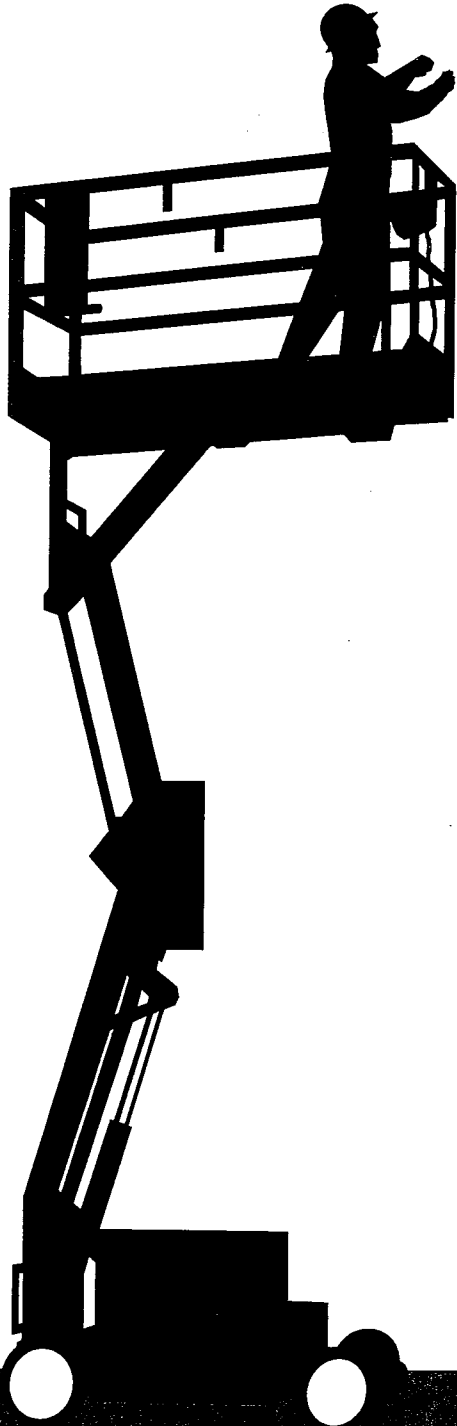


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SL-14

WORK PLATFORMS

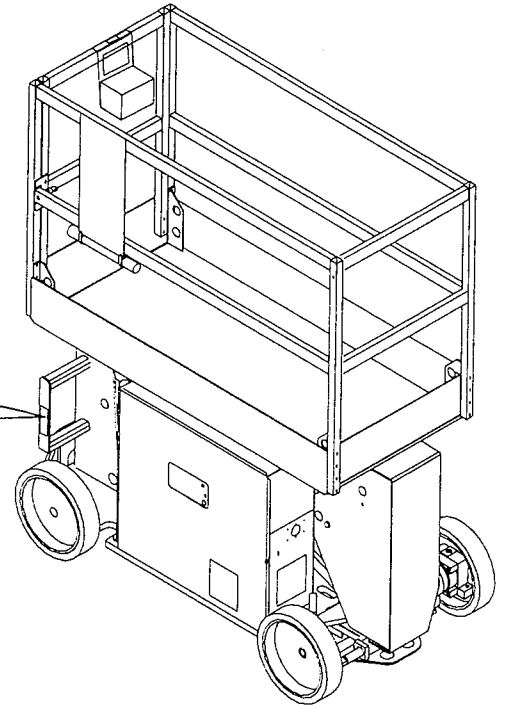
**Service &
Parts Manual**

SERVICE & PARTS MANUAL

SL-14

Domestic and European Models Serial Numbers 1000 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 top of the left side upper drive motor mounting bracket.



UpRight, Inc.	
1775 PARK ST.	SELMA, CA 93662 USA
MODEL NO. <input type="text"/>	MAX. PLATFORM HEIGHT <input type="text"/>
SERIAL NO. <input type="text"/>	BATTERY VOLTAGE <input type="text"/>
MAX. DISTRIBUTED LOAD <input type="text"/>	<input type="text"/>
CAUTION: CONSULT OPERATOR'S MANUAL BEFORE USE.	
THIS PLATFORM IS NOT ELECTRICALLY INSULATED	
<small>P/N 61205-000-00</small>	

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8/95 D

Forward

Introduction



HOW TO USE THIS MANUAL


This manual is divided into 7 sections. The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on the right side of this page. You can quickly find the first page of each section without looking through the table of contents which follows this page. The section number printed at the top corner of each page can also be used as a quick reference guide.

SPECIAL INFORMATION

NOTE: Gives helpful information.

 DANGER 
Indicates the hazard or unsafe practice <i>will</i> result in severe injury or death.

 WARNING 
Indicates the hazard or unsafe practice <i>could</i> result in severe injury or death.

 CAUTION 
Indicates the hazard or unsafe practice could result in <i>minor</i> injury or property damage.

WORKSHOP PROCEDURES

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

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

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Machine Preparation

2.0

Information on preparation for use & shipment, forklifting, transporting and storage.

Operation

3.0

Operating instructions and safety rules.

Maintenance

4.0

Preventative maintenance and service information.

Troubleshooting

5.0

Causes and solutions to typical problems.

Schematics

6.0

Schematics and valve block diagram with description and location of components.

Illustrated Parts Breakdown

7.0

Complete parts lists with illustrations.

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1.0 Introduction

PURPOSE

The purpose of this service and parts manual is to provide instructions and illustrations for the operation and maintenance of an UpRight SL-14 Work Platform manufactured by UpRight, Inc. of Selma, California.

SCOPE

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

1.1 General Description (Figure 1-1)

The SL-14 Work Platform consists of the platform, controller, elevating assembly, power module, control module, and chassis.

Platform

The platform has a reinforced wood floor, 40-44 inch (102-112 cm) high guardrails with midrail, 7-inch (178 mm) toeboards and an entrance gate at the rear of the platform.

⚠ WARNING ⚠

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

Controller

The Controller contains the controls to operate the machine. It should be hung on the front guardrail, but may be hand held if necessary. To operate the machine, the Foot Switch must be depressed to operate any function. A complete explanation of control functions can be found in Section 3.2 & 3.4.

Elevating Assembly

The platform is raised and lowered by the elevating assembly, a two section arm pivoting on a gear, and powered by a single stage lift cylinder. The hydraulic pump, driven by an electric motor, actuates the cylinder. Solenoid operated valves control raising and lowering.

Power Module

The power module contains two batteries and the Hydraulic Oil Reservoir.

Control Module

The Control Module contains two batteries, battery charger, hydraulic pump, hydraulic valve manifold, horn/alarm(s), volt/hour meter, electrical terminal strips, and chassis controls. A complete explanation of the chassis control functions is found in Section 3.2 & 3.4.

Chassis

The chassis is a structural frame that supports all the components of the SL-14 Work Platform.

PURPOSE OF EQUIPMENT

The SL-14 Work Platform is designed to elevate personnel and materials to overhead work areas and be driven with the platform elevated on firm, level surfaces **only**.

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

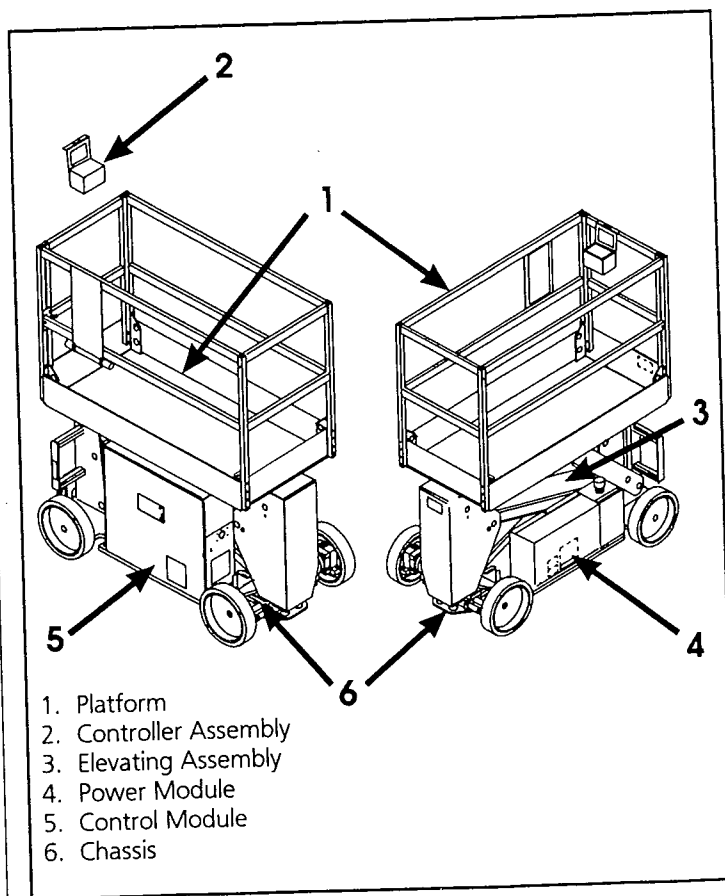


Figure 1-1: SL-14 Work Platform

SPECIAL LIMITATIONS

The objective of the SL-14 Work Platform is to provide a quickly deployable, self-propelled, variable height work platform for worksite use.



DANGER



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

1.2 Specifications

Table 1-1: Specifications

ITEM	DESCRIPTION
Platform Size Standard w/ Extension	25.75 in. x 59 in. [65 cm x 1.5 m] 23.25 in. x 98 in. [59 cm x 2.49 m]
Max. Platform Capacity Standard w/ Extension	660 lbs. [300 kgs] 550 lbs. [250 kgs]
Working Height	20 Ft. [6.1 m]
Maximum Platform Height	14 Ft. [4.3 m]
Minimum Platform Height	3 Ft. [90 cm]
Energy Source	24 volt battery pack (4-220 ampere-hour, 6 volt batteries), 4 HP DC Electric Motor
Lift System	Single Stage Lifting Cylinder
Driveable Height	14 Ft. [4.3 m]
Surface Speed High Speed Low Speed	0 to 2.53 MPH [0 to 4.2 kph] 0 to 0.75 MPH [0 to 1.2 kph]
Hydraulic Tank Capacity	2 Gallons [7.6 l]
Hydraulic Fluid	ISO #46
Dimensions Weight: Standard w/ Extension Overall Width Overall Height Overall Length	2000 lbs. [907 kgs] 2100 lbs. [953 kgs] 28.75 in. [73 cm] 76-80 in. [1.9-2 m] (Adjustable Guardrail) 64.25 in. [1.63 m]
Control System Two Speed Controller Proportional Controller	Two speeds Forward/Reverse/Lift with toggle switches. Foot operated interlock switch Proportional, single axis joystick with thumb rocker steering. Foot operated interlock switch
Drive Control Two Speed Proportional	Two speed, Forward and Reverse Proportional
Horizontal Drive	Dual front wheel hydraulic motors
Tires	14 in. [35.6 cm] diameter, solid rubber, non-marking
Braking	Two spring applied, hydraulic released Parking Brake Cylinders
Toeboard	7 in. [17.8 cm]
Guardrails (Adjustable)	40-44 in. [102-112 cm]
Turning Radius	18 in. [2.97 m] Inside 72 in. [1.8 m] Outside
Gradeability	25% (14 degree)
Wheel Base	48.5 in. [1.59 m]

NOTE: Specifications subject to change without notice.

NOTE: Read and familiarize yourself with all operating instructions before attempting to operate the SL-14 Work Platform.

2.1 Preparation for Use

⚠ CAUTION ⚠

STAND CLEAR when cutting the metal banding to avoid being cut when the banding snaps back.

1. Remove the metal banding from the module covers and elevating linkage.
2. Remove the banding from the control console.
3. Remove tie wraps holding guardrail gate.
4. Connect the negative (-) lead terminals to batteries in both modules (Figure 2-1).
5. Close the Emergency Lowering Valve (Figure 2-2), if necessary.

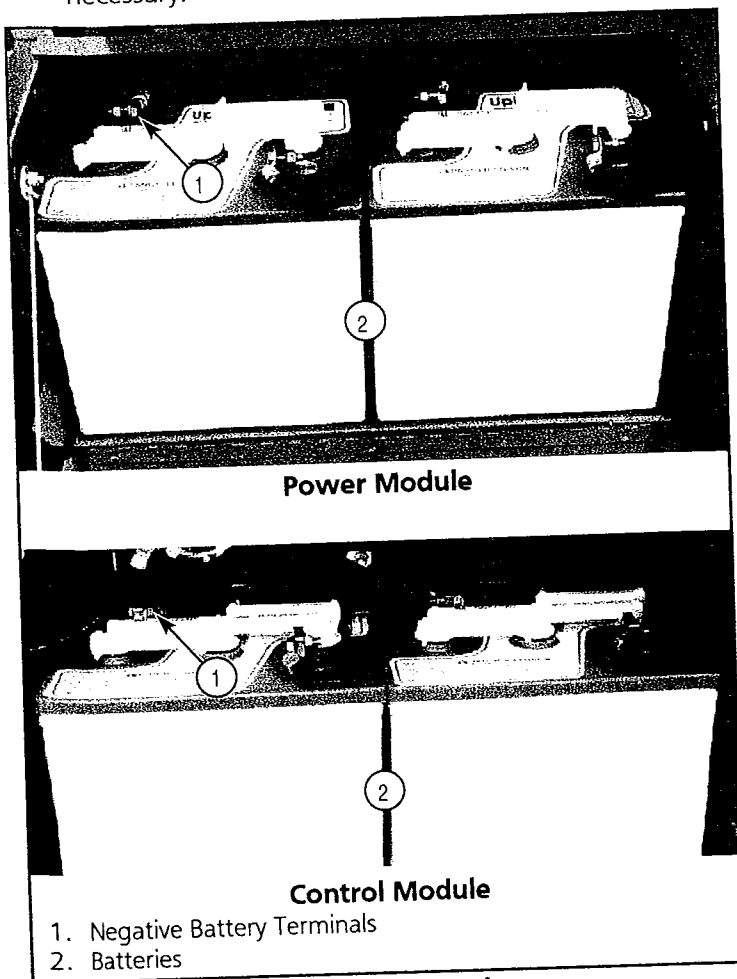


Figure 2-1: Batteries

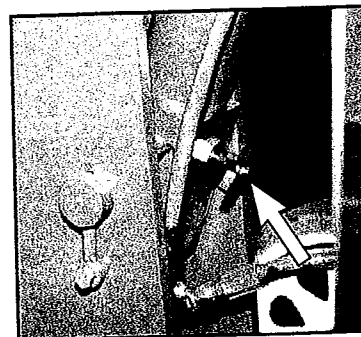


Figure 2-2: Emergency Lowering Valve

2.2 Forklifting Work Platform

NOTE: Forklifting is for transporting only.

⚠ WARNING ⚠

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

Forklift from the side of the platform by lifting under the modules (Figure 2-3).

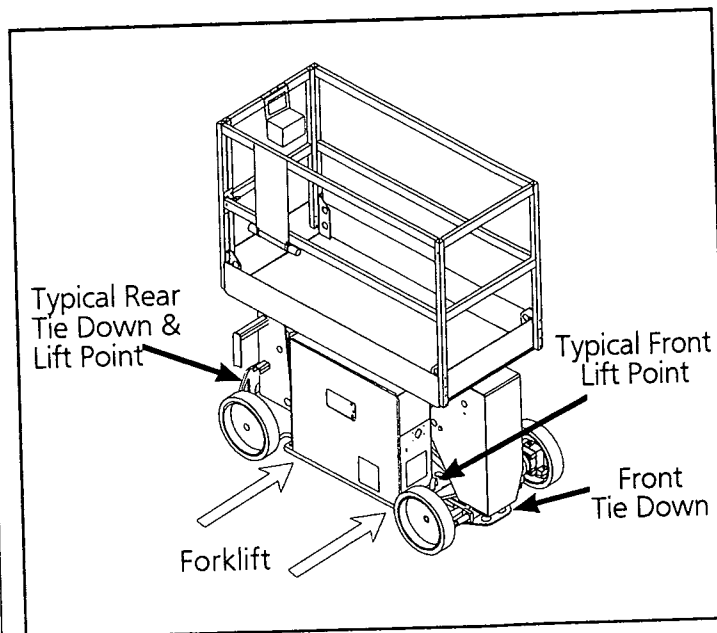


Figure 2-3: Forklifting

2.3 Transporting the Work Platform

1. Maneuver the work platform into transport position and chock the wheels.
2. Secure the work platform to the transport vehicle with chains or straps of adequate load capacity attached to the chassis tie down lugs (Figure 2-3).
3. Open the Emergency Lowering Valve.



CAUTION



The front chassis tie down lugs are not to be used for lifting the work platform.

Over-tightening of the chains or straps may result in damage to the machine.

2.4 Preparation for Shipment

1. Grease the machine (see Section 4.4).
2. Fully lower the platform.
3. Disconnect the battery negative (-) leads from the battery terminals (see Figure 2-1).
4. Band the Controller to the front guardrail.
5. Band the Platform to the Chassis at the center of the machine by running the banding through the guardrails at the Toeboards and under the Chassis. Be careful not to overtighten the banding and bend the Toeboards.
6. Open the Chassis Emergency Lowering Valve (Figure 2-2).

2.5 Storage

No preparation for storage is required when the work platform is in normal use. Regular maintenance procedures should continue to be performed (see Table 4-1).

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

PRESERVATION

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

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

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

BATTERY

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

3.0 Introduction

GENERAL FUNCTIONING

The battery powered electric motor directly drives a two-stage, low and high flow, hydraulic pump. The pump supplies oil under pressure to operate all work platform functions. The oil flow is directed to the different functions by electrically activated solenoid valves.

DRIVING

Two Speed Controller

With the Controller Key Switch **ON** and Chassis Key Switch turned to **PLATFORM**, both Chassis and Controller Emergency Stop Switches **ON**, the Foot Switch depressed, and the Drive/Lift Switch on **DRIVE**, the machine will drive forward or reverse at either **HIGH** or **LOW** speed depending on the position of the Drive/Lift Speed Range Switch.

Proportional Controller

With the Controller Key Switch **ON** and Chassis Key Switch turned to **PLATFORM**, both Chassis and Controller Emergency Stop Switches **ON**, the Foot Switch depressed, and the Drive/Lift Switch on **DRIVE**, the machine will drive forward or reverse at a speed proportional to the angle the Control Lever is pushed or pulled.

Driving with the Platform Lowered

Two Speed Controller

Moving the Drive Switch to **FORWARD** with the Drive/Lift Speed Range Switch in **HIGH** and the platform fully lowered will energize the Motor Start Relay, the Drive Coil, and the High Dump Coil to allow oil to flow from both Pump sections into the Parking Brake (releasing the Brake) and serially through the Hydraulic Motors. Moving the Drive Switch to **REVERSE** is the same as **FORWARD** except the Reverse Coil is energized causing the Motors to turn in the opposite direction. When driving in **LOW** the High Dump Coil is not energized so only oil from the low flow section of the Pump drives the Motors.

Proportional Controller

Moving the Control Lever to **FORWARD** with the platform fully lowered will energize the Motor Start Relay, the Drive Coil, and the Proportional Coil to allow oil to flow into the Parking Brake (releasing the Brake) and serially through the Hydraulic Motors. Moving the Control Lever to **REVERSE** is the same as **FORWARD** except the Reverse Coil is energized causing the Motors to turn in the opposite direction. The Proportional Valve closes or opens in proportion to the movement of the Control Lever (from center). As the Proportional Valve closes more oil is allowed to flow to the Forward/Reverse Valve increasing drive speed.

Driving with the Platform Elevated

Two Speed Controller

Raising the platform (see RAISING THE PLATFORM, below) activates the Down Switch. This prevents the High Dump Coil from energizing allowing oil from the low flow section only to drive the Motors. When raised the platform will only drive at slow speed.

Proportional Controller

Raising the platform (see RAISING THE PLATFORM, below) activates the Down Switch. This limits the output from the Proportional Control keeping the Proportional Coil from closing fully thus limiting drive speed. When raised the platform will only drive at a slower maximum speed.

Steering

Two Speed Controller

The Steering Switch, to the left of the Drive Switch, is a momentary rocker switch for steering the machine left and right. With power to the Controller and the Foot Switch depressed, moving the switch to **RIGHT** or **LEFT** will energize the Right or Left Steering Coil and allow oil to flow through the Steering Valve to the Steering Cylinder. Releasing the rocker switch de-energizes the Steering Coils and holds the Steering Cylinder in position. **The Steering Cylinder will not automatically return to center. The Steering Switch must be activated to change the wheels direction.**

Proportional Controller

At the top of the Control Lever is a momentary rocker switch for steering the machine left and right. With power to the Controller and the Foot Switch depressed, pressing the right or left side of the rocker switch will energize the Right or Left Steering Coil and allow oil to flow through the Steering Valve to the Steering Cylinder. Releasing the rocker switch de-energizes the Steering Coils and holds the Steering Cylinder in position. **The Steering Cylinder will not automatically return to center. The Steering Switch must be activated to change the wheels direction.**

RAISING THE PLATFORM

Two Speed Controller

With the Chassis Key Switch turned to **PLATFORM**, the Controller Key Switch turned to **LIFT**, both Chassis and Controller Emergency Stop Switches **ON**, the Speed Range Switch in **HIGH** or **LOW**, the Foot Switch depressed, and the Lift Switch pushed to **UP** the machine will elevate. Pushing the Lift Switch to **UP** energizes the Motor Relay, to start the Electric Motor, and Up Coil allowing oil to flow to the Lift Cylinder. When Lifting the High Dump Coil is not energized so only oil from the low flow section of the Pump flows to the Lift Cylinder.

Proportional Controller

With the Chassis Key Switch turned to **PLATFORM**, the Controller Key Switch **ON**, both Chassis and Controller Emergency Stop Switches **ON**, the Drive/Lift Switch on **LIFT**, and the Foot Switch depressed, the machine will elevate at a speed proportional to the angle the Control Lever is pushed forward.

Pushing forward on the Control Lever energizes the Proportional Coil, Up Coil and Motor Relay to start the Electric Motor. The greater the angle (from center) of the Control Lever the more the Proportional Valve closes. As the Proportional Valve closes more oil is allowed to flow through the Lift Valve to the Lift Cylinder increasing lift speed.

LOWERING THE PLATFORM

Lowering the platform electrically energizes the Down Alarm and the Down Coil. This allows the oil to flow out of the Lift Cylinder through an orifice, which controls the rate of descent, then back to the tank. During the last few inches of lowering the oil is forced through a smaller orifice slowing descent, effecting a Cushion Down.

Lowering the platform manually with the Emergency Down Valve allows the oil to flow out of the Lift Cylinder in the same manner but there is no Down Alarm.

SAFETY DESIGN

The SL-14 has the following features to ensure safe operation.

- The drive speed is limited to low speed when operating the work platform while the platform is elevated.
- The platform descent rate is controlled by an orifice (Fixed Speed). The lift cylinder is equipped with a holding valve to prevent descent should the lift hose rupture.
- Parking brakes are automatically engaged when the Drive Switch or Control Lever is released and the machine comes to a full stop.
- The Controller and Chassis Controls are equipped with Emergency Stop Switches for stopping all powered functions.
- The Foot Switch must be depressed for the Controller to function.
- An alarm is provided to signal when the platform is lowering with either Platform or Chassis Control.
- A Lift Switch is located in the Control Module on the Chassis for lifting and lowering the work platform from ground level.
- An Emergency Lowering Valve is provided at the base of the Lift Cylinder to lower the platform in the event electrical power is lost.

3.1 Safety Rules and Precautions

Always observe the following safety rules and precautions when using the SL-14 Work Platform:

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 a 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 before operating the machine.

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

CLOSE gate across entrance after mounting the platform.

NEVER use ladders or scaffolding on the platform.

NEVER attach overhanging loads or increase the size of the platform.

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

DISTRIBUTE all loads evenly on the platform. (For maximum platform load, refer to Table 1-1).

NEVER use damaged equipment. (Contact UpRight for instructions.)

NEVER modify or change operating or safety systems.

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

NEVER climb down elevating assembly with the platform elevated.

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

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

SECURE the work platform against unauthorized use by turning the chassis key switch off and removing the key from the key switch when leaving the machine unattended.

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

ALWAYS read, understand, and follow Section 8 of ANSI Standard A92.6-1990 when operating any work platform.

3.2 Controls and Indicators

The controls and indicators for operation of the SL-14 Work Platform are shown in Figure 3-1. The name and function of each control and indicator are listed in Table 3-1. The index numbers in Figure 3-1 correspond to the index numbers in Table 3-1. The operator should know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the unit.

Table 3-1: Controls and Indicators

PLATFORM

INDEX NO.	NAME	FUNCTION
1	FOOT SWITCH	Provides power to the Controller powered functions only when depressed, preventing accidental activation of the Controller.

TWO SPEED CONTROLLER

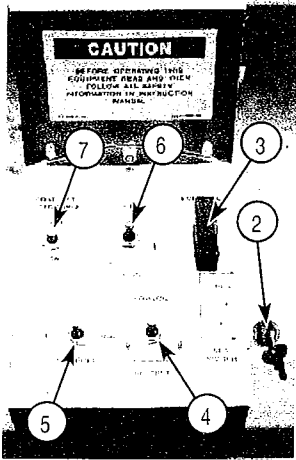
INDEX NO.	NAME	FUNCTION
2	KEY MODE SWITCH	Turn key clockwise to provide power to Drive and Steering Switches, turn counterclockwise to provide power to Lift Switch, both positions provide power to the Platform Foot Switch.
3	EMERGENCY STOP SWITCH	Push red cover to cut off power to all functions (OFF). Open cover and push toggle towards cover to provide power (ON).
4	DRIVE SWITCH	Push switch to FORWARD or REVERSE to travel in that direction.
5	STEERING SWITCH	Moving the momentary toggle switch Right or Left steers the work platform in that direction. Although the Steering Switch is self centering the steering system is not. The wheels must be steered back to straight.
6	LIFT SWITCH	Push switch to UP or DOWN to raise or lower the platform.
7	DRIVE/LIFT SPEED RANGE SWITCH	Push switch to HIGH for lift and high speed drive. Push the switch to LOW for lift and low speed drive.

PROPORTIONAL CONTROLLER

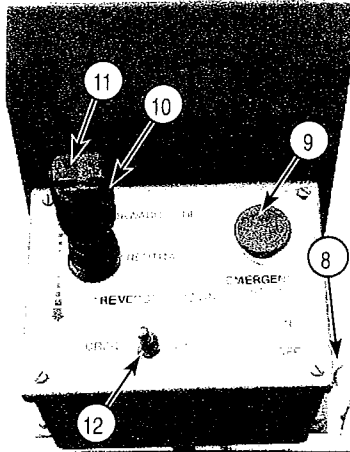
INDEX NO.	NAME	FUNCTION
8	KEY SWITCH	Turn key clockwise to provide power to the Platform Foot Switch.
9	EMERGENCY STOP SWITCH	Push red button to cut off power to all functions (OFF). Turn clockwise to provide power (ON).
10	CONTROL LEVER	Move joy stick forward or backwards to proportionally control Drive Valves or Lift and Down Valve depending on position of Drive/ Lift Switch.
11	STEERING SWITCH	Moving the momentary rocker switch Right or Left steers the work platform in that direction. Although the Steering Switch is self centering the steering system is not. The wheels must be steered back to straight.
12	DRIVE/LIFT SWITCH	Selecting DRIVE allows the work platform to move forward or reverse. Selecting LIFT allows the work platform to raise or lower.

CHASSIS

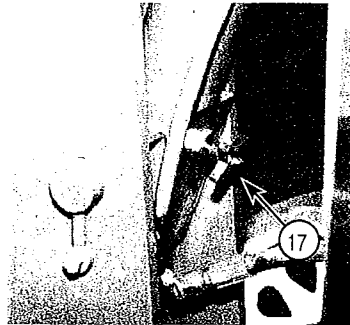
INDEX NO.	NAME	FUNCTION
13	EMERGENCY STOP SWITCH (Domestic)	Push red cover to cut off power to all functions (OFF). Open cover and push toggle towards cover to provide power (ON).
	EMERGENCY STOP SWITCH (European)	Push red button to cut off power to all functions (OFF). Turn clockwise to provide power (ON).
14	KEY SWITCH	Turn Key clockwise to PLATFORM to provide power to Controller and counterclockwise to CHASSIS to provide power to Chassis Controls.
15	CHASSIS LIFT SWITCH	Toggle switch to UP to lift the work platform and toggle switch to DOWN to lower the work platform.
16	VOLT/HOUR METER	Shows state of charge of batteries and hours machine has been on.
17	EMERGENCY LOWERING VALVE	Turn knob counterclockwise to lower the Platform. To close, turn knob fully clockwise. The platform cannot be raised until this valve is closed.
18	DOWN ALARM	Sounds an audible signal while platform is lowering during normal operation. If the Emergency Lowering Valve is used the alarm does not sound.



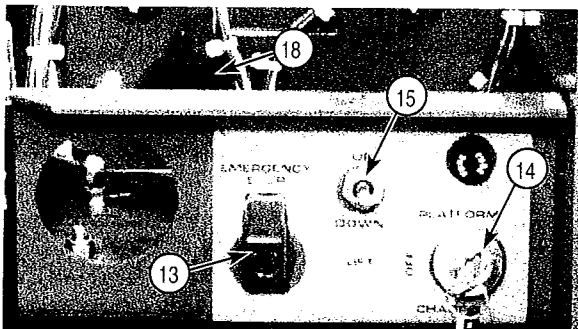
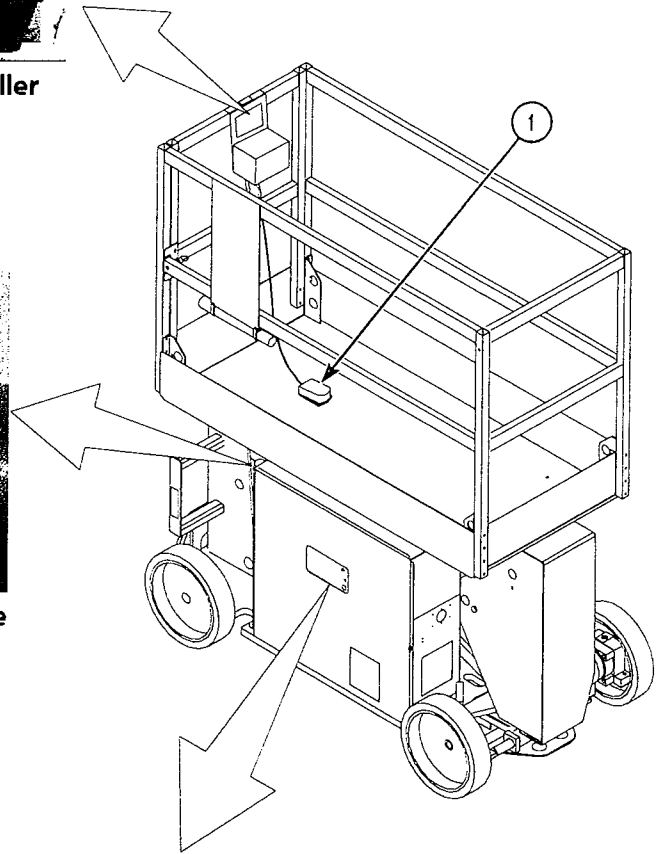
Two Speed Controller



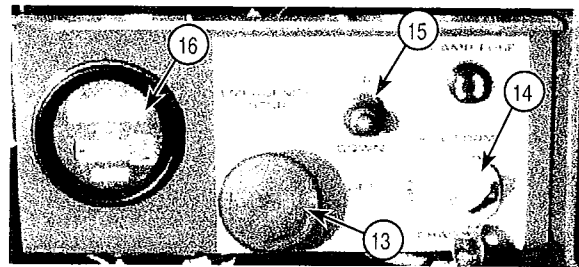
Proportional Controller



Emergency Lowering Valve



Domestic Chassis Control Panel



European Chassis Control Panel

Figure 3-1: Controls and Indicators

3.3 Pre-Operation Inspection

NOTE: Carefully read, understand and follow all safety rules and operating instructions. Perform the following steps each day before use.



WARNING



DO NOT perform service on work platform with the platform elevated unless the elevating assembly is properly blocked.

1. Open module covers and inspect for damage, oil leaks or missing parts.
2. Check the level of the hydraulic oil with the platform fully lowered. Oil should be visible in the sight gauge (Section 4.4). Add ISO #46 hydraulic oil if necessary.
3. Check that fluid level in the batteries is correct (See Battery Maintenance, Section 4.3).
4. Verify batteries are charged.
5. Check that A.C. extension cord has been disconnected from charger.
6. Check that all guardrails are in place with fasteners properly tightened.
7. Carefully inspect the entire work platform for damage such as cracked welds or structural members, loose or missing parts, oil leaks, damaged cables or hoses, loose connections and tire damage.
8. Move machine, if necessary, to unobstructed area to allow for full elevation.
9. Turn Chassis and Platform Emergency Stop Switches ON. Either open the switch guard and push the switch toward the guard OR turn the button clockwise.
10. Turn the Chassis Key Switch to **CHASSIS**.
11. Push Chassis Lift Switch to **UP** position and fully elevate platform.
12. Visually inspect the elevating assembly, lift cylinder, cables and hoses for damage or erratic operation. Check for missing or loose parts.
13. Partially lower the platform by pushing Chassis Lift Switch to **DOWN**, and check operation of the audible lowering alarm.
14. Open the Chassis Emergency Lowering Valve by turning knob counterclockwise to check for proper operation. Once the platform is fully lowered, close the valve by turning knob clockwise.
15. Turn the Chassis Key Switch to **PLATFORM**.
16. Close and secure module covers.
17. Unhook Controller from guardrail. Firmly grasp Controller hanger and Foot Switch together, in such a manner that the Foot Switch can be depressed, while performing the following checks from the ground.



WARNING



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

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

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

Protect control console cable from possible damage while performing checks.

TWO SPEED CONTROLLER

1. Turn the Emergency Stop Switch to the ON position. Open the switch guard and push the switch toward the guard.
2. Turn Controller Key Mode Switch to **DRIVE**.
3. While depressing Foot Switch, with the Speed Range Switch in **LOW** and then **HIGH**, push the Drive Switch to **FORWARD** and then **REVERSE** to check for speed and directional control.
4. Push Steering Switch RIGHT then LEFT to check for steering control.
5. Turn Key Switch to **OFF** and push the Emergency Stop Switch guard.
6. Rehook Controller on front guardrail and place Foot Switch on deck.

PROPORTIONAL CONTROLLER

Note: When equipped with Domestic Proportional Controller Option the Emergency stop switch will be the same as the Two Speed Controller.

1. Turn the Emergency Stop Button clockwise to the ON position.
2. Turn Controller Key Switch **ON**.
3. Turn Drive/Lift Switch to **DRIVE**.
4. While depressing Foot Switch, slowly push Control Lever to **FORWARD** then **REVERSE** to check for speed and directional control. The farther you push or pull the Control Lever the faster the machine will travel.
5. Push Steering Switch RIGHT then LEFT to check for steering control.
6. Turn Key Switch to **OFF** and push the Emergency Stop Button.
7. Rehook Controller on front guardrail and place Foot Switch on deck.

3.4 Operation

NOTE: Understand the functions of all the controls before operating the machine AND ensure that the Pre-Operation Inspection (Section 3.3) has been completed and any deficiencies corrected.

TWO SPEED CONTROLLER

Travel With Platform Lowered



1. Check that route is clear of obstructions, holes and drop-offs and is capable of supporting wheel loads.
2. Verify Chassis Key Switch is turned to **PLATFORM** and Chassis Emergency Stop Switch is ON, open the switch guard and push the switch toward the guard.
3. After mounting platform, close and latch gate. Check that guardrails are properly assembled and in position. Hang Controller on front guardrail.
4. Check clearances above, below and to the sides of platform.
5. Turn Controller Emergency Stop Switch ON, open the switch guard and push the switch toward the guard. When the switch guard is closed, Emergency Stop Switch will automatically go to OFF position.
6. Turn Controller Key Mode Switch to **DRIVE**.
7. While depressing Foot Switch, with the Speed Range Switch in **LOW**, push the Drive Switch to **FORWARD** or **REVERSE** to travel in the desired direction. While moving, push Drive/Lift Speed Range Switch to **HIGH** if faster speed is desired.
Set Speed Range Switch to **HIGH** for faster travel on level surfaces or to **LOW** for climbing grades or traveling in confined areas.

Steering

1. Turn the Key Mode Switch to **DRIVE**.
2. While depressing the Foot Switch, push the Steering Switch to **RIGHT** or **LEFT** to turn 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 straight ahead position by operating Steering Switch.

Elevating Platform

 WARNING 	
<p>LOOK up and around for obstructions before performing the lift function.</p> <p>DO NOT elevate the platform unless the work platform is on a firm and level surface.</p> <p>DO NOT operate the work platform within 10 feet of any electrical lines . THIS WORK PLATFORM IS NOT INSULATED.</p> <p>NEVER enter the Elevating Assembly while the platform is elevated.</p>	

1. Position Key Mode Switch to **LIFT**.
2. While depressing Foot Switch, push Lift Switch to **UP**.

Travel With Platform Elevated

 WARNING 	
<p>Travel with platform elevated ONLY on firm and level surfaces.</p>	

NOTE: Work platform will travel at reduced speed when platform is elevated.

1. Check that route is clear of persons, obstructions, holes and drop-offs, is level and capable of supporting the wheel loads.
2. Check clearances above, below and to the sides of platform.
3. Position Key Mode Switch to **DRIVE** position.
4. While depressing Foot Switch, push Drive Switch to **FORWARD** or **REVERSE** for desired direction of travel.

Lowering Platform

1. Turn Key Mode Switch to **LIFT** position.
2. While depressing Foot Switch, push Lift Switch to **DOWN**.

PROPORTIONAL CONTROLLER

Travel With Platform Lowered

1. Check that route is clear of obstructions, holes and drop-offs and is capable of supporting wheel loads.
2. Verify Chassis Key Switch is turned to **PLATFORM** and Chassis Emergency Stop Switch is ON.
3. After mounting platform, close and latch gate. Check that guardrails are properly assembled and in position. Hang Controller on front guardrail.
4. Check clearances above, below and to the sides of platform.
5. Turn Controller Emergency Stop Switch ON.
6. Turn Controller Key Switch to **ON**.
7. Turn Drive/Lift Switch to **DRIVE**.
8. While depressing Foot Switch, slowly push Control Lever to **FORWARD** or **REVERSE** position to travel in the desired direction. The farther you push or pull the Control Lever the faster the machine will travel.

Steering

1. Turn the Key Switch **ON**.
2. While depressing the Foot Switch, push the Steering Switch to **RIGHT** or **LEFT** to turn 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 straight ahead position by operating Steering Switch.

Elevating Platform

⚠ WARNING ⚠

LOOK up and around for obstructions before performing the lift function.

DO NOT elevate the platform unless the work platform is on a firm and level surface.

DO NOT operate the work platform within 10 feet of any electrical lines. **THIS WORK PLATFORM IS NOT INSULATED.**

NEVER enter the Elevating Assembly while the platform is elevated.

1. Position Drive/Lift Switch to **LIFT**.
2. While depressing Foot Switch, push the Control Lever slowly forward to raise the platform, increasing the Control Lever angle increases the lift speed.

Travel With Platform Elevated

NOTE: Work platform will travel at reduced speed when platform is elevated.

⚠ WARNING ⚠

Travel with platform elevated **ONLY** on firm and level surfaces.

1. Check that route is clear of persons, obstructions, holes and drop-offs, is level and capable of supporting the wheel loads.
2. Check clearances above, below and to the sides of platform.
3. Position Drive/Lift Switch to **DRIVE** position.
4. While depressing Foot Switch, push Control Lever to **FORWARD** or **REVERSE** for desired direction of travel.

Lowering Platform

1. Position Drive/Lift Switch to **LIFT**.
2. While depressing Foot Switch, pull back on the Control Lever.

EMERGENCY LOWERING

The Chassis Emergency Lowering Valve is located on the base of the Lift Cylinder (see Figure 3-1).

1. Open the Emergency Lowering Valve by turning the knob counterclockwise.
2. Once the platform is fully lowered, be certain that the Emergency Lowering Valve is closed again. The platform will not elevate if the Emergency Lowering Valve has not been closed.
3. To close the Emergency Lowering Valve, turn fully clockwise.

AFTER USE EACH DAY

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

4.0 Introduction



WARNING



Be sure to read, understand and follow all information in the Operation Section of this manual before attempting to operate or perform service on any SL-14 Work Platform.

This section contains instructions for the maintenance of the SL-14 Work Platform. Procedures for the operation inspection, adjustment, scheduled maintenance, and repair/removal are included.

Referring to Section 3.0 will aid in understanding the operation and function of the various components and systems of the SL-14 and help in diagnosing and repair of the machine.

SPECIAL TOOLS

The following is a list of special tools that are required to perform certain maintenance procedures. These tools may be purchased from your dealer.

Description	Part Number
Gauge, 0-600 psi	14124-006-00
Gauge, 0-3000 psi	14124-030-00
Fitting, Quick Disc.*	63965-002-00
Inclinometer**	10119-000-00
Tilt Sensor Adjusting Tool**	30622-000-00

* Required for European Models.

