

Constant Fan Tips

The comfort level and air quality of the living space can be significantly enhanced by encouraging the homeowner to select continuous air circulation between calls for cooling or heating. An ECM makes constant fan more practical because of its high efficiency, low noise, and low-speed operation.

Service Help Online

A company study showed that the number one cause of failure for the GE ECM is "no problem found," meaning a good motor was replaced in an attempt to solve the real problem. To help you avoid costly guesswork, GE ECM has put together the Dealer Toolbox™, an online resource where you can learn about the motor as well as our new sales and diagnostic tools.

Go to www.thedealertools.com



GE ECM

By Regal-Beloit



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GE ECM™ Home Comfort Guide



WARNING

Disconnect power from HVAC system before removing or replacing connectors or servicing motors. Wait at least 5 minutes before opening the motor after power has been disconnected to allow the motor capacitors to dissipate.

WORKING ON THE MOTOR WITH POWER CONNECTED MAY RESULT IN ELECTRICAL SHOCK OR OTHER CONDITIONS THAT MAY CAUSE PERSONAL INJURY, DEATH OR PROPERTY DAMAGE.

Important Service Tip:

Do not automatically assume the ECM has failed. Check the motor with the TECMate PRO™ and troubleshoot the system controller, wiring and connections before replacing the ECM.

First

Use this guide to check:

- The ECM and control
- Electrical connections
- System installation

If you must replace the control module, then be sure to use a direct replacement from the original equipment manufacturer (OEM). ECM control modules are OEM factory programmed for specific OEM applications. **Use of the wrong control module voids all product warranties and may result in improper or no blower operation.**

Finally

If a check of the control module indicates replacement is required, then also check the motor module. Installing a new control on a failed motor will result in the new control failing also.

