



ELECTRICAL SYSTEM TROUBLESHOOTING GUIDE ET PROPORTIONAL CRANES

3215E/351 *E/40**E/45**E

Included in this manual:

- ELECTRICAL DIAGNOSTIC SUPPORT
- FLOW CHARTS
- FUNCTIONALITY SCHEMATICS
- VOLTAGE ILLUSTRATIONS

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This manual also available online at www.venturo.com.

ELECTRICAL SYSTEM T/S GUIDE ET PROP CRANES

INST-34999 - 8/4/2026 (Rev: NEW0)

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READ THIS FIRST

QUICK START GUIDE (QSG)

THE QSG THAT FOLLOWS PROVIDES BASIC INSTRUCTIONS FOR OPERATING THE TRUCK, CRANE AND STABILIZERS.

BEFORE FOLLOWING THE QSG, REVIEW THESE WORK SAFELY RULES:



WORK SAFELY: FOLLOW THESE RULES

A careful operator is the best insurance against an accident.

Important safety points to remember and follow while operating this unit:

- **ALWAYS** have a clear view of the work area.
- **ALWAYS** use the proper tools with safety glasses when working with and/or around the truck
- **ALWAYS** make sure no one is around or on the truck before starting it.
- **ALWAYS** depress the clutch pedal before engaging or disengaging the PTO.
- **ALWAYS** stabilize the unit before attempting any lifting operation.
- **ALWAYS** repair any defects before placing the unit in service.
- **ALWAYS** disengage the PTO before moving the vehicle.
- **ALWAYS** make sure to extend the wire rope before extending the inner boom when using the winch.
- **ALWAYS** keep the load as close to the ground as possible.
- **ALWAYS** deduct the weight of the load handling equipment from the rated capacity of the crane.
- **ALWAYS** stand clear when positioning outriggers.
- **ALWAYS** keep the crane operating area clear of unauthorized personnel.
- **ALWAYS** stow crane prior to moving the vehicle.
- **ALWAYS** have 5 minimum cable wraps on the crane winch drum.

- **NEVER** operate the crane too close to a power line. (see OSHA CFR 1926.1407-1411)
- **NEVER** lubricate, adjust or service truck while the engine is running, except when necessary.
- **NEVER** allow anyone in the operator's position to accidentally start the engine while servicing.
 - After servicing, be sure all equipment, tools, and parts are removed.
- **NEVER** swing a load so it passes over people.
- **NEVER** swing a load so it passes over the cab of truck.
- **NEVER** rotate the crane too fast with a load.
- **NEVER** exceed the rated lifting capacity.
- **NEVER** leave the operator's station with a load suspended in the air.
- **NEVER** use the winch to drag a load into position before lifting.
- **NEVER** side load the boom by dragging a load from the side.
- **NEVER** use the crane for lifting people.
- **NEVER** use quick, jerky movements when operating the crane.
- **NEVER** operate the crane during an electrical storm or when high wind conditions exist.
- **NEVER** perform any work on the crane unless authorized to do so.
- **NEVER** attempt to service or repair the crane while the crane is operating.
- **NEVER** pick and carry with any crane.

*** The most crucial factors in the safe operation of the crane are a competent operator, mechanical soundness of the crane, and absolute assurance that the crane is not loaded to exceed its maximum rated capacity. ***



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TITLE

SAFETY RECOMMENDATIONS

VTEC QUICK START GUIDE

DATE

04-08-24

SUPERSEDES

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SECTION

VT1217

ABBREVIATIONS USED IN THIS GUIDE

- 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
- ELEC = ELECTRICAL
- SYS = SYSTEM
- T/S = TROUBLESHOOTING
- HYD = HYDRAULIC
- HPU = HYDRAULIC POWER UNIT
- QCM = QUICK CONNECT MALE
- QCF = QUICK CONNECT FEMALE
- BLU = BLUE
- BLK = BLACK
- YEL = YELLOW
- GRN = GREEN
- ORG = ORANGE
- PUR = PURPLE



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TITLE
ABBREVIATIONS

ELEC SYS T/S GUIDE

DATE
02-09-26

SUPERSEDES
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SECTION
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35010

COMPACT A2B SYSTEM

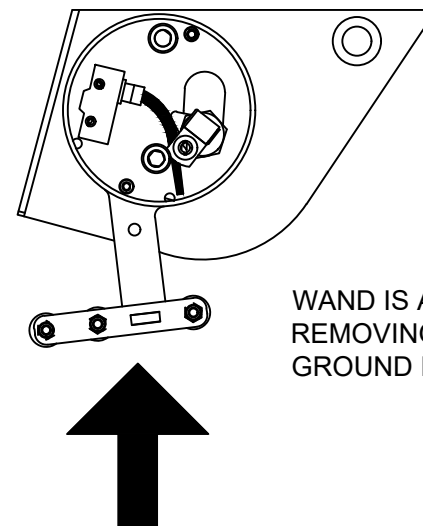
Why Is It Necessary?