** Used to adjust Optional Tilt Sensor.

4.1 Preventative Maintenance

Table 4-1: Preventative Maintenance Checklist

PAGE NO.	COMPONENT	INSPECTION OR SERVICES	INTERVAL			
			EA. SHIFT	50 HRS.	250 HRS.	1000 HRS.
4-3	Battery System	Check electrolyte level	X			
		Check specific gravity		X		
		Clean exterior			X	
		Check battery cable condition	X			
		Charge batteries	X			
		Clean terminals		X		
4-5	Hydraulic Oil	Check oil level	X			
		Change filter			X	
		Drain and replace oil (ISO #46)				X
	Hydraulic System	Check for leaks	X			
		Check hose connections		X		
		Check for exterior wear		X		
	Emergency Hydraulic System	Open the emergency lowering valve and check for serviceability	X			
	Controller	Check switch operation	X			
	Control Cable	Check the exterior of the cable for pinching, binding or wear	X			
	Platform Deck and Rails	Check fasteners for proper torque	X			
		Check welds for cracks	X			
		Check condition of deck	X			
	Tires	Check for damage	X			
4-11	Hydraulic Pump	Wipe clean		X		
		Check for leaks at mating surfaces		X		
		Check for hose fitting leaks	X			
		Check mounting bolts for proper torque		X		
4-12	Drive Motors	Check for operation and leaks	X			
4-12	Steering System	Check hardware & fittings for proper torque			X	
		Oil pivot pins		X		
		Check steering cylinder for leaks & mounting bolts for proper torque		X		

PAGE NO.	COMPONENT	INSPECTION OR SERVICES	INTERVAL			
			EA. SHIFT	50 HRS.	250 HRS.	1000 HRS.
4-5	Elevating Assembly	Inspect for structural cracks	X			
		Check pivot points for wear		X		
		Check pivot pin mounting bolts for proper torque		X		
		Check linkage gear for wear			X	
		Check elevating arms for bending			X	
		Grease linkage gear		X		
	Chassis	Check hoses for pinch or rubbing points	X			
		Check component mounting for proper torque			X	
		Check welds for cracks	X			
4-14	Lift Cylinder	Check the cylinder rod for wear		X		
		Check pivot pin mounting bolts for proper torque		X		
		Check seals for leaks		X		
		Inspect pivot points for wear		X		
		Check fittings for proper torque		X		
4-5	Entire Unit	Check for and repair collision damage	X			
		Check fasteners for proper torque			X	
		Check for corrosion-remove and repaint			X	
		Lubricate		X		
	Decals	Check for peeling or missing decals & replace	X			
4-15	Wheel Bearings	Check wheel assembly for play		X		
		Oil wheel bearings				X
	Electric Motor	Inspect brushes for wear			X	

4.2 Blocking Elevating Assembly (Figure 4-1)

⚠ CAUTION ⚠

DO NOT support or raise the front of the platform during any maintenance operation as this may result in damage to the tension members.

⚠ WARNING ⚠

BEFORE performing maintenance on work platform, while elevated, ensure that Elevating Assembly is properly supported.

DO NOT stand in Elevating Assembly area while installing or removing blocking device.

Use a blocking device capable of supporting one ton to block Elevating Assembly.

INSTALLATION

1. Park the work platform on firm level ground.
2. Open Control Panel access door.
3. Turn Chassis Key Switch to **CHASSIS**. Position Chassis Lift Switch to **UP** and elevate platform approximately six feet (2 m).
4. Place the blocking device between the upper Lift Cylinder mount and Chassis. Be careful not to place it on a hydraulic hose.
5. Push Chassis Lift Switch to **DOWN** position and gradually lower platform until lower boom is supported by the blocking device.

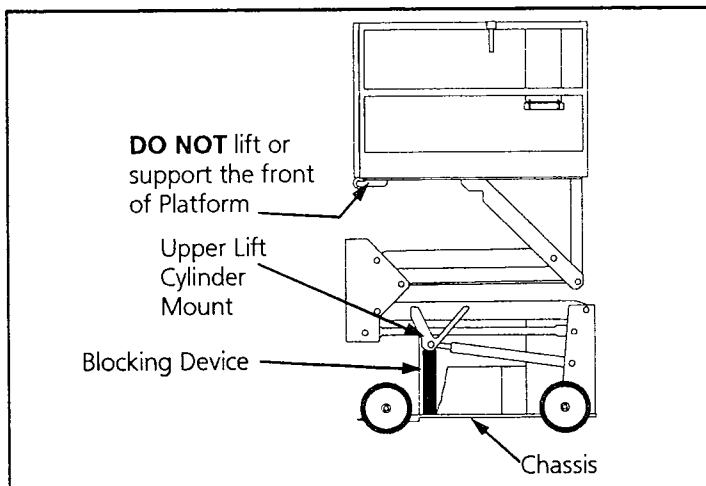


Figure 4-1: Blocking the Elevating Assembly

REMOVAL

1. Push Chassis Lift Switch to **UP** position and gradually raise platform until blocking device can be removed.
2. Remove blocking device.
3. Push Chassis Lift Switch to **DOWN** position and completely lower platform.
4. Close Control Panel access door.

4.3 Battery Maintenance

⚠ WARNING ⚠

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

Always wear safety glasses when working with batteries.

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

BATTERY INSPECTION AND CLEANING

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

⚠ CAUTION ⚠

If battery water level is not maintained, batteries will not fully charge creating a low discharge rate which will damage motor/pump unit and void warranty.

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

Clean the batteries when they 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.

BATTERY CHARGING (Figure 4-2)

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

**WARNING**

Charge the batteries only in a well ventilated area.

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

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

Never leave the charger unattended for more than two days.

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

Keep the charger dry.

Charge batteries as follows:

1. Check the batteries fluid level. If the electrolyte level is lower than $\frac{3}{8}$ in. (10mm) above the plates, add clean, distilled water only.
2. Connect the charger plug to a properly grounded outlet of the proper voltage and frequency.

Note: The 220 volt charger has a voltage selector switch that must be in the 220 v. position when connected to a 220 v. power source.

3. The charger turns on automatically after a short delay.
4. The charger turns off automatically when the batteries are fully charged.



Figure 4-2: Battery Charger

BATTERY CELL EQUALIZATION

The specific gravity of the electrolyte in the battery cells should be equalized monthly. To do this, charge the 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 8 hours. During this time, the charging current will be low (4 amps) as the cells are equalizing.

After equalization, the specific gravity of all cells should be checked with a hydrometer. The temperature corrected specific gravity should be 1.260. If a battery contains any cells with corrected readings below 1.230, the battery 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 1 to 2 hours to adequately mix the water and electrolyte.

4.4 Lubrication

Refer to Table 4-1 for the lubrication intervals and Figure 4-3 for location of items that require lubrication service.

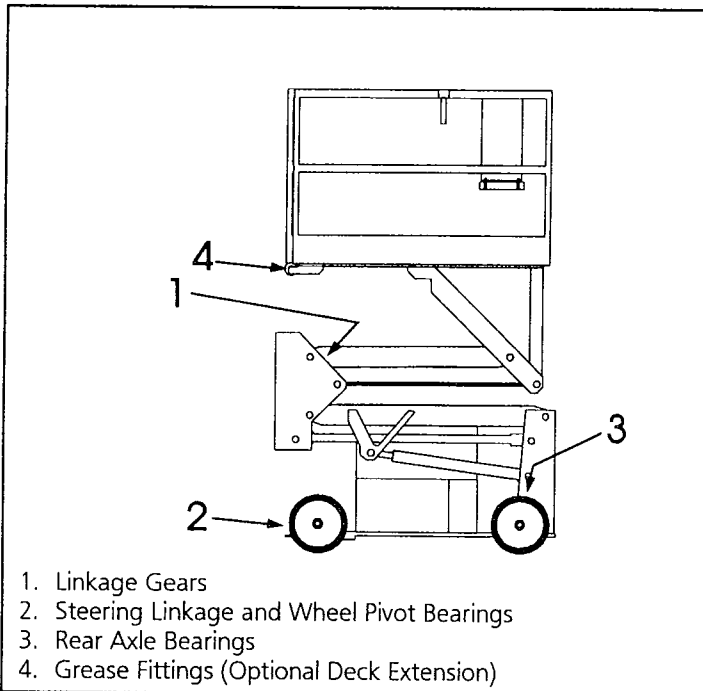


Figure 4-3: Lubrication Points

GREASE FITTINGS

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

LINKAGE GEARS

1. Raise platform fully.
2. Using another work platform or ladder get up high enough to comfortably reach gears.
3. Use a long handled brush to apply multi-purpose grease to the face of the gears.

CAUTION

Do not use hands to apply grease or allow any body part to enter the Elevating Assembly.

4. Lower the platform after greasing.

STEERING LINKAGE, WHEEL PIVOT BEARINGS, AND REAR AXLE BEARINGS

Apply one or two drops of motor oil to each pivot point.

HYDRAULIC OIL, TANK AND FILTER

Fluid Level

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

Oil Replacement (Figure 4-4)

1. Operate the work platform for five minutes to warm up the oil.

CAUTION

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

2. Provide a suitable container to catch the drained oil. The hydraulic tank has an oil capacity of 2.0 gallons (7.6 l).
3. Remove the drain plug and allow all oil to drain into the container, be sure to dispose of oil properly.
4. Reinstall the drain plug.
5. Unscrew the breather assembly from the tank.
6. Fill the hydraulic oil tank to the level of the Sight Gauge with ISO #46 hydraulic oil by pouring the oil into the breather port.

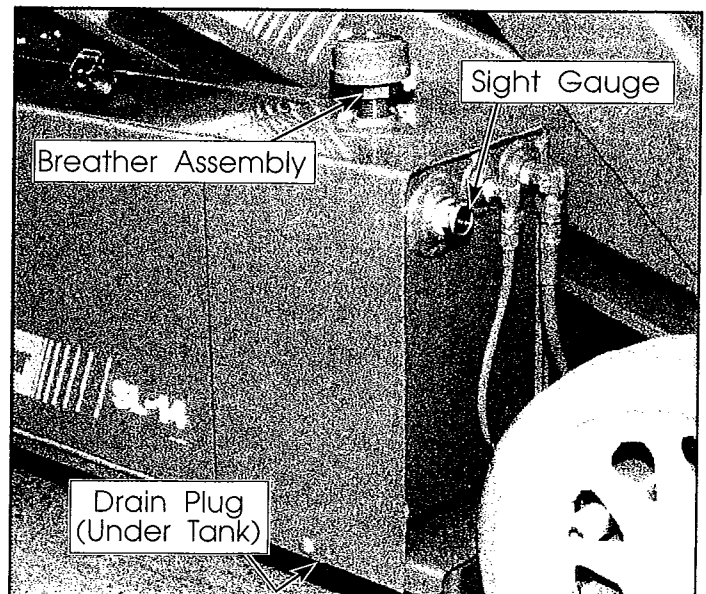


Figure 4-4: Hydraulic Oil Tank

Filter Replacement (Figure 4-5)

1. Unscrew the Filter by turning counterclockwise being careful not to spill the oil contained in the Filter.
2. Dispose of the oil and Filter in a proper manner.
3. Lubricate the seal on the new Filter with a little hydraulic oil and screw the Filter onto the Valve Block by turning clockwise.
4. Operate the work platform briefly to fill the new Filter with oil.
5. Check the hydraulic fluid level and add oil if necessary.

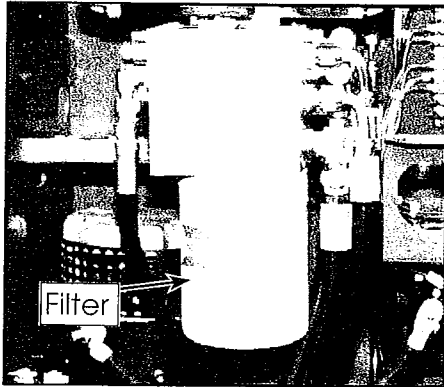


Figure 4-5: Hydraulic Filter

4.5 Setting Hydraulic Pressures

Referring to Figure 4-12 along with the other Figures will aid in the following procedures.

NOTE: Check the hydraulic pressures whenever the pump, manifold, or relief valve has been serviced or replaced.

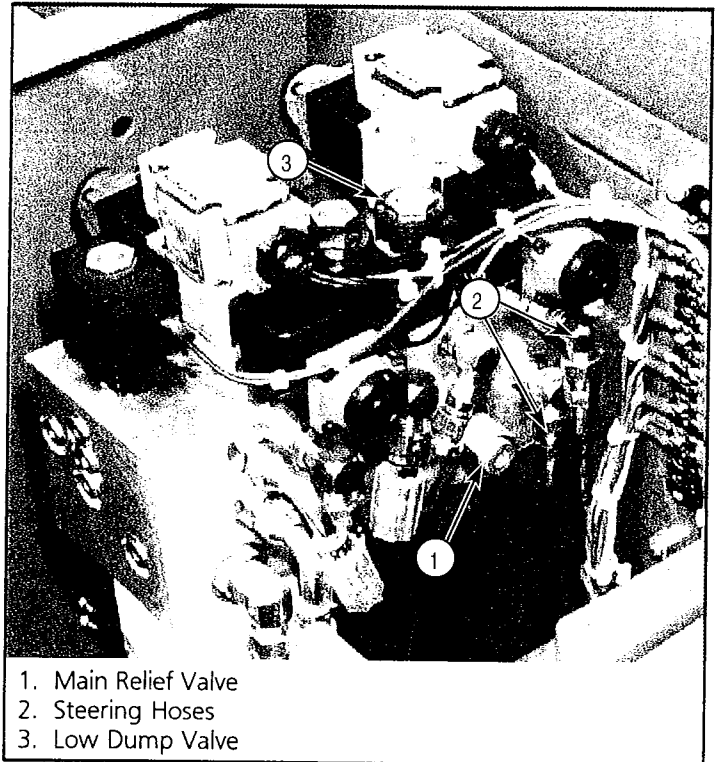
⚠ WARNING ⚠

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 (Figure 4-6)

1. Remove the gauge port plug or Quick Disconnect and install the 0-3000 psi pressure gauge assembly.
2. Disconnect one terminal from the Low Dump Coil.
3. Operate the hydraulic system for five minutes to warm the oil.
4. Remove the plug in the end of the Main Relief Valve to expose the adjusting screw or loosen the locking nut.
5. Turn the adjusting screw 2 to 3 turns counterclockwise.
6. Turn the Chassis Key Switch to **CHASSIS** and push and hold the Chassis Lift Switch to **LIFT**.
7. While holding the Chassis Lift Switch to **LIFT**, turn the adjusting screw clockwise until the gauge reads 2500 psi.
8. Reinstall the plug in the end of the Main Relief Valve or tighten the locking nut.
9. Reconnect the Low Dump Valve terminal.
10. Remove the gauge from the gauge port or Quick Disconnect and replace the plug or cap.



1. Main Relief Valve
2. Steering Hoses
3. Low Dump Valve

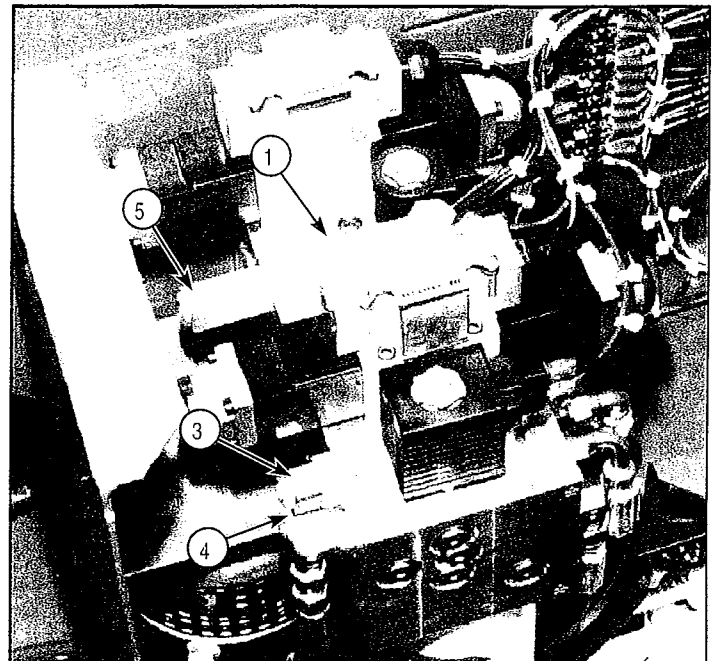
Figure 4-6: Domestic Hydraulic Manifold Assembly, Right Side View

COUNTERBALANCE VALVES (Figure 4-7)

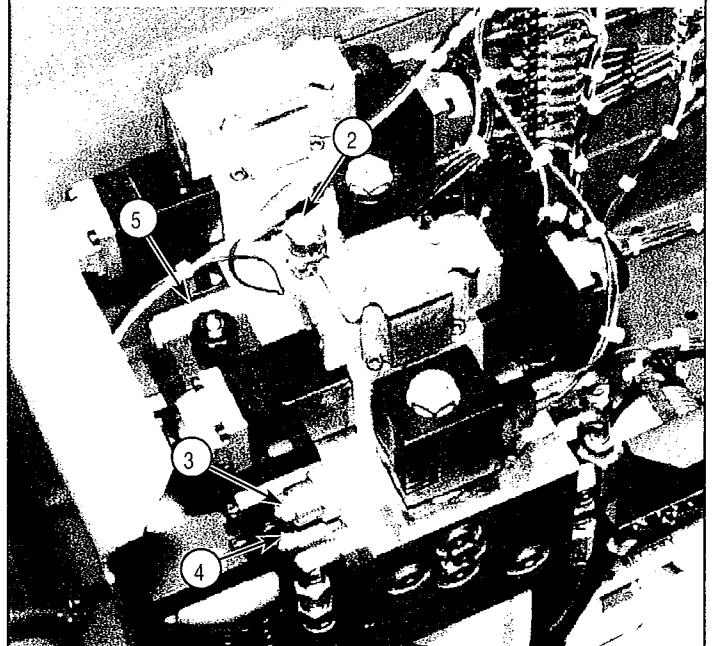
1. Remove the gauge port plug or Quick Disconnect and install the 0-600 psi pressure gauge assembly.
2. Using a one ton jack raise the front of the machine and securely block the front wheels off the ground.
3. Operate the hydraulic system for five minutes to warm the oil.
4. Remove the plugs from the ends of the Counterbalance Valves to expose the adjusting screws or loosen the locking nuts.
5. With the Controller hung on the side Guardrail and the Foot Switch depressed (for Two Speed Controller the Drive/Lift Speed Range Switch must be in **HIGH**), actuate the Controller to drive the machine **FORWARD**.
6. While holding the Drive Switch or Control Lever in **FORWARD**, adjust the Reverse Counterbalance Valve (upper valve) to 300-350 psi maximum by slowly turning the adjusting screw, clockwise decreases pressure.
7. To adjust the Forward Counterbalance Valve (lower valve) repeat the procedure but drive the machine in **REVERSE**.
8. Check the settings by actuating the Drive Switch or Control Lever **FORWARD** then **REVERSE** checking the gauge to ensure pressures are properly set. Readjust as needed.
9. Replace the end plugs in the Counterbalance Valves and remove the blocks and lower the machine to the ground.
10. Remove the gauge from the gauge port or Quick Disconnect and replace the plug or cap.
11. Check for proper operation of the drive system and Brakes.

STEERING RELIEF VALVE (Figure 4-6 & 4-7)

1. Remove the gauge port plug or Quick Disconnect and install the 0-3000 psi pressure gauge assembly.
2. Remove the plug from the end of the valve to expose the adjusting screw or loosen the locking nut.
3. Push the Steering Switch **RIGHT** and set the pressure to 1500 psi maximum by slowly turning the adjusting screw clockwise to increase pressure.
4. Replace the valve plug or tighten the locking nut.
5. Remove the gauge and reinstall the hose.
6. Check for proper operation of the steering system.



Domestic



European

1. Gauge Port
2. Quick Disconnect, Gauge Port
3. Reverse Counterbalance Valve
4. Forward Counterbalance Valve
5. Steering Relief Valve

Figure 4-7: Hydraulic Manifold Assembly, Left Side View

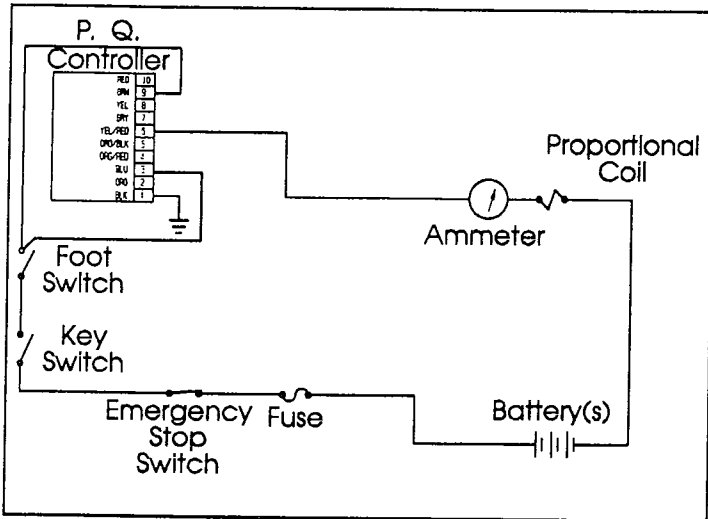


Figure 4-8: Proportional Control Test Circuit

4.6 Switch Adjustments

PROPORTIONAL CONTROL ADJUSTMENT (Figure 4-8)

To perform the adjustment the Controller (Control Box) must be disassembled by removing the four screws in the top of the Controller and lifting the top away from the base to expose the proportional controller, being careful not to damage or short-out any wires or switches.

1. Push Control Lever just far enough to illuminate the **PWM** LED indicator.
2. Set the **Lo** pot so the motor turns on when the LED lights up but the machine does not move.
3. Place an ammeter in series with the Proportional Coil (See Figure 4-8).
4. Select **LIFT** with Drive/Lift Switch and elevate platform 12-18 inches (305-457 mm).
5. Select **DRIVE** with Drive/Lift Switch.
6. Push Control Lever fully to **FORWARD** or **REVERSE** and check that machine speed is 20 ft. (6.1 m) in 18-22 seconds.
7. Adjust Midrange trim pot if required, turning clockwise increases speed.
8. Lower platform fully.
9. Push Control Lever fully to **FORWARD** or **REVERSE** and check that machine speed is 20 ft. (6.1 m) in 5-6 seconds.
10. Adjust Hi trim pot if required.

DOWN LIMIT SWITCH (Figure 4-9 & 4-10)

1. Raise platform until Mid Link Weldment is 2 inches (51 mm) off of the Chassis (Figure 4-10).
2. Disconnect wires coming from switch at Terminal Block positions 6 and 7 and connect an ohmmeter or continuity tester to the wires.
3. Adjust switch to just close, when actuating arm is moved downward, by loosening hex nut and moving the actuating arm. Raise and lower platform to verify adjustment and tighten hex nut.
4. Disconnect ohmmeter and reconnect wires.
5. Lower platform.

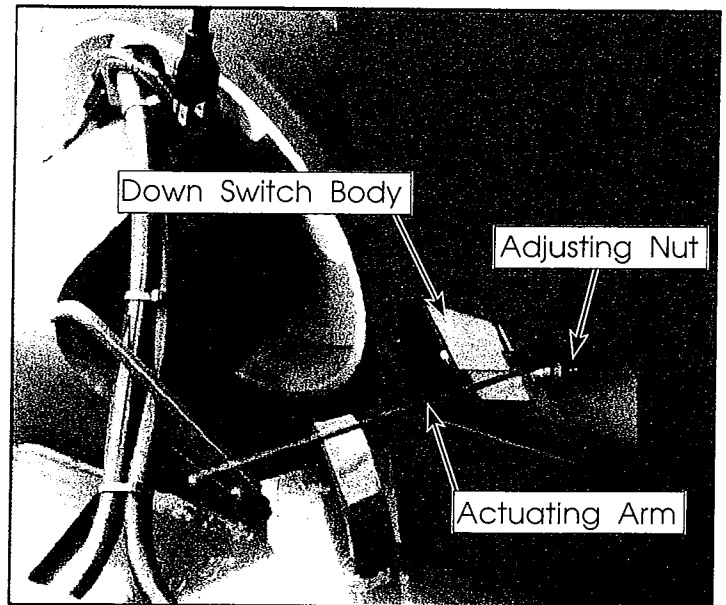


Figure 4-9: Down Switch

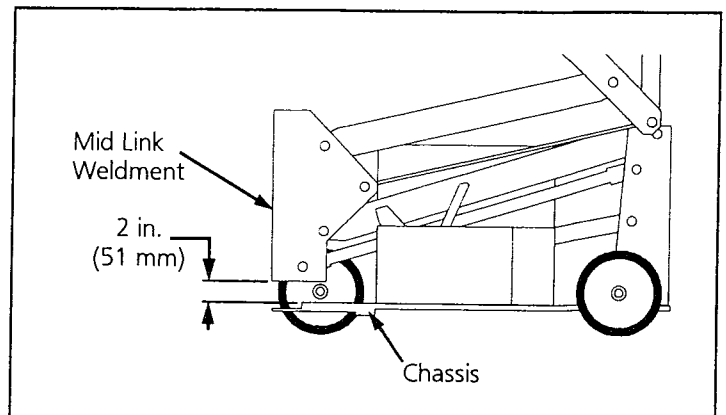


Figure 4-10: Down Switch Adjustment

OPTIONAL TILT SENSOR (Figure 4-11)

Adjust sensor anytime it has been removed or if the platform will not elevate on a level surface.

1. Place machine on a hard level surface $\pm 1/4^\circ$.
2. Use the Inclinator (P/N: 10119-000-00) or a precision level to ensure front and rear of Chassis is level $\pm 1/4^\circ$.
3. Place the Tilt Sensor Adjusting Tool (P/N: 30622-000-00) on the Tilt Sensor.
4. Adjust the three leveling screws until the bubble is centered in the circle.
5. Remove adjusting tool and check for proper operation of the Tilt Sensor.

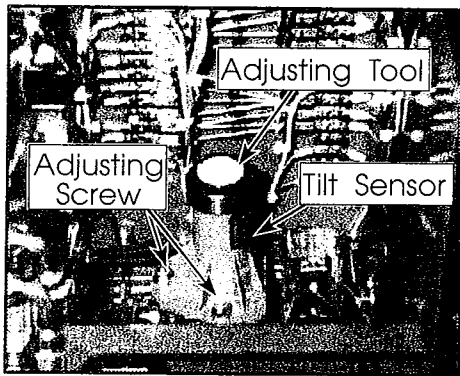


Figure 4-11: Optional Tilt Sensor

4.7 Hydraulic Manifold (Figure 4-12)

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

REMOVAL

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

DISASSEMBLY

NOTE: Mark all components as they are removed so as not to confuse their location during assembly. Refer to Figure 4-12 often to aid in disassembly and assembly.

1. Remove coils from solenoid valves.
2. Remove spool valve covers and spool valves.
3. Remove valves.
4. Remove fittings, plugs, springs, balls and orifices.

CLEANING AND INSPECTION

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

ASSEMBLY

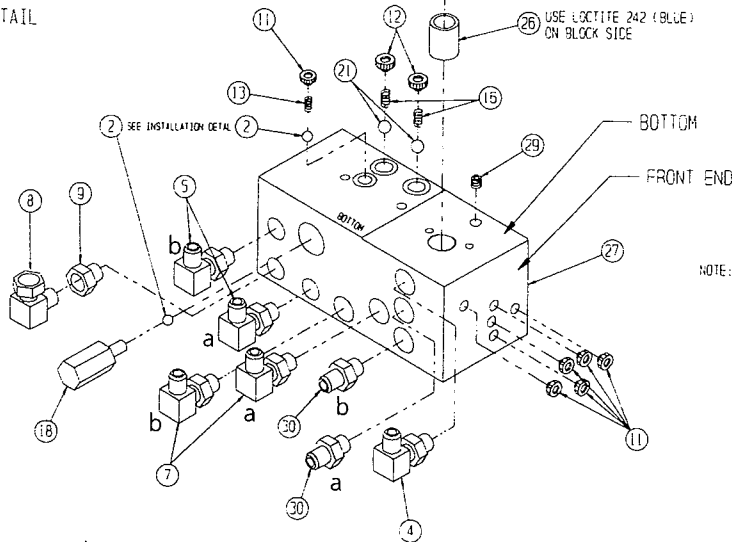
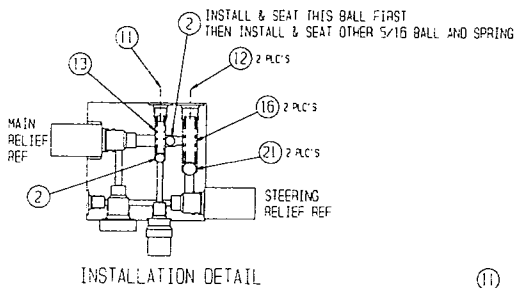
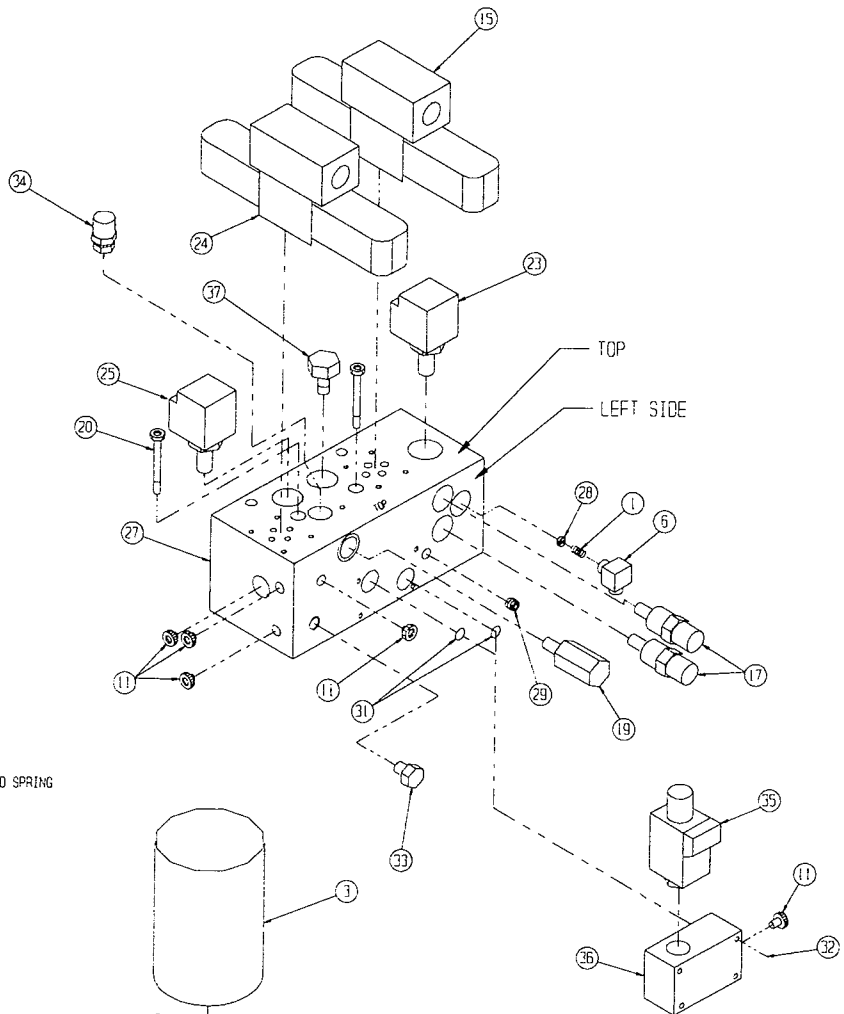
NOTE: Lubricate all O-rings before installation to prevent damage to O-rings. Seat all balls in manifold block by lightly tapping on the ball with a brass drift.

1. Install fittings, plugs, springs, balls and orifices. Be sure to follow assembly sequence in Figure 4-12 for Items 2, 5/16 check balls.
2. Install valves.
3. Install coils on solenoid valves.

INSTALLATION

1. Attach manifold assembly to mounting plate with fasteners.
2. Connect Solenoid leads to terminals (as previously tagged). Connect ground wires to Valve Block.
3. Connect hydraulic hoses. Be certain to tighten hoses to manifold.
4. Operate each hydraulic function and check for proper operation and leaks.
5. Adjust all hydraulic pressures according to instructions in Section 4.5.

1. Spring
2. Ball 5/16 Diameter
3. Oil Filter
4. Fitting, Return
5. Fitting: a. Low Pump, b. Left Steer
6. Fitting
7. Fitting: a. Lift, b. High Pump
8. Fitting, Right Steer
9. Fitting
11. Plug - SAE #4
12. Plug - SAE #6
13. Spring
15. Lift/Drive Valve
16. Spring
17. Counterbalance Valves (lower is Forward)
18. Main Relief Valve
19. Steering Relief Valve
20. Screw
21. Ball 7/16 Diameter
23. Reverse Valve
24. Steering Valve
25. Low Dump Valve
26. Filter Adapter
27. Valve Block
28. Brake Orifice
29. Plug 9 mm



NOTE: BALL IN PLUGS, ITEM-29, MUST BE DRIVEN IN TO SEAT EACH PLUG. TOP OF BALL MUST BE AT LEAST FLUSH WITH THE SURFACE OF THE BLOCK.

30. Fitting: a. Reverse Drive, b. Forward Drive
31. Two Speed: Plug - SAE #4
Proportional: O-Ring
32. Proportional Only: Screw
33. Plug
34. Two Speed: Plug - SAE #4
Proportional: Fitting Quick Disconnect
35. Two Speed: Plug - SAE #4
Proportional: Proportional Valve
36. Proportional Only: Proportional Valve Block
37. Two Speed: High Dump Valve
Proportional: Cartridge Plug

Figure 4-12: Hydraulic Manifold, Exploded View

4.8 Hydraulic Components

This section contains general information that applies to service and repair of any hydraulic component or system and brief specific information on each component required for reliable repairs.

Procedures for removal, disassembly, reassembly, cleaning, and installation are not given except for specific information that is not considered general shop practices or is special to that component.

GENERAL INFORMATION

Always follow these guidelines when servicing hydraulic components:

- Tag each hose or wire before removal.
- Remove dirt around fittings or components before removal.
- Plug all hoses immediately to prevent leakage or dirt entering the system.
- Disassemble and assemble components on a clean work area only.
- Clean parts with solvent and blow dry with filtered compressed air.
- Check threaded parts for stripped or damaged threads, bearing surfaces for scoring or excessive wear, springs for cracks and proper tension, and o-rings and seals for cuts, cracks, and excessive wear.
- Use new o-rings and seals whenever possible.
- Lubricate all o-rings and seals before assemble with clean hydraulic fluid.
- Use care when putting any cylinder in a vice or other holding device.

SPECIFIC INFORMATION

Hydraulic Pump (Figure 4-13)

- Lubricate the pump shaft with multi-purpose grease before attaching the pump to the motor.
- Use a criss-cross pattern to torque each capscrew a little at a time until all 4 capscrews are torqued to 20 ft. lbs. (27 N-m).
- Check the oil level in the hydraulic tank before operating the work platform.

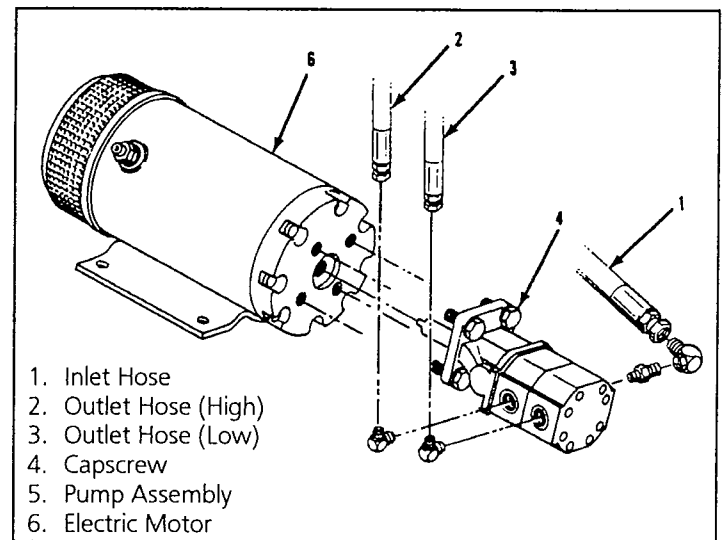


Figure 4-13: Typical Hydraulic Pump

Hydraulic Drive Motors (Figure 4-14)

Removal

1. Park the work platform on firm level ground and block the wheels to prevent the work platform from rolling.
2. Turn the wheels to expose the wheel motor to be removed.
3. After jacking up and securely blocking the front of the machine, remove the cotter pin, nut, wheel, and shaft key.
4. After disconnecting the hose assemblies remove the motor from the motor mount.

Installation

Reverse the removal process to install the motor while performing the following:

- Torque motor bolts to 65-75 ft. lbs. (88-120 N-m).
- Thoroughly clean the motor shaft and wheel bore of all grease, paint and foreign material.
- Lubricate nut face and threads.
- Torque each wheel hub nut to 140-160 ft. lbs. (203 N-m). Align the slot in the nut with the hole in the shaft and insert the cotter pin. **DO NOT** back off the nut to align.
- Operate the drive system to check for leaks and proper function.

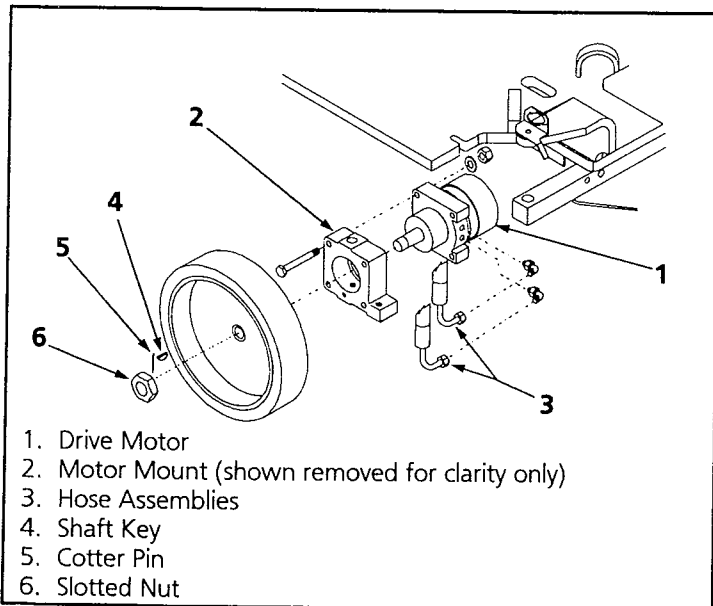
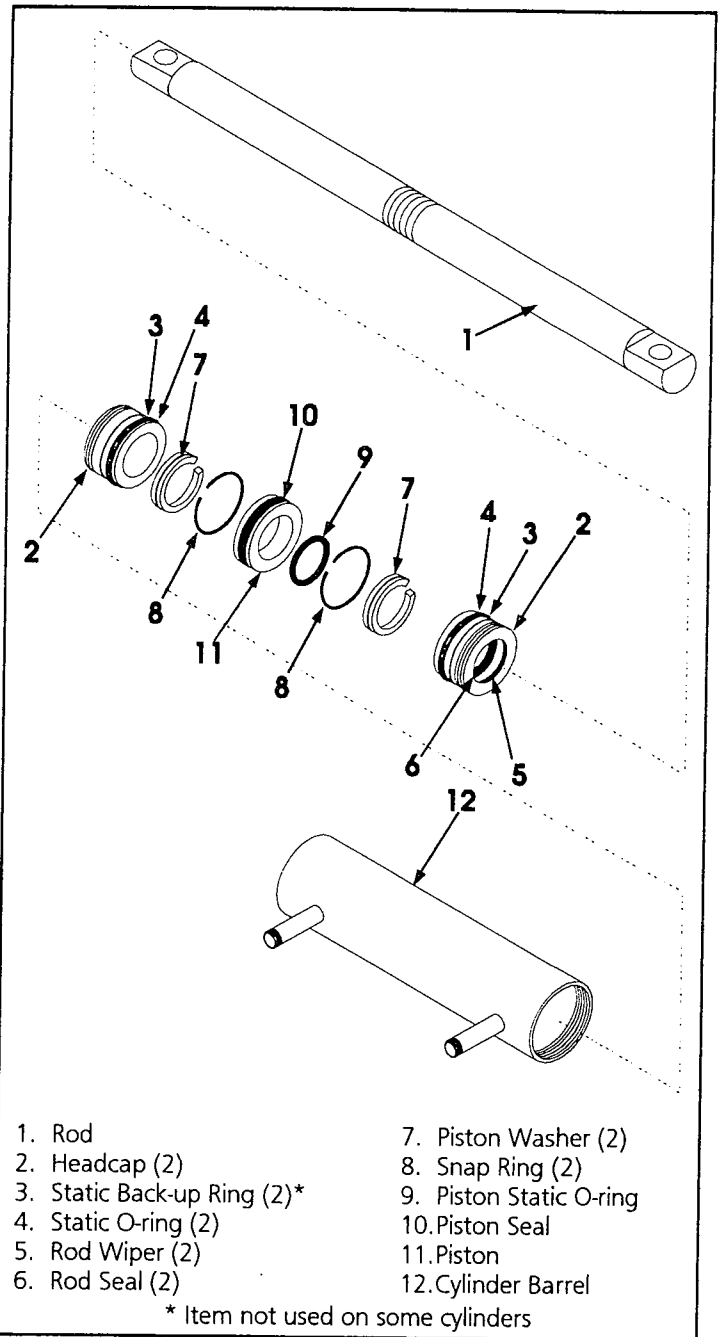


Figure 4-14: Drive Motor Installation

Steering Cylinder (Figure 4-15)

- Make sure steering linkage pins are smooth, clean and lubricated with multi-purpose grease before installation.
- Operate the steering circuit several times throughout its entire range of travel to expel trapped air and check for leaks.



