UpRight

LX31/41 Electric

WORK PLATFORMS

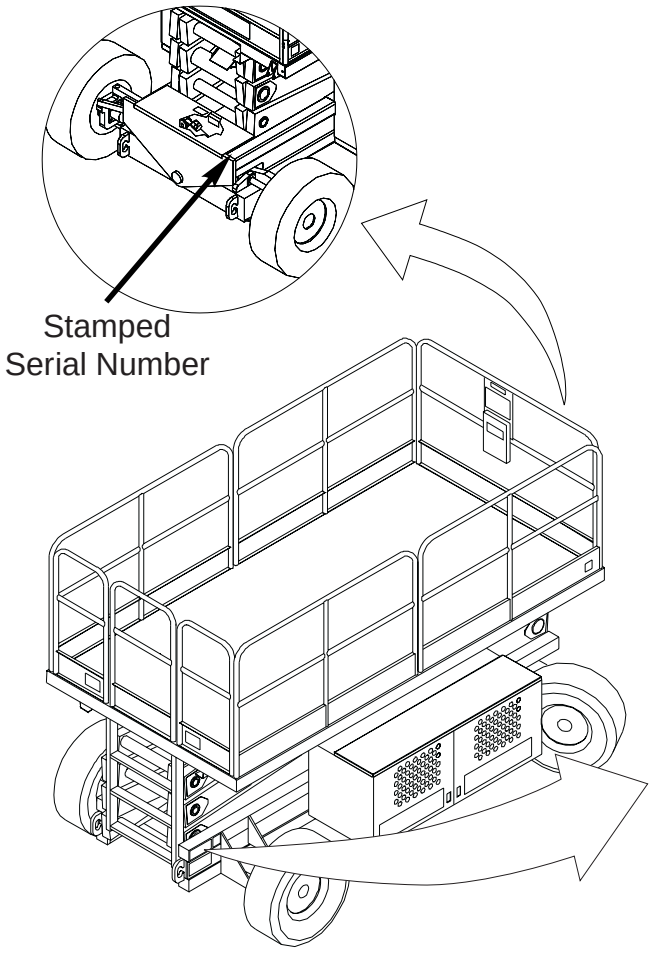
Service & Parts Manual

SERVICE & PARTS MANUAL

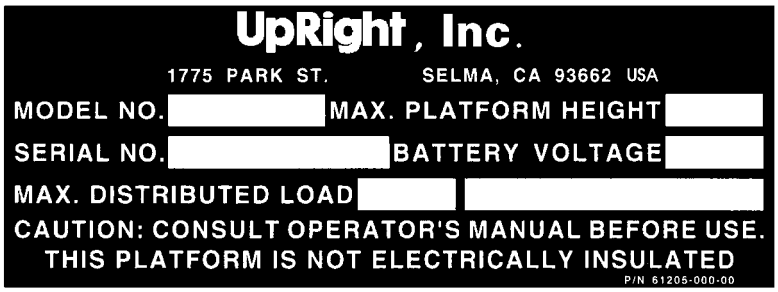
LX 31/41

Electric Models

Serial Numbers 3300 to current



When contacting UpRight for service or parts information, be sure to include the MODEL and SERIAL NUMBERS from the equipment name-plate. Should the nameplate be missing, the SERIAL NUMBER is also stamped on top of the chassis above the front axle pivot.



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FORWARD

HOW TO USE THIS MANUAL

This manual is divided into 6 sections. The section number printed at the top corner of each page can be used as a quick reference guide.

Special information

⚠ DANGER ⚠

Indicates the hazard or unsafe practice will result in severe injury or death.

⚠ WARNING ⚠

Indicates the hazard or unsafe practice could result in severe injury or death.

⚠ CAUTION ⚠

Indicates the hazard or unsafe practice could result in minor injury or property damage

NOTES: Give helpful information.

WORKSHOP PROCEDURES

CAUTION: Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause personal injury, or could damage a machine or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by UpRight, Inc., might be done, or of the possible hazardous consequences of each conceivable way, nor could UpRight Inc. investigate all such ways. Anyone using service procedures or tools, whether or not recommended by UpRight Inc., must satisfy themselves thoroughly that neither personal safety nor machine safety will be jeopardized.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and table.

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Section 1

INTRODUCTION & SPECIFICATIONS

1.1 INTRODUCTION

Purpose

The purpose of this service and parts manual is to provide instructions and illustrations for the operation and maintenance of the Work Platform manufactured by UpRight, Inc. of Selma, California.

Scope

The manual includes procedures for proper operation, maintenance, adjustment, and repair of this product as well as recommended maintenance schedules and troubleshooting.

1.2 GENERAL DESCRIPTION

The LX 31/41 Work Platform consists of the platform, controller, elevating assembly, power module, control module, and chassis.

Platform

The platform has a reinforced steel floor, 43.5 inch (1.11 m) high guardrails with midrail, 6 inch (152 mm) toeboards and an entrance gate at the rear of the platform. The guardrails can be folded down for access through doors or for shipment.

⚠ WARNING ⚠

DO NOT use the maintenance platform without guardrails properly assembled and in place.

Controller

The controller contains the controls to operate the machine. It should be hung on the front, left, or right guardrail, but may be hand held if necessary. To operate the machine, the interlock lever must be depressed to operate any function. A complete explanation of control functions can be found in Section 2.

Elevating Assembly

The platform is raised and lowered by the elevating assembly; a three (LX31), or four (LX41) section scissor assembly powered by a single stage lift cylinder. The hydraulic pump, driven by the batteries, powers the cylinder. Solenoid operated valves control raising and lowering.

Power Module

The power module contains the batteries, hydraulic pump, and hydraulic reservoir.

Control Module

The control module contains the hydraulic valve manifold, horn/alarms, volt/hour meter, electrical terminal strips, batteries, and chassis control panel. A complete explanation of the chassis control functions is found in Section 2.

Chassis

The chassis is a structural frame that supports all the components of the LX31/41 Work Platform.

1.3 PURPOSE OF EQUIPMENT

The objective of the LX31/41 Work Platform is to provide a quickly deployable, self propelled, variable height work platform to elevate personnel and materials to overhead work areas and be driven over normal terrains.

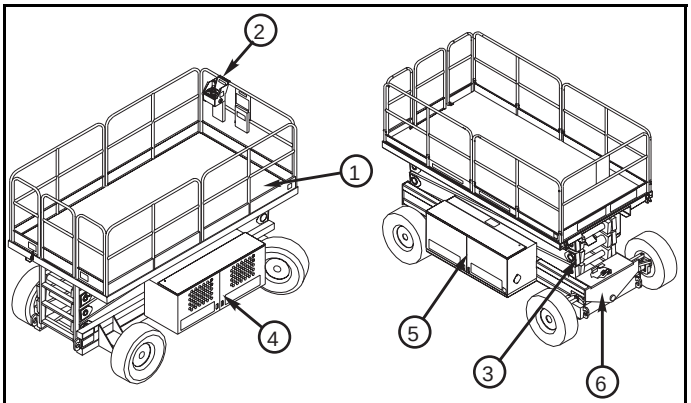
1.4 SPECIAL LIMITATIONS

Travel with the platform raised is limited to a creep speed range.

Elevating of the Work Platform is limited to firm, level surfaces only. Any degree of slope greater than 2° will lockout the elevating circuits and sound a warning alarm.

⚠ DANGER ⚠

The elevating function shall ONLY be used when the work platform is level and on a firm surface. The work platform is NOT intended to be driven over uneven, rough or soft terrain when elevated



1. Platform
2. Controller Assembly
3. Elevating Assembly
4. Power Module
5. Control Module
6. Chassis

Figure 1-1: Work Platform

1.5 SPECIFICATIONS

Table 1-1: Work Platform Specifications

ITEM	LX31	LX41
Platform Size (Inside Toeboards)		
Standard	143.38 in. x 70 in. [3.64 m x 1.78 m]	143.38 in. x 70 in. [3.64 m x 1.78 m]
w/ Extension	179.38 in. x 68 in. [4.56 m x 1.73 m]	179.38 in. x 68 in. [4.56 m x 1.73 m]
Max. Platform Capacity		
Standard	2000 lbs. [907 kg]	1,500 lbs. [680 kg]
w/ Extension	2000 lbs. [907 kg]	1,500 lbs. [680 kg]
on Extension	500 lbs. [227 kg]	500 lbs. [227 kg]
Max. No. of occupants		
Standard	8 people	6 people
on Extension	2 people	2 people
Height		
Working Height	37 ft. [11.4 m]	47 ft. [14.33 m]
Max. Platform Height	31 ft. [9.45 m]	40 ft. 6 in. [12.34 m]
Min. Platform Height	56.25 in. [1.43 m]	65.25 in. [1.66 m]
Dimensions		
Weight, Standard	9,920 lbs. [4,500 kg]	11,260 lbs. [5,108 kg]
Weight, w/ Extension	10,350 lbs. [4,695 kg]	11,690 lbs. [5,303 kg]
Overall Width	90 in. [2.29 m]	90 in. [2.29 m]
Overall Height	99.75 in. [2.53 m]	108.75 in. [2.76 m]
Overall Length, Standard	160.5 in. [4.08 m]	160.5 in. [4.08 m]
Driveable Height	31 ft. [9.45 m]	40 ft. 6 in. [12.34 m]
Surface Speed		
Platform Lowered	0 to 3.1 mph [0 to 5.0 km/h]	0 to 3.1 mph [0 to 5.0 km/h]
Platform Raised	0 to 0.3 mph [0 to .48 km/h]	0 to 0.3 mph [0 to .48 km/h]
System Voltage	48 Volt DC	48 Volt DC
Hydraulic Tank Capacity	28.3 Gallons [107.13 l]	28.3 Gallons [107.13 l]
Maximum Hydraulic System Pressure	3000 psi [206.8 bar]	3000 psi [206.8 bar]
Hydraulic Fluid		
Normal use (>32 oF [0 oC])	ISO #46	ISO #46
Low Temp use (-10 to 32 oF [-23 to 0 oC])	ISO #32	ISO #32
Lift System	One Single Stage Lift Cylinder	One Single Stage Lift Cylinder
Lift Speed	Raise, 50 sec./Lower, 48 sec.	Raise, 50 sec./Lower, 48 sec.
Drive Control	Proportional	Proportional
Control System	Joystick Controller with Interlock Lever and Thumb Rocker Steering; Speed & Function Selector Switches and Emergency Stop Button	Joystick Controller with Interlock Lever and Thumb Rocker Steering; Speed & Function Selector Switches and Emergency Stop Button
Horizontal Drive	2 Wheel, Electric Motors	2 Wheel, Electric Motors
Tires	9.5-16.5 NHS 8 Ply, 75psi [5.2 bar] (except polyfilled)	9.5-16.5 NHS 8 Ply, 75psi [5.2 bar] (except polyfilled)
Parking Brakes	Two, Spring Applied, Hydraulic Release, Multiple Disc	Two, Spring Applied, Hydraulic Release, Multiple Disc
Turning Radius (inside)	48 in. [1.22 m]	48 in. [1.22 m]
Maximum Gradeability	30% [16.7]	30% [16.7]
Wheel Base	115.75 in. [2.94 m]	115.75 in. [2.94 m]
Guardrails	43.5 in. [1.1 m] high, Fold Down with Gate	43.5 in. [1.1 m] high, Fold Down with Gate
Toeboard	6 in. [152 mm] High	6 in. [152 mm] High

NOTE: Specifications subject to change without notice. Hot weather or heavy use may reduce performance. Meets or exceeds all applicable requirements of OSHA and ANSI A92.6-1999.

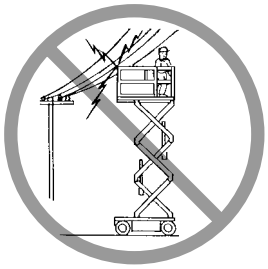
Section 2

MACHINE PREPARATION & OPERATION

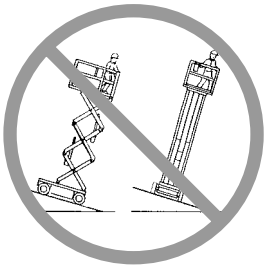
Warning

All personnel shall carefully read, understand and follow all safety rules, operating instructions, and the Scaffold Industry Association's ***Manual of Responsibilities (ANSI A92.6)*** before operating or performing maintenance on any Upright

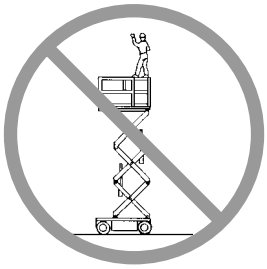
Safety Rules



NEVER operate the machine within ten feet of power lines. THIS MACHINE IS NOT INSULATED



NEVER elevate or drive elevated on uneven slopes or soft ground or elevate the platform unless the platform is level



NEVER sit, stand or climb on guardrail or midrail

NEVER operate the machine without first surveying the work area for surface hazards such as holes, drop-offs, bumps and debris.

NEVER operate the machine if all guardrails are not properly in place and secured with all fasteners properly torqued.

SECURE and lock gate after mounting platform.

KEEP all body parts clear of outriggers when extending or retracting (outrigger equipped machines only).

NEVER use ladders or scaffolding on the platform.

NEVER attach overhanging loads or increase platform size.

LOOK up, down and around for overhead obstructions and electrical conductors.

DISTRIBUTE all loads evenly on the platform. See the back cover for maximum platform load.

NEVER use damaged equipment. (Contact UpRight for instructions. See toll-free phone number on back cover.)

NEVER change operating or safety systems.

INSPECT the machine thoroughly for cracked welds, loose hardware, hydraulic leaks, damaged control cable, loose wire connections and wheel bolts.

NEVER climb down elevating assembly with the platform elevated.

NEVER perform service on machine while platform is elevated without blocking elevating assembly.

NEVER recharge battery near sparks or open flame; batteries that are being charged emit highly explosive hydrogen gas.

AFTER USE secure the work platform against unauthorized use by turning key switch off and removing key.

NEVER replace any component or part with anything other than original UpRight replacement parts without the manufacturer's consent.

California Proposition 65 Warning

Gasoline and diesel engine exhaust and some of their constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Section 2.1

MACHINE PREPARATION & OPERATION

2.1 INTRODUCTION

This manual covers the Electric model of the LX Series Work Platforms. This machine operates on a 48 volt battery powered system.

⚠ CAUTION ⚠

DO NOT use a machine that is damaged or malfunctioning. Tag and remove the unit from service until it is repaired.

2.2 PRE-OPERATION AND SAFETY INSPECTION

Carefully read, understand and follow all safety rules, labels, and operating instructions, then perform the following steps each day before use.

Perform a complete visual inspection of the entire unit prior to operating.

1. Open panels and check hydraulic components and hoses for damage or leaks. Check electrical components and wiring for damage or loose connections.
2. Inspect chassis, axles, hubs, and steering linkage for damage, deformation, buckeled paint, loose or missing hardware, and cracked welds.
3. With platform fully lowered, check the hydraulic oil level sight gauge on the hydraulic tank . Add ISO #46 hydraulic oil if necessary.
4. Check that fluid level in all batteries is correct (See Battery Maintenance in Section 3).
5. Check that all guardrails are in place. Insure that gate operates freely and latches securely.
6. Check tires for damage. Check tire pressure; 75 psi (5.2 bar) if equipped with pneumatic tires.
7. Carefully inspect the entire work platform for damage such as cracked welds or structural members, loose or missing parts, oil leaks, damaged cables or hoses, and loose connections.

System Function Inspection

⚠ WARNING ⚠

STAND CLEAR of the work platform while performing the following checks.

Before operating the work platform survey the work area for surface hazards such as holes, drop-offs, bumps and debris.

Check in ALL directions, including above the work platform, for obstructions and electrical conductors.

Protect control console cable from possible damage while performing checks.

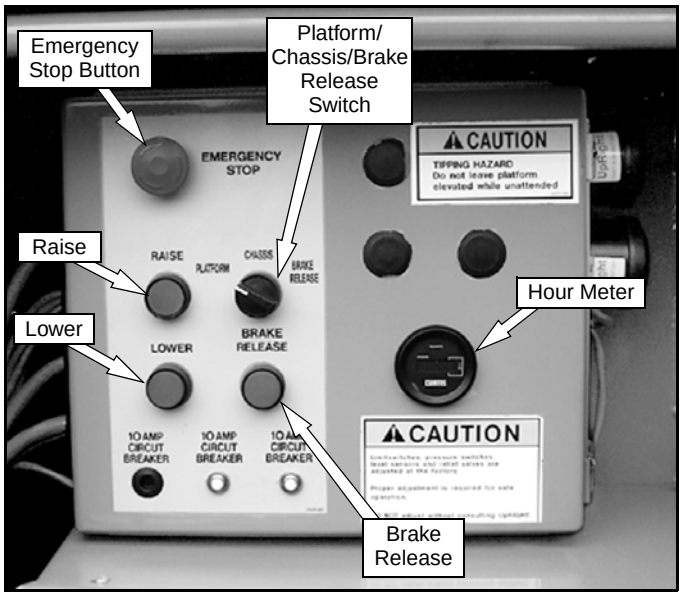


Figure 2-1: Chassis Control Panel

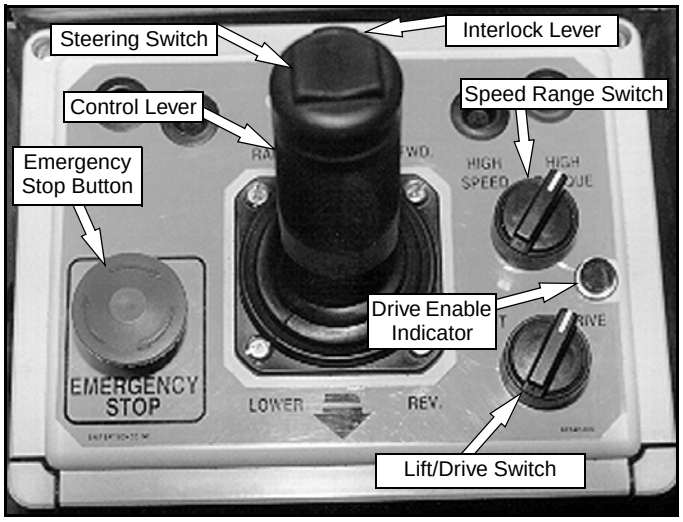


Figure 2-2: Controller

1. Unhook controller from guardrail. Firmly grasp controller handle in such a manner that the interlock lever can be depressed, while performing the following checks from the ground.
2. Turn platform controller key switch clockwise to ON.
3. Position drive/lift switch to DRIVE position. Drive enable indicator light will be illuminated.
4. With the speed range switch first in LOW SPEED and then again in HIGH SPEED depress the interlock lever and slowly push the control lever to FORWARD then REVERSE positions to check for speed and directional control. The farther you push or pull the control lever the faster the machine will travel.
5. Push steering switch RIGHT then LEFT to check for steering control.
6. Hook controller on guardrail in original position.
7. On chassis controls, turn key switch to Chassis.
8. From lower controls, push chassis raise button to elevate platform while pushing the tilt sensor (Figure 2-3) off of level. The platform should only partially elevate and the tilt alarm should sound. If the platform continues to elevate and/or there is no alarm STOP and remove the machine from service until it is repaired.
9. Release the tilt sensor and fully elevate platform.
10. Visually inspect the elevating assembly, lift cylinder, cables and hoses for damage or erratic operation. Check for missing or loose parts.
11. Lower the platform partially by pushing in on the chassis lower switch, and check operation of the audible lowering alarm.
12. Open the chassis emergency lowering valve (Figure 2-4) to check for proper operation by pulling and holding the knob out. Once the platform is fully lowered, close the valve by releasing the knob.
13. On chassis controls, turn key switch to platform.
14. Mount the platform making sure the gate is latched.
15. Turn platform controller key switch clockwise to ON. Position drive/lift switch to LIFT.
16. Depress the interlock lever and slowly push the control lever to RAISE to raise the platform, fully actuate the control lever to check proportional lift speed. Elevate the platform to 12 feet (3.7 m).
17. Slowly pull control lever to DOWN position to lower platform. Check that lowering alarm sounds.
18. Turn platform controller key switch to OFF, push the emergency stop button and dismount the platform.
19. Close and secure module covers.

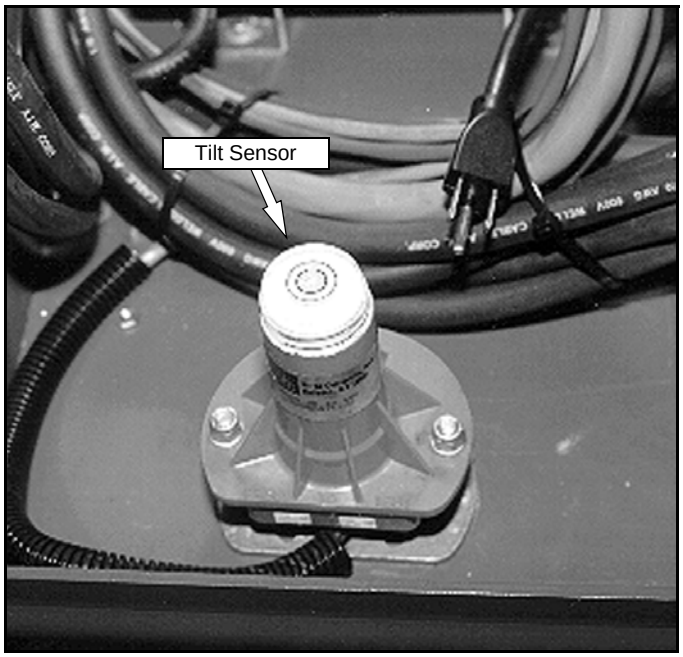


Figure 2-3: Tilt Sensor

2.3 OPERATION

Before operating work platform, ensure that the pre-operation and safety inspection has been completed, any deficiencies have been corrected and the operator has been thoroughly trained on this machine.

Travel With Platform Lowered

1. Verify chassis emergency stop switch is in the ON position (pulled out), the drive enable indicator light is on, and that the platform/chassis switch is on platform.

NOTE: If the drive enable indicator light is off, verify that the platform is fully lowered.

2. After mounting platform, close and latch gate. Check that guardrails are in position and properly assembled with fasteners properly torqued.
3. Check that route is clear of persons, obstructions, holes and drop-offs and surface is capable of supporting the wheel loads.
4. Check clearances above, below and to the sides of the platform.
5. Pull controller emergency stop button out to ON position.
6. Set the drive/lift speed range switch to LOW SPEED.
7. Grasp the control lever so the interlock lever is depressed (releasing the interlock lever cuts power to controller). Slowly push or pull the control lever to forward or REVERSE to travel in the desired direction. The farther you push or pull the control lever from center the faster the machine will travel.
8. While moving, push the drive/lift speed range switch to HIGH SPEED for travel on level surfaces or to LOW SPEED for climbing grades or traveling in confined areas.

Steering

1. Push the steering switch RIGHT or LEFT to turn the wheels. Observe the tires while maneuvering to insure proper direction.

NOTE: Steering is not self-centering. Wheels must be returned to the straight ahead position by operating the steering switch.

Raising and Lowering the Platform

1. Position the drive/lift switch to LIFT.
2. While holding the control lever so the interlock lever is depressed, push the control lever slowly to UP to raise the platform. Pushing the control lever farther increases the lift speed.
3. Lower the platform by pulling back on the control lever until the platform is fully lowered.

Travel with Work Platform Elevated

Travel with platform elevated ONLY on firm and level surfaces.

NOTE: The work platform will travel at reduced speed when in the elevated position, and only when the front axle is parallel with the rear axle.

1. Check that the route is clear of persons, obstructions, holes and drop-offs, surface is level and capable of supporting the wheel loads.
2. Check clearances above, below and to the sides of platform.
3. Position the drive/lift switch to the DRIVE position.
4. Push the control lever to FORWARD or REVERSE for the desired direction of travel.

If the machine quits driving and the tilt alarm sounds, immediately lower the platform and move the machine to a level location before re-elevating the platform.

Emergency Lowering

The emergency lowering knob is located at the front of the machine at the base of the scissor assembly (Figure 2-4).

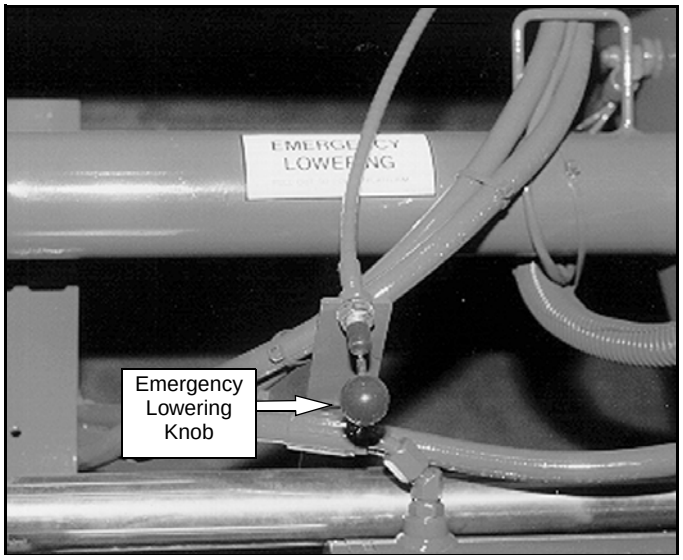


Figure 2-4: Emergency Lowering Knob

1. Open the emergency lowering valve by pulling on the knob and holding it.
2. Once the platform is fully lowered, release the knob to close the valve.
3. After Use Each Day
4. Ensure that the platform is fully lowered.
5. Park the machine on level ground, preferably under cover, secure against vandals, children or unauthorized operation.
6. Turn the key switch to OFF and remove the key to prevent unauthorized operation.

Parking Brake Release

Perform the following only when the machine will not operate under its own power and it is necessary to move the machine or when winching onto a trailer to transport.

⚠ WARNING ⚠

Never release brakes if machine is on a slope. Hook machine to towing vehicle before releasing brakes.

1. Turn Platform/Chassis/Brake Release switch to Brake Release position (Figure 2-5). Alarm will sound.
2. Momentarily push brake Release button.
3. The machine will now roll when pushed or pulled.
4. For normal operation, turn Platform/Chassis/ Brake Release switch to Platform position.

⚠ WARNING ⚠

Never operate work platform with the parking brakes released. Serious injury or damage could result.

Figure 2-5: Parking Brake Release Button

2.4 PREPARATION FOR SHIPMENT

1. Grease all the grease fittings (see Section 3).
2. Fully lower the platform.
3. Uncouple Anderson connectors to disconnect batteries.
4. Band the controller to the front guardrail.
5. Band the elevating linkage to the frame.

2.5 STORAGE

No preparation for storage is required when the work platform is in normal usage. Regular maintenance procedures should continue to be performed (see Section 3).

If the work platform is to be placed in long term storage (dead storage), follow the recommended preservation procedures, below.

PRESERVATION

1. Clean painted surfaces. If the paint is damaged, repaint.
2. Fill the hydraulic tank to operating level, fluid will be visible at the Sight Gauge. DO NOT fill the hydraulic tank while the platform is elevated.

NOTE: DO NOT drain the hydraulic system prior to long term storage.

3. Coat exposed portions of extended cylinder rods with a preservative such as multipurpose grease and wrap with barrier material.
4. Coat all exposed unpainted metal surfaces with preservative.

BATTERIES

1. Disconnect the batteries negative (-) cables and secure to the chassis.
2. Disconnect the remaining battery leads and secure to the chassis.
3. Remove the batteries and place in alternate service.

2.6 RAISING THE PLATFORM

From the Platform Controls

1. Select platform at the Chassis/Platform Switch.
2. Select lift at the Drive/Lift Switch.
3. Push the Control Handle forward.
   a. This will energize;
      - the Drive/Lift Relay
      - the Cutout Relay (the Cutout Relay will only stay energized if the Level Sensor is level within 2°)
      - the Up Relay (completing the circuit to the Up Solenoid Valve)
      - and the Proportional Valve
   b. This will allow oil flow;
      - through the Proportional Valve (regulating the speed to a rate which is proportional to the angle of Control Handle deflection)
      - through the Lift Valve
      - through the Down Valve
      - and to the Lift Cylinder (raising the Platform).

From the Chassis Controls

1. Select chassis at the Chassis/Platform Switch,
2. Press the Up Button
   a. This will energize
      - the Proportional Valve (regulating speed through 10 ohm resistor)
      - and the Lift Valve.
   b. This will allow oil flow
      - through the Proportional Valve (regulating the speed to a fixed rate which is set by the 10 ohm resistor)
      - through the Lift Valve
      - through the Down Valve
      - and to the Lift Cylinder (raising the Platform).

2.7 LOWERING THE PLATFORM

From the Platform Controls

1. Select platform at the Chassis/Platform Switch.
2. Pull the Control Handle backward.
   a. This will energize;
      - the Down Relay (completing the circuit to the Down Solenoid Valve)
      - and the Down Alarm Relay (completing the circuit to the Down Alarm).
   b. This will sound the down alarm, and allow oil to flow;
      - out of the Lift Cylinder
      - through the Down Orifice (regulating the descent speed)
      - through the Down Valve
      - through the Lift Valve
      - and out to the Hydraulic Reservoir.

From the Chassis Controls

1. Select chassis at the Chassis/Platform Switch.
2. Press the Down Button
   a. will energize;
      - the Down Relay (completing the circuit to the Down Solenoid Valve)
      - and the Down Alarm Relay (completing the circuit to the Down Alarm).
   b. This will sound the down alarm, and allow oil to flow;
      - out of the Lift Cylinder
      - through the Down Orifice (regulating the descent speed)
      - through the Down Valve
      - through the Lift Valve
      - and out to the Hydraulic Reservoir.

Emergency Lowering

The Down Alarm WILL NOT SOUND when lowering the platform with the Emergency Lowering Knob.

Pull out on the Emergency Lowering Knob to mechanically open the Down Valve. This will allow oil to flow;

- out of the Lift Cylinder
- through the Down Orifice (regulating the descent speed)
- through the Down Valve
- through the Lift Valve
- and out to the Hydraulic Reservoir.

2.8 DESIGN FEATURES

The LX31/41 has the following features to insure safe operation:

1. The Lift Valve will not energize unless the chassis is level.
2. A warning alarm sounds and Drive Valves are de-energized, if the work platform should become unlevel while elevated.
3. A motion alarm sounds when the work platform is lowering.
4. The platform descent rate is controlled by an orifice. The Lift Cylinder is equipped with a holding valve to prevent descent should a leak develop.
5. The drive speed is limited to “creep” speed when operating the work platform while elevated.
6. Holding brakes are automatically engaged when the Drive Valves are de-energized from the Controller or from a loss of power.
7. The Platform and Chassis controls are each equipped with an Emergency Stop Switch.
8. Up and Down Buttons are located in the Control Module on the chassis for lifting and lowering the work platform from ground level.
9. The Down Valve can be operated manually by means of a cable linkage in the event of powered function failure.
10. Dynamic braking, and runaway protection are provided by the use of Counterbalance Valves in the drive system.
11. A Level Sensor is used to sense when the machine is unlevel, disabling lift functions, and drive when elevated.

2.9 CONTROLS AND INDICATORS

The controls and indicators for operation of the LX31/41 Electric Work Platform are shown in Figure 2-6. The name and function of each control and indicator are listed in Table 2-1. The index numbers in Figure 2-6 correspond to the index numbers in Table 2-1. The operator shall know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the unit.

Table 2-1: Controls and Indicators

Controller/Platform

No.	Index Name	Function
1	Key Switch	Turn key fully RUN to provide power to the Interlock Switch
2	Emergency Stop Switch	Push red button to cut power to all controls (off). Turn clockwise to provide power (on).
3	Control Lever	Move joystick forward or backwards to control Drive and Lift Valves proportionally or Down Valve depending on position of Drive Lift Switch.
4	Steering Switch	Moving the momentary rocker switch RIGHT or LEFT steers the work platform in that direction. Although the Steering Switch is self centering, the steering system is not. The wheels must be steered back to straight.
5	Drive Speed/ Torque Selector Switch	Provides two speed/torque ranges, in forward or reverse. HIGH SPEED = Low Torque, and HIGH TORQUE = Low Speed
6	Drive/Lift Switch	Selecting DRIVE allows the work platform to move foward or reverse. Selecting LIFT allows the work platform to raise or lower.
7	Interlock Lever Switch	Provides power to the Controller powered functions, only when depressed, preventing accidental activation of the Controller.
8	Drive Enable Indicator	Illuminates when drive is enabled, turns off when drive is disabled.

Chassis

	Index Name	Function
9	Emergency Stop Switch	Push red button to cut power to all controls (off). Turn clockwise to provide power (on).
10	Raise Button	Press button to lift the platform.
11	Lower button	Press button to lower the platform.
12	Platform Chassis Switch	Turn switch to the left to enable platform controls. Turn switch to the right to enable chassis controls.
13	Brake release Button	Press button to release the Parking Brake.
14	Down Alarm*	Sounds an audible signal while platform is lowering during normal operation. If the Emergency Lowering Valve is used, the alarm does not sound.
	Tilt Alarm*	Sounds an audible signal when the platform is elevated and on a slope of 2° side to side of fore and aft.
15	Hour Meter (optional)	Tracks the number of hours of engine powered operation.
16	Brake release Pump	Releases the Parking Brake allowing the machine to be moved in the event power is lost or for winching onto a trailer. See Section 3.
17	Emergency Lowering Valve	Pull out to lower the platform in the event of powered function failure.

* Down Alarm and Tilt Alarm are the same unit with different inputs.

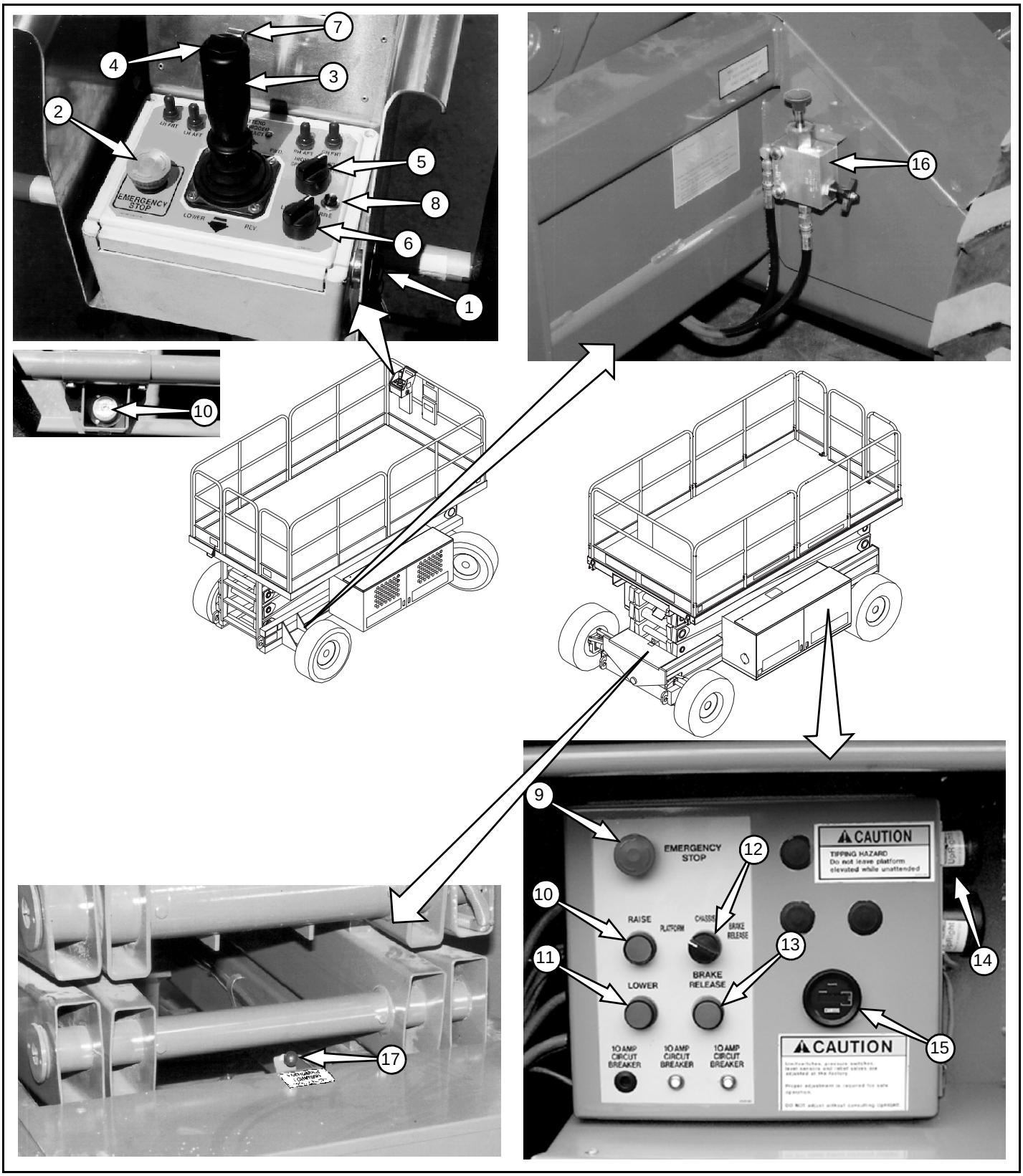


Figure 2-6: Controls and Indicators

2.10 FOLD DOWN GUARDRAILS

This procedure is only for passing through doorways. Guardrails must be returned to proper position before using the machine. Refer to Figure 2-7 (single deck) or Figure 2-8 (double deck).

Single Deck Fold Down Procedure

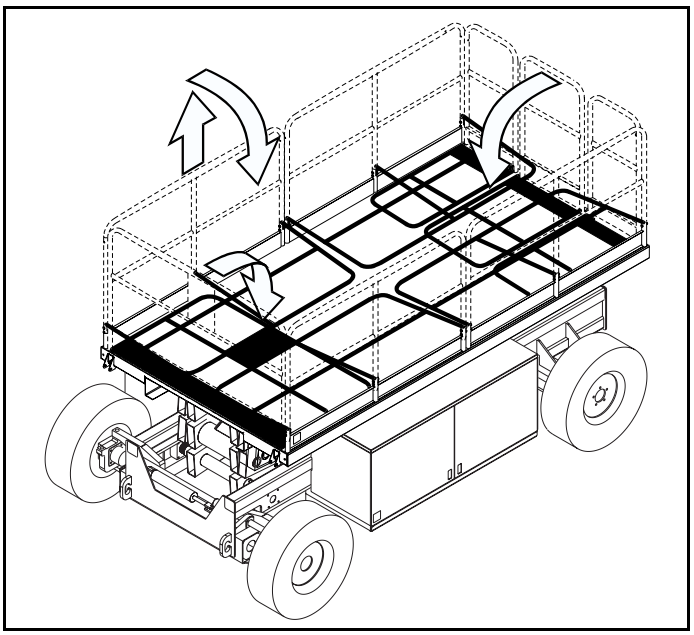


Figure 2-7: Fold Down Guardrails

NOTE: When performing the following procedures retain all fasteners.

1. Place controller on platform.
2. Starting at the front of the platform, remove nuts, bolts and washers from the top of the front guardrail. Fold the front guardrail down onto the platform.
3. Close and latch the gate.
4. Remove nuts, bolts and washers from the top of the rear guardrail. Fold the rear guardrail down onto the platform being careful to keep gate latched at all times.
5. Remove nuts, bolts and washers from the top of the side guardrails. Lift up and fold one side guardrail in so it rests on the deck. Repeat with other side guardrails.

Erection Procedure

1. Raise side guardrails making sure each is pushed down to secure the guardrail in the vertical position.
2. Install bolts, washers and nuts between the side guardrails, tighten securely.
3. Raise rear guardrail assembly, aligning holes and install bolts, washers and nuts. Tighten securely.
4. Raise front guardrail, aligning holes and install bolts, washers and nuts. Tighten securely.
5. Hang controller from front guardrail.
6. Before operating work platform check that all fasteners are in place and properly torqued.

⚠ WARNING ⚠

Before operating machine, guardrails must be securely fastened in their proper position.

Double Deck Fold Down Procedure

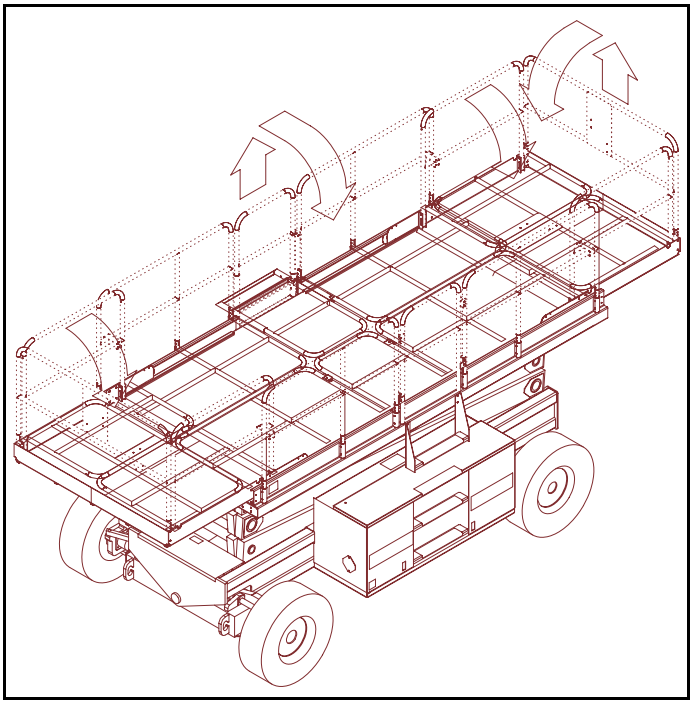


Figure 2-8: Fold Down Guardrails (Double Deck)

NOTE: When performing the following procedures retain all fasteners.

1. Place controller on platform.
2. Starting at the front slide out deck, remove nuts, bolts and washers from the top front corners of guardrails. Remove the nuts, bolts and washers from the slide out deck side guardrail midrails. Also remove nuts, bolts and washers located at the top of the sockets that hold the slide out deck side guardrails to the deck. Fold the side guardrails down onto the platform.
3. Follow step 2 to fold the side guardrails on the rear slide out deck.
4. Unlatch the gate so the left side guardrails can be folded down in two separate pieces. Also remove the nuts, bolts and washers opposite the gate latch on the right side guardrail so it too can be separated into two pieces.
5. Lift up and fold side guardrails in so they rest on the deck.
6. Lift up and fold front guardrail in so it rests on the deck. Repeat for rear guardrail.

Erection Procedure

1. Raise front guardrail making sure it is pushed down to secure the guardrail in the vertical position. Repeat for rear guardrail.
2. Raise side guardrails making sure each is pushed down to secure the guardrail in the vertical position, align holes and install bolts, washers and nuts. Tighten securely.
3. Raise one of the four slide out deck side guardrail assemblies, align holes and install bolts, washers and nuts. Tighten securely. Repeat this procedure for the other three slide out deck side guardrails.
4. Hang controller from front guardrail.
5. Before operating work platform check that all fasteners are in place and properly torqued.

⚠ WARNING ⚠

Before operating machine, guardrails must be securely fastened in their proper position.

NOTES

Section 3

MAINTENANCE

3.1 INTRODUCTION

⚠ WARNING ⚠

Be sure to read, understand and follow all information in the Operation Section of this manual before attempting to operate or perform service on any Work Platform.

NOTE: For Information on the engine refer to your local engine dealer.

This section contains instructions for the maintenance of the Work Platform. Procedures for the operation inspection, adjustment, scheduled maintenance, and repair/removal are included.

Referring to Section 2 will aid in understanding the operation and function of the various components and systems of the work platform, and help in diagnosing and repair of the machine.

Refer to “Table 3-1:” on page 3-5 for recommended maintenance intervals.

NOTE: Unless otherwise specified, torque all fittings according to “Table 3-2:” on page 3-26, and “Table 3-3:” on page 3-26.

Terminology

TERMINAL BLOCKS: Located in upper and lower control boxes. Designated by TB##. (##) designates the number of the block which is written on the terminal block. “R” right or “L” may follow the number.

WIRE COLOR: Indicated by color/color. First color refers to insulation color and second color indicates stripe. If second color is not given there is no stripe.

FORWARD: Front of machine indicated by yellow arrows on chassis.

AFT: Rear of machine indicated by orange arrows on machine.

General Procedures

CONTACT BLOCKS: Removed by inserting a flat screwdriver into the slot at either end of block and prying outward. Installed by pressing into an empty slot.

SWITCH MOUNT BASE: Assembled to back of switch actuator. Removed by rotating the small black lever counterclockwise and lifting off base.

TERMINAL BLOCKS: Remove wires by inserting a small flat bladed screwdriver into square beside wire. Install wires by stripping 1/2” (12,7 mm) of insulation, inserting screwdriver in square and inserting wire. Be sure no strands are bend backwards. Replace wires with same rating and type.

3.2 DATE CODE IDENTIFICATION ON HOSES

GATES uses a five digit code: Year, Month, Day.

i.e.: 6 11 29 - means 1996, month 11 (November), day 29.

