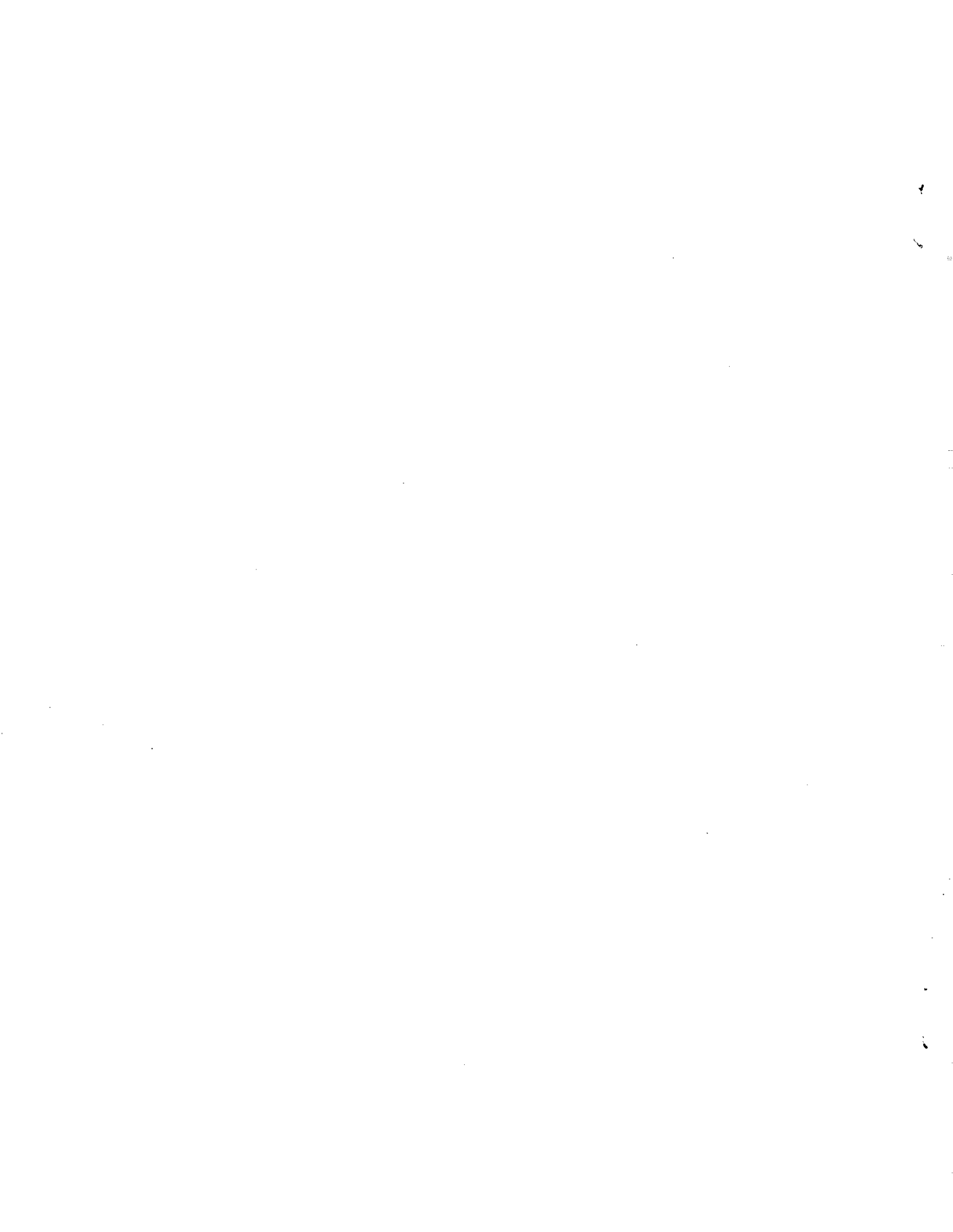


**This product is obsolete**

***MAX42***  
***Power Supply***  
***400V and 480V***

***Field Upgrade Bulletin***  
***801710 Rev. 1***



**MAX42**  
**Power Supply**  
**400V and 480V**

**Field Upgrade Bulletin**  
**801710**

**Revision 1 August 2011**

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# MAX42 POWER SUPPLY 400V AND 480V

