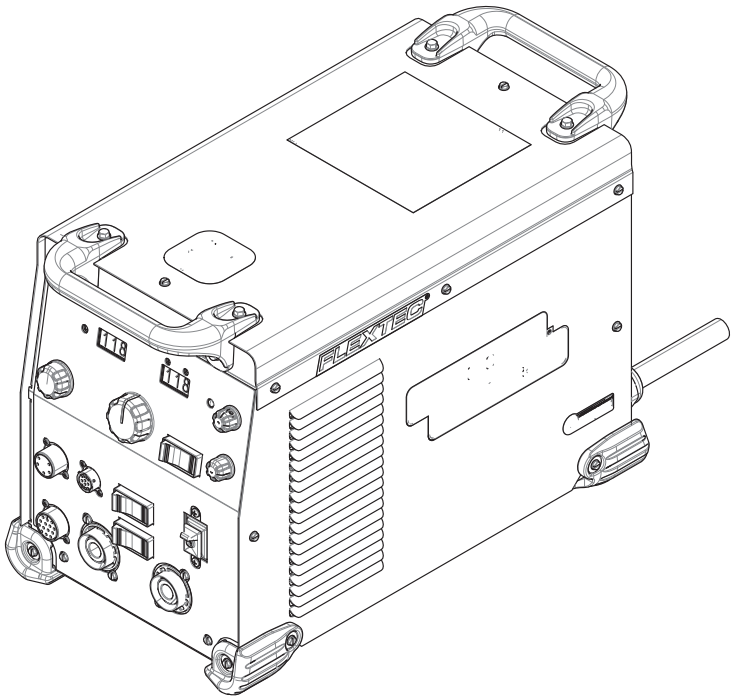
LINCOLN ELECTRIC

Service Manual

Flextec® 350X Power Connect



For use with machines having Code Numbers:

12822, 12946

GENUINE LINCOLN PARTS™

Register your machine:
www.lincolnelectric.com/register

Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

Need Help? Call 1.888.935.3877
to talk to a Service Representative

Hours of Operation:
8:00 AM to 6:00 PM (ET) Mon. thru Fri.

After hours?
Use "Ask the Experts" at lincolnelectric.com
A Lincoln Service Representative will contact you no later than the following business day.

For Service outside the USA:
Email: globalservice@lincolnelectric.com

SVM10526 | Issue Date Jul - 20

THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com

Table of Contents

This page intentionally left blank

This page intentionally left blank

This page intentionally left blank

USING THE STATUS LED TO TROUBLESHOOT SYSTEM PROBLEMS

Observe Safety Guidelines detailed in the beginning of this manual.

Errors are displayed on the user interface. In addition, there are status lights on the User Interface board and the Switchboard that contain error sequences.

Included in this section is information about the status lights and some basic troubleshooting charts for both machine and weld performance.

The status lights on the User Interface board, Crosslinc™, Input board, Inverter Control board and the Switchboard are dual-color LED's or green LEDs. Normal operation for each is described on the wiring diagram.

Error conditions are indicated in the following chart.

FAULT CODES

ERROR CODE NUMBER	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
6	1. Device that controls sequence of the welding operation halted due to an error.	1. Communication from the Power Source failed before mapping was complete.	1. Weld Terminals Remote: Re-trigger to recover from error. 2. Weld Terminals Local: Toggle Remote / Local Switch to recover from error.
18	1. ArcLink Auto-Mapping Failed.	1. The machine could not properly configure the devices that are attached to it. This configuration problem could be caused by the type of devices that are connected to the machine or a required device that is not connected.	1. Refer to the Operator's Manual for proper configuration. Verify all devices in the system are properly powered.
21	1. Device that controls sequence of the welding operation halted due to an error.	1. A component of the system encountered an error during the welding sequence and caused system to stop. The component with the error could be a wire drive, a user interface or some other part of the system.	1. Weld Terminals Remote: Re-trigger to recover from error. 2. Weld Terminals Local: Toggle Remote / Local Switch to recover from error.
31	1. Primary Overcurrent.	1. Peak current through the transformer primary has exceeded its threshold.	1. Check the input power (voltage and frequency). Verify that the PC boards and input rectifier are in working condition and proper input power and welding output

ERROR CODE NUMBER	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
			cable connections. Verify proper connections of main internal power components. Power must be cycled to the machine to reset the error.
36	1. Thermal Fault.	1. Machine shut off output due to elevated internal temperatures.	1. Check for material blocking intake or exhaust louvers. • Blow air in the rear louvers to clear dirt from the fan. **NOTE:** The Fan As Needed circuitry automatically shuts off the fan 5 minutes after welding has stopped. 2. Welding output ratings may have been exceeded. Allow the machine to cool down and reset. 3. Measure the thermostats at the Switchboard and replace if defective.
45	1. Output Voltage Limit Exceeded.	1. During OCV, the voltage at the studs exceeded the allowable levels.	1. If VRD is enabled, the stud voltage exceeded 35 volts peak. In standard operation, the stud voltage exceeded 113 volts peak. Verify the voltage feedback leads are properly connected inside the machine. Verify the input voltage is within ¬± 10% of the nominal value.
213	1. Communication Fault.	1. CAN communication between the User Interface board and the Switchboard has been interrupted.	1. Power must be cycled to the machine to reset the error. Visually inspect the CAN harness to ensure connections and condition. Verify power supply to the User Interface and Switchboard. Replace defective assemblies as required.
711	1. DC Link Capacitor Over/Under Voltage.	1. The voltage on the main DC link capacitors housed on the switchboard has either gone too high or too low.	1. Verify all phases of the AC input are connected.

TROUBLESHOOTING GUIDE

Observe Safety Guidelines detailed in the beginning of this manual.

FUNCTION PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
Major mechanical or electrical damage is evident.	1. Contact your local Lincoln Authorized Field Service Facility.	1. Contact the Lincoln Electric Service Department at 1-888-935-3877.
The machine is “dead”. No lights, no output, the machine appears to have no input power.	1. Make sure the line switch is in the ON position. 2. Check to make sure the correct input power is present at the machine.	1. Check the input switch for proper operation. Also check the associated leads for loose or faulty connections. See Wiring Diagram. 2. Perform the **Line Switch Test Procedure**. 3. Perform the **Input Rectifier And SCR (Pre-Charge) Board Test Procedure**. 4. Perform the **Auxiliary Power Board Test Procedure**. 5. Perform the **Main Capacitor Board Test Procedure**.
There is no welding output from the Flextec 350X Power Connect machine. **NOTE:** This problem may be accompanied by an error code.	1. Make sure the S5 weld terminals switch is in the “ON” position (standard models only). 2. Make certain the correct input power is being applied to the machine. The input may be too high or too low. In this case error 713 or 714 will be displayed. 3. There may be a thermal shutdown. Check the thermal LED.	1. Perform the **PFC Boost Board Test Procedure**. 2. Perform the **Main Capacitor Board Test Procedure**. 3. Perform the **Switchboard Test Procedure**. 4. Perform the **User Interface Board Test Procedure**. 5. Perform the **Output Rectifier Assembly Test Procedure**. 6. Perform the **Inverter Control Board Test Procedure**. 7. Perform the **Main Transformer Test Procedure**. 8. Perform the **Choke Test Procedure**.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
		9. Perform the **Mode Select Switch Test Procedure**.
The thermal LED is “ON”. The machine regularly overheats.	1. The welding application may be exceeding the duty cycle and/or limits of the machine. 2. Dirt or dust may have clogged the cooling channels inside the machine. 3. Air intake and exhaust louvers may be blocked due to inadequate clearance. 4. Make sure the fans are functioning correctly. The unit is equipped with F.A.N. (fan as needed) circuitry. The fans run whenever the output current is established and will continue running for approximately five minutes after the output current is disabled.	1. Perform the **Thermostat #1 and #2 Circuit Test Procedure**. 2. Perform the **Fan and F.A.N. Circuit Test Procedure**.
The machine turns on but the display is not visible, flickers or has missing digits.	1. Turn the machine off and back on to re-boot. 2. Check for loose or faulty connections at the user interface board. See Wiring Diagram.	1. Perform the **User Interface Board Test Procedure**. 2. Perform the **Auxiliary Power Board Test Procedure**.
The fan is running at all times.	1. Make sure there is no load on the output terminals.	1. Perform the **Fan And F.A.N. Circuit Test Procedure**. 2. Perform the **Inverter Control Board Test Procedure**.
Machine will not respond to the user controls and switches.	1. Make sure the machine is in “Local” control.	1. Perform the **User Interface Board Test Procedure**.
The CrossLinc™ function does not work.	1. Make sure a compatible wire feeder (LN-25X) is connected to the Flextec 350X Power Connect. 2. The weld voltage can only be adjusted from the LN-25X when the Flextec 350X Power Connect is in an OCV condition, not welding. 3. The green CrossLinc™ LEDs on both machines must be illuminated.	1. Check the cables between the power source and the feeder. The voltage drop must be less than 10 VDC.

WELDING PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
There is a general degradation of the welding performance.	1. Make sure the correct input power is being applied to the machine. 2. Make sure the machine's controls are set correctly for the welding process being used. 3. Check for poor connections or "loops" in the welding cables. 4. If using a wire feeder check for the correct and consistent wire feed speed at the wire feeder.	1. Perform the **Choke Test Procedure**. 2. Perform the **Current Transducer (LEM) Test Procedure**. 3. Perform the **Output Rectifier Assembly Test Procedure**.
The machine looses output during a weld.	1. A secondary over-current may have occurred. The welding application may have exceeded the current limitations of the machine. 2. Make sure the correct input power is being applied to the machine.	1. Perform the **Output Rectifier Assembly Test Procedure**. 2. If in SMAW mode, perform the **Boost Relay Test Procedure**. 3. Perform the **Boost Rectifier Test Procedure**.
Wire feeder won't work. Apparently no power to wire feeder.	1. Check the control cable connectors on the case front of the machine to make sure it is properly connected. 2. Check the control cable between the power source and the wire feeder for continuity.	1. Make sure the wire feeder is connected correctly to the power source. See Wiring Diagram and Operators manual.

General Description

Block diagram

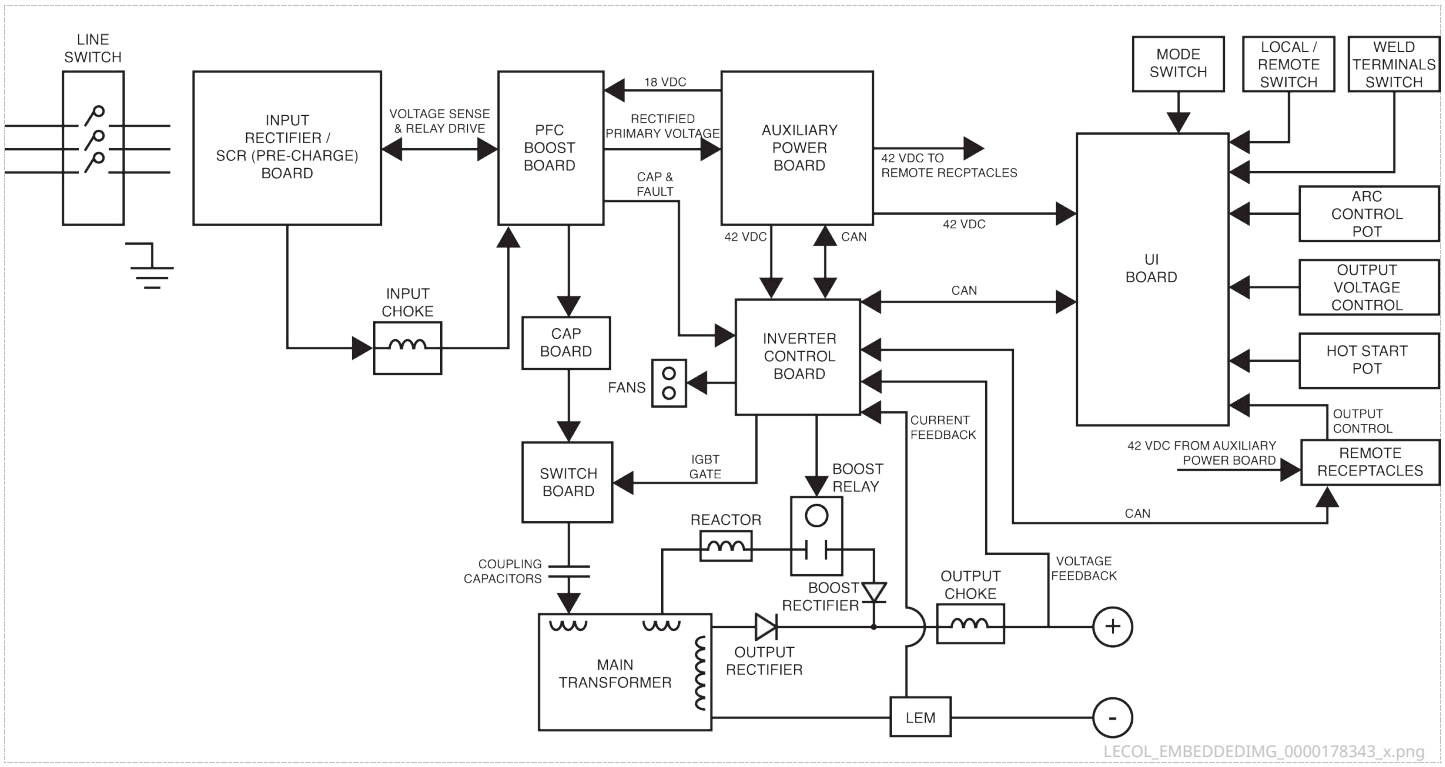


Figure 1. Block diagram

The Flextec 350X Power Connect™ is an inverter based welding power source that features integrated digital control and power conversion electronics. It will automatically connect to any AC input (single or three phase) voltages from 200 to 575 Volts. It communicates both internally and externally via ArcLink. It also has CrossLinc capabilities that communicates with compatible wire feeders. Using CrossLink the operator can adjust the open circuit voltage on the Flextec 350X Power Connect™ from the compatible wire feeder. This is accomplished by sending a 1000 Hz pulse through the welding cables.

Note: Unshaded areas of Block Logic Diagram are the subject of discussion

Input Section

Input section

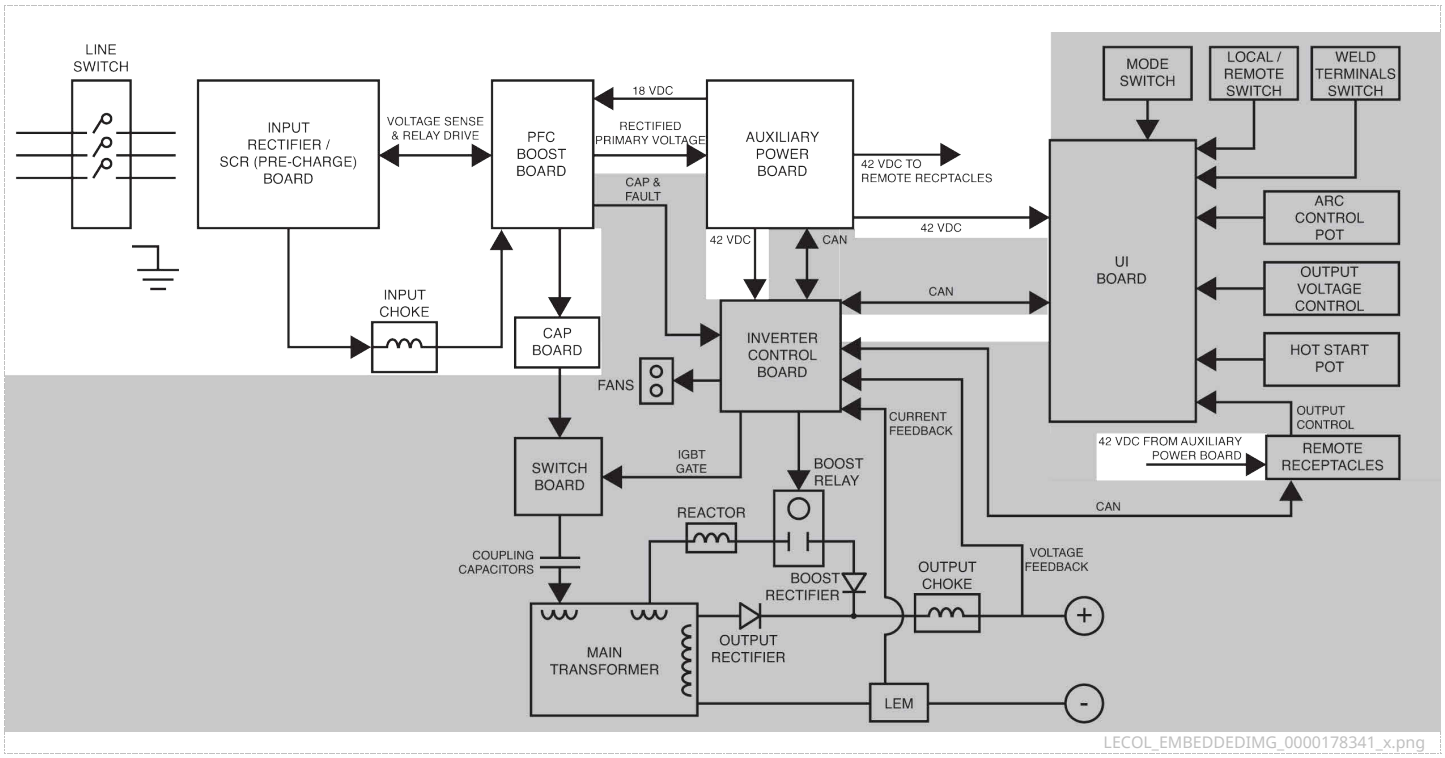


Figure 1. Input section

When a single or three phase input voltage is applied through the line switch to the input / precharge SCR bridge board the AC input voltage is rectified and controlled. This rectified voltage is applied, via the PFC boost board, to the auxiliary power board. The auxiliary board is then powered up. The auxiliary power board creates the 42 VDC and also sends 18 VDC to power the PFC boost board. The 42 VDC is applied to the UI board, the inverter control board and the remote receptacles. After the PFC boost board is powered it sends a closure signal to the pre-charge relay, located on the input / precharge SCR bridge board. The capacitor board is then charged to approximately 860 VDC.

Note: Unshaded areas of Block Logic Diagram are the subject of discussion

Insulated Gate Bipolar Transistor (IGBT) Operation

Insulated gate bipolar transistor (IGBT) operation

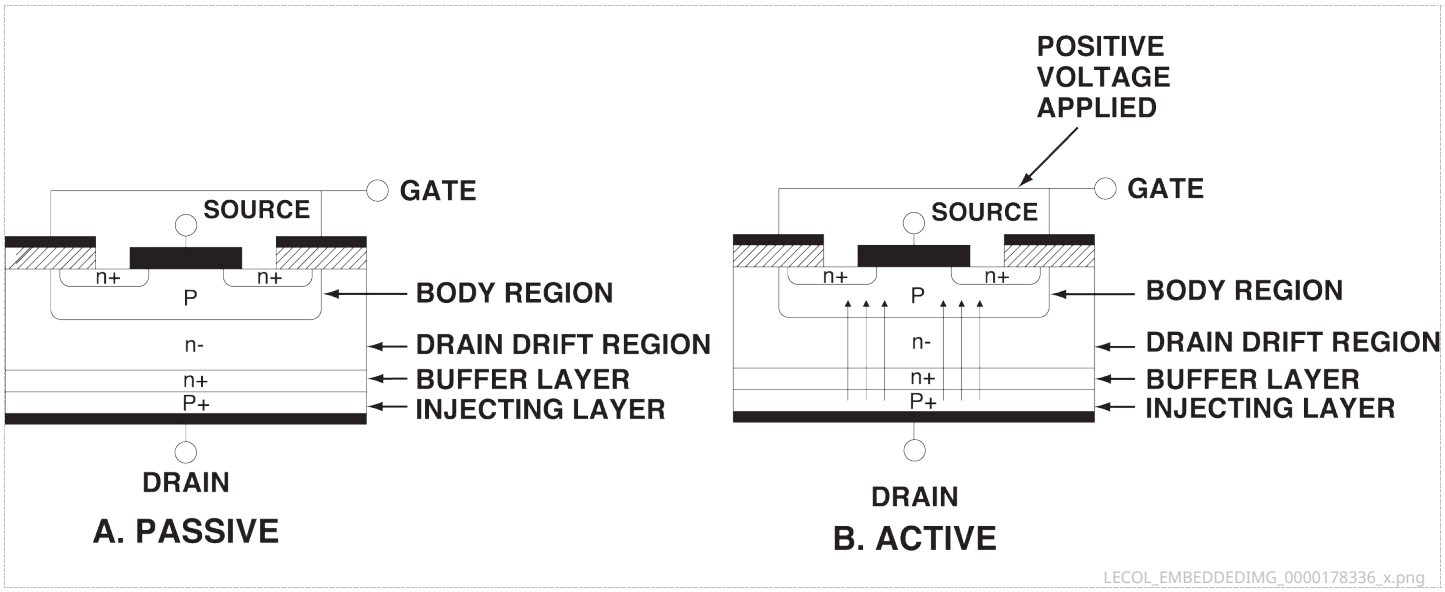


Figure 1. Insulated gate bipolar transistor (IGBT) operation

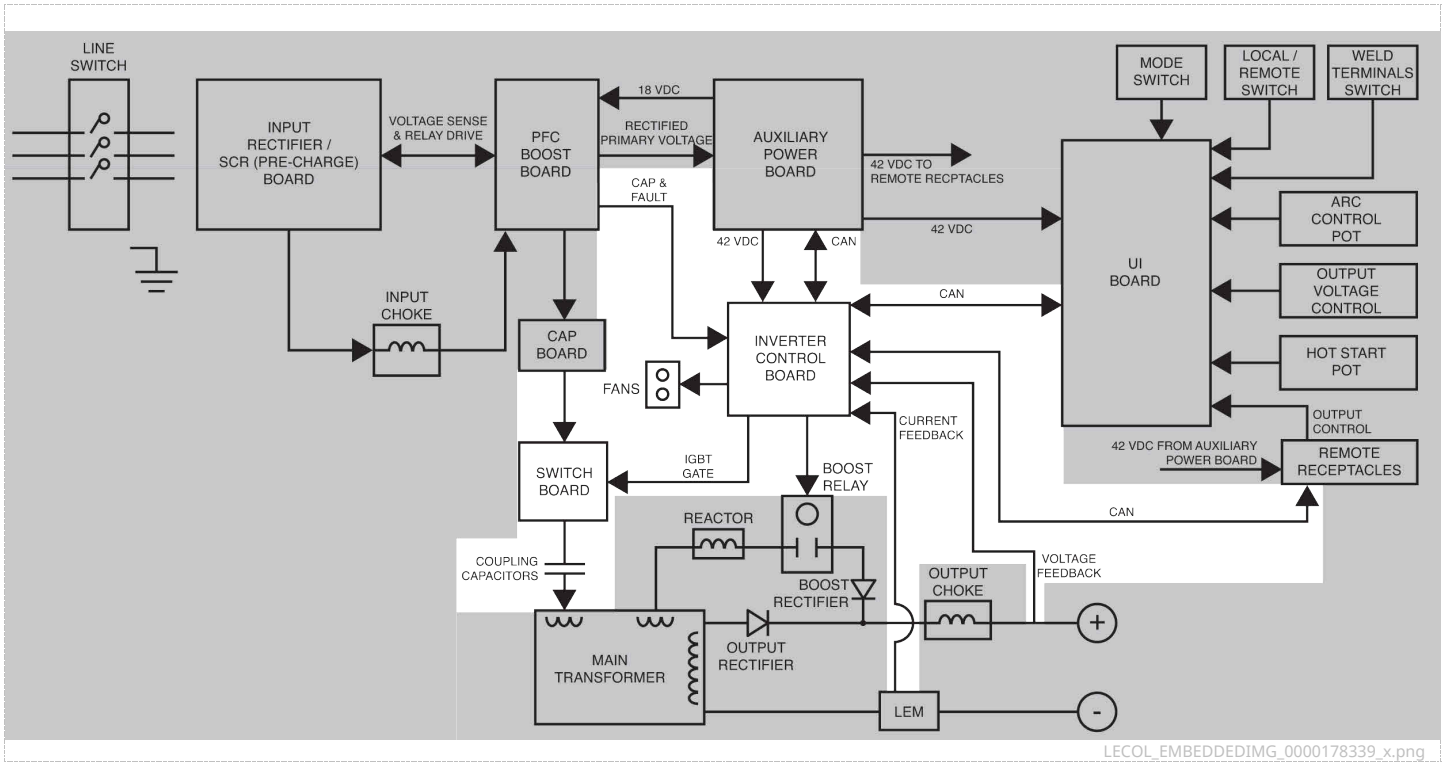
An IGBT is a type of transistor. IGBT are semiconductors well suited for high frequency switching and high current applications.

Example A in Figure E.8 shows an IGBT in passive mode. There is no gate signal, zero volts relative to the source and therefore, no current flow. The drain terminal of the IGBT may be connected to a voltage supply; but since there is no conduction, the circuit will not supply current to components connected to the source. The circuit is turned OFF like a light switch.

Example B shows the IGBT in an active mode. When the gate signals a positive DC voltage relative to the source, is applied to the gate terminal of the IGBT, it is capable of conducting current. A voltage supply connected to the drain terminal will allow the IGBT to conduct and supply current to the circuit components coupled to the source. Current will flow through the conducting IGBT to downstream components as long as the positive gate signal is present. This is similar to turning ON a light switch.

Inverter Control Board And Switchboard

Inverter control board and switchboard



LECOL_EMBEDDEDIMG_0000178339_x.png

Figure 1. Inverter control board and switchboard

The inverter control board is powered up by the 42 VDC from the auxiliary power board. From the 42 VDC the inverter control board creates several DC supplies for the internal electronics and a +5 VDC supply for Arclink communications. It also receives the 860 VDC capacitor voltage from the PFC boost board. The welding software is housed on the inverter control board and it is the master of the ArcLink system and controls the CAN communication. The welding voltage and current feedback are received by the inverter control board and also user commands from the UI board via Arclink communication protocol. It then sends the appropriate IGBT gate firing signals to the switchboard. The inverter control board also controls the cooling fans speed. The inverter control board also monitors the thermostat and thermistor circuits. In addition, it monitors the Crosslinc circuit and turns on the green LED when the Flextec 350X Power Connect™ is connected to a compatible crosslinc wirefeeder.

The main function of the switchboard is to receive and process the rectified and filtered primary power received from the input / precharge SCR bridge board and capacitor board. There are two quadrants of IGBTs housed on the switchboard that operate at 25 kHz and provide pulse width modulated power to the primary windings of the main transformer. The switchboard receives the IGBT gate firing signals from the inverter control board. See **Pulse Width Modulation** and **Insulated Gate Bipolar Transistor (IGBT) Operation**. The switchboard has 5 LEDs that indicate the current status of the board. LED 1 indicates that the board is receiving rectified and filtered primary voltage from the capacitor board. LEDs 2 thru 5 indicate that the switchboard is receiving IGBT gate drive signals from the inverter control board. The Pulse Width Modulated output of the switchboard is applied through coupling capacitors to the primary of the main transformer.

Note: Unshaded areas of Block Logic Diagram are the subject of discussion

Main Transformer

Main transformer

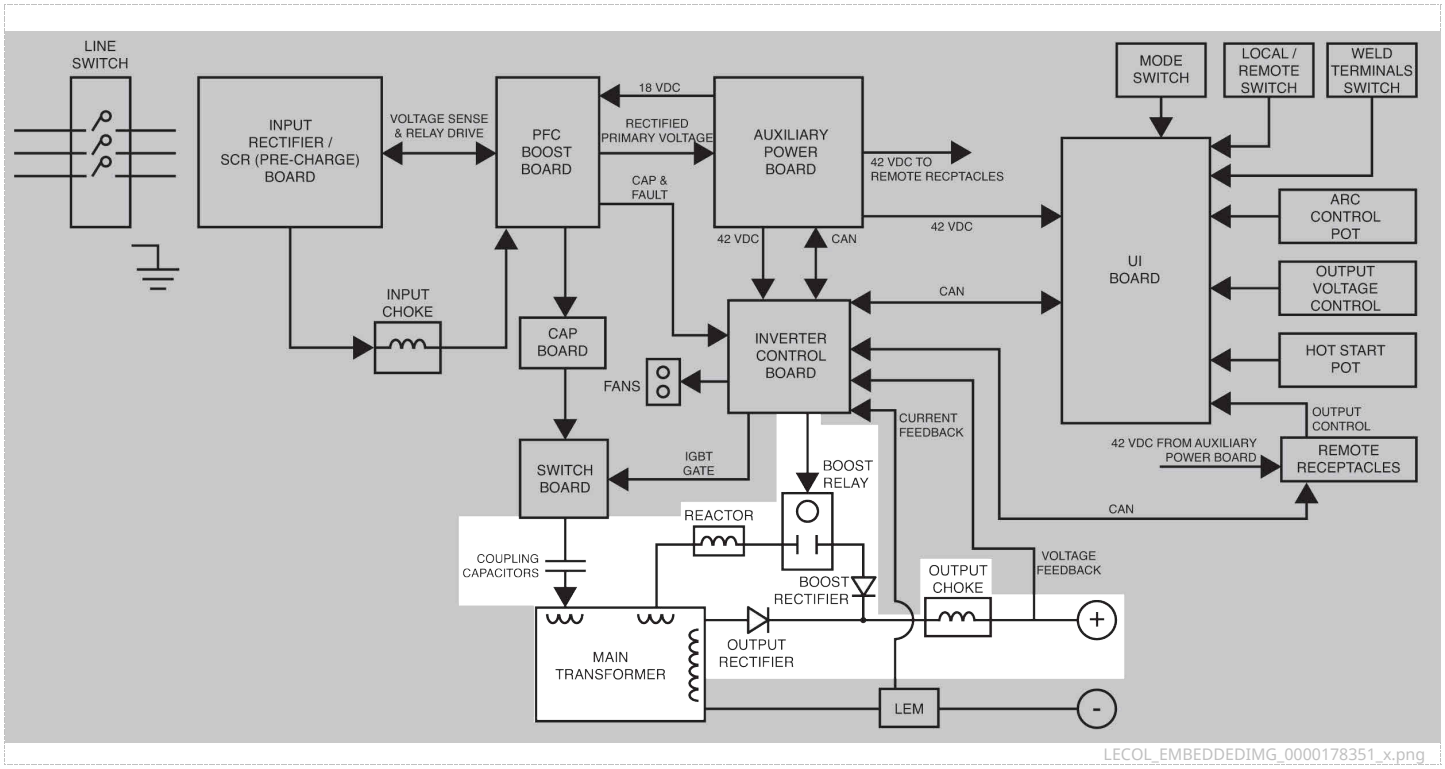


Figure 1. Main transformer

The main transformer is a step-down transformer. The primary windings receive the high voltage pulse width modulated power from the switch board. The 25 KHz AC output that is created on the center tapped weld secondary winding is applied to the output rectifiers. The boost winding output is applied to the boost relay via the boost reactor. When welding output current is drawn the boost relay receives a 15 VDC control signal from the inverter control board and the AC boost voltage is applied to the boost rectifier. The resultant elevated DC voltage is applied through the output choke to the positive output terminal. The boost circuit is active only in the SMAW mode.

Note: Unshaded areas of Block Logic Diagram are the subject of discussion

Output Rectifier And Choke

Output rectifier, choke and current transducer

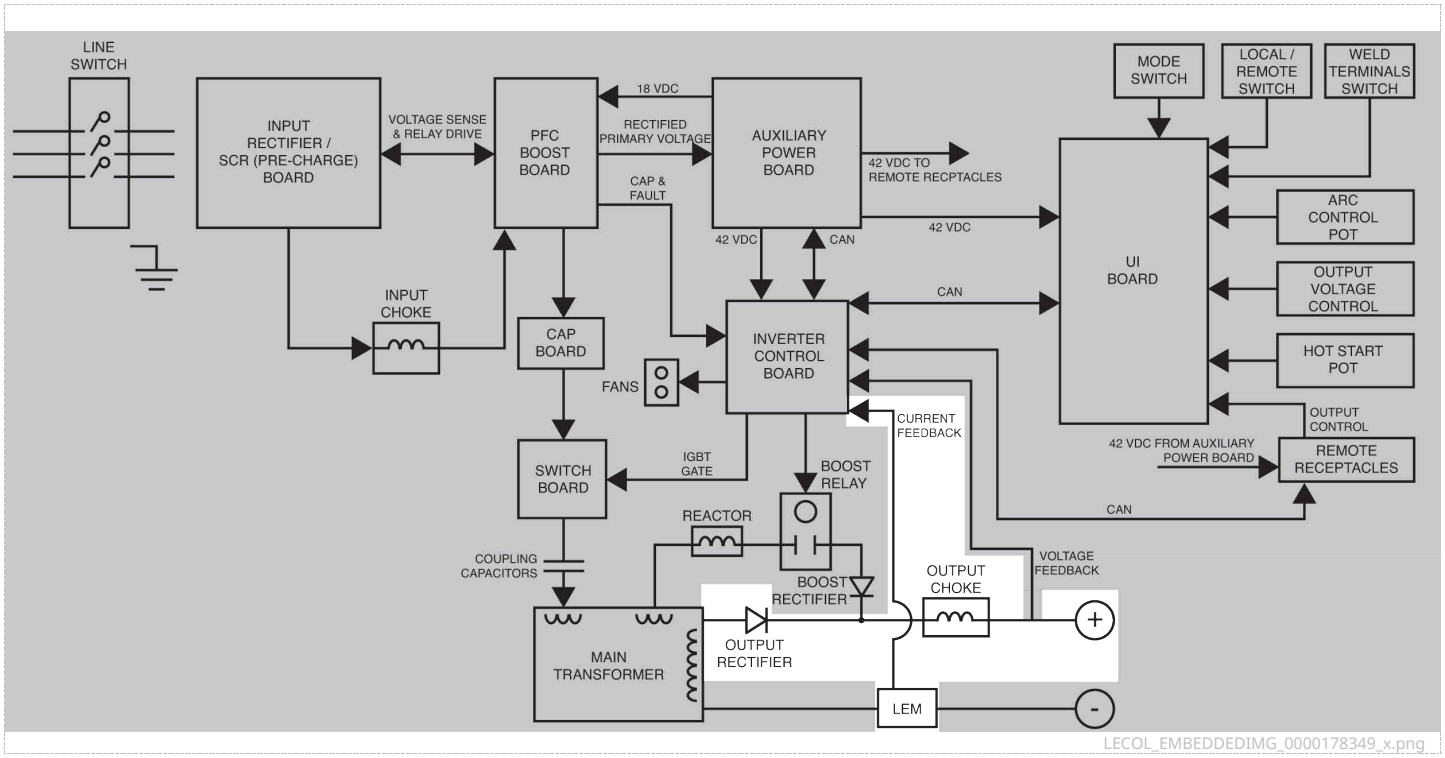


Figure 1. Output rectifier, choke and current transducer

There are two output diode modules mounted to a heatsink. The AC output of the center tapped weld secondary winding, of the main transformer, is full wave rectified by the output rectifier. The resultant DC output has a 50 KHz ripple content. This output power is applied through the output choke to the positive output terminal.

The output choke is an inductor that helps with arc stabilization at low welding output currents. The inductance allows for smoother arc and accurate waveform response.

Current Transducer (LEM)

The LEM converts welding current to a low voltage that is applied to the inverter control board for digital arc control.

Note: Unshaded areas of Block Logic Diagram are the subject of discussion

Pulse Width Modulation

Typical IGBT outputs

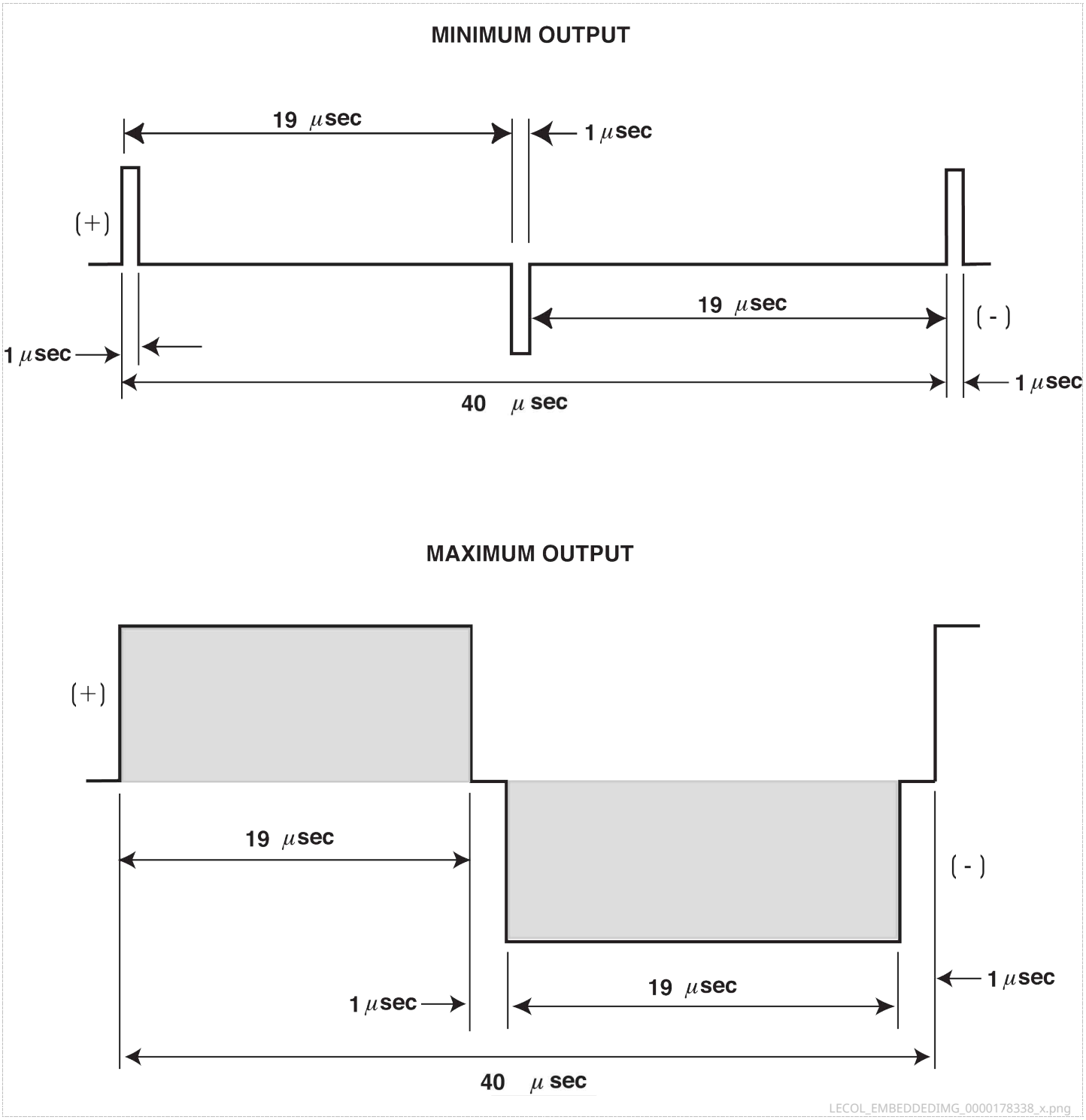


Figure 1. Typical IGBT outputs

The term Pulse Width Modulation is used to describe how much time is devoted to conduction in the positive and negative portions of the cycle. Changing the pulse width is known as modulation. Pulse Width Modulation (PWM) is the varying of the pulse width over the allowed range of a cycle to affect the output of the machine.

Minimum Output

By controlling the duration of the gate signal, the IGBT is turned on and off for different durations during the cycle. The top drawing in Figure E.7 shows the minimum output signal possible over a 40-microsecond time period.

The positive portion of the signal represents one IGBT group1 conducting for one microsecond. The negative portion is the other IGBT group1. The dwell time (off time) is 19 microseconds (both IGBT groups off). Since only two microseconds of the 40-microsecond time period are devoted to conducting, the output power is minimized.

Maximum Output

By holding the gate signal on for 19-microseconds each and allowing only two microseconds of dwell time (off time) during the 40-microsecond cycle, the output is maximized. The darkened area under the top curve can be compared to the area under the curve indicates that more power is present.

1 An IGBT group consists of two IGBT modules feeding one transformer primary winding.

Thermal Protection

There are two separate thermal protection circuits in the Flextec 350X Power Connect™. Two normally closed thermostats protect the output choke and the output rectifier bridge from over temperature. They are wired in series and are connected to the inverter control board. These protect the machine against reduced airflow or overload. If excessive operating temperatures should occur, the thermostats will open and the fans will turn on, the thermal symbol will illuminate, the output will be disabled and error 36 will be logged and displayed.

Two thermistors, located on the top and bottom switch board heatsinks, protect the IGBT` quadrants in the switch board. The resistance of these thermistors are read by the inverter control board and converted to temperatures. If excessive operating temperatures should occur the fans will turn on, the thermal symbol will illuminate, the output will be disabled and error 36 will be logged and displayed.

These devices are self-resetting once the machine cools down sufficiently or any overload is removed. If the thermal shutdown was caused by excessive output or duty cycle and the fans were operating normally, the power switch may be left ON and the reset should occur within a 15-minute timeframe. If the fans are not functioning normally or the air intake louvers are obstructed, then the power must be removed from the machine and the fan problem or air obstruction corrected.

If the machine was being operated in the “Remote” mode when the thermal fault occurred the remote trigger will needed to be opened and closed when the thermal fault has cleared to re-established output.

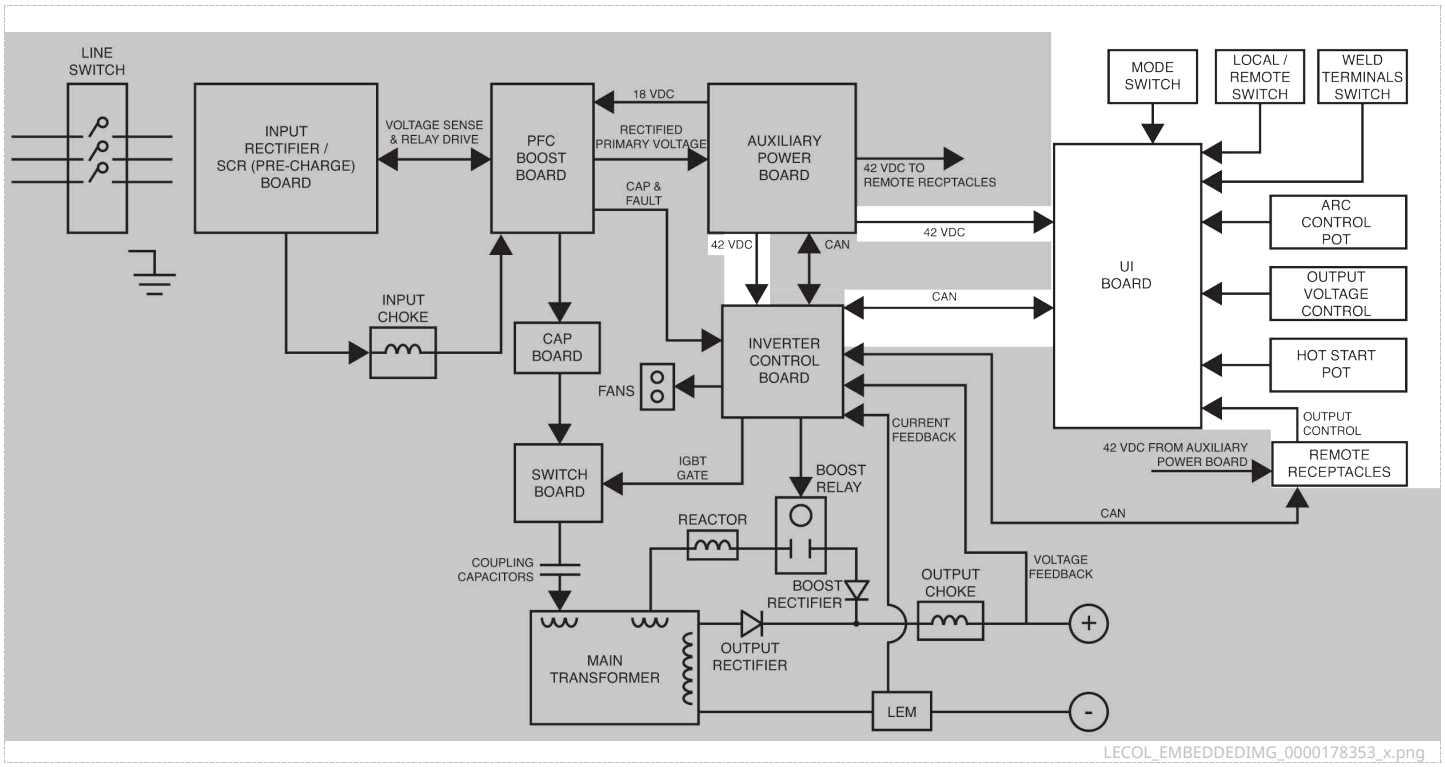
The PFC boost board and auxiliary power board are also thermally protected. If the current draw on the auxiliary power board exceeds four amps (for any reason) the fans will turn on. The welding output will NOT be disabled and the thermal symbol will NOT be illuminated. If the PFC boost board exceeds its normal operating temperature the fans will turn on. If the temperature continues to rise and exceeds a set limit then the welding output will be disabled and the thermal symbol will illuminate.

Protective Circuits

Protective circuits are designed into the Flextec 350X Power Connect™ to sense trouble and shut down the machine before damage occurs to the machine’s internal components.

User Interface (UI) Board

User interface (UI) board



LECOL_EMBEDDEDIMG_0000178353_x.png

Figure 1. User interface (UI) board

The UI board is powered by the 42 VDC received from the auxiliary power board. LED 5 indicates that the on-board power supply if functioning. Led 4 is the Arclink status indicator. The user controls, switches, and connectors allow the operator to communicate to the UI board the desired processes and welding requirements. The UI board then sends the desired parameters to the inverter control board via Arclink CAN communication. The UI board displays to the user the preset settings (voltage and current). During welding the UI board will display the actual voltage and current. The UI board also reads the input from the various receptacles used for connections to external equipment such as wirefeeders and remote controls. There are two Voltage Reduction Devices (VRD) lights on the board. When shipped the VRD function is disabled. VRD is enabled by setting the dipswitch on the UI board. When the VRD is enabled the open circuit is reduced to about 15 VDC in the GTAW and SMAW weld modes.

Note: Unshaded areas of Block Logic Diagram are the subject of discussion

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

AUXILIARY POWER BOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Auxiliary Power Board is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the auxiliary power board. See **Figure F.1**. See Wiring Diagram.
5. Using a volt/ohmmeter, perform the diode drop tests outlined in **Table F.1**. See **Figures F.2** and **Figures F.3**. See Wiring Diagram.
6. Carefully apply the correct input power to the machine and turn ON the machine.
7. Using a volt/ohmmeter, perform the voltage tests outlined in **Table F.2**. See **Figures F.2** and **Figures F.3**. See Wiring Diagram.
8. If any of the tests fail, the auxiliary power board may be faulty.
9. If faulty, perform the **Auxiliary Power Board Removal And Replacement Procedure**.
10. Perform the **Case Cover Replacement Procedure**.

Auxiliary power board diode drop tests

TEST POINT	TEST POINT	EXPECTED READING
PLUG J49 PIN 6 (LEAD B1C)	PLUG J49 PIN 1 (LEAD B2C)	0.6 TO 2.0 VDC
PLUG J47 PIN 9 (LEAD 51A)	PLUG J47 PIN 5 (LEAD 51)	0.3 TO 1.0 VDC

Auxiliary power board voltage tests

TEST POINT	TEST POINT	EXPECTED READING
PLUG J49 PIN 1 (LEAD B2C)	PLUG J49 PIN 6 (LEAD B1C)	860 VDC
PLUG J49 PIN 12 (LEAD 444)	PLUG J49 PIN 11 (LEAD 441)	18 VDC
PLUG J45 PIN 2 (LEAD 465)	PLUG J45 PIN 1 (LEAD 466)	5 VDC
PLUG J47 PIN 7 (LEAD 52C)	PLUG J47 PIN 10 (LEAD 51C)	42 VDC
PLUG J47 PIN 2 (LEAD 52A)	PLUG J47 PIN 9 (LEAD 51A)	42 VDC
PLUG J47 PIN 3 (LEAD 52)	PLUG J47 PIN 5 (LEAD 51)	42 VDC

Auxiliary power board location

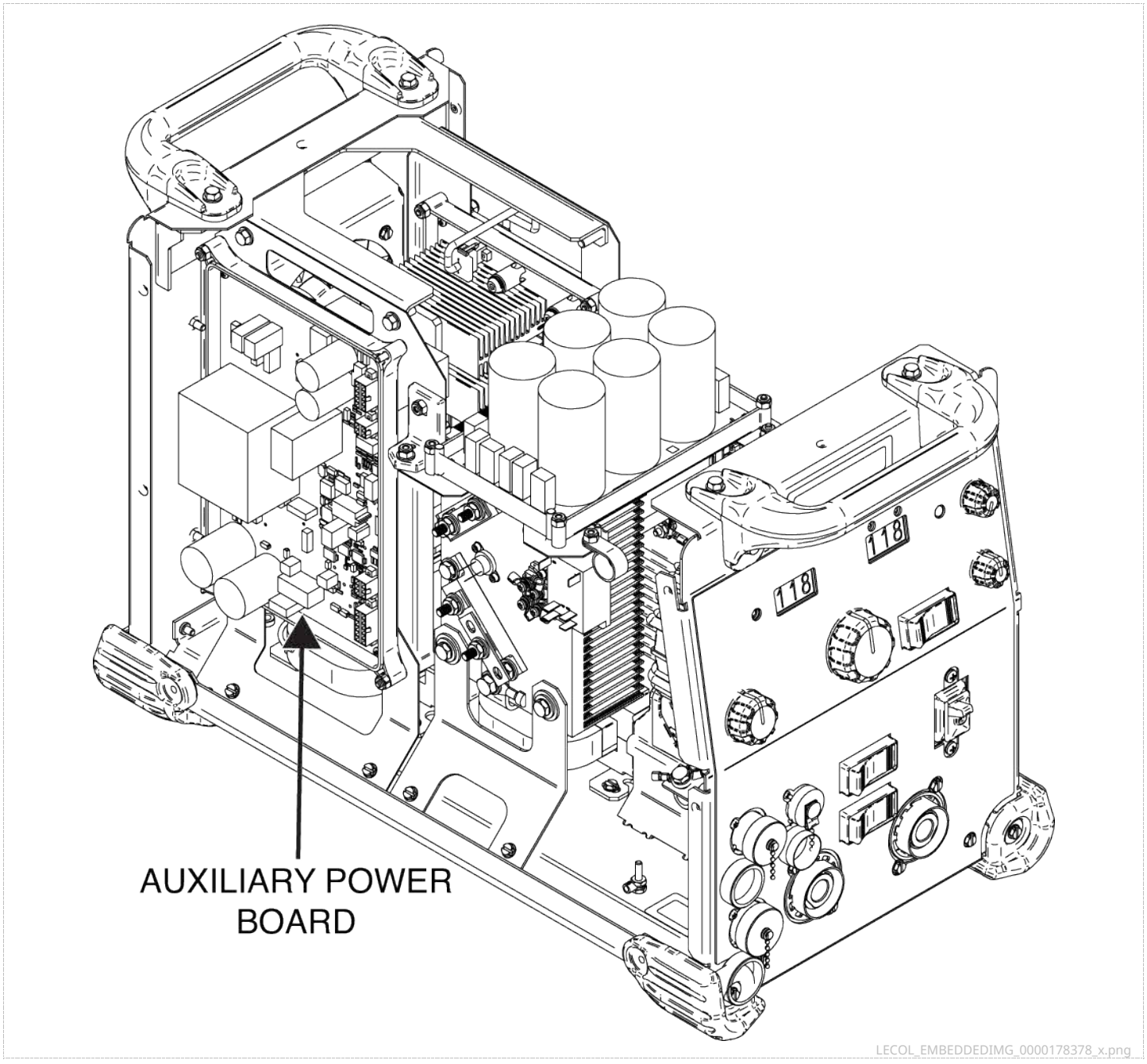
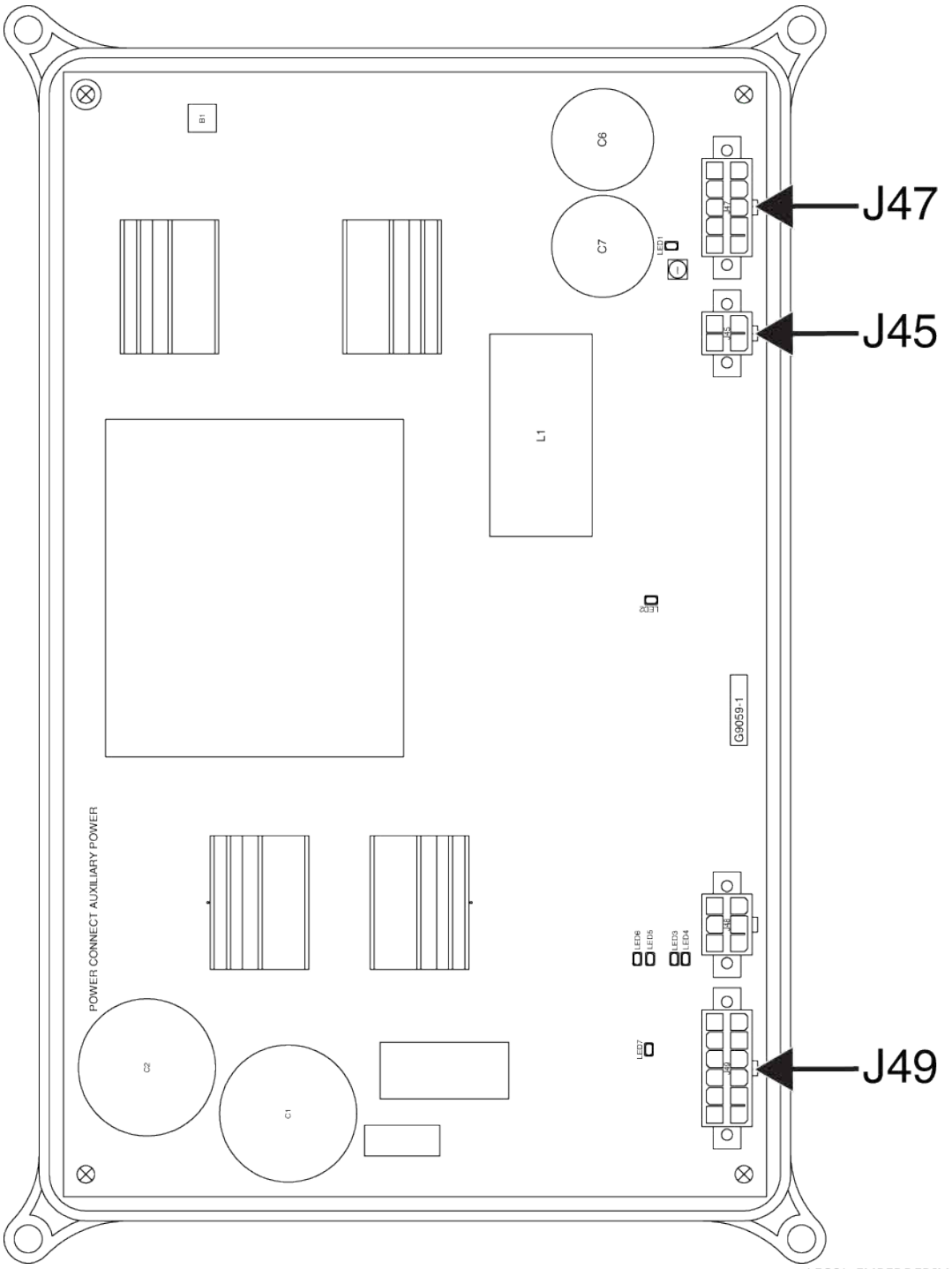


Figure 1. Auxiliary power board location

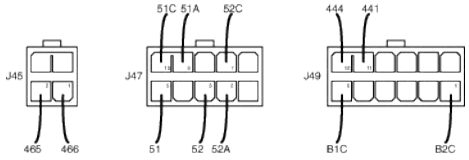
Auxiliary power board plug locations



LECOL_EMBEDDEDIMG_0000178377_x.png

Figure 2. Auxiliary power board plug locations

Auxiliary power board lead locations



LECOL_EMBEDDEDIMG_0000178376_x.png

Figure 3. Auxiliary power board lead locations

BOOST RECTIFIER TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Boost Rectifier is functioning properly.