PARKER uses a ten digit code: Plant, Year, Month, Day.

i.e.: XXXX 6 11 29 - means Plant XXXX, 1996, month 11 (November), day 29.

DAYCO stamps month, day and year on each hose.

3.3 SPECIAL TOOLS

The following is a list of special tools which may be required to perform certain maintenance procedures on the work platform.

- 0-1000 psi (0-69 bar) Hydraulic Pressure Gauge with Adapter Fittings
- 0-3000 psi(0-207 bar) Hydraulic Pressure Gauge with Adapter Fittings
- 0-6000 psi(0-414 bar) Hydraulic Pressure Gauge with Adapter Fittings
- Small Deutsch Connector Field Kit (UpRight P/N 030899-000)
- Large Deutsch Connector Field Kit (UpRight P/N 030898-000)
- Inclinometer

3.4 DEUTSCH CONNECTORS

Deutsch connectors are designed so that connector parts, contacts or electrical cables may be replaced without replacing the entire connector.

Figure 3-1: Deutsch Connector Kit, Small

Figure 3-2: Deutsch Connector Kit, Large

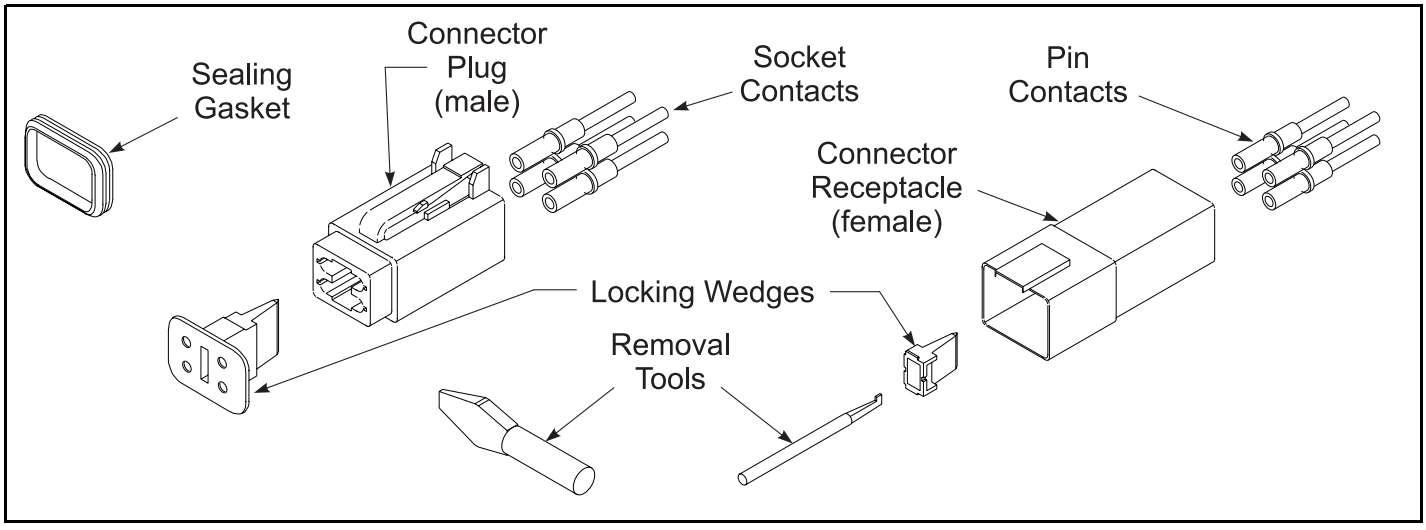


Figure 3-3: Plugs and Receptacles, Deutsch Connectors

Male Connector (Plug)

1. Disconnect the male connector (plug) from the female connector (receptacle).
2. Using the flat end of the Removal Tool (or flat blade screwdriver), pry the Locking Wedge from the Male Connector. Care should be taken that the Silicon Gasket is not damaged during this procedure.
3. Check all parts for damage. Replace all parts which are damaged or worn.
4. Replace or re-crimp the wires and contacts. Refer to “Crimping” procedure.

Female Connector (Receptacle)

1. Disconnect the male connector (plug) from the female connector (receptacle).
2. Using the notched end of the Removal Tool (or a wire hook), pull the Locking Wedge from the Female Connector.
3. Check all parts for damage. Replace all parts which are damaged or worn.
4. Replace or re-crimp the wires and contacts. Refer to “Crimping” procedure.

Releasing Locking Fingers

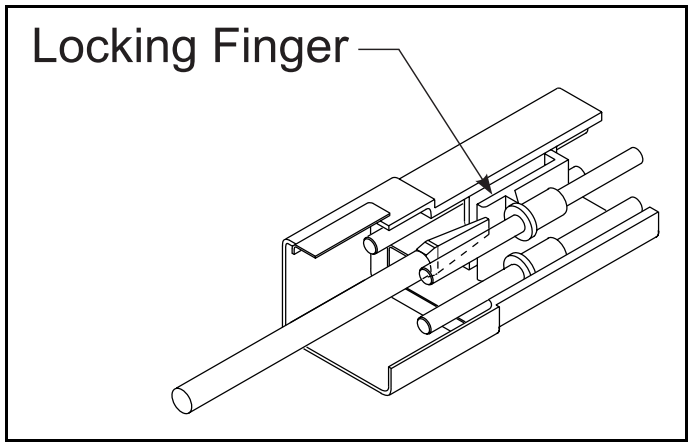


Figure 3-4: Locking Finger, Deutsch Connector

1. The Locking Fingers can be released following the removal of the Locking Wedge of either the male or female connector.
2. Use the removal tool (or flat bladed screwdriver) to push the Locking Fingers aside. This will release the grip on the contact.
3. Pull the wire and contact out of the connector.

Crimping

NOTE: Complete crimping instructions are included in each Field Kit.

1. Strip 1/4” (6,35 mm) from the wire.
2. Insert the contact into the crimping tool.
3. Insert the stripped wire into the contact. Copper strands should be visible in the bleed hole of the contact and no copper strands should be loose (outside) of the contact barrel.
4. Completely close the handles of the crimping tool. Release the handles of the crimping tool and remove the crimped contact.
5. Inspect the crimped contact to ensure that all strands are secure in the crimp barrel.

Removing Contact from Heavy Duty Plug

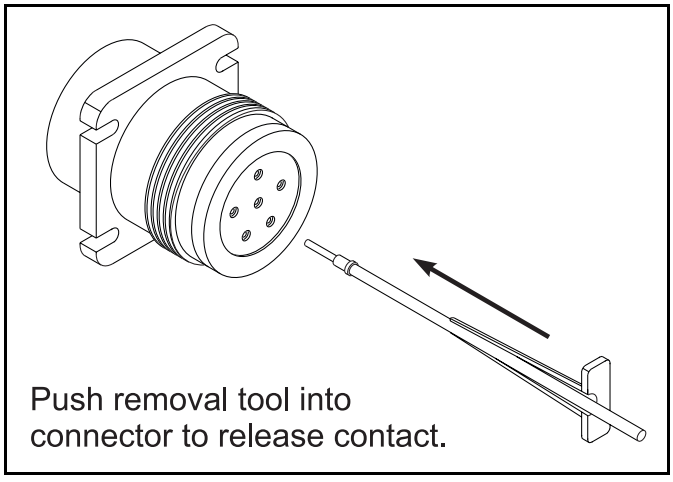


Figure 3-5: Heavy Duty Deutsch Connector

1. Slip the removal tool along the wire to be replaced.
2. Push the removal tool into the connector until the contact is released.
3. Pull the wire and contact out of the plug.

3.5 PREVENTATIVE MAINTENANCE

The Complete inspection consists of periodic visual and operational checks, together with all necessary minor adjustments to assure proper performance. Daily inspection will prevent abnormal wear and prolong the life of all systems. The inspection and maintenance schedule is to be performed at regular intervals. Inspection and maintenance shall be performed by personnel who are trained and familiar with mechanical and electrical procedures.

⚠ WARNING ⚠

Before performing preventative maintenance, familiarize yourself with the operation of the machine.

Always block the elevating assembly whenever it is necessary to enter the scissor assembly to perform maintenance while the platform is elevated.

The preventative maintenance table has been designed to be used primarily for machine service and maintenance repair. Please photocopy the following page and use the table as a checklist when inspecting the machine for service.

Preventative Maintenance Table Key

Interval

Daily=each shift or every day
50h/30d=every 50 hours or 30 days
250h/6m=every 250 hours or 6 months
1000h/2y=every 1000 hours or 2 years

Y=Yes/Acceptable N=No/Not Acceptable
R=Repaired/Acceptable

Preventative Maintenance Report

Date: _____
Owner: _____
Model No: _____
Serial No: _____
Serviced By: _____
Service Interval: _____

Table 3-1: Preventative Maintenance Checklist

	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Batteries	Check electrolyte level	6m			
	Check specific gravity	6m			
	Clean exterior	6m			
	Check battery cable condition	Daily			
	Clean terminals	6m			
Hydraulic Oil	Check oil level	Daily			
	Change filter	6m			
	Drain and replace oil	2y			
Hydraulic System	Check for leaks	Daily			
	Check hose connections	30d			
	Check hoses for exterior wear	30d			
Emergency Hydraulic System	Operate the emergency lowering valve and check for serviceability	Daily			
Controller	Check switch operation	Daily			
Control Cable	Check the exterior of the cable for pinching, binding or wear	Daily			
Platform Deck and Rails	Check fasteners for proper torque	Daily			
	Check welds for cracks	Daily			
	Check condition of deck	Daily			
Tires	Check for damage	Daily			
	Check lug nuts (torque to 150 ft. lbs. [203 Nm])	30d			
	Check air pressure (75 psi. [5.2 bar]	Daily			
Hydraulic Pump	Wipe clean	30d			
	Check for leaks at mating surfaces	30d			
	Check for hose fitting leaks	Daily			
	Check mounting bolts for proper torque	30d			
Drive Motors	Check for operation	Daily			
Torque Hubs	Check for leaks	Daily			
	Check Oil level	250h/6m			
	Change Oil after break-in	50h/30d			
	Change Oil	1000h/2y			

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Steering System	Check hardware & fittings for proper torque	6m			
	Grease pivot pins	30d			
	Oil king pins	30d			
	Check steering cylinder for leaks	30d			
Elevating Assembly	Inspect for structural cracks	Daily			
	Check pivot points for wear	30d			
	Check mounting pin pivot bolts for proper torque	30d			
	Check elevating arms for bending	6m			
	Grease linkage pins	30d			
Chassis	Check hoses for pinch or rubbing points	Daily			
	Check component mounting for proper torque	6m			
	Check welds for cracks	Daily			
Lift Cylinder	Check the cylinder rod for wear	30d			
	Check mounting pin pivot bolts for proper torque	30d			
	Check seals for leaks	30d			
	Inspect pivot points for wear	30d			
	Check fittings for proper torque	30d			
Entire Unit	Check for and repair collision damage	Daily			
	Check fasteners for proper torque	3m			
	Check for corrosion-remove and repaint	6m			
	Lubricate	30d			
Labels	Check for peeling, missing, or unreadable labels & replace	Daily			

3.6 BLOCKING ELEVATING ASSEMBLY

⚠ WARNING ⚠

Never perform service on the work platform in the elevating assembly area while platform is elevated without first blocking the elevating assembly.

DO NOT stand in elevating assembly area while deploying or storing brace.

Brace Installation

1. Park the work platform on firm level ground.
2. Verify platform emergency stop switch is ON.
3. Turn platform/chassis switch to CHASSIS.
4. Using the raise button, elevate platform until the scissors brace can be rotated to the vertical position.
5. From the left side of the machine, disengage the locking pin securing the brace. Rotate the scissor brace counterclockwise until it is vertical and between the two scissor center pivots.
6. Push lower button and gradually lower platform until brace is supporting the platform.

Brace Removal

1. Using chassis controls, gradually raise platform until the scissors brace clears the two scissor center pivots.
2. Rotate scissors brace clockwise until the locking pin engages.
3. Push lower button to completely lower platform.

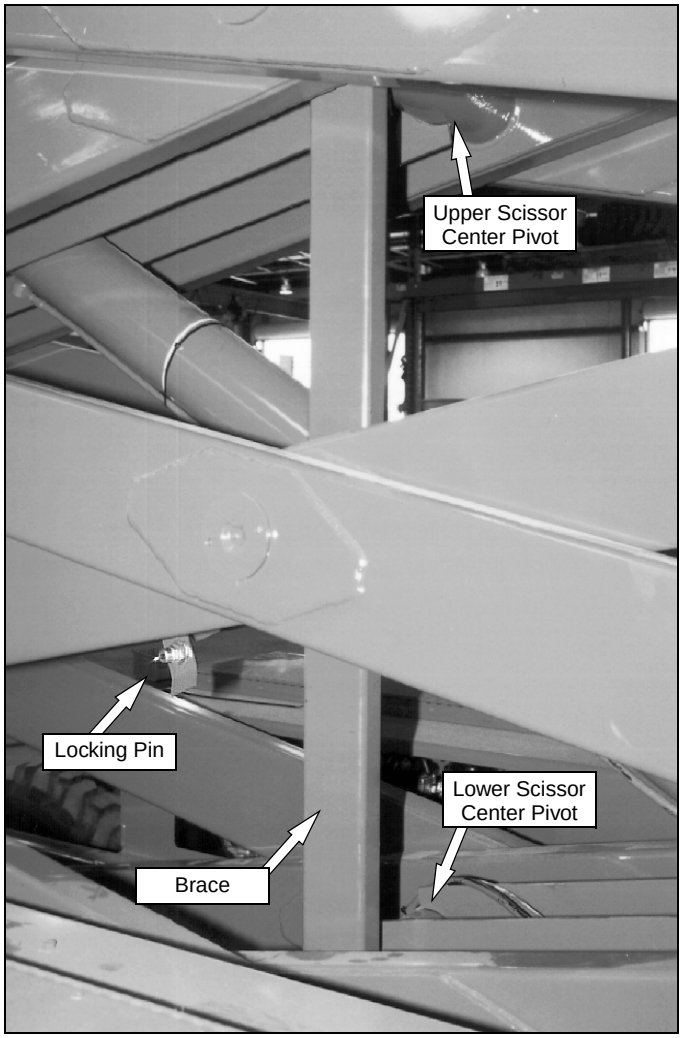


Figure 3-6: Blocking Elevating Assembly

3.7 BATTERY MAINTENANCE

⚠ WARNING ⚠

Hazard of explosive gas mixture. Keep sparks, flame, and smoking material away from battery.

Always wear safety glasses when working with batteries.

Battery fluid is highly corrosive. Thoroughly rinse away any spilled fluid with clean water.

Battery Inspection and Cleaning

Check battery fluid level daily, especially if work platform is being used in a warm, dry climate. If required, add distilled water ONLY. Use of tap water with high mineral content will shorten battery life.

The batteries and cables should be inspected regularly for signs of cracks in the cases, electrolyte leakage and corrosion of the terminals. Inspect cables for worn spots or breaks in the insulation and for broken cable terminals.

Clean the batteries when it shows signs of corrosion at the terminals or when electrolyte has overflowed during charging. Use a baking soda solution to clean the battery, taking care not to get the solution inside the cells. Rinse thoroughly with clean water. Clean batteries and cables contact surfaces to a bright metal finish whenever a cable is removed.

3.8 LUBRICATION

Refer to Table 3-1 for the lubrication intervals and Figure 3-7 for location of items that require lubrication service. Refer to the appropriate sections for lubrication information on the Steering Linkage, Torque hubs, and Hydraulic Oil and Filter.

Grease Fittings

Wipe each grease fitting before and after greasing. Using multipurpose grease in a grease gun, pump the grease into the fitting until grease just begins to appear at the edges of the pivot, wipe off any excess grease.

Steering Linkage

Apply one or two drops of penetrating oil to each pivot and King Pin bearing

Torque Hubs

NOTE: Change oil in torque hubs after the first 50 hours of operation. Change every 2000 hours thereafter.

1. Remove Torque Hub from drive assembly (refer to "3.15 Torque Hub" on page 3-17).
2. Remove drain plug from underside of Torque Hub.
3. Drain oil from unit.
4. Replace drain plug.
5. Remove fill plug from top side of torque hub.
6. Remove fill level plug from side of hub.
7. Fill unit with SAE 90 gear oil until oil comes out fill level plug opening (1/2 full).
8. Replace fill level plug. Replace fill plug.

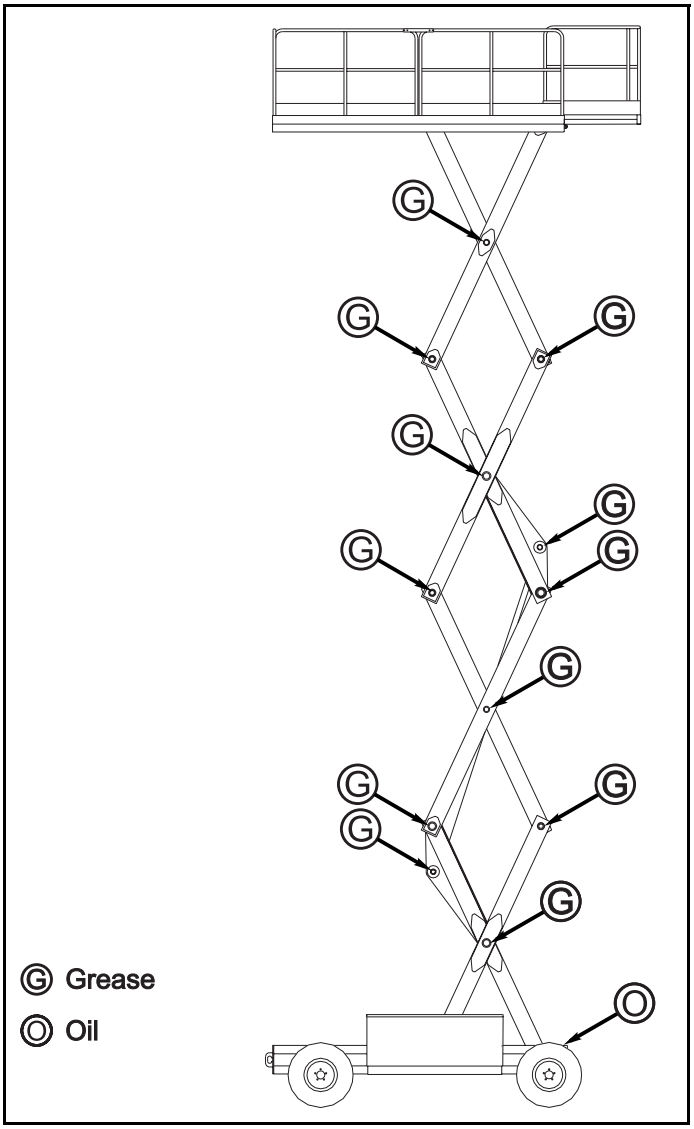


Figure 3-7: Lubrication Chart

Hydraulic Oil And Filter

Fluid Level

With the platform fully lowered, the oil should be visible in the Sight Gauge. If the oil is NOT visible, fill the tank until the oil can be seen. DO NOT fill above the Sight Gauge or when the Platform is elevated.

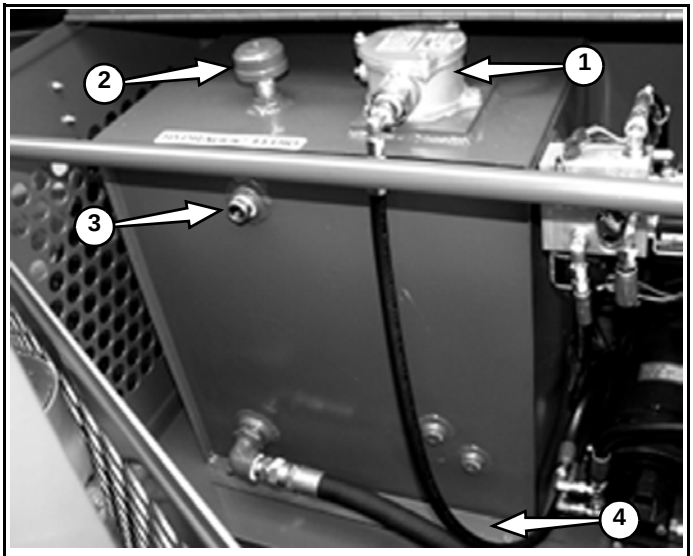
Oil and Filter Replacement

1. To change the filter only, follow Steps 5, 6, and 7.

⚠ CAUTION ⚠

The hydraulic oil may be hot enough to cause burns. Wear safety gloves and safety glasses when handling hot oil.

2. Provide a suitable container to catch the drained oil. The hydraulic tank has a capacity of 28.3 US gallons (107 l).
3. Remove the drain plug and allow all oil to drain into the container, be sure to dispose of oil properly.
4. Reinstall the drain plug.
5. Remove the three screws from the filter body cover and open the filter body.
6. Lift the filter element from the filter body.
7. Fill the hydraulic oil tank to the level of the sight gauge with ISO #46 hydraulic oil.
8. Insert the replacement filter element into the filter body and press into position.
9. Replace the filter body cover and screws.



1. Filter Body
2. Breather
3. Sight Gauge
4. Drain Plug (under tank)

Figure 3-8: Hydraulic Oil Tank and Filter

3.9 SETTING HYDRAULIC PRESSURES

NOTE: Follow Pump Set - Up procedure whenever Pump has been replaced, or when testing performance to isolate possible failure. Refer to Figure 3-11 for flow meter set - up.

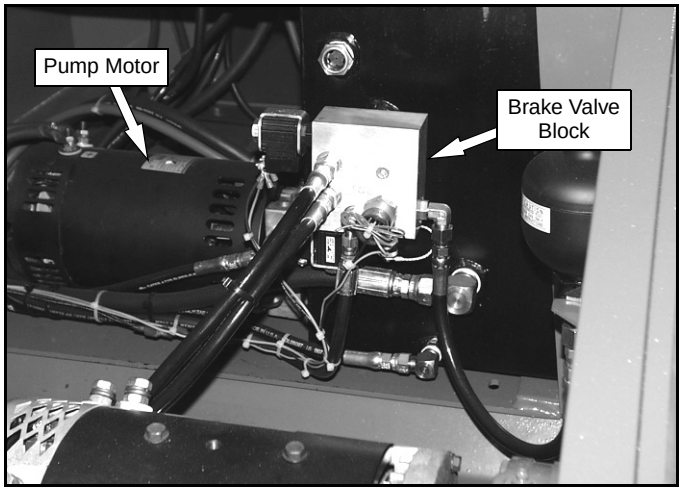
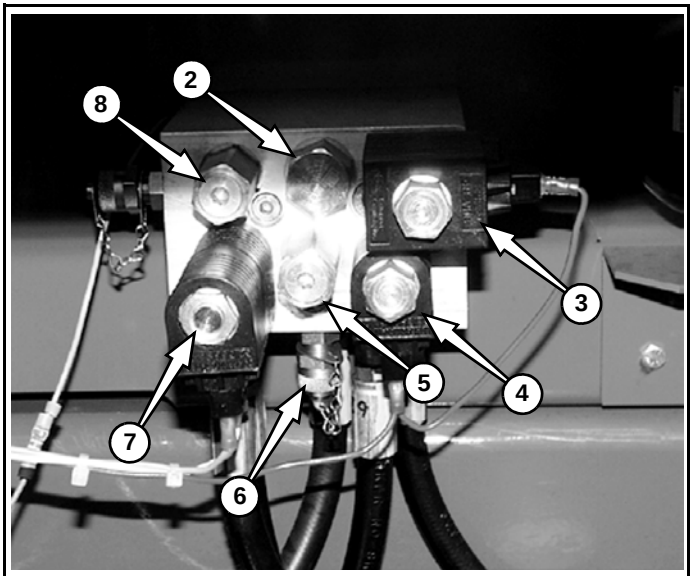


Figure 3-9: Hydraulic Pump



1. Steering relief valve
2. Flow Control Valve
3. Lift Solenoid
4. Dump Solenoid
5. Lift Relief Valve
6. High Pressure Test Port
7. Steering Solenoids
8. Lift Test Port

Figure 3-10: Valve Manifold

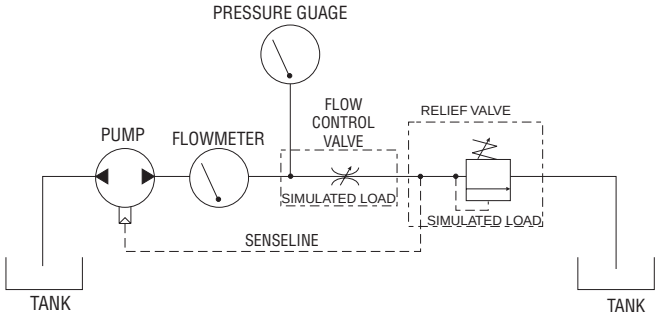


Figure 3-11: Flow Meter Set-up

Lift Relief Valve

1. Operate the hydraulic system 10 - 15 minutes to warm the oil.
2. Remove the cap or loosen the locknut on the Lift Relief Valve.
3. Turn the Lift Relief Valve adjustment screw counterclockwise two full turns.
4. Place rated load on the platform (Refer to specifications, Section 1)
5. Depress the Throttle Button, and the Raise Button to lift the platform.
6. Slowly turn the Lift Relief Valve adjustment screw clockwise until the platform begins to rise.
7. Replace the cap, or tighten the locknut on the Lift Relief Valve, and remove the load from the platform.

Steering Relief Valves

1. Operate the hydraulic system 10 to 15 minutes to warm the oil.
2. Install a 0-3000 P.S.I. (0-207 bar) gauge at the Main Pressure Test Port.
3. Loosen the locknut or remove the cap on the Left Steer Relief Valve.
4. Turn the adjustment screw two full turns counterclockwise.
5. Press the Steering Switch to the left and hold until the system bypasses.
6. Turn the Steering Relief Valve adjustment screw clockwise until the gauge reads 1500 P.S.I. (103,4 bar)
7. Tighten locknut or replace cap on Left Steering Relief Valve.
8. Repeat process for Right Steering Relief Valve.

3.10 SWITCH ADJUSTMENTS

Proportional Control Adjustment

Potentiometers are sealed to protect sensitive adjustments from vibrations, or from tampering. Remove sealant prior to adjustment, and replace after.

NOTE: Do not use silicone sealer; it will damage pots.

Use a small screwdriver or special adjustment tool to set adjustment pots. Pots can be easily damaged.

Pots have 15 turns of adjustment, more than one turn will often be required to complete the adjustment. If pots have been previously set, reset by turning no more than 1 turn at a time. If they have not been previously set, preset to about mid range and start from there.

Turn pot clockwise (CW) to increase settings.

Turn pot counterclockwise (CCW) to decrease settings.

Adjust pots only in sequence as outlined in this procedure.

Proportional Drive Control

IMPORTANT: Back out ramp trimpot 10 turns (counter clockwise) before making any adjustments.

Adjusting one pot affects the setting of others. After making all adjustments recheck each function to verify settings.

1. Adjust sensitivity threshold pot (located in upper control box) to obtain an equal threshold between forward and reverse directions (Figure 3-12).
2. Set Sevcon motor values. Drive adjustments are made through the motor control calibrator.

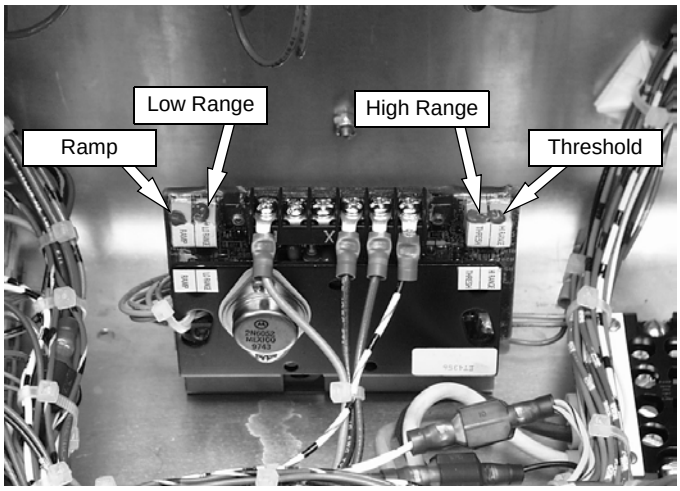


Figure 3-12: Rotary Control Adjustment, Upper Control Box

Platform Down Limit Switches

The Platform Down Switches close the circuit to the Cutout Relay, bypassing the Tilt Sensor when the platform is lowered; and to the Platform Down Relay, which provides power to the Drive Relay, Proportional Controller high speed circuit, and Series/Parallel Relay.

⚠ WARNING ⚠

DO NOT attempt to adjust Limit Switches without first blocking the elevating assembly (Refer to “3.6 Blocking Elevating Assembly” on page 3-6).

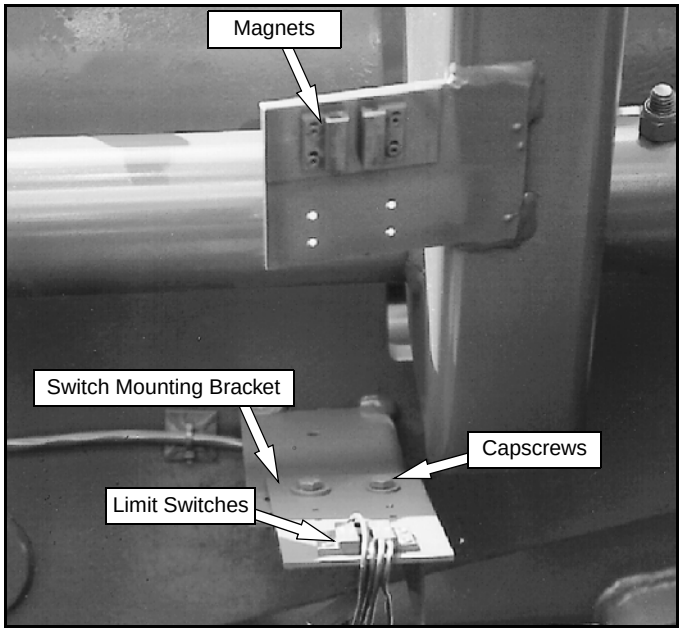


Figure 3-13: Platform Down Limit Switch

1. Lower the Platform completely.
2. With the Platform / Chassis switch on Chassis, push the Tilt Sensor base to test the alarm circuit.
3. If the alarm sounds, elevate the Platform and adjust the position of the switch mounting bracket by loosening the capscrews and nuts holding the bracket in place and moving the bracket until the switches align with the magnets. Lower the Platform and retest. When switches are aligned, alarm will not sound while platform is lowered.
4. With platform elevated, repeat step 2. When switches are properly adjusted, alarm will sound.

Tilt Sensor

The Tilt Sensor has three wires; red-power (48v in), black-ground, white-output (48v out). To verify the sensor is working properly there is one LED under the sensor; red indicates the sensor is level and the white wire is 'hot' (48v out).

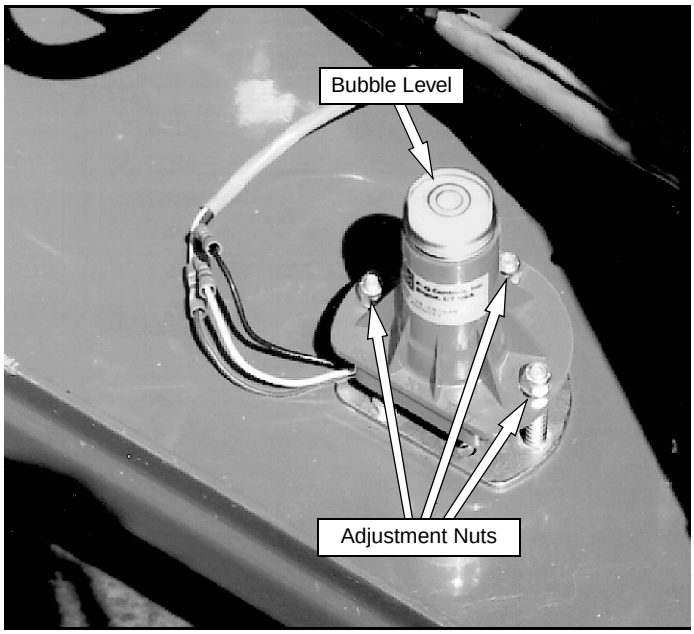


Figure 3-14: Tilt Sensor

1. Check tires for proper pressure.
2. Place machine on firm level surface ± ¼°.
3. Use Inclinometer to ensure that the front and rear of the Chassis are level within ± ¼°.
4. Adjust the three leveling locknuts until the bubble is centered in the circle on the attached bubble level.
5. Elevate the platform until the magnetic switches open (about 10 feet [3m]) and push the tilt sensor base to test the alarm circuit. Alarm should sound.

3.11 HYDRAULIC MANIFOLD

Though it is not necessary to remove the manifold to perform all maintenance procedures, a determination should be made prior to beginning as to whether or not the manifold should be removed before maintenance procedures begin.

Removal

1. Disconnect the battery ground cable.
2. Tag and disconnect the solenoid valve leads from the terminal strip.
3. Tag, disconnect and plug hydraulic hoses.
4. Remove the bolts that hold the manifold to the mounting bracket.
5. Remove manifold block.

Disassembly

NOTE: Mark all components as they are removed so as not to confuse their location during assembly. Refer to Figure 3-15 often to aid in disassembly and assembly.

1. Remove coils from solenoid valves.
2. Remove spool valve cover and spool valve.
3. Remove solenoid valves, lift relief valve, counterbalance valves and divider combiner valve.
4. Remove fittings, plugs, springs, balls and orifices.

Cleaning and Inspection

1. Wash the manifold in cleaning solvent to remove built up contaminants and then blow out all passages with clean compressed air.
2. Inspect the manifold for cracks, thread damage and scoring where O-rings seal against internal and external surfaces.
3. Wash and dry each component and check for thread damage, torn or cracked O-rings and proper operation.
4. Replace parts and O-rings found unserviceable.

Assembly

NOTE: Lubricate all O-rings before installation to prevent damage to O-rings. Seat all balls in manifold block by lightly tapping on the ball with a brass drift punch.

1. Install fittings, plugs, springs, balls and orifices. Use one drop of Locktite #242 on each screw-in orifice.
2. Install solenoid valves, lift relief valve, counter balance valves, divider combiner valve, and spool valve.
3. Install coils on solenoid valves.

Installation

1. Attach manifold assembly to mounting plate with bolts.
2. Connect Solenoid leads to terminal strip (as previously tagged).
3. Connect hydraulic hoses. Be certain to tighten hoses to manifold.
4. Operate each hydraulic function and check for proper operation and leaks.
5. Adjust lift relief, steering relief, and counterbalance valve pressures according to instructions in “3.9 Setting Hydraulic Pressures” on page 3-9.

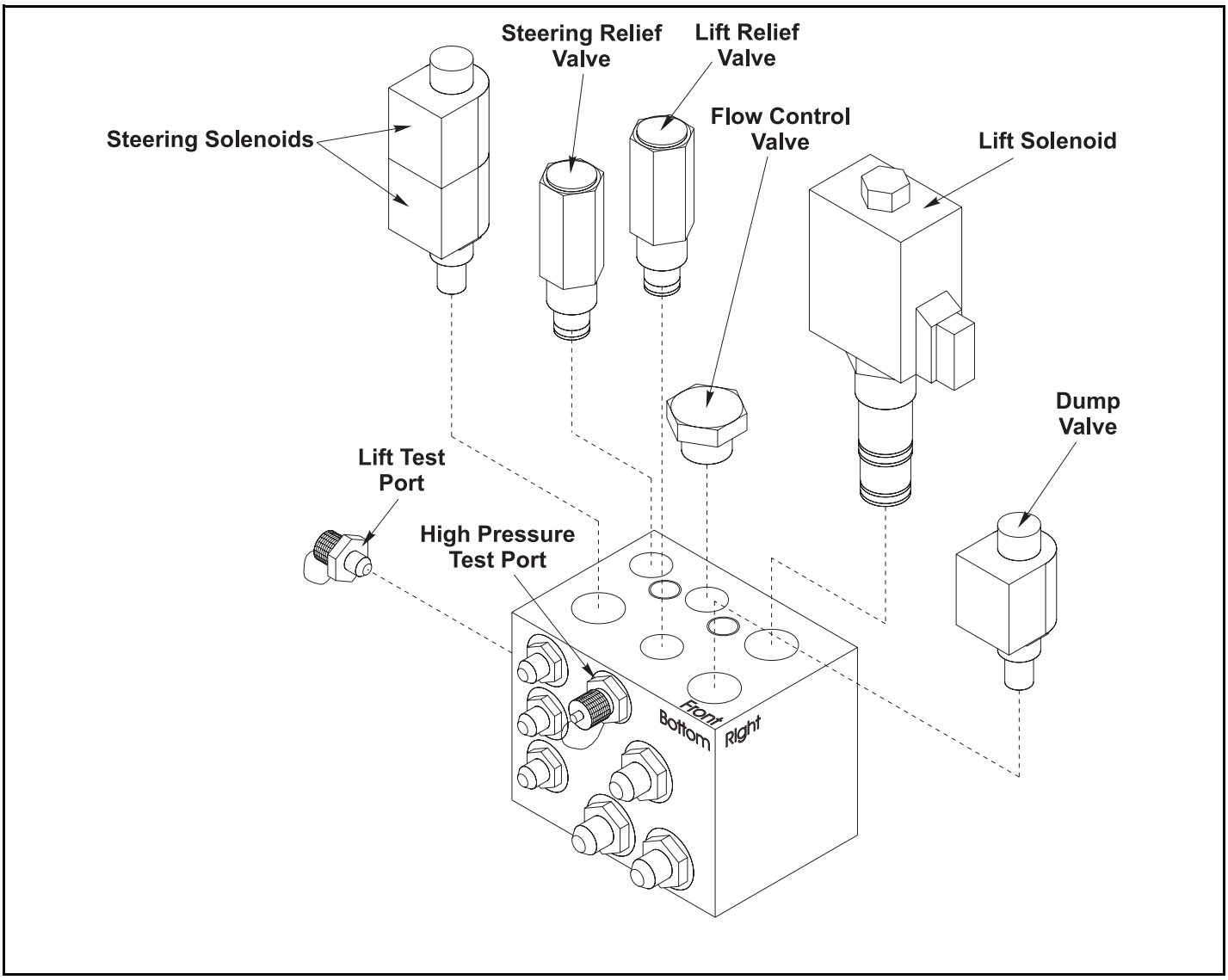


Figure 3-15: Hydraulic Manifold, Exploded View

3.12 HYDRAULIC POWER UNIT

NOTE: Brushes on the electric motor can be replaced without removing the hydraulic power unit from the chassis by raising and securely blocking the chassis and work from underneath the chassis.

NOTE: Power unit may be removed through the front of the chassis by moving the relay panel out of the way or through the bottom of the chassis by raising and securely blocking the chassis. Drain the hydraulic tank before removing power unit.

Removal

1. Mark, disconnect and plug the hose assemblies.
2. Mark and disconnect the electric cables.
3. Remove hardware which secures power unit and remove from chassis.

Installation

1. Install power unit using hardware previously removed.
2. Unplug and reconnect the hydraulic hoses.
3. Reconnect the electric cables.
4. Fill the tank with clean hydraulic fluid.
5. Check the oil level in the hydraulic tank before operating the work platform.
6. Operate the pump and check for leaks and proper operation.
7. Replenish hydraulic fluid if necessary.

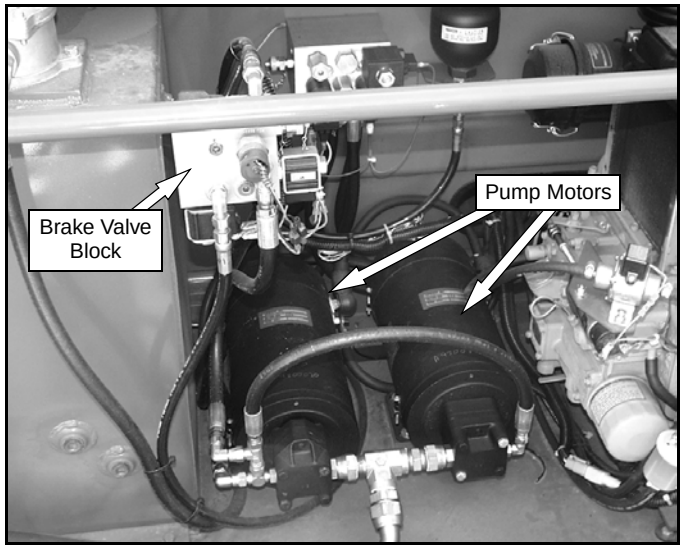


Figure 3-16: Hydraulic Power Unit

3.13 HYDRAULIC BRAKES

Removal

1. Park the work platform on firm level ground and block the wheels to prevent the work platform from rolling.
2. Disconnect the hydraulic brake lines.
3. Tag and disconnect electric cables from drive motors.

⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

Plug all port holes and hose assemblies IMMEDIATELY to prevent contamination from dust and debris.

4. Remove capscrews and washers holding the motor and brake to torque hub.
5. Remove the motor.
6. Remove the brake.

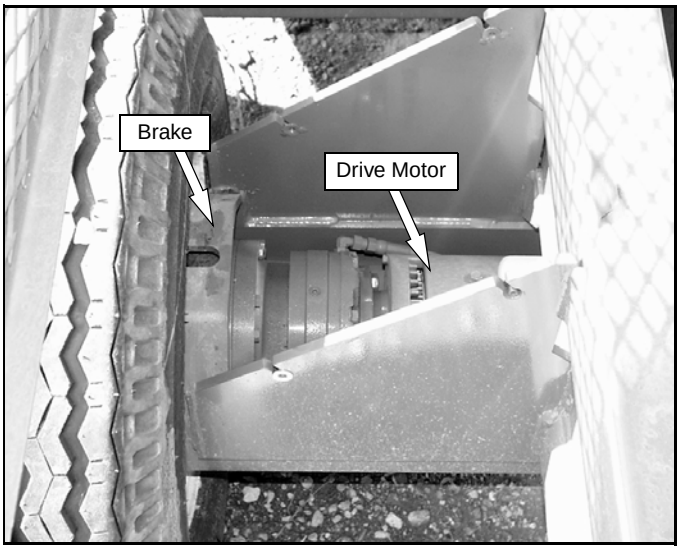


Figure 3-17: Rear Axle Assembly

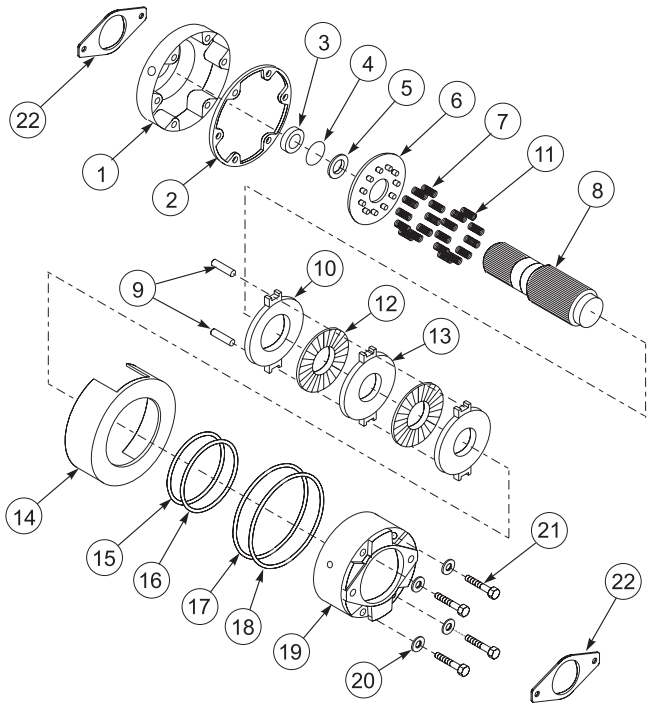
Brake Seal Replacement

Refer to Figure 3-18.

1. With shaft protrusion downward remove capscrews (21) and washers (20) from brake assembly.
2. Remove power plate (19) from housing (1). Remove the gasket (2).
3. Remove piston (14) from power plate (19) by introducing low pressure air (15 psi) into the hydraulic inlet. Make sure piston is not pointed at anyone.
4. Remove o-rings (16 & 18) and backup rings (15 & 17) from inner and outer diameter grooves of piston.
5. Clean piston (14) and power plate (19) assemblies with solvent. Inspect the sealing surfaces of the piston (14) and power plate (19). Inspect seal grooves in the piston. Replace brake assembly if they are damaged or scratched deeply. Lubricate piston (14), power plate (19), and seals (15, 16, 17, & 18) with clean hydraulic oil prior to assembly.
6. Install the backup rings (15 & 17) and o-rings (16 & 18) into the seal grooves in the piston.
7. Install piston into power plate using a shop press. Be careful not to damage the seals during assembly. Center cutouts in piston with torque pin holes in the power plate. Press piston to a depth no less than flush, but not exceeding 0.120" (3mm) below the surface of the power plate at cutouts in piston. This depth is critical. The brake will not hold if it is exceeded.
8. Install gasket (2).
9. Install power plate/piston assembly (14 & 19) to housing (1) using capscrews (21) and washers (20). Tighten sequentially, one turn at a time, to press the two assemblies together. Torque capscrews 50 - 60 ft.-lbs. (68 - 81 N-m)

Installation

1. Coat output shafts of brake and drive motor with high pressure molybdenum grease and install gasket (22) and brake onto torque hub.
2. Install gasket (22) and drive motor. Align holes and install the two cap screws and lock washers.
3. Reinstall cables to drive motor and hoses to the brake.
4. Install the wheel. Torque the wheel nuts to 150 ft. lbs.
5. Remove the jack stands and lower chassis to the ground.
6. Position chassis switch to parking brake release position. Alarm will sound.
7. Depress the electric motor start switch to energize brake hydraulic system.
8. Check for leaks and bleed air out of brake hydraulic system using bleed valve located on brake housing.



