

ELECTRICAL
SYSTEM GUIDE -
“ET NON-PROPORTIONAL”

3200E-4500E Non-Prop / Std A2B
(EDAAAA-0***, EGAAAD-0***,
EEAAAC-0***, EJAAAD-0***)



INTRODUCTION

ABBREVIATIONS USED IN THIS GUIDE

- CRANE FUNCTIONS

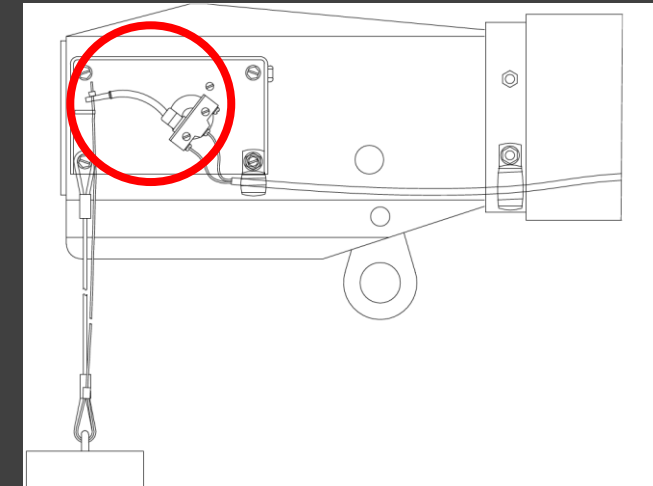
- WU = WINCH UP (RAISE LOAD / PAY IN)
 - WD = WINCH DOWN (LOWER LOAD / PAY OUT)
 - BU = BOOM UP (ELEVATE BOOM)
 - BD = BOOM DOWN (LOWER BOOM)
 - BO = BOOM OUT (EXTEND BOOM)
 - BI = BOOM IN (RETRACT BOOM)
 - RR = ROTATE RIGHT
 - RL = ROTATE LEFT
- A2B = ANTI-TWO-BLOCK

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 a Normally Open (N/O) switch, but it is configured such that during normal operation, the switch itself is actuated and the electrical circuit is Closed
 - The Closed electrical circuit provides a ground path to WU, BD, BO
 - When the hanging weight is contacted by the load block, the tension is taken off the A2B Switch trigger wire and the switch returns to its NON-actuated position 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)

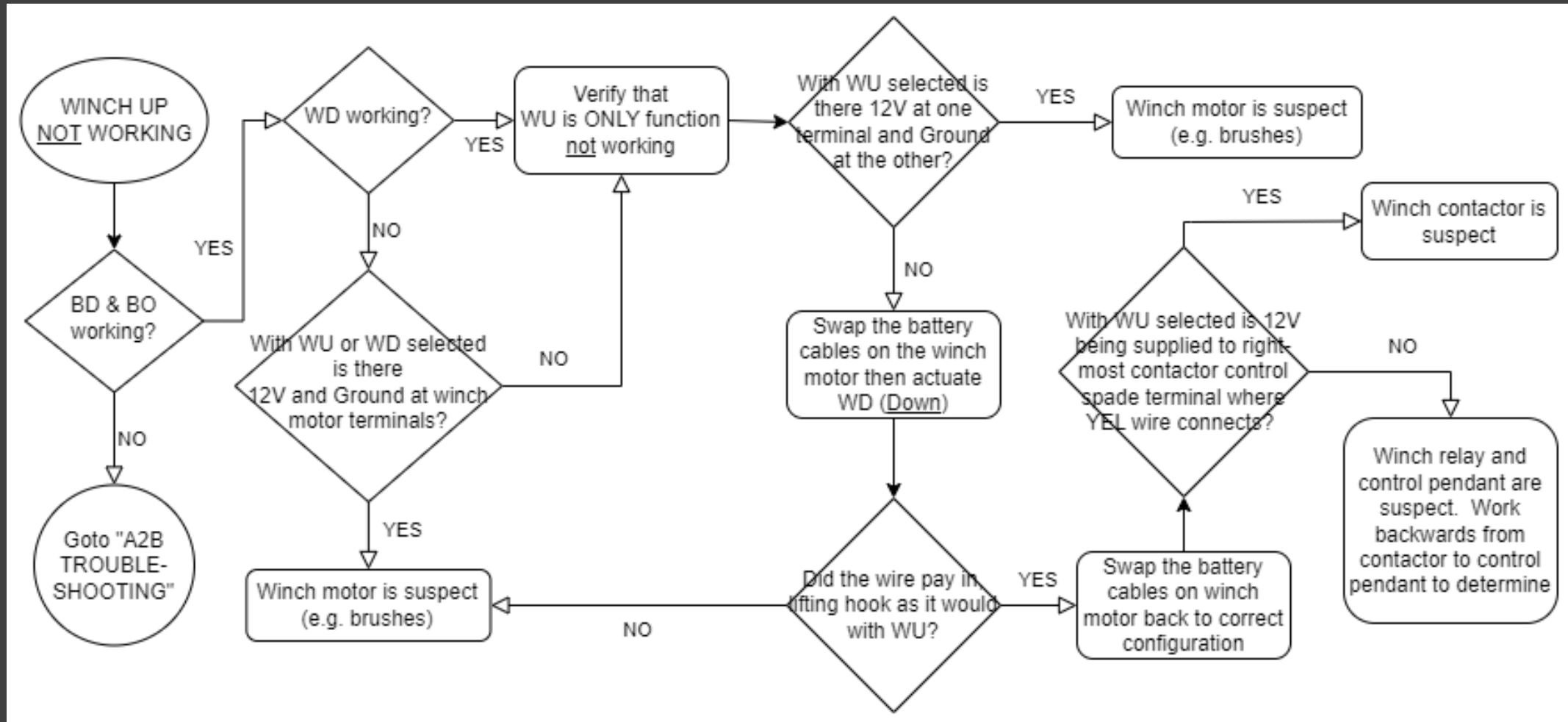
TESTING FOR GROUND

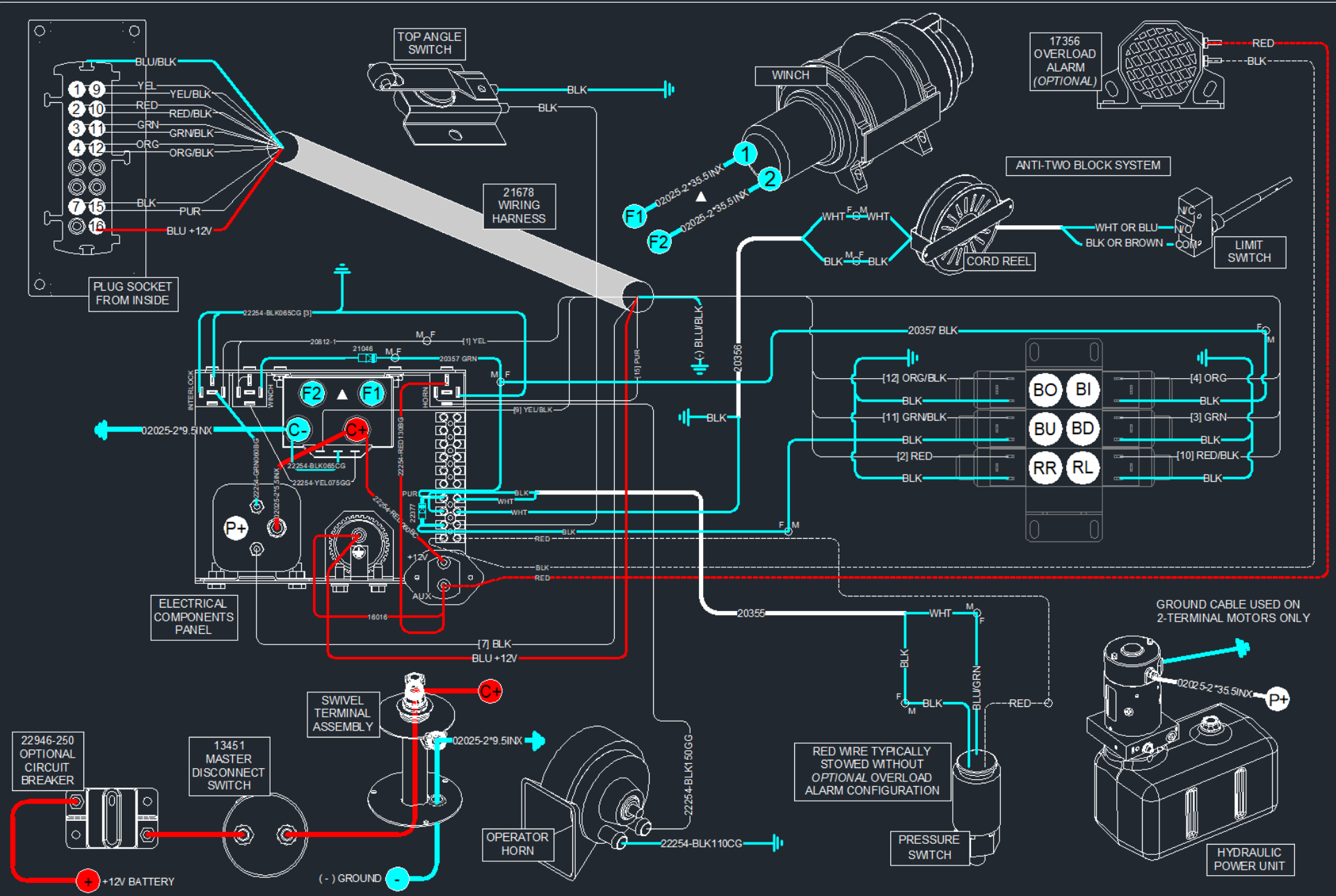
- Use Multimeter set to Continuity/Resistance measurement – ideally an audible alarm sounds when continuity is detected
- Touch probes together to make sure you either hear continuity alert OR register 0 ohms – in other words, you need to know how your multimeter indicates “continuity”
- Put one probe 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)