MATERIALS NEEDED

- 7/16" Nutdriver
- 1/2" Nutdriver
- Torx Nutdriver (Size T-20)
- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the boost rectifier. See **Figure F.1**. See Wiring Diagram.
5. Using a 7/16” nutdriver, remove the bolt and associated washers securing the transformer leads (X11 and X12) to the output rectifier. Label and disconnect the transformer leads (X11 and X12) from the output rectifier assembly. See **Figure F.2**. See Wiring Diagram.
6. Using a 1/2” nutdriver, remove the bolt securing the positive boost lead to the output rectifier heatsink. See **Figure F.2**. Label and disconnect positive boost lead.
7. Using a Torx nutdriver (Size T-20), remove the screw, lock washer and flat washer securing the leads to the four rectifier terminals. See **Figure F.3**. See Wiring Diagram. Label and disconnect leads.
8. Using a volt/ohmmeter, perform the diode drop tests outlined in **Table F.1**. See **Figure F.3**. See Wiring Diagram.
9. Connect all previously disconnected leads.
10. If any of the tests fail, the boost rectifier may be faulty.
11. If faulty, perform the **Boost Rectifier Removal And Replacement Procedure**.
12. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Boost rectifier diode drop tests

TEST POINT	TEST POINT	EXPECTED READING
AC TERMINAL (LEAD X21)	POSITIVE TERMINAL (POS)	0.3 VDC – 1.0 VDC
NEGATIVE TERMINAL (NEG)	AC TERMINAL (LEAD X21)	0.3 VDC – 1.0 VDC
NEGATIVE TERMINAL (NEG)	AC TERMINAL (LEADS 202A AND 202B)	0.3 VDC – 1.0 VDC
AC TERMINAL (LEADS 202A AND 202B)	POSITIVE TERMINAL (POS)	0.3 VDC – 1.0 VDC
POSITIVE TERMINAL (POS)	AC TERMINAL (LEAD X21)	OL
AC TERMINAL (LEAD X21)	NEGATIVE TERMINAL (NEG)	OL
AC TERMINAL (LEADS 202A AND 202B)	NEGATIVE TERMINAL (NEG)	OL
POSITIVE TERMINAL (POS)	AC TERMINAL (LEADS 202A AND 202B)	OL

Boost rectifier location

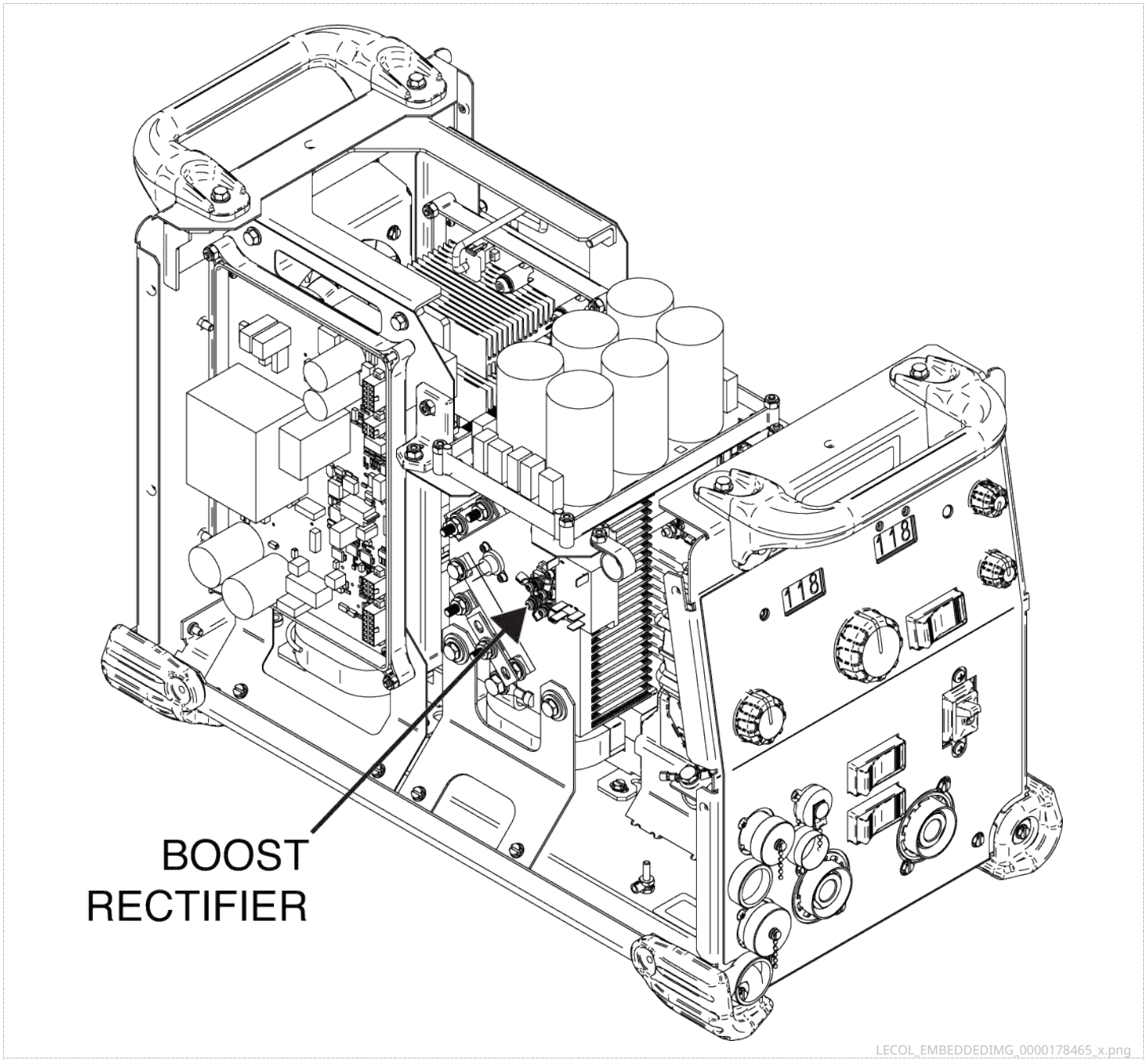
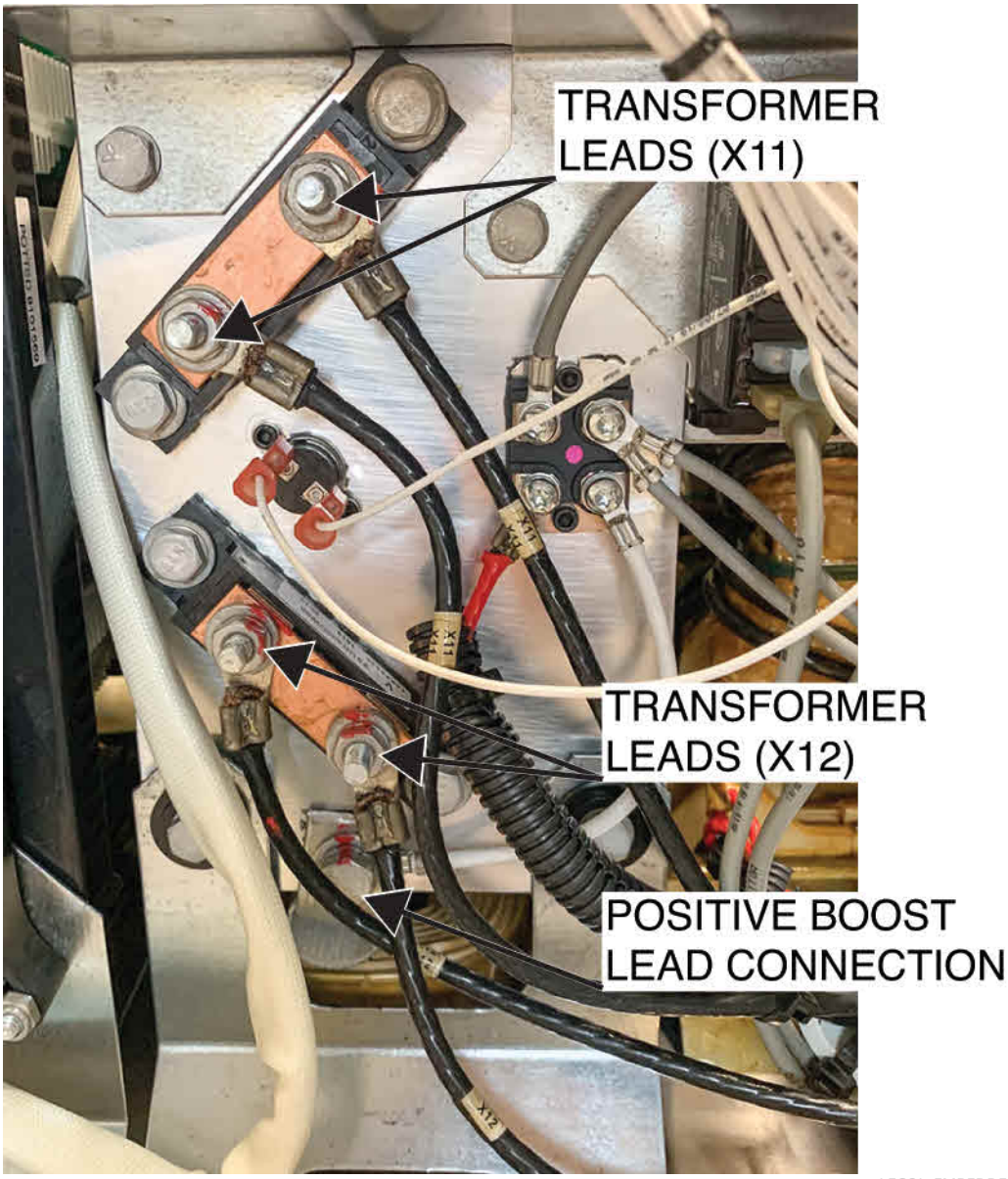


Figure 1. Boost rectifier location

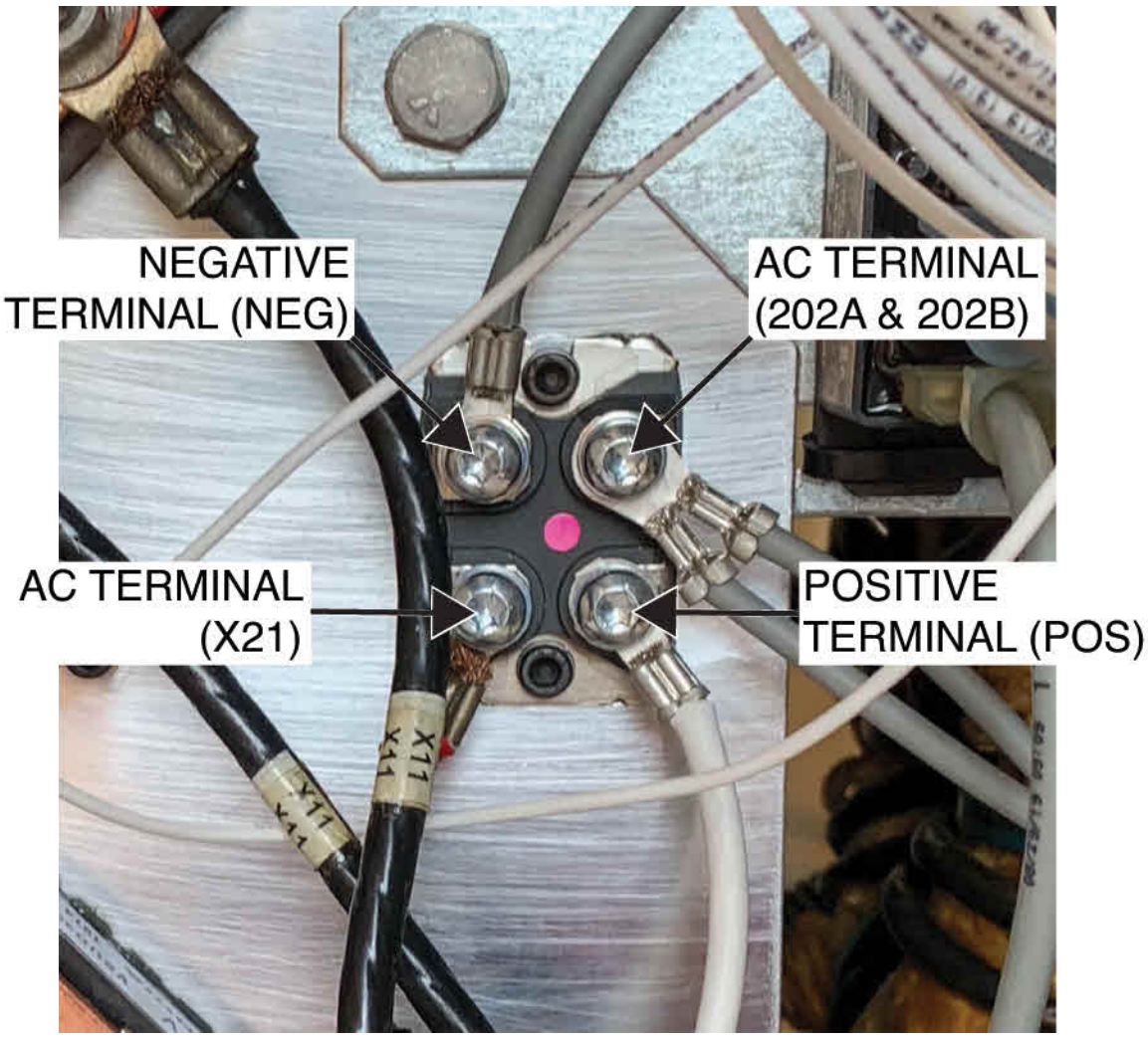
Transformer and positive boost lead connection locations



LECOL_EMBEDDEDIMG_0000178464_x.png

Figure 2. Transformer and positive boost lead connection locations

Boost rectifier terminal and lead locations



LECOL_EMBEDDEDIMG_0000178483_x.png

Figure 3. Boost rectifier terminal and lead locations

BOOST RELAY TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Boost Relay is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- External 15 VDC Power Supply
- Wiring Diagram

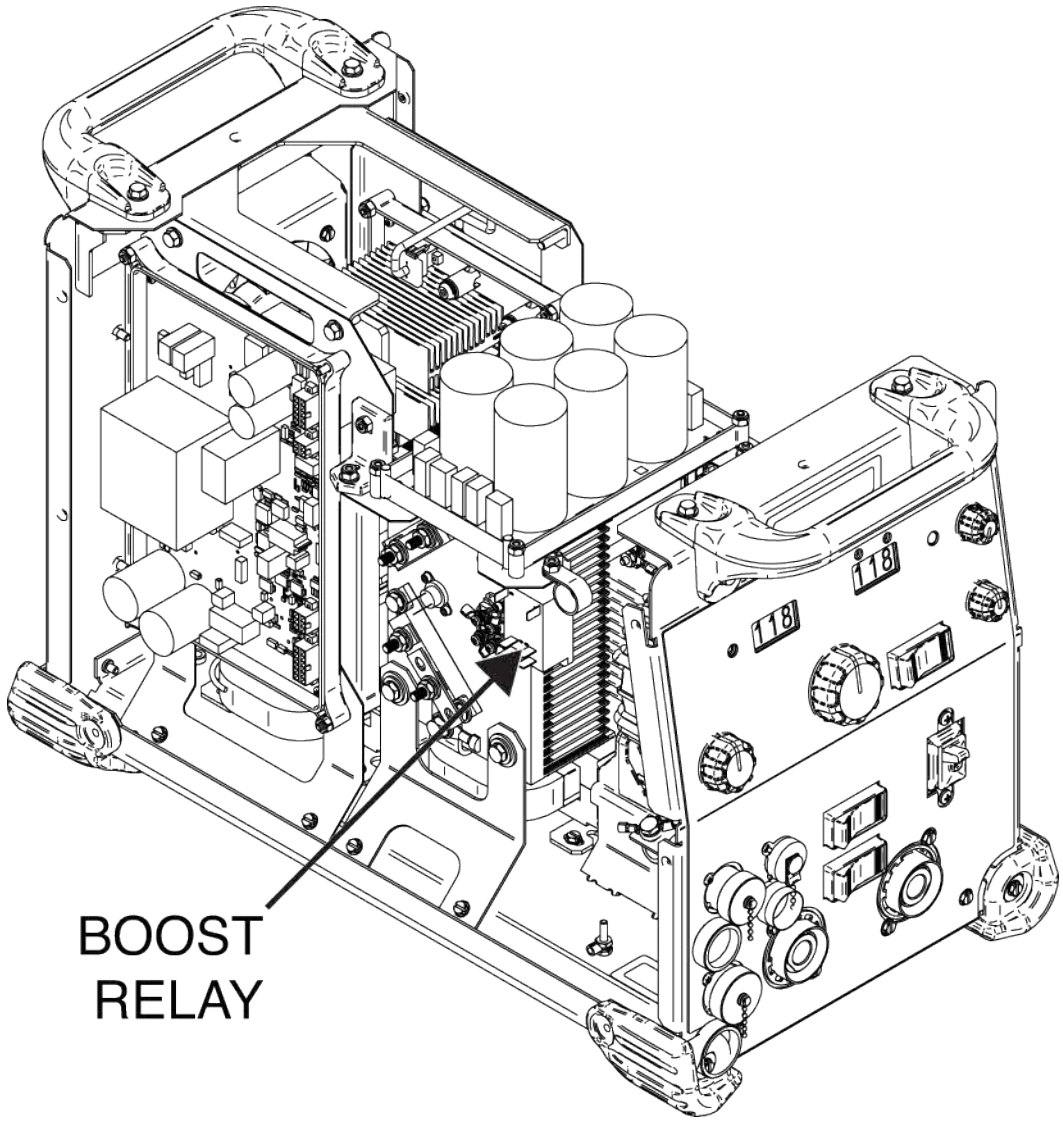
TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the boost relay. See **Figure F.1**. See Wiring Diagram.
5. Label and disconnect leads #228 and #227 from the boost relay. See **Figure F.2**. See Wiring Diagram.
6. Using a volt/ohmmeter, measure the resistance of the boost relay coil. See **Figure F.2**. The resistance should be approximately 83 ohms.
7. Label and disconnect the remaining leads from the boost relay. See **Figure F.2**. See Wiring Diagram.
8. Using a volt/ohmmeter, measure the resistance of the contacts (terminals 2 to 4 and terminals 6 to 8). See **Figure F.2**. See Wiring Diagram. The resistance between contacts should be infinite (open).
9. Using an external 15 VDC power supply, apply voltage to the coil terminals. An audible click should be heard as the contacts close. See Wiring Diagram.
10. Using a volt/ohmmeter, test the contacts again (terminals 2 to 4 and terminals 6 to 8), resistance should be very low (less than one ohm).
11. If any of the tests fail, the boost relay may be faulty.
12. If faulty, perform the **Boost Relay Removal And Replacement Procedure**.
13. Connect all previously removed leads.
14. Perform the **Case Cover Replacement Procedure**.

NOTE: The boost relay is only activated when the machine is in SMAW mode and welding current is being drawn.

Boost relay location



LECOL_EMBEDDEDIMG_0000178471_x.png

Figure 1. Boost relay location

Boost relay terminal and lead locations

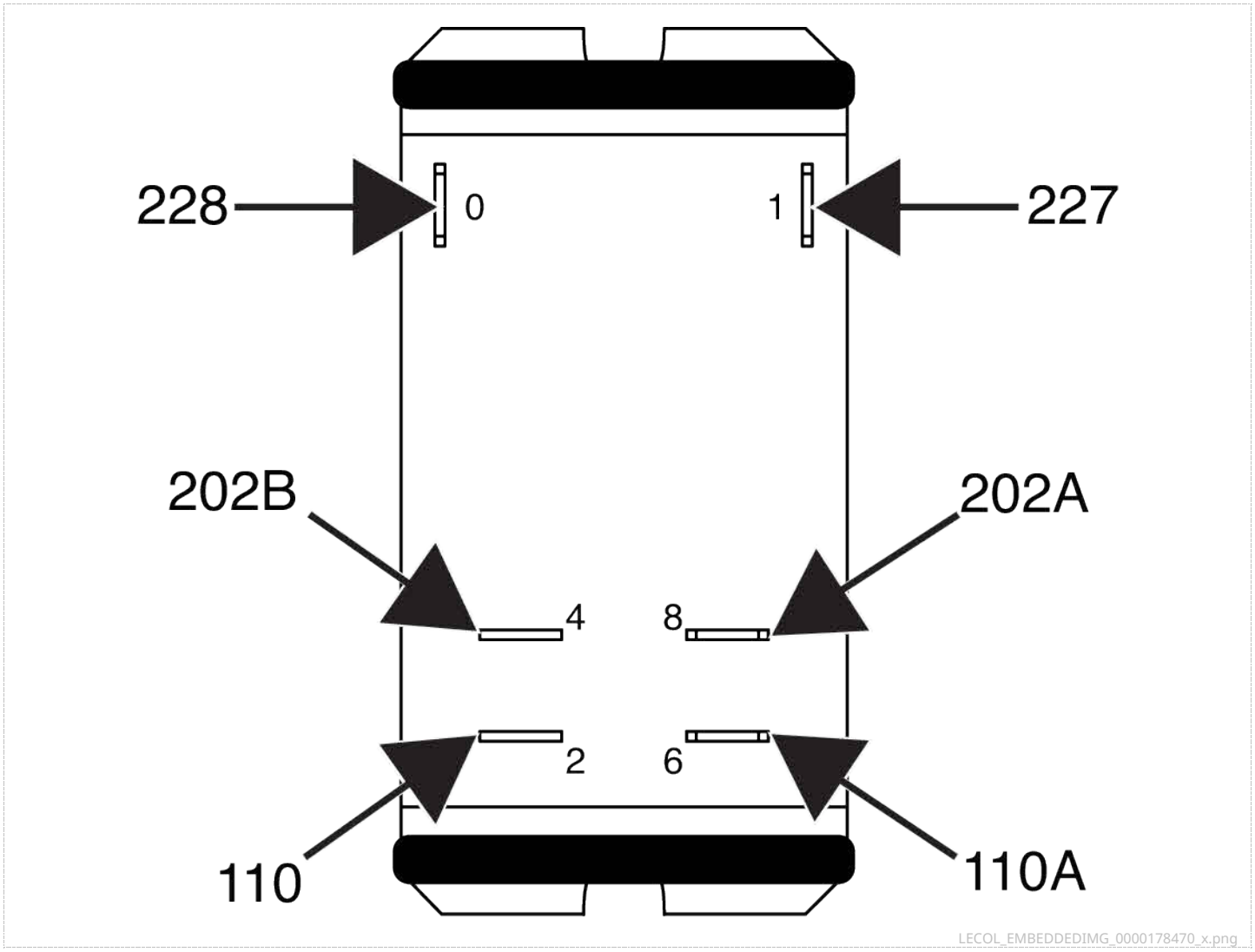


Figure 2. Boost relay terminal and lead locations

CAPACITOR DISCHARGE PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will help determine if the capacitors have been discharged.

MATERIALS NEEDED

- Resistor (1000 ohms and 25 watts minimum)
- Electrical Insulating Gloves
- Analog Voltmeter or Digital Multimeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Locate the SCR (pre-charge) board and input rectifier. See **Figure F.1**. See Wiring Diagram.
4. Locate the main capacitor board. See **Figure F.1**. See Wiring Diagram.
5. Using a volt/ohmmeter, measure the voltage between terminals B5 and B6 on the input rectifier. See **Figure F.2**. See Wiring Diagram. If no voltage is present, proceed with step 8. If any voltage is present continue with this procedure.
6. Using a 25 watt or more (25 to 1000 ohm) resistor connected to two test leads, carefully discharge the capacitors at terminals B5 and B6 on the input rectifier. See **Figure F.2**. See Wiring Diagram.
7. Locate the two large bolted connections labeled B1 and B2 on the main capacitor board. See **Figure F.3**. See Wiring Diagram.
8. Using a volt/ohmmeter, measure the voltage between terminals B1 and B2 on the main capacitor board. See **Figure F.3**. See Wiring Diagram. If no voltage is present, this procedure is complete. If any voltage is present continue with this procedure.
9. Using a 25 watt or more (25 to 1000 ohm) resistor connected to two test leads, carefully discharge the capacitors at terminals B1 and B2 on the main capacitor board. See **Figure F.3**. See Wiring Diagram.
10. Using a volt/ohmmeter, ensure the capacitors are discharged by connecting the positive meter probe to terminal B1 and the negative meter probe to terminal B2 on the main capacitor board. The voltage should be zero, if not repeat the discharge procedure. See Wiring Diagram.
11. Perform desired test(s) / repair procedure(s).
12. When testing is complete, perform the **Case Cover Replacement Procedure**.

SCR (pre-charge) board, input rectifier and main capacitor board locations

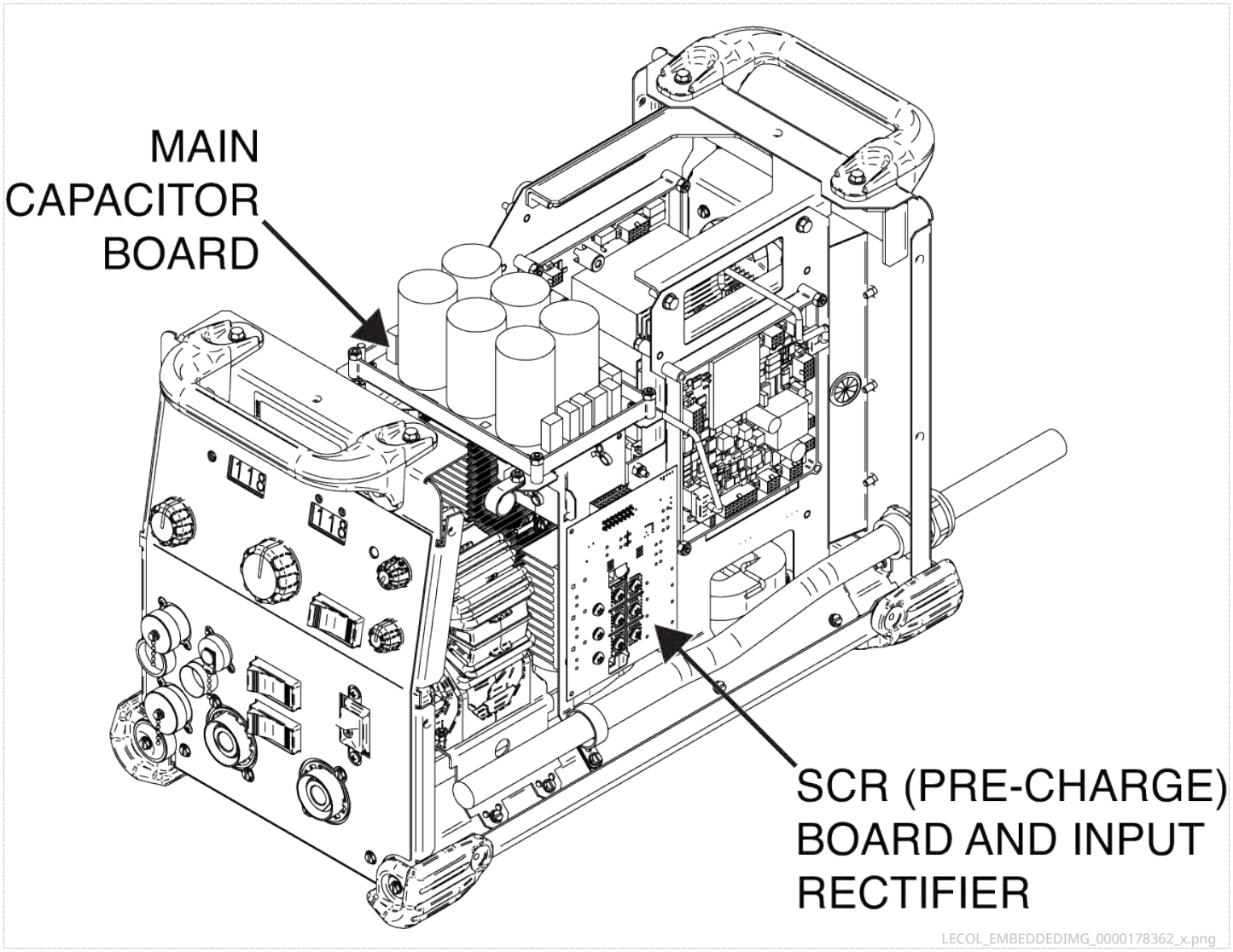
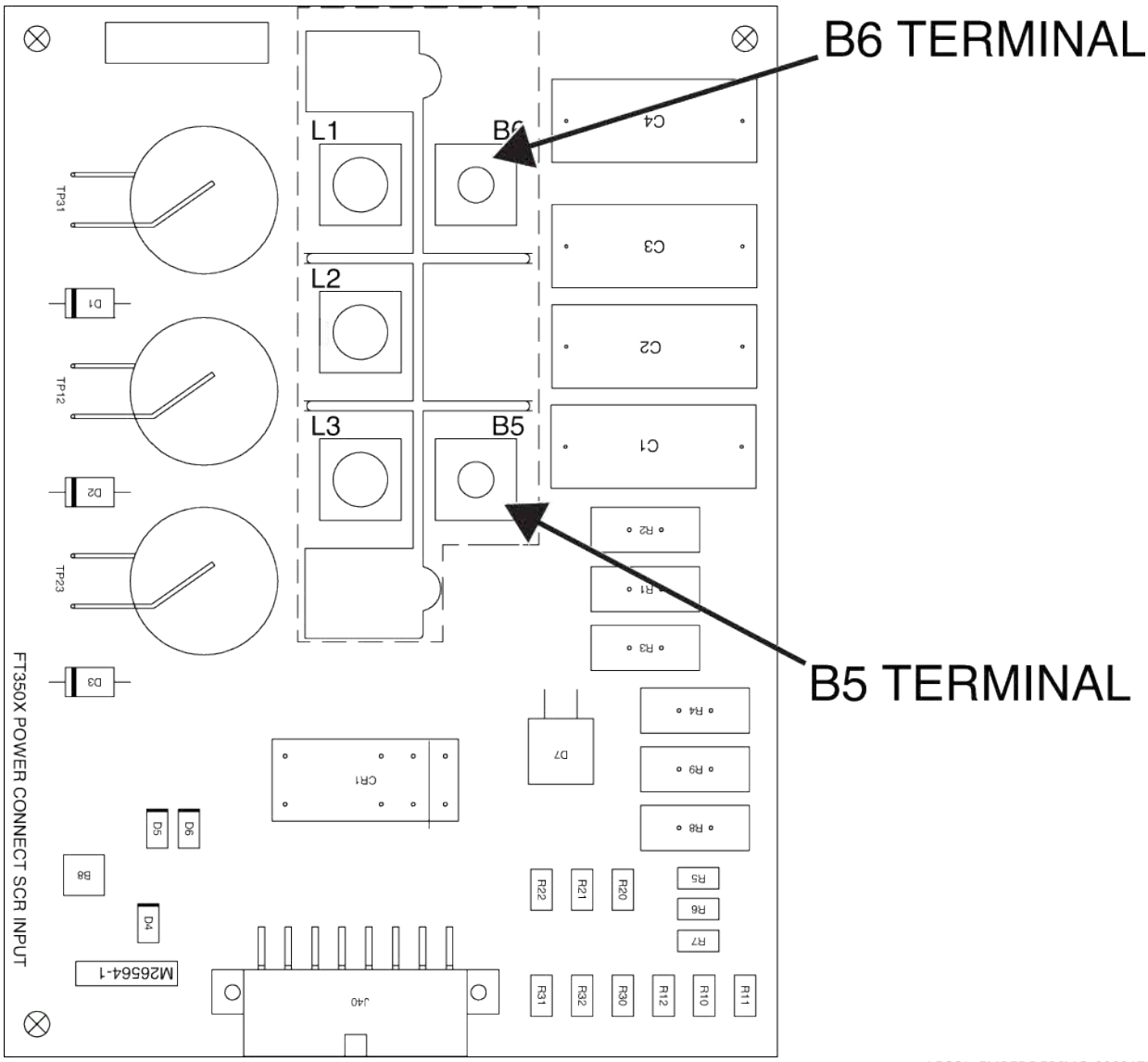


Figure 1. SCR (pre-charge) board, input rectifier and main capacitor board locations

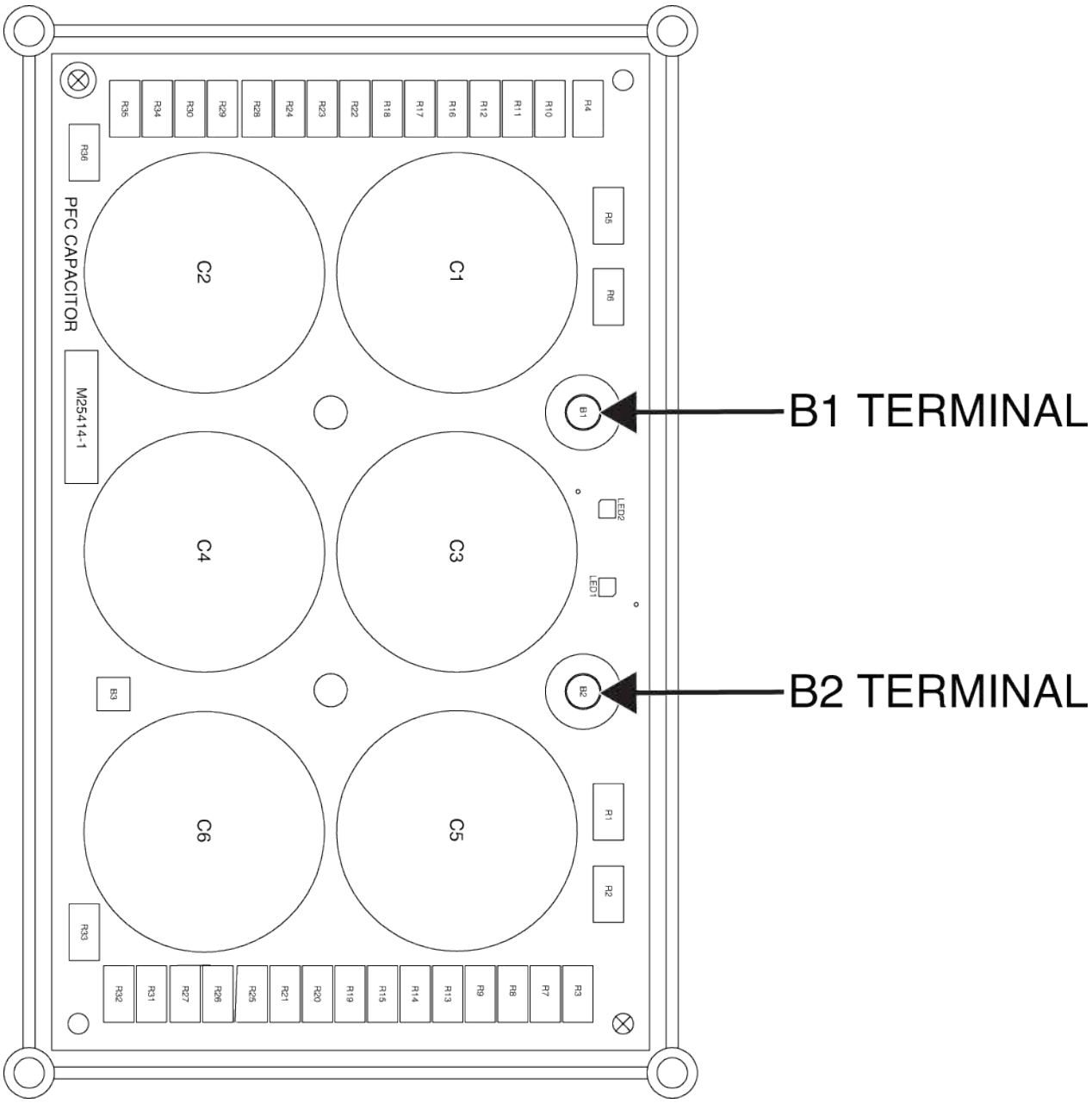
Input rectifier terminals B5 and B6



LECOL_EMBEDDEDIMG_0000178361_x.png

Figure 2. Input rectifier terminals B5 and B6

Main capacitor board terminals B1 and B2



LECOL_EMBEDDEDIMG_0000178360_x.png

Figure 3. Main capacitor board terminals B1 and B2

CHOKE TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Choke is shorted turn to turn or grounded.

MATERIALS NEEDED

- Volt/Ohmmeter
- 1/2" Nutdriver
- 1/2" Open End Wrench
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the choke. The choke is attached to the base near the transformer. See **Figure F.1**. See Wiring Diagram.
5. **OPEN:** No weld output. Using a volt/ohmmeter, test the resistance from the choke lead connected to the heatsink of the output rectifier to the positive output terminal. See Wiring Diagram. The resistance should be very low (less than one ohm).
6. **Turn To Turn Short:** Reduced inductance, arc instability, excessive heating of the choke. Check for any physical signs of arcing within the choke assembly.
7. **Choke Coil Grounded:** Reduced inductance, alternate weld current path. Electrically isolate the choke coil by disconnecting both choke leads. To electrically isolate the choke coil, using a 1/2” nutdriver and 1/2” open end wrench, remove the bolt, nut and associated washers securing the top choke lead to the positive output terminal. Using the 1/2” nutdriver, remove the other choke flex lead from the output rectifier heatsink. Take note of Positive white lead. Using a volt/ohmmeter, check the resistance from choke coil to chassis ground. Resistance should be at least 500,000 ohms. See Wiring Diagram.
8. If any of the tests fail, the line switch may be faulty.
9. Connect all previously removed leads. See Wiring Diagram.
10. If faulty, perform the **Choke Removal And Replacement Procedure**.
11. Perform the **Case Cover Replacement Procedure**.

Choke location

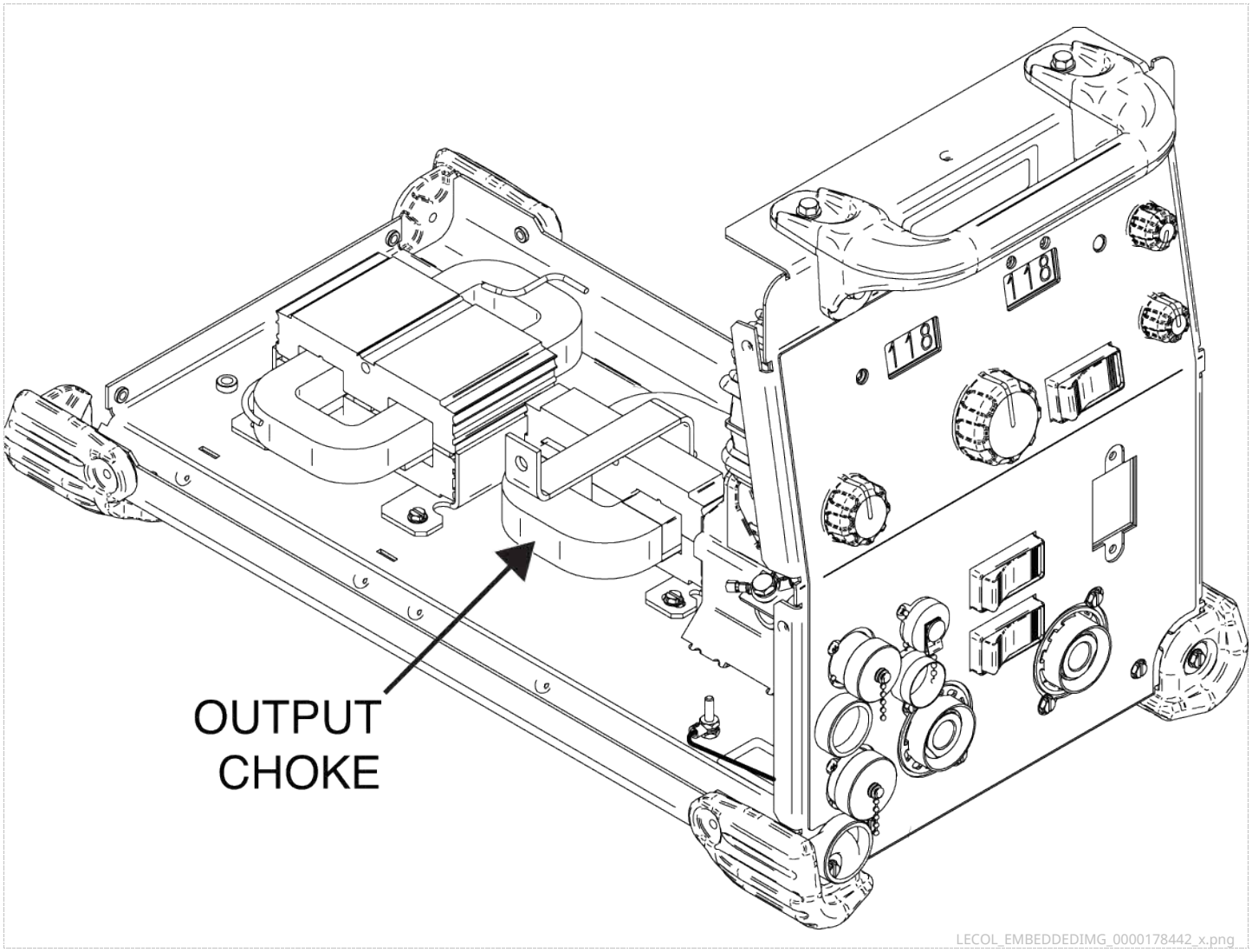


Figure 1. Choke location

CURRENT TRANSDUCER (LEM) TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Current Transducer (LEM) is functioning properly

MATERIALS NEEDED

- Volt/Ohmmeter
- Load Bank
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. The current transducer is located behind the negative output stud. See Wiring Diagram.
5. Locate the inverter control board. See **Figure F.1**. See Wiring Diagram.
6. Locate plug J11 on the inverter control board. See **Figure F.2**. See Wiring Diagram.
7. Carefully apply the correct input power to the machine and turn the machine ON.
8. Using a volt/ohmmeter, carefully check for the DC supply voltages to the current transducer per **Table F.1**. See **Figures F.2** and **F.3**. See Wiring Diagram.

   NOTE: Do not attempt to check the voltages at the current transducer connector. The terminals are small and delicate and may be damaged if probed with meter leads.
9. If the correct voltages are NOT present at the inverter control board, perform the **Inverter Control Board Test Procedure**.
10. Place the machine into a constant current output mode. Using a load bank, load the machine according to **Table F.2**.
11. Using a volt/ohmmeter, test the current transducer feedback versus actual output current. See **Table F.2**. See **Figures F.2** and **F.3**. See Wiring Diagram.
12. If the DC supply voltages are correct but the feedback voltages are incorrect the current transducer may be faulty.
13. If faulty, perform the **Current Transducer (LEM) Removal And Replacement Procedure**.

14. Perform the **Case Cover Replacement Procedure**.

Table F.1 - DC supply voltages from inverter control board

DESCRIPTION	TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
POSITIVE VOLTAGE SUPPLY	PLUG J11 PIN 4 (LEAD 216A)	PLUG J11 PIN 9 (LEAD 218A)	+15 VDC
NEGATIVE VOLTAGE SUPPLY	PLUG J11 PIN 5 (LEAD 217A)	PLUG J11 PIN 9 (LEAD 218A)	-15 VDC

Table F.2 - Current transducer feedback versus actual output current

ACTUAL OUTPUT CURRENT (AMPS)	TEST POINT (POS)	TEST POINT (NEG)	CURRENT TRANSDUCER FEEDBACK VOLTAGE
500	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	4.0 VDC
450	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	3.6 VDC
400	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	3.2 VDC
350	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	2.8 VDC
300	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	2.4 VDC
250	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	2.0 VDC
200	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	1.6 VDC
150	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	1.2 VDC
100	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	0.8 VDC
50	PLUG J11 PIN 10 (LEAD 215A)	PLUG J11 PIN 9 (LEAD 218A)	0.4 VDC

Inverter control board location

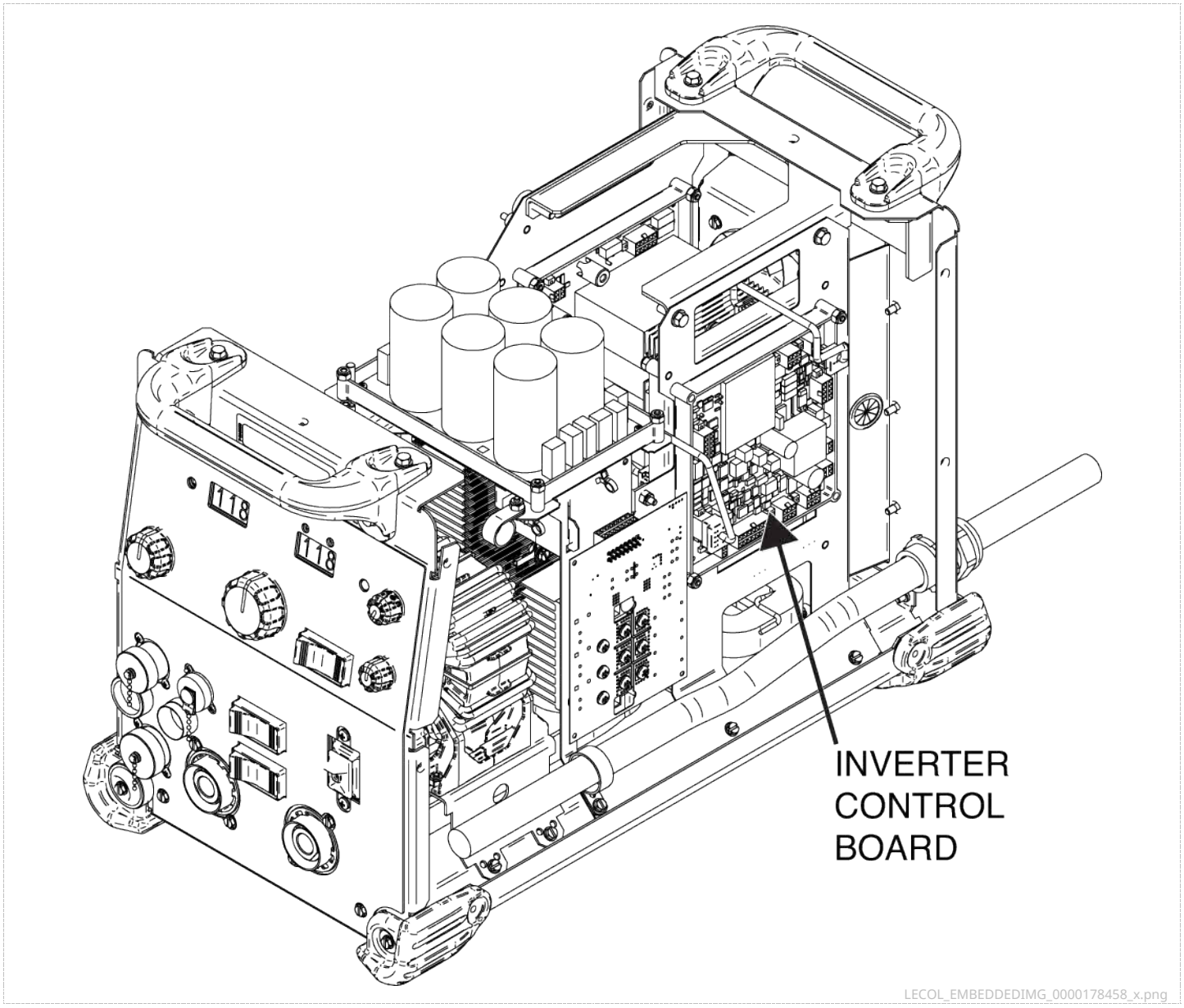
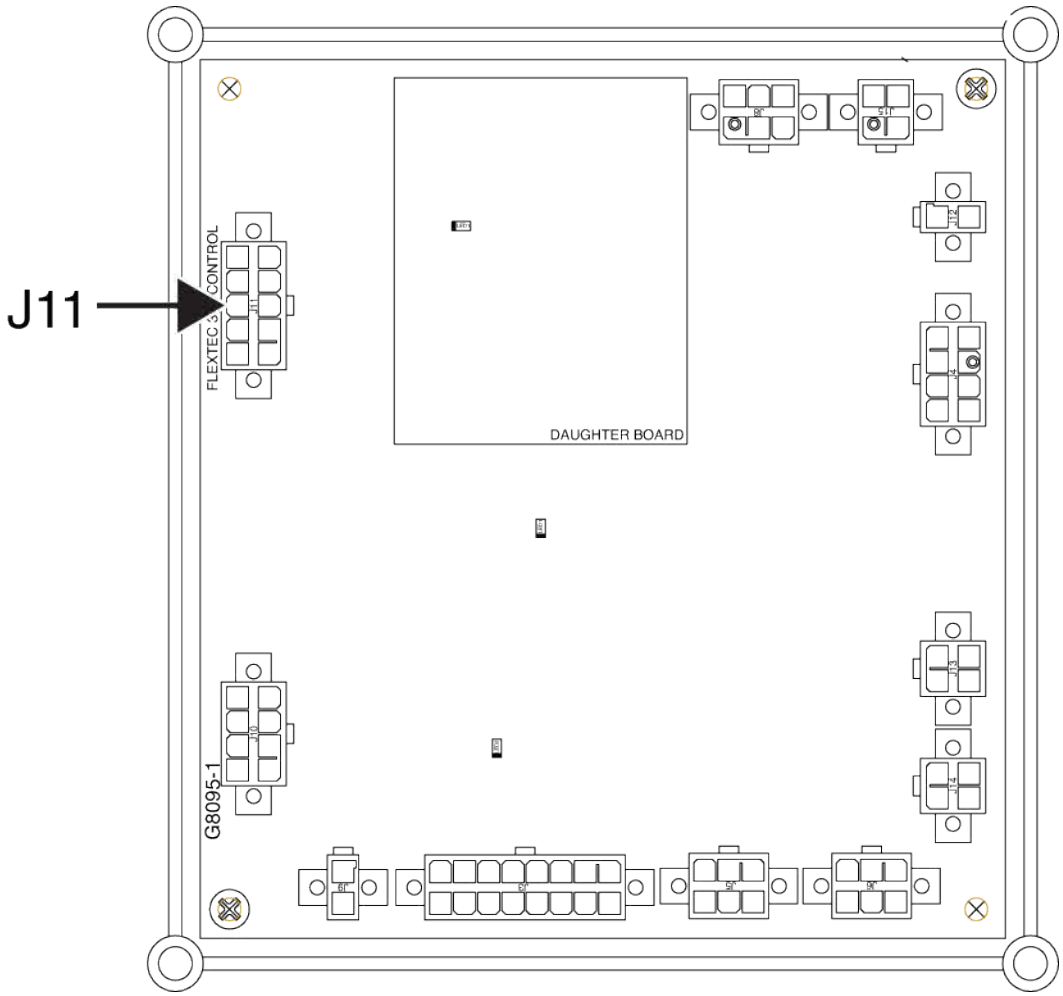


Figure 1. Inverter control board location

Plug J11 location on inverter control board

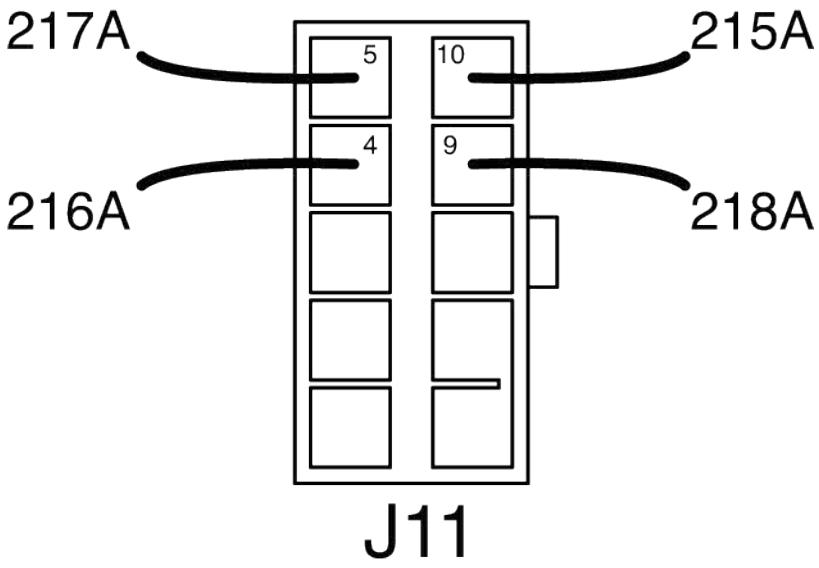


LECOL_EMBEDDEDIMG_0000178457_x.png

Figure 2. Plug J11 location on inverter control board

0000178455

Plug J11 lead locations



LECOL_EMBEDDEDIMG_0000178456_x.png

Figure 3. Plug J11 lead locations

FAN AND F.A.N. CIRCUIT TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Fan and F.A.N. Circuit are functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

NOTE: The fans should turn on briefly when the machine is turned on. The fans turn on during OCV or when welding current is present. The fans also turn on in the event of an over temperature condition.

