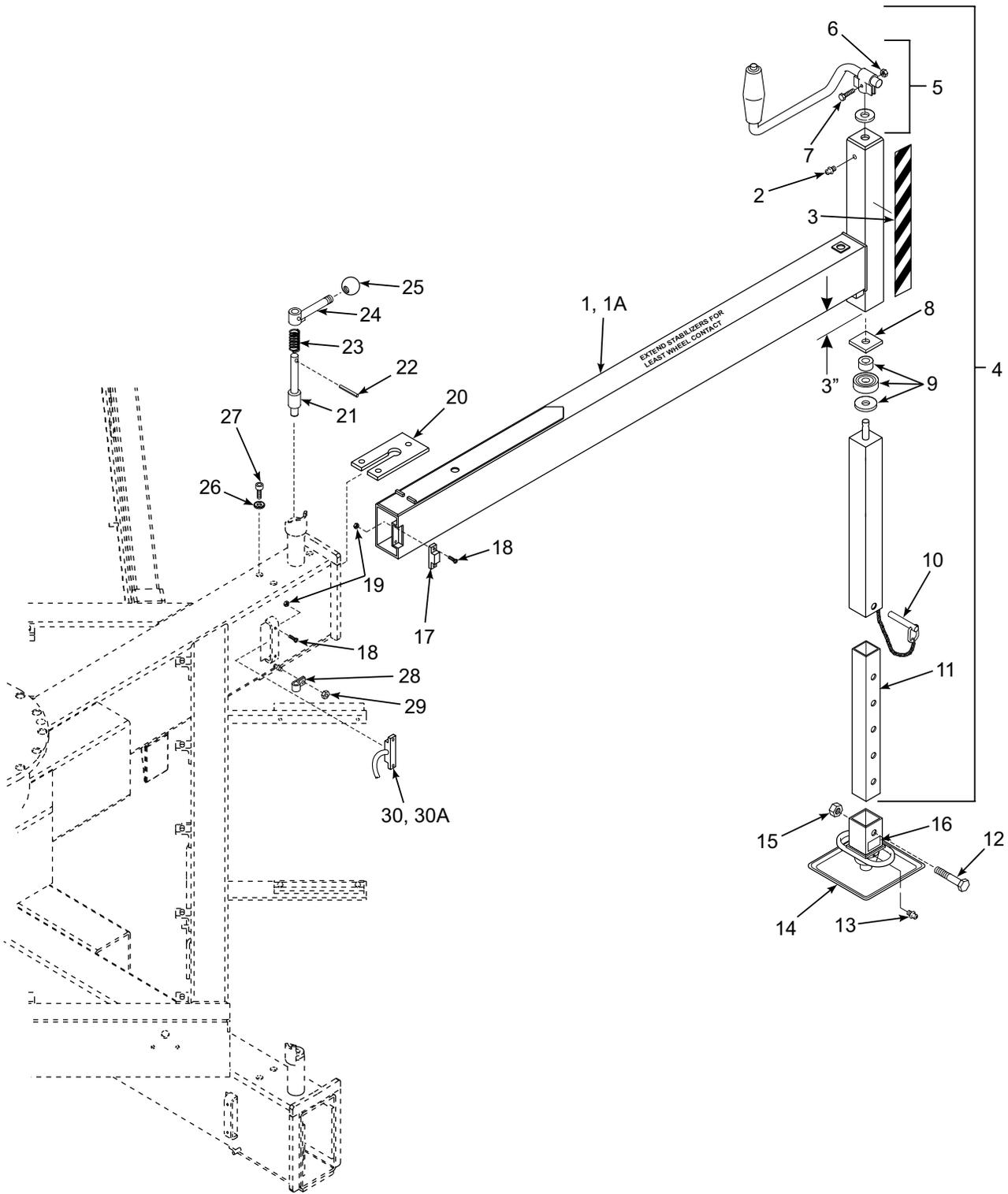


Figure 6-12. Right Front/Left Rear Outriggers

Table 6-12. Right Front/Left Rear Outriggers Parts List

Item No.	Part No.	Description	Qty
1	B23-01-0087	Outrigger, Front, Passenger Side	1
1A	B23-01-0087	Outrigger, Rear, Driver Side	1
2	B00-00-0085	Fitting, Grease, Straight, 1/4-28	1
3	B06-00-0167	Caution Tape, Black and Yellow	1 Roll
4	B23-02-0048	Assembly, Outrigger Jack (includes items 5 through 11)	1
5	B46-00-0028	Kit, Handle Replacement	1
6	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	1
7	0090-0007	Screw, Cap, 1/4-20 x 1-1/4 in.	1
8	B04-06-0030	Washer, 2.18 in. Square	1
9	B25-00-0068	Bearing Kit	1
10	B36-00-0039	Pin	1
11	B23-02-0053	Drop Tube, Quick Adjust	1
12	0090-0909	Screw, Cap, 5/8-11 x 3-1/4 in.	1
13	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	1
14	B23-02-0047	Weldment, Footpad	1
15	0090-0194	Nut, Hex, Nylon Lock, 5/8-11	1
16	B06-00-0036	Decal, Lube Weekly	1
17	B01-03-0031	Magnet, Proximity	1
18	0090-0813	Screw, Machine, #8-32 x 3/4 in.	4
19	0090-0181	Nut, Hex, Nylon Lock, #8-32	4
20	B31-00-0006 B31-00-0027	Plate, Guide, 5/16" Thick <u>or</u> Plate, Guide, 1/4" Thick	1
21	B36-00-0004	Pin, Plunger	1
22	0090-0319	Pin, Roll, 1/4 x 1-1/4 in.	1
23	B39-00-0004	Spring	1
24	B46-00-0005	Handle, Outrigger Pin	1
25	B46-00-0008	Knob, Ball	1
26	0090-0476	Washer, External Tooth Star, 1/2 in.	3
27	0090-0387	Screw, Socket Head Cap, 1/2-13 x 1/2 in.	3
28	B04-07-0032	Clamp, Cable/Hose, DG-6	3
29	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	2
30	B01-03-0029	Switch, Magnetic Reed w/72" SJO Cord, Front Outrigger – Passenger Side	1
30A	B01-03-0030	Switch, Magnetic Reed w/45" SJO Cord, Rear Outrigger – Driver Side	1

Note: Quantities shown for Items 2-29 are per outrigger.

6-13 LEFT FRONT/RIGHT REAR OUTRIGGERS PARTS LIST

Refer to Table 6-13 for the left front/right rear outriggers parts list.

