HYPERTHERM®
A Hypertherm Associates Brand

MAXPRO200® I/O Replacement

Field Service Bulletin

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Introduction

⚠ WARNING



ELECTRIC SHOCK CAN KILL

Disconnect electrical power before doing any installation or maintenance.

All work requiring removal of the plasma power supply outer cover or panels must be done by a qualified technician.

See the *Safety and Compliance Manual* (80669C) for more safety precautions.

Purpose

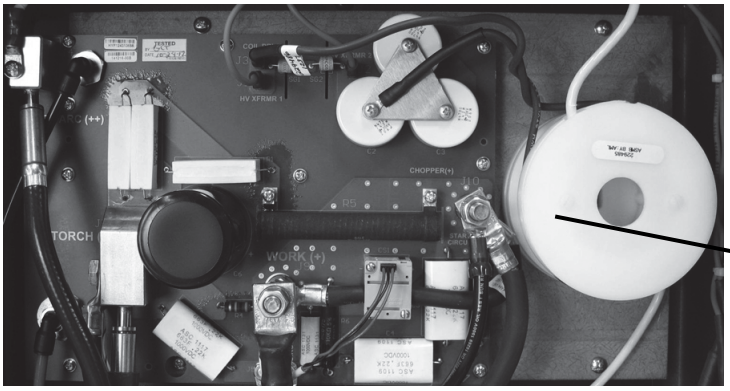
This Field Service Bulletin explains how to replace the I/O panel assembly in the MAXPRO200.

428041 Kit Contents

Part Number	Description	Quantity
Not for Sale	High frequency panel assembly	1
075217	3/8 inch /10 mm brass flat washer	1
Not for Sale	M10 kepnut	3
Not for Sale	PCB ground standoff	1
807790	MAXPRO200 I/O Replacement FSB	1

Required tools and materials

- 9/16 inch wrench
- 3/8 inch wrench
- 18 mm wrench
- Number 2 Phillips head screwdriver
- T-20 Torx screwdriver
- ¼ inch nutdriver



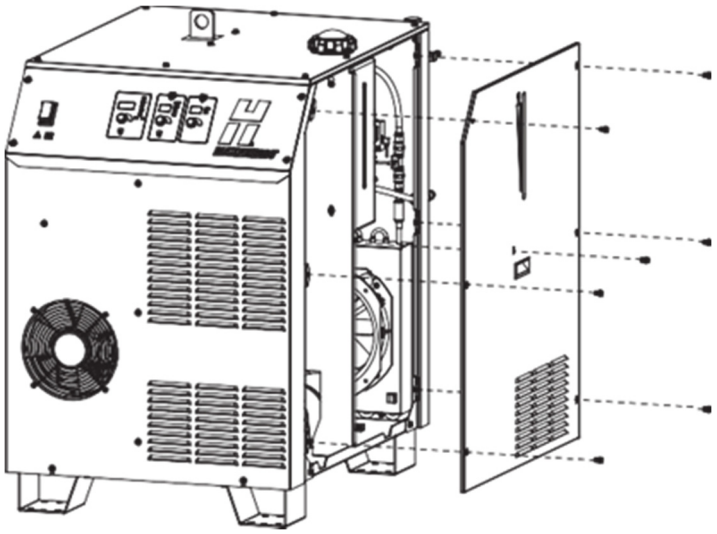
High frequency panel assembly

Note: The high frequency panel assembly may look different than what is shown in the photo above.