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the inverter control board. See **Figure F.1**. See Wiring Diagram.
5. Locate the plugs J13 and J14 on the inverter control board. With the two plugs still connected to the inverter control board carefully insert the meter probes into pin 4 (red wire +) and pin 3 (black wire -) of plug J13 and test per **Table F.1**. See **Figure F.2**. See Wiring Diagram.
6. Carefully apply the correct input power to the machine.
7. Repeat the above step for plug J14.
8. If the 42 VDC is present at the red and black leads and the fan does not run, the fan may be faulty.
9. If faulty, perform the **Fan Removal And Replacement Procedure**.
10. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Fan voltage tests

TEST DESCRIPTION	TEST POINT	TEST POINT	CONDITIONS	EXPECTED READING
BOTTOM FAN	PLUG J13 PIN 4 (RED WIRE +)	PLUG J13 PIN 3 (BLACK WIRE -)	FAN NOT RUNNING	0 VDC
TOP FAN	PLUG J14 PIN 4 (RED WIRE +)	PLUG J14 PIN 3 (BLACK WIRE -)	FAN NOT RUNNING	0 VDC
BOTTOM FAN	PLUG J13 PIN 4 (RED WIRE +)	PLUG J13 PIN 3 (BLACK WIRE -)	FAN RUNNING – FANS SHOULD RUN IF THERMOSTAT CIRCUIT IS OPENED. SEE WIRING DIAGRAM AND **Figure F.2**.	42 VDC
TOP FAN	PLUG J14 PIN 4 (RED WIRE +)	PLUG J14 PIN 3 (BLACK WIRE -)	FAN RUNNING – FANS SHOULD RUN IF THERMOSTAT CIRCUIT IS OPENED. SEE WIRING DIAGRAM AND **Figure F.2**.	42 VDC

Inverter control board location

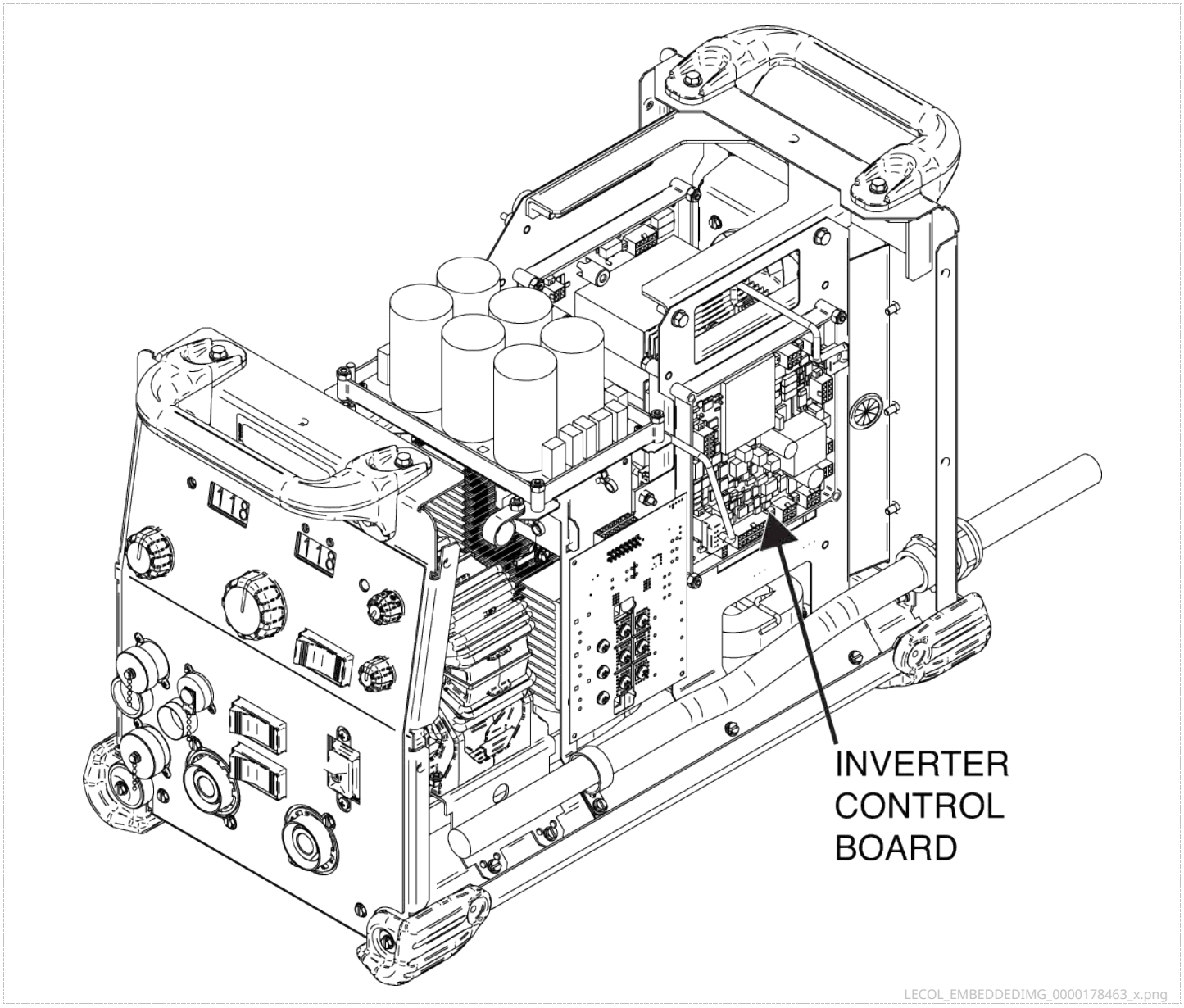


Figure 1. Inverter control board location

Inverter control board plugs J13 and J14 locations

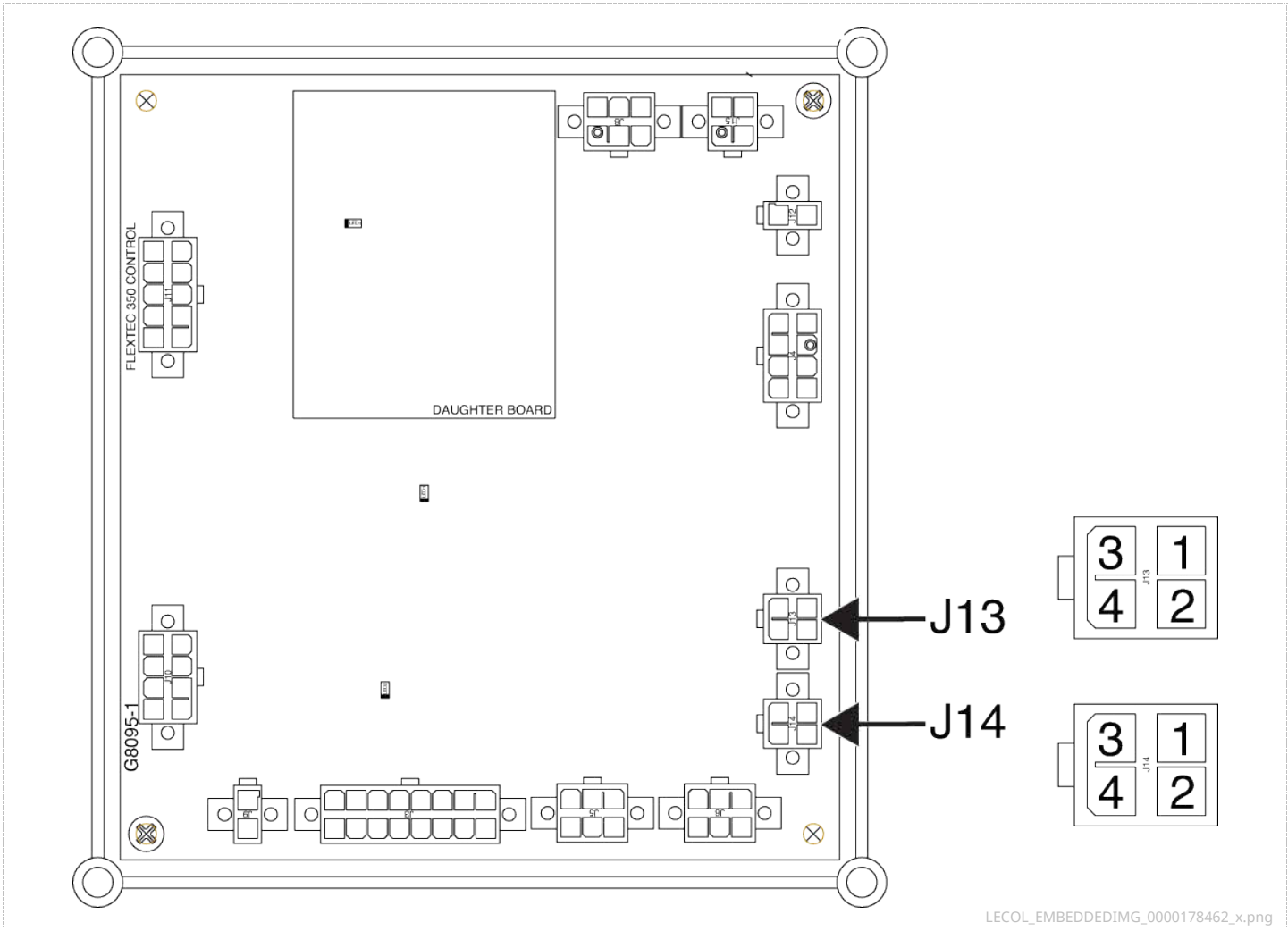


Figure 2. Inverter control board plugs J13 and J14 locations

INPUT RECTIFIER AND SCR (PRE-CHARGE) BOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Input Rectifier and the SCR (Pre-Charge) Board are functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the input rectifier and SCR (pre-charge) board. See **Figure F.1**. See Wiring Diagram.
5. Carefully remove the six cable ties securing the protective cover over the input rectifier and SCR (pre-charge) board. The cover can be lifted to perform tests. Do not completely remove the protective cover. See **Figure F.2**.
6. Using a volt/ohmmeter, perform the diode drop tests outlined in **Table F.1**. See **Figure F.2**. See Wiring Diagram.
7. If any of the tests fail, label and disconnect all leads connected to the input rectifier terminals and retest. See Wiring Diagram.
8. If any of the tests still fail, the input rectifier may be faulty.
9. If faulty, perform the **Input Rectifier Removal And Replacement Procedure**.
10. Connect any previously disconnected leads. See Wiring Diagram.
11. Carefully apply the correct input power to the machine and turn ON the machine.
12. Using a volt/ohmmeter, measure the voltage from SCR (pre-charge) board plug J40 pin 8 (lead 446) to plug J40 pin 16 (lead 445). See **Figures F.2** and **Figures F.3**. See Wiring Diagram. Normal reading is 15 VDC.
13. When testing is complete, close protective cover and secure with six cable ties.
14. If the test fails, the SCR (pre-charge) board may be faulty.
15. If faulty, perform the **SCR (Pre-Charge) Board Removal And Replacement Procedure**.
16. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Input rectifier diode drop tests

TEST POINT	TEST POINT	EXPECTED READING
TERMINAL L1	POSITIVE TERMINAL (B6)	0.3 VDC – 1.0 VDC
TERMINAL L2	POSITIVE TERMINAL (B6)	0.3 VDC – 1.0 VDC
TERMINAL L3	POSITIVE TERMINAL (B6)	0.3 VDC – 1.0 VDC
POSITIVE TERMINAL (B6)	TERMINAL L1	OL
POSITIVE TERMINAL (B6)	TERMINAL L2	OL
POSITIVE TERMINAL (B6)	TERMINAL L3	OL
NEGATIVE TERMINAL (B5)	TERMINAL L1	0.3 VDC – 1.0 VDC
NEGATIVE TERMINAL (B5)	TERMINAL L2	0.3 VDC – 1.0 VDC
NEGATIVE TERMINAL (B5)	TERMINAL L3	0.3 VDC – 1.0 VDC
TERMINAL L1	NEGATIVE TERMINAL (B5)	OL
TERMINAL L2	NEGATIVE TERMINAL (B5)	OL
TERMINAL L3	NEGATIVE TERMINAL (B5)	OL

Input rectifier and SCR (pre-charge) board locations

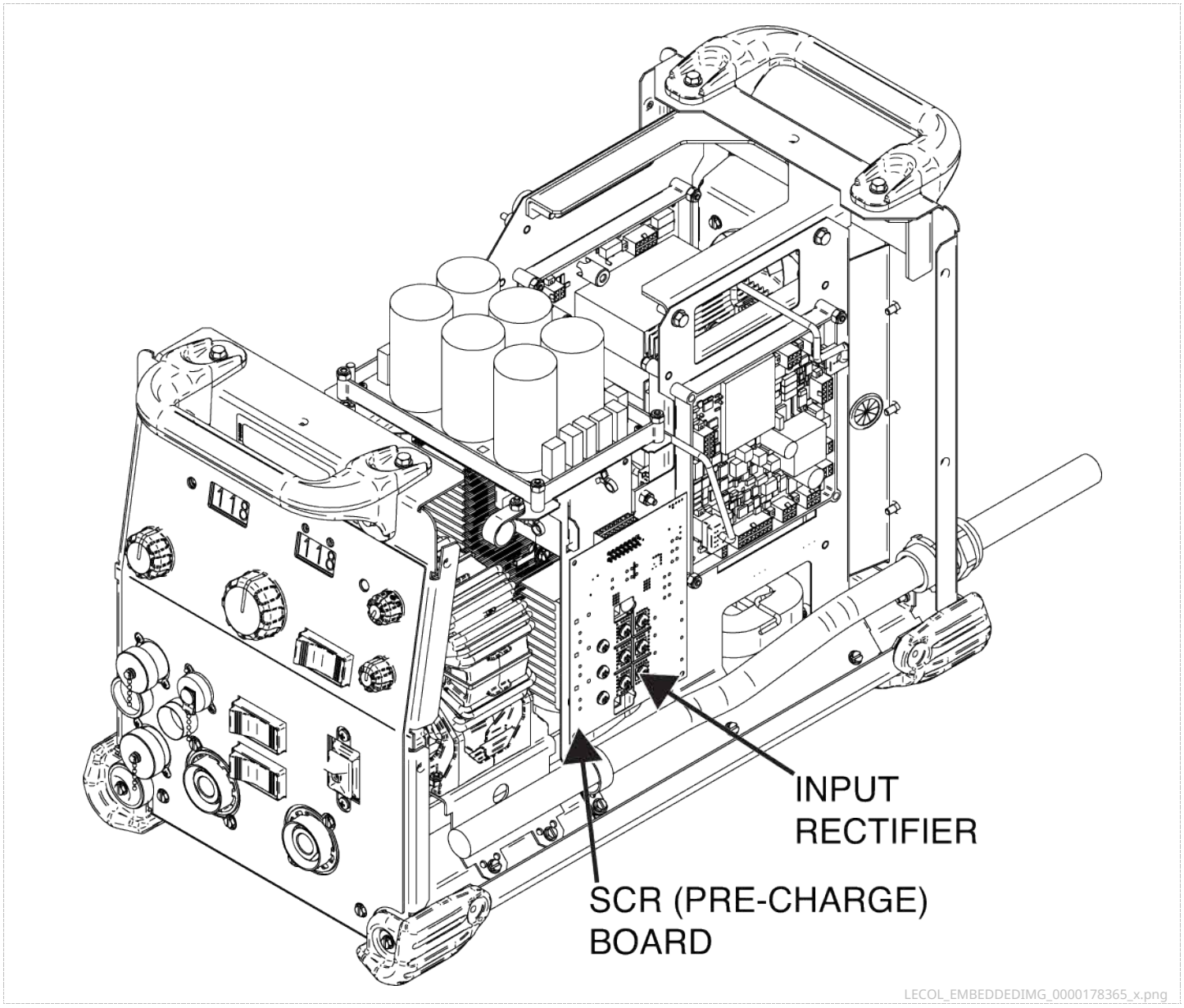
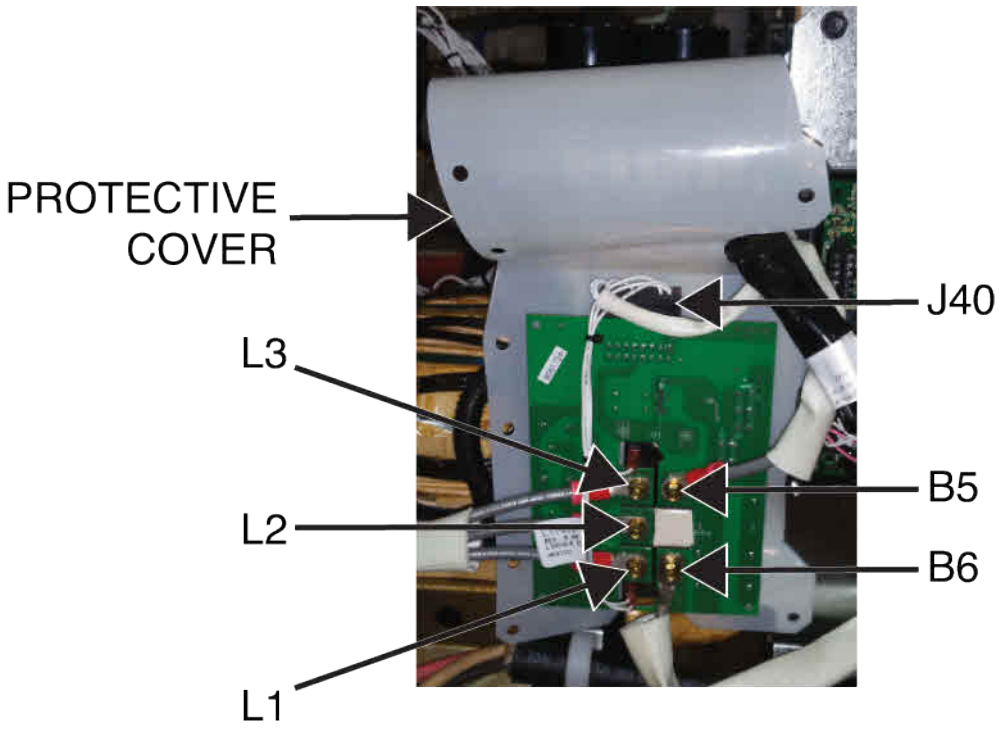


Figure 1. Input rectifier and SCR (pre-charge) board locations

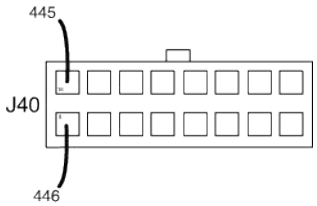
Input rectifier terminal and SCR (pre-charge) board plug J40 locations



LECOL_EMBEDDEDIMG_0000178364_x.png

Figure 2. Input rectifier terminal and SCR (pre-charge) board plug J40 locations

SCR (pre-charge) board plug J40 lead locations



LECOL_EMBEDDEDIMG_0000178383_x.png

Figure 3. SCR (pre-charge) board plug J40 lead locations

INVERTER CONTROL BOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Inverter Control Board is functioning properly. The procedure will not check all of the Inverter Control Board's circuitry.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the inverter control board. See **Figure F.1**. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn ON the machine.
6. Visually inspect the LEDs according to **Table F.1**. See **Figures F.2** and **Figures F.3**. See Wiring Diagram.
7. Using a volt/ohmmeter, perform the voltage tests outlined in **Table F.2**. See **Figures F.2** and **Figures F.3**. See Wiring Diagram.
8. If any of the tests fail, the inverter control board may be faulty.
9. If faulty, perform the **Inverter Control Board Removal And Replacement Procedure**.
10. Perform the **Case Cover Replacement Procedure**.

Inverter control board LED tests

DESCRIPTION	LOCATION	MEANING
LED 1	INVERTER CONTROL BOARD	+15 VDC SUPPLY ON

DESCRIPTION	LOCATION	MEANING
LED 2	INVERTER CONTROL BOARD	ARCLINK SUPPLY ON
LED 1	DAUGHTER BOARD	ARCLINK STATUS INDICATOR STEADY GREEN = SYSTEM OK BLINKING GREEN = OCCURS DURING STARTUP. NORMAL FOR FIRST 1 TO 30 SECONDS AFTER POWER IS APPLIED. ALTERNATING GREEN AND RED = READ THE ERROR CODE BEFORE THE MACHINE IS POWERED OFF.

Inverter control board voltage tests

DESCRIPTION	TEST POINT (POS)	TEST POINT (POS)	EXPECTED READING	CONDITIONS
CAN COMMUNICATION	PLUG J5 PIN 2 (LEAD 53A)	PLUG J5 PIN 1 (LEAD 54A)	2 VDC	MACHINE ON
USER INTERFACE BOARD INPUT POWER	PLUG J5 PIN 4 (LEAD 52A)	PLUG J5 PIN 3 (LEAD 51A)	42 VDC	MACHINE ON
FAN POWER	PLUG J13 PIN 4 (LEAD RED)	PLUG J13 PIN 3 (LEAD BLACK)	42 VDC	MACHINE ON
FAN POWER	PLUG J14 PIN 4 (LEAD RED)	PLUG J14 PIN 3 (LEAD BLACK)	42 VDC	MACHINE ON
	PLUG J6 PIN 2 (LEAD 53)	PLUG J6 PIN 1 (LEAD 54)	2 VDC	MACHINE ON
	PLUG J9 PIN 2 (LEAD 220D)	PLUG J9 PIN 1 (LEAD 221D)	60 VDC	MACHINE ON
	PLUG J11 PIN 1 (LEAD 220A)	PLUG J11 PIN 2 (LEAD 221A)	60 VDC	MACHINE ON
LEM SUPPLY	PLUG J11 PIN 4 (LEAD 216A)	PLUG J11 PIN 9 (LEAD 218A)	+15 VDC	MACHINE ON
LEM SUPPLY	PLUG J11 PIN 5 (LEAD 217A)	PLUG J11 PIN 9 (LEAD 218A)	-15 VDC	MACHINE ON
	PLUG J4 PIN 4 (LEAD 473)	PLUG J4 PIN 1 (LEAD B2D)	3 VDC	MACHINE ON
	PLUG J3 PIN 16 (LEAD 466)	PLUG J3 PIN 15 (LEAD 465)	3 VDC	MACHINE ON
	PLUG J6 PIN 3 (LEAD 463)	PLUG J13 PIN 1 (LEAD 464)	30 VDC	MACHINE ON

Inverter control board location

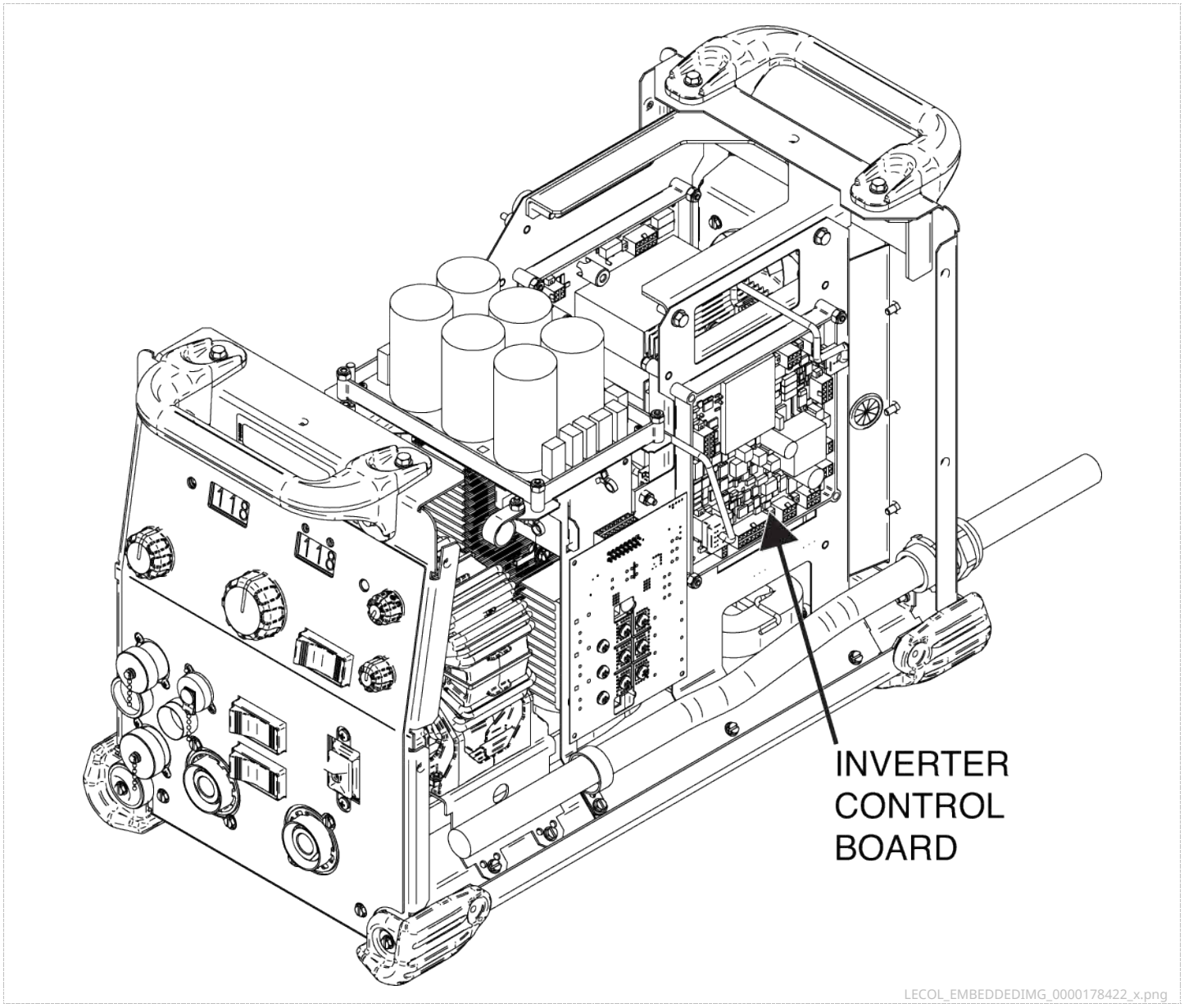


Figure 1. Inverter control board location

Inverter control board test points

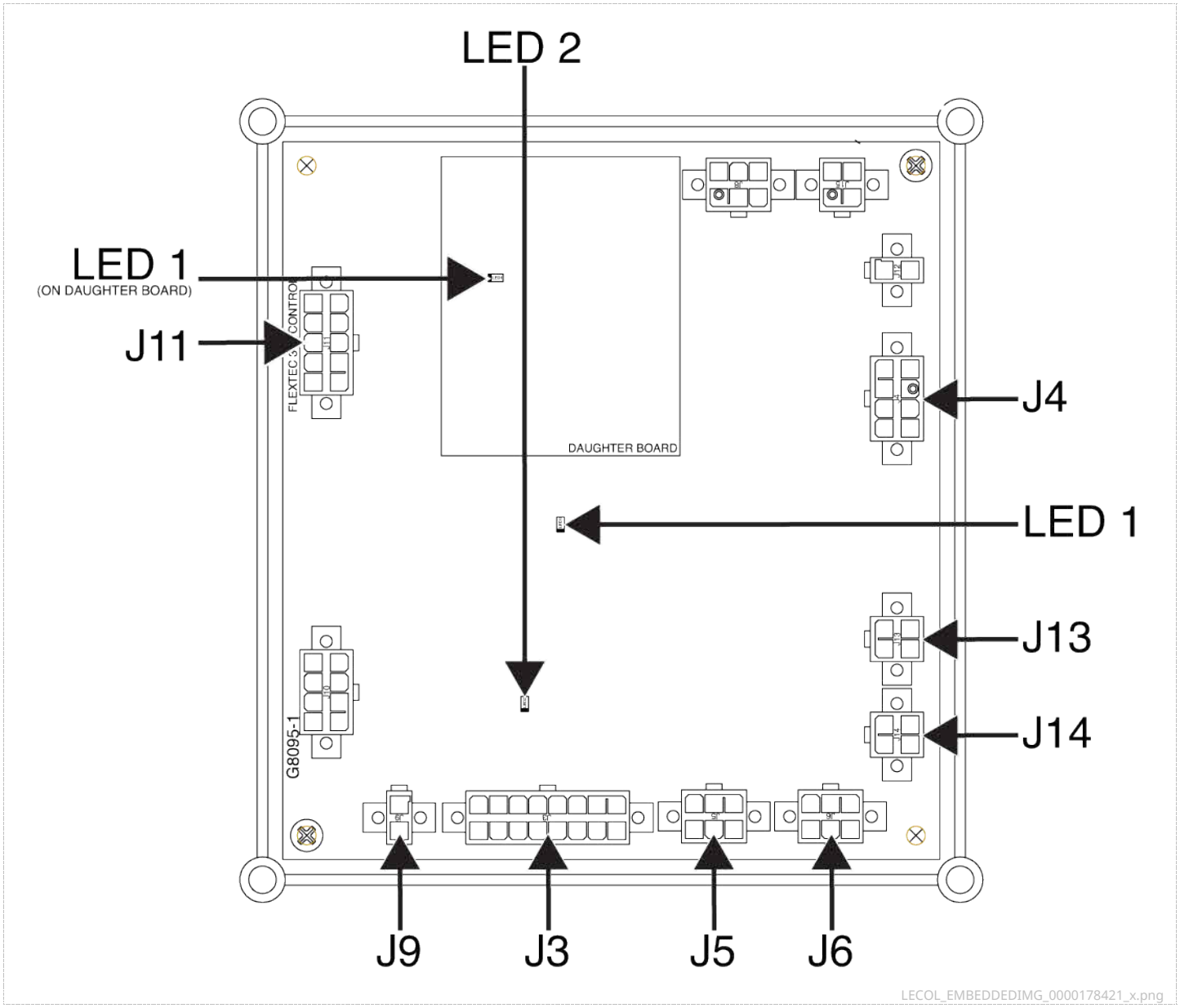


Figure 2. Inverter control board test points

Inverter control board lead locations

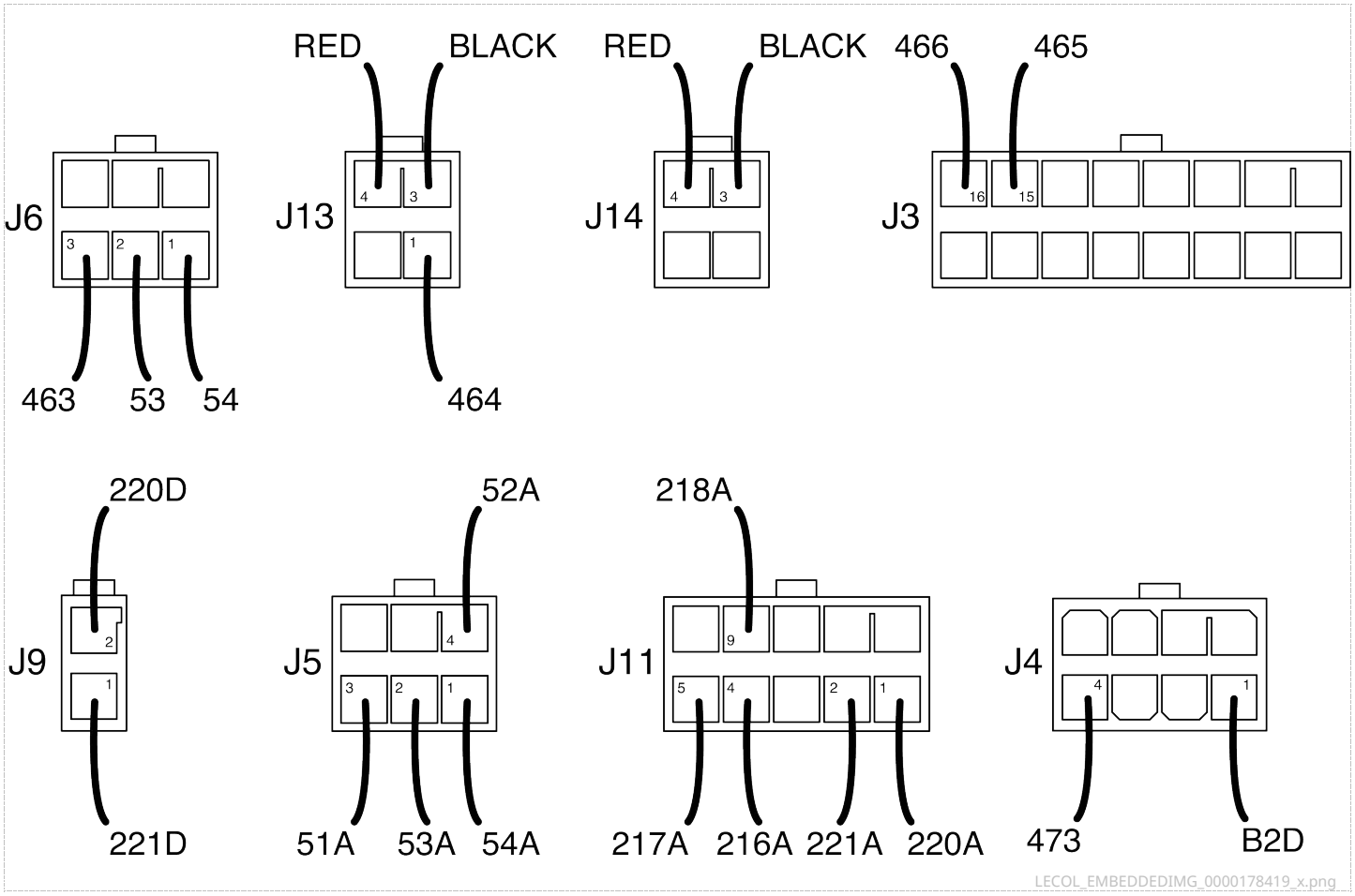


Figure 3. Inverter control board lead locations

LINE SWITCH TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Line Switch is functioning properly.

MATERIALS NEEDED

- Offset Phillips Screwdriver
- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the line switch on the rear of the front panel. See **Figure F.1**. See Wiring Diagram.
5. Carefully remove the cable tie, securing the plastic protective sleeve to the line switch. Move the plastic protective sleeve flap to gain access to the rear of the line switch. See Wiring Diagram.
6. Using an offset Phillips screwdriver, remove the six screws securing leads L1, L2, L3 and the three input (black, red and white) leads to the line switch. See **Figure F.2**. See Wiring Diagram. Label and disconnect leads from the line switch.
7. Using a volt/ohmmeter, perform the resistance tests outlined in **Table F.1**. See **Figure F.2**. See Wiring Diagram.
8. If any of the tests fail, the line switch may be faulty.
9. If faulty, perform the **Line Switch Removal And Replacement Procedure**.
10. Using an offset Phillips screwdriver, attach the six screws securing leads L1, L2, L3 and the three input (black, red and white) leads to the line switch. See Wiring Diagram.
11. Carefully position the flap and secure the plastic protective sleeve with a new cable tie.
12. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Line switch resistance tests

TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING	SWITCH POSITION
L1	WHITE LEAD	VERY LOW RESISTANCE (LESS THAN ONE OHM)	“ON” POSITION
L2	RED LEAD	VERY LOW RESISTANCE (LESS THAN ONE OHM)	“ON” POSITION
L3	BLACK LEAD	VERY LOW RESISTANCE (LESS THAN ONE OHM)	“ON” POSITION
L1	WHITE LEAD	HIGH RESISTANCE (GREATER THAN 500K OHMS)	“OFF” POSITION
L2	RED LEAD	HIGH RESISTANCE (GREATER THAN 500K OHMS)	“OFF” POSITION
L3	BLACK LEAD	HIGH RESISTANCE (GREATER THAN 500K OHMS)	“OFF” POSITION

Line switch location

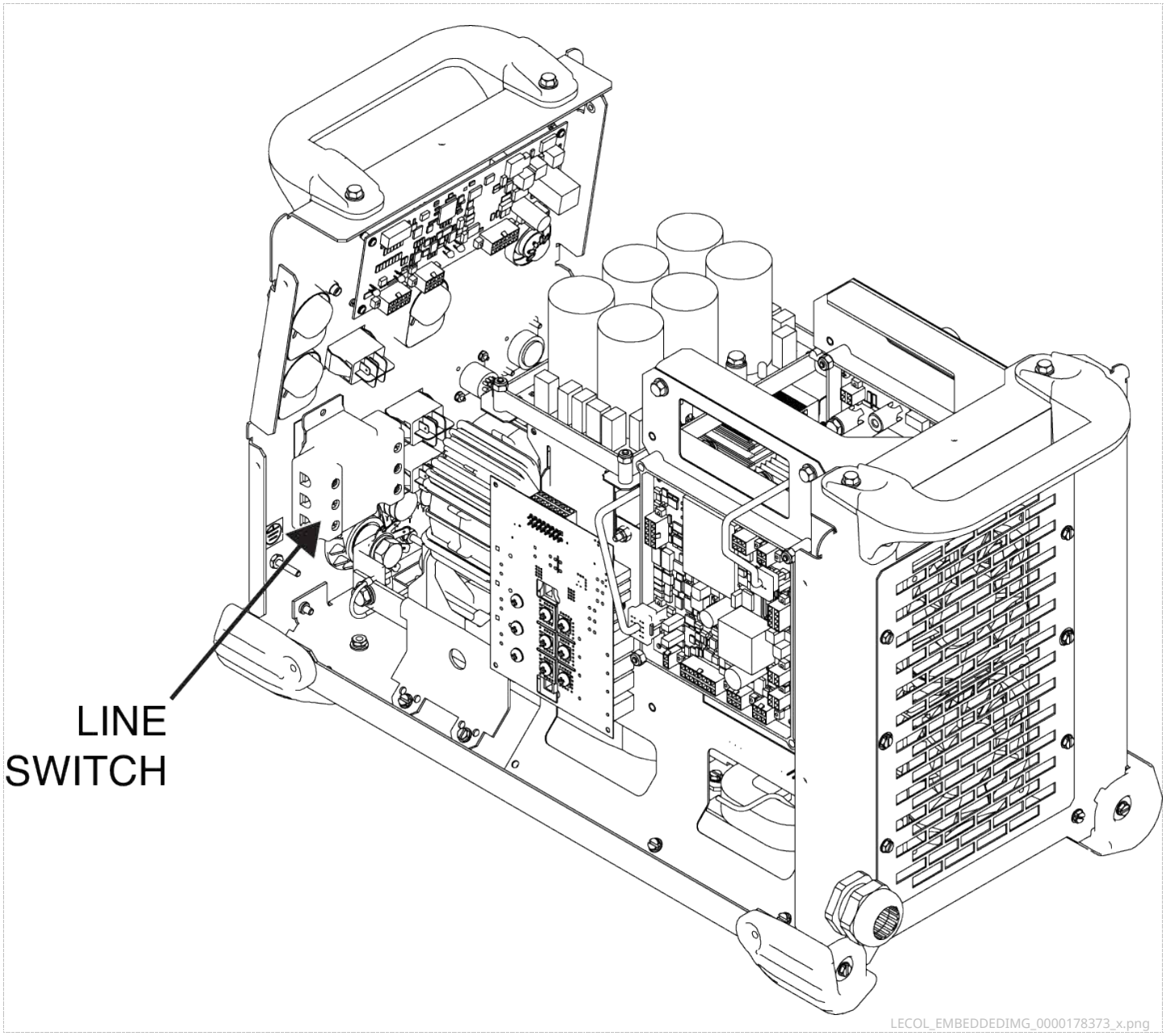


Figure 1. Line switch location

Line switch lead location

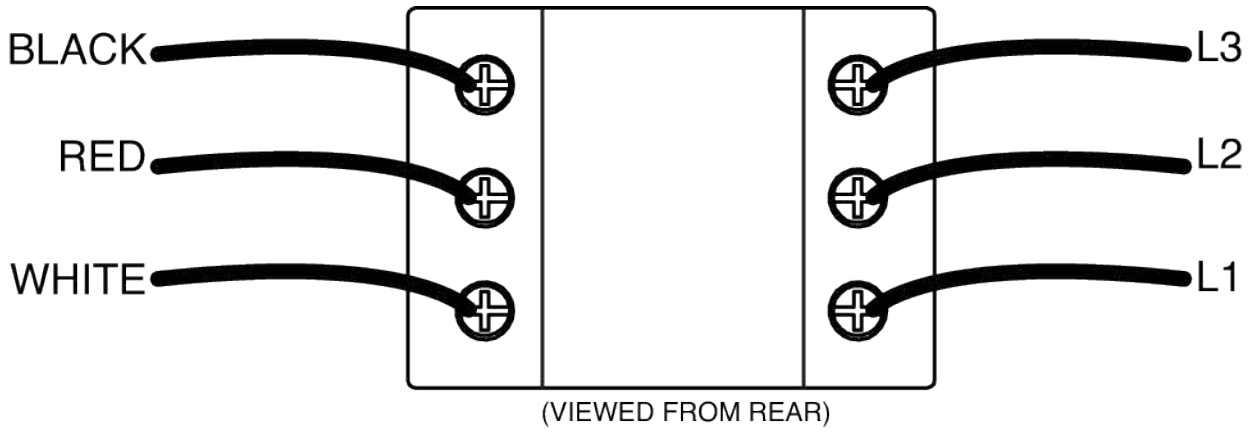


Figure 2. Line switch lead location

MAIN CAPACITOR BOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Main Capacitor Board is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the main capacitor board. See **Figure F.1**. See Wiring Diagram.
5. Carefully apply the correct input power to the machine and turn ON the machine.
6. Visually verify that LED 1 and LED 2 are illuminated Green. This indicates that voltage is present. See **Figure F.2**.
7. Using a volt/ohmmeter, measure the voltage at terminals B2 and B1 on the main capacitor board. See **Figure F.2**. See Wiring Diagram. Normal voltage is approximately 860 VDC.
8. If any of the tests fail, the main capacitor board may be faulty.
9. If faulty, perform the **Main Capacitor Board Removal And Replacement Procedure**.
10. Perform the **Case Cover Replacement Procedure**.

Main capacitor board location

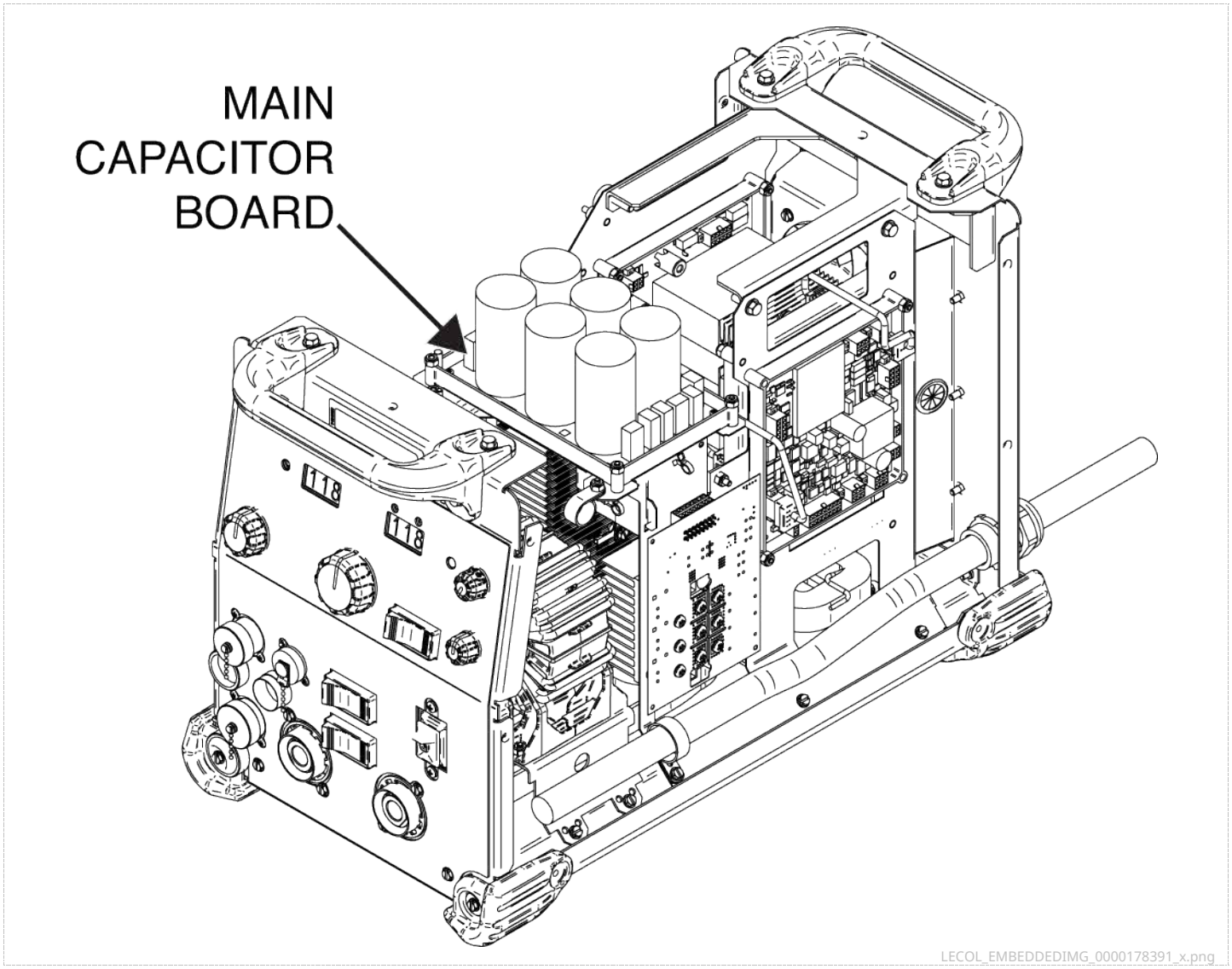
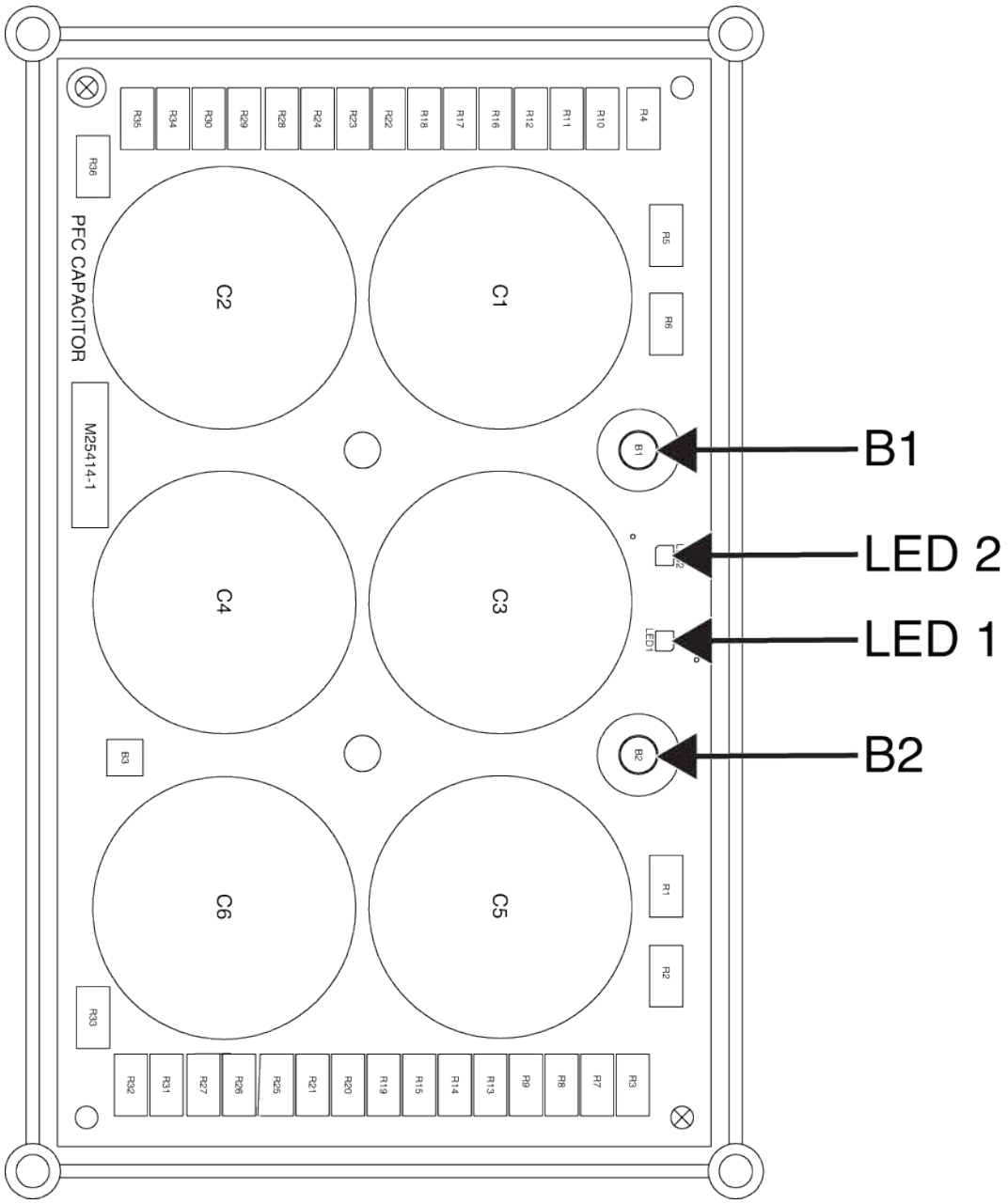


Figure 1. Main capacitor board location

Main capacitor board terminal and LED locations



LECOL_EMBEDDEDIMG_0000178390_x.png

Figure 2. Main capacitor board terminal and LED locations

MAIN TRANSFORMER TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Main Transformer is functioning properly. In order for this test to produce the expected results the Main Transformer must be receiving the correct input voltage from the Switchboard.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the main transformer. See **Figure F.1**. See Wiring Diagram.
5. Using a volt/ohmmeter, perform the voltage tests in **Table F.1**. See **Figure F.2**. See Wiring Diagram.
6. If any of the tests fail, the main transformer may be faulty.
7. If faulty, perform the **Main Transformer Removal And Replacement Procedure**.
8. Connect all previously removed leads.
9. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Main transformer voltage tests

TEST POINT	TEST POINT	EXPECTED READING	MACHINE CONDITION
X12 (AT OUTPUT RECTIFIER BUSS BAR)	X11 (AT OUTPUT RECTIFIER BUSS BAR)	120 VAC	MACHINE ON.
X21 (AT BOOST RECTIFIER)	LEAD #110 (AT BOOST RELAY)	24 VAC	MACHINE ON.
X11 (AT OUTPUT RECTIFIER BUSS BAR)	X13 (AT NEGATIVE OUTPUT TERMINAL)	24 VAC	MACHINE ON.

TEST POINT	TEST POINT	EXPECTED READING	MACHINE CONDITION
X12 (AT OUTPUT RECTIFIER BUSS BAR)	X13 (AT NEGATIVE OUTPUT TERMINAL)	40 VAC	MACHINE ON.

Main transformer location

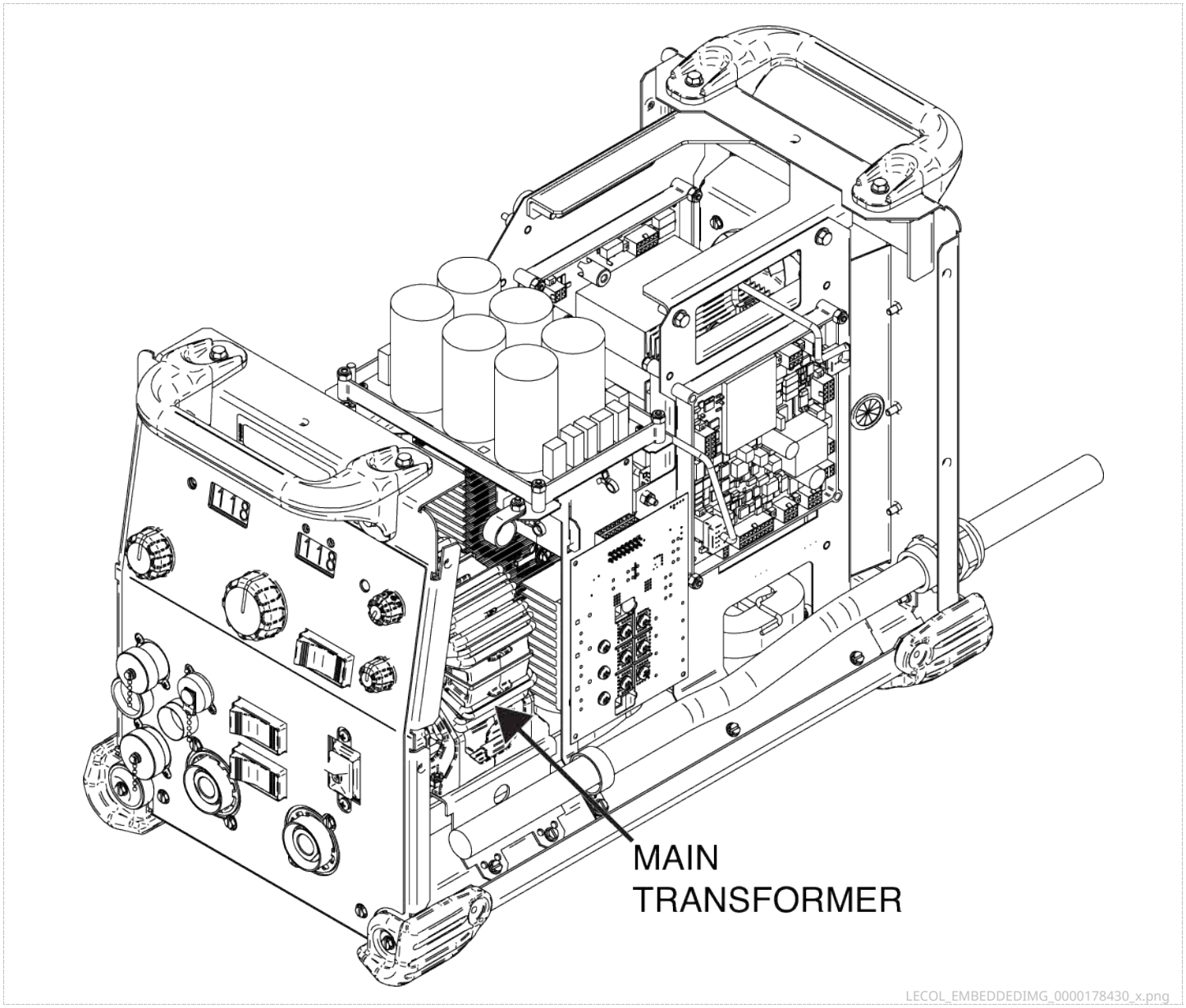


Figure 1. Main transformer location

Main transformer test point locations

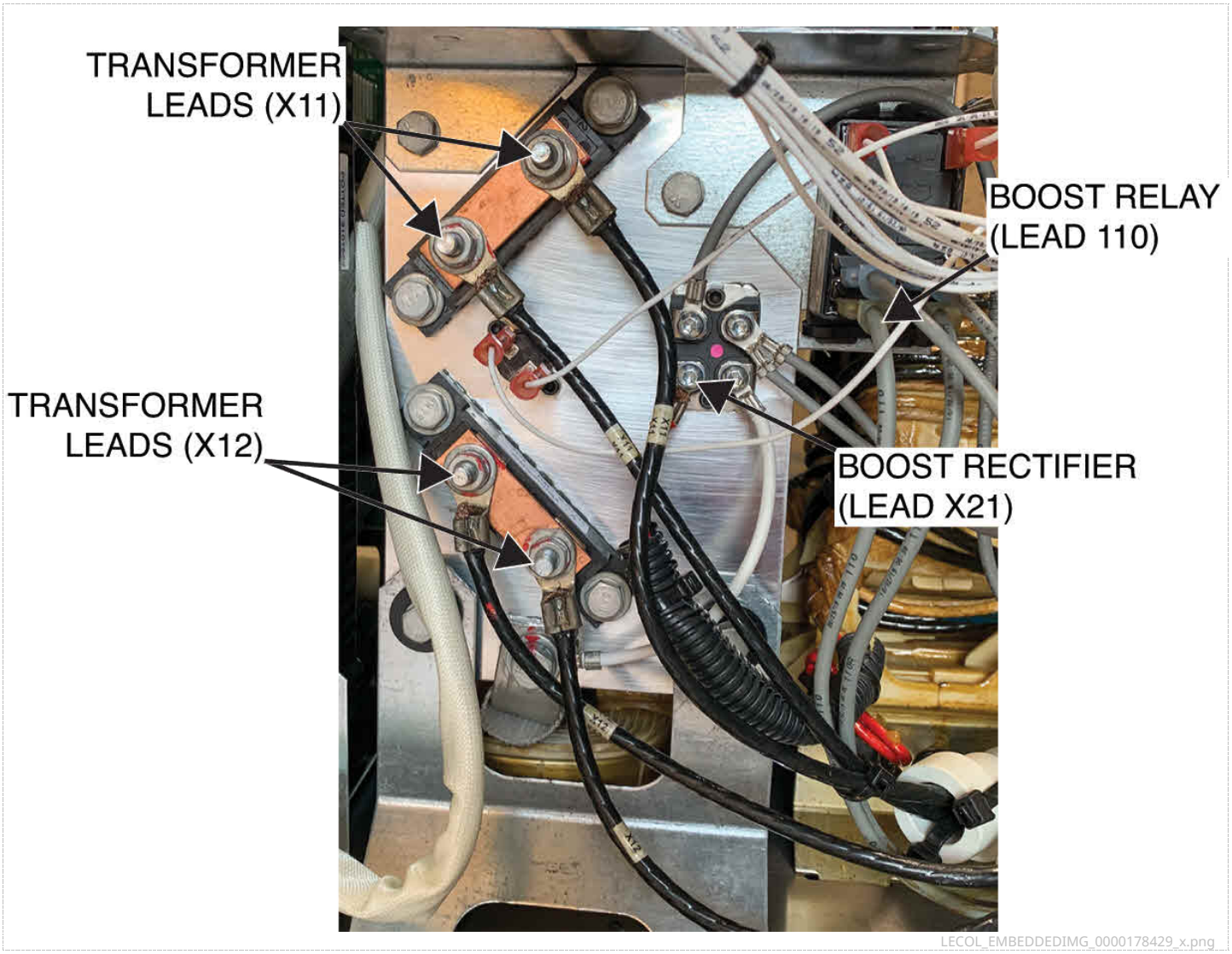


Figure 2. Main transformer test point locations

MODE SELECT SWITCH TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Mode Select Switch is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the mode select switch. See **Figure F.1**. See Wiring Diagram.
5. Label and disconnect plug J3 from the user interface board. See **Figure F.2**. See Wiring Diagram.
6. Using a volt/ohmmeter, perform the resistance tests outlined in **Table F.1**. See **Figure F.3**. See Wiring Diagram.
7. If any of the tests fail, the mode select switch may be faulty.
8. If faulty, perform the **Mode Select Switch Removal And Replacement Procedure**.
9. Connect plug J3 to the user interface board. See Wiring Diagram.
10. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Line switch resistance tests

SWITCH POSITION	TEST POINT	TEST POINT	EXPECTED READING
GTAW	PLUG J3 PIN 2 (LEAD 301)	PLUG J3 PIN 1 (LEAD 308)	VERY LOW RESISTANCE (LESS THAN ONE OHM) IN SWITCH POSTION. HIGH RESISTANCE (GREATER THAN 50OK OHMS) IN ALL OTHER POSITIONS.

SWITCH POSITION	TEST POINT	TEST POINT	EXPECTED READING
SMAW	PLUG J3 PIN 7 (LEAD 302)	PLUG J3 PIN 1 (LEAD 308)	VERY LOW RESISTANCE (LESS THAN ONE OHM) IN SWITCH POSTION. HIGH RESISTANCE (GREATER THAN 50OK OHMS) IN ALL OTHER POSITIONS.
CV	PLUG J3 PIN 6 (LEAD 303)	PLUG J3 PIN 1 (LEAD 308)	VERY LOW RESISTANCE (LESS THAN ONE OHM) IN SWITCH POSTION. HIGH RESISTANCE (GREATER THAN 50OK OHMS) IN ALL OTHER POSITIONS.
CV-INNERSHIELD	PLUG J3 PIN 5 (LEAD 305)	PLUG J3 PIN 1 (LEAD 308)	VERY LOW RESISTANCE (LESS THAN ONE OHM) IN SWITCH POSTION. HIGH RESISTANCE (GREATER THAN 50OK OHMS) IN ALL OTHER POSITIONS.
ARCLINK	PLUG J3 PIN 8 (LEAD 306)	PLUG J3 PIN 1 (LEAD 308)	VERY LOW RESISTANCE (LESS THAN ONE OHM) IN SWITCH POSTION. HIGH RESISTANCE (GREATER THAN 50OK OHMS) IN ALL OTHER POSITIONS.