1. Housing
2. Gasket
3. Ball Bearing
4. Retaining Ring
5. Oil Seal
6. Spring Retainer
7. Spring, Compression
8. Shaft
9. Pin, Torque
10. Primary Disk
11. Spring, Compression
12. Rotating Disk
13. Stationary Disk
14. Piston
15. Backup Ring
16. O-ring
17. Backup Ring
18. O-ring
19. Power Plate
20. Washer
21. Capscrews
22. Gaskets

Seal Kit (068569-000) Includes:

Item	Description	Quantity
2	Gasket	1
15	Backup Ring	1
16	O-ring	1
17	Backup Ring	1
18	O-ring	1
22	Gaskets	2

Figure 3-18: Brake Assembly

3.14 DRIVE MOTORS

Removal

1. Disconnect battery negative terminals or Anderson connectors (both sides on electric model).
2. Tag and disconnect electric cables from motor.
3. Remove and save hardware which secures drive motor to torque hub.

Installation

NOTE: Unless otherwise specified, torque all fittings according to "Table 3-2:" on page 3-26, and "Table 3-3:" on page 3-26.

1. Install drive motor to torque hub using original hardware.
2. Connect electric cables to motor.
3. Connect Anderson connectors or negative terminals on batteries.

Pump Motor

Removal

1. Disconnect battery negative terminals or Anderson connectors (both sides on electric model).
2. Tag and disconnect electric cables from motor.
3. Remove and save hardware which secures pump motor to pump assembly.

Installation

NOTE: Unless otherwise specified, torque all fittings according to "Table 3-2:" on page 3-26, and "Table 3-3:" on page 3-26.

1. Install motor using original hardware.
2. Connect electric cables to motor.
3. Connect Anderson connectors or negative terminals on batteries.

Drive Motor Brushes

Refer to Figure 3-19

1. If necessary, remove electric motor (Refer to previous section).
2. Release latch and remove headband.
3. Pull back brush spring and latch on hook.
4. Remove screw and set aside.

IMPORTANT: Be sure screw does not fall inside motor.

5. Remove old brush and replace with new brush.
6. Replace screw, unhook brush spring and return to original position.
7. Install and relatch headband.

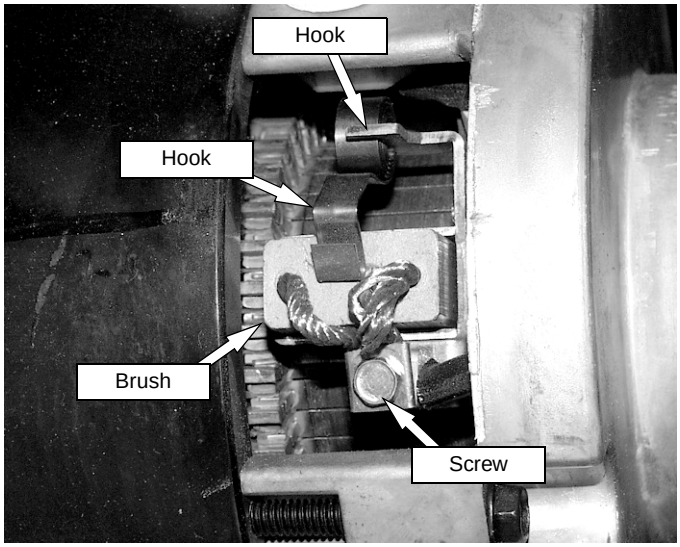


Figure 3-19: Replacing Drive Motor Brushes

3.15 TORQUE HUB

Removal

1. Park the work platform on firm level ground and block the wheels to prevent the work platform from rolling.
2. Disconnect battery negative terminals or Anderson connectors (both sides on electric model).
3. Loosen the wheel lug nuts on the torque hub to be removed.
4. Raise the rear of the work platform using a 2-ton jack.
5. Position two 2-ton jack stands under the rear axle to prevent the work platform from falling if the jack fails.
6. Remove the wheel nuts and wheel.
7. Disconnect hydraulic brake line from brake.

⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

Plug all port holes and hose assemblies IMMEDIATELY to prevent contamination from dust and debris.

8. Remove 90° fitting from side of torque hub.
9. Tag and remove electric cables from drive motors.
10. Remove mounting bolts from electric motor.
11. Separate electric motor from brake. Discard gasket.
12. Separate brake from torque hub. Discard gasket.
13. Remove 1/2-20 nuts and washers from torque hub.
14. Remove torque hub.

IMPORTANT: Note position of 90° fitting on torque hub body. Hub must be installed with fitting in same position.

Installation

IMPORTANT: Hub must be installed with 90° fitting in same position as when it was removed.

NOTE: Unless otherwise specified, torque all fittings according to "Table 3-2:" on page 3-26, and "Table 3-3:" on page 3-26.

1. Install torque hub using 1/2-20 nuts and 1/2 washers.
2. Remove plug from 90° fitting and install fitting in side of torque hub. Point fitting towards rear of hub.
3. Using 90 weight gear lube with EP additive, fill torque hub through top plug hole in rear cover until oil comes out of 90° fitting in side. Plug 90° fitting and top of rear cover.
4. Install new gasket and brake.
5. Install new gasket and electric motor.
6. Secure assembly using washers and bolts.
7. Connect hydraulic brake lines.
8. Connect electric cables.
9. Install wheels. Torque lug nuts to 150 ft. lbs.
10. Bleed brake lines if necessary (use DTE 26 or equivalent).
11. Remove jack stands and lower rear end.
12. Connect battery terminals or Anderson connectors.
13. Check function of brake.

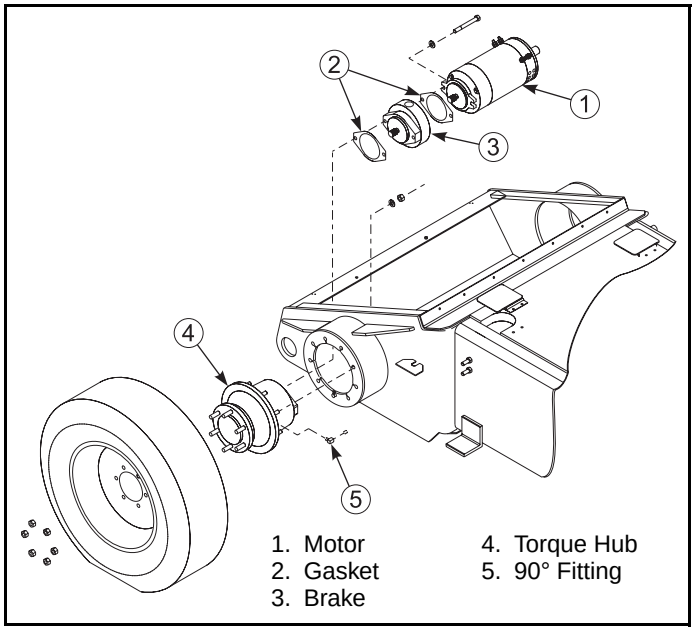


Figure 3-20: Torque Hub Assembly

3.16 TORQUE HUB SEAL REPLACEMENT

Roll And Leak Testing

IMPORTANT: Torque hubs should always be roll and leak tested before disassembly and after assembly to make sure gears and sealants are working properly.

Roll Test

Gears should be able to rotate by applying a constant force to the axle. Some gear packages roll with more difficulty than others. Do not be concerned if gears seem to roll hard as long as they roll with consistency. If you feel more drag only at certain points the gears are not rolling freely and should be checked for improper installation or defects.

Leak Test

The purpose of a leak test is to make sure the unit is air tight. Pressurize hub to 5 PSI (7 N-m). Torque hub has a leak if the air pressure starts to fall after hub has been pressurized. Use soap and water on hub to detect location of leaks. If a leak is detected, seal or O-ring must be replaced.

Pressing Tools

Use pressing tools to remove the seal, cup and cone.

Disassembly

CAUTION: Safety glasses should be used during disassembly of hub.

1. Remove two pipe plugs in cover and drain the oil from the unit.
2. Loosen and remove shoulder bolts and cap screws from cover. Remove cover from hub.
3. Remove O-ring. Remove thrust washer from counterbore in cover.
4. Remove input gear from planet gears.
5. Using a punch, remove retaining ring from groove around inside of input gear.
6. Lift carrier sub-assembly from hub. Lift ring gear from hub. Remove O-ring from counterbore in hub.
7. Remove pipe plugs from side of hub body.
8. Apply a preload to output shaft to remove retaining ring. Follow steps a & b.
   a. Place bearing cone pressing tool on retaining ring.
   b. Apply pressure to fixture using a hydraulic ram or by striking the fixture with a soft face hammer. Pressure should be applied until hub rotates with difficulty.
9. Using retaining ring pliers remove retaining ring. Remove spacer from output shaft.
10. Place spacer under hub so output shaft will fall through bottom when pressed out.
11. Press output shaft out of hub. Output shaft may come out with bearing cone and seal attached. Remove seal and discard. Use a punch and hammer to remove bearing cone. Be careful not to strike shaft with punch.
12. If seal and cone remain in hub, press them out using a pressing tool.
13. Lift bearing cone out of hub.
14. Stand hub on its small end. Using a punch and hammer, remove bearing cup from counterbore of hub. Be careful not to strike counterbore with punch.
15. Turn hub over on larger end. Using a punch and hammer, remove bearing cup from counterbore of hub. Be careful not to strike counterbore.

NOTE: Carrier sub-assembly does not need to be disassembled to replace seals.

Hub Assembly

NOTE: Unless otherwise specified, torque all fittings according to "Table 3-2:" on page 3-26, and "Table 3-3:" on page 3-26.

1. Oil output shaft and bearing cone. Using cone press, press bearing cone onto end of output shaft with retaining ring groove.
2. Stand hub on its small end. Using bearing cup pressing tool press bearing cup down into hub.

NOTE: Make sure cup sits square with counterbore.

3. Turn hub over so it sit on large end. Using bearing cup pressing tool press bearing cup into small end of hub.

NOTE: Make sure cup sits square with counterbore.

4. Place output shaft into hub so end of shaft with retaining ring groove points down.
5. Oil output shaft. Using seal pressing tool press seal into counterbore in small end of hub. The closed face of the seal should be up.
6. Turn hub over so small end points down. Using bearing cone pressing tool, press bearing cone onto output shaft. Rotate hub while pressing bearing. Stop pressing when hub starts to resist rotating.
7. Place spacer onto output shaft so it rests on top of bearing cone. Using retaining ring pliers, place retaining ring to make sure it is seated.
8. Hit the end of output shaft once or twice with a soft face hammer. Turn the shaft in both clockwise and counter clockwise directions while hitting. This will seat the bearing cone against the spacer and retaining ring allowing necessary endplay in the hub-shaft sub-assembly.
9. Turn hub over so it rests on large end. Measure endplay in hub-shaft sub-assembly. Follow steps a-c.
   a. Mount a dial indicator on hub. Locate the dial rod on top of output shaft.
   b. Lift up on output shaft until the needle on the dial stops moving.
   c. Read the dial. Reading should be no greater than .008 in.
      - If dial reads less than .008 in. (,203 mm) continue on to step10.
      - If dial reads more than .008 in. (,203 mm) repeat steps 8-15 of "DISASSEMBLY" section.
   d. Remove spacer and replace it with thicker spacer (SK91 068570-011).
   e. Repeat steps 6-9 and remeasure end play (Figure 3-21).
10. Apply a light coat of "Never Seize" to the pipe plugs and install into pipe plug holes in hub.

NOTE: Leave hole for 90° fitting open.

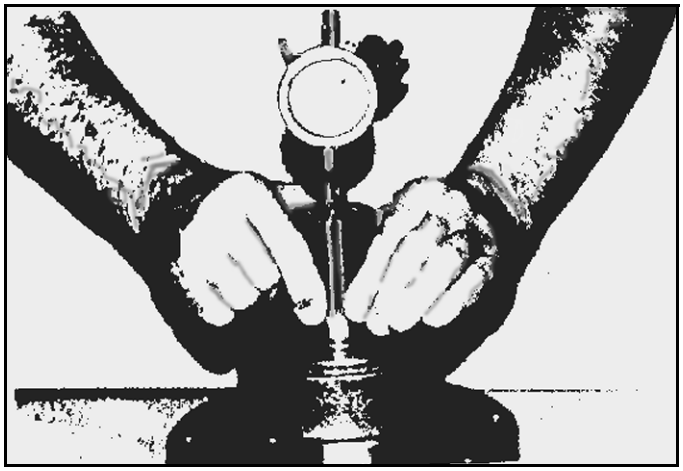


Figure 3-21: Measuring Hub End Play

Main Assembly

1. Position hub on its output shaft so that hubs small diameter end points down.
2. Using a marker, mark the four shoulder bolt holes in hub.
3. Grease O-ring and place in counterbore in hub.

NOTE: O-rings may be stretched or squeezed together in order to fit exactly in counterbore.

4. Oil all exposed surfaces inside hub. Oil carrier sub-assembly.
5. Place carrier sub-assembly, with spline connections down, into mesh with output shaft.
6. Place ring gear, with squared shoulder down, into mesh with the planet gears of the carrier sub-assembly. Make sure that marked shoulder bolt hole on ring gear aligns with any of the marked shoulder bolt holes on the hub. "X" mark should be on the cover side of ring gear.
7. Start one half of retaining ring into groove inside input gear. Use a soft punch to press the remaining half of the retaining ring into the groove.
8. Insert input gear, with large diameter end down, into mesh with planet gears.
9. Place large thrust washer over input gear so it rests on carrier housing. Oil all exposed surfaces inside hub.
10. Grease O-ring and place into counterbore of cover.

NOTE: O-rings may be stretched or squeezed together in order to fit exactly in counterbore.

11. Place cover on top of ring gear so the fill hole will be at top of hub when it is installed.
12. Install four shoulder bolts into shoulder bolt holes and tighten.
13. Install eight cap screws in remaining holes and tighten.
14. Apply 23-27 ft. lbs. (31 - 37 N-m) of torque to all bolts.
15. Apply a light coat of "Never Seize" to both pipe plugs and install into the two holes in cover.
16. Roll test the unit in both clockwise and counterclockwise directions. Turn hub nine full revolutions in each direction.
17. Leak test the hub at 5 PSI (7 N-m) for two to three minutes.

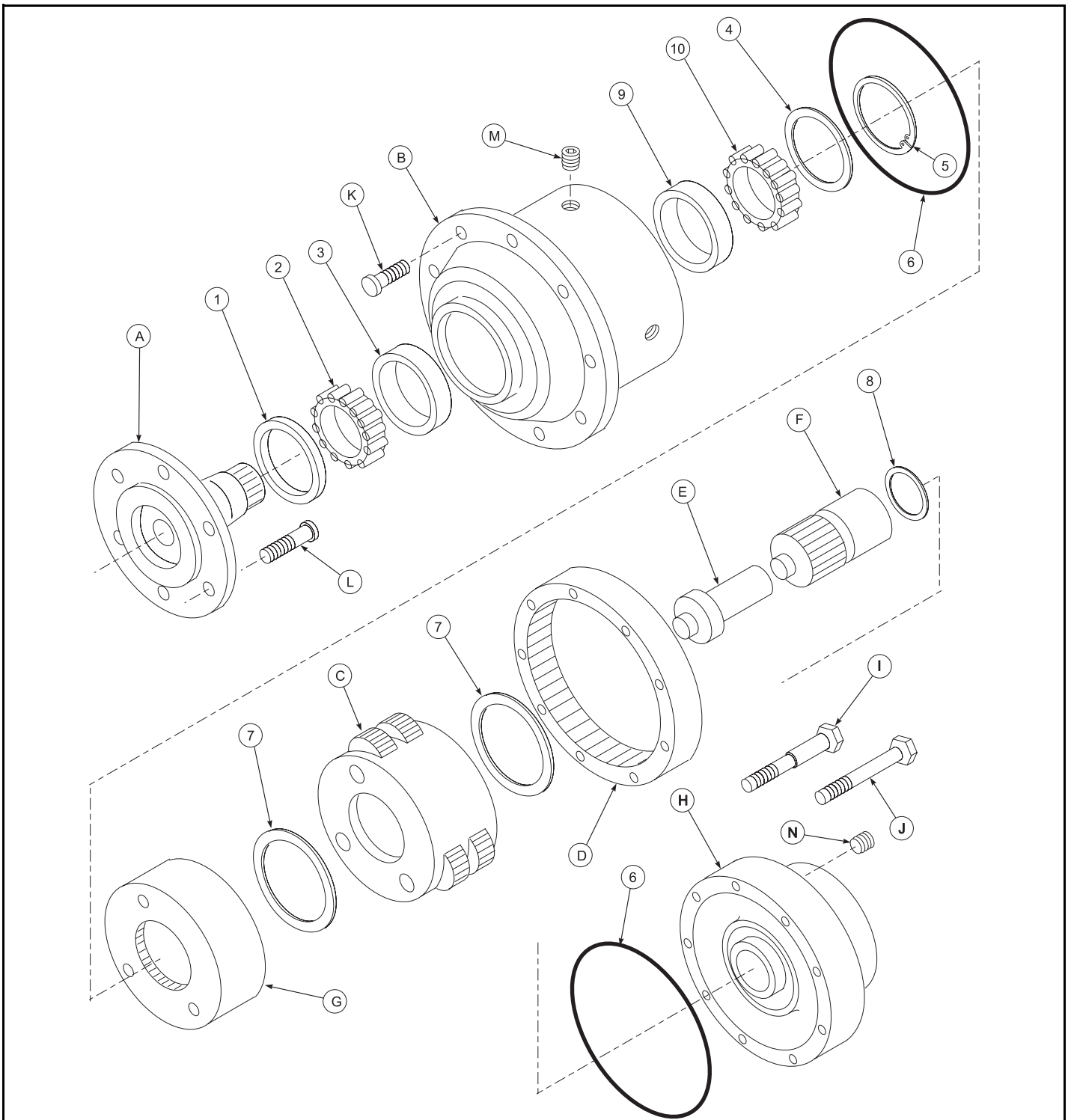


Figure 3-22: Torque Hub

3.17 CYLINDER REPAIR

Removal

1. Remove cylinder from machine.

NOTE: Refer to "Illustrated Parts Section" for location of cylinder and list of parts which secure cylinder.

NOTE: If necessary, refer to "3.6 Blocking Elevating Assembly" on page 3-6.

2. Mark and disconnect hoses and IMMEDIATELY cap the openings to prevent contamination.

⚠ WARNING ⚠

Cylinders may be very heavy. Support heavy cylinders before removing pins which secure cylinder to machine.

Disassembly

1. Remove head from cylinder body.
2. Carefully slide rod assembly out of cylinder.
3. remove seal kit components (wipers, rod seals, o-rings and backup rings) from head and piston.
4. Inspect parts for scratches, pits or polishing. Check seal grooves and sealing surfaces. Scratches or pits deep enough to catch the fingernail are unacceptable; replace the cylinder. Polishing is a sign of uneven loading. when this occurs, the surface should be checked for roundness. Cylinders not round within .007" (0,18 mm) should be replaced.

Assembly

NOTE: Unless otherwise specified, torque all fittings according to "Table 3-2:" on page 3-26, and "Table 3-3:" on page 3-26.

1. Lubricate all components with clean hydraulic fluid.

NOTE: To avoid cutting the seals, do not use sharp edged tools during seal replacement. After installing seals allow at least one hour for the seals to elastically restore to their original shape before assembling cylinder.

2. Install new seal kit components.
3. Lubricate rod wiper and seal with hydraulic fluid and slide head onto rod.
4. Lubricate seals on piston and head.
5. Carefully slide rod assembly into cylinder.
6. Secure head into cylinder.

Installation

1. Installation is reverse of removal.
2. Carefully remove elevating assembly support.
3. Slowly cycle cylinder several times to remove air from the hydraulic system.

Check for proper cylinder operation. Check hydraulic connections for leaks.

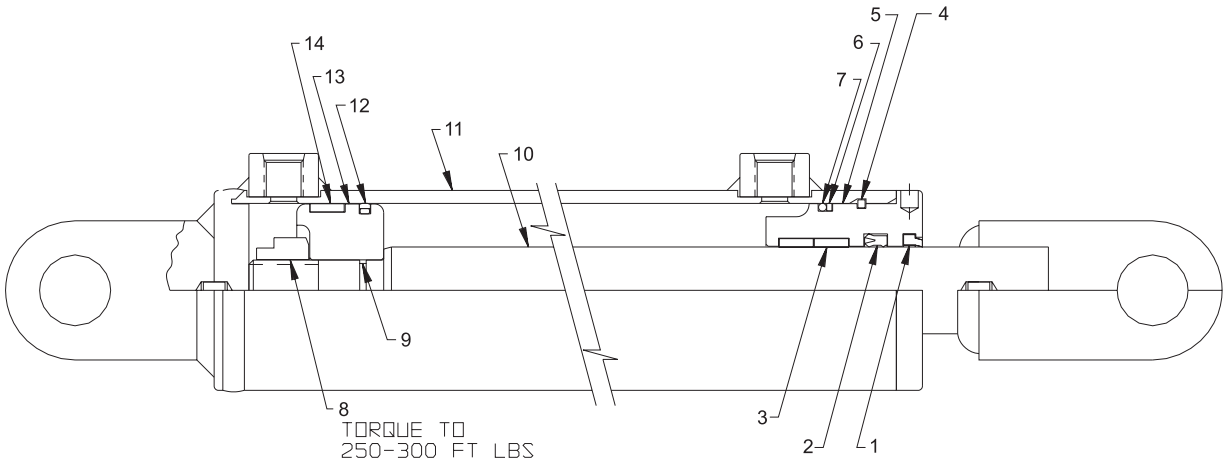
3.18 STEERING CYLINDER

Removal

1. Remove and cap the hoses. Mark them for reference.
2. Remove the hair pin retainers from the clevis pins at each end of the cylinder.
3. Remove the clevis pins.
4. Remove the cylinder from the chassis.

Installation

1. Align the ends of the cylinder with the mounts on the chassis.
2. Install the clevis pins.
3. Install the hair pin retainers into the clevis pins at each end of the cylinder.
4. Install the hoses, noting their orientation markings from disassembly.



1. Rod Wiper
2. Rod Seal
3. Wear Ring, 2 required
4. Retaining Ring
5. Head
6. Backup Ring
7. O-ring
8. Locknut
9. O-ring
10. Rod Weldment
11. Tube Weldment
12. Piston Seal
13. Piston
14. Wear Ring

Seal Kit Number: 067633-010

Figure 3-23: Steering Cylinder Cross Section

3.19 LIFT CYLINDER

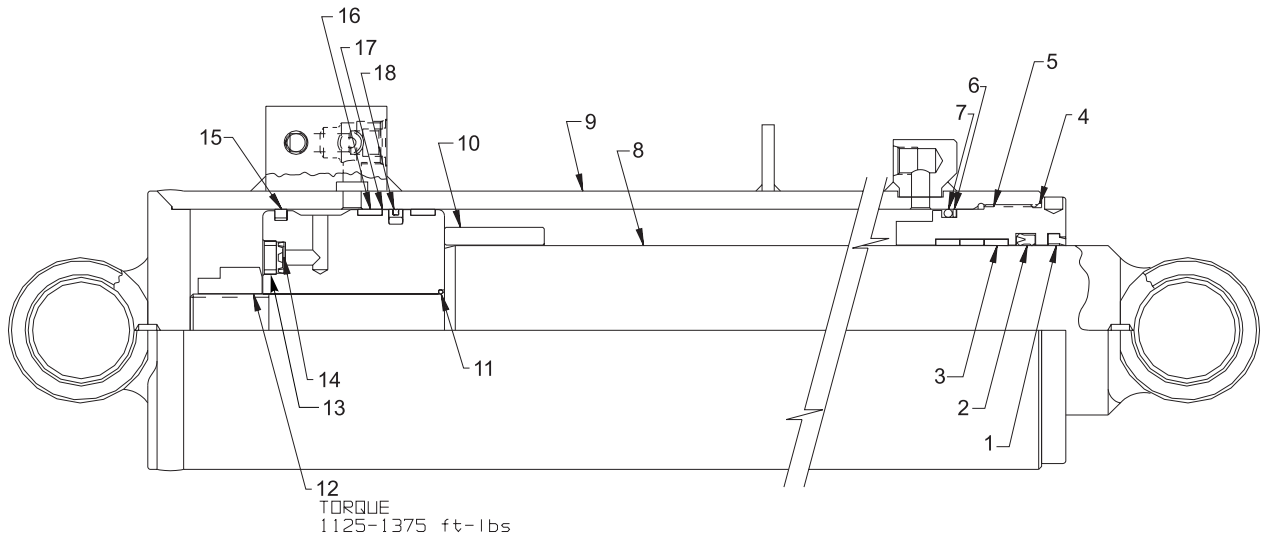
Removal

1. Raise and block the elevating assembly (see “3.6 Blocking Elevating Assembly” on page 3-6).
2. Open emergency lowering valve to be sure all pressure is out of the lift cylinder.
3. Remove and cap both hoses and fittings.
4. Remove the down valve and cable assembly.
5. Support the lift cylinder with a suitable lifting device to prevent falling.
6. Remove the retaining bolts from the upper and lower pivot pins.
7. Drive out the pivot pins, upper one first, then the lower one.
8. Hoist the cylinder out of the elevating assembly from the front. DO NOT sling the cylinder by the rod end pivot, this will cause the cylinder to extend when hoisted.
9. Inspect the rod, head, piston, and tube for scratches, pits, or polishing. Check seal groves and sealing surfaces. Scratches or pits deep enough to catch the fingernail are unacceptable,

Installation

NOTE: Before installing the cylinder, check the pins and bearings for excessive wear. Replace if necessary.

1. Using a suitable lifting device, lower the cylinder into the elevating assembly from the front. DO NOT sling the cylinder by the rod end pivot, this will cause the cylinder to extend when hoisted.
2. Align the pivots and install the pivot pins, lower one first, then the upper one.
3. Install the retaining bolts into the pivot pins.
4. Install the down valve and cable assembly. Adjust the cable to stop on the collar of the cable jacket, before the down valve reaches the full extent of it's pull. The down valve may leak if the cable is allowed to pull the spool of the valve beyond it's limit.
5. Install the hoses.
6. Lift and lower the machine for several cycles to work out the air. Check for leaks, repair as necessary.



1. Rod Wiper
2. Rod Seal
3. Wear Ring, 3 required
4. O-ring
5. Head
6. Backup Ring
7. O-ring
8. Rod Weldment
9. Tube Weldment
10. Spacer
11. O-ring
12. Locknut
13. Bushing
14. Orifice
15. Cast Iron Ring
16. Wear Ring, 2 required
17. Piston
18. Piston Seal

Seal Kit Number: 067635-010

Figure 3-24: Lift Cylinder Cross Section

NOTES:

3.20 TORQUE SPECIFICATIONS

Fasteners

Use the following values to torque fasteners used on UpRight Work Platforms unless a specific torque value is called out for the part being installed.

Hydraulic Components

Use the following values to torque hydraulic components used on UpRight Work Platforms.

NOTE: Always lubricate threads with clean hydraulic oil prior to installation.

Table 3-2: Torque Specifications for Fasteners

AMERICAN STANDARD CAP SCREWS								
SAE GRADE	5				8			
Cap Screw Size (inches)	TORQUE				TORQUE			
	Ft./Lbs		Nm.		Ft./Lbs.		Nm.	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAx
1/4 - 20	6.25	7.25	8.5	10	8.25	9.5	11	13
1/4 - 28	8	9	11	12	10.5	12	14	16
5/16 - 18	14	15	19	20	18.5	20	25	27
5/16 - 24	17.5	19	23	26	23	25	31	34
3/8 - 16	26	28	35	38	35	37	47.5	50
3/8 - 24	31	34	42	46	41	45	55.5	61
7/16 - 14	41	45	55.5	61	55	60	74.5	81
7/16 - 20	51	55	69	74.5	68	75	92	102
1/2 - 13	65	72	88	97.5	86	96	116	130
1/2 - 20	76	84	103	114	102	112	138	152
9/16 - 12	95	105	129	142	127	140	172	190
9/16 - 18	111	123	150	167	148	164	200	222
5/8 - 11	126	139	171	188	168	185	228	251
5/8 - 18	152	168	206	228	203	224	275	304
3/4 - 10	238	262	322	355	318	350	431	474
3/4 - 16	274	302	371	409	365	402	495	544
7/8 - 9	350	386	474	523	466	515	631	698
7/8 - 14	407	448	551	607	543	597	736	809
1 - 8	537	592	728	802	716	790	970	1070
1 - 14	670	740	908	1003	894	987	1211	1337

METRIC CAP SCREWS								
METRIC GRADE	8.8				10.9			
Cap Screw Size (millimeters)	TORQUE				TORQUE			
	Ft./Lbs.		Nm.		Ft./Lbs.		Nm.	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
M6 x 1.00	6	8	8	11	9	11	12	15
M8 x 1.25	16	20	21.5	27	23	27	31	36.5
M10 x 1.50	29	35	39	47	42	52	57	70
M12 x 1.75	52	62	70	84	75	91	102	123
M14 x 2.00	85	103	115	139	120	146	163	198
M16 x 2.50	130	158	176	214	176	216	238	293
M18 x 2.50	172	210	233	284	240	294	325	398
M20 x 2.50	247	301	335	408	343	426	465	577
M22 x 2.50	332	404	450	547	472	576	639	780
M24 x 3.00	423	517	573	700	599	732	812	992
M27 x 3.00	637	779	863	1055	898	1098	1217	1488
M30 x 3.00	872	1066	1181	1444	1224	1496	1658	2027

NOTE: These values apply to fasteners as received from the supplier, dry or when lubricated with normal engine oil. They do not apply if special graphitized or molydisulphide greases or other extreme pressure lubricants are used

Table 3-3: Torque Specifications for Hydraulic Components

Type: SAE Part Series	Cartridge Poppet		Fittings		Hoses	
	Ft/Lbs	Nm	Ft/Lbs	Nm	Ft/Lbs	Nm
#4	N/A	N/A	N/A	N/A	135-145	15-16
#6	N/A	N/A	10-20	14-27	215-245	24-28
#8	25-30	34-41	25-30	34-41	430-470	49-53
#10	35-40	47-54	35-40	47-54	680-750	77-85
#12	85-90	115-122	85-90	115-122	950-1050	107-119
#16	130-140	176-190	130-140	176-190	1300-1368	147-155

Section 4

TROUBLESHOOTING

4.1 INTRODUCTION

This section on troubleshooting provides guidelines on the types of problems users may encounter in the field, helps determine the cause of problems, and suggests proper corrective action.

Careful inspection and accurate analysis of the symptoms listed in the Troubleshooting Guide will localize the trouble more quickly than any other method. This manual cannot cover all possible problems that may occur. If a specific problem is not covered in this manual, call our toll free number for service assistance.

Referring to Section 2.0 and 5.0 will aid in understanding the operation and function of the various components and systems of the LX31/41 and help in diagnosing and repair of the machine.

⚠ WARNING ⚠

When troubleshooting, ensure that the work platform is resting on a firm, level surface.

When performing any service which requires the Platform to be raised, ensure that all four (4) outriggers are properly installed.

Unplug the machine or disconnect the battery when replacing or testing the continuity of any electrical component.

General Procedure

Use the charts on the following pages to help determine the cause of a fault in your UpRight LX31/41.

1. Verify your problem.
   a. Do a full function test from both platform controls and chassis controls and note all functions that are not operating correctly.
2. Narrow the possible causes of the malfunction.
   a. Use the troubleshooting guide to determine which components are common to all circuits that are not functioning correctly.
3. Identify the problem component.
   a. Test components that are common to all circuits that are not functioning correctly. Remember to check wires and terminals between suspect components. Be sure to check connections to battery negative.
4. Repair or replace component found to be faulty.
5. Verify that repair is complete.
   a. Do a full function test from both platform and chassis controls to verify that all functions are operating correctly and machine is performing to specified values.

UPRIGHT USA **TEL: 1-559-891-5200**
FAX: 1-559-896-9244

UPRIGHT IRELAND **TEL: 353-1-202-4100**
FAX: 353-1-202-4105

4.2 TROUBLESHOOTING ELECTRICAL SCHEMATICS

Table 4-1: Trouble Shooting Guide: Electrical Schematics

COMPONENT / FUNCTION	LOWER CONTROLS	UPPER CONTROLS	DRIVE FORWARD	DRIVE REVERSE	RAISE PLATFORM	LOWER PLATFORM	STEER RIGHT	STEER LEFT	BRAKES	TILT ALARM	DOWN ALARM	HIGH/LOW SPEED	BATTERY CHARGER	ENGINE (BI-ENERGY)	GENERATOR (BI-ENERGY)
Tilt Alarm ALM1										X					
Down Alarm ALM2											X				
Battery BAT1	X	X											X		
(Bi-Energy) Battery BAT2														X	X
Battery Charger CH1													X		
Main Power Contactor C1	X	X	X	X											
Forward Contactor C2			X												
Reverse Contactor C3				X											
Pump Override Contactor C4			X	X	X		X	X							
Pump/Traction Contactor C5							X	X							
Controller CONT	X	X	X	X	X		X	X		X	X	X			
Main Fuse F1	X	X											X		
Main Fuse F2	X	X											X		
Circuit Breaker CB1	X	X													
Circuit Breaker CB2	X	X													
(Bi-Energy) Circuit Breaker CB3														X	X
Tilt Alarm Diode D1			X	X						X					
Lift Diode D2			X	X	X										
Down Diode D3			X	X		X					X				
Down Alarm Diode D4											X				
Steer Right Diode D5							X								
Steer Left Diode D6								X							
Pump Start Diode D7	X	X													
Brake Relay Diode D8			X	X					X						
Brake Solenoid Diode D9			X	X					X						
Drive/Lift Diode D10			X	X	X										
Brake Release Relay Diode D11			X	X					X						
Down Solenoid Diode D12						X									
Diode D13		X													
Main Power Diode D14	X	X													
Diode D15			X	X	X										
Diode D16		X													
Pump Override Diode D17	X	X	X	X	X										
Diode D18			X	X	X										
Diode D19			X	X	X										
Diode D20			X	X	X										
Diode D22			X	X	X										
Power Relay Diode D23	X														
Power Relay Diode D24	X														
Brake Release Solenoid Diode D25			X	X					X						
Diode D26		X													
Diode D27		X													
Tilt Alarm Diode D28										X					
Up Solenoid Diode D29					X										
Up Solenoid Diode D30					X										
Diode D31			X	X	X										
Steer Left Solenoid Diode D32								X							
Steer Right Solenoid Diode D33							X								
Down Alarm Diode D34											X				

Table 4-1: Trouble Shooting Guide: Electrical Schematics (Continued)

Component	Function	Lower Controls	Upper Controls	Drive Forward	Drive Reverse	Raise Platform	Lower Platform	Steer Right	Steer Left	Brakes	Tilt Alarm	Down Alarm	High/Low Speed	Battery Charger	Engine (Bi-Energy)	Generator (Bi-Energy)
Main Fuse F1																
Main Fuse F2																
(Bi-Energy) Engine Fuse F9																
(Bi-Energy) Generator GEN																
Drive Enable Light L1																
Hour Meter M1																
Power Unit Motor MOT1		X	X	X	X	X			X	X						
Power Unit Motor MOT2		X	X	X	X	X			X	X						
Left Traction Motor MOT3				X	X				X							
Right Traction Motor MOT4				X	X			X								
(Bi-Energy) Fuel Pump P1																
Drive/Lift Relay R1		X	X	X	X	X										
8 Meter Cutout Relay R2																
Tilt Alarm Relay R3											X					
Up Relay R4						X										
Down Relay R5		X	X				X					X				
Down Alarm Relay R6												X				
Steer Right Relay R7								X								
Steer Left Relay R8									X							
Pump Start Relay R9		X	X													
Brake Relay R10				X	X					X						
Brake Release Relay R11				X	X					X						
Power Relay R12		X	X	X	X											
(Bi-Energy) Start Relay R13																
(Bi-Energy) Charge Relay R14																
Brake Release Relay R15										X						
Platform Power Relay R16		X	X	X	X	X										
Prevent Pump Start Relay R17																
(Bi-Energy) Starter Relay R18																
(Bi-Energy) Glow Plug Relay R19																
(Bi-Energy) Oil Pressure Relay R20																
Resistor Pack RES1		X	X	X	X											
Drive Enable Light Resistor RES2																
Joystck Interlock Switch S1			X	X	X			X	X							
Reverse Micro Switch S2					X											
Forward Micro Switch S3				X												
Lower Emergency Stop Switch S4		X		X	X	X		X	X							
Lift Switch S5						X	X									
Brake Release Switch S6				X	X					X						
Drive Switch S7				X	X											
Lift Switch S8				X	X	X										
High/Low Switch S9													X			
Platform Down Switches S10-S13				X	X		X									
8 Meter Cutout Switch S14																
Up Limit Switch S15				X	X	X										
Pump Start Switch S16		X	X	X	X	X										
Chassis/Platform Switch S17		X	X													
Upper Emergency Stop Switch S18			X	X	X	X		X	X							
Steering Micro Switch S19								X	X							
Proportional Speed Control Switch S20																
Ignition Keyswitch S21			X													

Table 4-1: Trouble Shooting Guide: Electrical Schematics (Continued)

COMPONENT	FUNCTION	LOWER CONTROLS	UPPER CONTROLS	DRIVE FORWARD	DRIVE REVERSE	RAISE PLATFORM	LOWER PLATFORM	STEER RIGHT	STEER LEFT	BRAKES	TILT ALARM	DOWN ALARM	HIGH/LOW SPEED	BATTERY CHARGER	ENGINE (BI-ENERGY)	GENERATOR (BI-ENERGY)
(Bi-Energy) Start Switch S22																
(Bi-Energy) Oil Pressure Switch S23																
(Bi-Energy) Glow Plug Switch S24																
(Bi-Energy) Engine Run Switch S25																
(Bi-Energy) Charge Switch S26																
(Bi-Energy) Starter Switch S27																
(Bi-Energy) Glow Plug Switch S28																
Tilt Sensor SEN1		X	X	X	X	X										
Up Solenoids SOL1-SOL2						X										
Down Solenoid SOL3							X									
Steer Right Solenoid SOL5								X								
Steer Left Solenoid SOL6									X							
Brake Solenoid SOL8				X	X					X						
Forward Solenoid SOL9				X												
Reverse Solenoid SOL10					X											
Brake Release Solenoid SOL11				X	X					X						
(Bi-Energy) Stop/Run Solenoid SOL12																
Tachometer-Generator TG1 & TG2																

4.3 TROUBLESHOOTING HYDRAULIC

Table 1: Troubleshooting Guide: Hydraulic Schematics

COMPONENT / FUNCTION	RAISE PLATFORM	LOWER PLATFORM	STEER RIGHT	STEER LEFT	RIGHT BRAKE	LEFT BRAKE
Accumulator ACC					X	X
Check Valve CV1					X	X
Check Valve CV2		X				
Left Brake Cylinder CYL1						X
Right Brake Cylinder CYL2					X	
Lift Cylinder CYL3	X					
Steering Cylinder CYL4			X	X		
Return Filter F1	X	X	X	X	X	X
Suction Strainer F2	X	X	X	X	X	X
Flow Divider FD1			X	X		
Brake Orifice ORF2					X	X
Lift Orifice ORF3	X	X				
Hydraulic Pump P1	X	X	X	X	X	X
Hydraulic Pump P2	X	X	X	X	X	X
Main Relief Valve RV1	X	X	X	X		
Steering Relief Valve RV2			X	X		
Pressure Switch S1					X	X
Brake Apply Valve V1					X	X
Brake Release Valve V2					X	X
Steering Valve V3			X	X		
Lift Valve V4	X					
Dump Valve V5			X	X		
Down Valve V6	X	X				

4.4 TROUBLESHOOTING THE MOS90

Important basics applicable to the motor control unit.

- The MOS90 has a green diagnostics L.E.D. in the front panel.
- The green L.E.D. will turn on and shine continuously when the MOS90 is powered up and working correctly.
- The green L.E.D. will be off if no power is supplied to the MOS90.
- The green L.E.D. will flash a sequence of flashes if the MOS90 is damaged or is receiving an improper signal. An explanation of the flash sequences "flash faults" is shown on the following pages.
- The MOS90 is high temperature protected by "thermal cutback". The cutback operates between 80°C (176°F) and 90°C (194°F). Powered functions will gradually operate slower and slower until 90°C (194°F). The MOS90 will shut down at 90°C (194°F). Continued operation at high temperature will damage the MOS90.
- The MOS90 is low voltage protected by "low voltage cutout". The MOS90 shuts down at 14.0 VDC. Powered functions suddenly stop. When input voltage goes above 14.0 VDC turns back on.

When a Flash Error occurs

Step 1.

Disconnect the 17 pin connector from the MOS90. Wait Five (5) seconds and plug it back in again. If the flash error repeats go to step Two (2). If the green L.E.D. lights up and stays on continuously - operate machine. Note which functions are being used when problem repeats itself.

Step 2.

Disconnect the 17 pin connector from the MOS90. Connect pin Six (6) to a fused battery supply (14.0 VDC minimum) and observe the green L.E.D. If flash error stays, replace MOS90. If green L.E.D. lights up and remains on continuously, check wiring.

NOTE: Troubleshoot the possible cause of the flash error before replacing the MOS90, for example an Eight (8) flash error will cure itself when the MOS90 cools down.

4.5 USING THE CALIBRATOR

The calibrator has 20 L.E.D. segments marked as shown.

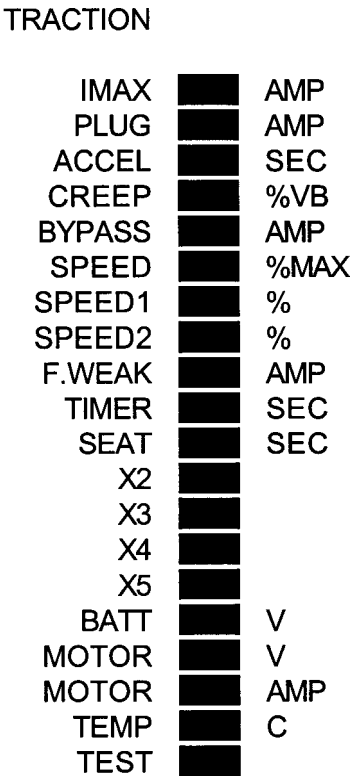


Figure 4-1: MOS90 Calibrator LED Segments

The values which should be expected when checking the machine are shown on the following page.

There are three buttons on the calibrator:

increment, marked +
decrement, marked -
select

When select is pressed, each L.E.D. will light in sequence until the select button is released. Each setting can be incremented or decremented using the + or - buttons when the adjacent L.E.D. is lit.

When "Test" L.E.D. is lit, the state of the MOS90 inputs is displayed. The first input displayed is the accelerator which can vary from 0-100%. When the + button is pressed once the switch Input 1 is displayed. This will be seen as "1.0P" until the switch Input voltage changes. "1.CL" will then be displayed. This is repeated for all the switch inputs.

When BATTV, MOTORV, MOTORA and TEMPC are selected, the controller shows their values. When BATTV is selected and the "+" button is held in, the highest voltage that the MOS90 has recorded will be displayed. When TEMPC is selected and the "+" button is held in, the highest temperature that the MOS90 has recorded will be displayed. The "-" button will display the lowest values.

When the MOS90 is first powered up, the recorded minutes of run time is displayed. The "+" button displays thousands of hours and the "-" button displays hundreds of hours. When the MOS90 is pulsing (being used) run time is being incremented and stored. The "dot" in the time display is blinking when MOS90 is being used, steady when idle.