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## Purpose

This field upgrade bulletin provides personnel at a field maintenance facility instructions in upgrading the MAX42 - 400V and 480V power supplies. **Maintenance personnel must be totally familiar with depot level repair of MAX42 power supplies.**

## Customer Supplied Tools

Allen wrench, 9/64" (4mm)  
Crimping tool  
Drill  
Drill bits, #20 (4mm), #29 (3.4mm) and #36 (2.7mm)  
Nut drivers, 1/4" (7mm), 5/16" (8mm), and 3/8" (10mm)  
Needle nose pliers  
Phillips head screwdriver, #1  
Phillips head screwdriver, small  
Soldering iron  
Solder  
\*\*Taps, 6-32 and 8-32  
Wire stripper

## Hypertherm Supplied Parts

\* Kit, MAX42 400V Upgrade, # 028630  
\* Kit, MAX42 480V Upgrade, # 028631  
    (1) Relay, 12 VDC Time Delay, # 003136  
    (1) Diode, Bridge 3 PH, 60A 1600V, # 009770  
    (1) Cable, Time Delay Relay to Input Rectifier, # 023572  
    (1) Jumper, MAX42 3 PH Line Choke, # 023618  
    (1) MOV/Cap Assembly, MAX43, # 029674  
    (1) Term 16-14 .250 QC Insul Fem, # 074015  
    \*\*(2) M/S 8-32 X 5/8, PH, PAN, S/Z, # 075078  
    \*\*(2) Lockwasher, #8, Int Tooth, S/Z, # 075173  
    \*\*(2) Flatwasher, #10, .204, .437, .064, S/Z, # 075202  
    (1) Clip, Relay Retaining, # 003141  
    (3) Term 18-14 #10 Ring Insul, # 074025  
    \*\*(1) M/S 6-32 X 1/4, PH, TRS, S/S, # 075012  
    \*\*(1) Lockwasher, #6, Int Tooth, S/S, # 075180  
    (1) PCB Assembly, MAX42 400V Inverter PS Trans, # 041303 (400V only)  
    (1) PCB Assembly, MAX42 480V Inverter PS Trans, # 041304 (480V only)  
Drill Fixture, # 045079  
Drill Fixture, # 045078

\* The upgrade kits for the 400V and 480V power supplies are identical except for the 400V and 480V Inverter Power Supply PCB Assemblies as indicated in the list above.

\*\* The metric drill bit sizes are given. The repair facility will determine the tap and screw and washer metric size equivalents.

## Hypertherm Supplied Drawings

Power Supply Wiring Diagram (400V, # 013-4-223); (480V, # 013-4-222)  
Inverter Wiring Diagram (400V, # 013-4-221); (480V, # 013-4-219)  
Inverter Subsystem Assembly (400V w/MOV, # 029-4-752); (480V w/MOV, # 029-4-754)  
Air Pack Power Supply Bracket Subassembly w/Time Delay Relay, # 029-2-716

# MAX42 POWER SUPPLY 400V AND 480V

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## Procedure

To aid in locating the components and subassemblies of the MAX42 400V or 480V power supply, refer to the 400V, 3 PH, 50 Hz Service Manual (801340) or 480V, 3 PH, 60 Hz Service Manual (801370). The service manuals reflect the pre-upgrade configurations. By referencing the wiring diagrams in these manuals and the new wiring diagrams and assembly drawings (listed on page 1), the maintenance technician will have a better understanding of how to accomplish the upgrade.

1. Shut the power off at the Power Supply and unplug power cord. Shut off the gas supply to Power Supply and disconnect hose.
2. Remove the Left and Right Enclosures by removing the screws and nuts.
3. Remove the Line Chokes from the Left Enclosure and disconnect the leads between Power Switch S1 and Inverter Power Supply PC BD Assembly PCB2.

