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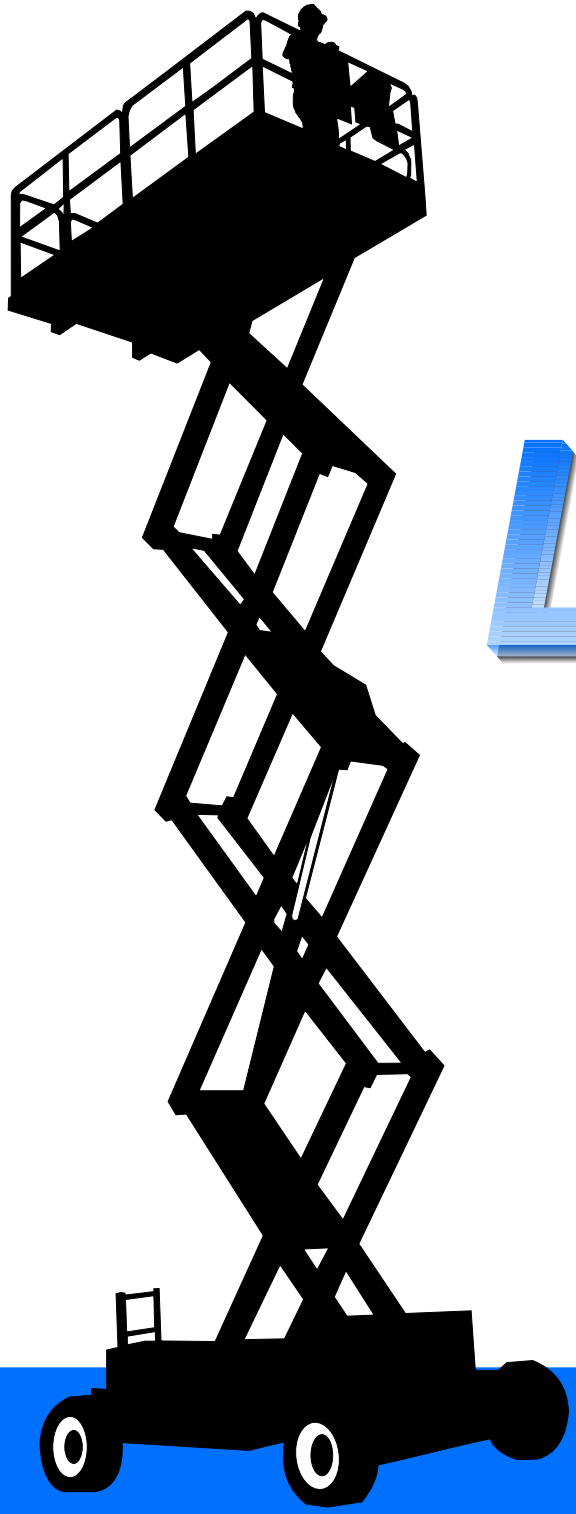


LX31/41

WORK PLATFORMS

Service & Parts Manual

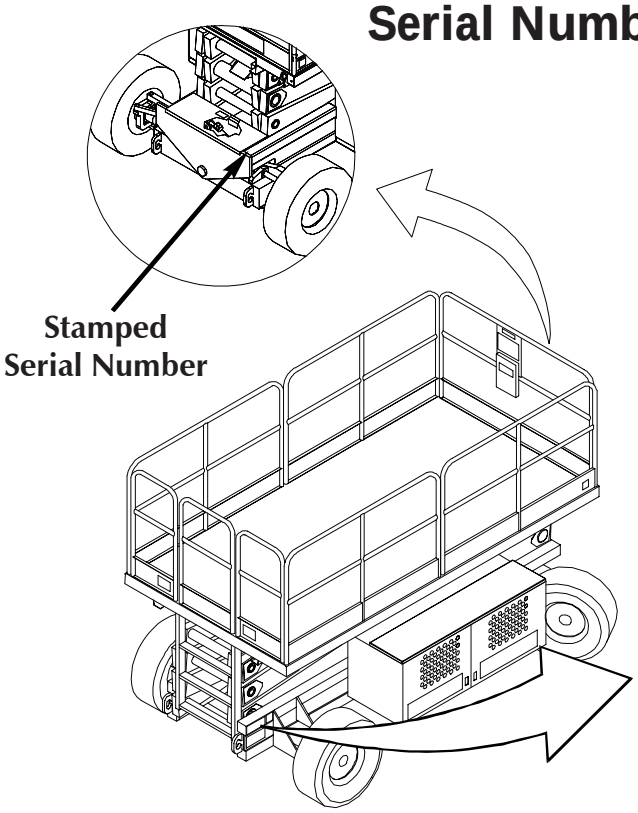
Publication Number 067904-000

SERVICE & PARTS MANUAL

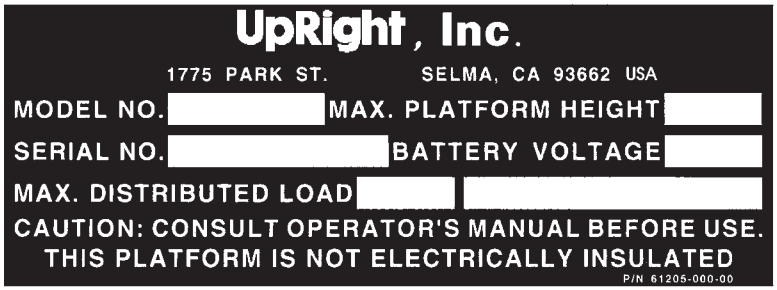
LX 31/41

Gasoline, Dual Fuel, and Diesel 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 top of the chassis above the front axle pivot.



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Foreword

Introduction

HOW TO USE THIS MANUAL

This manual is divided into 7 sections. The right hand pages 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 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

⚠ DANGER ⚠

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

NOTES: Give helpful information.

WORKSHOP PROCEDURES

CAUTION: Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause personal injury, or could damage a machine or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Up-Right, 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.

NOTES

Table of Contents

Contents

Table of Contents (cont.)

Contents

Section i

Table of Contents (cont.)

List of Illustrations

Contents

List of Illustrations

List of Tables

1.0 Introduction

PURPOSE

The purpose of this service and parts manual is to provide instructions and illustrations for the operation and maintenance of the LX 31/41 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

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

Platform

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

⚠ WARNING ⚠

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

Controller

The controller contains the controls to operate the machine. It should be hung on the front, left, or right guardrail, but may be hand held if necessary. To operate the machine, the interlock lever must be depressed to operate any function. A complete explanation of control functions can be found in *Section 3*.

Elevating Assembly

The platform is raised and lowered by the elevating assembly; a three (LX 31), or four (LX41) section scissor assembly powered by a single stage lift cylinder. The hydraulic pump, driven by the engine, powers the cylinder. Solenoid operated valves control raising and lowering.

Power Module

The power module contains the engine, hydraulic pump, hydraulic reservoir, and starter solenoid.

Control Module

The control module contains the L.P. bottle and/or fuel tank, hydraulic valve manifold, horn/alarms, volt/hour meter, electrical terminal strips, battery, and chassis control panel. A complete explanation of the chassis control functions is found in *Section 3*.

Chassis

The chassis is a structural frame that supports all the components of the LX 31/41 Work Platform.

PURPOSE OF EQUIPMENT

The objective of the LX 31/41 Work Platform is to provide a quickly deployable, self propelled, variable height work platform to elevate personnel and materials to overhead work areas and be driven over rough terrain (4WD model only).

SPECIAL LIMITATIONS

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

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

Four wheel models: driving while elevated is limited to flat surfaces only. Any degree of pitch in the front axle will lockout the drive, and axle floating circuits when elevated.

⚠ 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.

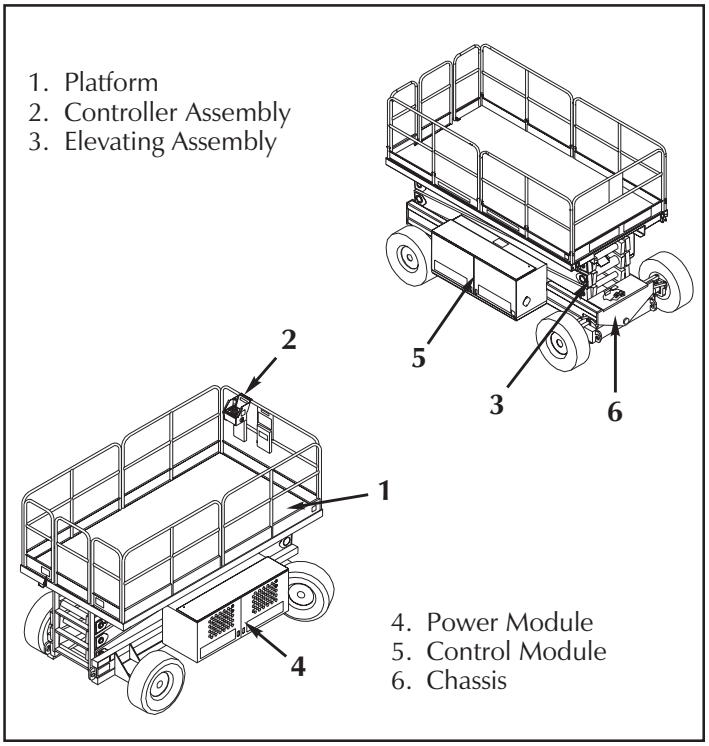


Figure 1-1: LX 31/41 Work Platform

1.2 Specifications

Table 1-1: Specifications

ITEM	LX31	LX41
Platform Size (Inside Toeboards)		
Standard	143.38 in. x 70 in. [3.64 m x 1.78 m]	143.38 in. x 70 in. [3.64 m x 1.78 m]
w/ Extension	179.38 in. x 68 in. [4.56 m x 1.73 m]	179.38 in. x 68 in. [4.56 m x 1.73 m]
Max. Platform Capacity		
Standard	2000 lbs. [907 kg]	1,500 lbs. [680 kg]
w/ Extension	2000 lbs. [907 kg]	1,500 lbs. [680 kg]
on Extension	500 lbs. [227 kg]	500 lbs. [227 kg]
Max. No. of occupants		
Standard	8 people	6 people
on Extension	2 people	2 people
Height		
Working Height	37 ft. [11.28 m]	47 ft. [14.33 m]
Max. Platform Height	31 ft. [9.45 m]	40 ft. 6 in. [12.34 m]
Min. Platform Height	56.25 in. [1.43 m]	65.25 in. [1.66 m]
Dimensions		
Weight, Standard	2WD: 9,220 lbs. [4,182 kg] 4WD: 9,580 lbs. [4,345 kg]	2WD: 10,560 lbs. [4,790 kg] 4WD: 10,920 lbs. [4,953 kg]
w/ Extension	2WD: 9,650 lbs. [4,377 kg] 4WD: 10,010 lbs. [4,540 kg]	2WD: 10,990 lbs. [4,985 kg] 4WD: 11,350 lbs. [5,148 kg]
Overall Width	90 in. [2.29 m]	90 in. [2.29 m]
Overall Height	99.75 in. [2.53 m]	108.75 in. [2.76 m]
Overall Length, Standard	160.5 in. [4.08 m]	160.5 in. [4.08 m]
Driveable Height	31 ft. [9.45 m]	40 ft. 6 in. [12.34 m]
Surface Speed		
Platform Lowered	0 to 3.1 mph [0 to 5.0 km/h]	0 to 3.1 mph [0 to 5.0 km/h]
Platform Raised	0 to 0.3 mph [0 to .48 km/h]	0 to 0.3 mph [0 to .48 km/h]
System Voltage	12 Volt DC	12 Volt DC
Hydraulic Tank Capacity	28.3 Gallons [107.13 l]	28.3 Gallons [107.13 l]
Maximum Hydraulic System Pressure	3000 psi [206.8 bar]	3000 psi [206.8 bar]
Hydraulic Fluid		
Normal Use (>32 °F [0 °C])	ISO #46	ISO #46
Low Temp. Use (-10 to 32 °F [-23 to 0 °C])	5W-20 Motor Oil	5W-20 Motor Oil
Lift System	One Single Stage Lift Cylinder	One Single Stage Lift Cylinder
Lift Speed	Raise, 40 sec./Lower, 60 sec.	Raise, 45 sec./Lower, 65 sec.
Platform Leveling	8.5° (12in. [.3m]) Side/Side, 6° (12in. [.3m]) Fore/Aft	8.5° (12in. [.3m]) Side/Side, 6° (12in. [.3m]) Fore/Aft
Power Source	Diesel or Gasoline 20 HP Kubota, 3 Cylinder, Water Cooled Engine	Diesel or Gasoline 20 HP Kubota, 3 Cylinder, Water Cooled Engine
Drive Control	Proportional	Proportional
Control System	Joystick Controller with Interlock Lever and Thumb Rocker Steering; Speed & Function Selector Switches and Emergency Stop Button	Joystick Controller with Interlock Lever and Thumb Rocker Steering; Speed & Function Selector Switches and Emergency Stop Button
Horizontal Drive	2WD: 2 Wheel, Hyd. Motors 4WD: 4 Wheel, Hyd. Motors	2WD: 2 Wheel, Hyd. Motors 4WD: 4 Wheel, Hyd. Motors
Tires	10-16.5 NHS 8 Ply, 50psi [3.4 bar]	10-16.5 NHS 8 Ply, 50psi [3.4 bar]
Parking Brakes	Two, Spring Applied, Hydraulic Release, Multiple Disc	Two, Spring Applied, Hydraulic Release, Multiple Disc
Turning Radius (inside)	48 in. [1.22 m]	48 in. [1.22 m]
Maximum Gradeability	2WD: 30% [16.7°] 4WD: 35% [19.3°]	2WD: 30% [16.7°] 4WD: 35% [19.3°]
Wheel Base	115.75 in. [2.94 m]	115.75 in. [2.94 m]
Guardrails	43.5 in. [1.1 m] high, Fold Down with Gate	43.5 in. [1.1 m] high, Fold Down with Gate
Toeboard	6 in. [152 mm] High	6 in. [152 mm] High

NOTE: Specifications subject to change without notice.

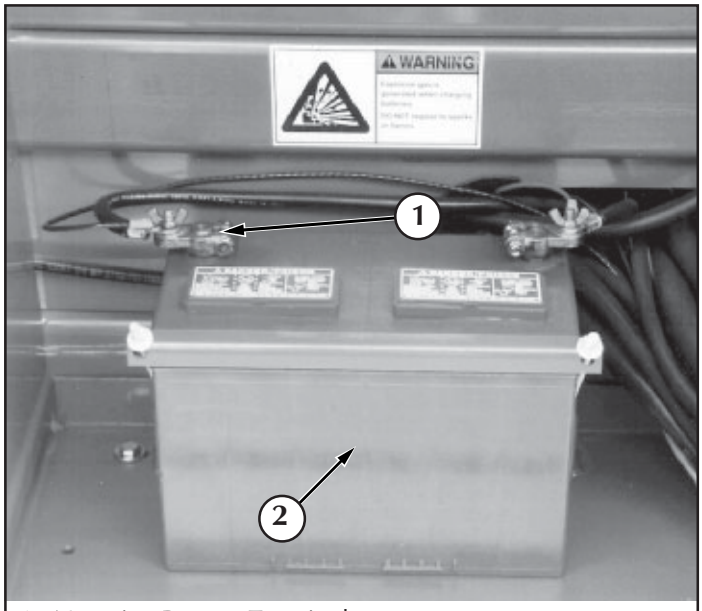
NOTE: Read and familiarize yourself with all operating instructions before attempting to operate the LX 31/41 Work Platform.

2.1 Preparation for Use

⚠ CAUTION ⚠

STAND CLEAR when cutting the metal banding to avoid being cut if 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 to the negative (-) battery terminal in power module (Figure 2-1).



1. Negative Battery Terminal
2. Battery

Figure 2-1: Battery

2.2 Transporting Work Platform

By Crane

1. Secure straps to chassis tie down/lifting lugs only (Figure 6).

By Truck

1. Maneuver the work platform into transport position and chock wheels.
2. Secure the work platform to the transport vehicle with chains or straps of adequate load capacity attached to the chassis tie down/lifting lugs (Figure 6).

⚠ CAUTION ⚠

Overtightening of chains or straps through tie down lugs may result in damage to work platform.

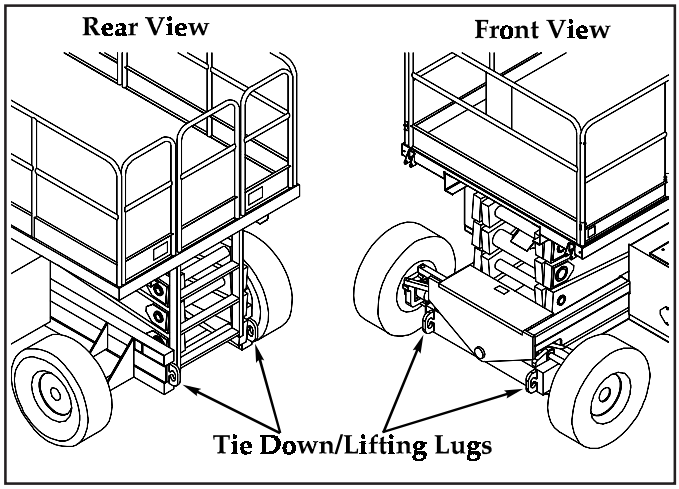


Figure 2-2: Transporting Work Platform

2.4 Preparation for Shipment

1. Grease all the grease fittings (see *Section 4.4*).
2. Fully lower the platform.
3. Disconnect the battery negative (-) lead from the battery terminal (Figure 2-1).
4. Band the controller to the front guardrail.
5. Band the elevating linkage to the frame.

2.5 Storage

No preparation for storage is required when the work platform is in normal usage. Regular maintenance procedures should continue to be performed (see Figure 4-1 and 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.
5. Service the engine according to the manufacturers recommendations.

BATTERY

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

3.0 Introduction

GENERAL FUNCTIONING

Closing the Upper and Lower Emergency Stop Switches, selecting **PLATFORM (OR CHASSIS)** controls at the Chassis/Platform Switch, starting the engine by turning the Key Switch, and closing the Trigger Switch, will energize the Power Relay (closing the circuit to the Engine Ignition System (or diesel run solenoid), to the Fuel Shut Off Solenoid, to the Fuel Pump, to the Fuel Solenoid, and to the Function Relays), and the Throttle Relay (increasing the Engine R.P.M.). This will turn the Pump providing oil flow under pressure to operate all of the functions of the work platform.

DRIVING

With Platform lowered

Selecting **HIGH SPEED** at the Torque Switch, **DRIVE** at the Drive Lift Switch, and pushing the Control Handle **FORWARD** or **REVERSE** will energize the Forward (or Reverse) Relay, Forward (or Reverse) Solenoid Valve, Platform Down Relay, Cutout Relay, Drive Relay (illuminating the Drive Enable Indicator, if equipped), Series/Parallel Relay, Series/Parallel Solenoid Valves, Shunt Solenoid Valve (4WD), Axle Float Relay (4WD), Axle Float Solenoid Valve (4WD), Joystick High Speed Enable circuit (selecting high speed range), and the Proportional Valve. This will allow oil pressure to unseat the Pilot Check Valves in the Axle Float Cylinder (allowing the Front Axle to float), allow oil to flow through the Proportional Valve (regulating the speed to a rate which is proportional to the angle of Control Handle deflection), through the Forward Valve and the Brake Shuttle Valve to the Brake Cylinder (releasing the brakes), through the Series/Parallel Valves (directing the oil flow in series to the rear Drive Motors), through the Shunt Valve (bypassing the front Drive Motors), through the Reverse Counterbalance Valve (preventing downhill runaway), through the Reverse Valve, and back to the Hydraulic Reservoir.

Selecting **HIGH TORQUE** at the Torque Switch, cuts power to the Series/Parallel Relay, the Series/Parallel Valves, or the Shunt Valve. This allows oil to flow in parallel to the front two Drive Motors, and the rear two Drive Motors which reduces the speed while increasing the torque of the drive function.

Machines equipped with outriggers must have them completely retracted (see ***Leveling the Platform***).

With Platform elevated

With the Platform raised, the Platform Down Switch opens which cuts power to the Platform Down Relay (breaking the circuit to the Series/Parallel Relay, Series/Parallel Valves, Shunt Valve (4WD), Axle Float Relay (4WD), and Axle Float Valve (4WD)), the Cutout Relay (Cutout Relay must now be energized by output from the Level Sensor), and the Joystick High Speed Enable circuit. This disables the high speed mode, locks the Front Axle, and limits the Joystick to low speed range.

Braking

Dynamic braking of the work platform and runaway protection on slopes is achieved hydrostatically by the Forward and Reverse Counterbalance Valves. When hydraulic pressure in the drive system drops below 800 psi, the Forward or Reverse Counterbalance Valve will close blocking the flow of oil in the drive system. Momentum stored in the machine will then cause the pressure to rise again above 800 psi when the Counterbalance Valve will open and relieve it. When dynamically braking, this process may cycle 3 to 4 times after the control handle is released absorbing energy with each cycle until the machine comes to a smooth stop. Both Rear Wheels are equipped with spring applied parking brakes which are hydraulically released when driving.

Steering

Depressing the Steer Switch to the **LEFT** or to the **RIGHT** will energize the Steer Left or Steer Right Relays (completing the circuit to the Steer Left or the Steer Right Solenoid). This will allow oil flow through the Steer Orifice (limiting the speed), through the Steer Valve (selecting direction), and to the Steer Cylinder (turning the Front Wheels). Return oil from the Steer Cylinder will flow back through the Steer Valve and out to the Hydraulic Reservoir.

RAISING THE PLATFORM

From the Platform Controls

Selecting **PLATFORM** at the Chassis/Platform Switch, selecting **LIFT** at the Drive/Lift Switch, and pushing the Control Handle **FORWARD** will energize the Drive/Lift Relay, the Cutout Relay (the Cutout Relay will only stay energized if the Level Sensor is level within 2°), the Up Relay (completing the circuit to the Up Solenoid Valve), and the Proportional Valve. This will allow oil flow through the Proportional Valve (regulating the speed to a rate which is proportional to the angle of Control Handle deflection), through the Lift Valve, through the Down Valve, and to the Lift Cylinder (raising the Platform).

Machines equipped with outriggers must have them either fully retracted or extended and taking load (see ***Leveling the Platform***).

From the Chassis Controls

Selecting **CHASSIS** at the Chassis/Platform Switch, pressing the Throttle Button, and pressing the Up Button, will energize the Throttle Relay (increasing the Engine R.P.M.), the Proportional Valve (regulating speed through 10 ohm resistor), and the Lift Valve. This will allow oil flow through the Proportional Valve (regulating the speed to a fixed rate which is set by the 10 ohm resistor), through the Lift Valve, through the Down Valve, and to the Lift Cylinder (raising the Platform).

LOWERING THE PLATFORM

From the Platform Controls

Selecting **PLATFORM** at the Chassis/Platform Switch, and pulling the Control Handle *backward* will energize the Down Relay (completing the circuit to the Down Solenoid Valve), and the Down Alarm Relay (completing the circuit to the Down Alarm). This will sound the down alarm, and allow oil to flow out of the Lift Cylinder, through the Down Orifice (regulating the descent speed), through the Down Valve, through the Lift Valve, and out to the Hydraulic Reservoir.

From the Chassis Controls

Selecting **CHASSIS** at the Chassis/Platform Switch, and pressing the Down Button will energize the Down Relay (completing the circuit to the Down Solenoid Valve), and the Down Alarm Relay (completing the circuit to the Down Alarm). This will sound the down alarm, and allow oil to flow out of the Lift Cylinder, through the Down Orifice (regulating the descent speed), through the Down Valve, through the Lift Valve, and out to the Hydraulic Reservoir.

Emergency Lowering

Pulling out on the Emergency Lowering Knob will mechanically open the Down Valve. This will allow oil to flow out of the Lift Cylinder, through the Down Orifice (regulating the descent speed), through the Down Valve, through the Lift Valve, and out to the Hydraulic Reservoir. **The Down Alarm WILL NOT SOUND when lowering the platform with the Emergency Lowering Knob.**

LEVELING THE PLATFORM

(Outrigger equipped machines only.)

With the Chassis / Platform switch on **PLATFORM**, and the Platform completely lowered, selecting EXTEND or RETRACT with any outrigger switch will energize the Outrigger Extend / Retract Relays providing power to the Outrigger Solenoid Valves. This will allow oil flow through the Outrigger Orifice (limiting speed), through the Outrigger Valve, over the Counterbalance Valve to extend the Outrigger Cylinder. Return oil flows through the Counterbalance Valve (opened by pilot pressure from the extend side of the circuit), through the Outrigger Valve, and back to the reservoir.

Once an Outrigger is extended, the Outrigger Limit Switch opens breaking the ground circuit to the Drive Relay (disabling drive). The Outrigger Pressure Switches will close when all outriggers are taking load, completing the ground circuit to the Up Relay (enabling lift). When Outriggers are fully retracted, the Outrigger Limit Switches will complete the ground circuit to the Pressure Switch Override Relay, which will complete the ground circuit to the Up Relay (enabling lift).

DESIGN FEATURES

The LX 31/41 has the following features to insure safe operation:

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

3.1 Safety Rules and Precautions

Always observe the following safety rules and precautions when using the LX 31/41 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 firm level surface.

NEVER sit, stand or climb on guardrail or midrail.

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

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

SECURE and lock gate after mounting platform.

KEEP all body parts clear of outriggers when extending or retracting.

NEVER use ladders or scaffolding on the platform.

NEVER attach overhanging loads or increase platform size.

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

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

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

NEVER change operating or safety systems.

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

NEVER climb down elevating assembly with the platform elevated.

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

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

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

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

ALWAYS read, understand, and follow all safety rules and operating instructions, and the Scaffold Industry Association's MANUAL OF RESPONSIBILITIES (ANSI/SIA A92.6-1990) before operating or performing maintenance on any UpRight self propelled aerial work platform.

3.2 Controls and Indicators

The controls and indicators for operation of the LX 31/41 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 shall know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the unit.

Table 3-1: Controls and Indicators

Controller/Platform

INDEX NO.	NAME	FUNCTION
1	KEY SWITCH	Turn key fully clockwise to start engine, when released key goes to RUN to provide power to the Interlock Switch.
2	EMERGENCY STOP SWITCH	Push red button to cut power to all controls (off). Turn clockwise to provide power (on).
3	CONTROL LEVER	Move joystick forward or backwards to control Drive and Lift Valves proportionally or Down Valve depending on position of Drive Lift Switch.
4	STEERING SWITCH	Moving the momentary rocker switch RIGHT or LEFT steers the work platform in that direction. Although the Steering Switch is self centering the steering system is not. **The wheels must be steered back to straight.**
5	DRIVE SPEED/ TORQUE SELECTOR SWITCH	Provides two speed/torque ranges, in forward or reverse. **HIGH SPEED**-low torque and **HIGH TORQUE**-low speed.
6	DRIVE/LIFT SWITCH	Selecting **DRIVE** allows the work platform to move forward or reverse. Selecting **LIFT** allows the work platform to raise or lower.
7	INTERLOCK LEVER SWITCH	Provides power to the Controller powered functions, only when depressed, preventing accidental activation of the Controller.
8	DRIVE ENABLE INDICATOR	Illuminates when drive is enabled, turns off when disabled.
9	OUTRIGGER SWITCHES	Push up to extend outriggers, down to retract them.
10	ORBIT LEVEL	Use when leveling machine with outriggers.
11	CHOKE BUTTON (gasoline / dual fuel)	Press to engage choke when starting engine.
	GLOW PLUG BUTTON (diesel)	Press and hold for 6 seconds to preheat glow plugs before starting.

Chassis

INDEX NO.	NAME	FUNCTION
12	HOURMETER (optional)	Tracks the number of hours of engine powered operation.
13	RAISE BUTTON	Press button to lift the platform and
14	LOWER BUTTON	Press button to lower the platform.
15	EMERGENCY STOP SWITCH	Push red button to cut power to all controls (off). Turn clockwise to provide power (on).
16	FUEL SELECTOR SWITCH (Dual Fuel Only)	Turning switch left or right changes the engine's fuel supply between **GASOLINE** and **PROPANE**. Placing the switch in the center position purges the fuel lines prior to changing fuels.
17	EMERGENCY LOWERING VALVE	Pull out to lower the platform in the event of powered function failure.
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.
	TILT ALARM*	Sounds an audible signal when the platform is elevated and on a slope of 2° side to side or fore and aft.
19	BRAKE RELEASE PUMP	Releases the Parking Brake allowing the machine to be moved in the event power is lost or for winching onto a trailer. See Section 3.5.
20	START BUTTON	Press to start the engine. Release after engine starts.
21	STOP BUTTON	Press to kill the engine.
22	THROTTLE BUTTON	Press to increase engine RPM when operating functions from the lower control panel.
23	PLATFORM / CHASSIS SWITCH	Turn switch to the left to enable platform controls. Turn switch to the right to enable chassis controls.
24	CHOKE BUTTON (gasoline / dual fuel)	Press to engage choke when starting engine.
	GLOW PLUG BUTTON (diesel)	Press and hold for 6 seconds to preheat glow plugs before starting.

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

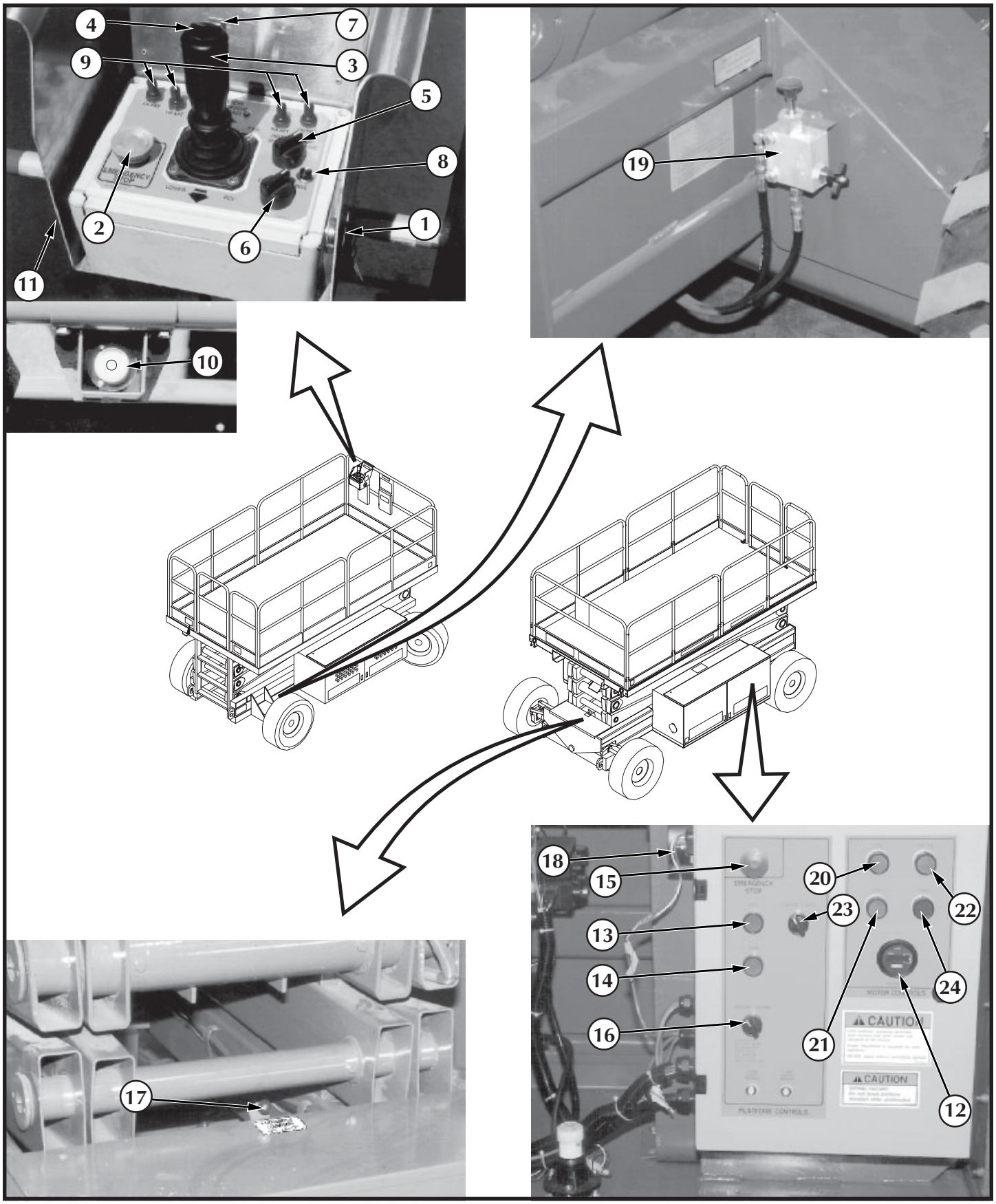


Figure 3-1: Controls and Indicators

3.3 Pre-Operation Inspection

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

1. Open modules and inspect for damage, oil leaks or missing parts.
2. Check the hydraulic oil level sight gauge on the hydraulic tank with the platform fully lowered. Add ISO #46 hydraulic oil if necessary.
3. Check that fluid level in the battery is correct (See Section 4.3, *Battery Maintenance*).
4. Check the engine oil level and fuel level.
5. Check that all guardrails are in place, the slide out deck extension is secured with the pin and all fasteners are properly tightened.
6. Check tire pressure; 50 psi (3.4 bar).
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. Place chassis and platform emergency stop switches in the ON position (Figure 3-1) by pulling the buttons out.
10. Verify platform/chassis switch is on **PLATFORM** (Figure 3-1).
11. **Dual Fuel Models**: set dual fuel selector to desired position. Set to the center position to purge the system when switching fuels. If the machine is to be operated on propane, open the supply valve on the tank.

Note: When using LP gas, use clean, water free liquid petroleum gas, preferably from a bulk storage tank. Follow the instructions located on the power module tray for filling the tank.

⚠ WARNING ⚠

If you smell propane, close the supply valve on the tank immediately until you have located and corrected the leak.

12. While the engine is cool check the engine coolant level.

⚠ CAUTION ⚠

DO NOT check coolant when engine or radiator is hot, hot coolant can cause severe burns.

SYSTEM FUNCTION INSPECTION

⚠ WARNING ⚠

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

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

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

Protect control console cable from possible damage while performing checks.

1. Unhook controller from front guardrail. Firmly grasp controller hanger in such a manner that the interlock lever can be depressed, while performing the following checks from the ground.
2. Turn controller key switch clockwise to **ON**. Turn fully clockwise to start engine, releasing the key once the engine starts.

Note: If the engine is cold, on gasoline / propane models, hold the choke button in while starting the engine. On diesel models, depress the glow plug button and hold for 6 seconds to engage the glow plugs.

3. Position drive/lift switch to **DRIVE** position.
4. With the speed range switch first in **HIGH TORQUE** and then in **HIGH SPEED** depress the interlock lever and slowly push the control lever to **FORWARD** then **REVERSE** positions to check for speed and directional control. The farther you push or pull the control lever the faster the machine will travel.
5. Push steering switch RIGHT then LEFT to check for steering control.
6. Depress the interlock switch on the control handle and position each outrigger switch to the **EXTEND** position to deploy all four outriggers. Check the drive enable indicator light, it should be off.
7. Fully retract all outriggers and check the drive enable indicator, it should be on.
8. Rehook controller on front guardrail.
9. Turn the platform/chassis switch to **CHASSIS**.
10. Push the throttle button in. Push chassis raise button to elevate platform while pushing the tilt sensor (Figure 1) off of level. The platform should only partially elevate and the tilt alarm should sound. If the platform continues to elevate and/or there is no alarm **STOP** and remove the machine from service until it is repaired.

11. Release the tilt sensor 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. Lower the platform partially by pushing in on the chassis lower switch, and check operation of the audible lowering alarm.
14. Open the chassis emergency lowering valve (Figure 3) to check for proper operation by pulling and holding the knob out. Once the platform is fully lowered, close the valve by releasing the knob.
15. Turn the platform/chassis switch to **PLATFORM**.
16. Mount the platform making sure the gate is latched.
17. Position drive/lift switch to **LIFT**.
18. Depress the interlock lever and slowly push the control lever to **UP** to raise the platform, fully actuate the control lever to check proportional lift speed. Slowly pull control lever to **DOWN** position to lower platform. Check that lowering alarm sounds.
19. Depress the interlock switch on the control handle and position any outrigger switch to the **EXTEND** position, outriggers should be disabled. If an outrigger extends during this test STOP. Lower the platform and remove the machine from service until it is repaired.
20. Turn controller key switch to **OFF**, push the emergency stop button and dismount the platform.
21. Close and secure module covers.

3.4 Operation

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

TRAVEL WITH PLATFORM LOWERED

1. Verify chassis emergency stop switch is in the ON position (turn counterclockwise), the drive enable indicator (if equipped) is on, and that the platform/chassis switch is on **PLATFORM**.

Note: If the drive enable indicator is off, verify that the platform is fully lowered and (if so equipped) the outriggers are all fully retracted.

2. After mounting platform, close and latch gate. Check that guardrails are in position and properly assembled with fasteners properly torqued.
3. Check that route is clear of persons, obstructions, holes and drop-offs and is capable of supporting the wheel loads.
4. Check clearances above, below and to the sides of the platform.
5. Pull controller emergency stop button out to ON position.
6. Turn controller key switch fully clockwise to start engine, releasing the key once the engine starts.

Note: If the engine is cold, on gasoline / propane models, hold the choke button in while starting the engine. On diesel models, depress the glow plug button and hold for 6 seconds to engage the glow plugs.

7. Set the drive/lift speed range switch to **HIGH TORQUE**.
8. Grasp the control lever so the interlock lever is depressed (releasing the interlock lever cuts power to controller). Slowly push or pull the control lever to **FORWARD** or **REVERSE** to travel in the desired direction. The farther you push or pull the control lever from center the faster the machine will travel.
9. While moving, push the drive/lift speed range switch to **HIGH SPEED** for travel on level surfaces or to **HIGH TORQUE** for climbing grades or traveling in confined areas.

Steering

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

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

Leveling the Platform (Outrigger equipped machines only)

⚠ WARNING ⚠

Never attempt to use the outriggers on soft ground. The surface beneath them must be suitable to support the weight of the machine.

1. Look around the machine, make sure that there is nothing obstructing the outriggers, and that the surface beneath them is suitable to support the weight of the machine.
2. Depress the interlock lever on the control handle and operate the outrigger switches to extend each outrigger until it is making firm contact with the ground.
3. While observing the bubble level on the front guardrail (fig. 3), extend the outrigger opposite the position of the bubble until the platform is level. For example: if the bubble is to the front and left in the orbit, extend the rear right outrigger. Continue to adjust until the bubble is centered in the small circle indicating that the platform is level.
4. Outriggers must be in firm contact with the supporting surface, observe each outrigger to verify.

To retract the outriggers:

1. Fully lower the platform.
2. Position each outrigger switch to **RETRACT**. Observe the outriggers to ensure that they are fully retracted. The drive enable indicator light will not come on until all four outriggers are fully retracted.

RAISING AND LOWERING THE PLATFORM

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

TRAVEL WITH WORK PLATFORM ELEVATED

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

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

1. Check that the 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 the drive/lift switch to the **DRIVE** position.
4. Push the control lever to **FORWARD** or **REVERSE** for the desired direction of travel.

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

EMERGENCY LOWERING

The emergency lowering valve is located at the front of the machine at the base of the scissor assembly, (Figure 3-1).

1. Open the emergency lowering valve by pulling on the knob and holding it.
2. Once the platform is fully lowered, release the knob to close the valve.

SWITCHING FUELS (DUAL FUEL ONLY)

1. With engine running turn the fuel selector switch (Figure 3-1) to the center position.
2. After the engine has quit running select the appropriate fuel supply.
3. Restart the engine.

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.

3.5 Parking Brake Release (Figure 3-1)

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

1. Close the needle valve by turning the knob clockwise.
2. Pump the brake release pump until the parking brakes release and the wheels can be turned.
3. The machine will now roll when pushed or pulled.
4. Be sure to open the needle valve and verify that the parking brakes have engaged before the machine is operated.

⚠ WARNING ⚠

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

3.6 Fold Down Guardrails (Figure 3-2)

This procedure is only for passing through doorways. Guardrails must be returned to proper position before using the machine.

FOLD DOWN PROCEDURE (FIGURE 3-2)

Note: When performing the following procedures retain all fasteners.

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

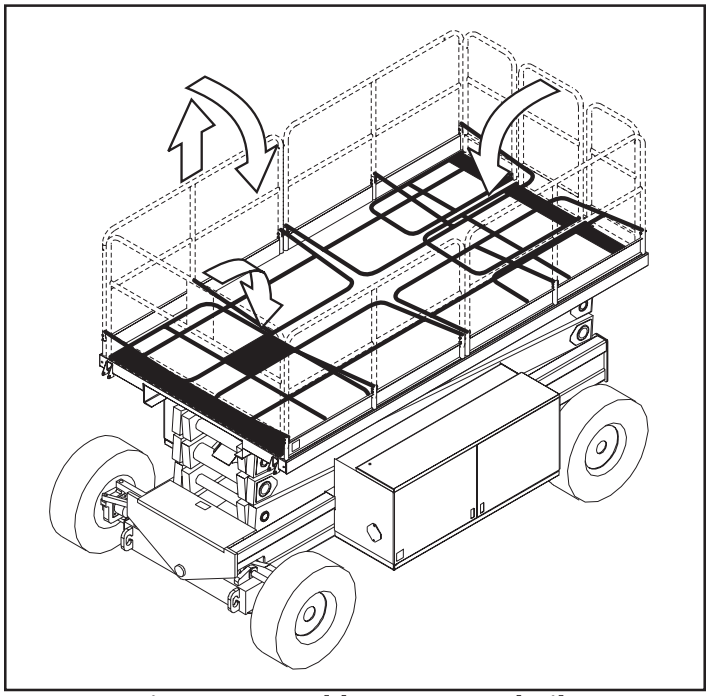


Figure 3-2: Fold Down Guardrails

ERECTION PROCEDURE

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

⚠ WARNING ⚠

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

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 LX 31/41 Work Platform.

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

This section contains instructions for the maintenance of the LX 31/41 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 LX 31/41 and help in diagnosing and repair of the machine.

Refer to Table 4-1, Preventative Maintenance Checklist, for recommended maintenance intervals.

SPECIAL TOOLS

The following is a list of special tools which may be required to perform certain maintenance procedures on the LX 31/41 work platform.

0-1000 PSI Hydraulic Pressure Gauge
with Adapter Fittings

0-3000 PSI Hydraulic Pressure Gauge
with Adapter Fittings

0-30 Gallon Hydraulic Flow Meter
With 0-3000 P.S.I. Simulated Load and Adapter Fittings (UpRight P/N 67040-000)

Inclinometer

4.1 Preventative Maintenance (Table 4-1)

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

⚠ WARNING ⚠

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

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

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

Preventative Maintenance Table Key

Interval

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

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

Preventative Maintenance Report

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

Table 4-1: Preventative Maintenance Checklist

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Battery	Check electrolyte level	6M			
	Check specific gravity	6M			
	Clean exterior	6M			
	Check battery cable condition	Daily			
	Clean terminals	6M			
Engine Oil and Filter	Check level and condition	Daily			
	Check for leaks	Daily			
	Change oil filter	100H			
Engine Fuel System	Check fuel level	Daily			
	Check for leaks	Daily			
	Replace fuel filter	6M			
	Check air cleaner	Daily			
Engine Coolant	Check coolant level (with engine cold)	Daily			
	Replace coolant	3M			
Hydraulic Oil	Check oil level	Daily			
	Change filter	6M			
	Drain and replace oil	2Y			
Hydraulic System	Check for leaks	Daily			
	Check hose connections	30D			
	Check hoses for exterior wear	30D			
Emergency Hydraulic System	Operate the emergency lowering valve and check for serviceability	Daily			
Controller	Check switch operation	Daily			
Control Cable	Check the exterior of the cable for pinching, binding or wear	Daily			
Platform Deck and Rails	Check fasteners for proper torque	Daily			
	Check welds for cracks	Daily			
	Check condition of deck	Daily			
Tires	Check for damage	Daily			
	Check air pressure (50 psi [3.4 bar])	Daily			
	Check lug nuts (torque to 90 ft. lbs. [123 Nm])	30D			

Table 4-1: Preventative Maintenance Checklist (cont'd.)

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Hydraulic Pump	Wipe clean	30D			
	Check for leaks at mating surfaces	30D			
	Check for hose fitting leaks	Daily			
	Check mounting bolts for proper torque	30D			
Drive Motors	Check for operation and leaks	Daily			
Torque Hubs	Check for leaks	Daily			
	Check Oil level	250H/6M			
	Change Oil after break-in	50H/30D			
	Change Oil	1000h/2y			
Steering System	Check hardware & fittings for proper torque	6M			
	Grease pivot pins	30D			
	Oil king pins	30D			
	Check steering cylinder for leaks	30D			
Elevating Assembly	Inspect for structural cracks	Daily			
	Check pivot points for wear	30D			
	Check mounting pin pivot bolts for proper torque	30D			
	Check elevating arms for bending	6M			
	Grease linkage pins	30D			
Chassis	Check hoses for pinch or rubbing points	Daily			
	Check component mounting for proper torque	6M			
	Check welds for cracks	Daily			
Lift Cylinder	Check the cylinder rod for wear	30D			
	Check mounting pin pivot bolts for proper torque	30D			
	Check seals for leaks	30D			
	Inspect pivot points for wear	30D			
	Check fittings for proper torque	30D			
Axle Cylinder	Check the cylinder rod for wear	30D			
	Check mounting pin pivot bolts for proper torque	30D			
	Check seals for leaks	30D			
	Inspect pivot points for wear	30D			
	Check fittings for proper torque	30D			
Entire Unit	Check for and repair collision damage	Daily			
	Check fasteners for proper torque	3M			
	Check for corrosion-remove and repaint	6M			
	Lubricate	30D			
Labels	Check for peeling, missing, or unreadable labels & replace	Daily			

4.2 Blocking Elevating Assembly (Figure 4-1)

⚠ WARNING ⚠

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

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

Installation

1. Park the work platform on firm level ground.
2. Verify platform emergency stop switch is ON.
3. Turn platform/chassis switch to **CHASSIS**.
4. Start the engine using the chassis controls.
5. Push the throttle button in, the button will stay in and the engine speed will increase. Using the raise button, elevate platform until the scissors brace can be rotated to the vertical position.
6. From the left side of the machine, disengage the locking pin securing the brace. Rotate the scissor brace counterclockwise until it is vertical and between the two scissor center pivots.
7. Push lower button and gradually lower platform until brace is supporting the platform.
8. Disengage throttle by pushing throttle button in again, the button will retract and the engine will come to idle speed.

Removal

1. Using chassis controls, gradually raise platform until the scissors brace clears the two scissor center pivots.
2. Rotate scissors brace clockwise until the locking pin engages.
3. Push lower button to completely lower platform.
4. Make sure the throttle button is disengaged and platform/chassis switch is on **PLATFORM**.

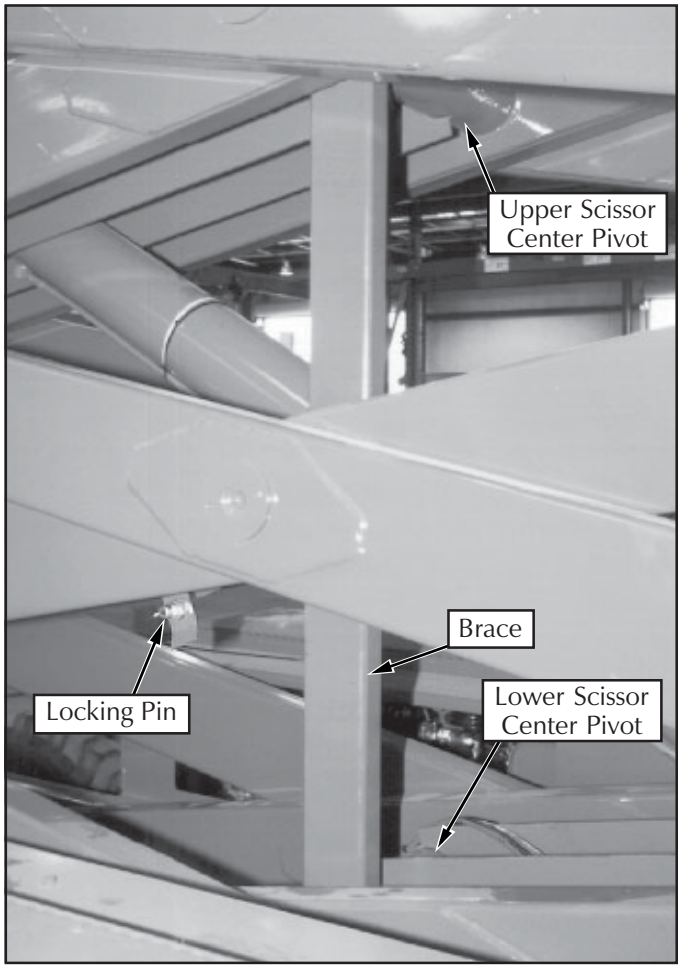


Figure 4-1: Blocking Elevating Assembly

4.3 Battery Maintenance

⚠ WARNING ⚠

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

Always wear safety glasses when working with batteries.

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

BATTERY INSPECTION AND CLEANING

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

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

Clean the battery when it shows signs of corrosion at the terminals or when electrolyte has overflowed during charging. Use a baking soda solution to clean the battery, 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.

4.4 Lubrication

Refer to Table 4-1 for the lubrication intervals and Figure 4-2 for location of items that require lubrication service. Refer to the appropriate sections for lubrication information on the Steering Linkage, Torque hubs, Hydraulic Oil and Filter, and Engine Oil and Filter.

GREASE FITTINGS

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

STEERING LINKAGE

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

TORQUE HUBS

Note: Change oil in torque hubs after the first 50 hours of operation. Change every 1000 hours thereafter.

1. Remove Torque Hub from rear drive assembly (refer to section 4.9).
2. Remove drain plug from underside of Torque Hub.
3. Drain oil from unit.
4. Replace drain plug.
5. Remove fill plug from top side of torque hub.
6. Fill unit with 90 wt. gear oil.
7. Replace fill plug.

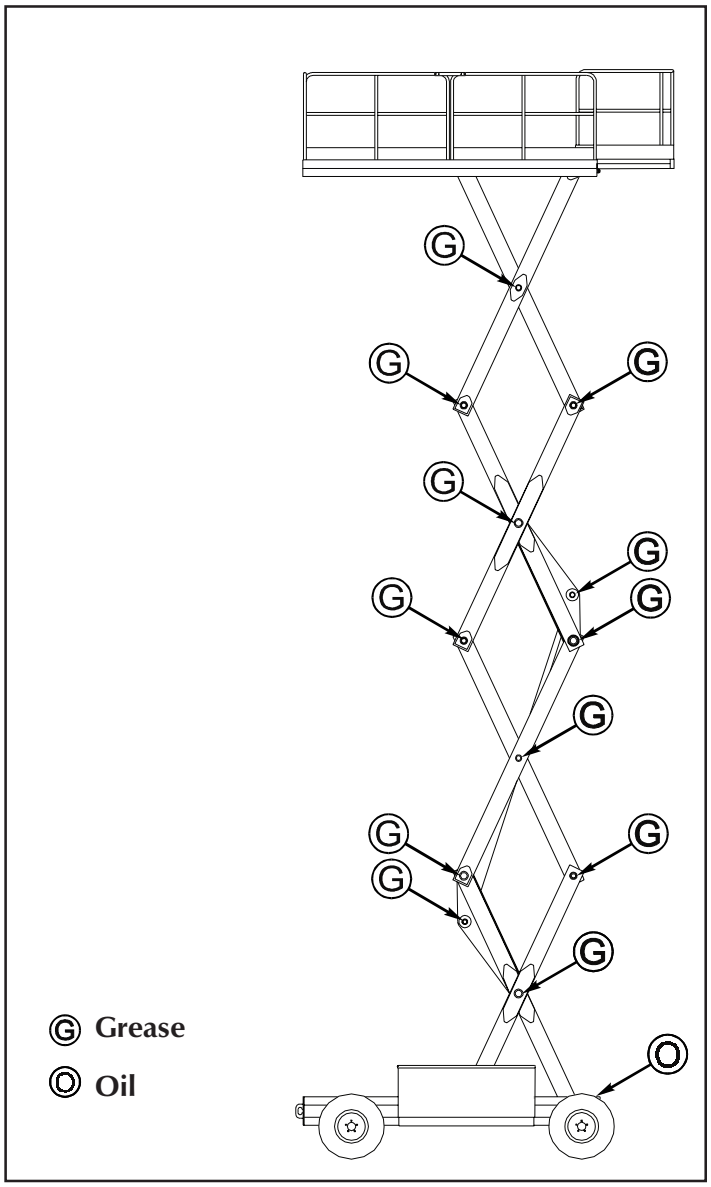


Figure 4-2: Lubrication Chart

HYDRAULIC OIL AND FILTER (Figure 4-3)

Fluid Level

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

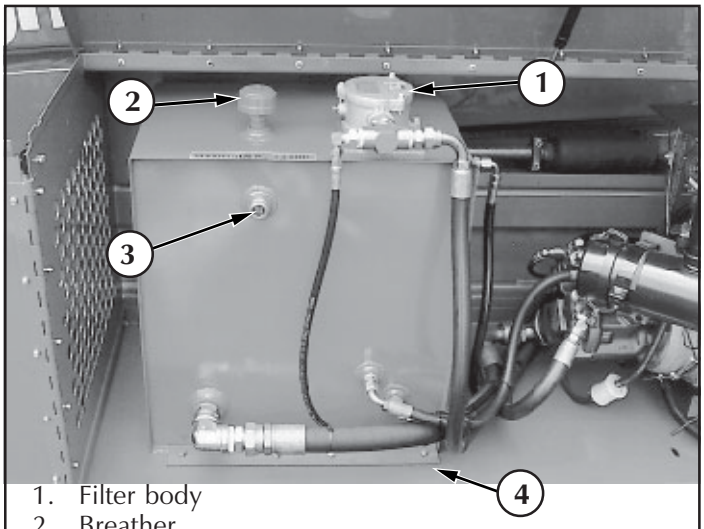
Oil and Filter Replacement

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

⚠ CAUTION ⚠

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

2. Provide a suitable container to catch the drained oil. The hydraulic tank has a capacity of 12.0 gallons (45.5 l).
3. Remove the drain plug and allow all oil to drain into the container, be sure to dispose of oil properly.
4. Reinstall the drain plug.
5. Remove the three screws from the filter body cover and open the filter body.
6. Lift the filter element from the filter body.
7. Fill the hydraulic oil tank to the level of the sight gauge with ISO #46 hydraulic oil.
8. Insert the replacement filter element into the filter body and press into position.
9. Replace the filter body cover and screws.



1. Filter body
2. Breather
3. Sight Gauge
4. Drain plug (under tank)

Figure 4-3: Hydraulic Oil Tank and Filter

ENGINE OIL AND FILTER (Figure 4-4)

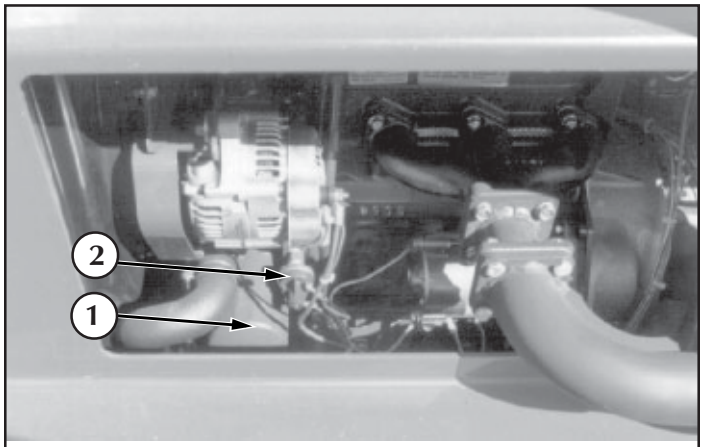
1. Provide a suitable container to catch the drained oil. Engine oil capacity is 4 quarts (3.25l).
2. Place the container under the oil pan and remove the drain plug.
3. When the drain plug is removed, unscrew the filler cap to speed up draining the oil.
4. After all of the oil has been drained, replace the drain plug.
5. Remove the filter using an oil filter wrench.
6. Replace with new filter, refer to section 7 for part number. Tighten filter by hand.

Note: Lubricate filter seal with clean engine oil prior to assembly.

7. Fill engine with motor oil per table 4-2.
8. Replace filler cap.

ENGINE	CAPACITY	TEMP	OIL
Gas / Propane	4 qts. (3.25l)	>10° f <10° f	10w-30 5w-30
Diesel	5.4 qts. (5.1l)	All	10w-30

Table 4-2: Engine oil



1. Engine Oil Filter
2. Oil Pressure Switch

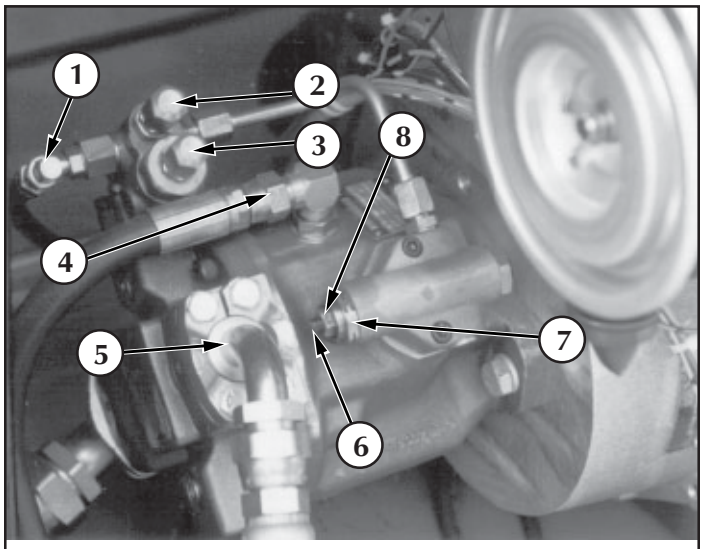
Figure 4-4: Engine Oil Filter (Typical)

4.5 Setting Hydraulic Pressures

Note: Follow Pump Set - Up procedure whenever Pump has been replaced, or when testing performance to isolate possible failure. Refer to figure 4-6 for flow meter set - up.

PUMP SET-UP (Figure 4-5)

1. Remove Pump output line and cap it.
2. Install flow meter input line to Pump output.
3. Remove Tank return line and cap.
4. Install flow meter output line to Tank.
5. Remove sense line from Pump.
6. Install flow meter sense line to Pump.
7. Remove caps on Standby and Max Pressure adjustment screws.
8. Press and hold Throttle Button to rev up engine.
9. Close simulated load flow control valve by turning fully clockwise.
10. Turn Standby pressure adjustment screw fully clockwise.
11. Adjust Max Pressure to 3000 P.S.I. (clockwise to increase, counterclockwise to decrease).
12. Turn Standby pressure adjustment screw counterclockwise until gauge reads 200 P.S.I.
13. Replace caps on Standby and Max Pressure adjustment screws.
14. Open simulated load flow control valve by turning fully counterclockwise.
15. Open simulated load pressure relief valve by turning fully counterclockwise.
16. Loosen large locknut on Horsepower Limiter Valve and turn adjustment screw counterclockwise two full turns.
17. Increase simulated load pressure relief valve by turning clockwise until gauge reads 1500 P.S.I.
18. Turn Horsepower Limiter adjustment screw clockwise until flow meter reads 12 G.P.M.
19. Tighten large locknut on Horsepower Limiter Valve.
20. Loosen small locknut on Horsepower Limiter Valve and turn adjustment screw counterclockwise two full turns.
21. Increase simulated load pressure relief valve by turning clockwise until gauge reads 2500 P.S.I.
22. Turn Horsepower Limiter Valve adjustment screw clockwise until flow meter reads 7 G.P.M.
23. Tighten small locknut on Horsepower Limiter Valve.
24. Replace hoses.



1. Sense Line
2. Standby PSI Adjustment
3. Max PSI Adjustment
4. Drain Line
5. Output Line
6. Horsepower Limiter Adjustment Screw
7. Low PSI Locknut
8. High PSI Locknut

Figure 4-5: Hydraulic Pump

LIFT RELIEF VALVE

1. Operate the hydraulic system 10 - 15 minutes to warm the oil.
2. Remove the cap or loosen the locknut on the Lift Relief Valve.
3. Turn the Lift Relief Valve adjustment screw counterclockwise two full turns.
4. Place rated load on the platform (2000 lbs for LX31, 1500 lbs for LX41)
5. Depress the Throttle Button, and the Raise Button to lift the platform.
6. Slowly turn the Lift Relief Valve adjustment screw clockwise until the platform begins to rise.

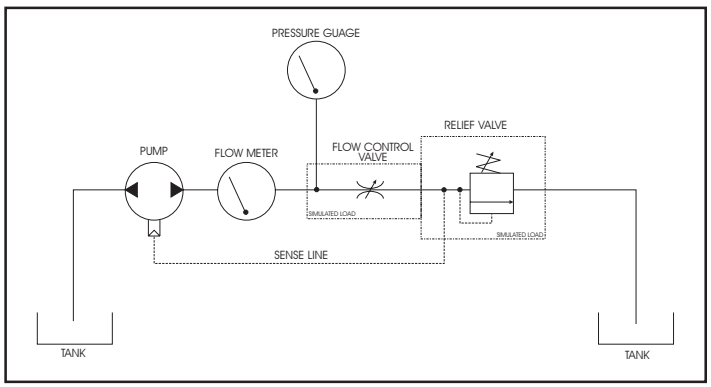
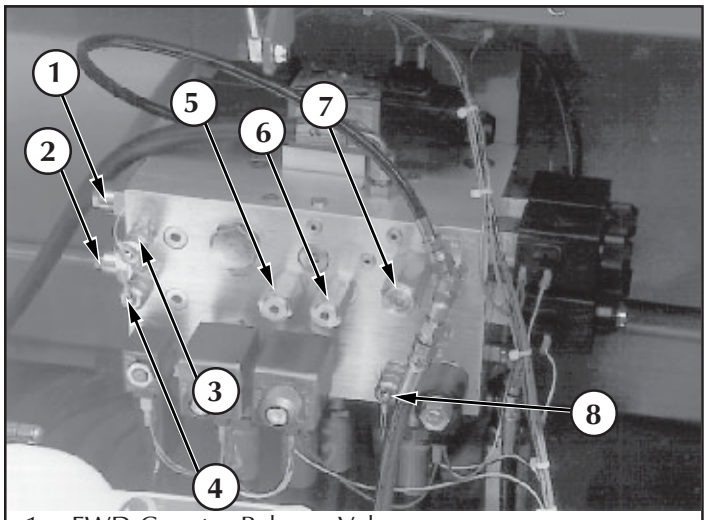


Figure 4-6: Flow Meter Set-Up



1. FWD Counter Balance Valve
2. REV Counter Balance Valve
3. FWD Drive PSI Test Port
4. REV Drive PSI Test Port
5. Steer Right Relief Valve
6. Steer Left Relief Valve
7. Lift Relief Valve
8. Main PSI Test Port

Figure 4-7: Valve Manifold

7. Replace the cap, or tighten the locknut on the Lift Relief Valve, and remove the load from the platform.

COUNTERBALANCE VALVES

1. Operate the hydraulic system 10 to 15 minutes to warm the oil.
2. Elevate the Front (4WD only), and Rear Wheels to allow them to spin freely, and place on jackstands suitable to support the weight of the machine.
3. Remove the Green/White wire from terminal 17 in the Control Panel Assembly.
4. Install a 0-1000 P.S.I. pressure gauge at the Forward Drive Pressure Test Port.
5. Loosen the locknut on the **Reverse** Counterbalance Valve, push the control handle **FORWARD**, and adjust the valve until the gauge reads 800 P.S.I. (CW to decrease P.S.I., CCW to increase P.S.I.) Tighten the locknut.
6. Install a 0-1000 P.S.I. pressure gauge at the Reverse Drive Pressure Test Port.
7. Loosen the locknut on the **Forward** Counterbalance Valve, push the control handle **REVERSE**, and adjust the valve until the gauge reads 800 P.S.I. (CW to decrease P.S.I., CCW to increase P.S.I.) Tighten the locknut.
8. Recheck the pressures and adjust as necessary.
9. Remove the gauge and replace the cap. Replace the Green/White wire to terminal 17. Lower the machine off of the jackstands.

STEERING RELIEF VALVES

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

BIDIRECTIONAL RELIEF VALVES

Note: Check or reset Drive Motor Relief Valves only if you suspect that one of the Rear Wheels is not turning due to premature bypass. This condition is rare and Bidirectional Relief Valves should not be reset as part of normal maintenance.

1. Operate the hydraulic system 10-15 minutes to warm the oil.
2. Remove the cap and install a 0-3000 P.S.I. pressure gauge at the Main Pressure Test Port.
3. Remove the Bidirectional Relief Valve from under the rear drive motor and exchange with the Lift Relief Valve.
4. Remove the cap from the Bidirectional Relief Valve and turn the adjustment screw two full turns counterclockwise.
5. Depress the Throttle Button and the Raise Button to lift the platform to full height and hold until system bypasses.
6. Turn the adjustment screw clockwise until the pressure reaches 3000 P.S.I.
7. Replace the cap and return the Bidirectional Relief Valve and the Lift Relief Valve to their original positions.
8. Repeat as necessary for the other Bidirectional Relief Valve.
9. Remove the gauge and replace the Test Port Cap.

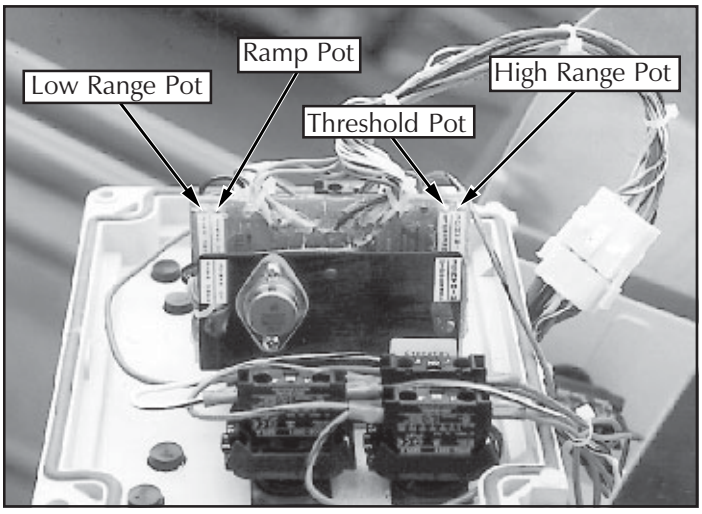


Figure 4-8: Proportional Controller

4.6 Switch Adjustments

PROPORTIONAL CONTROL ADJUSTMENT (Figure 4-8)

When required by the following procedure, lay out a twenty foot course, on level ground, free from potholes or other obstructions. Mark a starting line and finish line visible from the platform of the machine.

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

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

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

Turn pot clockwise (CW) to increase settings.

Turn pot counterclockwise (CCW) to decrease settings.

Adjust pots only in sequence as outlined in this procedure.

Procedure

1. Lower machine fully to insure that controller is in high speed range.
2. Turn Ramp Trimpot fully counterclockwise until a click is heard with each revolution.
3. Push Control Handle slightly forward, just enough to illuminate the red L.E.D. on the P.C.B.
4. Adjust the Threshold Trimpot so that the machine *just begins* to move.
5. Push the Control Handle fully forward and drive the machine over the 20 foot course.

Note: Do not steer the wheels during speed test, insure that the front wheels are straight prior to this operation. Allow the machine to rise to full speed, and mark time from second that the Front Wheels cross the starting line, until the second that the Front Wheels cross the finish line.

6. Adjust the Hi Trimpot to the proper high speed found in Table 5-1.
7. Elevate the platform enough to put the machine into low speed range.
8. Push the Control Handle fully forward and drive the machine over the 20 foot course.
9. Adjust the Lo Trimpot to the proper low speed found in Table 5-1.
10. Lower the machine fully and turn the Ramp Trimpot 8 to 10 turns clockwise. Adjust for smooth acceleration.
11. Recheck speeds to insure proper adjustment. Reset as necessary.

PLATFORM DOWN LIMIT SWITCHES (Figure 4-9)

The Platform Down Switches close the circuit to the Cutout Relay, (R15), bypassing the Tilt Sensor when the platform is lowered; and to the Platform Down Relay, (R16), which provides power to the Drive Relay, Proportional Controller high speed circuit, and Series/Parallel Relay (R5).

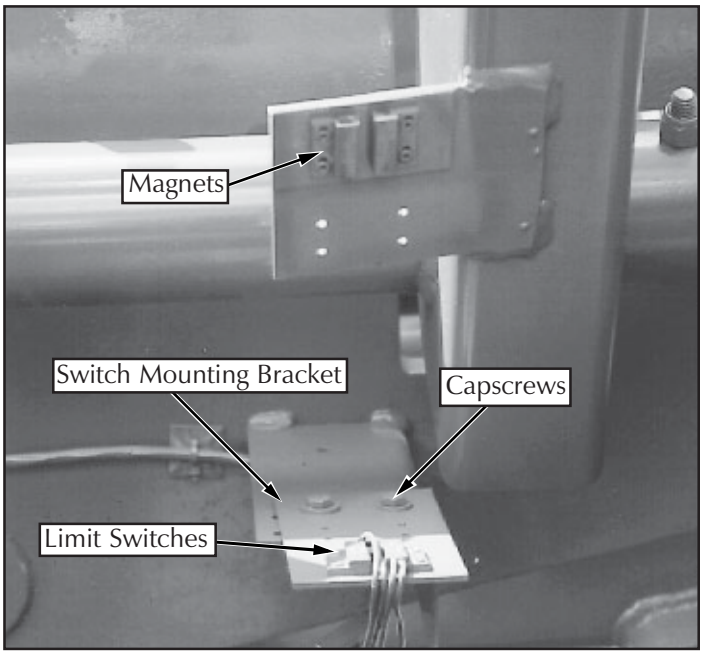


Figure 4-9: Platform Down Limit Switch

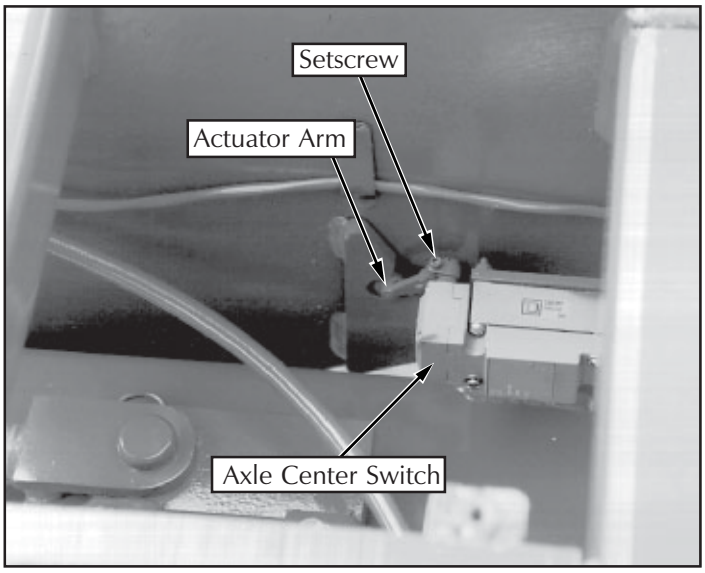


Figure 4-10: Axle Center Switch

⚠ WARNING ⚠

DO NOT attempt to adjust Limit Switches without first blocking the elevating assembly (see section 4.3).

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

AXLE CENTER SWITCH (Figure 4-10)

1. Place the work platform on a level surface with the front and rear axles parallel (on the same plane). Verify this using an inclinometer.
2. Loosen the setscrew on the lever of the limit switch. It should immediately spring to center. Tighten the setscrew.
3. Test the switch function by moving the machine to a location where the front axle will articulate off of center and raising the platform until the magnetic switches open (about 10 feet [3m]). The work platform should not drive. Retest with the axle off center in the other direction.

TILT SENSOR (Figure 4-11)

The Tilt Sensor has three wires; red-power (12v in), black-ground, white-output (12v out). To verify the sensor is working properly there are two LED's under the sensor; green indicates the sensor is on (has power), red indicates the sensor is level and the white wire is 'hot' (12v out).

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

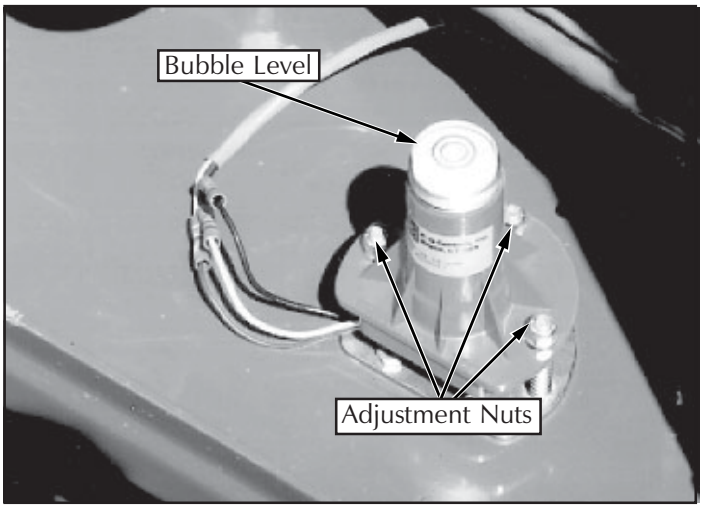


Figure 4-11: Tilt Sensor

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 prior to beginning as to whether or not the manifold should be removed before maintenance procedures begin.

REMOVAL

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

DISASSEMBLY

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

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

CLEANING AND INSPECTION

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

ASSEMBLY

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

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

INSTALLATION

1. Attach manifold assembly to mounting plate with bolts.
2. Connect Solenoid leads to terminal strip (as previously tagged).
3. Connect hydraulic hoses. Be certain to tighten hoses to manifold.
4. Operate each hydraulic function and check for proper operation and leaks.
5. Adjust lift relief, steering relief, and counterbalance valve pressures according to instructions in Section 4.5.

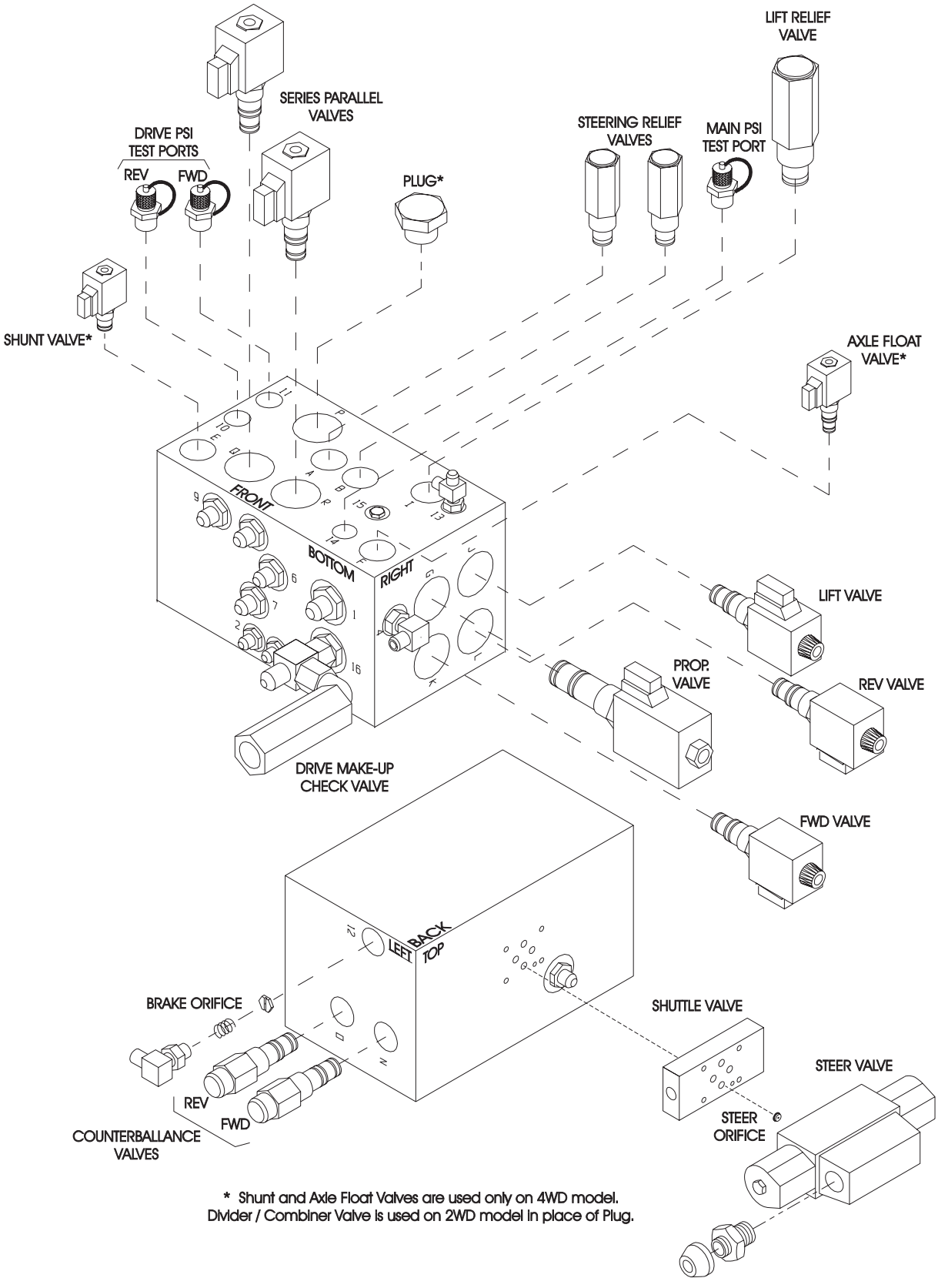


Figure 4-12: Hydraulic Manifold, Exploded View (4WD Shown)

4.8 Hydraulic Pump (Figure 4-13)

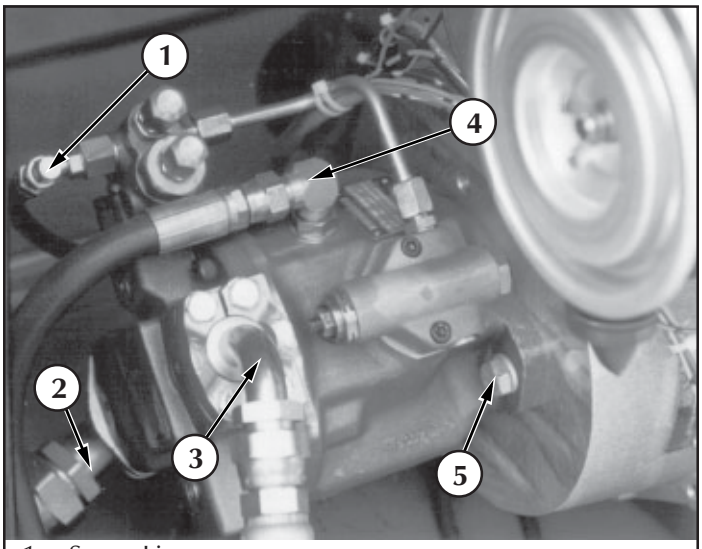
NOTE: If the hydraulic tank has not been drained, suitable means for plugging the hoses should be provided to prevent excessive fluid loss.