- | | |
|-----------------------------|-------------------------|
| 1. Rod | 7. Piston Washer (2) |
| 2. Headcap (2) | 8. Snap Ring (2) |
| 3. Static Back-up Ring (2)* | 9. Piston Static O-ring |
| 4. Static O-ring (2) | 10. Piston Seal |
| 5. Rod Wiper (2) | 11. Piston |
| 6. Rod Seal (2) | 12. Cylinder Barrel |

* Item not used on some cylinders

Figure 4-15: Steering Cylinder Assembly

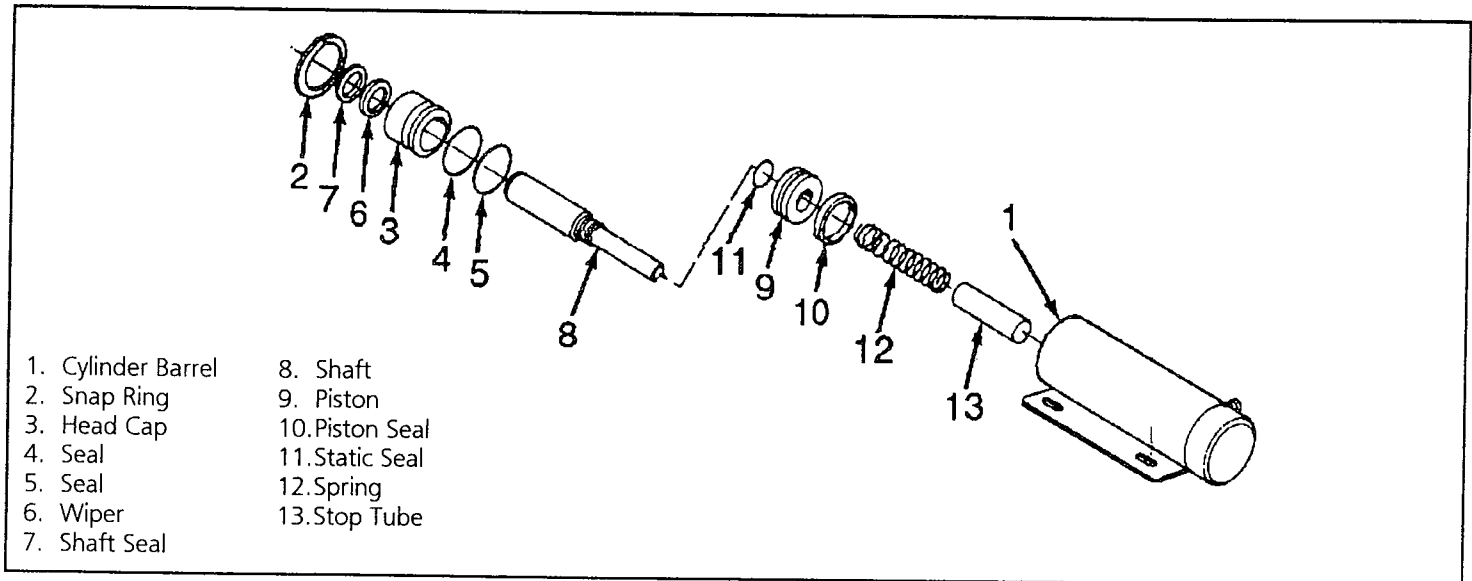


Figure 4-16: Brake Cylinder

Brake Cylinder (Figure 4-16 & 4-17)

- Block the wheels to prevent the work platform from rolling when the brake is removed.
- The piston screws onto the shaft with a static seal in between.
- Position the brake cylinder assembly on the chassis so that the cylinder pin is centered in the large radius of the wheel disk cutouts and the cylinder pin major diameter is flush with the outside edge of the wheel disk (Figure 4-17).
- Operate the brake retract circuit and check that the shaft clears the brake disc. Check for leaks.

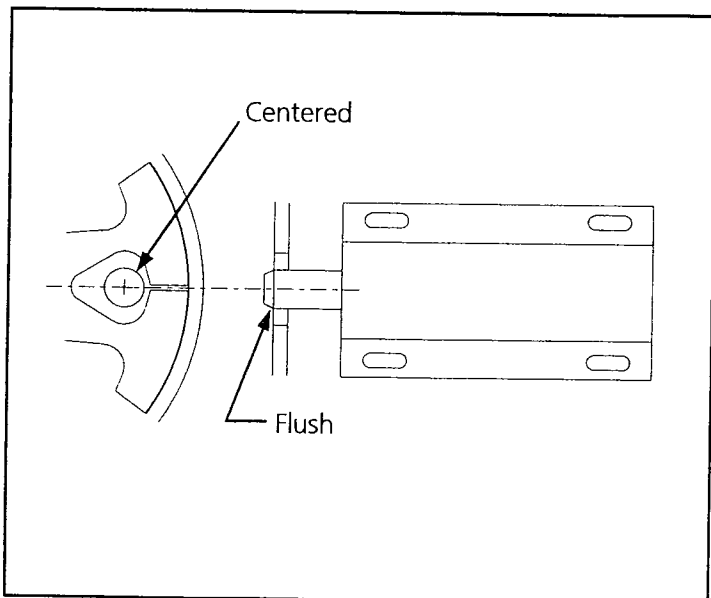


Figure 4-17: Brake Cylinder Installation

Lift Cylinder (Figure 4-18 & 4-19)

⚠ CAUTION ⚠

DO NOT support or raise the front of the platform during any maintenance operation as this might result in damage to the tension members.

- Raise and block the front of the elevating assembly approximately 12 inches (305 mm) above the chassis. Support with a jackstand with a minimum rating of 1000 lbs. (454 kg).
- Open Emergency Lowering Valve to be sure all pressure is off the Lift Cylinder.
- Support the Lift Cylinder to prevent falling.
- Screw the head cap into the cylinder barrel hand tight and then ¼ turn further (when applicable).
- The ports in the control block must be aligned with those in the lift cylinder and the o-rings must be properly seated in the control block to prevent leakage.
- Torque control block mounting bolts to 12-16 ft. lbs. (16-22 N-m).
- Before installing the cylinder, check the pins and bearings for excessive wear. Replace if necessary.
- After installation raise the machine and check for leaks.

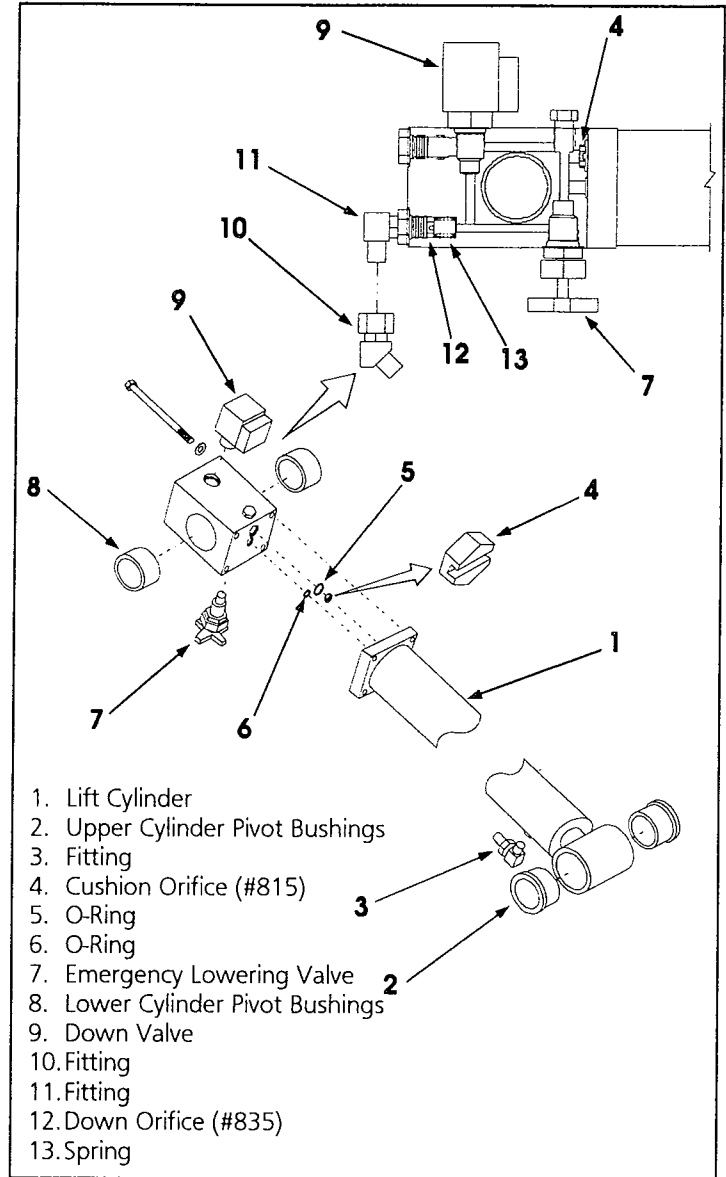
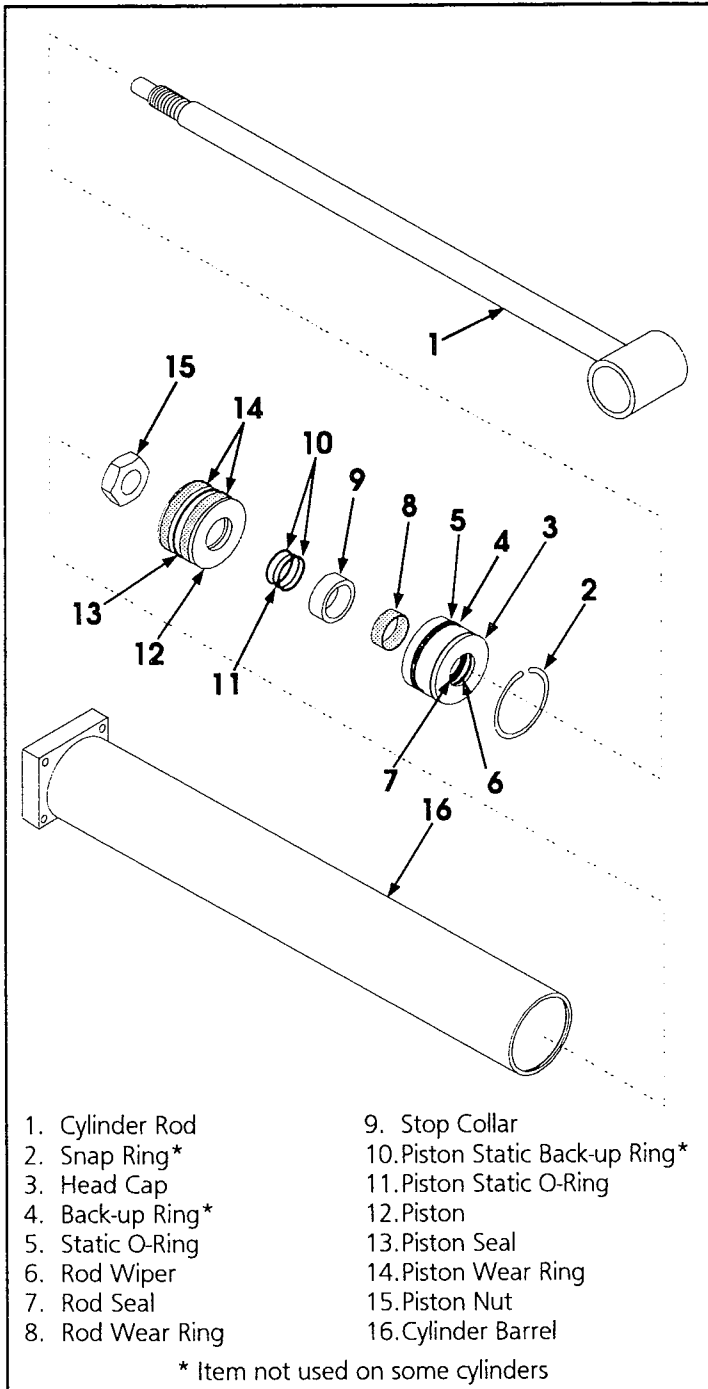


Figure 4-18: Lift Cylinder Installation



- | | |
|------------------|---------------------------------|
| 1. Cylinder Rod | 9. Stop Collar |
| 2. Snap Ring* | 10. Piston Static Back-up Ring* |
| 3. Head Cap | 11. Piston Static O-Ring |
| 4. Back-up Ring* | 12. Piston |
| 5. Static O-Ring | 13. Piston Seal |
| 6. Rod Wiper | 14. Piston Wear Ring |
| 7. Rod Seal | 15. Piston Nut |
| 8. Rod Wear Ring | 16. Cylinder Barrel |

* Item not used on some cylinders

Figure 4-19: Lift Cylinder Assembly

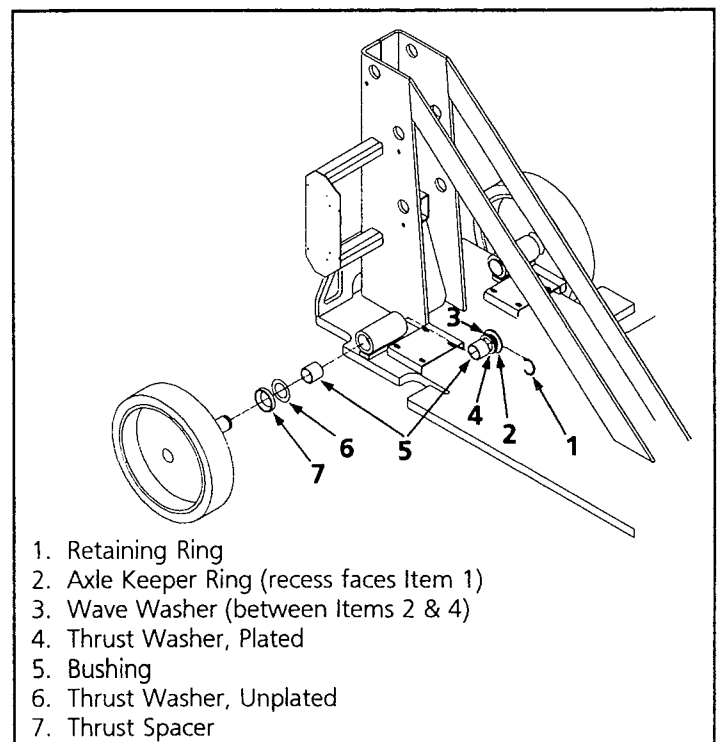
4.9 Rear Axle Bushings (Figure 4-20)

REMOVAL

1. Park the work platform on firm level ground and block the wheels to prevent the work platform from rolling.
2. After jacking up and securely blocking the rear of the machine, remove the retaining ring and pull the Wheel/Axle assembly out of the bushing housing.
3. Using a chisel split the bushings and remove them.

INSTALLATION

1. Using a bushing installation tool drive the outer bushing into the bore being careful to install the bushing straight.
2. Use a C-clamp, a bushing installation tool and a small steel plate against the outer end of the bushing housing, slowly tighten the C-clamp to install the inner bushing, being careful to install the bushing straight.
3. Lubricate the bushings and thrust washers with multi purpose grease and install the Wheel/Axle assembly making sure there are no burrs on the end of the shaft that might score the bushings. The recess in the Axle Keeper Ring, Item 2, must face the Retaining Ring, Item 1.
4. Apply a thin coating of multi purpose grease to the inner thrust washer and install the retaining ring.



1. Retaining Ring
2. Axle Keeper Ring (recess faces Item 1)
3. Wave Washer (between Items 2 & 4)
4. Thrust Washer, Plated
5. Bushing
6. Thrust Washer, Unplated
7. Thrust Spacer

Figure 4-20: Rear Axle Bushings

4.10 Electric Motor (Figure 4-21)

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 2A.
- 2A. 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 a power source 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 4-21A. 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 drive 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 and 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:

- Remove brush spring clip from its mounting on brush assembly.
 - Lift brush assembly from brush holder.
 - Disconnect brush assembly lead.
 - New brush assembly to be installed by reversing above procedure.
4. Inspect wire harness and all connections for signs of damage due to overheating.
 5. Check stator to see it is securely mounted.

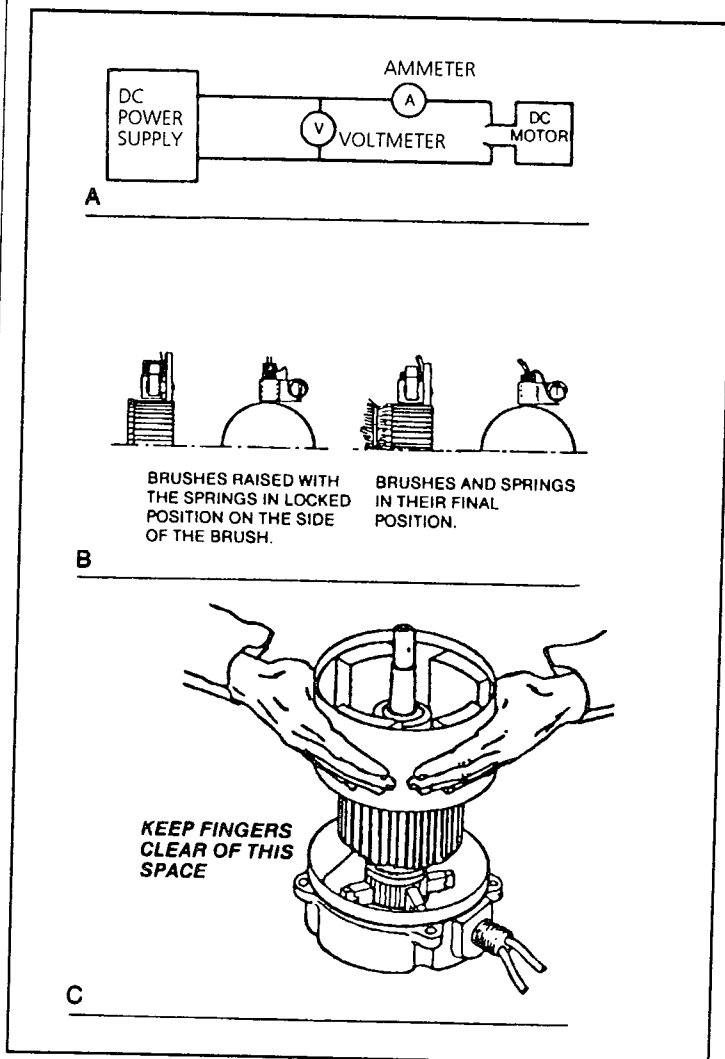


Figure 4-21: Electric Motor Service

REASSEMBLY

1. Install new brushes and be sure 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 4-21B and step 3 in the Inspection section).
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 re-use 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 4-21B.
6. Place the complete stator down over the vertical armature, and into position on the commutator 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 match-mark on both items. **These two marks must line up exactly. Rotate until they do.**
8. Assemble the drive 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.

4.11 Recommended Bolt Torque (Table 4-2)

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

Table 4-2: Bolt Torque

THREAD SIZE <small>American National Std.-UNC (course) Grade 5</small>	WIDTH ACROSS FLATS	TORQUE VALUE	
		ENGLISH	METRIC
1/4	7/16	110 In/Lbs	12 N·m
5/16	1/2	190 In/Lbs	22 N·m
3/8	9/16	30 Ft/Lbs	41 N·m
7/16	5/8	50 Ft/Lbs	68 N·m
1/2	3/4	75 Ft/Lbs	102 N·m
5/8	1 5/16	150 Ft/Lbs	203 N·m
3/4	1 1/8	250 Ft/Lbs	339 N·m
7/8	1 5/16	400 Ft/Lbs	542 N·m
1	1 1/2	600 Ft/Lbs	813 N·m

5.0 Introduction

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

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

GENERAL PROCEDURE

Troubleshooting should be carried out in two steps, first by thoroughly looking at the electrical circuits and components that could cause the problem. Loose terminal connections and short circuits are always a potential probable cause when troubleshooting. Secondly, the hydraulic system should be examined, but only after electrical circuits and components have been found fault free.

Referring to Section 3.0 will aid in understanding the operation and function of the various components and systems of the SL-14 and help in diagnosing and repair of the machine.

⚠ **WARNING** ⚠

When troubleshooting, ensure that the work platform is resting on a firm, level surface. When performing any service which requires the platform to be raised, the Elevating Assembly must be blocked. Disconnect the battery ground cables when replacing or testing the continuity of any electrical component.

FOR SERVICE ASSISTANCE, IN THE U.S.A., CALL:

1-800-926-LIFT

FROM OUTSIDE THE USA, CALL 1-209-896-5150

5.1 Troubleshooting Guide

Table 5-1: Troubleshooting Guide

PROBLEM	PROBABLE CAUSE	REMEDY
All functions inoperable, Electric Motor does not start.	1. Blown Control Circuit Fuse.	Check 15 amp Control Circuit Fuse. Replace if blown.
	2. Faulty Battery Charger.	Check the voltage output of the Battery Charger. If less than 24 VDC, repair or replace.
	3. Faulty Battery(ies).	After completely charging Batteries, test each Battery. Replace as required.
	4. Faulty Electric Motor.	While operating the steering function, check voltage across the Electric Motor terminals. If 24 VDC is present, replace the Motor .
	5. Faulty Motor Relay.	While operating the steering, check voltage across the coil terminals of Motor Relay. If no voltage is present, proceed with step 6. If 20 VDC or more, check continuity across the contact terminals of Motor Relay while still operating the steering function. If there is no continuity, replace the Motor Relay.
	6. Emergency Stop Switch failed open.	With the Emergency Stop Switch in the ON position, check continuity across the contacts. If none, replace.
	7. Key Switch.	Replace switch if inoperative.
	8. Faulty Foot Switch.	Check Foot Switch for continuity, replace if faulty.
All functions inoperable. Electric motor starts when control is actuated.	1. Hydraulic Reservoir low.	Check hydraulic fluid level, top off as required.
	2. Faulty Hydraulic Pump.	Check pressure and delivery of the Hydraulic Pump. Replace if required.
	3. Damaged Drive Coupling	Remove pump from motor and check coupling.
	4. Proportional Valve.	Check operation. Replace if required.
	5. Faulty Proportional Controller.	Check operation. Adjust or replace if required.

Troubleshooting

Table 5-1: Troubleshooting Guide (Cont.)

PROBLEM	PROBABLE CAUSE	REMEDY
Electric Motor continues to run after controls are returned to the OFF position.	Motor Relay contacts fused together.	With 0 voltage at the coil terminals of the Motor Relay check continuity across the contact terminals. If there is continuity, replace the Motor Relay.
Hourmeter does not register.	1. Electrical connections loose or connected improperly.	Tighten and/or correct the connections.
	2. Hourmeter failure.	Replace the meter.
All Controller functions inoperative.	1. Blown fuse.	Find short. Replace fuse.
	2. Key Switch.	Replace switch if inoperative.
	3. Faulty Foot Switch.	Check Foot Switch for continuity, replace if faulty.
	4. Faulty Emergency Stop Switch.	Check Emergency Stop Switches for continuity, replace if faulty.
	5. Control Cable.	Test cable and replace if damaged.
Platform will not elevate.	1. Emergency Lowering Valve open.	Close valve.
	2. Platform overloaded.	Observe maximum load rating.
	3. Ruptured hydraulic hose.	Replace the hose and check relief valve setting.
	4. Lift Valve Solenoid.	Test solenoid and replace if inoperative.
	5. Main Relief Valve stuck open.	Replace the relief valve.
	6. Lift Switch on Controller.	Test switch, replace if inoperative.
	7. Drive/Lift or Key Mode Switch.	Test the switch, replace if inoperative.
	8. Lift Valve.	Repair or replace valve.
	9. Faulty Diode.	Test Diodes, replace if necessary.
	10. Hydraulic Pump.	Check for pressure and delivery. Repair or replace if inoperative.
	11. Down Valve stuck open.	Remove and inspect the valve for sticky operation or damaged o-rings. Repair or replace if unserviceable.
	12. Low Dump Valve stuck open.	Remove and inspect the valve for sticky operation or damaged o-rings. Repair or replace if unserviceable.
	13. Proportional Coil.	Test solenoid and replace if inoperative.
	14. Proportional Controller.	Test controller, replace if inoperative.

PROBLEM	PROBABLE CAUSE	REMEDY
Unit will not steer. (Lift function operative.)	1. Steering Valve Coils (right and left).	Test coils, replace if inoperative.
	2. Open circuit in Control Cable.	Test cable for continuity, replace if defective.
	3. Steering Valve.	Test valve, replace if not serviceable.
	4. Mechanical damage.	Replace damaged parts.
	5. Steering Switch.	Replace steering switch.
	6. Diode.	Test diodes to steering valves. Replace if faulty.
Unit will not drive.	1. Drive/Lift or Key Mode Switch.	Position switch in DRIVE position. Test switch and replace if inoperative.
	2. Drive Valve.	Test valve and replace if inoperative.
	3. Control Cable.	Test cable and replace if damaged.
	4. Ruptured hydraulic hose.	Replace hose.
	5. Proportional Controller.	Test controller and replace if inoperative.
	6. Diode	Test Diodes, replace if necessary.
	7. Main pressure Relief Valve.	Test relief valve and replace if not serviceable.
	8. Hydraulic Pump.	Test pump pressure and delivery. Replace if not serviceable.
	9. Hydraulic Motors.	Test hydraulic pressure at drive circuit. If normal, replace motors.
Unit will not drive full speed.	1. Proportional Valve solenoid.	Test solenoid and replace if inoperative.
	2. High Dump Valve.	Test solenoid and replace if inoperative.
	3. Down Limit Switch.	Test and adjust switch, replace if inoperative.
	4. Proportional Controller.	Test the control and replace if inoperative.
	5. Hydraulic Motors worn.	Inspect the motors and replace if not serviceable.
	6. Hydraulic Pump worn.	Check pump pressure and delivery. Replace if not serviceable.
	7. Main pressure Relief Valve stuck open.	Check relief valve and replace if inoperative.
	8. Drive Speed Switch.	Replace switch.
No drive FWD but drives in REV. Lift function operable.	1. Faulty Drive Switch.	Test and replace if necessary.
	2. Faulty Proportional Controller.	Adjust Proportional Controller, replace if required.
	3. Faulty Counterbalance Valves.	Replace valve.

Table 5-1: Troubleshooting Guide (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
No drive REV but drives in FWD.	1. Faulty diode.	Test diodes, replace if faulty.
	2. Faulty Reverse Coil.	Test Reverse Coil, if proper voltage is present and coil is not magnetized, replace.
	3. Faulty Counterbalance Valves.	Replace valve.
	4. Faulty Proportional Controller.	Adjust Proportional Controller, replace if required.
Platform drifts down.	1. Emergency Lowering Valve partly open or faulty.	Ensure that the Emergency Lowering Valve is completely closed. If the platform still drifts down, replace the valve.
	2. Leaky Down Valve cartridge.	Replace the Down Valve.
	3. Faulty valve O-rings.	Check and replace O-rings on Emergency Lowering Valve and Down Valve.
	4. Lift Cylinder	Check and replace seals on Lift Cylinder piston.
Machine drives while lifting.	Faulty diode.	Test diodes, replace if faulty.
Platform lifts while driving.	Faulty diode.	Test diodes, replace if faulty.
Platform will not lower.	1. Blown fuse.	Locate electrical short and then replace fuse.
	2. Down Valve Coil.	Test coil and replace if inoperable.
	3. Control Cable.	Check cable and replace if damaged.
	4. Proportional Controller.	Test control and replace if inoperable.
	5. Drive/Lift or Key Mode Switch.	Check switch and replace if inoperable.
Platform starts to lower then stops.	Lift Cylinder oil viscosity too high.	Raise platform slightly and or steer machine to allow hydraulic oil to warm up, then lower platform.
Brake does not release.	Faulty Brake Cylinder.	Check and replace seals in cylinder.
Brake will not lock wheel.	1. Orifice plugged.	Remove and clean Brake Orifice.
	2. Faulty Brake Cylinder.	Check and replace seals in cylinder.

6.0 Introduction

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

The diagrams are to be used in conjunction with Table 5-1, Troubleshooting. They allow understanding of the make-up and functions of the systems for checking, tracing, and fault-finding during troubleshooting analysis.

Schematics or diagrams for options are located in Section 7, Illustrated Parts. Be sure to reference these diagrams along with the appropriate schematics and diagrams in this section when troubleshooting a machine with one or more of the options available.

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.

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6.1 Electrical Schematics

Table 6-1: Electrical Schematic Legend, Two Speed Controller

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Control Module under Terminal Strip.
BAT	Batteries (8) 6 volts	To store energy.	Two per Module.
CR1	Relay, Motor	Connects Batteries to Motor.	Control Module under Control Panel.
DIO1	Diode	Supplies power to Motor Relay when Steer Switch is activated RIGHT .	Between A-T10 and B-T10 on Fanning Strip.
DIO2	Diode	Supplies power to Motor Relay when Steer Switch is activated LEFT .	Between A-T9 and B-T10 on Fanning Strip.
DIO3	Diode	Supplies power to Drive Solenoid and DIO4 when Drive Switch is in REVERSE .	Between B-T11 and A-T12 on Fanning Strip.
DIO4	Diode	Supplies power to Motor Relay when Drive Switch is activated.	Between A-T12 and B-T12 on Fanning Strip.
DIO5	Diode	Supplies power to Motor Relay for LIFT operation.	Between A-T8 and B-T10 on Fanning Strip.
DIO6	Diode	Prevents feedback to Low Dump Valve during High Speed Drive operation.	Between A-T6 and B-T7 on Fanning Strip.
DIO7	Diode	Prevents feedback to Drive Switch (FORWARD) during high speed lift*.	Connected to T3 of the Speed Range Switch.
DIO8	Diode	Prevents feedback to Drive Switch (REVERSE) during high speed lift*.	Connected to T1 of the Speed Range Switch.
FU	Fuse, 15 AMP	Overload protection for the control circuit.	Center of Control Module, top right of Chassis Control Panel.
LSW	Switch, Down	Provides power to High Dump Coil when Platform is down.	Mounted to right rear of Control Module behind battery.
MOT	Motor, Electric	Provides power to Drive Hydraulic Pump.	Left side of Control Module.
SOL1	Solenoid, Right Steer (coil)	Shifts Steer Valve to RIGHT turn position.	Left end of rear Spool Valve mounted on top of Manifold Block.
SOL2	Solenoid, Left Steer (coil)	Shifts Steer Valve to LEFT turn position.	Right end of rear Spool Valve mounted on top of Manifold Block.
SOL3	Solenoid, Reverse (coil)	Actuates Reverse Valve to direct oil in drive circuit for reverse operation.	Top front of Manifold Block.
SOL4	Solenoid, Drive (coil)	Actuates Drive/Lift Valve to direct oil to drive circuit for forward or reverse operation.	Left end of forward Spool Valve mounted on top of Manifold Block.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SOL5	Solenoid, Down (coil)	Opens Down Valve.	Mounted to Lift Cylinder near lower pivot.
SOL6	Solenoid, Lift (coil)	Actuates Drive/Lift Valve to direct oil to lift circuit for raising the Platform.	Right end of forward Spool Valve mounted on top of Manifold Block.
SOL7	Solenoid, High Dump (coil)	Actuates High Dump Valve to allow oil to flow to Drive/Lift Valve for High Speed Drive operation.	Behind Drive/Lift Valve on top of Manifold Block.
SOL8	Solenoid, Low Dump* (coil)	Actuates Low Dump Valve to allow oil to flow to Drive/Lift Valve for High Speed Lift operation.	In front of Steering Valve on top of Manifold Block.
SW1	Switch, Emergency Stop	Control Circuit shut off.	Platform Controller
SW2	Switch, Emergency Stop	Control Circuit shut off.	Chassis Control Panel (center of Control Module).
SW3	Switch, Controller Key Mode	Supplies power to Drive and Steering Switches or Lift Switch.	Platform Controller, right side.
SW4	Switch, Foot	Supplies power to Controller Key Switch.	Platform deck.
SW5	Switch, Lift	Supplies power to Lift coil or Down coil and Alarm.	Platform Controller, upper center.
SW6	Switch, Drive	Supplies power to Drive or Drive and Reverse coils.	Platform Controller, lower right.
SW7	Switch, Steering	Supplies power to Right or Left coils.	Platform Controller, lower left.
SW8	Switch, Drive/Lift Speed Range	Provides power from Lift or Drive Switch to Low and/or High Dump coils.	Platform Controller, upper left .
SW9	Switch, Chassis Key	Provides power to either Controller or Chassis Controls.	Chassis Control Panel, lower right.
SW10	Switch, Chassis Lift	Provides power to Down Alarm and coil or Lift coil.	Chassis Control Panel, center.

* At the time of publication the High Speed Lift circuit was disconnected but the Low Dump Valve was installed, giving the machine Low Speed Lift only, later models may not have the Low Dump Valve.

Note: Terminal Strip 'A' (A-T) is the strip on the left side closest to the Hydraulic Manifold Block.

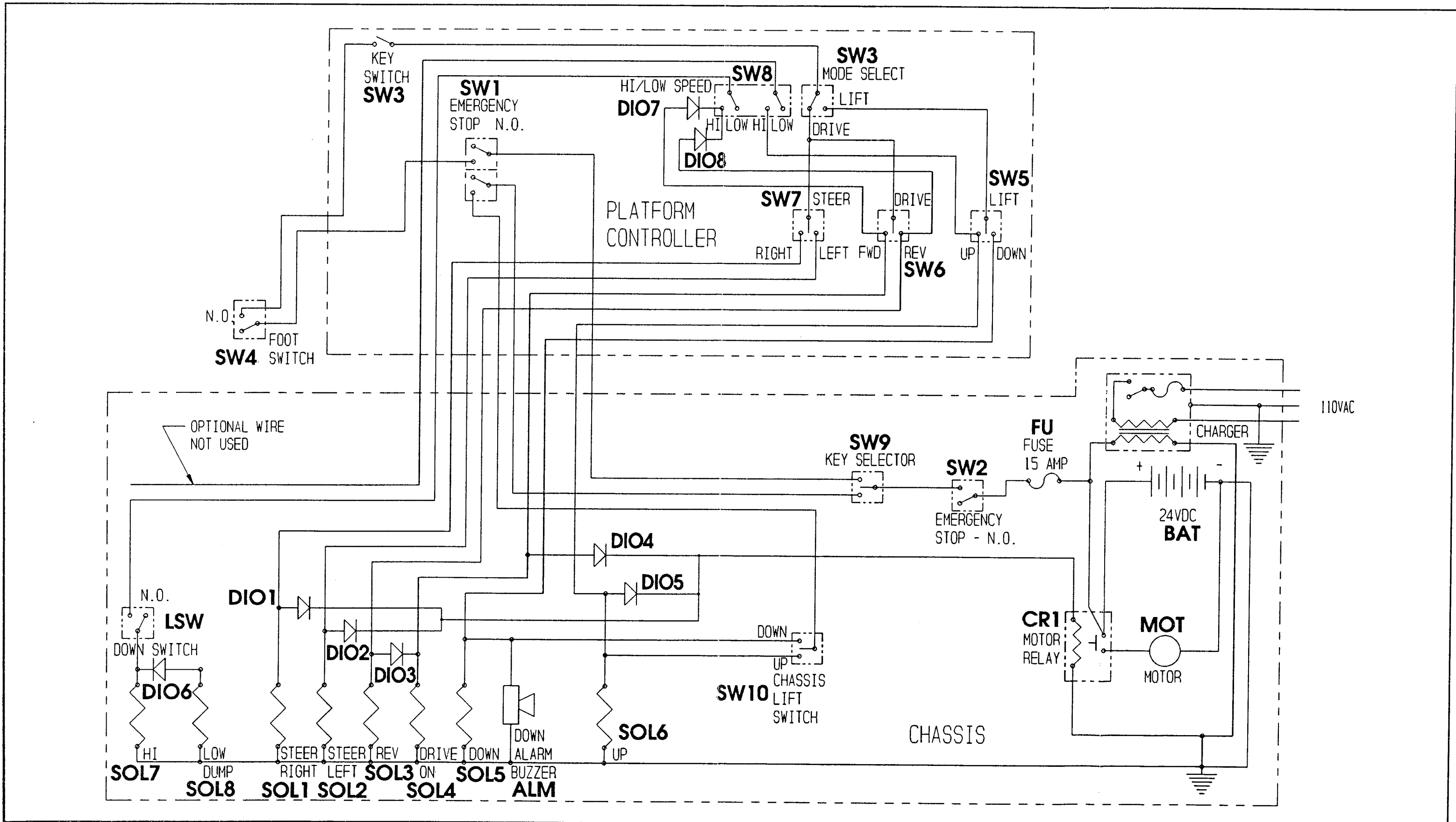


Figure 6-1: Electrical Schematic, Two Speed Controller

Table 6-2: Electrical Schematic Legend, Proportional Controller

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Control Module under Terminal Strip.
BAT	Batteries (8) 6 volts	To store energy.	Two per Module.
CONT	Controller, Proportional & Switch, Steering	Supplies power to Up/Fwd Relay or Dn/Rev Relay and Proportional Coil. Supplies power to R & L Steering coils.	Platform Controller (Control Box).
CR1	Relay, Motor	Connects Batteries to Motor.	Control Module, under Control Panel.
CR2	Relay, Up/Forward	Provides power to Up/Fwd. contacts in Drive/Lift Switch.	Controller.
CR3	Relay, Down/Reverse	Provides power to Down/Rev. contacts in Drive/Lift Switch.	Controller.
DIO1	Diode	Supplies power to Motor Relay when Steer Switch is activated LEFT.	Between A-T9 and B-T10 on Fanning Strip.
DIO2	Diode	Supplies power to Motor Relay when Steer Switch is activated RIGHT.	Between A-T10 and B-T10 on Fanning Strip.
DIO3	Diode	Supplies power to Drive Solenoid and DIO4 when Control Lever is in REVERSE.	Between B-T11 and A-T12 on Fanning Strip.
DIO4	Diode	Supplies power to Motor Relay when Drive/Lift Switch is in DRIVE and Control Lever is actuated.	Between A-T11 and B-T10 on Fanning Strip.
DIO5	Diode	Supplies power to Motor Relay for LIFT operation.	Between A-T8 and B-T10 on Fanning Strip.
DIO6	Diode	Prevents feedback to Motor Start Relay during High Speed Drive operation.	Between A-T6 and B-T7 on Fanning Strip.
FU1	Fuse, 15 AMP	Overload protection for the control circuit.	Center of Control Module, top right of Chassis Control Panel.
FU2	Fuse, 150 AMP	Overload protection for the Batteries.	Mounted above the batteries in the Control Module.
LSW	Switch, Down	Prevents High Speed Drive when Platform is elevated.	Mounted to right rear of Control Module behind battery.
MOT	Motor, Electric	Provides power to Drive Hydraulic Pump.	Left side of Control Module.
MTR	Meter, Volt/Hour	Shows state of charge of Batteries and hours machine has power on.	Chassis Control Panel.
R1	Resistor, 15 ohm	Lowers the current from the Chassis Lift Switch to the Proportional Coil.	Between A-T2 and B-T2

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SOL1	Solenoid, Left Steer (coil)	Shifts Steer Valve to LEFT turn position.	Right end of rear Spool Valve mounted on top of Manifold Block.
SOL2	Solenoid, Right Steer (coil)	Shifts Steer Valve to RIGHT turn position.	Left end of rear Spool Valve mounted on top of Manifold Block.
SOL3	Solenoid, Reverse (coil)	Actuates Reverse Valve to direct oil in drive circuit for reverse operation.	Top front of Manifold Block.
SOL4	Solenoid, Drive (coil)	Actuates Drive/Lift Valve to direct oil to drive circuit for forward or reverse operation.	Left end of forward Spool Valve mounted on top of Manifold Block.
SOL5	Solenoid, Down (coil)	Opens Down Valve.	Mounted to Lift Cylinder near lower pivot.
SOL6	Solenoid, Lift (coil)	Actuates Drive/Lift Valve to direct oil to lift circuit for raising the Platform.	Right end of forward Spool Valve mounted on top of Manifold Block.
SOL7	Solenoid, Proportional (coil)	Controls Proportional Valve. flow to Drive/Lift Valve for High Speed Drive operation.	Left side of Manifold Block mounted to Proportional Valve Block.
SOL8	Solenoid, Low Dump (coil)	Actuates Low Dump Valve to allow oil from Low Pump Section to bypass Drive/Lift Valve for High Speed Lift operation.	In front of Steering Valve on top of Manifold Block.
SW1	Switch, Emergency Stop	Control Circuit shut off.	Platform Controller.
SW2	Switch, Emergency Stop	Control Circuit shut off.	Chassis Control Panel (center of Control Module).
SW3	Switch, Controller Key	Supplies power to Controller.	Platform Controller, right side.
SW4	Switch, Foot	Supplies power to Controller Key Switch.	Platform deck.
SW5	Switch, Drive/Lift	Supplies power to Lift and Down coil and Down Alarm or Forward and Reverse coils.	Platform Controller, upper center.
SW6	Switch, Chassis Key	Provides power to either Controller or Chassis Controls.	Chassis Control Panel, lower right.
SW7	Switch, Chassis Lift	Provides power to Down Alarm and coil or Lift coil.	Chassis Control Panel, center.

Note: Terminal Strip 'A' (A-T) is the strip on the left side closest to the Hydraulic Manifold.

