UpRight

SL-26N

WORK PLATFORMS

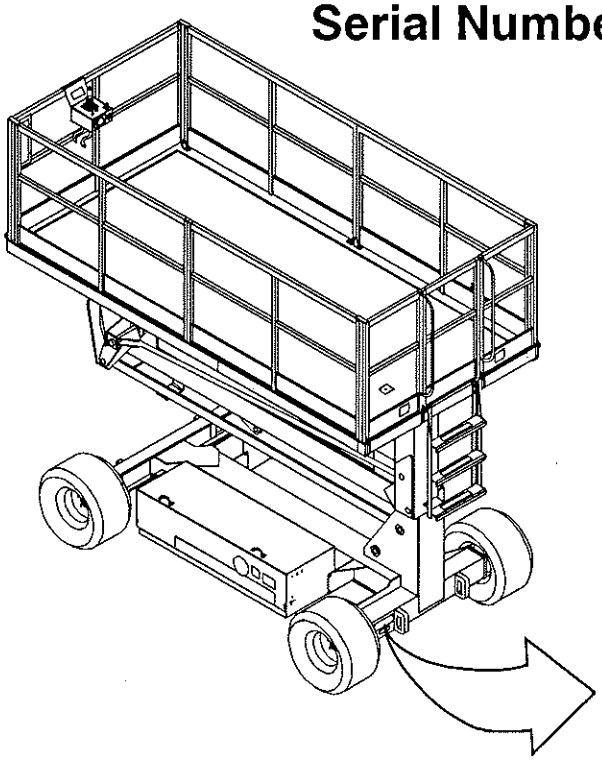
Service & Parts Manual

SERVICE & PARTS MANUAL

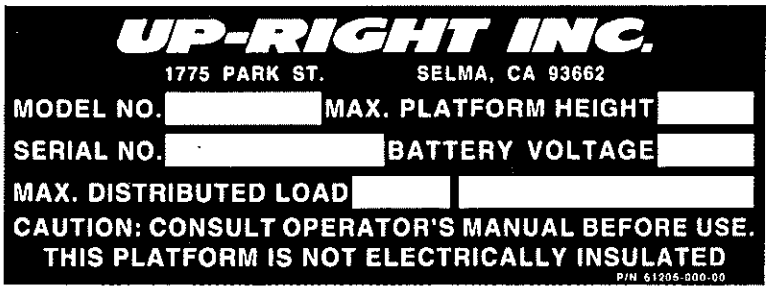
SL-26N

Electric and Dual Fuel Models

Serial Numbers 8617 to current



When contacting UpRight for service or parts information, be sure to include the MODEL and SERIAL NUMBERS from the equipment nameplate.



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Forward

Introduction

HOW TO USE THIS MANUAL

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

SPECIAL INFORMATION

NOTE: Gives helpful information.

⚠ DANGER ⚠

Indicates the hazard or unsafe practice ***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.

WORKSHOP PROCEDURES

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

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1.0 Introduction

PURPOSE

The purpose of this service and parts manual is to provide instructions and illustrations for the operation and maintenance of an UpRight SL-26N Work Platform manufactured by UpRight, Inc. of Selma, California.

SCOPE

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

1.1 General Description (Figure 1-1)

The SL-26N Work Platform consists of the platform, controller, elevating assembly, power module, control module, and chassis.

Platform

The platform has a reinforced wood floor, 43.5 inch (1105 mm) 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 guardrail, but may be hand held if necessary. To operate the machine, the Foot Switch must be depressed to operate any function. A complete explanation of control functions can be found in Sections 3.1 and 3.4.

Elevating Assembly

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

Power Module

Electric Model

The power module contains the batteries, battery charger, battery control components, and motor/pump assemblies.

Dual Fuel Model

The power module contains the engine, gas tank, L.P. bottle, L.P. gas valve, battery and starter solenoid.

Control Module

The control module contains the hydraulic tank, hydraulic valve manifold, horn/alarms, volt/hour meter, electrical terminal strips, and chassis controls. A complete explanation of the chassis control functions is found in Sections 3.1 and 3.4.

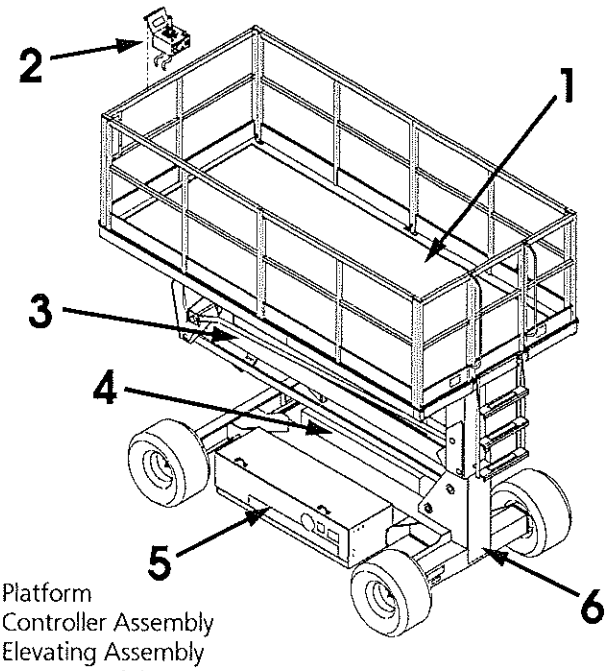
Chassis

The chassis is a structural frame that supports all the components of the SL-26N Work Platform.

PURPOSE OF EQUIPMENT

The SL-26N Work Platform is designed to elevate personnel and materials to overhead work areas and be driven with the platform elevated on firm, level surfaces **only**.

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



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

Figure 1-1: SL-26N Work Platform

SPECIAL LIMITATIONS

The objective of the SL-26N Work Platform is to provide a quickly deployable, self-propelled, variable height work platform for worksite use.

⚠ DANGER ⚠

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

1.2 Specifications

Table 1-1: Specifications

ITEM	DESCRIPTION
Platform Size	60 in. x 144 in. [1.52 m x 3.66 m]
Max. Platform Capacity	1300 lbs. [590 kg] (even distribution)
Working Height	32 Ft. [9.75 m]
Maximum Platform Height	26 Ft.[7.92 m]
Minimum Platform Height	51 in.[1.29 m]
Energy Source	
Electric Model	24 volt battery pack (8-220 ampere-hour, 6 volt batteries) 2 - 4 HP DC Electric Motors
Dual Fuel Model	20 HP Kohler dual fuel (gasoline/propane), 2 cylinder, air cooled engine
Lift System	Single Stage Lifting Cylinder
Driveable Height	26 Ft.
Surface Speed	
Platform Lowered	0 to 1.6 MPH (High Torque) [0 to 2.6 kph]
	0 to 3.0 MPH (High Speed) [0 to 4.8 kph]
Platform Raised	0 to 0.5 MPH [0 to .8 kph]
Hydraulic Tank Capacity	12 Gallons [45.5 l]
Hydraulic Fluid	ISO #46
Dimensions	
Weight: Electric Model	4960 lb. [2250 kg]
Weight: Dual Fuel Model	4630 lb.[2100 kg]
Overall Width	66 in.[1.68 m]
Overall Height	94.5 in. [2.4 m]
	(51 in.[1.29 m] w/ Guardrails lowered)
Overall Length	149 in.[3.78 m]
Control System	Proportional, single axis joystick with thumb rocker steering. Foot operated interlock switch.
Drive Control	Proportional
Horizontal Drive	Dual rear wheel hydraulic motors
Tires (Std.)	B78-13ST slab - 50 PSI
Braking	Spring Applied, Hydraulic Release Parking Brake
Toeboard	6 in. [152 mm]
Guardrails	43.5 in. [1.11 m]
Turning Radius	9 ft. 9 in. Inside [2.97 m]
Gradeability	
Electric Model	25%
Dual Fuel Model	30%
Wheel Base	100 in. [2.54 m]

NOTE: Specifications subject to change without notice.

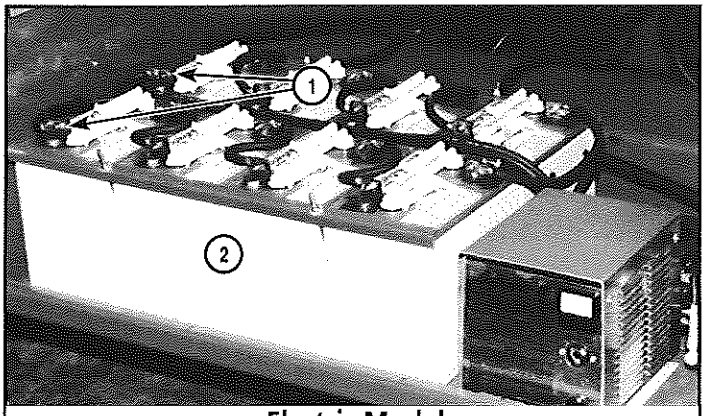
NOTE: Read and familiarize yourself with all operating instructions before attempting to operate the SL-26N Work Platform.

2.1 Preparation for Use

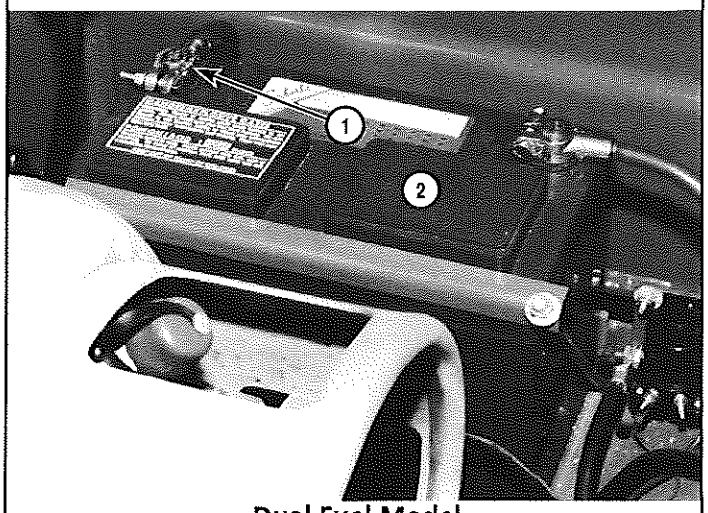
⚠ CAUTION ⚠

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

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



Electric Model



Dual Fuel Model

1. Negative Battery Terminal(s)
2. Battery(ies)

Figure 2-1: Batteries

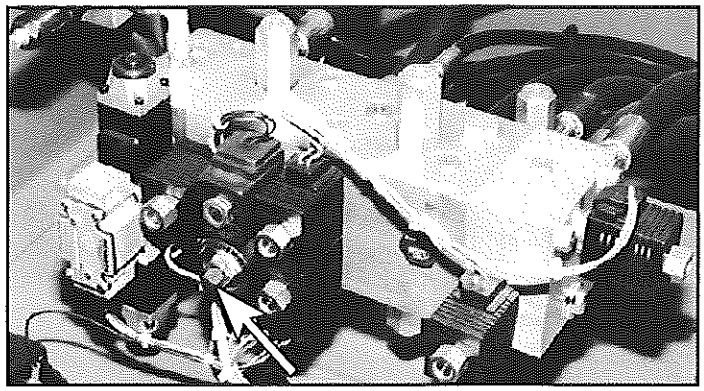


Figure 2-2: Emergency Lowering Valve

2.2 Forklifting Work Platform

NOTE: Forklifting is for transporting only.

⚠ WARNING ⚠

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

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

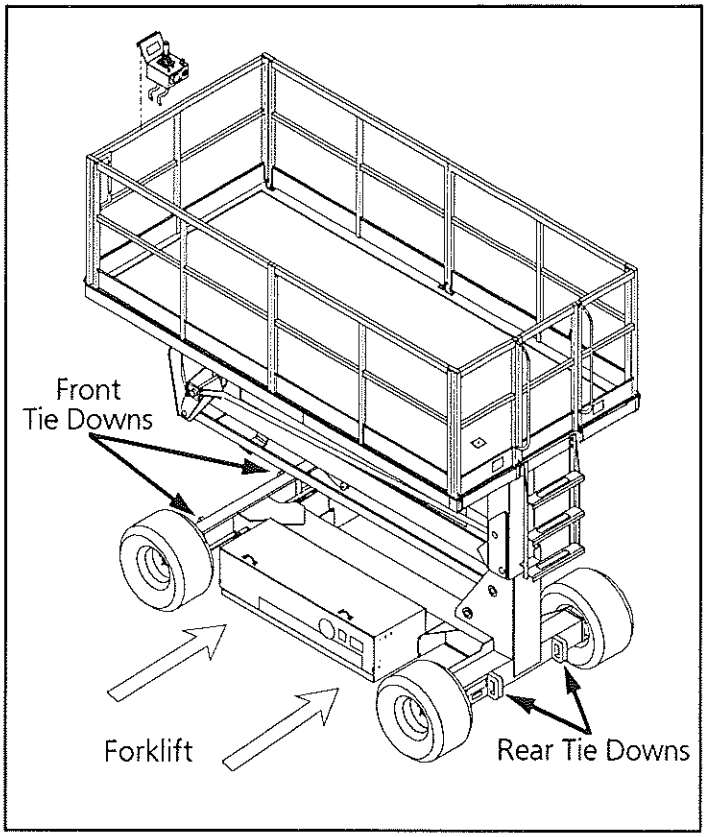


Figure 2-3: Forklifting

2.3 Transporting the Work Platform

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

> **⚠ CAUTION ⚠**
>
> The chassis tie down lugs are not to be used for lifting the work platform.
>
> Over-tightening of the chains or straps may result in damage to the machine.

2.4 Preparation for Shipment

1. Grease all the grease fittings (see Section 4.4).
2. Fully lower the platform.
3. Disconnect the battery(ies) negative (-) lead from the battery terminal(s) (see Figure 2-1).
4. Band the control console to the front guardrail.
5. Band the elevating linkage to the frame just behind the front wheels and at the rear wheels.
6. Open the Chassis Emergency Lowering Valve (Figure 2-2).

2.5 Storage

No preparation for storage is required when the work platform is in normal 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 Dual Fuel Engine according to the manufacturers recommendations.

BATTERY

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

3.0 Introduction

GENERAL FUNCTIONING

Either the engine OR each battery powered electric motor directly drives a hydraulic pump. The pump(s) supply oil under pressure to operate all the work platform functions. The oil flow is directed to the different functions by electrically activated solenoid valves.

DRIVING

With the Controller Key Switch **ON** (and the engine running, dual fuel models only), both chassis and controller Emergency Stop Switches **ON**, the Foot Switch depressed, and the Drive/Lift Switch on **DRIVE**, the machine will drive forward or reverse at a speed proportional to the angle the control lever is pushed or pulled.

Driving with the Platform Lowered

Selecting **HIGH SPEED** with the Drive Speed Switch and moving the Control Lever forward or reverse with the platform fully lowered will energize the Drive Relay, the High Speed Relay, the 2nd Speed Coil, the Series/Parallel Coils , the Proportional Coil and the Drive Coil to allow oil to flow into the Parking Brake (releasing the Brake) and serially through the Hydraulic Motors. The Proportional Valve closes or opens in proportion to the movement of the Control Lever (from center). As the Proportional Valve closes more oil is allowed to flow to the Drive Valve increasing drive speed.

Selecting **HIGH TORQUE** (low speed) on the Drive Speed Switch allows the oil to divide through the Hydraulic Motors to produce the high torque low drive speed.

Driving with the Platform Elevated

Raising the platform (see RAISING AND LOWERING THE PLATFORM, below) activates the High Speed Shutout Switch. This prevents the 2nd Speed Coil and Series/Parallel Coils from energizing. When raised the platform will only drive at the creep speed (motors in parallel).

Steering

On the top of the Control Lever is a momentary rocker switch for steering the machine left and right. Pressing the right or left side of the rocker switch will energize the Steering Coils and allow oil to flow through the Steering Valve to the Steering Cylinder. Releasing the rocker switch de-energizes the Steering Coils and holds the Steering Cylinder in position. **The Steering Cylinder will not automatically return to center. The Steering Switch must be activated to change the wheels direction.**

RAISING AND LOWERING THE PLATFORM

With the Controller Key Switch **ON** (and the engine running, dual fuel models only), both chassis and controller Emergency Stop Switches **ON**, the Foot Switch depressed, and the Drive/Lift Switch on **LIFT**, the machine will elevate at a speed proportional to the angle the Control Lever is pushed forward.

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

Lowering the platform electrically energizes the Down Alarm and the Down Coil. This allows the oil to flow out of the Lift Cylinder through an orifice, which controls the rate of descent, then back to the tank. Lowering the platform manually with the Emergency Down Valve allows the oil to flow out of the Lift Cylinder in the same manner but there is no Down Alarm.

SAFETY DESIGN

The SL-26N has the following features to ensure safe operation.

- The drive speed is limited to creep speed when operating the work platform while platform is elevated.
- The platform descent rate is controlled by an orifice (Fixed Speed). The lift cylinder is equipped with a velocity fuse to prevent descent should the lift hose rupture.
- A parking brake is automatically engaged when the Control Lever is released and the machine comes to a full stop.
- The Controller and chassis controls are equipped with Emergency Stop Switches for stopping all powered functions.
- The Foot Switch must be depressed for the Controller to function.
- An alarm is provided to signal when the platform is lowering.
- A lift switch is located in the Control Module on the Chassis for lifting and lowering work platform from ground level.
- An Emergency Down Valve is provided in the Control Module, to lower the platform in the event electrical power is lost.

3.1 Controls and Indicators

The controls and indicators for operation of the SL-26N Work Platform are shown in Figure 3-1. The name and function of each control and indicator are listed in Table 3-1. The index numbers in Figure 3-1 correspond to the index numbers in Table 3-1. The operator should know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the unit.

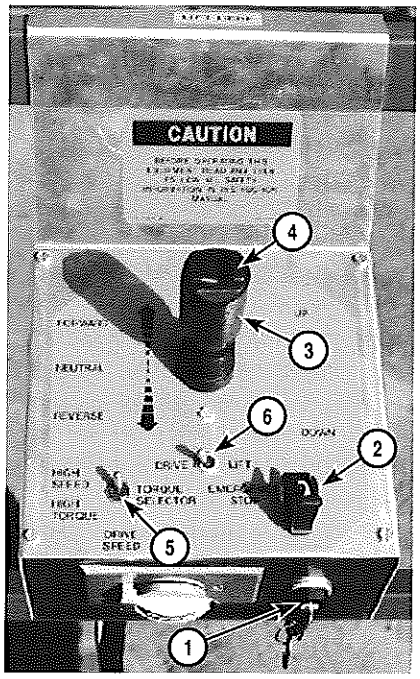
Table 3-1: Controls and Indicators

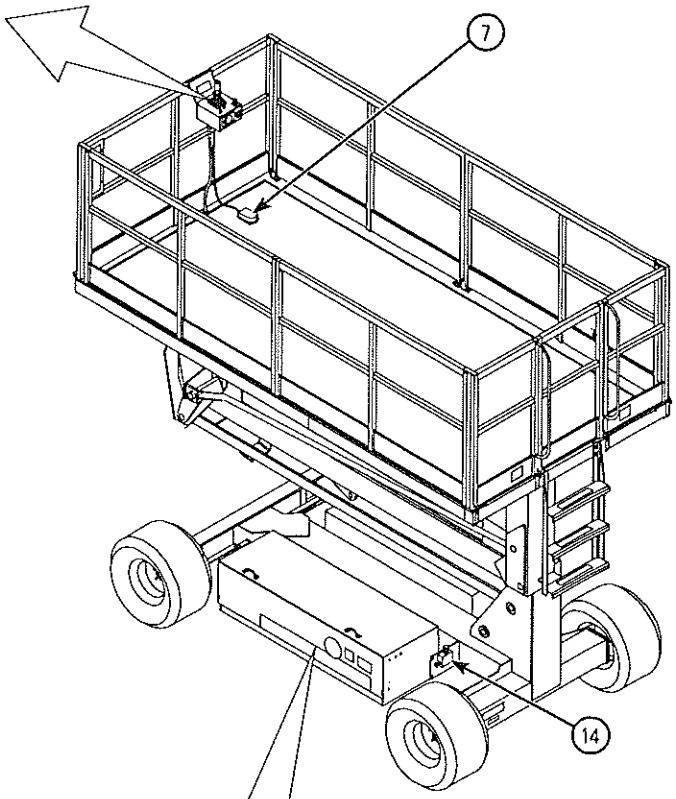
CONTROLLER/PLATFORM

INDEX NO.	NAME	FUNCTION
1	KEY SWITCH (Electric)	Turn key clockwise to provide power to the Platform Foot Switch.
	KEY SWITCH (Dual Fuel)	Turn key fully clockwise to start engine when released key goes to RUN to provide power to the Foot Switch.
2	EMERGENCY STOP SWITCH (platform)	Push red cover to cut off power to Controller. Open cover and push toggle towards cover to provide power.
3	CONTROL LEVER	Move joy stick forward or backwards to proportionally control Drive Valves or Lift and Down Valve depending on position of Drive Lift Switch.
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	FOOT SWITCH	Provides power to the Controller powered functions only when depressed, preventing accidental activation of the Controller.

CHASSIS

INDEX NO.	NAME	FUNCTION
8	VOLT/HOUR METER	Shows state of charge of batteries and hours machine has been on.
9	EMERGENCY STOP SWITCH (chassis)	Push red cover to cut off power to Controller. Open cover and push toggle towards cover to provide power.
10	CHASSIS LIFT SWITCH	Push switch up to lift the work platform and push switch down to lower the work platform.
11	FUEL SELECTOR SWITCH (Dual Fuel Only)	Moving switch up or down changes the engines fuel supply between **GASOLINE** and **PROPANE**. Placing the switch in the center position purges the fuel lines prior to changing fuels.
12	EMERGENCY LOWERING VALVE	Push in and turn knob ¼ turn counterclockwise, the knob will pop out and the Platform will lower. To close, push in and turn knob ¼ turn clockwise until detent engages. **The platform cannot be raised until this valve is closed.**
13	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.
14	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.





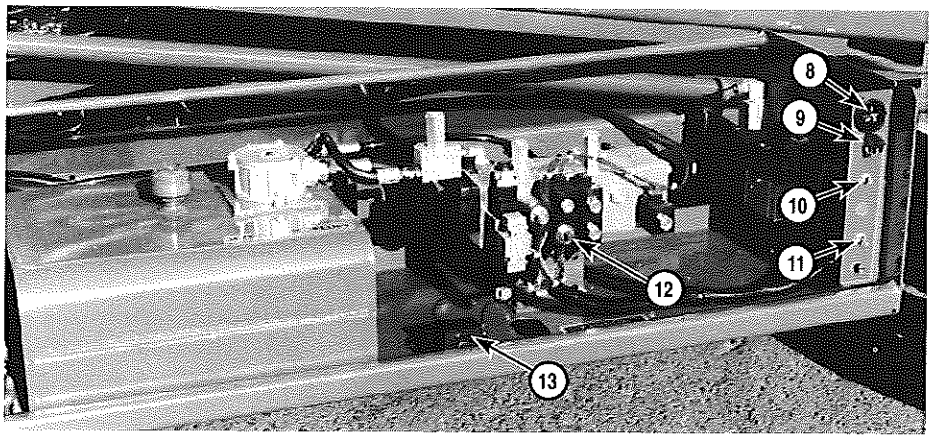


Figure 3-1: Controls and Indicators

3.2 Safety Rules and Precautions

Always observe the following safety rules and precautions when using the SL-26N Work Platform:

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

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

NEVER sit, stand or climb on guardrail or midrail.

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

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

CLOSE gate across entrance after mounting the platform.

NEVER use ladders or scaffolding on the platform.

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

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

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

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

NEVER change operating or safety systems.

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

NEVER climb down elevating assembly with the platform elevated.

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

CHECK all four tires for correct inflation (50 psi).

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

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

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

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

3.3 Pre-Operation Inspection

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

VISUAL INSPECTION

⚠ WARNING ⚠

DO NOT perform service on work platform with the platform elevated unless the Elevating Assembly is properly blocked.

1. Remove module covers and inspect for damage, oil leaks or missing parts.
2. Check the level of the hydraulic oil with the platform fully lowered (see Section 4.4). Oil should be visible in the sight gauge. Add ISO #46 hydraulic oil, if necessary.
3. Check that the fluid level in the batteries is correct (see Section 4.3).
4. 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.
5. Check that all guardrails are securely in place with all fasteners properly torqued.
6. Check tire pressure (50 psi).
7. Turn the Chassis Emergency Stop Switch to the ON position. Open the switch guard and push the switch toward the guard.

DUAL FUEL MODEL INSPECTION

1. Check fuel supply.
2. Check engine oil level (refer to engine manual).
3. 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. Over filling the propane tank may cause regulator freeze-up.

⚠ WARNING ⚠

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

ELECTRIC MODEL INSPECTION

1. Verify batteries are charged (see Section 4.3).
2. Check that A.C. extension cord has been disconnected from charger.

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 and Foot Switch together, in such a manner that the Foot Switch can be depressed, while performing the following checks from the ground.
2. Turn the Emergency Stop Switch to the ON position. Open the switch guard and push the switch toward the guard.
3. Turn Controller Key Switch clockwise to **ON**. Turn fully clockwise to start engine (Dual Fuel only).
4. Turn Drive/Lift Switch to **DRIVE** position.
5. With the Speed Range Switch first in **HIGH TORQUE** and then in **HIGH SPEED** depress the Foot Switch 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.
6. Push Steering Switch RIGHT then LEFT to check for steering control.
7. Position Drive/Lift Switch to **LIFT**, rehook Controller to front guardrail .

⚠ WARNING ⚠

LOOK up and around for obstructions prior to operating the lift function.

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

DO NOT elevate the platform unless the work platform is on firm level ground.

DO NOT enter the elevating assembly while the platform is elevated.

8. Push Chassis Lift Switch to **UP** position and fully elevate platform.
9. Visually inspect the elevating assembly, lift cylinder, cables and hoses for damage or erratic operation. Check for missing or loose parts.
10. Lower the platform partially by pushing Chassis Lift Switch to **DOWN**, and check operation of the audible lowering alarm.
11. Open the Chassis Emergency Lowering Valve to check for proper operation. Once the platform is fully lowered, close the valve.
12. Mount the platform making sure the gate has been latched.
13. Turn Drive/Lift Switch to **LIFT** .
14. Slowly push 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.
15. Turn Controller Key Switch to **OFF**, push the Emergency Stop Switch Guard and dismount the platform.
16. Close and secure module covers.

3.4 Operation

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

TRAVEL WITH PLATFORM LOWERED

1. Verify Chassis Emergency Stop Switch is in the ON position.
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. Open Controller Emergency Stop Switch Cover and push switch to the ON position.
6. Set the Drive/Lift Switch to the **DRIVE** position and turn the Key Switch to **ON**. On Dual Fuel models start the engine.
7. Set the Drive/Lift Speed Range Switch to **HIGH TORQUE**.
8. While stepping on the Foot Switch move the Control Lever **FORWARD** or **REVERSE** to travel in the desired direction.
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.

RAISING AND LOWERING THE WORK PLATFORM

⚠ WARNING ⚠

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

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

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

NEVER enter the Elevating Assembly while the platform is elevated.

1. Position the Drive/Lift Switch to **LIFT**.
2. While depressing the Foot Switch, 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

⚠ WARNING ⚠

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

NOTE: The Work Platform will travel at reduced speed when in the elevated position.

1. Check that the route is clear of persons, obstructions, holes and drop-offs and is 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.

EMERGENCY LOWERING

The Emergency Lowering Valve is located on the left hand side of the chassis through the cutout in the Control Module cover.

1. Open the Emergency Lowering Valve by pushing in and turning the knob counterclockwise approximately ¼ turn athe knob will pop out disengaging detent (see Figure 3-1).
2. Once the platform is fully lowered, be certain that the Emergency Lowering Valve is closed again. The platform will not elevate if the Emergency Lowering Valve has not been closed.
3. To close the Emergency Lowering Valve, push the knob in and turn approximately ¼ turn clockwise until the detent engages.

SWITCHING FUELS (DUAL FUEL ONLY)

1. With engine running push the Fuel Selector Switch 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 Brake Release Pump (Figure 3-2)

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

1. Close the needle valve by turning the knob clockwise.
2. Pump the Brake Release Pump until the Parking Brake Cylinder Rod clears the wheel rotor.
3. The machine will now roll when pushed or pulled.
4. Be sure to open the needle valve and verify that the cylinder rod has extended before the machine is operated.

⚠ WARNING ⚠

Never operate work platform with the Parking Brake inoperative. Serious injury or damage could result.

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

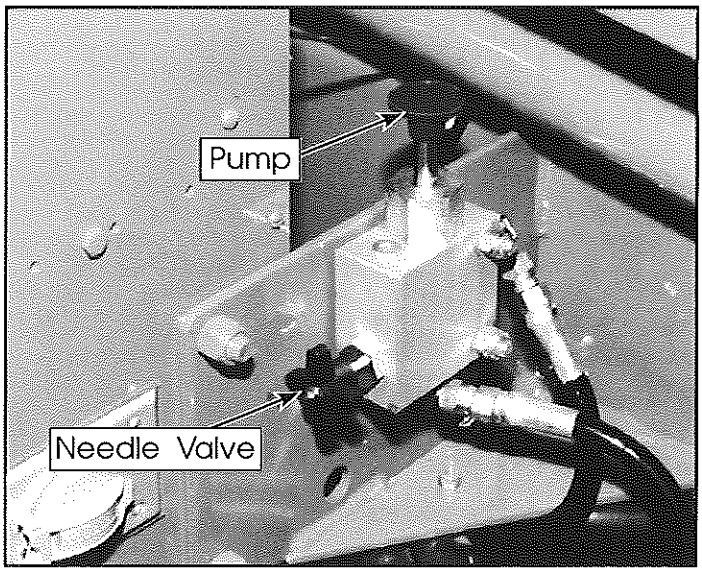


Figure 3-2: Brake Release Pump

3.6 Fold Down Guardrails (Figure 3-3)

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

FOLD DOWN PROCEDURE

NOTE: When performing the following procedures retain all fasteners.

1. Place Controller on deck.
2. Starting at the front of the Platform, remove nuts, bolts and washers from the top of the front guardrail. Fold the front guardrail forward and down.
3. Hang the Controller from the front guardrail.
4. Close and latch the gate.
5. Remove nuts, bolts and washers from the top of the rear guardrail. Fold the rear guardrail back and down being careful to keep gate latched at all times.
6. Fold one side guardrail in so it rests on the deck being careful not to damage the Foot Switch. Repeat with other side guardrail.

ERECTION PROCEDURE

1. Raise side guardrails.
2. Raise rear guardrail assembly, aligning holes and install bolts, washers and nuts. Tighten securely.
3. Place the Controller on the deck.
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.

⚠ DANGER ⚠

Before entering Platform, guardrails must be securely fastened in their proper position.

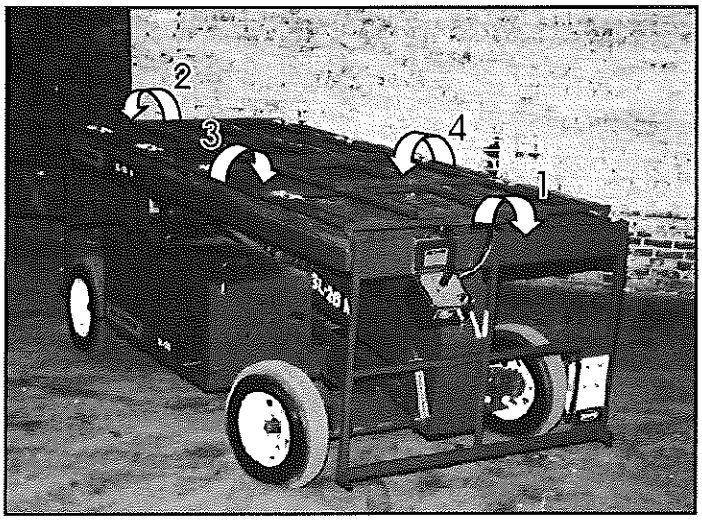


Figure 3-3: Fold Down Guardrails

4.0 Introduction

⚠ WARNING ⚠

Be sure to read, understand and follow all information in the Operation Section of this manual before attempting to operate or perform service on any SL-26N Work Platform.

Note: For Information on the Dual Fuel Engine refer to the engine manual.

This section contains instructions for the maintenance of the SL-26N Work Platform. Procedures for the operation inspection, adjustment, scheduled maintenance, and repair/removal are included.

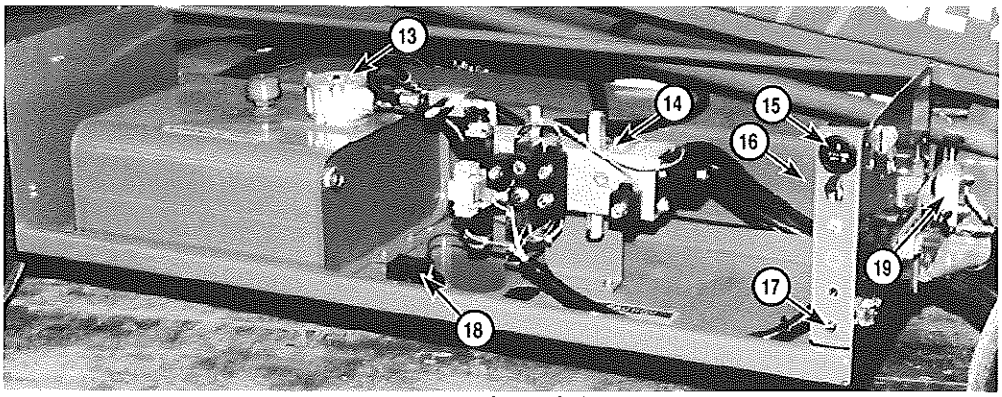
Refer to Figure 4-1, Location of Components, for location of the various components and Table 4-1, Preventative Maintenance Checklist, for recommended maintenance intervals. In Table 4-1, the Reference Numbers correspond to the item numbers in Figure 4-1 and the page numbers refer to where the complete information on that item is located in this manual.

SPECIAL TOOLS

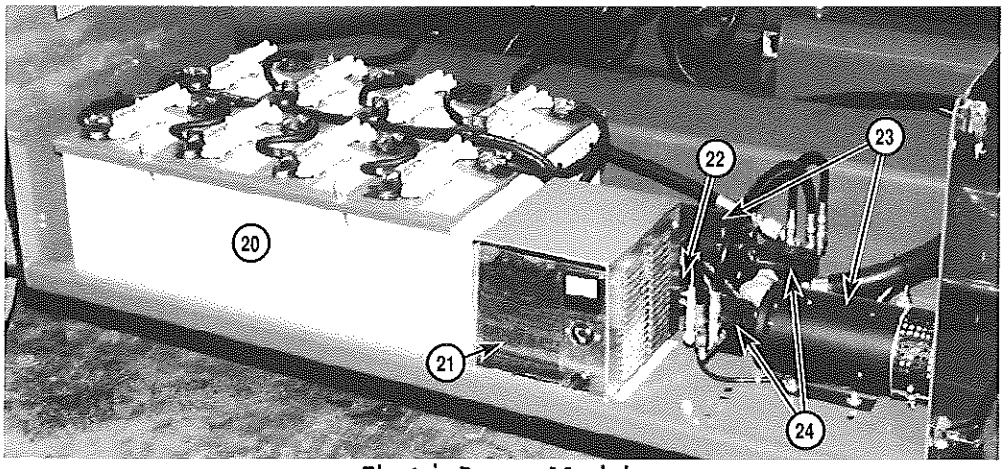
The following is a list of special tools that are required to perform certain maintenance procedures. These tools may be purchased from your dealer.