REMOVAL

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

INSTALLATION

1. Torque each capscrew a little at a time until both capscrews are torqued to 20 ft. lbs. (27 N-m).
2. Unplug and reconnect the hydraulic hoses.
3. Fill the pump completely with clean hydraulic oil by pouring it into the drain line cavity.
4. Check the oil level in the hydraulic tank before operating the work platform.
5. Set standby and maximum pressures, and horsepower limiter nodes as outlined under *Pump Setup* in section 4.5 *setting hydraulic pressures*.



1. Sense Line
2. Inlet Line
3. Output Line
4. Drain Line
5. Capscew (typ.)

Figure 4-13: Hydraulic Pump

4.9 Hydraulic Brakes, Drive Motors, And Hubs

REAR AXLE (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. Loosen the wheel nuts on the torque hub to be removed.
3. Raise the rear of the work platform using a 2-ton jack.
4. Position 2 1-ton jack stands under the rear axle to prevent the work platform from falling if the jack fails.
5. Remove the wheel lug bolts and wheel.
6. Tag and disconnect the hose assemblies from the drive motor and brake.

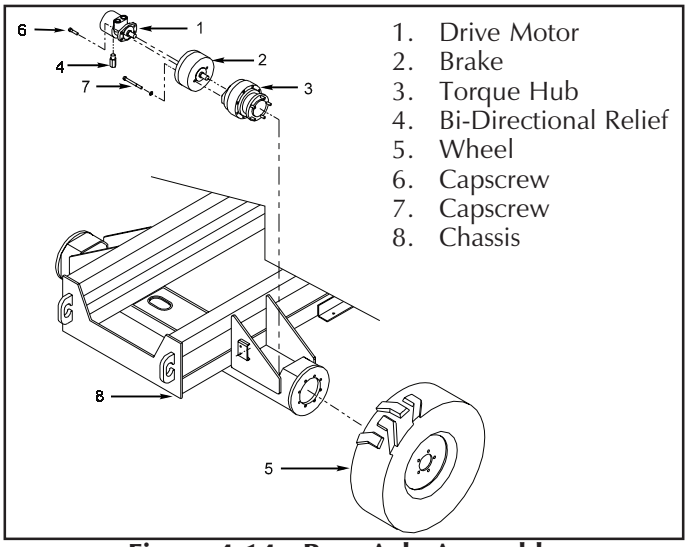
⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

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

Note: when disassembling, retain gaskets between components, they may be reused if undamaged.

7. Remove the four capscrews holding the motor to the brake. Remove the motor.
8. Remove the two socket head through bolts connecting the brake and the torque hub. Remove the brake.
9. Remove the eight capscrews connecting the torque hub to the rear axle. Remove the torque hub.



1. Drive Motor
2. Brake
3. Torque Hub
4. Bi-Directional Relief
5. Wheel
6. Capscrew
7. Capscrew
8. Chassis

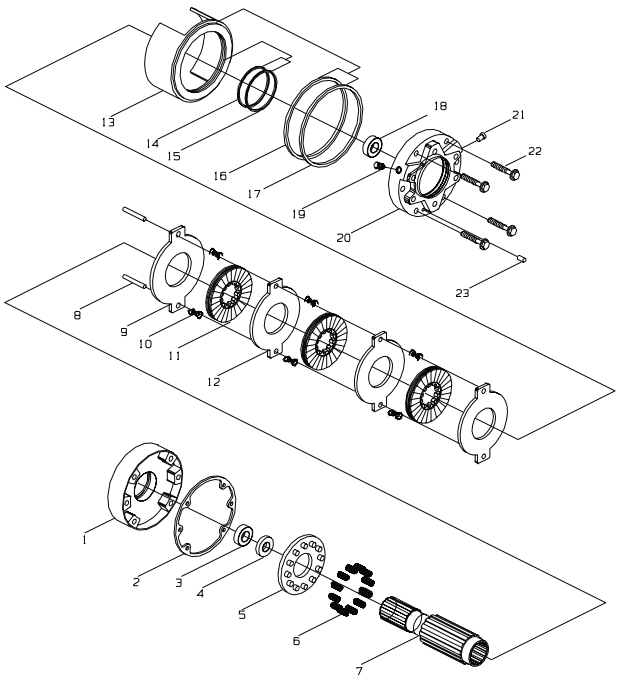
Figure 4-14: Rear Axle Assembly

Installation

1. Install the torque hub to the rear axle. Align the holes and install the eight capscrews, tighten.
2. Coat the output shaft of the brake with high pressure molybdenum grease and install brake into torque hub. Align holes and install the two socket head through bolts, tighten.
3. Coat the output shaft of the drive motor with high pressure molybdenum grease and install into brake. Align holes and install the four capscrews, tighten.
4. Reinstall the hose assemblies to the drive motor and brake.
5. Reinstall the wheel and wheel nuts onto the torque hub. Torque the wheel nuts to 90 ft. lbs. (122 N-m).
6. Remove the jack stands used to block the wheels. Lower the jack and remove.
7. Operate the drive system to check for leaks. If the brake was serviced, bleed out the air using the bleed valve located on the brake housing.

Seal Replacement, Brake (Figure 4-15)

1. With shaft protrusion downward remove the capscrews (22) from the brake assembly.
2. Remove the power plate (20) from the housing (1).
3. Remove the gasket (2), discard.
4. Remove the piston (13) from the power plate (20) by introducing low pressure air (15 psi) into the hydraulic inlet. Make sure the piston is pointed away from anyone.
5. Remove o-rings (15 & 17) and backup rings (14 & 16) from the inner and outer diameter grooves of the piston, discard.
6. Clean the piston (13) and power plate (20) assemblies with solvent. Inspect the sealing surfaces of the piston (13) and power plate (20). Inspect the seal grooves in the piston. Replace these parts if they are damaged or scratched deeply. Lubricate piston (13), power plate (20), and seals (14, 15, 16, & 17) with clean hydraulic oil prior to assembly.
7. Install the backup rings (14 & 16) and o-rings (15 & 17) into the seal grooves in the piston.
8. Install the piston into the power plate using a shop press. Be careful not to damage the seals during assembly. Center the cutouts in the piston with the torque pin holes in the power plate. Press the piston to a depth no less than flush, but not exceeding 0.120 in. below the surface of the power plate at the cutouts in the piston. This depth is critical, the brake will not hold if it is exceeded.
9. Install gasket (2).
10. Install power plate / piston assembly (13 & 20) to housing (1) using capscrews (22). Tighten sequentially, one turn at a time, to press the two assemblies together. Torque capscrews 50 to 60 ft.-lbs.

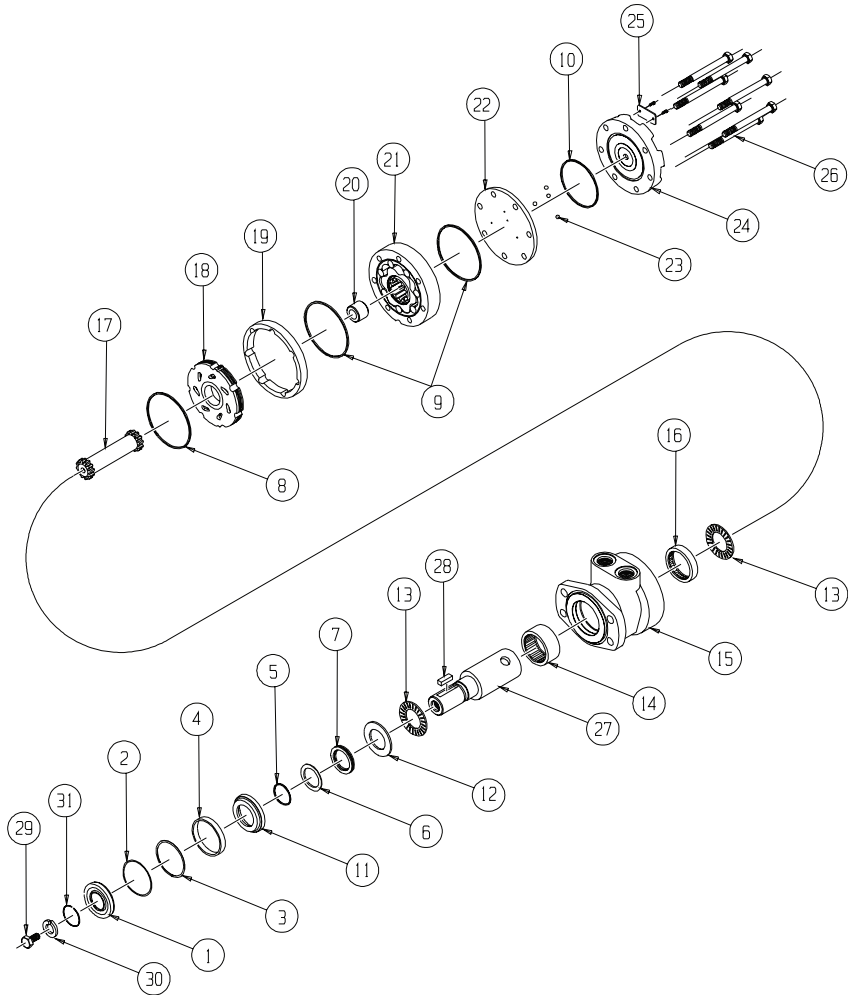


1. Housing
2. Gasket
3. Ball Bearing
4. Oil Seal
5. Spring Retainer
6. Spring, Compression
7. Shaft
8. Pin, Torque
9. Primary Disk
10. Spring, Compression
11. Rotating Disk.
12. Stationary Disk
13. Piston
14. Backup Ring
15. O-ring
16. Backup Ring
17. O-ring
18. Ball Bearing
19. Plug, Protective
20. Power Plate
21. Bleeder Screw
22. Capscrew
23. Pressure Relief Valve

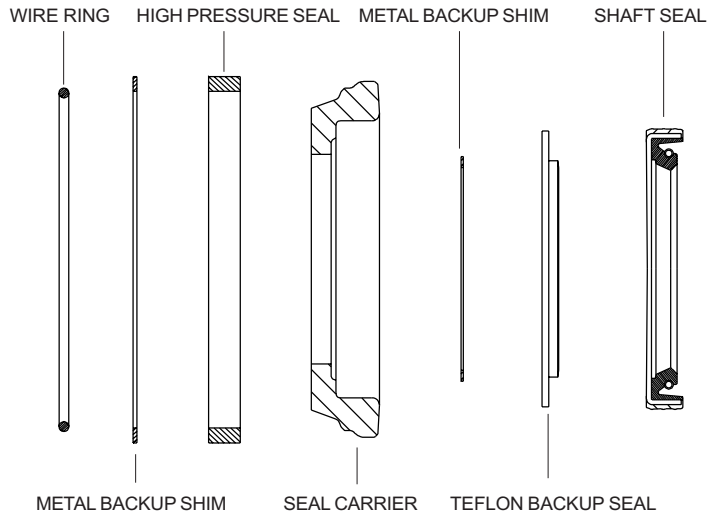
Figure 4-15: Brake Assembly

Seal Replacement, Rear Motor (Figure 4-16)

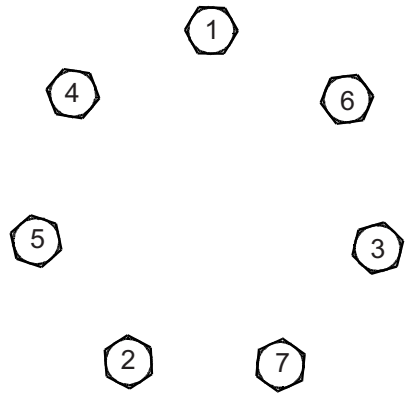
1. Remove all shaft related components from shaft (27) (i.e. Keys, wire rings, nuts). To aid in reassembly of the motor, make a "v" shaped set of lines from the end cover (24) to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to housing (15).
2. Loosen and remove seven bolts (26) holding motor assembly together. Remove end cover (24) and body seal (10). Discard seal. Remove balance plate (22) taking care not to drop the four steel balls (23) located in the four holes in the balance plate (22). Remove rotor assembly (21), manifold boot (19), manifold (18), drive link spacer (20) (note: some motors do not use spacer), drive link (17) and thrust bearing (13). Remove body seals (9) from rotor assembly (21) and housing seal (8) from housing (15) and discard seals. (note: compare old housing seal (8) to the two housing seals included in kit to determine which one to use.)
3. Gently tap shaft (27) upward from housing (15) and remove through rear of housing and lay aside. Remove housing (15) from vise and turn over. Pry dust seal (1) from housing. Push the seal carrier (11), thrust washer (12) and thrust bearing (13) down until they make contact with the roller bearing (14) located in the housing bore.
4. Remove wire ring (2), steel backup shim (3) and high pressure seal (4) from inner bore groove with a small screwdriver (note: compare old high pressure seal (8) to the two high pressure seals included in kit to determine which one to use.). Lift out seal carrier (11), thrust washer (12) and thrust bearing (13) from the housing bore. Using a small screwdriver, carefully pry shaft seal (7), teflon backup seal (6) and metal backup shim (5) from seal carrier (11) and discard. Lay seal carrier (11), thrust washer (12) and thrust bearing (13) aside. (note: if a new thrust washer (12) and seal carrier (11) is included in kit, old items may be discarded).
5. At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air (for safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.
6. Place shaft (27) on a clean flat surface with output end facing up. Place thrust bearing (13) then thrust washer (12) on shaft. Lightly coat seal area of shaft with clean oil and place plastic installation sleeve with shaft seal (7) down onto shaft covering all splines, keyways and wire ring grooves. Slide shaft seal (7) down onto shaft (27) making sure that lip on seal faces down (see figure 1 for correct seal orientation) until it contacts thrust washer (12). Remove plastic installation sleeve. Carefully install the teflon backup seal (6) onto the shaft (27) with the flat side up and the seal lip facing the shaft seal (7). Place the metal backup shim (5) onto the shaft and against the teflon backup seal (6). Place the seal carrier (11) onto the shaft (large end down) and carefully press the seal carrier (11) down onto the seal assembly using an arbor press and sleeve to compress the seals into the carrier.
7. With pilot side facing up, place housing (15) on spacers to raise housing approximately .250 above work surface (note: spacers should allow shaft to contact work surface). Place shaft/seal carrier assembly into housing (15). Install high pressure seal (4) into groove in housing. Install metal backup shim (3) against high pressure seal (4) in groove in housing bore by squeezing the shim (3) between thumb and forefinger to bow shim. While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into the groove making sure that the ends are butted.
8. While holding shaft into housing, place housing/shaft assembly in vise with shaft end down. Making sure that end of drive link (17) with crowned splines goes into shaft end, install drive link (17) into shaft and tap lightly to seat the seal carrier assembly against the wire ring (2). Place thrust bearing (13) over drive link (17). If seal carrier (27) is properly seated against wire ring (2), thrust bearing (13) will be flush with rear surface of housing.
9. Install housing seal (8) into groove in housing (15). Place manifold (18) onto housing (15) with side with only seven holes facing housing (15). Install manifold boot (19) over manifold (18) and align bolt holes. Place body seals (9) in grooves in both sides of rotor (21). Place rotor (21) onto manifold (18) with side of rotor with chamfer in splines facing manifold (18).
10. Install balance plate (22) onto rotor (21) making sure side with holes for steel balls (23) faces up. Install four steel balls (23) in holes in balance plate (22). Install end cover seal (10) into groove in end cover (24) and place end cover onto balance plate (22). Install seven assembly bolts (26) and pre-torque to 10 ft.lbs. Using the bolt torque sequence shown in figure 2, final torque all bolts to 50 ft.lbs.
11. Remove motor from vise and place on work surface with shaft (27) facing up. Making sure that lip on seal (1) faces up, place dust seal (1) over shaft (27). Using a sleeve and a hammer, carefully drive dust seal (1) into place.



1. Dust Seal
2. Split Wire Ring
3. Metal Backup Shim
4. High Pressure Seal
5. Metal Backup Shim
6. Teflon Backup Seal
7. Shaft Seal
8. Housing Seal
9. Body Seals (2)
10. End cover Seal
11. Seal Carrier
12. Thrust Washer
13. Thrust Bearing (2)
14. Front Housing Bearing
15. Housing
16. Rear Housing Bearing
17. Drive Link
18. Manifold
19. Manifold Boot
20. Drive Link Spacer
21. Rotor Assembly
22. Balance Plate
23. Steel Balls (4)
24. End cover
25. I.D. Tag Assembly
26. Assembly Bolts (7)
27. Shaft
28. Shaft Key
29. Shaft Bolt
30. Lock Washer
31. Wire Ring



Detail: Shaft Seal Assembly



Detail: Bolt Tightening Sequence

Figure 4-16: Rear Drive Motor Assembly

FRONT AXLE 4WD (Figure 4-17)

Removal

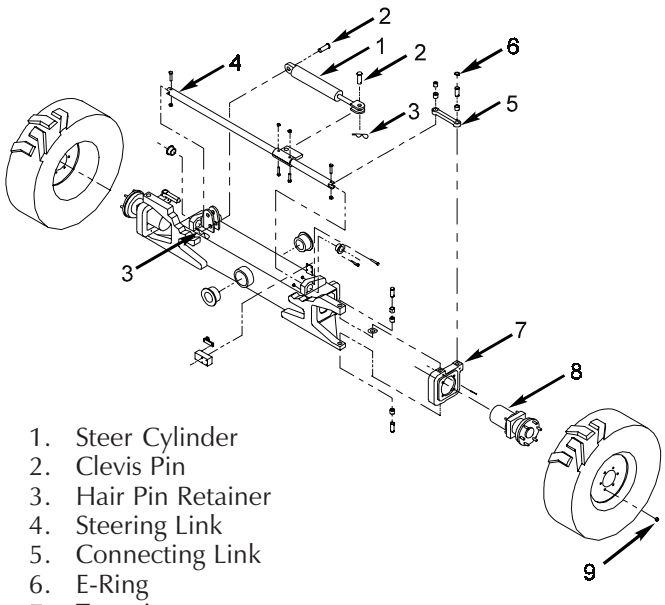
1. Park the work platform on firm level ground and block the wheels to prevent the work platform from rolling.
2. Loosen the wheel lug nuts on the motor to be removed.
3. Raise the front of the work platform using a 2-ton jack.
4. Position two 1-ton jack stands under the front axle to prevent the work platform from falling if the jack fails.
5. Remove the wheel nuts and wheel.

> **⚠ CAUTION ⚠**
>
> Clean all fittings before disconnecting the hose assemblies.
>
> Plug all port holes and hose assemblies IMMEDIATELY to prevent contamination from dust and debris.

6. Tag and disconnect the hose assemblies.
7. Remove the screw and nut from the end of the steering link. Swing the connecting link clear of the steering link.
8. Remove the 'E' ring from the steering link pin.
9. Lift the connecting link off of the steering link pin.
10. Swing the trunnion assembly around to gain access to the inside.
11. Remove the four nuts from inside the trunnion and remove the drive motor/hub assembly.

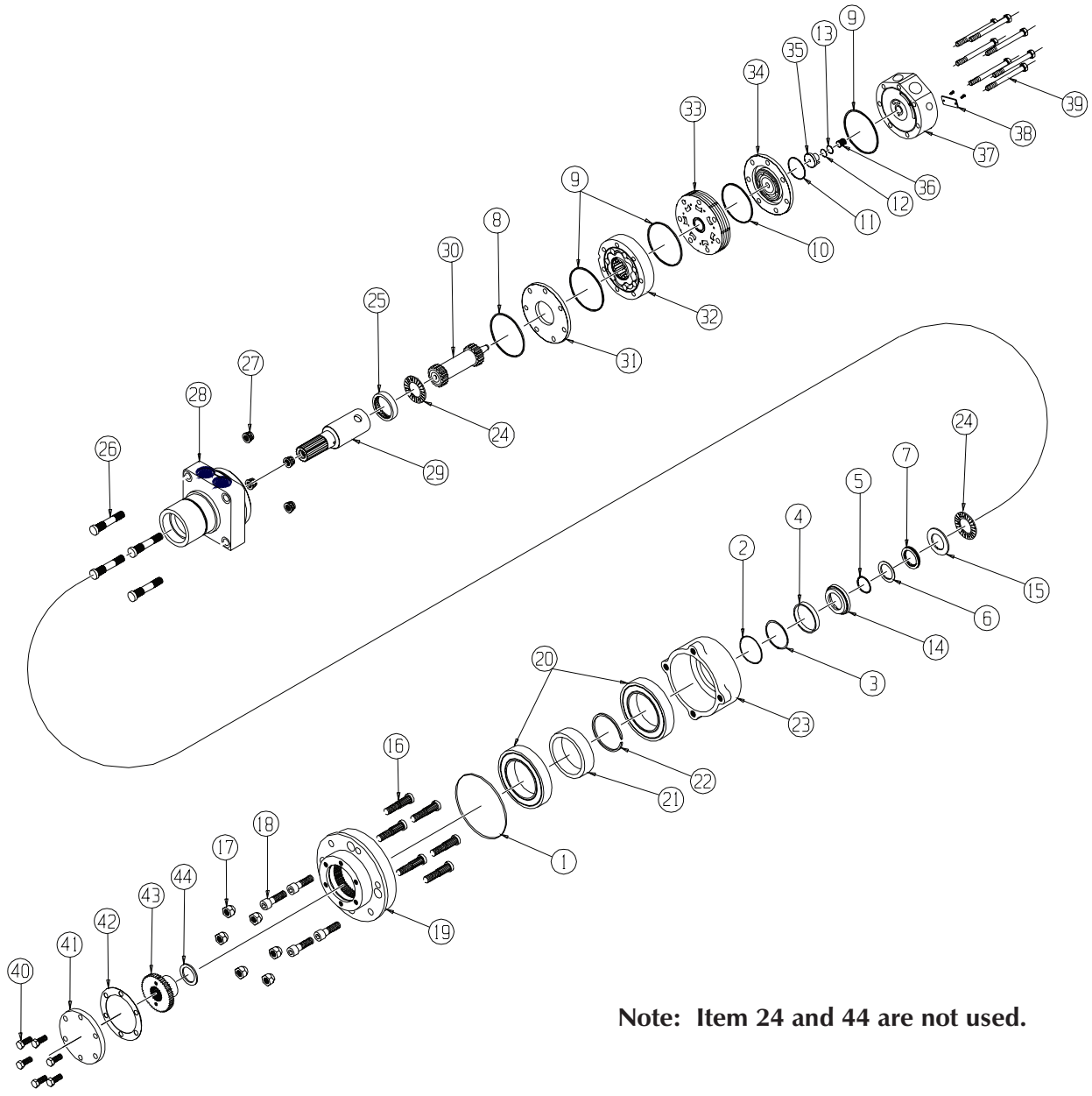
Installation

1. Position the drive motor/hub assembly into the steering trunnion and secure with the four nuts, tighten.
2. Install the connecting link onto the steering link pin and secure with the 'E' ring.
3. Swing the connecting link toward the steering link, and align the holes. Install the screw and nut, tighten.
3. Install the hose assemblies.
4. Install the wheel and wheel nuts onto the hub. Torque the wheel nuts to 90 ft. lbs. (122 N-m).
5. Remove the jack stands used to block the wheels. Lower the jack and remove.
6. Operate the drive system to check for leaks.



1. Steer Cylinder
2. Clevis Pin
3. Hair Pin Retainer
4. Steering Link
5. Connecting Link
6. E-Ring
7. Trunnion
8. Drive Motor
9. Wheel Nut

Figure 4-17: Front Axle Assembly 4WD



1. Flange Seal
2. Wire Ring
3. Metal Backup Shim
4. High Pressure Seal
5. Metal Backup Shim
6. Teflon Backup Seal
7. Shaft Seal
8. Housing Seal
9. Body Seals (3)
10. Manifold Seal
11. Commutator Seal
12. O-Ring Seal
13. Teflon Backup Seal
14. Seal Carrier
15. Thrust Washer
16. Studs (6)
17. Lug Nuts (6)
18. Capscrews (4)
19. Wheel Flange
20. 125mm Bearings (2)
21. Bearing Spacer
22. Thrust Ring
23. Bearing Hub
24. Thrust Bearings
25. Rear Housing Bearing
26. Planetary Mount Studs (4)
27. Mounting Nuts (4)
28. Housing
29. Shaft
30. Drive Link
31. Divider Plate
32. Rotor Assembly
33. Manifold
34. Commutator Assembly
35. End cover Piston
36. Piston Spring
37. End cover
38. I.D. Tag Assembly
39. Assembly Bolts (7)
40. Driver Cover Screws (6)
41. Driver Cover
42. Paper Gasket
43. Driver

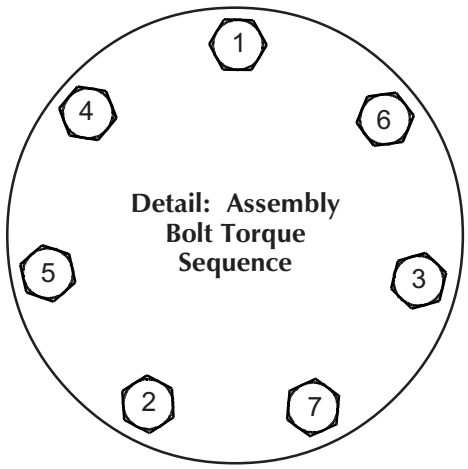
Figure 4-18: Front Drive Motor Assembly

Seal Replacement, Front Motor (Figure 4-18,19)

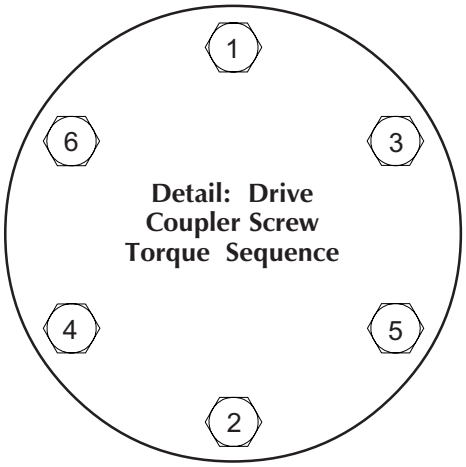
1. Remove six bolts (40) from end cap (41). Lift end cap (41) off of wheel flange (19). Peel or scrape paper gasket (42) off of end cap and/or wheel flange (19). If grease is between end cap (41) and driver (43), remove grease. Screw a 1/4-20 bolt (not included) into one of the two threaded holes in the driver (43) and lift the driver out of the wheel flange (19). If grease is between driver (43) and housing pilot (28), remove grease.
2. To aid in reassembly of the motor, make a "v" shaped set of lines from the end cover (37) to the housing (28) using either paint or a marker. With hub facing down, secure motor in vise by clamping on to housing (28). Loosen and remove seven bolts (39) holding motor assembly together. Remove end cover (37) carefully as piston (35) and spring (36) may fall out. If piston does not come out, carefully pry piston (35) out of end cover (37) and lay aside. Remove o-ring seal (12) and teflon backup seal (13) from end cover and discard seals. Remove spring (36) and lay aside.
3. Lift commutator container and commutator (34) from motor and lay aside. Place commutator on a flat, clean surface with the seal (11) facing up. Place the tip of a small screwdriver on the seal (11) and gently tap until opposite side of seal lifts from groove. Remove seal and discard.
4. Remove manifold (33), rotor set (32) and divider plate (31) from motor. Remove all seals (8, 9, & 10) from components and discard. (caution- do not allow rolls to drop from rotor assembly (32) when removing rotor assembly from motor.) Remove drive link (30) from motor and lay aside.
5. Remove motor from vise and re-clamp in vise with pilot side of housing facing up. Using a brass hammer, carefully tap shaft (29) down until rear shaft bearing (25) is protruding from rear housing surface approximately 5/8". Using a small screwdriver, remove wire ring (2), metal backup shim (3) and high pressure seal (4) from inner bore groove. Remove shaft/seal carrier assembly (29, 14, 5-7) up through housing. Remove seal carrier (14), thrust washer (15) and thrust bearing (24) from shaft and lay aside.
6. Using a small, flat bladed screwdriver, carefully pry shaft seal (7), teflon backup seal (6) and metal backup shim (5) from seal carrier (14) and lay aside. Lay seal carrier (14), thrust washer (15) and thrust bearing (24) aside.
7. At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air (for safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.
8. (note: shaft seals for 1-1/4" and 1-1/2" shafts are included in this kit. To determine which new seal to use for servicing, refer to old shaft seal). Place shaft on a clean surface with output end facing up. Install thrust bearing (24) and then thrust washer (15) onto shaft. After coating shaft seal (7) and teflon backup seal (6) with clean oil, install shaft seal (7) onto shaft with lip facing. Install teflon backup seal (6) with lip facing down followed by metal backup shim (5) (see figure 1 for correct seal position). Install seal carrier (14) onto shaft with large end facing down. Using a sleeve and press, gently press seal carrier (14) down to compress seal assembly (5-7) into seal carrier (14).
9. Place housing (28) in vise with pilot of housing facing up. Place spacer under housing (28) to prevent shaft (29) from dropping to work surface. Spacer should allow shaft to be about 1/2" below rear surface of housing.
10. Place shaft/shaft seal assembly into housing (28) with output end facing up. Install high pressure seal (4) into groove in inner bore of housing (28). Install metal backup shim (3) against high pressure seal (4) by squeezing the shim (3) between thumb and forefinger to bow shim. While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into groove making sure that the ends are butted.
11. While holding shaft into housing, secure housing/shaft assembly in vise with shaft end down. Gently tap shaft bearing (25) down into housing until bearing is approximately 1/16" below rear housing surface. Install drive link (30) into shaft and gently tap drive link (30) down to seat seal carrier (14) against wire ring (2). If shaft (29) is seated properly against wire ring (2) , rear surface of shaft (29) should be flush with rear surface of housing (28).
12. Install housing seal (8) into groove in housing (28). Place divider plate (31) onto housing (28) aligning bolt holes. Place body seals (9) in grooves in both sides of rotor (32). Place rotor (32) onto divider plate (31) with side of rotor with chamfer in splines facing divider plate (31). Place manifold (33) onto rotor (32) with seal groove side up. Install manifold seal (10).
13. Install the commutator seal (11) into the commutator (34) with the metal side facing up. Use finger pressure to press the seal down flush with the surface of the commutator. Place the commutator

container onto the manifold (33) and then place the commutator onto the protruding end of the drive link (30) making sure that the seal side faces up.

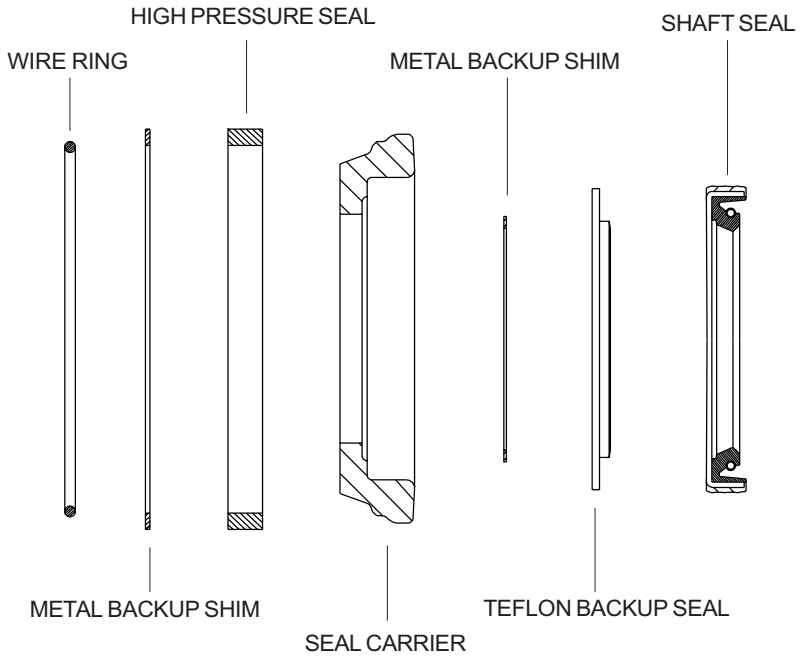
14. Install the remaining body seal (9) in the groove in the face of the end cover (37). Install piston spring (36) into end cover (37), then the white teflon backup seal (13) followed by the o-ring seal (12). Lining up the alignment pin with the hole in the end cover, press piston (35) into the end cover (37). While holding the piston (35) in the end cover (37), lower the end cover assembly onto the motor. Check to make sure that the end cover ports are in their original position.
15. Install the seven assembly bolts (39) and pre-torque to 10 ft. Lbs. Using bolt torque sequence shown in figure 2, final torque all bolts to 50 ft. Lbs.
16. Place spacer (44) over shaft (29) . Place driver (43) over shaft (29) while rotating wheel flange (19) slightly to allow splines to mate. Place paper gasket (42) onto wheel flange (19). Reapply grease between driver (43) and end cap (41) (only if end cap (41) does not have grease fitting). Place end cap (41) onto wheel flange (19). Install six bolts (40) and torque to 50 ft. Lbs. Using the bolt torque sequence shown if figure 3. If end cap (41) has grease fitting, apply grease.



Detail: Assembly Bolt Torque Sequence



Detail: Drive Coupler Screw Torque Sequence



Detail: Shaft Seal Assembly

Figure 4-19: Front Drive Motor Assembly, Details

4.10 Axle Cylinder (4WD Only)

REMOVAL (Figure 4-20)

Note: Be sure platform is fully down and that machine is on level ground.

1. Lift the chassis with a 2 ton jack, and place 1 ton jackstands underneath the left and right frame members just behind the articulating axle assembly. Lower the jack. The weight of the front of the chassis should *now* be supported by the jackstands, and the front wheels should *still* be allowed to touch the ground.
2. Remove the four screws from the front axle cover, remove cover.
3. Remove and cap the hoses.
4. Remove the hex nuts from the cylinder pins at both ends, remove pins.
5. Remove the cylinder from of the chassis.

SEAL REPLACEMENT (FIGURE 4-17)

Note: Provide a clean work area for this operation, and observe clean assembly practices. Seals and hydraulic cylinder components are highly sensitive to contamination that may not even be visible to the naked eye.

1. Use a spanner wrench to unscrew the head from the cylinder body tube.
2. Carefully slide the rod, piston, and head out of the body tube and place on a clean surface.
3. Remove cotter pin from cylinder rod.
4. Unscrew the slotted nut from the rod end.
5. Remove the piston from the rod.
6. Slide the rod out of the head.
7. Remove all of the old seals and wear rings, discard.
8. Thoroughly clean all parts with solvent. Rinse the inside of the tube and allow to drain. A high pressure rinse and wipe with a lint free rag is preferable.
9. Inspect the rod, head, piston, and tube for scratches, pits, or polishing. Check seal groves and sealing surfaces. Scratches or pits deep enough to catch the fingernail are unacceptable, replace the affected component. Polishing is a sign of uneven loading, when this occurs, the surface should be checked for roundness. Surfaces not round within .007" should be replaced.
10. Lubricate all components and seals with clean hydraulic oil prior to assembly.

Note: During seal replacement steps, do not use sharp edged tools to avoid cutting the seals. After assembling all seals, allow at least one hour for the seals to elastically restore to their original shape before assembly. Refer to Figure 4-16 for component identification and placement.

11. Separate the three components of the piston seal. Stretch the rubber inner ring over the piston and into the seal groove. Warm the teflon outer ring to 150°f using heated hydraulic fluid or water. Stretch the teflon outer ring into the seal groove. Clean the groove in the teflon ring and install the quad ring. Verify that none of the rings have twisted.
12. Install the glass filled nylon wear rings into the outer grooves in the piston.
13. Twist the U-Cup seal into a 'C' shape and allow it to snap into the groove in the head.
14. Use the above technique to install the wiper into the head.
15. Install the static o-ring and the static backup ring into the grove in the head. Verify that the backup ring is closest to the threads.
16. Install the sealing o-ring between the threads and the flange lip on the head, be careful not to damage the o-ring on the threads.
17. Slide the head assembly onto the rod.
18. Install the static o-ring into the groove on the rod.
19. Install the piston onto the rod.
20. Install the slotted nut and torque to 325 to 520 ft.-lbs. Install the cotter pin. Do not back off on the slotted nut to install the cotter pin. Once the torque has reached 325 ft.-lbs., increase until the next slot aligns with the hole in the rod.
21. Slide the piston, rod, and head into the tube. Be careful not to damage the piston seal on the threads during assembly. If necessary, use shimstock to protect the piston seal when inserting.
22. Use a spanner wrench to tighten the head.

INSTALLATION

1. Remove the pilot operated check valves and completely fill both ends of cylinder with hydraulic oil. Replace the pilot operated check valves.
2. Attach both ends of the cylinder to the upper and lower attachments with cylinder pins.
3. Install the hex nuts onto the cylinder pins, tighten.
4. Remove the jackstands from under the chassis.
5. Operate the work platform over rough terrain and check for proper function and leaks.

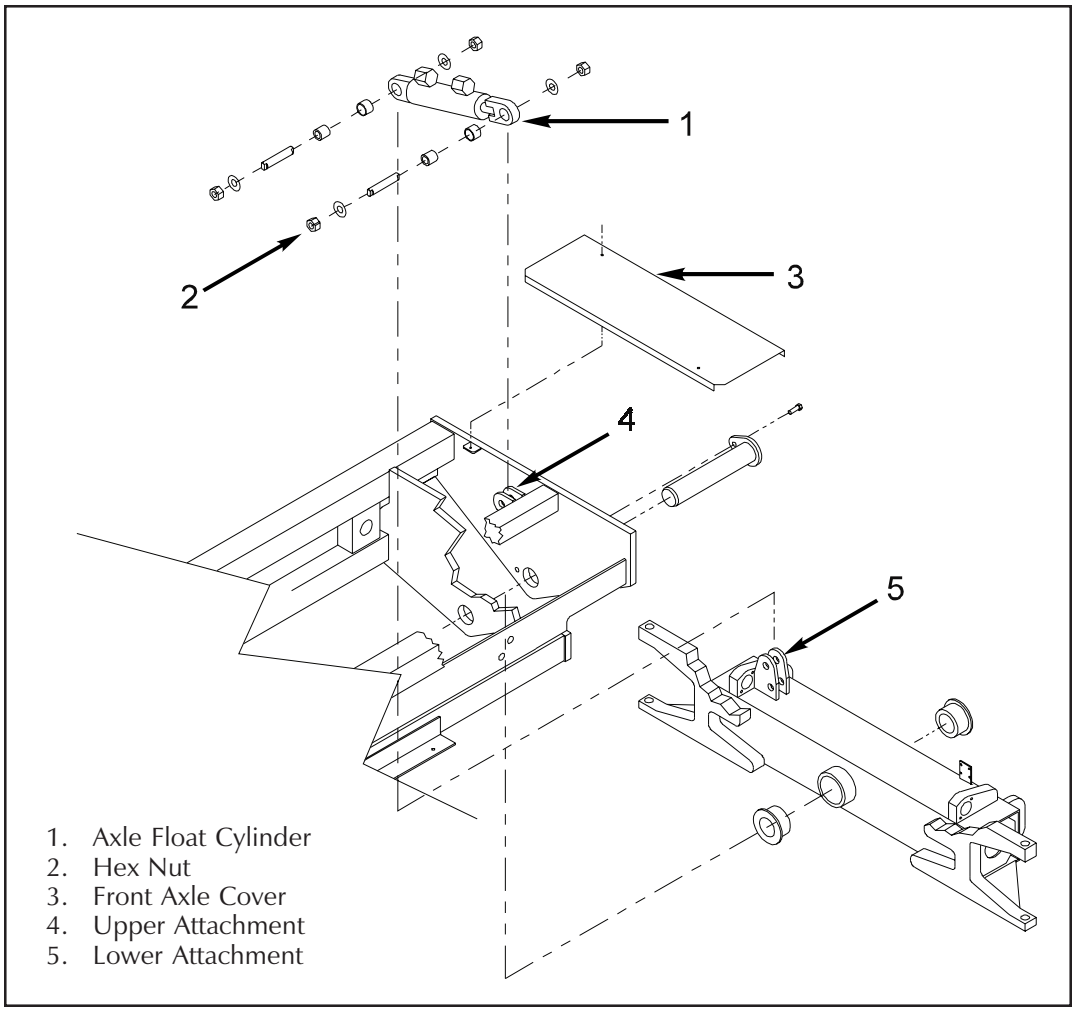


Figure 4-20: Floating Axle Assembly

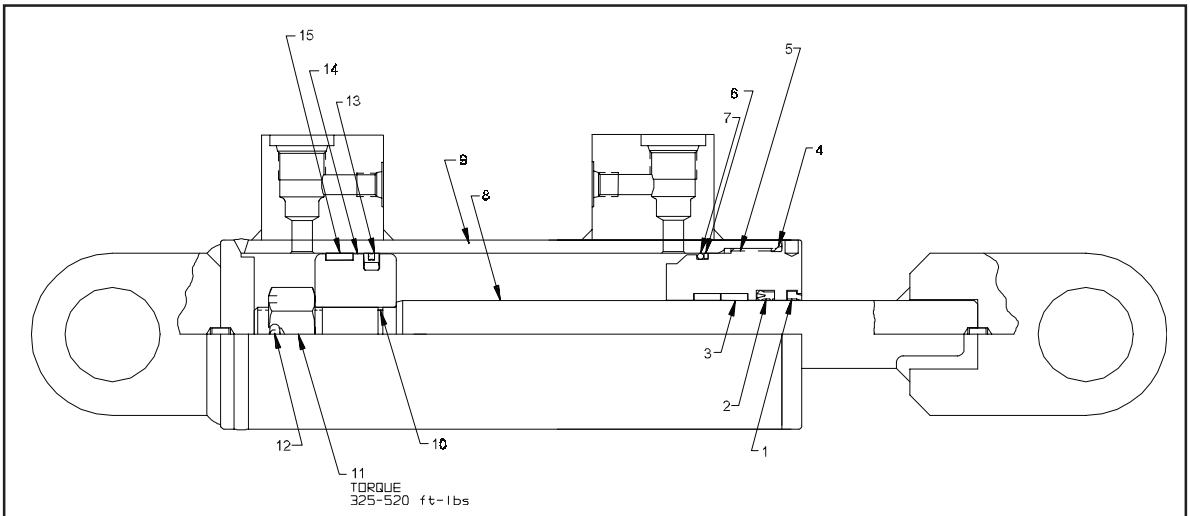


Figure 4-21: Axle Float Cylinder Cross Section

4.11 Steering Cylinder (Figure 4-22)

REMOVAL

1. Remove the two capscrews holding the front axle cover in place (4WD only).
2. Remove and cap the hoses. Mark them for reference.
3. Remove the hair pin retainers from the clevis pins at each end of the cylinder.
4. Remove the clevis pins.
5. Remove the cylinder from the chassis.

SEAL REPLACEMENT (FIGURE 4-23)

Note: Provide a clean work area for this operation, and observe clean assembly practices. Seals and hydraulic cylinder components are highly sensitive to contamination that may not even be visible to the naked eye.

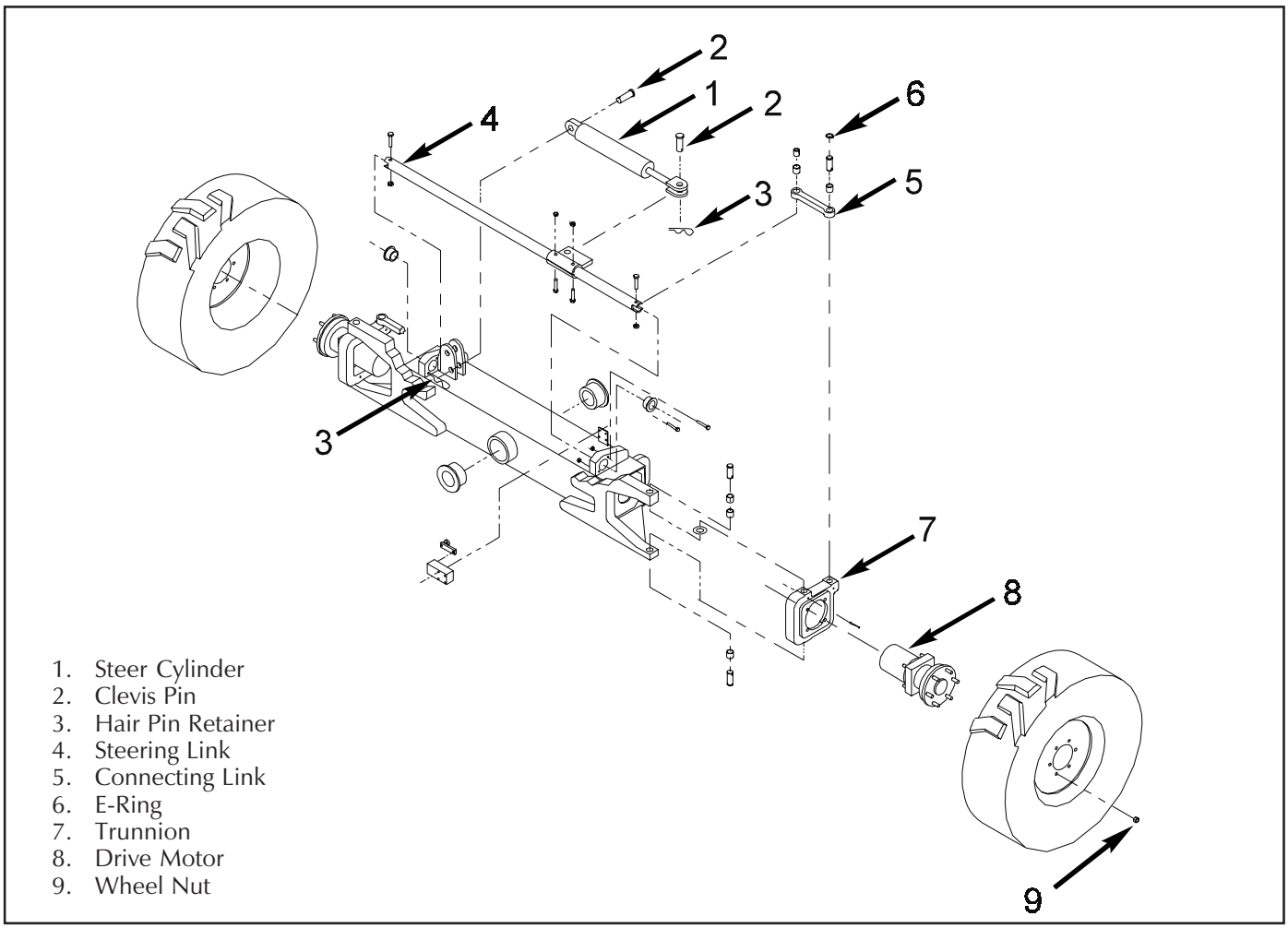
1. Use a spanner wrench to rotate the head until the retaining ring becomes visible in the grove milled into the side of the cylinder. Insert a screwdriver under the beveled edge of the retaining ring to start it through the opening. Continue to rotate the head until the retaining ring works it's way out of the opening.
2. Remove the rod, head, and piston from the tube.
3. Unscrew the locknut from the end of the rod.
4. Remove the piston from the rod.
5. Slide the rod out of the head.
6. Remove all of the old seals and wear rings, discard.
7. Thoroughly clean all parts with solvent. Rinse the inside of the tube and allow to drain. A high pressure rinse and wipe with a lint free rag is preferable.
8. Inspect the rod, head, piston, and tube for scratches, pits, or polishing. Check seal groves and sealing surfaces. Scratches or pits deep enough to catch the fingernail are unacceptable, replace the affected component. Polishing is a sign of uneven loading, when this occurs, the surface should be checked for roundness. Surfaces not round within .007" should be replaced.
9. Lubricate all components and seals with clean hydraulic oil prior to assembly.

Note: During seal replacement steps, do not use sharp edged tools to avoid cutting the seals. After assembling all seals, allow at least one hour for the seals to elastically restore to their original shape before assembly. Refer to Figure 4-16 for component identification and placement.

10. Stretch the o-ring loader into the seal grove on the piston. Verify that it has not been twisted or pinched. Start one edge of the bidirectional piston seal into the grove in the piston and work it around into the grove with your thumbs. Be very careful not to cut the outer diameter of this seal.
11. Install the wear ring into the grove on the piston.
12. Twist the u-cup seal into a 'C' shape and snap it into the grove inside of the head. Note that the 'U' groove in the seal should face the inside of the cylinder.
13. Use the above technique to install the wiper into the groove inside the head. Note that the blade of the wiper should face toward the outside of the cylinder.
14. Install the static backup ring into the groove closest to the inside edge of the head.
15. Install the static o-ring into the above groove, making sure that it falls inside of the static backup ring.
16. Slide the head onto the rod.
17. Install the static o-ring onto the end of the rod.
18. Install the piston onto the rod.
19. Install the locknut onto the rod, torque to 250 ft.-lbs.
20. Slide the piston, rod, and head into the tube. Be careful not to damage any of the seals during assembly. If necessary, use shimstock to prevent the seals from extruding into the retaining ring slot.
21. Using a spanner wrench, rotate the head until the retaining ring hole is visible in the groove milled into the side of the cylinder. Insert the retaining ring hook into the hole and rotate the head 1-1/4 turns until the retaining ring is drawn completely into the tube and the ends are covered.

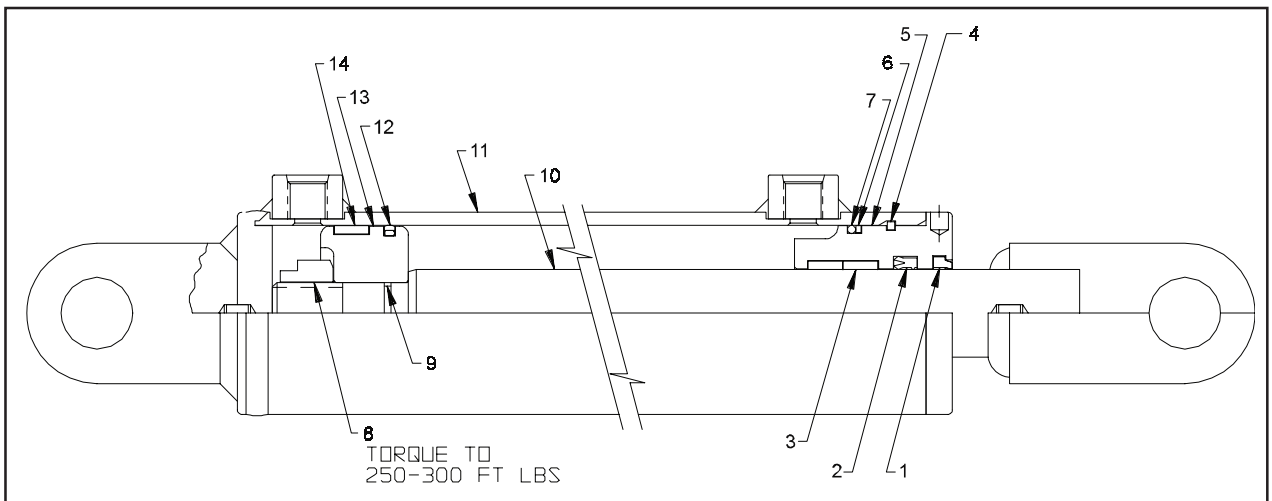
INSTALLATION

1. Align the ends of the cylinder with the mounts on the chassis.
2. Install the clevis pins.
3. Install the hair pin retainers into the clevis pins at each end of the cylinder.
4. Install the hoses, noting their orientation markings from disassembly.
5. Install the front axle cover and the two capscrews holding it in place, tighten (4WD only).



1. Steer Cylinder
2. Clevis Pin
3. Hair Pin Retainer
4. Steering Link
5. Connecting Link
6. E-Ring
7. Trunnion
8. Drive Motor
9. Wheel Nut

Figure 4-22: Front Axle Assembly 4WD



1. Rod wiper
2. Rod seal
3. Wear ring, 2 req'd
4. Retaining ring
5. Head
6. Backup ring
7. O-ring
8. Locknut
9. O-ring
10. Rod weldment
11. Tube weldment
12. Piston seal
13. Piston
14. Wear ring

Figure 4-23: Steering Cylinder Cross Section

4.12 Lift Cylinder (Figure 4-24)

REMOVAL

1. Raise and block the elevating assembly (see section 4.3).
2. Open emergency lowering valve to be sure all pressure is out of the lift cylinder.
3. Remove and cap both hoses and fittings.
4. Remove the down valve and cable assembly.
5. Support the lift cylinder with a suitable lifting device to prevent falling.
6. Remove the retaining bolts from the upper and lower pivot pins.
7. Drive out the pivot pins, upper one first, then the lower one.
8. Hoist the cylinder out of the elevating assembly from the front. **DO NOT sling the cylinder by the rod end pivot, this will cause the cylinder to extend when hoisted.**

SEAL REPLACEMENT (Figure 4-24)

Note: Provide a clean work area for this operation, and observe clean assembly practices. Seals and hydraulic cylinder components are highly sensitive to contamination that may not even be visible to the naked eye.

1. Use a spanner wrench to unscrew the head from the cylinder body tube.
2. Carefully slide the rod, piston, and head out of the body tube and place on a clean surface.
4. Unscrew the locknut from the rod end.
5. Remove the piston from the rod.
6. Slide the head off of the rod.
7. Remove all of the old seals and wear rings, discard. **Do not remove the cast iron ring from the piston.**
8. Thoroughly clean all parts with solvent. Rinse the inside of the tube and allow to drain. A high pressure rinse and wipe with a lint free rag is preferable.
9. Inspect the rod, head, piston, and tube for scratches, pits, or polishing. Check seal groves and sealing surfaces. Scratches or pits deep enough to catch the fingernail are unacceptable, replace the affected component. Polishing is a sign of uneven loading, when this occurs, the surface should be checked for roundness. Surfaces not round within .007" should be replaced.
10. Inspect and clean the cushion orifice if any debris is present.
11. Lubricate all components and seals with clean hydraulic oil prior to assembly.

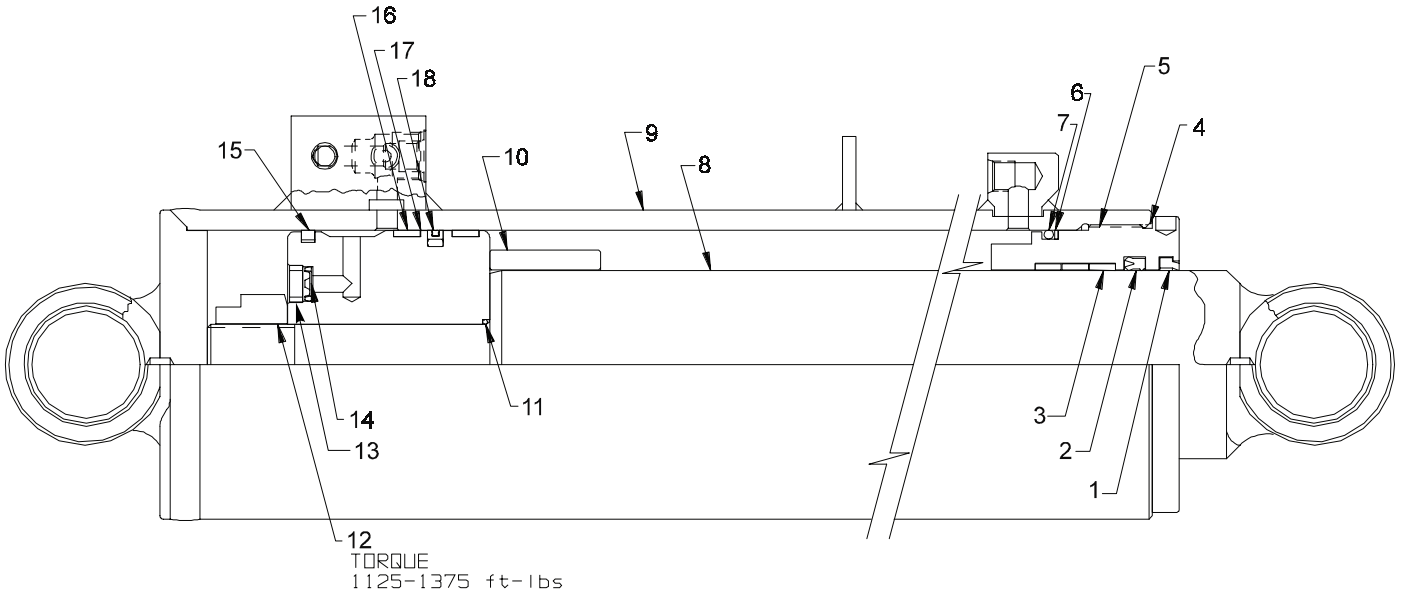
Note: During seal replacement steps, do not use sharp edged tools to avoid cutting the seals. After assembling all seals, allow at least one hour for the seals to elastically restore to their original shape before assembly. Refer to Figure 4-16 for component identification and placement.

12. Separate the three components of the piston seal. Stretch the rubber inner ring over the piston and into the seal groove. Warm the teflon outer ring to 150°f using heated hydraulic fluid or water. Stretch the teflon outer ring into the seal groove. Clean the groove in the teflon ring and install the quad ring. Verify that none of the rings have twisted.
13. Install the glass filled nylon wear rings into the outer grooves in the piston.
14. Twist the u-cup seal into a 'C' shape and allow it to snap into the groove in the head.
15. Use the above technique to install the wiper into the head.
16. Install the static o-ring and the static backup ring into the grove in the head. Verify that the backup ring is closest to the threads.
17. Install the sealing o-ring between the threads and the flange lip on the head, be careful not to damage the o-ring on the threads.
18. Slide the head assembly onto the rod.
19. Install the static o-ring into the groove on the rod.
20. Install the piston onto the rod.
21. Install the locknut and torque to 1125 ft.-lbs.
22. Slide the piston, rod, and head into the tube. Be careful not to damage the piston seal on the threads during assembly. If necessary, use shimstock to protect the piston seal when inserting.
23. Use a spanner wrench to tighten the head.

INSTALLATION

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

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



1. Rod wiper
2. Rod seal
3. Wear ring 3 req'd
4. O-ring
5. Head
6. Backup ring
7. O-ring
8. Rod weldment
9. Tube weldment
10. Spacer
11. O-ring
12. Locknut
13. Bushing
14. Orifice
15. Cast iron ring
16. Wear ring 2 req'd
17. Piston
18. Piston seal

Figure 4-24 Lift Cylinder Cross Section

4-13 Outrigger Cylinder (Figure 4-25)

REMOVAL

1. Remove the plug from the top of the outrigger cylinder.
2. Disconnect the wires from the pressure switch and the ball switch. Tag them for identification during reassembly.
3. Unscrew the strain relief and pull the wires out of the top of the cylinder.
4. Remove and cap the hoses. Tag them for identification during reassembly.
5. Remove the four capscrews, nuts, and washers holding the outrigger cylinder to the outrigger support weldment.
6. Remove the outrigger cylinder.

SEAL REPLACEMENT (FIGURE 4-26)

Note: Provide a clean work area for this operation, and observe clean assembly practices. Seals and hydraulic cylinder components are highly sensitive to contamination that may not even be visible to the naked eye.

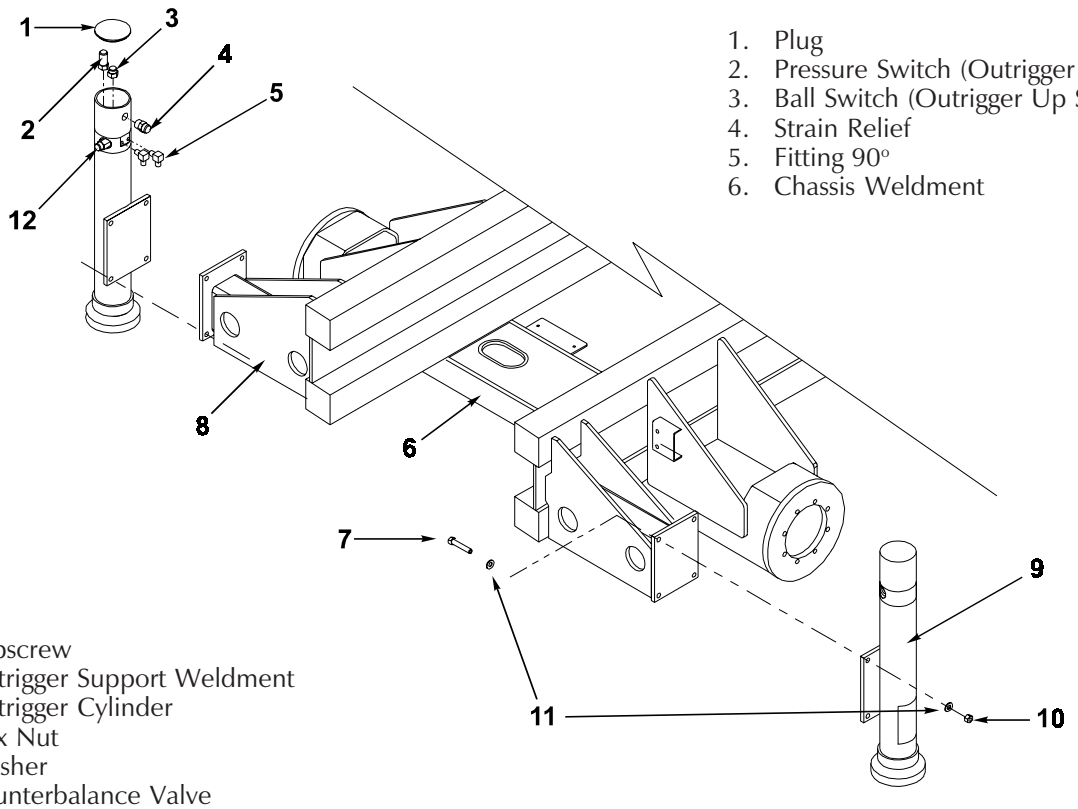
1. Clamp barrel assembly into vise, using aluminum sleeve to protect barrel from excessive scratches. Remove counterbalance valve from barrel assembly , use extreme caution valve is under pressure.
2. Unthread mount plate bolt from barrel assembly using a spanner wench, a sharp impact on wrench is needed to loosen loctite from threads. Remove mount plate from end of rod.
3. Unthread retaining nut and remove from barrel assembly, using a spanner wrench.
4. Gently remove rod assembly from inside barrel assembly using extreme caution not to damage chrome plating on rod.
5. Remove seal retainer from rod assembly. Remove & discard all seals from seal retainer (rod wiper, rod seal, and static seal #1).
6. Clamp rod assembly in vise, using aluminum sleeve to protect chrome plating from damage. Drill out stakes on piston nut apply heat to threads on rod and piston, to loosen loctite on threads. Remove piston from rod assembly using spanner wrench.
7. Remove piston from rod, remove piston seal and discard.
8. Clean all components with cleaning solvent. Clean all loctite from foot pad bolt.
9. Apply a light coating of hydraulic oil to all seals and sealing components prior to assembly.

Note: During seal replacement steps, do not use sharp edged tools to avoid cutting the seals. After assembling all seals, allow at least one hour for the seals to elastically restore to their original shape before assembly. Refer to Figure 4-26 for component identification and placement.

10. Install rod wiper by folding into a 'C' shape and allowing it to "snap" into the outer seal groove in the seal retainer.
11. Install rod seal into inner seal groove in seal retainer using above method.
12. Stretch static seal #1 into outer seal groove on seal retainer.
13. Stretch piston seal into seal groove on piston.
14. Install seal retainer onto rod assembly, from piston end of rod, using a sharp blow to seal retainer, with hard rubber mallet, to overcome seal squeeze.
15. Apply Loctite® #262 (or equivalent) to rod end threads. Install piston onto rod end, torque using spanner wrench until tight.
16. Install rod assembly into barrel assembly, using extreme caution not to damage chrome plating on rod.
17. Seat seal retainer into barrel using a sharp blow with a hard rubber mallet to overcome seal squeeze.
18. Thread retaining nut onto barrel assembly, using spanner wrench, tighten.
19. Apply Loctite® #242 (or equivalent) to threads of foot pad bolt.
20. While holding foot pad in place at end of rod, install foot pad bolt using spanner wrench, tighten.

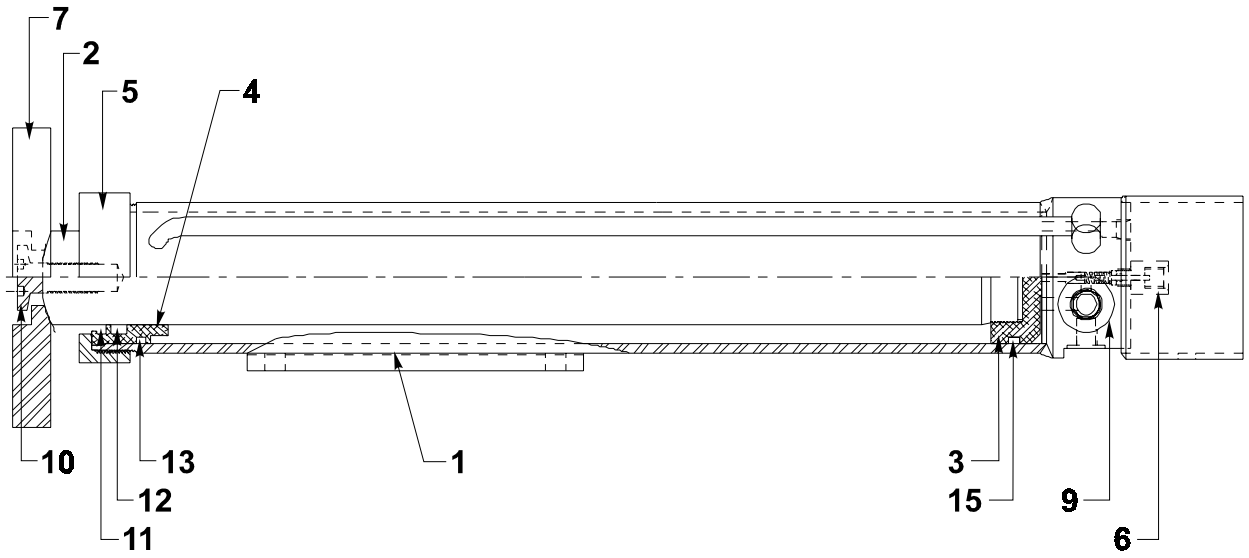
INSTALLATION

1. Install the outrigger cylinder to the outrigger support weldment using the four capscrews, nuts, and washers; tighten.
2. Install the hoses exactly as disassembled.
3. Thread the wires for the pressure switch and the ball switch through the strain relief.
4. Reattach the wires to the switches exactly as disassembled.
5. Tighten strain relief.
6. Install plug to top of outrigger cylinder.



1. Plug
2. Pressure Switch (Outrigger Down Sensor)
3. Ball Switch (Outrigger Up Sensor)
4. Strain Relief
5. Fitting 90°
6. Chassis Weldment
7. Capscrew
8. Outrigger Support Weldment
9. Outrigger Cylinder
10. Hex Nut
11. Washer
12. Counterbalance Valve

Figure 4-25: Outrigger Cylinder Installation



1. Barrel Assembly
2. Rod
3. Piston
4. Seal Retainer
5. Head Cap
6. Sensor Assembly
7. Foot Pad
9. Counterbalance Valve
10. Foot Pad Bolt
11. Rod Wiper
12. Rod Seal
13. Static Seal #1
15. Piston Seal

Figure 4-26: Outrigger Cylinder Cross Section

4.14 Engine Adjustments

Use the following procedures to set engine speeds for gasoline, propane, and diesel engines. For complete service information on Kubota engines, consult the Kubota Work Shop Manual for your engine.

GASOLINE ENGINE

Idle Speed (Figure 4-27)

1. Warm up the engine for 20 minutes and shut off.
2. Tighten the pilot screw of the carburetor completely, then loosen 1 to 1½ turns. Do not overtighten the pilot screw.
3. Start the engine. Release the throttle switch if it is engaged.
4. Back off on the throttle stop screw until the engine is barely running.
5. Adjust the pilot screw to achieve maximum RPM.
6. Adjust throttle stop screw until engine RPM reaches 1350 +/- 50.

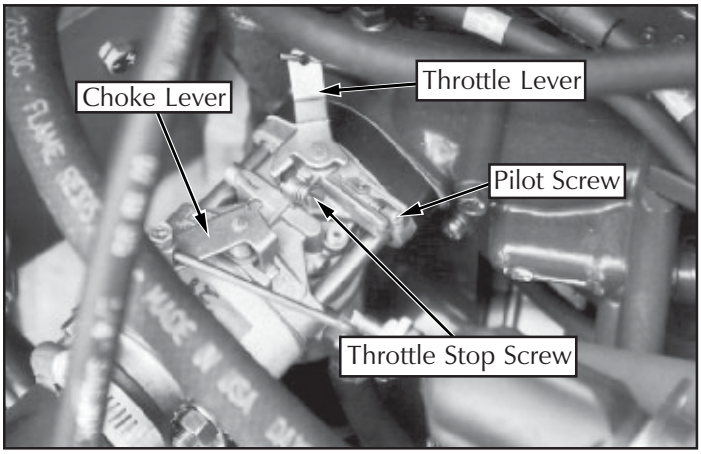


Figure 4-27: Gasoline Engine Carburetor

Governed High Speed (Figure 4-28)

1. Loosen the locknut on the governor lever.
2. While pushing the throttle fully open with the governor lever, turn the governor shaft fully clockwise with a screwdriver.
3. Tighten the locknut in this position.
4. Start the engine and depress the throttle button.
5. Adjust the high speed adjustment screw until the RPM reaches 3400 +/- 50.

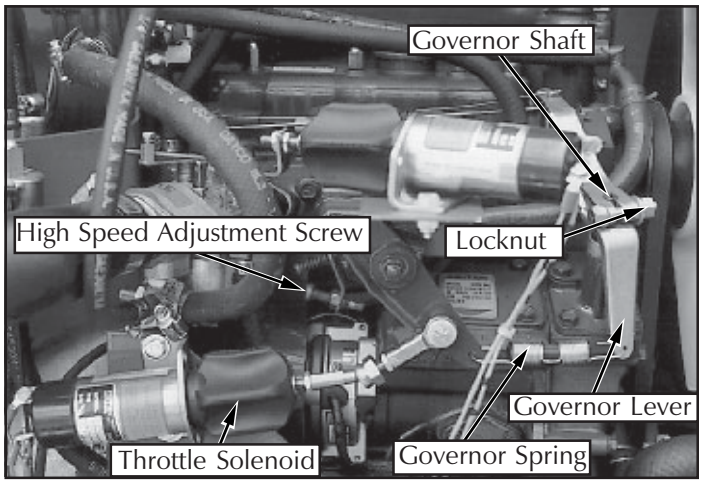


Figure 4-28: Gasoline Engine Governor

DIESEL ENGINE

Idle Speed (Figure 4-29)

1. Warm up the engine for 20 minutes.
2. Depress the throttle button to put the engine in high speed.
2. Adjust the idle stop screw until the RPM reaches 1350 +/- 50.
3. Apply one drop of sealant to protect the adjustment from vibration.

High Speed (Figure 4-29)

1. Warm up the engine for 20 minutes.
2. Depress the throttle button to put the engine in high speed.
2. Adjust the high speed screw until the RPM reaches 3000 +/- 50.
3. Apply one drop of sealant to protect the adjustment from vibration.

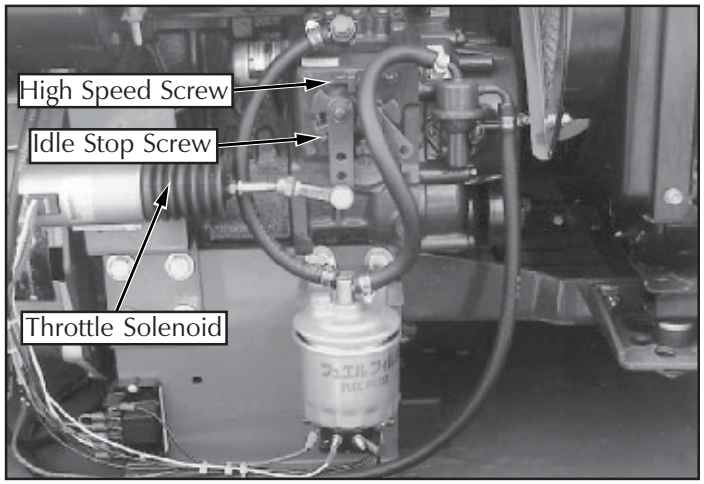


Figure 4-29: Diesel Engine

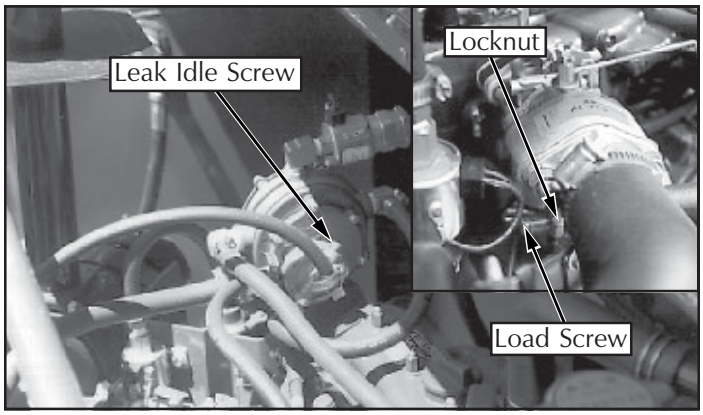


Figure 4-30: Propane Adjustment Screws

PROPANE ENGINE

Leak Idle Adjustment (Figure 4-30)

1. Turn leak idle screw in (clockwise) completely.
2. Turn out (counterclockwise) 1/4 turn.

Load Screw Adjustment (Figure 4-30)

1. Set leak idle screw per above procedure.
2. Loosen locknut on load screw.
3. Turn load screw in (clockwise) completely.
4. Turn out (counterclockwise) three full turns.
5. Start engine.
6. Turn load screw in (clockwise) until engine begins to "blubber" or run roughly.
7. Turn load screw out (counterclockwise) until engine "evens out" or runs smoothly.
8. While holding load screw adjustment in place with a screwdriver, tighten locknut.

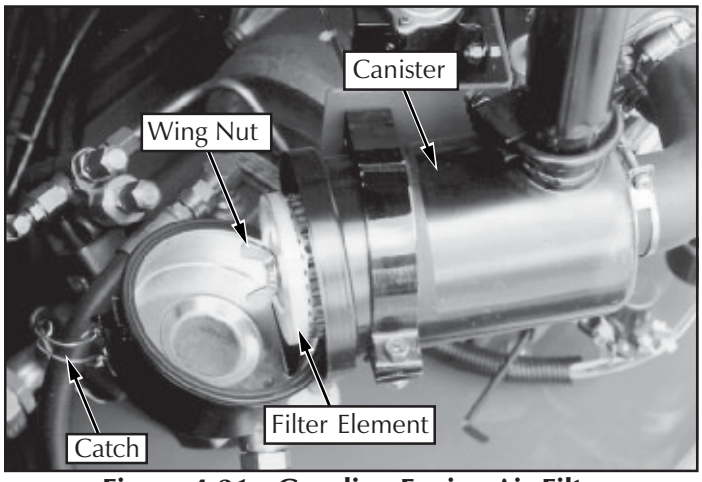


Figure 4-31: Gasoline Engine Air Filter

4.15 Filter Replacement

Use the following procedures for replacing the engine air and fuel filters. Refer to section *4.5 Lubrication* for hydraulic and engine oil filter replacement procedures.

GASOLINE / PROPANE ENGINE

Air Filter Element (Figure 4-31)

1. Unlock the two catches holding the filter canister closed.
2. Remove the wingnut from the filter assembly.
3. Remove and replace the air filter element.
4. Replace the wingnut, tighten.
5. Replace the cover and lock the catches.

Fuel Filter (Figure 4-32)

1. Use a screwdriver to loosen the hose clamps on the fuel lines. Slide the clamps out of the way.
2. Remove the in-line filter from the two lines.
3. Replace the filter, noting the direction of fuel flow as shown by the arrow on the body of the filter.
4. Reposition the clamps, tighten.

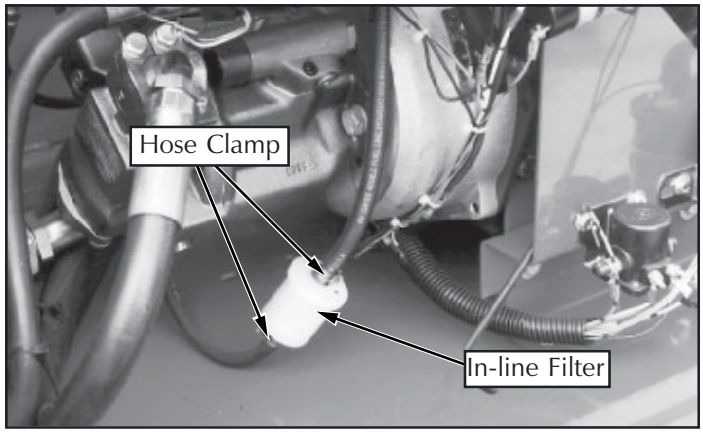


Figure 4-32: Gasoline Engine Fuel Filter

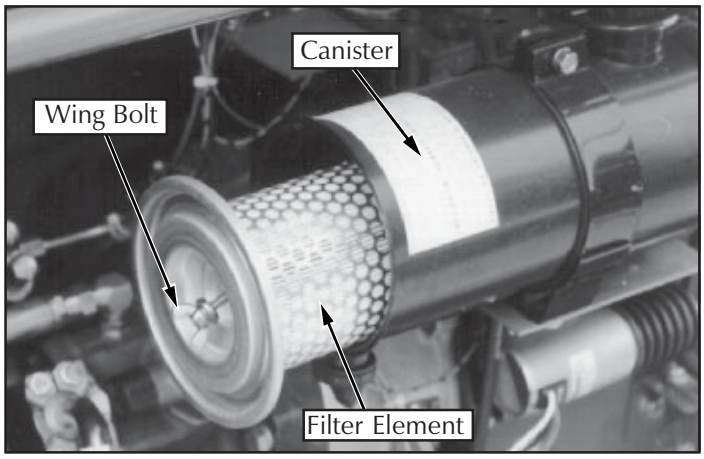


Figure 4-33: Diesel Engine Air Filter

DIESEL ENGINE

Air Filter Element (Figure 4-32)

1. Remove the wingbolt from the filter canister.
2. Remove and replace the filter element.
3. Replace the wingbolt, tighten.

