



1.0 Description

These instructions provide information on removing the control board in a MSH Series inverter/charger and replacing with a new control board (PN: TCB-MSHXXXXM or PN: TCB-MSHXXXXRE).

Note: This document is part of a series of service instructions to help qualified personnel replace components that have failed or have been damaged.

2.0 Installation Preparation

Before removing or replacing the control board, read this entire document and follow all instructions.

2.1 Safety Precautions

Follow all electrical safety precautions and the ESD prevention guidelines below, and in *Service Instructions: 64-1000 – Electrical Safety Precautions and Electrostatic Discharge Prevention*.



Warning: Hazardous voltages are present within the inverter when power is applied. Do not remove the inverter's top cover without first turning off and disconnecting all AC and DC power to the inverter. Always replace the top cover before reconnecting power.



Warning: The capacitors inside the inverter store electric energy even after all AC and DC power is removed. After disconnecting all AC and DC power to the inverter, wait 5 minutes for the energy in the capacitors to dissipate before working on the unit.



Caution: Observe all ESD safety precautions while working with the control board and within the inverter. Failure to follow ESD safety precautions could result in damage to internal components and the inverter.

2.2 Included Materials

Before dismantling the inverter, inspect the new control board to ensure there is no obvious physical damage. Look at the Model ID label on the new control board (see Figure 1) and verify that the model number on this label corresponds to the model number of the inverter that is being repaired. Contact Sensata Technologies if any item appears to be damaged, missing or incorrect.

Note: All removed items must be returned if repair is for warranty consideration. Save the packing material and shipping container to use when returning the removed items.

2.3 Required Tools and Equipment

Before disassembling the inverter, ensure you have the following tools and equipment to remove and replace the control board:

- T15 Torx head screwdriver (≥6" shaft required) – for #6-32 screws
- T25 Torx head screwdriver – for #10-32 screws
- 7/16" socket, socket wrench and ≥6" extension – for ¼-20 bolts
- Torque wrench (130 in-lbs torque required) – for ¼-20 bolts with 7/16" head
- Phillips screwdriver

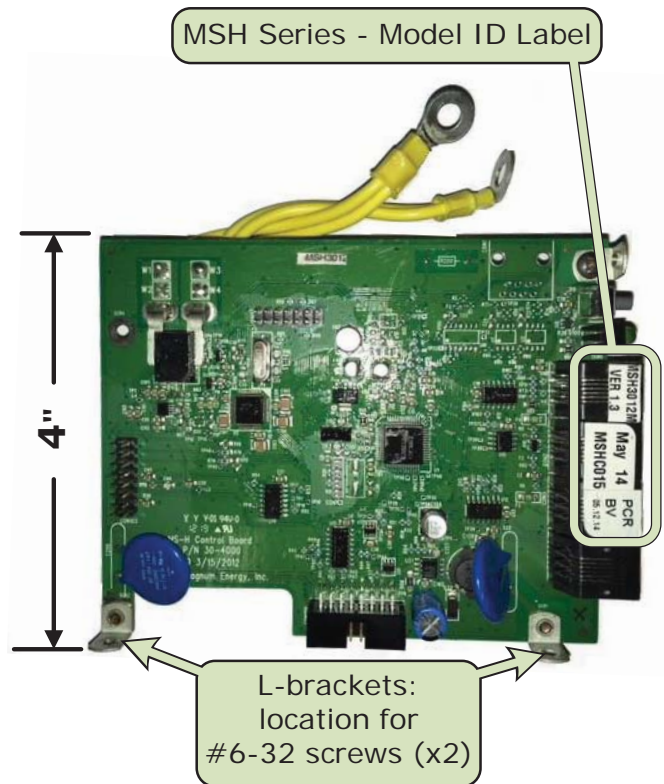


Figure 1, MSH Series Control Board

MSH Control Board Removal and Replacement

3.0 Removing and Replacing the MSH Series Control Board

This section provides information on removing and replacing the control board in a MSH Series inverter.

3.1 Removing the MSH Series Control Board

1. Remove the MSH inverter's top cover and review the internal components as shown in *Service Instructions: 64-1007 – MSH Top Cover Removal and Replacement with Internal Component Identification*.
2. Locate the MSH Series control board in the inverter (Figure 2, Item A), and then remove the two #6-32 screws securing it to the inverter base (Figure 1).
3. Remove the Phillips screw and the ¼-20 bolt (7/16" head) that connect the FET and transformer busbars to the MSH's control board, respectively (Figure 2, Items B & D).
4. Grasp the control board by its top edge (or upper corners) and firmly pull up to remove it from the bottom 16-pin FET board connector.
5. Locate and disconnect the 16-pin ribbon connector. See Figure 2, Item C.

The MSH control board is now removed. Using ESD precautions, place it component-side up on a grounded, static-free surface until it can be placed in an antistatic bag to be returned with any other replaced components.

