



Work Instructions

ECM Brake Resistor Retrofit Kit Installation

Model C60 MicroTurbine

Purpose and Scope

This document provides procedures for the installation of an ECM Brake Resistor Retrofit Kit on an existing Capstone Model C60 MicroTurbine System (Grid Connect or Stand Alone).

Guidelines

This document presents information sufficient to allow an Authorized Service Provider (ASP) to properly install the Model C60 ECM Brake Resistor Retrofit Kit (610090-100).

Retain all parts removed for use at installation, unless otherwise specified. Discard parts if 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 that the inlet fuel supply is shut off.
- Ensure that the MicroTurbine is disconnected from the utility. Isolate and lock out the utility (if applicable).
- Open the Stand Alone battery circuit breaker, lock in the OFF position, and then unplug the battery cable.
- Isolate and lock out any other sources of power to the MicroTurbine. For example, connections to the solid state relays in the MicroTurbine Communications Bay.
- Using a voltmeter, verify that no voltage is present on any electrical terminals.
- Never work on energized equipment.
- Ensure above power sources have been turned off and unit has been de-energized for at least five minutes to reduce the risk of electrical shock.

Material Information

Items listed below are contained within the Model C60 ECM Brake Resistor Retrofit Kit (610090-100).

Part Number	Description	Qty
517965-001	ECM Brake Resistor Assembly, 6.7 Ohms, 2900 W	1
518013-001	Label, ECM Brake Upgrade, Grid Connect	1
518014-001	Label, ECM Brake Upgrade, Stand Alone	1
510905-407	CDASSY, DNLD/SYS CODE, C60 VER 4.24	1
510376-116	CDASSY, PM PROGRAM, DIST, VER 2.09	1
440107-001	Work Instructions - ECM Brake Resistor Retrofit Kit Installation – C60	1

Recommended Tools

Use the Capstone's Recommended Tools (400003) or equivalent to perform procedures listed in this document.

Brake Resistor Removal and Replacement

Perform the following steps to replace the ECM Brake Resistor Assembly.

1. Remove the MicroTurbine left-side panels to gain access to the ECM.
2. Remove the ECM fan cover by removing the two M5 screws using a Phillips screwdriver (see Figure 1).

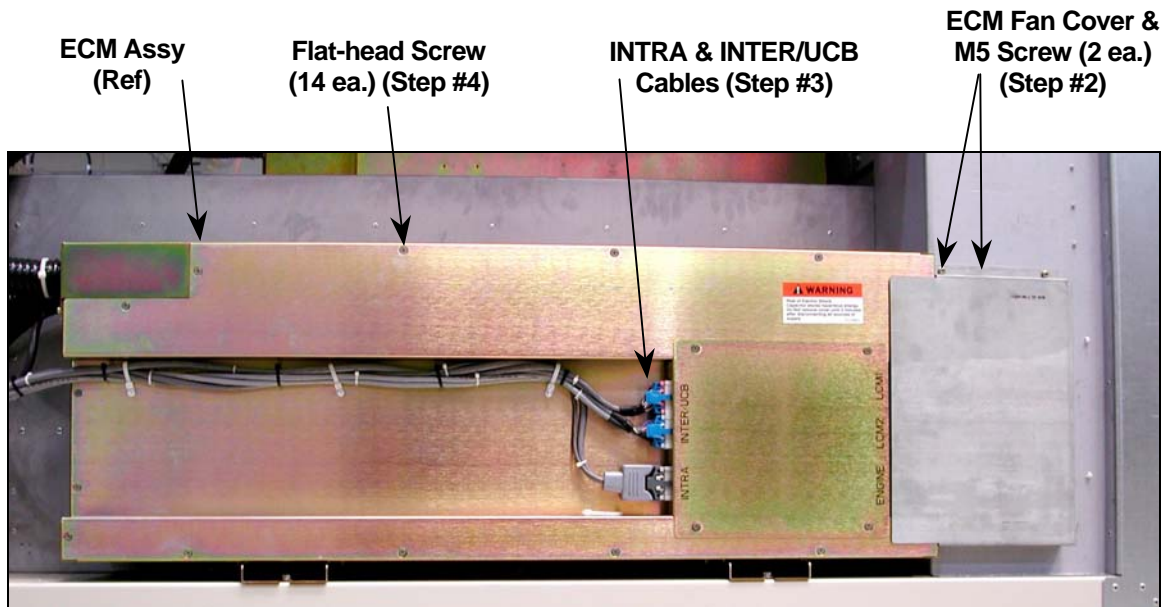


Figure 1. ECM Assembly (Cover On)

3. Remove the three harness connectors INTRA and INTER/UCB from the left side of ECM Control Board (not visible) (see Figure 1).
4. Remove the 14 flat-head screws on the ECM front cover using a #2 Phillips screwdriver (see Figure 1). Then, gently open the front cover towards the left side of the ECM to expose the Brake Resistor Assembly (see Figure 2).
5. Using a voltmeter, verify there is no voltage at the ECM DC Bus terminals (see Figure 2).