4.6 CALIBRATOR SETTINGS

Table 4-2: Calibrator Settings

LED	Function	Unit	Setting	Comments
1	MOS90 Maximum Amp. Capacity	Amps	600	Adjustable from 50 amps to 600 amps
2	Acceleration Delay	Seconds	1.0	Adjustable from 1.0 sec to 3.0 sec.
3	Deceleration Delay	Seconds	0.5	Adjustable from 0.5 sec. to 3.0 sec.
4	Traction Creep	%	0	Adjustable from 0% to 10%
5	Max. allowed Speed	%	65	Adjustable from 5% to 100%
6	Cutback Speed 1	%	20	Adjustable from 5% to 25%
7	Cutback Speed 2	%	75	Adjustable from 20% to 75%
8	Pump Current limit	Amps	270	Adjustable from 50 amps to 600 amps
9	Cutback1 Plug Current	Amps	400	Adjustable from 180 amps to 750 amps
10	CSC Proportional Gain	1	30	Adjustable from 1 to 100
11	CSC Integral Gain	1	20	Adjustable from 1 to 100
12	Low Voltage Cutout	Volts	25	Adjustable from 25 Volts to 40 Volts
13	Pump Acceleration Delay	Seconds	2.0	Adjustable from 1.0 to 3.0
14	Pump Creep	%	0%	Adjustable from 0% to 30%

4.7 UPRIGHT TRACTION CONTROLLER DISPLAY

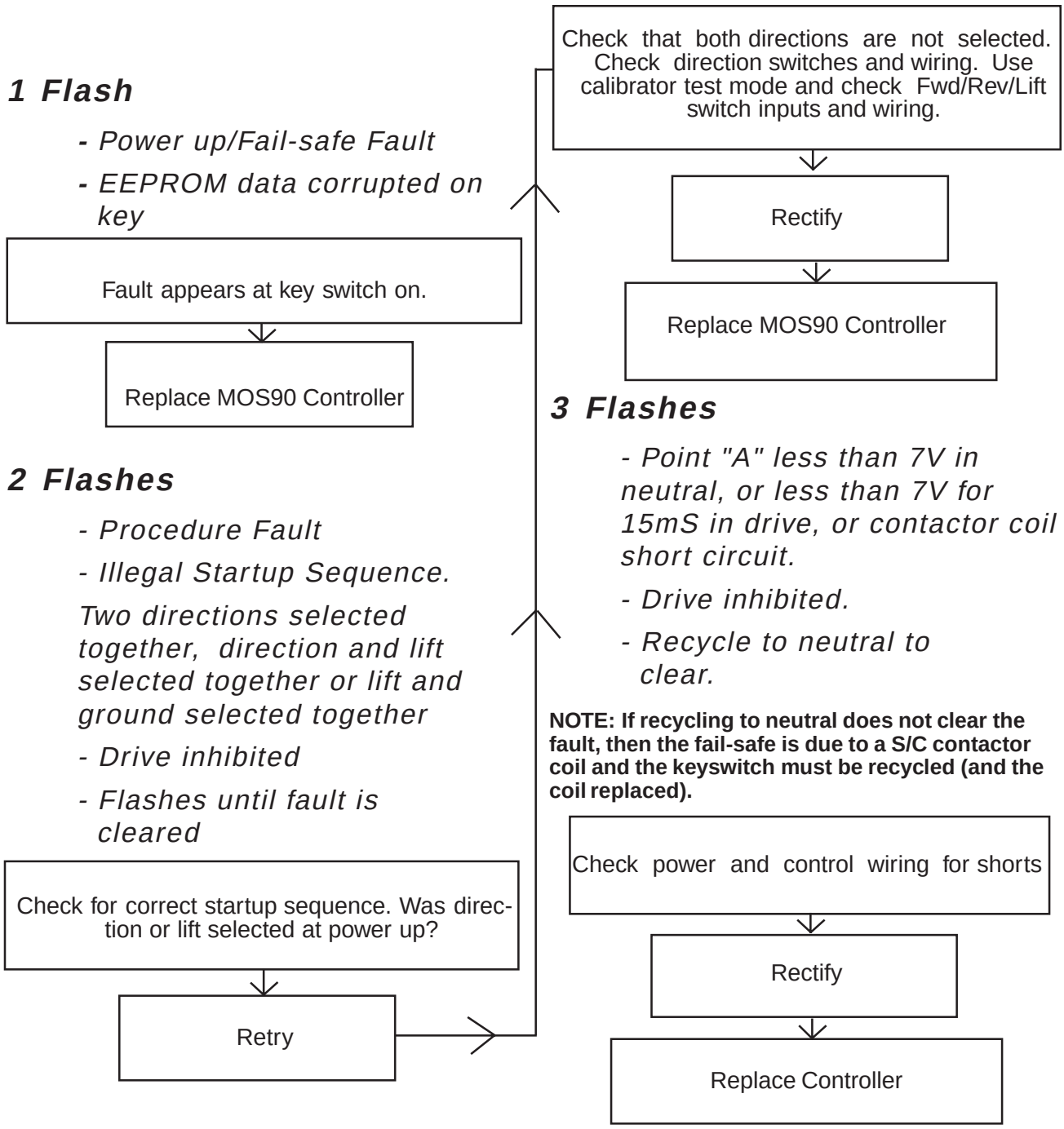
Table 4-3: Calibrator Display

Sequence No.	Test	Display	Input #
-	Acc. Input	0-100%	14
1	Forward	CL/OP	8
2	Reverse	CL/OP	11
3	Tach Input	0-100%	12
4	Elev. Pos.	CL=Clpsd. OP=Lifted	4
5	Tilt Switch	CL=Level OP=Tilt	7
6	Pump Switch	CL= Pump OP=Trac.	16
7	Act. Direction Tacho Output	OP=FWD CL=REV	2
8	High/Low Speed	CL=High OP=Low	13
9	Direction Flag	OP=No Dr. CL=Drv actv.	-
10	First Error Latch	Value= Flash Code	0-255

NOTE: CL = Switch Closed
OP = Switch Open

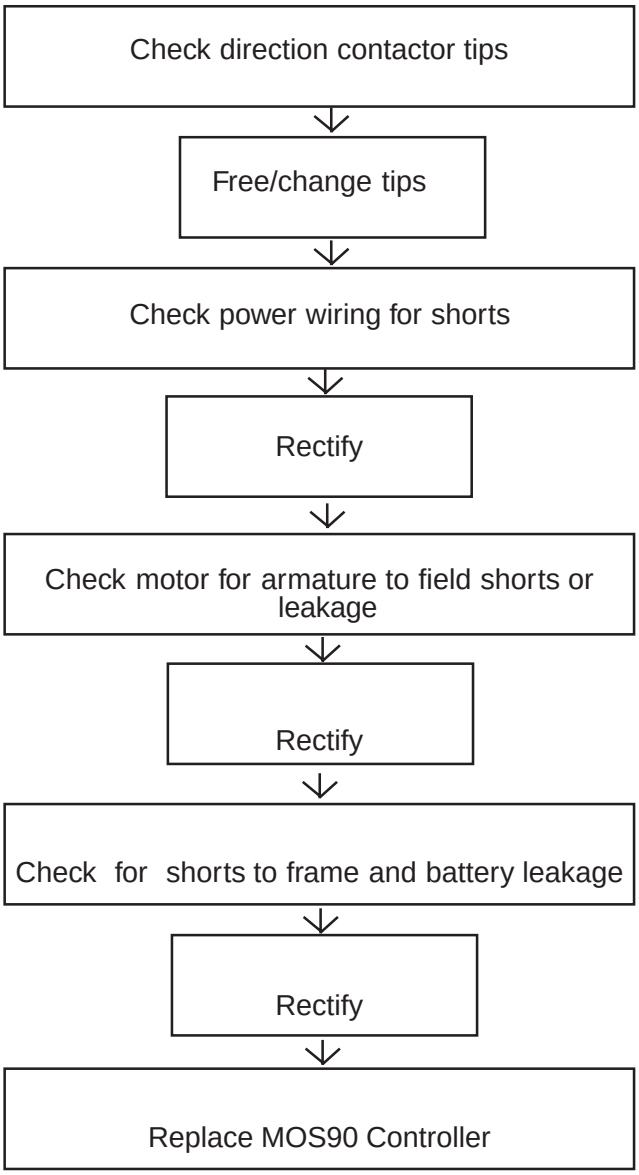
4.8 MOS90 FAULT FINDING FLOW CHARTS

At battery connection, the LED should not illuminate. At key ON, the LED should illuminate steadily. If the LED illuminates and remains steady, but no drive can be selected, the calibrator can be used to test the wiring harness.



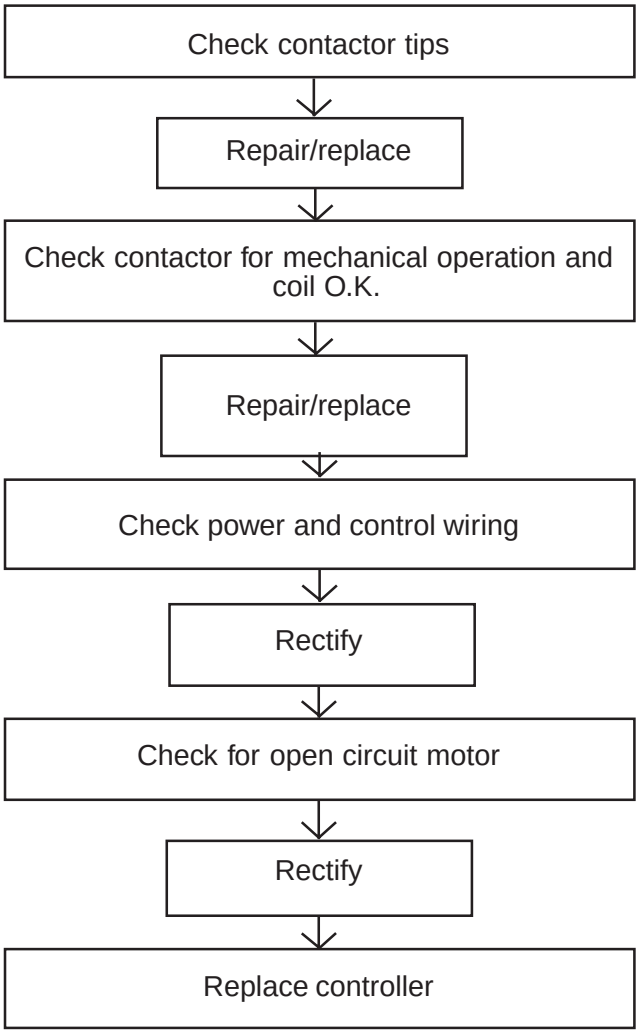
4 Flashes

- *Direction contactor welded. (Point "A" within 6V of B+ve in neutral)*
- *Leakage between motor armature and field.*
- *Drive inhibited.*
- *Flashes in neutral until fault is cleared*



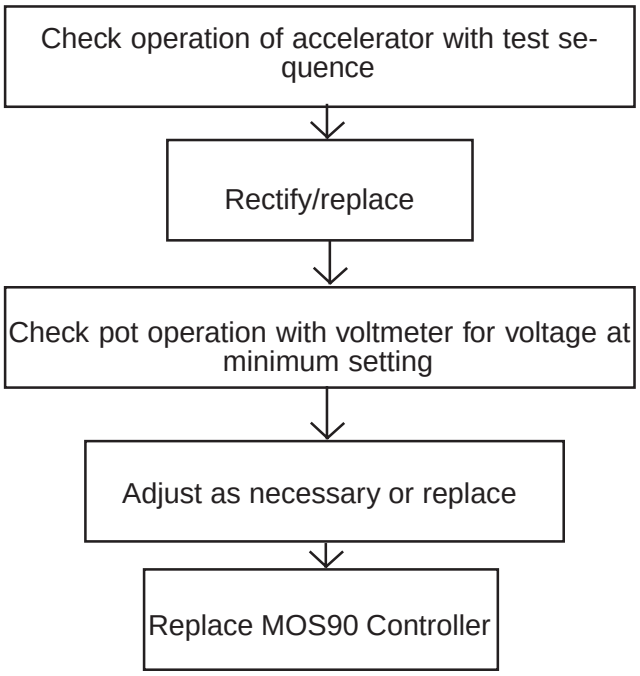
5 Flashes

- *Direction contactors (or line contactor) did not close.*
- *Motor armature or field open circuit.*
- *Point "A" not within 6V of B+ve within one second of selecting direction.*
- *Drive inhibited.*
- *Flashes until fault is cleared, when contactor closes.*



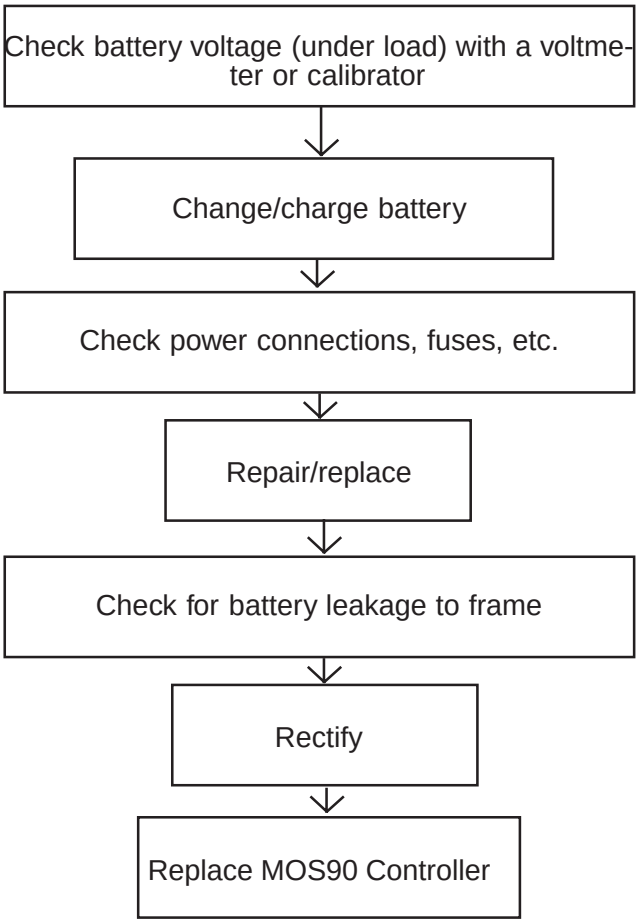
6 Flashes

- *Accelerator faults*
- *3.5 Volts to 0 Volts = Min. to Max. Speed on accelerator input (pin 14). Greater than 4.5 volts can mean an open accelerator pot. Less than 2.5 Volts on power up, indicates more than 30% demand*
- *Controller pulses at creep setting*
- *Flashes until fault cleared*



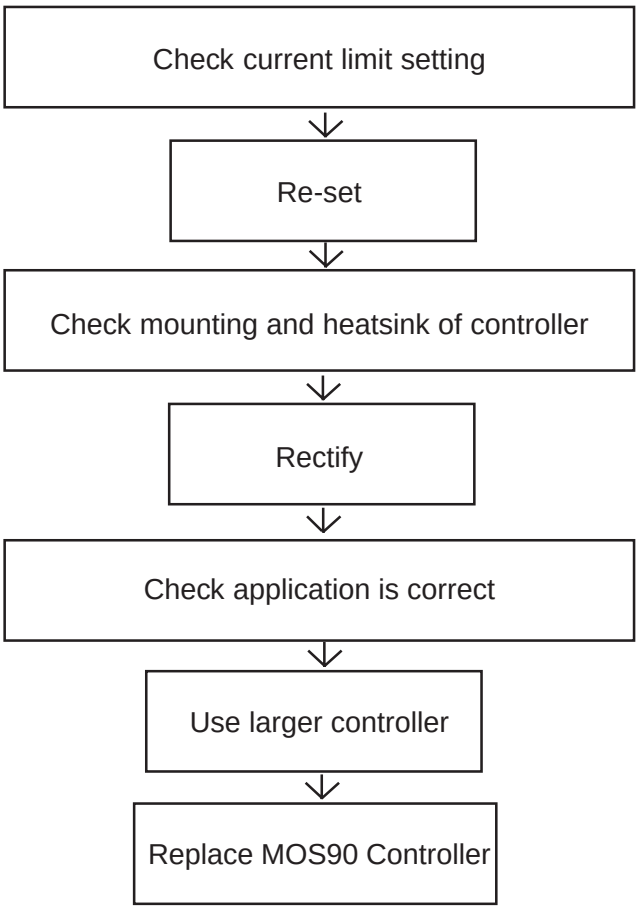
7 Flashes

- *Battery voltage dipped below 14 volts*
- *Drive inhibited*
- *Turn key switch off and on to clear flash*



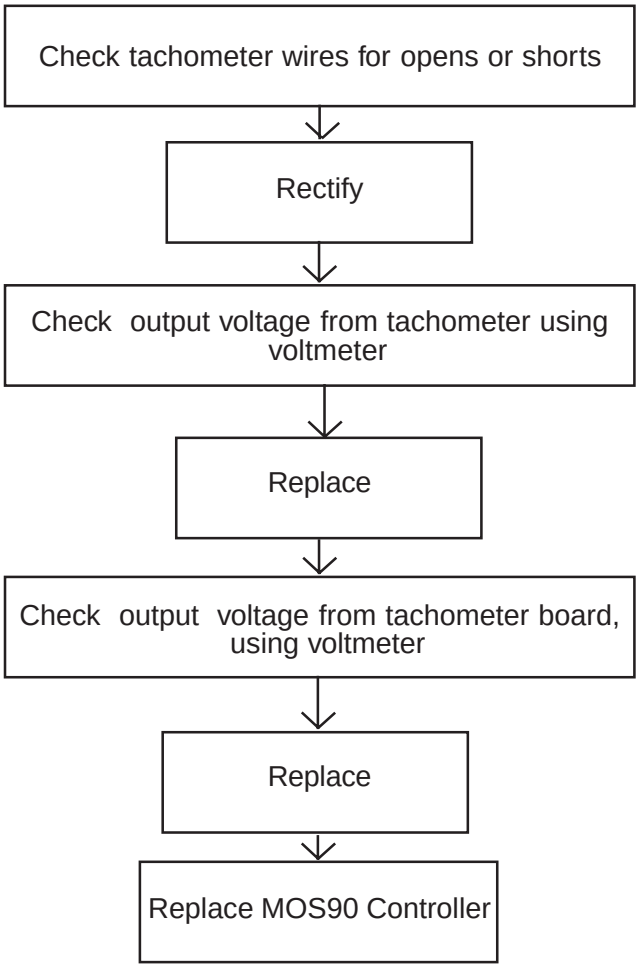
8 Flashes

- *Thermal cutback*
- *Heatsink temperature less than 80ºC (176ºF) (Current limit will be zero at 90ºC (194ºF)*
- *Allow unit to cool down, to clear flashing*



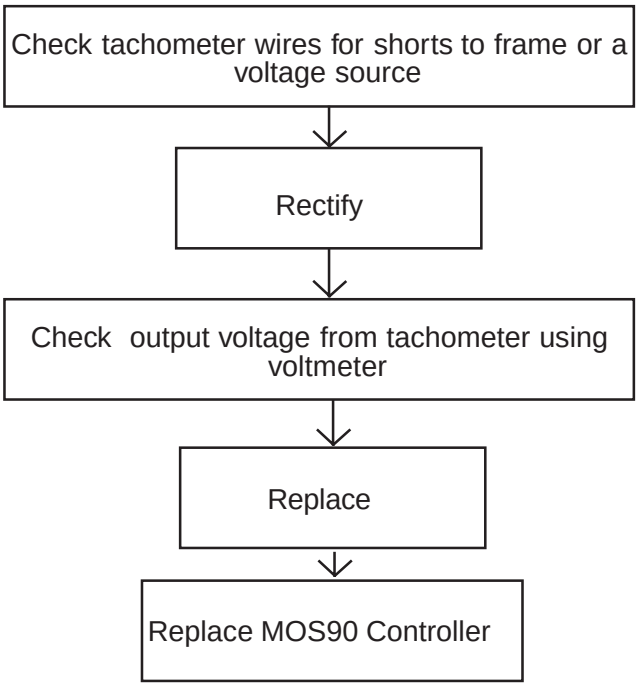
10 Flashes

- *Tachometer fault*
- *Drive inhibited*
- *Recycle key to clear fault*



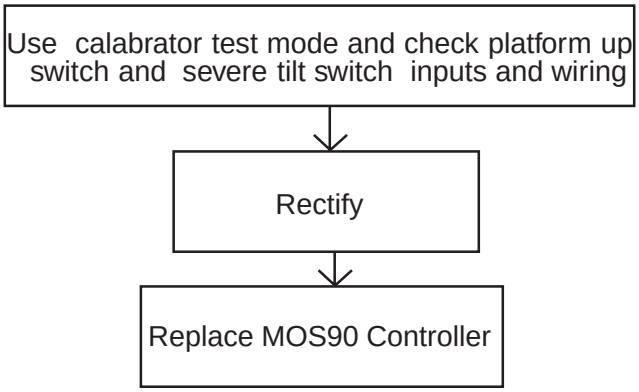
11 Flashes

- *Tachometer signal out of range*
- *Drive inhibited*
- *Flashes until fault cleared*



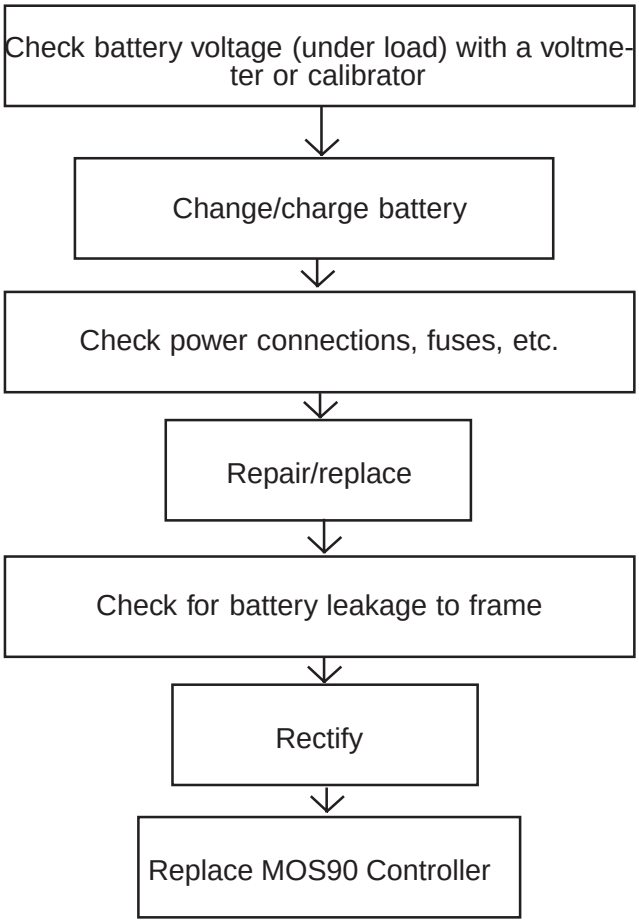
12 Flashes

- *Severe tilt condition with platform raised above 2 meters*
- *Vehicle goes into emergency stop (forced neutral state) and plug brakes to a stop*
- *Recycle nuetral to clear fault*



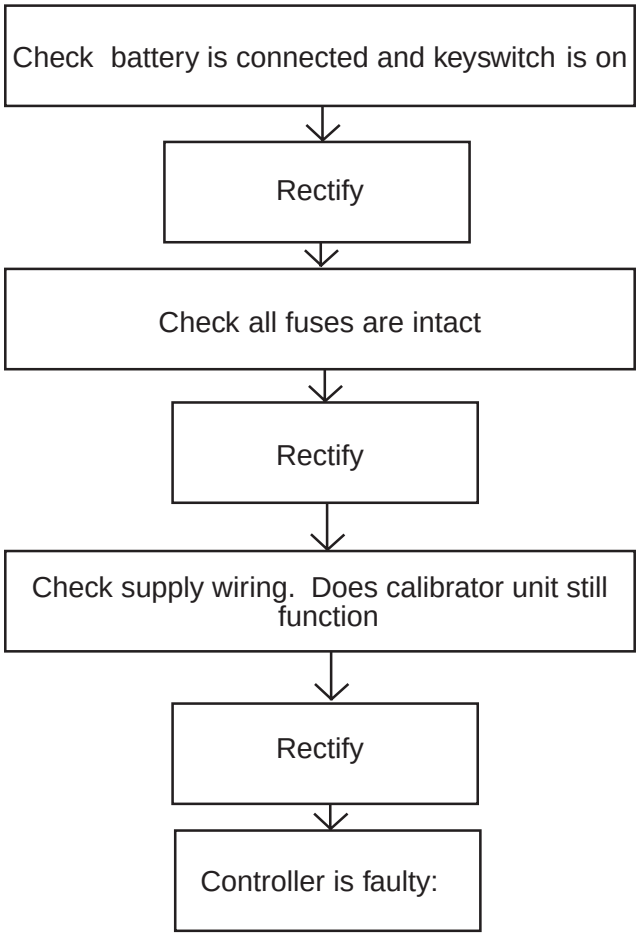
14 Flashes

- *Battery voltage has fallen out of range.*
- *Traction and pump mode will not be allowed*
- *Requires key recycle to clear fualt*

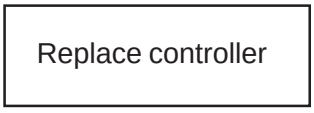


LED off

- *Unit not powered up or controller faulty, or LED faulty*



a) Auto fail-safe check failed. LED turns off when a direction is first selected after power up. Recycle keyswitch.
b) Contactor drive S/C. LED resets itself if short circuit clears.
c) Mosfets did not turn on. Recycle direction to neutral to clear fault indication.



4.9 ACTIVATING "TEST"

Position red LED at TEST. Press "+" or "-" to select the switch to be viewed.

The zero position input "-" should read zero and is set by adjusting the sensitivity threshold trim pot in the upper control box. Step on the foot switch and keeping the joystick centered, adjust the pot to give a readout of 1 or 2. Slowly back the pot down until the reading has just dropped to zero.

Connect voltmeter between B- and pin 14 on MOS90. Voltage at pin 14 in neutral should not be lower than +3.5 volts D.C. 3.5 VDC = 0% speed input, 0.0 VDC=100% speed input.

If set at an extremely high value MOS90 will read as fault and shut down.

Properly set the LX31/41 should start to move slowly with a small movement of the joystick after a very small "deadband" zone.

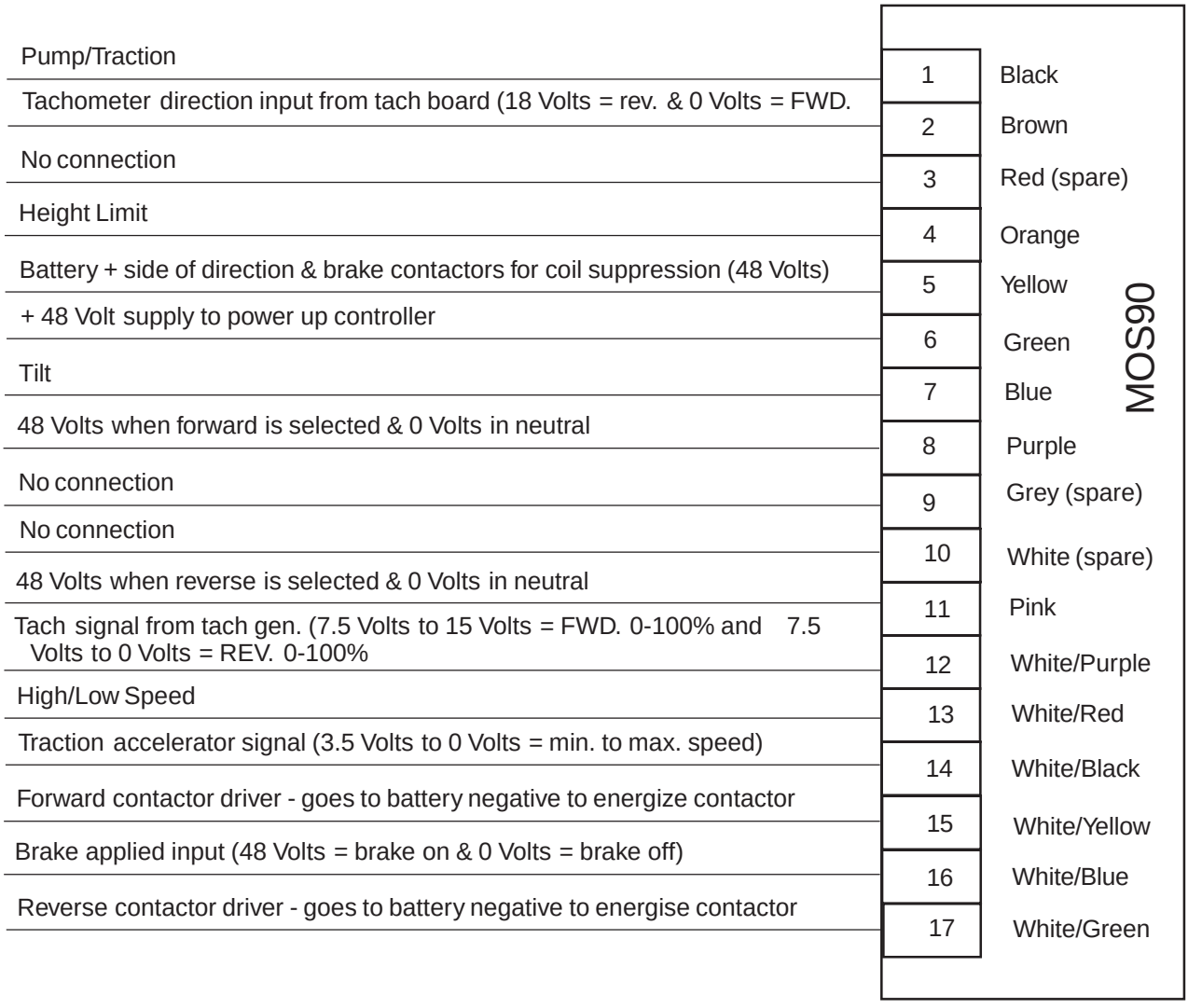
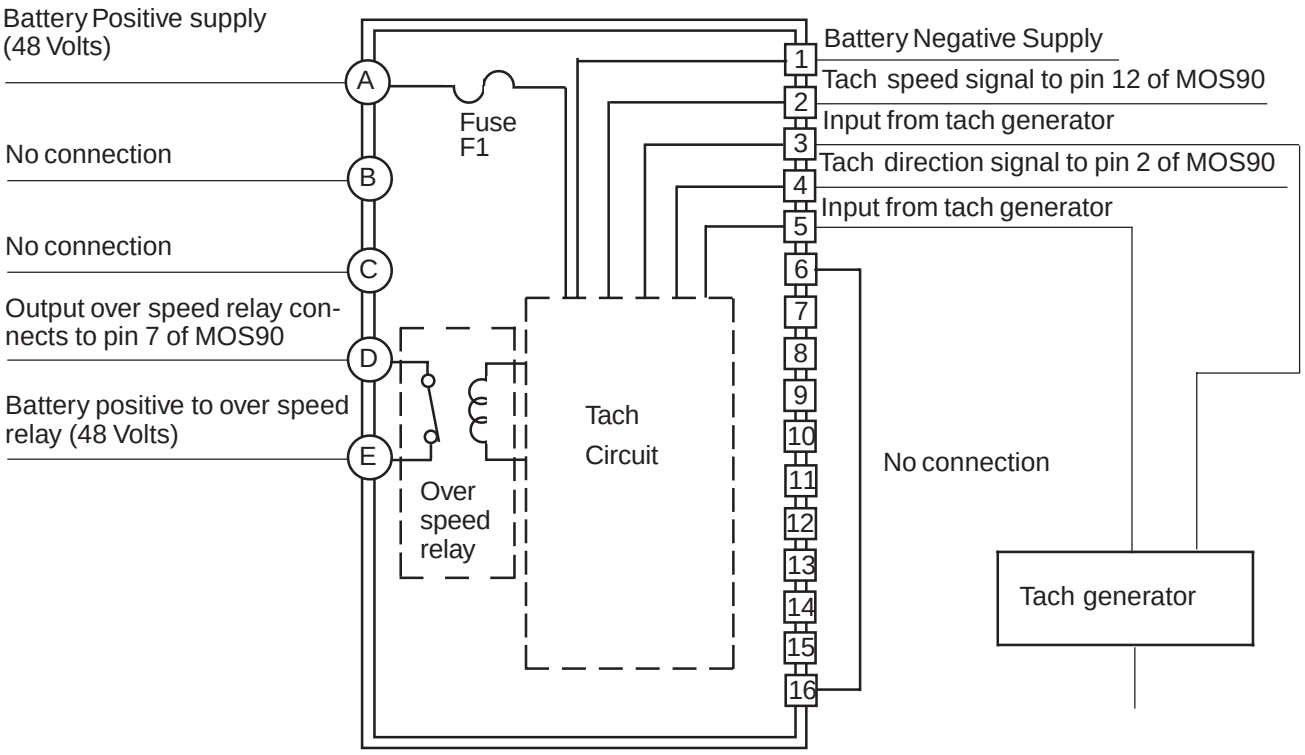


Figure 4-2: MOS90 17 Way Connector Pinout Designation



(D) 48 Volts = no over speed condition
0 Volts = over speed condition

[2] Tach speed signal from tach board
7.5 Volts to 15 volts = 0-100% speed in FWD.
7.5 Volts to 0 volts = 0-100% speed in REV.

[4] Tach direction signal
18 Volts = REV.
0 Volts = FWD.

[3]

[5] Output of tach generator
0 to +50 Volts = 0-100% speed in FWD.
0 to -50 Volts = 0-100% speed in REV.

Figure 4-3: Upright Tachometer Board

Section
4.9

TROUBLESHOOTING

Section 5

SCHEMATICS

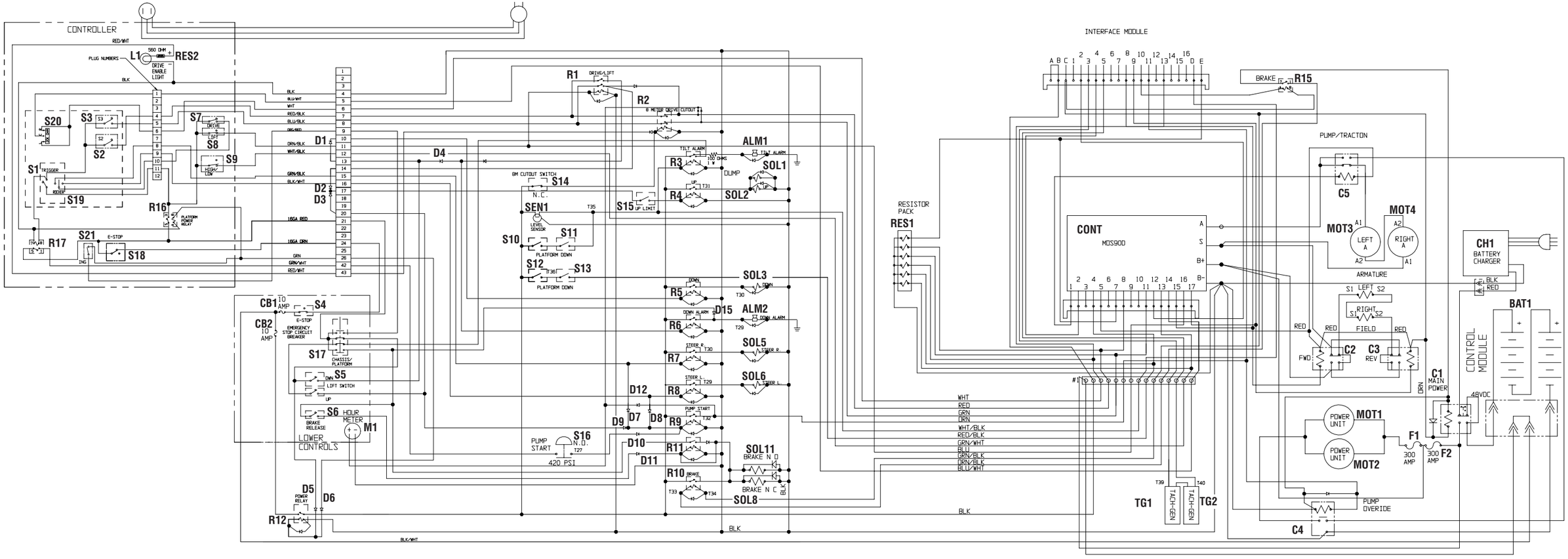
Introduction

This section contains electrical and hydraulic power schematics and associated information for maintenance purposes.

The diagrams are to be used in conjunction with the ***Troubleshooting Truth Tables*** in ***Section 4.*** They allow understanding of the makeup and functions of the systems for checking, tracing, and faultfinding during troubleshooting analysis.

The components that comprise the electrical and hydraulic systems are given a reference designation and are explained as to function and location in the following tables.

Schematic


CONTROLLER
INTERFACE MODULE
L1
RES2
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
S18
S19
S20
S21
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R15
R16
R17
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D15
ALM1
ALM2
SOL1
SOL2
SOL3
SOL5
SOL6
SOL8
SOL11
M1
CB1
CB2
RES1
CONT
MOS90D
MOT1
MOT2
MOT3
MOT4
C1
C2
C3
C4
C5
F1
F2
BAT1
CH1
TG1
TG2
LOWER CONTROLS
CONTROL MODULE
PLUMP/TRACTON
ARMATURE
FIELD
BRAKE
RESISTOR PACK
48VDC
BATTERY CHARGER
MAIN POWER
PUMP OVERIDE
PUMP START
420 PSI
LIFT SWITCH
EMERGENCY STOP CIRCUIT BREAKER
HOUR METER
BRAKE RELEASE
E-STOP
TRIGGER
ROCKER
DRIVE ENABLE LIGHT
PLATFORM DOWN
LEVEL SENSOR
UP LIMIT
TILT ALARM
DOWN ALARM
BRAKE N.O.
BRAKE N.C.
POWER RELAY
TACH-GEN
LEFT
RIGHT
FWD
REV
300 AMP
560 OHM
100 OHMS
10 AMP
BLK
WHT
RED
GRN
ORN
BLU
RED/WHT
BLU/WHT
RED/BLK
ORG/RED
ORN/BLK
WHT/BLK
GRN/BLK
BLK/WHT
GRN/WHT
BLU/BLK
16GA RED
16GA ORN
GRN
BLK/WHT

5.2 ELECTRICAL SCHEMATIC, ELECTRIC

Table 5-2: Electrical Schematic, 067447-003

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM1	Alarm, Tilt	Warning sound when machine is off-level	Lower Control Box
ALM2	Alarm, Down	Warning sound when deck is lowering	Lower Control Box
BAT1	Battery	Electrical Power	Control Module
C1	Main Power Contactor	Switch Power to All Solenoids and Motors	Relay Panel
C2	Forward Contactor	Switch Drive Motors to Forward	Relay Panel
C3	Reverse Contactor	Switch Drive Motors to Reverse	Relay Panel
C4	Pump Override Contactor	Overide Pump Motors	Relay Panel
C5	Pump/Traction Contactor	Switch Power *Between* Drive Motors and Pump Motors	Relay Panel
CB1	Circuit Breaker	Protect Emergency Stop Switch S4	Lower Control Box
CB2	Circuit Breaker	Protect Power Relay R9	Lower Control Box
CH1	Battery Charger	Charge Batteries	Control Module
CONT	Controller	Control Logic Module	Relay Panel
D1	Diode	Spike Protection	Between T10 & T13
D2	Diode	Spike Protection	Between T20 & T17
D3	Diode	Spike Protection	Between T14 & T17
D4	Diode	Power to Down Relay	Control Module
D5 & D6	Diode	Power to Power Relay	Control Module
D7 - D10	Diode	Power to Pump Start Relay	Control Module
D11	Diode	Power to Brake Release Relay	Control Module
D12	Diode	Power to Hour Meter	Control Module
D15	Diode	Power to Down Alarm	Control Module
F1 & F2	Fuse, Main	Protect Circuit Wiring	Relay Panel
L1	Drive Enable Light	Indicate Power to Drive Circuit	Upper Controls
M1	Hour Meter	Record Operating Time	Lower Control Box
MOT1 & 2	Electric Motor, Power Unit	Drive Hydraulic Pump	Power Module
MOT3	Electric Motor	Drive Left Rear Wheel	Chassis
MOT4	Electric Motor	Drive Right Rear Wheel	Chassis
R1	Drive/Lift Relay	Start Hydraulic Pumps	Lower Control Box
R2	8 Meter Cutout Relay	Drive Cutout	Lower Control Box
R3	Tilt Alarm Relay	Switch Power to ALM1	Lower Control Box
R4	Up Relay	Switch Power to SOL1 & 2	Lower Control Box
R5	Down Relay	Switch Power to SOL3	Lower Control Box
R6	Down Alarm Relay	Switch Power to ALM2	Lower Control Box
R7	Steer Right Relay	Switch Power to SOL5	Lower Control Box
R8	Steer Left Relay	Switch Power to SOL6	Lower Control Box
R9	Pump Start Relay	Provide Power to S1	Lower Control Box
R10	Brake Relay	Switch Power to SOL8	Lower Control Box
R11	Brake Release Relay	Switch Power to SOL11	Lower Control Box
R12	Power Relay	Switch Power to All Relays	Lower Control Box
R15	Brake Release Relay	Provide Power to Brake Relay R10	Relay Panel
R16	Platform Power Relay	Power to Upper Controls	Upper Controls
R17	Prevent Pump Start Relay	Power to Pump Start Switch	Upper Controls
RES1	Resistor Pack	Current Protection	Relay Panel
RES2	Resistor, Drive Enable Light	Limit Current to Drive Enable Light	Upper Controls
S1	Joystick Interlock Switch	Enable Upper Control Functions	Front of Joystick
S2	Interlock Switch	Enable Drive	Upper Controls
S3	Interlock Switch	Enable lift	Upper Controls
S4	Lower Emergency Stop Switch	Stop All Functions	Lower Controls
S5	Lift Switch	Provide Power to Up Relay & Down Relay	Lower Controls
S6	Brake release Switch	Provide Power to Brake release Relay	Lower Controls
S7	Drive Switch	Activate Drive	Upper Controls
S8	Lift Switch	Activate Lift	Upper Controls
S9	High/Low Switch	Speed Control	Upper Controls
S10 - S13	Platform Down Switch	Close when Platform is Fully Down	Bottom of Elevating Assembly
S14	8 Meter Cutout Switch	Stop Drive Function when Platform Reaches 8 Meters	Chassis
S15	Up Limit Switch	Stop Lift Function	Chassis
S16	Pump Start Switch	Provide Power to Pump Start Relay	Brake Valve Manifold
S17	Chassis/Platform Switch	Power to Either Upper or Lower Controls	Lower Control Box
S18	Upper Emergency Stop Switch	Stop All Functions	Upper Controls
S19	Steering Rocker Switch	Power to Steering Relays	Top of Joystick
S20	Proportional Speed Control	Control Speed of Motors for Drive and Lift	Joystick
S21	Ignition Switch (keyswitch)	Power to Upper Controls & Motors	Upper Controls
SEN1	Level Sensor	Stop Drive Function	Control Module
SOL 1 & 2	Up Solenoid	Control Lift Valve	Manifold
SOL3	Down Solenoid	Control Down Valve	Manifold
SOL5	Steer Right Solenoid	Control Steer Right Valve	Top of Manifold
SOL6	Steer Left Solenoid	Control Steer Left Valve	Top of Manifold
SOL8	Brake Solenoid	Control Brake Valve (powers on)	Manifold
SOL11	Brake Release Solenoid	Control Brake Valve (powers off)	Manifold
TG1 & TG2	Tachometer - Generator	Monitor Drive Motor Speed	Control Module

5.2 Electrical Schematic, Electric (067447-003) HYDRAULICS

Hydraulic Schematic - 067446-000

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ACC	Accumulator	Accumulate Hydraulic Fluid	Brake Valve Block
CV1	Check Valve	Slow Brake Release	Brake Valve Block
CV2	Check Valve	Reduce Platform Lowering Speed	Lift Cylinder
CYL1	Cylinder, Left Brake	Apply Left Brake Pressure	Left Brake
CYL2	Cylinder, Right Brake	Apply Right Brake Pressure	Right Brake
CYL3	Cylinder, Lift	Actuate Scissor Linkage to Lift Platform	Chassis
CYL4	Cylinder, Steering	Actuate Steering Linkage to Steer Front Wheels	Chassis
F1	Filter, Return	Filter Hydraulic Line	Tank
F2	Filter, Tank	Filter Contaminants	Tank
ORF1	Orifice, Steering	Limit Hydraulic Oil Flow to Steering Cylinder	Main Valve Block
ORF2	Orifice, Brake	Allow Brakes to Release Quickly and Apply Slowly	Brake Valve Block
ORF3	Orifice, Lift	Limit Hydraulic Oil Flow to Lift Cylinder	Lift Cylinder
P1 & P2	Hydraulic Pump	Provide Fluid Power for Hydraulic System	Chassis
RV1	Valve, Main Relief	Provide Over Pressure Protection for the Main Hydraulic Line	Main Valve Block
RV2	Valve, Steering Relief	Provide Over Pressure Protection for the Steering Components	Main Valve Block
S1	Pressure Switch	Disable Machine	Brake Valve Block
V1	Valve, Brake Apply	Direct Hydraulic Oil to the Brake Cylinders	Brake Valve Block
V2	Valve, Brake Release	Release Hydraulic Oil Pressure from Brakes	Brake Valve Block
V3	Valve, Steering	Control Hydraulic Oil Flow to Steering Cylinder	Main Valve Block
V4	Valve, Lift	Control Hydraulic Oil Flow to Lift Cylinder	Main Valve Block
V5	Valve, Dump	Divert Excess Oil	Main Valve Block
V6	Valve, Down	- Hold Oil in Lift Cylinder when Deck is Elevated. - Release Oil from Lift Cylinder to Lower Deck - Has Cable Actuated Manual Override for Emergency Lowering	Lift Cylinder

