

HY-BRID LIFTS™

BY CUSTOM EQUIPMENT INC

MAINTENANCE & TROUBLESHOOTING MANUAL
SELF-PROPELLED AERIAL WORK PLATFORM

SUPO-611
REV N



HB-1030

HB-1430

SERIES II

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1.1 | SAFETY SYMBOLS



“DANGER” indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

FAILURE TO FOLLOW THIS WARNING WILL CAUSE DEATH OR PERSONAL INJURY.



“WARNING” indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

FAILURE TO FOLLOW THIS WARNING MAY CAUSE DEATH OR PERSONAL INJURY.



“CAUTION” indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to equipment.

FAILURE TO FOLLOW THIS WARNING MAY CAUSE INJURY OR DAMAGE TO EQUIPMENT

1.2 | GENERAL RULES AND PRECAUTIONS

An operator of any type of work platform is subject to certain hazards that cannot be protected by mechanical means. It is therefore essential that operators be competent, careful, physically and mentally fit and thoroughly trained in safe operation of this machine.

Although Custom Equipment, Inc. Conforms to specified ANSI & OSHA, it is the responsibility of the owner to instruct operators with the safety requirements made not only by Custom Equipment, Inc., but by the various safety boards in your area, as well as additional requirements set forth by ANSI and OSHA. If you come across a situation that you think might be unsafe, stop the platform and request further information from qualified sources before proceeding.



NEVER REACH BETWEEN SCISSORS LINKS OR PROP UP PLATFORM UNLESS MAINTENANCE PINS ARE IN PLACE.



MAINTENANCE INFORMATION IS FOR USE BY TRAINED PERSONNEL ONLY.

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1.3 | SAFETY GUIDELINES

Maintenance Lock

The maintenance lock must be placed into position whenever the machine is being serviced in the raised or partially raised position. Serious injury and/or death could result if maintenance lock is not used properly.

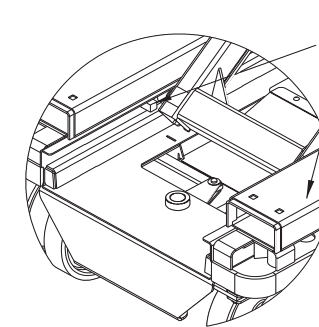


FIGURE 1: Maintenance Lock Pin use

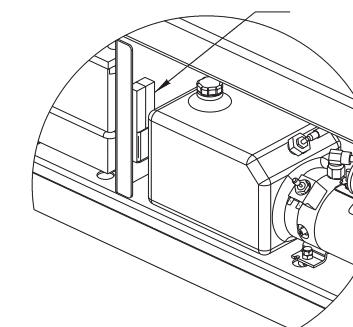


FIGURE 2: Maintenance Lock Pin storage location



FAILURE TO COMPLY WITH THE LISTED SAFETY PRECAUTIONS MAY RESULT IN MACHINE DAMAGE, PERSONNEL INJURY, OR DEATH.

- Never work under an elevated platform until maintenance locks have been engaged.
- Remove all rings, watches, and jewelry when performing any maintenance.
- Do not wear long hair unrestrained or loose fitting clothing and neckties which may become caught on or entangled in equipment.
- Observe and obey all warnings and cautions on machine and in manual.
- Keep oil, grease, water, etc. wiped from standing surfaces and handholds.
- Before making any adjustments, lubricating or performing any other maintenance, shut off all power controls.
- Battery should always be disconnected during replacement of electrical components.
- Keep all support equipment and attachments stowed in their proper place.
- Use only approved nonflammable cleaning solvents.
- After maintenance, inspect the machine as described for Pre-delivery.

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2.1 | BATTERY MAINTENANCE

This unit is equipped with deep cycle 12-volt batteries. The care and maintenance of your battery has much to do with how well this unit functions. Battery wiring and water level should be checked monthly. Do not overfill. When the cells are too full, fluid will seep out when charging. The solution is at its proper strength when the battery is manufactured. Use distilled water and keep fluid up to proper level. When required, water should be added to battery after charging, unless water level is below the plates.

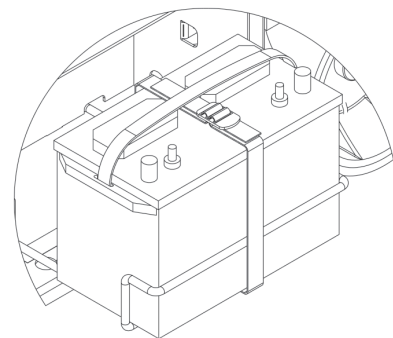


FIGURE 3: BATTERY MAINTENANCE



2.2 | CHARGING THE BATTERY

This unit is equipped with deep cycle 12-volt batteries. The care and maintenance of your battery has much to do with how well this unit functions. Battery wiring and water level should be checked monthly. Do not overfill. When the cells are too full, fluid will seep out when charging.



LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES. KEEP SPARKS AND FLAME AWAY FROM BATTERIES. DO NOT SMOKE WHILE CHARGING.

Note: The surrounding temperature greatly affects the power reserve within a battery. Example: A battery that is 100% charged at 80° F (27°C) drops to 65% at 32°F (0°C) At 0°F (-18°C), this battery will drop to 40% efficiency.

- Park the machine on a level surface.
- Plug charger into AC outlet until charged.
- Unplug charger.

The charger will not begin charging on severely discharged batteries. This will be evident by the three indicators blinking simultaneously.

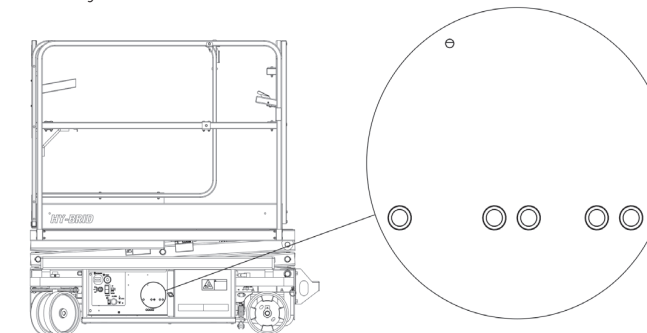


FIGURE 4: Battery Charger LED Display



Power	Battery 1 Status		Battery 2 Status		
	Charging	Ready	Charging	Ready	
Green LED (ON)	Red LED (OFF)	Green LED (OFF)	Red LED (OFF)	Green LED (OFF)	This display indicates that the power is on but there is no connection to a battery. The charger must see approximately five (5) volts on a battery to deliver D/C current.
Green LED (ON)	Red LED (ON)	Green LED (OFF)	Red LED (ON)	Green LED (OFF)	This display indicates that power is on and that both outputs are delivering D/C current to the batteries.
Green LED (ON)	Red LED (OFF)	Green LED (ON)	Red LED (OFF)	Green LED (ON)	This display indicates that power is on and that both outputs are finished charging and are in a float maintenance mode
Green LED (ON)	Red LED (FLASHING)	Green LED (ON)	Red LED (FLASHING)	Green LED (ON)	A flashing red light indicates there is a problem with a battery, such as low voltage or a bad cell.

2.3 | LUBRICATION

Item	Specification	Frequency of Lubrication
Front Wheels	Teflon Spray	Quarterly

2.4 | COMPONENTS REQUIRING ADJUSTMENT

Under normal use, no components should require adjustment. Contact the manufacturer if adjustments are required.

2.5 | EXAMINATION, REPAIR, REPLACEMENT OF LIMITED LIFE COMPONENTS

With proper use, battery maintenance, and regular inspection, there are no limited life components that require routine replacement.

2.6 | SAFETY DEVICES AND SYSTEMS REQUIRING CHECKS

Check safety functions as part of daily inspection. Check that the electromagnetic brakes are holding.]

2.7 | STORAGE

After periods of storage, exposure to extremes of ambient conditions-heat, cold, moisture, dust etc., inspect the machine. Refer to the Pre-Delivery/ Frequent Inspection Checklist in the Maintenance Manual.

2.8 | MAJOR ALTERATIONS OR REPAIRS

Any alterations must be approved by the manufacturer. Major repairs, which affect the stability, strength, or performance of the machine must also be approved by the manufacturer, recorded, and include machine inspection and testing. Never attach pipe racks, material lifting devices, or make any other alteration that is not part of the intended design of the machine.

2.9 | OTHER PROCEDURES**Setting the Tilt Sensor**

1. Verify that unit is powered (red or green LED illuminated/blinking).
2. Zero unit (teach unit home/level position).
 - Operate tilt platform until it has reached the desired home position (level).
 - Press and hold the button on top of the module for 5 seconds (both LEDs will be OFF).
 - Red and Green LEDs will now FLASH. User now has 5 seconds to "program"
 - Press and release button 3 times within 5 second period.
 - Red and Green LEDs will turn on solid for 2 seconds, indicating position is being learned

Voltage Test Points

Contact technical assistance for more details.

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FAILURE TO PERFORM INSPECTIONS AND PREVENTATIVE MAINTENANCE AT RECOMMENDED INTERVALS MAY RESULT IN THE UNIT BEING OPERATED WITH A DEFECT THAT MAY RESULT IN INJURY OR DEATH OF THE OPERATOR.

Regular inspection and conscientious maintenance is important to efficient economical operation of this machine. It will help to assure that equipment will perform satisfactorily with a minimum of service and repair. Make checks at the stated intervals or more frequently if required by local operating conditions. The following inspection checklists are required and included in this manual:

- Pre-Start (Required before operation at each work shift)
- Frequent (Required at intervals not more than three months)
- Pre-Delivery/Annual (Required at intervals not more than twelve months)

The rated life of the machine is Light Intermittent Duty (typical use 10 years, 40 weeks per year, 20 hours per week, 5 load cycles per hour).

3.1 | PRE-START INSPECTION CHECKLIST



THIS CHECKLIST MUST BE USED AT THE BEGINNING OF EACH SHIFT OR AFTER EVERY SIX TO EIGHT HOURS OF USE. FAILURE TO DO SO COULD AFFECT THE SAFETY OF THE OPERATOR.

Model: _____ Serial Number: _____

- Keep inspection records up-to-date.
- Record and report all discrepancies to your supervisor.
- A dirty machine cannot be properly inspected.