Description	Part Number
Gauge, 0-600 psi	14124-006-00
Gauge, 0-3000 psi	14124-030-00

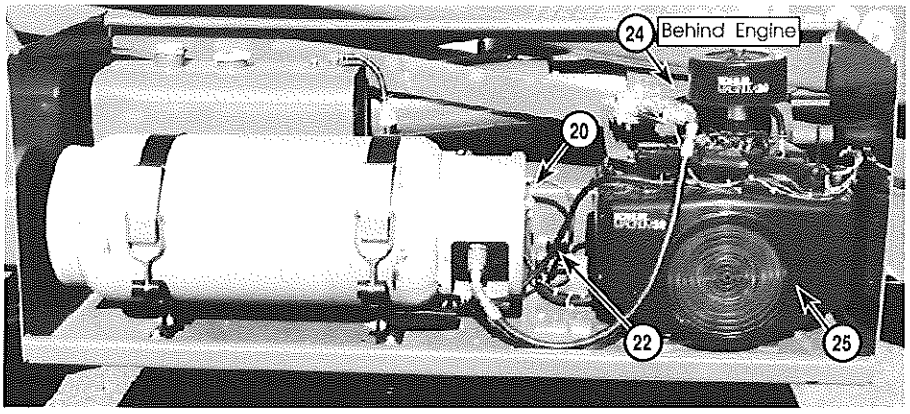
1. Platform
2. Controller
3. Control Cable
4. Elevating Assembly
5. Power Module
6. Control Module
7. Chassis
8. Brake Cylinder
9. Lift Cylinder
10. Steering Cylinder
11. Tires & Wheels
12. Drive Motors
13. Hydraulic Filter
14. Control Valve Assembly (see Figures 4-6, 4-7& 4-11)
15. Volt/Hour Meter
16. Terminal Block (behind Control Panel)
17. Fuse, 15 AMP
18. Down Alarm
19. Brake Release Pump
20. Battery(ies)
21. Battery Charger
22. Motor Start Relay(s)
23. Electric Motors (Electric only)
24. Hydraulic Pump(s)
25. Engine (Dual Fuel only)



Control Module



Electric Power Module



Dual Fuel Power Module

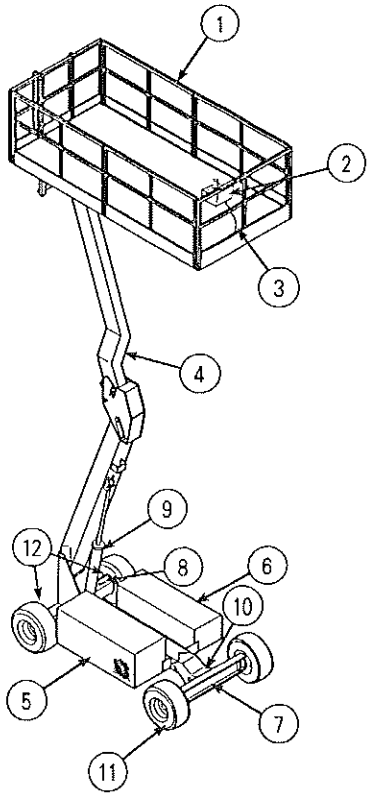


Figure 4-1: Location of Components

4.1
Preventative Maintenance

Table 4-1: Preventative Maintenance Checklist

Legend:

A= All Models
E= Electric Models
D= Dual Fuel Models

REF. NO.	PAGE NO.	COMPONENT	INSPECTION OR SERVICES	INTERVAL EA. SHIFT	50 HRS.	250 HRS.	1000 HRS.
20	4-4	Battery System	Check electrolyte level	A			
			Check specific gravity		A		
			Clean exterior			A	
			Check battery cable condition	A			
			Charge batteries	E			
			Clean terminals			A	
25	-	Engine Oil	Check level and condition	D			
			Check for leaks	D			
			Change oil filter		D		
25	-	Engine Fuel System	Check fuel level	D			
			Check for leaks	D			
			Replace fuel filter			D	
			Check air cleaner (See engine service manual for replacement)	D			
13	4-6	Hydraulic Oil	Check oil level	A			
			Change filter			A	
			Drain and replace oil (ISO #46)				A
14	4-10	Hydraulic System	Check for leaks	A			
			Check hose connections		A		
			Check hoses for exterior wear		A		
14	-	Emergency Hydraulic System	Open the emergency lowering valve and check for serviceability	A			
2	-	Controller	Check switch operation	A			
3	-	Control Cable	Check the exterior of the cable for pinching, binding or wear	A			
1	-	Platform Deck and Rails	Check fasteners for proper torque	A			
			Check welds for cracks	A			
			Check condition of deck	A			
11	-	Tires	Check for damage	A			
			Check air pressure (50psi-B78 x 13 ST)	A			
			Check lug nuts (torque to 90 ft. lbs. [123 Nm])		A		
24	4-6 4-12	Hydraulic Pump	Wipe clean		A		
			Check for leaks at mating surfaces		A		
			Check for hose fitting leaks	A			
			Check mounting bolts for proper torque		A		
			Check the drive coupling for proper torque and alignment				A
			Lubricate pump splines*			D	
12	4-13	Drive Motors	Check for operation and leaks	A			
10	4-6 4-16	Steering System	Check hardware & fittings for proper torque			A	
			Grease pivot pins *		A		
			Oil king pins*		A		
			Check steering cylinder for leaks & mounting bolts for proper torque		A		
4	4-4 4-6	Elevating Assembly	Inspect for structural cracks	A			
			Check pivot points for wear		A		
			Check mounting pin pivot bolts for proper torque		A		
			Check linkage gear for wear			A	
			Check elevating arms for bending			A	
			Grease linkage pins*		A		
			Grease linkage gear*		A		
7	-	Chassis	Check hoses for pinch or rubbing points	A			
			Check component mounting for proper torque			A	
			Check welds for cracks	A			
9	4-17	Lift Cylinder	Check the cylinder rod for wear		A		
			Check mounting pin pivot bolts for proper torque		A		
			Check pivot pin snap rings		A		
			Check seals for leaks		A		
			Inspect pivot points for wear		A		
			Check fittings for proper torque		A		
-	-	Entire Unit	Check for and repair collision damage	A			
			Check fasteners for proper torque			A	
			Check for corrosion-remove and repaint			A	
			Lubricate*		A		
-	-	Decals	Check for peeling or missing decals & replace	A			
11	4-14	Wheel Bearings	Check wheel assembly for play		A		
			Repack wheel bearings (replace wheel bearings and seals at 2000 hrs.)				A

NOTE: Maintenance components are located by REF. NO. in Figure 4-1. Components with no REF. NO. are not shown.

***Lubrication points are shown in Figure 4-4.**

4.2 Blocking Elevating Assembly (Figure 4-2)

⚠ CAUTION ⚠

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

⚠ WARNING ⚠

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

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

INSTALLATION

1. Park the work platform on firm, level ground.
2. Open Control Module cover.
3. Place Chassis Emergency Stop Switch to the ON position.
4. Position Chassis Lift/Lower Switch to **UP** and elevate platform approximately 12 inches (305 mm).
5. Place a jackstand with a minimum rating of 4000 lbs. between the Lower Boom and Chassis just behind the front axle.
6. Push Chassis Lift Switch to **DOWN** position and gradually lower platform until jackstand is secured tightly between Lower Boom and Chassis.

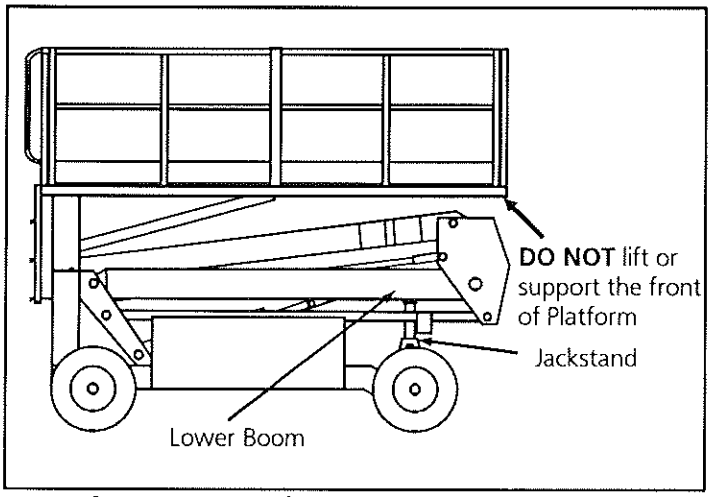


Figure 4-2: Blocking the Elevating Assembly

REMOVAL

1. Push Chassis Lift Switch to **UP** position and gradually raise platform until jackstand can be removed.
2. Remove jackstand.
3. Push Chassis Lift Switch to **DOWN** position and completely lower platform.

4.3 Battery Maintenance

⚠ WARNING ⚠

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

Always wear safety glasses when working with batteries.

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

BATTERY INSPECTION AND CLEANING

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

⚠ CAUTION ⚠

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

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

Clean the battery(ies) 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.

BATTERY CHARGING (ELECTRIC MODEL ONLY-Figure 4-3)

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

⚠ WARNING ⚠

Charge the batteries only in a well ventilated area.

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

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

Never leave the charger unattended for more than two days.

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

Keep the charger dry.

Charge batteries as follows:

1. Check the batteries fluid level. If the electrolyte level is lower than $^{3}/_{8}$ in. (10mm) above the plates, add clean, distilled water only.
2. Connect the charger plug to a properly grounded outlet of the proper voltage and frequency.
3. The charger turns on automatically after a short delay.
4. The charger turns off automatically when the batteries are fully charged.

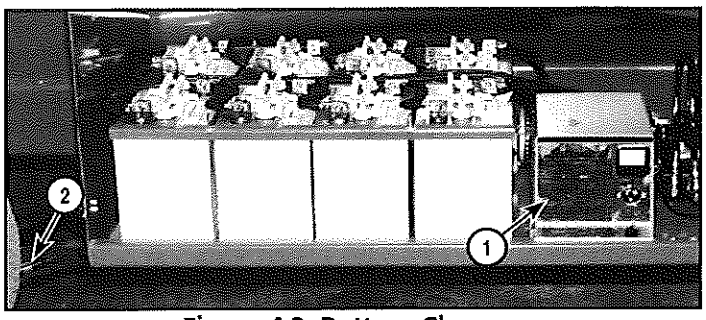


Figure 4-3: Battery Charger

BATTERY CELL EQUALIZATION

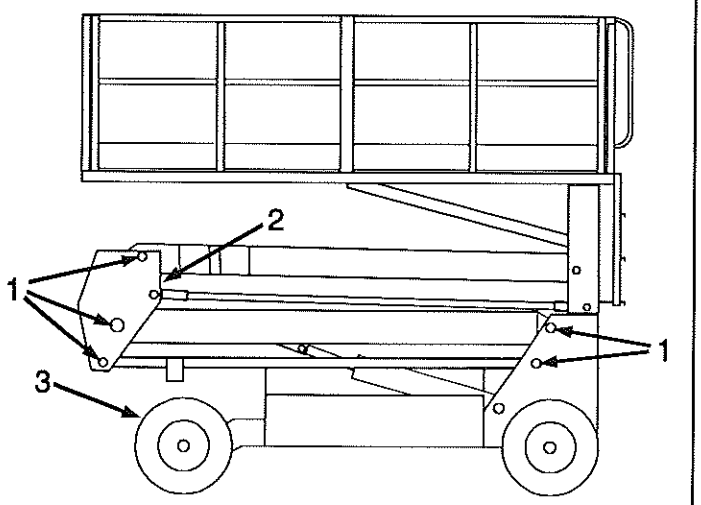
The specific gravity of the electrolyte in the battery cells should be equalized monthly. To do this, charge the battery as outlined in Battery Charging. After this initial charge, check the electrolyte level in all cells and add distilled water as necessary. Then, charge the batteries for an additional 8 hours. During this time, the charging current will be low (4 amps) as the cells are equalizing.

After equalization, the specific gravity of all cells should be checked with a hydrometer. The temperature corrected specific gravity should be 1.260. If the battery contains any cells with corrected readings below 1.230, the battery should be replaced.

Do not check the specific gravity in a cell to which water has just been added. If there is not enough electrolyte in a fully charged cell to obtain a sample for the hydrometer, add water and continue charging for 1 to 2 hours to adequately mix the water and electrolyte.

4.4 Lubrication

Refer to Table 4-1 for the lubrication intervals and Figure 4-4 for location of items that require lubrication service. Refer to the appropriate sections for lubrication information on the Hydraulic Oil Tank and Filter and Rear Wheel Bearings.



1. Grease Fittings
2. Linkage Gears
3. Steering Linkage

Figure 4-4: Lubrication Points

GREASE FITTINGS

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

LINKAGE GEARS

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

⚠ CAUTION ⚠

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

4. Lower the platform after greasing.

STEERING LINKAGE

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

DUAL FUEL HYDRAULIC PUMP

Remove the capscrews that mount the pump to the engine. Remove the pump from the engine and apply high pressure molybdenum grease to the splines. Reinstall the pump and secure with the capscrews.

HYDRAULIC OIL TANK AND FILTER (Figure 4-5)

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.

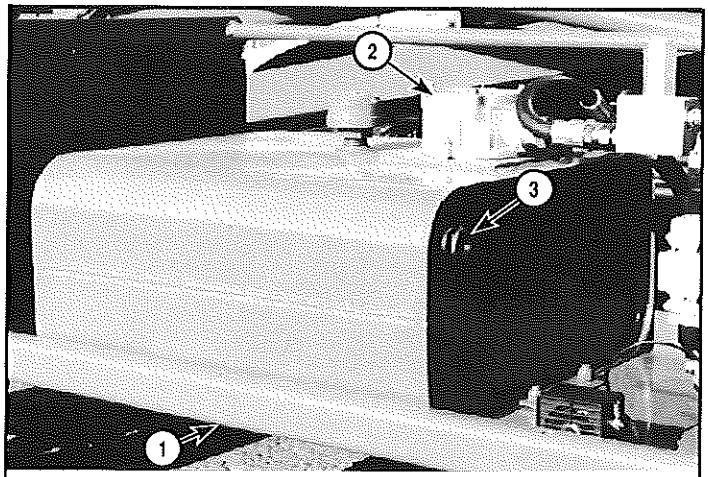
Oil and Filter Replacement

1. Operate the work platform for five minutes to warm up the oil. To change the filter only, go to Step 5.

⚠ CAUTION ⚠

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

2. Provide a suitable container to catch the drained oil. The hydraulic tank has an oil capacity of 12.0 gallons.
3. Remove the drain plug and allow all oil to drain into the container, be sure to dispose of oil properly.
4. Reinstall the drain plug.
5. Unscrew the filter top from the filter body.



1. Drain Plug (under tank)
2. Filter Housing
3. Sight Gauge

Figure 4-5: Hydraulic Oil Tank and Filter

6. Lift the filter element from the filter body.
7. Insert the replacement filter element into the filter body and press into position.
8. Fill the hydraulic oil tank to the level of the Sight Gauge with ISO #46 hydraulic oil by pouring the oil into the top of the filter. Since the oil is being filtered as it is going into the tank, it will take a while to fill the tank.

4.5 Setting Hydraulic Pressures

Referring to Figure 4-11 along with the other Figures will aid in the following procedures.

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

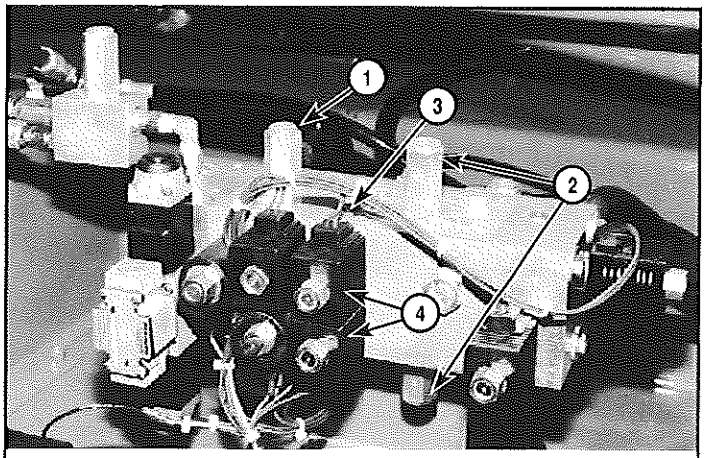
⚠ WARNING ⚠

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

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

MAIN RELIEF VALVE (Figure 4-6)

1. Operate the hydraulic system for five mnutes.
2. Remove the gauge port plug and install a 0-3000 psi pressure gauge assembly.
3. Remove the plug in the end of the Main Relief Valve to expose the adjusting screw.
4. Remove the hex nuts holding the Drive Coils onto the Drive Valves and remove the coils.
5. With the engine running and the Drive/Lift Switch in **DRIVE**, position the Control Lever to **REVERSE** and hold until the system bypasses (approximately 2 seconds).
6. While holding the Control Lever in **REVERSE**, set the pressure to 2000 psi maximum by slowly turning the adjusting screw, clockwise increases pressure.
7. Reinstall the coils on the Drive Valves.
8. Remove the pressure gauge and reinstall all plugs.



1. Main Relief Valve
2. Counterbalance Valves
3. Gauge Port Plug
4. Drive Coils

Figure 4-6: Hydraulic Manifold Assembly, Front View

COUNTERBALANCE VALVES (Figure 4-6)

1. Operate the hydraulic system for five mnutes
2. Remove the gauge port plug and install a 0-3000 psi pressure gauge assembly.
3. Exchange the top Counterbalance Valve with the Main Relief Valve.
4. Remove the plug from the end of the Counterbalance Valve to expose the adjusting screw.
5. Remove the hex nuts holding the Drive Coils onto the Drive Valves and remove the coils.
6. With the engine running and Lift/Drive Switch in **DRIVE**, position the Control Lever to **REVERSE** and hold until the system bypasses (approximately 2 seconds).
7. While holding the Control Lever in **REVERSE**, set the pressure to 900 psi maximum by slowly turning the adjusting screw, clockwise increases pressure.
8. Exchange the top Counterbalance Valve with the bottom Counterbalance Valve and repeat the procedure setting the bottom Counterbalance Valve to 1200 psi.
9. Be sure to reinstall the valves to their original locations and replace all plugs when finished setting pressures.

STEERING RELIEF VALVE (Figure 4-7)

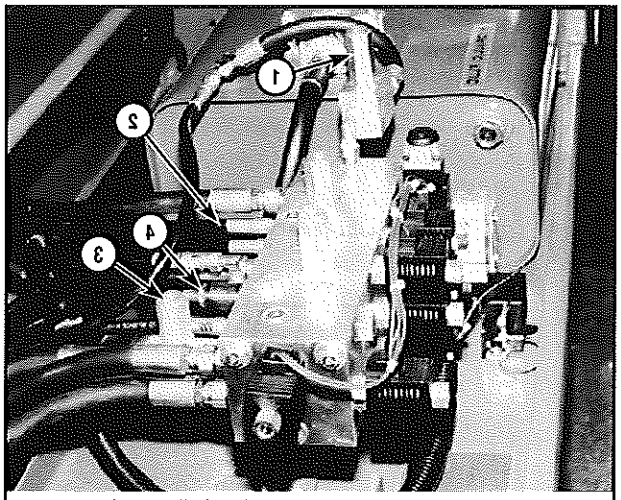
1. Remove the top steering hose from back of the manifold and replace it with a 0-3000 psi gauge assembly.
2. Block the end of the hose with a cap fitting.
3. Remove the plug from the end of the valve to expose the adjusting screw.
4. With the engine running, push the Steering Switch **RIGHT** and set the pressure to 1200 psi maximum by slowly turning the adjusting screw clockwise to increase pressure.
5. Replace the valve plug.
6. Remove the gauge and reinstall the hose.

DRIVE RELIEF VALVE (Figure 4-7)

1. Operate the hydraulic system for five mnutes
2. Remove the gauge port plug and install a 0-3000 psi pressure gauge assembly.
3. Exchange the Main Relief Valve with the Drive Relief Valve.
4. Remove the plug from the end of the valve to expose the adjusting screw.
5. Remove the hex nuts holding the Drive Coils onto the Drive Valves and remove the coils.
6. With the engine running and the Drive/Lift Switch in **DRIVE**, position the Control Lever to **REVERSE** and hold until the system bypasses (approximately 2 seconds).
7. While holding the Control Lever in **REVERSE**, set the pressure to 1500 psi maximum by slowly turning the adjusting screw, clockwise increases pressure.
8. Reinstall the valves to their original locations and replace all plugs when finished setting pressure.
9. Replace the Drive Valve Coils.

BRAKE PRESSURE REDUCING VALVE (Figure 4-7)

1. Using two 1-ton jack stands and a 2-ton jack, jack the work platform up to raise the rear wheels off the ground and block the machine securely.
2. Remove the outlet hose from the backside of the Brake Release Pump and install a 0-600 psi gauge assembly in-line with a tee fitting.
3. Remove the plug on the end of the Brake Relief Valve.
4. With the engine running, position the Control Lever to **REVERSE** and hold.



1. Steering Relief Valve
2. Top Steering Hose
3. Drive Relief Valve
4. Brake Pressure Reducing Valve

Figure 4-7: Hydraulic Manifold Assembly, Top View

5. While holding the Control Lever in **REVERSE**, set the pressure to 350-450 psi maximum by slowly turning the adjusting screw, clockwise increases pressure.
6. Replace the valve plug.
7. Remove the gauge and tee fitting and reinstall the hose.
8. Remove the jack stands and lower the machine.

4.6 Switch Adjustments

PROPORTIONAL CONTROL ADJUSTMENT (Figure 4-8)

1. Place an ammeter in series with the proportional coil.
2. With the machine running, select **LIFT** with the Drive/Lift Switch and open the Emergency Down Valve.
3. Push the Control Lever slightly forward to **LIFT**.
4. When two LED's illuminate, check the current draw , it should be .7 amps.
5. Push the Control Lever fully forward. The current draw should be 2.2 amps for 12v controllers and 1.9 amps for 24v controllers.
6. To adjust full output, turn the HIGH potentiometer clockwise to increase or counterclockwise to decrease the current draw.

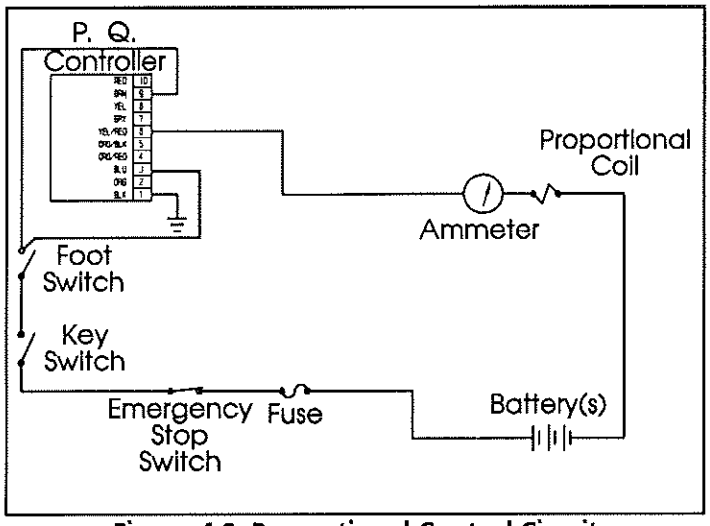


Figure 4-8: Proportional Control Circuit

DOWN LIMIT SWITCH (Figure 4-9)

The Down Limit and High Speed Shutout Switches are electrically separate but share the same body and adjustment, therefore when adjusting one switch the other switch adjustment should be verified.

1. Raise platform until Mid Link Weldment is 12-16 inches (305-406 mm) from top of front axle (Figure 4-10).
2. Disconnect wires coming from switch at Terminal Block positions 8 and 15 (Figure 4-9) and connect an ohmmeter or continuity tester to the wires.
3. Adjust switch to just open by loosening hex nut and moving the actuating arm. Raise and lower platform to verify adjustment and tighten hex nut.
4. Disconnect ohmmeter and reconnect wires.
5. Lower platform.

HIGH SPEED SHUTOUT SWITCH (Figure 4-9)

The Down Limit and High Speed Shutout Switches are electrically separate but share the same body and adjustment, therefore when adjusting one switch the other switch adjustment should be verified.

1. Barely raise platform until Mid Link Weldment just lifts off of front axle, less than 1 inch (25 mm) (Figure 4-10).
2. Disconnect wire coming from switch at Drive Cutout Relay (Figure 4-9) and connect an ohmmeter or continuity tester to the wire and to ground.
3. Adjust switch to just open by loosening hex nut and moving the actuating arm. Raise and lower platform to verify adjustment and tighten hex nut.
4. Disconnect ohmmeter and reconnect wires.
5. Lower platform.

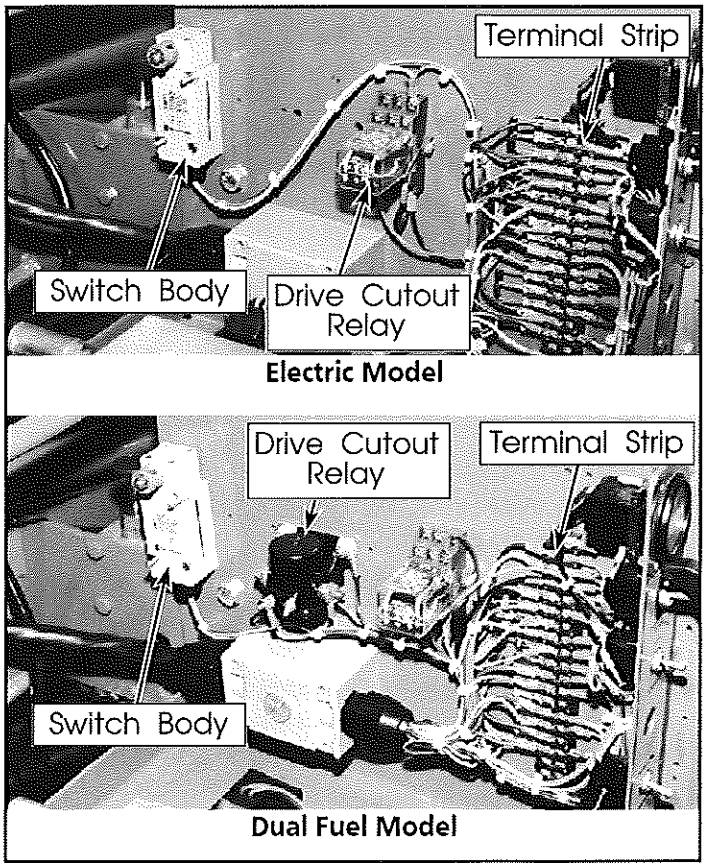


Figure 4-9: Down Limit & High Speed Shutout Switch

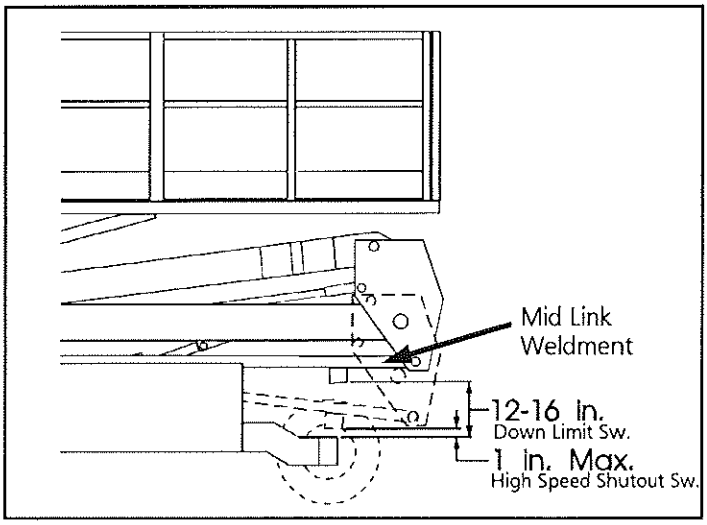


Figure 4-10: Down Limit & High Speed Shutout Switch Adjustment

4.7 Hydraulic Manifold (Figure 4-11)

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 4-11 often to aid in disassembly and assembly.

1. Remove coils from solenoid valves.
2. Remove spool valve covers and spool valves.
3. Remove solenoid valves, main relief valve, counterbalance valves and emergency lowering 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.

1. Install fittings, plugs, springs, balls and orifices. Use one drop of Locktite #242 on each screw-in orifice.
2. Install emergency lowering valve, counterbalance valves, main relief valve, brake pressure reducing valve, solenoid valves and spool valves.
3. Install coils on solenoid valves.

INSTALLATION

1. Attach manifold assembly to mounting plate with bolts.

Note: Longer bolt goes in hole nearest the front of the module.

2. Attach steering relief valve block.
3. Attach drive relief valve block.
4. Connect Solenoid leads to terminal strip (as previously tagged).
5. Connect hydraulic hoses. Be certain to tighten hoses to manifold.
6. Operate each hydraulic function and check for proper operation and leaks.
7. Adjust all hydraulic pressures according to instructions in Section 4.5.

1. Manifold
2. Manifold Block
3. Steering Valve
4. Series/Parallel Valve (2)
5. Steering Flow Divider
6. Flow Divider-Combiner
7. Creep Sped Flow Control
8. Brake Pressure Reducing Valve
9. Lowering Valve
10. Second Speed Valve
11. Main Relief Valve
12. Ball 5/16 Diameter
13. Steering Valve Block
14. Ball 1/2/ Diameter
15. Spring
16. Spring
17. Seat Ball
18. Piston
19. Proportional Valve
20. Fitting Adapter
21. Fitting Adapter Elbow
22. Plug - SAE #4
23. Plug - SAE #6
24. Plug - SAE #8
25. Lift Valve
26. Screw - 3/8
27. Washer - 3/8
28. Drive Relief Valve Block
29. O-Ring
30. Fitting Adapter
31. Fitting Adapter
32. Lowering Orifice
33. Cable Connector
34. Fitting Adapter
35. Fitting Adapter
36. Screw
37. Fitting Adaptor
38. Fitting Adaptor
39. Reverse Counterbalance Valve
40. Forward Counterbalance Valve
41. Steering Relief Valve
42. Spacer
43. O-Ring
44. Lift Check Valve
45. Spacer
46. Drive Relief Valve

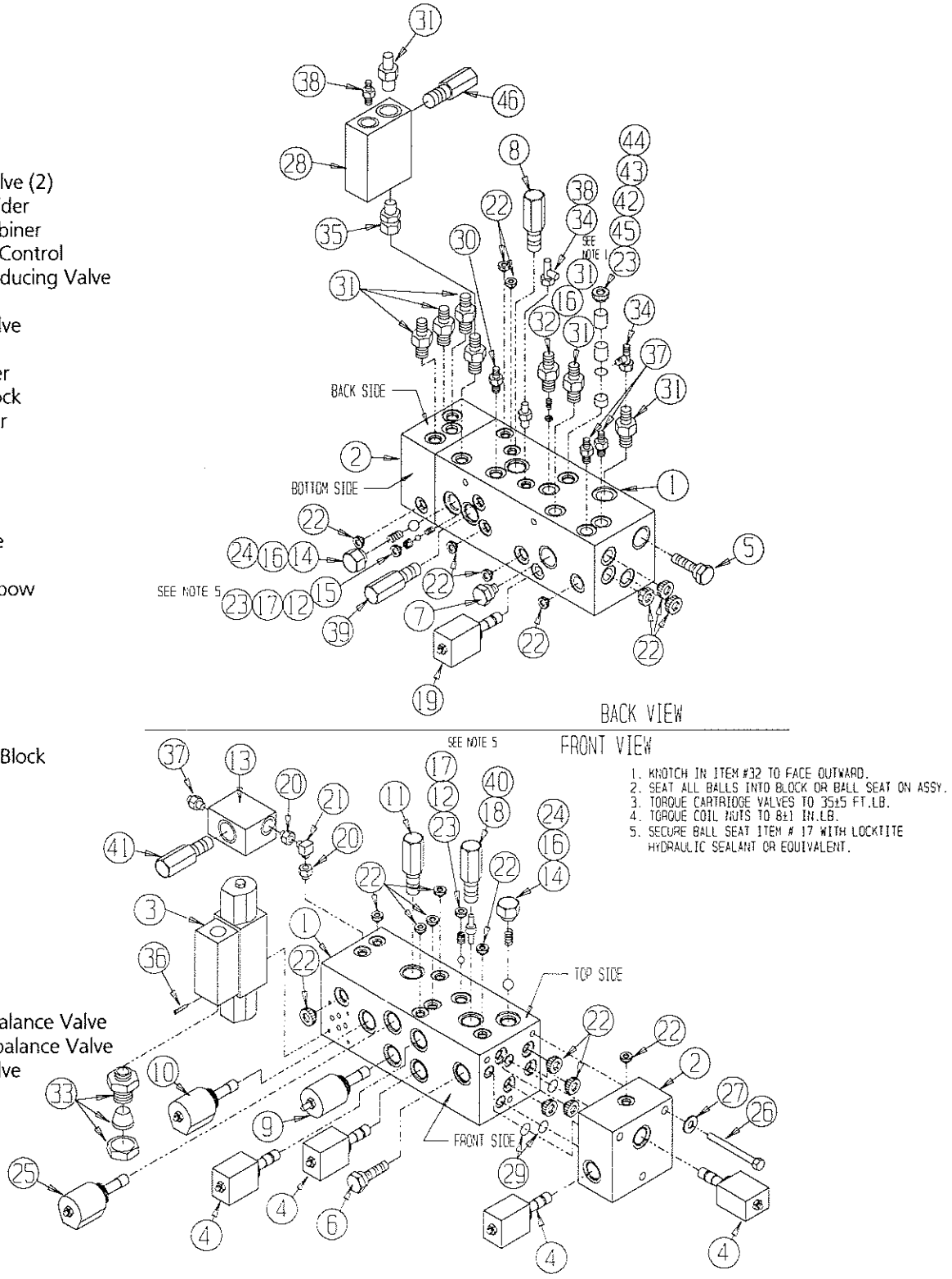


Figure 4-11: Hydraulic Manifold, Exploded View

4.8 Hydraulic Pumps

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

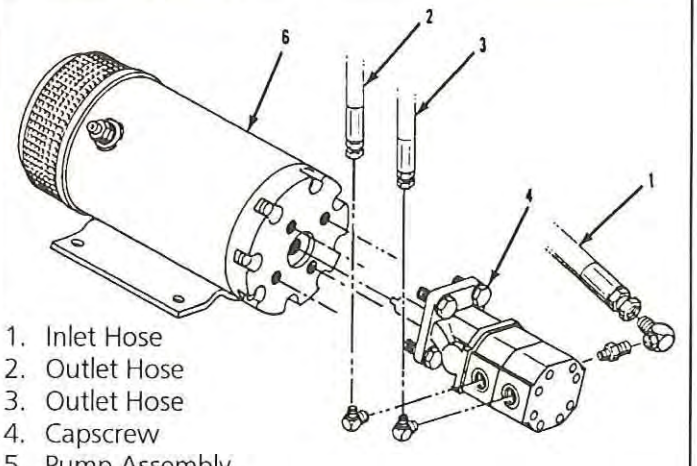
ELECTRIC MODELS (Figure 4-12)

Removal

1. Mark, disconnect and plug the hose assemblies.
2. Disconnect the fittings between the two pumps.
3. For the assembly mounted horizontally to the floor of the module, loosen the capscrews and remove the pump assembly from the motor.
4. For the assembly mounted vertically:
   A. Mark and remove the cables from the electric motor terminals.
   B. Loosen the capscrews mounting the motor to the bracket and remove the motor/pump assembly.
   C. Loosen the capscrews and remove the pump assembly from the motor.

Installation

1. Lubricate the pump shaft with general purpose grease and attach the pump(s) to the motor(s) with the capscrews.
2. Using a criss-cross pattern torque each capscrew a little at a time until all 4 capscrews are torqued to 20 ft. lbs. (27 N-m).
3. Install the vertically mounted motor/pump assembly onto the bracket and secure with the capscrews.
4. Reconnect the cables to the vertically mounted motor.
3. Install the fittings between the two motors.
4. Unplug and reconnect the hydraulic hoses.
5. Check the oil level in the hydraulic tank before operating the work platform.



1. Inlet Hose
2. Outlet Hose
3. Outlet Hose
4. Capscrew
5. Pump Assembly
6. Electric Motor

Figure 4-12: Typical Hydraulic Pump (Electric Model)

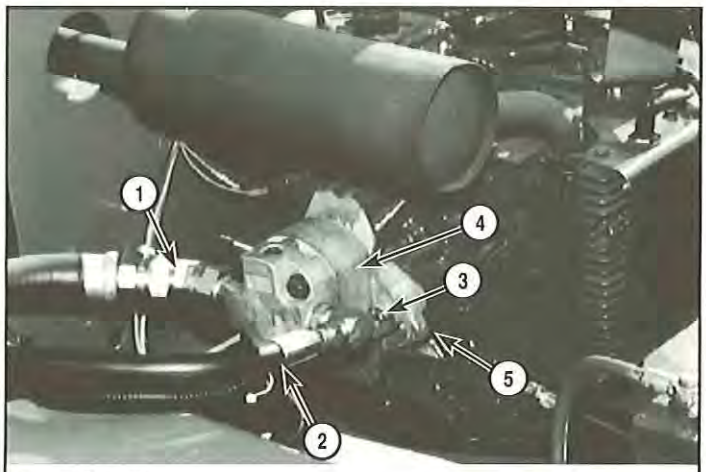
DUAL FUEL MODELS (Figure 4-13)

Removal

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

Installation

1. Lubricate the pump shaft with extreme high pressure molybdenum grease and attach the pump to the engine with the capscrews.
2. Torque each capscrew a little at a time until both capscrews are torqued to 20 ft. lbs. (27 N-m).
3. Unplug and reconnect the hydraulic hoses.
4. Check the oil level in the hydraulic tank before operating the work platform.



1. Inlet Hose
2. Outlet Hose
3. Capscrew
4. Pump Assembly
5. Engine Bell Housing

Figure 4-13: Typical Hydraulic Pump (Dual Fuel Model)

4.9 Hydraulic Drive Motors And Hubs (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 lug bolts on the motor to be removed.
3. Raise the rear of the work platform using a 2-ton jack.
4. Position 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. Remove the cotter pin, nut, hub, and shaft key.

