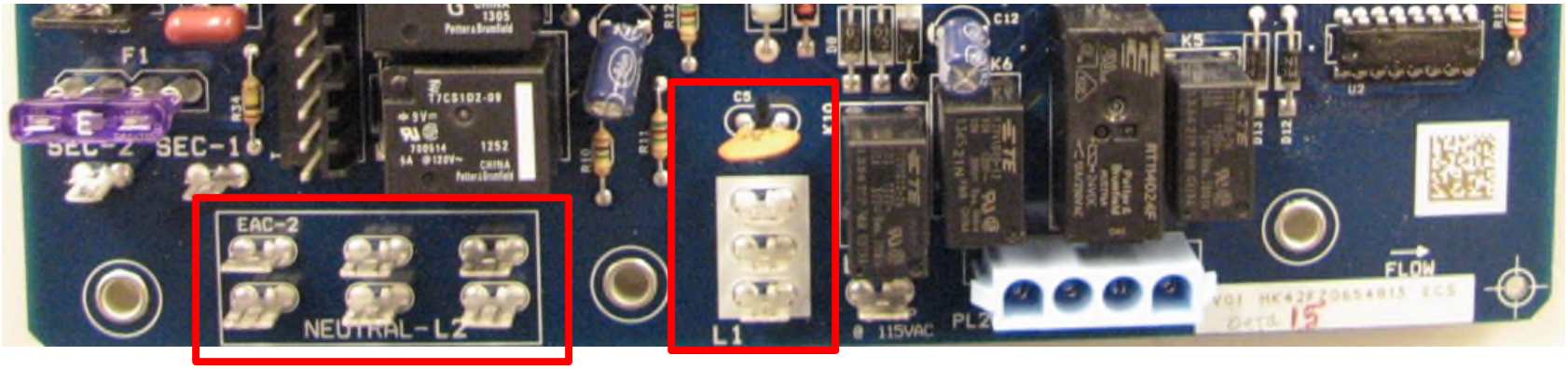
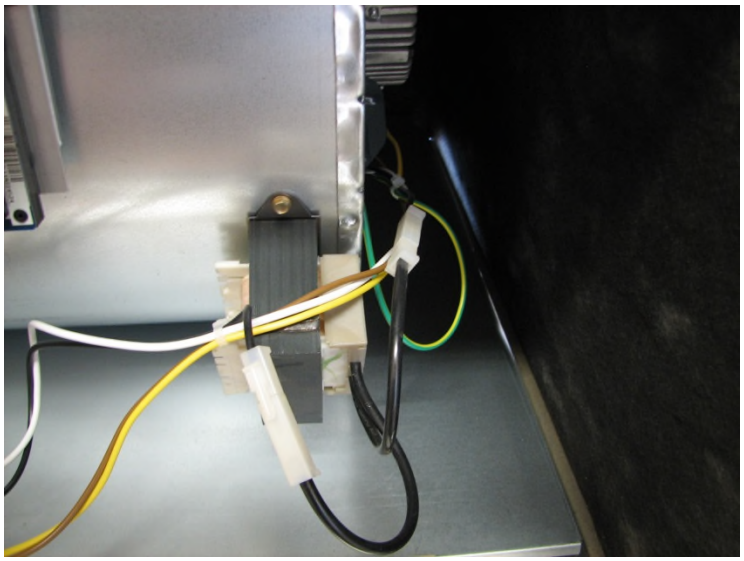
Troubleshooting Blower Motor



- Blower motor has 115 VAC applied to it
- Blower motor is powered whenever the control board has 115 VAC applied to it.
- Blower motor is controlled by a 0 to 15 VDC signal to the motor controller
- Manually close blower door switch.
- Verify 115 VAC power between L1 and Neutral L2
  - Wires at L1 and Neutral L2 removed for clarity
- Verify 24 VAC between R and Com at thermostat terminals
  - (not shown)

