

Having the correct troubleshooting tools and diagnostic processes are key best practices towards delivering the best customer service.

Did you know:

- Troubleshooting test kits sales YOY for indoor motors have decreased
- Testing continues to find “No Fault Found” motors returned from field
- Highest percentage for warranty indoor motors occurs in July and August
- Dealers return and perform additional warranty work 1 out of 5 times within one year on motors replaced in July and August

The guide is condensed to provide quick steps to help ensure the motor and blower control board are not prematurely condemned. Three specific areas are addressed:

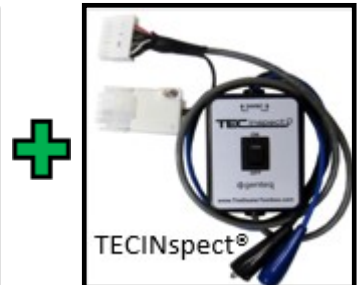
- Diagnostic tools
- Diagnostic processes
- Available training resources

Covering four specific motor types:

- Permanent Split capacitor (PSC)
- Constant Torque (CT)
- Electronically Commutated Motor (16 Pin)
- Electronically Commutated Motor (Serial Port)

Wiring configurations and system designs may change. Always consult your local FSR for the most current troubleshooting guides for your specific application.

| | | | |
|---|----------|---|----------|
| TEM6A0B24H21SAA 19143XXX3V | | TAM7AOC36H31EAA 16051XXXAV | |
| C-205XX564 | CNT03600 | C-205XX556 | CNT07750 |
| | MOT15029 | C-210XX66 | MOT14416 |
| C-205XX562 | CNT3600 | C-2133XX00 | CNT07750 |
| | MOD02654 | C-212XX366 | MOT14416 |
| | WIR07781 | C-212XX283 | CNT07690 |
| C-206XX319 | CNT3600 | | CNT07750 |
| | WIR07781 | | WIR07410 |
| C-210XX922 | CNT3600 | C-212XX818 | WIR06727 |
| | MOT16925 | C-212XX383 | CNT06628 |
| C-213XX931 | CNT03600 | C-213XXX78 | WIR07385 |
| | TRR01122 | | |
| C-213XX935 | MOT16925 | | |
| C-214XX138 | COL25334 | | |
| | VAL11798 | | |
| C-216XX609 | MOT16925 | | |
| | | TEM6A0C36H31SBA 20232XXX3V | |
| | | C-214XXX85 | CNT03600 |
| | | C-21XXX057 | MOT18589 |
| | | C-21XXX895 | CNT03600 |



Any quality multimeter is adequate

TOL02588 is recommended.

Other test kits are available.

Scan the QR Codes for addition troubleshooting information or login into Technical eLearning for more advanced motor courses:

Permanent Split Capacitor

PSC Motor


Checking Run Capacitors

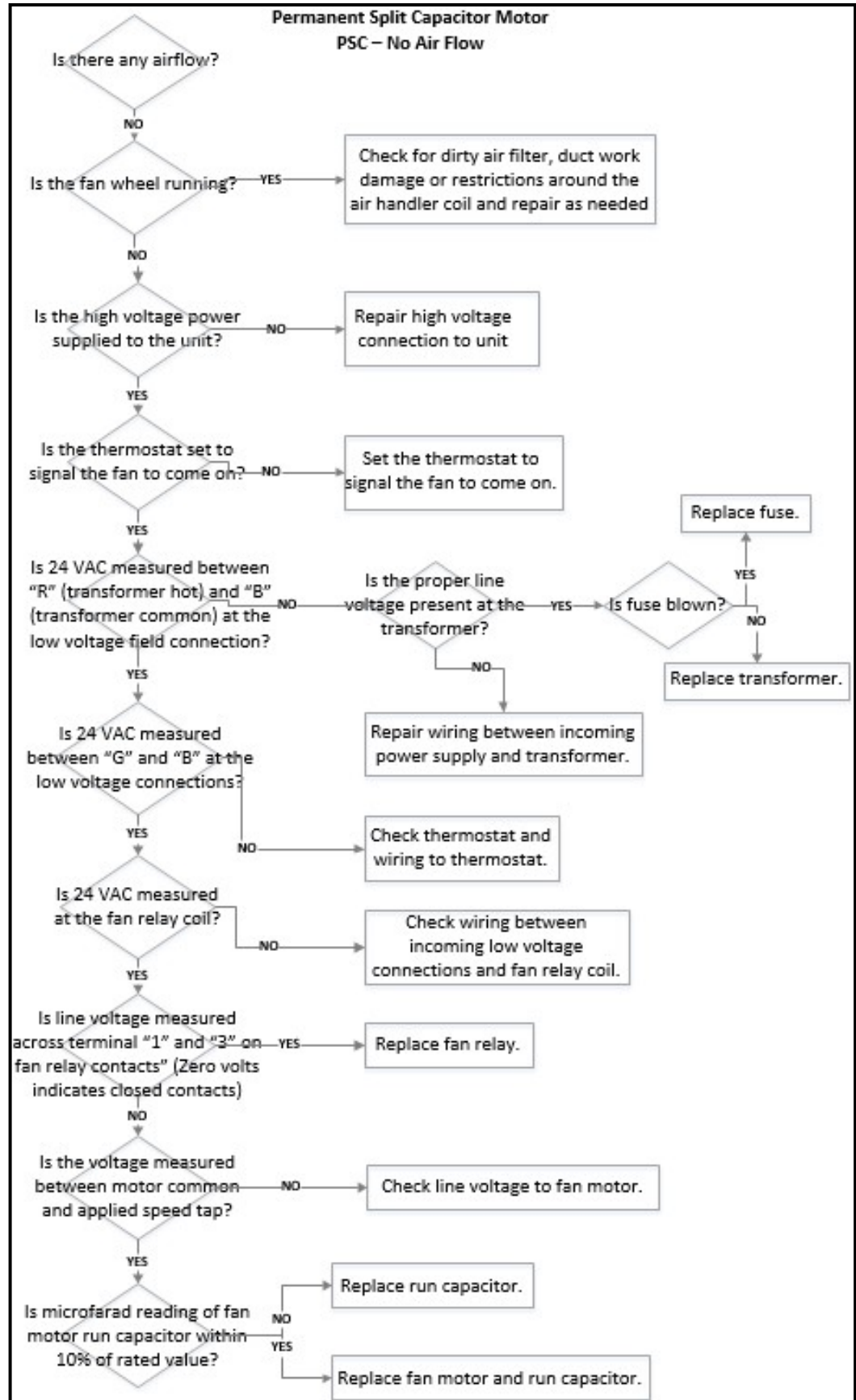
Run capacitors should be replaced with a capacitor of equal microfarad rating. The replacement capacitor working voltage must be equal to or higher than the original capacitor.

The best test on a suspect bad capacitor is substitution with a known good capacitor of equal microfarad and voltage rating.

Visually check suspected faulty capacitors for oil leaks, loose terminals and bulging or disfiguration of the capacitor case. Replace the capacitor without further tests if any of these symptoms exist.

Check the equipment wiring diagram for the correct capacitor mfd, and voltage rating. This information is provided on some diagrams or printed on the capacitor.

Newer multimeters generally have a microfarad feature to quickly assess if the run capacitor is within $\pm 10\%$ of the manufacturer's specifications at 25°C (77°F).