Mode select switch location

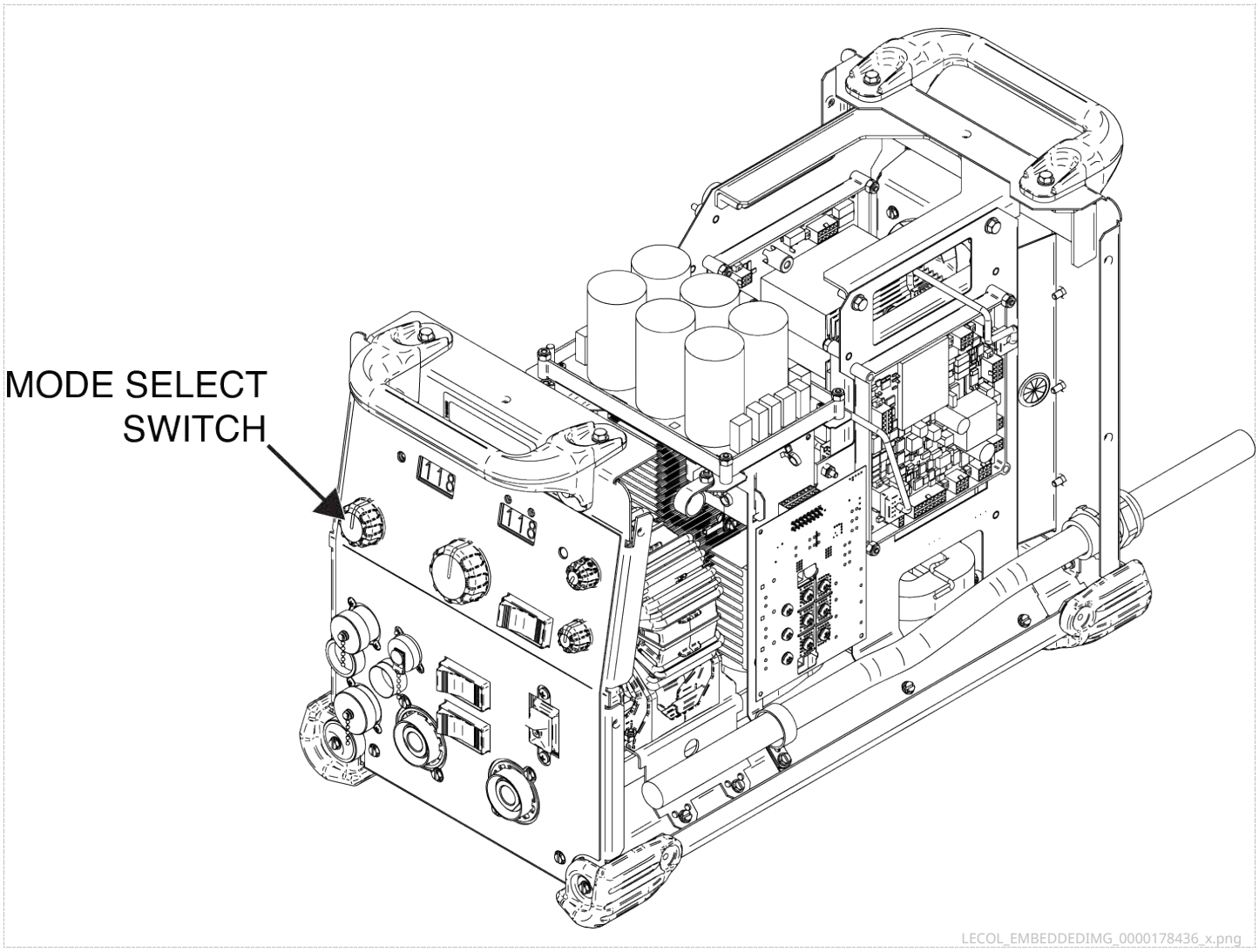
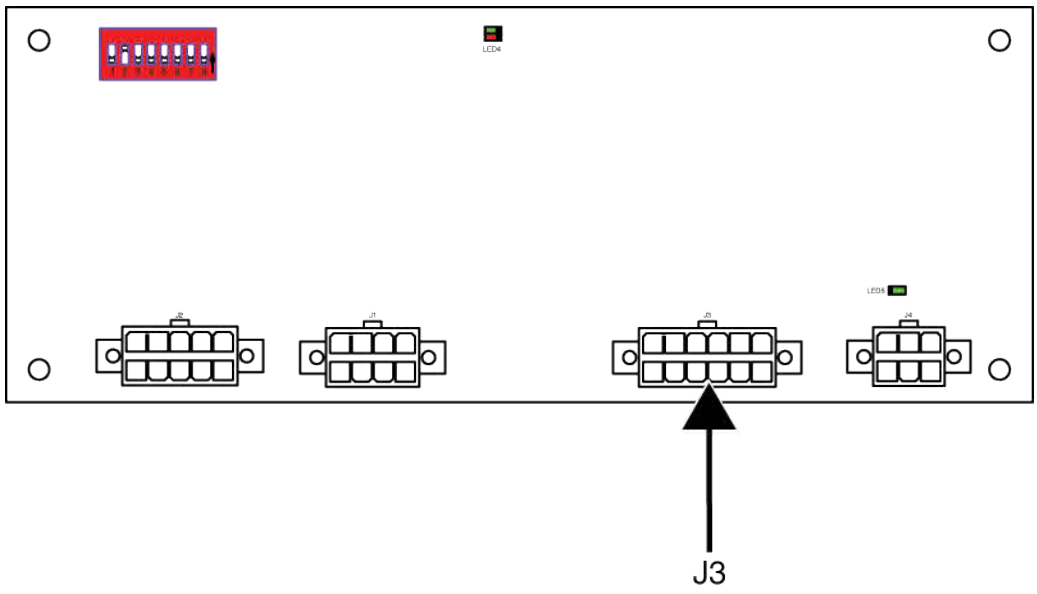


Figure 1. Mode select switch location

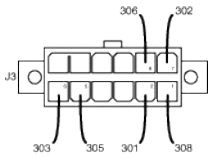
User interface board plug J3 location



LECOL_EMBEDDEDIMG_0000178435_x.png

Figure 2. User interface board plug J3 location

User interface board plug J3 lead locations



LECOL_EMBEDDEDIMG_0000178434_x.png

Figure 3. User interface board plug J3 lead locations

OUTPUT RECTIFIER ASSEMBLY TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Output Rectifier Assembly is functioning properly.

MATERIALS NEEDED

- 7/16" Nutdriver
- 1/2" Nutdriver
- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

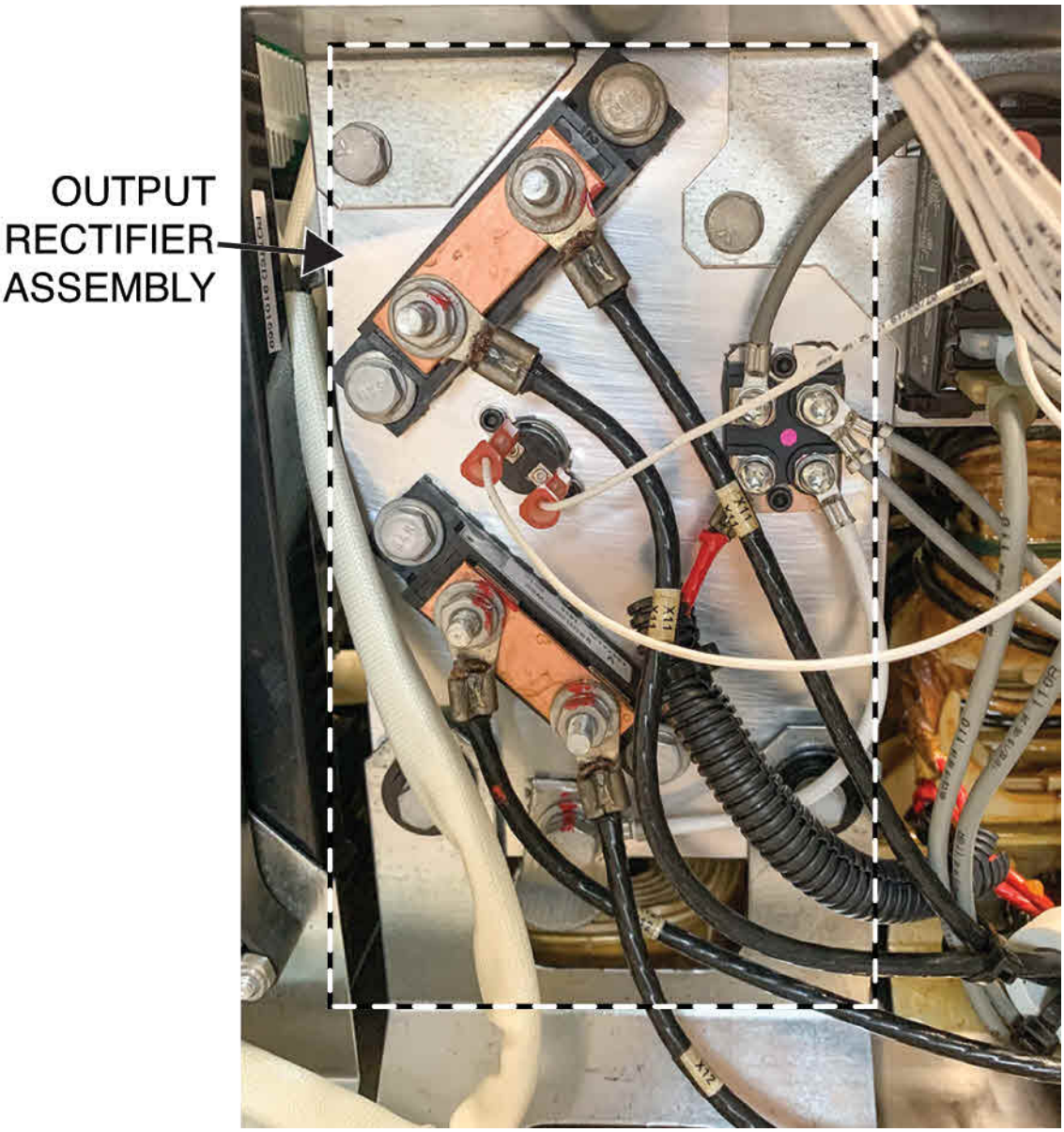
1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the output rectifier. See **Figure F.1**. See Wiring Diagram.
5. Using a 7/16” nutdriver, remove the bolt and associated washers securing the transformer leads (X11 and X12) to the output rectifier. Label and disconnect the transformer leads (X11 and X12) from the output rectifier assembly. See **Figure F.2**. See Wiring Diagram.
6. Using a 1/2” nutdriver, remove the bolt securing the positive boost lead to the output rectifier heatsink. See **Figure F.2**. Label and disconnect positive boost lead.
7. Using a volt/ohmmeter (set for diode testing), perform the forward voltage drop test per **Table F.1**. See **Figure F.2**. See Wiring Diagram.
8. If the tests determine that the diodes are shorted or open, the output rectifier assembly may be faulty.
9. When testing is complete connect any previously disconnected leads. See Wiring Diagram.
10. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Output rectifier forward voltage drop tests

TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
UPPER BUSS BAR	OUTPUT RECTIFIER HEATSINK	0.2 VDC – 0.7 VDC

TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
LOWER BUSS BAR	OUTPUT RECTIFIER HEATSINK	0.2 VDC – 0.7 VDC

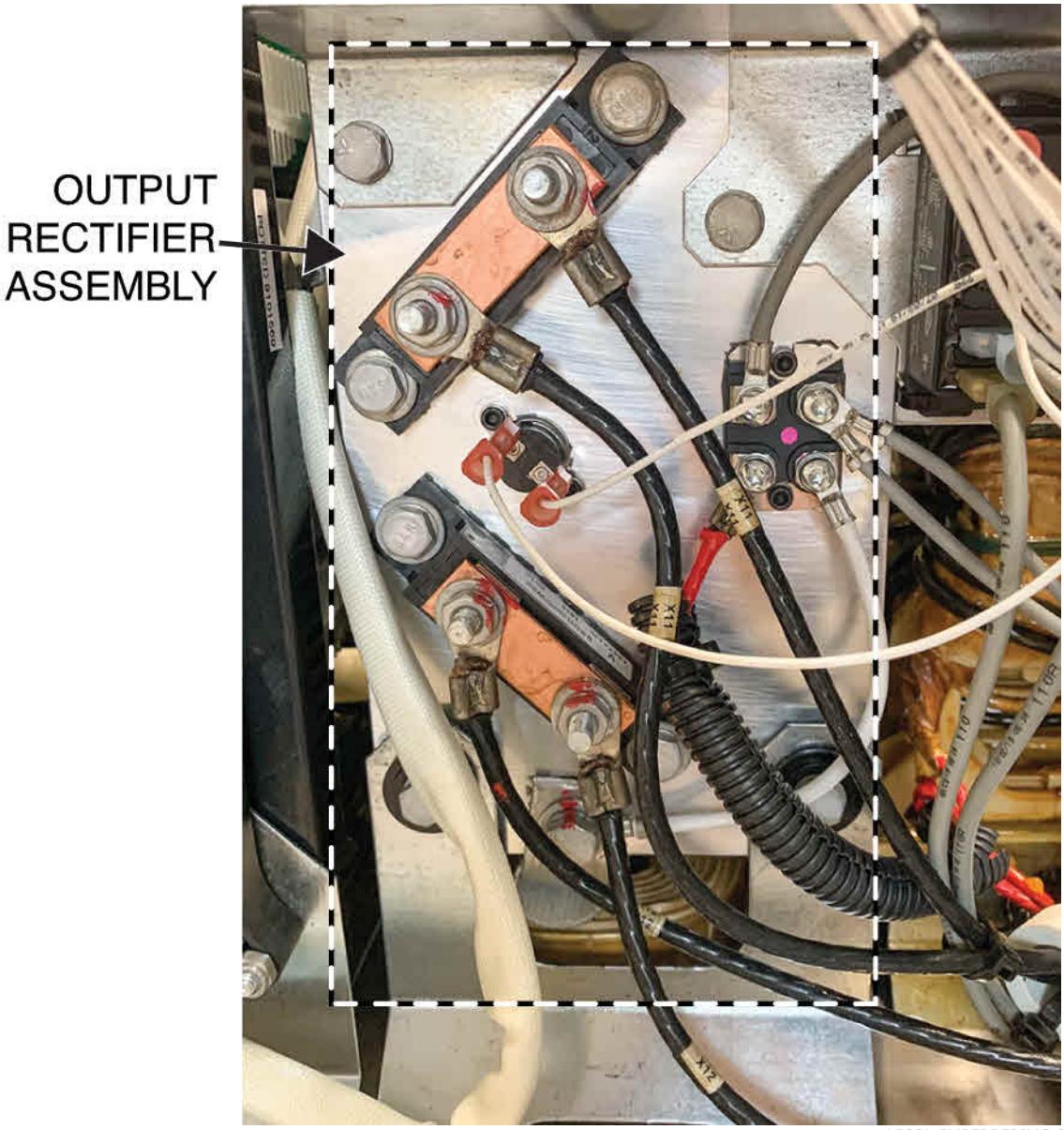
Output rectifier assembly location



LECOL_EMBEDDEDIMG_0000178404_x.png

Figure 1. Output rectifier assembly location

Lead X11 and X12 connection point locations



LECOL_EMBEDDEDIMG_0000178404_x.png

Figure 2. Lead X11 and X12 connection point locations

PFC BOOST BOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the PCF Boost Board is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the PFC boost board. See **Figure F.1**. See Wiring Diagram.
5. Using a volt/ohmmeter, perform the diode drop and resistance tests outlined in **Table F.1**. See **Figure F.2**. See Wiring Diagram.
6. If any of the tests fail, label and disconnect leads from the terminals and retest. See Wiring Diagram.
7. If any of the tests still fail, the PFC boost board may be faulty.
8. If faulty, perform the **PFC Boost Board Removal And Replacement Procedure**.
9. Perform the **Case Cover Replacement Procedure**.

Table F.1 - PFC boost board diode drop and resistance tests

TEST POINT	TEST POINT	EXPECTED READING
TERMINAL B1	TERMINAL B7	0.3 VDC – 1.0 VDC
TERMINAL B5	TERMINAL B7	0.3 VDC – 1.0 VDC
TERMINAL B1	TERMINAL B7	GREATER THAN 100K OHMS
TERMINAL B5	TERMINAL B7	GREATER THAN 100K OHMS

TEST POINT	TEST POINT	EXPECTED READING
TERMINAL B7	TERMINAL B2	0.3 VDC – 1.0 VDC
TERMINAL B7	TERMINAL B2	GREATER THAN 100K OHMS

PFC boost board location

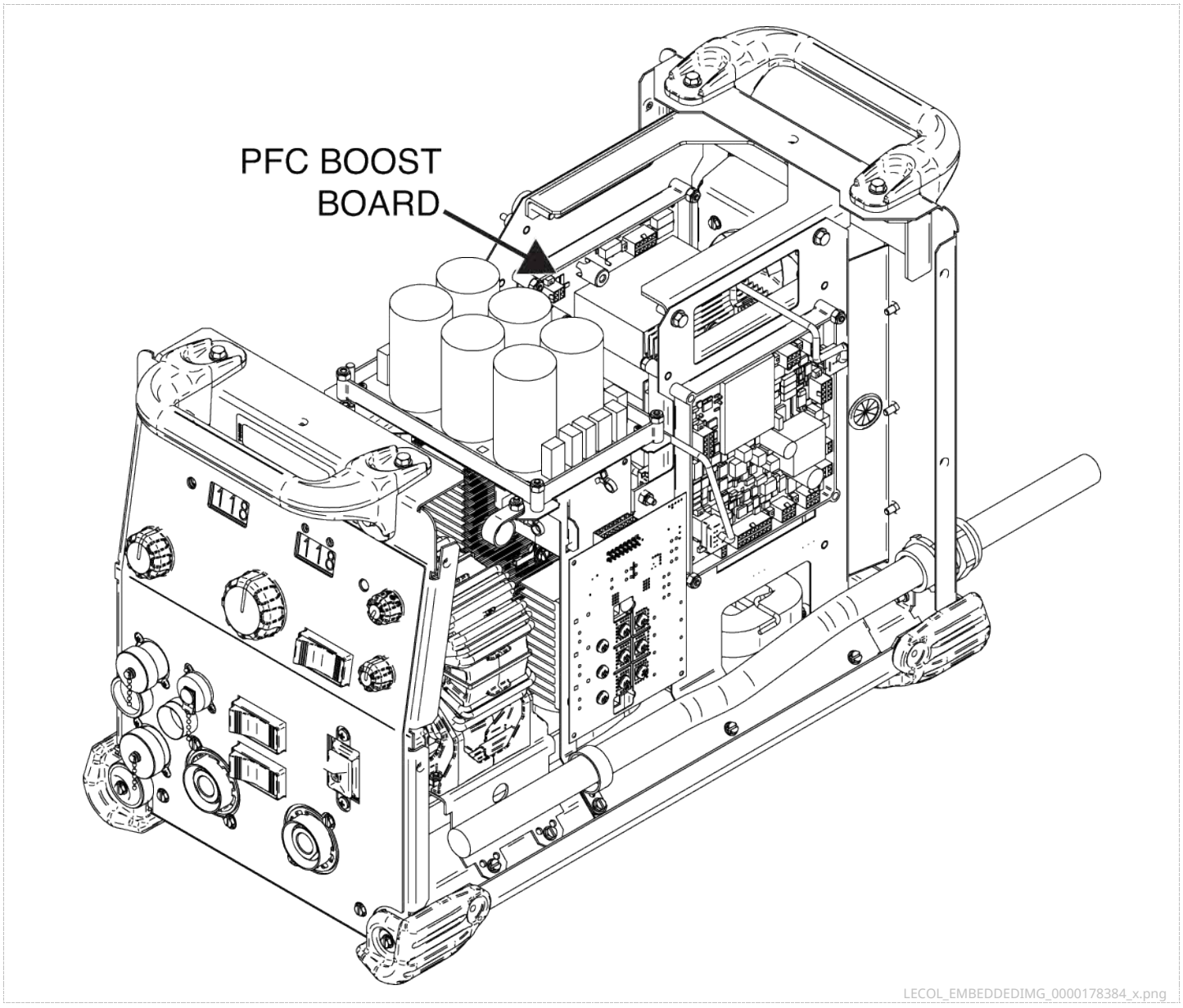
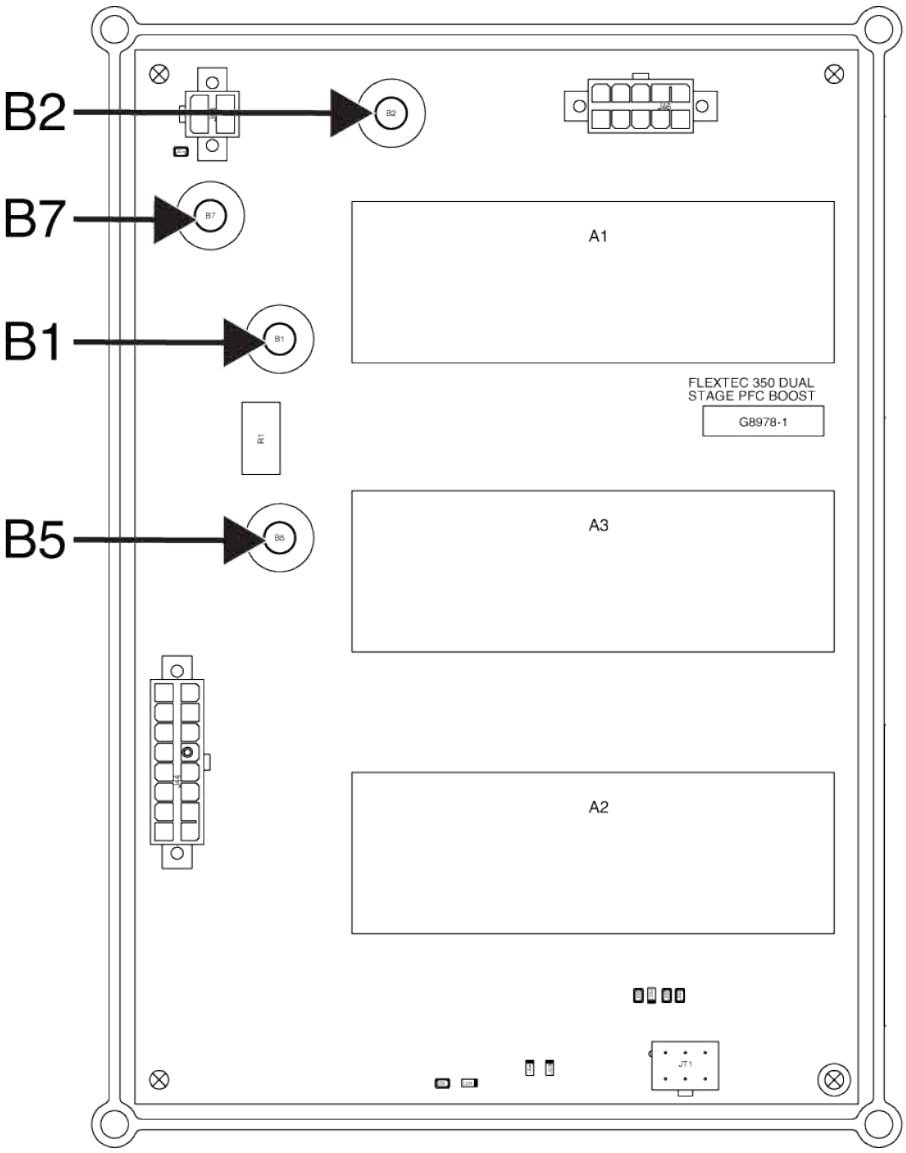


Figure 1. PFC boost board location

PFC boost board terminal locations



LECOL_EMBEDDEDIMG_0000178403_x.png

Figure 2. PFC boost board terminal locations

RETEST AFTER REPAIR

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

Retest a machine:

• If it is rejected under test for any reason that requires you to remove any part which could affect the machine's electrical characteristics.

OR

• If you repair or replace any electrical components.

TEST PROCEDURE

RATED OUTPUT TESTS

PROCESS	DUTY CYCLE	PHASES	VOLTS (AT RATED AMPS)	AMPS
GMAW (CV)	60%	3	31.5	350
GMAW (CV)	100%	3	29	300
GTAW (CC)	60%	3	24	350
GTAW (CC)	100%	3	22	300
SMAW (CC)	60%	3	34	350
SMAW (CC)	100%	3	32	300
FCAW-GS (CV)	60%	3	31.5	350
FCAW-GS (CV)	100%	3	29	300
FCAW-SS (CV)	60%	3	31.5	350
FCAW-SS (CV)	100%	3	29	300
GMAW (CV)	60%	1	29	300
GMAW (CV)	100%	1	27.5	270
GTAW (CC)	60%	1	22	300

PROCESS	DUTY CYCLE	PHASES	VOLTS (AT RATED AMPS)	AMPS
GTAW (CC)	100%	1	20.8	270
SMAW (CC)	60%	1	32	300
SMAW (CC)	100%	1	30.8	270
FCAW-GS (CV)	60%	1	29	300
FCAW-GS (CV)	100%	1	27.5	270
FCAW-SS (CV)	60%	1	29	300
FCAW-SS (CV)	100%	1	27.5	270

SPECIAL TESTING MODES

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

These modes can be used for calibration or to verify correct voltage and current calibration.

MATERIALS NEEDED

- Grid Load Bank
- Wiring Diagram
- Certified Voltmeter And Ammeter

CONSTANT VOLTAGE GRID LOAD TESTING

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the DIP switch on the user interface board. See **Figure F.1**.
5. Place the #4 DIP switch in the ON position. See **Figure F.1**. All other DIP switches should be in the OFF position.
6. Place the weld terminals on/remote switch into the remote position. See **Figure F.2**.
7. Place the weld process selection switch into the GTAW position. See **Figure F.2**.
8. The local/remote switch selects whether the local output control potentiometer or the remote 12-pin connector potentiometer will be used. Place the local/remote switch in the appropriate position for the testing situation. See **Figure F.2**.
9. The output control potentiometer controls voltage set (10.0 to 45.0 volts) when the local/remote switch is in the local position.
10. Turn the arc control potentiometer fully clockwise (+10). See **Figure F.2**.
11. Turn the hot start knob to the “0” position. See **Figure F.2**.
12. If necessary, disconnect the 14-pin feeder connector. See **Figure F.2**.
13. The 12-pin remote connector controls voltage set (10.0 to 45.0 volts) when local/remote switch is in the remote position.
14. Connect a load bank and the certified meters to the machine.

15. Carefully apply the correct input power to the machine and turn the machine ON. Allow at least thirty seconds after power on before running this test to allow for the ArcLink system to be mapped.
16. The left display will read “VOL “ and the right display will show the preset voltage.
17. Adjust the output control knob or the 12-pin remote potentiometer to set the preset voltage desired for testing.
18. Switch the weld terminals switch to the ON position (with the machine properly loaded by a grid load) and the machine will show the actual voltage and current on the displays.
19. When the output control potentiometer is changed quickly while operating, the output may “drop out” during a transition to a new voltage. This is normal for the special voltage grid load test mode. The meter reading on the machine must match the readings on the certified meters.
20. Switch the weld terminals switch to the Remote position and the output will turn off.
21. Carefully remove the input power from the machine.
22. Place the #4 DIP switch in the OFF position.
23. Perform the **Case Cover Replacement Procedure**.

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the DIP switch on the user interface board. See **Figure F.1**.
5. Place the #4 DIP switch in the ON position. See **Figure F.1**. All other DIP switches should be in the OFF position.
6. Place the weld terminals on/remote switch into the remote position. See **Figure F.2**.
7. Place the weld process selection switch into the GTAW position. See **Figure F.2**.
8. The local/remote switch selects whether the local output control potentiometer or the remote 12-pin connector potentiometer will be used. Place the local/remote switch in the appropriate position for the testing situation. See **Figure F.2**.
9. The output control potentiometer controls current set (2 to 815 amps) when the local/remote switch is in the Local position.
10. Turn the arc control potentiometer fully counter-clockwise (-10). See **Figure F.2**.
11. Turn the hot start knob to the “0” position. See **Figure F.2**.
12. If necessary, disconnect the 14-pin feeder connector. See **Figure F.2**.
13. The 12-pin remote connector controls current set (2 to 815 amps) when local/remote switch is in the remote position.
14. Connect a load bank and the certified meters to the machine.
15. Carefully apply the correct input power to the machine and turn the machine ON. Allow at least thirty seconds after power on before running this test to allow for the ArcLink system to be mapped.
16. The right display will read “Cur“ and the left display will show the preset for the current set.
17. Adjust the output control knob to set the preset current desired for testing.
18. Switch the weld terminals switch to the ON position (with the machine properly loaded by a grid load) and the machine will show the actual voltage and current on the displays. The meter reading on the machine must match the readings on the certified meters.
19. Switch the weld terminals switch to the remote position and the output will turn off.

20. Carefully remove the input power from the machine.
21. Place the #4 DIP switch in the OFF position.
22. Perform the **Case Cover Replacement Procedure**.

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the DIP switch on the user interface board. See **Figure F.3**.
5. Place the #8 DIP switch in the ON position. See **Figure F.3**. All other DIP switches should be in the OFF position.
6. Place the weld terminals on/remote switch into the remote position. See **Figure F.2**.
7. Place the weld process selection switch into the GTAW position. See **Figure F.2**.
8. Place the local/remote switch in the local position. See **Figure F.2**.
9. Turn the output control potentiometer fully counter-clockwise (minimum). See **Figure F.2**.
10. Turn the arc control potentiometer fully counter-clockwise (-10) (minimum). See **Figure F.2**.
11. Turn the hot start knob to the “0” position (minimum). See **Figure F.2**.
12. Carefully apply the correct input power to the machine and turn the machine ON.
13. The displays will show “---” “---”.
14. The local/remote switch will be used to step through the test steps and the error log.
15. The left display will show the test step number.
16. Turn the local/remote switch to remote, then back to local in order to enter Step 1. The left display will show the step number and the right display will show the value of the panel control or the remote control under test. To advance from one step to the next, operate the local/remote switch in the same manner used to enter step 1.
17. Step 1 - Arc Control Potentiometer, all models

ARC CONTROL SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT MIN. POSITION	1	0
TURNING UP	1	INCREASING
AT MAX. POSITION	1	100

18. Step 2 – 14-pin Wire Feeder Remote Potentiometer, CONSTRUCTION and FX350 models:

14-PIN REMOTE SETTING	LEFT DISPLAY	RIGHT DISPLAY
UNCONNECTED	2	0

19. Step 2 – 14-pin Wire Feeder Remote Potentiometer, STANDARD model:

14-PIN REMOTE SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT MIN. POSITION	2	0
TURNING UP	2	INCREASING
AT MAX. POSITION	2	100

20. Step 3 – Machine Output Control, all models:

OUTPUT CONTROL SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT MIN. POSITION	3	0
TURNING UP	3	INCREASING
AT MAX. POSITION	3	100

21. Step 4 – 12-pin Remote Potentiometer for STANDARD and CONSTRUCTION models, 3-pin Remote Potentiometer for FX350 models:

3-PIN AND 12-PIN REMOTE SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT MIN. POSITION	4	0
TURNING UP	4	INCREASING
AT MAX. POSITION	4	100

22. Step 5 – Hot Start Potentiometer, all models:

HOT START SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT MIN. POSITION	5	0
TURNING UP	5	INCREASING
AT MAX. POSITION	5	100

23. Step 6 – Toggle Switches, FX350 model:

TOGGLE SWITCH SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT INITIAL POSITIONS	6	1

24. Step 6 – Toggle Switches, CONSTRUCTION model:

TOGGLE SWITCH SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT INITIAL POSITIONS	6	3
REMOTE TRIGGER (S2): ON	6	2

TOGGLE SWITCH SETTING	LEFT DISPLAY	RIGHT DISPLAY
REMOTE TRIGGER (S2): OFF	6	3

25. Step 6 – Toggle Switches, STANDARD model:

TOGGLE SWITCH SETTING	LEFT DISPLAY	RIGHT DISPLAY
AT INITIAL POSITIONS	6	1
FEEDER TRIGGER (S3): ON	6	0
FEEDER TRIGGER (S3): OFF	6	1
REMOTE TRIGGER (S2): ON	6	0
REMOTE TRIGGER (S2): OFF	6	1
WELD TERMINALS (S5): ON	6	3
WELD TERMINALS (S5): OFF	6	1

26. Step 7 – Mode Switch, all models:

MODE SWITCH SETTING	LEFT DISPLAY	RIGHT DISPLAY
GTAW	7	0
SMAW	7	1
CV	7	2
CV-INNERSHIELD	7	3
ARCLINK (STANDARD MODELS)	7	4

27. Carefully remove the input power from the machine.
28. Place the #8 DIP switch in the OFF position.
29. Perform the **Case Cover Replacement Procedure**.

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the DIP switch on the user interface board. See **Figure F.3**.
5. Place the #8 DIP switch in the ON position. See **Figure F.3**. All other DIP switches should be in the OFF position.
6. Place the weld terminals on/remote switch into the ON position. See **Figure F.2**.
7. Place the weld process selection switch into the GTAW position. See **Figure F.2**.
8. Place the local/remote switch in the local position. See **Figure F.2**.
9. Turn the output control potentiometer fully counter-clockwise. See **Figure F.2**.

10. Turn the arc control potentiometer fully counter-clockwise (-10). See **Figure F.2**.
11. Turn the hot start knob to the “0” position. See **Figure F.2**.
12. Carefully apply the correct input power to the machine and turn the machine ON.
13. The displays will show “---” “---”.
14. The local/remote switch will be used to step through the test steps and the error log.
15. The left display will show the test step number.
16. Cycle the weld terminals switch until the left display shows “20”. The right display will show “---”.
17. Rotate the output control potentiometer clockwise.
18. The left display will show numbers between 1 and 25.
19. The right display will show the 25 most recent weld sequencer errors.
20. Return the output control potentiometer to zero.
21. Cycle the weld terminals switch again. The left display will show “21”. The right display will show “---”.
22. Rotate the output control potentiometer clockwise.
23. The left display will show numbers between 1 and 25.
24. The right display will show the 25 most recent weld controller errors.
25. Return the output control potentiometer to zero.
26. Cycle the weld terminals switch again. The left display will show “22”. The right display will show “---”.
27. Rotate the output control potentiometer clockwise.
28. The left display will show numbers between 1 and 25.
29. The right display will show the 25 most recent user interface errors.
30. Return the output control potentiometer to zero.
31. Carefully remove the input power from the machine.
32. Place the #8 DIP switch in the OFF position.
33. Perform the **Case Cover Replacement Procedure**.

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the DIP switch on the user interface board. See **Figure F.3**.
5. Place the #8 DIP switch in the ON position. See **Figure F.3**. All other DIP switches should be in the OFF position.
6. Place the weld terminals on/remote switch into the ON position. See **Figure F.2**.
7. Place the weld process selection switch into the GTAW position. See **Figure F.2**.
8. Place the local/remote switch in the local position. See **Figure F.2**.
9. Turn the output control potentiometer fully counter-clockwise. See **Figure F.2**.
10. Turn the arc control potentiometer fully counter-clockwise (-10). See **Figure F.2**.
11. Turn the hot start knob to the “0” position. See **Figure F.2**.
12. Carefully apply the correct input power to the machine and turn the machine ON.

13. Cycle the weld terminals switch until the left display shows “ 9”. The right display will show the last three digits of the switchboard software number (Example: S30146-07 is software, then the right display shows “607”).
14. Cycle the weld terminals switch until the left display shows “ 10”. The right display will show the last three digits of the switchboard boot code version.
15. Cycle the weld terminals switch until the left display shows “ 11”. The right display will show the last three digits of the switchboard main code version.
16. Cycle the weld terminals switch until the left display shows “ 12”. The right display will show the last three digits of the switchboard parameter file version.
17. Cycle the weld terminals switch until the left display shows “ 13”. The right display will show the last three digits of the switchboard weld set.
18. Cycle the weld terminals switch until the left display shows “ 14”. The right display will show the last three digits of the user interface boot code version.
19. Cycle the weld terminals switch until the left display shows “ 15”. The right display will show the last three digits of the user interface main code version.
20. Cycle the weld terminals switch until the left display shows “ 16”. The right display will show the last three digits of the user interface parameter version.
21. At this point, all software has been verified.
22. Carefully remove the input power from the machine.
23. Place the #8 DIP switch in the OFF position.
24. Perform the **Case Cover Replacement Procedure**.

User interface board DIP switch location and position

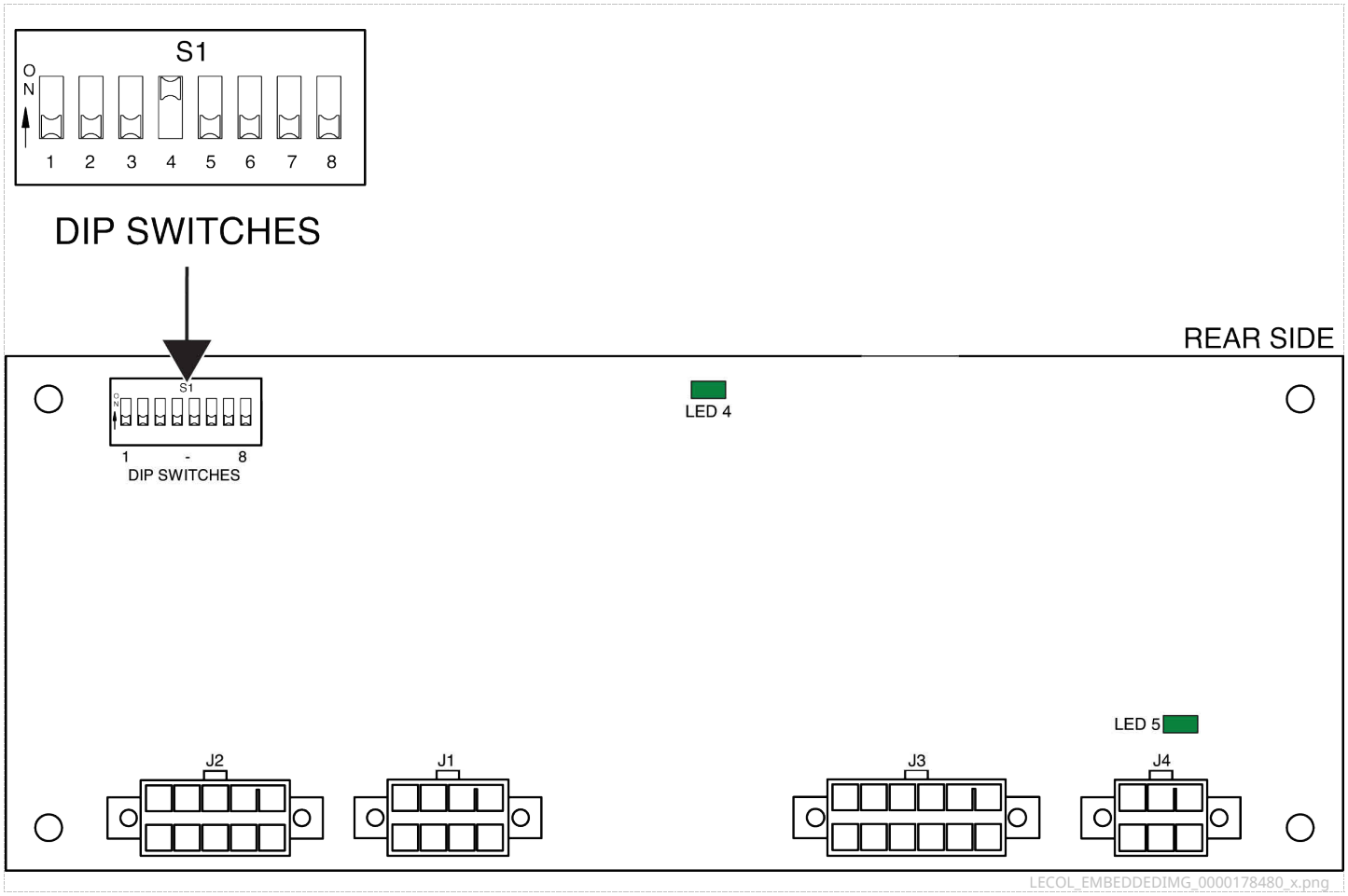


Figure 1. User interface board DIP switch location and position

User controls locations

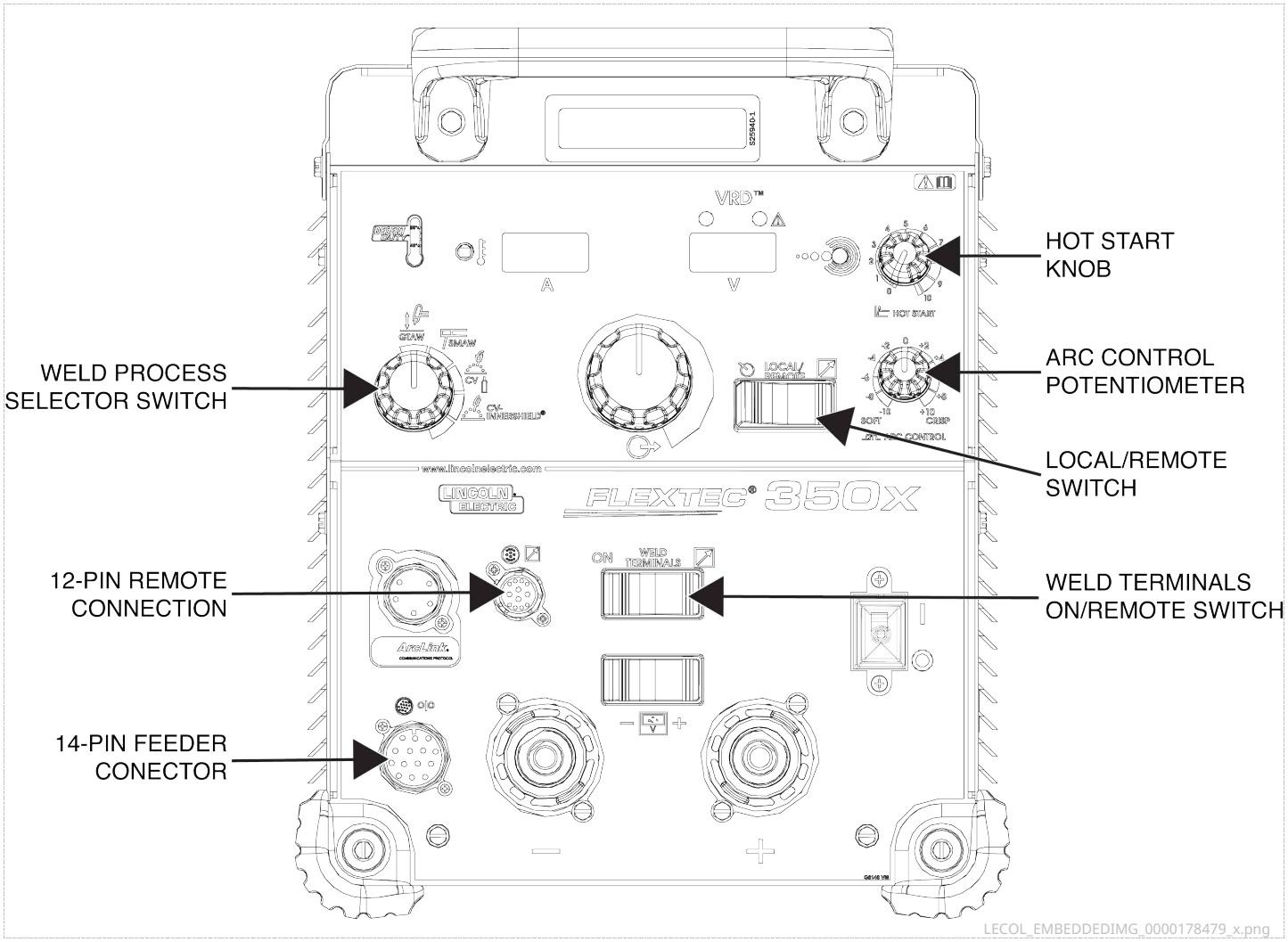


Figure 2. User controls locations

User interface board DIP switch location and position

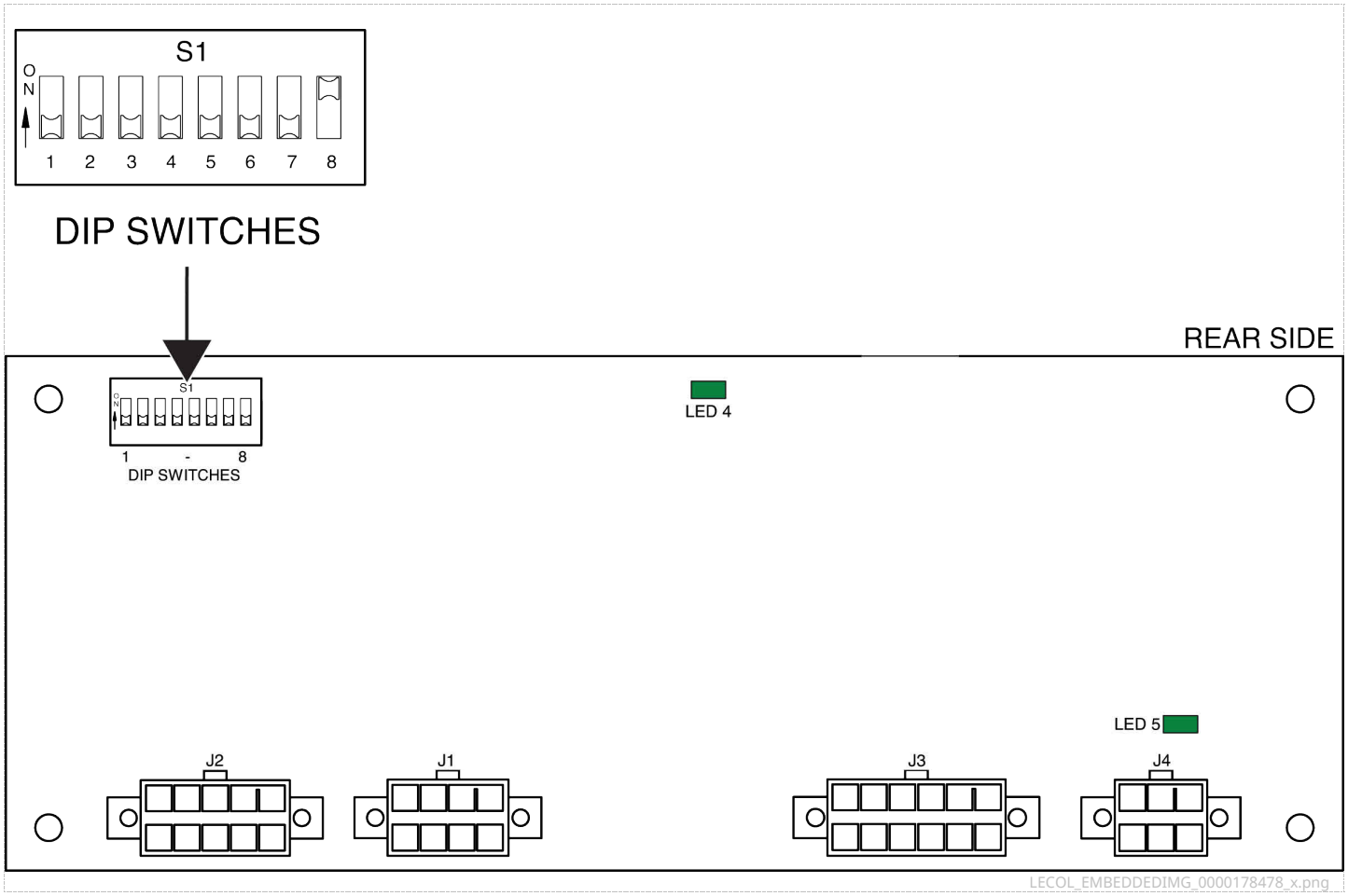


Figure 3. User interface board DIP switch location and position

SWITCHBOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Switchboard is functioning properly. In order for this test to produce the expected results the Switchboard must be receiving the correct input voltage from the Main Capacitor Board and the proper gate drive signals from the Inverter Control Board.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the switchboard. See **Figure F.1**. See Wiring Diagram.
5. Locate the inverter control board. See **Figure F.2**. See Wiring Diagram.
6. Using a volt/ohmmeter, perform the resistance and diode drop tests outlined in **Table F.1**. See **Figures F.3**, **F.4** and **F.5**. See Wiring Diagram.
7. If any of the resistance test results are not as expected, label and disconnect the leads attached to the terminals and retest.
8. Carefully apply the correct input power to the machine and turn ON the machine.
9. Visually check the LEDs per **Table F.2**. See **Figure F.3** for LED locations. See Wiring Diagram.
10. Using a volt/ohmmeter, measure the voltage between terminals B2 and B1. See **Figure F.3**. See Wiring Diagram. Normal voltage is approximately 860 VDC.
11. If any of the tests fail, the switchboard may be faulty.
12. If faulty, perform the **Switchboard Removal And Replacement Procedure**.
13. Perform the **Case Cover Replacement Procedure**.

Table F.1 - Switchboard resistance and diode drop tests

DESCRIPTION	TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING
CHECKING “HIGH-SIDE” IGBTs	SWITCHBOARD TERMINAL B4	SWITCHBOARD TERMINAL B2	0.3 TO 1.0 VDC
CHECKING “HIGH-SIDE” IGBTs	SWITCHBOARD TERMINAL B3	SWITCHBOARD TERMINAL B2	0.3 TO 1.0 VDC
CHECKING “HIGH-SIDE” IGBTs	SWITCHBOARD TERMINAL B2	SWITCHBOARD TERMINAL B4	100K OHMS
CHECKING “HIGH-SIDE” IGBTs	SWITCHBOARD TERMINAL B2	SWITCHBOARD TERMINAL B3	100K OHMS
CHECKING “LOW-SIDE” IGBTs	SWITCHBOARD TERMINAL B1	SWITCHBOARD TERMINAL B3	0.3 TO 1.0 VDC
CHECKING “LOW-SIDE” IGBTs	SWITCHBOARD TERMINAL B1	SWITCHBOARD TERMINAL B4	0.3 TO 1.0 VDC
CHECKING “LOW-SIDE” IGBTs	SWITCHBOARD TERMINAL B1	SWITCHBOARD TERMINAL B3	100K OHMS
CHECKING “LOW-SIDE” IGBTs	SWITCHBOARD TERMINAL B1	SWITCHBOARD TERMINAL B4	100K OHMS
THERMISTOR TEST	PLUG J12 PIN 1 (LEAD 431) ON INVERTER CONTROL BOARD (WITH PLUG J12 DISCONNECTED)	PLUG J12 PIN 2 (LEAD 433) ON INVERTER CONTROL BOARD (WITH PLUG J12 DISCONNECTED)	10K – 40K OHMS (TEMPERATURE DEPENDANT)
THERMISTOR TEST	PLUG J12 PIN 1 (LEAD 431) ON INVERTER CONTROL BOARD (WITH PLUG J12 DISCONNECTED)	SWITCHBOARD TERMINAL B2	5K – 20K OHMS (TEMPERATURE DEPENDANT)
THERMISTOR TEST	PLUG J12 PIN 2 (LEAD 433) ON INVERTER CONTROL BOARD (WITH PLUG J12 DISCONNECTED)	SWITCHBOARD TERMINAL B2	5K – 20K OHMS (TEMPERATURE DEPENDANT)

Table F.2 - Switchboard LEDs

LED NUMBER	LED COLOR	LED FUNCTION
1	GREEN	INDICATES SWITCHBOARD IS RECEIVING PRIMARY VOLTAGE FROM THE MAIN CAPACITOR BOARD.

LED NUMBER	LED COLOR	LED FUNCTION
2	GREEN	INDICATES SWITCHBOARD IS RECEIVING GATE DRIVE SIGNALS FROM THE INVERTER CONTROL BOARD.
3	GREEN	INDICATES SWITCHBOARD IS RECEIVING GATE DRIVE SIGNALS FROM THE INVERTER CONTROL BOARD.
4	GREEN	INDICATES SWITCHBOARD IS RECEIVING GATE DRIVE SIGNALS FROM THE INVERTER CONTROL BOARD.
5	GREEN	INDICATES SWITCHBOARD IS RECEIVING GATE DRIVE SIGNALS FROM THE INVERTER CONTROL BOARD.