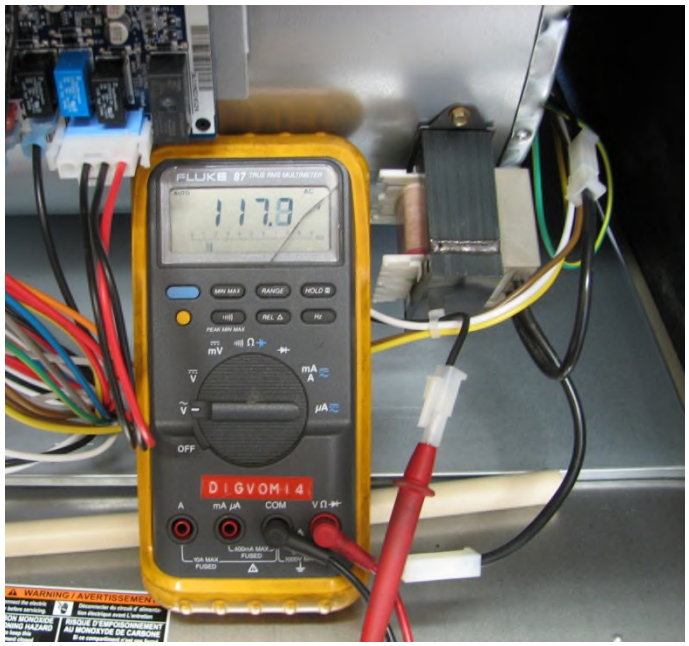
Power Choke

- ¾ hp & 1 hp blowers have a power choke
- Located on blower housing
- Verify 115 VAC to ground on both sides of the power choke
- Power choke may also be bypassed for troubleshooting purposes



Power Choke

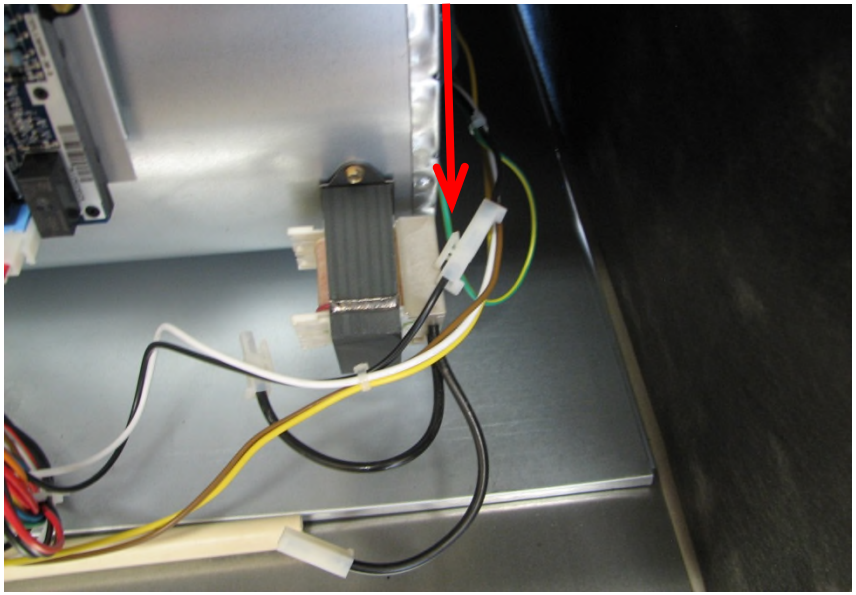
- Open blower door switch
- Disconnect L1 from power choke
- Insert meter probe into L1 harness.
- Close blower door switch
  - Verify 115 VAC power into power choke
- Release blower door switch
- Reconnect L1 to power choke
- Disconnect black lead between power choke and motor
- Insert meter lead into disconnected power choke lead
- Close blower door switch
  - Verify 115 VAC power into power choke
- Release blower door switch
- Reconnect power choke leads



Power Choke-Quick Test

- Power choke may be temporarily bypassed for troubleshooting
- Open blower door switch
- Disconnect power choke between L1 harness and blower motor
- Close blower door switch
- Verify 115 VAC at L1 harness
- Open blower door switch
- Connect L1 harness to blower motor
- Close blower door switch
- Continue with troubleshooting

