UpRight

AB46 RT

4 WHEEL DRIVE
WORK PLATFORM

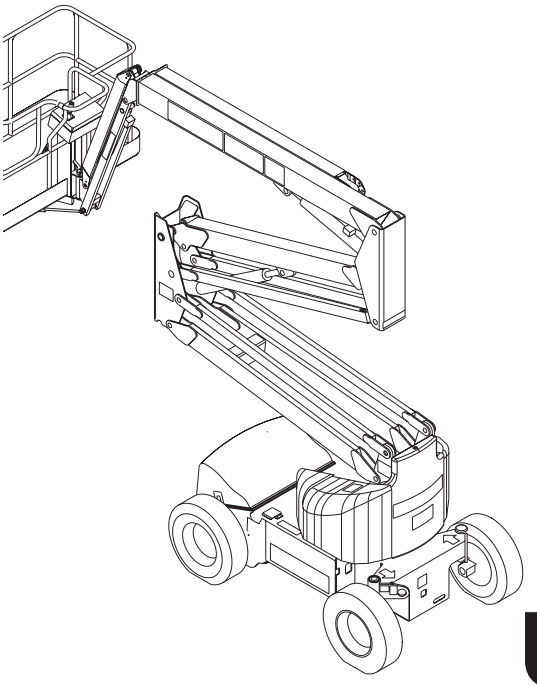
Service & Parts Manual

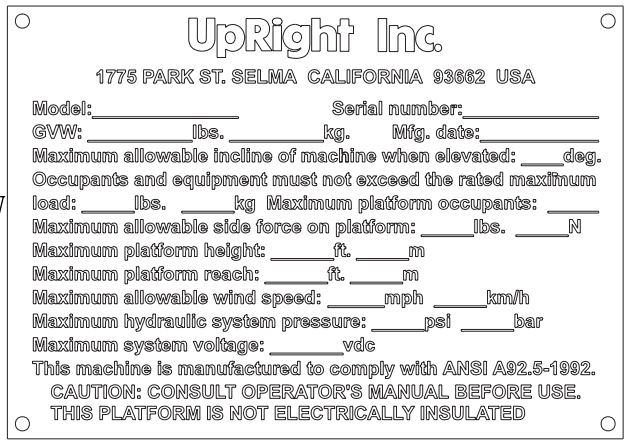
SERVICE & PARTS MANUAL

AB46RT
Aerial Work Platform

Serial Numbers 1000 - Current

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





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FORWARD

HOW TO USE THIS MANUAL

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

Special information

⚠ DANGER ⚠

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

NOTES: Give helpful information.

WORKSHOP PROCEDURES

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

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

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Section 1

INTRODUCTION & SPECIFICATIONS

1.1 INTRODUCTION

Purpose

The purpose of this service and parts manual is to provide instructions and illustrations for the operation and maintenance of the AB 46 Work Platform manufactured by UpRight, Inc. of Selma, California.

Scope

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

1.2 GENERAL DESCRIPTION

The AB46 Work Platform consists of the platform, controller, elevating assembly, power module, control module, and chassis.

Platform

The platform has a reinforced steel floor, 43.5 inch (1.11 m) high guardrails with midrail, 6 inch (152 mm) toeboards and an entrance gate at the side of the platform.

⚠ WARNING ⚠

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

Platform Controller

The platform controller contains the controls to operate the machine. It is located at the front of the platform cage. The foot switch must be depressed to operate any function from the platform. A complete explanation of control functions can be found in Section 2.

Elevating Assembly

The platform is raised and lowered by the elevating assembly; an articulated boom powered by two single stage lift cylinders. The hydraulic pump, driven by the engine, powers the cylinders. Solenoid operated valves control raising and lowering.

Chassis

The chassis is a structural frame that supports all the components of the AB46 Work Platform. It contains the engine, battery, hydraulic pump, and drive motor.

1.3 PURPOSE OF EQUIPMENT

The objective of the AB46 Work Platform is to provide a quickly deployable, self propelled, variable height work platform to elevate personnel and materials to overhead work areas.

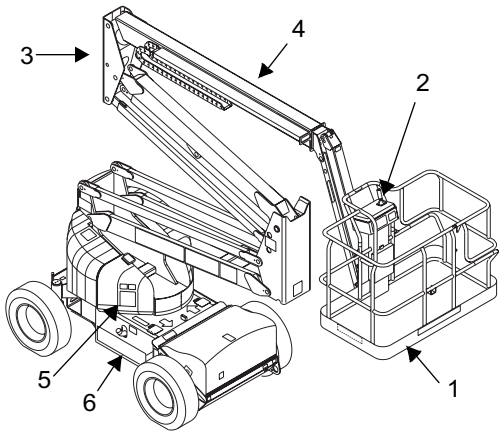
1.4 SPECIAL LIMITATIONS

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

Elevating of the Work Platform is limited to firm, level surfaces only. Any degree of slope greater than 5o will sound a warning alarm when machine is elevated. If machine is lowered, a light will illuminate on platform control box.

⚠ DANGER ⚠

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



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

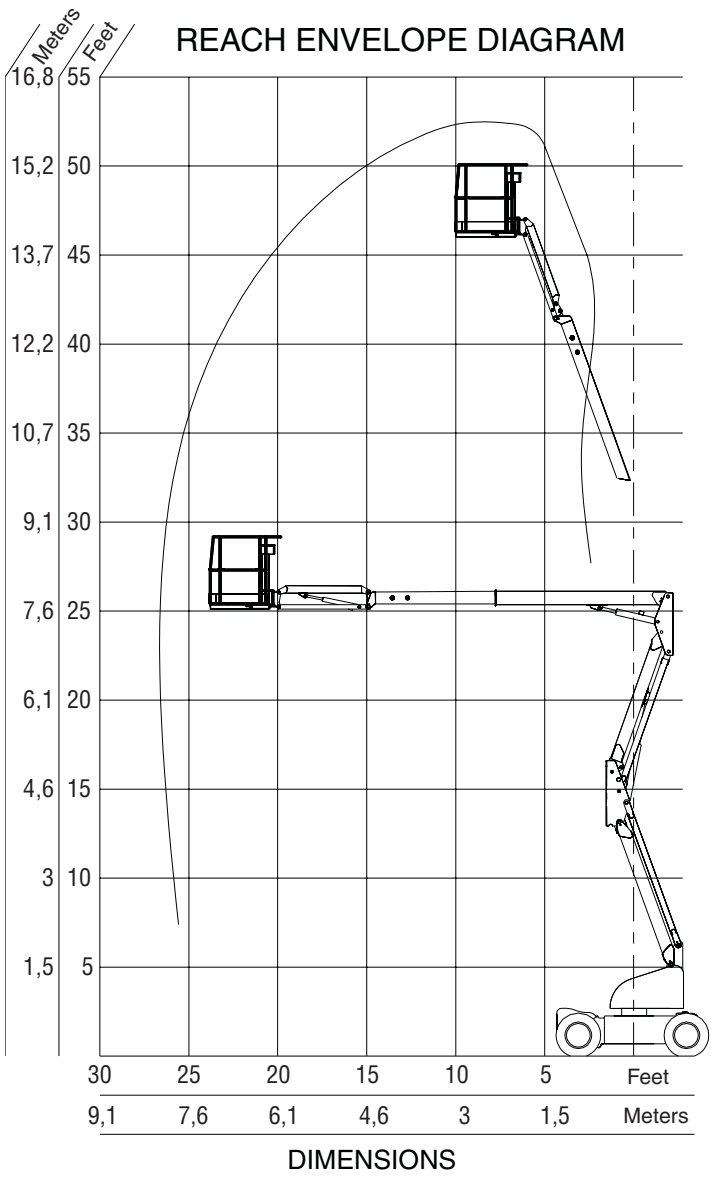
Figure 1-1: AB46 Work Platform

1.5 SPECIFICATIONS

Table 1-1: Work Platform Specifications

ITEM	Specification
Height	
Working height maximum	52 ft. 10 in. (16,1 m)
Platform height maximum	46 ft. 10 in. (14,27 m)
Platform step in height	19 in. (48,25 cm)
Up and over height	25 ft. 8 in. (7,82 m)
Drivable height	46 ft. 10 in. (14,27 m)
Horizontal outreach	24 ft. 6 in. (7,47 m)
Turret rotation	360 deg. noncontinuous
Platform rotation	160 deg.
Tail swing	None
Jib length	5 ft. (1,52 m)
Jib arc	140 deg.
Inside turning radius	3 ft. (91,44 cm)
Outside turning radius	12 ft. (3,66 m)
Drive speed (lowered)	4.5 mph
Drive speed (elevated)	.6 mph
Gradability	40%
Platform Size	69 in. x 39 in. (1,75 m x 1 m)
Guardrail height	43 1/2 in. (1,1 m)
Toeboards	6 in. (15,24 cm)
Maximum platform capacity	500 lbs. (226,8 kg)
Maximum no. of occupants	2
Weight (Gas Model)	14,460 lbs. (6559 kg)
Weight (Diesel Model)	14,660 lbs. (6649 kg)
Overall height	7 ft. 4 in. (2,23 m)
Overall length	18 ft. 4 in. (5,58 m)
Overall width	6 ft. 7 in. (2 m)
Wheel base	7 ft. 2 in. (2,18 m)
Wheel track	5 ft. 5 in. (1,65 m)
Ground Clearance	13 in. (33 cm)
Power source (Gas Model)	Ford VSG 413
Power source (Diesel Model)	John Deere 3015DF
System voltage	12VDC
Maximum Hyd. Pressure	5000 psi (344,74 bar)
Controls	Electric Proportional
Tires	14 x 17.5 10 ply lug tread

* Specifications subject to change without notice.
Refer to Service Manual for complete parts and service information.
Meets or exceeds all applicable requirements of OSHA and ANSI A92.5-1992



Section 2

MACHINE PREPARATION & OPERATION

Safety Rules

Warning

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

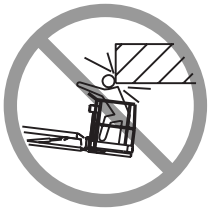
Electrocution Hazard

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

Collision Hazard

NEVER position the platform without checking for overhead obstructions

Tip Over Hazard



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

Fall Hazard

NEVER sit, stand or climb on guardrail or midrail

ALL OCCUPANTS must wear an approved fall restraint properly attached to designated platform anchorage point. Attach only one fall restraint to each anchorage point.

NEVER exceed maximum platform load of 500 lbs. (225 kg) and two (2) occupants.

NEVER exceed 45 lbs. (200 N) of side force per occupant.

DISTRIBUTE all platform loads evenly on the platform.

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

OPERATE machine only on surfaces capable of supporting wheel loads.

NEVER elevate the machine when wind speeds exceed 28 mph (12,5 m/sec.).

IN CASE OF EMERGENCY push emergency stop button to cut power to all machine functions.

ALWAYS close and secure gate after entering platform.

NEVER exit or enter platform while elevated.

NEVER use ladders, scaffolding, or other items to gain height; work only from the platform floor.

NEVER climb down elevating assembly while platform is elevated.

INSPECT the machine thoroughly for cracked welds, loose or missing hardware, hydraulic leaks, loose wire connections, and damaged cables or hoses before using.

VERIFY that all labels are in place and legible before using.

NEVER use a machine that is damaged, not functioning properly, or has damaged or missing labels.

IF ALARM SOUNDS while boom is elevated, STOP, carefully retract boom and lower platform without rotating. Move machine to a firm, level surface.

NEVER attach overhanging loads or use boom as a crane.

NEVER alter operating or safety systems without manufacturers written consent.

NEVER charge battery near sparks or open flame. Charging batteries emit explosive hydrogen gas.

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

NEVER tow the machine. Transport by truck or trailer only.

AFTER USE, secure the work platform from unauthorized use by turning both keyswitches off and removing all keys.

California Proposition 65 Warning

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

Section 2.1

MACHINE PREPARATION & OPERATION

2.1 INTRODUCTION

This manual covers the operation of internal combustion powered models of the AB-46 RT Articulated Boom.

2.2 PRE-OPERATION AND SAFETY INSPECTION

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

Perform a complete visual inspection of the entire unit prior to operating. Check the following areas for discrepancies:

1. Open panels and check hydraulic components / hoses for damage or leaks. Check electrical components / wiring for damage or loose connections.
2. Inspect chassis, axles, hubs, and steering linkage for damage, deformation, buckled paint, loose or missing hardware, and cracked welds.
3. Check tires for damage, punctures, and inflation; tire pressure must be 55 psi (3,8 bar).
4. Check all hoses / cables for wear.
5. Inspect elevating assembly for damage, deformation, buckled paint, loose or missing hardware, and cracked welds.
6. Inspect platform and guardrails for damage, deformation, buckled paint, loose or missing hardware, and cracked welds. Insure that gate operates freely and latches securely.
7. Check Hydraulic fluid level with platform fully lowered.
8. Check battery fluid level.
9. Check fuel level, add fuel if necessary.
10. Ensure that radiator is cold, check coolant level. Add if necessary.

⚠ WARNING ⚠

NEVER remove the cap from a hot radiator. Hot coolant can cause severe burns.

2.3 SYSTEM FUNCTION INSPECTION

NOTE: Refer to Figure 2-1 and Figure 2-2 for chassis and platform control locations.

1. Before performing the following tests, check area around machine and overhead for obstructions, holes, drop-offs, and debris.
2. Turn chassis key switch to chassis, and turn on (rotate clockwise) emergency stop switches at the chassis control panel and at the platform control panel.
3. Press the engine start button to crank the engine; release when engine starts. If engine is cold: press the preheat button and hold for six seconds prior to starting diesel models.
4. Push in the chassis emergency stop button engine should stop. Repeat for platform emergency stop button. Return both emergency stop buttons to the on position, and start engine.
5. Operate each function switch to raise / lower, extend / retract, rotate left / right, each section of the elevating assembly and observe the operation of the machine. All functions should operate through full cycle smoothly.
6. Turn chassis key switch to platform.
7. Mount the platform, close and latch the gate, and attach approved fall restraint to designated platform anchorage point. Attach only one fall restraint to each point.
8. Start the engine.
9. Without depressing the foot switch, move the drive control handle, machine should not function.
10. Depress the foot switch and move the drive control handle forward and reverse. Observe that proportional functions operate smoothly, and that brakes apply quickly after control is released.
11. While depressing foot switch, operate steer switch to left and right. Observe that steering wheels turn properly.
12. While depressing foot switch, turn function speed control knob to desired setting, and operate boom controls. Observe that boom operates smoothly, and that upper boom, jib, turret rotation, platform level, and platform rotation controls operate proportionally in conjunction with function speed control knob. Observe that platform maintains level when boom is elevated.
13. With the upper boom elevated one foot, operate drive control handle. Observe that drive speed is limited to creep approximately 1 foot (0,3m) per second). Lower upper boom to stowed position.
14. Press the service horn button. Observe that horn is audible.

⚠ WARNING ⚠

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

2.4 CONTROLS AND INDICATORS

NOTE: The following list corresponds to the numbered items in figures one and two.

1. Emergency stop.
2. Engine start.
3. Speed Selector.
4. Keyswitch.
5. Control fuses.
6. Riser control.
7. Upper boom control.
8. Boom extension control.
9. Jib control.
10. Turret rotation control.
11. Platform rotation control.
12. Platform level control.
13. Hourmeter.
14. Service horn button.
15. Drive control handle.
16. Function speed control.
17. Fuel selector (dual fuel).
18. Foot switch (located on platform floor).
19. Out of level indicator.
20. Preheat button (diesel).

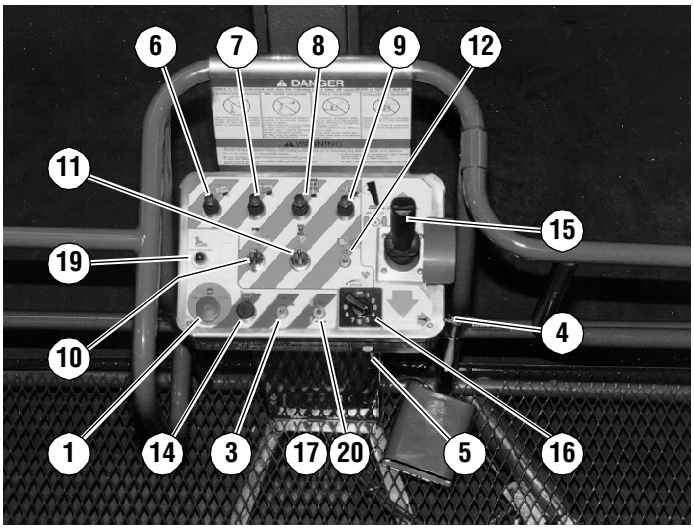


Figure 2-2: Platform Controls

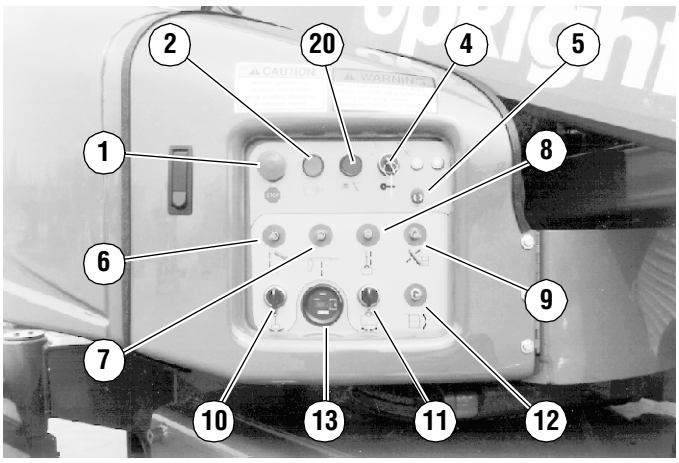


Figure 2-1: Chassis Controls

2.5 OPERATION

Before operating work platform insure that:

- Pre-operation and safety inspection has been completed, and any discrepancies have been corrected.
- The operator has been thoroughly trained on the operation of the machine.
- The work area is clear of all obstructions, holes, drop-offs, or persons in the route of travel.
- The surface is capable of supporting wheel loads.

Refer to Figure 2-1 and Figure 2-2 for control locations.

Emergency Stop

At any time during operation, press the emergency stop button to stop all functions in an emergency.

Service Horn

At any time during operation, press the service horn button to sound an audible warning if necessary.

⚠ WARNING ⚠

Always wear an approved fall restraint properly attached to designated platform anchorage point when driving or elevating the machine.

Attach only one fall restraint to each anchorage point (see Figure 2-3).

Figure 2-3: Fall Restraint Anchorage Point

Starting the engine

From the lower controls

1. Turn the chassis key switch to chassis position.
2. Press the start button to crank the engine. Release when the engine starts.
3. When the engine is cold: press and hold the choke button while starting gasoline / propane engines; press and hold the glow plug button for six seconds prior to starting diesel engines.

From the platform controls

1. Turn the chassis key switch to platform controls.
2. Turn the platform keyswitch fully clockwise to crank the engine. Release when engine starts.
3. When the engine is cold: Press and hold the choke button while starting gasoline / propane engines. Press and hold the glow plug button for six seconds prior to starting the diesel engine.

Driving

With Boom Lowered

1. Turn chassis key switch to platform, and turn on (turn clockwise) the chassis emergency stop switch.
2. Mount the platform, close and latch the gate.
3. Attach approved fall restraint to designated platform anchorage point. Attach only one fall restraint to each point (see Figure 2-3).
4. Start engine.
5. Check that the area around and above the work platform is clear of obstructions, holes, drop-offs, persons in the route of travel, and the surface is capable of supporting wheel loads.
6. Depress the foot switch and move the drive control handle forward to travel forward and reverse to travel in the reverse direction.
7. While driving, press the differential lock button, located on the front of the drive control handle, as necessary for improved traction.

NOTE: When the boom is rotated to the front of the chassis (steering wheels aft) directions of travel and steering will be reversed. Observe the color coded arrows on the control panel near the drive control handle, and on the chassis. They will indicate the direction of travel when the drive control handle is moved.

With Boom Elevated

Travel with boom elevated is restricted to firm level surfaces only.

When driving elevated, the machine will travel at creep speed 1/2 foot (0,15m) per second.

Steering

1. While depressing the foot switch, push the steering switch (located on top of the control handle) to the left to turn left, and right to turn right.

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

2.6 POSITIONING THE PLATFORM

Positioning the platform as close as possible to the work area requires some planning. First, you must survey the work site to find a suitable place to park the machine. This must be a firm level area as close as possible to the work area. Take into consideration all obstructions on the ground and overhead and avoid them.

Once you have moved the machine to a firm level surface as near as possible to the work area, follow the instructions on page five to position the platform as close to the work area as possible.

Always, before operating any function, check the area around and overhead for any obstructions or electrical conductors.

⚠ WARNING ⚠

NEVER exit the platform while the boom is elevated. Keep both feet firmly planted on the platform floor at all times.

Multifunction Controls

The UpRight AB-46 employs the use of multifunction controls. This means that riser or boom extension will function at full speed while simultaneously operating upper boom, jib, turret, or rotating the platform.

The turret may be rotated while driving if necessary to make turns in tight areas. All other boom functions will not operate while driving.

Lower Control Operation

All boom functions will operate at fixed speed.

1. Turn chassis keyswitch to chassis controls.
2. With engine running, operate boom control switches to position the platform.

Leveling the Platform

⚠ WARNING ⚠

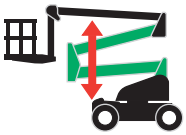
DO NOT operate the machine if the platform does not maintain level when elevated.

NOTE Platform leveling can be performed only with the boom stowed and should be done only to calibrate the automatic leveling system.

1. Set the function speed control dial to the desired setting. Rotate the dial clockwise to increase speed, counterclockwise to decrease. If you are not sure what speed to use, start out slow; the speed can be varied while operating the function.
2. While depressing the foot switch, push the platform level control switch forward to swing the platform upward, rearward to swing the platform downward. Release the switch to stop leveling.

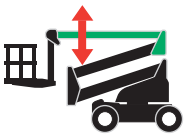
Rotating the Turret

1. Set the function speed control dial to the desired setting. Rotate the dial clockwise to increase speed, counterclockwise to decrease. If you are not sure what speed to use, start out slow; the speed can be varied while operating the function.
2. While depressing the foot switch, turn the turret rotation control switch counterclockwise to rotate left, clockwise to rotate right. Release the switch to stop rotation. Observe the area around the boom when rotating the turret to avoid any obstructions.



Elevating the Riser

1. While depressing the foot switch, push the riser control lever forward to elevate the riser, rearward to lower the riser. Release the control lever to stop elevating / lowering. The riser will function at a constant speed, function speed control setting is not necessary.



Elevating the Upper Boom

1. Set the function speed control dial to the desired setting. Rotate the dial clockwise to increase speed, counterclockwise to decrease. If you are not sure what speed to use, start out slow; the speed can be varied while operating the function.
2. While depressing the foot switch, push the upper boom control lever forward to elevate the upper boom, rearward to lower the upper boom. Release the control lever to stop elevating / lowering.

Extending the Upper Boom

1. While depressing the foot switch, push the boom extension control lever rearward to extend the boom, forward to retract the boom. Release the control lever to stop extending / retracting. The boom extension will function at a constant speed, function speed control setting is not necessary.

Elevating the Jib

1. Set the function speed control dial to the desired setting. Rotate the dial clockwise to increase speed, counterclockwise to decrease. If you are not sure what speed to use, start out slow; the speed can be varied while operating the function.
2. While depressing the foot switch, push the jib control lever forward to elevate the jib, rearward to lower the jib. Release the control lever to stop elevating / lowering.

Rotating the Platform

1. Set the function speed control dial to the desired setting. Rotate the dial clockwise to increase speed, counterclockwise to decrease. If you are not sure what speed to use, start out slow; the speed can be varied while operating the function.
2. While depressing the foot switch, turn the platform rotation control switch counterclockwise to rotate left, clockwise to rotate right. Release the switch to stop rotation.

2.7 EMERGENCY OPERATION

In the event of powered function failure, the elevating assembly may be lowered manually by the following procedure.

⚠ WARNING ⚠

NEVER climb down the elevating assembly. If controls do not respond, ask someone on the ground to lower the boom manually.

Lowering Elevating Assembly

1. Open the cover on the hydraulic module (opposite side of the turret from the chassis control panel).
2. Remove the wire loop retainer from the hand pump lever, and extend the handle upward to gain leverage.
3. Operate the manual override (knurled knob) on the appropriate valve (see Figure 2-4). Push in to lower / extend, pull out to raise / retract as required.
4. While holding the appropriate valve in position, pump the handle in and out until that section of the elevating assembly is lowered / retracted.
5. Repeat as necessary operating each valve until the elevating assembly is fully lowered.

Rotating Turret

1. To manually rotate the turret, remove the manual turret crank from inside of the control side turret cover.
2. Set ratchet direction on turret crank.
3. Place the socket of the crank onto the hex shaft stub of the turret rotation gearbox.
4. Turn the crank clockwise to rotate the turret counterclockwise, turn counterclockwise to rotate the turret clockwise (see Figure 2-5).

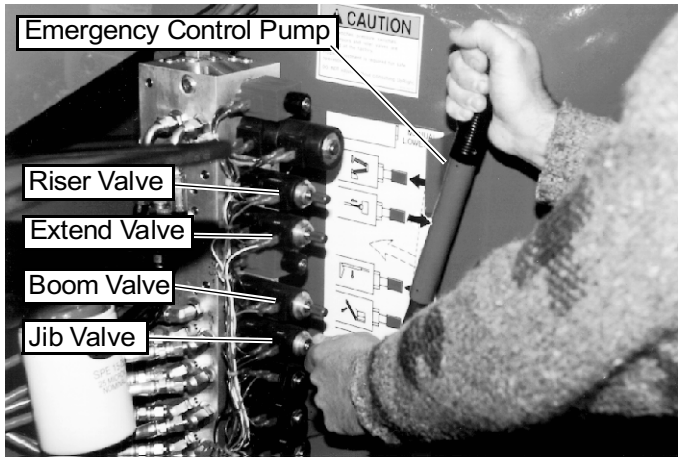


Figure 2-4: Emergency Control Operation

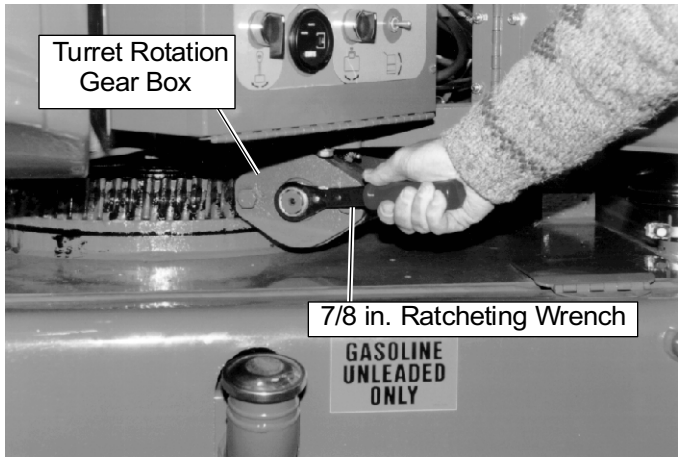


Figure 2-5: Manual Turret Rotation

2.8 EMERGENCY TOWING

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

The batteries must be connected in order to release the brakes.

1. Insure that the platform is fully lowered, and that the turret is rotated so that the platform is to the rear of the machine.
2. Attach chain / cable of sufficient strength for towing the machine to front or rear tie down lugs.
3. Turn the keyswitch to the parking brake release position. Alarm will sound.
4. Operate the brake release hand pump located on the back of the right rear bulkhead.
5. After moving the machine, return the keyswitch to the off position and remove the key to prevent unauthorized operation.

⚠ CAUTION ⚠

DO NOT move the machine faster than 3 mph(4,83 km/h). Faster speeds will damage drive components and void warranty.

2.9 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 all keys to prevent unauthorized operation.

2.10 TRANSPORTATION

By Crane

⚠ WARNING ⚠

Stand clear of machine when lifting.

Check specifications on back page, insure that crane and slings are of correct capacity to lift weight of unit.

1. Insure that boom is fully lowered and retracted.
2. Attach straps to chassis lifting lugs only. Insure that straps are adjusted properly to keep unit level when lifting.

By Truck or Trailer

1. Insure that boom is fully lowered and retracted.
2. Maneuver the machine onto bed of truck / trailer.
3. When winching, follow instructions for emergency towing. Attach winch cable to front tie down lugs.

⚠ CAUTION ⚠

Do not winch machine faster than 3 mph(4,83 km/h).

4. After winching, insure that brakes are set.
5. Secure the machine to the transport vehicle using chains / straps of adequate load capacity (refer to specifications, back page) attached to chassis tie down.
6. Place a 7.5" x 4" x 28"(19cm x 10cm x 71cm) wooden block under platform support braces as shown.
7. Attach ratchet strap; under platform floor grating, over support braces. Tighten securely, do not overtighten.

⚠ WARNING ⚠

NEVER elevate the machine while on a truck or trailer.

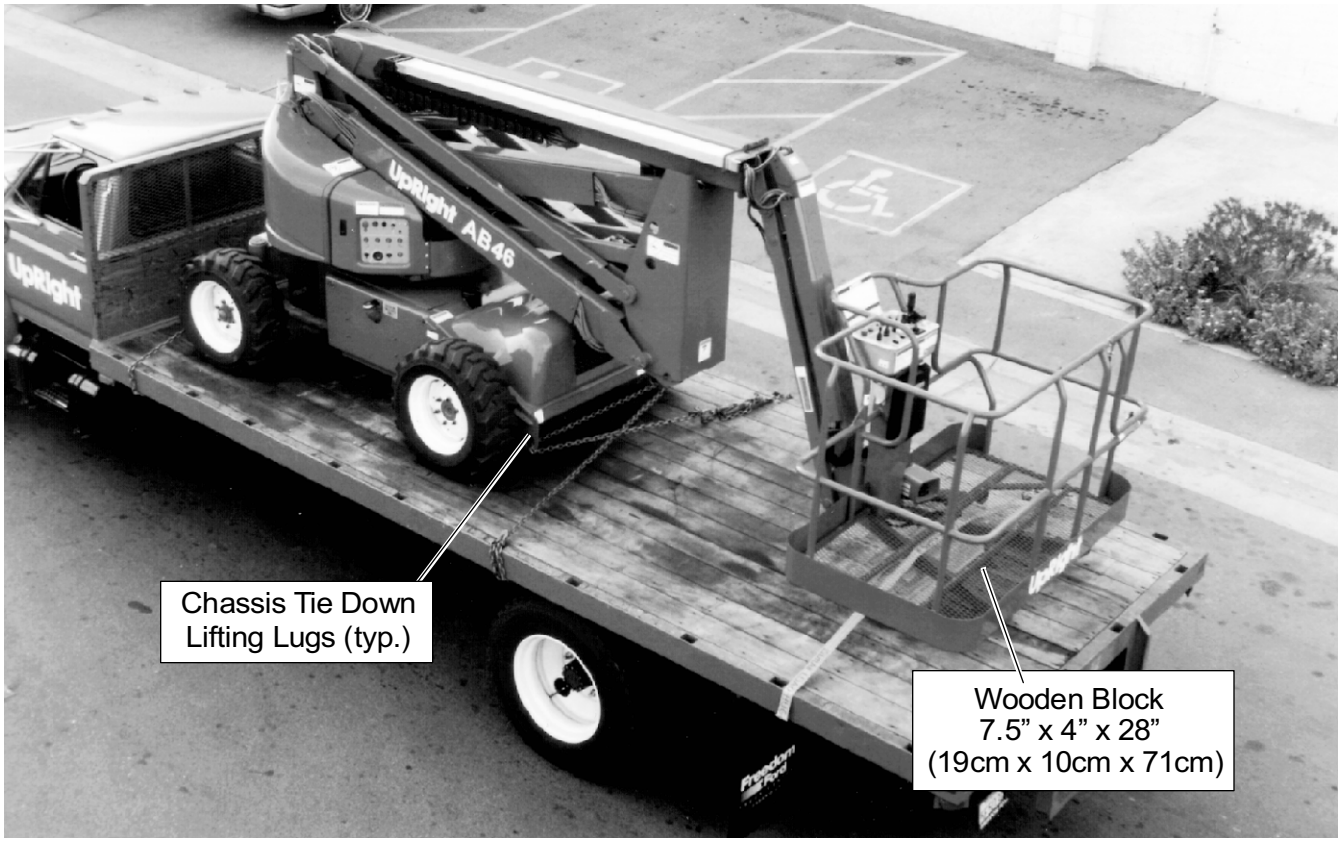


Figure 2-6: Securing the machine for transportation

2.11 MAINTENANCE

Fueling

Gasoline

1. Open fill pipe cap located on chassis left side (see Figure 2-7).
2. Fill to capacity with unleaded motor fuel only.
3. Check fuel level by lifting flap located on top of chassis left side. Fuel tank full capacity is 25 US gallons(94,6 l).

Diesel

1. Open fill pipe cap located on chassis left side (see Figure 2-7).
2. Fill to capacity with diesel motor fuel only, grade #1-D, or #2-D. Use distillate fuel only, do not use residual or blend.
3. Check fuel level by lifting flap located on top of chassis left side. Fuel tank full capacity is 25 US gallons(94,6 l).

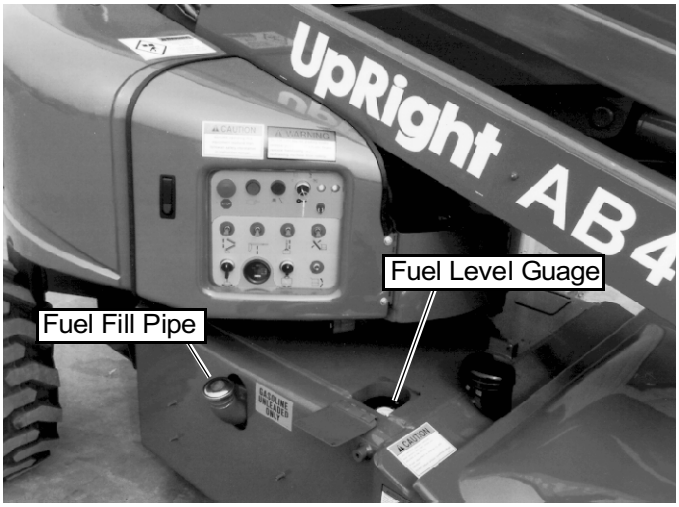


Figure 2-7: Fuel Pipe and Level Gauge

Hydraulic Oil

1. Check oil level at sight gauge inside engine compartment right hand side with the platform fully lowered.
2. If necessary, fill to capacity with clean ISO 46 compatible hydraulic oil.
3. Lift flap located on top of chassis right side.
4. Open filler / breather cap to add hydraulic oil (see Figure 2-8).
5. Replace cap.

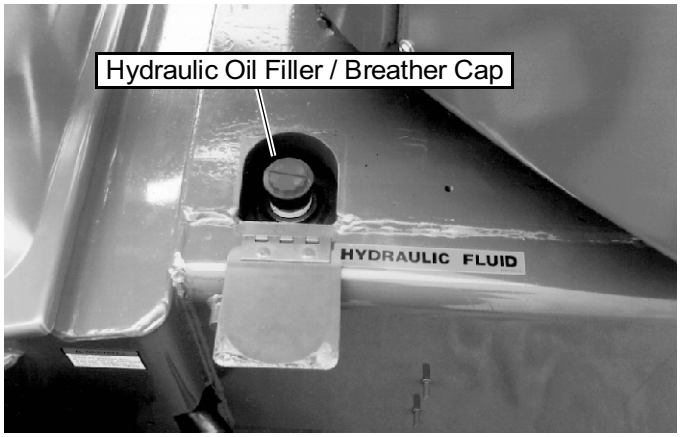


Figure 2-8: Hydraulic Oil Filler / Breather Cap

Lubrication

Refer to lubrication chart and guidelines.

Battery Maintenance

⚠ WARNING ⚠

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

Always wear safety glasses when working with battery.

Battery fluid is highly corrosive. Rinse away any spilled fluid thoroughly with clean water.

Always replace battery with UpRight battery or manufacturer approved replacement.

Check battery fluid level daily, especially if work platform is being used in a warm, dry climate.

If electrolyte level is lower than 3/8 in.(10 mm) above plates add distilled water only. DO NOT use tap water it will shorten battery life.

Keep terminals and top of battery clean.

Tires

Tire selection can affect the stability of the machine. Use only tires supplied by UpRight unless approved by the manufacturer in writing.

Section 3

MAINTENANCE

3.1 INTRODUCTION

⚠ WARNING ⚠

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

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

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

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

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

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

Terminology

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

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

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

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

General Proceedures

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

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

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

3.2 DATE CODE IDENTIFICATION ON HOSES

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

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

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

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

DAYCO stamps month, day and year on each hose.

3.3 SPECIAL TOOLS

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

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

3.4 DEUTSCH CONNECTORS

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

Figure 3-1: Deutsch Connector Kit, Small

Figure 3-2: Deutsch Connector Kit, Large

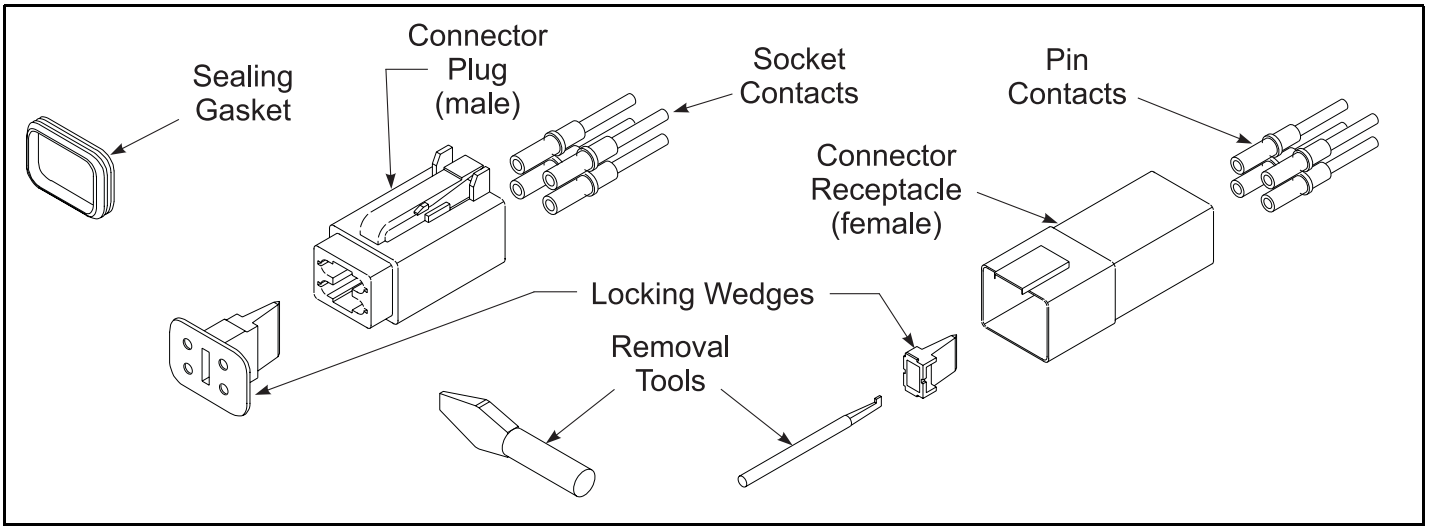


Figure 3-3: Plugs and Receptacles, Deutsch Connectors

Male Connector (Plug)

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

Female Connector (Receptacle)

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

Releasing Locking Fingers

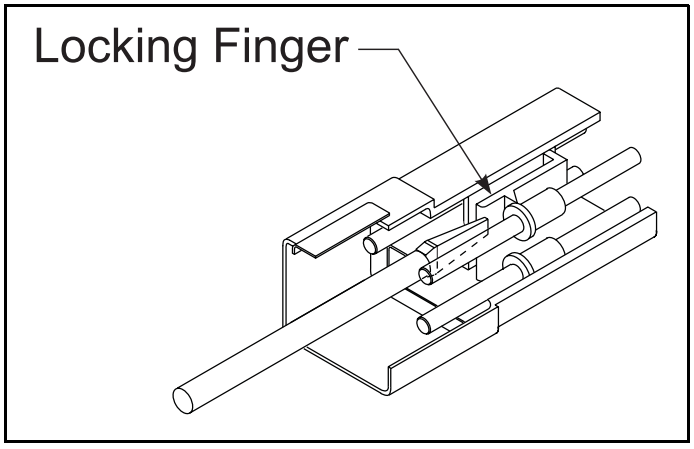


Figure 3-4: Locking Finger, Deutsch Connector

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

Crimping

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

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

Removing Contact from Heavy Duty Plug

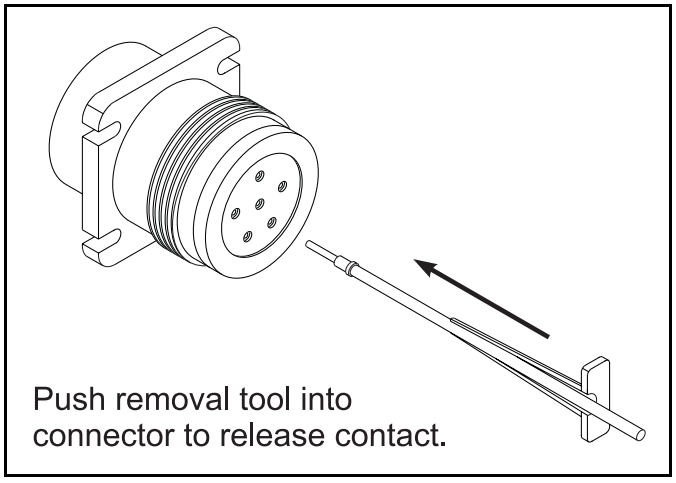


Figure 3-5: Heavy Duty Deutsch Connector

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

3.5 PREVENTATIVE MAINTENANCE

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

⚠ WARNING ⚠

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

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

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

Preventative Maintenance Table Key

Interval

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

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

Preventative Maintenance Report

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

Table 3-1: Preventative Maintenance Checklist

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Engine Oil	Check level and condition	Daily			
	Check for leaks	Daily			
	*Change oil & filter (Dual Fuel)	100hours			
	*Change oil & filter (Diesel)	200hours			
Engine Fuel System	Check fuel level	Daily			
	Check for leaks	Daily			
	Replace fuel filter	6m			
Engine Air Cleaner	Replace air cleaner	6m			
	Check air cleaner	Daily			
Battery	Check electrolyte level	Daily			
	Clean exterior	3m			
	Clean terminals	3m			
Engine Coolant	Check coolant level (with engine cold)	Daily			
	Replace coolant	3m			
Hydraulic Oil	Check oil level	Daily			
	Change filter	6m			
	Drain and replace with ISO 46 compatible oil	2y			
Hydraulic System	Check for leaks	Daily			
	Check hose connections	30d			
	Check hoses for exterior wear	30d			
Emergency Hydraulic System	Check operation of emergency over-ride valves and hand pump	Daily			
Controller	Check operation of all controls	Daily			
Platform	Check fasteners for proper torque	Daily			
Floor and Rails	Check welds for cracks	Daily			
	Check condition of platform	Daily			
	Check condition of anchorage points	Daily			
	Check condition of operators manual	Daily			
Tires	Check for damage	Daily			
	Check air pressure (55 psi)	Daily			
	Check lug nuts (torque to 90 ft. lbs. [123 Nm])	30d			
Hydraulic Pump	Wipe clean	30d			
	Check for leaks at mating surfaces	30d			
	Check for hose fitting leaks	Daily			
	Check mounting bolts for proper torque	30d			
Hydraulic Drive System	Check hydraulic drive motor operation	Daily			
	Check hoses, fittings, and valve block for leaks	Daily			

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Steering System	Check fittings for proper torque	6m			
	Oil all pivot points	30d			
	Check steering cylinder for leaks	30d			
	Check linkage for wear areas	30d			
	Check for missing / loose retainers	Daily			
Elevating Assembly	Inspect for structural cracks	Daily			
	Check pivot points for wear	30d			
	Check pivot pin retaining bolts for proper torque	30d			
	Check members for deformation	Daily			
Chassis	Check hoses for pinch or rubbing points	Daily			
	Check component mounting for proper torque	6m			
	Check welds for cracks	Daily			
Turret	Check ring gear for proper lubrication and wear	Daily			
	Lubricate worm gear bearings	150h/3m			
	Lubricate ring gear (MoS2 grease)	150h/3m			
Drive Hubs	Check for leaks	Daily			
	Check oil level	250h/6m			
	Change oil after break-in period	50h/30d			
	Change oil (SAE 90 wt. gear oil)	2000h/2y			
Lift Cylinders	Check the cylinder rods for wear	30d			
	Check pivot pin retaining bolts for proper torque	30d			
	Check seals for leaks	30d			
	Inspect pivot points for wear	30d			
	Check fittings for proper torque	30d			
Entire Unit	Check for and repair collision damage	Daily			
	Check fasteners for proper torque	3m			
	Check for corrosion, remove and repaint	3m			
	Lubricate	30d			
Labels	Check for peeling, missing, or unreadablelabels & replace	Daily			
Slew Ring	Check fasteners for proper torque	30d			

* First oil change after 50 hours.

3.6 BLOCKING ELEVATING ASSEMBLY

⚠ WARNING ⚠

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

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

Installing Brace

1. Park the work platform on firm level ground.
2. Fully retract upper boom.
3. Verify platform emergency stop switch is ON.
4. Turn platform/chassis switch to CHASSIS.
5. Using the raise button, elevate platform 8-12 inches (20 - 30 cm).
6. Connect a crane or overhead hoist capable of supporting elevating assembly to front of elevating assembly.
7. Install brace capable of supporting elevating assembly under upper boom as shown.
8. Push lower button and gradually lower platform until brace is supporting the platform.

Removing Brace

1. Using chassis controls, gradually raise platform until upper boom is off brace.
2. Remove brace and unhook chain from front of upper boom.
3. Push lower button to completely lower platform.

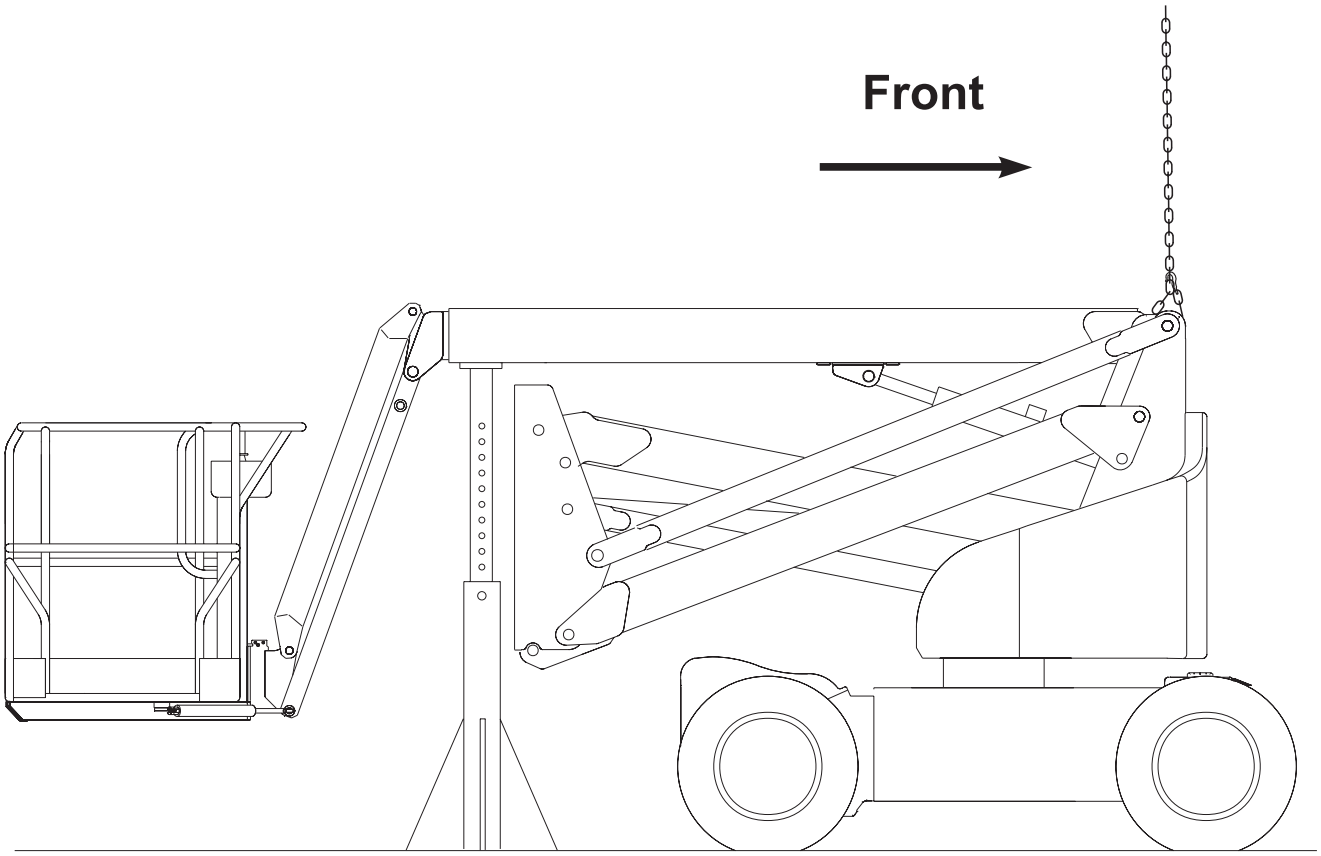


Figure 3-6: Blocking Elevating Assembly

3.7 BATTERY MAINTENANCE

⚠ WARNING ⚠

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

Always wear safety glasses when working with batteries.

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

Battery Inspection and Cleaning

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

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

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

⚠ WARNING ⚠

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

Always wear safety glasses when working with batteries.

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

Battery Charging

⚠ WARNING ⚠

Charge the battery only in a well ventilated area.

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

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

Never leave the charger unattended for more than two days.

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

Keep the charger dry.

Charge battery as follows:

1. Check the 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. Use a charger which turns off automatically when the batteries are fully charged.

3.8 LUBRICATION

Refer to “Table 3-1:” on page 3-5 for the lubrication intervals and Figure 3-7 for location of items that require lubrication service. Refer to the appropriate sections for lubrication information on the Steering Linkage, Torque hubs, Hydraulic Oil, Filter, and Engine Oil and Filter.

Grease Fittings

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

Hydraulic Oil And Filter

Fluid Level

With the platform fully lowered, check oil level on sight gauge. If the oil is NOT in operating range, add hydraulic fluid until oil is visible in operating range on dipstick or visible in sight gauge. DO NOT fill above operating range or when the platform is elevated.

Oil and Filter Replacement

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

⚠ 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.
3. Remove the drain plug and allow all oil to drain into the container. Be sure to dispose of oil properly.
4. Reinstall the drain plug.
5. Remove filter element from filter head (located beside valve block).
6. Apply a thin film of clean hydraulic oil (ISO No. 46) to the gasket of the replacement filter.
7. Thread replacement filter onto the filter head until the gasket makes contact then rotate 3/4 of a turn further.
8. Fill the hydraulic oil tank to operating level on sight gauge with ISO #46 hydraulic oil.

NOTE: For service Information on the engine refer to your engine manual (located in platform manual box or available from UpRight Inc.).

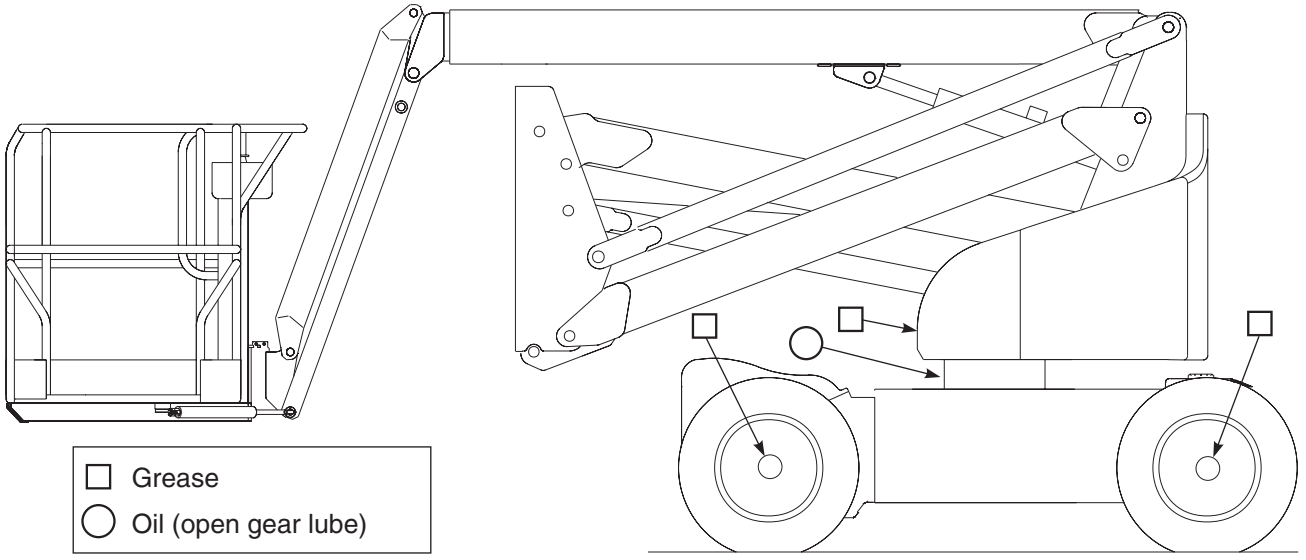


Figure 3-7: Lubrication Chart

3.9 PROPORTIONAL CONTROLLERS

Joystick Handle

1. If necessary, remove handle assembly from controller box.
2. Remove and replace defective parts.
3. If replacing PC board with resistor, note resistor adjustment (number of turns) and adjust new resistor to match old resistor setting.

NOTE: Check that pot operates correctly when handle is pushed completely forward and reverse.

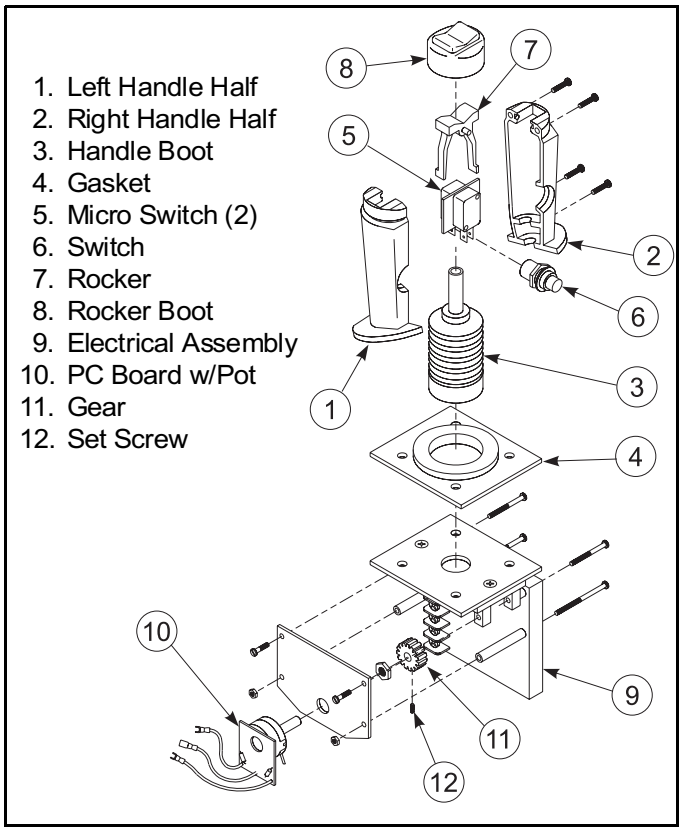


Figure 3-8: Propoortional Controller

Refer to Section 6 for repair part numbers.

Proportional Control Adjustment

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

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

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

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

Turn pot clockwise (CW) to increase settings.

Turn pot counterclockwise (CCW) to decrease settings.

Adjust pots only in sequence as outlined in this procedure.

Rotary Control for Boom Functions

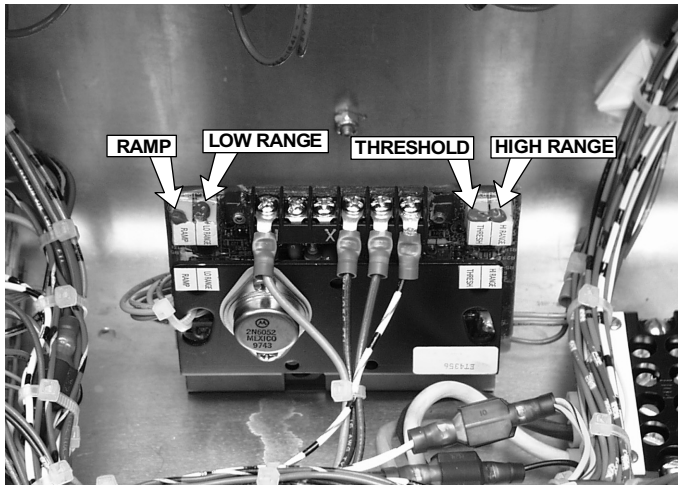


Figure 3-9: Rotary Control Adjustment, Upper Control Box

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

1. Verify that batteries are fully charged.
2. Connect ammeter in series at “A” terminal.
3. Set threshold at 1.00 amps or so upper boom elevates with rotary speed adjustment set on 2 and raise function switch actuated.
4. Set high range at 1.80 amps or so upper boom functions operate with speed adjustment on 9 or highest speed position. Check for proportional valve vibration. Valve is fully closed when it does not vibrate when energized. Do not over adjust.
5. Set low range at 1.15 amps or so machine slews 180 degrees in 45 seconds with speed control set at position 9 or full speed.
6. Turn ramp trimpot back in 10 turns. Set ramp trimpot until machine has a smooth start or upper boom delays 2 seconds with raise switch actuated and speed control set at position 9 or full speed.

Proportional Drive Control

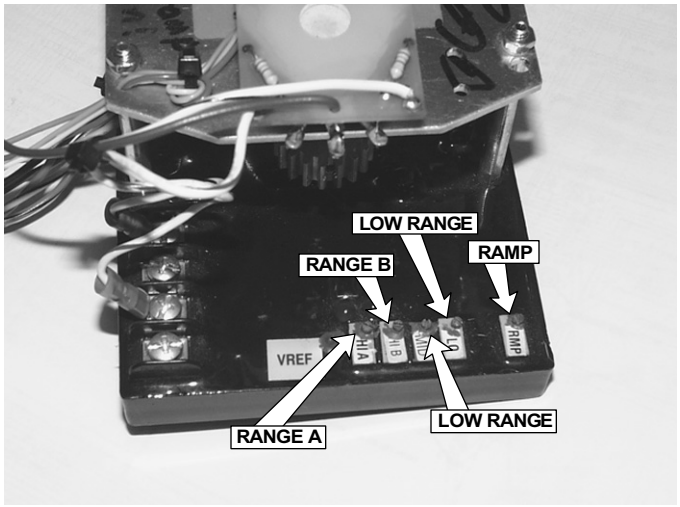


Figure 3-10: Proportional Control Adjustment, Upper Control Box

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

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

1. Adjust threshold pot at .45 amps or so machine barely creeps as first LED lights.
2. Adjust A, B pot at 1.15-1.20 amps or so machine travels 40’ in Eight seconds.
3. Adjust mid pot so machine travels One foot per second when platform is elevated.
4. Turn ramp back in 10 turns and adjust until machine stops in 2 to 3 feet(0,6m to 0,9m) from full speed when joystick is released.

3.10 PLATFORM DOWN LIMIT SWITCH

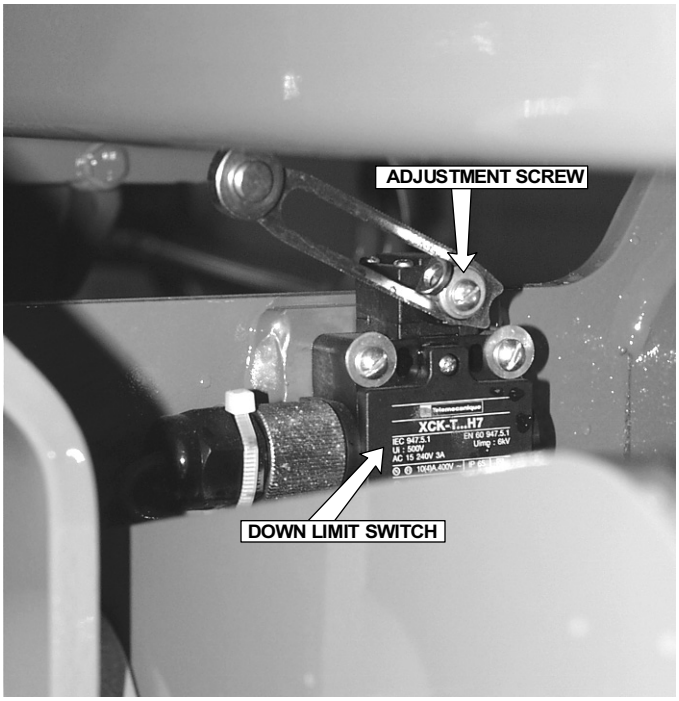


Figure 3-11: Platform Down Limit Switch

The Platform Down Switch bypasses the Tilt Sensor when the platform is fully lowered and closes the circuit to the Platform Down Relay, which allows high speed travel, cage trim function and turret rotation.