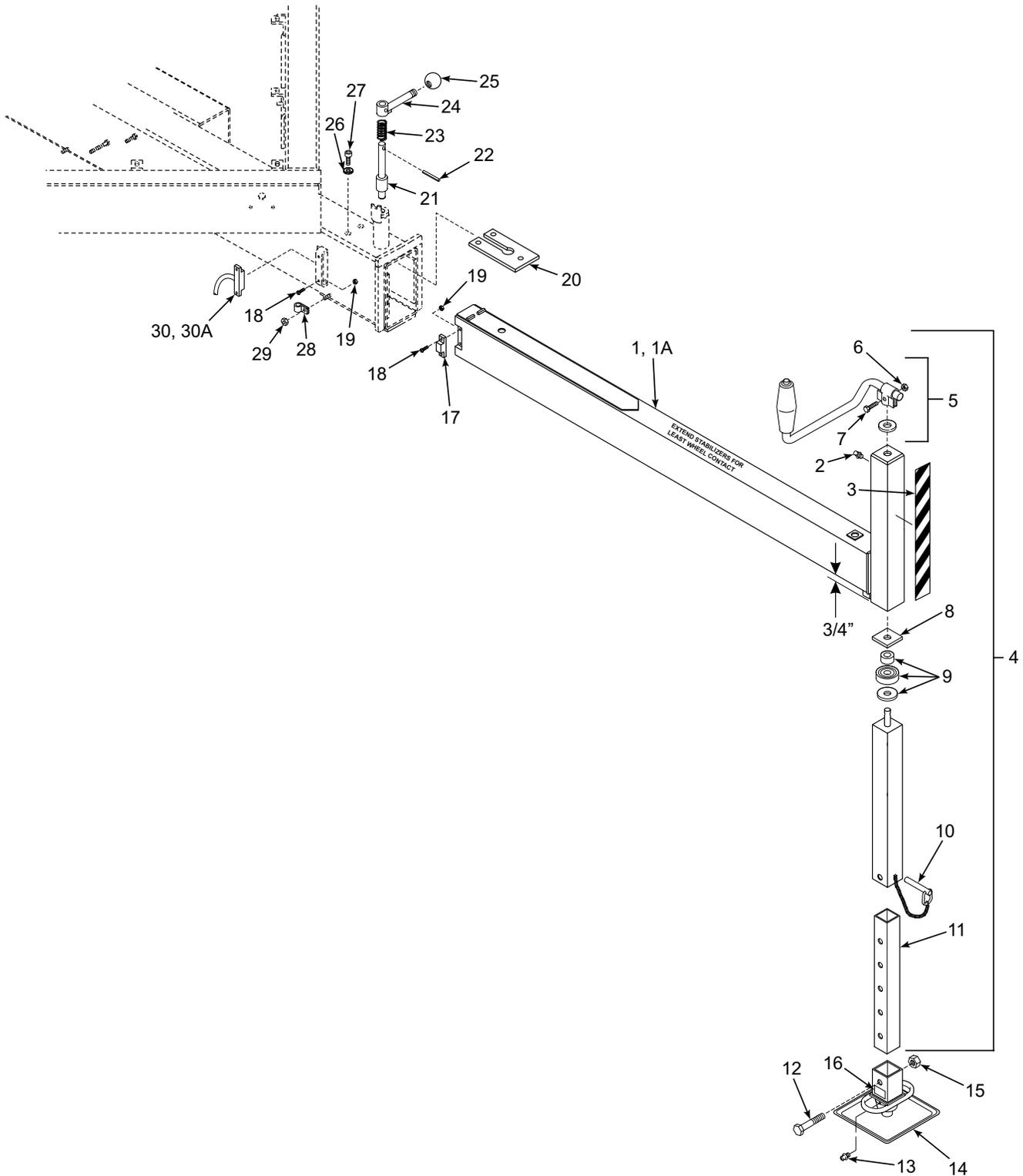


Figure 6-13. Left Front/Right Rear Outriggers

Table 6-13. Left Front/Right Rear Outriggers Parts List

Item No.	Part No.	Description	Qty
1	B23-01-0092	Outrigger, Rear, Passenger Side	1
1A	B23-01-0092	Outrigger, Front, Driver Side	1
2	B00-00-0085	Fitting, Grease, Straight, 1/4-28	1
3	B06-00-0167	Caution Tape, Black and Yellow	1 Roll
4	B23-02-0048	Assembly, Outrigger Jack (includes items 5 through 11)	1
5	B46-00-0028	Kit, Handle Replacement	1
6	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	1
7	0090-0007	Screw, Cap, 1/4-20 x 1-1/4 in.	1
8	B04-06-0030	Washer, 2.18 in. Square	1
9	B25-00-0068	Bearing Kit	1
10	B36-00-0039	Pin	1
11	B23-02-0053	Slide, Quick Adjust	1
12	0090-0909	Screw, Cap, 5/8-11 x 3-1/4 in.	1
13	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	1
14	B23-02-0047	Weldment, Footpad	1
15	0090-0194	Nut, Hex, Nylon Lock, 5/8-11	1
16	B06-00-0036	Decal, Lube Weekly	1
17	B01-03-0031	Magnet, Proximity	1
18	0090-0813	Screw, Machine, #8-32 x 3/4 in.	4
19	0090-0181	Nut, Hex, Nylon Lock, #8-32	4
20	B30-00-0006 B31-00-0027	Plate, Guide, 5/16" Thick <u>or</u> Plate, Guide, 1/4" Thick	1
21	B36-00-0004	Pin, Plunger	1
22	0090-0319	Pin, Roll, 1/4 x 1-1/4 in.	1
23	B39-00-0004	Spring	1
24	B46-00-0005	Handle, Outrigger Pin	1
25	B46-00-0008	Knob, Ball	1
26	0090-0476	Washer, External Tooth Star, 1/2 in.	3
27	0090-0387	Screw, Socket Head Cap, 1/2-13 x 1/2 in.	3
28	B04-07-0032	Clamp, Cable/Hose, DG-6	3
29	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	2
30	B01-03-0030	Switch, Magnetic Reed w/45" SJO Cord, Rear Outrigger – Passenger Side	1
30A	B01-03-0029	Switch, Magnetic Reed w/72" SJO Cord, Front Outrigger – Driver Side	1

Note: Quantities shown for Items 2-29 are per outrigger.

6-14 BASKET PARTS LIST

Refer to Table 6-14 for the basket parts list.

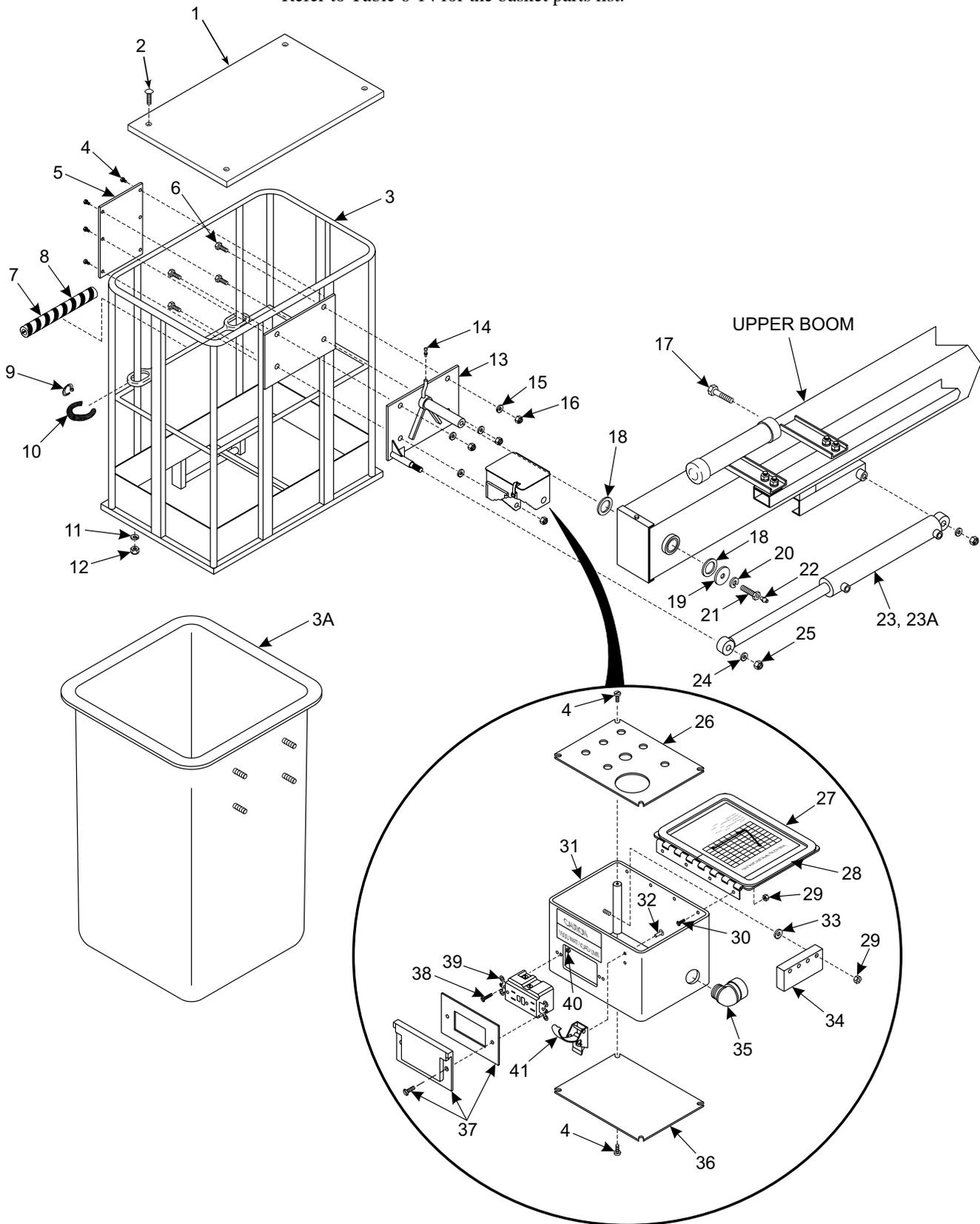


Figure 6-14. Basket

Table 6-14. Basket Parts List

Item No.	Part No.	Description	Qty
1	B44-00-0016	Plywood, Cage	1
2	0090-0128	Bolt, Carriage, 5/16-18 x 1-1/4 in.	4
3	B17-00-0045	Cage Weldment	1
3A	B17-00-0041	Bucket, Fiberglass – Option	1
4	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	14
5	B07-05-0007	Plate, Decal	1
6	0090-0461	Screw, Cap, 1/2-13 x 2 in.	4
7	B05-00-0001	Tube, Foam, 16-1/2 in.	1
8	B06-00-0167	Caution Tape, Black and Yellow	1 Roll
9	B01-09-0030	Wire, Tie, 7 x 3/32 in.	6
10	B00-00-0086	Casing, Wire, Slit, 5/16 in. dia. x 8.5 in. long	2
11	0090-0208	Washer, Lock, Split, 5/16 in.	4
12	0090-0160	Nut, Hex, 5/16-18	4
13	B30-00-0015	Bumper, Lid	1
14	B29-00-0011	Cage Mount Weldment	1
15	0090-0574	Washer, Flat, 1/2 in.	4
16	0090-0192	Nut, Hex, Nylon Lock, 1/2-13	4
17	0090-0108	Screw, Cap, 3/4-10 x 3-1/2 in.	1
18	B25-00-0004	Bearing, Bronze Thrust, 1-1/2 ID x 2-1/2 OD	2
19	B04-06-0001	Washer, Flat, 2 in. OD	1
20	0090-0210	Washer, Lock, Split, 3/8 in.	1
21	B04-05-0001	Screw, Cap, 3/8-16 x 1 in. Drilled for Zerk	1
22	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	1

