Electronically Commuted Motors (ECM) Troubleshooting

No Blower Operation

Check for 24V between XFMR & COM2 on ECM board

If NO, check transformer 240V primary at L1 & L2

If YES, move FAN switch to ON at thermostat. Check for 24V at G & C terminals on ECM board

If NO, thermostat not sending G signal

If YES, remove 16 pin harness from the motor and measure voltage on PIN 15 & PIN 1

If NO, wire harness is defective. Inspect & Ohm wires

If YES, low voltage circuit is good. Move to next step

High voltage unbroken in ECM motor circuit. Check for 208/230V at L1 & L2 (must be within 10% 187/253)

If NO, voltage, check breaker

If YES, disconnect high voltage. Remove 5 pin connector from motor. Restore power & measure high voltage between black & white wires. There should be no jumper between 1 & 2

If YES, the high voltage circuit is good. Disconnect power, wait 5 minutes & separate module from motor

Ohm motor windings on plug. Measure red to blue, red to black, & blue to black. Ohm readings should be within 10% & less than 20 Ohms. Ohm each motor winding to ground. A good motor will test infinite to ground

If YES, Ohms readings are correct, motor is GOOD

If YES, module is defective. Replace module if available. If NOT REPLACE module & motor

If NO, Ohms readings are incorrect, motor windings are defective. Replace motor and module (motor only is not available)

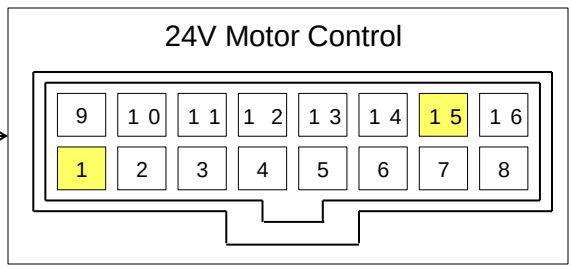
Incorrect Air Flow Or Loud Operation

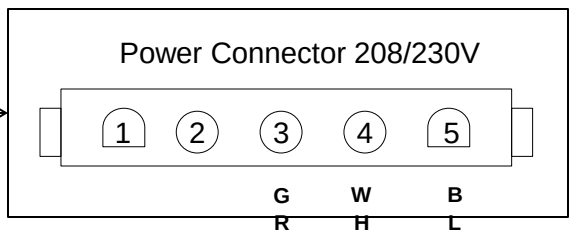
Remove the filter and check that all dampers, grilles and registers are open

Green light flashes once for every 100 CFM. Count flashes

Check dipswitch settings for this unit

NOTE: Motor rocking back & forth when starting is normal. If this is the only symptom, do not replace.





ECM Pin Designation / Functions

Pin	Description	Function	% Speed	Color
1	C1	Common	Blue	Blue
2	W/W1/G	Continuous Air	65	White/Black
3	C2			Jump to Pin
4	Delay			Orange/Black
5	Cool	½ ton speed	80	Green/White
6	Y1	Y1 from Stat	70	Blue/White
7	Adjust	Heat, Comfort	80	Red/White
8	Out			Blue/Black
9	O	Reversing Valve		Orange
10	BK/PWM	Humidistat	85	Black
11	Heat	½ ton speed	80	Green/black
12	R	Power		Red
13	EM/W2	Electric heat	110	White
14	Y/Y2	Heat & Cool	100	Black/White
15	G	Continuous Air	50	Green
16	Out+			Red/Black

Power Connector
208/230 Volts

Pin	Description	Color
1	-	-
2	-	-
3	Ground	Green
4	AC Line	White
5	AC Line	Black

Temporary Heating / Cooling While Waiting for an ECM Replacement

An electronically commuted motor (ECM) is a very expensive component for truck stock. There are two horsepower options (1/2 and 1 horsepower), two rotation (CCW or CW) choices and numerous programming variations. Consequently, few contractors choose to stock them. Unfortunately when an ECM fails, a consumer may be without heat or cool until the part arrives. Here is an easy way to make sure the customer is not without heating or cooling.
A readily available, inexpensive, totally enclosed, direct drive, PSC motor can be wired in temporarily.

Motor Requirements:

- Use a ½ or 1 horsepower motor
    - Notes:
        - A ¾ horsepower will likely work in place of a 1 horsepower
        - 3 ton models and under models use ½ horsepower
- 1075 or 1100 RPM
- 208/230 volt single phase
- 48 frame, 5 5/8" diameter
- Sleeve or ball bearings
- Ring or belly band mount
- Reversible CCW/CW
- Matching capacitor

Installation Steps:

- Disconnect power to the unit.
- Remove the five pin, high voltage plug from the motor.
- Remove the 16 pin wire harness from the ECM board and the motor module.
- Remove the failed ECM module and motor from the blower housing. Using the same motor mount, install the PSC motor.
- Connect high-speed and common wire on PSC motor to the contactor on the T1 and T2 side (by connecting the motor to T1 & T2 terminals, the blower will cycle with a call for heating or cooling). Attach green wire to ground.
- Install and mount the capacitor in a safe location.
- When the new part arrives, re-install the motor and module, package up your emergency motor for future use.

If given a choice, most consumers will pay a premium rather than be without heating and cooling.