Fuel Filter (Figure 4-34)

1. Provide a suitable container to catch spilled fuel, place under the fuel filter assembly.
2. Use a filter wrench to unscrew the fuel filter.
3. Remove and replace the filter.
4. Loosen the bleeder screw on the injector pump.
5. Operate the lift pump hand lever to pump fuel through the filter and up to the injector pump. Continue to pump until all of the air is bled from the system.
6. Tighten the bleeder screw.

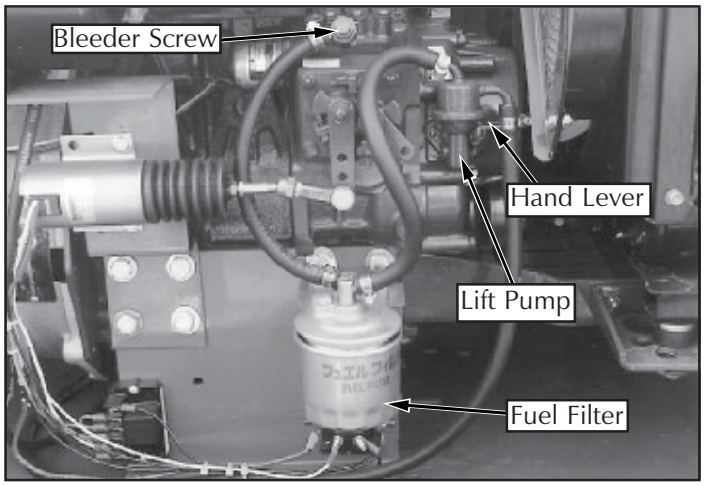


Figure 4-34: Diesel Engine Fuel Filter

4.16 Torque Specifications (Table 4-3,4)

FASTENERS

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

Table 4-3: Bolt Torque

THREAD SIZE American National Std.-UNC (course) Grade 5	WIDTH ACROSS FLATS	TORQUE VALUE ENGLISH	TORQUE VALUE 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 15/16	400 Ft/Lbs	542 N·m
1	1 1/2	600 Ft/Lbs	813 N·m

HYDRAULIC COMPONENTS

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

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

Table 4-4: Hydraulic Component Torque

TYPE: SAE PART SERIES	CARTRIDGE POPPET (Ft/Lbs)	CARTRIDGE POPPET Nm)	FITTINGS (Ft/Lbs	FITTINGS Nm)	HOSES (In/Lbs	HOSES Nm)
#4	N/A	N/A	N/A	N/A	135-145	15-16
#6	N/A	N/A	10-20	14-27	215-245	24-28
#8	25-30	34-41	25-30	34-41	430-470	49-53
#10	35-40	47-54	35-40	47-54	680-750	77-85
#12	85-90	115-122	85-90	115-122	950-1050	107-131
#16	130-140	176-190	130-140	176-190	1300-1368	147-155

Coil nuts: 30 IN/Lbs (3 Nm)

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.

Referring to *Section 3.0* and *6.0* will aid in understanding the operation and function of the various components and systems of the LX 31/41 and help in diagnosing and repair of the machine.

GENERAL PROCEDURE

Troubleshooting should be carried out in two steps. First, thoroughly study both hydraulic and electric schematics to determine possible causes. Loose terminal connections and short circuits are always a potential cause when troubleshooting. Second, check suspect components electrically, hydraulically and mechanically to determine if they are at fault.

⚠ 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 cable when replacing or testing the continuity of any electrical component.

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

1-800-926-LIFT

5.1 Troubleshooting Guide

Table 5-1: Troubleshooting Guide

PROBLEM	PROBABLE CAUSE	REMEDY
All functions inoperable, Engine does not start.	1. Blown Control Circuit Breaker	Check 15 amp Control Circuit Breaker. Replace if blown.
	2. Faulty Battery.	Check condition of battery. If serviceable, recharge battery. If defective, replace battery.
	3. Emergency Stop Switch failed open.	With the Emergency Stop Switch in the ON position, check continuity across the contacts. If none, replace.
	4. Key Switch.	Replace switch if inoperative.
Engine fails to start. Does not crank or cranks slowly.	1. Battery terminals corroded or loose.	Check and tighten terminals.
	2. Discharged battery.	Check condition of battery. If serviceable, recharge battery. If defective, replace battery.
	3. Starter Solenoid.	Replace the starter solenoid.
	4. Starter Motor.	Repair or replace starter.
	5. Key Switch.	Replace the switch.
	6. Main Circuit Breaker.	Check Circuit Breaker and replace if required.
	7. Emergency Stop Switch.	Replace switch if inoperative.
Engine cranks but will not start.	1. Engine Cold	Diesel: warm the Glow Plugs for 6 seconds prior to starting. Gasoline: Engage the Choke button while cranking.
	2. Out of fuel	Fill tank.
	3. Blocked fuel line.	Remove obstruction.
	4. Fuel Filter clogged.	Clean or replace filter.
	5. Air in the fuel system.	Tighten all fuel line fittings or clamps. Diesel Engine: Bleed System
	6. Water in fuel system.	Drain tank if necessary to remove all water.
	7. Oil Pressure Switch inoperative.	Check Pressure Switch. Replace if faulty.
	8. Fuel Pump defective/damaged.	Check fuel delivery, replace pump if necessary.
	9. Ignition system faulty. (Gas / Propane)	Check for spark, repair Ignition System as necessary

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

PROBLEM	PROBABLE CAUSE	REMEDY
Engine starts then stops.	1. Low fuel level.	Fill fuel tank.
	2. Fuel Filter clogged.	Clean or replace the filter element.
	3. Air leaks in the fuel system.	Tighten all fuel line connections and clamps.
	4. Water in the fuel.	Drain the tank if necessary to remove all water.
	5. Fuel pump defective/damaged.	Check fuel delivery, replace pump if necessary.
	6. Clogged air filter.	Clean or replace air filter.
	7. Key Switch.	Switch defective or damaged. Replace the switch.
All functions inoperable. Engine starts.	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 engine and check coupling.
	4. Proportional Valve.	Check operation. Replace if required.
	5. Faulty Proportional Controller.	Check operation. Adjust or replace if required.
Loss of power	1. Clogged Air Filter.	Clean or replace the filter.
	2. Clogged Fuel Filter.	Replace the filter.
	3. Incorrect fuel.	Drain and refill tank with proper fuel.
	4. Fuel pump defective/damaged.	Replace the pump.
	5. Incorrect Fuel Mixture. (Gasoline)	Follow Idle Speed Adjustment procedure, *Section 4.14*.
Engine stops.	1. Fuel Tank empty.	Refill tank and prime system as required.
	2. Water in fuel.	Drain fuel system to remove all water and refill with fresh fuel.
	3. Oil Pressure Switch inoperative.	Check Pressure Switch. Replace if faulty.
All Controller functions inoperative.	1. Blown fuse.	Find short. Replace fuse.
	2. Key Switch.	Replace switch if inoperative.
	3. Faulty Interlock Switch.	Check Interlock Switch for continuity, replace if faulty.
	4. Faulty E-Stop Switch.	Replace E-Stop Switch if inoperative.
	5. Control Cable.	Test cable and replace if damaged.
	6. Faulty Controller.	Replace Controller if inoperative.
	7. Faulty Proportional Valve.	Replace Proportional Valve if inoperative.
	8. Faulty Cutout Relay.	Replace Cutout Relay if inoperative.
Platform will not elevate.	1. Platform overloaded.	Observe maximum load rating.
	2. Out of level.	Elevate only on level ground.
	3. Lift Relay Faulty.	Check / replace lift relay.
	4. Lift Valve faulty.	Test solenoid and replace if inoperable.
	5. Lift Relief Valve.	Check and Replace the relief valve if necessary.

PROBLEM	PROBABLE CAUSE	REMEDY
Platform will not elevate. (cont'd)	6. Drive/Lift Switch on upper controls.	Test switch, replace if inoperable.
	7. Hydraulic Pump.	Check for pressure and delivery. Repair or replace if inoperative.
	8. Proportional Valve.	Test and replace if inoperable.
	9. Proportional Controller.	Test controller, replace if inoperable.
Unit will not steer.	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. Steering Orifice.	Remove and clean orifice.
Unit will not drive. (Platform Lowered)	1. Drive/Lift Switch.	Position switch in **DRIVE** position. Test switch and replace if inoperative.
	2. Forward or Reverse Solenoid Valve.	Test solenoid and replace if inoperative.
	3. Control Cable.	Test cable and replace if damaged.
	5. Proportional Controller.	Check controller adjustments, replace if inoperable.
	6. Main Relief Valve.	Test relief valve and replace if not serviceable.
	7. Hydraulic Pump.	Test pump pressure and delivery. Replace if not serviceable.
	8. Hydraulic Motors.	Test hydraulic pressure at drive circuit. If normal, replace motors.
	9. Drive Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
	10. Lift/Drive Relay.	Check for continuity across contacts, if none replace the relay.
	10. Cutout Relay.	If cutout relay is faulty, alarm will sound. Test and replace cutout relay.
	11. Platform Down Switch.	Test and replace magnet switch
	12. Froward or Reverse	Test / replace Forward or Reverse
	Relay.	Relay.
	13. Series / Parallel valve.	Trade Series / Parallel valves with Forward / Reverse Valves. If problem moves, replace affected valve.
Unit will not drive full speed.	1. Down Limit Switch.	Test / replace magnet switch.
	2. Series/Parallel Valve solenoids.	Test solenoid and replace if inoperable.
	3. Proportional Controller.	Replace controller if not adjustable.
	4. Proportional Valve.	Replace valve if Lift function is also affected.
	5. Hydraulic Motors worn.	Inspect the motors and replace if not serviceable.

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

PROBLEM	PROBABLE CAUSE	REMEDY
Unit will not drive full speed (cont'd)	6. Hydraulic Pump worn.	Check pump pressure and delivery. Replace if not serviceable.
	7. Bi-Directional Relief Valves.	Check relief valve and replace if inoperable.
	8. Torque Selector Switch.	Test / Replace switch.
	9. Platform Down Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
Unit will not drive (Platform elevated)	1. Proportional Controller	Check Controller Low Speed Adjustment. Replace if not adjustable.
No drive in one direction, other direction okay.	1. Faulty Drive Relay.	Test FWD contacts for continuity replace relay if required.
	2. Faulty Drive Coil.	Test Forward Coil if proper voltage is present and coil is not magnetized, replace.
	3. Faulty Drive Valve.	Trade FWD and REV valves, if symptoms change, replace affected valve.
	4. Counterballance Valves.	Trade Counterbalance Valves. If symptoms change, replace affected valve.
Platform drifts down.	1. Emergency Lowering/Down Valve partly open or faulty.	Ensure that the Emergency Lowering Valve is completely closed. If the platform still drifts down, replace the valve.
	2. Faulty valve O-rings.	Check and replace O-rings on Emergency Lowering/Down Valve and piston.
	3. Lift Cylinder.	Open Weep Line, check for bypass flow.
Platform will not lower.	1. Blown fuse.	Locate electrical short and then replace fuse.
	2. Down Valve Solenoid Coil.	Test coil and replace if inoperable.
	3. Control Cable.	Check cable and replace if damaged.
	4. Lift/Drive Relay.	Check down contacts for continuity, replace relay if necessary.
Brake does not release.	1. Brake Release Valve closed.	Open valve.
	2. Brake faulty.	Check for oil leakage, replace brake seals if necessary.
Brake will not engage	1. Brake Release Valve closed.	Open valve.

NOTES

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 Guide*. They allow understanding of the makeup and functions of the systems for checking, tracing, and faultfinding during trouble analysis.

The diagrams appear in the following order:

Section 6.1 Electrical Schematics

- Figure 6-1: Electrical Schematic, Two Wheel Drive, Gasoline / Propane Model
- Figure 6-2: Electrical Schematic, Two Wheel Drive, Diesel Model
- Figure 6-3: Electrical Schematic, Four Wheel Drive, Gasoline / Propane Model
- Figure 6-4: Electrical Schematic, Four Wheel Drive, Diesel Model
- Figure 6-5: Electrical Schematic, Two Wheel Drive, Gasoline / Propane Model (after serial number 1330)
- Figure 6-6: Electrical Schematic, Two Wheel Drive, Diesel Model (after serial number 1330)
- Figure 6-7: Electrical Schematic, Four Wheel Drive, Gasoline / Propane Model (after serial number 1330)
- Figure 6-8: Electrical Schematic, Four Wheel Drive, Diesel Model (after serial number 1330)
- Figure 6-9: Electrical Schematic, Two Wheel Drive, Gasoline / Propane Model, With Outrigger Option (after serial number 1330)
- Figure 6-10: Electrical Schematic, Two Wheel Drive, Diesel Model, With Outrigger Option (after serial number 1330)
- Figure 6-11: Electrical Schematic, Four Wheel Drive, Gasoline / Propane Model, With Outrigger Option (after serial number 1330)
- Figure 6-12: Electrical Schematic, Four Wheel Drive, Diesel Model, With Outrigger Option (after serial number 1330)

Section 6.2 Hydraulic Schematics

- Figure 6-13: Hydraulic Schematic, Two Wheel Drive Model w/ Outtriggers
- Figure 6-14: Hydraulic Schematic, Four Wheel Drive Model w/ Outtriggers
- Figure 6-15: Hydraulic Schematic, Two Wheel Drive Model w/ Outtriggers
- Figure 6-16: Hydraulic Schematic, Four Wheel Drive Model w/ Outtriggers

Section 6.3 Component Location

- Figure 6-17: Terminal Strip, Relay Identification
- Figure 6-18: Outrigger Valve Manifold
- Figure 6-19: Hydraulic Valve Manifold

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.

6.1 Electrical Schematics

Table 6-1: Electrical Schematic Legend, Two Wheel Drive, Gasoline / Propane Model (S/N: 1000-1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOD1	Ignition Module	Controls spark for engine.	Right side of engine, in power module.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PU1	Electric Fuel Pump	Supplies fuel to engine.	Top rear of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Choke Switch	Supplies power to choke relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.

Table 6-1: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Choke Switch	Supplies power to choke relay.	Lower control box, in panel, second from top, first from right.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL3	Gas Solenoid	Controls Fuel Valve.	Power module, inline with gasoline supply.
SOL4	Propane Shut-Off Solenoid	Controls propane valve.	Power module, inline propane supply.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL15	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL16	Choke Solenoid	Controls engine choke.	Power module, engine, right side.

Note: See figure 6-17 for relay, terminal strip locations.

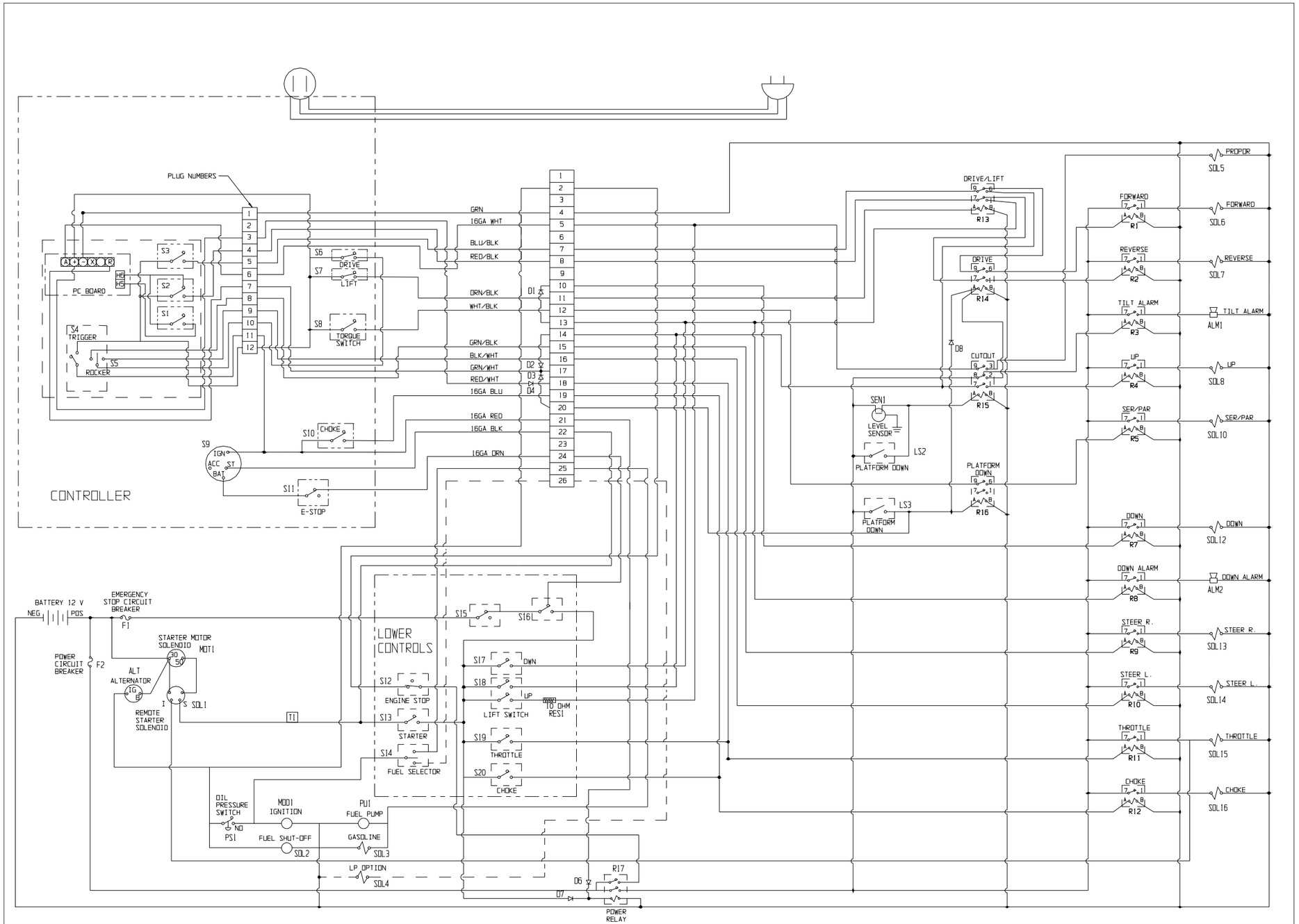


Figure 6-1: Electrical Schematic, Two Wheel Drive, Gasoline / Propane Model (Serial Number 1000-1330)

6.1 Electrical Schematics

Table 6-2: Electrical Schematic Legend, Two-Wheel Drive, Diesel Model (S/N: 1000-1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R18	Starter Relay	Switches power to starter.	Power module, engine assembly.
R19	Glow Plug Relay	Switches power to glow plugs.	Power module, engine assembly.
R20	Bosch® Throttle Relay	Controls Trombetta® throttle solenoid.	Power module, engine assembly.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
RES2	Glow Plugs	Used when starting cold engine.	Diesel engine cylinder head.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Glow Plug Switch	Supplies power to glow plug relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Glow Plug Switch	Supplies power to glow plug relay.	Lower control box, in panel, second from top, first from right.

Table 6-2: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.

Note: See figure 6-17 for relay, terminal strip locations.

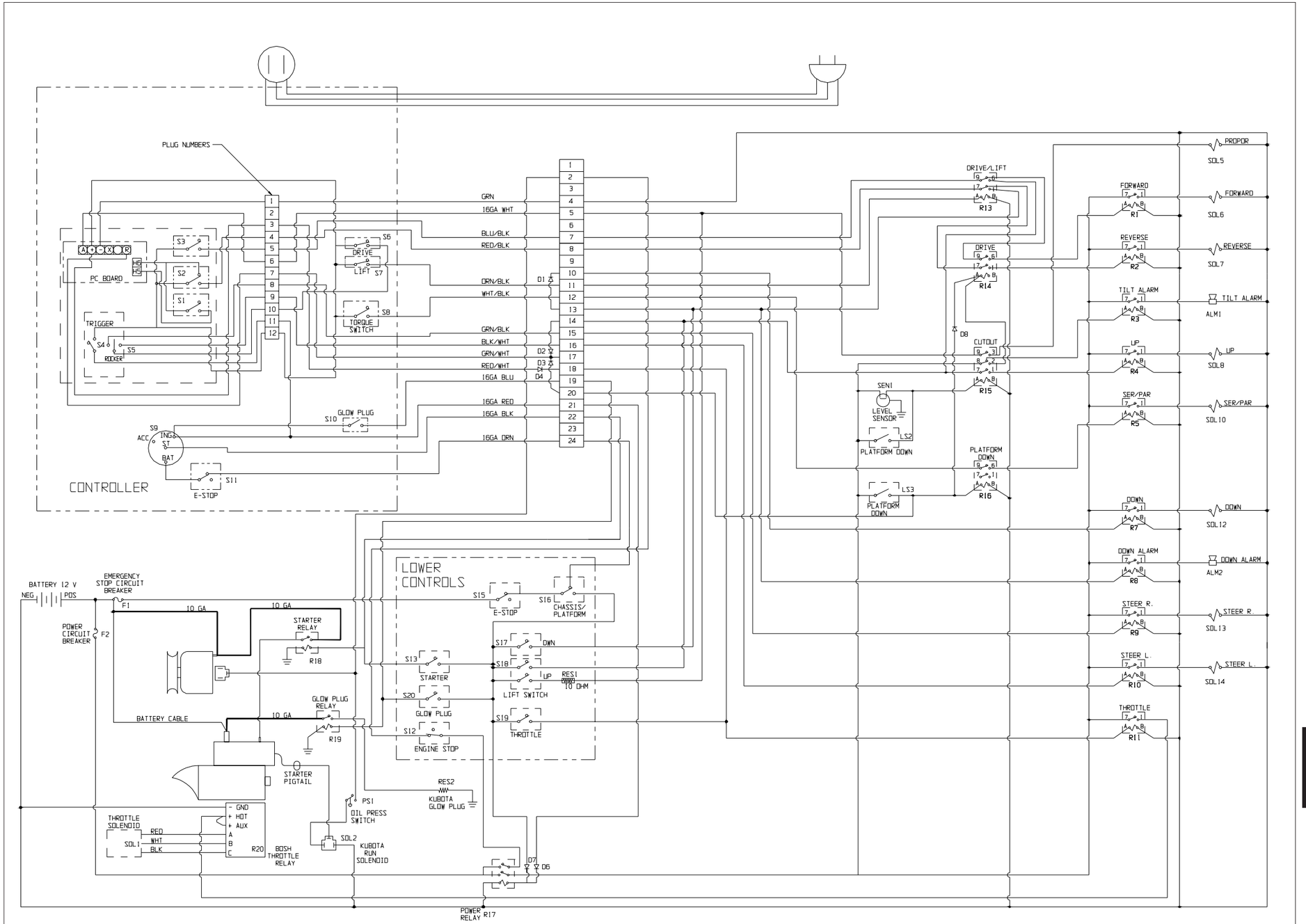


Figure 6-2: Electrical Schematic, Two Wheel Drive, Diesel Model (Serial Number 1000-1330)

6.1 Electrical Schematics

Table 6-3: Electrical Schematic Legend, Four Wheel Drive, Gasoline / Propane Model (S/N: 1000-1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D5	Diode	Supplies power to Platform Down Relay.	Between T22 and T23 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
LS1	Axle Center Switch	Cuts power to drive relay when axle is not centered while platform is elevated.	Front axle assembly.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOD1	Ignition Module	Controls spark for engine.	Right side of engine, in power module.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PU1	Electric Fuel Pump	Supplies fuel to engine.	Top rear of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R6	Axle Float Relay	Switches power to axle float solenoid.	Lower control box, second row, seventh relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Choke Switch	Supplies power to choke relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Choke Switch	Supplies power to choke relay.	Lower control box, in panel, second from top, first from right.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.

Table 6-3: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SOL1	Remote Starter Solenoid	Switches power to starter motor solenoid, and throttle solenoid during starting.	Power module, on, left side of engine.
SOL2	Fuel Shut-Off Solenoid	Controls fuel valve.	Power module,to rear of engine.
SOL3	Gas Solenoid	Controls Fuel Valve.	Power module, inline with gasoline supply.
SOL4	Propane Shut-Off Solenoid	Controls propane valve.	Power module, inline propane supply.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'C'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL9	Shunt Solenoid	Controls shunt valve.	Front of manifold, port markeed 'E'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL11	Axle Float Solenoid	Controls axle float valve.	Front of manifold, port marked 'F'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL15	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL16	Choke Solenoid	Controls engine choke.	Power module, engine, right side.

Note: See figure 6-17 for relay, terminal strip locations.

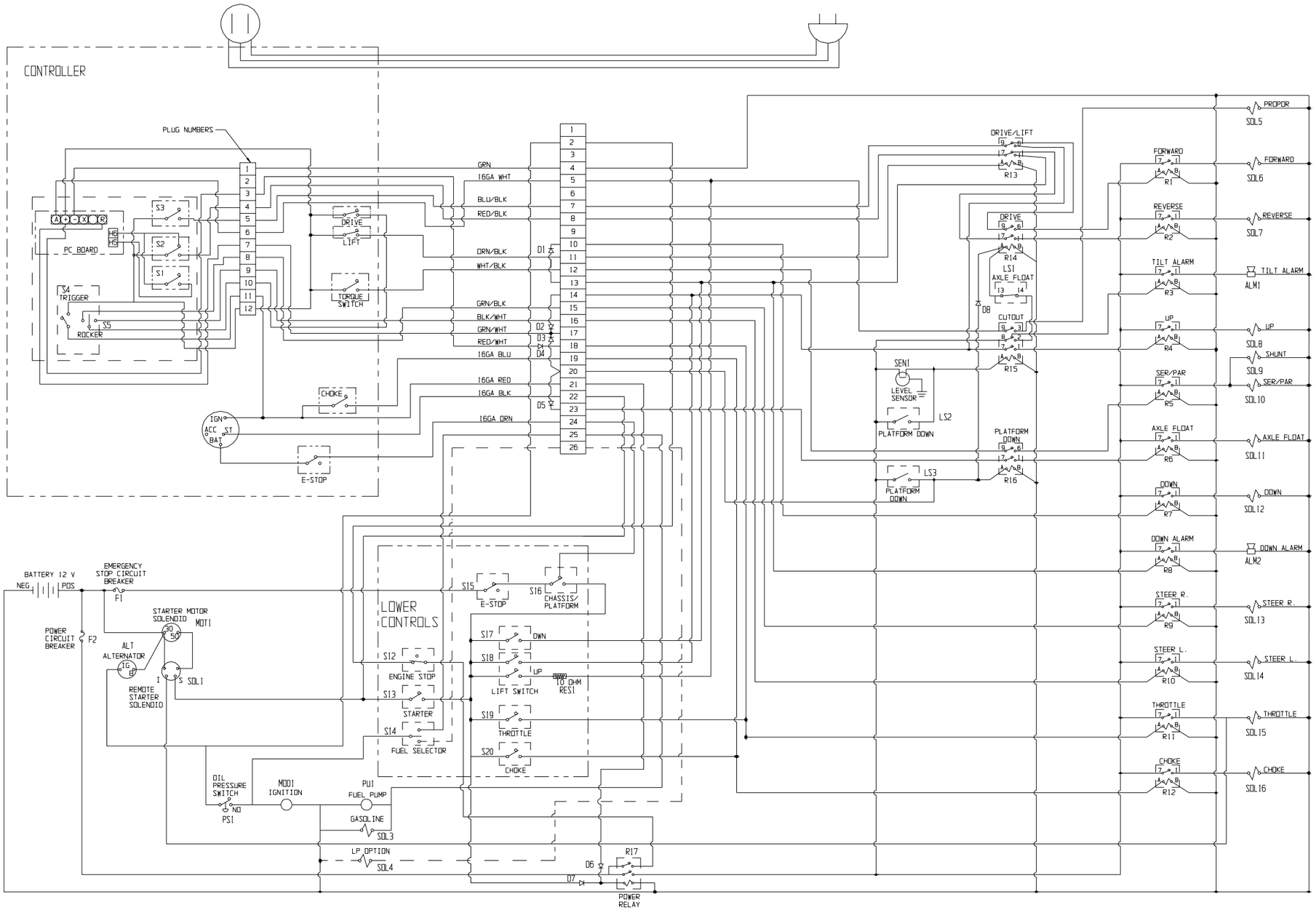


Figure 6-3: Electrical Schematic, Four Wheel Drive, Gasoline / Propane Model (Serial Number 1000-1330)

6.1 Electrical Schematics

Table 6-4: Electrical Schematic Legend, Four Wheel Drive, Diesel Model (S/N: 1000-1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D5	Diode	Supplies power to Platform Down Relay.	Between T22 and T23 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
LS1	Axle Center Switch	Cuts power to drive relay when axle is not centered while platform is elevated.	Front axle assembly.
LS2	Down Limit Switch	Bypasses level sensor, supplying power tocutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R6	Axle Float Relay	Switches power to axle float solenoid.	Lower control box, second row, seventh relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R18	Starter Relay	Switches power to starter.	Power module, engine assembly.
R19	Glow Plug Relay	Switches power to glow plugs.	Power module, engine assembly.
R20	Bosch® Throttle Relay	Controls Trombetta® throttle solenoid.	Power module, engine assembly.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
RES2	Glow Plugs	Used when starting cold engine.	Diesel engine cylinder head.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Glow Plug Switch	Supplies power to glow plug relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.

Table 6-4: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Glow Plug Switch	Supplies power to glow plug relay.	Lower control box, in panel, second from top, first from right.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL9	Shunt Solenoid	Controls shunt valve.	Front of manifold, port markeed 'E'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL11	Axle Float Solenoid	Controls axle float valve.	Front of manifold, port marked 'F'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.

Note: See figure 6-17 for relay, terminal strip locations.

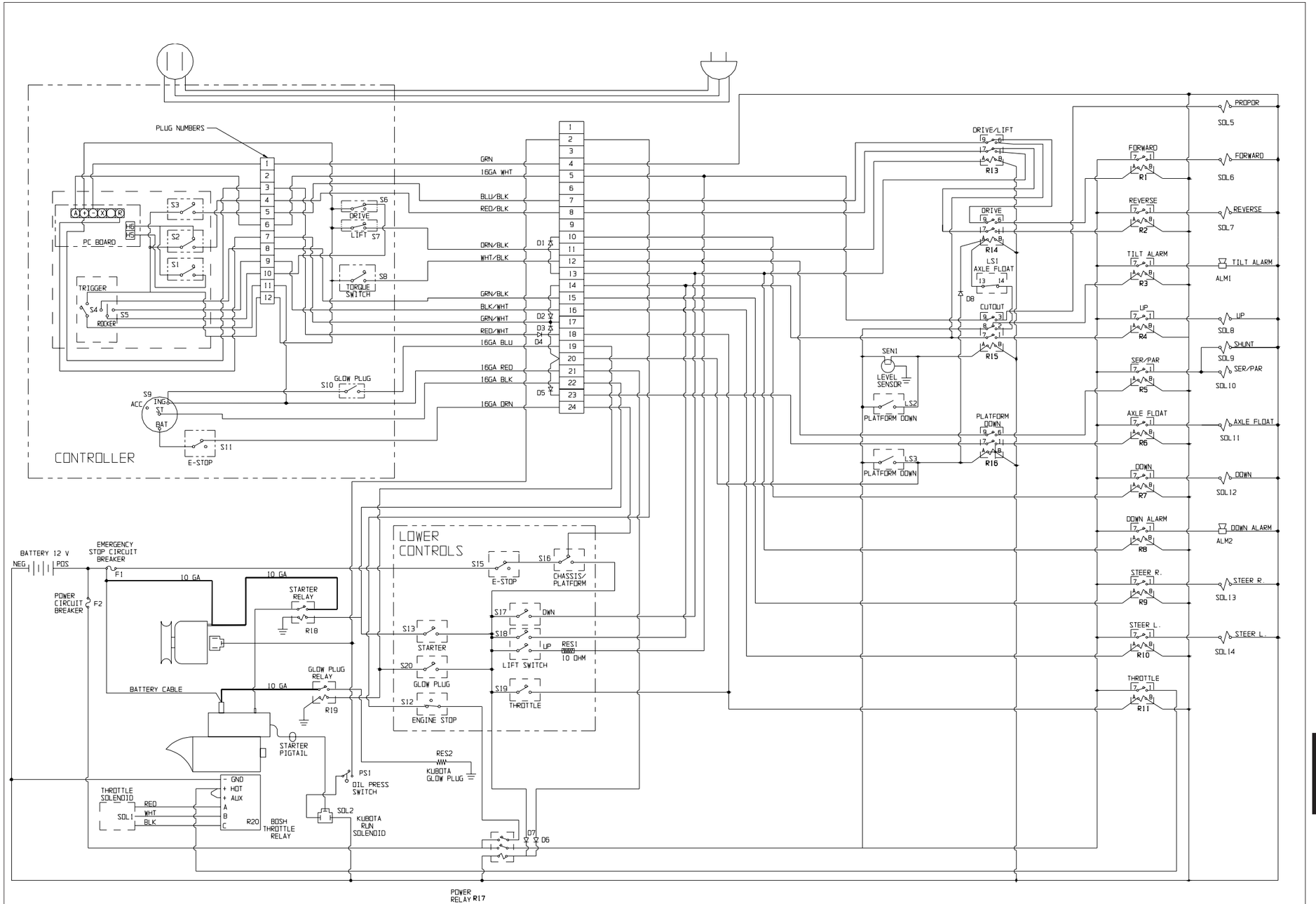


Figure 6-3: Electrical Schematic, Four Wheel Drive, Diesel Model (Serial Number 1000-1330)

6.1 Electrical Schematics

Table 6-5: Electrical Schematic Legend, Two Wheel Drive, Gasoline / Propane Model (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOD1	Ignition Module	Controls spark for engine.	Right side of engine, in power module.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PU1	Electric Fuel Pump	Supplies fuel to engine.	Top rear of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Choke Switch	Supplies power to choke relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Choke Switch	Supplies power to choke relay.	Lower control box, in panel, second from top, first from right.

Table 6-5: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL3	Gas Solenoid	Controls Fuel Valve.	Power module, inline with gasoline supply.
SOL4	Propane Shut-Off Solenoid	Controls propane valve.	Power module, inline propane supply.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL15	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL16	Choke Solenoid	Controls engine choke.	Power module, engine, right side.

Note: See figure 6-17 for relay, terminal strip locations.

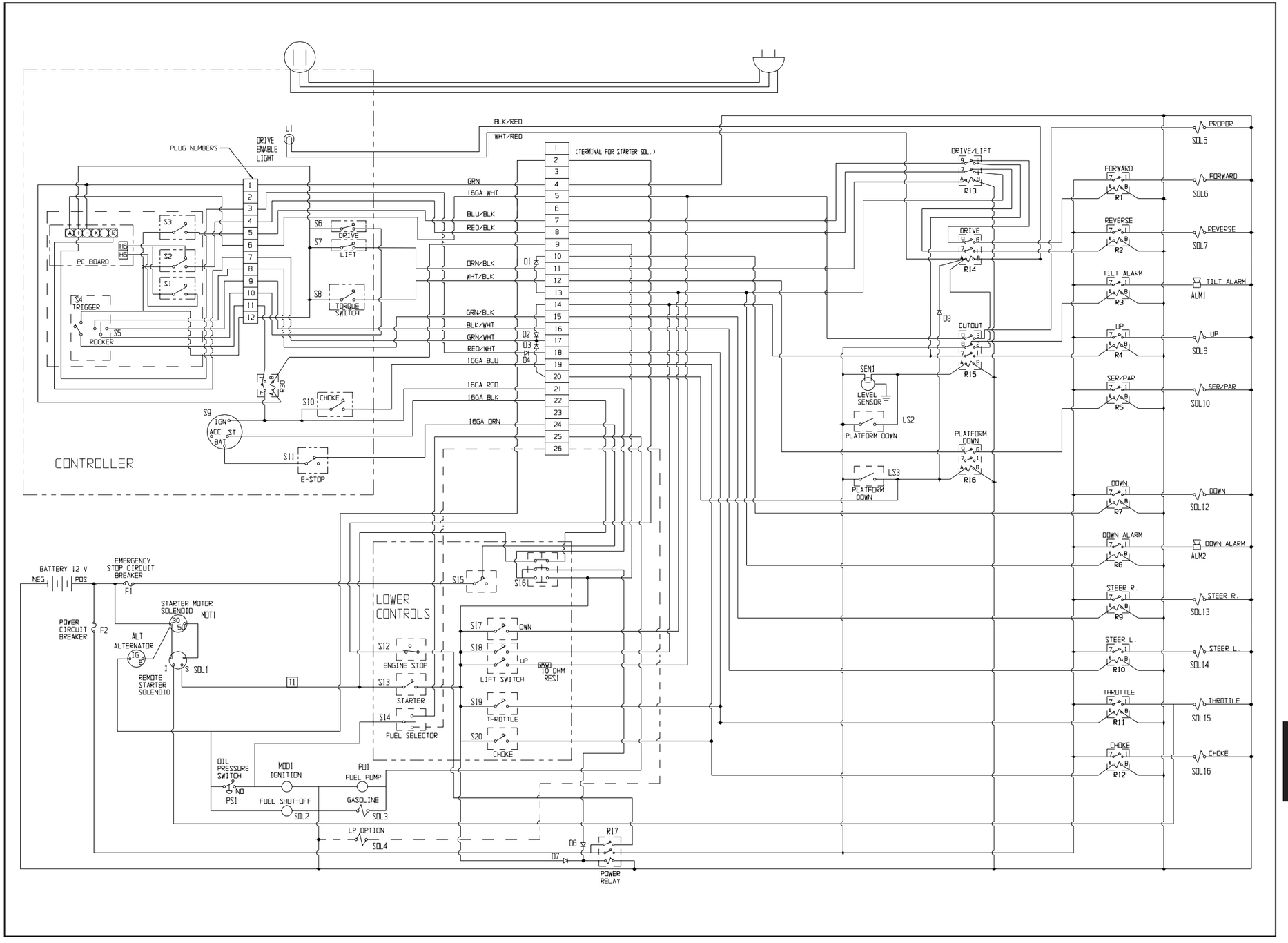


Figure 6-5: Electrical Schematic, Two Wheel Drive, Gasoline / Propane Model (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-6: Electrical Schematic Legend, Two-Wheel Drive, Diesel Model (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R18	Starter Relay	Switches power to starter.	Power module, engine assembly.
R19	Glow Plug Relay	Switches power to glow plugs.	Power module, engine assembly.
R20	Bosch® Throttle Relay	Controls Trombetta® throttle solenoid.	Power module, engine assembly.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
RES2	Glow Plugs	Used when starting cold engine.	Diesel engine cylinder head.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Glow Plug Switch	Supplies power to glow plug relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.

Table 6-6: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S20	Glow Plug Switch	Supplies power to glow plug relay.	Lower control box, in panel, second from top, first from right.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.

Note: See figure 6-17 for relay, terminal strip locations.

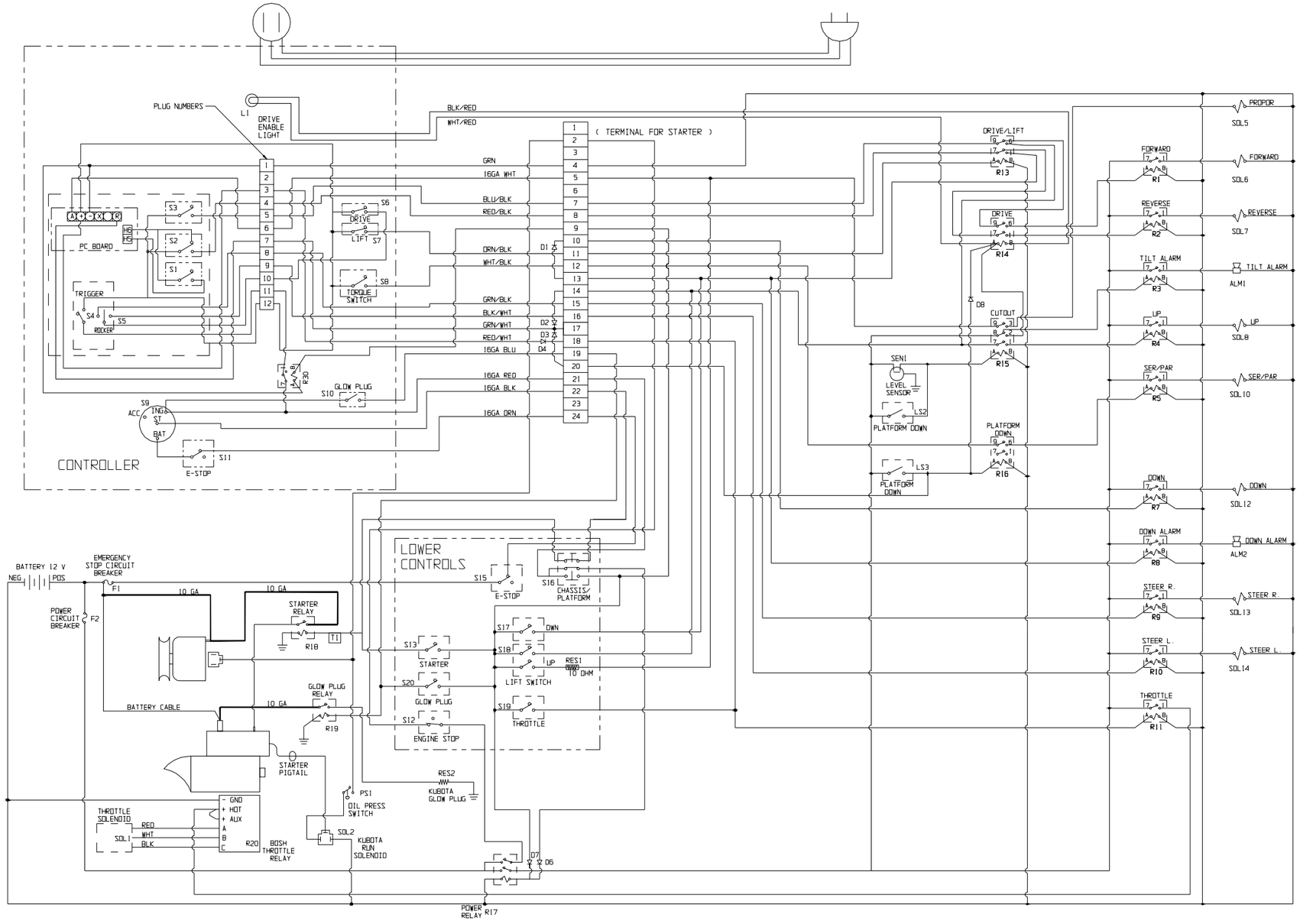


Figure 6-6: Electrical Schematic, Two Wheel Drive, Diesel Model (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-7: Electrical Schematic Legend, Four Wheel Drive, Gasoline / Propane Model (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D5	Diode	Supplies power to Platform Down Relay.	Between T22 and T23 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS1	Axle Center Switch	Cuts power to drive relay when axle is not centered while platform is elevated.	Front axle assembly.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOD1	Ignition Module	Controls spark for engine.	Right side of engine, in power module.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PU1	Electric Fuel Pump	Supplies fuel to engine.	Top rear of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R6	Axle Float Relay	Switches power to axle float solenoid.	Lower control box, second row, seventh relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Choke Switch	Supplies power to choke relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.

Table 6-7: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Choke Switch	Supplies power to choke relay.	Lower control box, in panel, second from top, first from right.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Remote Starter Solenoid	Switches power to starter motor solenoid, and throttle solenoid during starting.	Power module, on, left side of engine.
SOL2	Fuel Shut-Off Solenoid	Controls fuel valve.	Power module,to rear of engine.
SOL3	Gas Solenoid	Controls Fuel Valve.	Power module, inline with gasoline supply.
SOL4	Propane Shut-Off Solenoid	Controls propane valve.	Power module, inline propane supply.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL9	Shunt Solenoid	Controls shunt valve.	Front of manifold, port markeed 'E'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL11	Axle Float Solenoid	Controls axle float valve.	Front of manifold, port marked 'F'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL15	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL16	Choke Solenoid	Controls engine choke.	Power module, engine, right side.

Note: See figure 6-17 for relay, terminal strip locations.

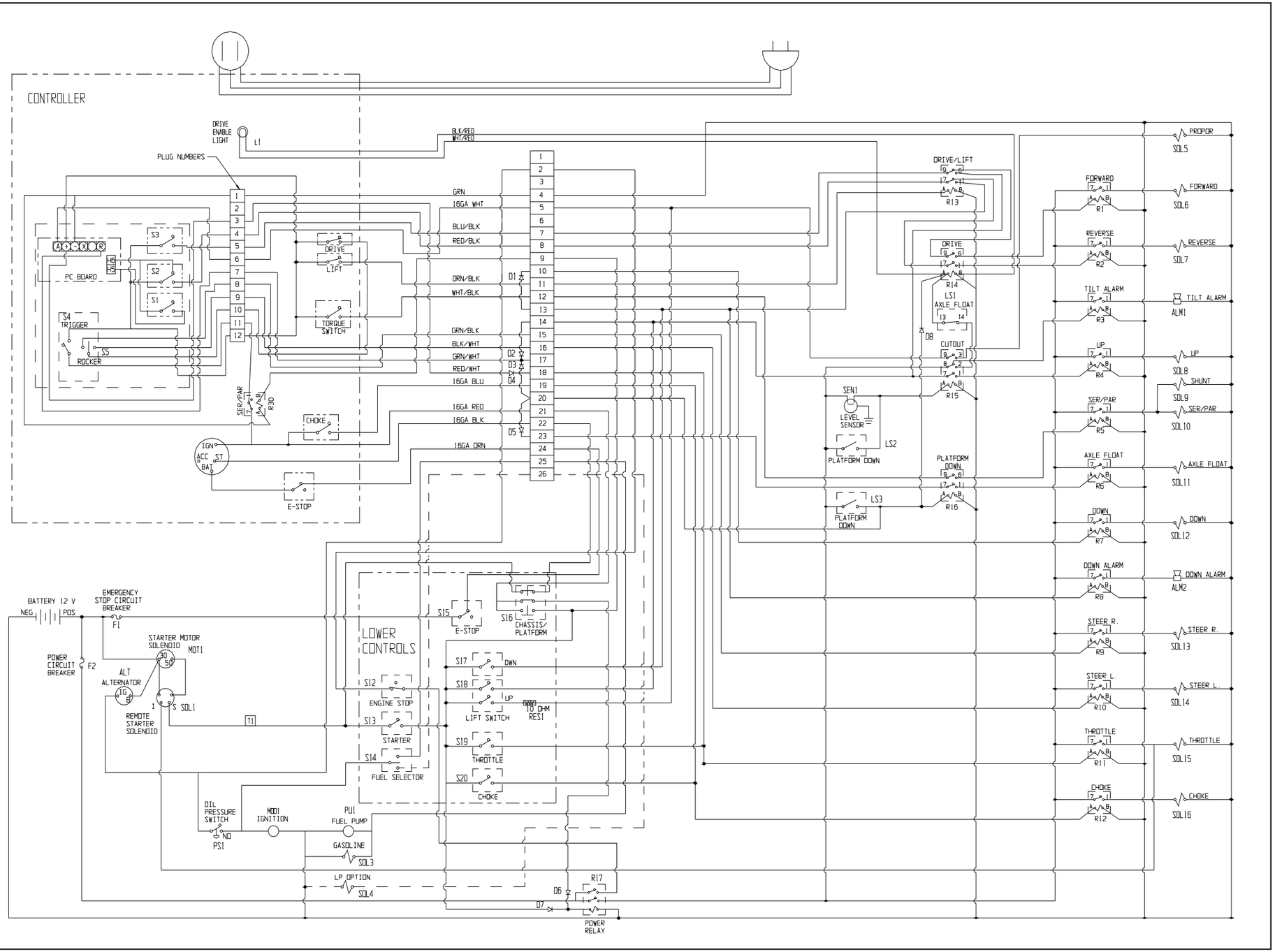


Figure 6-7: Electrical Schematic, Four Wheel Drive, Gasoline / Propane Model (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-8: Electrical Schematic Legend, Four Wheel Drive, Diesel Model (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D5	Diode	Supplies power to Platform Down Relay.	Between T22 and T23 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS1	Axle Center Switch	Cuts power to drive relay when axle is not centered while platform is elevated.	Front axle assembly.
LS2	Down Limit Switch	Bypasses level sensor, supplying power tocutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R6	Axle Float Relay	Switches power to axle float solenoid.	Lower control box, second row, seventh relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R18	Starter Relay	Switches power to starter.	Power module, engine assembly.
R19	Glow Plug Relay	Switches power to glow plugs.	Power module, engine assembly.
R20	Bosch® Throttle Relay	Controls Trombetta® throttle solenoid.	Power module, engine assembly.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
RES2	Glow Plugs	Used when starting cold engine.	Diesel engine cylinder head.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Glow Plug Switch	Supplies power to glow plug relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.

Table 6-8: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Glow Plug Switch	Supplies power to glow plug relay.	Lower control box, in panel, second from top, first from right.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throtttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL9	Shunt Solenoid	Controls shunt valve.	Front of manifold, port markeed 'E'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL11	Axle Float Solenoid	Controls axle float valve.	Front of manifold, port marked 'F'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.

Note: See figure 6-17 for relay, terminal strip locations.

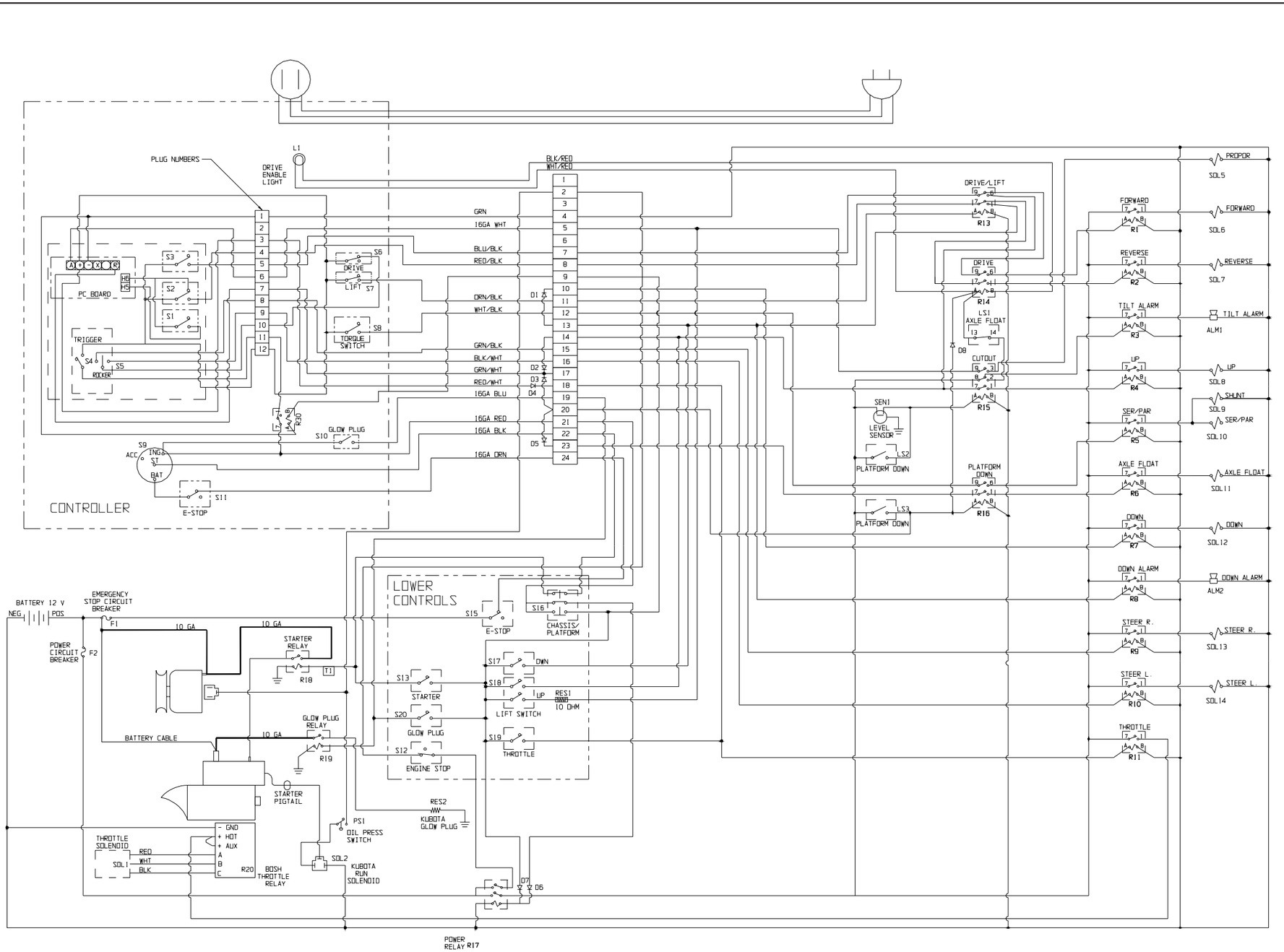


Figure 6-8: Electrical Schematic, Four Wheel Drive, Diesel Model (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-9: Electrical Schematic Legend, Two Wheel Drive, Gasoline / Propane Model, With Outrigger Option (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
D9	Diode	Isolates R29 coil.	Lower control box.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOD1	Ignition Module	Controls spark for engine.	Right side of engine, in power module.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PS2-5	Outrigger Pressure Switch	Completes ground circuit to up relay when outriggers are loaded.	Outrigger cylinders.
PU1	Electric Fuel Pump	Supplies fuel to engine.	Top rear of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R21	Left Hand Front Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R22	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R23	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R24	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R25	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R26	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R27	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R28	Right Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R29	Pressure Switch Override Relay	Completes ground circuit to up relay when outriggers are retracted.	Lower Control Module.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Choke Switch	Supplies power to choke relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.

Table 6-9: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Choke Switch	Supplies power to choke relay.	Lower control box, in panel, second from top, first from right.
S22-25	Outrigger Extend / Retract Switches	Supplies power to outrigger extend / retract relays.	Upper control box.
S26-29	Drive Interlock Switches	Completes ground circuit to drive relay when all outriggers are retracted.	Outrigger cylinders.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL3	Gas Solenoid	Controls Fuel Valve.	Power module, inline with gasoline supply.
SOL4	Propane Shut-Off Solenoid	Controls propane valve.	Power module, inline propane supply.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL15	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL16	Choke Solenoid	Controls engine choke.	Power module, engine, right side.
SOL17	OutriggerExtend Solenoid Left Hand Front	Controls Extend Valve.	Outrigger valve manifold.
SOL18	Outrigger Retract Solenoid Left Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL19	OutriggerExtend Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL20	Outrigger Retract Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL21	OutriggerExtend Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL22	Outrigger Retract Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL23	OutriggerExtend Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL24	Outrigger Retract Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.

Note: See figure 6-17 for relay, terminal strip locations.

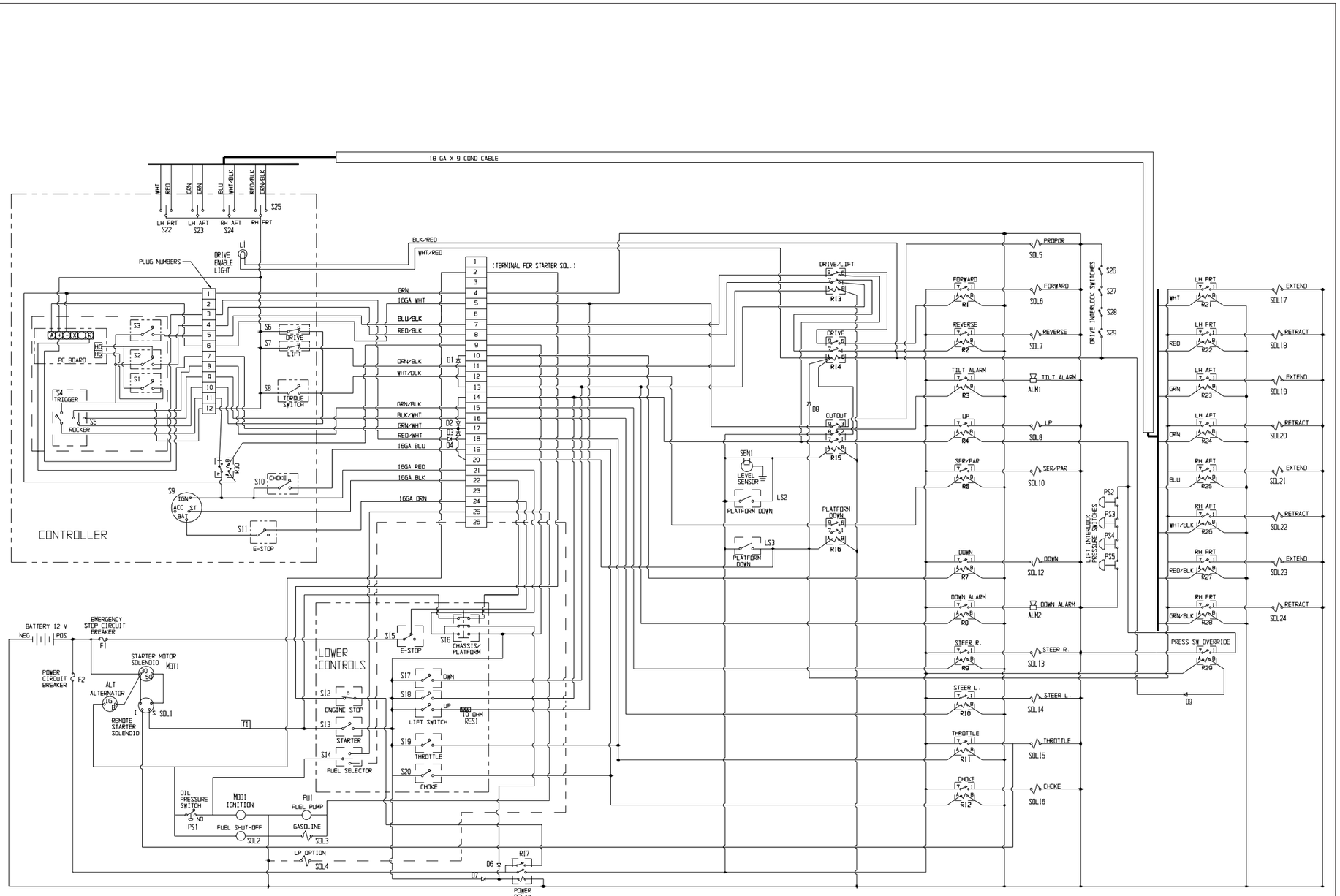


Figure 6-9: Electrical Schematic, Two Wheel Drive Gas / Propane Model w/ Outriggers (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-10: Electrical Schematic Legend, Two Wheel Drive, Diesel Model, With Outrigger Option (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
D9	Diode	Isolates R29 coil.	Lower control box.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PS2-5	Outrigger Pressure Switch	Completes ground circuit to up relay when outriggers are loaded.	Outrigger cylinders.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R18	Starter Relay	Switches power to starter.	Power module, engine assembly.
R19	Glow Plug Relay	Switches power to glow plugs.	Power module, engine assembly.
R20	Bosch® Throttle Relay	Controls Trombetta® throttle solenoid.	Power module, engine assembly.
R21	Left Hand Front Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R22	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R23	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R24	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R25	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R26	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R27	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R28	Right Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R29	Pressure Switch Override Relay	Completes ground circuit to up relay when outriggers are retracted.	Lower Control Module.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
RES2	Glow Plugs	Used when starting cold engine.	Diesel engine cylinder head.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.

Table 6-11: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Glow Plug Switch	Supplies power to glow plug relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Glow Plug Switch	Supplies power to glow plug relay.	Lower control box, in panel, second from top, first from right.
S22-25	Outrigger Extend / Retract Switches	Supplies power to outrigger extend / retract relays.	Upper control box.
S26-29	Drive Interlock Switches	Completes ground circuit to drive relay when all outriggers are retracted.	Outrigger cylinders.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL17	OutriggerExtend Solenoid Left Hand Front	Controls Extend Valve.	Outrigger valve manifold.
SOL18	Outrigger Retract Solenoid Left Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL19	OutriggerExtend Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL20	Outrigger Retract Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL21	OutriggerExtend Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL22	Outrigger Retract Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL23	OutriggerExtend Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL24	Outrigger Retract Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.

Note: See figure 6-17 for relay, terminal strip locations.

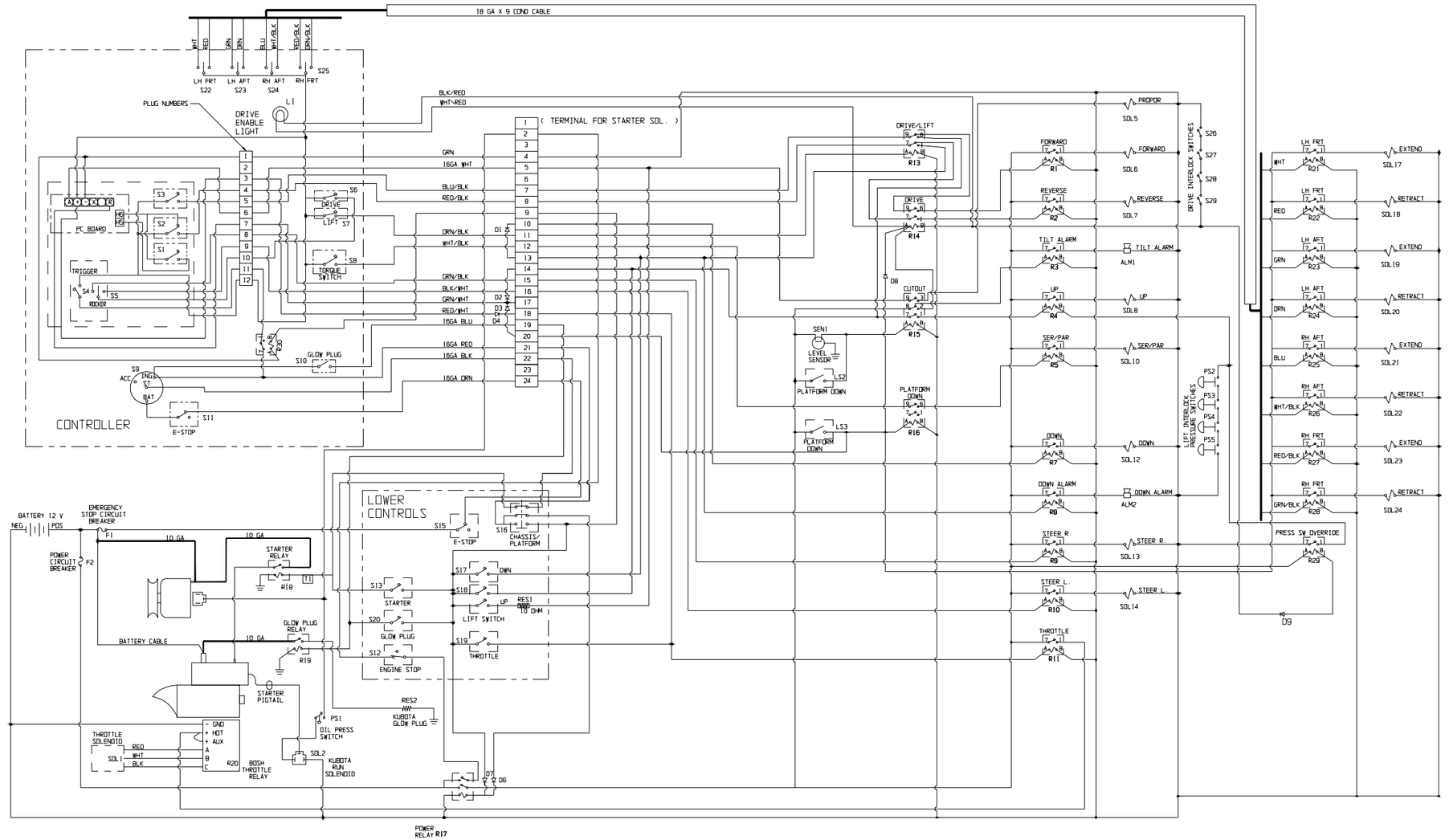


Figure 6-10: Electrical Schematic, Two Wheel Drive Diesel Model w/ Outriggers (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-11: Electrical Schematic Legend, Four Wheel Drive, Gasoline / Propane Model, With Outrigger Option (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D5	Diode	Supplies power to Platform Down Relay.	Between T22 and T23 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
D9	Diode	Isolates R29 coil.	Lower control box.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS1	Axle Center Switch	Cuts power to drive relay when axle is not centered while platform is elevated.	Front axle assembly.
LS2	Down Limit Switch	Bypasses level sensor, supplying power to cutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOD	Ignition Module	Controls spark for engine.	Right side of engine, in power module.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PS2-5	Outrigger Pressure Switch	Completes ground circuit to up relay when outriggers are loaded.	Outrigger cylinders.
PU1	Electric Fuel Pump	Supplies fuel to engine.	Top rear of engine, in power module.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R6	Axle Float Relay	Switches power to axle float solenoid.	Lower control box, second row, seventh relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R21	Left Hand Front Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R22	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R23	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R24	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R25	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R26	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R27	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R28	Right Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R29	Pressure Switch Override Relay	Completes ground circuit to up relay when outriggers are retracted.	Lower Control Module.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Choke Switch	Supplies power to choke relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.

Table 6-11: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Choke Switch	Supplies power to choke relay.	Lower control box, in panel, second from top, first from right.
S22-25	Outrigger Extend / Retract Switches	Supplies power to outrigger extend / retract relays.	Upper control box.
S26-29	Drive Interlock Switches	Completes ground circuit to drive relay when all outriggers are retracted.	Outrigger cylinders.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Remote Starter Solenoid	Switches power to starter motor solenoid, and throttle solenoid during starting.	Power module, on, left side of engine.
SOL2	Fuel Shut-Off Solenoid	Controls fuel valve.	Power module,to rear of engine.
SOL3	Gas Solenoid	Controls Fuel Valve.	Power module, inline with gasoline supply.
SOL4	Propane Shut-Off Solenoid	Controls propane valve.	Power module, inline propane supply.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL9	Shunt Solenoid	Controls shunt valve.	Front of manifold, port markeed 'E'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL11	Axle Float Solenoid	Controls axle float valve.	Front of manifold, port marked 'F'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL15	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL16	Choke Solenoid	Controls engine choke.	Power module, engine, right side.
SOL17	OutriggerExtend Solenoid Left Hand Front	Controls Extend Valve.	Outrigger valve manifold.
SOL18	Outrigger Retract Solenoid Left Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL19	OutriggerExtend Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL20	Outrigger Retract Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL21	OutriggerExtend Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL22	Outrigger Retract Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL23	OutriggerExtend Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL24	Outrigger Retract Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.

Note: See figure 6-17 for relay, terminal strip locations.

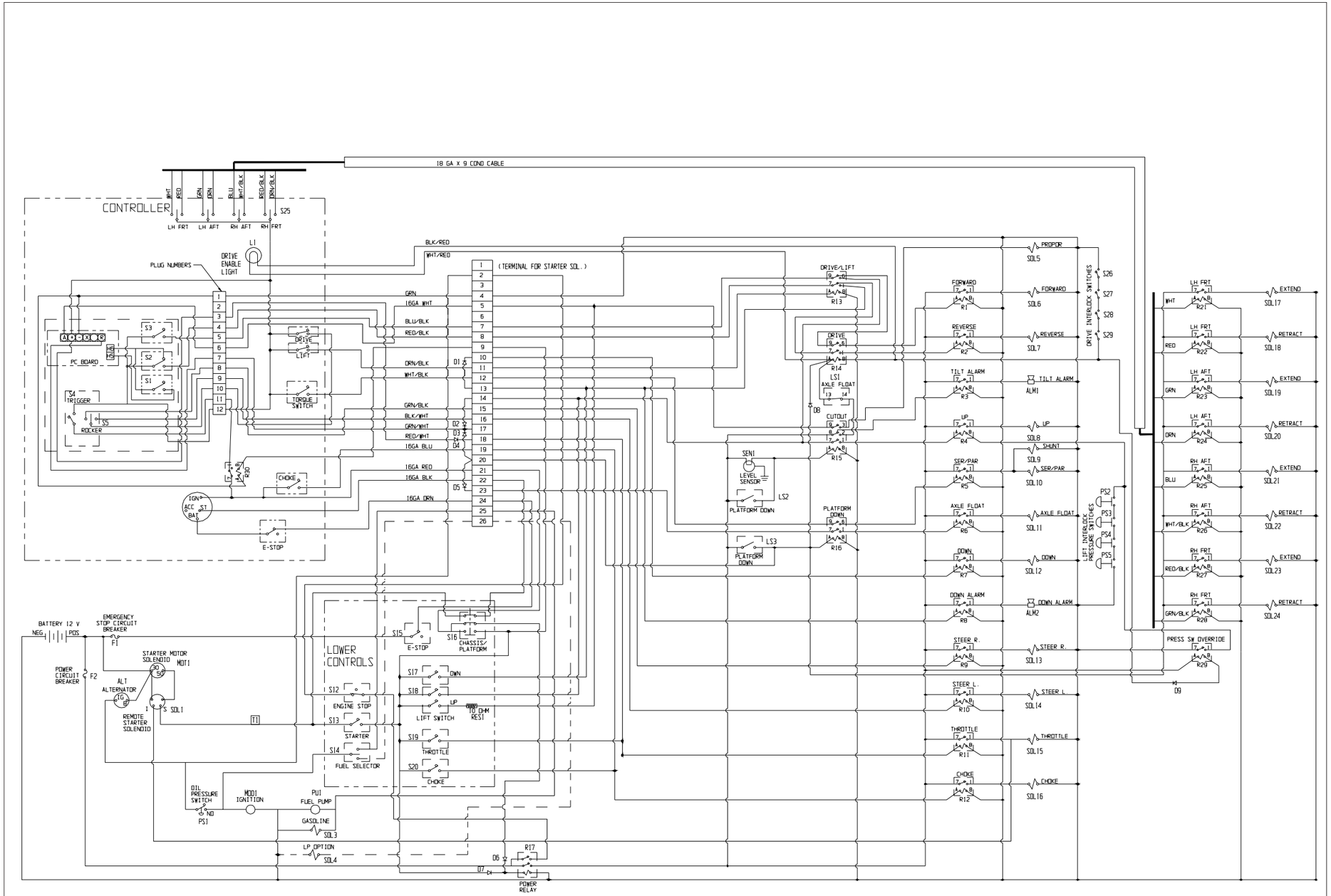


Figure 6-11: Electrical Schematic, Four Wheel Drive Gas / Propane Model w/ Outriggers (After Serial Number 1330)

6.1 Electrical Schematics

Table 6-12: Electrical Schematic Legend, Four Wheel Drive, Diesel Model, With Outrigger Option (After S/N 1330)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Alarm, Tilt	Provides warning sound when slope of machine excedes 3° side to side, or fore and aft.	Lower control box, exterior upper left side. Operated by the white wire.
ALM 2	Alarm, Down	Provides warning sound when deck is lowering.	Lower control box, exterior upper left side. Operated by red wire.
ALT	Alternator	Maintains current during operation.	Power module, front left side of engine.
BAT	Battery	Provides power for starting engine.	Control module. On left in rear of module.
D1	Diode	Supplies power to down relay.	Between T10 and T11 on fanning strip.
D2	Diode	Supplies power to high speed enable circuit.	Between T16 and T17 on fanning strip.
D3	Diode	Supplies power to high speed enable circuit.	Between T17 and T18 on fanning strip.
D4	Diode	Supplies power to Throttle Solinoid.	Between T18 and T19 on fanning strip.
D5	Diode	Supplies power to Platform Down Relay.	Between T22 and T23 on fanning strip.
D6	Diode	Supplies power to power relay.	Lower control box by power relay.
D7	Diode	Supplies power to power relay.	Lower control box by power relay.
D8	Diode	Supplies power to drive relay.	Lower control box by drive relay.
D9	Diode	Isolates R29 coil.	Lower control box.
F1	Emergency Stop Circuit Breaker	Supplies Power to Upper Control Ignition Switch.	Lower control box mounted in panel, lower right hand.
F2	Power Circuit Breaker	Supplies power to all function solenoids.	Lower control box mounted in panel, lower left hand.
L1	Drive Enable Light	Indicates when power is supplied to drive circuit.	Upper control box next to drive / lift switch.
LS1	Axle Center Switch	Cuts power to drive relay when axle is not centered while platform is elevated.	Front axle assembly.
LS2	Down Limit Switch	Bypasses level sensor, supplying power tocutout relay when platform is lowered.	Under scissors, near front right hand side of chassis.
LS3	Down Limit Switch	Supplies power to drive and platform down relays, and high speed enable circuit on controller when platform is lowered.	Under scissors, near front right hand side of chassis.
MOT1	Starter Motor, and Solenoid	Provides power to starter motor from battery.	Left side of engine, in power module.
PS1	Oil Pressure Switch	Cuts power to engine when oil pressure falls to dangerous level.	Left side of engine, in power module.
PS2-5	Outrigger Pressure Switch	Completes ground circuit to up relay when outriggers are loaded.	Outrigger cylinders.
R1	Forward Relay	Switches power to forward solenoid.	Lower control box, second row, second relay from left.
R2	Reverse Relay	Switches power to reverse solenoid.	Lower control box, second row, third relay from left.
R3	Tilt Alarm Relay	Switches power to tilt alarm.	Lower control box, second row, fourth relay from left.
R4	Up Relay	Switches power to lift solenoid.	Lower control box, second row, fifth relay from left.
R5	Series / Parallel Relay	Switches power to series / parallel solenoids.	Lower control box, second row, sixth relay from left.
R6	Axle Float Relay	Switches power to axle float solenoid.	Lower control box, second row, seventh relay from left.
R7	Down Relay	Switches power to down solenoid.	Lower control box, second row, seventh relay from left.
R8	Down Alarm Relay	Switches power to down alarm.	Lower control box, second row, eighth relay from left.
R9	Steer Right Relay	Switches power to steer right solenoid.	Lower control box, second row, ninth relay from left.
R10	Steer Left Relay	Switches power to steer left solenoid.	Lower control box, second row, tenth relay from left.
R11	Throttle Relay	Switches power to throttle solenoid.	Lower control box, second row, eleventh relay from left.
R12	Choke Relay	Switches power to choke solenoid.	Lower control box, second row, twelfth relay from left.
R13	Drive / Lift Relay	Directs power from forward (S3) and reverse (S2) switches to either forward / reverse or up / down relays.	Lower control box, first row, first relay from right.
R14	Drive Relay	Cuts power to forward and reverse relays when cutout relay is not energized and platform is elevated.	Lower control box, first row, second relay from left.
R15	Cutout Relay	Cuts power to drive and up relays when not energized by level sensor.	Lower control box, first row, third relay from left.
R16	Platform Down Relay	Cuts power to series / parallel relay when platform is elevated, selecting high torque mode.	Lower control box, second row, first relay from left.
R17	Power Relay	Switches power to all solenoids and engine.	Lower control box, first row, fourth relay from left.
R18	Starter Relay	Switches power to starter.	Power module, engine assembly.
R19	Glow Plug Relay	Switches power to glow plugs.	Power module, engine assembly.
R20	Bosch® Throttle Relay	Controls Trombetta® throttle solenoid.	Power module, engine assembly.
R21	Left Hand Front Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R22	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R23	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R24	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R25	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R26	Left Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R27	Left Hand Aft Extend Relay	Switches power to Extend Solenoid.	Lower control box.
R28	Right Hand Front Retract Relay	Switches power to Retract Solenoid.	Lower control box.
R29	Pressure Switch Override Relay	Completes ground circuit to up relay when outriggers are retracted.	Lower Control Module.
R30	Upper Control Power Relay	Cuts power to upper controls when lower controls are enabled.	Upper control box.
RES1	Proportional Resistor	Limits current to proportional solenoid.	Lower control box.
RES2	Glow Plugs	Used when starting cold engine.	Diesel engine cylinder head.
S1	Micro Switch	Supplies power to controller.	Upper control box, joystick.
S2	Reverse Micro Switch	Supplies power to drive / lift relay, forward / up contacts.	Upper control box, joystick.
S3	Forward Micro Switch	Supplies power to drive / lift relay, reverse / down contacts.	Upper control box, joystick.
S4	Interlock Micro Switch (Deadman Switch)	Interupts power to controlls when not engaged.	Upper control box, inside joystick handle.
S5	Steering Micro Switch (two)	Supplies power to steer left and steer right relays.	Upper control box. inside joystick handle.
S6,7	Drive / Lift Switch	Supplies Power to steering micro switch (drive) or to drive / lift relay (lift).	Upper control box, to the right of joystick.
S8	Torque Selector Switch	Supplies power to series / parallel relay.	Upper control box, to the right of joystick.