⚠ WARNING ⚠

DO NOT attempt to adjust Limit Switches without first blocking the elevating assembly

1. Lower the Platform completely.
2. With the Platform / Chassis switch on Chassis, push the Tilt Sensor base to test the alarm circuit.
3. If the alarm sounds, elevate the platform and adjust the position of the switch arm by loosening the adjustment screw and repositioning the arm. Lower the platform and retest. If down limit switch is properly adjusted, the tilt alarm will not sound.
4. With platform elevated, repeat step 2. When switch is properly adjusted, alarm will sound.

3.11 TILT SENSOR

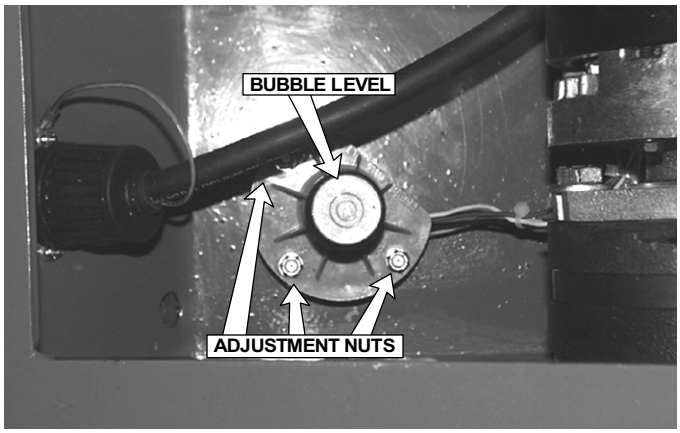


Figure 3-12: Tilt Sensor

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

1. Check tires for proper pressure.
2. Place machine on firm level surface ± ¼°.
3. Use Inclinometer to ensure that the front and rear of the chassis are level within ± ¼°.
4. Adjust the three leveling locknuts until the bubble is centered in the circle on the attached bubble level.
5. Elevate the platform until down limit switch opens and push the tilt sensor base to test the alarm circuit. Alarm should sound.

3.12 HYDRAULIC MANIFOLD

It is not necessary to remove the manifold to perform all maintenance procedures. Prior to performing maintenance, determination if the manifold needs to be removed.

Removal

1. Disconnect the battery.
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 3-13 often to aid in disassembly and assembly.

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

Cleaning and Inspection

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

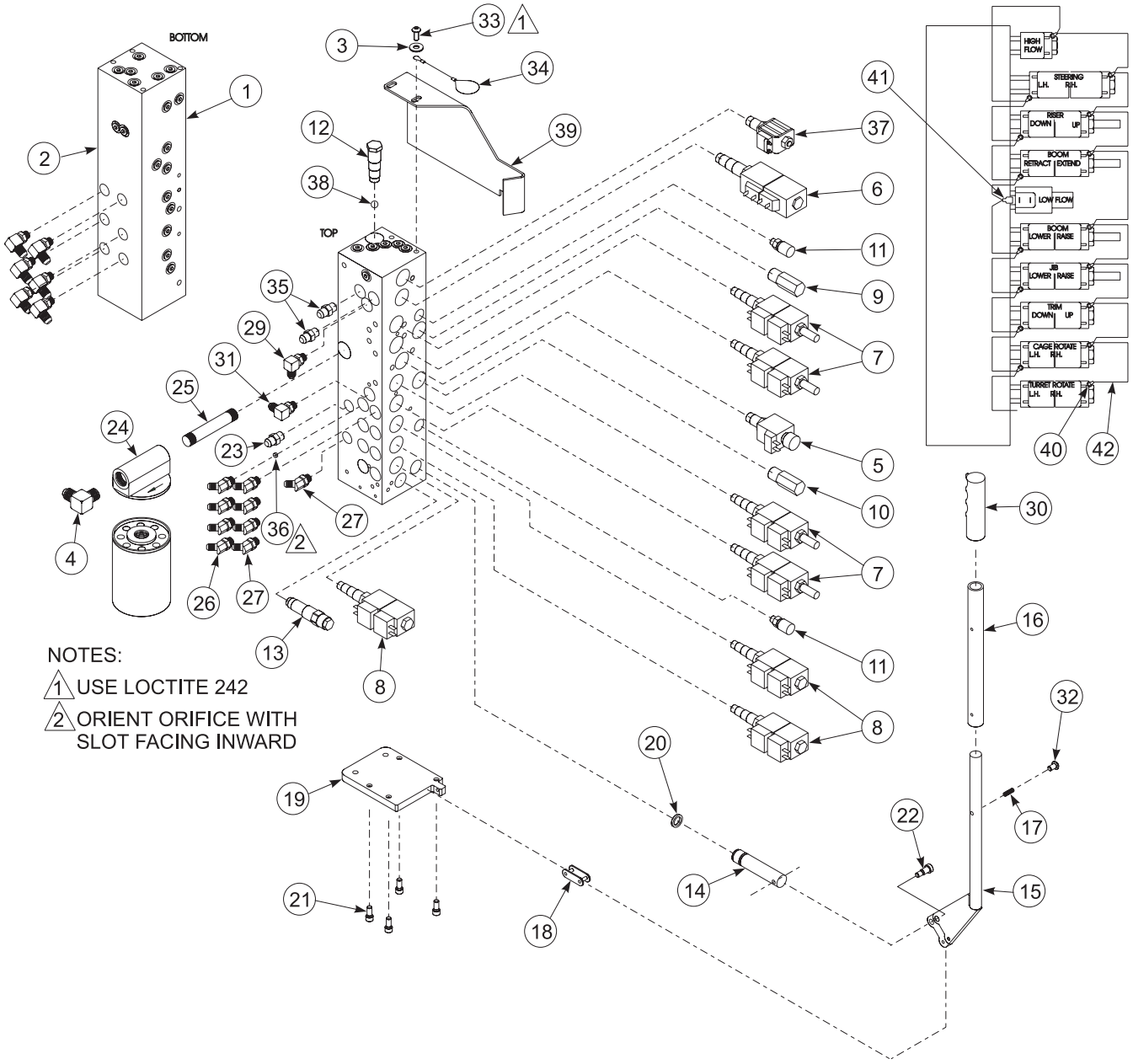
Assembly

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

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

Installation

1. Attach manifold assembly to mounting plate with bolts.
2. Connect Solenoid leads to terminal strip (as previously tagged).
3. Connect hydraulic hoses. Be certain to tighten hoses to manifold.
4. Plug in batteries.
5. Operate each hydraulic function and check for proper operation and leaks.
6. Adjust lift relief and counterbalance valve pressures according to instructions in Section 3.14.



NOTE: Refer to Section 5 for a listing of hydraulic valve ports.

1. Valve Block
2. Fitting
3. Washer, 5/16 Flat
4. Fitting, Elbow
5. Low Flow Valve
6. Steering Valve
7. 4-Way Closed Center
8. 4-Way Motor Spool
9. Relief Valve
10. Relief Valve
11. Plug
12. Diverter Valve
13. Counterbalance
14. Piston
15. Lever
16. Extension
17. Detent
18. Pivot Link
19. Mounting Plate
20. Seal
21. Screw, 5/16-18
22. Screw, 3/8 x 5/8
23. Fitting
24. Filter Assembly
25. Nipple
26. Fitting Elbow
27. Fitting, Elbow
28. Fitting, Elbow
29. Fitting Elbow
30. Grip
31. Fitting Elbow
32. Screw, 10-20
33. Screw, 5/16-18
34. Lanyard
35. Fitting Adapter
36. Orifice
37. High Flow Valve
38. Steel Ball, 7/16
39. Bracket
40. Connector Ring
41. Connector Female
42. Wire

Figure 3-13: Hydraulic Manifold, Exploded View

3.13 HYDRAULIC BRAKES

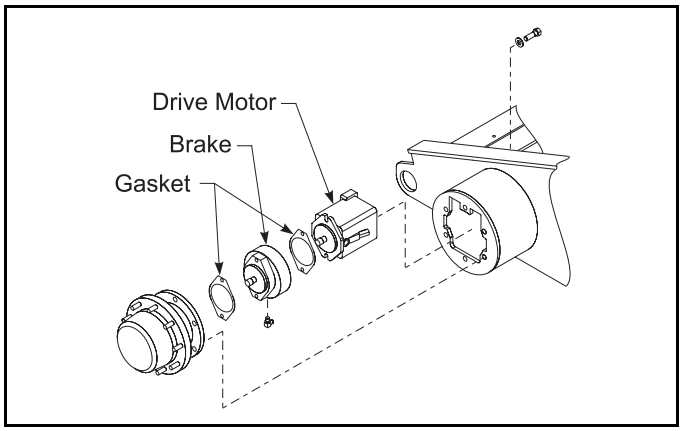


Figure 3-14: Rear Axle Assembly

Removal

1. Park the work platform on firm level ground and block the front wheels to prevent the work platform from rolling.
2. Support rear of machine using jackstands.
3. Disconnect the hydraulic brake lines.
4. Tag and disconnect hydraulic lines to drive motors.

⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

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

5. Remove Wheel from machine.
6. Remove hardware which secures torque hub to chassis. Remove torque hub assembly from chassis.
7. Remove capscrews and washers holding the drive motor and brake to torque hub.
8. Remove the drive motor.
9. Remove the gasket and brake.

NOTE: Brake seal kit (068569-010) includes two gaskets.

NOTE: Torque all hardware to torques listed on page 3-25 unless otherwise specified.

Installation

1. Coat output shafts of brake and drive motor with high pressure molybdenum grease and install gasket and brake onto torque hub.
2. Install gasket and drive motor. Align holes and install the two cap screws and lock washers.
3. Reinstall cables to drive motor and hoses to the brake.
4. Install the wheel. Torque the wheel nuts to 90 ft. lbs. (122 N-m).
5. Remove the jack stands and lower chassis to the ground.
6. Position chassis switch to parking brake release position. Alarm will sound.
7. Start the engine to energize brake hydraulic system.
8. Check for leaks and bleed air out of brake hydraulic system using bleed valve located on brake housing.

3.14 DRIVE PUMP SETTINGS

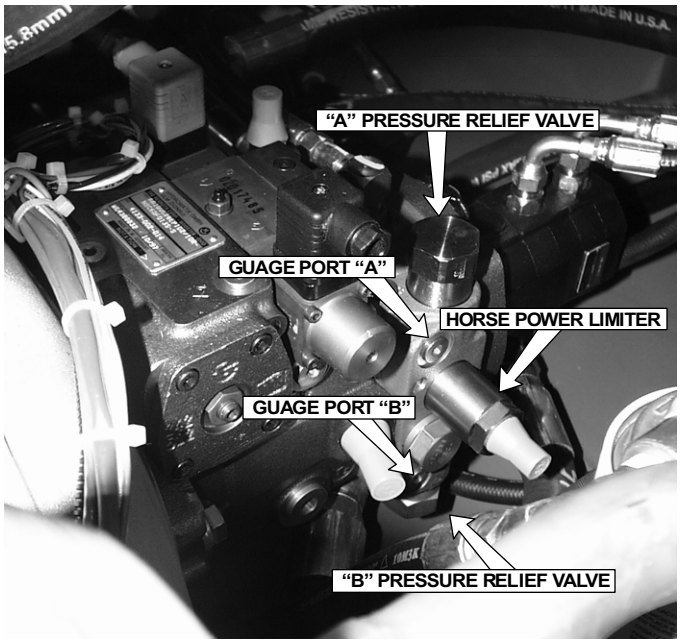


Figure 3-15: Hydraulic Pump

NOTE: Pump is properly adjusted at factory. Pump settings should only be checked if pump failure is suspected.

Pressure Override Valve

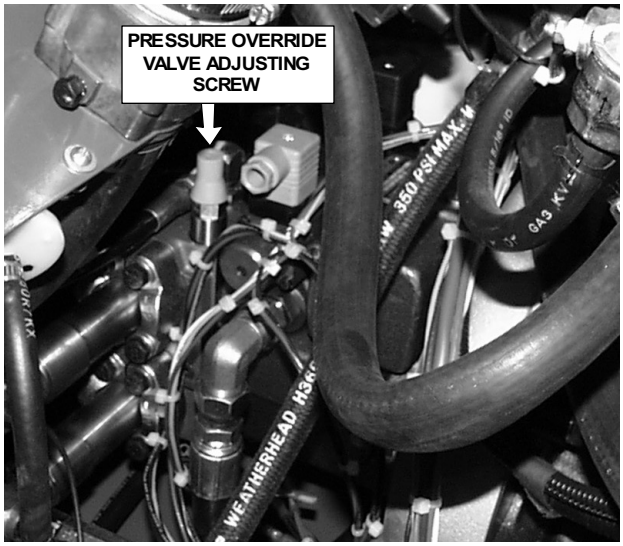


Figure 3-16: Pressure Override Valve

1. Position machine on a level surface capable of supporting machine on jackstsands.
2. Using jackstands, raise machine off the ground.
3. Connect 0-6000 psi(0-414 bar) pressure gauges at gauge port “A” and gauge port “B”.
4. With engine running at normal operating RPM, position drive joystick control to full forward.
5. Adjust pressure override valve so pressure gauge “A” reads 4900 PSI (338 bar). Turning pressure override adjustment screw clockwise increases pressure and turning counterclockwise decreases pressure.
6. Position drive joystick control to full reverse.
7. Check pressure reading on pressure gauge at “B”. Pressure readings should be the same.

Main Relief Valves

Main relief valves “A” and “B” should be bench tested off the machine.

NOTE: Main relief valves should be adjusted to 5300 PSI (365 bar).

Pump Removal

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

Pump Installation

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

IMPORTANT: If replacing the pump, be sure the pump and hydraulic tank are filled with oil before starting the engine. Damage to the pump may occur if it is run without first being filled with oil.

3.15 Front Drive Motor Removal

1. Park the work platform on firm level ground.
2. Mark and remove the brake lines.
3. Mark and remove the drive motor hydraulic lines.

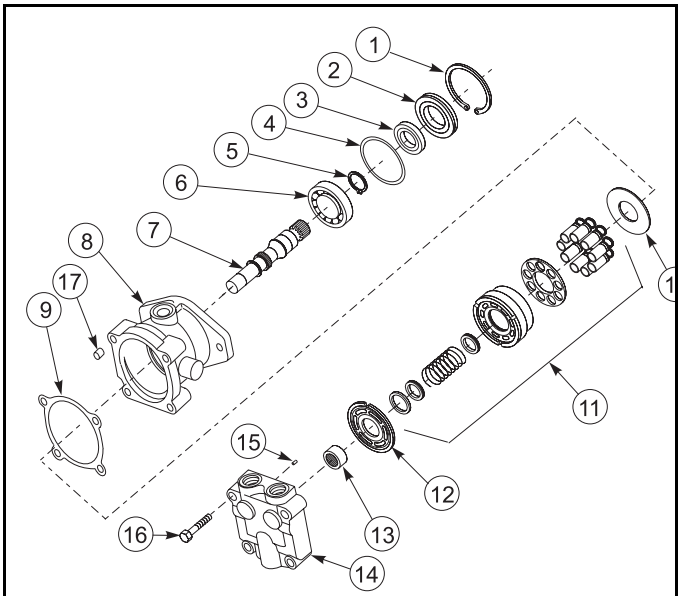
⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

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

4. Remove the cap screws and washers which secure the drive motor to the torque hubs. Remove the drive motor.

Front Drive Motor Seal Replacement



1. Retaining Ring
2. Seal Carrier
3. Lip Seal
4. O-Ring
5. Retaining Ring
6. Bearing
7. Shaft
8. Body
9. Gasket
10. Thrust Plate
11. Cylinder Kit
12. Valve Plate
13. Needle Bearing
14. End Cap
15. Pin
16. Cap Screw
17. Alignment Sleeve

Figure 3-17: Front Drive Motor

NOTE: Refer to IPB section for available repair parts.

Disassembly

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

1. Remove four cap screws which secure end cap. Remove end cap with valve plate. Do not allow valve plate to fall off end cap.
2. Carefully remove valve plate. It may be necessary to pry valve plate off with small screwdriver.
3. Remove the gasket.
4. Remove the alignment sleeves from housing.
5. Lay the motor on its side and remove cylinder block assembly.
6. Remove slipper guide and piston assemblies from cylinder block.
7. Using an O-ring pick, remove the thrust plate.
8. Remove the retaining ring. Remove the shaft and seal carrier with the seal.
9. Remove the O-ring from the seal carrier and remove the seal.
10. Remove small retaining ring and press the bearing off the shaft.

Closely examine all parts for pitting and wear. If pistons or cylinders are worn or pitted, replace cylinder block assembly.

If needle bearing is to be replaced, remove needle bearing using a puller. Press new bearing in place.

Bearing cage will protrude from end cap and serve as a pilot for the valve plate.

Replace all Gaskets and O-rings. Lubricate O-rings using petrolium jelly.

Front Drive Motor Assembly

1. Assembly is reverse of disassembly
2. Apply grease to one side of thrust plate to hold it in place.
3. Using clean hydraulic oil, thoroughly lubricate and install cylinder block assembly. Install retaining ring.

Installation

NOTE: Torque all hardware to torques listed on page 3-25 unless otherwise specified.

1. Install motor using hardware previously removed.
2. Install hydraulic oil lines.
3. Operate machine slowly for a short time to clear air from hydraulic system. If necessary replenish oil tank.
4. Check for leaks.
5. Operate machine to check for proper motor operation.

3.16 REAR DRIVE MOTOR REMOVAL

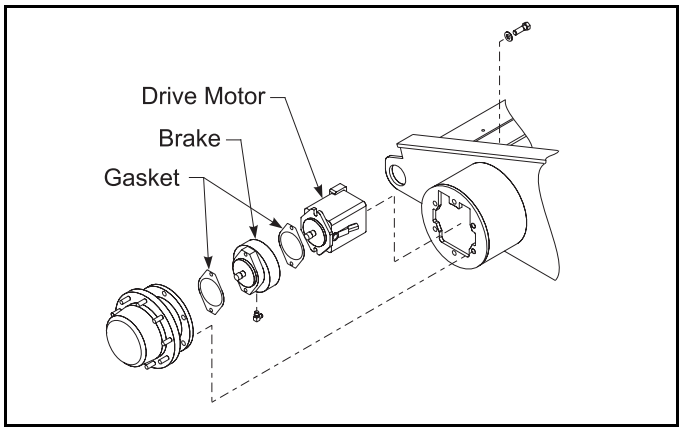


Figure 3-18: Rear Axle Assembly

1. Park the work platform on firm level ground and block the front wheels to prevent the work platform from rolling.
2. Support rear of machine using jackstands.
3. Disconnect the hydraulic brake lines.
4. Tag and disconnect hydraulic lines to drive motors.

⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

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

5. Remove the cap screws and washers which secure the drive motor to the torque hub. Remove the drive motor.

NOTE: Torque all hardware to torques listed on page 3-25 unless otherwise specified.

Assembly

1. Assembly is reverse of disassembly
2. Apply grease to one side of thrust plate to hold it in place.
3. Using clean hydraulic oil, thoroughly lubricate and install cylinder block assembly. Install retaining ring.

Installation

NOTE: Torque all hardware to torques listed on page 3-25 unless otherwise specified.

1. Install motor using hardware previously removed.
2. Install hydraulic oil lines.
3. Operate machine slowly for a short time to clear air from hydraulic system. If necessary replenish oil tank.
4. Check for leaks.
5. Operate machine to check for proper motor operation.

3.17 TORQUE HUBS

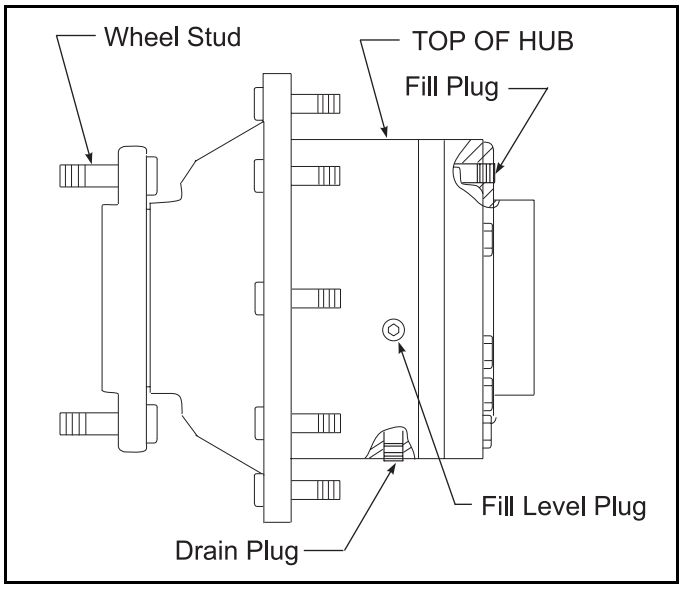


Figure 3-19: Torque Hub

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

1. Remove torque hub from drive assembly (refer to "Removal" section).
2. Remove drain plug from underside of torque hub and drain oil from unit.
3. Replace drain plug.
4. Remove fill plug from top side of torque hub.
5. Remove fill level plug from side of hub.
6. Fill unit with 90 wt. gear oil until oil comes out fill level plug opening (1/2 full).
7. Replace fill level plug. Replace fill plug.
8. Replace torque hub.

Removal

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

⚠ CAUTION ⚠

Clean all fittings before disconnecting the hose assemblies.

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

8. Remove 90° fitting from side of torque hub.
9. Mark and remove hoses from drive motor.
10. Remove mounting bolts from drive motor.
11. Separate drive motor from brake. Discard gasket.
12. Separate brake from torque hub. Discard gasket.

NOTE: New gaskets are available in brake seal kit (068569-010).

13. Remove 1/2-20 nuts and washers from torque hub.
14. Remove torque hub.

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

Installation

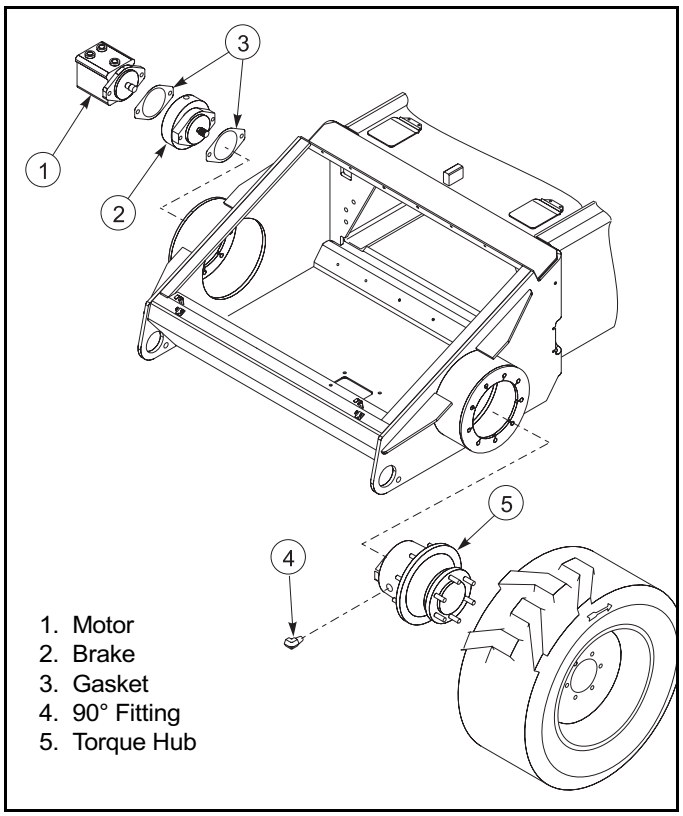


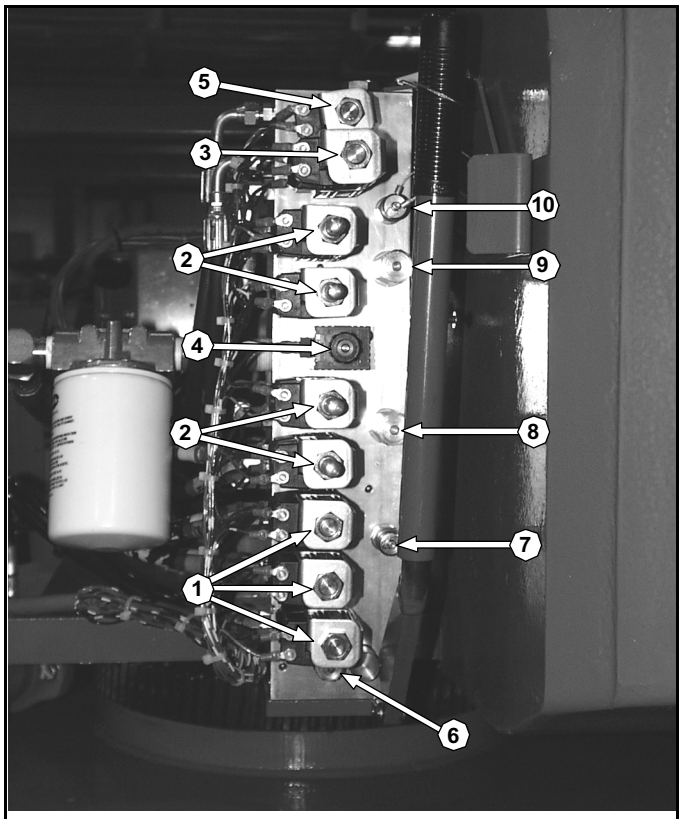
Figure 3-20: Torque Hub Assembly

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

NOTE: Torque all hardware to torques listed on page 3-25 unless otherwise specified.

1. Install torque hub using 1/2-20 nuts and 1/2 washers.
2. Remove plug from 90° fitting and install fitting in side of torque hub. Point fitting towards rear of hub.
3. Using SAE 90W weight gear lube with EP additive, fill torque hub through top plug hole in rear cover until oil comes out of 90° fitting in side. Plug 90° fitting and top of rear cover.
4. Install new gasket and brake.
5. Install new gasket and drive motor.
6. Secure assembly using washers and bolts.
7. Connect hydraulic brake lines.
8. Connect hoses to drive motor.
9. Install wheels. Torque lug nuts to 90ft. lbs. (123 Nm).
10. Bleed brake lines if necessary.
11. Remove jack stands and lower rear end.
12. Connect battery terminal.
13. Check function of brake.

3.18 SETTING HYDRAULIC PRESSURES



1. Motor Spool 4 way Valve, 3 position
2. Closed Center 4 way Valve, 3 position
3. Tandem Center 4 way, 3 position Valve
4. Low Flow Valve
5. High Flow Valve
6. Counterbalance Valve
7. Low Relief Gage Port Plug
8. Low Relief 1500 PSI
9. High Relief 2500 PSI
10. High Relief Gage Port Plug

Figure 3-21: Valve Manifold

Figure 3-8 shows complete hydraulic manifold assembly.

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

High Relief Valve

1. Operate the hydraulic system 10-15 minutes to warm the oil.
2. Remove the high relief port plug and install a 0-3000 psi(0-207 bar) pressure gauge assembly.
3. Remove the plug in the end of the high relief valve to expose the adjusting screw.
4. Operate Jib raise function until jib is completely raised.
5. While activating the jib raise switch, set the pressure to 2500 PSI) (173 bar) maximum by slowly turning the adjusting screw. Turning the adjusting screw clockwise increases pressure and counterclockwise decreases pressure.
6. Remove the pressure gauge and reinstall all plugs.

Low Relief Valve

1. Operate the hydraulic system 10 - 15 minutes to warm the oil.
2. Remove the low relief port plug and install a 0-3000 psi(0-207 bar) pressure gauge assembly.
3. Remove the plug in the end of the low relief valve to expose the adjusting screw.
4. Turn the low relief valve adjustment screw counterclockwise two full turns.
5. Operate jib lower function until jib is completely lowered.
6. While activating the jib lower switch, set the pressure to 1500 PSI (104 bar) maximum by slowly turning the adjusting screw. Turning the adjusting screw clockwise increases pressure and counterclockwise decreases pressure.
7. Remove the pressure gauge and reinstall all plugs.

Counterbalance Relief Valves

1. If any counterbalance relief valve is faulty, completely lower the jib, boom and elevating assembly and replace the counterbalance valve.
2. Replace or recalibrate (bench set) the counterbalance valve.
3. Slowly cycle function related to replaced counterbalance valve several times to remove air from system.

3.19 CYLINDER REPAIR

Removal

1. Remove cylinder from machine.

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

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

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

⚠ WARNING ⚠

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

Disassembly

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

Assembly

Note: Torque all hardware to torques listed on page 26 unless otherwise specified.

1. Lubricate all components with clean hydraulic fluid.

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

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

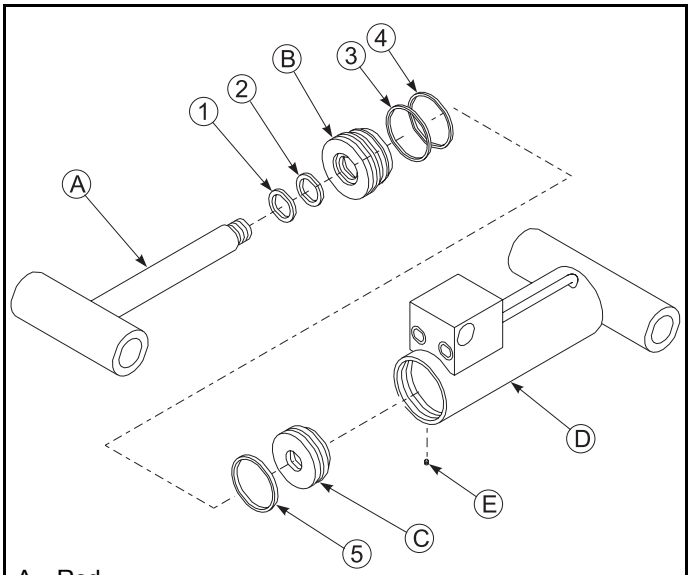
Installation

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

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

3.20 MASTER CYLINDER

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.



A. Rod
B. Head
C. Piston
D. Cylinder
E. Set Screw

Seal kit (068454-010) includes:
1. Rod Wiper
2. Rod Seal
3. Backup
4. Static Seal
5. Piston Seal

Figure 3-22: Master Cylinder

Removal

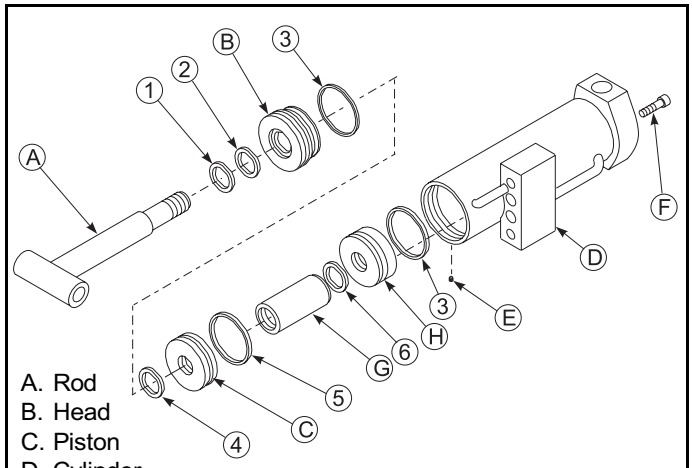
1. Raise elevating assembly until master cylinder pins are accessible.
2. Support the cage assembly (see Figure 3-6).
3. Remove rod end retaining bolt and rod end pin.
4. Mark and disconnect hoses and immediately cap the openings to prevent contamination.
5. Using a metal drift, remove rod end pin.
6. Remove base end pin retaining bolt and pin.
7. Carefully remove master cylinder.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.
2. Remove boom support.
3. Slowly raise and lower boom several times. Check hydraulic connections for leaks. Check for proper slave cylinder operation.

3.21 SLAVE CYLINDER

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.



A. Rod
B. Head
C. Piston
D. Cylinder
E. Set Screw
F. Cap Screw
G. Rod Extension
H. Head

Seal kit (068455-010) includes:
1. Rod Wiper
2. Rod Seal
3. Static Seal
4. Static Seal
5. Piston Seal
6. Rod Seal

Figure 3-23: Slave Cylinder

Removal

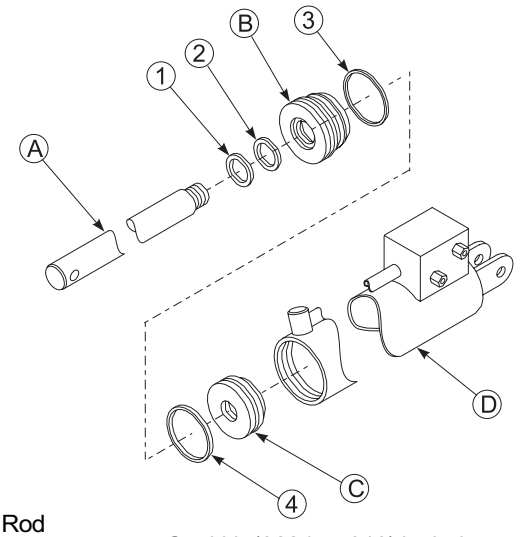
1. Extend boom until slave cylinder trunion pins are accessible. Support the cage assembly.
2. Remove rod end pin retaining bolt.
3. Mark and disconnect hoses and immediately cap the openings to prevent contamination.
4. Using a metal drift, remove rod end pin.
5. Remove trunion pin retaining bolts and using a pin puller, remove trunion pins.
6. Carefully remove slave cylinder.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.
2. Remove boom support.
3. Slowly raise and lower boom several times. Check hydraulic connections for leaks. Check for proper slave cylinder operation.

3.22 CAGE ROTATE CYLINDER

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.



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

Seal kit (068457-010) includes:

1. Rod Wiper
2. Rod Seal
3. Static Seal
4. Piston Seal

Figure 3-24: Cage Rotate Cylinder

Removal

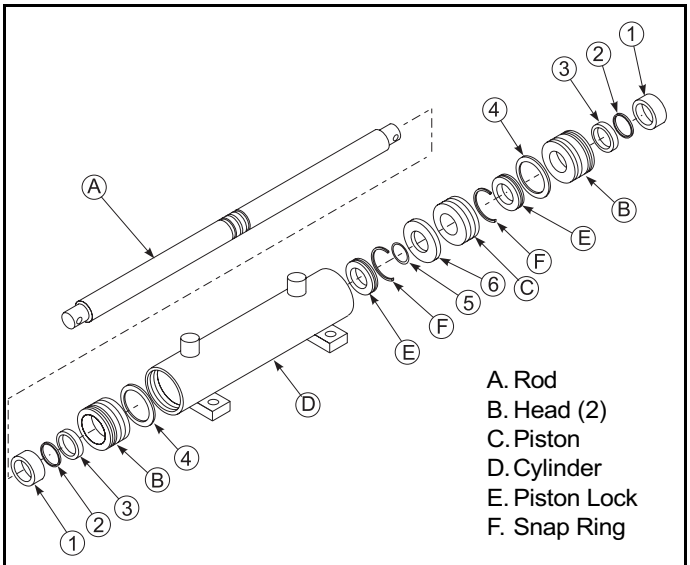
1. Support the cage assembly at a convenient working height.
2. Mark and disconnect hoses and immediately cap the openings to prevent contamination.
3. Remove hardware which secures cage rotate cylinder. Remove cage rotate cylinder.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.
2. Slowly cycle cage rotate cylinder several times. Check hydraulic connections for leaks. Check for proper cylinder operation.

3.23 STEERING CYLINDER

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.



A. Rod
B. Head (2)
C. Piston
D. Cylinder
E. Piston Lock
F. Snap Ring

Seal kit (068456-010) includes:

1. Journal Bearing (2)
2. Rod Wiper (2)
3. Rod Seal (2)
4. Static Seal (2)
5. Static Seal
6. Piston Seal

Figure 3-25: Steering Cylinder

Removal

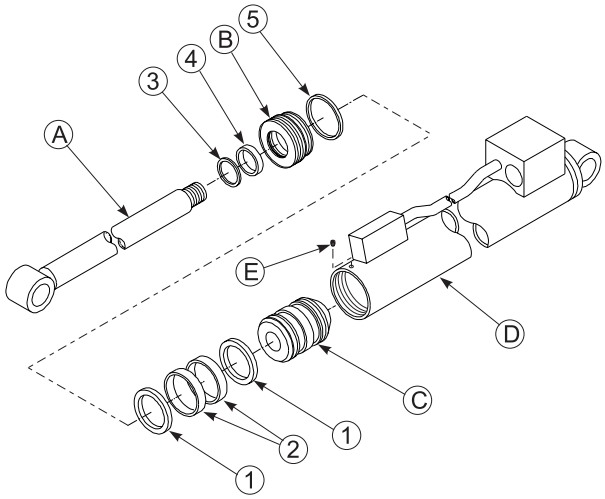
1. Mark and disconnect hoses and immediately cap the openings to prevent contamination.
2. Remove hardware which secures the steering arms to the spindles.
3. Remove hardware which secures steering cylinder to the chassis. Remove steering cylinder.
4. Mark steering arms for position on cylinder. Remove hardware which secures steering arms to rod ends. Using a hammer and drift, remove the roll pins which secure the steering arms to the rod ends.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.
2. Slowly steering cylinder several times. Check hydraulic connections for leaks. Check for proper cylinder operation.

3.24 JIB CYLINDER

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.



A. Rod
B. Head
C. Piston
D. Cylinder
E. Set Screw

Seal kit (068453-010) includes:
1. Piston Seal
2. Wear Ring
3. Rod Wiper
4. Rod Seal
5. Static Seal

Figure 3-26: Jib Cylinder

Removal

1. Using an overhead hoist or crane, support the cage assembly at a convenient working height.
2. Mark and disconnect hoses and immediately cap the openings to prevent contamination.
3. Remove hardware which secures jib cylinder pins.

NOTE: Jib cylinder is heavy. Take appropriate measures to support cylinder.

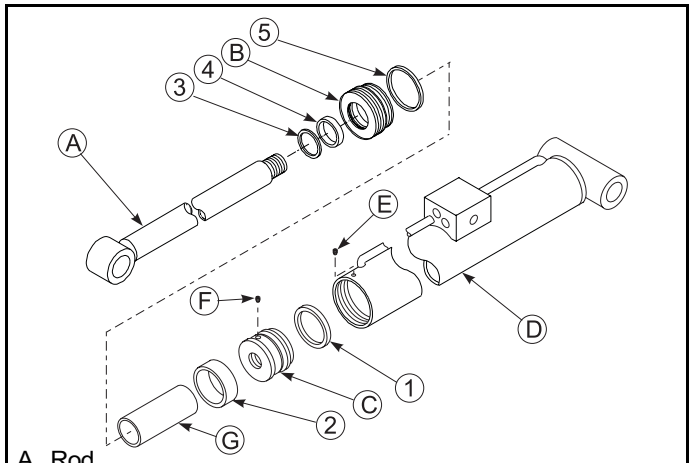
4. Remove jib cylinder pins. Remove jib cylinder.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.
2. Slowly cycle jib cylinder several times. Check hydraulic connections for leaks. Check for proper cylinder operation.

3.25 BOOM RAISE & BOOM RISER CYLINDERS

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.



A. Rod
B. Head
C. Piston
D. Cylinder
E. Set Screw
F Set Screw
G. Stop Tube

Boom Riser Seal kit (068451-010) and (068450-010) includes:
1. Piston Seal
2. Wear Ring
3. Rod Wiper
4. Rod Seal
5. Static Seal

Figure 3-27: Boom Riser Cylinder

Removal

1. Raise elevating assembly until cylinder pins are accessible.
2. Support the elevating assembly (see Figure 3-6).
3. Mark and disconnect hoses and immediately cap the openings to prevent contamination.
4. Remove hardware which secures cylinder. Remove cylinder.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.
2. Slowly cycle cylinder several times. Check hydraulic connections for leaks. Check for proper cylinder operation.

3.26 BOOM EXTEND CYLINDER

Refer to “3.19 Cylinder Repair” on page 3-21 for disassembly/assembly instructions.

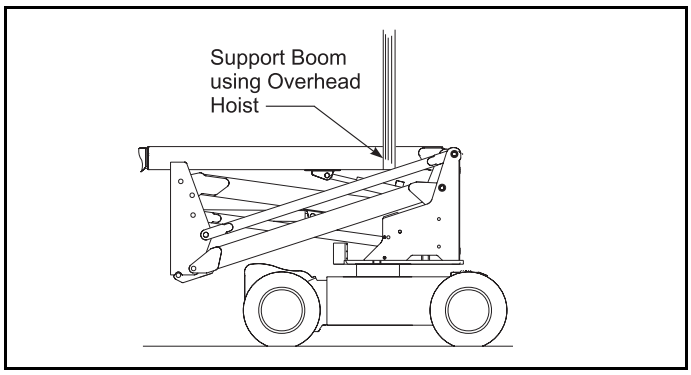
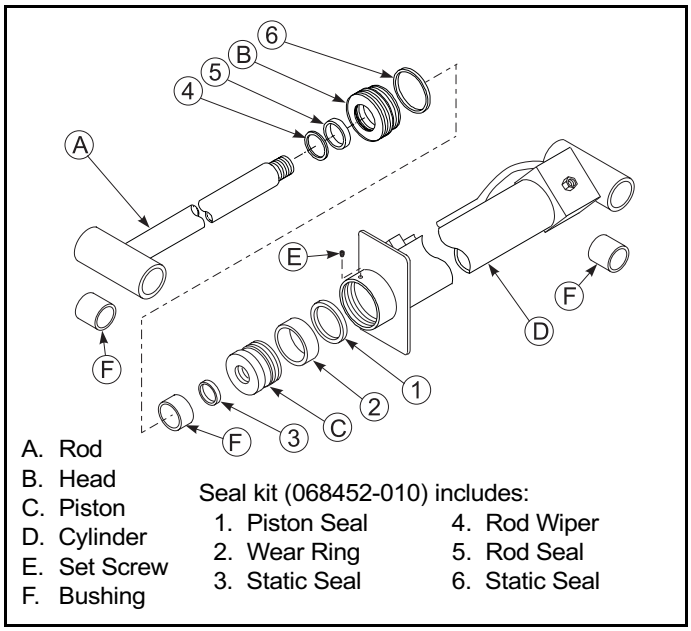


Figure 3-28: Removing Boom Extend Cylinder



A. Rod
B. Head
C. Piston
D. Cylinder
E. Set Screw
F. Bushing

Seal kit (068452-010) includes:

1. Piston Seal
2. Wear Ring
3. Static Seal
4. Rod Wiper
5. Rod Seal
6. Static Seal

Figure 3-29: Boom Extend Cylinder

Removal

1. Lower boom completely. Extend boom until front boom extend cylinder pin is accessable.
2. Use an overhead hoist or crane to support the rear of the boom (see Figure 3-28).
3. Remove rear boom pivot pin.
4. Remove clips which secure front boom extend cylinder pin. Remove pin.
5. Mark and disconnect boom extend cylinder hoses and immediately cap the openings to prevent contamination.
6. Using overhead hoist, slightly raise rear of boom.

NOTE: This will extend master cylinder and allow room to remove boom extend cylinder. It may be necessary to remove a counterbalance valve to allow master cylinder to expand.

7. Remove rear boom extend cylinder pin. Carefully remove boom extend cylinder. Measure length of expanded boom cylinder.

IMPORTANT: Boom extend cylinder must be expanded to the same length when it is reinstalled.

Installation

1. Follow steps from “REMOVAL” section in reverse order to install cylinder.

IMPORTANT: Boom extend cylinder must be expanded to the same length it was when it was removed.

2. Slowly cycle cylinder several times. Check hydraulic connections for leaks. Check for proper cylinder operation.

3.27 LONG TERM STORAGE

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

Preservation

1. Clean painted surfaces. If paint is damaged, repaint.
2. Fill the hydraulic tank to operating level. Fluid will be visible at the sight gauge.

IMPORTANT: 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 cylinder rods with a preservative such as multipurpose grease and wrap with a barrier material.
4. Coat all exposed unpainted metal surfaces with preservative.
5. Service the engine according to the manufacturers recommendations.
6. Remove the battery and place in alternative service.

3.28 TORQUE SPECIFICATIONS

Fasteners

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

Hydraulic Components

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

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

Table 3-2: Torque Specifications for Fasteners

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

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

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

Table 3-3: Torque Specifications for Hydraulic Components

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

Section 4

TROUBLESHOOTING

4.1 INTRODUCTION

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

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

Referring to Section 2.0 and 5.0 will aid in understanding the operation and function of the various components and systems of the AB46 and help in diagnosing and repair of the machine.

⚠ WARNING ⚠

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

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

General Procedure

Use the charts on the following pages to help determine the cause of a fault in your UpRight AB46.

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

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

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

Table 4-1: Troubleshooting Guide - Hydraulic Schematic

COMPONENT	FUNCTION	STEER	RISER	BOOM EXTEND	BOOM RAISE	JIB	CAGE LEVEL	CAGE ROTATE	SLEW	DRIVE	BRAKE RELEASE	PARKING BRAKE RELEASE	FRONT AXLE
Boom Pump		X	X	X	X	X	X	X	X				
Steer Valve		X											
Steer Cylinder		X											
High Relief		X	X	X	X	X	X	X	X				
Relief Check Valves		X	X	X	X	X	X	X	X	X	X		
High Dump		1	X	X									
Diverter Valve		2	2	2	2	2	2	2	2				
Riser Valve			X										
Riser Cylinder			X										
Riser C/B Valve			X										
Riser CK Valve			X										
Boom Extend Valve				X									
Boom Extend Cylinder				X									
Boom Extend C/B Valve				X									
Boom Extend CK Valve				X									
Boom Raise Valve					X								
Boom Raise Cylinder					X								
Boom Raise C/B Valve					X								
Boom Raise CK Valve					X								
Proportional Valve					X	X	X	X	X				
Jib Valve						X							
Jib Orifice						X							
Jib Cylinder						X							
Jib C/B Valve						X							
Jib CK Valve						X							
Master Cylinder							X						
Master Cylinder C/B Valves							X						
Master Cylinder CK Valves							X						
Slave Cylinder							X						
Slave Cylinder CB Valves							X						
Trim Level Valve							X						
Low Relief Valve			X	X	X	X	X	X	X				
Cage Rotate Cylinder								X					
Cage Rotate Valve								X					
Cage Rotate C/B Valve								X					
Cage Rotate CK Valve								X					
Slew Motor									X				
Turret Rotate Valve									X				
Turret Rotate CK Valve									X				

Table 4-1: Troubleshooting Guide - Hydraulic Schematic (Continued)

COMPONENT	FUNCTION	STEER	RISER	BOOM EXTEND	BOOM RAISE	JIB	CAGE LEVEL	CAGE ROTATE	SLEW	DRIVE	BRAKE RELEASE	PARKING BRAKE RELEASE	FRONT AXLE
1500 PSI Counterbalance									X				
1. High dump is not activated by steering. It will close for other functions while steering.													
2. Diverter valve is not activated during normal operation. Only for hand pump operation.													
Drive Pump										X			
Charge Pump										X			X
Charge Pump Relief Valve										X			X
Drive Motors										X			
Brake Valve										X	X		
Brake Orifices										X	X		
Brake Cylinders										X	X		
Left Axle Cylinder													X
Right Axle Cylinder													X
Left Axle Valve													X
Right Axle Valve													X
Hi Torque Valve													X

Table 4-2: Trouble Shooting Guide - Electrical Schematic

Component / Function	Engine run - Upper Controls	Engine Run - Lower Controls	Engine Start - Upper Controls	Engine Start - Lower Controls	Steer Right	Steer Left	Riser Elevate	Riaer Descend	Boom Extend	Boom Retract	Boom Raise	Boom Lower	Jib Up	Jib Down	Cage Level Up	Cage Level Down	Cage Rotate CCW	Cage Rotate CW	Slew CCW	Slew CW	Drive	Front Axle Lock	Parking Brake Release	Tilt Alarm	Tilt Light	Torque - Hi / Low
Battery	X	X																								
25 A Fuse	X	X																								
Chassis EM Stop Switch	X	X																								
Chassis Key Switch	X	X																					X			
10 A Circuit Breaker CB1	X	X																								
Chassis Control Power Relay	X	X																								
Starter Motor / Solenoid	X	X																								
Start Solenoid	X	X																								
Alternator	X	X																								
10 Amp Circuit breaker CB2		X																								
Platform EM Stop Switch	X	X																								
10 Amp Control Box Fuse	X																									
Control Box Key Switch	X																									
Diode DB20R	X																									
Diode DB20L		X																								
Engine Relay Contacts and Coil	X	X																								
Tilt Relay Contacts	X	X																						X	X	
Tilt Light off for normal operation	X	X																								
Tilt Alarm off for normal operation	X	X																								
Brake Relay Contacts	X	X																								
Tilt Sensor (red wire)	X	X																								
Tilt Sensor (white wire)	X	X																						X	X	
Propane Relay contacts (Dual Fuel)	X	X																								
Gas Relay contacts (Dual Fuel)	X	X																								
Propane Prime Switch (Dual Fuel)	X	X																								
Engine Run Solenoid (Diesel)	X	X																								
Glow Plug Relay (Diesel)			X	X																						
Glow Plug Solenoid (Diesel)			X	X																						
Glow Plug (Diesel)			X	X																						
Glow Plug Resistor (Diesel)			X	X																						
Horn Relay contacts	X	X																								
Throttle Relay contacts	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
Down Limit Switch	X	X																				X				X
Down Relay coil	X	X																								
Engine Oil Pressure Switch	X	X																								
Distributor	X	X																								
Ignition Coil	X	X																								

Table 4-2: Trouble Shooting Guide - Electrical Schematic (Continued)

Component / Function	Engine run - Upper Controls	Engine Run - Lower Controls	Engine Start - Upper Controls	Engine Start - Lower Controls	Steer Right	Steer Left	Riser Elevate	Riaer Descend	Boom Extend	Boom Retract	Boom Raise	Boom Lower	Jib Up	Jib Down	Cage Level Up	Cage Level Down	Cage Rotate CCW	Cage Rotate CW	Slew CCW	Slew CW	Drive	Front Axle Lock	Parking Brake Release	Tilt Alarm	Tilt Light	Torque - Hi / Low
Fuel Select Switch	X	X																								
Propane Relay coil	X	X																								
LP Valve	X	X																								
Gas Relay coil	X	X																								
Gas Valve	X	X																								
Chassis Control Power Relay coil		X																								
Chassis Control Power Relay contacts	X	X																								
Start Solenoid			X	X																						
Starter Motor			X	X																						
Start Switch				X																						
Choke Switch			X	X																						
Choke Relay			X	X																						
Choke			X	X																						
Choke Diode			X	X																						
Throttle Relay Coil							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
Throttle Solenoid							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
Lower Turret Rotate Switch																			X	X						
Lower Cage rotate Switch																	X	X								
Lower Trim Switch															X	X										
Lower Jib Switch													X	X												
Lower Boom Elevate Switch											X	X														
Lower Boom Extend Switch									X	X																
Lower Riser Switch							X	X																		
Diode DB16													X	X	X	X	X	X	X	X						
Diode DB8													X	X	X	X	X	X	X	X						
Diode DB8.1													X	X	X	X	X	X	X	X						
Boom Speed Relay coil													X	X	X	X	X	X	X	X						
Boom Speed Relay contacts																										
Turtle / Rabbit Knob													X	X	X	X	X	X	X	X						
Diode DB17							X	X	X	X																
Diode DB18											X	X														
Foot Switch					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
Boom Disconect Relay																										
Upper Turret Rotate Switch																			X	X						
Upper Cage rotate Switch																	X	X								
Upper Trim Switch															X	X										
Upper Jib Switch													X	X												
Lower Boom Elevate Switch											X	X														

Table 4-2: Trouble Shooting Guide - Electrical Schematic (Continued)

Component / Function	Engine run - Upper Controls	Engine Run - Lower Controls	Engine Start - Upper Controls	Engine Start - Lower Controls	Steer Right	Steer Left	Riser Elevate	Riaer Descend	Boom Extend	Boom Retract	Boom Raise	Boom Lower	Jib Up	Jib Down	Cage Level Up	Cage Level Down	Cage Rotate CCW	Cage Rotate CW	Slew CCW	Slew CW	Drive	Front Axle Lock	Parking Brake Release	Tilt Alarm	Tilt Light	Torque - Hi / Low
Upper Boom Extend Switch									X	X																
Upper Riser Switch							X	X																		
Turret Drive Relay contacts																	X	X	X	X						
Boom Disconnect Relay contacts							X	X	X	X	X	X	X	X												
Diode DB7													X	X	X	X	X	X	X	X						
Diode DB6											X	X														
Diode DB11													X	X	X	X	X	X								
Diode DB3							X	X	X	X																
Diode DB2							X	X	X	X																
Diode DB9											X	X														
Diode DB23L					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
Diode DB23R																					X					
Diode DB24																								X		
Speed Control Knob											X	X	X	X	X	X	X	X	X	X						
Boom Speed Relay contacts											X	X	X	X	X	X	X	X	X	X						
Boom Speed Relay coil													X	X	X	X										
Drive Enable Relay coil																					X					
Drive Enable Relay contacts																					X					
Steer Right Switch					X																					
Steer Left Switch						X																				
Down Relay contacts															X	X										
Down Relay contacts																								X		
Down Relay contacts																					X					
Boom Extend Drive Interlock Switch																					X					
Forward Proportional Valve																					X					
Reverse Proportional Valve																					X					
Brake Relay coil																					X					
Brake Solenoid Valve																					X					
Brake Relay contacts																					X					
Boom Disconnect Relay coil																					X					
Turret Drive Relay coil																					X					
Drive Joystick																					X					
High Low Torque Switch																					X					
Torque Relay contacts																					X					
Torque Relay coil																										X
Trim Up Solenoid Valve															X											
Trim Down Solenoid Valve																X										
Trim Up Relay coil															X											

Table 4-2: Trouble Shooting Guide - Electrical Schematic (Continued)

Component / Function	Engine Run - Upper Controls	Engine Run - Lower Controls	Engine Start - Upper Controls	Engine Start - Lower Controls	Steer Right	Steer Left	Riser Elevate	Riaer Descend	Boom Extend	Boom Retract	Boom Raise	Boom Lower	Jib Up	Jib Down	Cage Level Up	Cage Level Down	Cage Rotate CCW	Cage Rotate CW	Slew CCW	Slew CW	Drive	Front Axle Lock	Parking Brake Release	Tilt Alarm	Tilt Light	Torque - Hi / Low
Trim Up Relay contacts															X											
Trim Down Relay coil																X										
Trim Down Relay contacts																X										
Jib Up Solenoid Valve													X													
Jib Down Solenoid Valve														X												
Jib Up Relay coil													X													
Jib Up Relay contacts													X													
Jib Down Relay coil														X												
Jib Down Relay contacts														X												
Boom Up Solenoid Valve											X															
Boom Down Solenoid Valve												X														
Boom Up Relay coil											X															
Boom Up Relay contacts											X															
Boom Down Relay coil												X														
Boom Down Relay contacts												X														
Boom Extend Solenoid Valve									X																	
Boom Retract Solenoid Valve										X																
Boom Extend Relay coil									X																	
Boom Extend Relay contacts									X																	
Boom Retract Relay coil										X																
Boom Retract Relay contacts										X																
Riser Up Solenoid Valve							X																			
Riser Down Solenoid Valve								X																		
Riser Up Relay coil							X																			
Riser Up Relay contacts							X																			
Riser Down Relay coil								X																		
Riser Down Relay contacts								X																		
Cage Right Solenoid Valve																		X								
Cage Left Solenoid Valve																	X									
Cage Right Relay coil																		X								
Cage Right Relay contacts																		X								
Cage Left Relay coil																	X									
Cage Left Relay contacts																	X									
Turret Right Solenoid Valve																				X						
Turret Left Solenoid Valve																			X							
Turret Right Relay coil																				X						
Turret Right Relay contacts																				X						
Turret Left Relay coil																			X							

Table 4-2: Trouble Shooting Guide - Electrical Schematic (Continued)

COMPONENT / FUNCTION	ENGINE RUN - UPPER CONTROLS	ENGINE RUN - LOWER CONTROLS	ENGINE START - UPPER CONTROLS	ENGINE START - LOWER CONTROLS	STEER RIGHT	STEER LEFT	RISER ELEVATE	RIAER DESCEND	BOOM EXTEND	BOOM RETRACT	BOOM RAISE	BOOM LOWER	JIB UP	JIB DOWN	CAGE LEVEL UP	CAGE LEVEL DOWN	CAGE ROTATE CCW	CAGE ROTATE CW	SLEW CCW	SLEW CW	DRIVE	FRONT AXLE LOCK	PARKING BRAKE RELEASE	TILT ALARM	TILT LIGHT	TORQUE - HI / LOW
Turret Left Relay contacts																			X							
Steer Right Solenoid Valve					X																					
Steer Left Solenoid Valve						X																				
Proportional Valve											X	X	X	X	X	X	X	X	X	X						
High Flow Valve							X	X	X	X																
Diode DB21																							X			
Diode DB25																							X	X		
Anti Restart Relay			X	X																						
Hi / Low Torque Switch																										X
Boom Extend Drive Interlock Switch																						X				X