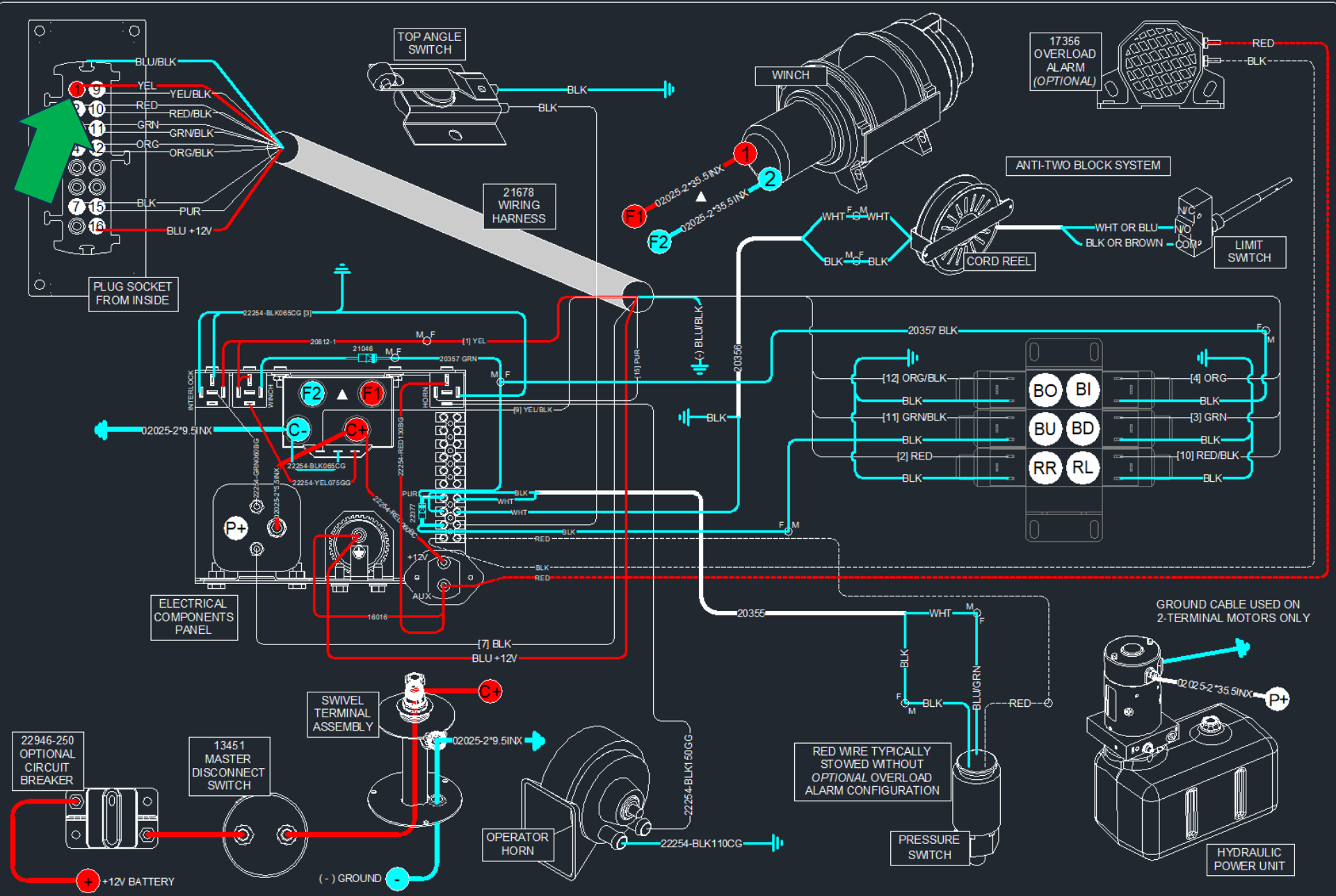
WINCH UP (WU) NOT WORKING





POWER "ON" – NOMINAL

TITLE	DATE	SECTION
WIRING DIAGRAM	03-06-25A	C400
45**E/40**E/351*E/3215E	SUPERSEDES	
NON PROPORTIONAL	04-11-24	28836



WINCH UP ACTUATED

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

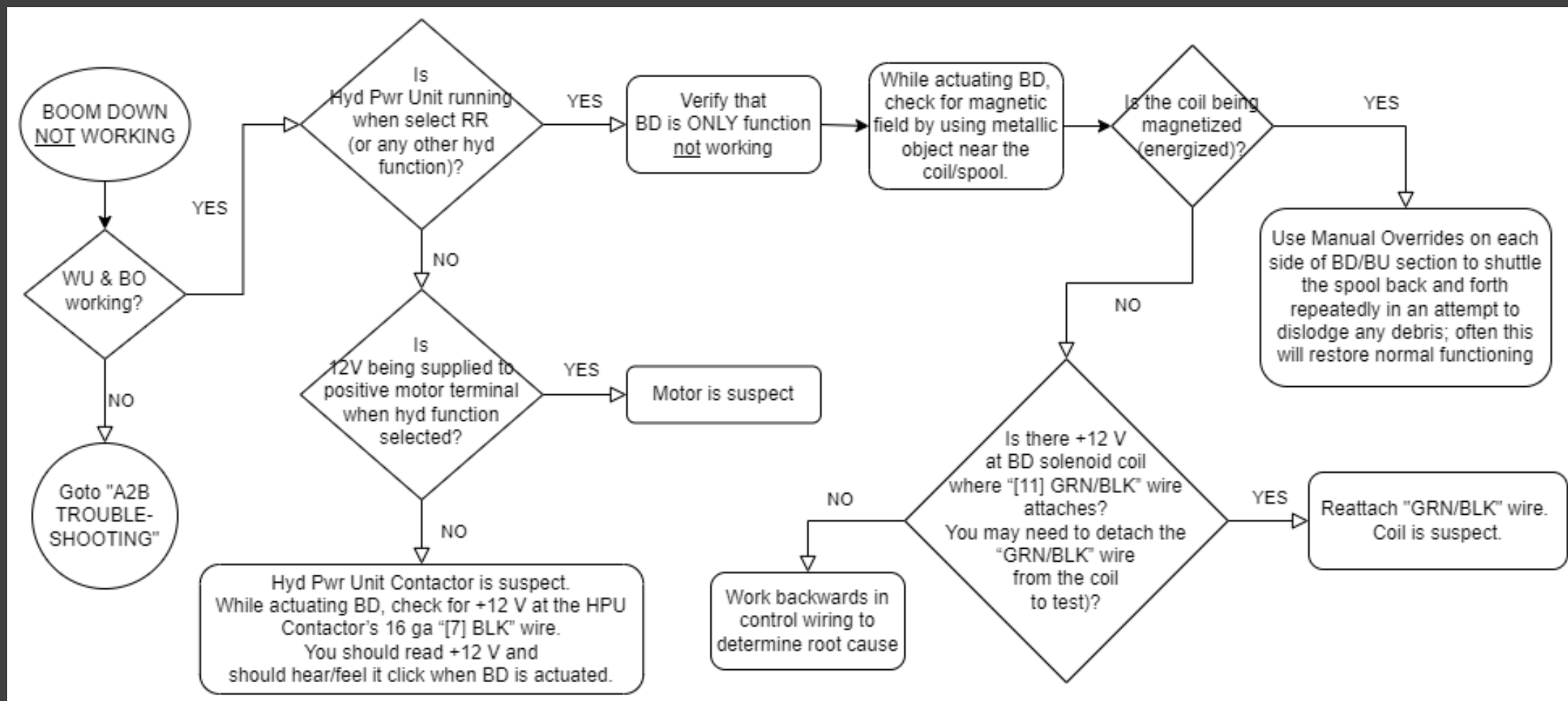
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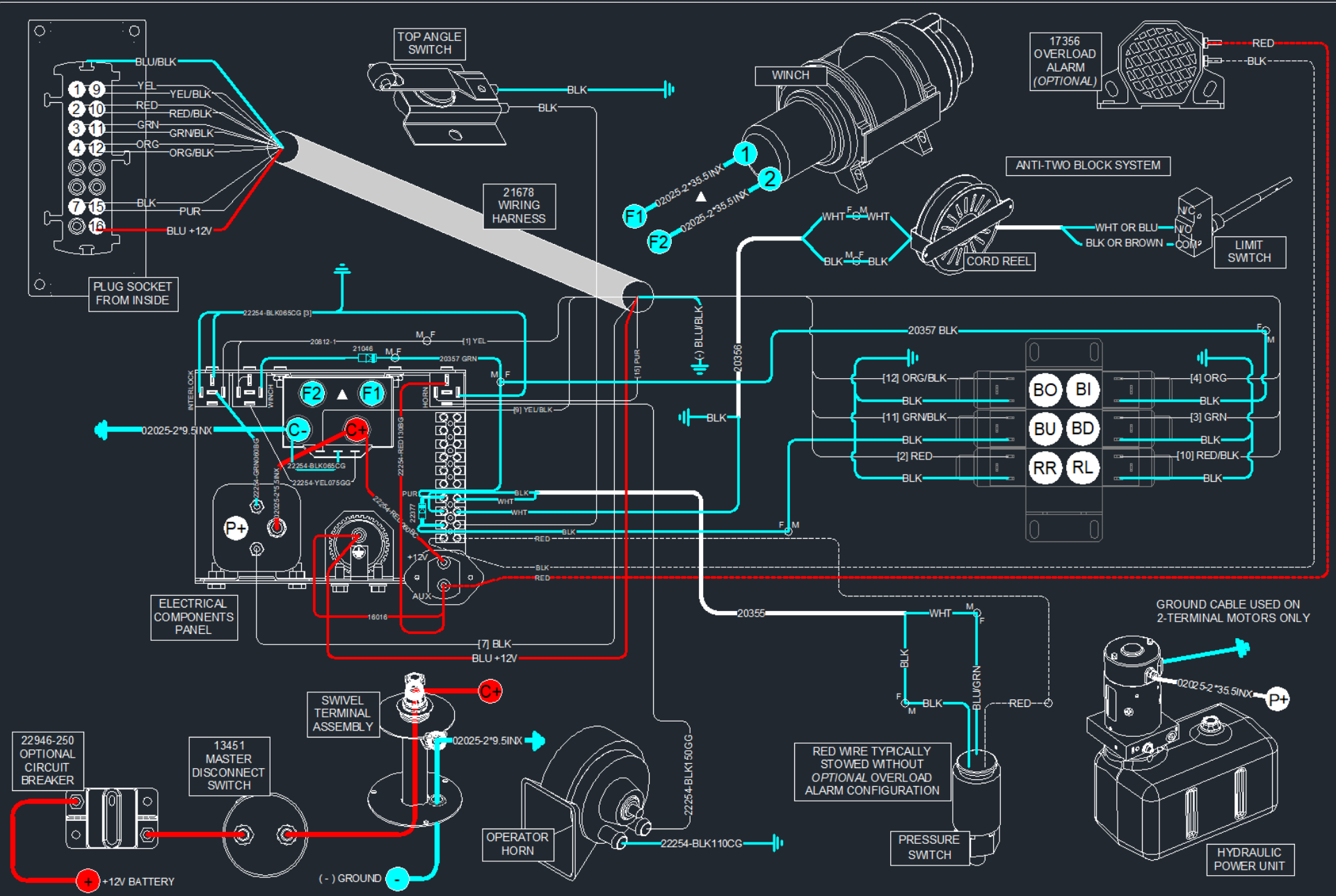
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C400

SUPER SEDES
04-11-24

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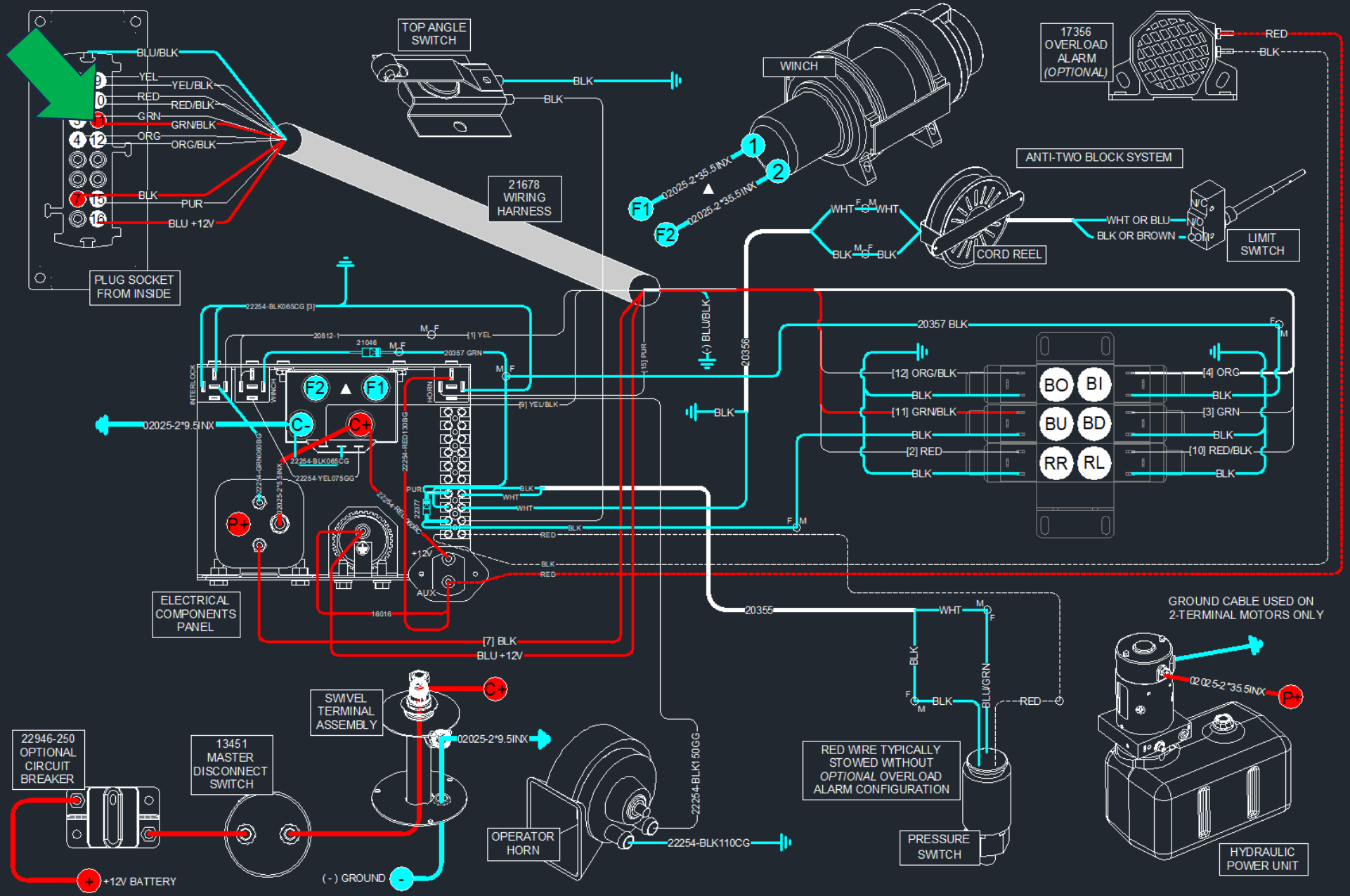
BOOM DOWN (BD) NOT WORKING