- Prevents over-tensioning of the wire-rope which could occur if the load block were to make contact with the boom tip
- An A2B System is Required by ASME/ANSI B30.5 SECTION 5-1.9.9.1

What Does It Do?

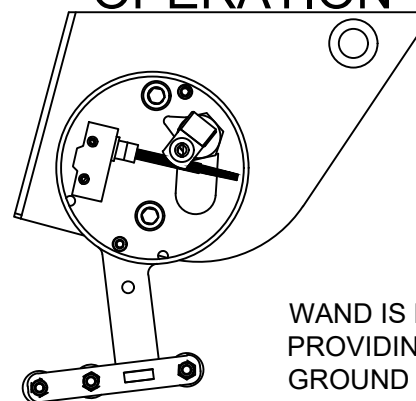
- The A2B Switch is located on the boom head (tip)
- The A2B Switch is wired as a Normally Closed (N/C) switch (when wand is relaxed); during normal operation the electrical circuit is Closed
- The Closed electrical circuit provides a ground path to WU, BD, BO
- When the A2B is contacted by the load 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)

A2B CONDITION ACTUATED



WAND IS ACTUATED
REMOVING ELECTRICAL
GROUND PATH

NORMAL OPERATION



WAND IS RELAXED
PROVIDING ELECTRICAL
GROUND PATH



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COMPACT A2B SYSTEM

ELEC SYS T/S GUIDE

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SUPSEDES
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SECTION

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35020

WEIGHTED ANTI-TWO-BLOCK ASSY

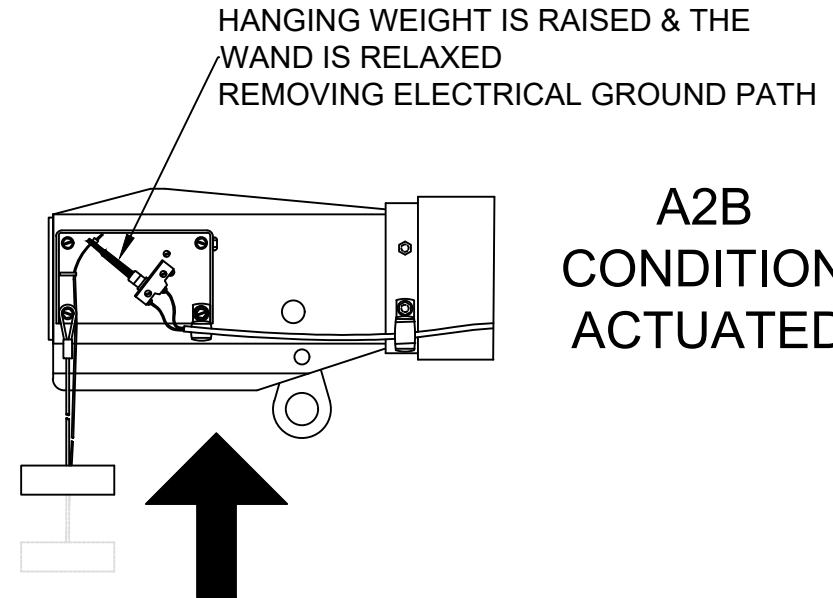
WEIGHTED A2B SYSTEM

Why Is It Necessary?