Section 5

SCHEMATICS

Introduction

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

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

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

Schematic **Page**

5.1 ELECTRICAL SCHEMATIC - GASOLINE

Table 5-1: Legend, Electrical Schematic Legend, Gasoline Model 068341-010

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Horn	Warning sound	Front of chassis
ALM 2	Alarm, Tilt	Provides warning sound when slope of machine excedes 3o side to side, or fore and aft.	Upper control box, exterior upper left side.
CB1	Circuit Breaker 10 AMP	Engine Power	Lower Control box
CB2	Circuit Breaker 10 AMP	Chassis Controls	Lower Control box
CB3	Circuit Breaker 10 AMP	Platform Controls	Upper Control box
CONT1	Controller	Controls operating speed of various functions	Upper control box
D1	Diode	Supplies power to throttle relay	Lower control box
D2	Diode	Supplies power to throttle relay	Lower control box
D3	Diode	Supplies power to throttle relay	Lower control box
D4	Diode	Spike protection diode	Joystick handle
D5	Diode	Supplies power to speed controller CONT1	Upper control box
D6	Diode	Supplies power to speed controller CONT1	Upper control box
D7	Diode	Supplies power to speed controller CONT1	Upper control box
D8	Diode	Supplies power to speed controller CONT1	Upper control box
D9	Diode	Supplies power to high flow solenoid	Upper control box
D10	Diode	Supplies power to high flow solenoid	Upper control box
D11	Diode	Supplies power to boom elevate speed relay	Upper control box
D12	Diode	Supplies power to boom elevate speed relay	Upper control box
D13	Diode	Provides power to throttle relay	Lower control box
D14	Diode	Provides power to Starter	Lower control box
D15	Diode	Provides power to throttle relay	Lower control box
D16	Diode	Provides power to right lock solenoid	Lower control box
D17	Diode	Power to tilt alarm ALM2	Lower control box
D18	Diode	Power to engine relay	Lower control box
D19	Diode	Power to throttle relay	Lower control box
D20	Diode	Power to hour meter	Engine compartment
D21	Diode	Power to left lock solenoid	Lower control box
FU1	Fuse 25 AMP	Main Fuse	Lower Control box
L1	Tilt Light	Lights when machine is in tilt condition	Upper Control box
MTR1	Hour Meter	Display run time	Lower Control box
PMP1	Drive Pump	Hydraulic Drive Power	Chassis
R1	Relay	Power to up trim solenoid	Relay Panel
R2	Relay	Power to down trim solenoid	Lower Control box
R3	Relay	Power to up jib solenoid	Lower Control box
R4	Relay	Power to down jib solenoid	Lower Control box
R5	Relay	Power to up boom solenoid	Lower Control box
R6	Relay	Power to down boom solenoid	Lower Control box
R7	Relay	Power to extend boom solenoid	Lower Control box
R8	Relay	Power to retract boom solenoid	Lower Control box
R9	Relay	Power to up riser solenoid	Upper Control box
R10	Relay	Power to down riser solenoid	Upper Control box
R11	Relay	Power to cage Right Solenoid	Upper Control box
R12	Relay	Power to cage left solenoid	Upper Control box
R13	Relay	Power to turret right solenoid	Relay Panel
R14	Relay	Power to turret left solenoid	Relay Panel
R15	Right Lock Relay	Power to Right Lock Solenoid	Lower Control box
R16	Left Lock Relay	Power to Left Lock Solenoid	Lower Control box
R17	Engine Throttle Relay	Power to Engine Throttle Relay	Lower Control box
R18	Low Tilt Relay	Disenables Drive Functions	Lower Control box
R19	Engine Relay	Enables Engine to operate	Lower Control box
R20	Power Relay	Power to Controller	Lower Control box
R21	Down Relay	Power to Hydraulic Pump	Lower Control box
R22	Boom Disconnect Relay	Power to Upper Controller	Upper Control box
R23	Boom Elevate Speed Relay	Power to Speed Controller	Upper Control box
R24	Turret Drive Relay	Power to Turret Rotate Solenoid	Upper Control box
R25	Drive Enable Relay	Power to Upper Control box	Upper Control box
R26	Brake Relay	Power to Brake Solenoid	Lower Control box
R27	Torque Relay	Torque Lock	Lower Control box
R28	Anti Restart Relay	Eliminates accidental restart	Lower control box
R29	Idle Relay	Controls Governer	Engine Compartment
R30	Horn Relay	Power to Horn	Lower Control box
RES1	Resistor	Speed control	Joystick control
S1	Trim Switch, (two)	Power to Trim Solenoid	Lower Control box Upper Control box
S2	Jib Switch (two)	Power to Jib Solenoid	Lower Control box Upper Control box
S3	Boom Elevate Switch (two)	Power to Boom Lift Solenoid	Lower Control box Upper Control box
S4	Boom Extend Switch (two)	Power to Boom Extend Solenoid	Lower Control box Upper Control box
S5	Riser Switch (two)	Power to Riser Solenoid	Lower Control box Upper Control box
S6	Cage Switch (two)	Power to Cage Rotate Solenoid	Lower Control box Upper Control box
S7	Turret Switch (two)	Power to Turret Rotate Solenoid	Lower Conrtol box Upper Control box
S8	High Torque Switch	High Torque	Joystick
S9	Choke/Glowplug Switch	Actuates Choke/Glowplug	Upper Control box
S10	Steer Switch	Power to left steer and right steer relays	Upper control box, top of joystick.
S11	Oil Pressure Switch	Stops Engine if low pressure	Engine
S12	Engine Start Switch	Starts Engine	Lower control box
S13	Platform/Chassis Switch	Supplies power to Platform/ Chassis	Lower control box
S14	Down Limit Switch	Controls travel speed Slow/ Fast	Turret at boom attachment
S15	Chassis Emergency Stop Switch	Emergency Stop	Lower control box
S16	Temp Switch	Over Temperature Control	Engine
S17	Foot Switch	Enables operation from platform	Floor of platform
S18	Hi/Lo Switch	Selects Hi or Low Speed	Platform control box
S19	Platform Key Switch	Enables operation from platform	Platform control box
S20	Horn Switch	Sounds horn	Platform control Box
S21	Boom Extend Drive Interlock	Controls travel speed Slow/ Fast	On Boom
S22	Platform Emergency Stop Switch	Emergency Stop	Platform control box
SNSR	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Trim UP Solenoid.	Controls lift valve.	Right side of manifold
SOL2	Trim Down Solenoid.	Controls lift valve.	Right side of manifold
SOL3	Jib Up Solenoid.	Controls lift valve.	Right side of manifold
SOL4	Jib Down Solenoid.	Controls lift valve.	Right side of manifold
SOL5	Boom Up Solenoid.	Controls lift valve.	Right side of manifold
SOL6	Boom Down Solenoid.	Controls lift valve.	Right side of manifold
SOL7	Boom Extend Solenoid	Controls reverse valve.	Right side of manifold
SOL8	Boom Retract Solenoid.	Controls lift valve.	Right side of manifold
SOL9	Riser Up Solenoid.	Controls lift valve.	Right side of manifold
SOL10	Riser Down Solenoid	Controls series / parallel valves.	Right side of manifold
SOL11	Cage Right Solenoid.	Controls lift valve.	Right side of manifold
SOL12	Cage Left Solenoid	Controls down valve.	Right side of manifold
SOL13	Turret Right Solenoid	Controls steer valve when steering right.	Right side of manifold
SOL14	TurretLeft Solenoid	Controls steer valve when steering left.	Right side of manifold
SOL15	Steer Right Solenoid	Controls engine throttle.	Right side of manifold
SOL16	Steer LeftSolenoid	Controls engine choke.	Right side of manifold
SOL17	Low Flow	Controls lift valve.	Right side of manifold
SOL18	High Flow	Controls lift valve.	Right side of manifold
SOL19	Left Lock Solenoid	Locks Left Axle Cylinder	Drive Valve Block
SOL20	Engine Choke Solenoid	Engine Choke Solenoid	Drive Valve Block
SOL21	Engine Throttle Solenoid	Controls Engine Throttle	Engine Compartment
SOL22	Brake Solenoid	Actuates Brakes	Drive Valve Block
SOL23	High Torque Solenoid	Allows High Torque	Drive Valve Block
SOL24	Right Lock Solenoid	Locks Right Axle Cylinder	Drive Valve Block

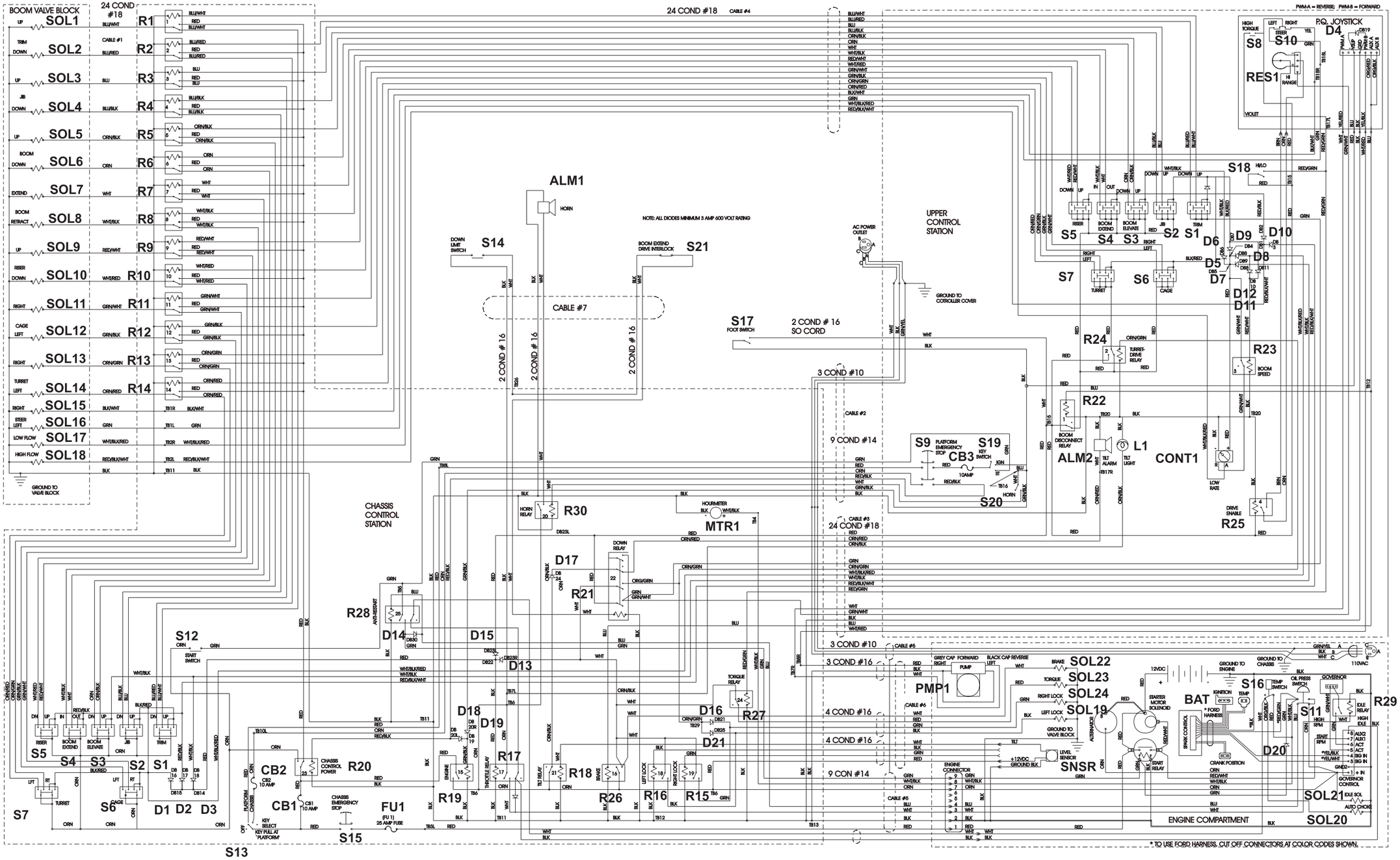


Figure 5-1: Legend, Electrical Schematic, Gasoline Model 068341-010

5.2 ELECTRICAL SCHEMATIC, DUAL FUEL

Table 5-2: Electrical Schematic Legend, Dual Fuel Model 068341-011

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Horn	Warning sound	Front of chassis
ALM 2	Alarm, Tilt	Provides warning sound when slope of machine excedes 3o side to side, or fore and aft.	Upper control box, exterior upper left side.
BAT	Battery	Power to start engine	Chassis
CB1	Circuit Breaker, 10 AMP	Engine Power	Lower Control box
CB2	Circuit Breaker, 10 AMP	Chassis Controls	Lower Control box
CB3	Circuit Breaker, 10 AMP	Chassis Controls	Lower Control box
CB4	Circuit Breaker, 10 AMP	Platform Controls	Upper Control box
CONT1	Controller	Controls operating speed of various functions	Upper control box
D1	Diode	Supplies power to throttle relay	Lower control box
D2	Diode	Supplies power to throttle relay	Lower control box
D3	Diode	Supplies power to throttle relay	Lower control box
D4	Diode	Spike protection diode	Joystick handle
D5	Diode	Supplies power to speed controller CONT1	Upper control box
D6	Diode	Supplies power to speed controller CONT1	Upper control box
D7	Diode	Supplies power to speed controller CONT1	Upper control box
D8	Diode	Supplies power to speed controller CONT1	Upper control box
D9	Diode	Supplies power to high flow solenoid	Upper control box
D10	Diode	Supplies power to high flow solenoid	Upper control box
D11	Diode	Supplies power to boom elevate speed relay	Upper control box
D12	Diode	Supplies power to boom elevate speed relay	Upper control box
D13	Diode	Provides power to throttle relay	Lower control box
D14	Diode	Power to Starter	Lower control box
D15	Diode	Provides power to throttle relay	Lower control box
D16	Diode	Provides power to right lock solenoid	Lower control box
D17	Diode	Power to tilt alarm ALM2	Lower control box
D18	Diode	Power to engine relay	Lower control box
D19	Diode	Power to throttle relay	Lower control box
D20	Diode	Power to hour meter	Engine Compartment
D21	Diode	Power to left lock solenoid	Lower control box
D22	Diode	Provides power to Starter	Lower control box
D23	Diode	Spike protection Diode	Engine comnpartment
FU1	Fuse, 25 AMP	Emergency Stop	Lower Control box
L1	Tilt Light	Lights when machine is in tilt condition	Upper Control box
MTR1	Hour Meter	Displays run time	Lower Control box
PMP1	Drive Pump	Hydraulic Drive Power	Chassis
R1	Relay	Power to up trim solenoid	Lower Control box
R2	Relay	Power to down trim solenoid	Lower Control box
R3	Relay	Power to up jib solenoid	Lower Control box
R4	Relay	Power to down jib solenoid	Lower Control box
R5	Relay	Power to up boom solenoid	Lower Control box
R6	Relay	Power to down boom solenoid	Lower Control box
R7	Relay	Power to extend boom solenoid	Lower Control box
R8	Relay	Power to retract boom solenoid	Lower Control box
R9	Relay	Power to up riser solenoid	Upper Control box
R10	Relay	Power to down riser solenoid	Upper Control box
R11	Relay	Power to cage Right Solenoid	Upper Control box

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
R12	Relay	Power to cage left solenoid	Upper Control box
R13	Relay	Power to turret right solenoid	Lower Control box
R14	Relay	Power to turret left solenoid	Lower Control box
R15	Right Lock Relay	Power to Right Lock Solenoid	Lower Control box
R16	Left Lock Relay	Power to Left Lock Solenoid	Lower Control box
R17	Engine Throttle Relay	Power to Engine Throttle Relay	Lower Control box
R18	Low Tilt Relay	Disenables Drive Functions	Lower Control box
R19	Engine Relay	Enables Engine to operate	Lower Control box
R20	Power Relay	Power to Controller	Lower Control box
R21	Down Relay	Lower the platform	Lower Control box
R22	Boom Disconnect Relay	Power to Upper Controller	Upper Control box
R23	Boom Elevate Speed Relay	Power to Speed Controller	Upper Control box
R24	Turret Drive Relay	Power to Turret Rotate Solenoid	Upper Control box
R25	Drive Enable Relay	Power to Upper Control box	Upper Control box
R26	Brake Relay	Power to Brake Solenoid	Lower Control box
R27	Torque Relay	Torque Lock	Lower Control box
R28	Anti Restart Relay	Eliminates accidental restart	Lower control box
R29	Prime Relay	Propane prime	Engine Compartment
R30	Horn Relay	Power to Horn	Lower Control box
R31	Relay	Gas Relay	Lower Control box
R32	Relay	Propane Relay	Lower Control box
R33	Relay	Idle Relay	Engine
RES1	Resistor	Speed control	Joystick control
S1	Trim Switch (two)	Power to Trim Solenoid	Lower Control box Upper Control box
S2	Jib Switch (two)	Power to Jib Solenoid	Lower Control box Upper Control box
S3	Boom Elevate Switch (two)	Power to Boom Lift Solenoid	Lower Control box Upper Control box
S4	Boom Extend Switch (two)	Power to Boom Extend Solenoid	Lower Control box Upper Control box
S5	Riser Switch (two)	Power to Riser Solenoid	Lower Control box Upper Control box
S6	Cage Switch (two)	Power to Cage Rotate Solenoid	Lower Control box Upper Control box
S7	Turret Switch (two)	Power to Turret Rotate Solenoid	Lower Conrtol box Upper Control box
S8	High Torque Switch	High Torque	Joystick
S9	Platform Emergency Stop Switch	Emergency Stop	Upper Control box
S10	Steer Switch	Power to left steer and right steer relays	Upper control box, top of joystick.
S11	Oil Pressure Switch	Stops Engine if low pressure	Engine
S12	Engine Start Switch	Starts Engine	Lower control box
S13	Platform/ Chassis Switch	Supplies power to Platform/ Chassis	Lower control box
S14	Down Limit Switch	Controls travel speed Slow/Fast	Turret at boom attachment
S15	Chassis Emergency Stop Switch	Emergency Stop	Lower control box
S16	Temp Switch	Over Temperature Control	Engine
S17	Foot Switch	Enables operation from platform	Floor of platform

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S18	Hi/Lo Switch	Selects Hi or Low Speed	Platform Control box
S19	Platform Key Switch	Enables Operation from Platform	Platform Control box
S20	Horn Switch	Sounds horn	Platform control Box
S21	Boom Extend Drive Interlock	Controls travel speed Slow/Fast	On Boom
S22	Propane/Gas Switch	Selects Propane/Gas	Platform control box
S23	Propane Prime Switch	Actuates Propane Prime Auto Choke Solenoid	Lower control box
SNSR	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Trim UP Solenoid.	Controls lift valve.	Right side of manifold
SOL2	Trim Down Solenoid.	Controls lift valve.	Right side of manifold
SOL3	Jib Up Solenoid.	Controls lift valve.	Right side of manifold
SOL4	Jib Down Solenoid.	Controls lift valve.	Right side of manifold
SOL5	Boom Up Solenoid.	Controls lift valve.	Right side of manifold
SOL6	Boom Down Solenoid.	Controls lift valve.	Right side of manifold
SOL7	Boom Extend Solenoid	Controls reverse valve.	Right side of manifold
SOL8	Boom Retract Solenoid.	Controls lift valve.	Right side of manifold
SOL9	Riser Up Solenoid.	Controls lift valve.	Right side of manifold
SOL10	Riser Down Solenoid	Controls series / parallel valves	Right side of manifold
SOL11	Cage Right Solenoid.	Controls lift valve.	Right side of manifold
SOL12	Cage Left Solenoid	Controls down valve.	Right side of manifold
SOL13	Turret Right Solenoid	Controls steer valve when steering right.	Right side of manifold
SOL14	TurretLeft Solenoid	Controls steer valve when steering left.	Right side of manifold
SOL15	Steer Right Solenoid	Controls engine throttle.	Right side of manifold
SOL16	Steer LeftSolenoid	Controls engine choke.	Right side of manifold
SOL17	Low Flow	Controls lift valve.	Right side of manifold
SOL18	High Flow	Controls lift valve.	Right side of manifold
SOL19	Left Lock Solenoid	Locks Left Axle Cylinder	Drive Valve Block
SOL20	Fuel Valve Solenoid	Allows Fuel to	Engine Compartment
SOL21	Propane Carburetor Solenoid	Controls Propane Carburetor	Engine Compartment
SOL22	Brake Solenoid	Actuates Brakes	Drive Valve Block
SOL23	High Torque Solenoid	Allows High Torque	Drive Valve Block
SOL24	Right Lock Solenoid	Locks Right Axle Cylinder	Drive Valve Block
SOL25	Idle Solenoid	Controls Idle Speed	Engine Compartment
SOL26	Auto Choke Solenoid	Actuates Choke	Engine Compartment
SOL27	Propane Carburetor Solenoid	Controls Propane Carburetor	Engine Compartment
SOL28	Propane Prime Solenoid	Activates Auto Choke	Engine Compartment

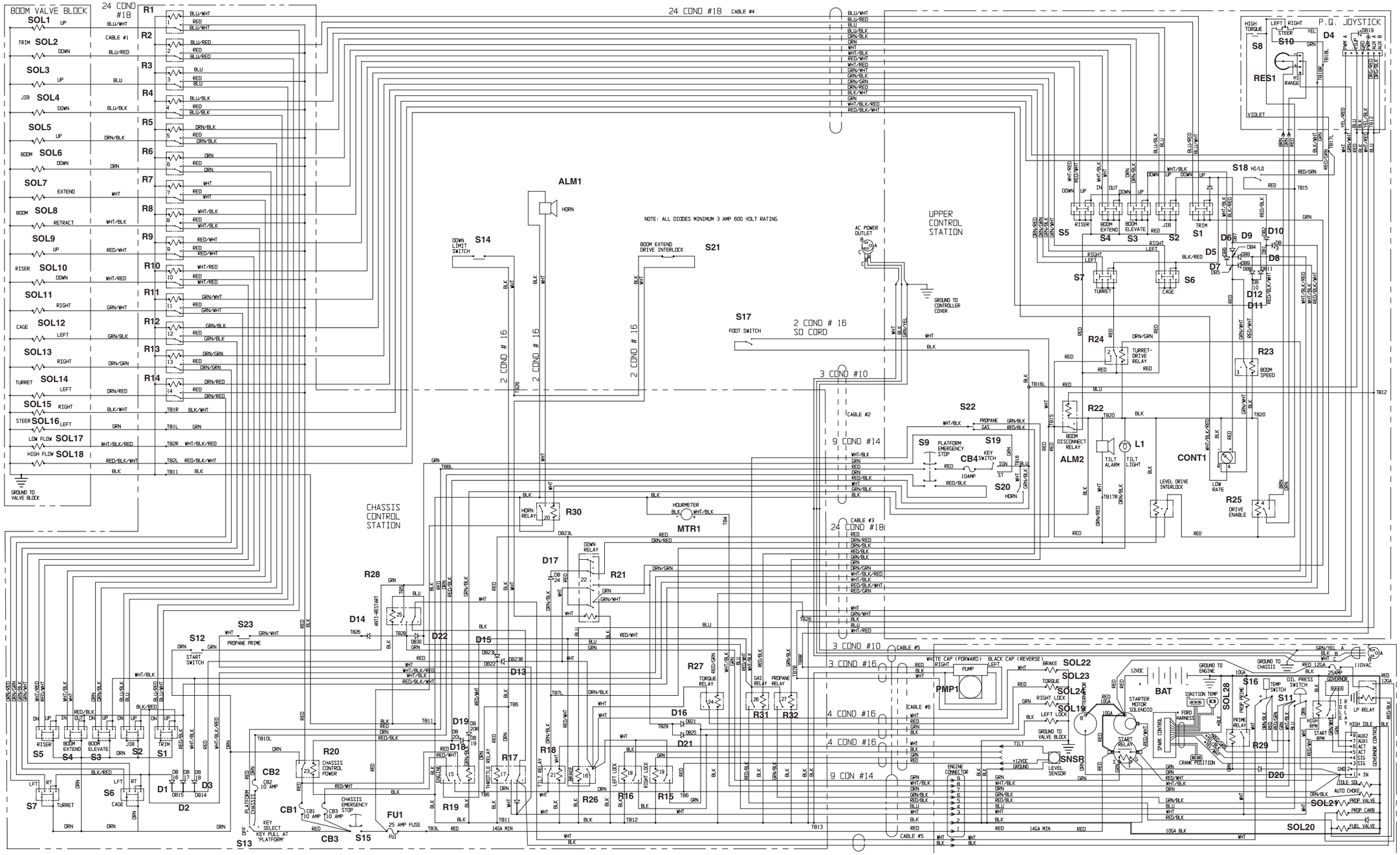


Figure 5-2: Electrical Schematic, Dual Fuel Model 068341-011

5.3 ELECTRICAL SCHEMATIC, DIESEL

Table 5-3: Electrical Schematic Legend, Diesel Model 068341-012

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
ALM 1	Horn	Warning sound	Front of chassis
ALM 2	Alarm, Tilt	Provides warning sound when slope of machine excedes 3o side to side, or fore and aft.	Upper control box, exterior upper left side.
CB1	Circuit Breaker, 10 AMP	Engine Power	Lower Control box
CB2	Circuit Breaker, 10 AMP	Chassis Controls	Lower Control box
CB3	Circuit Breaker, 10 AMP	Platform Controls	Upper Control box
CONT1	Controller	Controls operating speed of various functions	Upper control box
D1	Diode	Supplies power to throttle relay	Lower control box
D2	Diode	Supplies power to throttle relay	Lower control box
D3	Diode	Supplies power to throttle relay	Lower control box
D4	Diode	Spike protection diode	Joystick handle
D5	Diode	Supplies power to speed controller CONT1	Upper control box
D6	Diode	Supplies power to speed controller CONT1	Upper control box
D7	Diode	Supplies power to speed controller CONT1	Upper control box
D8	Diode	Supplies power to speed controller CONT1	Upper control box
D9	Diode	Supplies power to high flow solenoid	Upper control box
D10	Diode	Supplies power to high flow solenoid	Upper control box
D11	Diode	Supplies power to boom elevate speed relay	Upper control box
D12	Diode	Supplies power to boom elevate speed relay	Upper control box
D13	Diode	Provides power to throttle relay	Lower control box
D14	Diode	Power to Starter	Lower control box
D15	Diode	Provides power to throttle relay	Lower control box
D16	Diode	Provides power to right lock solenoid	Lower control box
D17	Diode	Power to tilt alarm ALM2	Lower control box
D18	Diode	Power to engine relay	Lower control box
D19	Diode	Power to throttle relay	Lower control box
D20	Diode	Power to hour meter	Engine Compartment
D21	Diode	Power to left lock solenoid	Lower control box
D22	Diode	Provides power to Starter	Lower control box
D23	Diode	Spike protection Diode	Engine comnpartment
FU1	Fuse	Main Fuse	Lower Control box
L1	Tilt Light	Lights when machine is in tilt condition	Upper Control box
MTR1	Hour Meter	Displays run time	Lower Control box
PMP1	Drive Pump	Hydraulic Drive Power	Chassis
R1	Relay	Power to up trim solenoid	Lower Control box
R2	Relay	Power to down trim solenoid	Lower Control box
R3	Relay	Power to up jib solenoid	Lower Control box
R4	Relay	Power to down jib solenoid	Lower Control box
R5	Relay	Power to up boom solenoid	Lower Control box
R6	Relay	Power to down boom solenoid	Lower Control box
R7	Relay	Power to extend boom solenoid	Lower Control box
R8	Relay	Power to retract boom solenoid	Lower Control box
R9	Relay	Power to up riser solenoid	Upper Control box
R10	Relay	Power to down riser solenoid	Upper Control box
R11	Relay	Power to cage Right Solenoid	Upper Control box
R12	Relay	Power to cage left solenoid	Upper Control box
R13	Relay	Power to turret right solenoid	Lower Control box
R14	Relay	Power to turret left solenoid	Lower Control box

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
R15	Right Lock Relay	Power to Right Lock Solenoid	Lower Control box
R16	Left Lock Relay	Power to Left Lock Solenoid	Lower Control box
R17	Engine Throttle Relay	Power to Engine Throttle Relay	Lower Control box
R18	Low Tilt Relay	Disenables Drive Functions	Lower Control box
R19	Engine Relay	Enables Engine to operate	Lower Control box
R20	Power Relay	Power to Controller	Lower Control box
R21	Down Relay	Lower the platform	Lower Control box
R22	Boom Disconnect Relay	Power to Upper Controller	Upper Control box
R23	Boom Elevate Speed Relay	Power to Speed Controller	Upper Control box
R24	Turret Drive Relay	Power to Turret Rotate Solenoid	Upper Control box
R25	Drive Enable Relay	Power to Upper Control box	Upper Control box
R26	Brake Relay	Power to Brake Solenoid	Lower Control box
R27	Torque Relay	Torque Lock	Lower Control box
R28	Anti Restart Relay	Eliminates accidental restart	Lower control box
R29	Prime Relay	Propane prime	Engine Compartment
R30	Horn Relay	Power to Horn	Lower Control box
R31	Relay	Gas Relay	Lower Control box
R32	Relay	Propane Relay	Lower Control box
RES1	Resistor	Speed control	Joystick control
S1	Trim Switch (two)	Power to Trim Solenoid	Lower Control box, Upper Control box
S2	Jib Switch (two)	Power to Jib Solenoid	Lower Control box, Upper Control box
S3	Boom Elevate Switch (two)	Power to Boom Lift Solenoid	Lower Control box, Upper Control box
S4	Boom Extend Switch (two)	Power to Boom Extend Solenoid	Lower Control box, Upper Control box
S5	Riser Switch (two)	Power to Riser Solenoid	Lower Control box, Upper Control box
S6	Cage Switch (two)	Power to Cage Rotate Solenoid	Lower Control box, Upper Control box
S7	Turret Switch (two)	Power to Turret Rotate Solenoid	Lower Conrtol box, Upper Control box
S8	High Torque Switch	High Torque	Joystick
S9	Platform Emergency Stop Switch	Emergency Stop	Upper Control box
S10	Steer Switch	Power to left steer and right steer relays	Upper control box,top of joystick.
S11	Oil Pressure Switch	Stops Engine if low pressure	Engine
S12	Engine Start Switch	Starts Engine	Lower control box
S13	Platform/ Chassis Switch	Supplies power to Platform/ Chassis	Lower control box
S14	Down Limit Switch	Controls travel speed, Slow/ Fast	Turret at boom attachment
S15	Chassis Emergency Stop Switch	Emergency Stop	Lower control box
S16	Temp Switch	Over Temperature Control	Engine
S17	Foot Switch	Enables operation from platform	Floor of platform
S18	Hi/Lo Switch	Selects Hi or Low Speed	Platform control box
S19	Platform Key Switch	Enables operation from platform	Platform control box
S20	Horn Switch	Sounds horn	Platform control Box

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
S21	Boom Extend Drive Interlock	Controls travel speed, Slow/ Fast	On Boom
S22	Propane/Gas Switch	Selects Propane/Gas	Platform control box
S23	Propane Prime Switch	Actuates Propane Prime Auto Choke Solenoid	Lower control box
SNSR	Level Sensor	Provides power to cutout relay when machine is level.	Control module.
SOL1	Trim UP Solenoid.	Controls lift valve.	Right side of manifold
SOL2	Trim Down Solenoid.	Controls lift valve.	Right side of manifold
SOL3	Jib Up Solenoid.	Controls lift valve.	Right side of manifold
SOL4	Jib Down Solenoid.	Controls lift valve.	Right side of manifold
SOL5	Boom Up Solenoid.	Controls lift valve.	Right side of manifold
SOL6	Boom Down Solenoid.	Controls lift valve.	Right side of manifold
SOL7	Boom Extend Solenoid	Controls reverse valve.	Right side of manifold
SOL8	Boom Retract Solenoid.	Controls lift valve.	Right side of manifold
SOL9	Riser Up Solenoid.	Controls lift valve.	Right side of manifold
SOL10	Riser Down Solenoid	Controls series / parallel valves	Right side of manifold
SOL11	Cage Right Solenoid.	Controls lift valve.	Right side of manifold
SOL12	Cage Left Solenoid	Controls down valve.	Right side of manifold
SOL13	Turret Right Solenoid	Controls steer valve when steering right.	Right side of manifold
SOL14	TurretLeft Solenoid	Controls steer valve when steering left.	Right side of manifold
SOL15	Steer Right Solenoid	Controls engine throttle.	Right side of manifold
SOL16	Steer LeftSolenoid	Controls engine choke.	Right side of manifold
SOL17	Low Flow	Controls lift valve.	Right side of manifold
SOL18	High Flow	Controls lift valve.	Right side of manifold
SOL19	Left Lock Solenoid	Locks Left Axle Cylinder	Drive Valve Block
SOL20	Fuel Valve Solenoid	Allows Fuel to	Engine Compartment
SOL21	Propane Carburetor Solenoid	Controls Propane Carburetor	Engine Compartment
SOL22	Brake Solenoid	Actuates Brakes	Drive Valve Block
SOL23	High Torque Solenoid	Allows High Torque	Drive Valve Block
SOL24	Right Lock Solenoid	Locks Right Axle Cylinder	Drive Valve Block
SOL25	Idle Solenoid	Controls Idle Speed	Engine Compartment
SOL26	Auto Choke Solenoid	Actuates Choke	Engine Compartment
SOL27	Propane Carburetor Solenoid	Controls Propane Carburetor	Engine Compartment
SOL28	Propane Prime Solenoid	Activates Auto Choke	Engine Compartment

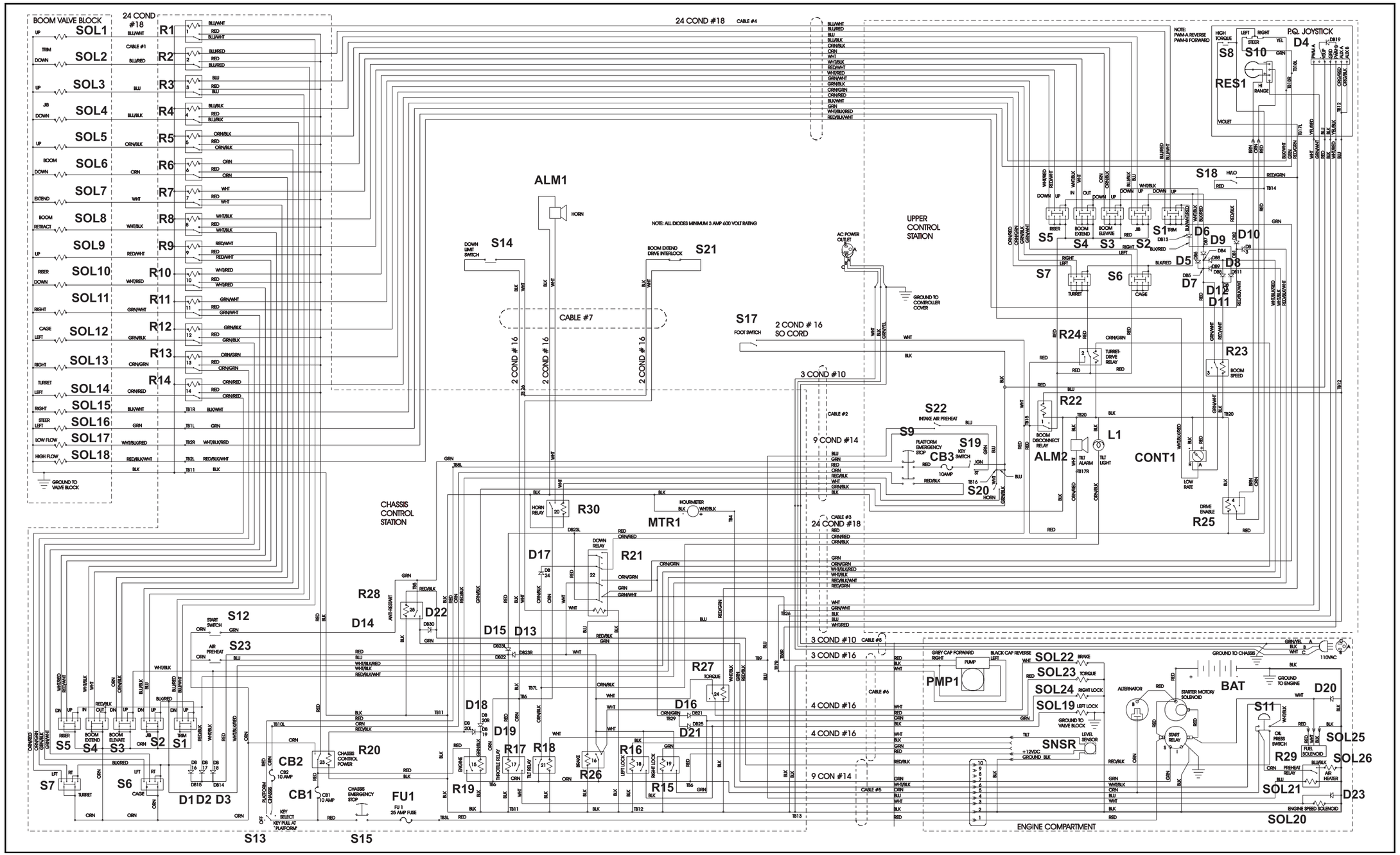


Figure 5-3: Electrical Schematic, Diesel Model 068341-012

5.4 HYDRAULIC SCHEMATIC

Table 5-4: Hydraulic Schematic Legend

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV1	Check Valve	Flow Check	Drive Pump
CV2	Check Valve	Flow Check	Slew Motor
CV3	Check Valve, Turret Rotate	Flow Check	Hydraulic Manifold
CV4	Check Valve, Trim	Flow Check	Hydraulic Manifold
CV5	Check Valve, Jib	Flow Check	Hydraulic Manifold
CV6	Check Valve, Boom Raise	Flow Check	Hydraulic Manifold
CV7	Check Valve, Boom Extend	Flow Check	Hydraulic Manifold
CV8	Check Valve, Riser	Flow Check	Hydraulic Manifold
CV9	Check Valve, High Relief	Flow Check	Hydraulic Manifold
CV10	Check Valve, High Relief	Flow Check	Hydraulic Manifold
CV11(2)	Check Valve, Brake Release	Flow Check	Hydraulic Manifold
CV12	Check Valve, High	Flow Check	Hydraulic Manifold
CV13	Check Valve, Low	Flow Check	Hydraulic Manifold
CV14 (2)	Check Valve, Hand Pump	Stops flow from hand pump through diverter valve	Hydraulic Manifold
CV15 (2)	Check Valve, Cage Rotate	Reduces pressure for smooth cage rotate operation	Hydraulic Manifold
CV16	Check Valve, Jib Lower	Sends oil through ORF1 to slow jib lowering	Hydraulic Manifold
CV17	Check Valve	Flow Check	Left Axle Cylinder
CV18	Check Valve	Flow Check	Right Axle Cylinder
CYL1	Steering Cylinder	Actuates steering linkage to steer front wheels	Front axle assembly
CYL2	Riser Cylinder	Raise Elevating Assembly	Elevating Assembly
CYL3	Boom Extend Cylinder	Extend Boom	Inside Boom
CYL4	Boom Raise Cylinder	Raise Elevating Assembly	Elevating Assembly
CYL5	Jib Cylinder	Raise Jib	Jib
CYL6	Master Cylinder	Maintain cage level	Rear of Boom
CYL7	Slave Cylinder	Maintain cage level	Front of Boom
CYL8	Cage Rotate Cylinder	Rotate cage	Between cage and Jib
CYL9	Left Brake Cylinder	Release left brake	Left brake
CYL10	Right Brake Cylinder	Release right brake	Right brake
CYL11	Left Axle Cylinder	Adjust Front Axle	Front Axle
CTL12	Right Axle Cylinder	Adjust Front Axle	Front Axle
FL1	Filter, Return	Keep oil clean	Hydraulic tank
Fl2	Filter, Suction Strainer	Keep oil clean	Pump
Fl3	Filter, Return	Keep oil clean	Hydraulic tank
Fl4	Filter, Suction Strainer	Keep oil clean	Pump
MOT1	Motor, Drive	Drive Motor	Left Rear
MOT2	Motor, Drive	Drive Motor	Right Front
MOT3	Motor, Drive	Drive Motor	Right Rear
MOT4	Motor, Drive	Drive Motor	Left Front
MOT5	Motor, Slew	Slew Motor	Bottom of Turret
ORF1	Jib Down Orifice	Limits the descent speed of the jib	Jib Cylinder
ORF2 & 3	Brake Apply Orifice	Allows Free Flow to Brakes	Drive Valve Block
PMP1	Drive Pump	Provides fluid power for drive system	Chassis
PMP2	Boom Pump	Provides fluid power for boom system	Chassis
PMP3	Hand Pump	Pump up brakes for towing	Hydraulic manifold
RV1	High Pressure Relief Valve	Limits maximum pressure	Hydraulic manifold
RV2	Low Pressure Relief Valve	Limits minimum pressure	Hydraulic manifold
RV3	Turret Rotate Relief Valve	Limit pressure to turret rotate motor	Hydraulic manifold
RV4	Riser Relief Valve	Limit pressure to riser cylinder	Riser cylinder
RV5	Boom Extend Relief Valve	Limit pressure to boom extend cylinder	Boom extend cylinder
RV6	Boom Raise Relief Valve	Limit pressure to boom raise cylinder	Boom raise cylinder
RV7	Jib Relief Valve	Limit pressure to jib cylinder	Jib cylinder
RV8 (2)	Master Relief Valve	Limit pressure to master cylinder	Master cylinder
RV9 (2)	Slave Relief Valve	Limit pressure to slave cylinder	Slave cylinder
RV10 (2)	Cage Rotate Relief Valve	Limit pressure to cage rotate cylinder	Cage rotate cylinder
RV11	Charge Relief Valve	Limit Charge Pressure	Drive Pump
V1	Steering Valve	Controls oil flow to steering cylinder	Top of manifold, ports marked 'D'
V2	Riser Valve	Controls oil flow to Riser Cylinder	Front of manifold, port
V3	Boom Extend Valve	Controls oil flow to Boom Extend Cylinder	Hydraulic manifold
V4	Boom Raise Valve	Controls oil flow to Boom Raise Cylinder	Hydraulic manifold
V5	Jib Valve	Controls oil flow to Jib Cylinder	Hydraulic manifold
V6	Trim/Level Valve	Controls oil flow to Master Cylinder	Hydraulic manifold
V7	Cage Rotate Valve	Controls loi flow to Cage Rotate Cylinder	Hydraulic manifold
V8	Turret Rotate Valve	Controls oil flow to Slew Motor (MOT1)	Hydraulic manifold
V9	Brake Apply Valve	Apply brakes	Brake valve block
V10	High Torque Valve	Allows extra oil flow to drive motors	Drive Block
V11	Low Rate Valve	Flow control	Hydraulic manifold
V12	High Dump Rate	Power to riser and boom extend cylinders	Hydraulic manifold
V13	Diverter Valve	Allows hand pump to function	Hydraulic manifold
V14	Left Axle Cylinder Valve	Controls Left Axle Cylinder	Drive Block
V15	Right Axle Cylinder Valve	Controls Left Axle Cylinder	Drive Block

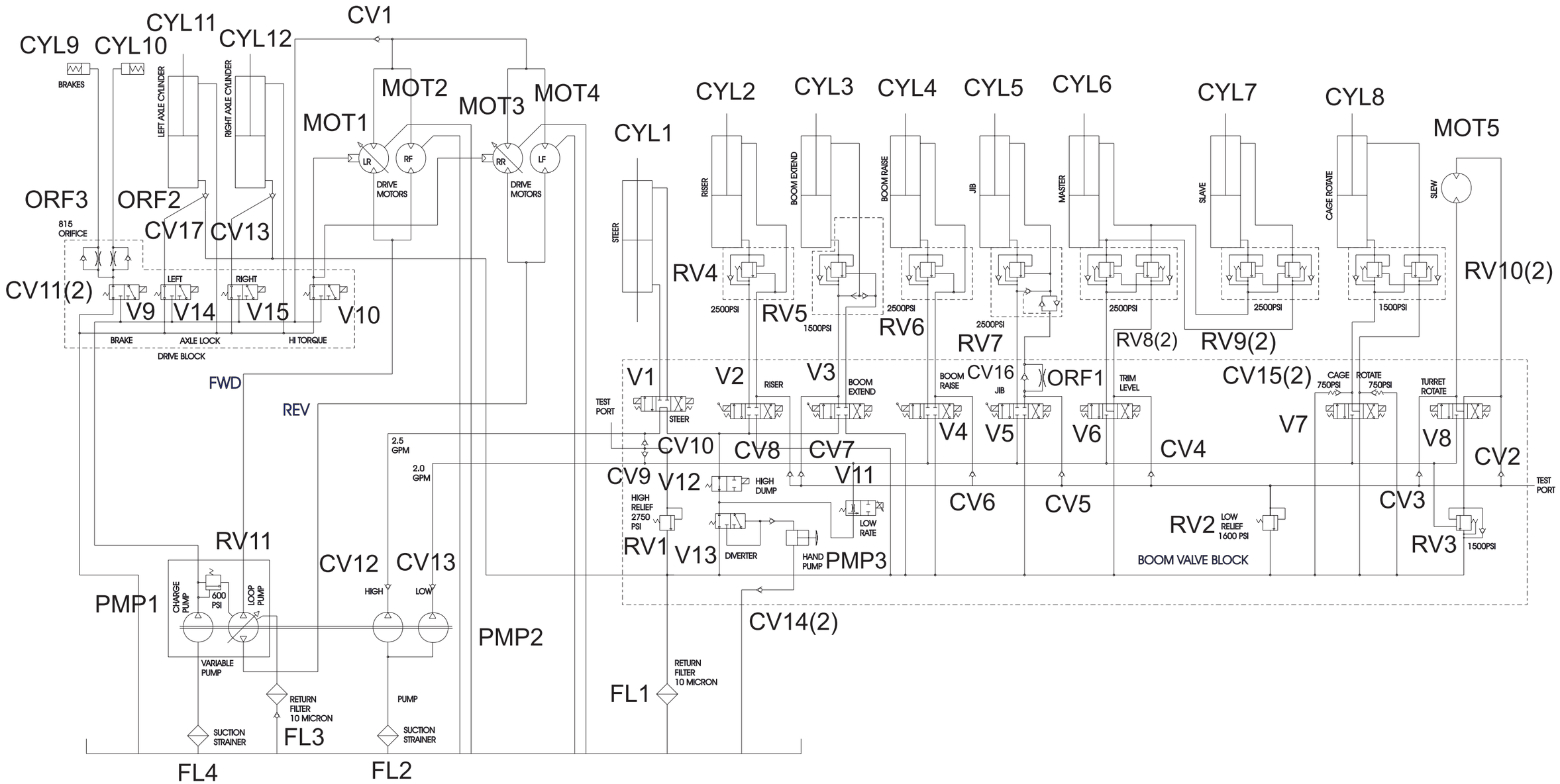


Figure 5-4: Hydraulic Schematic

5.5 BOOM VALVE BLOCK ASSEMBLY

Table 5-5: Boom Valve Block Legend

ITEM	DESCRIPTION
1	VALVE BLOCK SUB-ASSY
2	FITTING, 2062-4-4S
3	WASHER, 5/16 FLAT
4	90ø ELBOW 3/4 NPT X 3/4 JIC
5	FLOW CNTRL, WATERMAN
6	3 POS, 4 WAY, TANDEM CENTER
7	3 POS, 4 WAY, CLOSED CENTER
8	3 POS, 4 WAY, MOTOR SPOOL
9	RELIEF VALVE, 2750 PSI
10	RELIEF VALVE, 1600 PSI
11	PLUG, GAUGE PORT
12	DIVERTER VALVE
13	COUNTERBALANCE VALVE, TURRET ROTATE
14	PISTON, HAND PUMP
15	LEVER WELDMENT, HAND PUMP
16	LEVER EXTENSION, HAND PUMP
17	DETENT BALL / SPRING

ITEM	DESCRIPTION
18	PIVOT LINK
19	MOUNTING PLATE, VALVE BLOCK
20	SEAL, POLY PACK #12500625
21	SCREW, SOC.HD. 5/16-18 UNC X 1/2
22	SCREW, SHOULDER, 3/8 X 5/8
23	FITTING, STRAIGHT, 4MB-6MJ
24	FILTER ASSEMBLY
25	PIPE NIPPLE, 3/4 SCHD 40 X 4
26	FITTING, 45ø 6MB-4MJ
27	FITTING, 45ø SWIVEL EL. 4MB-4MJ
28	FITTING, 90ø 4MB-6MJ
29	FITTING, 90ø EL. 6MB-6MJ
30	HAND GRIP, VINYL
31	FITTING, 2062-6-4S
32	SCREW BUTT HEAD 1/4-20 UNC X 1/2
33	SCREW BUTT HEAD, 5/16-18 UNC X 3/4
34	LANYARD ASSEMBLY

ITEM	DESCRIPTION
35	FITTING 202702-6-6S
36	ORFICE
37	VALVE
38	STEEL BALL 7/16 DIA
39	BRACKET
40	CONNECTOR RING, 18-14 GA. #8
41	CONNECTOR, FEMALE, PUSH, .25
42	WIRE, 16 GA. BLACK

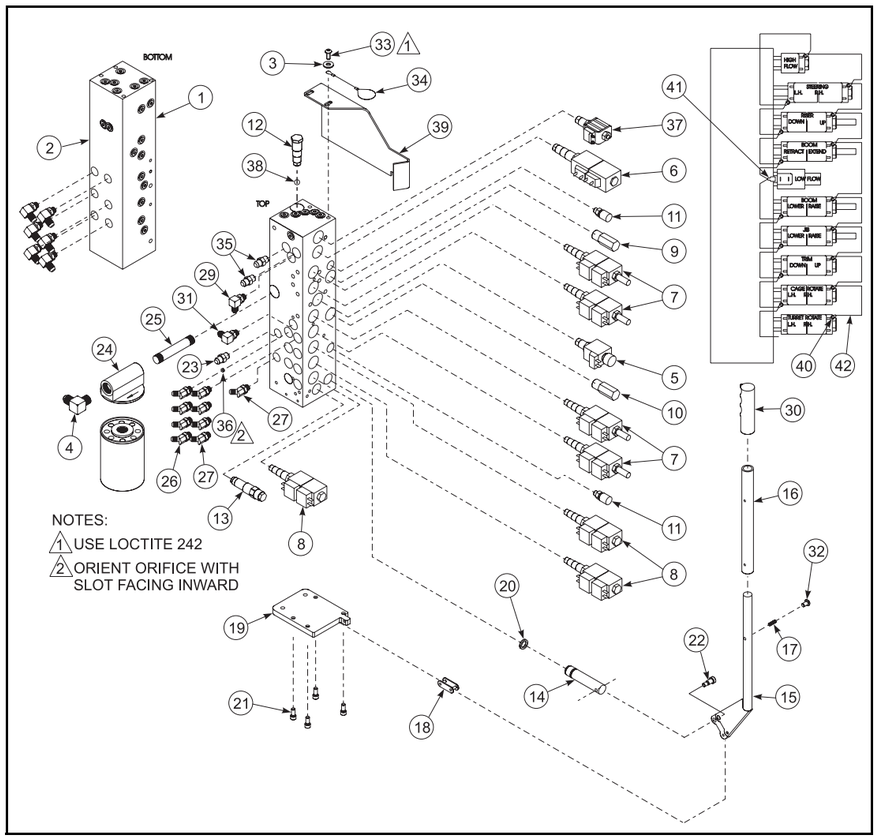


Figure 5-5: Boom Valve block Assembly - 068348-002

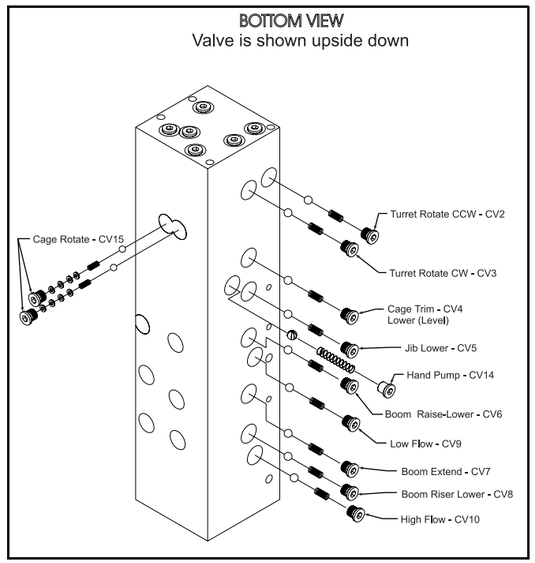


Figure 5-6: Check Ports

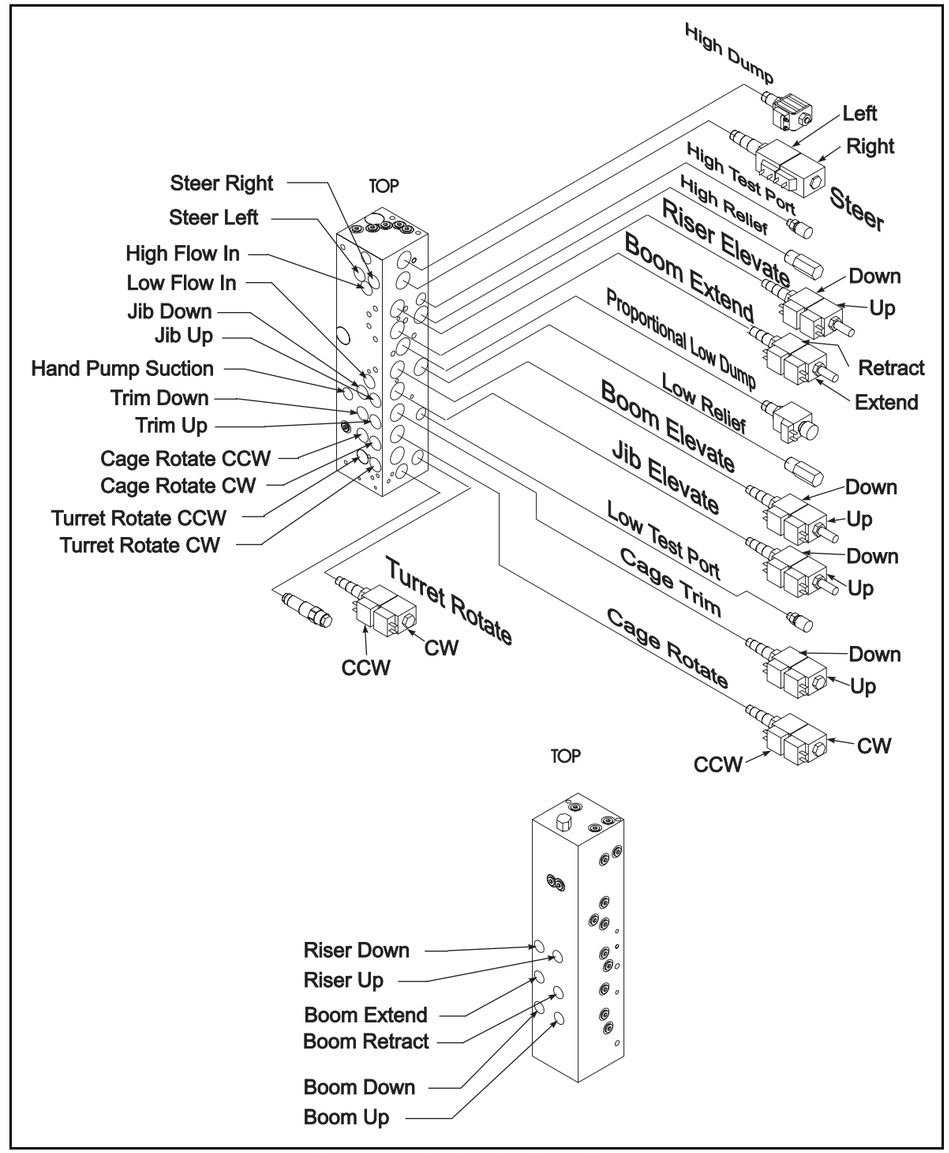


Figure 5-7: Hydraulic Valve Ports

5.6 DRIVE VALVE BLOCK ASSEMBLY

Table 5-6: Drive Valve Block Legend

ITEM	DESCRIPTION
1	Valve Block
2	Valve Spool, 2 Position - 3 Way
3	Plug
4	Adapter, 90ø - 6MB - 4MJ
5	Adapter, 90ø - 6MB - 6MJ
6	Adapter, Long, 90ø - 4MB - 4MJ
7	Adapter, 90ø - 4MB - 4MJ
8	Plug, #4 SAE
9	Orifice, Cessna #16097-805
10	Adapter, Straight, 4MB-4MJ

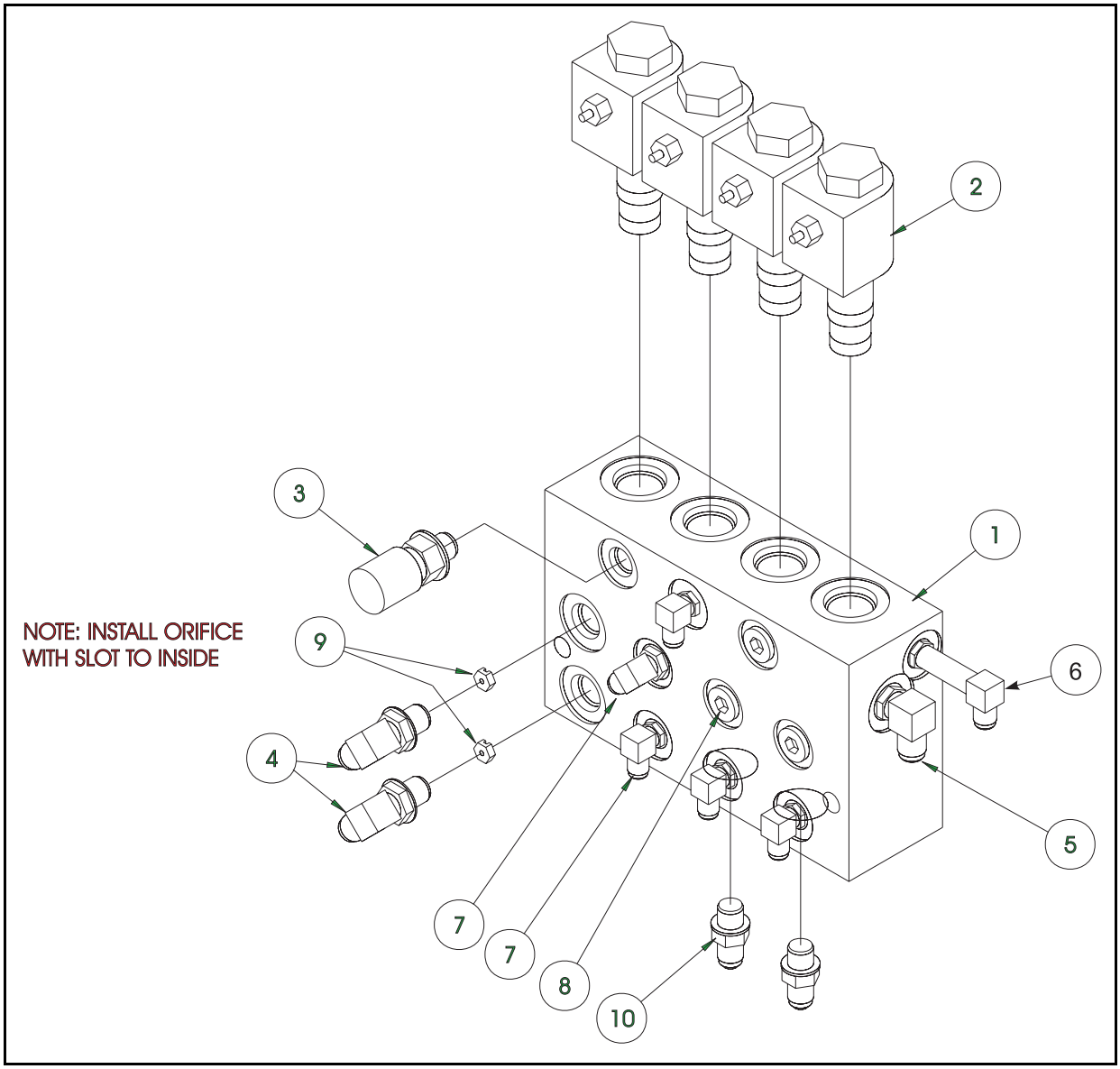


Figure 5-8: Drive Valve Block

5.7 UPPER CONTROL BOX COMPONENT LOCATION

Table 5-7: Upper Control Box Components

		Gas Model	Diesel Model
1	Emergency Stop Button	X	X
2	LP/Gas Switch	X	
3	Horn	X	X
4	Out of Level Lamp	X	X
5	Switch, Torque, Hi/Low	X	X
6	Switch, Jib Control	X	X
7	Switch, Boom Extend	X	X
8	Switch, Upper Boom	X	X
9	Switch, Riser Control	X	X
10	Rheostat, Controller	X	X
11	Joystick	X	X
12	Key Switch/Engine Start	X	X
13	Terminal Strip	X	X

		Gas Model	Diesel Model
14	Cable Connector, 3/4	X	X
15	Switch, Platform Level	X	X
16	Switch, Platform Rotate	X	X
17	Switch, Turret Rotate	X	X
18	Cable Connector, 1/2	X	X
19	Circuit Breaker, 10 amp	X	X
20	Terminal End	X	X
21	End Cap, Contact Block	X	X
22	Terminal Block, Tan	X	X
23	Terminal Block, Blue	X	X
24	Terminal Block, Orange	X	X
25	Relay, SPDT, 48 Volt	X	X

