UpRight

MX15/19

SERIES

Work Platforms

Service & Parts Manual

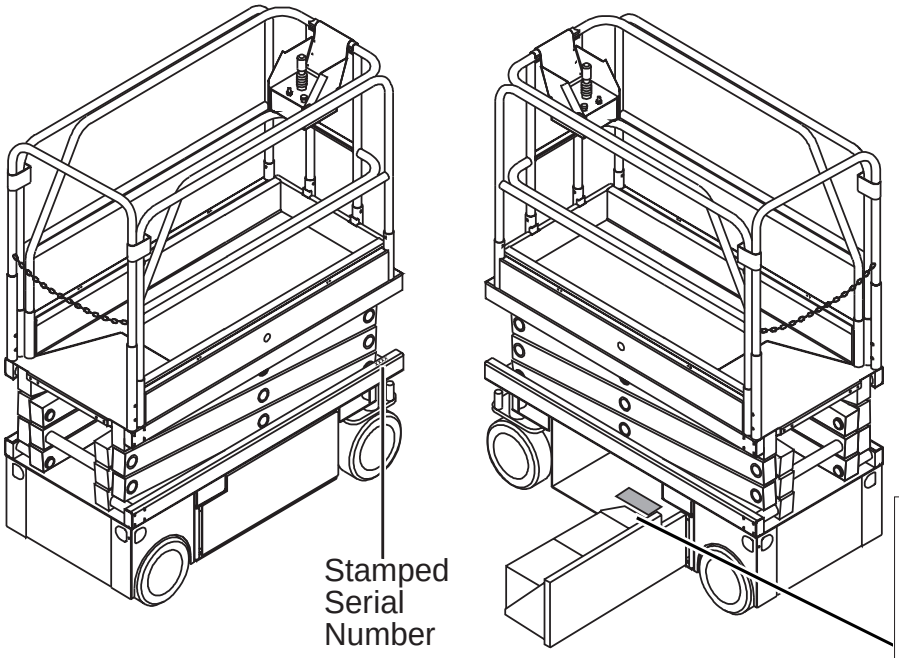
060569-004

SERVICE & PARTS MANUAL

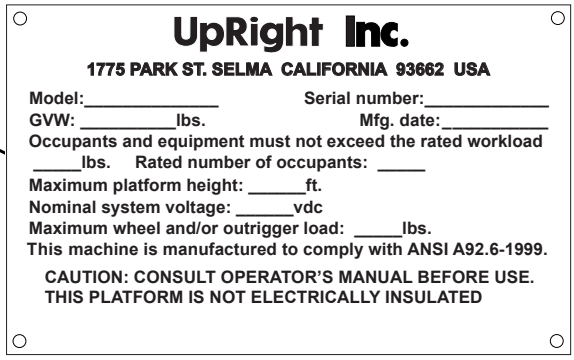
MX15/19

Aerial Work Platforms

Serial Numbers 14000 to Current



When contacting UpRight for service or parts information, be sure to include the MODEL and SERIAL NUMBERS from the equipment nameplate. Should the nameplate be missing, the SERIAL NUMBER is also stamped on the right side scissor rail toward the front of the machine.



UpRight, Inc.
1775 Park Street
Selma, California 93662
TEL: 559/891-5200
FAX: 559/891-9012
PARTS: 1-888-UR-PARTS
PARTS FAX: 559/896-9244

UpRight
Call Toll Free in the U.S.A.
1-800-926-LIFT

UpRight International Support Centre
Innsbruckweg 114
3047 AH Rotterdam
Netherlands
TEL: +31(0)10-238-0000
FAX: +31(0)10-238-0001
Parts Tel: +31(0)10-490-8090
Parts Fax: +31(0)10-490-8099

060569-004
6/00 K

FOREWORD

HOW TO USE THIS MANUAL

This manual is divided into six sections.

SECTION 1 INTRODUCTION

General description and machine specifications.

SECTION 2 OPERATION AND SPECIFICATIONS

Information on how to operate the work platform and how to prepare it for operation.

SECTION 3 MAINTENANCE

Preventative maintenance and service information.

SECTION 4 TROUBLESHOOTING

Causes and solutions to typical problems.

SECTION 5 SCHEMATICS

Schematics and valve block diagram with description and location of components. Large schematic drawings may be located in the back of the manual.

SECTION 6 ILLUSTRATED PARTS BREAKDOWN

Complete parts lists with illustrations. Large parts drawings may be located in the back of the manual.

SPECIAL INFORMATION

⚠ DANGER ⚠

Indicates an imminently hazardous situation which, if not avoided, will result in severe injury or death.

⚠ WARNING ⚠

Indicates a potentially hazardous situation which, if not avoided, could result in severe injury or death.

⚠ CAUTION ⚠

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTE: Gives helpful information.

WORKSHOP PROCEDURES

CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Note that this manual does contain warnings and cautions against some specific service methods that 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. When in doubt, contact your local distributor or UpRight, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

Section 1
Introduction

Section 2
Operation and Specifications

Section 3
Maintenance

Section 4
Troubleshooting

Section 5
Schematics

LIST OF TABLES

Section 2
Operation and Specifications

Section 3
Maintenance

Section 4
Troubleshooting

Section 5
Schematics

NOTES:

NOTES:

Section 1

INTRODUCTION

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 MX15/19 manufactured by UpRight, Inc. of Selma, California.

SCOPE

The manual includes procedures for proper operation, maintenance, adjustment, and repair of the MX15/19 as well as recommended maintenance schedules and troubleshooting.

1.2 GENERAL DESCRIPTION

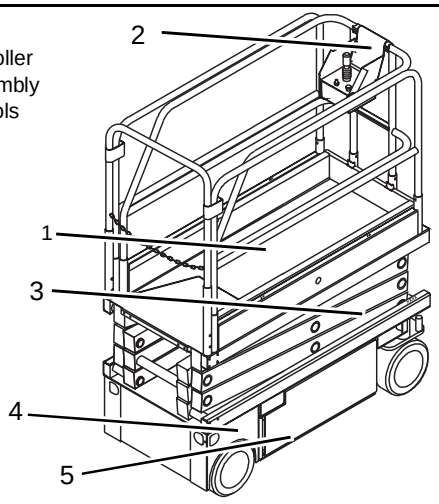
The MX15/19 consists of the platform, controller, elevating assembly, power module, control module, and chassis.

⚠ WARNING ⚠

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

Figure 1-1: MX15/19 Work Platform

1.Platform
2.Platform Controller
3.Elevating Assembly
4.Chassis Controls
5.Chassis



PLATFORM

The platform has a reinforced steel floor, 39.5 inch (.99 m) high guardrails with midrail, 6 inch (152 mm) toeboards, and an entrance gate at the rear of the platform.

PLATFORM CONTROLLER

The platform controller contains the controls to operate the machine. It is located at the front of the platform. A complete explanation of control functions can be found in Section 2.

ELEVATING ASSEMBLY

The platform is raised and lowered by the elevating assembly. The hydraulic pump, driven by an electric motor, powers the cylinder. Solenoid operated valves control raising and lowering.

CHASSIS

The chassis is a structural frame that supports all the components of the MX15/19 work platform. The platform is raised and lowered using a scissors mechanism. Lift is achieved using a single stage cylinder.

PURPOSE OF EQUIPMENT

The objective of the work platform is to provide a quickly deployable, sel- propelled, variable height work platform to elevate personnel and materials to overhead work areas.

Section 2

MX15/19

Serial No. 14000 to Current

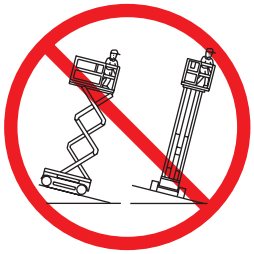
OPERATION AND SPECIFICATIONS

WARNING

All personnel shall carefully read, understand and follow all safety rules, operating instructions, and the Scaffold Industry Association's *MANUAL OF RESPONSIBILITIES of ANSI A92.6-1999* before performing maintenance on or operating any UpRight Aerial Work Platform.

Safety Rules

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



NEVER elevate the platform or drive the machine while elevated unless the machine is on firm level surface.

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 chain across entrance after mounting platform.

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.

2.1 INTRODUCTION

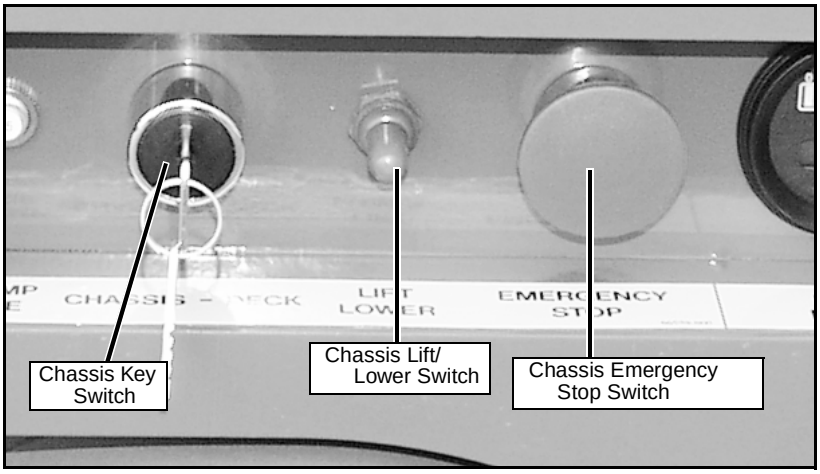
This manual covers all models of the MX15 and MX19 Self-Propelled Elevating Work Platforms. **This manual must be stored on the machine at all times.**

2.2 PRE-OPERATION SAFETY INSPECTION

Carefully read, understand and follow all safety rules, operating instructions, labels, and the Scaffold Industry Association's MANUAL OF RESPONSIBILITIES. Perform the following steps each day before use.

1. Open modules and inspect for damage, oil leaks, or missing parts.
2. Check the level of the hydraulic oil with the platform fully lowered. The hydraulic reservoir is located at the rear of the machine. The oil level should be visible through the side of the tank and must be between the MIN and MAX lines (see Figure 2-2). Add hydraulic fluid if necessary.
3. Check that fluid level in the batteries is correct (See Battery Maintenance,Page 2-8).
4. Verify that batteries are charged.
5. Check that A.C. extension cord has been disconnected from the plug in the left chassis module, and that the module doors are closed and locked.
6. Check that all guardrails are in place and all fasteners are properly tightened.
7. Inspect the machine thoroughly for cracked welds and structural damage, loose or missing hardware, hydraulic leaks, damaged control cable, loose wire connections and wheel bolts.
8. Move machine, if necessary, to an unobstructed area to allow for full elevation.
9. Pull Chassis Emergency Stop Switch to the ON position.
10. Pull Platform Emergency Stop Switch to the ON position.

Figure 2-1: Chassis Controls



11. Turn and hold the Chassis Key Switch to CHASSIS. Push the Chassis Lift/ Lower Switch to the UP position and raise the platform aproximately 7 feet (2.1m). Block the elevating assembly as described onPage 2-7.
12. Visually inspect the elevating assembly, lift cylinder, cables, and hoses for cracked welds and structural damage, loose hardware, hydraulic leaks, loose wire connections, and erratic operation. Check for missing or loose parts.
13. Verify that the depression mechanism supports have rotated into position under the machine. Remove the Scissor Brace as described on Page 2-7.
14. Turn and hold the Chassis Key Switch to CHASSIS. Push the Chassis Lift/Lower Switch to the UP position and fully elevate the platform. Partially lower the platform by pushing the Chassis Lift/Lower Switch to LOWER, and check for proper operation of the audible lowering alarm.

Figure 2-2: Emergency Lowering Valve Knob

15. Open the Emergency Lowering Valve (Figure 2-2) by pulling the knob out to check for proper operation. When the platform is lowered, release the knob.
16. Turn the Chassis Key Switch to DECK.
17. Check that theroute is clear of obstacles (persons, obstructions, holes, drop-offs, bumps and debris), is level, and is capable of supporting the wheel loads.
18. Mount the platform and properly close the entrance.

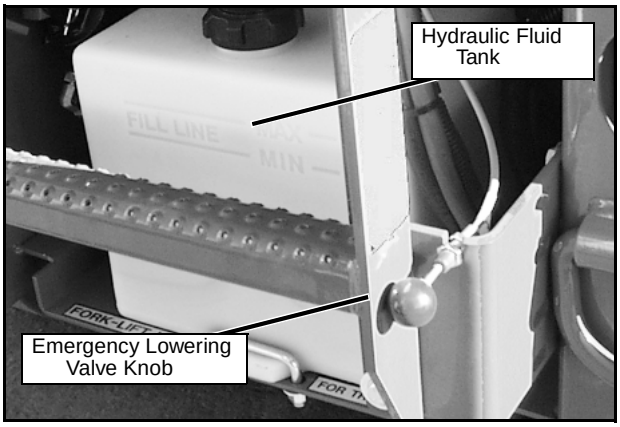
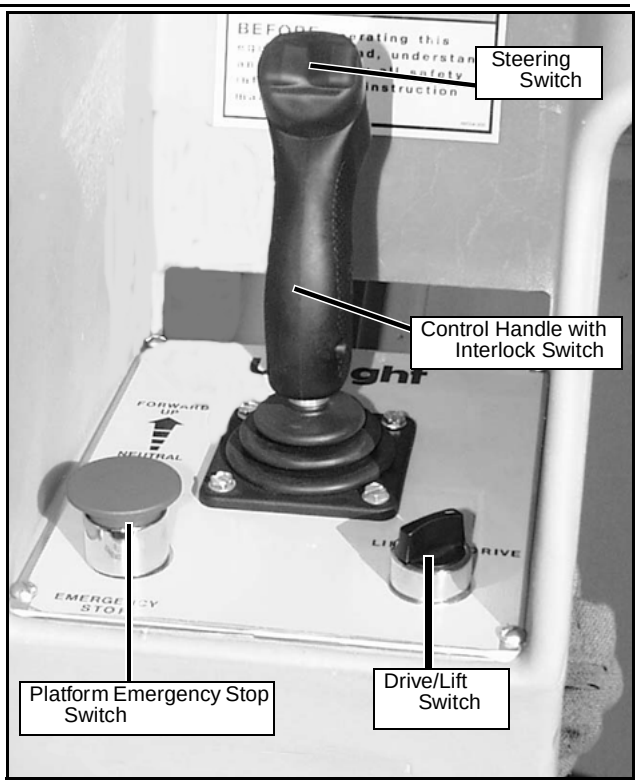


Figure 2-3: Platform Controls

19. Turn the Drive/Lift Switch to DRIVE. While engaging the Interlock Switch, move the Control Handle to FORWARD, then REVERSE, to check for speed control.
20. Push the Steering Switch RIGHT, then LEFT, to check for steering control.
21. Turn the Drive/Lift Switch to LIFT. Grasp the Control Handle, engaging the Interlock Switch, and push it forward to check platform lift controls. Raise the platform to full elevation.
22. Pull back on the Control Handle. The platform should descend, and the audible lowering alarm should sound.
23. Push the Platform Emergency Stop Switch to check for proper operation. All machine functions should be disabled. Pull out the Platform Emergency Stop Switch to resume.



2.3 OPERATION

Before operating the work platform, ensure that the Pre-Operation Safety Inspection has been completed and that any deficiencies have been corrected. **Never operate a damaged or malfunctioning machine.** The operator must be thoroughly trained on this machine, and must read, fully understand, and follow this Operator Manual and the Scaffold Industry Association's *Manual of Responsibilities of ANSI A92.6-1999.*

PLATFORM EXTENSION

Figure 2-4: Platform Extension

1. Mount the platform and properly close the entrance.
2. Engage the foot lever located at the rear of the platform extension. Push the platform extension forward until the pin engages the front stop.
3. To retract the platform extension, depress the foot lever and pull the platform extension toward the rear of the machine until the pin engages the rear stop

TRAVEL WITH PLATFORM LOWERED

1. Check that the route is clear of obstacles (persons, obstructions, holes, drop-offs, bumps, and debris), is level, and is capable of supporting the wheel loads.
2. Verify that the Chassis Key Switch is turned to DECK and the Chassis Emergency Stop Switch is ON (pulled out).
3. Mount the platform and properly close the entrance.
4. Check clearances above, below, and to the sides of the platform.
5. Pull the Platform Emergency Stop Switch out to the ON position.
6. Turn the Drive/Lift Switch to DRIVE.
7. Engage the Interlock Switch and move the Control Handle to FORWARD or REVERSE to travel in the desired direction. The speed of the machine will vary depending on how far from center the Control Handle is moved.

STEERING

1. Turn the Drive/Lift Switch to DRIVE.
2. While engaging the Interlock Switch, push the Steering Switch to RIGHT or LEFT to turn the wheels in the desired direction. Observe the tires while maneuvering the work platform to ensure proper direction.

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

ELEVATING PLATFORM

1. Select a firm, level surface.
2. Turn the Drive/Lift Switch to LIFT.
3. While engaging the Interlock Switch, push the Control Handle forward.
4. If the machine is not level, the tilt alarm will sound and the machine will not lift or drive. **If the tilt alarm sounds, the platform must be lowered and the machine moved to a firm, level surface before attempting to re-elevate the platform.**

NOTE: Depression mechanism supports will deploy automatically as the platform elevates and will retract after the platform has been lowered completely and has been driven.

Travel with Platform Elevated

NOTE: The machine will travel at reduced speed when the platform is elevated.

1. Check that the route is clear of obstacles (persons, obstructions, holes, drop-offs, bumps, and debris), is level, and is capable of supporting the wheel loads.
2. Check clearances above, below, and to the sides of theplatform.
3. Turn the Drive/Lift Switch to DRIVE.
4. Engage the Interlock Switch and move the Control Handle to FORWARD or REVERSE to travel in the desired direction. The speed of the machine will vary depending on how far from center the Control Handle is moved.
5. If the machine is not level, the tilt alarm will sound and the machine will not lift or drive. **If the tilt alarm sounds, the platform must be lowered and the machine moved to a firm, level surface before attempting to re-elevate the platform.**

Lowering Platform

1. Turn the Drive/Lift Switch to LIFT.
2. Check around the base of the platform to ensure that no one is in contact with the machine. Engage the Interlock Switch and pull back on the Control Handle to lower the platform.

Emergency Lowering

⚠ WARNING ⚠

If the platform should fail to lower, NEVER climb down the elevating assembly.

Stand clear of the elevating assembly while manually lowering the platform.

The Emergency Lowering Valve Knob is located beside the ladder at the rear of the machine (see Figure 2-2).

1. Open the Emergency Lowering Valve by pulling and holding the knob.
2. To close, release the knob. The platform will not elevate if the Emergency Lowering Valve is open.

After Use Each Day

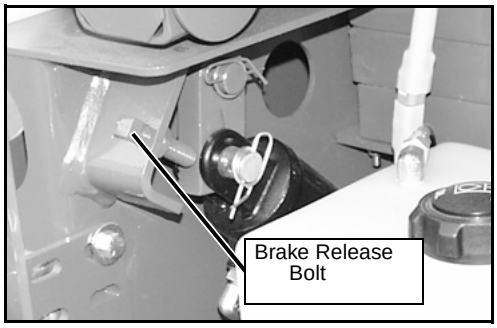
1. Ensure that the platform is fully lowered.
2. Park the machine on a firm, level surface, preferably under cover, secure against vandals, children and unauthorized operation.
3. Turn the Chassis Key Switch to OFF and remove the key to prevent unauthorized operation.

Parking Brake Release

Perform the following procedure 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.

Figure 2-5: Parking Brake Release

1. To release the brakes, loosen the jam nut and bolt until the brakes disengage the tires (Figure 2-5). The machine will now roll when pushed or pulled.
2. To re-engage the brakes, tighten the bolt until the brakes have fully engaged the tires. Secure the bolt with the locknut. Verify that the brakes have fully engaged the rear tires before operating the machine by testing their ability to hold the machine on a 25% (14°) grade.



⚠ WARNING ⚠

Never tow faster than 1 ft./sec. (.3m/sec.).

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

2.4 Transporting the Work Platform

By Crane

Secure the straps to Tie Down/Lifting D-Rings only.

By Forklift

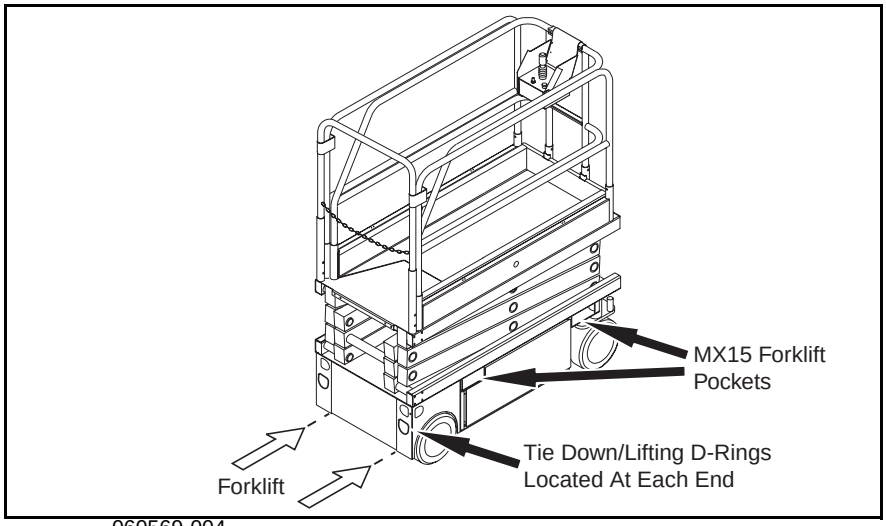
⚠ DANGER ⚠

Forklifting is for transport only.

See specifications for weight of the work platform and be certain that forklift is of adequate capacity to lift the work platform.

Both the MX15 and MX19 may be forklifted from the rear end of the machine between the wheels. The MX15 may also be forklifted from the side, using the forklift pockets shown in the diagram.

Figure 2-6: Transporting the Work Platform



By Truck

Maneuver the work platform into transport position and chock the wheels. Secure the work platform to the transport vehicle by attaching chains or straps of adequate load capacity to the Tie Down/Lifting D-Rings.

⚠ CAUTION ⚠

Overtightening of the chains or straps attached to the Tie Down/Lifting D-Rings may result in damage to the work platform.

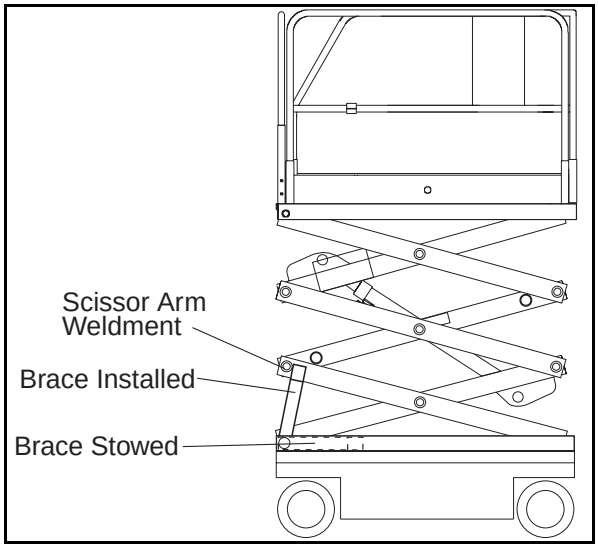
2.5 Maintenance

⚠ WARNING ⚠

Never perform service while the platform is elevated without first blocking the elevating assembly.

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

Figure 2-7: Scissor Brace



Blocking the Elevating Assembly

Scissor Brace Installation

1. Park the work platform on a firm, level surface. Completely unload the platform before installing the Scissor Brace.
2. Verify that the Chassis and Platform Emergency Stop Switches are ON by pulling each button out.
3. Turn and hold the Chassis Key Switch to CHASSIS. Push the Chassis Lift/Lower Switch to UP and elevate the platform approximately 7 ft. (2.1 m).
4. Rotate the Scissor Brace to a vertical position.
5. Carefully lower the platform until the end of the Scissor Arm Weldment rests on the Brace.

Scissor Brace Stowage

1. While holding the Brace, slowly raise the platform, using the Chassis Controls until the end of the Scissor Arm Weldment clears the Scissor Brace.
2. Rotate the Scissor Brace forward to rest on the Chassis.
3. Push the Chassis Lift/Lower Switch to LOWER and completely lower the platform.

BATTERY MAINTENANCE

⚠ WARNING ⚠

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

Always wear safety glasses when working near batteries.

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. ***Wash hands after use.***

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

⚠ DANGER ⚠

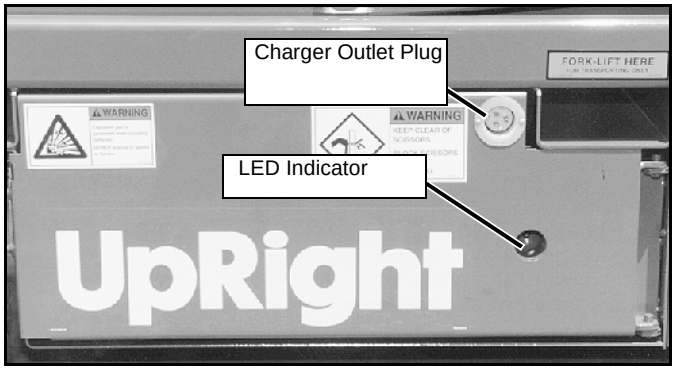
Always replace batteries with UpRight batteries or manufacturer approved replacements weighing 62 lbs. (28 kg) each.

- Check the battery fluid level daily, especially if the work platform is being used in a warm, dry climate. If electrolyte level is lower than 3/8 in. (10 mm) above the plates, add distilled water only. DO NOT use tap water with high mineral content, as it will shorten battery life.
- Keep the terminals and tops of the batteries clean.

BATTERY CHARGING

Figure 2-8: Battery Charger

Charge the batteries at the end of each work shift or sooner if the batteries have been discharged.



⚠ WARNING ⚠

Charge the batteries in a well-ventilated area.

Do not charge the batteries when the work platform is near a source of sparks or flames.

Permanent damage to the batteries will result if the batteries are not immediately recharged after discharging.

Never leave the battery charger operating for more than two days.

Never disconnect the cables from the batteries when the charger is operating.

Keep the charger dry.

1. Check the battery fluid level. If the battery fluid level is lower than 3/8 in. (10 mm) above the plates, add distilled water only.
2. Connect an extension cord to charger outlet plug in Left Module Door. Plug the extension

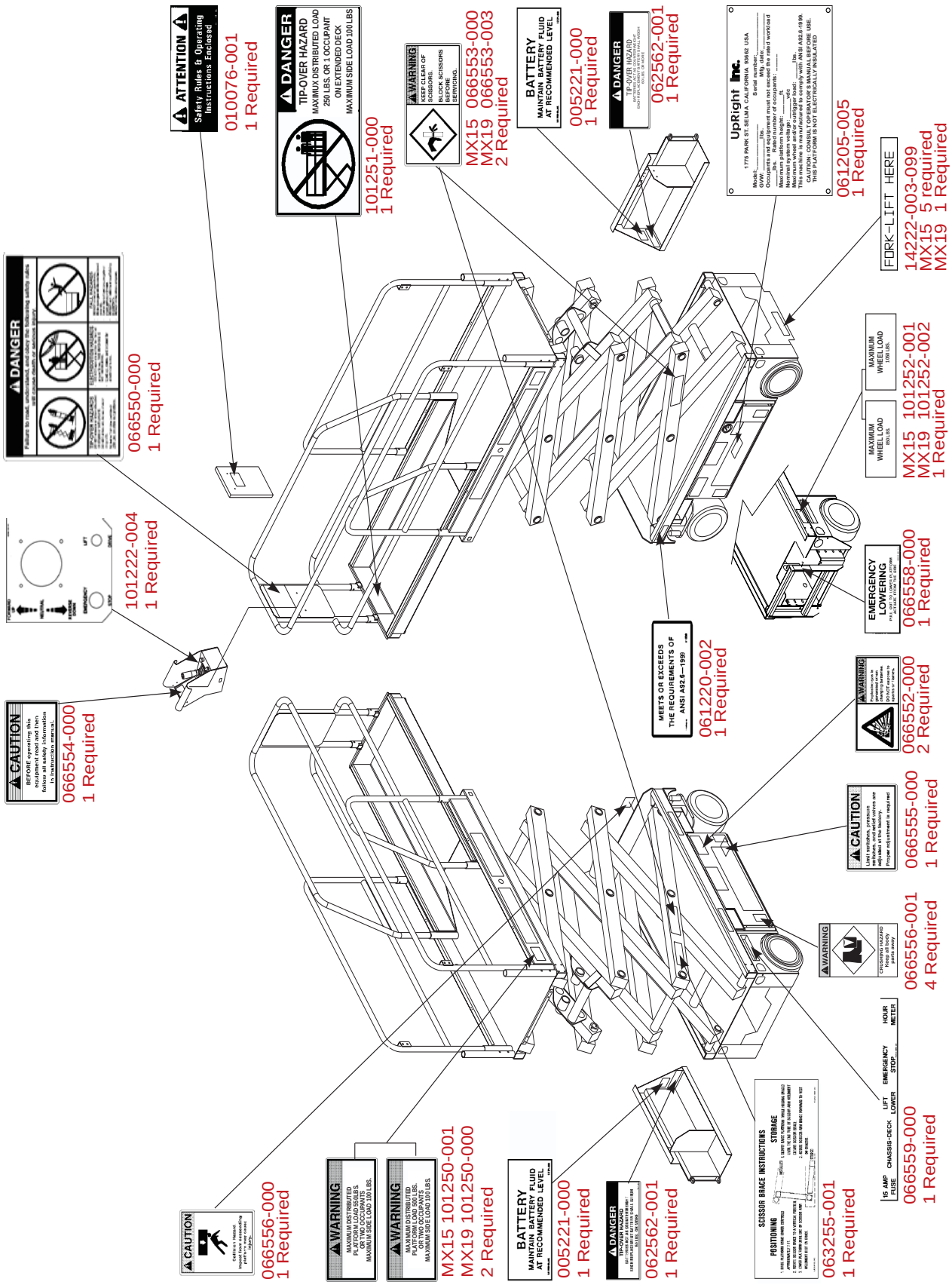
cord (12 guage (1.5 mm^2) minimum conductor diameter and 50 ft. (15 m) maximum length) into a properly grounded outlet of proper voltage and frequency.

3. The charger turns on automatically after a short delay. The LED charge indicator will illuminate. After completion of the charge cycle, the LED will blink, indicating that the charger is in a continuing maintenance mode. DO NOT leave the charger plugged in for more than 48 hours, as permanent damage to the batteries may occur.

NOTE: The battery charger circuit must be used with a GFI (Ground Fault Interrupt) outlet.

DO NOT operate the machine while the charger is plugged in.

Figure 2-9: Label Installation



NOTE: Labels can be ordered by using Part Number located by each label.

Ref. 065612-030, 065712-030

MXSeries label Installation: These labels shall be present and in good condition before operating the work platform. Be sure to read, understand and follow these labels BEFORE operating the work platform.

NOTES:

2.6 PREVENTATIVE MAINTENANCE

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

⚠ WARNING ⚠

Before performing preventative maintenance, know and follow the safety procedures and operating instructions found in this manual.

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

The preventative maintenance checklist has been designed for machine service and maintenance. Please photocopy the following page and use the checklist when inspecting the machine.

Preventative Maintenance 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 2-1: Preventative Maintenance Checklist

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Battery	Check electrolyte level	Daily			
	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	6m			
	Check welds for cracks	Daily			
	Check condition of deck	Daily			
Tires	Check for damage	Daily			
	Check lug nuts (torque to 108 Nm [80 ft. lbs.])	6m			
Hydraulic Pump	Wipe clean	30d			
	Check for leaks at mating surfaces	30d			
	Check for hose fitting leaks	Daily			
	Check mounting bolts for proper torque	6m			
Drive Motors	Check for operation and leaks	Daily			

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	6m			
	Check mounting pin pivot bolts for proper torque	6m			
	Check elevating arms for bending	6m			
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	6m			
	Check seals for leaks	30d			
	Inspect pivot points for wear	6m			
	Check fittings for proper torque	6m			
Entire Unit	Check for and repair collision damage	Daily			
	Check fasteners for proper torque	6m			
	Check for corrosion-remove and repaint	6m			
	Lubricate	30d			
Labels	Check for peeling, missing, or unreadable labels & replace	Daily			

2.7 SPECIFICATIONS

ITEM	MX15	MX19
Platform Size (Inside minimum)		
Standard w/Deck	22.5 in. x 100 in. (.57 m x 2.54 m)	22.5 in. x 100 in. (.57 m x 2.54 m)
Maximum Platform Capacity		
Standard w/Deck Extension	550 lbs. (250 kg)	500 lbs. (250 kg)
Maximum Number of Occupants		
Standard w/Deck Extension	2 People	2 People
on Extension	1 Person	1 Person
Height		
Working Height	21 ft. (6.3 m)	25 ft. (7.6 m)
Maximum Platform Height	15 ft. (4.5 m)	19 ft. (5.8 m)
Maximum Drivable Height	15 ft. (4.5 m)	19 ft. (5.8 m)
Dimensions		
Weight	2300 lbs. (890 kg)	3100 lbs. (1406kg)
Overall Width	30 in. (760 mm)	30 in. (760 mm)
Overall Height (Lowered)	74.9 in. (1.89 m)	79.25 in. (2.01 m)
Overall Length (Deck in)	68.75 in. (1.75 m)	68.75 in. (1.75 m)
Drivable Height	15 ft. (4.5 m)	19 ft. (5.8 m)
Drive Speed		
Platform Lowered	2.3 mph (3.7 km/h)	2.3 mph (3.7 km/h)
Platform Raised	.62 mph (1 km/h)	.62 mph (1 km/h)
Energy Source	24V battery pack (4-220 ampere hour, 6 Volt batteries, min. wt. 62 lbs. (28 kg) each), 4 HP DC electric motor	24V battery pack (4-220 ampere hour, 6 Volt batteries, min. wt. 62 lbs. (28 kg) each), 4 HP DC electric motor
System Voltage	24 VDC	24 VDC
Battery Charger	20 AMP, 120 VAC 60 Hz, Automatic	20 AMP, 120 VAC 60 Hz, Automatic
Hydraulic Tank Capacity	3.4 gal (12.9 L)	3.4 gal (12.9 L)
Maximum Hydraulic System Pressure	2500 psi (172 Bar)	3500 psi (241 Bar)
Lift System	One Single Stage Lift Cylinder	One Single Stage Lift Cylinder
Drive Control	Motor Control	Motor Control
Control System	Control Handle with Interlock Switch, Rotary Drive/Lift Switch, and Red Mushroom Emergency Stop Switch	Control Handle with Interlock Switch, Rotary Drive/Lift Switch, and Red Mushroom Emergency Stop Switch
Drive System	Dual Front Wheel Hydraulic Motors	Dual Front Wheel Hydraulic Motors
Tires	12 in. (30.5 cm) diameter solid rubber, Non-marking	12 in. (30.5 cm) diameter solid rubber, Non-marking
Parking Brake	Dual, Spring Applied, Hydraulic Release	Dual, Spring Applied, Hydraulic Release
Turning Radius (inside)	1 in. (25 mm) Inside	1 in. (25 mm) Inside
Maximum Gradeability	25% (14°)	25% (14°)
Wheel Base	48.5 in. (1.23 m)	48.5 in. (1.23 m)
Guardrails	39 in. (1.02 m	39 in. (1.02 m)
Toeboard	6 in. (152 mm)	6 in. (152 mm)

*Specifications are subject to change without notice. Hot weather or heavy use may affect performance.
The MX Series meets or exceeds all applicable requirements of OSHA and ANSI A92.6-1999

Section 3

MAINTENANCE

3.1 INTRODUCTION

Reference: • Section 2 for recommended maintenance intervals.

⚠ 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.

This section contains instructions for the maintenance of the work platform. Procedures for the inspection, adjustment, 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 repairing the machine.

WIRE COLOR

Wire color is 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.

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.

