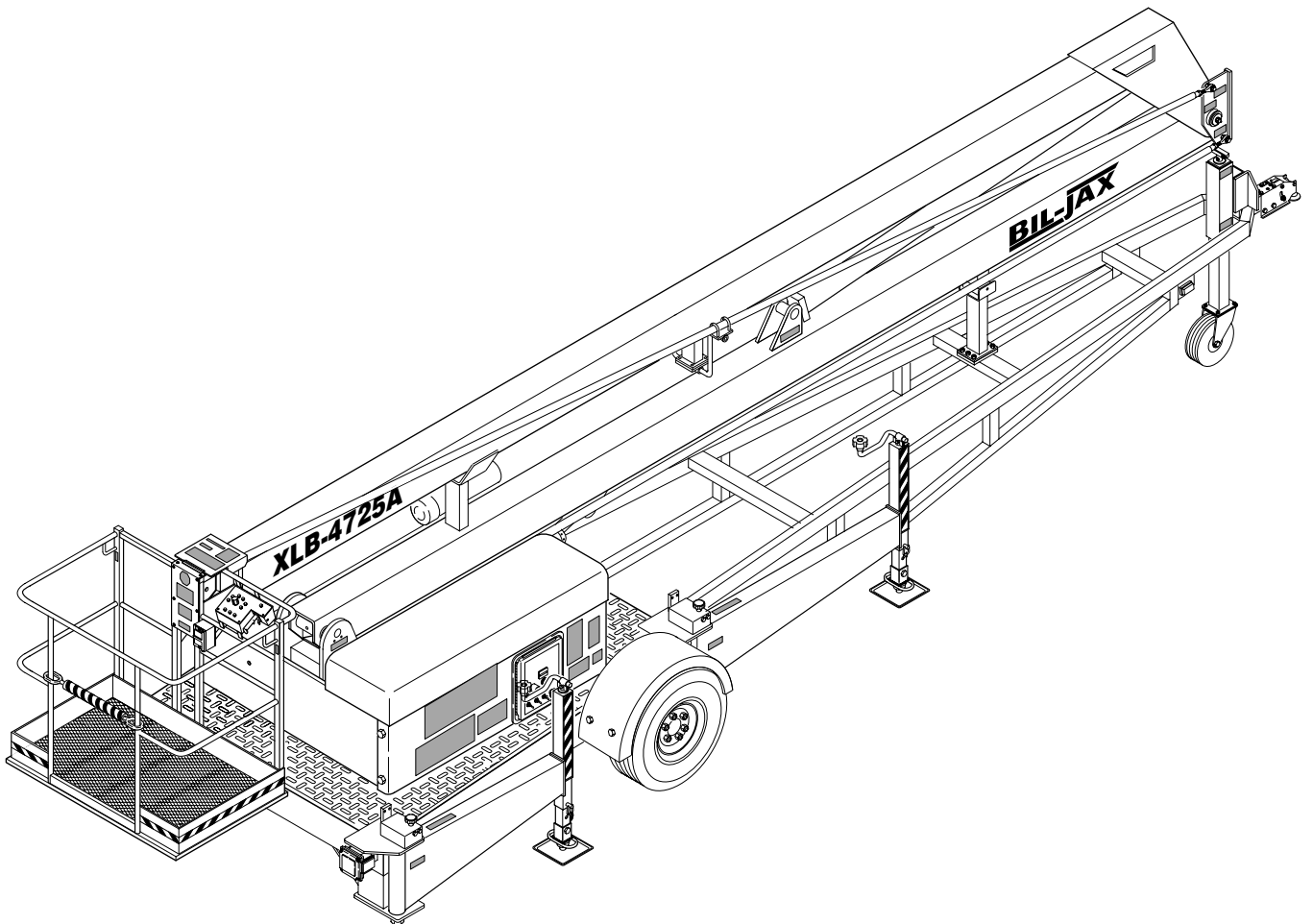


# **XLB-4725A**

Proportional  
Hydraulic Boom Lift



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## **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 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

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### 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**

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

---

#### **WARNING**

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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-4725A 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-4725A 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-4725A 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-4725A 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-4725A 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 450 lbs. (The older basket model capacity is 400 lbs. Refer to figures 6-16 and 6-16A for illustrations of the basket models). Basket elevation is by two hydraulic cylinders acting on upper and lower 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, a 24 Volt, 39 Amp, one horsepower, DC electric motor drives 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.

On the gasoline engine powered (Gas Model) boom lift, a 4-cycle, 8 horsepower, gasoline engine drives the hydraulic pump. A 12 volt DC storage battery powers the engine starter circuit. An auxiliary voltage regulator/rectifier provides 18 amps maximum charge current while the engine is running.

Two control panels use directional selector switches, rheostats, and proportional 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 adjustable from zero to 8 inches per second (0 to 40 ft/min). 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 plunger on the front end of the power compartment. Firmly pulling out and holding the valve plunger manually retracts the upper boom lift cylinder.

The XLB-4725A 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.

## 2-2 SPECIFICATIONS

### Boom Lift Work Platform

Model Number XLB-4725A      Serial Number \_\_\_\_\_

Manufactured by:    Bil-Jax, Inc.  
 125 Taylor Parkway  
 Archbold, Ohio 43502  
 419.445.9675

**Table 2-1. Specifications**

Feature	Battery Powered Model	Gasoline Powered Model
Rated Platform Load	450 lbs (204.1 kg) total [400 lbs (181.6 kg) total for early version basket]*	450 lbs (204.1 kg) total [400 lbs (181.6 kg) total for early version basket]*
Maximum Work Height	47 ft (14.34 m)	47 ft (14.34 m)
Extended Basket Height	40.5 ft (12.35 m)	40.5 ft (12.35 m)
Elevation Rate, Maximum	8 in./sec (203 mm/sec) [40 ft/min (12.2 m/min)]	8 in./sec (203 mm/sec) [40 ft/min (12.2 m/min)]
Horizontal Reach	25 ft (7.6 m)	25 ft (7.6 m)
Boom Rotation	360° Continuous	360° Continuous
Rotation Speed	8 in. per Second, Maximum	8 in. per Second, Maximum
Basket Dimensions	45 in. W x 30 in. D x 42 in. H (114.3 cm x 76 cm x 107 cm)	45 in. W x 30 in. D x 42 in. H (114.3 cm x 76 cm x 107 cm)
Power Source	24 Volt DC, Deep Cycle, 245 Amp-hour Battery	8 Horsepower Gasoline Engine
Battery Charger	110/120 Volt, 40 Amp	N/A
Hydraulic Pressure	2000 psi (13,790 kPa)	2000 psi (13,790 kPa)
Reservoir Capacity	5 Gallons (18.9 Liters)	5 Gallons (18.9 Liters)
Hydraulic Capacity	7 Gallons (26.5 Liters)	7 Gallons (26.5 Liters)
Hydraulic Oil	Energol HLP-HD46 (BP Oil)	Energol HLP-HD46 (BP Oil)
Gross Vehicle Weight	4,950 lbs (2247.3 kg)	4,750 lbs (2156.5 kg)
Tongue Weight	350 lbs (158.8 kg)	350 lbs (158.8 kg)
Trailer Brakes	Hydraulic Surge	Hydraulic Surge

\*Refer to figures 6-16 and 6-16A for basket views.

## 2-3 WARRANTY

Bil-Jax warrants its boom lifts for one year from the date of delivery against all defects of material and workmanship, provided the unit is operated and maintained in compliance with Bil-Jax’s operating and maintenance instructions; structural components are warranted for three years. Bil-Jax will, at its option, repair or replace any unit or component part which fails to function properly in normal use.

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

Components not manufactured by Bil-Jax are covered by their respective manufacturer’s warranties. A list of those components and their warranties is available upon written request to Bil-Jax.

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



# 3

## Operation

---

### 3-1 OPERATOR CONTROLS

The XLB-4725A 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.

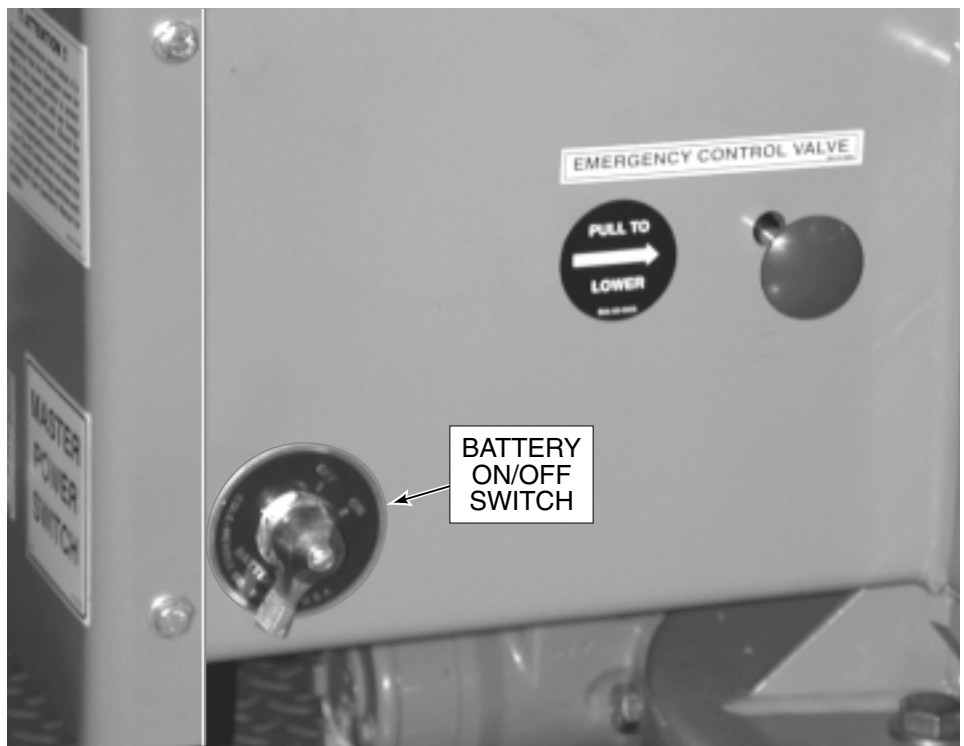


Figure 3-1. Battery ON/OFF Switch

## 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)

### ***HOUR Meter***

The HOUR meter displays the elapsed time that the boom lift has been in operation (UP/DOWN or ROTATION switches engaged). Display units are in hours and tenths.

### ***PLATFORM/OFF/GROUND Key Switch***

The PLATFORM/OFF/GROUND key switch enables boom lift control from either the lower control panel or the work platform. Removing the key disables lift operation.

### ***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 lift motion. To resume control, rotate the pushbutton clockwise to disengage the emergency stop switch contacts.

### ***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 BOOM UP/DOWN Selector Switch**

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

**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. Turning the SPEED CONTROL rheostat clockwise starts the boom motion. Rotation continues until the rheostat or the selector switch is released.

**LOWER BOOM UP/DOWN Selector Switch**

Holding the LOWER BOOM UP/DOWN selector switch in the UP position raises the lower boom. Holding the selector switch in the DOWN position lowers the lower boom. Turning the SPEED CONTROL rheostat clockwise starts the selected boom motion. The up or down boom motion continues until the rheostat is released, the selector switch is released, or the lower boom reaches a hard stop or a safe travel limit.

**SPEED CONTROL Rheostat**

A BOOM UP/DOWN or ROTATION selector switch must be held in a motion-enable position to enable the SPEED CONTROL rheostat. Turn the SPEED CONTROL rheostat clockwise to start boom motion. All boom motion speeds ramp up electronically. Turn the rheostat farther clockwise to increase the boom motion speed.

**Lower Control Panel – Gas Model Only**

The following engine controls are included on the lower control panel of the gas model boom lift. These controls are not shown.

**CHOKE Pushbutton**

Pressing the CHOKE pushbutton engages the choke solenoid. For cold starting, press the CHOKE pushbutton in for about 5 seconds while cranking the engine.

**ENGINE START/STOP Selector Switch**

Holding the START/STOP selector switch in the START position cranks the engine. The engine should not be cranked longer than 15 seconds at a time. Over-cranking will burn up the starter motor.

Holding the START/STOP selector switch in the STOP position stops the engine. The selector switch must be held down until the engine stops running.

## 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)

### **UPPER BOOM UP/DOWN Pushbuttons**

Pressing the UPPER BOOM UP pushbutton enables the upper boom to rise. Pressing the UPPER BOOM DOWN pushbutton enables the upper boom to descend. Squeezing the hand grip trigger starts the boom motion. The up or down boom motion continues until the trigger is released, the pushbutton is released, or the upper boom reaches a hard stop or a safe travel limit.

### **ROTATION CW/CCW Pushbuttons**

Pressing the ROTATION CW pushbutton enables the boom to rotate in the clockwise direction. Pressing the ROTATION CCW pushbutton enables the boom to rotate in the counterclockwise direction. Squeezing the hand grip trigger starts the boom motion. Rotation continues until the trigger is released or the pushbutton is released.

### **LOWER BOOM UP/DOWN Pushbuttons**

Pressing the LOWER BOOM UP pushbutton enables the lower boom to rise. Pressing the LOWER BOOM DOWN pushbutton enables the lower boom to descend. Squeezing the hand grip trigger starts the boom motion. The up or down boom motion continues until the trigger is released, the pushbutton is released, or the lower boom reaches a hard stop or a safe travel limit.

***Hand Grip and Trigger***

A BOOM UP/DOWN or ROTATION pushbutton must be depressed to enable the hand grip trigger. Pull the trigger up slowly to start boom motion. All boom motion speeds ramp up electronically. Pull the trigger higher to speed up the boom motion.

***POWER Pushbutton***

When pressed, the POWER pushbutton disconnects electrical power to the upper control panel. The POWER pushbutton should only be pressed to immediately stop all boom lift motion. To resume control, rotate the pushbutton clockwise to disengage the switch.

***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.

***EMERGENCY DOWN Pushbutton***

When pressed, the EMERGENCY DOWN pushbutton opens the upper cylinder retract solenoid valve to allow a controlled basket descent. Limited battery power is required to open the retract cylinder solenoid valve. This method of boom lowering should only be used when the BOOM DOWN pushbutton or trigger control fails.

**Upper Control Panel – Gas Model Only**

The following engine controls are included on the upper control panel of the gas model boom lift. These controls are not shown.

***CHOKE Pushbutton***

Pressing the CHOKE pushbutton engages the choke solenoid. For cold starting, press the CHOKE pushbutton down for about 5 seconds while cranking the engine.

***ENGINE START Pushbutton***

Pressing the ENGINE START pushbutton cranks the engine. The engine should not be cranked longer than 15 seconds at a time. Over-cranking will burn up the starter motor.

***ENGINE STOP Pushbutton***

Pressing the ENGINE STOP pushbutton stops the engine. The ENGINE STOP pushbutton must be held down until the engine stops running.

## 3-2 NORMAL OPERATING PROCEDURE

Perform the following procedures to operate the XLB-4725A 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 pull each outrigger away from the trailer frame. Swing the outriggers away 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.

**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 lower boom to the trailer frame. Stow the transport pin in its storage tube.
7. Turn the PLATFORM/OFF/GROUND key switch to the GROUND position.



### CAUTION

**Do not crank the engine for more than 15 seconds at a time. Extended engine cranking may overheat and damage the starter motor.**

8. **(Gas Model Only)** Toggle the ENGINE START switch to start the engine. If the engine is cold, hold the CHOKE switch down for about five seconds while cranking. Allow the engine to idle for at least five minutes before operating the boom lift hydraulics.
9. Use the lower control panel to operate the lift controls. Raise, lower, and rotate the boom to get familiar with the controls. Learn to smoothly start and stop the boom lift.
10. With the upper boom fully down, raise the lower boom to upper limit to position the basket for boarding. Turn the key switch to the PLATFORM position.
11. Raise the safety bar and enter the basket. Put on the safety harness and attach the lanyard to the basket railing. Operate the boom lift carefully.

### 3-3 EMERGENCY LOWERING

The XLB-4725A 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 front of the hydraulic power compartment.

To lower the work basket, pull out the valve plunger knob (Figure 3-4). Continue to pull out on the plunger to lower the basket. Only the upper boom lift cylinder will retract.

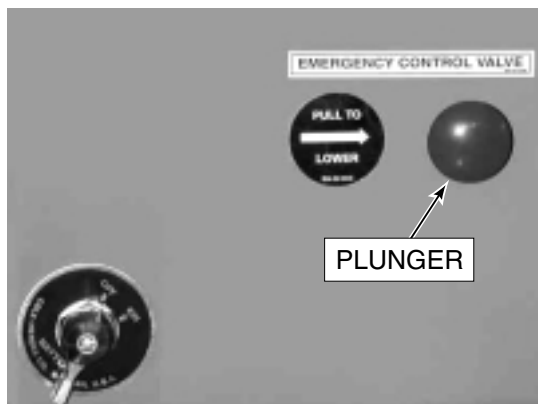


Figure 3-4. Emergency Lowering Valve

### 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.

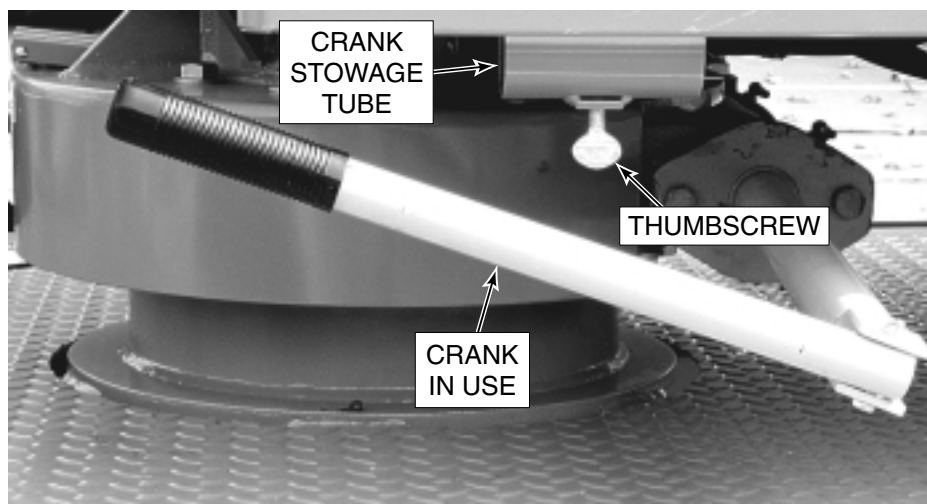


Figure 3-5. Boom Rotation

### 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.

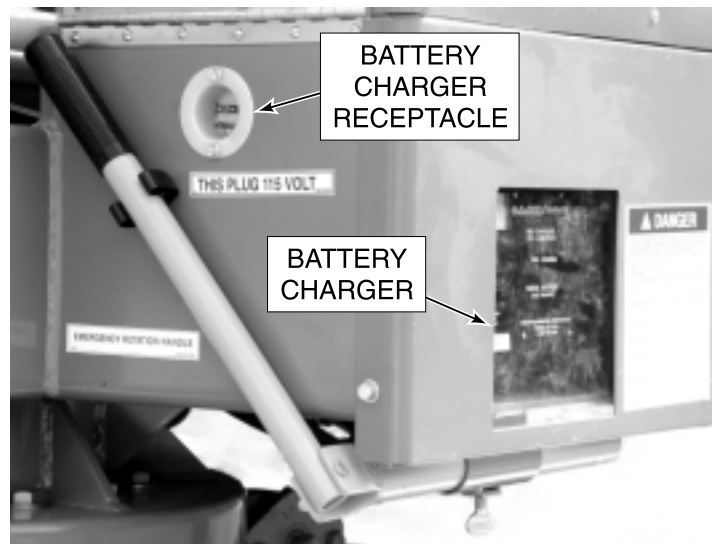
Recharge the DC boom lift batteries as follows:

#### **⚠ 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. 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 8 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**



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

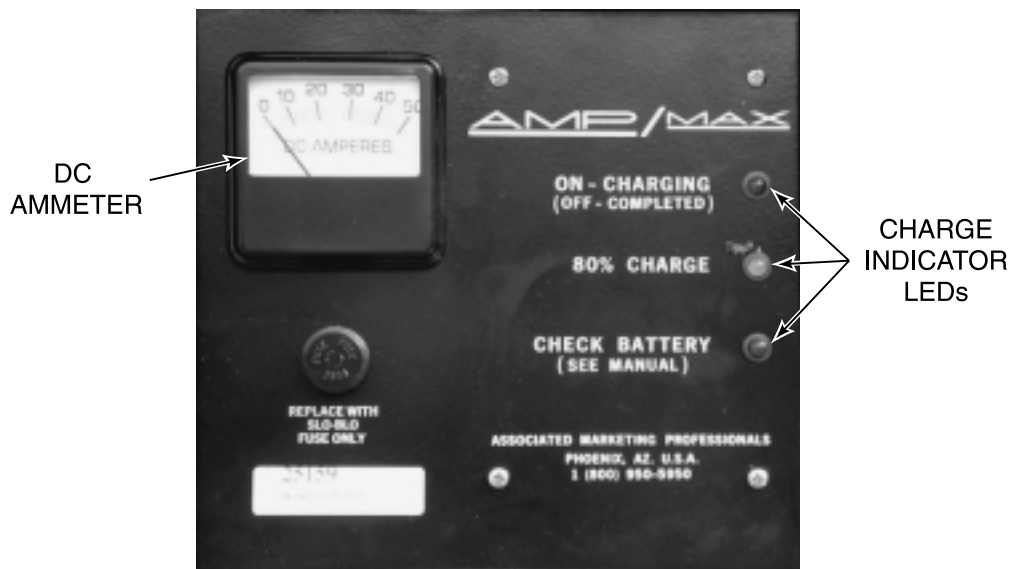


Figure 3-7. Battery Charger



### 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.

5. 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.

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

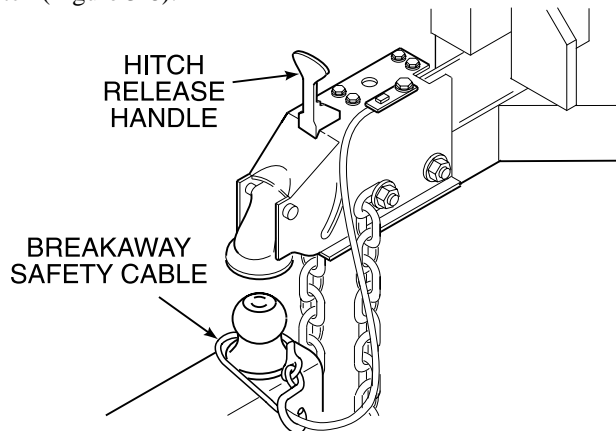
## 3-6 BOOM LIFT TRANSPORT

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

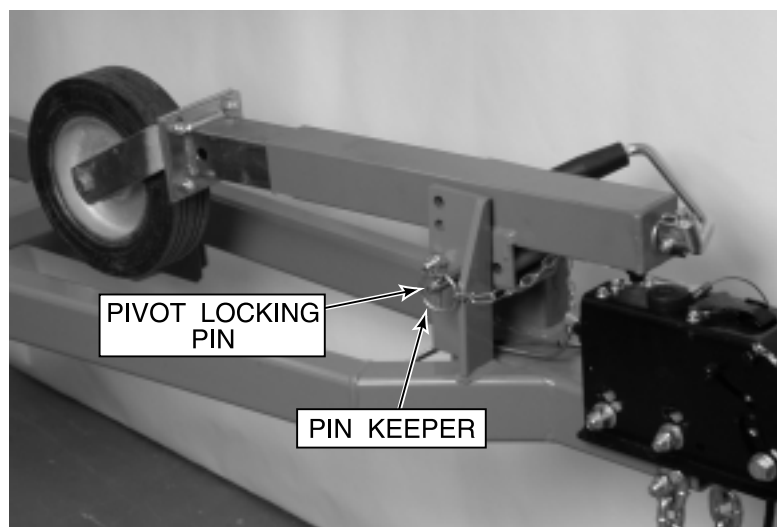
Trailer hitching requires a second person to give tow vehicle backing instructions.

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.

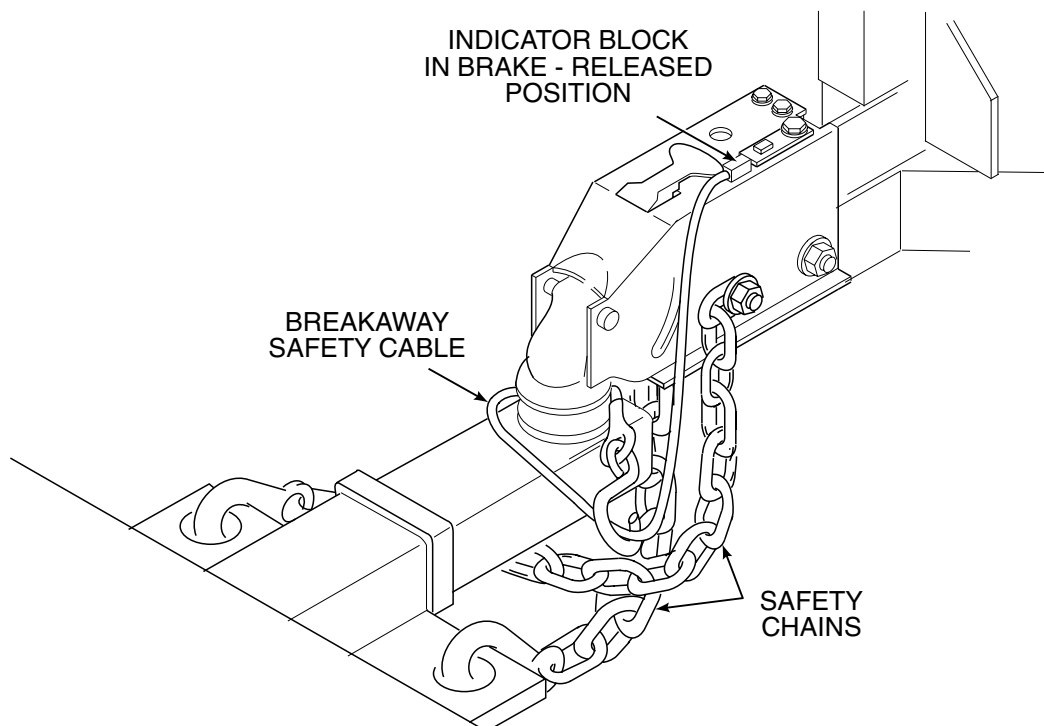


**Figure 3-9. Jack Travel Position**

**! 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. Check the position of the breakaway safety cable indicator block. If the indicator block is not in the brakes-released position shown in Figure 3-10, the brakes may drag. Position the breakaway safety cable and indicator block as shown.

9. Check the position of the trailer backup lever (Figure 3-11). The lever must be in the TOWING position (up) to enable operation of the surge brakes.
10. 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.
  - g. Check that the indicator block and backup lever are in their correct positions as shown in Figures 3-10 and 3-11.

### Trailer Towing and Backing

After backing and before towing the boom lift on the open road, always check the position of the backup lever. Make sure the backup lever is in the TOWING position (up). See Figure 3-11.

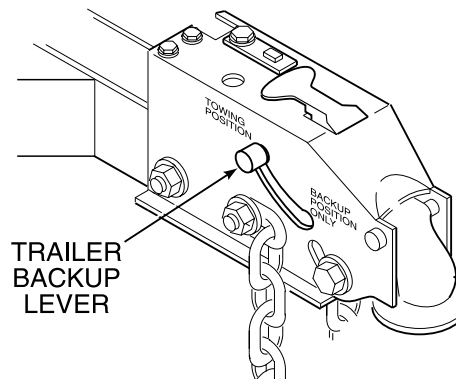


Figure 3-11. Backup Lever Position

### **⚠️ 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 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

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### 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/add engine oil.	✓	
Check/add transmission oil.	✓	
Check air filter for dirty or damaged elements. Clean or replace dirty filter elements. Replace all damaged elements.	✓	
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.

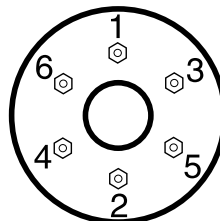
**Table 4-2. Monthly Service Checks**

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.	✓		
Change engine oil.		✓	
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.		✓	
Clean spark plug and readjust if necessary.		✓	
Check outrigger bushings and replace if necessary per paragraph 4-5.		✓	
Replace paper air filter element.			✓
Replace hydraulic oil and oil filter.			✓
Replace spark plug.			✓
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 450 pounds. Load early version basket with 400 pounds. See figures 6-16 and 6-16A for basket views.			✓

## 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.



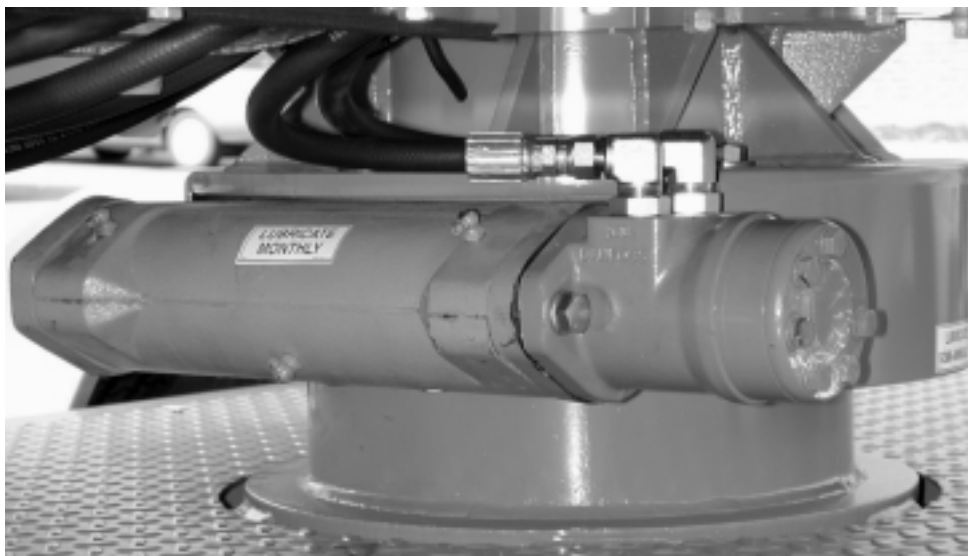
**Figure 4-1. Wheel Nut Tightening Sequence**

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

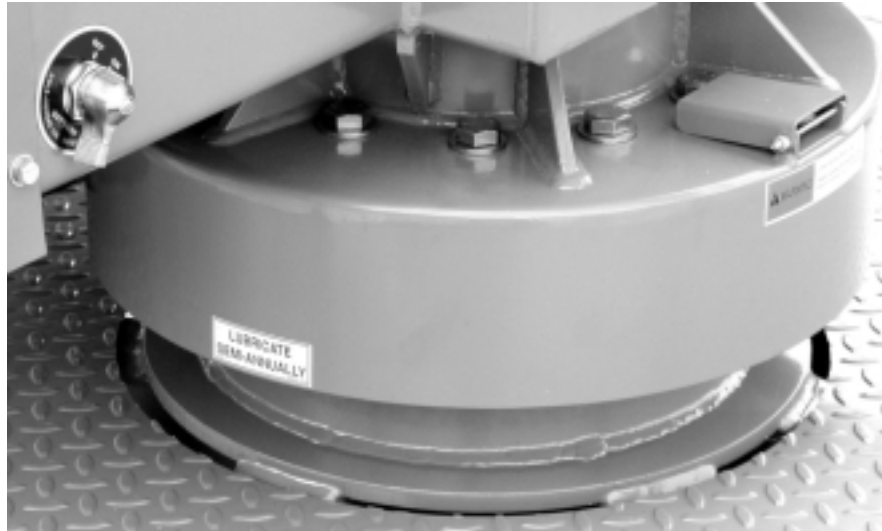
Lubrication makes operation of the XLB-4725A Boom Lift more efficient and extends the equipment life. Use the following procedures to lubricate the boom lift components.