POWER "ON" – NOMINAL

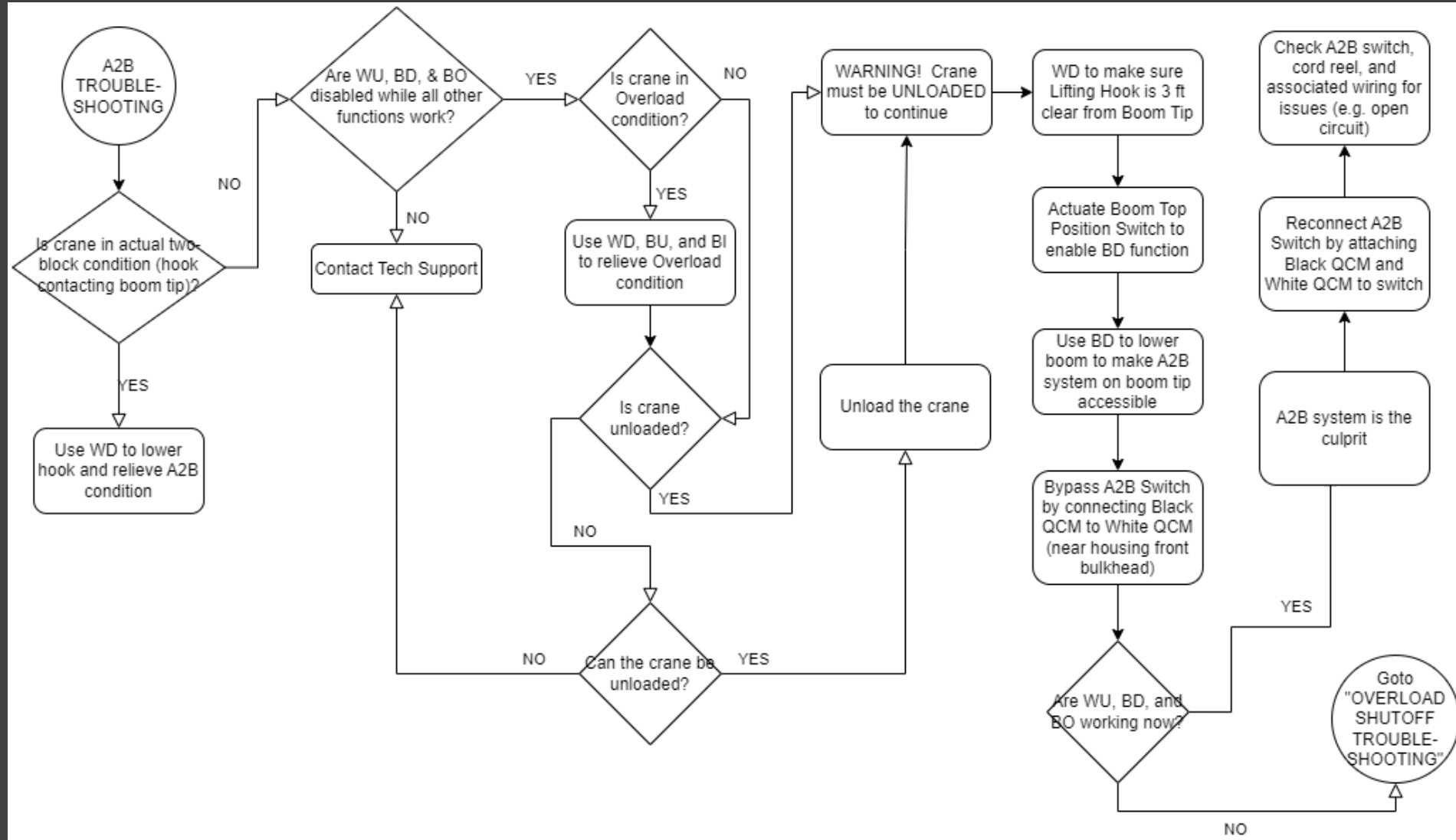
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BOOM DOWN ACTUATED

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A2B (ANTI-2-BLOCK) TROUBLESHOOTING



A2B Switch

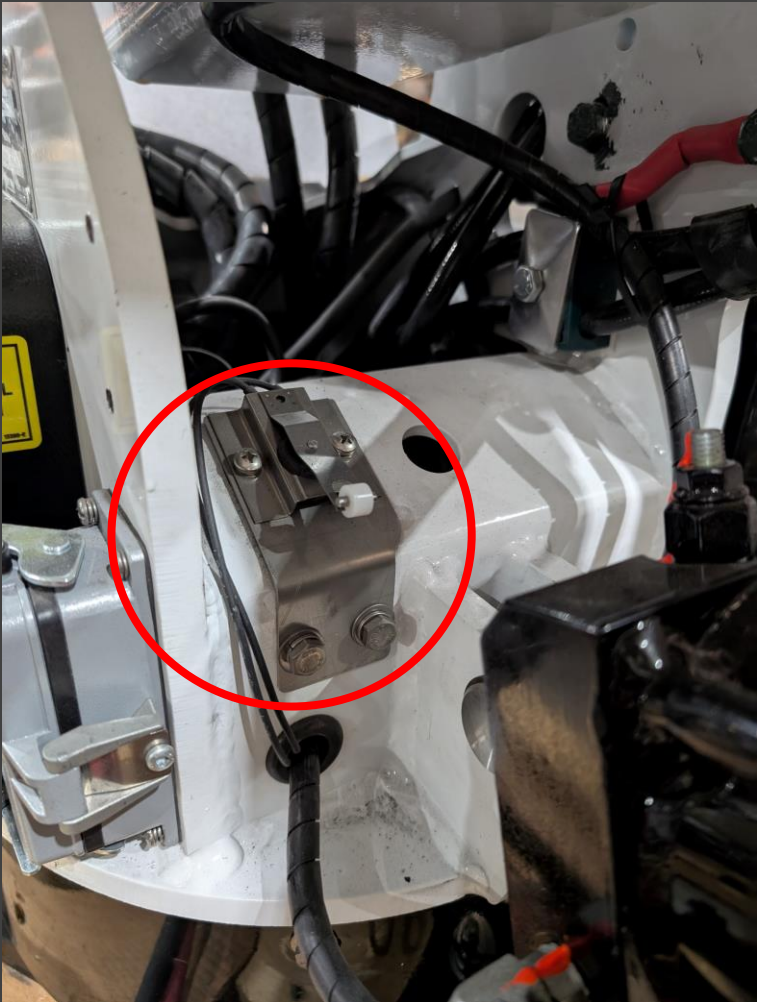


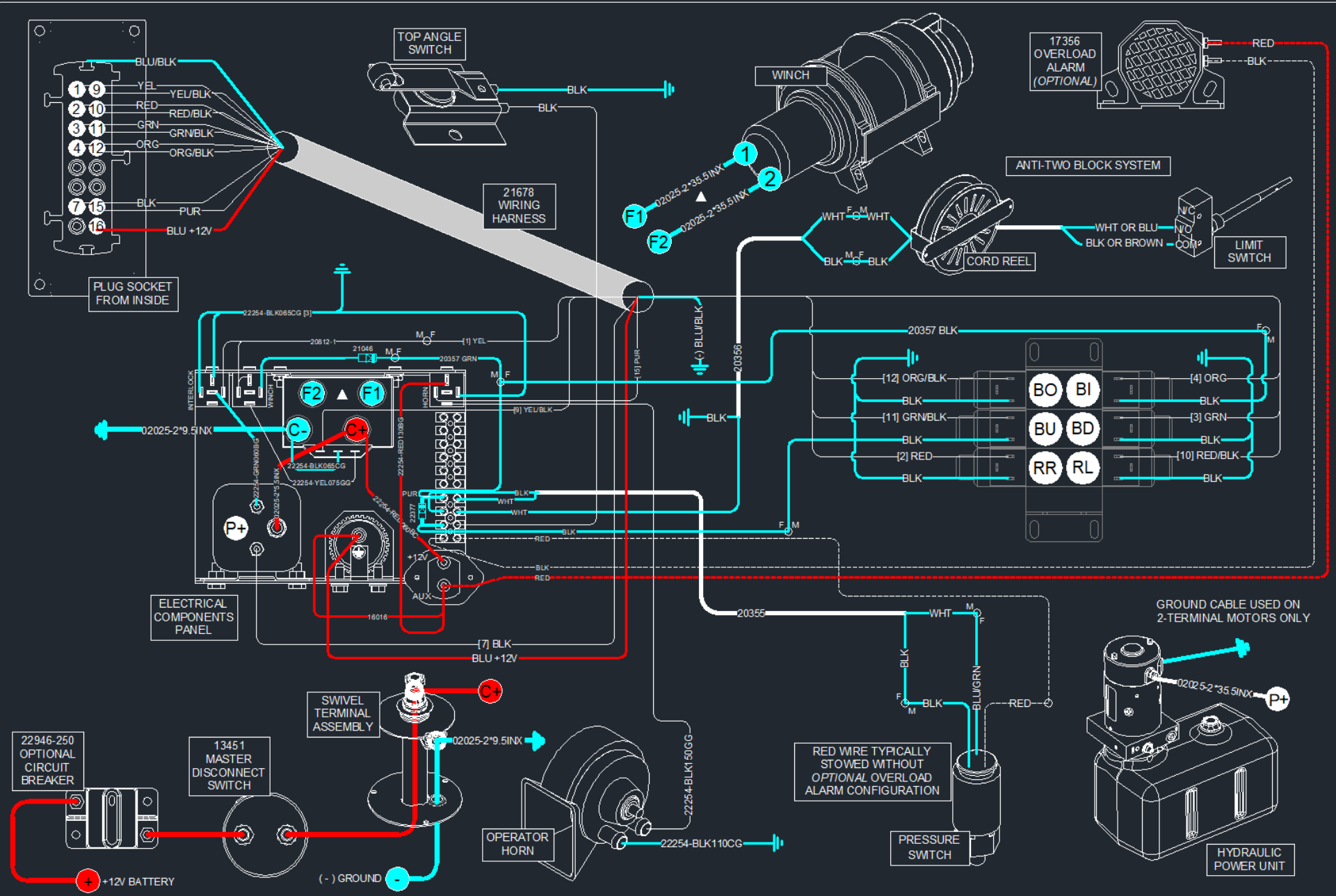
Normal operation:
Tension on wire connected to wand
switch and wand switch actuated



A2B condition:
No tension on wire connected to wand
switch and wand switch not actuated