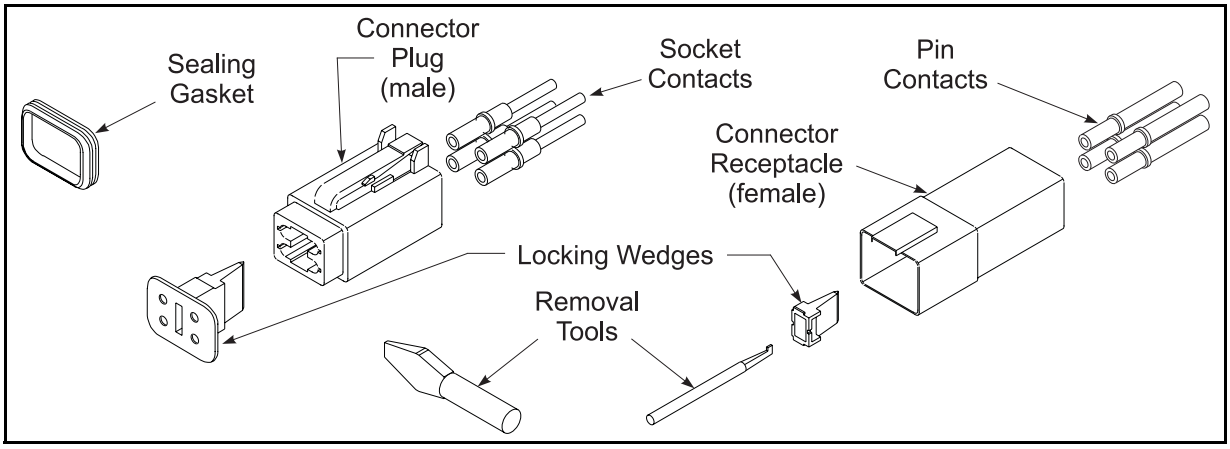
- 0-3000 psi (0-207 bar) Hydraulic Pressure Gauge with Adapter Fittings (UpRight P/N 014124-030)
- 0-5000 psi (0-344 bar) Hydraulic Pressure Gauge with Adapter Fittings (UpRight P/N 063971-000)
- Small UpRight Connector Field Kit (UpRight P/N 030899-000)
- Large UpRight Connector Field Kit (UpRight P/N 030898-000)
- Inclinometer (UpRight P/N 010199-000)

3.4 UPRIGHT CONNECTORS

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

Figure 3-1: UpRight Connector Kit

Figure 3-2: Plugs and Receptacles, UpRight 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.

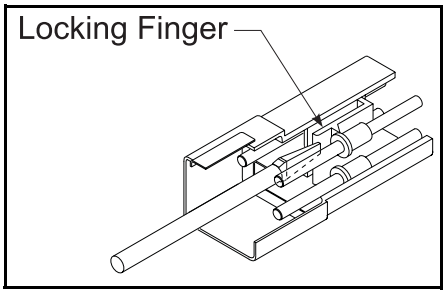
3. Check all parts for damage. Replace all parts which are damaged or worn.
4. Replace or recrimp the wires and contacts. Refer to “Crimping” procedure.

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 recrimp the wires and contacts. Refer to “Crimping” procedure.

Releasing Locking Fingers

Figure 3-3: Locking Finger, UpRight 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 blade 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

1. Strip .25 inch (6 mm) from the wire.

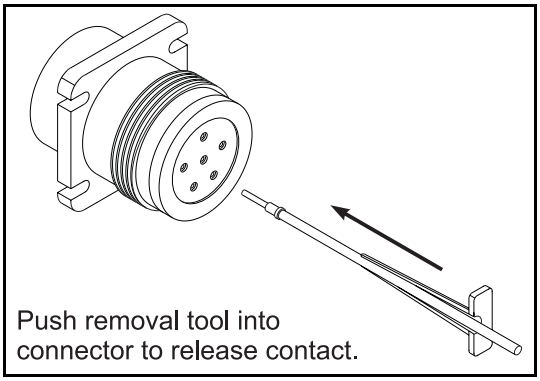
NOTE: Complete crimping instructions are included in each Field Kit.

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 3-4: Heavy Duty UpRight 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 SUPPORTING THE ELEVATING ASSEMBLY

⚠ WARNING ⚠

***NEVER** perform service in the elevating assembly area while the platform is elevated without first blocking the elevating assembly.*

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

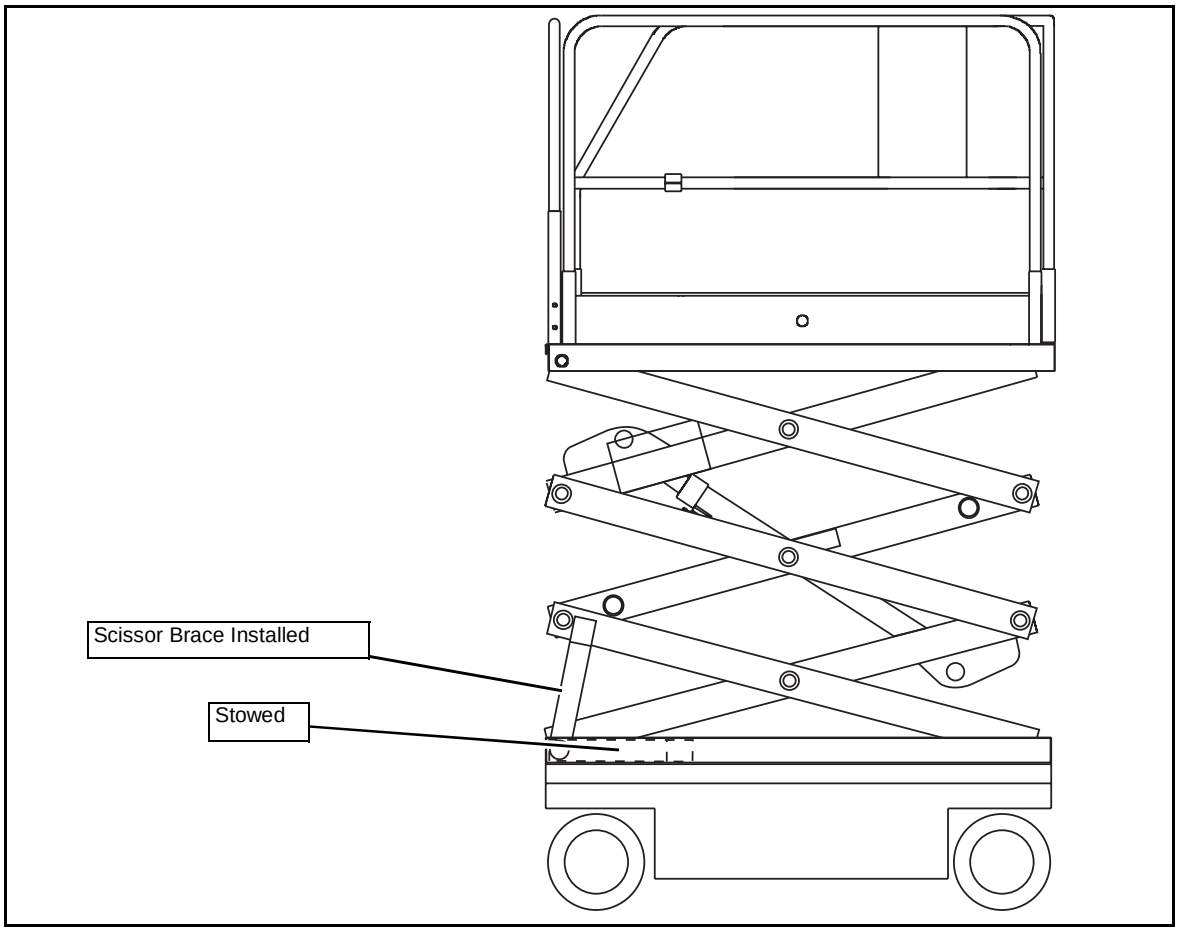
INSTALLING THE BRACE

1. Park the work platform on a firm, level surface.
2. Verify that Chassis and Platform Emergency Stop Switches are ON.
3. Turn and hold the Chassis Key Switch to CHASSIS.
4. Push the Chassis Lift Switch to UP and elevate the platform approximately 7 feet (2.1 m) for the MX15 or 9 feet (2.7 m) for the MX19.
5. Rotate the Scissor Brace towards the rear, holding it perpendicular to the scissor tube.
6. Push the Chassis Lift Switch to the DOWN position and gradually lower the platform until the scissor tube rests on the brace.

REMOVING THE BRACE

1. Turn and hold the Chassis Key Switch to CHASSIS. Push the Chassis Lift Switch to the UP position and gradually raise the platform until the scissor brace clears the scissor tube.
2. Rotate the scissor brace towards the front so that it rests on the chassis.
3. Push the Chassis Lift Switch to the DOWN position, and completely lower the platform.
4. Turn the Chassis Key Switch to DECK.

Figure 3-5: Supporting the Elevating Assembly



3.6 Battery Maintenance

⚠ WARNING ⚠

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

Always wear safety glasses when working near batteries.

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. ***Wash hands after use.***

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

⚠ DANGER ⚠

Always replace batteries with UpRight batteries or manufacturer approved replacements weighing 62 lbs. (28 kg) each.

Battery Inspection and Cleaning

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

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

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

When night air temperatures fall below 65°F (18°C), batteries charged in unheated areas should be placed on charge as soon as possible after use. Under such conditions, a four hour equalization charge once a week in the early afternoon will improve the state of charge and battery life.

Battery Charging

Charge battery as follows:

1. Check the fluid level. The electrolyte level should be at least 3/8 in. (10 mm) above the battery plates. If it is lower, add distilled water only.
2. Connect the charger plug to a properly grounded outlet of the proper voltage and frequency with an extension cord [12 gauge (1.5 mm²) conductor minimum and 50 ft. (15 m) in length maximum].
3. The charger turns on automatically after a short delay. The LED indicator will come on.
4. The charger automatically drops to trickle mode after approximately three hours. The LED charge indicator will blink. Charging may continue for up to 48 hours or until the machine is needed. DO NOT charge for more than 48 hours.

⚠ WARNING ⚠

Charge the battery only in a well-ventilated area.

Do not charge the battery when the work platform is in an area containing sparks or flames.

Permanent damage will result if the battery is not immediately recharged after discharging.

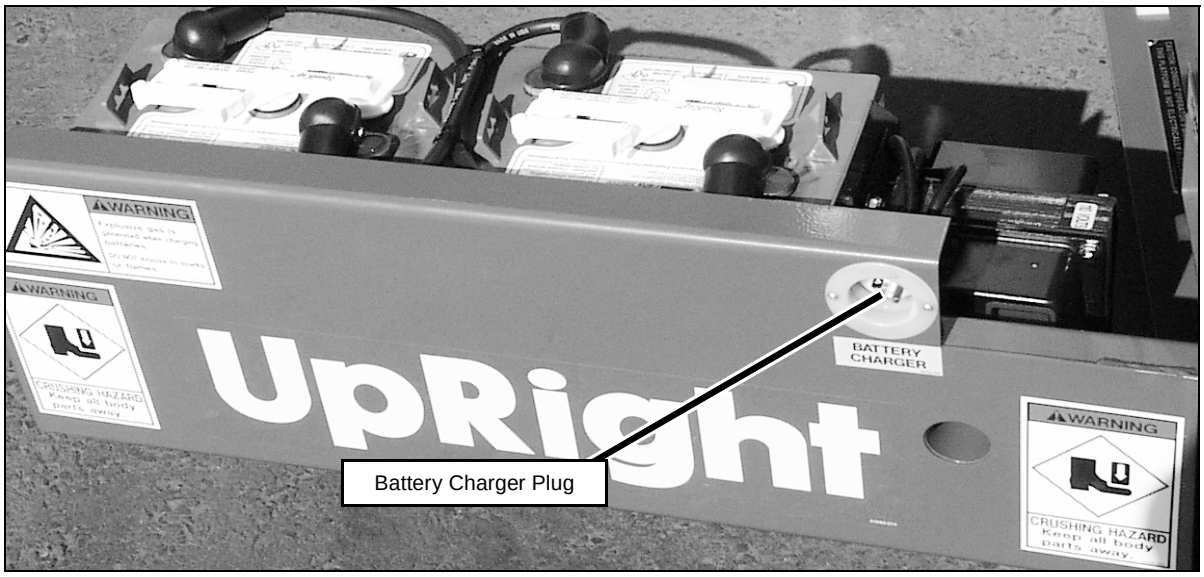
Never leave the charger unattended for more than two days.

Never disconnect the cables from the battery when the charger is operating.

DO NOT operate the machine while the charger is plugged in.

Keep the charger dry.

Figure 3-6: Batteries and Charger



BATTERY CELL EQUALIZATION

The specific gravity of the electrolyte in the battery cells should be equalized monthly. To do this, charge batteries as outlined in Battery Charging. After this initial charge, check the electrolyte level in all cells and add distilled water as necessary. Then, turn the charger on for an additional eight hours.

After equalization, the specific gravity of all cells should be checked with a hydrometer. The temperature corrected specific gravity in this state should be 1.260. If any corrected readings are below 1.230, the batteries containing such cells should be replaced.

Do not check the specific gravity in a cell to which water has just been added. If there is not enough electrolyte in a fully charged cell to obtain a sample for the hydrometer, add water and continue charging for one to two hours to adequately mix the water and electrolyte.

3.7 SWITCH ADJUSTMENTS

⚠ WARNING ⚠

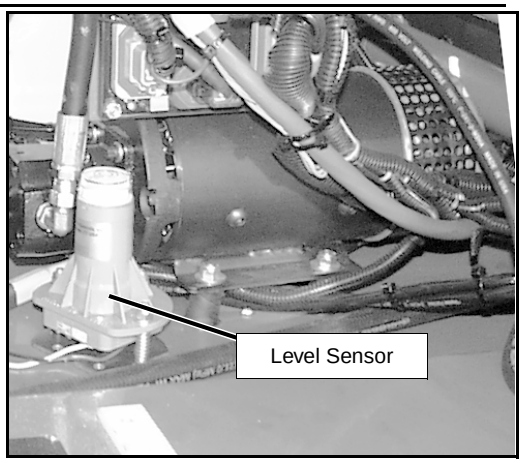
Always use the elevating assembly brace whenever it is necessary to enter the elevating assembly when the platform is elevated.

LEVEL SENSOR

INTRODUCTION

The Level Sensor has three wires: red-power (24 v in), black-ground, white-output (24 v out). To verify that the sensor is working properly, there is one LED under the sensor that indicates the sensor is off level.

Figure 3-7: Level Sensor



ADJUSTMENT

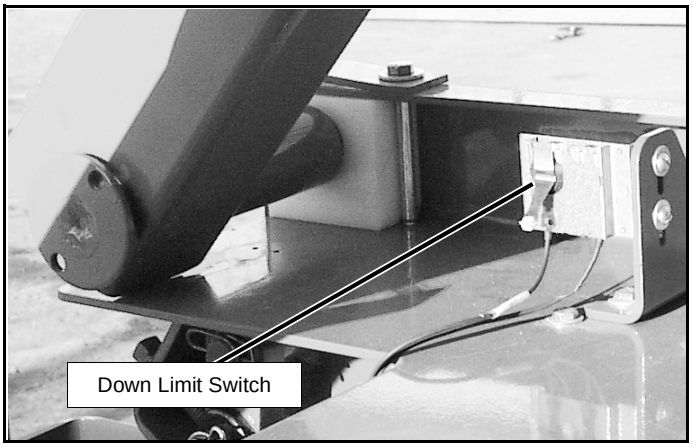
1. Place the machine on a firm level surface ± ¼°.
2. Use the Inclinometer (P/N: 10119-000-00) to ensure front and rear of chassis is level ± ¼°.
3. Adjust the three leveling locknuts until the bubble is centered in the circle on the attached bubble level.

TEST

Raise the platform approximately 7 feet, then push the level sensor to the side. The red LED should turn on, and the tilt alarm should sound.

DOWN LIMIT SWITCH

Figure 3-8: Down Limit Switch



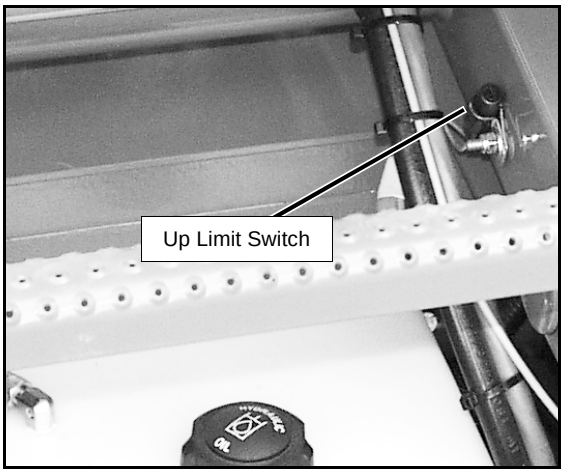
The Down Limit Switch cuts power to the High Speed Circuit and supplies power to the Level Sensor Circuit when the platform is elevated.The switch is located on the left side of the chassis at the rear of the machine.

The down limit adjustment for MX15 is 35 inches (89cm); 45 inches (114cm) for the MX19.

No adjustment of the switch should be necessary.

UP LIMIT SWITCH

Figure 3-9: Up Limit Switch



The Up Limit Switch cuts power to the Lift Solenoid when the platform is fully elevated, preventing the Lift Cylinder from bottoming out. The Up Limit Switch is a mercury switch that is located just in front of the right rear scissor pivot on the lower inner scissor assembly.

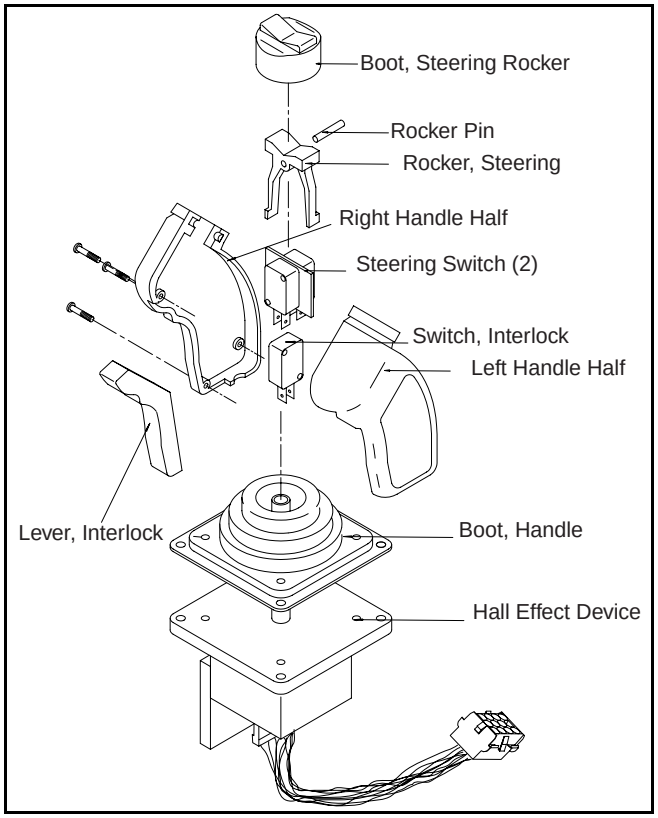
To adjust the switch, disconnect the wires to the switch and install a jumper, connecting the wires together. Slowly elevate the platform to full height. Place a mark on the chassis where the scissor slide block currently is. Lower the platform just enough to move the slide block ¼-½ in. (7-13 mm). Mark this location. Install a continuity tester or ohmmeter across the Up Limit Switch. Rotate the switch until it just opens. Secure the switch with the mounting screw and reconnect the wires to the switch

Lower and raise the platform to verify the adjustment. The slide block should stop at the second mark on the Chassis.

CONTROL HANDLE

Figure 3-10: Control Handle

1. Remove the handle if necessary from Platform Control box.
2. Remove and replace parts as needed. Refer to Section 6 for repair parts numbers.



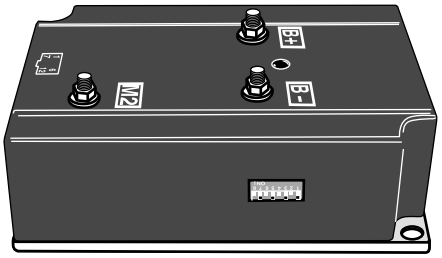
3.8 Motor Controller and I/O Board Dip Switch Settings

NOTE: Before dip switch settings will take effect, power must be disconnected or Emergency Stop switches must be depressed.

Controller

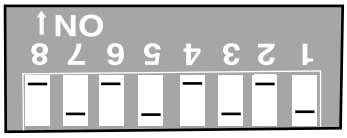
Figure 3-11: Controller

1	2	3	4	5	6	7	8
off	on	off	on	off	on	off	on



The above table shows the default dip switch settings on the controller box when the machine leaves the factory. The following adjustments may be made to these settings:

Switches 3 & 4 determine the elevated “creep” speed. If the machine does not operate at the specified speed at the default settings, use the following table to adjust the dip switch settings.



	3	4
1(slowest)	off	off
2	on	off
3 (default)	off	on
4 (fastest)	on	on

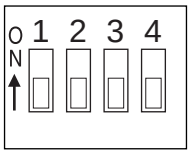
Switches 5 & 6 determine the deceleration time. Switch 5 is for the deceleration rate while the platform is lowered. Switch 6 is for the elevated rate.

Deceleration Speed	5	6
.24 sec.	off	off
1.27 sec.	on	on

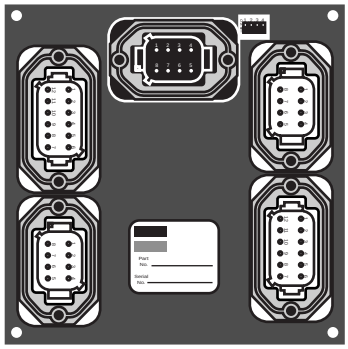
I/O Board

Figure 3-12: I/O Board

1	2	3	4
off	off	off	off



The above table shows the default dip switch settings on the I/O board when the machine leaves the factory. Switches 1 and 2 should not be changed. Switches 3 and 4 work together to determine the optional alarm settings.



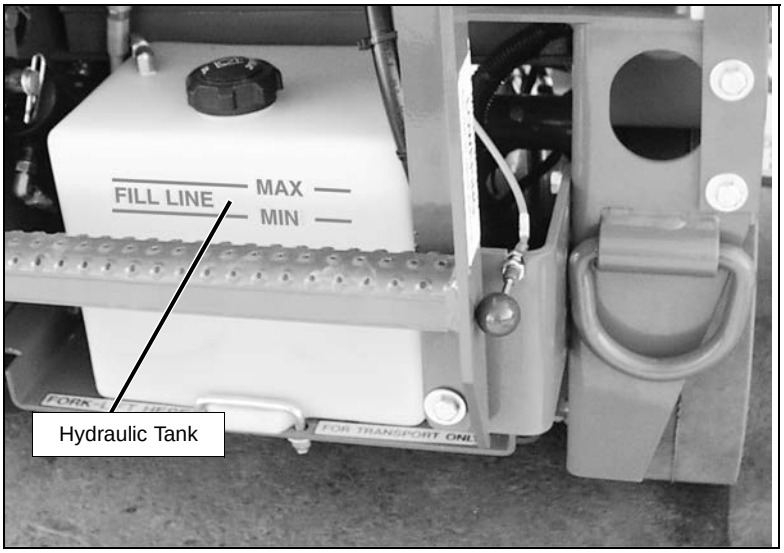
3	4	Result
off	off	Down alarm only
on	off	Down and Reverse alarm
off	on	Drive and Down alarm
on	on	All Motion alarm

3.9 Hydraulic Oil Tank and Filter

Fluid Level

With the platform **fully lowered**, check the oil level through the side of the tank. The level should be between the “max” and “min” lines.

Figure 3-13: Hydraulic Oil Tank



Oil and Filter Replacement

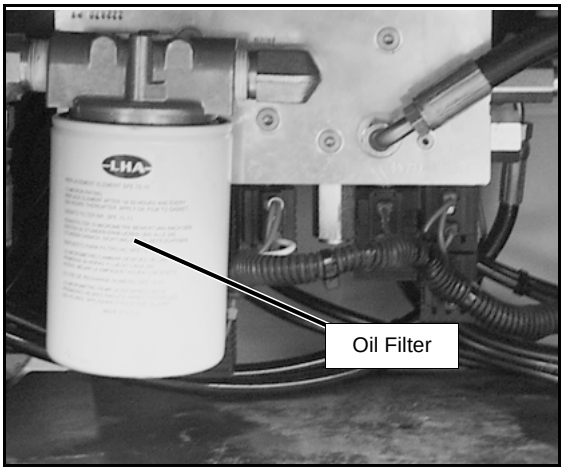
1. Operate the work platform for 10-15 minutes to bring the hydraulic oil up to normal operating temperature.

⚠ CAUTION ⚠

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

2. Provide a suitable container to catch the drained oil. Hydraulic tank has a 3.4 gal. (12.9 liter) capacity.
3. Remove the drain plug and allow all oil to drain. Dispose of hydraulic fluid properly--contact your local oil recycler.

Figure 3-14: Hydraulic Oil Filter from left side



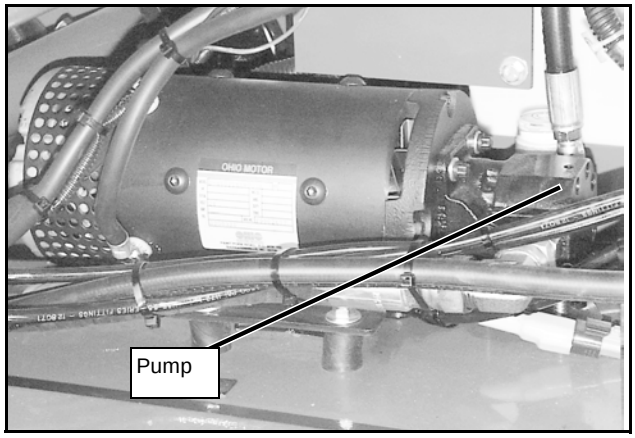
4. Clean magnet on drain plug and reinstall.
5. Unscrew the filter (located beside valve block, easily accessed through the left module) from the filter assembly.
6. Apply a thin film of clean hydraulic oil to the gasket of the replacement filter.
7. Screw the replacement filter onto the filter head until the gasket makes contact, then rotate the filter 3/4 of a turn further.
8. Fill the hydraulic reservoir with hydraulic oil until the oil level is between the minimum and maximum lines on the tank. Do not fill above the maximum line on the tank. Hydraulic tank has a 3.4 gal. (12.9 liter) capacity.
9. Operate all machine functions and recheck the fluid level. Add fluid if necessary.

3.10 Hydraulic Pump

Removal

NOTE: If the hydraulic tank has not been drained, plug the hoses to prevent excessive fluid loss.

Figure 3-15: Hydraulic Pump



1. Mark, disconnect, and plug the hose assemblies.
2. Loosen the capscrews and remove the pump assembly from the motor.

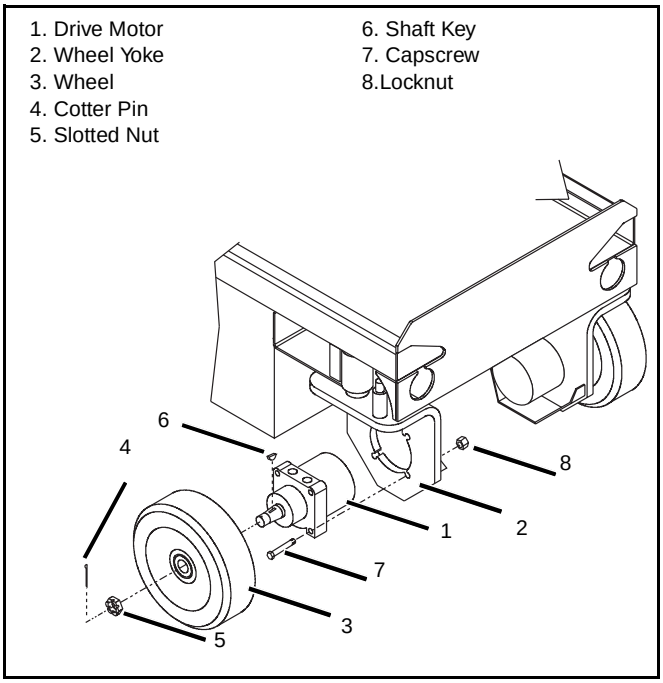
Installation

1. Lubricate the pump shaft with general purpose grease and attach the pump to the motor with the capscrews.
2. Using a crisscross pattern, torque each capscrew a little at a time until all capscrews are torqued to 20 ft/lbs (27 Nm).
3. Unplug and reconnect the hydraulic hoses.
4. Check the oil level in the hydraulic tank before operating the work platform.

3.11 Hydraulic Drive Motors and Hubs

Removal

Figure 3-16: Drive Motor Installation



1. Block the rear wheels to prevent the machine from rolling.
2. Use a 1 ton (1000 kg) capacity jack to raise the front of the machine. Place two 1 ton (1000 kg) jack stands under the machine. Remove jack.
3. Remove the cotter pin, slotted nut, wheel, and shaft key.

NOTE: Before disconnecting hoses, thoroughly clean off all outside dirt around fittings. (After disconnecting hoses and before removing from vehicle, IMMEDIATELY plug port holes.)

4. Tag, disconnect, and plug the hose assemblies to prevent foreign material from entering.
5. Remove the locknuts, capscrews, and drive motor.

Installation

1. Position the drive motor in the wheel yoke and secure with capscrews and locknuts.
2. Install the shaft key, wheel, and slotted nut. Torque the slotted nut to 75 ft/lbs (102 Nm). Install a new cotter pin. Do not back-off the nut to install the cotter pin.
3. Remove the plugs from the hose assemblies and connect to the drive motor.
4. Lift the platform with the jack and remove jack stands, then lower the jack and remove. Operate the drive system and check for leaks.

3.12 HYDRAULIC PRESSURE SETTINGS

Check the hydraulic pressures whenever the pump, manifold, or relief valves have been serviced or replaced.

⚠ WARNING ⚠

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

The oil in the hydraulic system is under very high pressure which can easily cause severe cuts. Obtain medical assistance immediately if cut by hydraulic oil.

MAIN RELIEF VALVE

1. Operate the hydraulic system 10-15 minutes to warm the oil.
2. Slowly drive the machine to within 3 inches of a solid, immovable brick wall. Ease the machine forward until the front of the chassis is in solid contact with the wall.
3. Insert a 5000 psi (344bar) pressure gauge into the test port.
4. Loosen the locknut or remove the cover on the Main Relief Valve and turn the adjusting screw counterclockwise two full turns.
5. Unhook the Platform Controls from the guardrail so that the machine may be operated from the ground. Slowly push the control lever in the direction of the wall.
6. Slowly turn the Main Relief Valve adjusting screw clockwise to increase the pressure until the gauge reads 3500 psi (241 bar) for the MX19, or 2500 psi (172 bar) for the MX15.
7. Tighten locknut or replace Main Relief Valve cover and torque to 6 ft/lbs (8 Nm.).

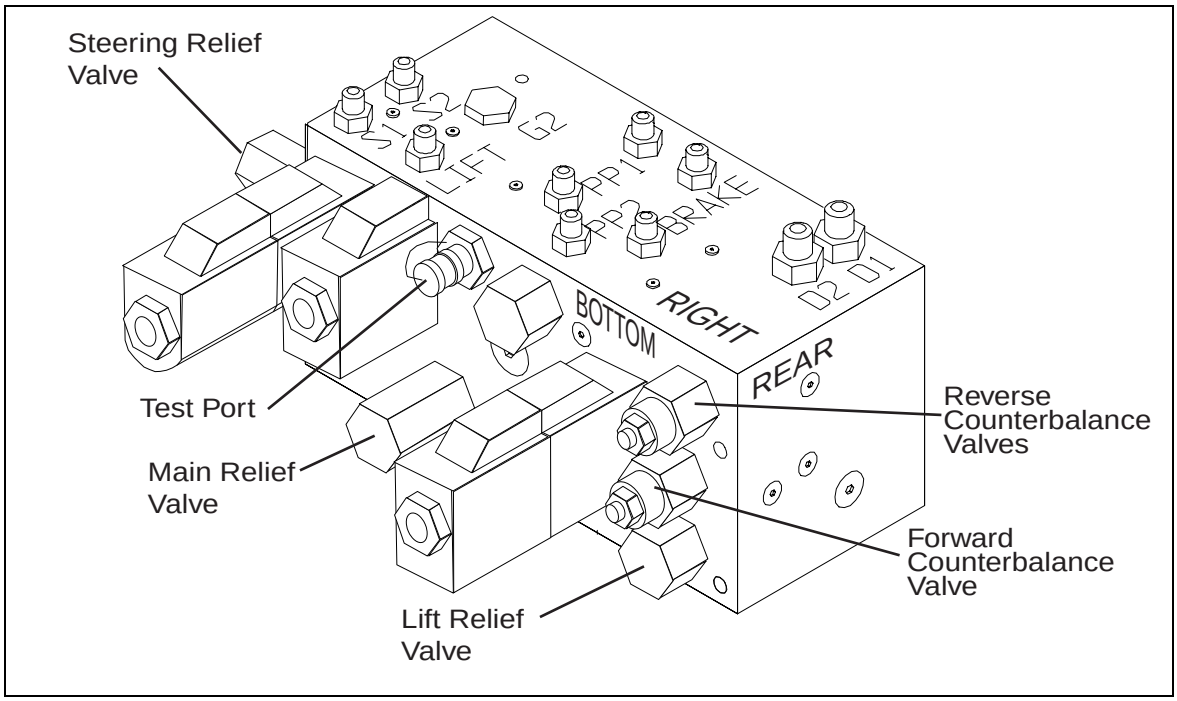
LIFT RELIEF VALVE

1. Operate the hydraulic system 10-15 minutes to warm the oil.
2. Loosen locknut or remove cover on the Lift Relief Valve and turn adjusting screw counter-clockwise two full turns.
3. Place the maximum rated load (see Specifications Table, Section 2) on the platform.
4. Turn and hold the Chassis Key Switch to CHASSIS. Push the Chassis Lift Switch to UP position and hold it there.
5. Slowly turn the Lift Relief Valve adjusting screw clockwise to increase the pressure until the platform just begins to rise.
6. Release the Chassis Lift Switch. Tighten locknut or replace Lift Relief Valve cover and torque to 6 ft/lbs (8 Nm.).

STEERING RELIEF VALVE

1. Operate the work platform for 10-15 minutes to bring the hydraulic oil up to normal operating temperature.
2. Connect a 3000 psi (207 bar) pressure gauge into the test port.
3. Loosen locknut or remove cover on the Steering Relief Valve and turn adjusting screw counterclockwise two full turns.
4. While one person holds the Steering Switch to steer right or left, slowly turn the Steering Relief Valve adjusting screw clockwise to increase the pressure until the gauge reads 1200 psi (82.7 bar).
5. Tighten locknut or replace Steering Relief Valve cover and torque to 6 ft/lbs (8 Nm.).
6. Remove gauge and replace cap.

Figure 3-17: Hydraulic Manifold Test Ports, from right side



COUNTERBALANCE VALVES

1. Operate the work platform for 10-15 minutes to bring the hydraulic oil up to normal operating temperature.
2. Remove test port cap and install the pressure gauge assembly.
3. Lift the work platform and block front wheels off the ground.
4. Loosen the locknuts on Counterbalance Valves.
5. With the Chassis Key Switch on DECK and the Drive/Lift Switch in DRIVE, depress the Interlock Lever and slowly pull the Control Lever to REVERSE to drive the wheels.
6. Adjust the Forward Counterbalance Valve by turning the adjustment screw until the pressure gauge indicates 800 psi (55 bar).
7. Slowly push the Control Lever to FORWARD to drive the wheels.
8. Adjust the Reverse Counterbalance Valve by turning the adjustment screw until the pressure gauge indicates 800 psi (55 bar).
9. Check the settings by slowly moving the Control Lever FORWARD, then REVERSE, checking the gauge to ensure pressures are properly set. Readjust as needed.
10. Tighten locknuts on valves to 6 ft/lbs (8 Nm.). Remove blocks and lower the work platform to the ground.
11. Remove the gauge from the gauge port and reinstall cap.
12. Check for proper operation of the drive system and brake.