Table 6-12: (cont.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S9	Ignition Switch	Supplies power to upper controls, engine, and starter motor solenoid.	Upper control box, right side.
S10	Glow Plug Switch	Supplies power to glow plug relay.	Upper control box, left side.
S11	Emergency Stop Switch	Cuts power to upper controls and engine.	Upper control box, to the left of joystick.
S12	Engine Stop Switch	Cuts power to ignition module, and fuel shut-off solenoid.	Lower control box, in panel second from top, second from right.
S13	Starter Switch	Supplies power to starter motor solenoid.	Lower control box, in panel, top, second from right.
S15	Emergency Stop Switch	Cuts power to lower controls and engine.	Lower control box, in panel, top, first from left.
S16	Chassis / Platform Switch	Supplies power to either upper or lower controls.	Lower control box, in panel, second from top, second from left.
S17	Down Switch	Supplies power to down relay.	Lower control box, in panel, third from top, first from left.
S18	Lift Switch	Supplies power to up relay.	Lower control box, in panel, second from top, first from left.
S19	Throttle Switch	Supplies power to throttle relay.	Lower control box, in panel, top, first from right.
S20	Glow Plug Switch	Supplies power to glow plug relay.	Lower control box, in panel, second from top, first from right.
S22-25	Outrigger Extend / Retract Switches	Supplies power to outrigger extend / retract relays.	Upper control box.
S26-29	Drive Interlock Switches	Completes ground circuit to drive relay when all outriggers are retracted.	Outrigger cylinders.
SEN1	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Throttle Solenoid	Controls engine throttle.	Power module, engine, right side.
SOL2	Run Solenoid	Controls fuel valve.	Power module, engine, on injection pump.
SOL5	Proportional Solenoid	Controls proportional valve.	Right side of manifold, port marked 'G'.
SOL6	Forward Solenoid	Controls forward valve.	Right side of valve manifold, port marked 'K'.
SOL7	Reverse Solenoid	Controls reverse valve.	Right side of manifold, port marked 'L'.
SOL8	Lift Solenoid.	Controls lift valve.	Right side of manifold, port marked 'J'.
SOL9	Shunt Solenoid	Controls shunt valve.	Front of manifold, port markeed 'E'.
SOL10	Series / Parallel Solenoid (two)	Controls series / parallel valves.	Front side of manifold, ports marked 'Q' & 'R'.
SOL11	Axle Float Solenoid	Controls axle float valve.	Front of manifold, port marked 'F'.
SOL12	Down Solenoid	Controls down valve.	Lift cylinder, lower end.
SOL13	Steer Right Solenoid	Controls steer valve when steering right.	Top of manifold, on steer valve.
SOL14	Steer Left Solenoid	Controls steer valve when steering left.	Top of manifold, on steer valve.
SOL17	OutriggerExtend Solenoid Left Hand Front	Controls Extend Valve.	Outrigger valve manifold.
SOL18	Outrigger Retract Solenoid Left Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL19	OutriggerExtend Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL20	Outrigger Retract Solenoid Left Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL21	OutriggerExtend Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL22	Outrigger Retract Solenoid Right Hand Aft	Controls Retract Valve.	Outrigger valve manifold.
SOL23	OutriggerExtend Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.
SOL24	Outrigger Retract Solenoid Right Hand Front	Controls Retract Valve.	Outrigger valve manifold.

Note: See figure 6-17 for relay, terminal strip locations.

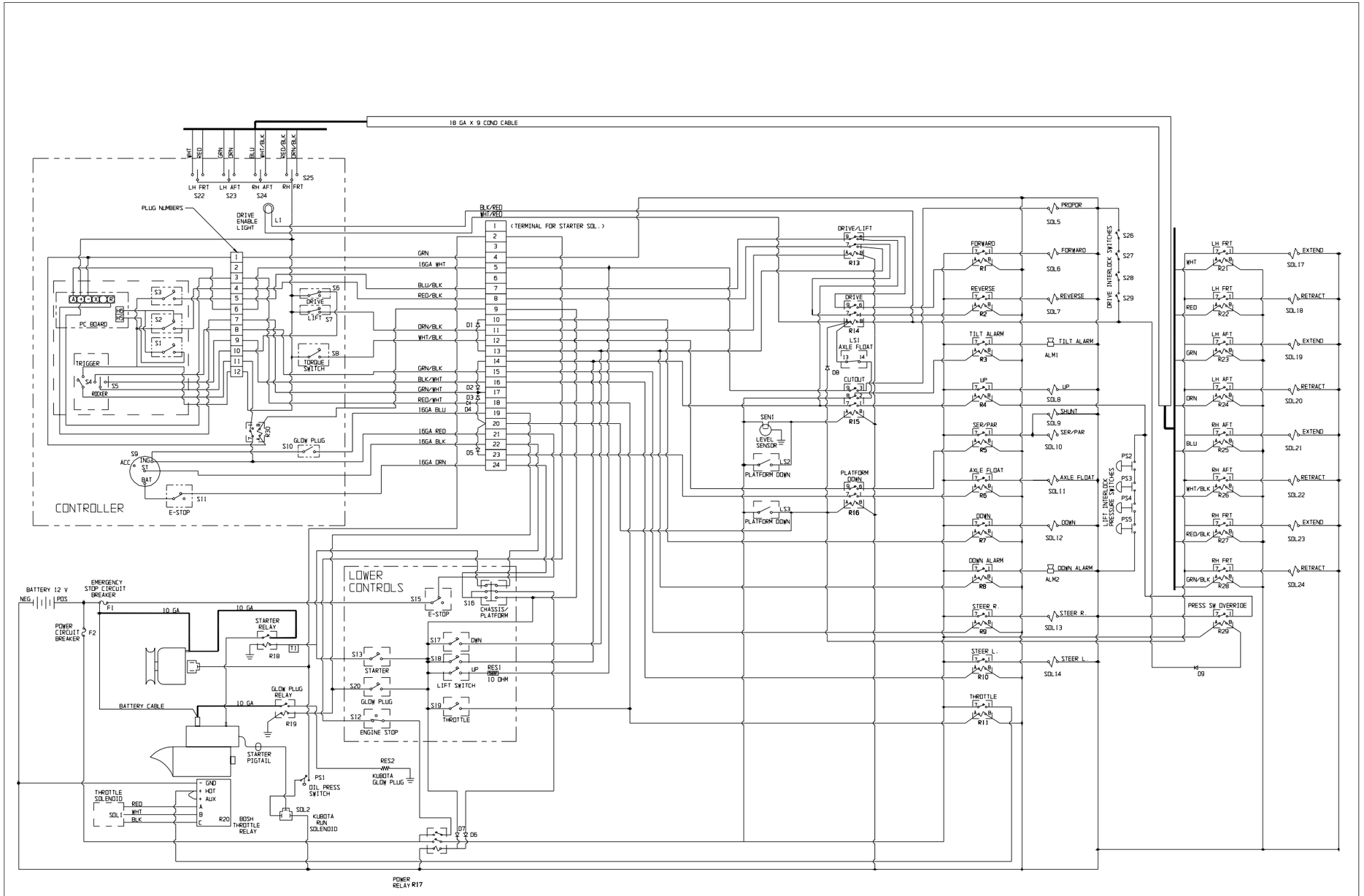


Figure 6-12: Electrical Schematic, Four Wheel Drive Diesel Model w/ Outriggers (After Serial Number 1330)

6.2 Hydraulic Schematics

Table 6-13: Hydraulic Schematic Legend, Two Wheel Drive Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Drive Make-up Check	Prevents cavitation of down stream motor when turning	Inline valve located bottom of manifold.
CV2	Sense Line Check	Not Used	Not servicable
CYL1	Steering Cylinder	Actuates steering linkage to steer front wheels.	Front axle assembly
CYL3	Lift Cylinder	Actuates scissor linkage to elevate platform.	Scissor assembly
CYL4,5	Brakes, Multi-disc	Parking brakes, spring applied, hyd. release.	Rear axle assembly
MOT 3,4	Rear Drive Motors	Drive the rear wheels.	Rear axle assembly
ORF1	Steering Orifice	Limits the oil flow to the steering cylinder.	Under stack valve SV2 between steer valve (V1) and manifold.
ORF2	Down Orifice	Limits the descent speed of the platform.	Under down valve (V12).
ORF3	Brake Orifice	Allows brakes to release quickly and apply slowly.	Left side top of manifold under fitting in port 12.
P1	Hydraulic Pump	Provides fluid power for hydraulic system.	Power module, engine assembly.
P2	Brake Release Pump	Used to release brakes when machine is towed.	Near rear axle assembly outside housing.
RV1	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'A'.
RV2	Left Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'B'.
RV3	Lift Relief Valve	Limits maximum load of elevating assembly.	Front of manifold port marked 'I'.
RV4,5	Bi-Directional Relief Valves	Allows oil flow to bypass drive motors when turning on tight radius.	Underneath each rear drive motor.
SV1	Sense Line Shuttle Valve	Not used.	Not serviceable.
SV2	Sense Line Shuttle Valve	Allows pilot pressure to pump sense line from steering.	Stack valve located between steering valve (V1) and manifold.
SV3	Drive Shuttle Valve	Allows oil pressure from drive to release brakes.	Not serviceable.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
V1	Steering Valve	Controls oil flow to steering cylinder (CYL1).	Top of manifold, ports marked 'D'.
V3	Proportional Valve	Regulates oil flow to lift and drive functions.	Right side of manifold, port marked 'G'.
V4	Lift Valve	Allows oil flow to lift cylinder (CYL3).	Right side of manifold, port marked 'J'.
V5	Forward Valve	Allows oil flow to drive system in forward, allows return oil flow from drive system in reverse.	Right side of manifold port marked 'K'.
V6	Reverse Valve	Allows oil flow to drive system in reverse, allows return oil flow from drive system in forward.	Right side of manifold port marked 'L.
V7	Forward Counter-balance Valve	Provides dynamic braking for machine in reverse and prevents runaway on slopes.	Left side ofmanifold, port marked 'N'.
V8	Reverse Counter-balance Valve	Provides dynamic braking for machine in forward and prevents runaway on slopes.	Left side ofmanifold, port marked 'O'.
V9,10	Series/Parallel Valves	Directs oil flow to drive motors in either series (for higher speed) or parallel (for higher torque) configuration.	Front of manifold, ports marked 'R' & 'Q'.
V11	Devider / Combiner Valve	Equalizes oil flow from front and rear drive motors when in parallel (High Torque) configuration.	Front of manifold, port marked 'P'.
V12	Down Valve	Holds oil in lift cylinder (CYL3) when deck is elevated. Allows oil to flow out of cylinder when deck is lowering. This valve has a cable actuated manual override for emergency lowering.	Base of lift cylinder, (CYL3).

Note: See figure 6-19 for hydraulic valve locations.

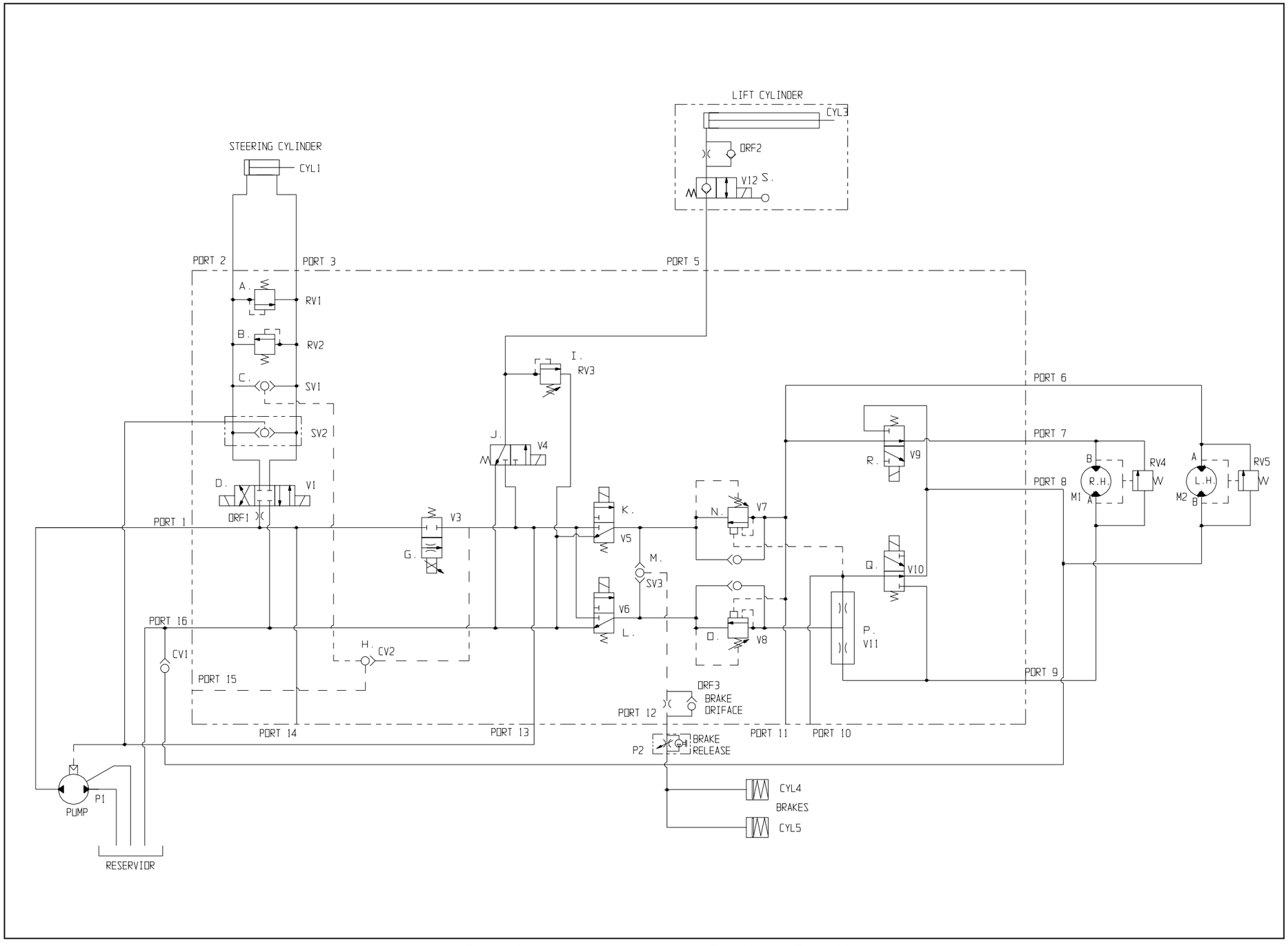


Figure 6-13: Hydraulic Schematic, Two Wheel Drive Model

6.2 Hydraulic Schematics

Table 6-14: Hydraulic Schematic Legend, Four Wheel Drive Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Drive Make-up Check	Prevents cavitation of down stream motor when turning	Inline valve located bottom of manifold.
CV2	Sense Line Check	Not Used	Not servicable
CYL1	Steering Cylinder	Actuates steering linkage to steer front wheels.	Front axle assembly
CYL2	Axle Float Cylinder	Locks front axle when platform is elevated.	Front axle assembly
CYL3	Lift Cylinder	Actuates scissor linkage to elevate platform.	Scissor assembly
CYL4,5	Brakes, Multi-disc	Parking brakes, spring applied, hyd. release.	Rear axle assembly
MOT 1,2	Front Drive Motors	Drive the front wheels.	Front axle assembly
MOT 3,4	Rear Drive Motors	Drive the rear wheels.	Rear axle assembly
ORF1	Steering Orifice	Limits the oil flow to the steering cylinder.	Under stack valve SV2 between steer valve (V1) and manifold.
ORF2	Down Orifice	Limits the descent speed of the platform.	Under down valve (V12).
ORF3	Brake Orifice	Allows brakes to release quickly and apply slowly.	Left side top of manifold under fitting in port 12.
P1	Hydraulic Pump	Provides fluid power for hydraulic system.	Power module, engine assembly.
P2	Brake Release Pump	Used to release brakes when machine is towed.	Near rear axle assembly outside housing.
RV1	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'A'.
RV2	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'B'.
RV3	Lift Relief Valve	Limits maximum load of elevating assembly.	Front of manifold port marked 'I'.
RV4,5	Bi-Directional Relief Valves	Allows oil flow to bypass drive motors when turning on tight radius.	Underneath each rear drive motor.
SV1	Sense Line Shuttle Valve	Not used.	Not serviceable.
SV2	Sense Line Shuttle Valve	Allows pilot pressure to pump sense line from steering.	Stack valve located between steering valve (V1) and manifold.
SV3	Drive Shuttle Valve	Allows oil pressure from drive to release brakes.	Not serviceable.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
V1	Steering Valve	Controls oil flow to steering cylinder (CYL1).	Top of manifold, ports marked 'D'.
V2	Axle Float Valve	Allows pilot pressure to release P.O. check valves on axle float cylinder (CYL2).	Front of manifold, port marked 'F'.
V3	Proportional Valve	Regulates oil flow to entire lift and drive functions.	Right side of manifold, port marked 'G'.
V4	Lift Valve	Allows oil flow to lift cylinder (CYL3).	Right side of manifold, port marked 'J'.
V5	Forward Valve	Allows oil flow to drive system in forward, allows return oil flow from drive system in reverse.	Right side of manifold port marked 'K'.
V6	Reverse Valve	Allows oil flow to drive system in reverse, allows return oil flow from drive system in forward.	Right side of manifold port marked 'L.
V7	Forward Counter-balance Valve	Provides dynamic braking for machine in reverse and prevents runaway on slopes.	Left side ofmanifold, port marked 'N'.
V8	Reverse Counter-balance Valve	Provides dynamic braking for machine in forward and prevents runaway on slopes.	Left side ofmanifold, port marked 'O'.
V9,10	Series / Parallel Valves	Directs oil flow to drive motors in either series (for higher speed) or parallel (for higher torque) configuration.	Front of manifold, ports marked 'R' & 'Q'.
V11	Shunt Valve	Bypasses oil flow from front drive motors when in High Speed Mode, allowing greater pressure for rear motors.	Front of manifold, port marked 'E'.
V12	Down Valve	Holds oil in lift cylinder (CYL3) when deck is elevated. Allows oil to flow out of cylinder when deck is lowering. This valve has a cable actuated manual override for emergency lowering.	Base of lift cylinder, (CYL3).

Note: See figure 6-19 for hydraulic valve locations.

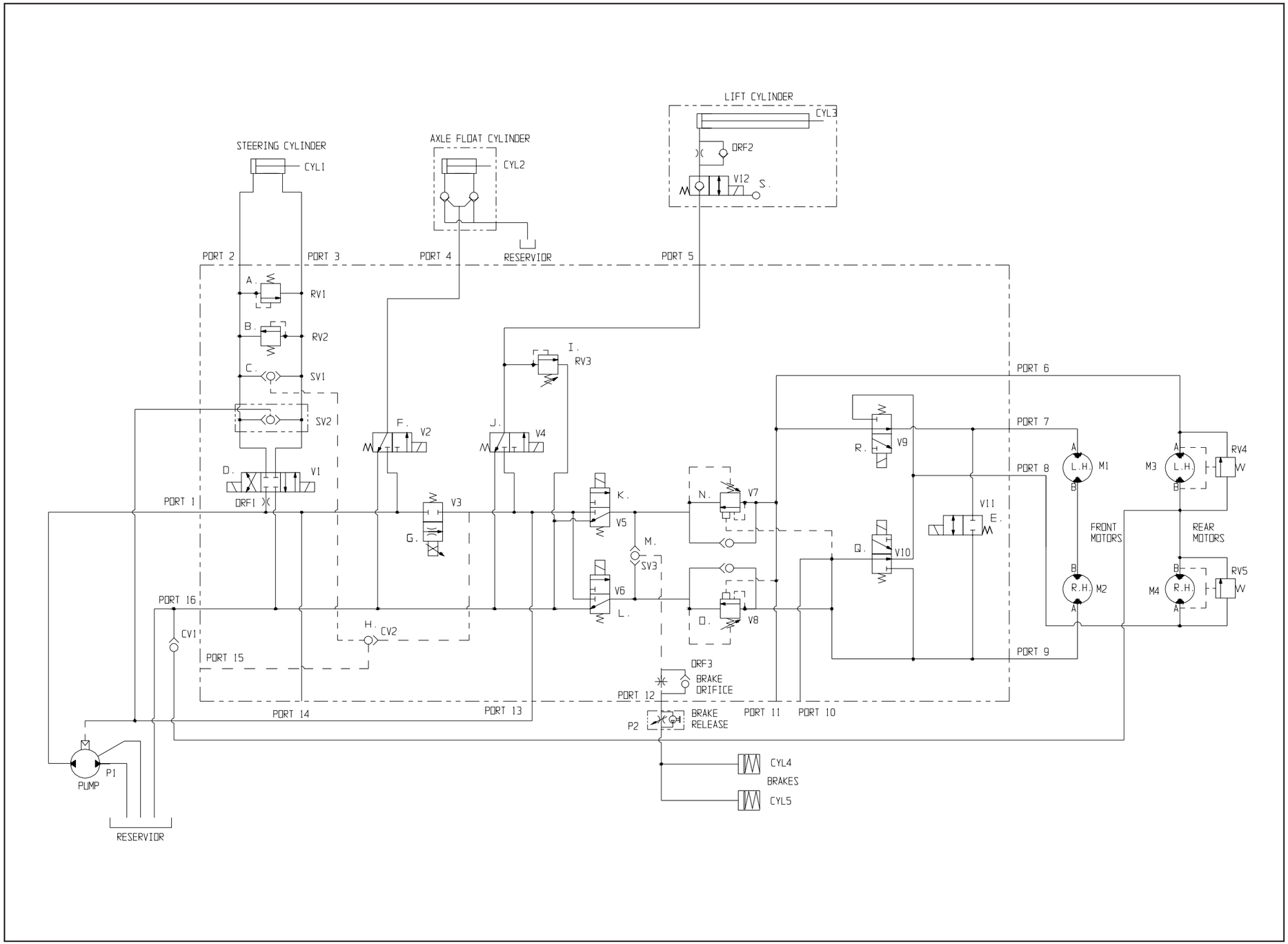


Figure 6-14: Hydraulic Schematic, Four Wheel Drive Model

6.2 Hydraulic Schematics

Table 6-15: Hydraulic Schematic Legend, Two Wheel Drive Model, With Outrigger Option

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Drive Make-up Check	Prevents cavitation of down stream motor when turning	Inline valve located bottom of manifold.
CV2	Sense Line Check	Not Used	Not servicable
CV3-10	Outrigger Sense Line Check Valves	Allows oil flow to load sense line only.	Outrigger valve manifold.
CYL1	Steering Cylinder	Actuates steering linkage to steer front wheels.	Front axle assembly
CYL2	Axle Float Cylinder	Locks front axle when platform is elevated.	Front axle assembly
CYL3	Lift Cylinder	Actuates scissor linkage to elevate platform.	Scissor assembly
CYL4,5	Brakes, Multi-disc	Parking brakes, spring applied, hyd. release.	Rear axle assembly
CYL6-9	Outrigger Cylinders	Extend and retract to level chassis.	Chassis assembly, aft of each wheel.
MOT 1,2	Front Drive Motors	Drive the front wheels.	Front axle assembly
MOT 3,4	Rear Drive Motors	Drive the rear wheels.	Rear axle assembly
ORF1	Steering Orifice	Limits the oil flow to the steering cylinder.	Under stack valve SV2 between steer valve (V1) and manifold.
ORF2	Down Orifice	Limits the descent speed of the platform.	Under down valve (V12).
ORF3	Brake Orifice	Allows brakes to release quickly and apply slowly.	Left side top of manifold under fitting in port 12.
ORF4	Outrigger Orifice	Regulates speed of outrigger operation.	Under pump "P" fitting on outrigger valve manifold.
P1	Hydraulic Pump	Provides fluid power for hydraulic system.	Power module, engine assembly.
P2	Brake Release Pump	Used to release brakes when machine is towed.	Near rear axle assembly outside housing.
PS2-5	Outrigger Pressure Switch	Closes when outriggers are loaded.	Outrigger cylinders.
RV1	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'A'.
RV2	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'B'.
RV3	Lift Relief Valve	Limits maximum load of elevating assembly.	Front of manifold port marked 'I'.
RV4,5	Bi-Directional Relief Valves	Allows oil flow to bypass drive motors when turning on tight radius.	Underneath each rear drive motor.
SV1	Sense Line Shuttle Valve	Not used.	Not serviceable.
SV2	Sense Line Shuttle Valve	Allows pilot pressure to pump sense line from steering.	Stack valve located between steering valve (V1) and manifold.
SV3	Drive Shuttle Valve	Allows oil pressure from drive to release brakes.	Not serviceable.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
V1	Steering Valve	Controls oil flow to steering cylinder (CYL1).	Top of manifold, ports marked 'D'.
V3	Proportional Valve	Regulates oil flow to entire lift and drive functions.	Right side of manifold, port marked 'G'.
V4	Lift Valve	Allows oil flow to lift cylinder (CYL3).	Right side of manifold, port marked 'J'.
V5	Forward Valve	Allows oil flow to drive system in forward, allows return oil flow from drive system in reverse.	Right side of manifold port marked 'K'.
V6	Reverse Valve	Allows oil flow to drive system in reverse, allows return oil flow from drive system in forward.	Right side of manifold port marked 'L.
V7	Forward Counter-balance Valve	Provides dynamic braking for machine in reverse and prevents runaway on slopes.	Left side ofmanifold, port marked 'N'.
V8	Reverse Counter-balance Valve	Provides dynamic braking for machine in forward and prevents runaway on slopes.	Left side ofmanifold, port marked 'O'.
V9,10	Series/Parallel Valves	Directs oil flow to drive motors in either series (for higher speed) or parallel (for higher torque) configuration.	Front of manifold, ports marked 'R' & 'Q'.
V11	Devider / Combiner Valve	Equalizes oil flow from front and rear drive motors when in parallel (High Torque) configuration.	Front of manifold, port marked 'P'.
V12	Down Valve	Holds oil in lift cylinder (CYL3) when deck is elevated. Allows oil to flow out of cylinder when deck is lowering. This valve has a cable actuated manual override for emergency lowering.	Base of lift cylinder, (CYL3).
V13-20	Counterbalance Valve	Lock outrigger cylinders.	On outrigger cylinders.
V21	Left Hand Front Outrigger Valve	Controls oil flow to LHF outrigger cylinder.	Outrigger valve manifold, first valve from right.
V22	Right Hand Front Outrigger Valve	Controls oil flow to RHF outrigger cylinder.	Outrigger valve manifold, second valve from right.
V23	Left Hand Rear Outrigger Valve	Controls oil flow to LHR outrigger cylinder.	Outrigger valve manifold, third valve from right.
V24	Right Hand Rear Outrigger Valve	Controls oil flow to RHR outrigger cylinder.	Outrigger valve manifold, fourth valve from right.

Note: See figure 6-18 , 19 for hydraulic valve locations.

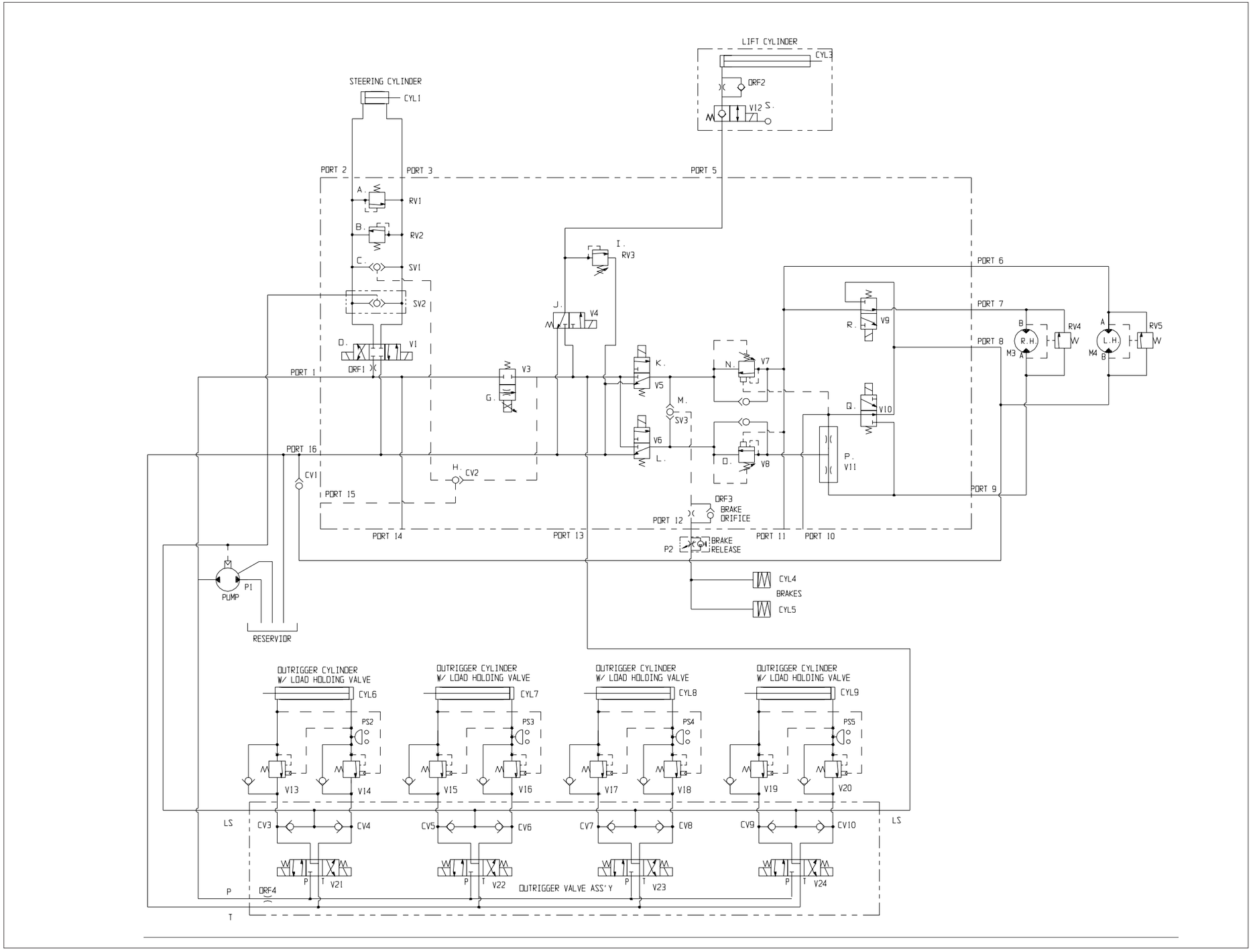


Figure 6-15: Hydraulic Schematic, Two Wheel Drive Model w/ Outriggers

Table 6-16: Hydraulic Schematic Legend, Four Wheel Drive Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Drive Make-up Check	Prevents cavitation of down stream motor when turning	Inline valve located bottom of manifold.
CV2	Sense Line Check	Not Used	Not servicable
CV3-10	Outrigger Sense Line Check Valves	Allows oil flow to load sense line only.	Outrigger valve manifold.
CYL1	Steering Cylinder	Actuates steering linkage to steer front wheels.	Front axle assembly
CYL2	Axle Float Cylinder	Locks front axle when platform is elevated.	Front axle assembly
CYL3	Lift Cylinder	Actuates scissor linkage to elevate platform.	Scissor assembly
CYL4,5	Brakes, Multi-disc	Parking brakes, spring applied, hyd. release.	Rear axle assembly
CYL6-9	Outrigger Cylinders	Extend and retract to level chassis.	Chassis assembly, aft of each wheel.
MOT 1,2	Front Drive Motors	Drive the front wheels.	Front axle assembly
MOT 3,4	Rear Drive Motors	Drive the rear wheels.	Rear axle assembly
ORF1	Steering Orifice	Limits the oil flow to the steering cylinder.	Under stack valve SV2 between steer valve (V1) and manifold.
ORF2	Down Orifice	Limits the descent speed of the platform.	Under down valve (V12).
ORF3	Brake Orifice	Allows brakes to release quickly and apply slowly.	Left side top of manifold under fitting in port 12.
ORF4	Outrigger Orifice	Regulates speed of outrigger operation.	Under pump "P" fitting on outrigger valve manifold.
P1	Hydraulic Pump	Provides fluid power for hydraulic system.	Power module, engine assembly.
P2	Brake Release Pump	Used to release brakes when machine is towed.	Near rear axle assembly outside housing.
PS2-5	Outrigger Pressure Switch	Closes when outriggers are loaded.	Outrigger cylinders.
RV1	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'A'.
RV2	Right Steer Relief Valve	Provides overpressure protection for steering components.	Front of manifold, port marked 'B'.
RV3	Lift Relief Valve	Limits maximum load of elevating assembly.	Front of manifold port marked 'I'.
RV4,5	Bi-Directional Relief Valves	Allows oil flow to bypass drive motors when turning on tight radius.	Underneath each rear drive motor.
SV1	Sense Line Shuttle Valve	Not used.	Not serviceable.
SV2	Sense Line Shuttle Valve	Allows pilot pressure to pump sense line from steering.	Stack valve located between steering valve (V1) and manifold.
SV3	Drive Shuttle Valve	Allows oil pressure from drive to release brakes.	Not serviceable.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
V1	Steering Valve	Controls oil flow to steering cylinder (CYL1).	Top of manifold, ports marked 'D'.
V2	Axle Float Valve	Allows pilot pressure to release P.O. check valves on axle float cylinder (CYL2).	Front of manifold, port marked 'F'.
V3	Proportional Valve	Regulates oil flow to entire lift and drive functions.	Right side of manifold, port marked 'G'.
V4	Lift Valve	Allows oil flow to lift cylinder (CYL3).	Right side of manifold, port marked 'J'.
V5	Forward Valve	Allows oil flow to drive system in forward, allows return oil flow from drive system in reverse.	Right side of manifold port marked 'K'.
V6	Reverse Valve	Allows oil flow to drive system in reverse, allows return oil flow from drive system in forward.	Right side of manifold port marked 'L.
V7	Forward Counter-balance Valve	Provides dynamic braking for machine in reverse and prevents runaway on slopes.	Left side ofmanifold, port marked 'N'.
V8	Reverse Counter-balance Valve	Provides dynamic braking for machine in forward and prevents runaway on slopes.	Left side ofmanifold, port marked 'O'.
V9,10	Series / Parallel Valves	Directs oil flow to drive motors in either series (for higher speed) or parallel (for higher torque) configuration.	Front of manifold, ports marked 'R' & 'Q'.
V11	Shunt Valve	Bypasses oil flow from front drive motors when in High Speed Mode, allowing greater pressure for rear motors.	Front of manifold, port marked 'E'.
V12	Down Valve	Holds oil in lift cylinder (CYL3) when deck is elevated. Allows oil to flow out of cylinder when deck is lowering. This valve has a cable actuated manual override for emergency lowering.	Base of lift cylinder, (CYL3).
V13-20	Counterbalance Valve	Lock outrigger cylinders.	On outrigger cylinders.
V21	Left Hand Front Outrigger Valve	Controls oil flow to LHF outrigger cylinder.	Outrigger valve manifold, first valve from right.
V22	Right Hand Front Outrigger Valve	Controls oil flow to RHF outrigger cylinder.	Outrigger valve manifold, second valve from right.
V23	Left Hand Rear Outrigger Valve	Controls oil flow to LHR outrigger cylinder.	Outrigger valve manifold, third valve from right.
V24	Right Hand Rear Outrigger Valve	Controls oil flow to RHR outrigger cylinder.	Outrigger valve manifold, fourth valve from right.

Note: See figure 6-18 , 19 for hydraulic valve locations.

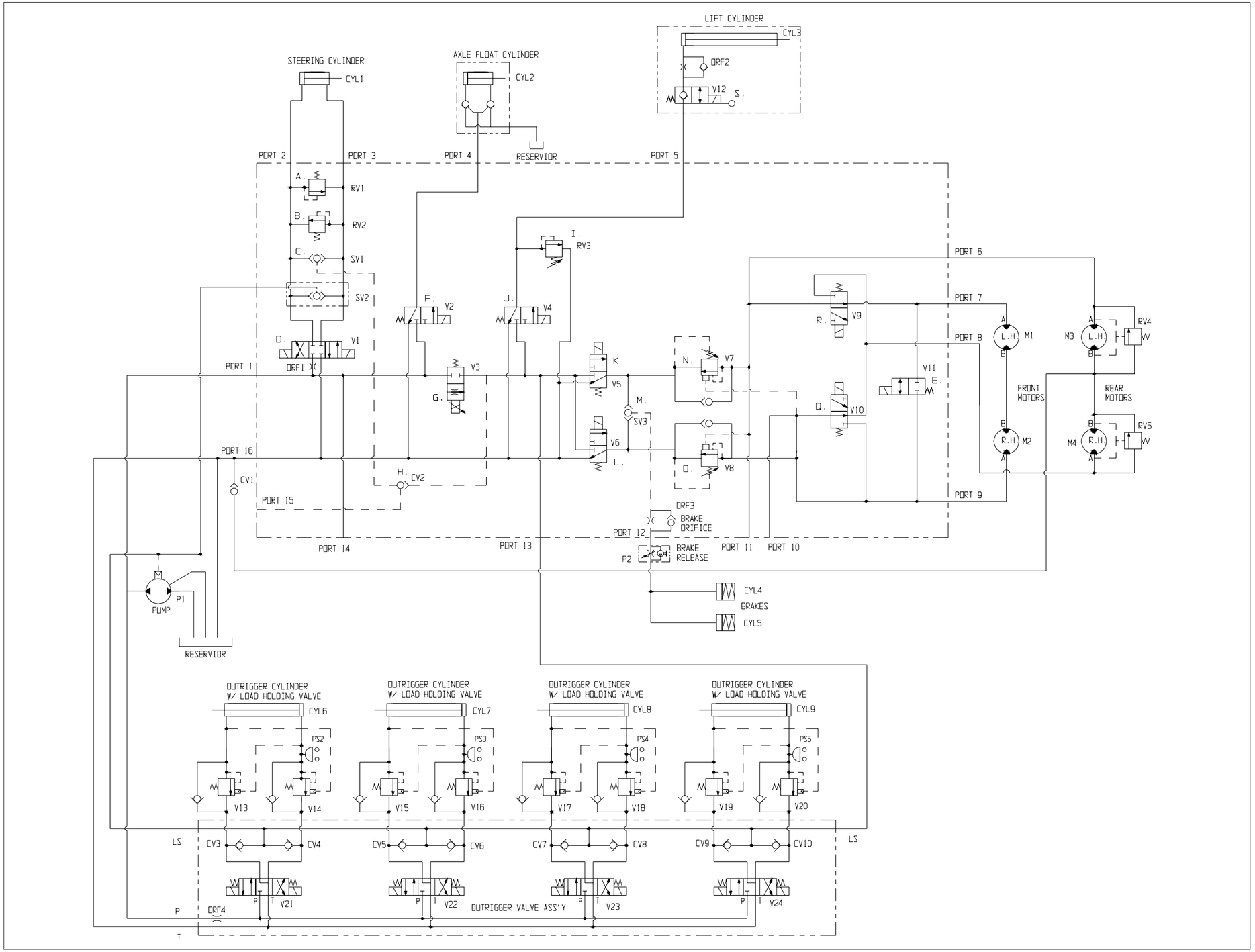
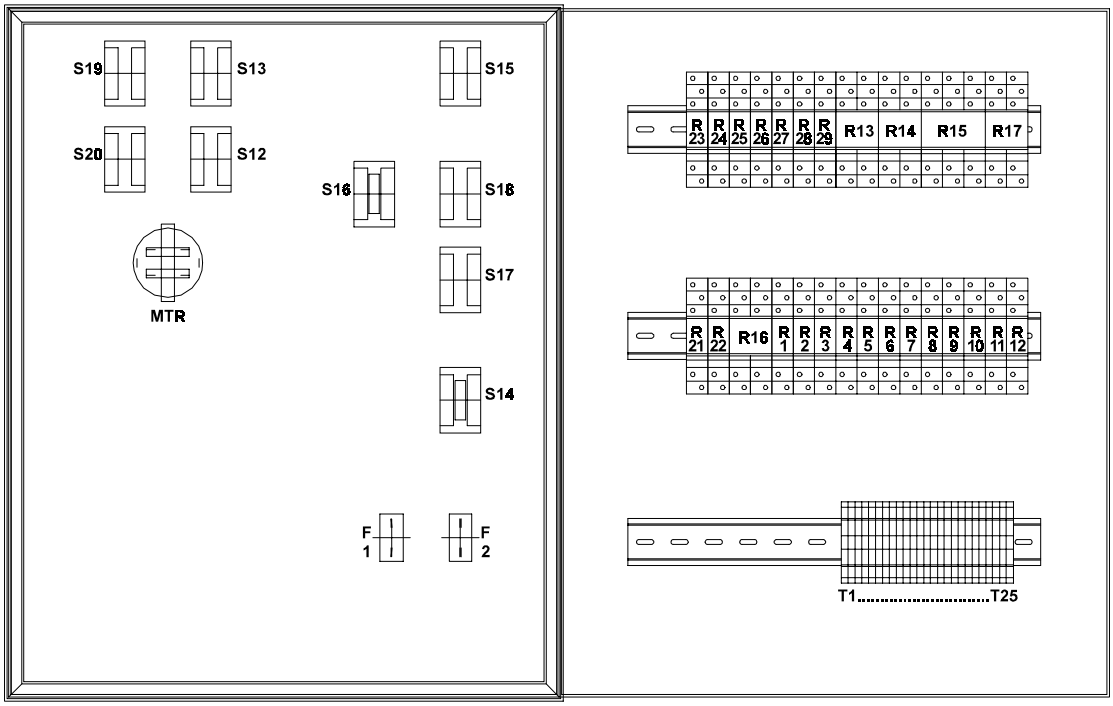


Figure 6-16: Hydraulic Schematic, Four Wheel Drive Model w/ Outriggers

6.3 Component Location



Lower Control Box (Open)

Figure 6-17: Terminal Strip, Relay Identification

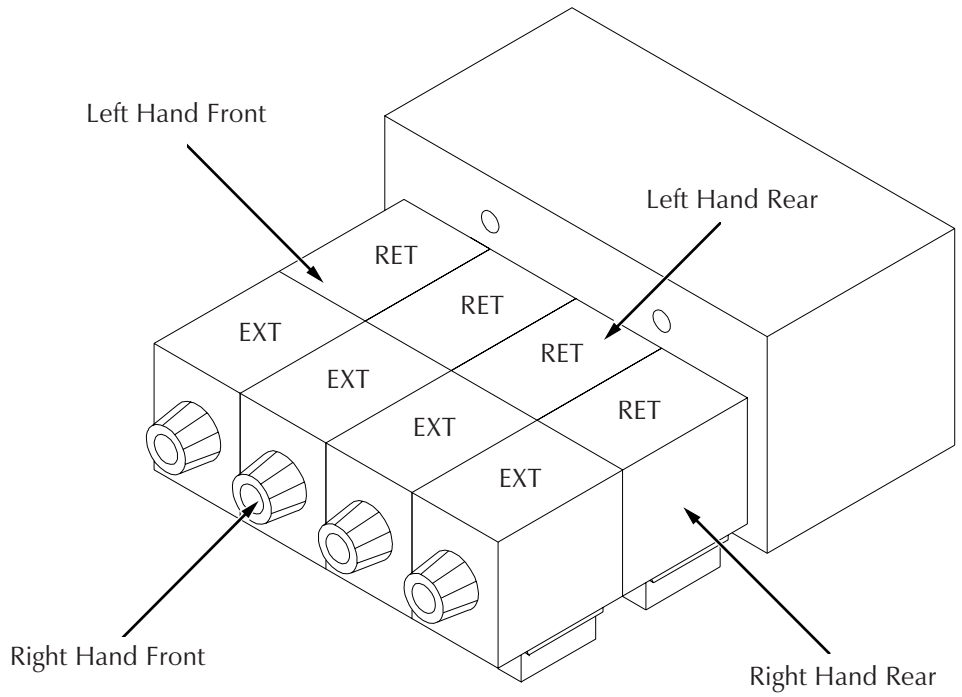


Figure 6-18: Outrigger Valve Locations

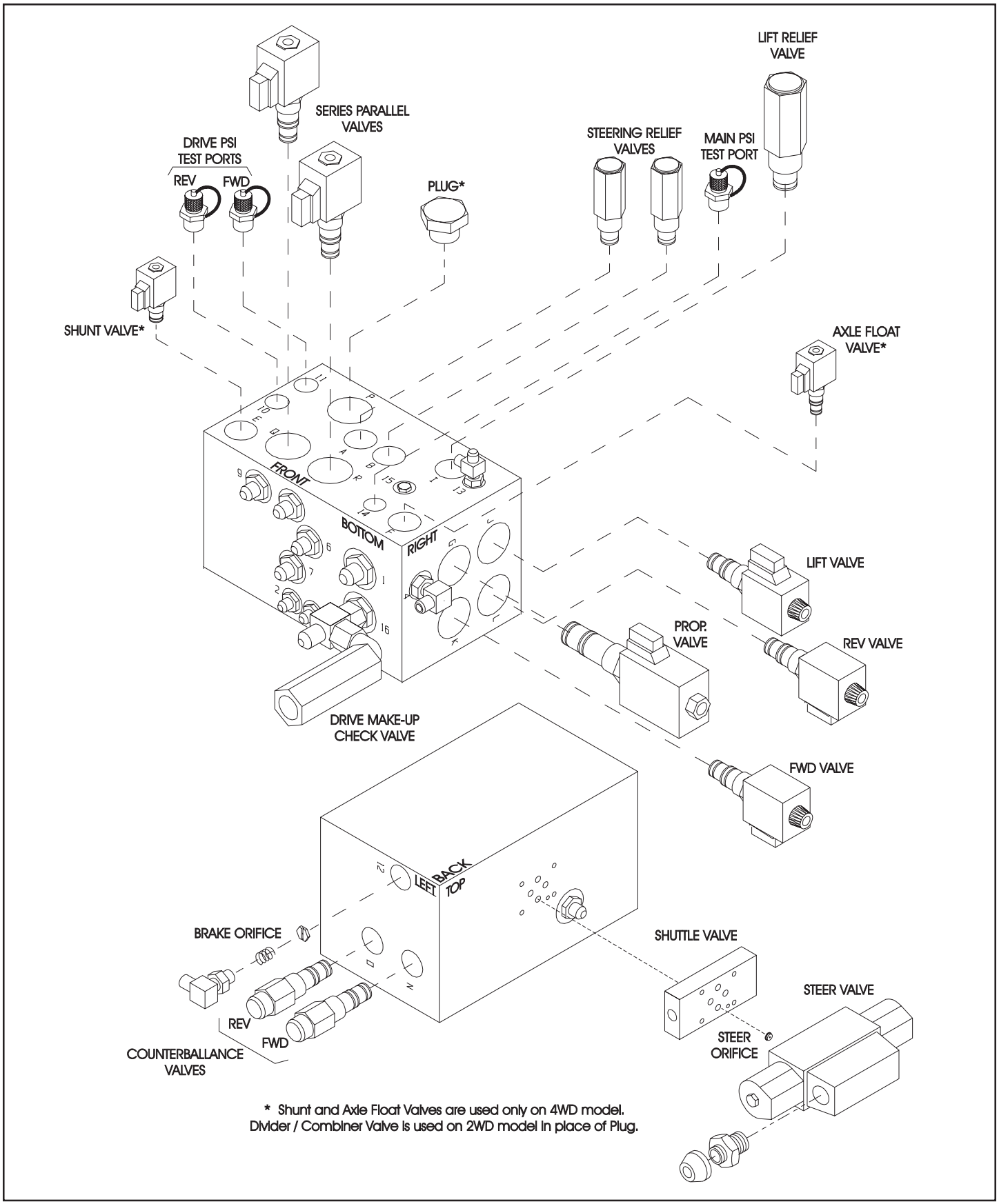


Figure 6-19: Hydraulic Manifold

NOTES:

7.0 Introduction

This section lists and illustrates the replaceable assemblies and parts of the LX 31/41 Work Platform, as manufactured by UpRight, Inc.

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

7.1 Index

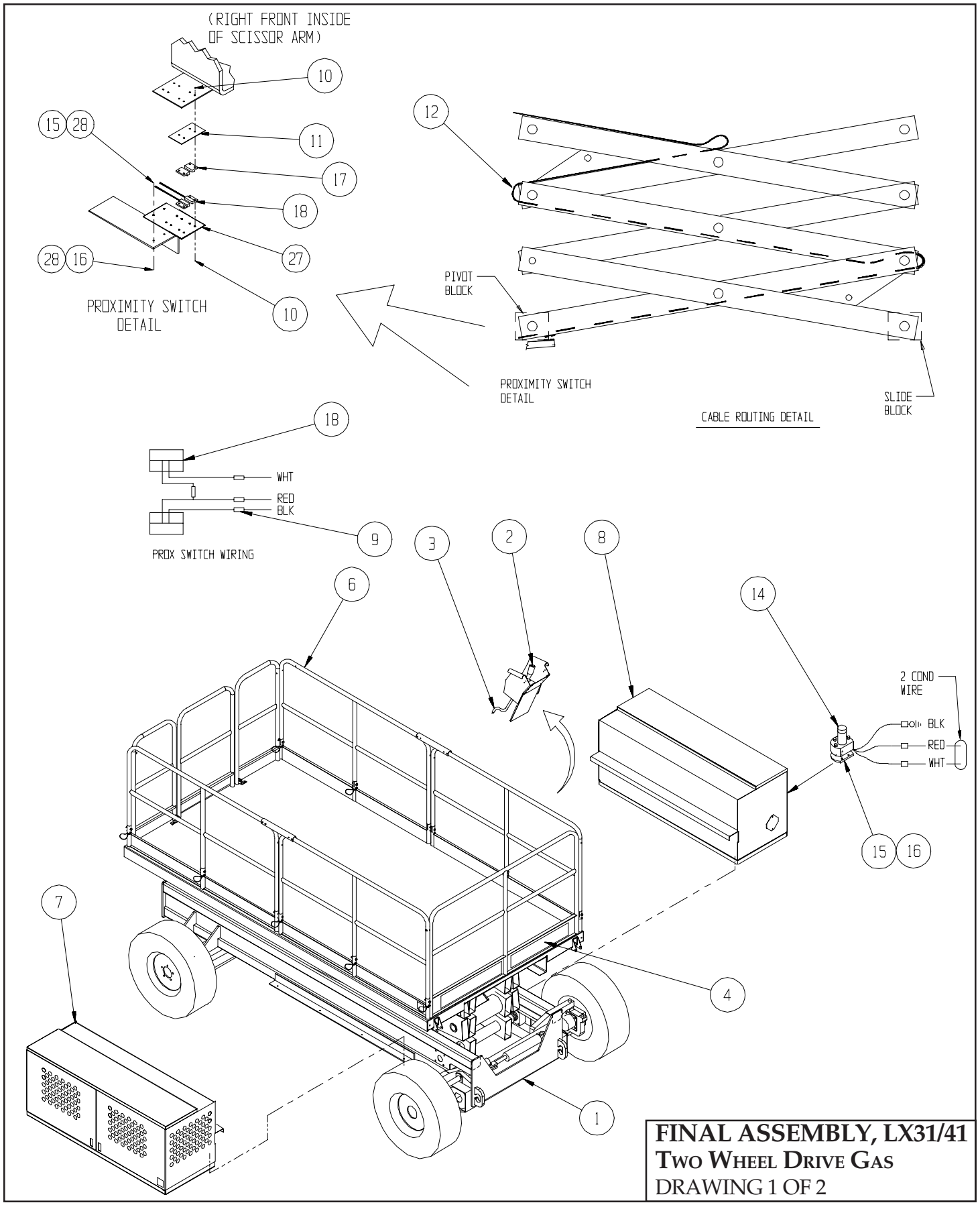
FINAL ASSEMBLY, LX31
Two Wheel Drive Gas
67501-000

ITEM	PART	DESCRIPTION	QTY.
1	67510-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-000	CONTROL CABLE ASSY	1
4	67532-000	LABEL-KIT	1
*	67533-000	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-001	POWER MODULE	1
8	67521-000	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	4
13	29480-099	WIRE, 10GA STRD RED	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	2
17	65373-005	MAGNET	2
18	65373-006	SWITCH	2
19	62125-016	BATTERY CABLE ASSY	1
20	62125-002	BATTERY CABLE ASSY	1
21	29616-003	TERMINAL, FEMALE PUSH	1
22	29616-002	TERMINAL, FEMALE PUSH	4
23	29601-019	TERMINAL, RING	1
24	29610-002	TERMINAL, FORK	5
25	29601-011	TERMINAL, RING	3
26	29448-099	WIRE, 7 CONDUCTOR	10'
27	67863-000	SWITCH MOUNT PLATE	1
28	14996-004	WASHER 1/4"	4

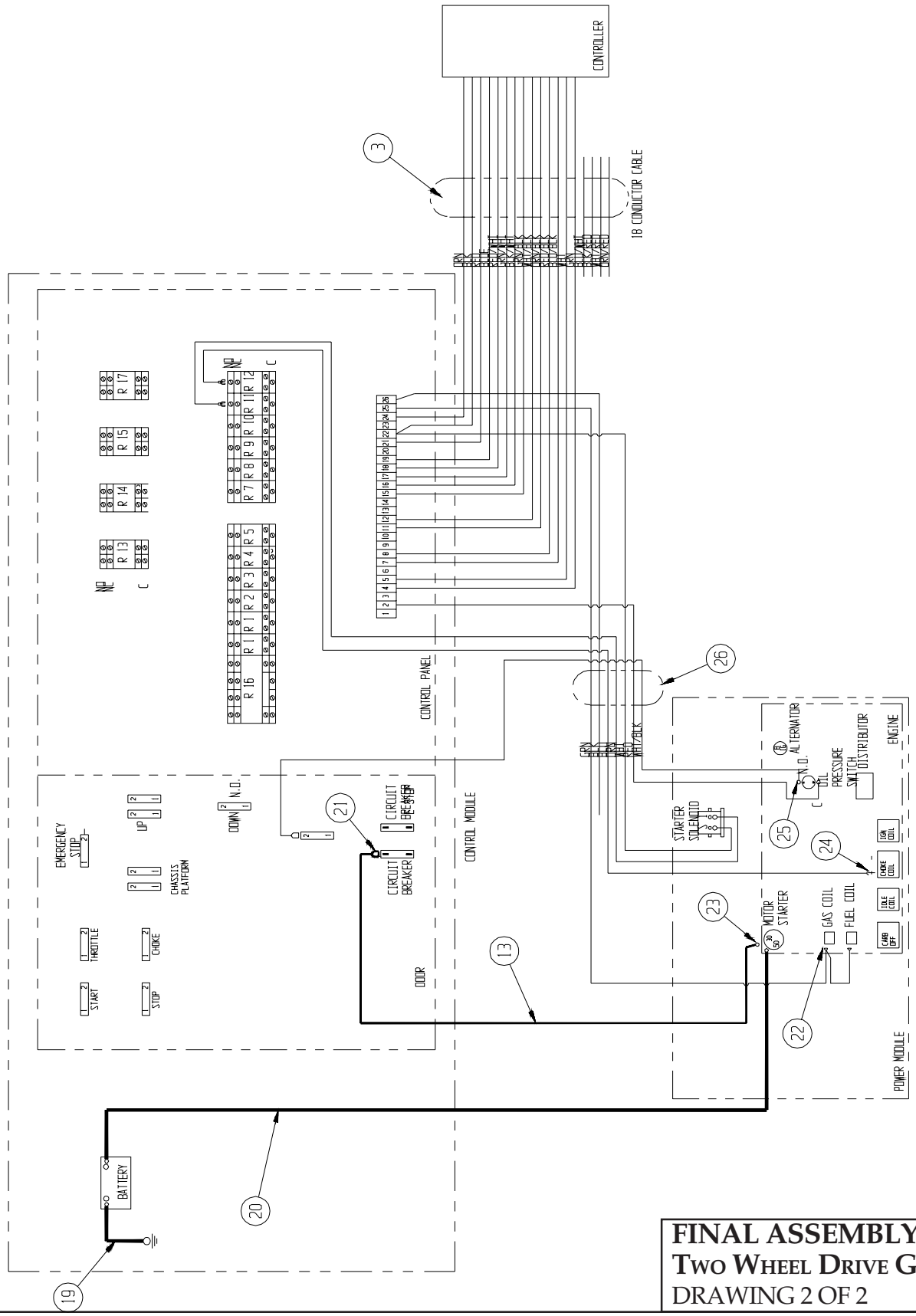
***Not Shown**

FINAL ASSEMBLY, LX41
Two Wheel Drive Gas
67541-000

ITEM	PART	DESCRIPTION	QTY.
1	67512-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-000	CONTROL CABLE ASSY	1
4	67532-000	LABEL KIT	1
*	67533-000	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-001	POWER MODULE	1
8	67521-000	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	8
13	29480-099	WIRE, 10GA STRD RED	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	2
17	65373-005	MAGNET	2
18	65373-006	SWITCH	2
19	62125-016	BATTERY CABLE ASSY	1
20	62125-002	BATTERY CABLE ASSY	1
21	29616-003	TERMINAL, FEMALE PUSH	1
22	29616-002	TERMINAL, FEMALE PUSH	4
23	29601-019	TERMINAL, RING	1
24	29610-002	TERMINAL, FORK	7
25	29601-011	TERMINAL, RING	3
26	29448-099	WIRE, 7 CONDUCTOR	10'
27	67863-000	SWITCH MOUNT PLATE	1
28	14996-004	WASHER 1/4"	4



FINAL ASSEMBLY, LX31/41
TWO WHEEL DRIVE GAS
DRAWING 1 OF 2



FINAL ASSEMBLY, LX31/41
TWO WHEEL DRIVE GAS
DRAWING 2 OF 2

NOTES:

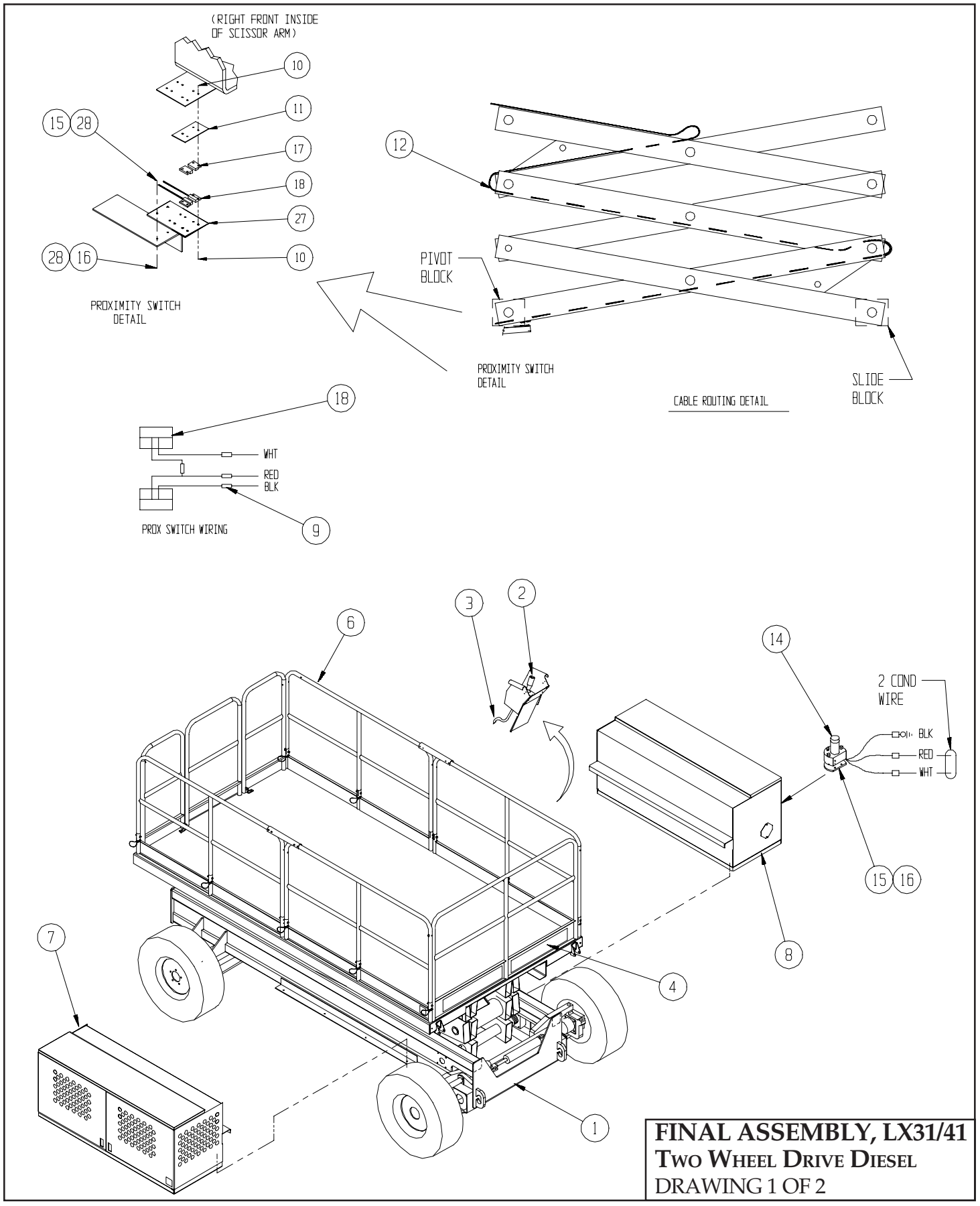
FINAL ASSEMBLY, LX31
Two Wheel Drive Diesel
67502-000

ITEM	PART	DESCRIPTION	QTY.
1	67510-000	BASIC ASSY	1
2	67528-001	CONTROLLER ASSY	1
3	67536-000	CONTROL CABLE ASSY	1
4	67532-001	LABEL-KIT	1
*	67533-000	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-002	POWER MODULE	1
8	67521-001	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	4
13	29480-099	WIRE, 10GA STRD RED	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	2
17	65373-005	MAGNET	2
18	65373-006	SWITCH	2
19	62125-016	BATTERY CABLE ASSY	1
20	62125-002	BATTERY CABLE ASSY	1
21	29616-003	TERMINAL, FEMALE PUSH	1
22	29616-002	TERMINAL, FEMALE PUSH	1
23	29601-019	TERMINAL, RING	1
24	29610-002	TERMINAL, FORK	2
25	29601-011	TERMINAL, RING	2
26	29448-099	WIRE, 7 CONDUCTOR	10
'27	67863-000	SWITCH MOUNT PLATE	1
28	14996-004	WASHER 1/4"	4

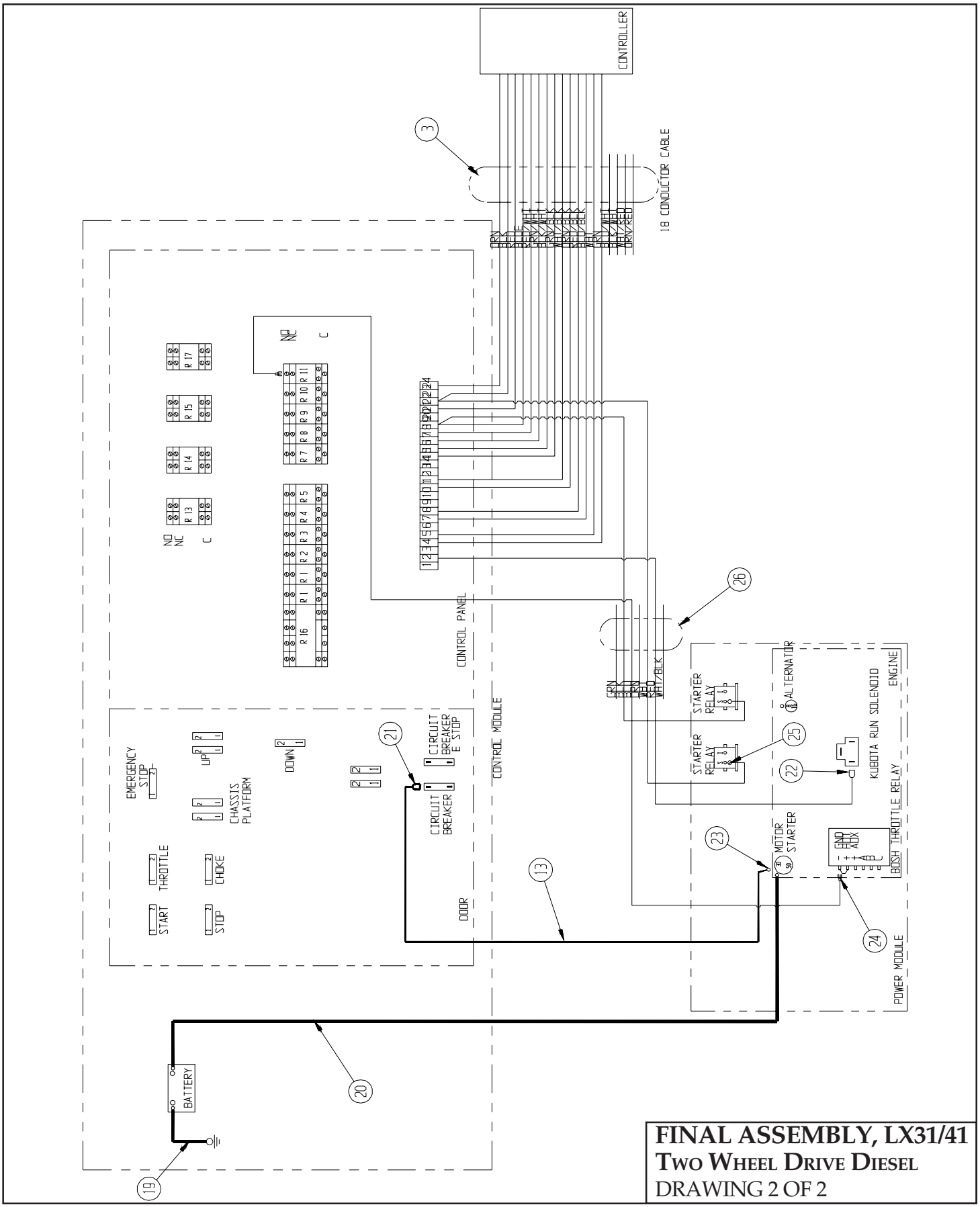
***Not Shown**

FINAL ASSEMBLY, LX41
Two Wheel Drive Diesel
67542-000

ITEM	PART	DESCRIPTION	QTY.
1	67512-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-001	CONTROL CABLE ASSY	1
4	67532-005	LABEL-KIT	1
*	67533-000	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-002	POWER MODULE	1
8	67521-001	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	8
13	29480-099	WIRE, 10GA STRD RED	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	3
17	65373-005	MAGNET	2
18	65373-006	SWITCH	2
19	62125-016	BATTERY CABLE ASSY	1
20	62125-002	BATTERY CABLE ASSY	1
21	29616-003	TERMINAL, FEMALE PUSH	1
22	29616-002	TERMINAL, FEMALE PUSH	1
23	29601-019	TERMINAL, RING	1
24	29610-002	TERMINAL, FORK	2
25	29601-011	TERMINAL, RING	2
26	29448-099	WIRE, 7 CONDUCTOR	10'
27	67863-000	SWITCH MOUNT PLATE	1
28	14996-004	WASHER 1/4"	4



FINAL ASSEMBLY, LX31/41
TWO WHEEL DRIVE DIESEL
DRAWING 1 OF 2



FINAL ASSEMBLY, LX31/41
TWO WHEEL DRIVE DIESEL
DRAWING 2 OF 2

NOTES:

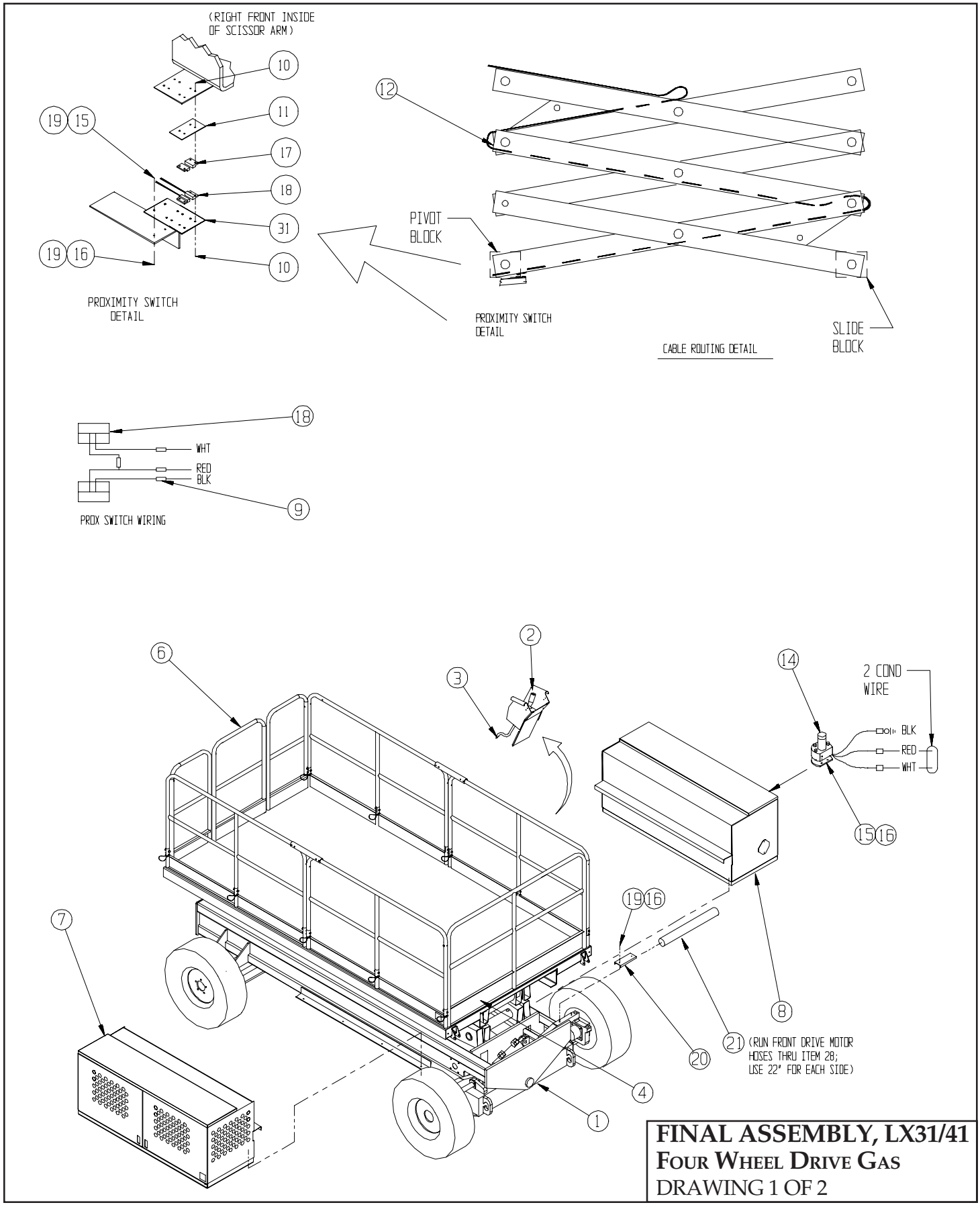
FINAL ASSEMBLY, LX31
FOUR WHEEL DRIVE GAS
67504-000

ITEM	PART	DESCRIPTION	QTY.
1	67511-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-000	CONTROL CABLE ASSY	1
4	67532-002	LABEL-KIT	1
*	67533-001	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-001	POWER MODULE	1
8	67521-002	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	4
13	29496-099	WIRE, 2 CONDUCTOR	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	6
17	65373-005	MAGNET	2
18	65373-006	SWITCH SENSOR	2
19	14996-004	WASHER 1/4 SAE	4
20	67699-000	HOSE CLAMP CHANNEL	2
21	67758-099	HOSE GUARD	3.7FT
22	62125-016	BATTERY CABLE ASSY	1
23	62125-002	BATTERY CABLE ASSY	1
24	29616-003	TERMINAL, FEMALE PUSH	1
25	29616-002	TERMINAL, FEMALE PUSH	4
26	29601-019	TERMINAL, RING	1
27	29610-002	TERMINAL, FORK	5
28	29601-011	TERMINAL, RING	3
29	29448-099	WIRE, 7 CONDUCTOR	10'
30	29480-099	WIRE, 10GA STRD RED	10'
31	67863-000	SWITCH MOUNT PLATE	1

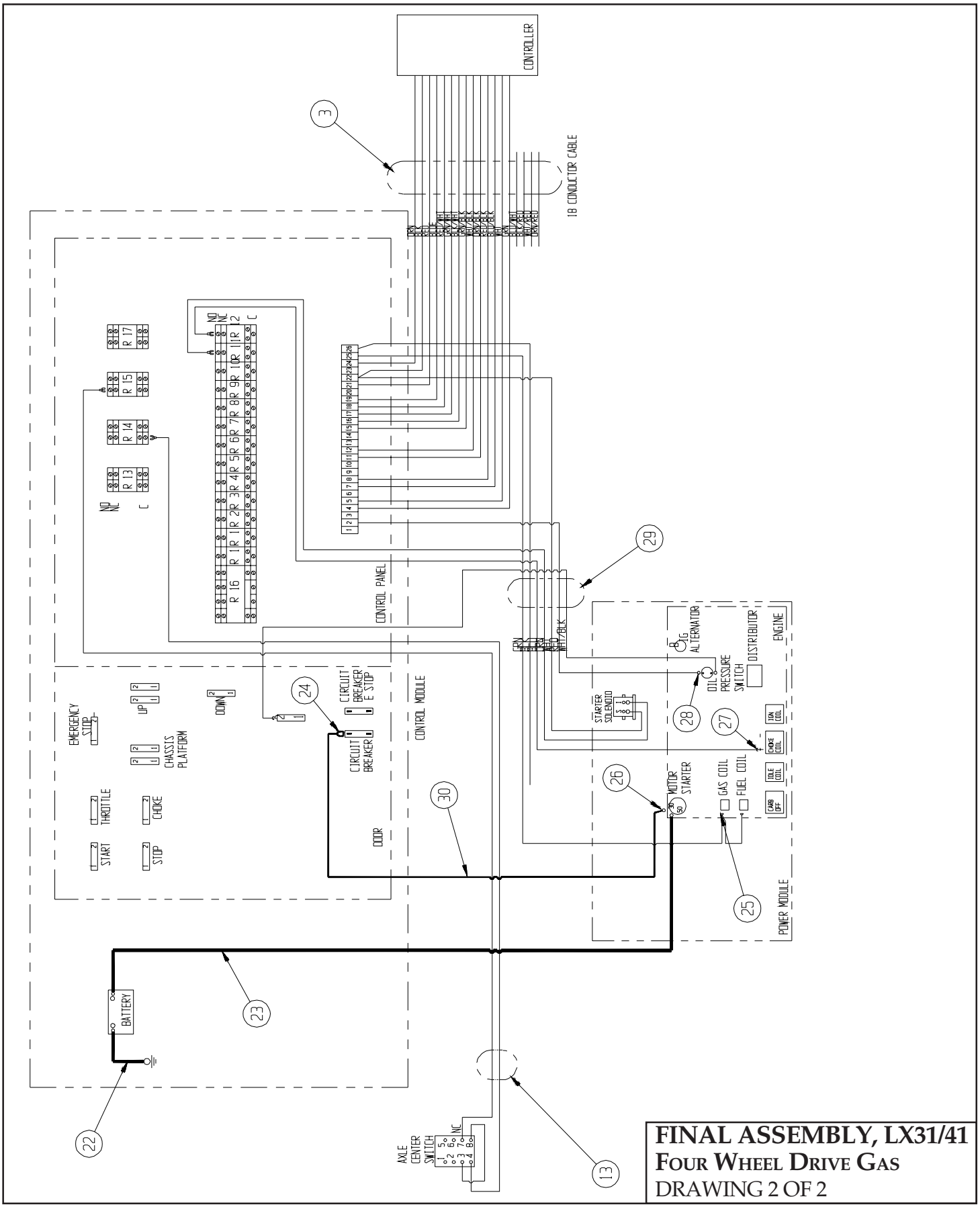
***Not Shown**

FINAL ASSEMBLY, LX41
FOUR WHEEL DRIVE GAS
67544-000

ITEM	PART	DESCRIPTION	QTY.
1	67513-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-000	CONTROL CABLE ASSY	1
4	67532-002	LABEL-KIT	1
*	67533-001	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-001	POWER MODULE	1
8	67521-002	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	4
13	29496-099	WIRE, 2 CONDUCTOR	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	6
17	65373-005	MAGNET	2
18	65373-006	SWITCH SENSOR	2
19	14996-004	WASHER 1/4 SAE	4
20	67699-000	HOSE CLAMP CHANNEL	2
21	67758-099	HOSE GUARD	3.7FT
22	62125-016	BATTERY CABLE ASSY	1
23	62125-002	BATTERY CABLE ASSY	1
24	29616-003	TERMINAL, FEMALE PUSH	1
25	29616-002	TERMINAL, FEMALE PUSH	4
26	29601-019	TERMINAL, RING	1
27	29610-002	TERMINAL, FORK	5
28	29601-011	TERMINAL, RING	3
29	29448-099	WIRE, 7 CONDUCTOR	10'
30	29480-099	WIRE, 10GA STRD RED	10'
31	67863-000	SWITCH MOUNT PLATE	1



FINAL ASSEMBLY, LX31/41
FOUR WHEEL DRIVE GAS
DRAWING 1 OF 2



FINAL ASSEMBLY, LX31/41
FOUR WHEEL DRIVE GAS
DRAWING 2 OF 2

NOTES:

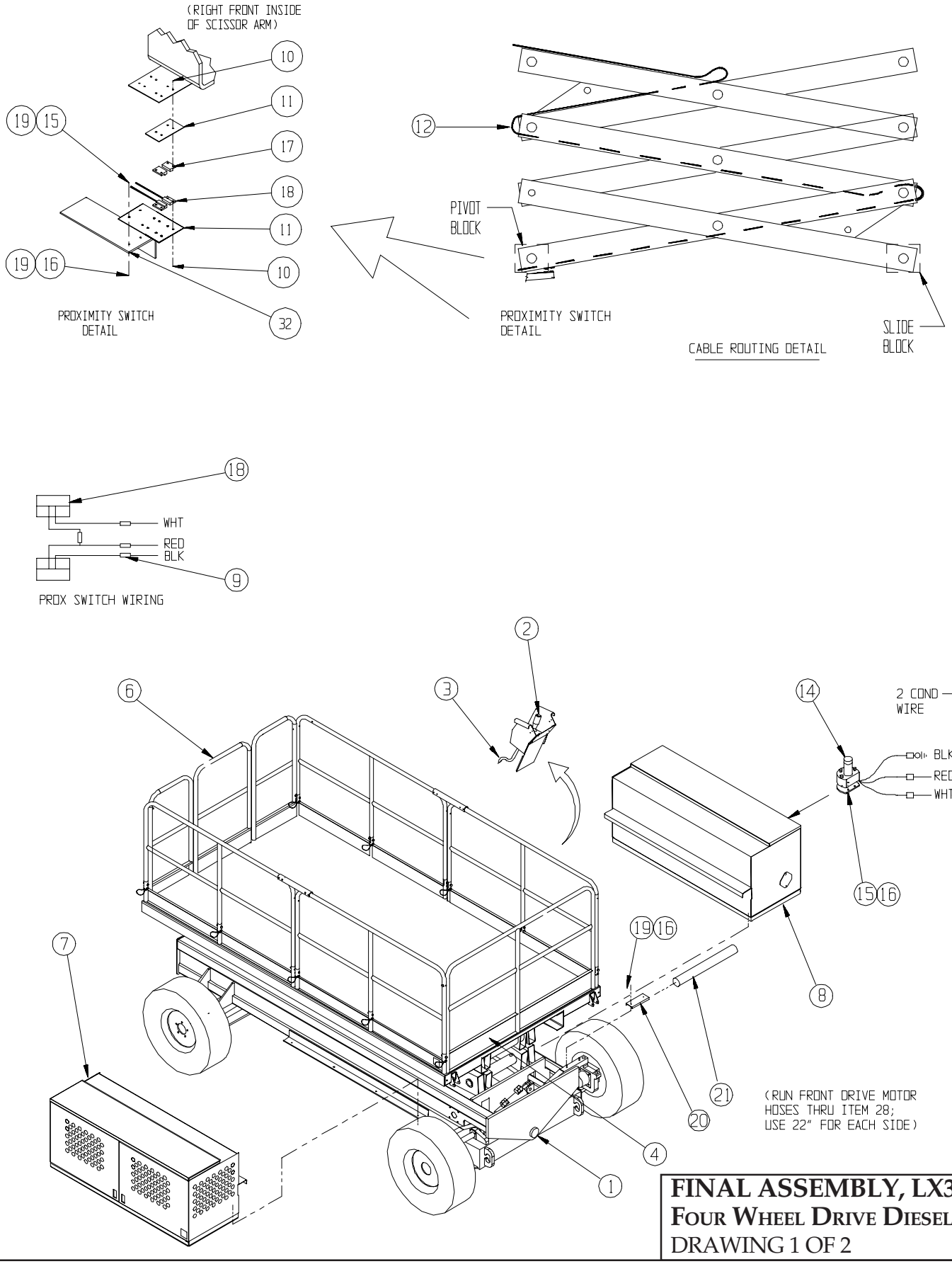
FINAL ASSEMBLY, LX31
Four Wheel Drive Diesel
67505-000