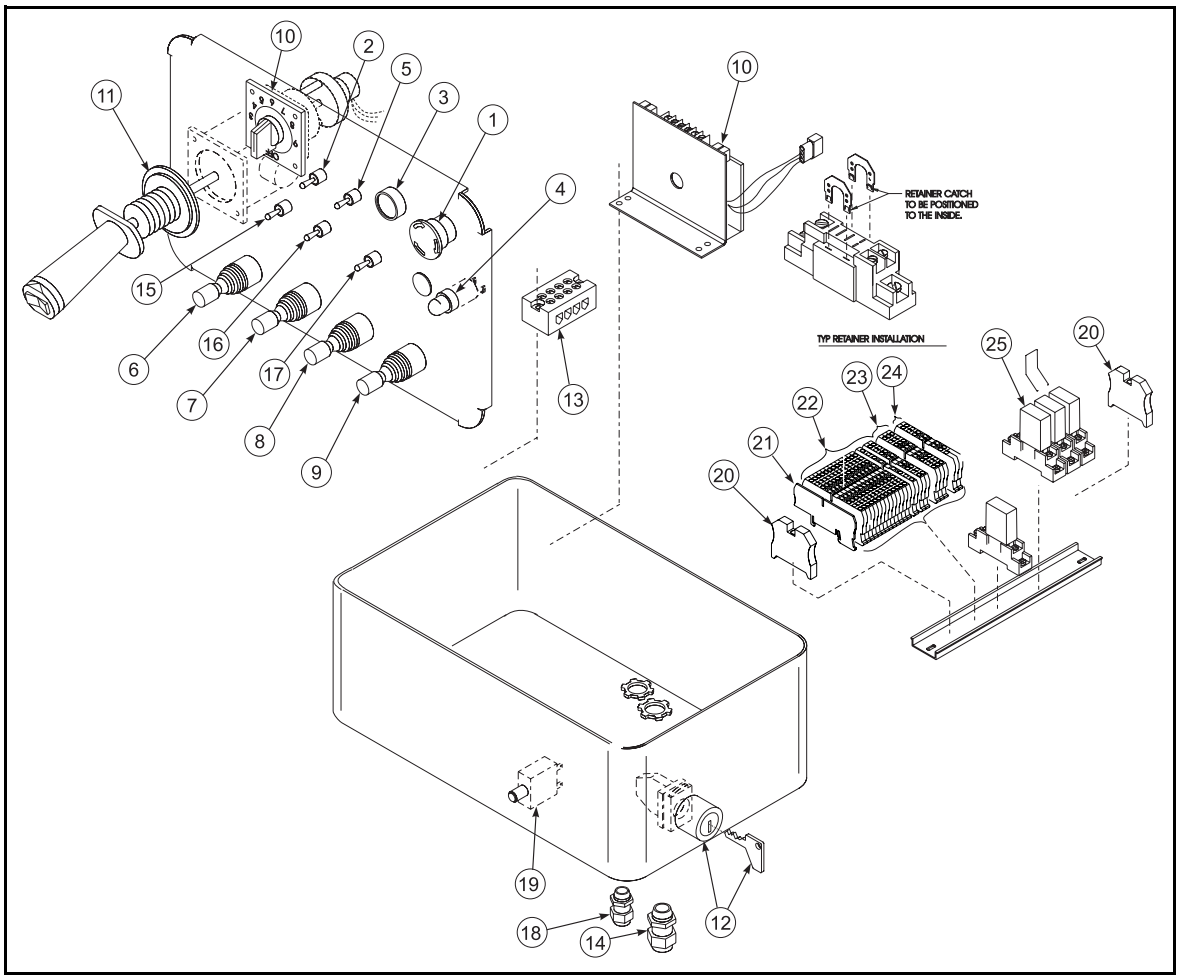


Figure 5-9: Upper Controller

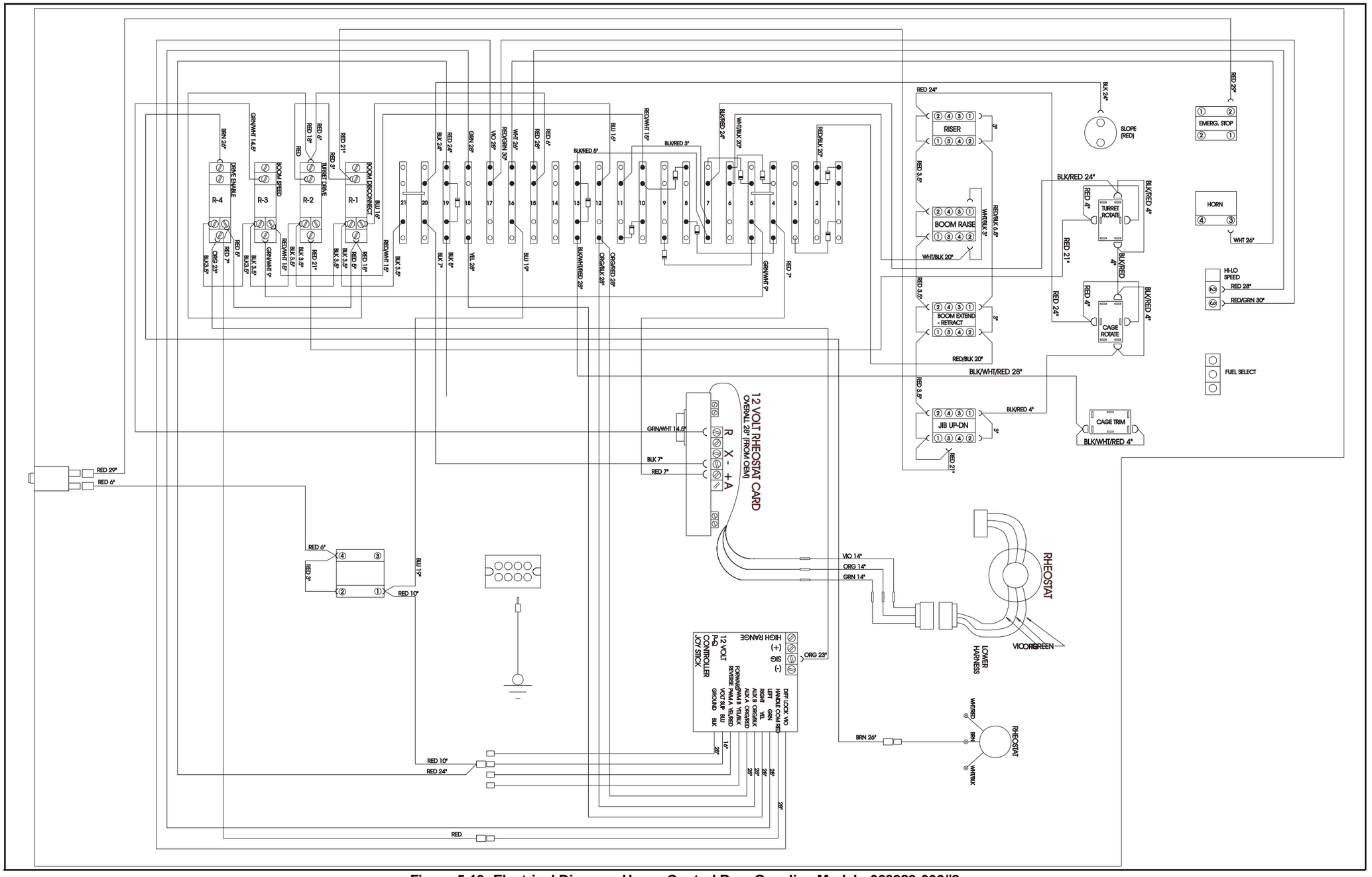


Figure 5-10: Electrical Diagram, Upper Control Box, Gasoline Model - 068329-006#2

SCHEMATICS

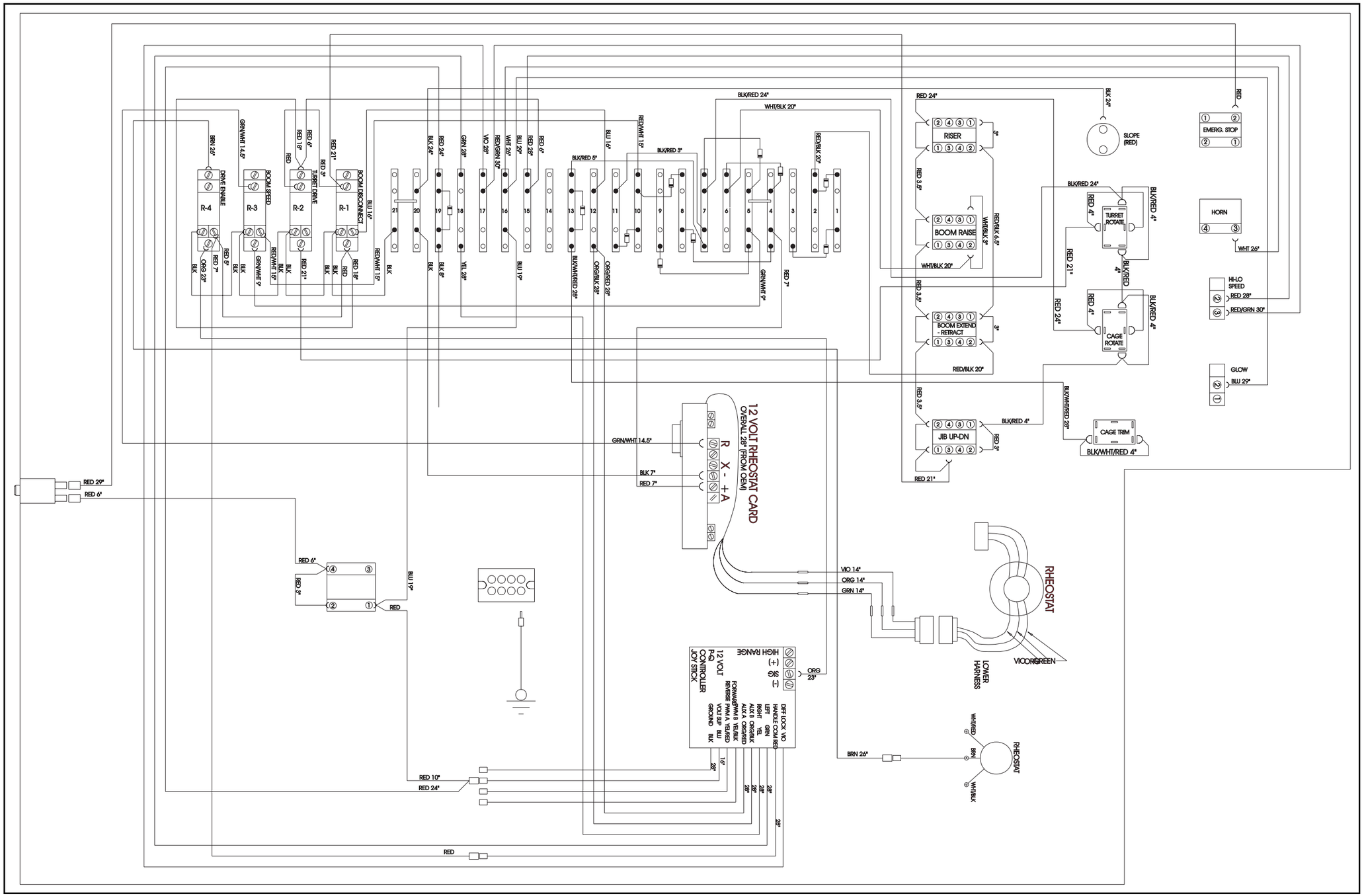


Figure 5-11: Electrical Diagram, Upper Control Box, Diesel Model - 068329-007#2

5.8 LOWER CONTROL BOX COMPONENT LOCATION

Table 5-8: Lower Control Box Components

ITEM	DESCRIPTION
1.	Emergency Stop Button
2.	Engine Start Button
3.	Choke/Glow Plug
4.	Key Switch
5.	Fuse (25A)
6.	Riser Switch
7.	Boom Raise Switch
8.	Boom Extend Switch
9.	Jib Extend Switch
10.	Turret Rotate
11.	Cage Rotate Switch
12.	Cage Level Switch
13.	Hour Meter
14.	Circuit Breaker

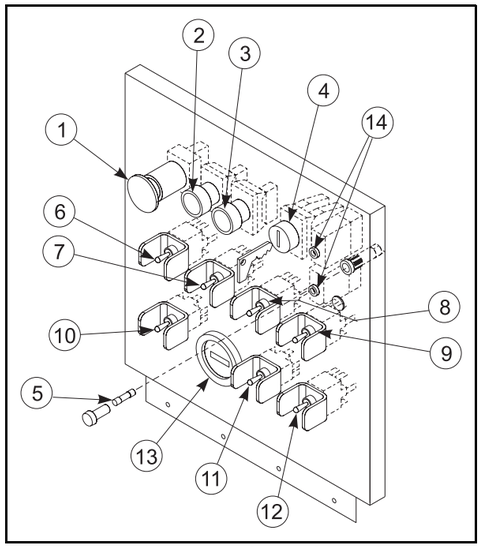


Figure 5-12: Lower Control Box Cover

Table 5-9: Lower Control Box Terminal Strip Components

ITEM	DESCRIPTION
1.	Cord Grip, 3/4”
2.	Terminal Strip (120VAC)
3.	End Block
4.	Jumper, 2 pin
5.	Terminal Block (blue)
6.	Terminal Block (tan)
7.	Relay, SPDT
8.	Retainer Clip, 1 pole
9.	Socket, Four Relay
10.	Retainer Clip, 4 pole
11.	Relay, 12 VDC, 4 pole
12.	End Block, Terminal
13.	Jumper, 3 pin
14.	Terminal Block (orange)
15.	Socket, Single Relay

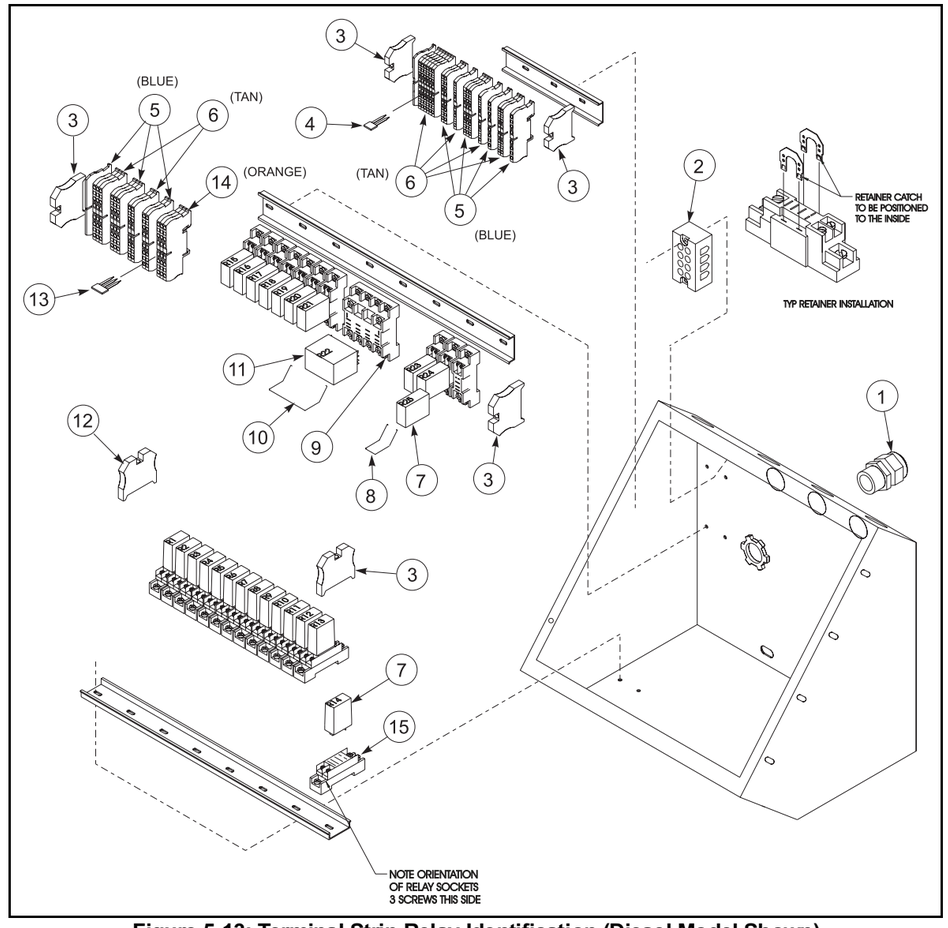


Figure 5-13: Terminal Strip Relay Identification (Diesel Model Shown)

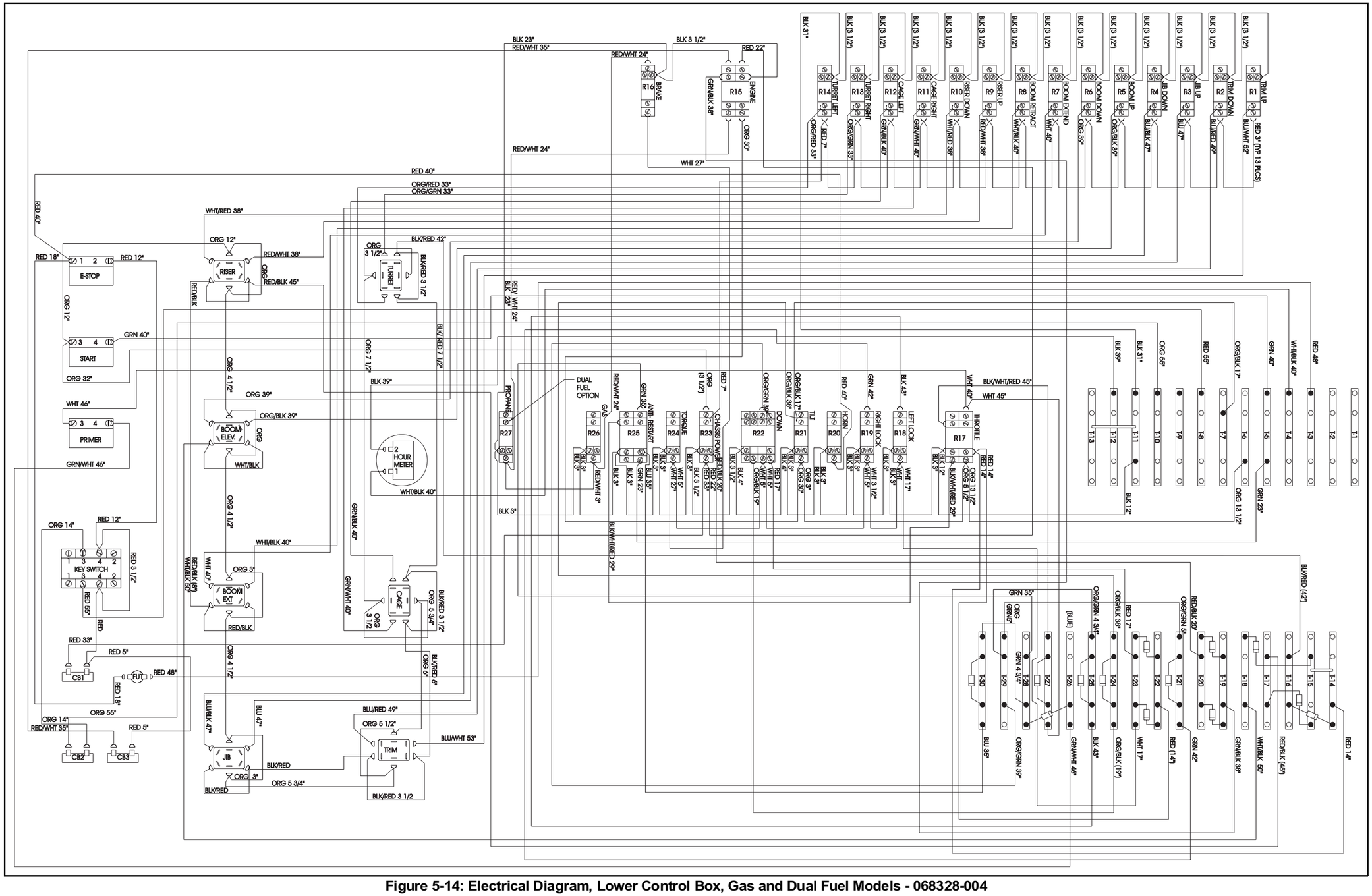


Figure 5-14: Electrical Diagram, Lower Control Box, Gas and Dual Fuel Models - 068328-004

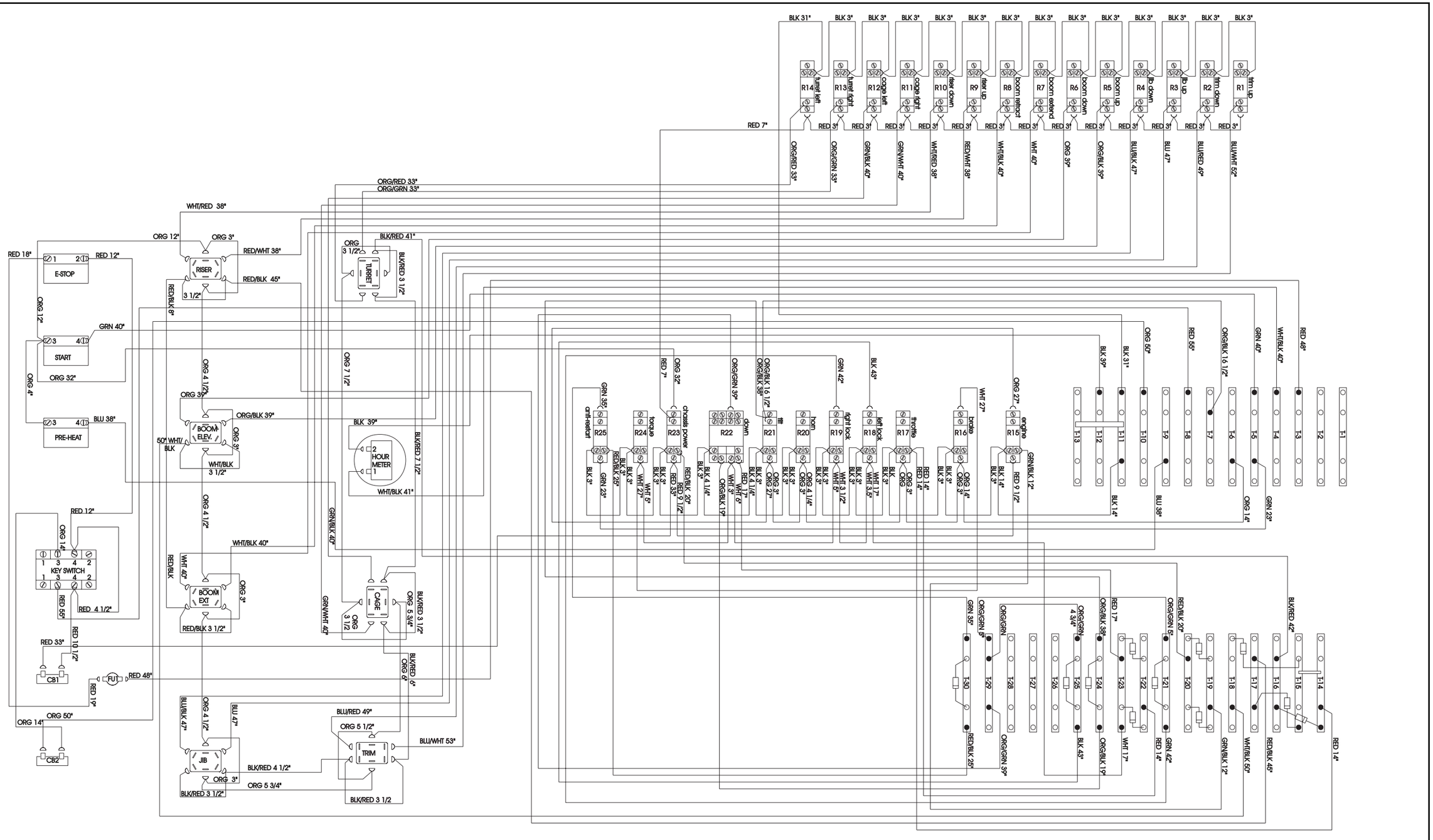


Figure 5-15: Electrical Diagram, Lower Control Box, Diesel Models - 068328-005

Notes

Section 6

ILLUSTRATED PARTS BREAKDOWN

Introduction

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

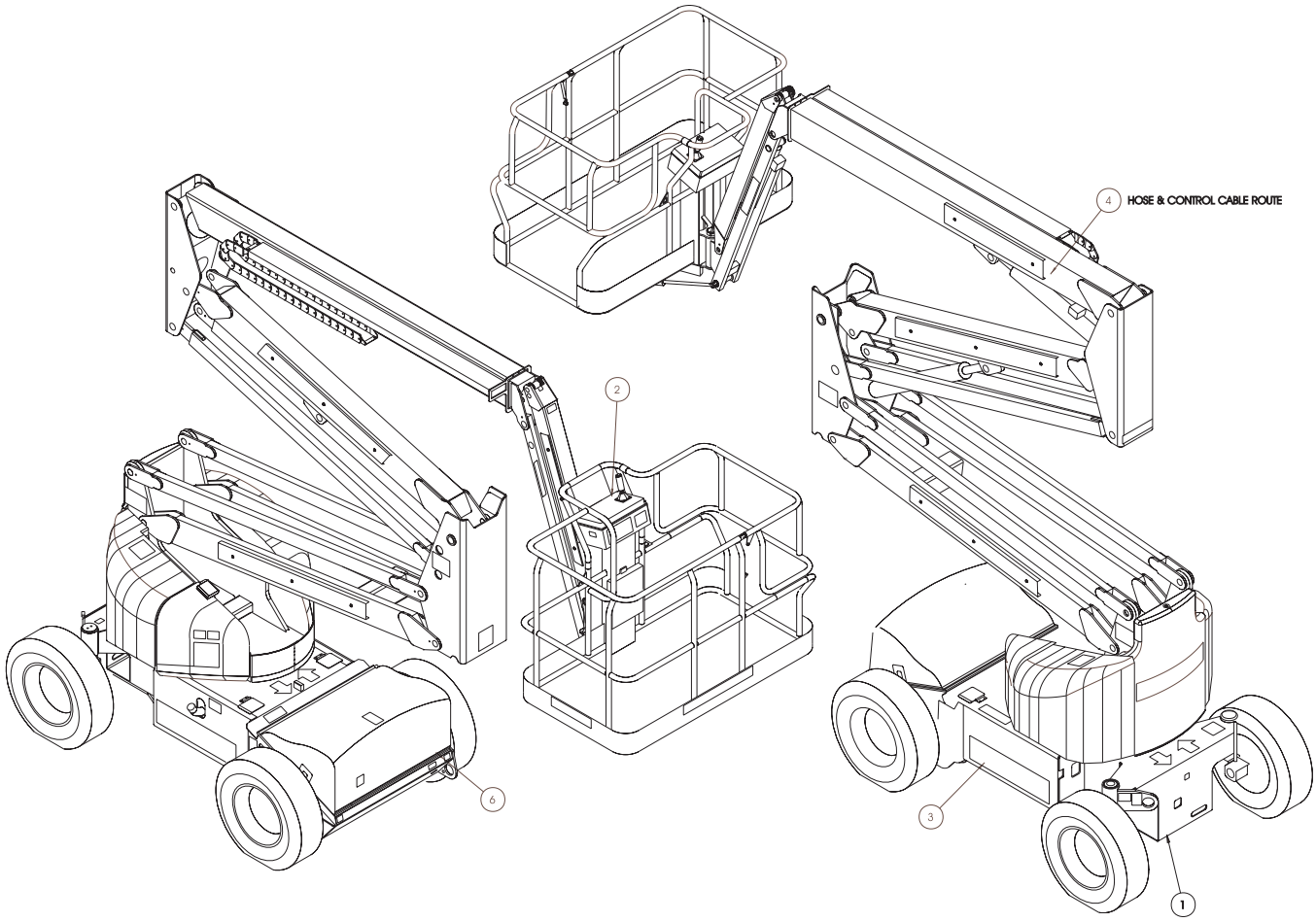
CONTENTS

Final Assembly, AB46RT Gas

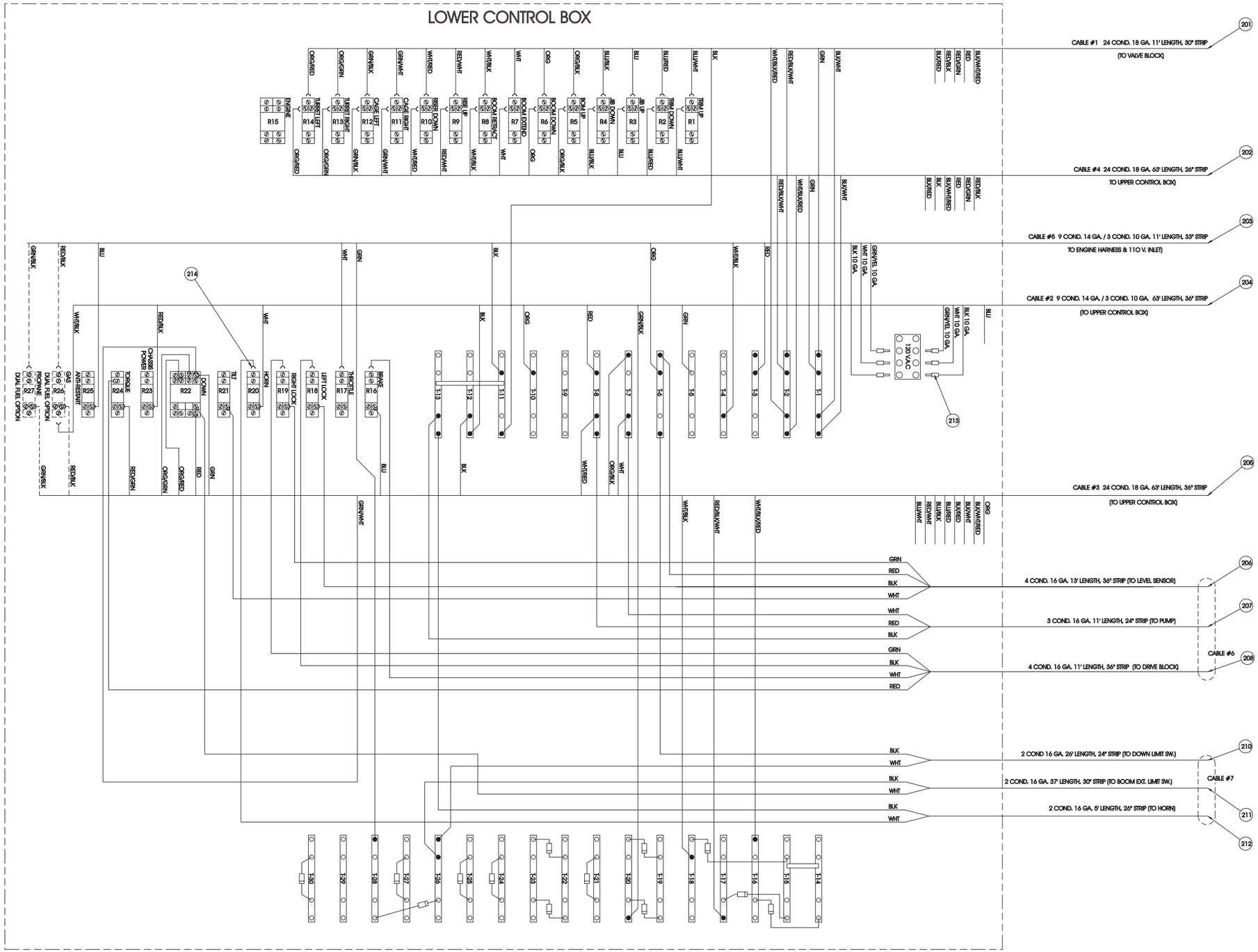
068311-000

ITEM	PART	DESCRIPTION	QTY.
1	68314-000	BASIC ASSY. AB46-G R/T	1
2	68339-007	CONTROLLER INSTL-GAS DOM	1
3	68335-004	LABEL KIT/INSTL-GAS	1
4	68336-003	HOSE KIT/INSTL-I/CNOT SHOWN	1
5	20032-003	FITTING TEE (SEE HOSE INSTL)	1
6	29945-014	LEVEL SENSORNOT SHOWN	1
7	20032-007	FITTING TEE (SEE HOSE INSTL)	1
8	14693-005	ADAPTOR (SEE HOSE INSTL)	1
9	11979-006	O-RING (SEE HOSE INSTL)	1
10	68952-000	CHECK VALVE (SEE HOSE INSTL)	1
11	67673-005	FITTING CROSS (SEE HOSE INSTL)	1
12	11934-001	FITTING 90ø (SEE HOSE INSTL)	1
13	068341-010	ELECTRCAL SCHEMATIC AB46 RT	REF
14	068340-004	HYDRAULIC SCHEMATIC AB46 RT	REF
201	29443-099	CABLE, 24 COND. 18 GA.	11 FT.
202	29433-099	CABLE, 24 COND. 18 GA.	63 FT.
203	29434-099	CABLE, 3-10 GA. / 9-14 GA.	11

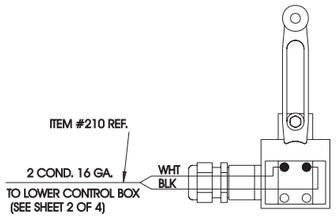
ITEM	PART	DESCRIPTION	QTY.
204	29434-099	CABLE, 3-10 GA. / 9-14 GA.	63 FT
205	29433-099	CABLE, 24 COND. 18 GA.	63 FT
206	29498-099	WIRE, 4 COND. 16 GA.	13 FT
207	29447-099	WIRE, 3 COND. 16 GA.	24 FT
208	29498-099	WIRE, 4 COND. 16 GA.	11 FT
210	29496-099	WIRE, 2 COND. 16 GA.	26 FT
211	29496-099	WIRE, 2 COND. 16 GA.	37 FT
212	29496-099	WIRE, 2 COND. 16 GA.	5 FT
213	68814-000	TERMINAL, PIN	6
214	29610-006	TERMINAL, FORK 18-16 #6	45
301	29601-005	TERMINAL, RING 18-22 GA. #10	22
302	29931-003	TERMINAL, FEM. PUSH-ON 16-14	15
303	14914-001	TERMINAL, MALE PUSH-ON 18-22 .25	3
401	29440-099	WIRE, 3 COND 12 GA. SO.	2 FT
402	29490-099	WIRE, 2 COND. 16 GA. SO.	8 FT
403	29496-099	WIRE, 2 COND. 16 GA.	2 FT



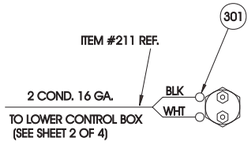
Final Assembly, Gas / 068311-000 / 1 of 4


LOWER CONTROL BOX
CABLE #1 24 COND. 18 GA. 11' LENGTH, 30" STRIP
(TO VALVE BLOCK)
CABLE #4 24 COND. 18 GA. 63' LENGTH, 26" STRIP
TO UPPER CONTROL BOX)
CABLE #5 9 COND. 14 GA. / 3 COND. 10 GA. 11' LENGTH, 33" STRIP
TO ENGINE HARNESS & 110 V. INLET)
CABLE #2 9 COND. 14 GA. / 3 COND. 10 GA. 63' LENGTH, 36" STRIP
(TO UPPER CONTROL BOX)
CABLE #3 24 COND. 18 GA. 63' LENGTH, 36" STRIP
(TO UPPER CONTROL BOX)
4 COND. 16 GA. 13' LENGTH, 36" STRIP (TO LEVEL SENSOR)
3 COND. 16 GA. 11' LENGTH, 24" STRIP (TO PUMP)
CABLE #6
4 COND. 16 GA. 11' LENGTH, 36" STRIP (TO DRIVE BLOCK)
2 COND 16 GA. 26' LENGTH, 24" STRIP (TO DOWN LIMIT SW.)
CABLE #7
2 COND. 16 GA. 37' LENGTH, 30" STRIP (TO BOOM EXT. LIMIT SW.)
2 COND. 16 GA. 5' LENGTH, 26" STRIP (TO HORN)
ENGINE
TURRET LEFT
TURRET RIGHT
CAGE LEFT
CAGE RIGHT
RISER DOWN
RISE UP
BOOM RETRACT
BOOM EXTEND
BOOM DOWN
BOOM UP
JIB DOWN
JIB UP
TRM DOWN
TRM UP
CHASSIS POWER
TORQUE
DOWN
TILT
HORN
RIGHT LOCK
LEFT LOCK
THROTTLE
BRAKE
GAS
ANTI-RESVRT
PROPANE
DUAL FUEL OPTION
110VAC

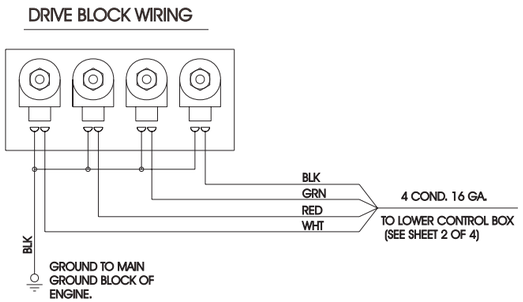
ILLUSTRATED PARTS BREAKDOWN

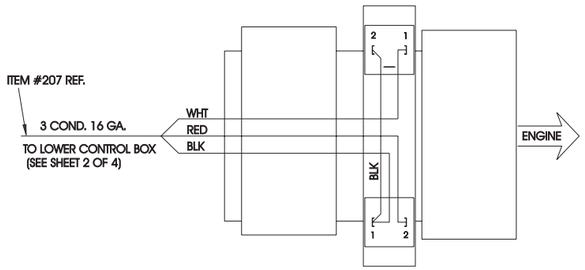


DOWN LIMIT SWITCH WIRING

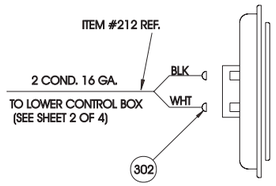


BOOM EXTENSION LIMIT SWITCH WIRING

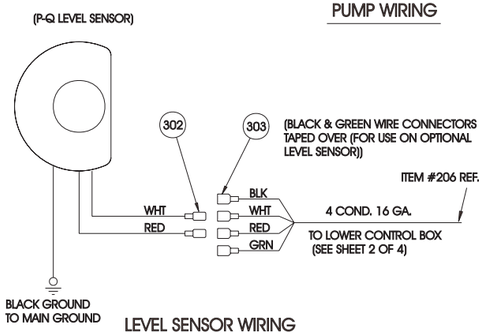




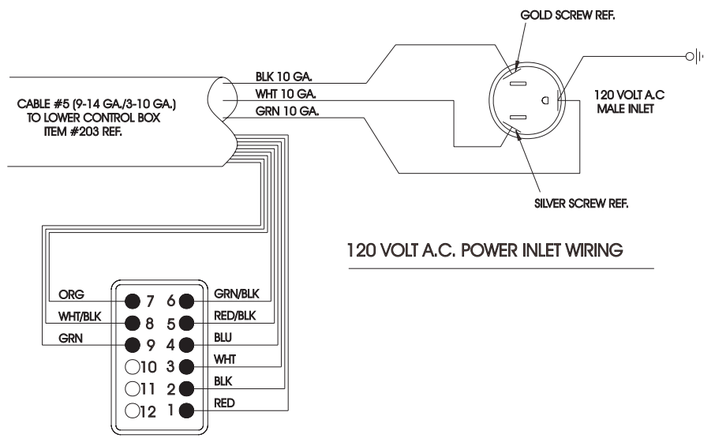
PUMP WIRING



HORN WIRING

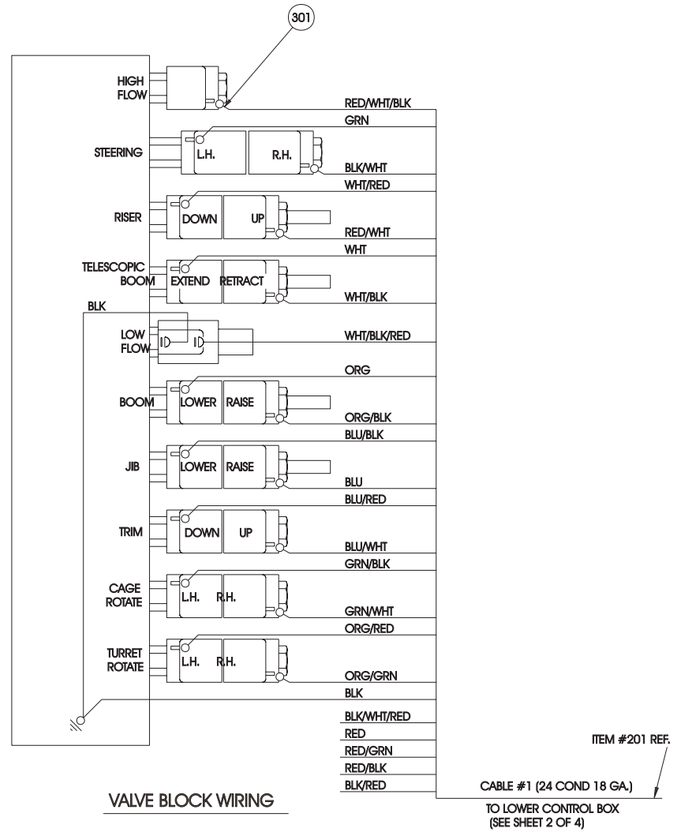


LEVEL SENSOR WIRING

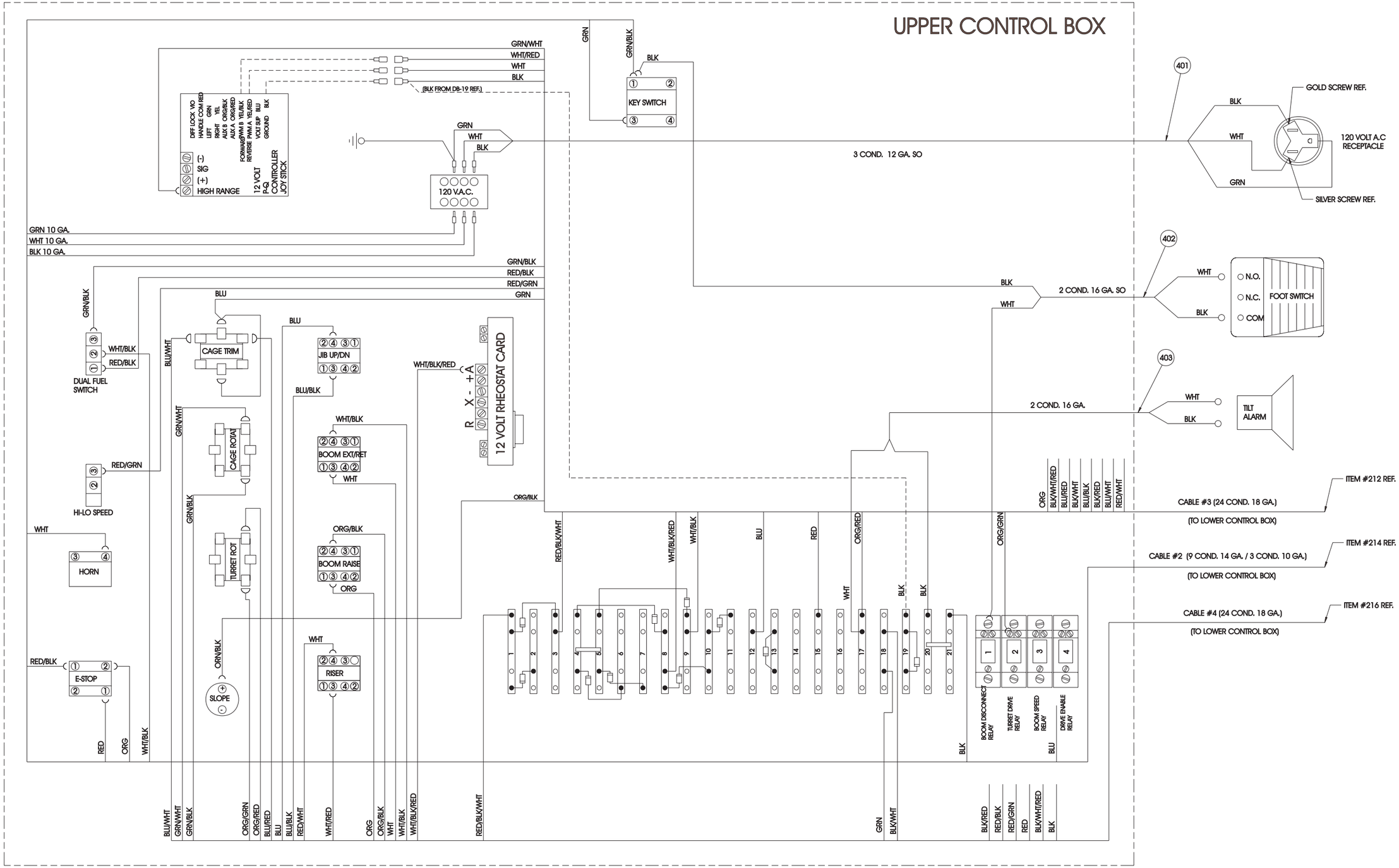


120 VOLT A.C. POWER INLET WIRING

ENGINE CABLE WIRING "DEUTSCH CONNECTOR"
SEE DWG. #68666-000 SHEET 2 OF 2 FOR
PART NUMBER CALL-OUTS



VALVE BLOCK WIRING

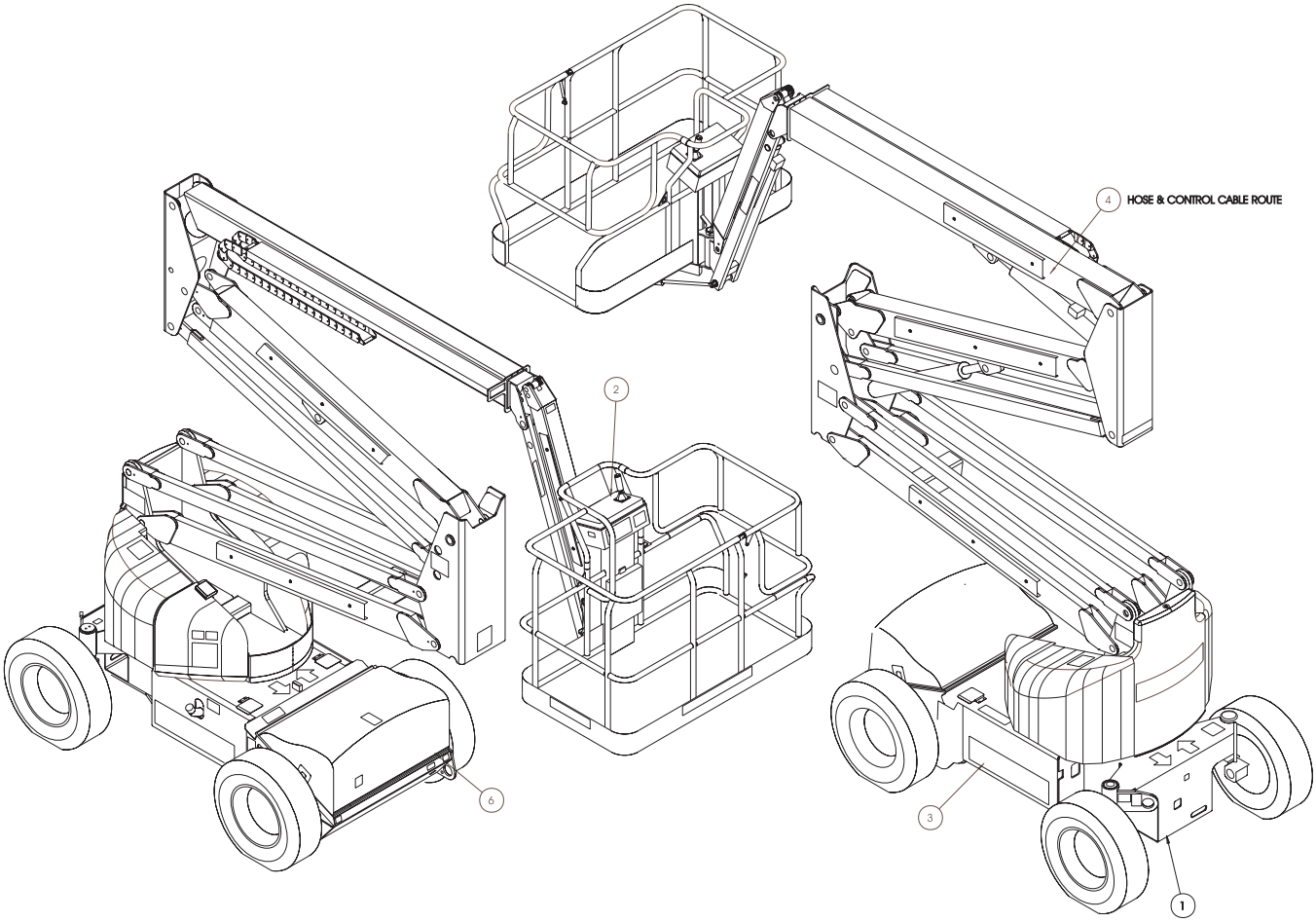

UPPER CONTROL BOX
GRN/WHT
WHT/RED
WHT
BLK
(BLK FROM DB-19 REF.)
DIFF LOCK VIO
HANDLE COM RED
LEFT GRN
RIGHT YEL
AUX B ORG/BLK
AUX A ORG/RED
FORWARD PWM B YEL/BLK
REVERSE PWM A YEL/RED
VOLT SUP BLU
GROUND BLK
(-)
SIG
(+)
HIGH RANGE
12 VOLT P-Q CONTROLLER JOY STICK
GRN
GRN/BLK
BLK
KEY SWITCH
GRN
WHT
BLK
120 V.A.C.
3 COND. 12 GA. SO
401
BLK
WHT
GRN
GOLD SCREW REF.
SILVER SCREW REF.
120 VOLT A.C RECEPTACLE
GRN 10 GA.
WHT 10 GA.
BLK 10 GA.
GRN/BLK
RED/BLK
RED/GRN
GRN
BLK
WHT
2 COND. 16 GA. SO
402
WHT
BLK
N.O.
N.C.
COM
FOOT SWITCH
403
WHT
BLK
2 COND. 16 GA.
TILT ALARM
GRN/BLK
WHT/BLK
RED/BLK
DUAL FUEL SWITCH
BLU
BLU/WHT
CAGE TRIM
BLU
JIB UP/DN
BLU/BLK
WHT/BLK
BOOM EXT/RET
WHT
ORG/BLK
BOOM RAISE
ORG
WHT
RISER
WHT/BLK/RED
R X - +A
12 VOLT RHEOSTAT CARD
GRN/WHT
CAGE ROTATE
RED/GRN
HI-LO SPEED
GRN/BLK
TURRET ROT
WHT
HORN
ORN/BLK
SLOPE
RED/BLK
E-STOP
RED
ORG
WHT/BLK
ORG
BLK/WHT/RED
BLU/RED
BLK/WHT
BLU/BLK
BLK/RED
BLU/WHT
RED/WHT
ITEM #212 REF.
CABLE #3 (24 COND. 18 GA.)
(TO LOWER CONTROL BOX)
ITEM #214 REF.
CABLE #2 (9 COND. 14 GA. / 3 COND. 10 GA.)
(TO LOWER CONTROL BOX)
ITEM #216 REF.
CABLE #4 (24 COND. 18 GA.)
(TO LOWER CONTROL BOX)
RED/BLK/WHT
WHT/BLK/RED
WHT/BLK
BLU
RED
ORG/RED
WHT
BLK
BLK
ORG/GRN
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
BOOM DISCONNECT RELAY
TURRET DRIVE RELAY
BOOM SPEED RELAY
DRIVE ENABLE RELAY
1 2 3 4
BLK
BLU
BLU/WHT
GRN/WHT
GRN/BLK
ORG/GRN
ORG/RED
BLU/RED
BLU
BLU/BLK
RED/WHT
WHT/RED
ORG
ORG/BLK
WHT
WHT/BLK
WHT/BLK/RED
RED/BLK/WHT
GRN
BLK/WHT
BLK/RED
RED/BLK
RED/GRN
RED
BLK/WHT/RED
BLK

Final Assembly, AB46RT Diesel

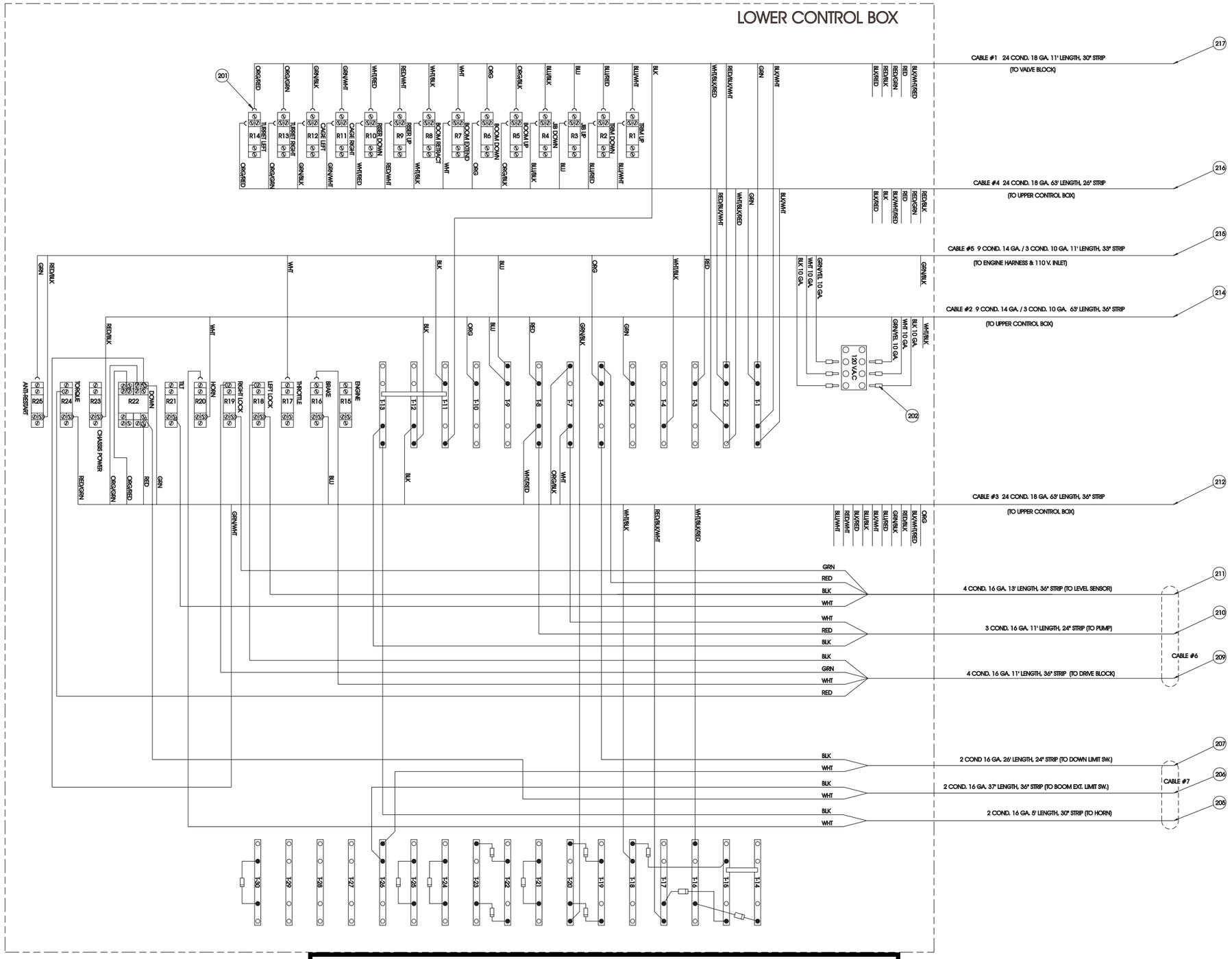
068312-000

ITEM	PART	DESCRIPTION	QTY.
1	68315-000	BASIC ASSY. AB46-D R/T	1
2	68339-008	CONTROLLER INSTL-DSL, DOM	1
3	68335-005	LABEL KIT/INSTL-DSL, DOM	1
4	68336-003	HOSE KIT/INSTL-DSL NOT SHOWN	1
5	20032-003	FITTING TEE (SEE HOSE INSTL)	1
6	29945-014	LEVEL SENSOR NOT SHOWN	1
7	20032-007	FITTING TEE (SEE HOSE INSTL)	1
8	14693-005	ADAPTOR (SEE HOSE INSTL)	1
9	11979-006	O-RING (SEE HOSE INSTL)	1
10	68952-000	CHECK VALVE (SEE HOSE INSTL)	1
11	67673-005	FITTING CROSS (SEE HOSE INSTL)	1
12	11934-001	FITTING 90ø (SEE HOSE INSTL)	1
201	29610-006	TERM, FORK 18-14 GA. #6	65
202	68814-000	TERM, PIN	12
205	29496-099	WIRE, 2 COND. 16 GA.	5 FT
206	29496-099	WIRE, 2 COND. 16 GA.	37 FT

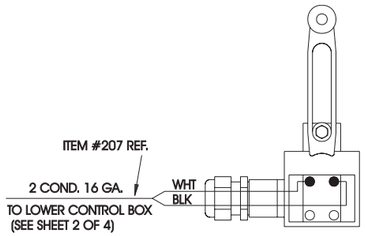
ITEM	PART	DESCRIPTION	QTY.
207	29496-099	WIRE, 2 COND. 16 GA.	24 FT
209	29498-099	WIRE, 4 COND. 16 GA.	11 FT
210	29447-099	WIRE, 3 COND. 16 GA.	11 FT
211	29498-099	WIRE, 4 COND. 16 GA.	13 FT
212	29433-099	CABLE, 24 COND. 18 GA.	63 FT
214	29434-099	CABLE, 3-10 GA. / 9-14 GA.	63 FT
215	29434-099	CABLE, 3-10 GA. / 9-14 GA.	63 FT
216	29433-099	CABLE, 24 COND. 18 GA.	63 FT
217	29433-099	CABLE, 24 COND. 18 GA.	11 FT
301	29601-005	TERM, RING 18-22 GA. #10	22
302	29931-003	TERM, FEM. PUSH-ON 16-14	15
303	14914-001	TERM, MALE PUSH-ON 18-22 .25	3
401	29440-099	WIRE, 3 COND. 12 GA. SO.	2FT.
402	29490-099	WIRE, 2 COND. 16 GA. SO.	8FT.
403	29496-099	WIRE, 2 COND. 16 GA.	2FT.