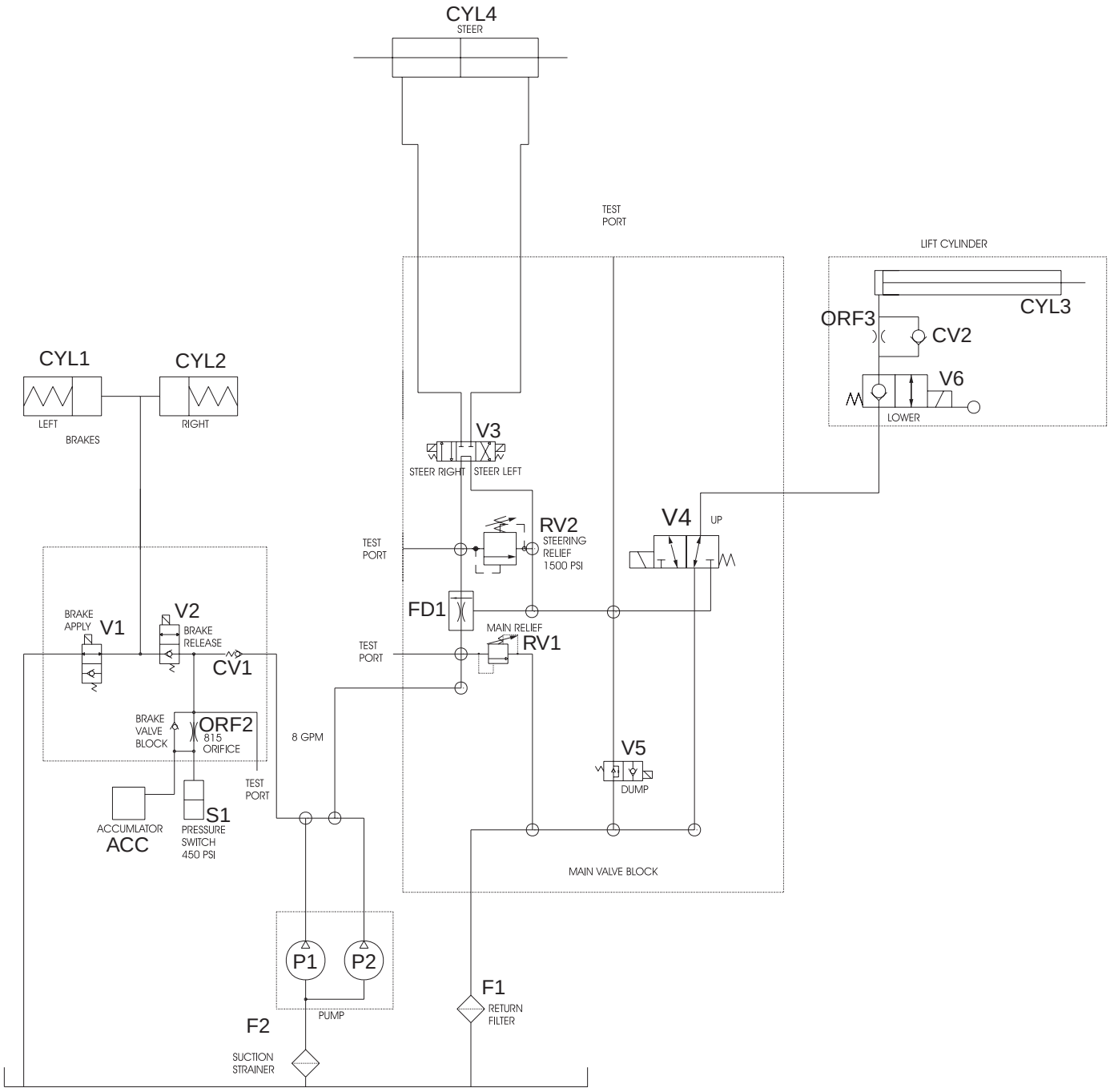
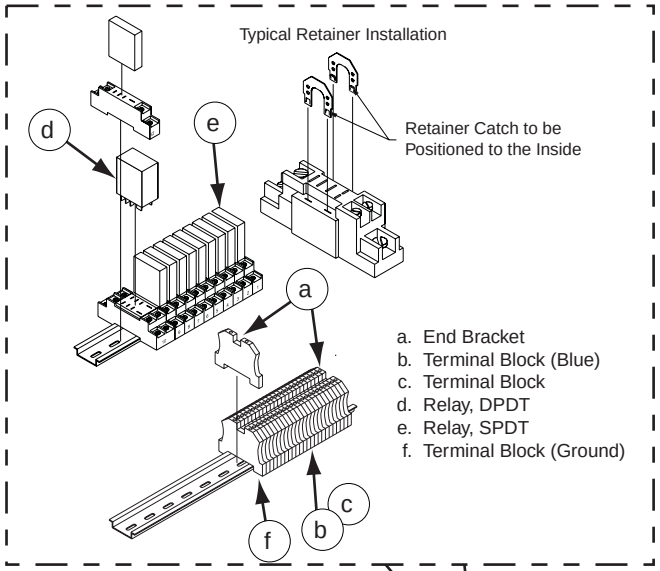
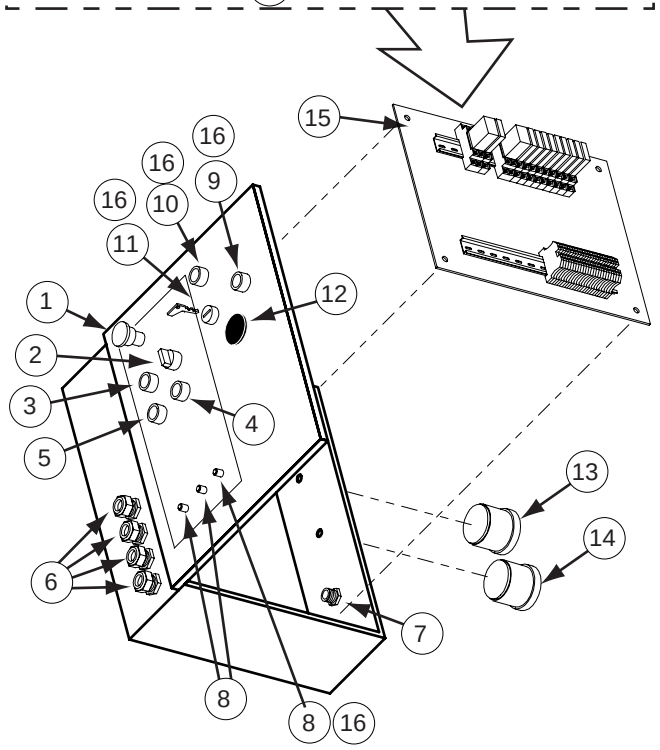


Figure 5-3: Hydraulic Schematic - 067446-000

5.4 COMPONENT IDENTIFICATION

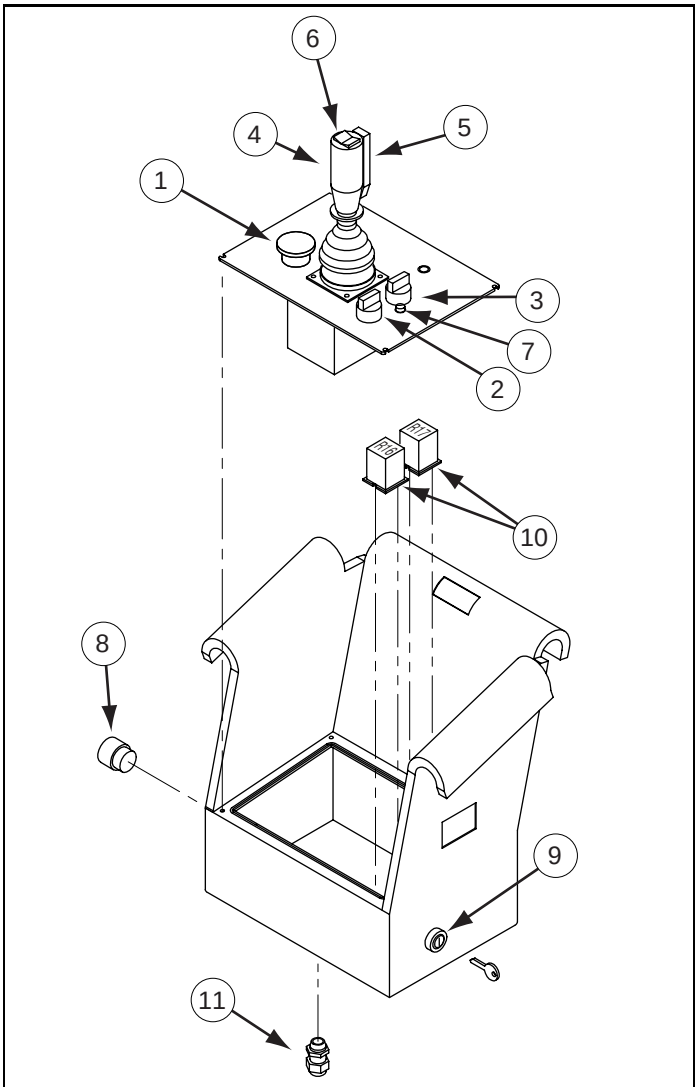




Lower Control Box

1. Emergency Stop Button
2. 3-Position Selector Switch (Platform/Chassis/Brake Release)
3. Raise Button
4. Brake Release Button
5. Lower Button
6. Cable Connector, 3/4
7. Cable Connector, 1/2
8. Circuit Breaker, 10 AMP
9. Glow Plug Button (Bi-Energy)
10. Start Button (Bi-Energy)
11. Ignition Key Switch (Bi-Energy)
12. Hour Meter
13. Down Alarm
14. Tilt Alarm
15. Panel Assembly
16. Plug (Electric)

Figure 5-4: Lower Control Box Assembly



Upper Control Box

1. Emergency Stop Button
2. Drive/Lift Switch
3. Speed Range Switch
4. Joystick
5. Interlock Switch
6. Rocker Switch (steering)
7. Drive Enable Light
8. Glow Plug Button (Bi-Energy)
9. Key Switch
10. Relay
11. Cable Connector

Figure 5-5: Upper Control Box Assembly

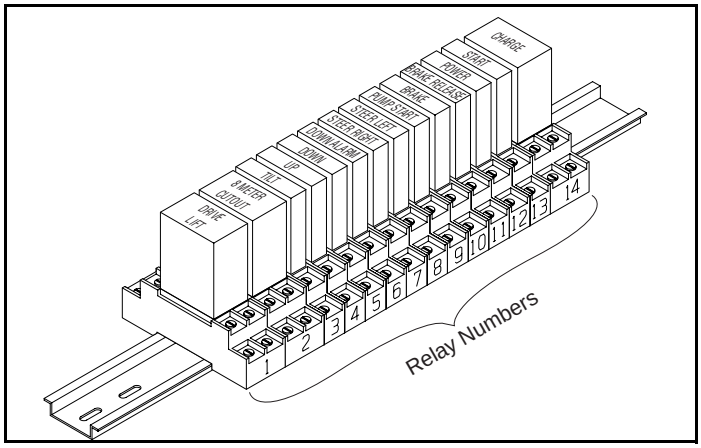


Figure 5-6: Lower Control Box Relays

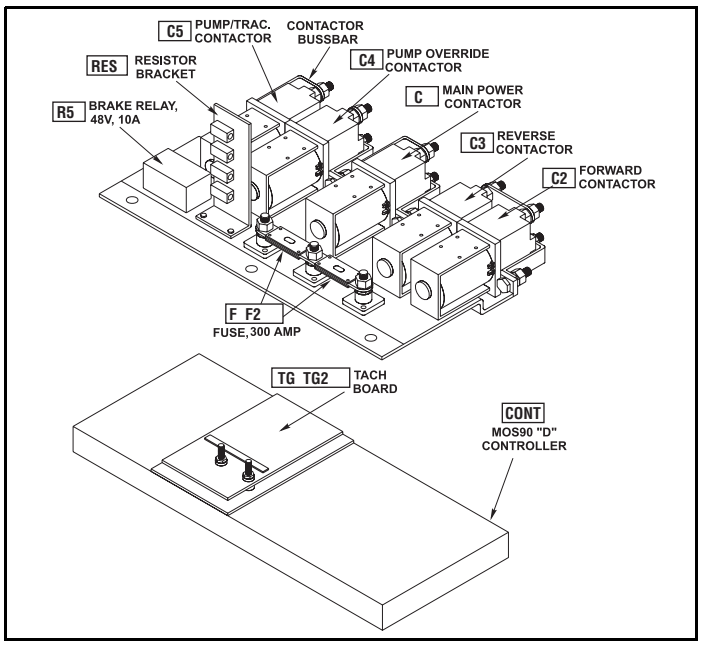
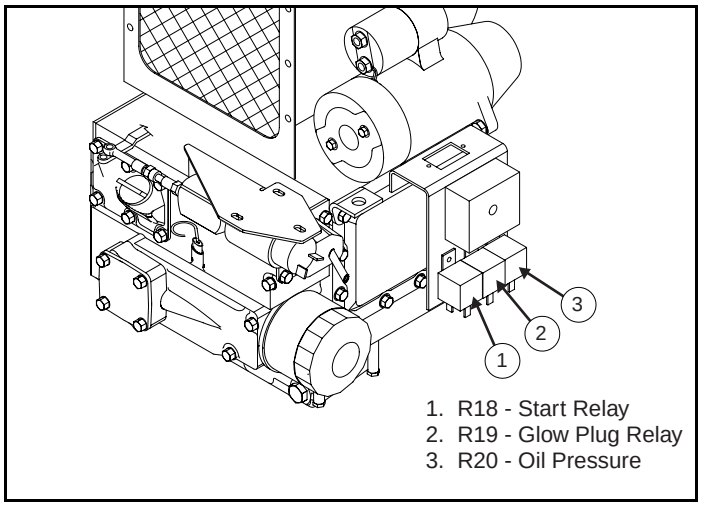


Figure 5-7: Relay Panel Assembly



1. R18 - Start Relay
2. R19 - Glow Plug Relay
3. R20 - Oil Pressure

Figure 5-8: Engine Relays (Bi-Energy)

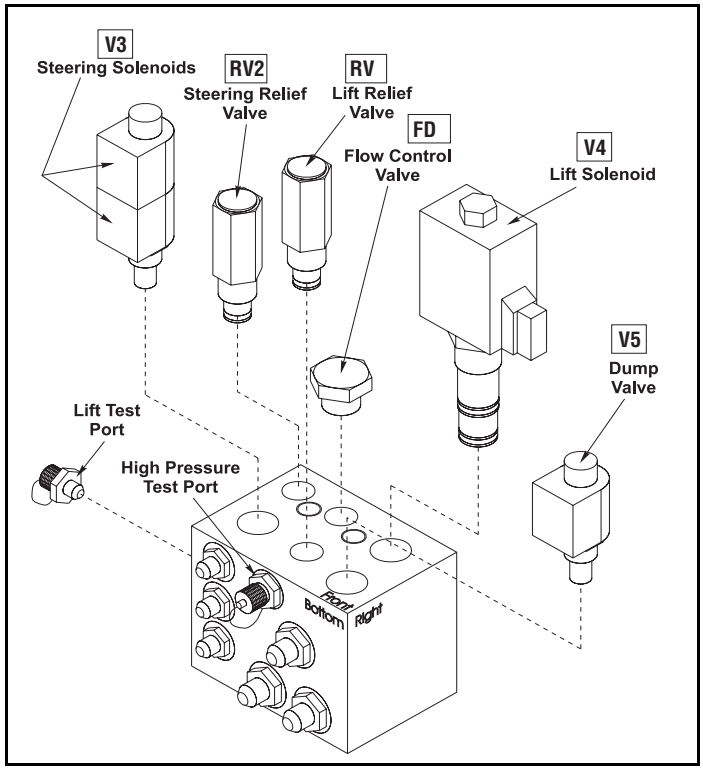


Figure 5-9: Valve Manifold, Exploded View

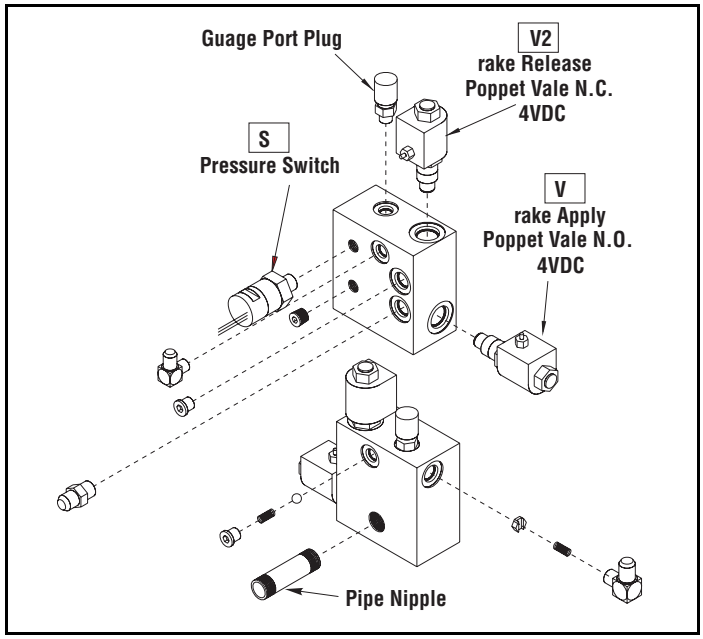


Figure 5-10: Brake Valve Manifold, Exploded View

Section
5.4

SCHEMATICS

Section 6

ILLUSTRATED PARTS BREAKDOWN

Introduction

This section lists and illustrates the replaceable assemblies and parts of this product, as manufactured by UpRight, Inc. Each parts list contains the component parts for that assembly.

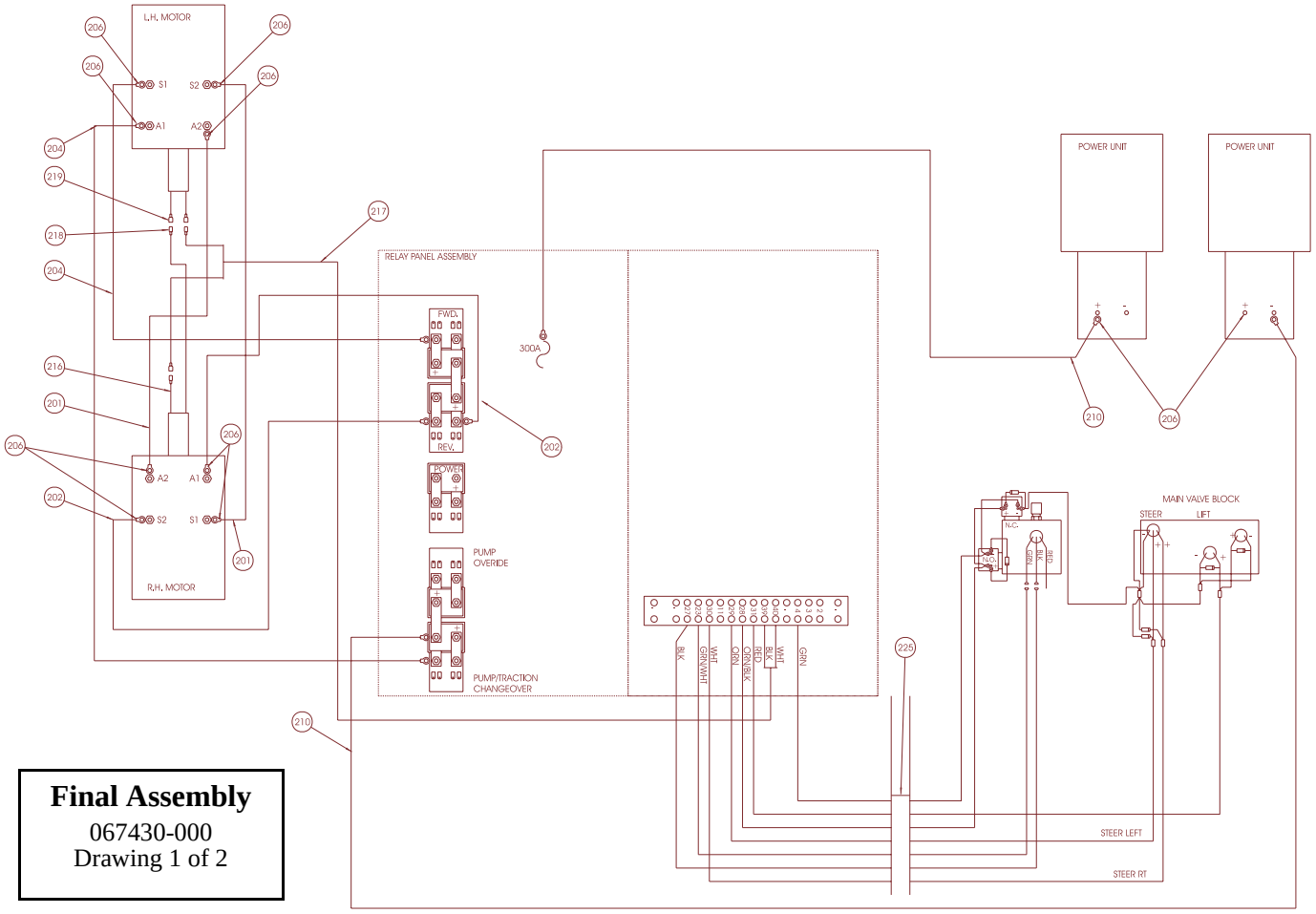
CONTENTS

Final Assembly, LX31

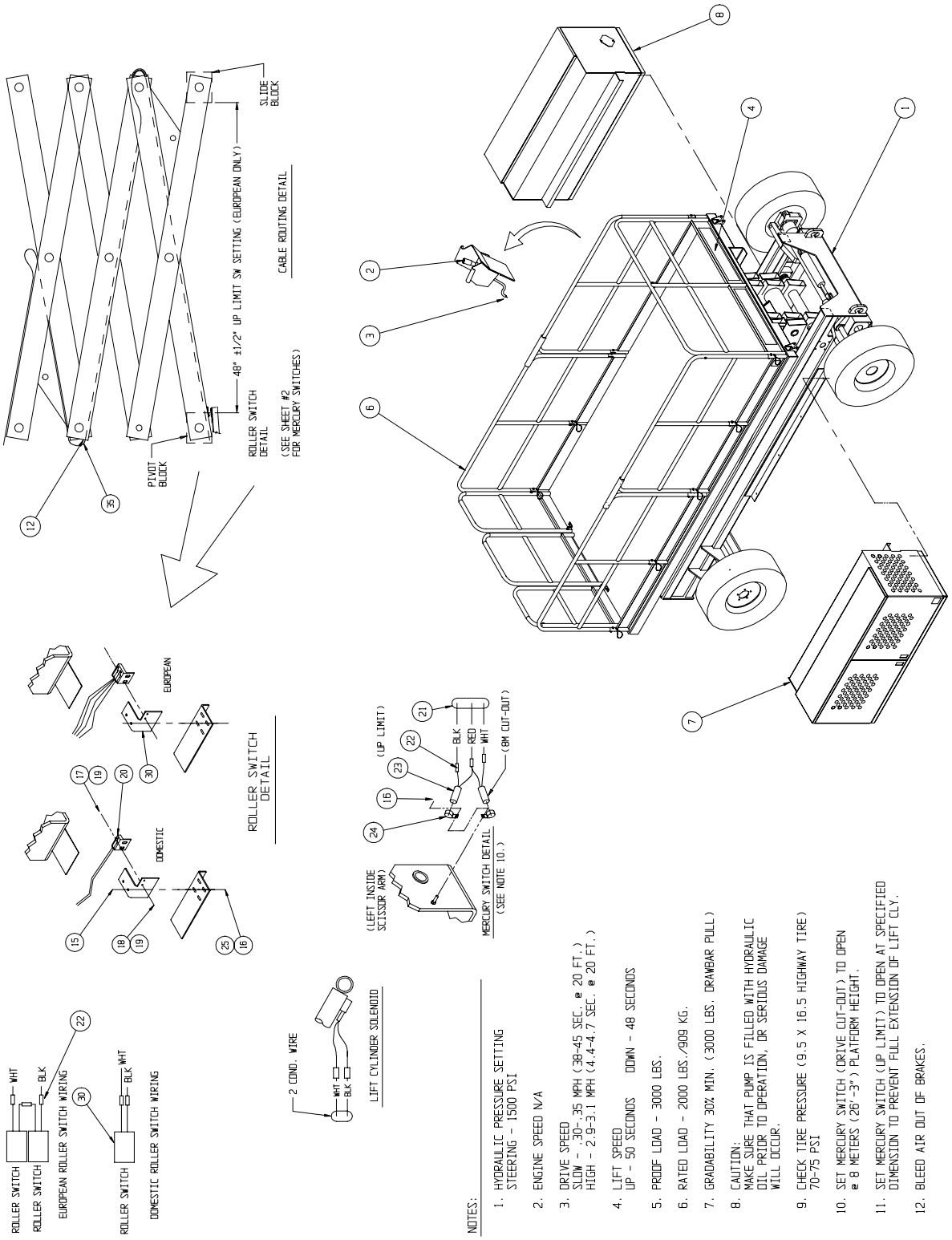
067430-000

	PART	DESCRIPTION	QTY.
1	067354-000	BASIC ASSY	1
2	067384-002	CONTROLLER ASSY	1
3	067536-000	CONTROL CABLE ASSY	1
4	067361-039	DECAL-KIT	1
5	067383-000	HOSE-KIT	1
6	067530-005	GUARDRAIL	1
7	067359-001	POWER MODULE	1
8	067360-001	CONTROL MODULE	1
9	067446-000	HYD SCHM.	REF
10	067447-003	ELEC. SCHM.	REF
12	067692-000	CLIP, CABLE RETAINER	4
13	020032-001	TEE, #4MJ-#4MJ-#4MJ	1
15	011252-006	SCRW, 1/4-20 X 3/4	2
16	011248-004	LOCKNUT, 1/4-20 UNC	3
17	011248-003	LOCKNUT, 10-24 UNC	2
18	011709-008	SCREW 10-24 UNC X 1	2
19	011240-003	WASHER #10 STD FLAT	1
20	066490-000	SWITCH ROLLER	1
21	029447-099	CABLE 3 COND. 16 GA.	10 FT
22	029620-002	CONN. BUTT 16-14 GA.	8

ITEM	PART	DESCRIPTION	QTY.
23	063497-001	MERCURY SWITCH	2
24	013919-013	CLAMP	2
25	014996-004	WASHER 1/4 SAE FLAT	4
30	067473-000	SWITCH MOUNT	1
33	015963-099	STRAP MATL.	9
201	068776-048	CABLE ASSY X 48" (3/8 X 3/8 LUG)	2
202	068776-014	CABLE ASSY X 165" (3/8 X 3/8 LUG)	2
204	068776-012	CABLE ASSY X 150" (3/8 X 3/8 LUG)	2
206	010154-001	BATTERY TERM. COVER	10
210	068777-107	CABLE ASSY X 107" (3/8 X 5/16 LUG)	2
211	029452-099	WIRE, 16 GA. BLACK	5FT
216	029355-099	WIRE, 16 GA. BLK/RED	5FT
217	029496-099	WIRE, 16 GA. 2 CON	16FT
218	014914-001	CONN. MALE PUSH, 14-16 .25	2
219	029931-003	CONN. FEM. PUSH, 14-16 .25	2
220	029601-012	CONN. RING, 14-16 #8	8
221	029601-015	CONN. RING, 14-16 N 3/8	1
222	029825-002	DIODE, 3 AMP, 400 VOLT	6
225	060214-099	WIRE, 16 AWG 15 CONN.	18FT
226	029620-002	CONN. BUTT 16-14	3



Final Assembly
067430-000
Drawing 1 of 2



NOTES:

1. HYDRAULIC PRESSURE SETTING
   STEERING - 1500 PSI
2. ENGINE SPEED N/A
3. DRIVE SPEED
   SLOW - 30-35 MPH (38-45 SEC. @ 20 FT.)
   HIGH - 2.9-3.1 MPH (4.4-4.7 SEC. @ 20 FT.)
4. LIFT SPEED
   UP - 50 SECONDS DOWN - 48 SECONDS
5. PROOF LOAD - 3000 LBS.
6. RATED LOAD - 2000 LBS./909 KG.
7. GRADABILITY 30% MIN. (3000 LBS. DRAWBAR PULL)
8. CAUTION:
   MAKE SURE THAT PUMP IS FILLED WITH HYDRAULIC OIL PRIOR TO OPERATION, OR SERIOUS DAMAGE WILL OCCUR.
9. CHECK TIRE PRESSURE (9.5 X 16.5 HIGHWAY TIRE)
   70-75 PSI
10. SET MERCURY SWITCH (DRIVE CUT-OUT) TO OPEN @ 8 METERS (26'-3") PLATFORM HEIGHT.
11. SET MERCURY SWITCH (UP LIMIT) TO OPEN AT SPECIFIED DIMENSION TO PREVENT FULL EXTENSION OF LIFT CLY.
12. BLEED AIR OUT OF BRAKES.

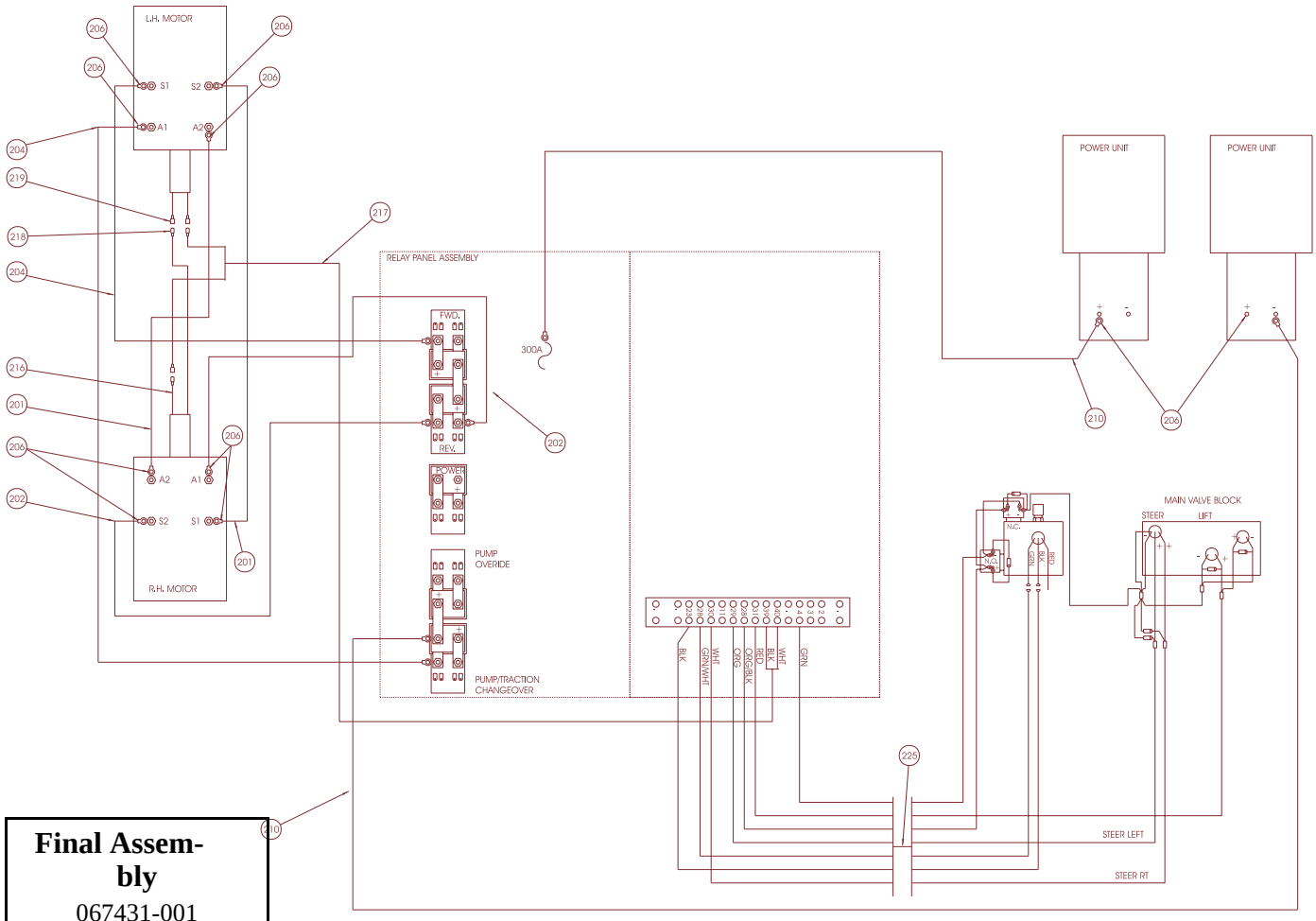
Final Assembly
067430-000
Drawing 2 of 2

Final Assembly, LX41

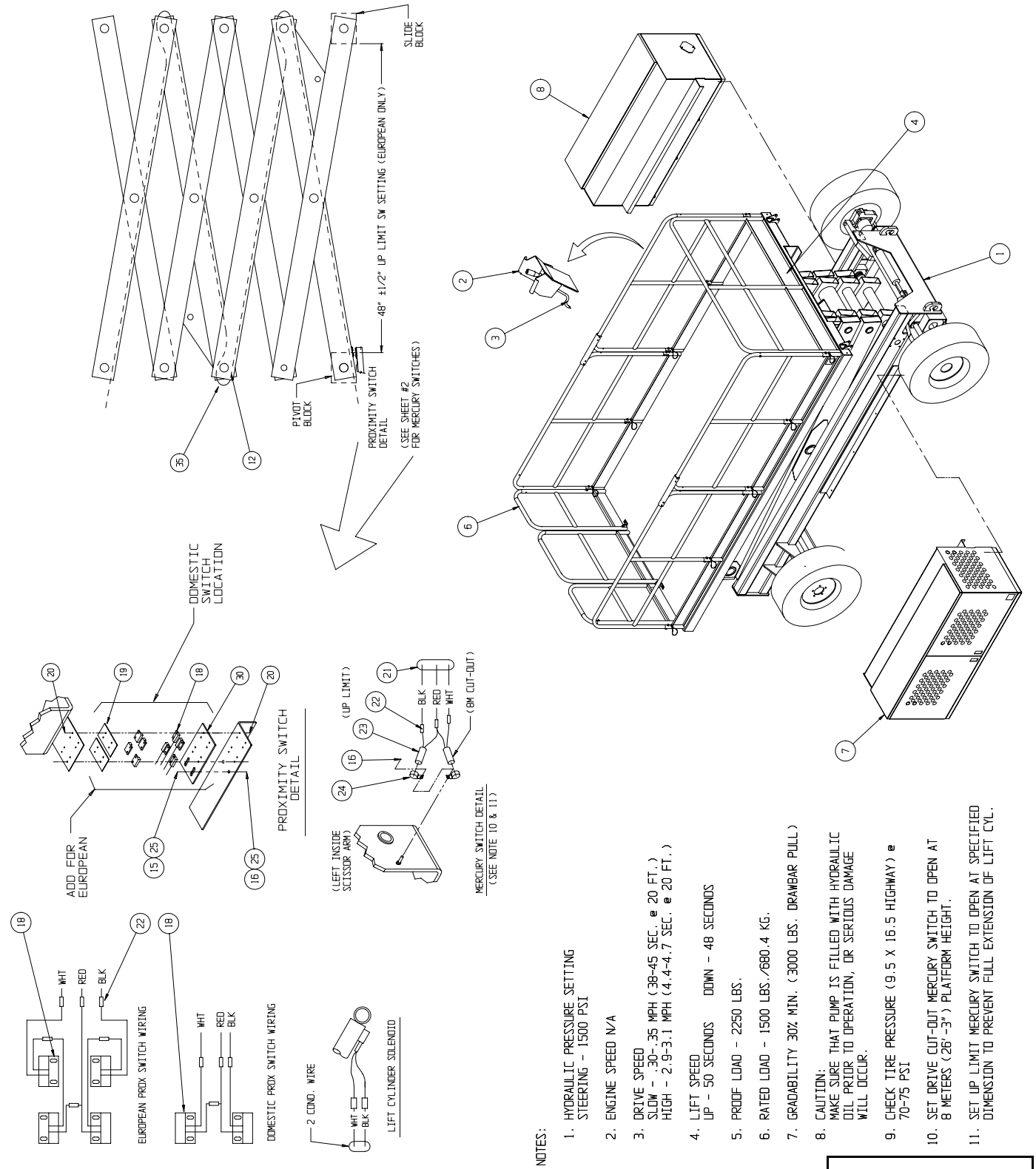
067431-000

	PART	DESCRIPTION	QTY
1	067355-000	BASIC ASSY	1
2	067384-002	CONTROLLER ASSY	1
3	067536-001	CONTROL CABLE ASSY	1
4	067361-040	DECAL-KIT	1
5	067383-000	HOSE-KIT	1
6	067530-005	GUARDRAIL	1
7	067359-001	POWER MODULE	1
8	067360-001	CONTROL MODULE	1
9	067446-000	HYD SCHM.	REF
10	067447-001	ELEC. SCHM.	REF
12	067692-000	CLIP, CABLE RETAINER	8
13	020032-001	TEE, #4MJ-#4MJ-#4MJ	1
15	011252-006	SCRW, 1/4-20 X 3/4	2
16	011248-004	LOCKNUT, 1/4-20 UNC	3

ITEM	PART	DESCRIPTION	QTY
17	065373-006	MAGNET	2
18	065373-005	SWITCH	2
19	067913-000	ALUM. SW. PAD	1
20	026551-005	RIVET 1/8 X 1/4 GRIP	8
21	029447-099	CABLE 3 COND. 16 GA.	10 FT
22	029620-002	CONN. BUTT 16-14 GA.	8
23	063497-001	MERCURY SWITCH	2
24	013919-013	CLAMP	2
25	014996-004	WASHER, 1/4 SAE FLAT	4
30	067863-000	SWITCH MOUNT	1
33	015963-099	STRAP MATL.	9
34	015964-000	STRAP HEAD	9
35	012865-099	WIRE LOOM 3/4 DIA	8



Final Assembly
067431-001



NOTES:

1. HYDRAULIC PRESSURE SETTING
   STEERING - 1500 PSI
2. ENGINE SPEED N/A
3. DRIVE SPEED
   SLOW - .30-.35 MPH (38-45 SEC. @ 20 FT.)
   HIGH - 2.9-3.1 MPH (4.4-4.7 SEC. @ 20 FT.)
4. LIFT SPEED
   UP - 50 SECONDS DOWN - 48 SECONDS
5. PROOF LOAD - 2250 LBS.
6. RATED LOAD - 1500 LBS./680.4 KG.
7. GRADABILITY 30% MIN. (3000 LBS. DRAWBAR PULL)
8. CAUTION:
   MAKE SURE THAT PUMP IS FILLED WITH HYDRAULIC OIL PRIOR TO OPERATION, OR SERIOUS DAMAGE WILL OCCUR.
9. CHECK TIRE PRESSURE (9.5 X 16.5 HIGHWAY) @ 70-75 PSI
10. SET DRIVE CUT-OUT MERCURY SWITCH TO OPEN AT 8 METERS (26'-3") PLATFORM HEIGHT.
11. SET UP LIMIT MERCURY SWITCH TO OPEN AT SPECIFIED DIMENSION TO PREVENT FULL EXTENSION OF LIFT CYL.