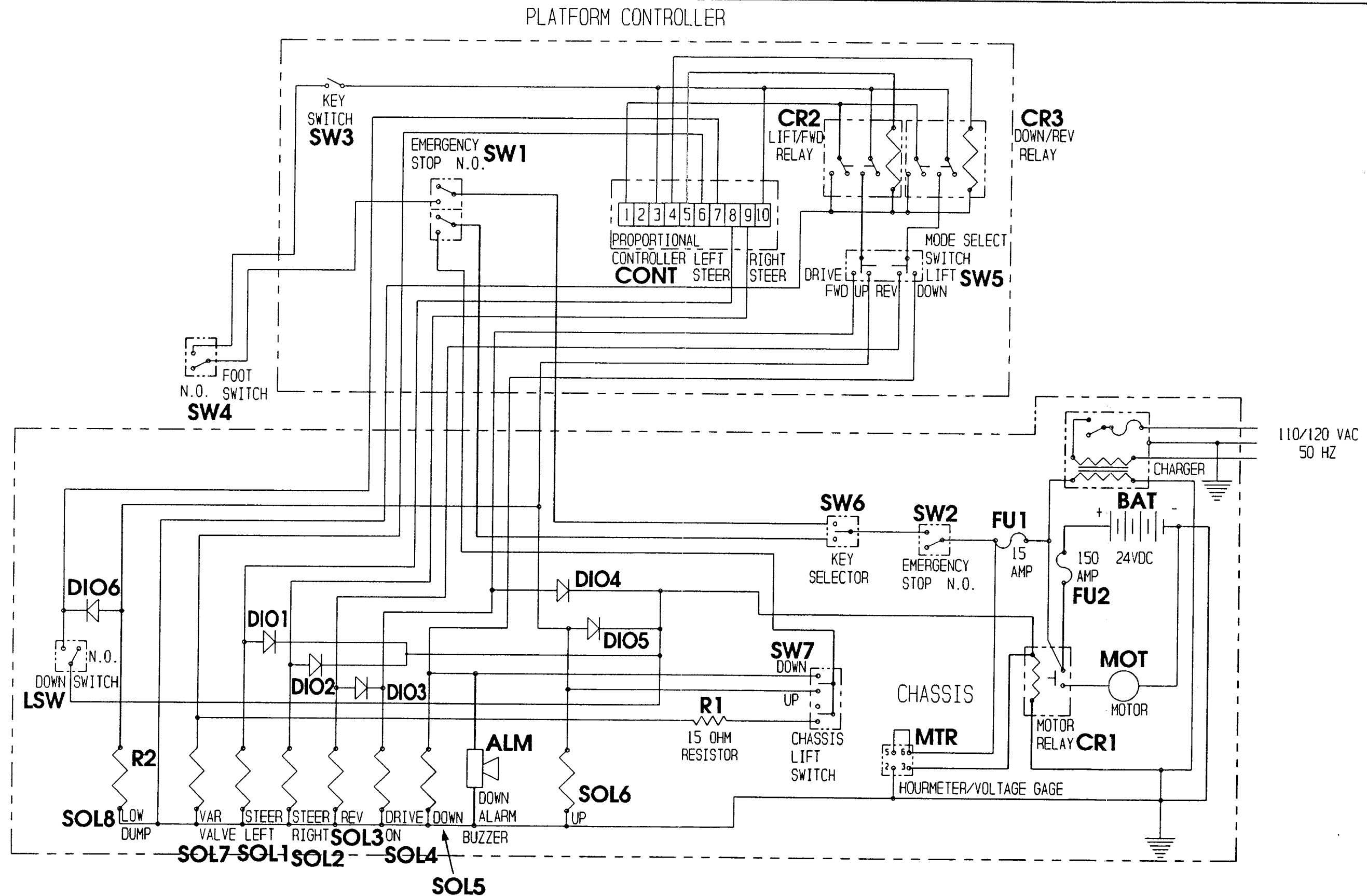


Figure 6-2: Electrical Schematic, Proportional Controller

6.2 Hydraulic Schematics

Table 6-3: Hydraulic Schematic Legend, Two Speed Controller

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Check Valve	Prevents back pressure from Main Relief Valve.	Bottom of Manifold Block nearest the centerline.
CV2	Check Valve	Prevents back pressure from entering steering circuit.	Bottom left of Manifold Block towards rear.
CV3	Check Valve	Isolates Low and High sections of Pump.	Bottom left of Manifold Block closest to filter.
CV4	Check Valve	Prevents back pressure from Main Relief Valve.	Under Main Relief Valve.
CYL1	Cylinder, Steering	Provides force to steer front wheels.	Center front of Chassis.
CYL2, CYL3	Cylinder, Brake	Stops Machine from moving while parked.	Chassis in front of rear axles.
CYL4	Cylinder, Lift	Provides force to lift Platform.	Between Chassis Pedestal weld't and Lower Arm weld't.
FL1	Filter	Filters oil returning to Tank.	Bottom front of Manifold Block.
FL2	Suction Screen	Traps particles in Hydraulic Tank.	Inside Hydraulic Tank at outlet.
MOT1	Drive Motor	Provides tractive effort for work platform.	At right front wheel.
MOT2	Drive Motor	Provides tractive effort for work platform.	At left front wheel.
ORF1	Orifice, Down	Controls the platform rate of descent.	At inlet fitting of Lift Cylinder.
ORF2	Orifice, Down Cushion	Controls platform rate of descent in the last 4 in.	Between Lift Cylinder and Lift Cylinder Valve Block.
ORF3	Orifice, Brake	Controls Brake engagement.	Under fitting at left front of Manifold Block.
PMP	Pump, Hydraulic	Supplies hydraulic oil flow for all functions	On Electric Motor at left side of Control Module.
RV1	Valve, Main Relief	Provides over pressure protection to Pump.	Near right rear of Manifold Block.
RV2	Valve, Steering Relief	Provides over pressure protection to Steering Cylinder.	Left side of Manifold Block towards rear.
V1	Valve, Steering	Provides directional control for Steering Cylinder.	Top rear of Manifold Block.
V2	Valve, Drive/Lift	Provides oil flow for Drive or Lift functions.	Top of Manifold Block, near front.
V3	Valve, Reverse	Provides directional control of oil for reverse drive.	Top front of Manifold Block.
V4	Valve, Down	Allows oil to flow out of Lift Cylinder to Tank.	Lift Cylinder Valve Block, at lower pivot.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
V5	Valve, High Dump	Allows oil flow from High Pump section to Drive Motors when Platform is down for High Speed Drive or to Lift Valve for High Speed Lift*.	Top of Manifold Block behind Drive/Lift Valve.
V6	*Valve, Low Dump	Allows oil to flow from Low Pump section to tank when High Pump section is providing oil for High Speed Lift.	Top of Manifold Block in front of Steering Valve.
V7	Valve, Counterbalance Forward	Prevents machine from running away on slopes and cushions stops.	Upper valve on Left side of Manifold Block, near the front.
V8	Valve, Counterbalance Reverse	Prevents machine from running away on slopes and cushions stops.	Lower valve on Left side of Manifold Block, near the front.
V9	Valve, Emergency Lowering	Allows oil to flow out of the Lift Cylinder to lower the Platform in the event of an emergency.	Lift Cylinder Valve Block at lower pivot.

* At the time of publication the High Speed Lift circuit was disconnected but the Low Dump Valve was installed, giving the machine Low Speed Lift only, later models may not have the Low Dump Valve.

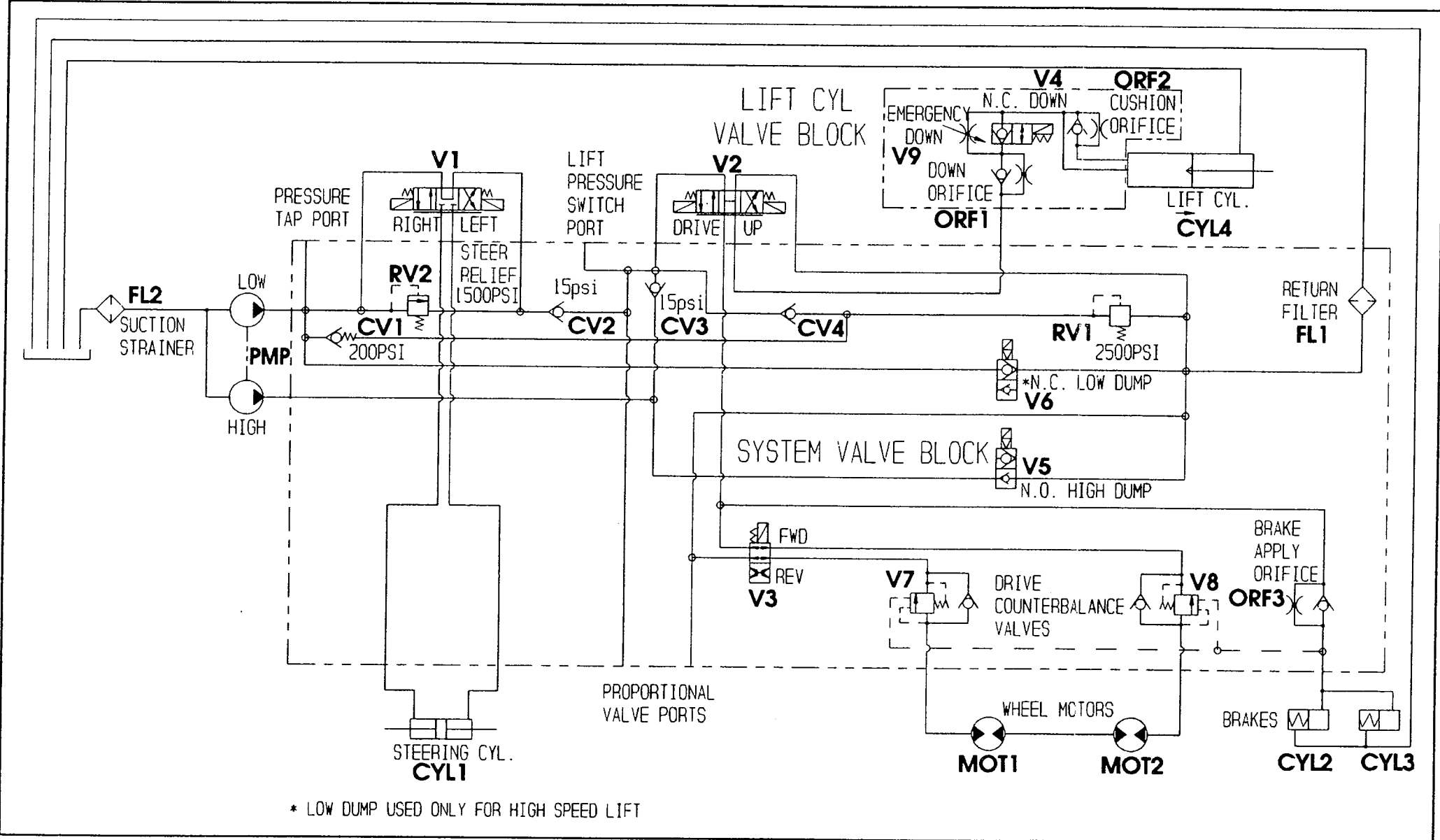


Figure 6-3: Hydraulic Schematic, Two Speed Controller

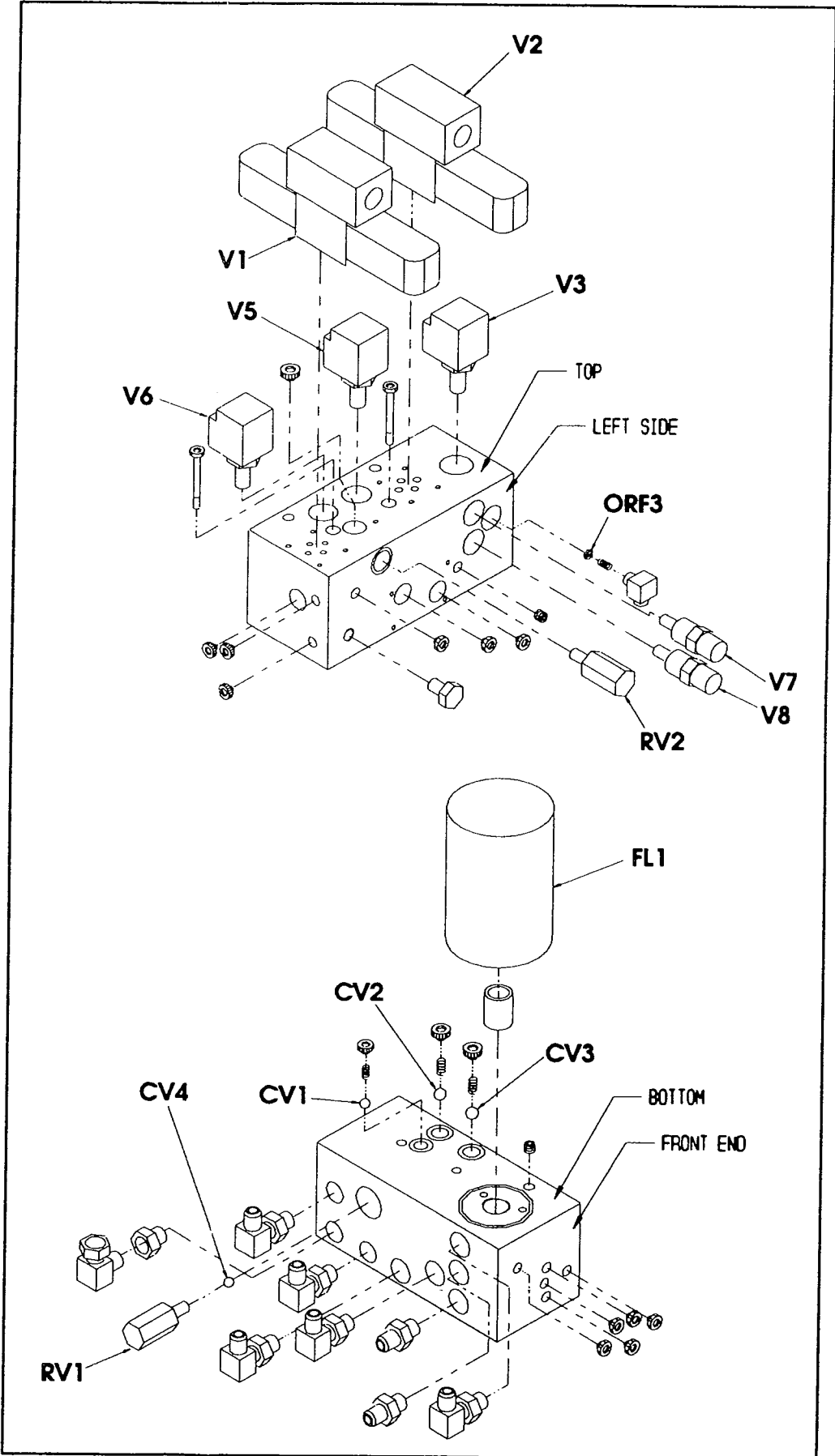


Figure 6-4: Hydraulic Manifold, Two Speed Controller

Table 6-4: Hydraulic Schematic Legend, Proportional Controller

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Check Valve	Prevents back pressure from Main Relief Valve.	Bottom of Manifold Block nearest the centerline.
CV2	Check Valve	Prevents back pressure from entering steering circuit.	Bottom left of Manifold Block towards rear.
CV3	Check Valve	Isolates Low and High sections of Pump.	Bottom left of Manifold Block closest to filter.
CV4	Check Valve	Prevents back pressure from Main Relief Valve.	Under Main Relief Valve.
CYL1	Cylinder, Steering	Provides force to steer front wheels.	Center front of Chassis.
CYL2, CYL3	Cylinder, Brake	Stops Machine from moving while parked.	Chassis in front of rear axles.
CYL4	Cylinder, Lift	Provides force to lift Platform.	Between Chassis Pedestal weld't and Lower Arm weld't.
FL1	Filter	Filters oil returning to Tank.	Bottom front of Manifold Block.
FL2	Suction Screen	Traps particles in Hydraulic Tank.	Inside Hydraulic Tank at outlet.
MOT1	Drive Motor	Provides tractive effort for work platform.	At right front wheel.
MOT2	Drive Motor	Provides tractive effort for work platform.	At left front wheel.
ORF1	Orifice, Down	Controls the platform rate of descent.	At inlet fitting of Lift Cylinder.
ORF2	Orifice, Down Cushion	Controls platform rate of descent in the last 4 in.	Between Lift Cylinder and Lift Cylinder Valve Block.
ORF3	Orifice, Brake	Controls Brake engagement.	Under fitting at left front of Manifold Block.
PMP	Pump, Hydraulic	Supplies hydraulic oil flow for all functions	On Electric Motor at left side of Control Module.
RV1	Valve, Main Relief	Provides over pressure protection to Pump.	Near right rear of Manifold Block.
RV2	Valve, Steering Relief	Provides over pressure protection to Steering Cylinder.	Left side of Manifold Block towards rear.
V1	Valve, Steering	Provides directional control for Steering Cylinder.	Top rear of Manifold Block.
V2	Valve, Drive/Lift	Provides oil flow for Drive or Lift functions.	Top of Manifold Block, near front.
V3	Valve, Reverse	Provides directional control of oil for reverse drive.	Top front of Manifold Block.
V4	Valve, Down	Allows oil to flow out of Lift Cylinder to Tank.	Lift Cylinder Valve Block, at lower pivot.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
V5	Valve, Proportional	Allows oil to flow proportionally into Drive or Lift circuits. Platform is down.	Left side of Manifold Block mounted on Proportional Valve Block.
V6	Valve, Low Dump	Allows oil to flow from Low Pump section to tank when High Pump section is providing oil for High Speed Lift.	Top of Manifold Block in front of Steering Valve.
V7	Valve, Counterbalance Forward	Prevents machine from running away on slopes and cushions stops.	Upper valve on Left side of Manifold Block, near the front.
V8	Valve, Counterbalance Reverse	Prevents machine from running away on slopes and cushions stops.	Lower valve on Left side of Manifold Block, near the front.
V9	Valve, Emergency Lowering	Allows oil to flow out of the Lift Cylinder to lower the Platform in the event of an emergency.	Lift Cylinder Valve Block at lower pivot.

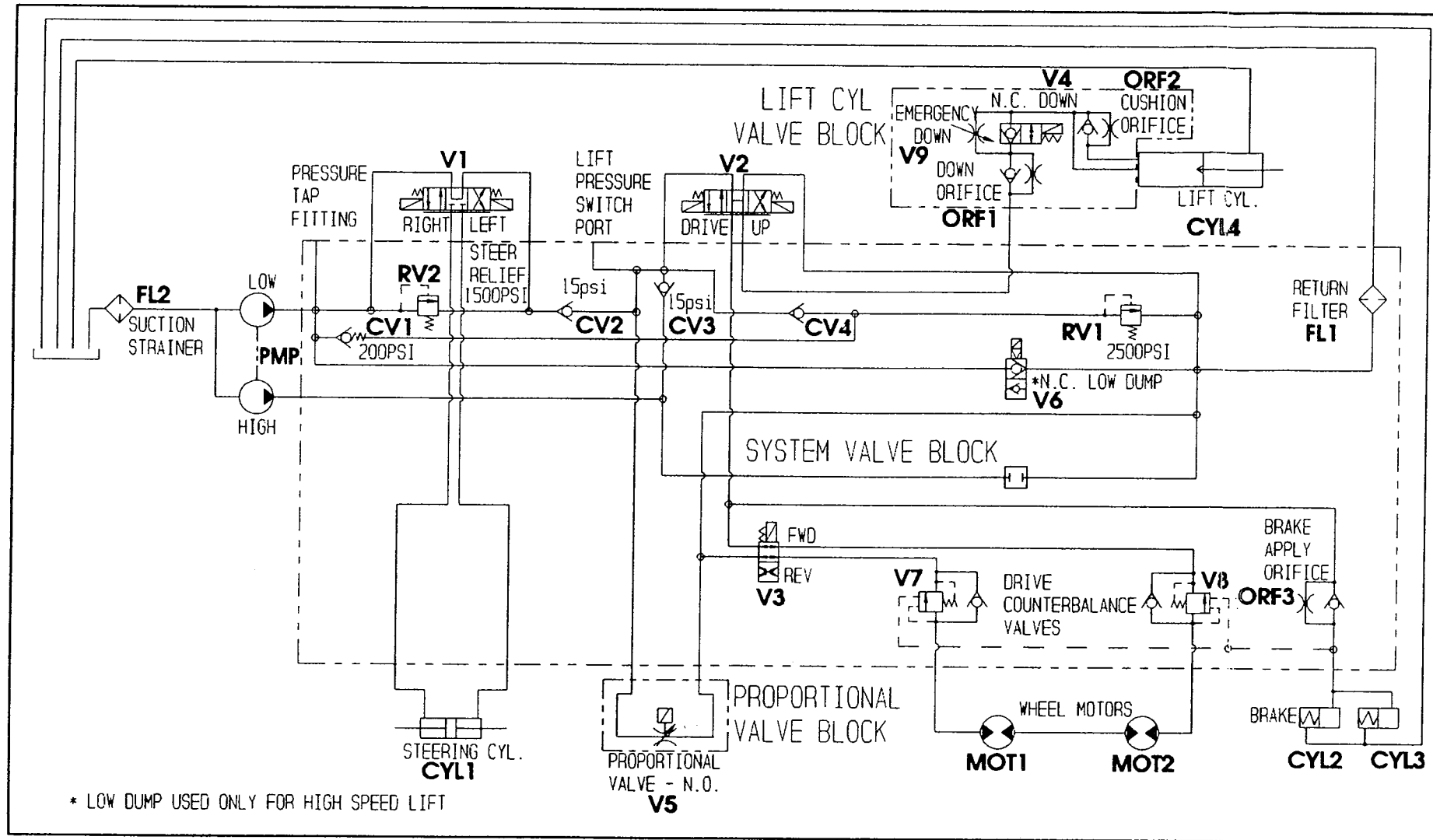


Figure 6-5: Hydraulic Schematic, Proportional Controller

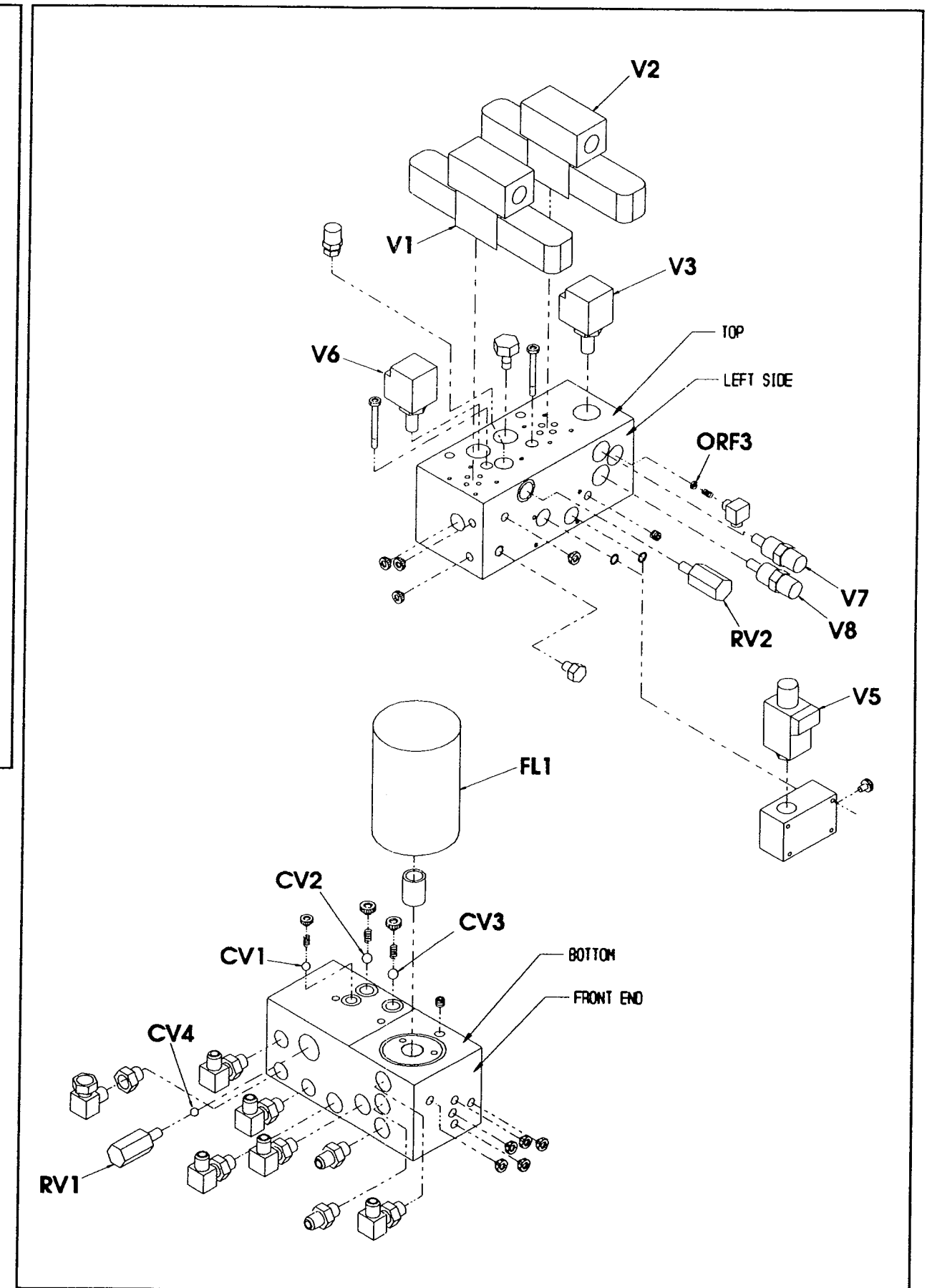


Figure 6-6: Hydraulic Manifold, Proportional Controller

7.0 Introduction

This section lists and illustrates the replaceable assemblies and parts of the SL-14 Work Platform, as manufactured by UpRight, Inc.

Each parts list contains the component parts for that assembly indented to show relationship where applicable.

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7.2 Illustrated Parts

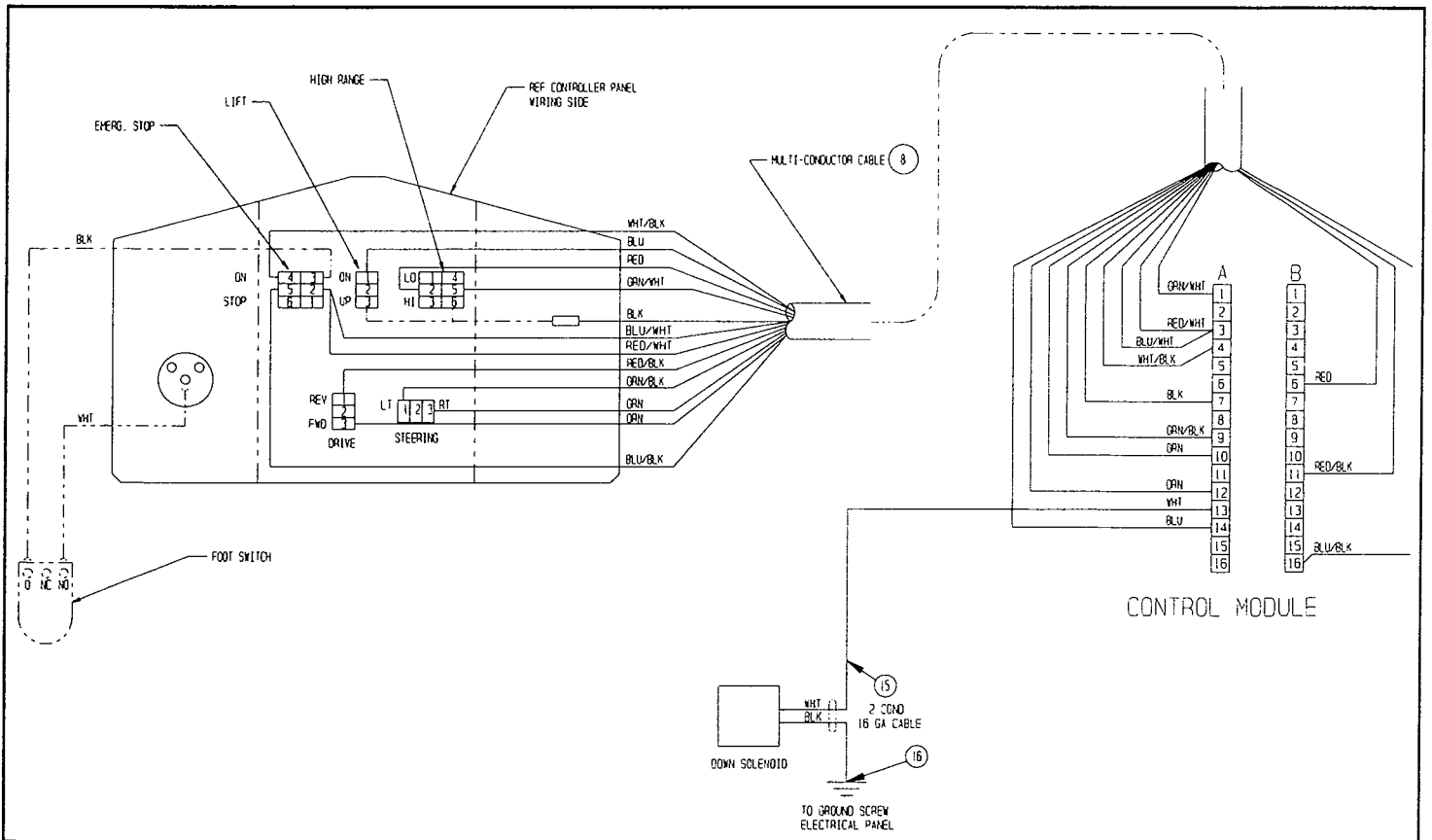
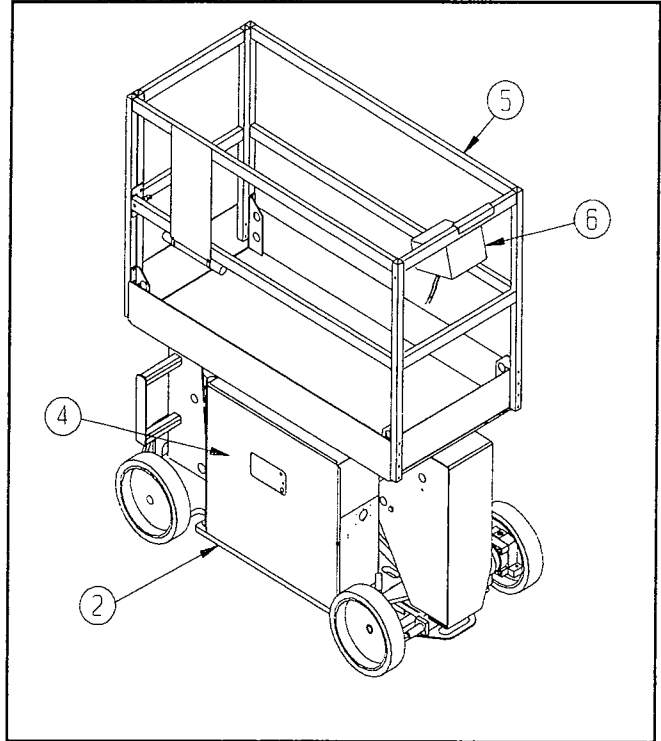
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Illustrated Parts Breakdown

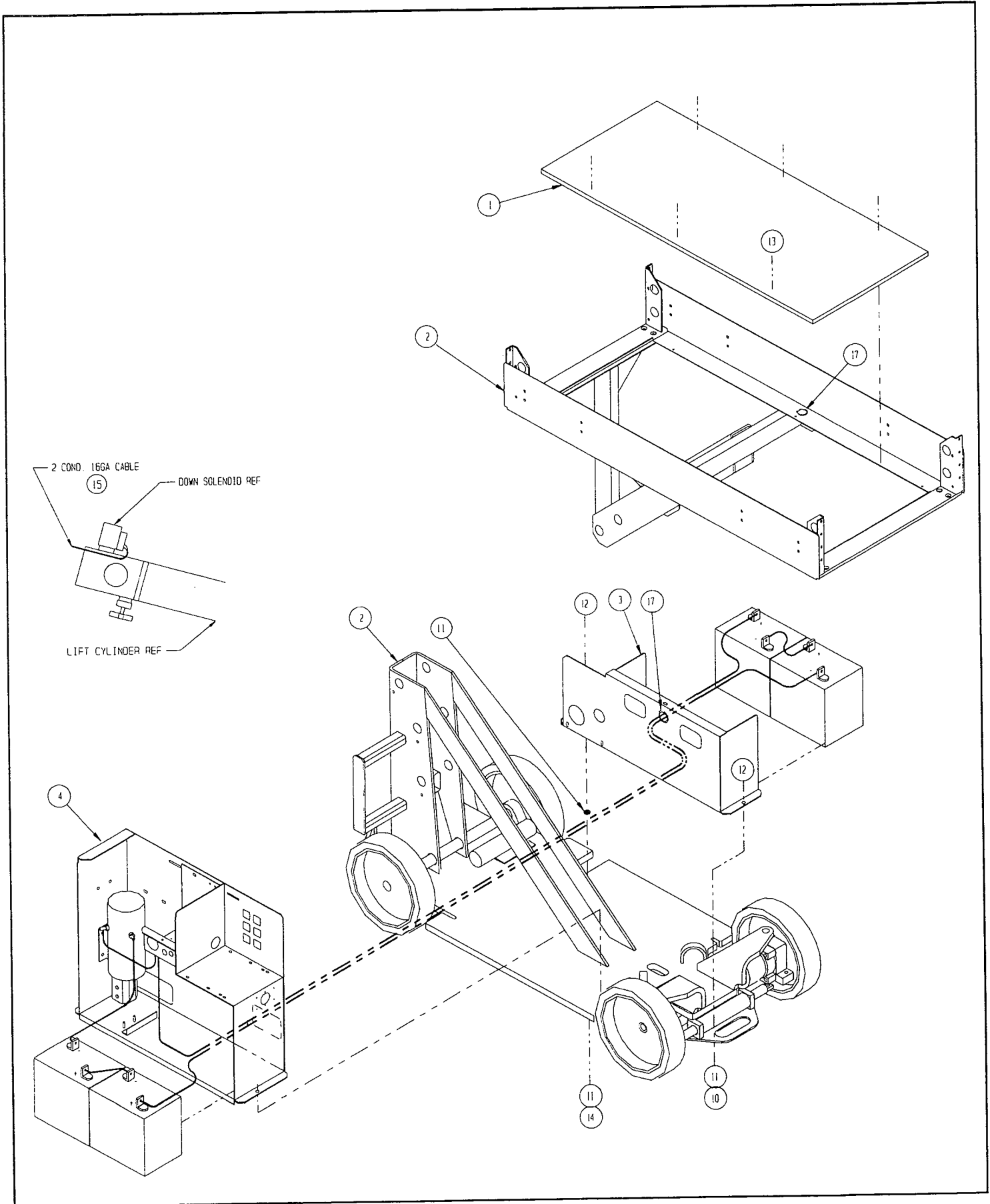
FINAL ASSEMBLY, DOMESTIC

65000-000-00

ITEM	PART	DESCRIPTION	QTY.
1	24611-025-00	PLYWOOD 1/2	1
2	65001-000-00	BASIC ASSEMBLY	1
3	65003-000-00	POWER MODULE ASSEMBLY	1
4	65004-000-00	CONTROL MODULE ASSEMBLY, DOMESTIC	1
5	65008-000-00	GUARDRAIL INSTALLATION, DOMESTIC	1
6	65009-000-00	CONTROLLER ASSEMBLY, DOMESTIC	1
7	65010-000-00	DECAL KIT/INSTALLATION, DOMESTIC	1
8	65011-000-00	CONTROL CABLE ASSEMBLY, STD.	1
9	65012-000-00	HOSE KIT/INSTALLATION	1
10	11256-016-00	SCREW HHC GR5 1/2-13UNC X 2	3
11	11240-008-00	WASHER FLAT STD 1/2	5
12	11248-008-00	NUT HEX ESNA 1/2-13 UNC	4
13	26554-006-00	RIVET POP 1/4 DIA .751-.875 GRIP	6
14	11256-018-00	SCREW HHC GR5 1/2-13UNC X 2-1/4	1
15	29496-099-00	WIRE 2 COND 16GA	5'
16	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	1
17	61796-099-00	GROMMET MATERIAL	1'



Illustrated Parts Breakdown

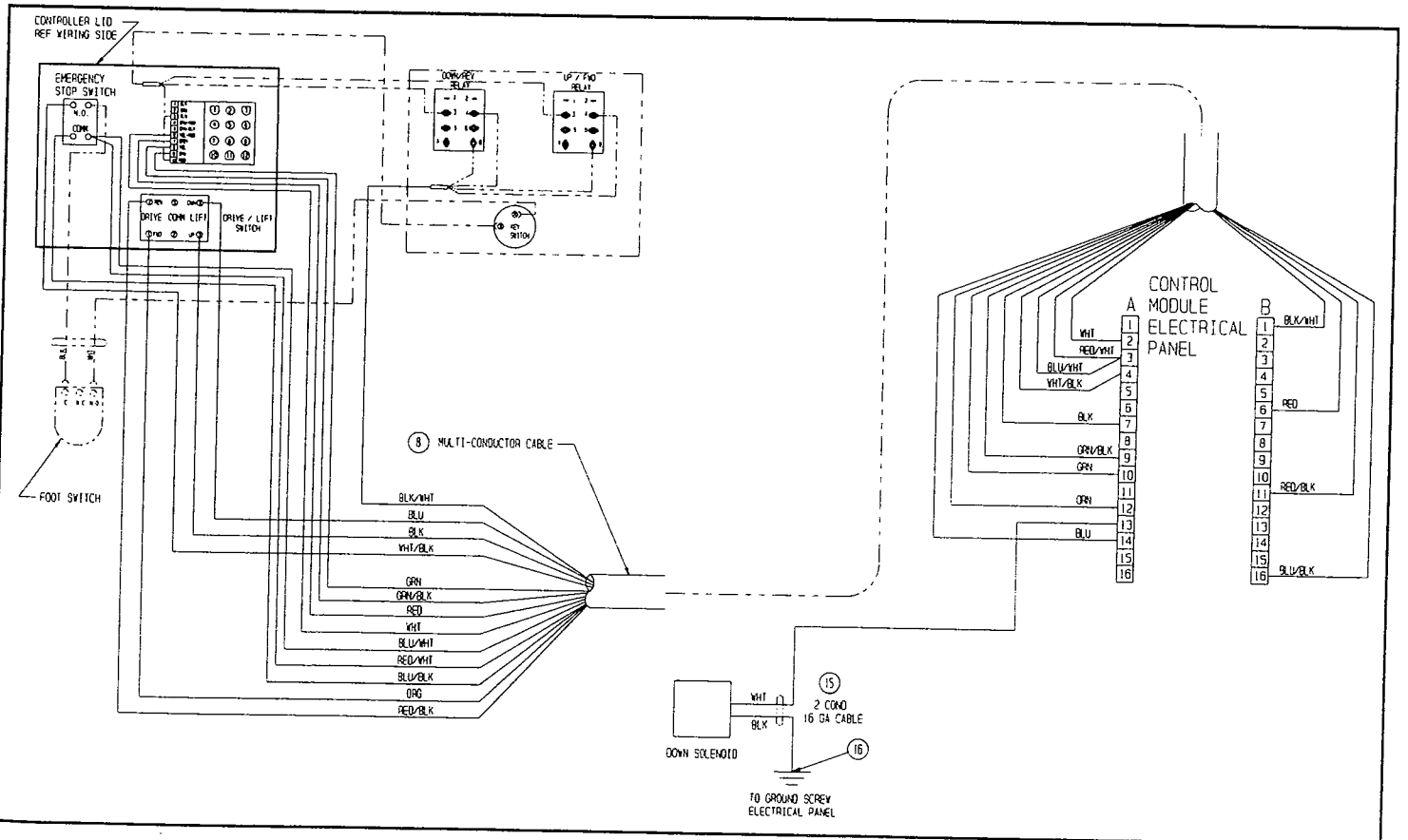
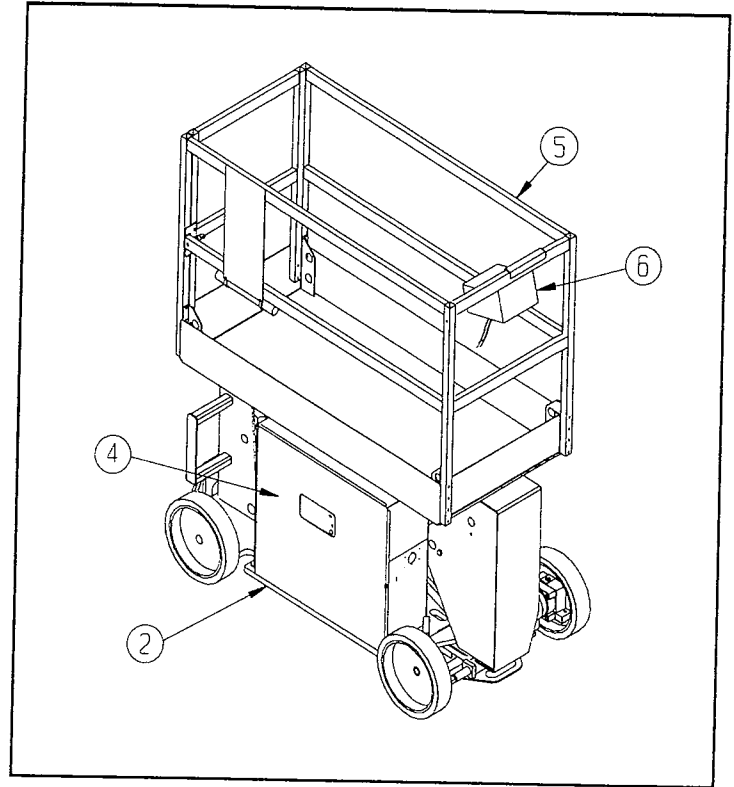