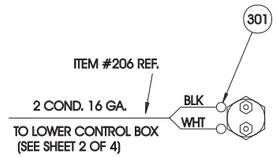
Final Assembly, Diesel / 068311-000 / 1 of 4



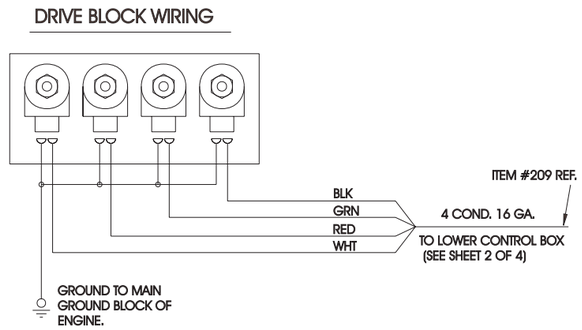
Final Assembly, Diesel / 068312-000 / 2 of 4

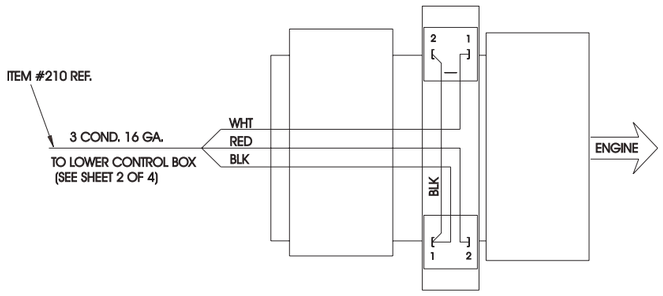


DOWN LIMIT SWITCH WIRING

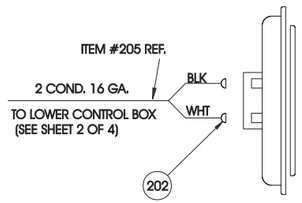


BOOM EXTENSION
LIMIT SWITCH WIRING

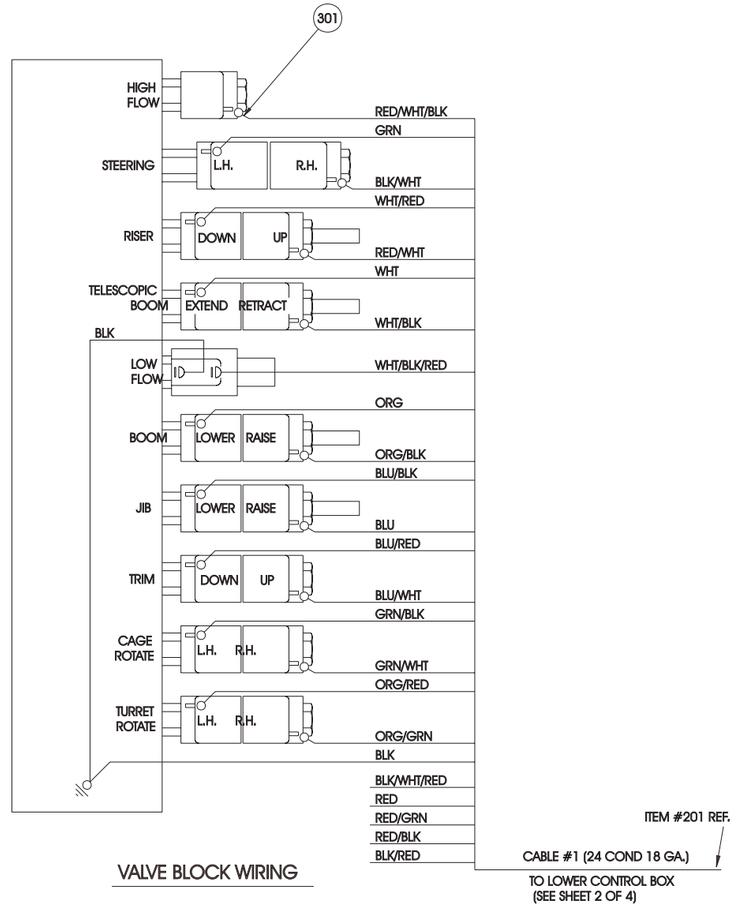




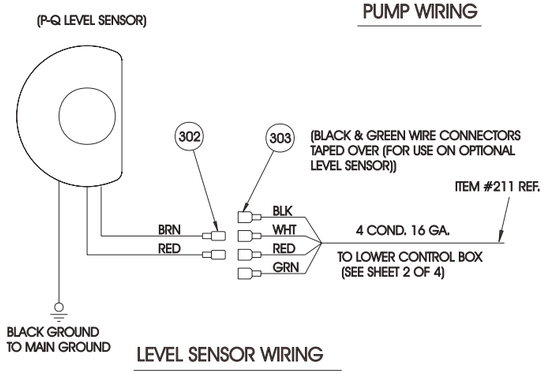
PUMP WIRING



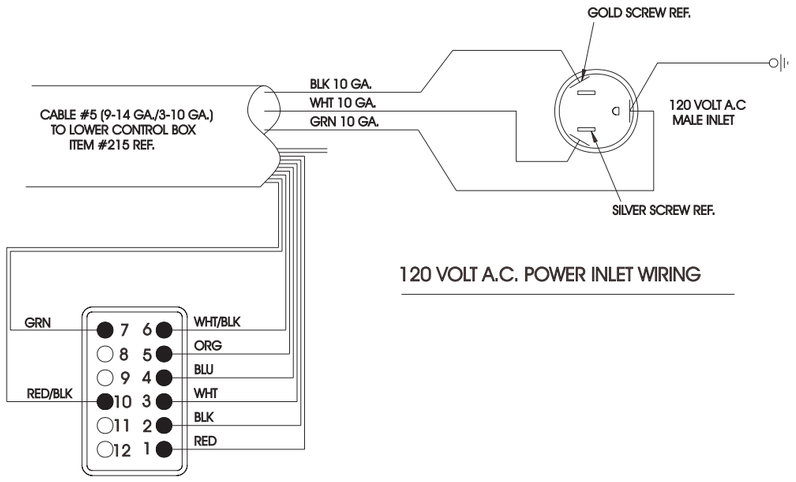
HORN WIRING



VALVE BLOCK WIRING

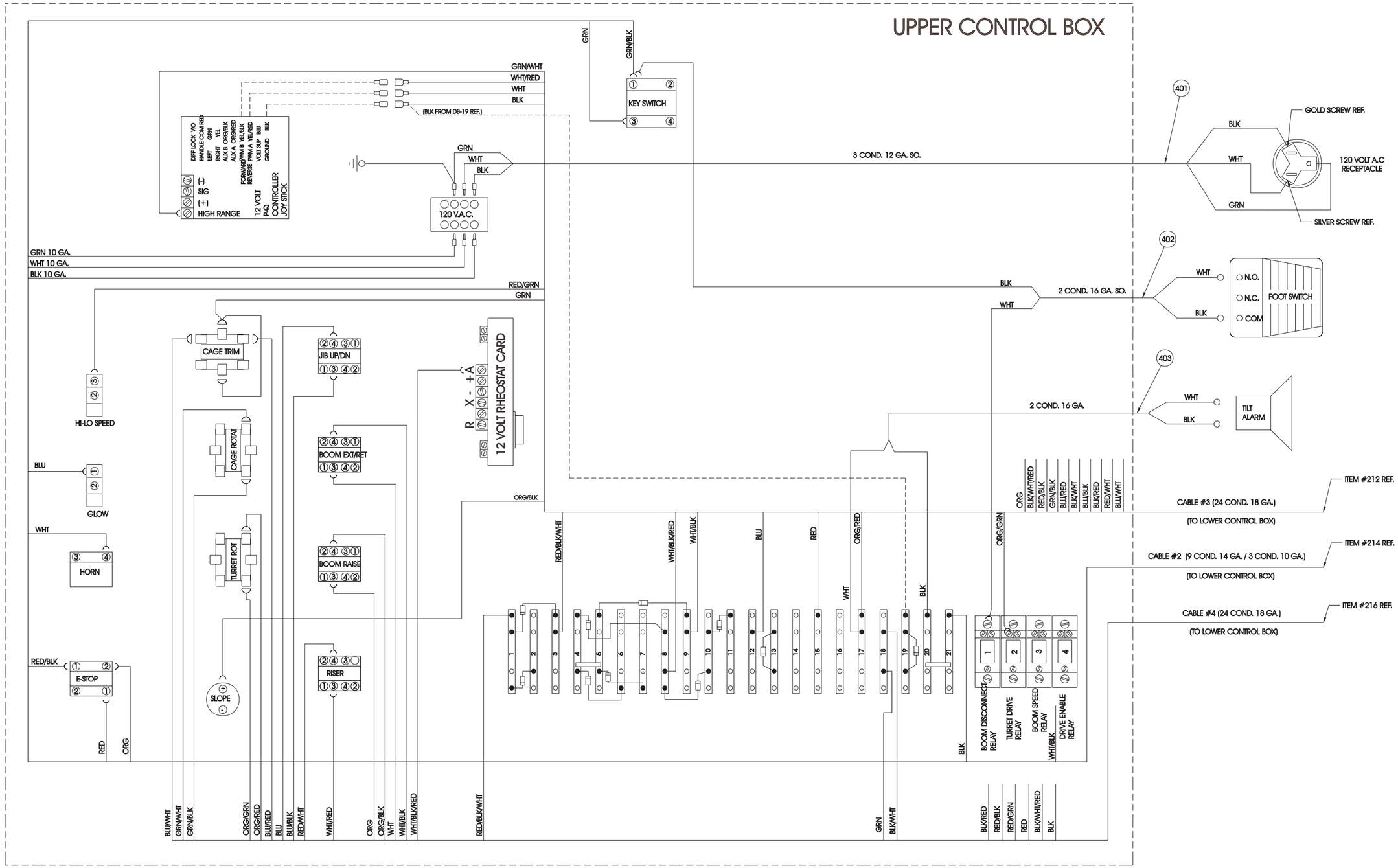


LEVEL SENSOR WIRING



120 VOLT A.C. POWER INLET WIRING

ENGINE CABLE WIRING "DEUTSCH CONNECTOR"
SEE DWG. #68666-000 SHEET 2 OF 2 FOR
PART NUMBER CALL-OUTS


UPPER CONTROL BOX
GRN
GRN/BLK
KEY SWITCH
GRN/WHT
WHT/RED
WHT
BLK
(BLK FROM DB-19 REF.)
DIFF LOCK VIO
HANDLE COM RED
LEFT GRN
RIGHT YEL
AUX A ORG/BLK
AUX A ORG/BLK
FORWARD PWM A YEL/BLK
REVERSE PWM A YEL/RED
VOLT SUP BLU
GROUND BLK
(-)
SIG
(+)
HIGH RANGE
12 VOLT P.Q. CONTROLLER JOY STICK
GRN
WHT
BLK
120 V.A.C.
3 COND. 12 GA. SO.
401
GOLD SCREW REF.
BLK
WHT
GRN
120 VOLT A.C RECEPTIACLE
SILVER SCREW REF.
GRN 10 GA.
WHT 10 GA.
BLK 10 GA.
RED/GRN
GRN
BLK
WHT
2 COND. 16 GA. SO.
402
WHT
BLK
N.O.
N.C.
COM
FOOT SWITCH
CAGE TRIM
JIB UP/DN
12 VOLT RHEOSTAT CARD
R X - +A
403
2 COND. 16 GA.
WHT
BLK
TILT ALARM
HI-LO SPEED
CAGE ROTAT
BOOM EXT/RET
BLU
GLOW
WHT
HORN
TURRET ROT
BOOM RAISE
ORG/BLK
ITEM #212 REF.
CABLE #3 (24 COND. 18 GA.)
(TO LOWER CONTROL BOX)
ITEM #214 REF.
CABLE #2 (9 COND. 14 GA. / 3 COND. 10 GA.)
(TO LOWER CONTROL BOX)
ITEM #216 REF.
CABLE #4 (24 COND. 18 GA.)
(TO LOWER CONTROL BOX)
RED/BLK
E-STOP
RED
ORG
SLOPE
RISER
RED/BLK/WHT
WHT/BLK/RED
WHT/BLK
BLU
RED
ORG/RED
WHT
BLK
ORG/GRN
BOOM DISCONNECT RELAY
TURRET DRIVE RELAY
BOOM SPEED RELAY
DRIVE ENABLE RELAY
WHT/BLK
BLU/WHT
GRN/WHT
GRN/BLK
ORG/GRN
ORG/RED
BLU/RED
BLU
BLU/BLK
RED/WHT
WHT/RED
ORG
ORG/BLK
WHT
WHT/BLK
WHT/BLK/RED
RED/BLK/WHT
GRN
BLK/WHT
BLK/RED
RED/BLK
RED/GRN
RED
BLK/WHT/RED
BLK
ORG
BLK/WHT/RED
RED/BLK
GRN/BLK
BLU/RED
BLK/WHT
BLU/BLK
BLK/RED
RED/WHT
BLU/WHT

ILLUSTRATED PARTS BREAKDOWN

Basic Assembly, AB46RT Gas

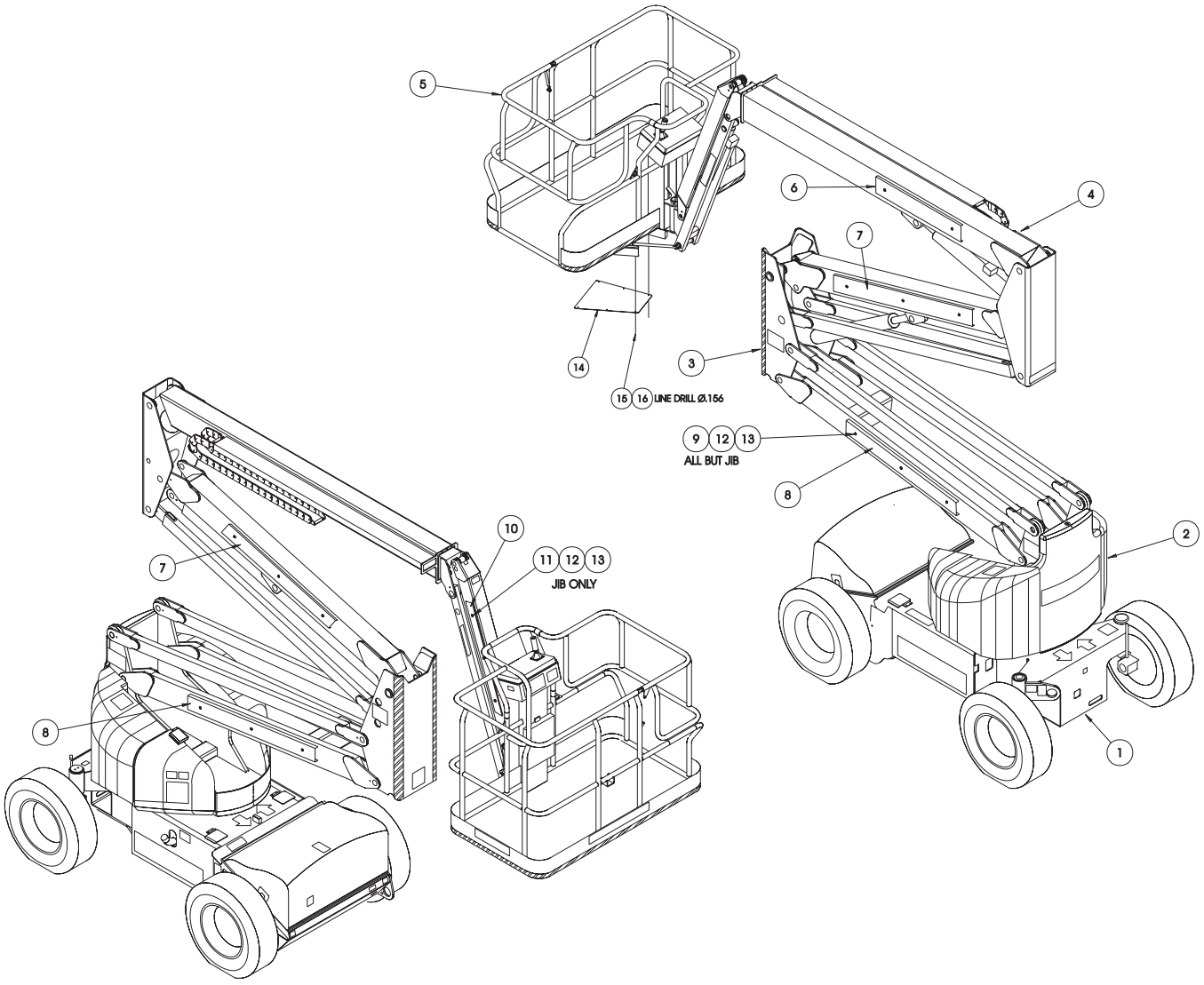
068314-000

ITEM	PART	DESCRIPTION	QTY.
1	68316-000	CHASSIS ASSY. AB46-GAS	1
2	68330-004	TURRET ASSY-GAS	1
3	68323-000	LOWER LINKAGE ASSY	1
4	68322-000	UPPER LINKAGE ASSY	1
5	68325-001	CAGE "B" ASSY	1
6	68703-000	HOSE GUARD	1
7	68704-000	HOSE GUARD (58")	2
8	68705-000	HOSE GUARD (68")	2
9	68706-000	HOSE CLAMP	14
10	68731-000	HOSE GUARD-JIB	1
11	68732-000	HOSE CLAMP-JIB	3
12	11248-004	NUT HEX ESNA 1/4-20 UNC	17
13	11240-004	WASHER 1/4 STD FLAT	17
14	68977-000	CAGE CYL. COVER	1
15	26526-004	SCR, SELF-TAPPING #10 X 1/2"LG.	6
16	11237-003	LOCKWASHER, #10 STAR	6

Basic Assembly, AB46RT Diesel

068315-000

ITEM	PART	DESCRIPTION	QTY.
1	68316-001	CHASSIS ASSY. AB46-DSL	1
2	68330-005	TURRET ASSY-DSL	1
3	68323-000	LOWER LINKAGE ASSY	1
4	68322-000	UPPER LINKAGE ASSY	1
5	68325-001	CAGE "B" ASSY	1
6	68703-000	HOSE GUARD	1
7	68704-000	HOSE GUARD (58")	2
8	68705-000	HOSE GUARD (68")	2
9	68706-000	HOSE CLAMP	14
10	68731-000	HOSE GUARD-JIB	1
11	68732-000	HOSE CLAMP-JIB	3
12	11248-004	NUT HEX ESNA 1/4-20 UNC	17
13	11240-004	WASHER 1/4 STD FLAT	17
14	68977-000	CAGE CYL. COVER	1
15	26526-004	SCR, SELF-TAPPING #10 X 1/2"LG.	6
16	11237-003	LOCKWASHER, #10 STAR	6


5
6
4
7
14
3
15
16
LINE DRILL Ø.156
9
12
13
ALL BUT JIB
8
2
10
7
11
12
13
JIB ONLY
8
1

Chassis Assembly, AB46RT Gas

068316-000

ITEM	PART	DESCRIPTION	QTY.
1	068870-000	CHASSIS WELDMENT R/T	1
2	011256-012	SCRW HHC 1/2-13UNC X 1 1/2	2
3	011239-008	WASHER, FLAT ASTM A325 1/2 O	28
4	011248-008	LOCKNUT, HEX ESNA 1/2-13UNC	16
5	068839-002	STEERING YOKE, L/H	1
6	068839-001	STEERING YOKE, R/H	1
7	068690-000	HYD. MOTOR, SUNDSTRAND	2
8	068847-000	AXLE RETAINER	1
9	068905-000	STEERING PIN,	2
10	068456-000	CYLINDER, STEERING	1
*	068456-010	Seal Kit	1
11	011253-020	SCREW, MODIFIED	2
12	011239-005	WASHER, FLAT ASTM A325 5/16 DIA.	4
13	011740-014	ROLPIN, 1/2 O X 1 3/4 LG.	2
14	011248-005	LOCKNUT, HEX ESNA 5/16-18UNC	2
15	068838-000	STEERING PIVOT WELDMENT	2
16	011256-018	SCRW, HHC GR5 1/2-13UNC X 2 1/4	4
17	062642-033	BRG. GARLOCK #20DU16	4
18	068380-000	STEERING PIN, SHORT	2
19	068835-000	FRONT AXLE WELDMENT	1
20	011240-008	WASHER, FLAT STD. 1/2"	4
21	011256-030	SCRW. HHC, GR 5 1/2-13UNC X 3 3/4	2
22	011257-014	SCRW. HHC, GR 5 5/8-11UNC X 1 3/4	12
23	068886-000	CYLINDER,	2
*	068886-010	Seal Kit	1
24	068576-001	BUSHING, GARLOCK #GF4852-40	2
25	068885-000	FITTING, SWIVEL	4
26	068327-004	TIRE/WHEEL ASSY. R.H.	2
27	068327-005	TIRE/WHEEL ASSY. L.H.	2
28	011257-012	SCRW. HHC, GR 5 5/8-11UNC X 1 1/2	12
29	068869-001	THRUST RING (UHMW)	2
30	068869-002	THRUST RING	4
31	011297-010	WASHER, BELLVILLE O 5/8	18
32	011469-005	LUG NUT, 9/16-18NF 90	36
33	011238-008	WASHER, SPLIT LOCK 1/2"	6
34	011737-016	ROLLPIN 1/4 DIA. X 2" LG.	4
35	068959-003	WASHER, SQ. STL. O1/2" 2 X 2 X 1/4 THK.	2
36	011225-008	WASHER, FENDER 1/2"	2
37	062642-023	BUSHING, GARLOCK #20DU20	4
38	011941-011	FITTING, STR. ADAPTER 8MB-10MJ	4
39	011934-010	FITTING, 90ø 10MB-8MJ	2
40	012004-004	PLUG, #4 S.A.E.	4
41	064297-001	P.O. CHECK VALVE	2
42	011934-001	FITTING, 90ø 4MB-4MJ	6
43	011941-001	FITTING, STR. ADAPTER 4MB-4MJ	2
44	011932-001	FITTING, 45ø 4FJX-4MJ	2
45	068575-000	HYD. MOTOR, WHITE	1
46	068571-000	DRIVE, WORM GEAR	1
47	014576-026	SCRW. GR 8 HHC. 5/8-11UNF X 3 1/4	18
48	011941-038	FITTING, STR. ADAPTER 10MB-4MJ	2
49	068884-000	PLANETARY DRIVE, FAIRFIELD	4
50	068569-001	BRAKE, AUSCO #75620	2
*	068569-010	Seal Kit	1
51	068904-000	DRAW LATCH	2
52	068898-002	LYNCH PIN, (PIVOT POINT #HANG-2)	4
53	068898-001	LYNCH PIN, (PIVOT POINT #HANG-1)	2
54	068878-000	COWLING PLATE	2

068316-000 (Continued)

ITEM	PART	DESCRIPTION	QTY.
55	068882-000	HYD. MOTOR,	2
56	068916-000	ENGINE COWLING	1
57	011934-007	FITTING, 90ø 8MB-6MJ	4
58	068902-000	STEERING LINK	2
59	011935-001	FITTING, 45ø 4MB-4MJ	2
60	068906-000	CYLINDER PIN	4
61	063783-002	LANYARD ASSY. X 5-1/2	2
62	011239-010	WASHER, FLAT ASTM A325 5/8 DIA.	24
63	011934-004	FITTING, 90ø 6MB-6MJ	2
64	068899-001	BUSHING, GARLOCK GM3236-24	4
65	011252-004	SCREW, HHC 1/4-20 X 1/2	2
66	011246-004	HEX NUT 1/4-20 ESNA THIN	2
67	068647-000	FLANGE KIT, 12SFO	4
68	011251-016	SCRW BTN HD 1/2-13UNC X 2	6
69	011257-042	SCRW. HHC, GR 5 5/8-11 X 5 1/4	1
70	011248-010	NUT, HEX 5/8-11 ESNA	1
71	013888-063	"O" RING	2
72	011256-034	SCRW, HHC, GR5 1/2-13UNC X 4 1/4	4
73	013965-006	SCRW, HHC 10-24 X 3/4	8
74	011240-003	WASHER FLAT STD #10	8
75	011248-003	NUT, 10-24 ESNA	8
76	011256-010	SCRW HHC, 1/2-13UNC X 1 1/4	4
77	068680-007	FITTING, 90ø ELBOW	2
78	011251-018	SCRW BTN HD 1/2-13UNC X 2 1/4	2
79	011248-004	NUT, HEX 1/4-20 ESNA	4
80	011252-016	SCRW HHC GR5 1/4-20UNC X 1	4
81	068386-001	DOOR WELDMENT RH	1
82	068386-000	DOOR WELDMENT LH	1
201	068893-000	RADIATOR HOSE, BOTTOM (GAS)	1
203	068894-000	RADIATOR HOSE, TOP (GAS)	1
205	069205-000	HYDRAULIC TANK ASSY. R/T (28 GAL)	1
206	069211-000	BRACKET, OVERFLOW TANK	1
207	068774-000	VIBRATION ISOLATOR	2
208	068890-000	INLET HOSE, AIR FILTER	1
209	068915-001	MUFFLER-RT	1
210	068953-000	VALVE BLOCK ASSY. R/T DRIVE	1
211	068903-000	AIR CLEANER	1
212	068903-001	RAIN CAP, AIR CLEANER	1
213	068903-002	CLAMP, AIR CLEANER	1
214	068866-000	ACCESS COVER	1
216	068710-000	FUEL TANK ASSY. GAS	1
217	069211-000	WASHER, FLAT STD. 3/8	14
218	011248-006	LOCKNUT, HEX. 3/8-16UNC ESNA	16
219	068871-000	ENGINE ASSY. R/T GAS	1
221	011253-008	SCRW, HHC. 5/16-18UNC X 1	6
222	011248-005	LOCKNUT, HEX. 5/16-18UNC ESNA.	8
223	020541-018	HOSE CLAMP	3
224	020541-011	HOSE CLAMP	4
225	068941-000	HEAT SHIELD	1
226	068868-001	FAN SHROUD	1
227	068934-000	SHROUD SPACER	4
228	011252-006	SCR, HHC. 1/4-20UNC X 3/4 LG.	14
229	011254-010	SCRW. HHC. GR5 3/8-16UNC X 1-1/4	11
230	011253-008	SCRW, HHC. 5/16-18UNC X 2-3/4	2
231	062299-002	BATTERY, 12 VDC	1
232	068960-000	EXHAUST FLANGE GASKET (GAS)	1
234	063946-020	SCR, HHC. M10-105 X 20MM LG.	2

068316-000 (Continued)

ITEM	PART	DESCRIPTION	QTY.
236	64275-048	BATTERY CABLE, POSITIVE (48")	1
237	64275-034	BATTERY CABLE, NEGATIVE (34")	1
238	68887-000	RADIATOR, R/T	1
239	68864-000	BRACE, RADIATOR	2
240	68549-000	HOLD DOWN BAR, BATTERY	1
241	12039-000	ROD, BATTERY HOLD DOWN	2
242	11240-005	WASHER, FLAT STD 5/16	10
243	11250-005	NUT, HEX 5/16-18UNC	4
244	68863-000	GRILL, RADIATOR	1
245	68966-000	OVERFLOW BOTTLE	1
246	REF.	TUBE (SUPPLIED WITH ITEM 245)	1
247	11248-004	LOCKNUT, 1/4-20UNC. ESNA	6
248	11252-008	SCR, HHC. 1/4-20UNC X 1	2
249	68867-000	DRAIN COVER	2
250	68865-000	OUTLET PLATE	1
251	14252-004	NUTSERT 1/4-20 UNC	8
252	11238-004	LOCKWASHER 1/4 SPLIT	8
253	11715-004	SCREW RD HD #6-32 X 1/2	2
254	11248-047	LOCKNUT #6-32 HEX	2
255	29945-013	LEVEL SENSOR (EUR)	REF
256	29945-014	LEVEL SENSOR (DOM)	REF
258	29961-000	INLET	1
259	29961-001	SEAL	1
260	11253-010	SCREW HHC 5/16-18 X 1-1/4	2
261	11252-004	SCREW HHC 1/4-20 X 1/2	4
262	11240-004	WASHER FLAT STD 1/4	4
263	11256-016	SCREW HHC 1/2-13 X 2	2
264	REF	GOVERNOR CONTROL PANEL	1
265	69209-000	BRACKET, GOVERNOR CONTROL	1
266	11826-006	SCREW, RD HD 10-32 X 3/4	4
267	11238-002	LOCKWASHER #10	4
268	11249-003	NUT HEX 10-32 ESNA	4

Chassis Assembly, AB46RT Diesel

068316-001

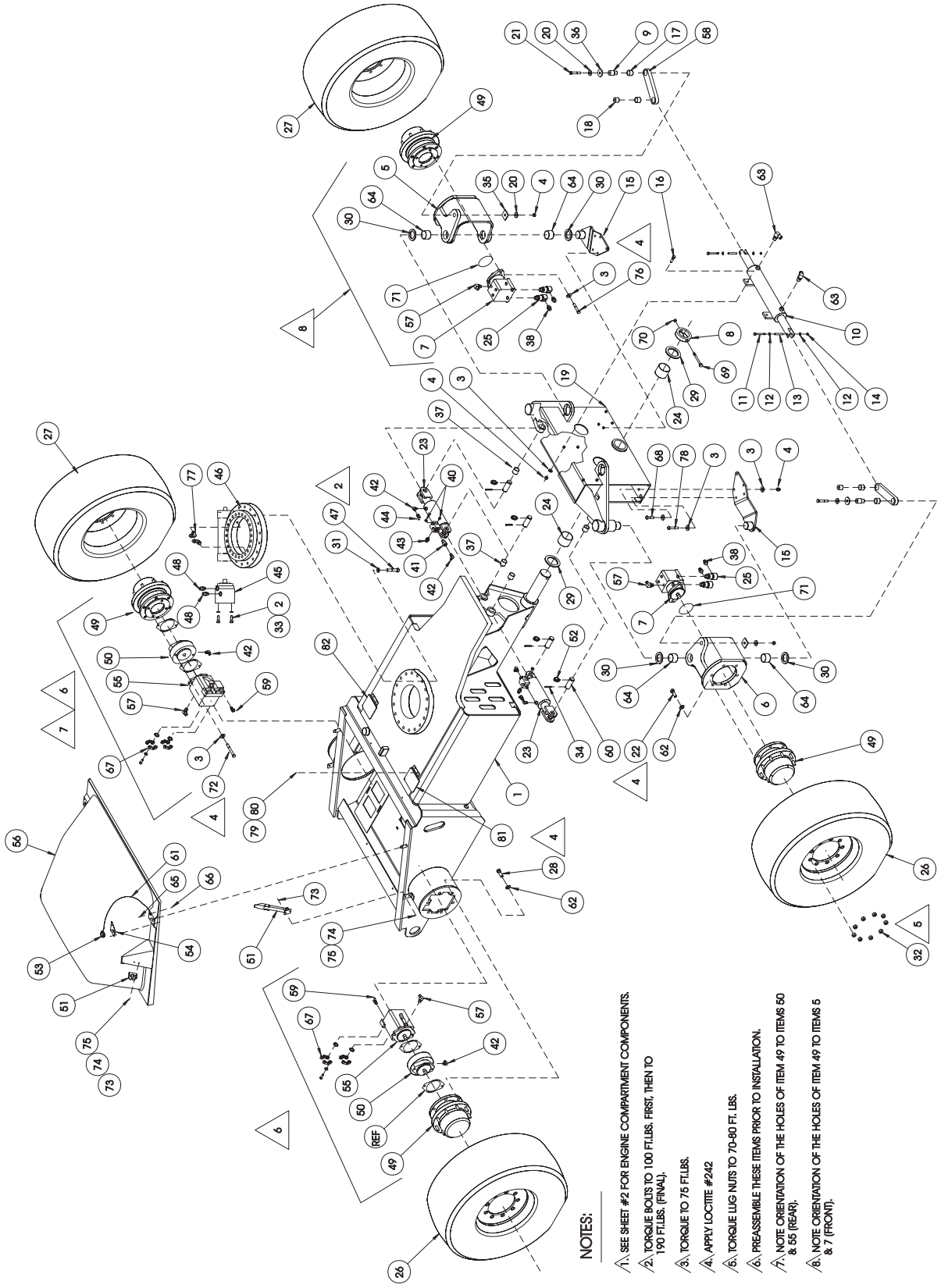
ITEM	PART	DESCRIPTION	QTY
1	68870-000	CHASSIS WELDMENT R/T	1
2	11256-012	SCRW HHC 1/2-13UNC X 1 1/2	2
3	11239-008	WASHER, FLAT ASTM A325 1/2 O	28
4	11248-008	LOCKNUT, HEX ESNA 1/2-13UNC	16
5	68839-002	STEERING YOKE, L/H	1
6	68839-001	STEERING YOKE, R/H	1
7	68690-000	HYD. MOTOR, SUNDSTRAND	2
8	68847-000	AXLE RETAINER	1
9	68905-000	STEERING PIN,	2
10	68456-000	CYLINDER, STEERING	1
*	11253-020	Seal Kit	1
11	68702-000	SCREW, MODIFIED	2
12	11239-005	WASHER, FLAT ASTM A325 5/16 DIA.	4
13	11740-014	ROLPIN, 1/2 O X 1 3/4 LG.	2
14	11248-005	LOCKNUT, HEX ESNA 5/16-18UNC	2
15	68838-000	STEERING PIVOT WELDMENT	2
16	11256-018	SCRW, HHC GR5 1/2-13UNC X 2 1/4	4
17	62642-033	BRG. GARLOCK #20DU16	4
18	68380-000	STEERING PIN, SHORT	2
19	68835-000	FRONT AXLE WELDMENT	1
20	11240-008	WASHER, FLAT STD. 1/2"	4
21	11256-030	SCRW. HHC, GR 5 1/2-13UNC X 3 3/4	2
22	11257-014	SCRW. HHC, GR 5 5/8-11UNC X 1 3/4	12
23	68886-000	CYLINDER,	2
*	68886-010	Seal Kit	1
24	68576-001	BUSHING, GARLOCK #GF4852-40	2
25	68885-000	FITTING, SWIVEL	4
26	68327-004	TIRE/WHEEL ASSY. R.H.	2
27	68327-005	TIRE/WHEEL ASSY. L.H.	2
28	11257-012	SCRW. HHC, GR 5 5/8-11UNC X 1 1/2	12
29	68869-001	THRUST RING (UHMW)	2
30	68869-002	THRUST RING	4
31	11297-010	WASHER, BELLVILLE O 5/8	18
32	11469-005	LUG NUT, 9/16-18NF 90	36
33	11238-008	WASHER, SPLIT LOCK 1/2"	6
34	11737-016	ROLLPIN 1/4 DIA. X 2" LG.	4
35	68959-003	WASHER, SQ. STL. O1/2" 2 X 2 X 1/4 THK.	2
36	11225-008	WASHER, FENDER 1/2"	2
37	62642-023	BUSHING, GARLOCK #20DU20	4
38	11941-011	FITTING, STR. ADAPTER 8MB-10MJ	4
39	11934-010	FITTING, 90ø 10MB-8MJ	2
40	12004-004	PLUG, #4 S.A.E.	4
41	64297-001	P.O. CHECK VALVE	2
42	11934-001	FITTING, 90ø 4MB-4MJ	6
43	11941-001	FITTING, STR. ADAPTER 4MB-4MJ	2
44	11932-001	FITTING, 45ø 4FJX-4MJ	2
45	68575-000	HYD. MOTOR, WHITE	1
46	68571-000	DRIVE, WORM GEAR	1
47	14576-026	SCRW. GR 8 HHC. 5/8-11UNF X 3 1/4	18
48	11941-038	FITTING, STR. ADAPTER 10MB-4MJ	2
49	68884-000	PLANETARY DRIVE, FAIRFIELD	4
50	68569-001	BRAKE, AUSCO #75620	2
*	68569-010	Seal Kit	1
51	68904-000	DRAW LATCH	2
52	68898-002	LYNCH PIN, (PIVOT POINT #HANG-2)	4
53	68898-001	LYNCH PIN, (PIVOT POINT #HANG-1)	2
54	68878-000	COWLING PLATE	2

068316-001 (Continued)

ITEM	PART	DESCRIPTION	QTY
55	68882-000	HYD. MOTOR,	2
56	68916-000	ENGINE COWLING	1
57	11934-007	FITTING, 90ø 8MB-6MJ	4
58	68902-000	STEERING LINK	2
59	11935-001	FITTING, 45ø 4MB-4MJ	2
60	68906-000	CYLINDER PIN	4
61	63783-002	LANYARD ASSY. X 5-1/2	2
62	11239-010	WASHER, FLAT ASTM A325 5/8 DIA.	24
63	11934-004	FITTING, 90ø 6MB-6MJ	2
64	68899-001	BUSHING, GARLOCK GM3236-24	4
65	11252-004	SCREW, HHC 1/4-20 X 1/2	2
66	11246-004	HEX NUT 1/4-20 ESNA THIN	2
67	68647-000	FLANGE KIT, 12SFO	4
68	11251-016	SCRW BTN HD 1/2-13UNC X 2	6
69	11257-042	SCRW. HHC, GR 5 5/8-11 X 5 1/4	1
70	11248-010	NUT, HEX 5/8-11 ESNA	1
71	13888-063	"O" RING	2
72	11256-034	SCRW, HHC, GR5 1/2-13UNC X 4 1/4	4
73	13965-006	SCRW, HHC 10-24 X 3/4	8
74	11240-003	WASHER FLAT STD #10	8
75	11248-003	NUT, 10-24 ESNA	8
76	11256-010	SCRW HHC, 1/2-13UNC X 1 1/4	4
77	68680-007	FITTING, 90ø ELBOW	2
78	11251-018	SCRW BTN HD 1/2-13UNC X 2 1/4	2
79	11248-004	NUT, HEX 1/4-20 ESNA	4
80	11252-016	SCRW HHC GR5 1/4-20UNC X 1	4
81	68386-001	DOOR WELDMENT RH	1
82	68386-000	DOOR WELDMENT LH	1
202	68896-000	RADIATOR HOSE, BOTTOM (DIESEL)	1
204	68895-000	RADIATOR HOSE, TOP (DIESEL)	1
205	69205-000	HYDRAULIC TANK ASSY. R/T (28 GAL)	1
206	69211-000	BRACKET, OVERFLOW TANK	1
207	68774-000	VIBRATION ISOLATOR	2
208	68890-000	INLET HOSE, AIR FILTER	1
209	68915-001	MUFFLER-RT	1
210	68953-000	VALVE BLOCK ASSY. R/T DRIVE	1
211	68903-000	AIR CLEANER	1
212	68903-001	RAIN CAP, AIR CLEANER	1
213	68903-002	CLAMP, AIR CLEANER	1
214	68866-000	ACCESS COVER	1
215	68710-001	FUEL TANK ASSY. DIESEL	1
217	11240-006	WASHER, FLAT STD. 3/8	14
218	11248-006	LOCKNUT, HEX. 3/8-16UNC ESNA	16
220	68872-000	ENGINE ASSY. R/T DSL	1
221	11253-008	SCRW, HHC. 5/16-18UNC X 1	4
222	11248-005	LOCKNUT, HEX. 5/16-18UNC ESNA.	6
223	20541-018	HOSE CLAMP	3
224	20541-011	HOSE CLAMP	4
226	68868-001	FAN SHROUD	1
227	68934-000	SHROUD SPACER	4
228	11252-006	SCR, HHC. 1/4-20UNC X 3/4 LG.	14
229	11254-010	SCRW. HHC. GR5 3/8-16UNC X 1-1/4	13
230	11253-008	SCRW, HHC. 5/16-18UNC X 2-3/4	2
231	62299-002	BATTERY, 12 VDC	1
233	68961-000	EXHAUST FLANGE GASKET (DSL)	1
235	63961-020	SCR, HHC. M8-1.25 X 20MM LG.	4
259	29961-001	SEAL	1

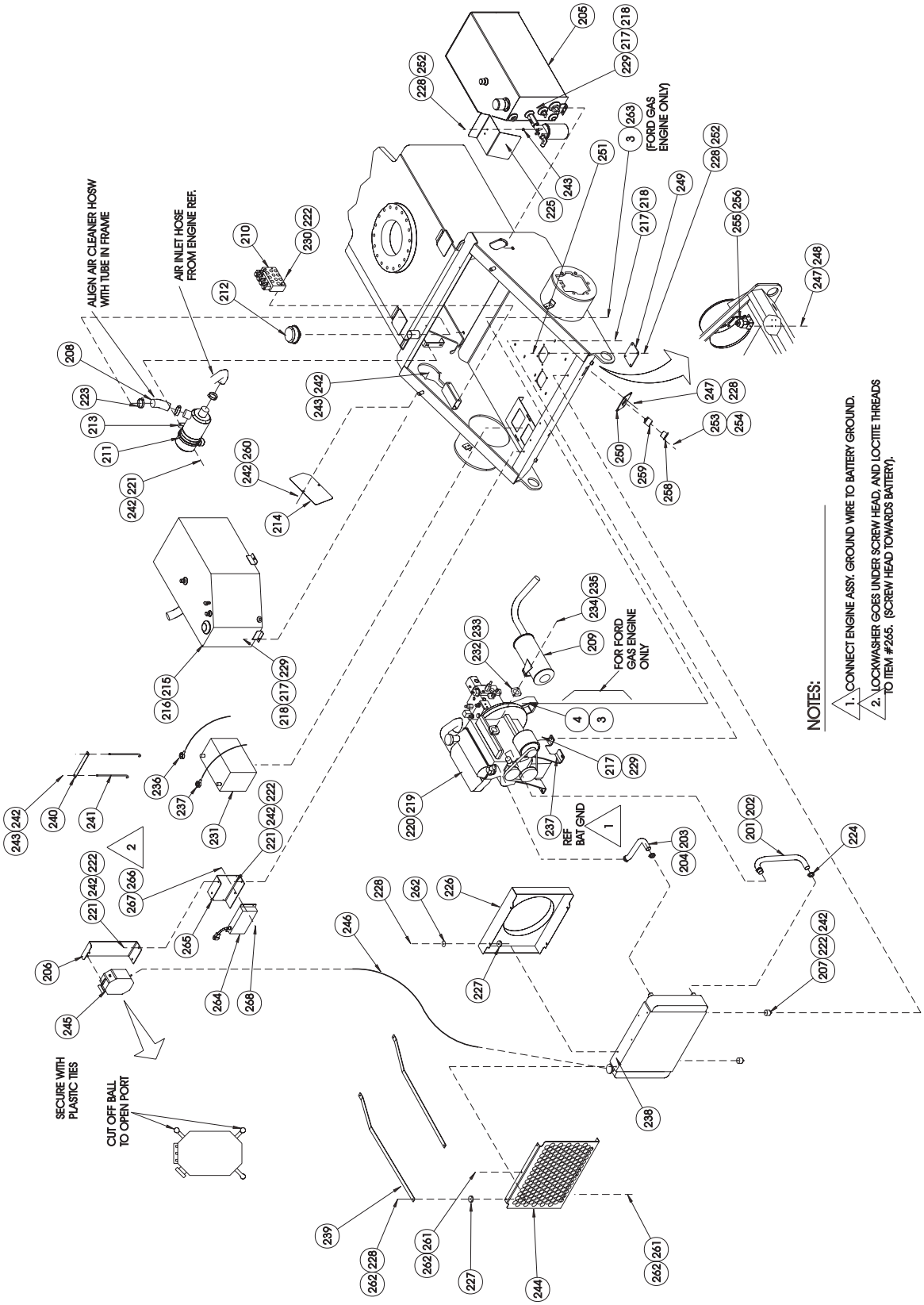
068316-001 (Continued)

ITEM	PART	DESCRIPTION	QTY
260	11253-010	SCREW HHC 5/16-18 X 1-1/4	2
261	11252-004	SCREW HHC 1/4-20 X 1/2	4
262	11240-004	WASHER FLAT STD 1/4	4
236	64275-048	BATTERY CABLE, POSITIVE (48")	1
237	64275-034	BATTERY CABLE, NEGATIVE (34")	1
238	68887-000	RADIATOR, R/T	1
239	68864-000	BRACE, RADIATOR	2
240	68549-000	HOLD DOWN BAR, BATTERY	1
241	12039-000	ROD, BATTERY HOLD DOWN	2
242	11240-005	WASHER, FLAT STD 5/16	8
243	11250-005	NUT, HEX 5/16-18UNC	4
244	68863-000	GRILL, RADIATOR	1
245	68966-000	OVERFLOW BOTTLE	1
246	REF.	TUBE (SUPPLIED WITH ITEM 245)	1
247	11248-004	LOCKNUT, 1/4-20UNC. ESNA	6
248	11252-008	SCR, HHC. 1/4-20UNC X 1	2
249	68867-000	DRAIN COVER	2
250	68865-000	OUTLET PLATE	1
251	14252-004	NUTSERT 1/4-20 UNC	8
252	11238-004	LOCKWASHER 1/4 SPLIT	8
253	11715-004	SCREW RD HD #6-32 X 1/2	2
254	11248-047	LOCKNUT #6-32 HEX	2
255	29945-013	LEVEL SENSOR (EUR)	REF
256	29945-014	LEVEL SENSOR (DOM)	REF
258	29961-000	INLET	1
259	29961-001	SEAL	1
260	11253-010	SCREW HHC 5/16-18 X 1 1/4	2
261	11252-004	SCREW HHC 1/4-20 X 1/2	4
262	11240-004	WASHER FLAT STD 1/4	4



NOTES:

1. SEE SHEET #2 FOR ENGINE COMPARTMENT COMPONENTS.
2. TORQUE BOLTS TO 100 FT.LBS. FIRST, THEN TO 190 FT.LBS. (FINAL).
3. TORQUE TO 75 FT.LBS.
4. APPLY LOCTITE #242
5. TORQUE LUG NUTS TO 70-80 FT. LBS.
6. PREASSEMBLE THESE ITEMS PRIOR TO INSTALLATION.
7. NOTE ORIENTATION OF THE HOLES OF ITEM 49 TO ITEMS 50 & 55 (REAR).
8. NOTE ORIENTATION OF THE HOLES OF ITEM 49 TO ITEMS 5 & 7 (FRONT).

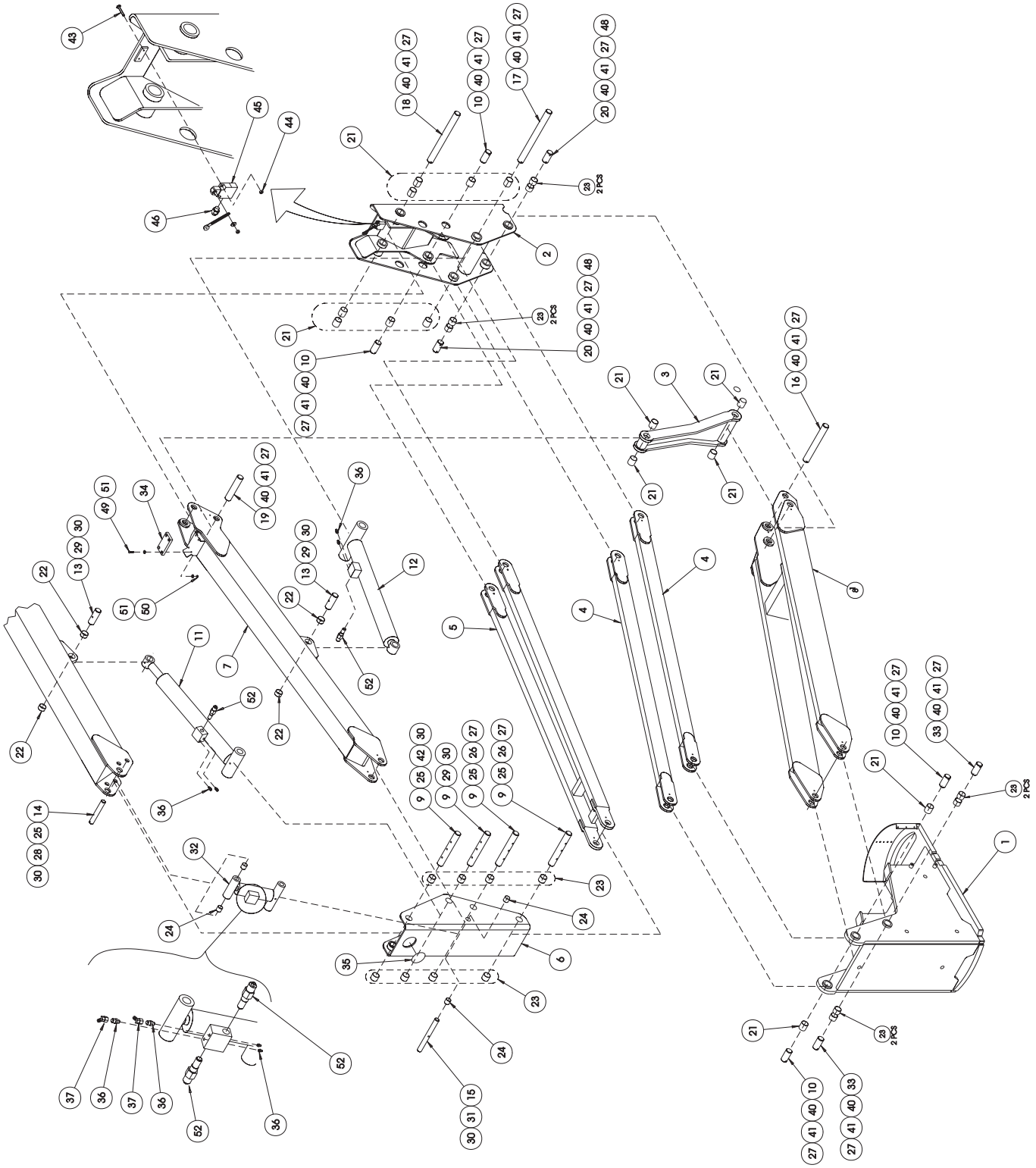

ALIGN AIR CLEANER HOSW WITH TUBE IN FRAME
AIR INLET HOSE FROM ENGINE REF.
(FORD GAS ENGINE ONLY)
FOR FORD GAS ENGINE ONLY
REF BAT GND
SECURE WITH PLASTIC TIES
CUT OFF BALL TO OPEN PORT
NOTES:
1. CONNECT ENGINE ASSY. GROUND WIRE TO BATTERY GROUND.
2. LOCKWASHER GOES UNDER SCREW HEAD, AND LOCTITE THREADS TO ITEM #265. (SCREW HEAD TOWARDS BATTERY).

Lower Boom Linkage Assembly

068323-000

ITEM	PART	DESCRIPTION	QTY.
1	68330-000	TURRET ASSEMBLY	REF
2	68397-000	RISER POST WELDMENT	1
3	68399-000	TENSION LINK WELDMENT	1
4	68400-000	1ST. TENSION RAIL WELDMENT	2
5	68543-000	2ND. TENSION RAIL WELDMENT	1
6	68412-000	FRONT RISER WELDMENT	1
7	68415-000	2ND. RISER BOOM WELDMENT	1
8	68417-000	1ST. RISER BOOM WELDMENT	1
9	68475-000	PIN, 1.75 DIA. X 12.25 LG.	4
10	68477-001	PIN, 1.75 DIA. X 3.75 LG.	4
11	68451-000	CYLINDER, BOOM RAISE	1
*	68451-010	SEAL KIT, BOOM	1
12	68450-000	CYLINDER, BOOM RISER	1
*	68450-010	SEAL KIT, RISER	1
13	68477-007	PIN, 1.75 DIA. X 5.00 LG.	2
14	68796-002	PIN, 1.50 DIA. X 8.50 LG.	1
15	68796-001	PIN, 1.50 DIA. X 12.25 LG.	1
16	68477-005	PIN, 1.75 DIA. X 13.75 LG.	1
17	68477-003	PIN, 1.75 DIA. X 19.50 LG.	1
18	68477-002	PIN, 1.75 DIA. X 16.50 LG.	1
19	68477-006	PIN, 1.75 DIA. X 8.63 LG.	1
20	68794-000	PIN, 1.75 DIA. X 5.88 LG.	2
21	62642-034	BUSHING, O 1.75 X 2 (28DU32)	14
22	62642-028	BUSHING, O 1.75 X 1 (28DU16)	4
23	62642-031	BUSHING, O 1.75 X 1.50 (28DU24)	16
24	62642-036	BUSHING, O 1.50 X 1.25 (24DU20)	4

ITEM	PART	DESCRIPTION	QTY.
25	65214-000	ROD END (PIN RETAINER) 3/8”	4
26	11254-006	SCR, HHC 3/8-16UNC X 3/4	14
27	11238-006	LOCKWASHER, SPLIT RING 3/8	14
28	11254-012	SCR, HHC 3/8-16UNC X 1 1/2	2
29	11254-028	SCR, HHC 3/8-16UNC X 3 1/2	3
30	11248-006	LOCKNUT, HEX 3/8-16UNC (ESNA)	6
31	11254-024	SCR, HHC 3/8-16UNC X 3	1
32	68454-000	MASTER CYLINDER	1
*	68454-010	SEAL KIT, MASTER	1
33	68794-001	PIN, 1.75 DIA X 4.75 LG.	2
34	68660-000	REST PAD	1
35	66516-004	CAP, 4”	1
36	11941-004	FITTING, STR 6MB-4MJ	6
37	11932-001	FITTING, 45ø 4FJX-4MJ	2
40	65214-001	ROD END (PIN RETAINER) 1/2”	12
41	11254-010	SCREW HHC 3/8-16UNC X 1-1/4”	12
42	11254-014	SCREW HHC 3/8-16UNC X 1-3/4”	1
43	11709-014	SCREW RD HD 10-24 X 1-3/4”	2
44	11248-003	NUT, 10-24 ESNA	2
45	68556-002	SWITCH	1
46	29925-000	STRAIN RELIEF	1
48	11739-020	ROLL PIN 3/8 X 2-1/2	2
49	11253-010	SCREW HHC 5/16-18 UNC X 1 1/4	4
50	11248-005	LOCKNUT HEX 5/16-18 UNC ESNA	4
51	14996-005	WASHER 5/16 SAE FLAT	8
52	68778-013	VALVE, COUNTERBALANCE	4

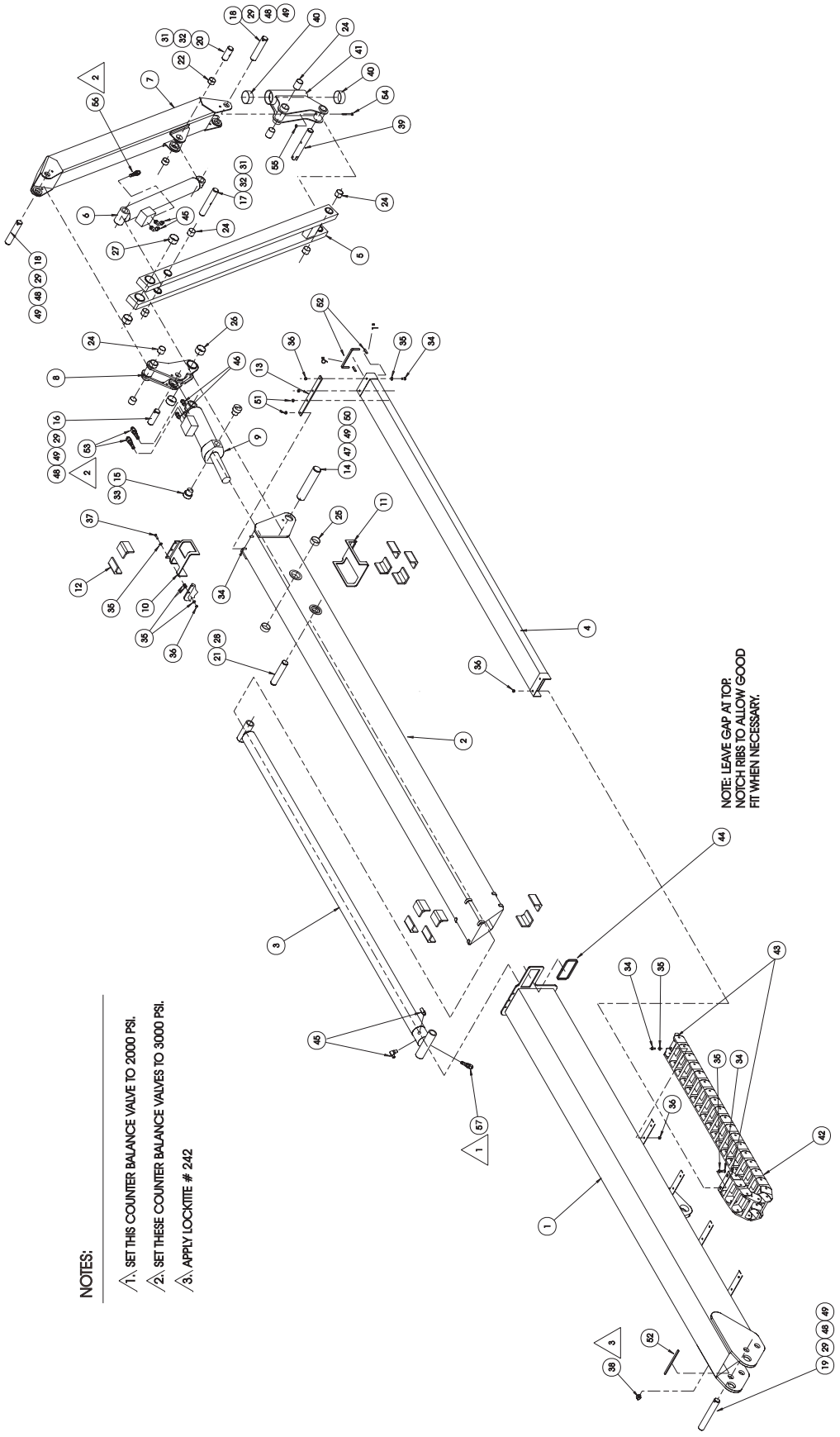


Upper Boom Linkage

068322-000

ITEM	PART	DESCRIPTION	QTY.
1	68497-000	TOP (OUTER) BOOM WELDMENT	1
2	68496-000	TOP (INNER) BOOM WELDMENT	1
3	68452-000	BOOM EXTEND CYLINDER	1
*	68452-010	SEAL KIT, EXTEND	1
4	68479-000	EXTENSION TUBE WELDMENT	1
5	68447-000	LEVELING TUBE WELDMENT	1
6	68453-001	JIB CYLINDER	1
*	68453-010	SEAL KIT, JIB CY.	1
7	68439-000	JIB BOOM WELDMENT	1
8	68438-000	SWINGING FRAME WELDMENT	1
9	68455-000	SLAVE CYLINDER	1
*	68455-010	SEAL KIT, SLAVE	1
10	68436-000	UPPER BEARING PAD CASSETTE	1
11	68435-000	LOWER BEARING PAD CASSETTE	1
12	68423-001	WEAR PAD	12
13	68492-000	EXT. TUBE MTG. BRACKET	1
14	68477-006	PIN, JIB ASSY. PIVOT	1
15	68473-000	PIN, SLAVE CYL. TRUNNION	2
16	68476-005	PIN, SLAVE CYL. ROD END	1
17	68476-006	PIN, JIB CYL. BASE	1
18	68476-003	PIN, BOOM PIVOT	2
19	68476-002	PIN, TELESCOPIC CYL. BASE	1
20	68476-004	PIN, JIB CYL. ROD END	1
21	68474-000	PIN, TELESCOPIC CYL. ROD END	1
22	62642-024	BUSHING, O 1.25 X.75 (20DU12)	2
24	62642-025	BUSHING, O 1.25 X 1.75 (20DU28)	8
25	62642-027	BUSHING, O 1.75 X .75 (28DU12)	2
26	62642-031	BUSHING, O 1.75 X 1.50 (28DU24)	2
27	62642-029	BUSHING, O 1.75 X 1.75 (28DU28)	2

ITEM	PART	DESCRIPTION	QTY.
28	11764-120	RETAINING RING, TRUARC #5100-125	2
29	65214-000	ROD END (PIN RETAINER)	4
31	11248-006	LOCKNUT, HEX. 3/8-16 UNC (ESNA)	2
32	11254-020	SCR, HHC 3/8-16 UNC X 2 1/2	2
33	12553-014	SCR, SOC HD. 1/4-20 UNC X 1 3/4	4
34	11822-006	SCR, BUTT. HD. 5/16-18 UNC X 3/4	8
35	14996-005	WASHER, FLAT 5/16 S.A.E.	30
36	11248-005	LOCKNUT, HEX. 5/16-18 UNC (ESNA)	12
37	11253-010	SCR, HHC. 5/16-18 X 1 1/4	6
38	62881-000	SWITCH, BALL DETENT	1
39	68508-000	PIN, LOWER	1
40	62642-040	BUSHING, O 2.50 X 1.00 (40DU16)	2
41	68470-000	PIVOT BRACKET WELDMENT	1
42	68691-022	CAT TRACK (22 LINKS)	1
43	REF.	MOUNTING BRACKET (SET)	1
44	68701-099	WEAR STRIP, POLYETHYLENE	1.33 FT
45	11934-003	FITTING 6-4	4
46	11941-001	FITTING 6-4	2
47	65214-001	ROD END	1
48	11254-010	SCREW HHC 3/8-16UNC X 1 1/4	4
49	11238-006	WASHER, 3/8 SPLIT LOCK	5
50	11254-008	SCREW, HHC 3/8-16UNC X 1	1
51	11246-005	NUT, HEX ESNA 5/16-18UNC	2
52	61692-099	GROMMET (EDGE COVER)	1.5 FT
53	68778-013	VALVE, COUNTER BALANCE - 3000 PSI	2
54	11253-020	SCREW HHC 5/16-18 X 2 1/2	1
55	11248-005	NUT HEX ESNA 5/16-18UNC	1
56	68778-001	VALVE, COUNTER BALANCE	1
57	068778-012	VALVE, COUNTER BALANCE - 2000 PSI	1


NOTES:
1. SET THIS COUNTER BALANCE VALVE TO 2000 PSI.
2. SET THESE COUNTER BALANCE VALVES TO 3000 PSI.
3. APPLY LOCKTITE # 242
NOTE: LEAVE GAP AT TOP.
NOTCH RIBS TO ALLOW GOOD
FIT WHEN NECESSARY.