3.13 HYDRAULIC MANIFOLD

It is not necessary to remove the manifold to perform all maintenance procedures. Decide beforehand as to whether or not the manifold should be removed before maintenance procedures begin.

REMOVAL

1. Make sure that the platform is completely lowered.
2. Tag and disconnect the solenoid valve wires.
3. Place a container of adequate capacity (approximately 1 gallon (3.79 L)) beneath the valve block to catch the oil. Tag, disconnect, and plug hydraulic hoses.
4. Remove the bolts that hold the manifold to the mounting bracket, being careful not to damage the ground wires.
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 3-18 often to aid in disassembly and assembly.

1. Remove coils from solenoid valves.
2. Remove spool valve covers and spool valves.
3. Remove solenoid valves, relief valves, and counterbalance valves.
4. Remove fittings and plugs.

CLEANING AND INSPECTION

1. Wash the manifold in cleaning solvent to remove built up contaminants, 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. Refer to Table 3-1 (Page 3-26) for the proper torque values when installing any hydraulic component.

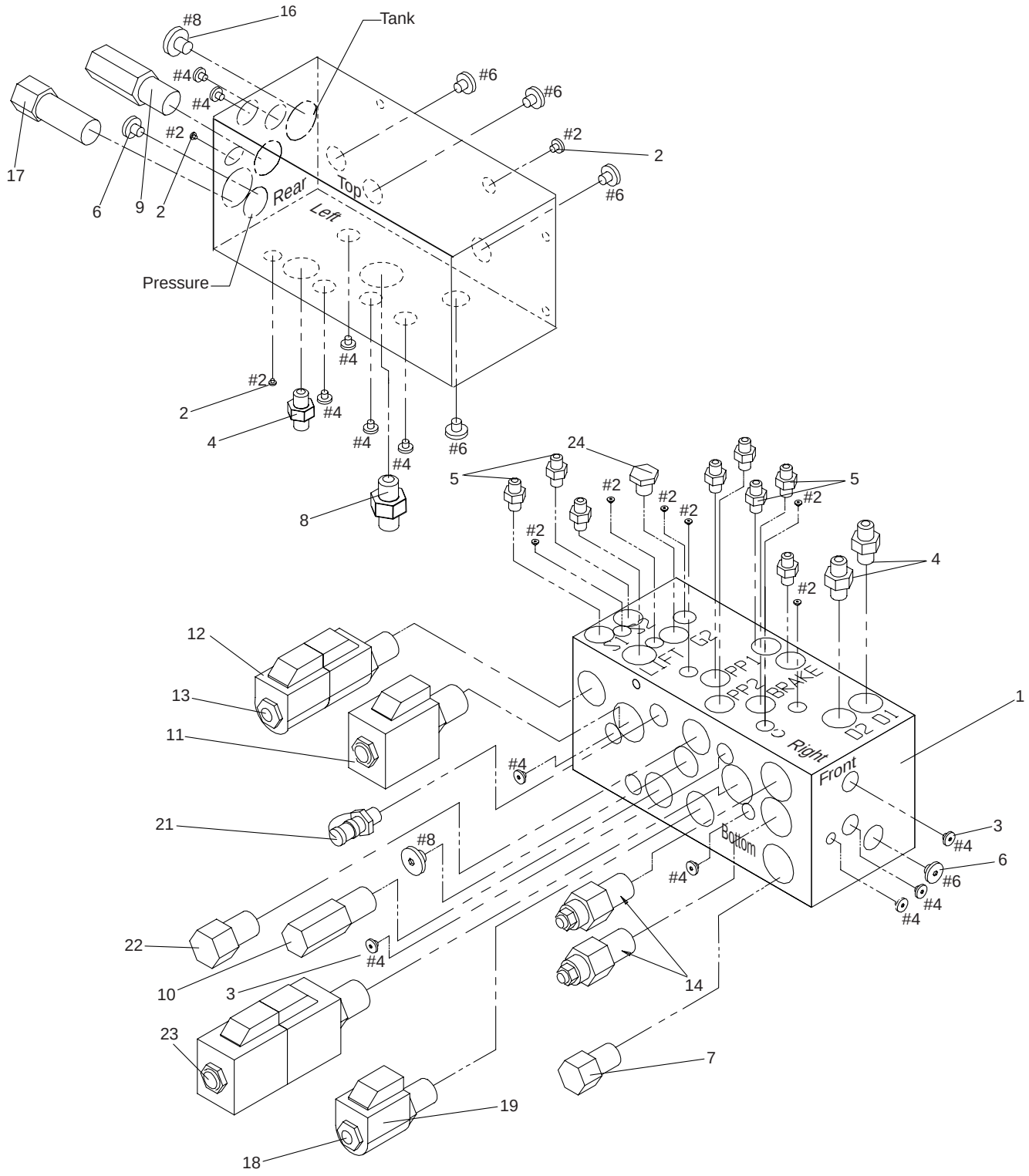
1. Install fittings and plugs.
2. Install counterbalance valves, relief valves, solenoid valves, and spool valves.
3. Install coils on solenoid valves.

INSTALLATION

NOTE: Refer to Table 3-1 on Page 3-26 for the proper torque values when installing any hydraulic component.

1. Attach manifold assembly to mounting brackets with bolts.
2. Connect solenoid leads (as previously tagged).
3. Connect hydraulic hoses. Be certain to tighten hoses to manifold.
4. Operate each hydraulic function and check for proper function and leaks.
5. Check the level of the hydraulic fluid in the tank.
6. Adjust all hydraulic pressures according to instructions on Page 3-12.

Figure 3-18: Hydraulic Manifold



1. CONTROL VALVE BLOCK
2. FITTING #2 PLUG
3. FITTING #4 PLUG
4. FITTING STRAIGHT 6MB - 6MJ
5. FITTING STR 4MBH - 4MJ
6. FITTING PLUG #6
7. RELIEF VALVE-- 2000 PSI (138 BAR
8. FITTING 8MB-8MJX
9. RELIEF VALVE, STEERING--1200 PSI (83 BAR)
10. RELIEF VALVE, MAIN--3000 PSI (207 BAR)
11. LIFT SOLENOID
12. COIL
13. STEERING SOLENOID
14. COUNTERBALANCE VALVE
16. FITTING PLUG #8
17. FLOW DIVIDER VALVE (1.0 GPM)
18. DEPRESSION MECHANISM VALVE W/ COIL
19. COIL
21. FITTING GAUGE
22. CHECK VALVE
23. DRIVE SOLENOID W/ COILS
24. FITTING, HEX PLUG 9MM

3.14 BRAKE CYLINDER

The brake cylinder is located between the rear wheels at the rear of the chassis.

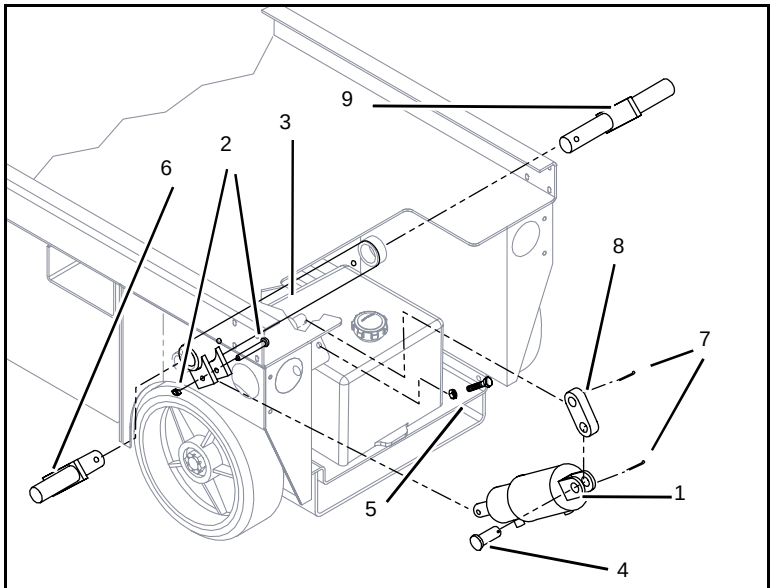
REMOVAL

1. Block the wheels to prevent the work platform from rolling when the brake is removed.
2. Remove the adjustment nut and bolt.
3. Tag and disconnect the hose assemblies and cap the openings to prevent foreign material from entering.
4. Remove the shoulder bolt and locknut that mount the cylinder rod to the brake tube.
5. Remove the cotter pin and pivot pin from the rear cylinder mount. Remove the cylinder.

Figure 3-19: Brake Cylinder Installation

DISASSEMBLY

1. Remove the snap ring from the barrel assembly and pull out the cylinder.
2. Completely disassemble the cylinder including removing the piston.
3. Remove all the seals and O-rings, noting their location to aid in re-assembly.



1. Brake Cylinder
2. Rod End Shoulder Bolt and Locknut
3. Brake Tube
4. Clevis End Pivot Pin
5. Adjustment Bolt and Nut
6. Left Brake
7. Cotter Pin
8. Cylinder Link
9. Right Brake

CLEANING AND INSPECTION

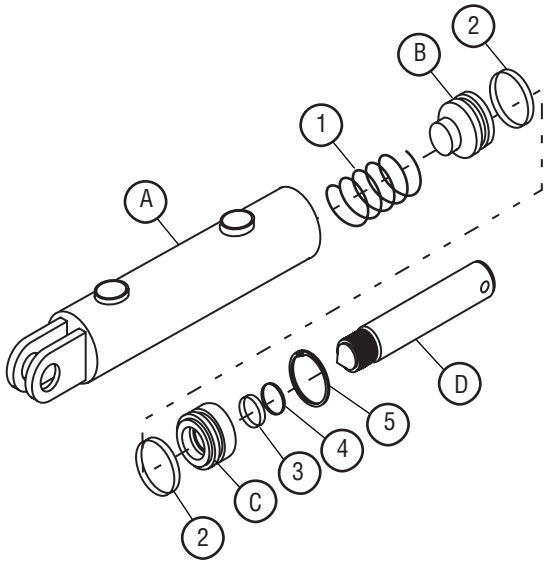
1. Wash all the metal parts in cleaning solvent and blow dry with filtered compressed air.
2. Inspect all the threaded components for stripped or damaged threads.
3. Check the inside surface of the cylinder barrel for scoring or excessive wear.
4. Check the piston and headcap for scoring or excessive wear.
5. Inspect the surface of the shaft for scoring or excessive wear.

ASSEMBLY

1. Lubricate and install new seals and O-rings.
2. Install the piston onto the shaft.
3. Install the headcap on the shaft.
4. Install the spring.
5. Lubricate the piston seal with clean hydraulic fluid and install the shaft assembly in the inner cylinder barrel.
6. Install the snap ring.

INSTALLATION

Figure 3-20: Brake Cylinder Assembly



A. Cylinder
B. Piston
C. Head
D. Rod

Seal Kit Includes:

Description	Qty
1. Spring	1
2. Seal	2
3. Seal	1
4. Wiper	1
5. Snap Ring	1

Seal Kit Part Number
066604-010

1. Install the clevis end pivot pin through the cylinder clevis and cylinder link and secure with a new cotter pin.
2. Install the rod end shoulder bolt through the cylinder rod and brake tube mounting tabs, and secure with the locknut.
3. Install the hydraulic hoses.
4. Install the adjustment bolt and locknut. Tighten the bolt until the brakes have fully engaged the tires. Secure the bolt with the locknut.
5. Lower the machine and operate the drive circuit to check that the brakes retract and clear the tires when driving and fully engage the tires when stopped. Verify that the brakes fully engage the rear tires by testing their ability to hold the machine on a 25% (14°) grade. If they do not, tighten the adjustment bolt until they do. Secure the bolt with the locknut.
6. Check for leaks.

3.15 STEERING CYLINDER

REMOVAL

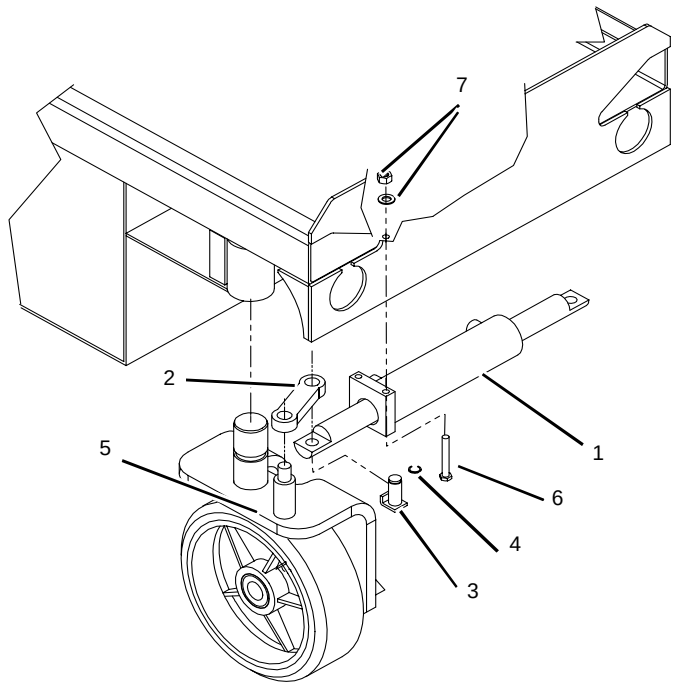
1. Turn the wheels to the straight position.
2. Elevate the platform and block the elevating assembly with the brace (see “Supporting the Elevating Assembly” on Page 3-4).
3. Tag and disconnect the hose assemblies from the cylinder fittings and immediately cap the openings to prevent foreign material from entering.
4. Remove the retaining rings from the pivot pins.
5. While supporting the cylinder, remove the locknuts, washers, and capscrews. Remove the cylinder.

DISASSEMBLY

1. Unscrew the internal head caps from the barrel, removing one head cap assembly from the rod.
2. Withdraw the other head cap, piston, and shaft assembly from the barrel tube.
3. Remove the snap rings from the piston washers and remove the piston washers, piston, O-ring, and head cap.
4. Remove the rod wiper, U-cup, O-ring, and backup ring from the headcap, and discard the seals.
5. Remove the piston ring and O-ring from the piston, and discard.

Figure 3-21: Steering Cylinder Installation

1. Steering Cylinder
2. Steering Link
3. Pivot Pin
4. Retaining Ring
5. Wheel Yoke
6. Capscrew
7. Locknut and Washer



CLEANING AND INSPECTION

1. Wash all the metal parts in cleaning solvent and blow dry with filtered compressed air.
2. Inspect all the threaded components for stripped or damaged threads.
3. Check the inside surface of the cylinder barrel for scoring or excessive wear.
4. Check the piston and headcaps for scoring or excessive wear.
5. Inspect the surface of the shaft for scoring or excessive wear.

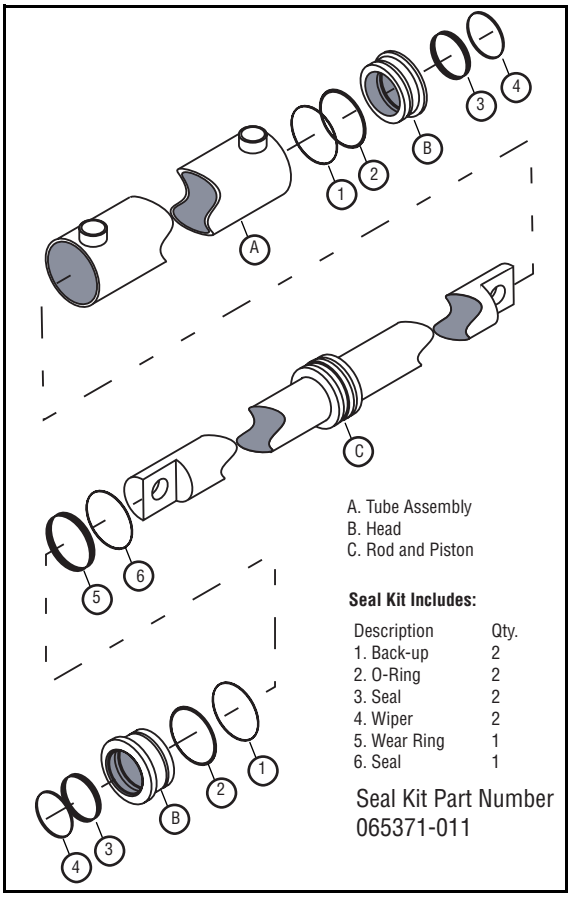
Figure 3-22: Steering Cylinder Assembly

ASSEMBLY

1. Lubricate and install new rod wiper, U-cup, O-ring, and backup ring on the headcaps.
2. Install one headcap onto the shaft.
3. Install the new piston rings and O-ring on the piston.
4. Lubricate the piston seal with clean hydraulic fluid, and install the shaft assembly in the cylinder barrel.
5. Install the other head cap into the cylinder barrel, and tighten both head caps.

INSTALLATION

1. Position the cylinder assembly in the chassis and secure with capscrews, washers, and locknuts.
2. Insert pivot pins and secure with retaining rings.
3. Connect the hose assemblies to the fittings.
4. Operate the steering circuit several times throughout its entire range of travel to expel trapped air, then check for leaks.



3.16 DEPRESSION MECHANISM CYLINDER

REMOVAL

Figure 3-23: Depression Mechanism Cylinder

1. Open the module door to access the cylinder.
2. Tag and disconnect the hose assemblies from the cylinder fittings and immediately cap the openings to prevent foreign material from entering.
3. Remove the cotter pins from the pivot pins.
4. While supporting the cylinder, remove pivot pins. Remove the cylinder.

DISASSEMBLY

1. Unscrew the head cap from the barrel, removing the head cap, piston, and shaft assembly from the barrel tube.
2. Unscrew the piston.
3. Remove all rod wipers, U-cups, O-rings, and backup rings from the headcap, and discard.
4. Remove the piston ring and O-ring from the piston, and discard.

CLEANING AND INSPECTION

1. Wash all the metal parts in cleaning solvent and blow dry with filtered compressed air.
2. Inspect all the threaded components for stripped or damaged threads.
3. Check the inside surface of the cylinder barrel for scoring or excessive wear.
4. Check the piston and headcaps for scoring or excessive wear.
5. Inspect the surface of the shaft for scoring or excessive wear.

ASSEMBLY

1. Lubricate and install new rod wiper, U-cup, O-ring, and backup ring on the headcaps.
2. Install the headcap onto the shaft.
3. Install the new piston rings and O-ring on the piston. Re-install the piston.
4. Lubricate the piston seal with clean hydraulic fluid and install the shaft assembly in the cylinder barrel.
5. Install the head cap into the cylinder barrel, and tighten the head caps.

INSTALLATION

1. Position the cylinder assembly in the chassis. Insert the pivot pins and secure with new cotter pins.
2. Connect the hose assemblies to the fittings.
3. Operate the steering circuit several times throughout its entire range of travel to expel trapped air, then check for leaks.

NOTES:

3.17 LIFT CYLINDER

REMOVAL

1. Elevate the platform and install the scissor brace (see “Supporting the Elevating Assembly” on Page 3-4).
2. Provide a suitable container to catch the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering.
3. Remove emergency lowering valve cable and down valve wires from the emergency lowering/down valve.
4. Remove the cable bracket from the lift cylinder.
5. Remove capscrews and locknuts securing lift cylinder pivot pins.
6. Remove lower pivot pin and lower cylinder to rest on chassis.
7. Attach a suitable hoisting device and sling to the cylinder, and remove upper pivot pin.
8. Carefully remove cylinder.

DISASSEMBLY

1. Remove the fittings, orifice, spring, and down valve from the cylinder assembly.
2. Loosen the set screw and unscrew the thread cap. Unscrew the internal head cap and withdraw the rod and piston assembly from the barrel tube.
3. Remove the piston from the rod, and then remove the head cap from the cylinder rod.
4. Remove all O-rings, seals, and wipers from the head cap and cylinder barrel.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the head cap, inside of the cylinder barrel, and the rod for signs of scoring or excessive wear.
4. Replace all seals and O-rings.

REASSEMBLY

1. Lubricate and install new O-rings, seals, and wipers in the cylinder barrel and on the head cap.

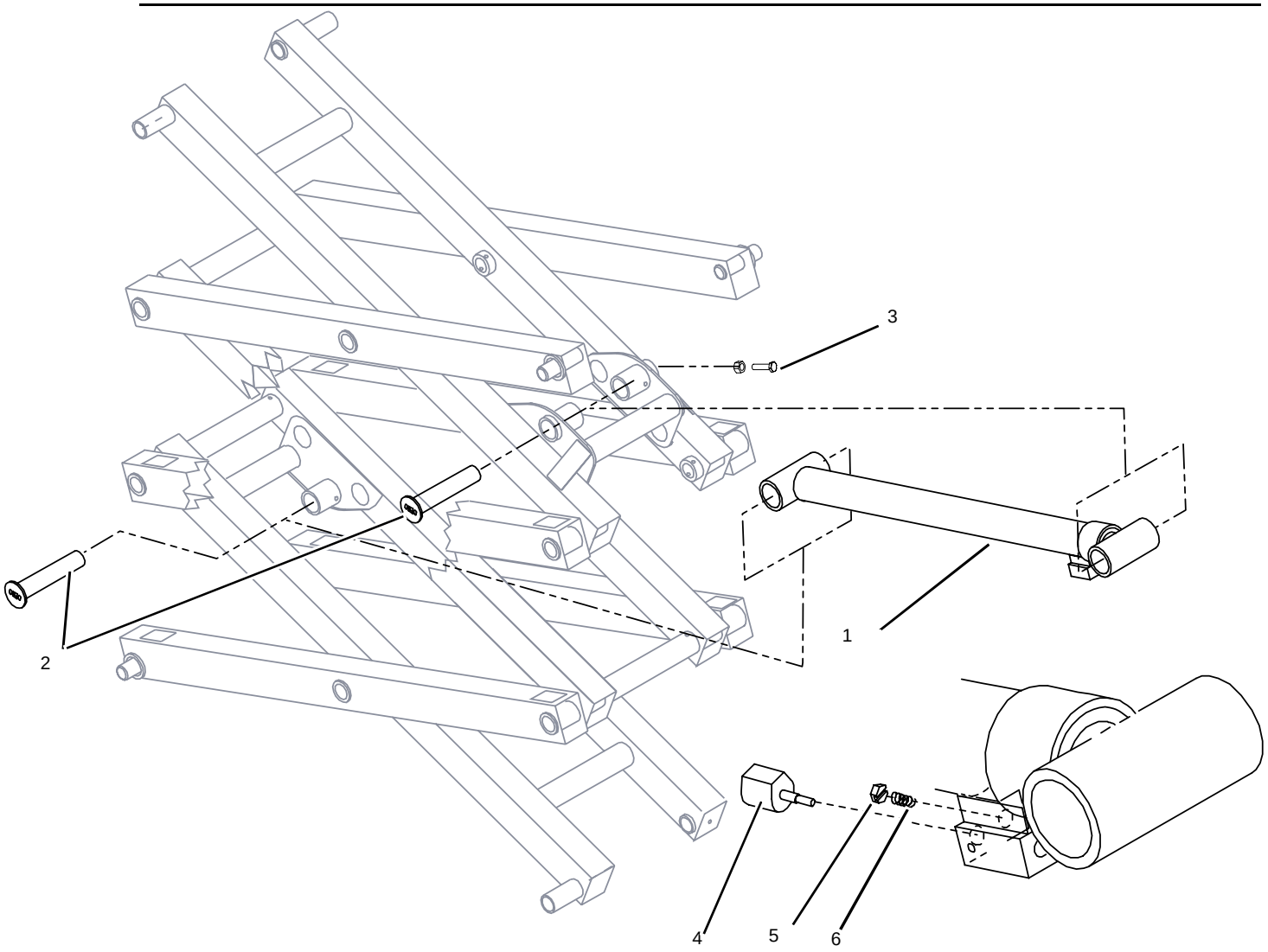
NOTE: Multipurpose lubricant should be used.

2. Install the thread cap, head cap, and piston on the cylinder rod.
3. Lubricate the piston and install the piston/rod assembly in the barrel tube.
4. Install the head cap into the barrel tube.
5. Thread the thread cap onto the barrel tube and tighten. Secure with the set screw.
6. Install the down valve, orifice, spring, and fittings.

INSTALLATION

1. Coat both pivot pins with anti-seize compound.
2. Attach a suitable hoisting device and sling to the cylinder. Carefully position cylinder in the elevating assembly, and install the upper pivot pin.
3. Install the capscrew and locknut.
4. Carefully lift the cylinder and align the lower mount, and install the pivot pin. Install the capscrew and locknut securing the pivot pin.
5. Install the cable bracket. Connect the emergency lowering valve cable and down valve wires.
6. Unplug hydraulic hoses and attach to the cylinder.
7. Replace hydraulic fluid removed from lift cylinder.
8. Test with weight at rated platform load to check system operation. Check for leaks and level of fluid.

Figure 3-24: Lift Cylinder



1. Lift Cylinder
2. Pivot Pit
3. Capscrew and Locknut
4. Solenoid
5. Down Orifice
6. Spring

3.18 ELECTRIC MOTOR

TROUBLESHOOTING

1. Read the nameplate to become familiar with the motor, especially the rated voltage.
2. Try to turn the shaft by hand. Keep motor leads separated while doing this. If the shaft turns freely, go to step 3. If the shaft won't turn, proceed to step a.
    a. The shaft could be tight for a number of reasons; this check is to determine if the tightness is of a temporary nature only. Obtain power to produce the nameplate voltage. **Do not make a permanent connection**. First, touch the motor leads quickly to the power supply just long enough to observe if the shaft runs. If it does turn, then hold the motor leads on the power supply for a longer time. If the motor sounds normal, go to step 3. If the motor sounds noisy, it should be taken apart as described in the disassembly section.
3. If the motor turned freely, connect an ammeter in the circuit, as shown in Figure 3-25A. With rated voltage applied and the shaft running free, the ammeter should read less than 20% of the nameplate full load current. If the motor meets the above conditions, then it can be assumed the original problem is external to the motor.

DISASSEMBLY

1. Remove thru bolts.
2. Remove pulley end cover.
3. Pull the armature out of the assembly in one swift motion.
4. Remove commutator end cover.

NOTE: Do not place the stator ring in any mechanical holding device during the disassembly or assembly operation. Permanent distortion or other damage will result.

INSPECTION

Once the motor has been disassembled, go through the following check list steps to determine where the problem lies.

1. Bearings should spin smoothly and easily, have ample lubrication, and be free of corrosion.
2. Armature should be checked for grounds and shorted turns. Refinish commutator surface if pitted or excessively worn.
3. Brushes should be checked for wear and to ensure that they are free in the brush holders.

NOTE: Observe how brushes are assembled in brush holders and position of brush lead. New brushes must be installed in same manner. Brushes should be removed as follows:

    a. Remove brush spring clip from its mounting on brush assembly.
    b. Lift brush assembly from brush holder.
    c. Disconnect brush assembly lead.
    d. The new brush assembly isto be installed by reversing Electric Motorabove procedure.

4. Inspect wire harness and all connections for signs of damage due to overheating.
5. Check stator to see that it is securely mounted.

REASSEMBLY

1. Install new brushes and be sure that they are free in the holder. Install brush with the lead wires positioned as when received. Raise all brushes to the locked position. (See Figure 3-17B and step 3 in the Inspection section above.)
2. Place commutator cover on a work bench with brush assembly facing upward.
3. Place the bearing spring into the bearing bore.
4. Take a complete armature assembly, including bearings, and insert commutator end bearing into the bearing bore.

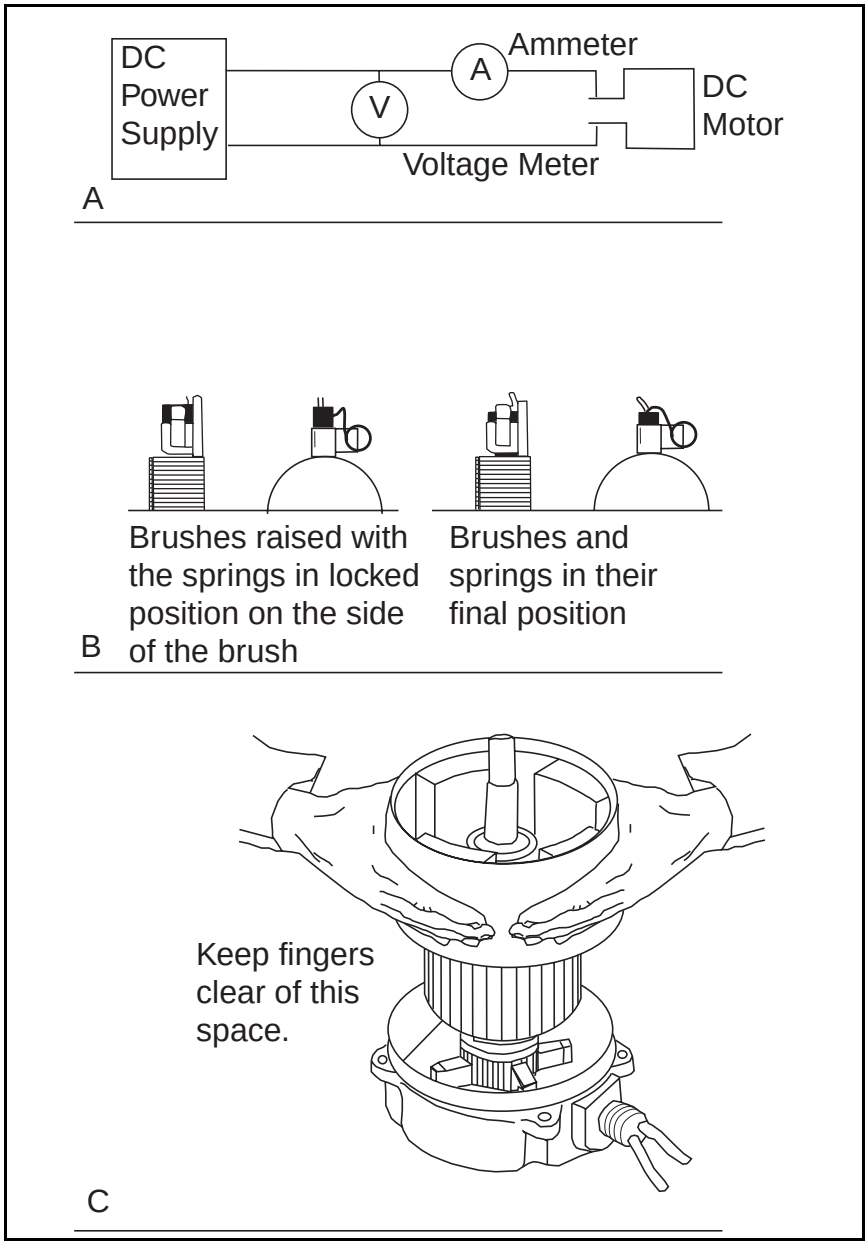
NOTE: Do not reuse bearings which have been removed from armature shaft. Keep assembly in a vertical position. Use extreme care not to damage armature with bearing pullers. New bearings should be installed by pressing inner race of bearing onto proper position on armature shaft.

5. Set the brushes to final position as shown in Figure B.
6. Place the complete stator down over the vertical armature and into position on the commuta-

tor cover.

7. The stator assembly must be placed in a definite relationship with the commutator covers in order to obtain a neutral brush setting. There is a matchmark on both items. These two marks must line up exactly. Rotate until they do.
8. Assemble the pulley end cover in the proper relationship. Insert mounting bolts and tighten alternately to ensure a good mechanical alignment.
9. Spin the shaft by hand to see if it is free. Be sure motor leads (if used) are not touching together. If the leads are touching, a generator action will give the effect of friction in the motor. A no-load test can now be performed. At rated voltage, observe the no-load current. It should be less than 20% of the nameplate full load current. Anything higher indicates:
   - Brushes are not on neutral setting (check matchmarks for exact alignment).
   - Faulty armature.

Figure 3-25: Electric Motor



3.19 TORQUE SPECIFICATIONS

HYDRAULIC COMPONENTS

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

Use the following values to torque hydraulic components used on UpRight work platforms.

Table 3-1: Torque Specifications for Hydraulic Components

Type: SAE Part Series	Cartridge Poppet		Fittings		Hoses	
	Ft/Lbs	Nm	Ft/Lbs	Nm	In/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

FASTENERS

This standard applies to the preloading of fasteners measured by installation torque.

NOTE: For other preloading methods or fasteners, consult UpRight Product Support Department.

This general standard applies to all SAE and Metric fasteners unless otherwise specified.

THREAD CONDITION

- For lubed or zinc plated fasteners, use K = .15
- For dry unplated fasteners, use K = .20

TORQUE TABLES

Table 3-2: Torque Specifications for SAE Fasteners

		SAE J429 Grade 5			SAE J429 Grade 8		
	Nominal Thread Size	Clamp Load	Tightening Torque K=.15	Tightening Torque K=.20	Clamp Load	Tightening Torque K=.15	Tightening Torque K=.20
		lbs.	in-lbs.	in-lbs.	lbs.	in-lbs.	in-lbs.
Unified Coarse Thread Series	1/4 -20	2,000	75	100	2850	107	143
	5/16 - 18	3,350	157	210	4700	220	305
		lbs.	ft-lbs.	ft-lbs.	lbs.	ft-lbs.	ft-lbs.
	3/8-16	4,950	23	31	6950	32.5	44
	7/16-14	6,800	37	50	9600	53	70
	1/2-13	9,050	57	75	12800	80	107
	9/16-12	11,600	82	109	16400	115	154
	5/8-11	14,500	113	151	20300	159	211
	3/4-10	21,300	200	266	30100	282	376
	7/8-9	29,435	321	430	41550	454	606
	1-8	38,600	483	640	54540	680	900

		SAE J429 Grade 5			SAE J429 Grade 8		
	Nominal Thread Size	Clamp Load	Tightening Torque K=.15	Tightening Torque K=.20	Clamp Load	Tightening Torque K=.15	Tightening Torque K=.20
		lbs.	in-lbs.	in-lbs.	lbs.	in-lbs.	in-lbs.
Unified Fine Thread Series	1/4 -28	2,300	85	115	3250	120	163
	5/16-24	3,700	173	230	5200	245	325
		lbs.	ft-lbs.	ft-lbs.	lbs.	ft-lbs.	ft-lbs.
	3/8-24	5,600	26	35	7900	37	50
	7/16-20	7,550	42	55	10700	59	78
	1/2-20	10,200	64	85	14400	90	120
	9/16-18	13,000	92	122	18300	129	172
	5/8-18	16,300	128	170	23000	180	240
	3/4-16	23,800	223	298	33600	315	420
	7/8-14	32,480	355	473	45855	500	668
	1-12	42,270	528	704	59670	745	995

Table 3-3: Torque Specifications for Metric Fasteners, U.S. Customary Units

	Grade 8.8			Grade 10.9			Grade 12.9		
Nominal Thread Size	Clamp Load	Tightening Torque		Clamp Load	Tightening Torque		Clamp Load	Tightening Torque	
		K = .15	K = .20		K = .15	K = .20		K = .15	K = .20
mm	lbs.	in-lbs.	in-lbs.	lbs.	in-lbs.	in-lbs.	lbs.	in-lbs.	in-lbs.
3	-	-	-	-	-	-	823	14.6	19.5
3.5	-	-	-	-	-	-	1,109	22.9	30.5
4	-	-	-	-	-	-	1,436	33.9	45.2
5	1,389	41.0	19.5	1,987	58.7	19.5	2,322	68.6	91.2
6	1,966	69.7	28.3	2,813	100.0	28.3	3,287	116.8	155.8
7	2,826	116.8	37.2	4,044	167.3	37.2	4,727	195.6	260.2
		ft-lbs.	ft-lbs.		ft-lbs.	ft-lbs.		ft-lbs.	ft-lbs.
8	3,579	14.1	18.8	5,122	20.1	26.9	5,986	23.6	31.4
10	11,742	27.9	37.2	8,117	39.9	53.3	9,486	46.7	62.3
12	8,244	48.7	64.9	11,797	69.7	92.2	13,787	81.1	108.4
14	11,246	77.4	103.3	16,093	110.6	147.5	18,808	129.1	172.6
16	15,883	125.4	166.7	21,971	173.3	230.9	25,677	202.1	269.2
18	19,424	171.9	229.4	26,869	238.2	317.2	31,401	278.1	371.0
20	2,304	243.4	325.3	34,286	337.8	449.9	40,070	394.6	525.9
22	30,653	331.9	442.5	42,403	458.8	612.2	49,556	536.2	715.4
24	35,711	420.4	562.0	49,400	583.4	778.1	57,733	682.2	909.4
27	46,435	617.3	84.8	64,235	853.4	1138.1	75,069	997.2	1329.8
30	56,753	837.9	1117.4	78,509	1159.4	1545.2	91,751	1354.9	1807.0
33	70,208	1140.3	1520.1	97,121	1576.9	2102.8	113,503	1843.9	2457.5
36	82,651	1464.1	1952.3	114,334	2025.3	2700.9	133,620	2367.6	3156.0

Table 3-4: Torque Specifications for Metric Fasteners, SI Units

	Grade 8.8			Grade 10.9			Grade 12.9		
Nominal Thread Size	Clamp Load	Tightening Torque		Clamp Load	Tightening Torque		Clamp Load	Tightening Torque	
		K = .15	K = .20		K = .15	K = .20		K = .15	K = .20
mm	N	Nm	Nm	N	Nm	Nm	N	Nm	Nm
3	-	-	-	-	-	-	3,660	1.65	2.2
3.5	-	-	-	-	-	-	4,932	2.59	3.45
4	-	-	-	-	-	-	6,387	3.83	5.11
5	6,177	4.63	2.2	8,840	6.63	2.2	10,330	7.75	10.3
6	8,743	7.87	3.2	12,512	11.3	3.2	14,623	13.2	17.6
7	12,570	13.2	4.2	17,990	18.9	4.2	21,025	22.1	29.4
8	15,921	19.1	25.5	22,784	27.3	36.5	26,626	32	42.6
10	52,230	37.8	50.5	36,105	54.1	72.2	42,195	63.3	84.4
12	36,670	66	88	52,475	94.5	125	61,328	110	147
14	50,025	105	140	71,587	150	200	83,663	175	234
16	70,650	170	226	97,732	235	313	114,218	274	365
18	86,400	233	311	119,520	323	430	139,680	377	503
20	10,250	330	441	152,513	458	610	178,238	535	713
22	136,350	450	600	188,618	622	830	220,433	727	970
24	158,850	570	762	219,743	791	1055	256,808	925	1233
27	206,550	837	115	285,728	1157	1543	333,923	1352	1803
30	252,450	1136	1515	349,223	1572	2095	408,128	1837	2450
33	312,300	1546	2061	432,015	2138	2851	504,885	2500	3332
36	367,650	1985	2647	508,582	2746	3662	594,368	3210	4279

NOTES:

Section 4

TROUBLESHOOTING

4.1 INTRODUCTION

The following section on troubleshooting provides guidelines on the types of problems users may encounter in the field, helps determine the causes 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 Sections 2 and 5 will aid in understanding the operation and function of the various components and systems and help in diagnosing and repairing the machine.

