ELECTRICAL SYSTEM GUIDE - “ET PROPORTIONAL”

3516E-4020E-4520E Prop / Compact A2B (EGAADD-P***, EEBAAC-P***, EJBAAD-P***)

VENCO VENTURO INDUSTRIES LLC

Rev 20250414

INTRODUCTION

ABBREVIATIONS USED IN THIS GUIDE

- CRANE FUNCTIONS
  - WU = WINCH UP (RAISE LOAD / PAY IN)
  - WD = WINCH DOWN (LOWER LOAD / PAY OUT)
  - BU = BOOM UP (ELEVATE BOOM)
  - BD = BOOM DOWN (LOWER BOOM)
  - BO = BOOM OUT (EXTEND BOOM)
  - BI = BOOM IN (RETRACT BOOM)
  - RR = ROTATE RIGHT
  - RL = ROTATE LEFT
- A2B = ANTI-TWO-BLOCK

WHY IS IT NECESSARY & WHAT DOES IT DO?

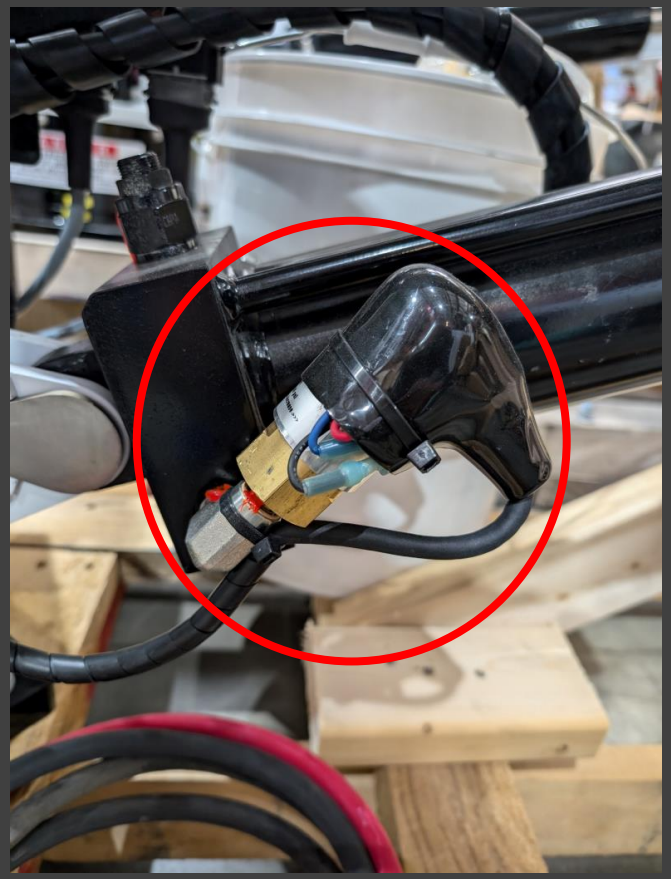
ANTI-TWO-BLOCK SYSTEM,
OVERLOAD PROTECTION SYSTEM,
& TOP POSITION SWITCH

ANTI-TWO-BLOCK (A2B) SYSTEM

- Why Is It Necessary?
  - Prevents over-tensioning of the wire-rope which could occur if the load block were to make contact with the boom tip
  - An Anti-Two-Block system is required by ASME/ANSI B30.5 Section 5-1.9.9.1
- What Does It Do?
  - The A2B Switch is located on the boom head (tip)
  - The A2B Switch is wired as a Normally Closed (N/C) switch (when wand is relaxed); during normal operation the electrical circuit is Closed
  - The Closed electrical circuit provides a ground path to WU, BD, BO
  - When the Compact A2B is contacted by the load block, the A2B Switch is actuated and the electrical circuit is Open
  - The Open electrical circuit removes the ground path from WU (relay), BD (valve coil), and BO (valve coil)

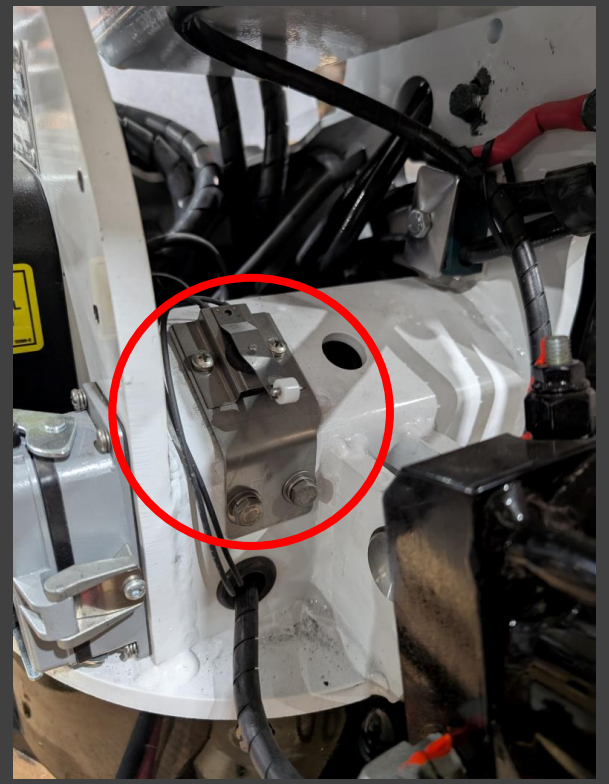
OVERLOAD PRESSURE SYSTEM

- Why Is It Necessary?
  - Prevents structural damage to the crane
- What Does It Do?
  - The heart of the system is the Overload Pressure Switch located at the base end of the elevation cylinder
  - The pressure in the base end of the elevation cylinder is used to approximate the stress on the crane due to the load it is lifting at a distance (“overturning moment”)
  - When the Overload Pressure Switch reaches its set pressure, it disconnects the Black Common wire from the Normally Closed Blue/Green wire, removing the ground path from WU (relay), BD (valve coil), and BO (valve coil)



TOP POSITION SWITCH

- Why Is It Necessary?
  - When the elevation cylinder reaches full stroke, the pressure in the base end of the cylinder exceeds the overload pressure, causing the crane to detect an overload condition (it is a “false” overload)
  - Overload disables Boom Down along w/ WU and BO
  - Without the Top Position Switch, the boom would be stuck at full elevation without any way to lower it, since Boom Down would be disabled
- What Does It Do?
  - Located on the front bulkhead of the housing near the base of the elevation cylinder
  - Normally Open (N/O) switch
  - When boom is fully elevated, switch is actuated by elevation cylinder base
  - Once actuated, switch provides alternate ground to Boom Down valve solenoid coil, allowing boom to be lowered and the pressure relieved



TROUBLESHOOTING

TOOLS / ITEMS NEEDED

- Multimeter with +12 VDC and Continuity/Resistance measurement capability
- Needle Nose Pliers
- Side Cutters (to cut zip ties)
- Zip Ties (to replace removed zip ties)

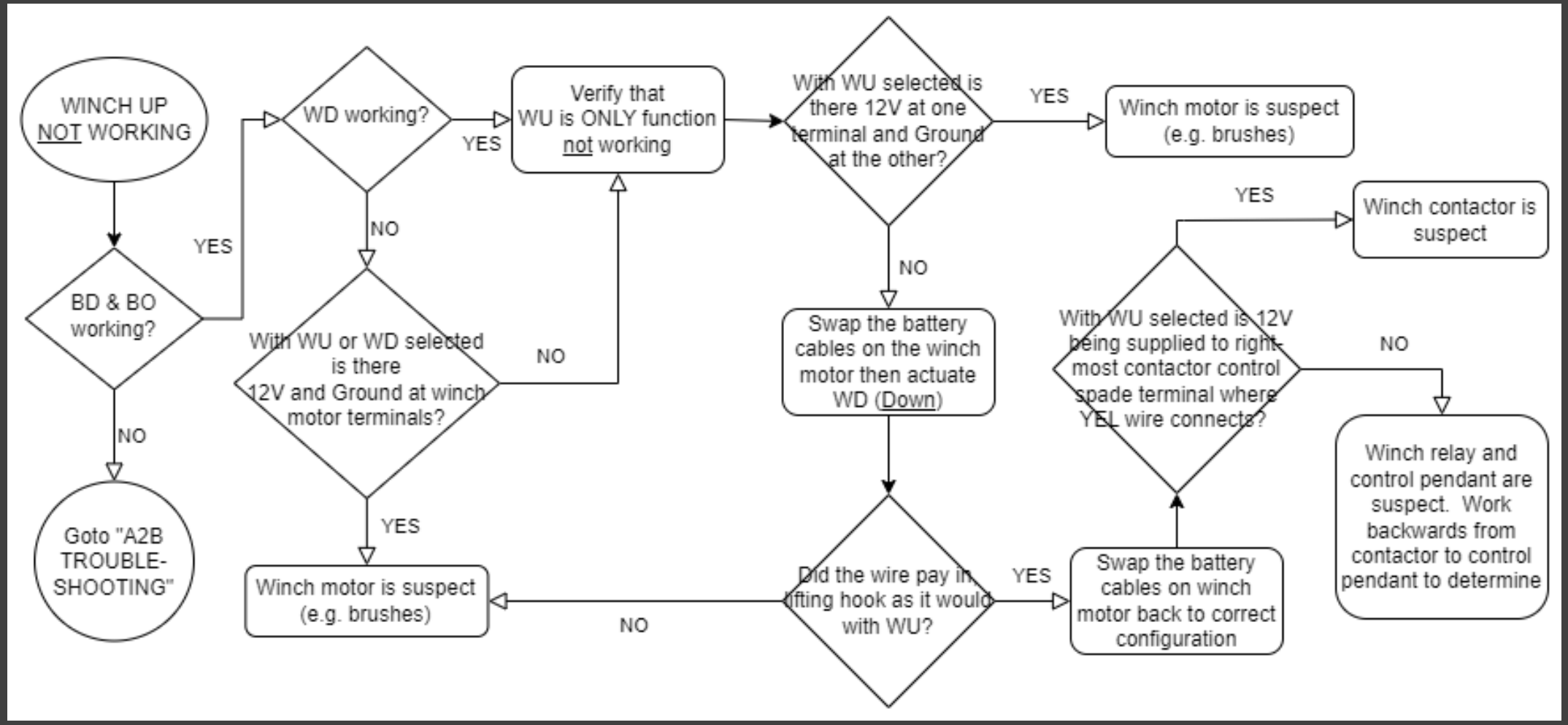
TESTING FOR GROUND

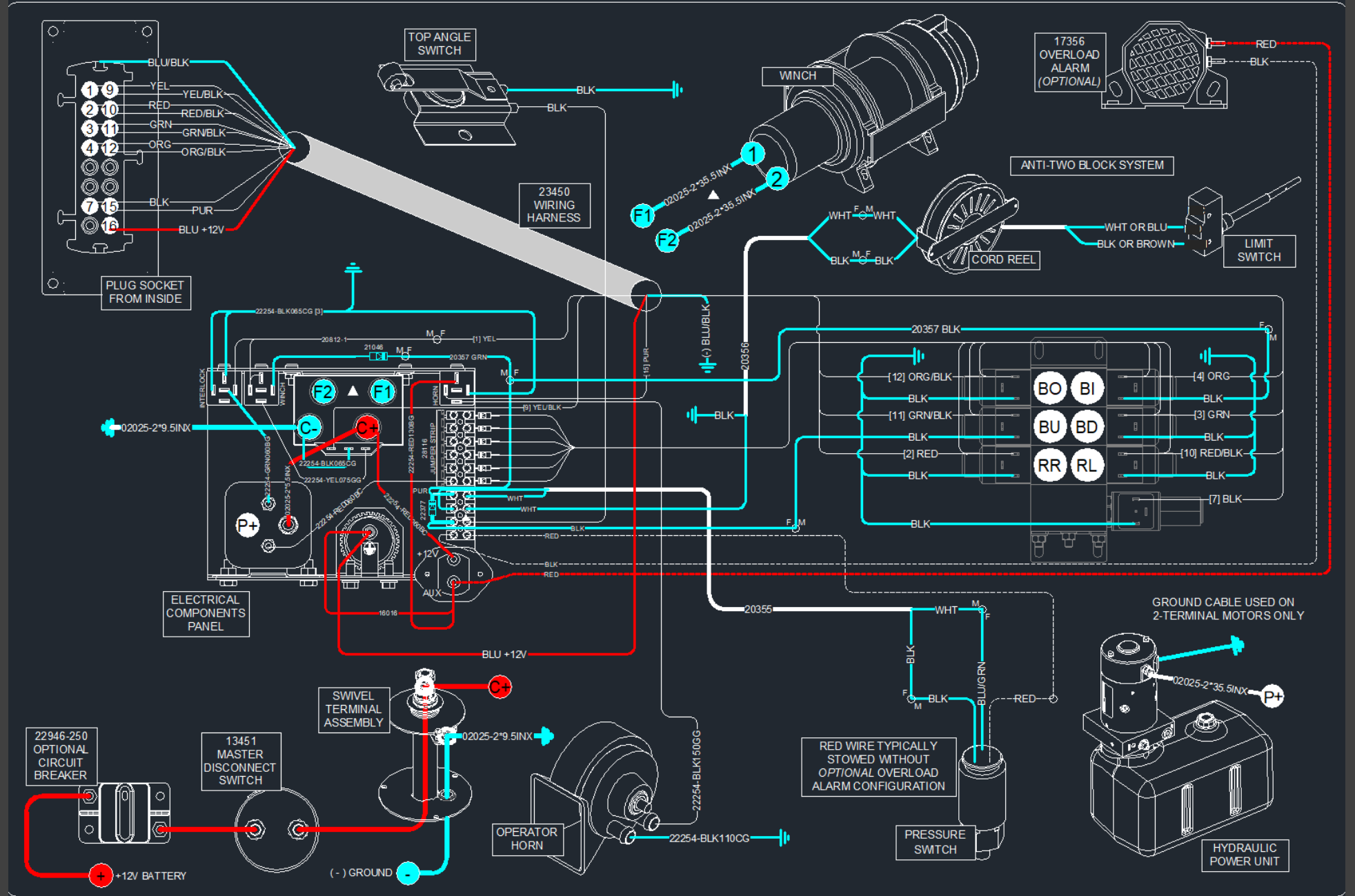
- Use Multimeter set to Continuity/Resistance measurement – ideally an audible alarm sounds when continuity is detected
- Touch probes together to make sure you either hear continuity alert OR register 0 ohms – in other words, you need to know how your multimeter indicates “continuity”
- Put one probe on the wire to be tested
- Touch other probe on a bolt that is threaded into the crane housing