Turret Assembly, AB46RT Gas

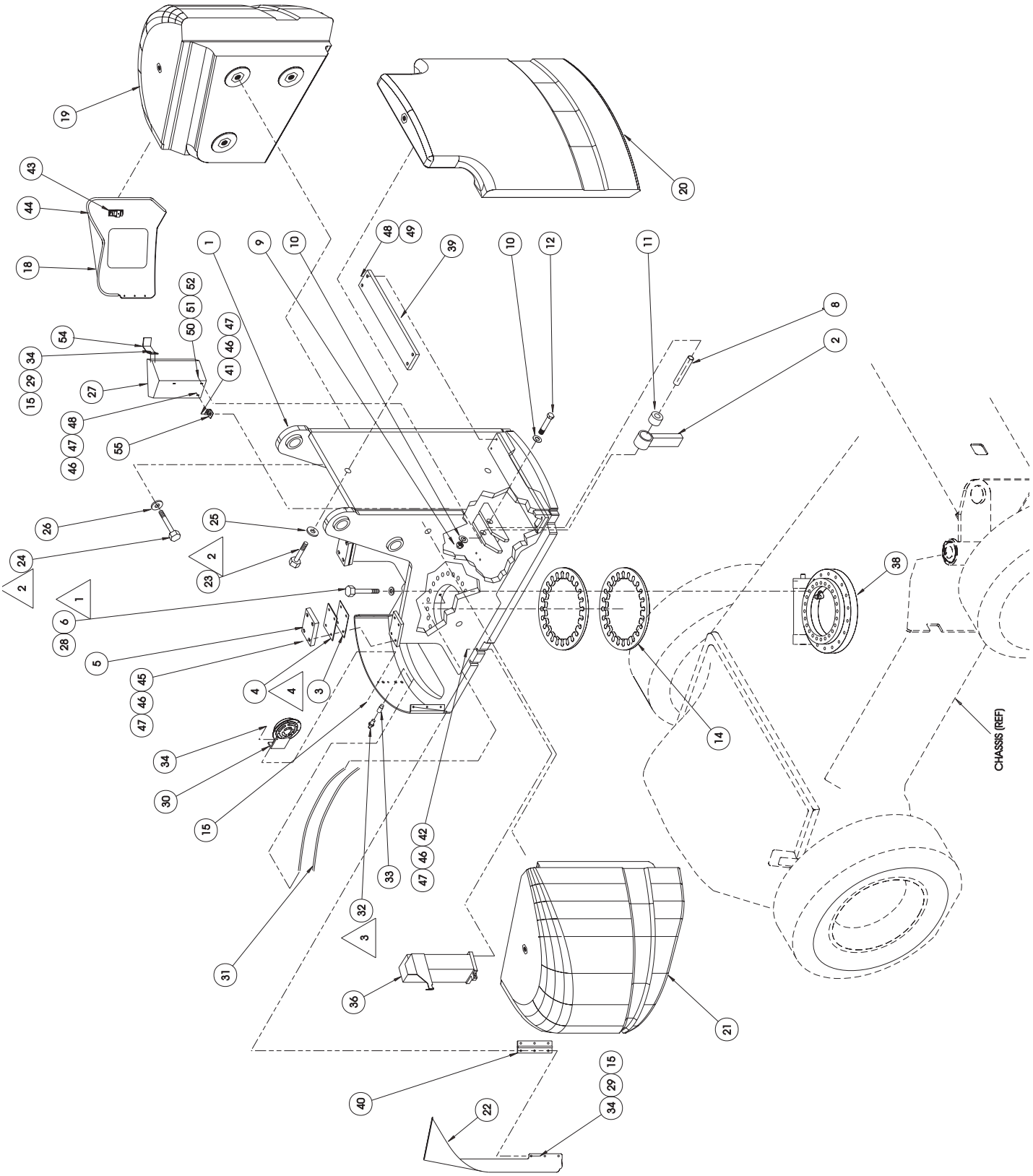
068330-004

ITEM	PART	DESCRIPTION	QTY.
1	68392-000	TURRET POST WELDMENT	1
2	68485-000	STOP WELDMENT	1
3	68319-000	SHIM, 16GA, REST PAD	4
4	68319-001	SHIM, 10GA, REST PAD	4
5	68660-000	REST PAD	2
6	11291-040	SCREW, HHC 5/8-11 X 4 GR 8	24
8	68478-000	TUBE, STL 1"O.D. X .120W X 3.10" LG	1
9	11248-012	NUT, HEX ESNA 3/4-10 ESNA	1
10	11240-012	WASHER 3/4 STL	2
11	68720-002	NEOPRENE SPRING CYLINDER-POLY.	1
12	14099-036	SCREW, HHC 3/4-10 X 4-1/2	1
14	19930-220	SPACER RING	2
15	11248-004	NUT, HEX ESNA 1/4-20	18
18	68656-000	COVER TRIM, GROUND CONTROL	1
19	68653-000	COUNTER WEIGHT, LEFT SIDE	1
20	68652-000	COUNTER WEIGHT, REAR	1
21	68654-000	COUNTER WEIGHT, RIGHT SIDE	1
22	68657-000	COVER TRIM, VALVE BLOCK	1
23	14099-012	SCREW HHC, 3/4-10UNC X 1-1/2	2
24	14918-020	SCREW HHC, 1-8UNC X 2-1/2	6
25	11239-012	WASHER FLAT ASTM 3/4" A325	2
26	11240-016	WASHER FLAT 1" STD	6
27	68328-004	LOWER CONTROL BOX-GAS RT	1
28	11297-010	BELLEVILLE WASHER 5/8 DIA	24
29	11240-004	WASHER, 1/4 FLAT STD	30
30	29958-001	HORN, 12 VOLT	1
31	68678-024	TUBING, POLYURETHANE 24"	2
32	13336-001	FITTING, GREASE	2
33	68679-003	FITTING, BULKHEAD	2
34	11252-006	SCREW, HHC 1/4-20 X 3/4	16
36	68348-002	VALVE BLOCK ASSY-I/C RT	1
38	REF	DRIVE WORM GEAR (68571)	REF
39	68660-001	REST PAD	1
40	68759-000	HINGE,TURRET COVER	2
41	11253-018	SCRW HHC GR5 5/16-18 X 1-1/2	1
42	11253-022	SCRW HHC GR5 5/16-18 X 2-3/4	2
43	68757-002	LATCH, SOUTHCO	2
44	61692-099	GROMMET MATERIAL	10FT
45	11253-012	SCRW HHC GR5 5/16-18 X 1-1/2	8
46	11248-005	NUT HEX 5/16-18 ESNA	12
47	14996-005	WASHER 5/16 FLAT SAE	22
48	11253-006	SCRW HHC GR5 5/16-18 X 3/4	5
49	11238-005	WASHER, SPLIT LOCK 5/16	4
50	11254-006	SCRW HHC GR5 3/8-16 UNC X 3/4	6
51	11238-006	WASHER, SPLIT LOCK 3/8	6
52	14996-006	WASHER, 3/8 FLAT SAE	6
54	68792-000	BRACKET	1
55	68793-000	BRACKET	1

Turret Assembly, AB46RT Diesel

068330-005

ITEM	PART	DESCRIPTION	QTY.
1	68392-000	TURRET POST WELDMENT	1
2	68485-000	STOP WELDMENT	1
3	68319-000	SHIM, 16GA, REST PAD	4
4	68319-001	SHIM, 10GA, REST PAD	4
5	68660-000	REST PAD	2
6	11291-040	SCREW, HHC 5/8-11 X 5 GR 8	24
8	68478-000	TUBE, STL 1"O.D. X .120W X 3.10" LG	1
9	11248-012	NUT, HEX ESNA 3/4-10 ESNA	1
10	11240-012	WASHER 3/4 STL	2
11	68720-002	NEOPRENE SPRING CYLINDER-POLY.	1
12	14099-036	SCREW, HHC 3/4-10 X 4-1/2	1
14	19930-220	SPACER RING	2
15	11248-004	NUT, HEX ESNA 1/4-20	18
18	68656-000	COVER TRIM, GROUND CONTROL	1
19	68653-000	COUNTER WEIGHT, LEFT SIDE	1
20	68652-000	COUNTER WEIGHT, REAR	1
21	68654-000	COUNTER WEIGHT, RIGHT SIDE	1
22	68657-000	COVER TRIM, VALVE BLOCK	1
23	14099-012	SCREW HHC, 3/4-10UNC X 1-1/2	2
24	14918-020	SCREW HHC, 1-8UNC X 2-1/2	6
25	11239-012	WASHER FLAT ASTM 3/4" A325	2
26	11240-016	WASHER FLAT 1" STD	6
27	68328-005	LOWER CONTROL BOX-DIESEL RT	1
28	11297-010	BELLEVILLE WASHER 5/8 DIA	24
29	11240-004	WASHER, 1/4 FLAT STD	30
30	29958-001	HORN, 12 VOLT	1
31	68678-024	TUBING, POLYURETHANE 24"	2
32	13336-001	FITTING, GREASE	2
33	68679-003	FITTING, BULKHEAD	2
34	11252-006	SCREW, HHC 1/4-20 X 3/4	16
36	68348-002	VALVE BLOCK ASSY-I/C RT	1
38	REF	DRIVE WORM GEAR (68571)	REF
39	68660-001	REST PAD	1
40	68759-000	HINGE,TURRET COVER	2
41	11253-018	SCRW HHC GR5 5/16-18 X 1-1/2	1
42	11253-022	SCRW HHC GR5 5/16-18 X 2-3/4	2
43	68757-002	LATCH, SOUTHCO	2
44	61692-099	GROMMET MATERIAL	10FT
45	11253-012	SCRW HHC GR5 5/16-18 X 1-1/2	8
46	11248-005	NUT HEX 5/16-18 ESNA	12
47	14996-005	WASHER 5/16 FLAT SAE	22
48	11253-006	SCRW HHC GR5 5/16-18 X 3/4	5
49	11238-005	WASHER, SPLIT LOCK 5/16	4
50	11254-006	SCRW HHC GR5 3/8-16 UNC X 3/4	6
51	11238-006	WASHER, SPLIT LOCK 3/8	6
52	14996-006	WASHER, 3/8 FLAT SAE	6
54	68792-000	BRACKET	1
55	68793-000	BRACKET	1


CHASSIS (REF)

Engine Assembly, AB46RT Gas

068871-000

ITEM	PART	DESCRIPTION	QTY.
1	68873-000	ENGINE, FORD GAS	1
3	INC'L W/ENG.	THROTTLE ACTUATOR	REF
4	INC'L W/ENG.	IGNITION MODULE	REF
5	68883-000	PUMP, REXROTH	1
6	68669-000	PUMP, BARNES	1
7	68779-000	CHECK VALVE,	2
8	68812-000	ADAPTER KIT, SPLIT FLANGE	2
9	68910-000	MOUNTING BRACKET	1
10	68861-000	MOUNTING BRACKET	1
11	68950-000	ADAPTER, #10 SPLIT FL/#10 J.I.C.	2
12	11936-005	FITTING, TEE	1
13	15961-010	FITTING, TEE	1
14	27972-000	SOLENOID, STARTER RELAY	1
15	68913-000	MOUNTING BRACKET, GOVERNOR	1
16	63674-012	SCR, HHC. M6-1.0 X 12MM LG.	1
17	63946-016	SCR, HHC. M10-1.5 X 16MM LG.	3
18	63946-020	SCR, HHC. M10-1.5 X 20MM LG.	2
19	14252-004	"NUT-SERT" 1/4-20UNC	4
20	11941-015	FITTING, 10MB-10MJ	1
21	11937-006	FITTING, 90ø 10FJX-10MJ	1
22	11934-027	FITTING, 90ø 8MB-4MJ	1
23	11934-019	FITTING, 90ø 16MB-16MJ	1
24	68132-001	SWITCH, AUTO RELAY	1
25	11252-006	SCR, HHC 1/4-20UNC X 3/4	4
26	11248-004	LOCK NUT 1/4-20UNC ESNA	4
27	16776-012	ROD, THROTTLE ACTUATOR 12 3/8" LG	1
28	68892-001	HOSE, INLET W/HOLE	1
29	68956-001	PIPE BUSHING, DIELECTRIC 3/8 X 1/4	1
30	68957-005	ELBOW, 1/2" TUBE X 1/4" PIPE	1
31	68955-099	HOSE, 1/2 NEOPRENE	FT 1.5
32	20541-018	HOSE CLAMP	1
33	68954-001	OIL PRESSURE SWITCH	1
34	11256-010	SCR, HHC. 1/2-13UNC X 1 1/4 LG.	2
35	11238-004	WASHER, SPLIT LOCK 1/2"	3
36	11923-001	FITTING, BUSHING 1/4 X 1/8 NPT	1
37	12739-099	HOSE, FUEL LINE	FT 1.1
38	11709-008	SCREW, MACH RD HD 10-24 X 1	3
39	20331-000	FILTER, IN-LINE FUEL	1
40	20541-001	HOSE CLAMP	3
41	11934-012	FITTING 90ø 10MB-12MJ	1
42	68988-000	FAN MOUNT	1
43	68996-000	FAN, PUSHER-JD	1
44	29939-001	LOCKNUT 3/8" CONDUIT	1
45	20541-004	HOSE CLAMP 7/16-1	2

ITEM	PART	DESCRIPTION	QTY.
46	11248-003	NUT, HEX ESNA 10-24	3
47	11240-003	WASHER FLT STD #10	7
48	11240-004	WASHER FLT STD 1/4	11
49	11239-008	WASHER FLT STD 1/2	2
50	11238-006	WASHER LOCK 3/8 SPLIT	2
51	11254-008	SCREW, HHC 3/8-16 X 1	4
52	66488-014	SCREW, SOCK HD M6 X 1.0 X 14mm	3
53	11252-008	SCREW, HHC 1/4-20UNC X 1	4
54	66488-025	SCREW, SOCK HD M6 X 1.0 X 25mm	1
55	66488-018	SCREW, SOCK HD M6 X 1.0 X 18mm	2
56	11261-004	NUT,HEX 1/4-28UNF	1
57	11238-004	WASHER, SPLIT LOCK 1/4"	2
58	69046-000	DIRECT MOUNT TEMP SWITCH	1
59	61254-002	CABLE ASSEMBLY (18" LG)	1
60	14996-006	WASHER, 3/8 SAE FLAT PLATED	1
61	63946-020	SCREW, HHC M10-1.5 X 20MM LG	1
201	29601-021	CONN RING 12-10 GA 3/8 DIA	2
202	29601-039	CONN RING 12-10 GA. 5/16	3
203	29601-013	CONN RING 16-14 GA. # 10	8
204	29620-002	BUTT CONNECTOR 14-16 GA.	4
205	29931-003	CONN FEMALE PUSH 16-14 GA. 1/4	5
206	29467-099	WIRE 14 AWG RED/BLK	FT. 4
207	29453-099	WIRE 16 AWG ORG	FT. 14
208	29477-099	WIRE 16 AWG ORG/BLK	FT3
209	29480-099	WIRE 10 AWG RED	FT. 8
210	29601-015	CONN RING 16-14 GA 3/8 DIA	2
211	29451-099	WIRE 16 AWG WHT	FT8
212	29350-099	WIRE 16 AWG GRN/BLK	FT4
213	29352-099	WIRE 16 AWG RED/WHT	FT4.5
214	29360-099	WIRE 16 AWG ORG/GRN	FT2
215	29452-099	WIRE 16 AWG BLK	FT13
216	29457-099	WIRE 16 AWG GRN	FT. 7
217	29479-099	WIRE 16 AWG WHT/BLK	5.5 FT
218	29450-099	WIRE 16 AWG BLU	FT. 6
219	29353-099	WIRE 16 AWG GRN/WHT	1.5 FT
220	68762-001	SOCKET - CONTACT	17
221	68764-000	PLUG - SEALING 12-14 GA.	3
222	68761-001	LOCK WEDGE - PLUG 12 SOCKET	1
223	68760-000	PLUG - CONNECTOR 12 SOCKET	1
224	29610-002	CONN FORK 16-14 AWG #8	5
225	29481-099	WIRE 10 AWG BLK	FT6
226	29460-099	WIRE 14 AWG RED	FT3
227	68761-009	LOCK WEDGE 8 SOCKET	1
228	68760-008	PLUG, CONNECTOR 8 SOCKET	1

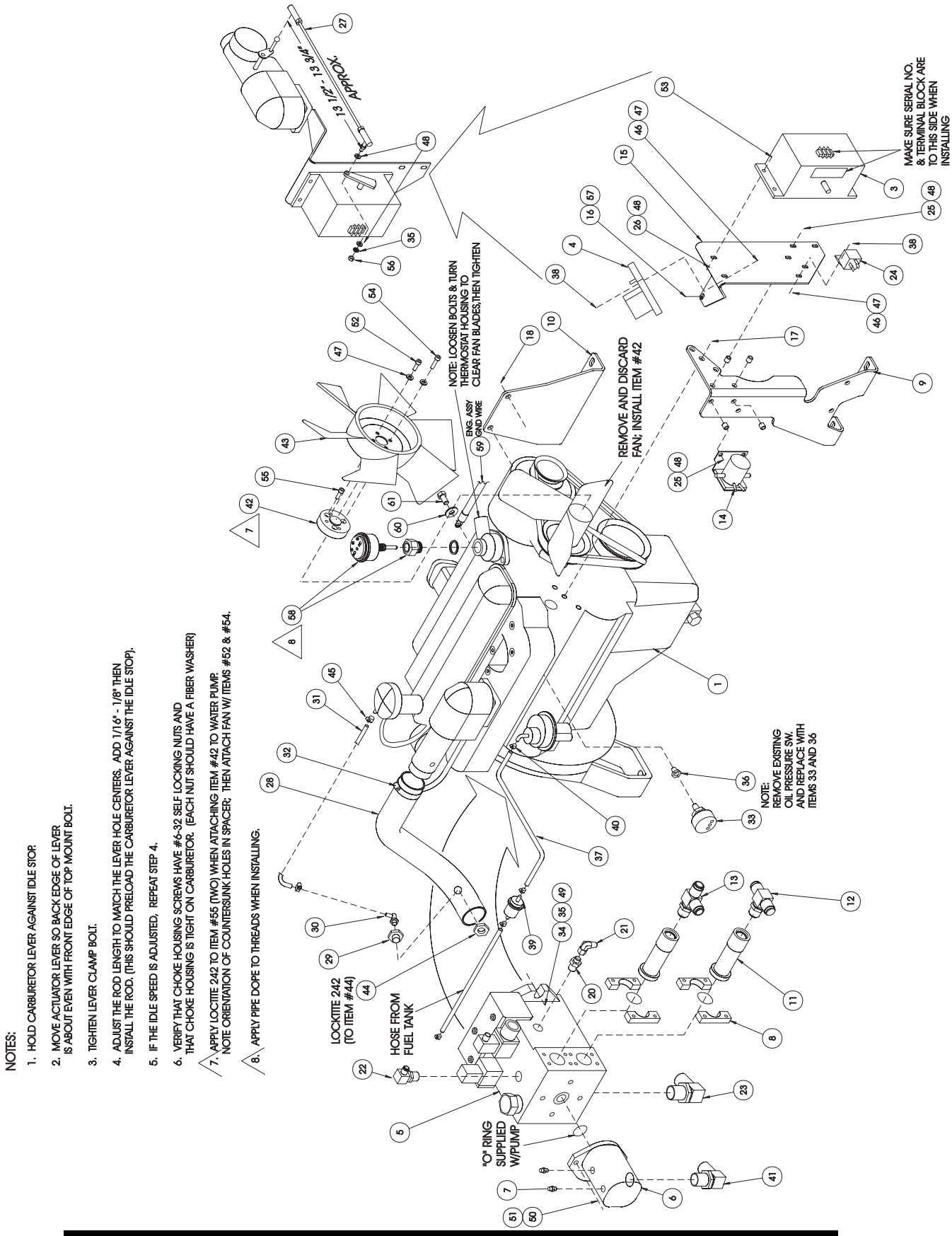
Engine Replacement Parts, AB46RT Gas

068871-000

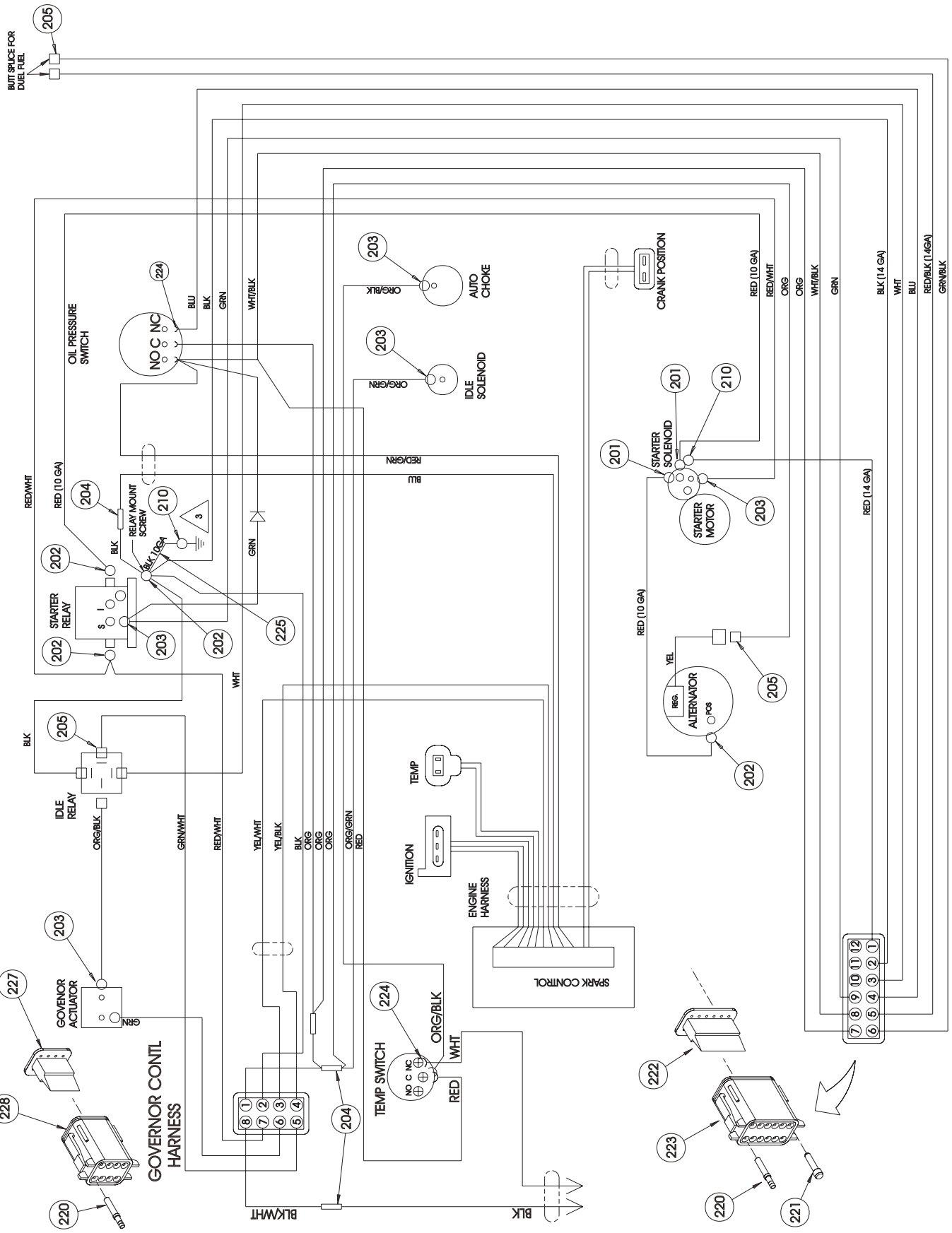
ITEM	PART	DESCRIPTION	QTY.
*	68873-001	OIL PRESSURE SWITCH	1
*	68873-002	CARBURATOR	1
*	68873-003	OIL FILTER	1
*	68873-004	FUEL FILTER	1
*	68873-005	FAN BELT	1
*	68873-006	IGNITION MODULE	1
*	68873-007	STARTER	1
*	68873-008	STARTER SOLENOID	1
*	68873-009	ALTERNATOR	1
*	68873-010	ALTERNATOR BRACKET	1
*	68873-011	WATER PUMP	1
*	68873-012	WATER PUMP GASKET	1
*	68873-013	WATER HOSE	1
*	68873-014	WATER HOSE CLAMP	1
*	68873-015	THERMOSTAT	1
*	68873-016	THERMOSTAT HOUSING GASKET	1
*	68873-017	SPARK PLUG	1
*	68873-018	SPARK PLUG WIRE	1

ITEM	PART	DESCRIPTION	QTY.
*	68873-019	SPARK PLUG WIRE CAP	1
*	68873-020	CARBURATOR MOUNT GASKET	1
*	68873-021	DISTRIBUTOR CAP	1
*	68873-022	DISTRIBUTOR ROTOR	1
*	68873-023	GOVERNOR	1
*	68873-024	THROTTLE LINKAGE	1
*	68873-025	OIL DRAIN PLUG	1
*	68873-026	OIL DRAIN PLUG CRUSH WASHER	1
*	68873-027	INTAKE MANIFOLD GASKET	1
*	68873-028	EXHAUST MANIFOLD GASKET	1
*	68873-029	EXHAUST MANIFOLD BOLTS	1
*	68873-030	HEAD GASKET	1
*	68873-031	VALVE COVER GASKET	1
*	68873-032	GOVERNOR ACTUATOR	1
*	68873-033	FLYWHEEL RING GEAR	1
*	68873-034	BALL JOINT - GOVERNOR END	1
*	68873-035	BALL JOINT- CARB END	1

ILLUSTRATED PARTS BREAKDOWN



Engine Assembly, AB46RT Gas / 068871-000 / 1 of 2


205
BUTT SPLICE FOR DUEL FUEL
OIL PRESSURE SWITCH
NO C NC
224
BLU
BLK
GRN
WHT/BLK
203
AUTO CHOKE
ORG/BLK
203
IDLE SOLENOID
ORG/GRN
CRANK POSITION
RED (10 GA)
RED/WHT
ORG
ORG
WHT/BLK
GRN
BLK (14 GA)
WHT
BLU
RED/BLK (14GA)
GRN/BLK
201
210
STARTER SOLENOID
201
203
STARTER MOTOR
RED (14 GA)
RED/GRN
BLU
RED/WHT
RED (10 GA)
204
RELAY MOUNT SCREW
210
BLK
BLK 10GA
GRN
202
STARTER RELAY
S
I
202
203
202
225
WHT
RED (10 GA)
YEL
ALTERNATOR
REG.
POS
205
202
BLK
205
IDLE RELAY
ORG/BLK
GRN/WHT
RED/WHT
YEL/WHT
YEL/BLK
BLK
ORG
ORG
ORG
ORG/GRN
RED
TEMP
IGNITION
ENGINE HARNESS
SPARK CONTROL
203
GOVENOR ACTUATOR
GRN
227
224
ORG/BLK
WHT
RED
TEMP SWITCH
NO C NC
222
228
GOVERNOR CONTL HARNESS
204
223
220
BLK/WHT
BLK
220
221

Engine Assembly, AB46RT Diesel

068872-000

ITEM	PART	DESCRIPTION	QTY.
1	68874-000	ENGINE, JOHN DEERE DIESEL	1
2	68876-000	PUMP ADAPTOR KIT	1
3	11941-015	FITTING, 10MB-10MJ	1
4	11937-006	FITTING, 90ø 10FJX-10MJ	1
5	68883-001	PUMP, REXROTH	1
6	68669-000	PUMP, BARNES	1
7	68779-000	CHECK VALVE,	2
8	68812-000	ADAPTER KIT, SPLIT FLANGE	2
9	68862-001	ENGINE MOUNTING PLATE	1
10	68862-002	ENGINE MOUNTING PLATE	1
11	63941-000	SOLENOID, THROTTLE	1
12	64423-000	SWIVEL, INLINE	1
13	11760-004	ROD END BEARING	1
14	27972-000	SOLENOID, STARTER RELAY	1
15	63946-020	SCR. HHC. M10-1.5 X 20MM LG.	12
16	63946-025	SCR. HHC. M10-1.5 X 25MM LG.	8
17	63961-016	SCR. HHC. M8-1.25 X 16MM LG.	10
18	63674-060	SCR. HHC. M6-1.0 X 60MM LG.	4
19	11252-006	SCR, HHC. 1/4-20UNC X 3/4 LG.	4
20	11248-004	LOCK NUT, 1/4-20UNC ESNA	4
21	68950-000	ADAPTOR, #10 SPLIT FL./#10 J.I.C.	2
22	11936-005	FITTING, TEE	1
23	15961-010	FITTING, TEE	1
24	11934-027	FITTING, 90ø 8MB-4MJ	1
25	11934-019	FITTING, 90ø 16MB-16MJ	1
26	68911-000	BRACKET, SOLENOID	1
27	68132-001	SWITCH, AUTO RELAY	1
28	20541-018	HOSE CLAMP	2
29	68954-001	OIL PRESSURE SWITCH	1
30	11919-002	PIPE PLUG, 1/4 NPT	1
31	11256-010	SCR, HHC. 1/2-13UNC X 1 1/4 LG.	2
32	11238-004	WASHER, SPLIT LOCK 1/2"	2
33	68891-000	HOSE, INLET	1
34	12733-099	HOSE, FUEL LINE 5/16 ID	1 FT

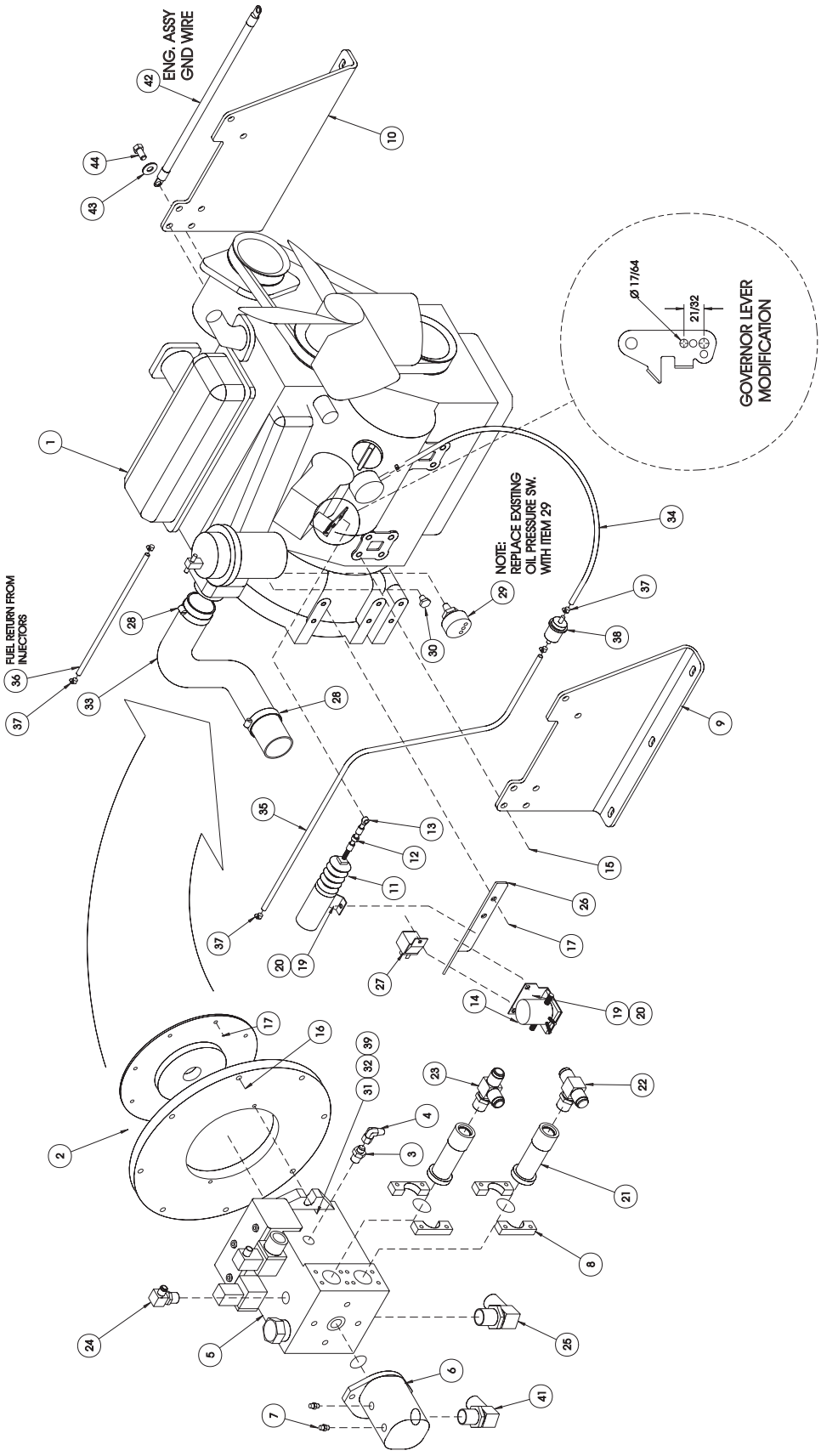
ITEM	PART	DESCRIPTION	QTY.
35	12733-099	HOSE, FUEL LINE 5/16 ID	3 FT
36	12736-099	HOSE, FUEL LINE 3/16 ID	3 FT
37	20541-001	HOSE CLAMP	6
38	20331-000	FILTER, IN-LINE FUEL	1
39	11239-008	WASHER FLAT ASTM A325 1/2	2
41	11934-012	FITTING 10-12S 90 DEG	1
42	61254-002	CABLE ASSEMBLY (18" LG)	1
43	14996-006	WASHER, 3/8 SAE FLAT PLATED	1
44	63946-020	SCREW, HHC M10-1.5 X 20MM LG	1
201	29601-021	CONN RING 12-10 GA 3/8 DIA	5
202	29601-039	CONN RING 12-10 GA. 5/16	2
203	29601-013	CONN RING 16-14 GA. # 10	2
204	29620-002	BUTT CONNECTOR 14-16 GA.	4
205	29931-003	CONN FEMALE PUSH 16-14 GA. 1/4	5
206	29478-099	WIRE 16 AWG RED/BLK	6 FT
207	29453-099	WIRE 16 AWG ORG	6 FT
208	29480-099	WIRE 10 AWG RED	7 FT
209	29601-015	CONN RING 16-14 GA 3/8 DIA	2
210	29451-099	WIRE 16 AWG WHT	7 FT
211	29452-099	WIRE 16 AWG BLK	10 FT
212	29457-099	WIRE 16 AWG GRN	6 FT
213	29479-099	WIRE 16 AWG WHT/BLK	6 FT
214	29450-099	WIRE 16 AWG BLU	6 FT
215	68762-001	SOCKET - CONTACT	8
216	68764-000	PLUG - SEALING 12-14 GA.	4
217	68761-001	LOCK WEDGE - PLUG	1
218	68760-000	PLUG - CONNECTOR	1
219	29825-002	DIODE 3A 400V	2
220	29610-002	CONN FORK 16-14 AWG #8	3
221	29481-099	WIRE 10 AWG BLK	6 FT
222	29702-000	FUSE HOLDER	1
223	29704-025	FUSE 25 AMP	1
224	29620-003	CONNECTOR BUTT 12-10GA INSL	1
225	29601-040	CONN RING 16-14GA 5/16	4

Engine Assembly Replacement Parts, AB46RT Diesel

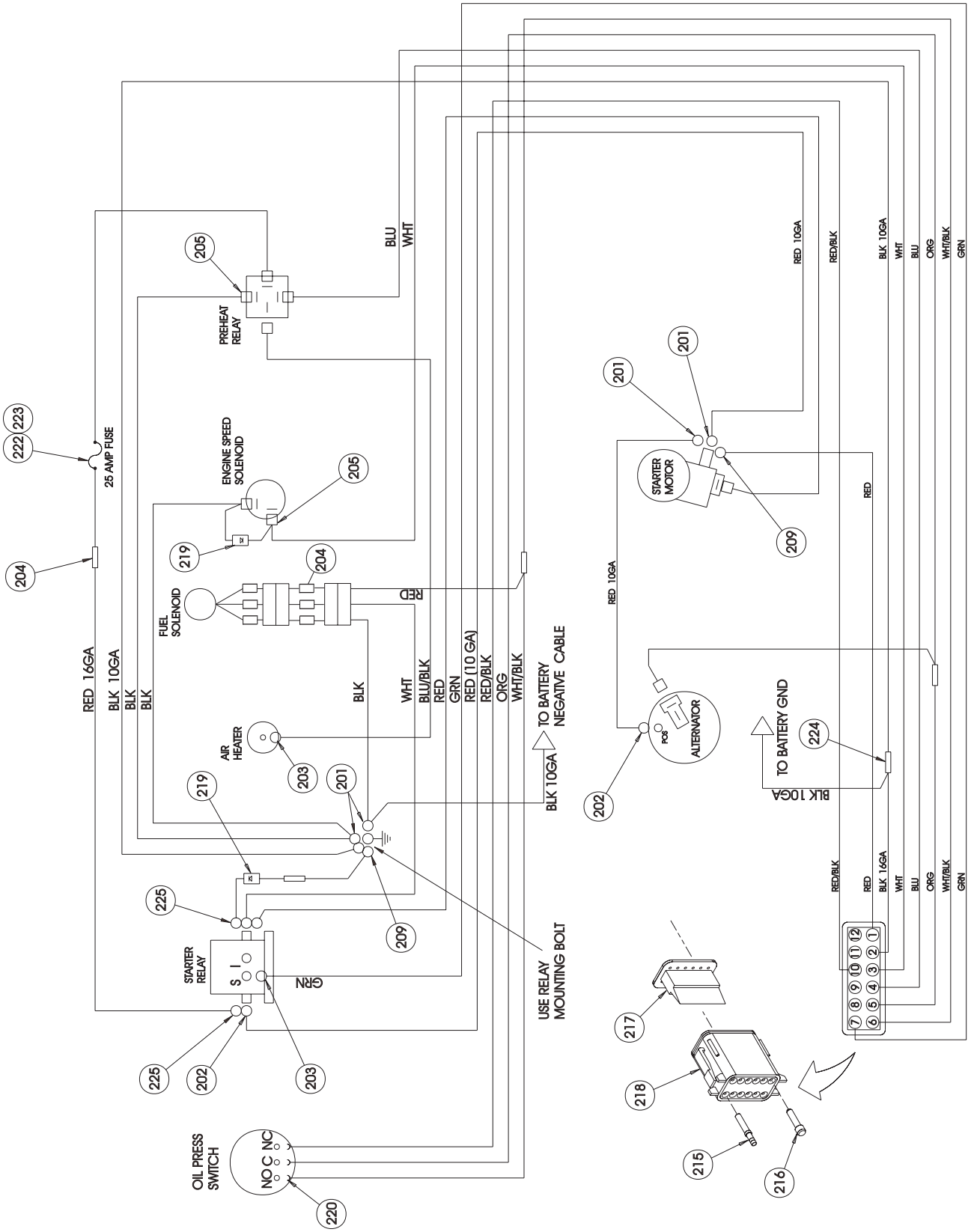
068872-000

ITEM	PART	DESCRIPTION	QTY.
*	68874-001	STARTER	1
*	68874-002	GOVERNOR ASSEMBLY	1
*	68874-003	OIL FILTER	1
*	68874-004	FUEL FILTER	1
*	68874-005	FAN BELT	1
*	68874-006	IGNITION MODULE	1
*	68874-007	INJECTOR	1
*	68874-008	INJECTION LINE	1
*	68874-009	STARTER SOLENOID	1
*	68874-010	ALTERNATOR	1
*	68874-011	ALTERNATOR BRACKET	1
*	68874-012	WATER PUMP	1
*	68874-013	WATER PUMP GASKET	1
*	68874-014	WATER HOSE	1
*	68874-015	WATER HOSE CLAMP	1
*	68874-016	THERMOSTAT	1

ITEM	PART	DESCRIPTION	QTY.
*	68874-017	THERMOSTAT HOUSING GASKET	1
*	68874-018	SPARK PLUG	1
*	68874-019	SPARK PLUG WIRE	1
*	68874-020	SPARK PLUG WIRE CAP	1
*	68874-021	DISTRIBUTOR CAP	1
*	68874-022	DISTRIBUTOR ROTOR	1
*	68874-023	THROTTLE LINKAGE	1
*	68874-024	OIL DRAIN PLUG	1
*	68874-025	OIL DRAIN PLUG CRUSH WASHER	1
*	68874-026	INTAKE MANIFOLD GASKET	1
*	68874-027	EXHAUST MANIFOLD GASKET	1
*	68874-028	EXHAUST MANIFOLD BOLTS	1
*	68874-029	HEAD GASKET	1
*	68874-030	VALVE COVER GASKET	1
*	68874-031	FUEL SHUT-OFF SOLENOID SYNCRO START #M806808	1



Engine Assembly, AB46RT Diesel / 068872-000 / 1 of 2


PREHEAT RELAY
205
BLU
WHT
25 AMP FUSE
222
223
204
ENGINE SPEED SOLENOID
205
219
FUEL SOLENOID
204
RED
RED 16GA
BLK 10GA
BLK
BLK
BLK
WHT
BLU/BLK
RED
GRN
RED (10 GA)
RED/BLK
ORG
WHT/BLK
TO BATTERY NEGATIVE CABLE
BLK 10GA
AIR HEATER
203
219
201
225
209
STARTER RELAY
S
I
GRN
USE RELAY MOUNTING BOLT
225
202
203
OIL PRESS SWITCH
NO
C
NC
220
201
201
STARTER MOTOR
209
RED 10GA
RED/BLK
BLK 10GA
WHT
BLU
ORG
WHT/BLK
GRN
RED
RED 10GA
ALTERNATOR
POS
202
TO BATTERY GND
BLK 10GA
224
RED/BLK
RED
BLK 16GA
WHT
BLU
ORG
WHT/BLK
GRN
1
2
3
4
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6
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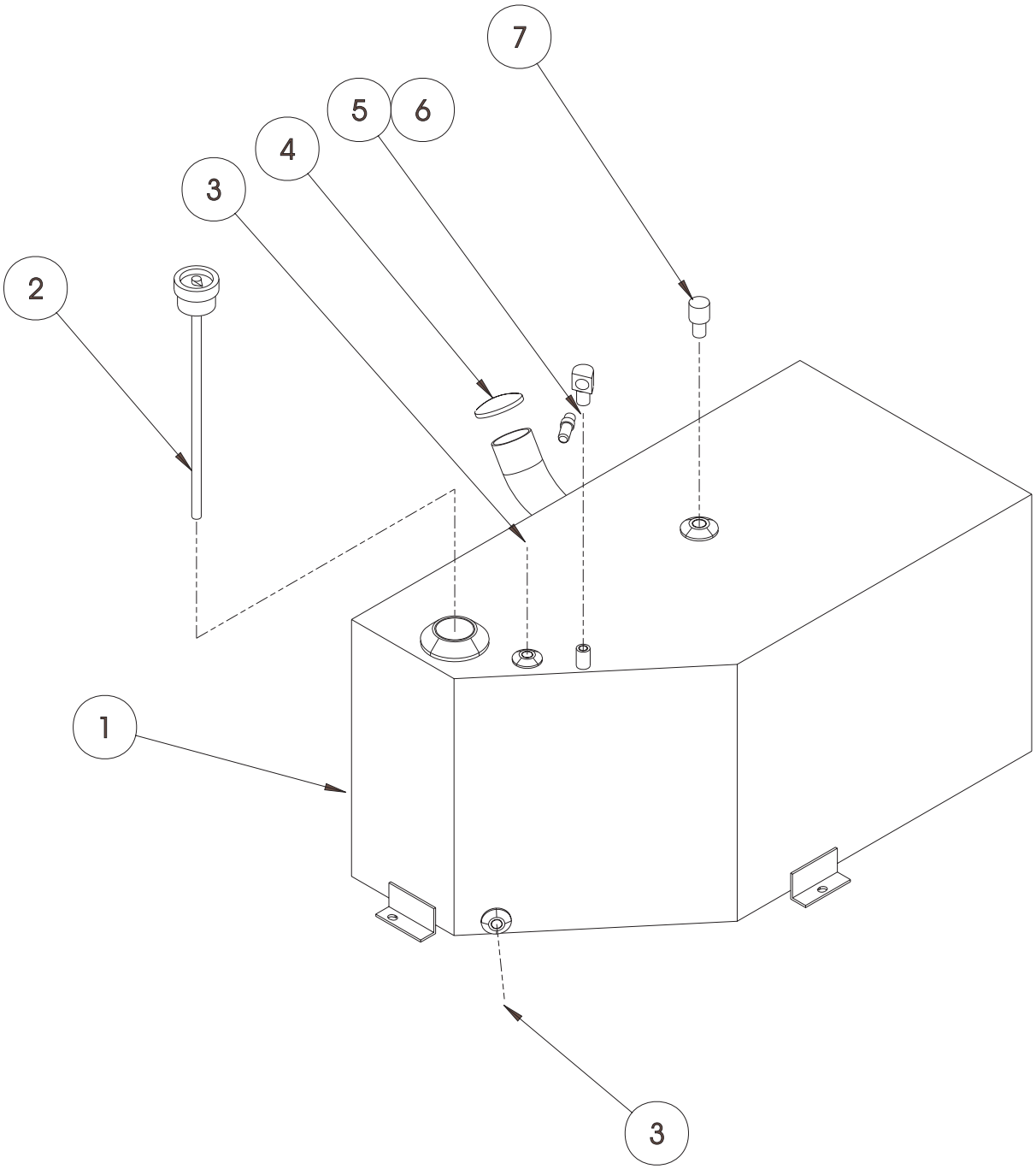
12
217
218
215
216

Fuel Tank Assembly, AB46RT Gas

068710-000

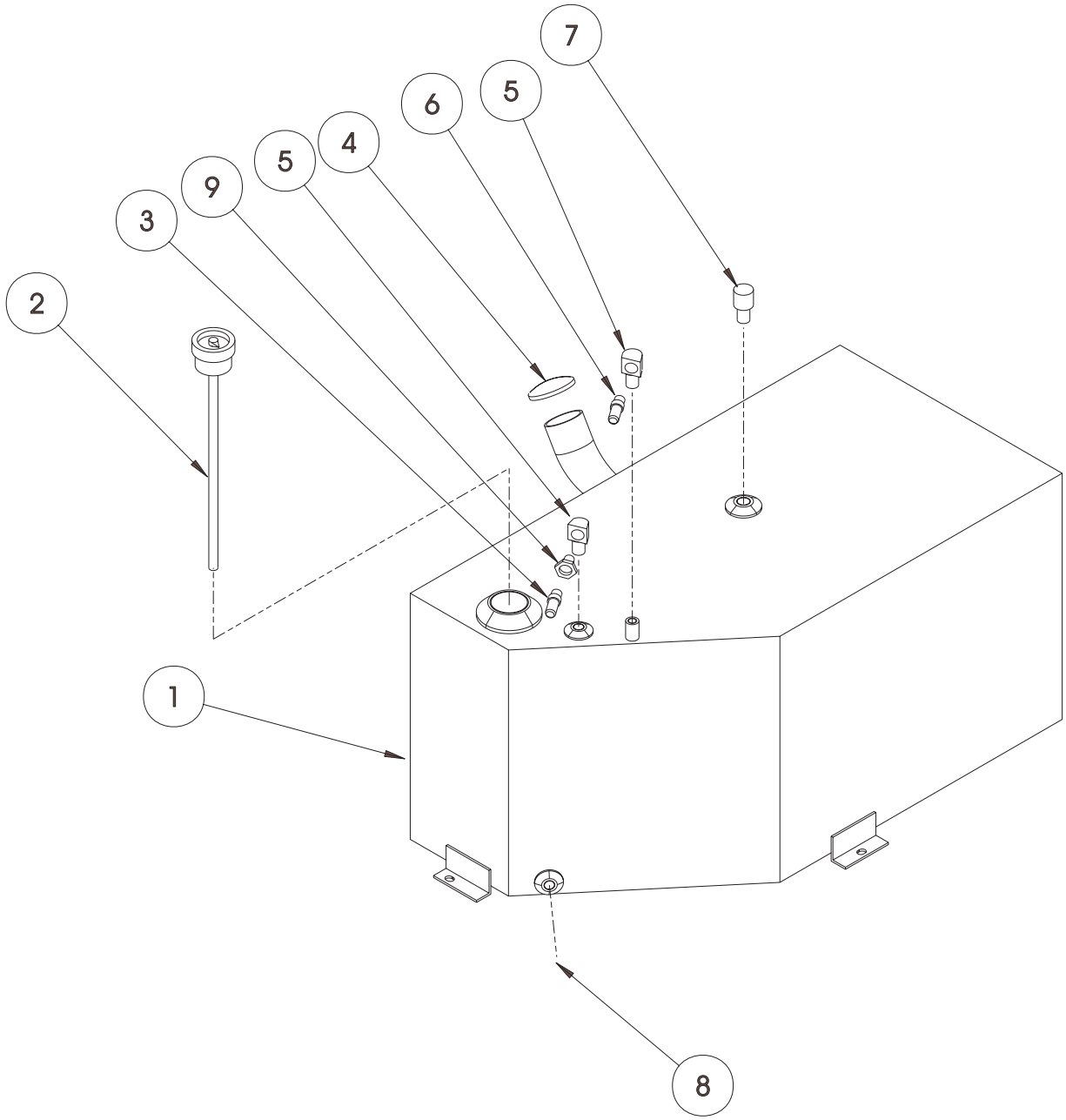
ITEM	PART	DESCRIPTION	QTY.
1	068671-000	FUEL TANK	1
2	063982-003	FUEL GAGE	1
3	011919-002	PLUG 1/4	2
4	063929-001	CAP-NON VENTED	1
5	003495-000	FITTING, STREET ELBOW 1/4	1
6	010178-003	FITTING, BARBED 1/4	1
7	068711-000	BREATHER, GITS	1



Fuel Tank Assembly, AB46RT Diesel

068710-001

ITEM	PART	DESCRIPTION	QTY.
1	068671-000	FUEL TANK	1
2	063982-003	FUEL GAGE	1
3	010178-001	FITTING, BARBED 1/8	1
4	063929-001	CAP-NON VENTED	1
5	003495-000	FITTING, STREET ELBOW 1/4	2
6	010178-005	FITTING, BARBED 1/4	1
7	068711-000	BREATHER, GITS	1
8	011919-002	FITTING, PLUG 1/4 HEX	1
9	003556-001	FITTING ADAPTER	1

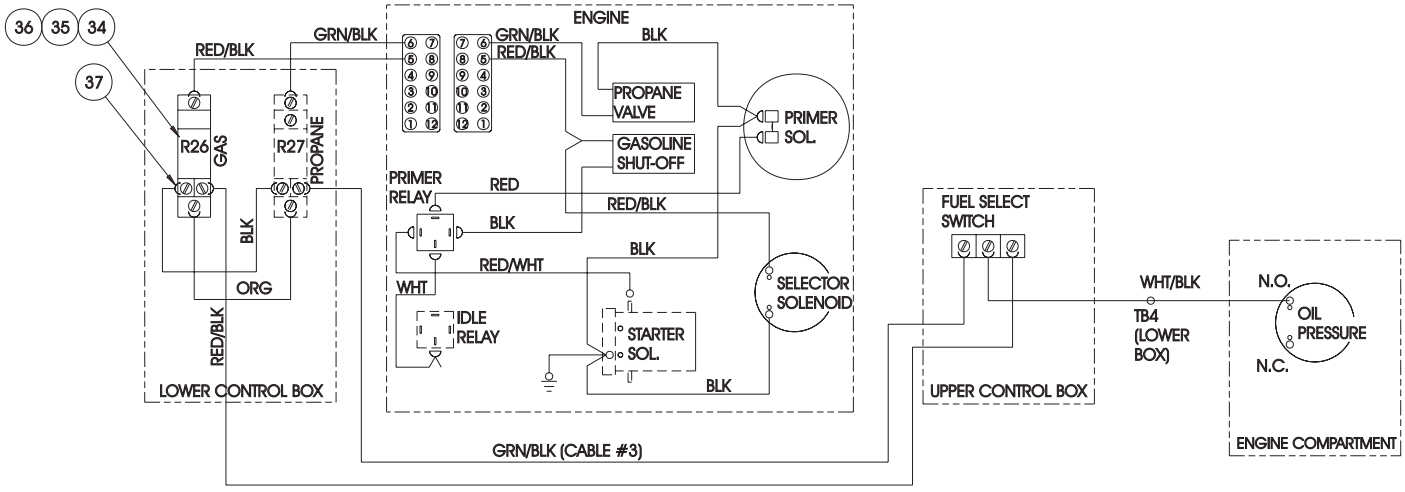


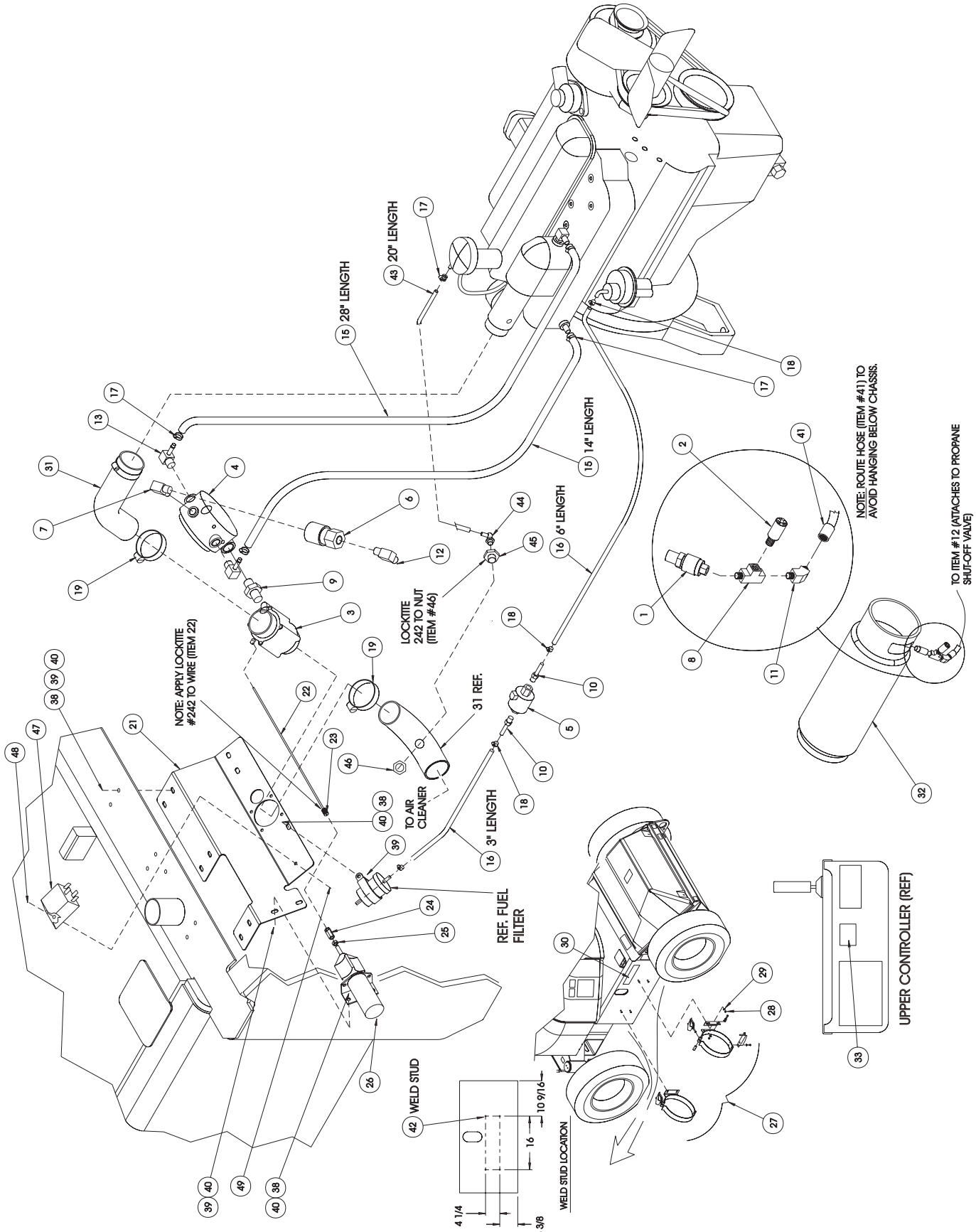
Dual Fuel Conversion Kit, AB46RT

068990-000

ITEM	PART	DESCRIPTION	QTY.
1	67615-070	TANK ADAPTOR,	1
2	67615-075	RELIEF VALVE,	1
3	68990-020	LPG CARBURETOR	1
4	68990-021	VAPORIZER/REGULATOR	1
5	68990-029	SHUT-OFF VALVE, GASOLINE	1
6	67615-052	SHUT-OFF VALVE, PROPANE	1
7	67615-057	STREET ELBOW, 1/4 NPT BRASS	1
8	67615-074	RUN TEE, 1/4 NPT BRASS	1
9	68990-022	NIPPLE, REDUCING 1/2 NPT/3/8 NPT	1
11	67615-056	FITTING, FLARE 3/8 TUBE-1/4NPT45ø EL	1
10	68990-023	FITTING, BARB 1/8 NPT-1/4 I.D. HOSE	2
12	67615-058	FITTING, 90ø 3/8 TUBE-1/4 NPT	1
13	68990-024	FITTING, 90ø BARB 1/4 NPT- 5/8 HOSE	2
14	67615-047	HOSE #6 S.S. w/2 3/8 SAE SWIVELS	1
15	68990-025	HOSE, 5/8 I.D.	FT. 4
16	67615-061	FUEL LINE 1/4" DIA.	FT. 2
17	68990-026	HOSE CLAMP, 5/8" DIA.	6
18	67615-064	HOSE CLAMP, 5/16" DIA.	4
19	68990-027	HOSE CLAMP, 2 1/2" DIA.	2
21	68990-014	MOUNTING BRACKET	1
22	69202-000	S.S. WIRE 26 GA. (0.063) X 12" LG.	1
23	69200-000	SET SCREW, (MODIFIED PER PRINT)	1
24	68987-004	COUPLING NUT 1/4-28 UNF	1
25	20495-004	JAM NUT 1/4-28 UNF.	1

ITEM	PART	DESCRIPTION	QTY.
26	68990-015	SOLENOID, TROMBETTA #D610-B1V12	1
27	68296-010	MTG. BRKT, PROPANE TANK	1
28	11248-006	LOCKNUT, 3/8-16 UNC ESNA	4
29	11240-006	WASHER, 3/8" FLAT	4
30	64189-001	LABEL, LIQUID WITHDRAWAL	1
31	68990-012	HOSE, AIR INTAKE (2 PARTS)	1
32	27934-003	TANK, PROPANE	1
33	64421-000	LABEL,	1
34	67662-001	SOCKET, RELAY (SINGLE POLE)	1
35	68756-001	RELAY, SINGLE POLE	1
36	67662-005	RETAINER CLIP	1
37	29610-006	TERMINAL, FORK	11
38	11252-006	SCREW, HHC. 1/4-20 UNC X 3/4 LG.	9
39	11248-004	LOCKNUT, 1/4-20 UNC. ESNA	9
40	11240-004	WASHER 1/4" FLAT	11
41	67615-047	HOSE, HIGH PRESSURE SUPPLY 42" LG.	1
42	14250-003	WELDSTUD 3/8-16 X 1	4
43	68678-099	HOSE, 1/2" NEOPRENE	FT1.67
44	68957-005	ELBOW 1/2 MALE BARB TO 1/4 MPT	1
45	68956-001	BUSHING, REDUCER	1
46	29939-001	LOCKNUT, 3/8" CONDUIT	1
47	68132-001	SWITCH, AUTO RELAY	1
48	11275-004	SCREW, MACH 10-32 X 1/2	1
49	11249-003	NUT, HEX ESNA 10-32	1



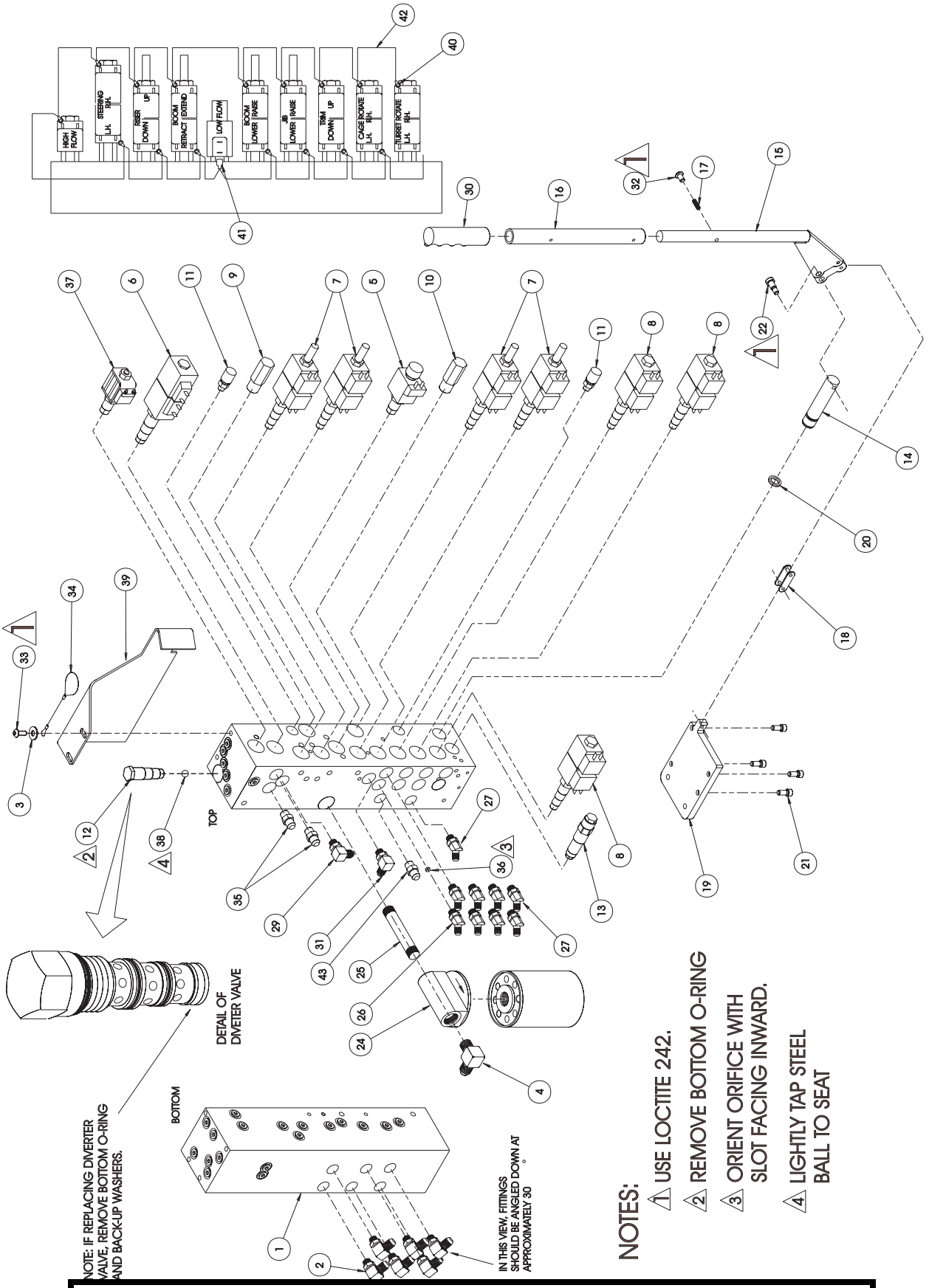


Dual Fuel Conversion Kit / 068990-000 / 2 of 2

Valve Block Assembly, AB46RT

068348-002

ITEM	PART	DESCRIPTION	QTY
1	68349-001	VALVE BLOCK SUB-ASSY.	1
2	11934-001	FITTING, 2062-4-4S	6
3	11240-005	WASHER 5/16 FLAT	2
4	11940-019	90ø ELBOW 3/4NPT X 3/4 JIC	1
5	68681-000	FLOW CNTRL,WATERMAN 12C241SP-11/A10	1
6	68683-000	3 POS, 4 WAY, TANDEM CENTER	1
7	68682-000	3 POS, 4 WAY, CLOSED CENTER	4
8	68684-000	3 POS, 4 WAY, MOTOR SPOOL	3
9	60390-018	RELIEF VALVE, 2750 PSI	1
10	60390-019	RELIEF VALVE, 1600 PSI	1
11	63965-001	PLUG, GAGE PORT	2
12	68558-000	DIVERTER VALVE	1
13	68778-011	COUNTERBALANCE VALVE	1
14	68430-000	PISTON, HAND PUMP	1
15	68428-000	LEVER WELDMENT, HAND PUMP	1
16	68429-000	LEVER EXTENSION, HAND PUMP	1
17	68564-001	DETENT BALL / SPRING	1
18	68566-000	PIVOT LINK	1
19	68425-000	MOUNTING PLATE, VALVE BLOCK	1
20	12499-016	SEAL, POLYPAK #12500625	1
21	14334-004	SCREW. SOC. HD. 5/16-18 UNC X 1/2	4
22	15936-005	SCREW, SHOULDER O 3/8 X 5/8 LG	1
24	05154-001	FILTER ASSY.	1
25	14028-008	PIPE NIPPLE, 3/4 SCHD 40 X 4	1
26	11935-013	FITTING 45ø 6MB-4MJ	1
27	11935-001	FITTING, 45ø SWIVEL EL. 4MB-4MJ	8
29	11934-004	FITTING 90ø EL. 6MB-6MJ	1
30	68700-000	HAND GRIP, VINYL	1
31	11934-003	FITTING 2062-6-4S	1
32	11821-004	SCRW BUTT HEAD 1/4-20UNC X 1/2	1
33	11822-006	SCRW BUTT HEAD 5/16-18 UNC X 3/4	2
34	63783-002	LANYARD ASSY	1
35	11941-005	FITTING 202702-6-6S	2
36	15919-000	ORFICE	1
37	68781-001	VALVE	1
38	61827-000	STEEL BALL 7/16 DIA	1
39	68791-000	BRACKET	1
40	29601-012	CONN. RING, 18-14 GA. #8	16
41	29616-002	CONN. FEM. PUSH, .25	1
42	29452-099	WIRE, 16 GA. BLACK	3 FT.
43	11941-002	FITTING STR 4MB-6MJ	1