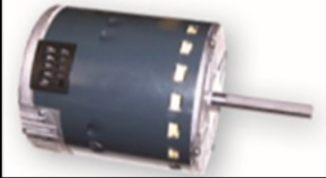

Microfarad Setting


Constant Torque Motor

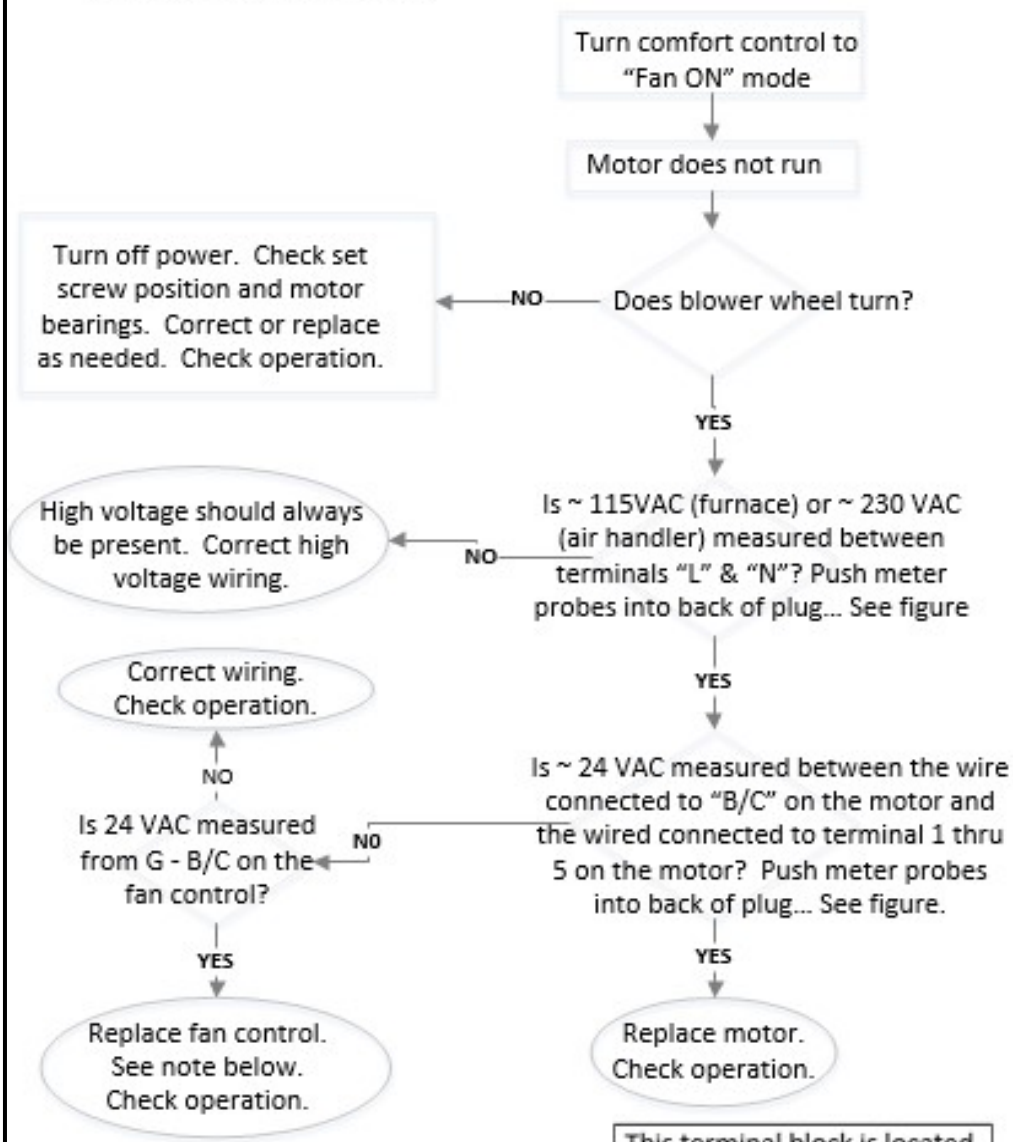
Diagnostic option

- Go/ No Go Test

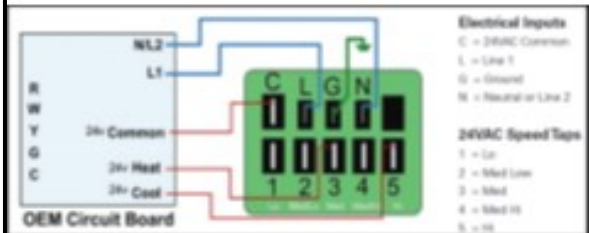
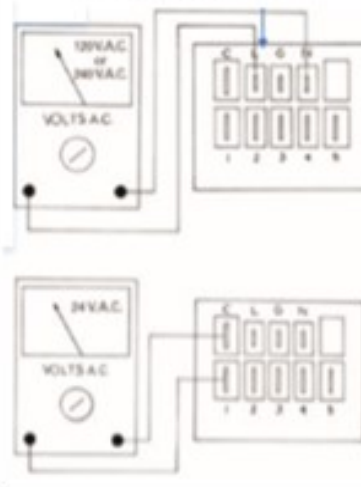
Constant Torque



Constant Torque Motors



This terminal block is located on the motor. Look for labels below on the motor side of the connection.



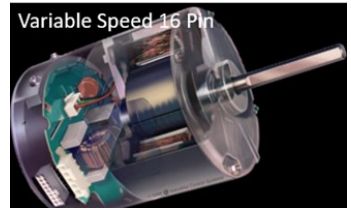


It's Hard To Stop A Trane.®

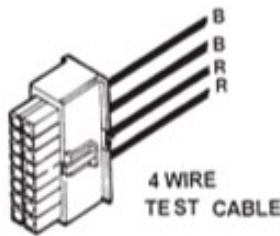
Electronic Commutated Motor - 16PIN

Diagnostic options

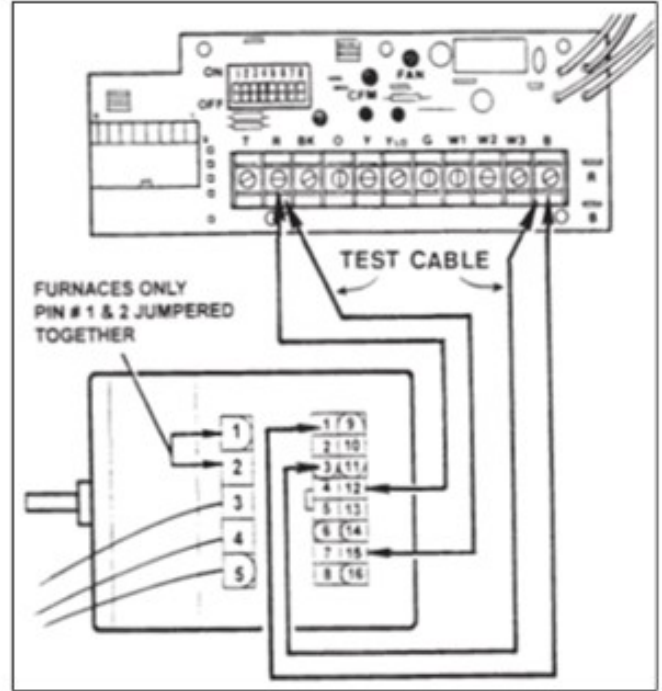
- Recommend: TECHINSpect - TOL02588 or
- Go / No Go test Kit Pub. 34-3403 - HS



1. Disconnect power to unit.
2. Remove 16 pin connection from ICM-2 motor.
3. Plug in 16 pin connector "4 wire test" cable to ICM-2 motor.
4. Check power plug at motor and verify that it is installed and properly seated.
5. Connect Red wire to "R" at motor control board.
6. Connect Blue wire to "B" at motor control board.

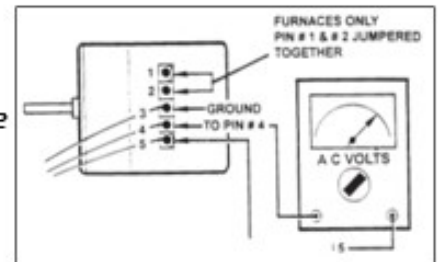


1. Turn on power to unit.
2. Motor should come on and run continuous fan speed.
3. If motor doesn't not run, verify 24 volts A.C. or correct line voltage is not present, troubleshoot and repair as needed.