TESTING FOR +12 V (DC)

- Use Multimeter set to DC Voltage measurement
- Put red probe on the +12 V source to be tested
- Put black probe on a bolt that is threaded into the crane housing
- You should see +12 V (or more) with an unloaded crane, and at least +9 V with a fully-loaded crane (e.g. when hydraulic power unit is operating against the internal relief valve)

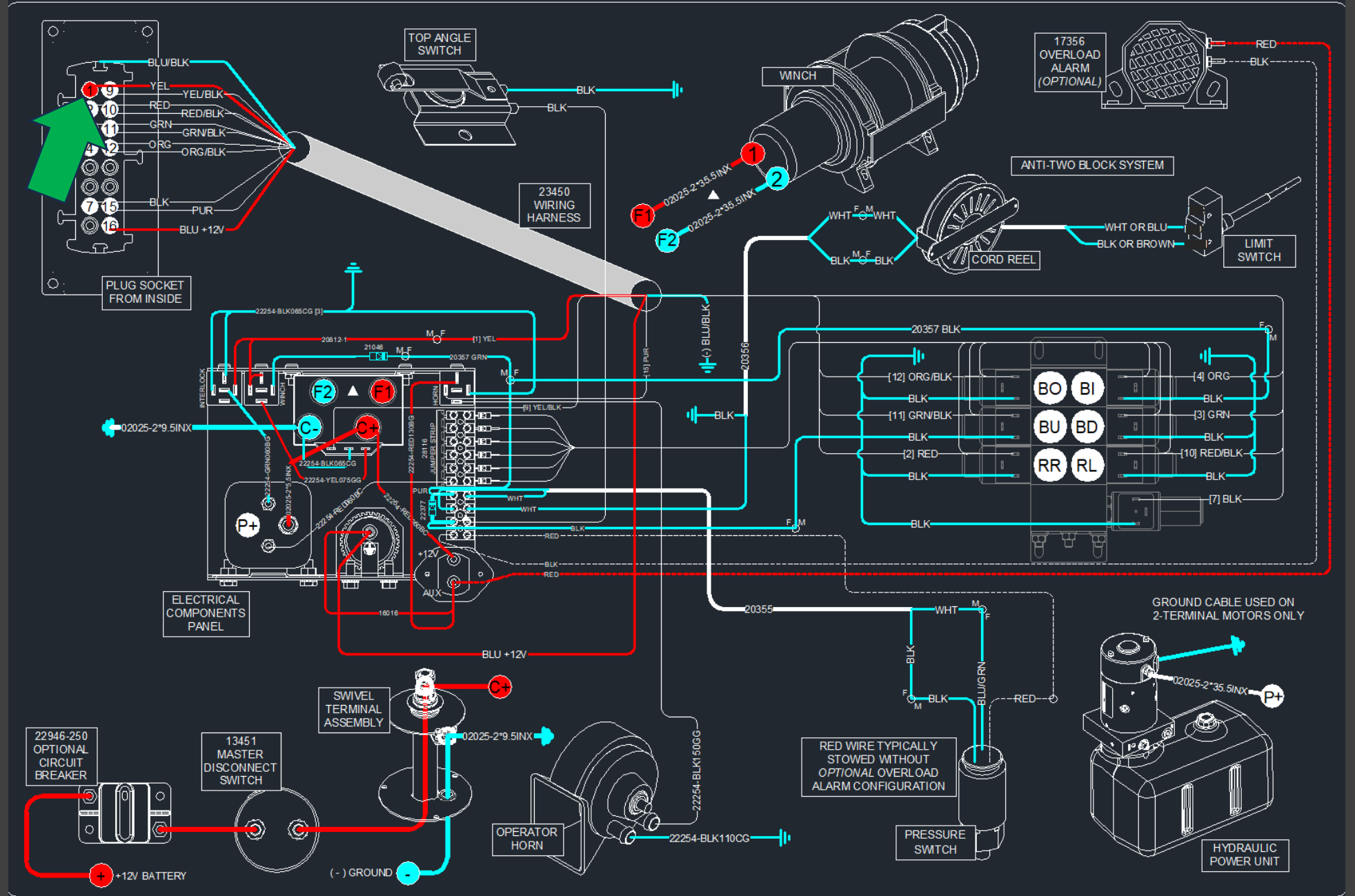
WINCH UP (WU) NOT WORKING





POWER "ON" – NOMINAL

TITLE	DATE	SECTION
WIRING DIAGRAM	03-06-25A	C400
45**E/40**E/351*E/3215E PROPORTIONAL	SUPERSEDES 04-11-24	28837



WINCH UP ACTUATED

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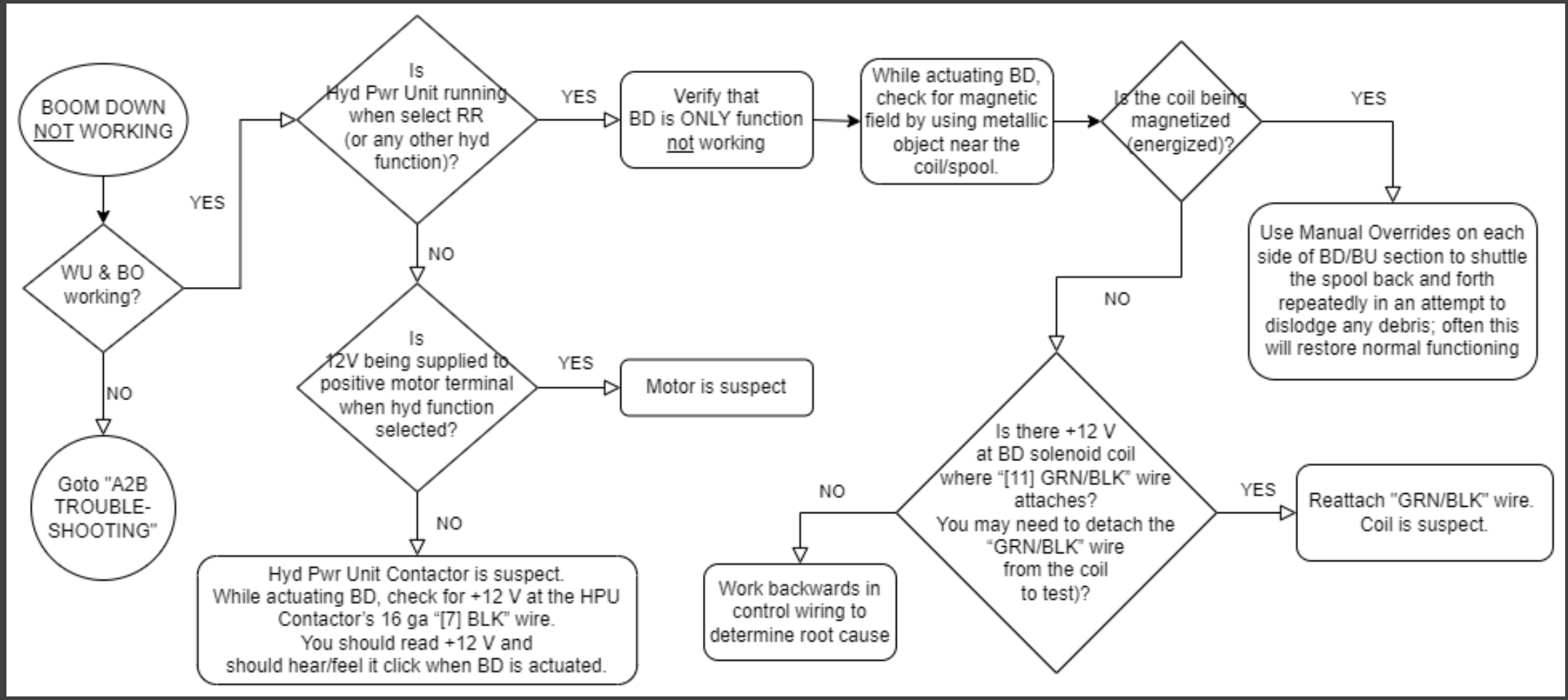
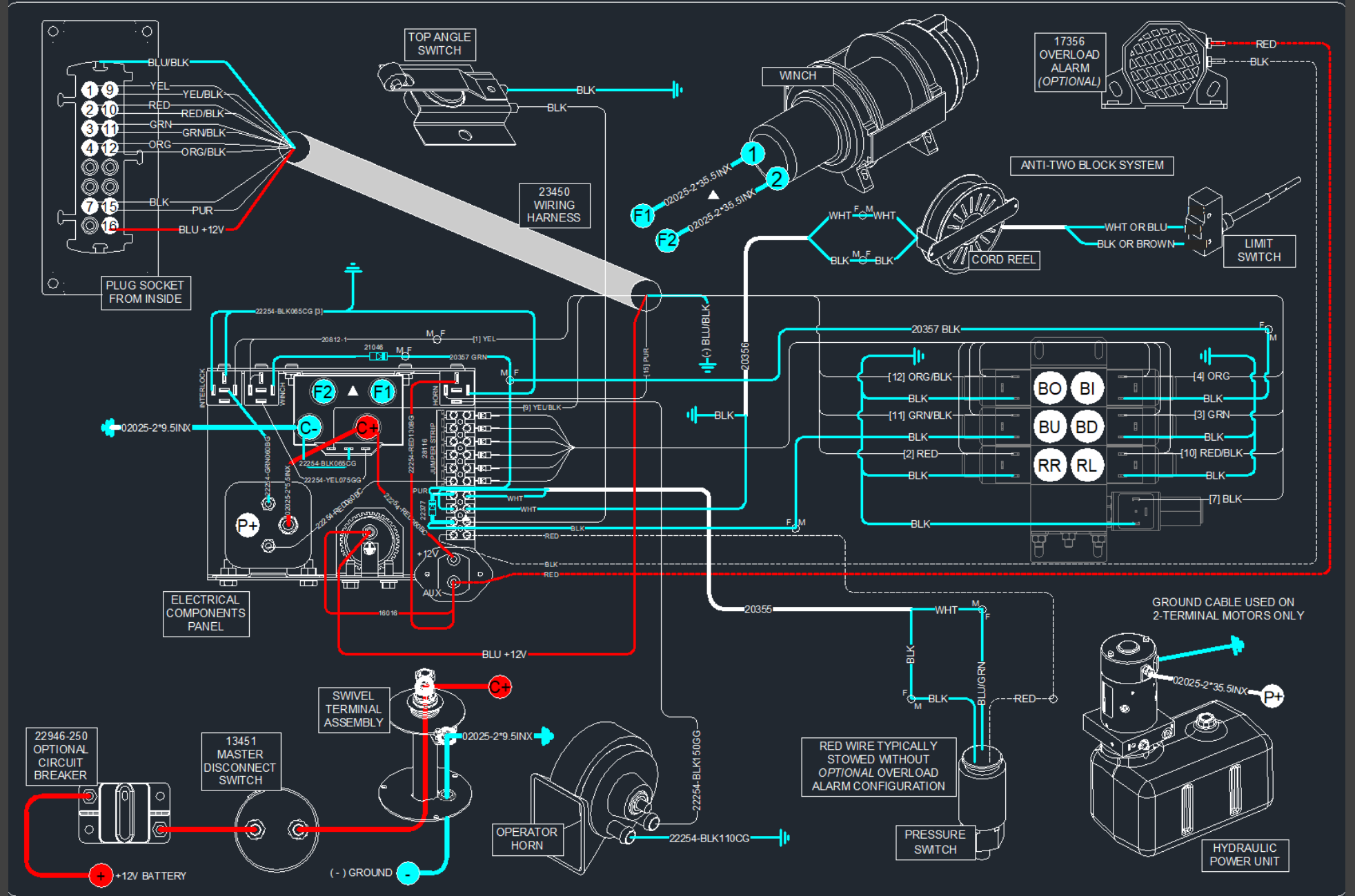
BOOM DOWN (BD) NOT WORKING