Illustrated Parts Breakdown

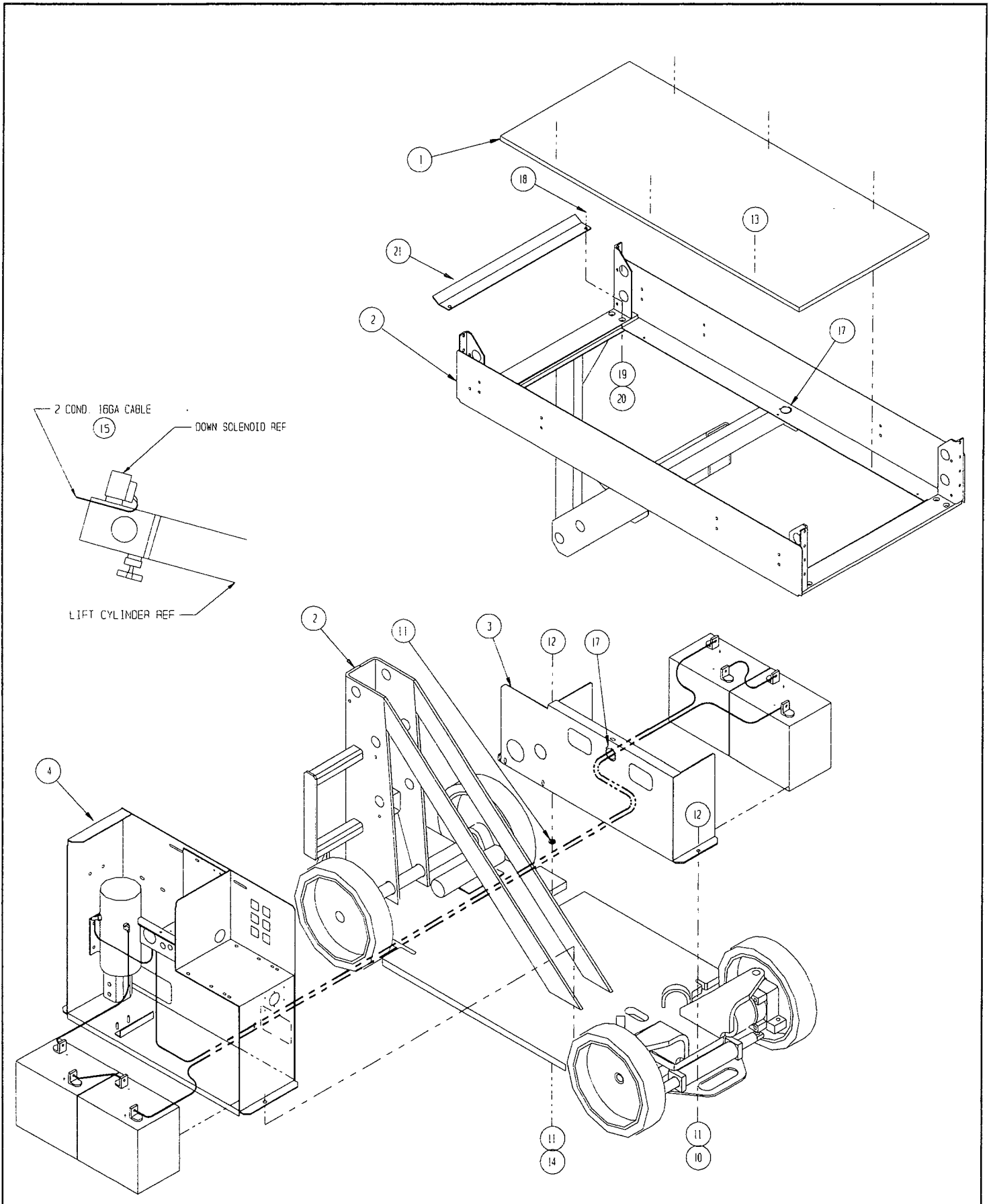
FINAL ASSEMBLY, EUROPE

65000-001-00

ITEM	PART	DESCRIPTION	QTY.
1	24611-025-00	PLYWOOD 1/2	1
2	65001-000-00	BASIC ASSEMBLY	1
3	65003-000-00	POWER MODULE ASSEMBLY	1
4	65004-001-00	CONTROL MODULE ASSEMBLY, EUROPE	1
5	65007-000-00	GUARDRAIL INSTALLATION, EUROPE	1
6	65009-001-00	CONTROLLER ASSEMBLY, EUROPE	1
7	65010-001-00	DECAL KIT/INSTALLATION, EUROPE	1
8	65011-001-00	CONTROL CABLE ASSEMBLY, EUROPE	1
9	65012-000-00	HOSE KIT/INSTALLATION	1
10	11256-016-00	SCREW HHC GR5 1/2-13UNC X 2	3
11	11240-008-00	WASHER FLAT STD 1/2	5
12	11248-008-00	NUT HEX ESNA 1/2-13 UNC	4
13	26554-006-00	RIVET POP 1/4 DIA .751-.875 GRIP	6
14	11256-018-00	SCREW HHC GR5 1/2-13UNC X 2-1/4	1
15	29496-099-00	WIRE 2COND 16GA	5'
16	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	1
17	61796-099-00	GROMMET MATERIAL	1'
18	11741-012-00	SCREW FLT HD SOC 3/8-16 X 1-1/2	2
19	11240-006-00	WASHER FLAT STD 3/8	2
20	11248-006-00	NUT HEX ESNA 3/8-16 UNC	2
21	65241-000-00	GATE SILL	1



Illustrated Parts Breakdown



Illustrated Parts Breakdown

BASIC ASSEMBLY

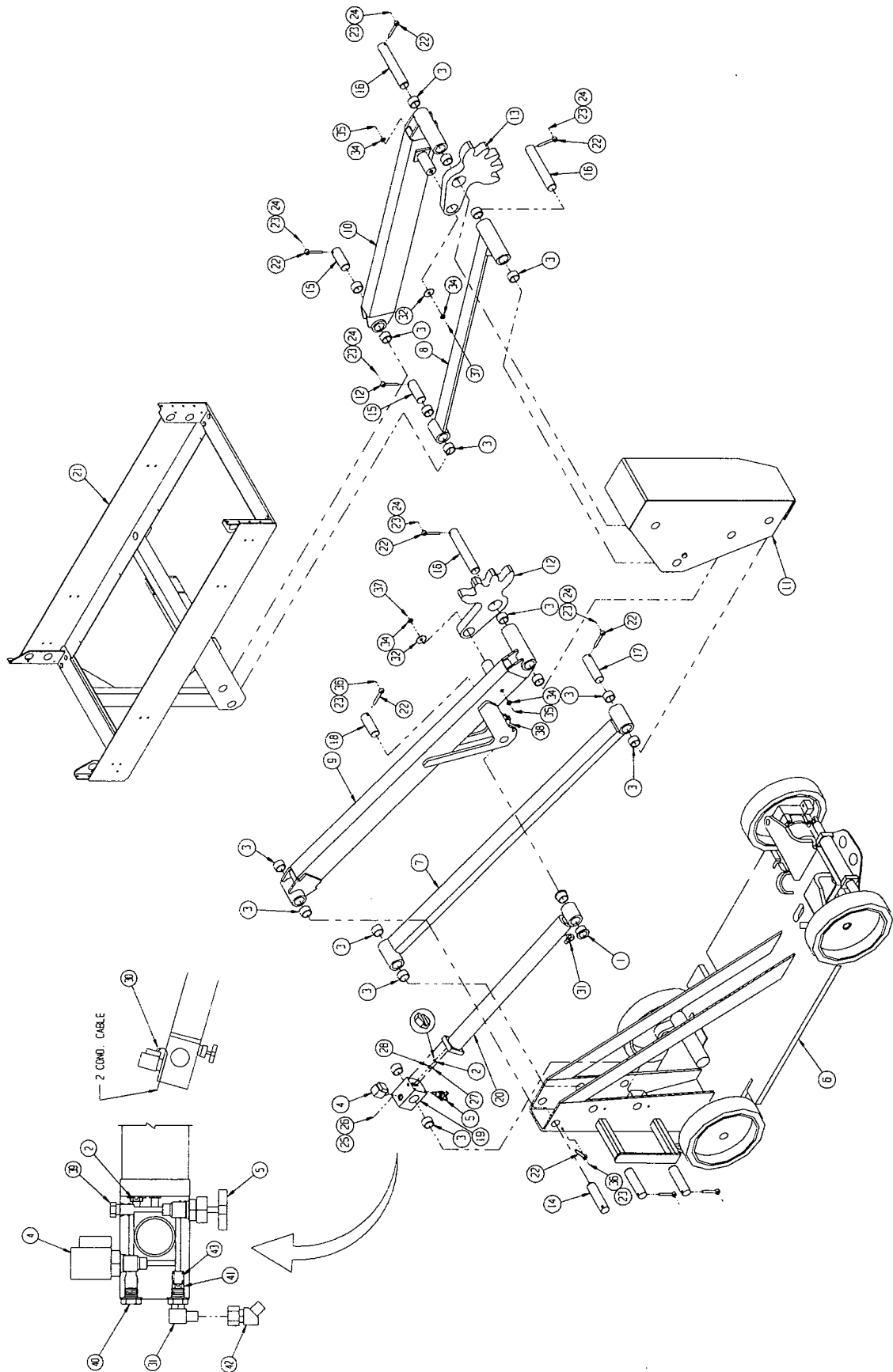
65001-000-00

ITEM	PART	DESCRIPTION	QTY.
1	64298-002-00	BUSHING	2
2	15919-002-00	ORIFICE, #815	1
3	63095-001-00	BEARING	18
4	63973-001-00	VALVE, SOLENOID	1
5	63981-002-00	VALVE, NEEDLE	1
6	65002-000-00	CHASSIS ASSY	1
7	65058-000-00	TENSION BEAM WELDMENT	1
8	65061-000-00	TENSION BAR WELDMENT	1
9	65065-000-00	LOWER BEAM WELDMENT	1
10	65071-000-00	UPPER BEAM WELDMENT	1
11	65073-000-00	GEAR HOUSING WELDMENT	1
12	65080-000-00	GEAR-BOTTOM	1
13	65081-000-00	GEAR-TOP	1
14	65082-000-00	PIN, MAST	3
15	65083-000-00	PIN, PLATFORM	2
16	65084-000-00	PIN, GEAR	3
17	65085-000-00	PIN, LOWER GEAR	1
18	65086-000-00	PIN, CYLINDER	1
19	65087-000-00	VALVE BLOCK, CYLINDER	1
20	65088-000-00	CYLINDER, LIFT	1
*	65088-010-00	SEAL KIT, LIFT CYLINDER	1

ITEM	PART	DESCRIPTION	QTY.
21	65100-000-00	PLATFORM WELDMENT	1
22	65214-000-00	ROD END 3/8 X 3	10
23	11248-006-00	NUT HEX ESNA 3/8-16 UNC	10
24	11254-012-00	SCREW HHC GR5 3/8-16UNC X 1-1/2	6
25	11240-005-00	WASHER FLAT STD 5/16	4
26	11253-040-00	SCREW HHC GR5 5/16-18UNC X 5	4
27	11979-004-00	O-RING	1
28	11979-008-00	O-RING	1
30	14914-001-00	CONN M PUSH	2
31	11934-004-00	FITTING	2
32	65184-000-00	THRUST WASHER	2
34	11239-012-00	WASHER FLAT ASTM A325 3/4 DIA	4
35	11248-012-00	NUT HEX ESNA 3/4-10 UNC	2
36	11254-014-00	SCREW HHC GR5 3/8-16UNC X 1-3/4	4
37	14099-056-00	SCREW HHC GR5 3/4-10UNC X 7	2
38	11240-006-00	WASHER FLAT STD 3/8	1
39	11920-002-00	PLUG, PIPE SOC HD 1/4-18 NPTF	1
40	20021-006-00	FITTING	1
41	15919-000-00	ORIFICE, #835	1
42	11932-003-00	FITTING	1
43	05133-000-00	SPRING	1

*Not Shown

Illustrated Parts Breakdown



Illustrated Parts Breakdown

CHASSIS ASSEMBLY

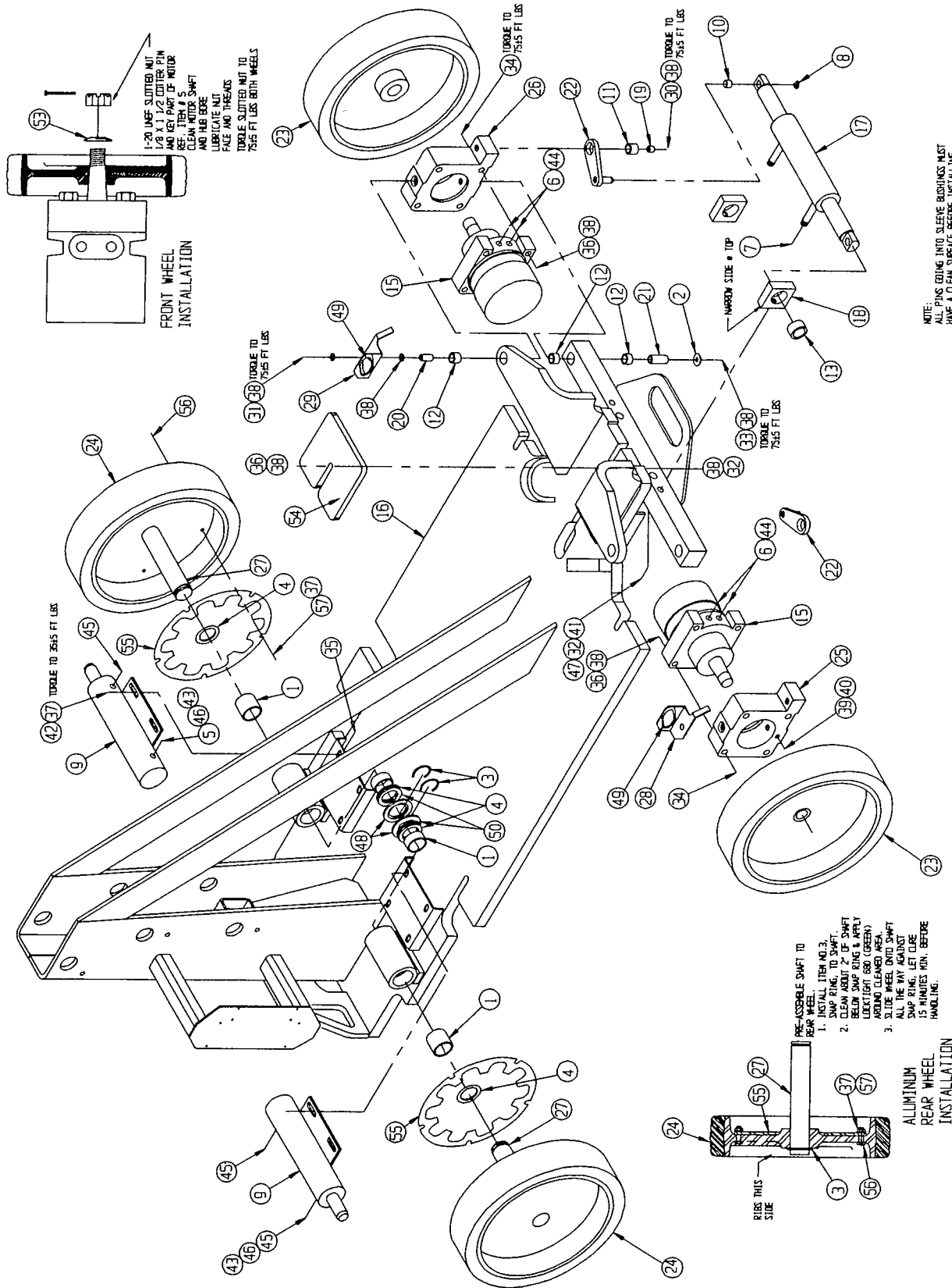
65002-000-00

ITEM	PART	DESCRIPTION	QTY.
1	63095-001-00	BEARING	4
2	10092-006-00	WASHER, THRUST	2
3	11764-023-00	RETAINING RING	4
4	11786-012-00	WASHER, THRUST, PLATED	4
5	11939-008-00	FITTING	1
6	11941-013-00	FITTING	4
7	12432-003-00	FITTING	2
8	13315-008-00	RETAINING RING	2
9	60479-000-00	BRAKE CYLINDER	2
*	60211-014-00	SEAL KIT, BRAKE CYLINDER	1
10	62642-002-00	BEARING	2
11	62642-018-00	BEARING	2
12	62642-019-00	BEARING	6
13	62642-024-00	BEARING	2
14*	65057-000-00	SPACER-THRUST, STEEL REAR WHEEL	2
15	63903-007-00	MOTOR, HYDRAULIC	2
*	61817-010-00	SEAL KIT, MOTOR	1
16	65020-000-00	CHASSIS WELDMENT SL-14	1
17	65036-000-00	CYLINDER, STEERING	1
*	65036-010-00	SEAL KIT, STEERING CYLINDER	1
18	65037-000-00	STEERING MOUNT	2
19	65038-000-00	STEERING PIN	2
20	65039-000-00	STEERING PIN-TOP	2
21	65040-000-00	STEERING PIN-LOWER	2
22	65041-000-00	STEERING LINK WELDMENT	2
23	65044-000-00	WHEEL/HUB -FRONT, STEEL	2
OR	65126-000-00	WHEEL/HUB -FRONT, ALUMINUM	2
24	65050-000-00	WHEEL/AXLE -REAR, STEEL	2
OR	65126-001-00	WHEEL/AXLE -REAR, ALUMINUM	2
25	65055-000-00	MOTOR MOUNT-RH	1

ITEM	PART	DESCRIPTION	QTY.
26	65056-000-00	MOTOR MOUNT-LH	1
27	65070-000-00	REAR AXLE, ALUMINUM WHEEL	2
28	65094-000-00	HOSE GUIDE R.H.	1
29	65095-000-00	HOSE GUIDE L.H.	1
30	11256-012-00	SCREW HHC GR5 1/2-13UNC X 1-1/2	2
31	11256-016-00	SCREW HHC GR5 1/2-13UNC X 2	2
32	11256-020-00	SCREW HHC GR5 1/2-13UNC X 2-1/2	4
33	11256-024-00	SCREW HHC GR5 1/2-13UNC X 3	2
34	11256-036-00	SCREW HHC GR5 1/2-13UNC X 4-1/2	8
35	11729-006-00	NUT, SPINLOCK	8
36	11248-008-00	NUT HEX ESNA 1/2-13 UNC	10
37	11240-006-00	WASHER FLAT STD 3/8	18
38	11240-008-00	WASHER FLAT STD 1/2	12
39	11705-016-00	SCREW ST HEXSOC 3/8-16UNC X 1	2
40	11273-006-00	NUT HEX JAM 3/8-16UNC	2
41	14996-008-00	WASHER 1/2 DIA SAE FLAT PLATED	2
42	11254-006-00	SCREW HHC GR5 3/8-16UNC X 3/4	8
43	11937-001-00	FITTING	2
44	11937-003-00	FITTING	4
45	11940-008-00	FITTING	3
46	20733-001-00	FITTING, TEE	2
47	11238-008-00	WASHER SPLIT LOCK 1/2	2
48	65152-000-00	AXLE - KEEPER RING	2
49	61796-099-00	GROMMET MATERIAL	2'
50	11730-001-00	WASHER, WAVE	2
53	11297-016-00	WASHER, 1" DIA	2
54	65030-000-00	FRONT WEAR PLATE	1
55	65079-000-00	BRAKE PLATE, ALUMINUM WHEEL	2
56	11254-012-00	SCREW, HHC 3/8-16 UNC X 1 1/2	10
57	11248-006-00	NUT, 3/8-16 UNC ESNA	10

*Not Shown

Illustrated Parts Breakdown



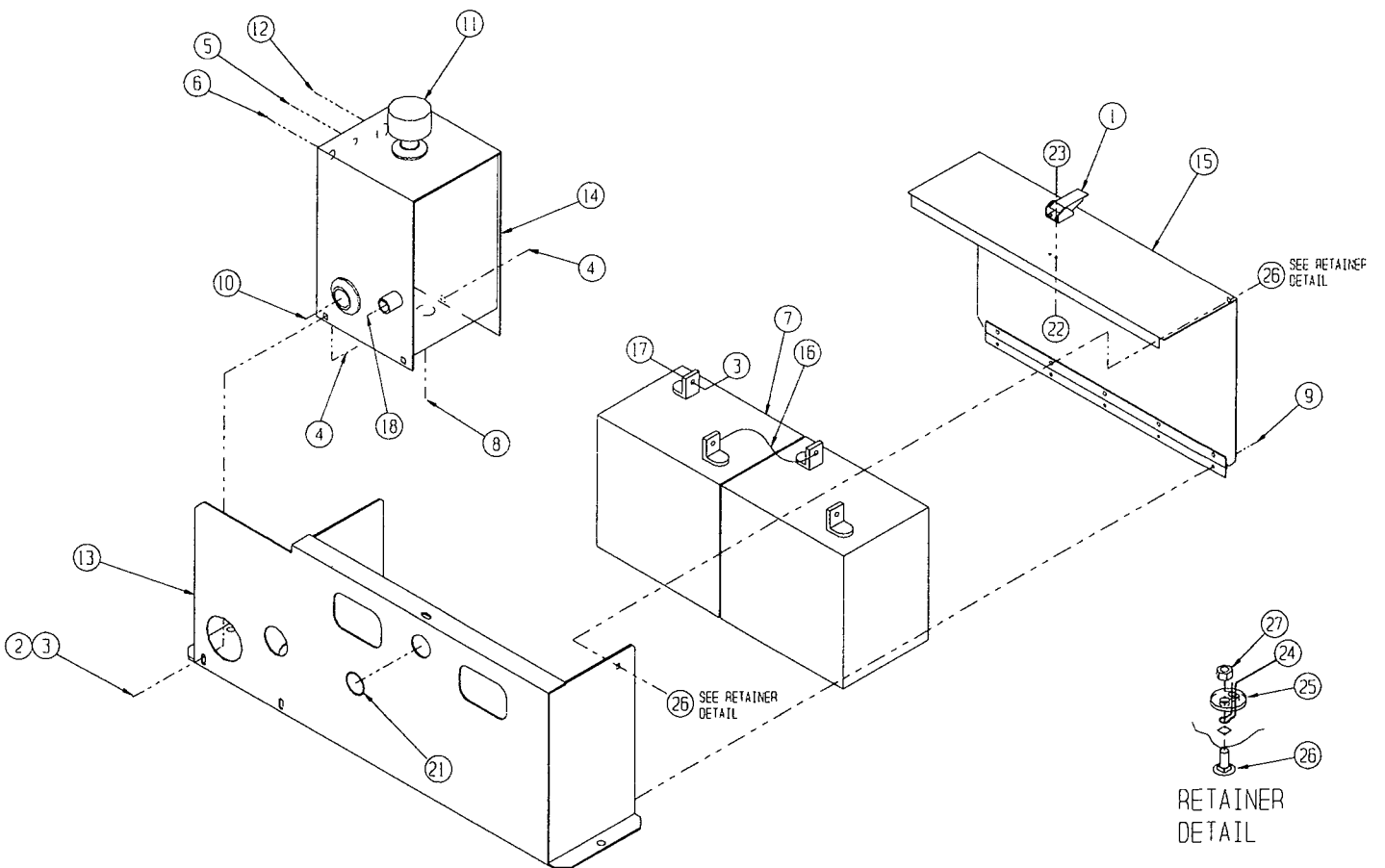
Illustrated Parts Breakdown

POWER MODULE ASSEMBLY

65003-000-00

ITEM	PART	DESCRIPTION	QTY.
1	05299-000-00	LATCH, TOGGLE	1
2	11240-005-00	WASHER FLAT STD 5/16	3
3	11248-005-00	NUT HEX ESNA 5/16-18 UNC	7
4	11830-008-00	BOLT CARRIAGE GR5 5/16-18 X 1	3
5	11940-004-00	FITTING	1
6	11940-010-00	FITTING	1
7	15796-000-00	BATTERY 6V 220AMP	2
8	21305-006-00	PLUG,MAGNETIC	1
9	26553-002-00	RIVET POP 3/16DIA .126-.250GRIP	5
10	61818-000-00	SUCTION SCREEN/FITTING	1
11	63930-001-00	CAP, FILLER VENT	1
12	63979-006-00	GAUGE, SIGHT	1
13	65176-000-00	POWER MODULE TRAY WELDMENT	1
14	65222-000-00	RESERVOIR WELDMENT	1
15	65230-000-00	MODULE COVER ASSY	1
16	61254-001-00	BATTERY CABLE ASSY X 12	1
17	11253-008-00	SCREW HHC GR5 5/16-18UNC X 1	4
18	11939-014-00	FITTING	1
21	61796-099-00	GROMMET MATERIAL	.8'
22	11248-002-00	NUT HEX ESNA 8-32 UNC	2
23	11708-004-00	SCREW MACH RD HD 8-32UNC X 1/2	2
24	64465-099-00	CABLE 1/16	1.8'
25	64464-000-00	CABLE RETAINER	2
26	11829-006-00	BOLT CARRIAGE 1/4-20UNC X 3/4	2
27	11248-004-00	NUT HEX ESNA 1/4-20 UNC	2

Illustrated Parts Breakdown



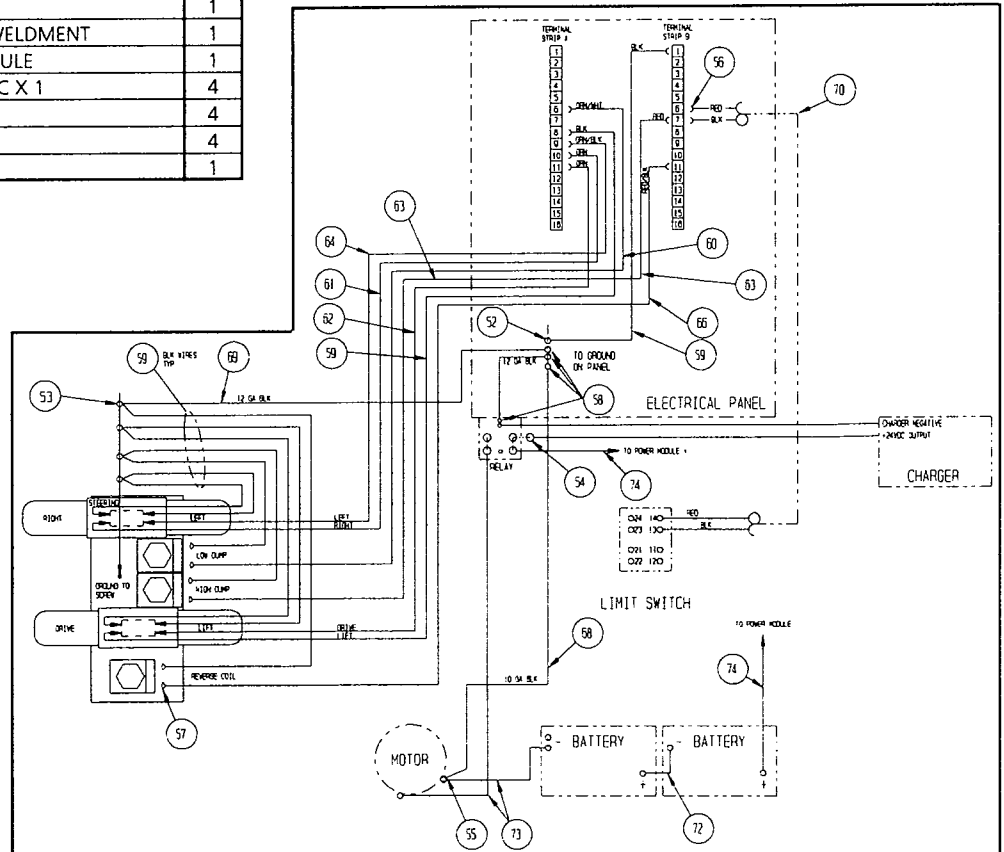
Illustrated Parts Breakdown

CONTROL MODULE ASSEMBLY, DOMESTIC 65004-000-00

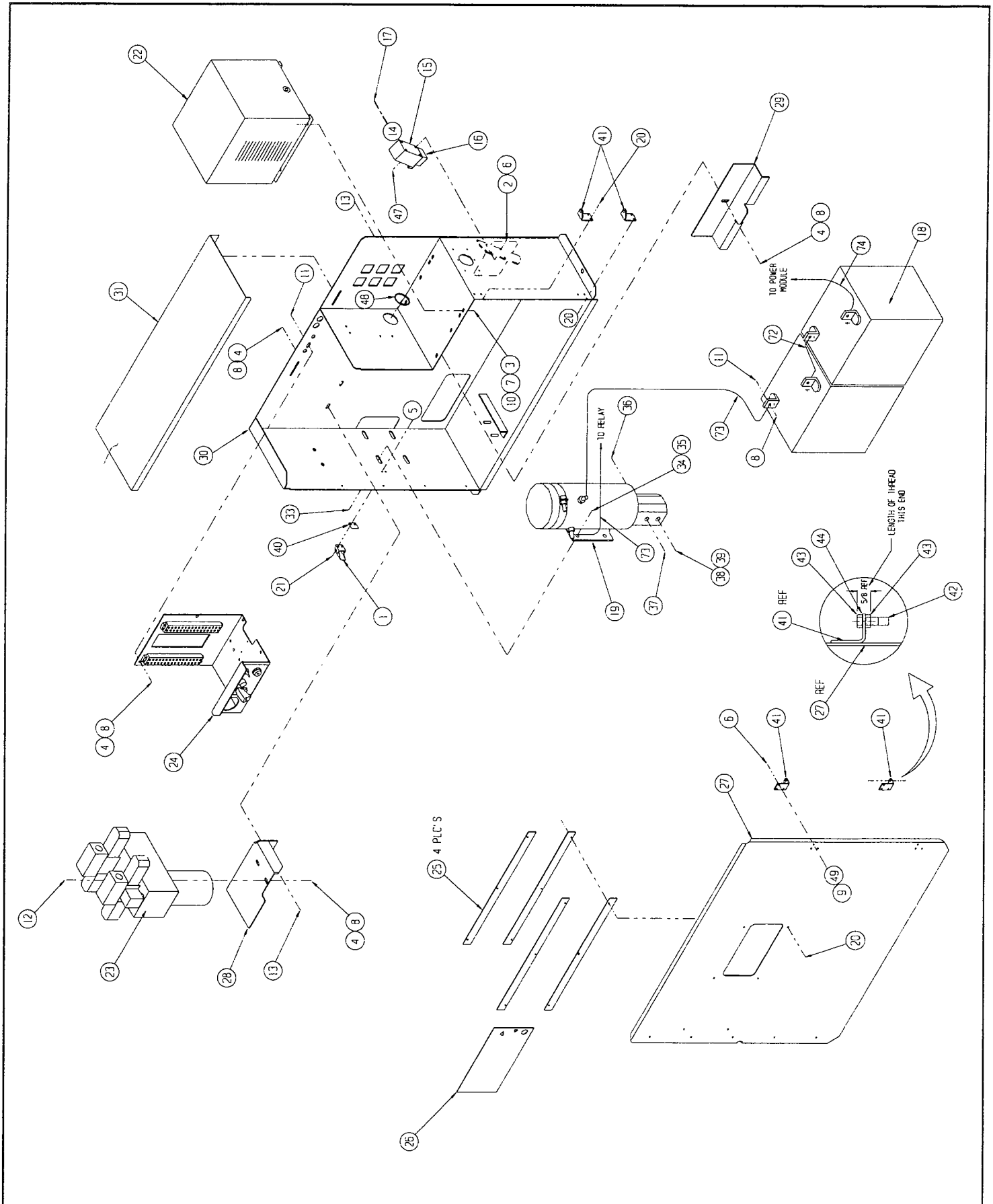
ITEM	PART	DESCRIPTION	QTY.
1	05299-000-00	LATCH, TOGGLE	1
2	11240-003-00	WASHER #10 STD STL FLAT (3/16)	4
3	11240-004-00	WASHER FLAT STD 1/4	4
4	11240-005-00	WASHER FLAT STD 5/16	7
5	11248-002-00	NUT HEX ESNA 8-32 UNC	2
6	11248-003-00	NUT HEX EXNA 10-24 UNC	10
7	11238-004-00	WASHER SPLIT LOCK 1/4	4
8	11248-005-00	NUT HEX ESNA 5/16-18 UNC	11
9	11709-006-00	SCREW MACH RD HD 10-24UNC X 3/4	6
10	11252-004-00	SCREW HHC GR5 1/4-20UNC X 1/2	4
11	11253-006-00	SCREW HHC GR5 5/16-18UNC X 3/4	8
12	14334-036-00	SCREW SOC HD 5/16-18UNC X 4-1/2	REF
13	11830-006-00	BOLT, CARRIAGE GR5 5/16-18 X 3/4	3
14	15793-003-00	SWITCH	1
15	15793-001-00	SWITCH	1
16	15793-002-00	SWITCH	1
17	19000-099-00	ROD 1/8 DIA CF STL WELDING	1'
18	15796-000-00	BATTERY 6V 220AMP	2
19	15797-000-00	POWER UNIT	1
-	15797-001-00	PUMP	1
*	15797-003-00	SEAL KIT, PUMP	1
20	26553-002-00	RIVET POP 3/16DIA .126-.250GRIP	12
21	11708-006-00	SCREW MACH RD HD 8-32UNC X 3/4	2
22	63944-011-00	CHARGER, BATTERY	1
23	65005-000-00	CONTROL VALVE ASSEMBLY, DOMESTIC	1
24	65006-000-00	ELECTRIC PANEL ASSEMBLY, DOMESTIC	1
25	65156-000-00	GUIDE	4
26	65158-000-00	ACCESS DOOR	1
27	65167-000-00	MODULE COVER-CONTROL	1
28	65170-000-00	VALVE BRACKET	1
29	65171-000-00	BATTERY BRACKET	1
30	65175-000-00	CONTROL MODULE TRAY WELDMENT	1
31	65216-000-00	TOP COVER-CONTROL MODULE	1
33	11254-008-00	SCREW HHC GR5 3/8-16UNC X 1	4
34	11240-006-00	WASHER FLAT STD 3/8	4
35	11248-006-00	NUT HEX ESNA 3/8-16 UNC	4
36	11941-012-00	FITTING	1

ITEM	PART	DESCRIPTION	QTY.
37	11941-005-00	FITTING	1
38	11934-003-00	FITTING	1
39	11932-001-00	FITTING	1
40	65242-000-00	LATCH SPACER	1
41	65246-000-00	HINGE	4
42	65245-000-00	STUD	2
43	11273-006-00	NUT HEX JAM 3/8-16UNC	4
44	11238-006-00	WASHER SPLIT LOCK 3/8	2
47	11709-012-00	SCREW MACH RD HD 10-24NC X1-1/2	4
48	61796-099-00	GROMMET MATERIAL	.8'
52	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	1
53	29601-019-00	CONN RING TERM 12-10GA #10	4
54	29601-040-00	CONN RING 5/16DIA 14-16GA INSL	1
55	29601-021-00	CONN RING TERM 12-10GA 3/8DIA	1
56	29610-001-00	CONN FORK TERM 22-18GA #6	10
57	29931-003-00	CONN F PUSH TERM 16-14GA .25T	6
58	29601-020-00	CONN RING TERM 12-10GA 1/4DIA	4
59	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	5'
60	29482-099-00	WIRE 16AWG STRD COP GRN/WHT	1.5'
61	29457-099-00	WIRE 16AWG THHN STRD COP GREEN	1.5'
62	29453-099-00	WIRE 16AWG THHN STRD COP ORANG	1.5'
63	29454-099-00	WIRE 16AWG THHN STRD COP RED	1.5'
64	05491-099-00	WIRE 16GA STRD COP GREEN & BLK	1.5'
66	29478-099-00	WIRE 16AWG STRD COP RED/BLK	1.5'
68	29481-099-00	WIRE 10 GA THHN STRD COP BLACK	2'
69	29472-099-00	WIRE 12AWG THHN STRD COP BLACK	2'
70	29496-099-00	WIRE 2COND 16GA	3'
72	64195-001-00	BATTERY CABLE ASSY X 12	1
73	62125-017-00	BATTERY CABLE ASSY X 13	2
74	64195-068-00	BATTERY CABLE ASSY X 68	2

*Not Shown



Illustrated Parts Breakdown



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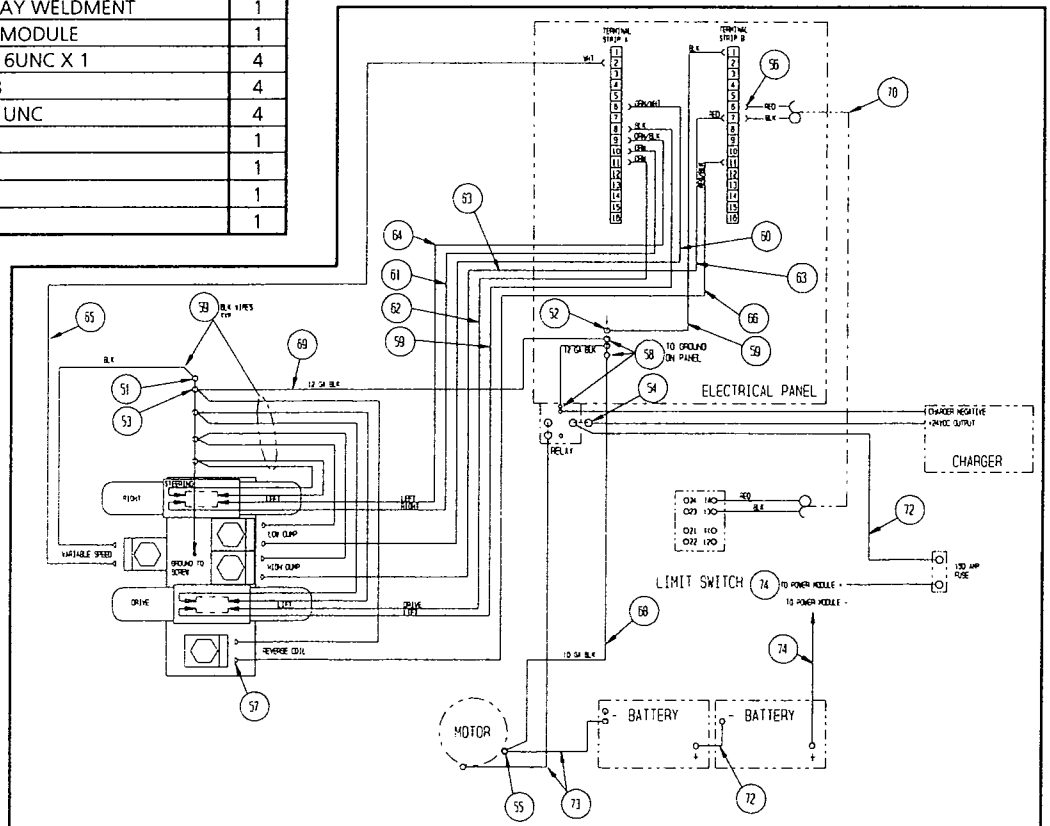
CONTROL MODULE ASSEMBLY, EUROPE