WARNING: Failure to verify that no voltage is present at the DC Bus terminals may cause personal injury or death.

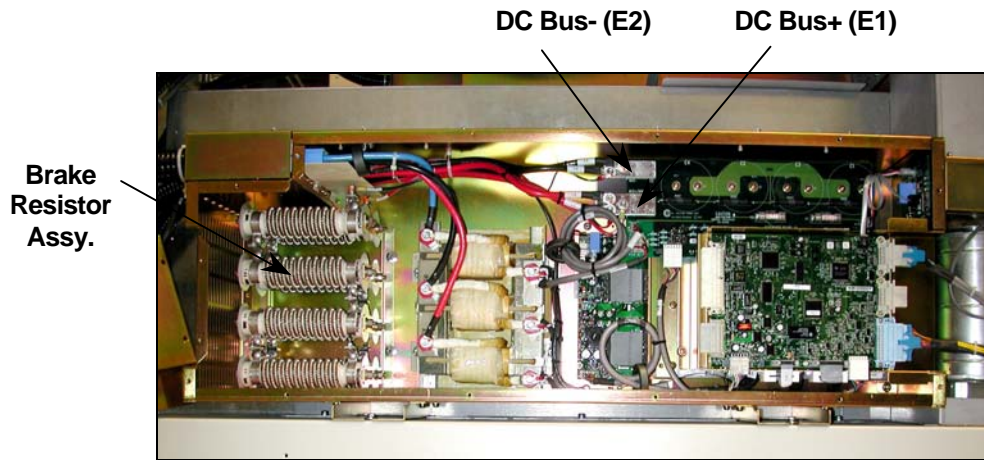


Figure 2. ECM Assembly (Cover Off)

6. Remove the four sets of nuts and washers (two on each side) that hold the Brake Resistor Assembly in place using a 10 mm socket wrench (see Figure 3).

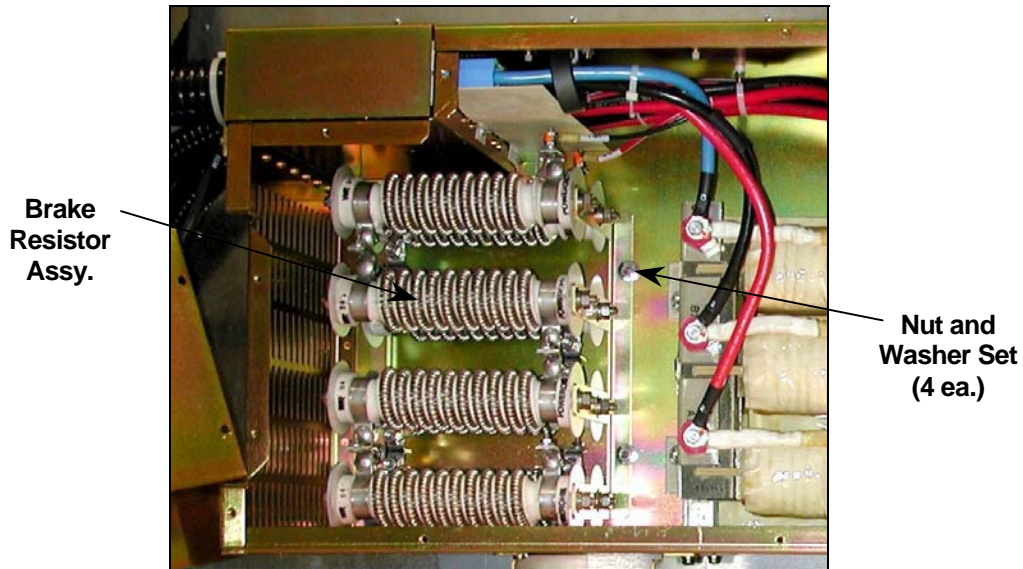


Figure 3. Removing Brake Resistor Assembly

7. Gently, pull the resistor assembly forward to clear the studs, and then lower it slightly to access the two terminals at the top right side of the resistor assembly (see Figure 4). Note that a black wire is connected to the front terminal and a red wire is connected to the rear terminal.