Instructions

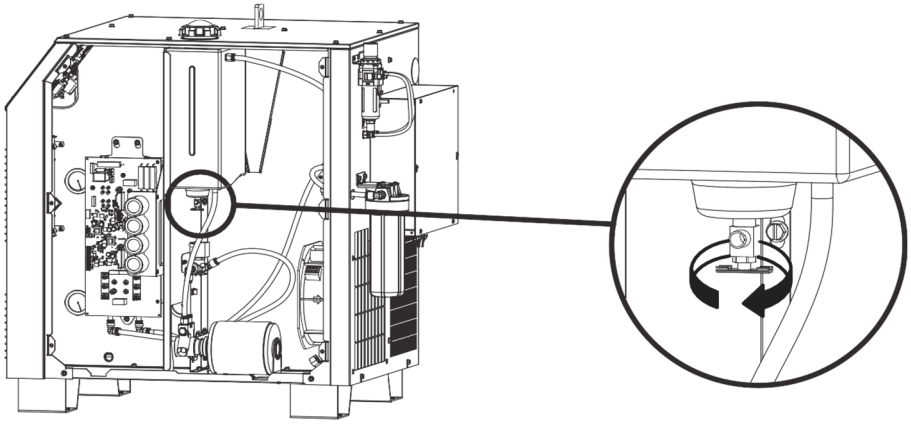
Remove right-side panel

1. Turn OFF power to the system. Disconnect line power by turning OFF the main disconnect switch. Make sure the switch on the power supply operator panel is in the OFF position.
2. Turn OFF all supply gases.
3. Use a 3/8 inch wrench to remove the side panel screws.



Drain the coolant system

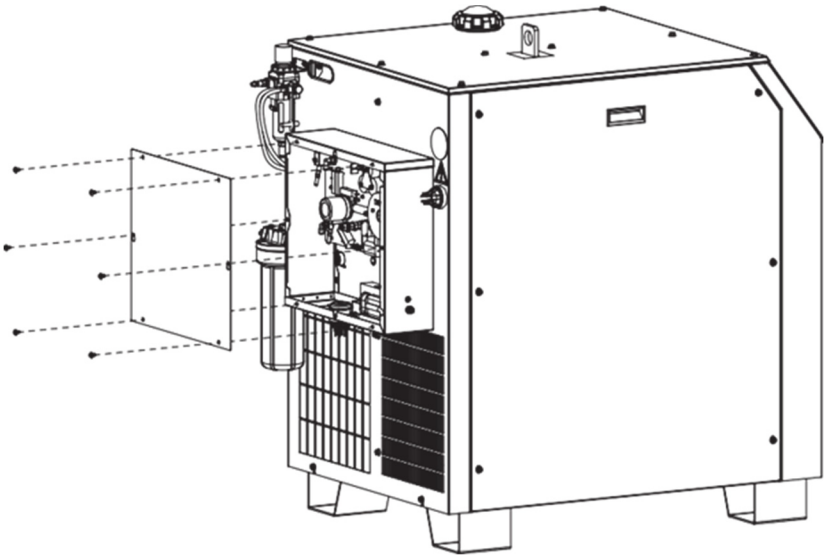
4. Locate the coolant drain valve and use a 20 liter (5 gallon) container to catch the coolant. Coolant will flow as soon as the drain is opened. Close the drain valve when the coolant stops flowing.



Note: If the coolant does not contain any dirt or particulates, you can reserve it for refilling the coolant system. If you fill the system with new coolant, dispose of used coolant according to local and national codes.

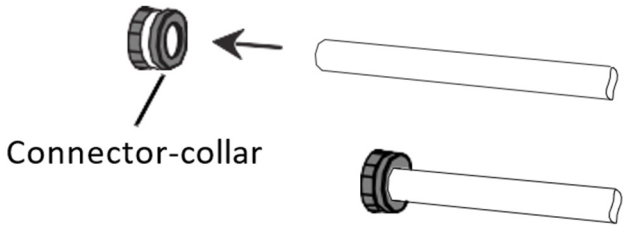
Remove the ignition enclosure panel

5. Turn OFF power to the system.
6. Disconnect line power by turning OFF the main disconnect switch.
7. Using a T-20 Torx screwdriver, remove the ignition enclosure panel screws (6).



Push-to-Connect fittings

8. The gas and coolant hose connections use push-to-connect fittings.
    a. To make a connection, push the hose into the fitting until it stops.