⚠ CAUTION ⚠

ONLY use a wheel puller to remove the hub. Using any other method of removal may damage the drive motor housing and void the warranty.

Clean all fittings before disconnecting the hose assemblies.

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

7. Tag and disconnect the hose assemblies.
8. Remove the capscrews, lockwashers and drive motor assembly from the rear axle.

Installation

1. Position the drive motor in the rear axle and secure with lockwashers and capscrews.
2. Reinstall the hose assemblies.
3. Thoroughly clean the motor shaft and hub bore of all grease, paint and foreign material.
4. Reinstall the shaft key, hub, and nut. Torque each wheel hub nut to 350 ft. lbs. [478 N-m). Align the slot in the nut with the hole in the shaft and insert the cotter pin. DO NOT back off the nut to align.
5. Reinstall the wheel and lug bolts onto the hub. Torque the lug bolts to 90 ft. lbs. [123 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 and proper function.

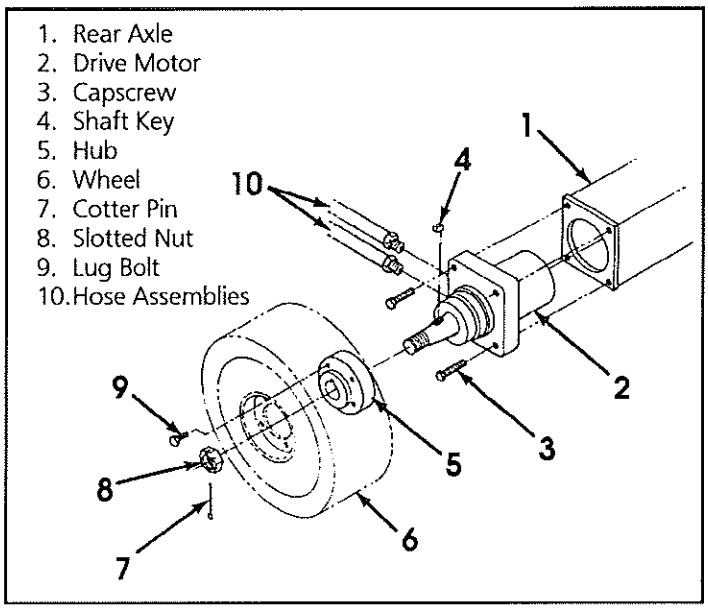


Figure 4-14: Drive Motor Installation

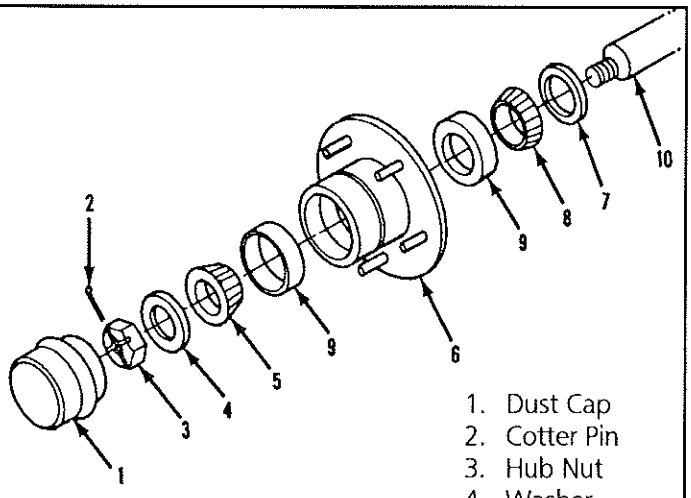
4.10 WHEEL BEARINGS (Figure 4-15)

REMOVAL

1. Loosen the wheel lug nuts then, using a 2 ton capacity jack, raise the work platform until the wheel to be worked on is off the ground.
2. Install jack stands to prevent the work platform from falling if the jack fails.
3. Remove the wheel lug nuts and the wheel.
4. Remove the dust cap.
5. Remove the cotter pin.
6. Remove the hub nut and washer.
7. Slide the entire hub assembly from the spindle and place on clean surface.
8. Remove the outside bearing cone and place on clean surface.
9. Remove the grease seal and the inside bearing cone.

Examine the bearing cups. If they are smooth, shiny and free of pits or any surface irregularities, **DO NOT** remove them.

10. If the cups need replacement, remove them by tapping around the circumference of the inside surface of the cups from the opposite side using a long drift.



1. Dust Cap
2. Cotter Pin
3. Hub Nut
4. Washer
5. Bearing Cone
6. Hub Assembly
7. Grease Seal
8. Bearing Cone
9. Bearing Cup
10. Spindle

Figure 4-15: Wheel Bearings

INSTALLATION

1. Position the replacement bearing cup over the opening in the hub assembly then position the worn cup over the replacement so that the bearing surfaces face each other. Use the old bearing cone as a drift to work the replacement into position by tapping evenly around the circumference.
2. Apply a liberal coating of multi purpose grease to the bearing surface of each cup.
3. Pack the inside bearing cone with multi purpose grease and position it within the rear bearing cup in the hub assembly. Install the new grease seal.
4. Apply a thin coating of multi purpose grease to the spindle to protect the grease seal then slide the hub assembly onto the spindle.
5. Pack the outside bearing cone with multi purpose grease and slide it onto the spindle until it seats in the outer bearing cup.
6. Install the washer and hub nut. Tighten the hub nut, while rotating the assembly, until the hub drags then back the nut to the first slot that aligns with the cotter pin hole in the spindle.
7. Install a new cotter pin and bend the end up over the hub nut and the spindle.
8. Install the dust cap and wheel/tire assembly. Torque the lug nuts to 90 ft. lbs. [123 N-m).
9. Remove jack stands and lower work platform to the ground.

4.11 Brake Cylinder (Figure 4-16)

REMOVAL

1. Block the wheels to prevent the work platform from rolling when the brake is removed.
2. Tag then disconnect the hose assemblies and cap the openings to prevent foreign material from entering.
3. Remove the locknuts and lockwashers that mount the cylinder to the chassis.

DISASSEMBLY

NOTE: Prepare a clean work area on which to service the internal parts.

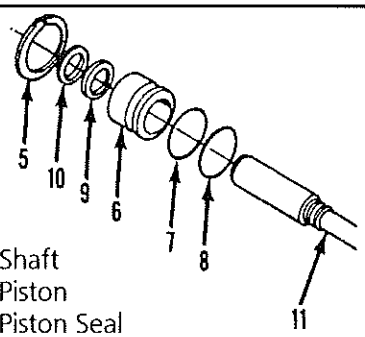
1. Remove fittings from cylinder barrel.
2. Remove the snap ring and withdraw the shaft and all attached components from the cylinder barrel.
3. Remove the head cap from the shaft then remove the wiper, shaft seal and seals from the head cap.
4. Unscrew the piston from the shaft and remove the static seal. Remove the piston seal from the piston.
5. Remove the spring and stop tube from the cylinder barrel.

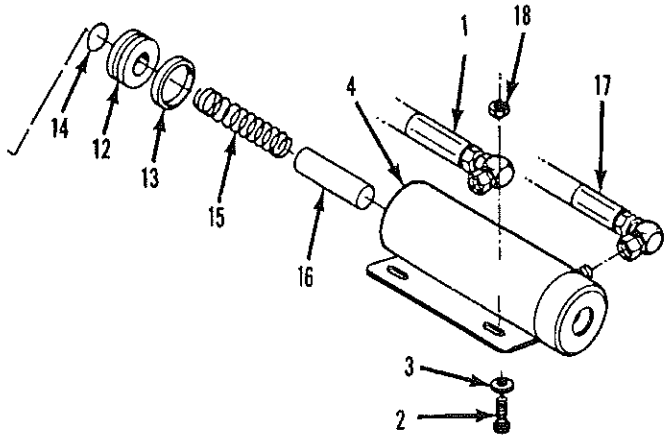
CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the head cap, outer edge surface of the piston, inside of the cylinder barrel and the shaft for signs of scoring or excessive wear.
4. Check the spring for cracks.
5. Replace any parts found unserviceable.
6. Discard all seals.

ASSEMBLY AND INSTALLATION

1. Install the piston seal on the piston then assemble the static seal, shaft and piston.
2. Position the spring and stop tube on the shaft assembly.
3. Lubricate the piston seal with clean hydraulic fluid, then install the shaft assembly in the cylinder barrel.
4. Lubricate the seals with clean hydraulic fluid and install on the head cap.
5. Install the shaft seal and wiper within the head cap.
6. Lubricate entire assembly's seals and the shaft seal and wiper with clean hydraulic fluid then install the head cap onto the shaft and into the cylinder barrel.
7. Secure with snap ring.
8. Position the brake cylinder assembly on the chassis so that the shaft fully engages the brake disc, however the shaft must clear the brake disc once retracted. Secure with locknuts and washers.
9. Connect the hose assemblies.
10. Operate the brake retract circuit and check that the shaft clears the brake disc. Check for leaks.





1. Hose Assembly
2. Capscrew
3. Lockwasher
4. Cylinder Barrel
5. Snap Ring
6. Head Cap
7. Seal
8. Seal
9. Wiper
10. Shaft Seal
11. Shaft
12. Piston
13. Piston Seal
14. Static Seal
15. Spring
16. Stop Tube
17. Hose Assembly
18. Locknut

Figure 4-16: Brake Cylinder

4.12 Steering Cylinder

REMOVAL

1. Mark and disconnect the hose assemblies from the fittings and immediately cap the openings to prevent foreign material from entering.
2. Remove the capscrews securing the rod ends to the steering linkage.
3. Loosen the nut and bolt in front of the Steering Cylinder that goes through the frame.
4. Remove the capscrews and locknuts that fasten the cylinder assembly to the chassis.
5. Remove the cylinder from the chassis.

DISASSEMBLY (Figure 4-17)

1. Remove the fittings from both ends of the cylinder.
2. Remove the headcaps from the barrel tube.
3. Withdraw the entire shaft assembly from either end of the barrel tube.
4. Remove the rod wipers, rod seals and static O-rings from the headcaps.
5. Discard all the seals.
6. Unscrew the No. 1 shaft from the No. 2 shaft and remove the piston.
7. Remove the piston seal and static O-ring from the piston and discard.

CLEANING AND INSPECTION

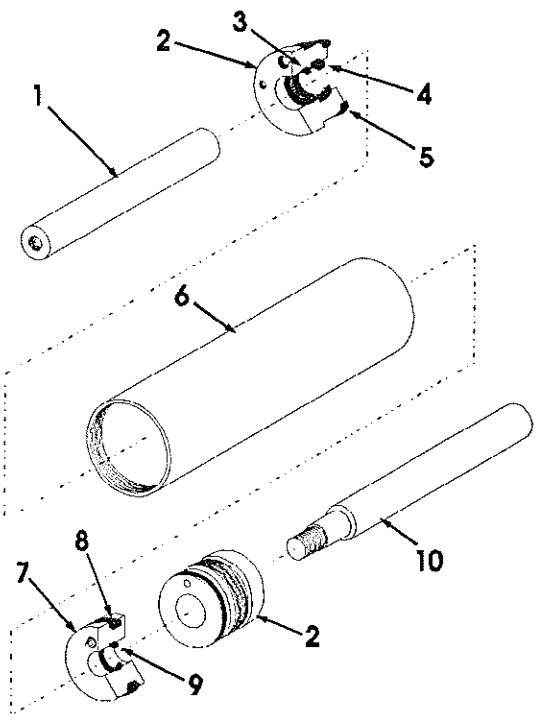
1. Wash all the metal parts in cleaning solvent and blow dry with filtered compressed air.
2. Inspect all the threaded components for stripped or damaged threads.
3. Check the inside surface of the barrel tube for scoring or excessive wear.
4. Check the piston and head caps for scoring or excessive wear.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

ASSEMBLY AND INSTALLATION (Figure 4-17)

1. Install a new piston seal and static O-rings
2. Install the piston on the No. 1 shaft.
3. Thread the No. 2 shaft onto the No. 1 shaft and tighten securely.
4. Lubricate the piston seal with clean hydraulic fluid and install the shaft assembly in the barrel tube.
5. Lubricate and install new rod seals and static O-rings on the headcaps.
6. Lubricate and install new rod wipers in the headcaps.
7. Install headcaps in the barrel tube and tighten until the mounting holes are in-line.
8. Install the fittings in the ends of the cylinder.
9. Position the cylinder assembly in the chassis and install the capscrews and locknuts, but DO NOT tighten.
10. Tighten the nut and bolt in front of the cylinder that goes through the frame and then tighten the cylinder mounting capscrews.
10. Install the cylinder rod ends.
11. Connect the hose assemblies to the fittings.
12. Operate the steering circuit several times throughout its entire range of travel to expel trapped air and check for leaks.

ADJUSTMENT

1. Disconnect the cylinder rod ends (if connected).
2. Operate steering so that both ends of the cylinder rod are equal length (± $^1/_{32}$ inch).
3. Position both tires so they are parallel with the frame and with each other.
4. Adjust the rod ends until they align with the holes on the steering linkage bars.
5. Reinstall the bolts through the steering linkage bars and rod ends. Tighten the jam nuts on the rod ends and all hardware.
6. When properly adjusted, the wheels must turn the same amount in each direction.



1. No. 2 Shaft
2. Headcap (2)
3. Rod Wiper (2)
4. Rod Seal (2)
5. Static O-ring (2)
6. Cylinder Barrel
7. Piston
8. Piston Seal
9. Piston Static O-ring
10. No. 1 Shaft

Figure 4-17: Steering Cylinder Assembly

4.13 Lift Cylinder

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

REMOVAL

1. Raise and block the front of the elevating assembly approximately 12 inches (305 mm) above the chassis. Support with a jackstand with a minimum rating of 4000 lbs. (1814 kg).
2. Open Emergency Lowering Valve to be sure all pressure is off the Lift Cylinder.
3. Remove and cap both hoses and fittings.
4. Support the Lift Cylinder to prevent falling.
5. Remove the set screw from the end of the cylinder rod.
6. Remove the retaining ring from the upper cylinder pin. Remove the upper cylinder pin by tapping out using a soft punch.
7. Remove the retaining bolt from the lower cylinder pin and remove the pin using a soft punch.
8. Remove the cylinder by sliding it out of the front of the machine.

DISASSEMBLY (Figure 4-18)

1. Unscrew the head cap from the cylinder barrel.
2. Remove the piston and rod assembly from the cylinder barrel.
3. Unscrew the piston nut and remove piston and head cap from the piston rod.
4. Remove the piston static O-ring from the cylinder rod and discard.
5. Remove the piston seal from the piston and discard.
6. Remove the static O-ring, rod seal and rod wiper.
7. Remove the rod end breather.
8. Do not remove the velocity fuse unless replacement is necessary.

CLEANING AND INSPECTION (Figure 4-18)

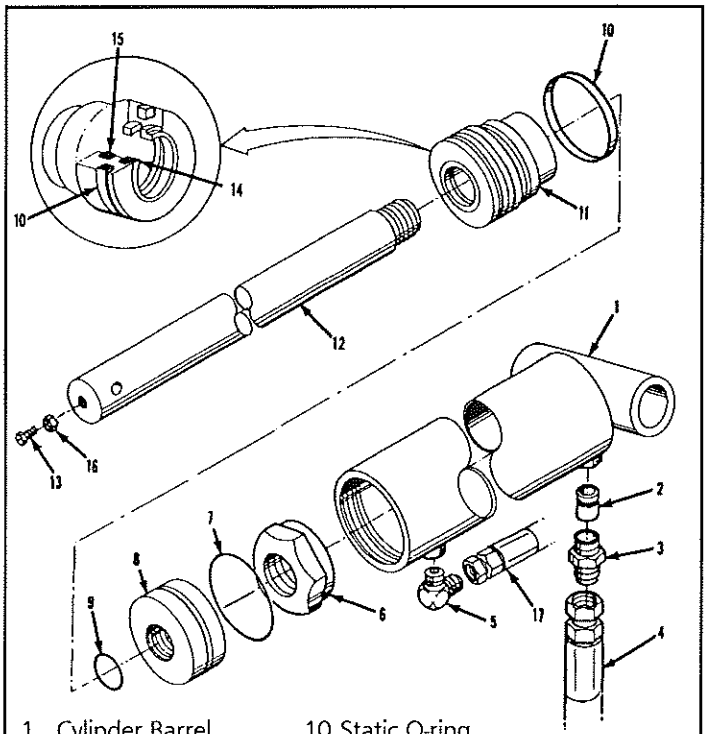
1. Clean all the metal parts in cleaning solvent and blow dry with filtered compressed air.
2. Check the working surfaces of the piston head cap, cylinder barrel and rod for excessive wear or scoring.
3. Replace parts found to be unserviceable.
4. Replace all seals, O-rings and wipers.

REASSEMBLY (Figure 4-18)

1. Lubricate the static O-ring, rod seal and rod wiper and then install in the head cap.
2. Install the piston seal on the piston.
3. Install the head cap, piston static seal, piston and piston nut on the cylinder rod. Torque nut to 70 ft. lbs. (96 N-m).

Note: The head cap should be installed from the piston end of the cylinder rod. Sliding the head cap over the pivot pin hole may damage the rod seal and rod wiper.

4. Lubricate and piston seal and install the piston and rod assembly into the cylinder barrel.
5. Screw the head cap into the cylinder barrel hand tight and then turn $1/4$ turn further.



1. Cylinder Barrel
2. Velocity Fuse
3. Fitting, Adapter
4. Hose Assembly
5. Breather
6. Piston Nut
7. Piston Seal
8. Piston
9. Piston Static O-ring
10. Static O-ring
11. Head Cap
12. Cylinder Rod
13. Set Screw
14. Rod Wiper
15. Rod Seal
16. Nut
17. Hose Assembly

Figure 4-18: Lift Cylinder Assembly

INSTALLATION

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

1. Place the cylinder in position taking care to support the cylinder to prevent falling.
2. Install the lower pin and retaining bolt.
3. Install the upper pin and retaining ring.
4. Install both hoses.
5. Raise the machine and check for leaks.

4.14 Electric Motor (Figure 4-19)

TROUBLESHOOTING

1. Read the nameplate to become familiar with the motor, especially the rated voltage.
2. Try to turn the shaft by hand. Keep motor leads separated while doing this. If the shaft turns freely go to step 3. If the shaft won't turn, proceed to step 2A.

2A. The shaft could be tight for a number of reasons. This check is to determine if the tightness is of a temporary nature only. Obtain a power source to produce the nameplate voltage. **Do Not Make A Permanent Connection**. First touch the motor leads quickly to the power supply just long enough to observe if the shaft runs. If it does turn, then hold the motor leads on the power supply for a longer time. If the motor sounds normal, go to step 3. If the motor sounds noisy, it should be taken apart as described in the disassembly section.

3. If the motor turned freely, connect an ammeter in the circuit as shown in Figure 4-19A. With rated voltage applied and the shaft running free, the ammeter should read less than 20% of the nameplate full load current. If the motor meets the above conditions then it can be assumed the original problem is external to the motor.

DISASSEMBLY

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

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

INSPECTION

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

1. Bearings should spin smoothly and easily and have ample lubrication and be free of corrosion.
2. Armature should be checked for grounds and shorted turns. Refinish commutator surface if pitted or exces-

sively worn.

3. Brushes should be checked for wear and to ensure that they are free in the brush holders.

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

- Remove brush spring clip from its mounting on brush assembly.
- Lift brush assembly from brush holder.
- Disconnect brush assembly lead.
- New brush assembly to be installed by reversing above procedure.

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

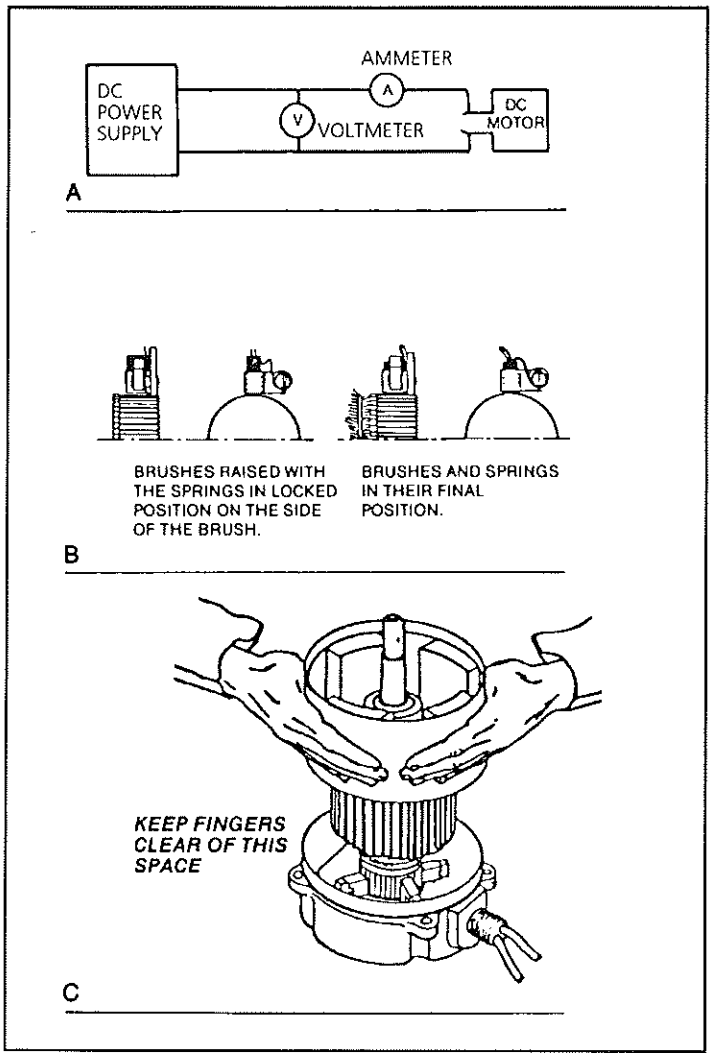


Figure 4-19: Electric Motor Service

REASSEMBLY

1. Install new brushes and be sure they are free in the holder. Install brush with the lead wires positioned as when received. Raise all brushes to the locked position. (See Figure 4-19B and step 3 in the Inspection section).
2. Place commutator cover on a work bench with brush assembly facing upward.
3. Place the bearing spring into the bearing bore.
4. Take a complete armature assembly, including bearings, and insert commutator end bearing into the bearing bore.

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

5. Set the brushes to final position as shown in Figure 4-19B.
6. Place the complete stator down over the vertical armature, and into position on the commutator cover.
7. The stator assembly must be placed in a definite relationship with the commutator covers in order to obtain a neutral brush setting. There is a match-mark on both items. **These two marks must line up exactly. Rotate until they do.**
8. Assemble the pulley end cover in the proper relationship. Insert mounting bolts and tighten alternately to ensure a good mechanical alignment.
9. Spin the shaft by hand to see if it is free. Be sure motor leads (if used) are not touching together. If the leads are touching, a generator action will give the effect of friction in the motor. A no-load test can now be performed. At rated voltage, observe the no-load current. It should be less than 20% of the nameplate full load current. Anything higher indicates:
   - Brushes are not on neutral setting (check matchmarks for exact alignment).
   - Faulty armature.

4.15 Recommended Bolt Torque (Table 4-2)

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

Table 4-2: Bolt Torque

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

5.0 Introduction

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

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

GENERAL PROCEDURE

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

⚠ 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(ies) 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
FROM OUTSIDE THE USA, CALL 1-209-896-5150

5.1 Troubleshooting Guide

Table 5-1: Troubleshooting Guide

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

Table 5-1: Troubleshooting Guide (Cont.)

PROBLEM	PROBABLE CAUSE	REMEDY
Electric Motor continues to run after controls are returned to the **OFF** position.	Motor Relay contacts fused together.	With 0 voltage at the coil terminals of the Motor Relay check continuity across the contact terminals. If there is continuity, replace the Motor Relay.
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 fuse.	Check fuse and replace if required.
	7. Emergency Stop Switch.	Replace switch if inoperative.
Engine cranks but will not start.	1. Out of fuel	Fill tank.
	2. Blocked fuel line.	Remove obstruction.
	3. Fuel Filter clogged.	Clean or replace filter.
	4. Air leaks in the fuel system.	Tighten all fuel line fittings or clamps.
	5. Water in fuel system.	Drain water separator and tank if necessary to remove all water.
	6. Magneto Oil Pressure Switch inoperative.	Check Pressure Switch. Replace if faulty.
	7. Fuel Pump defective/damaged.	Replace the pump.
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 filter separator and tank if necessary to remove all water.
	5. Fuel pump defective/damaged.	Replace the pump.
	6. Clogged air filter.	Clean or replace air filter.
	7. Key Switch.	Switch defective or damaged. Replace the switch.
Engine smokes (white).	1. Oil level too high in crankcase.	Drain oil to proper level.
	2. Piston rings worn or sticking.	Replace rings.
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. Incorrect valve clearance.	Adjust to proper clearance.
	5. Fuel pump defective/damaged.	Replace the pump.
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. Magneto Oil Pressure Switch inoperative.	Check Pressure Switch. Replace if faulty.
Hourmeter does not register.	1. Electrical connections loose or connected improperly.	Tighten and/or correct the connections.
	2. Hourmeter failure.	Replace the meter.
All Controller functions inoperative.	1. Blown fuse.	Find short. Replace fuse.
	2. Key Switch.	Replace switch if inoperative.
	3. Faulty Foot Switch.	Check Foot Switch for continuity, replace if faulty.
	4. Control Cable.	Test cable and replace if damaged.
Platform will not elevate.	1. Emergency Lowering Valve open.	Close valve.
	2. Platform overloaded.	Observe maximum load rating.
	3. Ruptured hydraulic hose.	Replace the hose and check relief valve setting.
	4. Lift Valve Solenoid.	Test solenoid and replace if inoperable.
	5. Main Relief Valve stuck open.	Replace the relief valve.
	6. Lift Switch on Controller.	Test switch, replace if inoperable.
	7. Drive/Lift Switch.	Test the switch, replace if inoperable.
	8. Lift Valve.	Repair or replace valve.
	9. Hydraulic Pump.	Check for pressure and delivery. Repair or replace if inoperative.
	10. Down Valve stuck open.	Remove and inspect the valve for sticky operation or damaged o-rings. Repair or replace if unserviceable.
	11. Proportional Coil.	Test solenoid and replace if inoperable.
	12. Proportional Controller.	Test controller, replace if inoperable.
	13. Up/Forward Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
Unit will not steer. (Lift function operative.)	1. Steering Valve Coils (right and left).	Test coils, replace if inoperative.
	2. Open circuit in Control Cable.	Test cable for continuity, replace if defective.
	3. Steering Valve.	Test valve, replace if not serviceable.
	4. Mechanical damage.	Replace damaged parts.
	5. Steering Switch.	Replace steering switch.
	6. Diode.	Test diodes to steering valves. Replace if faulty.

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

PROBLEM	PROBABLE CAUSE	REMEDY
Unit will not drive.	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.
	4. Ruptured hydraulic hose.	Replace hose.
	5. Proportional Controller.	Test controller and replace if inoperable.
	6. Main pressure 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. Up/Forward Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
	11. Down/Reverse Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
	12. Shuttle Valve not seating.	Check for contaminants and reseat ball in Valve Block.
Unit will not drive full speed.	1. Series/Parallel Valve solenoids.	Test solenoid and replace if inoperable.
	2. Bypass Valve (2nd Speed).	Test solenoid and replace if inoperable.
	3. Proportional Controller.	Test the control and replace if inoperable.
	4. Hydraulic Motors worn.	Inspect the motors and replace if not serviceable.
	5. Hydraulic Pump worn.	Check pump pressure and delivery. Replace if not serviceable.
	6. Main pressure Relief Valve stuck open.	Check relief valve and replace if inoperable.
	7. Torque Selector/ Drive Speed Switch.	Replace switch.
	8. High Speed Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
	9. High Speed Shutout Switch.	Check for continuity, replace if faulty.

PROBLEM	PROBABLE CAUSE	REMEDY
No drive **FWD** but drives in **REV**. Lift function operable.	1. Faulty Drive/Lift Switch.	Test Drive/Lift Switch for continuity. Replace if faulty.
	2. Faulty diode.	Test diodes . Replace if faulty.
	3. Faulty Forward Coil.	Test Forward Coil if proper voltage is present and coil is not magnetized, replace.
	4. Faulty Drive Valve.	Inspect Drive Valve, if spool is sticking replace.
	5. Faulty Counterbalance Valves.	Check pressure of Counterbalance Valves. Replace or reset valves as required.
	6. Shuttle Valve.	Check for contaminants and reseat ball in Valve Block.
No drive **FWD** but drives in **REV**. No lift function.	1. Faulty Up/Fwd. Relay.	Test Up/Fwd. Relay, replace if required.
	2. Faulty Proportional Controller.	Check operation of Proportional Controller. Adjust as necessary. Replace if required.
No drive **REV** but drives in **FWD**. Lift function operable.	1. Faulty Drive/Lift Switch.	Test Drive/Lift Switch for continuity. Replace if faulty.
	2. Faulty diode.	Test diodes, replace if faulty.
	3. Faulty REV Coil.	Test REV Coil, if proper voltage is present and coil is not magnetized, replace.
	4. Faulty Drive Valve.	Inspect Drive Valve, if spool is sticking replace.
	5. Faulty Counterbalance Valves.	Check pressure of Counter-balance Valves. Replace or or reset valves as required.
	6. Shuttle Valve.	Check for contaminants and reseat ball in Valve Block.
No drive **REV** but drives in **FWD**. No lift function.	1. Faulty Down/ Reverse Relay.	Check Down/Reverse Relay, replace if faulty.
	2. Faulty Proportional Controller.	Adjust Proportional Controller, replace if required.
Platform drifts down	1. Emergency Lowering Valve partly open or faulty.	Ensure that the Emergency Lowering Valve is completely closed. If the platform still drifts down, replace the valve.
	2. Check Valve leaking.	Check for oil bypassing Check Valve. Replace O-rings as required.
	3. Leaky Down Valve cartridge.	Replace the Down Valve.
	4. Faulty valve O-rings.	Check and replace O-rings on Emergency Lowering Valve, Down Valve and piston.
Platform drives while lifting.	Faulty diode.	Test diodes, replace if faulty.
Platform lifts while driving.	Faulty diode.	Test diodes, replace if faulty.

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

PROBLEM	PROBABLE CAUSE	REMEDY
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. Proportional Controller.	Test control and replace if inoperable.
	5. Drive/Lift Switch.	Check switch and replace if inoperable.
	6. Down/Reverse Relay.	Check for contact closure when energized. If contacts do not close, replace the relay.
Platform starts to lower then stops.	Lift Cylinder internal fuse blown (oil viscosity too high).	Raise platform slightly. Allow hydraulic oil to warm up, then lower platform.
Brake does not release.	1. Pressure Reducing Valve.	Check pressure at brake. Replace valve if not serviceable.
	2. Shuttle Valve stuck.	Clean or replace Shuttle Valve assembly.
	3. Faulty Brake Cylinder.	Check and replace seals in cylinder.
Brake will not lock wheel.	1. Orifice plugged.	Remove and clean Brake Orifice.
	2. Faulty Brake Cylinder.	Check and replace seals in cylinder.

6.0 Introduction

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

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

The diagrams appear in the following order:

Figure 6-1: Electrical Schematic, Electric Model.

Figure 6-2: Electrical Schematic, Dual Fuel Model.

Figure 6-3: Electrical Schematic, European Electric Model.

Figure 6-4: Electrical Schematic, European Dual Fuel Model.

Figure 6-5: Electrical Schematic, Optional Kubota Dual Fuel Model.

Figure 6-6: Hydraulic Schematic, Electric Model.

Figure 6-7: Hydraulic Schematic, Dual Fuel Model.

Figure 6-8: Hydraulic 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, Electric Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Control Module center front.
BAT	Batteries (8) 6 volts	To store energy.	Power Module.
CONT	Controller, Proportional & Switch, Steering	Supplies power to Up/Fwd Relay or Dn/Rev Relay and Proportional Coil. Supplies power to R & L Steering coils.	Platform Controller (Control Box).
CR1	Relay, Motor	Connects Batteries to Motor.	Power Module behind Battery Charger.
CR2	Relay, Motor	Connects Batteries to Motor.	Power Module behind Battery Charger.
CR3	Relay, Up/Fwd	Provides power to Up/Fwd contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR4	Relay, Dn/Rev	Provides power to Dn/Rev contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR5	Relay, High Speed	Controls Second Speed Valve and Series/Parallel Valves to cut out high speed when elevated.	Mounted to Control Module right bulkhead.
DIO1	Diode	Supplies power to Motor Relays when Steer Switch is activated **RIGHT.**	Between T1 and T2 on Fanning Strip.
DIO2	Diode	Supplies power to Motor Relay when Steer Switch is activated **LEFT.**	Between T3 and T2 on Fanning Strip.
DIO3	Diode	Supplies power to DIO6 for **LIFT** operation.	Between T5 and T6 on Fanning Strip.
DIO4	Diode	Supplies power to DIO6 for **FORWARD** operation.	Between T4 and T6 on Fanning Strip.
DIO5	Diode	Supplies power to DIO6 for **REVERSE** operation.	Between T7 and T6 on Fanning Strip.
DIO6	Diode	Supplies power to Motor Relays for **LIFT**, **FORWARD** & **REVERSE** operation.	Between T12 and T13 on Fanning Strip.
DIO7	Diode	Supplies power to Second Speed Coil for high speed lift.	Between T5 and T10 on Fanning Strip.
DIO8	Diode	Supplies power to alarm when Platform lowers.	Between T16 and T9 on Fanning Strip.
DIO9	Diode	Supplies power to Down Coil for **LOWERING** operation.	Between T16 and T8 on Fanning Strip.
DIO10	Diode	Provides power to LSW1 during **REVERSE** operation.	Between T7 and T15 on Fanning Strip.
DIO11	Diode	Provides power to LSW1 during **FORWARD** operation.	Between T4 and T15 on Fanning Strip.
DIO12	Diode	Provides power to Motor Relays during **STEER RIGHT & STEER LEFT** operation	Between T14 and T13 on Fanning Strip.
FU	Fuse, 15 AMP	Overload protection for the control circuit.	Right front of Control Module, Bottom of Chassis Control Panel.
LSW1	Switch, Down Limit	Provides power to Down Coil during **FORWARD & REVERSE** operation when Platform is down.	Mounted to rear of Control Module right bulkhead. Integrated with LSW2.
LSW2	Switch, High Speed Shutout	Opens high speed circuit from 2nd Speed and Series/ Parallel Coils allowing only creep speed when Platform is raised.	Mounted to rear of Control Module right bulkhead. Integrated with LSW1.
MOT1	Motor, Electric	Provides power to Drive Hydraulic Pump.	Right side of Power Module.
MOT2	Motor, Electric	Provides power to Drive Hydraulic Pump.	Right side of Power Module.
MTR	Meter, Voltage/ Hour	Shows state of charge of Batteries and hours machine has power on.	Right front of Control Module, top of Chassis Control Panel.
SOL1	Solenoid, Right Steer (coil)	Shifts Steer Valve to **RIGHT** turn position.	Top end of Spool Valve mounted on left front of Manifold Block.
SOL2	Solenoid, Left Steer (coil)	Shifts Steer Valve to **LEFT** turn position.	Bottom end of Spool Valve mounted on left front of Manifold Block.
SOL3	Solenoid, Forward (coil)	Opens Forward Valve to direct oil through drive circuit for forward operation.	Top center front of Manifold Block in front of Gauge Port.
SOL4	Solenoid, Reverse (coil)	Opens Reverse Valve to direct oil through drive circuit for reverse operation.	Bottom center front of Manifold Block below Forward Valve.
SOL5	Solenoid, Lift (Up Coil)	Opens Lift Valve.	Top front of Manifold Block, left of Forward Valve.
SOL6	Solenoid, Down (coil)	Opens Down Valve.	Bottom front of Manifold Block, below Lift Valve.
SOL7	Solenoid, Proportional (coil)	Controls Proportional Valve.	Bottom left of Manifold Block.
SOL8	Solenoid, 2nd Speed (coil)	Opens 2nd Speed Valve to allow high speed operation.	Front left of Manifold Block, right of Steering Valve.
SOL9	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Lower right front of Manifold Block.
SOL10	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Right end of Manifold Block.

Table 6-1: (cont'd.)

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SW1	Switch, Emergency Stop Button.	Control Circuit shut off.	Platform Controller (Control Box).
SW2	Switch, Emergency Stop Button.	Control Circuit shut off.	Chassis Control Panel (right front of Control Module).
SW3	Switch, Controller Key	Supplies power to Controller.	Platform Controller, right front.
SW4	Switch, Foot	Supplies power to Controller.	Platform deck.
SW5	Switch, Drive/Lift	Supplies power to Forward and Reverse or Up and Down Valve coils.	Platform Controller, center toggle.
SW6	Switch, Torque Selector (Drive/Lift Speed)	Provides either High Speed or High Torque drive/lift operation.	Platform Controller, left toggle.
SW7	Switch, Lift	Supplies power to Up and Proportional coils or Down coil.	Chassis Control Panel, right front of Control Module.