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.

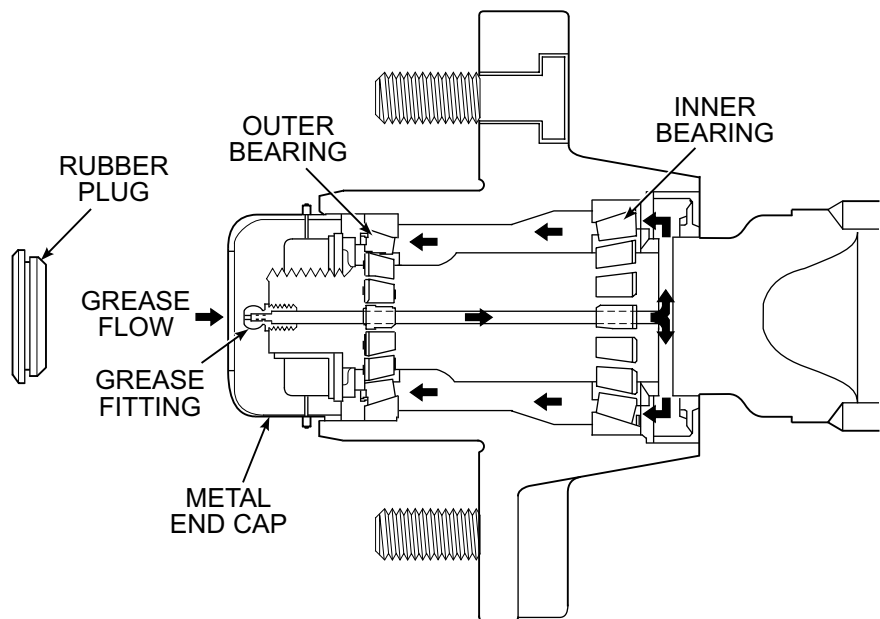


**Figure 4-3. Lubricate Semi-Annually**

4. 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.
5. 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.



6. 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.
  - 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**

7. 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 Energol HLP-HD46, 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

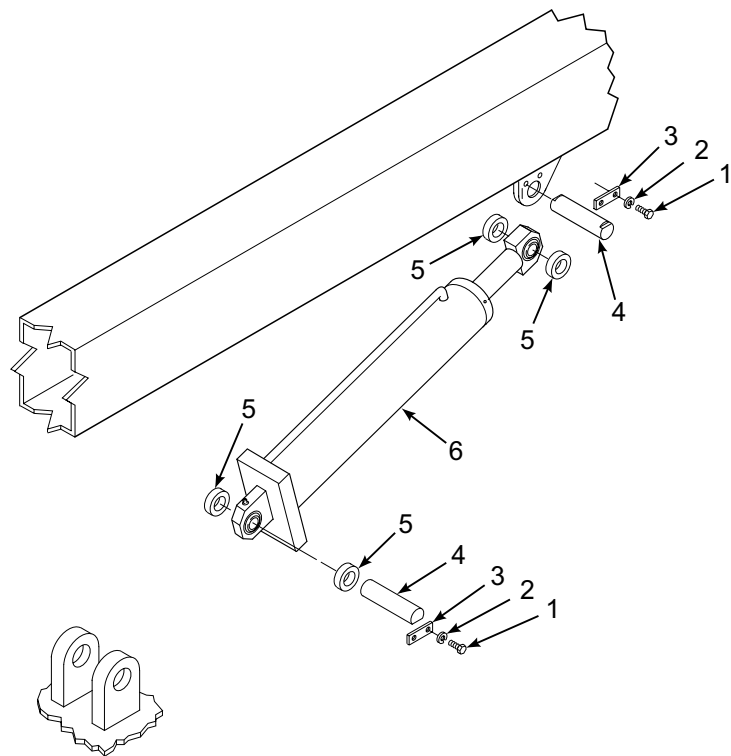
Delayed response or sporadic boom lift motions may indicate air in the lift cylinders. Use the following procedure to bleed entrapped air from the hydraulic system.

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 supports, 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.

**NOTE: Do not tamper with the cylinder counterbalance valves. If the counterbalance valves need adjustment, contact the Bil-Jax Service Department at 419.445.9675.**

### 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).

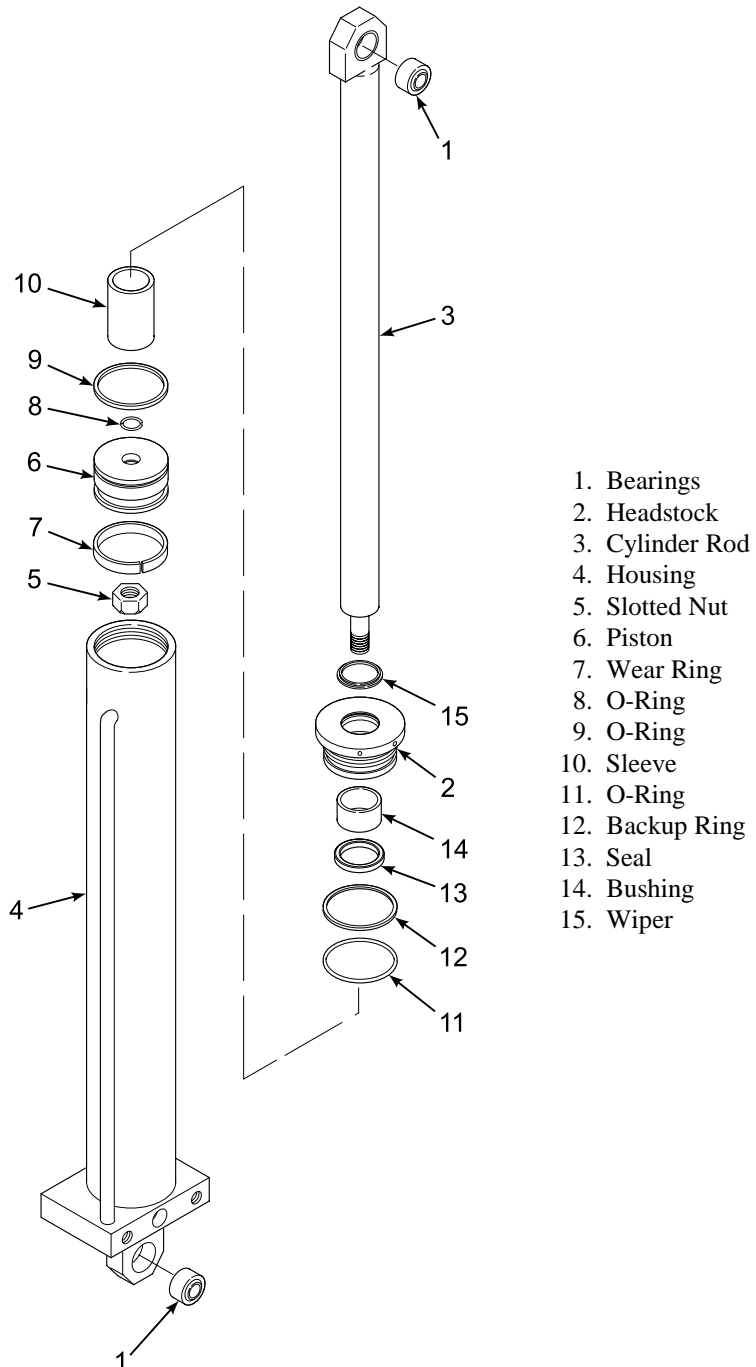


Figure 4-6. Hydraulic Cylinder Repair

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 LEVELING SYSTEM

### Check and Replace Outrigger Bushings

Check outrigger bushings every six months according to the following procedure:

1. Extend the outrigger (Figure 4-7). With the jack raised, draw a pencil line where the outrigger arm lines up with the latch pin mounting plate.
2. Lower the outrigger jack to raise the trailer wheel. Mark a second line where the outrigger arm lines up with the latch pin mounting plate.
3. Lower the trailer. Measure the distance between the two marks. If the distance exceeds 1/16 in., replace the outrigger bushings.

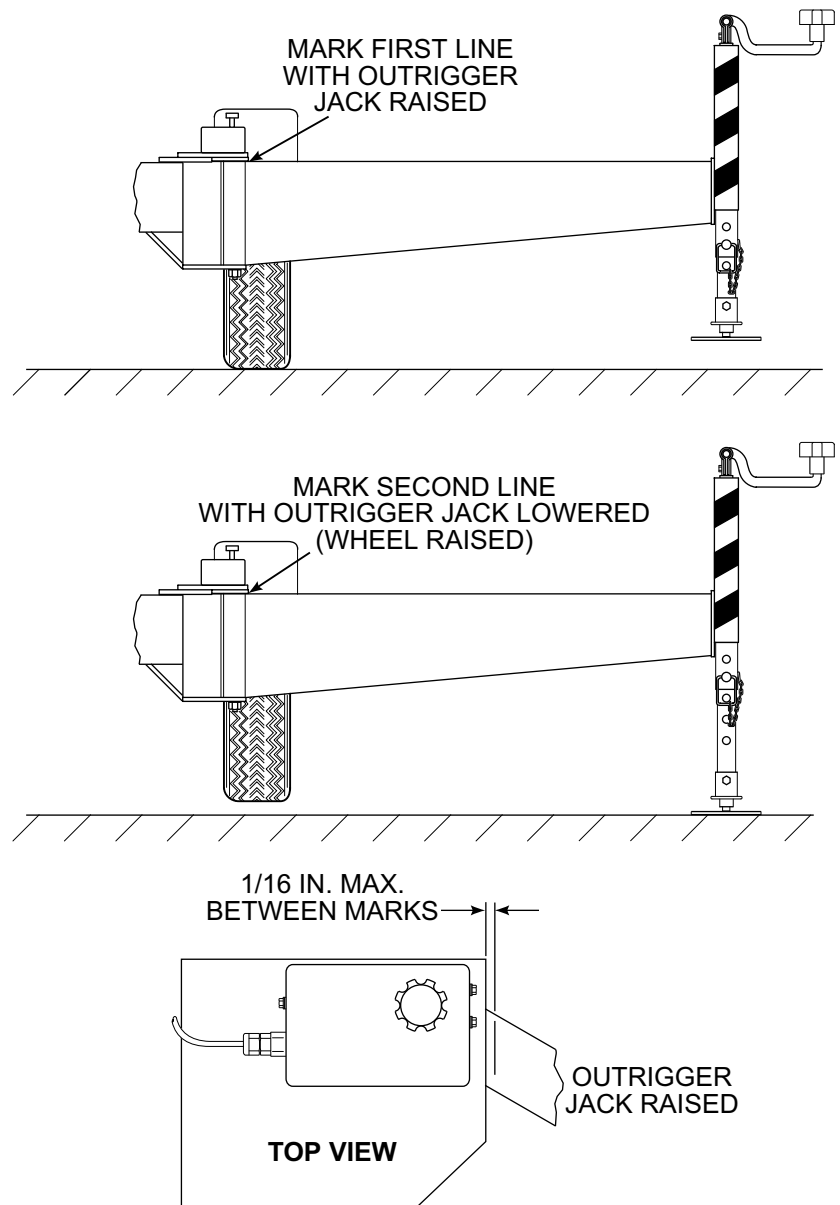
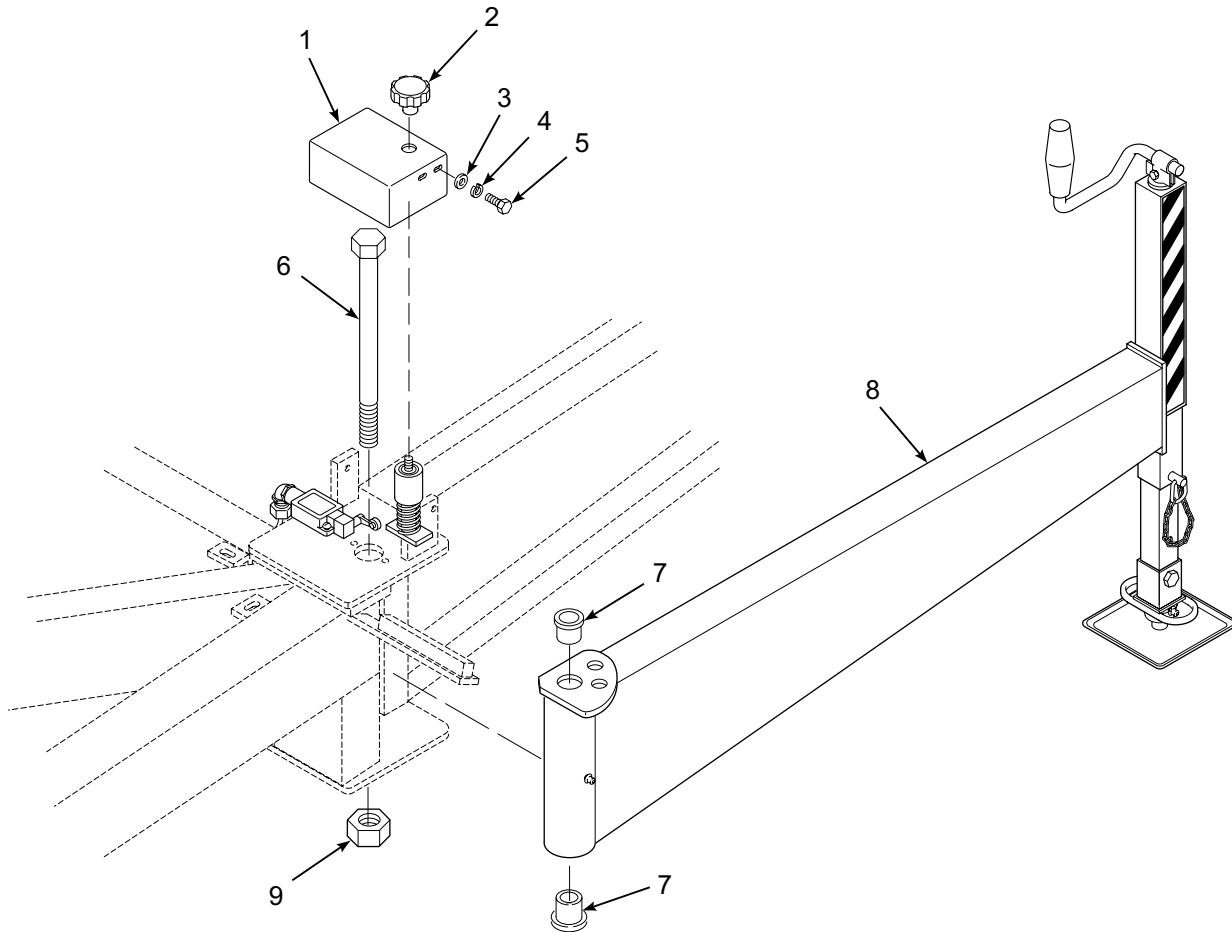


Figure 4-7. Checking Outrigger Bushings

Perform the following procedure to replace outrigger bushings. Refer to Figure 4-8.

1. Remove three screws (5), lock washers (4), and flat washers (3).
2. Unscrew and remove fluted knob (2). Remove pin cap (1).
3. Remove nylon lock hex nut (9) and cap screw (6). Remove outrigger (8).
4. Remove and replace bushings (7).
5. Reinstall the outrigger in reverse order of removal.



- |                 |                       |
|-----------------|-----------------------|
| 1. Pin Cap      | 6. Cap Screw          |
| 2. Fluted Knob  | 7. Bushings           |
| 3. Flat Washers | 8. Outrigger          |
| 4. Lock Washers | 9. Nylon Lock Hex Nut |
| 5. Screws       |                       |

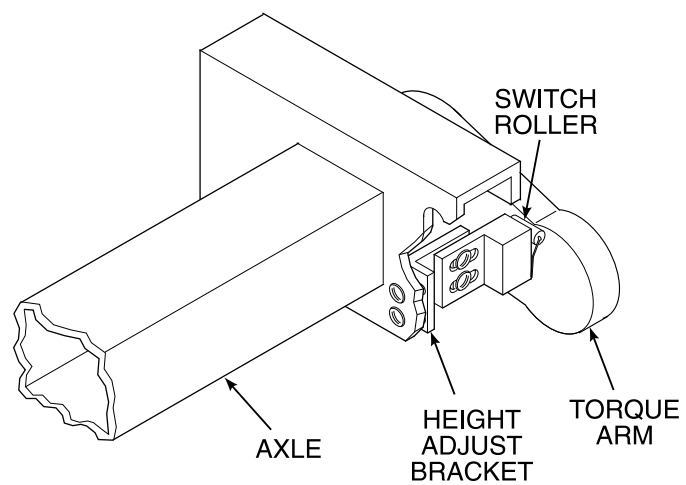
**Figure 4-8. Outrigger Bushing Replacement**



## 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 4-9.
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 4-9. Adjusting Axle Position Switches**

## 4-6 TROUBLESHOOTING

**Table 4-3. Troubleshooting Chart**

<b>Problem</b>	<b>Cause</b>	<b>Correction</b>
1. Outriggers indicator lamp will not light up.	<ul style="list-style-type: none"> <li>a. Master power switch turned off.</li> <li>b. Emergency stop or power button engaged (pushed in).</li> <li>c. All outriggers not deployed.</li> <li>d. At least one wheel not raised.</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn on master power switch.</li> <li>b. Rotate emergency stop buttons clockwise to disengage.</li> <li>c. Deploy all outriggers.</li> <li>d. Raise at least one wheel off the ground.</li> </ul>
2. Boom UP/DOWN and ROTATION functions do not work.	<ul style="list-style-type: none"> <li>a. Master power switch turned off.</li> <li>b. Low battery power.</li> <li>c. Boom lift is out of level.</li> <li>d. Emergency stop or power button engaged (pushed in).</li> <li>e. Battery ground or in-series cable loose.</li> <li>f. Short circuit burned out the power fuse.</li> <li>g. Battery cable or equipment ground lead loose or corroded.</li> <li>h. System interlock fault.</li> <li>i. Hydraulic pump not pumping.</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn on master power switch.</li> <li>b. Check battery charge LEDs on upper control panel. Recharge batteries if yellow or red LED is lighted.</li> <li>c. Level boom lift with outrigger jacks.</li> <li>d. Rotate emergency stop button clockwise to disengage.</li> <li>e. Check for and repair loose battery connections or ground fault.</li> <li>f. Check fuse status indicator D67 in lower control box. If LED is not on, replace fuse with spare and retry. If spare burns out, locate and correct short circuit in wiring.</li> <li>g. Clean and reconnect loose or corroded battery cable or ground lead.</li> <li>h. Check display for system status. Correct indicated fault conditions.</li> <li>i. Check pump motor operation; repair or replace if not running. Check gear pump; replace if hot to touch.</li> </ul>
3. Single boom lift or rotation function does not work.	<ul style="list-style-type: none"> <li>a. Loose wiring connector.</li> <li>b. Valve solenoid failed.</li> <li>c. System interlock fault.</li> <li>d. Broken or loose wire.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check wiring terminals in control box and at valve manifold; repair loose wiring terminal.</li> <li>b. Swab out valve solenoids and recheck function; replace solenoid if faulty.</li> <li>c. Check display for system status. Correct indicated fault conditions.</li> <li>d. Repair or replace wire.</li> </ul>
4. Boom lift and rotate functions do not operate properly.	<ul style="list-style-type: none"> <li>a. Rheostat or rheostat wiring failure.</li> <li>b. Valve solenoid not proportional type.</li> <li>c. Loose solenoid wiring.</li> <li>d. System interlock fault.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check rheostat; replace rheostat or repair wiring if loose or damaged.</li> <li>b. Swab out valve solenoids and recheck function; replace solenoid if faulty.</li> <li>c. Check wiring terminals in control box and at valve manifold; repair loose wiring terminal.</li> <li>d. Check display for system status. Correct indicated fault conditions.</li> </ul>

**Table 4-3. Troubleshooting Chart, Continued**

<b>Problem</b>	<b>Cause</b>	<b>Correction</b>
5. No operation of all functions when the trigger or speed control knob and a function switch is activated.	<ul style="list-style-type: none"> <li>a. Master power switch turned off.</li> <li>b. Short circuit burned out the power fuse.</li> <li>c. System interlock fault.</li> <li>d. Battery cable or equipment ground lead loose or corroded.</li> <li>e. Hydraulic pump not pumping.</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn on master power switch.</li> <li>b. Check fuse status indicator D67 in lower control box. If LED is not on, replace fuse with spare and retry. If spare burns out, locate and correct short circuit in wiring.</li> <li>c. Check display for system status. Correct indicated fault conditions.</li> <li>d. Clean and reconnect loose or corroded battery cable or ground lead.</li> <li>e. Check pump motor operation; repair or replace if not running. Check gear pump; replace if hot to touch.</li> </ul>
6. Boom lift and rotate functions operate intermittently.	<ul style="list-style-type: none"> <li>a. Loose connection at trigger or speed control knob.</li> <li>b. Loose connector at valve coil.</li> <li>c. System interlock fault.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check display reading for status. Reconnect wiring.</li> <li>b. Check wiring connection to valve coil; repair loose wiring.</li> <li>c. Check display for system status. Correct indicated fault conditions.</li> </ul>

### Troubleshooting Aids

A controller board with fault display LEDs and an error code display is inside the lower control panel. When a problem arises, open the lower control panel. Turn power on and observe the control board indicators. See Tables 4-4 and 4-5 for interpreting error codes and LED indicators on the controller board. Table 4-7 defines the level sensor LEDs in Figure 4-11. Hydraulic and electrical diagrams are provided in Figures 4-12 through 4-15.

**Table 4-4. Error Codes**

<b>Code</b>	<b>Error</b>	<b>Description</b>
EC01	Data Communications Error	Communication failure during self-test.
EC02	Proportional Control Out of Range	Boom lift function outside of programmed safe operating zone.
EC03	Upper Cylinder Down Output	Upper cylinder down circuit wiring or valve solenoid faulty.
EC04	Upper Cylinder Up Output	Upper cylinder up circuit wiring or valve solenoid faulty.
EC05	Motor/Run/Throttle Solenoid Output	Engine stop or throttle control circuit wiring or control device faulty.
EC06	Tilt Alarm Output (Beeper)	Alarm output circuit wiring or alarm beeper faulty.
EC08	Lower Cylinder Down Output	Lower cylinder down circuit wiring or valve solenoid faulty.
EC09	Lower Cylinder Up Output	Lower cylinder up circuit wiring or valve solenoid faulty.
EC10	Rotate CCW Output	Rotate CCW circuit wiring or valve solenoid faulty.
EC11	Rotate CW Output	Rotate CW circuit wiring or valve solenoid faulty.
EC12	Emergency Down Output	Emergency down circuit wiring or valve solenoid faulty.
EC13	Choke Output	Choke control circuit wiring or choke solenoid faulty.
EC14	Motor Start Output	Engine start circuit wiring or control device faulty.
EC15	Primary Bucket Switch Input	Primary bucket switch or switch circuit wiring faulty.
EC16	Secondary Bucket Switch Input	Secondary bucket switch or switch circuit wiring faulty.

Note: The related switch must be functionally sound to produce an error code other than EC01, EC06, EC15, or EC16.

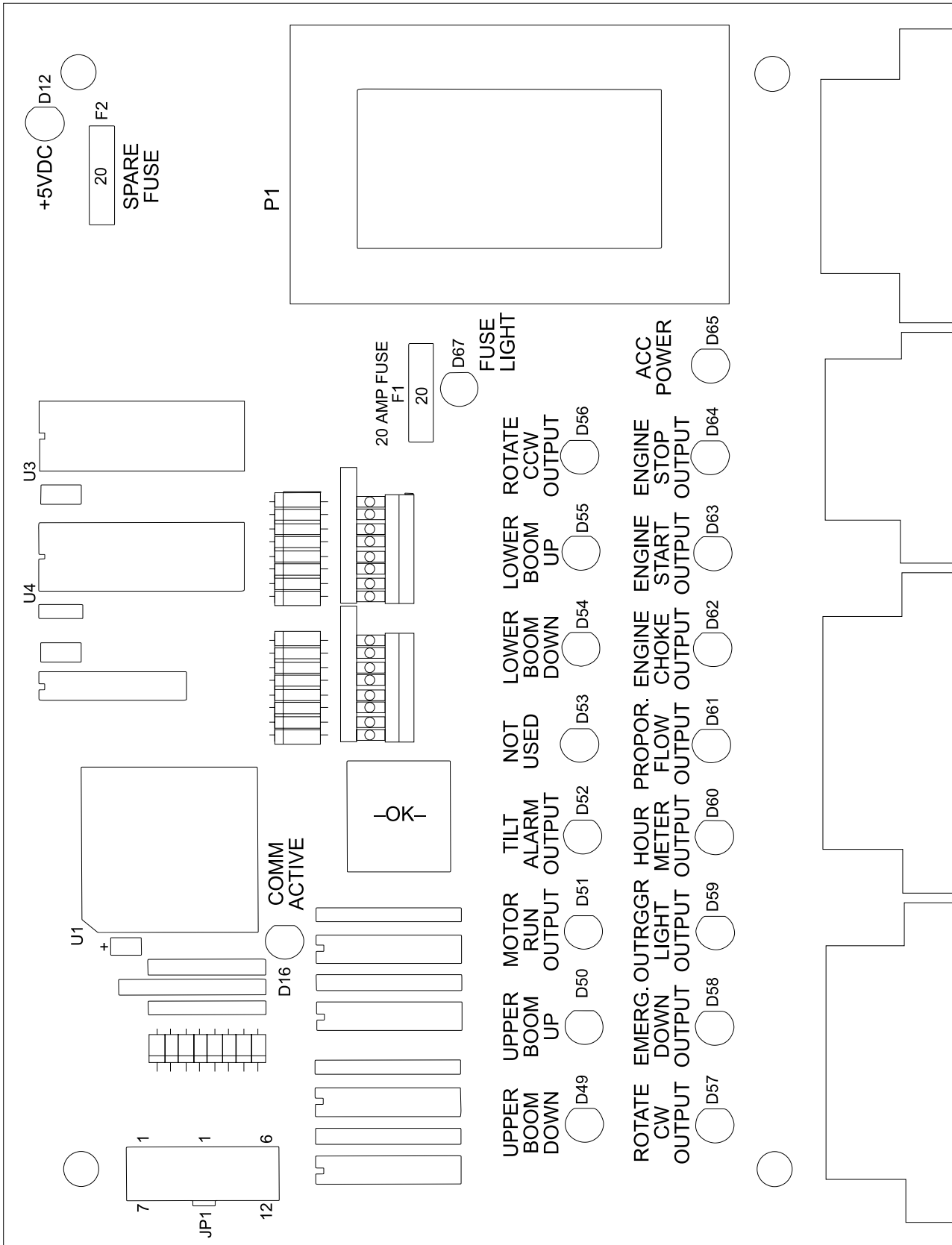


Figure 4-10. Lower Controller Board

 **CAUTION**

Integrated circuits can be damaged by static electrical discharge. When touching or handling circuit boards, wear an anti-static wristband grounded to a boom lift ground lug. When replacing a circuit board, stand on a grounded anti-static floor mat. Always seal circuit boards in static shield bags for storage and transport. Failure to use anti-static discharge protection can cause permanent damage to integrated circuit components.

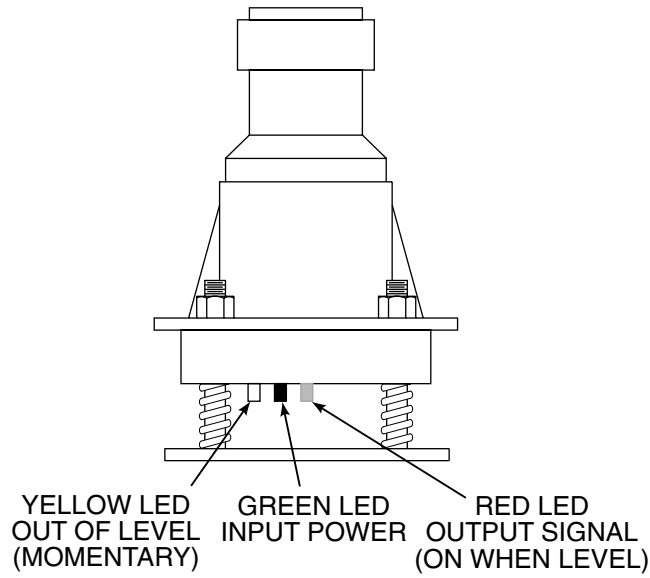
Table 4-5. LED Indicators

Indicator	Function	Color
D12	+5 Volt Regulated Supply	Red
D16	Communications Active	Green
D49	Upper Boom Down Output	Red
D50	Upper Boom Up Output	Red
D51	Motor Run Output	Red
D52	Tilt Alarm Output	Red
D53	Spare	Red
D54	Lower Boom Down Output	Red
D55	Lower Boom Up Output	Red
D56	Rotate CCW Output	Red
D57	Rotate CW Output	Red
D58	Emergency Down Output	Red
D59	Outrigger Light Output	Red
D60	Hour Meter Output	Red
D61	Proportional Flow Output	Red
D62	Engine Choke Output	Red
D63	Engine Start Output	Red
D64	Engine Stop Output	Red
D65	Accessory Power Output	Red
D67	Fuse Light	Red

Note: D16 should light when power is first turned on (following the control system self-test). A lighted red LED indicates a fault.

Table 4-6. Upper Control Box Specifications

Power Supply Voltage	12V/24V nominal, 7V to 35V transient
Operating Temperature	-40°C to +85°C
Storing Temperature	-40°C to +100°C
Digital Inputs	12/24V DC, 60V transient
Analog Inputs	0 to 5V DC, 60V transient



**Figure 4-11. Level Sensor**

**Table 4-7. Level Sensor LEDs**

<b>Color</b>	<b>Description</b>
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.