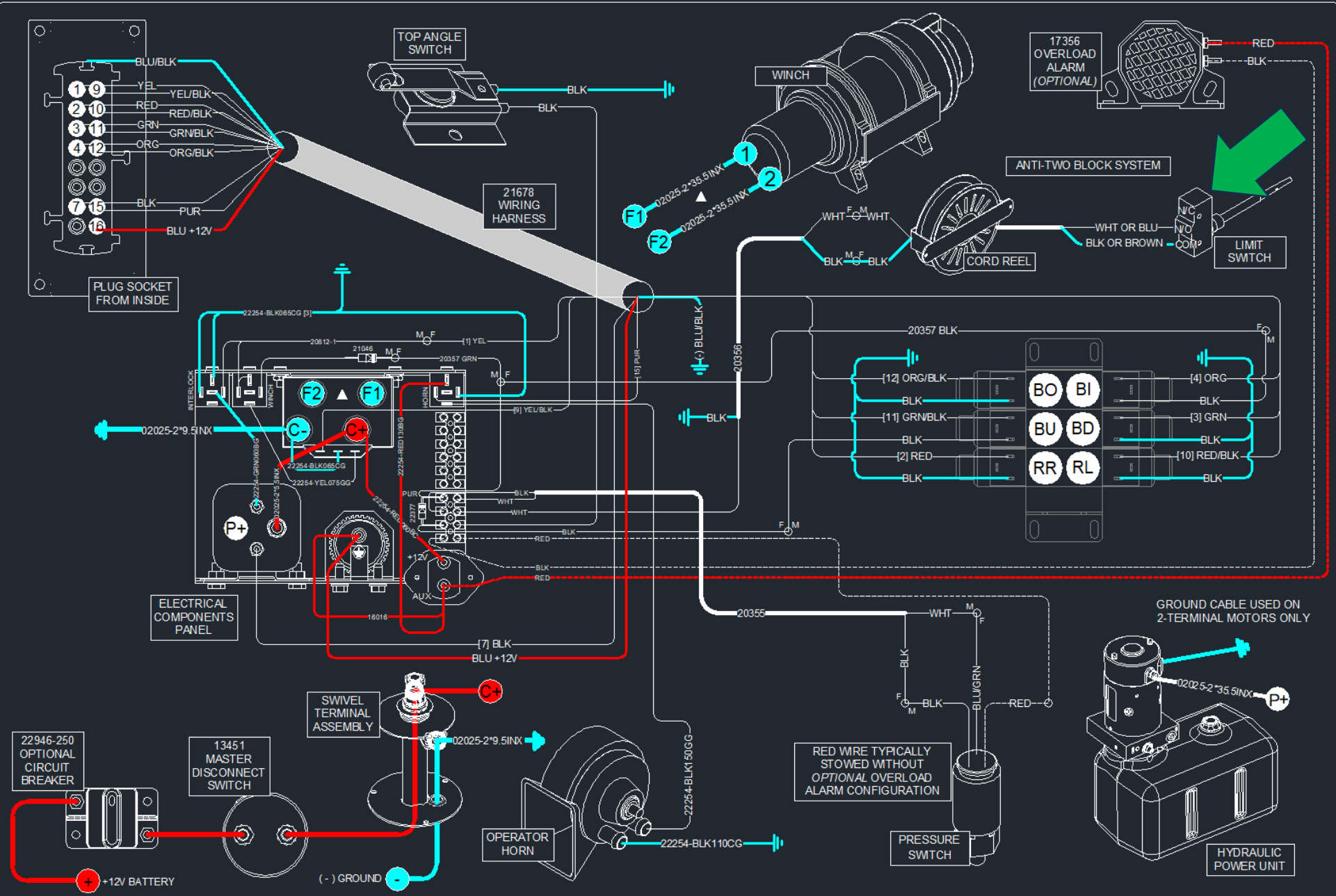
Top Position Switch





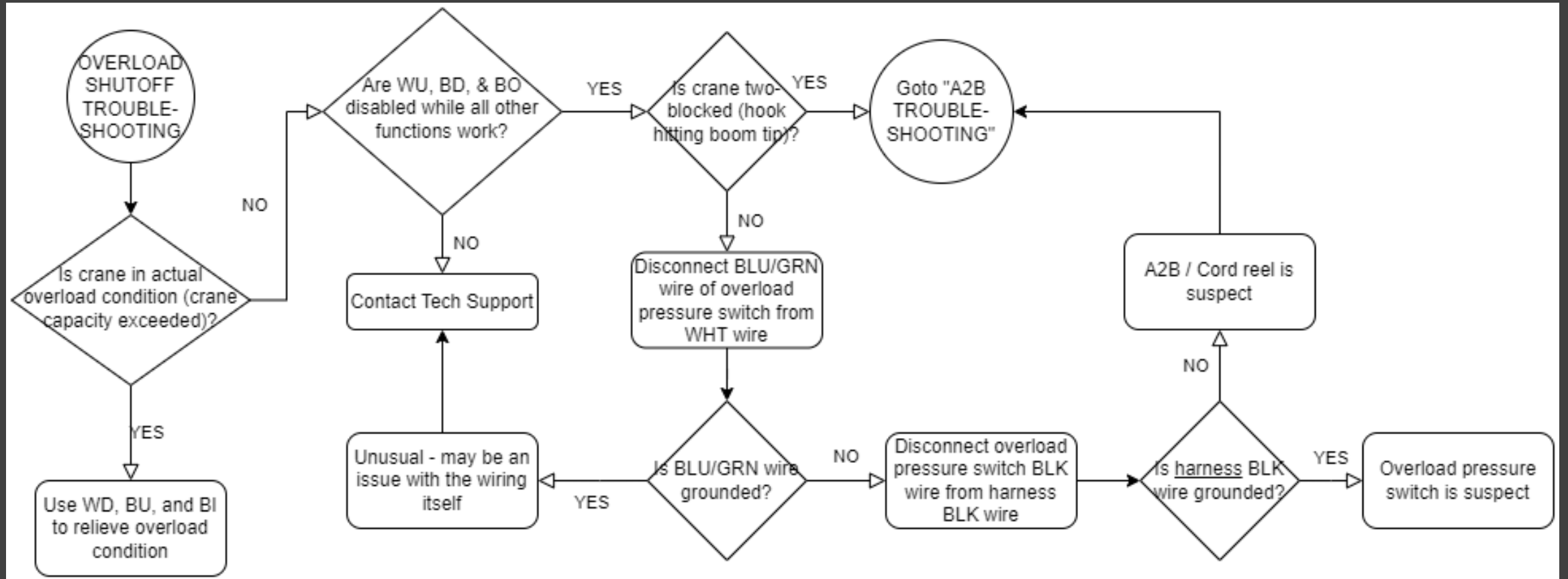
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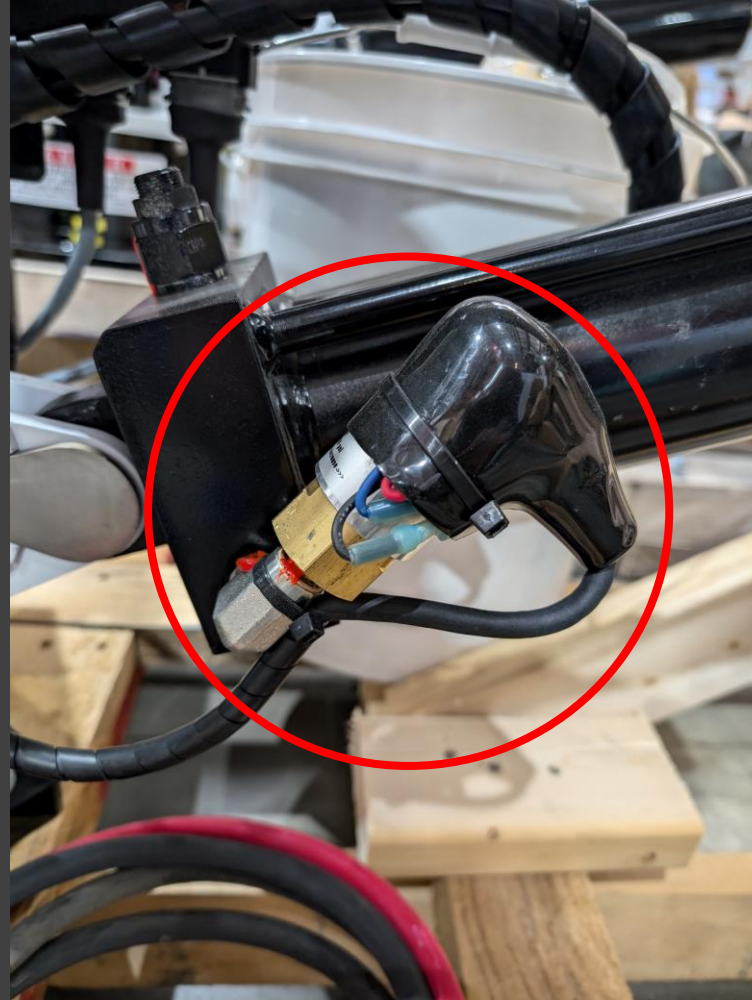


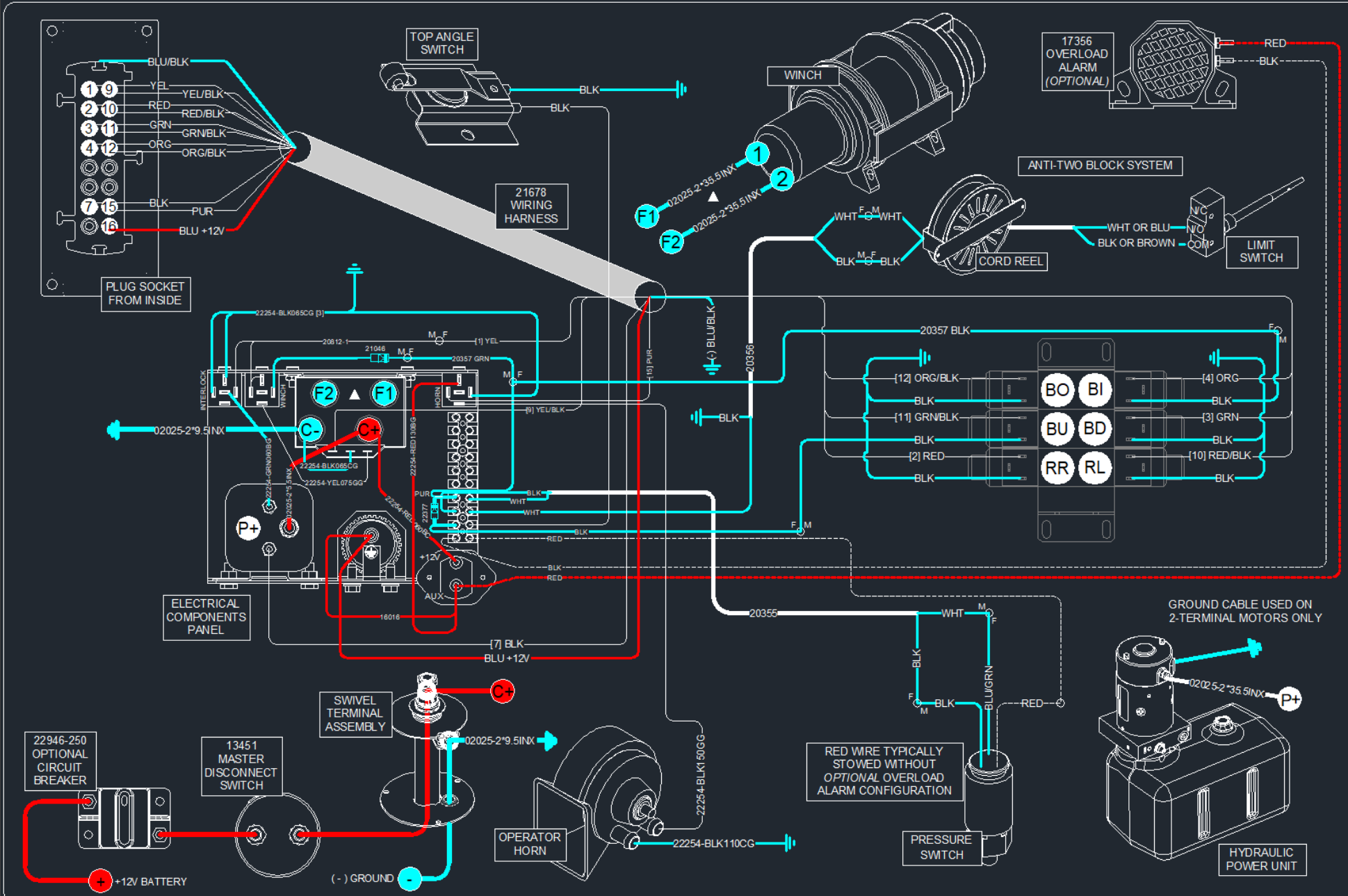
A2B CONDITION (SWITCH RELAXED)	TITLE WIRING DIAGRAM	DATE 03-06-25A	SECTION C400
	45**E/40**E/351*E/3215E NON PROPORTIONAL	SUPERSEDES 04-11-24	28836