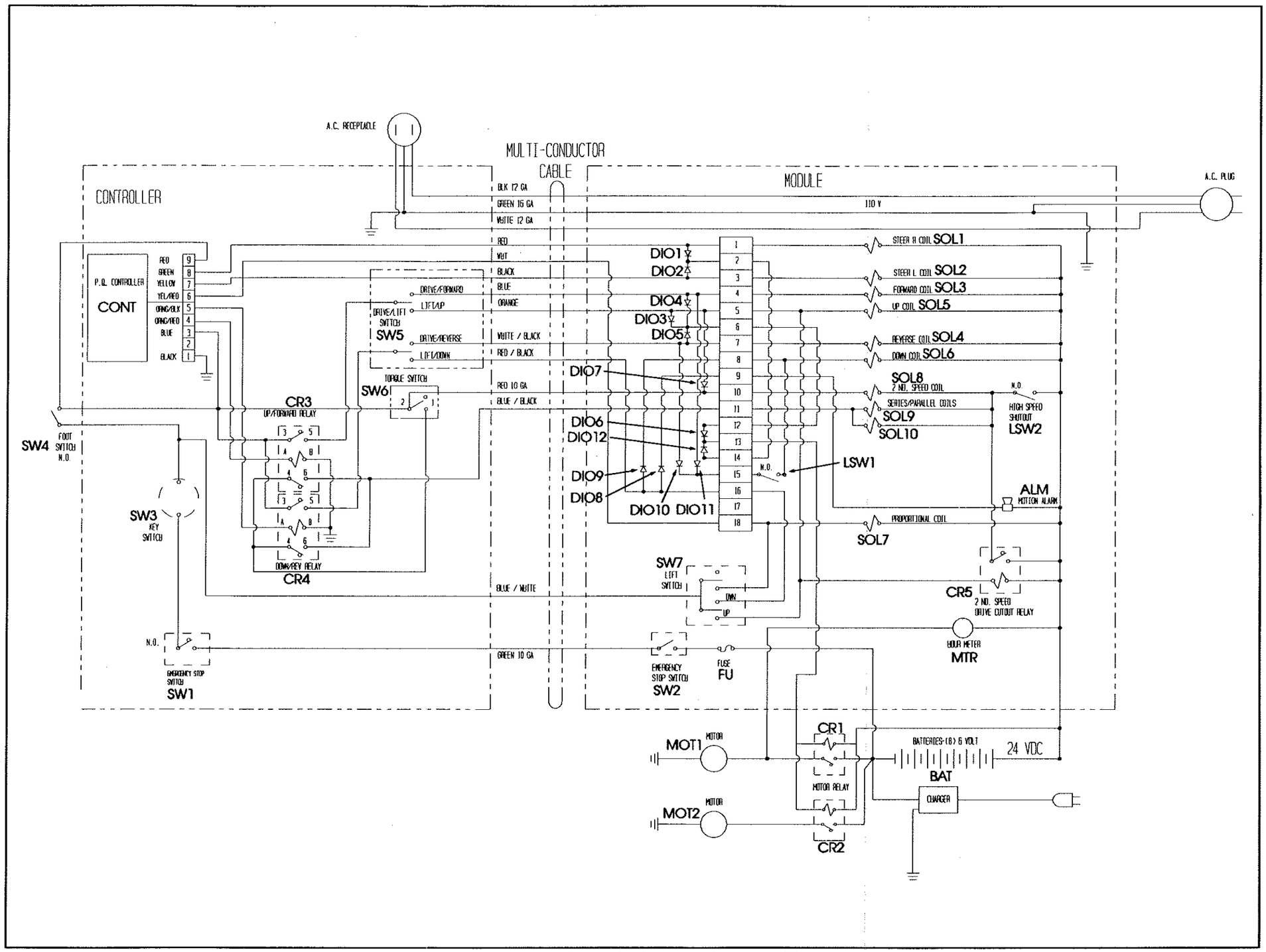


Figure 6-1: Electrical Schematic, Electric Model

Table 6-2: Electrical Schematic Legend, Dual Fuel Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Right rear of Control Module.
BAT	Battery 12 volts	To store energy	Power Module.
CO1	Coil, Choke	Opens Choke as Engine warms up.	Right side of Engine Carburetor.
CO2	Coil, Engine Idle	Holds throttle in idle position.	Left side of Engine Carburetor.
CO3	Coil, Fuel Shut-off	Allows fuel flow to Carburetor.	Right side of Engine Idle Coil.
CO4	Coil, Gasoline Valve	Allows gasoline to flow to Fuel Shut-off Valve.	In front of Battery on module floor.
CO5	Coil, L.P. Gas Valve	Allows L.P. Gas to flow to Fuel Shut-off Valve.	Left side of Engine, mounted to L.P. Gas Regulator.
CONT	Controller, Proportional & Switch, Steering	Supplies power to Up/Fwd Relay or Dn/Rev Relay and Proportional Coil. Supplies power to R & L Steering coils.	Platform Controller (Control Box).
CR1	Relay, Motor	Connects Batteries to Starter Motor.	Power Module right side of Battery.
CR2	Relay, Up/Fwd	Provides power to Up/Fwd contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR3	Relay, Dn/Rev	Provides power to Dn/Rev contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR4	Relay, Accelerator	Provides power to the Idle Coil to increase Engine speed.	Mounted to Control Module right bulkhead.
CR5	Relay, High Speed	Controls Second Speed Valve and Series/Parallel Valves to cut out high speed when elevated.	Mounted to Control Module right bulkhead.
DIO1	Diode	Supplies power to Accelerator Relay when Steer Switch is activated **RIGHT.**	Between T4 and T6 on Fanning Strip.
DIO2	Diode	Supplies power to Accelerator Relay when Steer Switch is activated **LEFT.**	Between T5 and T6 on Fanning Strip.
DIO3	Diode	Supplies power to Accelerator Relay for **LIFT** operation.	Between T6 and T7 on Fanning Strip.
DIO4	Diode	Supplies power to Down Coil.	Between T16 and T8 on Fanning Strip.
DIO5	Diode	Supplies power to Down Coil for high speed drive in **REVERSE.**	Between T7 and T15 on Fanning Strip.
DIO6	Diode	Supplies power to Down Alarm.	Between T16 and T9 on Fanning Strip.
DIO7	Diode	Supplies power to Down Coil for high speed drive **FORWARD.**	Between T4 and T15 on Fanning Strip.
DIO8	Diode	Prevents feedback to Fuel Cutoff Valves.	Connected to Engine Oil Pressure Switch PSW2.
DIO9	Diode	Prevents feedback to Fuel Cutoff Valves.	Connected to Accelerator Relay.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
FU	Fuse, 15 AMP	Overload protection for the control circuit.	Right front of Control Module, Bottom of Chassis Control Panel.
LSW1	Switch, Down Limit	Supplies power to Drive Cutout Relay when Platform is down.	Mounted to rear of Control Module right bulkhead. Integrated with LSW2.
LSW2	Switch, High Speed Shutout	Opens high speed circuit from 2nd Speed and Series/ Parallel Coils allowing only creep speed when Platform is raised.	Mounted to rear of Control Module right bulkhead. Integrated with LSW1.
MTR	Meter, Hour	Shows hours machine has power on.	Right front of Control Module, top of Chassis Control Panel.
PSW1	Pressure Switch, Engine Oil, normally closed.	Stops ignition if engine loses oil pressure.	Top right of engine.
PSW2	Pressure Switch, Engine Oil, normally open.	Stops fuel if engine loses oil pressure.	Top right of engine.
SOL1	Solenoid, Right Steer (coil)	Shifts Steer Valve to **RIGHT** turn position.	Top end of Spool Valve mounted on left front of Manifold Block.
SOL2	Solenoid, Left Steer (coil)	Shifts Steer Valve to **LEFT** turn position.	Bottom end of Spool Valve mounted on left front of Manifold Block.
SOL3	Solenoid, Forward (coil)	Opens Forward Valve to direct oil through drive circuit for forward operation.	Top center front of Manifold Block in front of Gauge Port.
SOL4	Solenoid, Reverse (coil)	Opens Reverse Valve to direct oil through drive circuit for reverse operation.	Bottom center front of Manifold Block below Forward Valve.
SOL5	Solenoid, Lift (Up Coil)	Opens Lift Valve.	Top front of Manifold Block, left of Forward Valve.
SOL6	Solenoid, Down (coil)	Opens Down Valve.	Bottom front of Manifold Block, below Lift Valve.
SOL7	Solenoid, Proportional (coil)	Controls Proportional Valve.	Bottom left of Manifold Block.
SOL8	Solenoid, 2nd Speed (coil)	Opens 2nd Speed Valve to allow high speed operation.	Front left of Manifold Block, right of Steering Valve.
SOL9	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Lower right front of Manifold Block.
SOL10	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Right end of Manifold Block.
SW1	Switch, Emergency Stop Button.	Control Circuit shut off.	Platform Controller (Control Box).
SW2	Switch, Emergency Stop.	Control Circuit shut off.	Chassis Control Panel, right front of Control Module.

Table 6-2: Cont'd.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SW3	Switch, Controller Key	Supplies power to Controller and starts engine.	Platform Controller, right front.
SW4	Switch, Foot	Control Circuit shut off.	Platform deck.
SW5	Switch, Drive/Lift	Supplies power to Forward and Reverse or Up and Down Valve coils.	Platform Controller, center toggle.
SW6	Switch, Torque Selector(Drive/Lift Speed)	Provides either High Speed or High Torque drive/lift operation.	Platform Controller, left toggle.
SW7	Switch, Lift	Supplies power to Up and Proportional coils or Down coil.	Chassis Control Panel, right front of Control Module.
SW8	Switch, Fuel Selector	Provides power to either Gasoline or L.P. Gas Valves.	Chassis Control Panel, right front of Control Module.

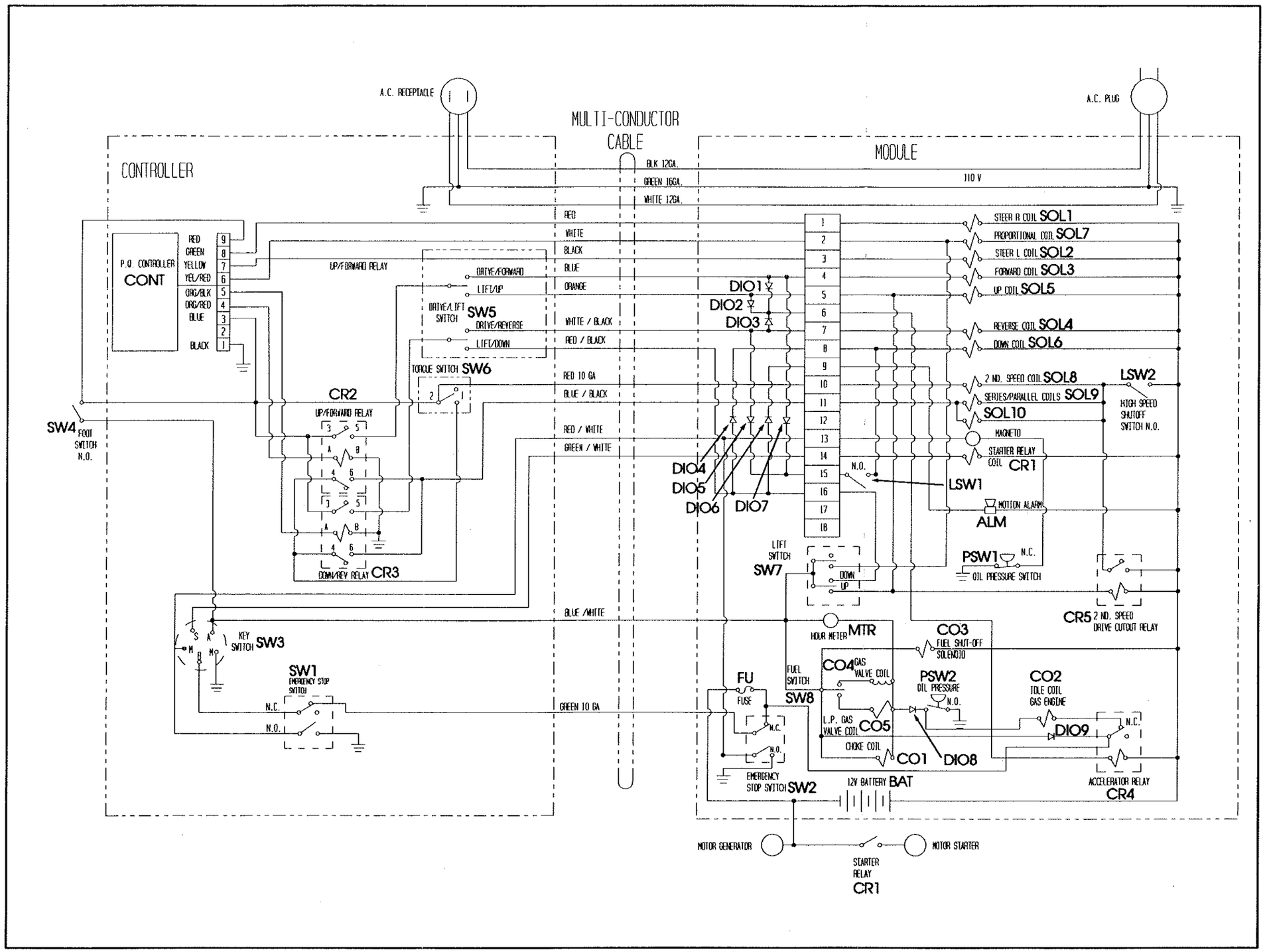


Figure 6-2: Electrical Schematic, Dual Fuel Model

Table 6-3: Electrical Schematic Legend, European Electric Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Control Module center front.
BAT	Batteries (8) 6 volts	To store energy.	Power Module.
CONT	Controller, Proportional & Switch, Steering	Supplies power to Up/Fwd Relay or Dn/Rev Relay and Proportional Coil. Supplies power to R & L Steering coils.	Platform Controller (Control Box).
CR1	Relay, Motor	Connects Batteries to Motor.	Power Module behind Battery Charger.
CR2	Relay, Motor	Connects Batteries to Motor.	Power Module behind Battery Charger.
CR3	Relay, Up/Fwd	Provides power to Up/Fwd contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR4	Relay, Dn/Rev	Provides power to Dn/Rev contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR5	Relay, High Speed	Controls Second Speed Valve and Series/Parallel Valves to cut out high speed when elevated.	Mounted to Control Module right bulkhead.
DIO1	Diode	Supplies power to Motor Relays when Steer Switch is activated **RIGHT**.	Between T1 and T2 on Fanning Strip.
DIO2	Diode	Supplies power to Motor Relay when Steer Switch is activated **LEFT**.	Between T3 and T2 on Fanning Strip.
DIO3	Diode	Supplies power to DIO6 for **LIFT** operation.	Between T5 and T6 on Fanning Strip.
DIO4	Diode	Supplies power to DIO6 for **FORWARD** operation.	Between T4 and T6 on Fanning Strip.
DIO5	Diode	Supplies power to DIO6 for **REVERSE** operation.	Between T7 and T6 on Fanning Strip.
DIO6	Diode	Supplies power to Motor Relays for **LIFT**, **FORWARD** & **REVERSE** operation.	Between T12 and T13 on Fanning Strip.
DIO7	Diode	Supplies power to Second Speed Coil for high speed lift.	Between T5 and T10 on Fanning Strip.
DIO8	Diode	Supplies power to alarm when Platform lowers.	Between T16 and T9 on Fanning Strip.
DI09	Diode	Supplies power to Down Coil for **LOWERING** operation.	Between T16 and T8 on Fanning Strip.
DI010	Diode	Provides power to LSW1 during **REVERSE** operation.	Between T7 and T15 on Fanning Strip.
DIO11	Diode	Provides power to LSW1 during **FORWARD** operation.	Between T4 and T15 on Fanning Strip.
DIO12	Diode	Provides power to Motor Relays during **STEER RIGHT & STEER LEFT** operation.	Between T14 and T13 on Fanning Strip.
FU1	Fuse, 15 AMP	Overload protection for the control circuit.	Right front of Control Module, Bottom of Chassis Control Panel.
FU2	Fuse, 150 AMP	Overload protection for Electric Motor.	Mounted to Power Module right bulkhead.
FU3	Fuse, 150 AMP	Overload protection for Electric Motor.	Mounted to Power Module right bulkhead.
LSW1	Switch, Down Limit	Provides power to Down Coil during **FORWARD** & **REVERSE** operation when Platform is down.	Mounted to rear of Control Module right bulkhead. Integrated with LSW2.
LSW2	Switch, High Speed Shutout	Opens high speed circuit from 2nd Speed and Series/ Parallel Coils allowing only creep speed when Platform is raised.	Mounted to rear of Control Module right bulkhead. Integrated with LSW1.
MOT1	Motor, Electric	Provides power to Drive Hydraulic Pump.	Right side of Power Module.
MOT2	Motor, Electric	Provides power to Drive Hydraulic Pump.	Right side of Power Module.
MTR	Meter, Voltage/ Hour	Shows state of charge of Batteries and hours machine has power on.	Right front of Control Module, top of Chassis Control Panel.
SOL1	Solenoid, Right Steer (coil)	Shifts Steer Valve to **RIGHT** turn position.	Top end of Spool Valve mounted on left front of Manifold Block.
SOL2	Solenoid, Left Steer (coil)	Shifts Steer Valve to **LEFT** turn position.	Bottom end of Spool Valve mounted on left front of Manifold Block.
SOL3	Solenoid, Forward (coil)	Opens Forward Valve to direct oil through drive circuit for forward operation.	Top center front of Manifold Block in front of Gauge Port.
SOL4	Solenoid, Reverse (coil)	Opens Reverse Valve to direct oil through drive circuit for reverse operation.	Bottom center front of Manifold Block below Forward Valve.
SOL5	Solenoid, Lift (Up Coil)	Opens Lift Valve.	Top front of Manifold Block, left of Forward Valve.
SOL6	Solenoid, Down (coil)	Opens Down Valve.	Bottom front of Manifold Block, below Lift Valve.
SOL7	Solenoid, Proportional (coil)	Controls Proportional Valve.	Bottom left of Manifold Block.
SOL8	Solenoid, 2nd Speed (coil)	Opens 2nd Speed Valve to allow high speed operation.	Front left of Manifold Block, right of Steering Valve.

Table 6-3: Cont'd.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SOL9	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Lower right front of Manifold Block.
SOL10	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Right end of Manifold Block.
SW1	Switch, Emergency Stop Button.	Control Circuit shut off.	Platform Controller (Control Box).
SW2	Switch, Emergency Stop Button.	Control Circuit shut off.	Chassis Control Panel (right front of Control Module).
SW3	Switch, Controller Key	Supplies power to Controller.	Platform Controller, right front.
SW4	Switch, Foot	Supplies power to Controller.	Platform deck.
SW5	Switch, Drive/Lift	Supplies power to Forward and Reverse or Up and Down Valve coils.	Platform Controller, center toggle.
SW6	Switch, Torque Selector (Drive/Lift Speed)	Provides either High Speed or High Torque drive/lift operation.	Platform Controller, left toggle.
SW7	Switch, Lift	Supplies power to Up and Proportional coils or Down coil.	Chassis Control Panel, right front of Control Module.
SW8	Switch, Chassis Key	Supplies power to Chassis Lift Switch.	Chassis Control Panel, right front of Control Module.

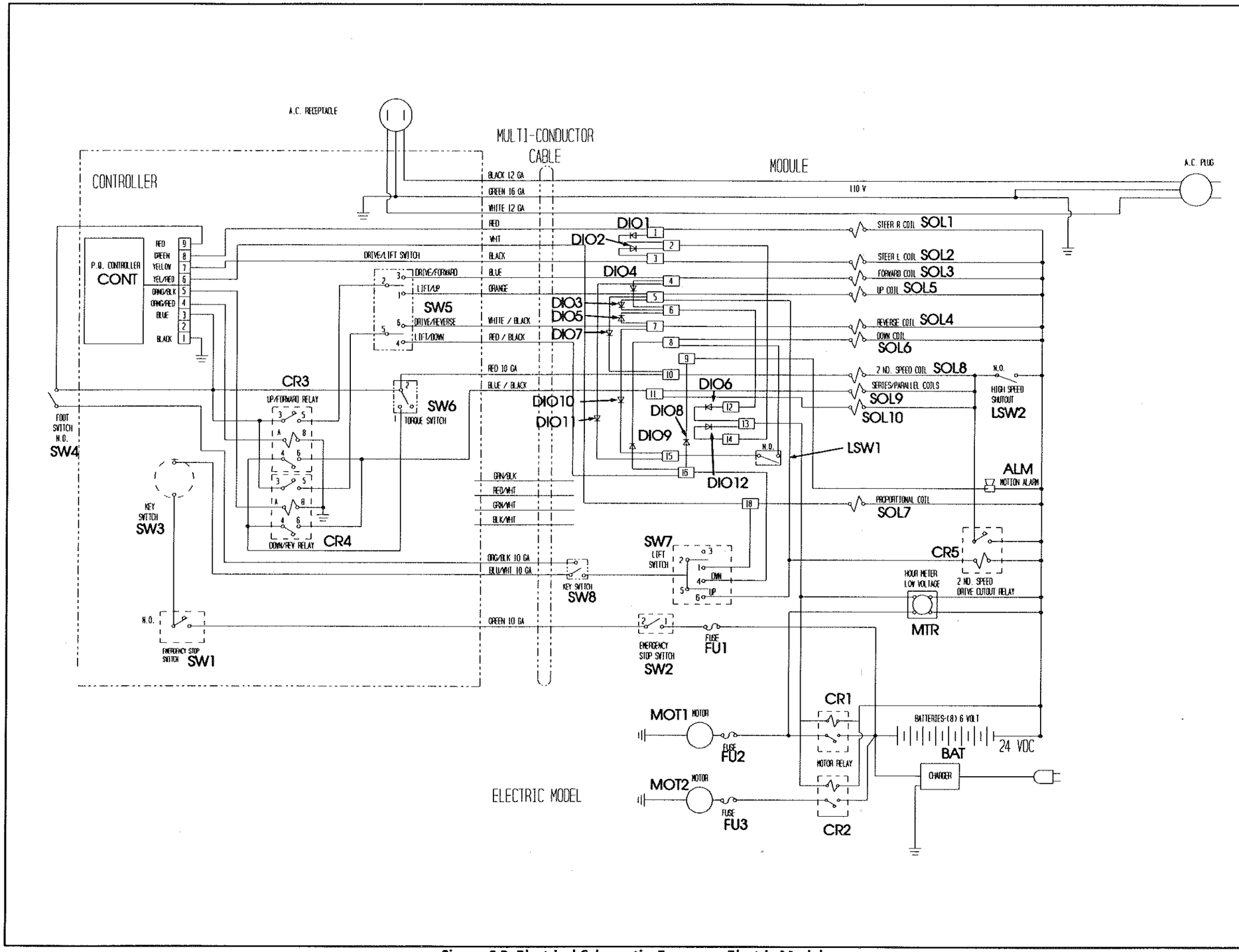


Figure 6-3: Electrical Schematic, European Electric Model

Table 6-4: Electrical Schematic Legend, European Dual Fuel Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Right rear of Control Module.
BAT	Battery 12 volts	To store energy	Power Module.
CO1	Coil, Choke	Opens Choke as Engine warms up.	Right side of Engine Carburetor.
CO2	Coil, Engine Idle	Holds throttle in idle position.	Left side of Engine Carburetor.
CO3	Coil, Fuel Shut-off	Allows fuel flow to Carburetor.	Right side of Engine Idle Coil.
CO4	Coil, Gasoline Valve	Allows gasoline to flow to Fuel Shut-off Valve.	In front of Battery on module floor.
CO5	Coil, L.P. Gas Valve	Allows L.P. Gas to flow to Fuel Shut-off Valve.	Left side of Engine, mounted to L.P. Gas Regulator.
CONT	Controller, Proportional & Switch, Steering	Supplies power to Up/Fwd Relay or Dn/Rev Relay and Proportional Coil. Supplies power to R & L Steering coils.	Platform Controller (Control Box).
CR1	Relay, Motor	Connects Batteries to Starter Motor.	Power Module right side of Battery.
CR2	Relay, Up/Fwd	Provides power to Up/Fwd contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR3	Relay, Dn/Rev	Provides power to Dn/Rev contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR4	Relay, Accelerator	Provides power to the Idle Coil to increase Engine speed.	Mounted to Control Module right bulkhead.
CR5	Relay, High Speed	Controls Second Speed Valve and Series/Parallel Valves to cut out high speed when elevated.	Mounted to Control Module right bulkhead.
DIO1	Diode	Supplies power to Accelerator Relay when Steer Switch is activated **RIGHT.**	Between T4 and T6 on Fanning Strip.
DIO2	Diode	Supplies power to Accelerator Relay when Steer Switch is activated **LEFT.**	Between T5 and T6 on Fanning Strip.
DIO3	Diode	Supplies power to Accelerator Relay for **LIFT** operation.	Between T6 and T7 on Fanning Strip.
DIO4	Diode	Supplies power to Down Coil.	Between T16 and T8 on Fanning Strip.
DIO5	Diode	Supplies power to Down Coil for high speed drive in **REVERSE**.	Between T7 and T15 on Fanning Strip.
DIO6	Diode	Supplies power to Down Alarm.	Between T16 and T9 on Fanning Strip.
DIO7	Diode	Supplies power to Down Coil for high speed drive **FORWARD**.	Between T4 and T15 on Fanning Strip.
DIO8	Diode	Prevents feedback to Fuel Cutoff Valves.	Connected to Engine Oil Pressure Switch PSW2.
DI09	Diode	Prevents feedback to Fuel Cutoff Valves.	Connected to Accelerator Relay.
DI010	Diode	Prevents feedback to Controller Key Switch.	Between T18 and Chassis Key Switch.
FU	Fuse, 15 AMP	Overload protection for the control circuit.	Right front of Control Module, Bottom of Chassis Control Panel.
LSW1	Switch, Down Limit	Supplies power to Drive Cutout Relay when Platform is down.	Mounted to rear of Control Module right bulkhead. Integrated with LSW2.
LSW2	Switch, High Speed Shutout	Opens high speed circuit from 2nd Speed and Series/ Parallel Coils allowing only creep speed when Platform is raised.	Mounted to rear of Control Module right bulkhead. Integrated with LSW1.
MTR	Meter, Hour	Shows hours machine has power on.	Right front of Control Module, top of Chassis Control Panel.
PSW1	Pressure Switch, Engine Oil, normally closed.	Stops ignition if engine loses oil pressure.	Top right of engine.
PSW2	Pressure Switch, Engine Oil, normally open.	Stops fuel if engine loses oil pressure.	Top right of engine.
SOL1	Solenoid, Right Steer (coil)	Shifts Steer Valve to **RIGHT** turn position.	Top end of Spool Valve mounted on left front of Manifold Block.
SOL2	Solenoid, Left Steer (coil)	Shifts Steer Valve to **LEFT** turn position.	Bottom end of Spool Valve mounted on left front of Manifold Block.
SOL3	Solenoid, Forward (coil)	Opens Forward Valve to direct oil through drive circuit for forward operation.	Top center front of Manifold Block in front of Gauge Port.
SOL4	Solenoid, Reverse (coil)	Opens Reverse Valve to direct oil through drive circuit for reverse operation.	Bottom center front of Manifold Block below Forward Valve.
SOL5	Solenoid, Lift (Up Coil)	Opens Lift Valve.	Top front of Manifold Block, left of Forward Valve.
SOL6	Solenoid, Down (coil)	Opens Down Valve.	Bottom front of Manifold Block, below Lift Valve.
SOL7	Solenoid, Proportional (coil)	Controls Proportional Valve.	Bottom left of Manifold Block.
SOL8	Solenoid, 2nd Speed (coil)	Opens 2nd Speed Valve to allow high speed operation.	Front left of Manifold Block, right of Steering Valve.
SOL9	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Lower right front of Manifold Block.
SOL10	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Right end of Manifold Block.
SW1	Switch, Emergency Stop Button.	Control Circuit shut off.	Platform Controller (Control Box).

Table 6-4: Cont'd.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SW2	Switch, Emergency Stop.	Control Circuit shut off.	Chassis Control Panel, right front of Control Module.
SW3	Switch, Controller Key	Supplies power to Controller and starts engine.	Platform Controller, right front.
SW4	Switch, Foot	Control Circuit shut off.	Platform deck.
SW5	Switch, Drive/Lift	Supplies power to Forward and Reverse or Up and Down Valve coils.	Platform Controller, center toggle.
SW6	Switch, Torque Selector (Drive/Lift Speed)	Provides either High Speed or High Torque drive/lift operation.	Platform Controller, left toggle.
SW7	Switch, Lift	Supplies power to Up and Proportional coils or Down coil.	Chassis Control Panel, right front of Control Module.
SW8	Switch, Fuel Selector	Provides power to either Gasoline or L.P. Gas Valves.	Chassis Control Panel, right front of Control Module.
SW9	Switch, Chassis Key	Provides power to either Foot Switch or Chassis Lift Switch.	Chassis Control Panel, right front of Control Module.

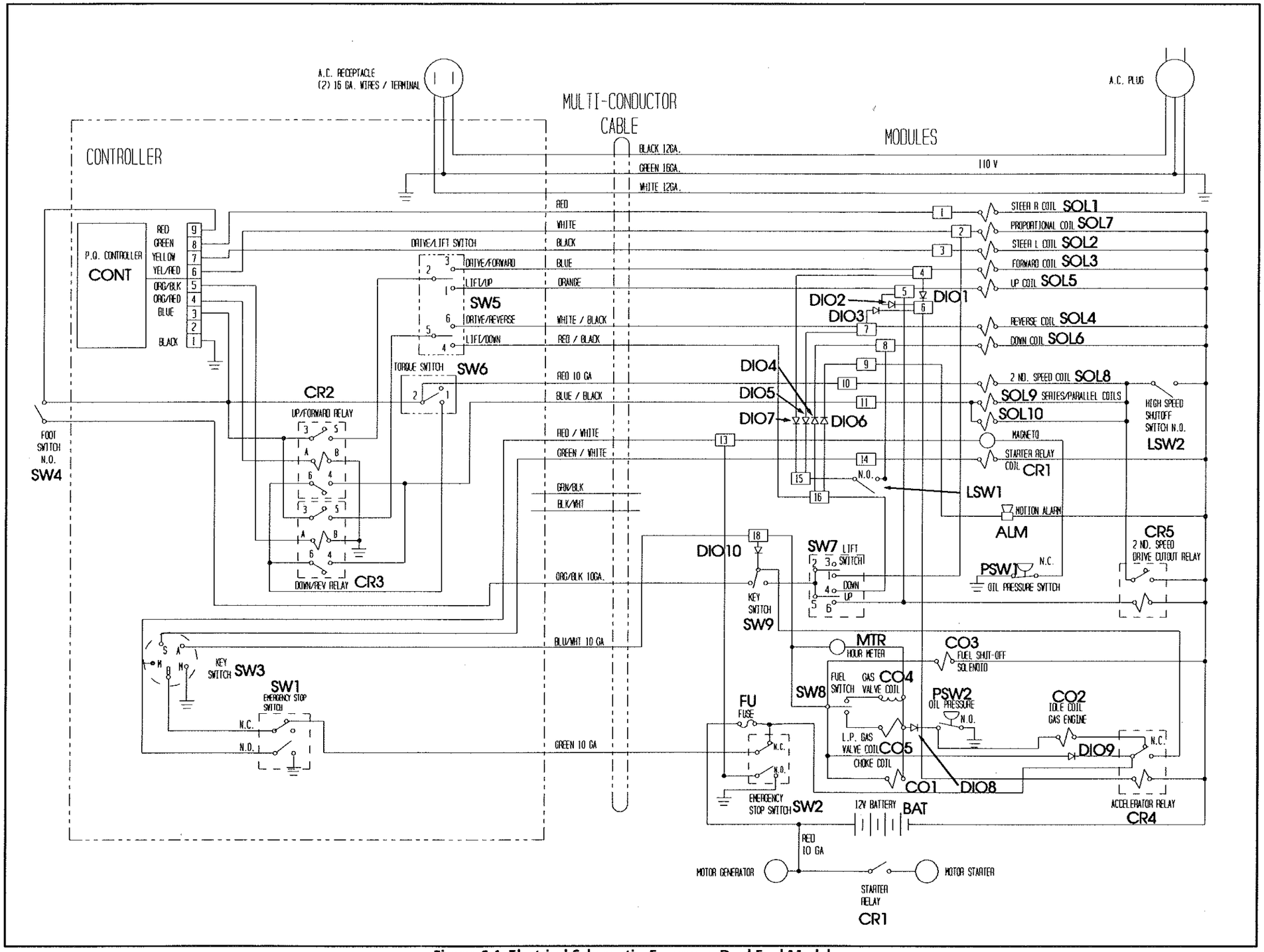


Figure 6-4: Electrical Schematic, European Dual Fuel Model

Table 6-3: Electrical Schematic Legend, Optional Kubota Dual Fuel Model

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM	Alarm, Down	Provides warning sound when deck is lowering.	Right rear of Control Module.
BAT	Battery 12 volts	To store energy	Power Module.
CO1	Coil, Choke	Closes Choke for Engine cold starting.	Top front of Engine.
CO2	Coil, Engine Idle	Increases Engine RPM for normal operation.	Front of Engine.
CO3	Coil, Fuel Shut-off	Allows fuel flow to Carburetor.	Bottom of Carburetor.
CO4	Coil, Gasoline Valve	Allows gasoline to flow to Fuel Shut-off Valve.	Rear of Engine under Air Cleaner.
CO5	Coil, L.P. Gas Valve	Allows L.P. Gas to flow to Fuel Shut-off Valve.	Left side of Engine, mounted to L.P. Gas Regulator.
CO6	Coil, Ignition	Provides high voltage to Distributor.	Mounted to front Engine mount.
CONT	Controller, Proportional & Switch, Steering	Supplies power to Up/Fwd Relay or Dn/Rev Relay and Proportional Coil. Supplies power to R & L Steering coils.	Platform Controller (Control Box).
CR1	Relay, Motor	Energizes Starter Solenoid.	Mounted to back Engine Mount.
CR2	Relay, Up/Fwd	Provides power to Up/Fwd contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR3	Relay, Dn/Rev	Provides power to Dn/Rev contacts in Drive/Lift Switch.	Platform Controller (Control Box).
CR4	Relay, Accelerator	Provides power to the Idle Coil to increase Engine speed.	Mounted to Control Module right bulkhead.
CR5	Relay, High Speed	Controls Second Speed Valve and Series/Parallel Valves to cut out high speed when elevated.	Mounted to Control Module right bulkhead.
CR6	Relay, Choke	Closes Choke for cold starting of Engine.	Mounted to Control Module right bulkhead.
DIO1	Diode	Supplies power to Accelerator Relay when Steer Switch is activated **RIGHT.**	Between T4 and T6 on Fanning Strip.
DIO2	Diode	Supplies power to Accelerator Relay when Steer Switch is activated **LEFT**.	Between T5 and T6 on Fanning Strip.
DIO3	Diode	Supplies power to Accelerator Relay for **LIFT** operation.	Between T6 and T7 on Fanning Strip.
DIO4	Diode	Supplies power to Down Coil.	Between T16 and T8 on Fanning Strip.
DIO5	Diode	Supplies power to Down Coil for high speed drive in **REVERSE.**	Between T7 and T15 on Fanning Strip.
DIO6	Diode	Supplies power to Down Alarm.	Between T16 and T9 on Fanning Strip.
DIO7	Diode	Supplies power to Down Coil for high speed drive **FORWARD.**	Between T4 and T15 on Fanning Strip.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
FU	Fuse, 15 AMP	Overload protection for the control circuit.	Right front of Control Module, Bottom of Chassis Control Panel.
LSW1	Switch, Down Limit	Supplies power to Drive Cutout Relay when Platform is down.	Mounted to rear of Control Module right bulkhead. Integrated with LSW2.
LSW2	Switch, High Speed Shutout	Opens high speed circuit from 2nd Speed and Series/ Parallel Coils allowing only creep speed when Platform is raised.	Mounted to rear of Control Module right bulkhead. Integrated with LSW1.
MTR	Meter, Hour	Shows hours machine has power on.	Right front of Control Module, top of Chassis Control Panel.
PMP	Pump, Fuel, Gasoline	Supplies fuel to Gasoline Valve.	Left front of Engine under Air Cleaner.
PSW1	Pressure Switch, Engine Oil, normally open.	Cuts fuel and Ignition if engine loses oil pressure.	Back of engine next to Oil Filter.
SOL1	Solenoid, Right Steer (coil)	Shifts Steer Valve to **RIGHT** turn position.	Top end of Spool Valve mounted on left front of Manifold Block.
SOL2	Solenoid, Left Steer (coil)	Shifts Steer Valve to **LEFT** turn position.	Bottom end of Spool Valve mounted on left front of Manifold Block.
SOL3	Solenoid, Forward (coil)	Opens Forward Valve to direct oil through drive circuit for forward operation.	Top center front of Manifold Block in front of Gauge Port.
SOL4	Solenoid, Reverse (coil)	Opens Reverse Valve to direct oil through drive circuit for reverse operation.	Bottom center front of Manifold Block below Forward Valve.
SOL5	Solenoid, Lift (Up Coil)	Opens Lift Valve.	Top front of Manifold Block, left of Forward Valve.
SOL6	Solenoid, Down (coil)	Opens Down Valve.	Bottom front of Manifold Block, below Lift Valve.
SOL7	Solenoid, Proportional (coil)	Controls Proportional Valve.	Bottom left of Manifold Block.
SOL8	Solenoid, 2nd Speed (coil)	Opens 2nd Speed Valve to allow high speed operation.	Front left of Manifold Block, right of Steering Valve.
SOL9	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Lower right front of Manifold Block.
SOL10	Solenoid, Series/ Parallel (coil)	Opens Series/Parallel Valve to allow high speed drive.	Right end of Manifold Block.
SW1	Switch, Emergency Stop.	Control Circuit shut off.	Platform Controller (Control Box).
SW2	Switch, Emergency Stop.	Control Circuit shut off.	Chassis Control Panel, right front of Control Module.