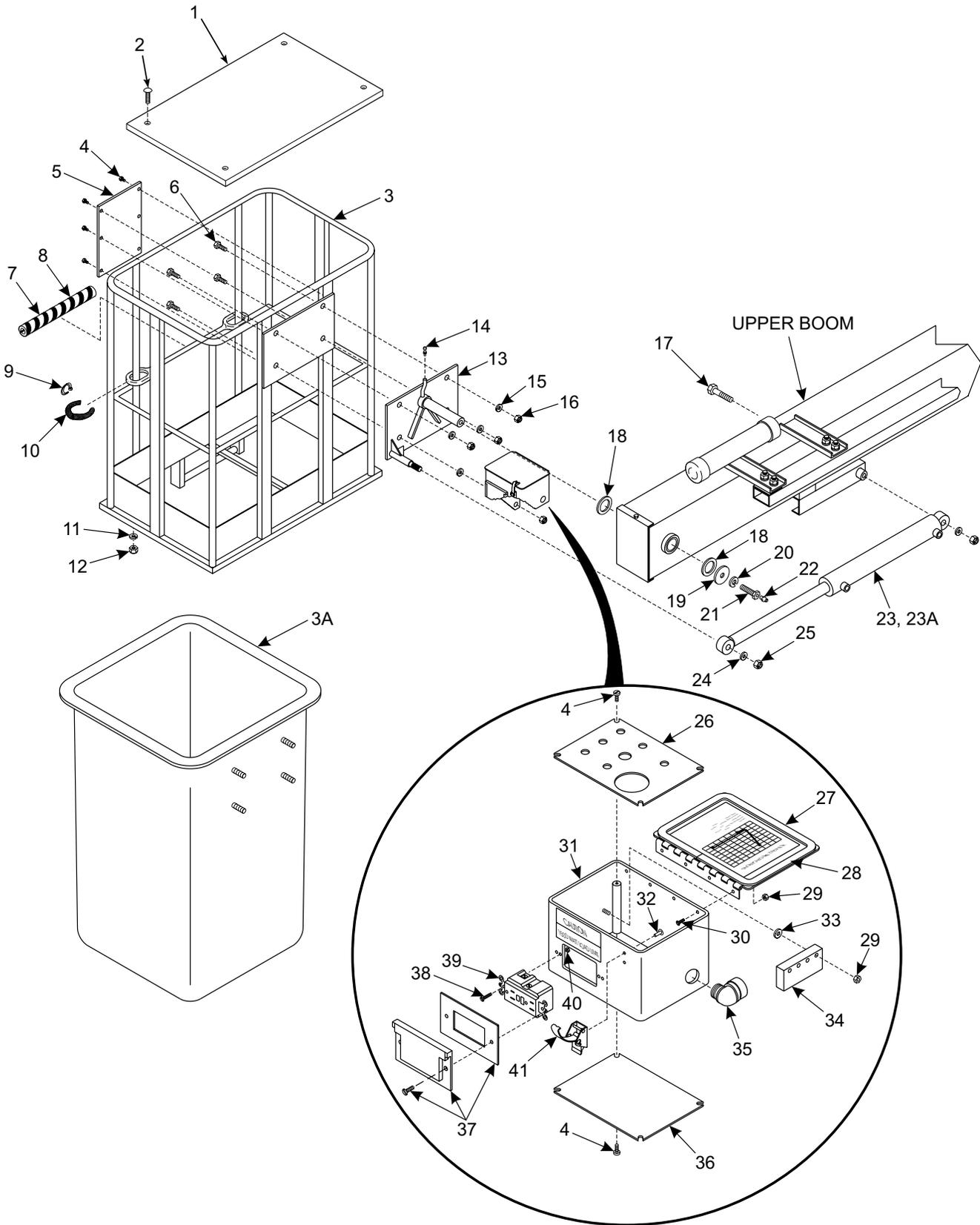


Figure 6-14. Basket

Table 6-14. Basket Parts List, Continued

Item No.	Part No.	Description	Qty
23	B02-03-0007	Cylinder, Slave Leveling, 2 in. Bore x 13-1/4 in. Stroke	1
23A	B02-13-0037	Kit, Seal Replacement, Leveling Cylinder	1
24	0090-0428	Washer, Flat, 3/4 in.	2
25	0090-0195	Nut, Hex, Nylon Lock, 3/4-10	2
26	B19-00-0003	Panel, Upper Control Box	1
27	B19-00-0005	Door, Upper Control Box	1
28	B32-00-0005	Weather Strip, 1/2 x 26-1/2 in.	1
29	0090-0181	Nut, Hex, Nylon Lock, 8-32	6
30	0090-0225	Screw, Machine, #8-32 x 1/2 in.	2
31	B19-00-0002	Upper Control Box	1
32	0090-0679	Rivet, Pop, 5/32 x 1/2 in.	2
33	0090-0414	Washer, Flat, #8	2
34	B01-10-0040	Switch, Mercury, 3 Degree Cage Level	1
35	B01-09-0023	Cord Grip, 90 Degree	1
36	B19-00-0004	Panel, Bottom, Upper Control Box	1
37	B01-10-0035	Cover, GFI	1
38	0090-0690	Screw, Machine, #6-32 x 5/8 in.	2
39	B01-10-0034	Receptacle, 120 Vac, GFI	1
40	0090-0180	Nut, Hex, Nylon Lock, 6-32	2
41	B42-00-0005	Latch	1

6-15 UPPER CONTROL BOX PARTS LIST

Refer to Table 6-15 for the upper control box parts list.

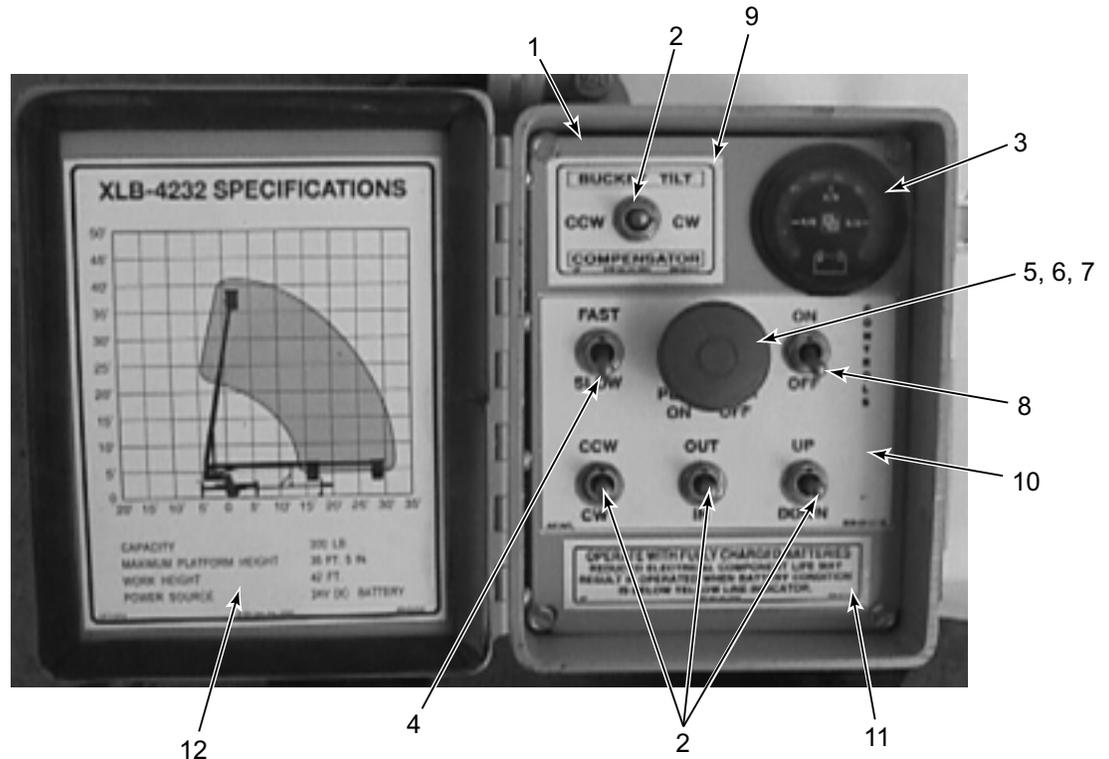


Figure 6-15. Upper Control Box

Table 6-15. Upper Control Box

Item No.	Part No.	Description	Qty
	B19-00-0010	Switch Panel Assembly, Upper Control Box (includes items 1-11)	1
1	B19-00-0003	Panel, Upper Control Box	1
2	B01-02-0010	Switch, Toggle, Lift/Telescope/Rotate/Tilt	4
3	B01-10-0017	Gage, Battery	1
4	B01-02-0013	Switch, Toggle, Speed	1
5	B01-02-0031	Button, Emergency Stop	1
6	B01-02-0032	NC Contact, Emergency Stop	1
7	B01-10-0055	Block, NC Contact Mount	1
8	B01-02-0012	Switch, Toggle, Controls On/Off	1
9	B06-00-0117	Decal, Bucket Tilt	1
10	B06-00-0118	Decal, Upper Control Box	1
11	B06-00-0116	Decal, "OPERATE WITH FULLY..."	1
12	B06-00-0144	Decal, Specifications	1

6-16 LOWER CONTROL BOX PARTS LIST

Refer to the Table 6-16 for the lower control box parts list.

