



# Work Instructions

## BCM Control Board Replacement - Capstone Model C60 MicroTurbine

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### Purpose and Scope

This document describes the procedure for replacing the Battery Control Module (BCM) Control Board on the Capstone Model C60 MicroTurbine.



**Figure 1. BCM Control Panel**

### Guidelines

This document presents information sufficient to allow an Authorized Service Provider (ASP) to properly replace the control board.

Conduct maintenance in a clean, well-lighted area using normal shop tooling to avoid damage to delicate components.

Retain all parts removed for use at assembly, unless otherwise specified. Discard all parts as noted in this document.

## Safety Precautions

Only an ASP should open the MicroTurbine and other equipment connected to the MicroTurbine due to the inherent danger of multiple power sources. Observe and adhere to the following Safety Precautions:

- Verify the inlet fuel supply is shut off.
- Ensure that the MicroTurbine is disconnected from the utility.
- Open the Stand Alone battery circuit breaker, lock in the OFF position, and then unplug the battery cable.
- Ensure above power sources have been turned off and unit has been disconnected for at least 5 minutes to reduce the risk of electrical shock.
- Use a voltmeter to verify that no voltage is present on any electrical terminals.
- Isolate and lock out the utility (if applicable), and any other sources of power.
- Never work on energized equipment.
- Observe all safety precautions to prevent Injury or death.

## Required Tools

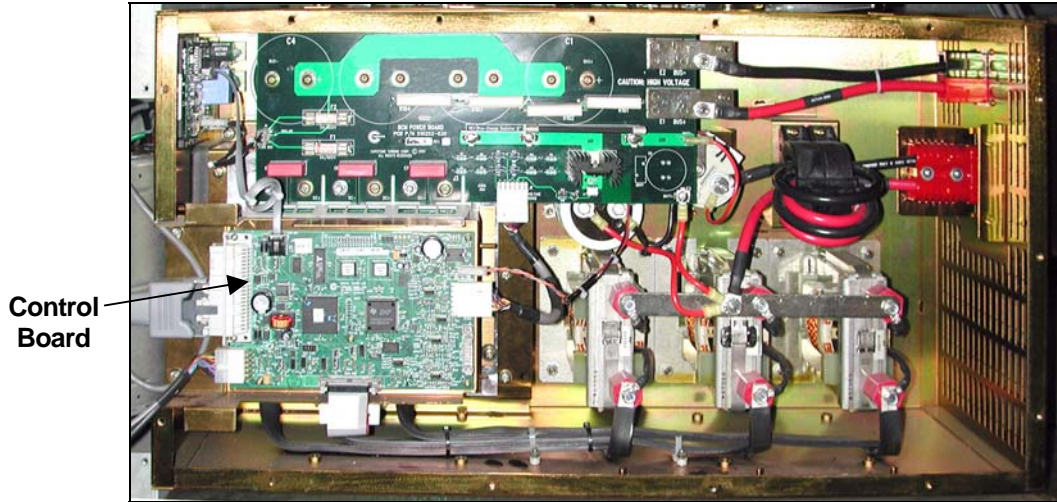
- 10mm socket wrench
- #2 Phillips screwdriver
- Anti-static ground strap

## Removal and Replacement Procedure

Perform the following steps:

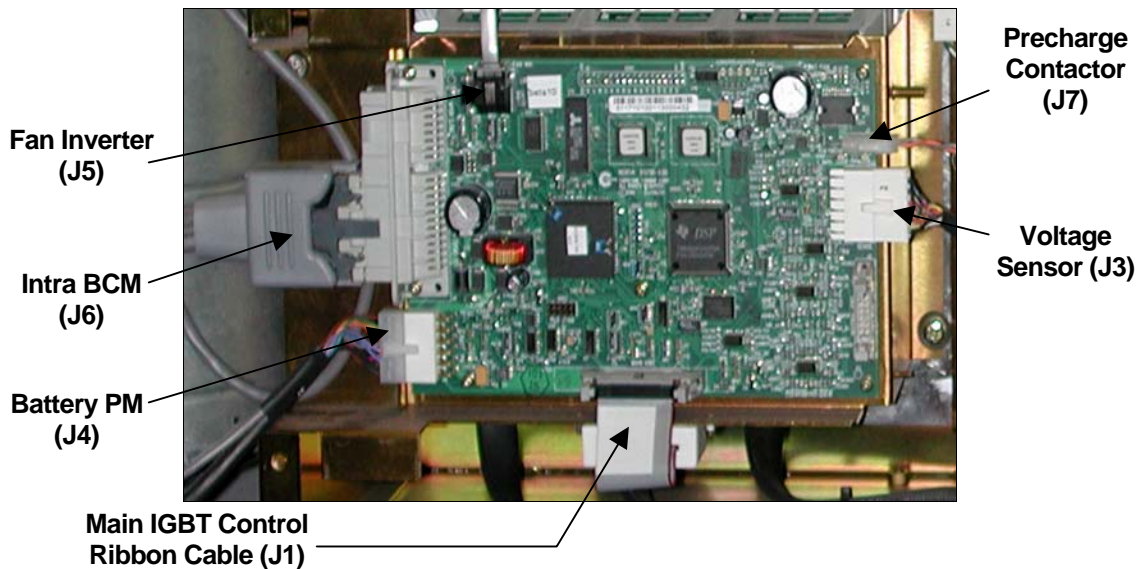
<b>CAUTION</b>	Use an anti-static wrist strap to prevent damage to sensitive electronic components in the BCM Assembly.
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1. Remove the MicroTurbine right-side panel.
2. Remove the BCM package cover using a #2 Phillips screwdriver to detach the 13 flat-head screws (see Figure 2).