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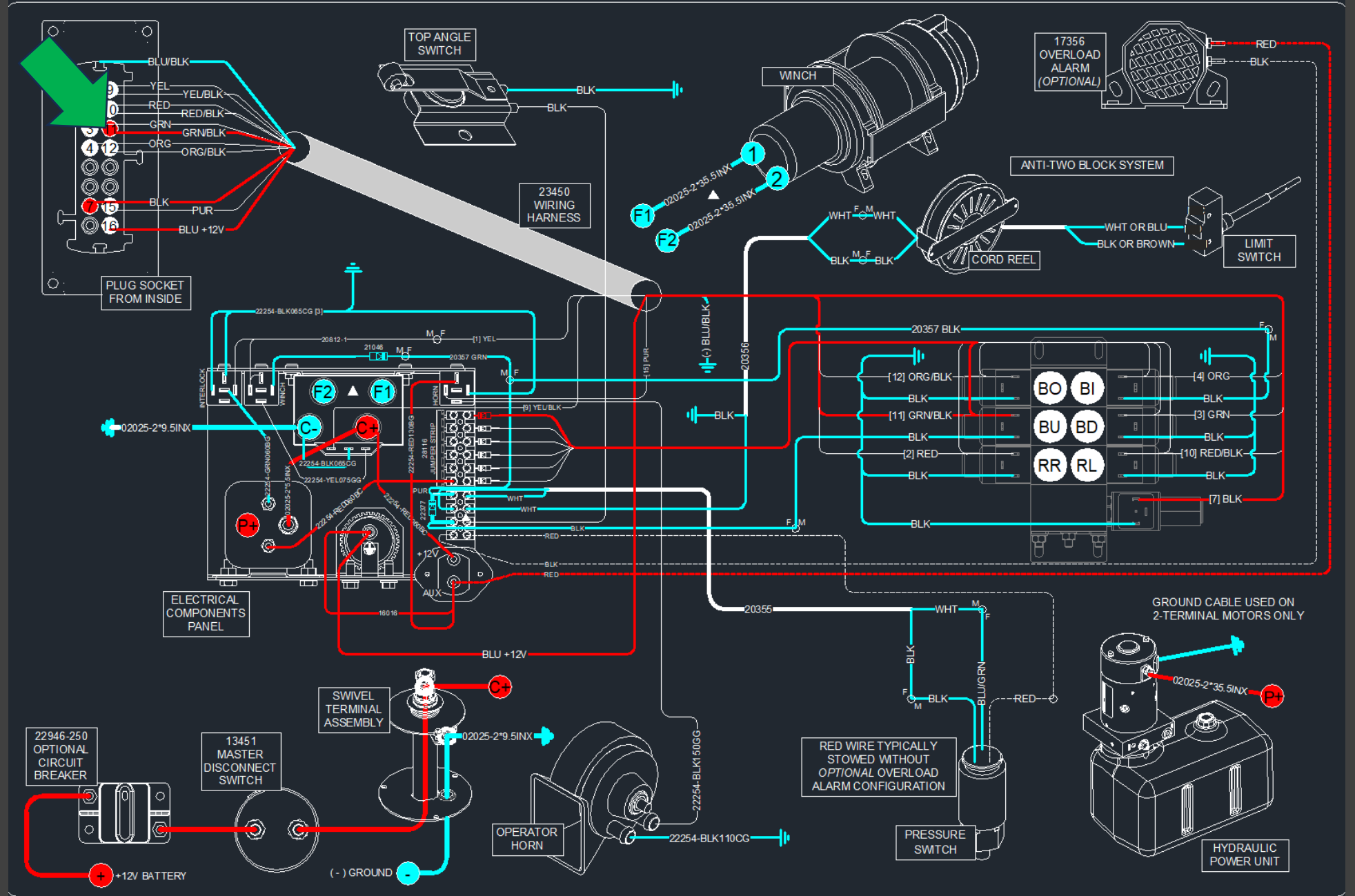

BOOM DOWN ACTUATED

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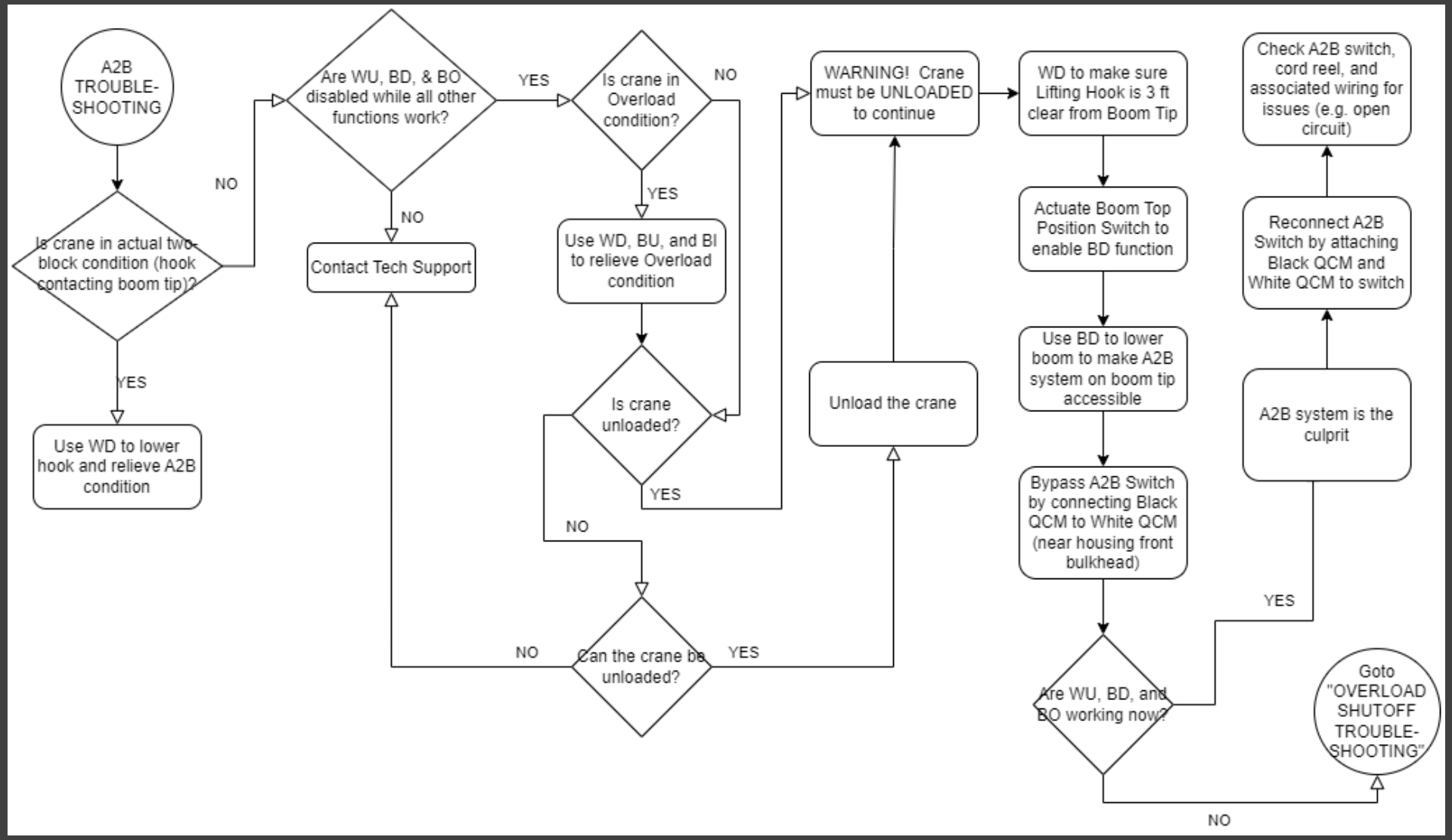
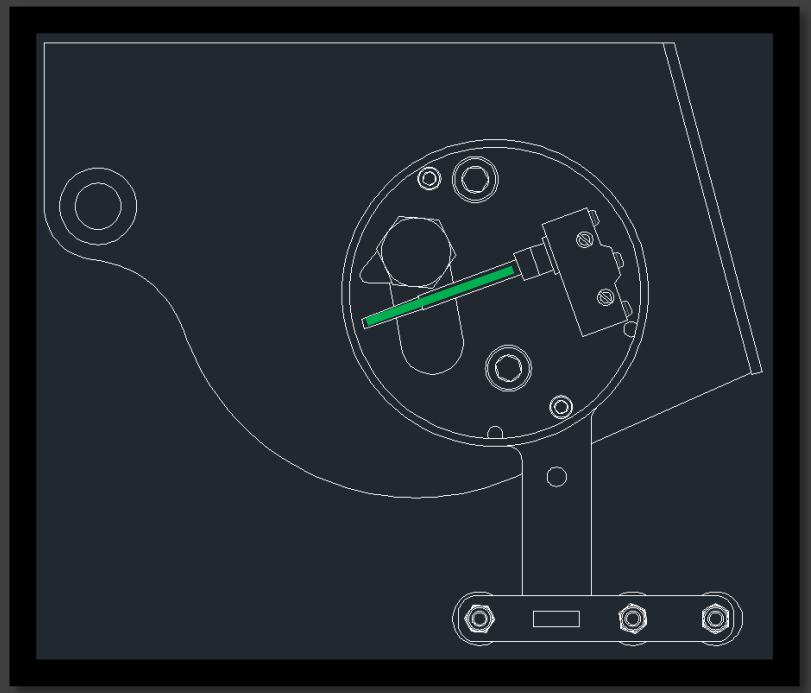
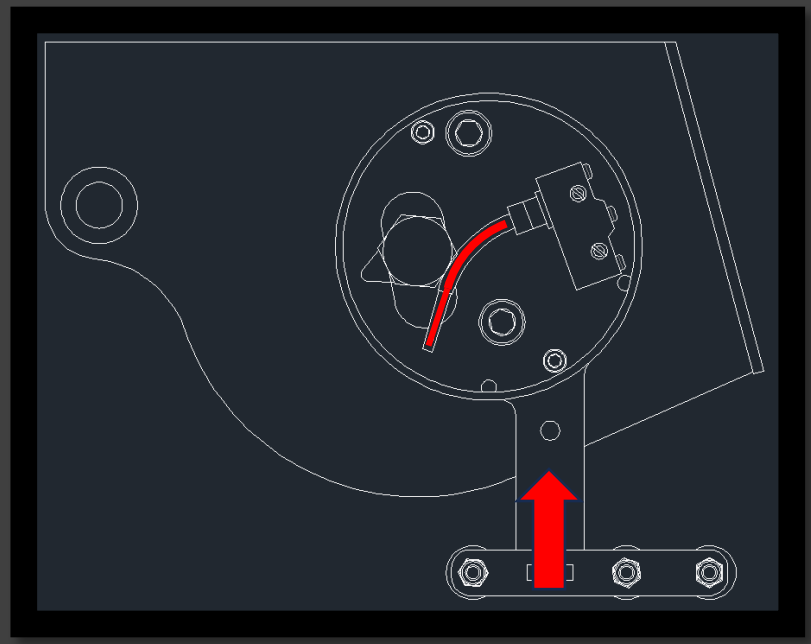
A2B (ANTI-2-BLOCK) TROUBLESHOOTING



A2B Switch

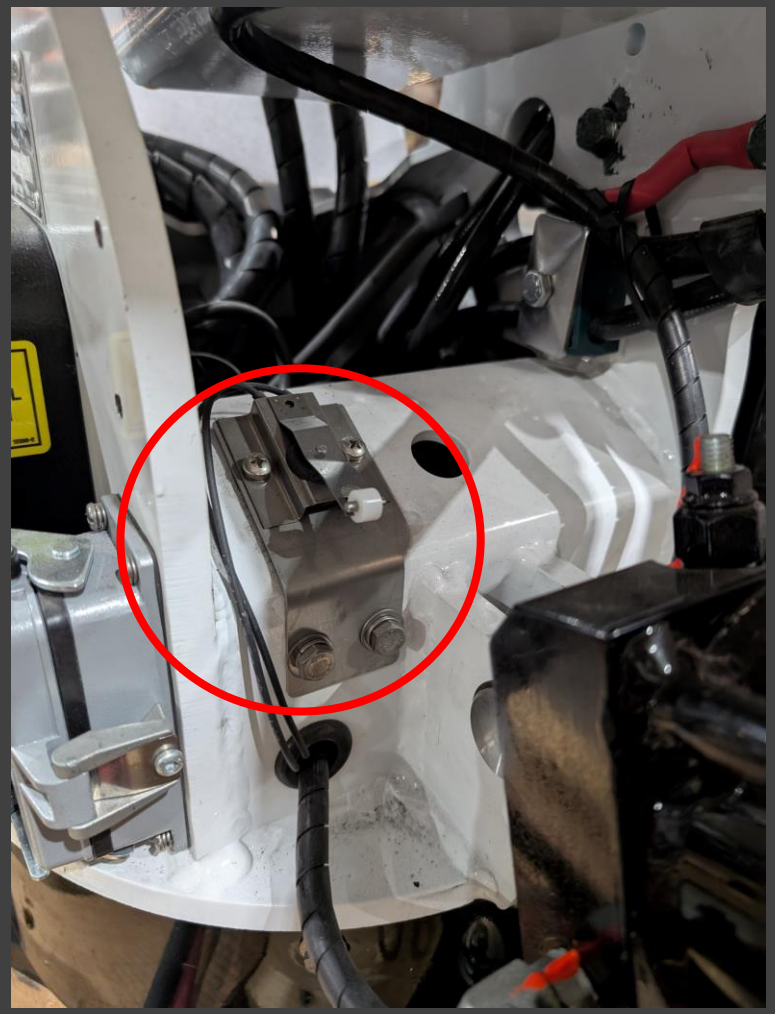


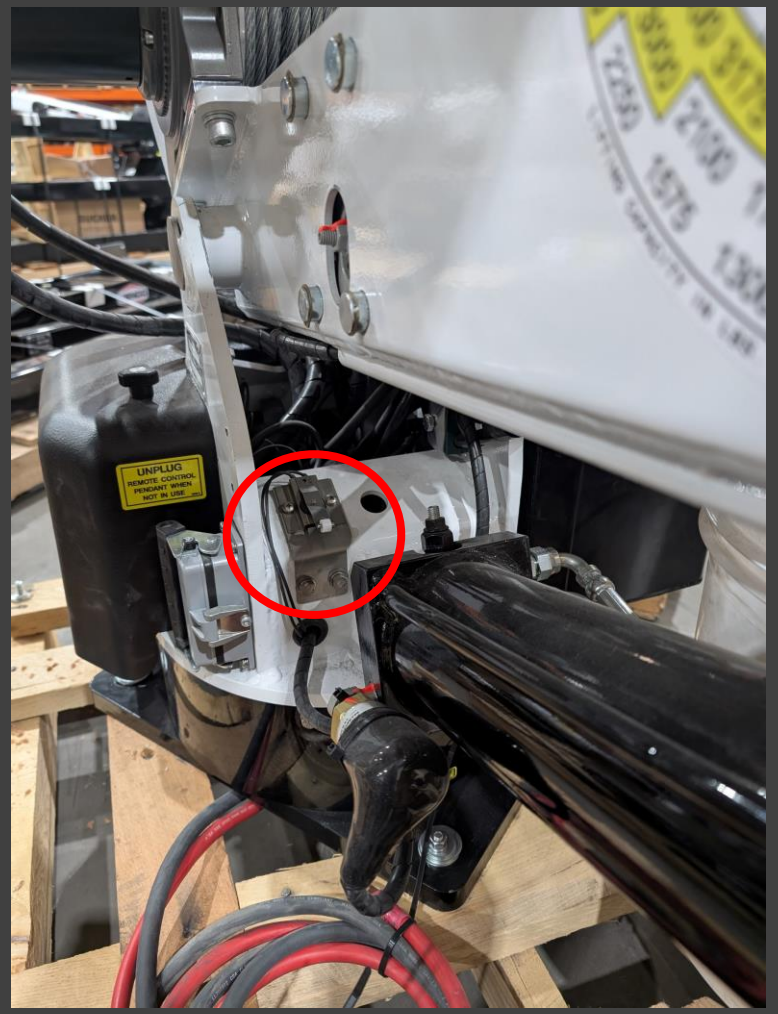
Normal operation:
Wand switch relaxed,
providing electrical ground path