Y – Yes/Acceptable N – No/Unacceptable R – Repaired

Description	Y	N	R
VISUAL INSPECTIONS			
Check that there are no damaged, dented, or bent structural members.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There are no loose or missing parts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warning and instructional labels are legible and secure. Ensure that load capacity is clearly marked.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check platform rails and safety gate for damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Platform and base controls are not missing, damaged, or disconnected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical cables and wires are not torn, frayed, or disconnected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic hoses are not torn or loose, and there are no leaks. Check that hoses and cables have no worn areas or chafing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the hydraulic fluid level with the platform fully lowered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the tires for damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check that all snap rings are secure in grooves on pivot pins.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUNCTIONAL TESTS			
Gate closes automatically and latches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLATFORM CONTROLS: Check all switches and push buttons for proper operation.			
• Emergency Stop (Stops all movement)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Up/Down Controls (Elevates, Lowers, Enable button must be pressed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Alarm (Not damaged, sounds for descent, overload)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• LED (Lights when overloaded)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BASE CONTROLS: Check all switches and push buttons for proper operation			
Master Power Switch (Disconnects Battery)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wheels: Front and rear wheels rotate freely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brakes: Engage and hold when platform is elevated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When beginning to elevate, overload light and alarm activate. Then, if not overloaded, allows elevation to continue, and light and alarm stop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date: _____ Inspected by: _____

3.2 | FREQUENT INSPECTION CHECKLIST



AERIAL PLATFORMS SHALL BE INSPECTED, SERVICED, AND ADJUSTED TO MANUFACTURER'S REQUIREMENTS BY A QUALIFIED MECHANIC PRIOR TO EACH SALE, LEASE, OR RENTAL, AND EVERY 3 MONTHS OR 150 HOURS, WHICHEVER COMES FIRST.

Model: _____ Serial Number: _____

- Check each item listed below.
- Use proper operating, service, and maintenance manual for specific information and settings
- If an item is found to be unacceptable make the necessary repairs and check the "repaired" box.
- When all items are "acceptable", the unit is ready for service.
- If an item is found to be unacceptable, make the necessary repairs and check the "repaired" box. When all items are "acceptable," the unit is ready for service.

Y – Yes/Acceptable N – No/Unacceptable R – Repaired

Description	Y	N	R
VISUAL INSPECTIONS			
Perform all the checks on the Pre-Start Inspection Checklist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspect the condition of hydraulic fluid in reservoir. Oil should have a clear amber color.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspect the entire machine for signs of damage, broken welds, loose bolts, or improper repairs. (Check for corrosion, cracking, abrasion, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check that all snap rings are secure in grooves on pivot pins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check if tires are leaning in or out.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that bubble level is in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that maintenance and inspection records are up to date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUNCTIONAL TESTS			
Perform all check on Pre-Start inspection checklist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Functions operate smoothly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Functions operate over full range of motion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency lowering – Manual override functions properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check that the platform does not drift down with a full load	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wheels lubricated if needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

Date: _____ Inspected by: _____

3.3 | PRE-DELIVERY/ANNUAL CHECKLIST



AERIAL PLATFORMS SHALL BE INSPECTED, SERVICED, AND ADJUSTED TO MANUFACTURER'S REQUIREMENTS BY A QUALIFIED MECHANIC PRIOR TO EACH SALE, LEASE, OR RENTAL, AND EVERY 3 MONTHS OR 150 HOURS, WHICHEVER COMES FIRST.

Model: _____ Serial Number: _____

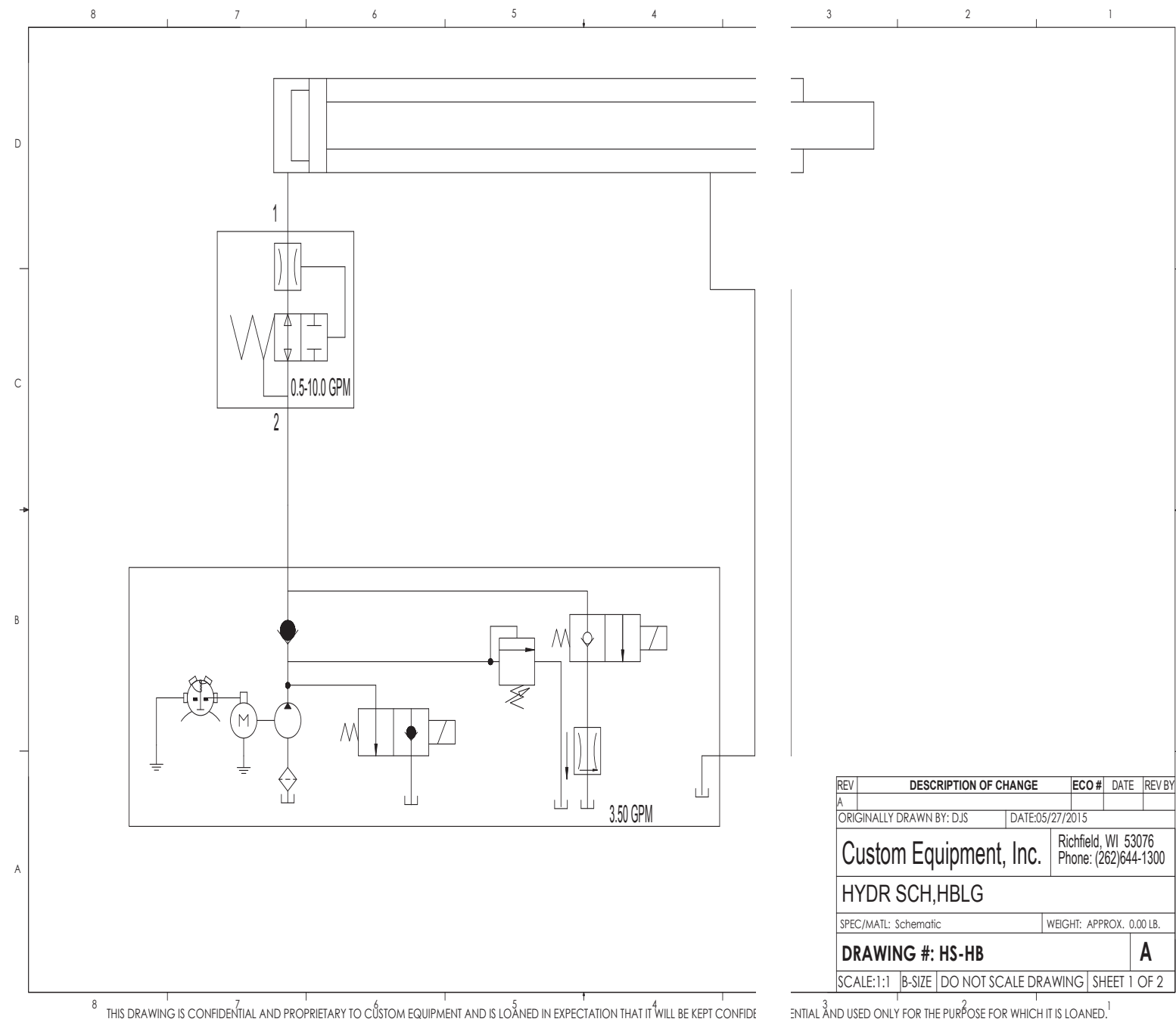
- Check each item listed below.
- Use proper operating, service, and maintenance manual for specific information and settings
- If an item is found to be unacceptable make the necessary repairs and check the "repaired" box.
- When all items are "acceptable", the unit is ready for service.
- If an item is found to be unacceptable, make the necessary repairs and check the "repaired" box. When all items are "acceptable," the unit is ready for service.