GENERAL PROCEDURE

Thoroughly study hydraulic and electronic schematics in **Section 5**. Check for loose connections and short circuits. Check/repair/replace each component in the Truth Tables listed under each machine function that does not operate properly.

Use the charts on the following pages to help determine the cause of a fault.

NOTE: Spike protection diodes at components have been left out of the charts for clarity.

⚠ WARNING ⚠

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

When performing any service that requires the platform to be raised, ensure that the platform is braced as described on page 3-4.

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

UPRIGHT USA Tel: 1-559-891-5200
FAX: 1-559-891-8931

UPRIGHT IRELAND Tel: +353-1-202-4100
FAX: +353-1-202-4105

4.2 TROUBLESHOOTING

1. *Verify your problem*. 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*. Use the troubleshooting guide to determine which components are common to all circuits that are not functioning correctly. To aid in troubleshooting, the letters following the component on the table are the same as the component's designation on the schematics.
3. *Identify the problem component*. 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*. Do a full function test from both the platform and chassis controls to verify that all functions are operating correctly and that the machine is performing according to specifications.

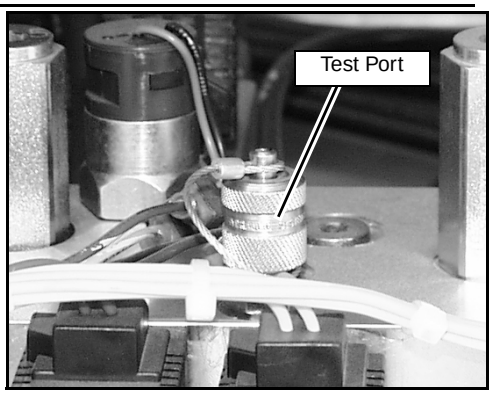
SPECIAL TOOLS

Following is a list of tools which may be required to perform certain maintenance procedures on the MX15/19.

- Flow Meter with Pressure Gauge (UpRight P/N 067040-000)
- 0-1000 psi (0-69 bar) Hydraulic Pressure Gauge with Adapter Fittings (UpRight P/N 014124-010)
- 0-3000 psi (0-207 bar) Hydraulic Pressure Gauge with Adapter Fittings (UpRight P/N 014124-030)
- Adapter Fitting (UpRight P/N 063965-002)
- Inclinometer (UpRight P/N 010119-000)
- Crimping Tool (UpRight P/N 028800-009)
- Terminal Removal Tool (UpRight P/N 028800-006)

ADJUSTMENT PROCEDURES

Figure 4-1: Hydraulic Test Port



Hydraulic settings must be checked whenever a component is repaired or replaced.

Remove counterbalance valves and "bench test" them if they are suspect.

Connect a pressure gauge of appropriate range to the test port located on the hydraulic manifold.

NOTE:Correct pressure settings are listed in the hydraulic schematic.

CHECKING PUMP PRESSURES

Remove hose from pump port and connect pressure tester.

4.3 UPRIGHT MOTOR CONTROLLER DIAGNOSTICS

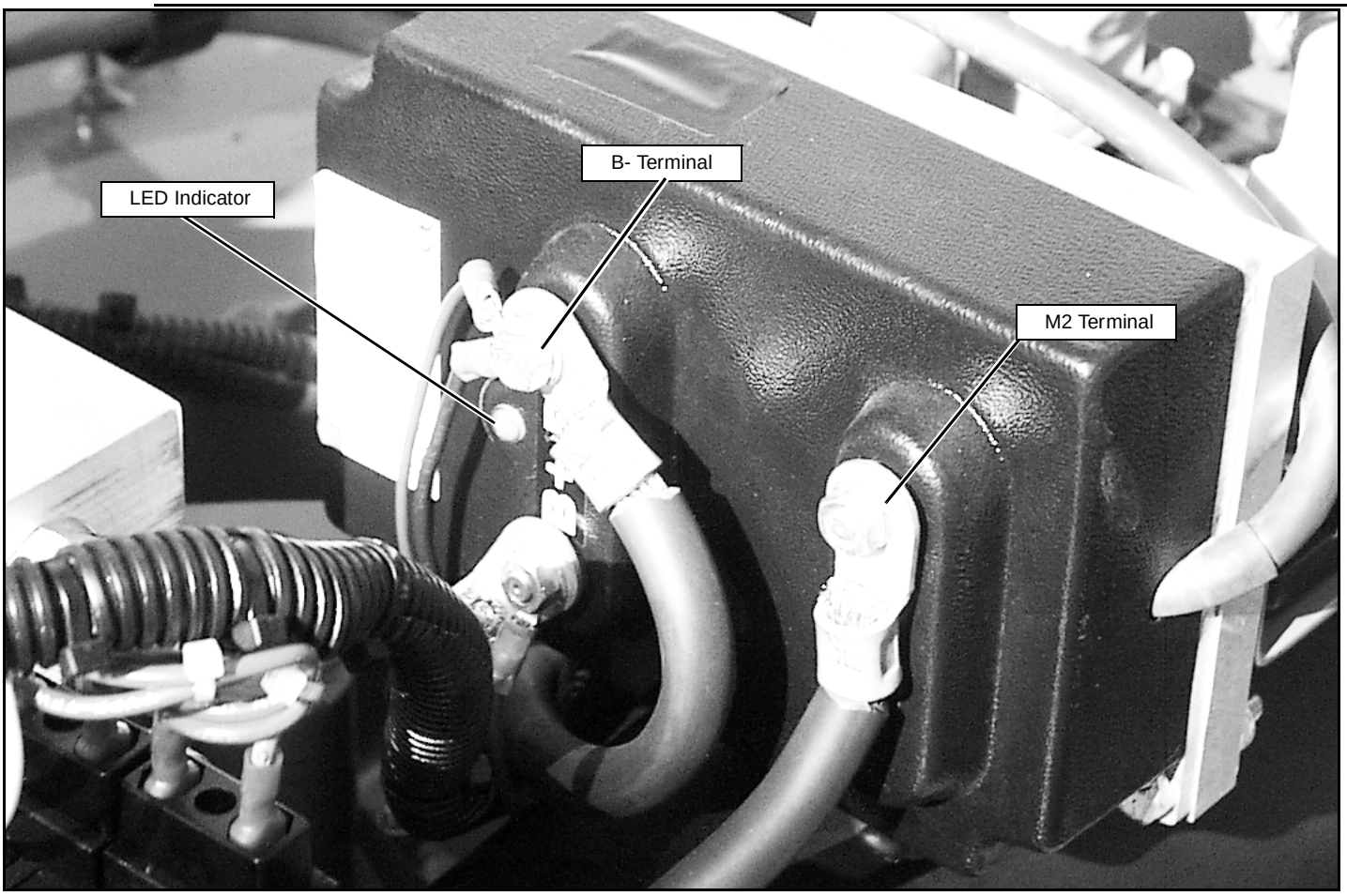
Batteries must be fully chargesd before troubleshooting.

Check/Repair all connections before replacing any components

Table 4-1: LED Fault Codes

FLASH CODE	MEANING	STATUS	CORRECTIVE ACTION
LED on	Power to the controller and the controller is operational.	System is functional.	None.
LED off	No power to the controller, or internal fault in the controller.	Battery cables not connected properly; Failed controller.	Check battery cable connections. Replace the controller.
2 Flash	Procedural fault.	Lift, drive, or steer switch is engaged at startup; Drive/Lift Switch rotated while operating.	Cycle the control handle through neutral to clear fault.
3 Flash	Controller senses B- at the M2 terminal.	Short circuit at the motor; M2 cable in contact with B- cable; Short circuit within controller.	Check cable routing and connections. Test terminals for source of B-. Replace the controller.
4 Flash	Controller senses B+ at the M2 terminal before engaging the motor start relay.	B+ cable routed incorrectly; M2 cable making contact with B+ cable; Motor start relay contacts welded closed.	Check cable routing and connections. Test terminals for source of B+. Replace the motor start relay.
5 Flash	Controller senses open circuit at M2 after engaging the motor start terminal.	Cables loose or not connected; Faulty motor start relay.	Check the cable routing and connections. Check the signal from motor controller to relay. Check/replace the motor start relay.
6 Flash	Faulty signal from control handle or I/O board.	Faulty control handle; Wiring error.	If upper controls are affected, check/replace the control handle. If lower controls are affected, check/replace the I/O board.
7 Flash	Battery voltage below 12V or above 45V.	Dead batteries; Bad cable connections.	Check batteries and cable connections.
8 Flash	Thermal cut-off.	Controller is overheated due to overuse or other failure.	Allow system to cool. Locate and repair other source of overheating.

Figure 4-2: Motor Controller



4.4 MEASURED VOLTAGE AT I/O BOARD

Be sure that both the Platform and Chassis Emergency Stop Switches are pulled out to the ON position.

All voltages are measured between the component and the B- terminal on the Motor Controller.

Table 4-2: I/O Board Troubleshooting Table

CONNECTOR	PIN NUMBER	DESCRIPTION
J1	1	24 Volts = Lift Mode Active / 0 Volts = Lift Mode Inactive
	2	No Connection
	3	24 Volts = Drive Allowed / 0 Volts = Drive Not Allowed
	4	24 Volts from Lower E-Stop / Lower E-Stop Not Depressed
	5	24 Volts from Upper E-Stop / Lower and Upper E-Stops Not Depressed
	6	24 Volts Out to Interlock Lever when Upper Controls Selected & Upper/Lower E-Stops Not Depressed
	7	No Connection
	8	24 Volts = Drive Forward or Lift Up / 0 Volts = Stop Drive Forward or Lift Up
	9	24 Volts = Drive Reverse or Lift Down / 0 Volts = Stop Reverse Drive or Lift Down
	10	Accelerator Input / 20K Pot / 3.5 Volts to 0 Volts, Minimum to Maximum Speed
	11	24 Volts = Steer Left / 0 Volts = Stop Steer Left
	12	24 Volts = Steer Right / 0 Volts = Stop Steer Right.
J2	1	Goes to 0 Volts to Activate Depression Mechanism Extend Solenoid / 24 Volts = Solenoid OFF
	2	No Connection
	3	24 Volt Supply for Solenoids
	4	Goes to 0 Volts to Activate Forward Solenoid / 24 Volts = Solenoid OFF
	5	Goes to 0 Volts to Activate Reverse Solenoid / 24 Volts = Solenoid OFF
	6	Goes to 0 Volts to Activate Lift Up Solenoid / 24 Volts = Solenoid OFF
	7	Goes to 0 Volts to Activate Steer Left Solenoid / 24 Volts = Solenoid OFF
	8	Goes to 0 Volts to Activate Steer Right Solenoid / 24 Volts = Solenoid OFF
J3	1	Goes to 0 Volts to Activate Alarm / 24 Volts = Alarm OFF
	2	24 Volts = Tilt Inactive / 0 Volts = Tilt Active
	3	24 Volt Supply for Alarm, Tilt Sensor, Lift Down and Depression Mechanism Retract Solenoids
	4	24 Volts = Below Height Limit / 0 Volts = Above Height Limit
	5	Goes to 0 Volts to Activate Lift Down Solenoid / 24 Volts = Solenoid OFF
	6	Goes to 0 Volts to Activate Depression Mechanism Solenoid / 24 Volts = Solenoid OFF
	7	24 Volts = High Speed Active / 0 Volts = Low Speed Active
	8	Battery Negative Supply for Tilt Sensor
J4	1	Goes to 0 Volts to Activate Line Contactor / 24 Volts = Line Contactor OFF
	2	Supplies 24 Volts to Upper Control / Lower Control Switch
	3	24 Volts = Lower Control Mode
	4	Supplies 24 Volts to Ground Lift Switch when in Lower Control Mode
	5	24 Volt Supply Output
	6	Goes to 0 Volts to Activate Hour Meter / 24 Volts = Hour Meter Not Activated
	7	24 Volts = Lift Up from Ground Control / 0 Volts = Lift Up OFF
	8	24 Volts = Lift Down from Ground Control / 0 Volts = Lift Down OFF
	9	24 Volt Supply Input from Battery via Lower E-Stop / Lower E-Stop Not Depressed
	10	24 Volts from Upper Control Switch / 24 Volts = Upper Control Mode
	11	Battery Negative Input to I/O Board
	12	24 Volt Supply for Hour Meter and Line Contactor
J5	1	24 Volts power to Pin 1 of SC1000 (Key ON Power)
	2	24 Volts = Command Controller to Drive / 0 Volts = Stop Controller Drive
	3	24 Volts = Command Controller to Steer / 0 Volts = Steer OFF
	4	24 Volts = Command Controller to Lift / 0 Volts = Stop Lift
	5	24 Volts = Command Normal Speed / 0 Volts = Command Speed Cutback
	6	24 Volts = Line Contactor OFF / 0 Volts = Line Contactor ON
	7	24 Volts = No Direction Solenoid Allowed / 0 Volts = Direction Solenoid Allowed to Activate
	8	Accelerator 3.5 Volts to 0 Volts / Minimum to Maximum Speed

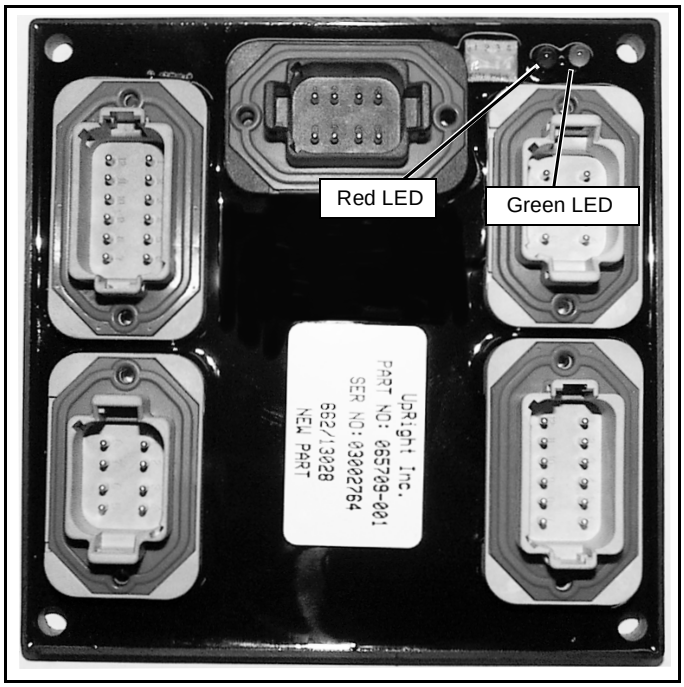
4.5 LED'S AT I/O BOARD

Green LED - Indicates that power is present at the board.

Red LED - Indicates a short in the system. To locate the problem, first cycle the emergency stop switches to clear. With the emergency stop switches on, and the keyswitch on, the green LED should be illuminated. The red LED should be off.

Next, perform all machine functions until the red LED is illuminated. Determine which function activated the red LED and check all components that are active for that function.

Figure 4-3: I/O Board



4.6 ELECTRIC

Table 4-3: Electrical Troubleshooting Table

Component / Function	Lower Controls	Upper Controls	Drive Forward	Drive Reverse	High Speed/Creep	Raise Platform	Lower Platform	Steer Left	Steer Right	Depression Mechanism Extend	Depression Mechanism Retract	Brakes	Tilt Alarm	Down Alarm	Battery Charge
Alarm--ALM															
Batteries--BAT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Battery Charger--CHG															X
5 AMP Circuit Breaker--F1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
175 AMP Fuse--F2	X	X	X	X	X	X	X	X	X	X	X	X			
Hour Meter/Low Voltage indicator--HM															
I/O Board--I/O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Motor Control--MC	X	X	X	X	X	X	X	X	X	X	X	X			
Motor--MOT			X	X	X	X	X	X	X	X	X	X			
Motor Relay--R1			X	X	X	X	X	X	X	X	X	X			
Chassis Emergency Stop Switch--S1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Chassis Lift Switch--S2						X	X								
Chassis Key Switch--S3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Lift/Drive Selector Switch--S4		X	X	X		X	X								
Platform Down Switch--S5					X										
Platform Emergency Stop Switch--S6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Interlock Switch--S7		X	X	X	X	X	X	X	X						
PQ Control Handle--S8		X	X	X		X	X								
Height Limit Switch--S9						X									
Platform Steering Switch--S10								X	X						
Tilt Sensor--SNSR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Steering Solenoid (right)--SOL1A									X						
Steering Solenoid (left)--SOL1B								X							
Platform Lift Solenoid--SOL2A						X									
Down Solenoid--SOL2B							X								
Depression Mechanism Extension Solenoid--SOL3A										X					
Depression Mechanism Retraction Solenoid--SOL3B											X				
Reverse Solenoid--SOL4A				X											
Forward Solenoid--SOL4B			X												

4.7 HYDRAULIC

Table 4-4: Hydraulic Troubleshooting Table

COMPONENT / FUNCTION	LIFT PLATFORM	LOWER PLATFORM	STEER RIGHT	STEER LEFT	DRIVE FORWARD	DRIVE REVERSE	CREEP	DEPRESSION MECHANISM EXTEND	DEPRESSION MECHANISM RETRACT	BRAKES
Check Valve--CV								X	X	
Steering Cylinder--CYL2			X	X						
Lift Cylinder--CYL1	X									
Depression Mechanism Cylinder--CYL3								X	X	
Brake Cylinder--CYL5										X
Priority Flow Divider--DVDR	X		X	X	X	X	X	X	X	X
Suction Strainer--FL1	X		X	X	X	X	X	X	X	
Return Filter--FL2	X		X	X	X	X	X	X	X	
Drive Motors (2)--MOT					X	X				
Pump--PMP	X		X	X	X	X	X	X	X	
Main Relief Valve--RV3	X				X	X	X	X	X	X
Steering Relief Valve--RV1			X	X						
Lift Relief Valve--RV2	X									
Orofice--OR	X	X								
Tank--TNK										
Steering Right/Left Valve--V1			X	X						
Lift Valve--V2A	X									
Down/Emergency Lowering Valve--V2B		X								
Depression Mechanism Retract Valve--V3B									X	
Depression Mechanism Extend Valve--V3A								X		
Forward/Reverse Valve--V4					X	X				
Counterbalance Valve--V5					X	X	X			X

Section 5

SCHEMATICS

5.1 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.

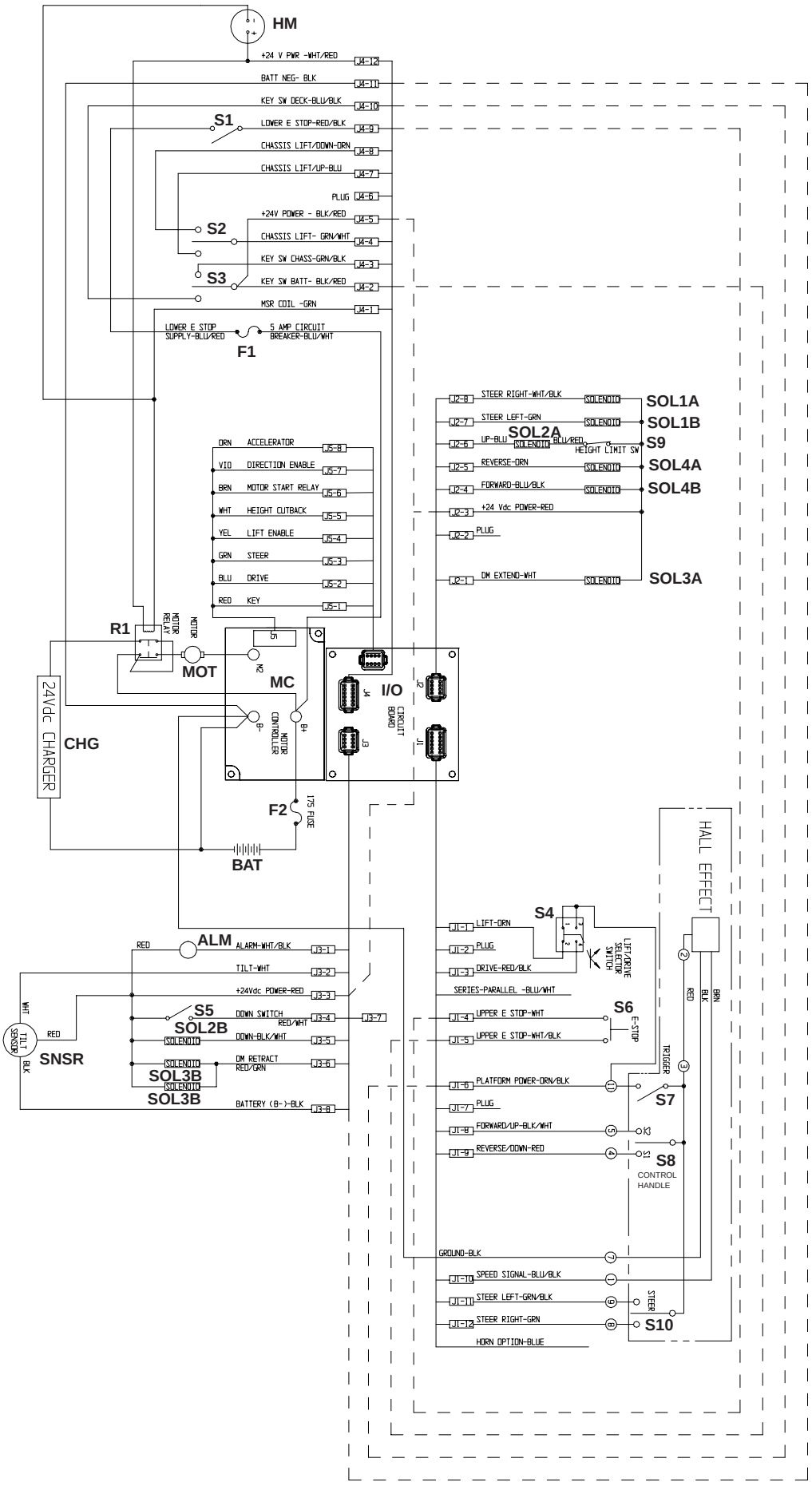
CONTENTS

5.2 ELECTRICAL SCHEMATIC

Legend: Electrical Schematic 065616-024

Reference Number	Name	Function	Location
ALM	Alarm	Provides warning sound when slope of machine exceeds 2° side-to-side, or fore and aft and also when deck is lowering	Right Door
BAT	Batteries	Powers work platform	Swing-out Modules on each side of the Chassis
CHG	Battery Charger	Charges battery	Left Battery Module
F1	5 AMP Circuit Breaker	Electrical overload protection	Chassis Controls
F2	175 AMP Fuse	Overload protection for electric motor	Right Door
HM	Hour Meter/Low Voltage indicator	Shows how many hours the machine has been in use	Chassis
I/O	I/O Board	Connection point for machine function wiring	Chassis
MC	Motor Control	Controls the speed of electric motor	Chassis
MOT	Motor	Provides power to hydraulic pump	Chassis
R1	Motor Relay	Starts and stops motor circuit	Right Door
S1	Chassis Emergency Stop Switch	Shuts down all machine functions	Chassis Controls
S2	Chassis Lift Switch	Elevates platform	Chassis Controls
S3	Chassis Key Switch	Allows some machine functions to be initiated from ground level	Chassis Controls
S4	Lift/Drive Selector Switch	Activates lift or drive functions	Platform Controls
S5	Platform Down Switch	Cuts out high speed drive when platform is elevated	Linkage
S6	Platform Emergency Stop Switch	Shuts down all machine functions	Platform Controls
S7	Interlock Switch	Safety mechanism for joystick	Platform Controls
S8	PQ Control Handle	Proportionally controls the drive and lift functions	Platform Controls
S9	Height Limit Switch	Stops lift before cylinder bottoms out	Linkage
S10	Steering Switch	Provides oil flow to steering cylinder	Platform control handle
SNSR	Tilt Sensor	Activates tilt alarm and disables all machine functions except platform lower when the machine is more than 2° out of level	Chassis between Battery Modules
SOL1A	Steering Solenoid (right)	Shifts steering valve to the left	Hydraulic Manifold
SOL1B	Steering Solenoid (left)	Shifts steering valve to the right	Hydraulic Manifold
SOL2A	Platform Lift Solenoid	Raises platform	Hydraulic Manifold
SOL2B	Down Solenoid	Lowers platform	Lift Cylinder
SOL3A	Depression Mechanism Extend Solenoid	Extends depression mechanism bars	Hydraulic Manifold
SOL3B	Depression Mechanism Retract Solenoid (2)	Retracts depression mechanism bars	Depression Mechanism cylinder
SOL4A	Reverse Solenoid	Shifts forward/reverse valve to reverse	Hydraulic Manifold
SOL4B	Forward Solenoid	Shifts forward/reverse valve to forward	Hydraulic Manifold

Figure 5-1: Electrical Schematic



5.3 HYDRAULIC SCHEMATIC

Legend: Hydraulic Schematic 065615-023

Reference number	Name	Function	Location
CV	Check Valve	Allows Depression Mechanism to retract in drive mode	Hydraulic Manifold
CYL1	Steering Cylinder	Provides force to turn front wheels	Front of Chassis above drive motors
CYL2	Lift Cylinder	Provides force to lift platform	Elevating Assembly
CYL3	Depression Mechanism Cylinder (2)	Extends or retracts DM bar	Front of hydraulic tank
CYL5	Brake Cylinder	Stops machine from moving while parked	Rear End of Chassis
DVDR	Priority Flow Divider	Provides priority oil flow to steering	Hydraulic Manifold
FL1	Suction Strainer	Traps particles in hydraulic tank	Inside hydraulic tank at outlet
FL2	Return Filter	Filters oil returning to tank	Back of hydraulic tank
MOT	Drive Motors (2)	Provides tractive effort to move platform	Front motor mounts
OR	Orifice	Controls the oil flow rate of the lift cylinder	Lift Cylinder
PMP	Pump	Provides hydraulic pressure for all functions	On Electric Motor between Battery Modules
RV1	Steering Relief	Provides pressure protection to pump and steering components when steering	Hydraulic Manifold
RV2	Lift Relief Valve	Limits load capacity	Hydraulic Manifold
RV3	Main Relief Valve	Provides pressure protection to hydraulic system	Hydraulic Manifold
TNK	Tank	Holds hydraulic oil	Rear end of Chassis
V1	Steering Right/ Left Valve	Provides directional control for steering	Hydraulic Manifold
V2A	Lift Valve	Provides oil control for drive or lift functions	Hydraulic Manifold
V2B	Down/ Emergency Lowering Valve	Allows oil to return to tank; manually operated for emergency lowering	Lift Cylinder
V3A	Depression Mechanism Extend Valve	Provides oil control for DM bar	Hydraulic Manifold
V3B	Depression Mechanism Retract Valve (2)	Provides oil control for DM bar	Depression Mechanism Cylinder
V4	Forward/Reverse Valve	Provides oil control for drive or lift functions	Hydraulic Manifold
V5	Counterbalance Valve (2)	Prevents machine from running away on slopes; cushions stops	Hydraulic Manifold

Figure 5-2: Hydraulic Schematic

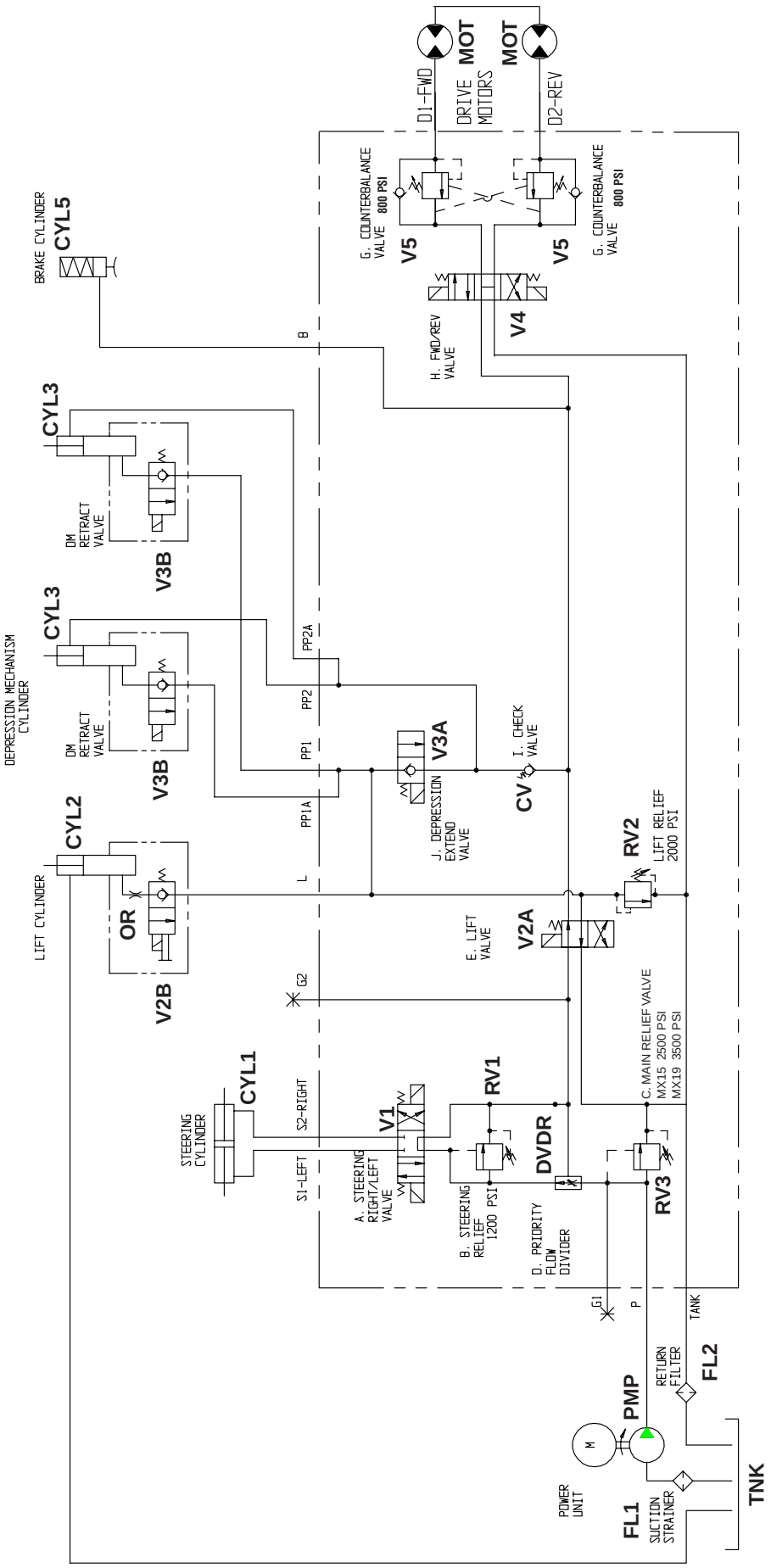


Figure 5-3: Valve Diagram

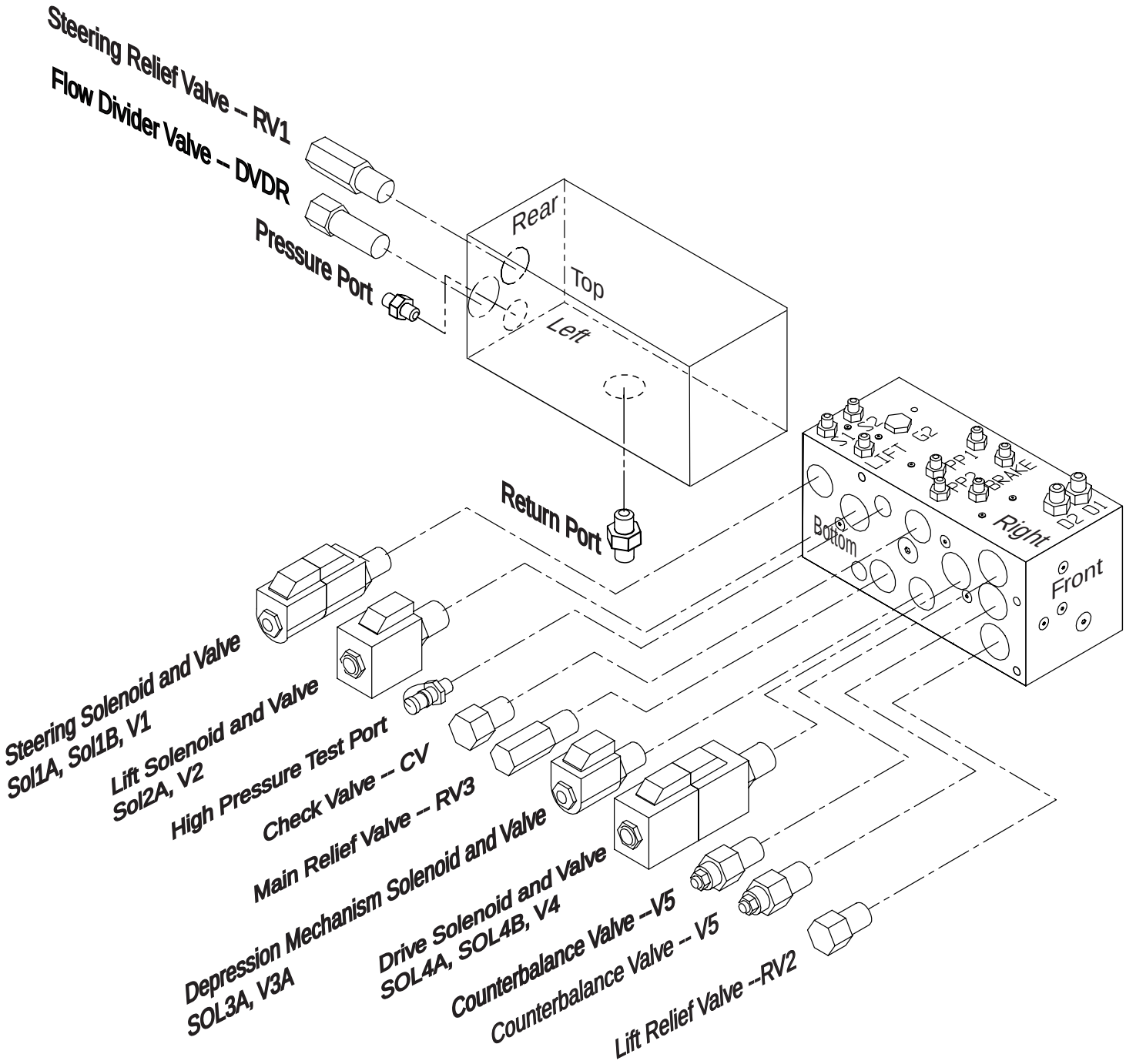
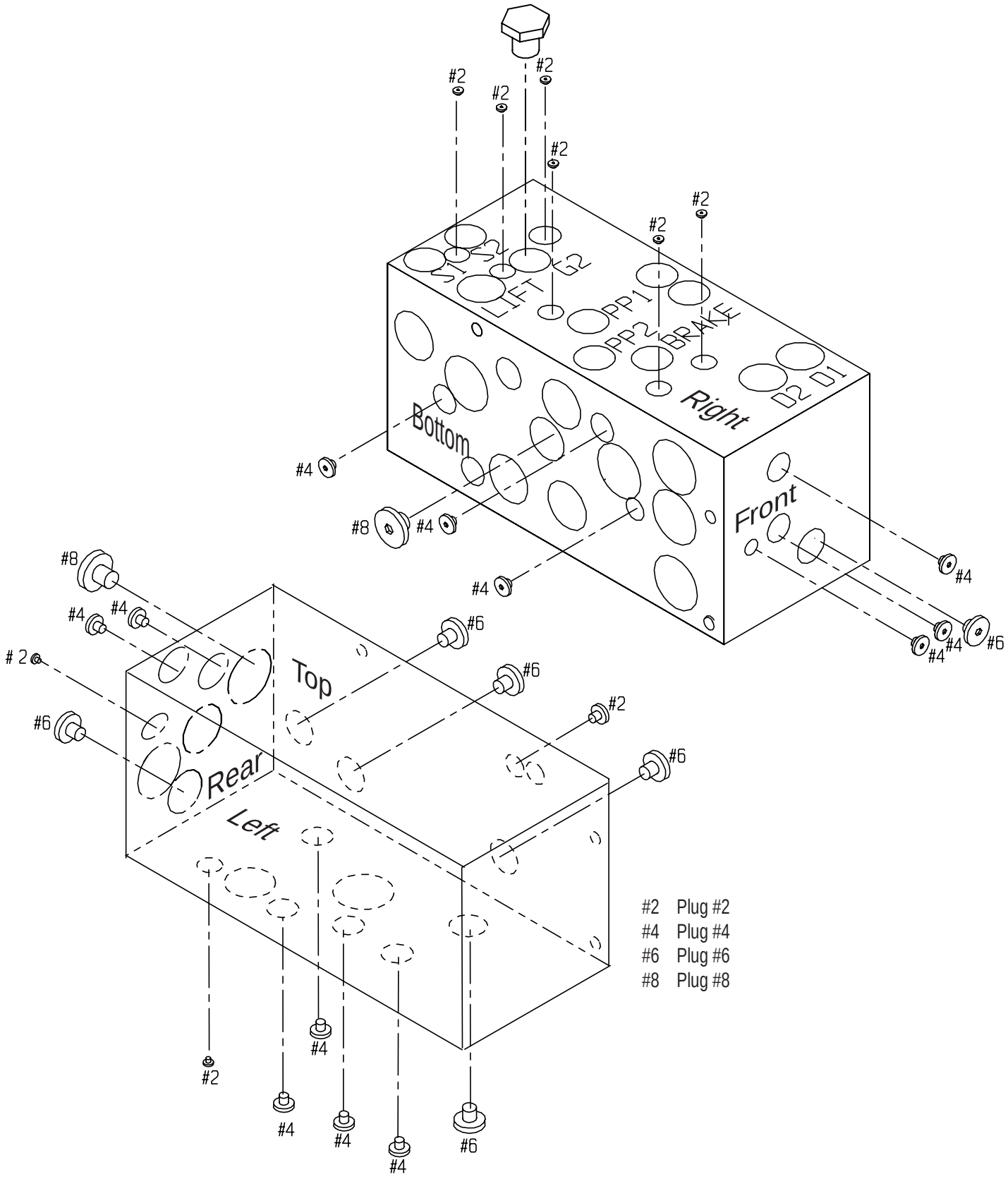


Figure 5-4: Plug Diagram



NOTES:

Section 6

ILLUSTRATED PARTS BREAKDOWN

6.1 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.