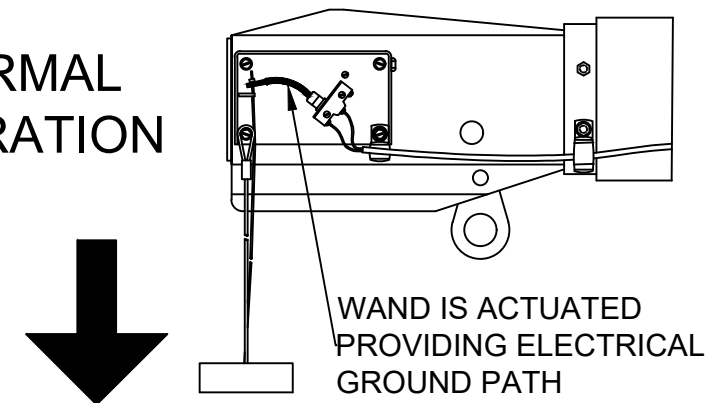
- Prevents over-tensioning of the wire-rope which could occur if the load block were to make contact with the boom tip
- An A2B System is Required by ASME/ANSI B30.5 SECTION 5-1.9.9.1

What Does It Do?

- The A2B Switch is located on the boom head (tip)
- The A2B Switch is wired as a Normally Open (N/O) 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 A2B hang weight is raised, the A2B Switch is relaxed and the electrical circuit is Open
- The Open electrical circuit removes the ground path from WU (relay), BD (valve coil), and BO (valve coil)



NORMAL OPERATION



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WEIGHTED A2B FUNCTIONALITY

DATE

04-23-26

SECTION

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3215E, 3515E, 4016E, 4516E

SUPERSEDES

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35025

OVERLOAD PRESSURE SWITCH

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 as 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)



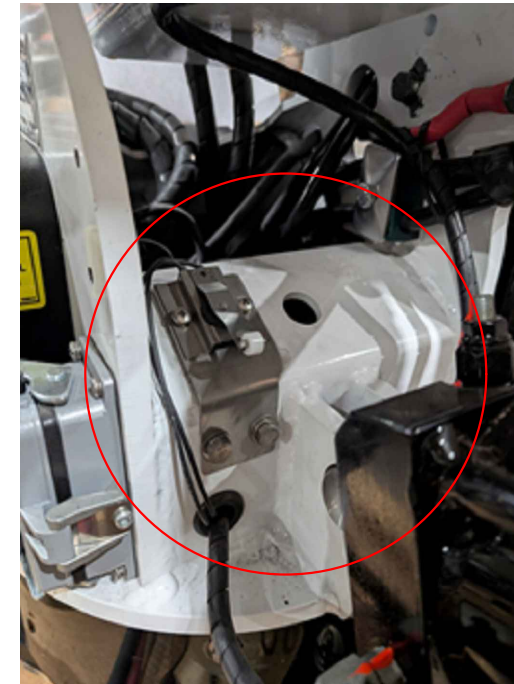
TOP POSITION SWITCH

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 disabled

What Does It Do?

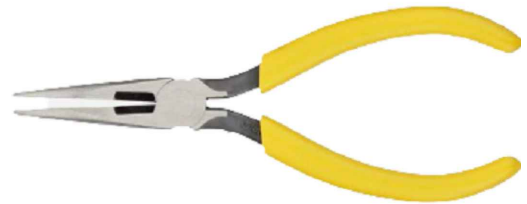
- Located at the front bulkhead of the housing near the base of the elevation cylinder
- Normally Open (N/O) switch
- When the boom is fully elevated, the switch is actuated by the elevation cylinder base
- Once actuated, the switch provides alternate ground to the Boom Down valve solenoid coil, allowing the boom to be lowered and the pressure relieved



REQUIRED FOR DIAGNOSTIC

Items Required

- Multimeter
- Needle Nose Pliers
- Diagonal Cutters
- 5 ½" Cable Ties



TESTING FOR + & - DC VOLTAGE

TESTING FOR GROUND

- Use the Multimeter set to Continuity/ Resistance measurement - ideally an audible alarm sounds when continuity is detected
- Touch probes together to make sure you either hear a 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 the other probe on a bolt that is threaded into the crane housing

TESTING FOR +12V (DC)