Y – Yes/Acceptable N – No/Unacceptable R – Repair

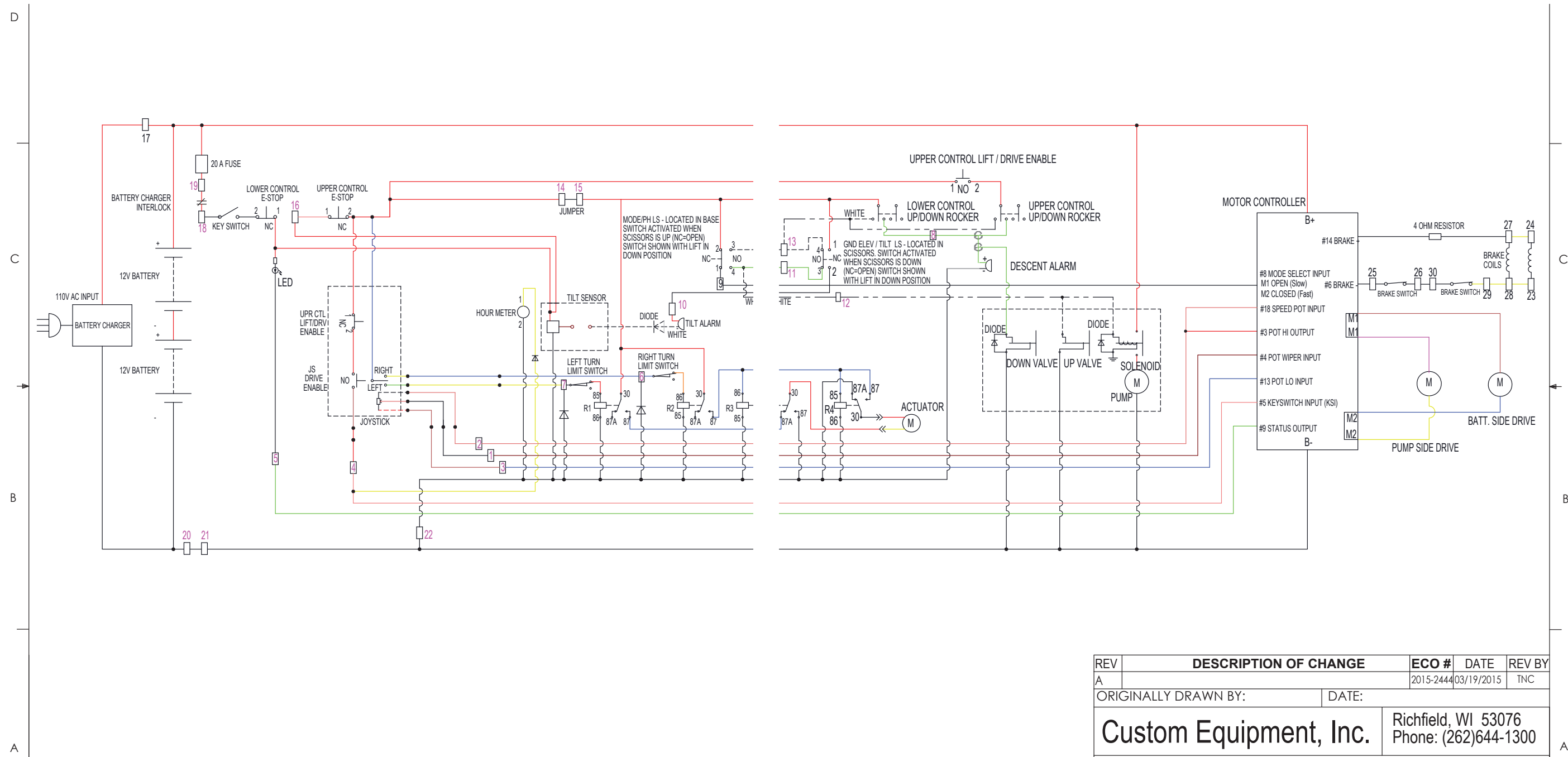
Base:	Y	N	R	Platform:	Y	N	R
Inspect slide tracks for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All rails in place/secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All frame bolts tight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No bent rails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pump Secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No broken welds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DC motor secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Platform power outlet safe/working (if installed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Battery Hold Downs Secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Entrance gate closes freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Batteries Fully Charged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cables in place/secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Counterweights secured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Functions:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wheels: Grease casters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Elevate/Lower Operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wheels: Bolts/Nuts Tight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Master Power Switch Breaks Circuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance Locks: Pins storage location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Stop Breaks Circuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All Shields/Guards in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Down Operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic Oil Level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Motion Alarms Functional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check all hydraulic hoses for leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brakes: Operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check all hydraulic fittings for leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bubble Level in Place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SCISSORS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	When beginning to elevate, overload light and alarm activate. Then, if not overloaded, allows elevation to continue, and light and alarm stop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No Broken Welds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	When overloaded, platform stops elevating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ret. Rings Secure on Pivots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Check battery Voltage: <12.5V, charge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No Bent Beam Members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wiring / Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All rollers turn freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Switches Secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decals:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Contractor(s) Secure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tight on Terminals (No Loose Wiring)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correct capacity noted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Operator/Service Manual Included	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper placement quantity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Battery Charger Secure & Operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:							

Date: _____ Inspected by: _____

4.1 | HYDRAULIC SCHEMATIC

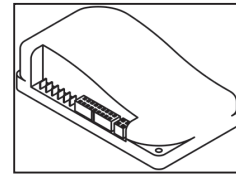


4.2 | ELECTRICAL SCHEMATIC



4.3 | LED DRIVE BOARD DIAGNOSTICS-BLUE CONTROLLER

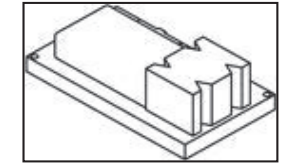
Note: If LED Diagnostics light flashes rapidly for 10 seconds when joystick enable switch is squeezed, before reading error code, use this table.



Programmer Display	LED Code	Explanation	Possible Cause
THERMAL CUTBACK	□ □	Over-/under-temp. Cutback	Temperature >92° C or <-25°C. Excessive load on vehicle. Electromagnetic brake not releasing properly.
THROTTLE FAULT 1	□ □ □	Pot high or pot low signal out of range	Throttle input wire open or shorted. Throttle pot device. Wrong type selected
SPD LIMIT POT FAULT	□ □ □ □	Speed limit pot fault	Speed limit pot wire(s) broken or shorted. Broken speed limit pot.
LOW BATTERY VOLTAGE	□ □ □ □ □	Battery voltage too low	Battery voltage <17 volts. Bad connection at battery or controller.
OVER-VOLTAGE	□ □ □ □ □ □	Battery voltage too high	Battery voltage >36 volts. Vehicle operating with charger attached. Intermittent battery connection.
MAIN OFF FAULT	□ □ □	Main cont. Off fault	Main contractor drive failed open.
MAIN CONT WELDED	□ □ □ □	Main contractor did not open	Main contractor welded. Main contractor driver fault. Brake coil resistance too high.
MAIN CONT DNC	□ □ □ □ □	Main contractor did not close	Main contractor stuck open. Main contractor driver fault. Brake coil resistance too high.
MAIN ON FAULT	□ □ □ □ □ □	Main cont. Driver On fault	Main contractor driver failed closed.
PROC/WIRING FAULT	□ □ □ □ □	HPD fault present > 100 sec.	Maladjusted throttle. Broken throttle pot or throttle mechanism.
BRAKE ON FAULT	□ □ □ □ □	Brake on fault	Electromagnetic brake driver shorted. Electromagnetic brake coil open.
PRE-CHARGE FAULT	□ □ □ □ □ □	Brake off fault	Controller failure. Low battery voltage.
BRAKE OFF FAULT	□ □ □ □ □ □ □	Pre-charge fault	Electromagnetic brake driver open. Electromagnetic brake coil shorted.
HPD	□ □ □ □ □ □ □ □	HPD fault	Improper sequence of throttle and KSI, push, or inhibit inputs. Maladjusted throttle pot.
CURRENT SENSE FAULT	□ □ □ □ □ □	Current sense voltage fault	Short in motor or in motor wiring. Controller failure.
HW FAILSAFE	□ □ □ □ □ □ □	Motor voltage fault	Motor voltage does not correspond to throttle request. Short in motor or in motor wiring. Controller failure.
EEPROM FAULT	□ □ □ □ □ □ □ □	EEPROM fault	EEPROM failure or fault.
POWER SECTION FAULT	□ □ □ □ □ □ □ □ □	Output section fault	EEPROM failure or fault. Short in motor or motor wiring. Controller failure.

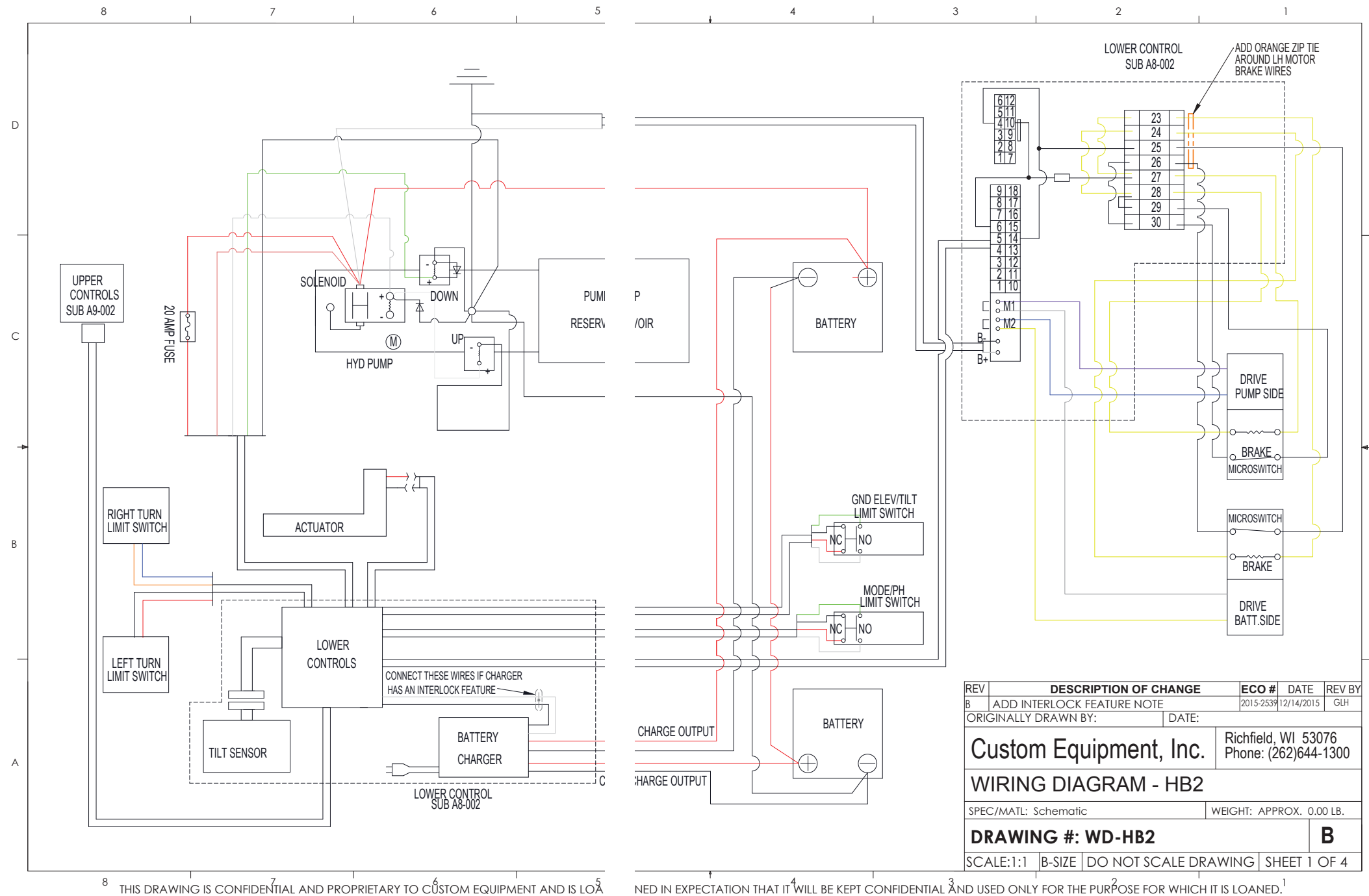
4.4 | LED DRIVE BOARD DIAGNOSTICS-BLACK CONTROLLER

Note: If no rapid flash is displayed and codes are immediately displayed, use this table.