Table 6-5: Cont'd.

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
SW3	Switch, Controller Key	Supplies power to Controller and starts engine.	Platform Controller, right front.
SW4	Switch, Foot	Control Circuit shut off.	Platform deck.
SW5	Switch, Drive/Lift	Supplies power to Forward and Reverse or Up and Down Valve coils.	Platform Controller, center toggle.
SW6	Switch, Torque Selector(Drive/Lift Speed)	Provides either High Speed or High Torque drive/lift operation.	Platform Controller, left toggle.
SW7	Switch, Lift	Supplies power to Up and Proportional coils or Down coil.	ChassisControl Panel, right front of Control Module.
SW8	Switch, Fuel Selector	Provides power to either Gasoline or L.P. Gas Valves.	ChassisControl Panel, right front of Control Module.
SW9	Switch, Choke	Provides power to Choke Relay .	On left side of Controller.

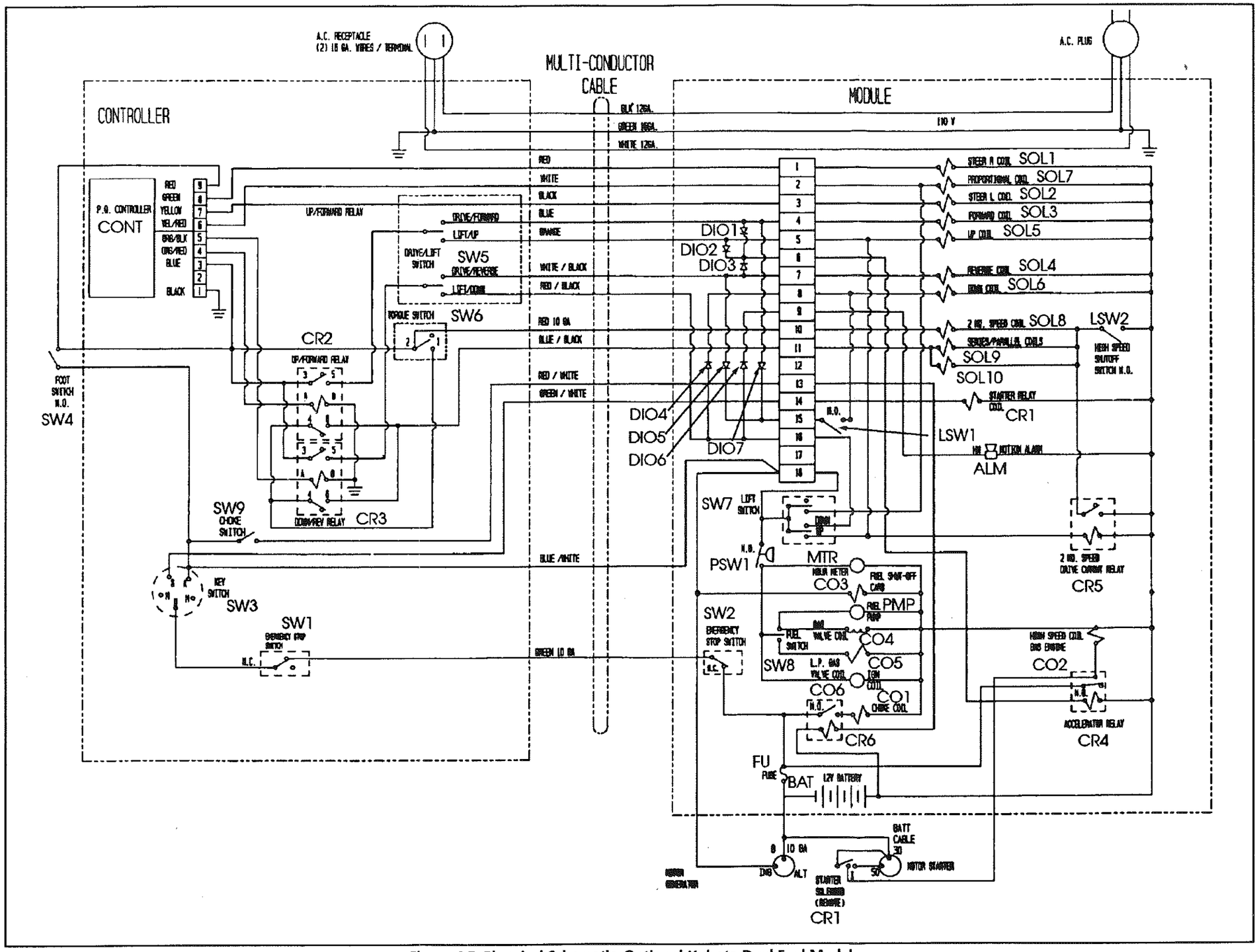


Figure 6-5: Electrical Schematic, Optional Kubota Dual Fuel Model

6.2
Hydraulic Schematic

Table 6-4: Hydraulic Schematic Legend

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Check Valve, Brake	Allows free flow from Brakes around Pressure Reducing Valve.	Bottom center of of Manifold Block.
CV2	Check Valve, Lift	Prevents oil from leaking through Lift Valve.	Center back of Manifold Block.
CYL1	Cylinder, Steering	Provides force to steer front wheels.	Center front of Chassis.
CYL2	Cylinder, Brake	Stops Machine from moving while parked.	Left rear side of Chassis.
CYL3	Cylinder, Lift	Provides force to lift Platform.	Between Chassis Pedestal weld't and Lower Arm weld't.
FC1	Flow Control, Creep Speed	Dumps oil to allow elevated creep speed.	Bottom left of Manifold Block.
FD1	Flow Divider, Steering	Diverts oil to Steering Valve.	Left end of Manifold Block.
FD2	Flow Divider/ Combiner	Allows positive traction in parallel drive.	Right front of Manifold Block, right side of Forward Valve.
FL1	Filter	Filters oil returning to Tank.	Top of Hydraulic Tank.
FL2	Suction Screen	Traps particles in Hydraulic Tank.	Inside Hydraulic Tank at outlet.
MOT1	Drive Motor	Provides tractive effort for work platform.	In left rear axle.
MOT2	Drive Motor	Provides tractive effort for work platform.	In right rear axle.
ORF1	Orifice, Down	Controls the platform rate of descent.	Center of back of Manifold Block.
PMP1	Pump, Hydraulic	Supplies hydraulic oil flow for all functions	On Electric Motor at right rear of Power Module **OR** rear of Engine.
PMP2 (Electric Model only)	Pump, Hydraulic	Supplies hydraulic oil flow for all functions	On Electric Motor at right side of Power Module.
PMP3	Pump, Brake Release	Provides a means of releasing the Parking Brake.	Mounted externally on right side of Control Module.
RV1	Valve, Main Relief	Provides over pressure protection to Pump.	Top left of Manifold Block.
RV2	Valve, Steering Relief	Provides over pressure protection to Steering Cylinder.	Middle back of Manifold Block.
RV3	Valve, Drive Relief	Provides over pressure protection to Drive Motors during steering.	Back of Manifold Block, on block in drive circuit.
SV1	Valve, Shuttle	Provides oil to Brake Cylinder when either Drive **FORWARD** or **REVERSE** are actuated.	Top center of Manifold Block.
V1	Valve, Steering	Provides directional control for Steering Cylinder.	Left front of Manifold Block.
V2	Valve, Counterbalance Forward	Prevents machine from running away on slopes and cushions stops.	Top of Manifold Block, just right of center.
V3	Valve, Counterbalance Reverse	Prevents machine from running away on slopes and cushions stops.	Bottom of Manifold Block, just right of center.
V4	Valve, Forward	Provides directional control of oil for forward drive.	Front center top of Manifold Block.
V5	Valve, Reverse	Provides directional control of oil for reverse drive.	Front center bottom of Manifold Block.
V6	Valve, Velocity Fuse	Locks Lift Cylinder if lines break.	Inside Lift Cylinder Port.
V7	Valve, Lift	Provides oil flow to Lift Cylinders.	Front top of Manifold Block, left of Forward Valve.
V8	Valve, Down	Allows oil to flow out of Lift Cylinder to Tank.	Front bottom of Manifold Block, below Lift Valve.
V9	Valve, Proportional	Prevents oil from bypassing while driving and lifting.	Bottom left of Manifold Block.
V10	Valve, Brake Release	Allows use of Brake Release Pump by closing return circuit.	On side of Brake Release Pump assembly.
V11	Valve, 2nd Speed	Closes to send all oil to Lift and Drive Valves for high speed operation.	Front left of Manifold Block, next to Steering Valve.
V12, V13	Valve Series/ Parallel	Shifting both valves changes the oil flow from high torque (parallel) to high speed (series).	Right end of Manifold Block.
V14	Valve, Brake Pressure Reducing	Drops system pressure to 390 psi for proper Brake operation.	Center back of Manifold Block.

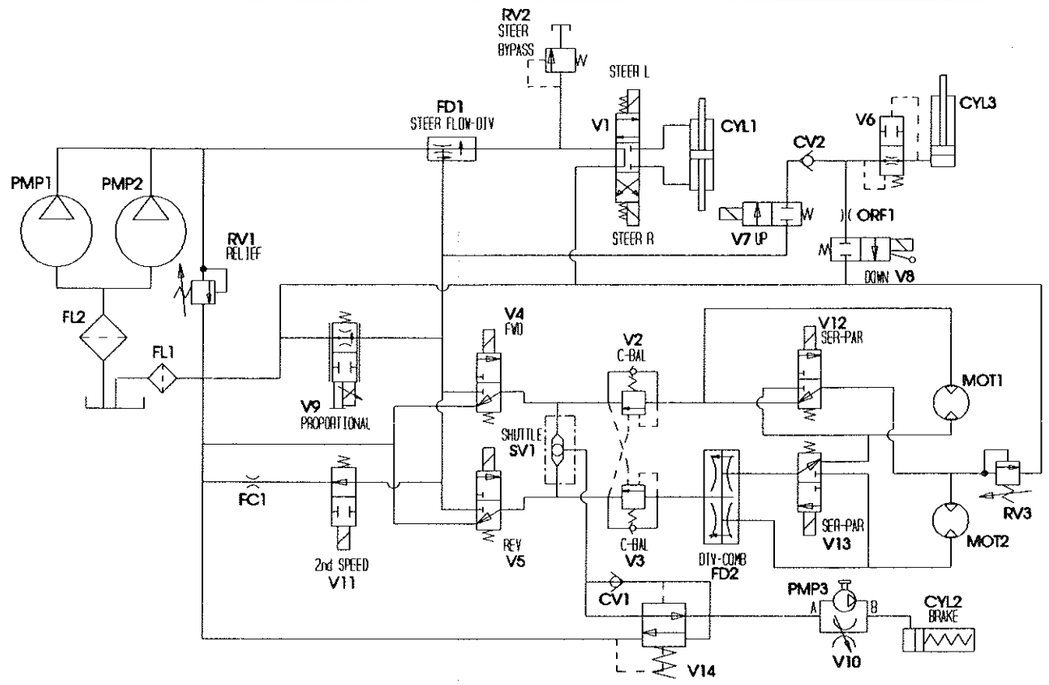


Figure 6-6: Hydraulic Schematic, Electric Model

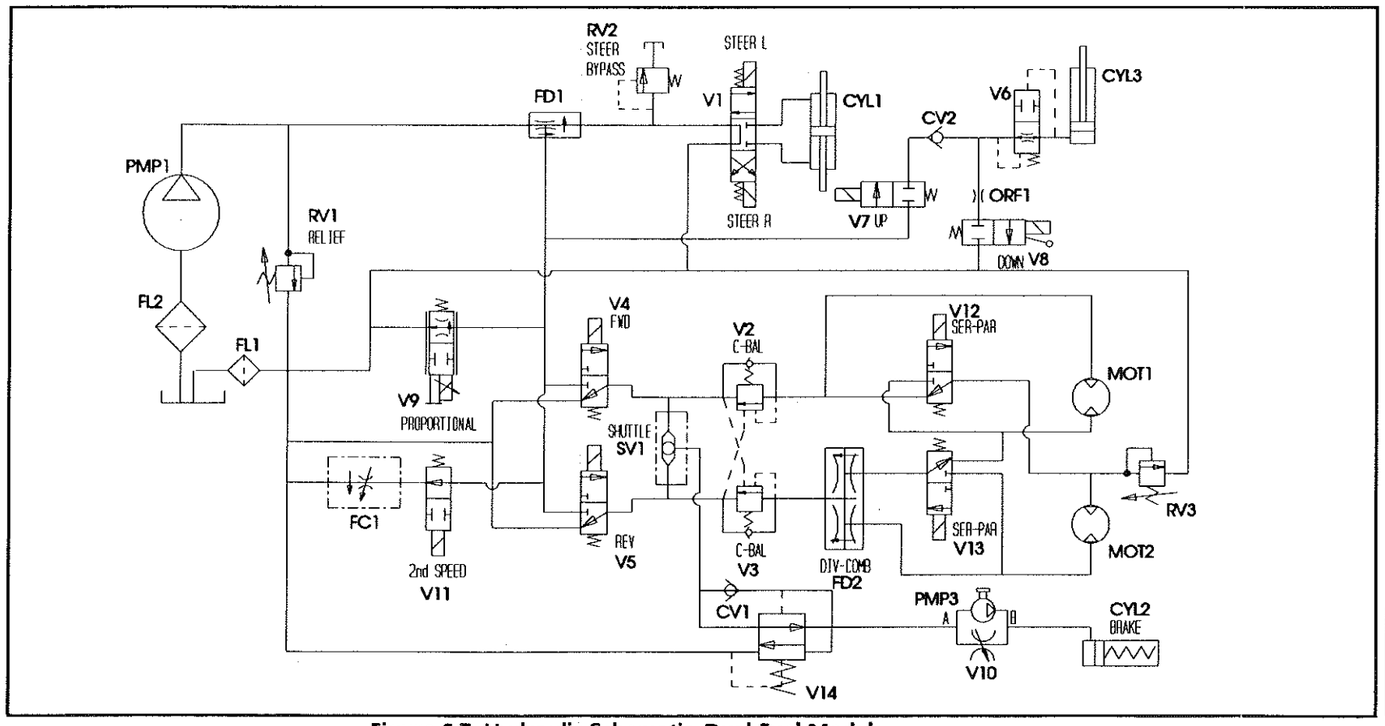
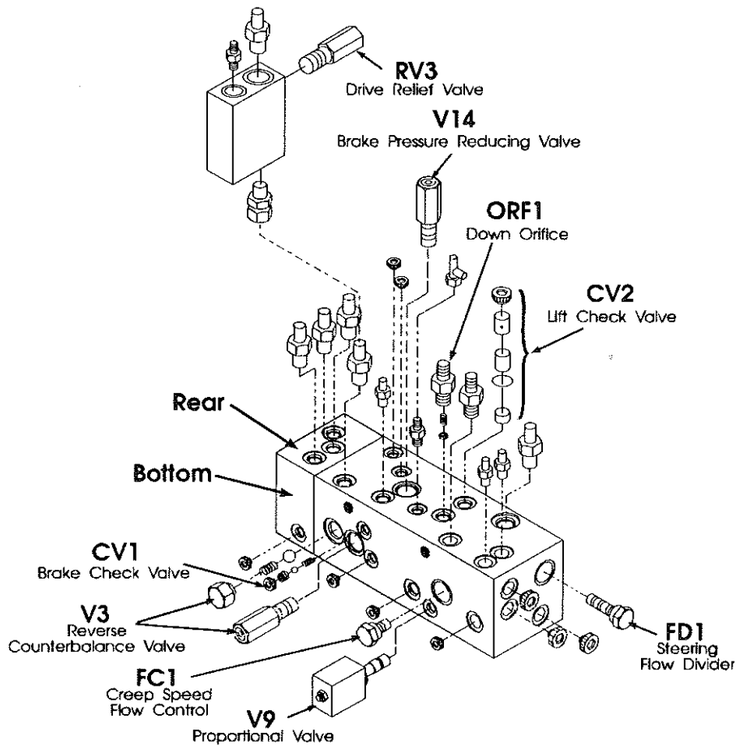


Figure 6-7: Hydraulic Schematic, Dual Fuel Model



Rear View

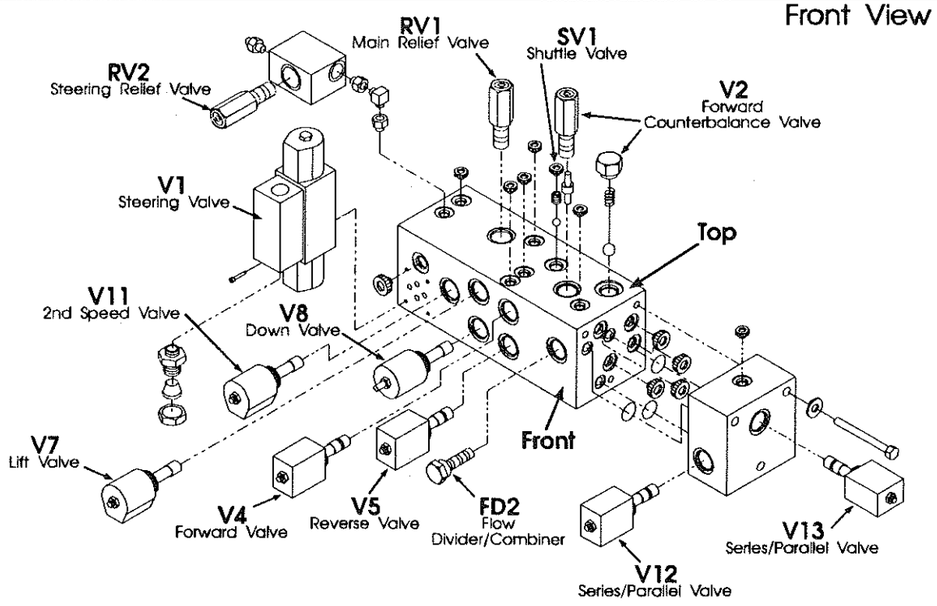


Figure 6-8: Typical Hydraulic Manifold

7.0 Introduction

This section lists and illustrates the replaceable assemblies and parts of the SL-26N 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

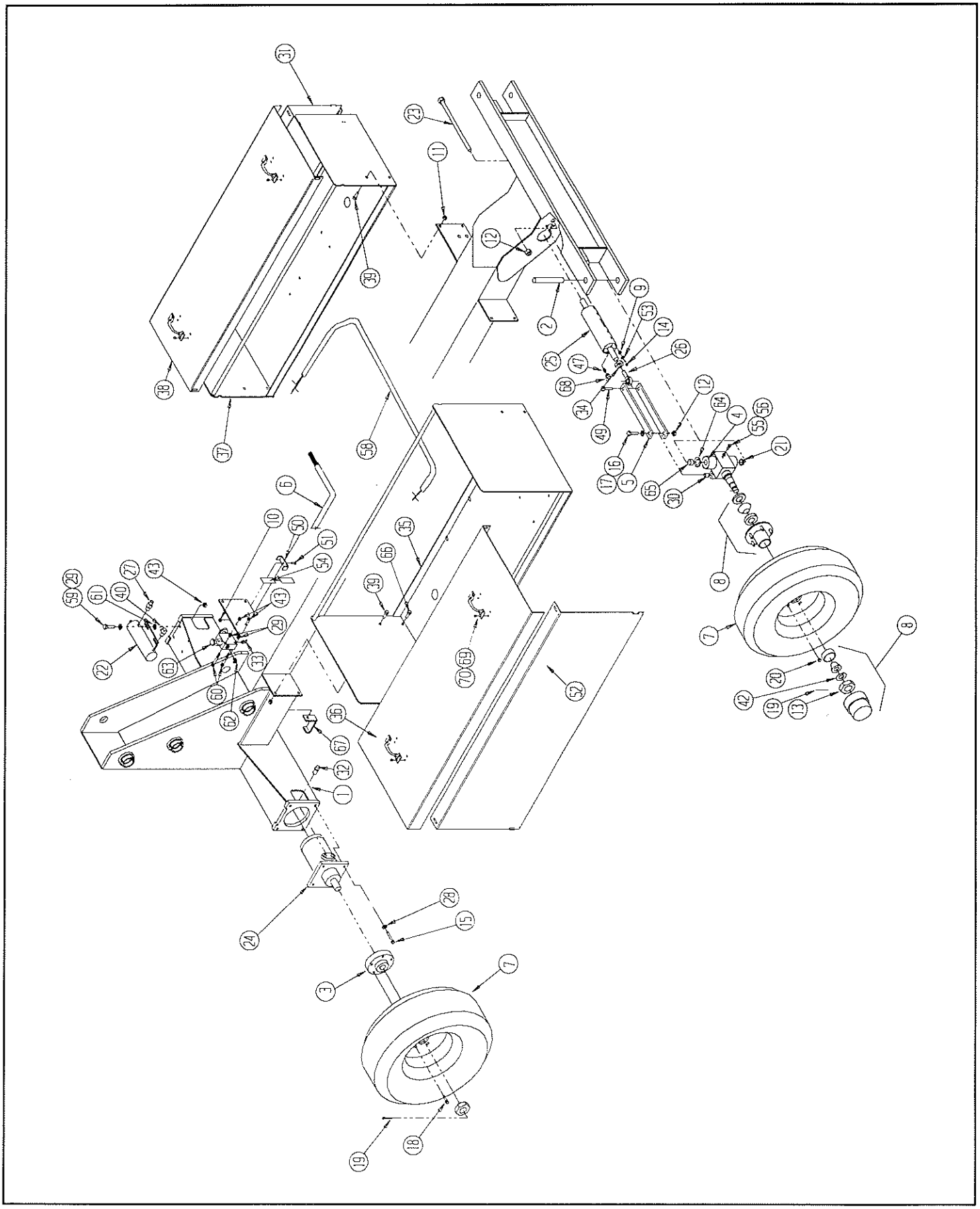
7.2 Illustrated Parts

Next Page.

CHASSIS ASSEMBLY
Electric & Dual Fuel

ITEM	PART	DESCRIPTION	QTY.
1	64010-001-00	Chassis Weldment	1
2	64161-000-00	Steering Pin	2
3	64029-001-00	Hub Drive Motor	2
4	64487-000-00	Steering Pivot Weldment	2
5	64033-002-00	Steering Linkage	4
6	64007-004-00	Control Cable Assy	1
7	64052-002-00	Tire/Wheel Assy	3
8	63911-000-00	Hub Assy	2
9	11239-006-00	Washer 5/16 Dia ASTM Flat	4
10	11248-004-00	Locknut 1/4-20 UNC HEX	1
11	11248-008-00	Locknut 1/2 - 11 UNC HEX	8
12	11248-010-00	Locknut 5/8 - 11 UNC HEX	5
13	15945-016-00	Nut 1-14 UNF Slotted HEX	2
14	11253-006-00	Screw 5/16 - 18 UNC HHC x 3/4	4
15	11266-020-00	Screw 1/2 - 20 UNF HHC x 2 1/2	8
16	11240-010-00	Washer 5/8 Flat	2
17	64150-000-00	Serrated Bolt	2
18	14122-001-00	Wheel Bolt	10
19	11754-012-00	Cotter Pin 5/32 DIA x 1 1/2	4
20	05105-000-00	Nut Lug	10/Ref
21	62649-002-00	Bearing	2
22	60479-000-00	Brake	1
*	60211-014-00	Seal Kit, Brake Cyl.	1
23	10181-096-00	Screw 5/8 - 11 UNC Grade 2 HHC x 12	1
24	63903-006-00	Motor Hyd.	2
*	63903-010-00	Seal Kit, Motor	1
25	63905-000-00	Cylinder, Steering	1
*	63905-010-00	Seal Kit, Steering Cyl.	1
26	63927-001-00	Rod End 5/8	2
27	11939-008-00	Fitting Adapter	1
28	11238-008-00	Lockwasher 1/2 DIA Split	8
29	11240-006-00	Washer 3/8 Flat	12
30	62642-001-00	Bearing	2
31	64220-000-00	Cover, Control Module Side	1
32	11935-006-00	Fitting Adaptor	3
33	11934-001-00	Fitting Adaptor	1
34	20495-010-00	Nut 5/8-18 UNF Jam Hex	2
35	64002-008-00	Power Module Assy -**ELECTRIC**	1
35	64002-009-00	Power Module Assy -**DUAL FUEL**	1

ITEM	PART	DESCRIPTION	QTY.
36	64219-000-00	Cover Power Module Top	1
37	64003-014-00	Control Module Assy -**ELECTRIC**	1
37	64003-013-00	Control Module Assy -**DUAL FUEL**	1
38	64221-000-00	Cover, Control Module	1
39	11256-010-00	Screw 1/2 -13 UNC HHC x 1 1/4	6
40	11940-008-00	Fitting Adapter	1
41	64008-008-00	Hose Kit-**ELECTRIC**	1
41	64008-007-00	Hose Kit-**DUAL FUEL**	1
42	63329-008-00	Washer 1-ID x 1-1/2 OD x .093 THK	2
43	11248-006-00	Locknut 3/8 - 16 UNC HEX	6
44			
45			
46			
47	11941-001-00	Fitting Adapter	2
48			
49	11257-024-00	Screw 5/8-11 UNC HHC X 3	2
50	64036-000-00	Hose Clamp	1
51	11252-014-00	Screw 1/4-20 UNC HHC x 1 3/4	1
52	64222-000-00	Cover, Power Module Side	1
53	11238-005-00	Lockwasher 5/16 Dia Split	4
54	29976-099-00	Tube 1/2 Dia Shrink	.17'
55	11705-024-00	Screw 3/8-16 UNC SOC HD x 1 1/2	2
56	11273-006-00	Nut 3/8-16 UNC HEX Jam	2
57	64052-003-00	Tire/Wheel Assy (with Brake Disk)	1
58	64205-001-00	Wire Harness-DUAL FUEL ONLY	1
59	11254-010-00	Screw 3/8 - 16 UNC HHC x 1 1/4	4
60	11254-020-00	Screw 3/8 - 16 UNC HHC x 2 1/2	2
61	63988-006-00	Washer, Shim 3/8 ID x 5/8 OD x .015 THK	A/R
62	11934-003-00	Fitting Adapter	1
63	63978-000-00	Hand Pump	1
64	64279-000-00	Thrust Washer	2
65	62642-020-00	Bearing	2
66	11256-012-00	Screw 1/2 - 13 UNC HHC x 1 1/2	1
67	64145-000-00	Hose Bracket	1
68	11937-001-00	Fitting 90°	2
69	25427-002-00	Handle	4
70	26553-002-00	Pop Rivet	16



POWER MODULE
Electric Model
64002-008-00

ITEM	PART	DESCRIPTION	QTY.
1	64057-001-00	Module Tray	1
2	63944-010-00	Charger	1
3	15797-000-00	Power Unit	2
*	10145-001-00	Brush Set, Motor (Ohio)	2
*	15797-001-00	Pump, Hydraulic	1
*	15797-003-00	Seal Kit, Hydraulic Pump	1
4	15796-000-00	Battery	8
5	10122-000-00	Starter Relay 24 VDC	2
6	63029-000-00	Bus Bar	1
7	62179-000-00	Cord 110 VAC	1
8	63083-000-00	Battery Hold Down	2
9	63082-000-00	J-Bolt	4
10	64194-000-00	Starter Bracket	1
11	62125-004-00	Battery Cable Assy x 18	1
12	05416-015-00	Battery Cable Assy x 9	7
13	62125-006-00	Battery Cable Assy x 12	1
14	62125-009-00	Battery Cable Assy x 40	1
15	05416-006-00	Battery Cable Assy x 15	3
16	29601-014-00	Term 1/4 DIA Ring 14-16 GA	2
17	11240-004-00	Washer 1/4 DIA STD Flat	5
18	11248-005-00	Locknut 5/16-UNC HEX	28
19	11248-004-00	Locknut 1/4-20 UNC HEX	6
20	11252-006-00	Screw 1/4-20 UNC HHC x 3/4	4
21	29931-003-00	Connect Term. 1/4 Push	1
22	29601-025-00	Conn Ring 8 GA 5/16	2
23	11253-008-00	Screw 5/16-18 UNC HHC x 1	20
24	11939-022-00	Fitting Adapter	1
25	05299-000-00	Latch Toggle	4
26	15959-004-00	Fitting Adapter	2
27	15960-006-00	Fitting Adapter	1
28	15961-006-00	Fitting Adapter	3
29	11937-004-00	Fitting Adapter	3
30	11708-004-00	Screw 8-32 UNC MACH RD HD x 1/2	8
31	11248-002-00	Locknut 8-32 UNC HEX	8
32	29457-099-00	Wire 16 AWG Green	1.5'
33	11253-006-00	Screw 5/16 - 18 UNC HHC x 3/4	4
34	11868-011-00	Strain Relief Bushing	1
35	14048-003-00	Fitting Adapter	1
36	29501-013-00	Connector Ring #10 14-16 GA	7
37	29601-015-00	Connect Ring 3/8 14-16 GA	1
38	29610-002-00	Conn. Fork 14-16 GA #8	1
39	29620-002-00	Conn Butt 14-16	3
40	11934-004-00	Fitting Adapter	1
41	11939-015-00	Fitting Adapter	1
42	62125-002-00	Cable Assy x 69	1
43			
44	29495-099-00	Wire 14 GA 3-Cond	10.25'
45	11240-005-00	Washer 5/16 DIA STD Flat	12

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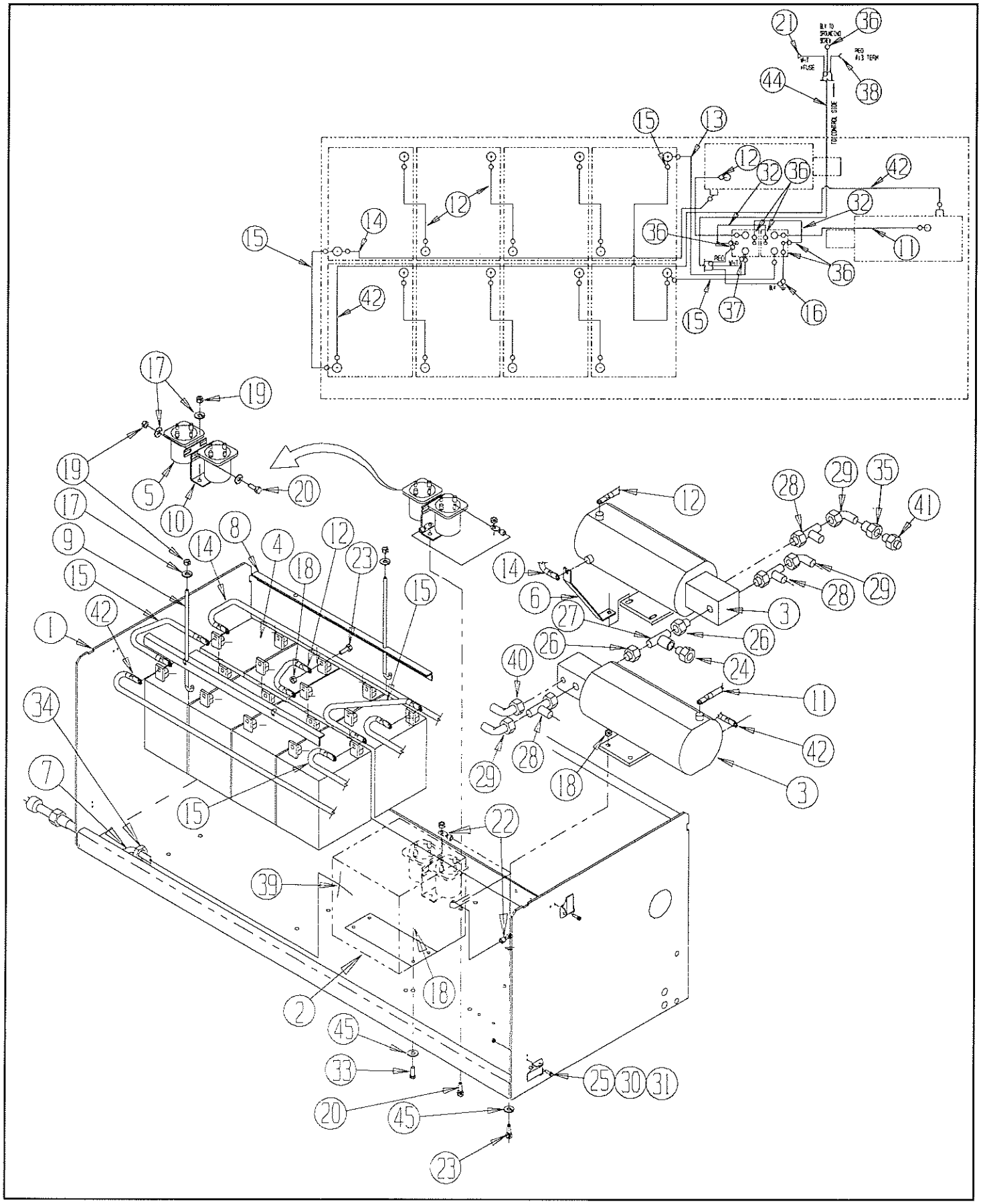

POWER MODULE
Dual Fuel Model
64002-009-00

ITEM	PART	DESCRIPTION	QTY.
1	64057-001-00	Module Tray - Power Weldment	1
2	63982-001-00	Fuel Level Gauge	1
3			
4	64040-00-00	Angle - Battery Hold Down	1
5	64039-000-00	Mounting Tab, Fuel Tank	2
6	63929-010-00	Fuel Tank	1
7	63902-003-00	Pump	1
*	63902-010-00	Seal Kit, Pump	1
8	63954-000-00	Engine, Gas	1
*	63954-001-00	Carburetor Kit	1
*	63954-004-00	Starter	1
9	62299-002-00	Battery 12 V GROUP 27C	1
10	27972-000-00	Starter Solenoid	1
11	27934-002-00	Tank, Propane 10 GA	1
12	27823-000-00	Bracket, Propane Tank (Set of 2)	1
13	12039-000-00	Battery Hold Down	2
14	11254-010-00	Screw 3/8 - 16 UNC HHC x 1 1/4	5
15	11254-008-00	Screw 3/8 - 16 UNC HHC x 1	9
16	11252-006-00	Screw 1/4 20 UNC HHC x 3/4	6
17	11248-006-00	Locknut 3/8 - 16 UNC HEX	13
18	11248-004-00	Locknut 1/4 - 20 UNC HEX	4
19	11240-004-00	Washer 1/4 DIA STD FLAT	4
20	11240-006-00	Washer 3/8 DIA STD FLAT	4
21	05299-000-00	Latch Toggle	4
22	63957-000-00	Propane Conversion Kit	1
*	63934-001-00	Microvac Switch	1
*	63934-002-00	L.P. Gas Regulator	1
*	63934-003-00	Filter Lock	1
*	63934-004-00	Gas Solenoid	1
*	63934-005-00	Carburetor Adapter	1