**Note: Tag or identify all cables and wires that are to be removed in the following steps. Refer to the wiring diagram if in doubt about wiring connections.**

4. Locate the inverter subsystem assembly and remove.
5. Remove the hardware in order to separate the Heatsink Subassembly from the Magnetic Tray Bracket Assembly.
6. At the Magnetic Tray Bracket Assembly remove the following:
  - Inverter Modulator PC BD Assembly PCB12 (To be reinstalled)
  - Inverter Power Supply PC BD Assembly PCB2. (Discard)
  - Gate Drive Transformer PC BD Assembly PCB11 (To be reinstalled)
  - Input Capacitor Bank (To be reinstalled)
7. At the Input Capacitor Bank do the following:
  - Unsolder wires W26 at E17 and W32 at E23.
  - Cut wires W23 and W30 to a length of 2-1/2 inches (64mm). Discard ends with terminals. Strip wires and solder W23 at E17 and W30 at E23.
  - Cut wires W22 and W27 at ring terminals. Replace no. 6 blue ring terminals with no. 10 blue ring terminals (074025). Crimp the terminals into place. Put the W22 and W27 markings back on to terminals.
8. At the Inverter I/O PC BD Assembly PCB1, do the following:
  - Remove wire W5 at E43.
  - Cut wire W4 at ring terminal. Replace no. 6 blue ring terminal with no. 10 blue ring terminal (074025). Crimp terminal on to W4. Put W4 marking back on to terminal.

## MAX42 POWER SUPPLY 400V AND 480V

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9. At the Magnetic Tray bracket assembly, reinstall the following:
  - Input Capacitor Bank
  - Gate Drive Transformer PC BD Assembly PCB11
10. Remove cable (wires W154 and W155) and discard.
11. Install new Inverter Power Supply PC BD Assembly PCB2 (400V-041303; 480V- 041304).
  - Feed the two longer cables with plastic wrap through the 5/8" (16mm) diameter hole in the magnetics tray. **Feed the cable with three wires first.**
  - Feed the cable with connector P46 through the slot in the magnetics tray.
12. Reinstall Inverter Modulator PC BD Assembly PCB12.
13. Remove Input Rectifier PC BD Assembly PCB3 from Heatsink Subassembly. ( Discard)
14. Remove the heatsink bracket (L-shaped) from the Heatsink Subassembly.
15. Attach drilling fixture (045079). See Figure 1
16. Drill two holes with #36 (2.7mm) drill bit.
17. Drill one hole with #29 (3.4mm) drill bit.
18. Remove drilling fixture.
19. Deburr the drilled holes.
20. Tap the two holes drilled in step 16 with a 6-32 (2.7mm) tap.
21. Tap the hole drilled in step 17 with a 8-32 (3.4mm) tap.
22. Install new Diode Bridge (009770). Secure Diode Bridge to Heatsink Subassembly using the following hardware. See Figure 2
  - (2) 8-32 X 5/8, PH, PAN, S/Z (075078) (Metric Equiv. (3.4mm X16mm)
  - (2) Lockwashers, #8, Int Tooth, S/Z (075173) (Use metric equivalent, if required.)
  - (2) Flatwasher, #10, S/Z (075202) (Use metric equivalent, if required.)
23. Reinstall the heatsink bracket (L-shaped) to the Heatsink Subassembly.
24. Install the MOV/filter assembly (029674) and secure with two screws. **Carefully tighten screws, the housing can easily be broken.**
25. Attach the yellow/green ground wire to the Heatsink Subassembly with the Diode Bridge outside mounting screw.