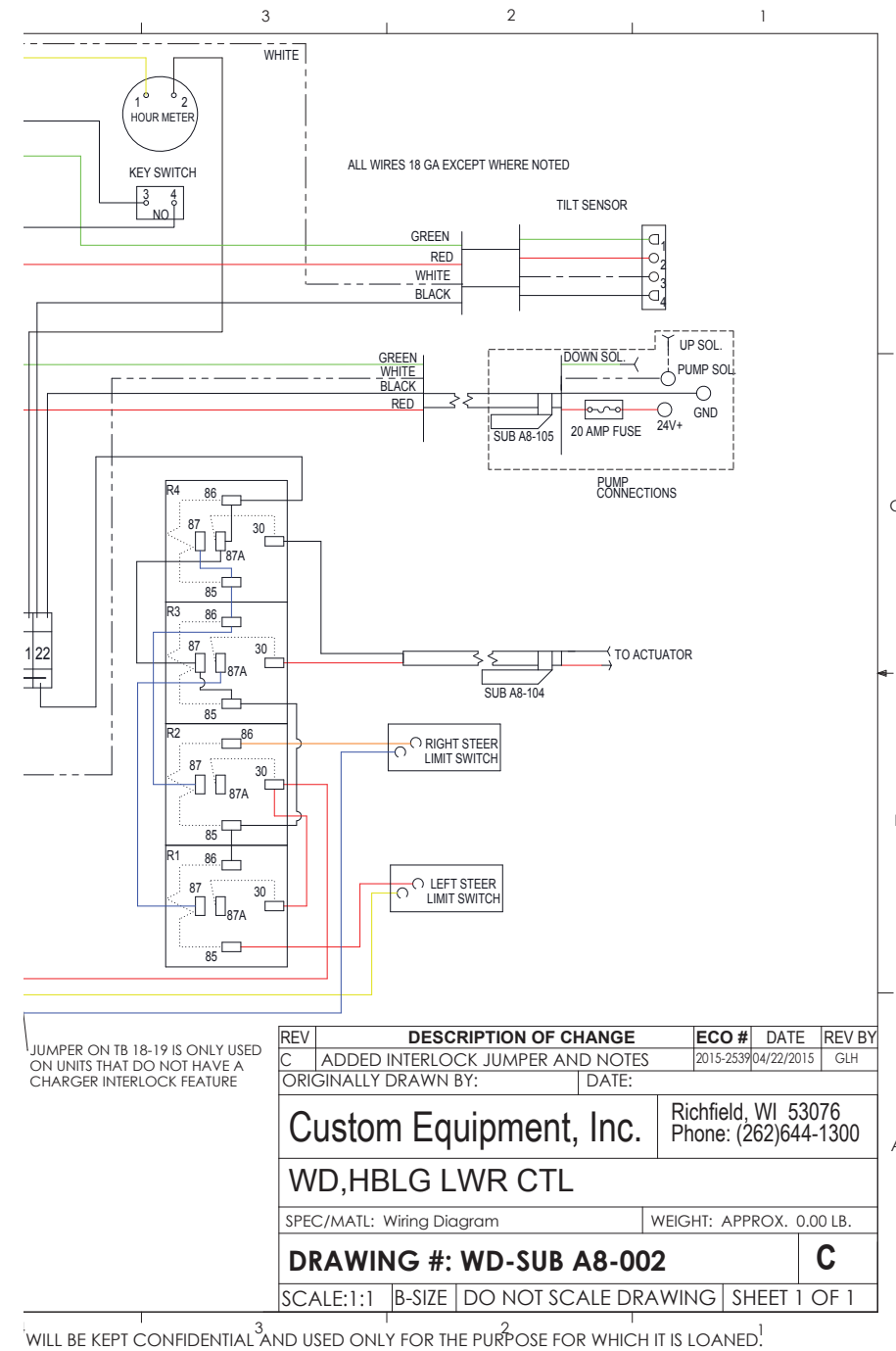
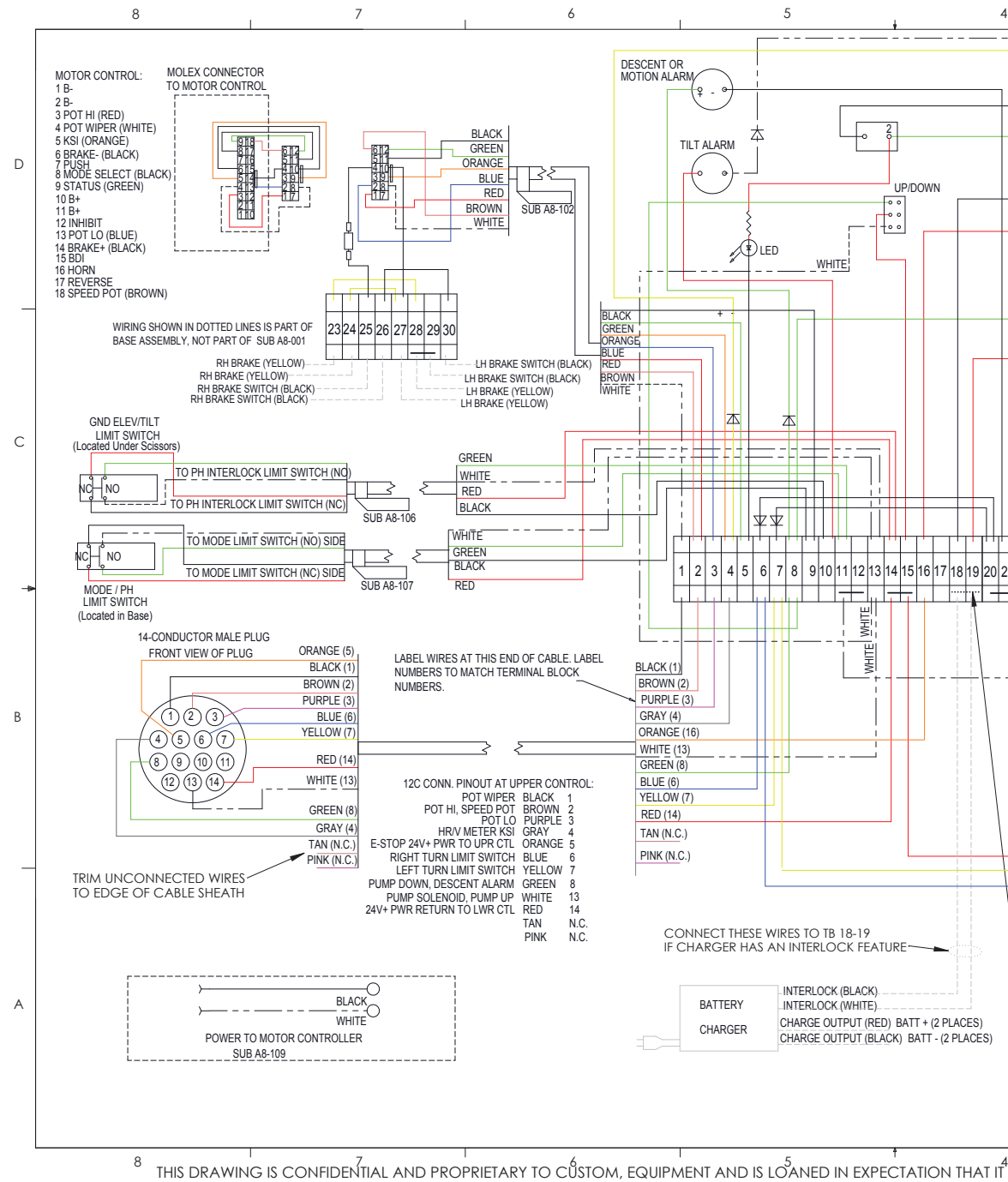


Programmer Display	LED Code	Explanation	Possible Cause
OVER TEMPERATURE	□ □ □ □ □	Over-/under-temp. Cutback	Temperature >92° C or <-25°C. Excessive load on vehicle. Electromagnetic brake not releasing properly or engaged.
EM-BRAKE SHORT	□ □ □	Electric brake fault	The electric brake mechanism or its wiring is shorted
EM-BRAKE OPEN	□ □ □ □	Electric brake fault	The electric brake mechanism or its wiring is open
QUICK STOP	□ □ □ □ □	Quick Stop	Quick stop has enabled
DEAD BAND START ERROR	□ □ □ □ □ □	Joystick is not in center position on start up	The joystick was engaged during vehicle power up, make sure joystick is in center position
DRIVE MOTOR SHORT	□ □ □ □	Drive motor fault	The drive motor or its wiring has a short
DRIVE MOTOR OPEN	□ □ □ □ □	Drive motor fault	The drive motor or its wiring is open
POWER RELAY SHORT	□ □ □ □ □ □	Power relay short	The power relay has developed a short
COMPONENT FAILURE	□ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
COMPONENT FAILURE	□ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
THROTTLE FAIL-BAND	□ □ □ □ □ □ □ □	Pot high or pot low signal out of range	Throttle input wire open or shorted Throttle pot device Wrong type of joystick selected.
COMPONENT FAILURE	□ □ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
COMPONENT FAILURE	□ □ □ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
COMPONENT FAILURE	□ □ □ □ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
COMPONENT FAILURE	□ □ □ □ □ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
COMPONENT FAILURE	□ □ □ □ □ □ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
BAD SOFTWARE REVISION	□ □ □ □ □ □ □	Controller error	The software in the controller is incorrect for the programmer being used.
BAD PWM VOLTAGE	□ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed
BAD PWM VOLTAGE	□ □ □ □ □ □ □ □ □	Controller error	An internal component of the controller has failed