ITEM	PART	DESCRIPTION	QTY.
23	64275-010-00	Battery Cable Assy	2
24	20541-003-00	Clamp Hose 3/8 - 7/8	2
25	20331-000-00	Filter Fuel In-line	1
26			
27	11941-022-00	Fitting Adapter	1
28	11934-010-00	Fitting Adapter	1
29	11932-007-00	Fitting Adapter	1
30	11919-002-00	Fitting Plug	1
31	64259-000-00	Relay Plate	1
32	12739-099-00	Hose 1/4 ID	4'
33	64195-014-00	Cable, Starter	1
34	10178-003-00	Fitting Barbed	3
35	11238-006-00	Lockwasher 3/8 DIA Split	2
36	11708-004-00	Screw 8-32 UNC MACH RD HD x 1/2	8
37	11248-002-00	Locknut 8-32 UNC HEX	10
38	11238-004-00	Lockwasher 1/4 DIA Split	2
39	11708-006-00	Screw 8-32 UNF RD HD x 3/4	2
40	11240-002-00	Washer #8 STD FLAT	2
41			
42	10150-005-00	Fitting Adapter	2
43	64232-000-00	Backfire Bracket	1
44	11248-006-00	Locknut 5/16 - 18 UNC HEX	2
45	11240-005-00	Washer 5/16 DIA STD FLAT	2
46	63954-010-00	Switch, Oil Pressure N/C	1
47	63954-011-00	Switch, Oil Pressure N/O	1
48	60193-001-00	Elbow, Street	1
50	14914-001-00	Connector Male Push 16-14, 25 TAB	2
51			
52	29601-014-00	Connector Ring 16-14 1/4 DIA	1
53	29610-002-00	Connector Ring 16-14 #8	1
54	29456-099-00	Wire 16 AWG Yellow	.5'

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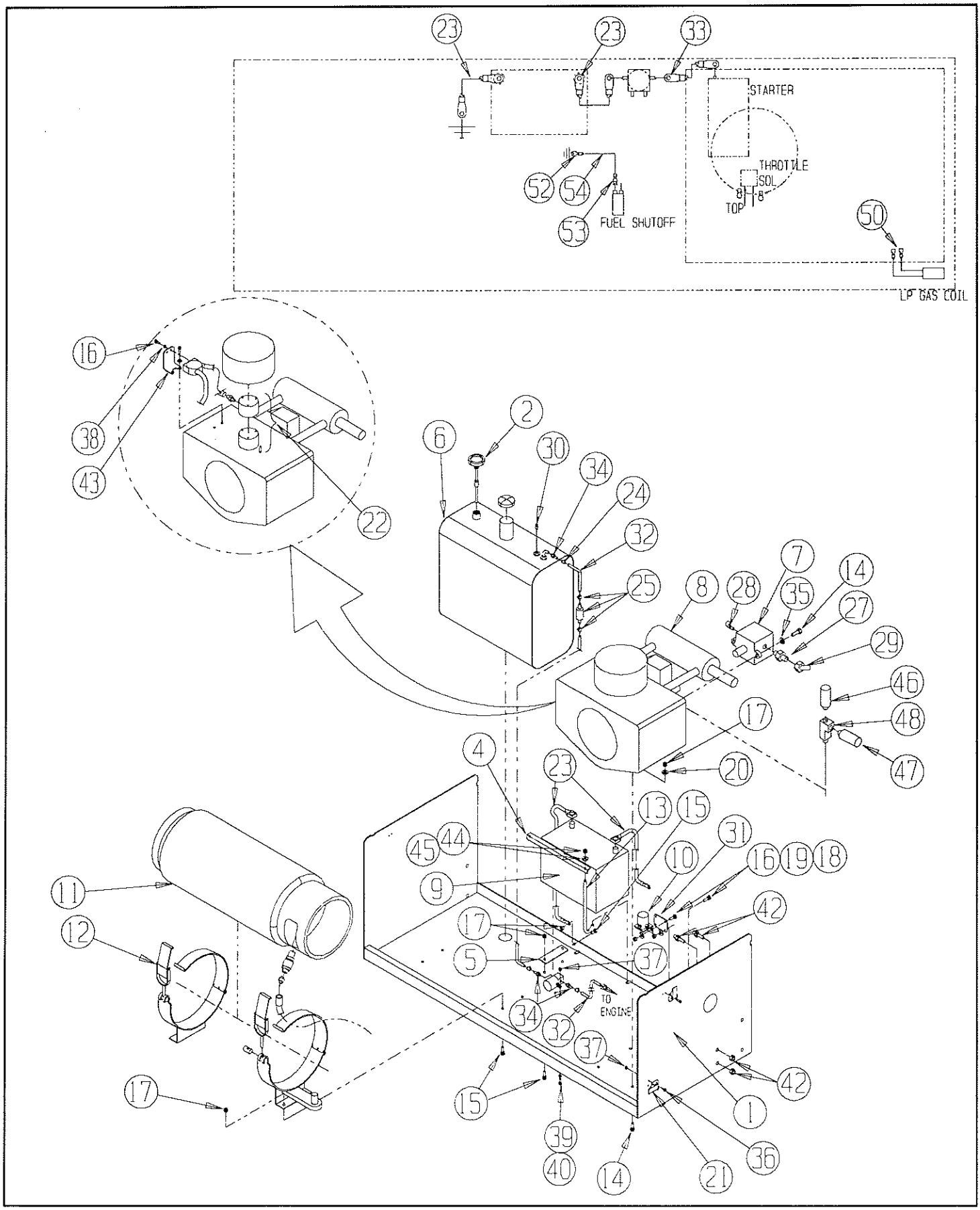
STARTER
THROTTLE SOL
TOP
FUEL SHUTOFF
LP GAS COIL
TO ENGINE

CONTROL MODULE
Electric Model
64003-014-00

ITEM	PART	DESCRIPTION	QTY.
1	05299-000-00	Latch Toggle	4
2	11238-005-00	Lockwasher 5/16 Dia Split	2
3	11248-006-00	Locknut 3/8-16 UNC HEX	8
4	11248-047-00	Locknut 6-32 UNC HEX	4
5	15941-001-00	Switch, Toggle, Emergency Stop	1
6	63962-001-00	Backup-Ring	1
7	11254-008-00	Screw 3/8-16 UNC HHC x 1	9
8	11254-010-00	Screw 3/8-16 UNC HHC x 1 1/4	1
9	15793-007-00	Body - Switch	1
10	11715-006-00	Screw 6-32 UNC RH x 3/4	4
11	11715-008-00	Screw 6-32 UNC RH x 1	4
12	15793-002-00	Head - Switch	1
13	11940-006-00	Fitting Adapter	1
14	11708-004-00	Screw 8-32 UNC MACH RD HD x 1/2	8
15	11248-002-00	Locknut 8-32 UNC HEX	8
16	15915-000-00	Box Bell	1
17	15752-000-00	Hour Meter	1
18	21305-006-00	Magnet Plug	1
19	27962-001-00	Relay	1
20	27963-000-00	Socket	1
21	29701-000-00	Fuse Holder	1
22	29704-015-00	Fuse AGC 15 Amp	1
23	29925-001-00	Connector Cable	1
24	29928-000-00	Term Block	1
25	63779-002-00	Horn 24V	1
26	29961-000-00	Inlet, AC Male, Flanged	1
27	29962-000-00	Electrical Box Cover	1
28	29936-006-00	Guard, Switch	1
29	63919-001-00	Filter, Hydraulic	1
*	63919-010-00	Element, Filter	1
30	63930-010-00	Oil Reservoir	1
31	63932-016-00	Elbow 1-NPT BLK STL Street	1
32	63935-000-00	Suction Screen	1
33	64004-011-00	Control Valve Assy -Electric	1
*	30576-003-00	Service Block	1
34	64039-000-00	Fuel Tank Mounting Tab	3
35	64045-000-00	Mount - Manifold	1

ITEM	PART	DESCRIPTION	QTY.
36	64217-000-00	Fanning Strip Assy	1
37	64058-002-00	Module Weldment	1
38	64414-000-00	Decal - Module Controls	1
39			
40	12798-001-00	Switch, Toggle, Lift/Lower	1
41			
42	11939-019-00	Fitting Adapter	1
43	14434-008-00	Screw 5/16 - 18 UNC SOC HD x 1" LG	2
44			
45	11252-006-00	Screw 1/4 - 20 UNC HHC x 3/4	4
46	11248-004-00	Locknut 1/4 - 20 UNC HEX	4
47	29925-011-00	Connector Cable	1
48	11715-004-00	Screw 6-32 UNC x 1/2	2
49	11248-003-00	Locknut 10-24 UNC HEX	2
50	29925-000-00	Connector - Cable	1
51	15793-003-00	Lever	1
52	11709-016-00	Screw 10-24 UNC RD HD MACH x 2" LG	2
53	20733-002-00	Fitting Adapter Tee	1
54	63979-006-00	Sight Glass	
55	19000-099-00	Rod 1/8 Dia	1'
60	29452-099-00	Wire 16 AWG Black	7.5'
61	29455-099-00	Wire 16 AWG Brown	3'
62	29450-099-00	Wire 16 AWG Blue	3'
63	29451-099-00	Wire 16 AWG White	5'
64	29453-099-00	Wire 16 AWG Orange	4.75'
65	29455-099-00	Wire 16 AWG Yellow	4.42'
66	29454-099-00	Wire 16 AWG Red	4.42'
67	29457-099-00	Wire 16 AWG Green	4.83'
68	29458-099-00	Wire 16 AWG Purple	3.67'
69	29480-099-00	Wire 16 AWG Red	Ref.
70	29620-002-00	Conn. Butt 16-14	10
71	29610-002-00	Conn. Fork 16-14, #8	32
72	29601-014-00	Conn. Ring 16-14, 1/4	10
73	29931-003-00	Conn. Female Push 16-14, 1/4	6
74			
75	29601-019-00	Conn. Ring 12-10, #10	Ref.
76	29601-013-00	Conn. Ring 16-14, #10	6

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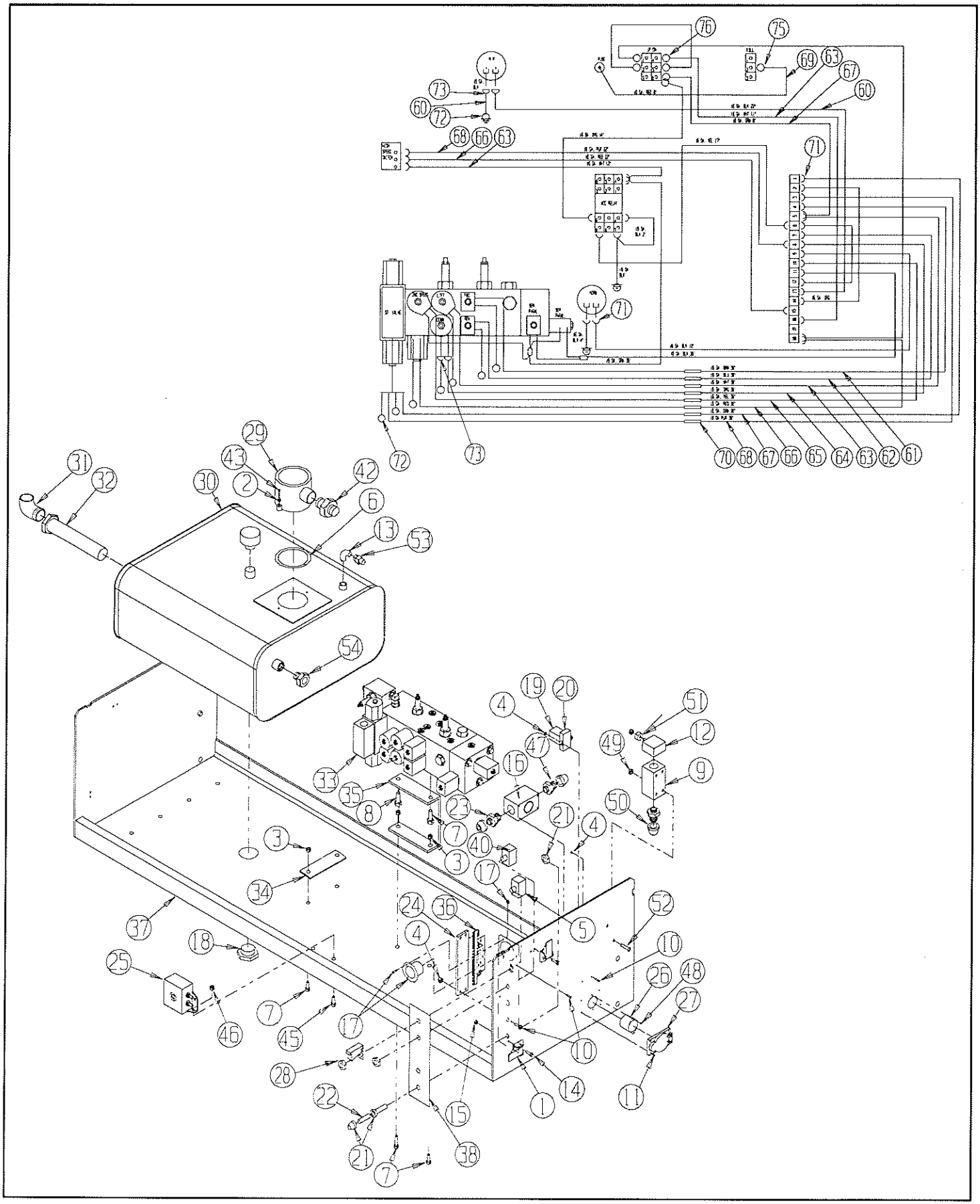
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CONTROL VALVE ASSEMBLY
Electric Model
64004-011-00

ITEM	PART	DESCRIPTION	QTY.
1	64050-001-00	Manifold - SL-26	1
2	64051-000-00	Manifold Block	1
3	15763-000-00	Steering Valve 24 VDC	1
*	13888-007-00	O-Ring	4
4	61797-000-00	3-Way Valve	4
5	63924-001-00	Flow Regulator	1
6	63924-003-00	Flow Divider-Combiner	1
7	64218-000-00	Orifice Plug	1
8	63922-001-00	Pressure Reducing	1
9	63925-002-00	Lowering Valve	1
10	15762-000-00	Valve-Solenoid N.O.-24V	1
11	60390-000-00	Relief Valve - Preset 2000 PSI	2
12	05135-000-00	Ball 5/16 Dia Stl	2
13	64223-000-00	Valve Block	1
14	08998-000-00	Ball 1/2 Dia Stl	2
15	15799-000-00	Spring	1
16	05133-000-00	Spring	3
17	61728-000-00	Seat Ball	2
18	63920-000-00	Piston	1
19	63952-002-00	Proportional Valve	1
20	15959-001-00	Fitting Adapter	2
21	13963-002-00	Fitting Adapter Elbow	1
22	12004-004-00	Plug - SAE #4	20
23	12004-006-00	Plug - SAE #6	3
24	20021-008-00	Plug - SAE #8	2
25	15764-000-00	Valve - Solenoid N.C.-24V	1
26	11254-022-00	Screw 3/8-16 UNC HHC x 2 3/4	3
27	11240-006-00	Washer 3/8 DIA STD Flat	3
28	64169-000-00	Block, Valve, Drive Relief	1
29	13888-044-00	O-Ring	3
30	11941-004-00	Fitting Adapter	1
31	11941-006-00	Fitting Adapter	8
32	15919-003-00	Orifice Lower	1
33	29925-000-00	Conn Cable 3/4	1
34	20733-003-00	Fitting Adapter	1
35	64170-005-00	Fitting Adapter	1
36	14412-016-00	Screw 10-24 UNC SOC HD x 2	4
37	11941-005-00	Fitting Adaptor	3
38	11941-001-00	Fitting Adaptor	3
39	60390-005-00	Relief Valve - Preset 1200 PSI	1
40	60390-004-00	Relief Valve - Preset 900 PSI	1
41	60390-002-00	Relief Valve - Preset 1100 PSI	1
42	64281-000-00	Spacer	1
43	13888-007-00	O-Ring	1
44	03391-002-00	Check Valve, Lift	1
45	64278-000-00	Spacer	1

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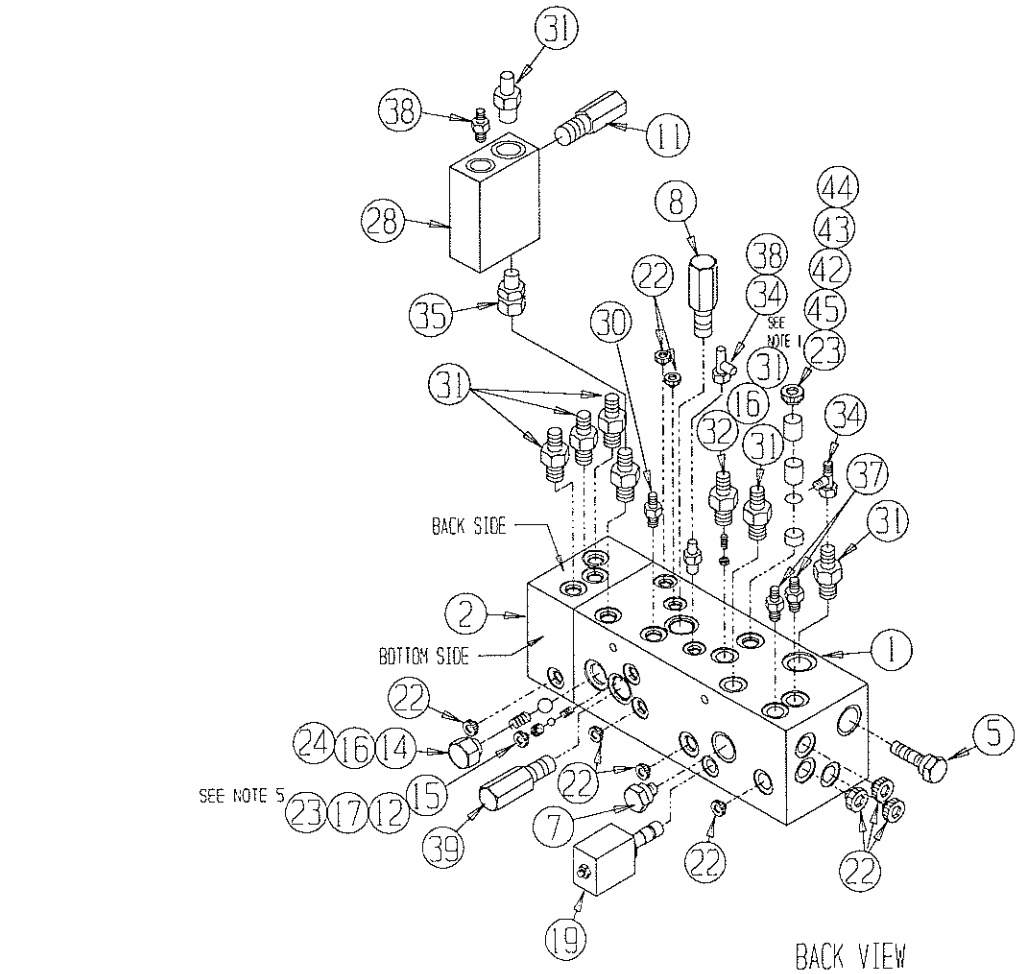

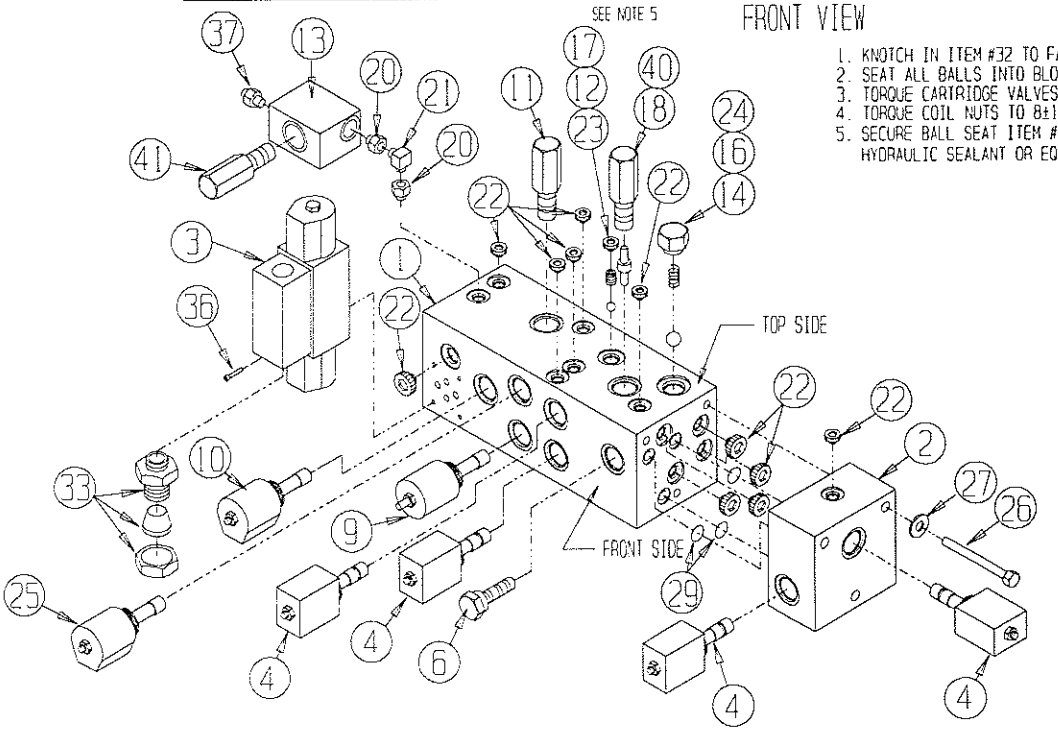

1. KNOTCH IN ITEM #32 TO FACE OUTWARD.
2. SEAT ALL BALLS INTO BLOCK OR BALL SEAT ON ASSY.
3. TORQUE CARTRIDGE VALVES TO 35±5 FT.LB.
4. TORQUE COIL NUTS TO 8±1 IN.LB.
5. SECURE BALL SEAT ITEM # 17 WITH LOCKTITE HYDRAULIC SEALANT OR EQUIVALENT.

CONTROL MODULE
Dual Fuel Model
64003-013-00

ITEM	PART	DESCRIPTION	QTY.
1	05299-000-00	Latch Toggle	4
2	11238-005-00	Lockwasher 5/16 DIA Split	2
3	11248-006-00	Locknut 3/8-16 UNC HEX	8
4	11248-047-00	Locknut 6-32 UNC HEX	6
5	15941-001-00	Switch, Toggle, Emergency Stop	1
6	63962-001-00	Backup-Ring	1
7	11254-008-00	Screw 3/8 - 16 UNC HHC x 1	9
8	11254-010-00	Screw 3/8 - 16 UNC HHC x 1 1/4	1
9	15793-007-00	Body - Switch	1
10	11715-006-00	Screw 6-32 UNC RH x 3/4	4
11	11715-008-00	Screw 6-32 UNC RH x 1	4
12	15793-002-00	Head - Switch	1
13	11940-006-00	Fitting Adapter	1
14	11708-004-00	Screw 8-32 UNC MACH RD HD x 1/2	8
15	11248-002-00	Locknut 8-32 UNC HEX	8
16	15915-000-00	Box Bell	1
17	15752-000-00	Hour Meter	1
18	21305-006-00	Magnet Plug	1
19	27962-000-00	Relay	1
20	27963-000-00	Socket	1
21	29701-000-00	Fuse Holder	1
22	29704-015-00	Fuse AGC 15 AMP	1
23	29925-001-00	Connector Cable	1
24	29928-000-00	Terminal Block	1
25	63779-002-00	Horn 6 VDC	1
26	29961-000-00	Inlet, AC Male, Flanged	1
27	29962-000-00	Electrical Box Cover	1
28	29936-006-00	Guard, Switch	1
29	63919-001-00	Filter Hydraulic	1
*	63919-010-00	Element, Filter	1
30	63930-010-00	Oil Reservoir	1
31	63931-016-00	Elbow 1-NPT BLK STL STREET	1
32	63935-000-00	Suction Screen	1
33	64004-010-00	Control Valve Assy -D/F	1
*	30576-003-00	Service Block	1
34	64039-000-00	Fuel Tank Mounting Tab	3
35	64045-002-00	Mount-Manifold	1
36	64056-005-00	Fanning Strip Assy	1

ITEM	PART	DESCRIPTION	QTY.
37	64058-002-00	Module Weldment	1
38	64414-000-00	Decal - Module Controls	1
39			
40	12798-001-00	Switch, Toggle, Lift/Lower	1
41	29871-001-00	Switch, Toggle, Fuel Selector	1
42	11939-019-00	Fitting Adapter	1
43	14334-008-00	Screw 5/16 - 18 UNC SOC HD x 1	2
44	27972-000-00	Relay	1
45	11252-006-00	Screw 1/4 - 20 UNC HHC x 3/4	4
46	11248-004-00	Locknut 1/4 - 20 UNC HEX	4
47	29925-011-00	Connector Cable	1
48	11715-004-00	Screw 6-32 UNC x 1/2	2
49	11248-003-00	Locknut 10-24 UNC HEX	2
50	29925-000-00	Connector - Cable	1
51	15793-003-00	Lever	1
52	11709-016-00	Screw 10-24 UNC RD HD MACH x 2" LG	2
53	20733-002-00	Fitting Adapter Tee	1
54	63979-006-00	Sight Glass	1
55	19000-099-00	Rod 1/8 DIA	1'
60	29452-099-00	Wire 16 AWG BLACK	9'
61	29455-099-00	Wire 16 AWG BRN	3.667'
62	29450-099-00	Wire 16 AWG BLU	3.75'
63	29451-099-00	Wire 16 AWG WHT	5.5'
64	29453-099-00	Wire 16 AWG ORG	3'
65	29456-099-00	Wire 16 AWG YEL	3.667'
66	29454-099-00	Wire 16 AWG RED	4.417'
67	29457-099-00	Wire 16 AWG GRN	5.333'
68	29458-099-00	Wire 16 AWG PUR	4.417'
69	29480-099-00	Wire 10 AWG RED	2'
70	29620-002-00	Conn Butt 16-14	9
71	29610-002-00	Conn Fork 16-14 #8	28
72	29601-014-00	Conn Ring 16-14 1/4 DIA	6
73	29931-003-00	Conn Female Push 16-14 1/4	3
74	29601-015-00	Conn Ring 16-14 3/8 Dia	3
75	29601-019-00	Conn Ring 12-10 #10	REF.
76	29601-013-00	Conn Ring 16-14 #10	15
77	29825-002-00	Diode	1

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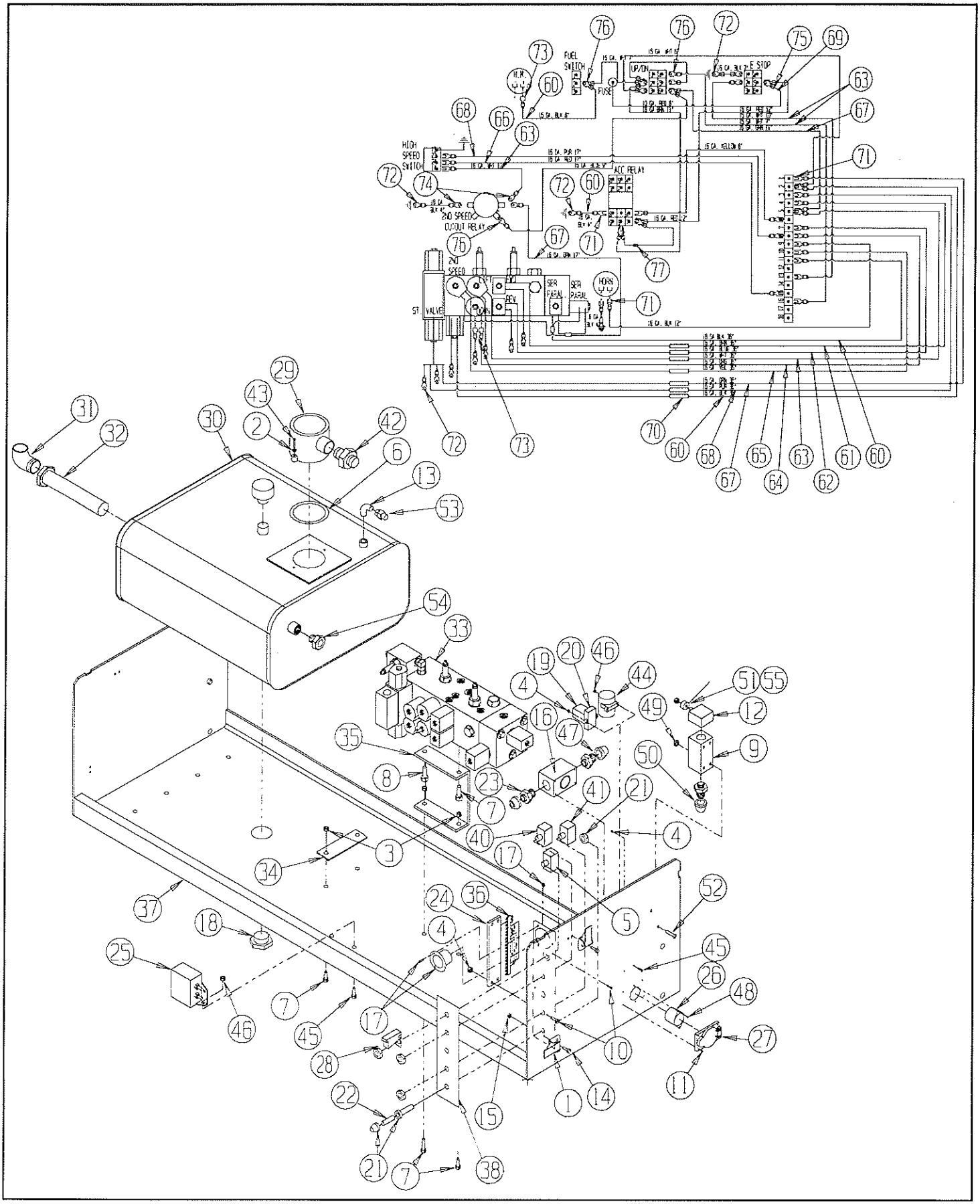
FUEL SWITCH
FUSE
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E STOP
HIGH SPEED SWITCH
ACC RELAY
2ND SPEED CUTOUT RELAY
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SER PARAL
HORN
ST VALVE
REV

CONTROL VALVE ASSEMBLY
Dual Fuel Model
64004-010-00

ITEM	PART	DESCRIPTION	QTY.
1	64050-001-00	Manifold - SL-26	1
2	64051-000-00	Manifold Block	1
3	63928-003-00	Steering Valve 12 VDC	1
*	13888-007-00	O-Ring	4
4	63923-001-00	3-Way Valve	4
5	63924-001-00	Flow Regulator	1
6	63924-003-00	Flow Divider-Combiner	1
7	64218-000-00	Orifice Plug	1
8	63922-001-00	Pressure Reducing	1
9	63925-001-00	Lowering Valve	1
10	60296-000-00	Valve-Solenoid N.O.-12V	1
11	60390-000-00	Relief Valve - Preset 2000 PSI	2
12	05135-000-00	Ball 5/16 Dia Stl	2
13	64223-000-00	Valve Block	1
14	08998-000-00	Ball 1/2 Dia Stl	2
15	15799-000-00	Spring	1
16	05133-000-00	Spring	3
17	61728-000-00	Seat Ball	2
18	63920-000-00	Piston	1
19	63952-001-00	Proportional Valve	1
20	15959-001-00	Fitting Adapter	2
21	13963-002-00	Fitting Adapter Elbow	1
22	12004-004-00	Plug - SAE #4	20
23	12004-006-00	Plug - SAE #6	3
24	20021-008-00	Plug - SAE #8	2
25	60291-000-00	Valve - Solenoid N.C.-12V	1
26	11254-022-00	Screw 3/8-16 UNC HHC x 2 3/4	3
27	11240-006-00	Washer 3/8 DIA STD Flat	3
28	64169-000-00	Block, Valve, Drive Relief	1
29	13888-044-00	O-Ring	3
30	11941-004-00	Fitting Adapter	1
31	11941-006-00	Fitting Adapter	8
32	15919-003-00	Orifice Lower	1
33	29925-000-00	Conn Cable 3/4	1
34	20733-003-00	Fitting Adapter	1
35	64170-005-00	Fitting Adapter	1
36	14412-016-00	Screw 10-24 UNC SOC HD x 2	4
37	11941-005-00	Fitting Adaptor	3
38	11941-001-00	Fitting Adaptor	3
39	60390-005-00	Relief Valve - Preset 1200 PSI	1
40	60390-004-00	Relief Valve - Preset 900 PSI	1
41	60390-002-00	Relief Valve - Preset 1100 PSI	1
42	64281-000-00	Spacer	1
43	13888-007-00	O-Ring	1
44	03391-002-00	Check Valve, Lift	1
45	64278-000-00	Spacer	1

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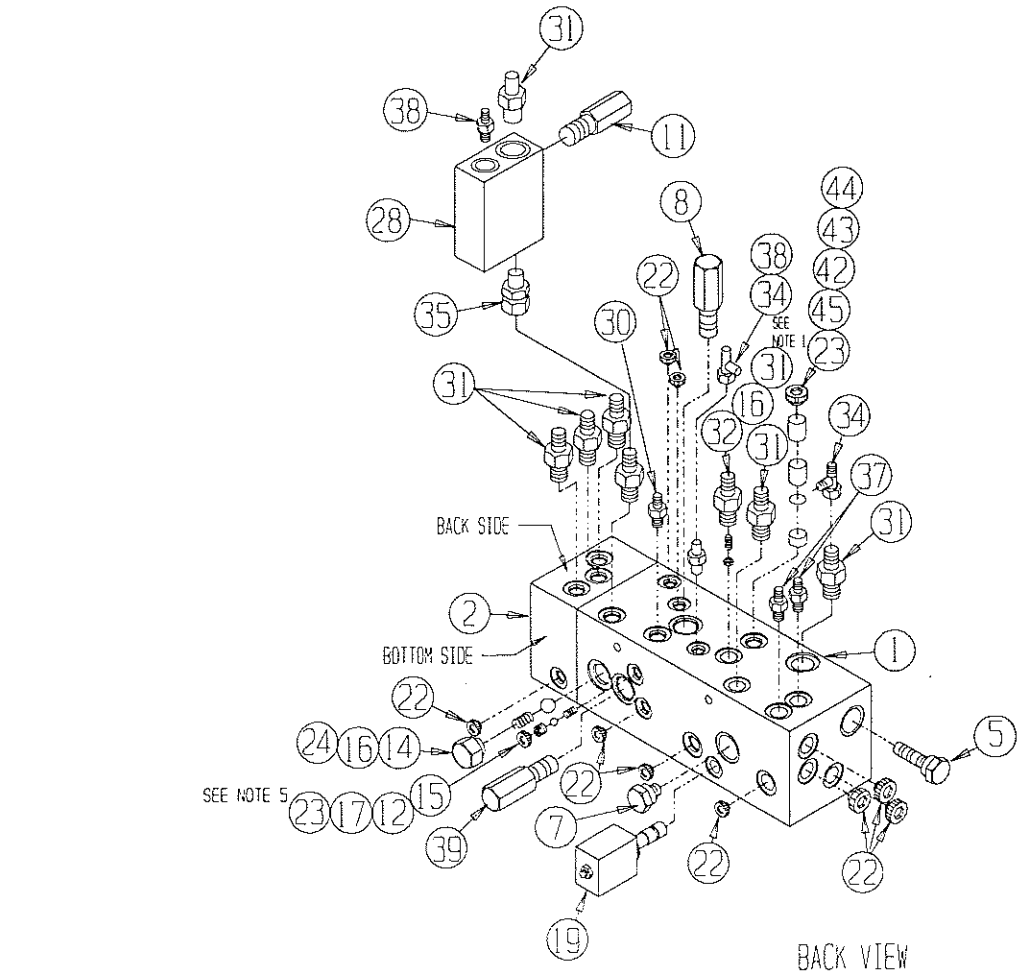

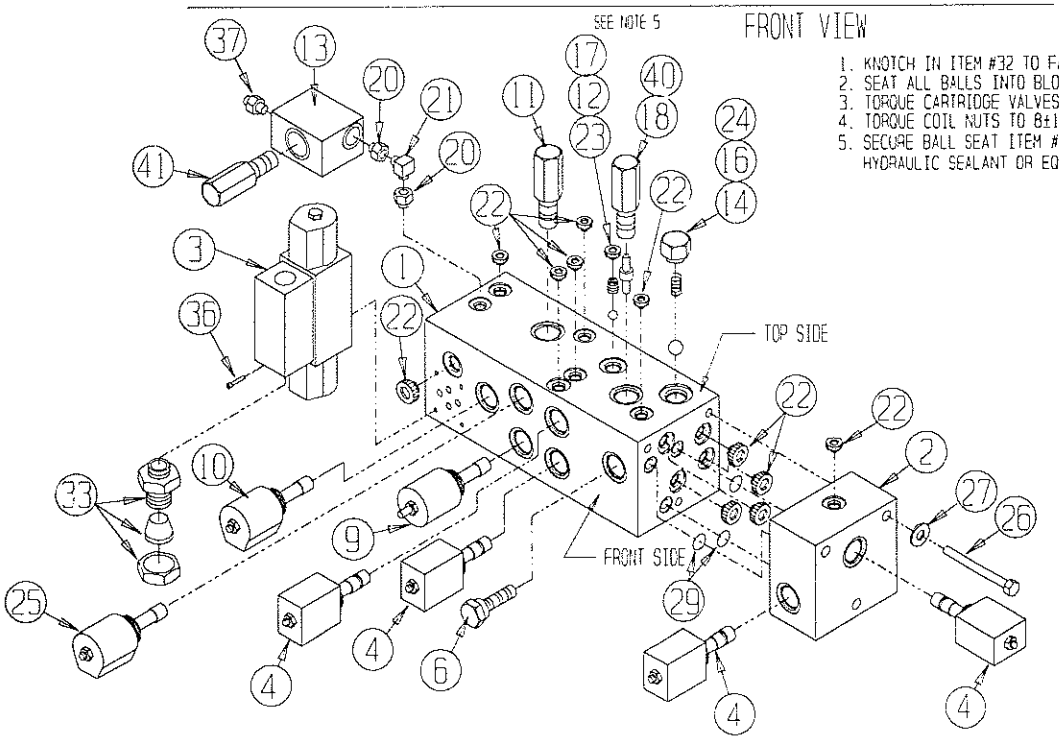

1. KNOTCH IN ITEM #32 TO FACE OUTWARD.
2. SEAT ALL BALLS INTO BLOCK OR BALL SEAT ON ASSY.
3. TORQUE CARTRIDGE VALVES TO 35±5 FT.LB.
4. TORQUE COIL NUTS TO 8±1 IN.LB.
5. SECURE BALL SEAT ITEM # 17 WITH LOCKTITE HYDRAULIC SEALANT OR EQUIVALENT.