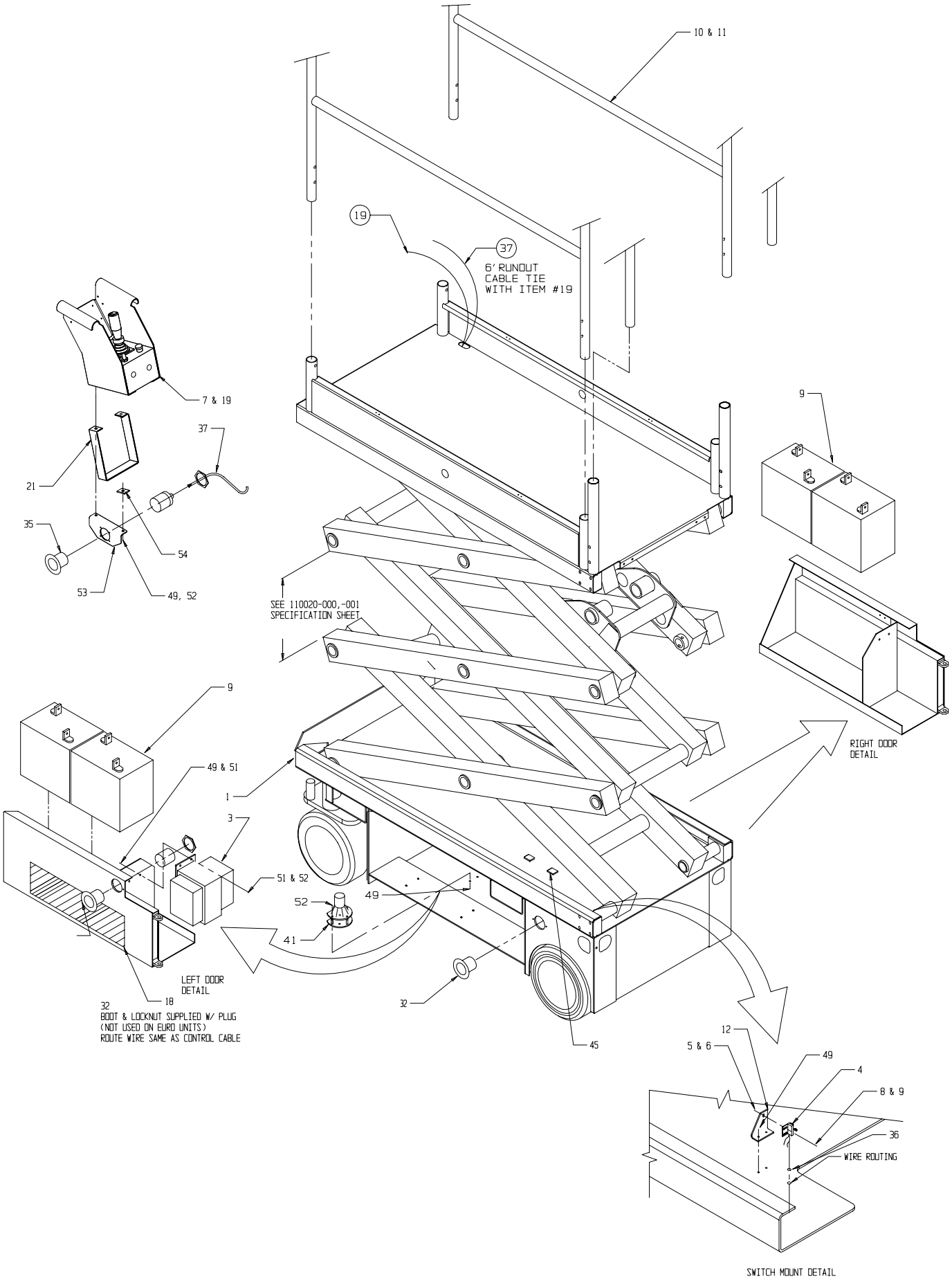
CONTENTS

Final Assembly, MX15

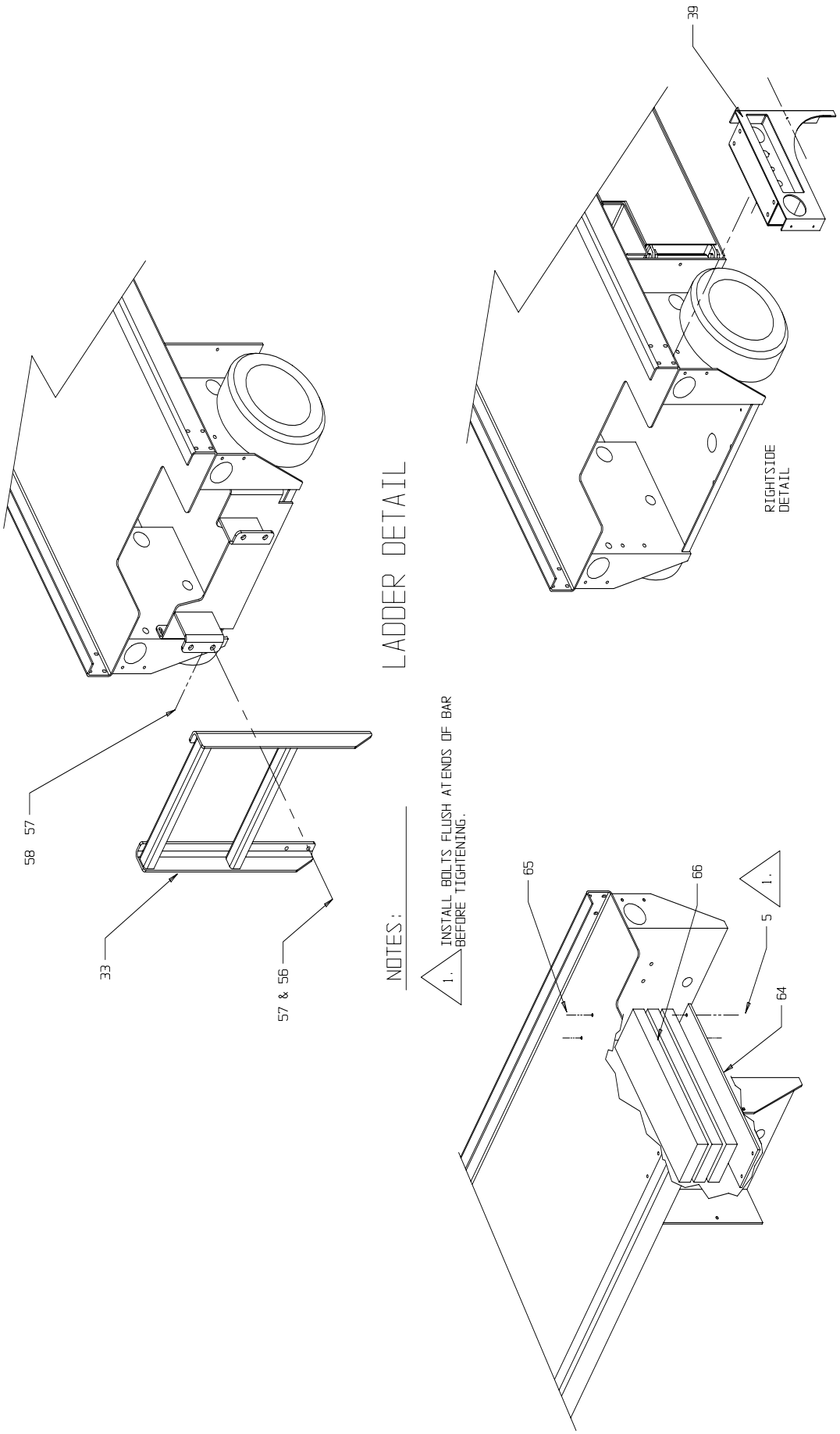
065600-020

ITEM	PART	DESCRIPTION	QTY.
1	065601-020	BASIC ASSY	1
3	063944-001	CHARGER	1
4	066490-020	SWITCH ROLLER ASSY	1
5	011248-003	NUT HEX ESNA 10-24	2
6	011240-003	WASHER #10 STD FLAT	4
7	065610-020	CONTROLLER ASSEMBLY	1
8	013965-005	SCREW HHC 10-24 X 5/8	2
9	015796-000	BATTERY 6 V	4
	015796-001	BATTERY, DRY	
10	065614-000	EXTENSION DECK	1
11	065603-004	PLATFORM/GUARDRAIL ASSY	1
12	066489-000	SWITCH BRACKET	1
14	065611-021	HYDRAULIC HOSE KIT / INST.	1
15	065615-023	HYDRAULIC SCHEMATIC	REF
16	065616-024	ELECTRICAL SCHEMATIC	REF
17	110020-002	MX SPECIFICATION SHEET	REF
18	065612-030	LABEL KIT / INSTALLATION	1
19	065609-020	CONTROL CABLE ASSY	1
20	065943-002	WIRE HARNESS ASSY	1
21	065746-000	CONTROLLER GUIDE	1
20	065943-002	WIRE HARNESS ASSY	1
21	065746-000	CONTROLLER GUIDE	1
22	062125-052	CABLE ASSY X 52	1
23	064195-019	CABLE ASSY X 19	1
24	064195-104	CABLE ASSY X 104	1
25	064195-014	CABLE ASSY X 014	2
26	062125-005	CABLE ASSY X 14	1
27	101182-001	CABLE ASSY W/ CONNECTOR	1

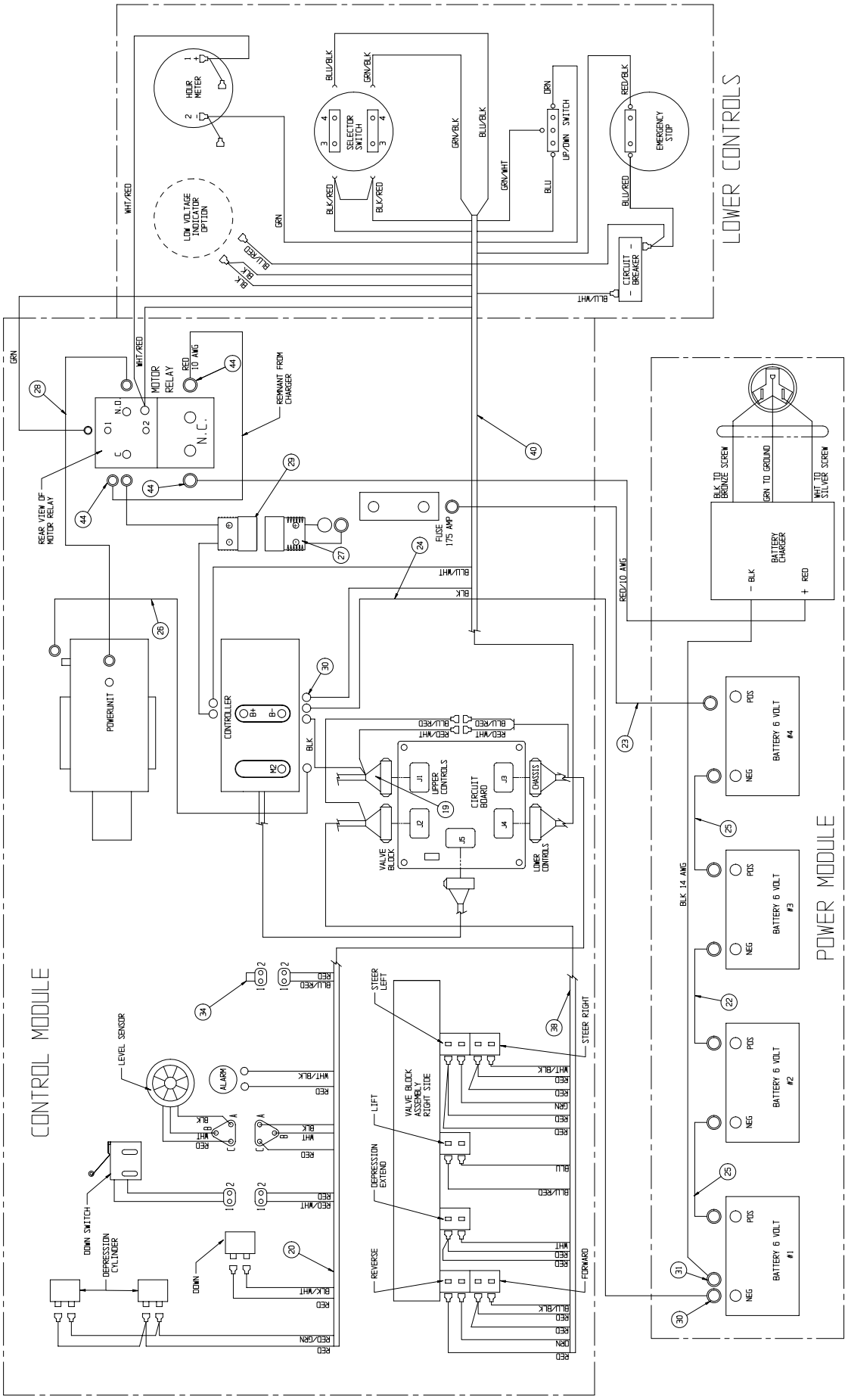
ITEM	PART	DESCRIPTION	QTY.
28	062125-003	CABLE ASSY X 24	1
29	101182-002	CABLE ASSY W/ CONNECTOR	1
30	010154-001	COVER BATTERY TERMINAL	10
31	029601-039	CONN RING 5/16 10-12	3
32	067336-000	PLUG ASSY M 110Vac	2
33	066307-015	LADDER WELDMENT	1
34	063497-025	PLUG, BYPASS WIRE ASS'Y	1
35	067336-001	PLUG ASSY FM 110Vac	1
37	029435-099	WIRE AWG 14 GA 3 CONN.	37
38	065942-002	CABLE ASSY VALVE BLOCK	1
39	065980-002	WHEEL COVER ASSY	1
40	067340-001	WIRE ASS'Y LOWER CONTROLS	1
41	029945-020	LEVEL SENSOR WIRE ASSY	1
44	029601-021	CONN RING 3/8 10-12	1
45	013283-002	CABLE MOUNT	2
46	011252-012	SCREW HHCS1/4-20 X 1 1/2	2
49	011252-006	SCREW HHC 1/4-20UNC X 3/4	6
50	011238-004	WASHER 1/4 LOCK	2
51	011240-004	WASHER 1/4 STD FLAT	8
52	011248-004	NUT HEX ESNA 1/4-20UNC	12
53	066505-000	BRACKET	1
54	065682-000	SPACER	1
56	011254-008	SCREW HHC 3/8-16 UNC X 1	4
57	011240-006	WASHER 3/8 STD FLAT	8
58	011248-006	NUT HEX ESNA 3/8-16 UNC	4
64	065798-000	MOUNTING PLATE BALLAST	1
65	011252-048	SCREW HHC 1/4-20 UNC X 6	4
66	019775-017	BAR	3



Drawing # 1 of 3



Drawing # 2 of 3



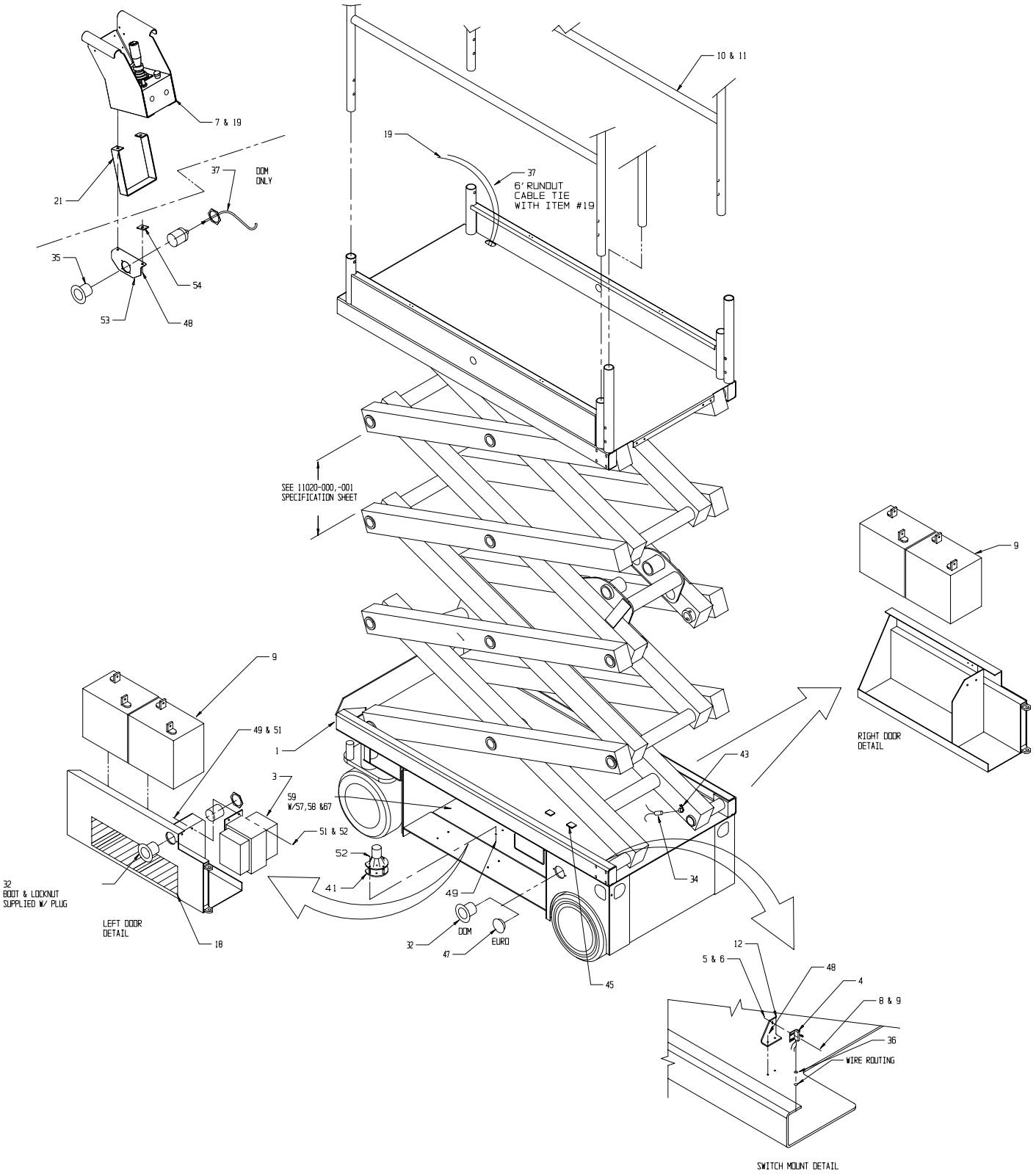
Drawing # 3 of 3

Final Assembly, MX19

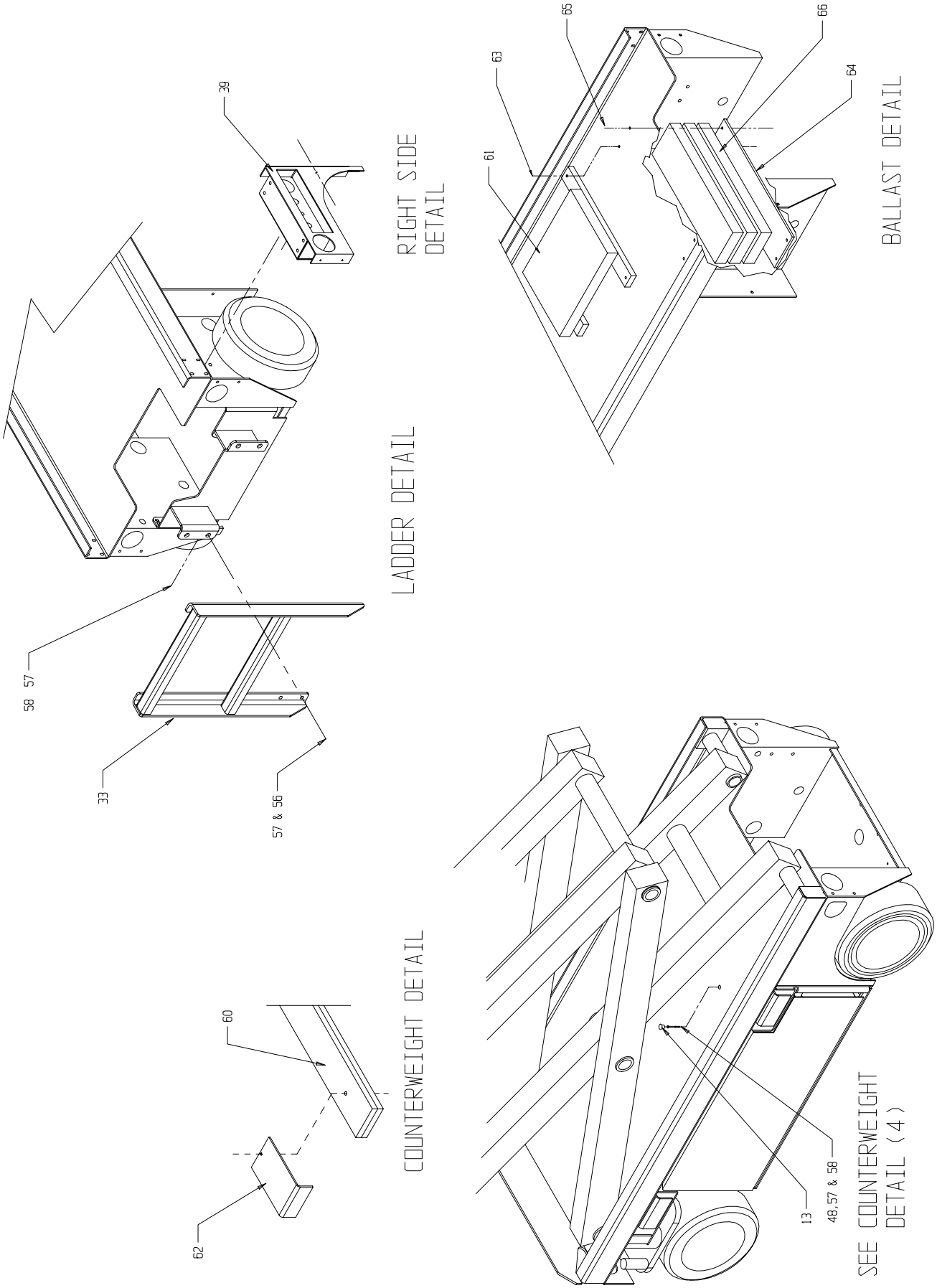
065700-020

ITEM	PART	DESCRIPTION	QTY.
1	065701-020	BASIC ASSY	1
3	063944-001	CHARGER	1
4	066490-020	SWITCH ROLLER ASSY	1
5	011248-003	NUT HEX ESNA 10-24	2
6	011240-003	WASHER #10 STD FLAT	4
7	065610-020	CONTROLLER ASSEMBLY	1
8	013965-005	SCREW HHC 10-24 X 5/8	2
9	015796-000	BATTERY 6 V	4
	015796-001	BATTERY, DRY	
10	065614-000	EXTENSION DECK	1
11	065603-004	PLATFORM/GUARDRAIL ASSY	1
12	066489-000	SWITCH BRACKET	1
13	066516-009	HOLE PLUG	4
14	065611-021	HOSE KIT / INST.	1
15	065615-023	HYDRAULIC SCHEMATIC	REF
16	065616-024	ELECTRICAL SCHEMATIC	REF
17	110020-002	MX SPECIFICATION SHEET	REF
18	065712-030	LABEL KIT / INSTALLATION	1
19	065609-021	CONTROL CABLE ASSY	1
20	065943-002	WIRE HARNESS ASSY	1
21	065746-000	CONTROLLER GUIDE	1
22	062125-052	CABLE ASSY X 52	1
23	064195-019	CABLE ASSY X 19	1
24	064195-104	CABLE ASSY X 104	1
25	064195-014	CABLE ASSY X 014	2
26	062125-005	CABLE ASSY X 14	1
27	101182-001	CABLE ASSY X 35	1
28	062125-003	CABLE ASSY X 24	1
29	101182-002	CABLE ASSY X 18	10
30	010154-001	COVER BATTERY TERMINAL	10
31	029601-039	CONN RING 5/16 10-12	3

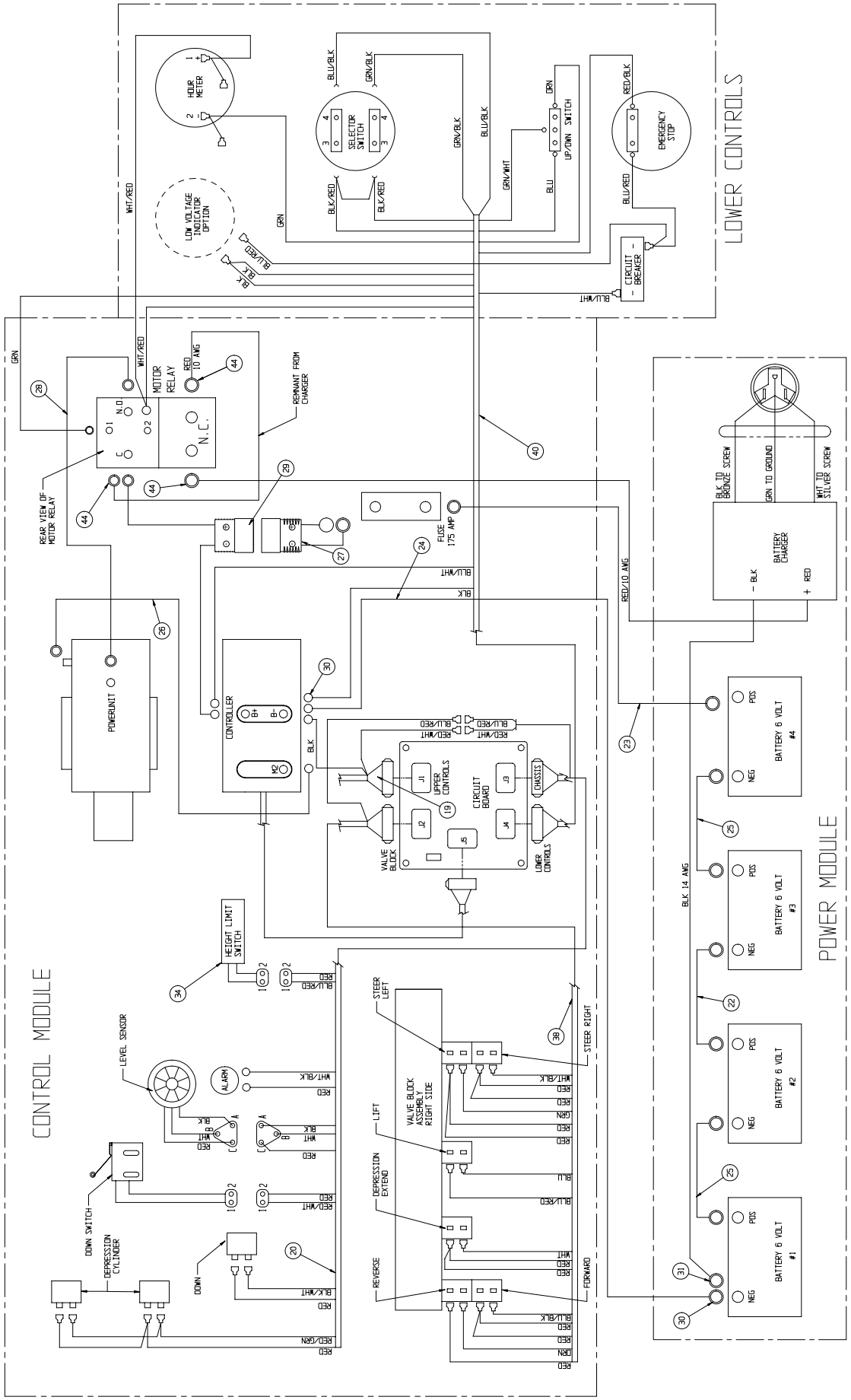
ITEM	PART	DESCRIPTION	QTY.
32	067336-000	PLUG ASSY M 110Vac	2
33	066307-019	LADDER WELDMENT	1
34	063497-020	SWITCH MERCURY ASSY	1
35	067336-001	PLUG ASSY FM 110Vac	1
37	029495-099	WIRE AWG 14 GA 3 CONN.	37
38	065942-002	CABLE ASSY VALVE BLOCK	1
39	065980-002	WHEEL COVER ASSY	1
40	067340-001	WIRE ASS'Y LOWER CONTROLS	1
41	029945-020	LEVEL SENSOR ASSY	1
43	013919-013	CLAMP	1
44	029601-021	CONN RING 3/8 10-12	1
45	013283-002	CABLE MOUNT	2
48	011252-006	SCREW HHC 1/4-20 X 3/4	2
49	011252-020	SCREW HHC 1/4-20UNC X 2-1/2	6
50	011238-004	WASHER 1/4 LOCK	2
51	011240-004	WASHER 1/4 STD FLAT	8
52	011248-004	NUT HEX ESNA 1/4-20UNC	9
53	066505-000	BRACKET	1
54	065682-000	SPACER	1
56	011254-008	SCREW HHC 3/8-16 UNC X 1	4
57	011240-006	WASHER 3/8 STD FLAT	16
58	011248-006	NUT HEX ESNA 3/8-16 UNC	8
59	065963-001	BALLAST PLATE	4
60	065962-000	BALLAST BAR	4
61	065963-010	BALLAST WA.	1
62	065613-000	COVER CW'T	4
63	011252-056	SCREW HHC 1/4-20 UNC X 7	2
64	065798-000	MOUNTING PLATE BALLAST	1
65	011252-048	SCREW HHC 1/4-20 UNC X 6	2
66	019775-017	BAR	3
67	011254-020	SCREW HHC 3/8-16 X 2-1/2	4