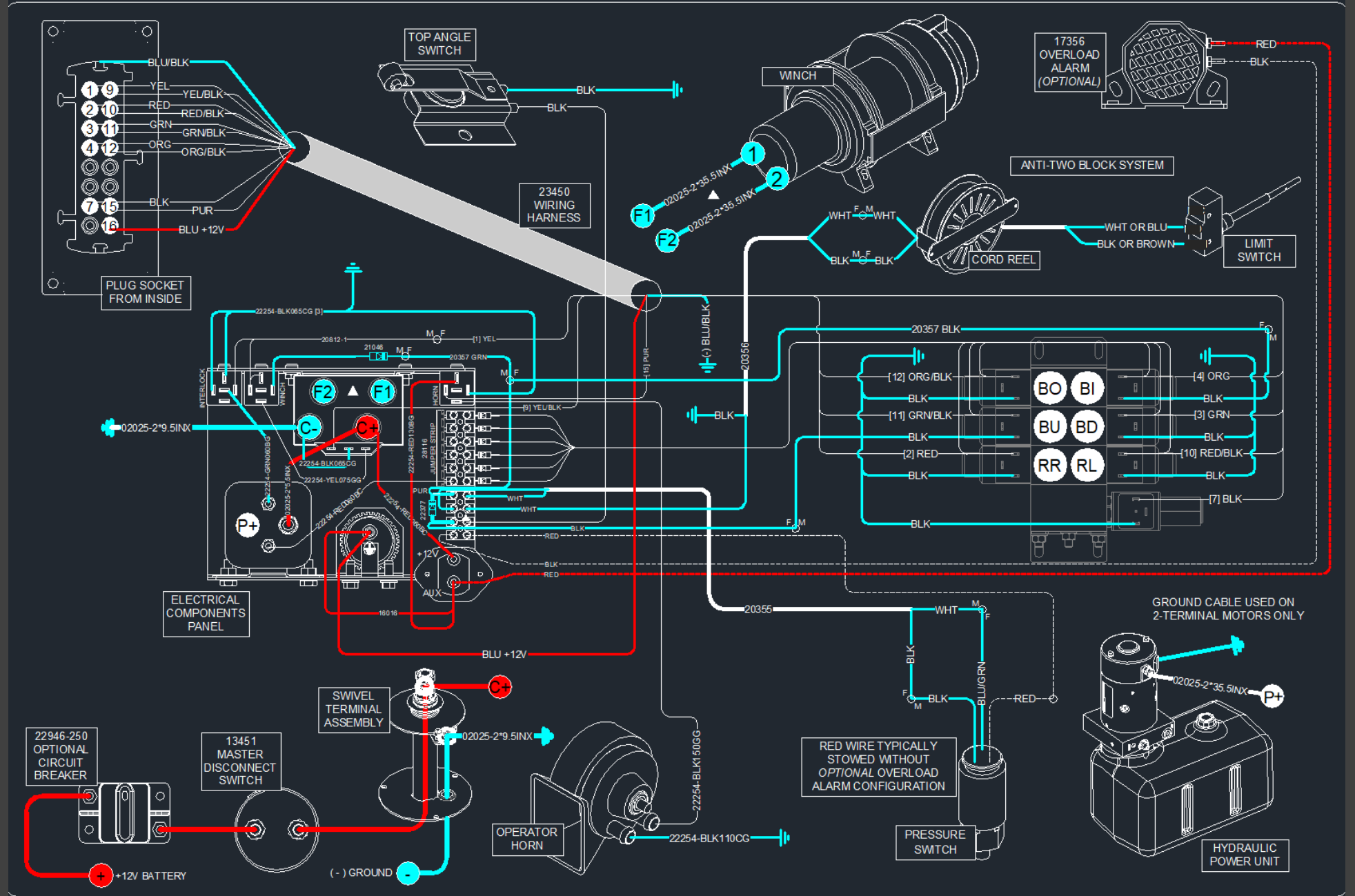


A2B condition:
Wand switch actuated,
removing electrical ground path

Top Position Switch







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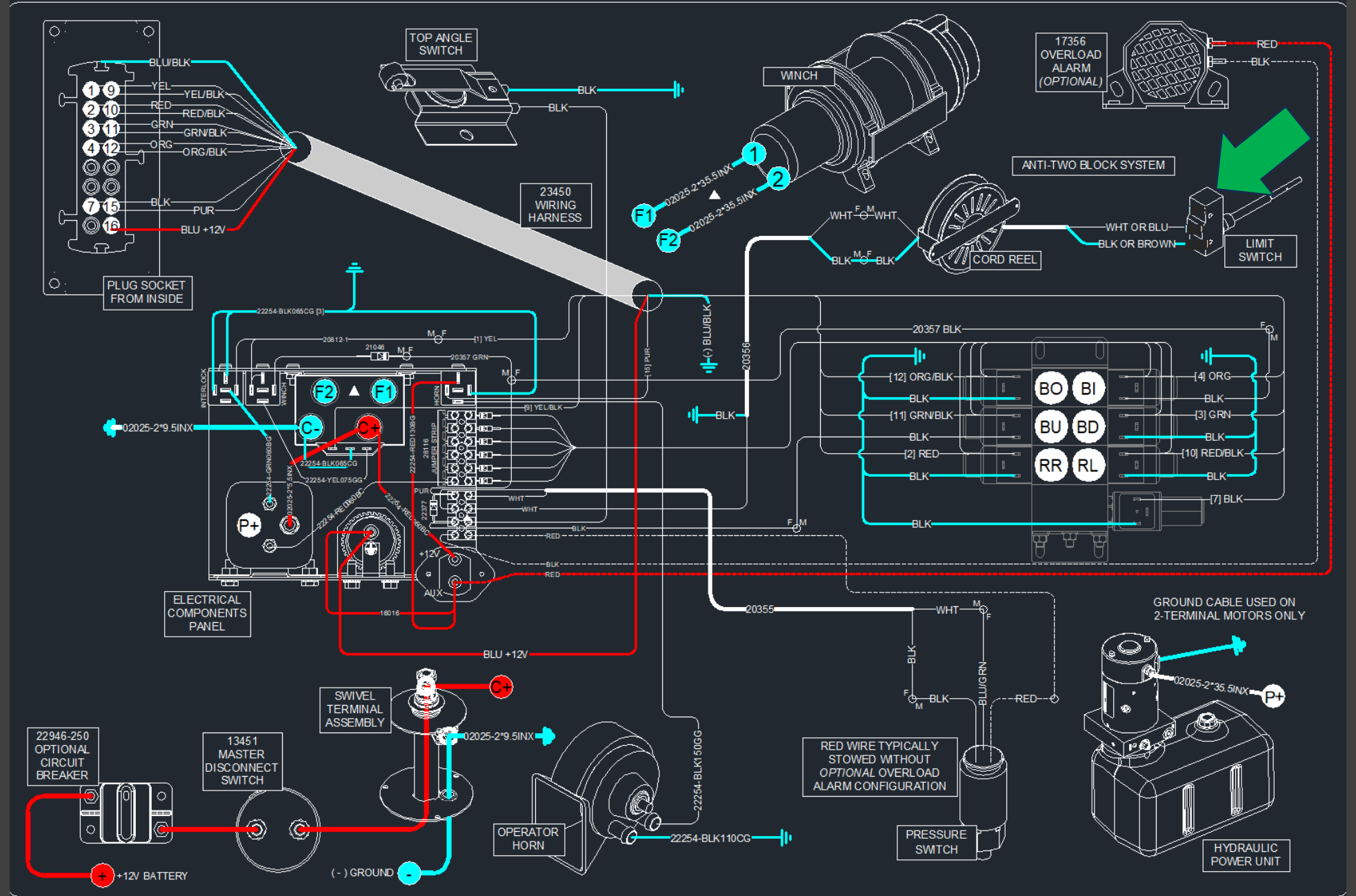

A2B CONDITION

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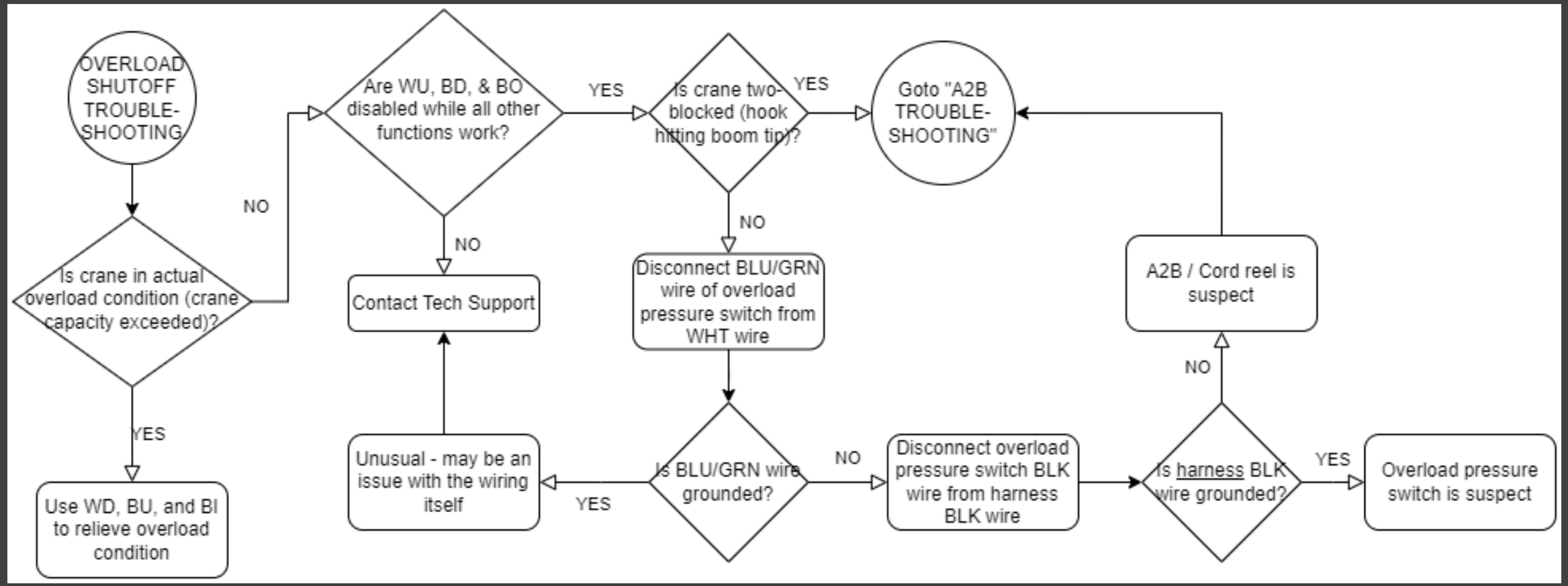
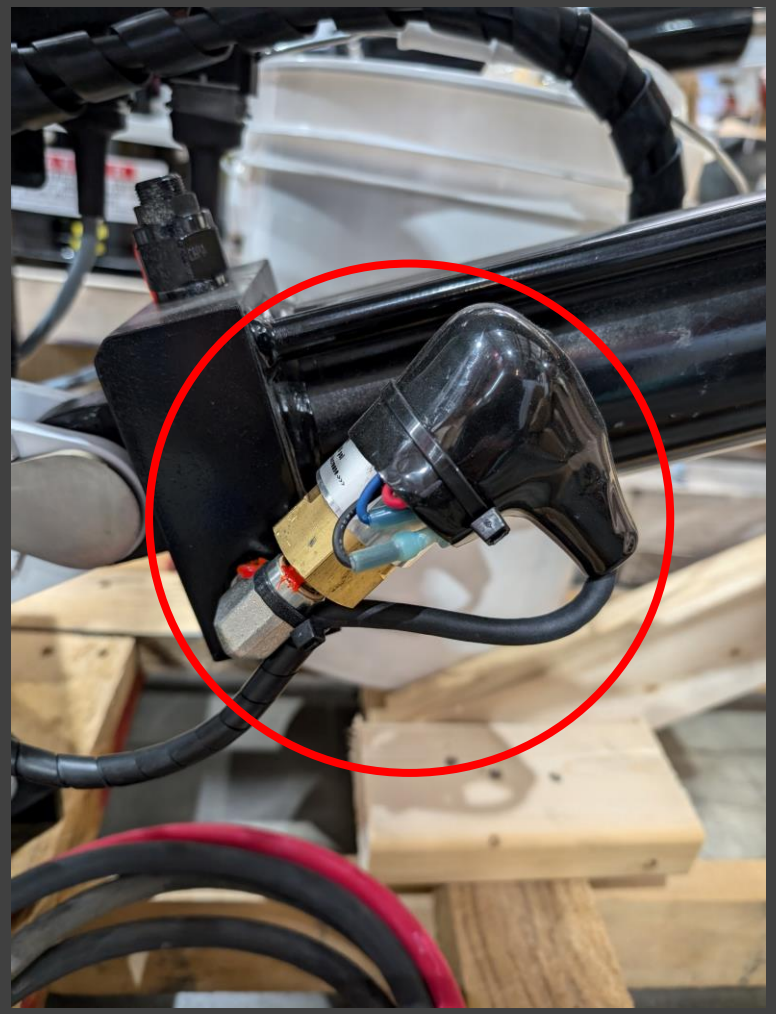
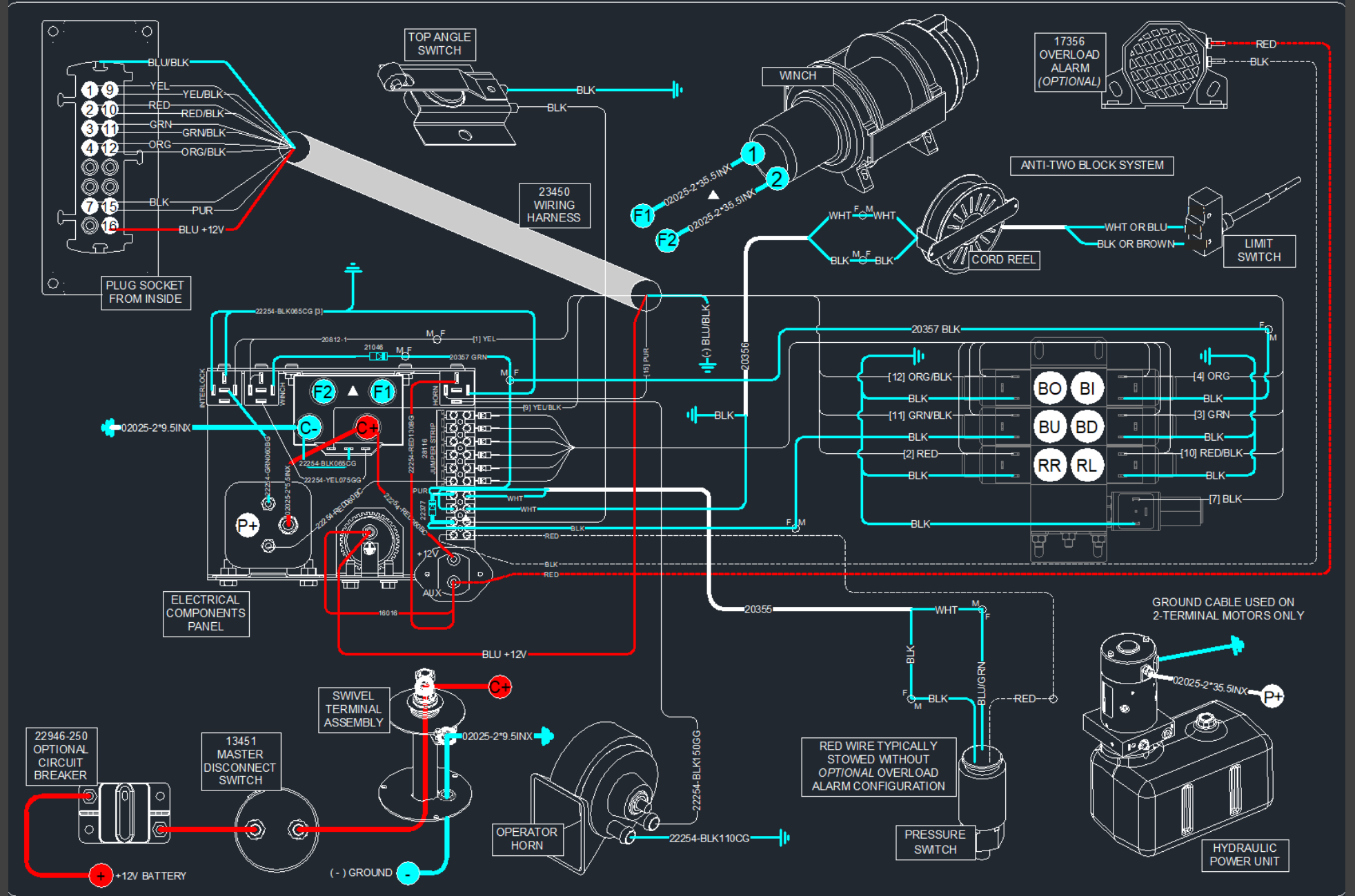
OVERLOAD SHUTOFF TROUBLESHOOTING