ELEVATING ASSEMBLY
Electric & Dual Fuel

ITEM	PART	DESCRIPTION	QTY.
1	64001-011-00	Chassis Assy-**DUAL FUEL**	REF.
1	64001-012-00	Chassis Assy-**ELECTRIC**	REF.
2	64089-000-00	Lift Gear	2
3	64090-000-00	Pivot Pin 1.75 x 11.45	3
4	64093-000-00	Cylinder Pin	1
5	64094-000-00	Pivot Pin 1.75 x 13.11	2
6	64095-000-00	Pivot Pin 2.75 x 13.27	3
7	64060-002-00	Lower Boom Weldment	1
8	64070-002-00	Mid-Linkage Weldment	1
9	64078-002-00	Upper Boom Weldment	1
10	64084-002-00	Lower Tension Weldment	1
11	64087-000-00	Upper Tension Weldment	1
12	11248-016-00	Locknut 1-8 UNC HEX	6
13	14918-056-00	Screw 1-8 UNC HEX HEAD CAP x 7	6
14	11705-020-00	Screw 3/8 -16 UNC Set Hex Soc x 1-1/4	1
15	11764-020-00	Retaining Ring	2
16	64450-000-00	Wire Cover	1
17	64451-000-00	Wire Cover	1
18	62642-030-00	Bearing	6
19	62649-010-00	Bearing	2
20	62649-020-00	Bearing	12
21	11254-024-00	Screw 3/8 - 16 UNC HHC x 3	6
22	11273-006-00	Nut 3/8 - 16 UNC JAM HEX	1
23	64111-001-00	Pedestal Weldment	1
24	63904-000-00	Lift Cylinder	1
*	63904-010-00	Seal Kit, Lift Cylinder	1
*	63904-011-00	Velocity Fuse	1
25	11254-030-00	Screw 3/8 - 16 UNC HHC x 3 3/4	3
26	11248-006-00	Locknut 3/8 - 16 UNC HEX	9
27	11934-013-00	Fitting Adapter	1
28	11940-006-00	Fitting Adapter	1
29	13336-001-00	Grease Fitting	5
30	64092-000-00	Pin (1 3/4)	1
31	11246-014-00	Locknut 3/8 - 16 UNC THIN	4

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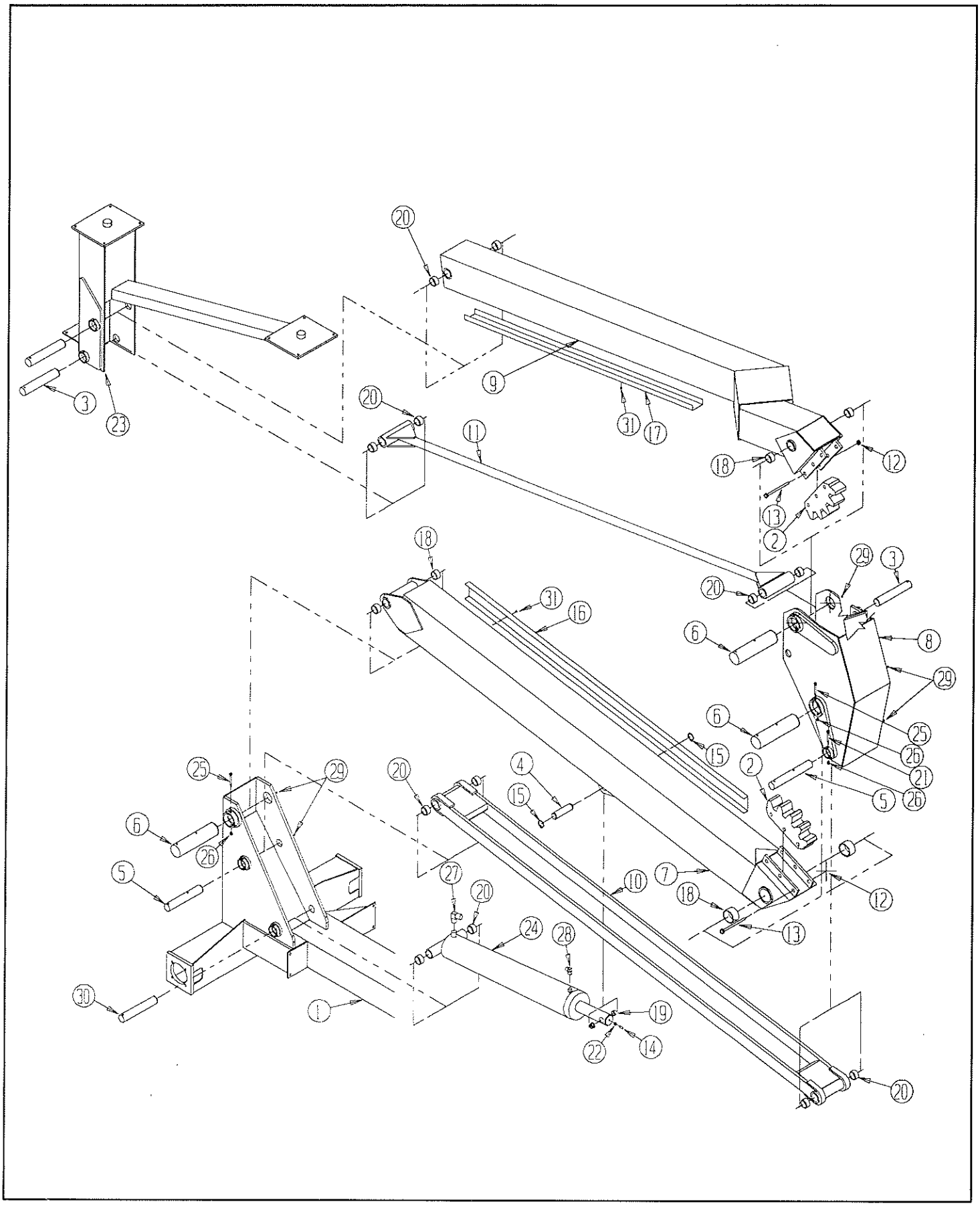
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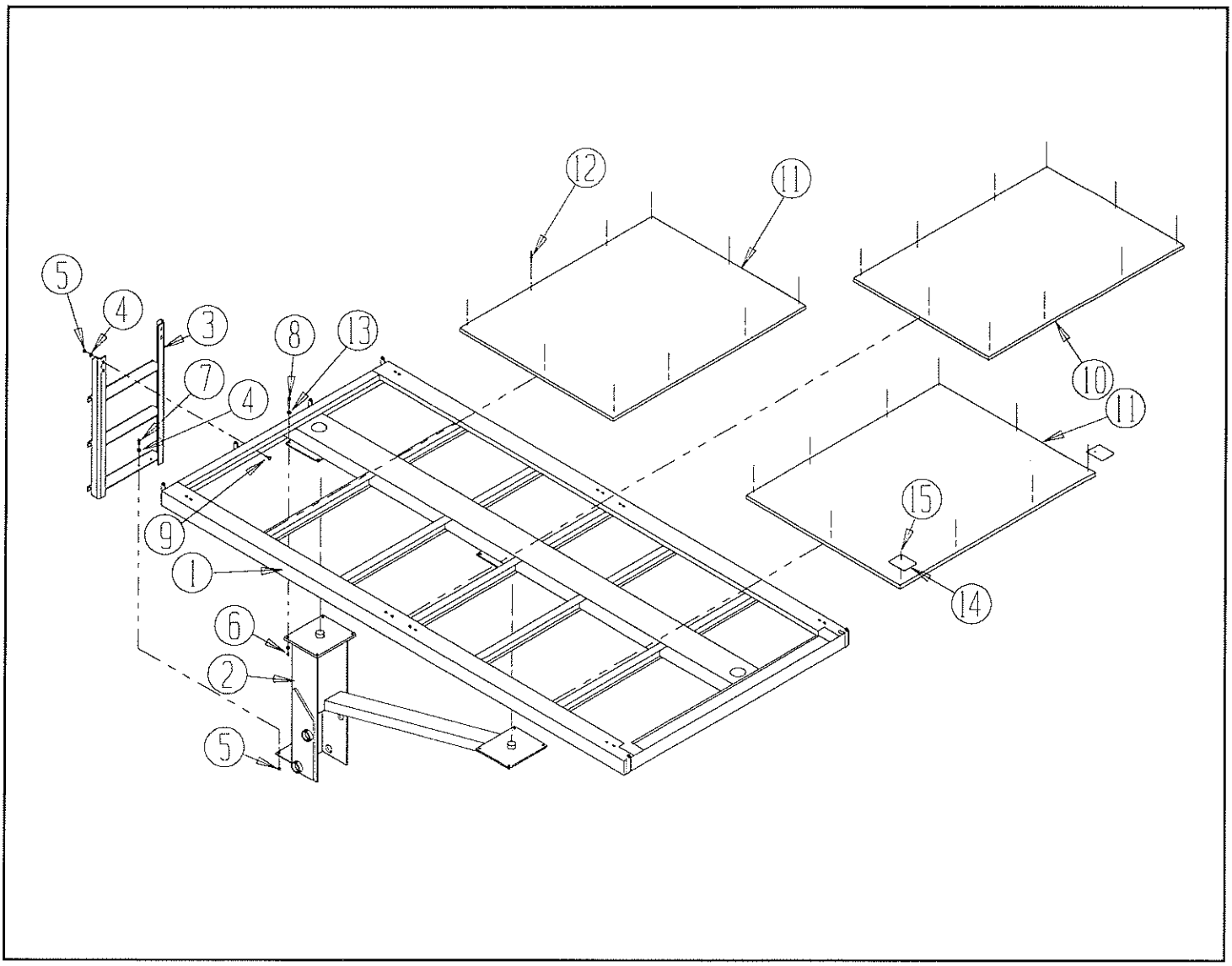
PLATFORM ASSEMBLY
Electric & Dual Fuel

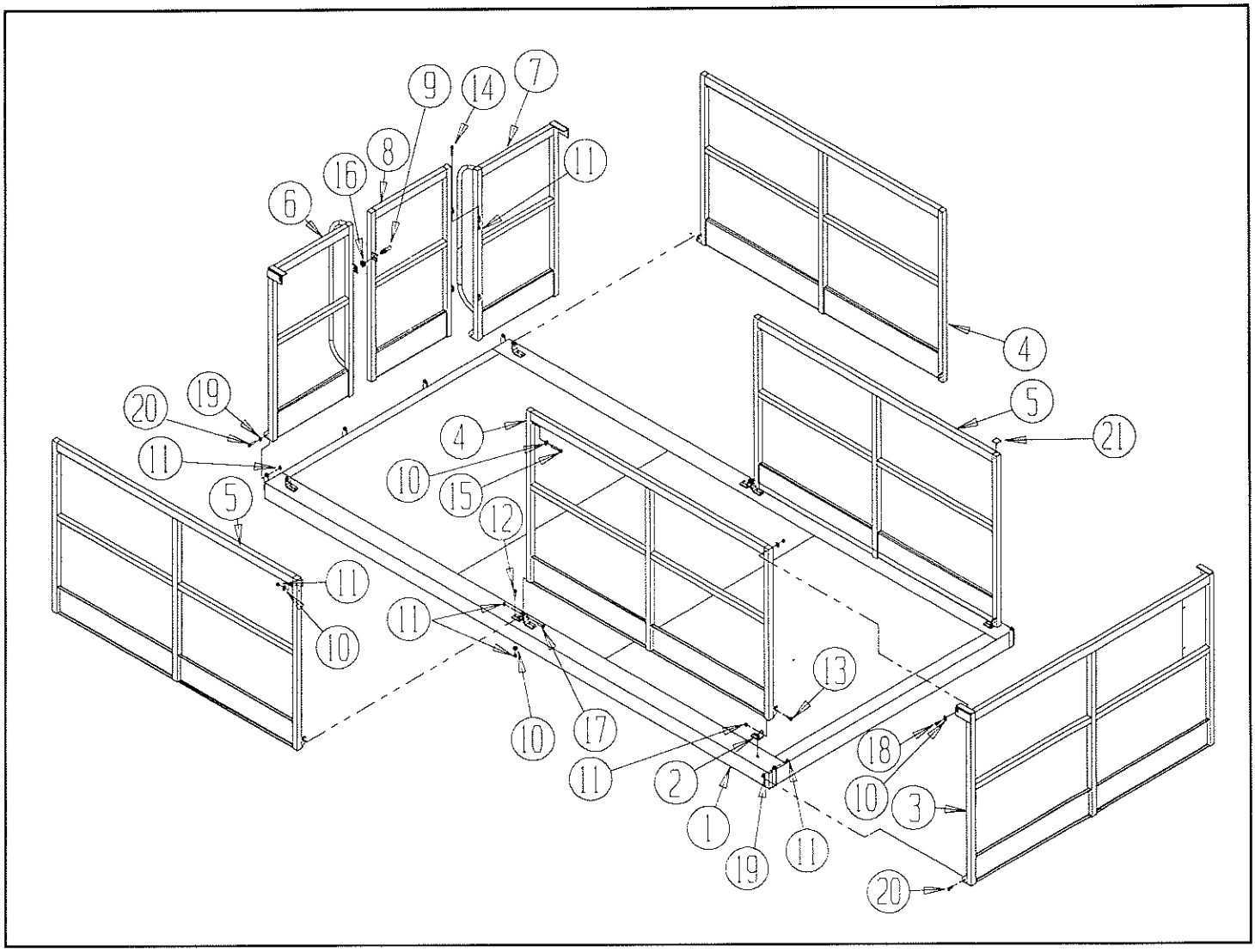
ITEM	PART	DESCRIPTION	QTY.
1	64100-001-00	Deck Weldment	1
2	64111-001-00	Pedestal Weldment	REF.
3	64119-000-00	Ladder Weldment	1
4	11240-006-00	Washer 3/8 Dia Std Flat	6
5	11248-006-00	Locknut 3/8 - 16 UNC	6
6	11248-008-00	Locknut 1/2 - 16 UNC	8
7	11254-010-00	Screw 3/8 - 16 UNC x 1 1/4	2
8	11256-016-00	Screw 1/2 -13 UNC x 2	8
9	11831-008-00	Bolt Carriage 3/8 -16 UNC x 1	4
10	26505-003-00	Plywood 3/4, 42 x 50	1
12	26505-004-00	Plywood 3/4, 48 x 50	2
13	11240-008-00	Washer 1/2 Dia Std Flat	16
14	64424-000-00	Cover Plate	2
15	26526-006-00	Screw Rd, HD, #10 x 3/4	4



GUARDRAIL ASSEMBLY
Electric & Dual Fuel

ITEM	PART	DESCRIPTION	QTY.
1	64100-001-00	Platform Weldment	REF.
2	64046-000-00	Rail Mounting Bracket	8
3	64124-002-00	Front Rail Weldment	1
4	64125-001-00	Side Rail Weldment - RH	1
5	64126-001-00	Side Rail Weldment - LH	2
6	64127-002-00	Rear Rail Weldment - RH	1
7	64128-002-00	Rear Rail Weldment- LH	1
8	64129-001-00	Gate Weldment	1
9	03570-000-00	Retaining Pin Assy	1
10	11240-006-00	Washer 3/8 DIA STD Flat	28
11	11248-006-00	Locknut 3/8 - 16 UNC	36

ITEM	PART	DESCRIPTION	QTY.
12	11254-008-00	Screw 3/8 - 16 UNC HHC x 1	16
13	11254-010-00	Screw 3/8 - 16 UNC HHC X 1 1/4	4
14	11254-022-00	Screw 3/8 - 16 UNC HHC X 2 3/4	2
15	11254-026-00	Screw 3/8 - 16 UNC HHC x 3 1/4	2
16	20495-012-00	Nut 3/4 - 16 UNF JAM HEX	1
17	11254-014-00	Screw 3/8 - 16 UNC HHC x 1 3/4	2
18	11254-018-00	Screw 3/8 16 UNC HHC x 2 1/4	4
19	11273-006-00	Nut 3/8 - 16 UNC JAM HEX	6
20	11254-012-00	Screw 3/8 - 16 UNC HHC x 1 1/2	6
21	63926-001-00	Plug- Sq Tube	8



CONTROLLER ASSEMBLY
Electric Model
64005-010-00

ITEM	PART	DESCRIPTION	QTY.
1	64099-008-00	Controller Body	1
2	64098-005-00	Controller Panel	1
3	64047-002-00	Decal - Controller	1
4	05440-000-00	Switch, Key	1
-	05442-000-00	Key (only)	1
5	63959-000-00	Control Lever	1
*	63953-001-00	Switch, Steering	1
*	63953-002-00	Boot, Control Lever	1
6	63906-000-00	Switch, Foot	1
7	61831-000-00	Decal - Before Operating	1
8	61515-000-00	Decal - Lift Here	1
9	29939-003-00	Locknut 3/4 - NPT	1
10	29939-002-00	Locknut 1/2 - npt	1
11	29925-000-00	Connector 1/2	1
12	29925-011-00	Connector Cable 3/4	1
13	29495-099-00	Cord 14/3 Wire	6'
14	26611-002-00	Electrical Box Cover	1
15	15941-001-00	Switch, Drive/Lift	1
16	12797-000-00	Switch, Emergency Stop & Torque	2
17	11811-006-00	Screw 10-32 SLFTP Type F RD HD x 3/4	6
18	29936-006-00	Switch Guard	1
19	08942-000-00	Receptacle	1
20			
21			
22	29616-001-00	Conn Term	10
23	29610-002-00	Conn Term	12
24	29452-099-00	Wire 16 AWG Black	6'
25			
26			
27	63956-001-00	Connector, Plug	1
28	63956-002-00	Pin	9
29	63951-002-00	Relay	2
30	11248-047-00	Locknut 6-32 UNF HEX	6
31	11715-004-00	Screw 6-32 UNF x 1/2	4
32			
33	29610-004-00	Conn Fork 12-10 GA #10	2
34	29481-099-00	Wire 10 AWG Black	5'

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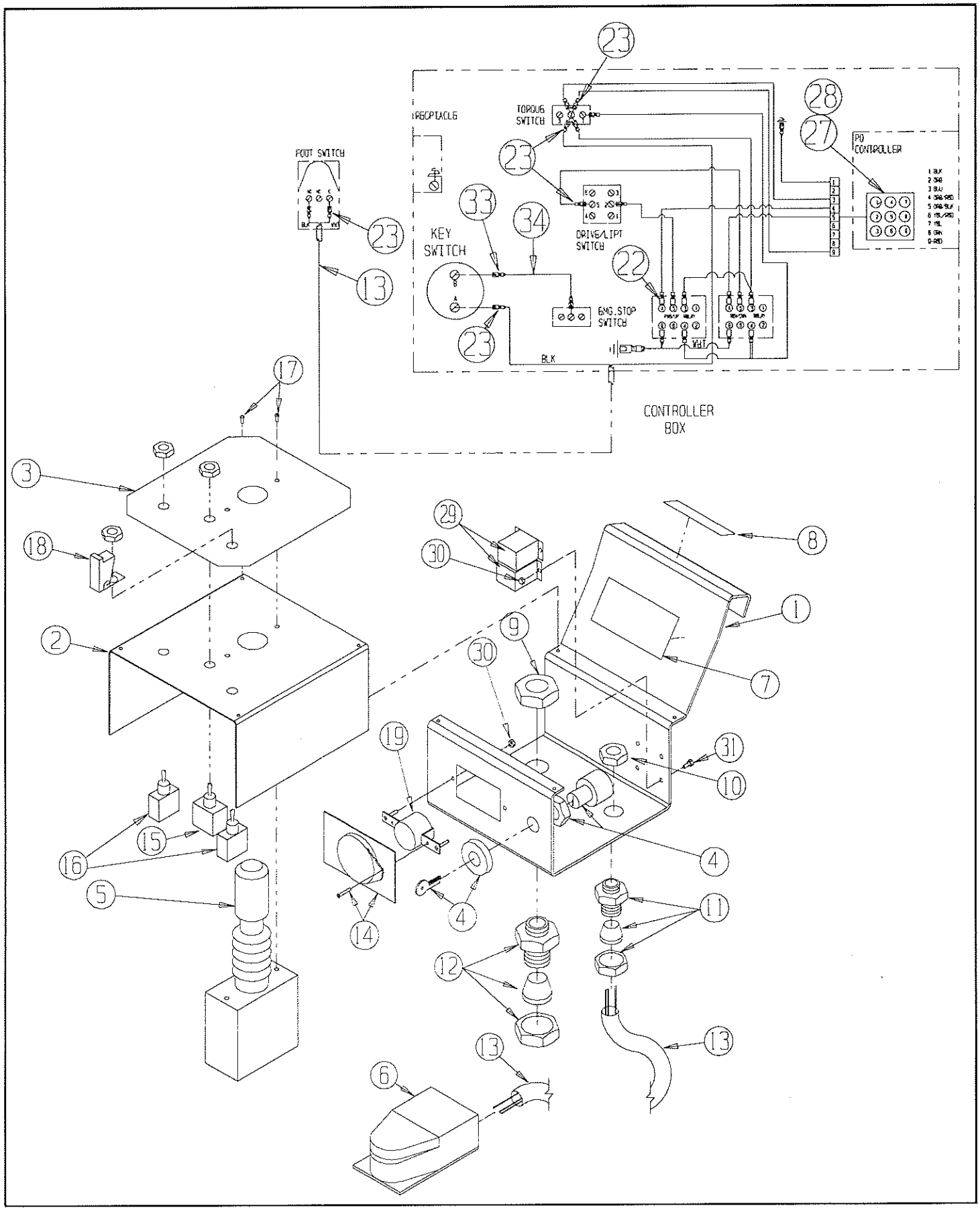
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RECEPTACLE
TORQUE SWITCH
PD CONTROLLER
POUT SWITCH
33
34
KEY SWITCH
DRIVE/LIFT SWITCH
22
13
EMG.STOP SWITCH
BLK
WHT
CONTROLLER BOX
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CONTROLLER ASSEMBLY
Dual Fuel Model
64005-009-00

ITEM	PART	DESCRIPTION	QTY.
1	64099-008-00	Controller Body	1
2	64098-005-00	Controller Panel	1
3	64047-002-00	Decal - Controller	1
4	63916-000-00	Switch, Key	1
-	63916-001-00	Key (only)	1
5	63953-000-00	Control Lever	1
*	63953-001-00	Switch, Steering	1
*	63953-002-00	Boot, Control Lever	1
6	63906-000-00	Switch, Foot	1
7	61831-000-00	Decal - Before Operating	1
8	61515-000-00	Decal - Lift Here	1
9	29939-003-00	Locknut 3/4 - NPT	1
10	29939-002-00	Locknut 1/2 - npt	1
11	29925-000-00	Connector 1/2	1
12	29925-011-00	Connector Cable 3/4	1
13	29495-099-00	Cord 14/3 Wire	6'
14	26611-002-00	Electrical Box Cover	1
15	15941-001-00	Switch, Emergency Stop & Drive/Lift	2
16	12797-000-00	Switch, Torque	1
17	11811-006-00	Screw 10-32 SLFTP Type F RD HD x 3/4	6
18	29936-006-00	Switch Guard	1
19	08942-000-00	Receptacle	1
20			
21			
22	29616-001-00	Conn Term	10
23	29610-002-00	Conn Term	14
24	29452-099-00	Wire 16 AWG Black	6'
25			
26			
27	63956-001-00	Connector, Plug	1
28	63956-002-00	Pin	9
29	63951-002-00	Relay	2
30	11248-047-00	Locknut 6-32 UNF HEX	6
31	11715-004-00	Screw 6-32 UNF x 1/2	4
32			
33	29610-004-00	Conn Fork 12-10 GA #10	2
34	29481-099-00	Wire 10 AWG Black	5'

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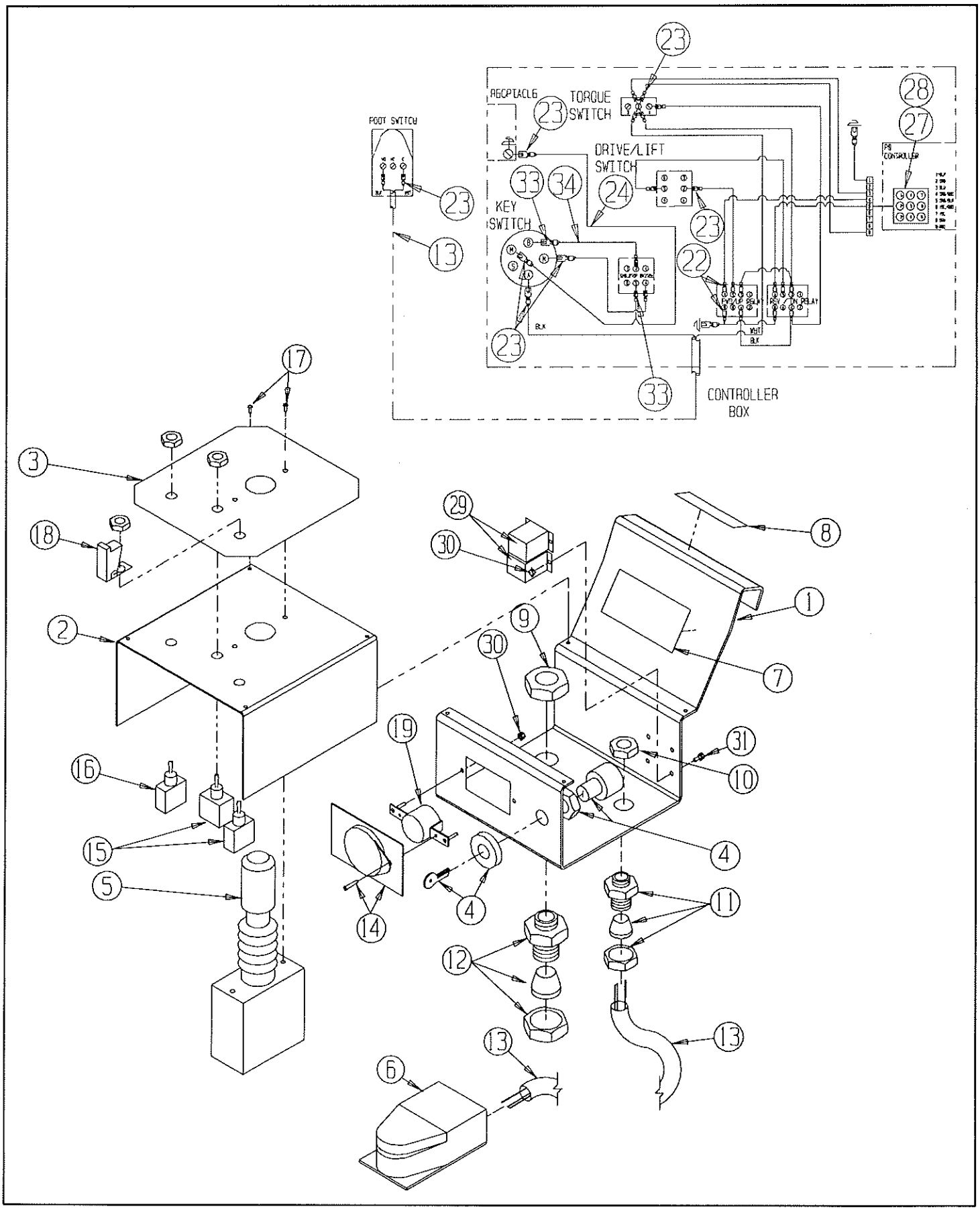
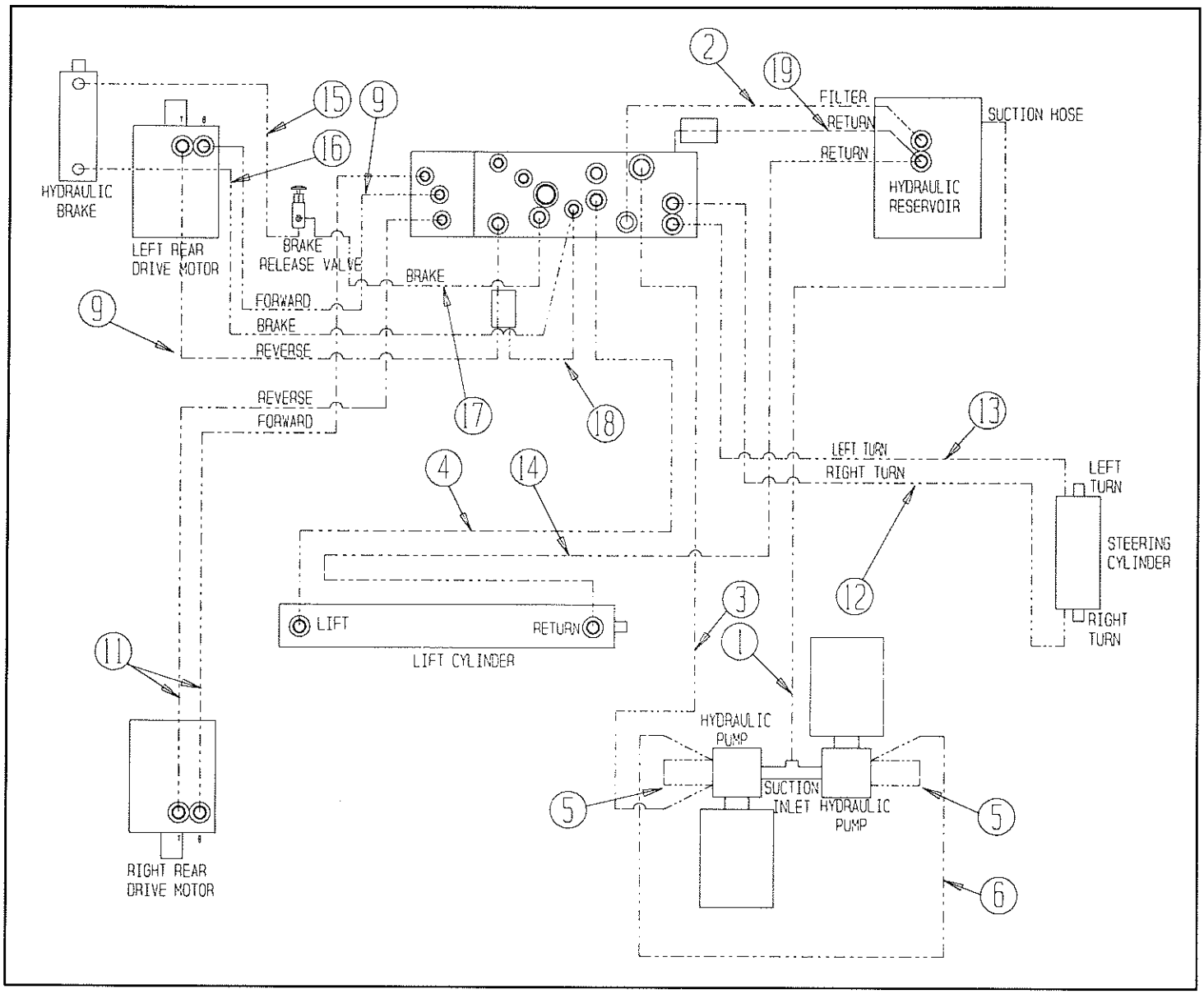

FOOT SWITCH
RECEPTACLE
TORQUE SWITCH
DRIVE/LIFT SWITCH
KEY SWITCH
PC CONTROLLER
CONTROLLER BOX

HOSE INSTALLATION
Electric Model
64008-008-00

ITEM	PART	DESCRIPTION	QTY.
1	64157-004-00	Hose Assy x 47	1
2	64156-002-00	Hose Assy x 23	1
3	64156-013-00	Hose Assy x 50	1
4	64156-004-00	Hose Assy x 53	1
5	61132-010-00	Hose Assy x 13	2
6	61132-011-00	Hose Assy x 23	1
7			
8			
9	64156-009-00	Hose Assy x 49	2
10			

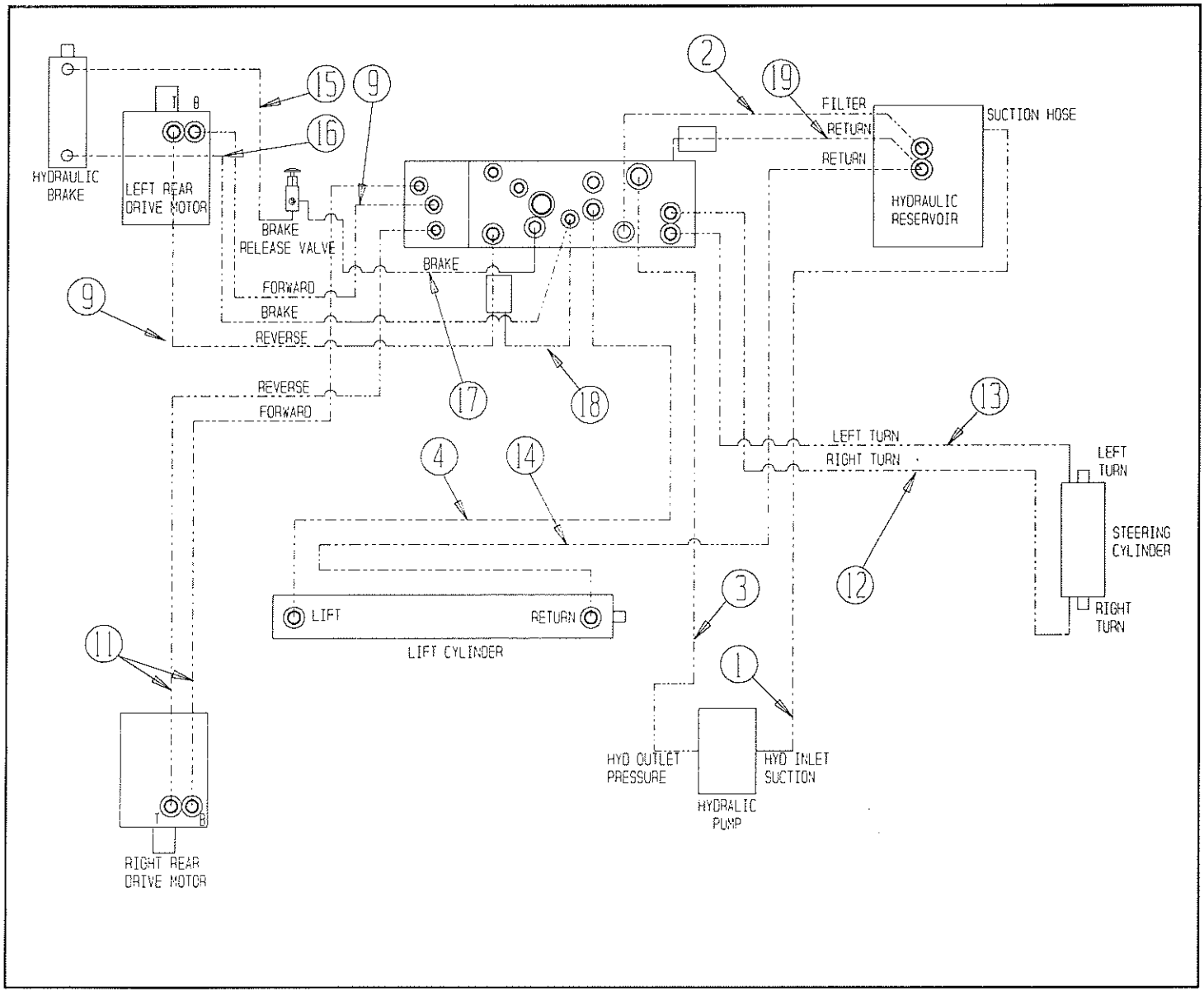
ITEM	PART	DESCRIPTION	QTY.
11	64156-011-00	Hose Assy x 71	2
12	61131-006-00	Hose Assy x 77 1/2	1
13	61131-007-00	Hose Assy x 64	1
14	61132-007-00	Hose Assy x 103	1
15	60460-014-00	Hose Assy x 31	1
16	60460-006-00	Hose Assy x 64	1
17	60460-015-00	Hose Assy x 40	1
18	61351-011-00	Hose Assy x 18	1
19	60861-021-00	Hose Assy x 12	1