OVERLOAD SHUTOFF TROUBLESHOOTING



Overload Pressure Switch

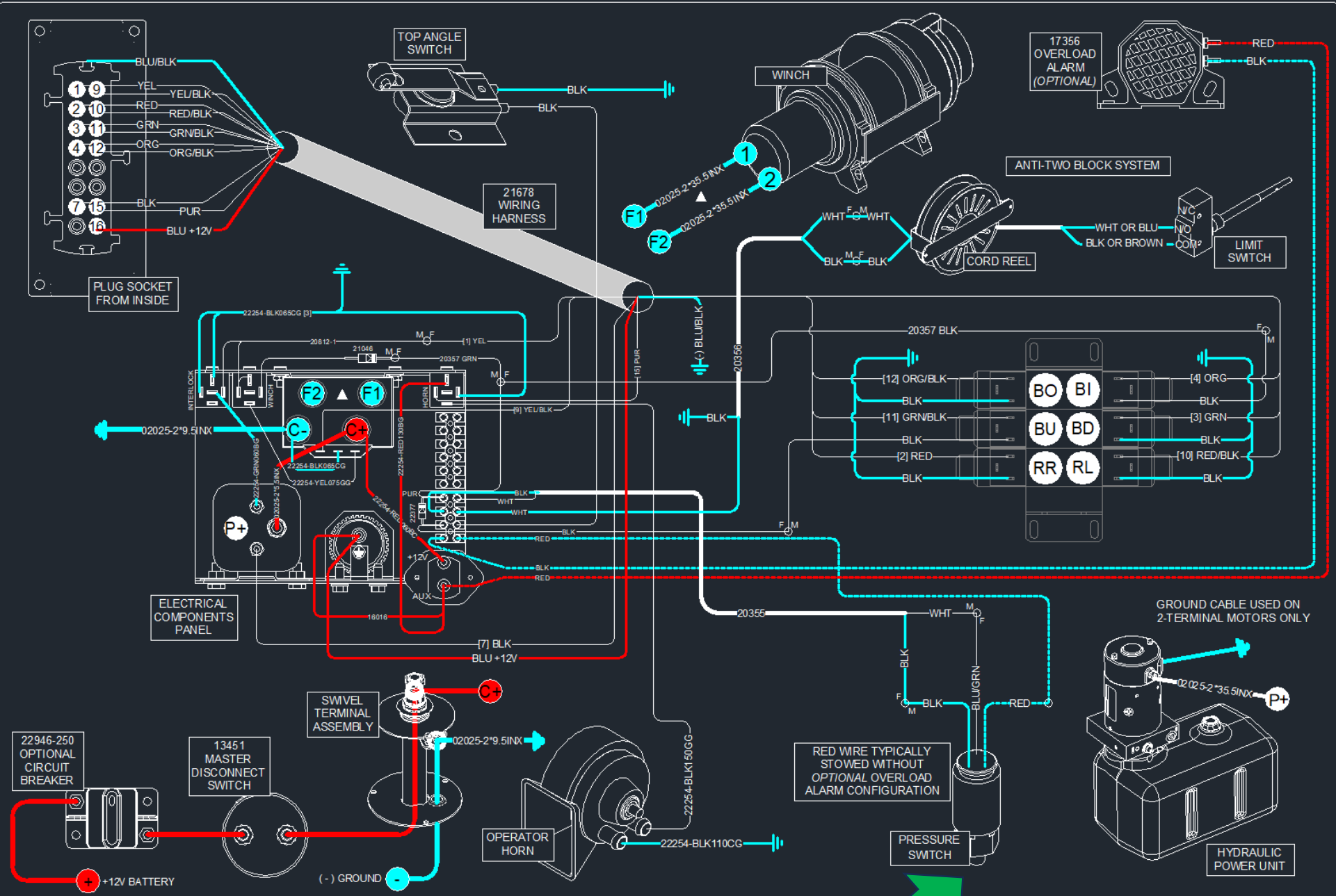




POWER "ON" – NOMINAL

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

DATE	SECTION
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SUPERSEDES	
04-11-24	28836

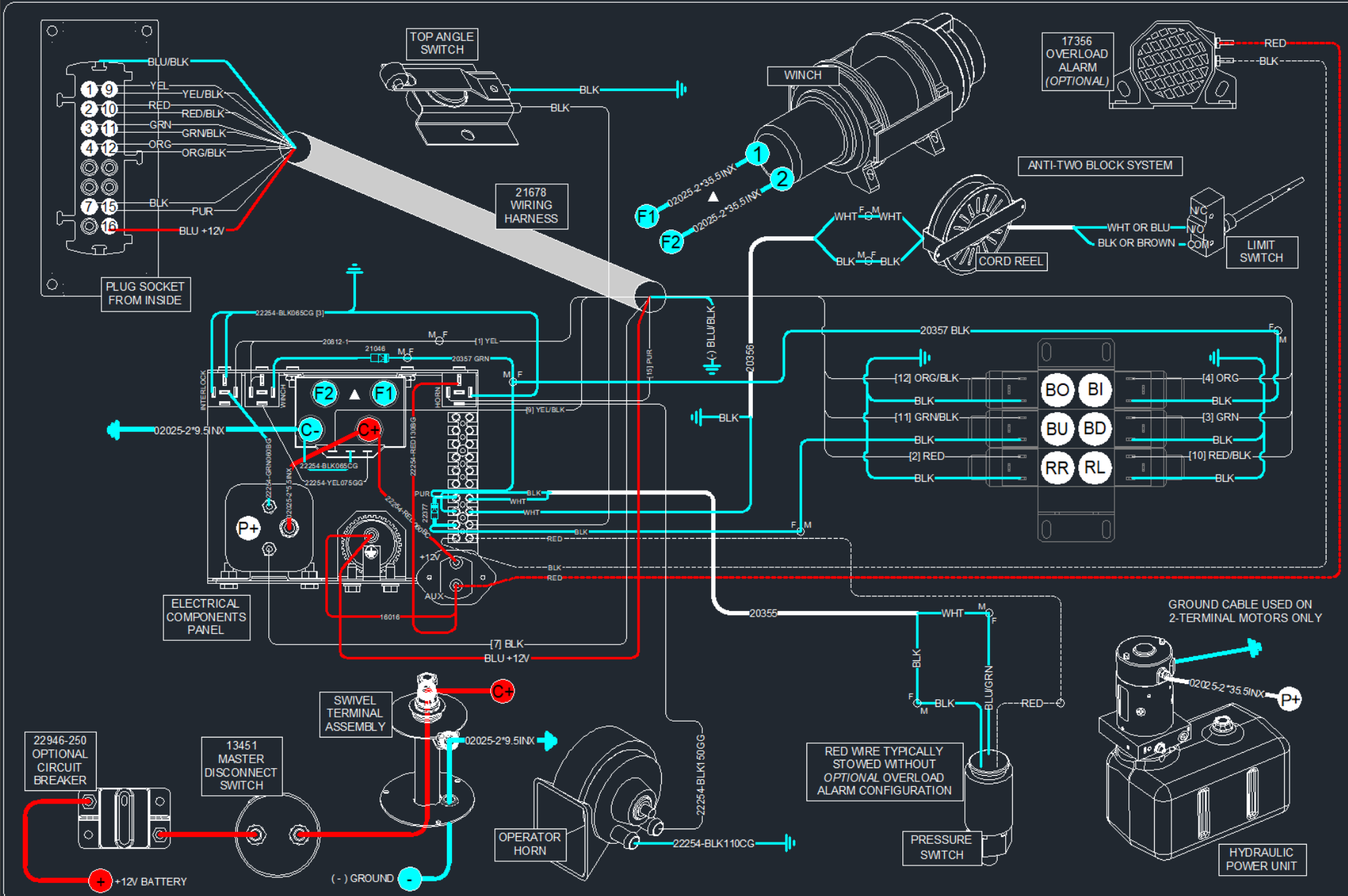


OVERLOAD CONDITION

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

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ELECTRICAL SCHEMATICS



POWER "ON" – NOMINAL

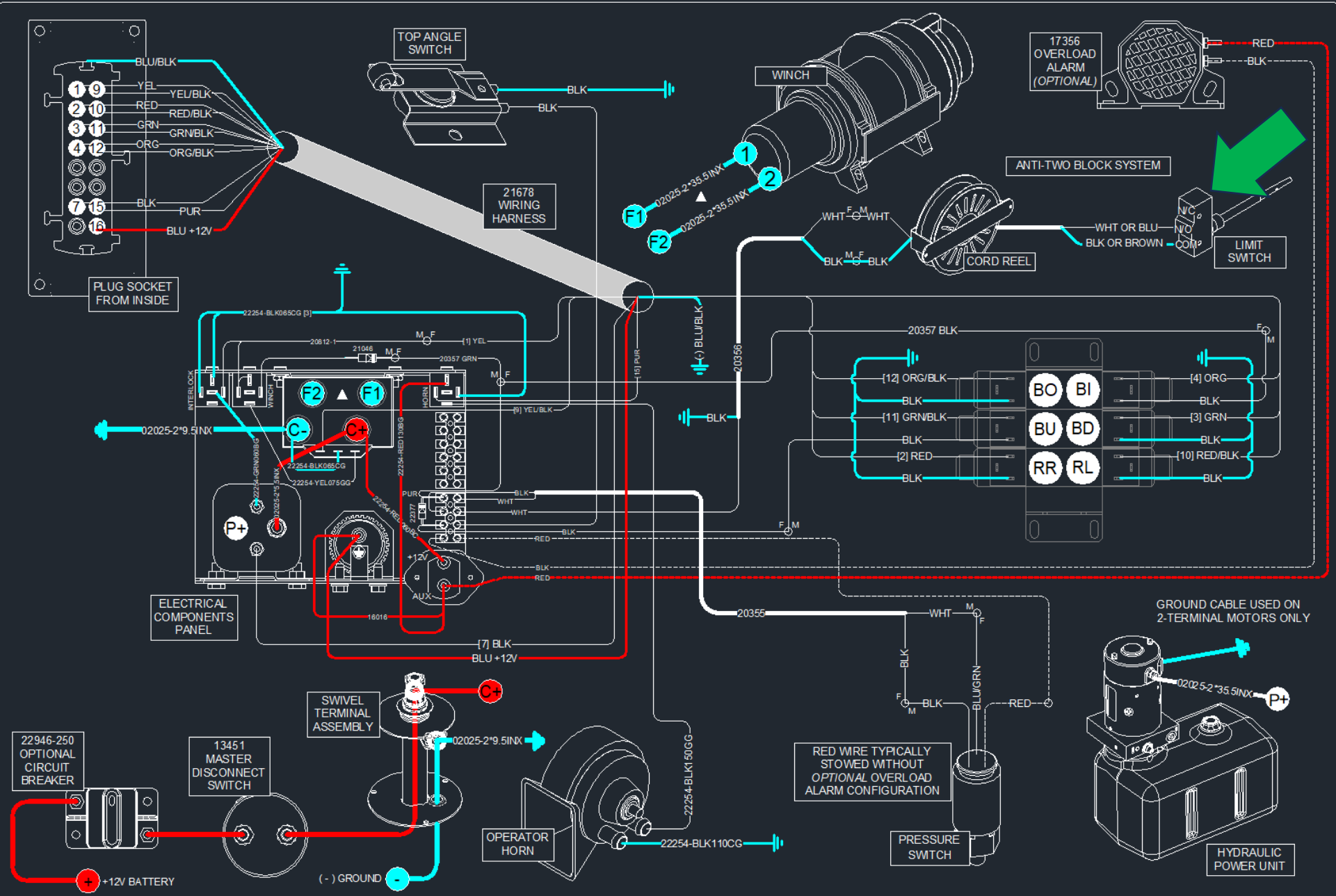
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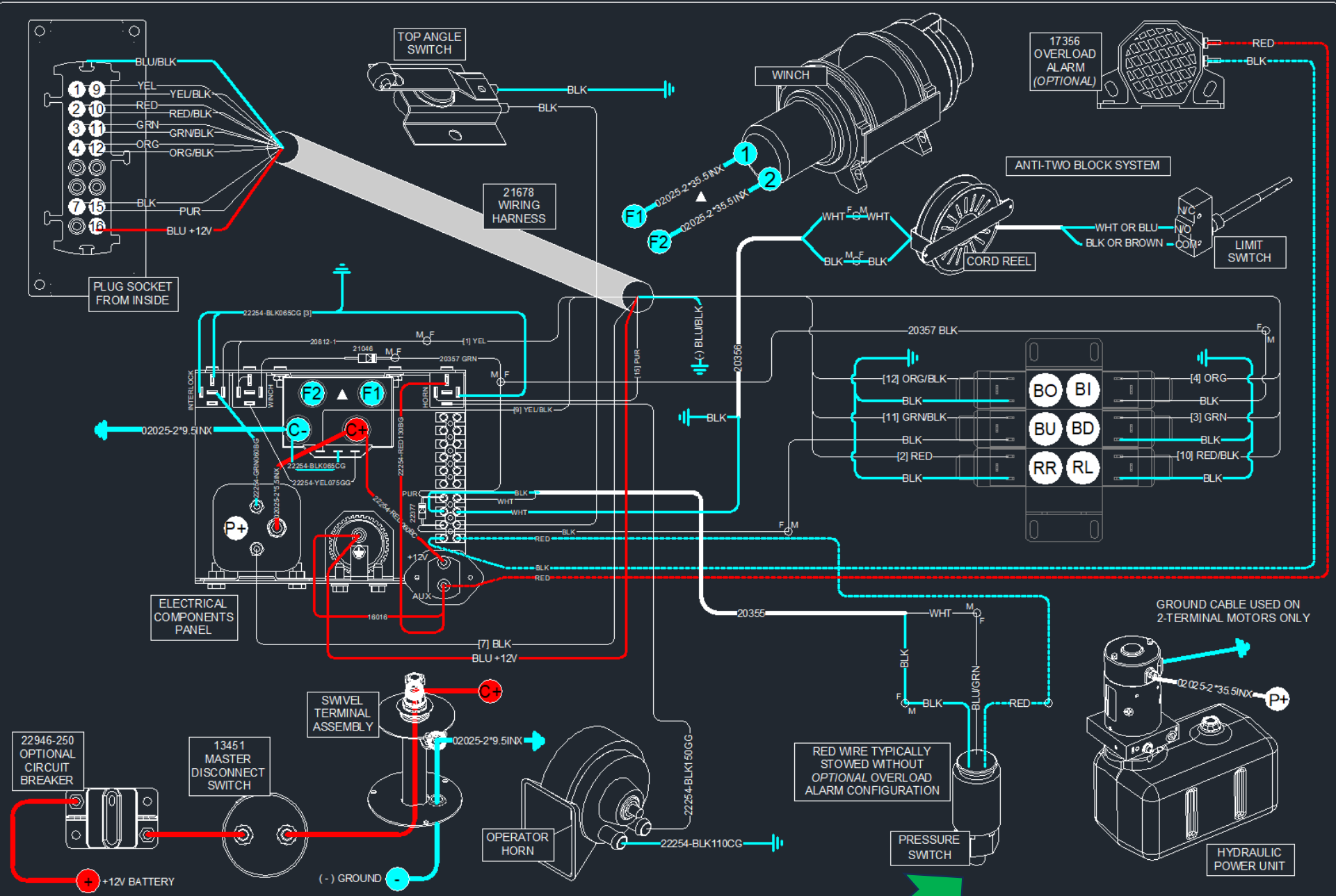
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A2B CONDITION (SWITCH RELAXED)	TITLE WIRING DIAGRAM	DATE 03-06-25A	SECTION C400
	45**E/40**E/351*E/3215E NON PROPORTIONAL	SUPERSEDES 04-11-24	28836