Drawing # 1 of 3



Drawing # 2 of 3

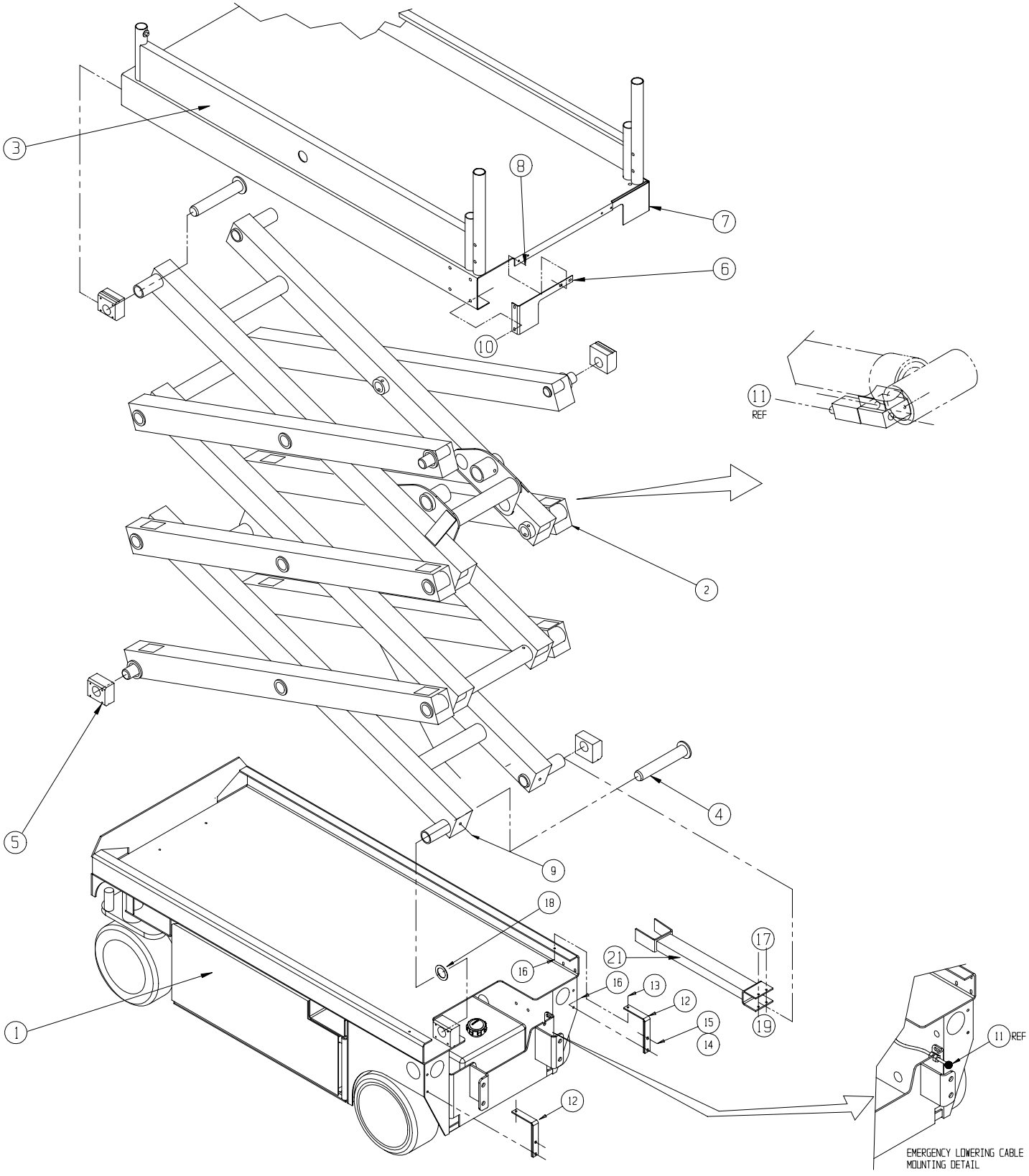


Drawing # 3 of 3

Basic Assembly, MX15

065601-020

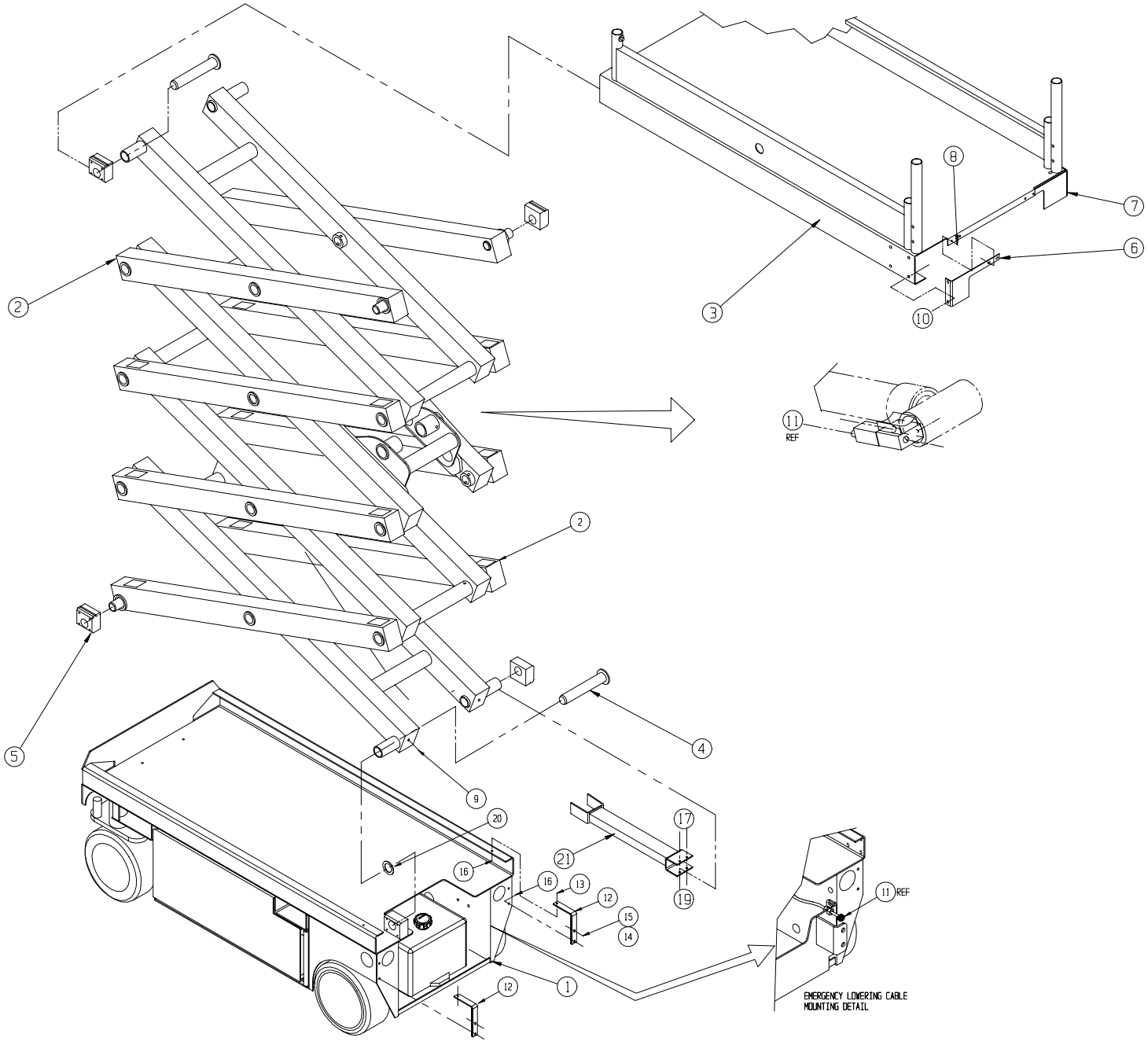
ITEM	PART	DESCRIPTION	QTY.
1	065602-020	CHASSIS ASS'Y	1
2	065605-020	SCISSOR ARM ASS'Y X15	1
3	066250-001	PLATFORM WELDMENT	1
4	065698-000	LOWER PIVOT PIN WELDMENT	4
5	065726-000	SLIDE PAD	8
6	065728-000	DECK BRACKET L.H.	1
7	065727-000	DECK BRACKET R.H.	1
8	014027-006	SCREW HHD SLFTP 1/4-28 x 3/4	4
9	011739-020	ROLLPIN 3/8 DIA. x 2 1/2	4
10	014066-008	SCREW SLFTP 1/4-28 X 1	8
11	065754-006	EMERGENCY LOWERING CABLE	1
12	065937-001	BEARING RETENTION ANGLE	2
13	011254-034	SCREW HHC 3/8-16UNC X 4 1/4	2
14	011254-014	SCREW HHC 3/8-16UNC X 1 3/4	4
15	011240-006	WASHER 3/8 STD FLAT	4
16	011248-006	NUT HEX ESNA 3/8-16UNC	6
17	011829-022	CARRIAGE BOLT 1/4-20 X 2-3/4 PLATED	2
18	011786-007	MACHINERY BUSHING 1-1/2 X 14 GA.	2
19	011248-004	LOCK NUT HEX 1/4-20	2
21	065764-000	SCISSOR CHOCK WELDMENT X15/19	1


3
8
7
6
10
11
REF
2
5
4
9
18
17
21
16
16
13
12
15
14
19
1
12
11
REF
EMERGENCY LOWERING CABLE
MOUNTING DETAIL

Basic Assembly, MX19

065701-020

ITEM	PART	DESCRIPTION	QTY.
1	065602-020	CHASSIS ASS'Y	1
2	065705-020	SCISSOR ARM ASS'Y X19	1
1	065602-020	CHASSIS ASS'Y	1
2	065705-020	SCISSOR ARM ASS'Y X19	1
3	066250-001	PLATFORM WELDMENT	1
4	065698-000	LOWER PIVOT PIN WELDMENT	4
5	065726-000	SLIDE PAD	8
6	065728-000	DECK BRACKET L.H.	1
7	065727-000	DECK BRACKET R.H.	1
8	014027-006	SCREW HHD SLFTP 1/4-28 x 3/4	4
9	011739-020	ROLLPIN 3/8 DIA. x 2 1/2	4
10	014066-008	SCREW SLFTP 1/4-AB x 1	16
11	065754-006	EMERGENCY LOWERING CABLE	1
13	011254-034	SCREW HHC 3/8-16UNC X 4 1/4	2
12	065937-001	BEARING RETENTION ANGLE	2
13	011254-034	SCREW HHC 3/8-16UNC X 4 1/4	2
14	011254-014	SCREW HHC 3/8-16UNC X 1 3/4	4
15	011240-006	WASHER 3/8 STD FLAT	4
16	011248-006	NUT HEX ESNA 3/8-16UNC	6
17	011829-022	CARRIAGE BOLT 1/4-20 X 2-3/4 PLATED	2
19	011248-004	LOCK NUT 1/4-20	2
21	065764-000	SCISSOR CHOCK WELDMENT X15/19	1

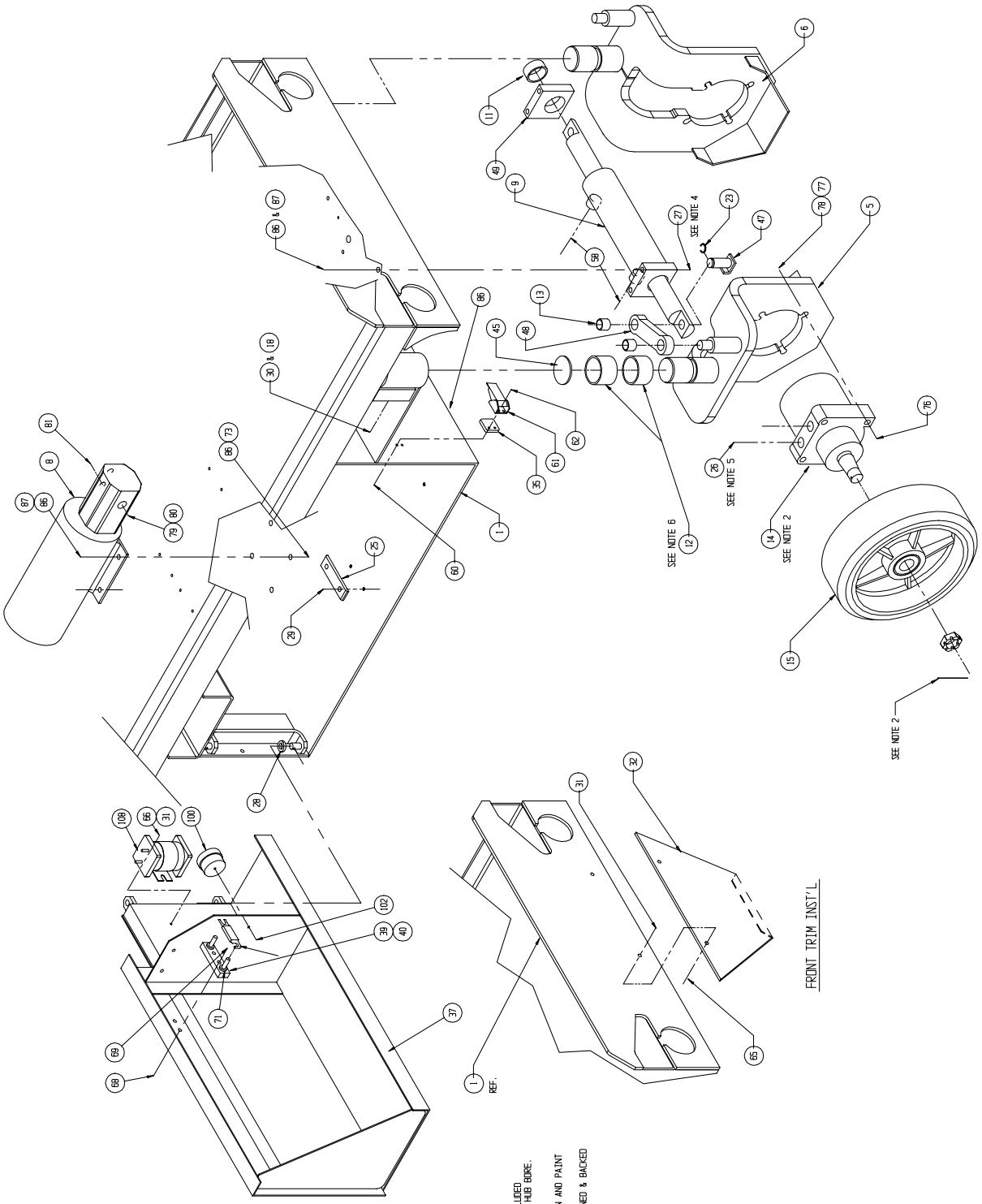

2
3
8
7
6
10
11
REF
2
5
4
9
20
16
17
21
19
16
13
12
15
14
12
1
11
REF
EMERGENCY LOWERING CABLE
MOUNTING DETAIL

Chassis Assembly

065602-020

ITEM	PART	DESCRIPTION	QTY.
1	065620-010	CHASSIS WELDMENT X15	1
2	065678-000	BRAKE PIVOT WELDMENT	1
3	011753-012	COTTER PIN 1/8 X 1 1/2	5
4	065685-000	BRAKE ACTUATOR WELDMENT	2
5	065690-010	YOKE WELDMENT R.H. X15	1
6	065691-010	YOKE WELDMENT L.H. X15	1
7	101152-001	HYDRAULIC TANK ASS'Y X15	1
8	065933-000	POWER UNIT	1
	065933-006	MOTOR	
	065933-007	PUMP	
	065933-008	BRUSHES	
9	065371-000	STEERING CYLINDER	1
	065371-011	SEAL KIT	
10	011781-020	BEARING	4
11	027931-072	BEARING	2
12	027931-059	BEARING	4
13	027931-022	BEARING	4
14	101125-001	DRIVE MOTOR	2
	101125-010	DRIVE MOTOR SEAL KIT	
15	065743-000	DRIVE WHEEL	2
16	065744-020	IDLER WHEEL	2
18	011273-006	NUT HEX 3/8-16 JAM	2
19	065657-001	TRAY WELDMENT L.H.	1
20	066604-000	BRAKE CYLINDER	1
	066604-010	SEAL KIT	
	066604-015	SPRING	
21	027931-071	BEARING	2
23	013315-010	RING, RETAINING "E"	2
25	063728-001	SLIDE BLOCK	4
26	011935-003	FITTING, 45× 6MBH-6MJ	4
27	011254-032	SCREW HHC 3/8-16 x 4	4
28	011782-010	THRUST WASHER 1/2 X 7/8 X 3/16 LG	2
29	026553-004	RVT POP 3/16 DIA. .25-.38 GRIP	8
30	011287-008	SCREW SET 3/8-16 x 1	2
31	011252-008	SCREW HHC 1/4-20 UNC X 1	2
32	065756-000	FRONT TRIM COVER	1
35	064754-000	SPACER LATCH	2
36	101120-122	VALVE BLOCK ASS'Y	1
37	065650-001	TRAY WELDMENT R.H. X15/19	1
39	010149-000	FUSE BLOCK	1
40	010148-001	FUSE 175 AMP	1
42	065736-000	WHEEL COVER L.H. X15/19	1
44	065737-001	FORKLIFT POCKET	1
45	065733-000	THRUST PAD 1/4 UHMW	2
47	065800-000	WELDMENT, STEER PIN	2
48	065731-000	STEER LINK X15/19	2
49	065732-000	STEER GUIDE	2
50	065984-000	HEAT SINK	1
51	063973-001	VALVE N.C.	2
52	066322-000	CYLINDER LINK	1
55	066096-016	SCREW 1/2-13UNC SQ HD x 2	1
56	018183-058	TUBE 1-3/8 O.D. x 1/8 WALL x 5/8 LG	1

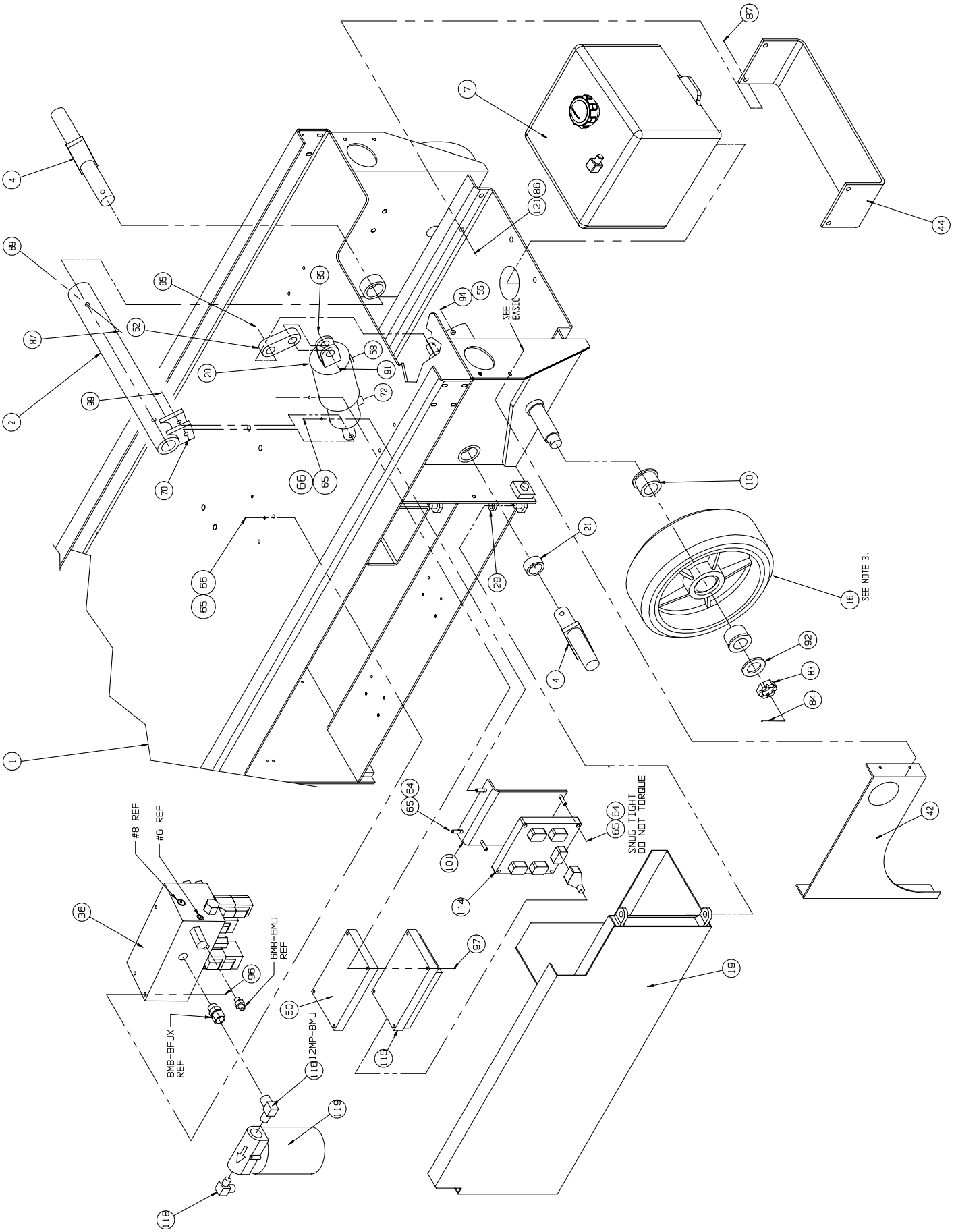
ITEM	PART	DESCRIPTION	QTY.
58	011934-001	FITTING 4MBH-4MJ	5
60	011248-002	LOCK NUT 8-32	2
61	05299-000	LATCH TOGGLE	2
62	011708-006	SCREW MACH RD HD 8-32 x 3/4	2
64	011252-008	SCREW HHC 1/4-20 X 1	4
65	011248-004	LOCK NUT 1/4-20	20
66	011240-004	WASHER FLAT STD 1/4	10
67	011252-006	SCREW HHC 1/4-20 x 3/4	5
68	011709-008	SCREW MACH HD RD 10-24 x 1	2
69	011248-003	LOCK NUT 10-24	2
70	011248-005	LOCK NUT 5/16-18	5
71	011240-005	WASHER FLAT STD 5/16	14
72	011934-003	FITTING 90 6MBH-4MJ	1
73	011254-008	SCREW HHC 3/8-16 X 1	4
76	011256-026	SCREW HHC 1/2-13 x 3-1/4	8
77	011240-008	WASHER FLAT STD 1/2	8
78	011248-008	LOCK NUT 1/2-13	8
79	011941-012	FITTING 8MB-12MJ	1
80	011937-007	FITTING 90 12FJX-12MJ	1
81	011934-004	FITTING 90 6MBH-6MJ	1
83	015945-016	NUT SLOTTED HEX JAM 1-14 UNF	2
84	011754-012	COTTER PIN 5/32 x 1-1/2	2
85	011757-010	COTTER RUE RING	4
86	011240-006	WASHER FLAT STD 3/8	20
87	011248-006	LOCK NUT 3/8-16	15
89	011254-020	SCREW HHC 3/8-16 x 2-1/2	2
91	011848-041	CLEVIS PIN 3/4 x 2	1
92	063329-008	WASHER, FLAT 1" I.D. 2" O.D.	2
94	011273-008	NUT 1/2-13 JAM HEX	1
96	011252-040	SCREW HHC 1/4-20 UNC X 5	3
97	012553-012	SCREW, SOCKET HD 1/4-20UNC X 1-1/2	2
99	063559-006	SHOULDER BOLT 3/8 x 2	1
100	066807-001	ALARM DUAL TONE	1
101	065683-001	I/O MOUNT ANGLE	1
102	011252-006	SCREW RD HD 6-32 X 3/4	2
103	011848-036	CLEVIS PIN 5/8 X 2 1/4	2
104	011848-019	CLEVIS PIN 3/4 X 2 1/2	2
105	011780-040	BEARING 5/8 X 13/16 X 1/2 LG	4
107	014996-010	WASHER 5/8 SAE FLAT PLATED	8
108	010122-001	SOLENOID	1
109	065970-001	CYLINDER DEPRESSION MECHANISM	2
	065970-011	SEAL KIT	
110	065971-000	DEPRESSION RAIL WELDMENT L.H.	1
111	065971-001	DEPRESSION RAIL WELDMENT R.H.	1
114	065709-001	CIRCUIT BOARD	1
115	065708-001	MOTOR CONTROL	1
118	011940-018	FITTING 12MP-8MJ	1
119	05154-001	FILTER ASSY	1
	05154-002	FILTER ELEMENT	
120	065359-000	LADDER SUPPORT WELDMENT	1
121	011254-008	SCREW HHC 3/8-16UNC X 1	4



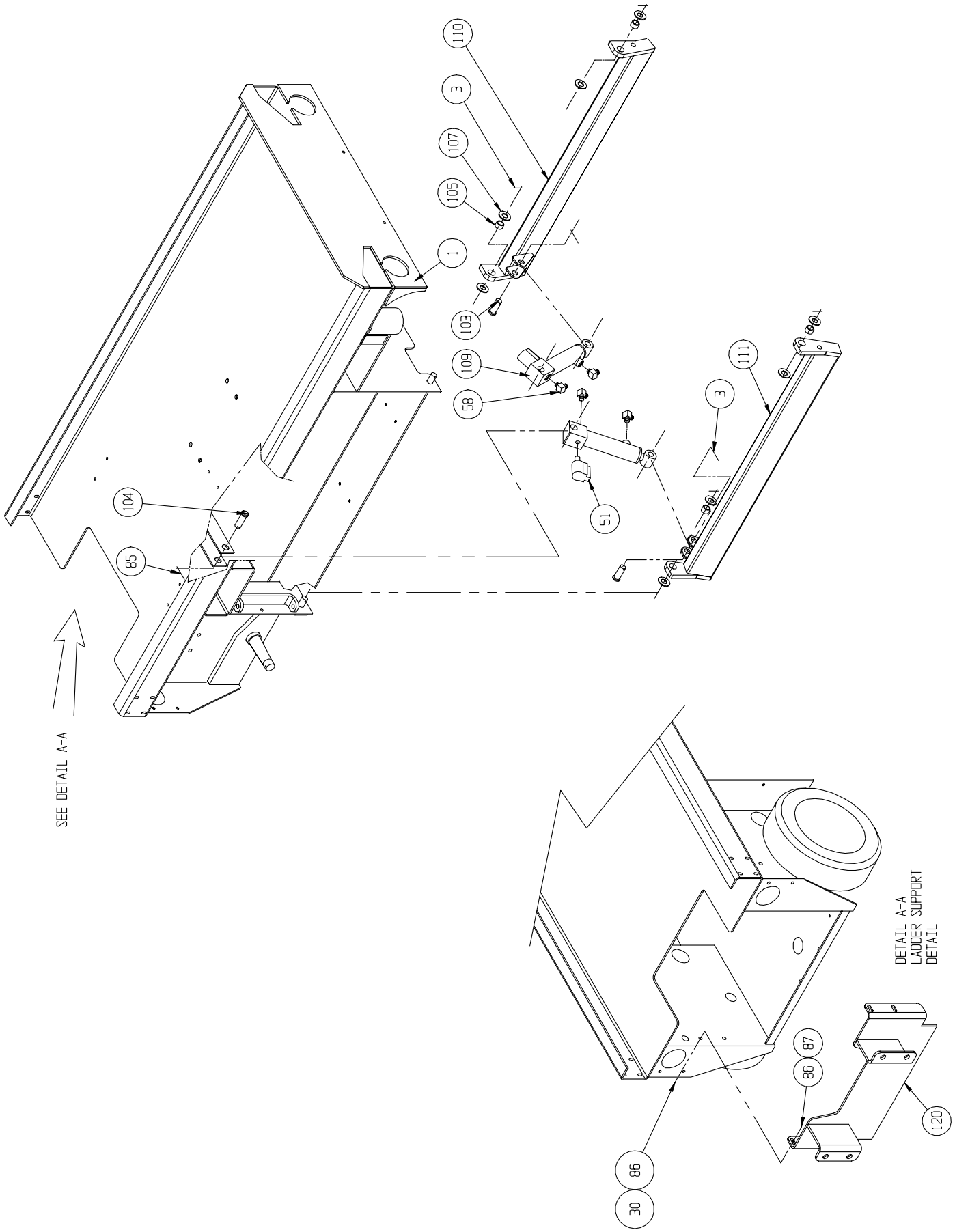
NOTES:

1.
2. 1-20 UNEF SLOTTED NUT & 1/8 x 1-1/2 COTTER PIN INCLUDED WITH ITEM (14) DRIVE MOTOR. CLEAN MOTOR SHAFT AND HUB BORE. LUBRICATE NUT FACE AND THREADS. TORQUE SLOTTED NUTS TO 75 15 FT-LBS. AFTER TORQUING NUTS, MASK AROUND NUT AND COTTER PIN AND PAINT NUT, COTTER PIN, AND SHAFT SILVER.
3. WHEEL (16) MUST TURN FREELY WITH NUT FIRMLY TIGHTENED & BACKED OFF 1-2 SLOTS MAXIMUM.
4. INSTALL AS SHOWN TO REDUCE HYDRAULIC HOSE DAMAGE.
5. ROTATE 45° (26) FITTING TO REAR AGAINST THE MOTOR CUT OUT BOTH SIDES.
6. LOCTITE 80 GRN ITEM (12) BOTTOM BEARING AND STAKE.
7. UNLESS OTHERWISE NOTED TORQUE FASTENERS TO UPRIGHT SPEC. #105 & TORQUE FITTINGS TO UPRIGHT SPEC. #106.

Drawing # 1 of 3



Drawing # 2 of 3

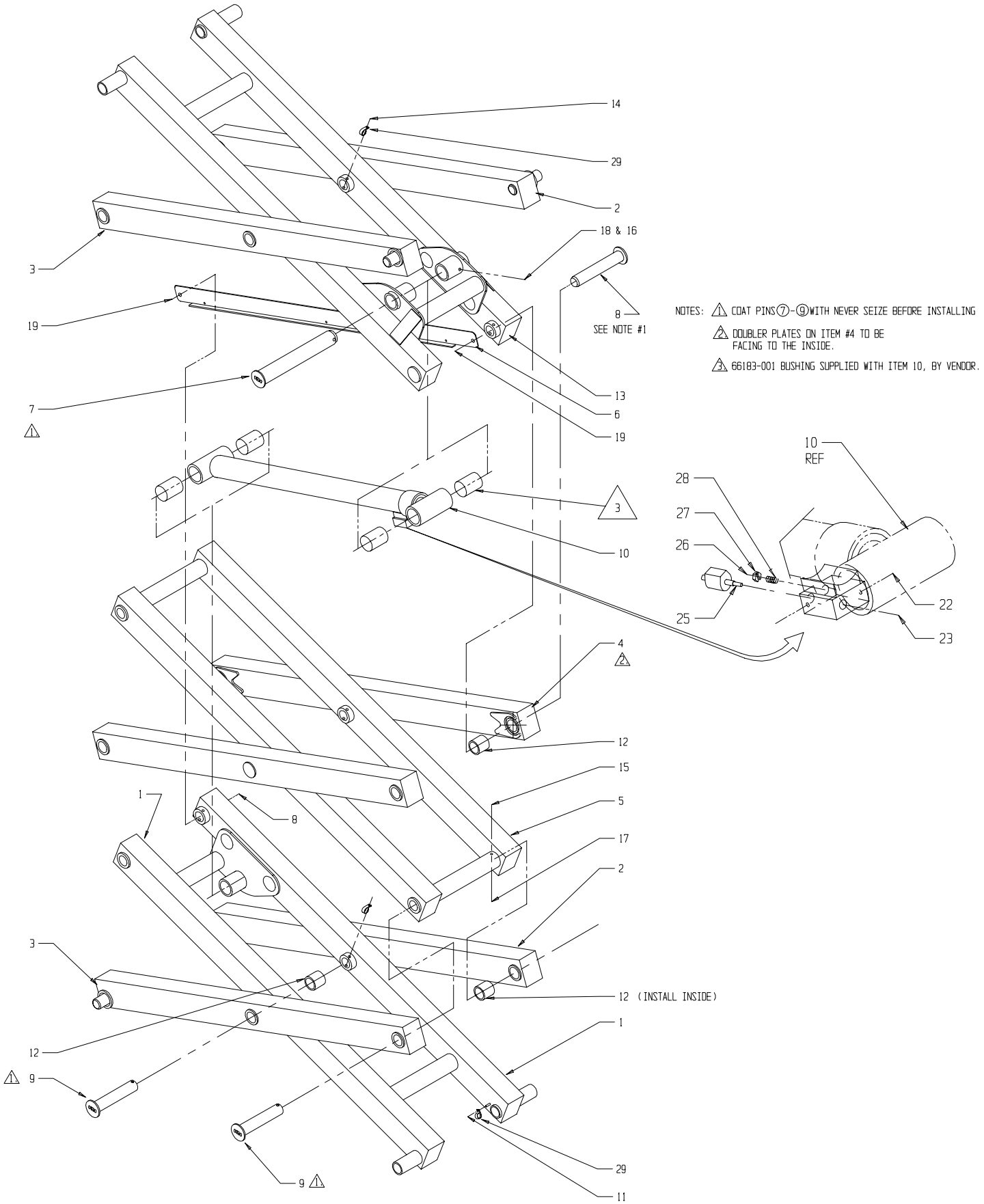


Drawing # 3 of 3

Scissor Linkage Assembly, MX15

065605-020

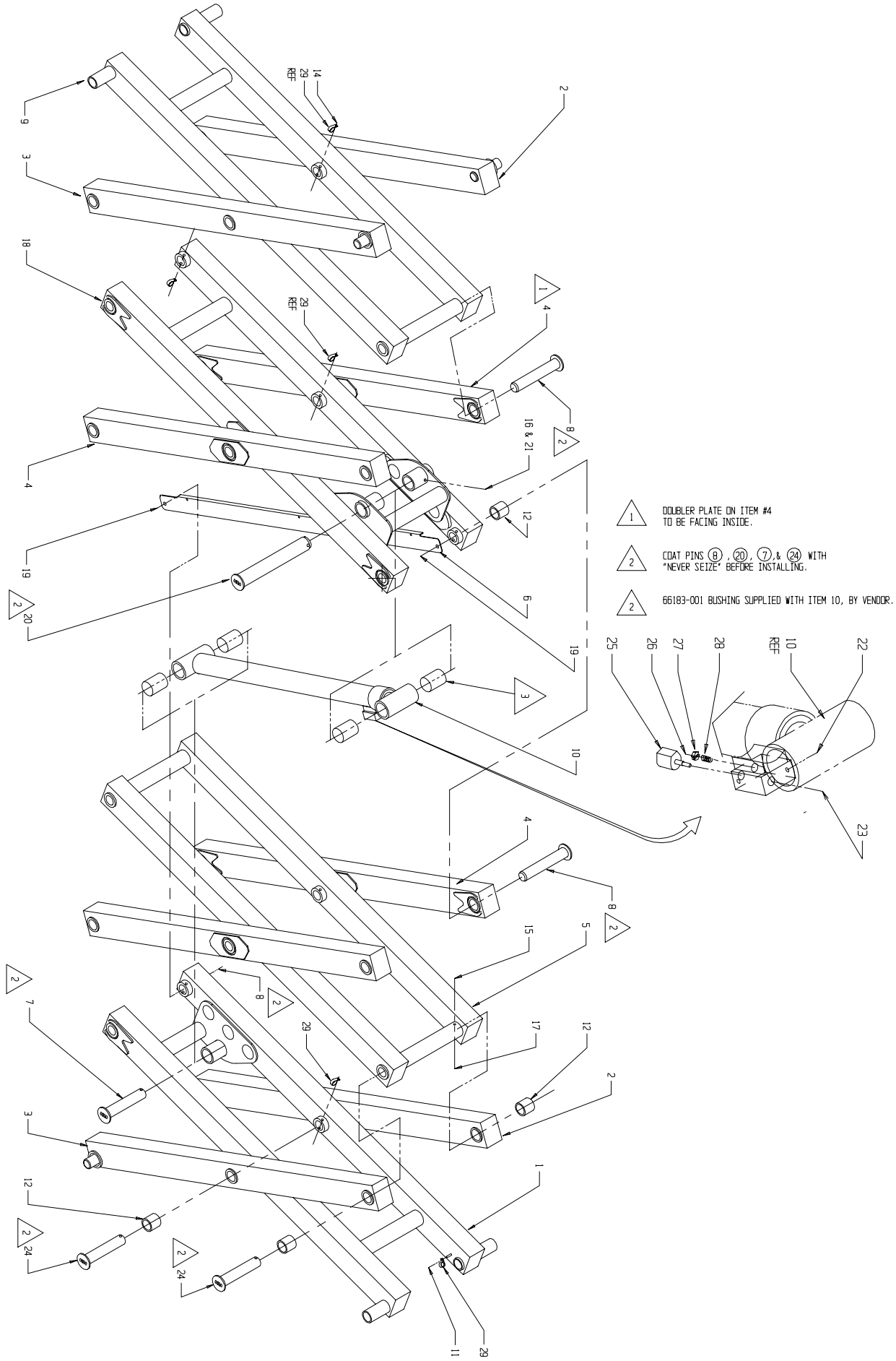
ITEM	PART	DESCRIPTION	QTY.
1	065640-000	INNER ARM WELDMENT	1
2	065671-000	OUTER BEAM WELDMENT R.H.	2
3	065672-000	OUTER BEAM WELDMENT L.H.	2
4	065675-001	OUTER BEAM WELDMENT	2
5	065677-000	INNER CENTER BEAM WELDMENT	1
6	065687-000	CABLE GUIDE	1
7	065696-000	CYLINDER PIN WELDMENT	2
8	065697-000	PIN KEEPER WELDMENT	2
9	065920-000	PIVOT PIN WELDMENT	12
10	065372-020	LIFT CYLINDER	1
	065372-012	SEAL KIT	
11	011248-004	LOCKNUT 1/4-20UNC HEX	1
12	066183-002	BUSHING	14
13	065640-001	INNER ARM WELDMENT	1
14	011253-024	SCREW 5/16-18UNC HHC X 3	3
15	011253-022	SCREW 5/16-18UNC HHC X 2 3/4	11
16	011254-026	SCREW 3/8-16UNC HHC X 3 1/4	2
17	011248-005	LOCKNUT 5/16-18UNC HEX	16
19	065688-000	GUARD RIVET	2
21	011248-006	LOCKNUT 3/8-16UNC HEX	2
22	012004-004	PLUG #4	1
23	012004-006	PLUG #6	1
25	066179-000	VALVE	1
26	011941-005	FITTING 6MB-6MJ ST	1
27	015919-001	ORIFICE #840	1
28	05133-000	SPRING	1
29	013919-009	CLAMP	3


14
29
2
18 & 16
3
8
SEE NOTE #1
19
13
7
6
19
10
REF
28
27
26
25
22
23
3
10
4
12
15
1
8
5
17
2
3
12 (INSTALL INSIDE)
12
1
9
29
9
11
NOTES: 1 COAT PINS 7-9 WITH NEVER SEIZE BEFORE INSTALLING
2 DOUBLER PLATES ON ITEM #4 TO BE FACING TO THE INSIDE.
3 66183-001 BUSHING SUPPLIED WITH ITEM 10, BY VENDOR.