Switchboard location

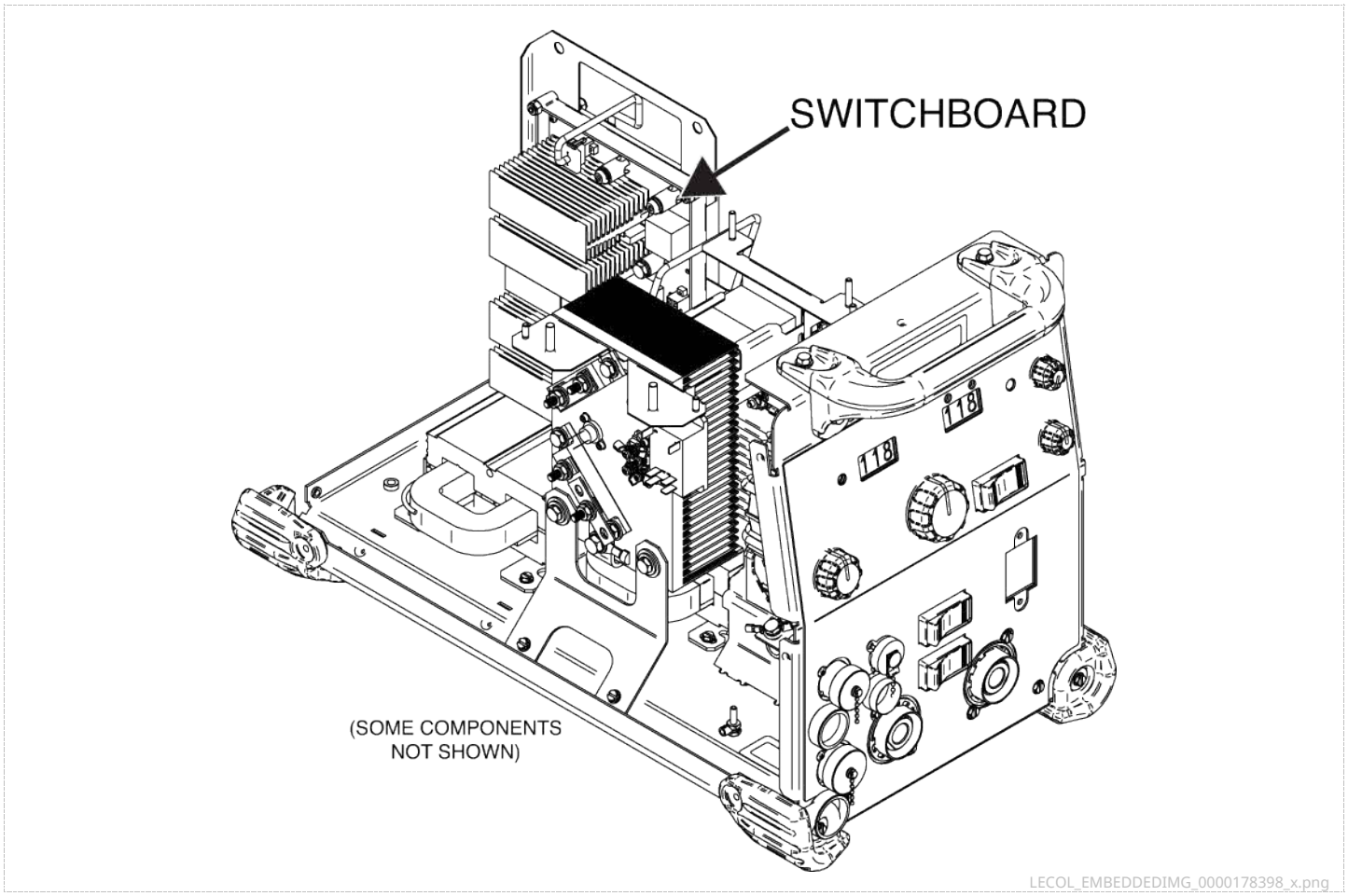


Figure 1. Switchboard location

Inverter control board location

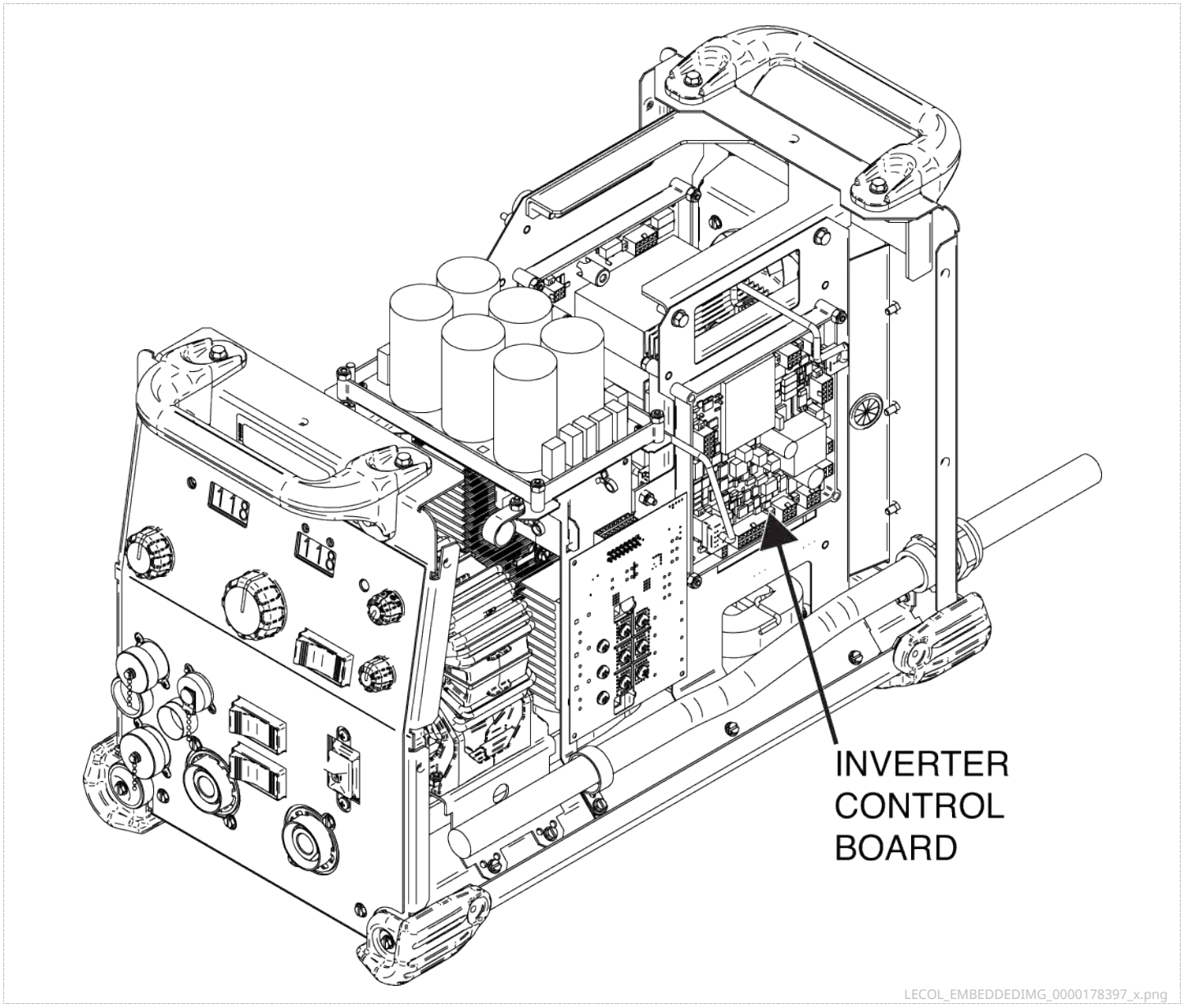


Figure 2. Inverter control board location

Switchboard terminal and LED locations

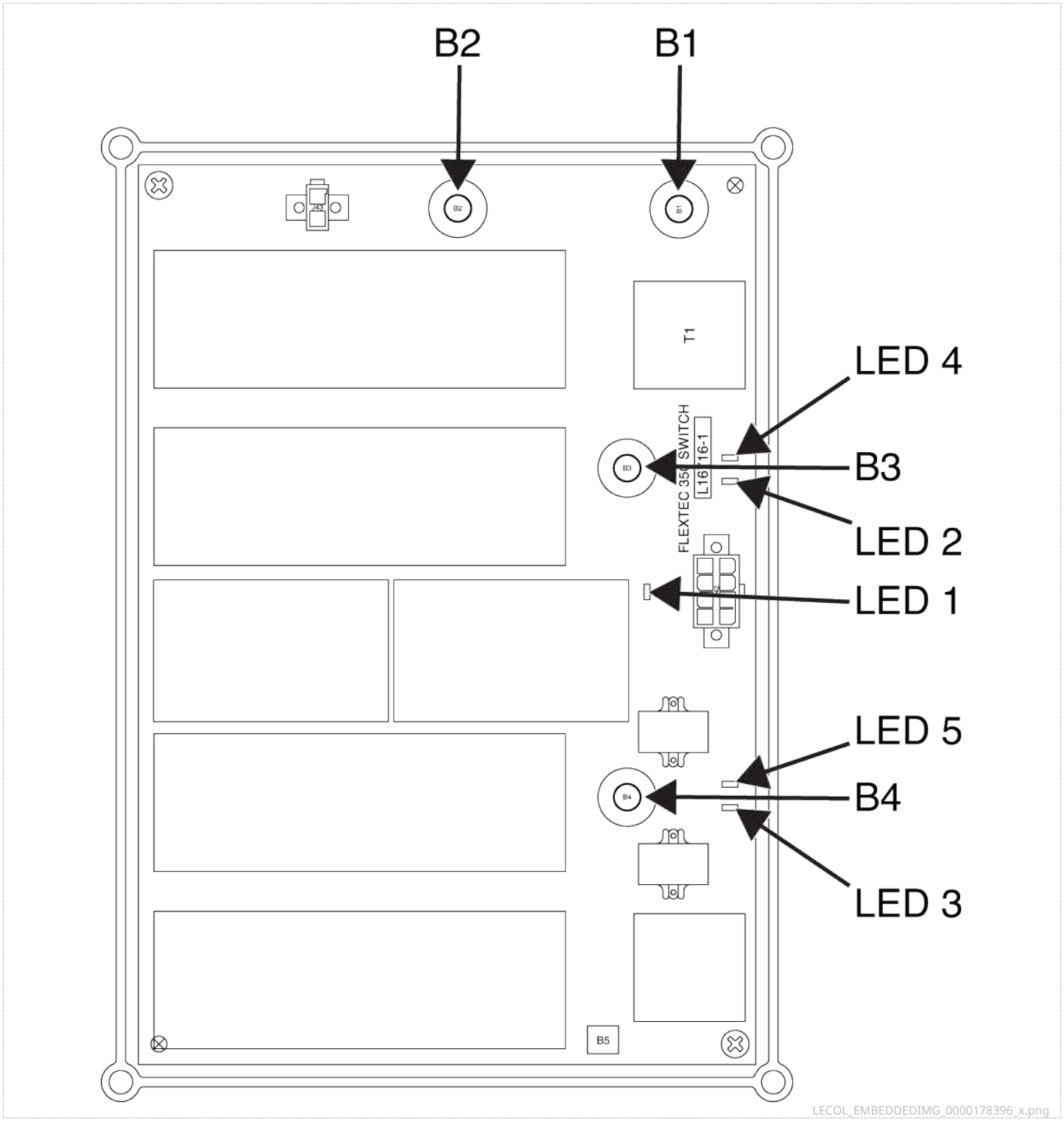


Figure 3. Switchboard terminal and LED locations

Inverter control board plug J12 location

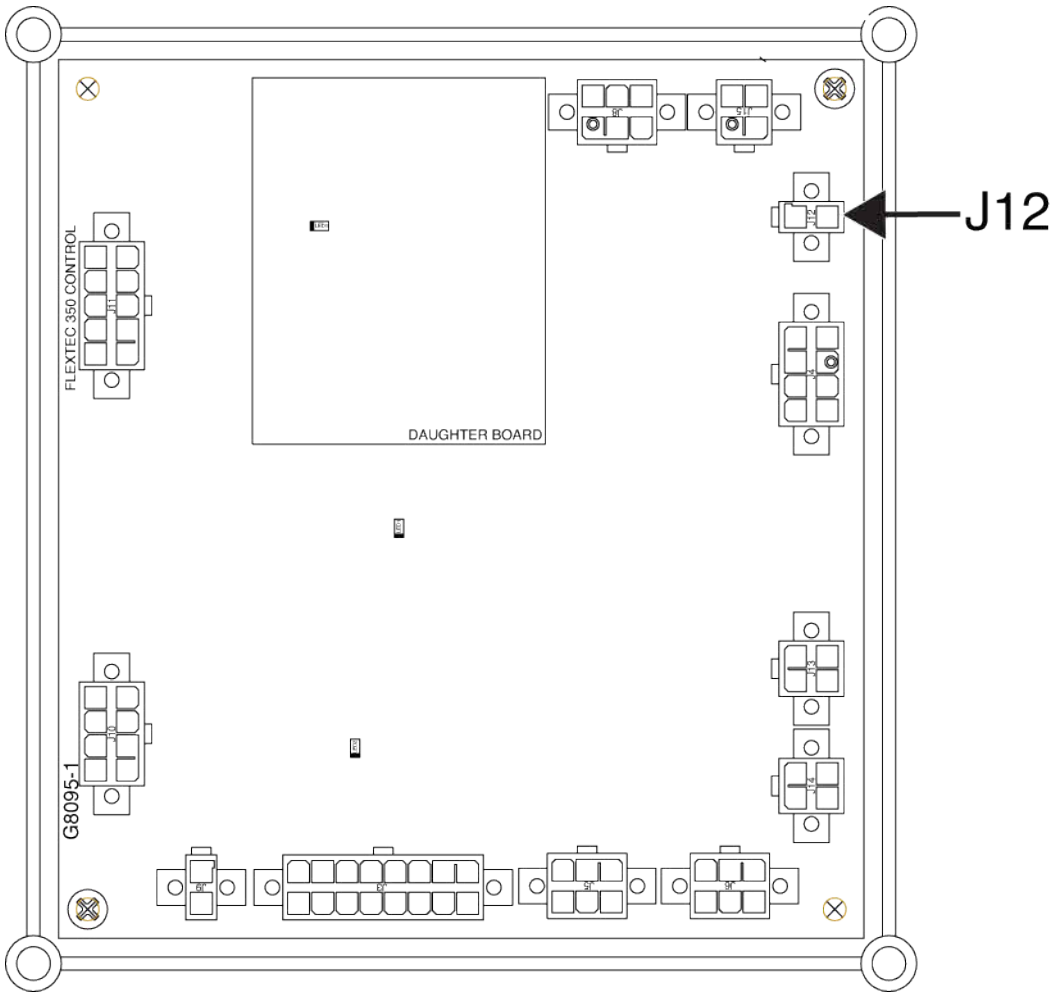


Figure 4. Inverter control board plug J12 location

Inverter control board plug J12 lead locations

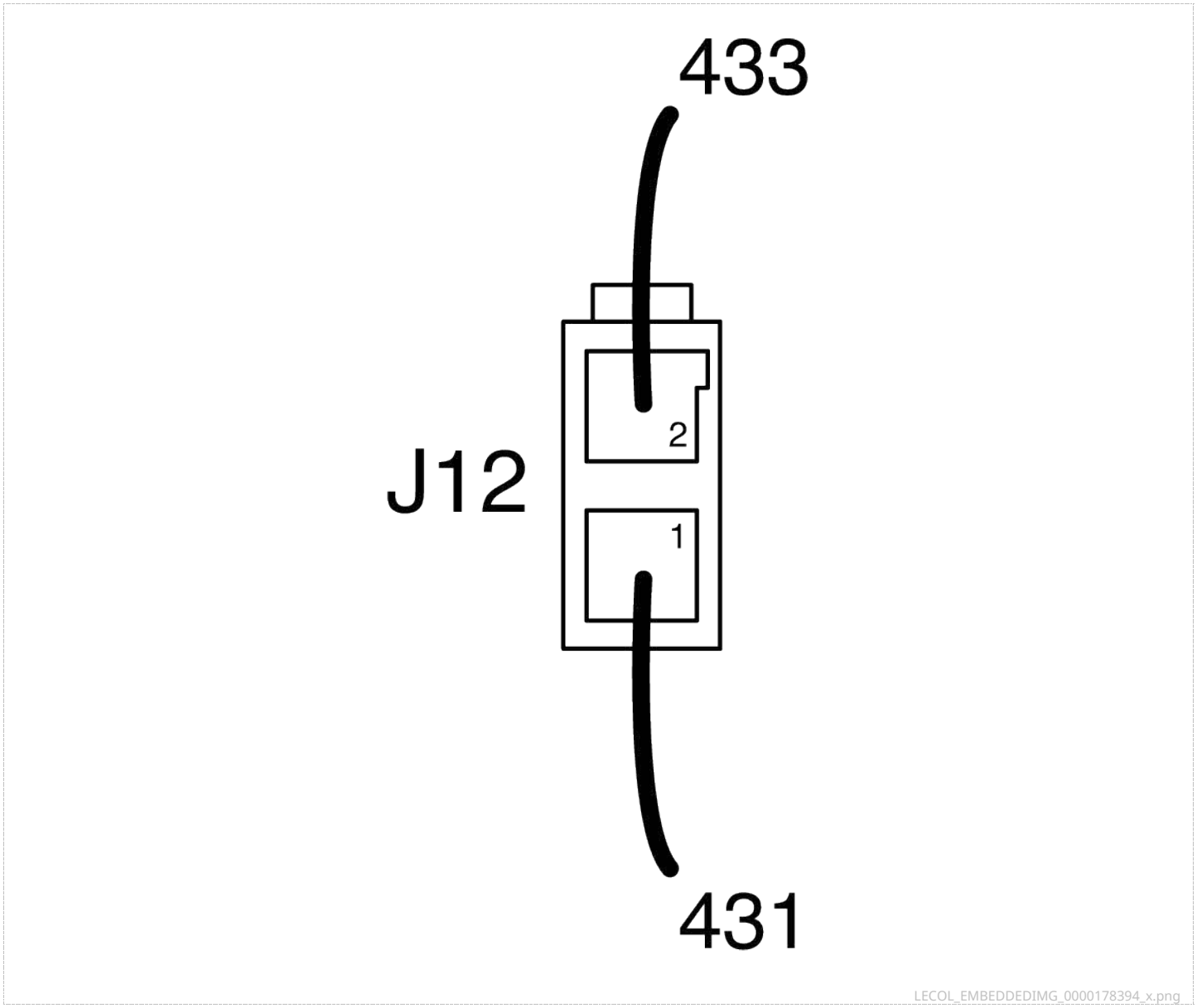


Figure 5. Inverter control board plug J12 lead locations

THERMOSTAT #1 AND #2 CIRCUIT TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the Thermostat Circuit is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

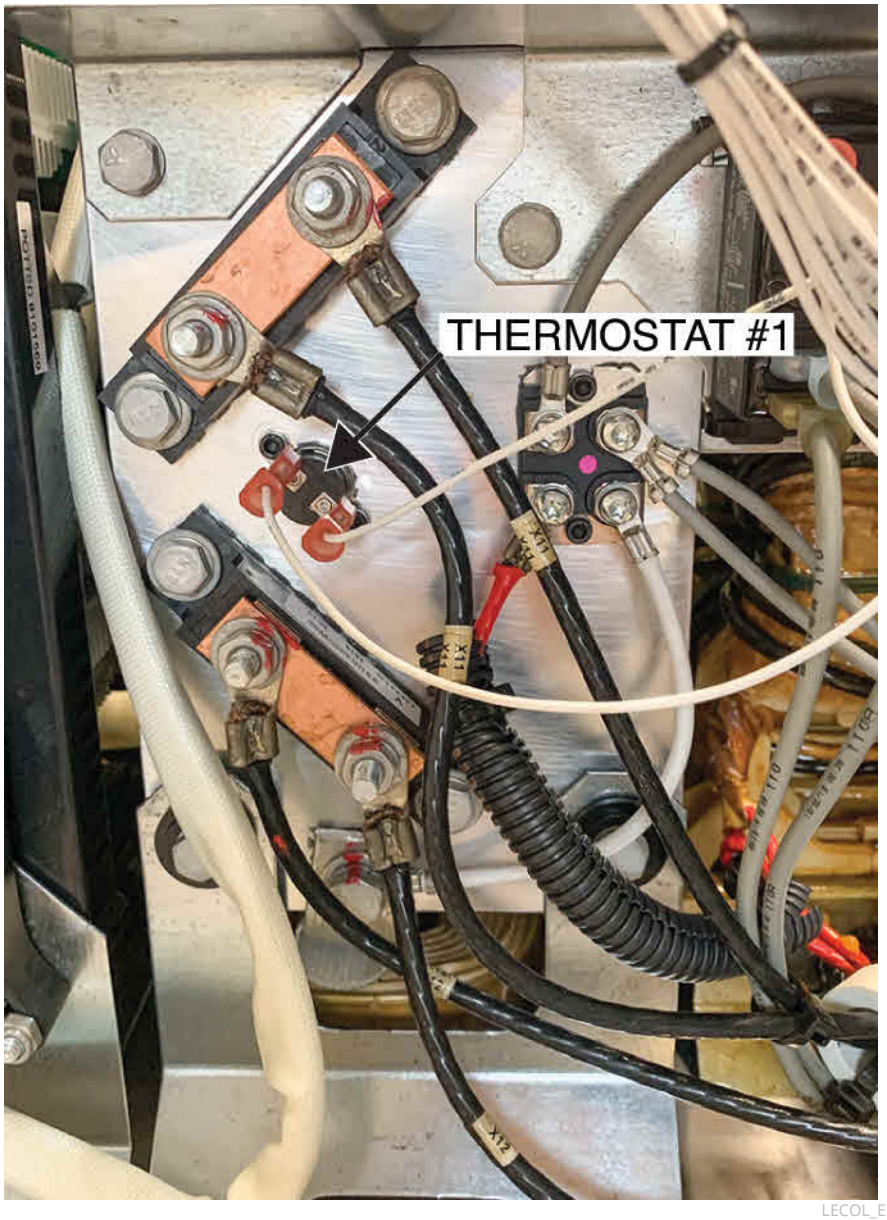
TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate thermostat #1 on the output rectifier heatsink. See **Figure F.1**. See Wiring Diagram.
5. Label and disconnect leads #224 and #225 from thermostat #1. See Wiring Diagram.
6. Using a volt/ohmmeter, test the resistance from one thermostat terminal to the other. The resistance should be very low (less than one ohm).
7. If the resistance is greater than one ohm, the thermostat may be faulty.
8. Thermostat #2 is located inside the output choke coil. See Wiring Diagram.
9. Label and disconnect the two in-line connections attached to leads #226 and #224 on thermostat #2 in the output choke. See Wiring Diagram.
10. Using a volt/ohmmeter, check the resistance of thermostat #2 from lead #226 to #224. The resistance should be very low (less than one ohm). See Wiring Diagram.
11. If the resistance is greater than one ohm, thermostat #2 may be faulty. If faulty, perform the **Choke Removal And Replacement Procedure**.
12. Connect all previously removed leads. See Wiring Diagram.
13. Locate the inverter control board. See **Figure F.2**. See Wiring Diagram.
14. To check the thermostat circuit, locate plug J3 on the inverter control board. See **Figure F.3**. See Wiring Diagram.
15. Label and disconnect plug J3 from the inverter control board. See **Figure F.3**. See Wiring Diagram.

16. Using a volt/ohmmeter, check the resistance from plug J3 pin 5 (lead #225) to pin 13 (lead #226). See **Figure F.4**. Resistance should be less than one ohm. If the resistance is greater than one ohm, there is an open or high resistance connection in the thermostat circuit. See Wiring Diagram.
17. Connect any previously remove plugs and leads. See Wiring Diagram.
18. Perform the **Case Cover Replacement Procedure**.

Thermostat #1 location



LECOL_EMBEDDEDIMG_0000178452_x.png

Figure 1. Thermostat #1 location

Inverter control board location

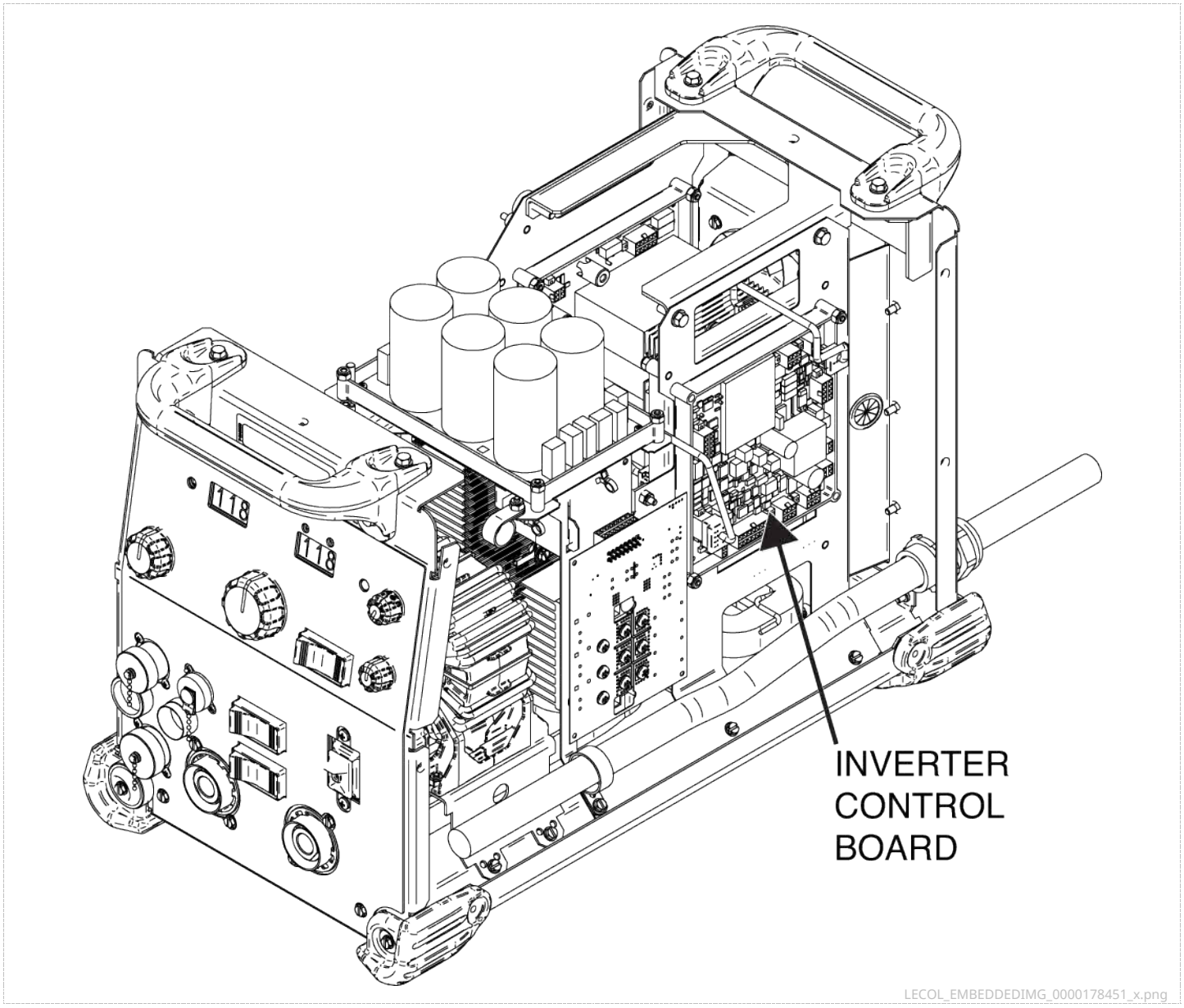
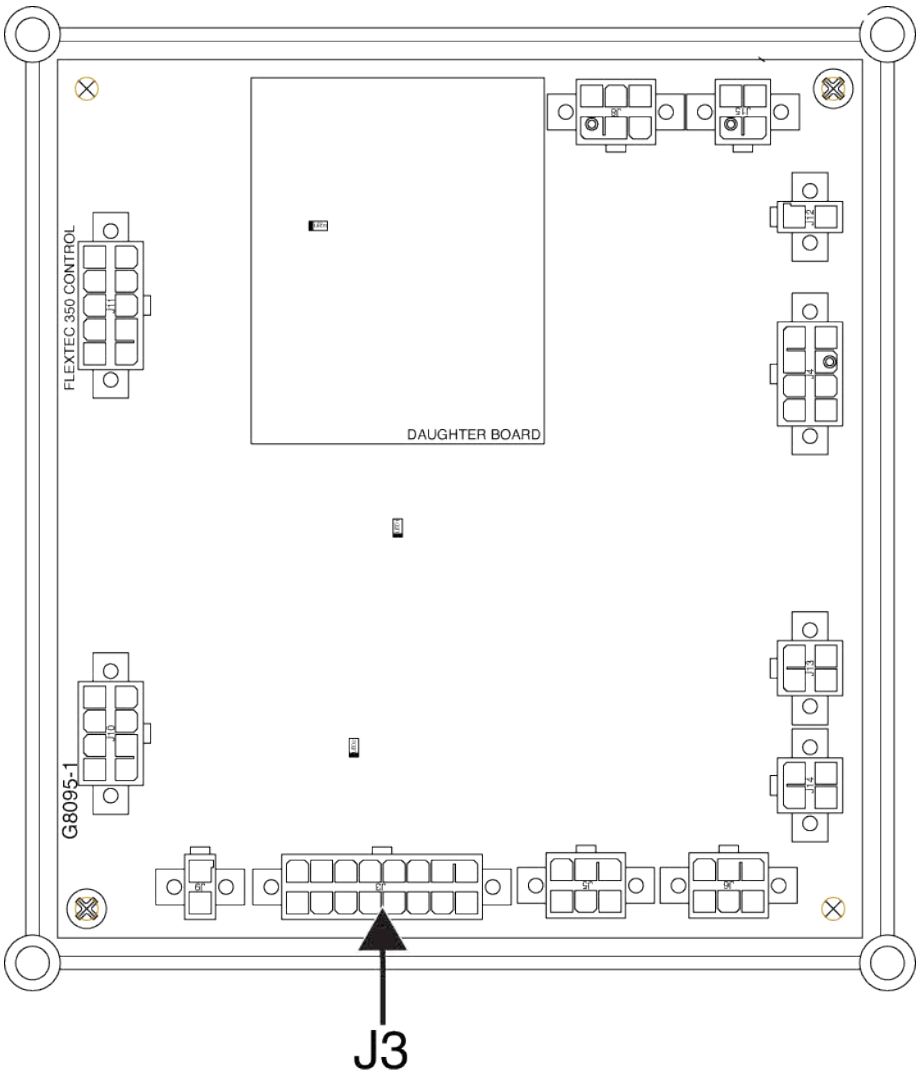


Figure 2. Inverter control board location

Inverter control board plug J3 location



LECOL_EMBEDDEDIMG_0000178450_x.png

Figure 3. Inverter control board plug J3 location

Inverter control board plug J3 lead locations

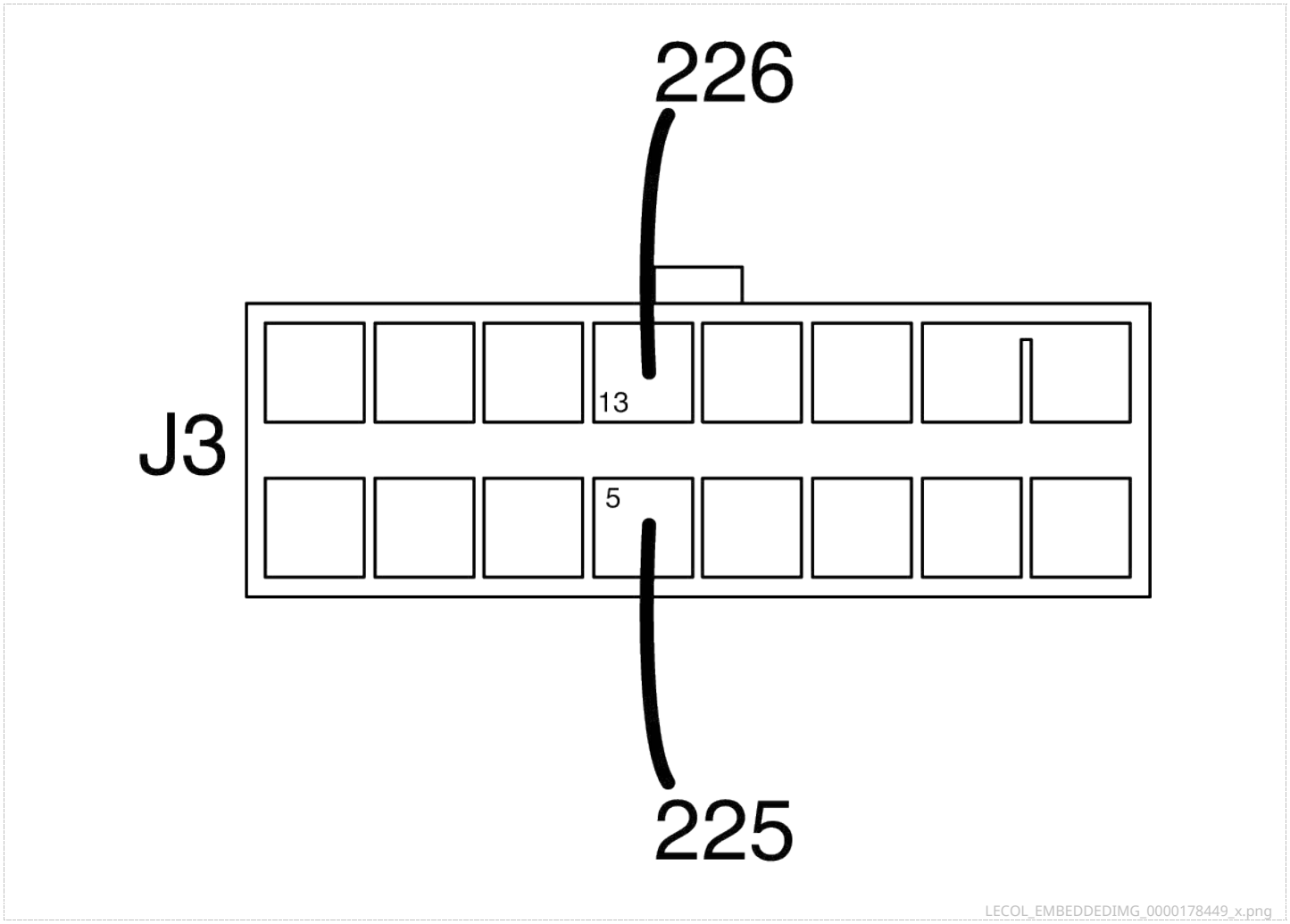


Figure 4. Inverter control board plug J3 lead locations

USER INTERFACE BOARD TEST PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This test will help determine if the User Interface Board is functioning properly.

MATERIALS NEEDED

- Volt/Ohmmeter
- Wiring Diagram

TEST PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Locate the user interface board. See **Figure F.1**. See Wiring Diagram.
5. Using a volt/ohmmeter, perform the resistance tests outlined in **Table F.1** with all plugs connected to the board. See **Figure F.2** and **Figure F.3**. See Wiring Diagram.
6. Carefully apply the correct input power to the machine and turn ON the machine.
7. Observe and make sure the status LEDs on the front and rear of the user interface board are indicating a properly functioning user interface board. See **Tables F.2** and **F.3**. See **Figure F.2**.
8. Using a volt/ohmmeter, perform the voltage tests outlined in **Table F.4**. See **Figures F.2** and **Figures F.3**. See Wiring Diagram.
9. If any of the tests fail, the user interface board may be faulty.
10. If faulty, perform the **User Interface Board Removal And Replacement Procedure**.
11. Perform the **Case Cover Replacement Procedure**.

Table F.1 - User interface board resistance tests

TEST POINT	TEST POINT	EXPECTED READING
PLUG J1 PIN 6 (LEAD 281)	PLUG J1 PIN 1 (LEAD 282)	0 – 3.24 K OHMS DEPENDENT ON ARC CONTROL POT POSITION.

TEST POINT	TEST POINT	EXPECTED READING
PLUG J1 PIN 5 (LEAD 252)	PLUG J1 PIN 3 (LEAD 253)	0 – 3.24 K OHMS DEPENDENT ON OUTPUT CONTROL KNOB POSITION.
PLUG J1 PIN 4 (LEAD 317)	PLUG J1 PIN 2 (LEAD 316)	0 – 3.24 K OHMS DEPENDENT ON HOT START KNOB POSITION.

Table F.2 - User interface board LEDs

LED NUMBER	LED COLOR	FUNCTION
1	AMBER	THERMAL LED
2	GREEN	VRD LED VOLTAGE REDUCED
3	RED	VRD LED VOLTAGE NOT REDUCED
4	GREEN	STATUS “OK”
4	RED/GREEN	STATUS “ERROR” (CHECK CODE FOR SPECIFIC ERROR) (BI-COLOR)
5	GREEN	+15 VDC POWER SUPPLY “OK”

Table F.3 - User interface board LED indication

LIGHT CONDITION	MEANING
STEADY GREEN	SYSTEM “OK”
ALTERNATING GREEN AND RED	A SYSTEM FAULT HAS OCCURRED. IF THE USER INTERFACE BOARD STATUS LED IS FLASHING ANY COMBINATION OF RED AND GREEN, ERRORS ARE PRESENT. INDIVIDUAL CODE DIGITS ARE FLASHED IN RED WITH A LONG PAUSE BETWEEN DIGITS. IF MORE THAN ONE CODE IS PRESENT, THE CODES WILL BE SEPARATED BY A GREEN LIGHT. SEE **FAULT CODES**.

Table F.4 - User interface board voltage tests

DESCRIPTION	TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING	CONDITIONS
INPUT FROM AUXILIARY POWER BOARD	PLUG J4 PIN 4 (LEAD 52C)	PLUG J4 PIN 3 (LEAD 51C)	42 VDC	MACHINE ON.
CAN COMMUNICATION	PLUG J4 PIN 2 (LEAD #54A)	PLUG J4 PIN 1 (LEAD #53A)	2 VDC	MACHINE ON.
+15 VDC SUPPLY	PLUG J3 PIN 3 (LEAD #290)	PLUG J1 PIN 1 (LEAD #282)	15 VDC	MACHINE ON.

DESCRIPTION	TEST POINT (POS)	TEST POINT (NEG)	EXPECTED READING	CONDITIONS
+10 VDC	PLUG J1 PIN 7 (LEAD #280)	PLUG J1 PIN 1 (LEAD #282)	10 VDC	MACHINE ON.
WELD TERMINALS SWITCH	PLUG J3 PIN 9 (LEAD #212)	PLUG J3 PIN 4 (LEAD #210)	0 VDC	WELD TERMINALS SWITCH ON.
WELD TERMINALS SWITCH	PLUG J3 PIN 9 (LEAD #212)	PLUG J3 PIN 4 (LEAD #210)	15 VDC	WELD TERMINALS SWITCH OFF.
LOCAL/REMOTE SWITCH	PLUG J3 PIN 10 (LEAD #289)	PLUG J3 PIN 3 (LEAD #290)	15 VDC	LOCAL/REMOTE SWITCH IN REMOTE POSITION.
LOCAL/REMOTE SWITCH	PLUG J3 PIN 10 (LEAD #289)	PLUG J3 PIN 3 (LEAD #290)	0 VDC	LOCAL/REMOTE SWITCH IN LOCAL POSITION.
REMOTE TRIGGER	PLUG J2 PIN 9 (LEAD #4)	PLUG J1 PIN 1 (LEAD 282)	15 VDC	MACHINE ON.
ARC CONTROL SUPPLY	PLUG J1 PIN 7 (LEAD #280)	PLUG J1 PIN 1 (LEAD #282)	10 VDC	MACHINE ON.
OUTPUT CONTROL SUPPLY	PLUG J1 PIN 8 (LEAD #251)	PLUG J1 PIN 1 (LEAD #282)	10 VDC	MACHINE ON.
MODE SWITCH	PLUG J3 PIN 1 (LEAD #308)	PLUG J1 PIN 1 (LEAD 282)	15 VDC	MODE SWITCH IN GTAW POSITION.
MODE SWITCH	PLUG J3 PIN 1 (LEAD #308)	PLUG J1 PIN 1 (LEAD 282)	12.5 VDC	MODE SWITCH IN SMAW POSITION
MODE SWITCH	PLUG J3 PIN 1 (LEAD #308)	PLUG J1 PIN 1 (LEAD 282)	10 VDC	MODE SWITCH IN CV-GAS POSITION.
MODE SWITCH	PLUG J3 PIN 1 (LEAD #308)	PLUG J4 PIN 3 (LEAD #51C)	7.5 VDC	MODE SWITCH IN CV-INNERSHIELD POSITION.

User interface board location

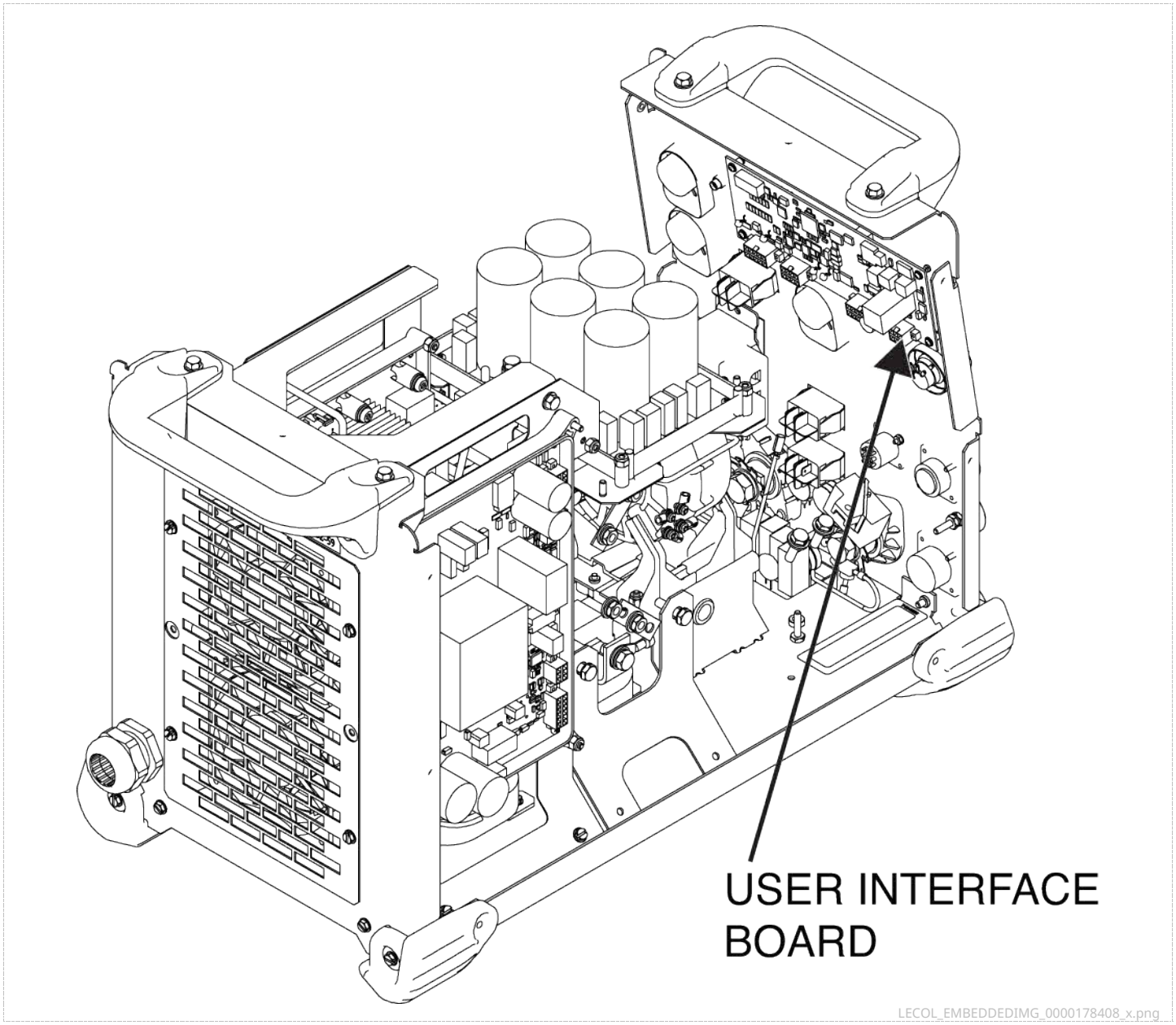
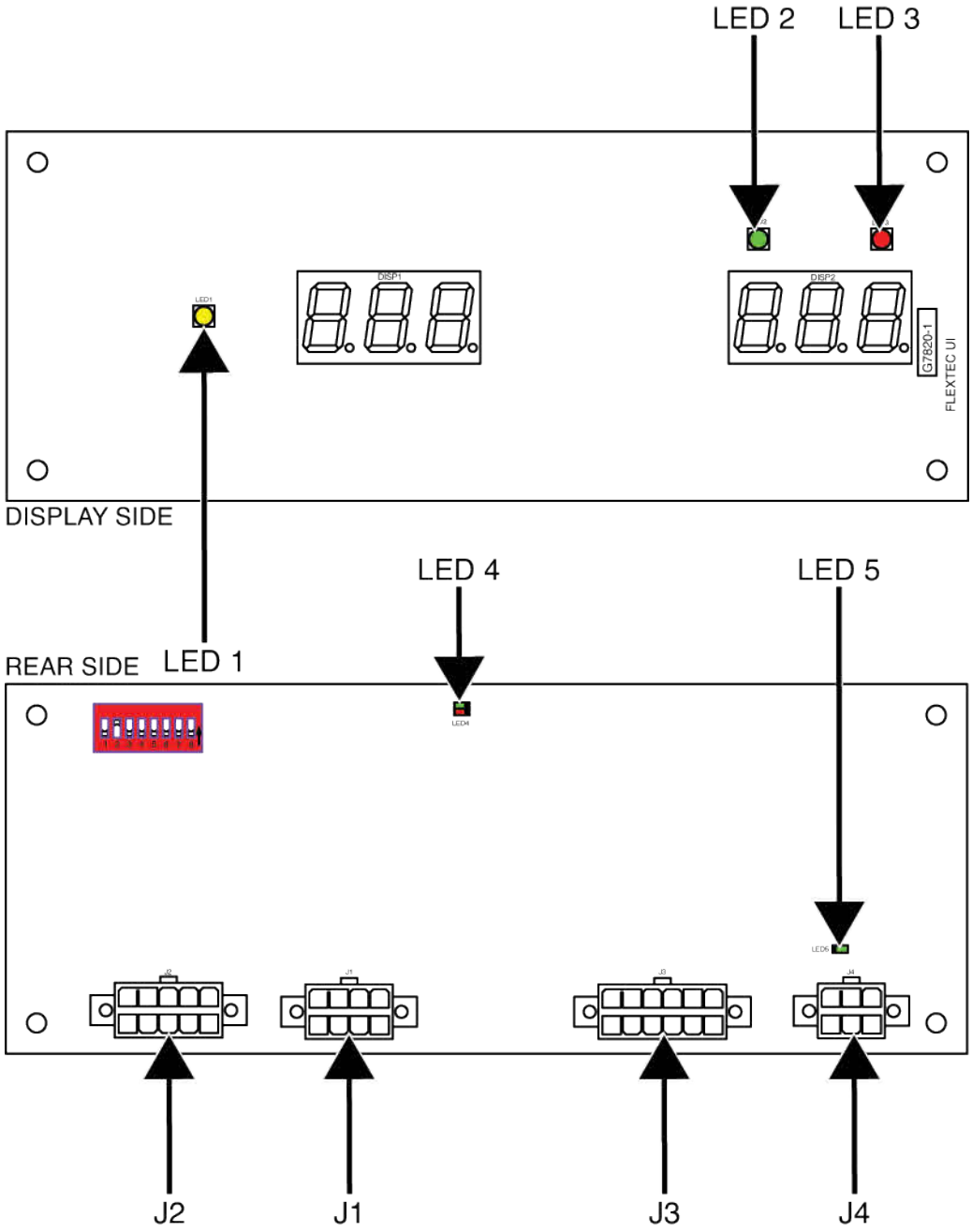


Figure 1. User interface board location

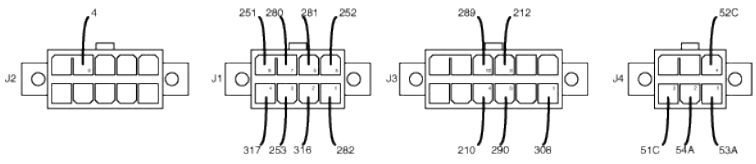
User interface board plug and LED locations



LECOL_EMBEDDEDIMG_0000178407_x.png

Figure 2. User interface board plug and LED locations

User interface board lead locations



LECOL_EMBEDDEDIMG_0000178406_x.png

Figure 3. User interface board lead locations

AUXILIARY POWER BOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Auxiliary Power Board.

MATERIALS NEEDED

- 3/8” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

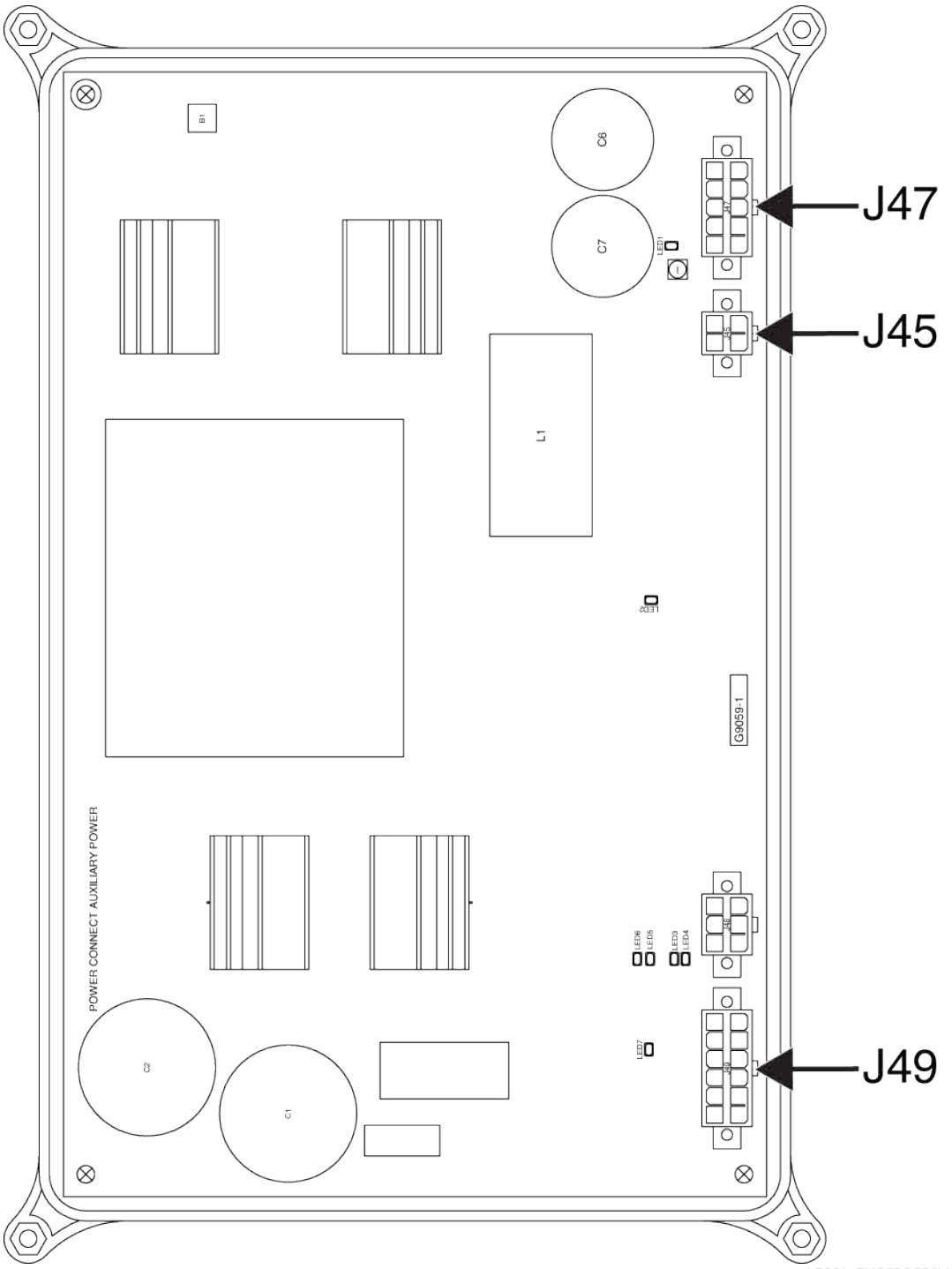
1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Label and disconnect plugs J45, J47 and J49 from the auxiliary power board. See **Figure F.1**. See Wiring Diagram.
5. Using a 3/8” nutdriver, remove the four nuts securing the auxiliary power board to the PFC board bracket. See **Figure F.2**.
6. The auxiliary power board can now be removed from it’s mounting posts and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new auxiliary power board into the machine.
2. Using a 3/8” nutdriver, attach the four nuts securing the auxiliary power board to the PFC board bracket.
3. Connect plugs J45, J47 and J49 to the auxiliary power board. See Wiring Diagram.
4. Perform the **Case Cover Replacement Procedure**.
5. Perform the **Retest After Repair Procedure**.

Auxiliary power board plug locations



LECOL_EMBEDDEDIMG_0000178381_x.png

Figure 1. Auxiliary power board plug locations

Auxiliary power board mounting nut locations

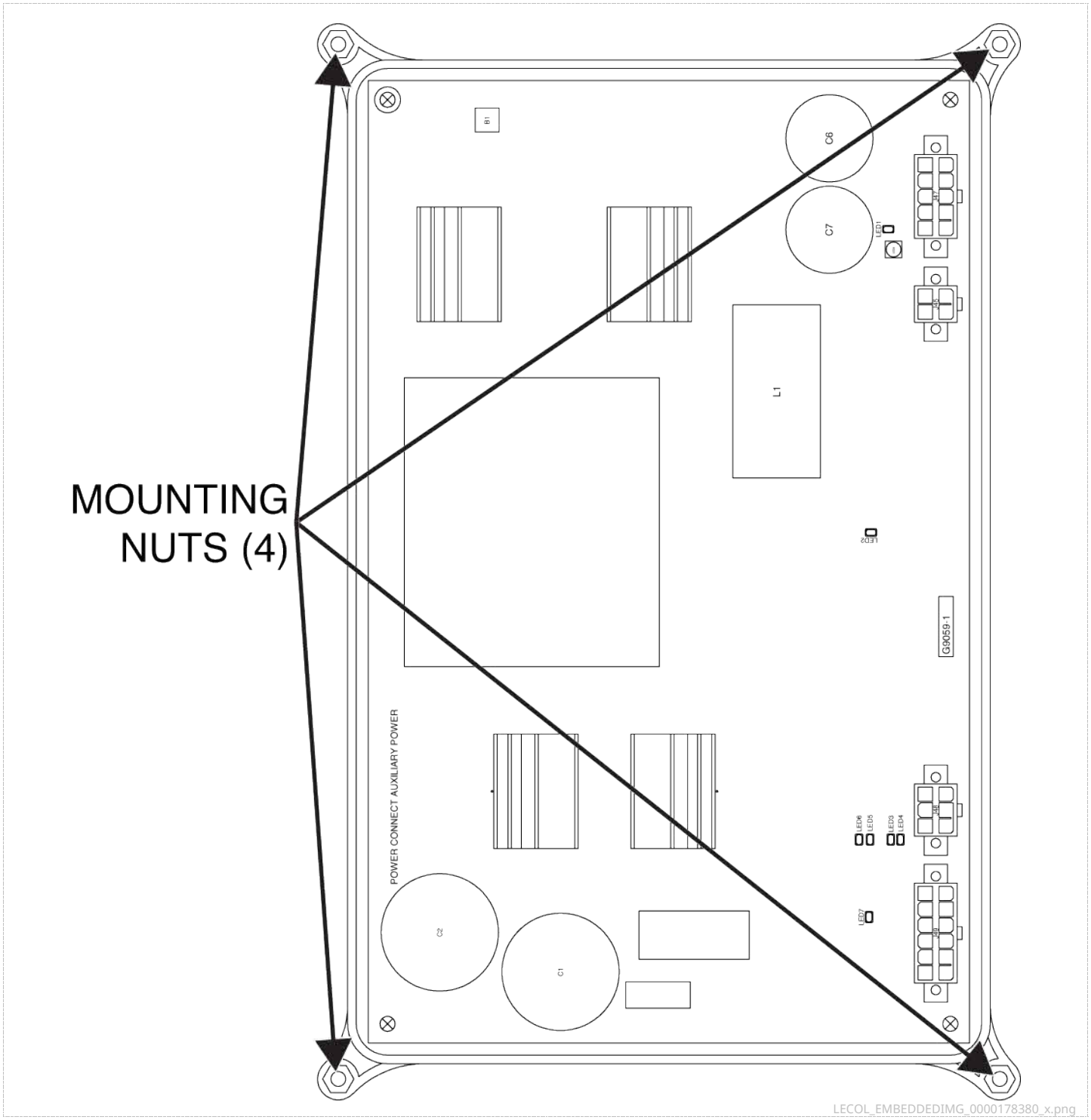


Figure 2. Auxiliary power board mounting nut locations

BOOST RECTIFIER REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Boost Rectifier.

MATERIALS NEEDED

- Torx Nutdriver (Size T-20)
- 7/64” Allen Wrench
- Penetrox Heat Sink Compound (Lincoln Part #T12837-1)
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

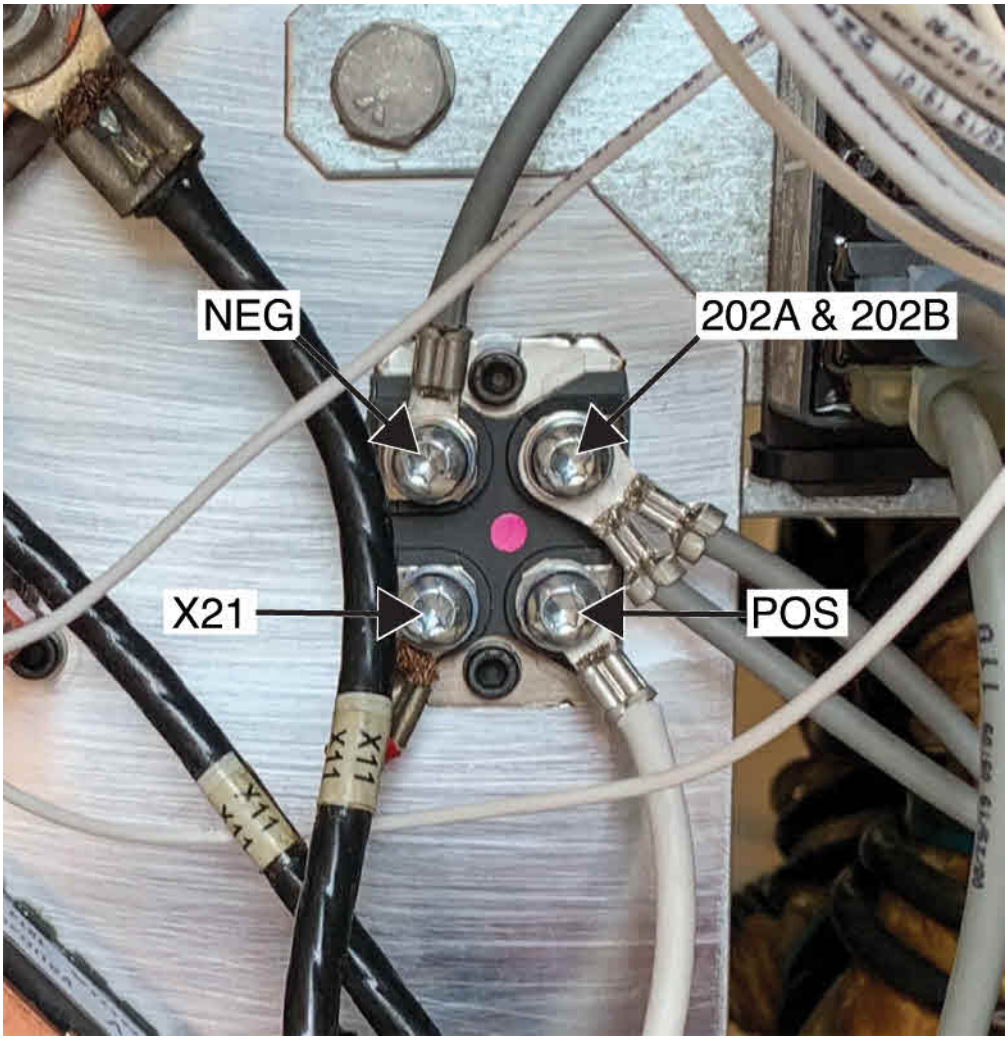
1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Using a torx nutdriver (size T-20), remove the four screws, lock washers and flat washers securing leads 202A, 202B, X21, POS and NEG to the boost rectifier. See **Figure F.1**. See Wiring Diagram. Label and disconnect leads.
5. Using a 7/64” Allen wrench, remove the two screws and washers securing the boost rectifier to the heatsink. See **Figure F.2**.
6. The boost rectifier can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Apply a coating of Penetrox heat sink compound to the mating surfaces of the boost rectifier and the heatsink.
2. Carefully position the new boost rectifier into the machine.
3. Using a 7/64” Allen wrench, attach the two screws and washers securing the boost rectifier to the heatsink.
4. Using a torx nutdriver (size T-20), attach the four screws, lock washers and flat washers securing leads 202A, 202B, X21, POS and NEG to the boost rectifier. See Wiring Diagram.
5. Perform the **Case Cover Replacement Procedure**.
6. Perform the **Retest After Repair Procedure**.

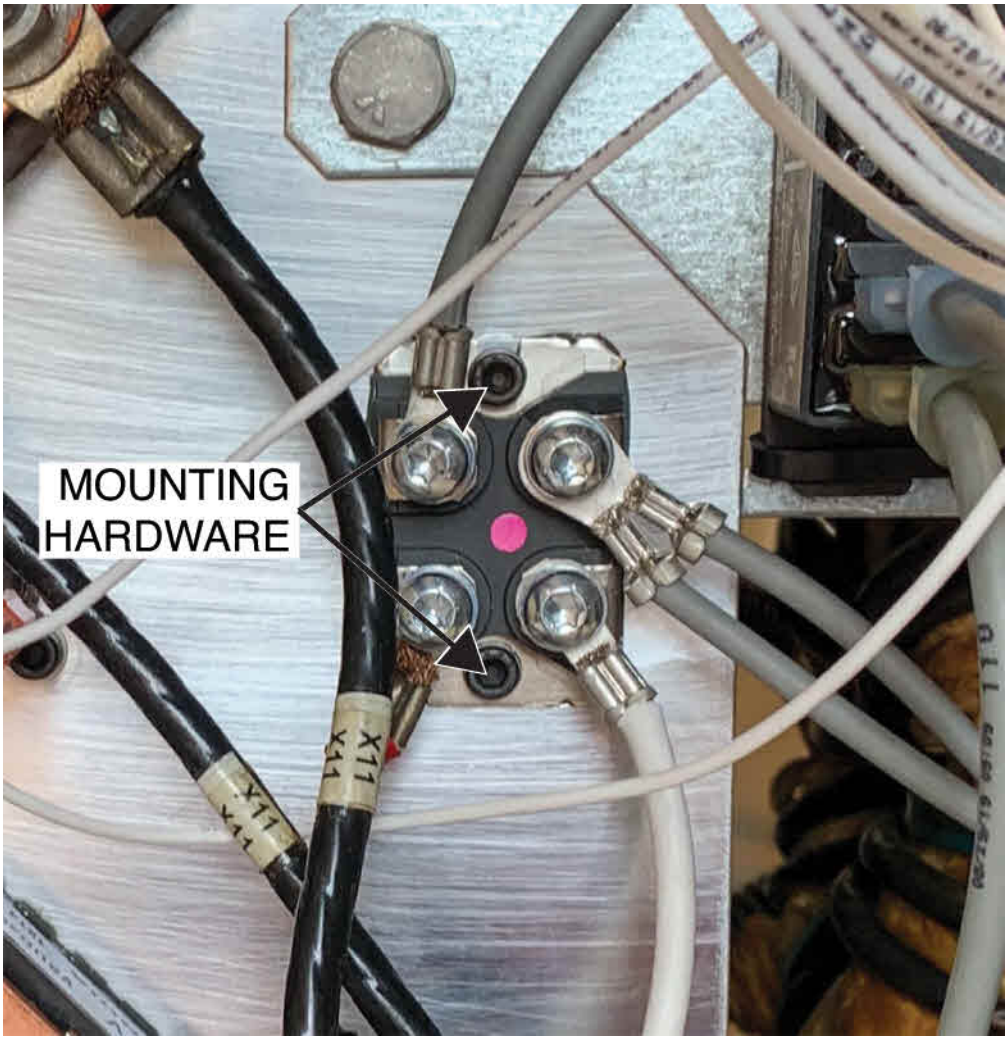
Boost rectifier lead locations



LECOL_EMBEDDEDIMG_0000178468_x.png

Figure 1. Boost rectifier lead locations

Boost rectifier mounting screw locations



LECOL_EMBEDDEDIMG_0000178467_x.png

Figure 2. Boost rectifier mounting screw locations

BOOST RELAY REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Boost Relay.