GE ECM

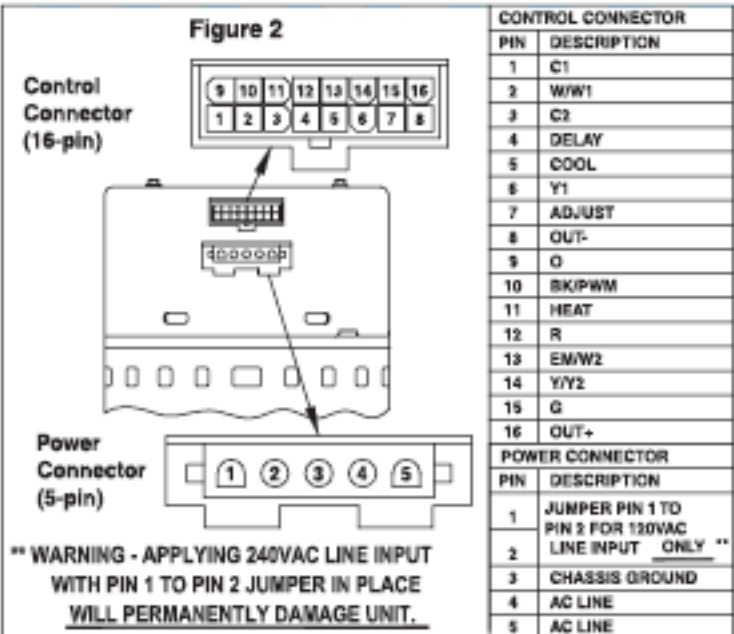
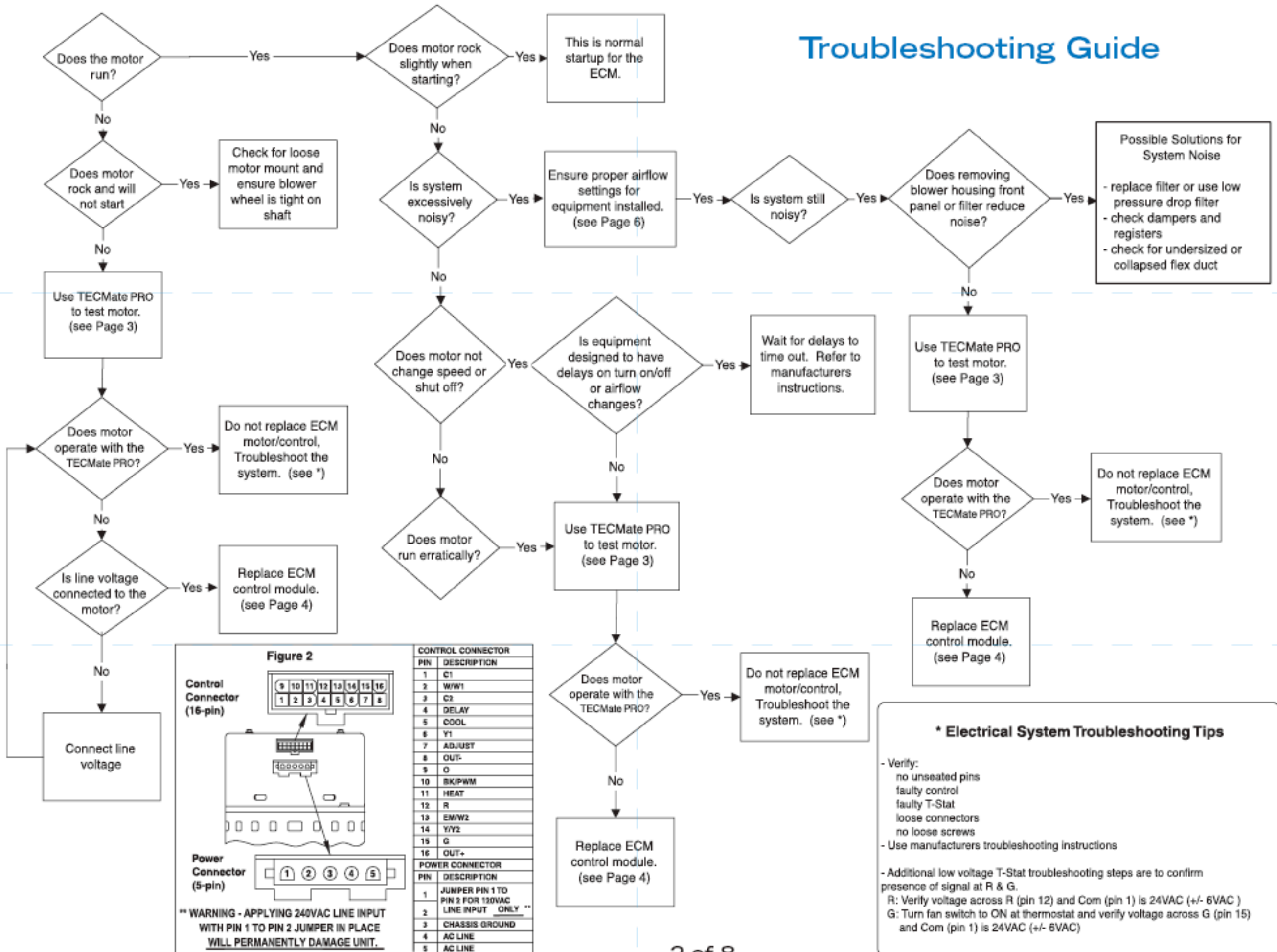
Home Comfort Guide

The purpose of this booklet is to provide you with guidelines for delivering the ultimate in comfort to your customers. It also gives instructions for troubleshooting GE ECM-driven systems.

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Troubleshooting Guide



*** Electrical System Troubleshooting Tips**

- Verify:
 - no unseated pins
 - faulty control
 - faulty T-Stat
 - loose connectors
 - no loose screws
- Use manufacturers troubleshooting instructions
- Additional low voltage T-Stat troubleshooting steps are to confirm presence of signal at R & G.
 - R: Verify voltage across R (pin 12) and Com (pin 1) is 24VAC (+/- 6VAC)
 - G: Turn fan switch to ON at thermostat and verify voltage across G (pin 15) and Com (pin 1) is 24VAC (+/- 6VAC)

Troubleshooting with the TECMate PRO™

ECMs are used in one of two modes: Thermostat Mode or Variable Speed Mode. Thermostat Mode is controlled by a 24VAC signal usually from a thermostat. Variable Speed Mode is controlled by a Pulse Width Modulating (PWM) signal. In either mode, the TECMate PRO is capable of identifying a motor control failure versus other HVAC system controller or wiring failures.

