

## Detailed H-Bridge Assembly Instructions

1. It is assumed that all traces have been checked for continuity and all holes have been drilled before this procedure is started
2. Solder resistors and ICs.
  - a. R9 is a 1K resistor
  - b. All other resistors are 10K
  - c. Pin one of each IC is closest to the IC designator
3. Solder jumpers and power wires
  - a. The smaller jumpers are 22 gauge wire
  - b. The larger jumpers are 16 gauge wire
  - c. The ground (-) is 16 gauge wire with black insulation
  - d. The positive rail (+) is the wire with the fuse holder
4. Test circuit and stop to verify assembly if any step fails
  - a. Apply 12 volts from a bench power supply
  - b. Check for 12 volts at gate for M1, M2, M4, M5, M6 and M8
  - c. Check for 0 volts at gate for M3 and M7
  - d. Apply 12 volts to Enable 1
    - i. Check for 0 volts at M1 and 12 volts at M2
    - ii. Check for 0 volts at M3 and 12 volts at M4
  - e. With 12 volts still applied to Enable 1, apply 12 volts to Direction 1
    - i. Check for 12 volts at M1 and 0 volts at M2
    - ii. Check for 12 volts at M3 and 0 volts at M4
  - f. Remove 12 volts from Enable 1 and Direction 1
  - g. Apply 12 volts to Enable 2
    - i. Check for 0 volts at M5 and 12 volts at M6
    - ii. Check for 0 volts at M7 and 12 volts at M8
  - h. With 12 volts still applied to Enable 2, apply 12 volts to Direction 2
    - i. Check for 12 volts at M5 and 0 volts at M6
    - ii. Check for 12 volts at M7 and 0 volts at M8
  - i. Remove 12 volts from Enable 2 and Direction 2
  - j. Remove 12 volts from a bench power supply
5. Solder FETs
  - a. Bend the leads of each FET
    - i. Bend where the lead makes a transition from thin to thick
    - ii. Bend up – toward the text
  - b. The FQP47P06 FETs are soldered to the side that is attached to the positive rail (+)
  - c. The FDP55N06 FETs are soldered to the side that is attached to the negative rail (-)
6. Solder Diodes
  - a. Each location for the diode has the cathode (C) or anode marked (A)
  - b. Bend each diode on the end that has the cathode marked (the end with the line)
  - c. Cut the longer lead to the same length as the shorter lead

- d. With the circuit sitting flat on any surface, insert each diode on the copper side and solder from the copper side
7. Test circuit
- a. Place a 1K resistor between M1- and M1+
  - b. Place a 1K resistor between M2- and M2+
  - c. Apply 12 volts from a bench power supply
    - i. Check for 0 volts from M1- to M1+
    - ii. Check for 0 volts from M2- to M2+
  - d. Apply 12 volts to Enable 1
    - i. Check for 12 volts from M1- to M1+
    - ii. Check for 0 volts from M2- to M2+
  - e. With 12 volts still applied to Enable 1, apply 12 volts to Direction 1
    - i. Check for -12 volts from M1- to M1+
    - ii. Check for 0 volts from M2- to M2+
  - f. Remove 12 volts from Enable 1 and Direction 1
  - g. Apply 12 volts to Enable 1
    - i. Check for 0 volts from M1- to M1+
    - ii. Check for 12 volts from M2- to M2+
  - h. With 12 volts still applied to Enable 1, apply 12 volts to Direction 1
    - i. Check for 0 volts from M1- to M1+
    - ii. Check for -12 volts from M2- to M2+
  - i. Remove 12 volts from Enable 2 and Direction 2
  - j. Remove 12 volts from a bench power supply