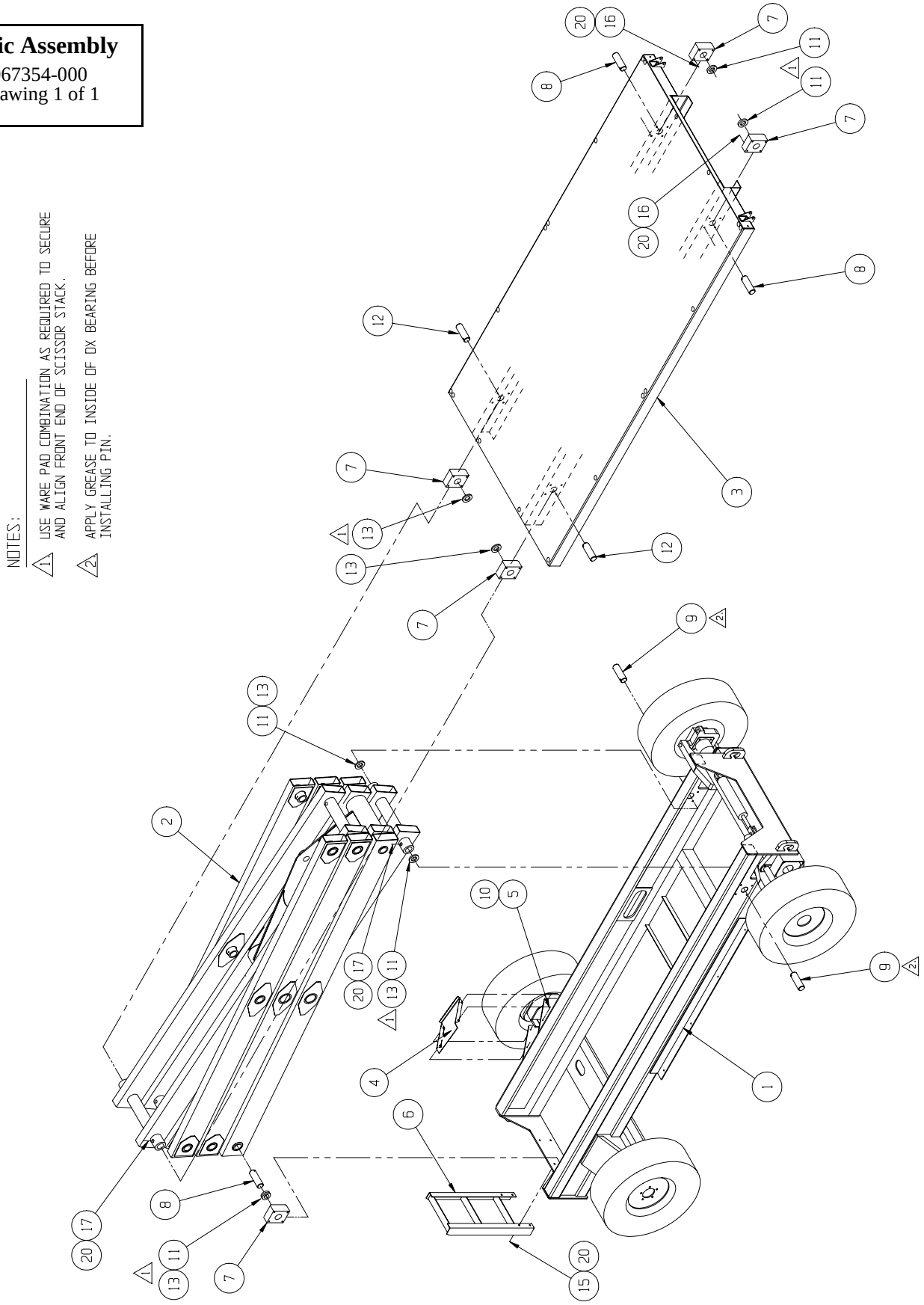
Final Assembly
067431-001
Drawing 2 of 2

Basic Assembly, LX31

067354-000

	PART	DESCRIPTION	QTY.
1	067358-000	CHASSIS ASSEMBLY	1
2	067422-002	SCISSOR LINKAGE	1
3	067780-001	PLATFORM WELDMENT	1
4	067879-001	MOTOR COVER	2
5	011253-008	SCR H H C 5/16 X 1	8
6	067935-001	LADDER WELDMENT	1
7	067738-000	SLIDE BLOCK	6
8	067852-000	PIN	4
9	067853-000	PIN	2
10	014996-005	WASHER 5/16 DIA	8
11	066189-000	SPACER 1/4	4
12	067853-001	PIN	2
13	066189-004	SPACER 1/8	8
15	011256-012	SCREW HHC 1/2-13 X 1 1/2	4
16	011256-028	SCREW HHC 1/2-13 X 3 1/2	8
17	014033-032	SCREW HHC 1/2-13 X 4 GR8	8
20	011248-008	NUT 1/2-13 ESNA	16

Basic Assembly
067354-000
Drawing 1 of 1

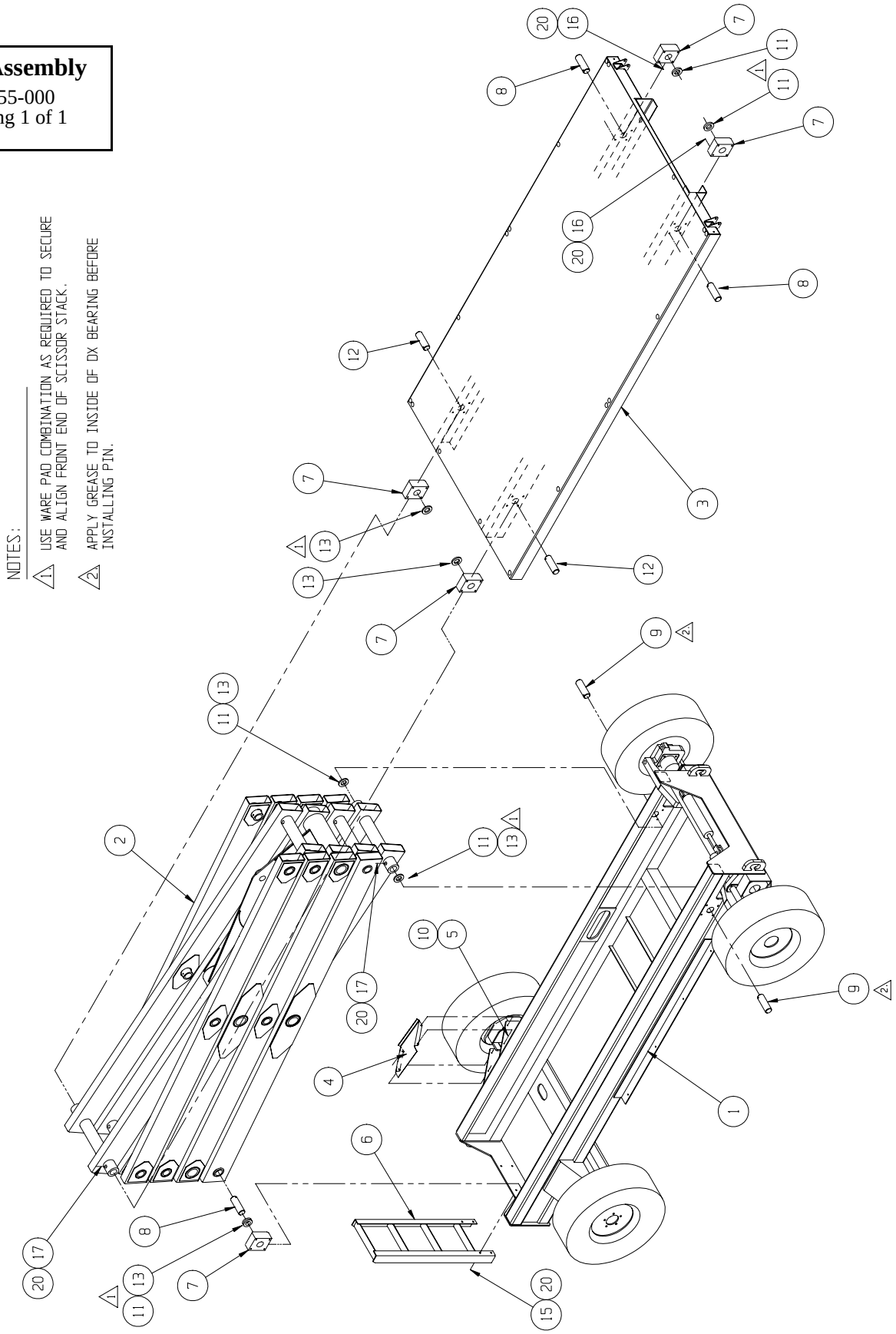


Basic Assembly, LX41

067355-000

	PART	DESCRIPTION	QTY.
1	067358-000	CHASSIS ASSEMBLY	1
2	067423-002	SCISSOR LINKAGE	1
3	067780-001	PLATFORM WELDMENT	1
4	067879-001	MOTOR COVER	2
5	011253-008	SCR HHC 5/16 X 1	8
6	067935-000	LADDER WELDMENT	1
7	067738-000	SLIDE BLOCK	6
8	067852-000	PIN	4
9	067853-000	PIN	2
10	014996-005	WASHER 5/16 DIA	8
11	066189-000	SPACER 1/4	4
12	067853-001	PIN	2
13	066189-004	SPACER 1/8	8
15	011256-012	SCREW HHC 1/2-13 X 1 1/2	4
16	011256-028	SCREW HHC 1/2-13 X 3 1/2	8
17	014033-032	SCREW HHC 1/2-13 X 4	8
20	011248-008	NUT 1/2-13 ESNA	16

Basic Assembly
067355-000
Drawing 1 of 1



Chassis Assembly, LX31/41

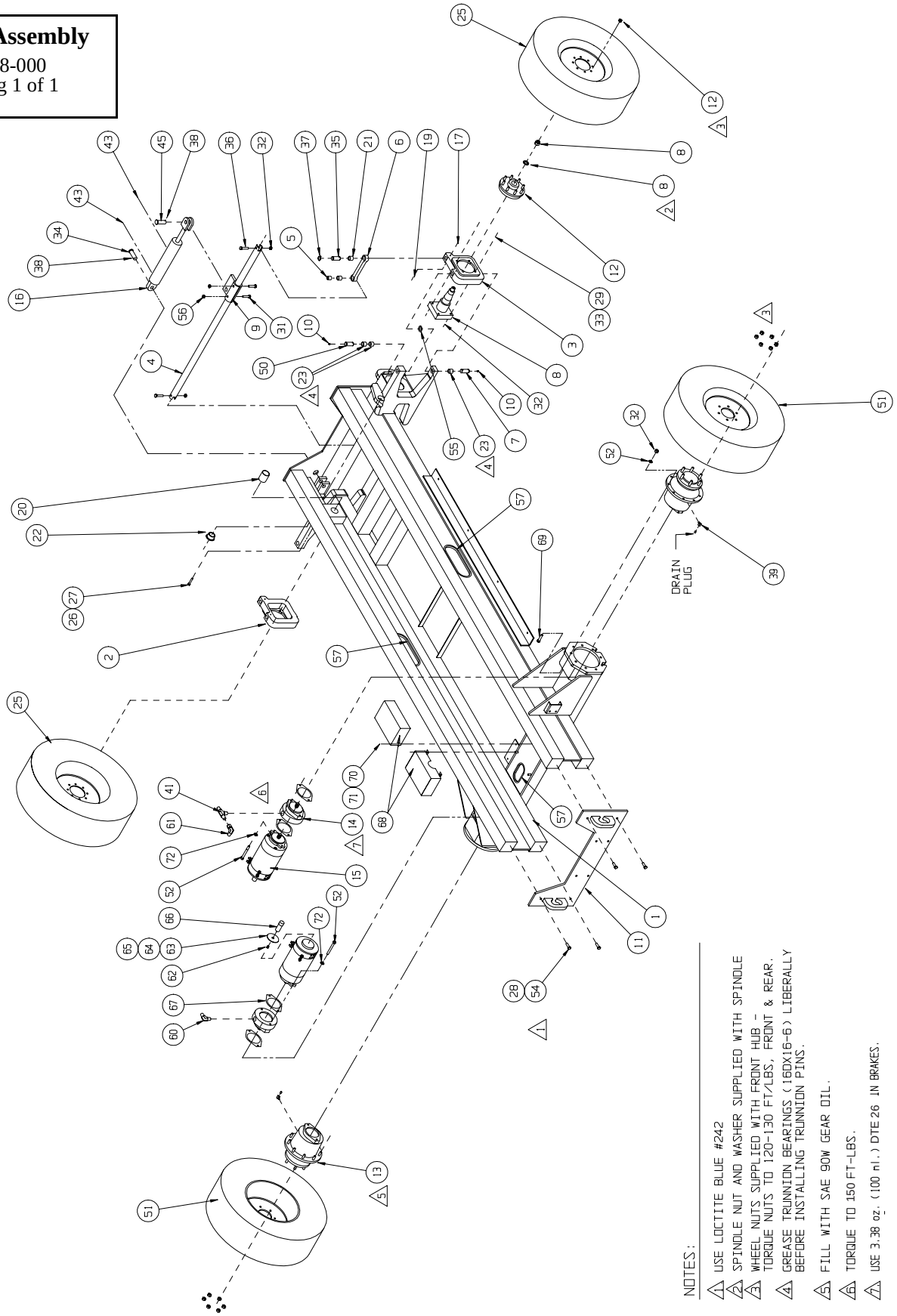
067358-000

	PART	DESCRIPTION	QTY.
1	067715-001	CHASSIS WELDMENT (FIXED AXLE)	1
2	067743-000	TRUNNION (L.H.)	1
3	067742-000	TRUNNION (R.H.)	1
4	067739-000	STEERING LINK	1
5	067812-000	BUSHING, STEERING	2
6	067813-000	CONNECTING LINK	2
7	067746-000	TRUNNION PIN LOWER	2
8	067833-000	SPINDLE WELDMENT	2
9	067748-000	STEERING CLAMP	1
10	013336-003	GREASE FITTING 1/8"	4
11	067816-000	PLATE WELDMENT	1
12	067613-000	HUB, 8 BOLT ON 8" B.C.	2
13	068570-001	PLANTEARY DRIVE	2
14	068569-000	BRAKE	2
15	068573-000	MOTOR ELECTRIC	2
16	067633-000	STEERING CYLINDER	1
*	067633-010	SEAL KIT	-
17	011252-020	SCREW HHC 1/4-20 X 2 1/2	4
19	011248-004	NUT 1/4-20 HEX ESNA	4
20	067606-020	BEARING, SCISSOR PIVOT	2
21	062642-020	BUSHING 160U16	4
22	062649-020	BEARING, STEERING ROD	2
23	067606-010	BEARING, 160X16	6
25	067665-004	TIRE & WHEEL ASSY FRONT	2
26	011254-020	SCREW HHC 3/8-16 X 2 1/2	4
27	011248-006	NUT 3/8-16 HEX ESNA	4
28	011258-012	SCREW HHC 3/4-10 X 1 1/2	4
29	011238-008	WASHER 1/2 SPLIT LOCK	29
30	011256-012	SCREW HHC 1/2-13 X 1 1/2	16
31	011257-028	SCREW HHC 5/8-11 X 3 1/2	2
32	011247-008	NUT 1/2-20UNF HEX ESNA THIN	28
33	011256-024	SCREW HHC 1/2-13 X 3	8
34	011848-050	PIN CLEVIS 1 X 2 3/4	1

ITEM	PART	DESCRIPTION	QTY.
35	067746-001	PIN STEERING LINK	2
36	011256-020	SCREW HHC 1/2-13 X 2 1/2	2
37	013315-011	RETAINING "E" RING	2
38	062889-012	HAIRPIN COTTER	2
39	003495-000	FITTING ELBOW STREET 6MB-6FJ	2
40	011469-005	LUG NUT 9/16-18	10
41	011936-001	FITTING TEE 4MJ-4MJ-4MB	1
43	011934-003	FITTING, 6 MB - 4 MJ 90 DEGREES	2
44	012030-010	SCREW SOC HD CAP 1/2-13 X 1 1/4	8
45	011848-051	PIN CLEVIS 1 DIA. X 2	1
49	012030-032	SCREW SOC HD CAP 1/2-13 X 4	4
50	067746-002	PIN TRUNNION UPPER	2
51	068327-000	TIRE/WHEEL ASSY REAR	2
52	011256-034	SCREW HHC 1/2-13 X 4 1/4	4
54	011238-012	WASHER SPLIT LOCK 3/4	4
55	064279-000	THRUST WASHER	2
56	011248-010	NUT 5/8-11 HEX ESNA	2
57	067805-099	GROMMET MATL	7FT
58	024501-003	SHEET 1/8 RUBBER 3 X 48	1
60	011934-001	FITTING 90 DEGREES 4MJ-4MJ	1
61	011937-001	FITTING 90 DEGREES 4MJ-4FJ	1
62	Kit	COUPLING	2
63		MOUTING PLATE	2
64		SCREW R.H. #2-56 X 1/4	6
65		WASHER	6
66	068551-001	TACH ASSY KIT (ITEMS 62-65)	2
67	REF	GASKET	4
68	067367-000	MOTOR COVER	2
69	011468-020	STUD WHEEL 1/2-20 X 2 3/8	18
70	011248-005	NUT HEX ESNA 5/16-18UNC	4
71	011240-005	WASHER 5/16 STD FLAT	4
72	011239-008	WASHER ASTM 1/2	4

*Not Shown

Chassis Assembly
067358-000
Drawing 1 of 1

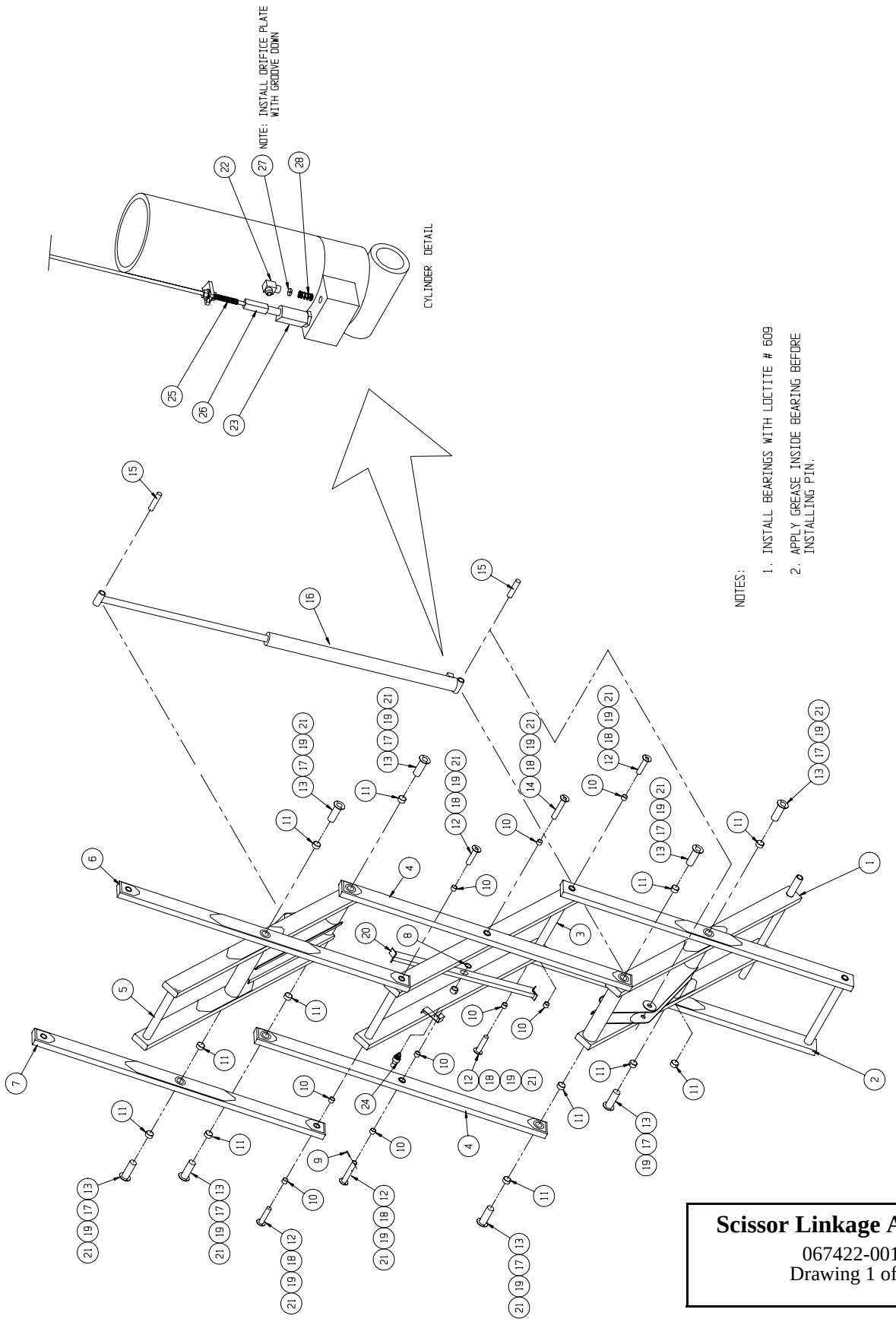


Scissor Linkage Assembly, LX31

067422-001

	PART	DESCRIPTION	QTY.
1	067550-001	ARM WELDMENT	1
2	067551-001	ARM WELDMENT	1
3	067552-000	ARM WELDMENT	1
4	067593-000	ARM WELDMENT	2
5	067828-001	ARM WELDMENT	1
6	067830-000	ARM WELDMENT	1
7	067832-000	ARM WELDMENT	1
8	011786-017	MACHINERY BUSHING, 2” ID X 14 GA.	1
9	011757-028	COTTER PIN 3/8 DIA X 3 1/2	1
10	067606-020	BEARING, 2” ID X 1 1/2” LG.	12
11	067606-030	BEARING, 3” ID X 1 1/2” LG.	16
12	067583-000	PIN WELDMENT	5
13	067580-000	PIN WELDMENT	8
14	067585-000	PIN WELDMENT	1
15	067586-000	PIN, CYLINDER	2
16	067635-000	LIFT CYLINDER	1
*	067635-010	SEAL KIT	-
17	014033-048	H.H.C.S. 1/2-13UNC X 6 GR. 8	8
18	014033-032	H.H.C.S. 1/2-13UNC X 4 GR. 8	6
19	011248-008	HEX LOCK NUT 1/2-13UNC	14
20	067591-000	SUPPORT WELDMENT	1
21	013336-001	GREASE FITTING	14
22	011934-004	ADAPTER 90 DEGREES #6	1
23	063925-004	DOWN VALVE	1
24	003570-001	RETAINING PIN ASSY	1
25	067659-000	CABLE ASSY	1
26	067877-000	COUPLER	1
27	015919-003	ORIFICE PLATE	1
28	005133-000	SPRING	1

*Not Shown



Scissor Linkage Assembly

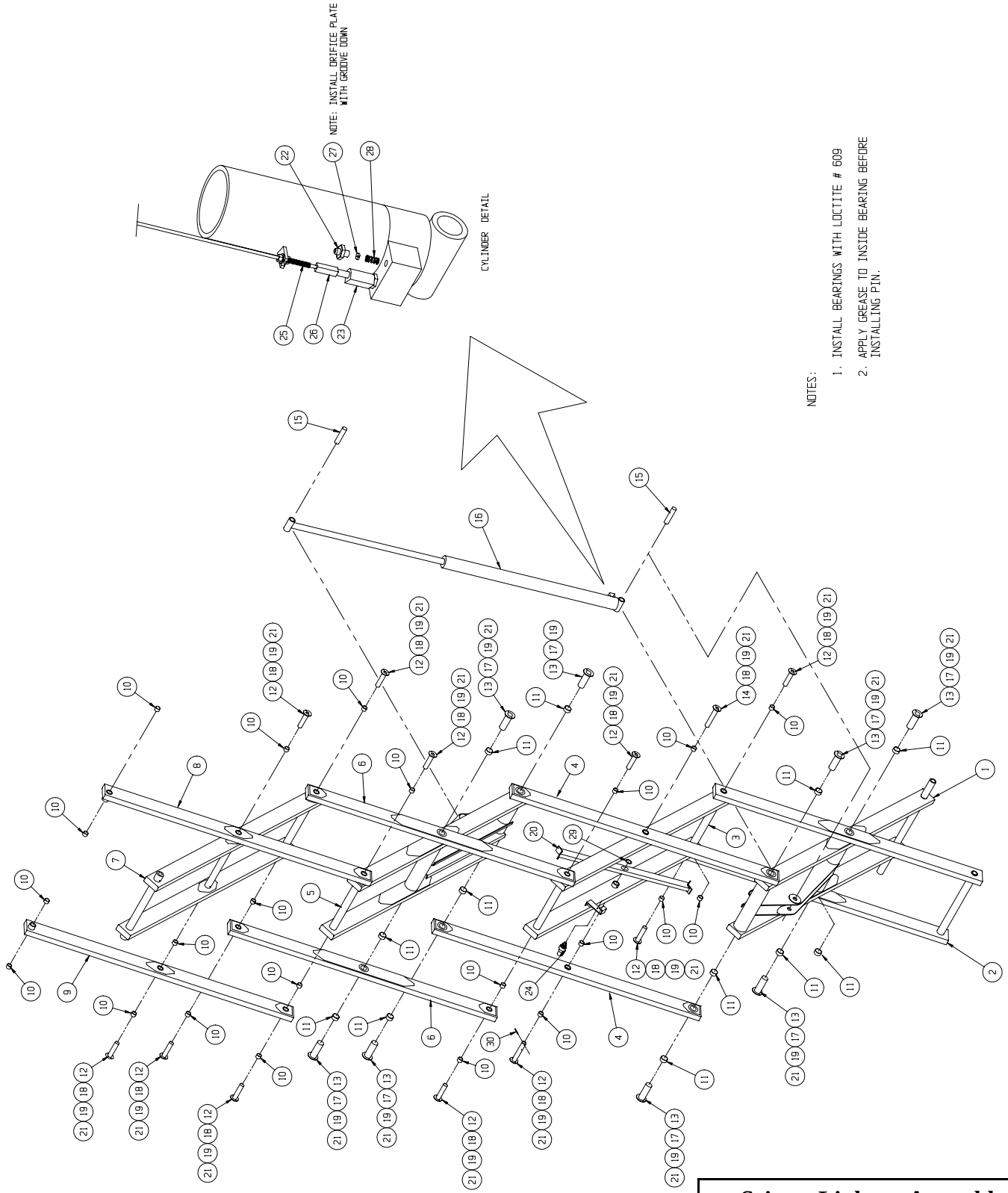
067422-001
Drawing 1 of 1

Scissor Linkage Assembly, LX41

067423-001

	PART	DESCRIPTION	QTY.
1	067550-001	ARM WELDMENT	1
2	067551-001	ARM WELDMENT	1
3	067552-000	ARM WELDMENT	1
4	067593-000	ARM WELDMENT	2
5	067553-001	ARM WELDMENT	1
6	067554-000	ARM WELDMENT	2
7	067555-000	ARM WELDMENT	1
8	067556-000	ARM WELDMENT	1
9	067557-000	ARM WELDMENT	1
10	067606-020	BEARING, 2" ID X 1 1/2" LG.	28
11	067606-030	BEARING, 3" ID X 1 1/2" LG.	16
12	067583-000	PIN WELDMENT	11
13	067580-000	PIN WELDMENT	8
14	067585-000	PIN WELDMENT	1
15	067586-000	PIN, CYLINDER	2
16	067635-000	LIFT CYLINDER	1
*	067635-010	SEAL KIT	-
17	014033-048	H.H.C.S. 1/2-13UNC X 7 1/2 GR. 8	8
18	014033-032	H.H.C.S. 1/2-13UNC X 4 1/2 GR. 8	12
19	011248-008	HEX LOCK NUT 1/2-13UNC	20
20	067591-000	SUPPORT WELDMENT	1
21	013336-001	GREASE FITTING	20
22	011941-005	STRAIGHT ADAPTER #6	1
23	063925-004	DOWN VALVE	1
24	003570-001	RETAINING PIN ASSY	1
25	065754-004	CABLE ASSY	1
26	067877-000	COUPLER	1
27	015919-003	ORIFICE PLATE	1
28	005133-000	SPRING	1
29	011786-017	MACHINERY BUSHING, 2" ID X 14 GA.	1
30	011757-028	COTTER PIN 3/8 DIA X 3 1/2	1

*Not Shown



Scissor Linkage Assembly

067423-001

Drawing 1 of 1

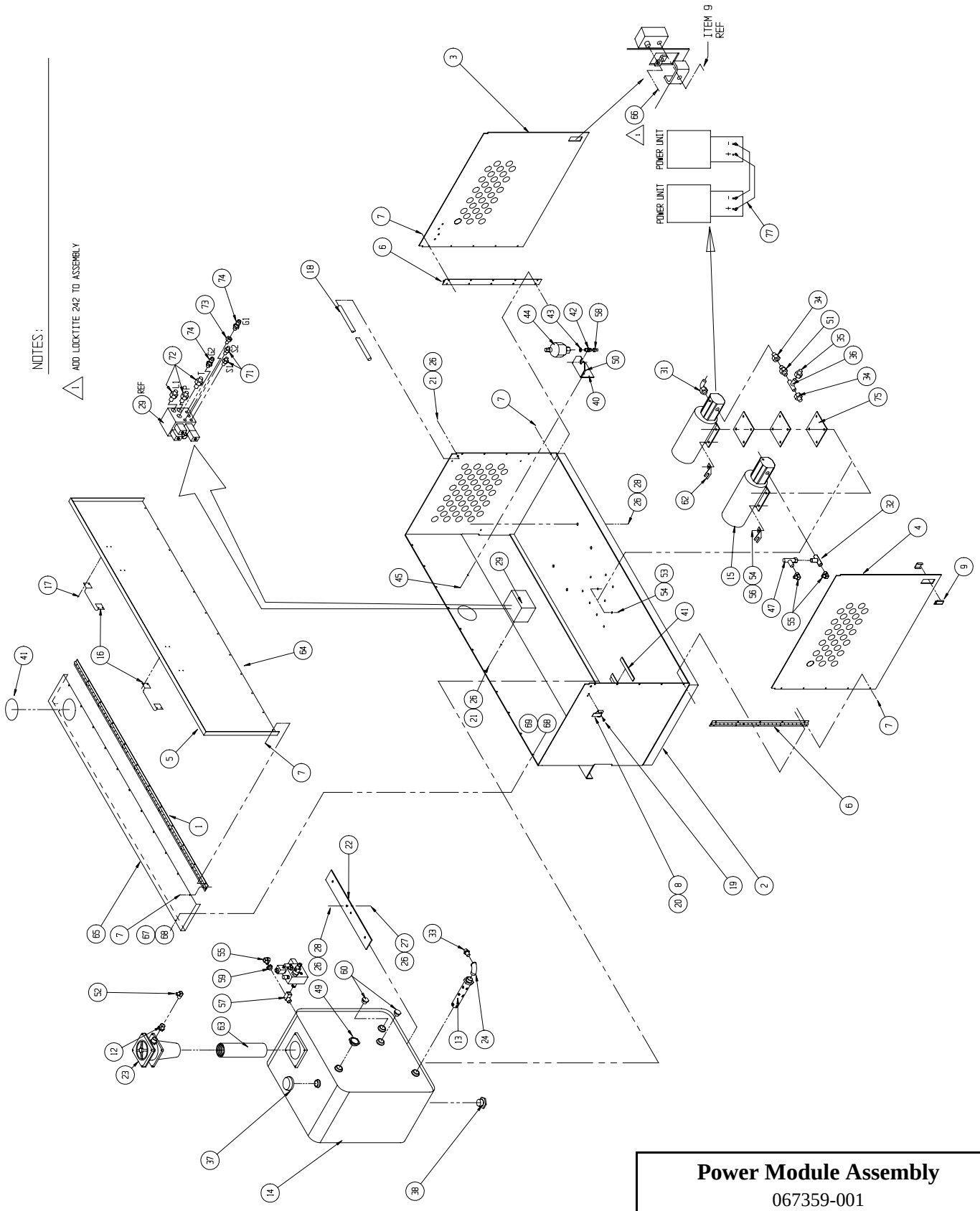
Power Module Assembly, LX31/41 Electric

067359-001

	PART	DESCRIPTION	QTY.
1	067809-001	HINGE, 2 X 71	1
2	067811-001	POWER MODULE WELDMENT	1
3	067800-002	MODULE DOOR, R.H.	1
4	067801-002	MODULE DOOR, L.H.	1
5	067799-004	MODULE COVER	1
6	067808-000	HINGE, 2 X 22	2
7	026554-002	POP RIVET, 1/4 DIA. (.251-.375 GRIP) 56	
8	005299-000	LATCH, TOGGLE	2
9	067629-000	LATCH, FLUSH LIFT & TURN	2
12	014923-007	FITTING 16MP-12FP	1
13	063935-000	SUCTION SCREEN	1
14	067841-000	TANK, HYDRAULIC	1
15	067388-000	POWER UNIT	2
16	025427-002	HANDLE	2
17	026533-002	RIVET POP, 3/160 (.126-.250 GRIP)	8
18	067856-001	STIFFENER BAR	1
19	011708-004	SCREW RD HD 8-32 X 1/2	4
20	011248-002	NUT HEX 8-32 ESNA	4
21	011254-002	SCREW HHC 3/8-16 X 3/4	4
22	064039-001	HYDRAULIC TANK MOUNTING TAB	1
23	067624-000	HYDRAULIC FILTER	1
*	067624-010	HYDRAULIC FILTER ELEMENT	-
24	063931-016	ELBOW 90 DEGREES	1
25	067854-000	ANGLE RES. MOUNT	1
26	011240-006	WASHER 3/8 FLAT STD	8
28	011248-006	NUT HEX 3/8-16 ESNA	7
29	067389-000	VALVE BLOCK	1
30	068324-002	BRAKE VALVE ASSY	1
31	011934-004	FITTING EL 6MP-6MJ	1
32	015961-006	FITTING TEE 6MP-6MJ	1
33	011939-024	FITTING 16MP-16MJ	1
34	015959-004	FITTING 12FJX-8MB	2
35	011939-022	FITTING STR 12MJ-16MP	1
36	011982-004	FITTING TEE 12MP-12FP-12FP	1
37	063930-001	BREATHER/FILLER CAP	1
38	021305-007	PLUG, MAGNETIC	1

ITEM	PART	DESCRIPTION	QTY.
40	068712-002	BRACKET	1
41	066516-004	PLUG 4"	1
42	010150-005	FITTING BULKHEAD	1
43	011979-008	O-RING	1
44	068565-000	ACCUMULATOR	1
45	011252-006	SCREW HHC 1/4-20 X 3/4	2
47	020733-002	FITTING TEE 6FJX-6MJ-6MJ	1
49	063979-006	GAGE, LUBE SIGHT	1
50	011248-004	NUT HEX ESNA 1/4-20	6
51	013487-010	FITTING STR 12MP-12MP	1
52	011941-010	FITTING 90 6MP-6MJ	1
53	011253-007	SCREW HHC 5/16-18 X 7/8	8
54	011240-005	WASHER 5/16 FLAT STD	8
55	011937-003	FITTING 90 6FJX-6MJ	3
56	011250-005	NUT HEX 5/16-18	8
57	011982-008	FITTING TEE 8MP-8FP-8FP	1
58	013969-002	FITTING 4MJ-8FJ	1
59	011939-014	FITTING 8MP-6MJ	1
60	021305-006	FITTING PLUG	2
61	011939-018	FITTING STR 12MP-6MJ	1
62	063029-000	BUSS BAR	2
63	067765-000	TUBE EXTENSION	1
64	067799-003	COVER	1
65	067799-004	COVER	1
66	063947-008	NUT HEX ESNA M8	2
67	011275-006	SCREW HHC #10 X 3/4	4
68	011240-003	WASHER #10 STD FLAT	8
69	011249-003	NUT HHC ESNA #10	4
71	011941-005	FITTING 6MB-6MJ	2
72	011941-010	FITTING 8MB-8MJ	3
73	014280-002	FITTING 6MB-4FB	1
74	063965-001	FITTING CONNECTOR GAGE	2
75	067377-000	MOTOR SPACER	3
77	068776-016	CABLE ASSY X 16 (3/8 X 3/8 LUG)	2

*Not Shown



Power Module Assembly

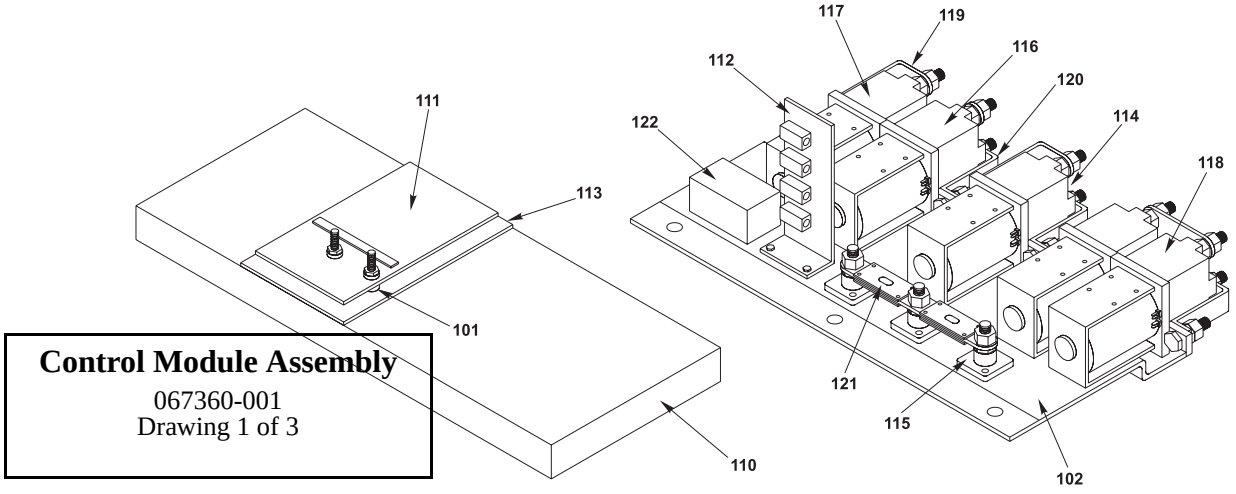
067359-001
Drawing 1 of 1

Control Module Assembly, LX31/41

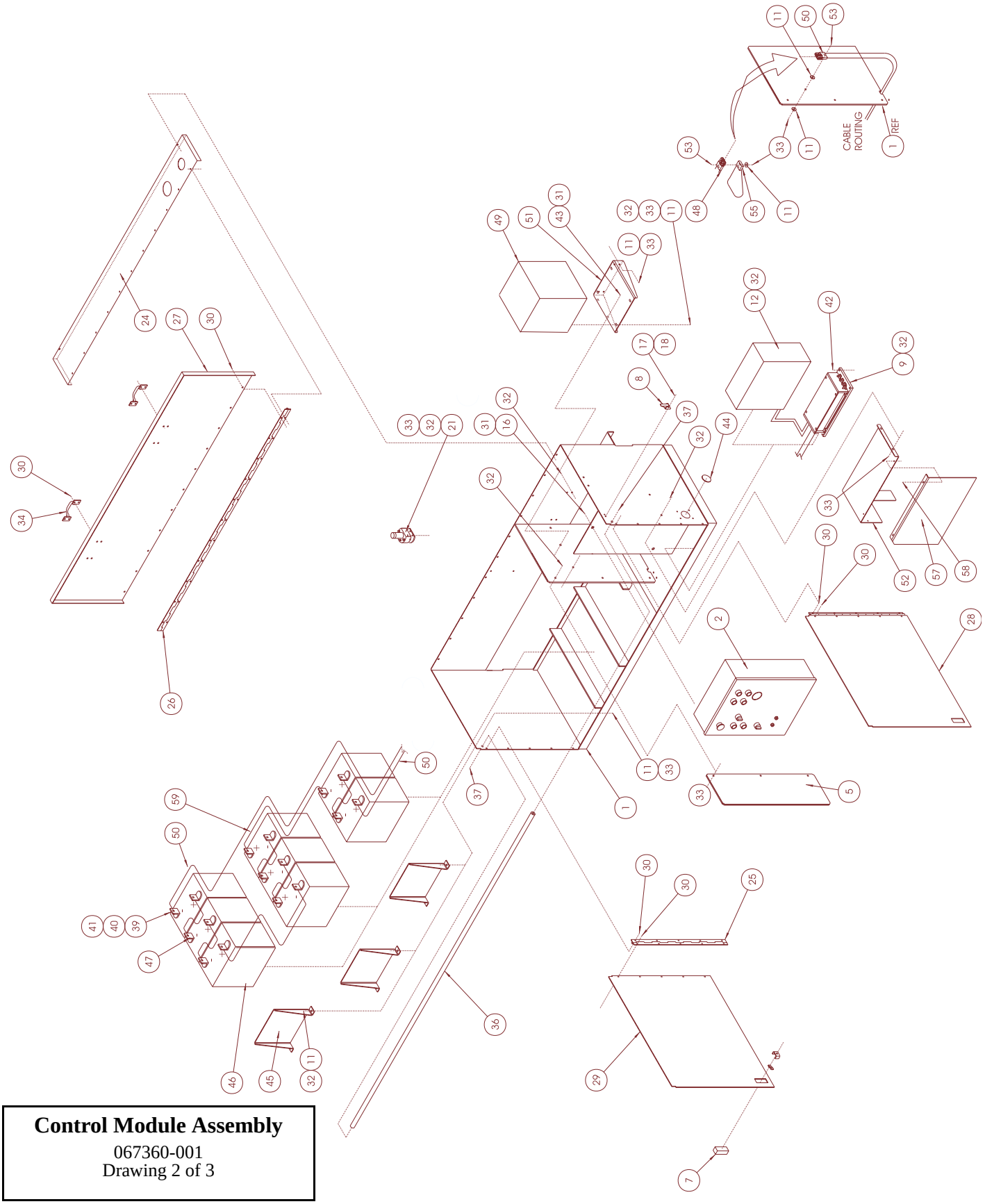
067360-001

	PART	DESCRIPTION	QTY
1	067810-001	CONTROL MODULE WELDMENT	1
2	067362-001	CONTROL BOX ASSY BI ENERGY DOM	1
5	067399-000	BATTERY DIVIDER	1
7	067629-000	LATCH, FLUSH LIFT & TURN	2
8	005299-000	LATCH, TOGGLE	2
9	068489-001	CONTROL MOUNT	1
10	067947-008	NUT HEX ESNA M8	2
11	011240-004	WASHER 1/4 FLAT	30
12	067387-000	RELAY PANEL ASSY	1
16	011254-008	SCREW HHC GR5 3/8-16UNC X 1	2
17	011708-004	SCREW MACH RD HD 8-32UNC X 1/2	4
18	011248-002	LOCKNUT, ESMA 8-32UNC	4
21	029945-017	LEVEL SENSOR	1
24	067799-005	MODULE COVER	1
25	067808-000	HINGE, 1 1/2 X 23 7/8	2
26	067809-001	HINGE, 1 1/2	1
27	067799-003	MODULE COVER/CONTROL	1
28	067800-003	MODULE DOOR, R.H.	1
29	067801-003	MODULE DOOR, L.H.	1
30	026554-002	POP RIVET, 1/4 DIA (.251-.375 GRIP)	60
31	011248-006	NUT, 3/8-16 ESNA	4
32	011252-006	SCREW, HHC 1/4-20 X 3/4	25
33	011248-004	NUT, 1/4-20 ESNA	38
34	025427-002	HANDLE	2
36	067856-001	WELDMENT, STIFFENER	1
37	011254-006	SCREW HHC 3/8-16 X 3/4	2
39	011240-005	WASHER 5/16 STD FLAT	16
40	011253-007	SCREW HHC 5/16-18UNC X 7/8	16
41	014025-005	NUT HEX CENTERLOCK 5/16-18UNC	16
42	011821-004	SCREW BUTT HD. 1/4-20UNC X 1/2	4
43	011240-006	WASHER 3/8 STD FLAT	10
44	064462-014	PLUG HOLE	1
45	067396-000	BATTERY SUPPORT	3
46	068568-000	BATTERY	8
47	068334-010	BATTERY CABLE ASSY X 10	5
48	068332-004	BATTERY CABLE ASSY	1
49	068574-000	CHARGER	1
50	068332-003	BATTERY CABLE ASSY	1

ITEM	PART	DESCRIPTION	QTY
51	067366-000	BATTERY CHARGER BRACKET	1
52	067368-000	RELAY COVER	1
53	011252-012	SCREW HHC 1/4-20UNC X 1 1/2	4
55	029902-002	CONNECTOR HANDLE	1
57	067338-000	RELAY COVER	1
58	062786-004	SCREW SELF TAP #10	3
59	068334-014	CABLE ASSY X 14	2
100	067387-000	PANEL ASSY	REF
101	067387-006	SPACER	2
102	067387-007	CONTACTOR MOUNTING BRACKET	1
*103	067387-008	INSULATING SHEET	1
*104	067387-009	HARNESS ASSY	1
*105	067387-010	CABLE ASSY, 9”	1
*106	067387-011	CABLE ASSY, 14”	1
*107	067387-012	CABLE ASSY, 17”	1
*108	067387-013	CABLE ASSY, 18”	1
*109	067387-014	CABLE ASSY, 22”	1
110	067387-005	MOS90 “D” CONTROLLER	1
111	067387-015	TACH BOARD ASSY	1
112	067387-016	RESISTOR BRACKET ASSY	1
113	067387-017	TACHOMETER BRACKET ASSY	1
114	067387-018	SUPPRESION ASSY	1
115	067387-019	TERMINAL SUB ASSY	3
116	067387-020	PUMP OVERRIDE CONT., SW200-673	1
117	068552-000	PUMP TRAC. CONTACTOR, SW201-179	1
118	068552-001	REV/FWD CONTACTOR, SW202-221	1
119	068550-013	CONTACTOR BUSSBAR	2
120	067387-021	CONTACTOR BUSSBAR	1
121	067387-022	FUSE, 300 AMP	2
122	067387-023	RELAY, 48V 10A	1
207	068777-003	CABLE ASSY X 25” (5/16 X 3/8 LUG)	REF
208	068777-004	CABLE ASSY X 20” (5/16 X 3/8 LUG)	REF
211	029452-099	WIRE, 16 GA. BLACK	5FT
218	014914-001	CONN. MALE PUSH, 14-16 .25	3
219	029931-003	CONN. FEM. PUSH, 14-16 .25	3
221	029601-015	CONN. RING, 14-16 N 3/8	2
223	029440-099	CABLE, 12 GA. 3 COND. S.O.	REF