## MAX42 POWER SUPPLY 400V AND 480V

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26. Attach the Heatsink Subassembly to the Magnetic Tray Bracket Assembly. Reconnect all wires and cables. See related 400V or 480V wiring diagrams and drawing 029-4-752 (400V) or 029-4-754 (480V).
27. Perform the inverter test.
28. Remove the Air Pack Power Supply Bracket Subassembly and modify as follows:
  - Attach drilling fixture (045078). See Figure 3
  - Drill three holes with #20 drill bit and deburr.
29. Remove drilling fixture.
30. Install Time Delay Relay Cable (023572) socket end to Air Pack Power Supply Bracket Subassembly with the following hardware. See drawing 029-2-716.
  - (1) M/S 6-32 X 1/4, PH, TRS, S/S (075012) (Metric Equiv. (2.7mm X 6.4mm)
  - (1) Lockwasher, # 6, Int Tooth, S/S (075180) (Use metric equivalent, if required.)
31. Install Time Delay Relay (003136) and secure in position with Relay Retaining Clip (003141).
32. Reinstall the Air Pack Power Supply Bracket Subassembly.
33. On the Air Pack Power Supply Bracket Subassembly, on TB2-13 (top right position) remove the violet wire and cut off terminal. Strip wire and crimp on Terminal 16-14 .250 QC Insul Female (074015).
34. Connect the Time Delay Relay Cable (023572) as follows:
  - Connect the male terminal with female terminal installed in step 33.
  - Connect the fork terminal to TB2-13
  - Connect cable (red, blue and black wires) to Inverter Power Supply PC BD Assembly PCB2.
35. Install the 3 PH Line Jumpers (023618) between the Power Switch S1 and Inverter Power Supply PC BD Assembly PCB2.
36. Ensure the Control PC BD Assembly PCB14 and Pilot Arc Control PC BD Assembly PCB 15 have been upgraded to current revision levels.
37. Reinstall the Right and Left Enclosures.
38. Test MAX42 upgraded system.