65004-001-00

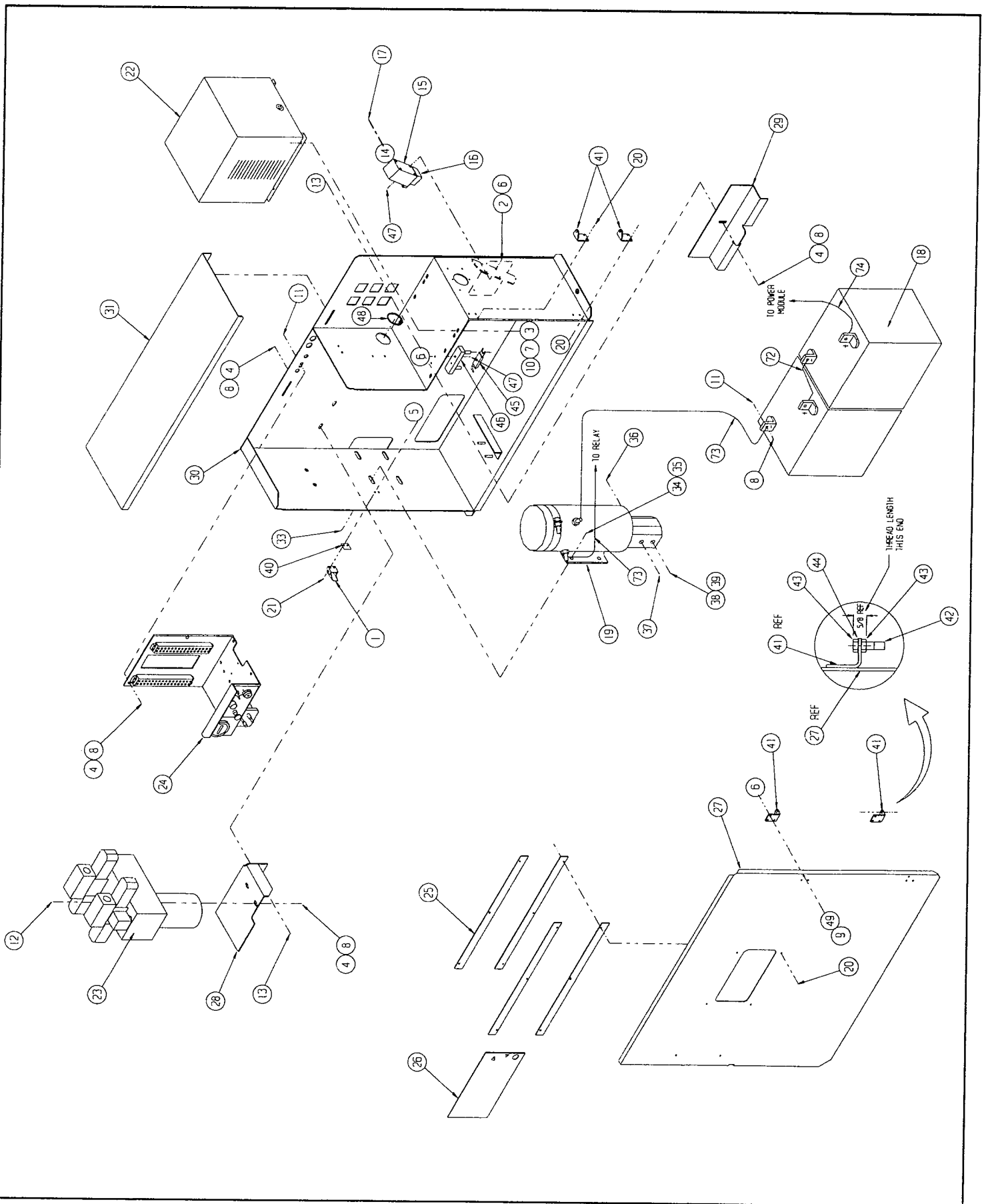
ITEM	PART	DESCRIPTION	QTY.
1	05299-000-00	LATCH TOGGLE	1
2	11240-003-00	WASHER #10 STD STL FLAT (3/16)	4
3	11240-004-00	WASHER FLAT STD 1/4	4
4	11240-005-00	WASHER FLAT STD 5/16	7
5	11248-002-00	NUT HEX ESNA 8-32 UNC	2
6	11248-003-00	NUT HEX EXNA 10-24 UNC	12
7	11238-004-00	WASHER SPLIT LOCK 1/4	4
8	11248-005-00	NUT HEX ESNA 5/16-18 UNC	11
9	11709-006-00	SCREW MACH RD HD 10-24UNC X 3/4	6
10	11252-004-00	SCREW HHC GR5 1/4-20UNC X 1/2	4
11	11253-006-00	SCREW HHC GR5 5/16-18UNC X 3/4	8
12	14334-036-00	SCREW SOC HD 5/16-18UNC X 4-1/2	REF
13	11830-006-00	BOLT, CARRIAGE GR5 5/16-18 X 3/4	3
14	15793-003-00	SWITCH	1
15	15793-007-00	SWITCH_BODY	1
16	15793-002-00	SWITCH	1
17	19000-099-00	ROD 1/8 DIA CF STL WELDING	1'
18	15796-000-00	BATTERY 6V 220AMP	2
19	15797-000-00	POWER UNIT	1
-	15797-001-00	PUMP	1
*	15797-003-00	SEAL KIT, PUMP	1
20	26553-002-00	RIVET POP 3/16DIA .126-.250GRIP	12
21	11708-006-00	SCREW MACH RD HD 8-32UNC X 3/4	2
22	63948-011-00	CHARGER, BATTERY	1
23	65005-001-00	CONTROL VALVE ASSY, EUROPE	1
24	65006-001-00	ELECTRIC PANEL ASSY, EUROPE	1
25	65156-000-00	GUIDE	4
26	65158-000-00	ACCESS DOOR	1
27	65167-000-00	MODULE COVER-CONTROL	1
28	65170-000-00	VALVE BRACKET	1
29	65171-000-00	BATTERY BRACKET	1
30	65175-000-00	CONTROL MODULE TRAY WELDMENT	1
31	65216-000-00	TOP COVER-CONTROL MODULE	1
33	11254-008-00	SCREW HHC GR5 3/8-16UNC X 1	4
34	11240-006-00	WASHER FLAT STD 3/8	4
35	11248-006-00	NUT HEX ESNA 3/8-16 UNC	4
36	11941-012-00	FITTING	1
37	11941-005-00	FITTING	1
38	11934-003-00	FITTING	1
39	11932-001-00	FITTING	1

ITEM	PART	DESCRIPTION	QTY.
40	65242-000-00	LATCH SPACER	1
41	65246-000-00	HINGE	4
42	65245-000-00	STUD	2
43	11273-006-00	NUT HEX JAM 3/8-16UNC	4
44	11238-006-00	WASHER SPLIT LOCK 3/8	2
45	10148-000-00	FUSE 150AMP	1
46	10149-000-00	FUSE BLOCK	1
47	11709-012-00	SCREW MACH RD HD 10-24NC X1-1/2	6
48	61796-099-00	GROMMET MATERIAL	.8'
51	29601-013-00	CONN RING TERM 16-14 GA #10	1
52	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	1
53	29601-019-00	CONN RING TERM 12-10GA #10	4
54	29601-040-00	CONN RING 5/16DIA 14-16GA INSL	1
55	29601-021-00	CONN RING TERM 12-10GA 3/8DIA	1
56	29610-001-00	CONN FORK TERM 22-18GA #6	11
57	29931-003-00	CONN F PUSH TERM 16-14GA .25T	8
58	29601-020-00	CONN RING TERM 12-10GA 1/4DIA	4
59	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	5'
60	29482-099-00	WIRE 16AWG STRD COP GRN/WHT	1.5'
61	29457-099-00	WIRE 16AWG THHN STRD COP GREEN	1.5'
62	29453-099-00	WIRE 16AWG THHN STRD COP ORANG	1.5'
63	29454-099-00	WIRE 16AWG THHN STRD COP RED	1.5'
64	05491-099-00	WIRE 16GA STRD OP GREEN & BLK	1.5'
65	29451-099-00	WIRE 16AWG THHN STRD COP WHITE	1.5'
66	29478-099-00	WIRE 16AWG STRD COP RED/BLK	1.5'
68	29481-099-00	WIRE 10 GA THHN STRD COP BLACK	2'
69	29472-099-00	WIRE 12AWG THHN STRD COP BLACK	2'
70	29496-099-00	WIRE 2COND 16GA	3'
72	64195-001-00	BATTERY CABLE ASSY X 12	2
73	62125-017-00	BATTERY CABLE ASSY X 13	2
74	64195-068-00	BATTERY CABLE ASSY X 68	2

*Not Shown



Illustrated Parts Breakdown

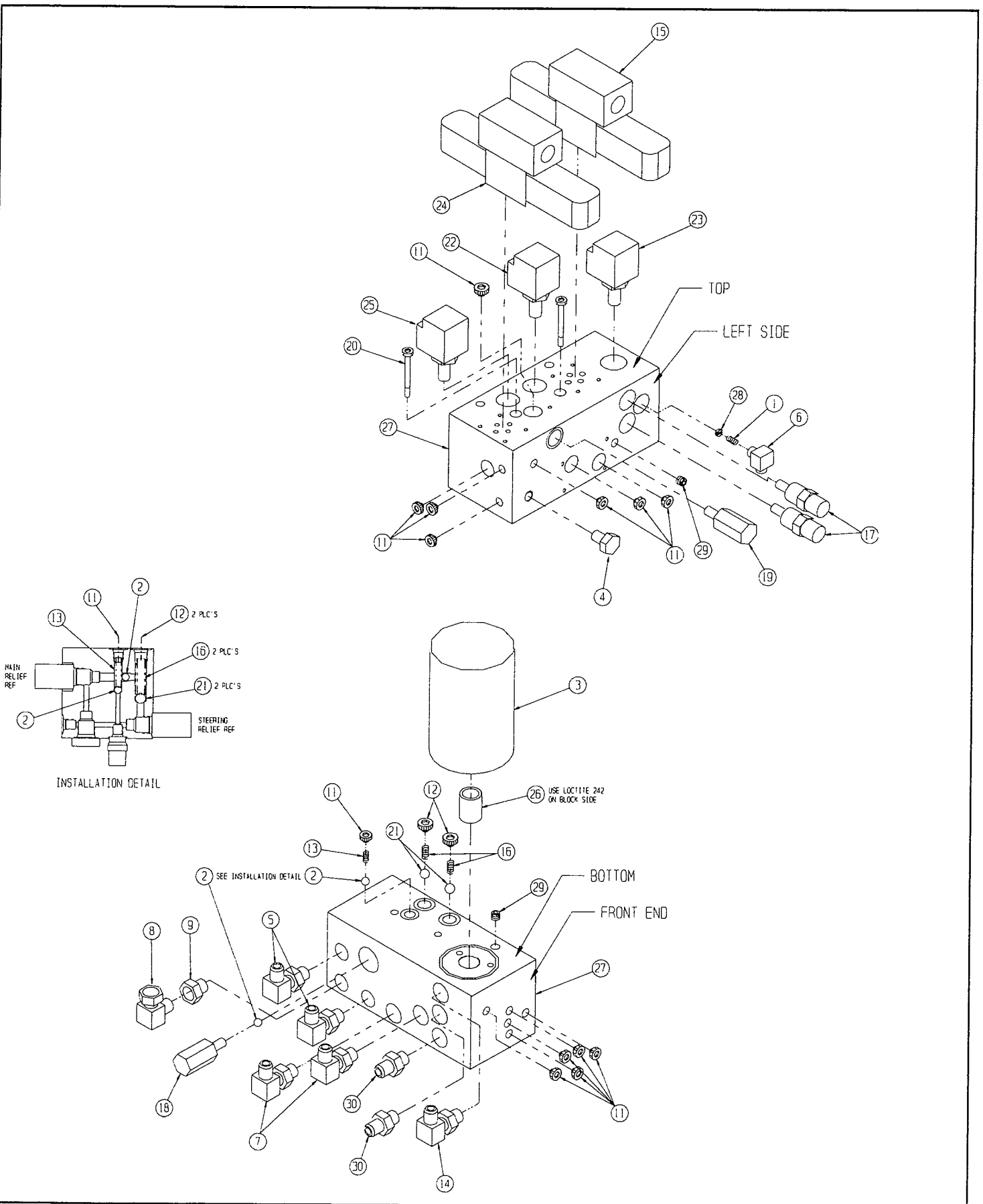


Illustrated Parts Breakdown

CONTROL VALVE ASSEMBLY, DOMESTIC 65005-000-00

ITEM	PART	DESCRIPTION	QTY.
1	05133-000-00	SPRING	1
2	05135-000-00	BALL 5/16 DIA STEEL	2
3	05154-002-00	FILTER	1
4	11920-002-00	PLUG PIPE SOC HD 1/4-18 NPTF	1
5	11934-001-00	FITTING	2
6	11934-003-00	FITTING	1
7	11934-004-00	FITTING	2
8	11937-001-00	FITTING	1
9	11941-001-00	FITTING	1
11	12004-004-00	PLUG	13
12	12004-006-00	PLUG	2
13	13987-006-00	SPRING	1
14	11934-007-00	FITTING	1
15	63928-004-00	VALVE, DRIVE/LIFT	1
16	15799-000-00	SPRING	2
17	15900-000-00	VALVE, COUNTERBALANCE	2
18	60390-007-00	VALVE, RELIEF	1
19	60390-008-00	VALVE, RELIEF	1
20	14334-036-00	SCREW SOC HD 5/16-18UNC X 4-1/2	2
21	61827-000-00	BALL 7/16 DIA STEEL	2
22	63923-005-00	VALVE, SOLENOID	1
23	63923-006-00	VALVE, SOLENOID	1
24	15763-000-00	VALVE, SOLENOID, STEERING	1
25	63973-001-00	VALVE, SOLENOID	1
26	65169-000-00	FILTER ADAPTER	1
27	65177-000-00	VALVE BLOCK	1
-	30576-006-00	VALVE BLOCK, SERVICE	1
28	15919-000-00	ORIFICE, #835	1
29	63977-001-00	PLUG	2
30	11941-005-00	FITTING	2

Illustrated Parts Breakdown



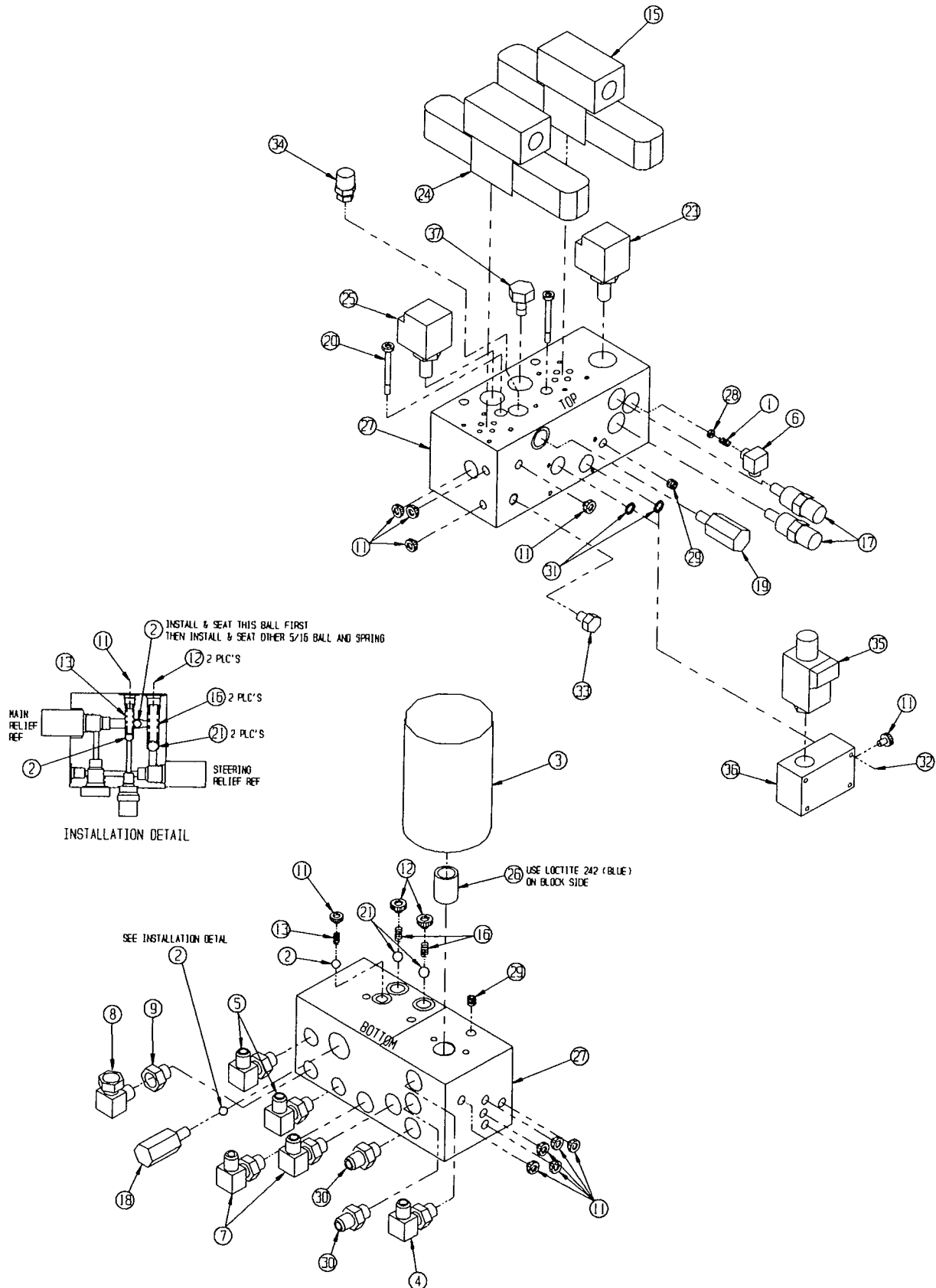
Illustrated Parts Breakdown

CONTROL VALVE ASSEMBLY, EUROPE

65005-001-00

ITEM	PART	DESCRIPTION	QTY.
1	05133-000-00	SPRING	1
2	05135-000-00	BALL 5/16 DIA STEEL	2
3	05154-002-00	FILTER	1
4	11934-007-00	FITTING	1
5	11934-001-00	FITTING	2
6	11934-003-00	FITTING	1
7	11934-004-00	FITTING	2
8	11937-001-00	FITTING	1
9	11941-001-00	FITTING	1
11	12004-004-00	PLUG	11
12	12004-006-00	PLUG	2
13	13987-006-00	SPRING	1
15	63928-004-00	VALVE, DRIVE/LIFT	1
16	15799-000-00	SPRING	2
17	15900-000-00	VALVE, COUNTERBALANCE	2
18	60390-007-00	VALVE, RELIEF	1
19	60390-008-00	VALVE, RELIEF	1
20	14334-036-00	SCREW SOC HD 5/16-18UNC X 4-1/2	2
21	61827-000-00	BALL 7/16 DIA STEEL	2
23	63923-006-00	VALVE, SOLENOID	1
24	15763-000-00	VALVE, SOLENOID, STEERING	1
25	63973-001-00	VALVE, SOLENOID	1
26	65169-000-00	FILTER ADAPTER	1
27	65177-000-00	VALVE BLOCK	1
-	30576-006-00	VALVE BLOCK, SERVICE	1
28	15919-004-00	ORIFICE, #824	1
29	63977-001-00	PLUG	2
30	11941-005-00	FITTING	2
31	11979-008-00	O-RING	2
32	14412-016-00	SCRW SOC HD CAP 10-24 X 2	4
33	11919-002-00	FITTING	1
34	63965-001-00	CONNECTOR, QUICK	1
35	63986-002-00	VALVE PROPORTIONAL	1
36	65172-000-00	VALVE BLOCK, PROPORTIONAL	1
37	63955-008-00	PLUG	1

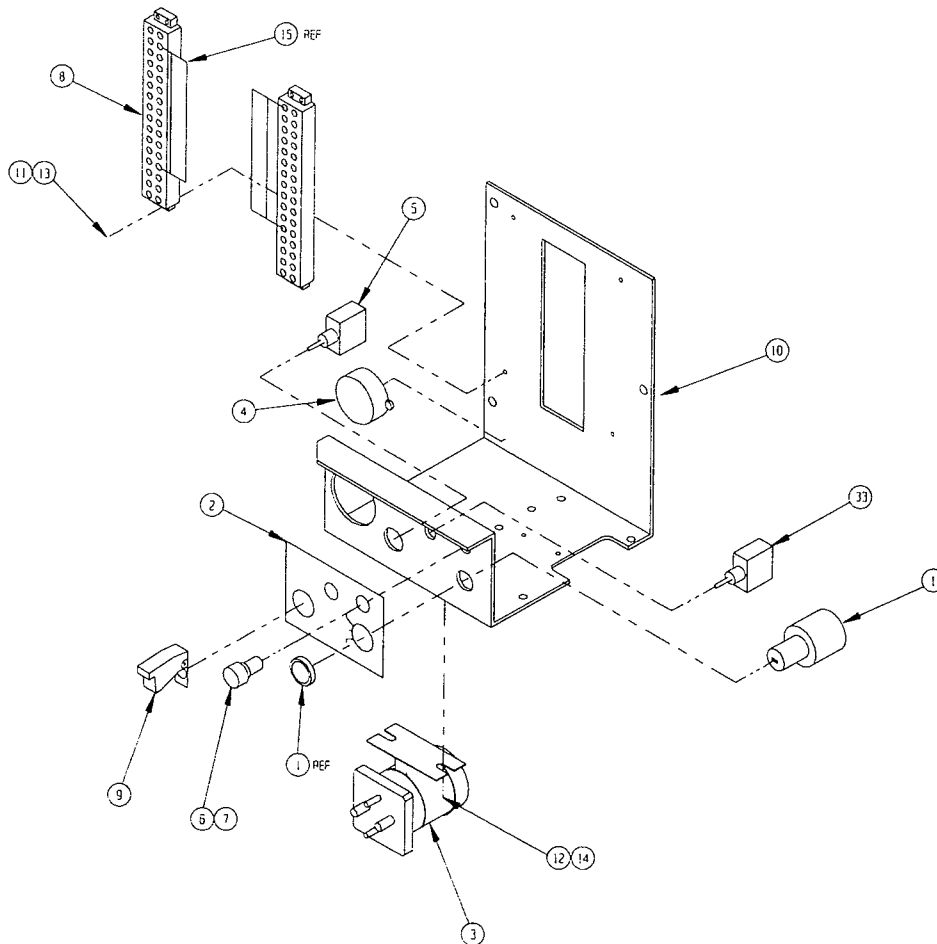
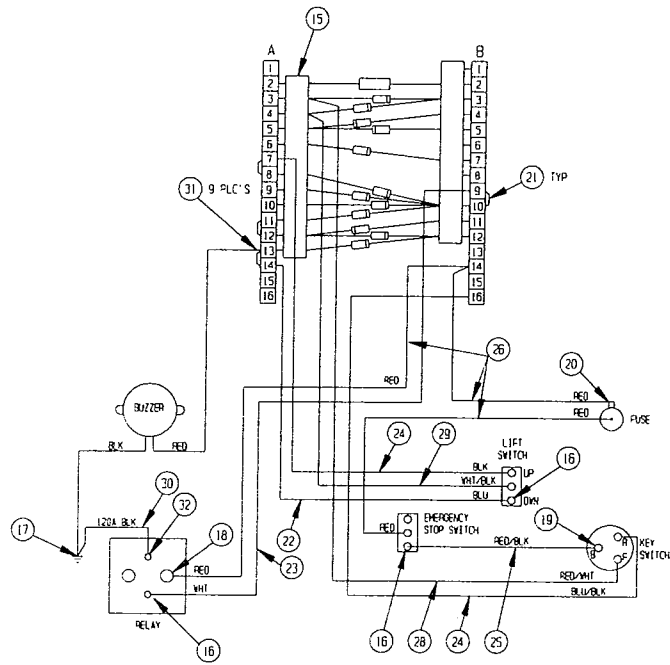
Illustrated Parts Breakdown



ELECTRIC PANEL ASSEMBLY, DOMESTIC
65006-000-00

ITEM	PART	DESCRIPTION	QTY.
1	10155-000-00	KEY SWITCH	1
*	10155-001-00	KEY	1
2	65090-000-00	DECAL	1
3	10122-000-00	RELAY	1
4	10189-000-00	BUZZER	1
5	12797-000-00	SWITCH	1
6	29701-000-00	FUSE HOLDER	1
7	29704-015-00	FUSE AGC 15 AMP	1
8	29928-006-00	TERM BLOCK	2
9	29936-006-00	SWITCH GUARD	1
10	65174-000-00	ELECTRICAL BRACKET	1
11	11715-006-00	SCREW MACH RD HD 6-32 UNC X 3/4	4
12	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	3
13	11248-047-00	NUT LOCK HH ESNA 6-32 UNC	4
14	11248-004-00	NUT HEX ESNA 1/4-20 UNC	3
15	64056-009-00	FANNING STRIP ASSY	1
-	29927-007-00	FANNING STRIP	2
-	29825-002-00	DIODE	12
16	29601-013-00	CONN RING TERM 16-14 GA #10	7
17	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	2
18	29601-040-00	CONN RING 5/16DIA 14-16GA INSL	1
19	29610-002-00	CONN FORK TERM 16-14GA #8	3
20	29931-003-00	CONN F PUSH TERM 16-14GA .25T	1
21	29932-002-00	TERM JUMPER	4
22	29450-099-00	WIRE 16AWG THHN STRD COP BLUE	2
23	29451-099-00	WIRE 16AWG THHN STRD COP WHITE	1
24	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	1
25	29478-099-00	WIRE 16AWG STRD COP RED/BLK	1
26	29454-099-00	WIRE 16AWG THHN STRD COP RED	1
28	29483-099-00	WIRE 16AWG STRD COP RED/WHT	2
29	29479-099-00	WIRE 16AWG STRD COP WHT/BLK	2
30	29417-099-00	WIRE 12 AWG BLACK	1
31	29610-001-00	CONN FORK TERM 22-18GA #6	9
32	29601-019-00	CONN RING TERM 12-10GA #10	1
33	12798-000-00	SWITCH	1

Illustrated Parts Breakdown



Illustrated Parts Breakdown

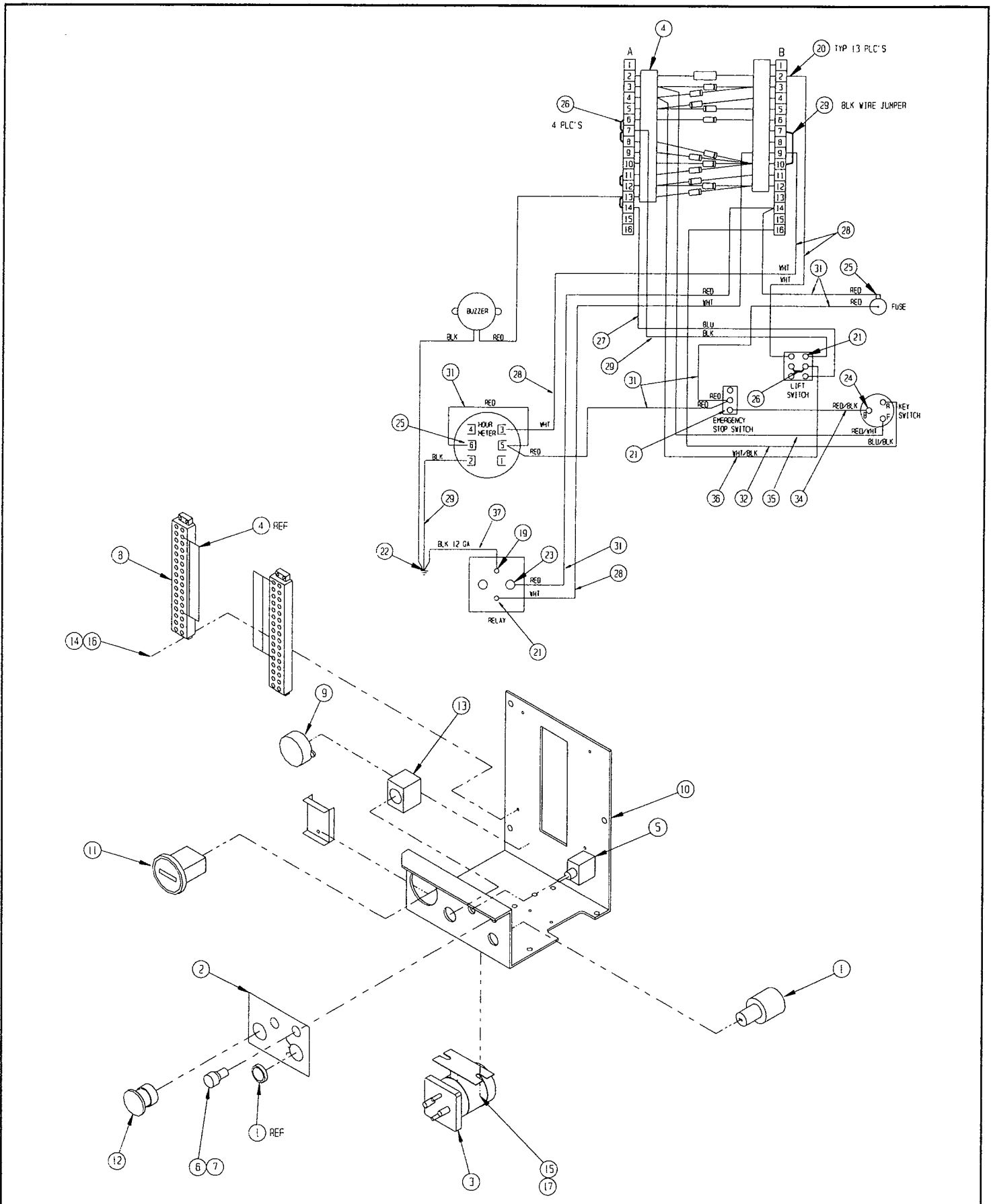
ELECTRIC PANEL ASSEMBLY, EUROPE

65006-001-00

ITEM	PART	DESCRIPTION	QTY.
1	10155-000-00	KEY SWITCH	1
*	10155-001-00	KEY	1
2	65090-000-00	DECAL	1
3	10122-000-00	RELAY	1
4	64056-009-00	FANNING STRIP ASSY	1
-	29927-007-00	FANNING STRIP	2
-	29825-002-00	DIODE	12
-	29731-004-00	RESISTOR, 30 OHM	1
-	29731-002-00	RESISTOR, 15 OHM	1
5	12798-001-00	SWITCH, TOGGLE	1
6	29701-000-00	FUSE HOLDER	1
7	29704-015-00	FUSE AGC 15 AMP	1
8	29928-006-00	TERM BLOCK	2
9	10189-000-00	BUZZER	1
10	65174-000-00	ELECTRICAL BRACKET	1
11	29959-000-00	HOUR METER/LOW VOLTAGE INDICATOR	1
12	63968-001-00	PUSH BUTTON	1
13	63968-002-00	CONTACT BLOCK	1
14	11715-006-00	SCREW MACH RD HD 6-32 UNC X 3/4	4
15	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	2
16	11248-047-00	NUT LOCK HH ESNA 6-32 UNC	4
17	11248-004-00	NUT HEX ESNA 1/4-20 UNC	2
19	29601-019-00	CONN RING TERM 12-10GA #10	1
20	29610-001-00	CONN FORK TERM 22-18GA #6	13
21	29601-013-00	CONN RING TERM 16-14 GA #10	9
22	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	3
23	29601-040-00	CONN RING 5/16DIA 14-16GA INSL	1
24	29610-002-00	CONN FORK TERM 16-14GA #8	3
25	29931-003-00	CONN F PUSH TERM 16-14GA .25T	6
26	29932-002-00	TERM JUMPER	5
27	29450-099-00	WIRE 16AWG THHN STRD COP BLUE	2
28	29451-099-00	WIRE 16AWG THHN STRD COP WHITE	5
29	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	3
31	29454-099-00	WIRE 16AWG THHN STRD COP RED	1
32	29475-099-00	WIRE 16AWG STRD COP BLU/BLK	1
34	29478-099-00	WIRE 16AWG STRD COP RED/BLK	1
35	29483-099-00	WIRE 16AWG STRD COP RED/WHT	2
36	29479-099-00	WIRE 16AWG STRD COP WHT/BLK	2
37	29417-099-00	WIRE 12 AWG BLACK	1

*Not Shown

Illustrated Parts Breakdown



Illustrated Parts Breakdown

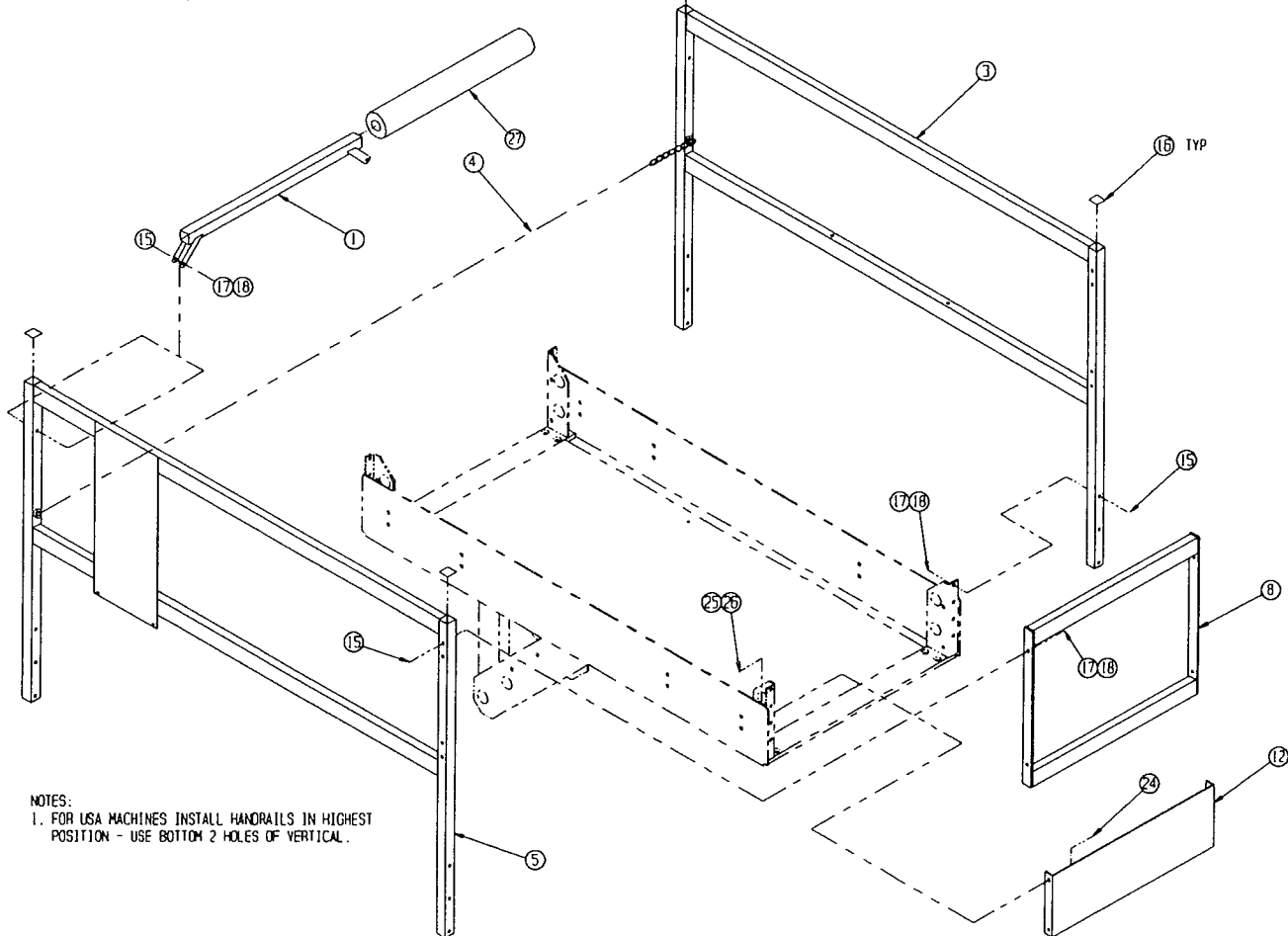
GUARDRAIL INSTALLATION, DOMESTIC 65008-002-00, Serial Numbers 1388 to current

ITEM	PART	DESCRIPTION	QTY.
1	65194-000-00	REAR TOP RAIL WELDMENT	1
3	65189-001-00	GUARDRAIL WELDMENT	1
4	65185-000-00	GUARG CHAIN ASSEMBLY	1
5	65192-001-00	GUARDRAIL WELDMENT	1
8	65128-000-00	END RAIL WELDMENT	1
12	65147-000-00	TOEBOARD-FRONT	1
15	11253-016-00	SCREW HHC GR5 5/16-18UNC X 2	14
16	63926-001-00	PLUG, TUBE	4
17	11240-005-00	WASHER FLAT STD 5/16	14
18	11248-005-00	NUT HEX ESNA 5/16-18 UNC	14
24	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	4
25	11240-004-00	WASHER FLAT STD 1/4	4
26	11248-004-00	NUT HEX ESNA 1/4-20 UNC	4
27	10191-001-00	BUMPER	1

GUARDRAIL INSTALLATION, DOMESTIC 65008-000-00, Serial Numbers through 1387

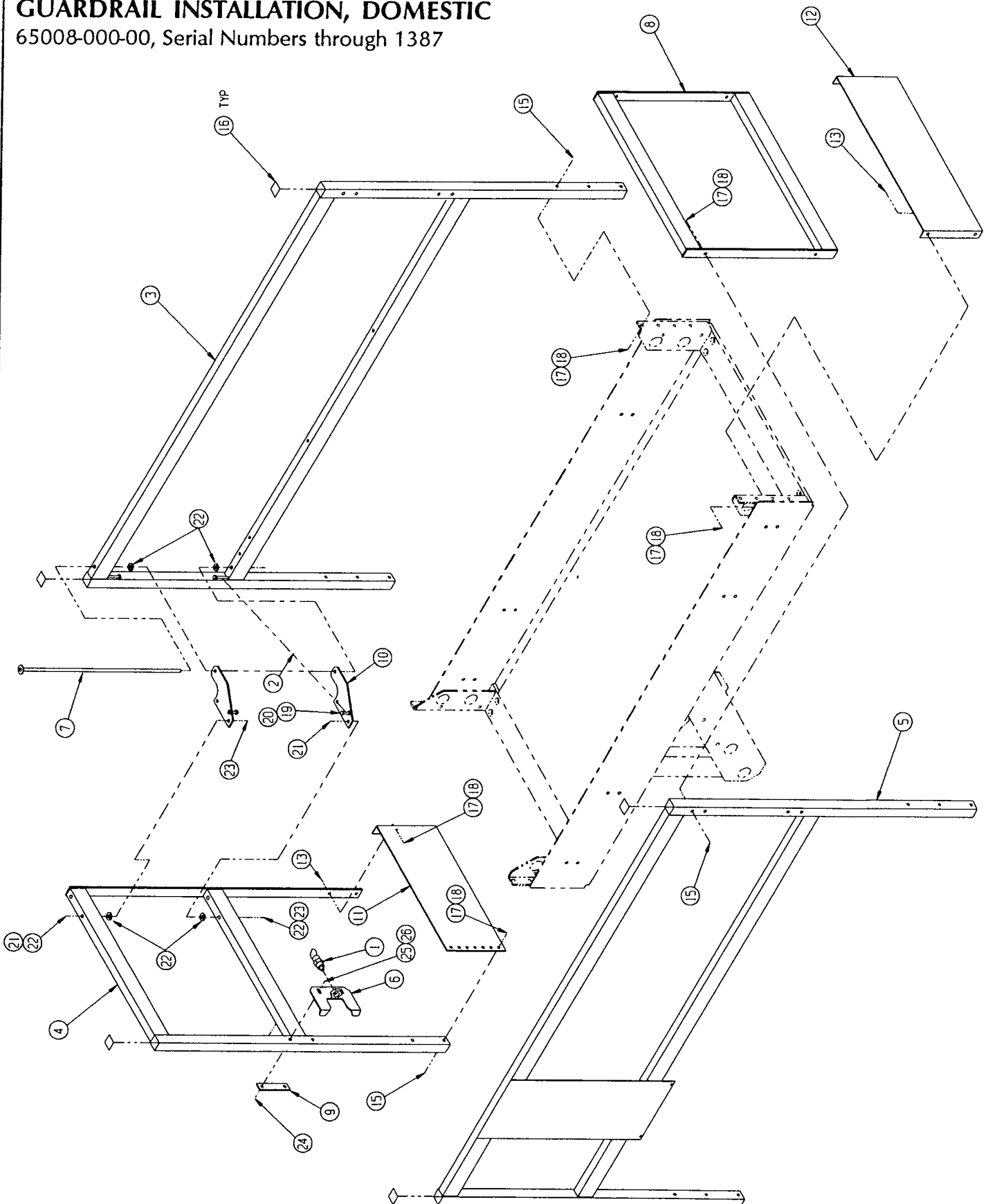
ITEM	PART	DESCRIPTION	QTY.
1	03570-000-00	RETAINING PIN ASSY	1
3	65189-000-00	GUARDRAIL WELDMENT	1
4	65193-000-00	GATE WELDMENT	1
5	65192-000-00	GUARDRAIL WELDMENT	1
6	65123-000-00	LATCH PLATE WELDMENT	1
7	65196-000-00	HINGE PIN WELDMENT	1
8	65128-000-00	END RAIL WELDMENT	1
9	65144-000-00	BACKING PLATE	1
10	65145-000-00	HINGE	2
11	65247-000-00	TOEBOARD EUROPE	1
12	65147-000-00	TOEBOARD-FRONT	1
13	11253-006-00	SCREW HHC GR5 5/16-18UNC X 3/4	6
15	11253-016-00	SCREW HHC GR5 5/16-18UNC X 2	14
16	63926-001-00	PLUG, TUBE	5
17	11240-005-00	WASHER FLAT STD 5/16	22
18	11248-005-00	NUT HEX ESNA 5/16-18 UNC	22
21	11254-024-00	SCREW HHC GR5 3/8-16UNC X 3	4
22	11240-006-00	WASHER FLAT STD 3/8	10
23	11248-006-00	NUT HEX ESNA 3/8-16 UNC	4
24	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	2
25	11240-004-00	WASHER FLAT STD 1/4	2
26	11248-004-00	NUT HEX ESNA 1/4-20 UNC	2