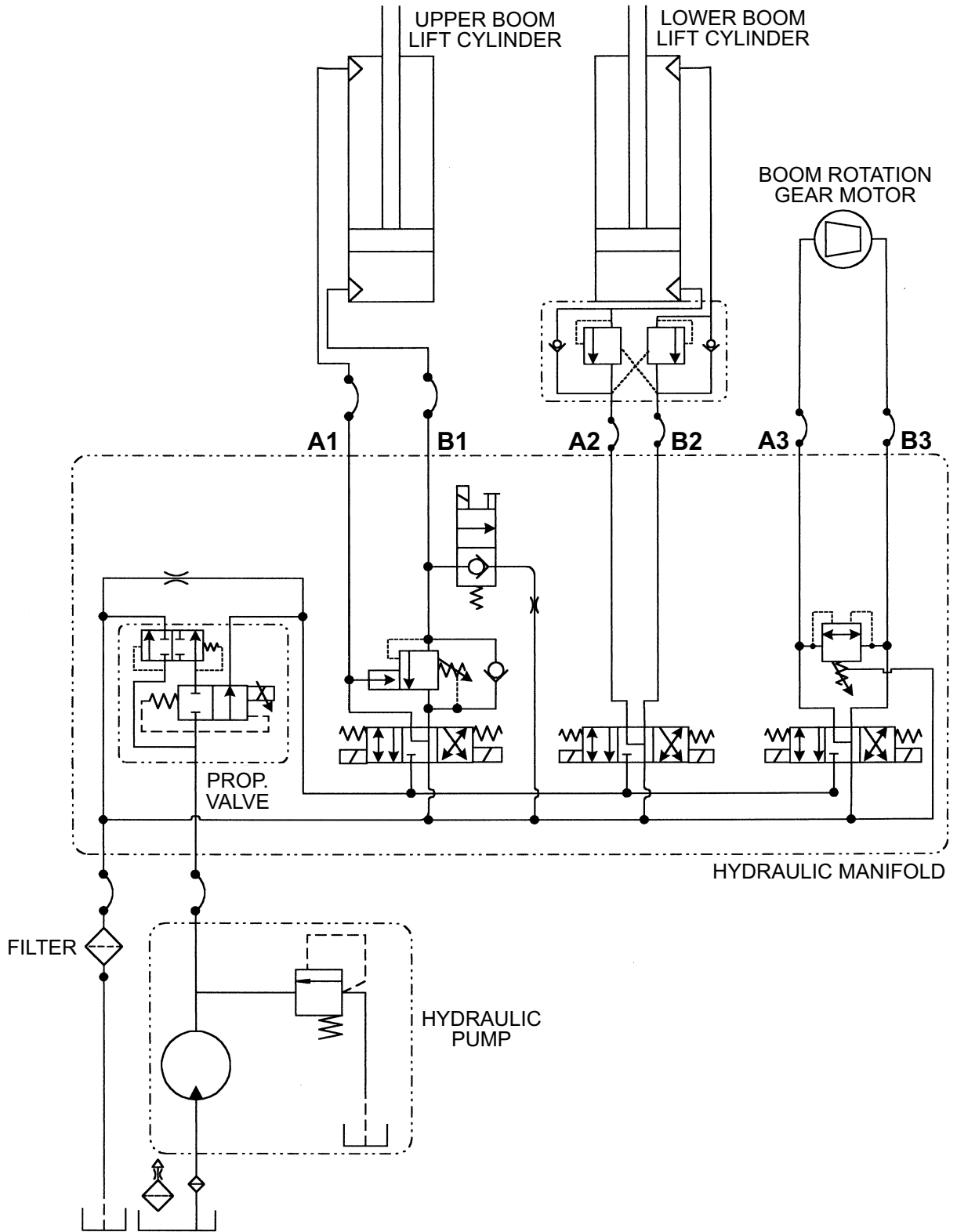


Figure 4-12. DC Model Hydraulic Diagram

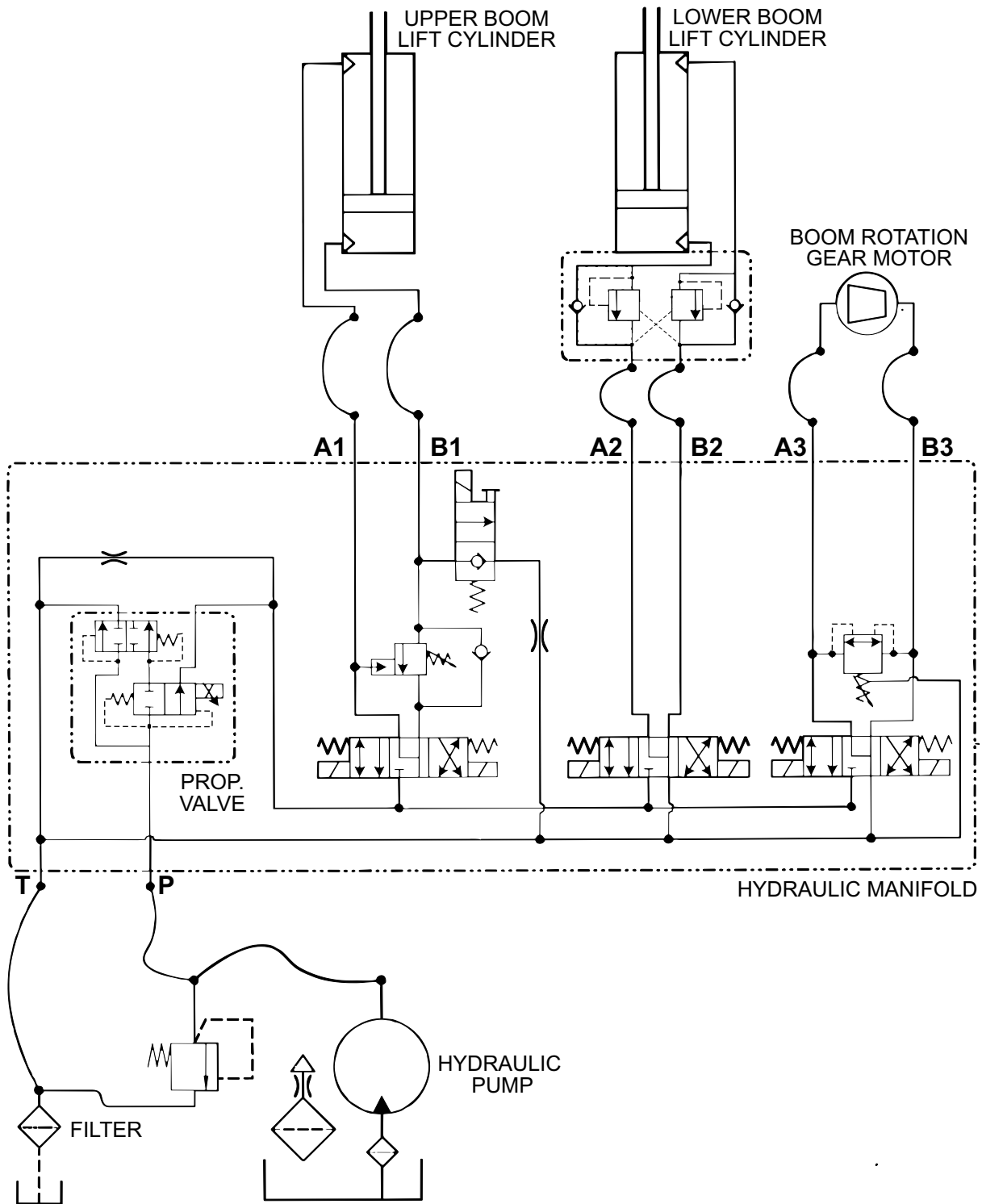


Figure 4-13. Gas Model Hydraulic Diagram



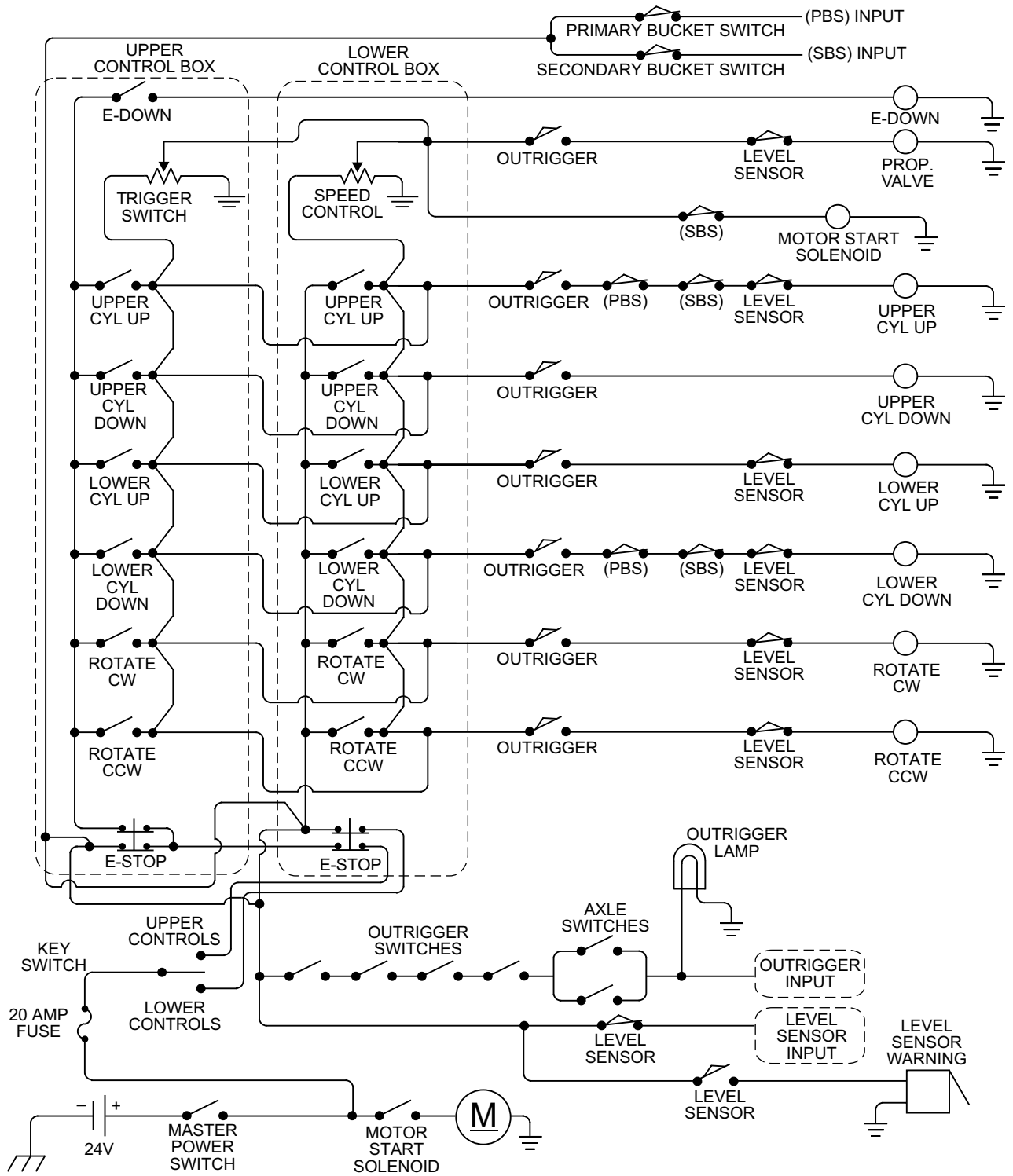


Figure 4-14. PC Logic Diagram, DC Model

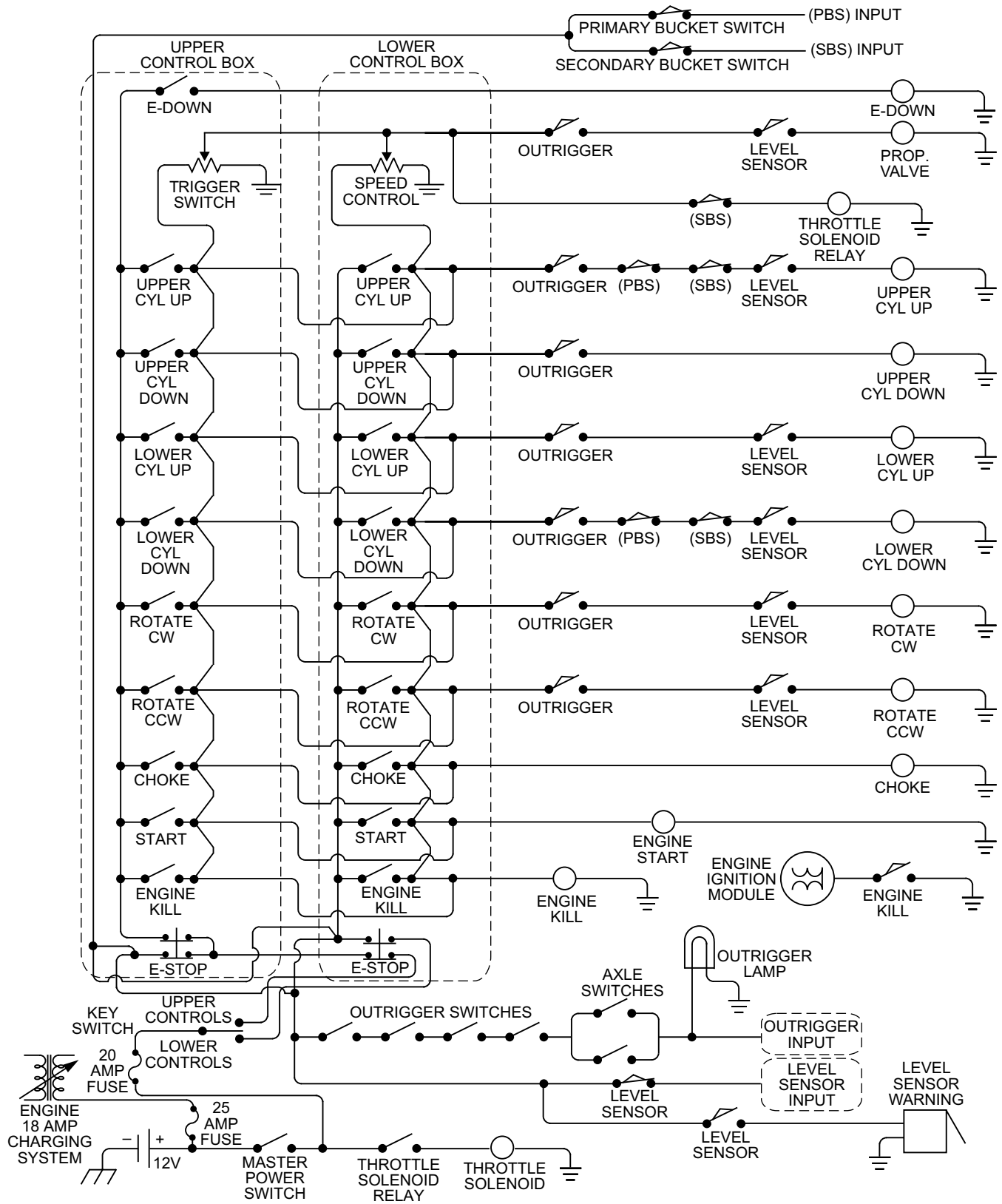


Figure 4-15. PC Logic Diagram, Gas Model

## 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 CarbonDioxide, 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/m<sup>3</sup> 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/m<sup>3</sup> OSHA 29 CFR 1910.1000

HEALTH: 1 FIRE: 1 SPECIFIC: X REACTIVITY: 0

-----  
 PHYSICAL DATA: BOILING POINT: 400+ DEG F. VAPOR PRESSURE (PSIA): N/A  
 SPECIFIC GRAVITY (H<sub>2</sub>O=1): 0.87 SOLUBILITY IN WATER: NEGLIGIBLE  
 PH OF CONCENTRATE: N/A  
 APPEARANCE AND ODOR: PALE YELLOW, PETROLEUM ODOR

-----  
 FIRE AND EXPLOSION HAZARD DATA FLASH POINT(METHOD USED): 425 DEG F.  
 FLAMMABLE LIMITS: NOT DETERMINED LEL: N/A UEL: N/A  
 EXTINGUISHING MEDIA: SAND, DRY CHEMICAL, FOAM, CO<sub>2</sub>. TREAT AS CLASS B FIRE.  
 UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

-----  
 REACTIVITY 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-4725A Boom Lift.

**Table 5-1. Replacement Decals, DC Model**

Decal No.	Description of Decal	Qty
B06-00-0006	EMERGENCY CONTROL VALVE	1
B06-00-0033	CAUTION: THIS UNIT SHALL ONLY BE TOWED WHEN...	2
B06-00-0034	DANGER: ...DURING CHARGING, EXPLOSIVE OXYHYDROGEN GAS...	1
B06-00-0036	LUBRICATE WEEKLY	36
B06-00-0037	LUBRICATE SEMI-ANNUALLY	1
B06-00-0041	MASTER POWER SWITCH	1
B06-00-0060	STOP...READ OPERATING...	2
B06-00-0062	THIS PLUG 115 VOLT	2
B06-00-0068	THE HYDRAULIC SYSTEM...	1
B06-00-0115	1500 WATT LOAD LIMIT	1
B06-00-0116	OPERATE WITH FULLY CHARGED BATTERIES...	1
B06-00-0129	OIL LEVEL – TRANSPORT POSITION	1
B06-00-0130	LUBRICATE MONTHLY	5
B06-00-0139	DANGER: BEFORE USING: EXTEND, LOCK, STABILIZE...	5
B06-00-0145	DANGER: BOOM SAFETY INSTRUCTIONS	2
B06-00-0146	DANGER: HIGH VOLTAGE OPERATION – LARGE LABEL	1
B06-00-0151	DANGER: 110 VOLT	1
B06-00-0161B	Bil-Jax TRANSFER	2
B06-00-0167	Caution Tape, Black and Yellow	
B06-00-0173	SAFETY HARNESS LANYARD ATTACHMENT POINT	2

Decal No.	Description of Decal	Qty
B06-00-0189	WARNING: LEVEL MACHINE BEFORE USE...	1
B06-00-0192	OPERATION AND SERVICE MANUAL INSIDE	1
B06-00-0225	WARNING: STAY CLEAR WHILE RAISING ...	1
B06-00-0243	GASOLINE FILL	1
B06-00-0261	CAUTION: ANSI DECAL	1
B06-00-0268	EMERGENCY ROTATION HANDLE	1
B06-00-0290	ATTENTION: DC MOTOR FAILURE WARNING	1
B06-00-0321 or B06-00-0380	MAXIMUM CAPACITY 400 LBS (early model basket) MAXIMUM CAPACITY 450 LBS	2
B06-00-0328 or B06-00-0328-A	XLB-4725A SPECIFICATIONS	2
B06-00-0334	DANGER: HIGH VOLTAGE OPERATION – SMALL LABEL	1
B06-00-0335	XLB-4725A TRANSFER	2
B06-00-0371	ERROR CODES	1
B06-00-0372	UPPER CONTROLS DECALS, DC MODEL	1
B06-00-0373	LOWER CONTROLS DECALS, DC MODEL	1
B06-00-0374	UPPER CONTROLS DECALS, GAS MODEL	1
B06-00-0375	LOWER CONTROLS DECALS, GAS MODEL	1
B06-00-0376	OPERATING INSTRUCTIONS – PROPORTIONAL CONTROLS	2

**⚠ DANGER** BEFORE USING: EXTEND, LOCK, STABILIZE  
OUTRIGGERS; AND LEVEL MACHINE. CFTRFC B06-00-0130

B06-00-0139

**⚠ 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 electrical power source and should be considered energized by all personnel coming in contact with machine. CFTRFC B06-00-0146

**!! 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. B06-00-0290

**OPERATION AND SERVICE MANUAL INSIDE**

COFC B06-00-0192

**EMERGENCY ROTATION HANDLE**

OFA B06-00-0268

**THIS PLUG 115 VOLT**

ELL B06-00-0062

**GASOLINE FILL**

B06-00-0243

**⚠ 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 valves, 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. FFU B06-00-0261

**⚠ CAUTION**

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

COIA/RFT B06-00-0033

**BOOM OPERATING INSTRUCTIONS (PROPORTIONAL CONTROLS)**

1. Read and follow all manuals and decals.
2. Disconnect the boom hitch from the towing vehicle.
3. Extend lock and base all four (4) outriggers.
4. Level the lift using the four (4) outriggers and by referencing the T-level located at the front of the boom power base. Remove as much weight as possible from the trailer tires.
5. Always wear safety harness and attach lanyard when operating from the basket.
6. If using gas model, start engine from either the lower or upper control box. It may be necessary to hold the choke for a short time when engine is cold. If using DC model, turn master power switch to "on". Familiarize yourself with the operation of the lift, using the ground controls before operating the lift from the platform.
7. On the lower control panel, position "control selector" switch to "upper". The lift is now ready to operate from the basket.
8. Select function by pressing and holding button. Grasp the handle and slowly squeeze the trigger. Boom speed increases the harder the trigger is squeezed.

ITT B06-00-0374

**⚠ DANGER**

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

CFTRFC B06-00-0334

**SAFETY HARNESS LANYARD ATTACHMENT POINT**

UFC B06-00-0173

B06-00-0376

**⚠ 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 owners manual and all decals on machine before operating. It is operators responsibility to comply with all warnings and instructions.
- Survey the job site and identify all potential hazards.
- Inspect lift for proper maintenance and any damage or worn components. DO NOT operate until proper maintenance has been performed and all damaged or worn parts have been replaced. One remedy listed for proper maintenance is to be replaced.
- NEVER TAKE CHARGES—DO NOT use this lift if you are under the influence of drugs or alcohol, or if you feel drowsy, ill, or unsteady in any way.
- OPERATE ON FIRM AND LEVEL SURFACE ONLY—do not use on loose ground or other soft surfaces. The large wheels require tracks should be added to the base of the outriggers. Additional track support may be necessary on unlevel or soft terrain.
- Extend, lock, and stabilize all four outriggers.
- Level machine before use of basket assembly. It is not level and the necessary outrigger adjustment should be made to level machine before continuing.
- At all times, wear seat belt, safety harness and lanyard.
- Check battery before every lift. Make sure the battery is fully charged.
- When working on public roads, warnings and barriers must be set up in accordance with all local, state, and federal traffic laws.
- Control of lift must be kept at all times and other equipment away from unit while in use.

**DISUSE**

- To avoid head injuries, always keep hands inside basket area during boom movement.
- DO NOT use without all four outriggers fully extended, locked and stabilized.
- DO NOT release outriggers with boom extended or operator in basket.
- DO NOT move or reposition trailer while operator occupies basket.
- DO NOT use when exposed to high winds, rain, snow or ice.

**WORKFORCE** CFTRFC B06-00-0145

**LUBRICATE MONTHLY**

RF B06-00-0130

**LUBRICATE SEMI-ANNUALLY**

COIA B06-00-0037

**EMERGENCY CONTROL VALVE**

CFTRFC B06-00-0006

**LUBRICATE WEEKLY**

COIA B06-00-0036

**⚠ DANGER**

**110 VOLT**

GFT/LFG B06-00-0151

B06-00-0151

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.

FR/CFG

B06-00-0034

**MASTER  
POWER  
SWITCH**

RFT B06-00-0041

B06-00-0041

**STOP**

**READ OPERATING  
INSTRUCTIONS BEFORE  
OPERATING  
MACHINE**

RIL B06-00-0060

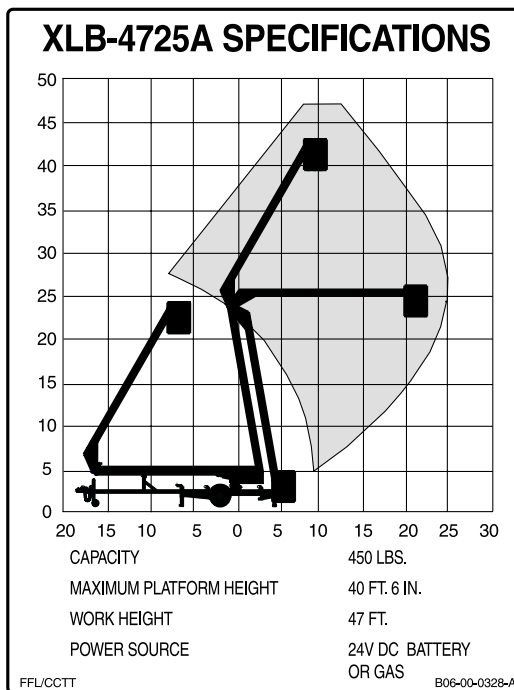
B06-00-0060

**⚠ WARNING**

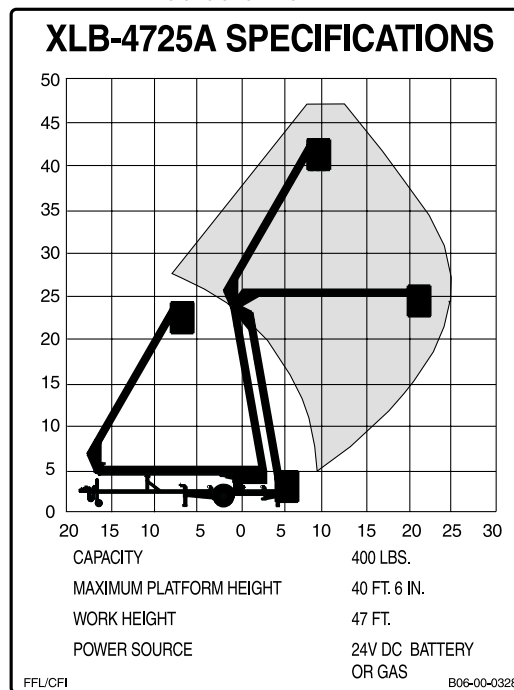
**STAY CLEAR  
WHILE RAISING  
OR LOWERING**

CCFO B06-00-0225

B06-00-0225



B06-00-0328-A



B06-00-0328

**TRANSPORT  
POSITION**

**MAX**

**MIN**

RIF B06-00-0129

B06-00-0129

**⚠ 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.

MS/CA/LL

B06-00-0116

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

OIL B06-00-0068

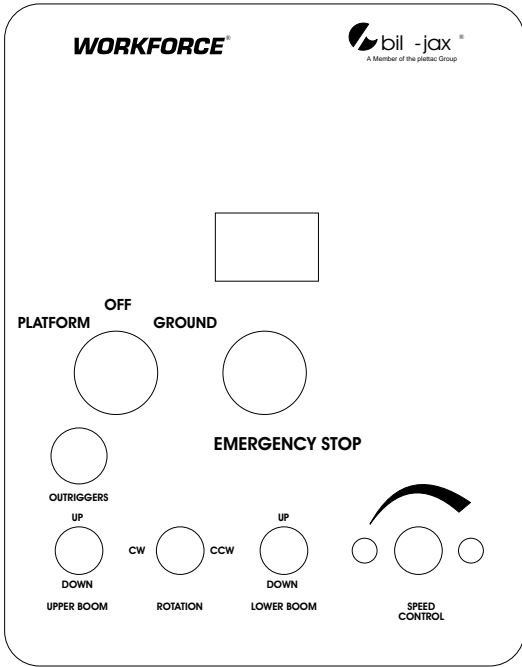
B06-00-0068

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

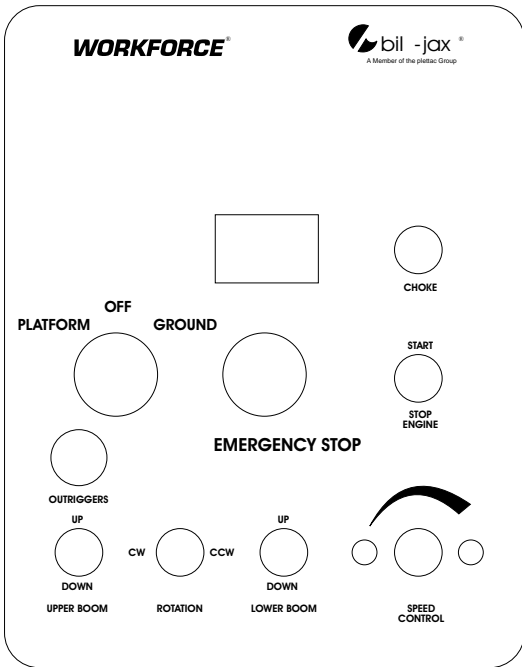
AIF/RFC B06-00-0115

B06-00-0115

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



B06-00-0373



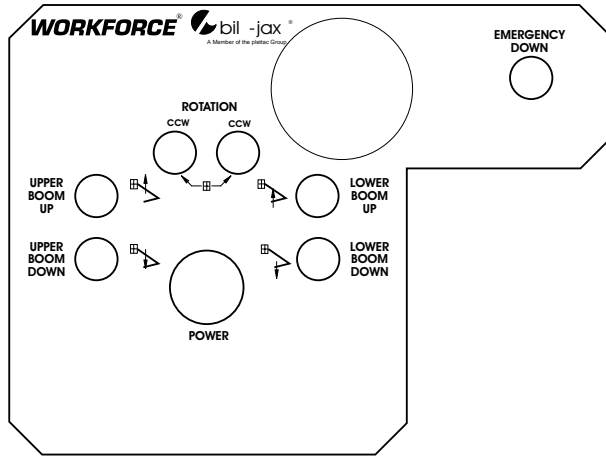
B06-00-0375

**BIL-JAX**

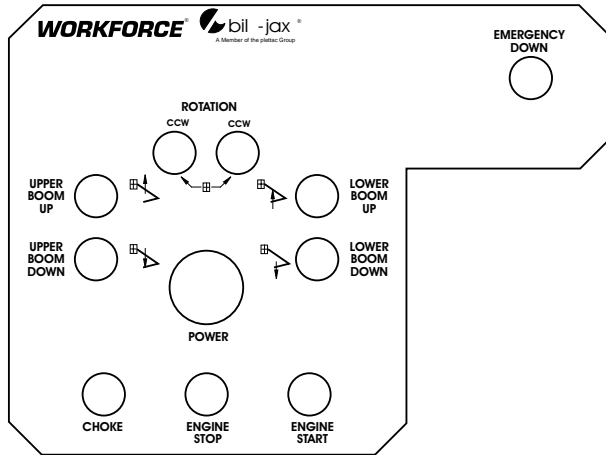
B06-00-0161B

**XLB-4725A**

B06-00-0335



B06-00-0372



B06-00-0374

**ERROR CODE CHART**

EC01	Data Communication Error
EC02	Proportional Control out of Range
EC03	Upper Cylinder Down Output
EC04	Upper Cylinder Up Output
EC05	Motor/Run/Throttle Solenoid Output
EC06	Tilt Alarm Output (Beeper)
EC08	Lower Cylinder Down Output
EC09	Lower Cylinder Up Output
EC10	Rotate CCW Output
EC11	Rotate CW Output
EC12	Emergency Down Output
EC13	Choke Output
EC14	Motor Start Output
EC15	Primary Bucket Switch Input
EC16	Secondary Bucket Switch Input