OVERLOAD CONDITION

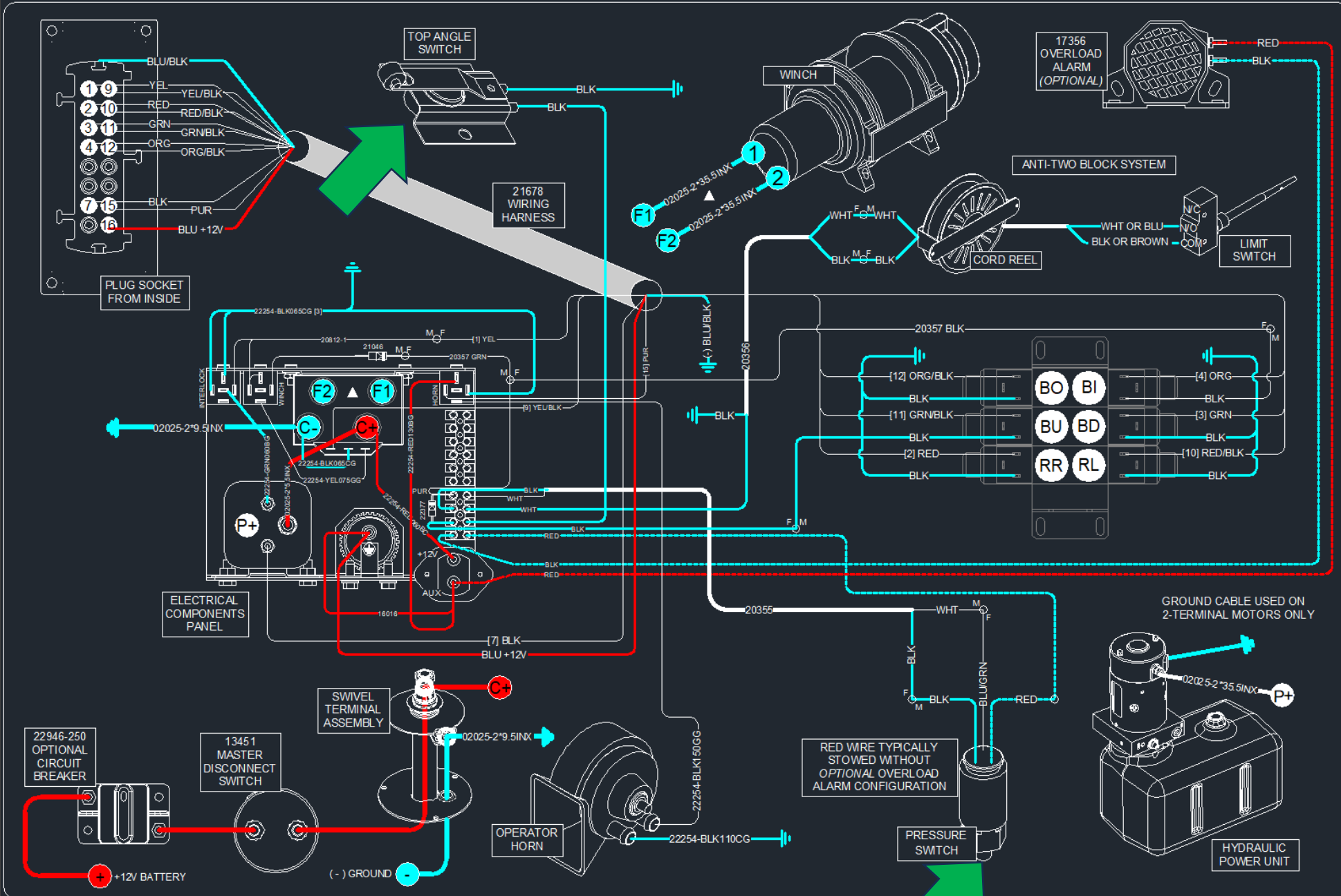
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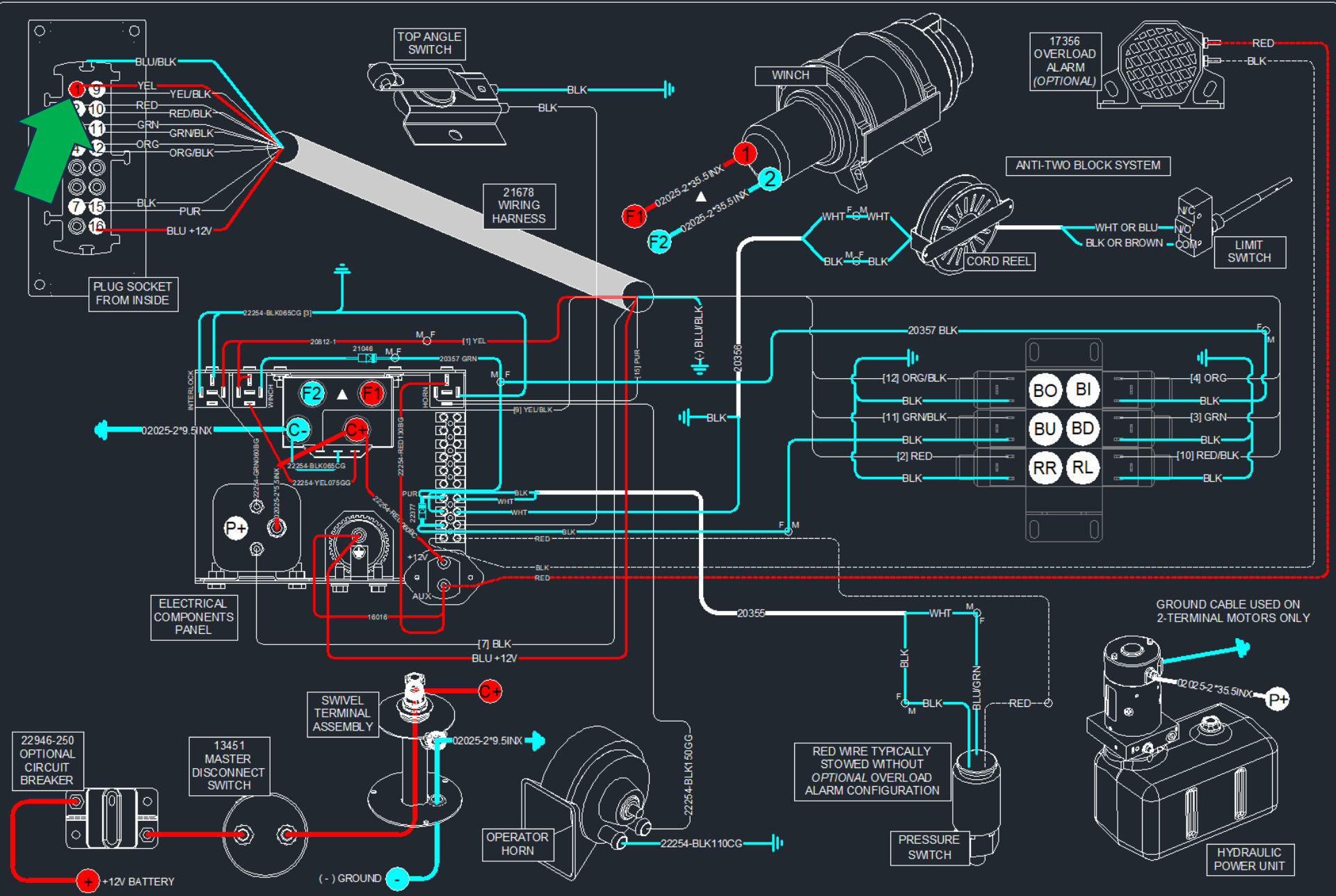
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TOP POSITION SWITCH ACTUATED IN OVERLOAD CONDITION

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

DATE	03-06-25A	SECTION	C400
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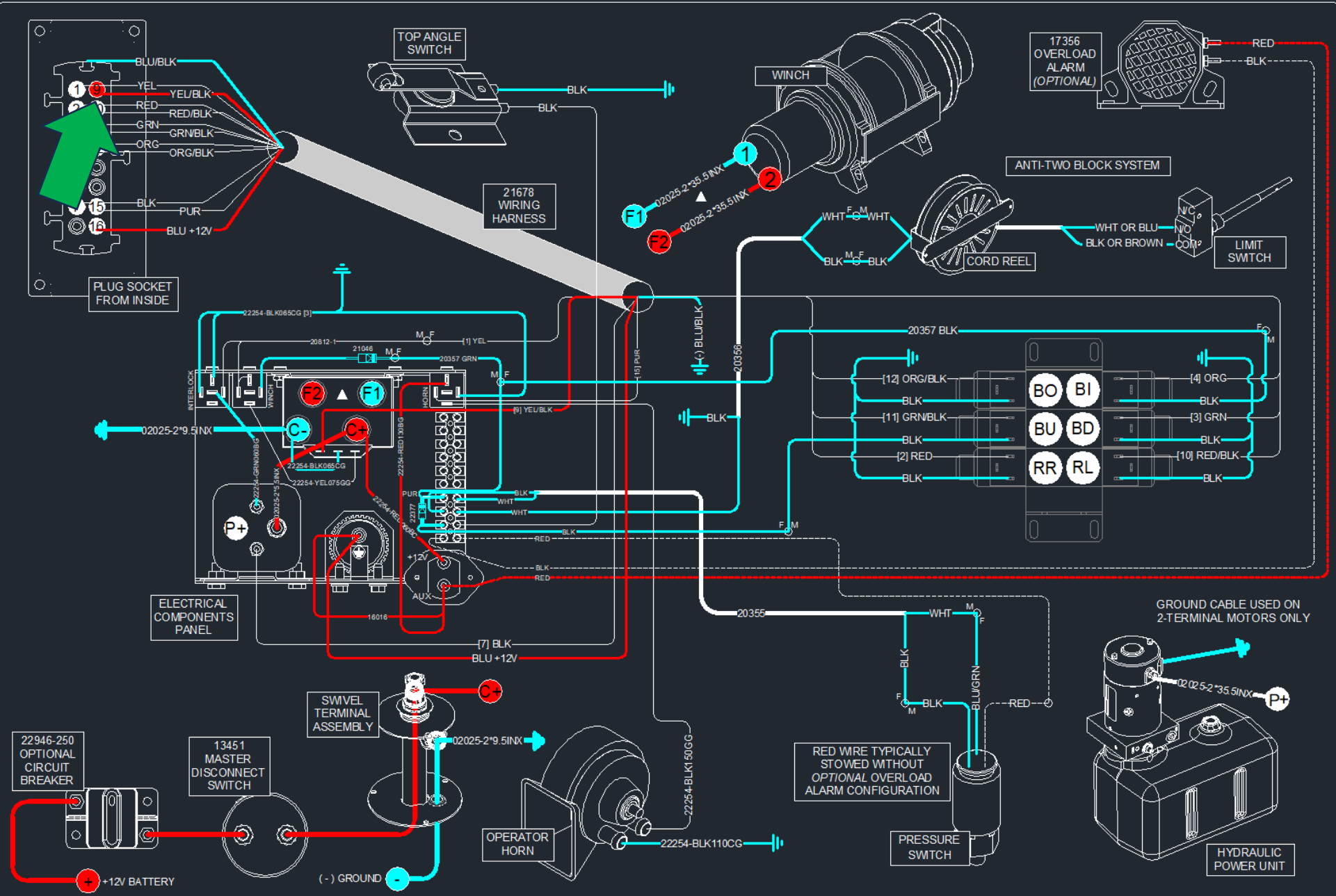