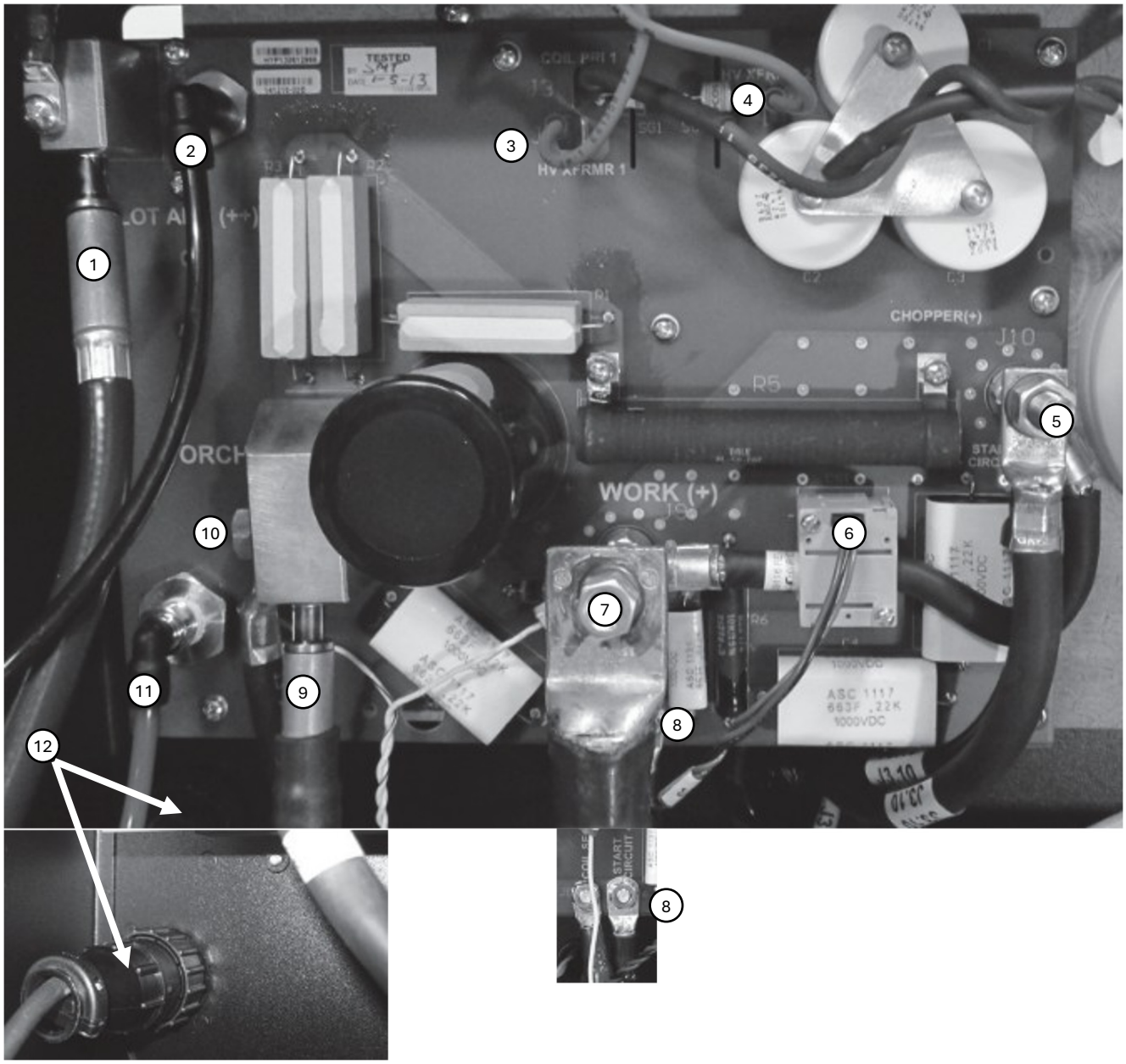
    b. To disconnect a fitting, push the connector-collar toward the fitting, hold the collar in place and pull the hose away from the fitting.



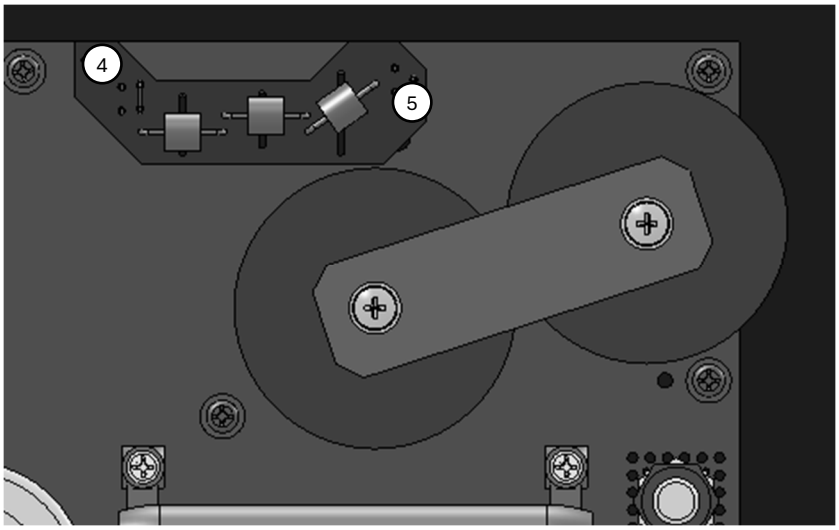
Remove the connections to the I/O PCB assembly

Note: Using the following photograph, disconnect the wires and cables from the I/O PCB assembly. Each cable and connection is identified in the table on the next page. The I/O PCB assembly may look different than what is shown in the photo.