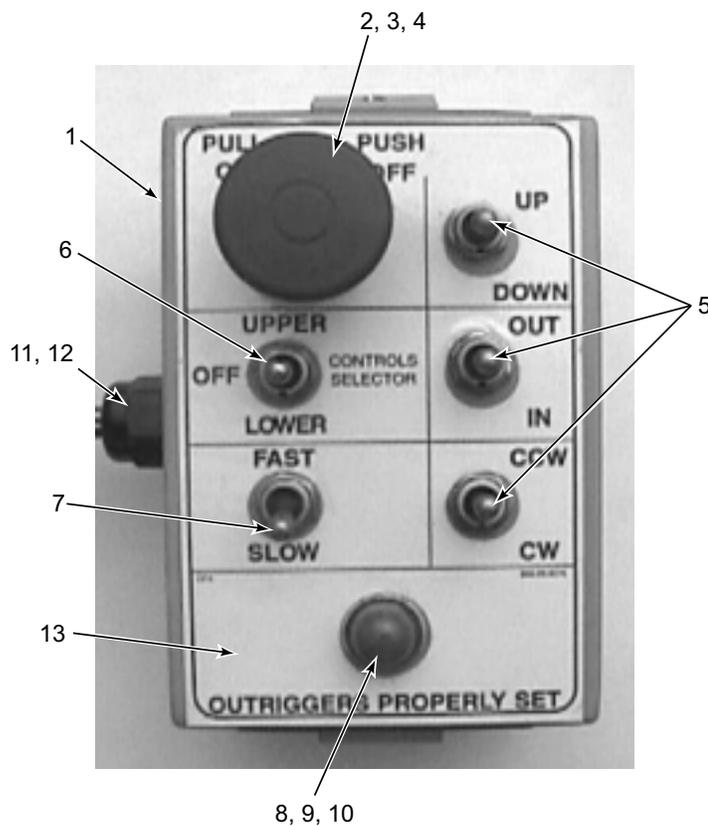


Figure 6-16. Lower Control Box

Table 6-16. Lower Control Box Parts List

Item No.	Part No.	Description	Qty
	B19-00-0009	Control Box Assembly, Lower (includes items 1-13)	1
1	B19-00-0006	Box, Lower Control	1
2	B01-02-0031	Button, Emergency Stop	1
3	B01-02-0032	NC Contact, Emergency Stop	1
4	B01-10-0055	Block, NC Contact Mount	1
5	B01-02-0010	Switch, Toggle, Lift/Telescope/Rotate	3
6	B01-02-0011	Switch, Toggle, Controls Selector	1
7	B01-02-0013	Switch, Toggle, Speed	1
8	B01-10-0111	Socket, Lamp	1
9	B01-10-0112	Lens, Green	1
10	B01-10-0056	Bulb, 24 Volt	1
11	B01-09-0029	Cord Grip, 1/2 in.	1
12	B04-07-0030	Plastic Nut, 1/2 in. Cord Grip	1
13	B06-00-0119	Decal, Lower Control Box	1

6-17 COMBINATION VALVE ASSEMBLY PARTS LIST

Refer to Table 6-17 for the proportional valve assembly parts list.

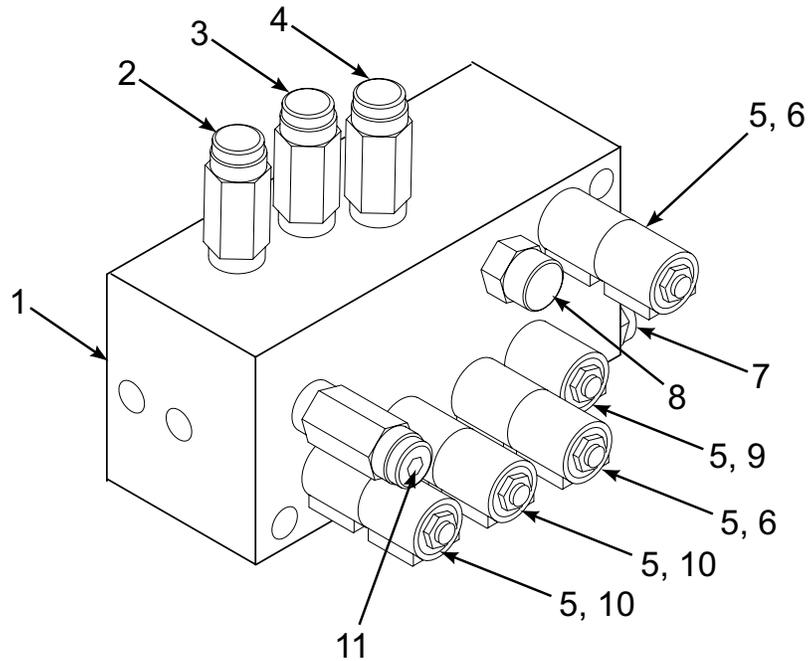


Figure 6-17. Combination Valve Assembly

Table 6-17. Combination Valve Assembly Parts List

Item No.	Part No.	Description	Qty
1	B02-04-0069	Valve Assembly, Combination, 24 Volt DC	1
2	B02-14-0078	Valve, Cartridge Relief, Basket Rotation	1
3	B02-14-0063	Valve, Cartridge, Crossover Relief	1
4	B02-14-0077	Valve, Cartridge, Crossover Relief, Rotation	1
5	B01-08-0001	Coil, 24 Volt	9
6	B02-14-0042	Valve, Cartridge, 4 - Way	2
7	B02-14-0064	Valve, Cartridge, Flow Control, 1.25	1
8	B02-14-0065	Valve, Cartridge, Flow Control, 1.0	1
9	B02-14-0067	Valve, Cartridge, NC, High Down	1
10	B02-14-0066	Valve, Cartridge, 4 – Way, Telescoping and Basket Leveling	2
11	B02-14-0079	Valve, Cartridge Relief, Basket Rotation	1

6-18 SURGE BRAKES PARTS LIST

Refer to Table 6-18 for the surge brakes parts list.

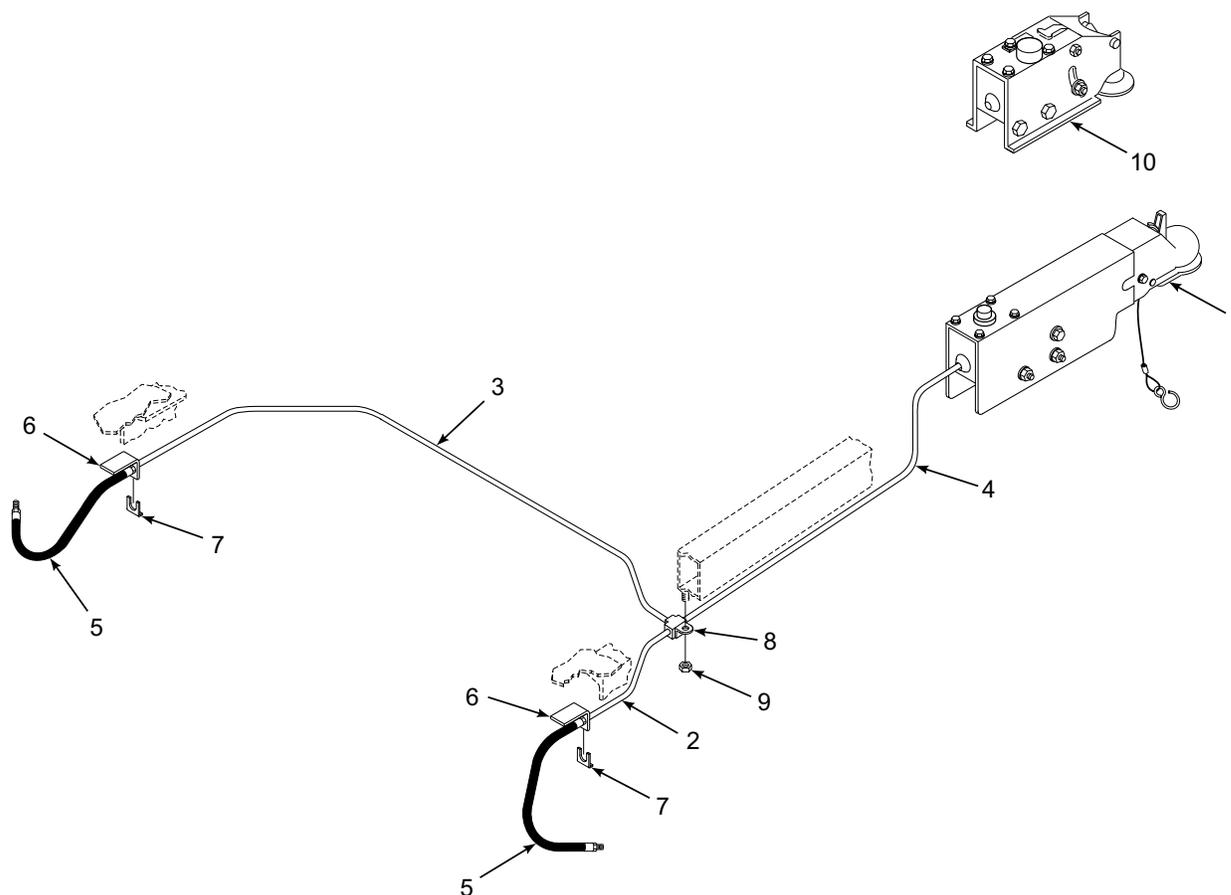


Figure 6-18. Surge Brakes

Table 6-18. Surge Brakes Parts List

Item No.	Part No.	Description	Qty
1	B12-00-0169	Surge Brake Coupler Assembly	1
	B21-00-0001	Brake Line Kit (includes items 3 through 9)	1
2	**	Brake Line, 3/16 x 17 in.	1
3	**	Brake Line, 3/16 x 45 in.	1
4	**	Brake Line, 3/16 x 15-3/4 ft.	1
5	**	Hose, 18-7/8 in.	2
6	**	Bracket, Hose	2
7	**	Clip, Hose	2
8	**	Tee	1
9	0090-0183	Nut, Lock, 1/4-20	1
10	B12-00-0013	Surge Brake Coupler Assembly, Early Version	1

**Not procurable, order brake line kit.

6-19 DC MODEL HYDRAULIC SYSTEM PARTS LIST

Refer to Table 6-19 for the DC model boom lift hydraulic system parts list.