ITEM	PART	DESCRIPTION	QTY.
1	67511-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-000	CONTROL CABLE ASSY	1
4	67532-003	LABEL-KIT	1
*	67533-001	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-002	POWER MODULE	1
8	67521-003	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	4
13	29496-099	WIRE, 2 CONDUCTOR	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	6
17	65373-005	MAGNET	2
18	65373-006	SWITCH	2
19	14996-004	WASHER 1/4 SAE	4
20	67699-000	HOSE CLAMP CHANNEL	2
21	67758-099	HOSE GUARD	3.7'
22	62125-016	BATTERY CABLE ASSY	1
23	62125-002	BATTERY CABLE ASSY	1
24	29616-003	TERMINAL, FEMALE PUSH	1
25	29616-002	TERMINAL, FEMALE PUSH	1
26	29601-019	TERMINAL, RING	1
27	29610-002	TERMINAL, FORK	4
28	29601-011	TERMINAL, RING	2
29	29448-099	WIRE, 7 CONDUCTOR	10'
30	29480-099	WIRE, 10GA STRD RED	10'
31	67863-000	SWITCH MOUNT PLATE	1

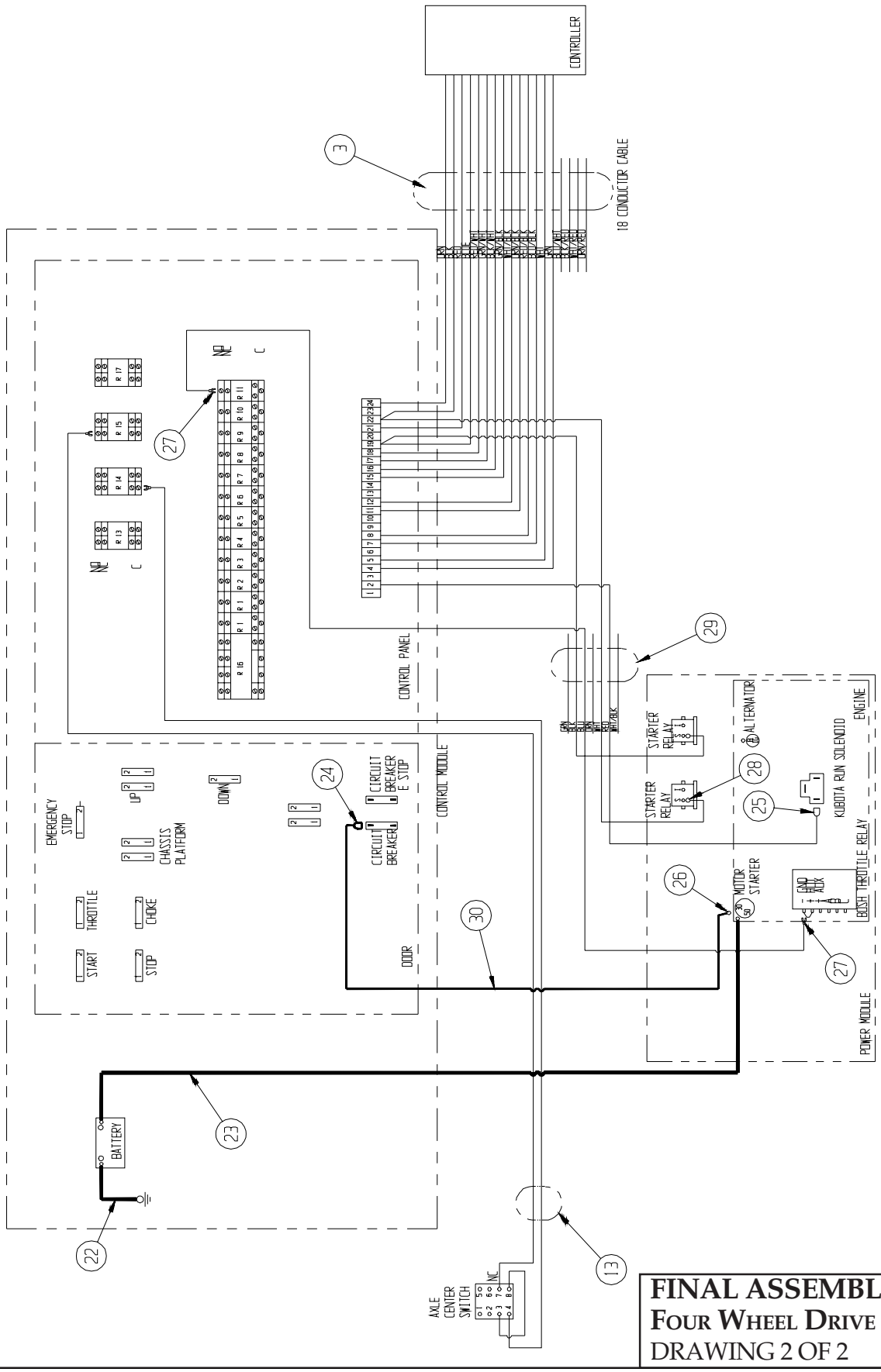
***Not Shown**

FINAL ASSEMBLY, LX41
Four Wheel Drive Diesel
67545-000

ITEM	PART	DESCRIPTION	QTY.
1	67513-000	BASIC ASSY	1
2	67528-000	CONTROLLER ASSY	1
3	67536-001	CONTROL CABLE ASSY	1
4	67532-007	LABEL-KIT	1
*	67533-001	HOSE-KIT	1
6	67530-002	GUARDRAIL ASSY	1
7	67522-002	POWER MODULE	1
8	67521-003	CONTROL MODULE	1
9	29620-002	CONN. BUTT 16-14 GA.	8
10	26551-005	RIVET 1/8 X 1/4 GRIP	8
11	67913-000	ALUM. SW. PAD	2
12	67692-000	CLIP, CABLE RETAINER	4
13	29496-099	WIRE, 2 CONDUCTOR	10'
14	29945-013	LEVEL SENSOR	1
15	11252-006	SCRW, 1/4-20 X 3/4	2
16	11248-004	LOCKNUT, 1/4-20 UNC	6
17	65373-005	MAGNET	2
18	65373-006	SWITCH	2
19	14996-004	WASHER 1/4 SAE	4
20	67699-000	HOSE CLAMP CHANNEL	2
21	67758-099	HOSE GUARD	3.7'
22	62125-016	BATTERY CABLE ASSY	1
23	62125-002	BATTERY CABLE ASSY	1
24	29616-003	TERMINAL, FEMALE PUSH	1
25	29616-002	TERMINAL, FEMALE PUSH	1
26	29601-019	TERMINAL, RING	1
27	29610-002	TERMINAL, FORK	4
28	29601-011	TERMINAL, RING	2
29	29448-099	WIRE, 7 CONDUCTOR	10'
30	29480-099	WIRE, 10GA STRD RED	10'
32	67863-000	SWITCH MOUNT PLATE	1



FINAL ASSEMBLY, LX31/41
FOUR WHEEL DRIVE DIESEL
DRAWING 1 OF 2



FINAL ASSEMBLY, LX31/41
FOUR WHEEL DRIVE DIESEL
DRAWING 2 OF 2

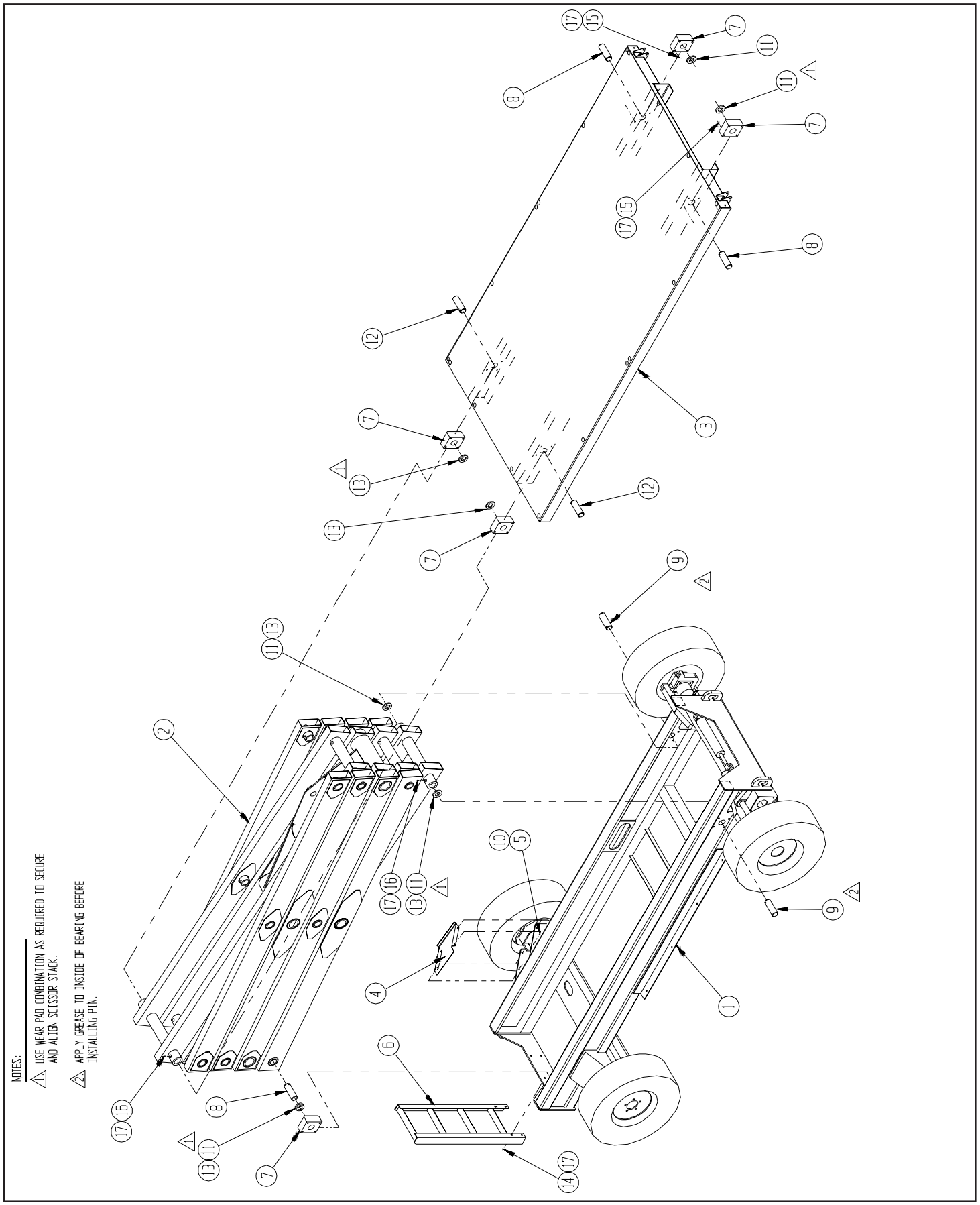
NOTES:

BASIC ASSEMBLY, LX31
TWO WHEEL DRIVE
67510-000

ITEM	PART	DESCRIPTION	QTY.
1	67518-000	CHASSIS ASSEMBLY	1
2	67515-000	SCISSOR LINKAGE	1
3	67780-000	PLATFORM WELDMENT	1
4	67879-000	MOTOR COVER	2
5	11253-008	SCREW H H C 5/16 X 1	8
6	67737-001	LADDER WELDMENT	1
7	67738-000	SLIDE BLOCK	6
8	67852-000	PIN	4
9	67853-000	PIN	2
10	14996-005	WASHER 5/16 DIA	8
11	66189-000	SPACER 1/4	4
12	67853-001	PIN	2
13	66189-004	SPACER 1/8	8
14	11256-012	SCREW HHC 1/2-13 X 1 1/2	4
15	11256-028	SCREW HHC 1/2-13 X 3 1/2	8
16	14033-032	SCREW HHC 1/2-13 X 4 GR8	8
17	11248-008	NUT 1/2-13 ESNA	16

BASIC ASSEMBLY, LX41
TWO WHEEL DRIVE
67512-000

ITEM	PART	DESCRIPTION	QTY.
1	67518-000	CHASSIS ASSEMBLY	1
2	67516-000	SCISSOR LINKAGE	1
3	67780-000	PLATFORM WELDMENT	1
4	67879-000	MOTOR COVER	2
5	11253-008	SCREW HHC 5/16 X 1	8
6	67737-000	LADDER WELDMENT	1
7	67738-000	SLIDE BLOCK	6
8	67852-000	PIN	4
9	67853-000	PIN	2
10	14996-005	WASHER 5/16 DIA	8
11	66189-000	SPACER 1/4	4
12	67853-001	PIN	2
13	66189-004	SPACER 1/8	8
14	11256-012	SCREW HHC 1/2-13 X 1 1/2	4
15	11256-028	SCREW HHC 1/2-13 X 3 1/2	8
16	14033-032	SCREW HHC 1/2-13 X 4	8
17	11248-008	NUT 1/2-13 ESNA	16

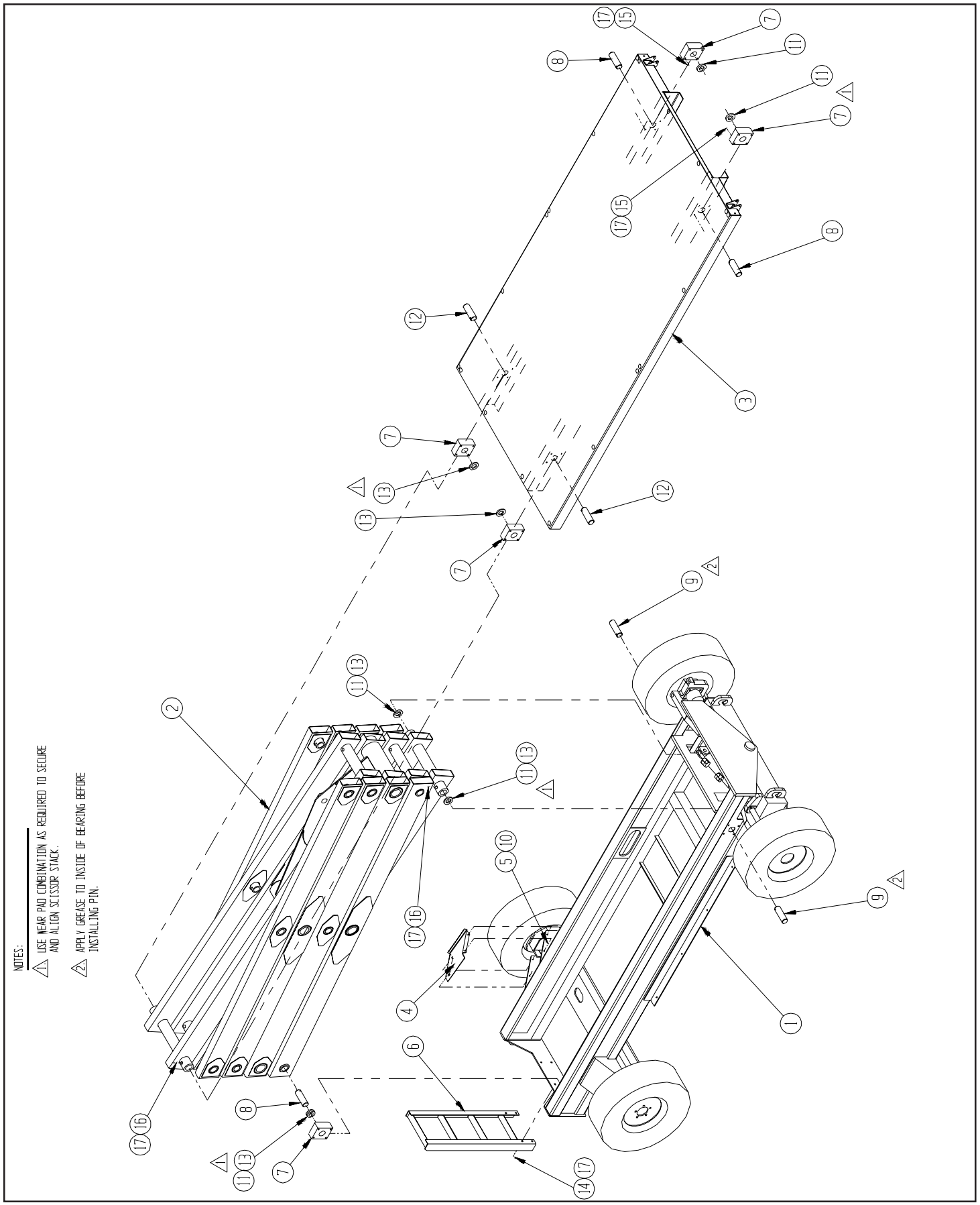

NOTES:
1 USE WEAR PAD COMBINATION AS REQUIRED TO SECURE AND ALIGN SCISSOR STACK.
2 APPLY GREASE TO INSIDE OF BEARING BEFORE INSTALLING PIN.

BASIC ASSEMBLY, LX31
FOUR WHEEL DRIVE
67511-000

ITEM	PART	DESCRIPTION	QTY.
1	67519-000	CHASSIS ASSEMBLY	1
2	67515-000	SCISSOR LINKAGE	1
3	67780-000	PLATFORM WELDMENT	1
4	67879-000	MOTOR COVER	2
5	11253-008	SCREW HHC 5/16 X 1	8
6	67737-001	LADDER WELDMENT	1
7	67738-000	SLIDE BLOCK	6
8	67852-000	PIN	4
9	67853-000	PIN	2
10	14996-005	WASHER, 5/16 DIA	8
11	66189-000	SPACER 1/4	4
12	67853-001	PIN	2
13	66189-004	SPACER 1/8	8
14	11256-012	SCREW HHC 1/2-13 X 1 1/2	4
15	11256-028	SCREW HHC 1/2-13 X 3 1/2	8
16	14033-032	SCREW HHC 1/2-13 X 4 GR8	8
17	11248-008	NUT 1/2-13 ESNA	16

BASIC ASSEMBLY, LX41
FOUR WHEEL DRIVE
67513-000

ITEM	PART	DESCRIPTION	QTY.
1	67519-000	CHASSIS ASSEMBLY	1
2	67516-000	SCISSOR LINKAGE	1
3	67780-000	PLATFORM WELDMENT	1
4	67879-000	MOTOR COVER	2
5	11253-008	SCR HHC 5/16 X 1	8
6	67737-000	LADDER WELDMENT	1
7	67738-000	SLIDE BLOCK	6
8	67852-000	PIN	4
9	67853-000	PIN	2
10	14996-005	WASHER 5/16 DIA	8
11	66189-000	SPACER 1/4	2
12	67853-001	PIN	2
13	66189-004	SPACER 1/8	8
14	11256-012	SCREW 1/2-13 X 1 1/2	4
15	11256-028	SCREW HHC 1/2-13 X 3 1/2	8
16	14033-032	SCREW HHC 1/2-13 X 4	8
17	11248-008	NUT 1/2-13 ESNA	16


NOTES:
1. USE WEAR PAD COMBINATION AS REQUIRED TO SECURE AND ALIGN SCISSOR STACK.
2. APPLY GREASE TO INSIDE OF BEARING BEFORE INSTALLING PIN.

CHASSIS ASSEMBLY, LX31/41

TWO WHEEL DRIVE

67518-000

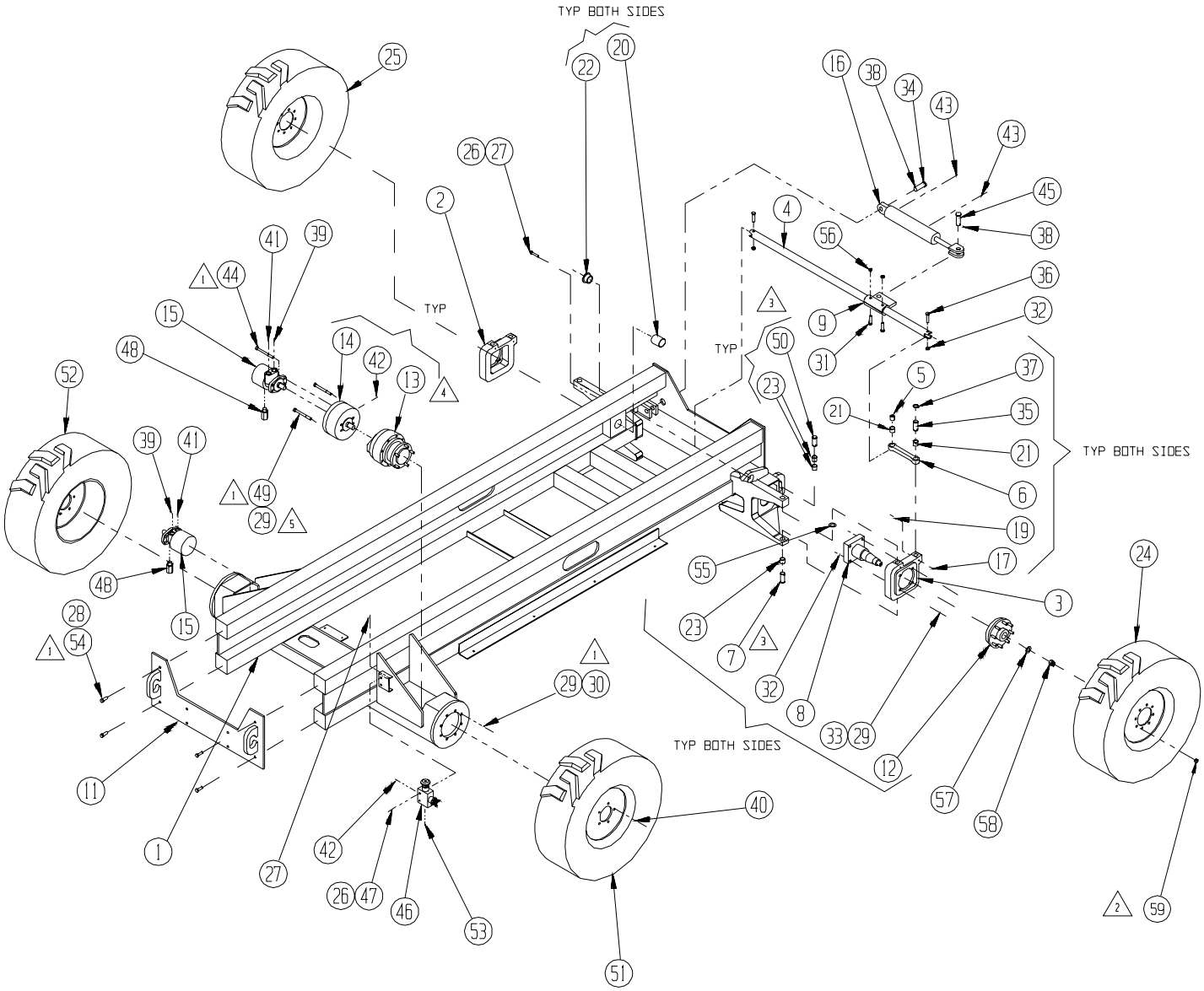
ITEM	PART	DESCRIPTION	QTY.
1	67715-000	CHASSIS WELDMENT	1
2	67743-000	TRUNNION (L.H.)	1
3	67742-000	TRUNNION (R.H.)	1
4	67739-000	STEERING LINK	1
5	67812-000	BUSHING, STEERING	2
6	67813-000	CONNECTING LINK	2
7	67746-000	TRUNNION PIN LOWER	2
8	67833-000	SPINDLE WELDMENT	2
9	67748-000	STEERING CLAMP	1
11	67816-000	REAR PLATE WELDMENT	1
12	67613-000	HUB, 8 BOLT ON 8" B.C.	2
*	67613-010	GREASE SEAL	1
*	67613-011	INNER CUP	1
*	67613-012	OUTER CUP	1
*	67613-013	INNER CONE	1
*	67613-014	OUTER CONE	1
*	67613-015	DUST CAP	1
*	67613-016	STUD	1
13	67600-000	TORQUE HUB	2
*	67600-010	BEARING	2
*	67600-011	SHAFT SEAL	2
*	67600-012	STUD	10
*	67600-013	O-RING	2
14	67603-000	BRAKE	2
*	67603-010	BRAKE SEAL KIT	1
15	67601-001	HYDRAULIC MOTOR	2
*	67601-010	HYD. MOT. SEAL KIT	1
16	67633-000	STEERING CYLINDER	1
*	67633-010	STEER CYL. SEAL KIT	1
17	11252-020	SCREW HHC 1/4-20 X 2 1/2	4
19	11248-004	NUT 1/4-20 HEX ESNA	4
20	67606-020	BEARING, SCISSOR PIVOT	2
21	62642-020	BUSHING	4
22	62649-020	BEARING, STEERING ROD	2
23	67606-010	BEARING	6
24	67665-000	TIRE & WHEEL ASSY FRONT RHD	1
*	67665-002	TIRE / WHEEL OPTIONAL POLLY FILL	-
*	67609-001	WHEEL, 16.5 x 8.25, 8 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1
25	67665-001	TIRE & WHEEL ASSY FRONT LHD	1
*	67665-003	TIRE / WHEEL OPTIONAL POLLY FILL	-
*	67609-001	WHEEL, 16.5 x 8.25, 8 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1

ITEM	PART	DESCRIPTION	QTY.
26	11254-020	SCREW HHC 3/8-16 X 2 1/2	6
27	11248-006	NUT 3/8-16 HEX ESNA	6
28	11258-012	SCREW HHC 3/4-10 X 1 1/2	4
29	11238-008	WASHER 1/2 SPLIT LOCK	33
30	11256-012	SCREW HHC 1/2-13 X 1 1/2	16
31	11257-028	SCREW HHC 5/8-11 X 3 1/2	2
32	11248-008	NUT 1/2-13 HEX ESNA	10
33	11256-024	SCREW HHC 1/2-13 X 3	8
34	11848-050	PIN CLEVIS 1 X 2 3/4	1
35	67746-001	PIN STEERING LINK	2
36	11256-020	SCREW HHC 1/2-13 X 2 1/2	2
37	13315-011	RETAINING "E" RING	2
38	11755-012	PIN 3/16 X 1 1/2 COTTER	2
39	11935-006	FITTING 10 MB - 10 MJ 45°	2
40	11469-005	LUG NUT 9/16-18 REAR	10
41	11934-011	FITTING, 10 MB - 10 MJ 90°	4
42	11934-001	FITTING, 4 MB - 4 MJ 90°	3
43	11934-003	FITTING, 6 MB - 4 MJ 90°	2
44	12030-010	SCRW SOC HD CAP 1/2-13 X 1-1/4	8
45	11848-051	PIN CLEVIS 1 DIA. X 2	1
46	63978-000	HAND PUMP ASSY	1
47	11240-006	WASHER 3/8 STD	2
48	12877-008	VALVE, BI DIRECTIONAL RELIEF	2
49	12030-032	SCRW SOC HD CAP 1/2-13 X 4	4
50	67746-002	PIN TRUNNION UPPER	2
51	67666-000	TIRE/WHEEL ASSY REAR RHD	1
*	67666-002	TIRE / WHEEL OPTIONAL POLY FILL	-
*	67605-000	WHEEL, 16.5 x 8.25, 8 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1
52	67666-001	TIRE/WHEEL ASSY REAR LHD	1
*	67666-003	TIRE / WHEEL OPTIONAL POLY FILL	-
*	67605-000	WHEEL, 16.5 x 8.25, 8 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1
53	11941-001	FITTING 4MB-4MJ STR	1
54	11238-012	WASHER SPLIT LOCK 3/4	4
55	11782-006	THRUST BEARING	2
56	11248-010	NUT 5/8-11 HEX ESNA	2
57	67613-017	WASHER	2
58	15945-016	SPINDLE NUT	2
59	11469-006	WHEEL NUT, FRONT	16

***Not Shown**

NOTES:

1. USE LOCTITE BLUE #242
2. TORQUE NUTS TO 80-90 FT/LBS, FRONT & REAR.
3. GREASE TRUNNION BEARINGS (16DX16-6) LIBERALLY BEFORE INSTALLING TRUNNION PINS.
4. FILL WITH SAE 90W GEAR OIL.
5. TORQUE TO 75 FT-LBS.



CHASSIS ASSEMBLY, LX31/41

FOUR WHEEL DRIVE

67519-000

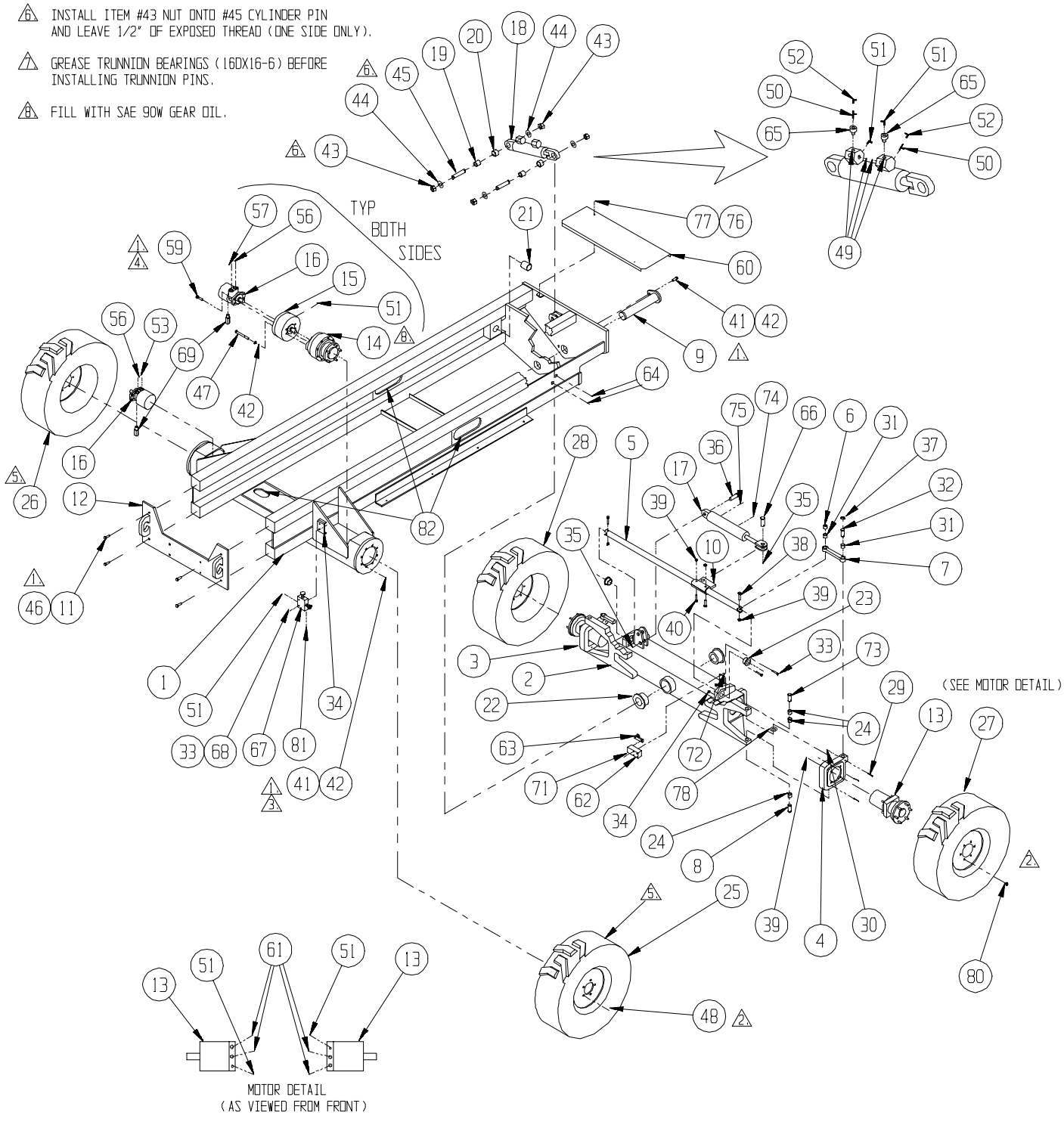
ITEM	PART	DESCRIPTION	QTY.
1	67729-000	CHASSIS WELDMENT	1
2	67700-000	AXLE WELDMENT	1
3	67743-000	TRUNNION (L.H.)	1
4	67742-000	TRUNNION (R.H.)	1
5	67739-000	STEERING LINK	1
6	67812-000	BUSHING	2
7	67813-000	CONNECTING LINK	2
8	67746-000	TRUNNION PIN, LOWER	2
9	67814-000	PIVOT SHAFT, FRONT AXLE	1
10	67748-000	STEERING CLAMP	1
11	11238-012	LOCKWASHER SPLIT 3/4	4
12	67816-000	REAR PLATE WELDMENT	1
13	67607-001	HYDRAULIC MOTOR (FRONT)	2
*	67607-010	HYD. MOT. SEAL KIT	1
14	67600-000	TORQUE HUB	2
*	67600-010	BEARING	2
*	67600-011	SHAFT SEAL	2
*	67600-012	STUD	10
*	67600-013	O-RING	2
15	67603-000	BRAKE	2
*	67603-010	BRAKE SEAL KIT	1
16	67601-001	HYDRAULIC MOTOR	2
*	67601-010	HYD. MOT. SEAL KIT	1
17	67633-000	STEERING CYLINDER	1
*	67633-010	STEER CYL. SEAL KIT	1
18	67634-000	AXLE PIVOT CYLINDER	1
*	67634-010	AXLE PIVOT CYL. SEAL KIT	1
19	67637-000	PIVOT BUSHING	2
20	27931-057	BEARING, PIVOT CYL.	2
21	67606-020	BEARING, SCISSOR PIVOT	2
22	64298-004	BEARING, AXLE PIVOT	2
23	62649-020	BEARING, STEERING ROD	2
24	67606-010	BEARING	6
51	67666-000	TIRE/WHEEL ASSY REAR RHD	1
*	67666-002	TIRE / WHEEL OPTIONAL POLY FILL	-
*	67605-000	WHEEL, 16.5 x 8.25, 8 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1
52	67666-001	TIRE/WHEEL ASSY REAR LHD	1
*	67666-003	TIRE / WHEEL OPTIONAL POLY FILL	-
*	67605-000	WHEEL, 16.5 x 8.25, 8 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1
27	67664-000	TIRE & WHEEL - RH 4WD FRONT	1
*	67664-002	TIRE / WHEEL OPTIONAL POLLY FILL	-
*	67609-000	WHEEL, 16.5 x 8.25, 6 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1
28	67664-001	TIRE & WHEEL - LH 4WD FRONT	1
*	67664-003	TIRE / WHEEL OPTIONAL POLLY FILL	-
*	67609-000	WHEEL, 16.5 x 8.25, 6 BOLT	1
*	67610-000	TIRE 10-16.5 NHS 8 PLY	1
*	12282-001	VALVE STEM	1

ITEM	PART	DESCRIPTION	QTY.
29	11252-020	SCREW, HHC 1/4-20UNC X 2-1/2	6
30	11248-004	NUT, HEX 1/4-20 ESNA	6
31	62642-020	BEARING	4
32	67746-001	STEERING LINK PIN	2
33	11254-020	SCREW, HHC 3/8-16UNC X 2-1/2	6
34	11248-006	NUT, HEX 3/8-16UNC ESNA	6
35	11755-012	PIN, COTTER 3/16D X 1-1/2	2
36	11848-050	PIN, CLEVIS 1 X 2-3/4	1
37	13315-011	RETAINING "E" RING	2
38	11256-020	SCREW, HHC 1/2-13UNC X 2-1/2	2
39	11248-008	NUT, HEX 1/2-13UNC ESNA	11
40	11256-028	SCREW, HHC 1/2-13UNC X 3-1/2	2
41	11256-012	SCREW, HHC 1/2-13UNC X 1-1/2	17
42	11238-008	LOCKWASHER, SPLIT 1/2	37
43	11249-016	LOCKNUT, HEX 1-14UNF ESNA	4
44	11297-016	WASHER, BELL 1"	4
45	64370-001	CYLINDER PIN 1 X 5-1/4	2
46	11258-012	SCREW, HHC 3/4-10UNC X 1-1/2	4
47	12030-032	SCREW, SOC HD 1/2-13UNC X 4	8
48	11469-005	LUG NUT, 9/16-18 90°	10
49	12004-004	FITTING, PLUG SAE#4	4
50	15961-004	FITTING, TEE 4MB - 4MJ - 4MJ	2
51	11934-001	FITTING, 90° 4MB - 4MJ	7
52	11937-001	FITTING, 90° 4FJX - 4MJ	2
53	15961-010	FITTING, TEE 10MB - 10MJ-10MJ	1
54	10150-005	FITTING, BULKHD. 8MJ - 8MJ	4
55	11941-014	FITTING, 12MB - 8MJ	2
56	11935-006	FITTING, 45° 10MB - 10MJ	2
57	11934-011	FITTING, 90° 10MB - 10MJ	1
58	11934-003	FITTING, 90° 6MB - 4MJ	2
59	12030-010	SCREW SOC HD 1/2-13 X 1-1/4	8
60	67878-000	AXLE COVER 4WD	1
61	67674-008	FITTING 45° 12MB - 8MJ	4
62	64296-003	LIMIT SWITCH	1
63	64294-004	CLAMP LEVER	1
64	12002-010	FITTING 10MJ - 10MJ 90°	4
65	64297-001	CHECK VALVE	2
66	11848-051	CLEVIS PIN 1" DIA. X 2"	1
67	63978-000	HAND PUMP (BRAKE)	1
68	11240-006	WASHER 3/8 STD	2
69	12877-008	VALVE BIDIRECTIONAL RELIEF	2
70	67673-001	FITTING 4MJ-4MJ CROSS	1
71	11709-018	SCREW MACH RD HD 10-24 X 2-1/4	4
72	11248-003	NUT HEX ESNA 10-24	4
73	67746-002	TRUNNION PIN UPPER	2
74	11935-003	FITTING 6MB - 6MJ 45°	1
75	11941-005	FITTING 6MB - 6MJ STR	1
76	11252-004	SCREW HHC 1/4-20 X 1/2	2
77	11240-004	WASHER 1/4 FLAT STD	2
78	64279-000	THRUST BEARING	2
80	11469-003	WHEEL NUT, FRONT	12
81	11941-001	FITTING 4MB-4MJ STR	1
82	67805-009	GROMMET MATERIAL	7'

***Not Shown**

NOTES:

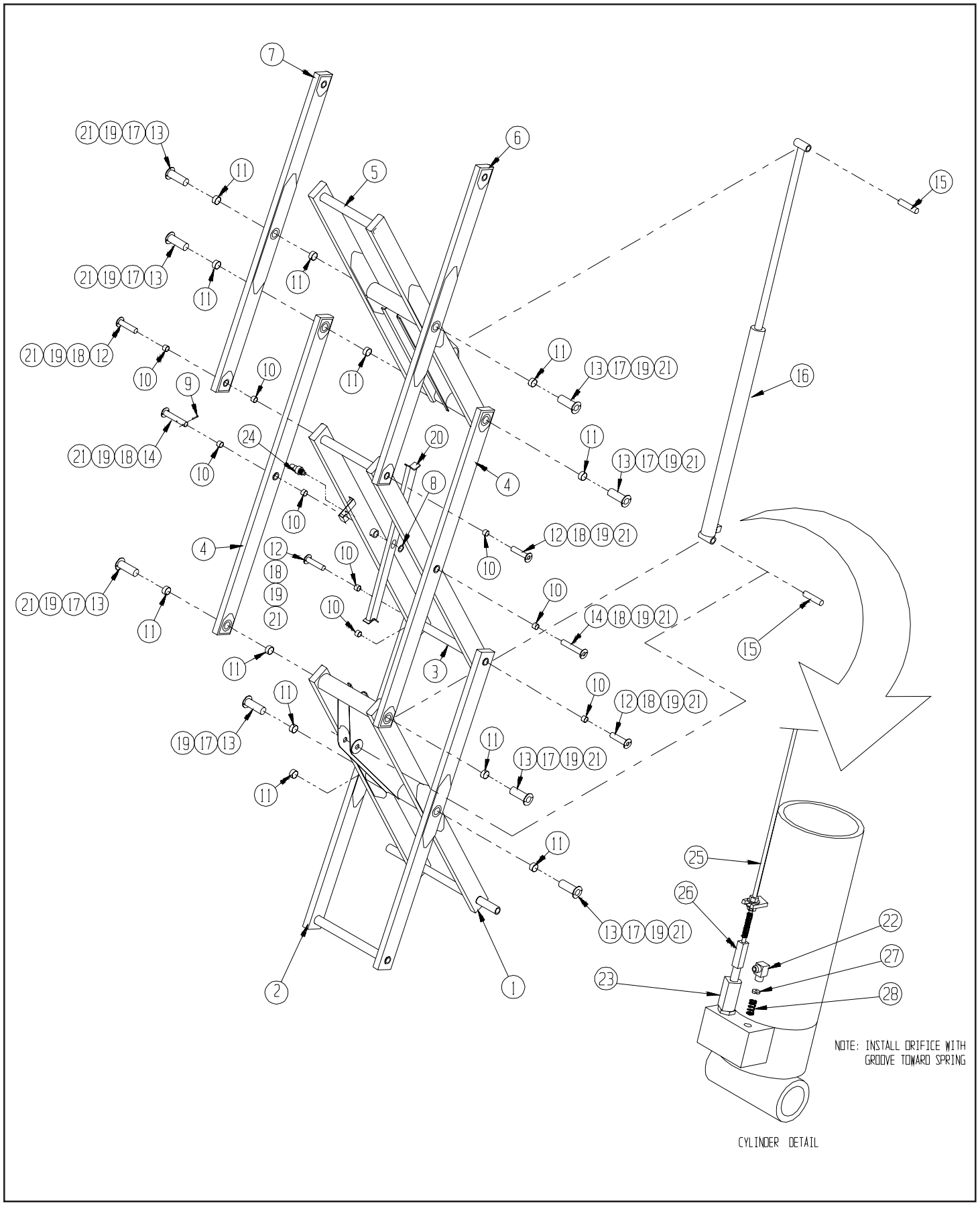
1. APPLY LOCTITE 242 TO THREADS.
2. TORQUE WHEEL NUTS TO 75-85 FT/LBS.(FRONT); 80-90 FT/LBS (REAR).
3. TORQUE MOUNTING BOLTS TO 75 FT/LBS.
4. TORQUE MOTOR / BRAKE / TORQUE HUB MOUNTING SOCKET HEAD TO 75 FT/LBS.
5. NOTE TIRE LUG TO WHEEL ORIENTATION.
6. INSTALL ITEM #43 NUT ONTO #45 CYLINDER PIN AND LEAVE 1/2" OF EXPOSED THREAD (ONE SIDE ONLY).
7. GREASE TRUNNION BEARINGS (16DX16-6) BEFORE INSTALLING TRUNNION PINS.
8. FILL WITH SAE 90W GEAR OIL.



SCISSOR LINKAGE ASSEMBLY
LX31
67515-000

ITEM	PART	DESCRIPTION	QTY.
1	67550-000	ARM WELDMENT	1
2	67551-000	ARM WELDMENT	1
3	67552-000	ARM WELDMENT	1
4	67593-000	ARM WELDMENT	2
5	67828-000	ARM WELDMENT	1
6	67830-000	ARM WELDMENT	1
7	67832-000	ARM WELDMENT	1
8	11786-017	MACHINERY BUSHING, 2" ID X 14 GA.	1
9	11734-024	ROLL PIN, 3/8 DIA. X 3" LG.	1
10	67606-020	BEARING, 2" I.D. X 1 1/2" LG.	12
11	67606-030	BEARING, 3" I.D. X 1 1/2" LG.	16
12	67583-000	PIN WELDMENT	4
13	67580-000	PIN WELDMENT	8
14	67585-000	PIN WELDMENT	2
15	67586-000	PIN, CYLINDER	2
16	67635-000	LIFT CYLINDER	1
*	67635-010	SEAL KIT	1
17	14033-048	H.H.C.S. 1/2-13 UNC X 6 GR. 8	8
18	14033-032	H.H.C.S. 1/2-13 UNC X 4 GR. 8	6
19	11248-008	HEX LOCK NUT 1/2-13 UNC	14
20	67591-000	SUPPORT WELDMENT	1
21	13336-001	GREASE FITTING	14
22	11934-004	ADAPTER 90° #6	1
23	63925-003	DOWN VALVE	1
24	03570-001	RETAINING PIN ASSY	1
25	67659-000	CABLE ASSY	1
26	67877.000	COUPLER	1
27	15919-006	ORIFICE	1
28	05133-000	SPRING	1

***Not Shown**


NOTE: INSTALL ORIFICE WITH GROOVE TOWARD SPRING
CYLINDER DETAIL

SCISSOR LINKAGE ASSEMBLY
LX41
67516-000

ITEM	PART	DESCRIPTION	QTY.
1	67550-000	ARM WELDMENT	1
2	67551-000	ARM WELDMENT	1
3	67552-000	ARM WELDMENT	1
4	67593-000	ARM WELDMENT	2
5	67553-000	ARM WELDMENT	1
6	67554-000	ARM WELDMENT	2
7	67555-000	ARM WELDMENT	1
8	67556-000	ARM WELDMENT	1
9	67557-000	ARM WELDMENT	1
10	67606-020	BEARING, 2" I.D. X 1 1/2" LG.	28
11	67606-030	BEARING, 3" I.D. X 1 1/2" LG.	16
12	67583-000	PIN WELDMENT	10
13	67580-000	PIN WELDMENT	8
14	67585-000	PIN WELDMENT	2
15	67635-000	LIFT CYLINDER	1
*	67635-010	SEAL KIT	1
16	67635-000	LIFT CYLINDER	1
17	14033-048	H.H.C.S. 1/2-13 UNC X 7 1/2 GR. 8	8
18	14033-032	H.H.C.S. 1/2-13 UNC X 4 1/2 GR. 8	12
19	11248-008	HEX LOCK NUT 1/2-13 UNC	20
20	67591-000	SUPPORT WELDMENT	1
21	13336-001	GREASE FITTING	20
22	11941-005	STRAIGHT ADAPTER #6	1
23	63925-005	DOWN VALVE	1
24	03570-001	RETAINING PIN ASSY	1
25	65754-004	CABLE ASSY	1
26	67877-000	COUPLER	1
27	15919-006	ORIFICE	1
28	05133-000	SPRING	1
29	11786-017	MACHINERY BUSHING, 2" ID X 14 GA.	1
30	11734-024	ROLL PIN, 3/8 DIA. X 3" LG.	1

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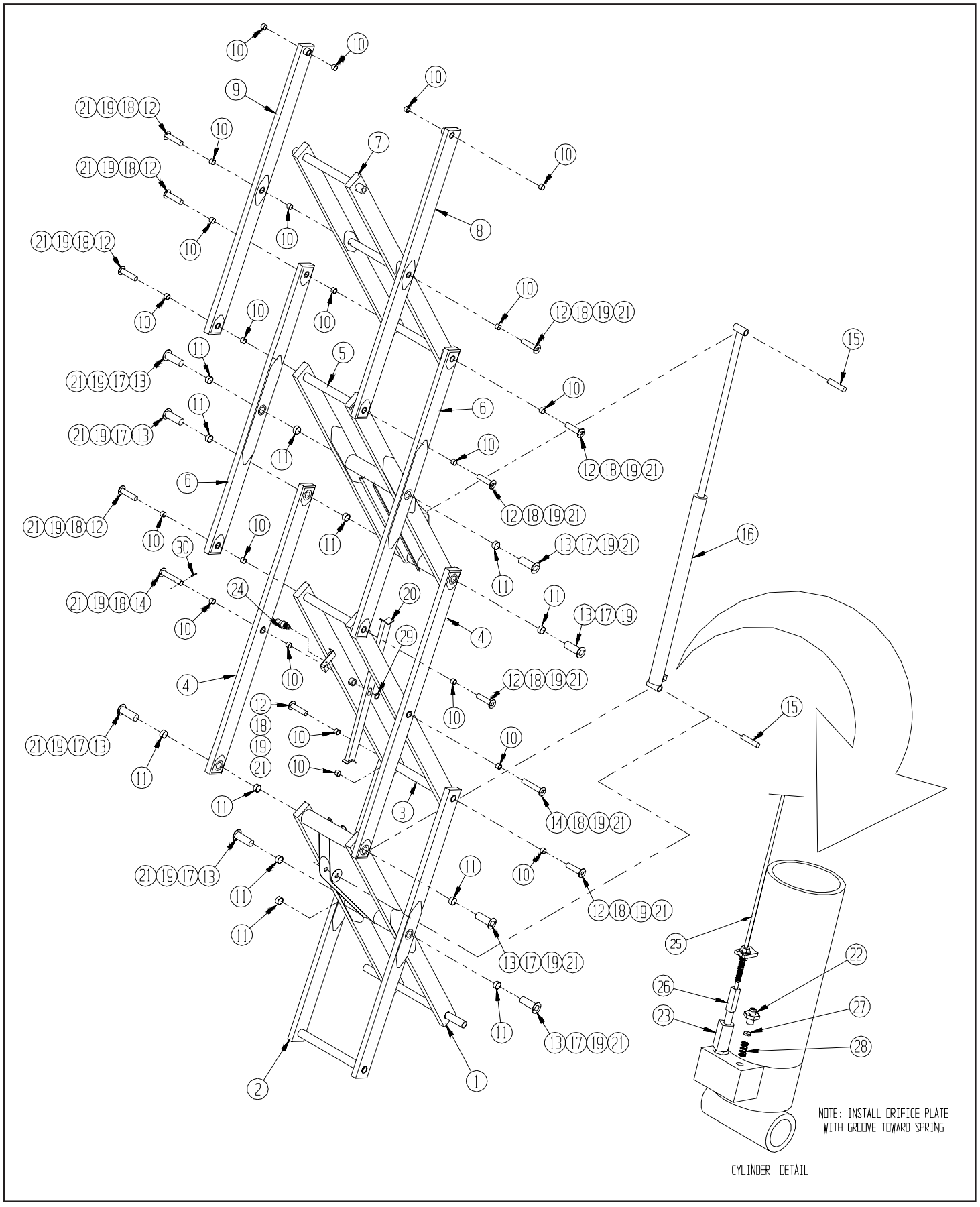

NOTE: INSTALL ORIFICE PLATE WITH GROOVE TOWARD SPRING
CYLINDER DETAIL

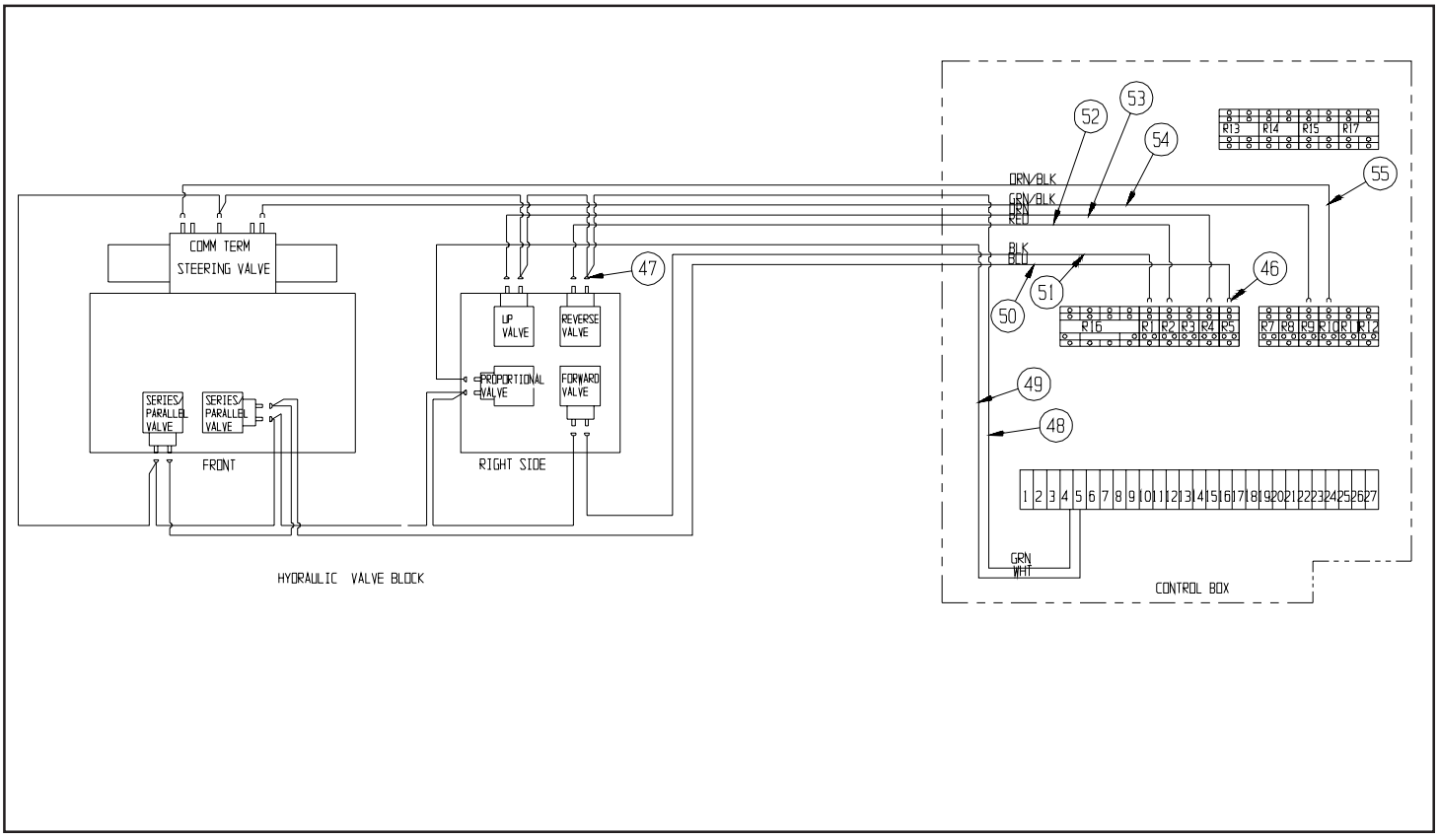
CONTROL MODULE ASSEMBLY, LX31/41

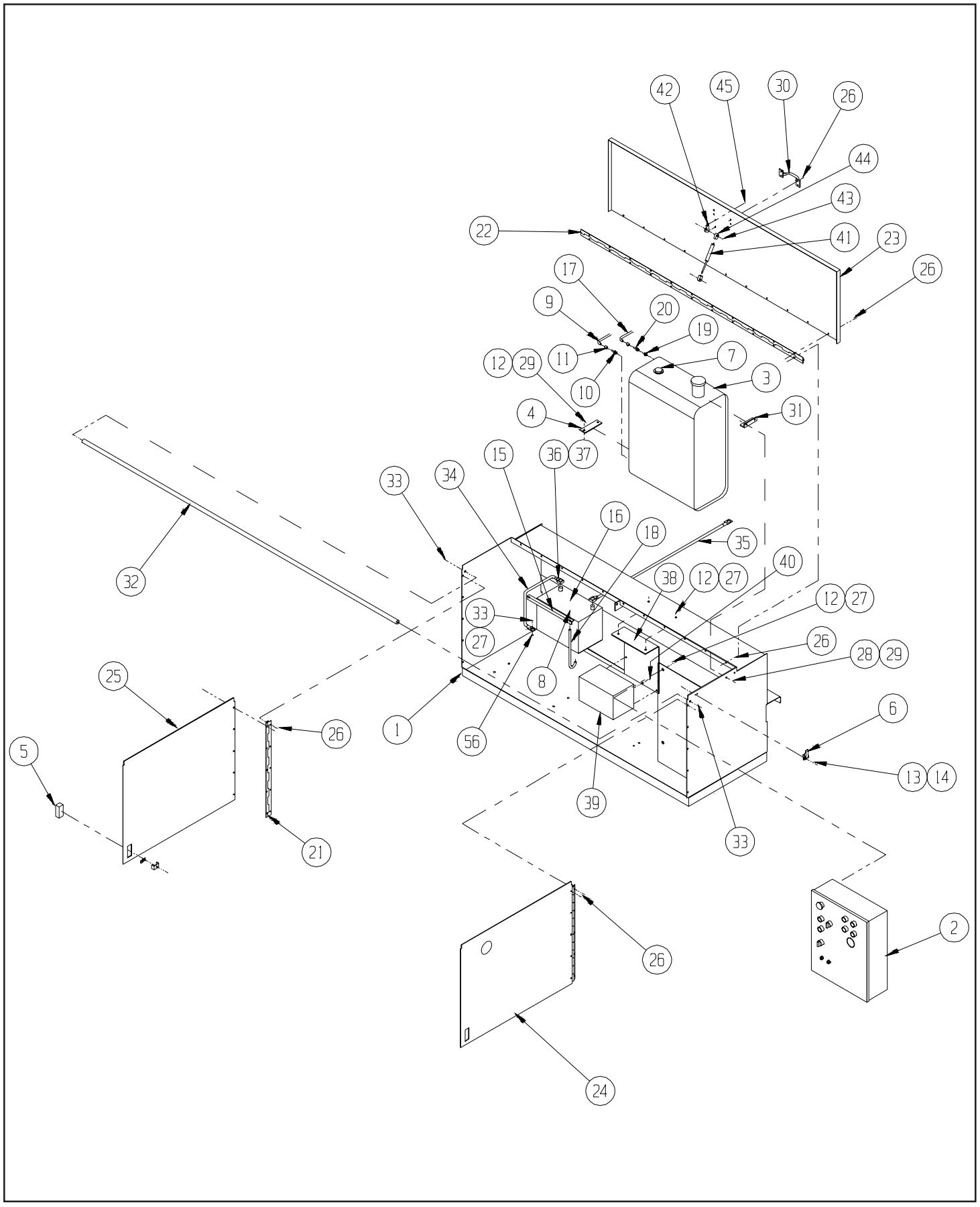
Two Wheel Drive Gas

67521-000

ITEM	PART	DESCRIPTION	QTY.
1	67810-000	CONTROL MODULE WELDMENT	1
2	67527-000	CONTROL BOX ASSY, GAS / PROPANE	1
3	67631-000	FUEL TANK, GASOLINE	1
4	64039-000	MOUNTING TAB, FUEL TANK	3
5	67629-000	LATCH, FLUSH LIFT & TURN	2
6	05299-000	LATCH, TOGGLE	2
7	63982-002	FUEL LEVEL GAGE	1
8	11240-004	WASHER 1/4 FLAT	2
9	12739-099	HOSE, 1/4 I.D.	11'
10	10178-003	FITTING, BARBED 1/4	1
11	63125-008	HOSE CLAMP	2
12	11254-008	SCRW HHC GR5 3/8-16UNC X 1	13
13	11708-004	SCRW MACH RD HD 8-32UNC X 1/2	4
14	11248-002	LOCK NUT, ESNA 8-32UNC	4
15	64040-000	ANGLE, BATTERY HOLD DOWN	1
16	62299-002	BATTERY, 12 VDC GROUP-27C	1
17	12736-099	HOSE 3/16 ID	11'
18	63082-000	ROD, BATTERY HOLD DOWN	2
19	03556-001	FITTING BUSHING	1
20	10178-001	FITTING BARBED 3/16	1
21	67808-000	HINGE, 1 1/2 X 23 7/8	2
22	67809-000	HINGE, 1 1/2 X 65	1
23	67799-002	MODULE COVER / CONTROL	1
24	67800-000	MODULE DOOR, R.H.	1
25	67801-000	MODULE DOOR, L.H.	1
26	26554-002	POP RIVET, 1/4 DIA (.251-.375 GRIP)	46
27	11248-006	NUT, 3/8-16 ESNA	14
28	11252-006	SCREW, HHC 1/4-20 X 3/4	2

ITEM	PART	DESCRIPTION	QTY.
29	11248-004	NUT, 1/4-20 ESNA	4
30	25427-002	HANDLE	1
31	67854-000	ANGLE, RESERVOIR MOUNT	1
32	67856-000	WELDMENT, STIFFENER	1
33	11254-006	SCREW HHC 3/8-16 X 3/4	3
34	62125-016	CABLE, BATTERY X 16	1
35	62125-002	CABLE, BATTERY X 69	1
36	14435-001	TERMINAL, BATTERY	2
37	10154-000	COVER, BATTERY TERMINAL	2
38	67892-000	BRACKET, VALVE BLOCK	1
39	67524-000	VALVE BLOCK ASSY. (2 W.D.)	1
40	11254-004	SCRW HHC GR5 3/8-16UNC X 1/2	4
41	63650-012	GAS SPRING	1
42	67902-000	BRACKET, GAS SPRING	1
43	15936-004	SCR, SHOULDER 3/8 DIA. X 1/2	2
44	67648-008	END FITTING, GAS SPRING	2
45	11253-008	SCR HHC 5/16-18 X 1	2
46	29610-002	TERMINAL #6 FORK	12
47	29616-002	TERMINAL 16 GA FEMALE PUSH ON	18
48	29457-099	WIRE 16 GA - GREEN	4'
49	29451-099	WIRE 16 GA - WHITE	3'
50	29450-099	WIRE 16 GA - BLUE	3'
51	29452-099	WIRE 16 GA - BLACK	3'
52	29454-099	WIRE 16 GA - RED	3'
53	29453-099	WIRE 16 GA - ORANGE	3'
54	05491-099	WIRE 16 GA - GREEN/BLACK	3'
55	29477-099	WIRE 16 GA - ORANGE/BLACK	3'
56	11237-006	WASHER 3/8 STAR	1

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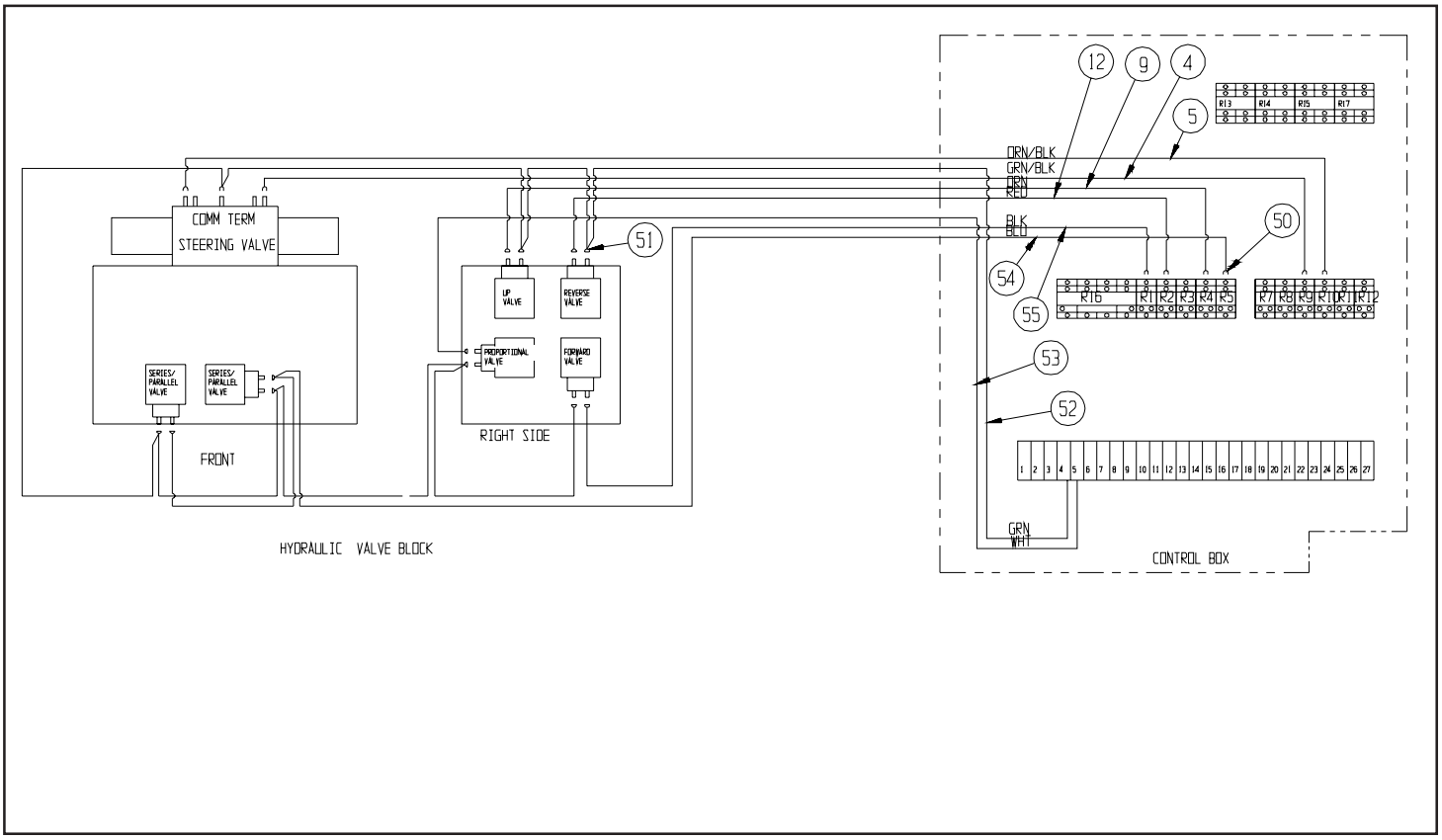
CONTROL MODULE ASSEMBLY, LX31/41

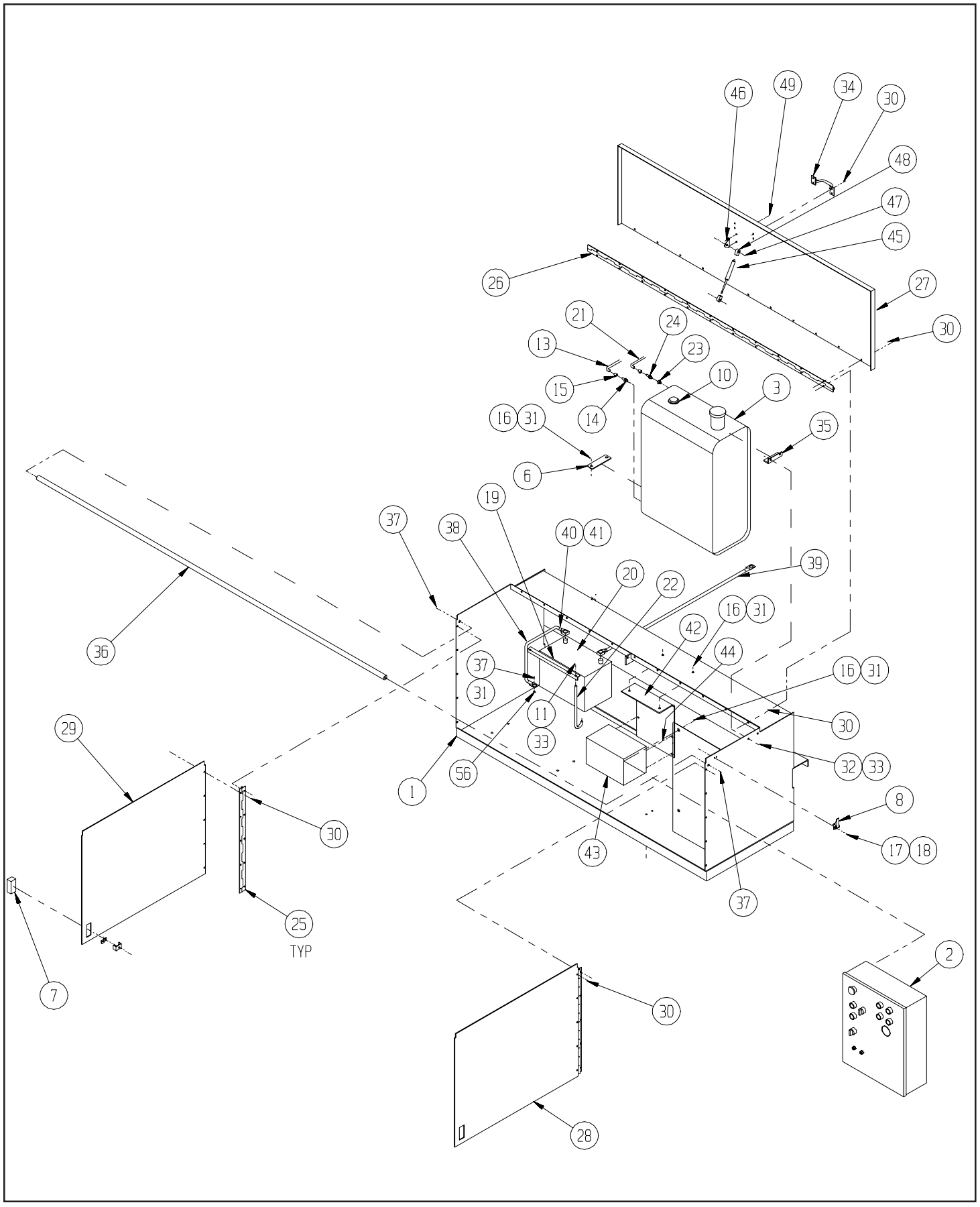
Two Wheel Drive Diesel

67521-001

ITEM	PART	DESCRIPTION	QTY.
1	67810-000	CONTROL MODULE WELDMENT	1
2	67527-001	CONTROL BOX ASSY, DIESEL	1
3	67631-000	FUEL TANK, GASOLINE	1
4	05491-099	WIRE 16 GA - GREEN/BLACK	3'
5	29477-099	WIRE 16 GA - ORANGE/BLACK	3'
6	64039-000	MOUNTING TAB, FUEL TANK	3
7	67629-000	LATCH, FLUSH LIFT & TURN	2
8	05299-000	LATCH, TOGGLE	2
9	29453-099	WIRE 16 GA - ORANGE	3'
10	63982-002	FUEL LEVEL GAGE	1
11	11240-004	WASHER 1/4 FLAT	2
12	29454-099	WIRE 16 GA - RED	3'
13	12739-099	HOSE, 1/4 I.D.	11'
14	10178-003	FITTING, BARBED 1/4	1
15	63125-008	HOSE CLAMP	2
16	11254-008	SCRW HHC GR5 3/8-16UNC X 1	10
17	11708-004	SCRW MACH RD HD 8-32UNC X 1/2	6
18	11248-002	LOCK NUT, ESMA 8-32UNC	6
19	64040-000	ANGLE, BATTERY HOLD DOWN	1
20	62299-002	BATTERY, 12 VDC GROUP-27C	1
21	12736-099	HOSE 3/16 ID	11'
22	63082-000	ROD, BATTERY HOLD DOWN	2
23	03556-001	FITTING BUSHING	1
24	10178-001	FITTING BARBED 3/16	1
25	67808-000	HINGE, 1 1/2 X 23 7/8	2
26	67809-000	HINGE, 1 1/2 X 65	1
27	67799-002	MODULE COVER / CONTROL	1
28	67800-000	MODULE DOOR, R.H.	1

ITEM	PART	DESCRIPTION	QTY.
29	67801-000	MODULE DOOR, L.H.	1
30	26554-002	POP RIVET, 1/4 DIA (.251-.375 GRIP)	46
31	11248-006	NUT, 3/8-16 ESNA	11
32	11252-006	SCREW, HHC 1/4-20 X 3/4	2
33	11248-004	NUT, 1/4-20 ESNA	2
34	25427-002	HANDLE	1
35	67854-000	ANGLE, RESERVOIR MOUNT	1
36	67856-000	WELDMENT, STIFFENER	1
37	11254-006	SCREW HHC 3/8-16 X 3/4	3
38	62125-016	CABLE, BATTERY X 16	1
39	62125-002	CABLE, BATTERY X 69	1
40	14435-001	TERMINAL, BATTERY	2
41	10154-000	COVER, BATTERY TERMINAL	2
42	67892-000	BRACKET, VALVE BLOCK	1
43	67524-000	VALVE BLOCK ASSY. (2 W.D.)	1
44	11254-004	SCR HHC GR5 3/8-16UNC X 1/2	4
45	63650-012	GAS SPRING	1
46	67902-000	BRACKET, GAS SPRING	1
47	15936-004	SCR, SHOULDER 3/8 DIA.X 1/2	2
48	67648-008	END FITTING, GAS SPRING	2
49	11253-008	SCR, HHC 5/16-18 X 1	2
50	29610-002	TERMINAL #6 FORK	12
51	29616-002	TERMINAL 16 GA FEMALE PUSH ON	18
52	29457-099	WIRE 16 GA - GREEN	4'
53	29451-099	WIRE 16 GA - WHITE	3'
54	29450-099	WIRE 16 GA - BLUE	3'
55	29452-099	WIRE 16 GA - BLACK	3'
56	11237006	WASHER 3/8 STAR	1

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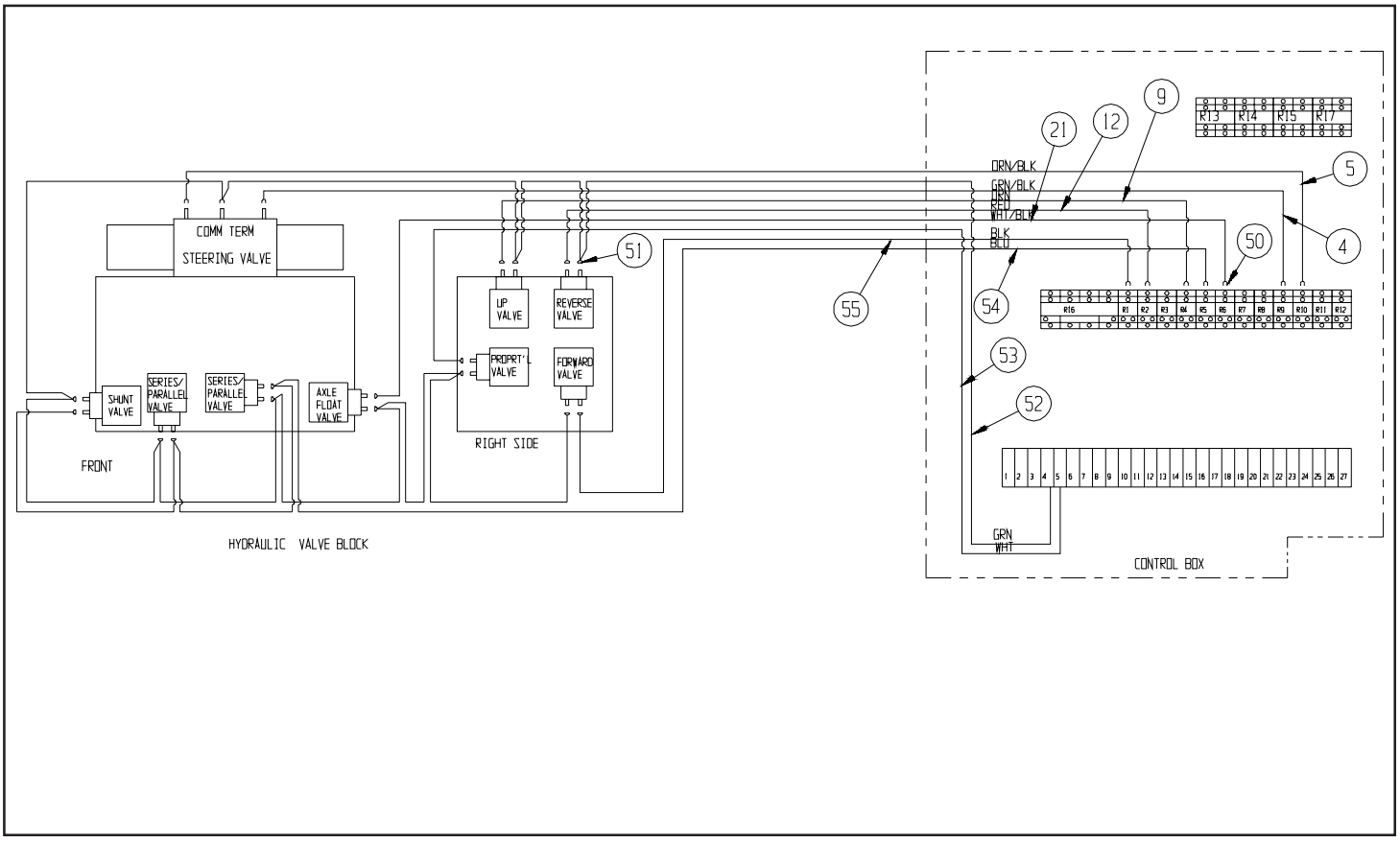
CONTROL MODULE ASSEMBLY, LX31/41