Overload Pressure Switch





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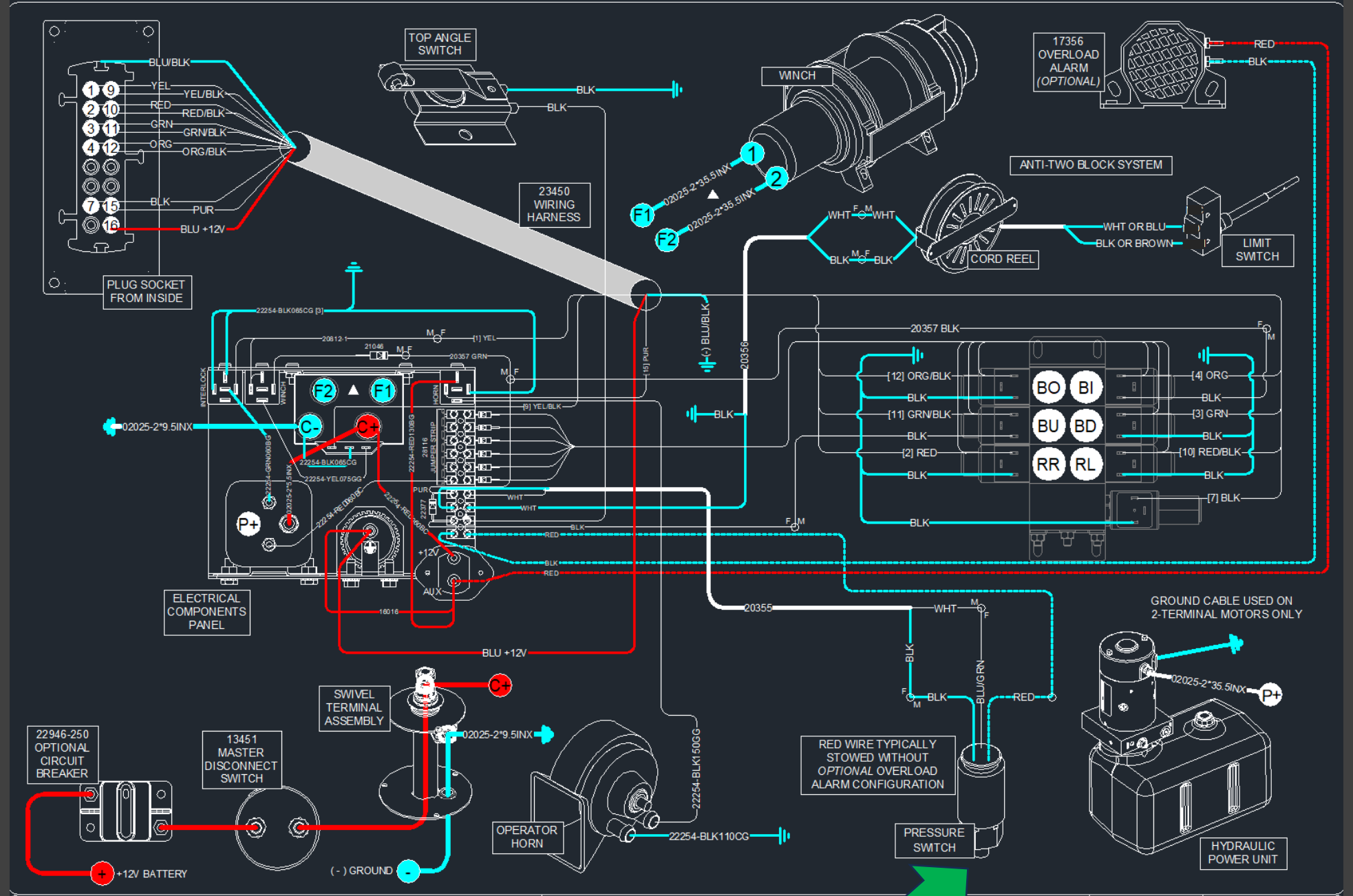

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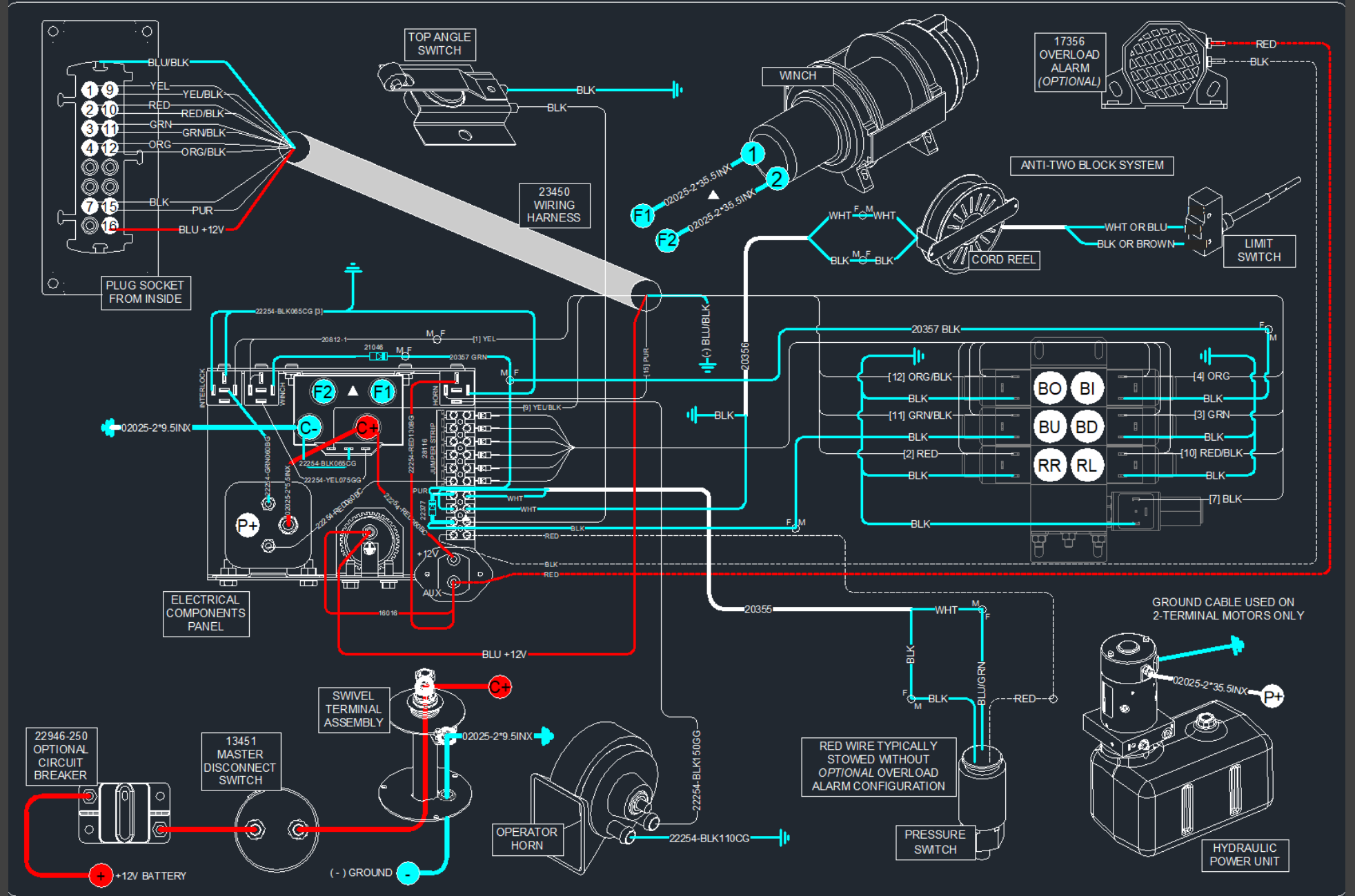
ELECTRICAL SCHEMATICS



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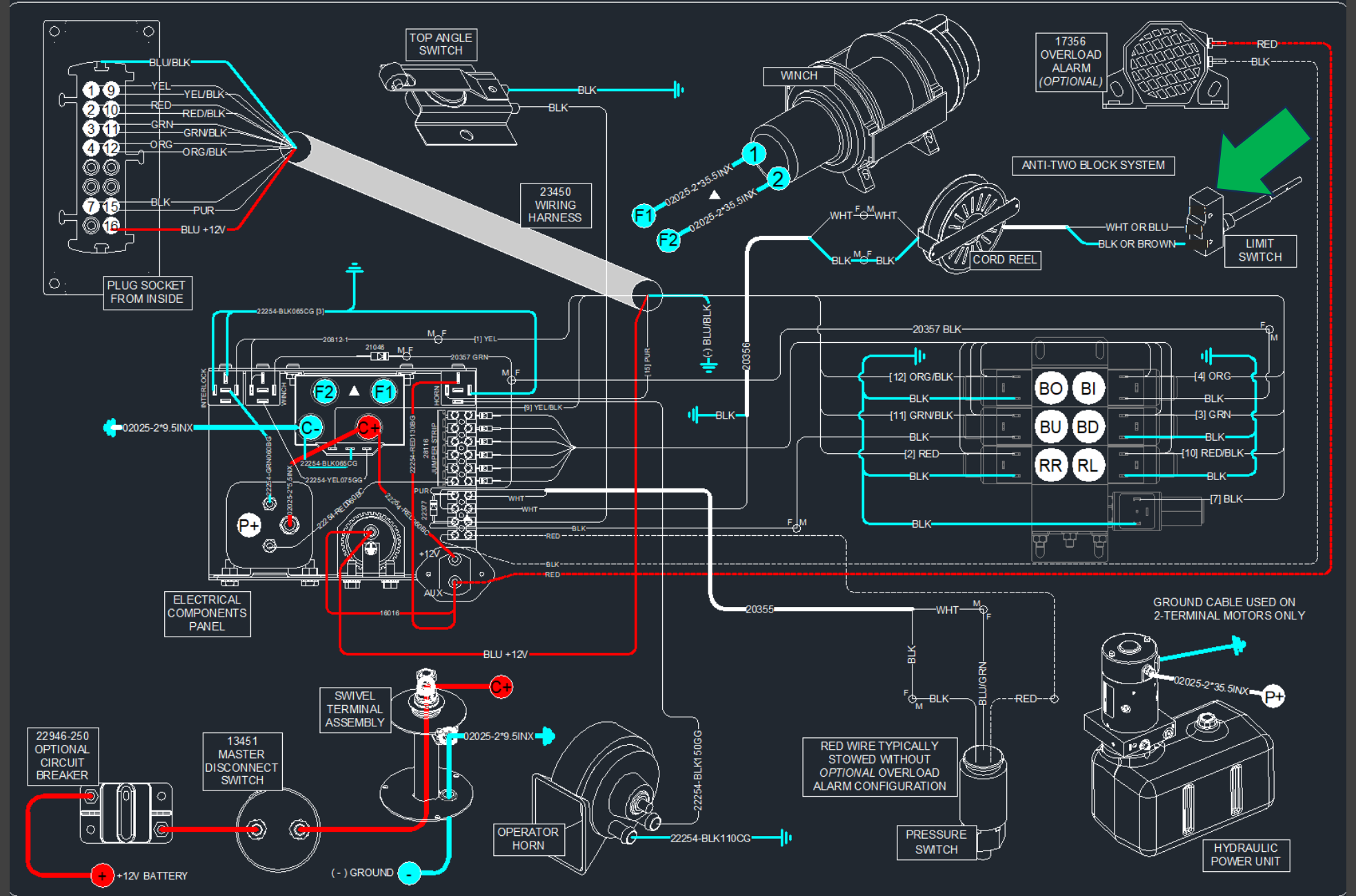