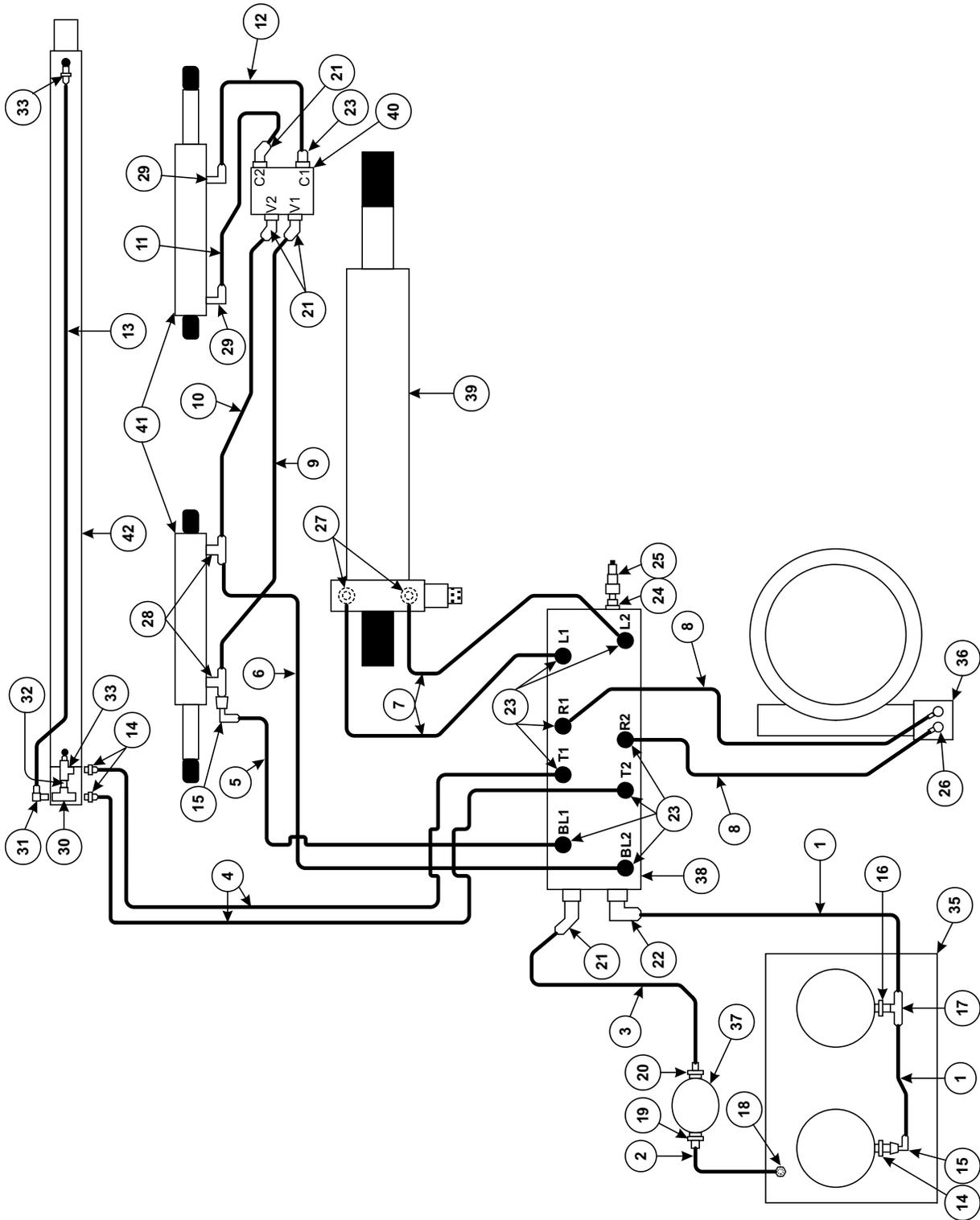


Figure 6-19. DC Model Hydraulic System

Table 6-19. DC Model Hydraulic System Parts List

Item No.	Part No.	Description	Qty
	B02-16-0008	Hose Kit (includes items 1-13)	1
1	B02-01-0042	Hose, 6 M3K x 13 in., W/2 6-6 FJX	2
2	B05-02-0132	Hose, 6 LOLA x 9.5 in., W/2 8 JIC-8 Barb	1
3	B02-01-0150	Hose, 6 M3K x 10 in., W/2 6-6 FJX	1
4	B02-01-0047	Hose, 6 M3K x 66 in., W/6-6 FJX, 6-6 FJX 90°	2
5	B02-01-0037	Hose, 4 M3K x 62 in., W/2 4-6 FJX	1
6	B02-01-0038	Hose, 4 M3K x 75 in., W/2 4-6 FJX	1
7	B02-01-0044	Hose, 6 M3K x 33 in., W/2 6-6 FJX	2
8	B02-01-0043	Hose, 6 M3K x 23.5 in., W/2 6-6 FJX	2
9	B02-01-0142	Hose, 4 M3K x 409 in., W/2 4-6 FJX	1
10	B02-01-0144	Hose, 4 M3K x 394 in., W/2 4-6 FJX	1
11	B02-01-0143	Hose, 4 M3K x 33 in., W/2 4-6 FJX	1
12	B02-01-0141	Hose, 4 M3K x 17 in., W/2 4-6 FJX	1
13	B02-01-0069	Hose, 6 M3K x 199.5 in., W/2 6-6 FJX	1
14	B02-02-0015	Fitting, Hex Nipple, 6 JICM-6 NPTM	3
15	B02-02-0033	Fitting, 90° Elbow, 6 JICM-6 JICFS	2
16	B02-02-0030	Fitting, Hex Nipple, 6 JICFS-6 NPTM	1
17	B02-02-0008	Fitting, Tee, 6 JICM	1
18	B02-02-0036	Fitting, Hex Nipple, 8 JICM-6 NPTM	1
19	B02-02-0037	Fitting, Hex Nipple, 8 JICM-12 NPTM	1
20	B02-02-0200	Fitting, Hex Nipple, 6 JIC-12 NPTM	1
21	B02-02-0198	Fitting, 45° Elbow, 6 JICM-6 ORM	4
22	B02-02-0070	Fitting, 90° Elbow, 6 JICM-6 ORM	1
23	B02-02-0084	Fitting, Hex Nipple, 6 JICM-6 ORM	9
24	B02-02-0196	Fitting, Hex Nipple, 4 ORM-2 NPTM	1
25	B02-02-0018	Fitting, Quick Connect Male	1
26	B02-02-0025	Fitting, 90° Elbow, 6 JICM-10 ORM	2
27	B02-02-0031	Fitting, Hex Nipple, 6 JICM-8 ORM	2
28	B02-02-0028	Fitting, Tee, 6 JICM-6 JICM-4 NPTM	2
29	B02-02-0012	Fitting, 90° Elbow, 6 JICM-4 NPTM	2
30	B02-02-0026	Fitting, Tee, 6 NPTFM	1
31	B02-02-0029	Fitting, 90° Elbow, 6 JICM-6 NPTM	1
32	B02-02-0027	Fitting, Hex Nipple, 4 NPTM-6 NPTM	1
33	B02-04-0009	Valve, P.O. Check	1
34	B02-02-0017	Fitting, Hex Nipple, 6 JICM-4 NPTM	1
35	B02-05-0017	Dual Pump Unit, Hydraulic	1
36	B02-06-0006	Motor, Hydraulic Gear	1
37	B02-00-0003	Oil Filter Assembly	1
38	B02-04-0069	Valve Manifold Assembly, DC	1
39	B02-03-0024	Cylinder, Lift, 4 in. Bore x 33 in. Stroke	1
40	B02-04-0068	Valve, P.O. Check	1
41	B02-03-0007	Cylinder, Basket Level, 2 in. Bore x 13.25 in. Stroke	2
42	B02-03-0020	Cylinder, Boom Extend, 2.5 in. Bore x 168 in. Stroke	1

6-20 POWER UNIT PARTS LIST

Refer to Table 6-20 for the power unit parts list.