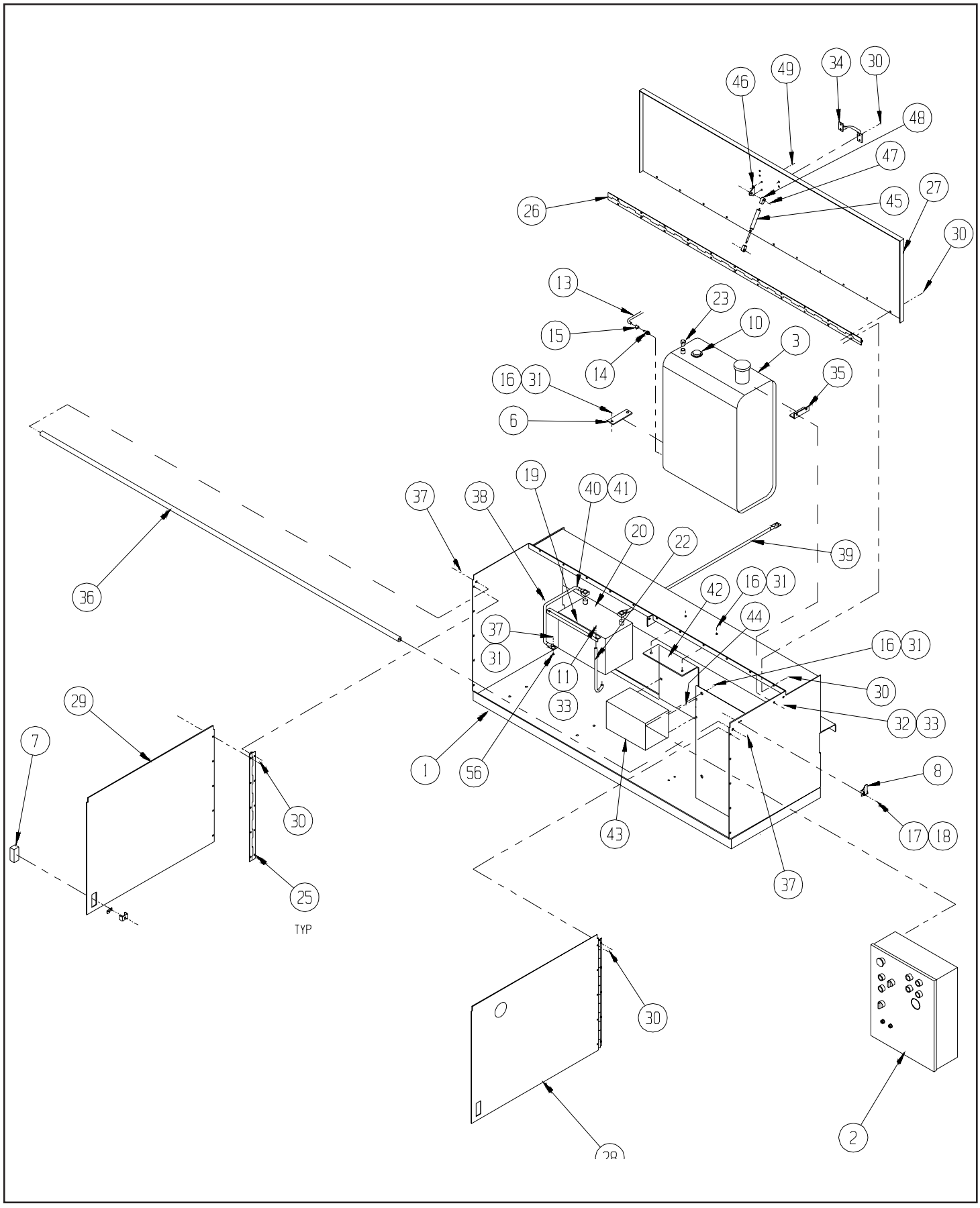
FOUR WHEEL DRIVE GAS

67521-002

ITEM	PART	DESCRIPTION	QTY.
1	67810-000	CONTROL MODULE WELDMENT	1
2	67527-000	CONTROL BOX ASSY, D/F	1
3	67631-000	FUEL TANK, GASOLINE	1
4	05491-099	WIRE 16 GA - GREEN/BLACK	3'
5	29477-099	WIRE 16 GA - ORANGE/BLACK	3'
6	64039-000	MOUNTING TAB, FUEL TANK	3
7	67629-000	LATCH, FLUSH LIFT & TURN	2
8	05299-000	LATCH, TOGGLE	2
9	29453-099	WIRE 16 GA - ORANGE	3'
10	63982-002	FUEL LEVEL GAGE	1
11	11240-004	WASHER 1/4 FLAT	2
12	29454-099	WIRE 16 GA - RED	3'
13	12739-099	HOSE, 1/4 I.D.	11'
14	10178-003	FITTING, BARBED 1/4	1
15	63125-008	HOSE CLAMP	1
16	11254-008	SCRW HHC GR5 3/8-16UNC X 1	13
17	11708-004	SCRW MACH RD HD 8-32UNC X 1/2	4
18	11248-002	LOCK NUT, ESMA 8-32UNC	4
19	64040-000	ANGLE, BATTERY HOLD DOWN	1
20	62299-002	BATTERY, 12 VDC GROUP-27C	1
21	29479-099	WIRE 16 GA - WHITE/BLACK	3'
22	63082-000	ROD, BATTERY HOLD DOWN	2
23	11919-002	FITTING PLUG 1/4 PIPE	1
25	67808-000	HINGE, 1 1/2 X 23 7/8	2
26	67809-000	HINGE, 1 1/2 X 65	1
27	67799-002	MODULE COVER / CONTROL	1
28	67800-000	MODULE DOOR, R.H.	1

ITEM	PART	DESCRIPTION	QTY.
29	67801-000	MODULE DOOR, L.H.	1
30	26554-002	POP RIVET, 1/4 DIA (.251-.375 GRIP)	46
31	11248-006	NUT, 3/8-16 ESNA	14
32	11252-006	SCREW, HHC 1/4-20 X 3/4	2
33	11248-004	NUT, 1/4-20 ESNA	4
34	25427-002	HANDLE	1
35	67854-000	ANGLE, RESERVOIR MOUNT	1
36	67856-000	WELDMENT, STIFFENER	1
37	11254-006	SCREW HHC 3/8-16 X 3/4	5
38	62125-016	CABLE, BATTERY X 16	1
39	62125-002	CABLE, BATTERY X 69	1
40	14435-001	TERMINAL, BATTERY	2
41	10154-000	COVER, BATTERY TERMINAL	2
42	67892-000	BRACKET, VALVE BLOCK	1
43	67524-001	VALVE BLOCK ASSY. (4 W.D.)	1
44	11254-004	SCRW HHC GR5 3/8-16UNC X 1/2	4
45	63650-012	GAS SPRING	1
46	67902-000	BRACKET, GAS SPRING	1
47	15936-004	SCR, SHOULDER 3/8 DIA. X 1/2	2
48	67648-008	END FITTING, GAS SPRING	2
49	11253-008	SCR, HHC 5/16-18 X 1	2
50	29610-002	TERMINAL #6 FORK	12
51	29616-002	TERMINAL 16 GA FEMALE PUSH ON	18
52	29457-099	WIRE 16 GA - GREEN	4'
53	29451-099	WIRE 16 GA - WHITE	3'
54	29450-099	WIRE 16 GA - BLUE	3'
55	29452-099	WIRE 16 GA - BLACK	3'
56	11237-006	WASHER 3/8 STAR	1

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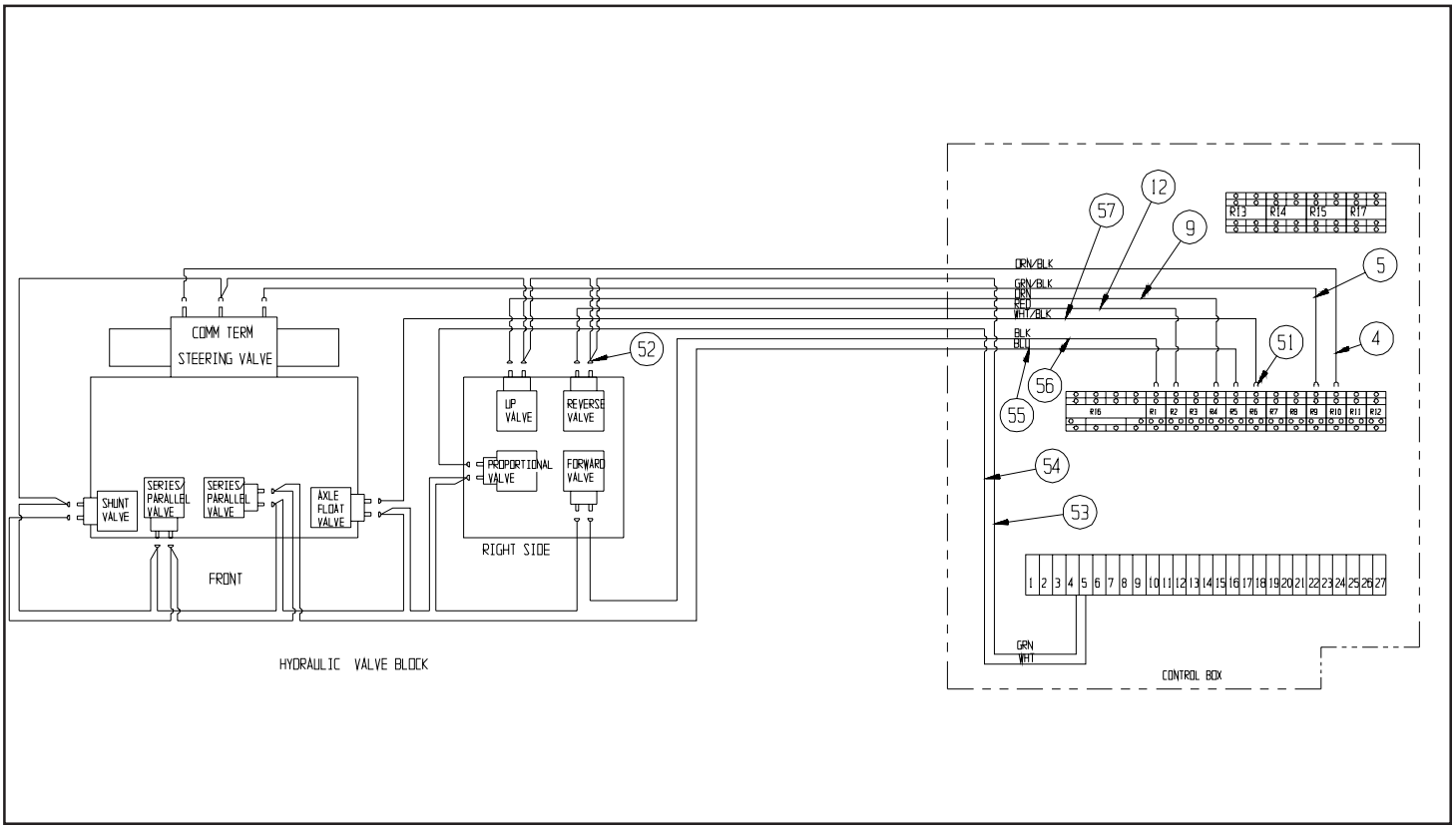
CONTROL MODULE ASSEMBLY, LX31/41

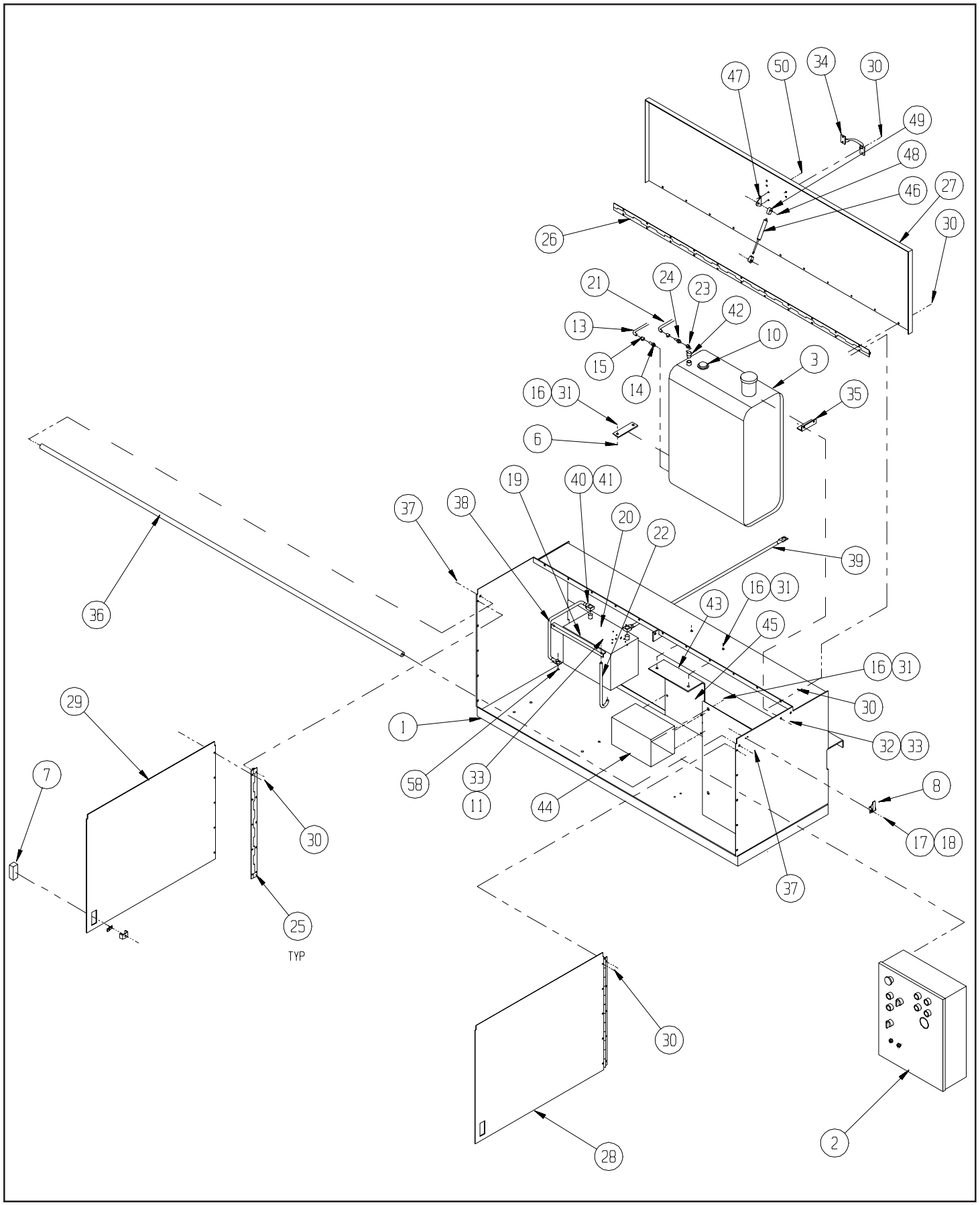
FOUR WHEEL DRIVE DIESEL

67521-003

ITEM	PART	DESCRIPTION	QTY.
1	67810-000	CONTROL MODULE WELDMENT	1
2	67527-001	CONTROL BOX ASSY, DIESEL	1
3	67631-000	FUEL TANK, GASOLINE	1
4	29477-099	WIRE 16 GA - ORANGE/BLACK	3'
5	05491-099	WIRE 16 GA - GREEN/BLACK	3'
6	64039-000	MOUNTING TAB, FUEL TANK	3
7	67629-000	LATCH, FLUSH LIFT & TURN	2
8	05299-000	LATCH, TOGGLE	2
9	29453-099	WIRE 16 GA - ORANGE	3'
10	63982-002	FUEL LEVEL GAGE	1
11	11240-004	WASHER 1/4 FLAT	2
12	29454-099	WIRE 16 GA - RED	3'
13	12739-099	HOSE, 1/4 I.D.	11'
14	10178-003	FITTING, BARBED 1/4	1
15	63125-008	HOSE CLAMP	2
16	11254-008	SCRW HHC GR5 3/8-16UNC X 1	10
17	11708-004	SCRW MACH RD HD 8-32UNC X 1/2	4
18	11248-002	LOCK NUT, ESMA 8-32UNC	4
19	64040-000	ANGLE, BATTERY HOLD DOWN	1
20	62299-002	BATTERY, 12 VDC GROUP-27C	1
21	12736-099	HOSE 3/16 ID	11'
22	63082-000	ROD, BATTERY HOLD DOWN	2
23	03556-001	FITTING BUSHING	1
24	10178-001	FITTING BARBED 3/16	1
25	67808-000	HINGE, 1 1/2 X 23 7/8	2
26	67809-000	HINGE, 1 1/2 X 65	1
27	67799-002	MODULE COVER / CONTROL	1
28	67800-000	MODULE DOOR, R.H.	1
29	67801-000	MODULE DOOR, L.H.	1

ITEM	PART	DESCRIPTION	QTY.
30	26554-002	POP RIVET, 1/4 DIA (.251-.375 GRIP)	46
31	11248-006	NUT, 3/8-16 ESNA	11
32	11252-006	SCREW, HHC 1/4-20 X 3/4	2
33	11248-004	NUT, 1/4-20 ESNA	4
34	25427-002	HANDLE	1
35	67854-000	ANGLE, RESERVOIR MOUNT	1
36	67856-000	WELDMENT, STIFFENER	1
37	11254-006	SCREW HHC 3/8-16 X 3/4	3
38	62125-016	CABLE, BATTERY X 16	1
39	62125-002	CABLE, BATTERY X 69	1
40	14435-001	TERMINAL, BATTERY	2
41	10154-000	COVER, BATTERY TERMINAL	2
42	03495-000	FITTING 1/4 STREET EL	1
43	67892-000	BRACKET, VALVE BLOCK	1
44	67524-001	VALVE BLOCK ASSY. (4 W.D.)	1
45	11254-004	SCR HHC GR5 3/8-16UNC X 1/2	4
46	63650-012	GAS SPRING	1
47	67902-000	BRACKET, GAS SPRING	1
48	15936-004	SCREW, SHOULDER 3/8 DIA. X 1/2	2
49	67648-008	END FITTING, GAS SPRING	2
50	11253-008	SCR, HHC 5/16-18 X 1	2ITEM
51	29610-002	TERMINAL #6 FORK	12
52	29616-002	TERMINAL 16 GA FEMALE PUSH ON	18
53	29457-099	WIRE 16 GA - GREEN	4'
54	29451-099	WIRE 16 GA - WHITE	3'
55	29450-099	WIRE 16 GA - BLUE	3'
56	29452-099	WIRE 16 GA - BLACK	3'
57	29479-099	WIRE 16 GA - WHITE/BLACK	3'
56	11237-006	WASHER 3/8 STAR	1

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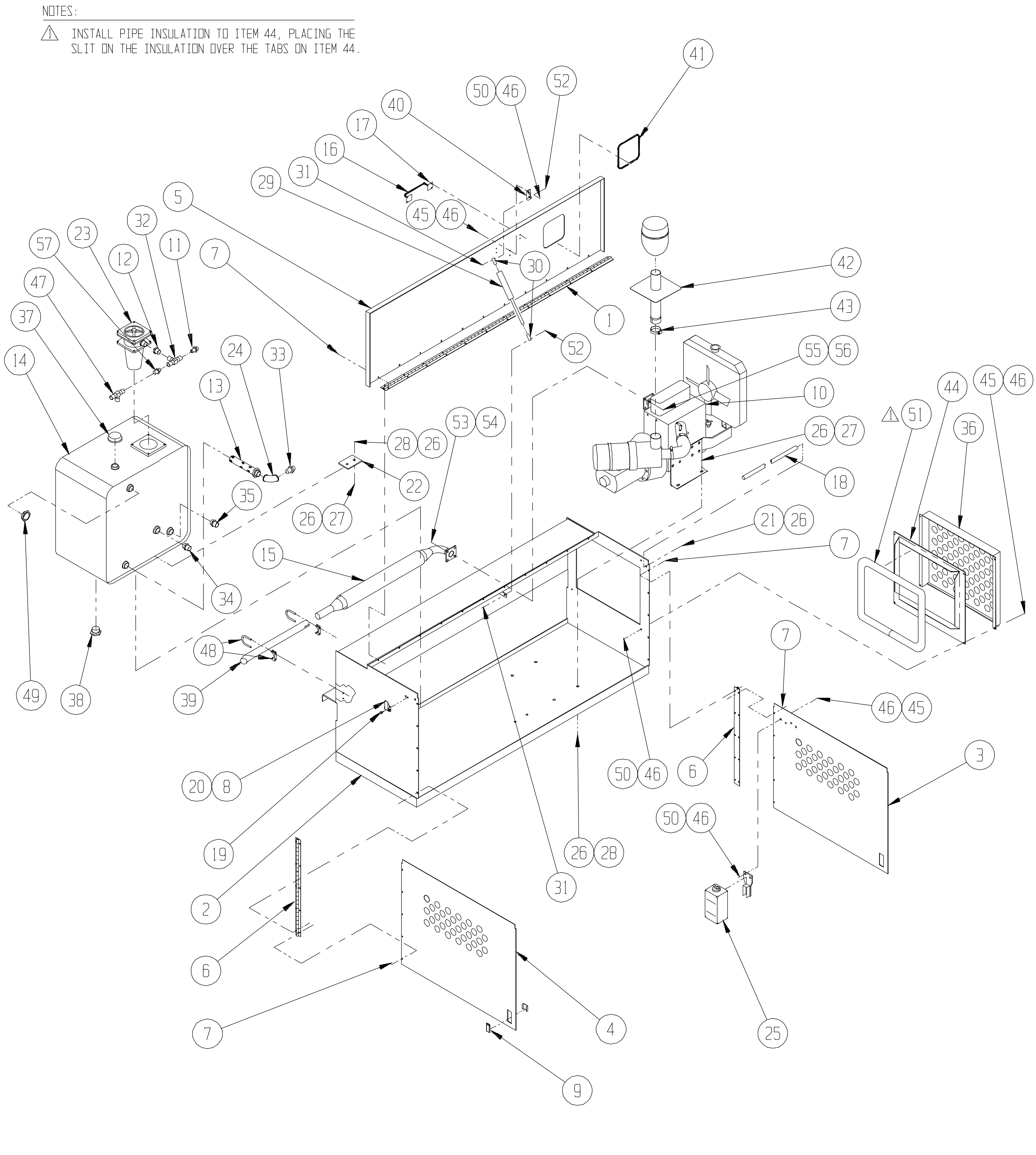
POWER MODULE ASSEMBLY, LX31/41
GAS
67522-001

ITEM	PART	DESCRIPTION	QTY.
1	67809-000	HINGE, 2 X 65	1
2	67811-000	POWER MODULE WELDMENT	1
3	67800-001	MODULE DOOR, R.H.	1
4	67801-001	MODULE DOOR, L.H.	1
5	67799-000	MODULE COVER	1
6	67808-000	HINGE, 2 X 22	2
7	26554-002	POP RIVET, 1/4 DIA. (.251 - .375 GRIP)	42
8	05299-000	LATCH, TOGGLE	2
9	67629-000	LATCH, FLUSH LIFT & TURN	2
10	67523-001	ENGINE ASSY, DUAL FUEL KUBOTA	1
11	11939-021	FITTING 12MP-12MJ	1
12	11923-012	FITTING 16MP-12FP	1
13	63935-000	SUCTION SCREEN	1
14	67841-000	TANK, HYDRAULIC	1
15	67615-018	MUFFLER ASSY	1
16	25427-002	HANDLE	1
17	26533-002	RIVET POP, 3/16D .126 -.250 GRIP	4
18	67856-000	STIFFENER BAR	1
19	11708-004	SCREW RD HD 8-32 X 1/2	4
20	11248-002	NUT HEX 8-32 ESNA	4
21	11254-006	SCREW HHC 3/8-16 X 3/4	2
22	64039-000	TANK MOUNTING TAB	2
23	67624-000	HYDRAULIC FILTER	1
*	67624-010	ELEMENT, FILTER	1
24	11916-011	ELBOW 90° 20FP-20FP (1-1/4 NPT)	1
25	67615-017	OVERFLOW KIT	1
26	11240-006	WASHER 3/8 FLAT STD	22
27	11254-008	SCREW HHC 3/8-16 X 1	10
28	11248-006	NUT HEX 3/8-16 ESNA	12

ITEM	PART	DESCRIPTION	QTY.
29	63650-012	SPRING, PRESSURIZED GAS	1
30	67648-008	END FITTING, GAS SPRING	2
31	15936-004	SCREW SHOULDER 3/8« X 1/2	2
32	14902-005	FITTING TEE 12MP-12FP	1
33	11939-030	FITTING 20MP-20MJ	1
34	11939-013	FITTING 8MP-4MJ	1
35	11939-015	FITTING 8MP-8MJ	1
36	67898-000	RADIATOR COVER	1
37	63930-001	BREATHER/FILLER CAP	1
38	21305-007	PLUG, MAGNETIC	1
39	67696-000	EXHAUST TUBE	1
40	67902-000	BRACKET, GAS SPRING	1
41	10070-099	SEAL STRIP GASKET	1.57'
42	67691-001	SNORKEL WELDMENT	1
43	20541-013	HOSE CLAMP	1
44	67697-000	BREATHER SPACER (RADIATOR)	1
45	11252-008	SCREW HHC 1/4-20 X 1	12
46	11240-004	WASHER FLAT STD 1/4	12
47	11928-003	FITTING 4MP-4MJ-4MJ TEE	1
48	13259-006	CLAMP, MUFFLER 1-1/2"	2
49	63979-006	GAGE, LUBE SIGHT	1
50	11248-004	NUT HEX ESNA 1/4-20	8
51	66697-099	PIPE INSULATION 1-3/8«	1
52	11248-005	NUT HEX 5/16-18 ESNA	2
53	11253-007	SCREW HHC 5/16-18 X 7/8	4
54	11240-005	WASHER 5/16 FLAT STD	4
55	11238-005	WASHER LOCK 5/16	4
56	11250-005	NUT HEX 5/16-18	4
57	11923-007	FITTING 12MP-4FP	1

***Not Shown**


NOTES:
⚠ INSTALL PIPE INSULATION TO ITEM 44, PLACING THE SLIT ON THE INSULATION OVER THE TABS ON ITEM 44.
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POWER MODULE ASSEMBLY, LX31/41

DIESEL

67522-002

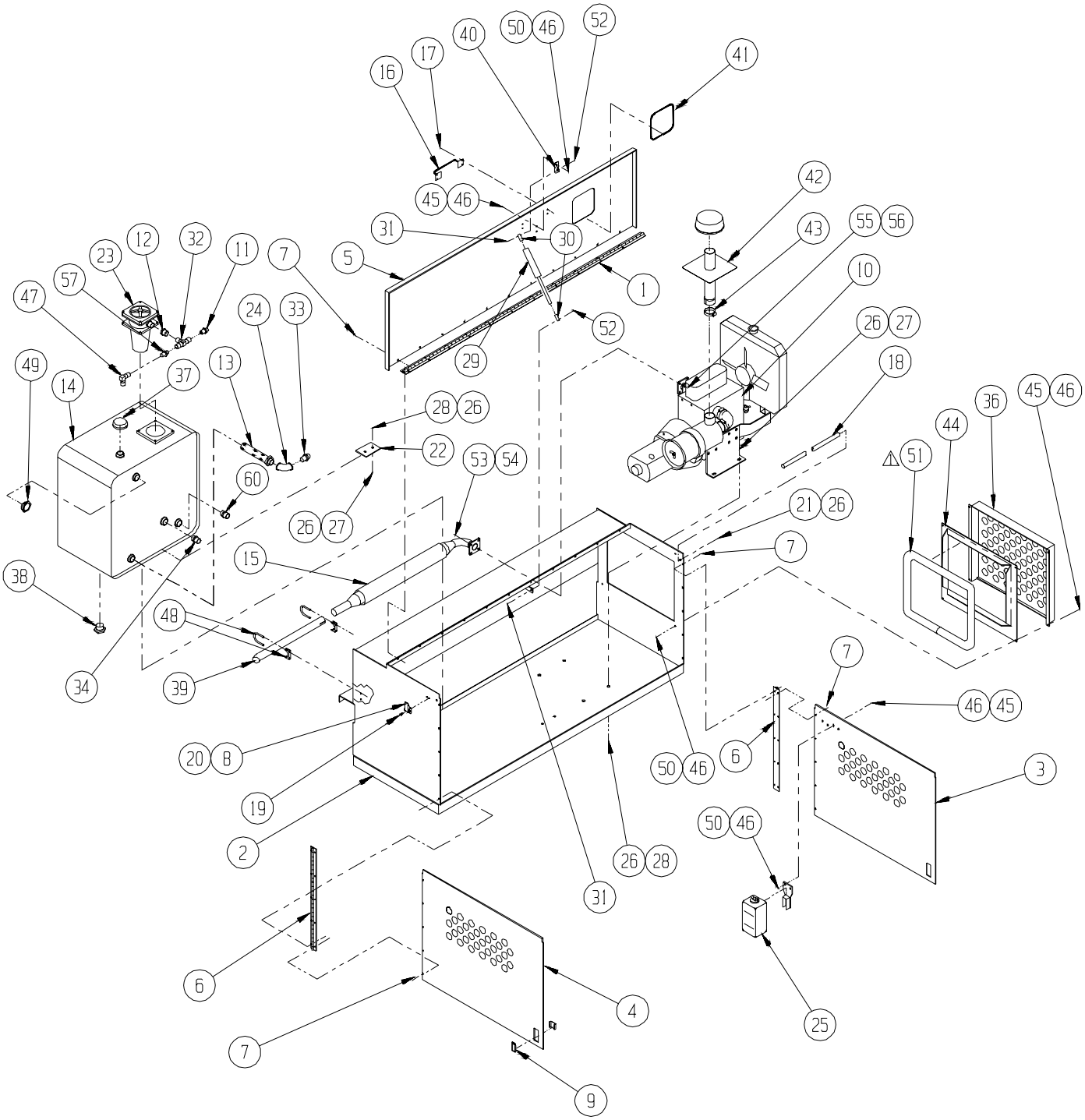
ITEM	PART	DESCRIPTION	QTY.
1	67809-000	HINGE, 2 X 65	1
2	67811-000	POWER MODULE WELDMENT	1
3	67800-001	MODULE DOOR, R.H.	1
4	67801-001	MODULE DOOR, L.H.	1
5	67799-001	MODULE COVER (DIESEL)	1
6	67808-000	HINGE, 2 X 22	2
7	26554-002	POP RIVET, 1/4 DIA. (.251 - .375 GRIP)	42
8	05299-000	LATCH, TOGGLE	2
9	67629-000	LATCH, FLUSH LIFT & TURN	2
10	67523-002	ENGINE ASSY, DIESEL KUBOTA	1
11	11939-021	FITTING 12MP-12MJ	1
12	11923-012	FITTING 16MP-12FP	1
13	63935-000	SUCTION SCREEN	1
14	67841-000	TANK, HYDRAULIC	1
15	67614-017	MUFFLER ASSY	1
16	25427-002	HANDLE	1
17	26533-002	RIVET POP, 3/16D .126 -.250 GRIP	4
18	67856-000	STIFFENER BAR	1
19	11708-004	SCREW RD HD 8-32 X 1/2	4
20	11248-002	NUT HEX 8-32 ESNA	4
21	11254-006	SCREW HHC 3/8-16 X 3/4	2
22	64039-000	TANK MOUNTING TAB	2
23	67624-000	HYDRAULIC FILTER	1
*	67624-010	ELEMENT, FILTER	1
24	11916-011	ELBOW 90° 20FP-20FP (1-1/4 NPT)	1
25	67614-016	OVERFLOW KIT	1
26	11240-006	WASHER 3/8 FLAT STD	22
27	11254-008	SCREW HHC 3/8-16 X 1	10
28	11248-006	NUT HEX 3/8-16 ESNA	12

ITEM	PART	DESCRIPTION	QTY.
29	63650-012	SPRING, PRESSURIZED GAS	1
30	67648-008	END FITTING, GAS SPRING	2
31	15936-004	SCREW SHOULDER 3/8«» X 1/2	2
32	14902-005	FITTING TEE 12MP-12FP	1
33	11939-030	FITTING 20MP-20MJ	1
34	11939-013	FITTING 8MP-4MJ	1
35	11939-015	FITTING 8MP-8MJ	1
36	67898-000	RADIATOR COVER	1
37	63930-001	BREATHER/FILLER CAP	1
38	21305-007	PLUG, MAGNETIC	1
39	67696-001	EXHAUST TUBE, DIESEL	1
40	67902-000	BRACKET, GAS SPRING	1
41	10070-099	SEAL STRIP GASKET	1.77'
42	67691-000	SNORKEL WELDMENT, DIESEL	1
43	20541-013	HOSE CLAMP	1
44	67697-001	BREATHER SPACER	1
45	11252-008	SCREW HHC 1/4-20 X 1	12
46	11240-004	WASHER FLAT STD 1/4	12
47	11940-014	FITTING 90° 4MP-4MJ	1
48	13259-006	CLAMP, MUFFLER 1-1/2"	2
49	63979-006	GAGE, LUBE SIGHT	1
50	11248-004	NUT HEX ESNA 1/4-20	8
51	66697-099	PIPE INSULATION 1-3/8 DIA.	1
52	11248-005	NUT HEX 5/16-18 ESNA	2
53	11253-007	SCREW HHC 5/16-18 X 7/8	4
54	11240-005	WASHER 5/16 FLAT STD	4
55	11238-005	WASHER LOCK 5/16	4
56	11250-005	NUT HEX 5/16-18	4
57	11923-007	FITTING 12MP-4FP	1

***Not Shown**

NOTES:

⚠ INSTALL PIPE INSULATION TO ITEM 44, PLACING THE SLIT ON THE INSULATION OVER THE TABS ON ITEM 44.



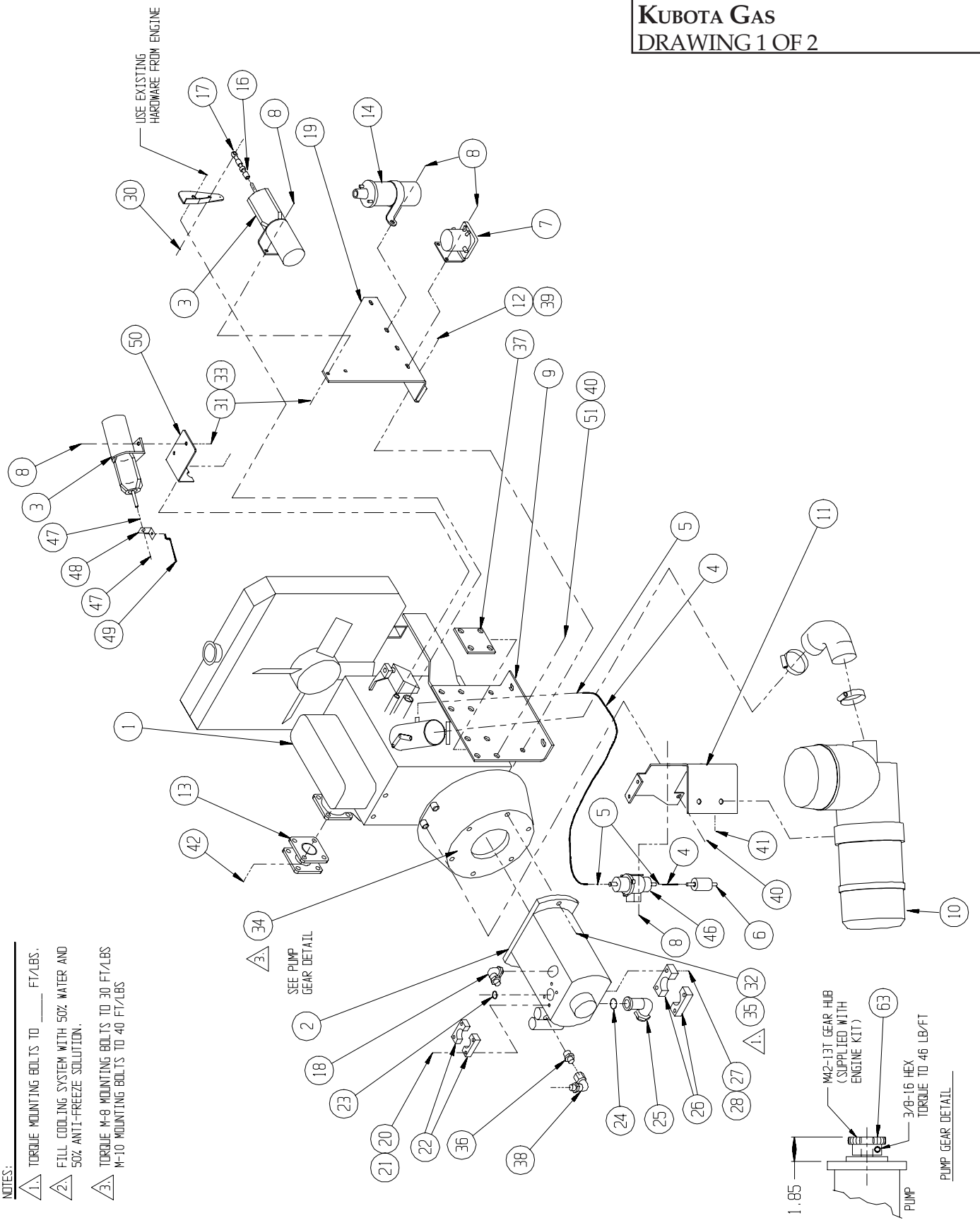
ENGINE ASSEMBLY, LX31/41
KUBOTA GAS
67523-001

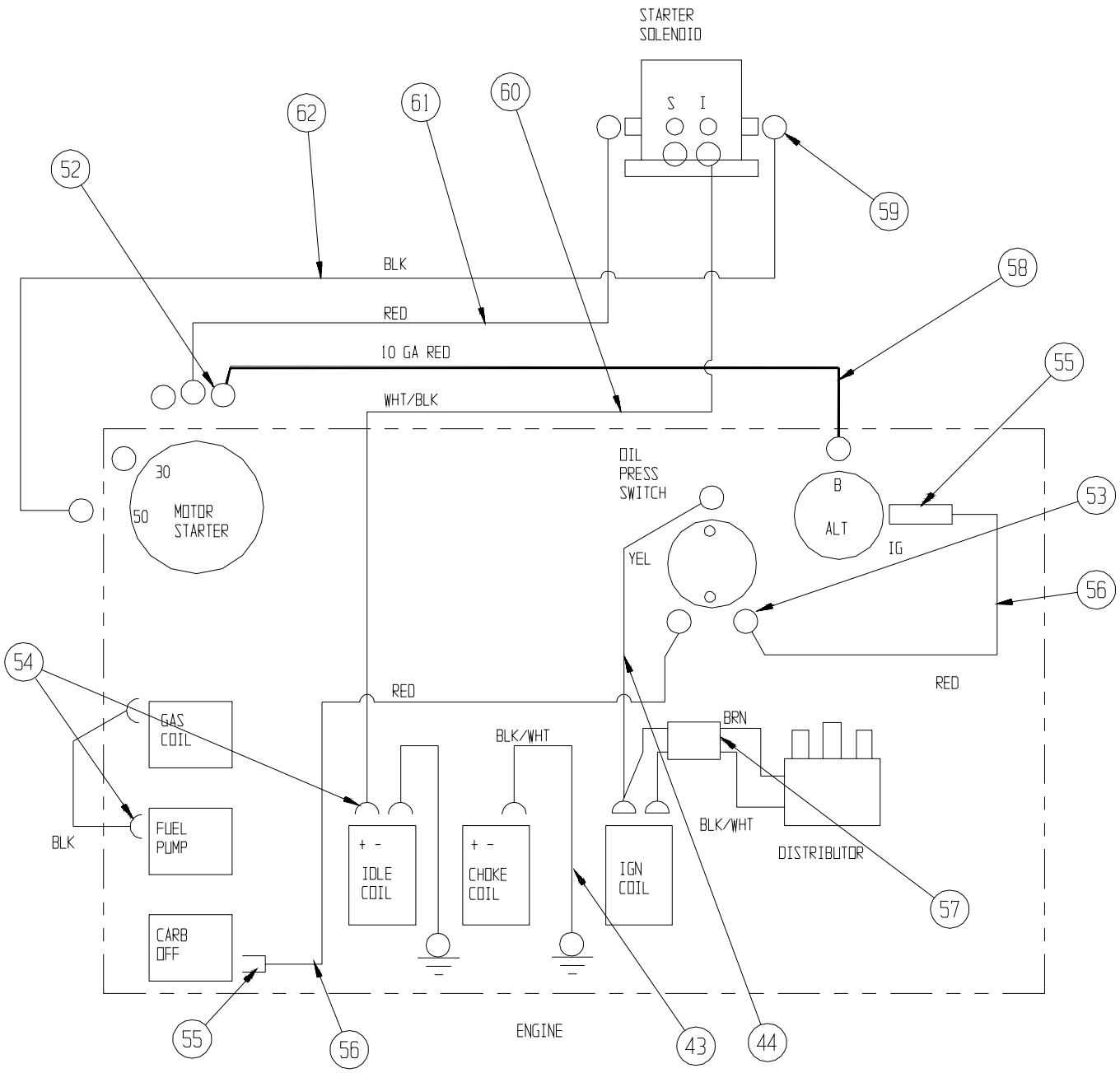
ITEM	PART	DESCRIPTION	QTY.
1	67615-000	ENGINE, KUBOTA GAS	1
*	64505-011	OIL FILTER ELEMENT	1
*	64505-009	FUEL FILTER ELEMENT	1
*	64505-007	CARBURETOR	1
*	67615-013	RADIATOR	1
*	67615-014	RADIATOR CAP	1
*	67615-015	WATER PUMP	1
*	67615-016	THERMOSTAT	1
*	67615-019	FAN BELT	1
*	64505-002	SPARK PLUG	1
*	67615-020	SPARK PLUG WIRE #1	1
*	67615-021	SPARK PLUG WIRE #2	1
*	67615-022	SPARK PLUG WIRE #3	1
*	67615-023	COIL WIRE	1
*	67615-024	DISTRIBUTOR CAP	1
*	67615-025	ROTOR	1
*	67615-026	IGNITION MODULE	1
*	67615-028	ALTERNATOR	1
*	64505-004	VOLTAGE REGULATOR	1
*	67615-030	STARTER	1
*	64505-005	OIL PRESSURE SWITCH	1
*	67615-006	WG750 ENGINE PARTS MANUAL	1
*	67615-007	WG750 ENGINE SERVICE MANUAL	1
2	67608-000	PUMP, VARIABLE DISPLACEMENT	1
3	63941-000	SOLENOID, THROTTLE, CHOKE	2
4	12733-099	HOSE, FUEL LINE	4.5'
5	20541-001	HOSE CLAMP	6
6	20331-000	FUEL FILTER, INLINE	1
7	27972-000	SOLENOID, STARTER RELAY	1
8	11252-006	SCREW HHC 1/4-20 X 3/4	12
9	67874-000	BRACKET, ENGINE MOUNT GAS	2
10	64505-008	AIR CLEANER ELEMENT	1
11	67872-000	BRACKET, AIR CLEANER	1
12	11254-008	SCREW HHC 3/8-16 X 1	2
13	64177-004	WELDMENT, MUFFLER SPACER	1
14	67615-027	COIL, IGNITION	1
16	64423-000	INLINE SWIVEL - 1/4	1
17	11760-004	ROD END BEARING - 1/4-28	1
18	11934-008	FITTING 8MB-8MJ 90°	1
19	67871-000	BRACKET, SOLENOID	1
20	11254-010	SCREW HHC 3/8-16UNC X 1-1/4	4
21	11238-006	LOCKWASHER, SPLIT 3/8	6

ITEM	PART	DESCRIPTION	QTY.
22	67670-012	SPLIT FLANGE - HALF 3/4	2
23	67671-012	"O"-RING	1
24	67671-020	"O"-RING	1
25	14338-008	FITTING SPLIT FLANGE - 20MJ 90°	1
26	67670-020	SPLIT FLANGE - HALF 1-1/4	2
27	11255-010	SCREW HHC 7/16-14UNC X 1-1/4	4
28	11238-007	LOCK WASHER SPLIT 7/16	4
30	11252-008	SCREW HHC 1/4-20UNC X 1	3
31	11240-004	WASHER FLAT STD 1/4	6
32	11238-004	WASHER SPLIT LOCK 1/2	2
33	11248-004	NUT HEX 1/4-20 ESNA	12
34	67617-021	KTR BELL HOUSING	1
35	11256-010	SCREW HHC 1/2-13UNC X 1-1/4	2
36	11941-001	FITTING STR 4MB-4MJ	1
37	64183-000	SPACER, ENGINE	2
38	11937-001	FITTING 90° 4FJ-4MJ	1
39	11240-006	WASHER FLAT STD 3/8	2
40	63946-030	SCREW HHC M10 X 1.25 GR5 X 30MM	14
41	REF	SCREW (SUPPLIED W/ AIR CLEANER)	2
42	REF	SCREW MANIFOLD (SUPPLIED W/ ENGINE)	4
43	63574-099	WIRE 16 AWG BLK/WHT	3'
44	29456-099	WIRE 16 AWG YEL	2.5'
45	67672-010	SCREW HHC M8 X 1.25 X 10MM	2
46	67615-011	ELECTRIC FUEL PUMP	1
47	11261-004	SCREW HHC 1/4-28 UNF	2
48	30624-019	CHOKE ANGLE	1
49	30624-020	CHOKE ROD	1
50	30624-008	CHOKE SOLENOID BRACKET	1
51	11240-007	WASHER FLAT STD 7/16	12
52	29601-021	CONN RING 12-10 GA. 5/16D	4
53	29601-014	CONN RING 16-14 GA. 1/4D	6
54	29610-002	CONN FORK 16-14 GA. #8	6
55	29616-002	CONN FEMALE PUSH 16-14 GA. 1/4	2
56	29454-099	WIRE 16 AWG RED	2'
57	29942-099	TUBING HEAT SHRINK 1/4"	1'
58	29480-099	WIRE 10 AWG RED	2'
59	29601-039	CONN RING 10-12 GA 5/16 D	4
60	29479-099	WIRE 16 AWG WHT/BLK	4'
61	29470-099	WIRE 12 AWG RED	8'
62	29472-099	WIRE 12 AWG BLK	3'
63	67615-029	SPLINE GEAR	1

***Not Shown**

ENGINE ASSEMBLY, LX31/41
KUBOTA GAS
DRAWING 1 OF 2





ENGINE ASSEMBLY, LX31/41
KUBOTA GAS
DRAWING 2 OF 2

NOTES:

ENGINE ASSEMBLY, LX31/41

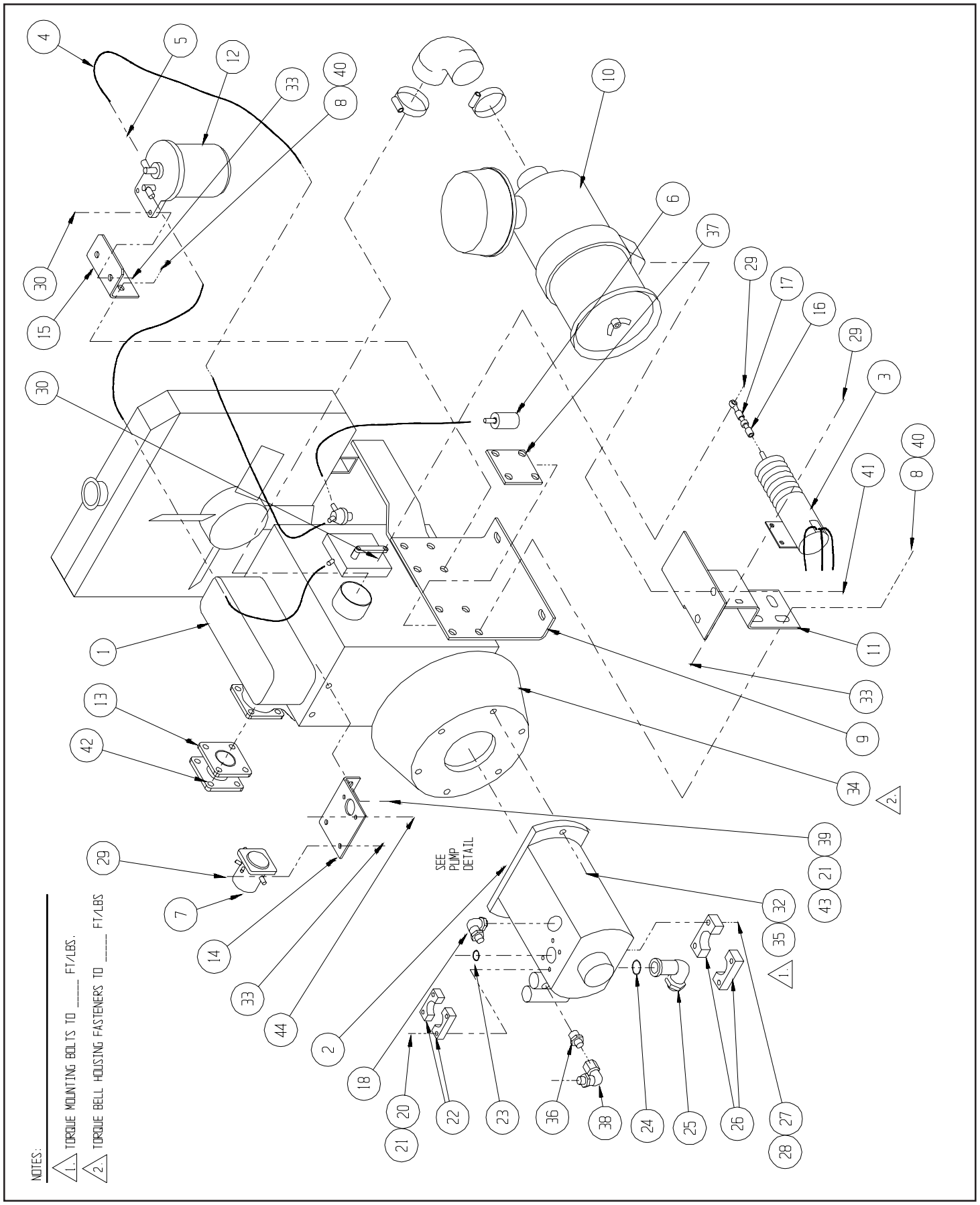
KUBOTA DIESEL

67523-002

ITEM	PART	DESCRIPTION	QTY.
1	67614-000	ENGINE, KUBOTA DIESEL	1
*	67614-004	OIL FILTER ELEMENT	1
*	67614-026	FUEL PUMP, LIFT	1
*	67614-009	INJECTION PUMP	1
*	67614-010	INJECTOR NOZZLE	3
*	67614-011	GLOW PLUG	3
*	67614-012	RADIATOR	1
*	67614-013	RADIATOR CAP	1
*	67614-014	THERMOSTAT	1
*	67614-015	WATER PUMP	1
*	67614-018	FAN BELT	1
*	67614-019	ALTERNATOR	1
*	67614-020	VOLTAGE REGULATOR	1
*	67614-022	STARTER	1
*	67614-023	OIL PRESSURE SWITCH	1
*	67614-024	KUBOTA D905 ENGINE PARTS MANUAL	1
*	67614-025	KUBOTA D905 ENGINE SERVICE MANUAL	1
2	67608-000	PUMP, VARIABLE DISPLACEMENT	1
3	67668-001	SOLENOID, THROTTLE	1
*	67668-002	THROTTLE RELAY	1
4	12733-099	HOSE, FUEL LINE	9'
5	20541-001	HOSE CLAMP	6
6	67614-007	FUEL FILTER, INLINE	1
7	27972-000	SOLENOID, STARTER RELAY	1
8	11240-007	WASHER FLAT STD 7/16	12
9	64180-001	ENGINE MOUNT BRACKET	2
10	67614-005	AIR FILTER ELEMENT	1
11	67859-000	BRACKET, AIR CLEANER	1
12	67614-006	FUEL FILTER - SPIN ON CARTRIDGE	1
13	64177-004	WELDMENT, MUFFLER SPACER	1
14	67850-000	BRACKET, SOLENOID/GLOW	1

***Not Shown**

ITEM	PART	DESCRIPTION	QTY.
15	67870-000	BRACKET, DIESEL FUEL FILTER	1
16	64423-000	INLINE SWIVEL - 1/4	1
17	11760-004	ROD END BEARING - 1/4-28	1
18	11934-008	FITTING 8MB-8MJ 90°	1
19	14338-002	FITTING SPLIT FLANGE - 12MJ 90°	1
20	11254-010	SCREW HHC 3/8-16UNC X 1-1/4	4
21	11238-006	LOCKWASHER, SPLIT 3/8	6
22	67670-012	SPLIT FLANGE - HALF 3/4	2
23	67671-012	"O"-RING	1
24	67671-020	"O"-RING	1
25	14338-008	FITTING SPLIT FLANGE - 20MJ 90°	1
26	67670-020	SPLIT FLANGE - 1-1/4	2
27	11255-010	SCREW HHC 7/16-14UNC X 1-1/4	4
28	11238-007	LOCK WASHER SPLIT 7/16	4
29	11252-004	SCREW HHC 1/4-20UNC X 1/2	2
30	11252-008	SCREW HHC 1/4-20UNC X 1	3
31	11240-004	WASHER FLAT STD 1/4	2
32	11238-004	WASHER SPLIT LOCK 1/2	2
33	11248-004	NUT HEX 1/4 ESNA	7
34	67617-000	KTR BELL HOUSING KIT	1
35	11256-010	SCREW HHC 1/2-13UNC X 1-1/4	2
36	11941-001	FITTING STR 4MB-4MJ	1
37	64183-000	SPACER, ENGINE	2
38	11937-001	FITTING 90° 4FJ-4MJ	1
39	11240-006	WASHER FLAT STD 3/8	2
40	63946-030	SCREW HHC M10 X 1.25 GR5 X 30MM	12
41	REF	SCREW (SUPPLIED W/ AIR CLEANER)	2
42	REF	SCREW MANIFOLD (SUPPLIED W/ ENGINE)	4
43	67672-010	SCREW HHC M8 X 1.25 X 10MM	2
44	11248-003	NUT HEX ESNA 10-24UNC	2

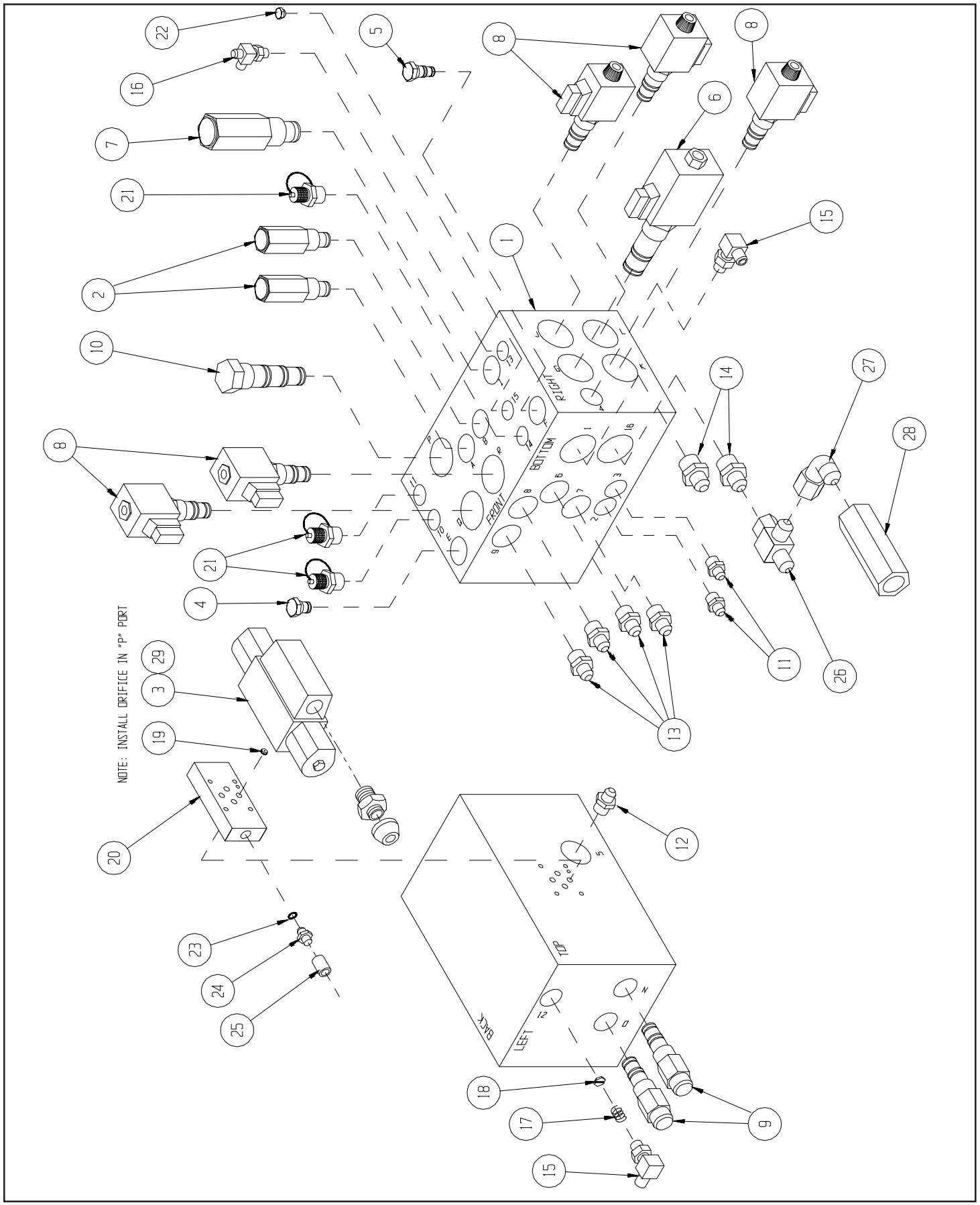

NOTES:
1. TORQUE MOUNTING BOLTS TO ____ FT/LBS.
2. TORQUE BELL HOUSING FASTENERS TO ____ FT/LBS
SEE PUMP DETAIL

VALVE BLOCK ASSEMBLY, LX31/41

Two Wheel Drive

67524-000

ITEM	PART	DESCRIPTION	QTY.
1	67821-000	VALVE BLOCK	1
2	60390-007	VALVE, STEERING RELIEF	2
3	63928-001	VALVE, STEERING	1
4	63955-010	PLUG, CAVITY #8 - 2 WAY	1
5	63955-009	PLUG, CAVITY #8 - 3 WAY	1
6	67621-000	VALVE, PROPORTIONAL	1
7	60390-016	VALVE, LIFT RELIEF	1
8	67622-000	VALVE, SOL. 2 POS 3 WAY	5
9	14862-001	VALVE, COUNTERBALANCE	2
10	67623-000	VALVE, FLOW DIVIDER/COMBINER	1
11	11941-005	ADAPTER, #6 MB - #6 MJ	2
12	11941-009	ADAPTER, #8 MB - #6 MJ	1
13	11941-015	ADAPTER, #10 MB - #10 MJ	4
14	11941-020	ADAPTER, #12 MB - #12 MJ	2
15	11934-004	ADAPTER, 90° #6 MB - #6 MJ	2
16	15961-004	ADAPTER, TEE #4MB-#4MJ-#4MJ	1
17	05133-000	SPRING	1
18	15919-000	ORIFICE	1
19	67667-000	ORIFICE .059 DIA. (1.5MM)	1
20	67619-000	STACK PLATE, SHUTTLE VALVE	1
21	63965-001	PLUG, GUAGE PORT	3
22	20021-004	PLUG, #4 MB	1
23	11979-002	O-RING, #2 MB	1
24	11939-000	ADAPTER, #2 MJ - #2 MP	1
25	11929-001	COUPLER, #2 FP - #2 FP	1
26	20733-005	ADAPTER, TEE #12FJX-#12MJ-#12MJ	1
27	13968-005	ADAPTER 90°, #12FJX-#12MP	1
28	67618-004	CHECK VALVE	1
29	14412-022	SCRW SOC HD #10-24UNC X 2-3/4	4

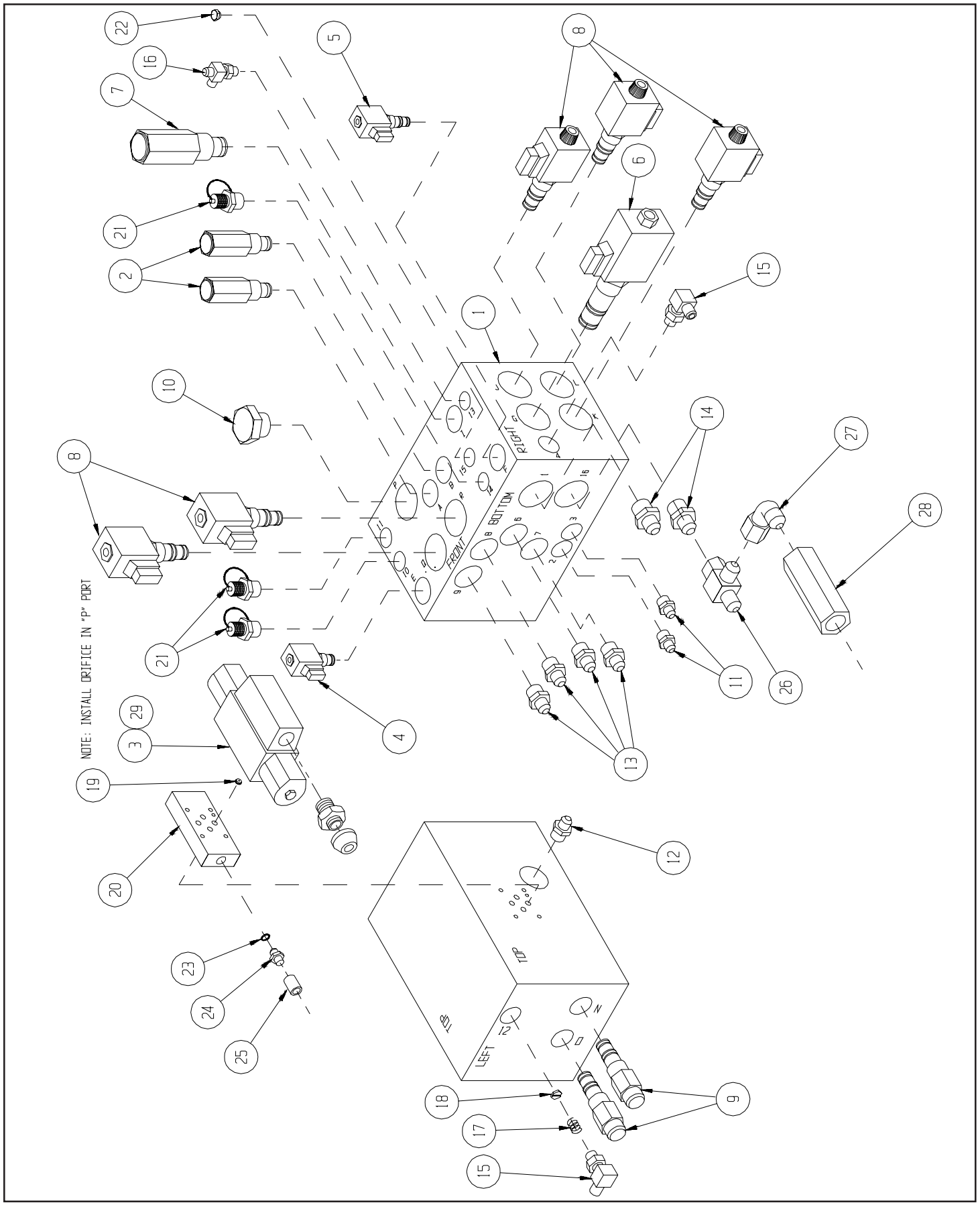

NOTE: INSTALL ORIFICE IN "P" PORT
RIGHT
BOTTOM
FRONT
TOP
BACK
LEFT

VALVE BLOCK ASSEMBLY, LX31/41

Four Wheel Drive

67524-001

ITEM	PART	DESCRIPTION	QTY.
1	67821-000	VALVE BLOCK	1
2	60390-007	VALVE, STEERING RELIEF	2
3	63928-001	VALVE, STEERING	1
4	63355-002	VALVE, SHUNT	1
5	67649-000	VALVE, AXLE FLOAT	1
6	67621-000	VALVE, PROPORTIONAL	1
7	60390-016	VALVE, LIFT RELIEF	1
8	67622-000	VALVE, SOL. 2 POS 3 WAY	5
9	14862-001	VALVE, COUNTERBALANCE	2
10	20021-012	PLUG, #12 MB	1
11	11941-005	ADAPTER, #6 MB - #6 MJ	2
12	11941-009	ADAPTER, #8 MB - #6 MJ	1
13	11941-015	ADAPTER, #10 MB - #10 MJ	4
14	11941-020	ADAPTER, #12 MB - #12 MJ	2
15	11934-004	ADAPTER, 90° #6 MB - #6 MJ	2
16	15961-004	ADAPTER, TEE #4MB-#4MJ-#4MJ	1
17	05133-000	SPRING	1
18	15919-000	ORIFICE	1
19	67667-000	ORIFICE .059 DIA. (1.5MM)	1
20	67619-000	STACK PLATE, SHUTTLE VALVE	1
21	63965-001	PLUG, GUAGE PORT	3
22	20021-004	PLUG, #4 MB	1
23	11979-002	O-RING, #2 MB	1
24	11939-000	ADAPTER, #2 MJ - #2 MP	1
25	11929-001	COUPLER, 2 FP - #2 FP	1
26	20733-005	ADAPTER, TEE #12FJX-#12MJ-#12MJ	1
27	13968-005	ADAPTER 90°, #12FJX - #12MP	1
28	67618-004	CHECK VALVE, DRIVE MAKE-UP	1
29	14412-022	SCRW SOC HD #10-24UNC X 2-3/4	4

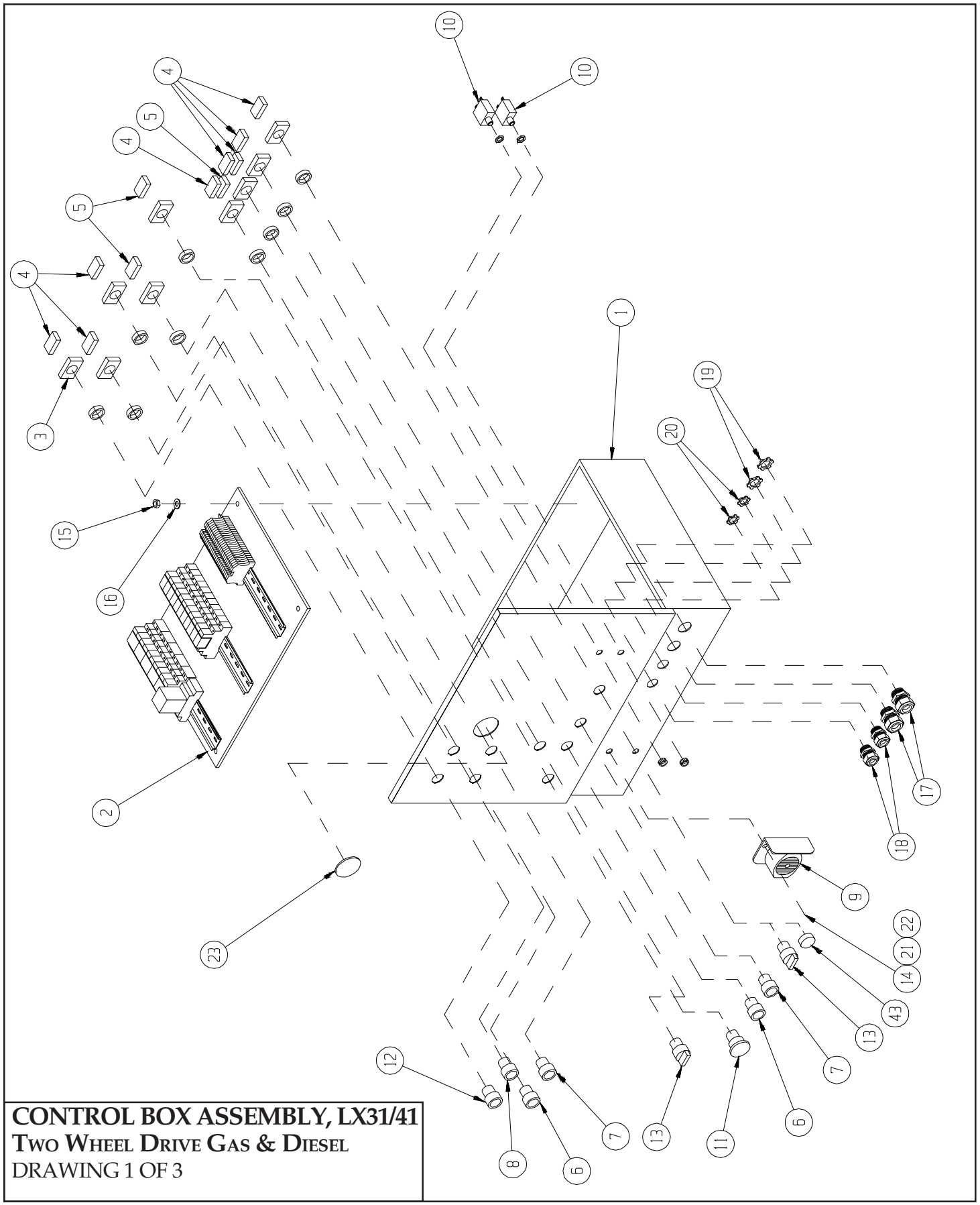

NOTE: INSTALL ORIFICE IN "P" PORT
RIGHT
BOTTOM
FRONT
LEFT
TOP

CONTROL BOX ASSEMBLY, LX31/41
Two Wheel Drive, Gas
67527-002

ITEM	PART	DESCRIPTION	QTY.
1	67825-000	ENCLOSURE	1
2	67529-003	PANEL ASSEMBLY, DUAL FUEL	1
3	64417-001	MOUNTING LATCH	9
4	64443-001	CONTACT BLOCK, N.O.	7
5	64443-002	CONTACT BLOCK, N.C.	4
6	67652-000	PUSH BUTTON, GREEN	2
7	67653-000	PUSH BUTTON, RED	2
8	67654-000	PUSH BUTTON, BLK.	1
9	63778-000	ALARM, DUAL FUNCTION	1
10	29868-007	CIRCUIT BREAKER, 15 AMP.	2
11	64446-003	PUSH BUTTON, MUSHROOM, RED	1
12	67656-000	PUSH BUTTON, ALTERNATE ACTION, BLK.	1
13	67657-000	SELECTOR, 2 POS.	2
14	11252-006	SCRW, HHC 1/4-20UNC X 3/4	2
15	11248-006	NUT, SELF LOCKING, 3/8-16	4
16	14996-006	FLATWASHER, 3/8"	4
17	29925-011	STRAIN RELIEF, 3/4"	2
18	29925-000	STRAIN RELIEF, 1/2"	2
19	29939-003	CONDUIT NUT, 3/4"	2
20	29939-002	CONDUIT NUT, 1/2"	2
21	11248-004	LOCKNUT, 1/4-20UNC ESNA	2
22	14996-004	WASHER, 1/4" SAE	2
23	66516-000	PLUG, HOLE 2.09 DIA.	1
24	29825-002	DIODE 3 AMP	7
25	29610-002	TERMINAL #8 FORK	37
26	29610-003	TERMINAL #6 FORK	32
27	29731-005	RESISTOR, 10 OHM	1
28	29496-099	CABLE 2 COND 16GA	25'
29	29447-099	CABLE 3 COND 16GA	5'
30	05491-099	WIRE 16GA GRN/BLK	1'
31	29450-099	WIRE 16GA BLU	8'
32	29451-099	WIRE 16GA WHT	7'
33	29452-099	WIRE 16GA BLK	10'
34	29456-099	WIRE 16GA YEL	2'
35	29457-099	WIRE 16GA GRN	1'
36	29459-099	WIRE 16GA BLU/WHT	5'
37	29475-099	WIRE 16GA BLU/BLK	6'
38	29477-099	WIRE 16GA ORN/BLK	4'
39	29478-099	WIRE 16GA RED/BLK	4'
40	29482-099	WIRE 16GA GRN/WHT	3'
41	29483-099	WIRE 16GA RED/WHT	2'
42	29620-002	CONN 16GA BUTT	2
43	64602-029	PLUG 15/16	1

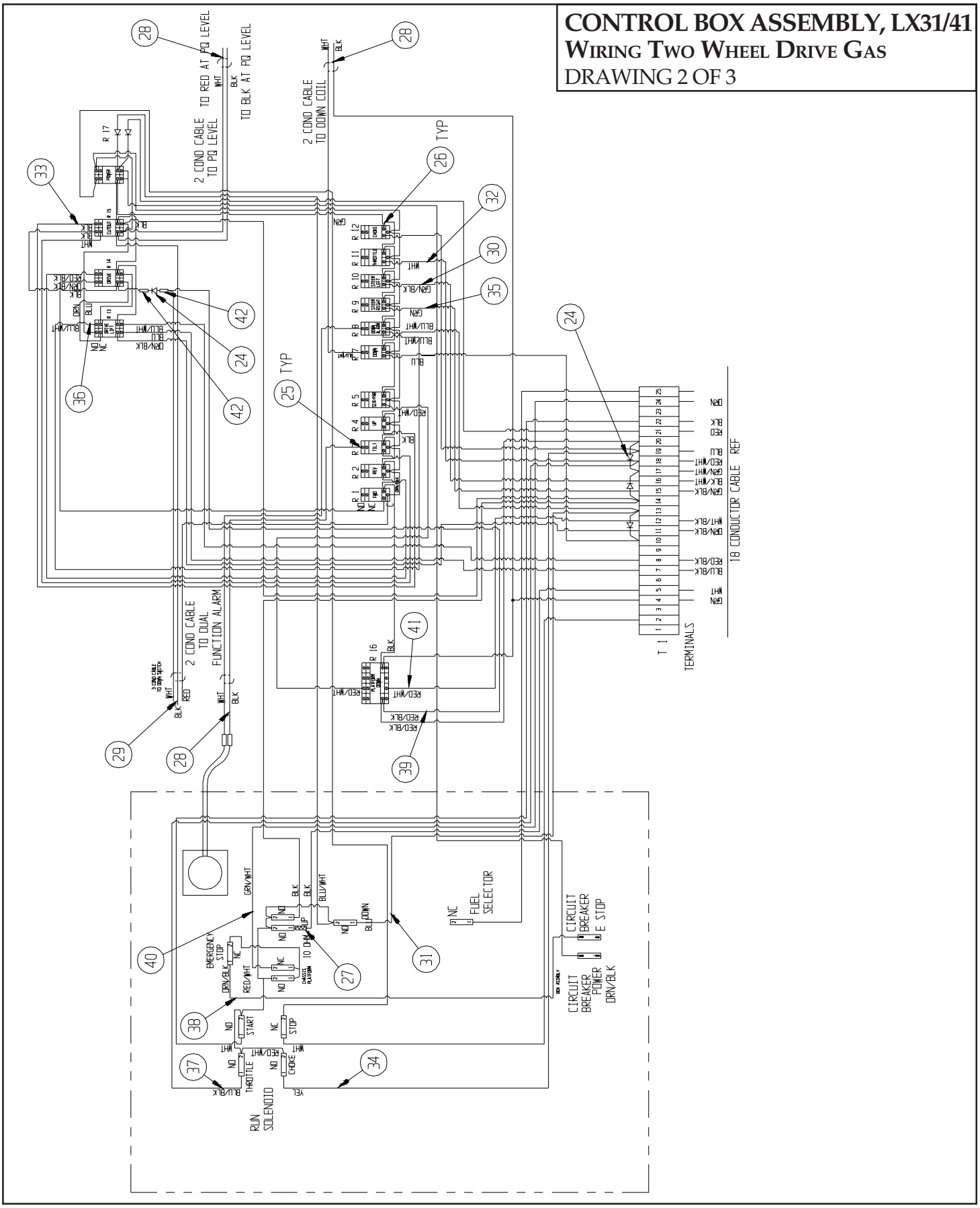
CONTROL BOX ASSEMBLY, LX31/41
Two Wheel Drive, Diesel
67527-003

ITEM	PART	DESCRIPTION	QTY.
1	67825-000	ENCLOSURE	1
2	67529-003	PANEL ASSEMBLY, DUAL FUEL	1
3	64417-001	MOUNTING LATCH	8
4	64443-001	CONTACT BLOCK, N.O.	7
5	64443-002	CONTACT BLOCK, N.C.	3
6	67652-000	PUSH BUTTON, GREEN	2
7	67653-000	PUSH BUTTON, RED	2
8	67654-000	PUSH BUTTON, BLK.	1
9	63778-000	ALARM, DUAL FUNCTION	1
10	29868-007	CIRCUIT BREAKER, 15 AMP.	2
11	64446-003	PUSH BUTTON, MUSHROOM, RED	1
12	67656-000	PUSH BUTTON, ALTERNATE ACTION, BLK.	1
13	67657-000	SELECTOR, 2 POS.	1
14	11252-006	SCRW, HHC 1/4-20UNC X 3/4	2
15	11248-006	NUT, SELF LOCKING, 3/8-16	4
16	14996-006	FLATWASHER, 3/8"	4
17	29925-011	STRAIN RELIEF, 3/4"	2
18	29925-000	STRAIN RELIEF, 1/2"	2
19	29939-003	CONDUIT NUT, 3/4"	2
20	29939-002	CONDUIT NUT, 1/2"	2
21	11248-004	LOCKNUT, 1/4-20UNC ESNA	2
22	14996-004	WASHER, 1/4" SAE	2
23	66516-000	PLUG, HOLE 2.09 DIA.	1
24	29825-002	DIODE 3 AMP	7
25	29610-002	TERMINAL #8 FORK	35
26	29610-003	TERMINAL #6 FORK	31
27	29731-005	RESISTOR, 10 OHM	1
28	29496-099	CABLE 2 COND 16GA	25'
29	29447-099	CABLE 3 COND 16GA	5'
30	05491-099	WIRE 16GA GRN/BLK	1'
31	29450-099	WIRE 16GA BLU	8'
32	29451-099	WIRE 16GA WHT	6'
33	29452-099	WIRE 16GA BLK	6'
34	29456-099	WIRE 16GA YEL	2'
35	29457-099	WIRE 16GA GRN	1'
36	29459-099	WIRE 16GA BLU/WHT	5'
37	29475-099	WIRE 16GA BLU/BLK	4'
38	29477-099	WIRE 16GA ORN/BLK	4'
39	29478-099	WIRE 16GA RED/BLK	4'
40	29482-099	WIRE 16GA GRN/WHT	2'
41	29483-099	WIRE 16GA RED/WHT	2'
42	29620-002	CONN 16GA BUTT	2
43	64602-029	PLUG 15/16	2