9. Remove the torch lead connections labeled 1, 2, 9, 11, and 12. Use a 20 liter (5 gallon) container to catch any coolant remaining in the torch leads.
10. Remove all the remaining labelled connections from the I/O PCB assembly.



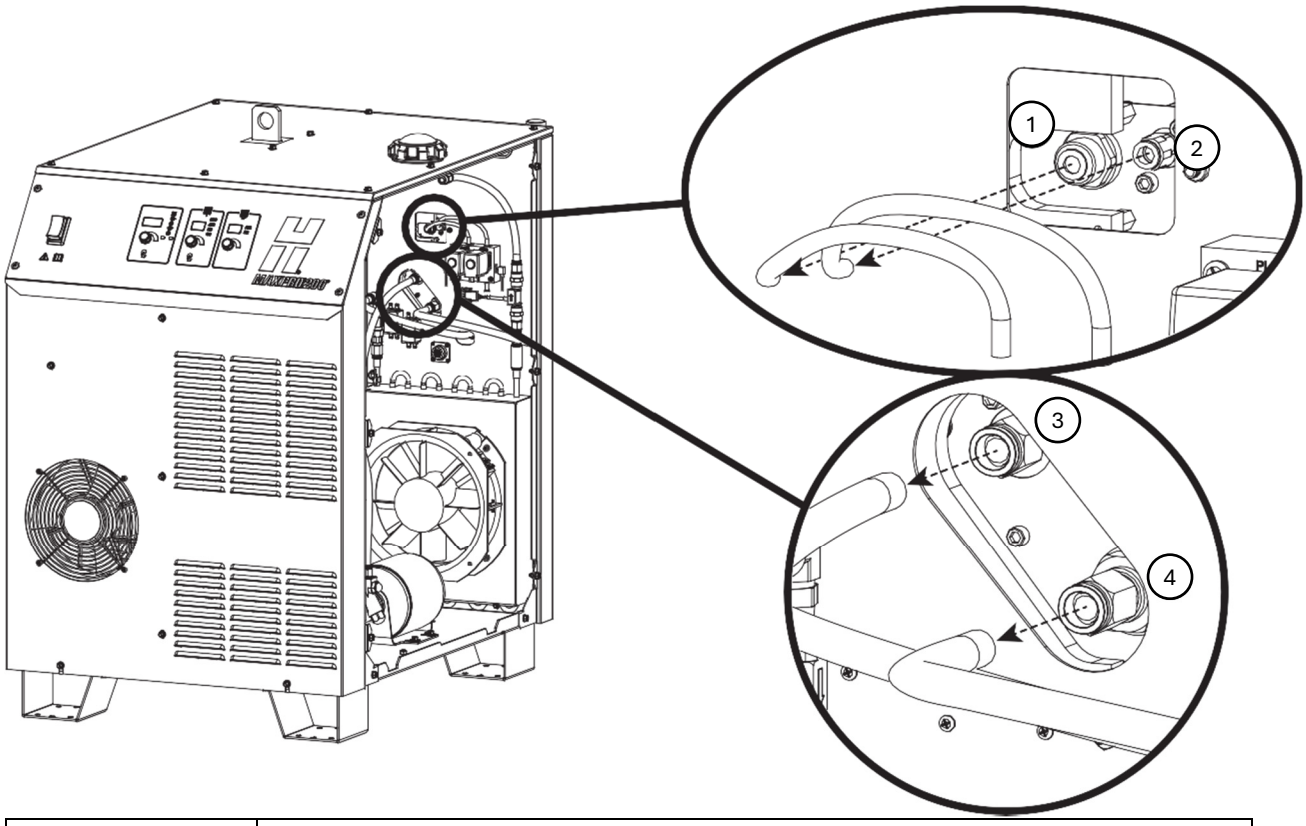
11. The I/O PCB may also look like what is shown below. In this case, reference the image below for labelled connection points:



Number	Connection ID	Label/Description
1	PILOT ARC (++)	Blue hose from the torch lead
2	Plasma gas hose (no ID on the board)	Black tubing from the torch lead
3	J1/ HV XFMR 1	22AWG, 10kV, red wire with 6.3mm (0.25 inch) push on connector from HFHV (high frequency, high voltage) transformer
4	J2/ HV XFMR 2	22AWG, 10kV, red wire with 6.3mm (0.25 inch) push on connector from HFHV transformer
5	J10	There are 3 connections on the threaded stud: 1) J3.10 – 2AWG black wire from chopper WORK J2.9 2) J3.10 – 6AWG black wire from R36 pilot arc resistor 3) 4AWG black wire from WORK (+) through CS1
6	CS1	J8 (3 twisted red, black, and blue wires)
7	J9/WORK (+)	Work lead
8	J6/START CIRCUIT ++	J3.6 – 6AWG black wire with ring terminal from the chopper J2.7
9	TORCH (-)/J7	Braided blue coolant hose (supply to torch lead)
10	J7/TORCH (-)	J3.7 – 2AWG black wire from the inductors
11	Coolant return (no ID on the board)	Red coolant hose (return from the torch lead)
12	No ID on the board	Torch connector – torch solenoid valve, torch type, and torch identification

Remove the connections inside the power supply

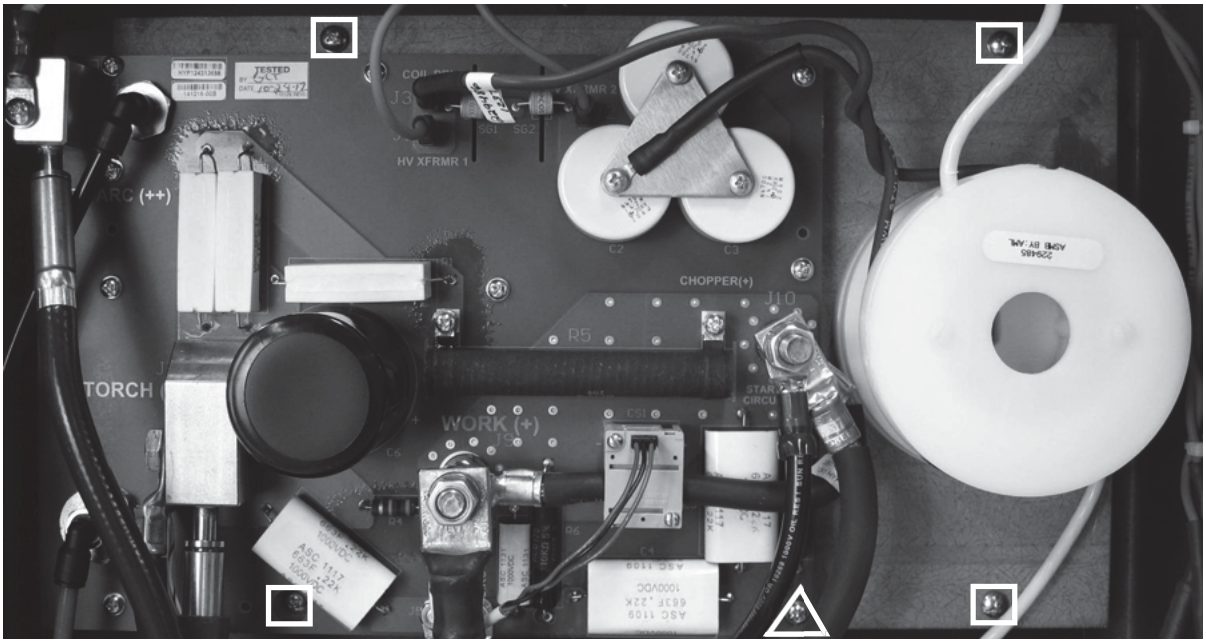
12. Remove the four hoses shown below. Some coolant may drip from the hoses when disconnected. Make sure not to swap the coolant lines when reinstalling.
    a. **Note**: See “Push-to-Connect fittings” on **page 5** for more information on the connections.