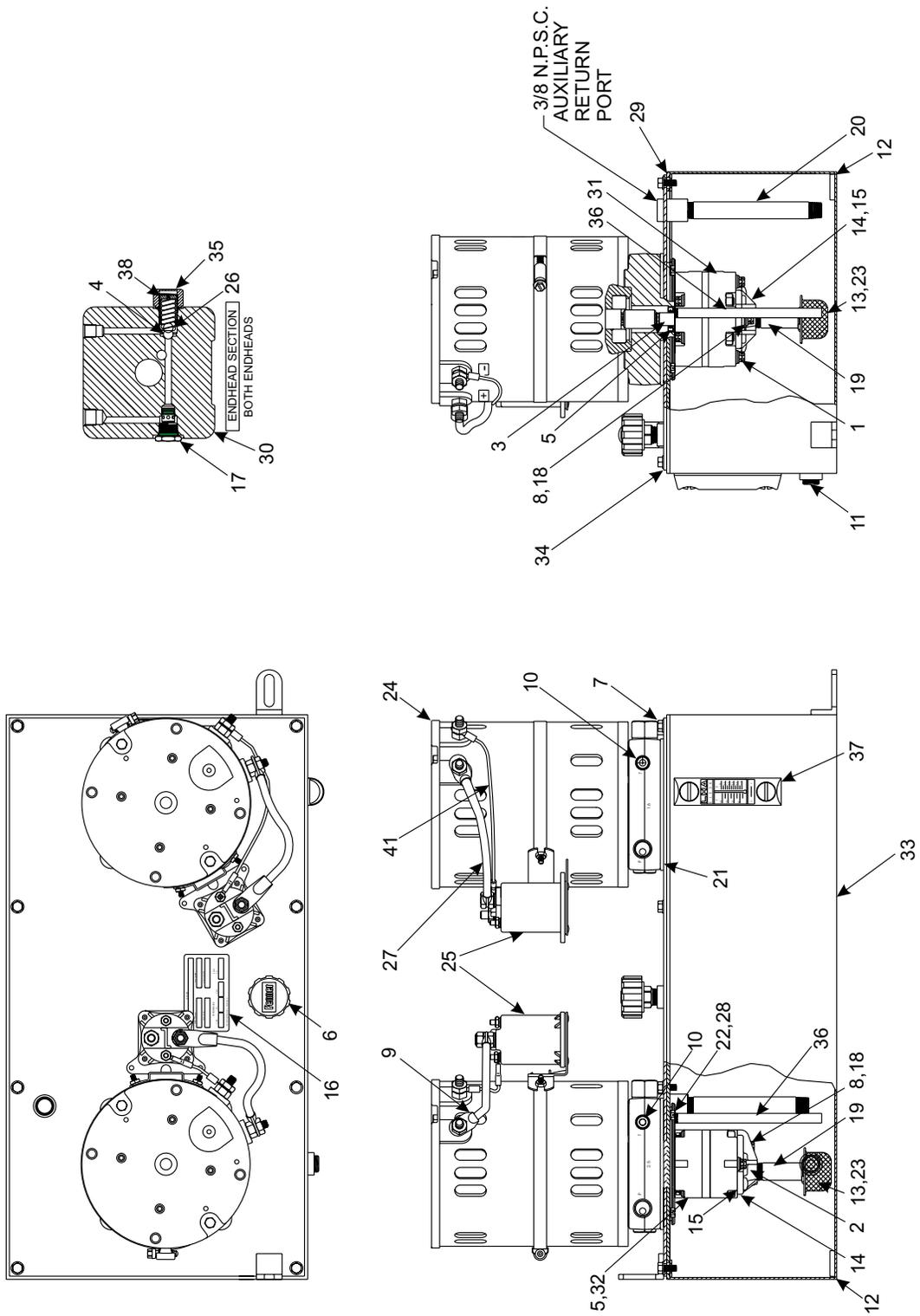


Figure 6-20. Power Unit

Table 6-20. Power Unit Parts List

Item No.	Part No.	Description	Qty
	B02-05-0017	Power Unit, 24V DC, Dual Pump and Motor	1
1	B02-15-0088	Bolt, Torx, 5/16-24 x 2-3/4 in.	2
2	B02-15-0089	Bolt, Torx, 5/16-24 x 3 in.	2
3	B02-15-0119	Coupling, SAE 9T-20/40	2
4	B02-15-0128	Steel Ball, 3/8 in.	2
5	B02-15-0091	Seal, Shaft	2
6	B02-15-0025	Cap, Breather	1
7	B02-15-0230	Screw, Taptite, 1/4-20 x 1/2 in.	8
8	B02-15-0093	Washer, Flat, .338 ID x .645 OD x .060 Thk.	2
9	B01-01-0014	Cable, Battery, 8 in.	1
10	B02-02-0023	Plug, #4 NPT	2
11	B02-15-0097	Plug, 3/8 NPT	1
12	B02-15-0061	Magnet	2
13	B02-15-0121	Filter, 149 Micron	2
14	B02-15-0125	Cover, Suction	2
15	B02-15-0126	Screw, Taptite, M6 x 1.0 x 12mm	4
16	Not Replaceable	Plate, Name	1
17	B02-15-0197	Valve, Cartridge Check	2
18	B02-15-0170	Bolt, Torx, 5/16-18 x 1 in.	2
19	B02-15-0342	Pipe, PVC, 2-1/2 in., 3/8 NPT	2
20	B02-15-0343	Pipe, PVC, 5-1/2 in., 3/8 NPT	1
21	B02-15-0219	Gasket, End Head	2
22	B02-15-0199	Bolt, Hex, 12-24 x 1/2 in.	8
23	B02-15-0229	Nut, Electrical Pipe	2
24	B01-07-0001	Motor, 24V DC	2
25	B02-15-0085	Solenoid, Smart Start	2
26	B02-15-0129	Spring, Relief	2
27	B01-01-0010	Cable, Battery, 13 in.	1
28	B02-15-0065	Washer, Lock, .223 ID x .377 OD x .056 Thk.	8
29	B02-15-0220	Gasket, Reservoir Cover	1
30	B02-15-0226	End Head	2
31	B02-15-0078	Pump Assembly, 1.6 Short Spline	1
32	B02-15-0079	Pump Assembly, 2.5 Short Spline	1
33	B02-15-0221	Reservoir, 6 Gallon	1
34	B02-15-0222	Cover, Reservoir	1
35	B02-15-0030	Relief Cap Assembly	2
36	B02-15-0338	Return Tube, 3/8 x 6 in.	2
37	B02-15-0084	Gauge, Oil Level/Temperature	1
38	B02-15-0026	Valve, Screw Adjust	2

7

ANSI Reprint

The following sections are reprinted from the ANSI A92.2-2001 code in effect at the time of manufacture. Permission to reprint has been granted by the Scaffold Industry Association.

7. Responsibilities of Dealers and Installers

- 7.1 General Responsibilities.** Each dealer or installer as applicable shall comply with the requirements of this section.
- 7.2 Vehicle Specifications.** Each dealer or installer, or both, who sells an aerial device shall inform the owner or user, or both, of the manufacturer's minimum vehicle specifications.
- 7.3 Vehicle Weight Distribution.** The installer shall be responsible for the weight distribution of the completed mobile unit in accordance with the requirements of the aerial device and the applicable regulations. Allowance shall be made for the weight of readily removable tools and material specified by the user.
- 7.4 Manuals.** Upon delivery of the equipment to the owner or user, the dealer or installer shall provide the manuals as required by Paragraph 6.4 of this standard and manuals for auxiliary equipment added by the installer.
- 7.5 Installations.** The installer shall comply with Sections 5 and 6 of this standard relating to proper installation and shall follow the instructions of the manufacturer. In the event the original manufacturer no longer exists, an equivalent entity may provide these instructions. The installer of an aerial device shall, before the mobile unit is placed in operation, perform stability tests in accordance with the requirements of 4.5.1 and 4.5.2, the operational and visual tests in accordance with the requirements of 6.6.1 and 6.6.2, and the appropriate electrical tests required in 5.4.3 of this standard. The installer shall, when installing an aerial device on a chassis which is a highway vehicle, comply with all requirements of the applicable Federal Motor Vehicle Safety Standards in effect at the time of installation. Certification as a manufacturer (alteration, intermediate or final) of a motor vehicle under the Federal Motor Vehicle Safety Standards is required. The travel height of the mobile unit shall be posted in a location that is readily visible to the vehicle operator. For insulated aerial devices, the installer shall assure conformance to the Qualification test requirements of 5.3.2 by either obtaining certification of the test and performing a periodic test after installation, or by performing the Qualification test.
- 7.6 Quality Assurance.** The installer shall have a documented quality assurance program which will ensure compliance with this standard.
- 7.7 Welding.** All welds made by the installer, whose failure could result in motion of the platform(s) shall meet the Structural Welding Code AWS D1.1-98 and AWS D1.2-98. The installer shall establish applicable welding quality assurance procedures for all weldments.
- 7.8 Training.** The dealer or installer shall offer training or training materials that aid owners and users in the operation, inspection, testing and maintenance of the aerial device. This training shall be offered initially and subsequently on request.
- 7.8.1 Dealer or Installer as User.** Whenever a dealer or installer directs personnel to operate an aerial device (inspecting, sales demonstrations, or any form of use), the dealer or installer shall assume the responsibilities of users as specified in Section 9 of this standard. All personnel authorized to operate the aerial device shall have been trained.

8. Responsibilities of Owners

8.1 General Responsibilities. Each owner shall comply with the requirements of this section. The following responsibilities pertain to the owner's inspection, testing, maintenance, modification, training, and transfer of ownership. These activities shall be performed by qualified person(s).

8.2 Inspection and Testing Classifications.

8.2.1 Initial Inspection and Test. Prior to initial use, all new or modified mobile units shall be inspected and tested to ensure compliance with the provisions of this standard. Verification by the manufacturer, the installer or an equivalent entity(s), meets this requirement.

8.2.2 Regular Inspection and Tests. The inspection procedure for mobile units is divided into two classifications based upon the intervals at which inspections and tests shall be performed. Intervals shall be set by the owner in accordance with the manufacturer's recommendations. Such intervals are dependent upon component function and exposure to wear, deterioration and other agents which adversely affect component life. Two classifications are designated:

- (1) Frequent Inspection and Test: Daily to monthly intervals.
- (2) Periodic Inspection and Test: One to twelve month intervals.

8.2.3 Frequent Inspection and Test. Items determined by the owner in accordance with the manufacturer's recommendations for each specific aerial device shall be inspected for defects. The following tests and inspections shall be performed by the operator once daily, prior to first use:

- (1) Operating controls and associated mechanisms for conditions interfering with proper operation.
- (2) Visual and audible safety devices for malfunction.
- (3) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.
- (4) Fiberglass and other insulating components for visible damage or contamination.
- (5) Missing or illegible operational and instructional markings.
- (6) Electrical systems of/or related to the aerial device for malfunction, signs of excessive deterioration, dirt and moisture accumulation.
- (7) Visual inspection of bolts, pins, and other fasteners for loose, deformed or missing fasteners and other locking devices. Any suspected items shall be carefully examined or tested and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be replaced or repaired before use.