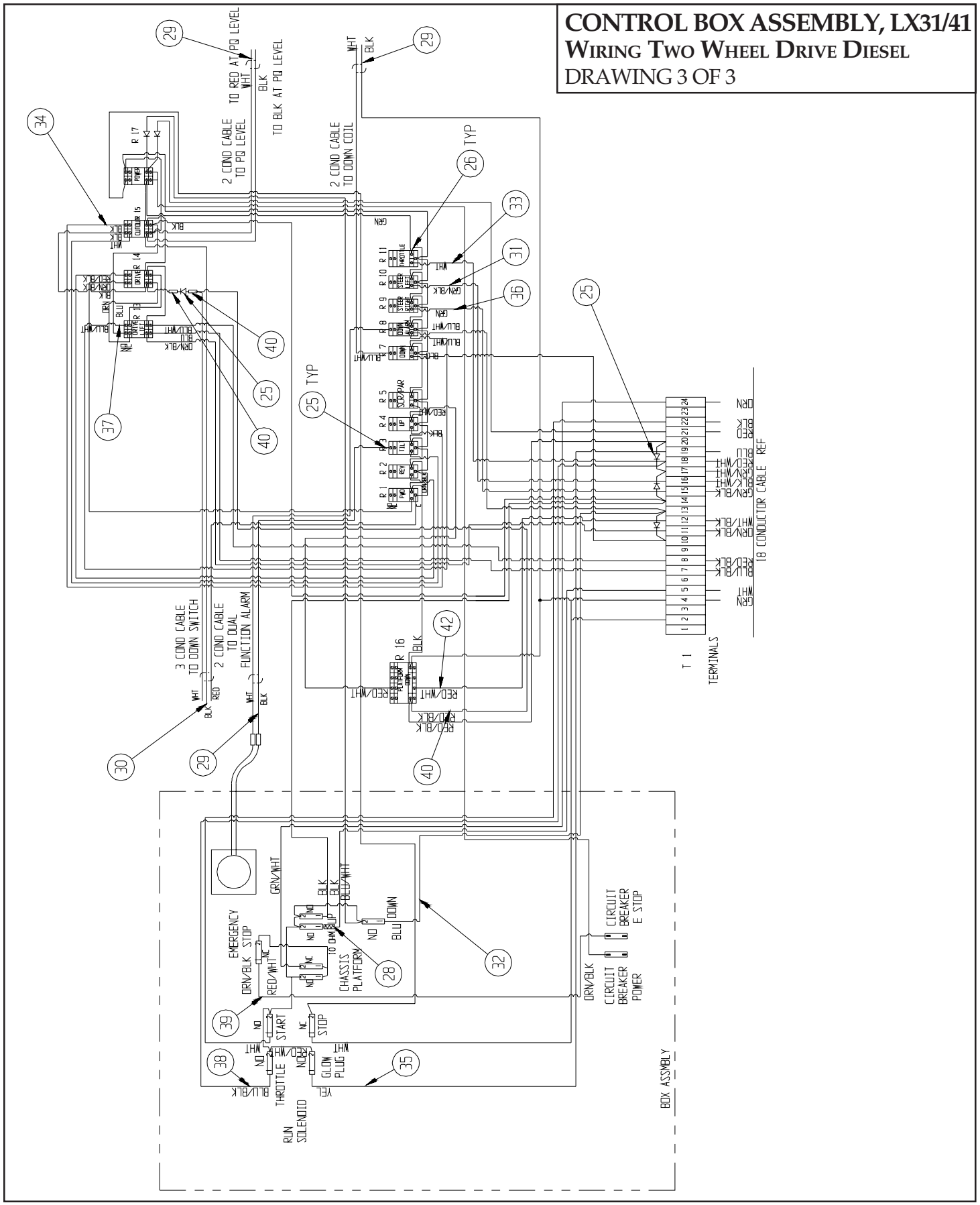


CONTROL BOX ASSEMBLY, LX31/41
TWO WHEEL DRIVE GAS & DIESEL
DRAWING 1 OF 3

CONTROL BOX ASSEMBLY, LX31/41
WIRING TWO WHEEL DRIVE GAS
DRAWING 2 OF 3



CONTROL BOX ASSEMBLY, LX31/41
WIRING TWO WHEEL DRIVE DIESEL
DRAWING 3 OF 3

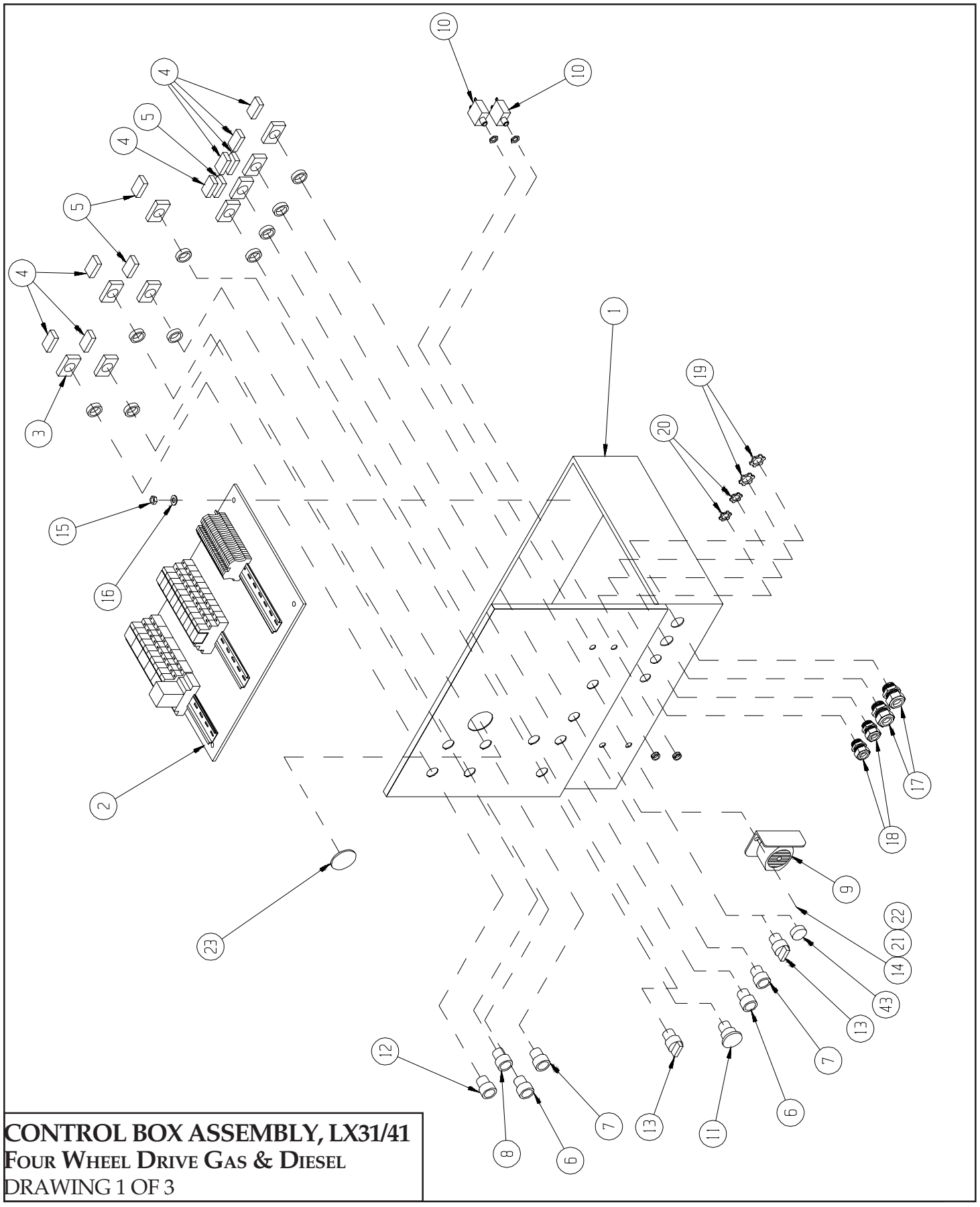


CONTROL BOX ASSEMBLY, LX31/41
Four Wheel Drive, Gas
67527-000

ITEM	PART	DESCRIPTION	QTY.
1	67825-000	ENCLOSURE	1
2	67529-000	PANEL ASSEMBLY, DUAL FUEL	1
3	64417-001	MOUNTING LATCH	9
4	64443-001	CONTACT BLOCK, N.O.	7
5	64443-002	CONTACT BLOCK, N.C.	4
6	67652-000	PUSH BUTTON, GREEN	2
7	67653-000	PUSH BUTTON, RED	2
8	67654-000	PUSH BUTTON, BLK.	1
9	63778-000	ALARM, DUAL FUNCTION	1
10	29868-007	CIRCUIT BREAKER, 15 AMP.	2
11	64446-003	PUSH BUTTON, MUSHROOM	1
12	67656-000	PUSH BUTTON, ALTERNATE ACTION, BLK.	1
13	67657-000	SELECTOR SWITCH, 2 POS.	2
14	11252-006	SCRW, HHC 1/4-20UNC X 3/4	2
15	11248-006	NUT, SELF LOCKING, 3/8-16	4
16	14996-006	FLATWASHER, 3/8"	4
17	29925-011	CABLE CONNECTOR, 3/4"	2
18	29925-000	CABLE CONNECTOR, 1/2"	2
19	29939-003	STRAIN RELIEF, 3/4"	2
20	29939-002	STRAIN RELIEF, 1/2"	2
21	11248-004	LOCKNUT, 1/4-20UNC ESNA	2
22	14996-004	WASHER, 1/4 DIA. SAE	2
23	66516-000	PLUG, HOLE 2.09 DIA	1
24	29825-002	DIODE 3 AMP	7
25	29610-002	TERMINAL #8 FORK	37
26	29610-003	TERMINAL #6 FORK	32
27	29731-005	RESISTOR, 10 OHM	1
28	29496-099	CABLE 2 COND 16GA	25'
29	29447-099	CABLE 3 COND 16GA	5'
30	05491-099	WIRE 16GA GRN/BLK	1'
31	29450-099	WIRE 16GA BLU	8'
32	29451-099	WIRE 16GA WHT	7'
33	29452-099	WIRE 16GA BLK	10'
34	29456-099	WIRE 16GA YEL	2'
35	29457-099	WIRE 16GA GRN	1'
36	29459-099	WIRE 16GA BLU/WHT	5'
37	29475-099	WIRE 16GA BLU/BLK	6'
38	29477-099	WIRE 16GA ORN/BLK	4'
39	29478-099	WIRE 16GA RED/BLK	4'
40	29482-099	WIRE 16GA GRN/WHT	2'
41	29483-099	WIRE 16GA RED/WHT	2'
42	29620-002	CONN 16GA BUTT	2
43	64602-029	PLUG 15/16	1

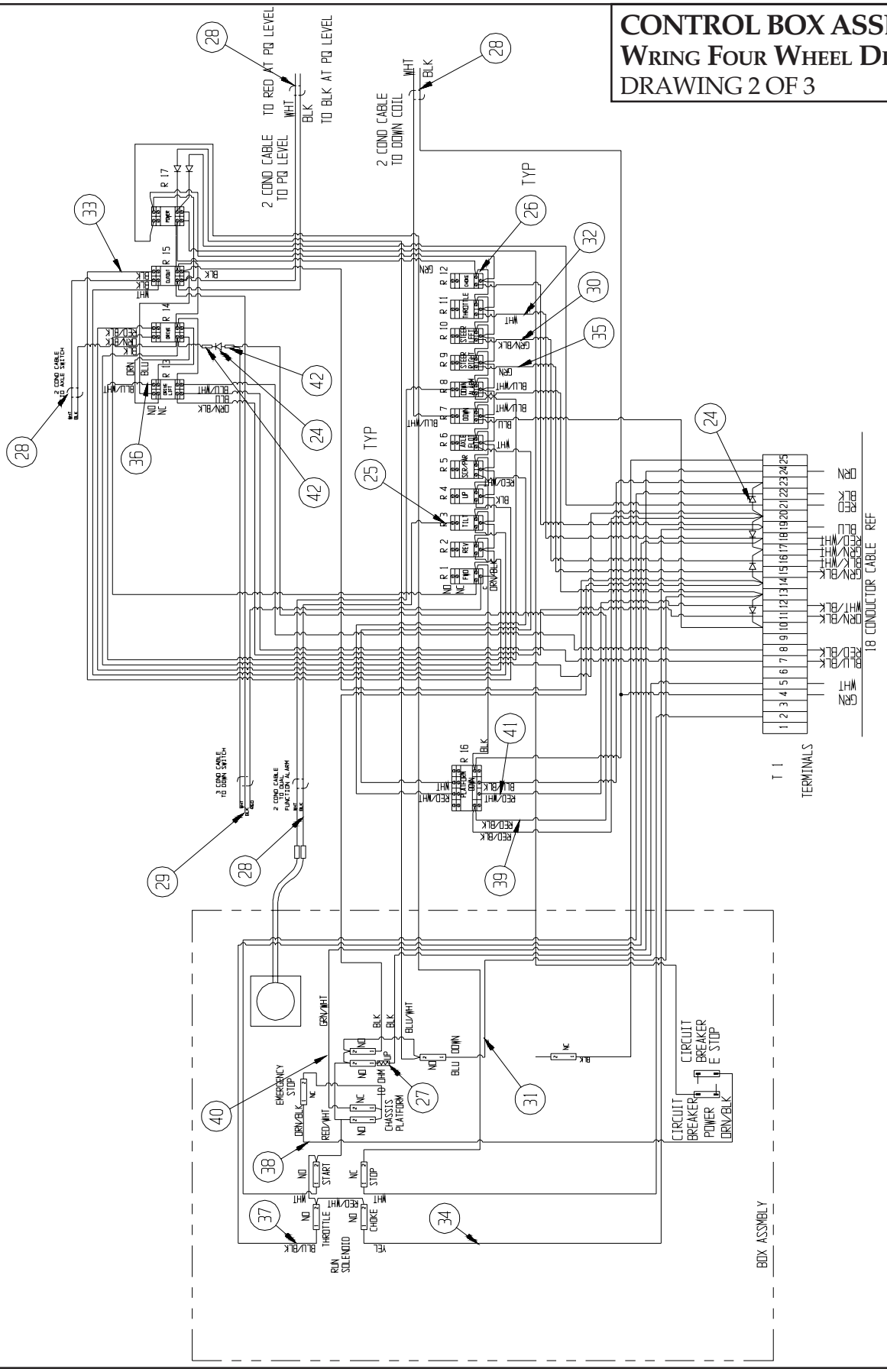
CONTROL BOX ASSEMBLY, LX31/41
Four Wheel Drive, Diesel
67527-001

ITEM	PART	DESCRIPTION	QTY.
1	67825-000	ENCLOSURE	1
2	67529-000	PANEL ASSEMBLY, DUAL FUEL	1
3	64417-001	MOUNTING LATCH	8
4	64443-001	CONTACT BLOCK, N.O.	7
5	64443-002	CONTACT BLOCK, N.C.	3
6	67652-000	PUSH BUTTON, GREEN	2
7	67653-000	PUSH BUTTON, RED	2
8	67654-000	PUSH BUTTON, BLK.	1
9	63778-000	ALARM, DUAL FUNCTION	1
10	29868-007	CIRCUIT BREAKER, 15 AMP.	2
11	64446-003	PUSH BUTTON, MUSHROOM	1
12	67656-000	PUSH BUTTON, ALTERNATE ACTION, BLK.	1
13	67657-000	SELECTOR SWITCH, 2 POS.	1
14	11252-006	SCRW, HHC 1/4-20UNC X 3/4	2
15	11248-006	NUT, SELF LOCKING, 3/8-16	4
16	14996-006	FLATWASHER, 3/8"	4
17	29925-011	CABLE CONNECTOR, 3/4"	2
18	29925-000	CABLE CONNECTOR, 1/2"	2
19	29939-003	STRAIN RELIEF, 3/4"	2
20	29939-002	STRAIN RELIEF, 1/2"	2
21	11248-004	LOCKNUT, 1/4-20UNC ESNA	2
22	14996-004	WASHER, 1/4 DIA. SAE	2
23	66516-000	PLUG, HOLE 2.09 DIA	1
24	29825-002	DIODE 3 AMP	7
25	29610-002	TERMINAL #8 FORK	35
26	29610-003	TERMINAL #6 FORK	31
27	29731-005	RESISTOR, 10 OHM	1
28	29496-099	CABLE 2 COND 16GA	25'
29	29447-099	CABLE 3 COND 16GA	5'
30	05491-099	WIRE 16GA GRN/BLK	1'
31	29450-099	WIRE 16GA BLU	8'
32	29451-099	WIRE 16GA WHT	6'
33	29452-099	WIRE 16GA BLK	6'
34	29456-099	WIRE 16GA YEL	2'
35	29457-099	WIRE 16GA GRN	1'
36	29459-099	WIRE 16GA BLU/WHT	5'
37	29475-099	WIRE 16GA BLU/BLK	4'
38	29477-099	WIRE 16GA ORN/BLK	4'
39	29478-099	WIRE 16GA RED/BLK	4'
40	29482-099	WIRE 16GA GRN/WHT	2'
41	29483-099	WIRE 16GA RED/WHT	2'
42	29620-002	CONN 16GA BUTT	2
43	64602-029	PLUG 15/16	1

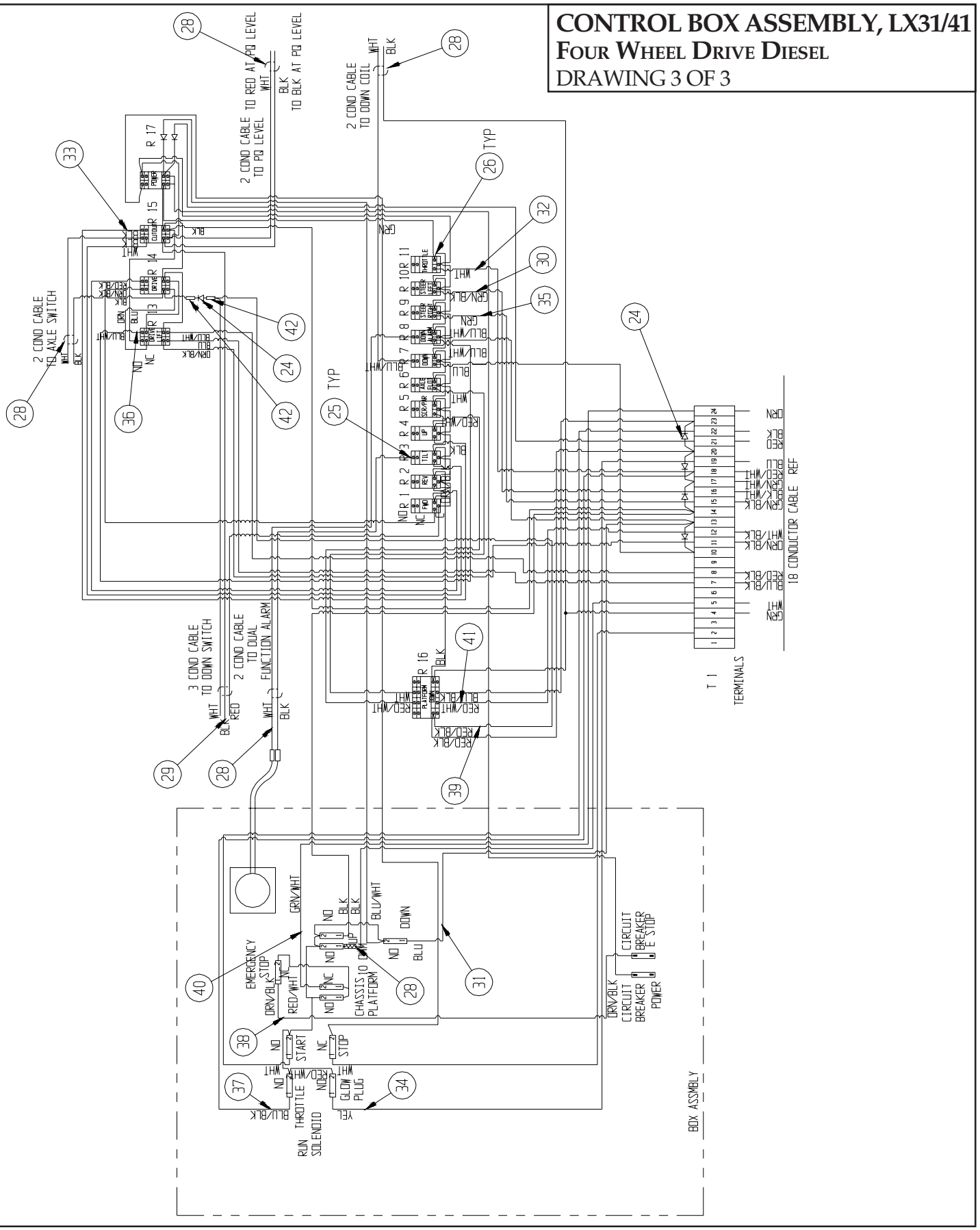


CONTROL BOX ASSEMBLY, LX31/41
FOUR WHEEL DRIVE GAS & DIESEL
DRAWING 1 OF 3

CONTROL BOX ASSEMBLY, LX31/41
WRING FOUR WHEEL DRIVE GAS
DRAWING 2 OF 3



CONTROL BOX ASSEMBLY, LX31/41
FOUR WHEEL DRIVE DIESEL
DRAWING 3 OF 3



PANEL ASSEMBLY, LX31/41
Two Wheel Drive Gas
67529-002

ITEM	PART	DESCRIPTION	QTY.
1	67727-000	PLATE, MOUNTING	1
2	67893-000	MOUNTING RAIL, 12"	3
3	67661-001	RELAY, SPDT	11
4	67661-002	RELAY, DPDT	4
5	67661-004	RELAY, 4PDT	1
6	67662-001	SOCKET RELAY, SPDT	12
7	67662-002	SOCKET RELAY, DPDT	4
8	67662-004	SOCKET RELAY, 4PDT	1
9	67662-005	RETAINER CLIP	12
10	67662-006	RETAINER CLIP	4
11	67662-007	RETAINER CLIP	1
12	67660-001	TERMINAL BLOCK	12
13	67660-002	TERMINAL BLOCK, BLUE	11
14	67660-003	TERMINAL BLOCK, GROUND	1
15	67660-006	END BRACKET	2
16	11709-004	SCREW	6
17	14996-003	WASHER	6
18	11248-003	ESNA NUT	6

PANEL ASSEMBLY, LX31/41
Two Wheel Drive Diesel
67529-003

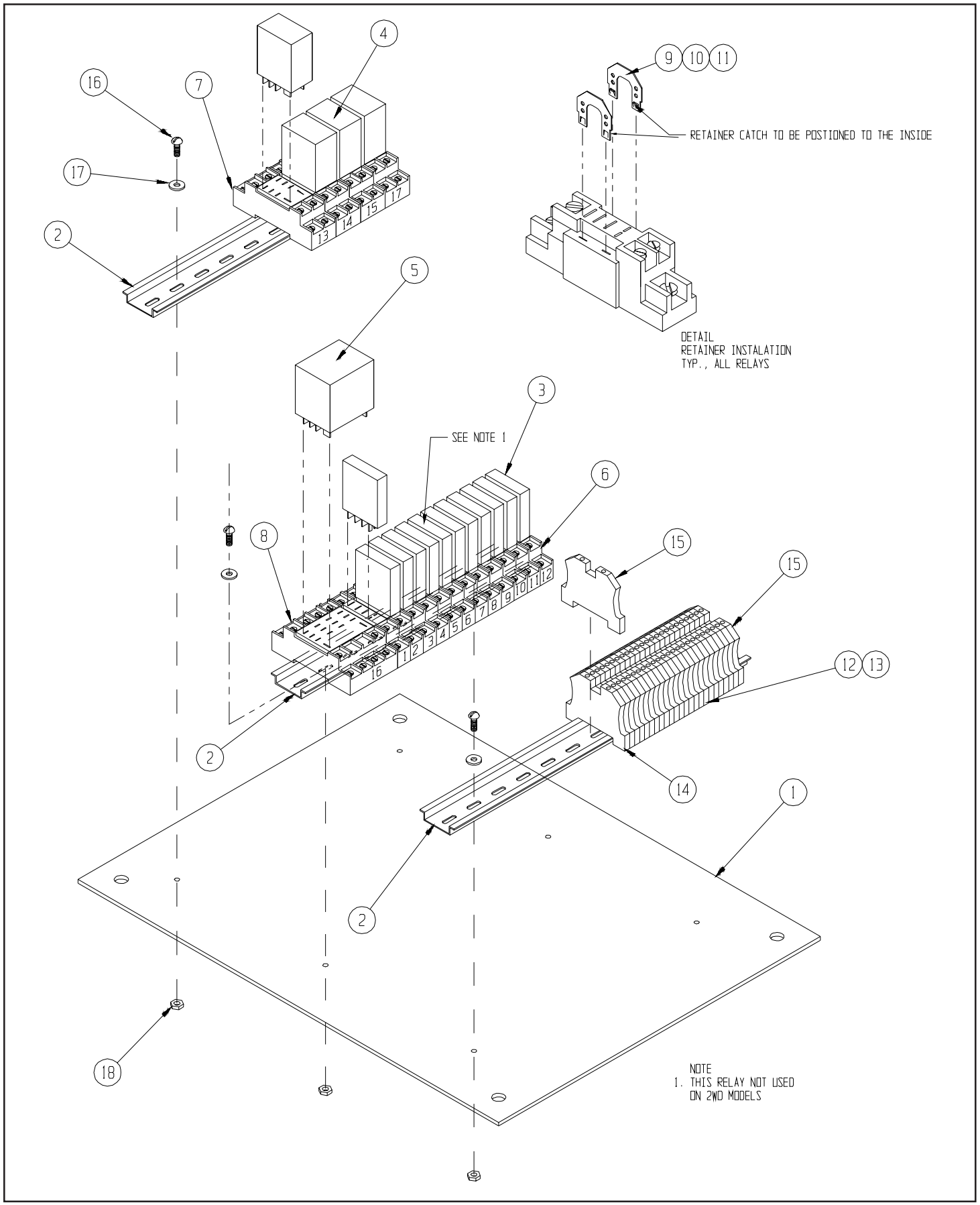
ITEM	PART	DESCRIPTION	QTY.
1	67727-000	PLATE, MOUNTING	1
2	67893-000	MOUNTING RAIL, 12"	3
3	67661-001	RELAY, SPDT	11
4	67661-002	RELAY, DPDT	4
5	67661-004	RELAY, QPDT	1
6	67662-001	SOCKET, RELAY, SPDT	12
7	67662-002	SOCKET, RELAY, DPDT	4
8	67662-004	SOCKET, RELAY, 4PDT	1
9	67662-005	RETAINER CLIP	12
10	67662-006	RETAINER CLIP	4
11	67662-007	RETAINER CLIP	1
12	67660-001	TERMINAL BLOCK	12
13	67660-002	TERMINAL BLOCK, BLUE	11
14	67660-003	TERMINAL BLOCK, GROUND	1
15	67660-006	END BRACKET	2
16	11709-004	SCREW	6
17	14996-003	WASHER	6
18	11248-003	ESNA NUT	6

PANEL ASSEMBLY, LX31/41
Four Wheel Drive Gas
67529-000

ITEM	PART	DESCRIPTION	QTY.
1	67727-000	PLATE, MOUNTING	1
2	67893-000	MOUNTING RAIL, 12"	3
3	67661-001	RELAY, SPDT	12
4	67661-002	RELAY, DPDT	4
5	67661-004	RELAY, 4PDT	1
6	67662-001	SOCKET, RELAY, SPDT	12
7	67662-002	SOCKET, RELAY, DPDT	4
8	67662-004	SOCKET, RELAY, 4PDT	1
9	67662-005	RETAINER CLIP	12
10	67662-006	RETAINER CLIP	4
11	67662-007	RETAINER CLIP	1
12	67660-001	TERMINAL BLOCK	13
13	67660-002	TERMINAL BLOCK, BLUE	13
14	67660-003	TERMINAL BLOCK, GROUND	1
15	67660-006	END BRACKET	2
16	11709-004	SCREW	6
17	14996-003	WASHER	6
18	11248-003	ESNA NUT	6

PANEL ASSEMBLY, LX31/41
Four Wheel Drive Diesel
67529-001

ITEM	PART	DESCRIPTION	QTY.
1	67727-000	PLATE, MOUNTING	1
2	67893-000	MOUNTING RAIL, 12"	3
3	67661-001	RELAY, 4PDT	12
4	67661-002	RELAY, DPDT	4
5	67661-004	RELAY, 4PDT	1
6	67662-001	SOCKET, RELAY, SPDT	12
7	67662-002	SOCKET, RELAY, DPDT	4
8	67662-004	SOCKET, RELAY, 4PDT	1
9	67662-005	RETAINER CLIP	12
10	67662-006	RETAINER CLIP	4
11	67662-007	RETAINER CLIP	1
12	67660-001	TERMINAL BLOCK	12
13	67660-002	TERMINAL BLOCK, BLUE	12
14	67660-003	TERMINAL BLOCK, GROUND	1
15	67660-006	END BRACKET	2
16	11709-004	SCREW	6
17	14996-003	WASHER	6
18	11248-003	ESNA NUT	6


4
16
7
17
2
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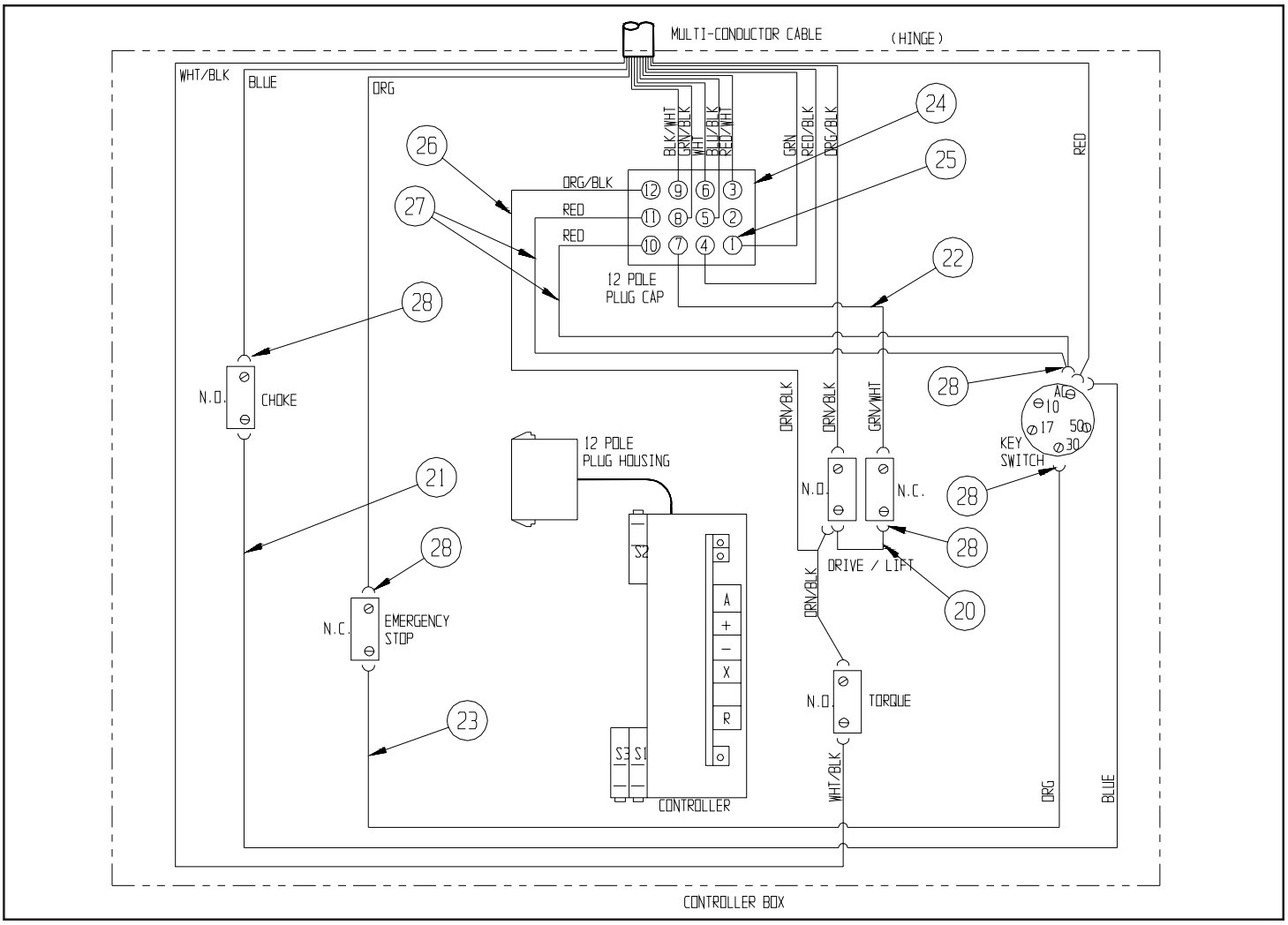
9
10
11
RETAINER CATCH TO BE POSTIONED TO THE INSIDE
DETAIL
RETAINER INSTALATION
TYP., ALL RELAYS
3
SEE NOTE 1
6
8
15
15
12
13
2
14
1
2
18
NOTE
1. THIS RELAY NOT USED
ON 2WD MODELS

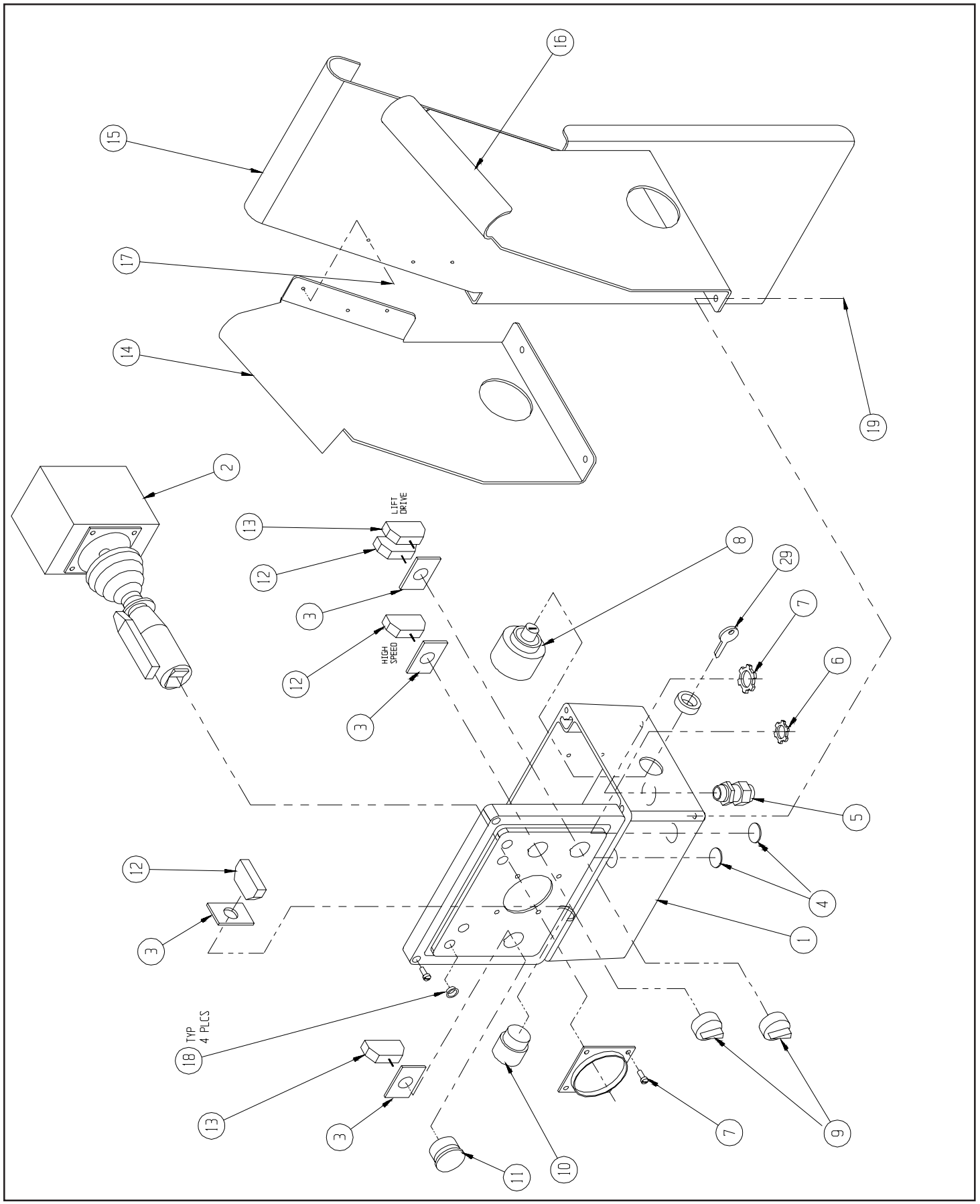
CONTROLLER ASSEMBLY, LX31/41
For Serial Numbers 1000-1330
67528-000 (Obsolete)

ITEM	PART	DESCRIPTION	QTY.
1	67802-000	ENCLOSURE BOX	1
2	67643-001	CONTROLLER, PROPORTIONAL 12V	1
*	15772-001	SWITCH, MICRO	3
*	66544-014	SWITCH, STEERING	2
*	63913-003	BOOT, STEERING SWITCH	1
*	63913-004	ROCKER ASSEMBLY	1
-	66544-010	HANDLE, 2 PIECE	1
-	66544-011	LEVER, INTERLOCK	1
*	66544-012	SWITCH, INTERLOCK	1
-	66544-013	BOOT, JOYSTICK SHAFT	1
-	66544-015	FLANGE, CONTROLLER MOUNTING	1
3	64417-001	MOUNTING LATCH	4
4	64462-007	CAP PLUG 7/8 DIA.	2
5	29925-011	STRAIN RELIEF, 3/4"	1
6	29939-002	CONDUIT NUT, 1/2"	2
7	29939-003	CONDUIT NUT, 3/4"	1
8	63639-006	KEY SWITCH	1
9	67657-000	OPERATOR, SELECTOR SWITCH	2
10	67653-000	OPERATOR, PUSH BUTTON	1

ITEM	PART	DESCRIPTION	QTY.
11	64446-003	OPERATOR, MUSHROOM BUTTON	1
12	64443-001	CONTACT BLOCK, N.O.	3
13	64443-002	CONTACT BLOCK, N.C.	2
14	66094-001	HANGER L.H.	1
15	67889-000	HANGER, REAR PLATE	1
16	66095-001	HANGER R.H.	1
17	26551-007	RIVET, POP 1/8 .251-.312 GRIP	6
18	64462-002	CAPLUG 1/2" DIA.	4
19	11253-004	SCREW HHC 5/16-18UNC X 1/2	4
20	29452-099	WIRE 16 GA. BLACK	1'
21	29450-099	WIRE 16 GA. BLUE	3'
22	29482-099	WIRE 16 GA. GRN/WHT	1'
23	29453-099	WIRE 16 GA. ORG	1'
24	63956-003	PLUG, HOUSING	1
25	63956-010	PIN, CONTACT MALE	11
26	29477-099	WIRE 16 GA. ORG/BLK	1'
27	29454-099	WIRE 16 GA. RED	2'
28	29610-004	CONNECTOR FORK TERM 12-10 GA. #10	15
29	63936-015	KEY ONLY	1

***Not Shown**




16
15
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14
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2
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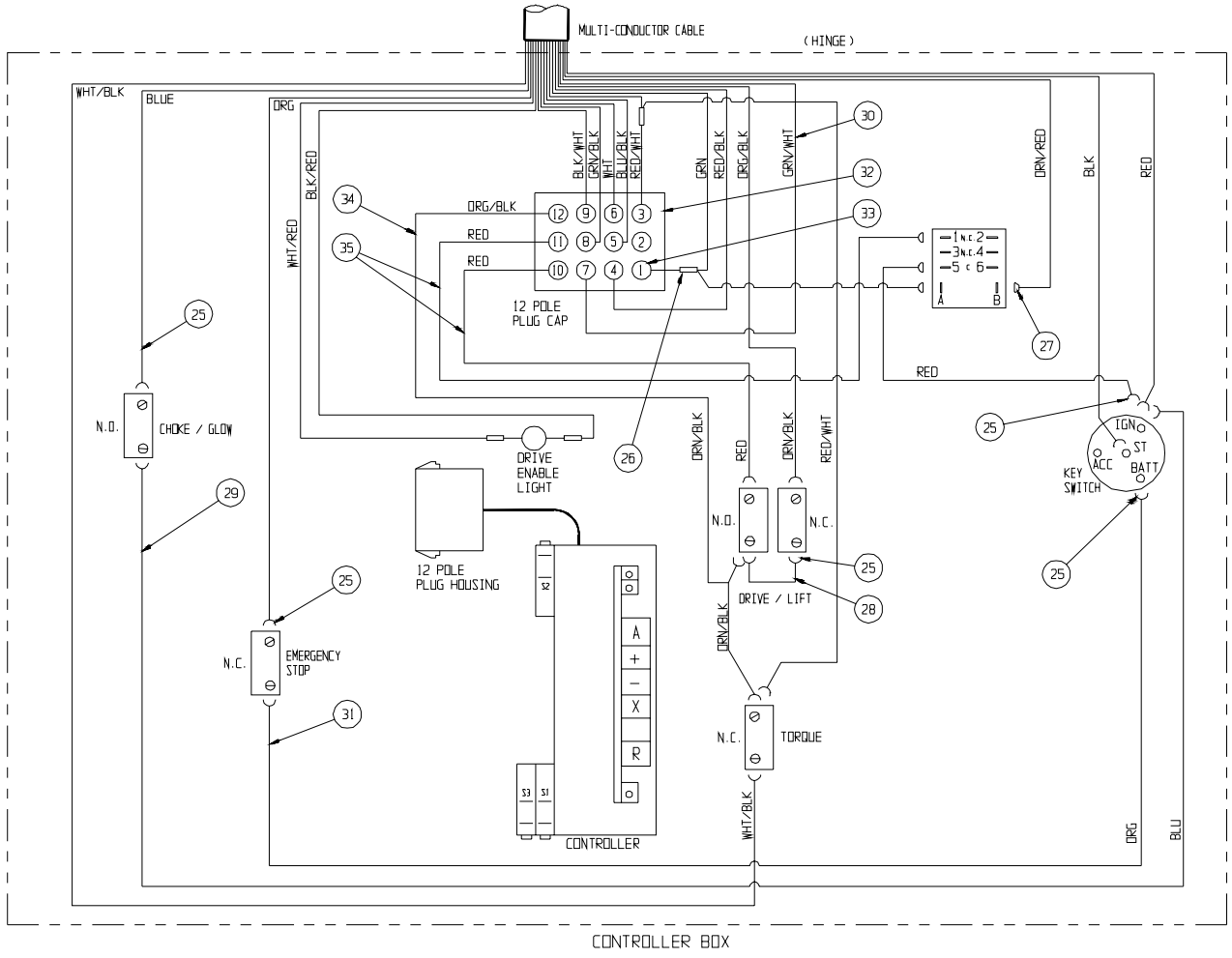
LIFT DRIVE
12
3
HIGH SPEED
8
29
7
6
5
4
1
TYP 4 PLCS
18
11
10
9

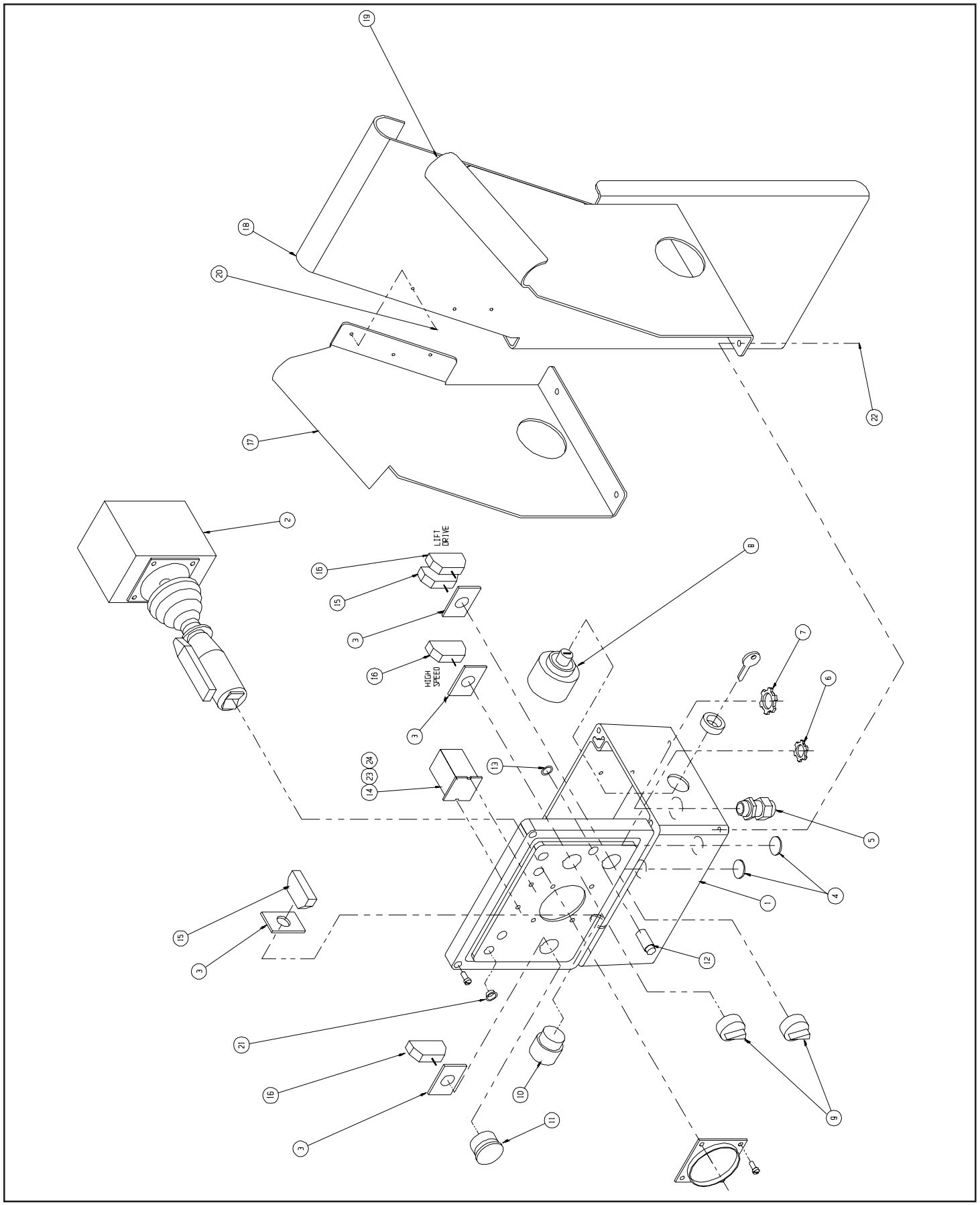
CONTROLLER ASSEMBLY, LX31/41
For Serial Numbers After 1330
67528-000

ITEM	PART	DESCRIPTION	QTY.
1	67802-000	ENCLOSURE BOX	1
2	67643-001	CONTROLLER, PROPORTIONAL 12V	1
3	64417-001	MOUNTING LATCH	4
4	64462-007	CAP PLUG 7/8 DIA.	2
5	29925-011	CABLE CONNECTOR, 3/4"	1
6	29939-002	CONDUIT NUT, 1/2"	2
7	29939-003	CONDUIT NUT, 3/4"	1
8	64666-000	KEY SWITCH	1
*	63936-015	KEY ONLY	1
9	67657-000	SELECTOR SWITCH	2
10	67653-000	PUSH BUTTON	1
11	64446-003	MUSHROOM BUTTON	1
12	68133-000	INDICATOR LIGHT	1
13	67806-000	RING, RETAINING	1
14	63951-001	RELAY	1
15	64443-001	CONTACT BLOCK, N.O.	2
16	64443-002	CONTACT BLOCK, N.C.	3
17	66094-001	PANEL, CONTROLLER L.H.	1

ITEM	PART	DESCRIPTION	QTY.
18	67889-000	REAR PLATE, CONTROLLER HANGER	1
19	66095-001	PANEL, CONTROLLER R.H.	1
20	26551-007	RIVET, POP 1/8 .251-.312 GRIP	6
21	64462-002	CAPLUG 1/2" DIA.	4
22	11253-004	SCREW HHC 5/16-18UNC X 1/2	4
23	11715-004	SCREW, #6-32 X 1/2	2
24	11248-047	LOCKNUT, #6-32	2
25	29610-004	CONNECTOR FORK TERM 12-10 GA. #10	15
26	29620-002	CONNECTOR BUTT. 16-14 GA.	4
27	29615-002	CONNECTOR FEMALE PUSH 16-14 GA.	4
28	29452-099	WIRE 16 GA. BLACK	1 FT
29	29450-099	WIRE 16 GA. BLUE	3 FT
30	29482-099	WIRE 16 GA. GRN/WHT	1 FT
31	29453-099	WIRE 16 GA. ORG	1 FT
32	63956-003	PLUG, HOUSING	1
33	63956-010	PIN, CONTACT MALE	11
34	29477-099	WIRE 16 GA. ORG/BLK	1 FT
35	29454-099	WIRE 16 GA. RED	2 FT

***Not Shown**




19
18
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22
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2
LIFT DRIVE
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3
8
16
HIGH SPEED
3
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1
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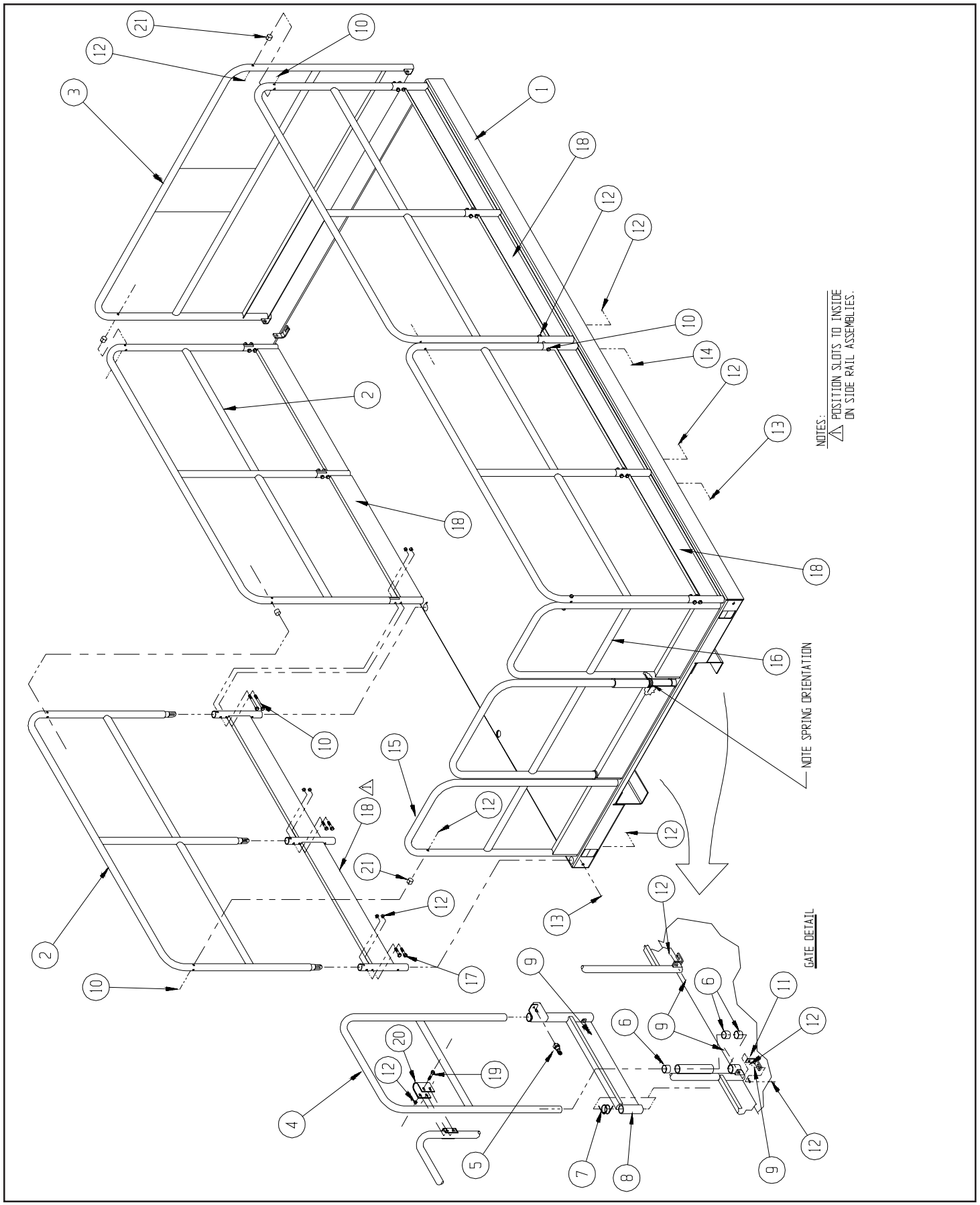
9

GUARDRAIL / DECK ASSEMBLY, LX31/41

WITHOUT SLIDEOUT DECK

67530-000

ITEM	PART	DESCRIPTION	QTY.
1	REF	PLATFORM WELDMENT	1
2	67751-000	SIDE GUARDRAIL WELDMENT	4
3	67885-000	END GUARDRAIL WELDMENT	1
4	67883-000	GATE WELDMENT	1
5	03570-000	RETAINING PIN ASSY	1
6	62642-026	BEARING	3
7	66526-000	TORSION SPRING	1
8	67764-000	GATE KICK RAIL WELDMENT	1
9	11254-008	SCREW HHC 3/8-16UNC X 1	18
10	11254-032	SCREW HHC 3/8-16UNC X 4	10
11	64046-000	BRACKET, RAIL MOUNTING	6
12	11248-006	NUT HEX ESNA 3/8-16UNC	54
13	11254-018	SCREW HHC 3/8-16UNC X 2 1/4	8
14	11254-036	SCREW HHC 3/8-16UNC X 4-1/2	2
15	67881-000	END GUARDRAIL WELDMENT, LH	1
16	67880-000	END GUARDRAIL WELDMENT, RH	1
17	11254-014	SCREW HHC 3/8-16UNC X 1 3/4	16
18	67757-000	KICK RAIL WELDMENT	4
19	11254-020	SCR HHC 3/8-16 X 2-1/2	2
20	67693-000	RETAINER	1
21	67695-000	SPACER	6

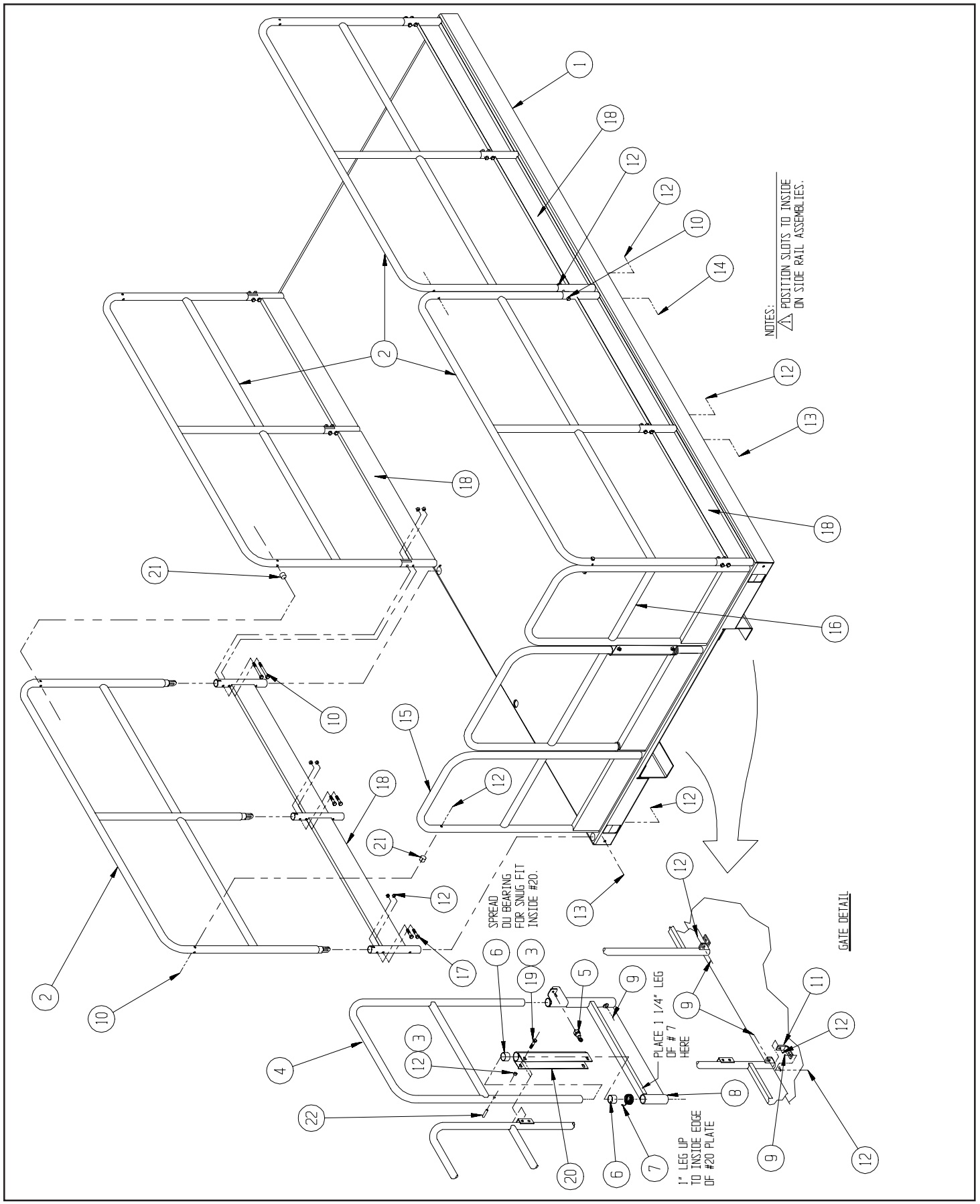

NOTES:
1. POSITION SLOTS TO INSIDE ON SIDE RAIL ASSEMBLIES.
NOTE SPRING ORIENTATION
GATE DETAIL

GUARDRAIL / DECK ASSEMBLY, LX31/41
WITH SLIDEOUT DECK
67530-003

ITEM	PART	DESCRIPTION	QTY.
1	67780-000	PLATFORM WELDMENT*	1
2	67751-000	SIDE GUARDRAIL WELDMENT*	4
3	11240-006	WASHER, FLAT STD 3/8	4
4	67883-000	GATE WELDMENT	1
5	03570-000	RETAINING PIN ASSY	1
6	62642-026	BEARING	2
7	66526-002	TORSION SPRING	1
8	67764-001	GATE KICK RAIL WELDMENT	1
9	11254-008	SCREW HHC 3/8-16UNC X 1	18
10	11254-032	SCREW HHC 3/8-16UNC X 4	8
11	64046-000	BRACKET, RAIL MOUNTING	6
12	11248-006	NUT HEX ESNA 3/8-16UNC	52
13	11254-018	SCREW HHC 3/8-16UNC X 2 1/4	8
14	11254-036	SCREW HHC 3/8-16UNC X 4-1/2	2
15	67881-000	END GUARDRAIL WELDMENT	1
16	67880-001	END GUARDRAIL WELDMENT	1
17	11254-014	SCREW HHC 3/8-16UNC X 1 3/4	16
18	67757-000	KICK RAIL WELDMENT*	4
19	11254-020	SCR HHC 3/8-16 X 2-1/2	2
20	67712-000	PIVOT TUBE WELDMENT	1
21	67695-000	SPACER	4
22	11739-014	ROLL PIN 3/8D X 1 3/4	1

*** After serial number 1330:**
Use 67751-001 for front right hand guardrail.
Use only 3 67751-000 side rail.
Use only 2 67757-000 kick rail.

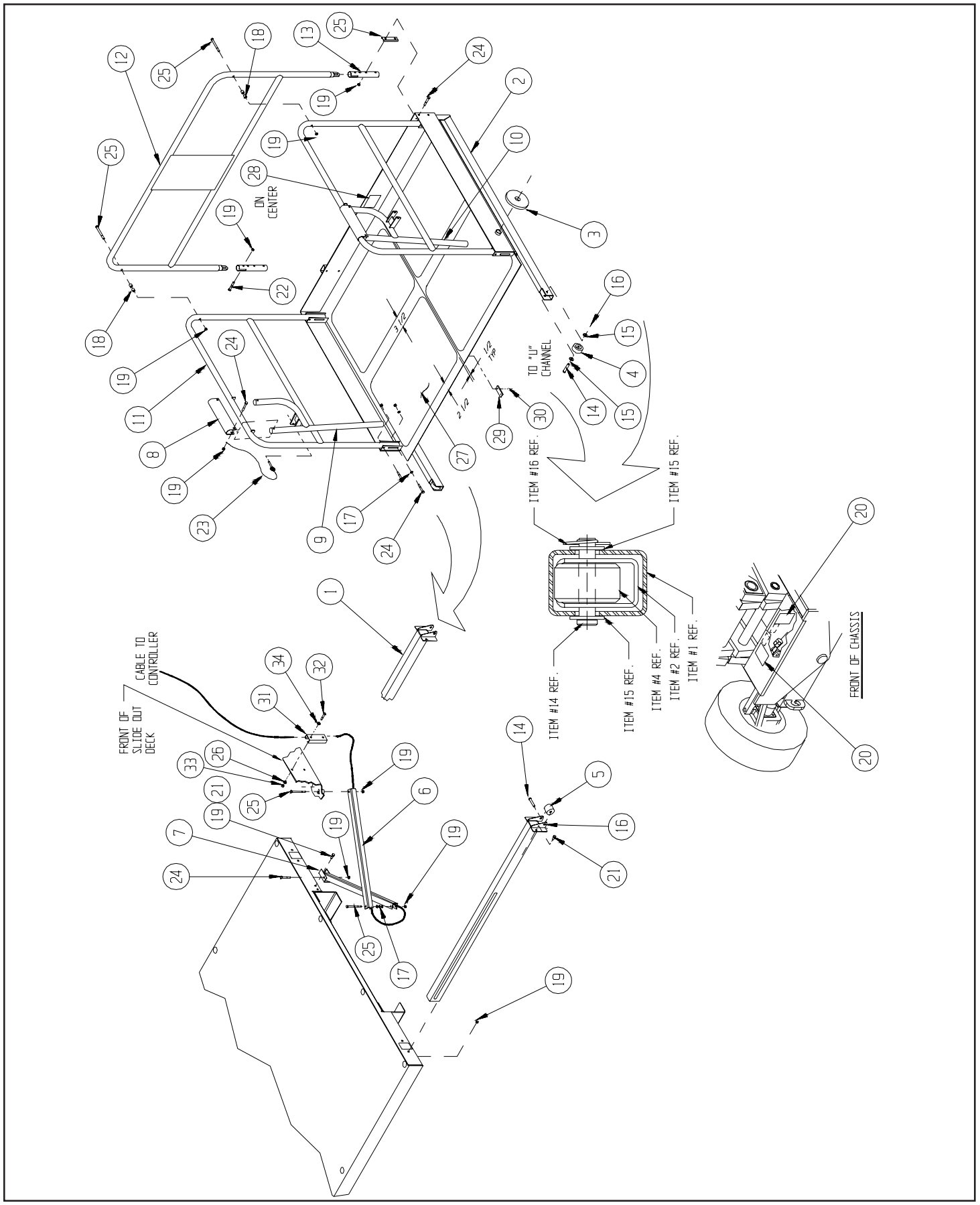
*** Platforms (67780-000) manufactured after Oct. 1996 will have front kick rails welded on.**


NOTES:
1. POSITION SLOTS TO INSIDE ON SIDE RAIL ASSEMBLIES.
SPREAD DU BEARING FOR SNUG FIT INSIDE #20.
PLACE 1 1/4" LEG OF #7 HERE
1" LEG UP TO INSIDE EDGE OF #20 PLATE
GATE DETAIL

SLIDEOUT DECK ASSEMBLY, LX31/41

67866-000

ITEM	PART	DESCRIPTION	QTY.
1	67744-000	GUIDE RAIL WELDMENT	2
2	67787-000	SLIDEOUT DECK WELDMENT	1
3	67760-001	WHEEL, SLIDEOUT DECK	2
4	67719-000	ROLLER	2
5	67720-000	ROLLER	2
6	67818-001	ARM, CABLE GUIDE	2
7	67786-001	BRACKET, CABLE GUIDE	1
8	67761-000	PIVOT, PUSH BAR	2
9	67862-001	HANDLE WELDMENT (L.H.)	1
10	67862-002	HANDLE WELDMENT (R.H.)	1
11	67776-001	GUARDRAIL WELDMENT	2
12	67778-000	GUARDRAIL WELDMENT	1
13	67755-001	SWING TUBE	2
14	11848-038	CLEVIS PIN, 1/2" DIA. X 2-1/2	4
15	11239-008	WASHER, FLAT 1/2" DIA. ASTM	4
16	11757-005	RUE RING	4
17	14996-006	WASHER, FLAT 3/8" DIA	11
18	67695-000	SPACER	4
19	11248-006	LOCKNUT, 3/8-16 UNC ESNA	23
20	66556-000	LABEL, WARNING DESCEND PLTFM	2
21	11254-008	SCR. HHC 3/8-16 UNC X 1	6
22	11254-014	SCR. HHC 3/8-16 UNC X 1 3/4	4
23	10414-000	LOCKING PIN ASSY 5/16" DIA.	2
24	11254-020	SCR. HHC 3/8-16 UNC X 2 1/2	13
25	11254-032	SCR. HHC 3/8-16 UNC X 4	4
26	11240-005	WASHER 5/16 FLAT STD	4
27	60086-000	SAFETY WALK (20 X 32)	4
28	66557-001	LABEL PLATFORM CAPCITY	1
29	63728-001	SLIDE BLOCK	1
30	26553-004	POP RIVET 3/16 DIA.(.250-.375)	2
31	63666-004	WIRE CHANNEL	1
32	11253-012	SCR. HHC 5/16-18 X 1-1/2	2
33	11248-005	NUT HEX 5/16-18 ESNA	2

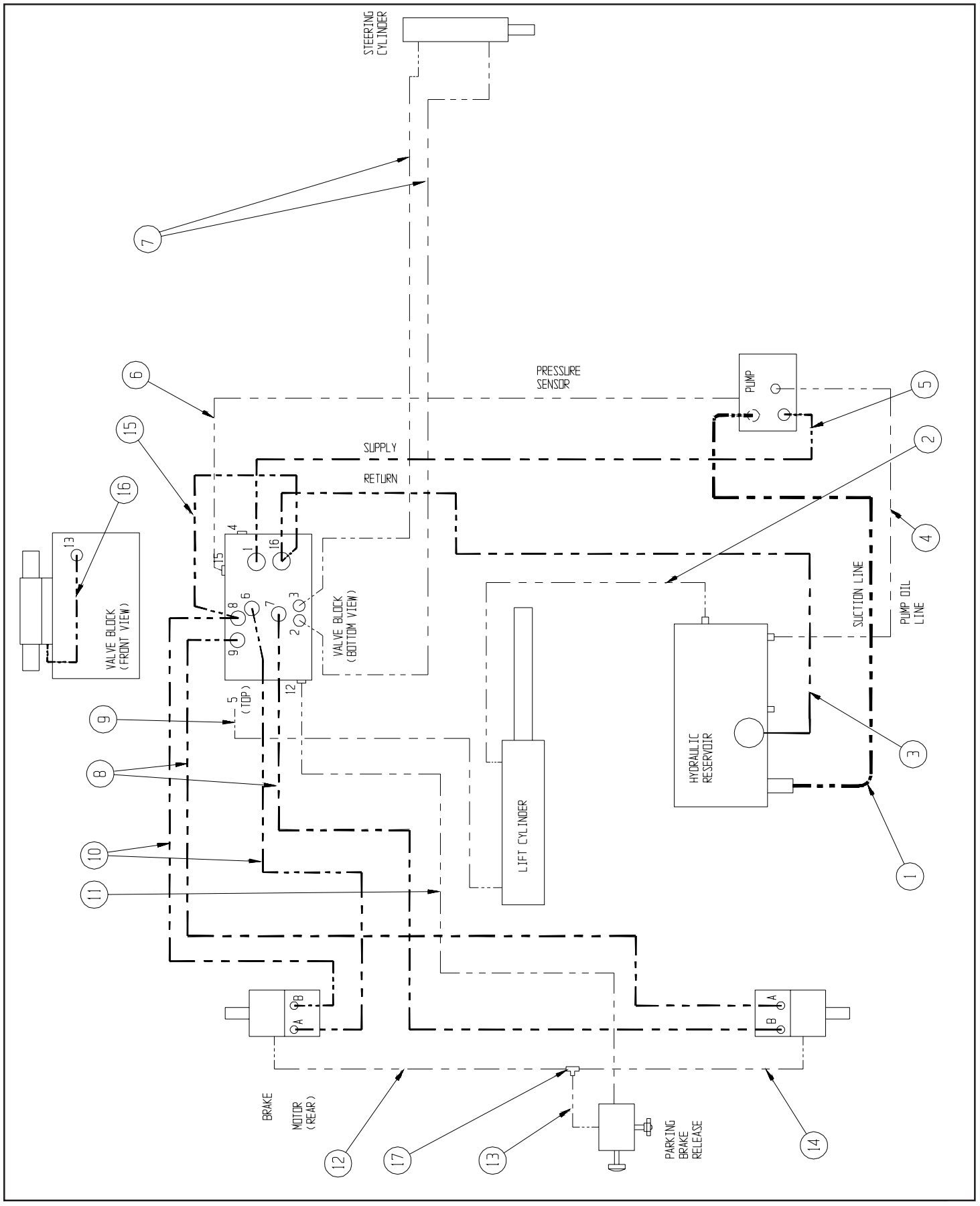

ON CENTER
TO "U" CHANNEL
ITEM #16 REF.
ITEM #15 REF.
ITEM #14 REF.
ITEM #15 REF.
ITEM #4 REF.
ITEM #2 REF.
ITEM #1 REF.
CABLE TO CONTROLLER
FRONT OF SLIDE OUT DECK
FRONT OF CHASSIS

HOSE ASSEMBLY, LX31/41

Two Wheel Drive

67533-000

ITEM	PART	DESCRIPTION	QTY.
1	67680-027	1-1/4 HOSE ASSY X 27 20FJX-20FJX 90°	1
2	67857-334	3/8 HOSE ASSY X 334 6FJX-6FJX 90°	1
3	67676-131	3/4 HOSE ASSY X 131 12FJX-12FJX 90°	1
4	67682-026	1/2 HOSE ASSY X 26 8FJX-8FJX 90°	1
5	67858-108	3/4 HOSE ASSY X 108 12FJX-12FJX	1
6	65234-096	1/4 HOSE ASSY X 96 4FJX-4FJX	1
7	67683-085	3/8 HOSE ASSY X 85 6FJX-6FJX45°	2
8	67677-144	5/8 HOSE ASSY X 144 10FJX-10FJX90°	2
9	67684-200	3/8 HOSE ASSY X 200 6FJX-6FJX90°	1
10	67677-112	5/8 HOSE ASSY X 112 10FJX-10FJX90°	2
11	65234-152	1/4 HOSE ASSY X 152 4FJX-4FJX	1
12	65234-014	1/4 HOSE ASSY X 46.5 4FJX-4FJX	1
13	65234-032	1/4 HOSE ASSY X 32 4FJX-4FJX	1
14	65234-001	1/4 HOSE ASSY X 20 4FJX-4FJX	1
15	67685-030	1/2 HOSE ASSY X 30 12MP-10FJX	1
16	67686-022	1/8 HOSE ASSY X 22 2MP-4FJX	1
17	20032-001	FITTING 4MJ-4MJ TEE	REF

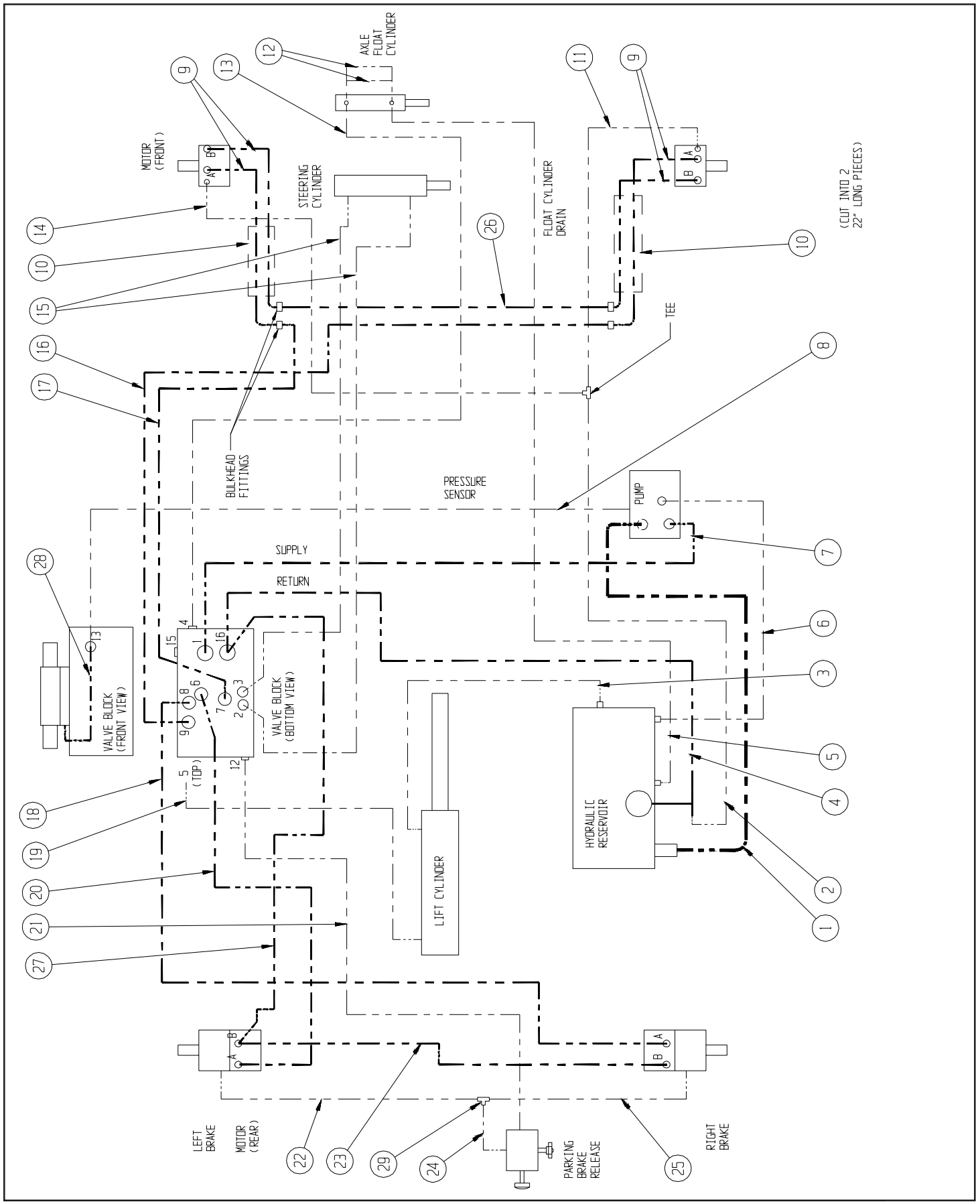

STEERING CYLINDER
PRESSURE SENSOR
PUMP
SUPPLY
RETURN
VALVE BLOCK (FRONT VIEW)
VALVE BLOCK (BOTTOM VIEW)
SUCTION LINE
PUMP OIL LINE
HYDRAULIC RESERVOIR
LIFT CYLINDER
BRAKE
MOTOR (REAR)
PARKING BRAKE RELEASE

HOSE ASSEMBLY, LX31/41

FOUR WHEEL DRIVE

67533-001

ITEM	PART	DESCRIPTION	QTY.
1	67680-027	1-1/4 HOSE ASSY X 27 20FJX-20FJX 90°	1
2	62192-009	1/4 HOSE ASSY X 65 4FJX-4FJX	1
3	67857-334	3/8 HOSE ASSY X 334 6FJX-6FJX90°	1
4	67676-131	3/4 HOSE ASSY X 131 12FJX-12FJX 90°	1
5	67681-152	1/4 HOSE ASSY X 152 4FJX-4FJX 90°	1
6	67682-026	1/2 HOSE ASSY X 26 8FJX-8FJX 90°	1
7	67858-108	3/4 HOSE ASSY X 108 12FJX-12FJX	1
8	65234-096	1/4 HOSE ASSY X 96 4FJX-4FJX	1
9	67679-044	1/2 HOSE ASSY X 44 10FJX-8FJX 45°	4
10	67758-099	HOSE GUARD - NYLON	1
11	67681-080	1/4 HOSE ASSY X 80 4FJX-4FJX 90°	1
12	67918-008	1/8 HOSE ASSY X 8 4FJX-4FJX	2
13	67681-100	1/4 HOSE ASSY X 100 4FJX-4FJX 90°	1
14	67681-115	1/4 HOSE ASSY X 115 4FJX-4FJX 90°	1
15	67683-085	3/8 HOSE ASSY X 85 6FJX-6FJX 45°	2
16	67677-090	5/8 HOSE ASSY X 90 10FJX-10FJX 90°	1
17	67677-055	5/8 HOSE ASSY X 55 10FJX-10FJX 90°	1
18	67677-144	5/8 HOSE ASSY X 144 10FJX-10FX J90°	1
19	67684-200	3/8 HOSE ASSY X 200 6FJX-6FJX 90°	1
20	67677-112	5/8 HOSE ASSY X 112 10FJX-10FJX 90°	1
21	65234-152	1/4 HOSE ASSY X 152 4FJX-4FJX	1
22	65234-014	1/4 HOSE ASSY X 46.5 4FJX-4FJX	1
23	67687-061	5/8 HOSE ASSY X 61 10FJX90-10FJX90	1
24	65234-032	1/4 HOSE ASSY X 32 4FJX-4FJX	1
25	65234-001	1/4 HOSE ASSY X 20 4FJX-4FJX	1
26	67687-100	5/8 HOSE ASSY X 100 10FJX90-10FJX90	1
27	67685-120	1/2 HOSE ASSY X 120 12MP-10FJX	1
28	67686-022	1/8 HOSE ASSY X 22 2MP-4FJX	1
29	20032-001	FITTING 4MJ-4MJ TEE	1