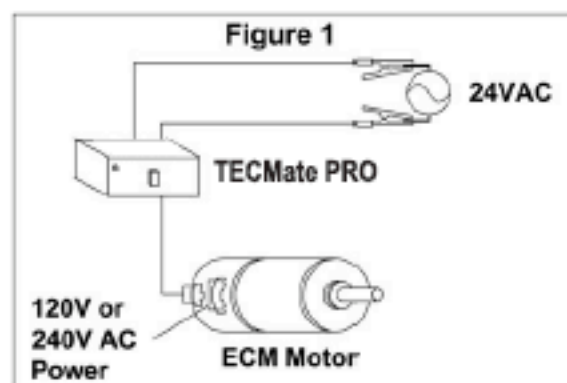
The table on the back of the TECMate PRO provides steps for operating.

1.

CAUTION

Disconnect AC power from the system being serviced and wait 5 minutes before opening motor.

2. Remove the 16-pin connector from the motor, and connect the 16-pin connector from the TECMate PRO to the motor. Do not disconnect the 5-pin AC power connector from the motor (see Figure 1).



CAUTION

Do not operate motor without blower wheel attached. Such operation will cause the motor to oscillate up and down.

3. Connect the two alligator clips from the TECMate PRO to a 24VAC source.
4. Place the switch on the TECMate PRO in the OFF position.
5. Reconnect AC power to the system.
6. Place the switch in the ON position and the LED light should illuminate when connected properly to 24VAC. Observe the motor for 15 seconds. (Refer to the Table on back of the TECMate PRO for operation guidelines.)

- If the motor starts with the TECMate PRO, then the system malfunction is not caused by an ECM control problem. Refer to the Troubleshooting Guide on page 2 for help in diagnosing the system malfunction.
- When finished testing, place the switch in the OFF position and wait for the motor to completely stop. (Based on the OEM program, sometimes the motor will not shut off immediately after a test; this is normal.)
- If the motor does not start with the TECMate PRO, then proceed to replace the electronic control module in accordance with the instructions below. **Note: before replacing the electronic control module, you must test the motor module to ensure it is not also damaged. Procedures for testing the motor module are included in “Replacing the ECM Module” instructions below.**

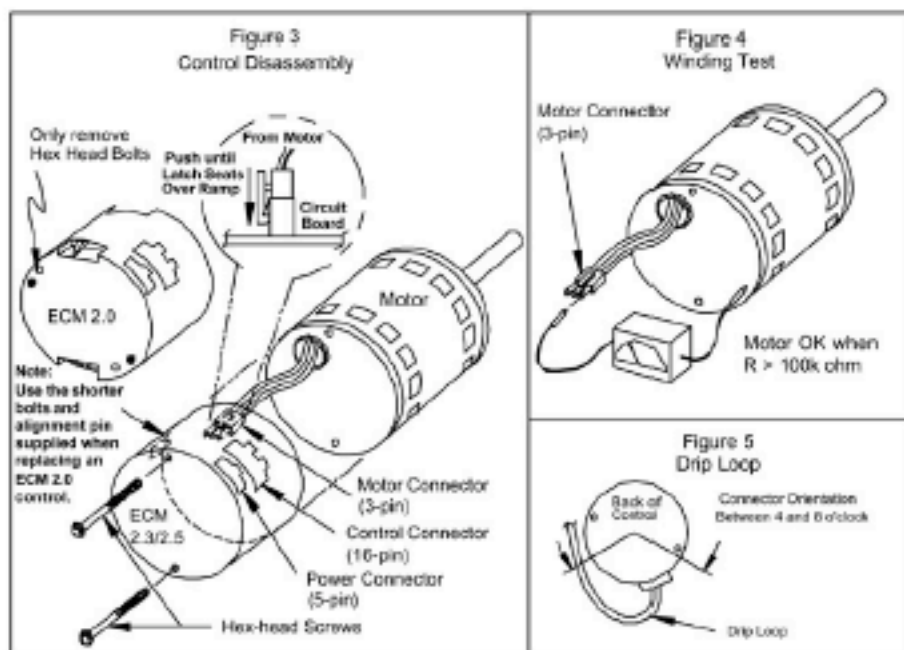
Replacing the ECM Control Module

⚠ WARNING

You must have the correct replacement module. USING THE WRONG MODULE VOIDS ALL PRODUCT WARRANTIES AND MAY PRODUCE UNEXPECTED RESULTS.

⚠ WARNING

Disconnect AC power from the HVAC system and wait 5 minutes before opening motor to avoid electrical shock from the motor's capacitors.