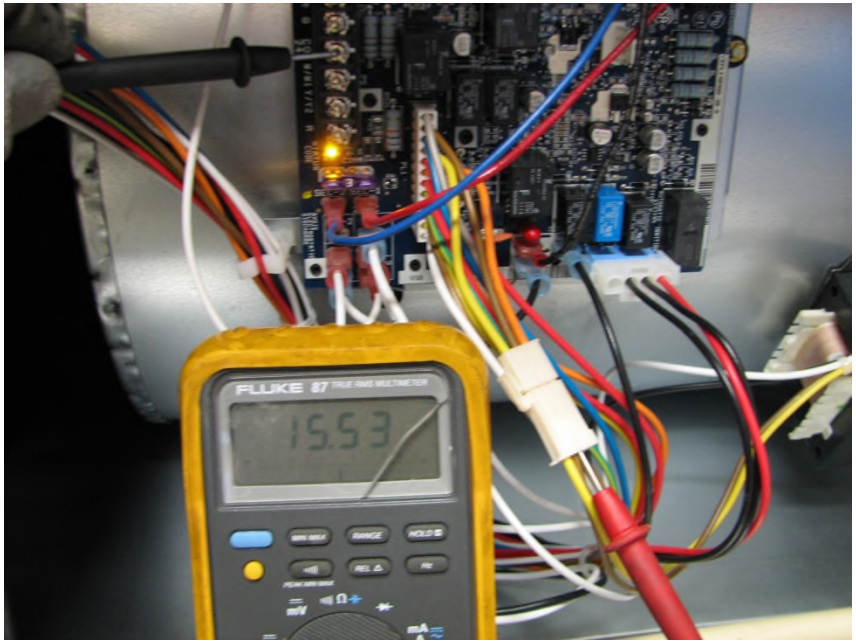
L1 harness connected to blower motor



Remember to reconnect power choke when completed

Checking 15 VDC Power To Blower

- Verify all harnesses are connected
- 115 VAC power ON
- Blower door switch closed
- Meter set to volts DC (VDC)
- Component Self-Test OFF (SW1-6, TST)
- Insert meter probe into the back of brown lead of PL16
- Touch other meter probe to COM on furnace control
- Voltage will be about 15 VDC



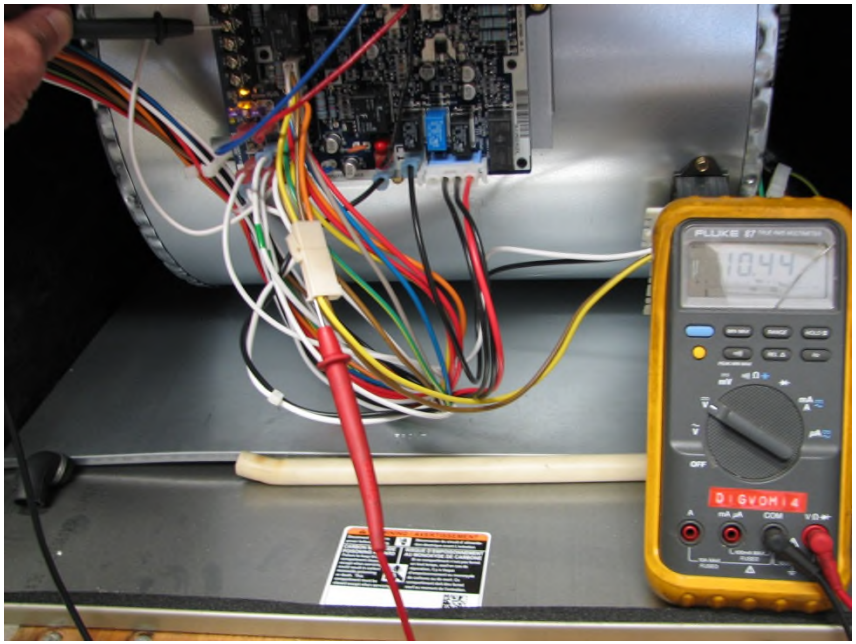
Note: All low voltage troubleshooting is done with PL16 connected and PL13 at blower motor (not shown)

Checking 15 VDC Power To Blower Motor

- 15 VDC is nominal
- May be slightly higher or lower
  - Actual line voltage affects low voltage
  - Meter type or impedance affects reading
- If ranges are way high or low
- Or reading is unstable or scrolling
  - Check harness connectors and pins
  - Clean meter probes
  - Try a probe with a finer point to improve contact inside connector

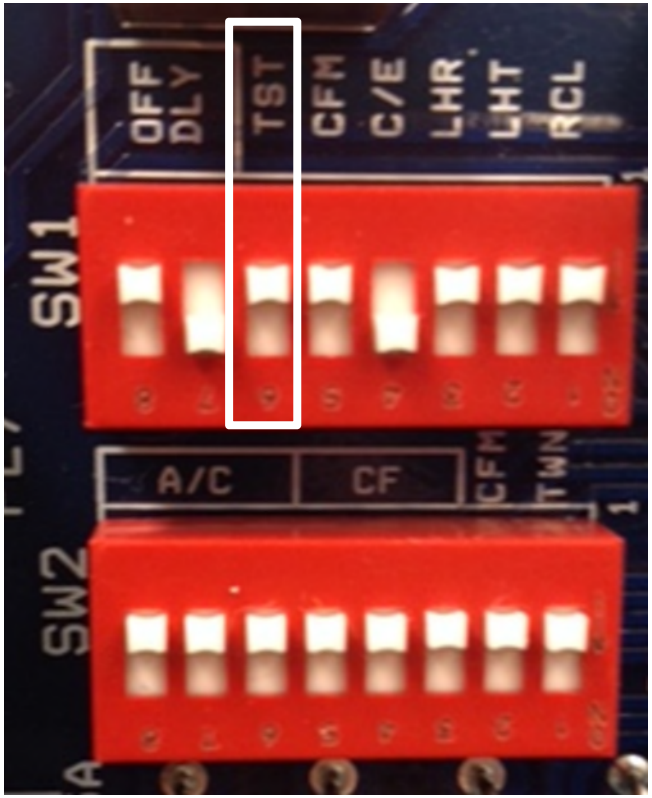
Checking Motor Torque Control Signal To Blower Motor