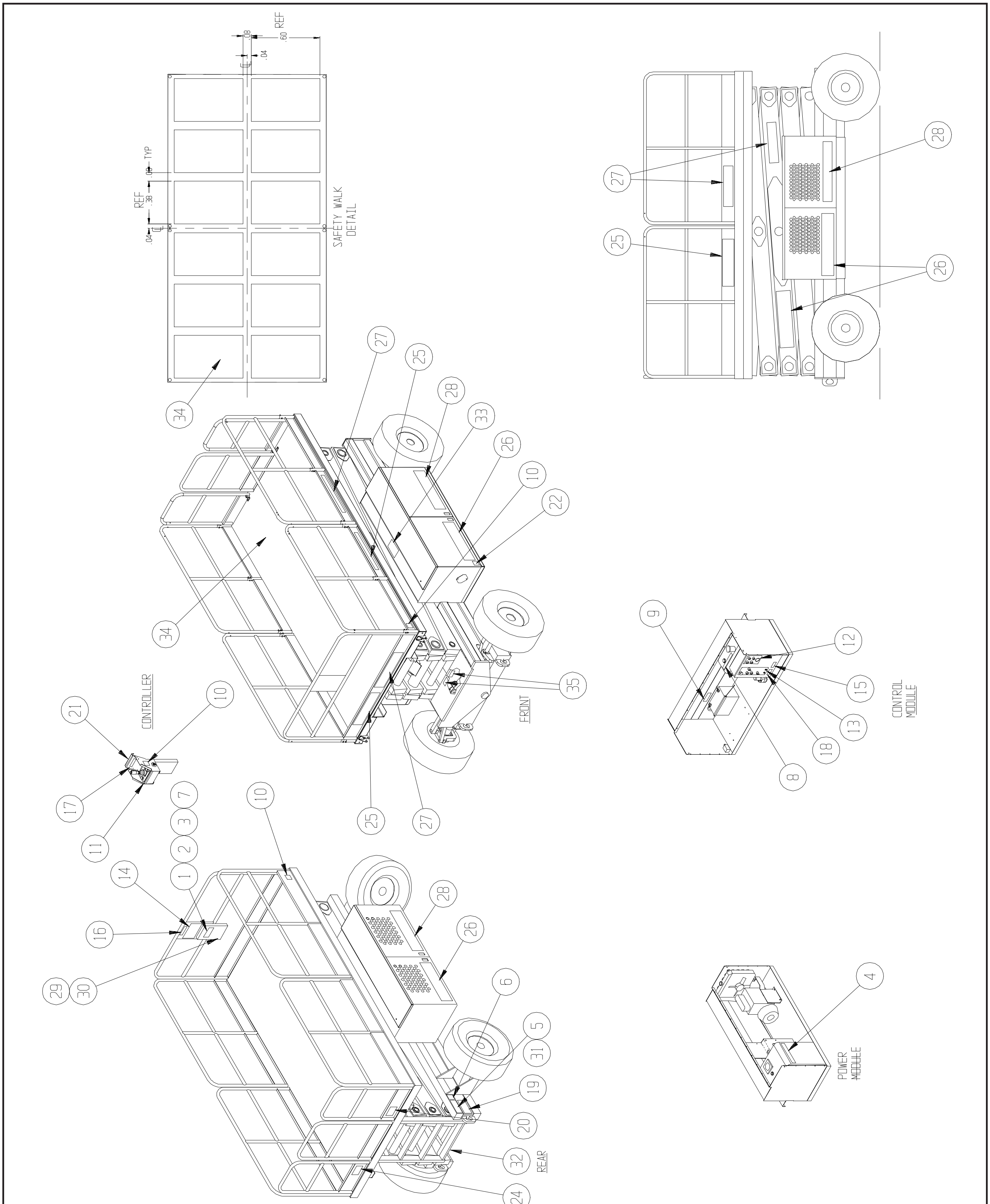

AXLE FLOAT CYLINDER
MOTOR (FRONT)
STEERING CYLINDER
FLOAT CYLINDER DRAIN
(CUT INTO 2 22" LONG PIECES)
TEE
BULKHEAD FITTINGS
PRESSURE SENSOR
PUMP
SUPPLY
RETURN
VALVE BLOCK (FRONT VIEW)
VALVE BLOCK (BOTTOM VIEW)
HYDRAULIC RESERVOIR
LIFT CYLINDER
LEFT BRAKE
MOTOR (REAR)
PARKING BRAKE RELEASE
RIGHT BRAKE

LABEL KIT, LX31
Two Wheel Drive
GAS 67532-000, DIESEL 67532-001

ITEM	PART	DESCRIPTION	GAS QTY.	DIESEL QTY.
1	10076-000	MANUAL CASE	1	1
2	10076-001	LABEL-ATTENTION	1	1
3	67903-000	USER MANUAL LX-SERIES	1	1
4	60197-000	LABEL-HYD. FLUID	1	1
5	61205-000	NAME PLATE	1	1
6	61220-001	LABEL-ANSI	1	1
7	60577-000	ANSI MANUAL	1	1
8	64166-000	LABEL-UNLEADED FUEL	1	
	27898-000	LABEL-DIESEL FUEL		1
9	66552-000	LABEL-WARNING BATTERY	1	1
10	64444-000	LABEL-USA	4	4
11	67642-000	LABEL-CONTROLLER	1	1
12	67638-000	LABEL-MOTOR CONTROLS	1	1
13	67639-000	LABEL-PLATFORM CONTROLS	1	1
14	66550-009	LABEL-DANGER	11	
15	66551-002	LABEL-CAUTION	1	1
16	66551-003	LABEL-DANGER TIPPING	1	1
17	66554-000	LABEL-READ	1	1
18	66555-000	LABEL-DO NOT ADJUST	1	1
19	63423-000	LABEL-BRAKE RELEASE	1	1
20	66562-000	LABEL-TIRE PSI 50	1	1
21	61515-000	LABEL-LIFT HERE	1	1
22	66568-000	LABEL-WARNING	1	1
23	66558-000	LABEL, EMERG. LOWERING	2	2
24	66557-010	LABEL-MAX LOAD	2	2
25	61683-005	LABEL-UPRIGHT 4 1/2	3	3
26	61683-007	LABEL-UPRIGHT 5 1/2	4	4
27	67644-002	LABEL-LX31 2WD	5	5
28	67644-001	LABEL-LX31 2WD	2	2
29	11248-004	NUT HEX ESNA 1/4-20UNC	4	4
30	11525-008	SCREW HHC 1/4-20UNC X 1	4	4
31	65368-000	DRIVE SCREW	4	4
32	60830-000	SAFETY WALK	4	4
33	66561-001	LABEL, MAINT. BRACE	1	1
34	60086-000	SAFETY WALK 20 X 32	12	12

LABEL KIT, LX31
Four Wheel Drive
GAS 67532-002, DIESEL 67532-003

ITEM	PART	DESCRIPTION	GAS QTY.	DIESEL QTY.
1	10076-000	MANUAL CASE	1	1
2	10076-001	LABEL-ATTENTION	1	1
3	67903-000	USER MANUAL LX-SERIES	1	1
4	60197-000	LABEL-HYD. FLUID	1	1
5	61205-000	NAME PLATE	1	1
6	61220-001	LABEL-ANSI	1	1
7	60577-000	ANSI MANUAL	1	1
8	64166-000	LABEL-UNLEADED FUEL	1	
	27898-000	LABEL-DIESEL FUEL		1
9	66552-000	LABEL-WARNING BATTERY	1	1
10	64444-000	LABEL-USA	4	4
11	67642-000	LABEL-CONTROLLER	1	1
12	67638-000	LABEL-MOTOR CONTROLS	1	1
13	67639-000	LABEL-PLATFORM CONTROLS	1	1
14	66550-009	LABEL-DANGER	1	1
15	66551-002	LABEL-CAUTION	1	1
16	66551-003	LABEL-DANGER TIPPING	1	1
17	66554-000	LABEL-READ	1	1
18	66555-000	LABEL-DO NOT ADJUST	1	1
19	63423-000	LABEL-BRAKE RELEASE	1	1
20	66562-000	LABEL-TIRE PSI 50	1	1
21	61515-000	LABEL-LIFT HERE	1	1
22	66568-000	LABEL-WARNING	1	1
23	66558-000	LABEL, EMERG. LOWERING	2	2
24	66557-010	LABEL-MAX LOAD	2	2
25	61683-005	LABEL-UPRIGHT 4 1/2	3	3
26	61683-007	LABEL-UPRIGHT 5 1/2	4	4
27	67644-006	LABEL-LX31 4WD	5	5
28	67644-005	LABEL LX31 4WD	2	2
29	11248-004	NUT HEX ESNA 1/4-20UNC	4	4
30	11525-008	SCREW HHC 1/4-20UNC X 1	4	4
31	65368-000	DRIVE SCREW	4	4
32	60830-000	SAFETY WALK	4	4
33	66561-001	LABEL, MAINT. BRACE	1	1
34	60086-000	SAFETY WALK 20 X 32	12	12



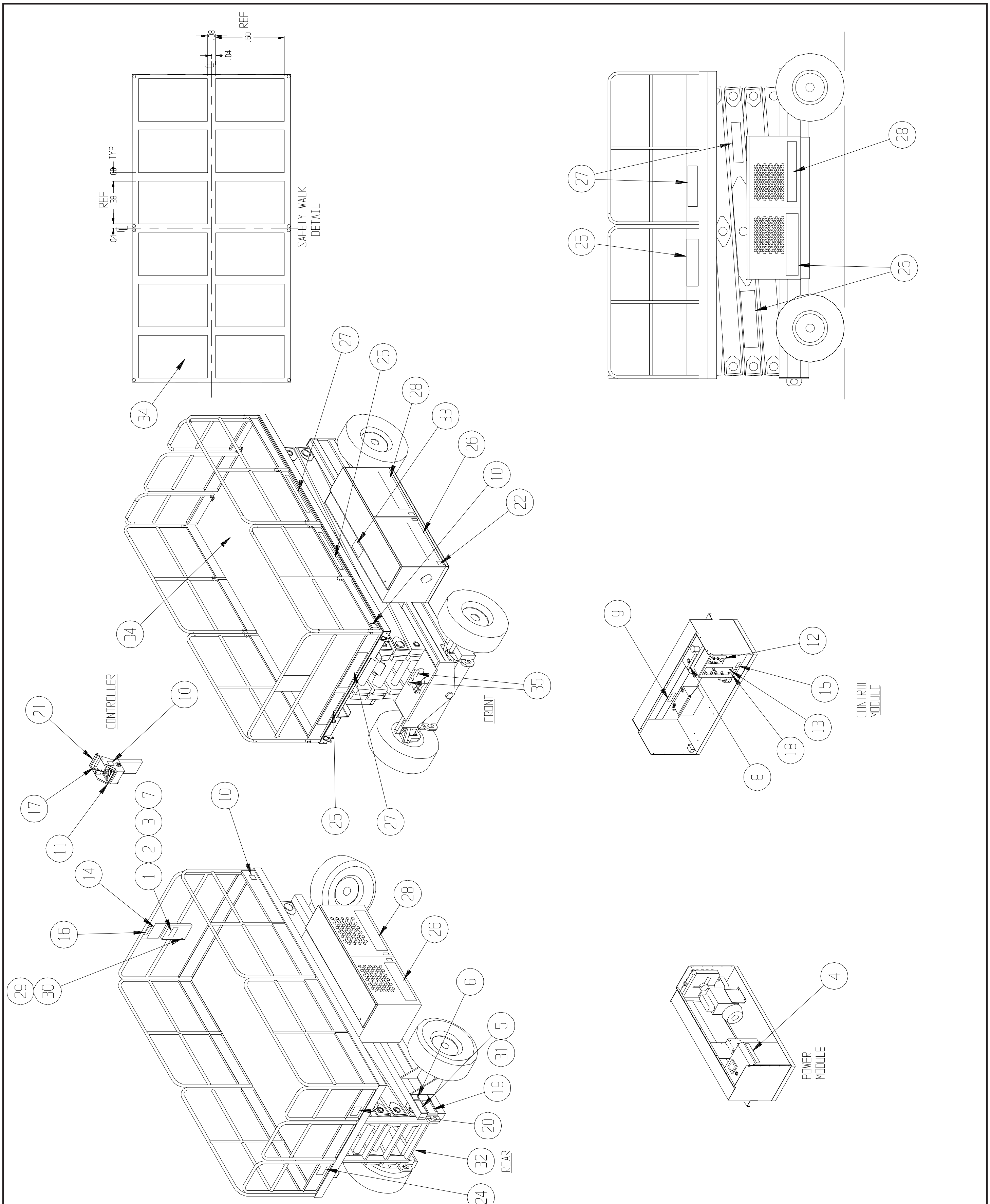
SAFETY WALK DETAIL
CONTROLLER
FRONT
REAR
CONTROL MODULE
POWER MODULE

LABEL KIT, LX41
Two Wheel Drive
GAS 67532-004, DIESEL 67532-005

ITEM	PART	DESCRIPTION	GAS QTY.	DIESEL QTY.
1	10076-000	MANUAL CASE	1	1
2	10076-001	LABEL-ATTENTION	1	1
3	67903-000	USER MANUAL LX-SERIES	1	1
4	60197-000	LABEL-HYD. FLUID	1	1
5	61205-000	NAME PLATE	1	1
6	61220-001	LABEL-ANSI	1	1
7	60577-000	ANSI MANUAL	1	1
8	64166-000	LABEL-UNLEADED FUEL	1	
	27898-000	LABEL-DIESEL FUEL		1
9	66552-000	LABEL-WARNING BATTERY	1	1
10	64444-000	LABEL-USA	4	4
11	67642-000	LABEL-CONTROLLER	1	1
12	67638-000	LABEL-MOTOR CONTROLS	1	1
13	67639-000	LABEL-PLATFORM CONTROLS	1	1
14	66550-009	LABEL-DANGER	1	1
15	66551-002	LABEL-CAUTION	1	1
16	66551-003	LABEL-DANGER TIPPING	1	1
17	66554-000	LABEL-READ	1	1
18	66555-000	LABEL-DO NOT ADJUST	1	1
19	63423-000	LABEL-BRAKE RELEASE	1	1
20	66562-000	LABEL-TIRE PSI 50	1	1
21	61515-000	LABEL-LIFT HERE	1	1
22	66568-000	LABEL-WARNING	1	1
23	66558-000	LABEL, EMERG. LOWERING	2	2
24	66557-007	LABEL-MAX LOAD	2	2
25	61683-005	LABEL-UPRIGHT 4 1/2	3	3
26	61683-007	LABEL-UPRIGHT 5 1/2	4	4
27	67644-004	LABEL-LX31 2WD	5	5
28	67644-003	LABEL-LX31 2WD	2	2
29	11248-004	NUT HEX ESNA 1/4-20UNC	4	4
30	11525-008	SCREW HHC 1/4-20UNC X 1	4	4
31	65368-000	DRIVE SCREW	4	4
32	60830-000	SAFETY WALK	4	4
33	66561-001	LABEL, MAINT. BRACE	1	1
34	60086-000	SAFETY WALK 20 X 32	12	12

LABEL KIT, LX41
Four Wheel Drive
GAS 67532-006, DIESEL 67532-007

ITEM	PART	DESCRIPTION	GAS QTY.	DIESEL QTY.
1	10076-000	MANUAL CASE	1	1
2	10076-001	LABEL-ATTENTION	1	1
3	67903-000	USER MANUAL LX-SERIES	1	1
4	60197-000	LABEL-HYD. FLUID	1	1
5	61205-000	NAME PLATE	1	1
6	61220-001	LABEL-ANSI	1	1
7	60577-000	ANSI MANUAL	1	1
8	64166-000	LABEL-UNLEADED FUEL	1	
	27898-000	LABEL-DIESEL FUEL		1
9	66552-000	LABEL-WARNING BATTERY	1	1
10	64444-000	LABEL-USA	4	4
11	67642-000	LABEL-CONTROLLER	1	1
12	67638-000	LABEL-MOTOR CONTROLS	1	1
13	67639-000	LABEL-PLATFORM CONTROLS	1	1
14	66550-009	LABEL-DANGER	1	1
15	66551-002	LABEL-CAUTION	1	1
16	66551-003	LABEL-DANGER TIPPING	1	1
17	66554-000	LABEL-READ	1	1
18	66555-000	LABEL-DO NOT ADJUST	1	1
19	63423-000	LABEL-BRAKE RELEASE	1	1
20	66562-000	LABEL-TIRE PSI 50	1	1
21	61515-000	LABEL-LIFT HERE	1	1
22	66568-000	LABEL-WARNING	1	1
23	66558-000	LABEL, EMERG. LOWERING	2	2
24	66557-007	LABEL-MAX LOAD	2	2
25	61683-005	LABEL-UPRIGHT 4 1/2	3	3
26	61683-007	LABEL-UPRIGHT 5 1/2	4	4
27	67644-008	LABEL-LX31 2WD	5	5
28	67644-007	LABEL-LX31 2WD	2	2
29	11248-004	NUT HEX ESNA 1/4-20UNC	4	4
30	11525-008	SCREW HHC 1/4-20UNC X 1	4	4
31	65368-000	DRIVE SCREW	4	4
32	60830-000	SAFETY WALK	4	4
33	66561-001	LABEL, MAINT. BRACE	1	1
34	60086-000	SAFETY WALK 20 X 32	12	12



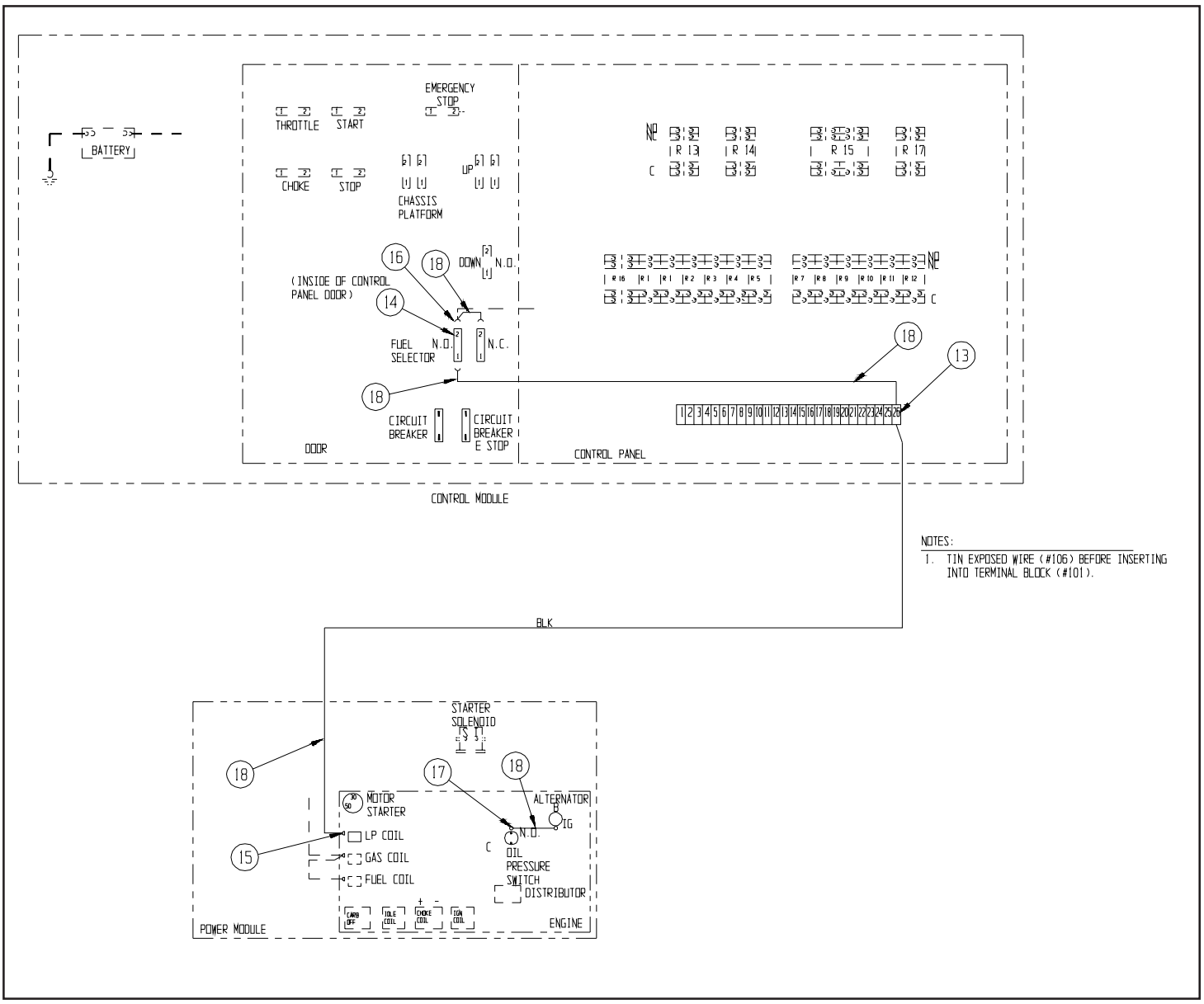
SAFETY WALK DETAIL
CONTROLLER
FRONT
REAR
CONTROL MODULE
POWER MODULE

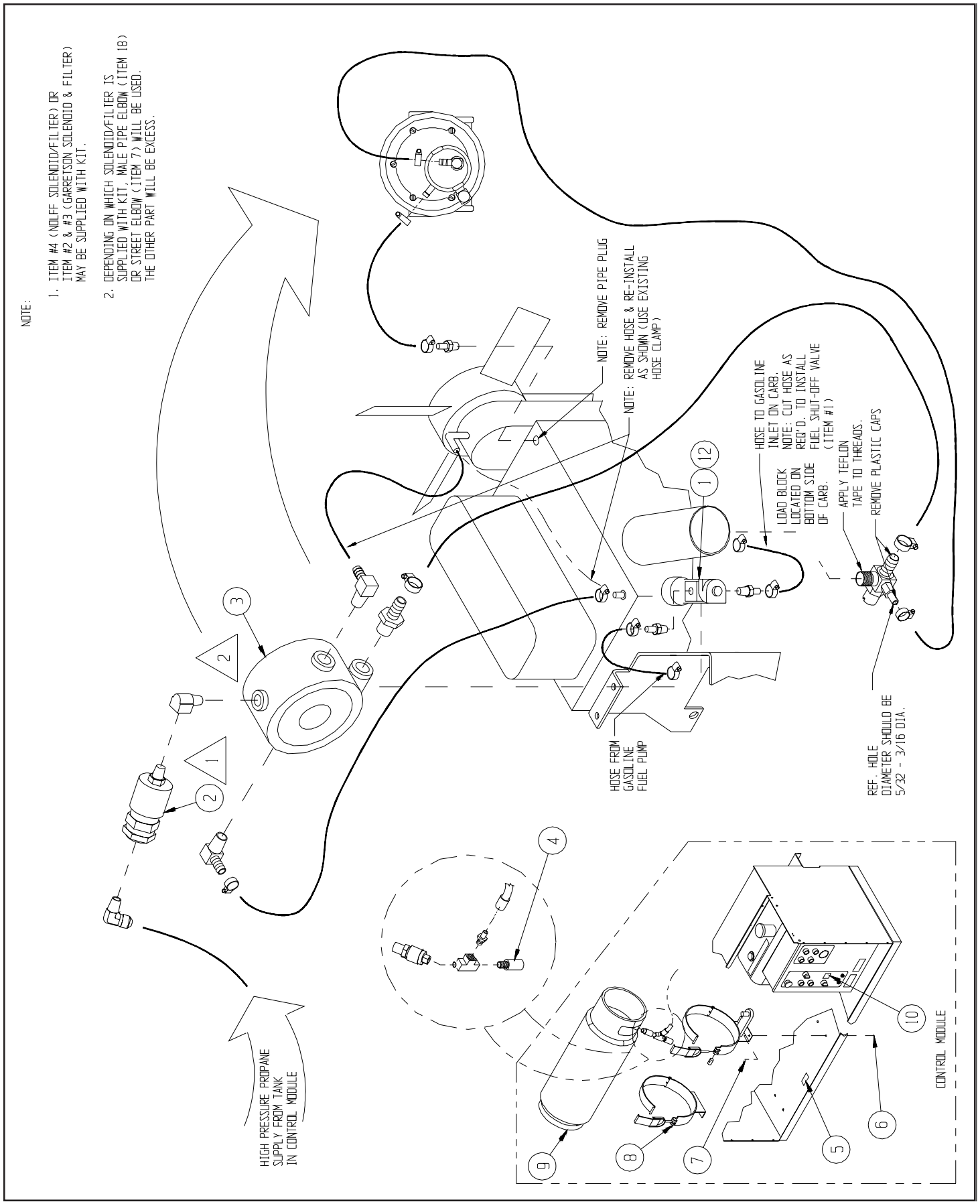
DUAL FUEL OPTION, LX31/41

67905-000

ITEM	PART	DESCRIPTION	QTY.
1	63934-004	GASOLINE SHUT-OFF VALVE	1
2	67615-003	SOLENOID/FILTER	1
3	67615-004	REGULATOR / VAPORIZER	1
4	67615-005	RELIEF VALVE 400 PSI	1
5	64189-001	DECAL	1
6	11248-006	LOCKNUT 3/8-16 UNC ESNA	4
7	11254-008	SCRW, HHC 3/8-16 UNC X 1	4
8	27823-000	TANK MOUNTING BRACKET	1
9	27934-003	FUEL TANK, PROPANE	1

ITEM	PART	DESCRIPTION	QTY.
10	64421-000	DECAL	1
11	11252-006	SCRW, HHC 1/4-20 UNC X 3/4	2
12	11248-004	LOCKNUT, 1/4-20 UNC ESNA	2
13	67660-001	TERM BLOCK (TAN)	1
14	64443-001	CONTACT BLOCK N.O.	1
15	29616-002	TERMINAL, FEMALE PUSH 16-14GA .25	1
16	29610-006	CONN FORK 16-14GA. #6	2
17	29601-011	TERMINAL, RING 16-14GA. #6	2
18	29452-099	WIRE, 16 AWG BLACK	13'



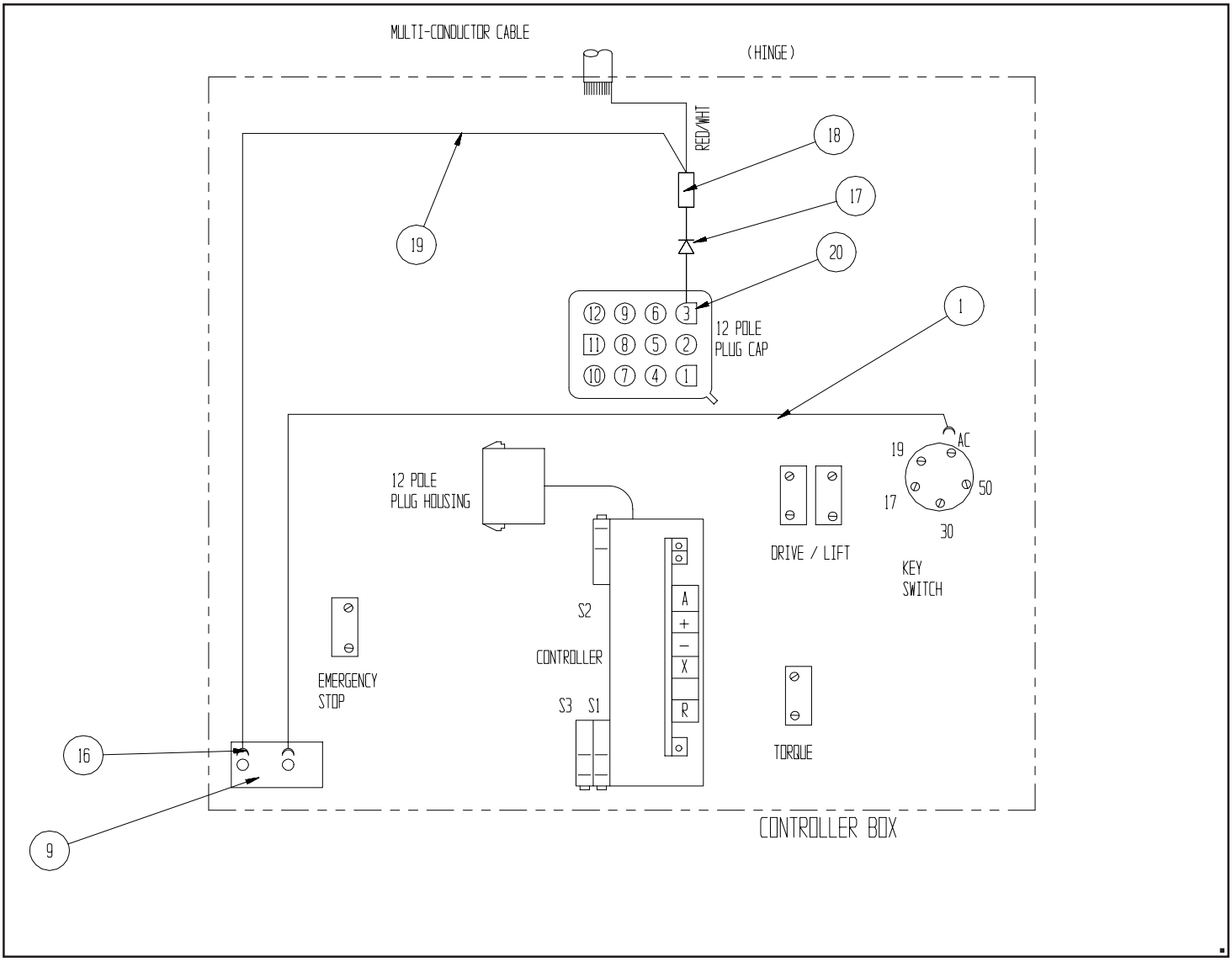

NOTE:
1. ITEM #4 (NOLFF SOLENOID/FILTER) OR ITEM #2 & #3 (GARRETSON SOLENOID & FILTER) MAY BE SUPPLIED WITH KIT.
2. DEPENDING ON WHICH SOLENOID/FILTER IS SUPPLIED WITH KIT, MALE PIPE ELBOW (ITEM 18) OR STREET ELBOW (ITEM 7) WILL BE USED. THE OTHER PART WILL BE EXCESS.
NOTE: REMOVE PIPE PLUG
NOTE: REMOVE HOSE & RE-INSTALL AS SHOWN (USE EXISTING HOSE CLAMP)
HOSE TO GASOLINE INLET ON CARB. NOTE: CUT HOSE AS REQ'D. TO INSTALL FUEL SHUT-OFF VALVE (ITEM #1)
LOAD BLOCK LOCATED ON BOTTOM SIDE OF CARB.
APPLY TEFLON TAPE TO THREADS.
REMOVE PLASTIC CAPS
HOSE FROM GASOLINE FUEL PUMP
REF. HOLE DIAMETER SHOULD BE 5/32 - 3/16 DIA.
HIGH PRESSURE PROPANE SUPPLY FROM TANK IN CONTROL MODULE
CONTROL MODULE

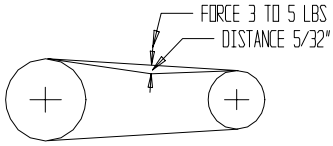
GENERATOR OPTION

GASOLINE & PROPANE

67848-000

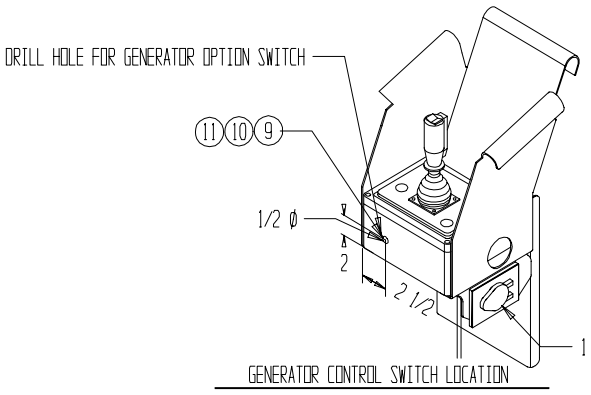
ITEM	PART	DESCRIPTION	QTY
1	29454-099	WIRE, 16 GA	1 FT
2	67907-000	POWER TO PLATFORM OPT. (NOT SHOWN)	1
4	27979-000	GENERATOR	1
5	64212-000	CORD ASSY	1
6	63949-042	SHEAVE, GENERATOR	1
7	11994-010	V-BELT	1
9	12797-000	SWITCH, TOGGLE	1
10	08271-000	SWITCH GUARD	1
11	64211-000	DECAL, ON-OFF	1
12	11254-010	BOLT 3/8-16 X 1 1/4	8
13	11248-006	ESNT 3/8-16	8
14	67875-000	RADIATOR BRACKET	1
15	64389-000	MOUNTING PLATE, GENERATOR	1
16	29610-004	CONN FORK 16-14 #10	3
17	29825-002	DIODE, 3 AMP	1
18	29620-002	CONN, BUTT 16 GA	1
19	29483-099	WIRE 16 GA RED/WHT	1 FT
20	63956-002	PIN, MALE CONTACT	1

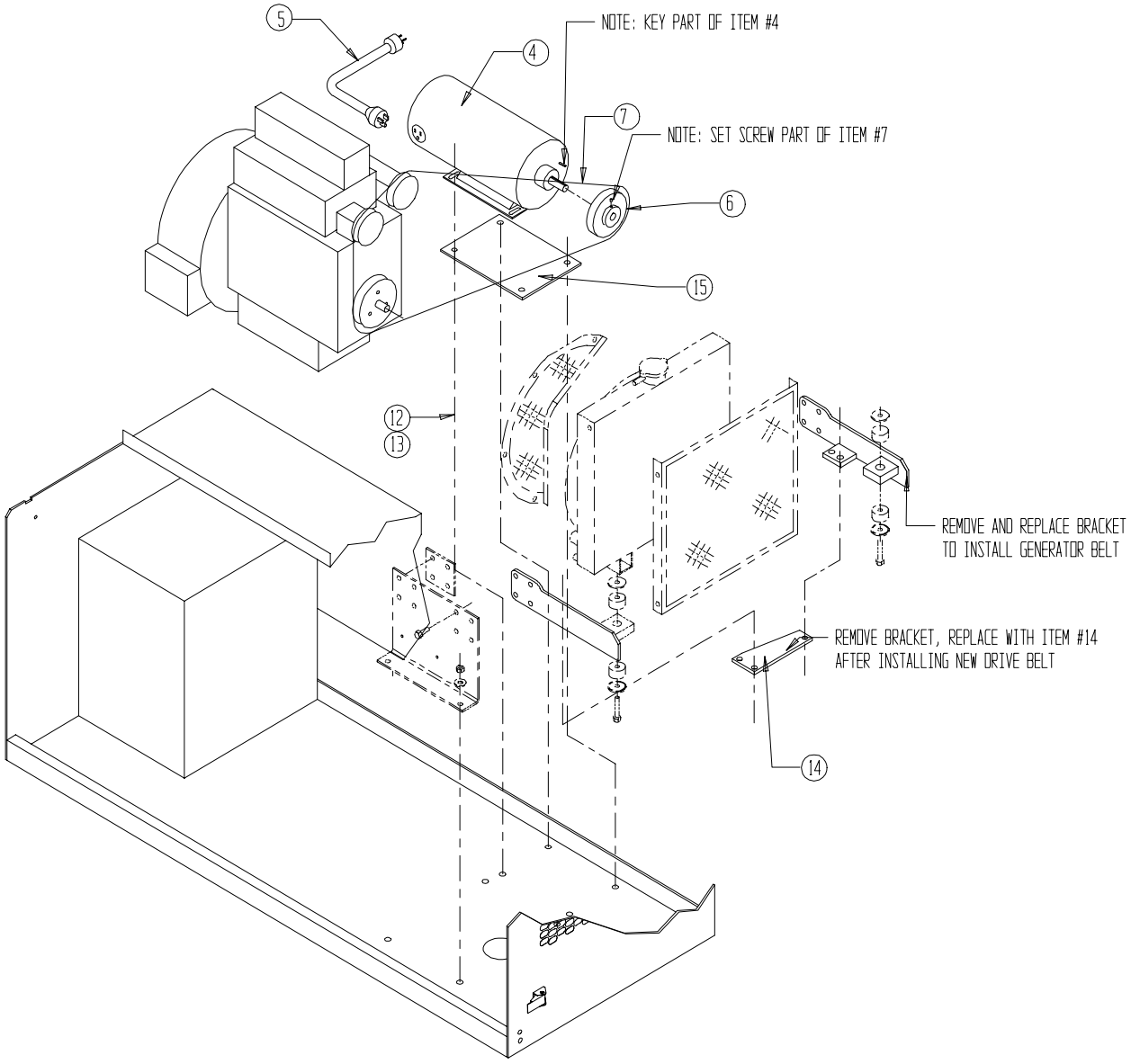




BELT TENSION DETAIL

NOTES:
1. INSTALL ITEMS AS SHOWN AND CHECK ALIGNMENT OF ITEMS #6 BEFORE INSTALLING ITEM #7. ITEM #6 SHOULD BE PARALLEL AND INLINE USING A STRAIGHT EDGE.
2. APPLY TENSION TO ITEM #5 BY MOVING ITEM #6 SECURE WITH MOUNTING HARDWARE AS SPECIFIED BELT SHOULD DEFLECT AS SHOWN 5/32" WITH 3-5 LBS FORCE.
3. SET HIGH ENGINE SPEED TO 3450 RPM +50 RPM / -0 RPM
4. REPLACE STD FAN BELT WITH LONGER BELT (ITEM #7)



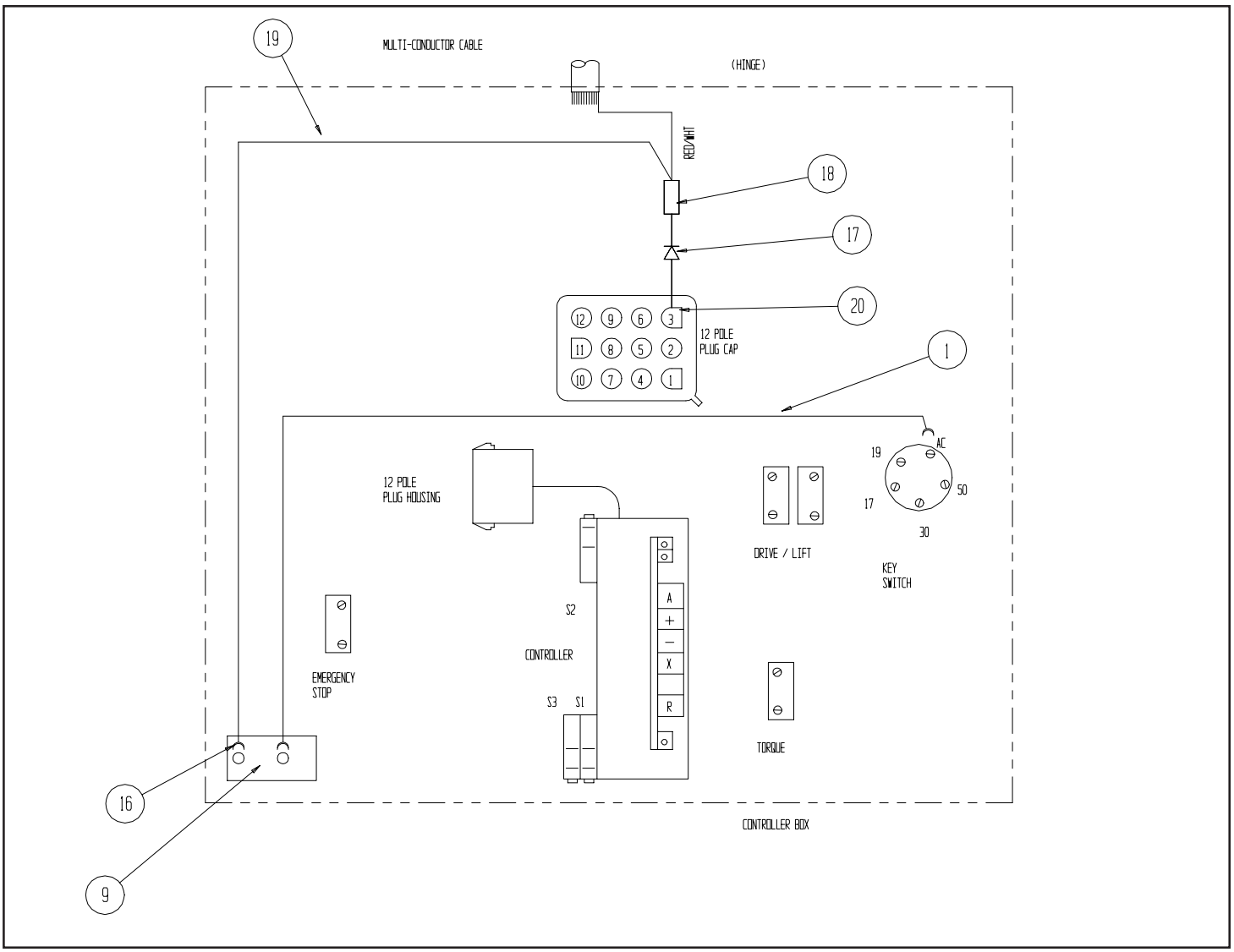


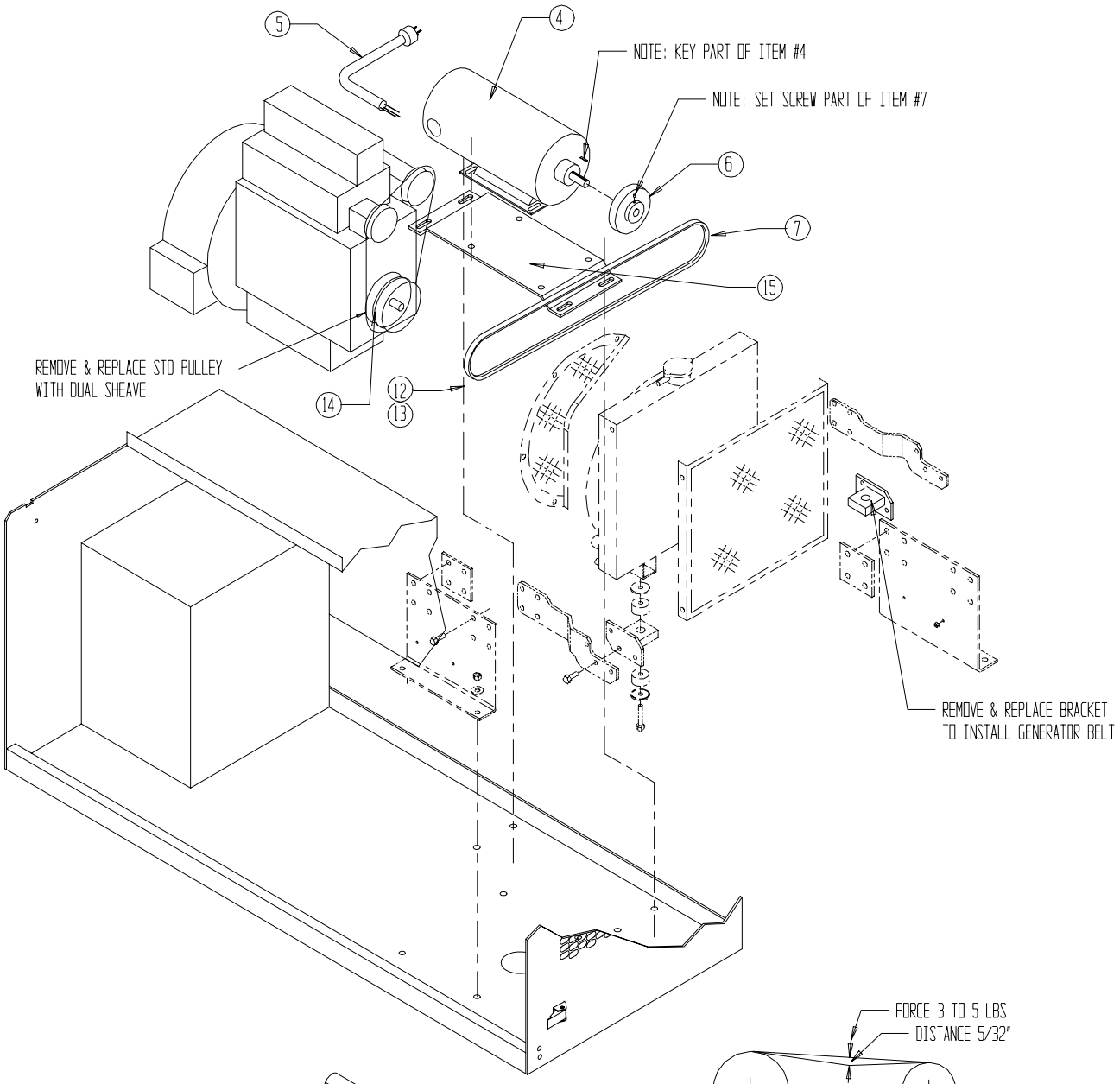
GENERATOR OPTION

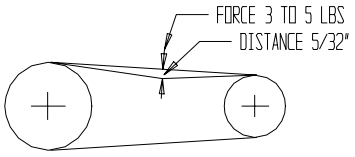
DIESEL

67849-000

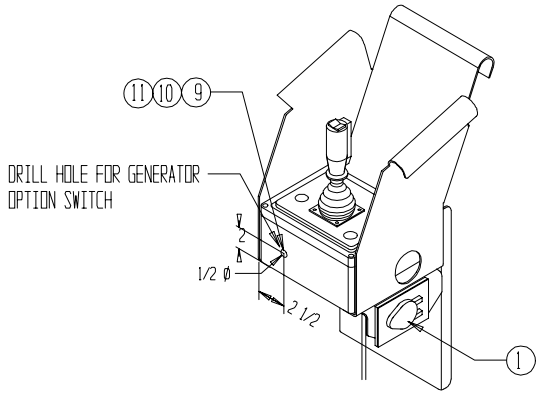
ITEM	PART	DESCRIPTION	QTY
1	29454-099	WIRE, 16 GA RED	1 FT
2	67907-000	POWER TO PLATFORM OPT. (NOT SHOWN)	1
4	27979-001	WINCO GENERATOR	1
5	64212-001	CORD ASSY	1
6	63949-042	SHEAVE, GENERATOR	1
7	11994-002	V-BELT 3L-310	1
9	12797-000	SWITCH, TOGGLE	1
10	08271-000	SWITCH GUARD	1
11	64211-000	DECAL, ON-OFF	1
12	11254-010	BOLT 3/8-16 X 1 1/4	8
13	11248-006	ESNT 3/8-16	8
14	67614-021	DUAL SHEAVE - KUBOTA #17213-74281	1
15	65916-000	MOUNTING PLATE, GENERATOR	1
16	29610-004	CONN FORK 16-14 #10	3
17	29825-002	DIODE, 3 AMP	1
18	29620-002	CONN, BUTT 16 GA	1
19	29483-099	WIRE 16 GA, RED WHT	1 FT
20	63956-002	PIN, MALE CONTACT	1







BELT TENSION DETAIL



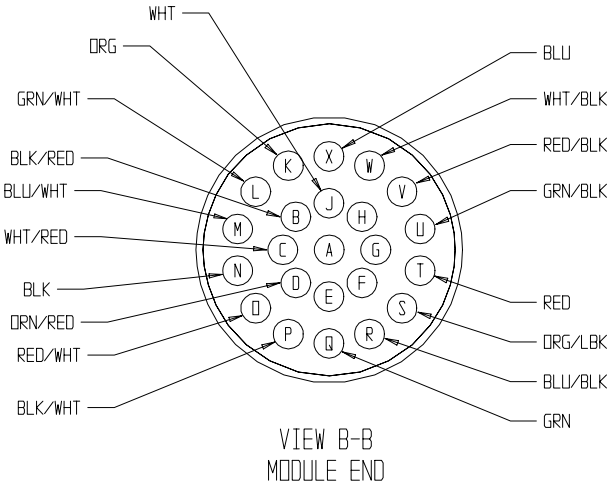
GENERATOR CONTROL SWITCH LOCATION

NOTES:

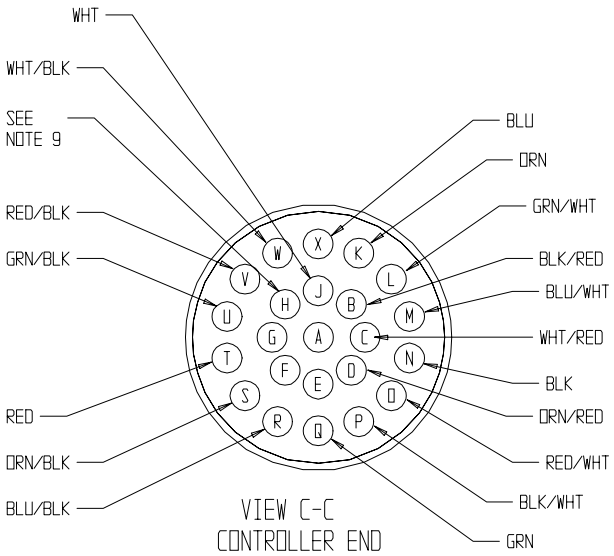
1. INSTALL ITEMS AS SHOWN AND CHECK ALIGNMENT OF ITEMS #6 BEFORE INSTALLING ITEM #7. ITEM #6 SHOULD BE PARALLEL AND INLINE USING A STRAIGHT EDGE.
2. APPLY TENSION TO BELT (ITEM #7) BY MOVING GENERATOR (ITEM #4). SECURE WITH MOUNTING HARDWARE AS SPECIFIED BELT SHOULD DEFLECT AS SHOWN 5/32" WITH 3-5 LBS FORCE.
3. SET HIGH ENGINE SPEED TO 3000 RPM +0/-50 RPM

REMOVABLE CONTROLLER OPTION
LX 31/41
61898-002

ITEM	PART	DESCRIPTION	QTY
1	28800-003	PLUG CONNECTOR (FEMALE)	1
2	28800-004	PIN CONTACT (MALE)	15
3	28800-015	PLUG SEALING	16
4	28800-016	RECEPTACLE W/ CLAMP (MALE)	1
5	28800-005	SOCKET CONTACT (FEMALE)	15
6	30719-001	110 VAC BRACKET	1
7	11254-020	SCREW HHC GRD5 3/8-16UNC X 2 1/2	2
8	11240-006	WASHER 3/8 STD FLAT	4
9	11248-006	NUT HEX ESNA 3/8-16	2

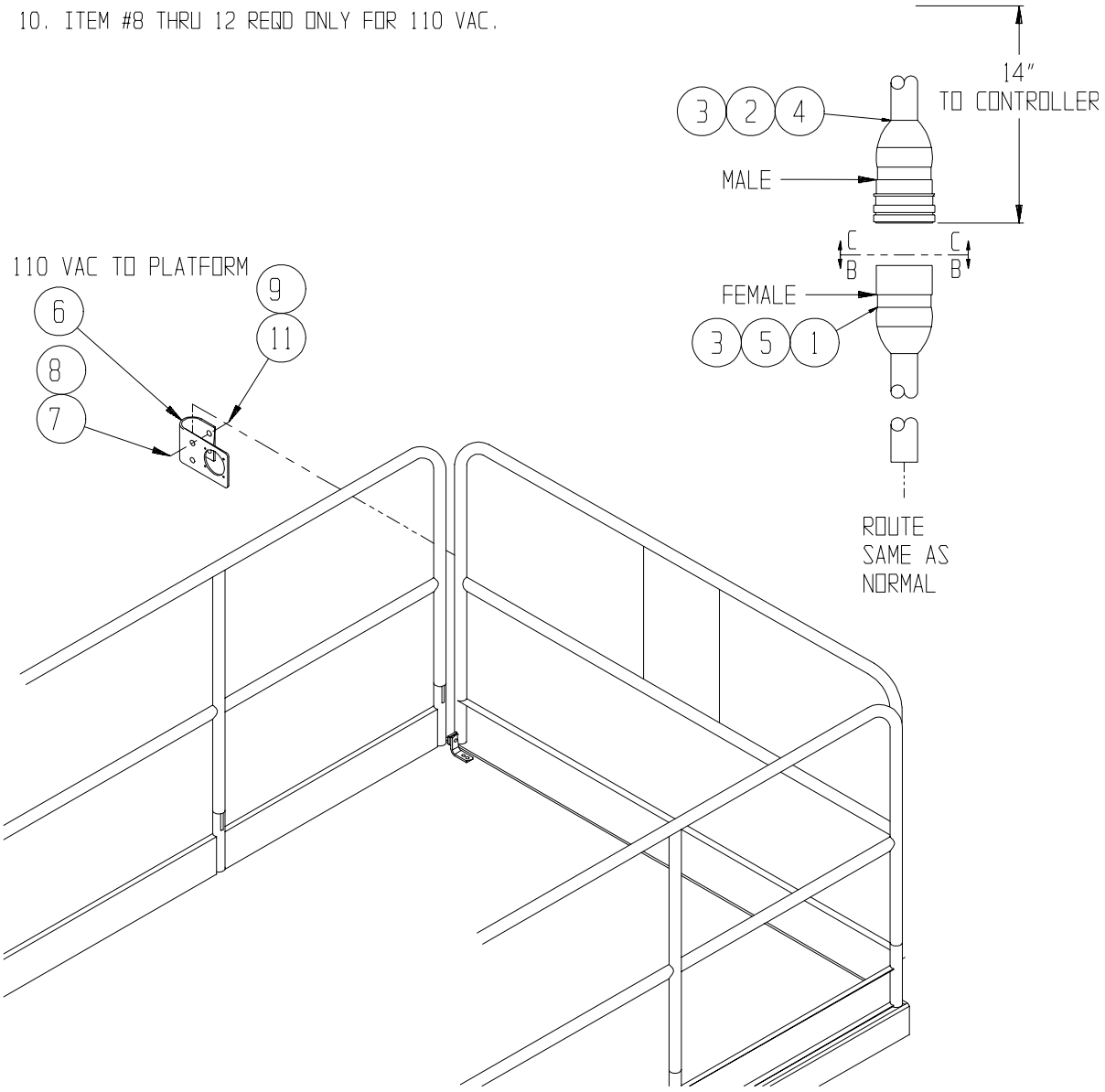


VIEW B-B
MODULE END



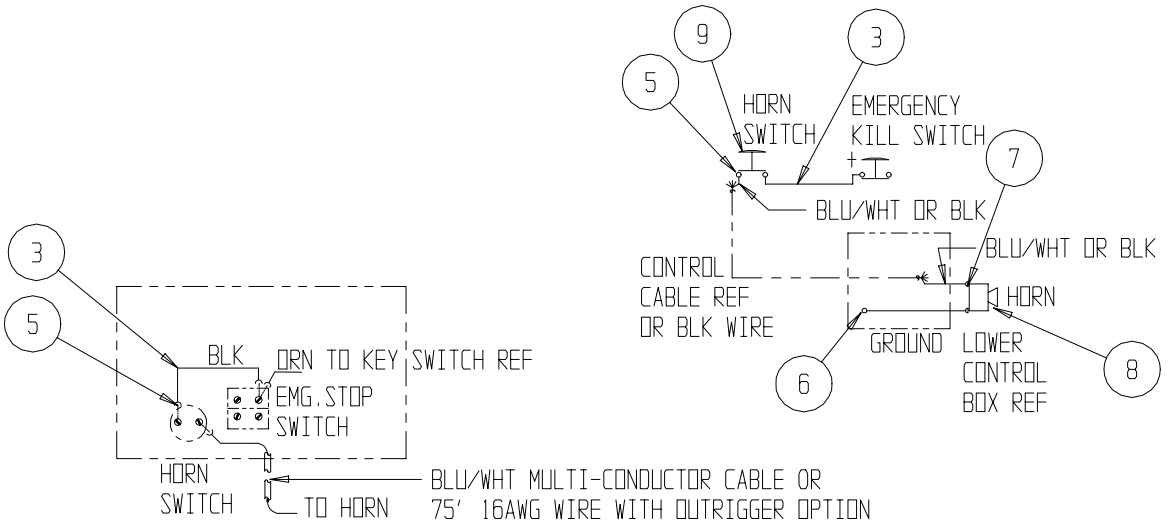
VIEW C-C
CONTROLLER END

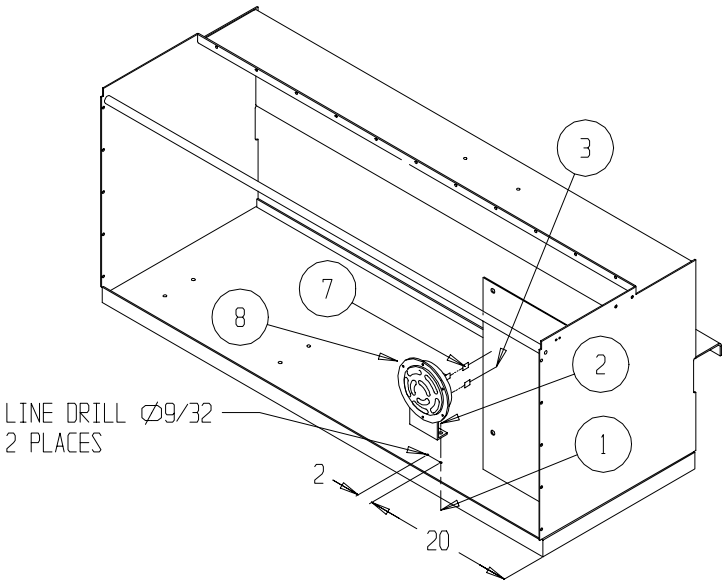
1. CUT OFF CONTROL CABLE 14 INCHES BELOW STRAIN RELIEF ON CONTROLLER.
2. CUT OUTER CABEL COVER OF LINKAGE CABEL BACK APPROXIMATELY 1-1/2 INCH AND STRIP APPROXIMATELY 1/4 INCH OF EACH END.
3. CRIMP SOCKETS (28800-005) ONTO WIRE ENDS AND INSERT INTO CONNECTOR (28800-016). REF. VIEW B-B.
4. CUT OUTER CABEL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

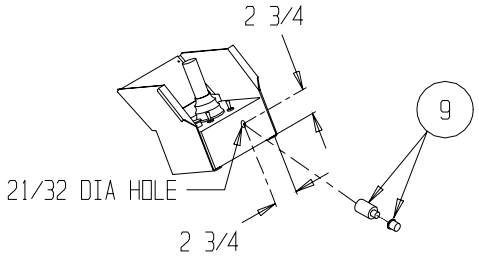


HORN OPTION
LX 31/41
67908-000

ITEM	PART	DESCRIPTION	QTY
1	11252-008	SCREW HHC 1/4-20 X 1	2
2	11248-004	NUT HEX 1/4-20	2
3	29452-099	WIRE 16 GA BLACK	75 FT
4	63917-000	SWITCH PUSHBUTTON	1
5	29610-002	CONNECTOR FORK	3
6	29601-014	CONNECTOR RING	1
7	29615-002	CONECTOR PUSH	2
8	29958-001	HORN 24VDC	1



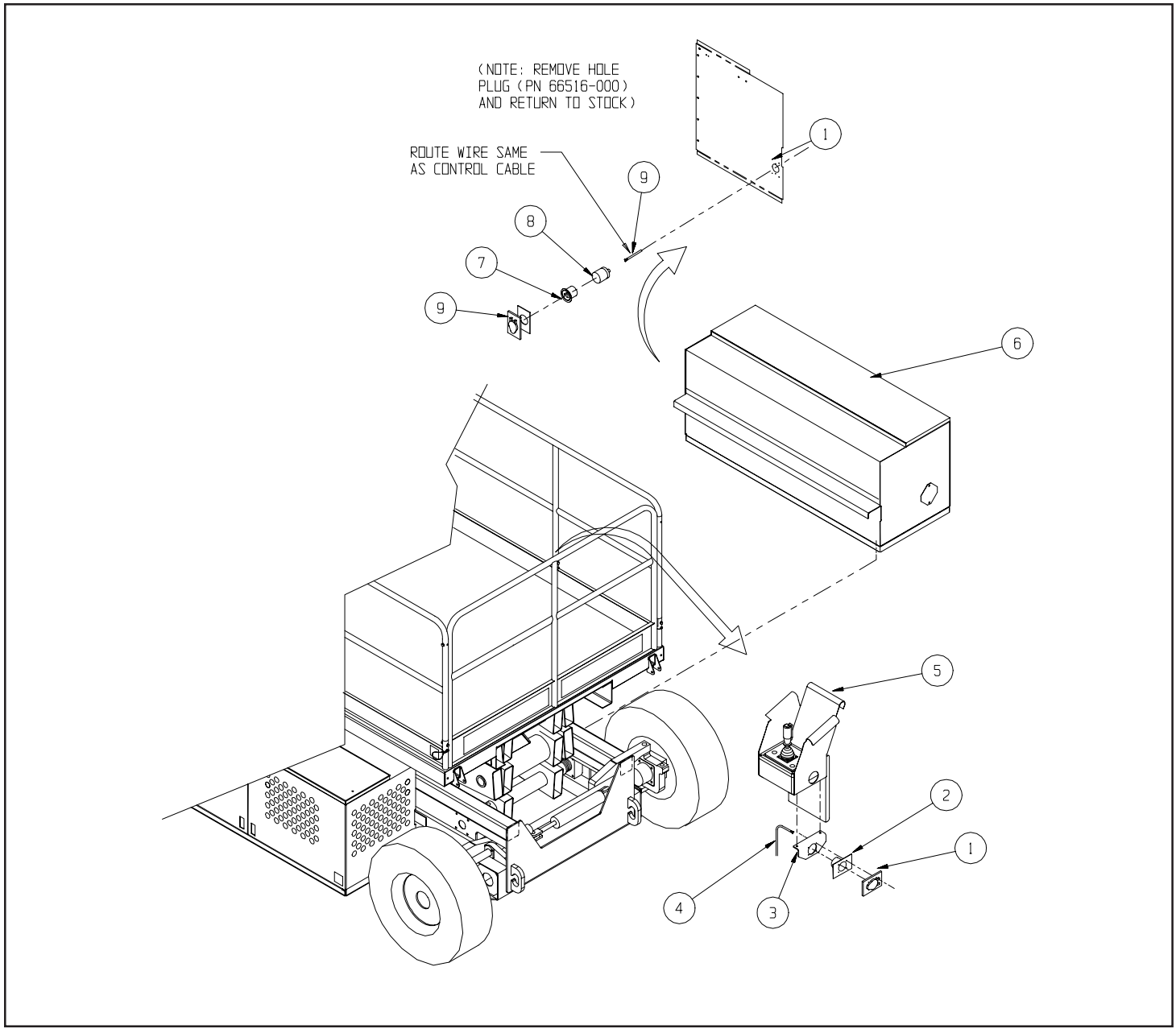




CONTROLLER MODIFICATION

POWER TO PLATFORM OPTION
LX 31/41
67907-000

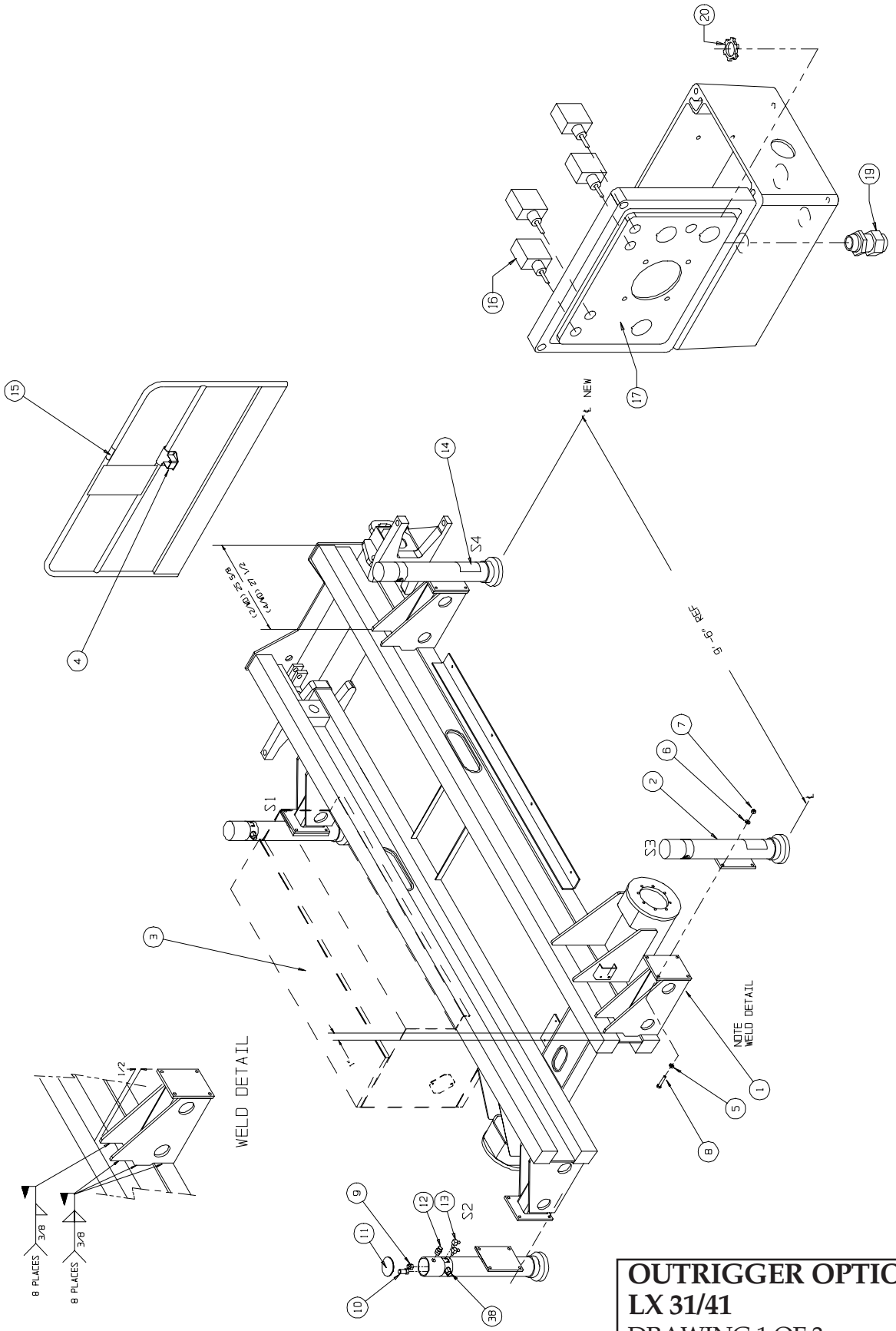
ITEM	PART	DESCRIPTION	LX31 QTY	LX41 QTY
1	11715-004	SCREW, RD HD 6-32 X 1/2	10	10
2	08942-001	OUTLET	1	1
3	64520-000	POWER BRACKET	1	1
4	29495-099	WIRE 14 GA 3-COND (LX 31)	75FT	-
	29435-099	WIRE 14 GA 3-COND (LX 41)	-	90FT
5	REF	CONTROLLER	1	1
6	REF	CONTROL MODULE	1	1
7	29961-000	INLET PLUG	1	1
8	29961-001	SEAL, INLET PLUG	1	1
9	29962-000	ELEC BOX COVER	1	1



OUTRIGGER OPTION
LX 31/41
67957-000

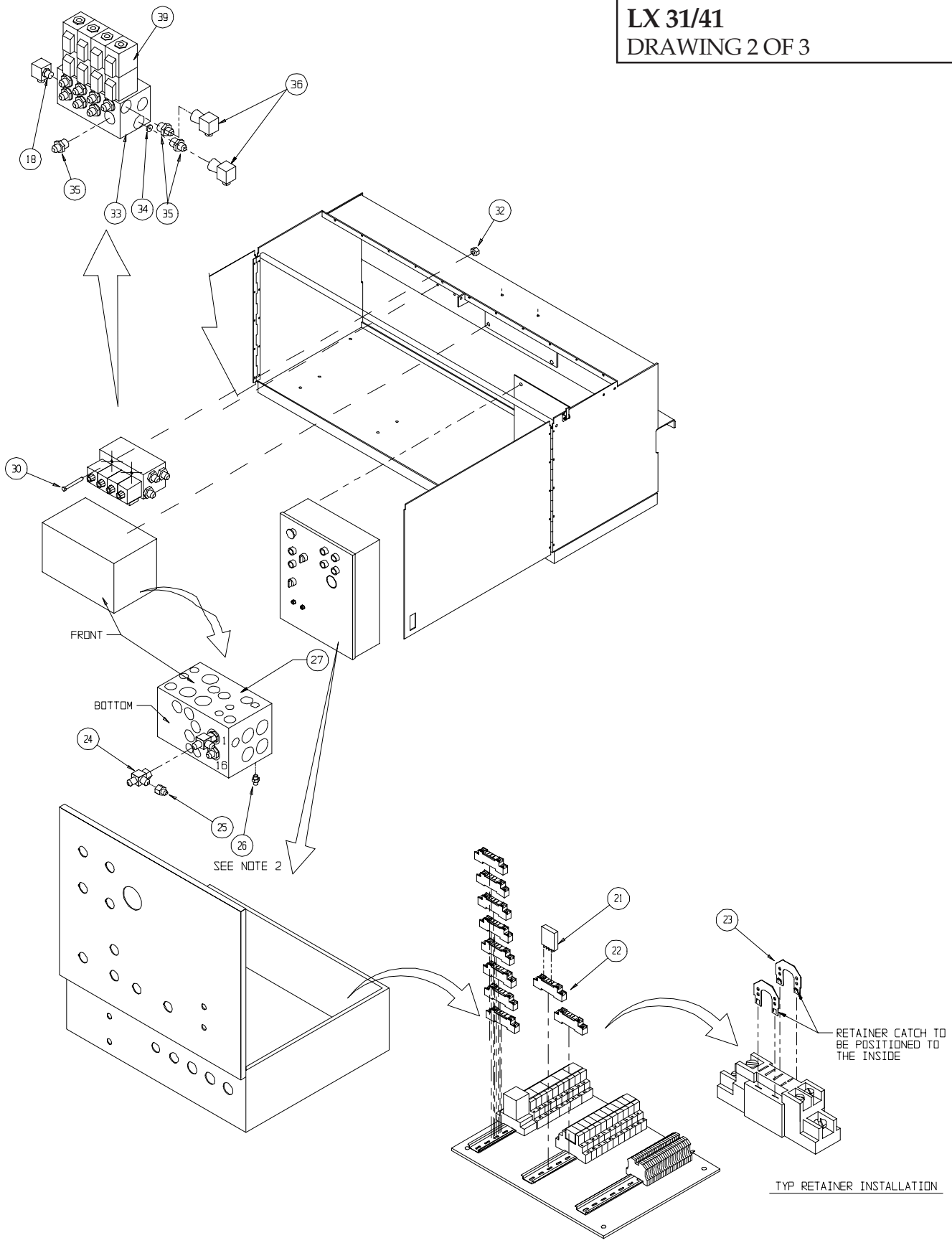
ITEM	PART	DESCRIPTION	QTY
1	067844-000	OUTRIGGER SUPPORT WELDMENT	4
2	067840-000	OUTRIGGER CYL.	4
*	067840-010	SEAL KIT	
3	067957-001	CONTROL MODULE ASSY	1
4	064676-001	LEVEL MOUNT ASSY	1
5	067954-000	CONTROLLER ASSY	1
6	011240-008	WASHER 1/2 STD FLAT	32
7	011246-008	NUT HEX ESNA 1/2-13 UNC	16
8	011256-020	SCREW HHC 1/2-13UNC X 2 1/2	16
9	062881-000	SWITCH BALL	4
10	063921-006	SWITCH PRESS.	4
11	066516-004	PLUG	4
12	029925-007	CONN. CABLE	4
13	011934-004	FITTING 6MBH - 6MJ	8
14	066556-001	LABEL CAUTION	4
15	066551-003	LABEL TIPPING	1
16	012798-000	TOGGLE SWITCH SPDT-MOMENTARY	4
17	067642-001	LABEL CONTROLLER	1
18	011934-001	64MBH - 4MJ 90 DEG. ELBOW	1
19	029925-000	CONN. CABLE	1
20	029939-002	NUT LOCK 1/2 NPT	1
21	067661-001	RELAY SPDT	9
22	067662-001	SOCKET RELAY	9
23	067662-005	RETAINER CLIP	18
24	020733-005	FITTING TEE 12FLX-12MJ-12MJ	1
25	014693-003	FITTING ADA 12FJ-6MJ	1
26	011941-013	FITTING 10MB-6MJ STR	1
27	029931-003	CONN FM PUSH 16-14 1/4	16
30	011252-028	SCREW HHC 1/4-20UNC X 3 1/2	2
32	011248-004	NUT HEX ESNA 1/4-20UNC	2
33	067525-000	VALVE BLOCK OUTRIGGER	1
34	063664-007	FITTING ORIFICE	1
35	011941-005	FITTING STR 6MB-6MJ	10
36	011937-003	6FJX - 6MJ 90 DEG. SWIVEL MNT. ELBOW	2
37	029601-014	TERMINAL RING 1/4" DIA.	1
38	067840-011	COUNTERBALANCE VALVE	8
39	067525-002	OUTRIGGER EXTEND / RETRACT VALVE	4
40	005469-099	WIRE 16AWG X 9 COND	95 FT
41	029452-099	WIRE 16AWG BLK	1 FT
42	029610-004	CONN. FORK #10 12-10GA.	16
43	005469-099	WIRE 16AWG. 9 COND	4 FT
44	029496-099	WIRE 16GA 2 COND	10 FT
45	062192-033	1/4 HOSE ASSY X 80 6FJX-6FJX	2
46	062192-034	1/4 HOSE ASSY X 118 6FJX-6FJX	2
47	062192-035	1/4 HOSE ASSY X 137 6FJX-6FJX	2
48	062192-036	1/4 HOSE ASSY X 176 6FJX-6FJX	2
49	062192-032	1/4 HOSE ASSY X 24 6FJX-6FJX	2
50	065234-005	1/4 HOSE ASSY X 26 4FJX-4FJX	1

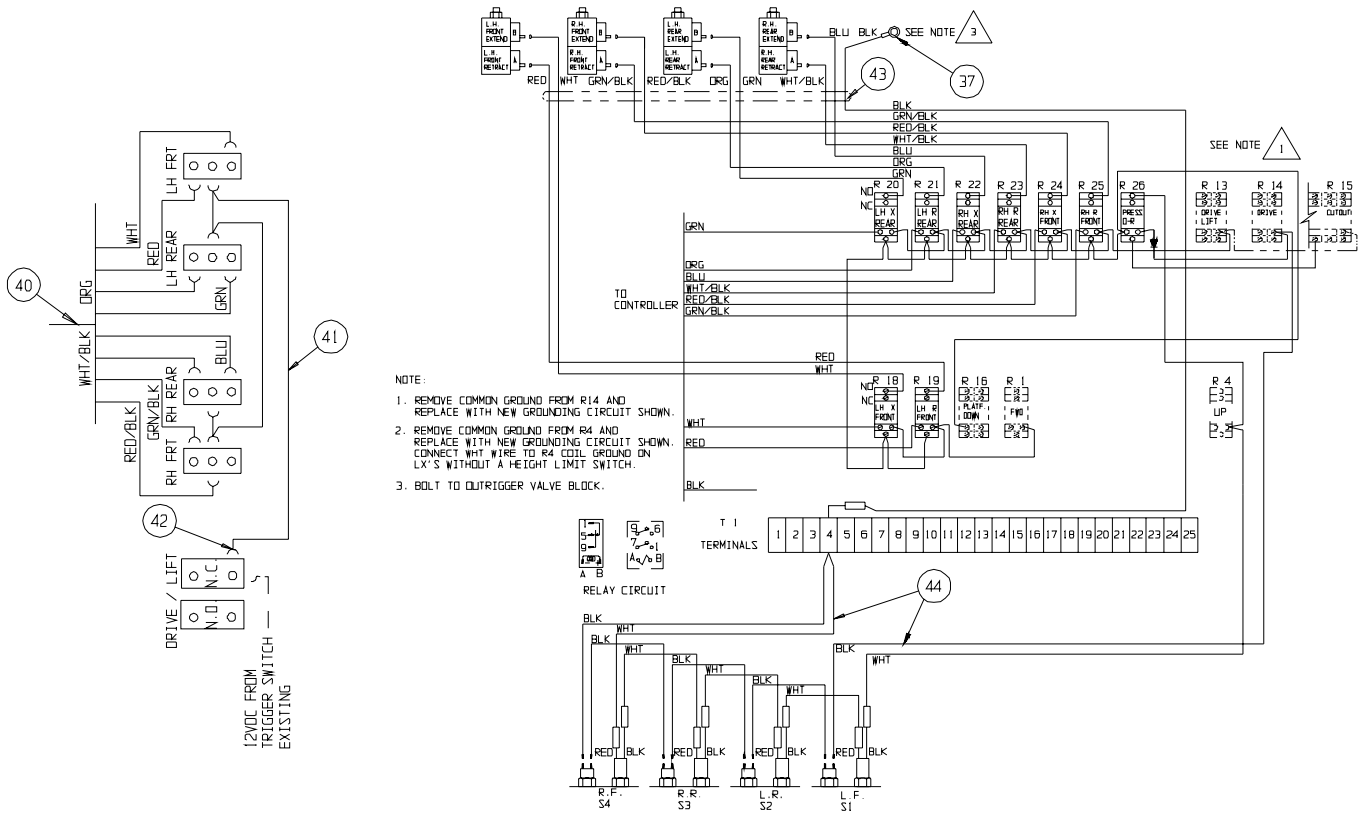
***Not Shown**



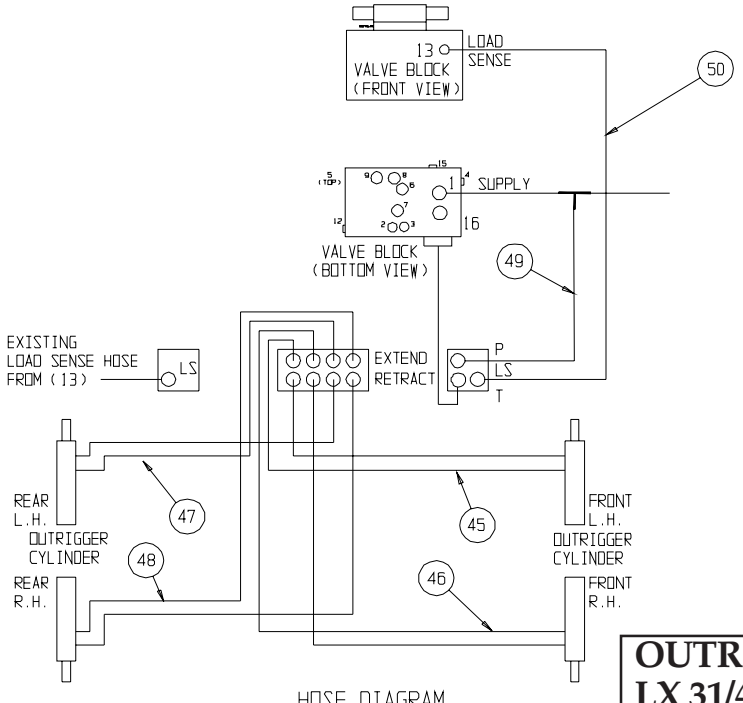
OUTRIGGER OPTION
LX 31/41
DRAWING 1 OF 3

OUTRIGGER OPTION
LX 31/41
DRAWING 2 OF 3





WIRING DIAGRAM



HOSE DIAGRAM

OUTRIGGER OPTION
LX 31/41
DRAWING 3 OF 3

NOTES:

UpRight

Call Toll Free in U.S.A.

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