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



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TESTING FOR + & - VOLTAGE

DATE

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SECTION

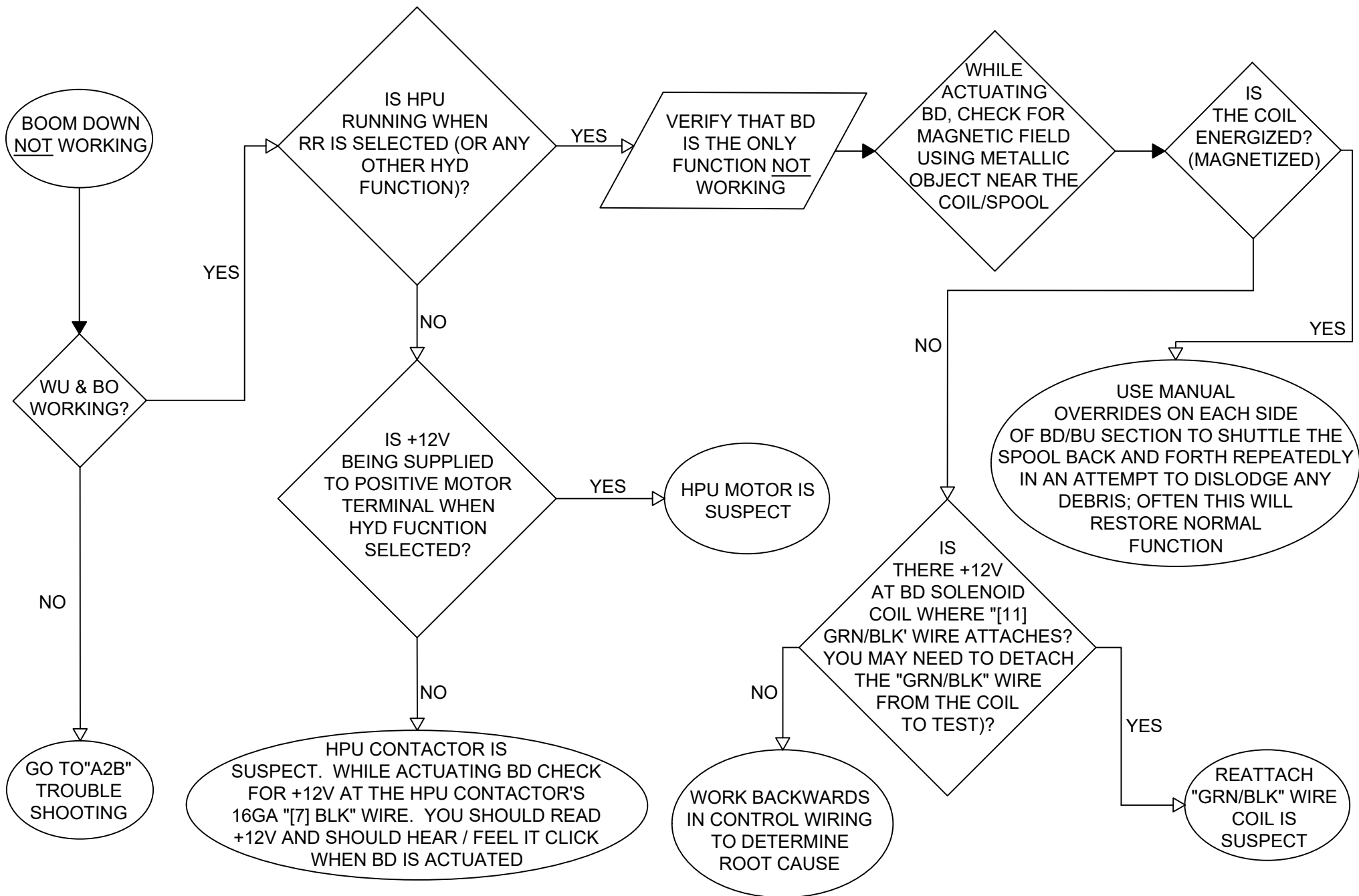
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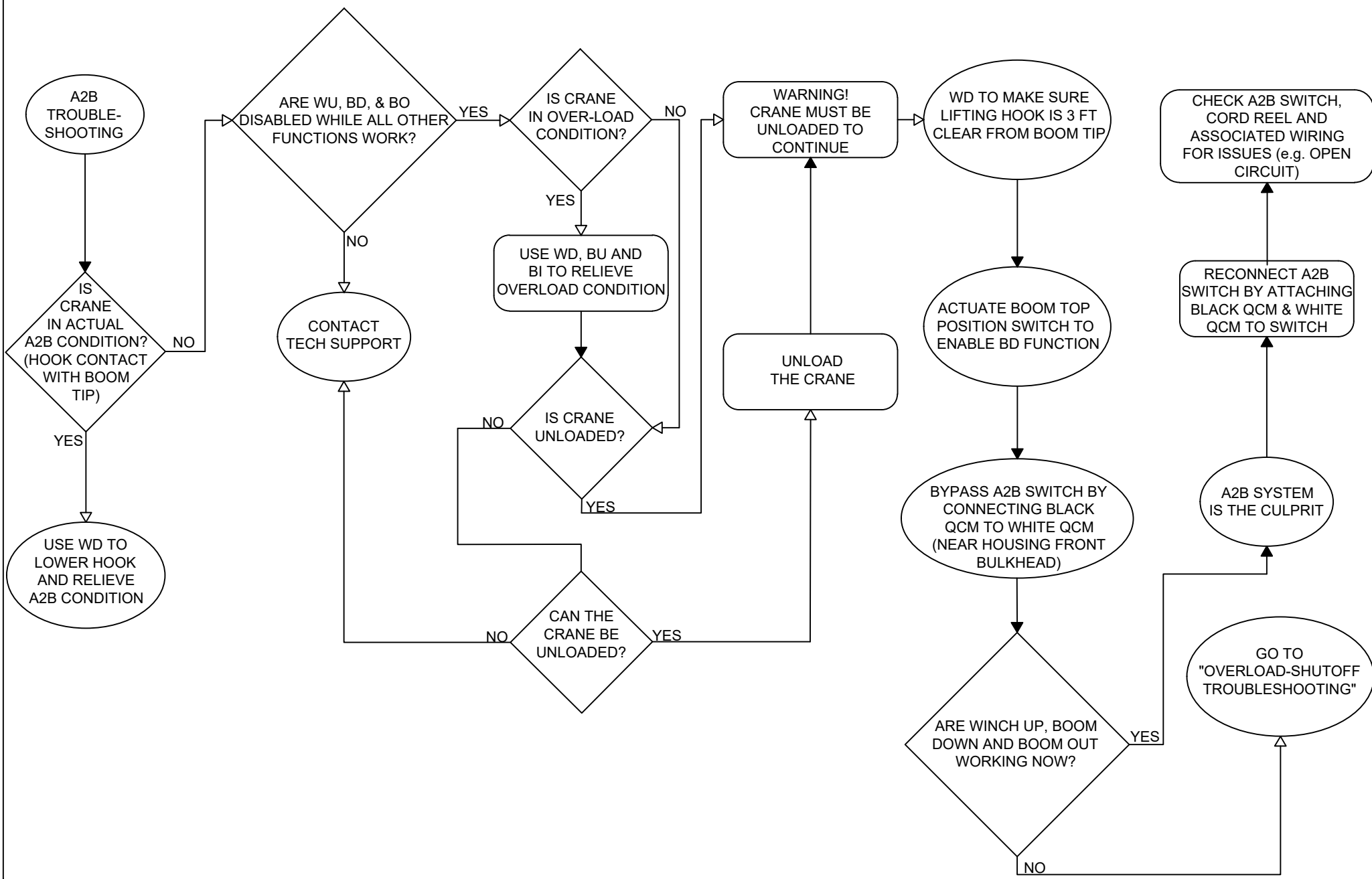
ELEC SYS T/S GUIDE