RTT

B06-00-0371

B06-00-0371

MAXIMUM CAPACITY

**400 LBS.**

AFL

B06-00-0321

B06-00-0321

MAXIMUM CAPACITY

**450 LBS.**

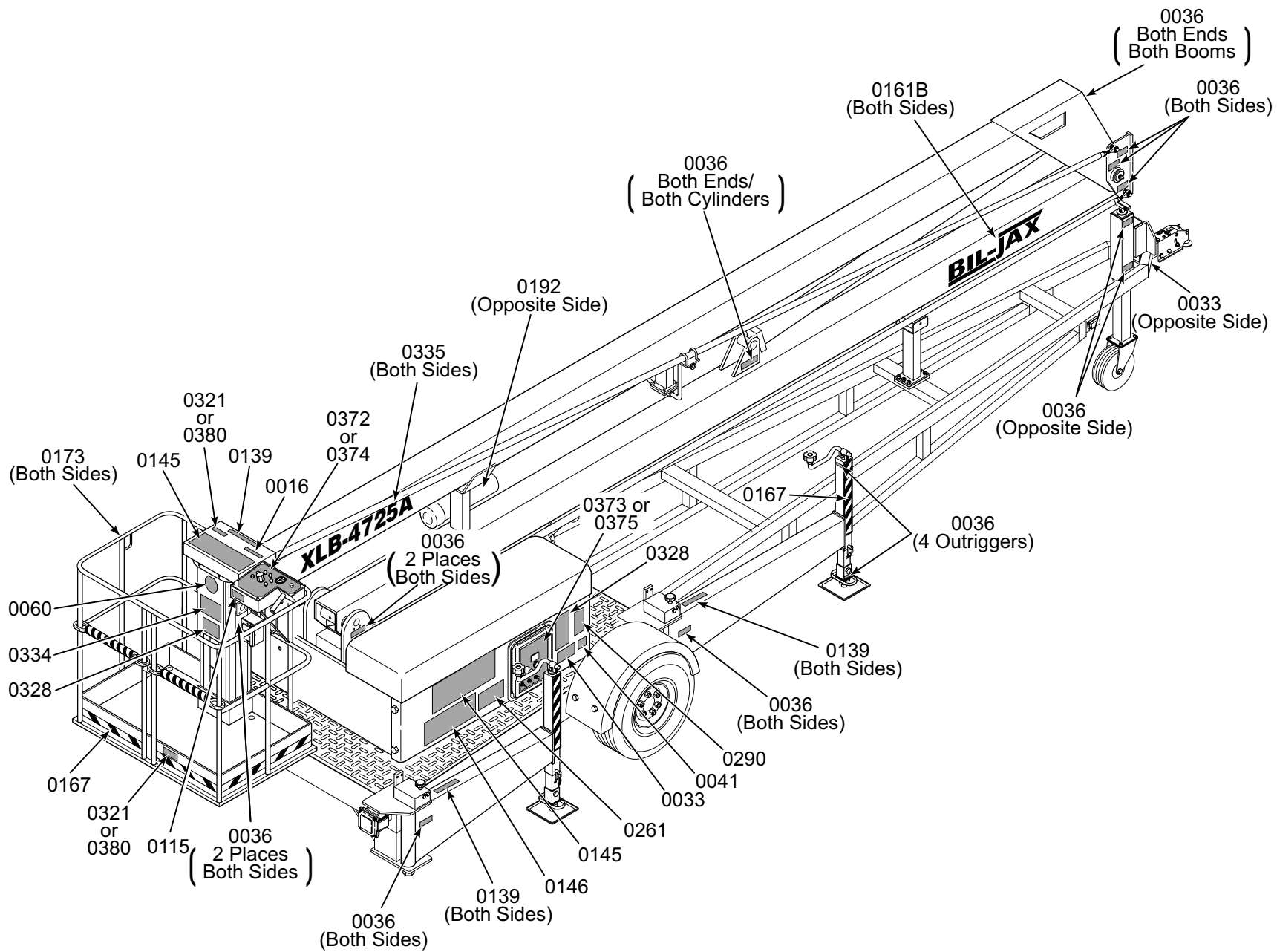
CCTT

B06-00-0380

B06-00-0380

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

Figure 5-2. Decal Locations, Trailer and Boom



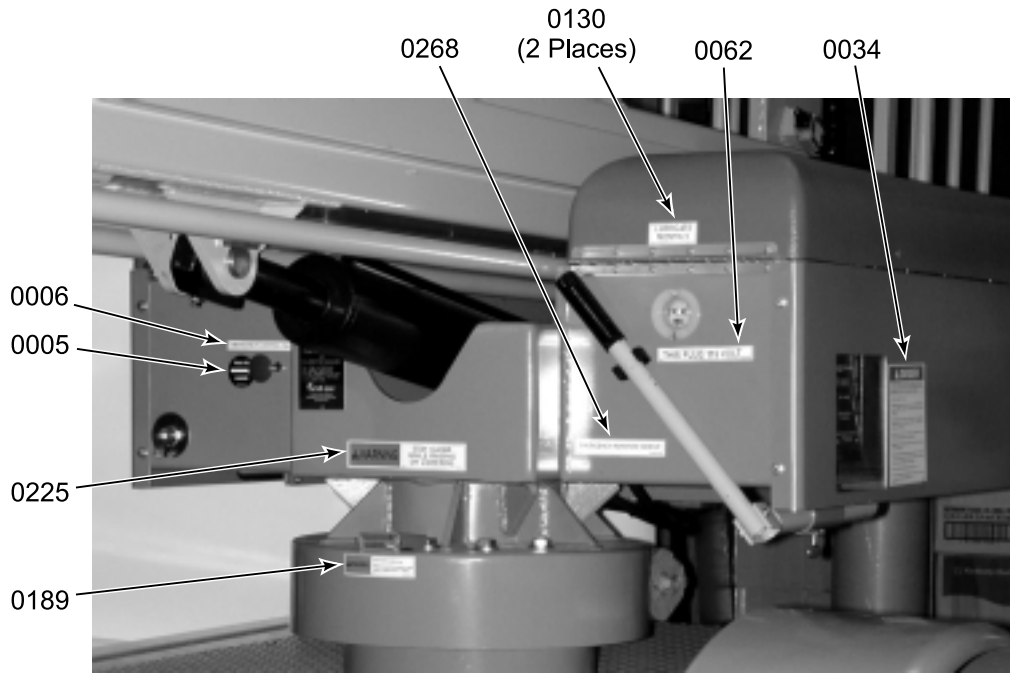


Figure 5-3. Decal Locations, Power Compartments Exterior



Figure 5-4. Decal Locations, Power Compartment Interior

# 6

## Parts List

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## 6-1 UPPER BOOM PARTS LIST

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

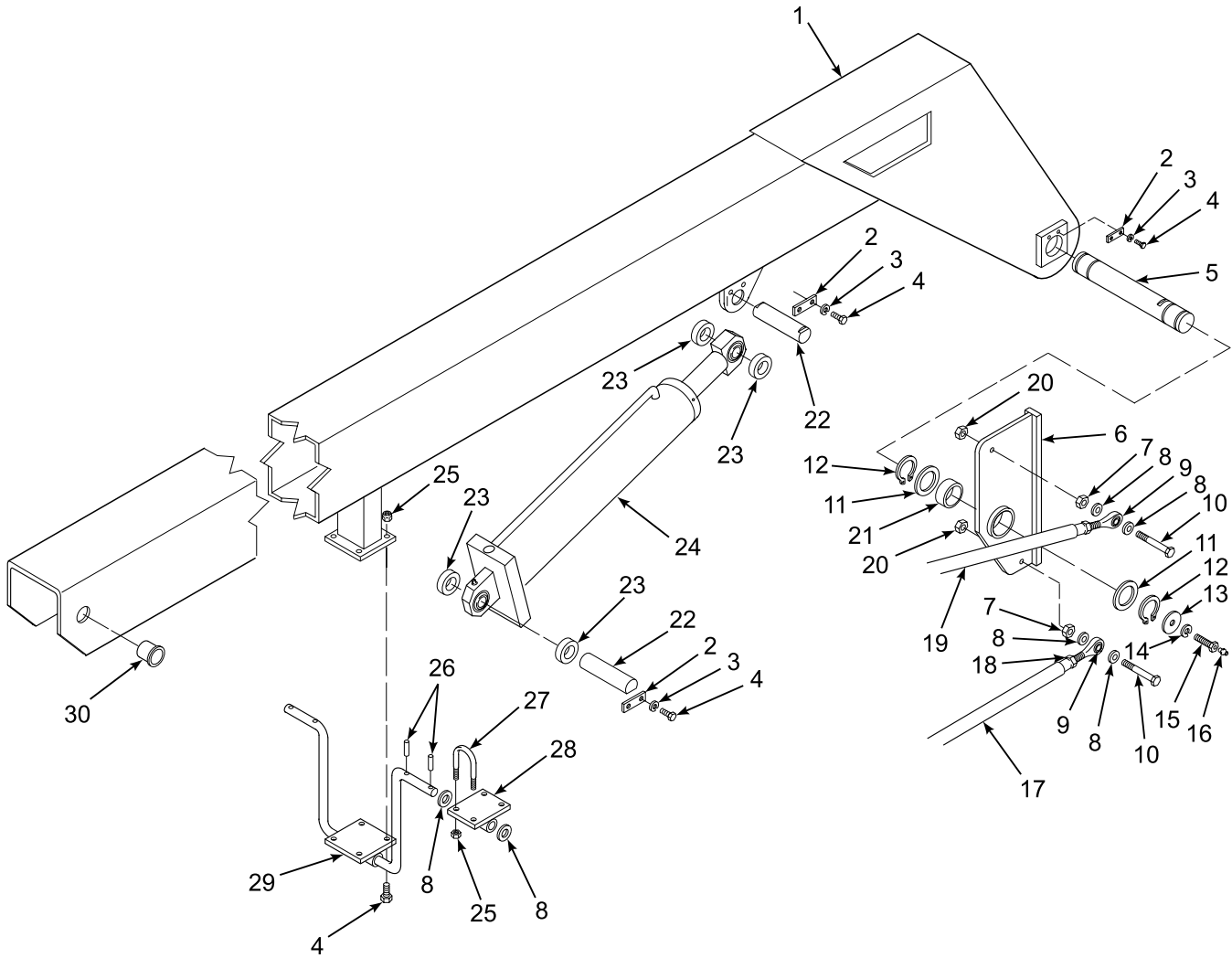


Figure 6-1. Upper Boom

Table 6-1. Upper Boom Parts List

Item No.	Part No.	Description	Qty
1	B14-00-0006	Boom, Upper	1
2	B29-00-0005	Plate, Lift Pin Locking	6
3	0090-0208	Washer, Lock, Split, 5/16 in.	12
4	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	16
5	B36-01-0022	Pin, Boom, Pivot	1
6	B29-00-0118	Leveling Bar Knuckle	2
7	0090-0485	Nut, Hex, 1/2-13	4
8	0090-0574	Washer, Flat, 1/2 in.	12
9	B25-00-0014	Bearing, Tie Rod End, 1/2 in. R.H. Thread	4
10	0090-0461	Screw, Cap, 1/2-13 x 2 in.	4
11	B04-06-0028	Washer, Shim	4
12	B04-07-0090	Ring, Retaining	4
13	B04-06-0001	Washer, Flat, 2 in. OD	2
14	0090-0210	Washer, Lock, Split, 3/8 in.	2
15	B04-05-0001	Screw, Cap, 3/8-16 x 1 in.	2
16	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	2
17	B11-03-0028	Bar, Lower Leveling	2
18	0090-0167	Nut, Jam, 1/2-20	4
19	B11-03-0027	Bar, Upper Leveling	2
20	0090-0191	Nut, Nylon Lock, 1/2-13	4
21	B25-00-0053	Bushing, Bronze, 1-1/2 in. ID	2
22	B36-01-0005	Pin, Lift Cylinder	2
23	B30-00-0002	Spacer, Lift Pin	4
24	B02-03-0022	Cylinder, Upper Boom Lift, 3 in. Bore x 54 in. Stroke (See Figure 6-3)	1
25	0090-0185	Nut, Nylon Lock, 5/16-18	12
26	0090-0285	Pin, Roll, 3/16 x 1 in.	4
27	0090-0662	U-Bolt	4
28	B29-00-0125	Bracket, U-Bolt	2
29	B29-00-0124	Support, Upper Leveling Bar	1
30	B25-00-0023	Bearing, Bronze	2

## 6-2 LOWER BOOM PARTS LIST

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

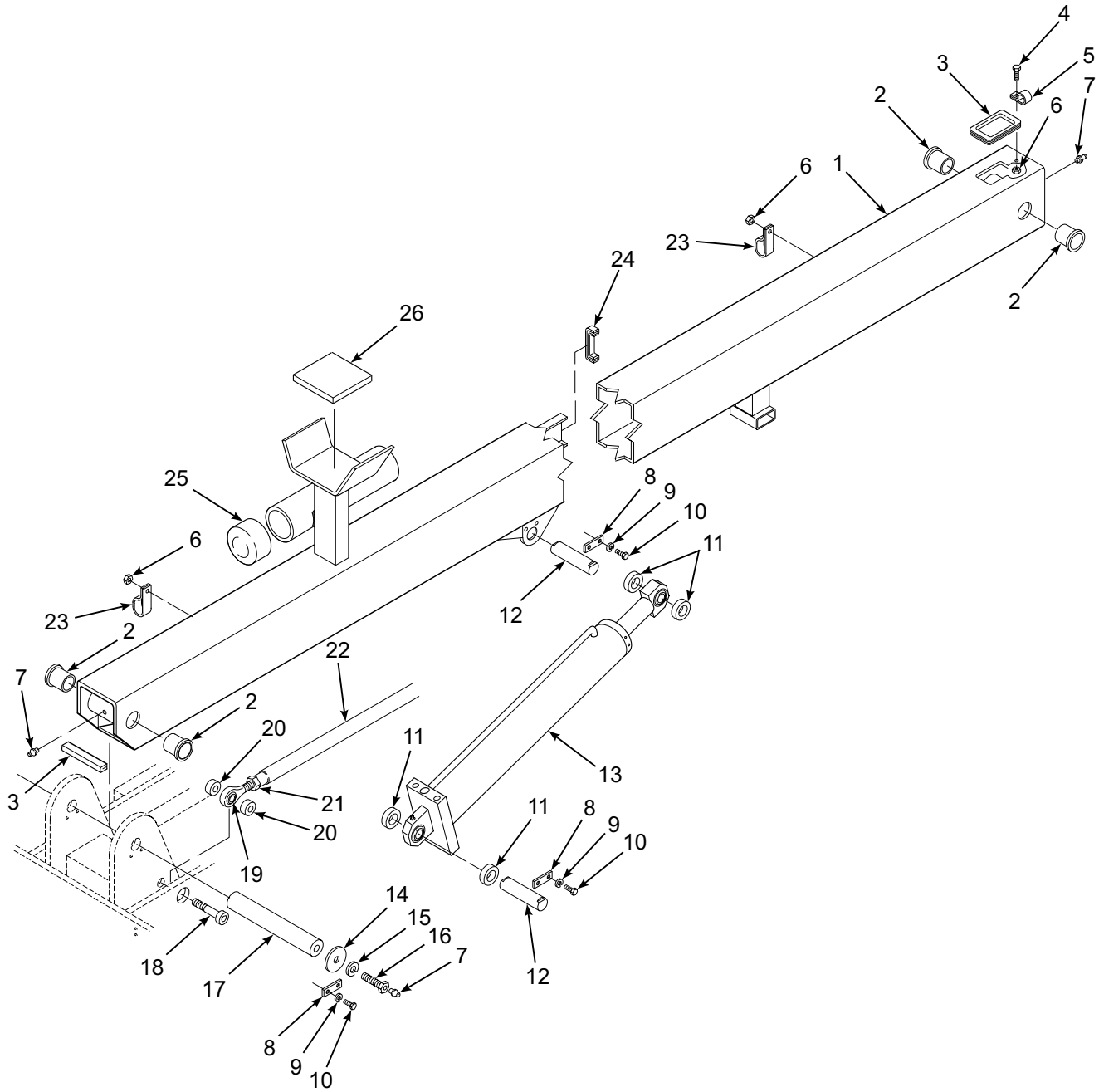


Figure 6-2. Lower Boom



Table 6-2. Lower Boom Parts List

Item No.	Part No.	Description	Qty
1	B14-00-0008	Boom, Lower	1
2	B25-00-0023	Bearing, Bronze, 1.75 OD x 1.5 ID	4
3	B34-00-0007	Trimlock, 1/4 in.	2 ft.
4	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	3
5	B04-07-0034	Clamp, Cable/Hose, DG 12	3
6	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	5
7	B00-00-0009	Fitting, Grease, 3/16 in. Drive	4
8	B29-00-0005	Plate	6
9	0090-0208	Washer, Lock, Split, 5/16 in.	12
10	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	12
11	B30-00-0002	Spacer, Lift Cylinder Pin	4
12	B36-01-0005	Pin, Lift Cylinder	2
13	B02-03-0013	Cylinder, Lower Boom Lift, 4 in. Bore x 25 in. Stroke (See Figure 6-4)	1
14	B04-06-0001	Washer, Flat, 2 in. OD	2
15	0090-0210	Washer, Lock, Split, 3/8 in.	2
16	B04-05-0001	Screw, Cap, 3/8-16 x 1 in.	2
17	B36-01-0007	Pin, Lower Boom Pivot	1
18	0090-0392	Screw, Socket, 1/2-13 x 2-1/2 in.	2
19	B25-00-0013	Bearing, Tie Rod End, 1/2 in. L.H. Thread	2
20	B30-00-0038	Spacer, Levering Bar Stanchion	4
21	0090-0168	Nut, 1/2-20 LH	2
22	B11-03-0028	Bar, Lower Leveling	2
23	B04-07-0036	Clamp, Cable/Hose, DG 16	2
24	B34-00-0006	Trimlock, 1/8 in.	1 ft.
25	B00-00-0014	Cap, Black Plastic	2
26	B30-00-0044	Pad, Rubber, Upper Boom Support	1

### 6-3 UPPER CYLINDER PARTS LIST

Refer to Table 6-3 for the upper cylinder parts list.

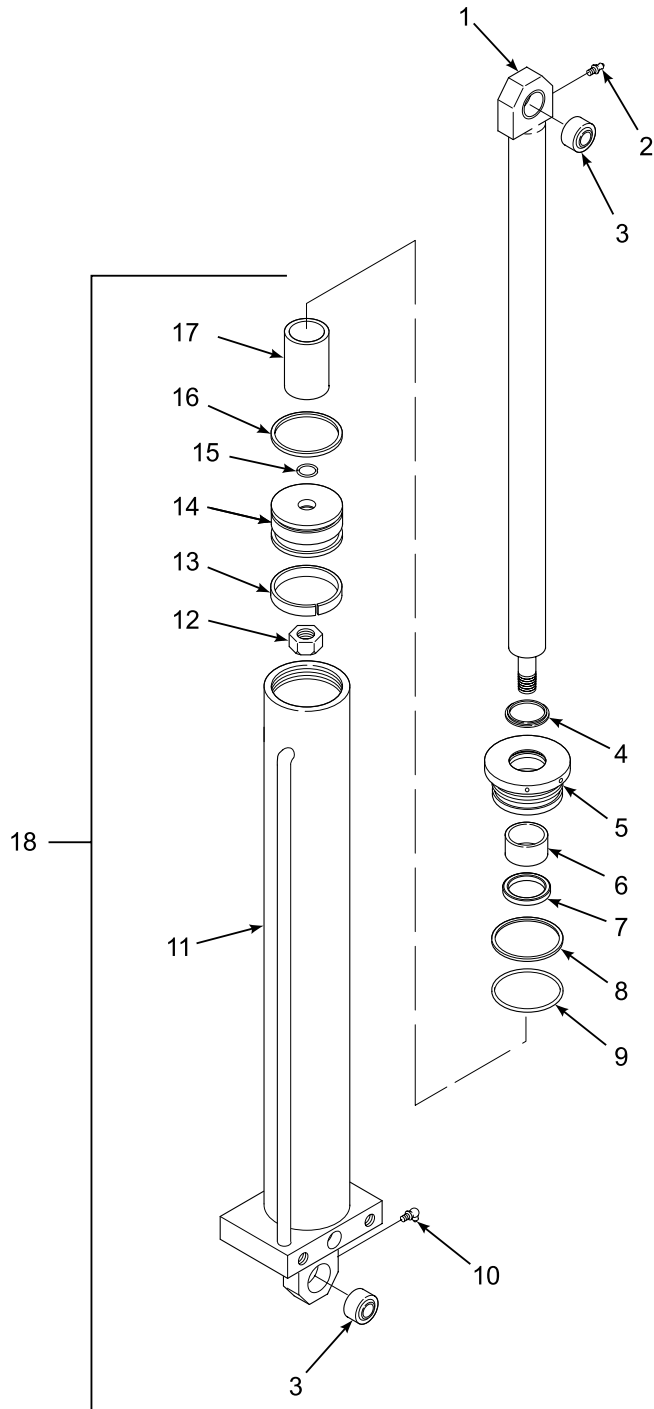


Figure 6-3. Upper Cylinder

Table 6-3. Upper Cylinder Parts List

Item No.	Part No.	Description	Qty
1	**	Rod, Cylinder	1
2	B00-00-0061	Fitting, Grease, Straight	1
3	B02-13-0103	Bearing, Spherical	2
4	*	Wiper, Rod	1
5	**	Headstock	1
6	**	Bushing, Bronze	1
7	*	Seal	1
8	*	Ring, Backup	1
9	*	O-Ring	1
10	B00-00-0106	Fitting, Grease, 90°	1
11	**	Cylinder Housing	1
12	**	Nut, Slotted	1
13	*	Ring, Wear	1
14	**	Piston	1
15	*	O-Ring	1
16	*	Seal	1
17	**	Sleeve, Stop	1
18	B02-03-0022	Cylinder, Upper Boom Lift, 3 in. Bore x 54 in. Stroke	1
19	B22-00-0010	Kit, Seal (Not Illustrated) (includes items 4, 7, 8, 9, 13, 15, and 16)	1

\*Part of Seal Kit, item 19.

\*\*Not procurable; order Upper Boom Lift Cylinder, item 18.

## 6-4 LOWER CYLINDER PARTS LIST

Refer to Table 6-4 for lower cylinder parts list.

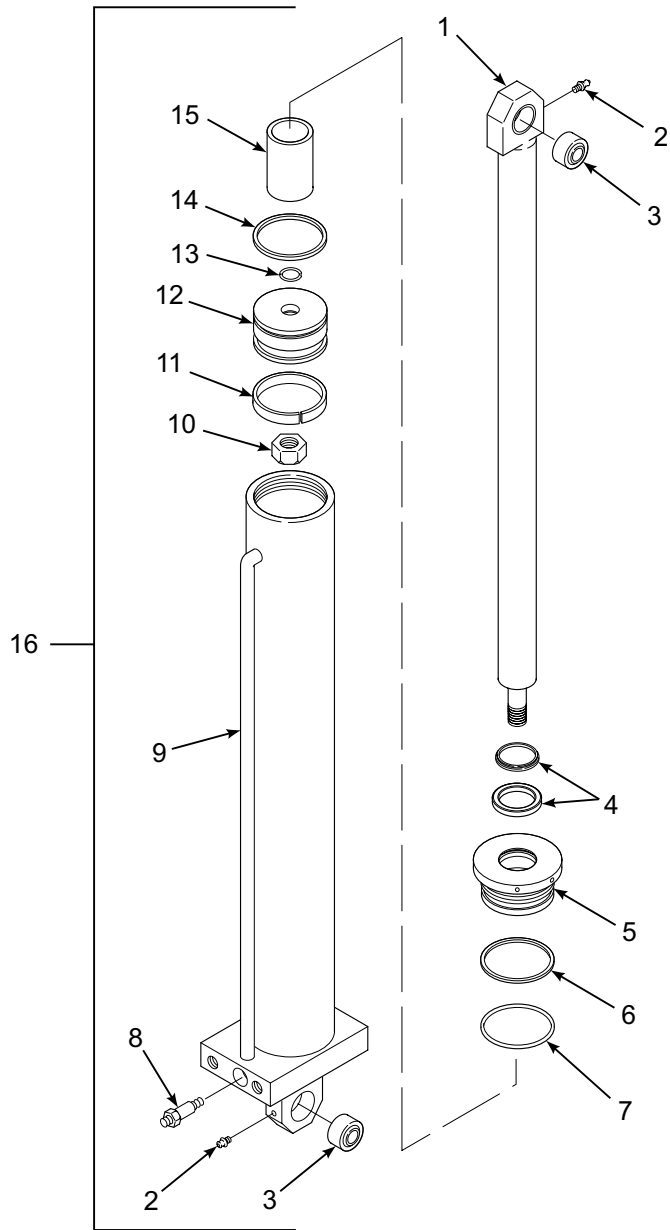


Figure 6-4. Lower Cylinder

Table 6-4. Lower Cylinder Parts List

Item No.	Part No.	Description	Qty
1	**	Rod, Cylinder	1
2	B00-00-0061	Fitting, Grease, Straight	2
3	B02-13-0103	Bearing, Spherical	2
4	*	Wiper, Rod	1
5	**	Headstock	1
6	*	Ring, Backup	1
7	*	O-Ring	1
8	B02-04-0064	Valve, Counterbalance	2
9	**	Cylinder Housing	1
10	**	Nut, Slotted	1
11	*	Ring, Wear	1
12	**	Piston	1
13	*	O-Ring	1
14	*	Seal	1
15	**	Sleeve, Stop	1
16	B02-03-0013	Cylinder, Lower Boom Lift, 4 in. Bore x 25 in. Stroke	1
17	B22-00-0011	Kit, Seal (Not Illustrated) (includes items 4, 6, 7, and 12)	1

\*Part of Seal Kit, item 17.

\*\*Not procurable; order Lower Boom Lift Cylinder, item 16.

## 6-5 DC MODEL BATTERY COMPARTMENT PARTS LIST

Refer to Table 6-5 for the DC model boom lift battery compartment parts list.

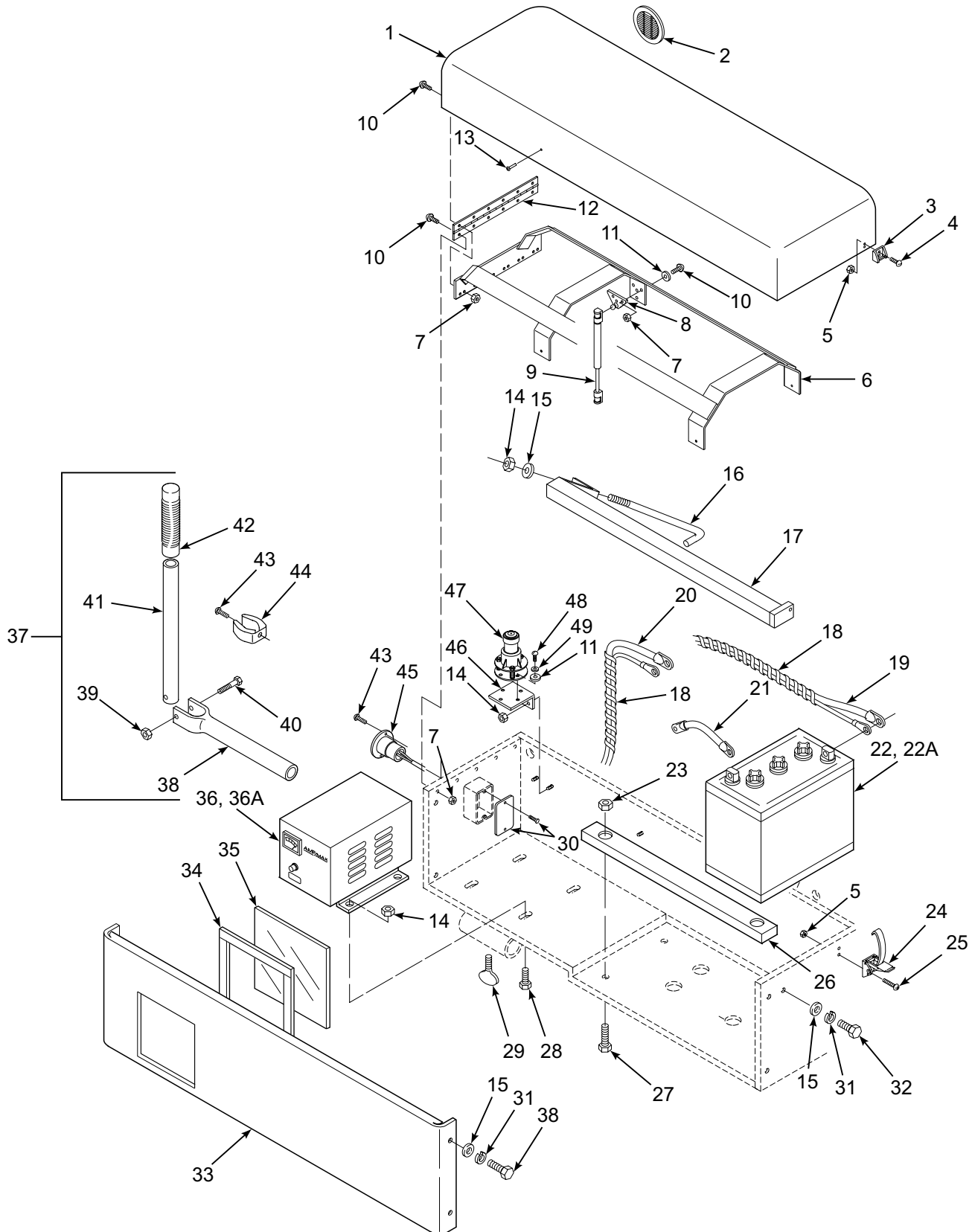


Figure 6-5. DC Model Battery Compartment

Table 6-5. 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	7
15	0090-0419	Washer, Flat, 1/4 in.	6
16	B04-07-0005	Rod, Threaded, Battery Retaining, 1/4 in.	1
17	B29-00-0135	Hold Down Bracket, 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	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	4
24	B42-00-0005	Latch, Lid	1

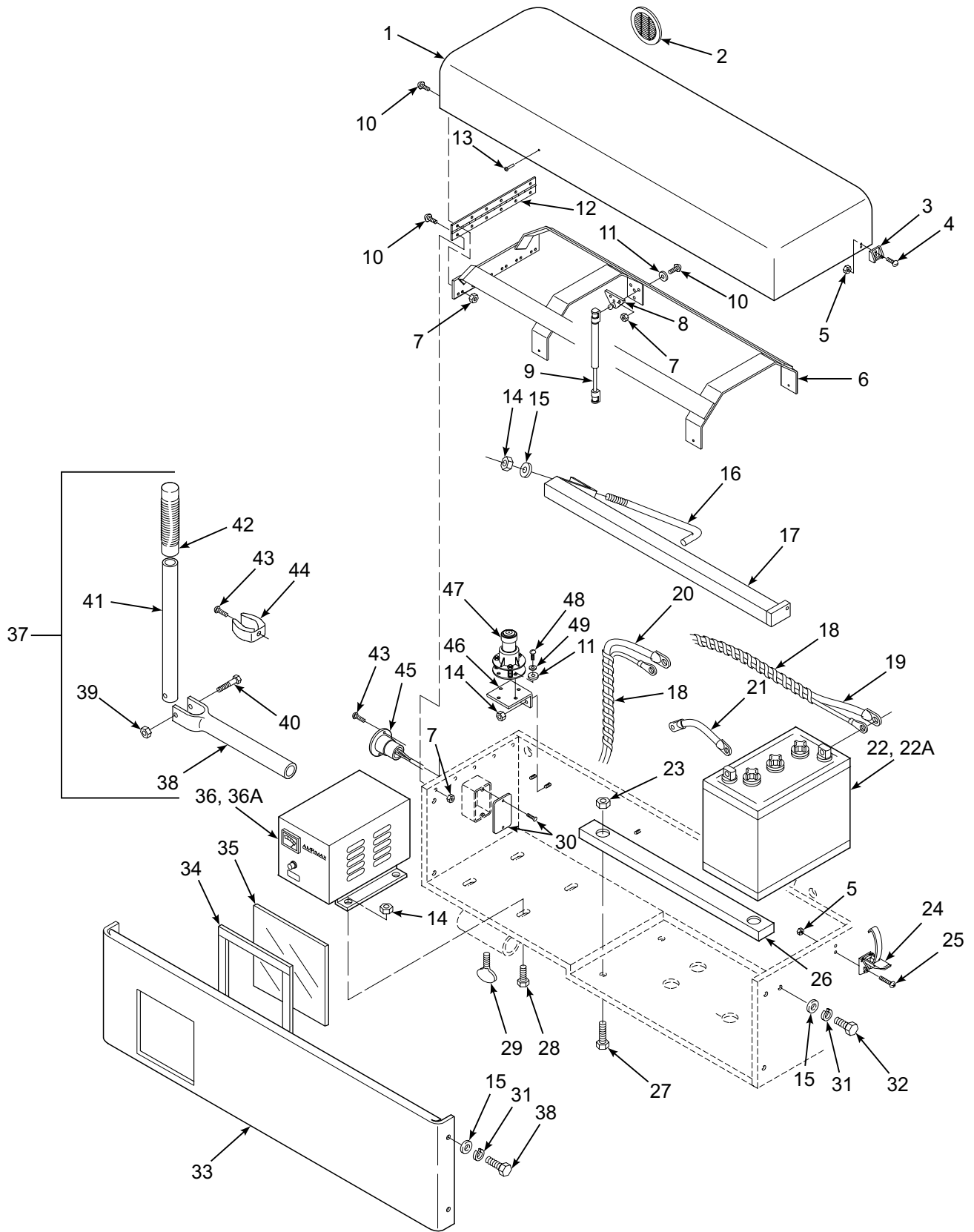


Figure 6-5. DC Model Battery Compartment



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

Item No.	Part No.	Description	Qty
25	0090-0814	Screw, Machine, #8-32 x 7/8 in.	2
26	B30-00-0040	Spacer	2
27	0090-0042	Screw, Cap, 3/8-16 x 1 in.	4
28	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	8
29	0090-0409	Screw, Thumb, 3/8-16 x 3/4 in.	1
30	B18-00-0026	Cover	1
31	0090-0206	Washer, Lock, Split, 1/4 in.	5
32	0090-0688	Bolt, Hex, 1/4-20 x 1 in.	1
33	B18-00-0010	Cover, Side	1
34	B05-00-0007	Tape, Foam Adhesive Back, 1/16 x 1/2 in.	32 in.
35	B18-00-0018	Plexiglass, 1/8 in. x 8 in. x 8 in.	1
36	B01-05-0006	Charger, Battery, 40 Amp, 110 Volt AC, 60 Hz	1
36A	B01-05-0027	Charger, Battery, 40 Amp, 220 Volt AC, 50 Hz	1
37	B03-00-0078	Handle Assembly, Manual Rotation (includes items 38 through 42)	1
38	B11-03-0018	Tube, Manual Boom Rotation	1
39	0090-0834	Nut, Nylon Lock, 1/4-20	1
40	0090-0011	Screw, Cap, 1/4-20 x 1-3/4 in.	1
41	B07-10-1042	Handle, Manual Boom Rotation	1
42	B46-00-0018	Grip, Rubber	1
43	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	3
44	B04-07-0062	Clip, Gripper	1
45	B01-10-0003	Receptacle, Flush Mount	1
46	B29-00-0021	Bracket, Level Sensor Mounting	1
47	B01-10-0016	Sensor, Slope, 3°, 0.5 Second Delay	1
48	0090-0231	Screw, Machine, #10-24 x 1/2 in.	4
49	0090-0205	Washer, Lock, #10	4

## 6-6 GAS MODEL ENGINE COMPARTMENT PARTS LIST

Refer to Table 6-6 for the gas model boom lift engine compartment parts list.