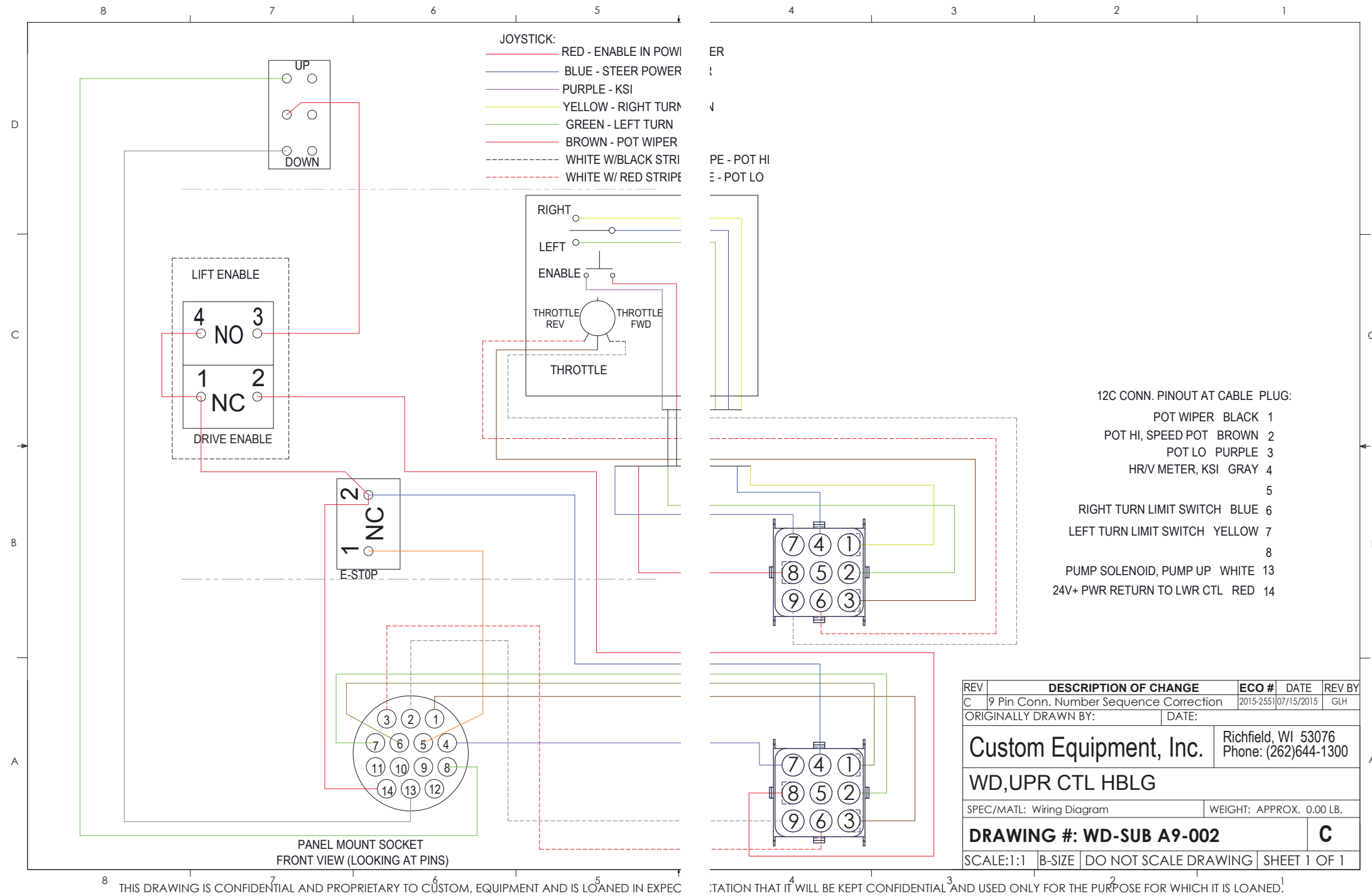
5.1 | WIRING DIAGRAM Part No. WD-HB2



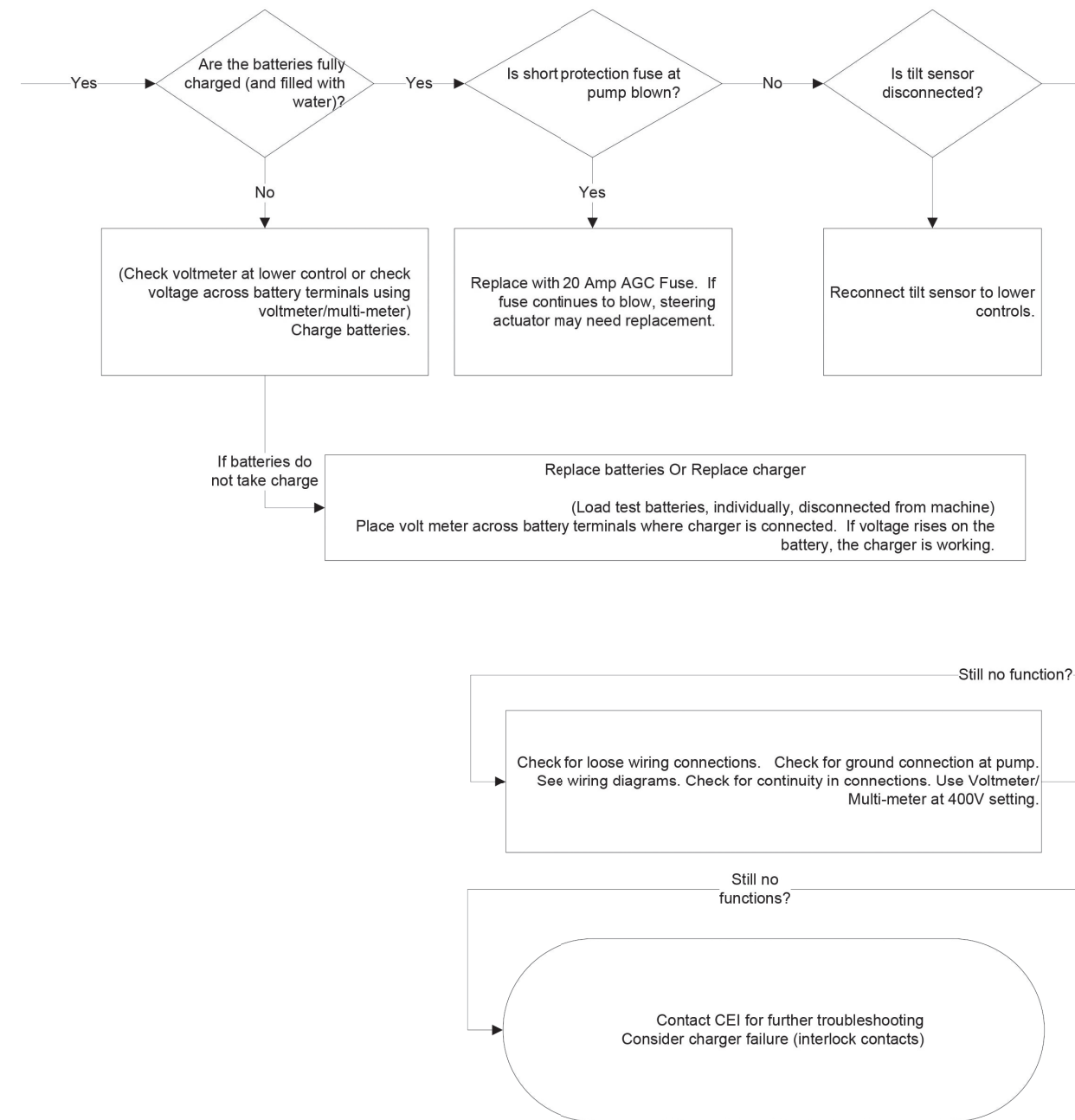
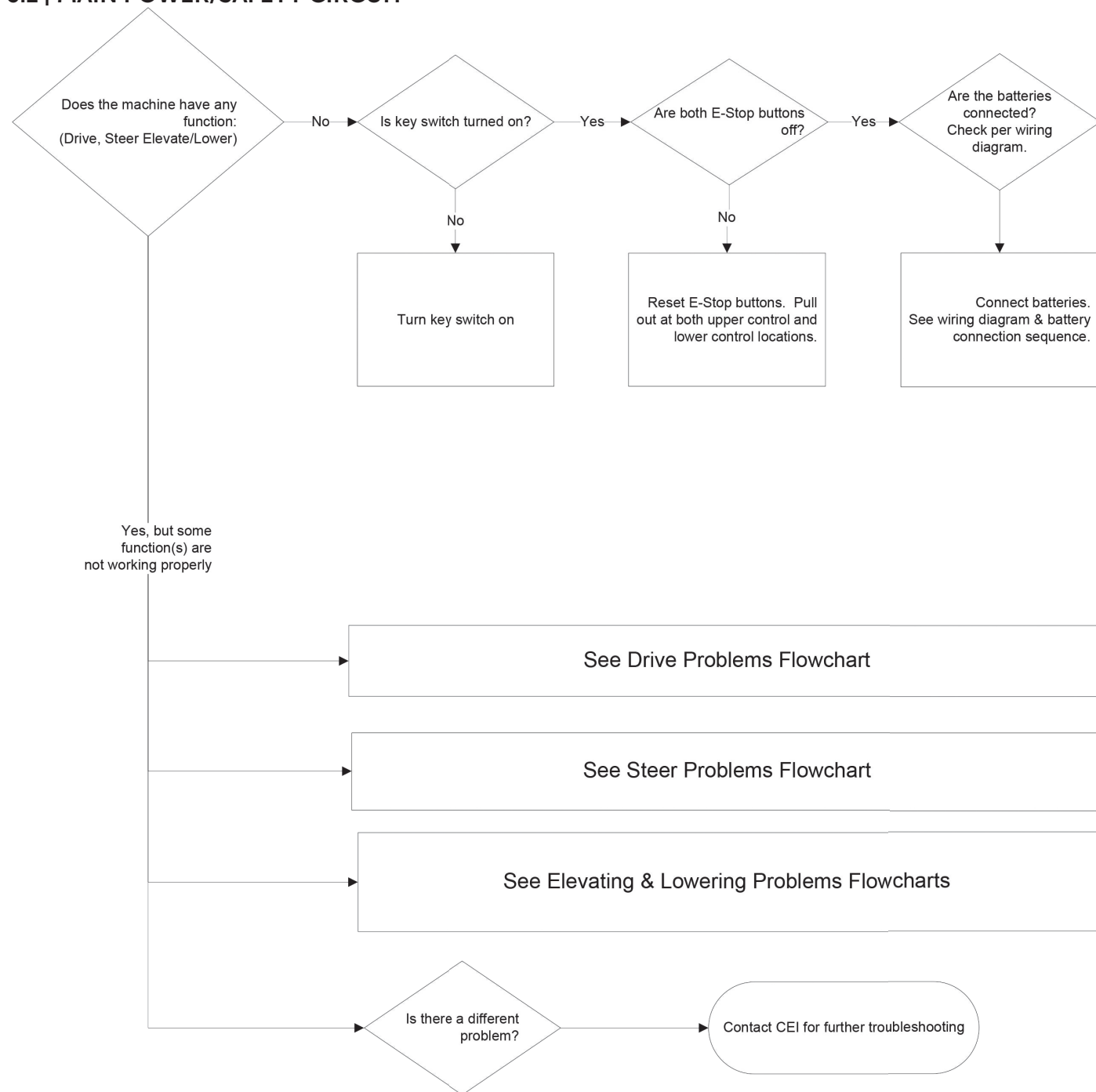
5.2 | LOWER CONTROLS WIRING DIAGRAM
Part No. SUB A8-002