- 115 VAC power ON
- Blower door switch closed
- Component Self-Test OFF (SW1-6, TST)
- Meter set to volts DC (VDC)
- Insert meter probe into the back of yellow lead of PL16
- Touch other meter probe to COM on furnace control
- Voltage will be about 10 to 12 VDC

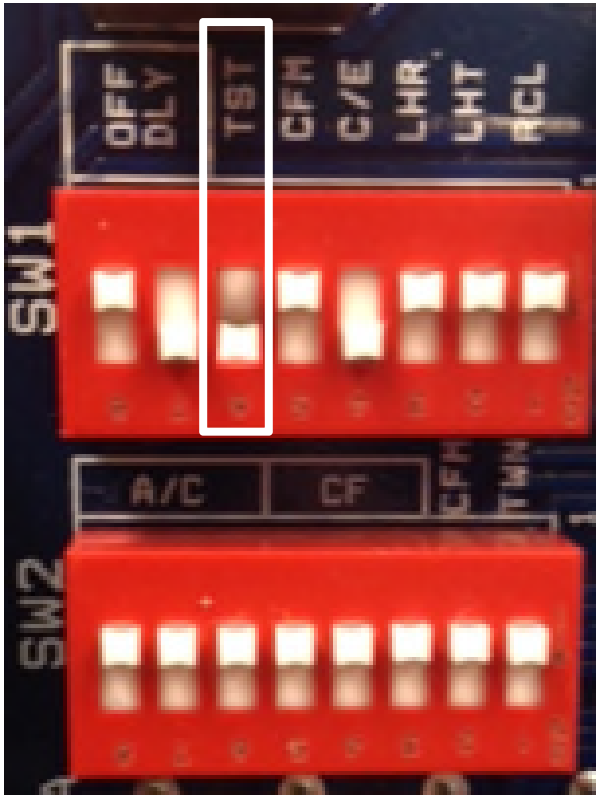


Component Self Test

Component Self Test
SW1-6 (TST)
Switch is OFF



Component Self Test
SW1-6 (TST)
Switch is ON

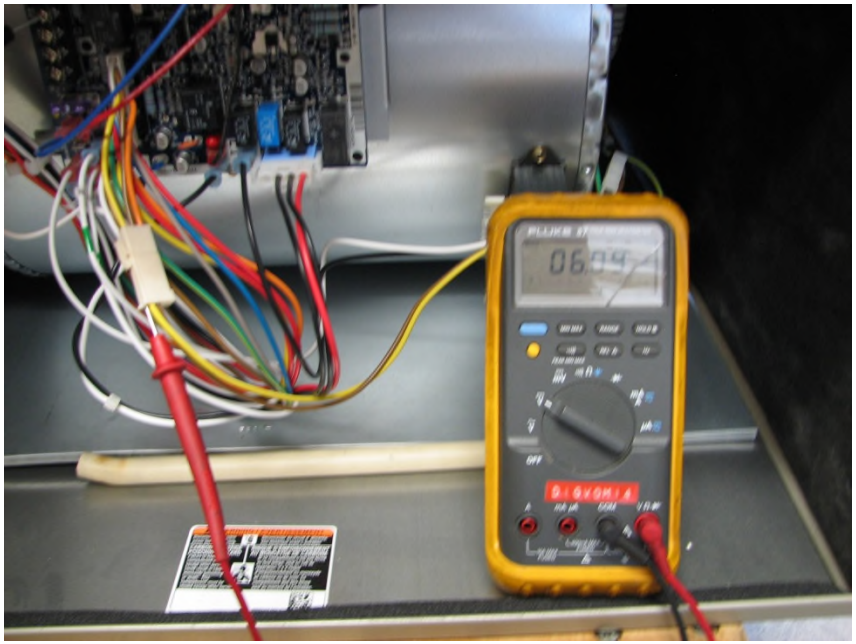


Checking Motor Torque Control Signal To Blower Motor

- Turn Component Self Test ON (SW1-6, TST)
- Meter set to volts DC (VDC)
- Meter probe remains in the back of the yellow lead of PL16
- Touch other meter probe to COM on furnace control
- Initially, voltage will be about 10 to 12 VDC as Component Self Test Starts