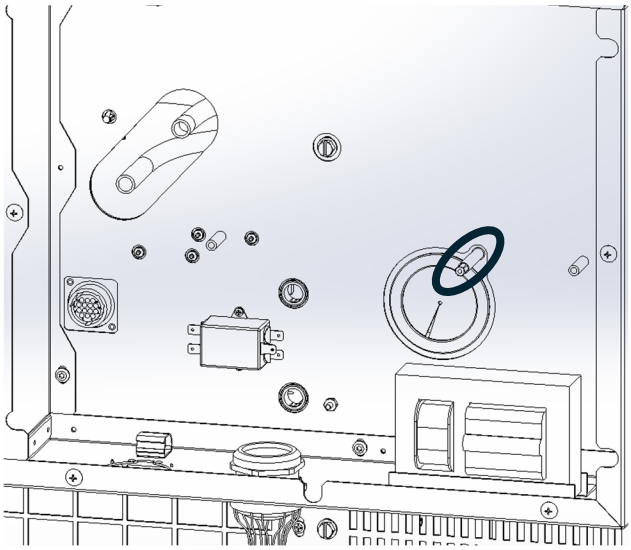
Number	Description
1	Black ¼ inch OD hose from the plasma output of the gas manifold
2	Blue hose from the shield valve output of the gas manifold
3	Coolant hose from the outlet of the cold plate
4	Coolant hose from the inlet to the filter

Remove the high frequency ignition panel assembly

13. Remove the screws (4) that secure the high frequency ignition panel assembly (white squares) and the grounding screw at the bottom right corner of the I/O PCB assembly (white triangle). Keep the screws for use when installing the new I/O panel assembly. The I/O panel assembly may look different than what is shown in the photograph.



14. After the I/O panel assembly has been removed, remove the brass ground standoff (shown in the black oval) using the ¼ inch nut driver.

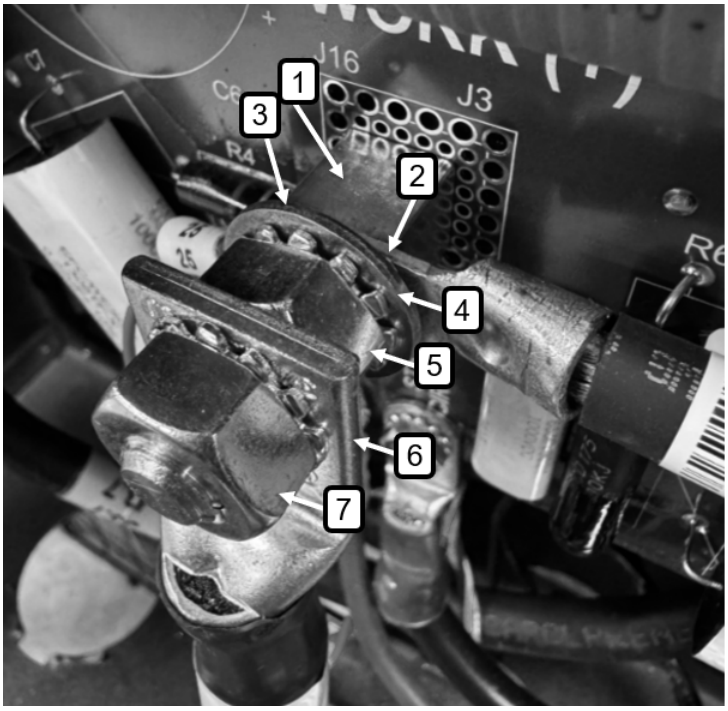


Install the new high frequency panel assembly

15. Install the new brass ground standoff from the 428041 kit. It may be slightly longer than the one that was removed. Tighten the standoff to 2.5 to 3.0 Nm (23-27 inch-lbs).
16. Align the panel with the mounting holes (4) and use the screws removed earlier in step 13 to secure the panel in place.
17. Tighten the screw indicated by the triangle on the previous page to 0.8 to 1.0 Nm (7-10 in-lbs). Tighten screws indicated by squares on the previous page to 2.5 to 3.0 Nm (23-27 inch-lbs).
18. Reconnect all wires, cables, and hoses to the I/O PCB assembly. Use the photograph and table on the previous pages as a guide to identifying the cables and connectors. Use the table below for torque specifications.