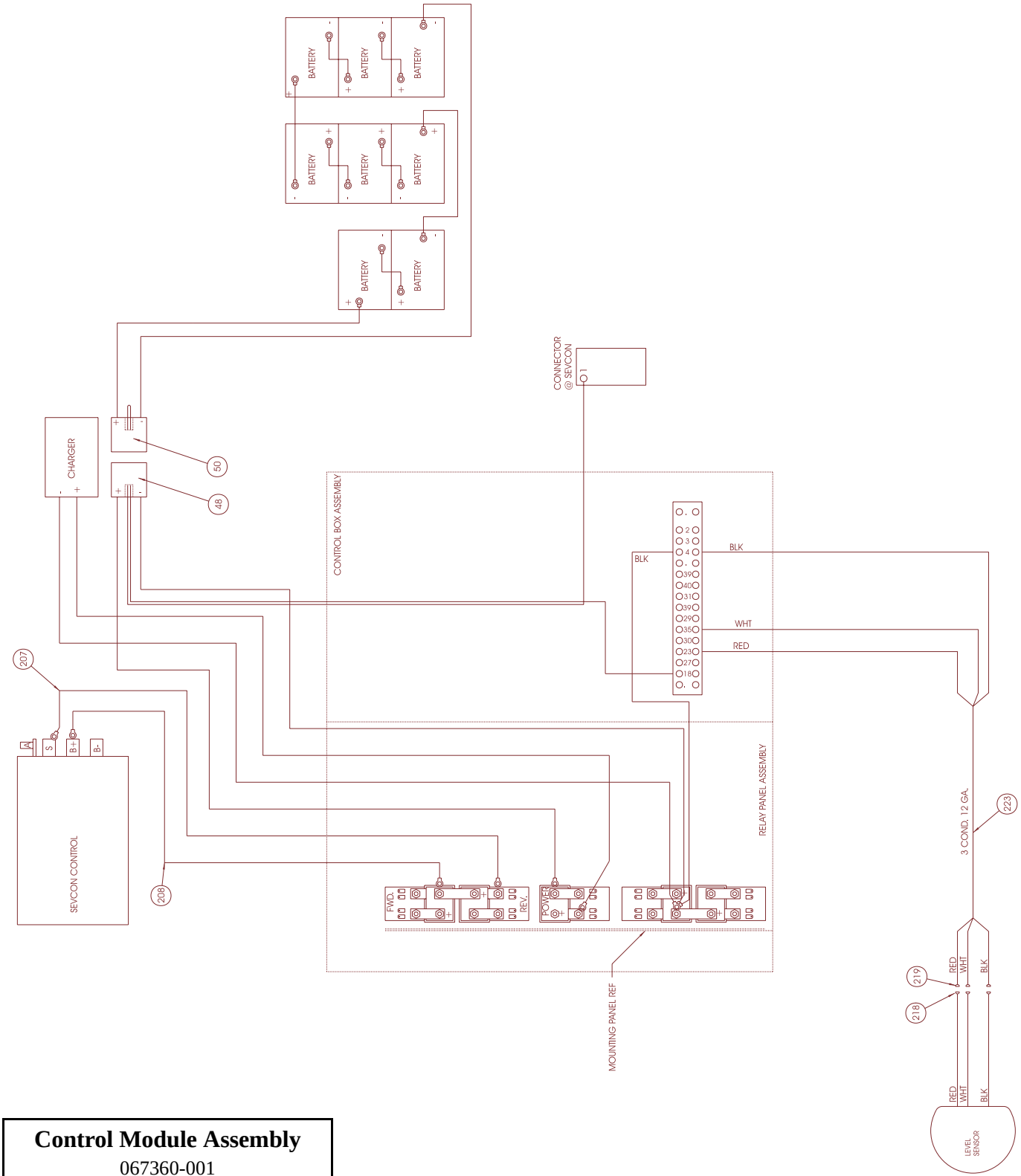


Control Module Assembly
067360-001
Drawing 1 of 3



Control Module Assembly

067360-001
Drawing 2 of 3



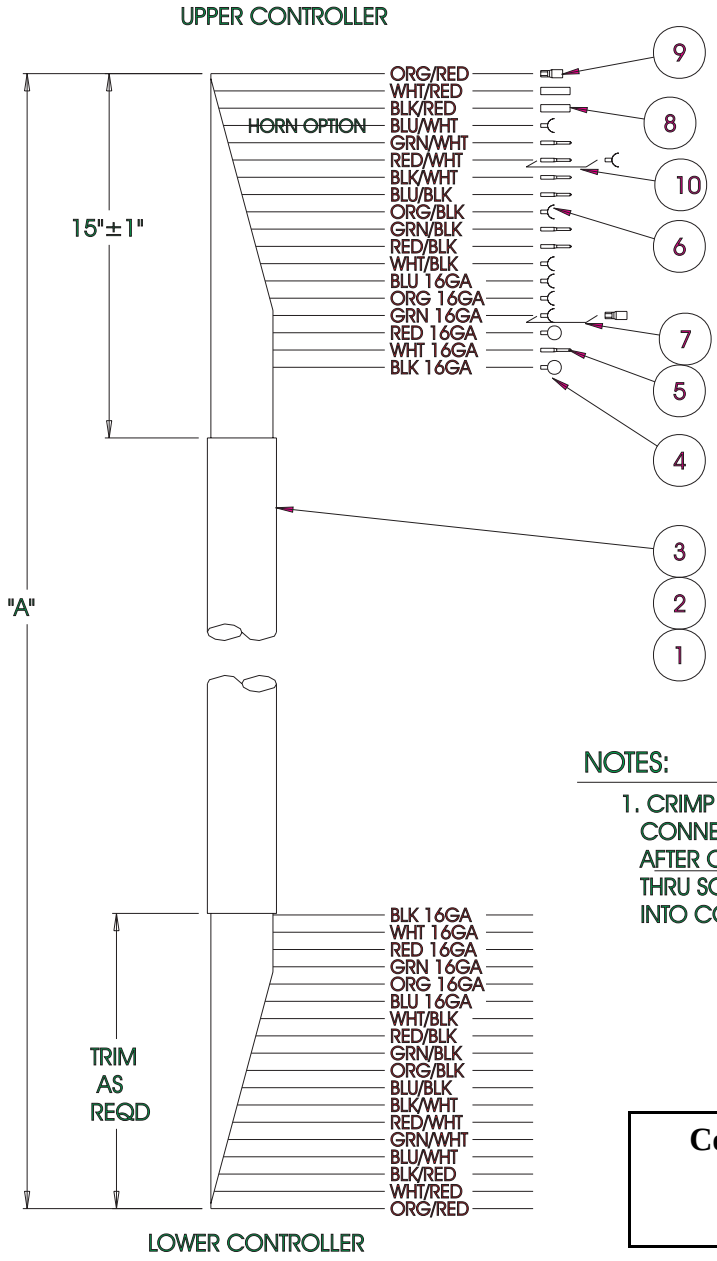
Control Module Assembly

067360-001
Drawing 3 of 3

Control Cable Assembly, LX31/41

067536-000

	PART	DESCRIPTION	QTY.
1	067645-099	CABLE, 16/6, 18/12 MULTICONDUCTOR	FT 62
4	029601-013	CONN RING TERM 16-14 GA #10	2
5	063956-002	PIN, CONTACT MALE 20-14 GA	8
6	029610-002	CONN FORK TERM 16-14 GA #8	6
7	029457-099	WIRE, 16GA GRN X 12 IN	1
8	029620-002	CONN, BUTT 16-14GA	2
9	029616-001	CONN, FEMALE PUSH 16-14GA X .188	2
10	029483-099	WIRE 16 GA RD/WHT X 14 IN	1



NOTES:

1. CRIMP ON PINS AND CONNECTORS ARE INSTALLED AFTER CABLES ARE ROUTED THRU SCISSOR ARMS AND INTO CONTROL BOXES.

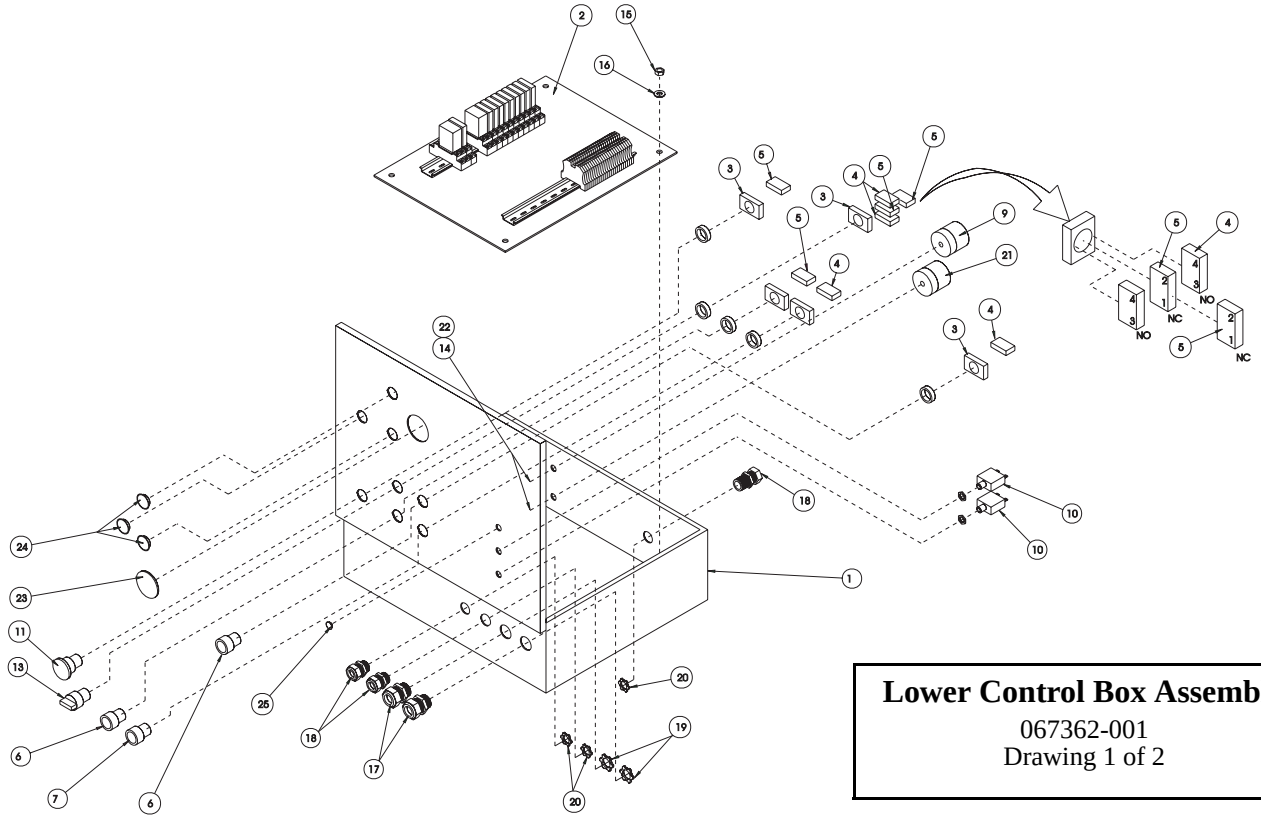
Control Cable Assembly
067536-000
Drawing 1 of 1

Lower Control Box Assembly, LX31/41

067362-001

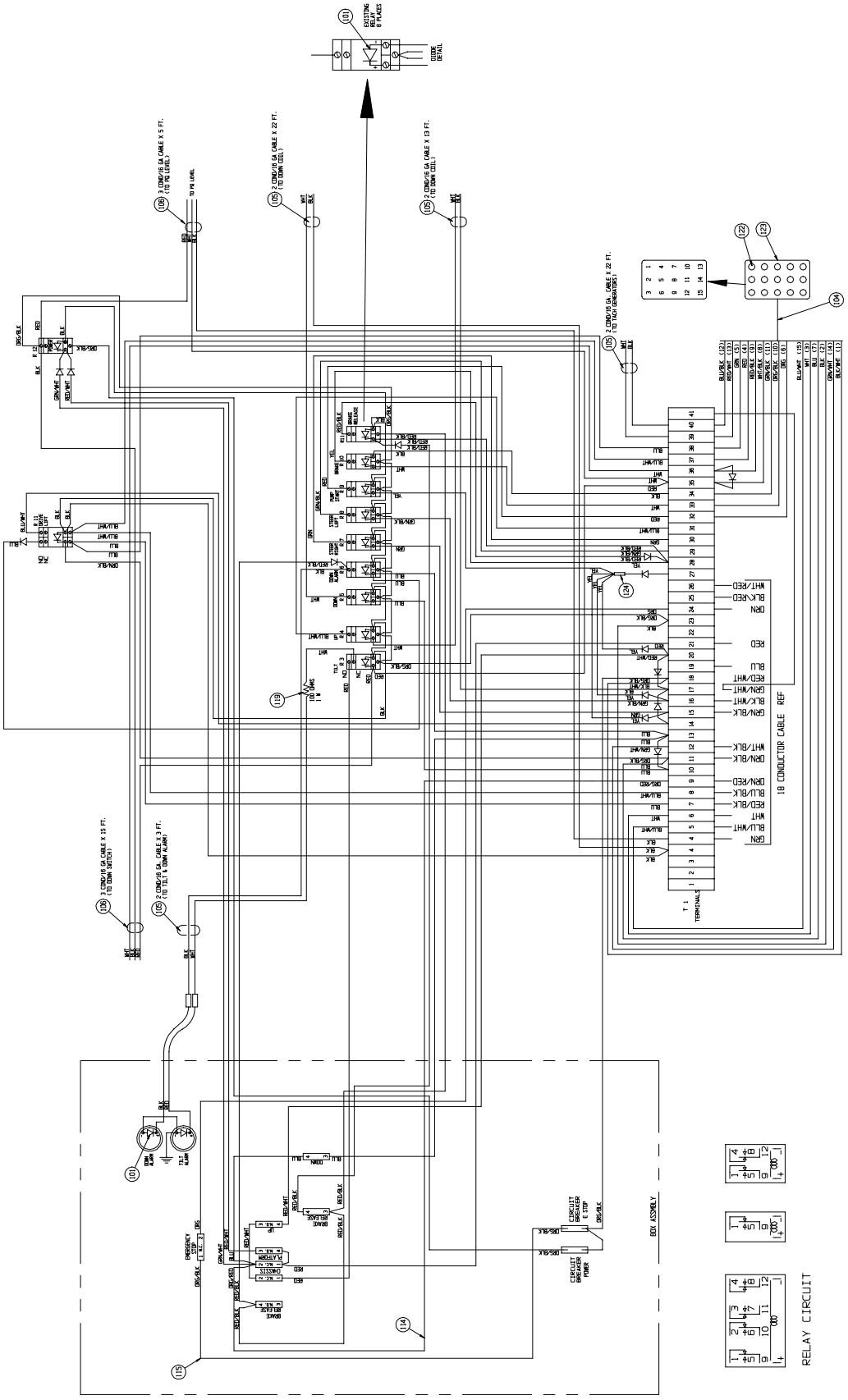
	PART	DESCRIPTION	QTY.
1	067825-001	ENCLOSURE	1
2	067363-001	PANEL ASSEMBLY, ELEC.	1
3	064417-001	MOUNTING LATCH	5
4	064443-001	CONTACT BLOCK, N.O.	4
5	064443-002	CONTACT BLOCK, N.C.	3
6	067652-000	PUSH BUTTON, MOM. FLUSH ,GREEN	2
7	067653-000	PUSH BUTTON, MOM. EXT. RED	2
8	067654-000	PUSH BUTTON, MOM. FLUSH, BLK.	1
9	066807-003	ALARM, DOWN	1
10	068582-010	CIRCUIT BREAKER, 10 AMP.	2
11	064446-003	PUSH BUTTON, MUSHROOM, RED	1
13	064445-011	SELECTOR SWITCH, 3 POS.	1
14	011252-006	SCREW HHC 1/4-20UNC X 3/4	2
15	011248-006	NUT, SELF LOCKING, 3/8-16	4
16	014996-006	FLATWASHER, 3/8"	4
17	029925-010	CABLE CONNECTOR	4
18	029925-000	CABLE CONNECTOR, 1/2"	1
19	029939-003	CONDUIT NUT, 3/4"	2
20	029939-002	CONDUIT NUT, 1/2"	3
21	066807-001	ALARM	2
22	014996-004	WASHER 1/4 SAE	2
23	066516-000	PLUG, HOLE 2.09 DIA.	1
24	064462-029	PLUG, 15/16 DIA. FLUSH	3

ITEM	PART	DESCRIPTION	QTY.
25	064462-002	PLUG, 1/2 DIA. FLUSH	1
101	029825-002	DIODE 3 AMP	25
102	029610-002	TERMINAL #8 FORK	35
103	029610-003	TERMINAL #6 FORK	31
104	060214-099	WIRE 16 AWG 15 COND	FT 2
105	029496-099	CABLE 2 COND 16GA	FT 22
106	029447-099	CABLE 3 COND 16GA	FT 14
107	005491-099	WIRE 16GA GRN/BLK	FT 1
108	029450-099	WIRE 16GA BLU	FT 8
109	029451-099	WIRE 16GA WHT	FT 6
110	029452-099	WIRE 16GA BLK	FT 10
111	029456-099	WIRE 16GA YEL	FT 2
112	029457-099	WIRE 16GA GRN	FT 1
113	029459-099	WIRE 16GA BLU/WHT	FT 5
114	029475-099	WIRE 16GA BLU/BLK	FT 4
115	029477-099	WIRE 16GA ORN/BLK	FT 4
116	029478-099	WIRE 16GA RED/BLK	FT 4
117	029482-099	WIRE 16GA GRN/WHT	FT 2
118	029483-099	WIRE 16GA RED/WHT	FT 2
119	029731-012	RESISTOR, 100 OHM	1
120	029620-002	CONN 16GA BUTT	2
122	063956-002	CONNECTER PIN	15
123	063956-006	PLUG 15 POSITION	1



Lower Control Box Assembly
067362-001
Drawing 1 of 2

Lower Control Box Assembly
067362-001
Drawing 2 of 2

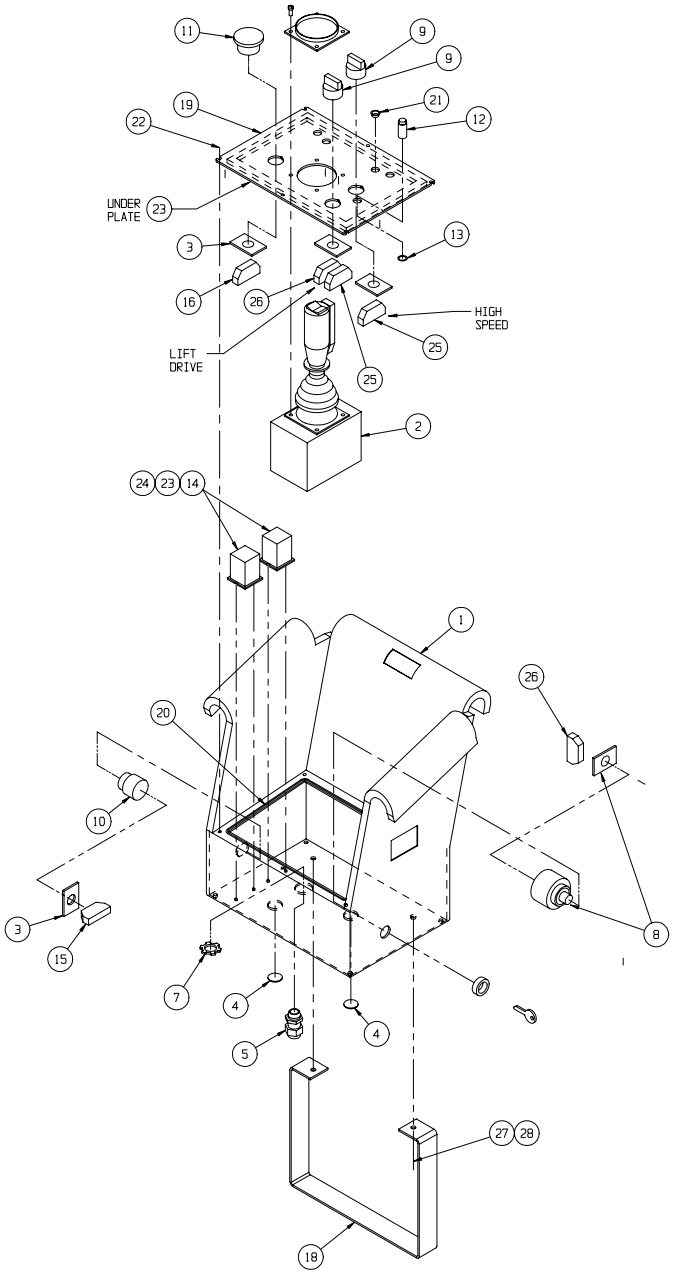


Controller Assembly 48V, LX31/41

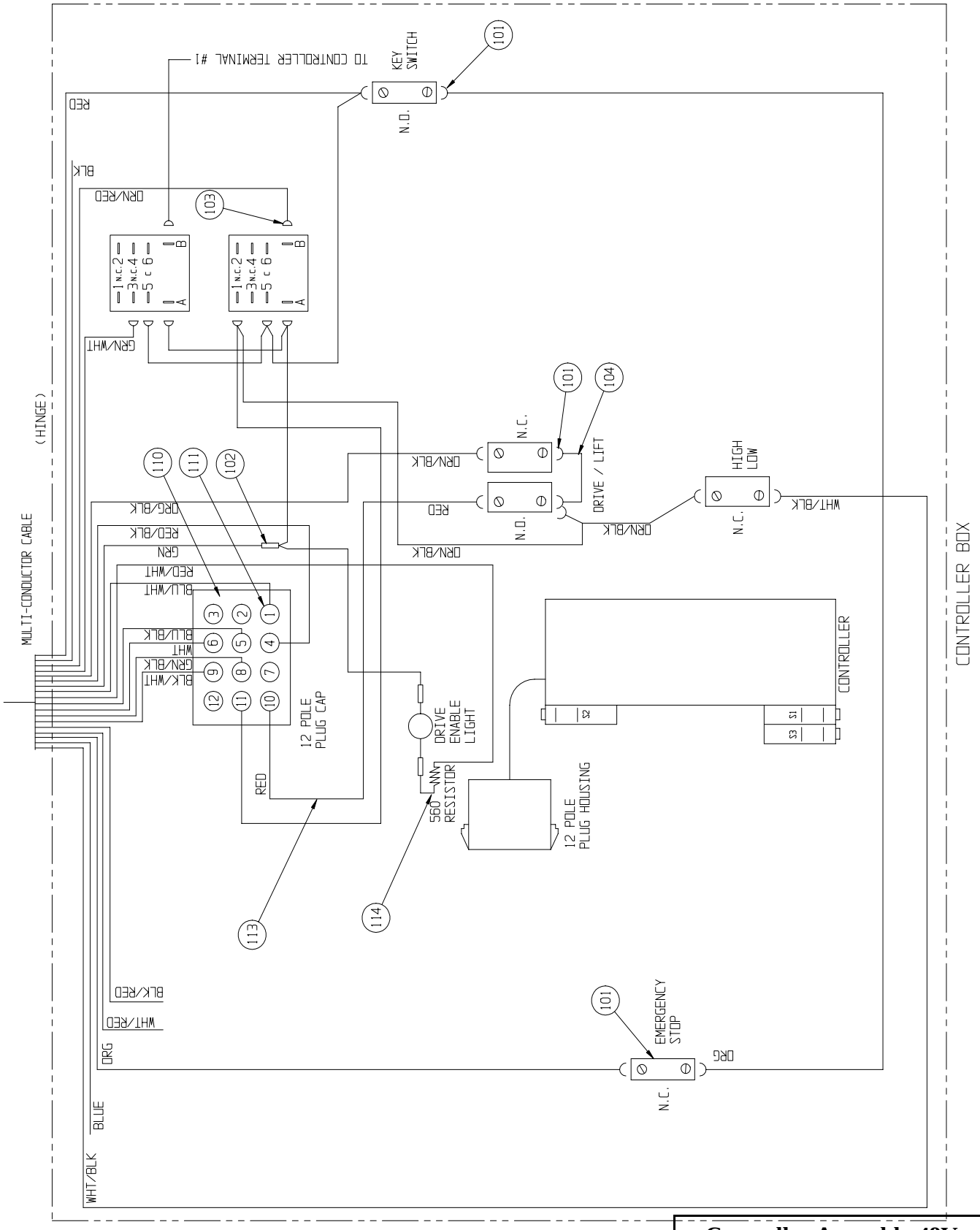
067384-001

	PART	DESCRIPTION	QTY.
1	067487-000	LX CONTROL BOX	1
2	067385-000	CONTROLLER 48V	1
*	066786-016	Boot, Rocker Switch	1
*	066786-024	Steering Micro Switch	2
*	066544-013	Boot, Handle	1
*	068592-008	Drive Micro Switch	3
*	066786-011	Handle Halve, Front	1
*	66786-012	Handle Halve, Rear	1
*	066786-013	Gasket, Handle	2
*	066786-013	Gasket, Handle	2
3	064417-001	MOUNTING LATCH	2
4	064462-007	CAP PLUG 7/8 DIA.	2
5	029925-011	CABLE CONNECTOR, 3/4"	1
6	029939-002	CONDUIT NUT, 1/2"	2
7	029939-003	CONDUIT NUT, 3/4"	1
8	068807-000	KEY OPERATE	1
9	066805-002	SELECTOR SWITCH	2
10	067653-000	PUSH BUTTON	1
11	064446-003	MUSHROOM BUTTON	1
12	068133-001	INDICATOR LIGHT GRN	1
13	067806-000	RING, RETAINING	1
14	063951-003	RELAY	2
15	064443-001	CONTACT BLOCK, N.O.	1
16	064443-002	CONTACT BLOCK, N.C.	1
18	067483-000	CONTROLLER SUPPORT	1
19	067486-000	COVER PLATE, CONTROLLER BOX	1
20	068889-099	WEATHERSTRIP 1/2 X 3/16 FOAM	3 FT
21	064462-002	CAPLUG 1/2" DIA.	4
22	010952-004	SCREW BUTT HD TORX 10-24UNC X 1/2	6
23	011715-004	SCREW, #6-32 X 1/2	4
24	011248-047	LOCKNUT, #6-32	4
25	066805-011	CONTACT BLOCK N.C.	2
26	066805-010	CONTACT BLOCK N.O.	2
27	011252-006	SCREW, 1/4-20 UNC HEX HEAD CAP x 3/4	2
28	011248-004	LOCKNUT, 1/4-20 UNC	2
101	029610-004	CONNECTOR FORK TERM 12-10 GA. #10	15
102	029620-002	CONNECTOR BUTT. 16-14 GA.	4
103	029615-002	CONNECTOR FEMALE PUSH 16-14 GA.	4
104	029452-099	WIRE, 16 GA. BLACK	1FT
105	029450-099	WIRE, 16 GA. BLUE	1FT
109	029453-099	WIRE, 16 GA. ORG	1FT
110	063956-003	PLUG, HOUSING	1
111	063956-010	PIN, CONTACT MALE	11
112	029477-099	WIRE, 16GA. ORG/BLK	1FT
113	029454-099	WIRE, 16 GA. RED	2FT
114	029731-008	RESISTOR	1

* Not Shown



Controller Assembly 48V
067384-001
Drawing 1 of 2

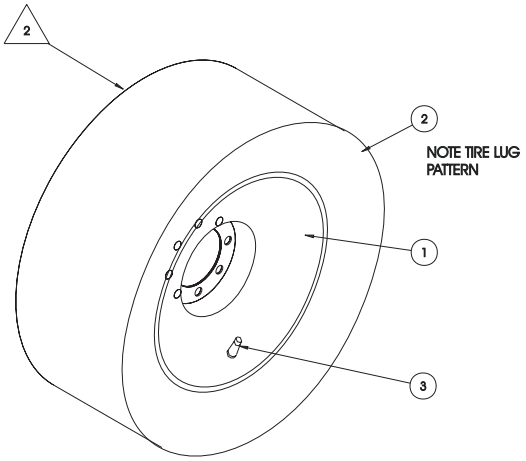


Controller Assembly 48V
067384-001 - Drawing 2 of 2

Tire & Wheel Assembly, Front, LX31/41

067665-004

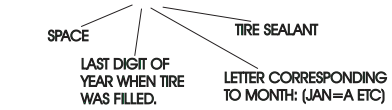
	PART	DESCRIPTION	QTY.
1	067609-001	WHEEL, 16.5 X 8.25 8 HOLE, 8 BC	1
2	068555-000	TIRE, 9.5 X 16.5 NHS 10 PLY	1
3	012282-001	VALVE STEM	1



NOTES:

1. FILL TIRE & WHEEL ASSY WITH 60-64 FL. OZ. OF TRAC SEAL (OR EQUIV) TIRE SEALANT. INFLATE TO 75 PSI MIN TIRE PRESSURE. -TRAC SEAL REQ. WT.= 6.5 LBS (REF)

2. BRAND BACKSIDE OF TIRE/WHEEL ASSY AS FOLLOWS: "UPRIGHT 6KT"

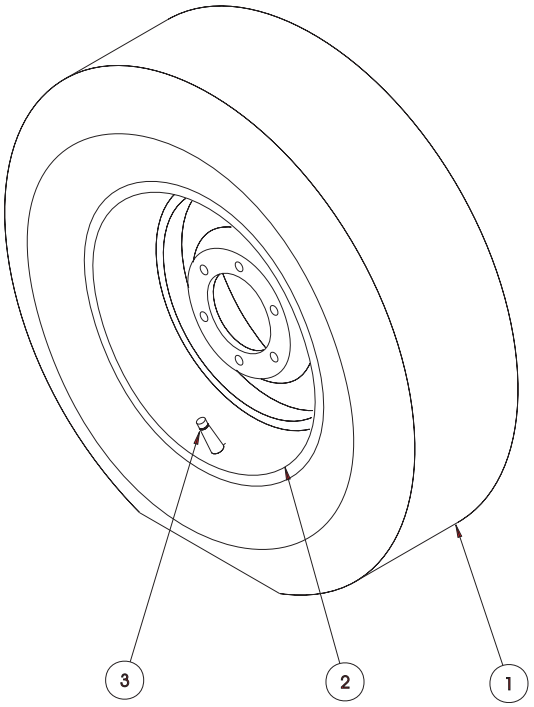


Tire & Wheel Assembly, Front
067665-004
Drawing 1 of 1

Tire & Wheel Assembly, Rear, LX31/41

068327-000

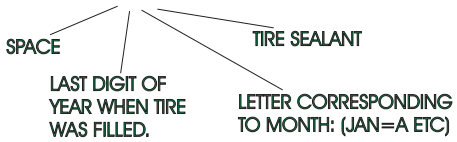
	PART	DESCRIPTION	QTY.
1	068555-000	TIRE 16.5 X 9.50 10 PLY	1
2	067609-000	WHEEL 16.5 X 8.25, 6 HOLE ON 6" B.C.	1
3	012282-001	VALVE STEM	1



NOTES:

1. FILL TIRE & WHEEL ASSY WITH 60-64 FL. OZ. OF TRAC SEAL (OR EQUIV) TIRE SEALANT. INFLATE TO 50 PSI MIN TIRE PRESSURE. -TRAC SEAL REQ. WT.= 6.5 LBS (REF)

2. BRAND BACKSIDE OF TIRE/WHEEL ASSY AS FOLLOWS: "UPRIGHT 6KT"



Tire & Wheel Assembly, Rear

067327-000

Drawing 1 of 1

Label Kit/Installation, LX31

067361-009

	PART	DESCRIPTION	QTY
1	010076-000	MANUAL CASE	1
2	010076-001	LABEL, ATTENTION	1
3	067449-000	USER MANUAL LX-SERIES	1
4	060197-000	LABEL, HYDRAULIC FLUID	1
5	061205-000	NAME PLATE	1
6	061220-001	LABEL, ANSI	1
7	060577-000	ANSI MANUAL	1
8	067365-000	LABEL, LOWER CONTROLLER	1
9	066552-000	LABEL, WARNING BATTERY	1
10	064444-000	LABEL, USA	4
11	067642-005	LABEL, CONTROLLER	1
13	067639-001	LABEL, PLATFORM CONTROLS	1
14	066550-009	LABEL, DANGER	1
15	066551-002	LABEL, CAUTION	1
16	066551-003	LABEL, DANGER TIPPING	1
17	062562-002	LABEL, BATTERY 120 LBS	1
19	066554-000	LABEL, READ	1
20	066555-000	LABEL, DO NOT ADJUST	2
21	063423-000	LABEL, BRAKE RELEASE	1
22	066562-001	LABEL, TIRE PSI 75	1
23	061515-000	LABEL, LIFT HERE	1
24	066568-000	LABEL, WARNING	1
26	066557-010	LABEL, MAX LOAD 2000 LBS	2
28	061683-005	LABEL, UPRIGHT 4 1/2	3
29	061683-007	LABEL, UPRIGHT 5 1/2	4
30	067644-002	LABEL, LX31 2WD	3
31	067644-001	LABEL, LX31 2WD	4
33	011248-004	NUT HEX ESNA 1/4-20UNC	4
*35	011252-008	SCREW HHC 1/4-20UNC X 1	4
36	065368-000	TACK	4
37	060830-000	SAFETY WALK	4
38	066561-001	LABEL, MAINT. BRACE	1
39	060086-000	SAFETY WALK 20 X 32	12
40	066558-000	LABEL, EMERG. LOWERING	2
41	068641-003	LABEL, PARKING BRAKE	1

* Not Shown

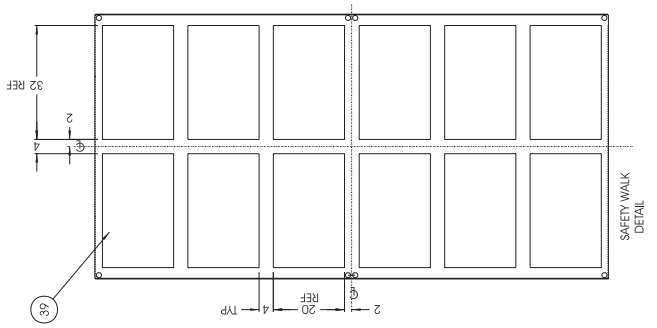
Label Kit/Installation, LX41

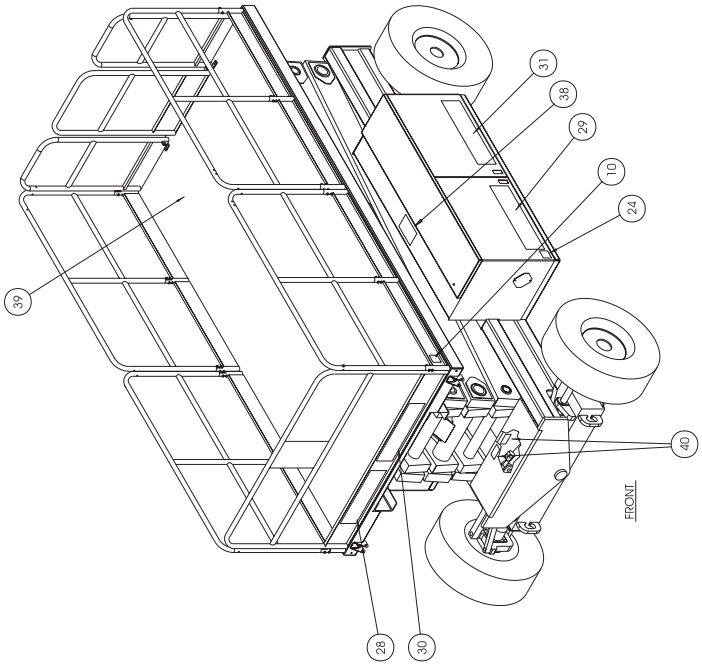
067361-010

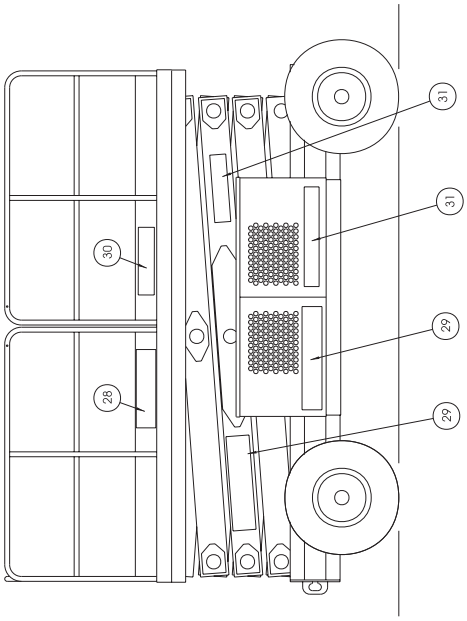
	PART	DESCRIPTION	QTY
1	010076-000	MANUAL CASE	1
2	010076-001	LABEL, ATTENTION	1
3	067449-000	USER MANUAL LX-SERIES	1
4	060197-000	LABEL, HYDRAULIC FLUID	1
5	061205-000	NAME PLATE	1
6	061220-001	LABEL, ANSI	1
7	060577-000	ANSI MANUAL	1
8	067365-000	LABEL, LOWER CONTROLLER	1
9	066552-000	LABEL, WARNING BATTERY	1
10	064444-000	LABEL, USA	4
11	067642-005	LABEL, CONTROLLER	1
13	067639-000	LABEL, PLATFORM CONTROLS	1
14	066550-009	LABEL, DANGER	1
15	066551-002	LABEL, CAUTION	1
16	066551-003	LABEL, DANGER TIPPING	1
17	062562-002	LABEL, BATTERY 160 LBS	1
19	066554-000	LABEL, READ	1
20	066555-000	LABEL, DO NOT ADJUST	2
21	063423-000	LABEL, BRAKE RELEASE	1
22	066562-001	LABEL, TIRE PSI 75	1
23	061515-000	LABEL, LIFT HERE	1
24	066568-000	LABEL, WARNING	1
26	066557-007	LABEL, MAX LOAD 1500 LBS	2
28	061683-005	LABEL, UPRIGHT 4 1/2	3
29	061683-007	LABEL, UPRIGHT 5 1/2	4
30	067644-004	LABEL, LX41 2WD	3
31	067644-003	LABEL, LX41 2WD	4
33	011248-004	NUT HEX ESNA 1/4-20UNC	4
*35	011252-008	SCREW HHC 1/4-20UNC X 1	4
36	065368-000	TACK	4
37	060830-000	SAFETY WALK	4
38	066561-001	LABEL, MAINT. BRACE	1
39	060086-000	SAFETY WALK 20 X 32	12
40	066558-000	LABEL, EMERG. LOWERING	2
41	068641-003	LABEL, PARKING BRAKE	1

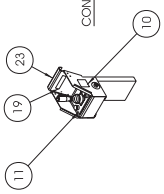
* Not Shown

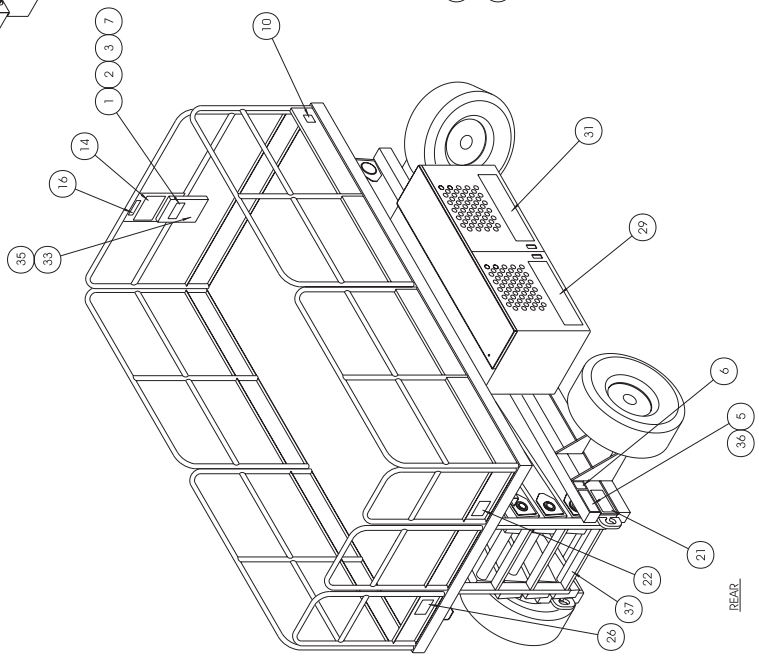
Label Kit/Installation
067361-009 & 010
Drawing 1 of 1

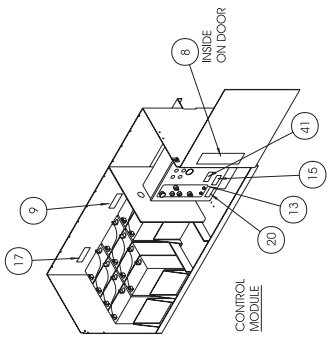


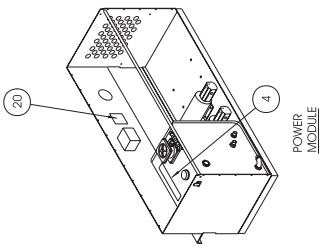








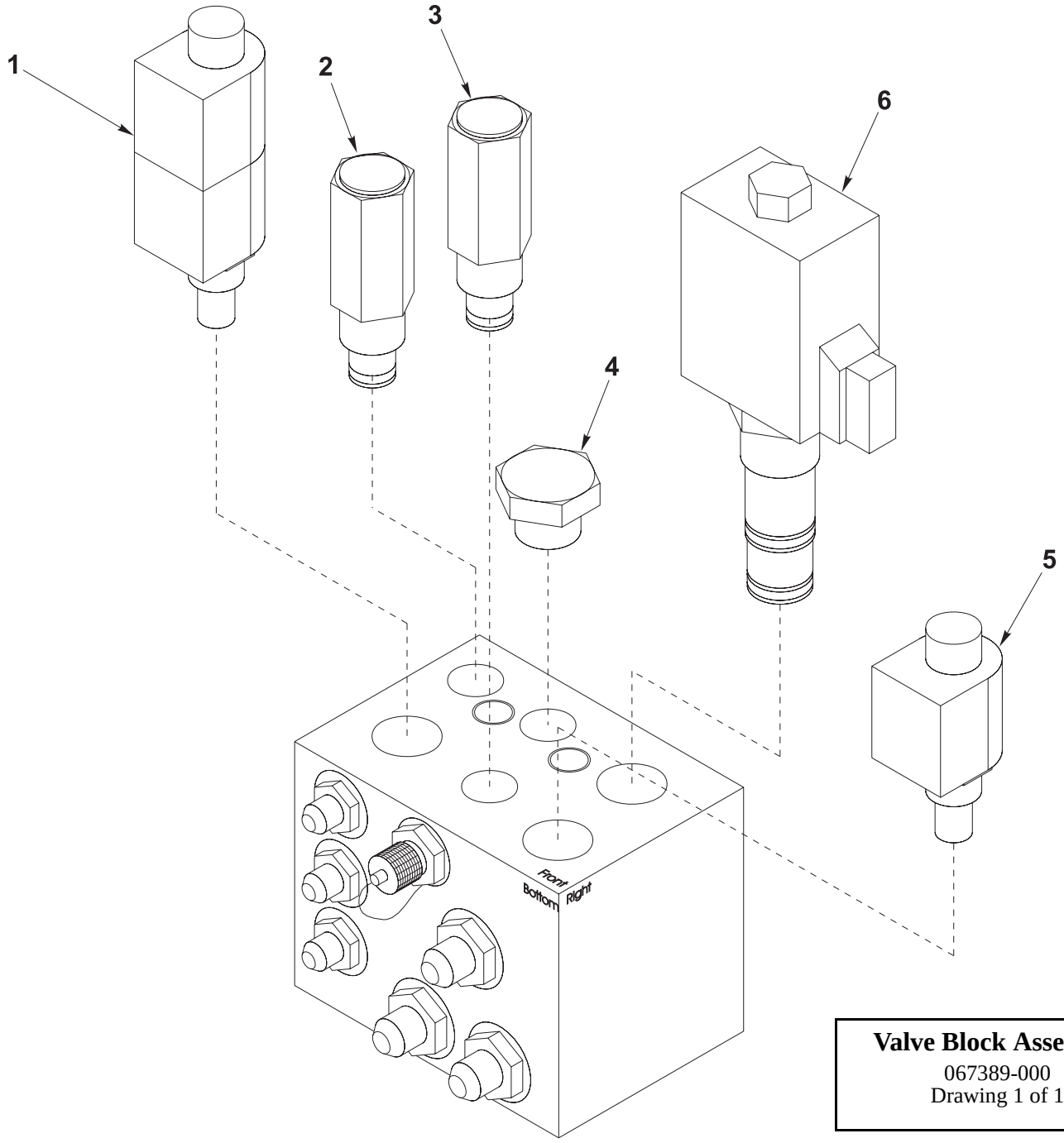




Valve Block Assembly, LX31/41

067389-000

	PART	DESCRIPTION	QTY.
1	067389-005	STEERING SOLENOID	2
2	067389-006	STEERING RELIEF VALVE	1
3	067389-007	LIFT RELIEF VALVE	1
4	067389-008	FLOW CONTROL VALVE	1
5	067389-009	DUMP VALVE	1
6	067389-010	LIFT SOLENOID	1



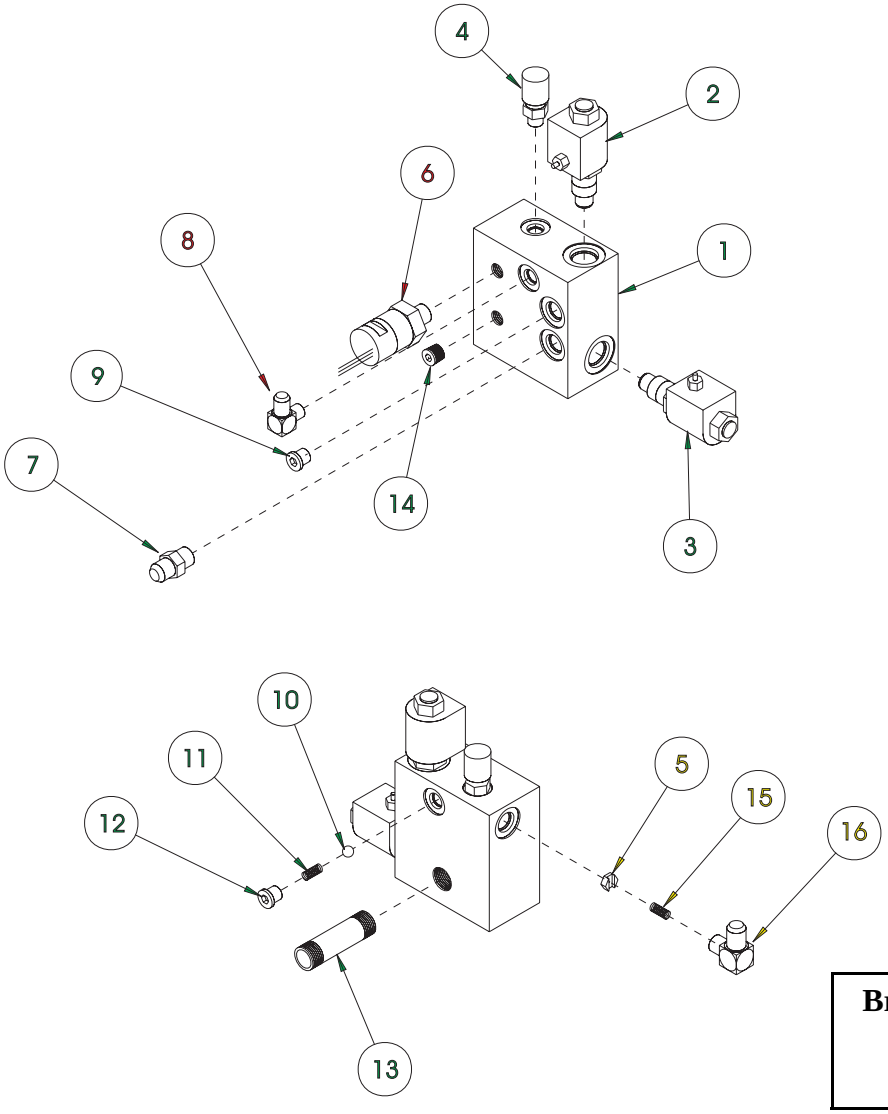
Valve Block Assembly
067389-000
Drawing 1 of 1