5.3 | UPPER CONTROLS WIRING DIAGRAM
Part No. SUB A9-002

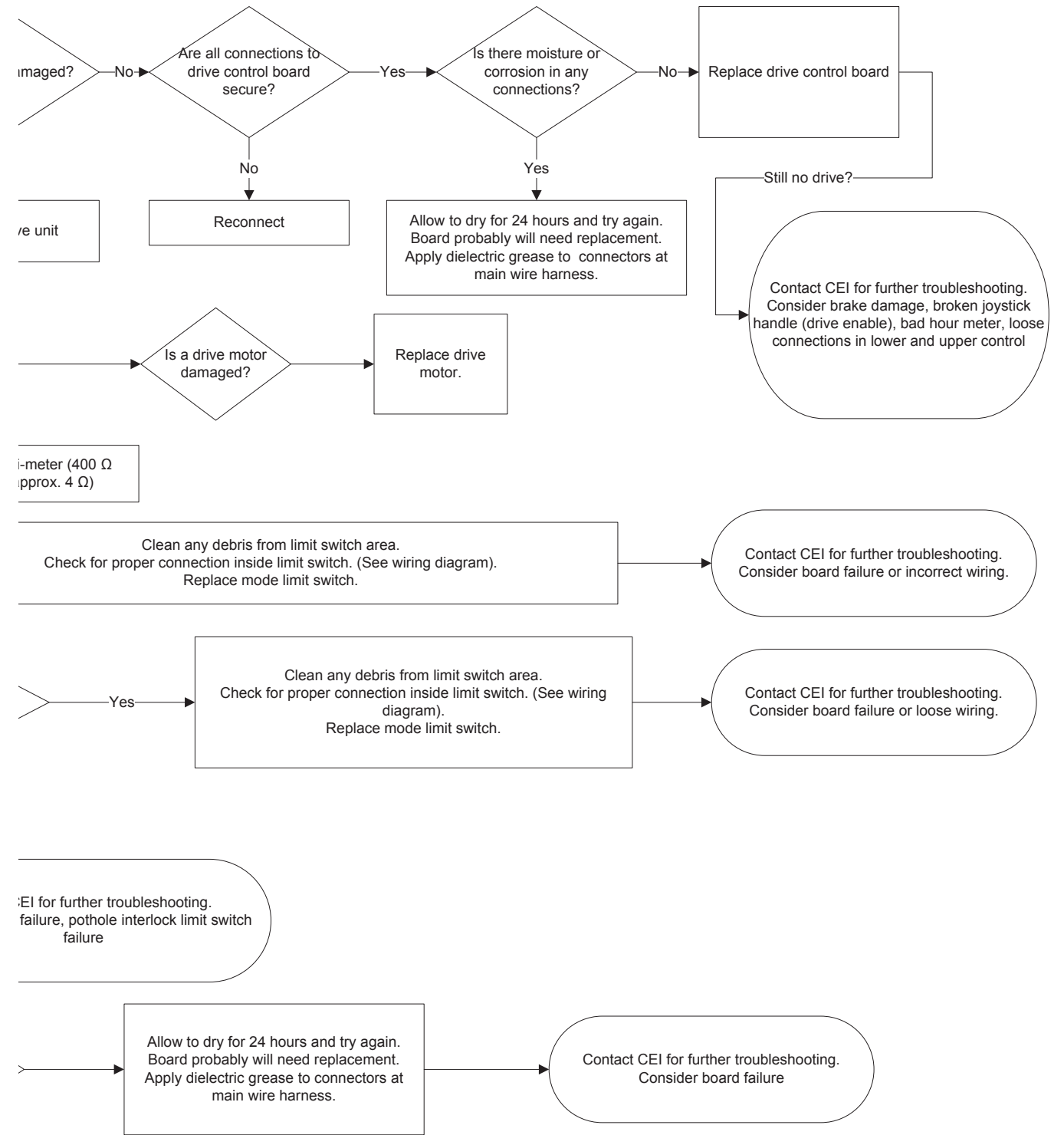
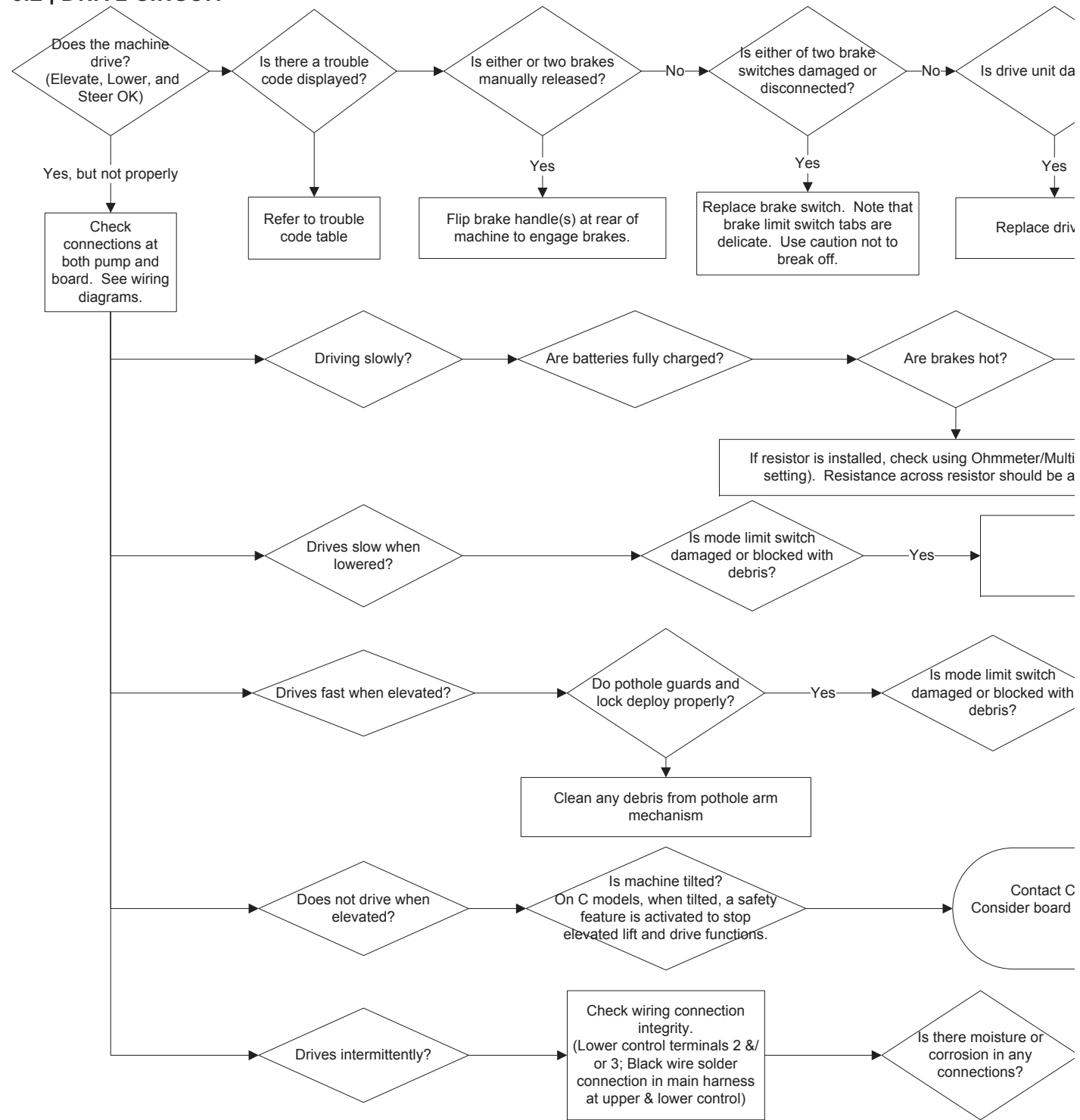