Checking Motor Torque Control Signal To Blower Motor

- Voltage remains constant on the yellow lead of PL16
- Until Component Self Test starts the main blower
  - After approximately 25 seconds
  - After hot surface igniter turns off
- As blower starts
  - Voltage on PL16 will quickly drop
- Nominal voltage on yellow lead of PL16 decreases to 6 to 8 VDC
  - Voltage is stable until blower shuts down
- Voltage increases to 10 to 12 VDC when blower turns off
  - About 15 seconds after blower starts



Motor Control Voltages During Component Self Test

1. Remove blower door.
2. Remove the wire from the thermostat “R” terminal from the control board or disconnect the communication connector from the control board
3. Turn Setup Switch, SW1-6 (TST) “ON.”
4. Manually close blower door switch.

Function during Component Self Test after SW1-6 turned “ON”	Start Time	End Time	Voltage	
	0 Sec	0 Sec	Yellow wire of PL16 to Com	Brown wire of PL16 to Com
Inducer starts in high speed and stays running	0 Sec	10 Sec	10 to 12 VDC	15 VDC
Hot surface igniter turns on	10 Sec	25 Sec	10 to 12 VDC	15 VDC
Blower motor turns on at 50% PWM	25 Sec	40 Sec	6 to 8 VDC	15 VDC
Inducer shifts to low speed	40 Sec	50 Sec	10 to 12 VDC	15 VDC
Inducer turns off	50 Sec	50 Sec	10 to 12 VDC	15 VDC

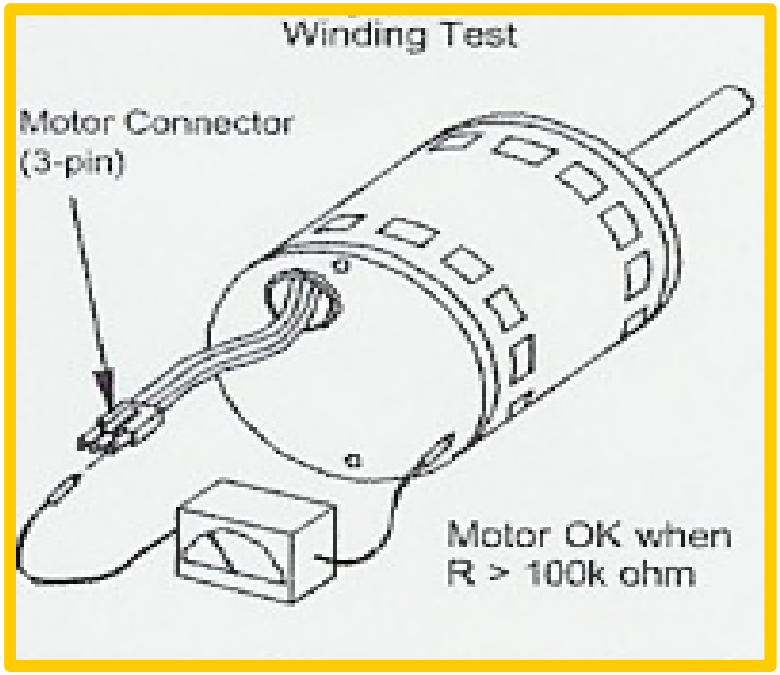
Have Line and Control Voltage to Motor – Does Not Run

- Separate electronic control module from motor
- Warning power down 5 minutes prior to separating motor

Courtesy of Genteq

Testing Motor Test “A”

- Three Phase Style Windings
- Ohm each of the three motor leads to unpainted part of end shield
- Resistance test to ground should be over 100K ohms
- Replace Motor if under 100K
- Motor passes perform TEST “B”



Courtesy of Genteq

After Component Self Test

- Remove lead from PL16
- Turn SW1-6 (TST) “OFF”
- Reconnect thermostat “R” lead or communication connector
- Disengage blower door switch
- Re-install outer doors
- Verify furnace operation