GUARDRAIL INSTALLATION, DOMESTIC 65008-002-00, Serial Numbers 1388 to current



Illustrated Parts Breakdown

GUARDRAIL INSTALLATION, DOMESTIC 65008-000-00, Serial Numbers through 1387



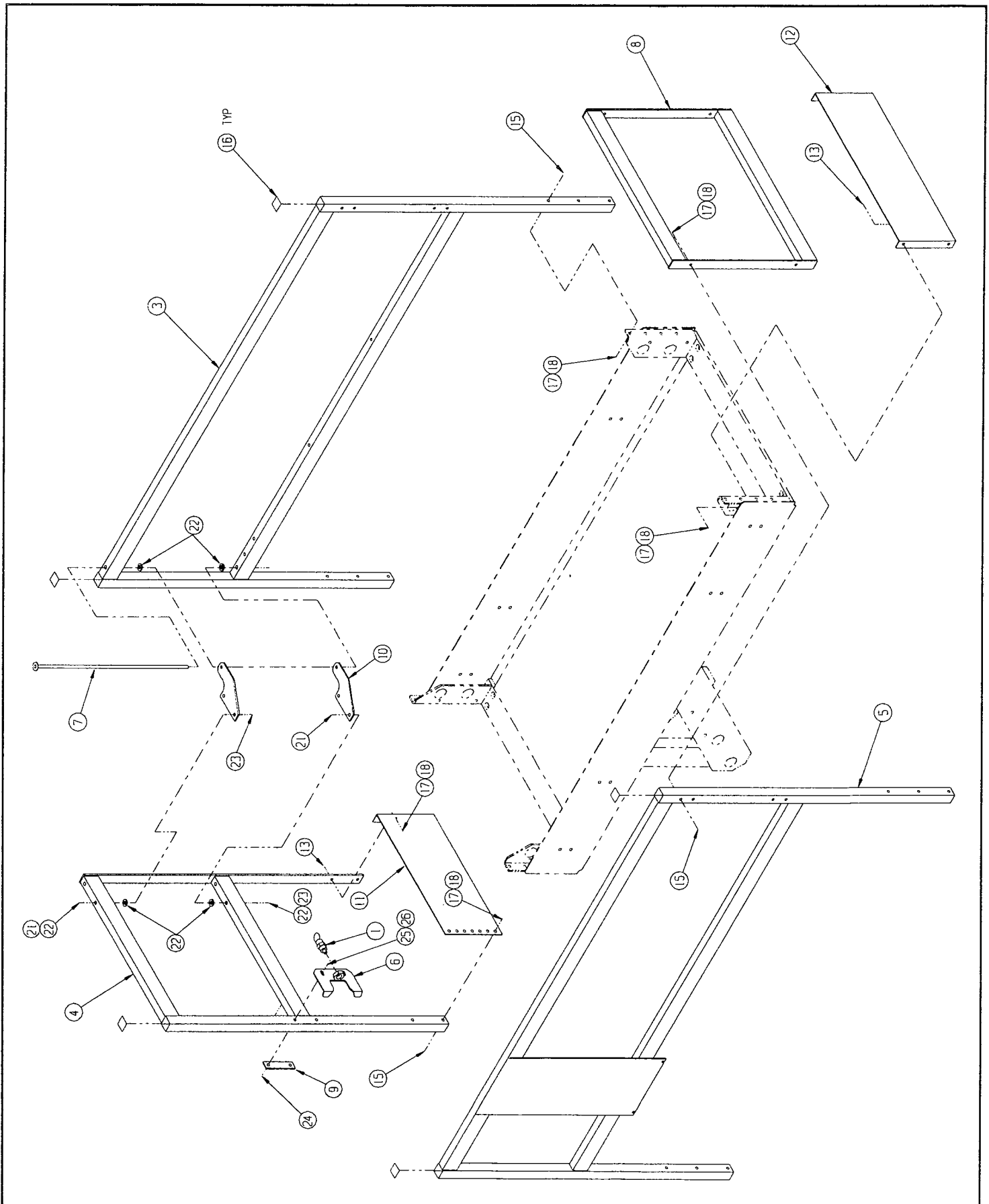
Illustrated Parts Breakdown

GUARDRAIL INSTALLATION, EUROPE

65007-000-00

ITEM	PART	DESCRIPTION	QTY.
1	03570-000-00	RETAINING PIN ASSY	1
2	14512-003-00	SPRING	2
3	65111-000-00	GUARDRAIL WELDMENT EUROPE	1
4	65116-000-00	GATE WELDMENT	1
5	65120-000-00	GUARDRAIL WELDMENT EUROPE	1
6	65123-000-00	LATCH PLATE WELDMENT	1
7	65196-000-00	HINGE PIN WELDMENT	1
8	65128-000-00	END RAIL WELDMENT	1
9	65144-000-00	BACKING PLATE	1
10	65145-000-00	HINGE	2
11	65247-000-00	TOEBOARD EUROPE	1
12	65147-000-00	TOEBOARD-FRONT	1
13	11253-006-00	SCREW HHC GR5 5/16-18UNC X 3/4	6
15	11253-016-00	SCREW HHC GR5 5/16-18UNC X 2	14
16	63926-001-00	PLUG, TUBE	5
17	11240-005-00	WASHER FLAT STD 5/16	22
18	11248-005-00	NUT HEX ESNA 5/16-18 UNC	22
19	11273-004-00	NUT HEX JAM 1/4-20UNC	4
20	11252-012-00	SCREW HHC GR5 1/4-20UNC X 1-1/2	2
21	11254-024-00	SCREW HHC GR5 3/8-16UNC X 3	4
22	11240-006-00	WASHER FLAT STD 3/8	10
23	11248-006-00	NUT HEX ESNA 3/8-16 UNC	4
24	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	2
25	11240-004-00	WASHER FLAT STD 1/4	2
26	11248-004-00	NUT HEX ESNA 1/4-20 UNC	2

Illustrated Parts Breakdown



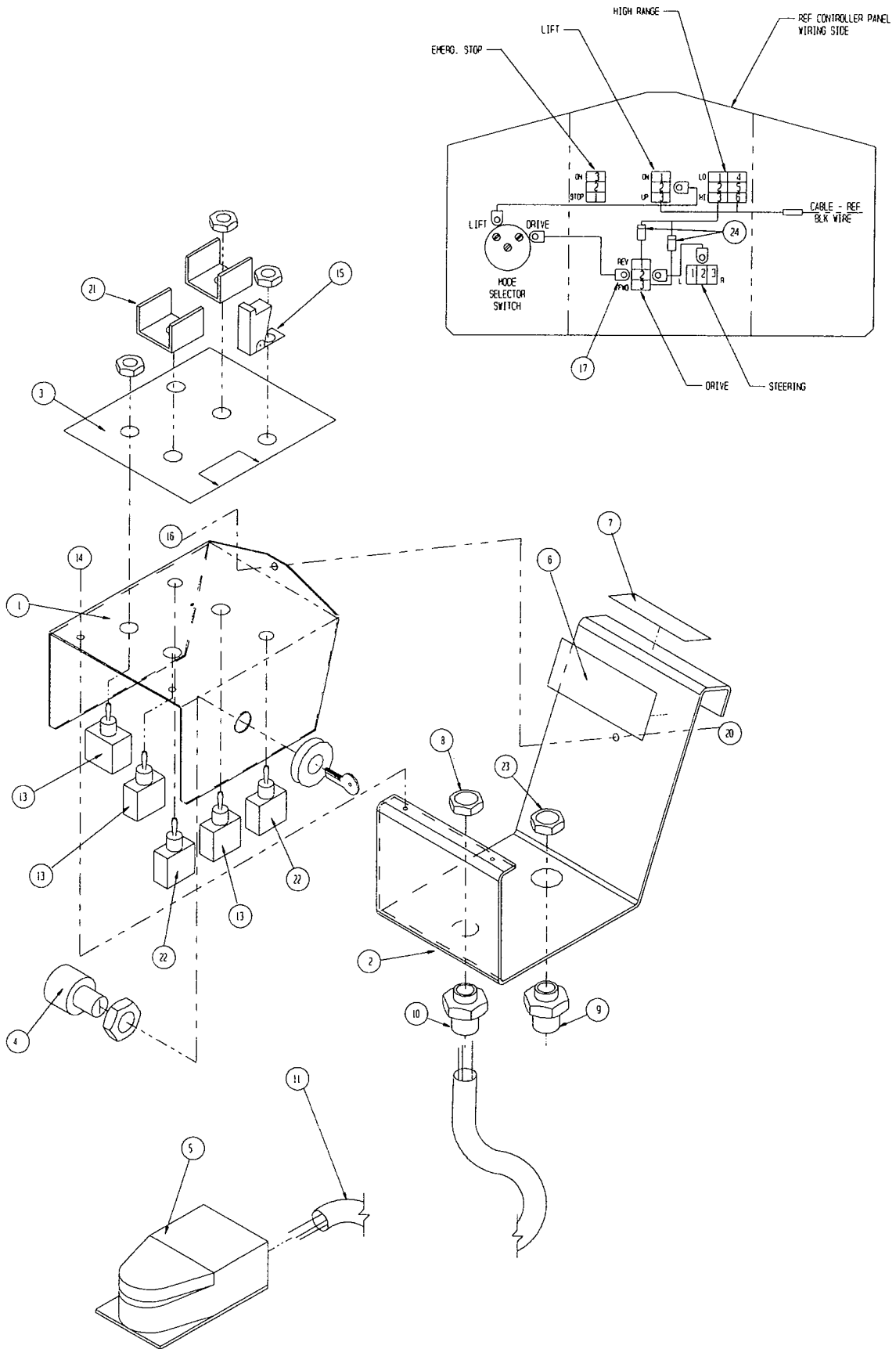
Illustrated Parts Breakdown

CONTROLLER ASSEMBLY, DOMESTIC

65009-000-00

ITEM	PART	DESCRIPTION	QTY.
1	61809-000-00	CONTROLLER CONSOLE	1
2	65235-000-00	CONTROLLER HANGER	1
3	61813-000-00	DECAL- CONTROLLER	1
4	10155-000-00	KEY SWITCH	1
-	10155-001-00	KEY	1
5	63906-000-00	SWITCH, FOOT	1
6	61831-000-00	DECAL-BEFORE OPERATING	1
7	61515-000-00	DECAL - LIFT HERE	1
8	29939-002-00	LOCKNUT	1
9	29925-011-00	CONNECTOR, CABLE	1
10	29925-000-00	CONNECTOR, CABLE	1
11	29495-099-00	WIRE 14GA 3COND	6'
13	12798-000-00	SWITCH	3
14	14073-006-00	SCREW 8-32 HEX HD X 3/4 SLF TAP	2
15	29936-006-00	SWITCH GUARD	1
16	11248-002-00	NUT HEX ESNA 8-32 UNC	1
17	29601-013-00	CONN RING TERM 16-14 GA #10	6
18	29610-003-00	CONN FORK TERM 12-10 GA #6	4
19	29456-099-00	WIRE 16AWG THHN STRD COP YELLOW	2.4'
20	11708-004-00	SCREW MACH RD HD 8-32UNC X 1/2	1
21	08271-000-00	GUARD-TOGGLE SWITCH	2
22	15941-001-00	SWITCH, TOGGLE	2
23	29939-003-00	LOCKNUT 3/4NPT T&B #142	1
24	29825-002-00	DIODE	2

Illustrated Parts Breakdown



Illustrated Parts Breakdown

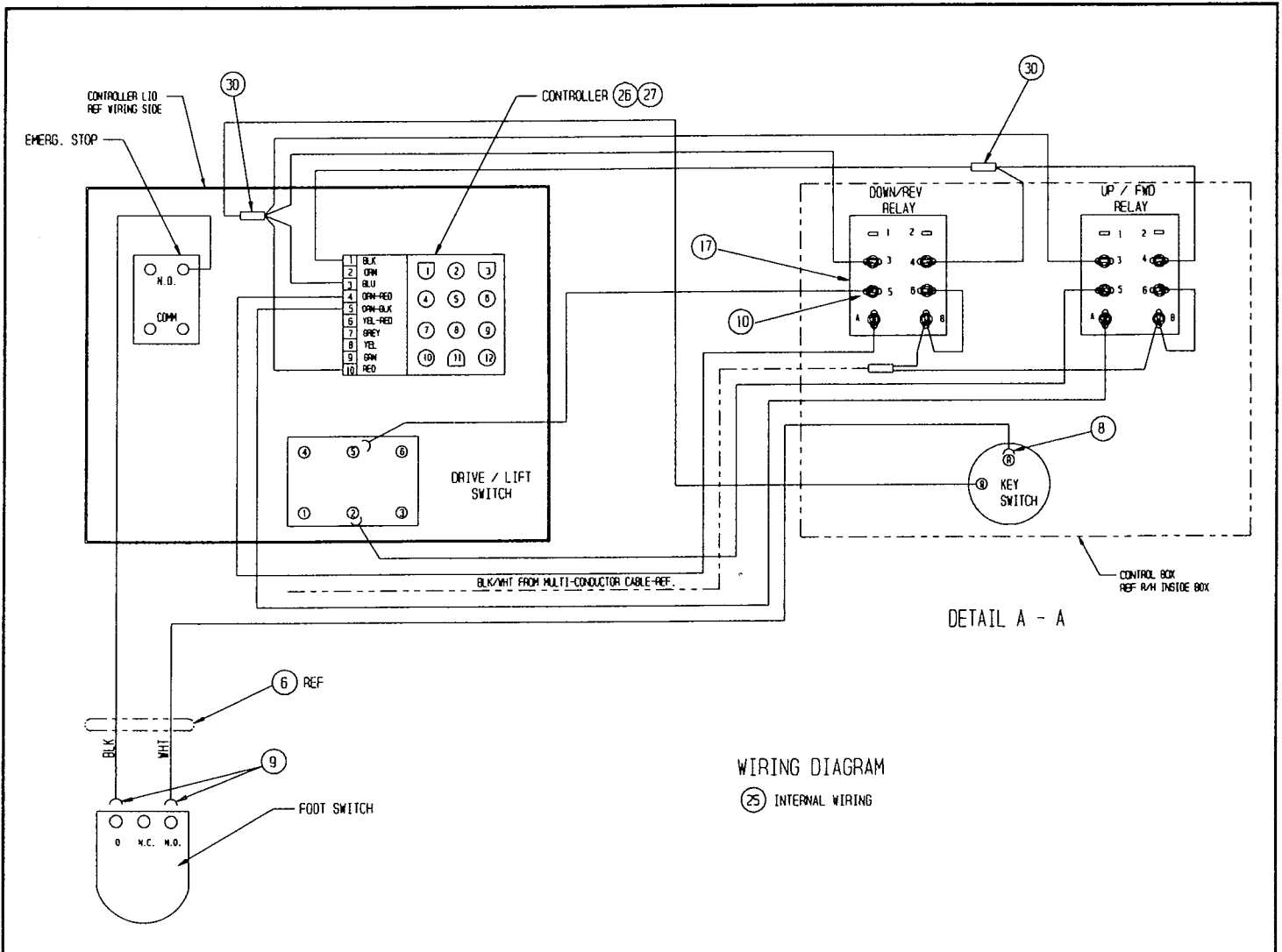
CONTROLLER ASSEMBLY, EUROPE

65009-001-00

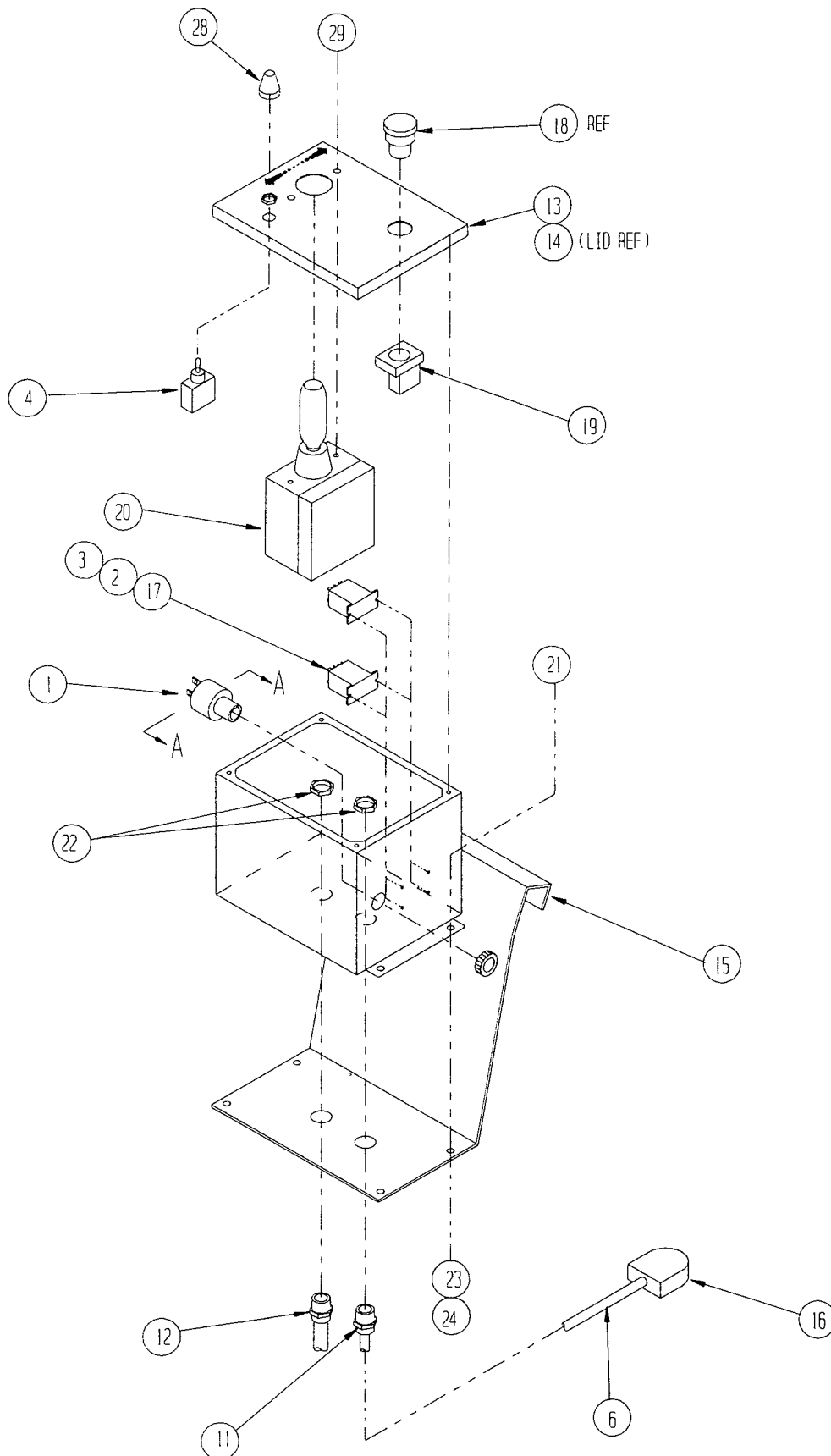
ITEM	PART	DESCRIPTION	QTY.
1	05440-000-00	KEYSWITCH	1
*	05442-000-00	KEY	1
2	11248-047-00	NUT LOCK HH ESNA 6-32 UNC	4
3	11715-004-00	SCREW MACH RD HD 6-32UNC X 1/2	4
4	15941-001-00	SWITCH, TOGGLE	1
6	29495-099-00	WIRE 14GA 3COND	6'
7	29601-013-00	CONN RING TERM 16-14 GA #10	3
8	29610-002-00	CONN FORK TERM 16-14GA #8	2
9	29610-003-00	CONN FORK TERM 12-10 GA #6	2
10	29616-001-00	CONN F PUSH TERM 16-14X.187 INS	8
11	29925-000-00	CONNECTOR, CABLE	1
12	29925-011-00	CONNECTOR, CABLE	1
13	63465-000-00	DECAL, CONTROLLER PROPORTIONAL	1
14	65238-001-00	CONTROLLER BOX EUROPE-SL14	1
15	63467-000-00	CONTROLLER HANGER	1

ITEM	PART	DESCRIPTION	QTY.
16	63906-000-00	SWITCH, FOOT	1
17	63951-002-00	RELAY	2
18	63968-001-00	PUSHBUTTON	1
19	63968-002-00	CONTACT BLOCK	2
20	63975-000-00	CONTROLLER	1
21	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	4
22	29939-002-00	LOCKNUT	2
23	11248-004-00	NUT HEX ESNA 1/4-20 UNC	4
24	11239-004-00	WASHER FLAT ASTM A325 1/4 DIA	4
25	29456-099-00	WIRE 16AWG THHN STRD COP YELLOW	3'
26	63956-003-00	PLUG	1
27	63956-002-00	PIN	9
28	29872-000-00	BOOT	1
29	11826-004-00	SCREW MACH RD HD 10-32UNF X 1/2	2
30	29620-003-00	CONN BUTT 12-10 GA INSL	3

*Not Shown



Illustrated Parts Breakdown



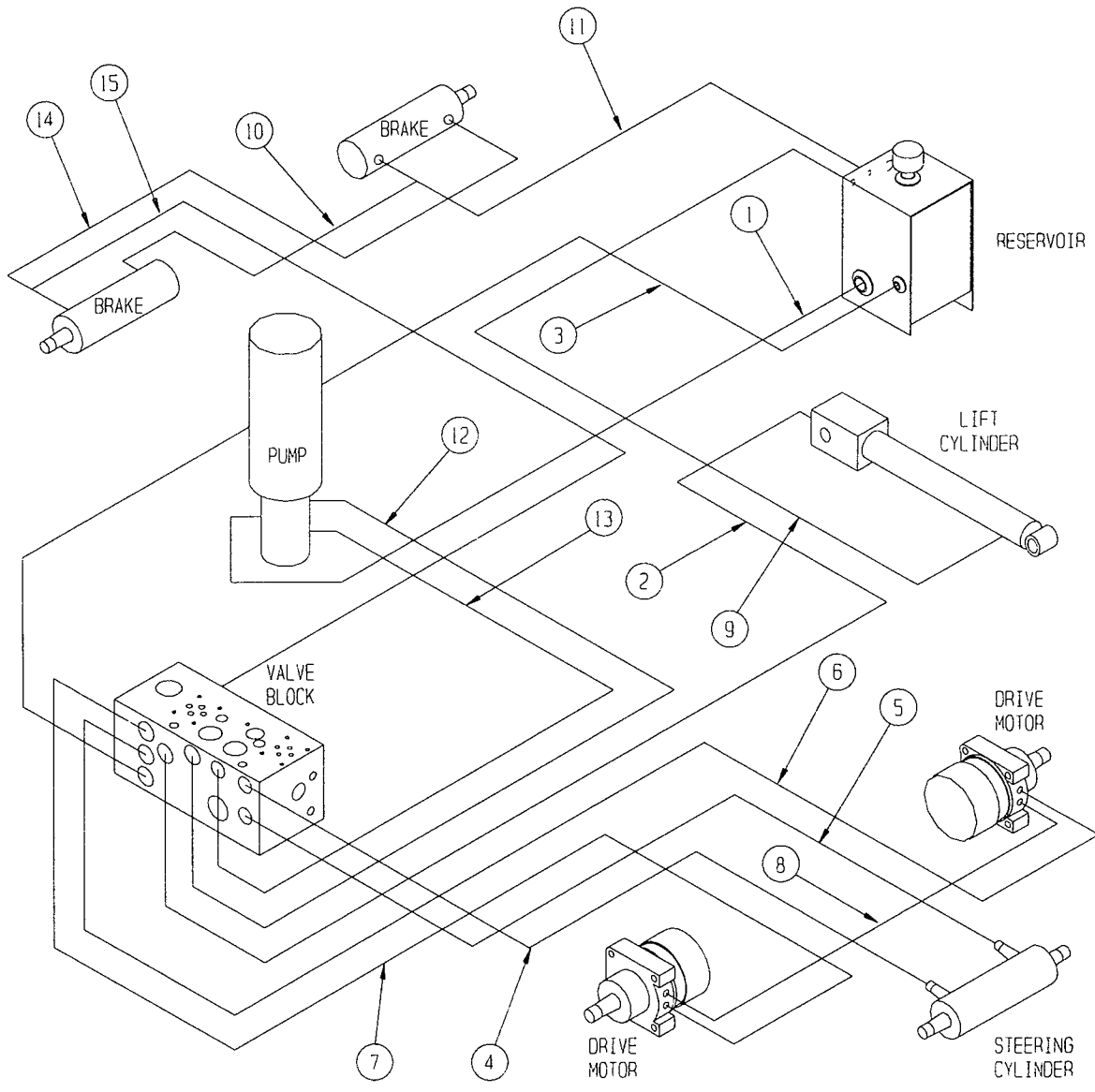
Illustrated Parts Breakdown

HOSE KIT/INSTALLATION

65012-000-00

ITEM	PART	DESCRIPTION	QTY.
1	61789-005-00	HOSE ASSEMBLY X 11 3/4	1
2	65216-002-00	HOSE ASSEMBLY X 45	1
3	65216-001-00	HOSE ASSEMBLY X 30	1
4	61351-035-00	HOSE ASSEMBLY X 55	1
5	61353-006-00	HOSE ASSEMBLY X 53	1
6	65236-001-00	HOSE ASSEMBLY X 69 1/2	1
7	65227-002-00	HOSE ASSEMBLY X 72	1
8	65227-003-00	HOSE ASSEMBLY X 42	1
9	62192-018-00	HOSE ASSEMBLY X 59	1
10	61351-036-00	HOSE ASSEMBLY X 10 1/2	1
11	61351-037-00	HOSE ASSEMBLY X 15	1
12	65233-001-00	HOSE ASSEMBLY X 20	1
13	65234-001-00	HOSE ASSEMBLY X 20	1
14	65234-003-00	HOSE ASSEMBLY X 18 1/2	1
15	65234-004-00	HOSE ASSEMBLY X 38	1

Illustrated Parts Breakdown



**Section
7.2**

Illustrated Parts Breakdown

DECAL KIT/INSTALLATION, DOMESTIC 65010-000-00

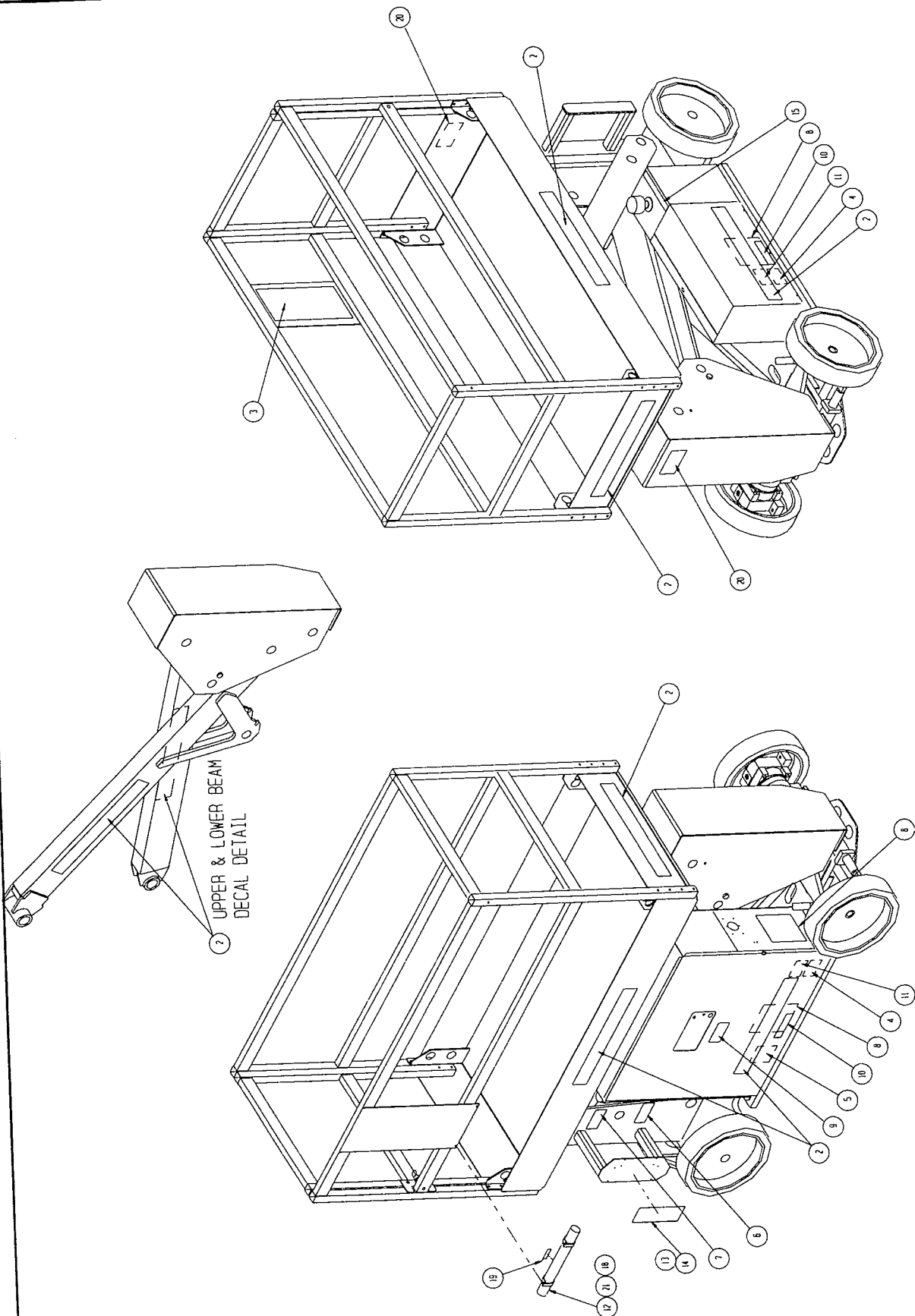
ITEM	PART	DESCRIPTION	QTY.
2	65091-000-00	DECAL SL-14 19-1/2 X 2-1/2	7
3	62560-000-00	DECAL-DANGER INSTRUCTIONS	1
4	62562-000-00	DECAL-DANGER BATTERIES	2
5	62561-000-00	DECAL-CAUTION RELIEF VALVE	1
6	05223-000-00	DECAL-EMERGENCY DOWN VALVE	1
7	61220-001-00	DECAL-ANSI REQUIREMENTS 1990	1
8	61214-000-00	DECAL-DANGER HYDROGEN GAS	3
9	27993-000-00	DECAL-LOWER PLATFORM	1
10	14222-003-99	DECAL - FORK LIFT HERE	2
11	05221-000-00	DECAL-BATTERY FLUID	2
12	65099-000-00	INSTRUCTION TUBE ASSY	1
*	03613-002-00	TUBE	1
*	03612-000-00	CAP, END	2
*	20398-012-00	CLAMP	2
13	61205-000-00	NAME PLATE	1
14	26551-009-00	RVT POP 1/8 .375-.500 GRIP	4
15	60197-000-00	DECAL-HYDRAULIC FLUID	1
18	60577-000-00	MANUAL A92.6 ANSI RESPONSABILITY	1
19	03610-000-00	DECAL- OPERATING INSTRUCTION STORAGE	1
20	65092-000-00	DECAL- MAX LOAD 660 LBS	2
21	60578-000-00	USER MANUAL, SL14	1

DECAL KIT/INSTALLATION, EUROPE 65010-001-00

ITEM	PART	DESCRIPTION	QTY.
2	65091-000-00	DECAL SL-14 19-1/2 X 2-1/2	7
12	65099-000-00	INSTRUCTION TUBE ASSY	1
*	03613-002-00	TUBE	1
*	03612-000-00	CAP, END	2
*	20398-012-00	CLAMP	2
13	61205-000-00	NAME PLATE	1
14	26551-009-00	RVT POP 1/8 .375-.500 GRIP	4
19	03610-000-00	DECAL- OPERATING INSTRUCTION STORAGE	1
21	60578-000-00	USER MANUAL, SL14	1

*Not Shown

Illustrated Parts Breakdown

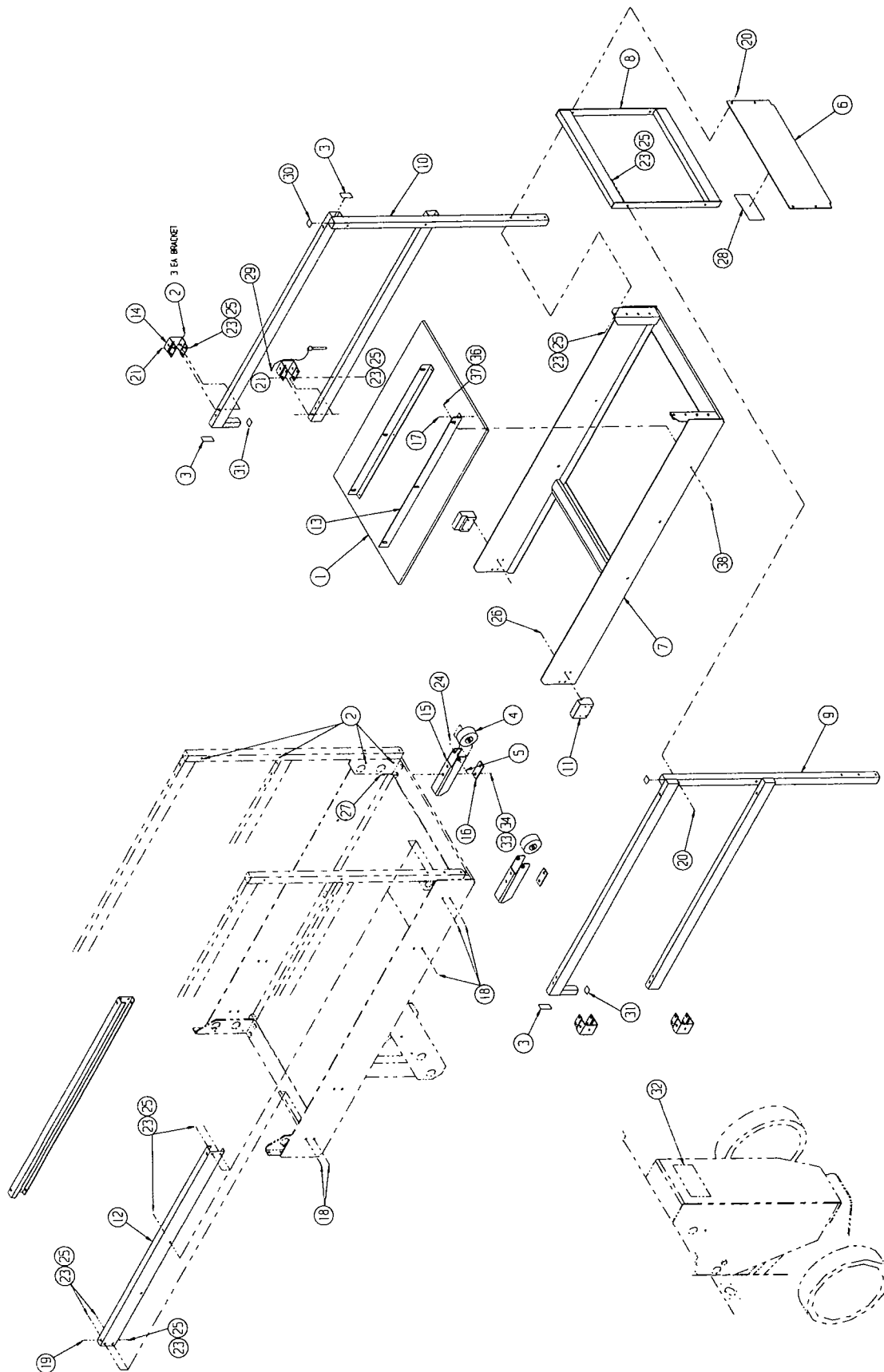


Illustrated Parts Breakdown

DECK EXTENSION OPTION, DOMESTIC 65200-000-00

ITEM	PART	DESCRIPTION	QTY.
1	24611-027-00	PLYWD 1/2	1
2	10080-006-00	CLIP, TREE	20
3	63926-002-00	PLUG, TUBING	8
4	63989-001-00	WHEEL	2
5	63990-001-00	AXLE	2
6	65110-000-00	TOEBOARD DECK EXT	1
7	65130-000-00	DECK EXTENSION WELDMENT	1
8	65137-000-00	RAIL WELDMENT	1
9	65138-000-00	RAIL RIGHT EXTENSION WELDMENT	1
10	65141-000-00	RAIL LEFT EXTENSION WELDMENT	1
11	65148-000-00	SLIDE BLOCK	2
12	65149-000-00	SIDE RAIL	2
13	65150-000-00	KEEPER	2
14	65153-000-00	SLIDE BRACKET	4
15	65154-000-00	ROLLER MOUNT	2
16	65155-000-00	DOUBLER	2
17	26553-007-00	RIVET POP 3/16D .376-500GRIP LF	6
18	11830-006-00	BOLT CARRIAGE GR5 5/16-18 X 3/4	10
19	11830-028-00	BOLT CARRIAGE GR5 5/16-18 X3-1/2	2
20	11253-016-00	SCREW HHC GR5 5/16-18UNC X 2	8
21	11253-024-00	SCREW HHC GR5 5/16-18UNC X 3	8
23	11240-005-00	WASHER FLAT STD 5/16	28
24	11240-008-00	WASHER FLAT STD 1/2	2
25	11248-005-00	NUT HEX ESNA 5/16-18 UNC	28
26	26527-008-00	SCREW 1/4 AB HEXSLOT SLFTAP X 1	8
27	11741-012-00	SCREW FLT HD SOC 3/8-16 X 1-1/2	4
28	05652-000-00	DECAL-MAX LOAD 250LBS	1
29	61786-000-00	LOCKING PIN ASSY-GUARDRAIL	1
30	63926-001-00	PLUG, TUBE	2
31	63926-003-00	PLUG TUBE 1"-SQ	2
32	61520-000-00	DECAL-MAX LOAD 550 LBS	2
33	11240-006-00	WASHER FLAT STD 3/8	4
34	11248-006-00	NUT HEX ESNA 3/8-16 UNC	4
36	11240-004-00	WASHER FLAT STD 1/4	6
37	11248-004-00	NUT HEX ESNA 1/4-20 UNC	6
38	11829-006-00	BOLT CARRIAGE 1/4-20UNC X 3/4	6

Illustrated Parts Breakdown



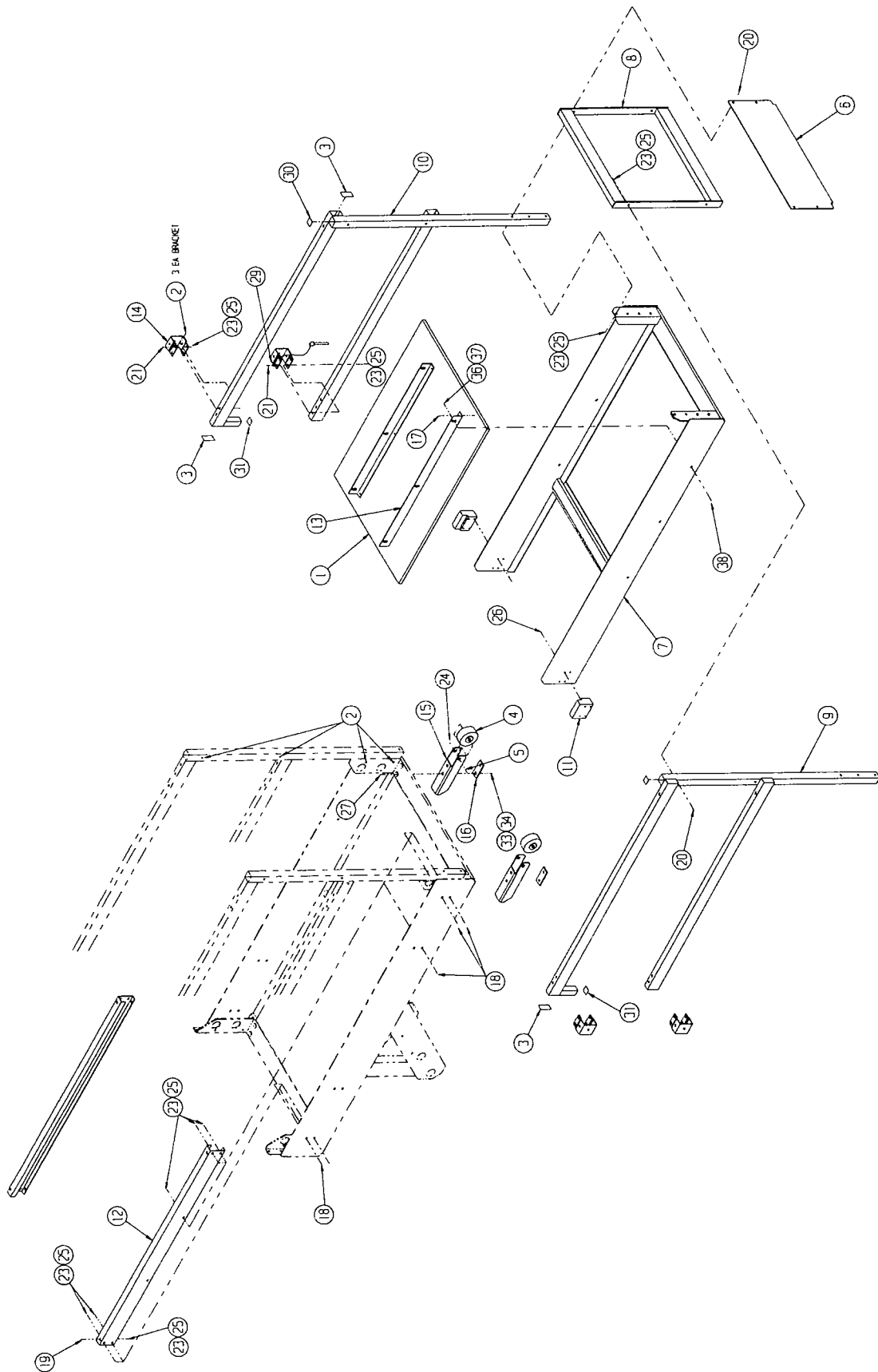
Illustrated Parts Breakdown

DECK EXTENSION OPTION, EUROPE

65200-001-00

ITEM	PART	DESCRIPTION	QTY.
1	24611-027-00	PLYWOOD 1/2	1
2	10080-006-00	CLIP, TREE	20
3	63926-002-00	PLUG, TUBING	8
4	63989-001-00	WHEEL	2
5	63990-001-00	AXLE	2
6	65110-000-00	TOEBOARD DECK EXT	1
7	65130-000-00	DECK EXTENSION WELDMENT	1
8	65137-000-00	RAIL WELDMENT	1
9	65142-000-00	RAIL RIGHT EXT. WELD. EUROPE	1
10	65143-000-00	RAIL LEFT EXT. WELD. EUROPE	1
11	65148-000-00	SLIDE BLOCK	2
12	65149-000-00	SIDE RAIL	2
13	65150-000-00	KEEPER	2
14	65153-000-00	SLIDE BRACKET	4
15	65154-000-00	ROLLER MOUNT	2
16	65155-000-00	DOUBLER	2
17	26553-007-00	RIVET POP 3/16D .376-.500GRIP LF	6
18	11830-006-00	BOLT CARRIAGE GR5 5/16-18 X 3/4	10
19	11830-028-00	BOLT CARRIAGE GR5 5/16-18 X3-1/2	2
20	11253-016-00	SCREW HHC GR5 5/16-18UNC X 2	8
21	11253-024-00	SCREW HHC GR5 5/16-18UNC X 3	8
23	11240-005-00	WASHER FLAT STD 5/16	28
24	11240-008-00	WASHER FLAT STD 1/2	2
25	11248-005-00	NUT HEX ESNA 5/16-18 UNC	28
26	26527-008-00	SCREW 1/4 AB HEXSLOT SLFTAP X 1	8
27	11741-012-00	SCREW FLT HD SOC 3/8-16 X 1-1/2	4
29	61786-000-00	LOCKING PIN ASSY-GUARDRAIL	1
30	63926-001-00	PLUG, TUBE	2
31	63926-003-00	PLUG TUBE 1"-SQ	2
33	11240-006-00	WASHER FLAT STD 3/8	4
34	11248-006-00	NUT HEX ESNA 3/8-16 UNC	4
36	11240-004-00	WASHER FLAT STD 1/4	6
37	11248-004-00	NUT HEX ESNA 1/4-20 UNC	6
38	11829-006-00	BOLT CARRIAGE 1/4-20UNC X 3/4	6