Scissor Linkage Assembly, MX19

065705-020

ITEM	PART	DESCRIPTION	QTY.
1	065640-001	INNER ARM WELDMENT	1
2	065671-000	OUTER BEAM WELDMENT R.H.	2
3	065672-000	OUTER BEAM WELDMENT L.H.	2
4	065675-000	OUTER BEAM WELDMENT	4
5	065677-000	INNER CENTER BEAM WELDMENT	1
6	065687-000	CABLE GUIDE	1
7	065696-000	CYLINDER PIN WELDMENT	1
8	065697-000	PIN KEEPER WELDMENT	2
9	065721-000	UPPER BEAM WELDMENT	1
10	065372-020	LIFT CYLINDER	1
	065372-012	SEAL KIT	
11	011248-004	LOCKNUT 1/4-20UNC HEX	1
12	066183-002	BUSHING	20
14	011253-024	SCREW 5/16-18UNC HHC X 3	4
15	011253-022	SCREW 5/16-18UNC HHC X 2 3/4	16
16	011254-026	SCREW 3/8-16UNC HHC X 3 1/4	2
17	011248-005	LOCKNUT 5/16-18UNC HEX	20
18	065722-000	INNER BEAM WELDMENT	1
19	065688-000	GUARD RIVET	2
20	065750-000	CYLINDER PIN WELDMENT	1
21	011248-006	LOCKNUT 3/8-16UNC HEX	2
22	012004-004	PLUG #4	1
23	012004-006	PLUG #6	1
24	065920-000	PIVOT PIN WELDMENT	18
25	066179-000	VALVE	1
26	011941-005	FITTING 6MB-6MJ ST	1
27	015919-001	ORIFICE	1
28	05133-000	SPRING	1
29	013919-009	CLAMP	4

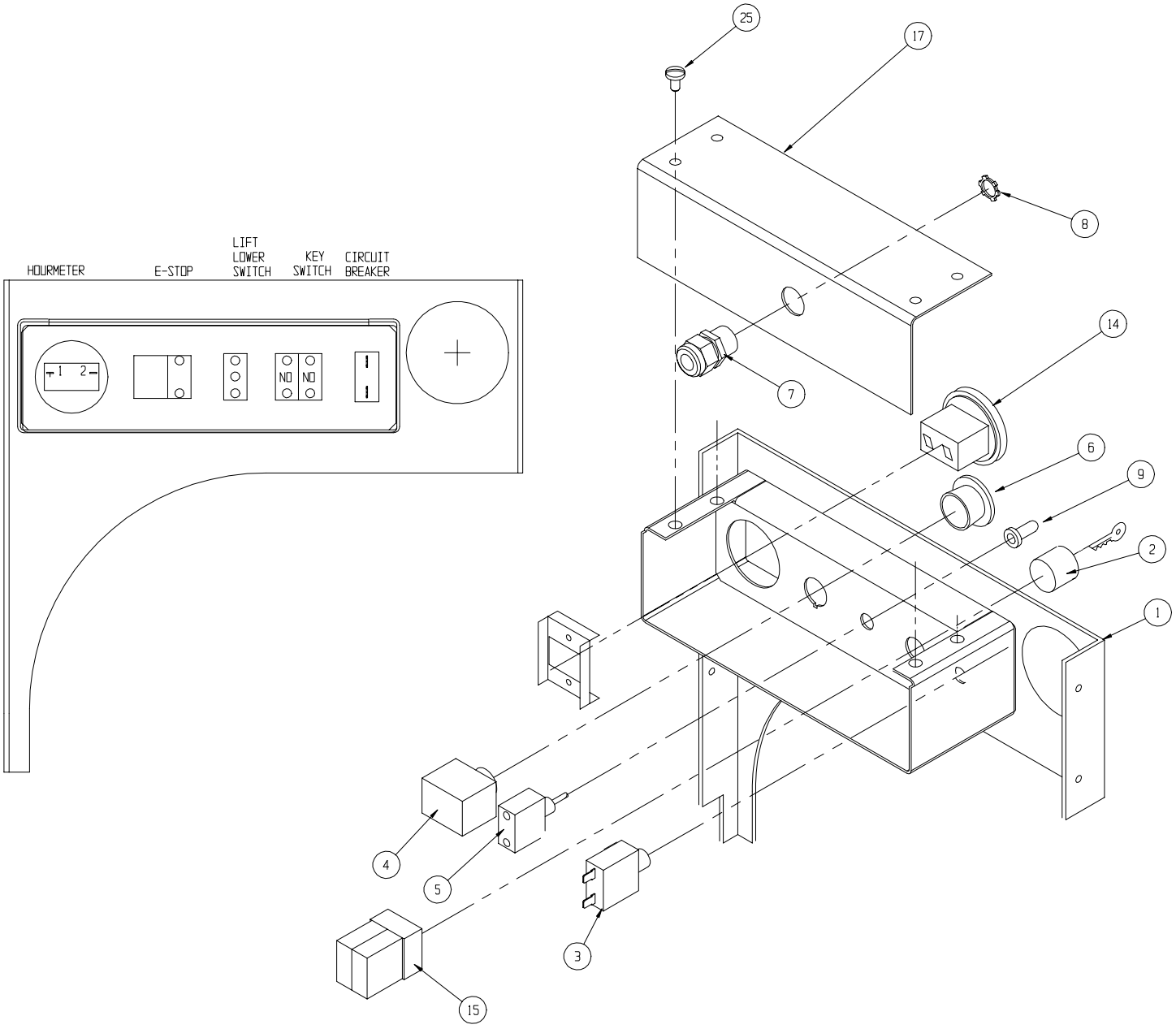

1 DOUBLER PLATE ON ITEM #4 TO BE FACING INSIDE.
2 COAT PINS (8), (20), (7),& (24) WITH "NEVER SEIZE" BEFORE INSTALLING.
2 66183-001 BUSHING SUPPLIED WITH ITEM 10, BY VENDOR.
9
14
29 REF
2
3
18
29 REF
1
4
8
2
16 & 21
4
12
19
2
20
6
19
3
10
25
26
27
28
10 REF
22
23
4
8
2
15
5
2
7
8
2
29
17
12
2
3
1
12
2
24
2
24
11
29

Wheel Cover Assembly

065980-002

ITEM	PART	DESCRIPTION	QTY.
1	065979-000	WHEEL COVER WELDMENT	1
2	066805-004	KEYSWITCH	1
	068807-010	REPLACEMENT KEY	
3	068582-005	CIRCUIT BREAKER	1
4	066805-011	SWITCH CONTACT BLOCK	1
5	012798-000	SWITCH TOGGLE	1
6	066805-006	SWITCH HEAD MUSHROOM	1
7	029925-010	CONNECTOR CABLE	1

ITEM	PART	DESCRIPTION	QTY.
8	029939-003	LOCKNUT 3/4 NPT	1
9	029872-000	BOOT SWITCH COVER	1
14	015752-000	HOURMETER	1
15	066805-010	SWITCH CONTACT N.O.	2
17	065978-000	COVER	1
25	011811-006	SCREW SLFTP F HWH 10-32 X 3/4	4

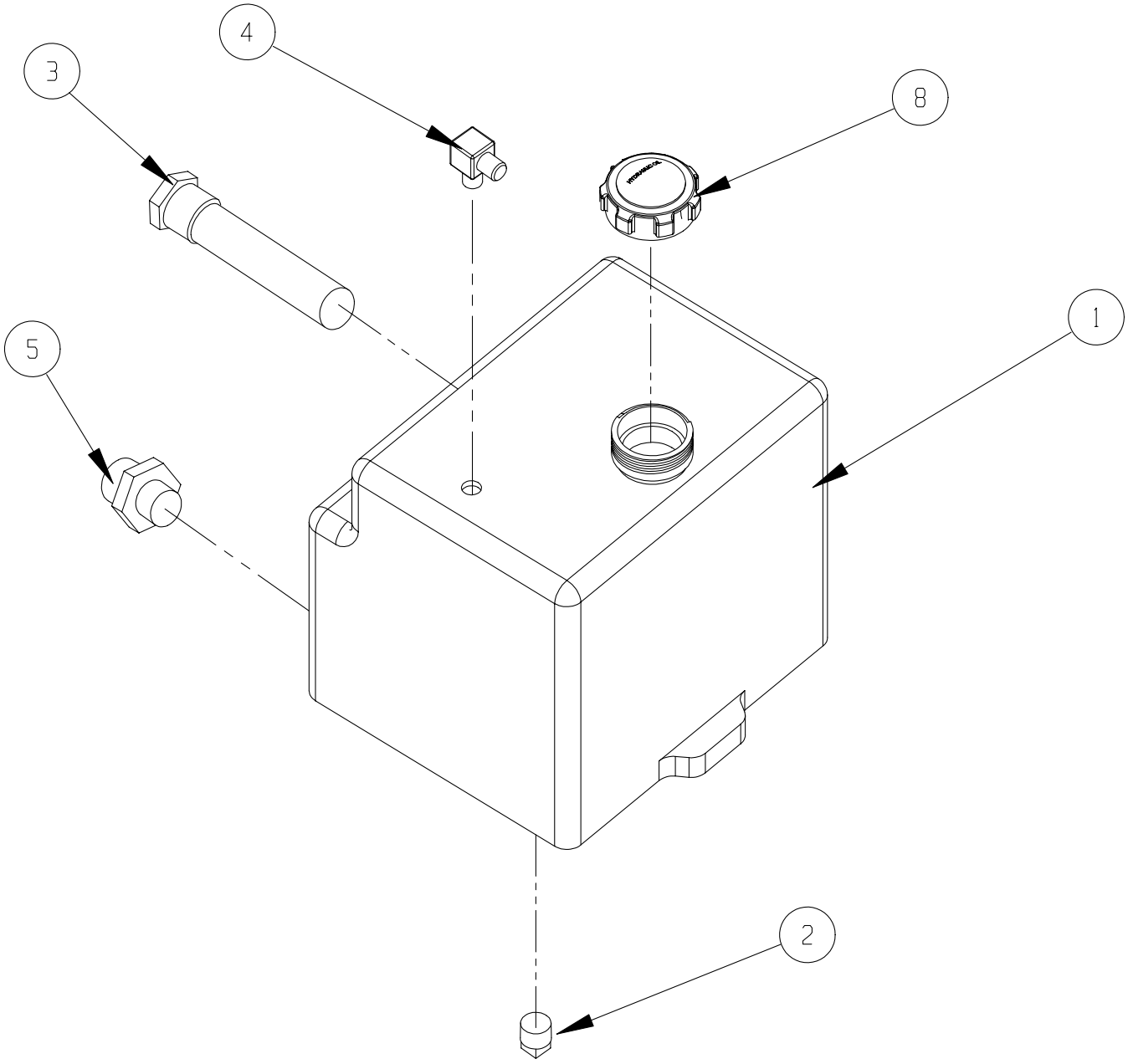


Hydraulic Tank Assembly

101152-001

ITEM	PART	DESCRIPTION	QTY.
1	101056-001	TANK, HYDRAULIC	1
2	021305-006	PLUG, MAGNETIC	1
3	061818-000	STRAINER, SUCTION	1
4	011940-006	FITTING ELBOW, 4MP-6MJ	1p

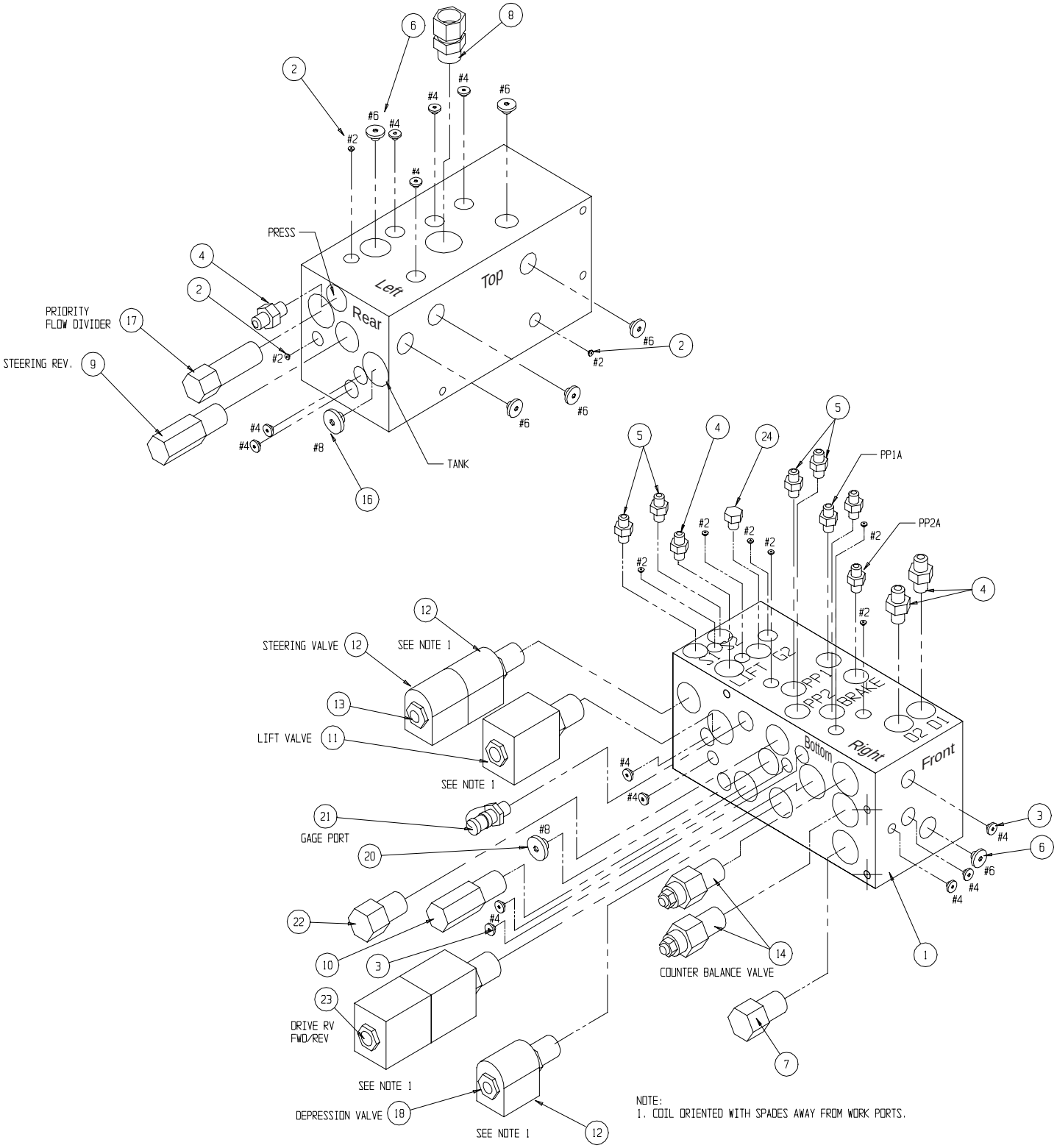
ITEM	PART	DESCRIPTION	QTY.
5	011939-015	FITTING 8MP-8MJ	1
6	011939-015	FITTING, REDUCER 8MP-6MJ	1
8	068982-001	HYDRAULIC TANK LID	1



Valve Block Assembly

101120-122

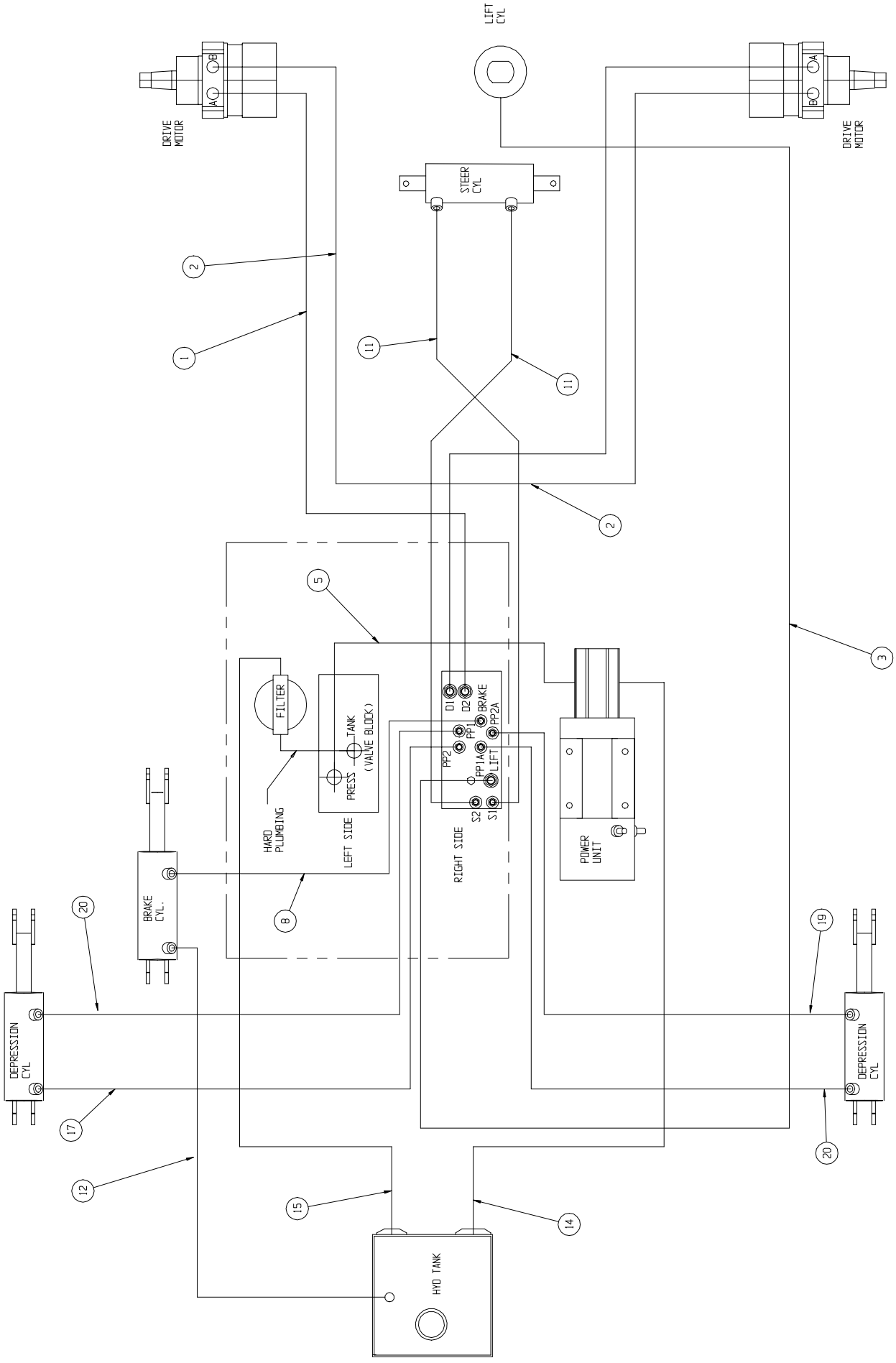
ITEM	PART	DESCRIPTION	QTY.
1	100020-040	CONTROL VALVE BLOCK	1
2	012004-002	FITTING #2 PLUG	9
3	012004-004	FITTING #4 PLUG	15
4	011941-005	FITTING STRAIGHT 6MB - 6MJ	4
5	011941-001	FITTING STR 4MBH - 4MJ	7
6	012004-006	FITTING PLUG #6	6
7	060390-009	VALVE RELIEF (2500 PSI)	1
8	064170-005	FITTING 8MB-8FJX	1
9	060390-017	RELIEF VALVE, STEERING (1200 PSI)	1
10	060390-025	RELIEF VALVE, MAIN (3000 PSI)	1
11	063923-006	2 POS - 4 WAY SOLENOID W/ COIL	1
12	101120-033	COIL	2
13	064845-000	3 POS - 4 WAY SOLENOID W/ COILS	1
14	101120-035	COUNTERBALANCE VALVE	2
16	020021-008	FITTING PLUG #8	1
17	064843-000	FLOW DIVIDER VALVE (1.0 GPM)	1
18	063973-001	2 POS POPPET VALVE W/ COIL	1
19	101120-033	COIL	1
20	012004-008	FITTING, #8 PLUG	1
21	063965-001	FITTING GAUGE	1
22	064841-000	CHECK VALVE	1
23	063923-021	3 POS - 4 WAY SOLENOID W/ COILS	1
24	020021-004	FITTING, HEX PLUG #4	1


PRESS
Left
Top
Rear
PRIORITY
FLOW DIVIDER
STEERING REV.
TANK
PP1A
PP2A
STEERING VALVE
SEE NOTE 1
LIFT VALVE
SEE NOTE 1
GAGE PORT
COUNTER BALANCE VALVE
DRIVE RV
FWD/REV
SEE NOTE 1
DEPRESSION VALVE
SEE NOTE 1
Bottom
Right
Front
NOTE:
1. COIL ORIENTED WITH SPADES AWAY FROM WORK PORTS.

Hose Kit Installation

065611-021

ITEM	PART	DESCRIPTION	QTY.
1	101244-037	HOSE ASSY 3/8 X 37 (6FJX-6FJX)	1
2	101243-034	HOSE ASSY 3/8 X 34 (6FJX-6FJX X 90)	2
3	068965-150	HOSE ASSY 3/8 X 150 (6FJX-6FJX X 90)	1
5	068965-013	HOSE ASSY 3/8 X 13 (6FJX-6FJX X 90)	1
8	107091-054	HOSE ASSY 3/16 X 54 (4FJX-4FJX X 90)	1
11	107090-031	HOSE ASSY 1/4 X 31 (4FJX-4FJX X 90)	2
12	061351-045	HOSE ASSY 1/8 X 13 (4FJX-4FJX)	1
14	061789-017	HOSE ASSY 3/4 X 17 1/2 (12FJX-12MP)	1
15	064156-021	HOSE ASSY 1/2 X 42 (8FJX-8FJX)	1
17	107091-038	HOSE ASSY 3/16 X 38 (4FJX-4FJX90)	1
19	107091-032	HOSE ASSY 3/16 X 32	1
20	107091-037	HOSE ASSY 3/16 X 37	2

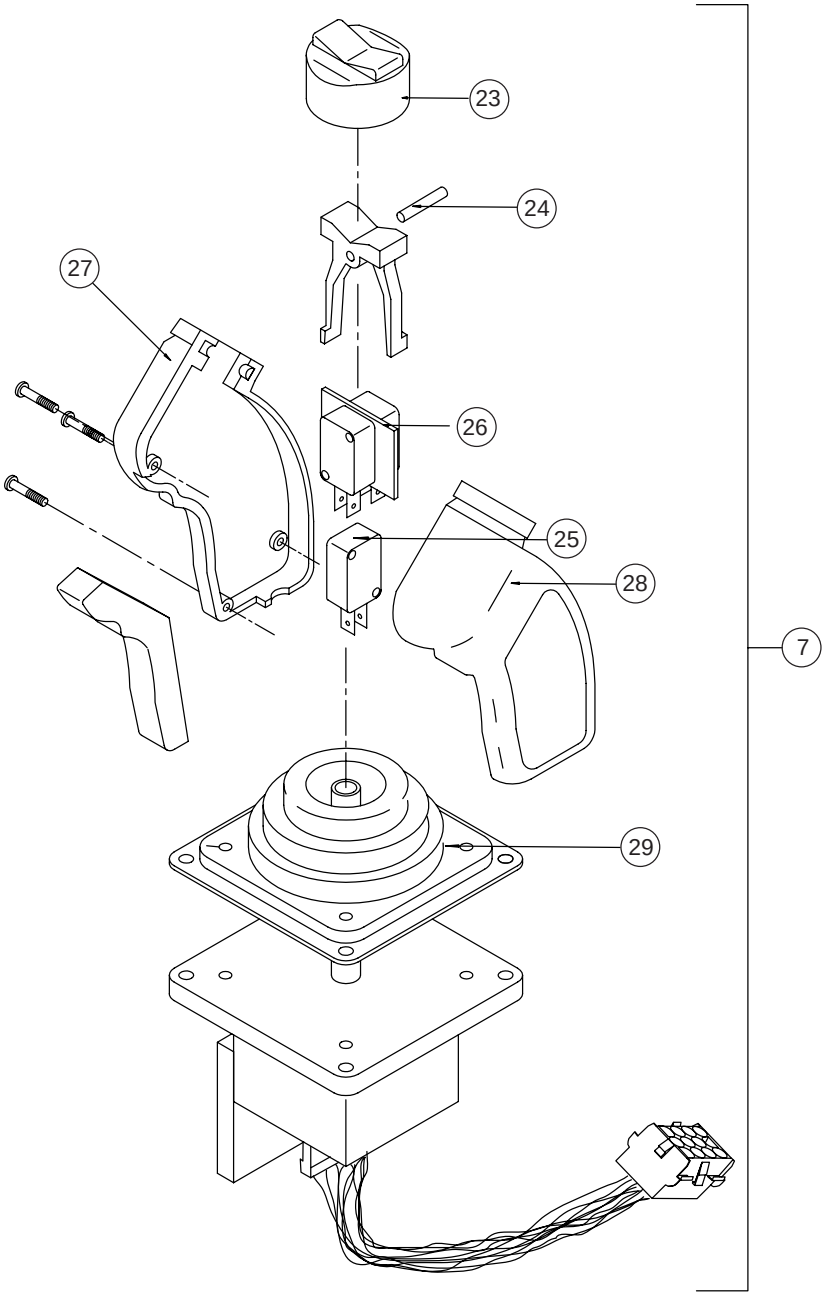

LIFT CYL
DRIVE MOTOR
DRIVE MOTOR
STEER CYL
FILTER
TANK (VALVE BLOCK)
PRESS
HARD PLUMBING
LEFT SIDE
RIGHT SIDE
D1
D2
BRAKE
PP2A
PP1
PP2
PP1A
LIFT
S2
S1
POWER UNIT
BRAKE CYL.
DEPRESSION CYL
DEPRESSION CYL
HYD TANK
1
2
2
3
5
8
11
11
12
14
15
17
19
20
20

Platform Controller

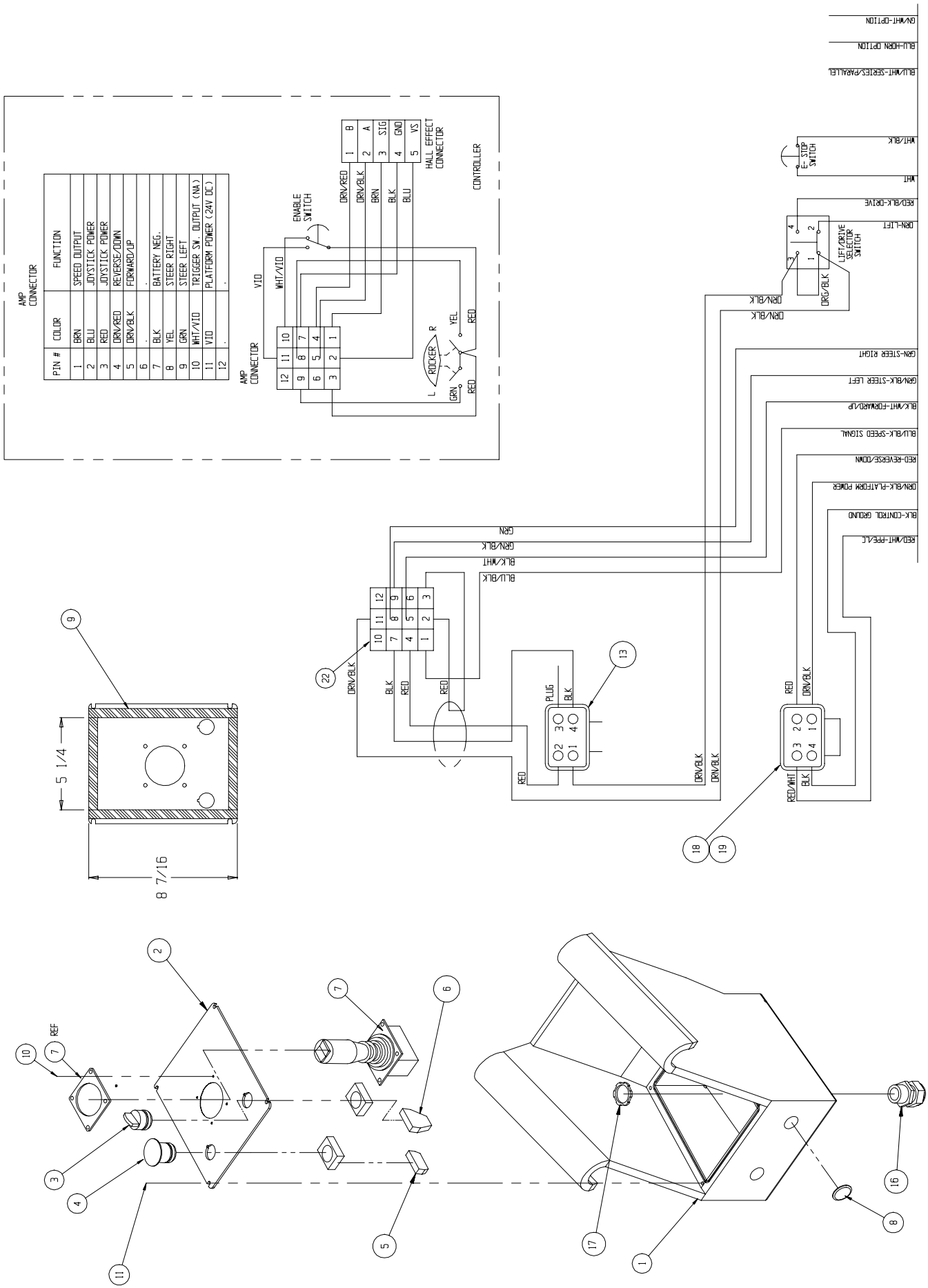
065610-020

ITEM	PART	DESCRIPTION	QTY.
1	101188-000	BOX CONTROLLER	1
2	101223-002	COVER CONTROLLER	1
3	066805-002	SWITCH SELECTOR-2 POSITION	1
4	066805-006	SWITCH PUSH BUTTON	1
5	066805-011	CONTACT NC	1
6	066805-012	CONTACT NO - NC	1
7	065512-000	CONTROLLER PQ	1
8	064462-009	HOLE PLUG	2
9	068889-099	WEATHERSTRIP	FT 2.3
10	011811-006	SCREW SLFTP 10-32 X 3/4	4
11	011761-004	SCREW MACH SLOTTED TRUSS HD #10-24 X 1/2	4
13	101240-000	CABLE ASSY CONTROLLER EURO	1
16	029925-010	CONN CABLE	1

ITEM	PART	DESCRIPTION	QTY.
17	029939-003	LOCKNUT 3/4	1
18	067990-020	4 PIN RECEPTACLE	1
19	067990-023	4 PIN WEDGE	1
22	063956-003	CONN 12 PIN	1
23	063953-001	CAP, RUBBER	1
24	065512-013	ROCKER PIN	1
25	063953-007	SWITCH, INTERLOCK	1
26	065512-015	SWITCH, STEERING	2
27	065512-016	HANDLE HALF, RIGHT	1
28	065512-017	HANDLE HALF, LEFT	1
29	065512-018	BOOT, HANDLE	1



Drawing # 1 of 2



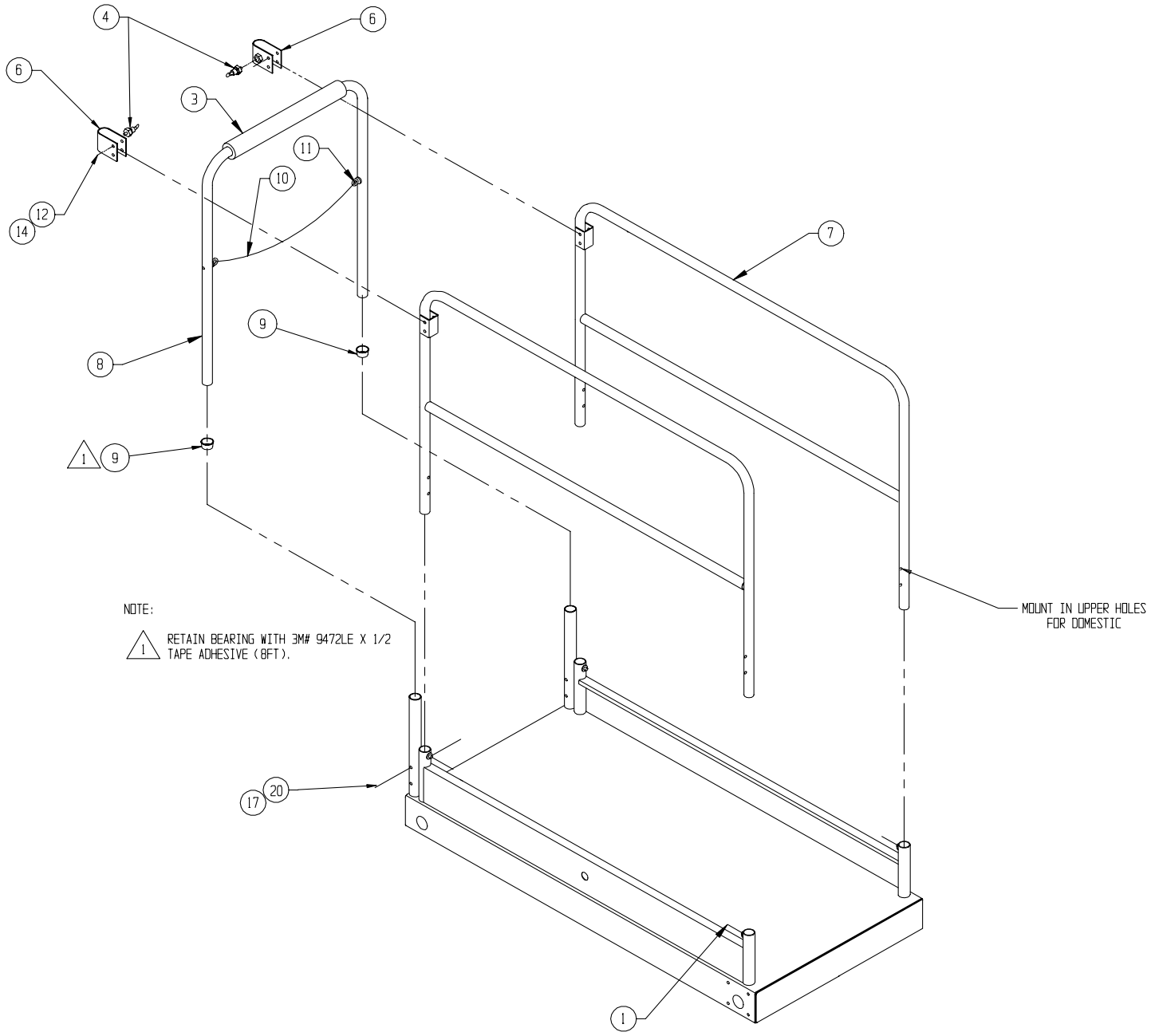
Drawing # 2 of 2

Platform Guardrail Assembly

065603-004

ITEM	PART	DESCRIPTION	QTY.
1	066171-003	TAP BOLT 3/8-16 X 2 (FULL THREAD)	4
3	066692-022	FOAM TUBING	1
4	03570-000	RETAINING PIN ASSY	2
6	066498-000	WELDMENT, GATE LATCH	2
7	066257-007	WELDMENT SIDE RAIL	2
8	066261-001	WELDMENT, END RAIL	1
9	065987-000	CAPLUG BEARING	2

