

Reducing the Effects of Electromagnetic Interference for the GE ECM™ 2.3 Motor

Electromagnetic Interference (EMI) is any electrical energy that causes interference with the normal operation of an electronic device such as a radio receiver or television. EMI is produced by most electronic appliances as a result of either rapid changes in voltages or the generation of high frequency currents.

The GE ECM™ motor is designed to meet the specification of the US regulatory authority, Federal Communications Commission (FCC), part 15, class B. As a class B device, the ECM motor must meet the most restrictive emission limits under this FCC regulation. The ECM has internal filters that reduce the conductive energy to comply with FCC regulations.

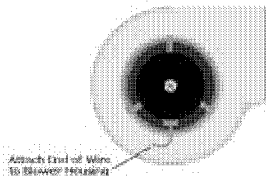
Recommendations for proper installation to minimize motor generated EMI

To date, GE has over 1.5 million ECM units in the field. The very limited number of reported EMI issues is a demonstration of the suitability of the ECM motor in residential and light commercial applications. Although very effective, the ECM's filters cannot completely eliminate EMI emissions. And even EMI levels that are below the FCC limits could cause interference with weak television or radio signals. Proper installation of the ECM motor is crucial to limiting EMI.

To keep the motor EMI to a minimum, follow these installation guidelines:

- 1) **Grounding** - Attach a direct grounding wire from the blower housing to the green grounding wire on the input voltage line via the connection harness. The motor enclosure is internally connected to the connector ground. The green wire of figure 1 shows a typical ground connection from motor to blower housing.

Figure 1



- 2) **Routing of Cables** - Use short wires for power connections. The opportunity for emissions increases in long wires.

- 3) **Thermostat Connections** - Shielded or twisted connections for signal cables are desirable. Use bundled wires for thermostat cables and/or keep them separated as far as practical from TV, radio, or intercom cables.
- 4) **Filtering on Control Signals** - Although this may not be needed, it has been shown that a small filter (capacitor or ferrite bead) connected from thermostat lines to ground will reduce EMI.
- 5) **Cabinet Grounding Considerations** - The metal enclosure of a furnace or air handler should be an effective part of EMI filtering. Sometimes however, the metal panels do not make a reliable interconnection due to poor assembly, installation damage, or corrosion. This allows an increase in the radiated EMI of the system. Reduce this by grounding the cabinet and by keeping good electrical contact between all cabinet panels.
- 6) **Separated Motor and Control** - In applications where the ECM control is separated from the motor, proper grounding of the shielded cable, control housing, and motor is required.

Suggestions to improve TV reception in poor signal strength areas

Remote locations could experience TV interference when the motor operates. This is due to a weakness of the signal from the TV station. The following recommendations have been shown to improve TV reception:

- 1) Check antenna orientation and cable connections. Poor cable connections or cable splitters reduce the signal strength from antenna. The assistance of a local TV installer may be beneficial in checking the installation.
- 2) "Off the Shelf" TV antenna signal amplifiers may be used to increase TV signal strength. This type of amplifier is connected to the residential TV antenna. Radio Shack's High-Gain Antenna-Mounted Signal Amplifier (Part # 15-1109) can be ordered at the following website:
www.radioshack.com



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