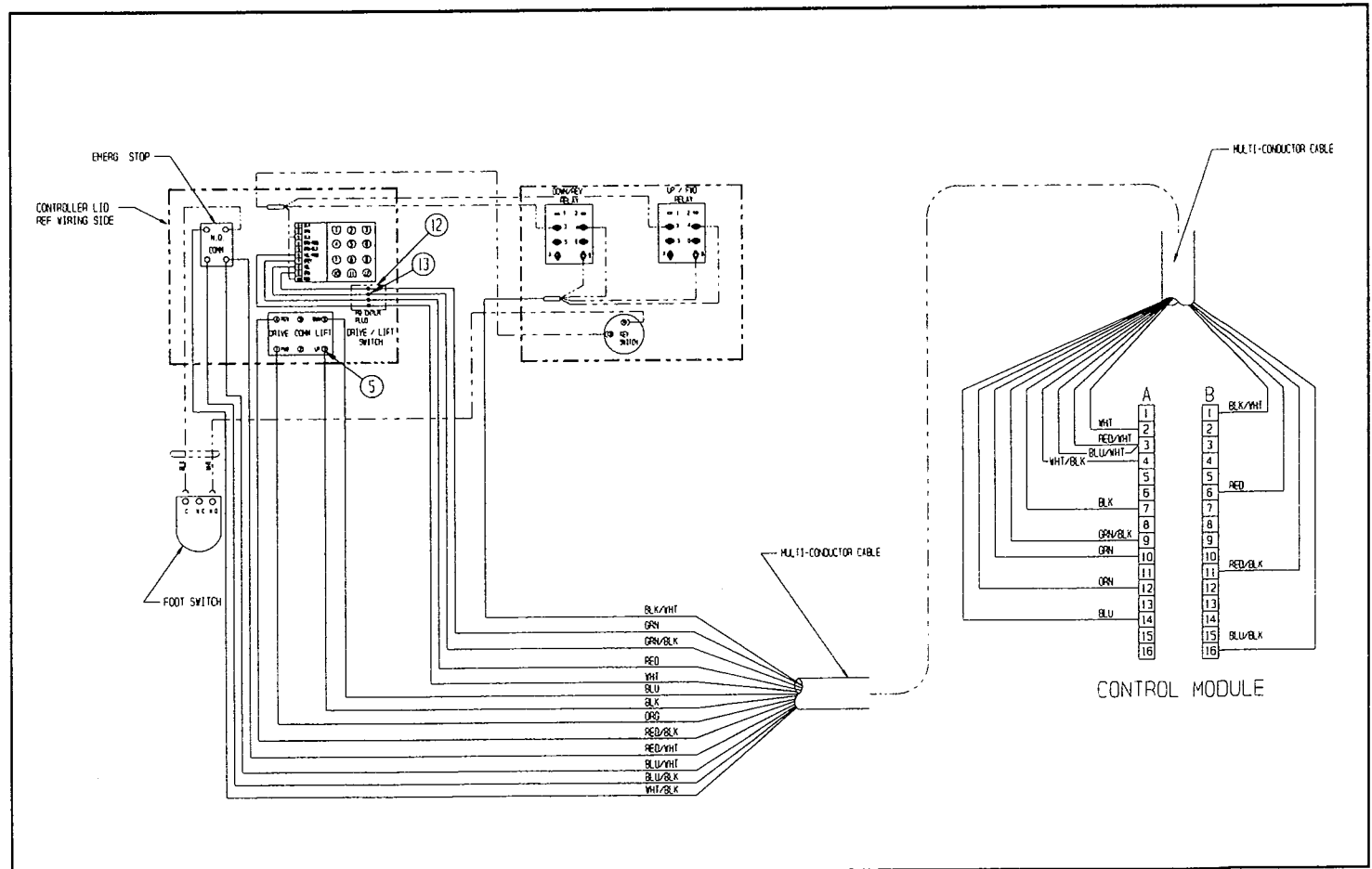
Illustrated Parts Breakdown



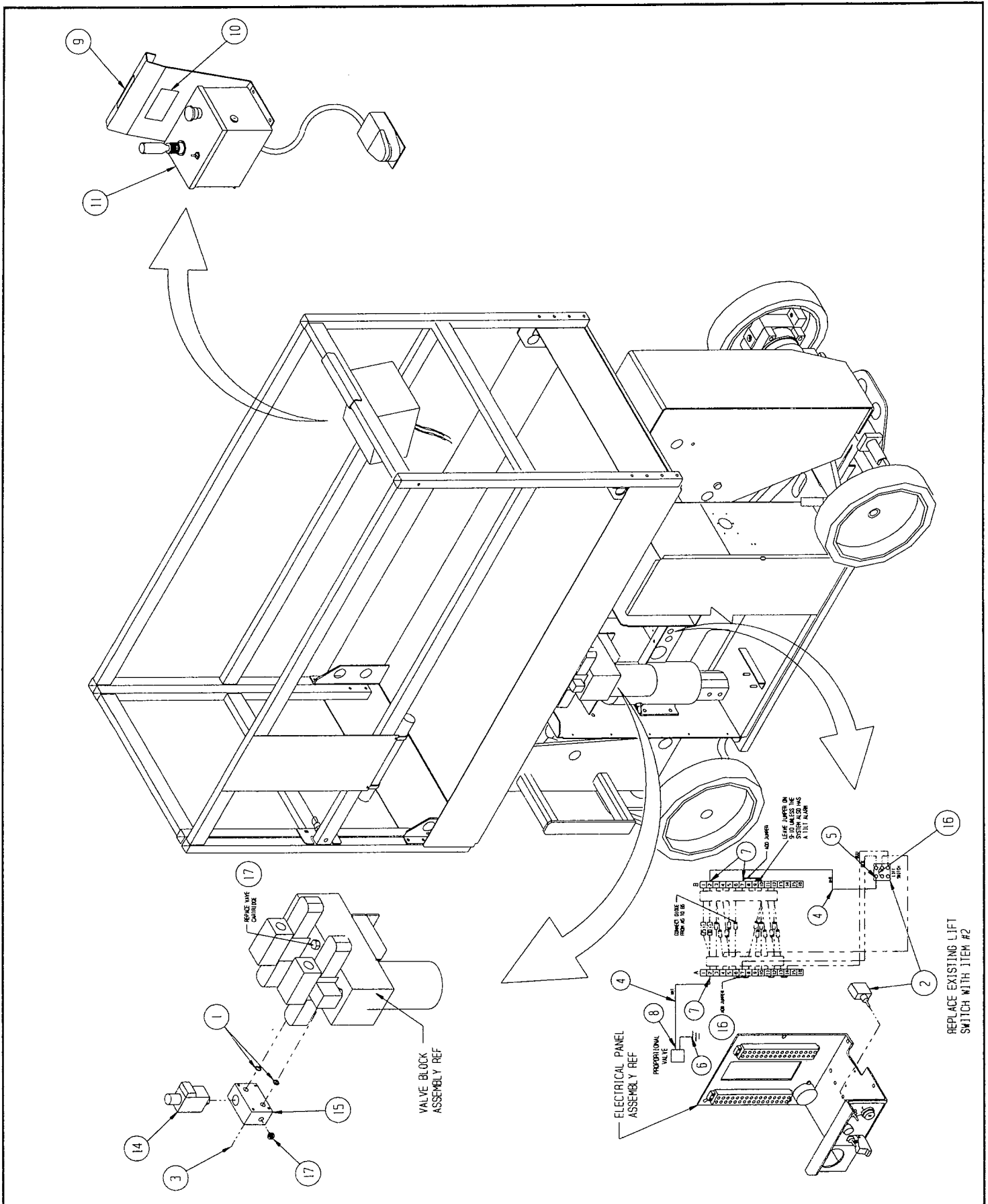
PROPORTIONAL CONTROLLER OPTION

65202-000-00

ITEM	PART	DESCRIPTION	QTY.
1	11979-008-00	O-RING	2
2	12798-001-00	SWITCH, TOGGLE	1
3	14412-016-00	SCREW SOC HD CAP 10-24 X 2	4
4	29451-099-00	WIRE 16AWG THHN STRD COP WHITE	3'
5	29601-013-00	CONN RING TERM 16-14 GA #10	2
6	29601-015-00	CONN RING TERM 16-14GA 3/8DIA	1
7	29610-001-00	CONN FORK TERM 22-18GA #6	4
8	29931-003-00	CONN F PUSH TERM 16-14GA .25T	2
9	61515-000-00	DECAL - LIFT HERE	1
10	61831-000-00	DECAL-BEFORE OPERATING	1
11	65009-001-00	CONTROLLER ASSY SL-14 EUROPE	1
12	63955-008-00	PLUG	1
13	63956-002-00	PIN	4
14	63986-002-00	VALVE PROPORTIONAL	1
15	65172-000-00	VALVE BLOCK	1
16	29932-002-00	TERM JUMPER	2
17	12004-004-00	PLUG	1



Illustrated Parts Breakdown

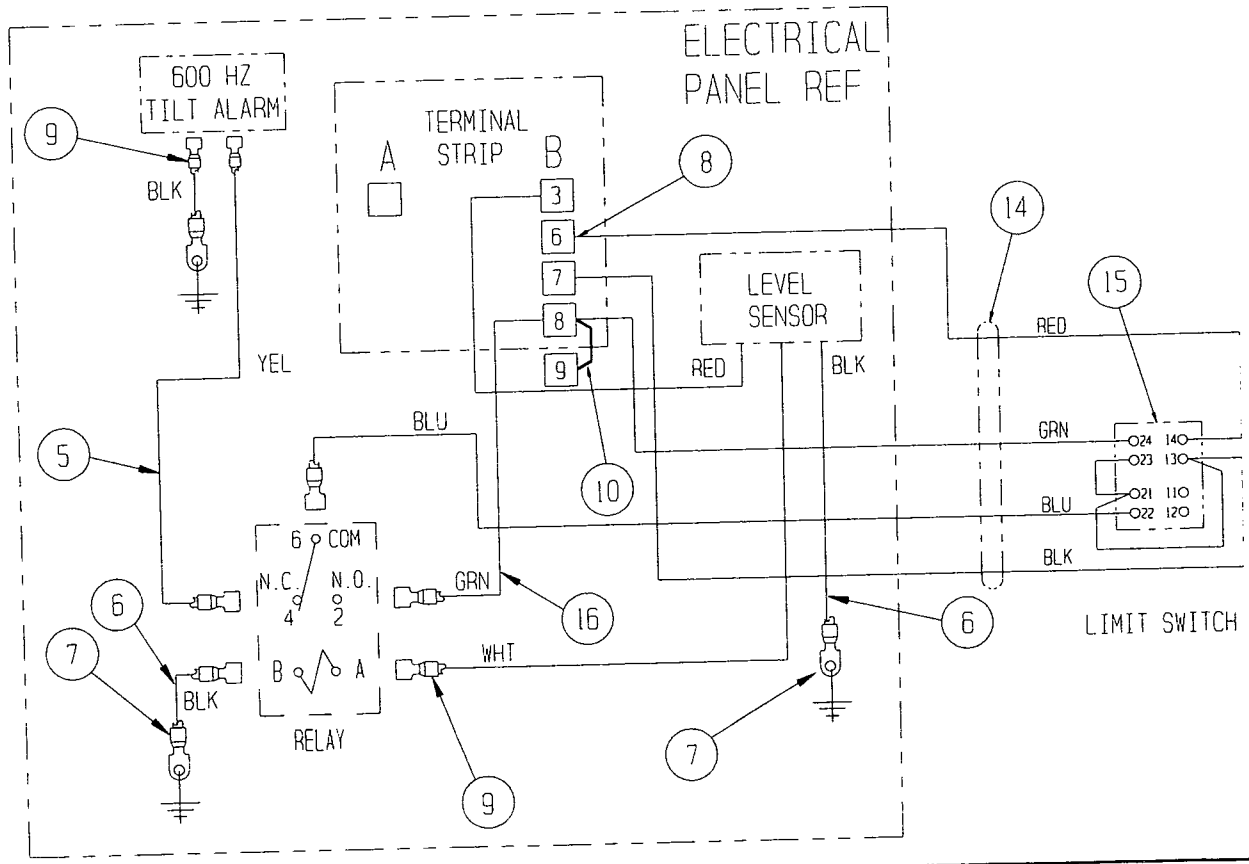
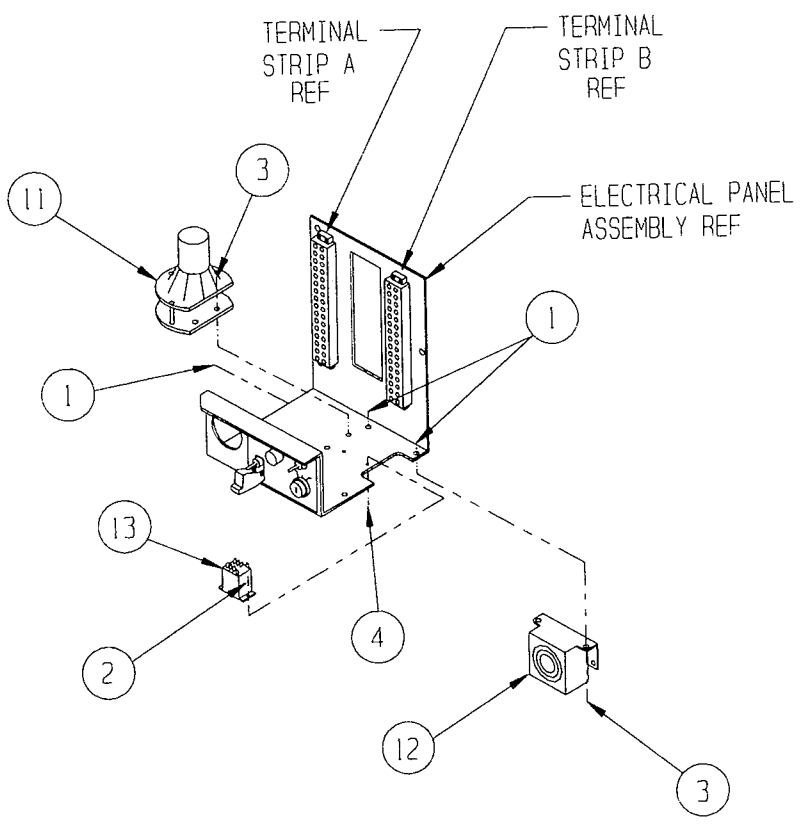


TILT ALARM OPTION

65203-000-00

ITEM	PART	DESCRIPTION	QTY.
1	11248-004-00	NUT HEX ESNA 1/4-20 UNC	4
2	11248-047-00	NUT LOCK HH ESNA 6-32 UNC	2
3	11252-006-00	SCREW HHC GR5 1/4-20UNC X 3/4	4
4	11715-008-00	SCREW MACH RD HD 6-32 UNC X 1	2
5	29456-099-00	WIRE 16AWG THHN STRD COP YELLOW	2'
6	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	3'
7	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	3
8	29610-001-00	CONN FORK TERM 22-18GA #6	4
9	29616-001-00	CONN F PUSH TERM 16-14X.187 INS	7
10	29932-002-00	TERM JUMPER	1
11	29945-006-00	LEVEL SENSOR	1
12	63779-001-00	ALARM 600HZ	1
13	63951-002-00	RELAY	1
14	29498-099-00	WIRE 16GA 4-COND	3'
15	15793-007-00	SWITCH,BODY	1
16	29457-099-00	WIRE 16AWG THHN STRD COP GREEN	2'

Illustrated Parts Breakdown



Illustrated Parts Breakdown

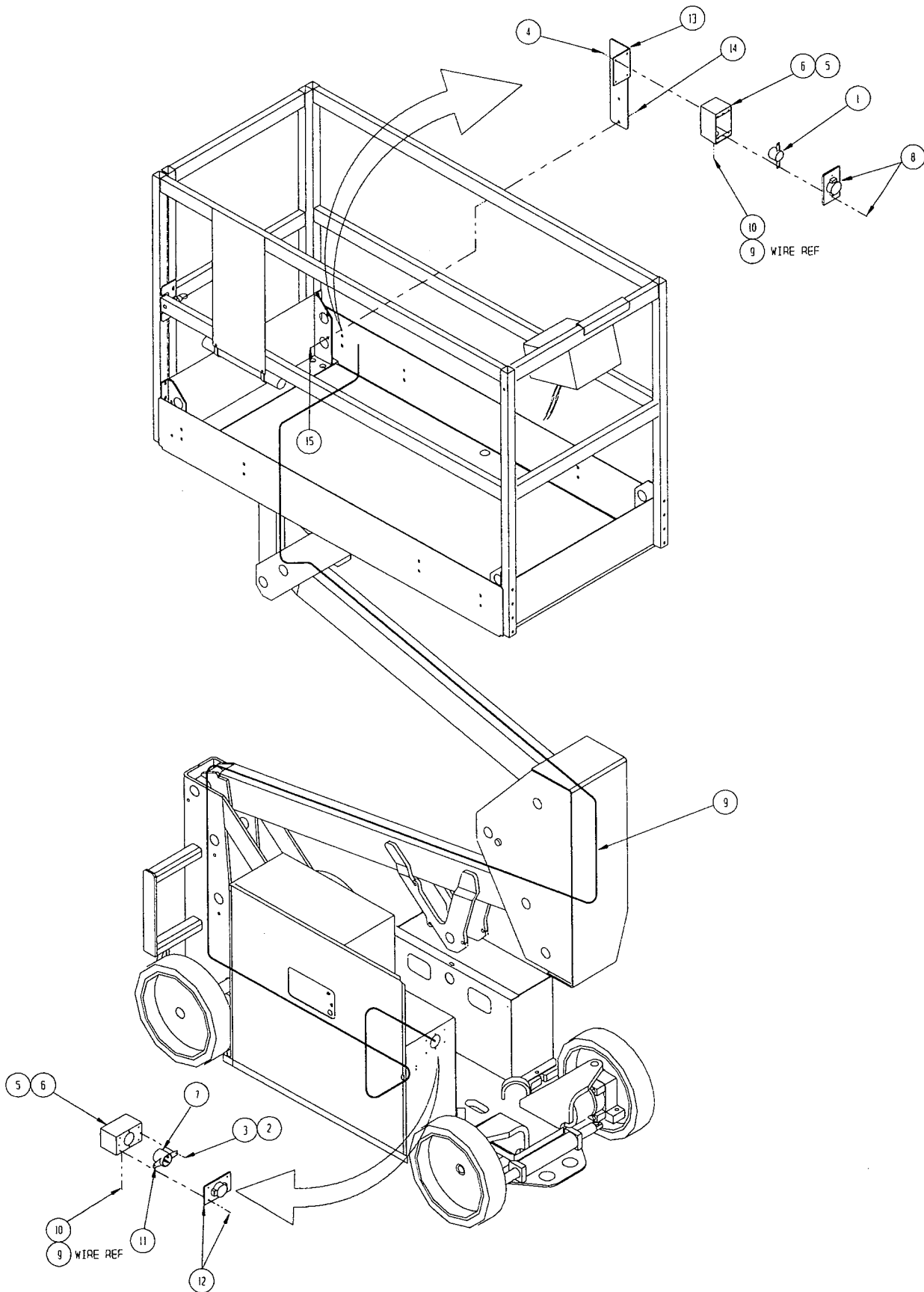
POWER TO PLATFORM OPTION

65204-000-00

ITEM	PART	DESCRIPTION	QTY.
1	08942-000-00	RECEPTACLE	1
2	11248-047-00	NUT LOCK HH ESNA 6-32 UNC	2
3	11715-004-00	SCREW MACH.RD HD 6-32UNC X 1/2	2
4	11811-006-00	SCREW SLFTP F HH 10-32UNF X 3/4	4
5	29925-000-00	STRAIN RELIEF	2
6	15769-000-00	BELL BOX	2
7	15788-000-00	SUB PLATE	1
8	26611-002-00	COVER, BOX	1
9	29495-099-00	WIRE 14GA 3 COND	36'
10	29925-000-00	CONNECTOR, CABLE	2
11	29961-000-00	INLET FLANGE, MALE	1
12	29962-000-00	COVER, ELEC. BOX	1
13	65228-000-00	POWER TO PLATFORM BRACKET	1
14	11830-006-00	BOLT CARRIAGE GR5 5/16-18 X 3/4	2
15	11248-005-00	NUT HEX ESNA 5/16-18 UNC	2

Illustrated Parts Breakdown

Section
7.2



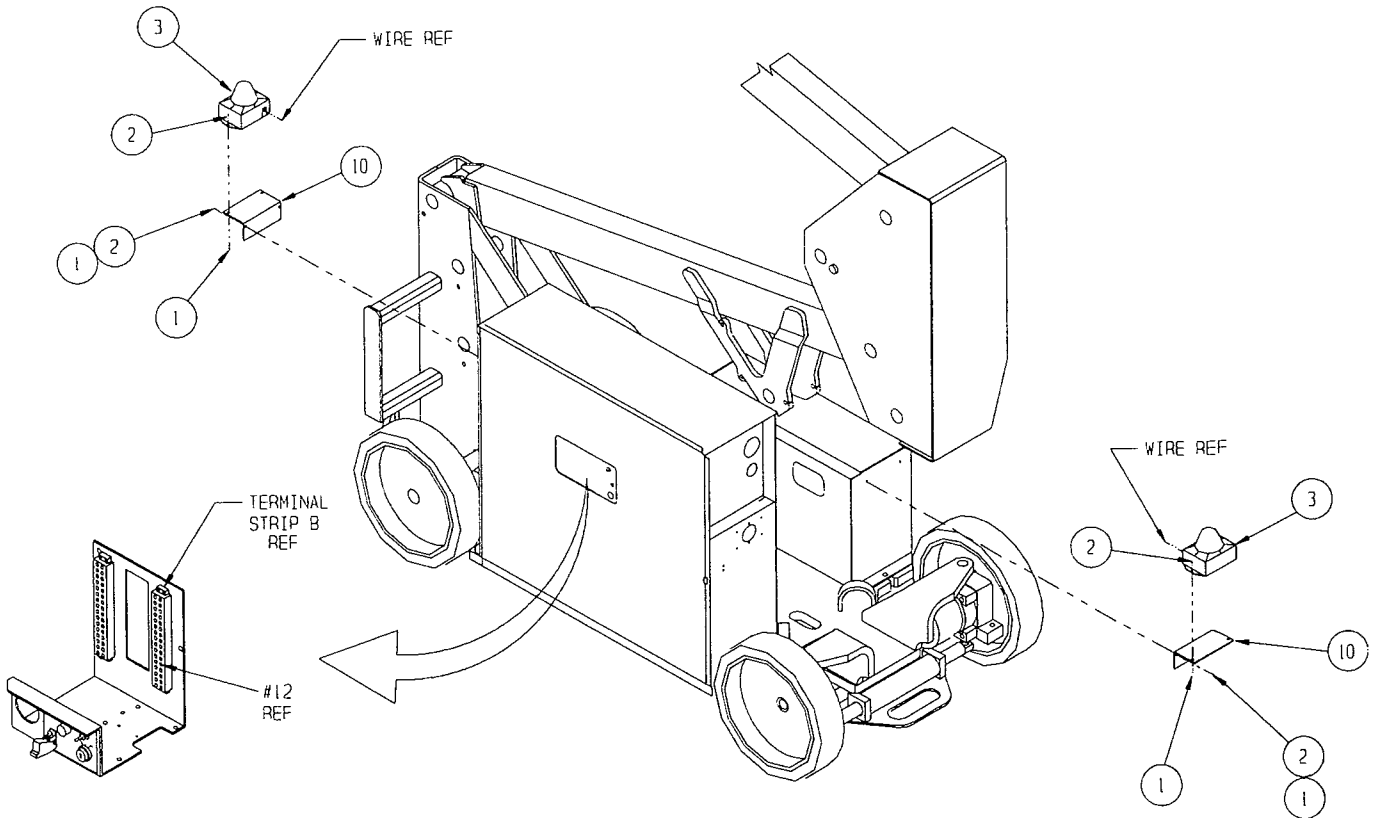
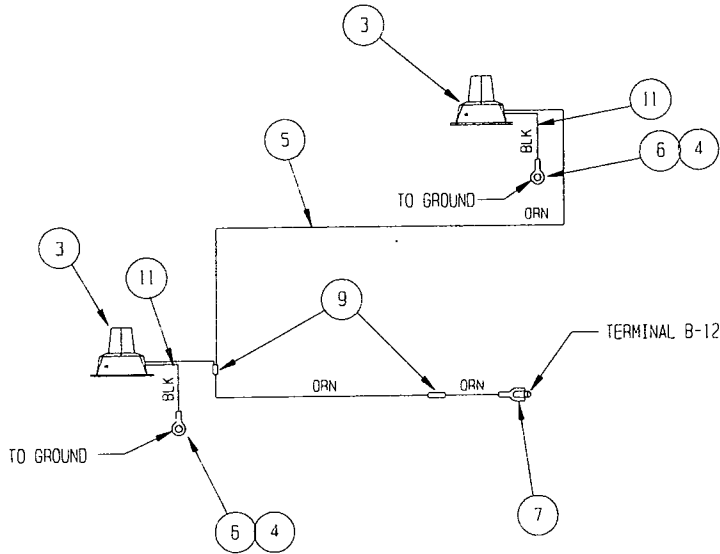
Illustrated Parts Breakdown

FLASHING AMBER LIGHT OPTION

65205-000-00

ITEM	PART	DESCRIPTION	QTY.
1	11249-003-00	NUT HEX ESNA 10-32 UNF	8
2	11826-008-00	SCREW MACH RD HD 10-32UNF X 1	8
3	12848-004-00	LIGHT, FLASHING	2
4	25626-004-00	SCREW, SELF TAP 10-32 X 1/2	2
5	29453-099-00	WIRE 16AWG THHN STRD COP ORANG	9'
6	29601-013-00	CONN RING TERM 16-14 GA #10	2
7	29610-001-00	CONN FORK TERM 22-18GA #6	1
9	29620-002-00	CONN BUTT 16-14 GA INSL	2
10	63193-000-00	BRACKET, LIGHT MOUNT	2
11	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	1'

Illustrated Parts Breakdown



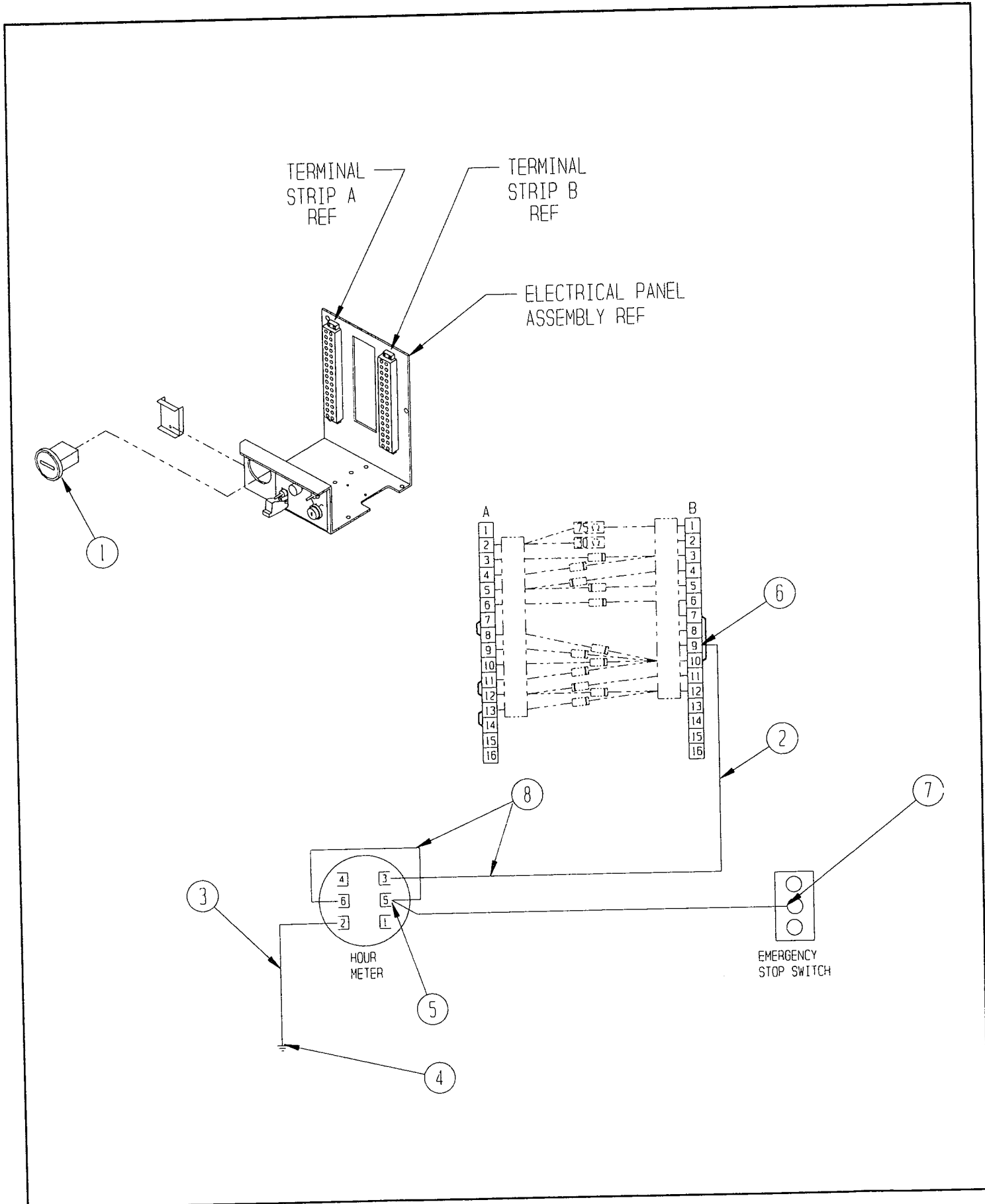
Illustrated Parts Breakdown

HOURMETER OPTION

65208-000-00

ITEM	PART	DESCRIPTION	QTY.
1	29959-000-00	HOURMETER/LOW VOLTAGE INDICATOR	1
2	29451-099-00	WIRE 16AWG THHN STRD COP WHITE	1'
3	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	.4'
4	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	1
5	29616-001-00	CONN F PUSH TERM 16-14X.187 INS	4
6	29610-001-00	CONN FORK TERM 16-14 GA #6	1
7	29601-013-00	CONN RING TERM 16-14 GA #10	1
8	29454-099-00	WIRE 16 AWG THHN STRD COP RED	.5'

Illustrated Parts Breakdown



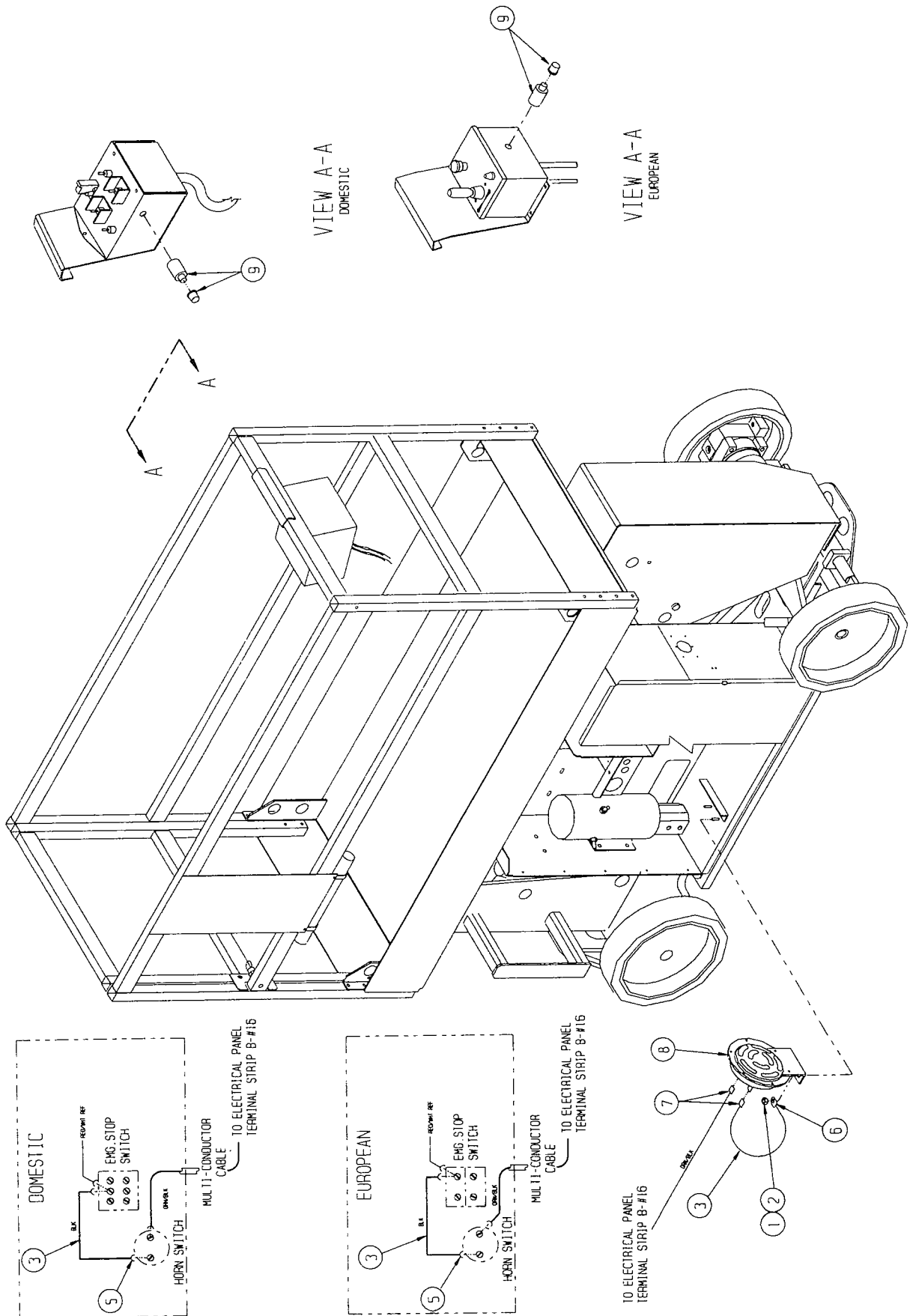
Illustrated Parts Breakdown

HORN OPTION

65201-000-00

ITEM	PART	DESCRIPTION	QTY.
1	11240-004-00	WASHER FLAT STD 1/4	2
2	11248-004-00	NUT HEX ESNA 1/4-20 UNC	2
3	29452-099-00	WIRE 16AWG THHN STRD COP BLACK	1'
5	29610-002-00	CONN FORK TERM 16-14GA #8	3
6	29601-014-00	CONN RING TERM 16-14GA 1/4DIA	1
7	29615-002-00	CONN F PUSH TERM 14-16GA .187T	2
8	29958-000-00	HORN 24V	1
9	63917-000-00	SWITCH, PUSH BUTTON	1

Illustrated Parts Breakdown

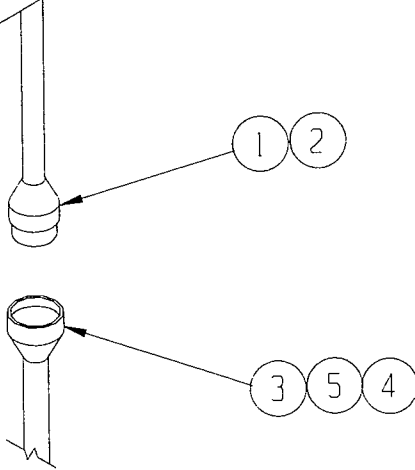
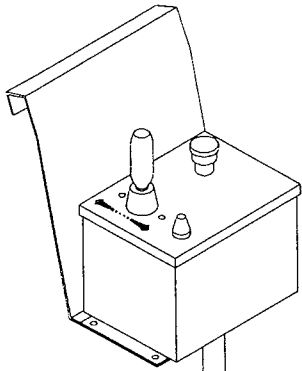


REMOVABLE CONTROLLER OPTION

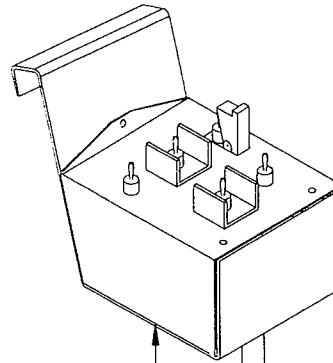
65207-000-00

ITEM	PART	DESCRIPTION	QTY.
1	28800-003-00	CONNECTOR PLUG	1
2	28800-004-00	PIN CONTACT	15
3	28800-005-00	SOCKET	15
4	28800-015-00	SEALING PLUG	8
5	28800-016-00	CONNECTOR RECEPTACLE	1

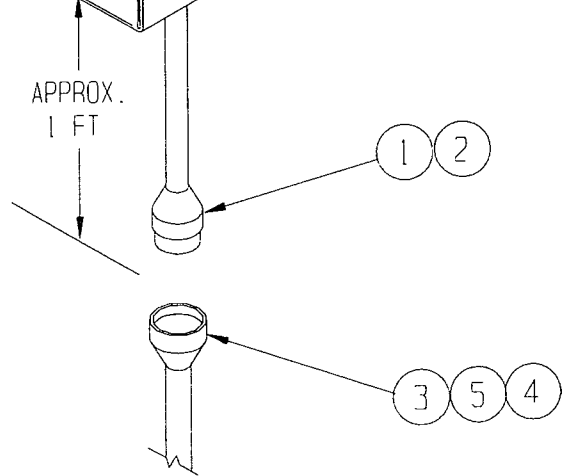
Illustrated Parts Breakdown



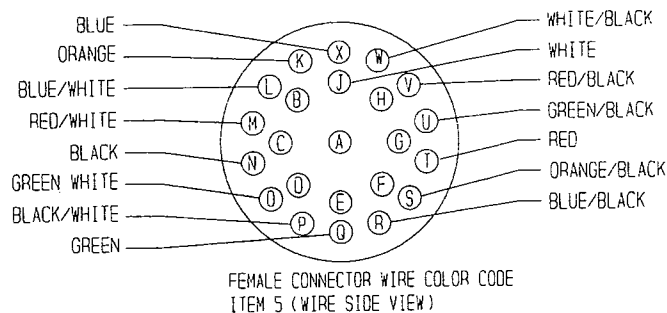
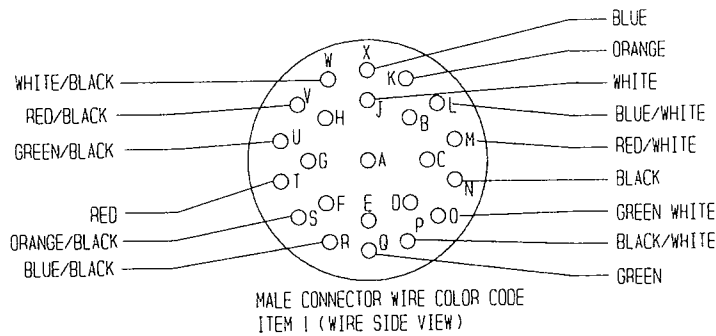
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