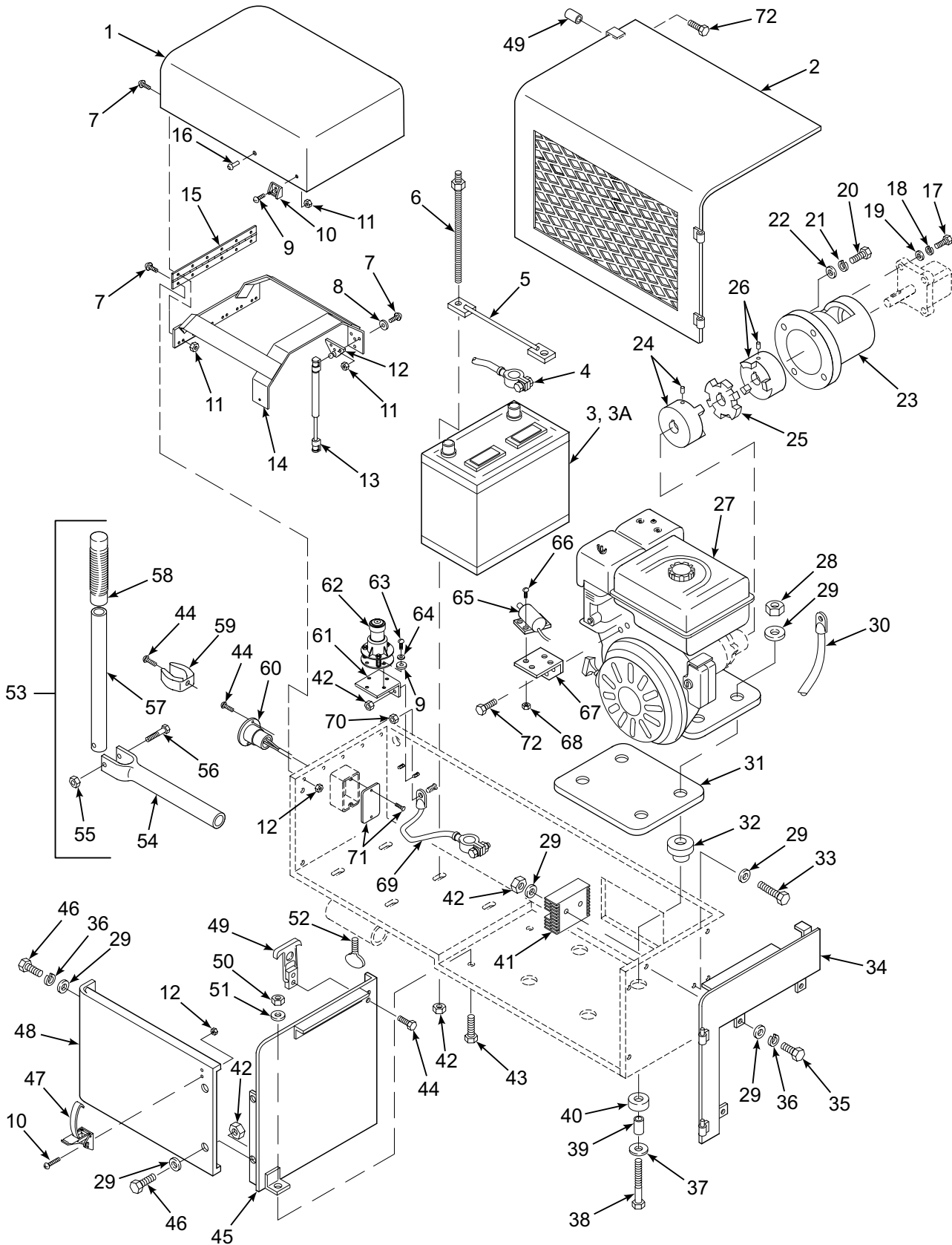


Figure 6-6. Gas Model Engine Compartment

Table 6-6. Gas Model Engine Compartment Parts List

Item No.	Part No.	Description	Qty
1	B18-00-0052	Lid, Compartment Cover	1
2	B18-00-0129	Plate, Top, Engine Cover	1
3	B01-04-0004	Battery, 12 Volt	1
3A	B01-04-0012	Battery, Dry Cell, 12 Volt	1
4	B01-01-0110	Cable, Battery, 2 Ga. x 45 in.	1
5	B29-00-0001	Strap, Battery Hold-Down	1
6	B04-07-0003	Rod, Threaded, Battery Hold-Down	2
7	0090-0232	Screw, Machine, #10-24 x 5/8 in.	15
8	0090-0415	Washer, Flat, #10	7
9	0090-0225	Screw, Machine, #8-32 x 1/2 in.	3
10	B42-00-0006	Clip, Latch	1
11	0090-0182	Nut, Hex, Nylon Lock, #10-24	15
12	B29-00-0073	Bracket, Ball Mounting	1
13	B39-00-0034	Spring, Gas	1
14	B18-00-0132	Frame, Compartment Cover	1
15	B42-01-1002	Hinge	1
16	0090-0684	Rivet, Pop, 3/16 x 1/2	1
17	0090-0030	Screw, Machine, 5/16-18 x 1 in.	4
18	0090-0208	Washer, Lock, 5/16	4
19	0090-0420	Washer, Flat, 5/16	4
20	0090-0043	Screw, Machine, 3/8-16 x 1-1/4 in.	4
21	0090-0210	Washer, Lock, 3/8	4
22	0090-0422	Washer, Flat, 3/8	4
23	0192-0030	Housing, Coupler	1
24	0192-0026	Coupler Body, Modified	1
25	0192-0028	Insert, Coupler	1
26	B00-00-0045	Coupler Body	1
27	B20-00-0009	Engine, Gasoline, 8 HP	1
28	0090-0183	Nut, Hex, Nylon Lock, 1/4	4
29	0090-0419	Washer, Flat, 1/4 in.	8
30	B01-01-0067	Cable, Battery, 2 Ga. x 45 in.	1
31	B07-06-5198	Plate, Engine Isolation Mount	1
32	B20-00-0007	Bushing, Isolation Mount	4
33	0090-0007	Screw, 1/4-20 x 1-1/4	2
34	B18-00-0128	Cover, Engine Panel, Rear	1
35	0090-0010	Screw, 1/4-20 x 1-1/2	3
36	0090-0206	Washer, Lock, 1/4 in.	5

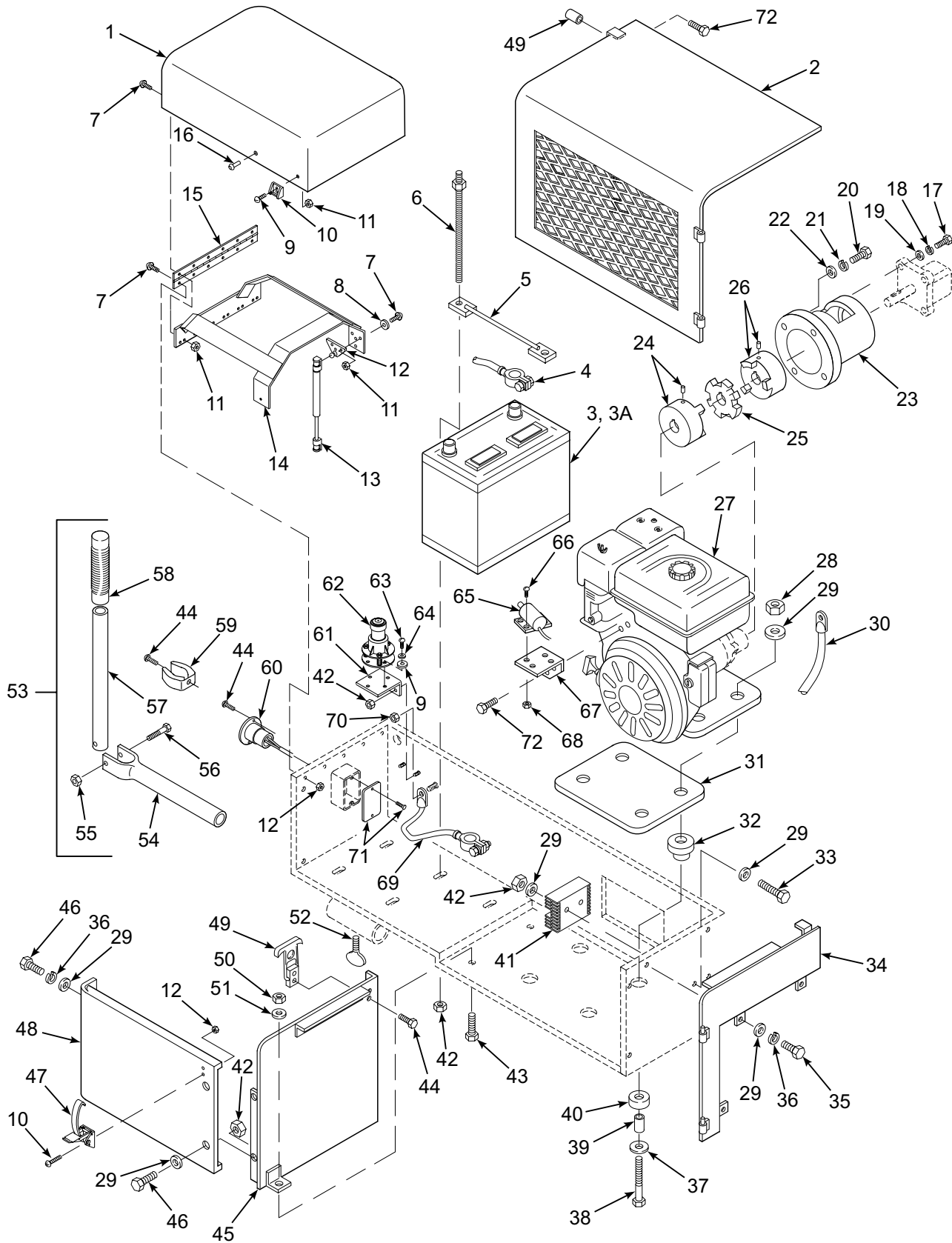


Figure 6-6. Gas Model Engine Compartment

Table 6-6. Gas Model Engine Compartment Parts List, Continued

Item No.	Part No.	Description	Qty
37	0090-0787	Washer, Fender	4
38	0090-0014	Screw, 1/4-20 x 2-1/2	4
39	B07-10-1026	Spacer, Isolation Mount Ring	4
40	B20-00-0006	Ring, Isolation Mount	4
41	B20-00-0013	Regulator/Rectifier, Voltage, 12 Volt, 18 Amp	1
42	0090-0183	Nut, Nylon Lock, 1/4 in.	6
43	0090-0028	Screw, Machine, 5/16-18 x 3/4	1
44	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	6
45	B18-00-0127	Cover, Engine Panel, Front	1
46	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	4
47	B42-00-0005	Latch, Lid	1
48	B18-00-0054	Cover, Side	1
49	B42-00-0011	Latch, Draw, Flexible	1
50	0090-0185	Nut, Nylon Lock, 5/16-18	2
51	0090-0420	Washer, Flat, 5/16 in.	2
52	0090-0409	Screw, Thumb, 3/8-16 x 3/4 in.	1
53	B03-00-0078	Handle Assembly, Manual Rotation (includes items 54 through 59)	
54	B11-03-0018	Tube, Manual Boom Rotation	1
55	0090-0834	Nut, Nylon Lock, 1/4-20	1
56	0090-0011	Screw, Cap, 1/4-20 x 1-3/4 in.	1
57	B07-10-1042	Handle, Manual Boom Rotation	1
58	B46-00-0018	Grip, Rubber	1
59	B04-07-0062	Clip, Gripper	1
60	B01-10-0003	Receptacle, Flush Mount	1
61	B29-00-0021	Bracket, Level Sensor Mounting	1
62	B01-10-0016	Sensor, Slope, 3°, 0.5 Second Delay	1
63	0090-0231	Screw, Machine, #10-24 x 1/2 in.	4
64	0090-0205	Washer, Lock, #10	4
65	B01-10-0084	Solenoid, Choke, 12 Volt	1
66	0090-0708	Screw, Machine, #6-32 x 3/8 in.	4
67	B29-00-0095	Bracket, Solenoid	1
68	0090-0180	Nut, Nylon Lock, #6-32	4
69	B01-01-0006	Cable, Battery, 2 Ga. x 16 in.	1
70	0090-0188	Nut, Nylon Lock, 3/8-16	1
71	B18-00-0026	Cover	1
72	0090-0472	Screw, Sheet Metal, #10 x 1/2	2

## 6-7 DC MODEL POWER COMPARTMENT PARTS LIST

Refer to Table 6-7 for the DC model power compartment parts list.

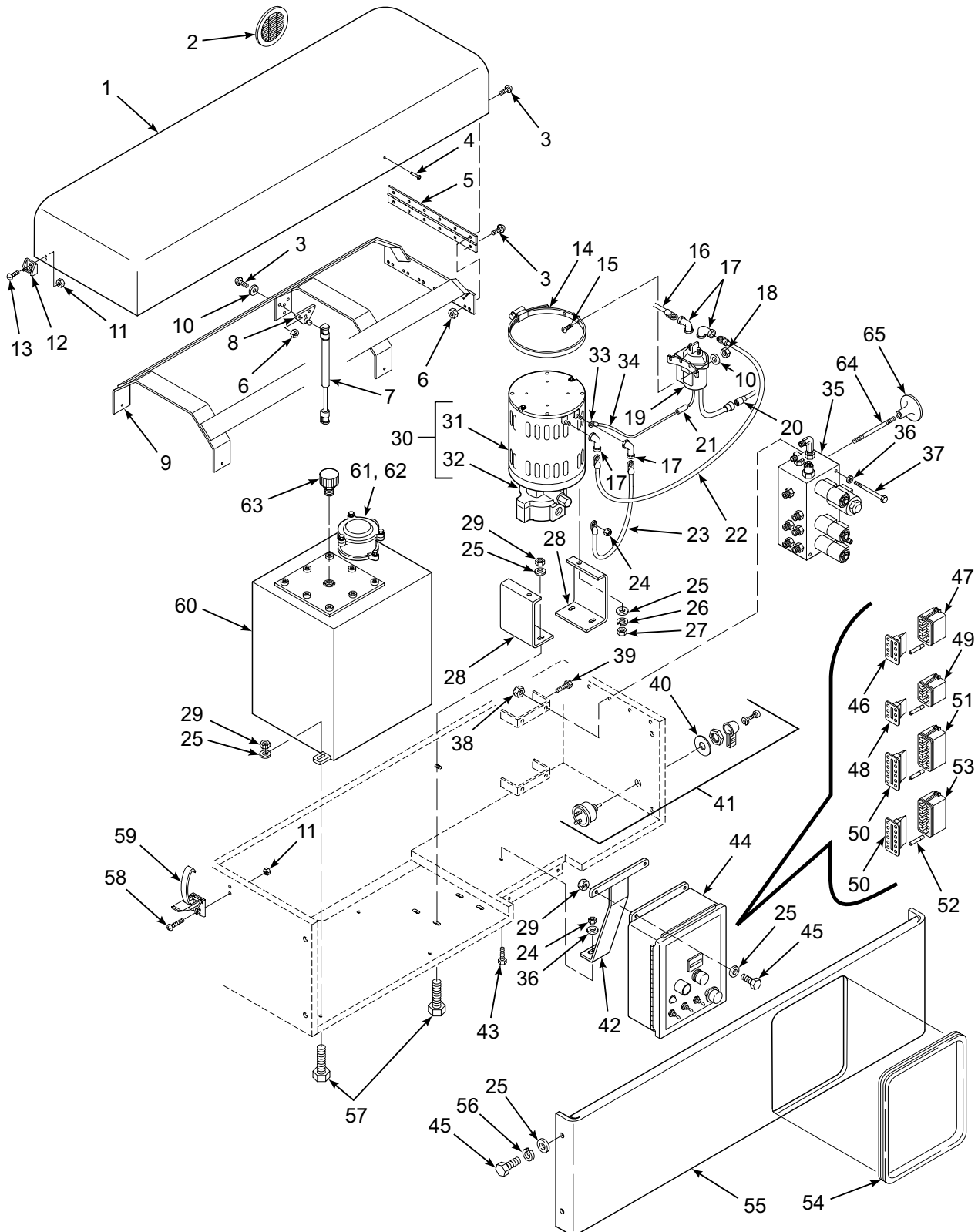


Figure 6-7. DC Model Power Compartment

Table 6-7. 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.	15
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	15
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	B02-15-0216	Clamp, Hose	1
15	0090-0231	Screw, Machine, #10-24 x 1/2 in.	2
16	B01-01-0028	Cable, Battery, 2 Ga. x 33 in.	1
17	B01-09-0018	Boot, Terminal	4
18	0090-0157	Nut, Hex, #10-24	2
19	B02-15-0345	Solenoid, Motor	1
20	B02-15-0346	Wiring Assembly, 4 Pin	1
21	B01-09-0050	Wire, Butt Splice Crimp 18/22A	1
22	B01-01-0010	Cable, Battery, 2 Ga. x 13 in.	1
23	B01-01-0027	Cable, Battery, 2 Ga. x 19 in.	1
24	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	2
25	0090-0419	Washer, Flat, 1/4 in.	13
26	0090-0206	Washer, Lock, Split, 1/4 in.	2
27	0090-0159	Nut, Hex, 1/4 -20	2
28	B29-00-0126	Bracket, Pump/Motor	2
29	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	11
30	B02-05-0021	Pump and Motor Assembly	1
31	B01-07-0004	Motor, Pump	1
32	B02-05-0020	Pump, Gear, Fixed Displacement, 1.4 gal. per min.	1

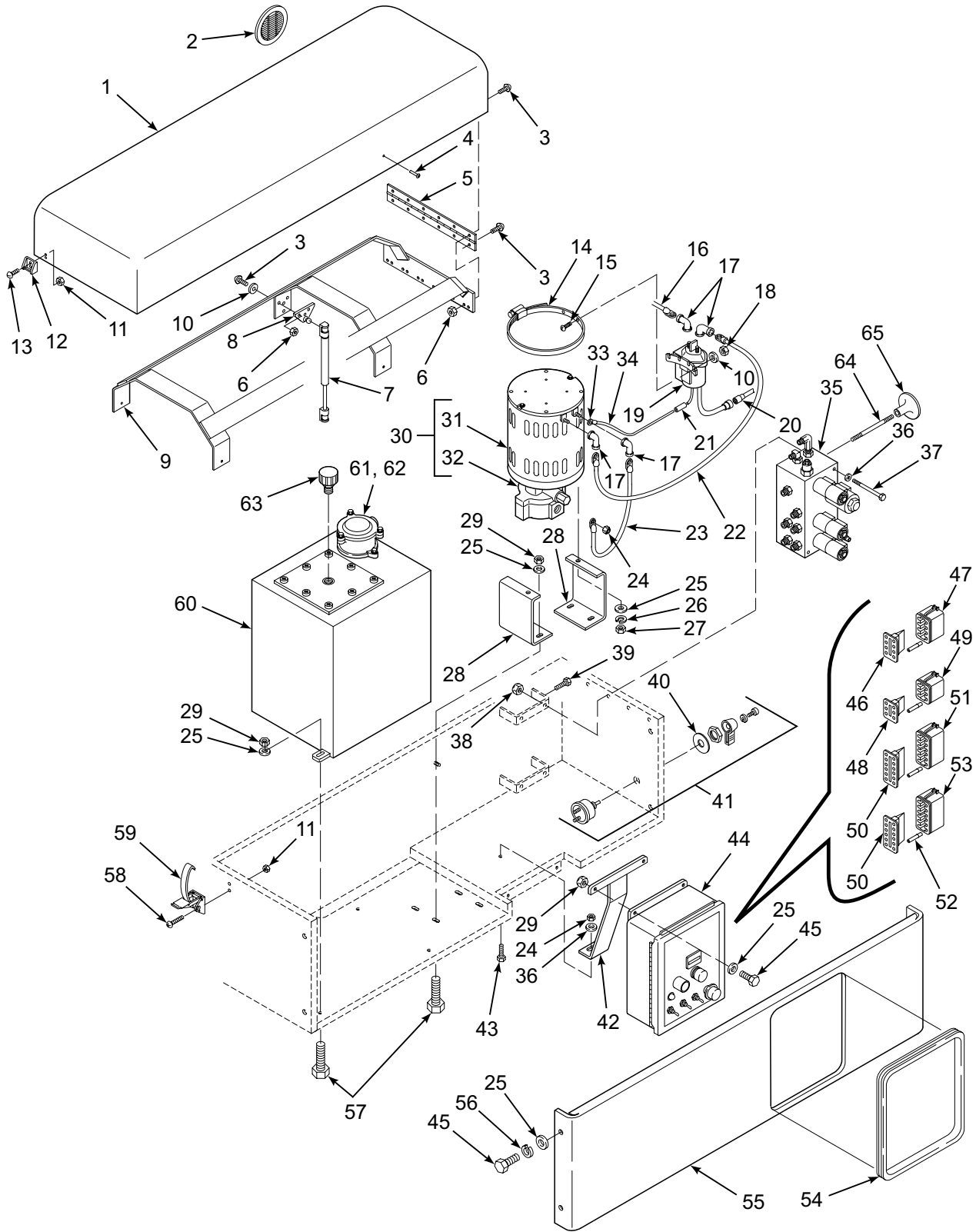


Figure 6-7. DC Model Power Compartment



Table 6-7. DC Model Power Compartment Parts List, Continued

Item No.	Part No.	Description	Qty
33	B01-09-0001	Ring, Wire, 3/8	1
34	B05-01-0009	Wire, 16 Ga.	6 in.
35	B02-04-0066	Manifold, Proportional Valve, 24 Volt	1
36	0090-0420	Washer, Flat, 5/16 in.	2
37	0090-0926	Screw, Cap, 5/16-18 x 4-1/2 in.	2
38	0090-0185	Nut, Hex, Nylon Lock, 5/16-18	2
39	0090-0344	Screw, Thread Cutting, #10-24 x 1/2 in.	1
40	B00-00-0112	Faceplate, Master Power Switch	1
41	B01-02-0060	Switch, Master Power	1
42	B29-00-0143	Bracket, Lower Control Box	1
43	0090-0042	Screw, Cap, 3/8-16 x 1	1
44	B01-02-0066	Box, Lower Control (DC Model)	1
45	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	8
46	B01-09-0076	Insert, 8 Pin	1
47	B01-09-0075	Connector, 8 Pin	1
48	B01-09-0074	Insert, 6 Pin	1
49	B01-09-0073	Connector, 6 Pin	1
50	B01-09-0078	Insert, 12 Pin	2
51	B01-09-0077	Connector, 12 Pin, Gray	1
52	B01-09-0080	Socket, Female	26
53	B01-09-0079	Connector, 12 Pin, Black	1
54	B34-00-0006	Trimlock, 1/8 in.	37 in.
55	B18-00-0143	Cover, Side	1
56	0090-0206	Washer, Lock, Split, 1/4 in.	4
57	0090-0688	Screw, 1/4-20 x 1 in.	7
58	0090-0814	Screw, Machine, #8-32 x 7/8 in.	2
59	B42-00-0005	Latch, Lid	1
60	B03-00-0103	Assembly, Reservoir	1
61	B02-00-0025	Assembly, Filter Head	1
62	B02-00-0026	Element, Filter	1
63	B02-15-0025	Cap, Breather	1
64	B07-06-1039	Rod, Emergency Lowering Valve Actuator	1
65	B46-00-0031	Pull Knob, Valve Actuator	1

## 6-8 GAS MODEL POWER COMPARTMENT PARTS LIST

Refer to Table 6-8 for the gas model power compartment parts list.

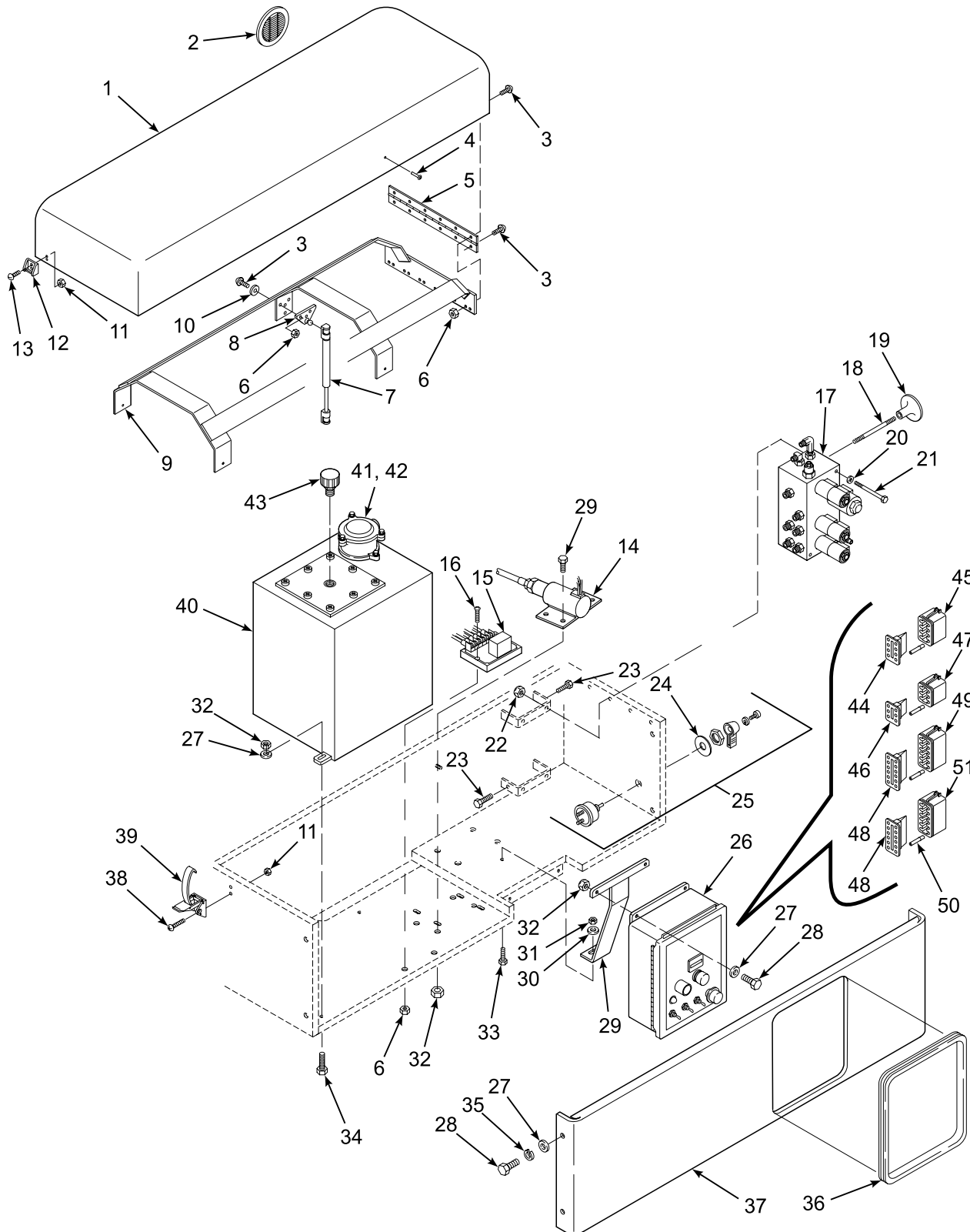


Figure 6-8. Gas Model Power Compartment

Table 6-8. Gas 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.	15
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	15
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	3
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	B01-10-0167	Kit, Solenoid, Engine Throttle	1
15	B01-10-0191	Control Module, Throttle Solenoid	1
16	0090-0737	Screw, Machine, #10-24 x 1-1/4 in.	2
17	B02-04-0067	Manifold, Proportional Valve, 24 Volt	1
18	B07-06-1039	Rod, Emergency Lowering Valve Actuator	1
19	B46-00-0031	Pull Knob, Valve Actuator	1
20	0090-0420	Washer, Flat, 5/16 in.	2
21	0090-0926	Screw, Cap, 5/16-18 x 4-1/2 in.	2
22	0090-0185	Nut, Hex, Nylon Lock, 5/16-18	2
23	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	2
24	B00-00-0112	Faceplate, Master Power Switch	1
25	B01-02-0060	Switch, Master Power	1
26	B01-02-0064	Box, Lower Control (Gas Model)	1
27	0090-0419	Washer, Flat, 1/4 in.	11
28	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	12
29	B29-00-0143	Bracket, Lower Control Box	1
30	0090-0422	Washer, Flat, 3/16 in.	1
31	0090-0188	Nut, Hex, Nylon Lock, 3/8-16	1
32	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	8
33	0090-0042	Screw, Cap, 3/8-16 x 1	1