3.2 Replacing the MSH Series Control Board

Note: If the FET board also needs to be replaced, follow the information described in *Service Instructions: 64-1005 – Large FET Board Removal and Replacement, before replacing the control board*.

1. Remove the new control board from its antistatic bag, and then connect the 16-pin ribbon cable connector. Before pushing in the connector, ensure it is seated with the red stripe on the ribbon cable facing toward the rear of the inverter and the connector pins are aligned correctly.
2. Insert the new control board into the bottom 16-pin connector located on the FET board. Ensure the connector pins are aligned correctly before pushing in.
3. Replace the two #6-32 screws (T15 head) to secure the new control board to the FET board.
4. Reconnect the Phillips screw and the ¼-20 bolt (7/16" head) that connect the MSH's control board to the FET and transformer busbars, respectively (Figure 2, Items B & D).

The new control board is now installed, review all the connections a final time and ensure they are correct.

5. If there are no other internal components to replace, reinstall the top cover as described in *Service Instructions: 64-1007 – MSH Top Cover Removal and Replacement with Internal Component Identification*.

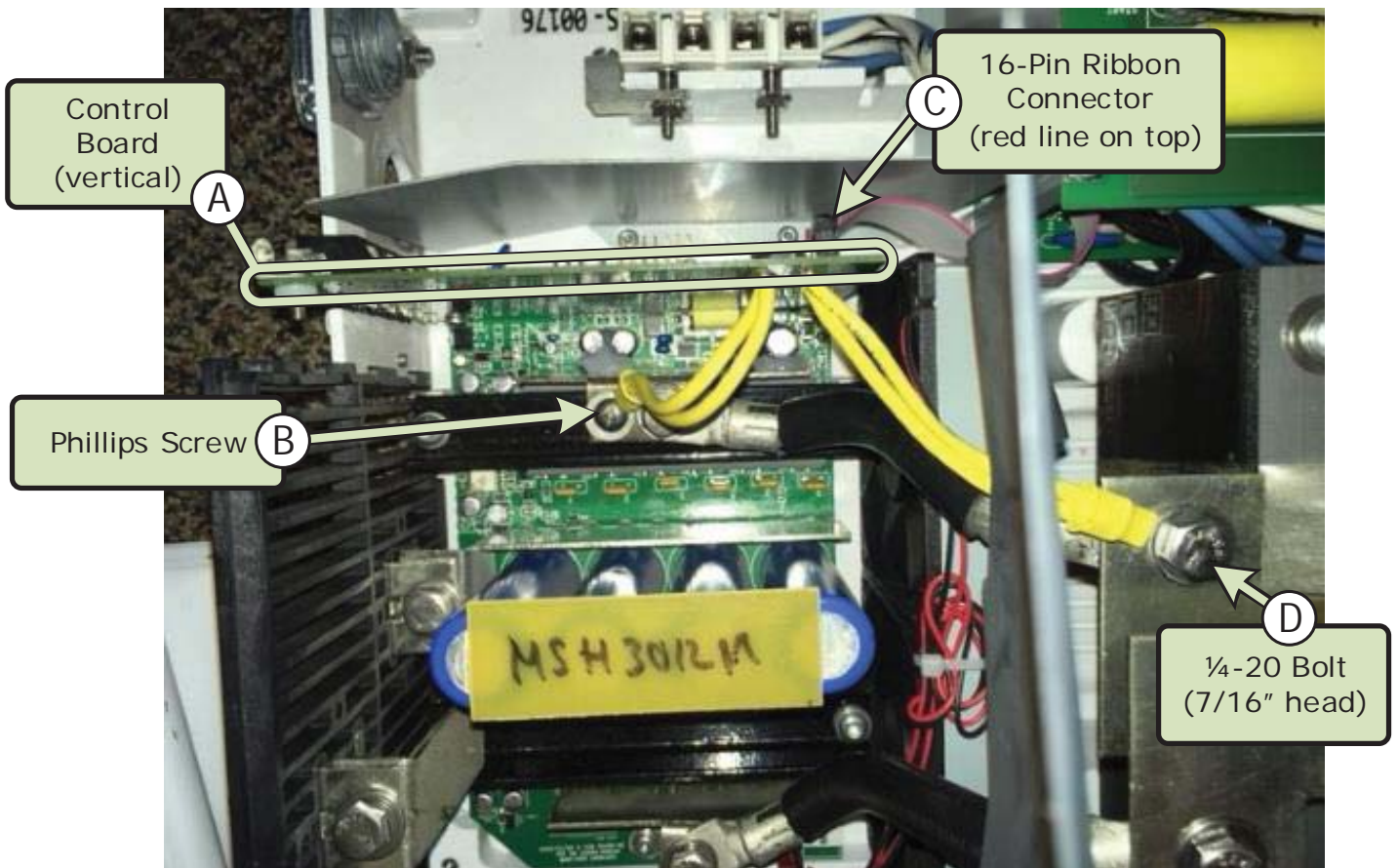


Figure 2, Top View of an MSH Control Board