8.2.4 Periodic Inspection or Test. An inspection of the mobile unit shall be performed at the intervals defined in 8.2.2 depending upon its activity, severity of service, and environment, or as specifically indicated below. (These inspections shall include the requirements of 8.2.3):

- (1) Structural members for deformation, cracks or corrosion
- (2) Parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire and synthetic ropes, and sheaves for wear, cracks or distortion.
- (3) Hydraulic and pneumatic relief valve settings.
- (4) Hydraulic system for proper oil level.
- (5) Hydraulic and pneumatic fittings, hoses, and tubing for evidence of leakage, abnormal deformation or excessive abrasion.
- (6) Compressors, pumps, motors, and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed, and excessive heating.
- (7) Hydraulic and pneumatic valves for malfunction and visible cracks in the external valve housing, leaks, and sticking spools.
- (8) Visually inspect any vacuum prevention systems and verify function of such systems on Category "A" aerial devices.
- (9) Hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage.

- (10) Hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system indicating other component deterioration.
- (11) Electrical systems and components for deterioration or wear including those not readily visible on a frequent inspection.
- (12) Performance test of all boom movements.
- (13) Condition and tightness of bolts and other fasteners.
- (14) Welds, as specified by the manufacturer.
- (15) Legible and proper identification, operational, and instructional markings.
- (16) If the aerial device is rated as an insulated device, the electrical insulating components and system(s) shall be thoroughly inspected for lack of cleanliness and other conditions that compromise insulation. Then these components and system(s) shall be tested for compliance with the rating of the aerial device in accordance with one of the applicable methods and procedures as outlined in section 5.4.3 of this standard:
 - (a) If the aerial device is used for AC bare-hand work, the unit shall undergo a 60 Hz test as shown in Table 2 at least every three years;
 - (b) If the aerial device is used for DC bare-hand work, the unit shall undergo a DC test as shown in Table 2 at least every three years;
 - (c) After repair or modification of any component that crosses the insulating system(s), or the repair or replacement of an insulating component(s), the unit shall be dielectrically tested in accordance with section 5.4.3;
 - (d) An insulated replacement boom shall be tested to insure conformance to 5.3.3 by the supplier;
 - (e) Bare-hand work units shall be tested as shown in Table 1 after any major repair to the insulated boom or any insulated boom replacement. Any suspected items shall be carefully examined or tested and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be replaced or repaired before use.

8.3 Inspection and Test Records.

- (1) Items to be inspected shall be designated to the operator or other authorized person making frequent inspections. Records of frequent inspections need not be made. However, where a safety hazard is found, it shall be reported in writing to a person responsible for the corrective action and that report and a record of the correction shall be maintained for five years, or as required by applicable regulations.
- (2) Written, dated and signed reports and records shall be made of periodic inspections and tests and retained for a period of five years or as required by applicable regulations.

8.4 Maintenance. Maintenance and frequency of maintenance shall be determined by the owner in accordance with the manufacturer's recommendations. Welding repairs of components or welds, designated as critical in the manufacturers manual, shall be made in accordance with the manufacturers recommendations. Should the original manufacturer no longer exist an equivalent entity may determine the required procedure.

8.4.1 Maintenance Training. The owner shall train their maintenance personnel in inspection and maintenance of the aerial device in accordance with the manufacturer's recommendations and Section 8 of this standard.

8.5 Modifications. No modifications or additions which affect the stability, mechanical, hydraulic, or electrical integrity or the safe operation of the aerial device shall be made without the written approval of the manufacturer. If such modifications or changes are made, the capacity, operation, and maintenance instruction markings shall be changed accordingly. In no case shall the safety factors be reduced below those specified in this standard or below the manufacturers design safety factors, whichever are greater. Should the original manufacturer no longer exist, an equivalent entity may approve required modification.

8.6 Weight Distribution. Changes in loading or additions made to the mobile unit after the final acceptance that affect weight distribution shall meet applicable regulations

by governmental agencies. In no case shall axle loads of the fully loaded vehicle exceed the Gross Axle Weight Ratings (GAWR) assigned by the manufacturer.

Note: Any change in weight distribution may adversely affect stability.

8.7 Transfer of Ownership. When a change in ownership of an aerial device occurs, it shall be the responsibility of the seller to provide the manufacturer's manual(s) for that aerial device to the purchaser. It is the responsibility of the purchaser to notify the manufacturer of the unit model and serial number and the name and address of the new owner within 60 days.

8.8 Markings. The markings on the aerial device shall not be removed, defaced, or altered. All missing or illegible markings shall be promptly replaced.

8.9 Parts. When parts or components are replaced they shall be identical in specification and function to the original aerial device parts or components or shall provide an equal or greater factor of safety.

8.10 Safety Bulletins. Owners shall comply with safety related bulletins as received from the manufacturer, dealer or installer.

8.11 Manuals. The owner shall insure that the operating manual(s) is stored on the mobile unit.

8.12 Training, Retraining, and Familiarization of Operators.

8.12.1 Owner as a Renter or Lessor. When an owner functions as a renter or lessor he shall have the same responsibilities as specified under Section 11 of this standard.

8.12.2 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of aerial devices, including recognition and avoidance of hazards associated with their operation, shall operate an aerial device. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

- (1) The purpose and use of manuals.
- (2) That operating manuals are an integral part of the aerial device and must be properly stored on the vehicle when not in use.
- (3) A pre-start inspection.
- (4) Responsibilities associated with problems or malfunctions affecting the operation of the aerial device.
- (5) Factors affecting stability.
- (6) The purpose of placards and decals.
- (7) Workplace inspection.
- (8) Applicable safety rules and regulations, such as Part 4, ANSI C2-1997, National Electrical Safety Code (applies to utility workers as defined in ANSI C2). The above standard is an example; other industries using aerial devices have safety rules pertinent to that industry.
- (9) Authorization to operate.
- (10) Operator warnings and instructions.
- (11) Actual operation of the aerial device. Under the direction of a qualified person, the trainee shall operate the aerial device for a sufficient period of time to demonstrate proficiency in the actual operation of the aerial device.
- (12) Proper use of personal fall protection equipment

8.12.3 Retraining. The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

8.12.4 Familiarization. When an operator is directed to operate an aerial device he/she is not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues :

- (1) The location of the manuals.
- (2) The purpose and function of all controls.
- (3) Safety devices and operating characteristics specific to the aerial device.

9. Responsibility of Users.

9.1 General Responsibilities. Each User shall comply with the requirements of this section.

9.2 Personnel. Only trained and authorized personnel shall be permitted to operate the aerial device.

9.3 Training, Retraining, and Familiarization of Operators.

9.3.1 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of aerial devices, including recognition and avoidance of hazards associated with their operation, shall operate an aerial device. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

- (1) The purpose and use of manuals.
- (2) That operating manuals are an integral part of the aerial device and must be properly stored on the vehicle when not in use.
- (3) A pre-start inspection.
- (4) Responsibilities associated with problems or malfunctions affecting the operation of the aerial device.
- (5) Factors affecting stability.
- (6) The purpose of placards and decals.
- (7) Workplace inspection.
- (8) Applicable safety rules and regulations, such as Part 4, ANSI C2-1997, National Electrical Safety Code. (applies to utility workers as defined in ANSI C2). The above standard is an example; other industries using aerial devices have safety rules pertinent to that industry.
- (9) Authorization to operate.
- (10) Operator warnings and instructions.
- (11) Actual operation of the aerial device. Under the direction of a qualified person, the trainee shall operate the aerial device for a sufficient period of time to demonstrate proficiency in the actual operation of the aerial device.
- (12) Proper use of personal fall protection equipment

9.3.2 Retraining. The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

9.3.3 Familiarization. When an operator is directed to operate an aerial device he/she is not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

- (1) The location of the manuals.
- (2) The purpose and function of all controls.
- (3) Safety devices and operating characteristics specific to the aerial device.

9.4 Application. The employer and assigned operator shall insure that the aerial device is used only for intended applications as defined in the operating manual, and that recognized safety practices are observed.

9.5 Mobile Operation. Before and during driving, the driver shall:

- (1) Avoid traveling on any surface that adversely affects vehicle stability.
- (2) Maintain a safe distance from obstacles and overhead lines.
- (3) Maintain communications between the driver and the operator.
- (4) Under all travel conditions, the driver shall limit travel speed in accordance with conditions of the ground surface, congestion, and slope.

9.6 Alterations. Altering or disabling of safety devices, guards, or interlocks if so equipped shall be prohibited.

9.7 Bare-Hand Work. For bare-hand work, a Category "A" aerial device shall be used.

9.8 Lower Controls. The lower controls of aerial devices shall not be used for continuous operation with personnel in the platform.