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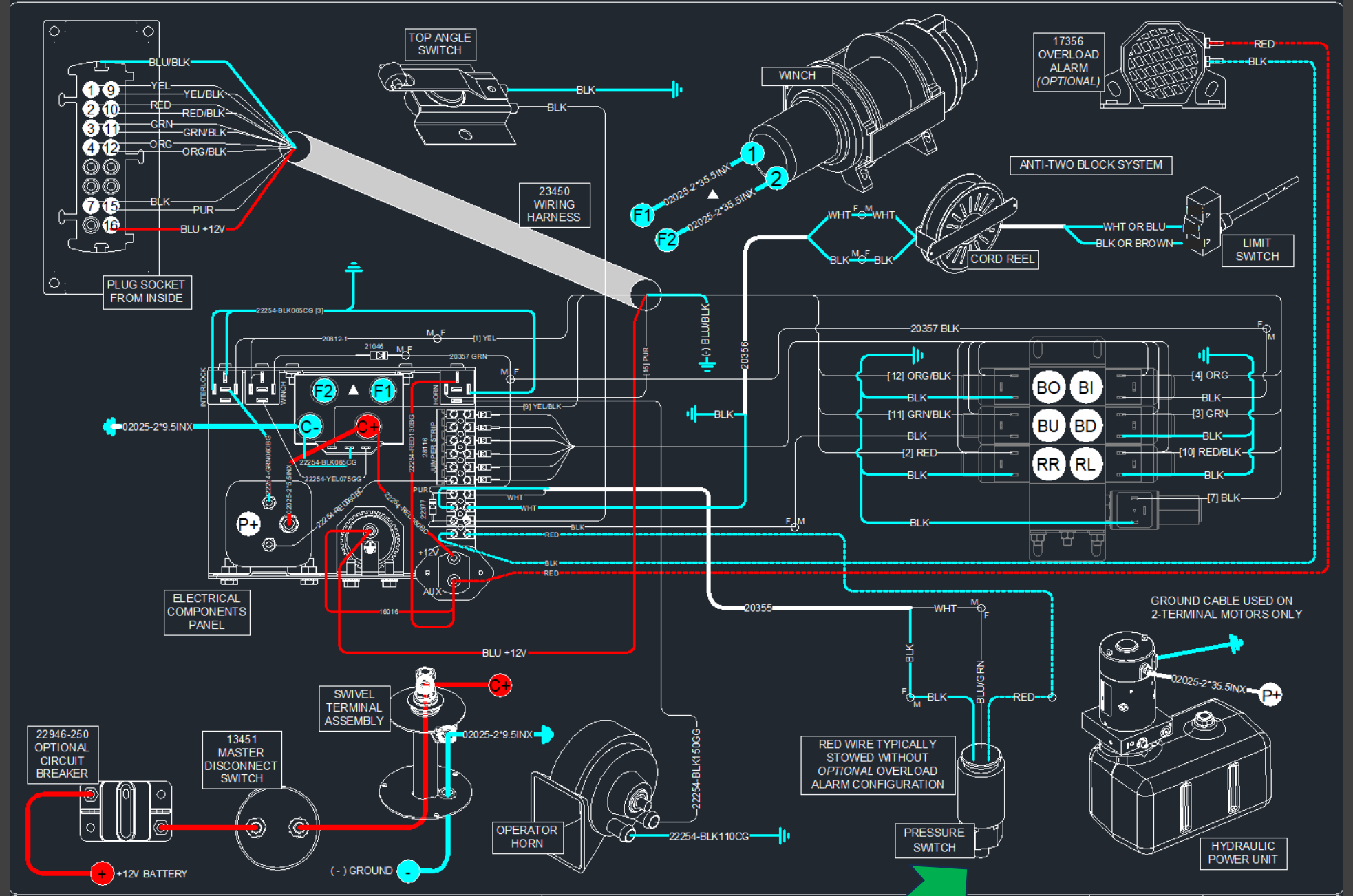

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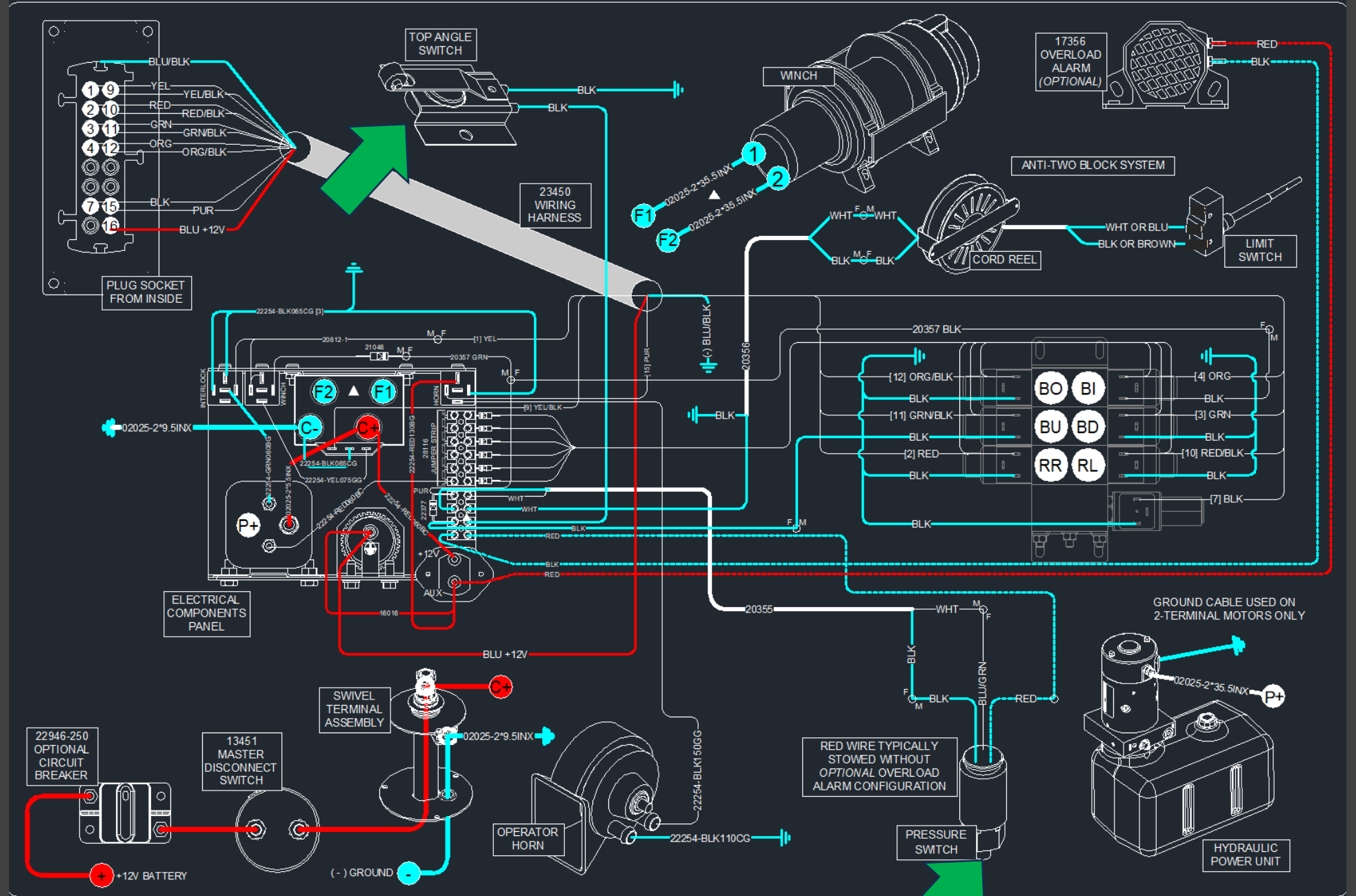
TOP ANGLE SWITCH
WINCH
17356 OVERLOAD ALARM (OPTIONAL)
ANTI-TWO BLOCK SYSTEM
23450 WIRING HARNESS
PLUG SOCKET FROM INSIDE
CORD REEL
LIMIT SWITCH
WHT OR BLU
BLK OR BROWN
BLU/BLK
YEL
YEL/BLK
RED
RED/BLK
GRN
GRN/BLK
ORG
ORG/BLK
BLK
PUR
BLU +12V
02025-2*35.5INX
02025-2*9.5INX
20357 BLK
20356
20355
[12] ORG/BLK
[11] GRN/BLK
[2] RED
[4] ORG
[3] GRN
[10] RED/BLK
[7] BLK
BO
BI
BU
BD
RR
RL
ELECTRICAL COMPONENTS PANEL
SWIVEL TERMINAL ASSEMBLY
22946-250 OPTIONAL CIRCUIT BREAKER
13451 MASTER DISCONNECT SWITCH
+12V BATTERY
(-) GROUND
OPERATOR HORN
22254-BLK110CG
22254-BLK150GG
RED WIRE TYPICALLY STOWED WITHOUT OPTIONAL OVERLOAD ALARM CONFIGURATION
PRESSURE SWITCH
GROUND CABLE USED ON 2-TERMINAL MOTORS ONLY
HYDRAULIC POWER UNIT
TOP POSITION SWITCH ACTUATED IN OVERLOAD CONDITION
TITLE
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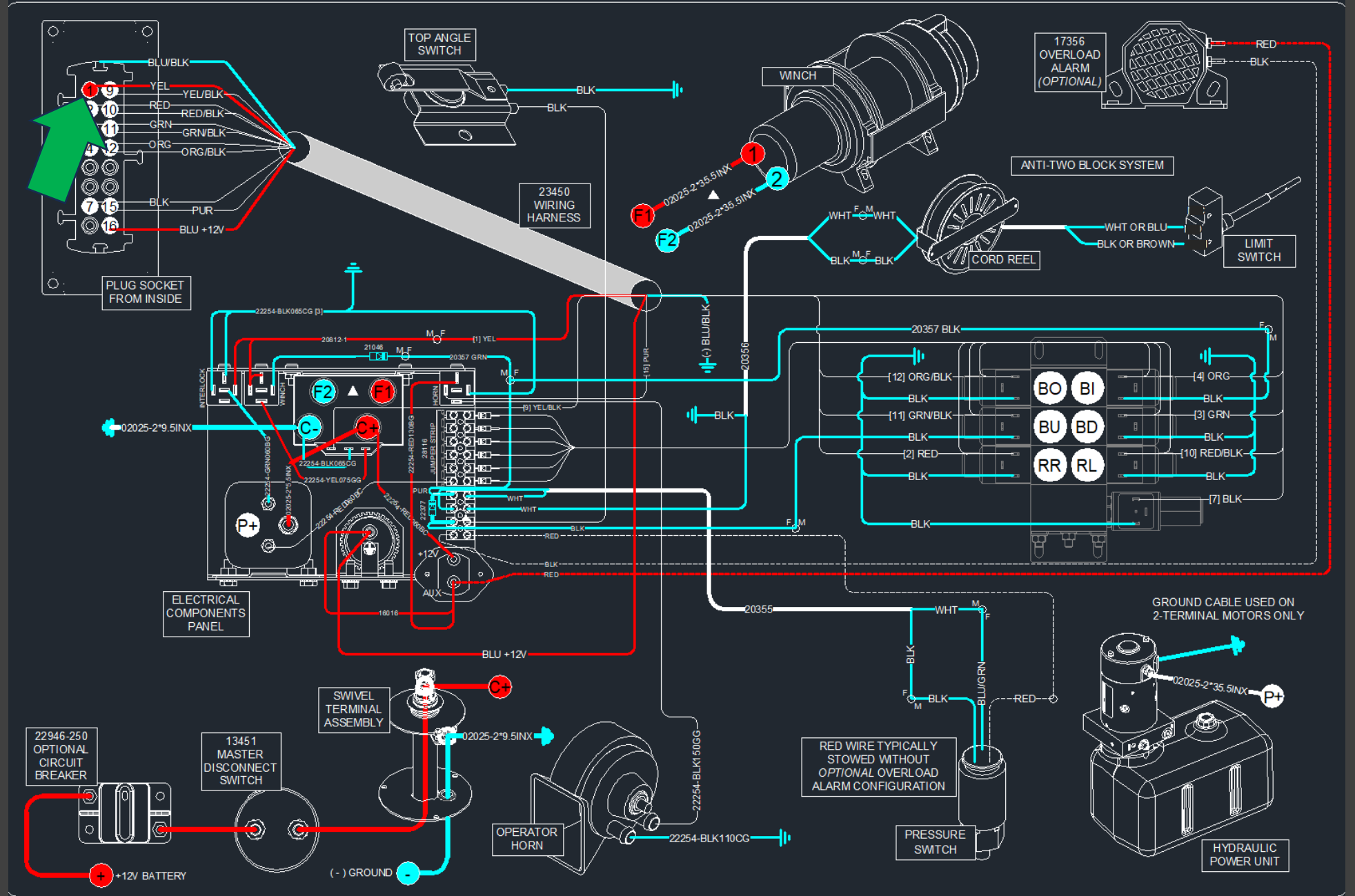