WINCH UP ACTUATED

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

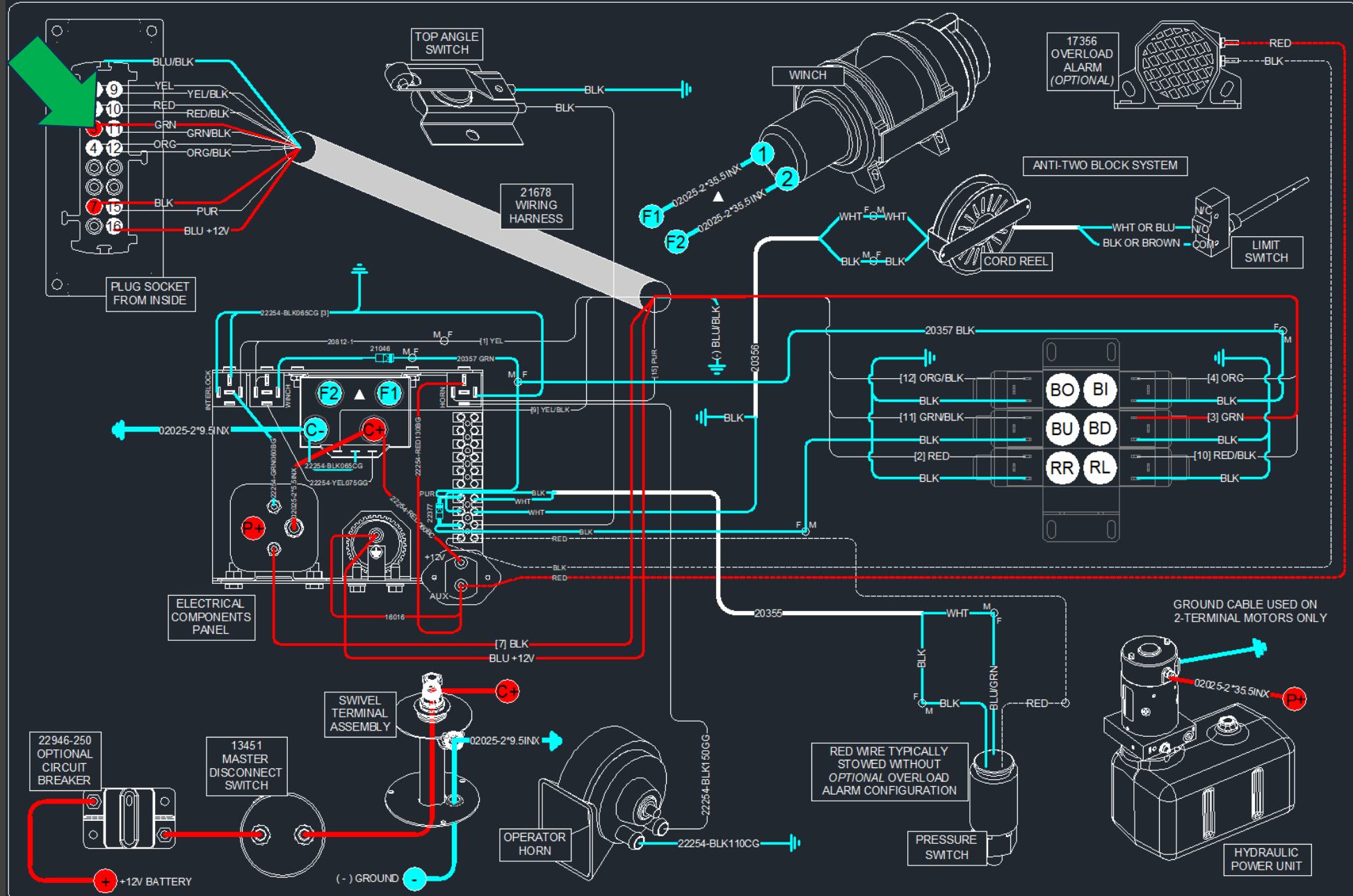
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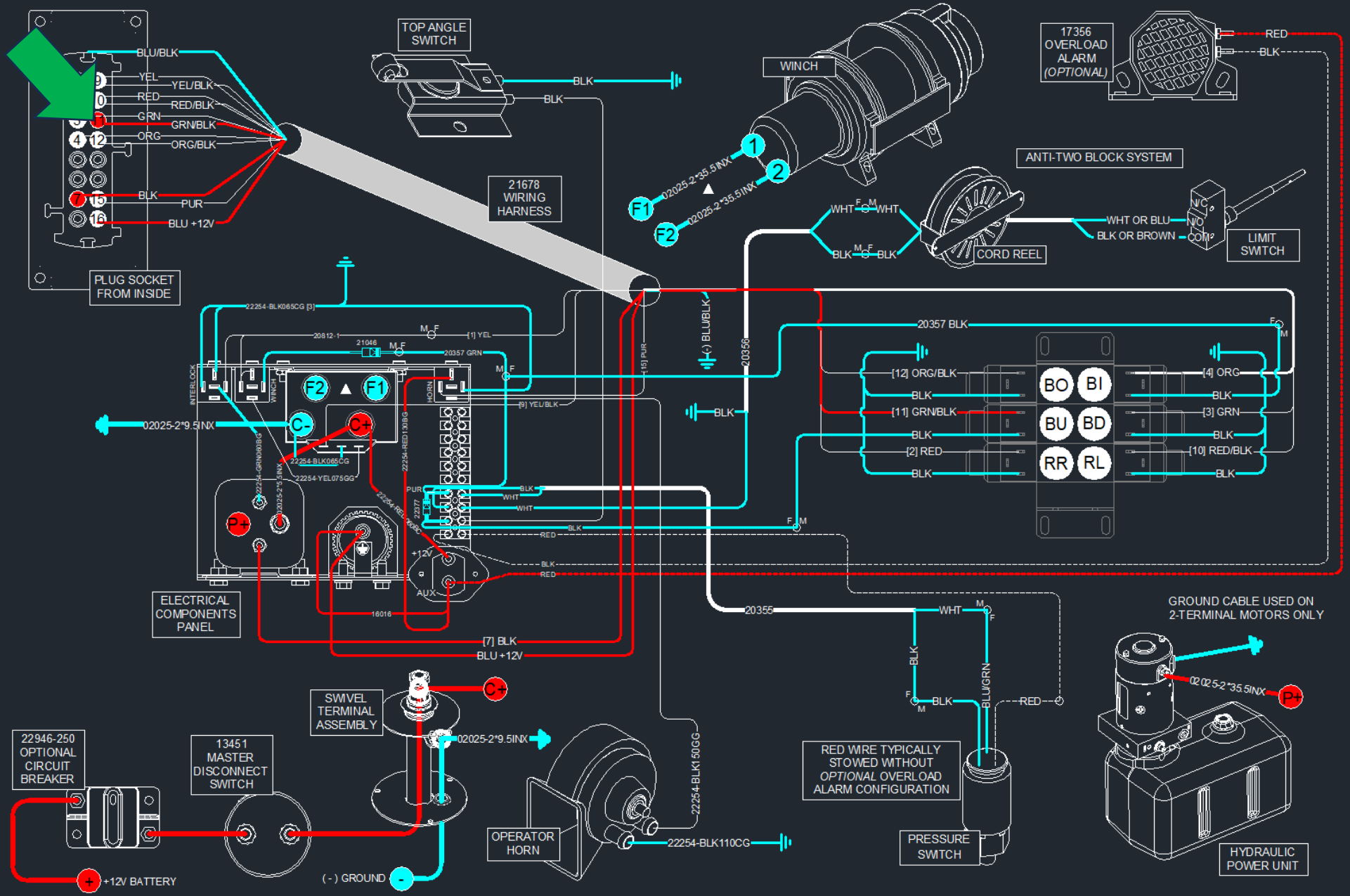
WINCH DOWN ACTUATED

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WIRING DIAGRAM	03-06-25A	C400
45**E/40**E/351**E/3215E	SUPER SEDES	
NON PROPORTIONAL	04-11-24	28836



BOOM UP ACTUATED

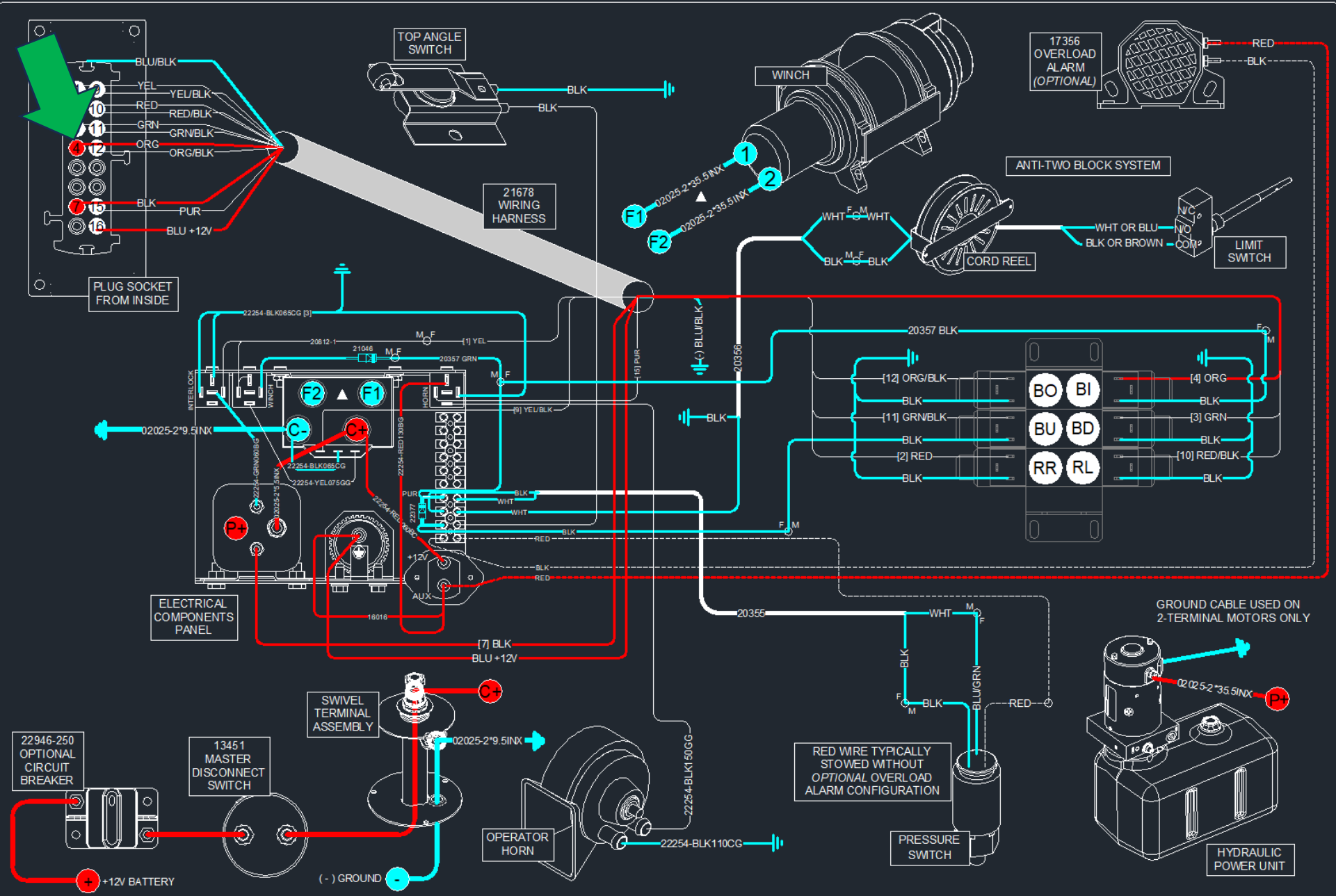
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45**E/40**E/351**E/3215E NON PROPORTIONAL		SUPERSEDES 04-11-24	28836