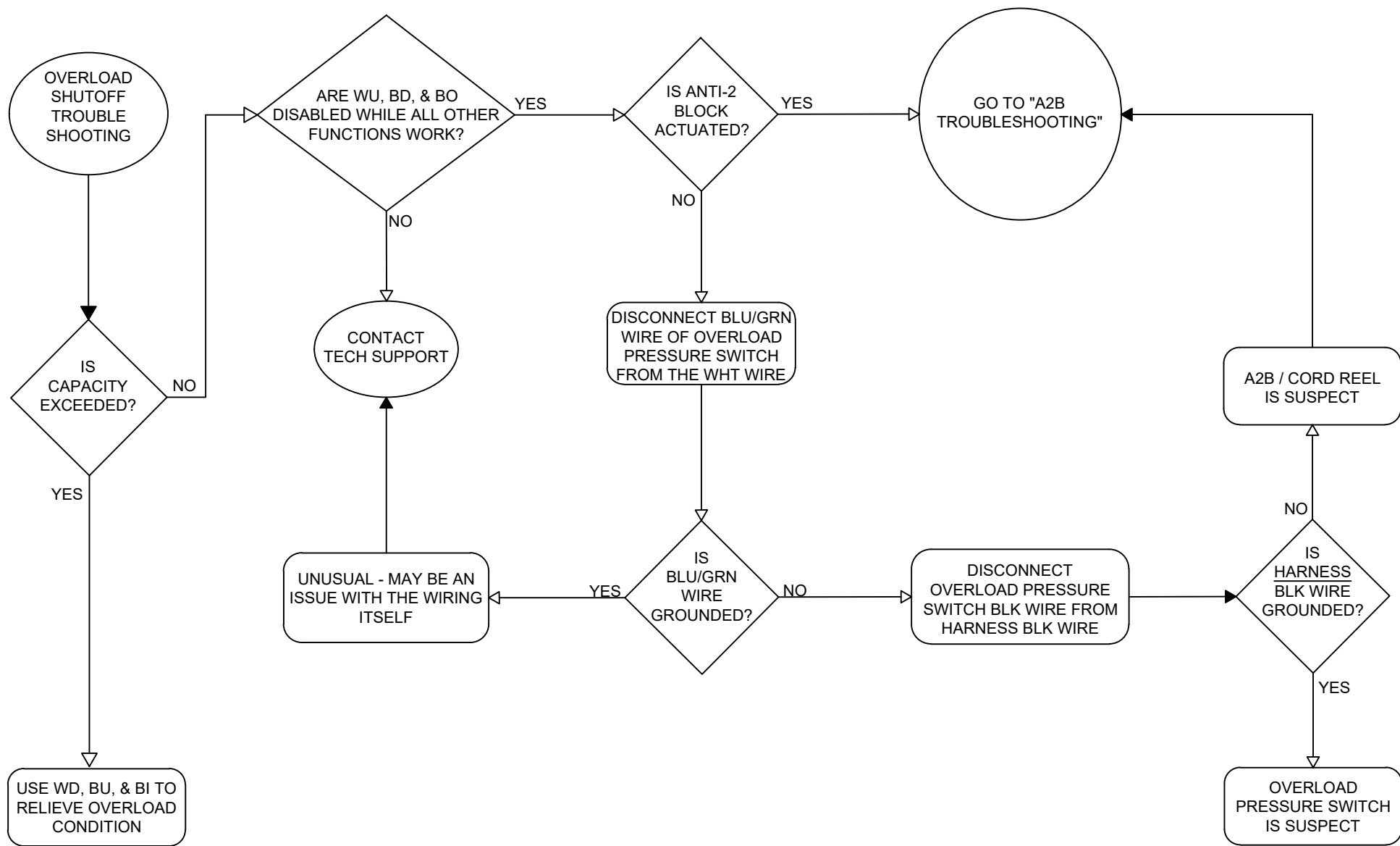
SUPERSEDES

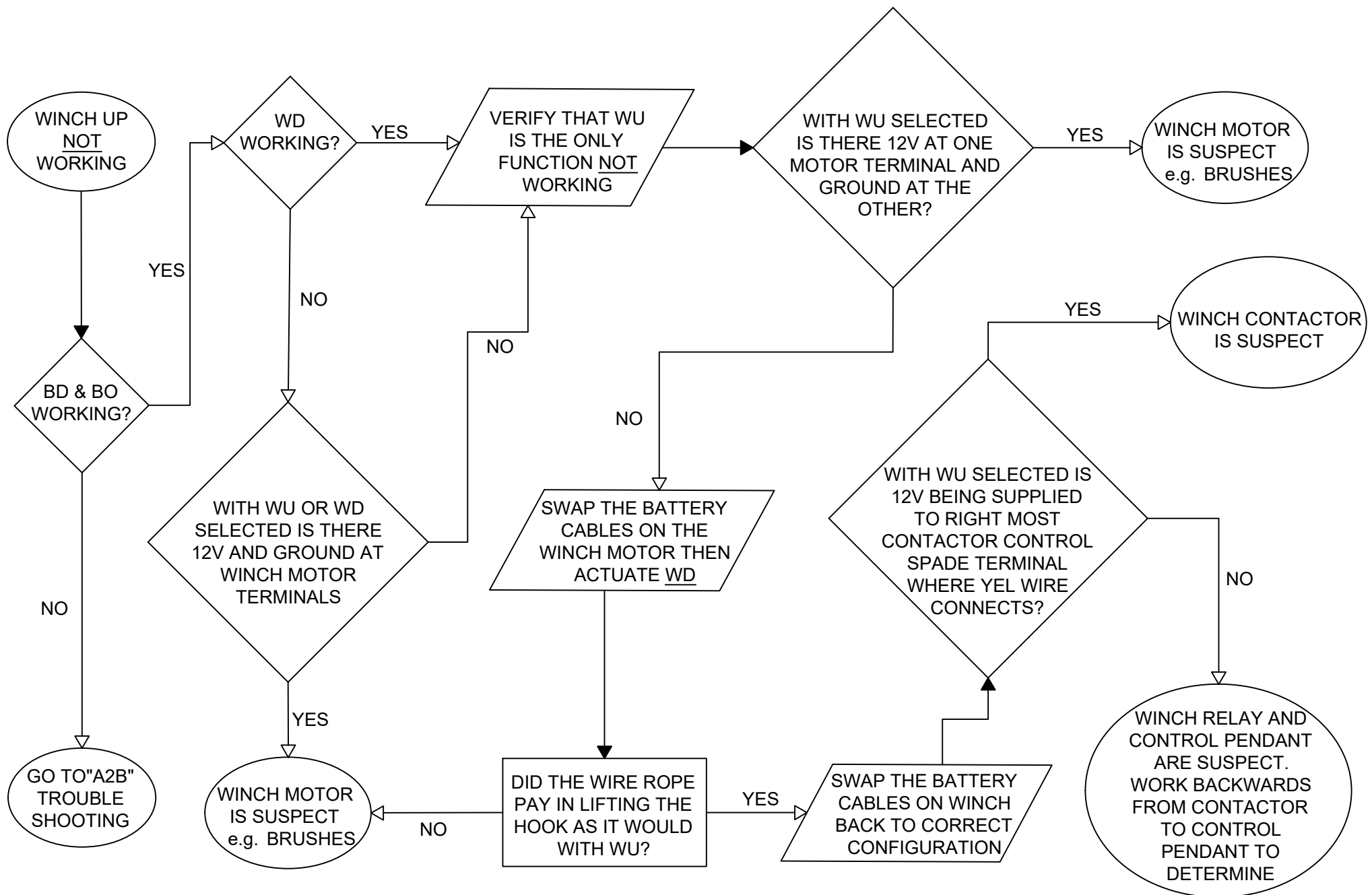
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35060











VENTURO CRANES LIMITED WARRANTY POLICY

Venturo products are built to last...we guarantee them.

As a purchaser of any new Venturo product covered by warranty, you will receive 1 year of the most complete coverage available...and, at no added cost to you.

1-Year Limited Warranty Policy

This limited policy warrants new products of Venturo to be free from defects in material and workmanship for a period of one (1) year from date of original installation. OEM products or accessories purchased by Venturo as part of or offered with our product will carry the OEM manufacturer's respective warranty. Our warranty covers:

- ***Repair or replacement of product***
- ***Labor to repair or replace product***
- ***Freight to return and/or replace product***

We shall not be liable for any contingent liabilities arising out of the improper function of any products. Warranty shall become void if the product is improperly installed, modified, damaged, abused or used for application other than intended use. There is no warranty of merchantability, fitness for a particular purpose, warranty arising from course of dealing or usage of trade, or any other implied or expressed warranty, except as made specifically herein. This warranty supersedes all previous warranties, written or implied.

Warranty Claims

Venco Venturo Industries LLC will make a good faith effort for prompt correction or other adjustment with respect to any product, which proves to be defective after our inspection and within the warranty period. Before any repairs are attempted or before returning any product, your Venturo Distributor is required to obtain a warranty claim number. This number is necessary for any claim to be considered. To obtain a warranty claim number, Venturo requires the model and serial number. Only authorized Venturo Distributors can perform warranty. For the name and address of your local Venturo Distributor call the **Warranty Claim Department - 513-772-8448**.

WARNING - It is the responsibility of the installer to ensure the installation is completed according to the manufacturer's recommendations, ensure the ultimate user understands how to operate product in a safe manner, and understands the need for regular service and maintenance by an authorized Venturo Distributor. No modifications or alterations may be made to any Venturo product without the expressed written consent of Venco Venturo Industries LLC. Installation of any Venturo product must be done by an authorized Venturo Distributor, to the standards of the industry; including maintenance, service and affixing of all instruction, safety and warning decals. Users should be instructed as to the safe operation at time of delivery. Maintenance, service, operation and safety warning decals are available on request from Venco Venturo Industries LLC.

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