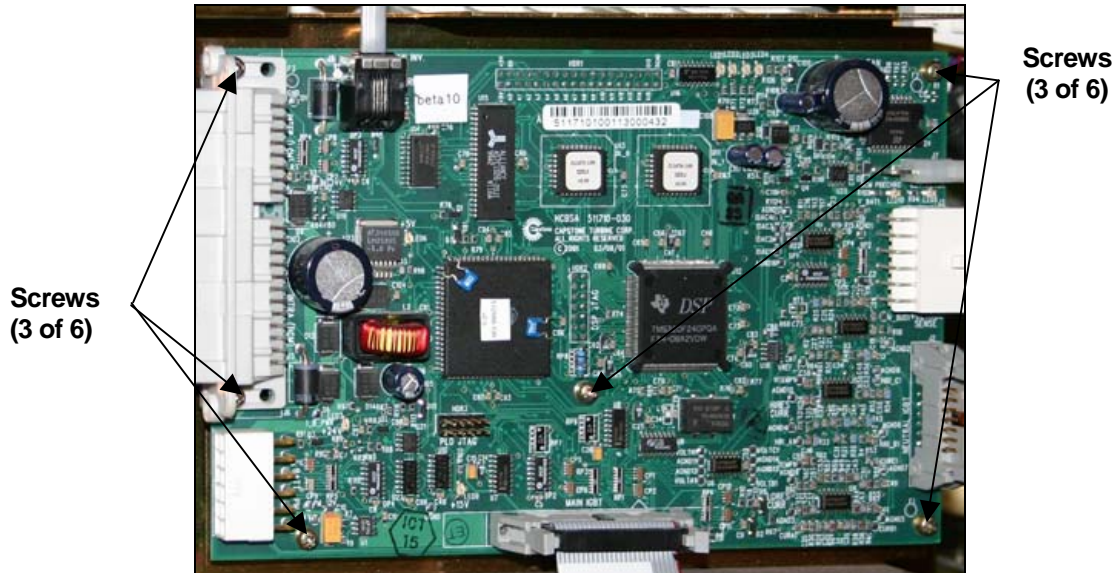
**Figure 2. BCM Assembly (Cover Removed)**

3. Remove the following cable connections: Main IGBT (J1), Intra BCM (J6), Battery PM (J4), Fan Inverter (J5), Voltage Sensor (J3), and Precharge Contactor (J7). See Figure 3 for harness locations.



**Figure 3. Control Panel Connector Removal**

4. Remove the Control Board from the mounting plate by removing six #2 Phillips screws (see Figure 4).



**Figure 4. Control Panel Connector Removal**

5. Install new Control Board. Reinstall all six mounting screws, as some provide necessary grounding.
6. Reconnect all power and communication cables to the Control Board. Verify ribbon cable connection at J1 for the IGBT is secured.
7. The Control Board can be programmed for BCM or LCM software functions. Verify that the PM is programmed properly for the BCM Assembly P/N. Check the configuration using CRMS or the Display Panel. If the BCM assembly P/N does not match that on the physical label on the BCM, reprogram the BCM per CRMS Instructions.

**NOTE**

A 4011 software compatibility fault will be reported if software does not match the device or code set.

8. Verify that the battery controller software installed in the Control Panel matches that of the system code set. Reprogram the battery software if necessary.
9. Test the system for proper operation as detailed in the MicroTurbine User's Manual.

## Responsibility

It is the responsibility of Capstone to make these procedures available to the Authorized Service Providers so they can successfully complete this task.

It is the responsibility of the Authorized Service Providers to read this document, understand its contents, and effectively complete the replacement procedures.

It is the responsibility of the Authorized Service Provider to provide Capstone with a Field Service Report when the replacement task is completed.

## Notifying Capstone Technical Support

If you have additional questions or need further assistance, please call Capstone Technical Support:

### **Capstone Technical Support**

Toll Free Telephone: (877) 282-8966

Service Telephone: (818) 407-3600 • Fax: (818) 734-1080

E-mail: [service@capstoneturbine.com](mailto:service@capstoneturbine.com)

### **Capstone Technical Support (Japan)**

Service Telephone: (818) 407-3700 • Fax: (818) 734-1080

E-mail: [servicejapan@capstoneturbine.com](mailto:servicejapan@capstoneturbine.com)