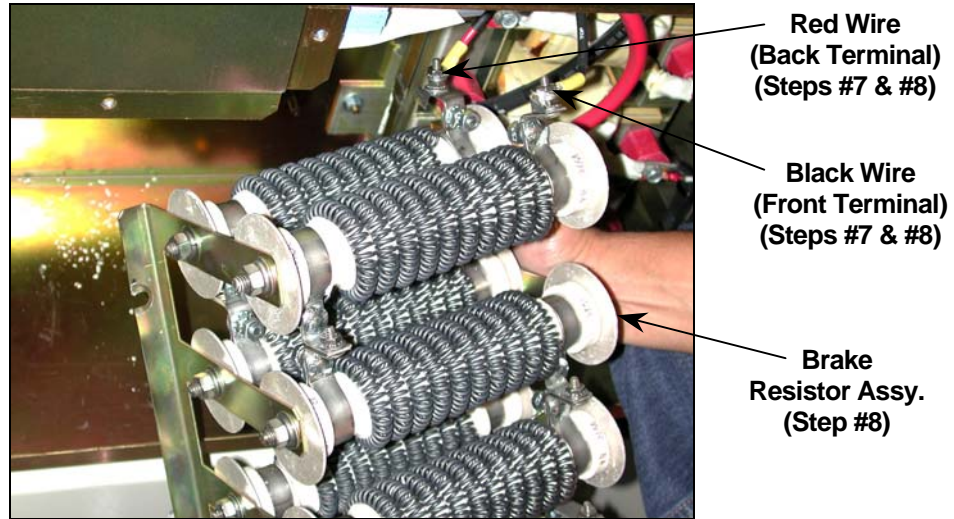


Figure 4. Accessing Wiring Terminals

8. Remove the two 10-24 nuts (see Figure 4) using a 3/8-wrench, and disconnect the red and black wires. Remove the Brake Resistor Assembly and discard it.
9. Install the new Brake Resistor Assembly in reverse order. Apply the following torque values as you tighten the various parts:
 - 30 lb-in on each terminal for tightening the black and red wires.
 - 66 lb-in on each of the four nuts for securing the Brake Resistor Assembly.
10. Apply the appropriate label over the PN: 51xxxxxx portion of the existing label on the ECM to reflect the new ECM configuration (see Figure 5). Note that two labels are included with the kit, one for the Grid Connect and one for the Stand Alone ECM.

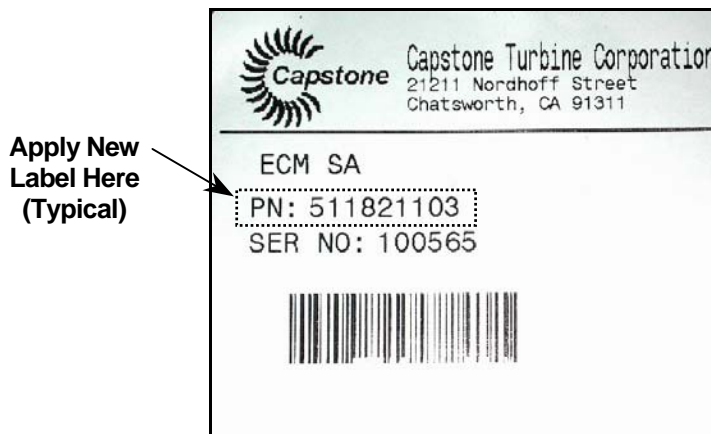


Figure 5. Applying the New Label

11. Re-install the ECM front cover. Apply 35 lb-in torque on each of the 14 flat-head screws.
12. Reconnect the three harness connectors INTRA and INTER/UCB to the left side of ECM Control Board.
13. Replace the MicroTurbine left-side panels.
14. Turn on power and fuel supply.
15. Install v4.24 system software from the CDASSY onto the MicroTurbine.
16. Copy the v2.09 PM programmer software files from the CDASSY (Software, PM Program, Config File, v2.09) into the CRMS PM directory (Default - C:\Capstone\PM) on your computer, and overwrite existing files.
17. Reprogram ECM PM to reflect the updated ECM Assembly configuration. Note that the new ECM Part Number must be used during the re-program process - since the new features of the control software are activated only after the new ECM Part Number is programmed into the ECM PM. Refer to the CRMS Manual, Maintenance Edition, "PM Uploading", Chapter 8 (410014), for detailed PM Write instructions.
18. Test the system for proper operation as detailed in the MicroTurbine User's Manual (400001).

Notifying Capstone Customer Service

Upon completion of the ECM Brake Resistor retrofit kit installation, notify Capstone Technical Support as follows:

1. Complete a Field Service Report. Include the MicroTurbine serial number and part number located on the nameplate at the rear of the enclosure.
2. Send the completed Field Service Report (via e-mail or fax) to Capstone Technical Support as follows:

Capstone Technical Support

Telephone: (818) 407-3600

Facsimile: (818) 734-1080

Toll Free Telephone: (877) 282-8966

E-mail: service@capstoneturbine.com

Capstone Technical Support - Japan

Telephone: (818) 407-3700

Facsimile: (818) 734-1080

E-mail: servicejapan@capstoneturbine.com