6.1 | MAIN POWER/SAFETY CIRCUIT



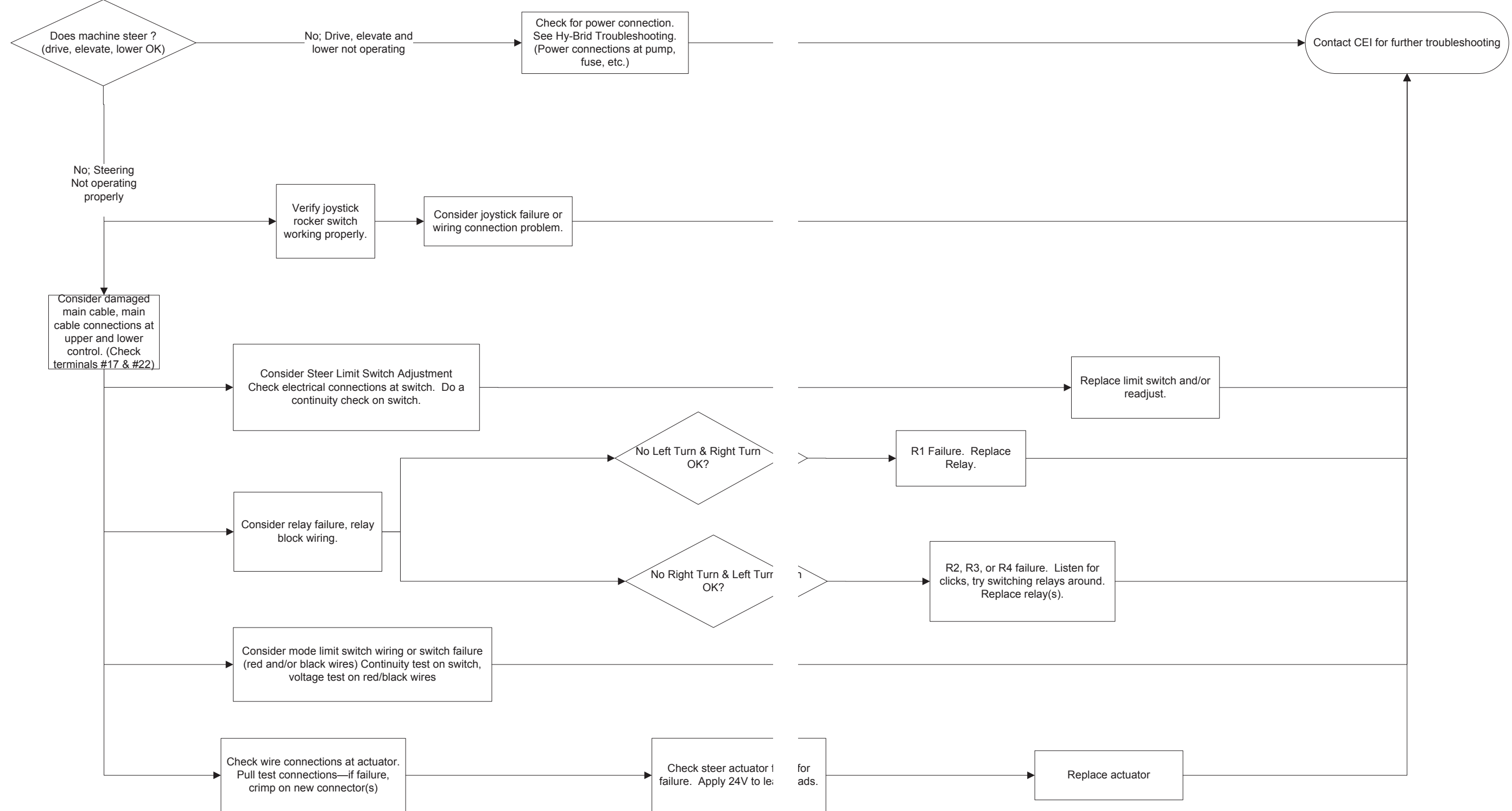
Hy-Brid Troubleshooting Flowchart
Revision A: Initial Release 01/14/2010

6.2 | DRIVE CIRCUIT

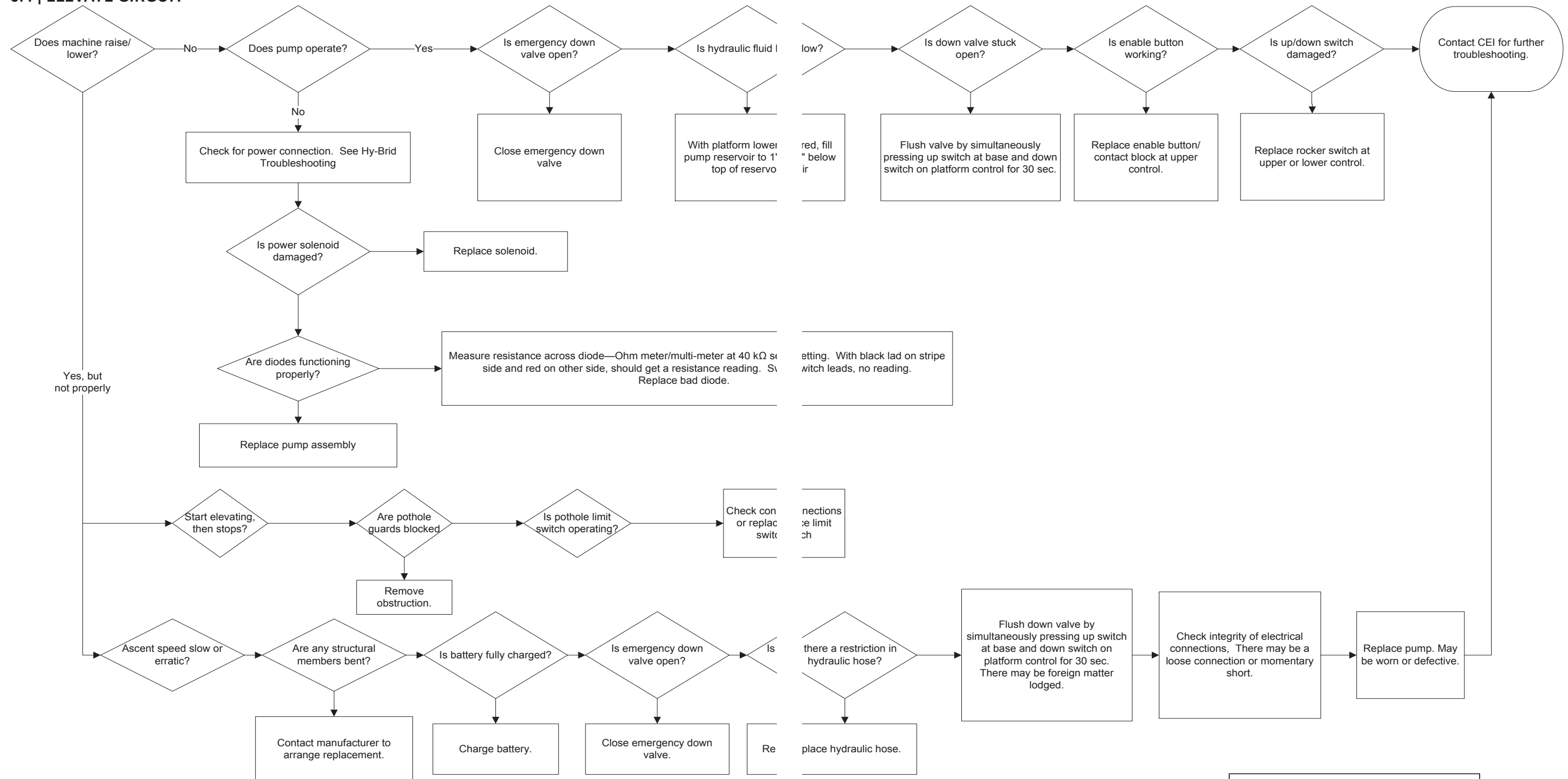


Hy-Brid Troubleshooting Flowchart
Drive Problems
Revision A: Initial Release 01/14/2010

6.3 | STEER CIRCUIT

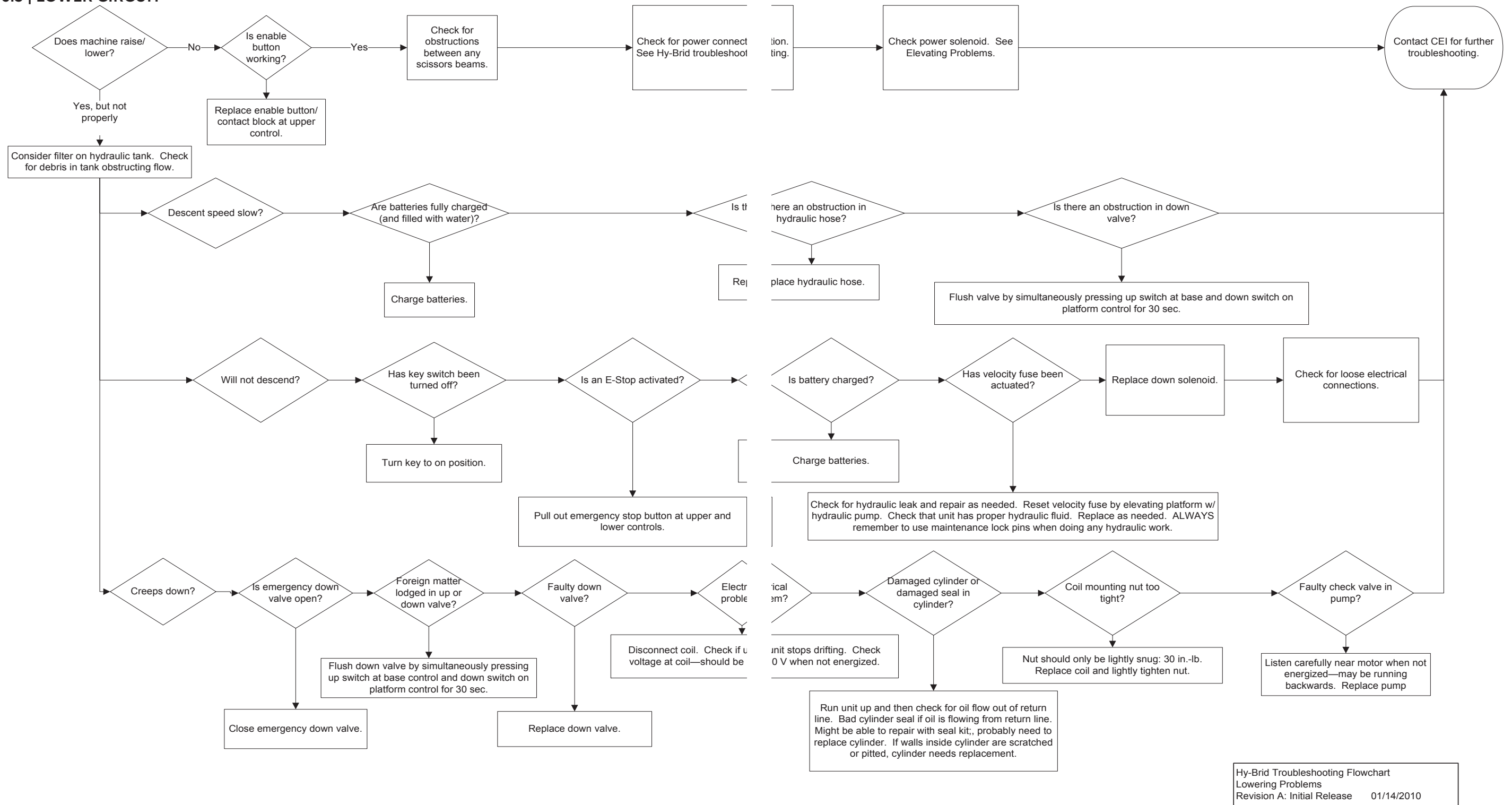


6.4 | ELEVATE CIRCUIT



Hy-Brid Troubleshooting Flowchart
Elevating Problems
Revision A: Initial Release 01/14/2010

6.5 | LOWER CIRCUIT



Hy-Brid Troubleshooting Flowchart
Lowering Problems
Revision A: Initial Release 01/14/2010



USE ONLY MANUFACTURER APPROVED REPLACEMENT PARTS. USE OF NON-OEM PARTS WILL VOID WARRANTY.