10. Responsibilities of Operators

10.1 General Responsibilities. Each operator shall comply with the requirements of this section.

- 10.2 Operation.** During operation of the aerial device all platform occupants shall use appropriate fall protection connected to the aerial device at the platform position.
- 10.3 Work Platform.** The operator shall not use railings, planks, ladders or any other device in or on the work platform for achieving additional working height or reach.
- 10.4 Brakes.** The vehicle parking brake(s) shall be set at all times that the boom is elevated except when the aerial device is being used in accordance with 9.5.
- 10.5 Loading.** Any loading which includes a horizontal load shall be avoided unless the mobile unit is designed for that application.
- 10.6 Observations.** Observations during operation for any defects shall be conducted on an ongoing basis.
- 10.6.1 Pre-start Inspection.** Items determined by the owner in accordance with the manufacturer's recommendations for each specific aerial device shall be inspected for defects prior to each day's operation. The following tests and inspections shall be performed by the operator once daily, prior to first use:
- (1) Operating controls and associated mechanisms for conditions interfering with proper operation.
 - (2) Visual and audible safety devices for malfunction.
 - (3) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.
 - (4) Fiberglass and other insulating components for visible damage or contamination.
 - (5) Missing or illegible operational and instructional markings.
 - (6) Electrical systems of/or related to the aerial device for malfunction, signs of excessive deterioration, dirt and moisture accumulation.
 - (7) Visual inspection of bolts, pins, and other fasteners for loose, deformed or missing fasteners and other locking devices. Any suspected items shall be carefully examined or tested and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be replaced or repaired before use.
- 10.7 Worksite.** Before the aerial device is used the worksite shall be surveyed for hazards such as:
- (1) Untamped earth fills.
 - (2) Ditches.
 - (3) Dropoffs and floor obstructions.
 - (4) Debris.
 - (5) Overhead obstructions and electrical conductors.
 - (6) Weather conditions.
 - (7) Presence of unauthorized persons.
- 10.8 Precautions.** Before and during each use the operator shall:
- (1) Check for overhead obstructions and electrical conductors.
 - (2) Insure that the load on the platform and/or load lifting devices are in accordance with the manufacturer's rated capacity.
 - (3) Insure that outriggers and stabilizers are used if the manufacturer's instructions require their use.
 - (4) Insure that guardrails are properly installed, and the gates are closed.
 - (5) Use outrigger pads when necessary to provide firm footing.
- 10.9 Mobile Operation.** Before engaging in mobile operation the operator shall determine that the aerial device is specifically designed for mobile operation.
- 10.10 Personnel.** Only trained and authorized personnel shall be permitted to operate the aerial device.
- 10.11 Training, Retraining, and Familiarization of Operators.**
- 10.11.1 General Training.** Only personnel who have received general instructions regarding the inspection, application and operation of aerial devices, including recognition and avoidance of hazards associated with their operation, shall operate an aerial device. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:
- (1) The purpose and use of manuals.

- (2) That operating manuals are an integral part of the aerial device and must be properly stored on the vehicle when not in use.
- (3) A pre-start inspection.
- (4) Responsibilities associated with problems or malfunctions affecting the operation of the aerial device.
- (5) Factors affecting stability.
- (6) The purpose of placards and decals.
- (7) Workplace inspection.
- (8) Applicable safety rules and regulations, such as Part 4, ANSI C2-1997, National Electrical Safety Code (applies to utility workers as defined in ANSI C2). The above standard is an example; other industries using aerial devices have safety rules pertinent to that industry.
- (9) Authorization to operate.
- (10) Operator warnings and instructions.
- (11) Actual operation of the aerial device. Under the direction of a qualified person, the trainee shall operate the aerial device for a sufficient period of time to demonstrate proficiency in the actual operation of the aerial device.
- (12) Proper use of personal fall protection equipment

10.11.2 Retraining. The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

10.11.3 Familiarization. When an operator is directed to operate an aerial device he/she is not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

- (1) The location of the manuals.
- (2) The purpose and function of all controls.
- (3) Safety devices and operating characteristics specific to the aerial device.

11. Responsibilities of Renters, Lessors or Lessees

11.1 General Responsibilities. Each renter or lessor or lessee shall comply with the requirements of the applicable section or sections below.

11.1.1 Lessor or Lessee as Dealer or Installer. When a lessor or lessee uses the aerial device as a dealer or installer he shall have the same responsibilities as specified under Section 7 of this standard.

11.1.2 Lessor or Lessee as Owner. When a lessor or lessee uses the aerial device as an owner he shall have the same responsibilities as specified under Section 8 of this standard.

11.1.3 Lessor or Lessee as User. When a lessor or lessee uses the aerial device as a user he shall have the same responsibilities as specified under Section 9 of this standard.

11.1.4 Lessor or Lessee as Operator. When a lessor or lessee uses the aerial device as an operator he shall have the same responsibilities as specified under Section 10 of this standard.

11.2 Ownership Duties. The renter or lessor shall carry out the duties of ownership specified in this standard which are not assigned to the renting entity or lessee as the user.

11.3 Obligations. Upon delivery each renter or lessor of an aerial device shall provide the operators manual and the ANSI/SIA A92.2-xxxx Manual of Responsibilities for dealers, owners, users, operators, lessors and lessees of Vehicle Mounted Elevating and Rotating Aerial Devices. These manuals shall be stored on the mobile unit.

11.4 Training. The renter or lessor shall offer training or training materials that aid the renting entity or lessee in the operation, inspection, testing and maintenance of the aerial device. This training shall be offered initially and subsequently on request.

11.4.1 General training. Only personnel who have received general instructions regarding the inspection, application and operation of aerial devices, including recognition and avoidance of hazards associated with their operation, shall

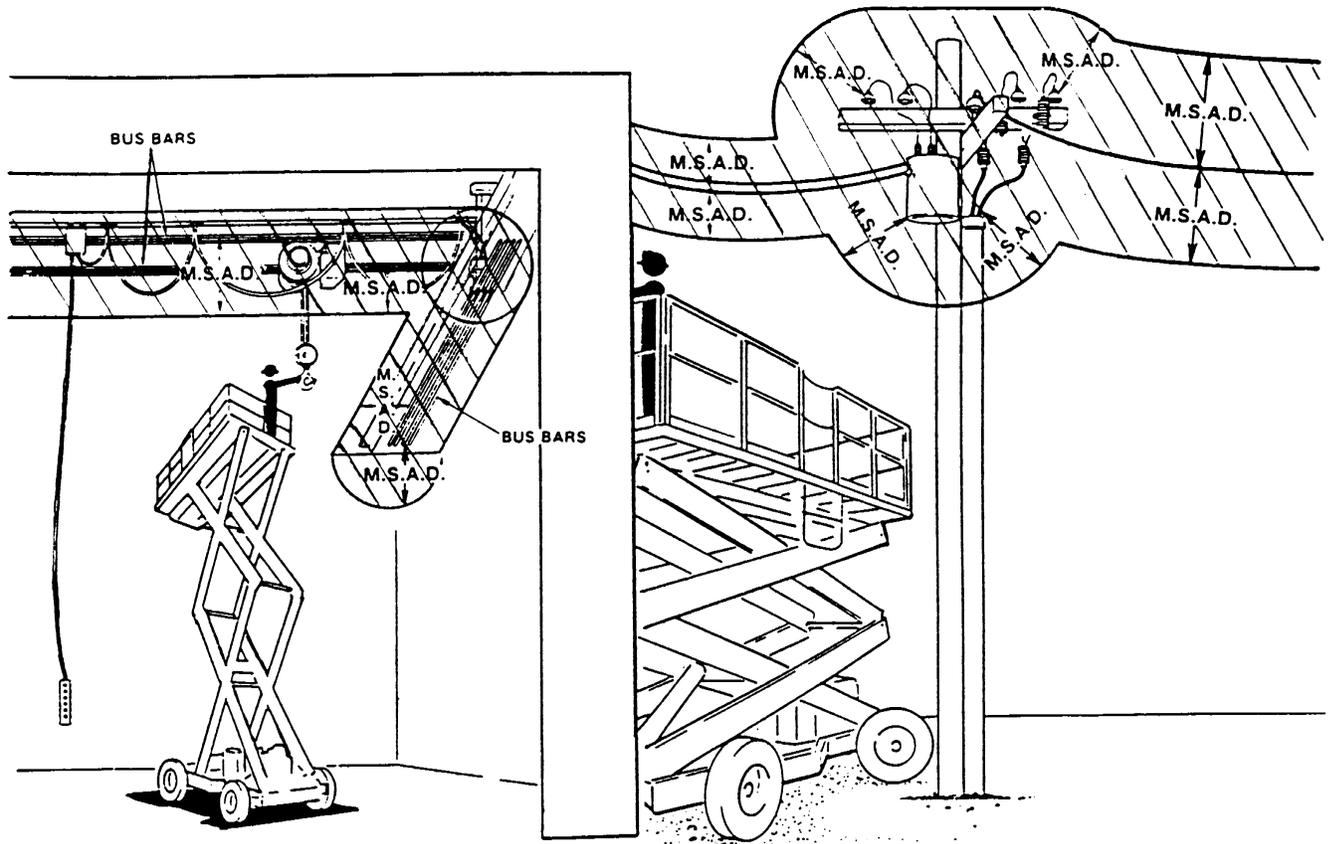
operate an aerial device. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

- (1) The purpose and use of manuals.
- (2) That operating manuals are an integral part of the aerial device and must be properly stored on the vehicle when not in use.
- (3) A pre-start inspection.
- (4) Responsibilities associated with problems or malfunctions affecting the operation of the aerial device.
- (5) Factors affecting stability.
- (6) The purpose of placards and decals.
- (7) Workplace inspection.
- (8) Applicable safety rules and regulations, such as Part 4, ANSI C2-1997, National Electrical Safety Code (applies to utility workers as defined in ANSI C2). The above standard is an example; other industries using aerial devices have safety rules pertinent to that industry.
- (9) Authorization to operate.
- (10) Operator warnings and instructions.
- (11) Actual operation of the aerial device. Under the direction of a qualified person, the trainee shall operate the aerial device for a sufficient period of time to demonstrate proficiency in the actual operation of the aerial device.
- (12) Proper use of personal fall protection equipment

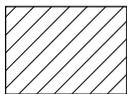
11.4.2 Familiarization. When an operator is directed to operate an aerial device he/she is not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

- (1) The location of the manuals.
- (2) The purpose and function of all controls.
- (3) Safety devices and operating characteristics specific to the aerial device.

11.5 Communications. In the event the manufacturer or installer provides the renter or lessor manuals, bulletins, or other materials for the information of the user of an aerial device, the renter or lessor shall pass them on to the user without any undue delay.



M.S.A.D. = Minimum Safe Approach Distance (See Table 7-1).



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 7-1. 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



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