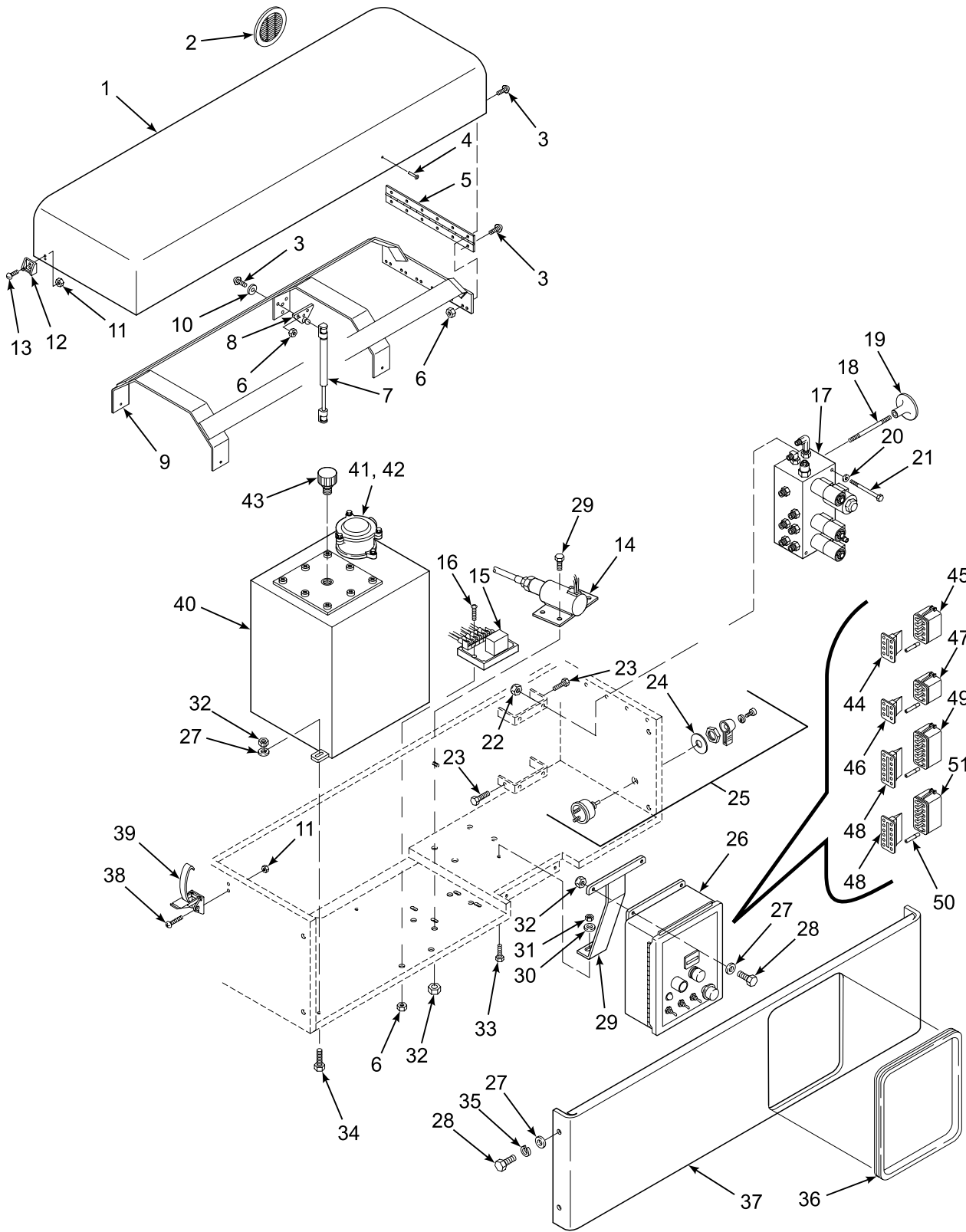


Figure 6-8. Gas Model Power Compartment

Table 6-8. Gas Model Power Compartment Parts List, Continued

Item No.	Part No.	Description	Qty
34	0090-0688	Screw, 1/4-20 x 1 in.	3
35	0090-0206	Washer, Lock, Split, 1/4 in.	4
36	B34-00-0006	Trimlock, 1/8 in.	37 in.
37	B18-00-0143	Cover, Side	1
38	0090-0814	Screw, Machine, #8-32 x 7/8 in.	2
39	B42-00-0005	Latch, Lid	1
40	B03-00-0103	Assembly, Reservoir	1
41	B02-00-0025	Assembly, Filter Head	1
42	B02-00-0026	Element, Filter	1
43	B02-15-0025	Cap, Breather	1
44	B01-09-0076	Insert, 8 Pin	1
45	B01-09-0075	Connector, 8 Pin	1
46	B01-09-0074	Insert, 6 Pin	1
47	B01-09-0073	Connector, 6 Pin	1
48	B01-09-0078	Insert, 12 Pin	2
49	B01-09-0077	Connector, 12 Pin, Gray	1
50	B01-09-0080	Socket, Female	26
51	B01-09-0079	Connector, 12 Pin, Black	1



Table 6-9. Frame and Rotation Unit Parts List

Item No.	Part No.	Description	Qty
1	B11-03-0036	Turntable Weldment	1
2	0090-0710	Screw, Machine, #8-32 x 2-3/4 in.	1
3	B18-00-0021	Cover, Level Housing	1
4	0090-0181	Nut, Hex, Nylon Lock, #8-32	1
5	B00-00-0001	Level, Bubble	1
6	0090-0643	Screw, Cap, 5/8-11 x 2-3/4 in.	12
7	0090-0612	Washer, Flat, 5/8 in.	30
8	B13-00-0001	Ring, Worm Gear	1
9	B02-02-0025	Fitting, 90° Elbow	2
10	B02-06-0006	Motor, Hydraulic	1
11	0090-0461	Screw, Cap, 1/2-13 x 2 in.	2
12	0090-0212	Washer, Lock, Split, 1/2 in.	2
13	B13-00-0006	Slew Ring Assembly (includes items 8 and 14)	1
14	B25-00-0031	Slew Ring	1
15	B00-00-0061	Fitting, Grease, 1/8 in. NPT Straight	1
16	B00-00-0106	Fitting, Grease, 90°	3
17	B07-04-1006	Plate, Tread	1
18	B03-00-0122	Kit, Rotary Conductor	1
19	B01-09-0032	Spade, Female, 16/14 Ga.	4
20	B00-00-0060	Support, Rotary Conductor	2
21	B01-10-0107	Conductor, Rotary	1
22	0090-0355	Screw, Set, 1/4-20 x 1/4 in.	2
23	B12-00-0088	Trailer Weldment (accommodates later model trailer axle and jack)	1
23A	B12-00-0059	Trailer Weldment (accommodates early model trailer axle and jack)	1
24	0090-0633	Screw, Cap, 5/8-11 x 1-1/2 in.	18
25	0090-0160	Nut, Hex, 5/16-18	14
26	0090-0208	Washer, Lock, Split, 5/16 in.	14
27	0090-0420	Washer, Flat, 5/16 in.	14
28	0090-0127	Bolt, Carriage, 5/16-18 x 1 in.	14

## 6-10 HITCH AND JACK ASSEMBLY PARTS LIST

Refer to Table 6-10 for the hitch and jack assembly parts list.

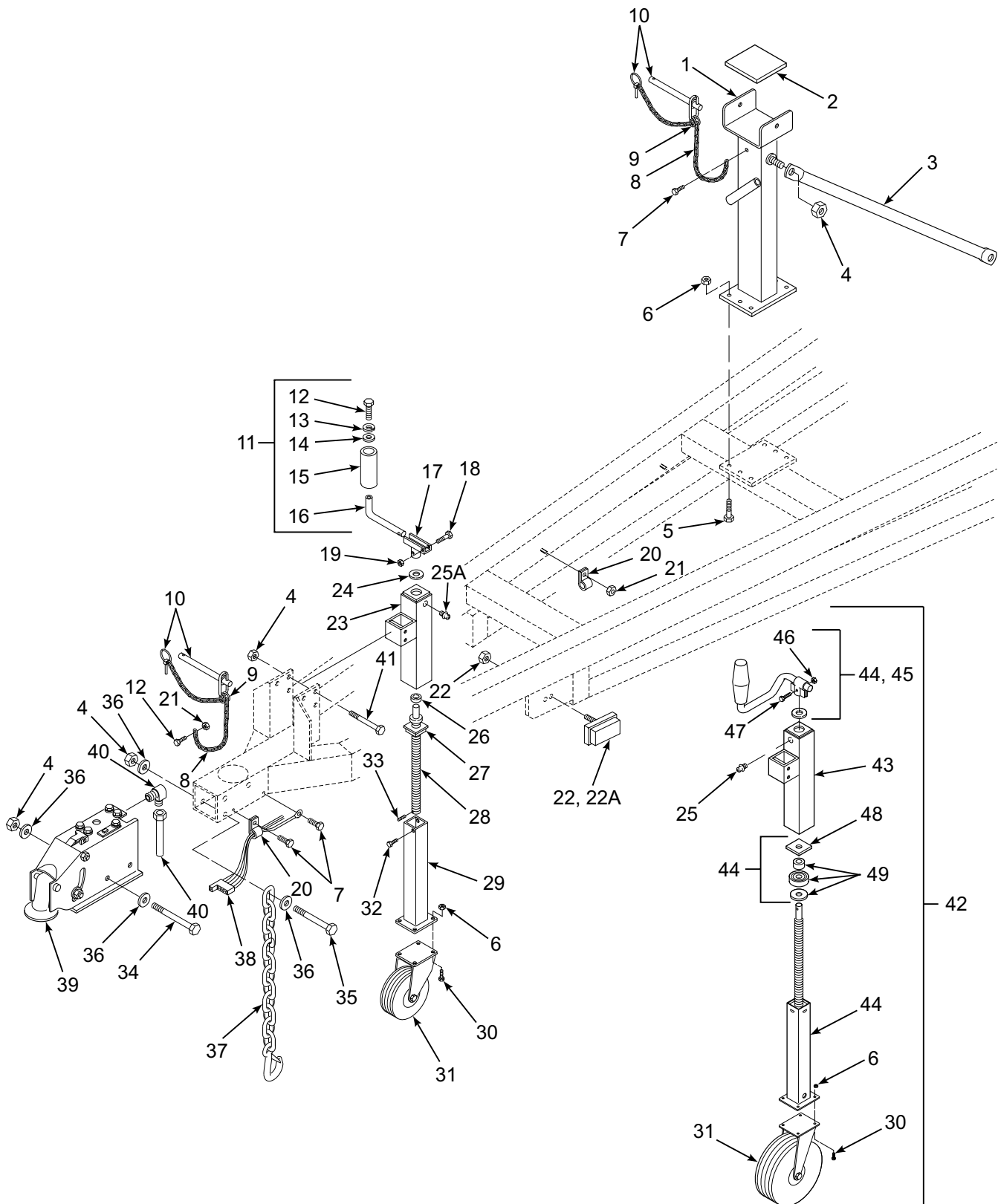


Figure 6-10. Hitch and Jack Assembly



Table 6-10. Hitch and Jack Assembly Parts List

Item No.	Part No.	Description	Qty
1	B29-00-0119	Post, Support	1
2	B30-00-0009	Pad, Rubber	1
3	0022-01-03	Brace, Guard Rail	2
4	0090-0192	Nut, Hex, Nylon Lock, 1/2-13	8
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	B03-00-0092	Assembly, Jack Handle, Early Version	1
12	0090-0005	Screw, Cap, 1/4-20 x 3/4 in.	2
13	0090-0206	Washer, Lock, 1/4 in.	1
14	0090-0875	Washer, Flat, 1/4 in.	1
15	B46-00-0014	Grip, Handle	1
16	B46-00-0003	Handle, Jack	1
17	B46-00-0004	Mount, Jack Handle	1
18	0090-0010	Screw, Cap, 1/4-20 x 1-1/2 in.	2
19	0090-0834	Nut, Lock, 1/4-20	2
20	B04-07-0032	Clamp, Cable/Hose, DG 6	2
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
23	B23-02-0039	Weldment, Outer Jack Tube	1
24	0090-0428	Washer, Flat, 3/4 in.	1
25	B00-00-0085	Fitting, Grease, 1/4-28	1
25A	B00-00-0009	Fitting, Grease, 3/16 in. Drive	1
26	B25-00-0011	Bearing, Thrust	1
27	B04-02-8006	Nut, Jack, 1-1/4 in.	1
28	B23-02-0038	Screw, Jack, 1/4 x 15 in.	1
29	B23-02-0040	Weldment, Inner Jack Tube	1
30	0090-0042	Screw, Cap, 3/8-16 x 1 in.	4
31	B03-00-0148	Caster Assembly	1
32	0090-0360	Screw, Socket, 1/4-20 x 1/2 in.	2
33	0090-0319	Pin, Roll, 1/4 x 1-1/4 in.	1

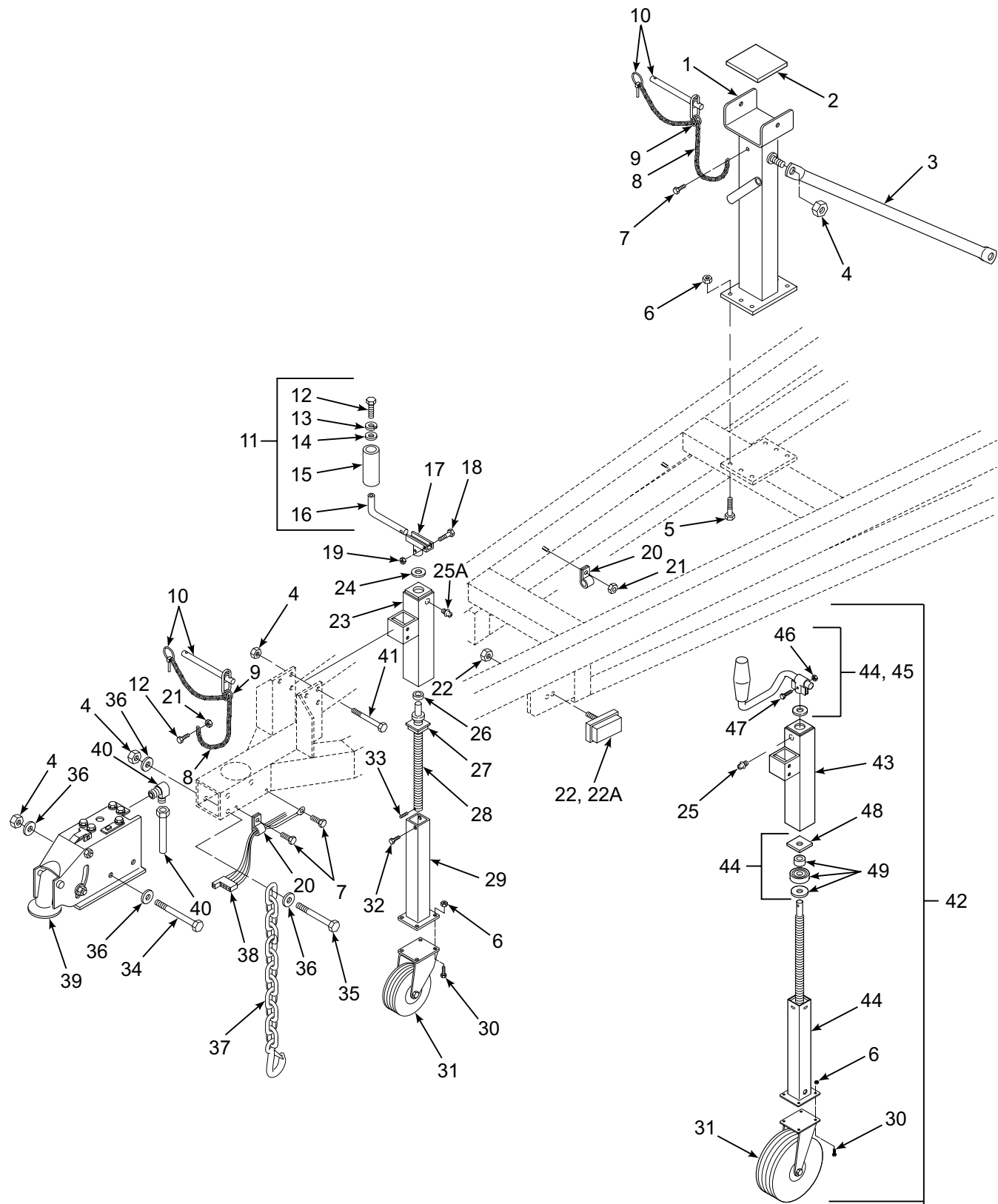


Figure 6-10. Hitch and Jack Assembly

Table 6-10. Hitch and Jack Assembly Parts List, Continued

Item No.	Part No.	Description	Qty
34	0090-0080	Screw, Cap, 1/2-13 x 4-1/2 in.	2
35	0090-0081	Screw, Cap, 1/2-13 x 5 in.	1
36	0090-0574	Washer, Flat, 1/2 in.	6
37	B03-00-0017	Chain, Safety	2
38	B01-01-0121	Harness, Tail Light	1
39	B12-00-0013	Hitch, Tow	1
40	B21-00-0001	Kit, Brake Line	1
41	0090-0712	Screw, Cap, 1/2-13 x 4-3/4 in.	1
*42	B03-00-0105	Assembly, Jack (includes items 6, 25, 30, 31 and 43 through 49)	1
43	B23-02-0058	Weldment, Outer Jack Tube	1
44	B23-02-0057	Assembly, Inner Jack Tube (includes items 45 through 49)	1
45	B46-00-0028	Kit, Handle Replacement (includes items 46 and 47)	1
46	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	1
47	0090-0007	Screw, Cap, 1/4-20 x 1-1/4 in.	1
48	B04-06-0030	Washer, 2.18 in. Square	1
49	B25-00-0068	Bearing Assembly	1

\*Item 42 replaces early version jack, items 6, 11, 17 through 19, and 23 through 33.

## 6-11 SQUARE TUBE AXLE AND WHEEL ASSEMBLY PARTS LIST

Refer to Table 6-11 for the square tube axle and wheel assembly parts list.

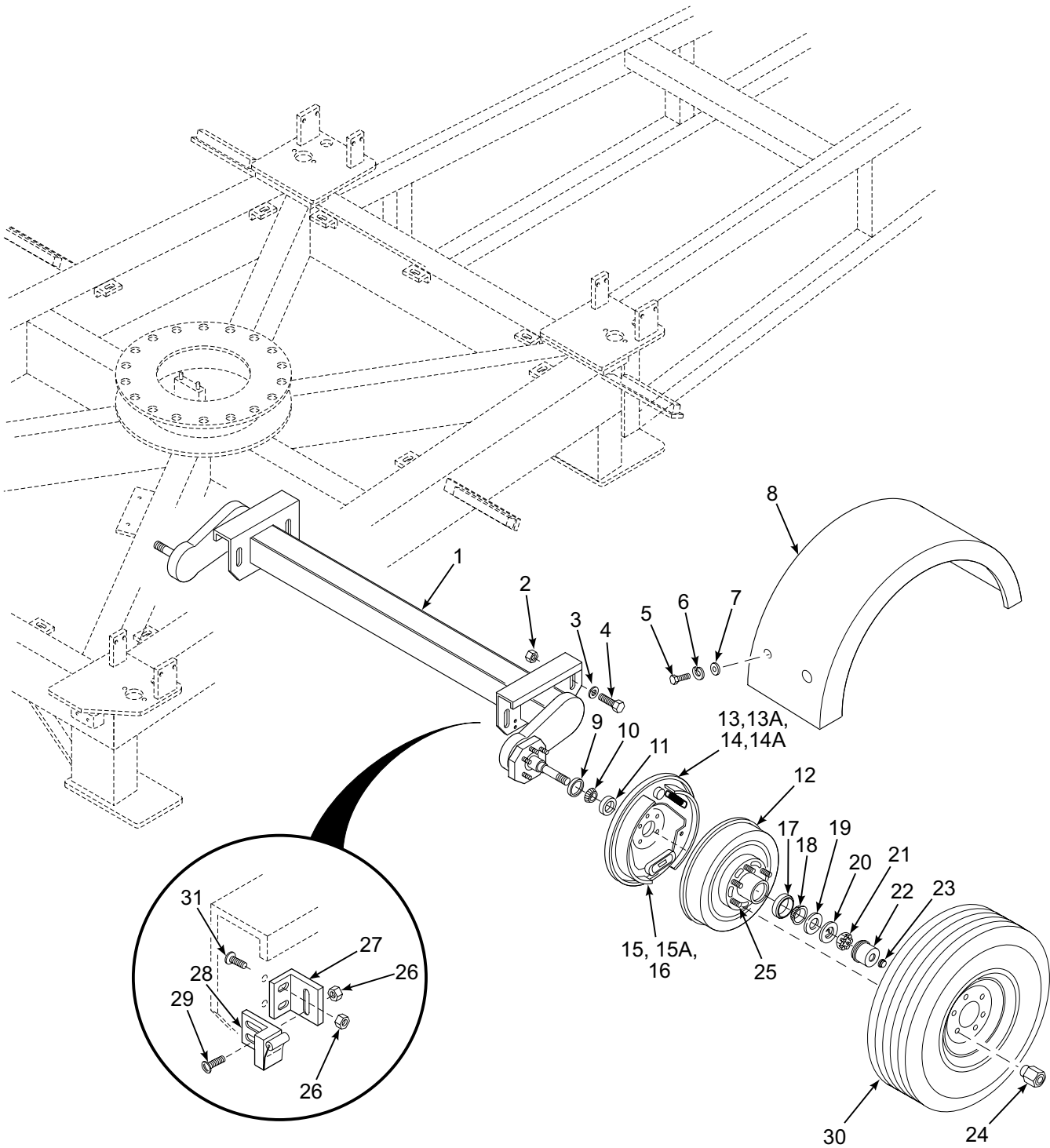


Figure 6-11. Square Tube Axle and Wheel Assembly

Table 6-11. 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	B12-00-0082	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	B10-00-0042	Brake Assembly, Left Hand, Hydraulic	1
13A	B10-00-0043	Brake Assembly, Right Hand, Hydraulic	1
*14	B10-00-0044	Brake Assembly, Right Hand, Electric (Not Illustrated)	1
*14A	B10-00-0045	Brake Assembly, Left Hand, Electric (Not Illustrated)	1
15	B10-00-0048	Kit, Hydraulic Brake Shoe/Lining, Right Hand	1
15A	B10-00-0047	Kit, Hydraulic Brake Shoe/Lining, Left Hand	1
*16	B10-00-0046	Kit, Electric Brake Shoe/Lining (Not Illustrated)	2
17	B10-00-0056	Cup, Outer Bearing	2
18	B10-00-0054	Cone, Outer Bearing	2
19	B10-00-0059	Washer, Spindle	2
20	B10-00-0051	Washer, Tang, EZ Lube	2
21	B10-00-0060	Nut, Spindle, EZ Lube	2
22	B10-00-0057	Cap, Grease, EZ Lube	2
23	B10-00-0058	Plug, Rubber, EZ Lube Grease Cap	2
24	0090-0624	Nut, Wheel Lug, 1/2-20	12
25	B10-00-0050	Stud, Wheel, 1/2-20	12
26	0090-0182	Nut, Hex, Nylon Lock, #10-24	8
27	B07-01-1081	Bracket, Limit Switch	2
28	B01-02-0075	Switch, Limit, Axle Position	2
29	0090-0232	Screw, Machine, #10-24 x 5/8 in.	4
30	B08-02-0003	Tire, ST225/75D-15	2
31	0090-0236	Screw, Machine	4

\*Optional equipment on original boom lift order only.

## 6-12 HEX TUBE AXLE AND WHEEL ASSEMBLY PARTS LIST

Refer to Table 6-12 for the early version axle and wheel assembly parts list.

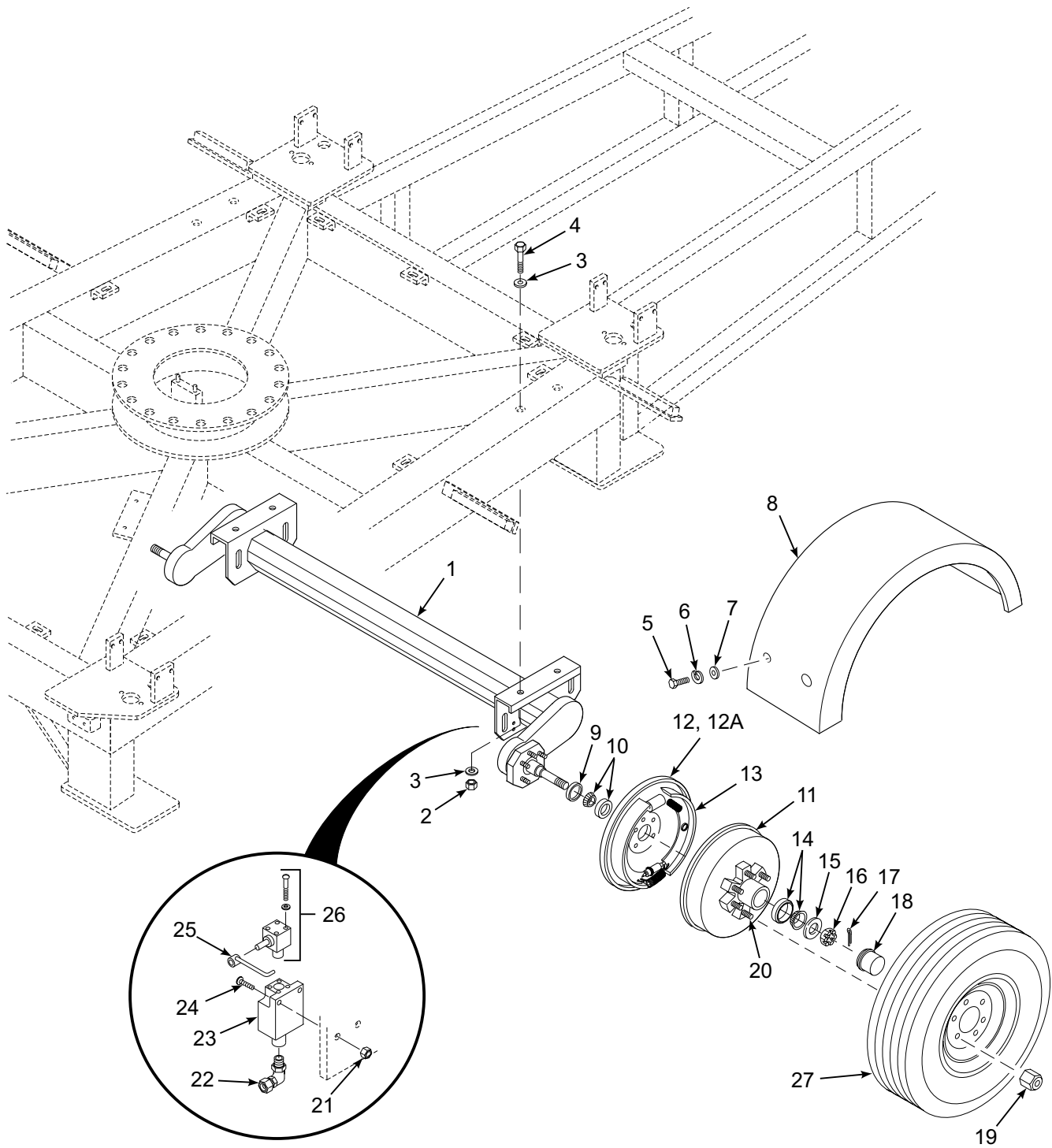


Figure 6-12. Hex Tube Axle and Wheel Assembly

Table 6-12. 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	0090-0877	Screw, Cap, 1/2-13 x 8-1/2	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	B12-00-0082	Fender	2
9	B32-00-0014	Seal, Grease	2
10	B25-00-0060	Assembly, Inner Bearing	
11	B12-00-0071	Assembly, Wheel Hub (Includes bearings, grease seal, and studs)	2
12	B10-00-0031	Brake Assembly, Left Hand, Hydraulic	1
12A	B10-00-0030	Brake Assembly, Right Hand, Hydraulic	1
13	B10-00-0016	Brakes Pads, Set (left and right wheel)	1
14	B25-00-0061	Assembly, Outer Bearing	2
15	B10-00-0059	Washer, Spindle	2
16	0090-0880	Nut, Spindle	2
17	0090-0881	Pin, Cotter, 5/32 x 2 in.	2
18	B32-00-0013	Cap, Dust	2
19	0090-0624	Nut, Wheel Lug, 1/2-20	12
20	B04-07-0107	Stud, Wheel, 1/2-20 x 2-1/2 in.	12
21	0090-0182	Nut, Hex, Nylon Lock, #10-24	8
22	B01-09-0051	Fitting, Cable Grip, 90°, 1/2 in.	2
23	B01-03-0006	Switch Body, Limit, Axle Position	2
24	0090-0236	Screw, Machine, #10-24 x 3/4 in.	4
25	B01-03-0014	Actuator, Limit Switch	2
26	B01-03-0007	Head, Limit Switch	2
27	B08-02-0003	Tire, ST225/75D-15	2

## 6-13 TAIL LIGHTS AND JUNCTION BOX PARTS LIST

Refer to Table 6-13 for the tail lights and junction box parts list.

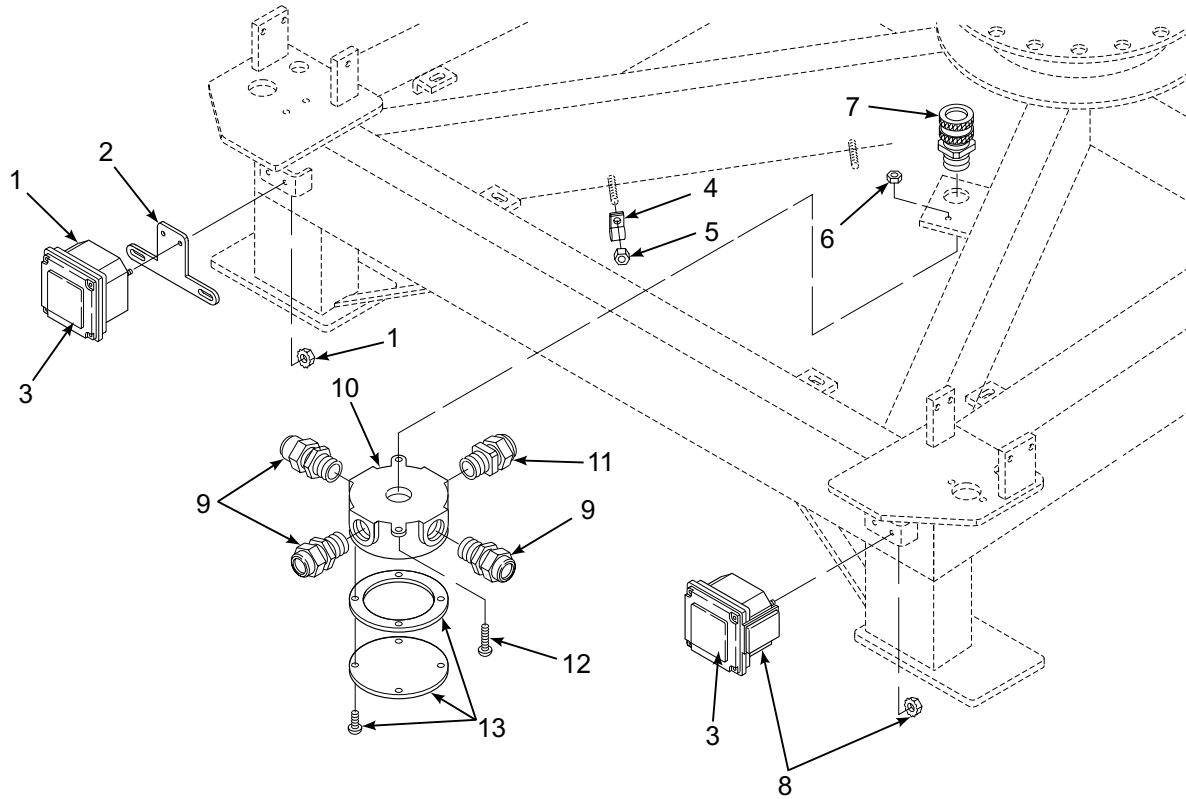


Figure 6-13. Tail Lights and Junction Box



**Table 6-13. Tail Lights and Junction Box Parts List**

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
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	B04-07-0032	Clamp, Cable/Hose, DG 6	4
5	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	4
6	0090-0182	Nut, Hex, Nylon Lock, #10-24	1
7	B01-09-0009	Fitting, Cable Grip, 3/8 in.	1
8	B01-10-0023	Tail Light Assembly, Right	1
9	B01-09-0029	Fitting, Cable Grip, 1/2 in.	3
10	B01-10-0026	Junction	1
11	B01-09-0007	Fitting, Cable Grip, 3/4 in.	1
12	0090-0236	Screw, Machine, #10-24 x 3/4 in.	1
13	B01-10-0027	Cover and Gasket, Junction Box	1

## 6-14 FRONT OUTRIGGERS PARTS LIST

Refer to Table 6-14 for the front outriggers parts list.