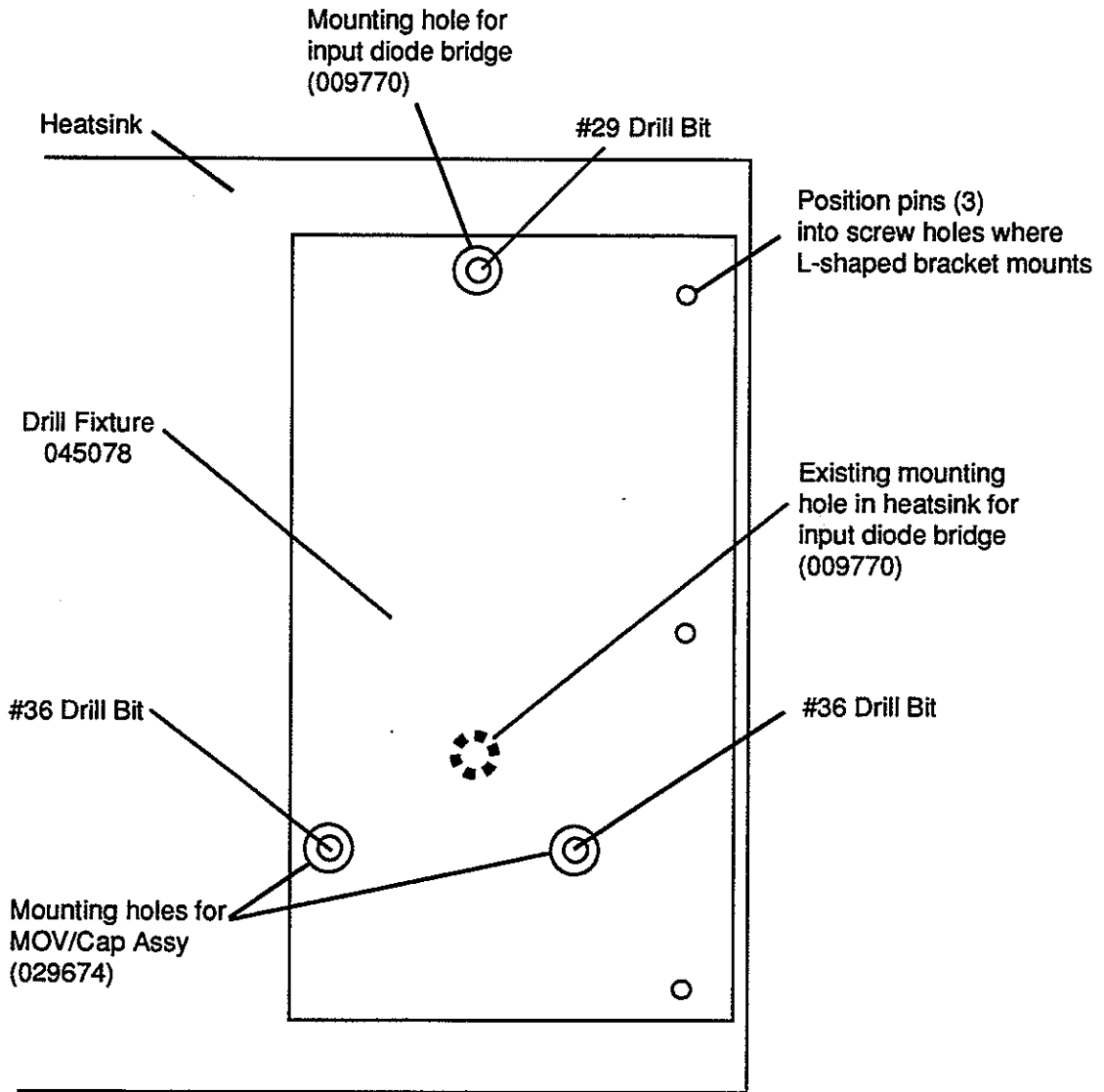


Figure 1 Drill Fixture 045079 Positioned on Heatsink

# MAX42 POWER SUPPLY 400V AND 480V

- (2) 8-32 X 5/8, PH, PAN, S/Z (075078)
- (2) Lockwashers, #8, Int Tooth, S/Z (075173)
- (2) Flatwasher, #10, S/Z (075202)
- (2 Places)