BOOM DOWN ACTUATED

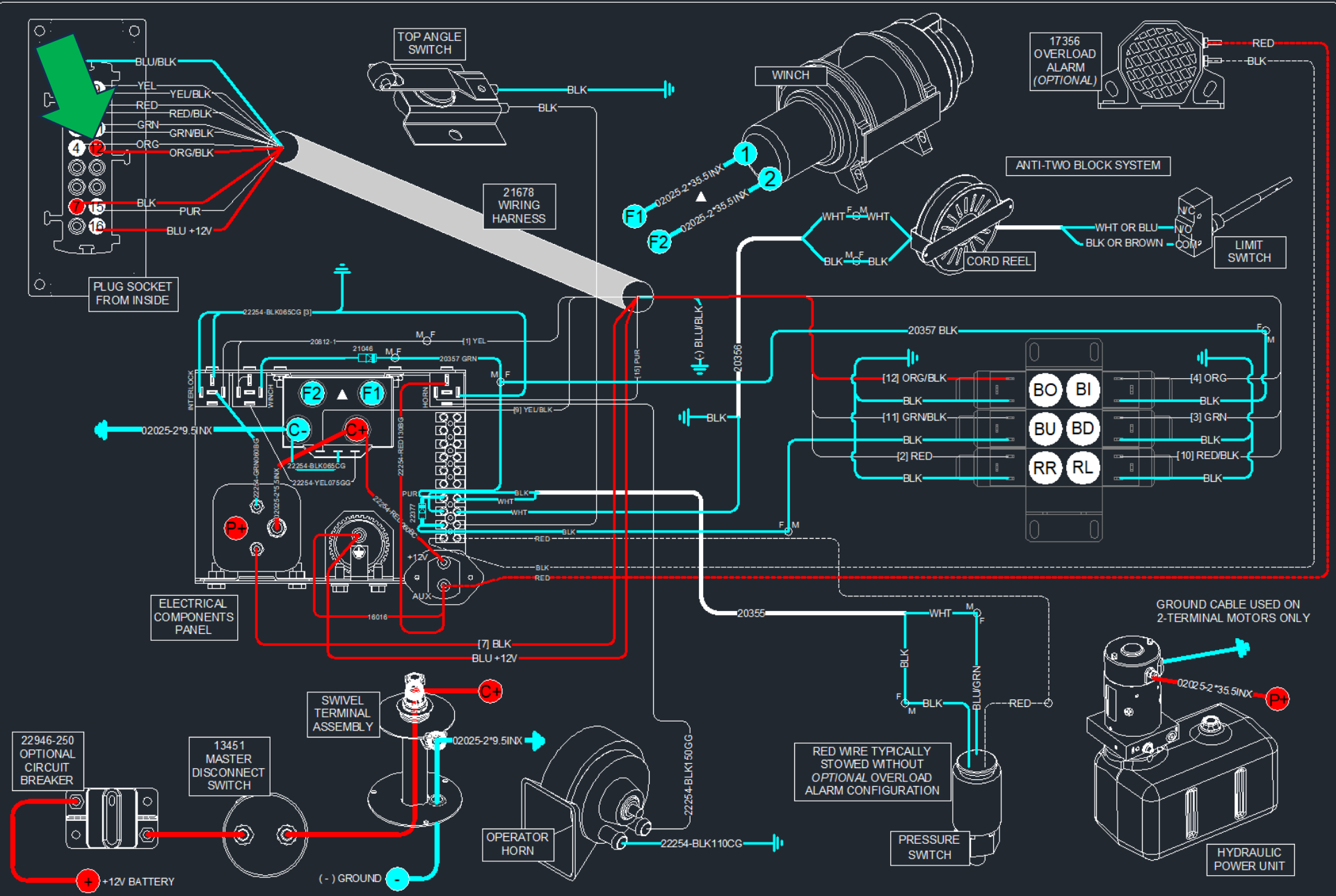
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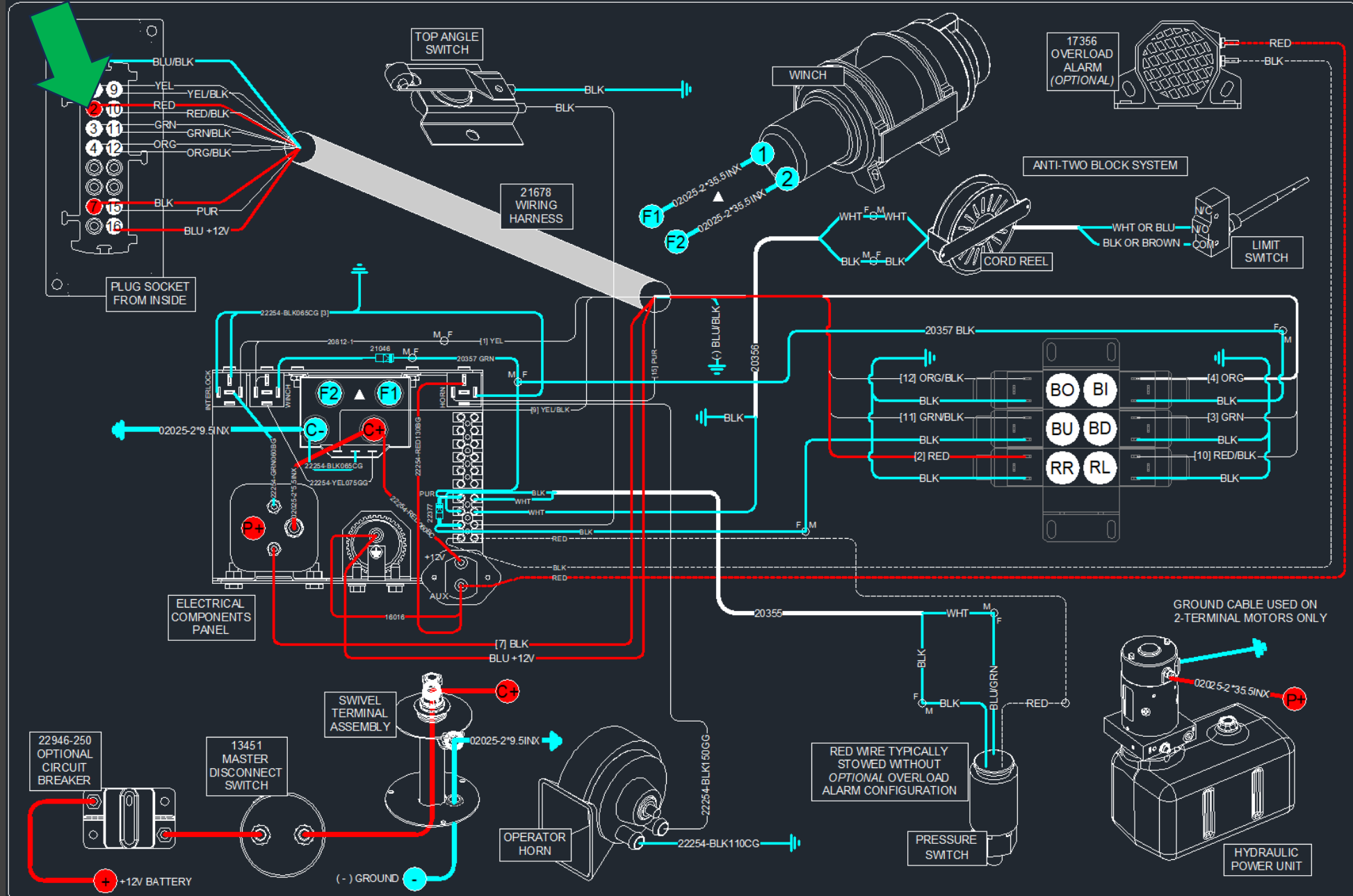
BOOM OUT ACTUATED

TITLE WIRING DIAGRAM		DATE 03-06-25A	SECTION C400
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BOOM IN ACTUATED

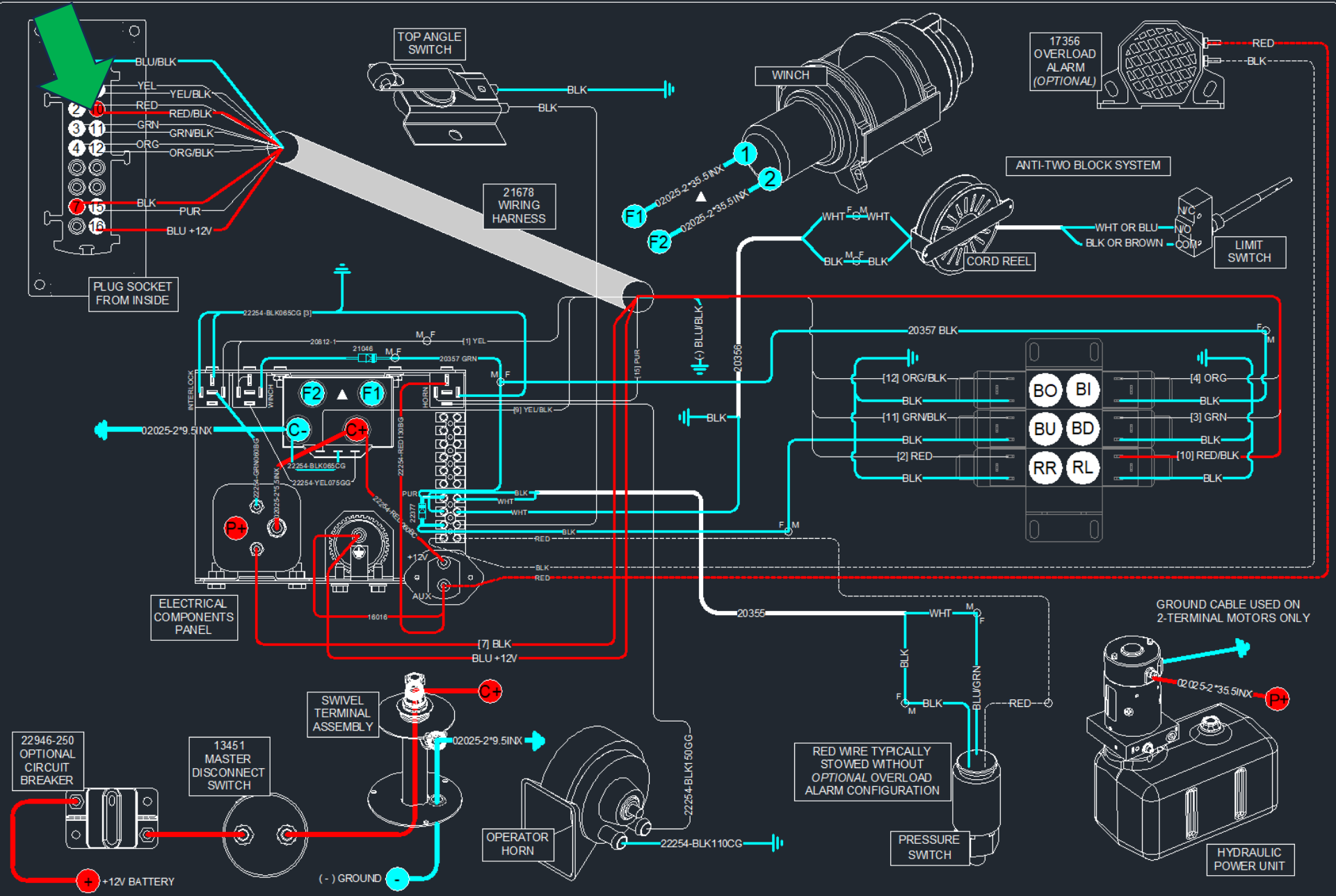
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ROTATE LEFT ACTUATED

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

DATE	SECTION
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SUPERSEDES	
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ROTATE RIGHT ACTUATED

TITLE
WIRING DIAGRAM
 45**E/40**E/351*E/3215E
 NON PROPORTIONAL

DATE
03-06-25A

SECTION
C400

SUPER SERIES
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