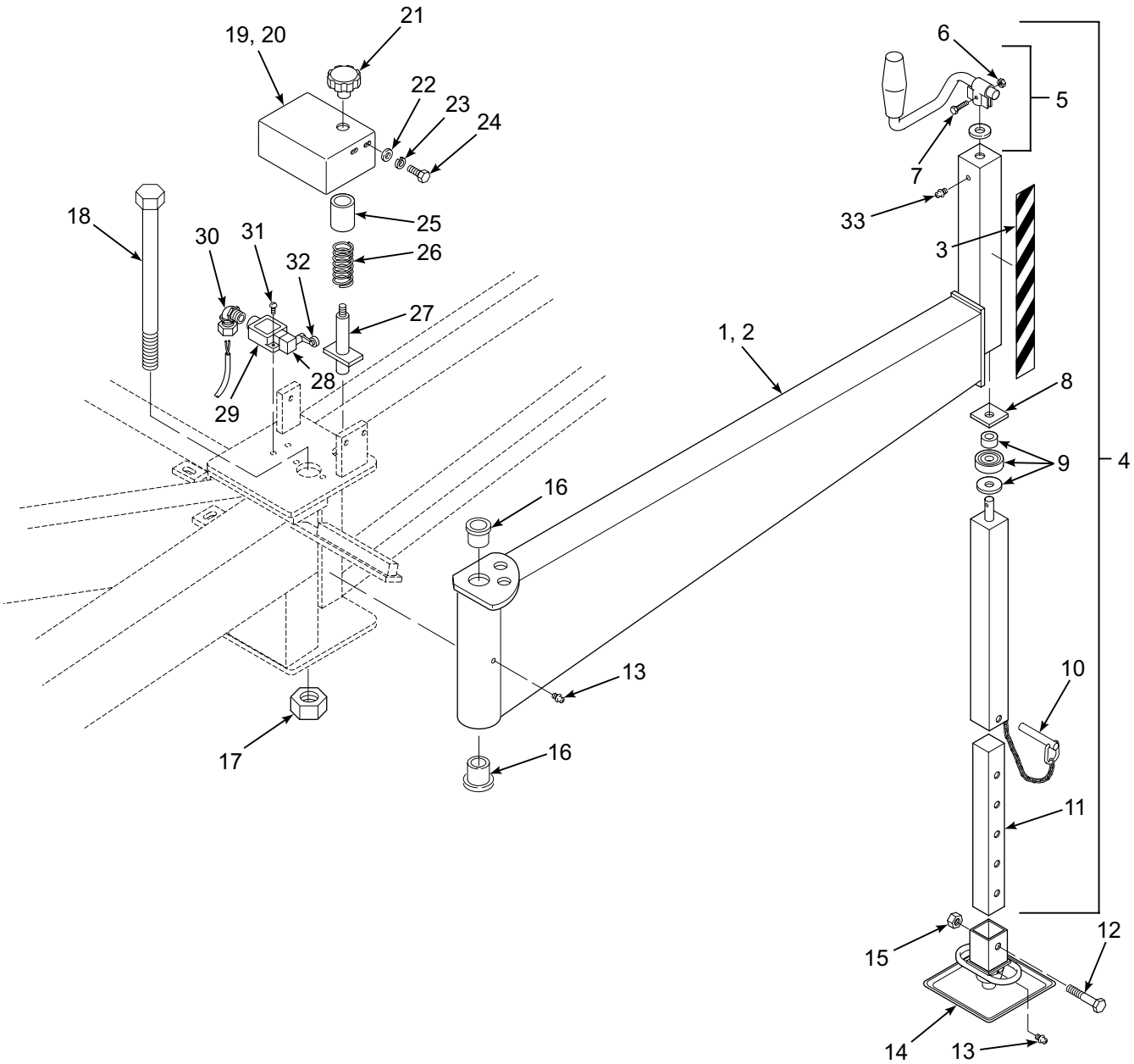


Figure 6-14. Front Outriggers

Table 6-14. Front Outriggers Parts List

Item No.	Part No.	Description	Qty
1	B23-01-0088	Outrigger, Front, Passenger Side	1
2	B23-01-0089	Outrigger, Front, Driver side	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.	2
14	B23-02-0047	Weldment, Footpad	1
15	0090-0194	Nut, Hex, Nylon Lock, 5/8-11	1
16	B25-00-0052	Bushing, Bronze	2
17	0090-0889	Nut, Hex, Nylon Lock, 1-1/4-7	1
18	0090-0888	Screw, Cap, 1-1/4-7 x 16 in.	1
19	B11-03-0032	Cap, Driver Side, Outrigger Locator Pin	1
20	B11-03-0031	Cap, Passenger Side, Outrigger Locator Pin	1
21	B46-00-0024	Knob, Fluted	1
22	0090-0420	Washer, Flat, 5/16 in.	3
23	0090-0208	Washer, Lock, 5/16 in.	3
24	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	3
25	B30-00-0037	Spacer, Outrigger Locator Pin	1
26	B39-00-0028	Spring, 1.13 OD x 0.915 ID	1
27	B11-03-0030	Pin, Outrigger Locator	1
28	B01-03-0007	Head, Side Rotary, Limit Switch	1
29	B01-03-0006	Body, Limit Switch	1
30	B01-09-0051	Cable Grip, 90°, 1/2 in.	1
31	0090-0232	Screw, Machine, #10-24 x 5/8 in.	2
32	B01-03-0008	Roller Lever, Limit Switch	1
33	B00-00-0085	Fitting, Grease, Straight, 1/4-28	1

## 6-15 REAR OUTRIGGER PARTS LIST

Refer to Table 6-15 for the rear outrigger parts list.

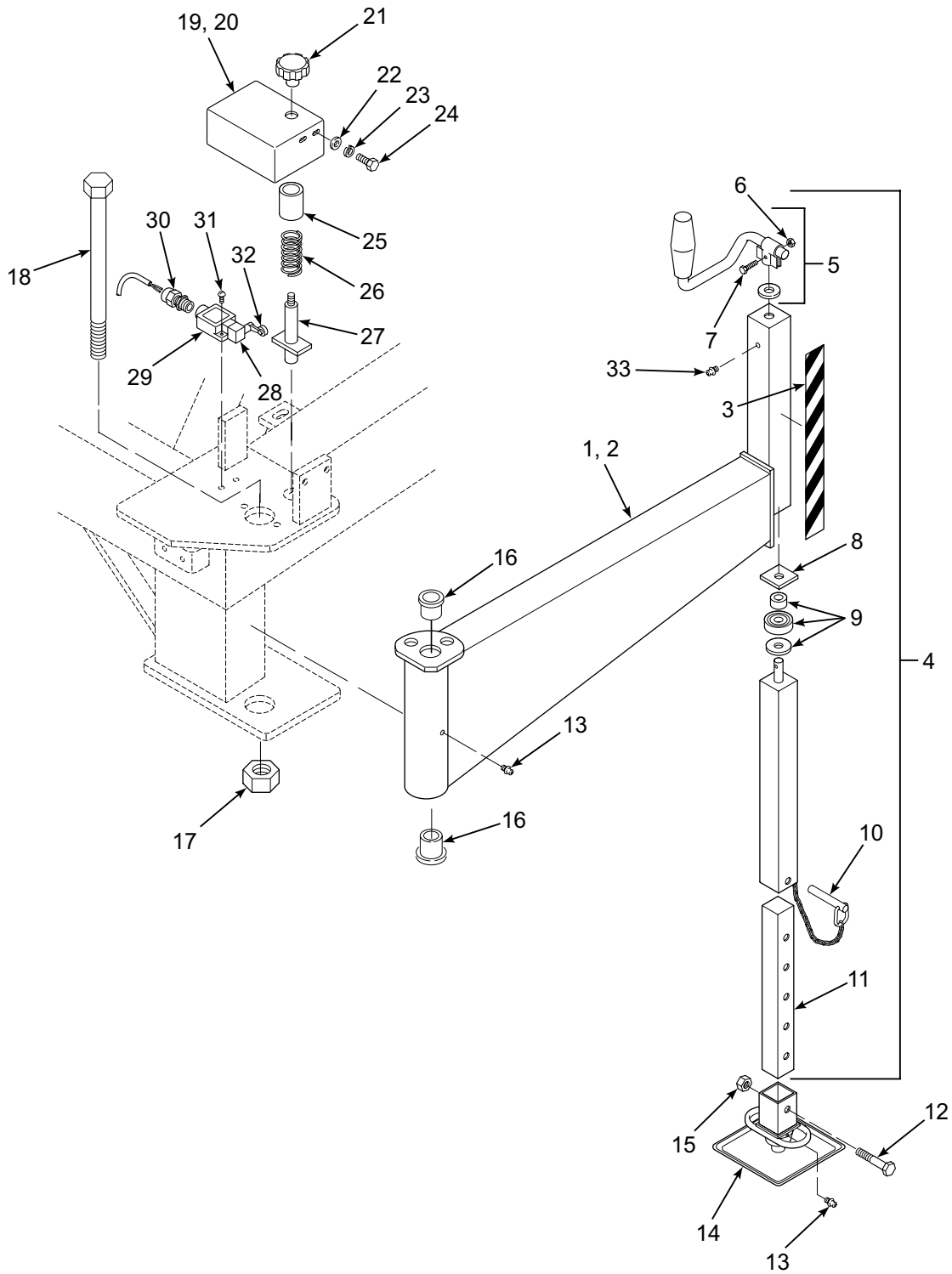


Figure 6-15. Rear Outrigger

Table 6-15. Rear Outrigger Parts List

Item No.	Part No.	Description	Qty
1	B23-01-0090	Outrigger, Rear, Passenger Side	1
2	B23-01-0091	Outrigger, Rear, Driver side	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.	2
14	B23-02-0047	Weldment, Footpad	1
15	0090-0194	Nut, Hex, Nylon Lock, 5/8-11	1
16	B25-00-0052	Bushing, Bronze	2
17	0090-0889	Nut, Hex, Nylon Lock, 1-1/4-7	1
18	0090-0888	Screw, Cap, 1-1/4-7 x 16 in.	1
19	B11-03-0032	Cap, Driver Side, Outrigger Locator Pin	1
20	B11-03-0031	Cap, Passenger Side, Outrigger Locator Pin	1
21	B46-00-0024	Knob, Fluted	1
22	0090-0420	Washer, Flat, 5/16 in.	3
23	0090-0208	Washer, Lock, 5/16 in.	3
24	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	3
25	B30-00-0037	Spacer, Outrigger Locator Pin	1
26	B39-00-0028	Spring, 1.13 OD x 0.915 ID	1
27	B11-03-0030	Pin, Outrigger Locator	1
28	B01-03-0007	Head, Side Rotary, Limit Switch	1
29	B01-03-0006	Body, Limit Switch	1
30	B01-09-0029	Cable Grip, 1/2 in.	1
31	0090-0232	Screw, Machine, #10-24 x 5/8 in.	2
32	B01-03-0008	Roller Lever, Limit Switch	1
33	B00-00-0085	Fitting, Grease, Straight, 1/4-28	1

## 6-16 BASKET PARTS LIST

Refer to Table 6-16 for the basket parts list.

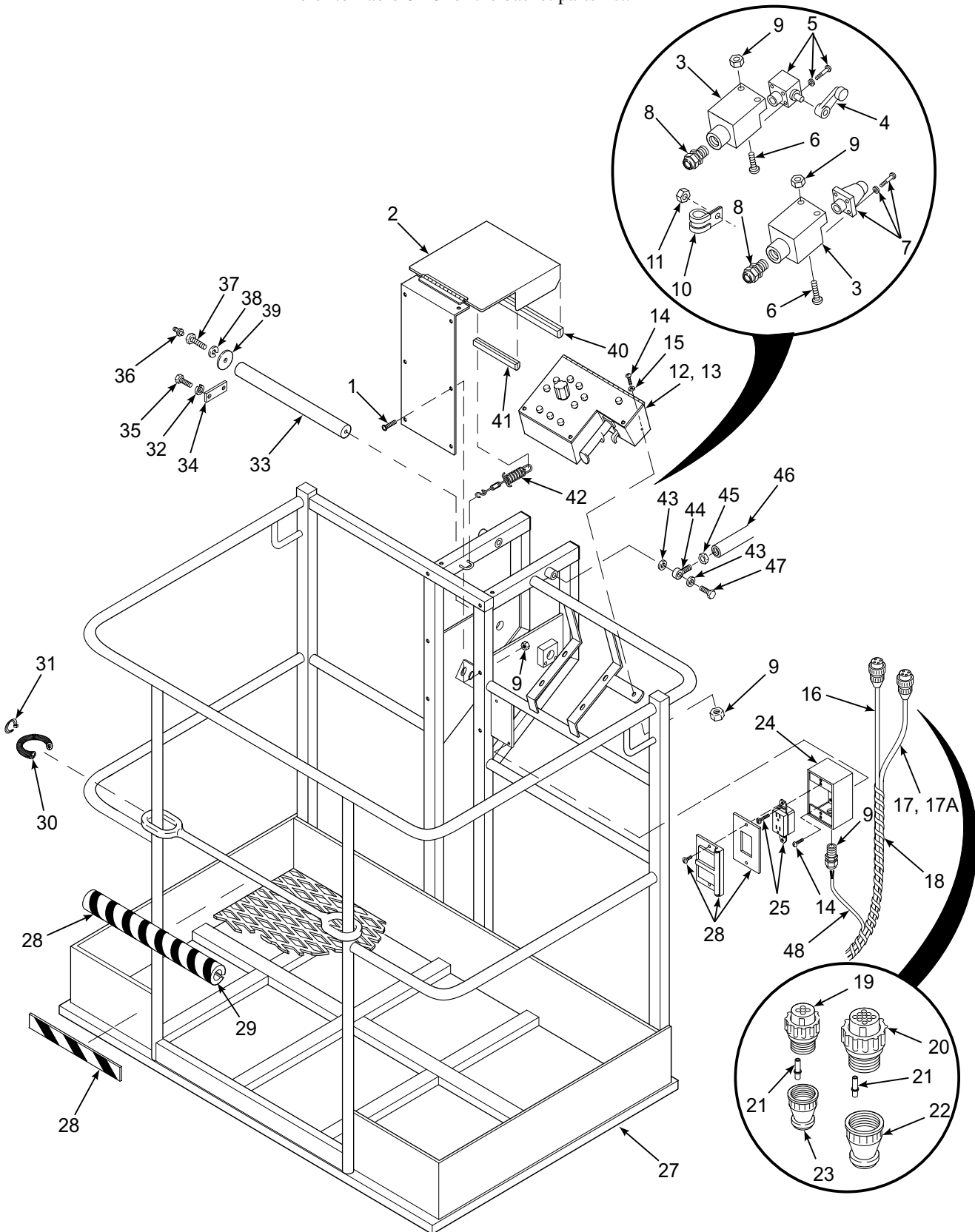


Figure 6-16. Basket

Table 6-16. Basket Parts List

Item No.	Part No.	Description	Qty
1	0090-0344	Screw, Threadcutting, #10-24 x 1/2 in.	8
2	B17-00-0102	Guard, Hand	1
3	B01-03-0006	Switch, Limit	2
4	B01-03-0008	Roller Lever, Limit Switch	1
5	B01-03-0007	Head, Side Rotary, Limit Switch	1
6	0090-0238	Screw, Machine, #10-24 x 1 in.	4
7	B01-03-0016	Head, Roller Plunger, Limit Switch	1
8	B01-09-0029	Cable Grip, 1/2 in.	3
9	0090-0182	Nut, Hex, Nylon Lock, #10-24	10
10	B04-07-0034	Clamp, Cable/Hose, DG 12	1
11	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	1
12	B01-02-0065	Control, Proportional (DC Model)	1
13	B01-02-0063	Control, Proportional (Gas Model)	1
14	0090-0232	Screw, Machine, #10-24 x 5/8 in.	6
15	0090-0415	Washer, Flat, #10	4
16	B05-01-0039	Wire, 18-5	54 ft.
17	B05-01-0038	Wire, 20-2	43 in.
17A	B05-01-0038	Wire, 20-2	39 in.
18	B05-04-0001	Wrap, Black Spiral	3.5 ft.
19	B01-09-0083	Plug, Socket, 4 Terminal	1
20	B01-09-0086	Plug, Socket, 9 Terminal	1
21	B01-09-0089	Terminal, 18-14 SG	9

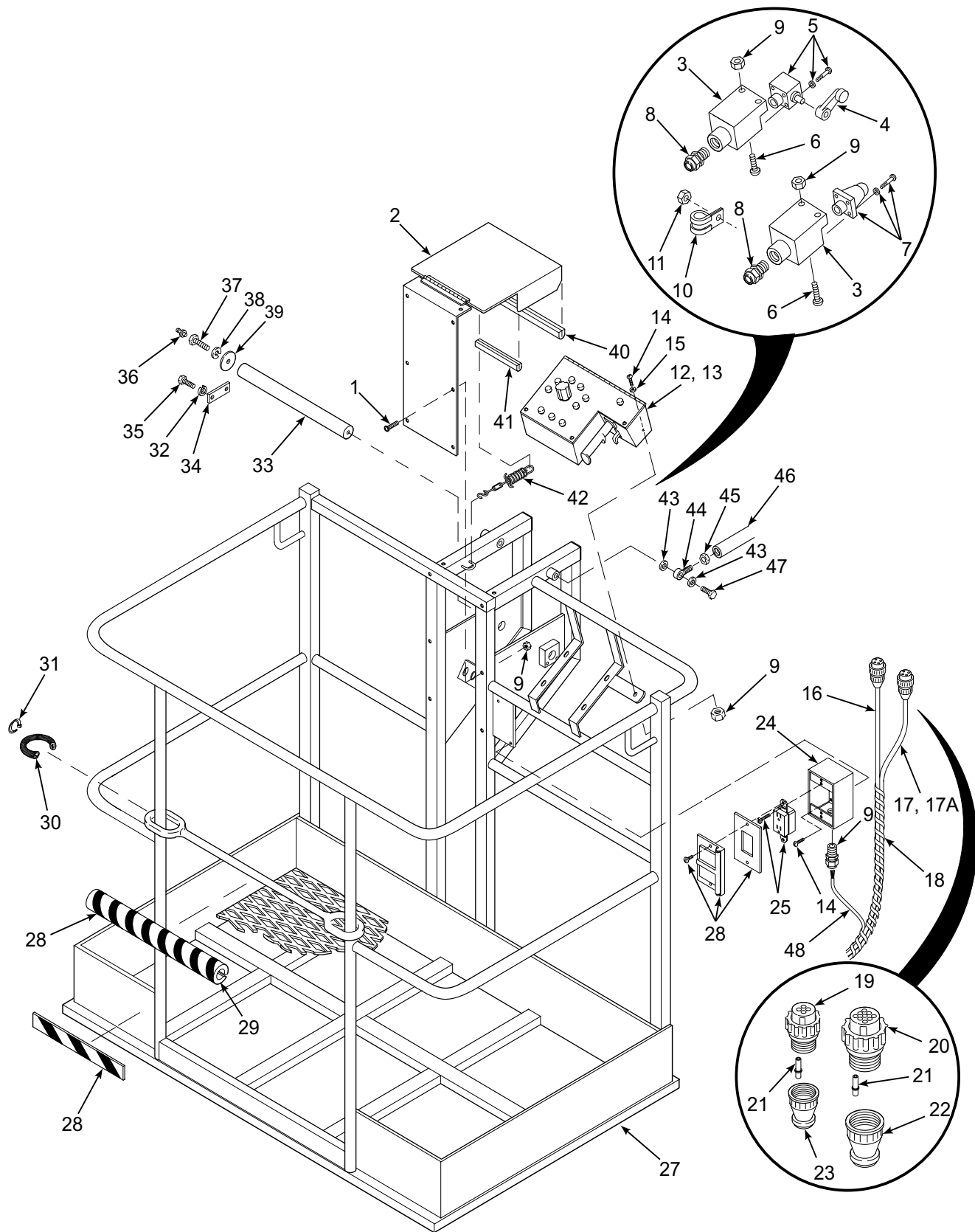


Figure 6-16. Basket



Table 6-16. Basket Parts List, Continued

Item No.	Part No.	Description	Qty
22	B01-09-0088	Cable Housing, 9 Contact Plug	1
23	B01-09-0085	Cable Housing, 4 Contact Plug	1
24	B01-10-0046	Junction Box, 110 Vac Outlet	1
25	B01-10-0034	Receptacle, 120 Vac, GFI	1
26	B01-10-0035	Cover, GFI	1
27	B17-00-0103	Cage Weldment	1
28	B06-00-0167	Caution Tape, Black and Yellow	1 Roll
29	B05-00-0001	Tube, Foam, 21-1/2 in.	1
30	B00-00-0086	Casing, Wire, Slit, 5/16 in. dia. x 8.5 in. long	2
31	B01-09-0030	Wire, Tie, 7 x 3/32 in.	6
32	0090-0208	Washer, Lock, Split, 5/16 in.	4
33	B36-01-0007	Pin, Boom Pivot	1
34	B29-00-0005	Plate	2
35	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	4
36	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	2
37	B04-05-0001	Screw, Cap, 3/8-16 x 1 in.	2
38	0090-0210	Washer, Lock, Split, 3/8 in.	2
39	B04-06-0001	Washer, Retaining	2
40	B34-00-0006	Trimlock, 1/8 in.	16 in.
41	B34-00-0006	Trimlock, 1/8 in.	5 in.
42	B39-00-0041	Spring, Extension	2
43	0090-0574	Washer, Flat, 1/2 in.	4
44	B25-00-0013	Bearing, Tie Rod End, 1/2 in. L.H. Thread	2
45	0090-0168	Nut, Jam, 1/2-20, L.H. Thread	2
46	B11-03-0027	Bar, Upper Leveling	2
47	0090-0461	Screw, Cap, 1/2-13 x 2 in.	2
48	B05-01-0028	Wire, 14-3, SDN	55 ft.

## 6-16A BASKET PARTS LIST, EARLY MODEL

Refer to Table 6-16A for the early model basket parts list.

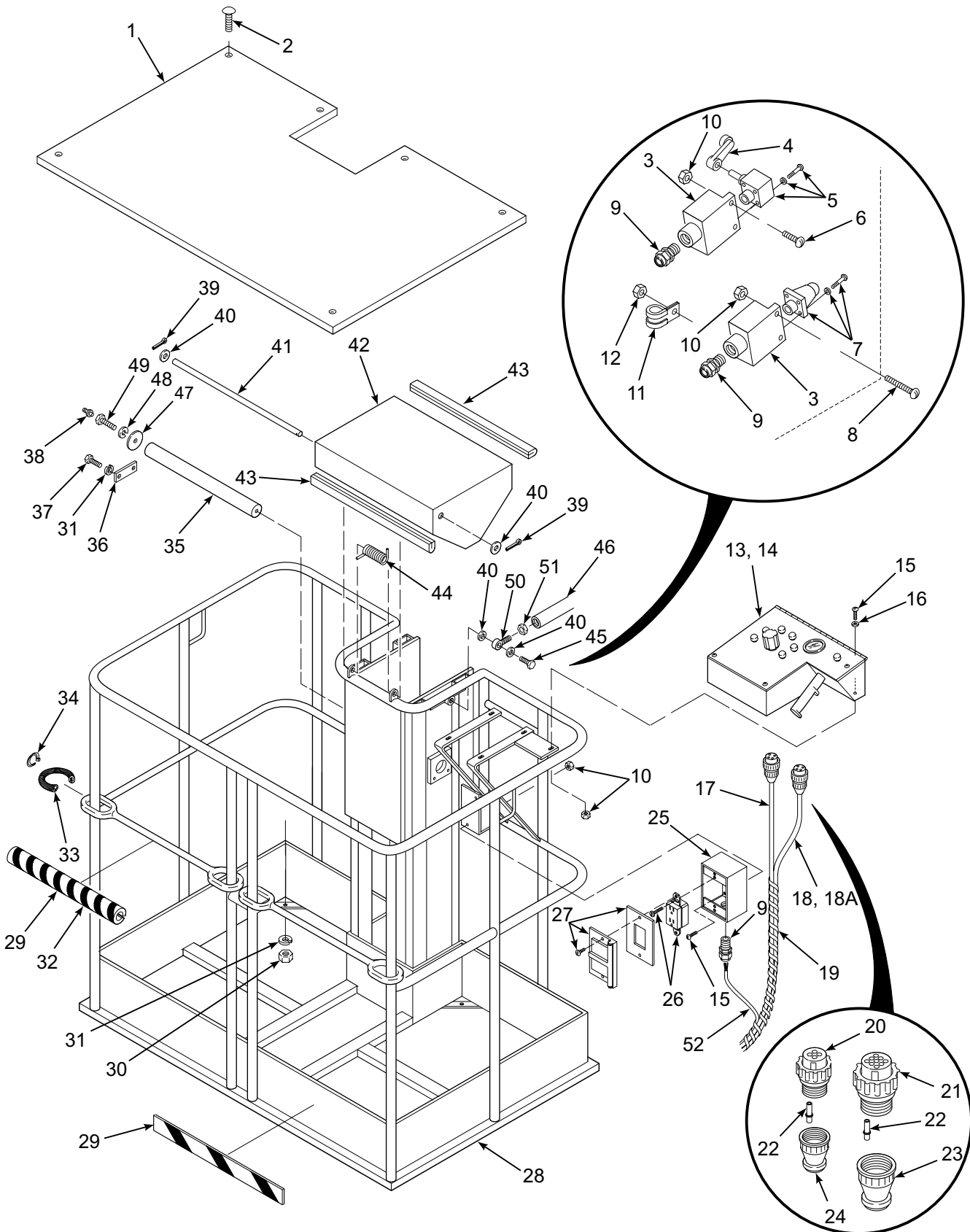


Figure 6-16A. Basket, Early Model

Table 6-16A. Basket Parts List, Early Model

Item No.	Part No.	Description	Qty
1	B44-00-0029	Platform, Basket	1
2	0090-0128	Bolt, Carriage, 5/16-18 x 1-1/4 in.	6
3	B01-03-0006	Switch, Limit	2
4	B01-03-0008	Roller Lever, Limit Switch	1
5	B01-03-0007	Head, Side Rotary, Limit Switch	1
6	0090-0238	Screw, Machine, #10-24 x 1 in.	2
7	B01-03-0016	Head, Roller Plunger, Limit Switch	1
8	0090-0702	Screw, Machine, #10-24 x 2 in.	2
9	B01-09-0029	Cable Grip, 1/2 in.	3
10	0090-0182	Nut, Hex, Nylon Lock, #10-24	10
11	B4-07-0034	Clamp, Cable/Hose, DG 12	1
12	0090-0183	Nut, Hex, Nylon Lock, 1/4-20	1
13	B01-02-0065	Control, Proportional (DC Model)	1
14	B01-02-0063	Control, Proportional (Gas Model)	1
15	0090-0232	Screw, Machine, #10-24 x 5/8 in.	6
16	0090-0415	Washer, Flat, #10	4
17	B05-01-0039	Wire, 18-5	54 ft.
18	B05-01-0038	Wire, 20-2	44 in.
18A	B05-01-0038	Wire, 20-2	39 in.
19	B05-04-0001	Wrap, Black Spiral	3 ft.
20	B01-09-0083	Plug, Socket, 4 Terminal	1
21	B01-09-0086	Plug, Socket, 9 Terminal	1
22	B01-09-0089	Terminal, 18-14 SG	9

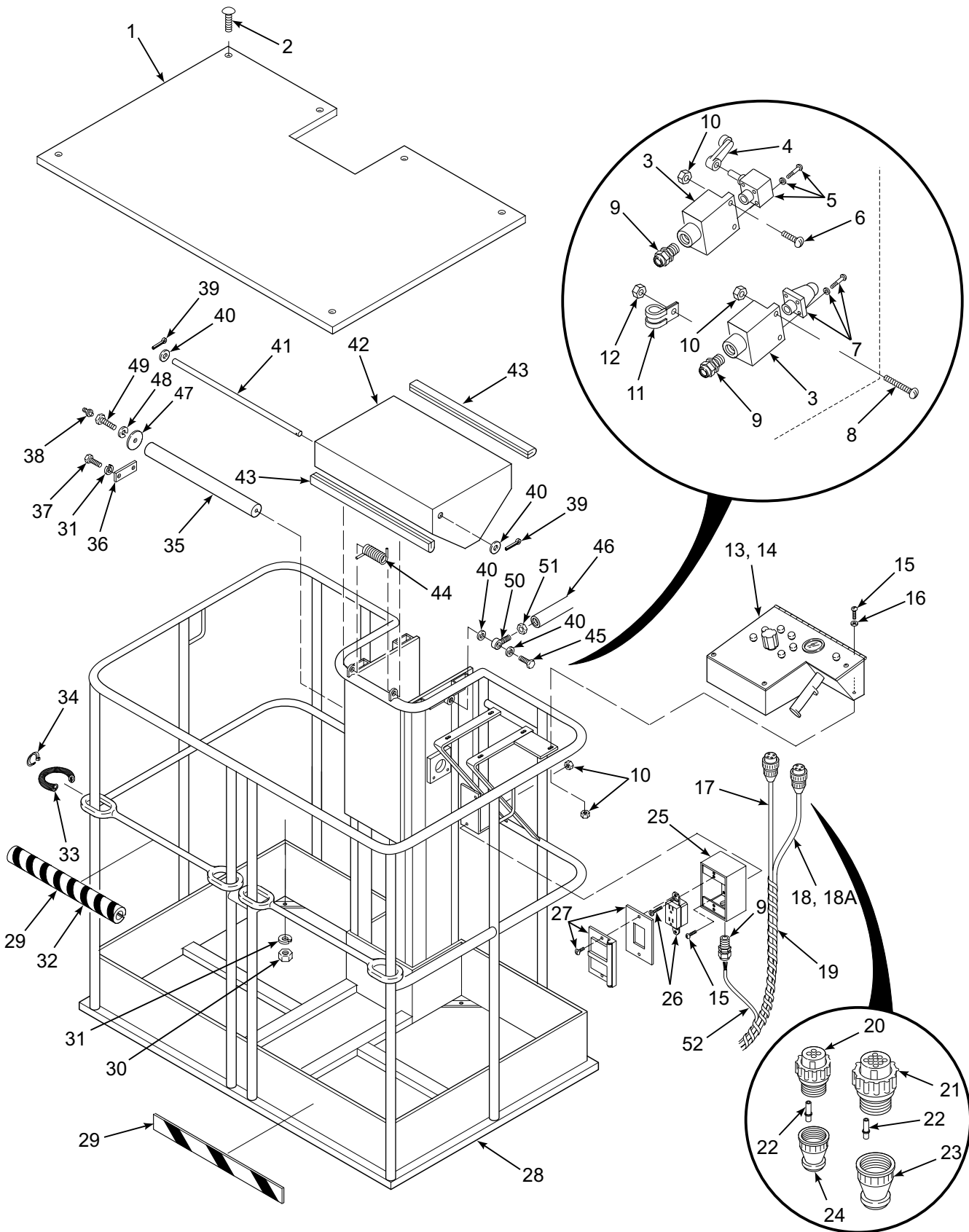


Figure 6-16A. Basket, Early Model

Table 6-16A. Basket Parts List, Early Model, Continued

Item No.	Part No.	Description	Qty
23	B01-09-0088	Cable Housing, 9 Contact Plug	1
24	B01-09-0085	Cable Housing, 4 Contact Plug	1
25	B01-10-0046	Junction Box, 110 Vac Outlet	1
26	B01-10-0034	Receptacle, 120 Vac, GFI	1
27	B01-10-0035	Cover, GFI	1
28	B17-00-0093	Cage Weldment	1
29	B06-00-0167	Caution Tape, Black and Yellow	1 Roll
30	0090-0160	Nut, Hex, 5/16-18	6
31	0090-0208	Washer, Lock, Split, 5/16 in.	10
32	B05-00-0001	Tube, Foam, 14 in.	2
33	B00-00-0086	Casing, Wire, Slit, 5/16 in. dia. x 8.5 in. long	4
34	B01-09-0030	Wire, Tie, 7 x 3/32 in.	12
35	B36-01-0007	Pin, Boom Pivot	1
36	B29-00-0005	Plate	2
37	0090-0028	Screw, Cap, 5/16-18 x 3/4 in.	4
38	B00-00-0009	Fitting, Grease, Straight, 3/16 in.	2
39	0090-0153	Cotter Pin	2
40	0090-0574	Washer, Flat, 1/2 in.	6
41	B36-00-0032	Rod, Pinch Point Cover	1
42	B18-00-0113	Guard, Hand	1
43	B34-00-0006	Trimlock, 1/8 in. x 16 in. long	2
44	0089-151	Spring, Torsion	1
45	0090-0461	Screw, Cap, 1/2-13 x 2 in.	2
46	B11-03-0027	Bar, Upper Leveling	2
47	B04-06-0001	Washer, Retaining	2
48	0090-0210	Washer, Lock, Split, 3/8 in.	2
49	B04-05-0001	Screw, Cap, 3/8-16 x 1 in.	2
50	B25-00-0013	Bearing, Tie Rod End, 1/2 in. L.H. Thread	2
51	0090-0168	Nut, 1/4-20, L.H. Thread	2
52	B05-01-0028	Wire, 14-3 SDN	55 ft.