HOSE INSTALLATION
Dual Fuel Model
64008-007-00

ITEM	PART	DESCRIPTION	QTY.
1	64157-001-00	Hose Assy x 35	1
2	64156-002-00	Hose Assy x 23	1
3	64156-003-00	Hose Assy x 64	1
4	64156-004-00	Hose Assy x 53	1
5			
6			
7			
8			
9	64156-009-00	Hose Assy x 49	2
10			

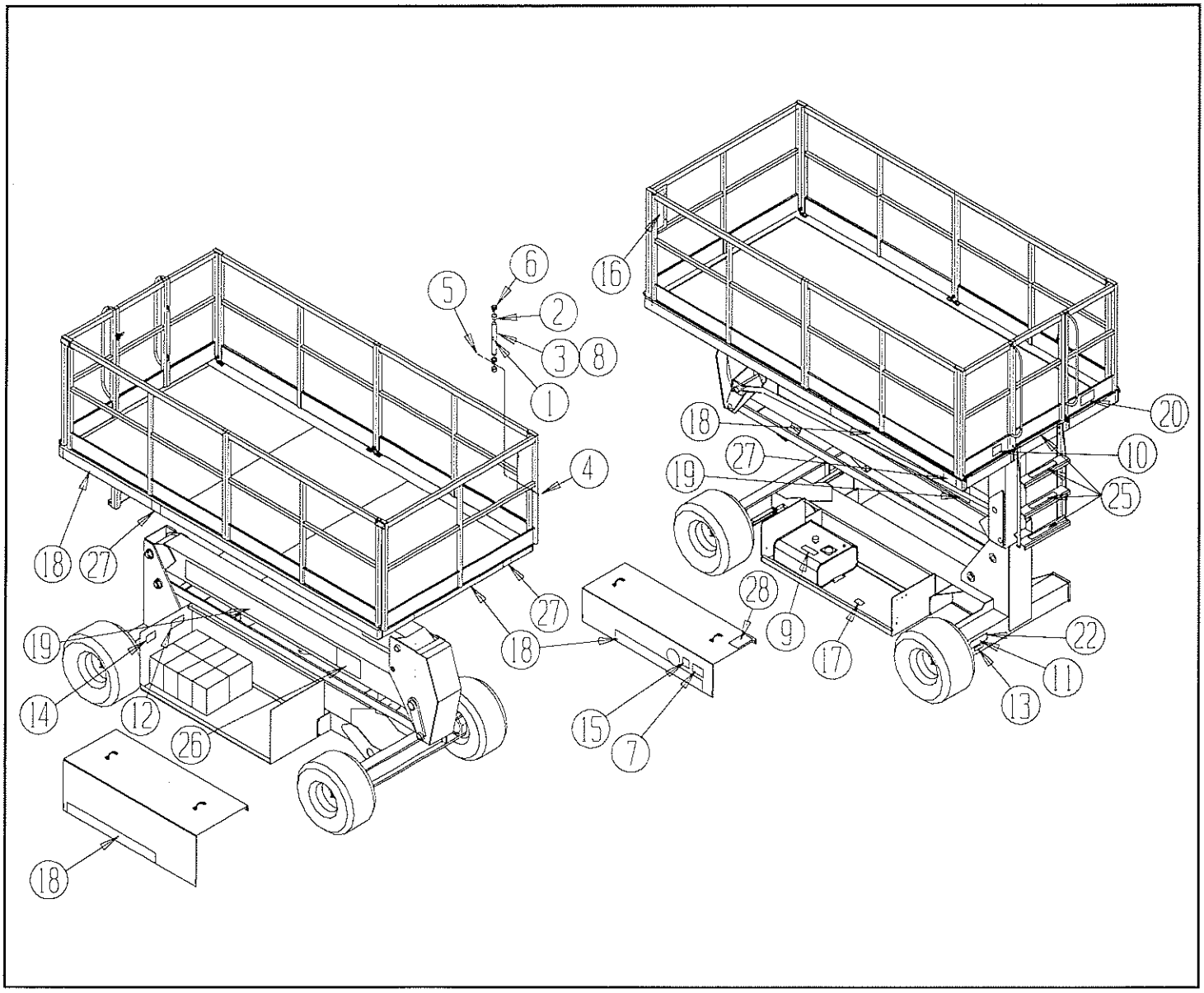
ITEM	PART	DESCRIPTION	QTY.
11	64156-011-00	Hose Assy x 71	2
12	61131-006-00	Hose Assy x 77 1/2	1
13	61131-007-00	Hose Assy x 64	1
14	61132-007-00	Hose Assy x 103	1
15	60460-014-00	Hose Assy x 31	1
16	60460-006-00	Hose Assy x 64	1
17	60460-015-00	Hose Assy x 40	1
18	61351-011-00	Hose Assy x 18	1
19	60861-021-00	Hose Assy x 12	1



DECAL KIT
Electric Model
64006-006-00

ITEM	PART	DESCRIPTION	QTY.
1	03610-000-00	Decal - Operating Instructions	1
2	036212-000-00	Cap	2
3	03613-002-00	Tube	1
4	11248-004-00	Locknut 1/4-20 UNC HEX	2
5	11252-006-00	Screw 1/4-20 UNC HHC x 3/4	2
6	20398-012-00	Clamp	2
7	27993-000-00	Decal - Lower Platform	1
8	60577-000-00	ANSI Manual	1
9	60197-000-00	Decal - Hydraulic Fluid	1
10	60350-001-00	Decal - Load 1250 LBS.	2
11	61205-000-00	Decal - Nameplate	1
12	61214-000-00	Decal - Danger Hydrogen Gas	1
13	61220-001-00	Decal - ANSI Requirement	1
14	05221-000-00	Decal - Batt, Level	1

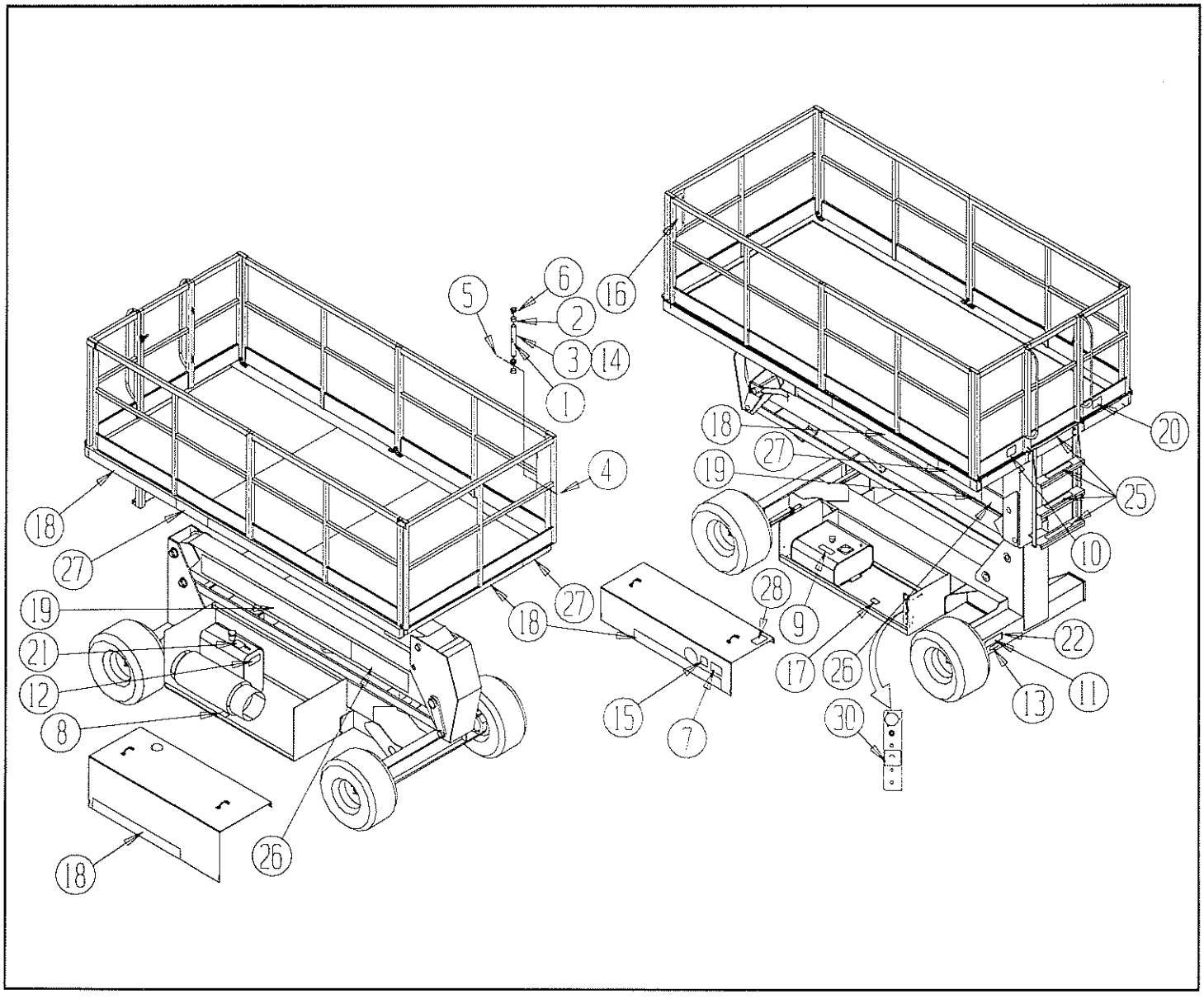
ITEM	PART	DESCRIPTION	QTY.
15	62524-001-00	Decal - Emergency Lowering	1
16	62560-000-00	Decal - Danger Instructions	1
17	62561-000-00	Decal - Caution Relief Valve	1
18	64048-000-00	Decal - SL-26 4 x 40	5
19	64049-000-00	Decal - SL-26 7 1/4 x 68 1/2	2
20	64165-000-00	Decal - Tire Pressure 50 PSI	1
21			
22	27551-005-00	Rivet, Pop	4
23			
24			
25	60830-00-00	Safety Walk	4
26	64227-000-00	Decal - N 7 1/4 x 4	2
27	64228-000-00	Decal - N 4 x 3	3
28	63423-000-00	Decal - Brake Release	1



DECAL KIT
Dual Fuel Model
64006-007-00

ITEM	PART	DESCRIPTION	QTY.
1	03610-000-00	Decal - Operating Instructions	1
2	03612-000-00	Cap	2
3	03613-002-00	Tube	1
4	11248-004-00	Locknut 1/4 - 20 UNC HEX	2
5	11252-006-00	Screw 1/4-20 UNC HHC x 3/4	2
6	20398-012-00	Clamp	2
7	27993-000-00	Decal - Lower Platform	1
8	64189-000-00	Decal - Vapor Withdrawal	1
9	60197-000-00	Decal - Hydraulic Fluid	1
10	60350-001-00	Decal - Load 1250 Lbs.	2
11	61205-000-00	Decal - Nameplate	1
12	61214-000-00	Decal - Danger Hydrogen Gas	1
13	61220-001-00	Decal - ANSI Requirement	1
14	60577-000-00	ANSI Manual	1
15	62524-001-00	Decal - Emergency Lowering	1

ITEM	PART	DESCRIPTION	QTY.
16	62560-000-00	Decal - Danger Instructions	1
17	62562-000-00	Decal - Caution Relief Valve	1
18	64048-000-00	Decal - SL-26 4 x 40	5
19	64049-000-00	Decal - SL-26 7 1/4 x 68 1/2	2
20	64165-000-00	Decal - Tire Pressure 50 P.S.I.	1
21	64166-000-00	Decal - Gas Unleaded Only	1
22	26551-005-00	Rivet, Pop	4
23			
24			
25	60830-000-00	Safety Walk	4
26	64227-000-00	Decal - N 7-1/4 x 4	2
27	64228-000-00	Decal - N 4 x 3	3
28	63423-000-00	Decal - Brake Release	1
29			
30	64421-000-00	Decal - Switch Fuels	1



OPTION: KUBOTA DUAL FUEL ENGINE
Dual Fuel
30627-000-00

ITEM	PART	DESCRIPTION	QTY.
1	64505-000-00	Engine, Dual Fuel, Kubota	1
2	20398-012-00	Hose Clamp	1
3	63941-000-00	Solenoid, Throttle	2
4	12739-099-00	Hose 1/4 ID	5 ft
5	03495-001-00	Fitting Adapter	1
6	11238-004-00	Lockwasher 1/4 DIA Split	2
7	10178-003-00	Fitting Adapter	3
8	11254-010-00	Screw 3/8-16 UNC HHC x 1 1/4	12
9	11238-006-00	Lockwasher 3/8 Dia Split	12
10	11254-008-00	Screw 3/8 - 16 UNC HEX x 1	12
11	11248-006-00	Locknut 3/8-16 UNC HEX	12
12	11252-006-00	Screw 1/4-20 UNC HHC x 3/4	12
13	11240-004-00	Washer 1/4 DIA STD Flat	6
14	11248-004-00	Locknut 1/4-20 UNC HEX	11
15*	30624-016-00	Module Tray Weldment	1
16	63902-001-00	Pump, Hydraulic	1
17	63125-008-00	Clamp	5
18	30624-008-00	Choke Sol Bracket	1
19	30624-009-00	Coil Bracket	1
20	30624-020-00	Choke Rod	1
21	01253-006-00	Screw 5/16-18 HHC x 3/4	2
22	64177-001-00	Muffler Weldment, SL26N	1
23	30624-007-00	Angle Mount	2
24	30624-021-00	Spacer, Engine	2
25	63939-000-00	Drive Plate	1
26	63938-000-00	Flywheel Cover	1
27	30624-014-00	Muffler Tail Pipe	1
28	30624-010-00	Hose Bracket	1
29	30624-011-00	Reg. Bracket	1
30	30624-012-00	Air, Fuel & Gas Bracket	1
31	11240-006-00	Washer 3/8 Dia STD Flat	10
32	11256-006-00	Screw 1/2-13 UNC HHC x 3/4	2
33	27972-000-00	Starter Sol.	1
34	11238-005-00	Lockwasher 5/16 DIA Split	10

ITEM	PART	DESCRIPTION	QTY.
35	63957-000-00	Propane Conversion Kit	1
A	63934-004-00	Solenoid, Gasoline	1
*	63934-001-00	Switch, Microvac	1
*	63934-002-00	Regulator, L.P. Gas	1
*	63934-003-00	Filter Lock 12v	1
*	63934-005-00	Adapter, Carburetor	1
36	11275-006-00	Screw 10-32 UNC HHC x 3/4	2
37	11249-003-00	Locknut 10-32 UNC HEX	2
38	63945-001-00	Switch, Pressure	1
39	11760-004-00	Rod End	1
40	64423-000-00	Inline Swivel	1
41	11250-006-00	Nut 3/8-16 UNC HEX	4
42	11287-008-00	Screw 5/16-18 UNC SOC HD x 1	8
43	63946-030-00	Screw 10M x 1.25 HHC x 30MM	12
44	18024-002-00	Tube 3/8 OD x .049 Wall x 7/8	1
45	11252-014-00	Screw 1/4-20 UNC HHC x 1 3/4	1
46	30624-019-00	Choke Angle	1
47	11261-004-00	Nut 1/4-28 UNF HEX	3
48	30624-022-00	Com. Lever Control	1
49	30624-023-00	Control Plate	1
50*	64157-000-00	Hose, Hydraulic Return	1
51*	64156-000-00	Hose, Hydraulic Supply	1
52	64275-023-00	Cable, Batt. x 23	1
53	27962-000-00	Relay, Choke	1
54	27963-000-00	Socket, Relay	1
55	11248-047-00	Locknut 6-32 UNC HEX	2
56	11715-004-00	Screw 6-32 UNC x 1/2	2
57	30624-017-00	Wire Loom	1
58	63917-000-00	Switch, Choke Push Button	1
59	29610-002-00	Conn, Fork 16-14 x #8	2
60	29451-099-00	Wire 16 AWG WHT	1 ft
61	—	Switch, Key (Kubota 0172F018)	1
62	12797-000-00	Switch, Emergency Stop Toggle	1
63	30624-024-00	Decal, Choke Button	1

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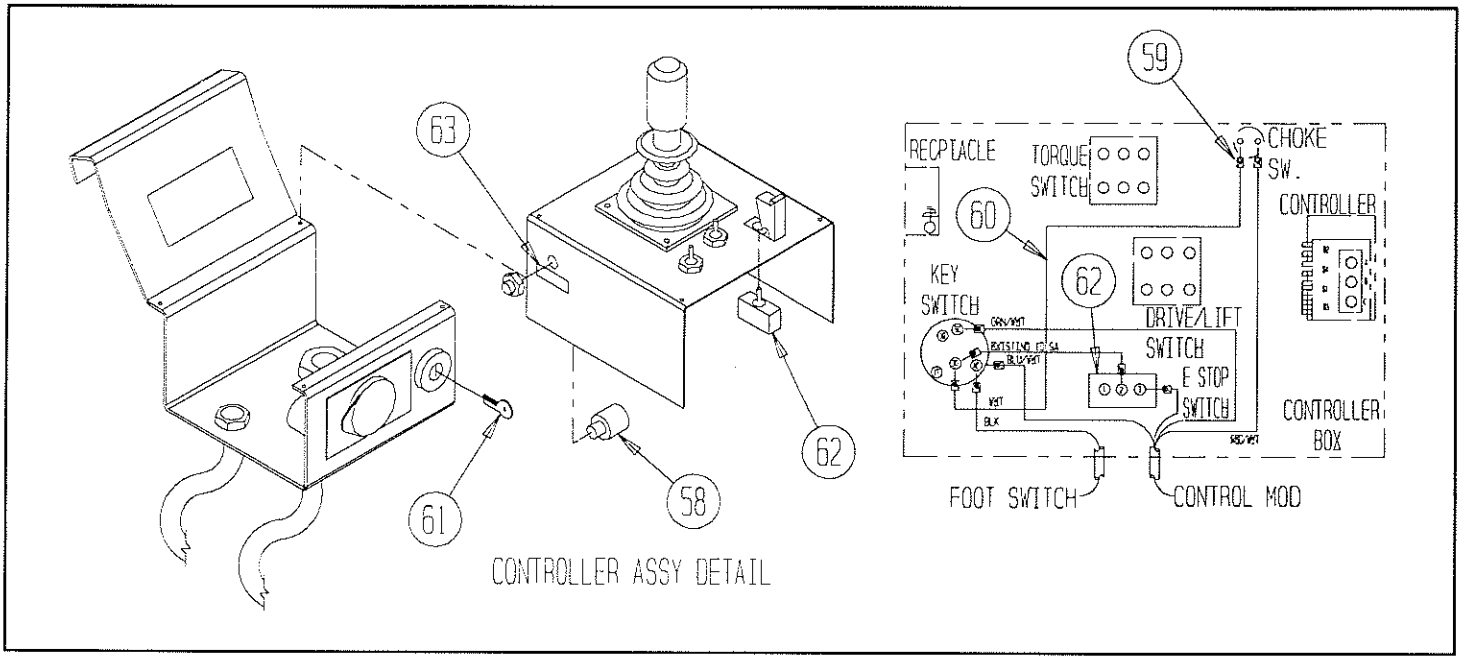
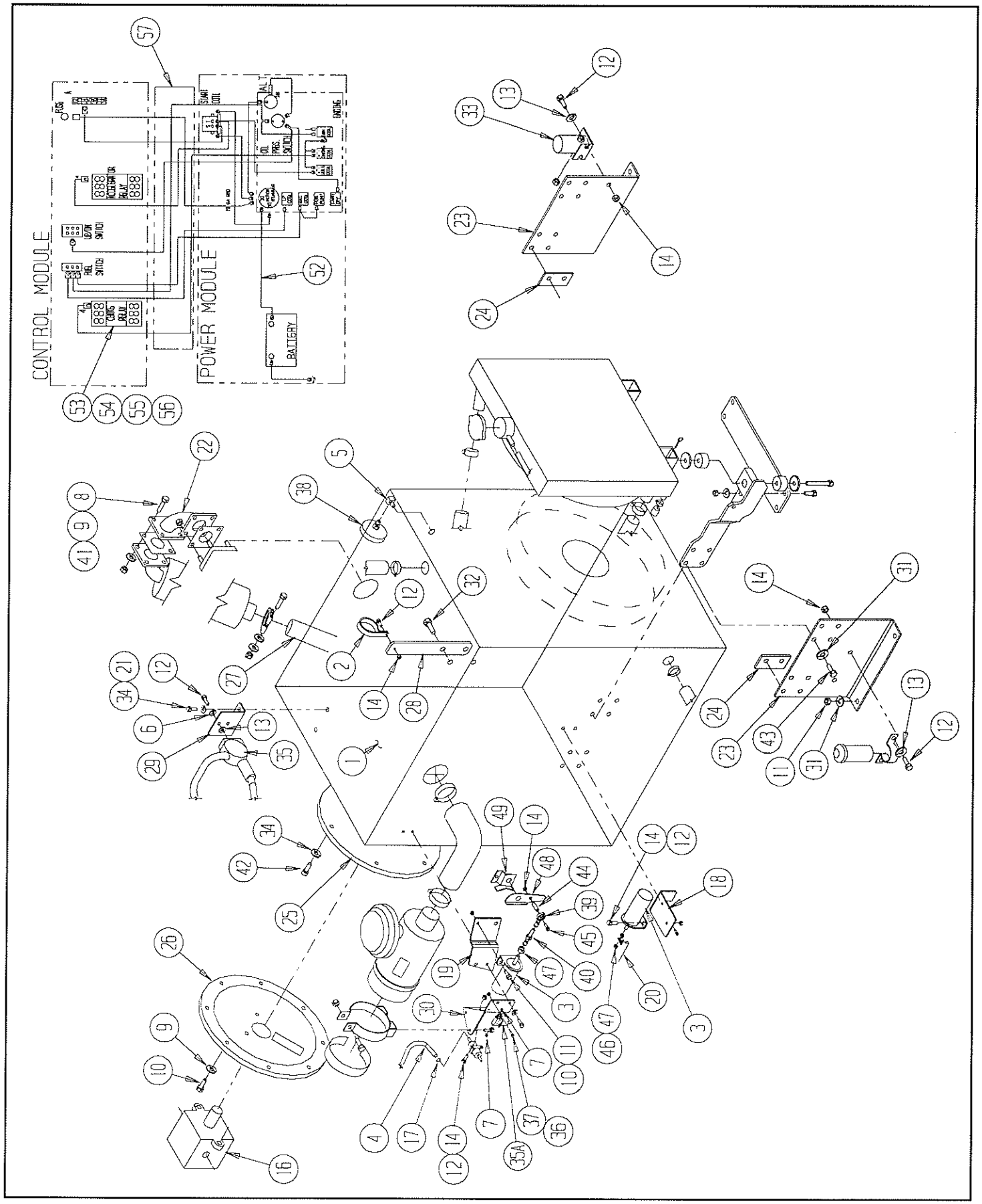
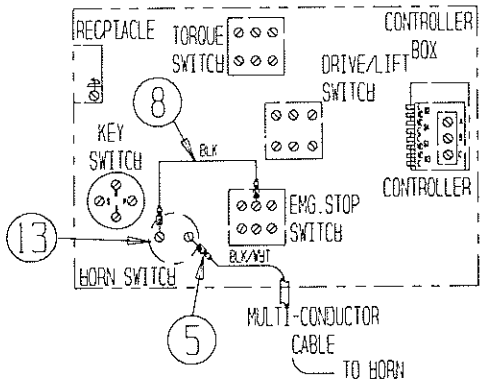



CONTROL MODULE
POWER MODULE
BATTERY

OPTION: HORN & FLASHING BEACON
Electric & Dual Fuel

ITEM	PART	DESCRIPTION	QTY.
1	12848-004-00	Light 12-24 Volt	2
2	63193-000-00	Light Mount Bracket	2
3	29702-000-00	Fuse Holder	1
4	29704-002-00	Fuse 2 Amp	1
5	29610-002-00	Term, Fork	5
6	29601-013-00	Term. Ring	1
7	29620-002-00	Connect, Butt	1
8	29452-099-00	Wire 16 GA BLK	17 ft
9	11249-003-00	Locknut 10-32 Hex	4
10	11826-004-00	Screw 10-32 RD.HD. Mach x 1/2	4
11	29958-001-00	Horn 12v - **Dual Fuel**	1
12	29958-000-00	Horn 24v - **Electric**	1
13	63917-000-00	Switch	1
14	29918-010-00	Tie Down	5
15	26551-007-00	Poprivet 1/8 x .251 Grip	5
16	29052-099-00	Wire 16 AWG Black	.5 ft
17	29931-003-00	Conn. FM Push 16-14 1/4	2
18	29601-014-00	Conn. Ring 16-14 1/4	1
19	11248-004-00	Locknut 1/4 - 20 UNC HEX	1
20	11252-006-00	Screw 1/4 - 20 UNC HHC x 3/4	1



ELECTRIC SCHEMATIC
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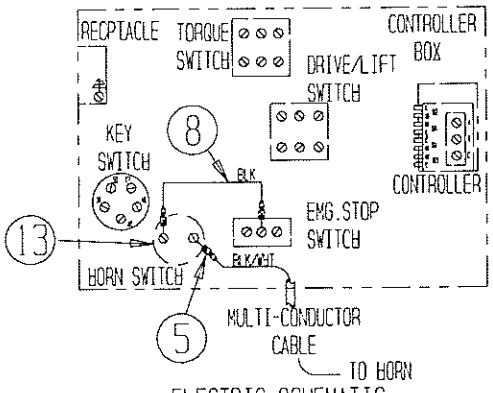

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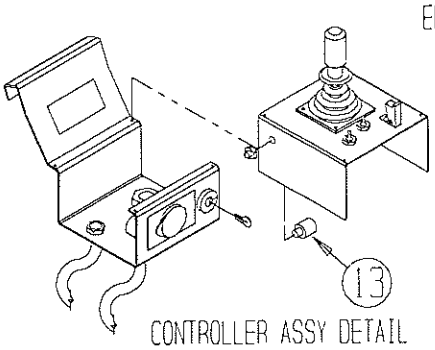
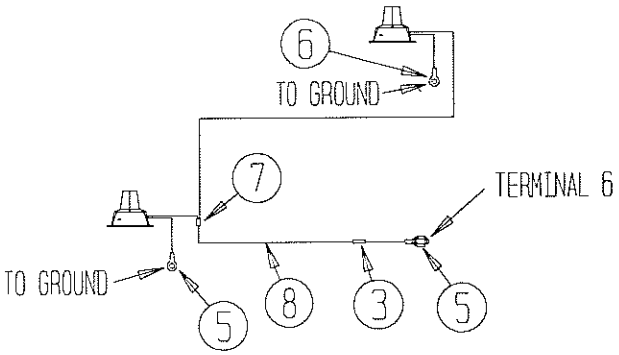
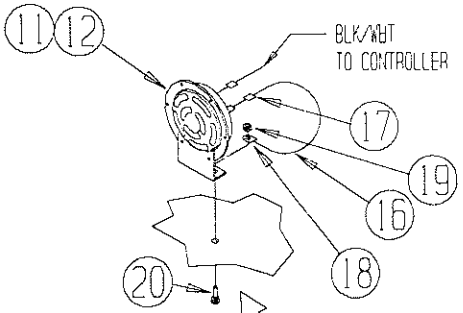
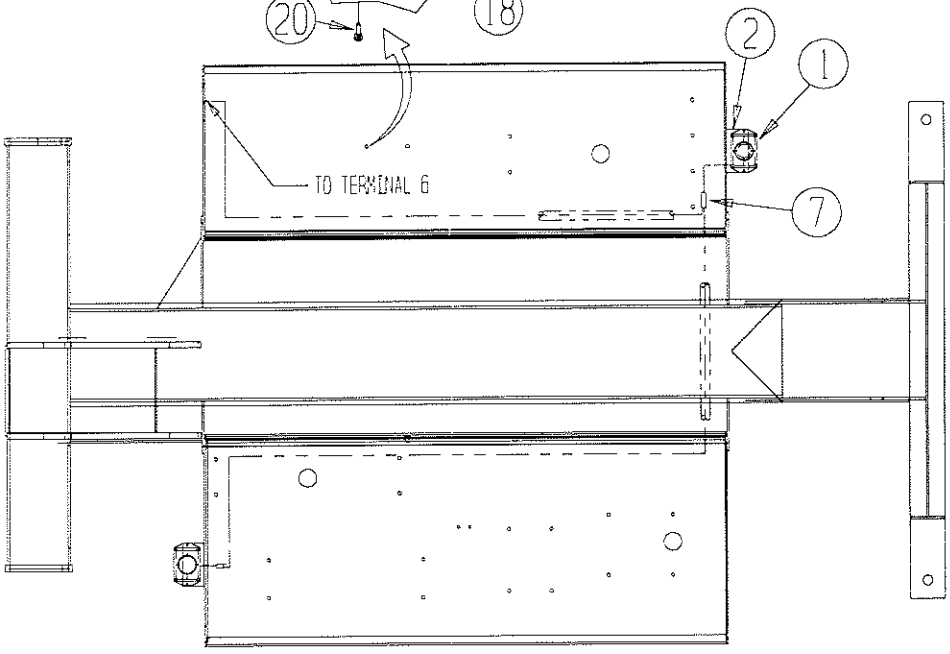
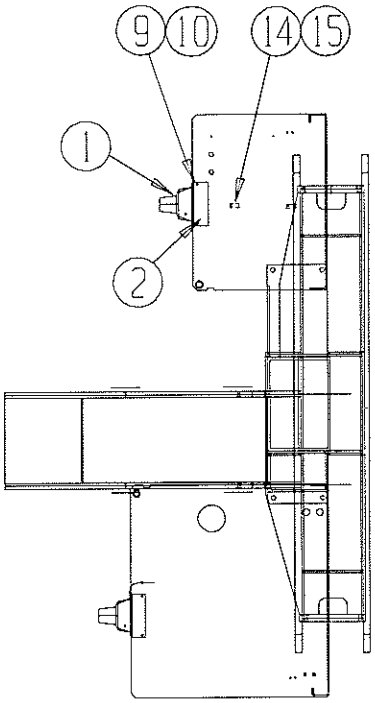


CONTROLLER ASSY DETAIL



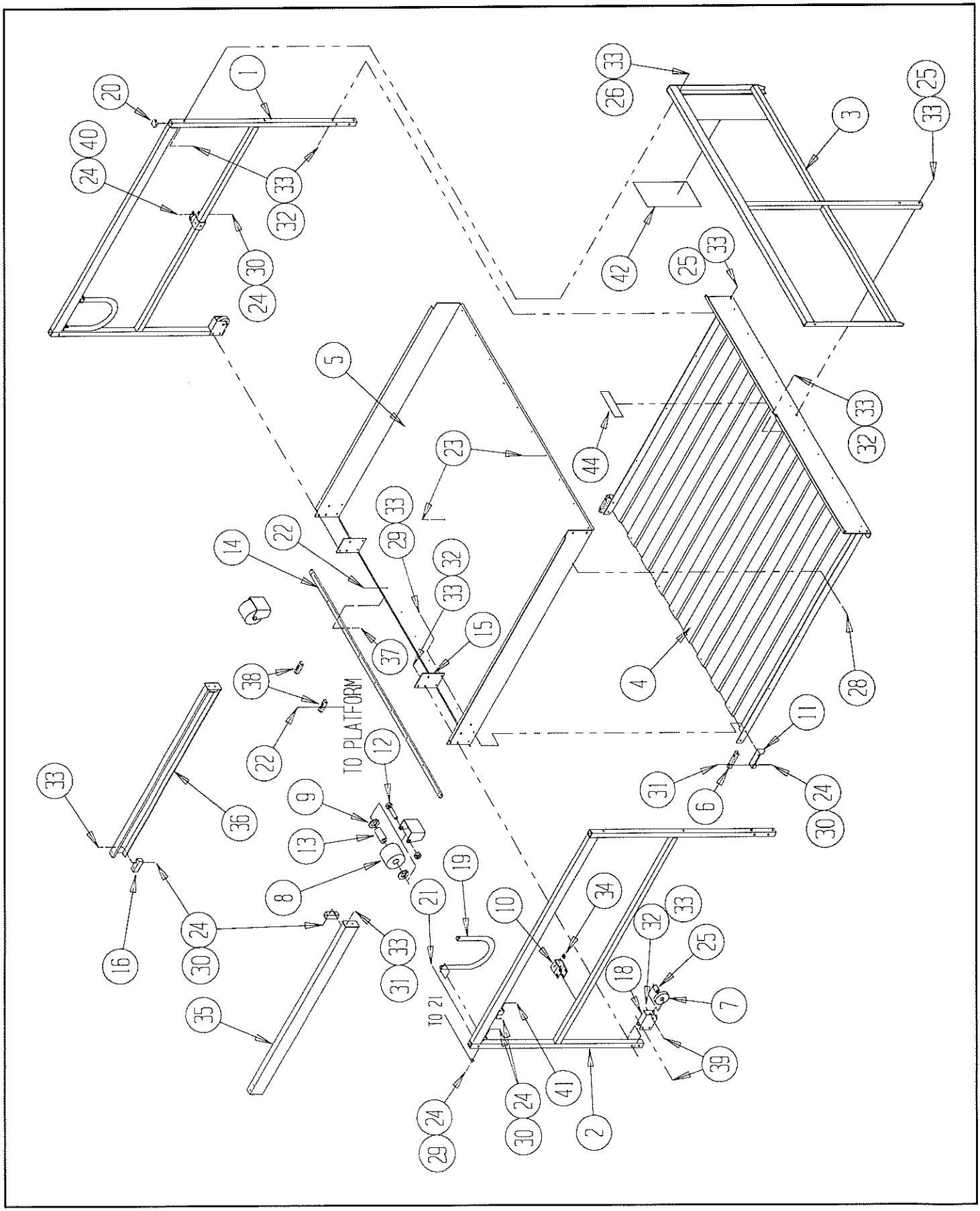






OPTION: DECK EXTENSION
Electric & Dual Fuel
64252-000-00

ITEM	PART	DESCRIPTION	QTY.
1	64241-000-00	Weldment - Side Rail	1
2	64242-000-00	Weldment - Side Rail	1
3	64243-001-00	Weldment - Front Rail	1
4	64245-001-00	Weldment - Front Rail	1
5	64255-001-00	Floor - Diamond Aluminum	1
6	63727-000-00	Block	2
7	64233-000-00	Wheel	2
8	64234-000-00	Wheel	2
9	64235-000-00	Washer	4
10	64239-000-00	Clip - Guardrail	2
11	64425-000-00	Weldment Slide Bracket	2
12	63990-003-00	Axle	2
13	64249-000-00	Bushing - Spanner	2
14	64256-001-00	Bearing Strip	1
15	64265-000-00	Gusset Plate	2
16	64267-000-00	Bumper Pad	4
17			
18	64273-000-00	Bracket - Rear Wheel	2
19	64270-000-00	Handle	2
20	63926-001-00	Cap	4
21	64248-000-00	Pin - Quick Release	2
22	26553-008-00	Rivet - Pop 3/16 DIA 1/2-5/8 Grip	9
23	26553-002-00	Rivet - Pop 3/16 DIA 1/8-1/4 Grip	33
24	11240-004-00	Washer 1/4 Std. Flat	20
25	64240-000-00	Bushing	2
26	11254-018-00	Screw - Cap 3/8-16 x 2 1/4	10
27	11252-008-00	Screw - Cap 1/4-20 x 1	8
28	11254-010-00	Screw - Cap 3/8-16 x 1 1/4	4
29	11252-024-00	Screw - Cap 1/4 - 20 x 3	2
30	11248-004-00	Locknut 1/4-20	16
31	12553-008-00	Screw 1/4-20 UNC SOC HD x 1	4
32	11248-006-00	Locknut 3/8-16	16
33	11240-006-00	Washer 3/8 Std Flat	16
34	10080-006-00	Tree Clip	6
35	64259-000-00	Slide Weldment R.H.	1
36	64260-000-00	Slide Weldment L.H.	1
37	11240-002-00	Washer #8	5
38	64247-000-00	Guide Slide	2
39	11254-020-00	Screw - Cap 3/8 -16 x 2 1/2	6
40	11252-016-00	Screw - cap 1/4-20 x 2	4
41	11252-012-00	Screw - Cap 1/4 -20 x 1 1/2	2
42	62560-000-00	Decal, Danger	1
43	64226-000-00	Decal, Danger	1
44	64262-000-00	Decal, Caution 500 lbs. Cap	1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UpRight

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1-800-926-LIFT

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FAX: 353/1/284-0015

P/N 60587-003-00
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