- Furnace ICM2 motor correct voltage is 120 VAC and there must be a jumper wire in the plug between #1 and #2.

- Air handler ICM-2 motor correct voltage is 220 VAC.



TOL02588
available at your local
Supply location



Pub. # 34-3403-HS
Available on ComfortSite

- Order Center
- Marketing Materials
- Trane Technical

**Click on QR code for
additional motor details
and diagnostics**



Generally, failures are less likely to occur within the motor windings due to the three phase construction.

It is not uncommon to experience failures within the motor module, generally due to external influences: moisture, electrical surges, excessive duct static, etc.

The image illustrates a damaged thermistor within the module. After testing motor windings, wiring harnesses and proper control inputs, the motor issue was corrected by simply replacing the motor module.





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Electronically Commutated Motor - Serial Port

Diagnostic options

- Recommended: TECHINspect - TOL02588 or
- Go / No Go test harness Pub. # 34-3454-01



Step 1: Disconnect high voltage from the unit.

Step 2: Validate the unit is at zero energy with a volt-ohm meter

Step 3: Disconnect the 4 pin low voltage / communication harness from the serial port motor

Step 4: Insert the 4 pin connector from the Go / No Go test harness into the motor's 4 pin low voltage / communication receptacle.

Step 5: Connect the red wire and blue wires to the 24 VAC connection from the secondary side of the 24 VAC transformer.

Step 6: Reconnect the high voltage to the unit being tested and go to step 7

Step 7: Does the serial port variable speed motor start and run after a short delay to turn on?

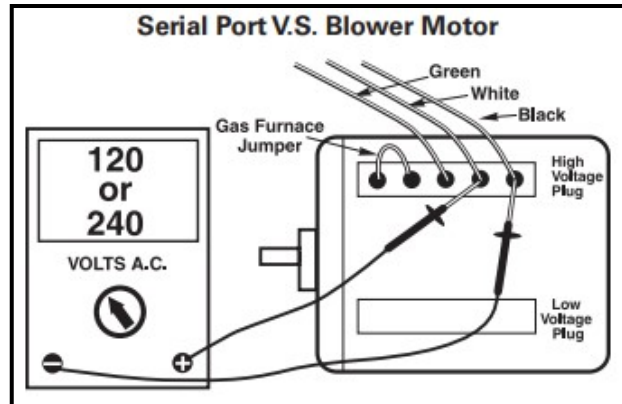
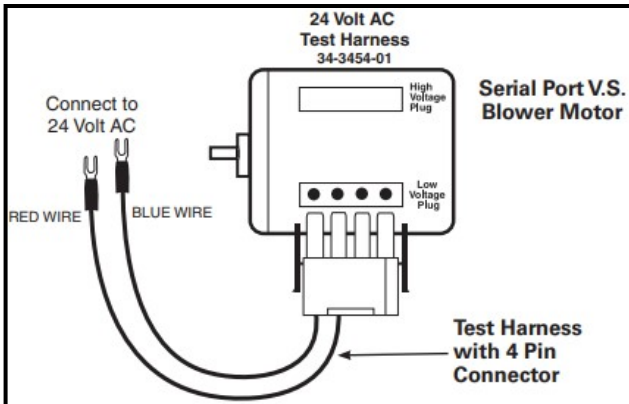
YES: Serial port variable speed motor is good. Check the furnace IFC or the air handler control board

NO: Go to step #8

Step 8: Is there 120VAC at the gas furnace or 240 VAC at the air handler serial port variable speed motor, SPVS motor, high voltage plug?

YES: If the motor turns freely, replace the SPVS motor

NO: Repair as needed and retest



TOL02588
available at your local Supply Location



Pub. # 34-3454-01

- Available Comfortsite
- Order center
 - Marketing Materials
 - Trane Technical