Brake Valve Block Assembly, LX31/41

068324-002

	PART	DESCRIPTION	QTY.
1	068481-000	VALVE BLOCK, BRAKE	1
2	068553-000	VALVE, POPPET N.C. 48VDC	1
3	068674-000	VALVE, POPPET N.O. 48VDC	1
4	063965-001	PLUG, GUAGE PORT	1
5	015919-002	ORIFICE, CESSNA 815	1
6	063921-010	PRESSURE SWITCH,	1
7	011934-003	STR. ADAPTER #6MB - #6MJ	1
8	011934-026	ELBOW 90ø #4MB - #4MJ	1

ITEM	PART	DESCRIPTION	QTY.
9	012004-006	PLUG #6	2
10	005135-000	STEEL BALL, 5/16" DIA.	1
11	013987-009	SPRING, 1/4 DIA. X 19/32 LG.	1
12	012004-004	PLUG, #4 SAE	1
13	014021-005	PIPE NIPPLE 1/2" SCH 40 X 2 1/2" LG.	1
14	011920-002	PLUG,PIPE SOC HD 1/4-18 NPTF	1
15	068798-001	SPRING 3/8 OD .035WIRE X 1 1/4 LG	1
16	011934-004	ELBOW 90ø #6 SAE - #6 JIC	1

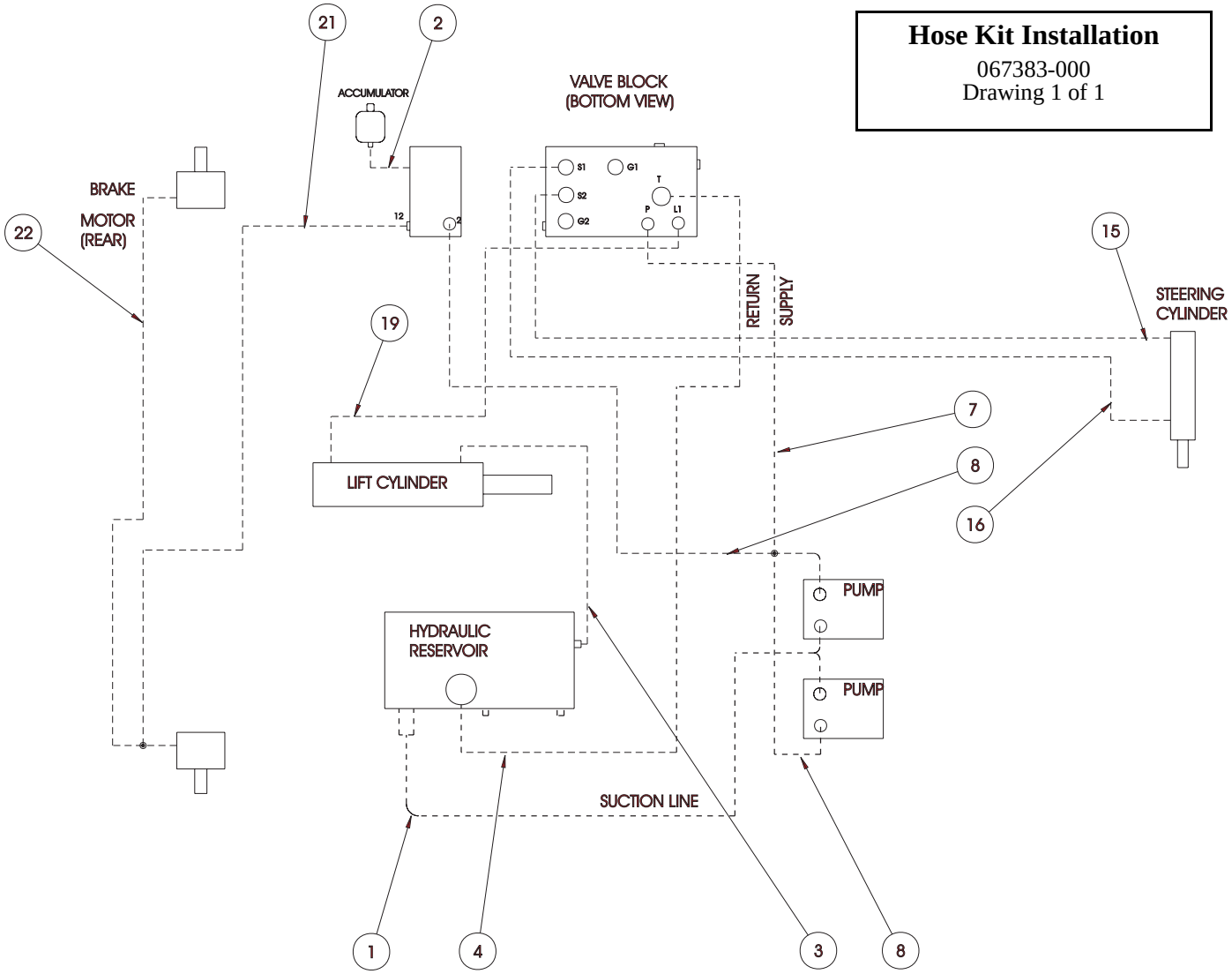


Brake Valve Block Assembly
068324-002
Drawing 1 of 1

Hose Kit Installation, LX31/41

067383-000

	PART	DESCRIPTION	QTY.
1	100118-024	1 HOSE ASSY X 24 16FJX-16FJX 90ø	1
2	068763-040	1/4 HOSE ASSY X 40 4FJ X 6FJX	1
3	068745-334	3/8 HOSE ASSY X 334 6FJX-6FJX	1
4	068745-062	3/8 HOSE ASSY X 62 6FJX-6FJX	1
7	068745-035	3/8 HOSE ASSY X 35 6FJX-6FJX	1
8	068745-023	3/8 HOSE ASSY X 23 1/2 6FJX-6FJX	2
15	067683-109	3/8 HOSE ASSY X 109 6FJX-6FJX45ø	1
16	067683-118	3/8 HOSE ASSY X 118 6FJX-6FJX45ø	1
19	067684-236	3/8 HOSE ASSY X 236 6FJX-6FJX	1
21	065234-093	1/4 HOSE ASSY X 93 4FJX-4FJX	1
22	065234-062	1/4 HOSE ASSY X 62 4FJX-4FJX	1



Slide-Out Deck Installation, LX31/41

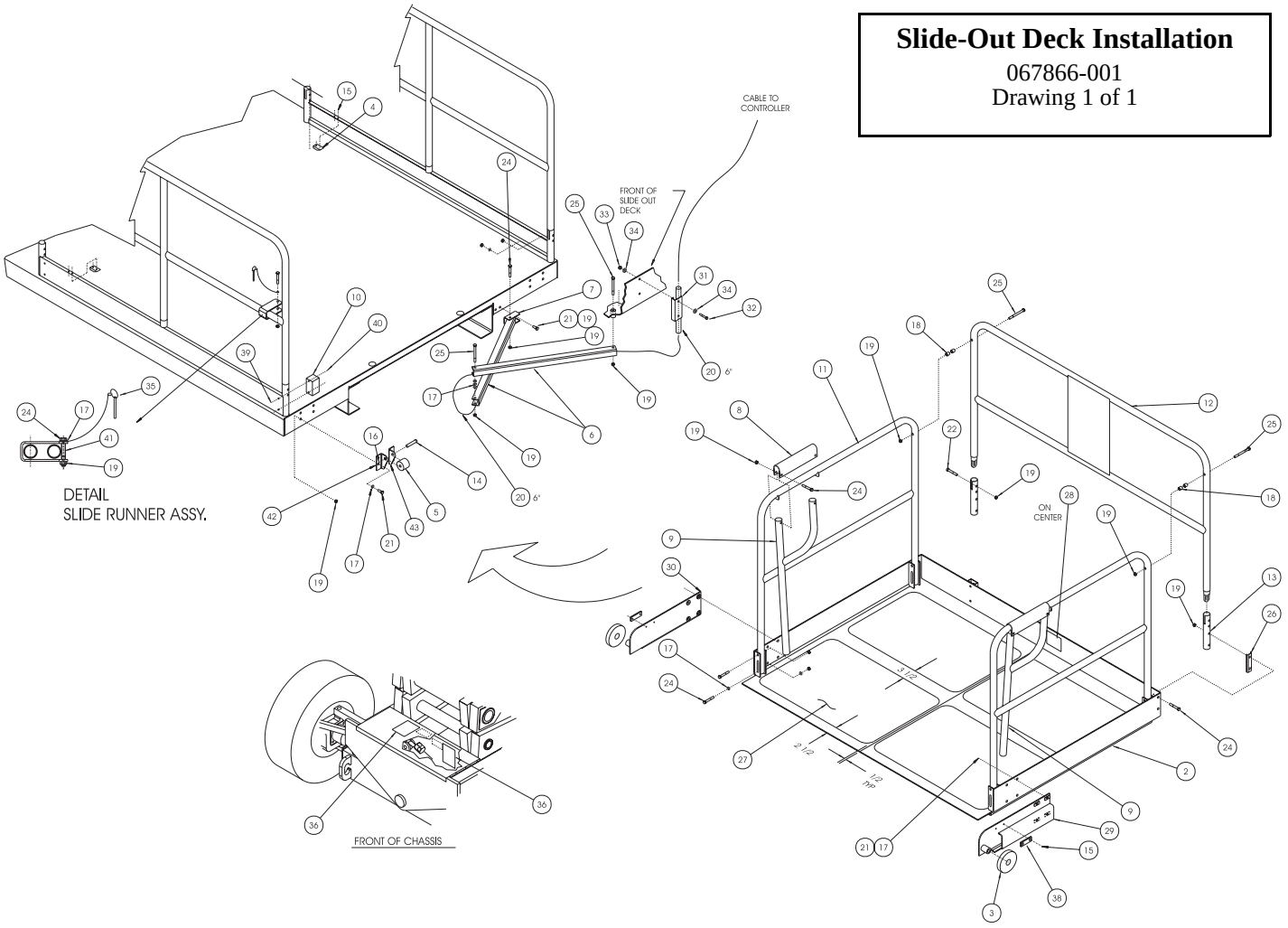
067866-001

	PART	DESCRIPTION	QTY.
2	067787-001	SLIDE-OUT DECK WELDMENT	1
3	067760-002	WHEEL, SLIDE-OUT DECK	2
4	066193-000	STOP	2
5	067720-000	ROLLER	2
6	067818-001	ARM, CABLE GUIDE	2
7	067786-001	BRACKET, CABLE GUIDE	1
8	067761-000	PIVOT, PUSH BAR	2
9	067862-003	HANDLE WELDMENT	2
10	066170-002	WEAR PAD	2
11	067776-001	GUARDRAIL WELDMENT	2
12	067778-000	GUARDRAIL WELDMENT	1
13	067755-001	SWING TUBE	2
14	011848-038	CLEVIS PIN, 1/2" DIA X 2 1/2	2
15	026553-008	RIVET POP N 3/16 X (.5-.63 GRIP)	4
16	011757-005	COTTER PIN, RUE RING	2
17	014996-006	WASHER, FLAT 3/8" DIA	42
18	067695-000	SPACER	4
19	011248-006	LOCKNUT, 3/8-16UNC ESNA	34
20	012865-099	LOOM, WIRE 3/4"	1FT
21	011254-008	SCREW HHC 3/8-16UNC X 1	10
22	011254-014	SCREW HHC 3/8-16UNC X 1 3/4	4

ITEM	PART	DESCRIPTION	QTY.
*23	011254-006	SCREW HHC 3/8-16UNC X 3/4	8
24	015936-014	SCREW SHOU 3/8-16UNC X 1 3/4	12
25	011254-032	SCREW HHC 3/8-16UNC X 4	4
26	067920-000	SPACER, GUARDRAIL	2
27	060086-000	SAFETY WALK (20 X 32)	4
28	066557-001	LABEL, PLATFORM CAPY	1
29	067867-001	ROLLER BRACKET REAR WELDMENT L.H.	1
30	067867-000	ROLLER BRACKET REAR WELDMENT R.H.	1
31	063666-004	WIRE CHANNEL	1
32	011253-012	SCREW HHC 5/16-18 X 1 1/2	2
33	011248-005	NUT HEX 5/16-18 ESNA	2
34	011240-005	WASHER 5/16 FLAT STD	4
35	010414-000	LOCKING PIN ASSY 5/16 N	1
36	066556-000	LABEL, WARNING DESEND PLTFM	2
38	066198-000	WEAR PAD	2
39	011252-012	SCREW HH 1/4-20 X 1 1/2	4
40	011248-004	NUT 1/4-20 ESNA	4
41	015770-099	HOSE 3/8 DIA X 1 1/2 LG	4
42	067783-003	ROLLER BRACKET R.H.	2
43	067783-004	ROLLER BRACKET L.H.	2

* Not Shown

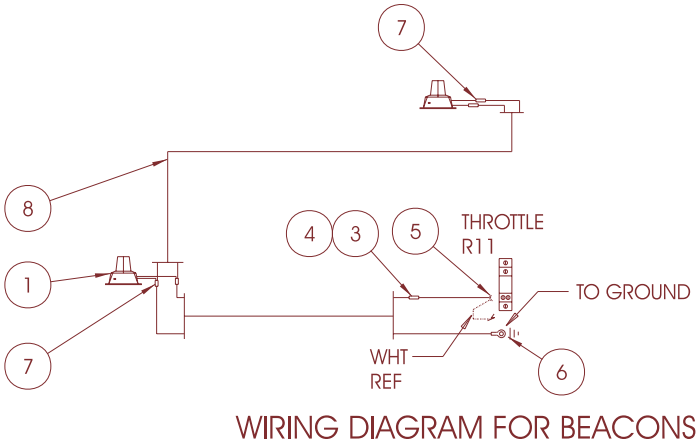
Slide-Out Deck Installation
067866-001
Drawing 1 of 1



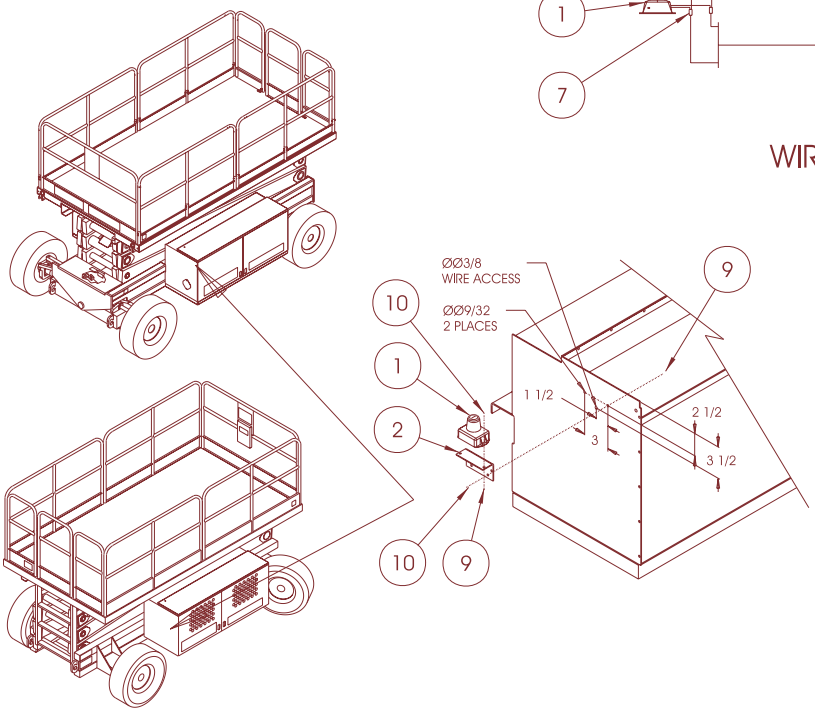
Amber Beacon Option, LX31/41

067947-000

	PART	DESCRIPTION	QTY.
1	012848-004	LIGHT 12-24 VOLT	2
2	063193-000	LIGHT BRACKET	2
3	029702-000	FUSE HOLDER	1
4	029704-002	FUSE 2 AMP	1
5	029610-002	CONN. FORK 16-14 #8	1
6	029601-013	CONN. RING 16-14 #10	1
7	029620-002	CONN. BUTT 16-14	4
8	029496-099	WIRE 16 AWG 2 COND	18FT
9	011249-003	NUT HEX ESNA #10-32	4
10	011826-004	SCREW MACH. RD. HD. #10-32 X 1/2	4



WIRING DIAGRAM FOR BEACONS

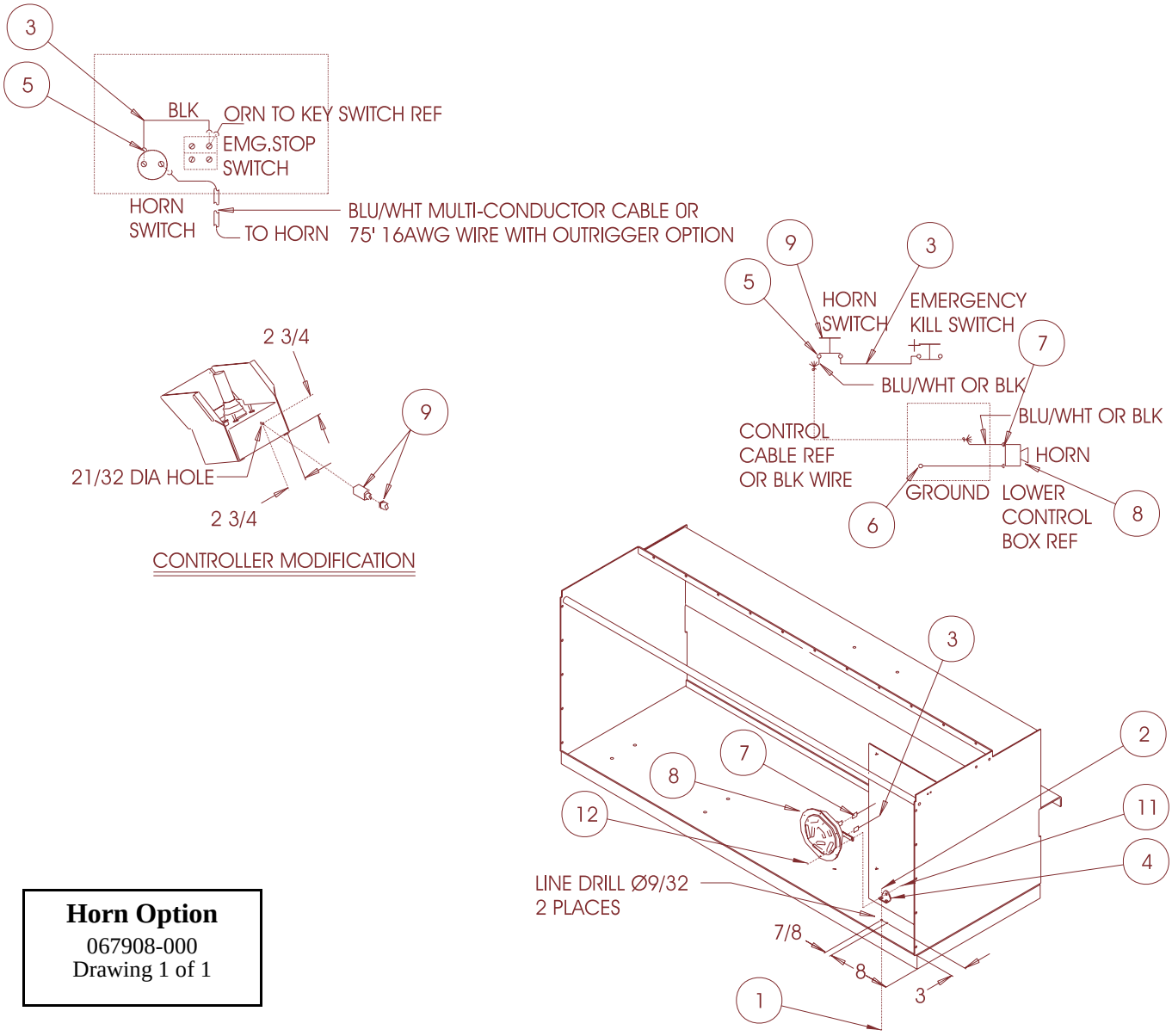


Amber Beacon Option
067947-000
Drawing 1 of 1

Horn Option, LX31/41

067908-000

	PART	DESCRIPTION	QTY.
1	011252-008	SCREW HHC 1/4-20 X 1	2
2	011248-004	NUT HEX 1/4-20	2
3	029452-099	WIRE 16 GA BLACK	75FT
4	067902-000	BRACKET, GAS SPRING	1
5	029610-002	CONNECTOR FORK	3
6	029601-014	CONNECTOR RING	1
7	029615-002	CONNECTOR PUSH	2
8	029958-001	HORN 24VDC	1
9	063917-000	SWITCH PUSHBUTTON	1
11	011248-005	NUT HEX ESNA 5/16-18	1
12	011253-008	SCREW HHC 5/16-18UNC X 1	1



Horn Option
067908-000
Drawing 1 of 1

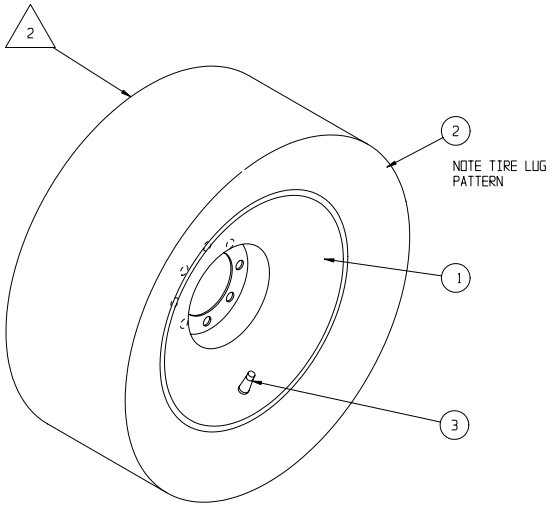
Poly Fill Tire Option, LX31/41

067910-001

	PART	DESCRIPTION	QTY.
1	067665-005	POLY FILL TIRE & WHEEL ASSY-FRONT	2
2	068327-003	POLY FILL TIRE & WHEEL ASSY-REAR	2

067665-005

ITEM	PART	DESCRIPTION	QTY.
1	067609-001	WHEEL, 16.5 X 8.25 8 HOLE, 8 BC	1
2	068555-000	TIRE, 9.5 X 16.5 NHS 10 PLY	1
3	012282-001	VALVE STEM	1



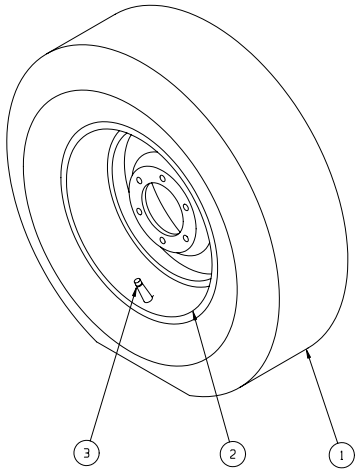
NOTES:

1. FILL TIRE/WHEEL ASSY WITH 110 LBS MIN TO 120 LBS MAX OF POLYFILL OR EQUIVALENT.

2. BRAND BACKSIDE OF TIRE/WHEEL ASSY AS FOLLOWS:
"UPRIGHT 6KP"
SPACE
TIRE SEALANT
LAST DIGIT OF YEAR WHEN TIRE WAS FILLED
LETTER CORRESPONDING TO MONTH: JAN=1=A FEB=2=B ECT.

068327-003

ITEM	PART	DESCRIPTION	QTY.
1	068555-000	TIRE, 9.5 X 16.5 10 PLY	1
2	067609-000	WHEEL, 16.5 X 8.25 6 HOLE ON 6" 8 B.C.	1
3	012282-001	VALVE STEM	1



NOTES:

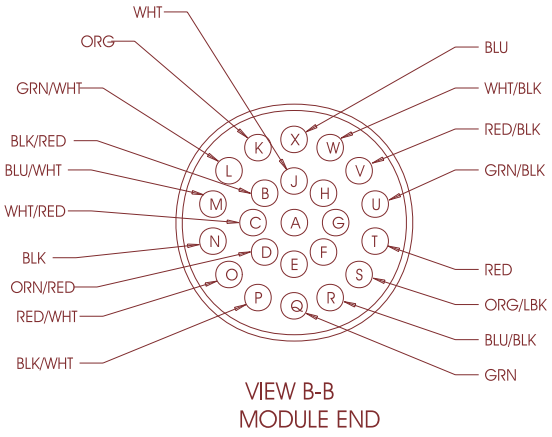
1. FILL TIRE/WHEEL ASSY WITH 110 LBS MIN TO 120 LBS MAX OF POLYFILL OR EQUIVALENT.

2. BRAND BACKSIDE OF TIRE/WHEEL ASSY AS FOLLOWS:
"UPRIGHT 6KP"
SPACE
TIRE SEALANT
LAST DIGIT OF YEAR WHEN TIRE WAS FILLED
LETTER CORRESPONDING TO MONTH: JAN=1=A FEB=2=B ECT.

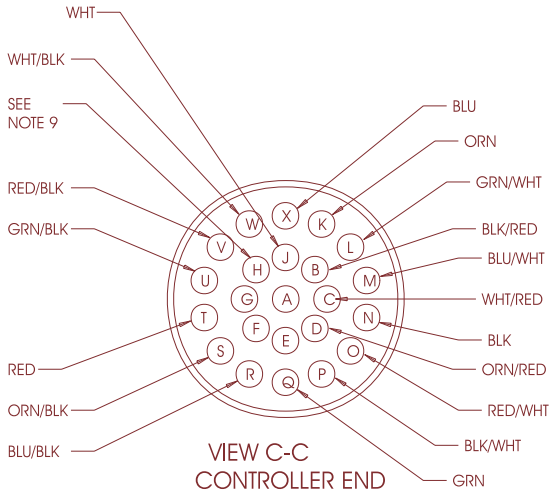
Removable Controller Option, LX31/41

061898-002

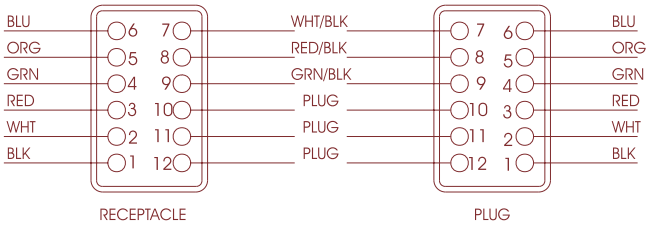
	PART	DESCRIPTION	QTY.
1	028800-003	PLUG CONNECTOR (FEMALE)	1
2	028800-004	PIN CONTACT (MALE)	15
3	028800-015	PLUG SEALING	16
4	028800-016	RECEPTACLE CONNCTOR W/CLAMP (MALE)	1
5	028800-005	SOCKET CONTACT (FEMALE)	15
8	030719-001	110 VAC BRACKET	1
10	011254-020	SCREW HHC GRD5 3/8-16UNC X 2 1/2	2
11	011240-006	WASHER 3/8 STD FLAT	4
12	011248-006	NUT HEX ESNA 3/8-16	2
13	068761-000	LOCKING WEDGE-CONN	1
14	068760-001	CONNECTOR-RECEPTACLE	1
15	068762-000	PIN-CONTACT	9
16	068761-001	LOCKING WEDGE-CONN	1
17	068760-000	PLUG-CONNECTOR	1
18	068762-001	SOCKET-CONTACT	9
19	068764-000	PLUG-CONNECTOR	6
20	068908-000	BOOT ELECT. PLUG	1
21	068908-001	BOOT ELECT. RECEPTACLE	1



VIEW B-B
MODULE END



VIEW C-C
CONTROLLER END

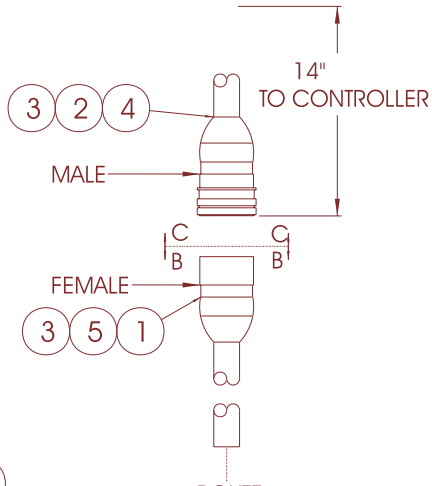


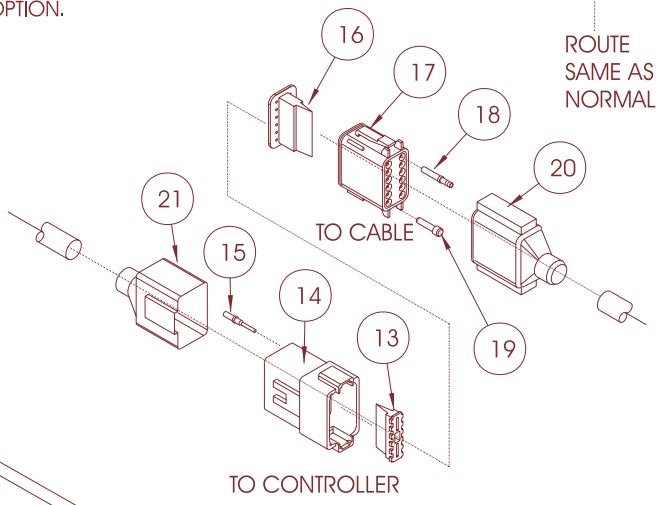
OUTRIGGER
OPTION

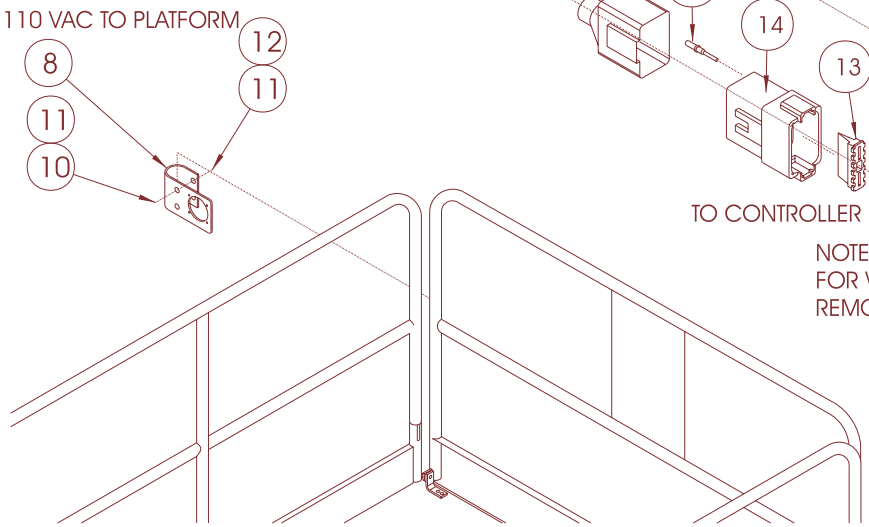
PART NAME

Removable Controller Option
067898-002
Drawing 1 of 2

1. CUT OFF CONTROL CABLE 14 INCHES BELOW STRAIN RELIEF ON CONTROLLER.
2. CUT OUTER CABEL COVER OF LINKAGE CABEL BACK APPROXIMATELY 1-1/2 INCH AND STRIP APPROXIMATELY 1/4 INCH OF EACH END.
3. CRIMP SOCKETS (28800-005) ONTO WIRE ENDS AND INSERT INTO CONNECTOR (28800-016). REF. VIEW B-B.
4. CUT OUTER CABEL COVER OF CONTROLLER END BACK APPROXIMATELY 1-1/2 INCH AND STRIP APPROXIMATELY 1/4 INCH OF EACH END.
5. SLIDE BOOT AND CLAMP ONTO CABLE.
6. CRIMP PINS (28800-004) ONTO WIRE ENDS AND INSERT INTO CONNECTOR (28800-003). REF. VIEW C-C.
7. CLAMP BOOT TO CONNECTOR.
8. CONNECT CONTROLLER AND TEST MACHINE FOR PROPER FUNCTION.
9. USE TERMINAL " H " FOR HORN OPTION OR IF AUX WIRE IS REQUIRED.
10. ITEM #8 THRU 12 REQD ONLY FOR 110 VAC.
11. ITEM # 13 THRU 21 REQD ONLY OUTRIGGER OPTION.







NOTE: USE DEUTSCH #HDT-48-00 HAND CRIMPER FOR WIRE TO PIN/SOCKET. USE #DT-RT1 TOOL TO REMOVE WEDGES IN PLUG & RECEPTACLE.

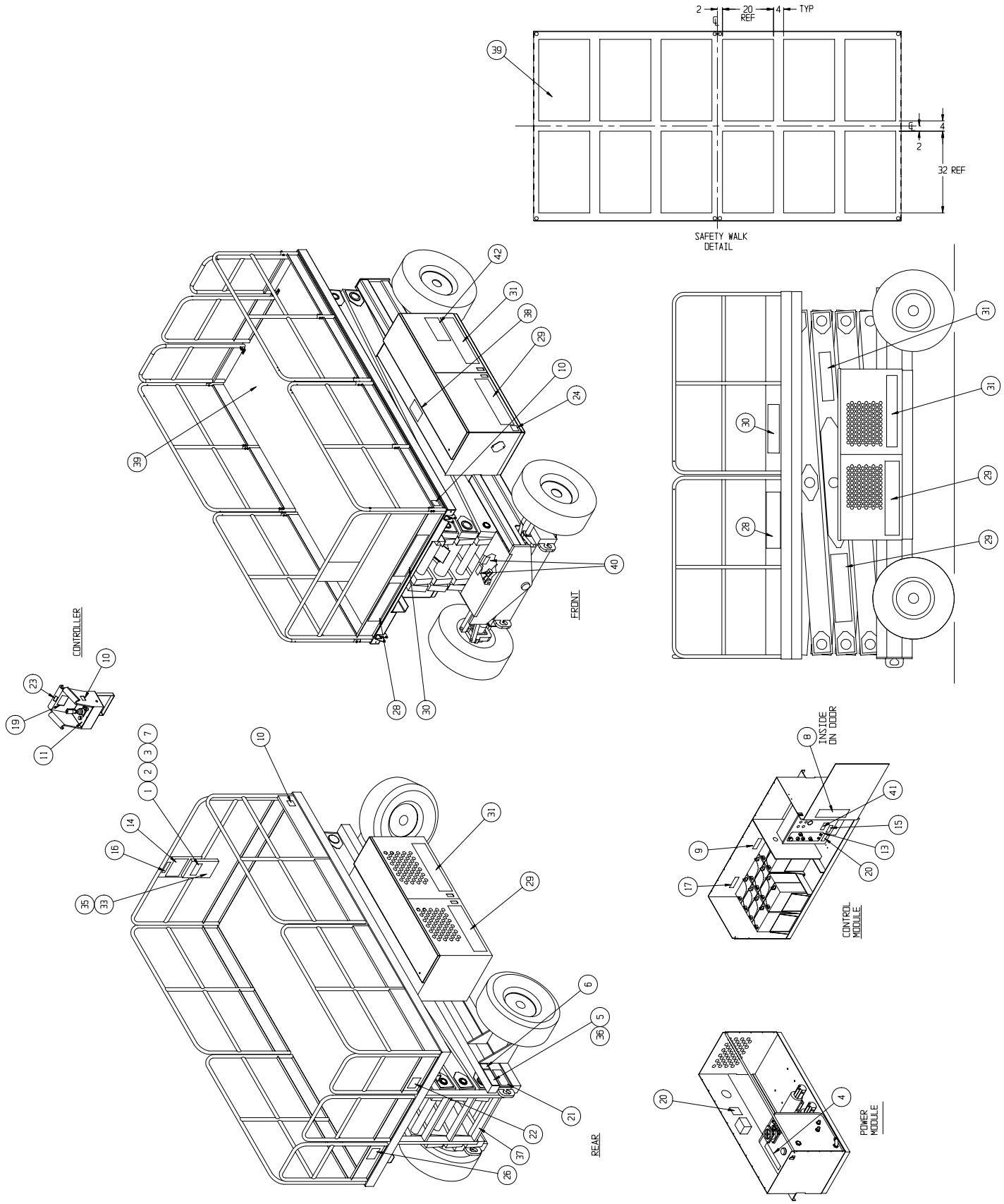
Removable Controller Option
067898-002
Drawing 2 of 2

Label Kit LX31

067369-039

	PART	DESCRIPTION	QTY.
1	010076-000	MANUAL CASE	1
2	010076-001	LABEL-ATTENTION	1
3	067449-001	USER MANUAL LX-SERIES	1
4	060197-000	LABEL-HYDRAULIC FLUID	1
5	061205-005	NAME PLATE	1
6	061220-002	LABEL-ANSI	1
7	060577-004	ANSI MANUAL	1
8	067365-000	LABEL-LOWER CONTROLLER	1
9	066552-000	LABEL-WARNING BATTERY	1
10	064444-000	LABEL-USA	4
11	067642-005	LABEL-CONTROLLER	1
13	067639-001	LABEL-PLATFORM CONTROLS	1
14	066550-009	LABEL-DANGER	1
15	066551-002	LABEL-CAUTION	1
16	066551-003	LABEL-DANGER TIPPING	1
17	062562-002	LABEL-BATTERY 120 LBS	1
19	066554-000	LABEL-READ	1
20	066555-000	LABEL-DO NOT ASJUST	2

ITEM	PART	DESCRIPTION	QTY.
21	063423-000	LABEL-BRAKE RELEASE	1
22	066562-001	LABEL-TIRE PSI 75	1
23	061515-000	LABEL-LIFT HERE	1
24	066568-000	LABEL-WARNING	1
26	101250-008	LABEL-MAX LOAD 2000 LBS	2
28	061683-005	LABEL-UPRIGHT 4-1/2	3
29	061683-007	LABEL UPRIGHT 5-1/2	4
30	067644-002	LABEL-LX31 2WD	3
31	067644-001	LABEL-LX31 2WD	4
33	011248-004	NUT HEX ESNA 1/4-20 UNC	4
35	011252-008	SCREW HHC 1/4-20 UNC X 1	4
36	065368-000	TACK	4
37	060830-000	SAFETY WALK	4
38	066561-001	LABEL MAINT. BRACE	1
39	060086-000	SAFETY WALK 20 X 32	12
40	066558-000	LABEL, EMERG. LOWERING	2
41	068641-003	LABEL, PARKING BRAKE	1
42	101252-013	LABEL, MAX WHEEL LOAD 3900 LBS	1


2
20 REF
4 TYP
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4
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32 REF
SAFETY WALK DETAIL
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FRONT
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CONTROLLER
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21
22
37
26
REAR
8
INSIDE DR DOOR
41
15
9
13
20
17
CONTROL MODULE
20
4
POWER MODULE

Label Kit LX 41

067361-040

	PART	DESCRIPTION	QTY.
1	010076-000	MANUAL CASE	1
2	010076-001	LABEL-ATTENTION	1
3	067449-001	USER MANUAL LX-SERIES	1
4	060197-000	LABEL-HYDRAULIC FLUID	1
5	061205-005	NAME PLATE	1
6	061220-002	LABEL-ANSI	1
7	060577-004	ANSI MANUAL	1
8	067365-000	LABEL-LOWER CONTROLLER	1
9	066552-000	LABEL-WARNING BATTERY	1
10	064444-000	LABEL-USA	4
11	067642-005	LABEL-CONTROLLER	1
13	067639-001	LABEL-PLATFORM CONTROLS	1
14	066550-009	LABEL-DANGER	1
15	066551-002	LABEL-CAUTION	1
16	066551-003	LABEL-DANGER TIPPING	1
17	062562-002	LABEL-BATTERY 120 LBS	1
19	066554-000	LABEL-READ	1
20	066555-000	LABEL-DO NOT ASJUST	2

ITEM	PART	DESCRIPTION	QTY.
21	063423-000	LABEL-BRAKE RELEASE	1
22	066562-001	LABEL-TIRE PSI 75	1
23	061515-000	LABEL-LIFT HERE	1
24	066568-000	LABEL-WARNING	1
26	101250-008	LABEL-MAX LOAD 2000 LBS	2
28	061683-005	LABEL-UPRIGHT 4-1/2	3
29	061683-007	LABEL UPRIGHT 5-1/2	4
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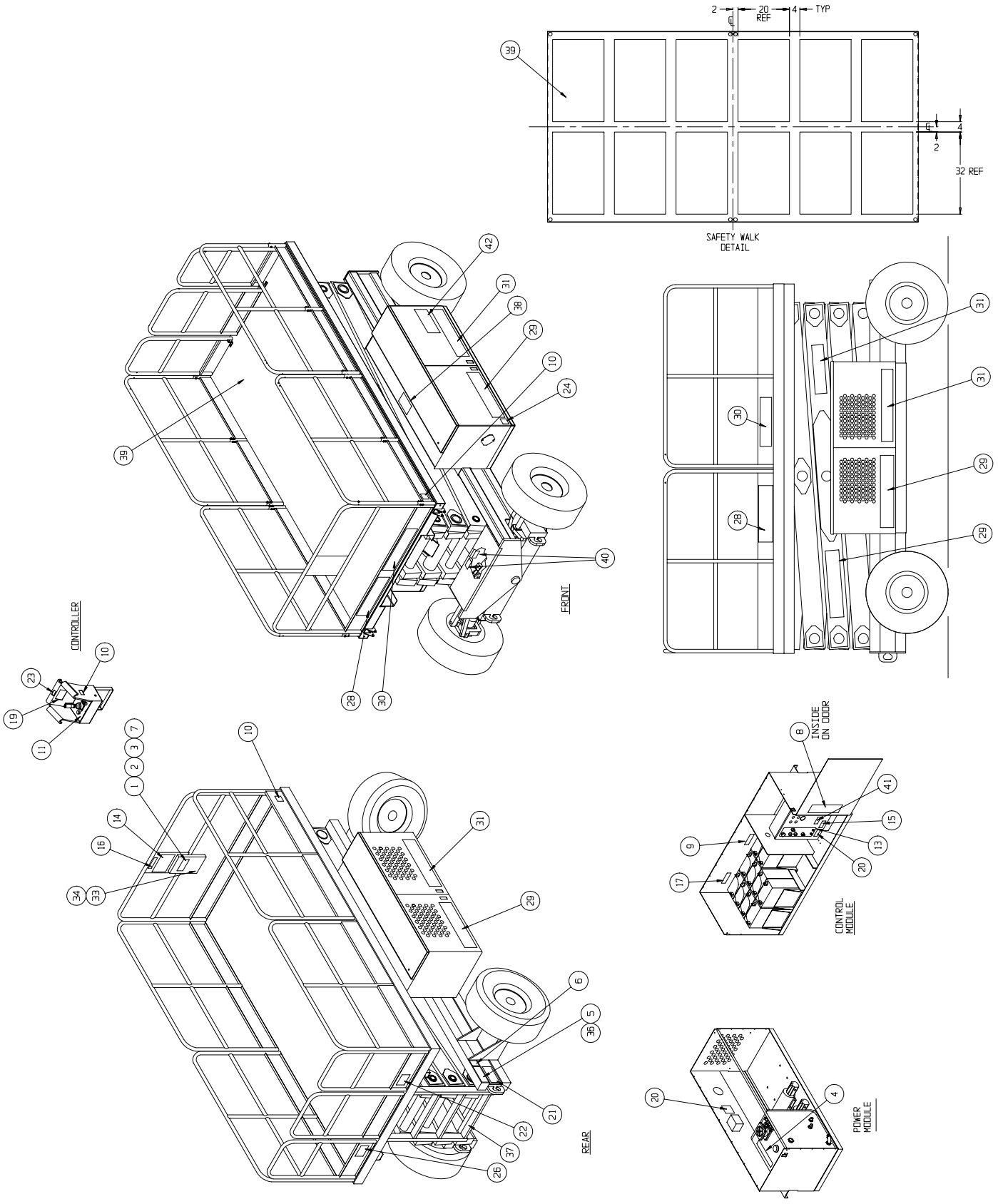
37	060830-000	SAFETY WALK	4
38	066561-001	LABEL MAINT. BRACE	1
39	060086-000	SAFETY WALK 20 X 32	12
40	066558-000	LABEL, EMERG. LOWERING	2
41	068641-003	LABEL, PARKING BRAKE	1
42	101252-014	LABEL, MAX WHEEL LOAD 4200 LBS	1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32 REF
SAFETY WALK DETAIL
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REAR
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INSIDE DN DOOR
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20
17
CONTROL MODULE
20
4
POWER MODULE

ILLUSTRATED PARTS BREAKDOWN

NOTES:

UpRight

Call Toll Free in U.S.A.
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PARTS: 1-888-UR-PARTS
PARTS FAX: 559/896-9244

067448-001
12/99 K