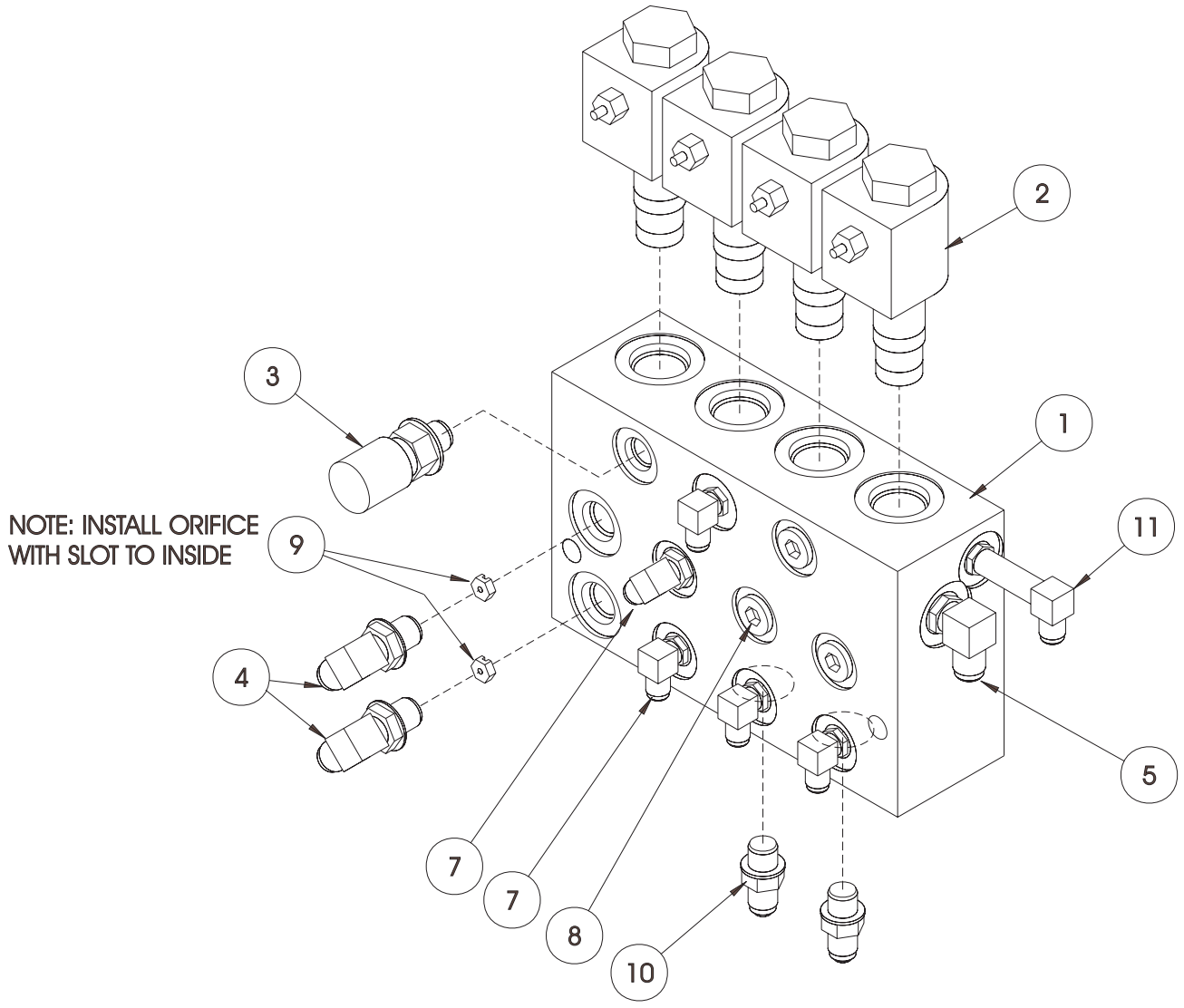


Valve Block Assembly, AB46RT / 068348-000

Drive Valve Block Assembly, AB46RT Gas & Diesel

068953-000

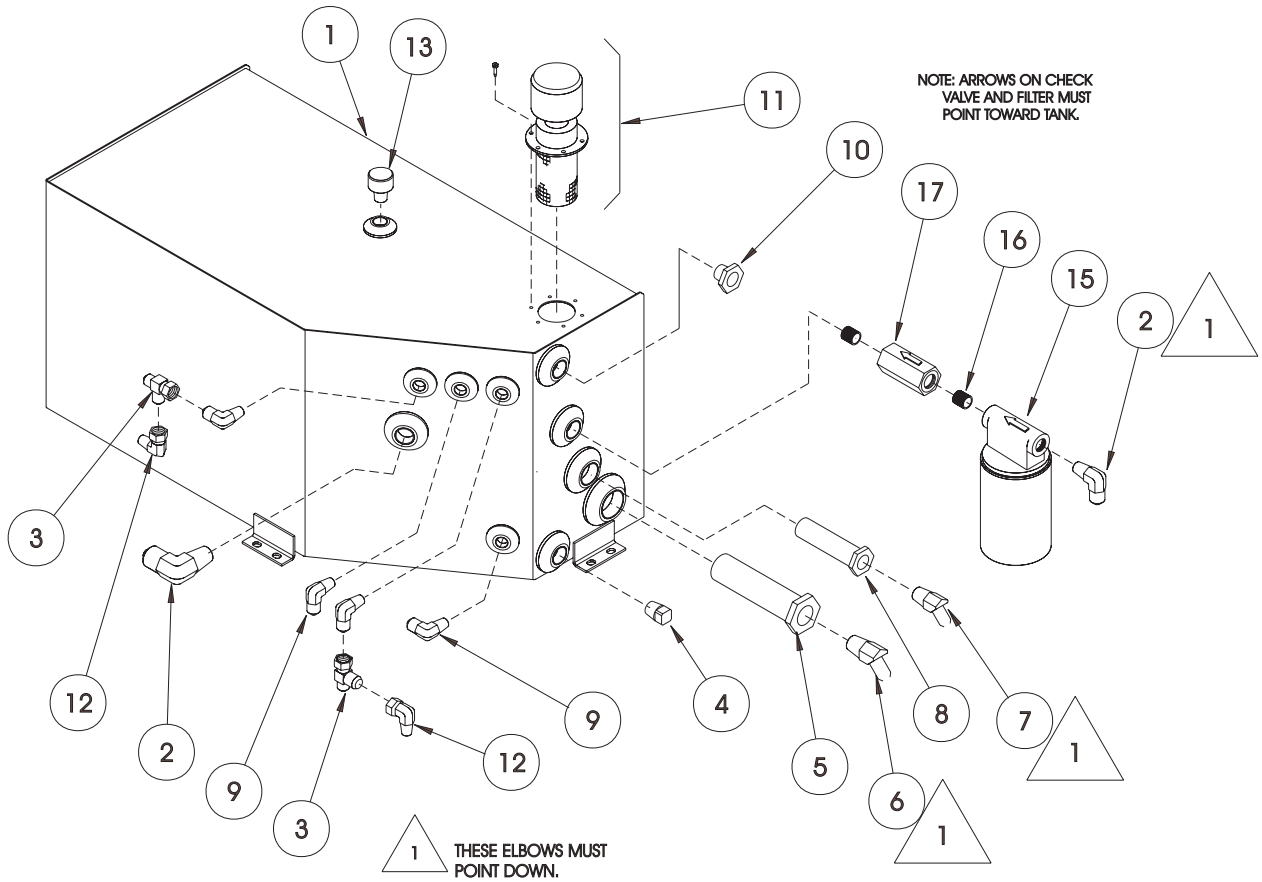
ITEM	PART	DESCRIPTION	QTY.
1	68859-000	VALVE BLOCK	1
2	67649-000	VALVE, 2 POSITION - 3 WAY	4
3	63965-001	PLUG, GUAGE PORT	1
4	11934-003	FITTING, 90ø 6MB-4MJ	2
5	11934-004	FITTING, 90ø 6MB-6MJ	1
7	11934-001	FITTING, 90ø 4MB-4MJ	5
8	12004-004	PLUG, #4 S.A.E.	3
9	15919-002	ORIFICE, CESSNA #16097-815	2
10	11941-001	FITTING, STR. ADAPTER 4MB-4MJ	2
11	15736-001	FITTING, LG. 90ø 4MB-4MJ	1



Hydraulic Tank Assembly, AB46RT

069205-000

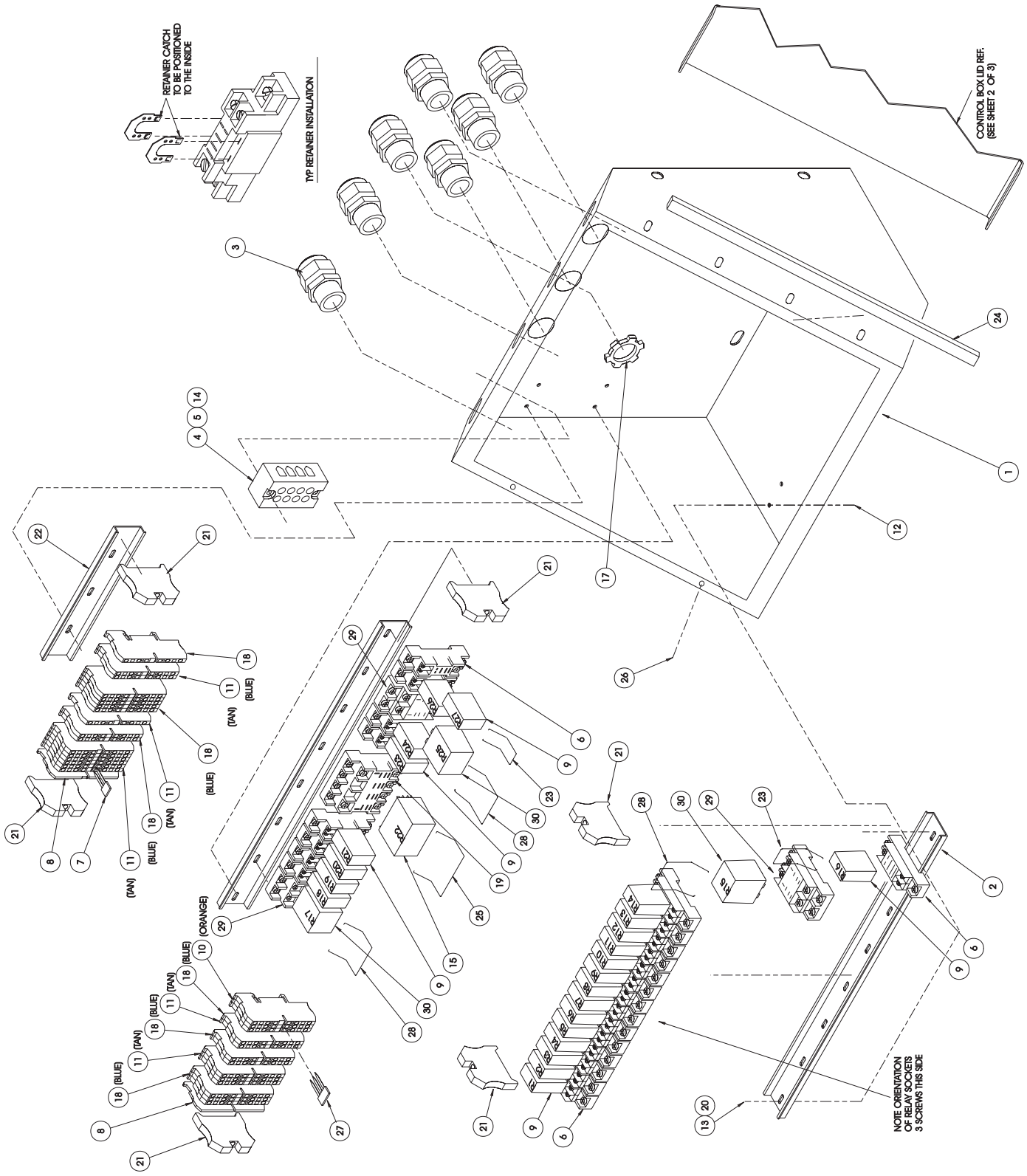
ITEM	PART	DESCRIPTION	QTY.
1	68995-000	HYDRAULIC RESERVOIR	1
2	11940-019	FITTING, 90ø ELBOW 12MP-10MJ	2
3	20733-002	FITTING, TEE 6MJ-6MJ-6FJ	2
4	21305-007	PLUG, MAGNETIC	1
5	63935-000	STRAINER	1
6	13485-020	FITTING, 45ø ELBOW 16MP-16MJ	1
7	13485-017	FITTING, 45ø ELBOW 12MP-12MJ	1
8	61818-000	STRAINER	1
9	11940-010	FITTING, 90ø ELBOW 6MP-6MJ	4
10	63979-006	SIGHT GUAGE	1
11	68840-000	FILLER BREATHER CAP & SCREEN	1
12	11937-003	FITTING, 90ø ELBOW 6FJ-6MJ	2
13	68711-000	BREATHER, GITS	1
15	05154-001	FILTER, HYDRAULIC SPIN ON	1
16	12467-003	NIPPLE, PIPE 3/4 CLOSE	2
17	68809-000	CHECK VALVE	1



Ground Control Box Assembly, AB46RT Das & Dual Fuel

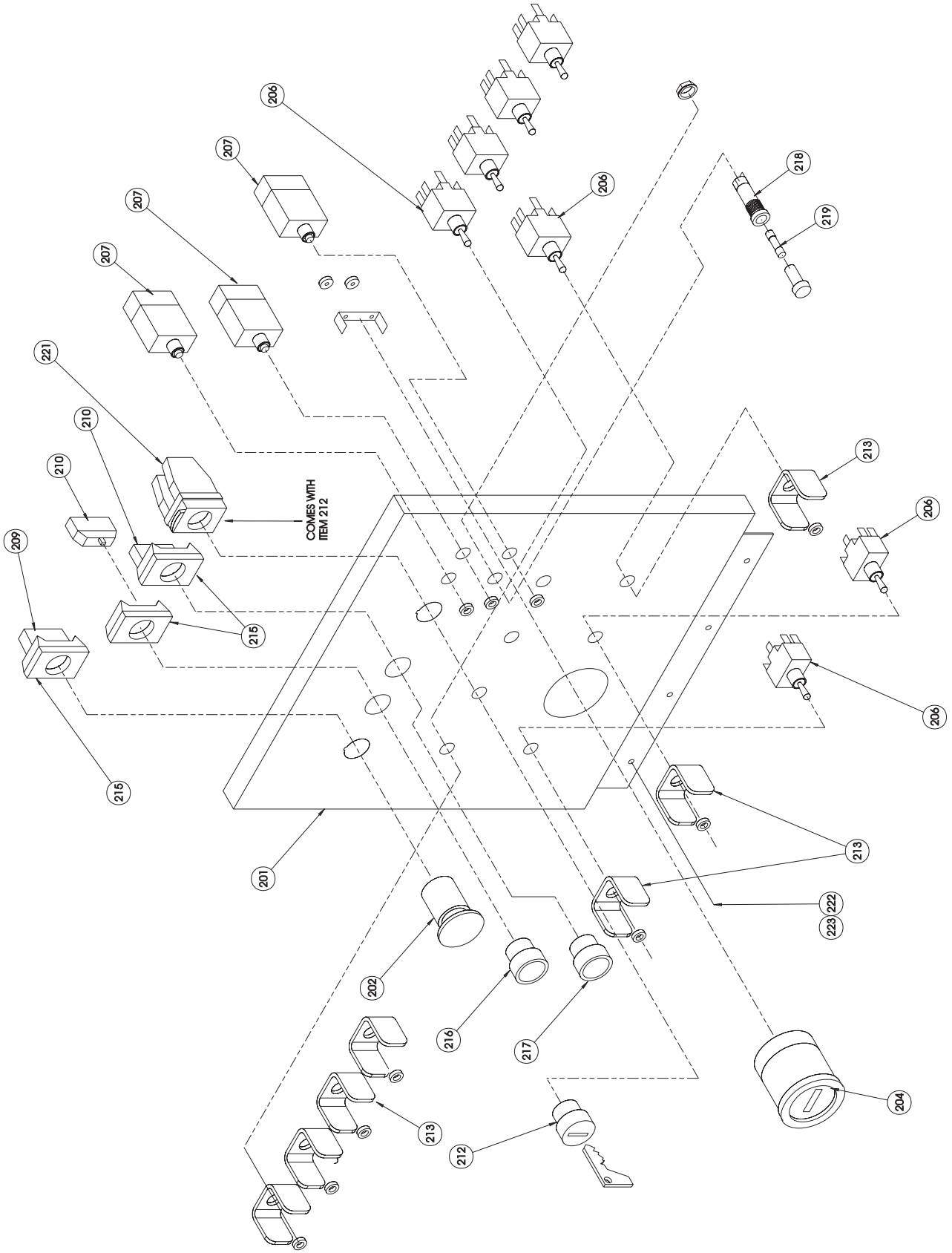
068328-004

ITEM	PART	DESCRIPTION	QTY.
1	68717-000	BOX, GROUND CONTROL	1
2	67893-002	DIN RAIL, 14" LONG	2
3	29925-001	CORD GRIP, 3/4"	7
4	68734-004	TERMINAL STRIP (120 VOLT A.C.)	1
5	11709-010	SCREW, RD HD #10-24 UNC X 1 1/4	2
6	67662-001	SOCKET, RELAY SINGLE	23
7	68773-002	JUMPER 2 PIN	1
8	68698-004	END CAP TERMINAL BLOCK	2
9	67661-001	RELAY, SPDT 12 VDC	23
10	68698-000	BLOCK, TERMINAL (ORANGE)	3
11	68698-001	BLOCK, TERMINAL (TAN)	13
12	11248-047	NUT, ESNA 6-32	6
13	11240-001	WASHER, FLAT STD #6	6
14	11248-003	LOCKNUT, #10-24 UNC ESNA	2
15	67661-004	RELAY, 12VDC (FOUR POLE)	1
16	13283-002	CABLE MOUNT	18
17	29939-003	CONDUIT LOCKNUT 3/4"	7
18	68698-002	BLOCK, TERMINAL (BLUE)	14
19	67662-004	SOCKET, RELAY FOUR	1
20	11715-003	SCREW, RD HD MACH 6-32 X 1/2	6
21	67660-006	END BLOCK, TERMINAL	6
22	67893-001	DIN RAIL 4" LONG	1
23	67662-005	RETAINER CLIP, 1 POLE RELAY	23
24	68889-099	WEATHERSTRIP (FT)	4.5
25	67662-007	RETAINER CLIP, 4 POLE RELAY	1
26	14252-004	NUT-SERT 1/4-20 UNC	2
27	68773-003	JUMPER 3 PIN	1
28	67662-006	RETAINER CLIP 2 POLE	3
29	67662-002	SOCKET, RELAY 2 POLE	3
30	67661-002	RELAY 12 VOLT 2 POLE	3
201	68719-000	CONTROLLER BOX LID	1
202	64446-003	EMERGENCY STOP BUTTON	1
204	15752-000	HOUR METER	1
206	12798-004	TOGGLE SWITCH MOM DPDT	7
207	68582-010	CIRCUIT BREAKER 10 AMP	3
209	64443-002	CONTACT BLOCK N.C.	1
210	64443-001	CONTACT BLOCK N.O.	2
212	68588-001	KEY SELECTOR SWITCH	1
*	68807-010	Key	1
213	08271-001	GUARD, TOGGLE SWITCH	7
215	64417-001	FLANGE, 3 CONTACT	3
216	67652-000	PUSH BUTTON, MOMENTARY GREEN	1
217	67654-000	PUSH BUTTON, MOMENTARY BLACK	1
218	29701-000	FUSE HOLDER	1
219	29704-025	FUSE 25A	1
221	66805-012	CONTACT BLOCK, 1 N.O. INC	2
222	11709-004	SCRW MACH RD HD 10-24UNC X 1/2"	4
223	11248-003	NUT HEX ESNA 10-24 UNC	4
301	29452-099	WIRE, 16 GA. BLACK	13 FT
302	29451-099	WIRE, 16 GA. WHITE	5 FT
303	29454-099	WIRE, 16 GA. RED	30 FT
304	29457-099	WIRE, 16 GA. GREEN	8.3 FT
305	29453-099	WIRE, 16 GA. ORANGE	25 FT
306	29450-099	WIRE, 16 GA. BLUE	18 FT
307	29479-099	WIRE, 16 GA. WHITE/BLACK	10 FT
308	29478-099	WIRE, 16 GA. RED/BLACK	6.5 FT
309	05491-099	WIRE, 16 GA. GREEN/BLACK	5.3 FT
310	29477-099	WIRE, 16 GA. ORANGE/ BLACK	9.5 FT
311	29475-099	WIRE, 16 GA. BLUE/BLACK	4 FT
313	29483-099	WIRE, 16 GA. RED/WHITE	3.2 FT
314	29482-099	WIRE, 16 GA. GREEN/WHITE	3.3 FT
315	29459-099	WIRE, 16 GA. BLUE/WHITE	4.3 FT
316	29355-099	WIRE, 16 GA. BLACK/RED	5.5 FT
317	29356-099	WIRE, 16 GA. WHITE/RED	3.1 FT
318	29357-099	WIRE, 16 GA. ORANGE/RED	5.8 FT
319	29358-099	WIRE, 16 GA. BLUE/RED	4.2 FT
321	29360-099	WIRE, 16 GA. ORANGE/GREEN	3 FT
322	29825-003	DIODE 3AMP 400V	12
323	29610-002	CONN FORK TERM 16-14	150
324	29616-002	CONN F PUSH TERM 16-14 X .25	46
325	29616-001	CONN F PUSH TERM. 16-14 X .187	4

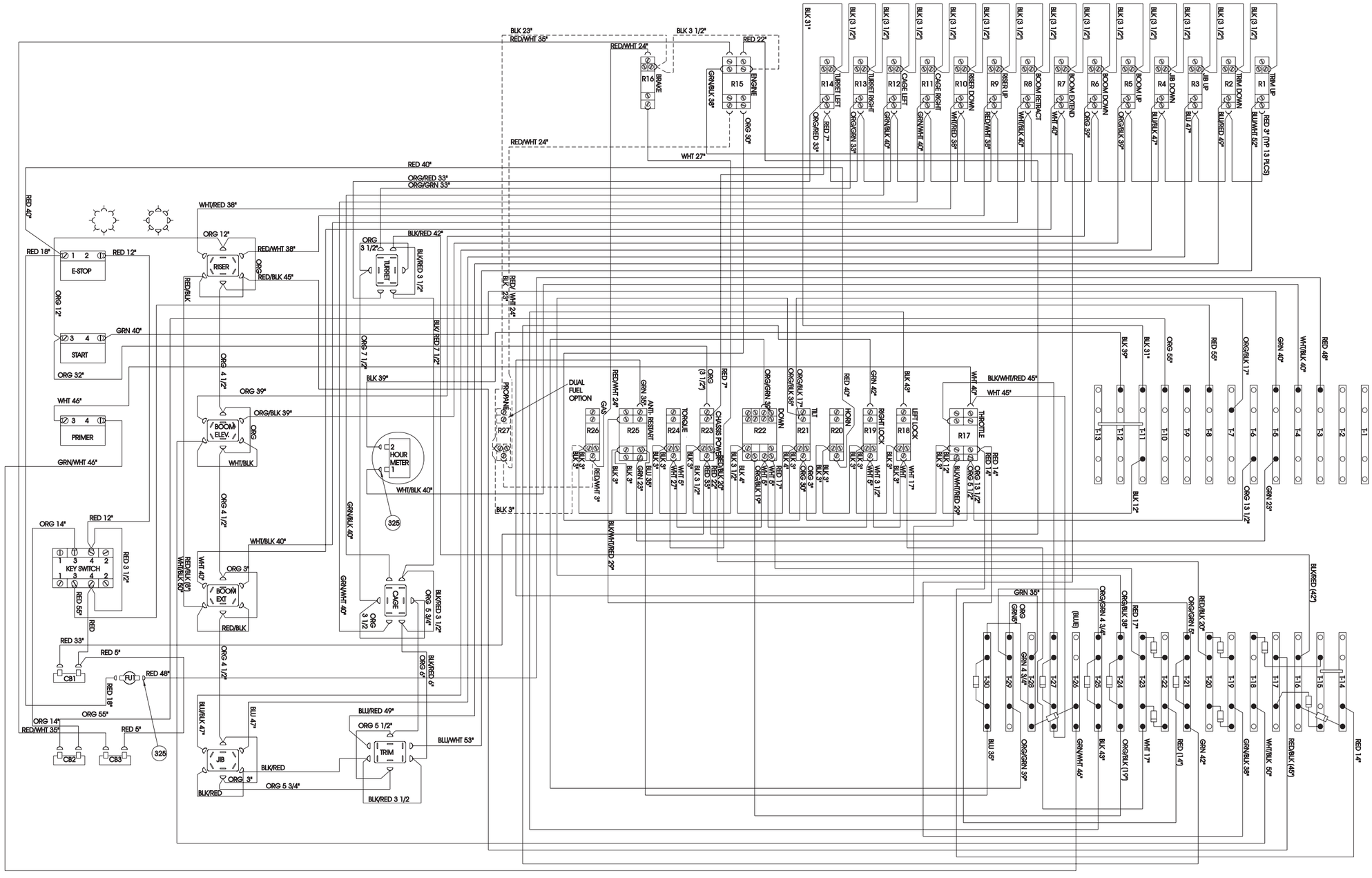


Ground Control Box Assembly, Gas / 068328-004 / 1 of 3

Illustrated Parts Breakdown



Ground Control Box Assembly, Gas / 068328-004 / 2 of 3

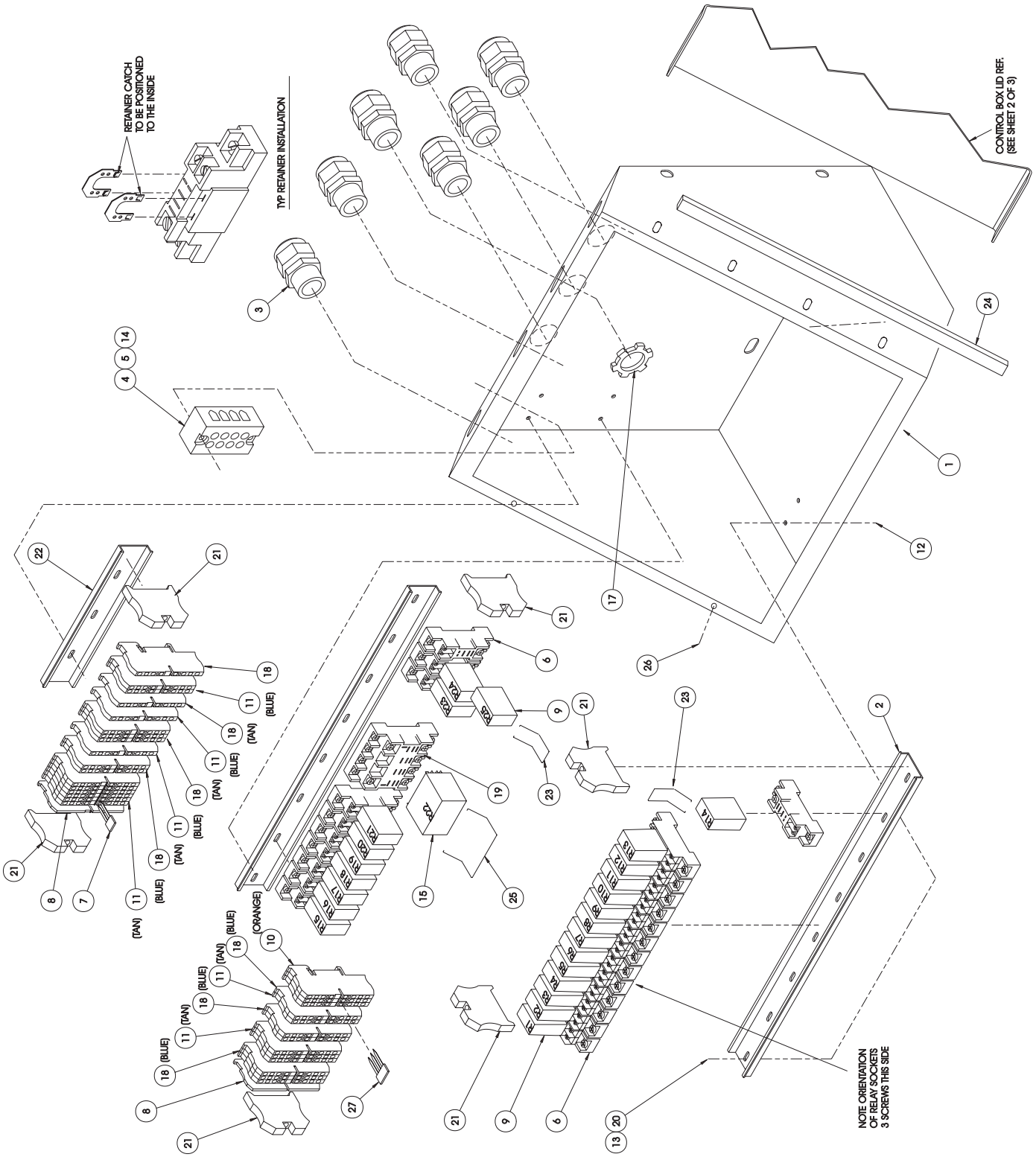

E-STOP
START
PRIMER
KEY SWITCH
CB1
CB2
CB3
FU
RISER
BOOM ELEV.
BOOM EXT
JIB
TURRET
CAGE
TRIM
HOUR METER
DUAL FUEL OPTION
BRAKE
ENGINE
TURRET LEFT
TURRET RIGHT
CAGE LEFT
CAGE RIGHT
RISER DOWN
RISER UP
BOOM RETRACT
BOOM EXTEND
BOOM DOWN
BOOM UP
JIB DOWN
JIB UP
TRIM DOWN
TRIM UP
GAS
ANTI- RESTART
TORQUE
CHASSIS POWER
DOWN
TILT
HORN
RIGHT LOCK
LEFT LOCK
THROTTLE
PROPANE
RED 40"
WHT 27"
RED/WHT 24"
BLK 23"
RED/WHT 35"
BLK 3 1/2"
RED 22"
GRN/BLK 38"
ORG 30"
ORG/RED 33"
ORG/GRN 33"
WHT/RED 38"
ORG 12"
RED/WHT 38"
RED/BLK 45"
RED 18"
RED 12"
ORG 12"
GRN 40"
ORG 32"
WHT 46"
GRN/WHT 46"
ORG 14"
RED 33"
RED 5"
RED 48"
ORG 14"
RED/WHT 35"
RED 5"
ORG 55"
RED 18"
ORG 4 1/2"
ORG 39"
ORG/BLK 39"
WHT/BLK
WHT/BLK 40"
ORG 3"
RED/BLK
BLK/RED
ORG 3"
ORG 5 3/4"
BLK/RED 3 1/2
BLU/BLK 47"
BLU 47"
BLU/RED 49"
ORG 5 1/2"
BLU/WHT 53"
BLK/RED
ORG 7 1/2"
BLK 39"
BLK/RED 7 1/2"
RED/ WHT 24"
BLK 29"
BLK 3"
BLK/WHT(RED 29"
BLK/RED 42"
BLK/RED 3 1/2"
ORG 5 3/4"
BLK/RED 6"
ORG 3 1/2"
ORG 3 1/2"
BLK/RED 3 1/2"
RED 7"
ORG (3 1/2")
ORG/BLK 17"
ORG/BLK 38"
ORG/GRN 39"
RED/WHT 24"
GRN 35"
RED 40"
GRN 42"
BLK 43"
WHT 40"
BLK/WHT/RED 45"
WHT 45"
RED 14"
BLK 31"
BLK 12"
ORG 13 1/2"
GRN 23"
BLK 39"
ORG 55"
RED 55"
ORG/BLK 17"
GRN 40"
WHT/BLK 40"
RED 48"
GRN 35"
ORG/GRN 4 3/4"
ORG/BLK 38"
RED 17"
ORG/GRN 5"
RED/BLK 20"
BLK/RED (42")
RED 14"
WHT/BLK 50"
RED/BLK (48")
GRN/BLK 38"
GRN 42"
RED (14")
WHT 17"
ORG/BLK (19")
BLK 43"
GRN/WHT 46"
ORG/GRN 39"
BLU 35"
(BLUE)
ORG GRN 5"
GRN 4 3/4"

Ground Control Box Assembly, AB46RT Diesel

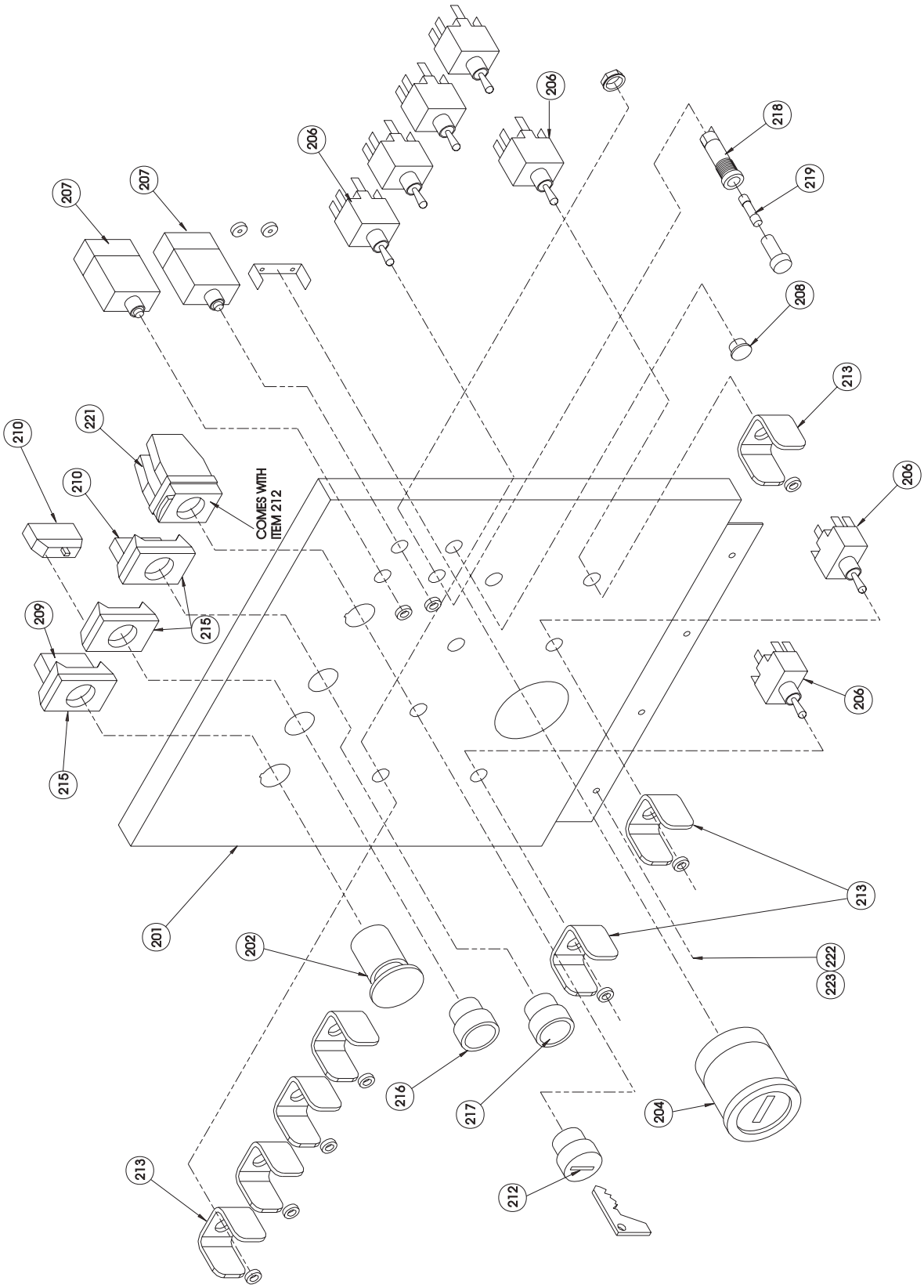
068328-005

ITEM	PART	DESCRIPTION	QTY.
1	68717-000	BOX, GROUND CONTROL	1
2	67893-002	DIN RAIL, 14" LONG	2
3	29925-001	CORD GRIP, 3/4"	7
4	68734-004	TERMINAL STRIP (120 VOLT A.C.)	1
5	11709-010	SCREW, RH #10-24 UNC X 1 1/4	2
6	67662-001	SOCKET, RELAY SINGLE	24
7	68773-002	JUMPER 2 PIN	1
8	68698-004	END CAP TERMINAL BLOCK	2
9	67661-001	RELAY, SPDT 12 VOLT DC	24
10	68698-000	BLOCK, TERMINAL (ORANGE)	3
11	68698-001	BLOCK, TERMINAL (TAN)	14
12	11248-047	NUT, ESNA 6-32	6
13	11240-001	WASHER, FLAT STD #6	6
14	11248-003	LOCKNUT, #10-24 UNC ESNA	2
15	67661-004	RELAY, 12VDC (FOUR POLE)	1
16	13283-002	CABLE MOUNT	18
17	29939-003	CONDUIT LOCKNUT 3/4"	7
18	68698-002	BLOCK, TERMINAL (BLUE)	13
19	67662-004	SOCKET, RELAY FOUR	1
20	11715-003	SCREW, RD HD MACH 6-32 X 1/2	6
21	67660-006	END BLOCK, TERMINAL	6
22	67893-001	DIN RAIL 4" LONG	1
23	67662-005	RETAINER CLIP, 1 POLE RELAY	24
24	68889-099	WEATHERSTRIP (FT)	4.5
25	67662-007	RETAINER CLIP, 4 POLE RELAY	1
26	14252-004	NUT-SERT 1/4-20 UNC	2
27	68773-003	JUMPER 3 PIN	1
201	68719-000	CONTROLLER BOX LID	1
202	64446-003	EMERGENCY STOP BUTTON	1
204	15752-000	HOUR METER	1
206	12798-004	TOGGLE SWITCH MOM DPDT	7
207	68582-010	CIRCUIT BREAKER 10 AMP	2
208	66516-008	PLUG, O .437 HEYCO	1
209	64443-002	CONTACT BLOCK N.C.	1
210	64443-001	CONTACT BLOCK N.O.	2

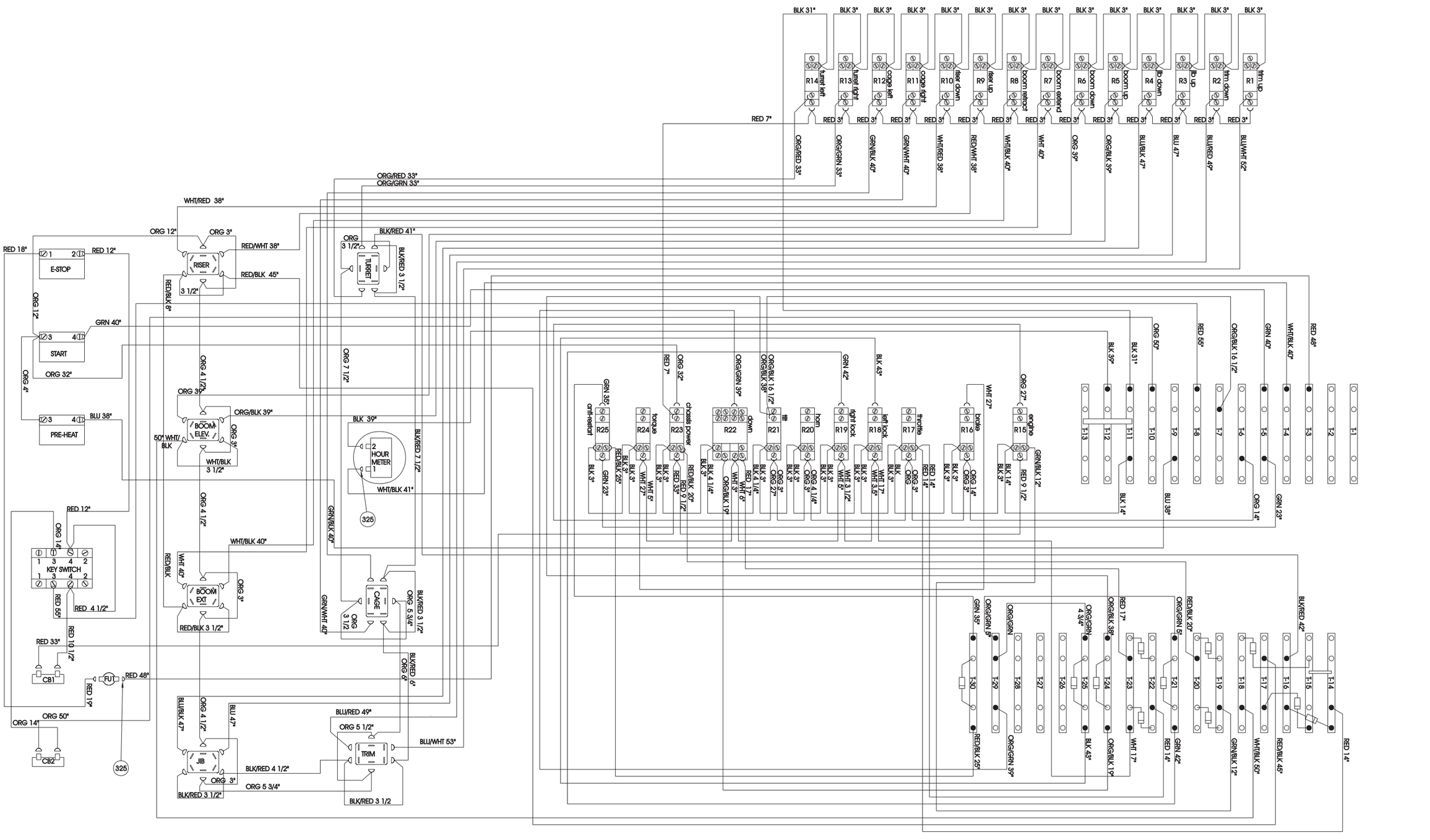
ITEM	PART	DESCRIPTION	QTY.
212	68588-001	KEY SELECTOR SWITCH	1
*	68807-010	Key	1
213	08271-001	GUARD, TOGGLE SWITCH	7
215	64417-001	FLANGE, 3 CONTACT	3
216	67652-000	PUSH BUTTON, MOMENTARY GREEN	1
217	67654-000	PUSH BUTTON, MOMENTARY BLACK	1
218	29701-000	FUSE HOLDER	1
219	29704-025	FUSE 25A	1
221	66805-012	CONTACT BLOCK, 1 N.O. INC	2
222	11709-004	SCRW MACH RD HD 10-24UNC X 1/2"	4
223	11248-003	NUT HEX ESNA 10-24 UNC	4
301	29452-099	WIRE, 16 GA. BLACK	FT 13
302	29451-099	WIRE, 16 GA. WHITE	FT 5
303	29454-099	WIRE, 16 GA. RED	FT 30
304	29457-099	WIRE, 16 GA. GREEN	FT 8.3
305	29453-099	WIRE, 16 GA. ORANGE	FT 25
306	29450-099	WIRE, 16 GA. BLUE	FT 18
307	29479-099	WIRE, 16 GA. WHITE/BLACK	FT 10
308	29478-099	WIRE, 16 GA. RED/BLACK	FT 6.5
309	05491-099	WIRE, 16 GA. GREEN/BLACK	FT 5.3
310	29477-099	WIRE, 16 GA. ORANGE/ BLACK	FT 9.5
311	29475-099	WIRE, 16 GA. BLUE/BLACK	FT 4
313	29483-099	WIRE, 16 GA. RED/WHITE	FT 3.2
314	29482-099	WIRE, 16 GA. GREEN/WHITE	FT 3.3
315	29459-099	WIRE, 16 GA. BLUE/WHITE	FT 4.3
316	29355-099	WIRE, 16 GA. BLACK/RED	FT 5.5
317	29356-099	WIRE, 16 GA. WHITE/RED	FT 3.1
318	29357-099	WIRE, 16 GA. ORANGE/RED	FT 5.8
319	29358-099	WIRE, 16 GA. BLUE/RED	FT 4.2
321	29360-099	WIRE, 16 GA. ORANGE/GREEN FT 3	
322	29825-003	DIODE 3AMP 400V	11
323	29610-002	CONN FORK TERM 16-14	142
324	29616-002	CONN F PUSH TERM 16-14 X .25	46
325	29616-001	CONN F PUSH TERM 16-14 X .187	4



Ground Control Box Assembly, Diesel / 068328-004 / 1 of 3



Ground Control Box Assembly, Diesel / 068328-004 / 2 of 3



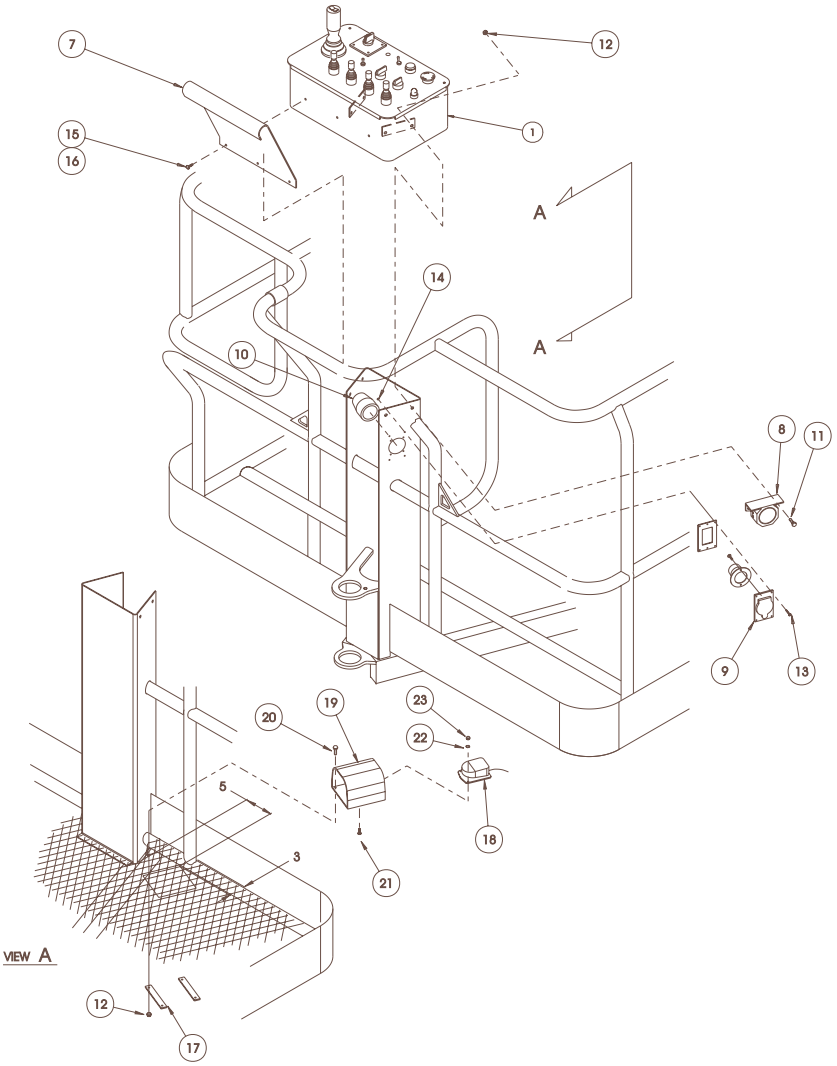
Ground Control Box Assembly, Diesel / 068328-004 / 3 of 3

Controller Installation, AB46RT Gas

068339-007

ITEM	PART	DESCRIPTION	QTY.
1	68329-006	CONTROLLER ASSY - DOM RT (GAS)	1
7	68750-000	DECAL MOUNT	1
8	63778-001	ALARM	1
9	08942-001	FEMALE RECEPTACLE	1
10	29961-001	SEAL	1
11	11252-008	SCREW HHC 1/4-20 UNC X 1	4
12	11248-004	NUT HEX 1/4-20 UNC ESNA	8
13	11715-006	SCREW RD HD 6-32 UNC X 3/4	4
14	11248-047	NUT HEX 6-32 UNC ESNA	4

ITEM	PART	DESCRIPTION	QTY.
15	11709-006	SCREW RD HD 10-24 UNC X 3/4	3
16	11248-003	NUT HEX 10-24 UNC ESNA	3
17	68820-000	RETAINING STRAP-FOOTSWITCH	2
18	63906-000	FOOT SWITCH CLPR	1
19	64479-000	SWITCH GUARD, FOOT	1
20	11252-012	SCREW HHC 1/4-20 UNC X 1 1/2	4
21	66695-006	SCREW FLAT HD 10-24 UNC X 3/4	2
22	13949-003	WASHER, #10 STAR, EXTERNAL TOOTH	2
23	11250-003	HEX NUT 10-24 UNC	2

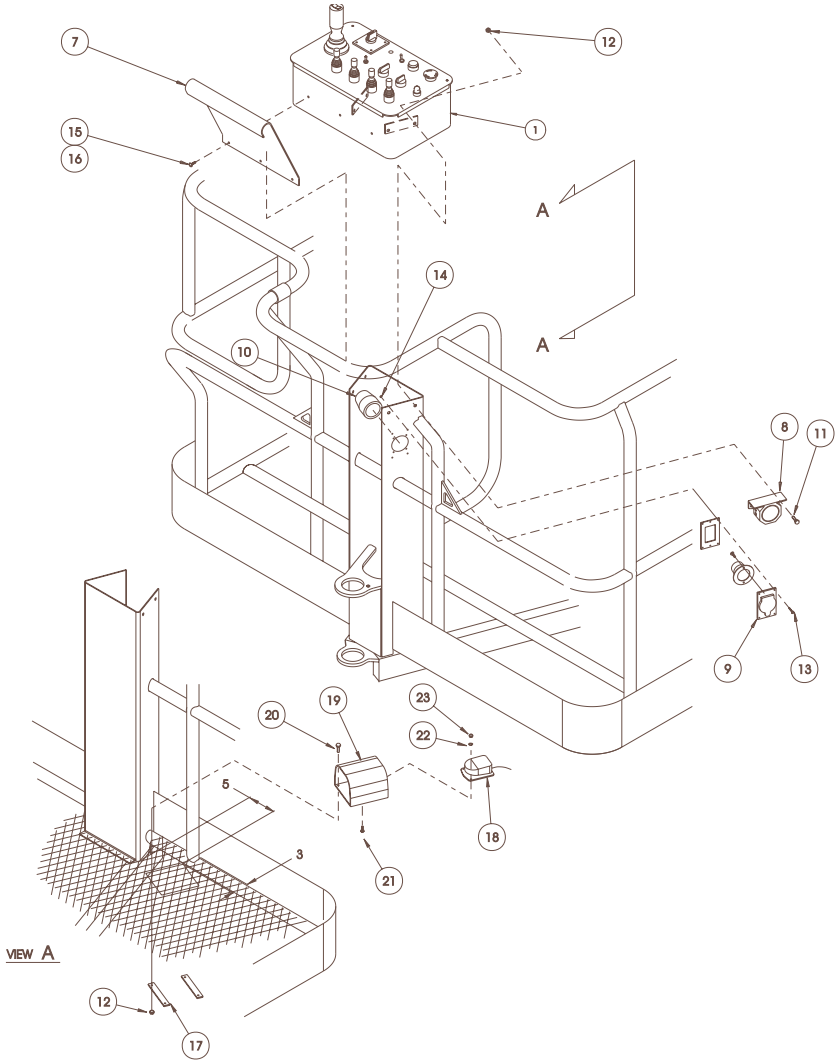


Controller Installation, AB46RT Diesel

068339-008

ITEM	PART	DESCRIPTION	QTY.
1	68329-007	CONTROLLER ASSY - DOM RT (DIESEL)	1
7	68750-000	DECAL MOUNT	1
8	63778-001	ALARM	1
9	08942-001	FEMALE RECEPTACLE	1
10	29961-001	SEAL	1
11	11252-008	SCREW HHC 1/4-20 UNC X 1	4
12	11248-004	NUT HEX 1/4-20 UNC ESNA	8
13	11715-006	SCREW RD HD 6-32 UNC X 3/4	4
14	11248-047	NUT HEX 6-32 UNC ESNA	4

ITEM	PART	DESCRIPTION	QTY.
15	11709-006	SCREW RD HD 10-24 UNC X 3/4	3
16	11248-003	NUT HEX 10-24 UNC ESNA	3
17	68820-000	RETAINING STRAP-FOOTSWITCH	2
18	63906-000	FOOT SWITCH CLPR	1
19	64479-000	SWITCH GUARD, FOOT	1
20	11252-012	SCREW HHC 1/4-20 UNC X 1 1/2	4
21	66695-006	SCREW FLAT HD 10-24 UNC X 3/4	2
22	13949-003	WASHER, #10 STAR, EXTERNAL TOOTH	2
23	11250-003	HEX NUT 10-24 UNC	2

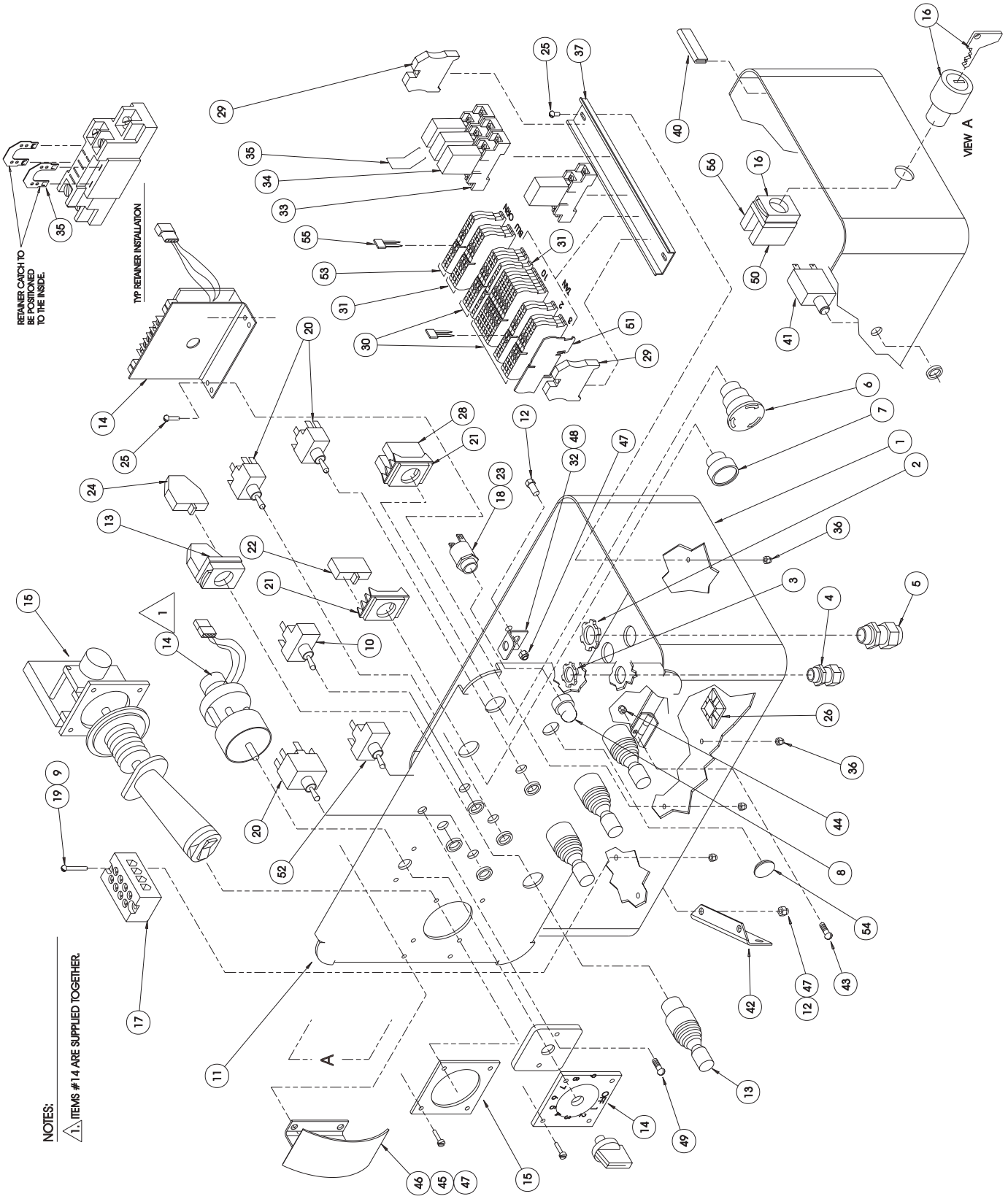


Controller Assembly - Platform, AB46RT Gas

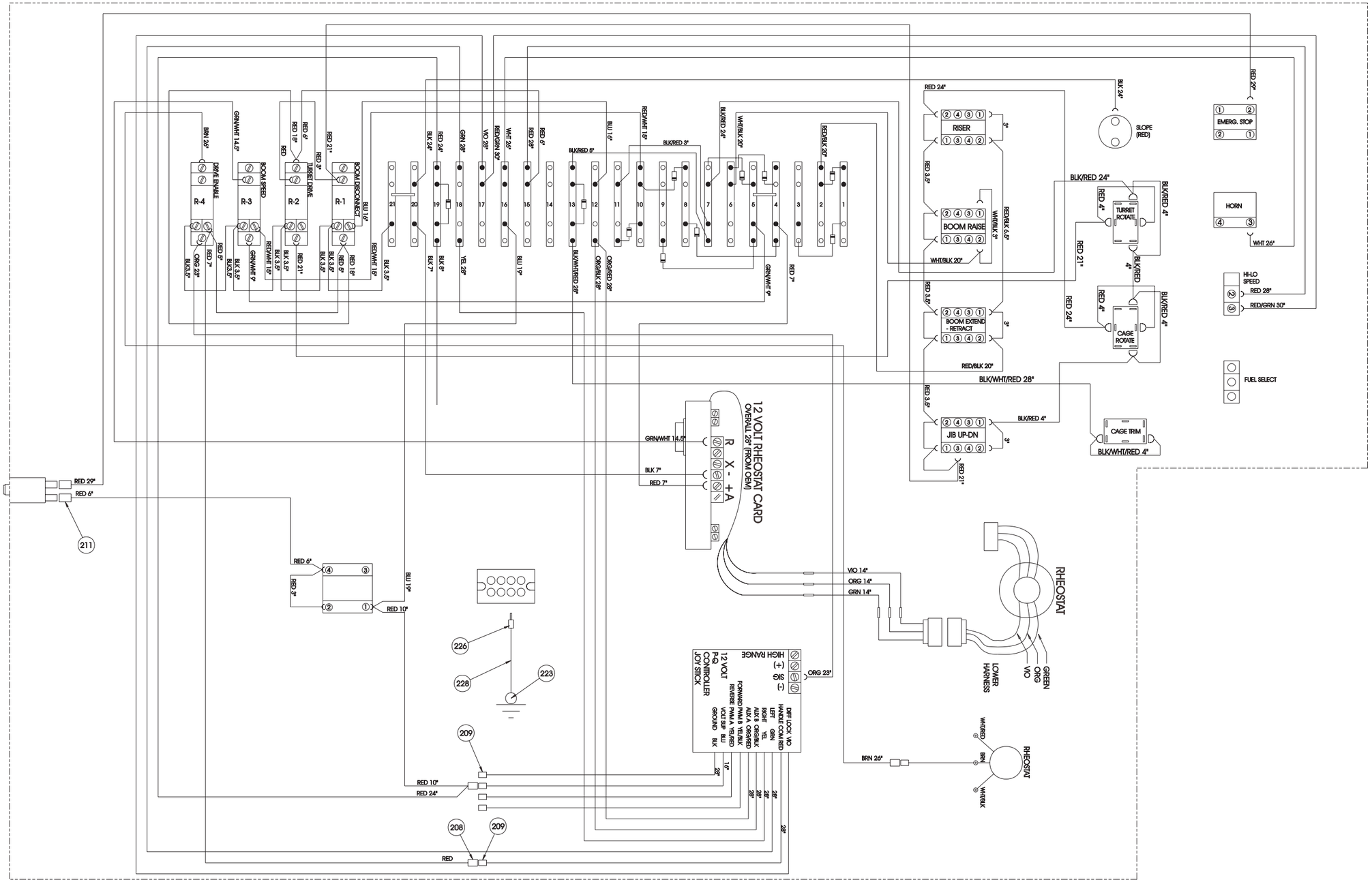
068329-006

ITEM	PART	DESCRIPTION	QTY.
1	68589-001	BOX, ENCLOSURE	1
2	29939-003	LOCKNUT 3/4" NPT	4
3	29939-002	LOCKNUT 1/2" NPT	1
4	29925-000	CONNECTOR CABLE 1/2" NPT	1
5	29925-001	CONNECTOR CABLE 3/4" NPT	4
6	64446-003	EMERGENCY STOP BUTTON	1
7	67654-000	PUSH BUTTON FLUSH (BLACK)	1
8	68595-001	LENS, RED	1
9	11249-003	NUT, HEX 10-32 ESNA	2
10	29871-001	SWITCH, TOGGLE 2 POS HOLD SPDT	1
11	68800-000	LID ASSY, CONTROLLER I/C	1
12	11252-005	SCREW 1/4-20UNC X 5/8	5
13	68594-000	JOYSTICK - OPERATOR	4
14	68593-001	RHEOSTAT - CONTROLLER (12VOLT)	1
15	68795-000	JOYSTICK, P-Q	1
*	68795-010	HANDLE HALF, TRS, RIGHT	1
*	68795-011	HANDLE HALF, TRS, LEFT	1
*	68795-012	BOOT, M115, 0.31 SHAFT	1
*	68795-013	GASKET, M115 TRS GRIP	1
*	68795-014	SWITCH, XG3-Z1	1
*	68795-015	PUSH BUTTON, BLACK, SWITCH SPST	1
*	68795-016	SWTCH ACTUATOR,ROCKER SWCH GRP	1
*	68795-017	CAP, ROCKER SWITCH GRIP	1
*	68795-018	ELECTRICAL ASSEMBLY, M115-1596	1
*	68795-019	ELEC ASSY, 500 ohm POTENTIOMETER	1
*	68795-020	PINION GEAR, M115	1
*	68795-021	SOCKET SET SCREW, 6-32 x 1/8, CUP	1
16	68819-000	KEYSWITCH & KEY	1
*	68807-010	KEY	1
17	68734-004	TERMINAL STRIP, 120V AC	1
18	68590-000	BASE INDICATOR (LAMP)	1
19	11826-012	SCREW RD HD 10-32 X 1-1/2	2
20	12798-004	SWITCH TOGGLE 3 POS MOM DPDT	3
21	64417-001	FLANGE MOUNT	2
22	64443-001	CONTACT BLOCK, N.O.	1
23	68591-001	LAMP T-2-1/2	1
24	66805-012	CONTACT BLOCK, N.O./N.C.	8
25	11715-003	SCREW RD HD 6-32 X 3/8	4
26	13283-002	CABLE MOUNT	2
28	64443-002	CONTACT BLOCK N.C.	2
29	67660-006	TERMINAL END	2
30	68698-001	TERMINAL BLOCK (TAN)	15
31	68698-002	TERMINAL BLOCK (BLUE)	4
32	68799-000	ANGLE, CONTROLLER	1
33	67662-001	RELAY SOCKET	4
34	67661-001	RELAY, SPDT 12 VOLT	4
35	67662-005	RETAINING CLIP & WIRE	4
36	11250-001	NUT HEX 6-32	4

ITEM	PART	DESCRIPTION	QTY.
37	67893-003	MOUNTING RAIL, DIN 8-1/4"	1
38	013888-064	O-RING	-
39	029872-000	BOOT, SWITCH	-
40	68897-099	GASKET, BLACK RUBBER	FT3.25
41	68582-010	CIRCUIT BREAKER 10 AMP	1
42	68767-000	BRACKET, UPPER CONTROLLER	2
43	11708-004	SCREW 8-32 X 1/2	2
44	11248-002	NUT, HEX ESNA 8-32 UNC	2
45	11252-003	SCRW HHC 1/4-20 UNC X 3/8"	2
46	68801-000	HAND SUPPORT WELDMENT	1
47	11248-004	NUT HEX ESNA 1/4-20UNC	7
48	14252-004	NUT SERT 1/4-20	1
49	11825-006	SCRW RD HD 1/4-20 UNC X 3/4"	1
50	66805-011	CONTACT BLOCK GE 1 N.C.	1
51	68698-004	END CAP, CONTACT BLOCK	1
52	12797-000	SWITCH TOGGLE 2 POS SPDT	1
53	68698-000	TERMINAL BLOCK ORANGE	2
54	66516-005	PLUG, 11/16 FLUSH	1
55	68773-002	JUMPER 2 PIN	2
56	66805-010	CONTACT BLOCK GE 1 N.O.	1
202	29454-099	WIRE 16GA RED | FT	10
203	29482-099	WIRE 16GA GREEN/WHT	FT 3
204	68735-099	WIRE 16GA BLACK/RED	FT 5
205	29452-099	WIRE 16GA BLACK	FT 9.3
206	29610-006	TERM FORK 18-14GA #6	60
207	29620-002	BUTT CONNECTOR 18-14GA	6
208	14914-001	CONN MALE PUSH INSULATED	3
209	29931-003	CONN FEMALE PUSH INSULATED	6
210	29451-099	WIRE 16GA WHITE	FT 5.8
211	29931-003	CONN FEMALE PUSH .25 (16-14GA)	12
212	29450-099	WIRE 16GA BLUE	FT 4.1
213	29825-002	DIODE 3 AMP 400V	10
214	29478-099	WIRE 16GA RED/BLACK	FT 3.5
215	29457-099	WIRE 16GA GREEN	FT 1.5
216	29616-001	CONN FEMALE PUSH .187 (16-14GA)	3
217	29360-099	WIRE 16GA ORANGE/GREEN	FT 2
218	29453-099	WIRE 16GA ORANGE	FT 1.2
219	29458-099	WIRE 16GA PURPLE	FT 1.2
220	29479-099	WIRE 16GA WHITE/BLACK	FT 4
221	29459-099	WIRE 16GA BLUE/WHITE	FT .5
222	29483-099	WIRE 16GA RED/WHITE	FT 2.5
223	29601-039	RING TERM	1
224	29455-099	WIRE 16GA BROWN	FT 3
225	29361-099	WIRE 16GA BLK/WHT/RED	FT 2
226	68814-000	PIN TERMINAL	6
227	REF	RECEPTACLE	1
228	29464-099	WIRE 14GA GREEN	FT .5


RETAINER CATCH TO BE POSITIONED TO THE INSIDE.
TYP RETAINER INSTALLATION
VIEW A
A
NOTES:
1. ITEMS #14 ARE SUPPLIED TOGETHER.