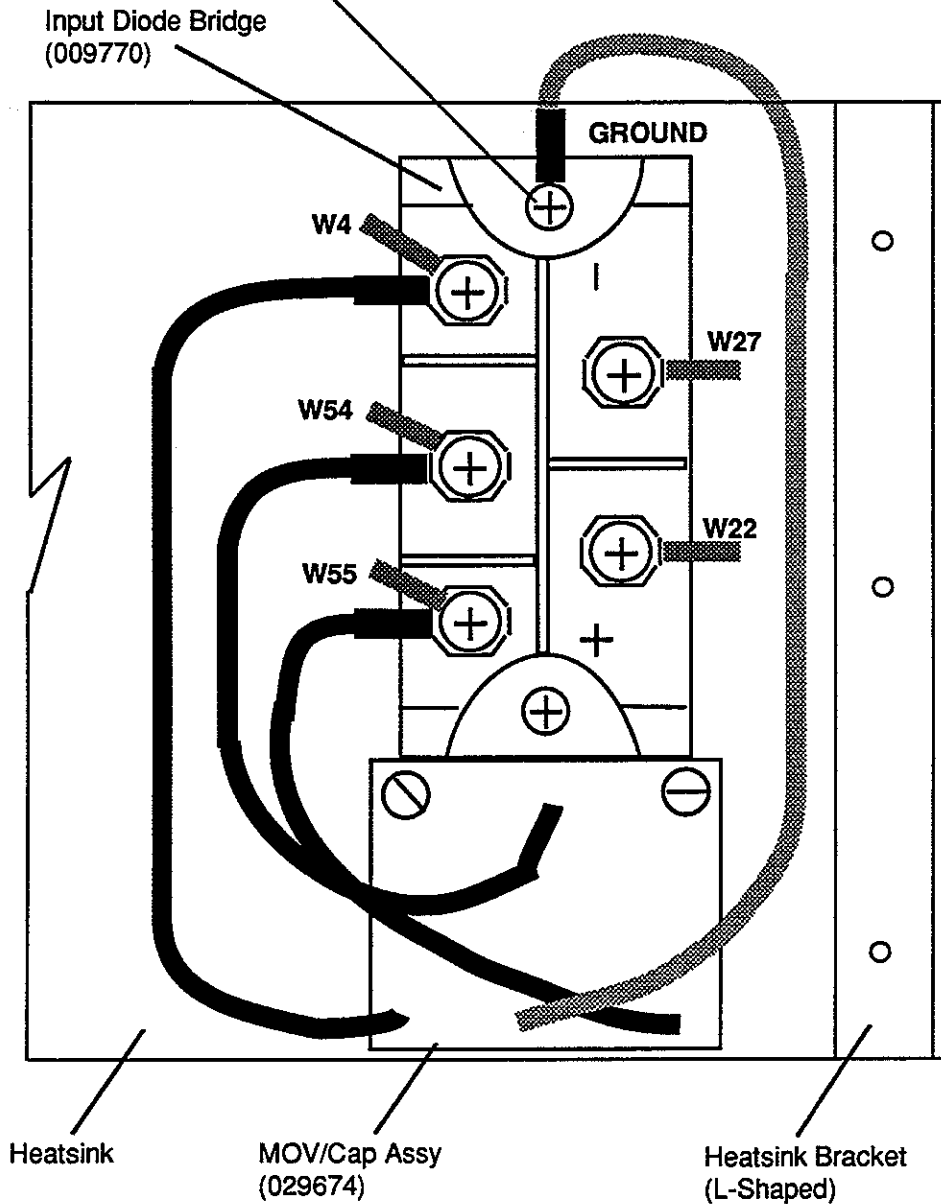
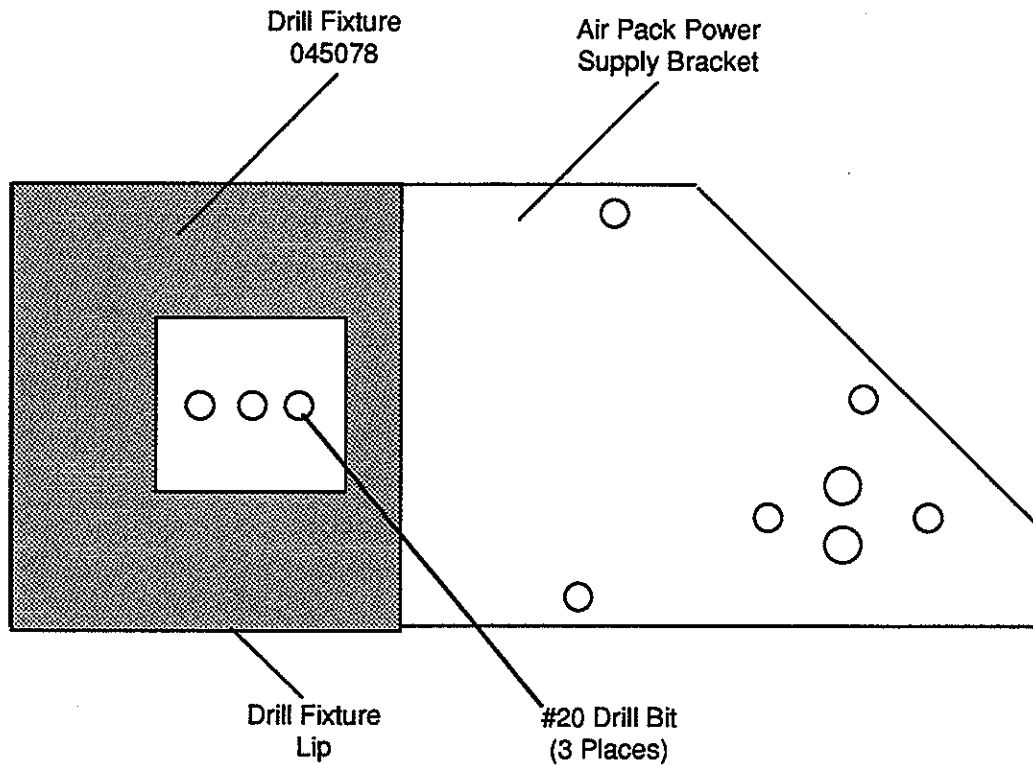


Figure 2 Diode Bridge and MOV/Cap Assembly Installation



**Figure 2 Drill Fixture 045078 Positioned on Air Pack Power Supply Bracket**

# **MAX42 POWER SUPPLY 400V AND 480V**

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## **NOTES**