MATERIALS NEEDED

- Pliers
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Label and disconnect plugs 227, 228, 110A, 110B, 202A and 202B from the boost relay terminals. See **Figure F.1**. See Wiring Diagram.
5. Using pliers, remove the two cable ties securing the boost relay to the top rectifier bracket. See **Figure F.2**. See Wiring Diagram.
6. The boost relay can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new boost relay onto the top rectifier bracket.
2. Attach the two cable ties securing the boost relay to the top rectifier bracket.
3. Connect plugs 227, 228, 110A, 110B, 202A and 202B to the boost relay terminals. See Wiring Diagram.
4. Perform the **Case Cover Replacement Procedure**.
5. Perform the **Retest After Repair Procedure**.

Boost relay terminal locations

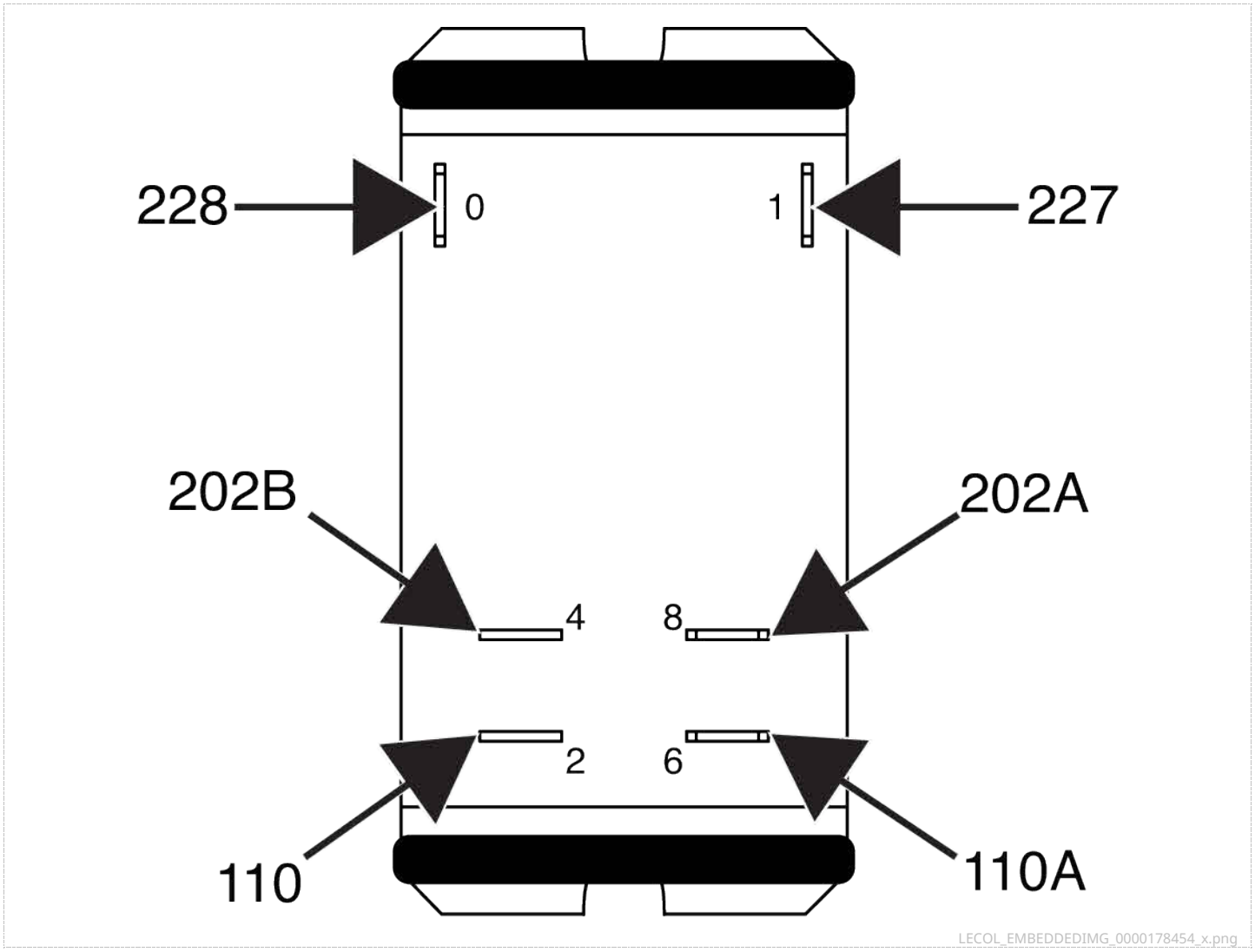


Figure 1. Boost relay terminal locations

Boost relay cable tie locations

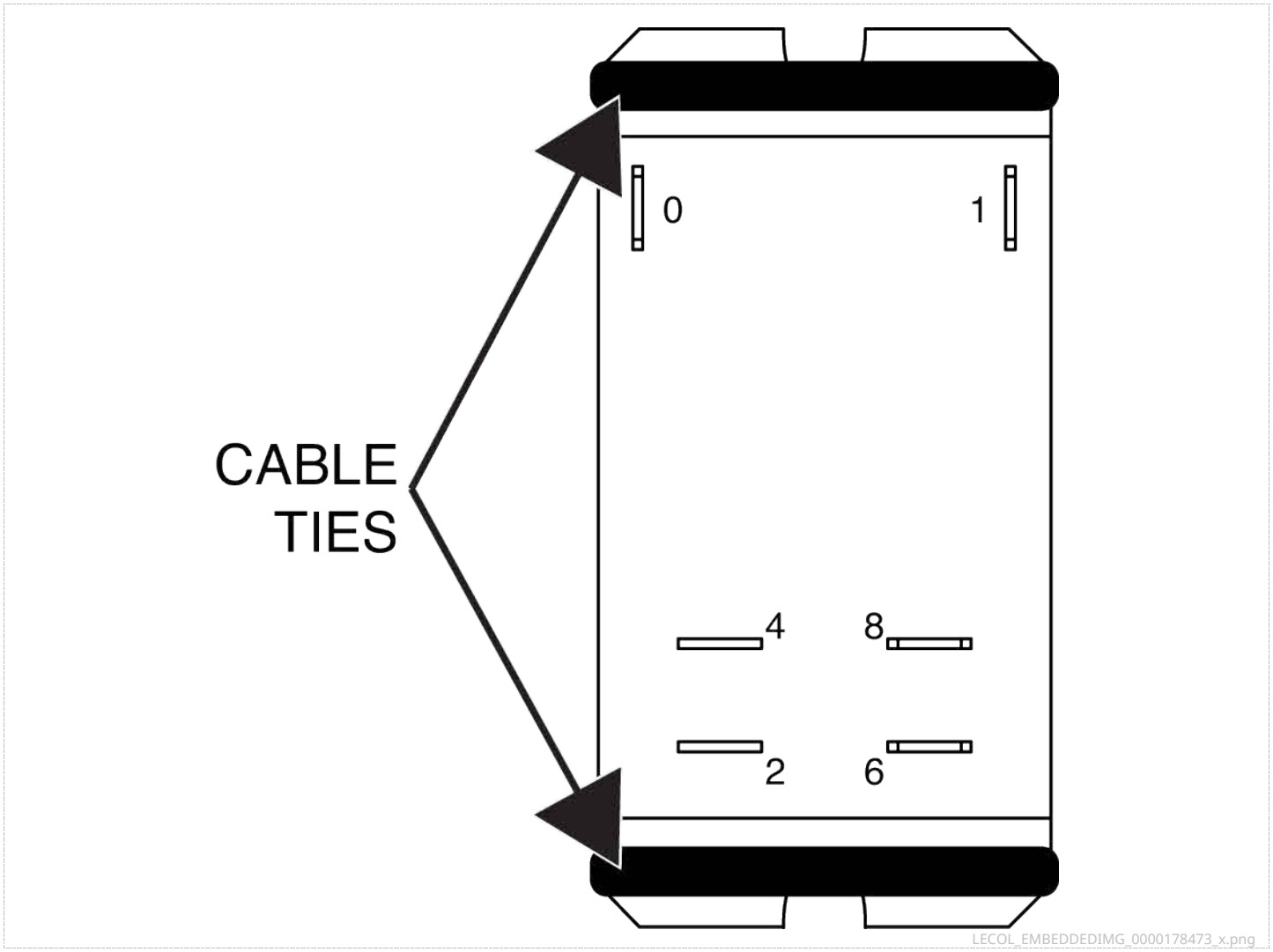


Figure 2. Boost relay cable tie locations

CASE COVER REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Case Sheet Metal Covers.

MATERIALS NEEDED

- 5/16" Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Using a 5/16” nutdriver, remove the four screws and washers securing the corner caps to the left and right case sides. See **Figure F.1**. **NOTE:** It is not necessary to remove the corner caps completely at this time.
3. Using a 5/16” nutdriver, remove the nine screws (two on top, four on the left side and three on the right side) securing the roof to the machine. See **Figures F.1** and **F.2**.
4. Using a 5/16” nutdriver, remove the two screws securing the right case side to the machine. See **Figure F.1**.
5. The case covers can now be removed.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the right case side onto the machine.
2. Using a 5/16” nutdriver, attach the two screws securing the right case side to the machine.
3. Carefully position the roof onto the machine.
4. Using a 5/16” nutdriver, attach the nine screws (two on top, four on the left side and three on the right side) securing the roof to the machine.
5. Using a 5/16” nutdriver, attach the four screws and washers securing the corner caps to the left and right case sides.

Corner cap, right case side and roof mounting screw locations

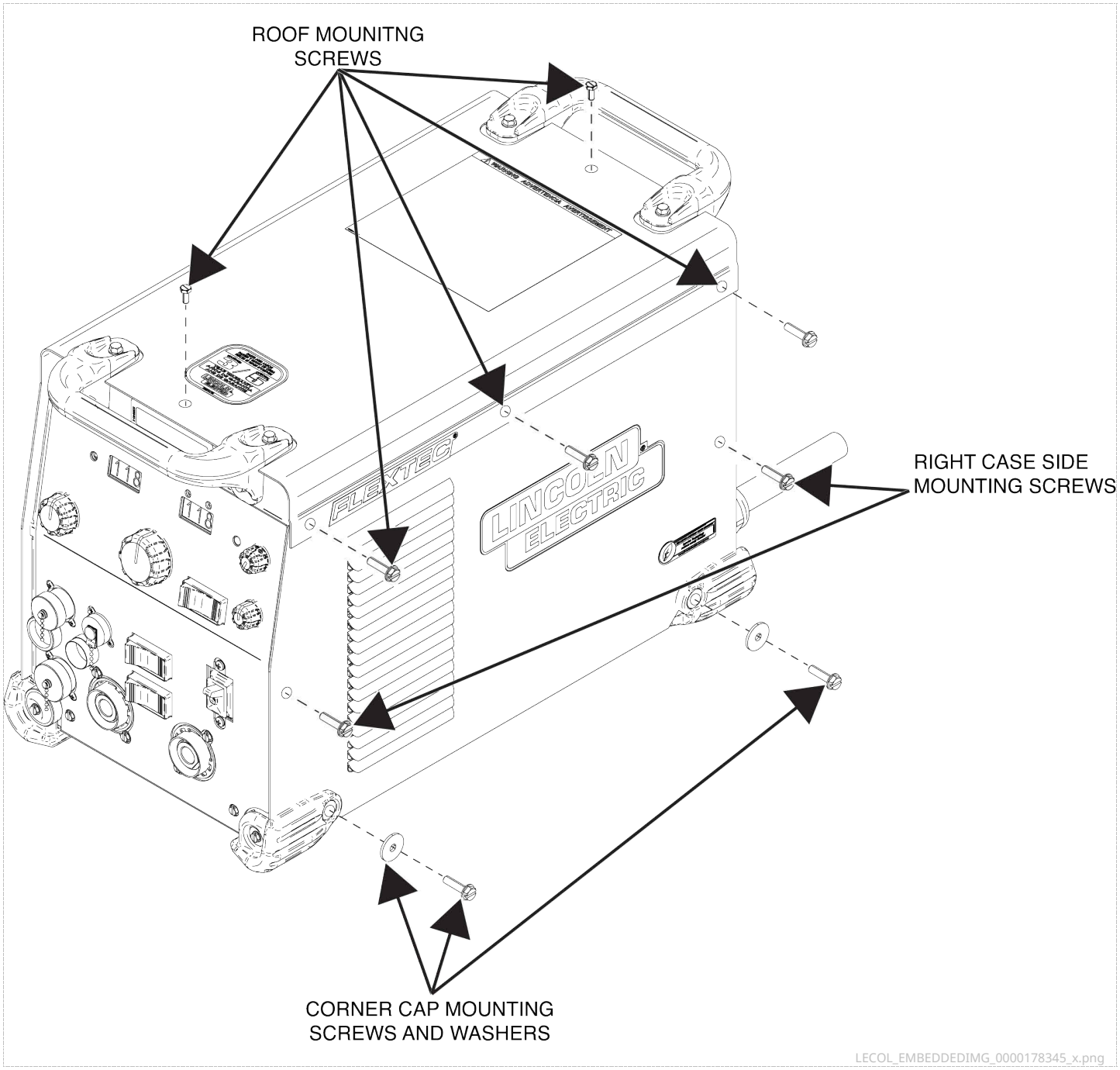


Figure 1. Corner cap, right case side and roof mounting screw locations

Roof mounting screw locations

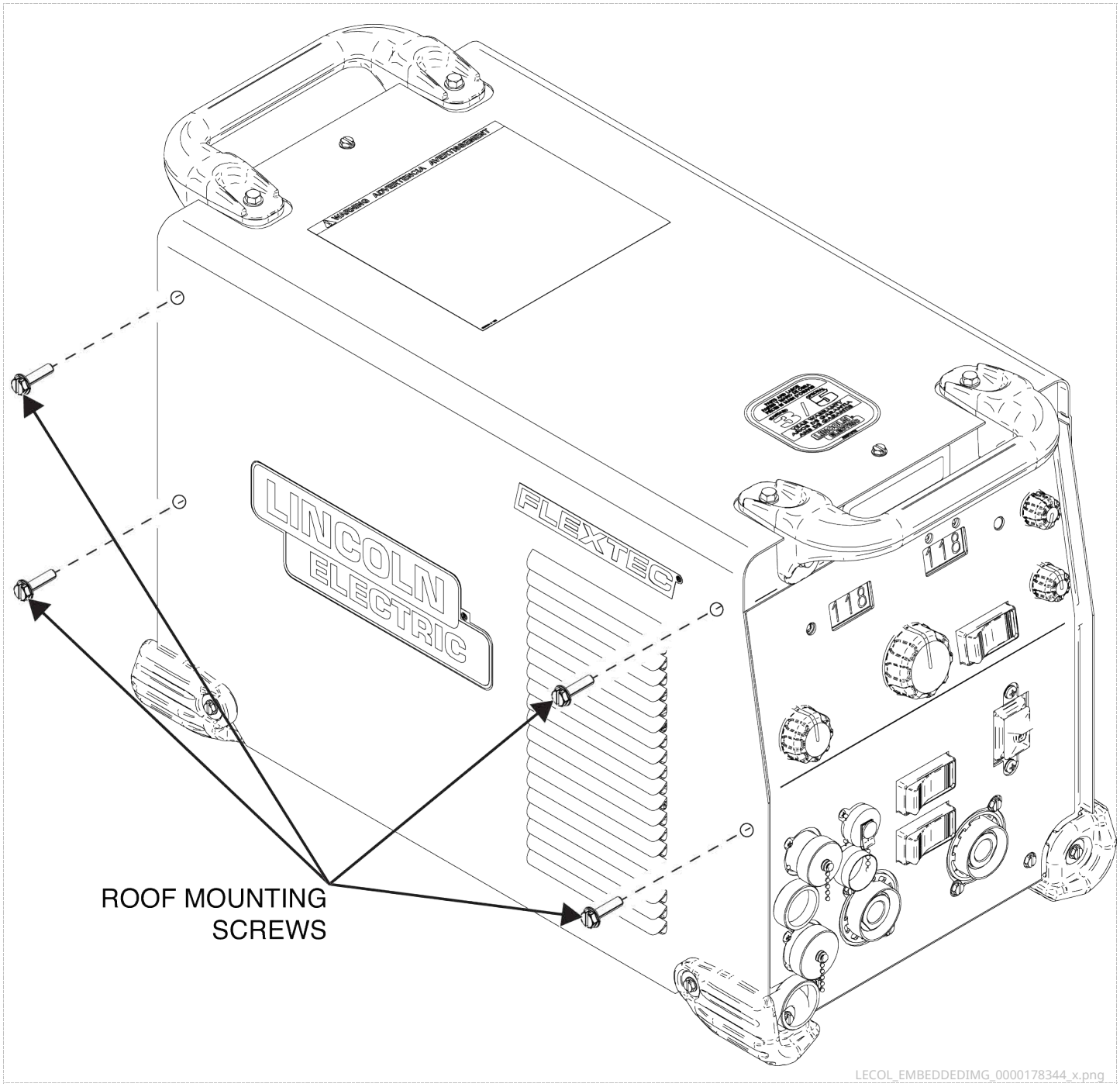


Figure 2. Roof mounting screw locations

CHOKE REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Choke.

MATERIALS NEEDED

- 1/2” Nutdriver
- 3/8” Nutdriver
- 5/16” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

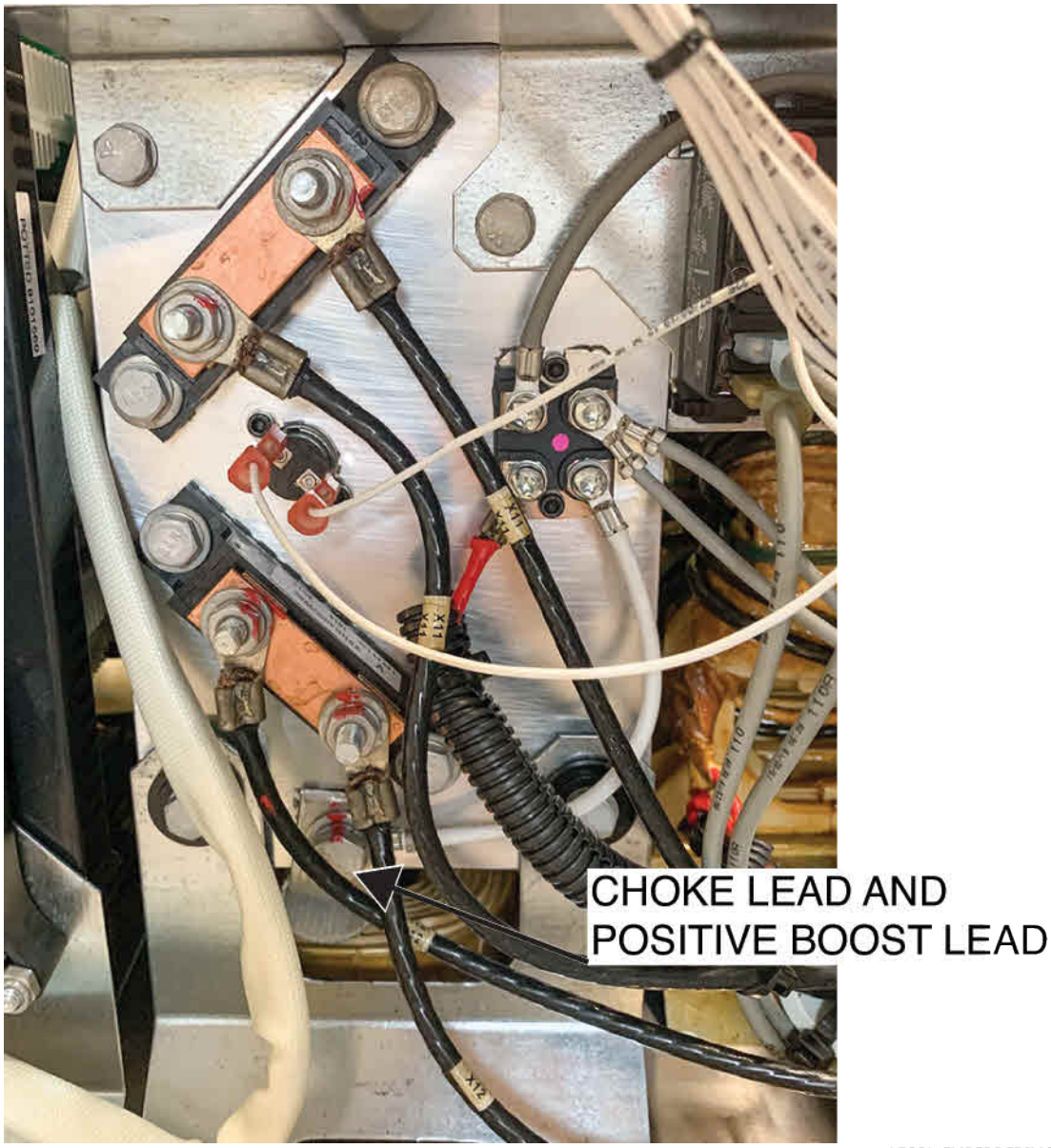
1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Perform the **Main Capacitor Board Removal Procedure**.
5. Using a 1/2” nutdriver, remove the bolt, lock washer and flat washer securing the choke lead and POS lead to the heatsink. See **Figure F.1**. See Wiring Diagram. Label and disconnect POS lead.
6. Using a 1/2” nutdriver, remove the bolt, lock washer and flat washer securing the choke lead to the rear of the positive output terminal. See **Figure F.2**. See Wiring Diagram.
7. Using a 3/8” nutdriver, remove the nut securing the cable holder closed. Remove the leads from the holders. See **Figure F.3**. See Wiring Diagram.
8. Using a 3/8” nutdriver, remove the two nuts and washers securing the heatsink holder to the PFC board bracket. See **Figure F.3**.
9. Using a 5/16” nutdriver, remove the two screws securing the bottom rectifier bracket to the base. See **Figure F.3**.
10. Carefully maneuver the output rectifier assembly to allow for access and removal of the choke.
11. Using a 5/16” nutdriver, remove the two screws securing the choke to the base of the machine. See **Figure F.4**. See Wiring Diagram.
12. The choke can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new choke into the machine.
2. Using a 5/16” nutdriver, attach the two screws securing the choke to the base of the machine.
3. Carefully position the output rectifier assembly into the machine.
4. Using a 5/16” nutdriver, attach the two screws securing the bottom rectifier bracket to the base.
5. Using a 3/8” nutdriver, attach the two nuts and washers securing the heatsink holder to the PFC board bracket.
6. Carefully position the previously removed leads into the cable holder. See Wiring Diagram.
7. Using a 3/8” nutdriver, attach the nut securing the cable holder closed.
8. Using a 1/2” nutdriver, attach the bolt, lock washer and flat washer securing the choke lead to the rear of the positive output terminal. See Wiring Diagram.
9. Using a 1/2” nutdriver, attach the bolt, lock washer and flat washer securing the choke lead and POS lead to the heatsink. See Wiring Diagram.
10. Perform the **Main Capacitor Board Replacement Procedure**.
11. Perform the **Case Cover Replacement Procedure**.
12. Perform the **Retest After Repair Procedure**.

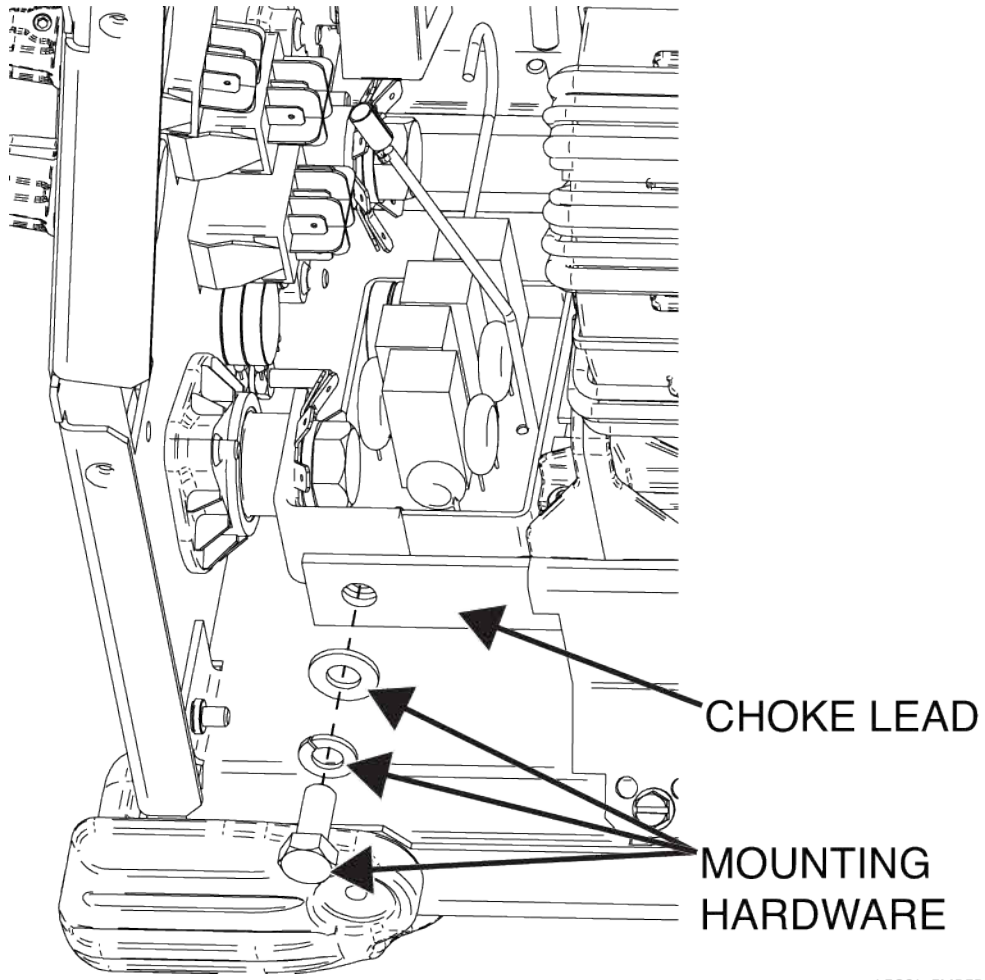
Choke lead and POS lead connection location



LECOL_EMBEDDEDIMG_0000178427_x.png

Figure 1. Choke lead and POS lead connection location

Choke lead and mounting hardware location



LECOL_EMBEDDEDIMG_0000178426_x.png

Figure 2. Choke lead and mounting hardware location

Heatsink holder, cable holder and bottom rectifier bracket locations

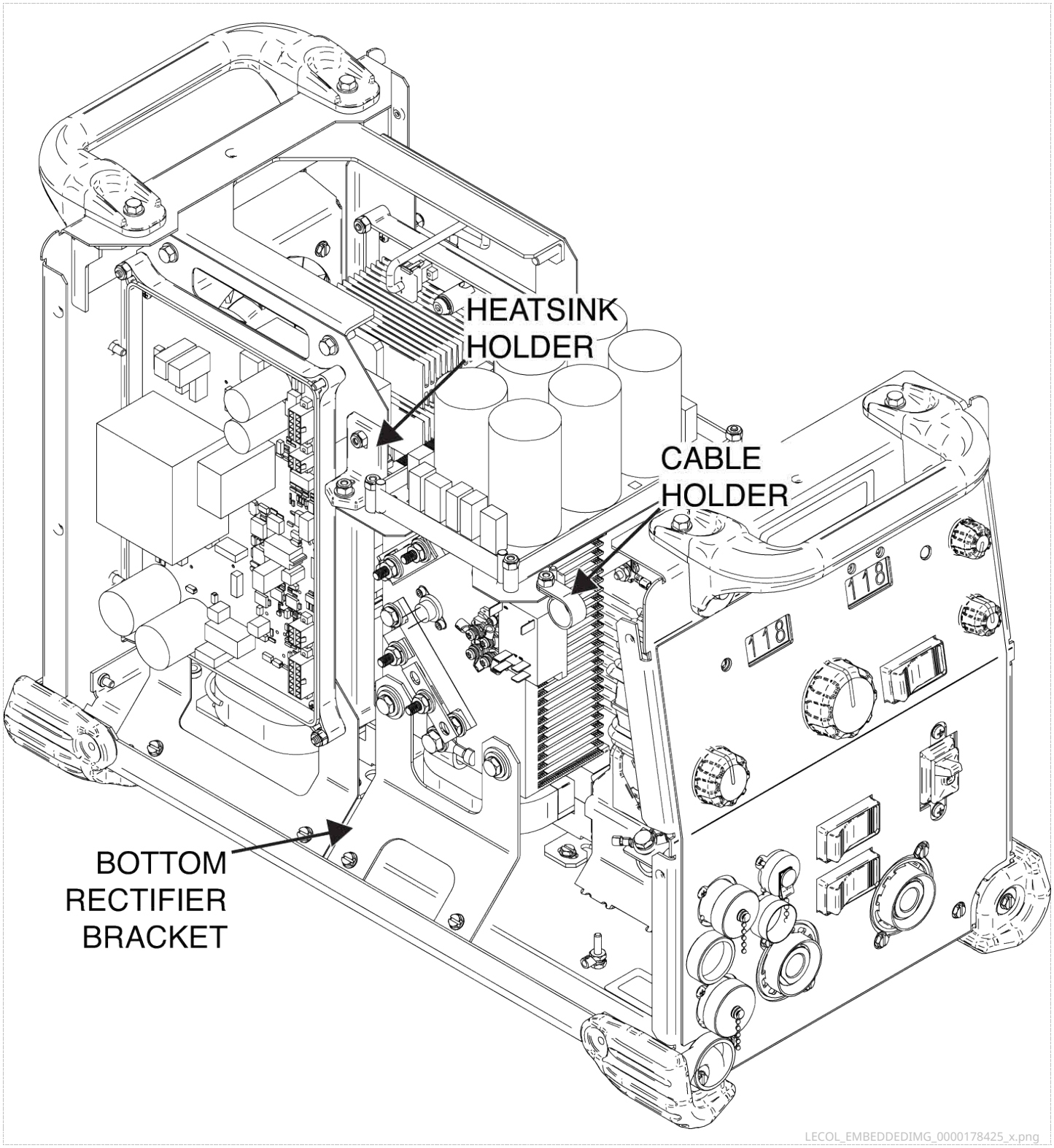


Figure 3. Heatsink holder, cable holder and bottom rectifier bracket locations

Choke mounting screw locations

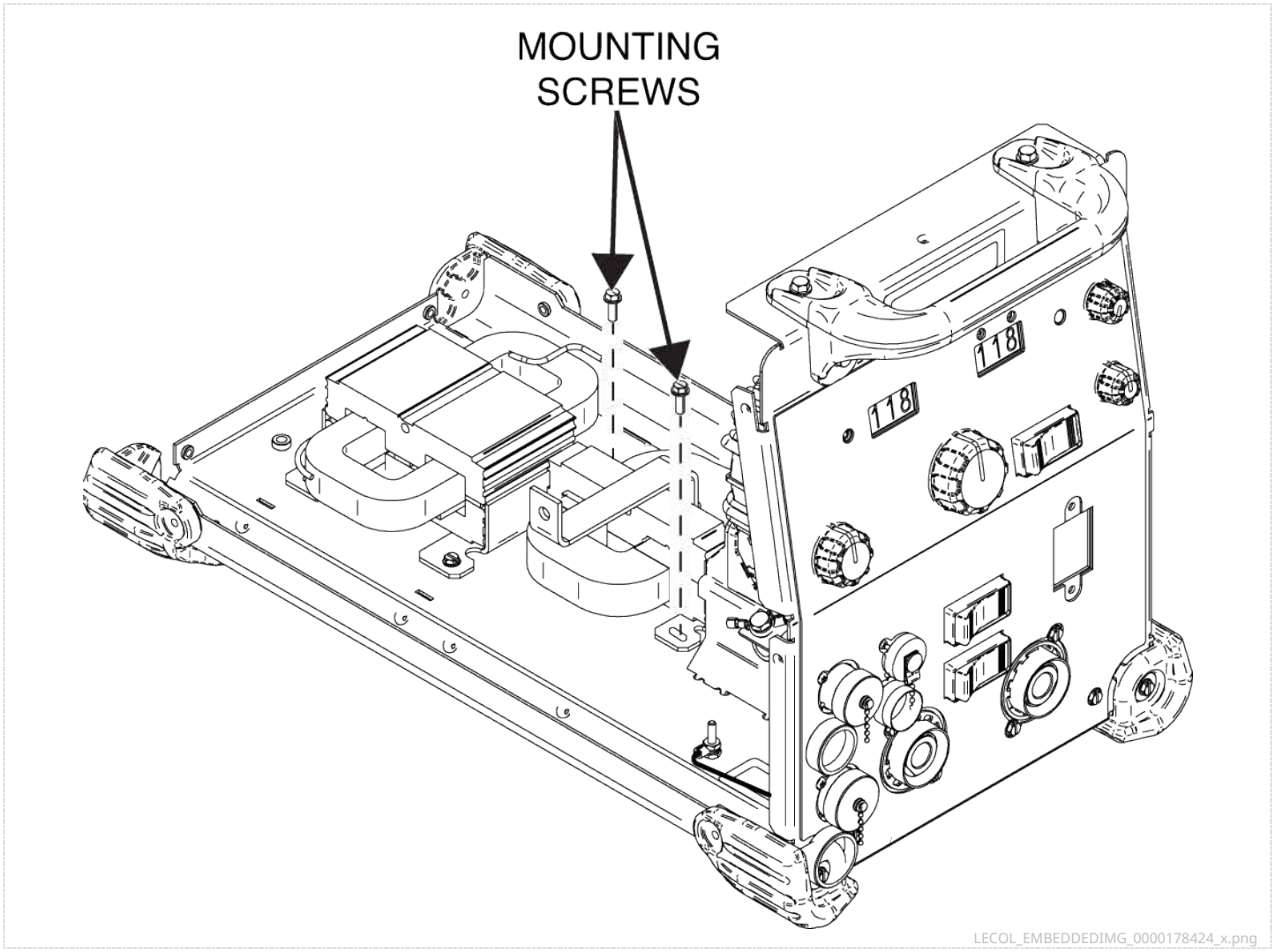


Figure 4. Choke mounting screw locations

CURRENT TRANSDUCER REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Current Transducer (LEM).

MATERIALS NEEDED

- 7/16” Nutdriver
- Pliers
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Using a 7/16” nutdriver, remove the two bolts, lock washers and flat washers securing the NEG lead and the X13 leads to the copper bar. See **Figure F.1**. See Wiring Diagram.
5. Using pliers, remove the cable tie securing the current transducer (LEM) to the copper bar. See Wiring Diagram.
6. Label and disconnect the plug from the rear of the current transducer. See Wiring Diagram.
7. The current transducer (LEM) can now be removed from the copper bar and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new current transducer (LEM) onto the copper bar.
2. Connect the plug to the rear of the current transducer. See Wiring Diagram.
3. Using a cable tie, secure the current transducer (LEM) to the copper bar. See Wiring Diagram.
4. Using a 7/16” nutdriver, attach the two bolts, lock washers and flat washers securing the NEG lead and the X13 leads to the copper bar. See Wiring Diagram.
5. Perform the **Case Cover Replacement Procedure**.
6. Perform the **Retest After Repair Procedure**.

NEG lead, X13 lead and mounting hardware locations

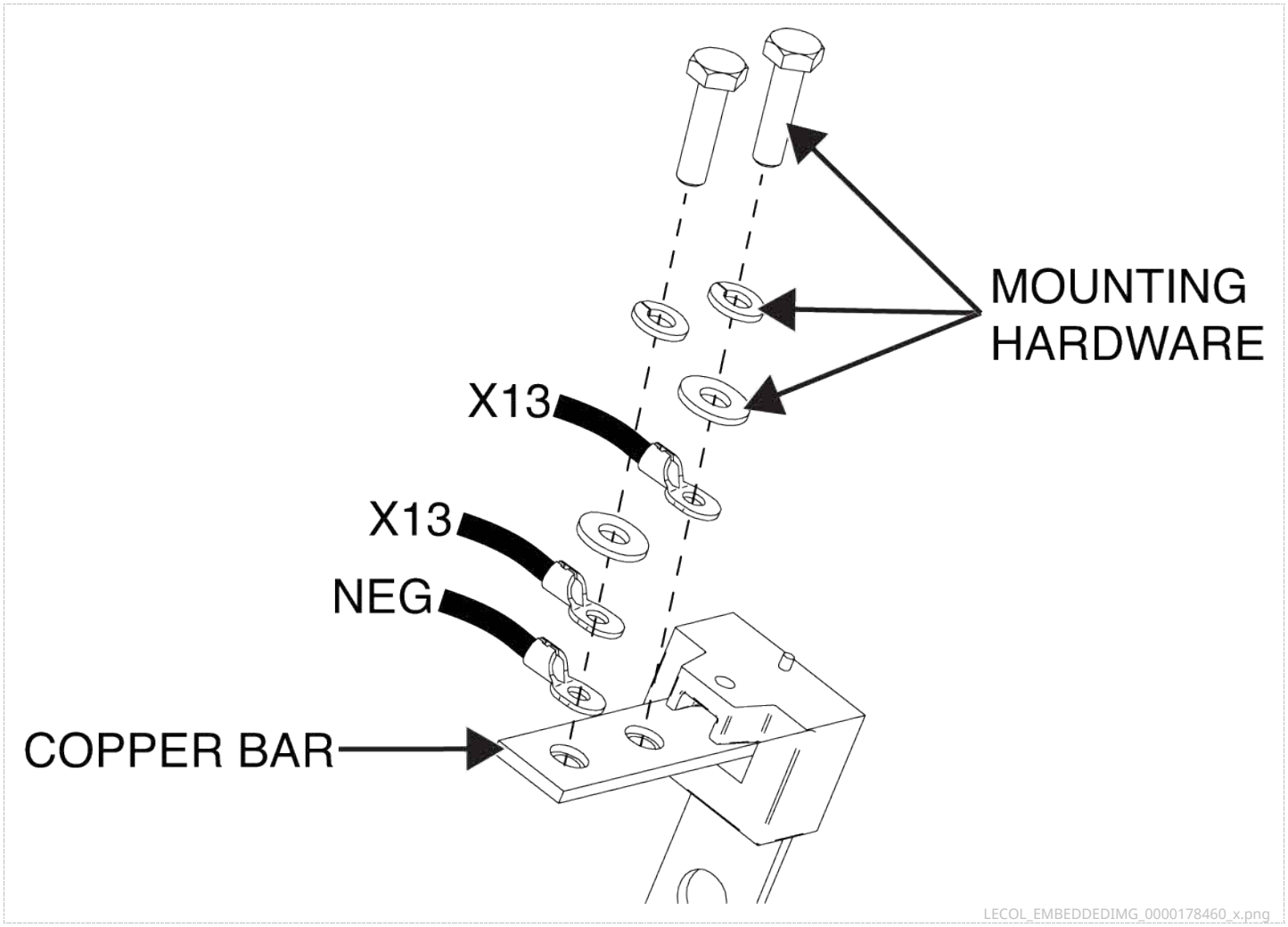


Figure 1. NEG lead, X13 lead and mounting hardware locations

FAN REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Fan Assembly.

MATERIALS NEEDED

- 5/16” Nutdriver
- Slotted Screwdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Using a 5/16” nutdriver, remove the four screws securing the brickwork fan guard to the rear of the machine. See **Figure F.1**.
5. Using a slotted screwdriver, remove the two screws and washers securing the fan bracket to the machine. See **Figure F.1**.
6. Label and disconnect plugs J13 and J14 from the inverter control board. See **Figure F.2**. See Wiring Diagram.
7. Carefully route the plugs through the grommet to allow for the removal of the fans.
8. Using a 5/16” nutdriver, remove the four screws securing each fan to the fan bracket. See **Figure F.3**.
9. Each fan can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new fan(s) into the fan bracket.
2. Using a 5/16” nutdriver, attach the four screws securing each fan to the fan bracket.
3. Carefully route plugs J13 and J14 through the grommet. See Wiring Diagram.
4. Connect plugs J13 and J14 to the inverter control board. See Wiring Diagram.
5. Using a slotted screwdriver, attach the two screws and washers securing the fan bracket to the machine.

6. Using a 5/16” nutdriver, attach the four screws securing the brickwork fan guard to the rear of the machine.
7. Perform the **Case Cover Replacement Procedure**.
8. Perform the **Retest After Repair Procedure**.

Brickwork fan guard and fan bracket mounting screw locations

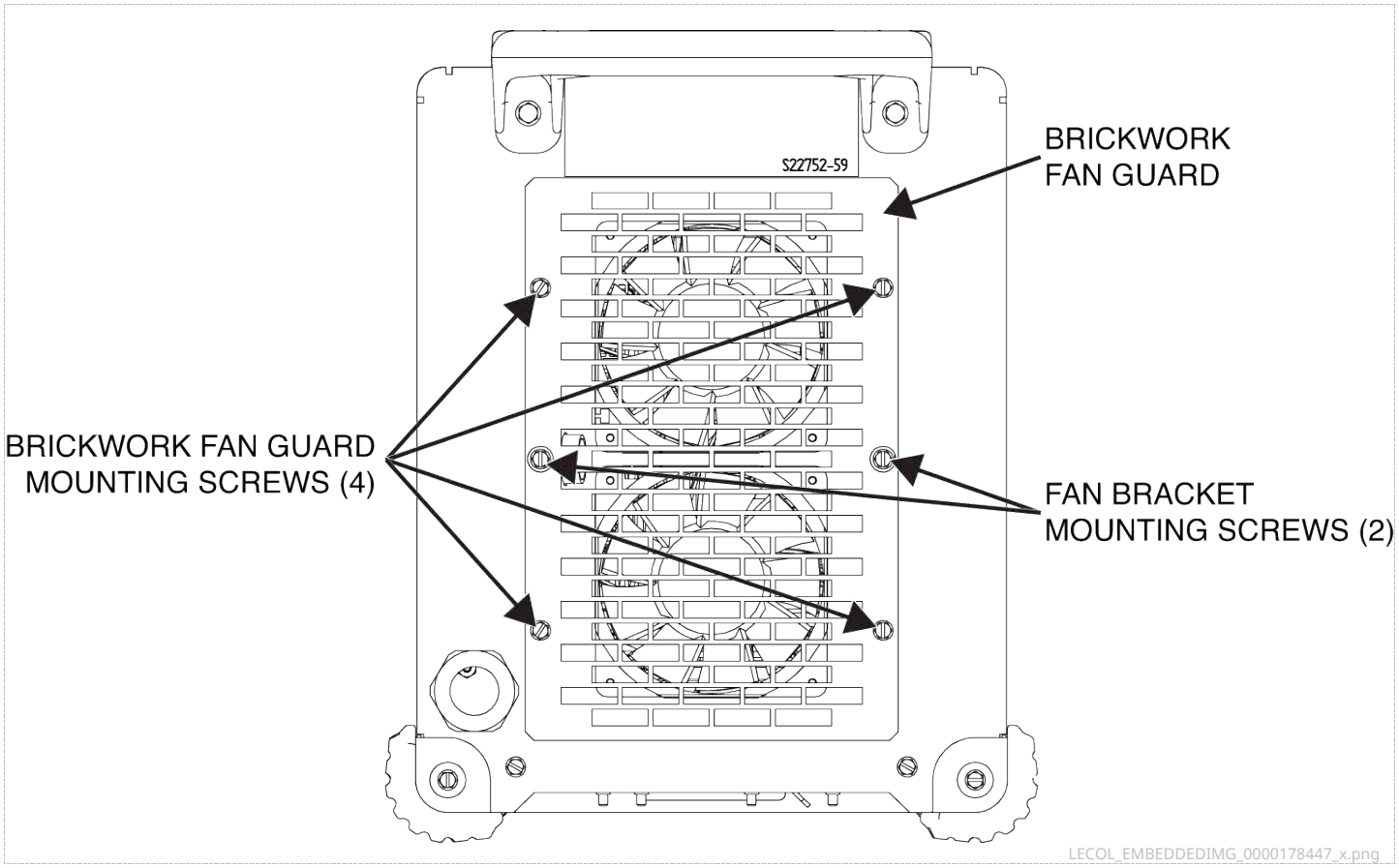
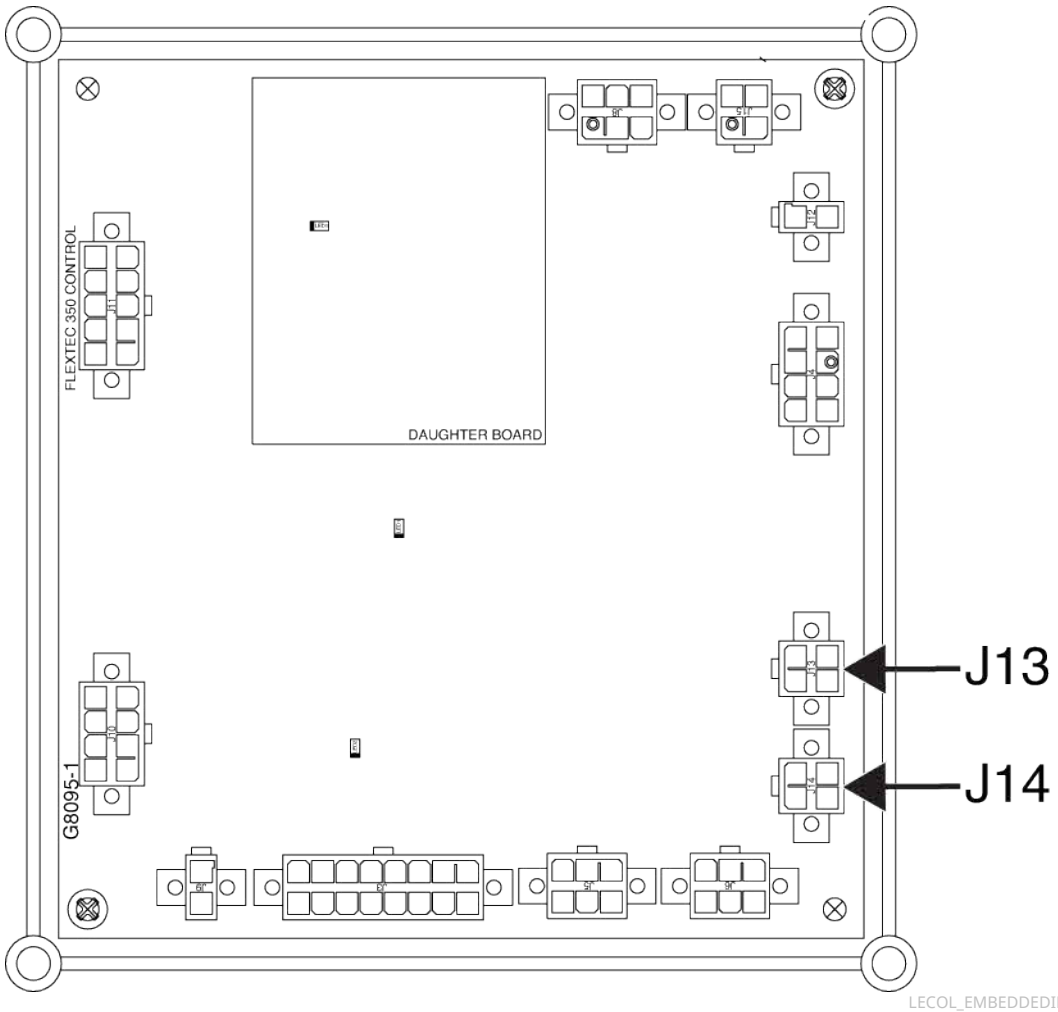


Figure 1. Brickwork fan guard and fan bracket mounting screw locations

Inverter control board plug J13 and J14 locations



LECOL_EMBEDDEDIMG_0000178446_x.png

Figure 2. Inverter control board plug J13 and J14 locations

Fan mounting screw locations

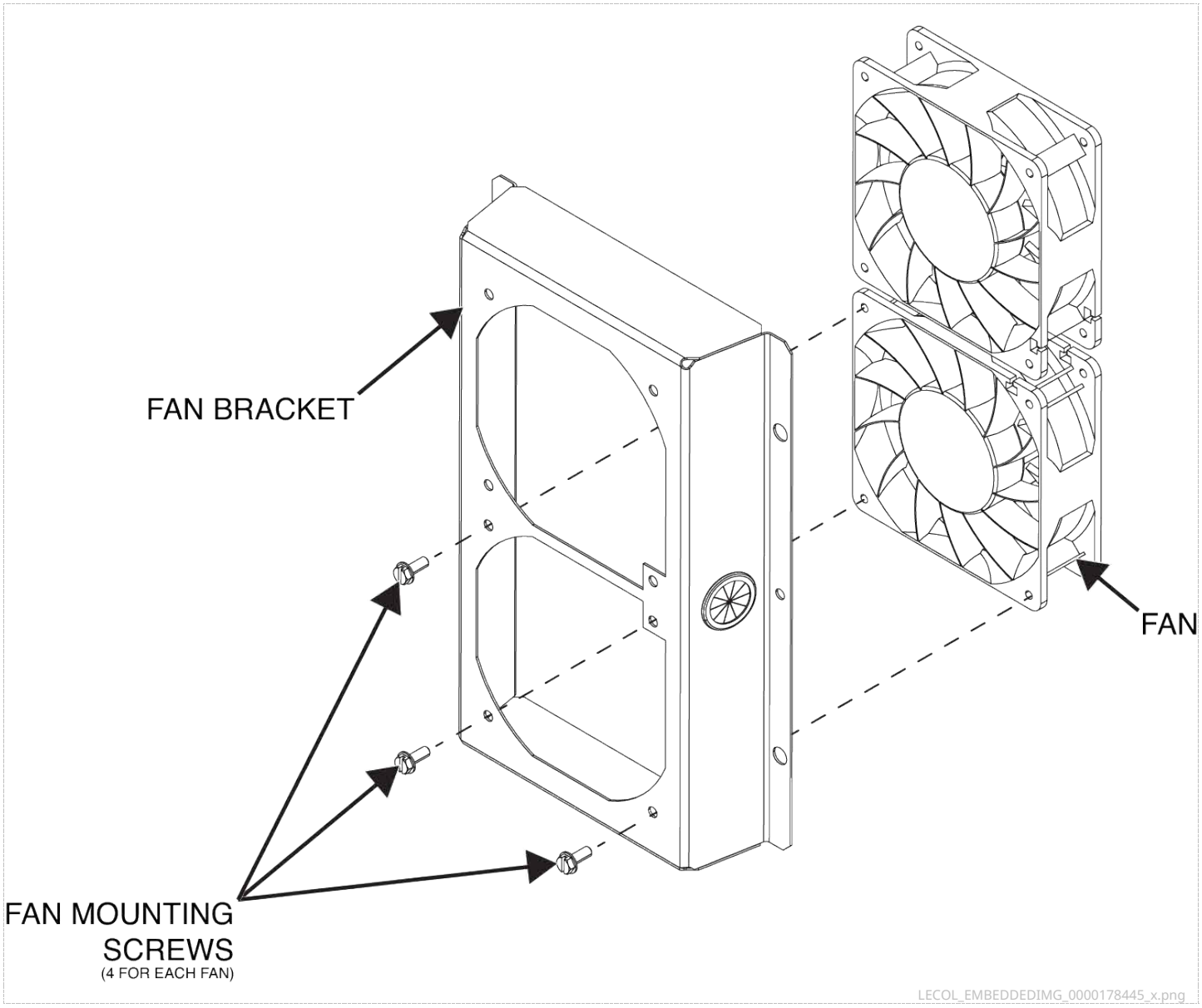


Figure 3. Fan mounting screw locations

INPUT RECTIFIER REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Input Rectifier.

MATERIALS NEEDED

- Torx Nutdriver (Size T-25)
- Penetrox Heat Sink Compound (Lincoln Part #T12837-1)
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Perform the **SCR (Pre-Charge) Board Removal Procedure**.
5. Using a Torx nutdriver (size T-25), remove the two screws and washers securing the input rectifier to the heatsink. See **Figure F.1**.
6. The input rectifier can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Apply a coating of Penetrox heat sink compound to the mating surfaces of the input rectifier and the heatsink.
2. Carefully position the new input rectifier into the machine.
3. Using a Torx nutdriver (size T-25), attach the two screws and washers securing the input rectifier to the heatsink.
4. Perform the **SCR (Pre-Charge) Board Replacement Procedure**.
5. Perform the **Case Cover Replacement Procedure**.
6. Perform the **Retest After Repair Procedure**.

Mounting hardware locations

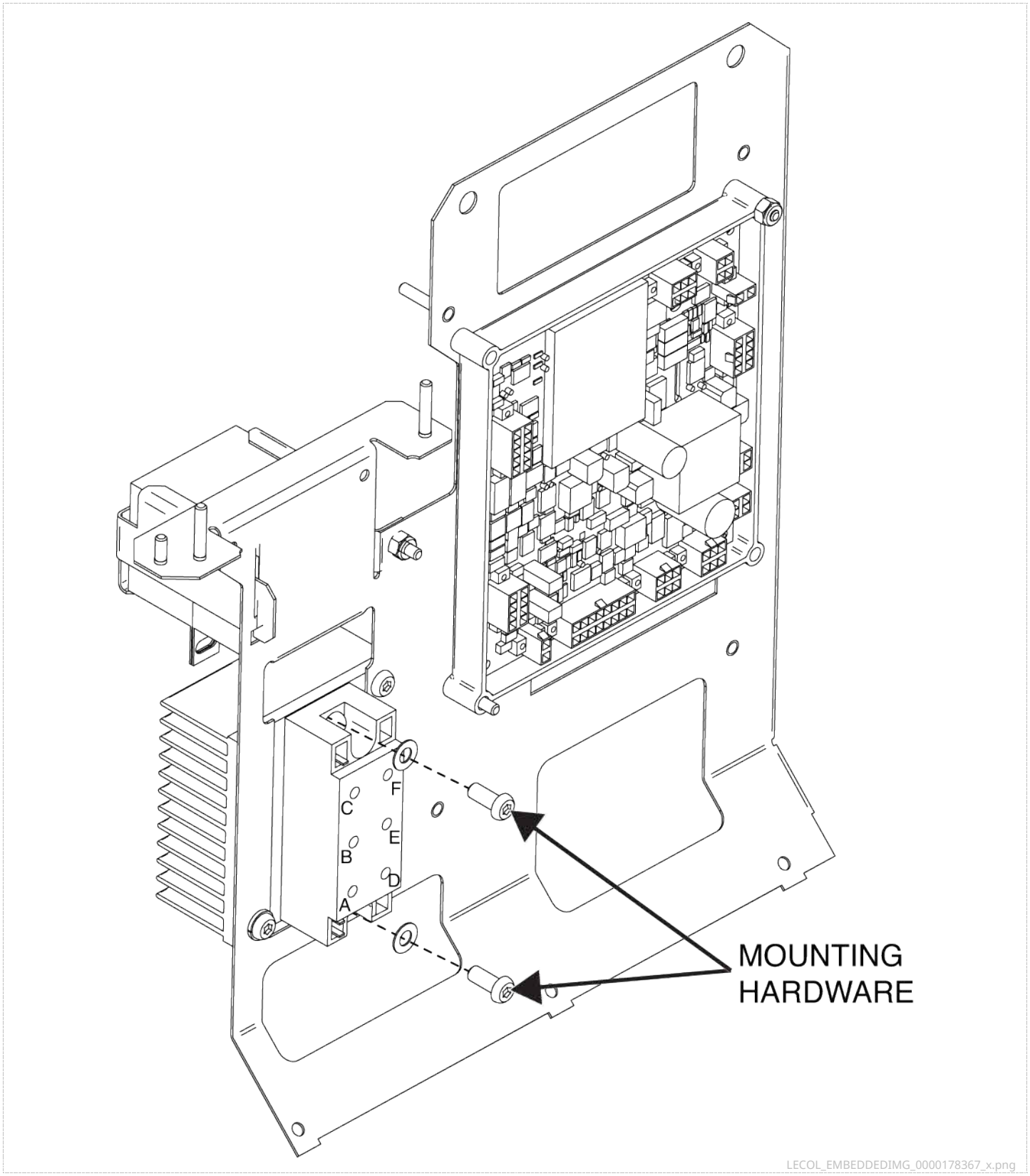


Figure 1. Mounting hardware locations

INVERTER CONTROL BOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Inverter Control Board.