REPLACEMENT OF THE FOLLOWING COMPONENTS WILL AFFECT THE STRENGTH, STABILITY, OR SAFETY FUNCTION OF THE UNIT: BATTERY (ELEC-047), HYDRAULIC CYLINDER (HYDR-007-1 OR HYDR-041-2), DRIVE CONTROL BOARD (ELEC-903), AND ALL STRUCTURAL COMPONENTS.

Refer to the Hy-Brid Lifts Operation and Safety Manual for decal part numbers and locations.

In addition to the decals listed in the Operation and Safety Manual, a partial list of replacement parts . These represent current model revisions. A full parts manual, part# SUPO-682 is available from Hy-Brid Lifts.

Refer to our website, www.hybridlifts.com for more complete part listings and earlier revisions. Several parts are model-, serial number-, or manufacture date-specific. Contact your dealer for replacement part availability and pricing.

Description	Part Number	Notes
ALARM,SLOW PULSE	ELEC-635	DESCENT/MOTION ALARM
ALARM-FAST PULSE	ELEC-635-1	TILT ALARM
ASM,CTL UPR (HB ANSI)	SUB A9-002	
ASM,SCISSOR CYL 2X 10FT	SUB A7-KIT	
ASM,SCISSOR CYL 3X/4X 14/18	SUB A7-1-KIT	
BOARD,DRIVE CTL (HB2)	SUB 903	
BUTTON,PUSH GREEN	ELEC-602-KIT2	
BUTTON,PUSH/PULL RED E-STOP	ELEC-071-KIT	
CHARGER,24V	ELEC-747	
CONTACT BLOCK,NC	ELEC-072	
CONVERSION KIT: ANSI/CSA HB2	1023000650-KIT	
CORD,NEMA 515/IEC C13,36	ELEC-639-3	
DECALS,HB-1030,KIT	112-21-008-50-K	
DECALS,HB-1430,KIT	112-21-008-55-K	
DRIVE MOTOR BRAKE L,HB,EUC	ELEC-627-3L	
DRIVE MOTOR BRAKE R,HB,EUC	ELEC-627-3R	
DRIVE MOTOR,24V ELE,HB,EUC	ELEC-626-3L-KIT	
DRIVE MOTOR,24V ELE,HB,EUC	ELEC-626-3R-KIT	
EMERGENCY STOP BUTTON	ELEC-071-KIT	
HYDRAULIC OIL	HYDR-032	Not available as a replacement part. Replace with Flomite #150, Dexron II, Mobil-DTE 2 or equivalent.
JOYSTICK	ELEC-601	
LWR CONTROLS (ANSI STYLE HB2)	SUB A8-002	
MAIN CABLE ASSEMBLY	SUB A13-4	
MANUAL BOX	HARD-603	
MANUAL,PARTS HB-1030/1430 S2	SUPO-682	
METER,HOUR	ELEC-610-2	
ORING,0.19X12.5	HARD-606-1	
RELAY,SPDT,ICE CUBE,24V DC	ELEC-631	
SENSOR,TILT 1.5 X 2.0 NO	ELEC-629	REQUIRED IN CANADA: OK FOR USA
SENSOR,TILT 2.0 X 2.0 NO	ELEC-628	USA ONLY: IN CANADA USE ELEC-629
SWITCH,KEY	ELEC-073F-KIT	
SWITCH,LIMIT,BUTTON MICRO	ELEC-627-4-KIT	
SWITCH,LIMIT,ROT LVR,NO/NC PO	ELEC-123-5	
SWITCH,ROCKER DPDT	ELEC-133B	
WHL,10X2,GREY UR	WHEEL-604-KIT	
WHL,10X4 GREY UR KW 1.0	WHEEL-600-1	
WHL,8X2 GREY UR,OFFSET	WHEEL-611-KIT	

LIMITED WARRANTY

Warranty Statement—North America Only

1. LIMITED WARRANTIES

Subject to the terms, conditions and limitations set forth herein, Custom Equipment, Inc. (the "Company") warrants to the first end-user ("Buyer") that:

- a. Limited Product Warranty
- b. For a period of 12 months from the date that a new product manufactured by the Company ("Product") is delivered to the Buyer, the Product will (i) conform to the specifications published by the Company for such Product as of the date of delivery; and (ii) be free of any defect in material and/or workmanship under normal use and maintenance; and
- c. Extended Structural and Chassis Warranty
For a period of 60 months from the date that the Product is delivered to the Buyer, the chassis and other structural components of such Product will be free from defects in material and/or workmanship under normal use and maintenance.

2. EXCLUSIONS / WHAT IS NOT COVERED

The following items are NOT covered under this Limited Warranty:

Defects in, and damage or loss relating to, any batteries incorporated by the Company into or made a part of the Product. Any such defects, damage or loss shall be exclusively covered by the battery manufacturer's warranty, if any. For more information regarding the battery warranty, the Buyer should contact the battery manufacturer using the contact information shown on the battery;

Damage or loss resulting from or caused by carrier handling;

Damage or loss resulting from or caused by normal wear and tear, weathering, lack of use or use with incompatible equipment or software;

Damage resulting from or caused by improper maintenance, improper handling or storage, improper use, abuse, neglect, operation beyond rated capacity, or operation after discovery of defective or worn parts;

Any part, component or assembly altered or modified in any way not approved in writing by the Company;

Damage to any equipment or parts not manufactured by the Company; and

Acts of God, accidents or any other causes beyond the Company's reasonable control.

3. MAKING A WARRANTY CLAIM

As a prerequisite to making any claim under this Limited Warranty, Buyer must give the Company written notice of any suspected defect promptly after discovery. Such notice shall specifically identify the suspected defect, the original delivery date and complete Buyer identification and location information. The Company will not accept any Product for warranty service without receiving Buyer's written notice and issuing a return goods authorization. If requested by the Company, Buyer shall return the defective Product, or parts, components or assemblies thereof, to the Company, F.O.B. Company's designated location. All returned Products or parts, components or assemblies thereof that are replaced under this Limited Warranty shall become the property of the Company. The Company reserves the right to review Buyer's maintenance and operation records and procedures to determine if the alleged defect(s) were due to any of the items listed in Sections 2 of this Limited Warranty. The Company shall not be liable for any claim under this Limited Warranty if Buyer fails to satisfy the conditions set forth in this Section.

4. EXCLUSIVE WARRANTY REMEDIES

- a. Exclusive Repair or Replace Remedy
The Company's sole obligation and Buyer's exclusive remedy with respect to any defect in the Product occurring during the warranty periods set forth in Section 1 of this Limited Warranty shall be for the Company, at its option, to repair or replace (or have one of its designated authorized dealers repair or replace) the Product or part, component or assembly thereof that contains a defect in materials or workmanship. The Company reserves the right, at its discretion, to use new, re-manufactured or refurbished replacement parts. Notwithstanding anything in this Limited Warranty to the contrary, the Company shall not be obligated to replace the entire Product if a covered defect can be remedied by the repair or replacement of a defective part, component or assembly. The Company shall be responsible for the cost of all parts and labor charges, up to the Maximum Labor Amount determined in accordance with Section 4(b) of this Limited Warranty, necessary to remedy such defect.
- b. Labor Charges
If field repairs or parts replacement are necessary on any Product covered by this Limited Warranty, the Company will reimburse its designated authorized dealer for those direct labor costs incurred to perform such field repairs or parts replacement up to the maximum amount specified in the Company's current Field Service Rate (hereinafter, the "FSR") or in any 'Flat Rate Guides' or similar agreement established with the authorized dealer (such maximum amount shall be referred to in this Limited Warranty as the "Maximum Labor Amount"). Current versions of the Company's FSR and Flat Rate Guides are incorporated by reference into this Limited Warranty. For a current copy of the Company's FSR and Flat Rate Guides, Buyer should contact the Company at 1-866-334-0756. Buyer shall be responsible for any costs or fees due to the authorized dealer in excess of the Maximum Labor Amount.

5. DISCLAIMER OF OTHER EXPRESS AND IMPLIED WARRANTIES

EXCEPT FOR THE LIMITED WARRANTIES SET FORTH IN SECTION 1 ABOVE, THE COMPANY MAKES NO OTHER REPRESENTATIONS OR WARRANTIES AND HEREBY DISCLAIMS ALL EXPRESS OR IMPLIED REPRESENTATIONS OR WARRANTIES REGARDING THE PRODUCT, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT OF PROPRIETARY OR THIRD-PARTY RIGHTS OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. No employee or representative of the Company or any of its authorized dealers is authorized to modify any term, condition or limitation in this Limited Warranty unless such modification is made in writing and signed by an officer of the Company.

6. LIMITATION OF LIABILITY

NOTWITHSTANDING ANYTHING IN THIS WARRANTY TO THE CONTRARY, IN NO EVENT SHALL THE COMPANY OR ANY OF ITS AFFILIATES OR SUBSIDIARIES BE LIABLE TO BUYER FOR ANY INDIRECT, SPECIAL, EXEMPLARY, PUNITIVE OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS, LOST REVENUE, DOWN TIME, LOSS OF BUSINESS OPPORTUNITY OR OTHER ECONOMIC LOSSES), WHETHER IN AN ACTION IN CONTRACT OR TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHERWISE, EVEN IF THE COMPANY HAS BEEN SPECIFICALLY ADVISED OF THE POSSIBILITIES OF SUCH DAMAGES.

Version of 2.1.13

HY-BRID LIFTS™

BY CUSTOM EQUIPMENT INC

Self-Propelled Aerial Work Platform
Maintenance & Troubleshooting Manual
HB-1030/1430

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These machines comply with ANSI/SIA A92.6 and CSA B354.2-01

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