## 6-17 UPPER CONTROL BOX – EXTERNAL PARTS LIST

Refer to Table 6-17 for the upper control box parts list.



Figure 6-17. Upper Control Box (DC Model) – External

Table 6-17. Upper Control Box – External Parts List

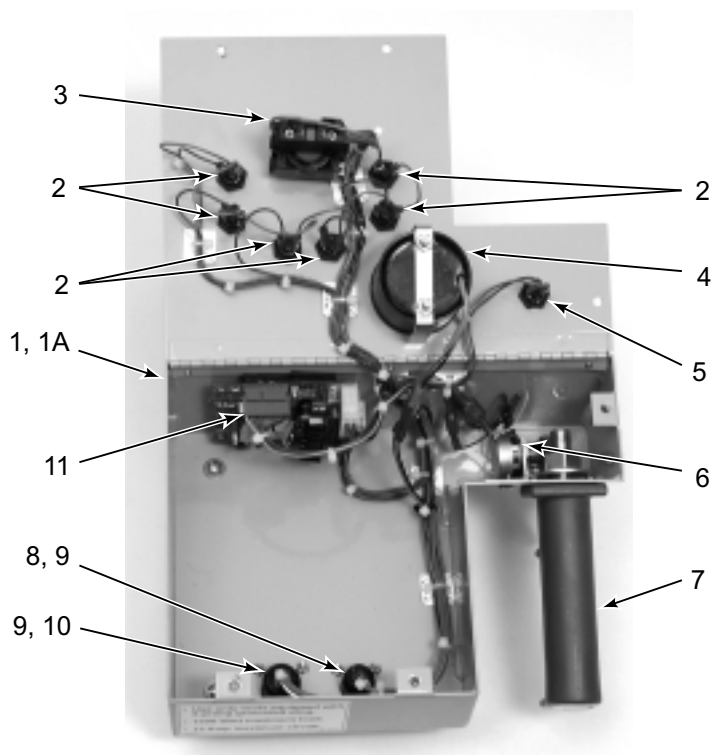
Item No.	Part No.	Description	Qty
1	B01-02-0065	Control Box Assembly, Upper (DC Model)	1
1A	B01-02-0063	Control Box Assembly, Upper (Gas Model) (Not Illustrated)	1
2	B06-00-0372	Decal, Upper Control Box (DC Model)	1
2A	B06-00-0374	Decal, Upper Control Box (Gas Model) (Not Illustrated)	1
*3	B01-10-0017	Gage, Battery	1
4	B01-02-0069	Switch, Pushbutton, Red	1
5	B01-10-0185	Switch, Trigger	1
6	B01-10-0186	Handle, Grip	1
**7	B01-02-0068	Switch, Pushbutton, Yellow	6
8	B01-02-0072	Switch, Emergency Stop	1

\*Equipped on DC model boom lift only.

\*\*Three additional switches included on gas model boom lift.

## 6-18 UPPER CONTROL BOX – INTERNAL PARTS LIST

Refer to the Table 6-18 for the internal upper control box parts list.



**Figure 6-18. Upper Control Box (DC Model) – Internal**

**Table 6-18. Upper Control Box – Internal Parts List**

Item No.	Part No.	Description	Qty
1	B01-02-0065	Control Box, Upper (DC Model)	1
1A	B01-02-0063	Control Box, Upper (Gas Model) (Not Illustrated)	1
2	B01-02-0068	Switch, Pushbutton, Yellow	6
3	B01-02-0072	Switch, Emergency Stop	1
*4	B01-10-0017	Gage, Battery	1
5	B01-02-0069	Switch, Pushbutton, Red	1
6	B01-10-0185	Switch, Trigger	1
7	B01-10-0186	Handle, Grip	1
8	B01-09-0084	Flange Receptacle, 4 Contact	1
9	B01-09-0090	Pin, 18-14 SG	9
10	B01-09-0087	Flange Receptacle, 9 Contact	1
11	B01-10-0184	Circuit Board	1

\*Equipped on DC model boom lift only.

## 6-19 LOWER CONTROL BOX PARTS LIST

Refer to Table 6-19 for the lower control box parts list.

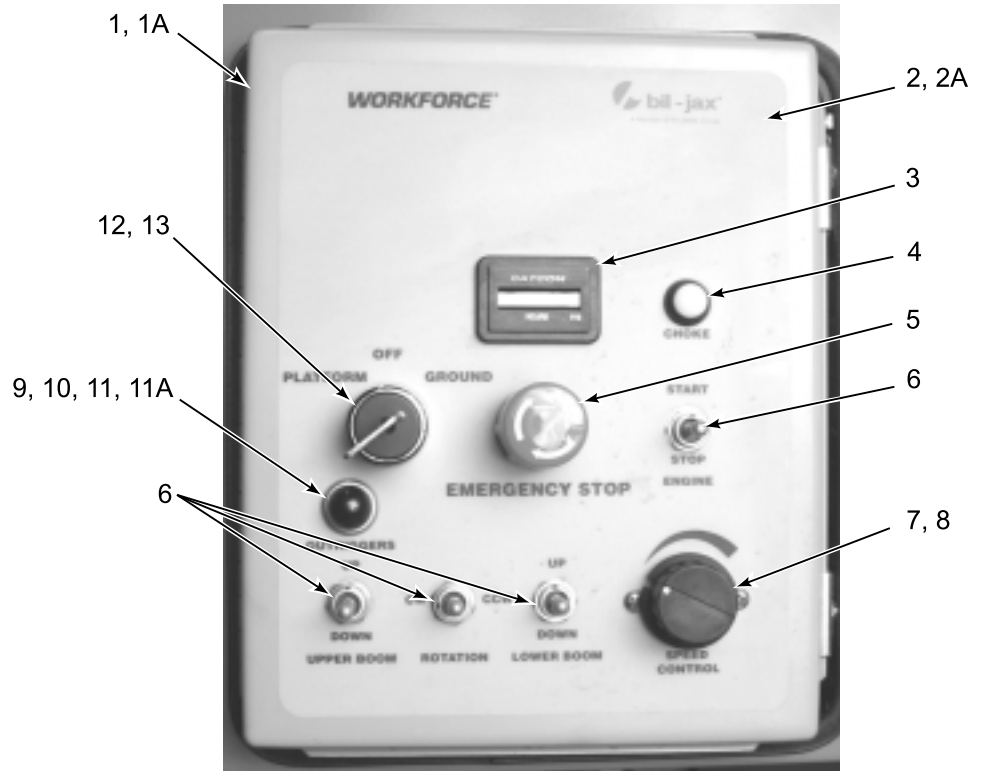


Figure 6-19. Lower Control Box (Gas Model)

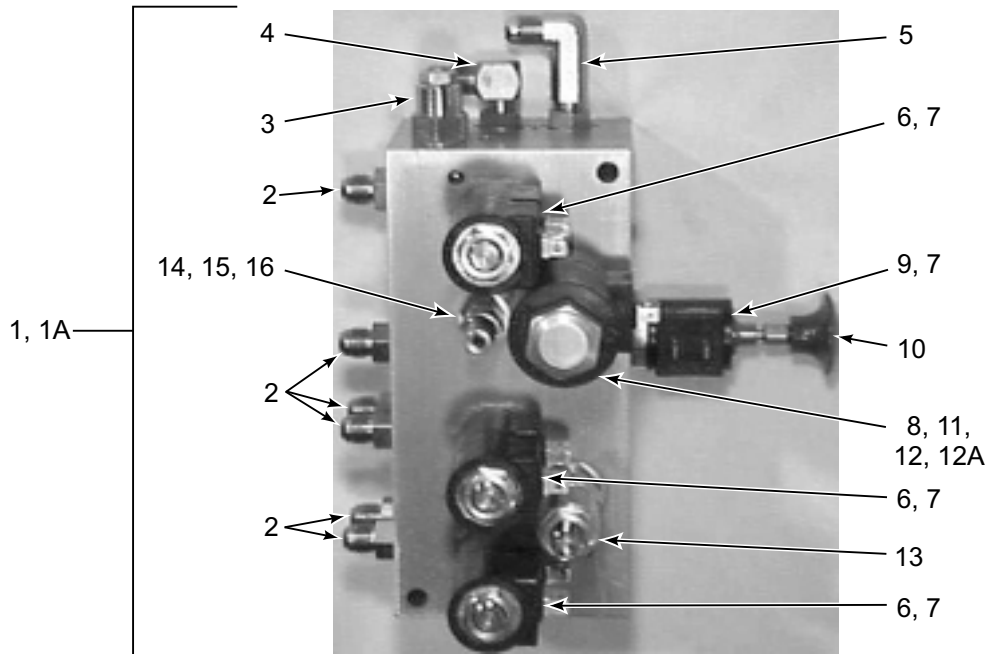


Table 6-19. Lower Control Box Parts List

Item No.	Part No.	Description	Qty
1	B01-02-0066	Control Box, Lower (DC Model) (Not Illustrated)	1
1A	B01-02-0064	Control Box, Lower (Gas Model)	1
2	B06-00-0373	Decal, Lower Control Box (DC Model) (Not Illustrated)	1
2A	B06-00-0375	Decal, Lower Control Box (Gas Model)	1
3	B01-10-0181	Meter, Hour	1
4	B01-02-0068	Switch, Pushbutton, Yellow	1
5	B01-02-0072	Stop Switch, Emergency	1
6	B01-02-0070	Switch, Toggle	4
7	B01-10-0183	Sensor, Speed Control	1
8	B46-00-0032	Knob, Speed Control	1
9	B01-10-0182	Socket, Lamp	1
10	B01-10-0112	Lens, Green	1
11	B01-10-0042	Bulb, 12 Volt (Gas Model)	1
11A	B01-10-0056	Bulb, 24 Volt (DC Model)	1
12	B01-02-0073	Switch, Key	1
13	B38-00-0010	Key	1

## 6-20 PROPORTIONAL VALVE ASSEMBLY PARTS LIST

Refer to Table 6-20 for the proportional valve assembly parts list.



**Figure 6-20. Proportional Valve Assembly**

**Table 6-20. Proportional Valve Assembly Parts List**

Item No.	Part No.	Description	Qty
1	B02-04-0066	Valve Ass'y, Proportional, 24 Volt (DC Model)	1
1A	B02-04-0067	Valve Ass'y, Proportional, 12 Volt (Gas Model)	1
2	B02-02-0084	Fitting, Hex Nipple, 6 JIC, 6 ORM	6
3	B02-04-0064	Valve, Counterbalance	1
4	B02-02-0070	Fitting, 90° Elbow, 6 JIC, 6 ORM	1
5	B02-02-0195	Fitting, 90° Elbow, 6 JIC, 6 ORM LL	1
6	B02-14-0042	Valve, 4 - Way Cartridge	3
6	B01-08-0002	Coil, 12 Volt (Gas Model)	7
7	B01-08-0014	Coil, 18 Volt (DC Model)	7
8	B02-14-0045	Disc, Orifice	1
9	B02-14-0043	Valve, Emergency Lowering	1
10	B46-00-0031	Knob, Emergency Down	1
11	B02-14-0044	Proportional, Valve	1
12	B01-08-0012	Proportional, Coil, 12 Volt (Gas Model)	1
12A	B01-08-0013	Proportional, Coil, 24 Volt (DC Model)	1
13	B02-14-0041	Valve, Relief, Bi-directional	1
14	B02-02-0196	Nipple, 4 ORM, 2 NPTM	1
15	B02-02-0018	Coupler, Male, 2 NPTFM	1
16	B02-14-0047	Plug, Orifice	1

## 6-21 SURGE BRAKES PARTS LIST

Refer to Table 6-21 for the surge brakes parts list.

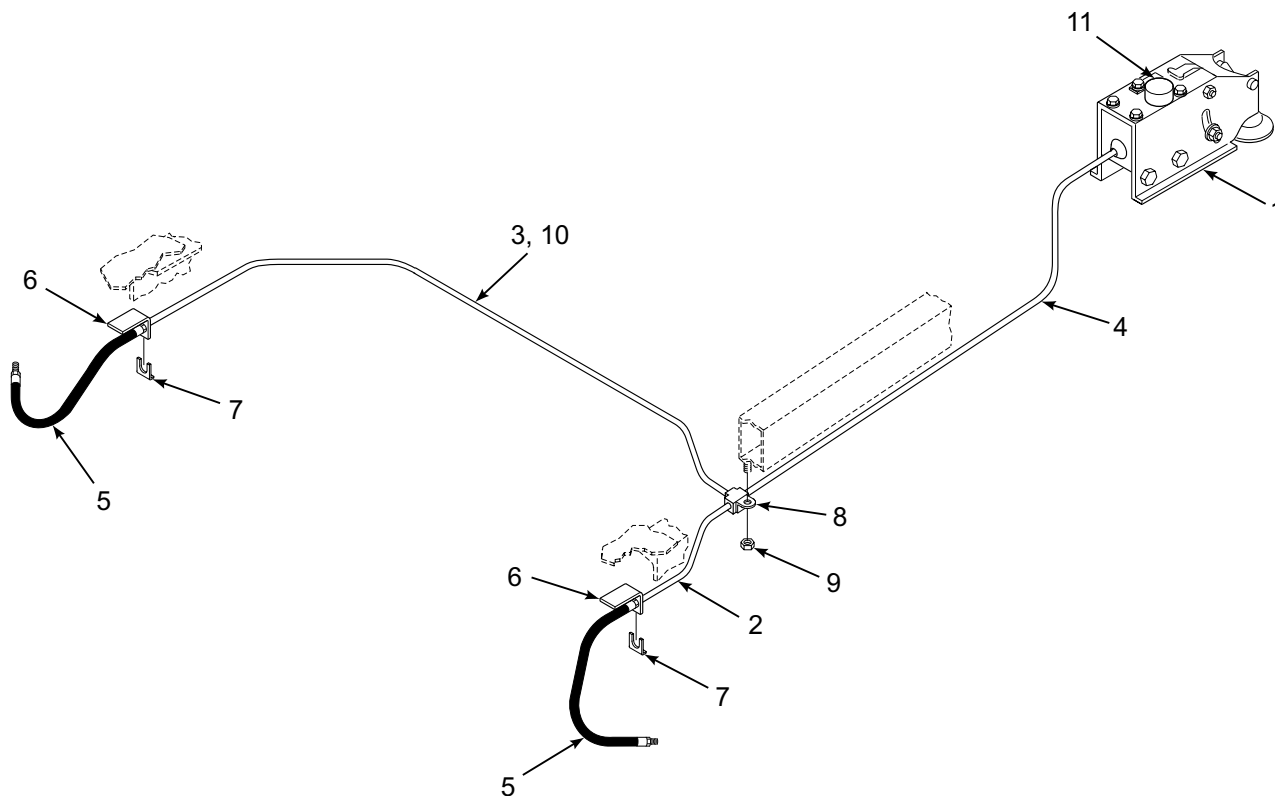


Figure 6-21. Surge Brakes

Table 6-21. Surge Brakes Parts List

Item No.	Part No.	Description	Qty
1	B12-00-0013	Surge Break 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	B01-09-0012	Clamp, Hose, Insulated, 5/16 in.	1
11	B12-00-0033	Cap, Replacement	1

\*\*Not procurable, order brake line kit.

## 6-22 DC MODEL HYDRAULIC SYSTEM PARTS LIST

Refer to Table 6-22 for the DC model boom lift hydraulic system parts list.

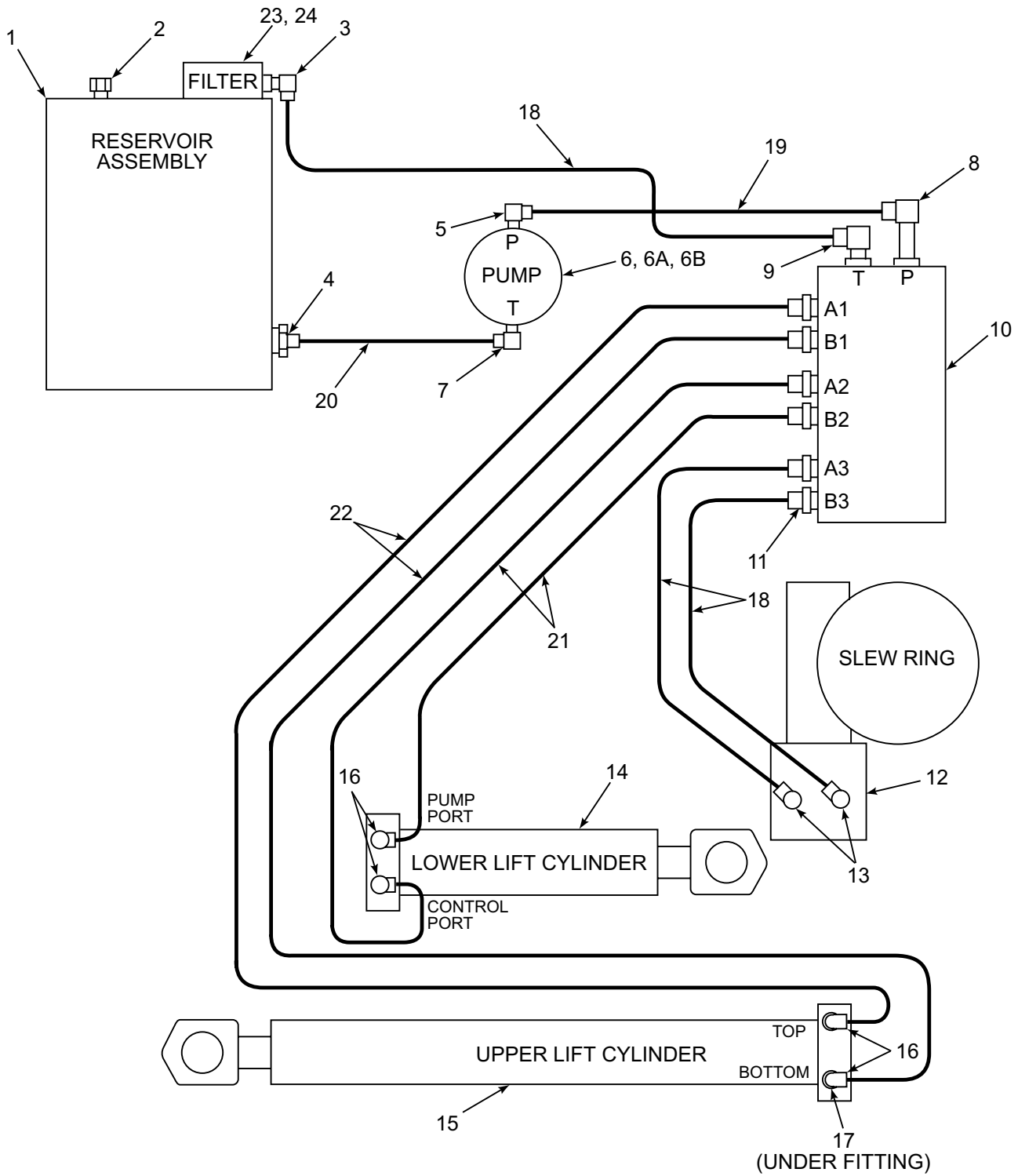


Figure 6-22. DC Model Hydraulic System

**Table 6-22. DC Model Hydraulic System Parts List**

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1	B03-00-0103	Reservoir Assembly	1
2	B02-15-0025	Cap, Breather	1
3	B02-02-0096	Elbow, 90°, 6 JIC-8 NPT	1
4	B02-02-0175	Adapter, 8 Bead, 12 NPT	1
5	B02-02-0029	Fitting, 90° Elbow, 6 JIC-6 NPT	1
6	B02-05-0021	Pump and Motor Assembly, Hydraulic	1
6A	B01-07-0004	Motor, DC, Hydraulic Pump	1
6B	B02-05-0020	Pump, Hydraulic	1
7	B02-02-0174	Elbow, 90°, 8 NPT, 8 Bead	1
8	B02-02-0195	Elbow, 90°, 6 JIC-6 ORM LL	1
9	B02-02-0070	Elbow, 90°, 6 JIC-6 ORM	1
10	B02-04-0066	Valve Manifold, Proportional, DC	1
11	B02-02-0084	Hex Nipple, Fitting, 6 JIC, 6 ORM	6
12	B02-06-0006	Motor, Hydraulic Gear	1
13	B02-02-0025	Elbow, 90°, 6 JIC-10 ORM	2
14	B02-03-0013	Cylinder, Lower Lift, 4 in. Bore x 25 in. Stroke	1
15	B02-03-0022	Cylinder, Upper Lift, 3 in. Bore x 54 in. Stroke	1
16	B02-02-0032	Elbow, 90°, 6 JIC-8 ORM	4
17	B02-04-0004	Valve, Velocity Fuse, 10 GPM	1
	B02-16-0001	Hose Kit (includes items 18-22)	1
18	B02-01-0043	Hose, 6 M3K x 23.5 in., W2 6-6 FJX	3
19	B02-01-0140	Hose, 6 M3K x 20 in., W2 6-6 FJX	1
20	B05-02-0002	Hose, 8 LOLA x 4 in.	1
21	B02-01-0082	Hose, 6 M3K x 55 in., W2 6-6 FJX	2
22	B02-01-0125	Hose, 6 M3K x 204 in., W2 6-6 FJX	2
23	B02-00-0025	Assembly, Filter Head	1
24	B02-00-0026	Element, Filter	1



**Table 6-23. Gas Model Hydraulic System Parts List**

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1	B03-00-0103	Reservoir Assembly	1
2	B02-15-0025	Cap, Breather	1
3	B02-02-0065	Tee, 8 NPT-8 NPTFM-8 NPTFM	1
4	B02-02-0035	Adapter, 6 JIC-8 NPTM	1
5	B02-02-0062	Elbow, 90°, 8 NPT 90	1
6	B02-04-0061	Valve, Pressure Relief	1
7	B02-02-0096	Elbow, 90°, 6 JIC-8 NPT	1
8	B02-02-0180	Elbow, 90°, 8 JIC-8 NPT	1
9	B02-05-0015	Pump, Hydraulic, 0.15 cu. in./rev.	1
10	B02-02-0188	Elbow, 90°, 10 JIC-6 NPT	1
11	B02-02-0187	Elbow, 90°, 10 JIC-12 NPT	1
12	B02-02-0157	Elbow, 90°, 8 JIC-6 NPT	1
13	B02-02-0195	Elbow, 90°, 6 JIC-6 ORM LL	1
14	B02-04-0067	Valve Manifold, Proportional (Gas Model)	1
15	B02-02-0070	Fitting, 90° Elbow, 6 JIC-6 ORM	1
16	B02-02-0084	Hex Nipple, Fitting, 6 JIC, 6 ORM	6
17	B02-06-0006	Motor, Hydraulic Gear	1
18	B02-02-0025	Fitting, 90° Elbow, 6 JIC-10 ORM	2
19	B02-03-0013	Cylinder, Lower Lift, 4 in. Bore x 25 in. Stroke	1
20	B02-02-0032	Fitting, 90° Elbow, 6 JIC-8 ORM	4
21	B02-03-0022	Cylinder, Upper Lift, 3 in. Bore x 54 in. Stroke	1
22	B02-04-0004	Valve, Velocity Fuse, 10 GPM	1
	B02-16-0002	Hose Kit (includes items 23-27)	1
23	B02-01-0125	Hose, 6M3K x 204 in. w/2ea. 6-6FJX fittings	2
24	B02-01-0082	Hose, 6M3K x 55 in. w/2ea. 6-6FJX fittings	2
25	B02-01-0043	Hose, 6M3K x 23.5 in. w/2ea. 6-6FJX fittings	4
26	B02-01-0134	Hose, 10M3K x 26 in. w/2ea. 10-10FJX fittings	1
27	B02-01-0129	Hose, 8M3K x 27 in. w/2ea. 8-8FJX fittings	1
28	B02-00-0025	Assembly, Filter Head	1
29	B02-00-0026	Element, Filter	1





# 7

## ANSI Reprint

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The following sections are reprinted from the ANSI A92.2-1990 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 materials 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 its 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 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 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 ANSI/AWS D1.1-90 and ANSI/AWS D1.2-90. The installer shall establish applicable welding quality assurance procedures for all weldments.
- 7.8 Training.** The dealer or installer shall offer operator training initially in the operation of the aerial device(s) to the purchaser.

## 8. Responsibilities of the Owners and Users

**8.1 General Responsibilities.** Each owner or user shall comply with the requirements of this section.

The following responsibilities pertain to owner and user inspection, testing, maintenance and modification. 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 test shall be performed. Safe intervals shall be set by the user based on the recommendations that shall be supplied by the manufacturer.

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 user based on recommendations by the manufacturer for each specific aerial device shall be inspected for defects.

Inspection and tests referred to as critical in the manufacturer's manual shall be strictly adhered to.

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 of visible damage or contamination
- (5) Missing illegible operational markings
- (6) Electrical apparatus for malfunction, signs or excessive deterioration, dirt, and moisture accumulation

Any suspected items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be replace or repaired before use.

**8.2.4 Periodic Inspection and 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 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) Hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage
- (9) Hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system indicating other component deterioration
- (10) Electrical systems and components for deterioration or wear including those not readily visible on frequent inspection
- (11) Performance test of all boom movements
- (12) Condition and tightness of bolts and other fasteners
- (13) Welds, as specified by the manufacturer
- (14) Legible and proper markings of controls, ratings, and instructions
- (15) If the aerial device is rated and used as an insulated device, the electrical insulating components and system(s), after a thorough inspection for lack of cleanliness and other hazards, 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 A.C. bare-hand work, the unit shall undergo a 60 hertz test as shown in Table 2 at least every three years.
  - (b) If the aerial device is used for D.C. bare-hand work, the unit shall undergo a D.C. 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 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 user based on the recommendation of the manufacturer.

Maintenance referred to as critical in the manufacturer's manual shall be strictly adhered to.

Welding repairs or components or welds, designated as critical in the manufacturer's manual, shall be made in accordance with the manufacturer's recommendations. Should the original manufacturer no longer exist an equivalent entity may determine the required procedure.

**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 manufacturer's 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 (G.A.W.R.) assigned by the manufacturer.

**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.

**8.10 Safety Bulletins.** Owner and user shall comply with safety related bulletins as received from the manufacturer, dealer or installer.

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

**8.12 Training of Operators.** Each trainee shall be instructed in the safe and proper operation of the aerial device utilizing the manufacturer's operator's manual, the user's work instructions, and the appropriate standards referenced in Section 2.

Such training shall include "hands-on" use to successfully demonstrate the trainee's proficiency to the satisfaction of the qualified person designated to administrate the user's training program.

**8.13 Operation.**

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

**8.13.2 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.

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

- (1) Avoid traveling on any surface that adversely effects vehicle stability
- (2) Maintain a safe distance from obstacles
- (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

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

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

**8.13.6 Lower Controls.** On aerial devices having both upper and lower controls, the lower controls shall not be used for continuous operation of the aerial device with individual(s) in the platform.

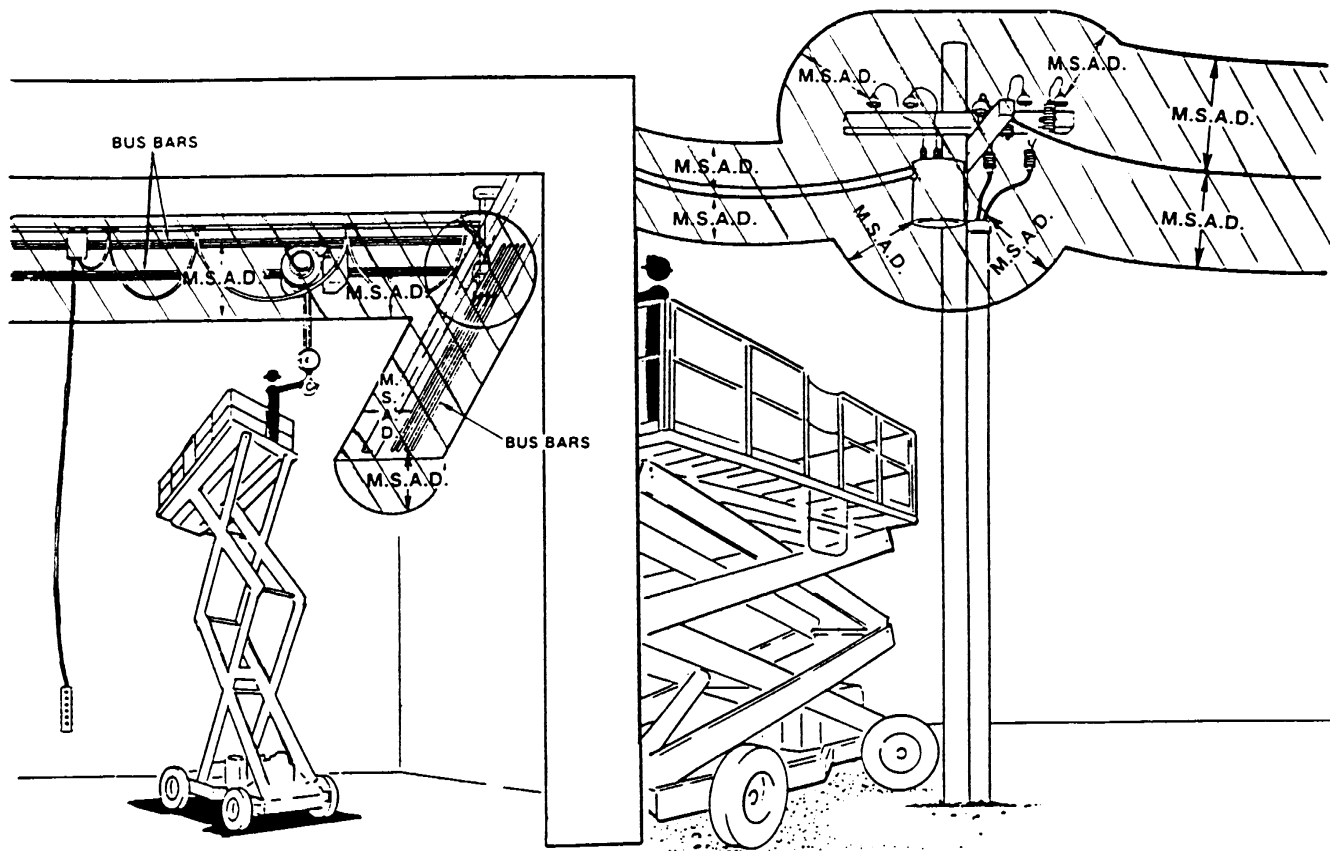
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## 9. Responsibilities of Renters or Lessors

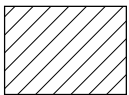
- 9.1 General Responsibilities.** Each renter or lessor shall comply with the requirements of this section.
- 9.2 Ownership Duties.** The renter or lessor shall carry out the duties of ownership specified in this standard which are not assumed by the renting entity of lessee as the user.
- 9.3 Obligations.** Each renter or lessor of an aerial device shall provide a copy of user responsibilities within this standard.
- 9.4 Training.** The renter or lessor shall offer operator training initially to the renting entity or lessee.
- 9.5 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.

## 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 the operator shall wear a body belt or harness and be connected to the aerial device with a lanyard 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 8.13.3.
- 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.
- 10.7 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.



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.**

<b>Voltage Range (Phase to Phase)</b>	<b>Minimum Safe Approach Distance</b>	
	<b>(Feet)</b>	<b>(Meters)</b>
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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