MATERIALS NEEDED

- 3/8" Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Label and disconnect plugs J3, J4, J5, J6, J9, J10, J11, J12, J13 and J14 from the inverter control board. See **Figure F.1**. See Wiring Diagram.
5. Using a 3/8” nutdriver, remove the two nuts securing the inverter control board to the switchboard etc panel. See **Figure F.2**. Label and disconnect ground lead from lower mounting post prior to removing board. See Wiring Diagram.
6. The inverter control board can now be removed from it’s mounting posts and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new inverter control board into the machine.
2. Attach ground lead to lower mounting post. See Wiring Diagram.
3. Using a 3/8” nutdriver, attach the two nuts securing the inverter control board to the switchboard etc panel.
4. Connect plugs J3, J4, J5, J6, J9, J10, J11, J12, J13 and J14 to the inverter control board. See Wiring Diagram.
5. Perform the **Case Cover Replacement Procedure**.
6. Perform the **Retest After Repair Procedure**.

Inverter control board plug locations

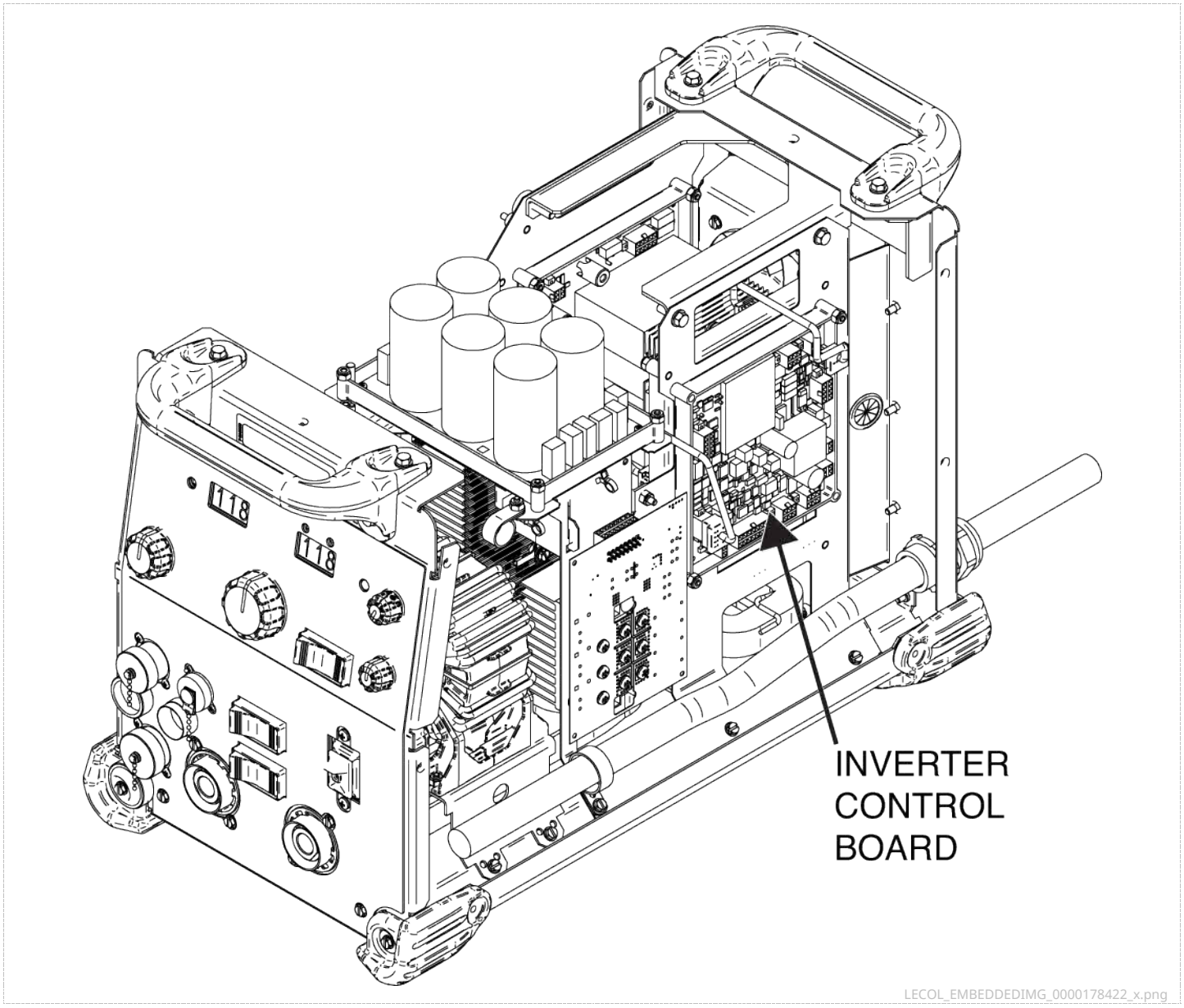


Figure 1. Inverter control board plug locations

Inverter control board mounting nut locations

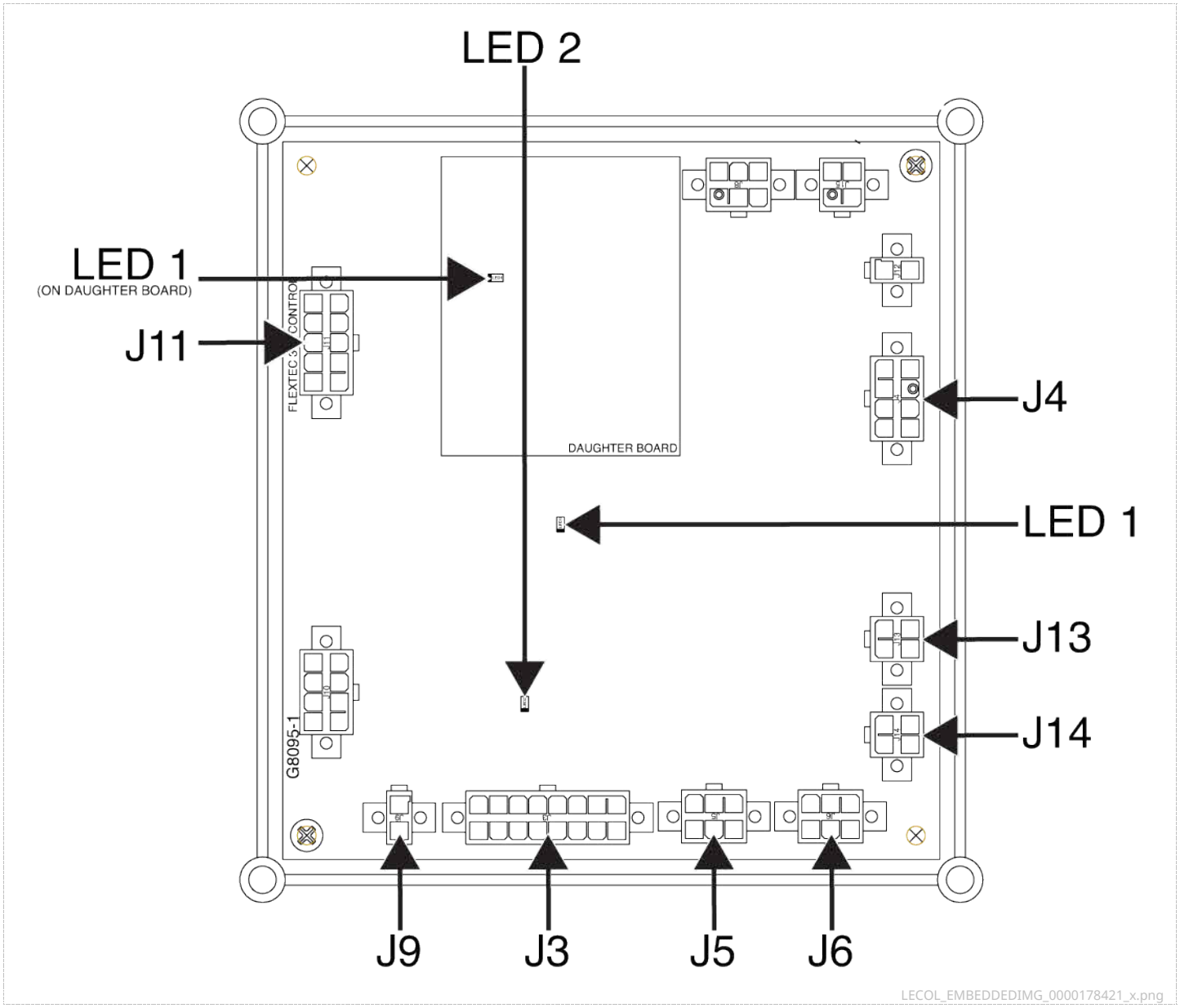


Figure 2. Inverter control board mounting nut locations

LINE SWITCH REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Line Switch.

MATERIALS NEEDED

- Pliers
- 3/8” Nutdriver
- 5/16” Nutdriver
- Phillips Screwdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Carefully remove the cable tie, securing the plastic protective sleeve to the line switch. Move the plastic protective sleeve flap to gain access to the rear of the line switch. See Wiring Diagram.
5. Using a 3/8” nutdriver, remove the nut, lock washer and flat washer securing the ground lead to the ground stud on the front panel. See **Figure F.1**. See Wiring Diagram.
6. Using a 5/16” nutdriver, remove the two screws and washers securing the line switch to the front panel. See **Figure F.2**.
7. Carefully maneuver the line switch out of the front panel. Do not remove completely from the machine.
8. Using a Phillips screwdriver, loosen the six screws securing leads L1, L2, L3 and the three input leads to the terminals of the line switch. See **Figure F.3**. See Wiring Diagram.
9. The line switch can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Using a Phillips screwdriver, attach the six screws securing leads L1, L2, L3 and the three input leads to the terminals of the line switch. See Wiring Diagram.
2. Carefully position the new line switch into the front panel.

3. Using a 5/16” nutdriver, attach the two screws and washers securing the line switch to the front panel.
4. Using a 3/8” nutdriver, attach the nut, lock washer and flat washer securing the ground lead to the ground stud on the front panel. See Wiring Diagram.
5. Carefully attach the cable tie, securing the plastic protective sleeve to the line switch.
6. Perform the **Case Cover Replacement Procedure**.
7. Perform the **Retest After Repair Procedure**.

Ground lead and ground stud locations

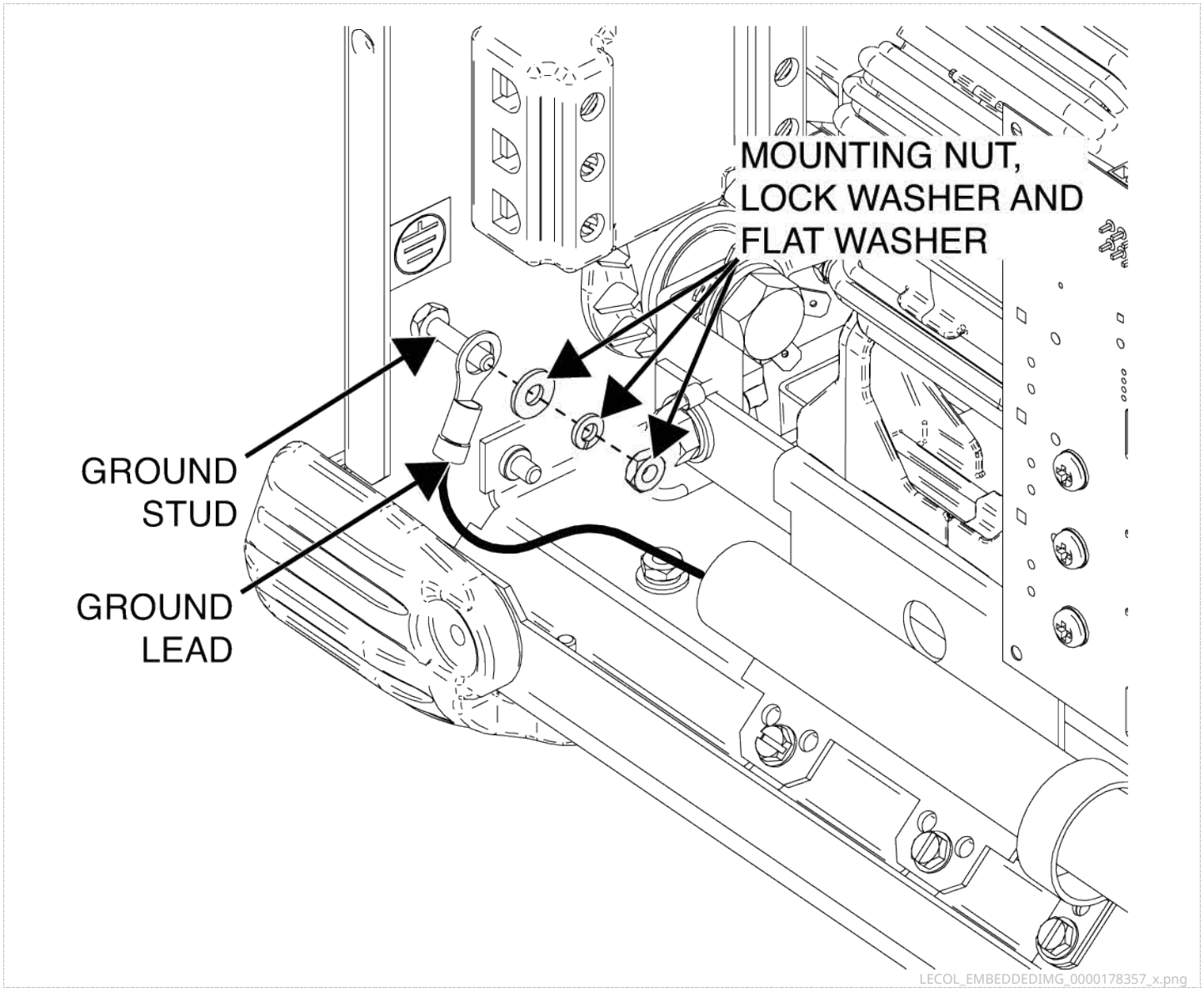


Figure 1. Ground lead and ground stud locations

Line switch mounting screw locations

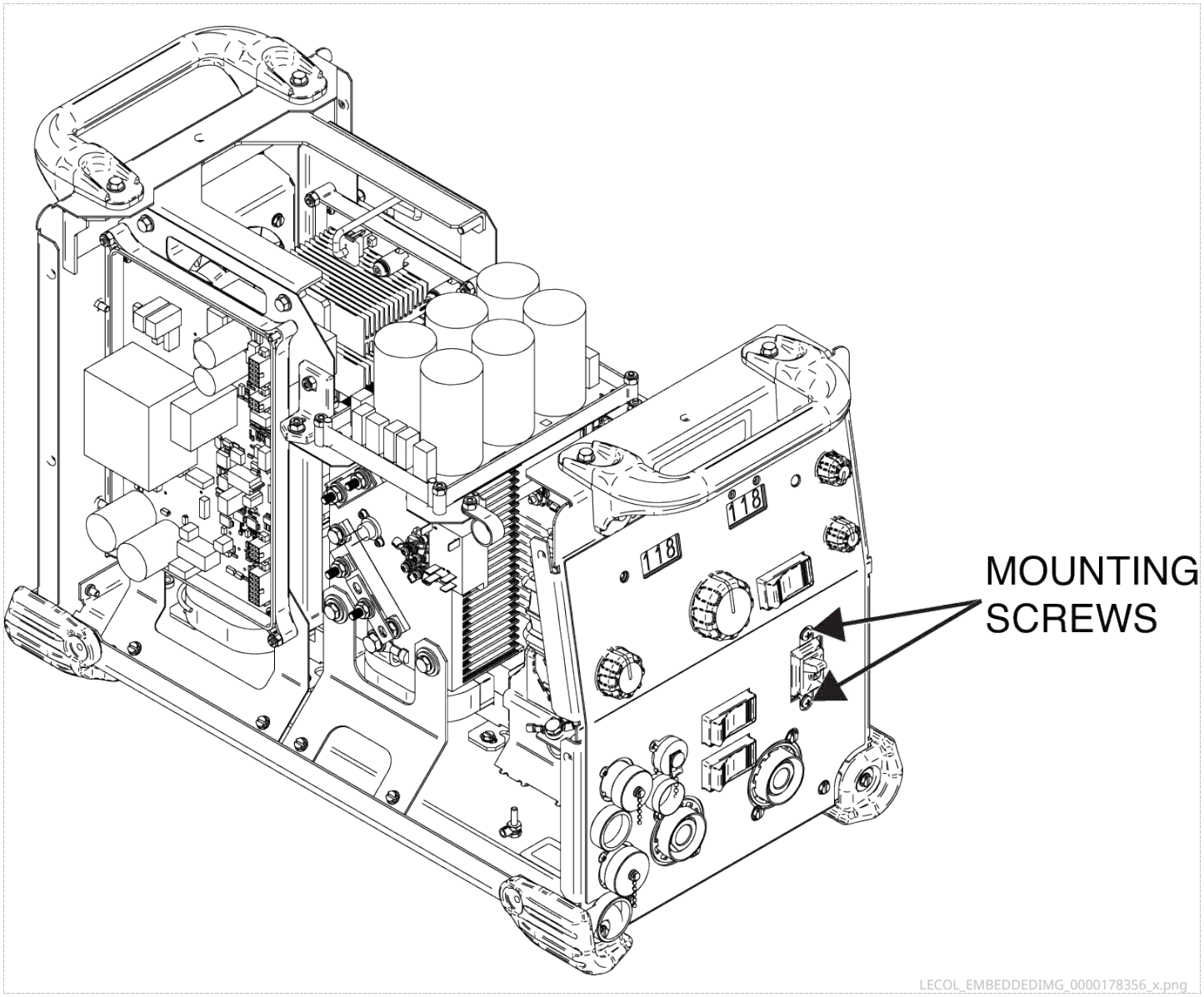


Figure 2. Line switch mounting screw locations

Line switch lead locations

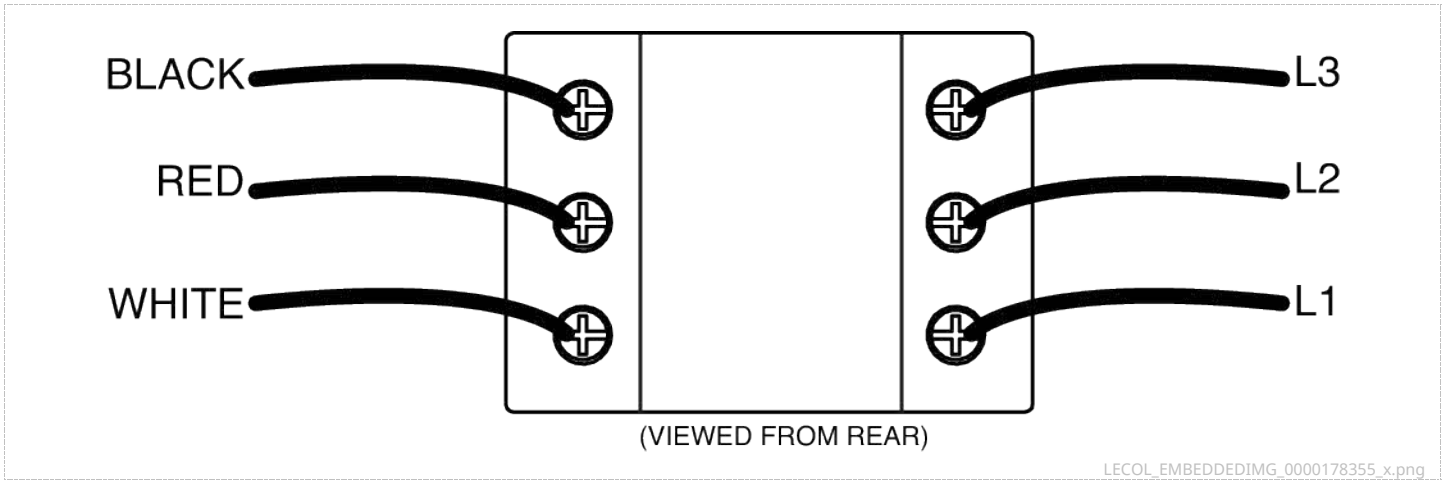


Figure 3. Line switch lead locations

MAIN CAPACITOR BOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Main Capacitor Board.

MATERIALS NEEDED

- 7/16” Nutdriver
- 3/8” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Using a 7/16” nutdriver, remove the screw and lock washer securing leads B2 and B2A to terminal B2 on the main capacitor board. See **Figure F.1**. See Wiring Diagram. Label and disconnect leads B2 and B2A from the terminal.
5. Using a 7/16” nutdriver, remove the screw and lock washer securing leads B1 and B1A to terminal B1 on the main capacitor board. See **Figure F.1**. See Wiring Diagram. Label and disconnect leads B1 and B1A from the terminal.
6. Using a 3/8” nutdriver, remove the four nuts securing the main capacitor board to the brackets. See **Figure F.2**.
7. The main capacitor board can now be removed from it’s mounting posts and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new main capacitor board into the machine.
2. Using a 3/8” nutdriver, attach the four nuts securing the main capacitor board to the brackets.
3. Using a 7/16” nutdriver, attach the screw and lock washer securing leads B1 and B1A to terminal B1 on the main capacitor board. See Wiring Diagram.
4. Using a 7/16” nutdriver, attach the screw and lock washer securing leads B2 and B2A to terminal B2 on the main capacitor board. See Wiring Diagram.

5. Perform the **Case Cover Replacement Procedure**.
6. Perform the **Retest After Repair Procedure**.

Main capacitor board terminal locations

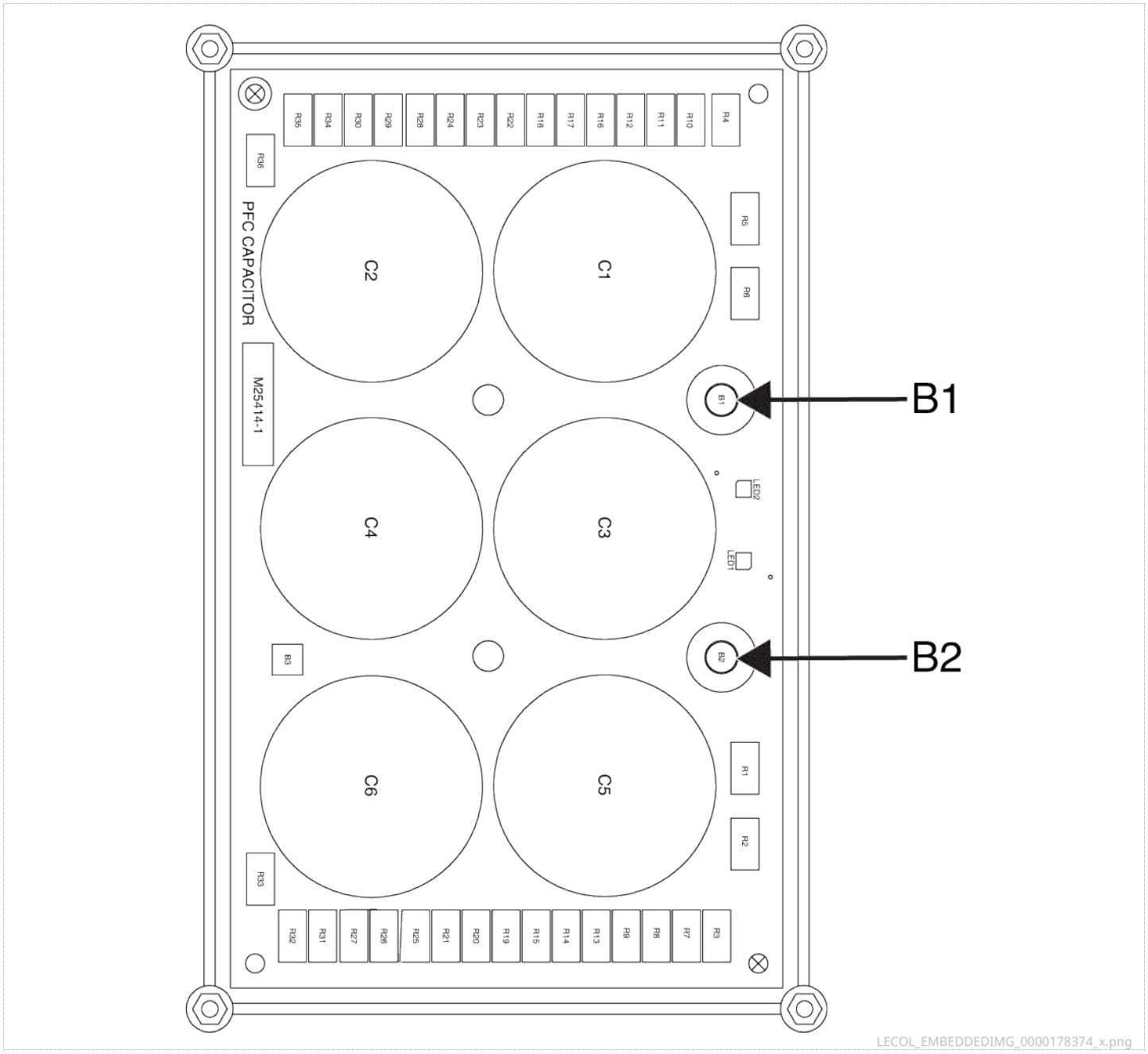


Figure 1. Main capacitor board terminal locations

Main capacitor board mounting nut locations

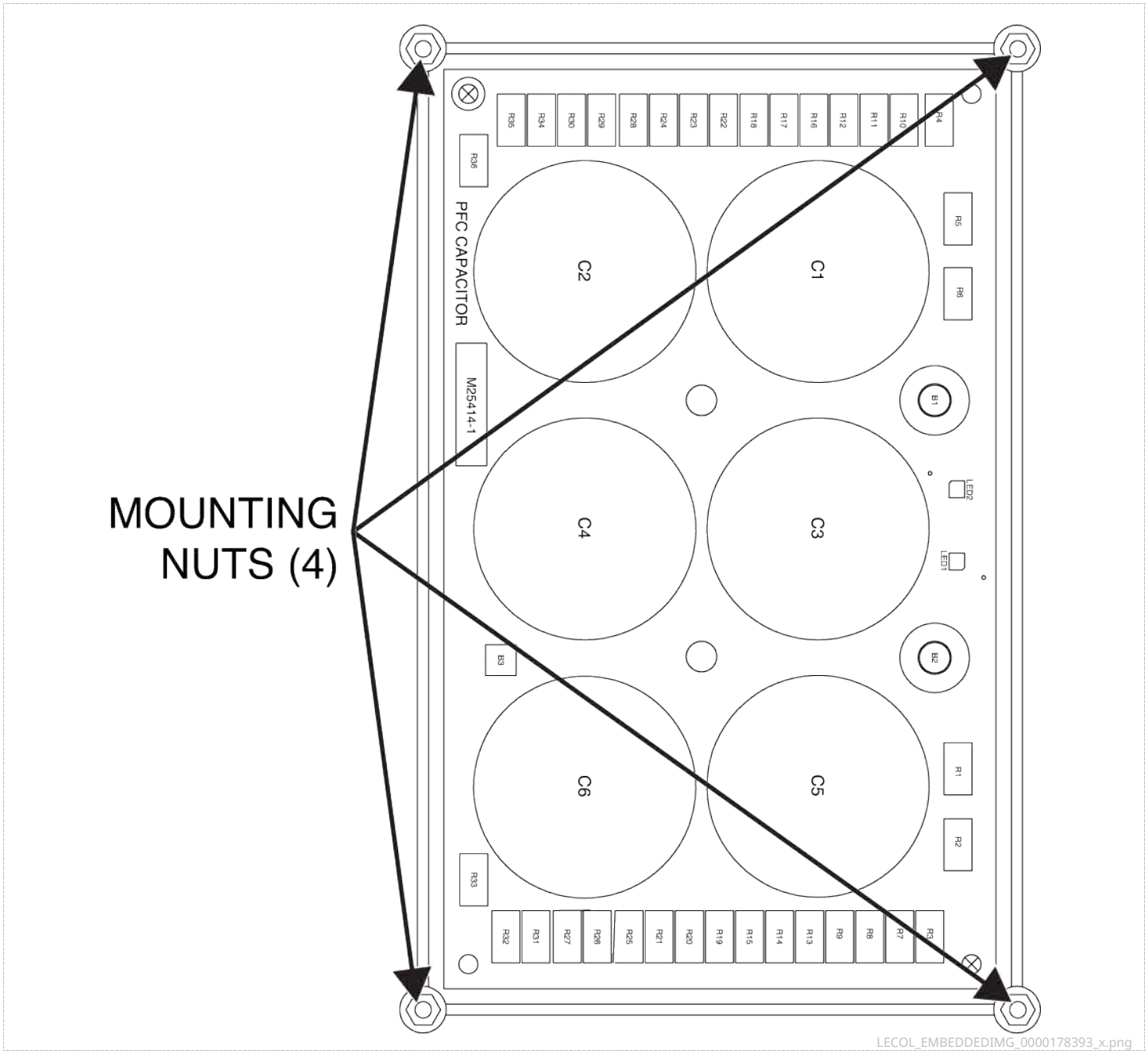


Figure 2. Main capacitor board mounting nut locations

MAIN TRANSFORMER REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Main Transformer.

MATERIALS NEEDED

- Phillips Screwdriver
- Small 3/8” Open End Wrench
- 7/16” Nutdriver
- Torx Nutdriver (Size T-15)
- 5/16” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Perform the **SCR (Pre-Charge) Board Removal Procedure**.
5. Perform the **PFC Boost Board Removal Procedure**.
6. Using a Phillips screwdriver and a small 3/8” open end wrench, remove the bolt, nut and two lock washers securing the short transformer primary lead (201). See **Figure F.1**. See Wiring Diagram.
7. Using a 7/16” nutdriver, remove the bolt and lock washer securing lead 204 to terminal B3 of the switchboard. See **Figure F.2**. See Wiring Diagram.
8. Using a 7/16” nutdriver, remove the two nuts, lock washers and flat washers securing the X11 leads to the top output rectifier terminal. See **Figure F.3**. See Wiring Diagram.
9. Using a 7/16” nutdriver, remove the two nuts, lock washers and flat washers securing the X12 leads to the bottom output rectifier terminal. See **Figure F.3**. See Wiring Diagram.
10. Using a torx nutdriver (size T-15), remove the screw, lock washer and flat washer securing lead X21 to the boost rectifier. See **Figure F.3**. See Wiring Diagram.
11. Using a 7/16” nutdriver, remove the two bolts, lock washers and flat washers securing each pair of X13 leads to the copper bar. See **Figure F.4**. See Wiring Diagram.
12. Label and disconnect leads 110 and 110A from the boost relay. See **Figure F.5**. See Wiring Diagram.

13. Using a 5/16” nutdriver, remove the two screws securing the main transformer to the base of the machine. See **Figure F.6**. See Wiring Diagram.
14. Carefully route the transformer leads to allow for the removal. See Wiring Diagram.
15. The main transformer can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new main transformer into the machine.
2. Using a 5/16” nutdriver, attach the two screws securing the main transformer to the base of the machine.
3. Connect leads 110 and 110A to the boost relay. See Wiring Diagram.
4. Using a 7/16” nutdriver, attach the two bolts, lock washers and flat washers securing each pair of X13 leads to the copper bar. See Wiring Diagram.
5. Using a torx nutdriver (size T-15), attach the screw, lock washer and flat washer securing lead X21 to the boost rectifier. See Wiring Diagram.
6. Using a 7/16” nutdriver, attach the two nuts, lock washers and flat washers securing the X12 leads to the bottom output rectifier terminal. See Wiring Diagram.
7. Using a 7/16” nutdriver, attach the two nuts, lock washers and flat washers securing the X11 leads to the top output rectifier terminal. See Wiring Diagram.
8. Using a 7/16” nutdriver, attach the bolt and lock washer securing lead 204 to terminal B3 of the switchboard. See Wiring Diagram.
9. Using a Phillips screwdriver and a small 3/8” open end wrench, attach the bolt, nut and two lock washers securing the short transformer primary lead (201). See Wiring Diagram.
10. Perform the **PFC Boost Board Replacement Procedure**.
11. Perform the **SCR (Pre-Charge) Board Replacement Procedure**.
12. Perform the **Case Cover Replacement Procedure**.
13. Perform the **Retest After Repair Procedure**.

Short transformer primary lead location

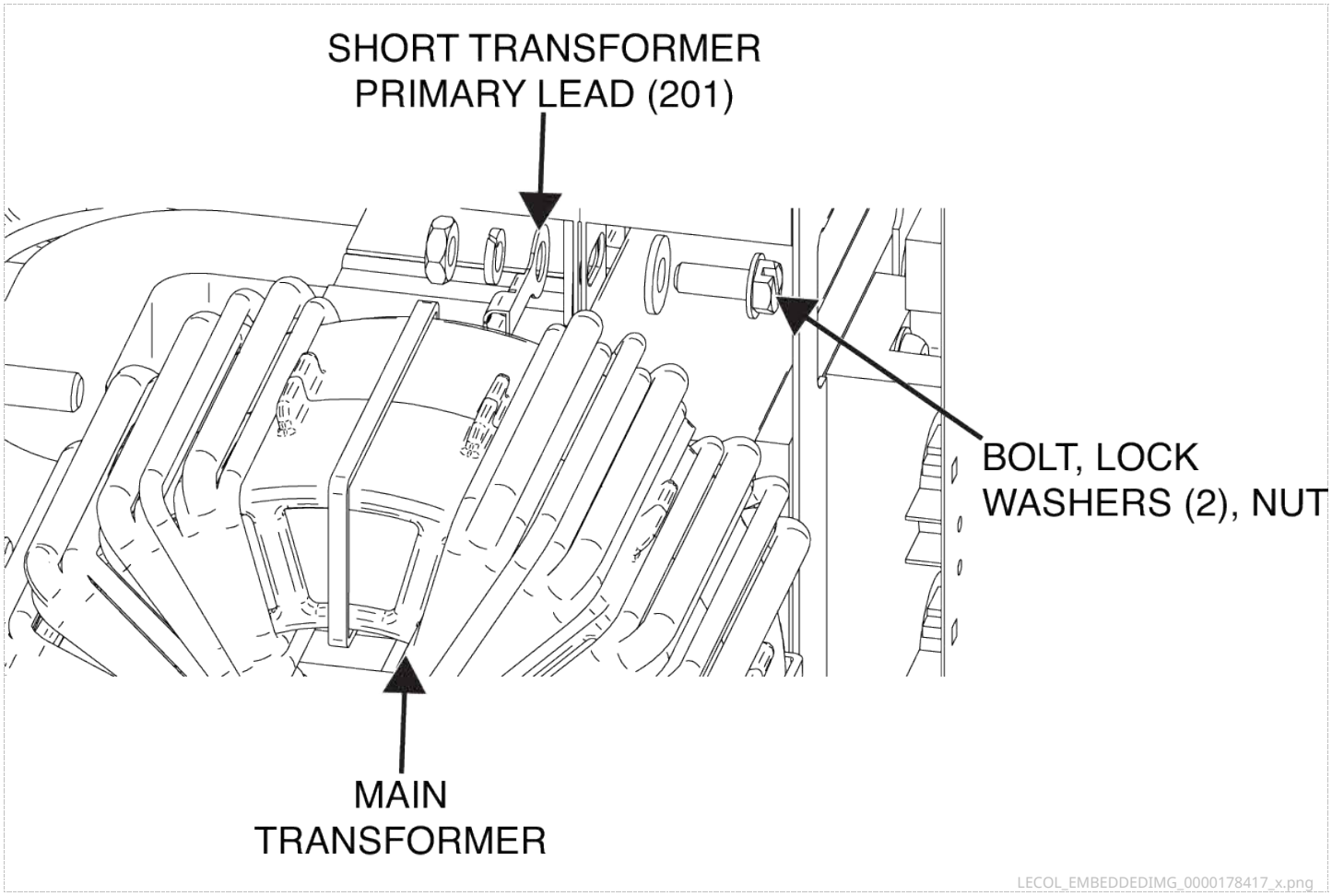


Figure 1. Short transformer primary lead location

Switchboard terminal B3 location

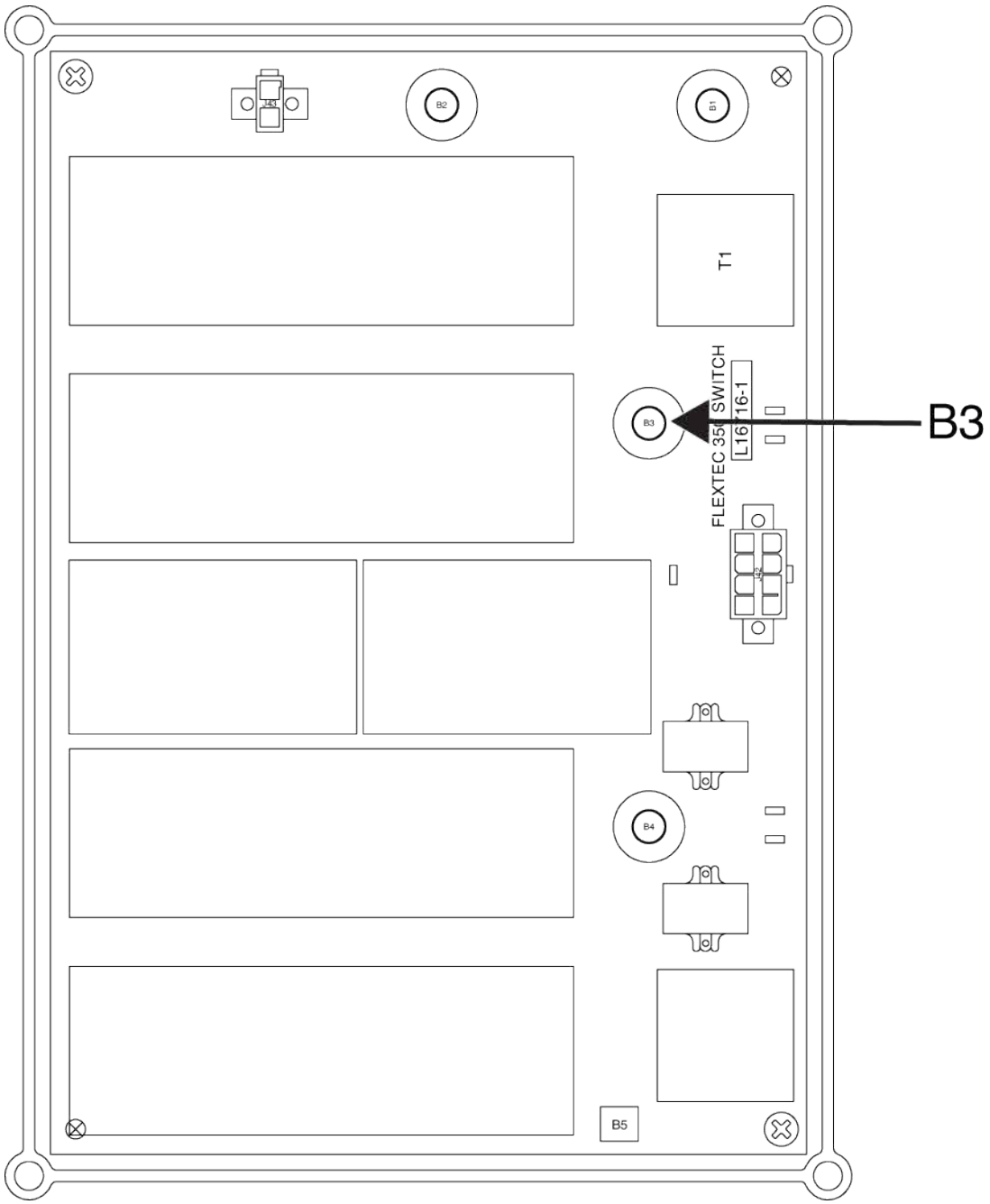
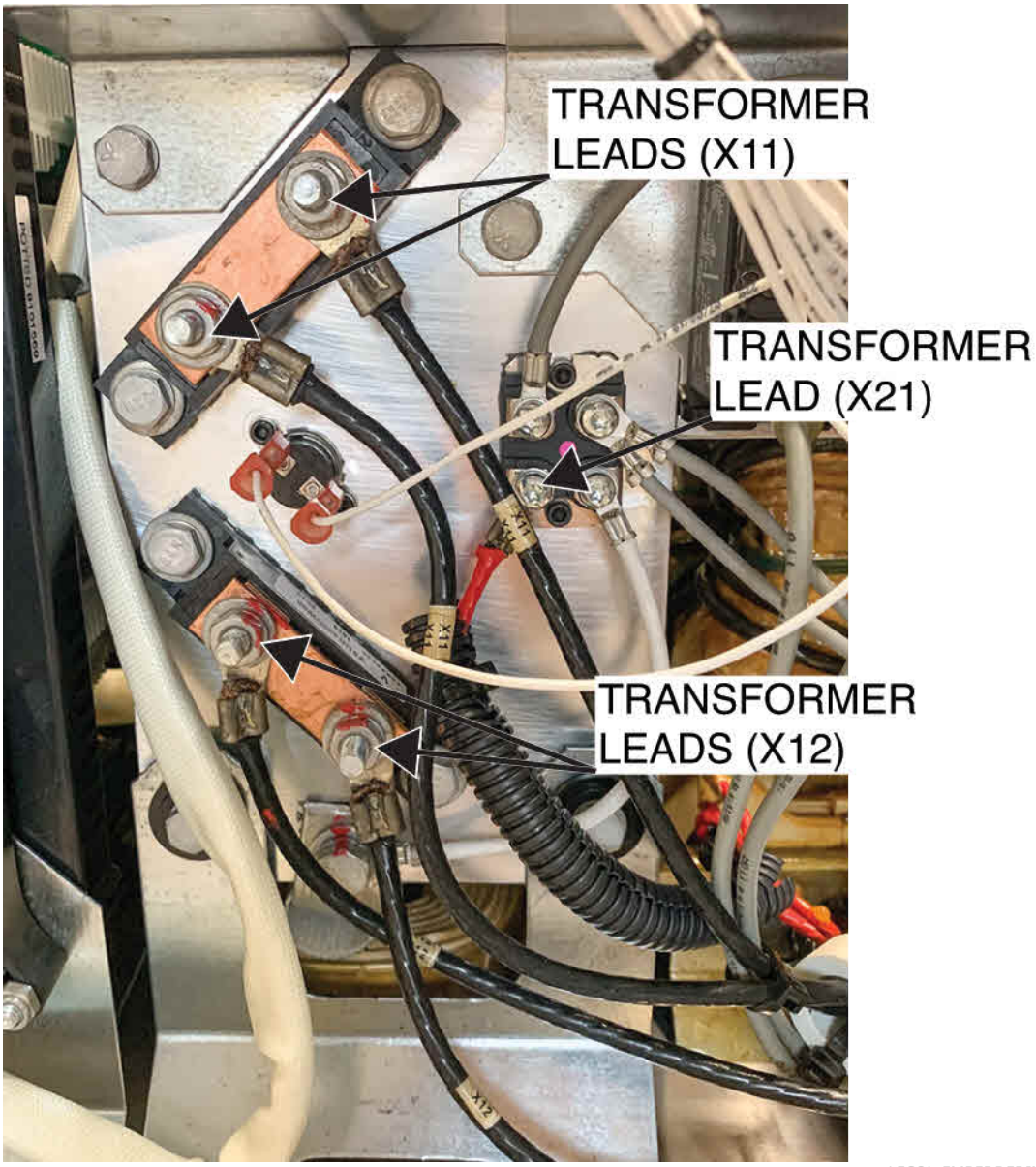


Figure 2. Switchboard terminal B3 location

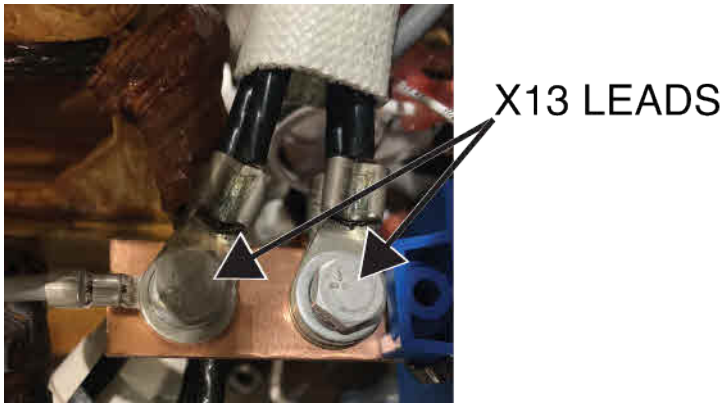
Transformer leads X11, X12 and X21 locations



LECOL_EMBEDDEDIMG_0000178415_x.png

Figure 3. Transformer leads X11, X12 and X21 locations

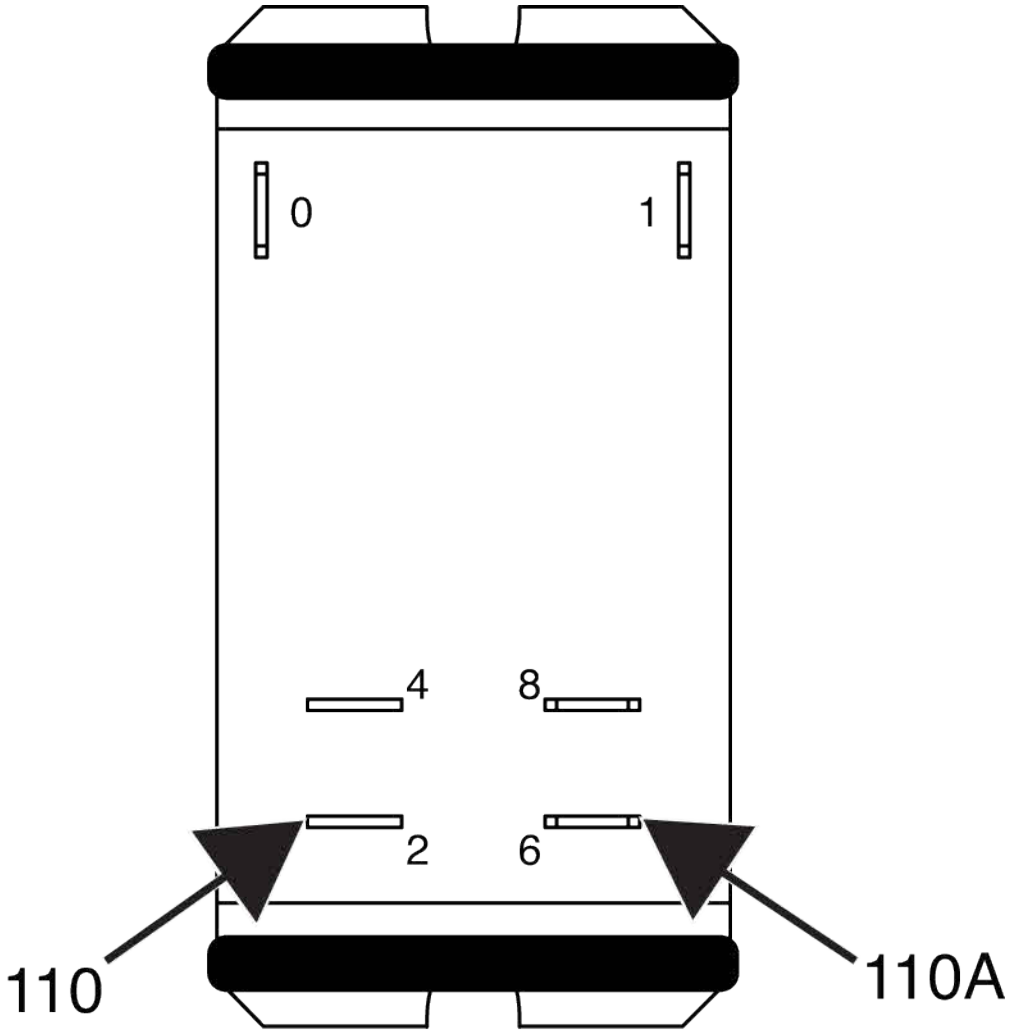
X13 lead locations



LECOL_EMBEDDEDIMG_0000178414_x.png

Figure 4. X13 lead locations

Boost relay leads 110 and 110A locations



LECOL_EMBEDDEDIMG_0000178433_x.png

Figure 5. Boost relay leads 110 and 110A locations

Main transformer mounting screw locations

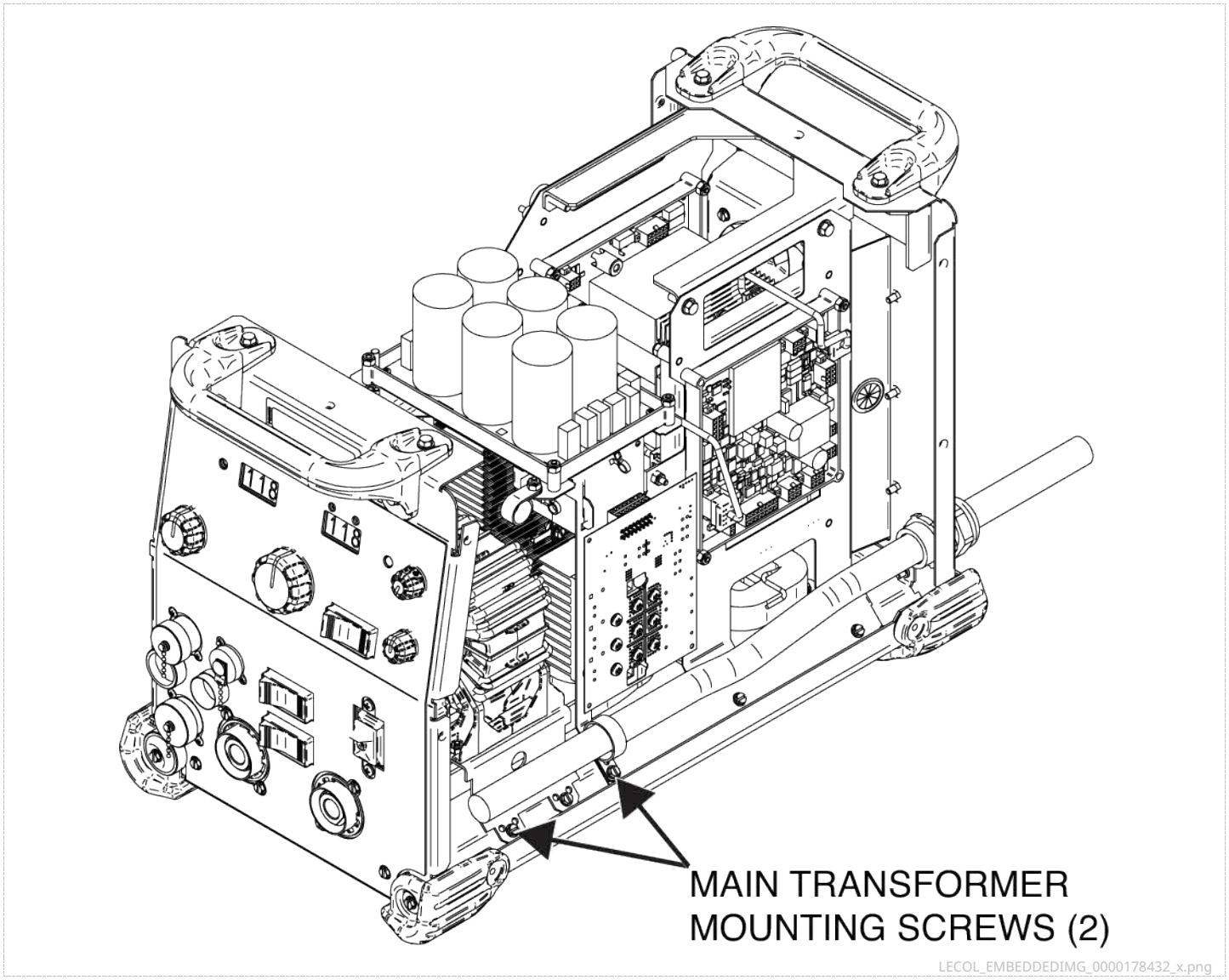


Figure 6. Main transformer mounting screw locations

MODE SELECT SWITCH REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Mode Select Switch.

MATERIALS NEEDED

- 5/64" Allen Wrench
- 9/16" Nutdriver
- Molex Removal Tool
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Using a 5/64” Allen wrench, loosen the setscrew securing the knob to the shaft of the mode select switch. See **Figure F.1**.
5. Using a 9/16” nutdriver, remove the nut securing the mode select switch to the front panel. See **Figure F.1**.
6. Label and disconnect plug J3 from the user interface board. See **Figure F.2**. See Wiring Diagram.
7. Using a molex removal tool, disconnect leads 301, 302, 303, 305, 306 and 308 from molex plug J3. See **Figure F.3**. See Wiring Diagram.
8. The mode select switch can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Using a molex removal tool, connect leads 301, 302, 303, 305, 306 and 308 to molex plug J3. See Wiring Diagram.
2. Connect plug J3 to the user interface board. See Wiring Diagram.
3. Carefully position the new mode select switch into the machine.
4. Using a 9/16” nutdriver, remove the nut securing the mode select switch to the front panel.
5. Using a 5/64” Allen wrench, tighten the setscrew securing the knob to the shaft of the mode select switch.

6. Perform the **Case Cover Replacement Procedure**.
7. Perform the **Retest After Repair Procedure**.

Mode select switch knob location

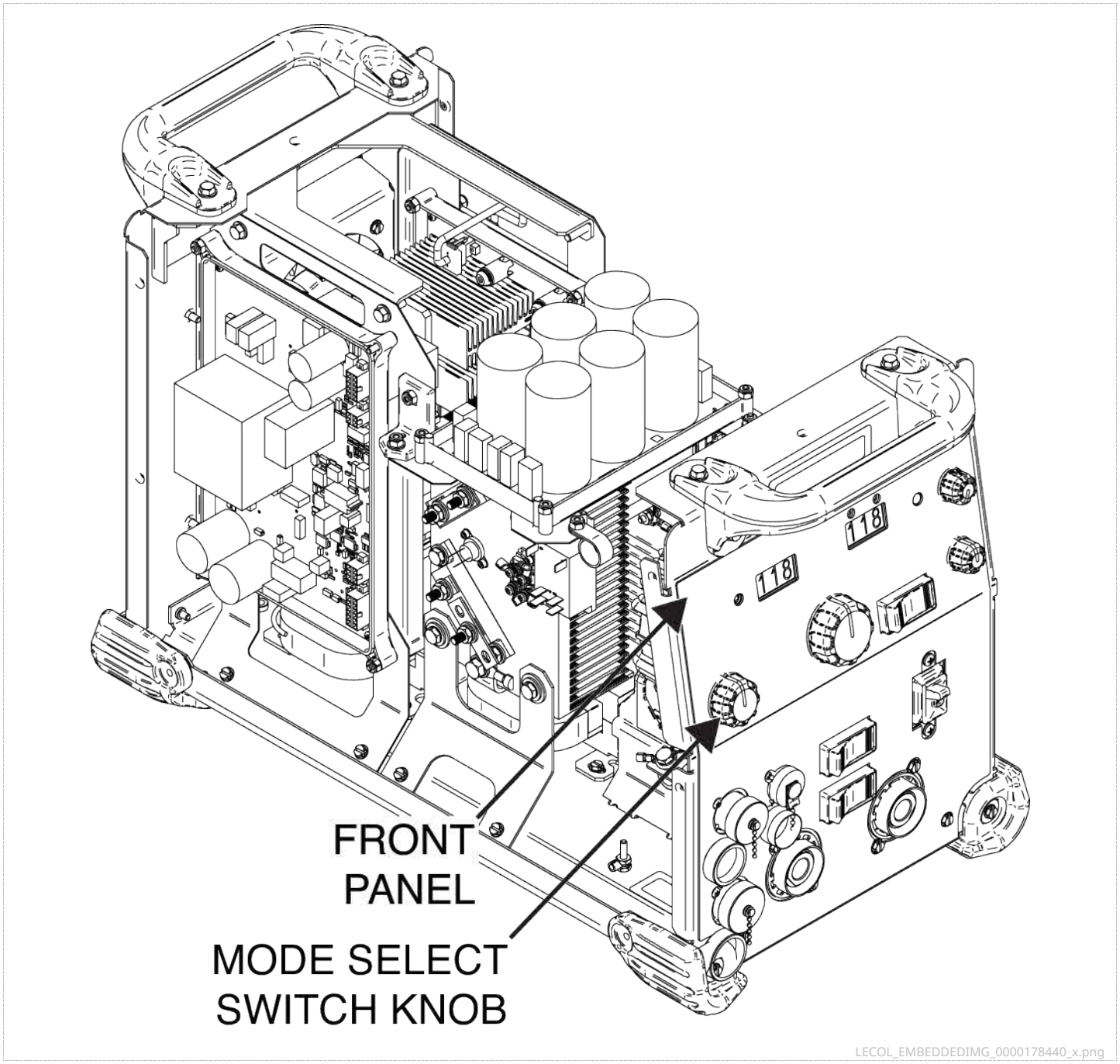
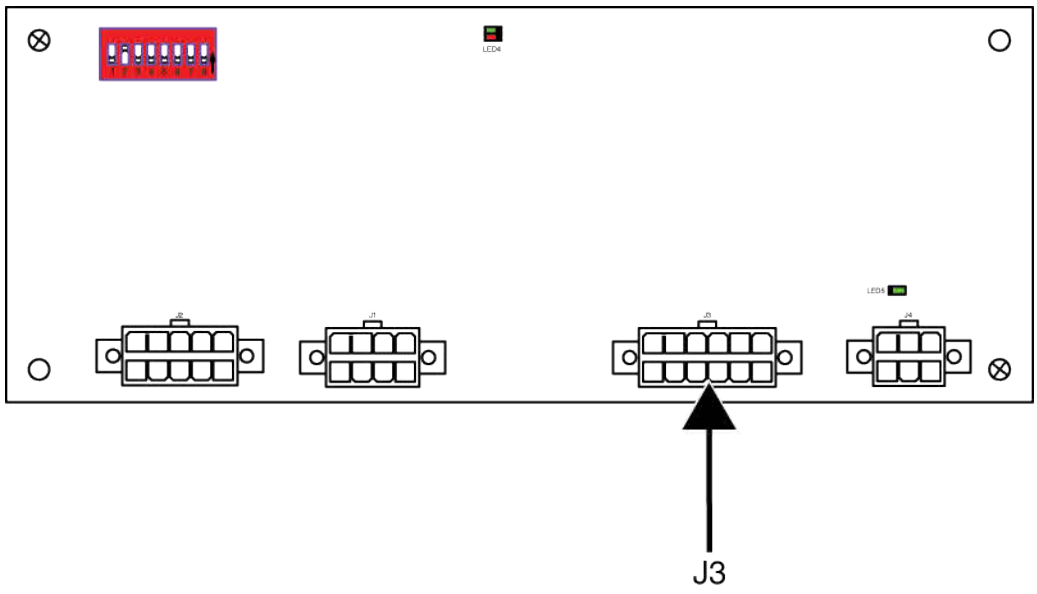


Figure 1. Mode select switch knob location

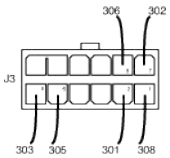
User interface board plug J3 location



LECOL_EMBEDDEDIMG_0000178439_x.png

Figure 2. User interface board plug J3 location

User interface board plug J3 lead locations



LECOL_EMBEDDEDIMG_0000178438_x.png

Figure 3. User interface board plug J3 lead locations

OUTPUT RECTIFIER REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Output Rectifier Assembly.