1. Unplug the 16-pin connector and the 5-pin connector from the motor control (see Figure 3).
2. Remove the blower assembly from the HVAC system.
3. Remove the two (2) hex-head screws from the back of the control (see Figure 3).
4. Unplug the 3-pin connector from inside the control by squeezing the latch and gently pulling on the connector (see Figure 3).
5. Ensure the motor module is not damaged by performing two simple tests:

Test A -- measure resistance between each of the 3 motor leads to the unpainted part of the endshield (see fig. 4); if the motor fails (i.e. resistance <100k ohms), then replace the motor module with the equivalent; if motor passes (i.e. resistance >100k ohms) then perform Test B.

Test B -- measure motor phase-to-phase resistance by checking these combinations of the 3-pin motor connector with an ohmmeter: lead 1 to lead 2; lead 1 to lead 3; & lead 2 to lead 3. Resistance values should be in the ranges indicated below:

MOTOR Hp RATING	RESISTANCE (Ohms)
3/4 and 1	2 to 3.3
1/2	5 to 7
1/3	4 to 5.2

If measured resistance is outside the range, then the motor module needs to be replaced with an equivalent.

6. Insert the 3-pin connector back into the new control module. A slight click will be heard when inserted properly (see Figure 3).
7. Attaching the new control module:
 - (a) If replacing an ECM 2.0 control with an ECM 2.3 control, insert plastic tab into perimeter of replacement control and align tab with mating hole in the end shield. Use the new shorter bolts provided to ensure a secure attachment. Orient the control connectors to the end shield between 4 & 8 o'clock, insert bolts and tighten (see figure 5).

- (b) If replacing an ECM 2.3 with an ECM 2.3 control, orient the new control to the motor's end shield with connectors facing down, insert bolts and tighten.
8. Reinstall the blower/motor assembly into the HVAC system by following the manufacturer's guidelines.
 9. Plug the 16-pin connector and the 5-pin connector back into the motor. **The connectors are keyed. Observe proper orientation.**
 10. **Be certain to form a drip-loop so that water cannot enter the motor by draining down the cables (see Figure 5).**
 11. Final installation check. Ensure the system is set up as follows:
 - (a) Verify the condensate drain is not plugged or clogged.
 - (b) Reconnect the AC power to the HVAC system and verify that the new motor control module is working properly.
 - (c) Check and plug leaks in return ducts and equipment cabinet.
 - (d) The system should run quietly and smoothly.

Note: If this is a repeat failure, then it is important that you check the following:

- Any evidence of moisture requires correcting the issue.
- If this area is subject to high amounts of lightning strikes, the use of additional transient protection may be helpful. Visit www.thedealertoolbox.com to learn more.

Ultimate Comfort Setup Guidelines

The GE ECM provides a wide array of programming options that makes it easier to optimize homeowner comfort.

Basic Steps to Ultimate Comfort

1. Perform a room-by-room load calculation using ACCA Manual J.
2. Select the properly sized equipment to deliver the expected comfort and efficiency.
3. Keep static pressure to a minimum. Design ductwork for minimum static and maximum comfort. Look for and recommend ductwork improvements where necessary.

4. Recommend high efficiency, low static filters and recommend keeping the filters clean.
5. Select the proper cooling airflow to match the system tonnage using the identified switches or jumpers on the system control board.
6. If needed, make airflow adjustments to further optimize comfort using the trim selection on the system control board.

Heating Tips

Furnaces are typically factory set to operate at the middle of the heating rise range. Verify that the heating airflow setting is correct per the manufacturer. Field adjustments are available to the installer to optimize comfort. To understand what heating airflow adjustments are available and how to select those settings, refer to the manufacturer's installation manual.

Cooling Tips

Furnaces and Air handlers are typically factory set for the highest available cooling airflow. It is important to first select the proper airflow setting on the system controller to match the cooling tonnage and then if necessary, adjust the trim setting to optimize comfort. Refer to the manufacturer's installation manual on how to make system airflow and trimming adjustments.

Dehumidification Tips

For situations where high humidity is a problem, the ECM can be connected to operate at a reduced airflow to significantly improve dehumidification. This can be achieved by either connecting a standard humidistat to the system controller or by choosing an airflow ramp profile that will best fit the dehumidification needs of the installation. The blower control board arrives in the field with factory settings. Install a humidistat or select the airflow ramp profile that best meets the comfort needs of a specific installation and climate.