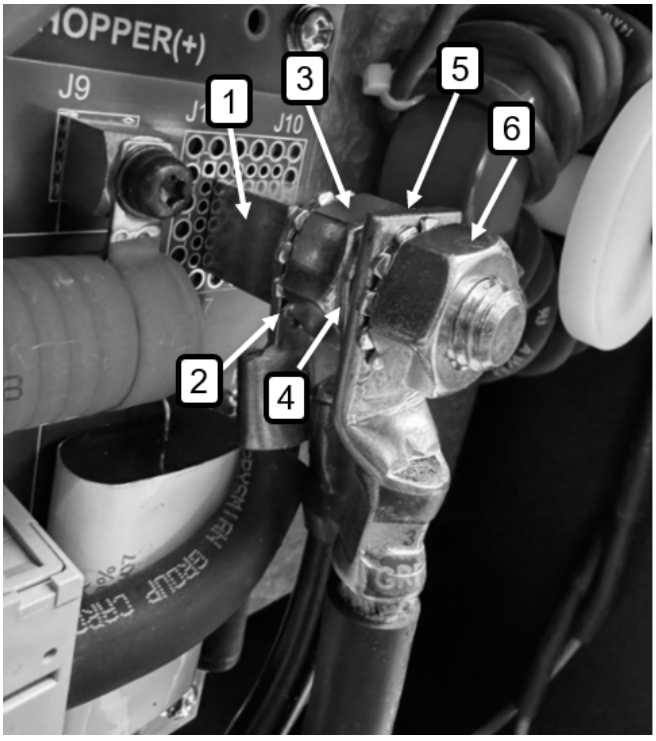
Number on Photo	Label on Cable	Torque	Notes
5	J3.10	11 to 12 Nm (100 to 110 inch-lbs)	Labelled J10 on the PCB
7	No label	11 to 12 Nm (100 to 110 inch-lbs)	Labelled WORK(+) on the PCB
8	J3.6	3 to 4 Nm (25 to 35 inch-lbs)	Labelled START CIRCUIT ++ on the PCB
10	J3.7	11 to 12 Nm (100 to 110 inch-lbs)	Labelled TORCH (-) on the PCB

19. For reference on the connection order for cables and wires on the WORK (+) stud, reference the image below:



1. Stud
2. Ring terminal from Current Sensor cable
3. Ring terminal from yellow wire labelled 25
4. 075217 (flat washer)
5. M10 Kepnut
6. Ring terminal from Work Lead
7. M10 Kepnut

20. For reference on the connection order for cables and wires on the J10 stud, reference the image below:

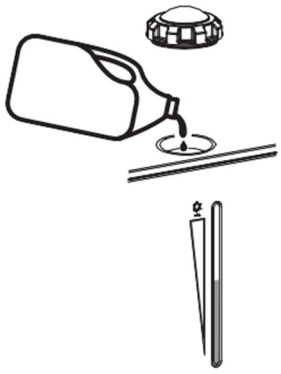


1. Stud
2. Ring terminal from Current Sensor cable
3. M10 Kepnut
4. Ring Terminal from J3.10 Wire (small)
5. Ring Terminal from J3.10 Wire (large)
6. M10 Kepnut

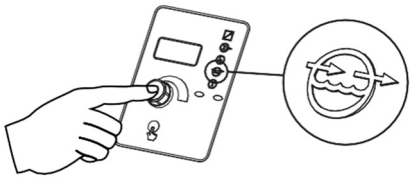
21. Reconnect the four hoses inside the power supply. See “Remove the connections inside the power supply” on page 8 for more details.
22. Replace the right-side panel.
23. Reconnect the line power by turning ON the main disconnect switch.

Fill the power supply with coolant

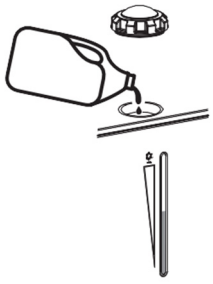
24. The system will take 14.2 liters to 17.0 liters (3.75 to 4.5 gallons) of coolant depending on the length of the torch leads.
25. Add coolant to the power supply until the tank is full.



26. Turn ON the power supply, then press and release the amps selector knob as many times as needed until the flow symbol is selected. The flow rate will be shown in the three digit display. There is a 45 second delay before the system will report a low coolant flow error. If the flow rate has not reached 0.5 gallons per minute (gpm) the system will turn off the pump.



27. If the system displays an error, turn OFF the power to the system and add coolant to the tank until it is full again. Repeat steps 26 and 27 until no error is displayed.



28. Add coolant to the power supply until the tank is full and replace the filler cap.