MATERIALS NEEDED

- 1/2” Nutdriver
- 7/16” Nutdriver
- 3/8” Nutdriver
- 5/16” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Perform the **Main Capacitor Board Removal Procedure**.
5. Perform the **Boost Rectifier Removal Procedure**.
6. Perform the **Thermostat #1 Removal Procedure**.
7. Using a 1/2” nutdriver, remove the screw, lock washer and flat washer securing the choke lead and positive boost lead to the heatsink. See **Figure F.1**. See Wiring Diagram. Label and disconnect the choke lead and positive boost lead.
8. Using a 7/16” nutdriver, remove the two nuts, lock washers and flat washers securing the X11 leads to the top rectifier module. See **Figure F.1**. See Wiring Diagram. Label and disconnect X11 leads.
9. Using a 7/16” nutdriver, remove the two nuts, lock washers and flat washers securing the X12 leads to the top rectifier module. See **Figure F.1**. See Wiring Diagram. Label and disconnect X12 leads.
10. Using a 3/8” nutdriver, remove the nut securing the cable holder closed. See **Figure F.2**. Open the cable holder and remove the leads. See Wiring Diagram.
11. Using a 5/16” nutdriver, remove the two screws securing the bottom rectifier bracket to the machine. See **Figure F.2**. See Wiring Diagram.
12. Carefully remove the output rectifier assembly out of the machine.

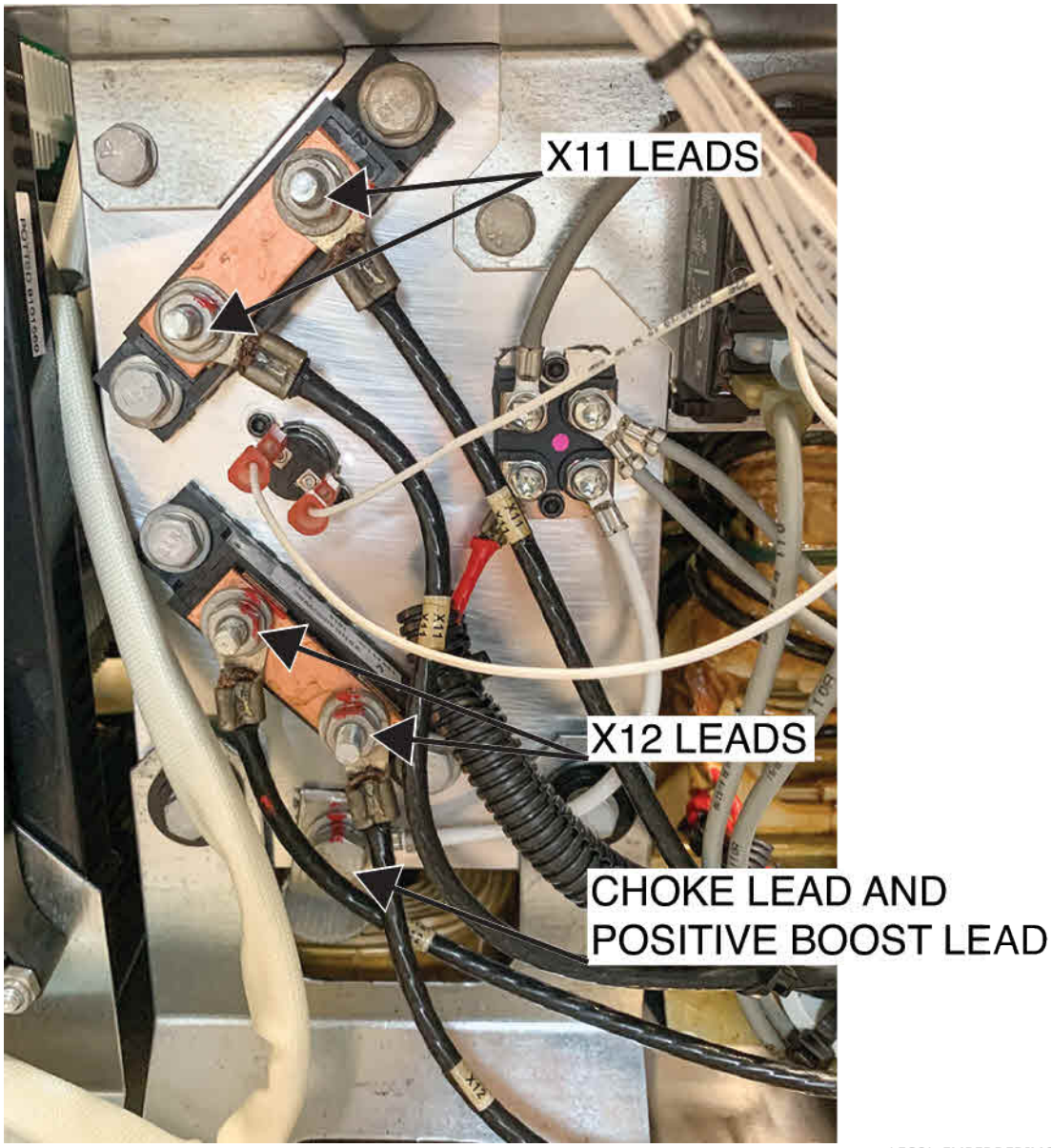
13. Using a 7/16” nutdriver, remove the two screws and washers securing the bottom rectifier bracket to the heatsink. See **Figure F.2**.
14. The output rectifier assembly can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Using a 7/16” nutdriver, attach the two screws and washers securing the bottom rectifier bracket to the heatsink.
2. Carefully position the new output rectifier assembly into the machine.
3. Using a 5/16” nutdriver, attach the two screws securing the bottom rectifier bracket to the machine.
4. Open the cable holder and place the previously removed leads into the cable holder. See Wiring Diagram.
5. Using a 3/8” nutdriver, attach the nut securing the cable holder closed.
6. Using a 7/16” nutdriver, attach the two nuts, lock washers and flat washers securing the X12 leads to the top rectifier module. See Wiring Diagram.
7. Using a 7/16” nutdriver, attach the two nuts, lock washers and flat washers securing the X11 leads to the top rectifier module. See Wiring Diagram.
8. Using a 1/2” nutdriver, attach the screw, lock washer and flat washer securing the choke lead and positive boost lead to the heatsink. See Wiring Diagram.
9. Perform the **Thermostat #1 Replacement Procedure**.
10. Perform the **Boost Rectifier Replacement Procedure**.
11. Perform the **Main Capacitor Board Replacement Procedure**.
12. Perform the **Case Cover Replacement Procedure**.
13. Perform the **Retest After Repair Procedure**.

Choke lead, positive boost lead, X11 and X12 lead locations



LECOL_EMBEDDEDIMG_0000178493_x.png

Figure 1. Choke lead, positive boost lead, X11 and X12 lead locations

Cable holder and bottom rectifier bracket location

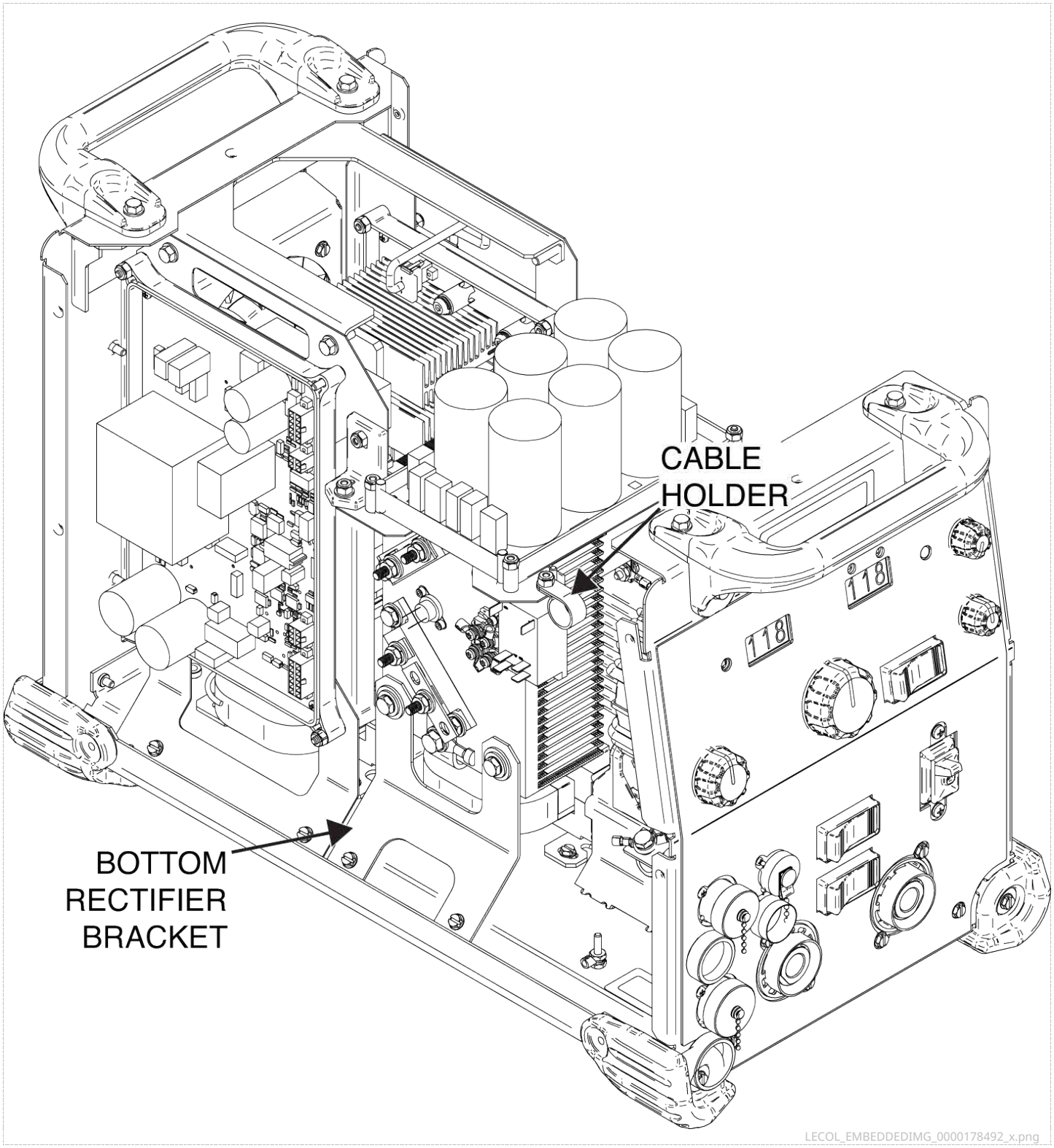


Figure 2. Cable holder and bottom rectifier bracket location

PFC BOOST BOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the PFC Boost Board.

MATERIALS NEEDED

- 3/8” Nutdriver
- 5/16” Nutdriver
- 7/16” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Perform the **Auxiliary Power Board Removal Procedure**.
5. Using a 3/8” nutdriver, remove the two screws securing the PFC board bracket to the machine. See **Figure F.1**. See Wiring Diagram.
6. Using a 5/16” nutdriver, remove the two screws (at the bottom of the bracket) securing the PFC board bracket to the machine. See **Figure F.1**.
7. Label and disconnect plugs J53 and J46 from the PFC boost board. See **Figure F.2**. See Wiring Diagram.
8. Carefully route all leads through the PFC board bracket to allow for removal. See Wiring Diagram.
9. Using a 3/8” nutdriver, remove the two nuts and washers securing the heatsink holder to the PFC board bracket. See **Figure F.1**.
10. Using a 7/16” nutdriver, remove the screw and lock washer securing lead B2 to terminal B2 on the PFC boost board. See **Figure F.2**. See Wiring Diagram.
11. Using a 7/16” nutdriver, remove the screw and lock washer securing lead B1 to terminal B1 on the PFC boost board. See **Figure F.2**. See Wiring Diagram.
12. Using a 7/16” nutdriver, remove the screw and lock washer securing lead B7 to terminal B7 on the PFC boost board. See **Figure F.2**. See Wiring Diagram.
13. Using a 7/16” nutdriver, remove the screw and lock washer securing lead B5 to terminal B5 on the PFC boost board. See **Figure F.2**. See Wiring Diagram.

14. Label and disconnect plug J44 from the PFC boost board. See **Figure F.2**. See Wiring Diagram.
15. Carefully remove the PFC board bracket from the machine. Carefully route cables through the bracket as necessary.
16. Using a 3/8” nutdriver, remove the four nuts securing the PFC boost board to the PFC board bracket. See **Figure F.3**. See Wiring Diagram.
17. The PFC boost board can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new PFC boost board onto the PFC board bracket.
2. Using a 3/8” nutdriver, attach the four nuts securing the PFC boost board to the PFC board bracket.
3. Carefully position the PFC board bracket into the machine. Route cables through the bracket as necessary.
4. Connect plug J44 to the PFC boost board. See Wiring Diagram.
5. Using a 7/16” nutdriver, attach the screw and lock washer securing lead B5 to terminal B5 on the PFC boost board. See Wiring Diagram.
6. Using a 7/16” nutdriver, attach the screw and lock washer securing lead B7 to terminal B7 on the PFC boost board. See Wiring Diagram.
7. Using a 7/16” nutdriver, attach the screw and lock washer securing lead B1 to terminal B1 on the PFC boost board. See Wiring Diagram.
8. Using a 7/16” nutdriver, attach the screw and lock washer securing lead B2 to terminal B2 on the PFC boost board. See Wiring Diagram.
9. Using a 3/8” nutdriver, attach the two nuts and washers securing the heatsink holder to the PFC board bracket.
10. Carefully route all leads through the PFC board bracket. See Wiring Diagram.
11. Connect plugs J53 and J46 to the PFC boost board. See Wiring Diagram.
12. Using a 5/16” nutdriver, attach the two screws (at the bottom of the bracket) securing the PFC board bracket to the machine.
13. Using a 3/8” nutdriver, attach the two screws securing the PFC board bracket to the machine.
14. Perform the **Auxiliary Power Board Replacement Procedure**.
15. Perform the **Case Cover Replacement Procedure**.
16. Perform the **Retest After Repair Procedure**.

PFC board bracket and heatsink holder locations

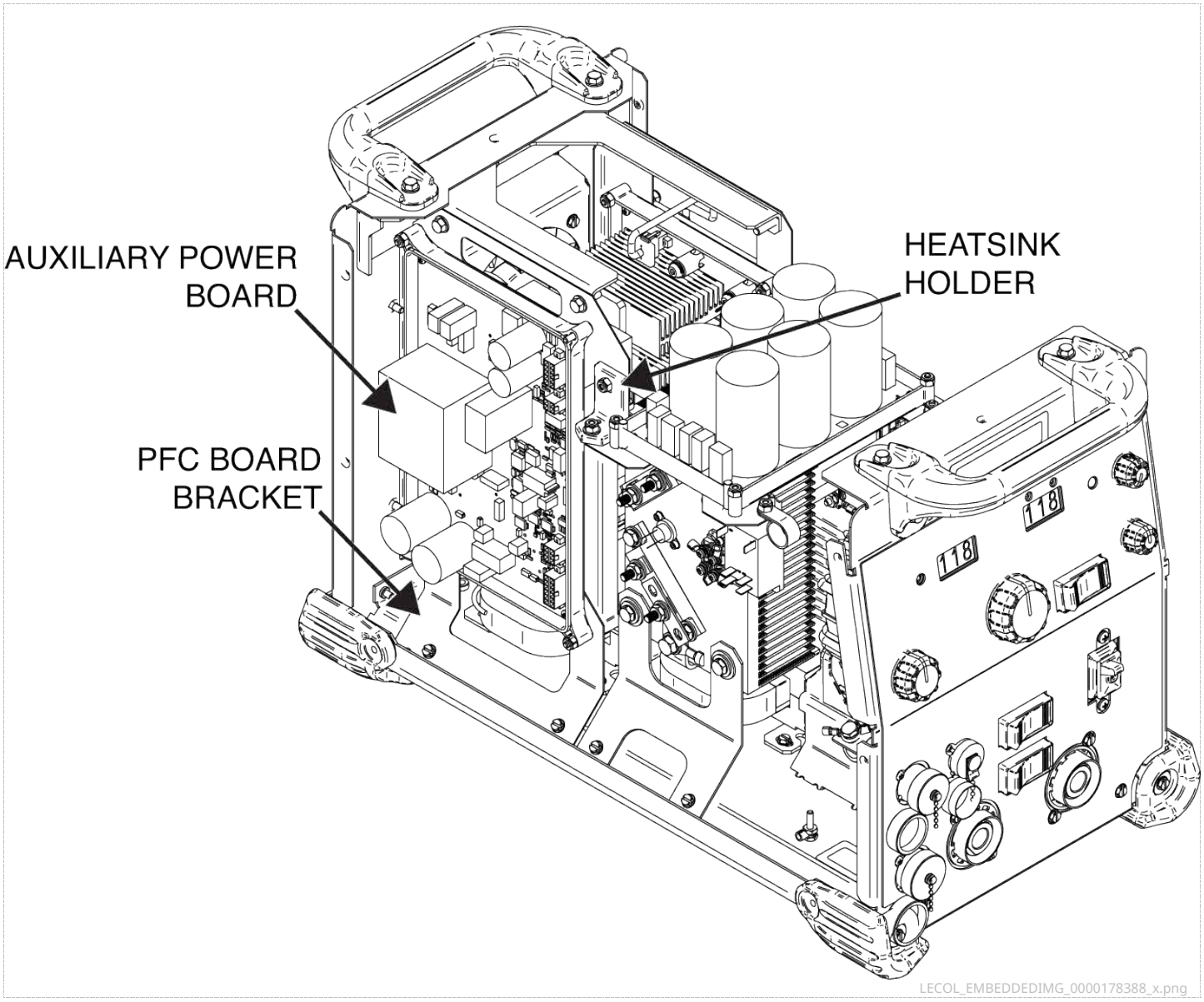


Figure 1. PFC board bracket and heatsink holder locations

PFC boost board plug and terminal locations

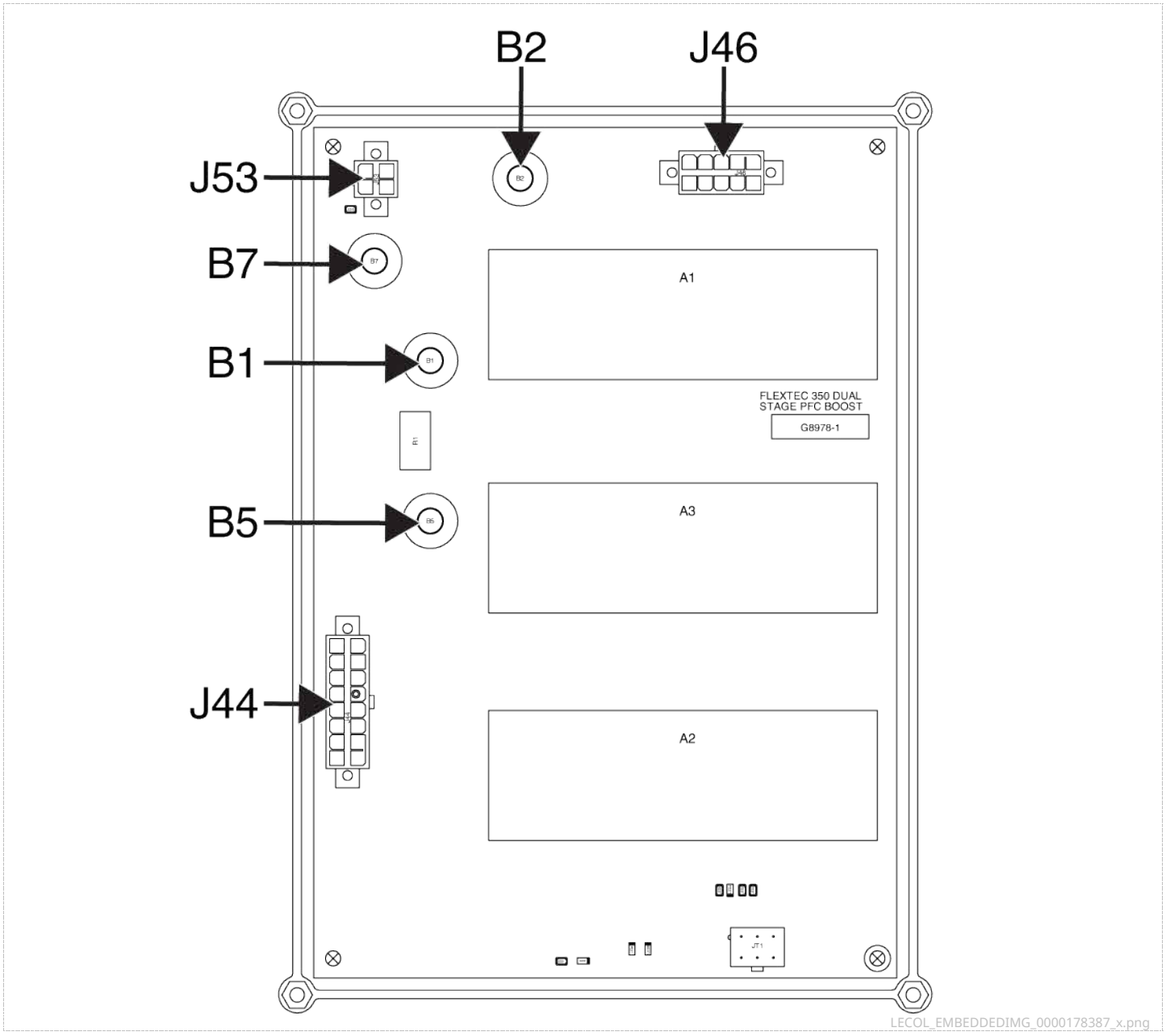


Figure 2. PFC boost board plug and terminal locations

PFC boost board mounting nut locations

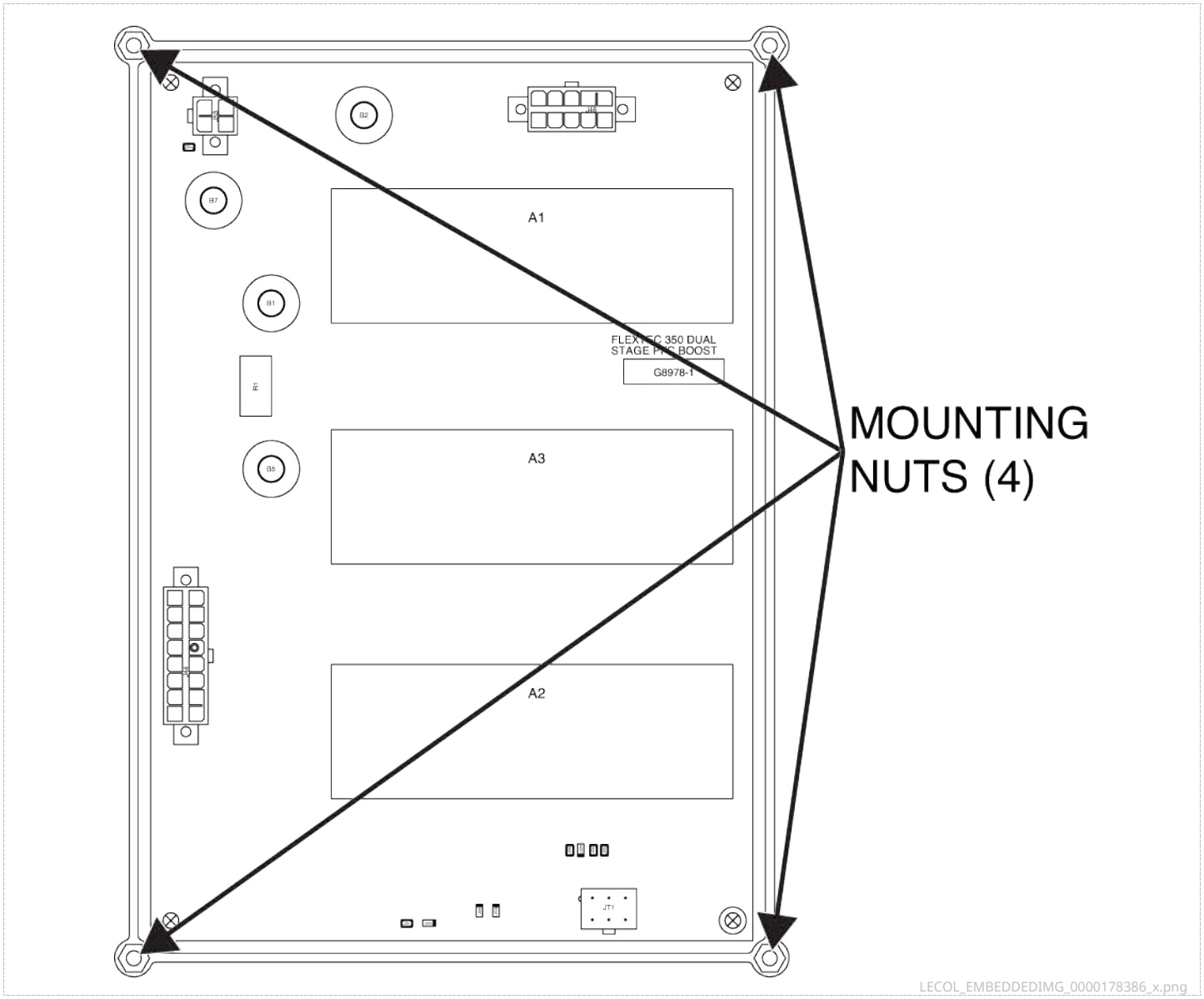


Figure 3. PFC boost board mounting nut locations

SCR (PRE-CHARGE) BOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the SCR (Pre-Charge) Board.

MATERIALS NEEDED

- Phillips Screwdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Carefully remove the six cable ties securing the protective cover over the input rectifier and SCR (pre-charge) board. See **Figure F.1**.
5. Label and disconnect leads 411, 412 and 417 from the input rectifier. See **Figure F.2**. See Wiring Diagram.
6. Using a Phillips screwdriver, remove the screw, lock washer and flat washer securing leads L1, L2, L3, B5 and B6 to the terminals of the input rectifier. See **Figure F.2**. See Wiring Diagram. Note the board will be free of the machine, use caution to prevent any damage to the board.
7. Label and disconnect plug J40 from the SCR (pre-charge) board. See **Figure F.2**. See Wiring Diagram.
8. The SCR (pre-charge) board can now be removed and replaced.

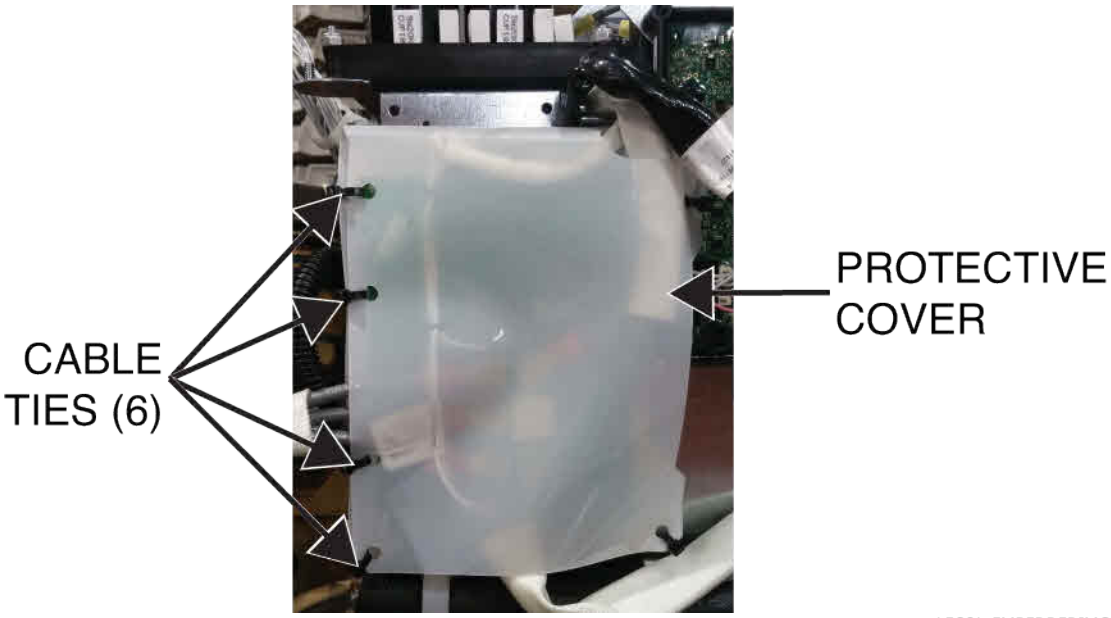
REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new SCR (pre-charge) board and protective cover into the machine.
2. Connect plug J40 to the SCR (pre-charge) board. See Wiring Diagram.
3. Using a Phillips screwdriver, attach the screw, lock washer and flat washer securing leads L1, L2, L3, B5 and B6 to the terminals of the input rectifier. See Wiring Diagram.
4. Connect leads 411, 412 and 417 to the input rectifier. See Wiring Diagram.
5. Attach the six cable ties securing the protective cover over the input rectifier and SCR (pre-charge) board.

6. Perform the **Case Cover Replacement Procedure**.
7. Perform the **Retest After Repair Procedure**.

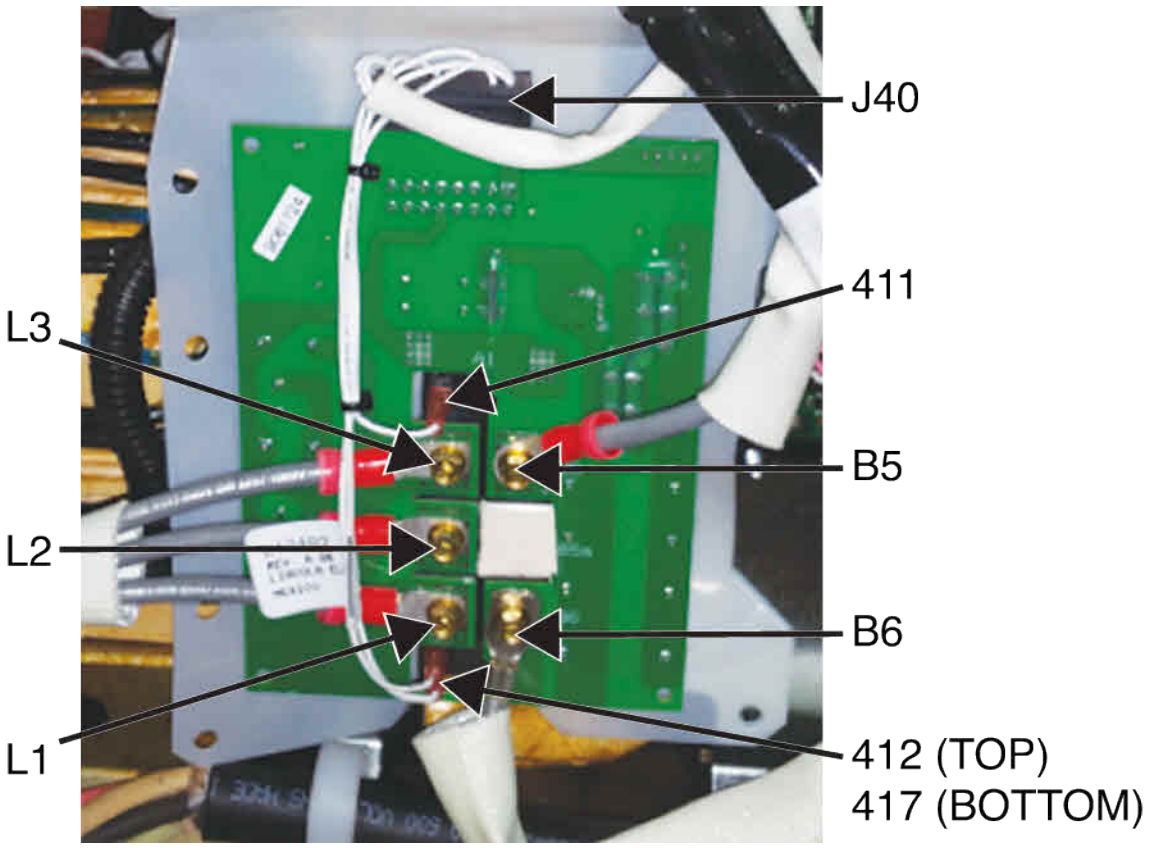
Protective cover cable tie locations



LECOL_EMBEDDEDIMG_0000178370_x.png

Figure 1. Protective cover cable tie locations

SCR (pre-charge) board plug J40 and input rectifier lead and plug locations



LECOL_EMBEDDEDIMG_0000178369_x.png

Figure 2. SCR (pre-charge) board plug J40 and input rectifier lead and plug locations

SWITCHBOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Switchboard.

MATERIALS NEEDED

- 7/16” Nutdriver
- Torx Nutdriver (Size T-25)
- 3/8” Nutdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Perform the **PFC Boost Board Removal Procedure**.
5. Using a 7/16” nutdriver, remove the bolt and lock washer securing lead 204 to terminal B3 of the switchboard. See **Figure F.1**. See Wiring Diagram.
6. Using a torx nutdriver (size T-25), remove the screw and lock washer securing lead 201 to terminal B4 of the switchboard. See **Figure F.1**. See Wiring Diagram.
7. Using a torx nutdriver (size T-25), remove the screw and lock washer securing lead B1A to terminal B1 of the switchboard. See **Figure F.1**. See Wiring Diagram.
8. Using a torx nutdriver (size T-25), remove the screw and lock washer securing lead B2A to terminal B2 of the switchboard. See **Figure F.1**. See Wiring Diagram.
9. Label and disconnect plugs J42 and J43 from the switchboard. See **Figure F.1**. See Wiring Diagram.
10. Using a 3/8” nutdriver, remove the four nuts securing the switchboard to the mounting bracket. See **Figure F.2**.
11. The switchboard can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new switchboard into the machine.
2. Using a 3/8” nutdriver, attach the four nuts securing the switchboard to the mounting bracket.
3. Connect plugs J42 and J43 to the switchboard. See Wiring Diagram.
4. Using a torx nutdriver (size T-25), attach the screw and lock washer securing lead B2A to terminal B2 of the switchboard. See Wiring Diagram.
5. Using a torx nutdriver (size T-25), attach the screw and lock washer securing lead B1A to terminal B1 of the switchboard. See Wiring Diagram.
6. Using a torx nutdriver (size T-25), attach the screw and lock washer securing lead 201 to terminal B4 of the switchboard. See Wiring Diagram.
7. Using a 7/16” nutdriver, attach the bolt and lock washer securing lead 204 to terminal B3 of the switchboard. See Wiring Diagram.
8. Perform the **PFC Boost Board Replacement Procedure**.
9. Perform the **Case Cover Replacement Procedure**.
10. Perform the **Retest After Repair Procedure**.

Switchboard terminal and plug locations

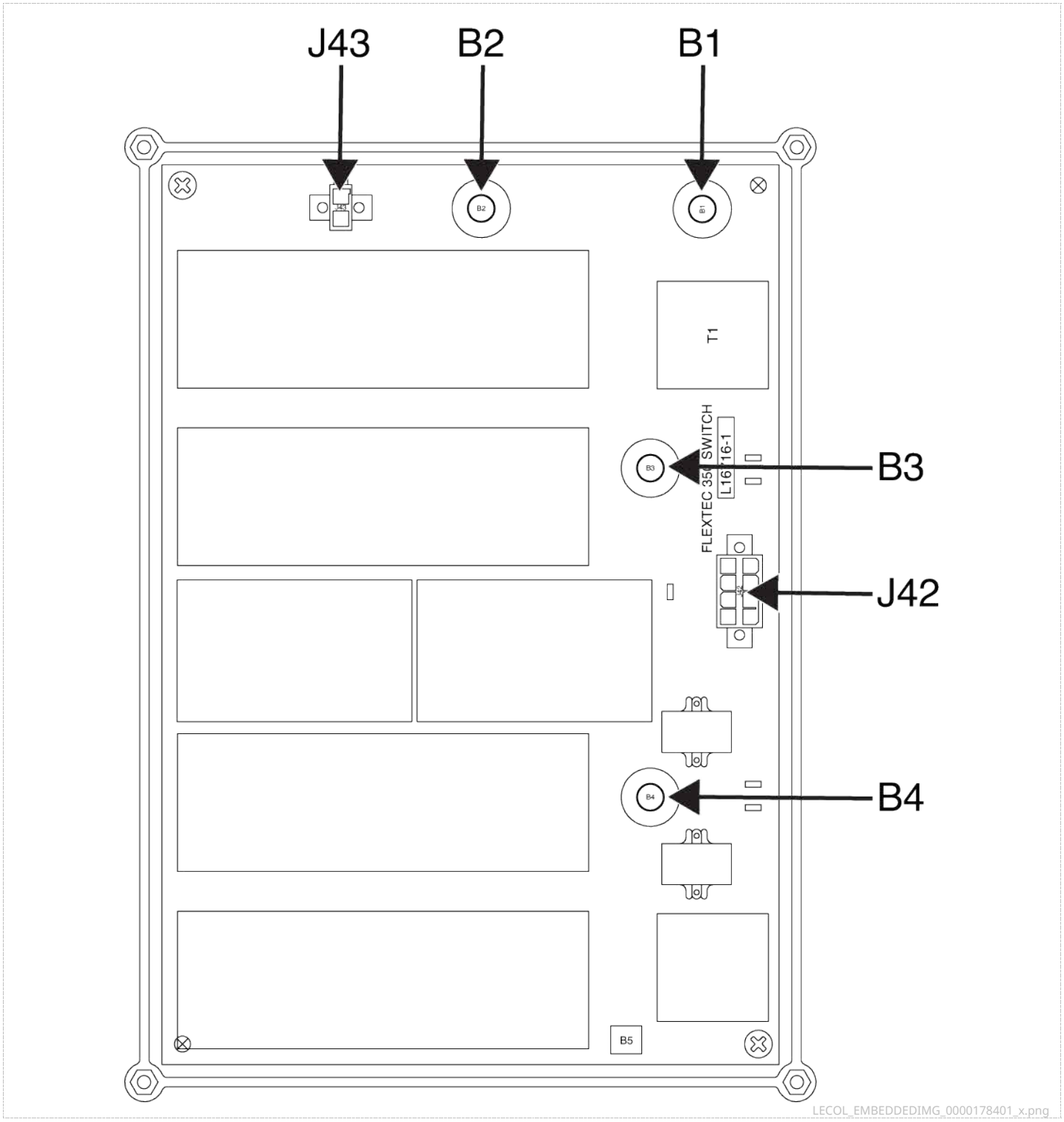


Figure 1. Switchboard terminal and plug locations

Switchboard mounting nut locations

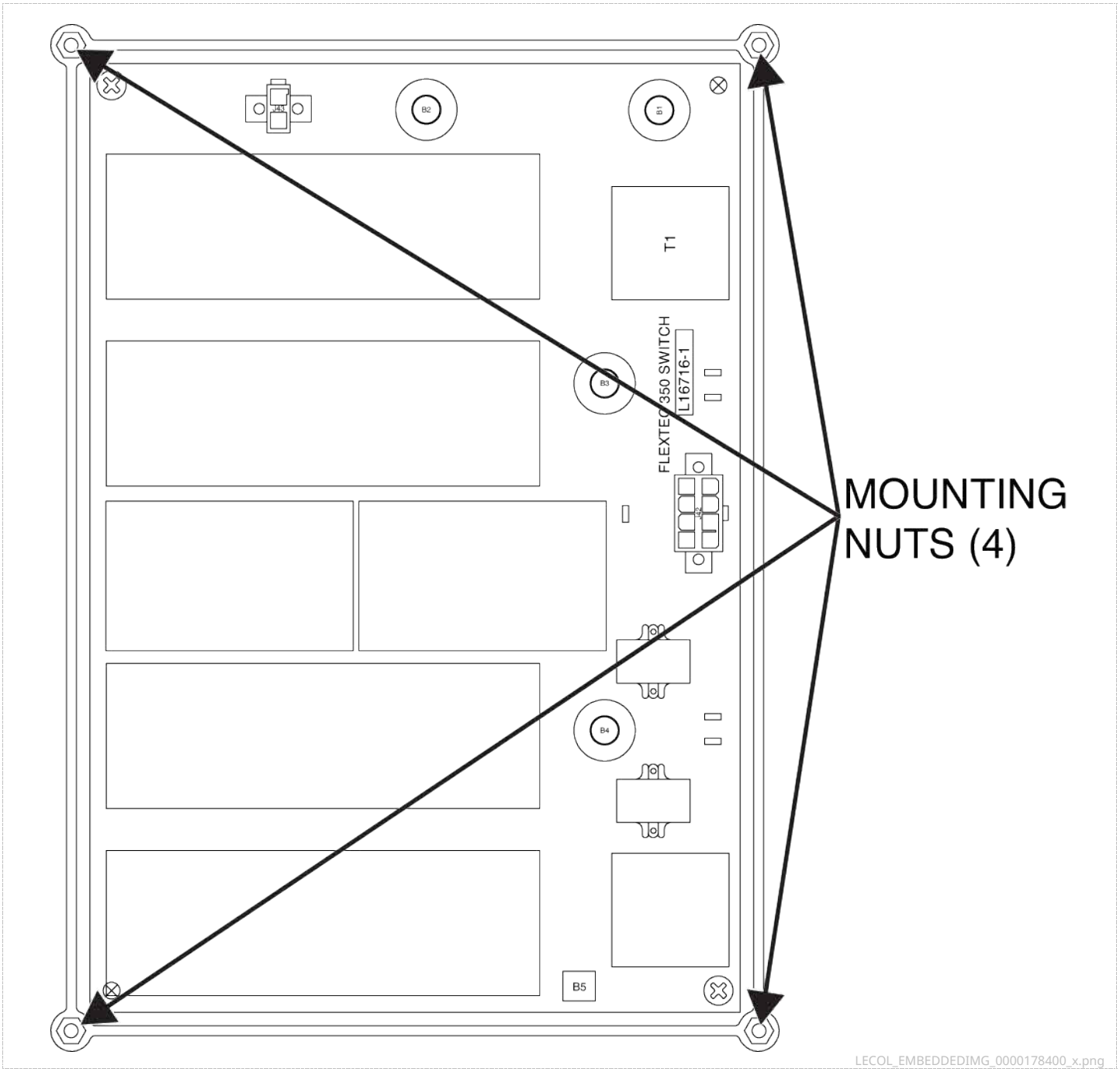


Figure 2. Switchboard mounting nut locations

THERMOSTAT #1 REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the Thermostat #1.

MATERIALS NEEDED

- 7/64” Allen Wrench
- Penetrox Heat Sink Compound (Lincoln Part #T12837-1)
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

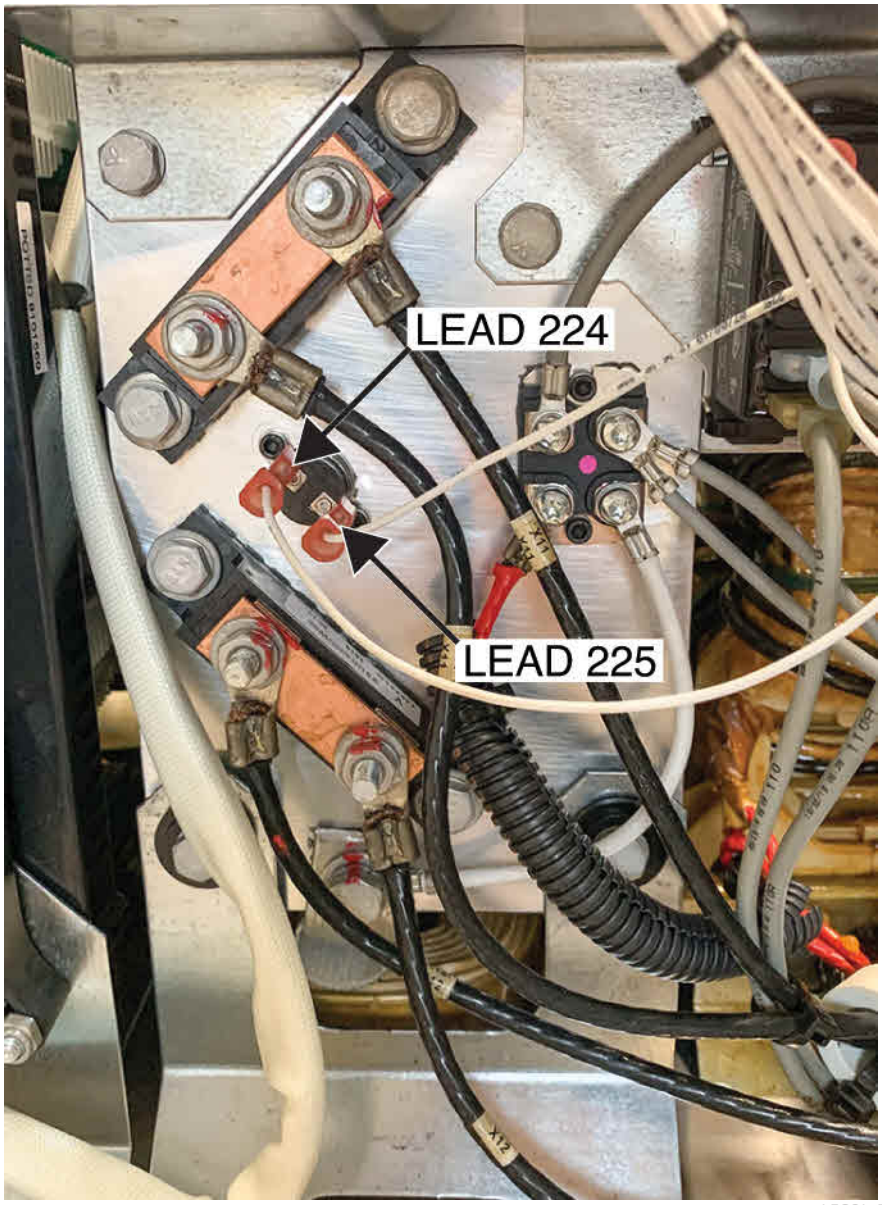
1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Label and disconnect leads 224 and 225 from thermostat #1. See **Figure F.1**. See Wiring Diagram.
5. Using a 7/64” Allen wrench, remove the two screws securing thermostat #1 to the output rectifier heatsink. See **Figure F.2**. See Wiring Diagram.
6. Thermostat #1 can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Clean the mating surface of the output rectifier heatsink.
2. Apply a coating of Penetrox heat sink compound to the rear of thermostat #1.
3. Carefully position the new thermostat #1 onto the output rectifier heatsink.
4. Using a 7/64” Allen wrench, attach the two screws securing thermostat #1 to the output rectifier heatsink.
5. Connect leads 224 and 225 to thermostat #1. See Wiring Diagram.
6. Perform the **Case Cover Replacement Procedure**.
7. Perform the **Retest After Repair Procedure**.

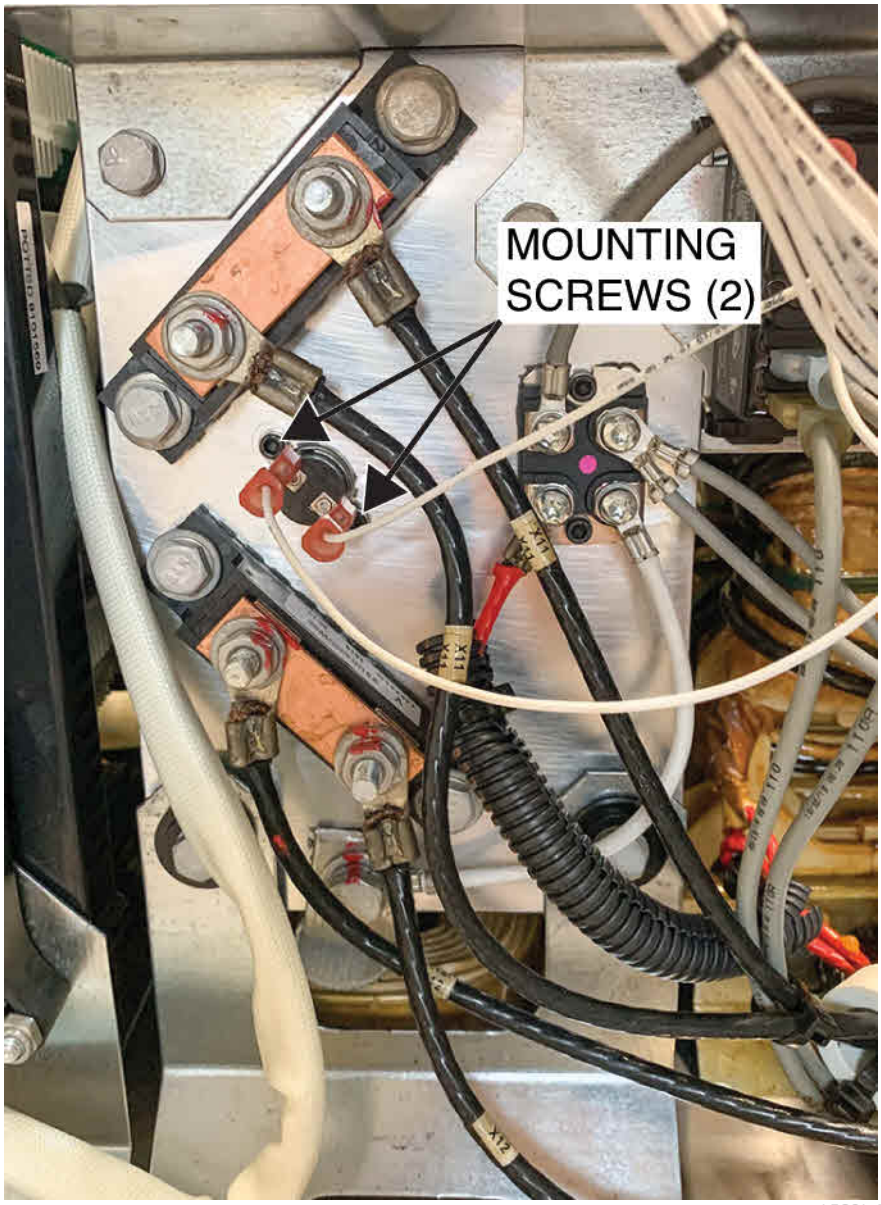
Thermostat #1 lead locations



LECOL_EMBEDDEDIMG_0000178476_x.png

Figure 1. Thermostat #1 lead locations

Thermostat #1 mounting screw locations



LECOL_EMBEDDEDIMG_0000178475_x.png

Figure 2. Thermostat #1 mounting screw locations

USER INTERFACE BOARD REMOVAL AND REPLACEMENT PROCEDURE

WARNING:

Type of Hazard:
Service and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

How to avoid:
If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TEST DESCRIPTION

This procedure will aid the technician in the removal and replacement of the User Interface Board.

MATERIALS NEEDED

- Phillips Screwdriver
- Wiring Diagram

REMOVAL PROCEDURE

Procedure Steps:

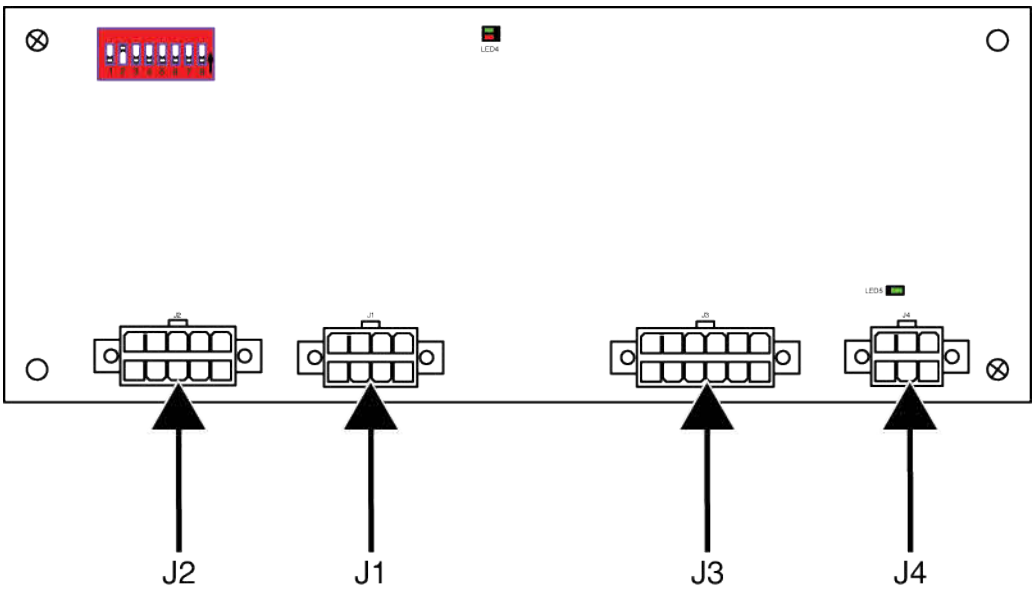
1. Turn off the Flextec 350X Power Connect machine.
2. Perform the **Case Cover Removal Procedure**.
3. Perform the **Capacitor Discharge Procedure**.
4. Label and disconnect plugs J1, J2, J3 and J4 from the user interface board. See **Figure F.1**. See Wiring Diagram.
5. Using a Phillips screwdriver, remove the two screws securing the user interface board to the front panel. See **Figure F.2**.
6. Carefully pry the user interface board off the mounting posts.
7. The user interface board can now be removed and replaced.

REPLACEMENT PROCEDURE

Procedure Steps:

1. Carefully position the new user interface board into the machine.
2. Carefully press the user interface board onto it’s mounting posts.
3. Using a Phillips screwdriver, attach the two screws securing the user interface board to the front panel.
4. Connect plugs J1, J2, J3 and J4 to the user interface board. See Wiring Diagram.
5. Perform the **Case Cover Replacement Procedure**.
6. Perform the **Retest After Repair Procedure**.

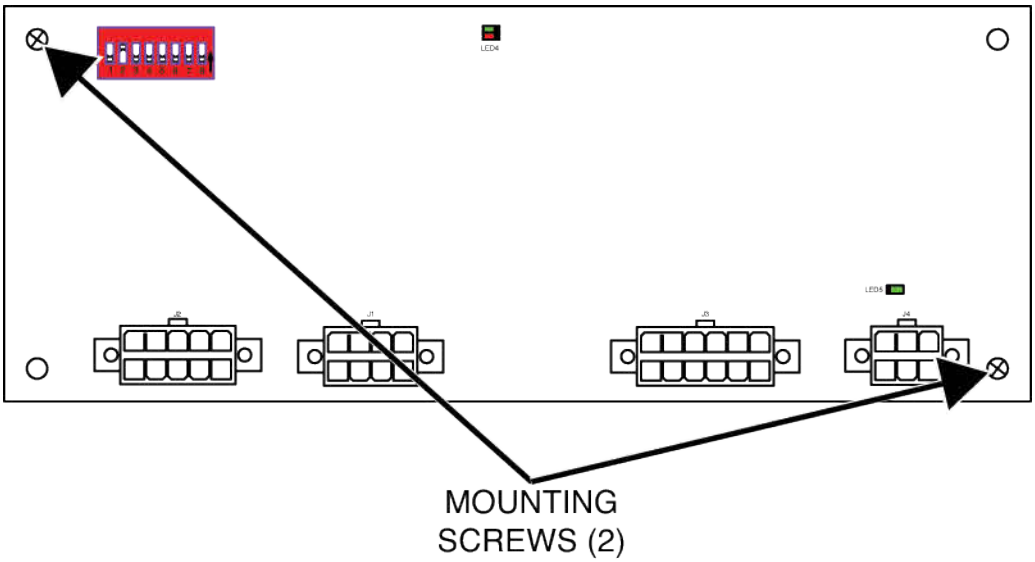
User interface board plug locations



LECOL_EMBEDDEDIMG_0000178412_x.png

Figure 1. User interface board plug locations

User interface board mounting screw locations



LECOL_EMBEDDEDIMG_0000178411_x.png

Figure 2. User interface board mounting screw locations