ILLUSTRATED PARTS BREAKDOWN



Controller Assembly, Platform, Gas / 068329-009 / 2 of 2

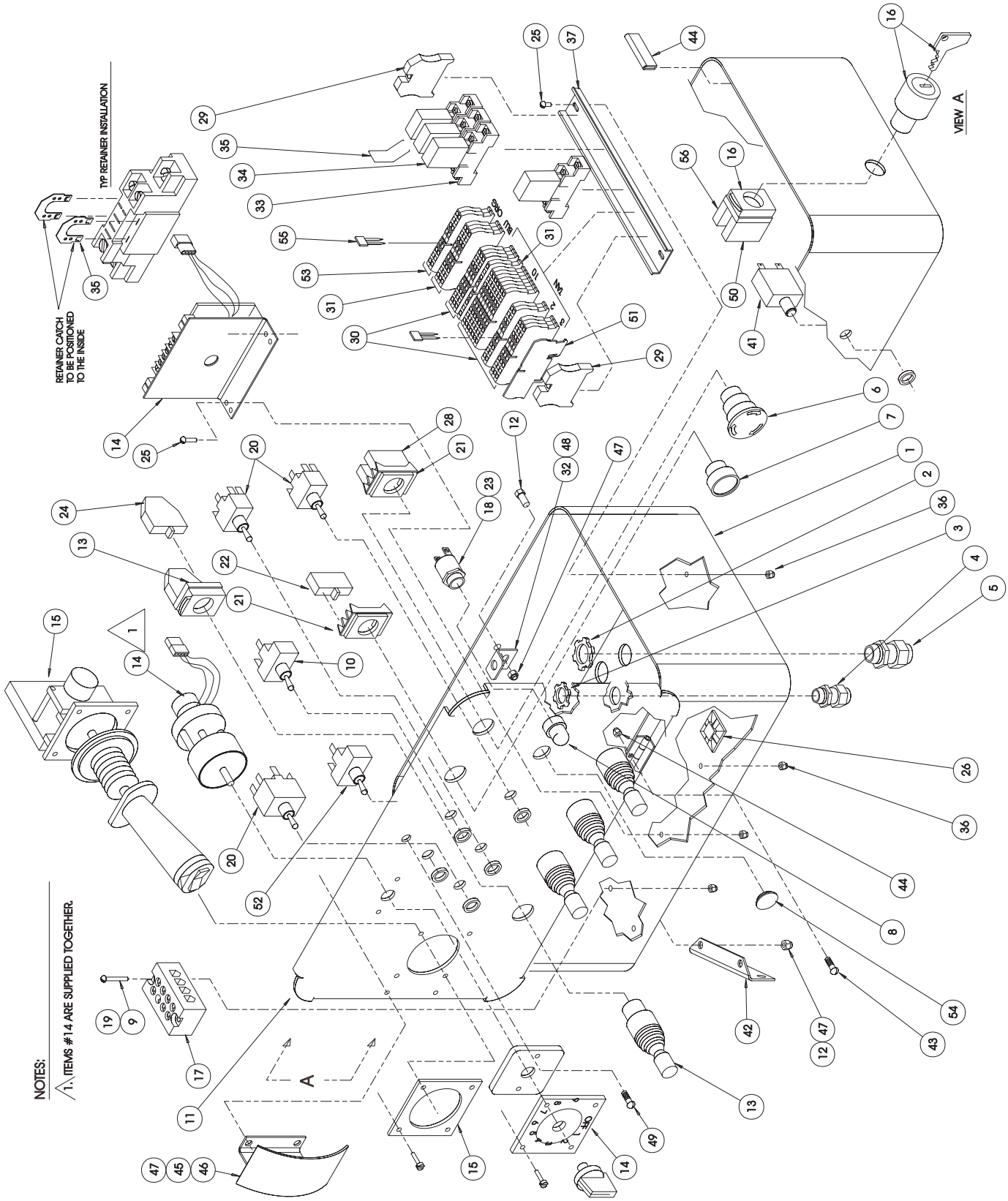
NOTES

Controller Assembly - Platform, AB46RT Diesel

068329-007

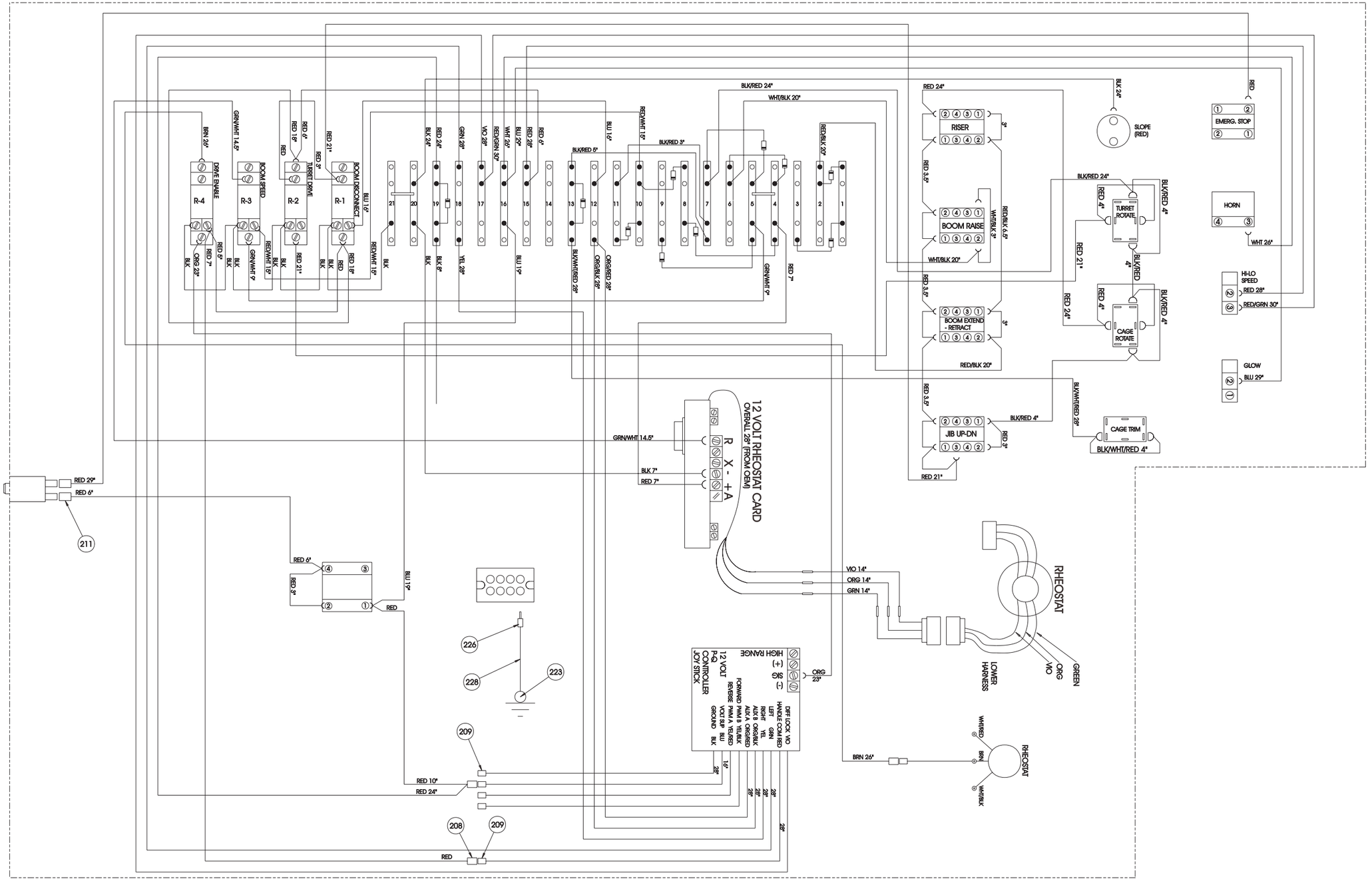
ITEM	PART	DESCRIPTION	QTY.
1	68589-001	BOX, ENCLOSURE	1
2	29939-003	LOCKNUT 3/4" NPT	4
3	29939-002	LOCKNUT 1/2" NPT	1
4	29925-000	CONNECTOR CABLE 1/2" NPT	1
5	29925-001	CONNECTOR CABLE 3/4" NPT	4
6	64446-003	EMERGENCY STOP BUTTON	1
7	67654-000	PUSH BUTTON FLUSH (BLACK)	1
8	68595-001	LENS, RED	1
9	11249-003	NUT, HEX 10-32 ESNA	2
10	12798-003	SWITCH, TOGGLE 2 POS MOM	1
11	68800-000	LID ASSY, CONTROLLER I/C	1
12	11252-005	SCREW 1/4-20UNC X 5/8	5
13	68594-000	JOYSTICK - OPERATOR	4
14	68593-001	RHEOSTAT - CONTROLLER (12VOLT)	1
15	68795-000	JOYSTICK, P-Q	1
*	68795-010	HANDLE HALF, TRS, RIGHT	1
*	68795-011	HANDLE HALF, TRS,RIGHT	1
*	68795-012	BOOT, M115, 0.31 SHAFT	1
*	68795-013	GASKET, M115 TRS GRIP	1
*	68795-014	SWITCH, XG3-Z1	1
*	68795-015	PUSH BUTTON, BLACK, SWITCH SPST	1
*	68795-016	SWITCH ACTUATOR, ROCKER SWCH GRIP	1
*	68795-017	CAP, ROCKER SWITCH GRIP	1
*	68795-018	ELECTRICAL ASSEMBLY, M115-1596	1
*	68795-019	ELEC ASSY, 500 ohm POTENTIOMETER	1
*	68795-020	PINION GEAR, M115	1
*	68795-021	SOCKET SET SCREW, 6-32 x 1/8, CUP	1
16	68819-000	KEYSWITCH & KEY	1
*	68807-010	KEY	1
17	68734-004	TERMINAL STRIP, 120V AC	1
18	68590-000	BASE INDICATOR (LAMP)	1
19	11826-012	SCREW RD HD 10-32 X 1-1/2	2
20	12798-004	SWITCH TOGGLE 3 POS MOM DPDT	3
21	64417-001	FLANGE MOUNT	2
22	64443-001	CONTACT BLOCK, N.O.	1
23	68591-001	LAMP T-2-1/2	1
24	66805-012	CONTACT BLOCK, N.O./N.C.	8
25	11715-003	SCREW RD HD 6-32 X 3/8	4
26	13283-002	CABLE MOUNT	2
28	64443-002	CONTACT BLOCK N.C.	2
29	67660-006	TERMINAL END	2
30	68698-001	TERMINAL BLOCK (TAN)	15
31	68698-002	TERMINAL BLOCK (BLUE)	4
32	68799-000	ANGLE, CONTROLLER	1
33	67662-001	RELAY SOCKET	4
34	67661-001	RELAY, SPDT 12 VOLT	4
35	67662-005	RETAINING CLIP & WIRE	4
36	11250-001	NUT HEX 6-32	4

ITEM	PART	DESCRIPTION	QTY.
37	67893-003	MOUNTING RAIL, DIN 8-1/4"	1
38	013888-064	O-RING	-
39	029872-000	BOOT, SWITCH	-
40	68897-099	GASKET, BLACK RUBBER	FT 3.25
41	68582-010	CIRCUIT BREAKER 10 AMP	1
42	68767-000	BRACKET, UPPER CONTROLLER	2
43	11708-004	SCREW 8-32 X 1/2	2
44	11248-002	NUT, HEX ESNA 8-32 UNC	2
45	11252-003	SCRW HHC 1/4-20 UNC X 3/8"	2
46	68801-000	HAND SUPPORT WELDMENT	1
47	11248-004	NUT HEX ESNA 1/4-20UNC	7
48	14252-004	NUT SERT 1/4-20	1
49	11825-006	SCRW RD HD 1/4-20 UNC X 3/4"	1
50	66805-011	CONTACT BLOCK GE 1 N.C.	1
51	68698-004	END CAP, CONTACT BLOCK	1
52	12797-000	SWITCH TOGGLE 2 POS SPDT	1
53	68698-000	TERMINAL BLOCK ORANGE	2
54	66516-005	PLUG, 11/16 FLUSH	1
55	68773-002	JUMPER 2 PIN	2
56	66805-010	CONTACT BLOCK GE 1 N.O.	1
202	29454-099	WIRE 16GA RED | FT	10
203	29482-099	WIRE 16GA GREEN/WHT	FT3
204	68735-099	WIRE 16GA BLACK/RED	FT5
205	29452-099	WIRE 16GA BLACK	FT9.3
206	29610-006	TERM FORK 18-14GA #6	60
207	29620-002	BUTT CONNECTOR 18-14GA	6
208	14914-001	CONN MALE PUSH INSULATED	3
209	29931-003	CONN FEMALE PUSH INSULATED	6
210	29451-099	WIRE 16GA WHITE	FT5.8
211	29931-003	CONN FEMALE PUSH .25 (16-14GA)	12
212	29450-099	WIRE 16GA BLUE	FT4.1
213	29825-002	DIODE 3 AMP 400V	10
214	29478-099	WIRE 16GA RED/BLACK	FT3.5
215	29457-099	WIRE 16GA GREEN	FT1.5
216	29616-001	CONN FEMALE PUSH .187 (16-14GA)	3
217	29360-099	WIRE 16GA ORANGE/GREEN	FT2
218	29453-099	WIRE 16GA ORANGE	FT1.2
219	29458-099	WIRE 16GA PURPLE	FT1.2
220	29479-099	WIRE 16GA WHITE/BLACK	FT4
221	29459-099	WIRE 16GA BLUE/WHITE	FT .5
222	29483-099	WIRE 16GA RED/WHITE	FT 2.5
223	29601-039	RING TERM	1
224	29455-099	WIRE 16GA BROWN	FT3
226	68814-000	PIN TERMINAL	6
227	REF	RECEPTACLE	1
228	29464-099	WIRE 14GA GREEN	FT .5
229	29361-099	WIRE 16 GA BLK/WHT/RED	FT2



Controller Assembly, Platform, Diesel / 068329-007 / 1 of 2

ILLUSTRATED PARTS BREAKDOWN



Controller Assembly, Platform, Diesel / 068329-007 / 2 of 2

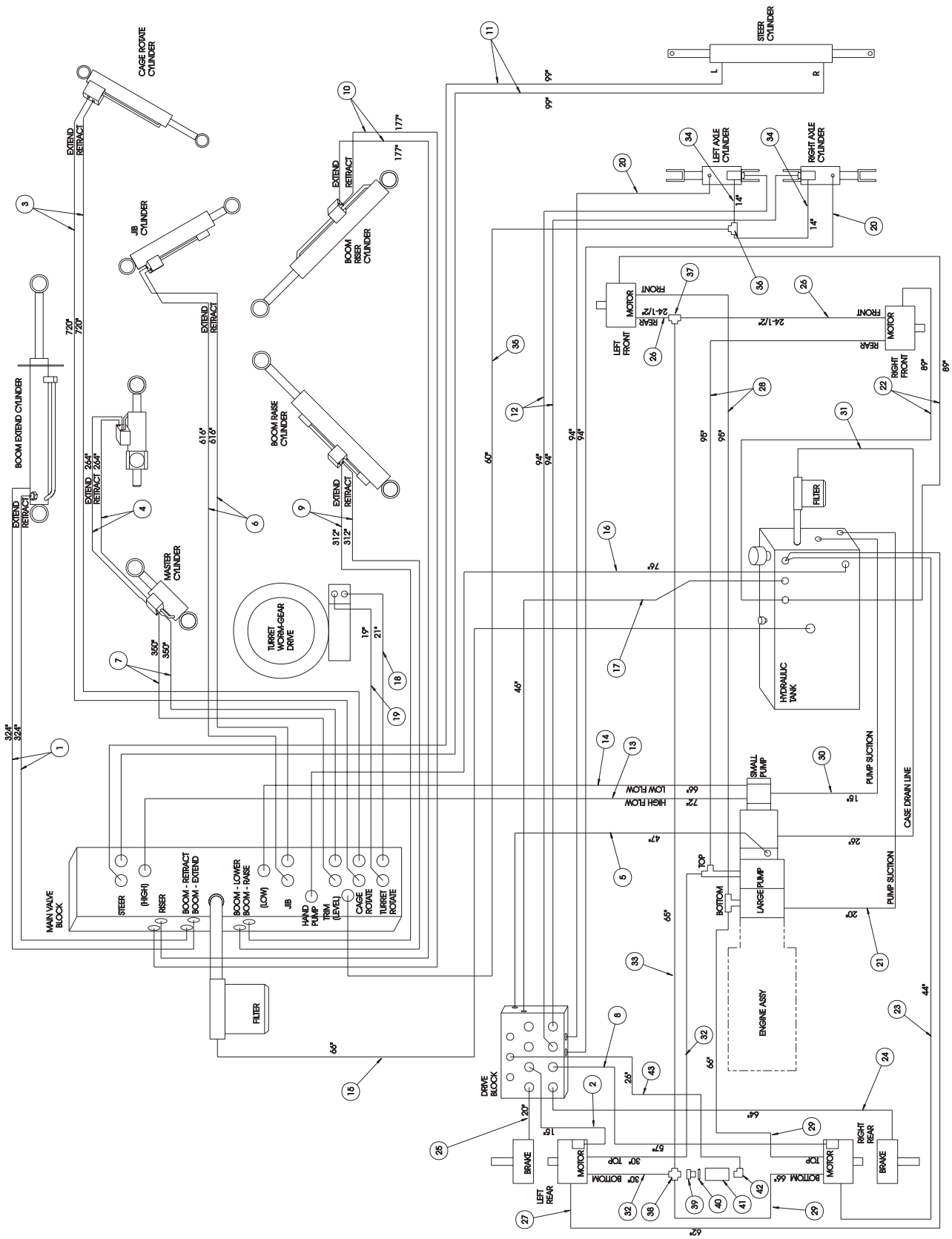
NOTES

Hose Kit, AB46RT Gas & Diesel

068336-003

ITEM	PART	DESCRIPTION	QTY.
1	68737-324	1/4 HOSE ASSY X 324" 4FJX -4FJX	2
2	61351-037	1/8 HOSE ASSY X 15" 4FJX-4FJX	1
3	68737-720	1/4 HOSE ASSY X 720" 4FJX-4FJX	2
4	68808-264	3/16 HOSE ASSY X 264" 4FJX-4FJX	2
5	68737-047	1/4 HOSE ASSY X 47"4FJX-4FJX	1
6	68736-616	3/16 HOSE ASSY X 616" 4FJX-4FJX	2
7	68736-350	3/16 HOSE ASSY X 350" 4FJX-4FJX	2
8	61351-013	1/8 HOSE ASSY X 57" 4FJX-4FJX	1
9	68737-312	1/4 HOSE ASSY X 312" 4FJX-4FJX	2
10	68737-177	1/4 HOSE ASSY X 177" 4FJX-4FJX	2
11	68964-099	1/4 HOSE ASSY X 99" 6FJX-6FJX90øS	2
12	61351-054	1/8 HOSE ASSY X 94" 4FJX-4FJX	2
13	68964-072	1/4 HOSE ASSY X 72" 6FJX-6FJX90ø	1
14	68753-066	1/4 HOSE ASSY X 66" 4FJX-6FJX90ø	1
15	68740-066	1/2 HOSE ASSY X 66" 10FJX-10FJX	1
16	68965-076	3/8 HOSE ASSY X 76" 6FJX-6FJX90ø	1
17	68745-046	3/8 HOSE ASSY X 46" 6FJX-6FJX	1
18	68736-021	3/16 HOSE ASSY X 21" 4FJX-4FJX	1
19	68736-019	3/16 HOSE ASSY X 19" 4FJX-4FJX	1
20	68737-094	1/4 HOSE ASSY X 94" 4FJX-4FJX	2
21	68739-020	1" HOSE ASSY X 20" 16FJX-16FJX	1
22	68745-089	3/8 HOSE ASSY X 89" 6FJX- 6FJX	2

ITEM	PART	DESCRIPTION	QTY.
23	68745-044	3/8 HOSE ASSY X 44" 6FJX- 6FJX	1
24	68737-064	1/4 HOSE ASSY X 64" 4FJX- 4FJX	1
25	68737-020	1/4 HOSE ASSY X 20" 4FJX-4FJX	1
26	68962-024	5/8 HOSE ASSY X 24-1/2"10FJX- 10FJX	2
27	68745-062	3/8 HOSE ASSY X 62" 6FJX-6FJX	1
28	68962-095	5/8 HOSE ASSY X 95" 10FJX-10FJX	2
29	68963-066	5/8 HOSE ASSY X 66" 10FJX-12FL	2
30	68744-015	3/4 HOSE ASSY X 15" 12FJX-12FJX	1
31	68743-026	5/8 HOSE ASSY X 26" 10FJX-10FJX	1
32	68963-030	5/8 HOSE ASSY X 30" 10FJX-12FL	2
33	68962-065	5/8 HOSE ASSY X 65" 10FJX-10FJX	1
34	68753-014	1/4 HOSE ASSY X 14" 4FJX-6FJX90	2
35	68763-060	1/4 HOSE ASSY X 60" 4FJX-6FJX	1
36	20032-003	FITTING TEE	REF
37	20032-007	FITTING TEE	REF
38	67673-005	FITTING, CROSS	REF
39	14693-005	FITTING, REDUCER	REF
40	11979-006	O-RING	REF
41	68952-000	CHECK VALVE	REF
42	11934-001	FITTING 90ø	REF
43	68737-026	1/4 HOSE ASSY X 26" 4FJX-4FJX	1



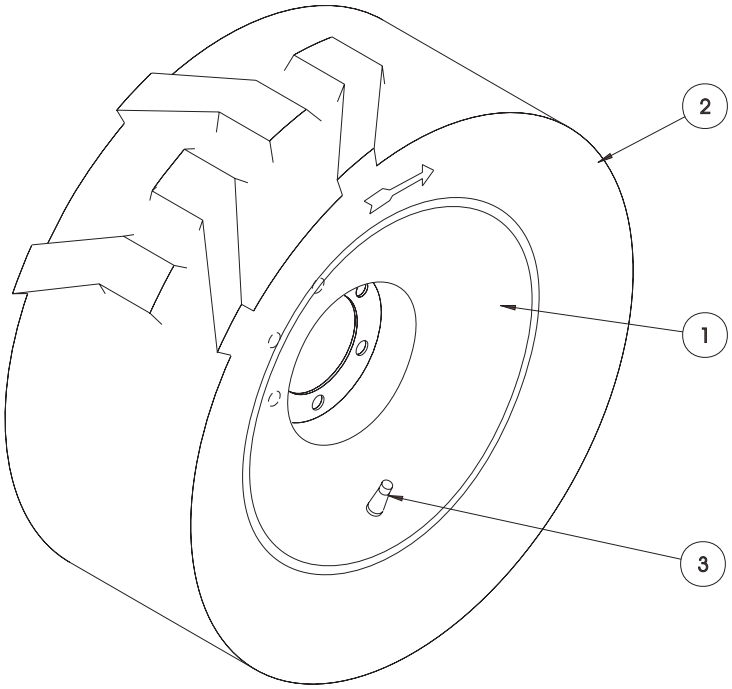
Hose Kit / 068336-003

Tire & Wheel Assembly, AB46RT Gas & Dieel

068327-004 LEFT
068327-005 RIGHT

ITEM	PART	DESCRIPTION	QTY.
1	68881-000	WHEEL, 10.5 X 17.5 9 HOLES	1
2	68880-000	TIRE, 14-17.5 NHS 8 PLY	1
3	12282-001	VALVE STEM	1

(RIGHT HAND SHOWN,
LEFT HAND REVERSED)



NOTES:

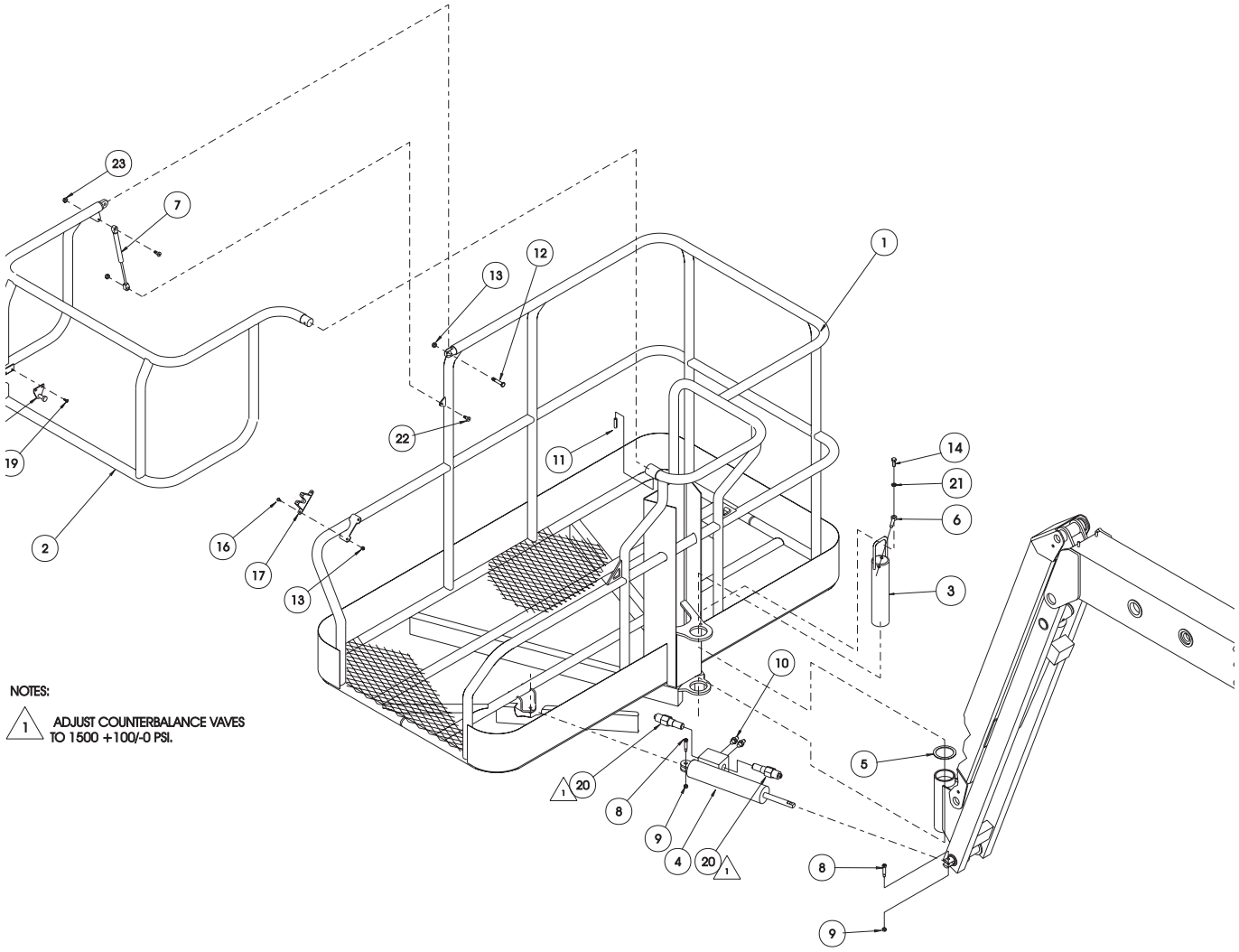
1. FILL TIRE & WHEEL ASSY WITH 110-115 FL. OZ. OF TRAC SEAL (OR EQUIV) TIRE SEALANT. INFLATE TO 55 PSI MIN TIRE PRESSURE.
   -TRAC SEAL REQ. WT.= 11.8 LBS (REF)

Cage "B" Assembly, AB46RT

068325-001

ITEM	PART	DESCRIPTION	QTY.
1	68500-001	CAGE "B" WELDMENT	1
2	68532-000	LIFT-UP GATE WELDMENT	1
3	68775-000	BASKET PIN WELDMENT	1
4	68457-000	CYLINDER, CAGE ROTATION	1
*	68457-010	SEAL KIT, CAGE ROTATE	1
5	68651-000	THRUST WASHER G32DU (MODIFIED)	1
6	65214-000	PIN RETAINER	1
7	63650-012	GAS SPRING	1
8	15936-010	SHOULDER BOLT	2
9	11248-005	LOCKNUT	2
10	11939-004	FITTING, 4MP-4MJ	2
11	11737-012	ROLLPIN 1/4" X 1-1/2"	1

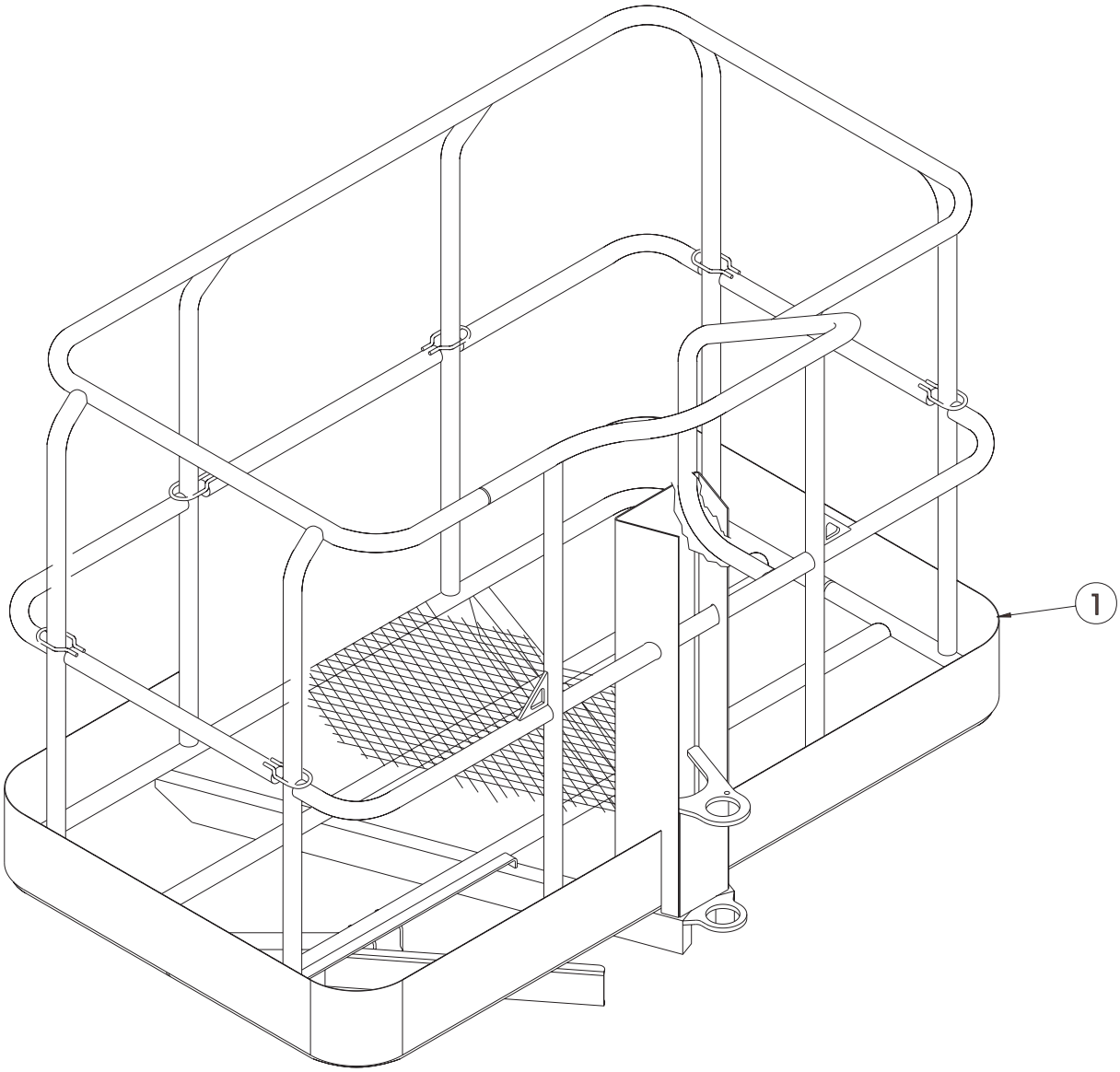
ITEM	PART	DESCRIPTION	QTY.
12	11703-008	SCREW, HHC 1/4-20 X 1-1/2	1
13	11248-004	NUT HEX 1/4-20	3
14	11254-008	SCREW HHC 3/8-16 X 1	1
16	11821-005	SCREW BUTTON HD 1/4-20 UNC X 5/8	2
17	68277-000	LATCH ROTARY	1
18	68806-000	STRIKER WELDMENT	1
19	11709-004	SCREW RND HD 10-24 UNC X 1/2	2
20	68778-000	VALVE COUNTERBALANCE (550 PSI)	2
21	11238-006	LOCKWASHER 3/8 SPLIT	1
22	15936-005	SHOULDER BOLT 3/8 X 5/8 LG	2
23	11248-005	NUT, ESNA 5/16-18	2



Cage “A”, AB46RT

068500-000

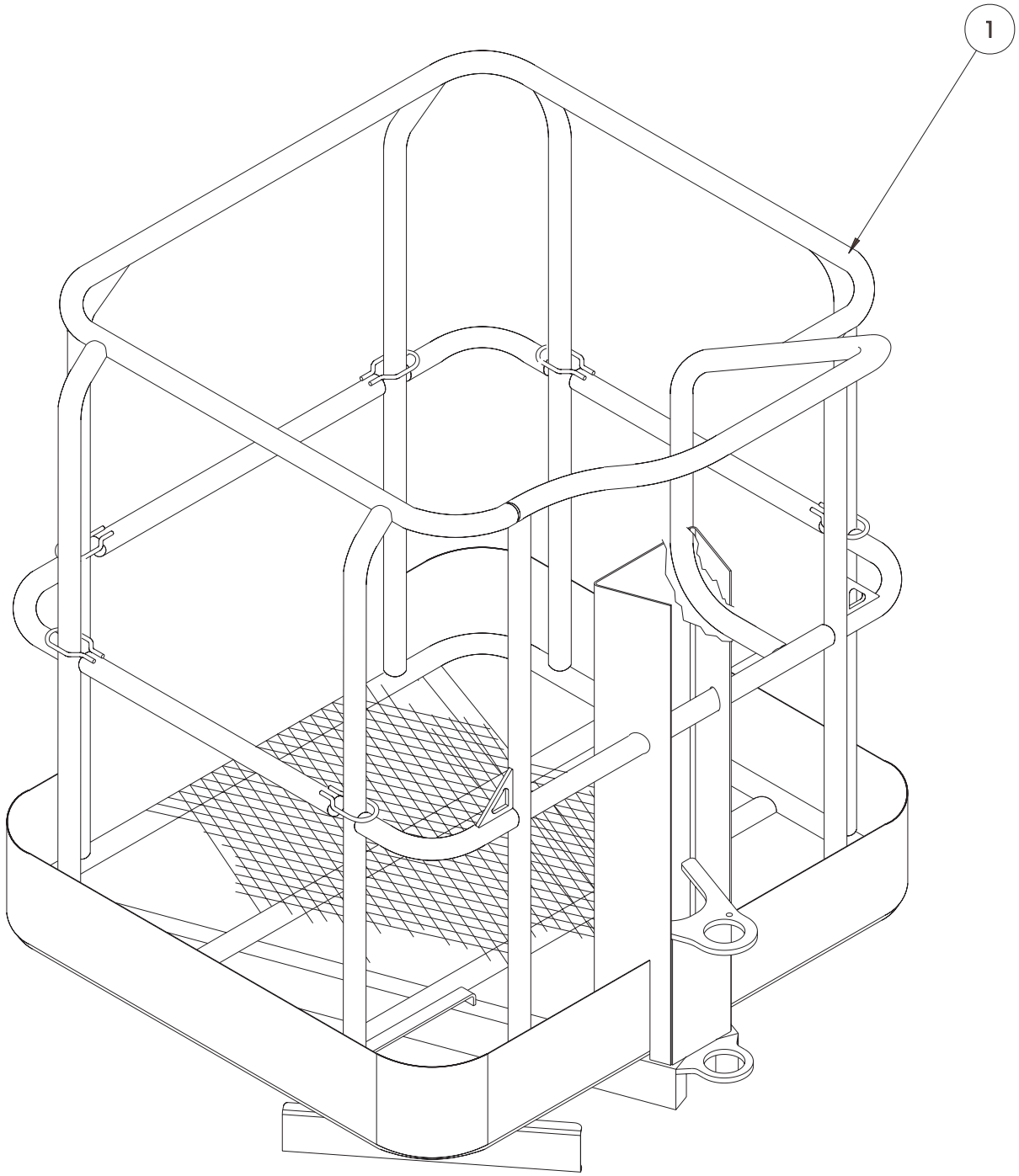
ITEM	PART	DESCRIPTION	QTY.
1	68500-000	CAGE “A” WELDMENT	1



4 Ft. Cage, AB46RT

068500-003

ITEM	PART	DESCRIPTION	QTY.
1	68500-003	CAGE WELDMENT 4 FT	1



Label Kit, AB46RT Gas

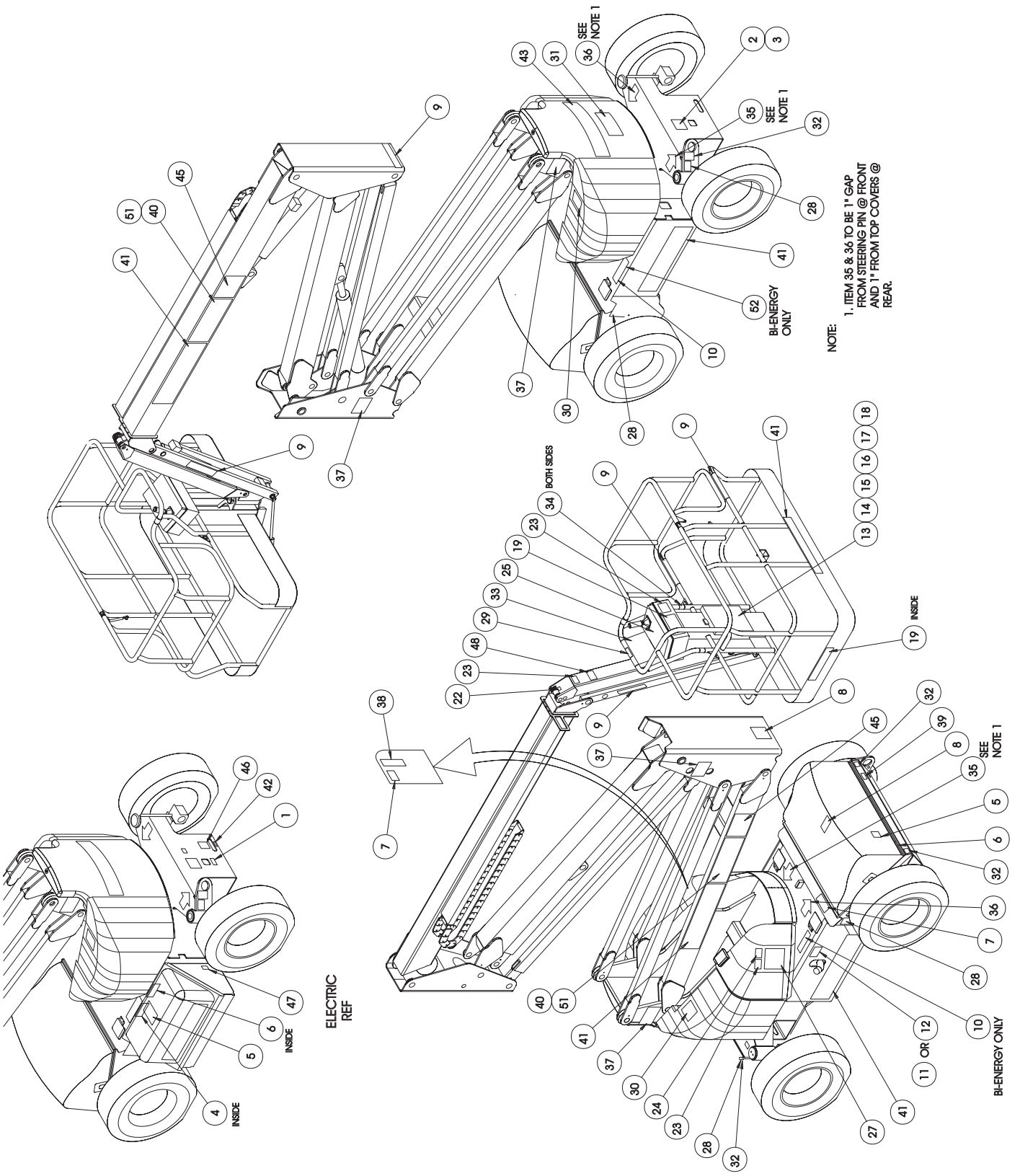
068335-004

ITEM	PART	DESCRIPTION	QTY.
2	061205-002	NAME PLATE / BOOM	1
3	065368-000	TACK	4
5	066552-000	LABEL EXPLOSIVE GAS	1
6	005221-000	LABEL BATTERY LEVEL	1
7	066555-000	LABEL LIMIT SWITCH	2
8	066556-000	LABEL PINCH POINT	2
9	066553-001	LABEL PINCH POINT	5
10	060197-000	LABEL HYDRAULIC FLUID	1
12	064166-000	LABEL UNLEADED FUEL	1
13	010076-000	MANUAL CASE	1
14	010076-001	LABEL ATTENTION	1
15	068342-003	USER MANUAL DOM RT	1
16	060565-000	ANSI MANUAL	1
17	011248-004	NUT HEX ESNA 1/4-20UNC	4
18	011252-008	SCREW HHC X 1/4-20 X 1	4
19	062557-012	MAX LOAD 500 Lb / 225 Kg	2
22	064444-000	LABEL USA	1
23	066554-000	LABEL BEFORE OPERATION	3
24	068979-000	LABEL CHOCK WHEEL	1
25	068586-014	LABEL UPPER CONTROLS RT GAS	1
27	068587-010	LABEL LOWER CONTROLS	1
28	066562-004	TIRE PSI 55 PSI	4
29	068980-000	LABEL FOOT SWITCH MAY FLOOD	1
30	066568-000	LABEL CRUSHING HAZARD	2
31	064199-001	LABEL 4WD	1
32	068632-000	LABEL HOLD DOWN	4
33	068633-000	LABEL READ & UNDERSTAND	1
34	068635-000	LABEL HARNESS POINT	2
35	068637-000	LABEL ARROW YELLOW	2
36	068637-001	LABEL ARROW ORANGE	2
37	066553-004	LABEL PINCH POINT	4
38	068638-000	LABEL EMERGENCY LOWER	1
39	068639-000	LABEL POWER TO PLATFORM	1
40	068634-001	LABEL AB46	2
41	061683-005	LABEL UPRIGHT	5
43	061683-007	LABEL UPRIGHT	1
45	068984-000	LABEL RT	2
48	068649-000	LABEL, CAUTION- RAISE JIB BOOM	1

Label Kit, AB46RT Diesel

068335-005

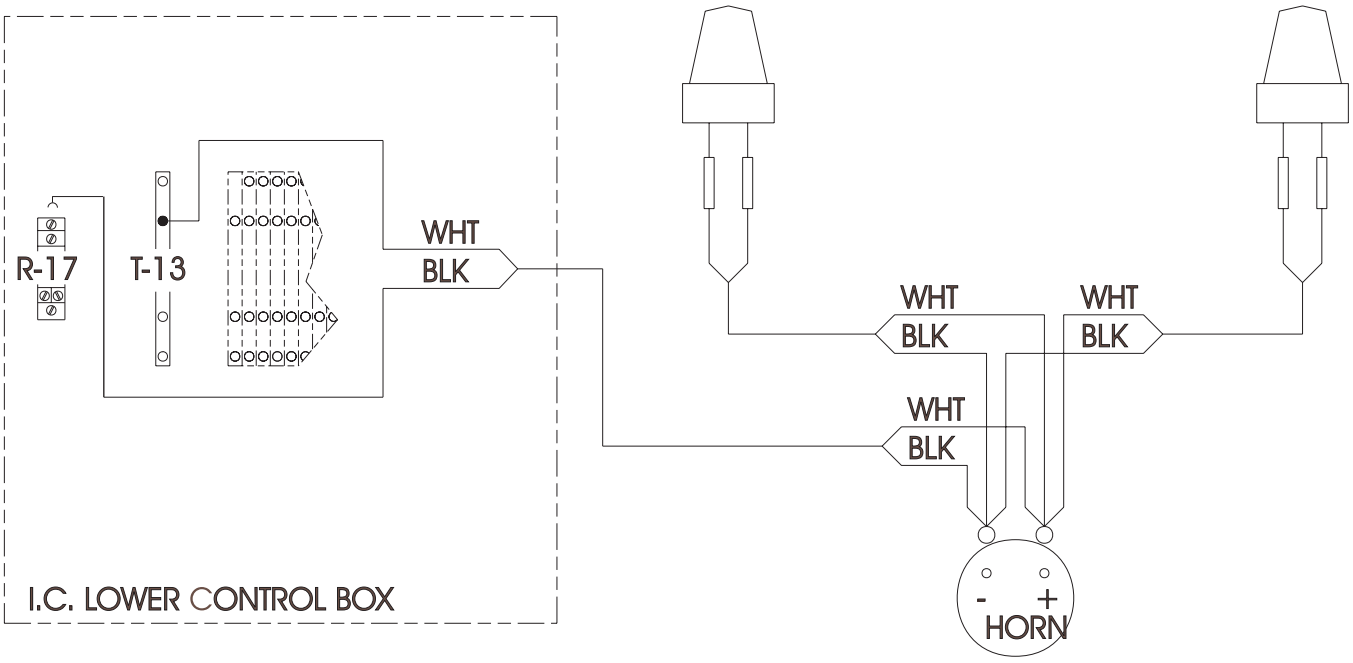
ITEM	PART	DESCRIPTION	QTY.
2	061205-002	NAME PLATE / BOOM	1
3	065368-000	TACK	4
5	066552-000	LABEL EXPLOSIVE GAS	1
6	005221-000	LABEL BATTERY LEVEL	1
7	066555-000	LABEL LIMIT SWITCH	2
8	066556-000	LABEL PINCH POINT	2
9	066553-001	LABEL PINCH POINT	5
10	060197-000	LABEL HYDRAULIC FLUID	1
11	027898-000	LABEL DIESEL FUEL	1
13	010076-000	MANUAL CASE	1
14	010076-001	LABEL ATTENTION	1
15	068342-003	USER MANUAL DOM RT	1
16	060565-000	ANSI MANUAL	1
17	011248-004	NUT HEX ESNA 1/4-20UNC	4
18	011252-008	SCREW HHC X 1/4-20 X 1	4
19	062557-012	MAX LOAD 500 Lb / 225 Kg	2
22	064444-000	LABEL USA	1
23	066554-000	LABEL BEFORE OPERATION	3
24	068979-000	LABEL CHOCK WHEEL	1
25	068586-013	LABEL UPPER CONTROLS RT DSL	1
27	068587-010	LABEL LOWER CONTROLS	1
28	066562-004	TIRE PSI 55 PSI	4
30	066568-000	LABEL CRUSHING HAZARD	2
31	064199-001	LABEL 4WD	1
32	068632-000	LABEL HOLD DOWN	4
33	068633-000	LABEL READ & UNDERSTAND	1
34	068635-000	LABEL HARNESS POINT	2
35	068637-000	LABEL ARROW YELLOW	2
36	068637-001	LABEL ARROW ORANGE	2
37	066553-004	LABEL PINCH POINT	4
38	068638-000	LABEL EMERGENCY LOWER	1
39	068639-000	LABEL POWER TO PLATFORM	1
40	068634-001	LABEL AB46	2
41	061683-005	LABEL UPRIGHT	5
43	061683-007	LABEL UPRIGHT	1
45	068984-000	LABEL RT	2
48	068649-000	LABEL, CAUTION- RAISE JIB BOOM	1

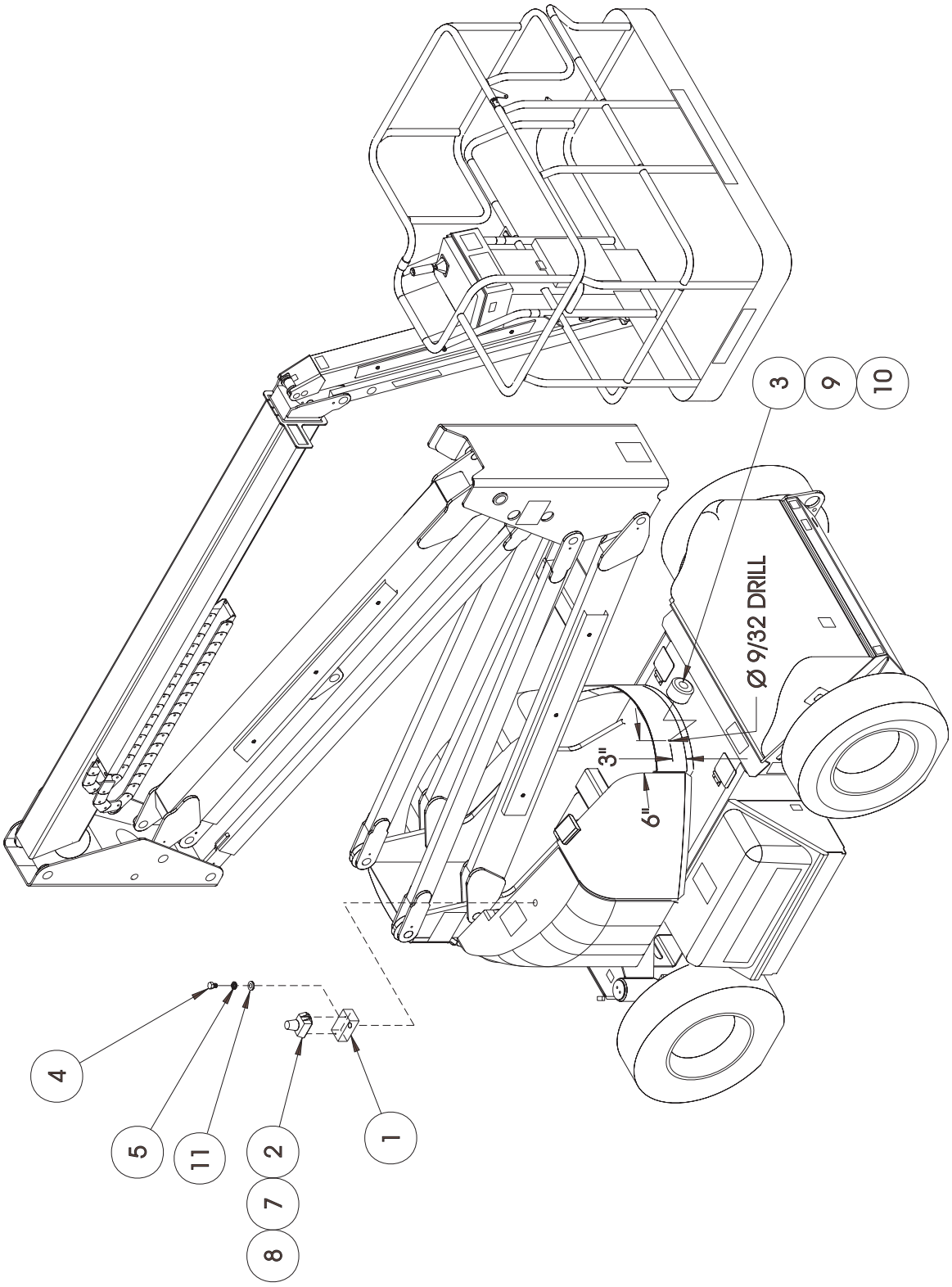

NOTE:
1. ITEM 35 & 36 TO BE 1" GAP FROM STEERING PIN @ FRONT AND 1" FROM TOP COVERS @ REAR.
BI-ENERGY ONLY
BOTH SIDES
INSIDE
ELECTRIC REF
SEE NOTE 1
OR
BI-ENERGY ONLY

Motion Alarm / Flashing Beacon Option, AB46RT

068294-000

ITEM	PART	DESCRIPTION	QTY.
1	68817-000	STROBE MOUNT WELDMENT	2
2	12848-004	FLASHING STROBE LIGHT	2
3	66807-004	HORN	1
4	11258-008	SCR. HHC 3/4-10 UNC X 1	2
5	11238-016	WASHER, SPLIT LOCK	2
6	29496-099	WIRE, C COND. 16 GA.	FT. 8
7	11709-004	SCREW # 10-24 UNC X 1/2" LG	4
8	11248-003	LOCKNUT # 10-24 UNC ESNA	4
9	11252-006	SCREW, HHC 1/4-20UNC X 3/4" LG.	1
10	11238-004	LOCKWASHER, 1/4" SPLIT RING	1
11	11240-012	WASHER FLAT STD 3/4	2

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10
Ø 9/32 DRILL
3"
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NOTES

UpRight

Call Toll Free in U.S.A.
1-800-926-LIFT
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Selma, California 93662
TEL: 559/891-5200
FAX: 559/891-9012
PARTS: 1-888-UR-PARTS
PARTSFAX: 559/896-9244

068344 -000
B 8/99 K