ITEM	PART	DESCRIPTION	QTY.
10	063133-003	CHAIN ASS'Y	1
11	015748-002	REPAIR LINK	1
12	011248-005	NUT 5/16-18	4
14	011253-018	SCREW 5/16-18 HHC X 2 1/4	4
17	011254-018	SCREW 3/8-16 HHC X 2 1/4	2
20	011248-006	NUT 3/8-16 HEX	2

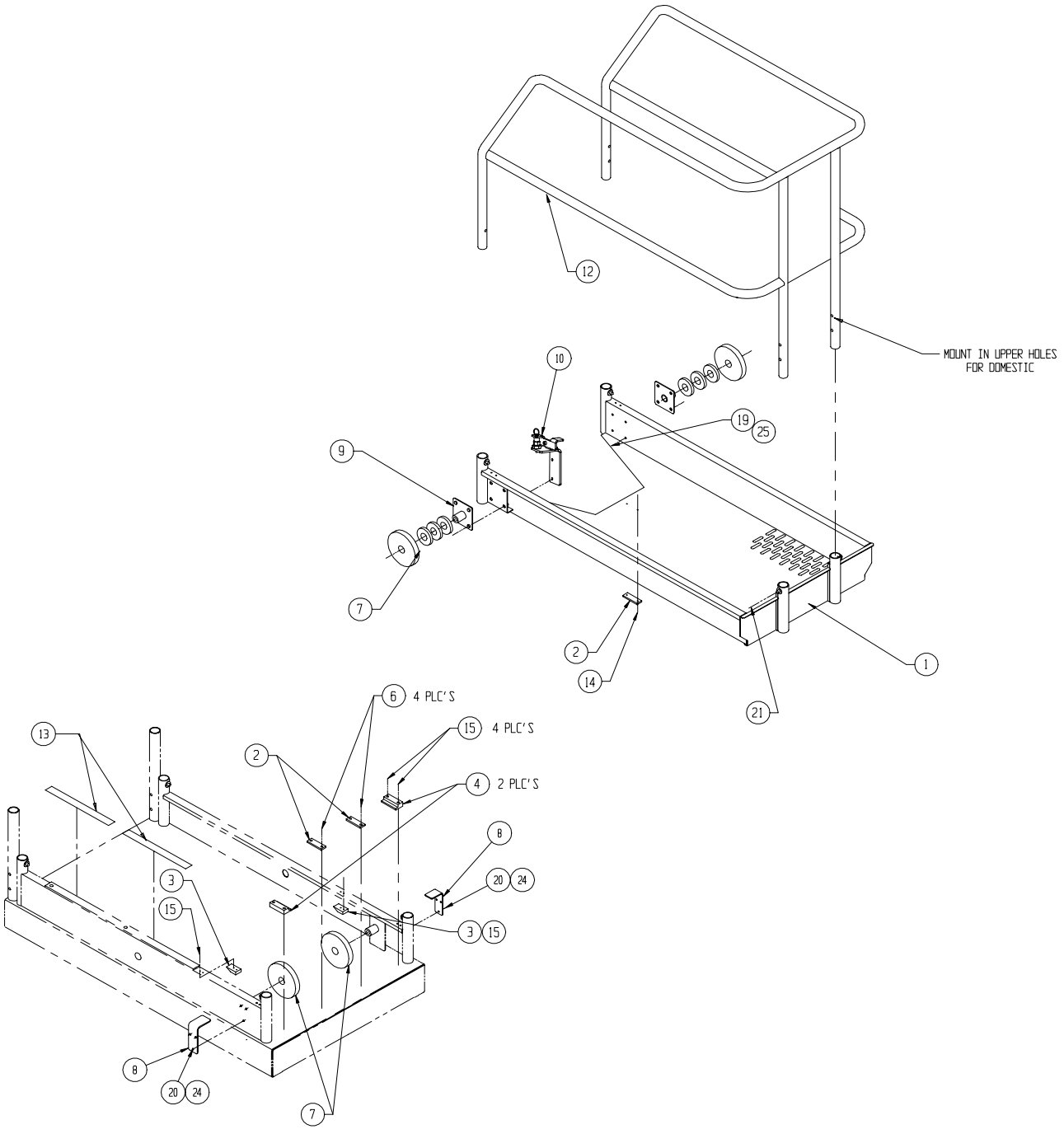


Deck Extension Installation

065614-000

ITEM	PART	DESCRIPTION	QTY.
1	066251-001	WELDMENT DECK EXT.	1
2	066198-000	WEAR PAD	3
3	066193-000	STOP	2
4	066176-000	WEAR PAD	2
6	026553-002	RIVET 3/16 DIA X .126-.250	4
7	066195-000	PLATFORM ROLLER	4
8	066407-011	BRACKET	2
9	066256-000	WELDMENT ROLLER MOUNT	2
10	067185-000	WELDMENT DECK STOP	1
12	066260-001	WELDMENT EXT. RAIL X15	1
13	065988-099	TAPE UHMW 1"	FT 3

ITEM	PART	DESCRIPTION	QTY.
14	026553-004	RIVET 3/16 DIA X 3/8 GRIP	2
15	026553-008	RIVET 3/16 DIA X 1/2 GRIP	8
18	011254-016	SCREW HHC 3/8-16 X 2	2
19	011254-014	SCREW HHC 3/8-16 X 1 3/4	6
20	011252-006	SCREW HHC 1/4-20 X 3/4	8
21	066171-003	BOLT TAP 3/8-16UNC X 2	4
24	011240-004	WASHER 1/4 FLAT	16
25	011238-006	WASHER 3/8 LOCK	8
26	014996-020	WASHER SAE 1-1/4 ZINC PLATED	6

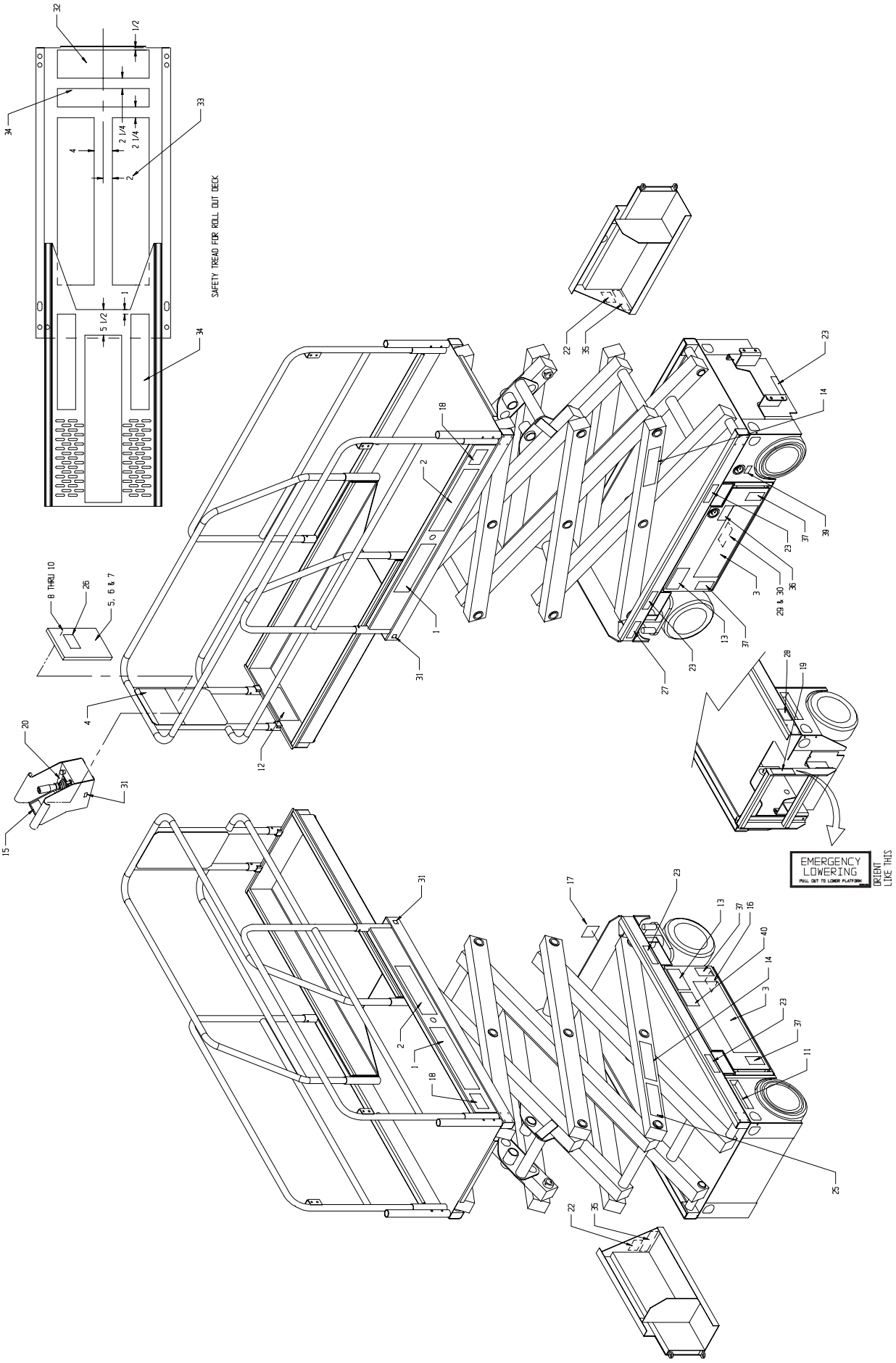


Label Installation, MX15

065612-030

ITEM	PART	DESCRIPTION	QTY.
1	061683-004	LABEL UPRIGHT	2
2	061684-022	LABEL MX 15	2
3	061683-014	LABEL UPRIGHT	2
4	066550-000	LABEL DANGER	1
5	060577-004	ANSI MANUAL	1
6	010076-000	MANUAL CASE	1
7	060570-004	USER MANUAL MX15/19	1
8	011248-004	LOCKNUT 1/4-20UNC HEX	4
9	011252-006	SCREW 1/4-20UNC HHC X 3/4	4
10	011240-004	WASHER 1/4 STD FLAT	4
11	066559-000	LABEL CONTROLS	1
12	101251-000	LABEL MAX LOAD DECK EXT.	1
13	066552-000	LABEL WARNING	2
14	066553-000	LABEL WARNING KEEP CLEAR	2
15	066554-000	LABEL CAUTION	1
16	066555-000	LABEL CAUTION	1
17	066556-000	LABEL CAUTION	1
18	101250-001	LABEL MAX LOAD PLATFORM	2
19	066558-000	LABEL EMERG. LOWERING	1

ITEM	PART	DESCRIPTION	QTY.
20	101222-004	LABEL CONTROLLER	1
22	05221-000	LABEL BATTERY	2
23	014222-003-99	LABEL FORK-LIFT HERE	5
25	063255-001	LABEL SCISSOR BRACE	1
26	010076-001	LABEL INST.	1
27	061220-002	LABEL ANSI	1
28	101252-001	LABEL WHEEL MAX LOAD	1
29	061205-005	NAME PLATE	1
30	065368-000	TACK	4
31	064444-000	LABEL USA	4
32	060830-003	SAFETY WALK 6 X 20	1
33	060830-002	SAFETY WALK 8 X 36	3
34	060830-001	SAFETY WALK 4 X 20	3
35	062562-001	LABEL DANGER	2
36	066522-000	LABEL BATTERY CHARGER	1
37	066556-001	LABEL WARNING	4
39	068639-000	LABEL POWER TO PLATFORM	1
40	107051-000	BATTERY DISCONNECT	1

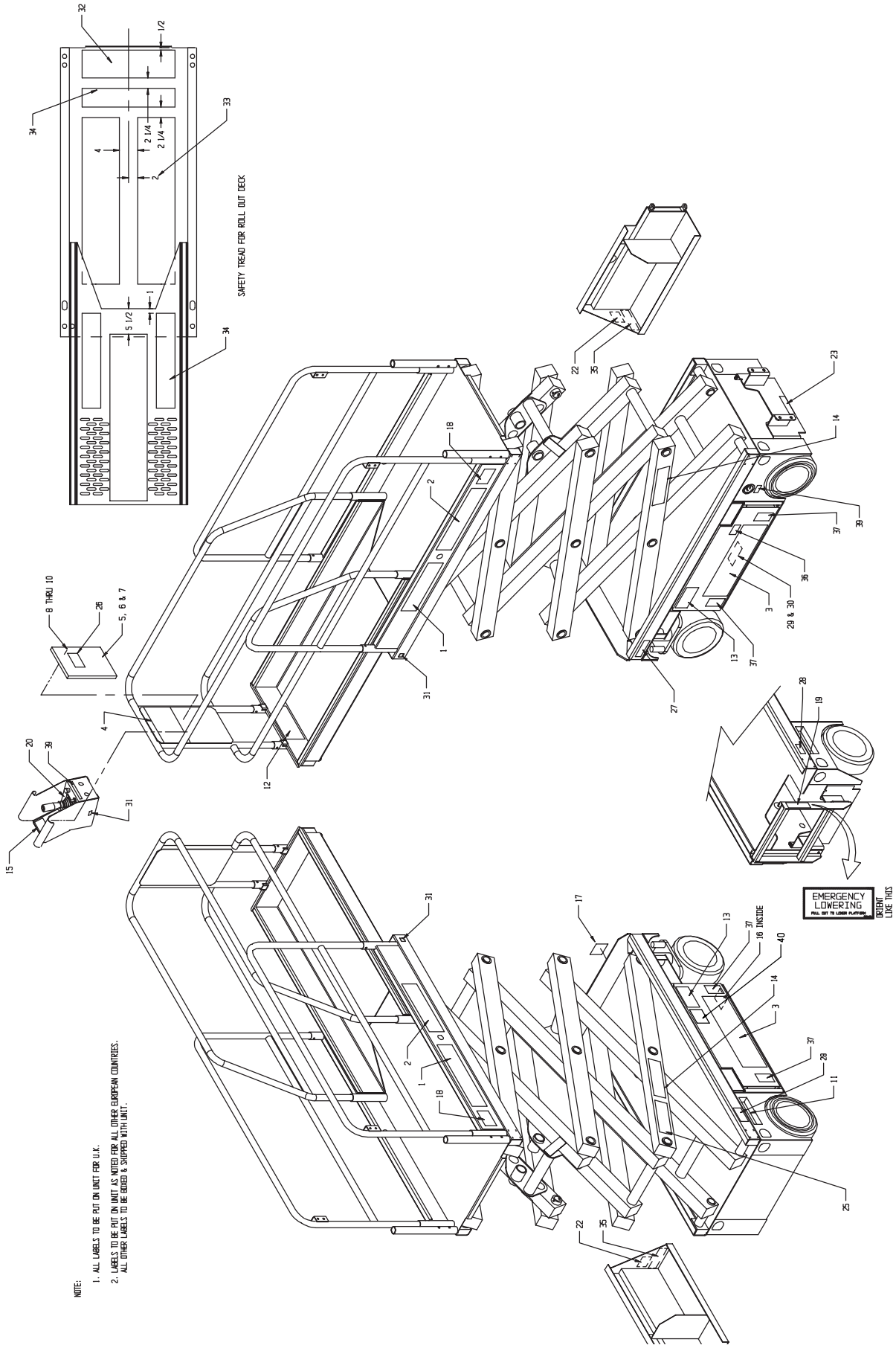

SAFETY TREAD FOR ROLL OUT DECK
EMERGENCY LOWERING
PULL OUT TO LOWER PLATFORM
ORIENT LIKE THIS

Label Installation, MX19

065712-030

ITEM	PART	DESCRIPTION	QTY.
1	061683-004	LABEL UPRIGHT	2
2	061684-023	LABEL MX 19	2
3	061683-014	LABEL UPRIGHT	2
4	066550-000	LABEL DANGER	1
5	060577-004	ANSI MANUAL	1
6	010076-000	MANUAL CASE	1
7	060570-004	USER MANUAL MX15/19	1
8	011248-004	LOCKNUT 1/4-20UNC HEX	4
9	011252-006	SCREW 1/4-20UNC HHC X 3/4	4
10	011240-004	WASHER 1/4 STD FLAT	4
11	066559-000	LABEL CONTROLS	1
12	101251-000	LABEL MAX LOAD DECK EXT	1
13	066552-000	LABEL WARNING	2
14	066553-003	LABEL WARNING KEEP CLEAR	2
15	066554-000	LABEL CAUTION	1
16	066555-000	LABEL CAUTION	1
17	066556-000	LABEL CAUTION	1
18	101250-000	LABEL MAX LOAD PLATFORM	2
19	066558-000	LABEL EMERG. LOWERING	1

ITEM	PART	DESCRIPTION	QTY.
20	101222-004	LABEL CONTROLLER	1
22	05221-000	LABEL BATTERY	2
23	14222-003-99	LABEL FORK-LIFT HERE	1
25	063255-001	LABEL SCISSOR BRACE	1
26	010076-001	LABEL INST.	1
27	061220-002	LABEL ANSI	1
28	101252-002	LABEL WHEEL MAX LOAD WHEEL	1
29	061205-005	NAME PLATE	1
30	065368-000	TACK	4
31	064444-000	LABEL USA	4
32	060830-003	SAFETY WALK 6 X 20	1
33	060830-002	SAFETY WALK 8 X 36	3
34	060830-001	SAFETY WALK 4 X 20	3
35	062562-001	LABEL DANGER	2
36	066522-000	LABEL BATTERY CHARGER	1
37	066556-001	LABEL WARNING	4
39	068639-000	LABEL POWER TO PLATFORM	1
40	107051-000	BATTERY DISCONNECT	1

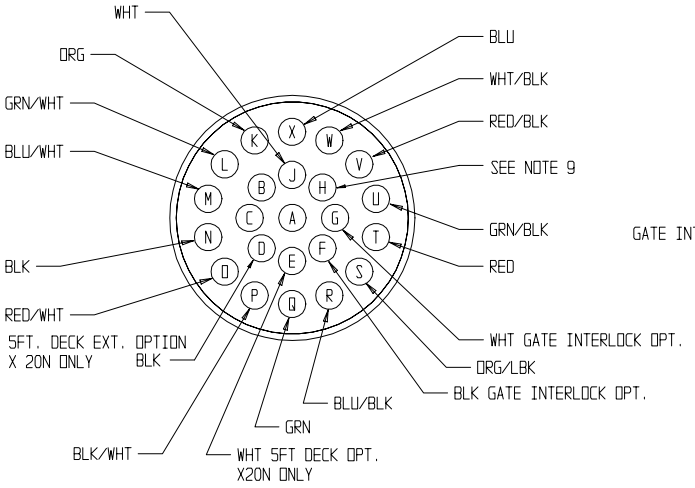

SAFETY TREAD FOR ROLL OUT DECK
8 THRU 10
26
5, 6 & 7
EMERGENCY LOWERING
PULL OUT TO LOWER PLATFORM
ORIENT LIKE THIS
16 INSIDE
NOTE:
1. ALL LABELS TO BE PUT ON UNIT FOR U.K.
2. LABELS TO BE PUT ON UNIT AS NOTED FOR ALL OTHER EUROPEAN COUNTRIES.
ALL OTHER LABELS TO BE BOXED & SHIPPED WITH UNIT.

Removable Controller Option

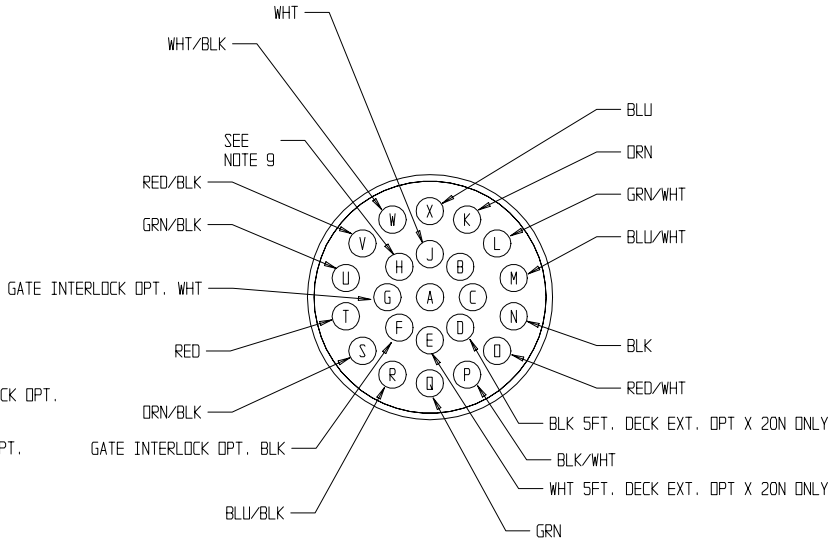
061898-010

1	065926-010	PLUG CONNECTOR	1
2	068762-000	PIN CONTACT	15
3	068764-000	PLUG SEALING	16
4	065926-015	RECEPTACLE CONNECTOR	1
5	068762-001	SOCKET CONTACT	15
8	030719-001	110 VAC BRACKET	1

9	030719-002	AIR BRACKET WELDMENT	1
10	011254-018	SCREW HHC GRD5 3/8-16UNC X 2 1/4	4
11	011240-006	WASHER 3/8 STD FLAT	4
12	011248-006	NUT HEX ESNA 3/8-16	2

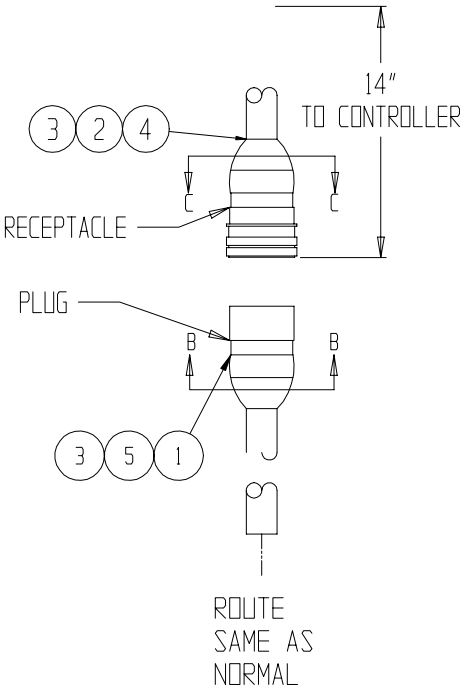


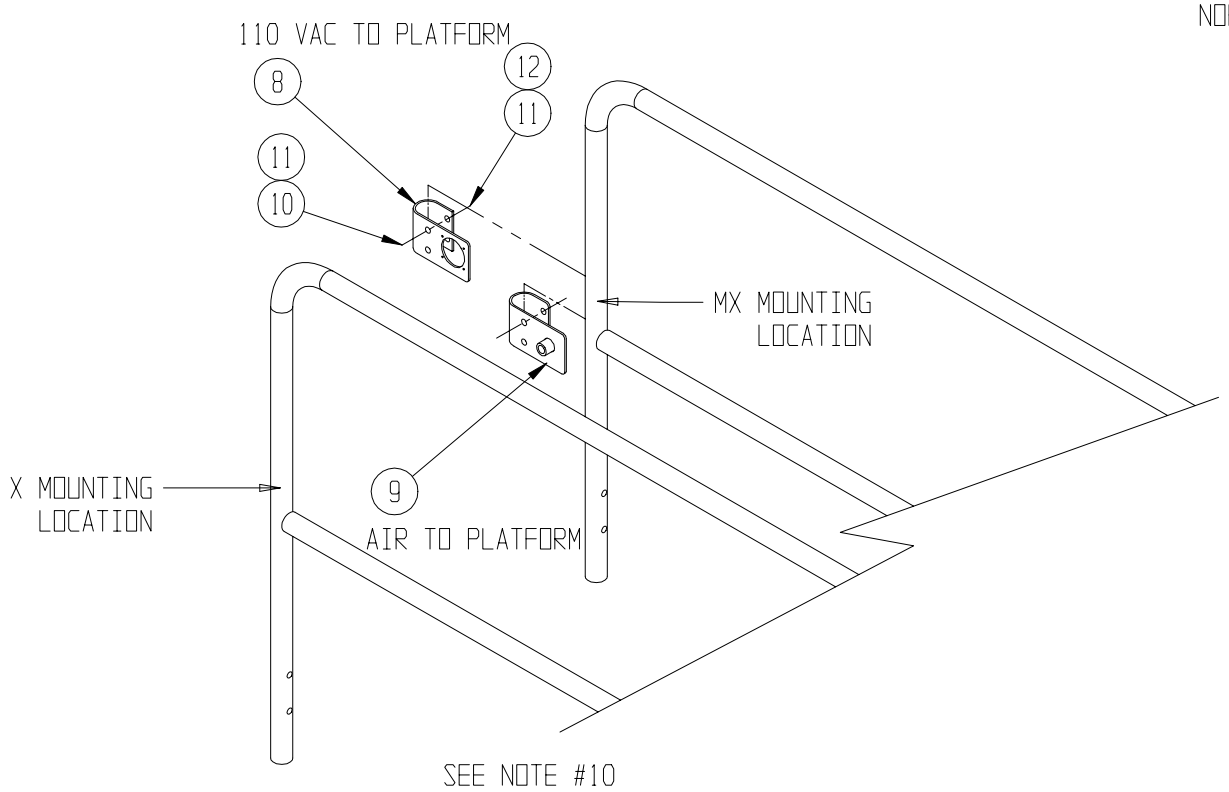
VIEW C-C
MODULE END



VIEW B-B
CONTROLLER END

1. CUT OFF CONTROL CABLE 14 INCHES BELOW STRAIN RELIEF ON CONTROLLER.
2. CUT OUTER CABLE COVER OF LINKAGE CABLE BACK APPROXIMATELY 1-1/2 INCH AND STRIP APPROXIMATELY 1/4 INCH OF EACH END.
3. CRIMP SOCKETS (ITEM 5) ONTO WIRE ENDS AND INSERT INTO PLUG REF. VIEW B-B.
4. CUT OUTER CABLE 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 (ITEM 2) ONTO WIRE ENDS AND INSERT INTO RECEPTACLE. REF. VIEW C-C.
7. CLAMP BOOT TO CONNECTOR.
8. CONNECT CONTROLLER AND TEST MACHINE FOR PROPER FUNCTION.
9. USE TERMINAL "H" OR "X" W/MOTOR CONTROL FOR HORN OPTION OR IF AUX WIRE IS REQUIRED.
10. ITEM #8 THRU 12 REQD ONLY FOR 110 VAC AND/OR AIR TO PLATFORM.

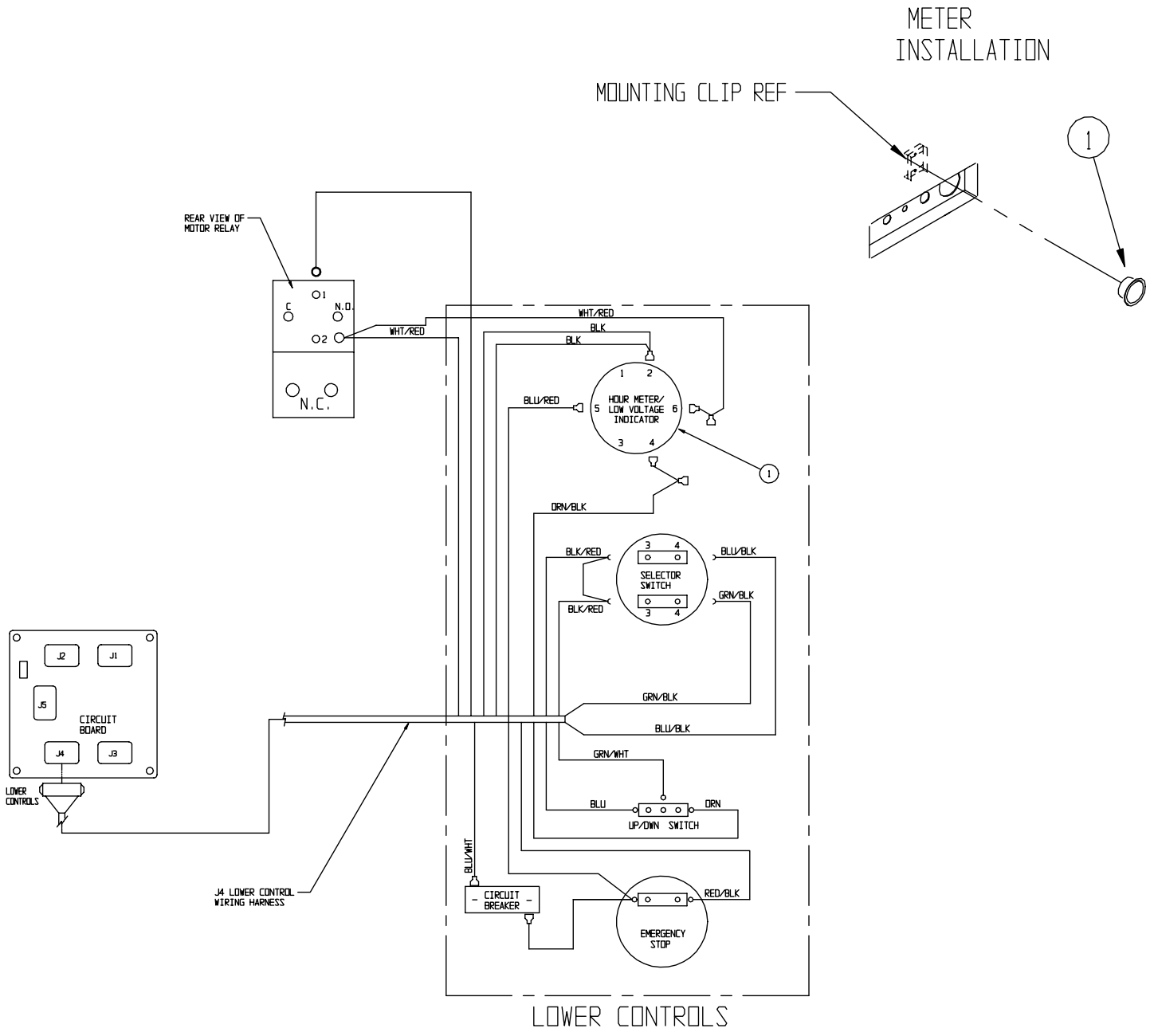




Hour Meter with Battery Low Voltage Indicator

066613-020

ITEM	PART	DESCRIPTION	QTY.
1	029959-000	HR/LOW VOLTAGE IND.	1

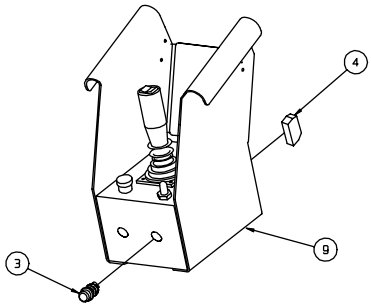


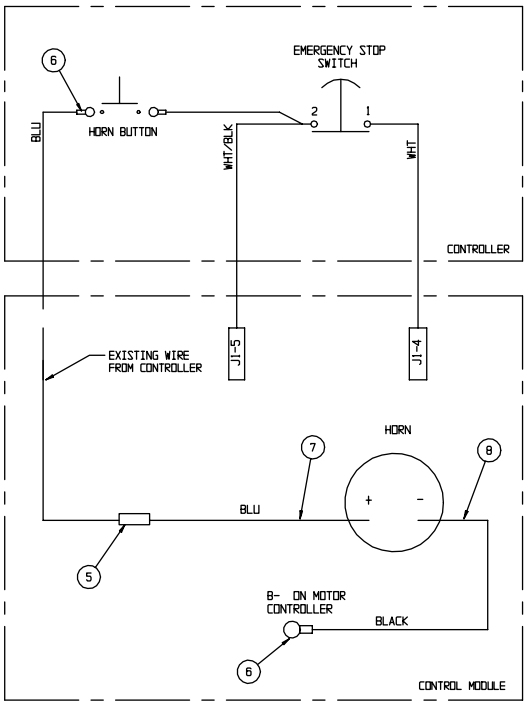
Operator Horn Assembly

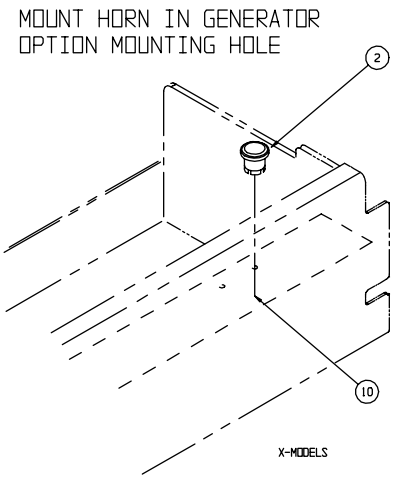
066614-020

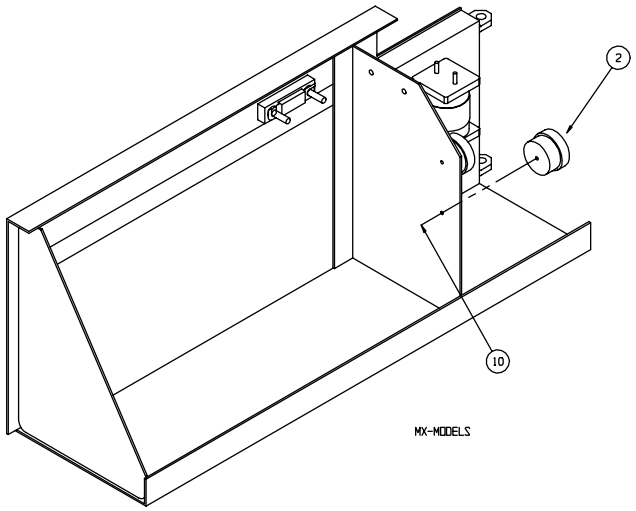
ITEM	PART	DESCRIPTION	QTY.
1		CONTROL MODULE ASSEMBLY	REF
2	066807-002	HORN, 24 VDC	1
3	066805-018	SWITCH, PUSH BUTTON 6E	1
4	066805-010	CONTACT BLOCK NO	1
5	029620-002	CONNECTOR, BUTT 16-14 GA	1
6	029601-013	CONNECTOR, RING TERMINAL	4

ITEM	PART	DESCRIPTION	QTY.
7	029453-099	WIRE, 16 AWG BLUE	4 FT
8	029452-099	WIRE, 16 AWG BLACK	4 FT
9		CONTROLLER ASSY	REF
10	011252-006	SCREW HHC 1/4-20 X 3/4	1









NOTES:

UpRight, Inc.
1775 Park Street
Selma, California 93662
TEL: 559/891-5200
FAX: 559/891-9012
PARTS: 1-888-UR-PARTS
PARTS FAX: 559/896-9244

UpRight

Call Toll Free in the U.S.A.
1-800-926-LIFT

UpRight International Support Centre
Innsbruckweg 114
3047 AH Rotterdam
Netherlands
TEL: +31(0)10-238-0000
FAX: +31(0)10-238-0001
Parts Tel: +31(0)10-490-8090
Parts Fax: +31(0)10-490-8099

060569-004
6/00 K