WINCH UP ACTUATED

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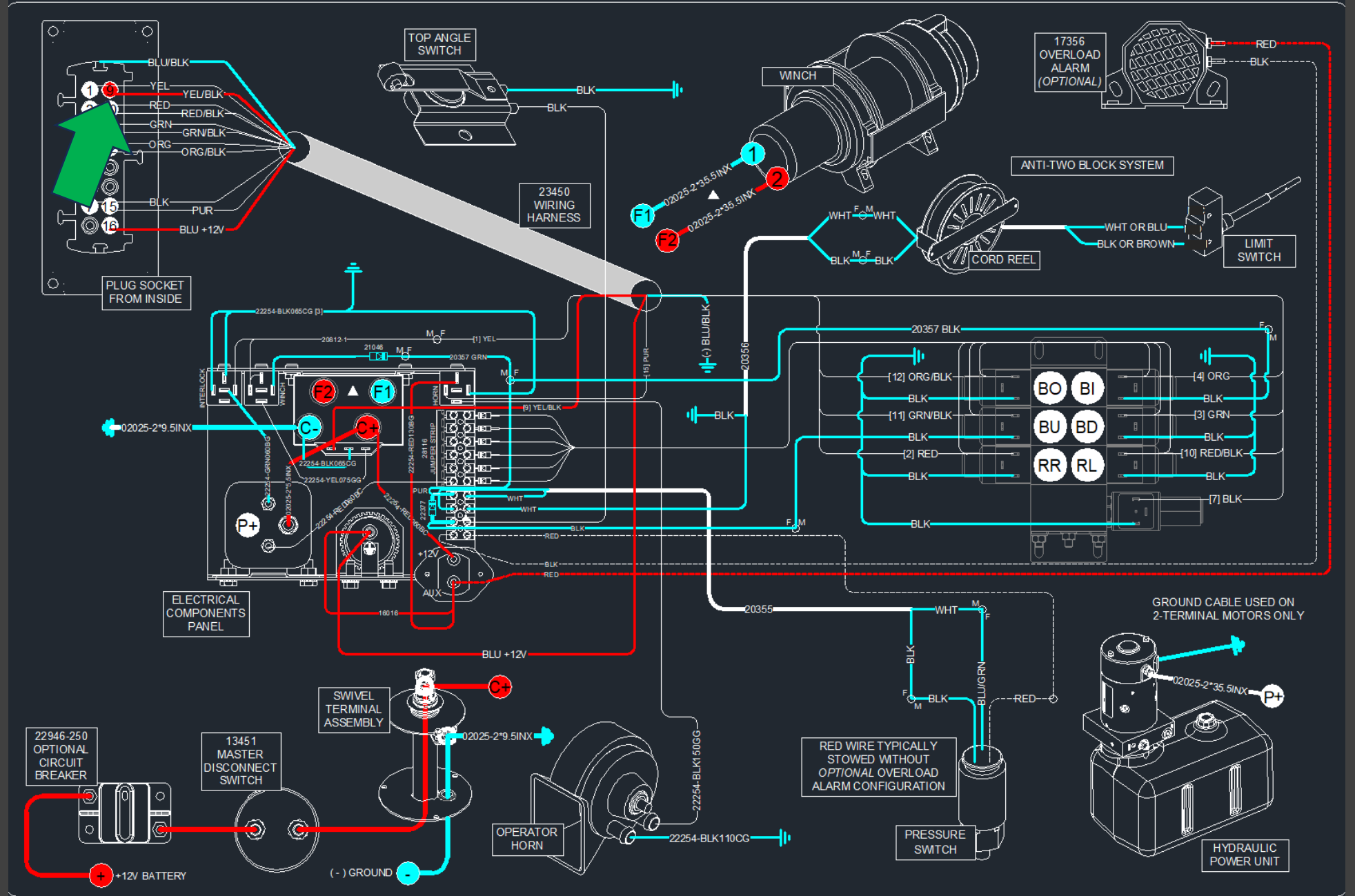

WINCH DOWN ACTUATED

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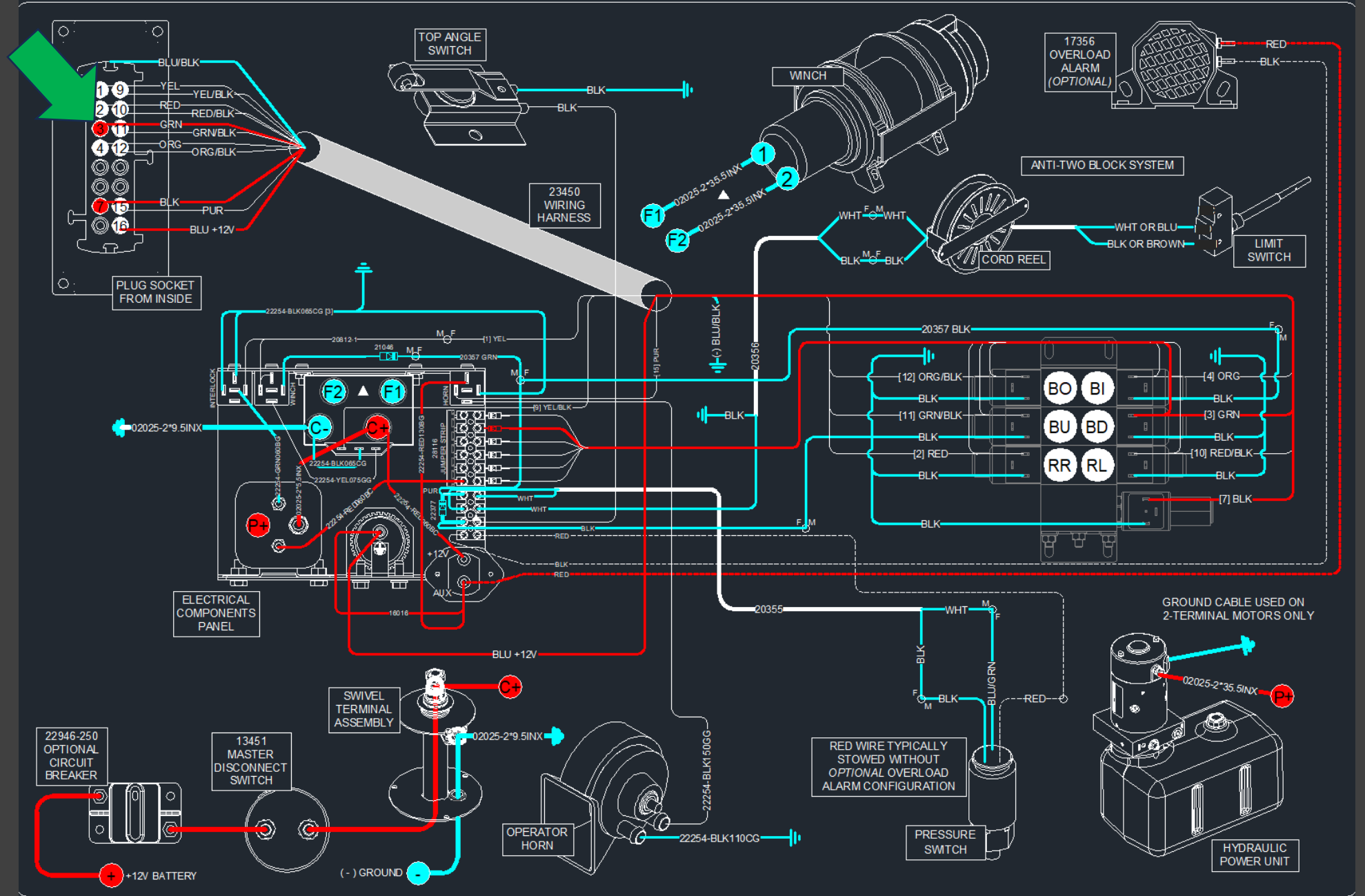

BOOM UP ACTUATED

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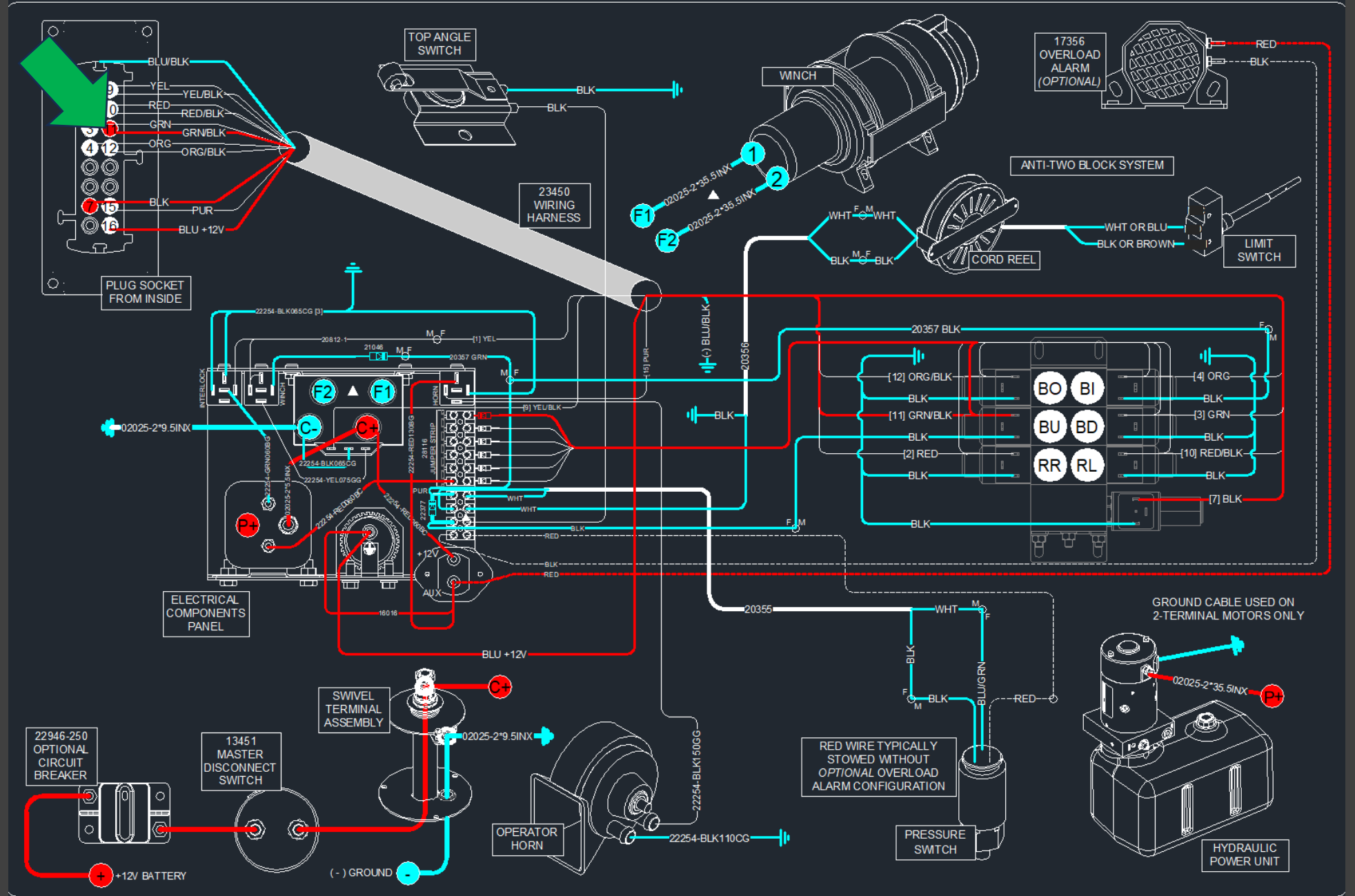

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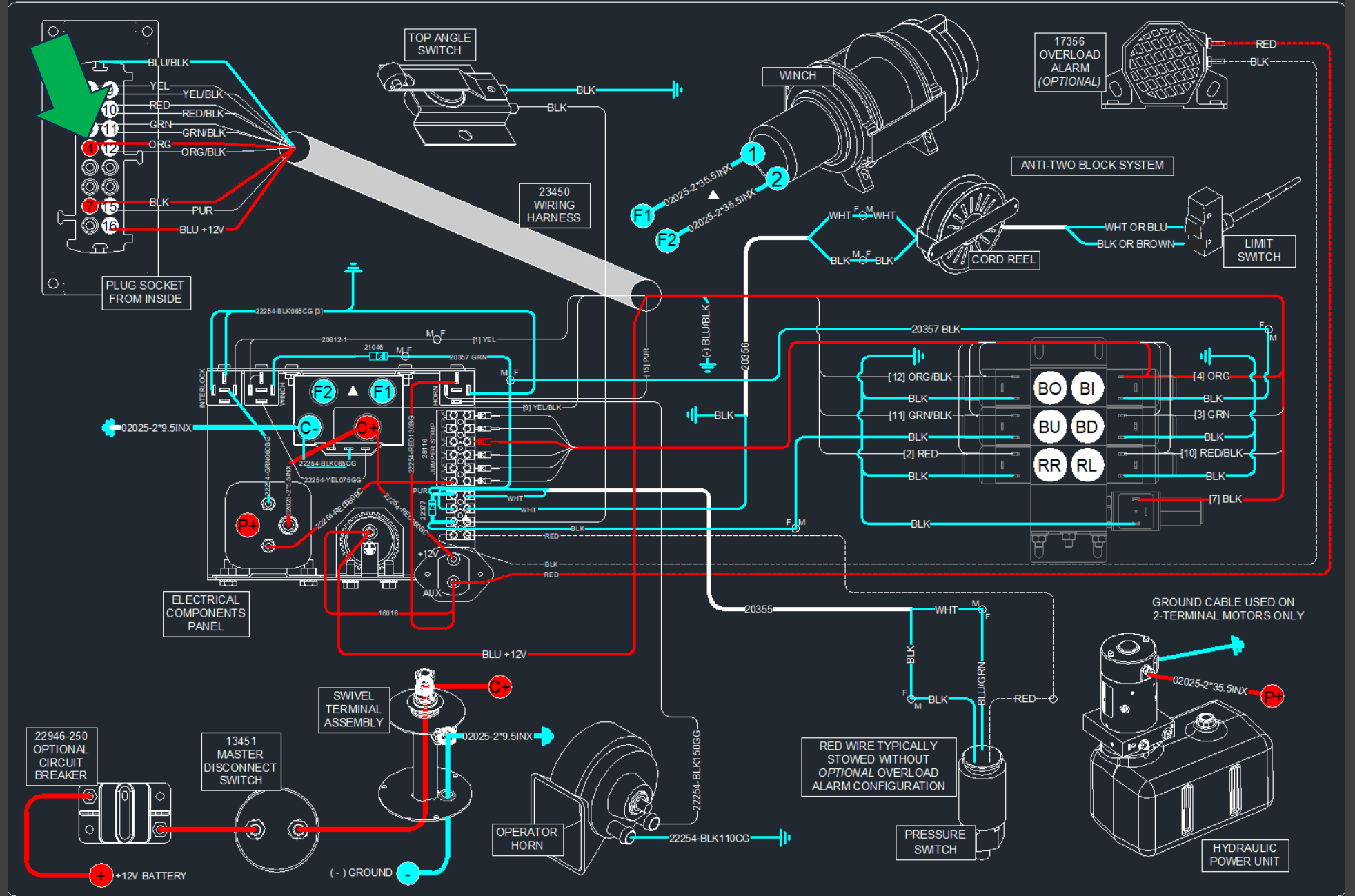

BOOM OUT ACTUATED

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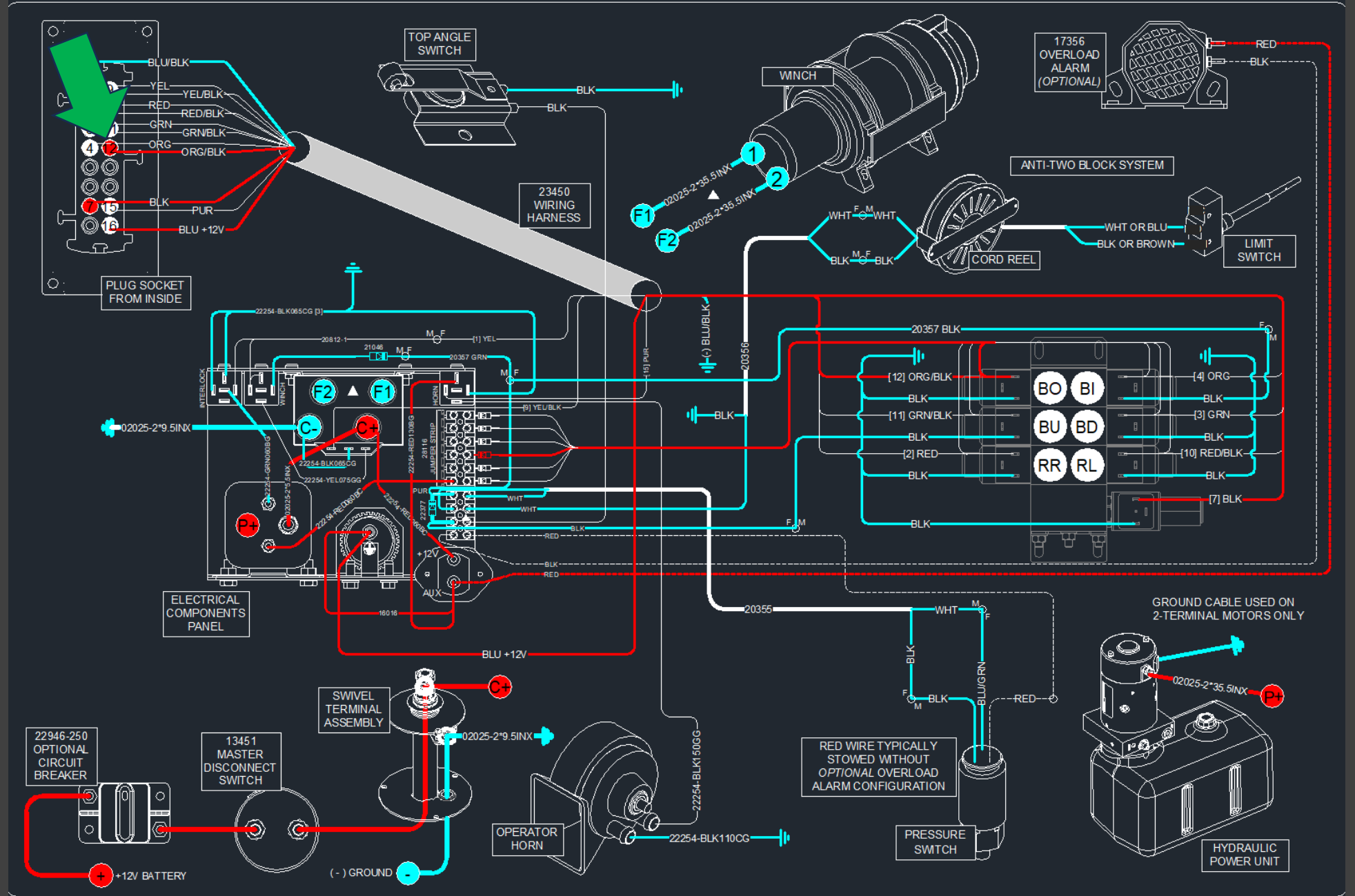

BOOM IN ACTUATED

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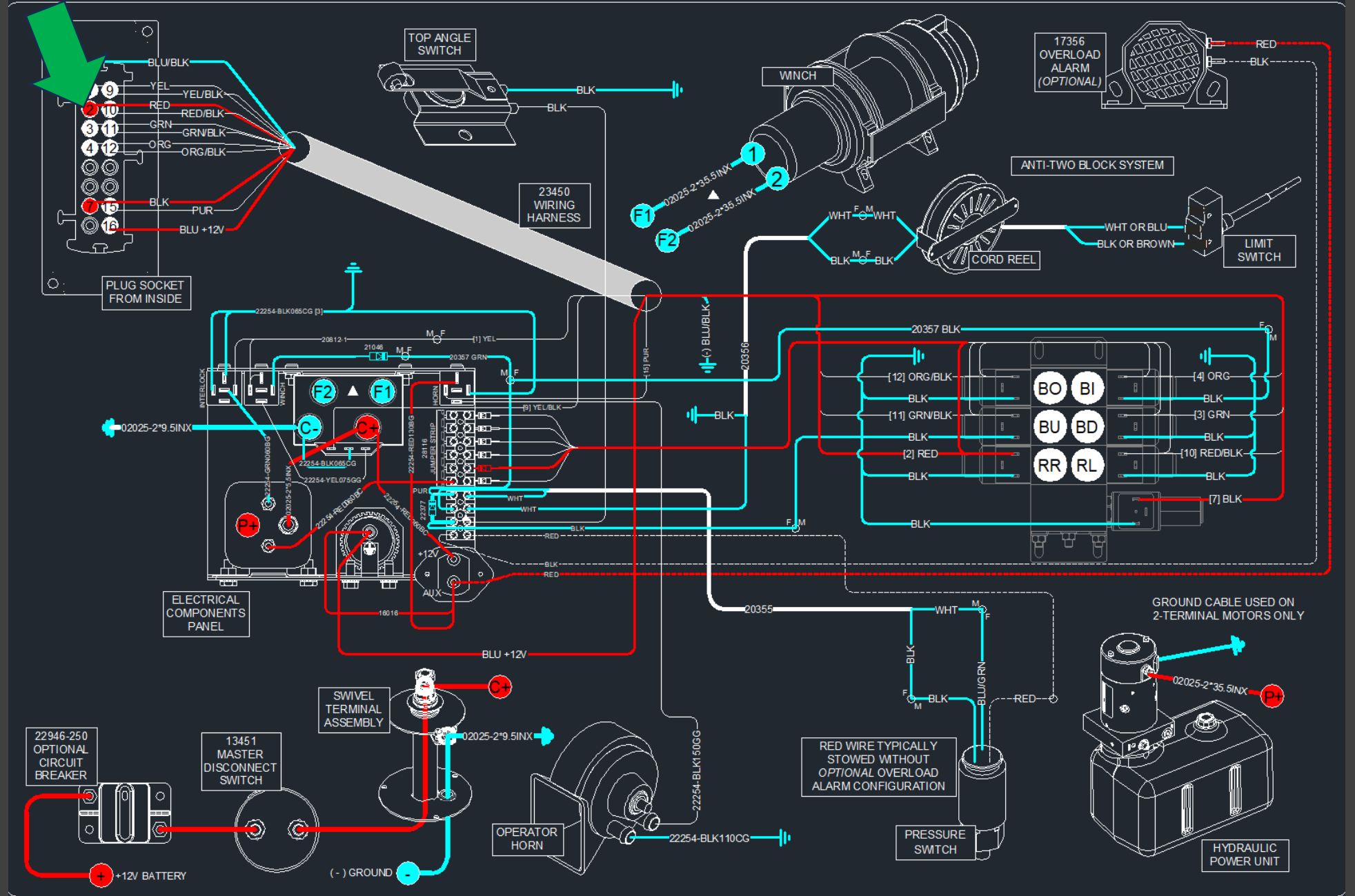

ROTATE LEFT ACTUATED

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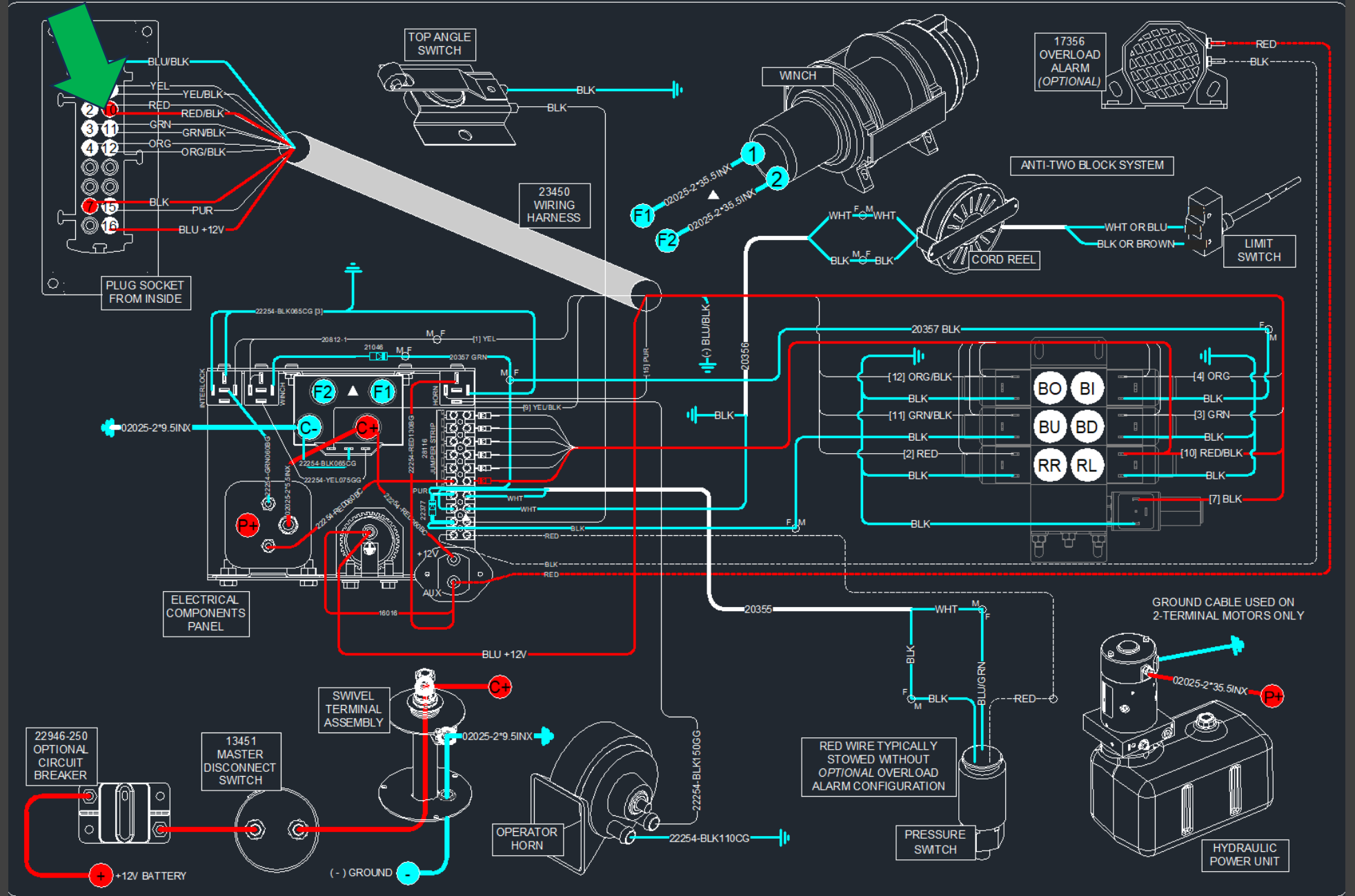

ROTATE RIGHT ACTUATED

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