Rockwell Automation
Allen-Bradley

Bulletin 1334 575V
Troubleshooting Guide

Power ON - Indicates input power is connected when illuminated.

Momentary Overload Protection Circuit - When constantly illuminated, indicates an overload condition exceeded (60) seconds - Momentarily illuminated whenever circuit is activated.

Under Voltage Protection - When illuminated, indicates that the Drive has tripped OFF due to an input voltage that is less than 518 volts.

Over Voltage Protection - When illuminated, indicates that the Drive has tripped OFF due to the bus voltage exceeding 937V DC.

"A" Phase Protection Trip - When illuminated, indicates either:
- An "A" Phase Overload Condition Greater Than 200%
- An External "A" Phase Short

"B" Phase Protection Trip - When illuminated, indicates either:
- A "B" Phase Overload Condition Greater Than 200%
- An External "B" Phase Short

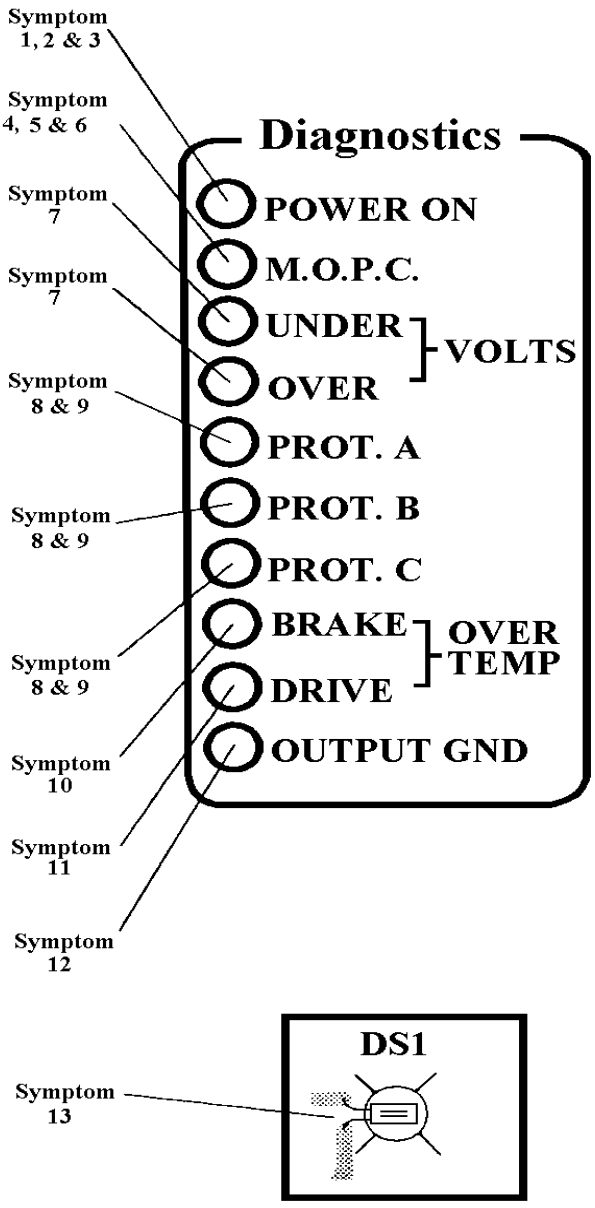
"C" Phase Protection Trip - When illuminated, indicates either:
- A "C" Phase Overload Condition Greater Than 200%
- An External "C" Phase Short

Brake Resistor Over Temperature Protection Trip - When illuminated, indicates excessive brake resistor temperature.

Drive Over Temperature Protection Trip - When illuminated, indicates that the heatsink temperature of the Drive has exceeded the maximum safe operating limit.

Output Ground Fault Protection Trip Indication - When illuminated, indicates that the Drive circuitry has shorted to GROUND.

DS1 - Located on the High Voltage Sensing Board. When illuminated, indicates that the bus potential is in excess of 42V DC.



IMPORTANT: Drive Fault Trips. Before resetting any fault trip, refer to the following troubleshooting procedures to isolate and correct the fault.

WARNING: Hazardous voltage levels can exist on some printed circuit boards and Drive components. If diagnostic LED(s) PROT. A, PROT. B, or PROT. C are lit, hazardous voltages can be present at the output terminals even though the STOP push-button has been depressed. If neon light DS1 on the High Voltage Sensing Board is lit, hazardous voltages are present in the Drive cabinet. To guard against personal injury when boards or wires are being disconnected or reconnected or fuses are being replaced, always Remove Power to the Drive at the Disconnect Device, Wait (60) Seconds, and Ensure That DS1 Is Not Lit Before Servicing.

WARNING: Use specified incoming line fuses to guard against equipment damage and personal injury should electrolytic capacitor cases rupture due to short circuit or insulation breakdown**.**

CAUTION: To Guard Against Equipment Damage When Troubleshooting the Drive, Before Pressing the START Push-button Always Ensure: That the Speed Pot or speed reference is set to MINIMUM**.** That the FWD/REV Switch (if present), is in the proper position**.** That the motor is uncoupled from its mechanical load

IMPORTANT: ESD Precautions**.** ESD (Electrostatic Discharge) generated by static electricity can damage the CMOS devices on various Drive boards**.** To guard against this type of damage, it is recommended that when circuit boards are removed or installed, the following precautions be observed**.**

- Wear a wrist type grounding strap that is grounded to the Drive chassis**.**
- DO NOT remove the new circuit board from its conductive wrapper unless a ground strap is worn**.**
- When removing any circuit hoard from the Drive, immediately place it in conductive packing material**.**

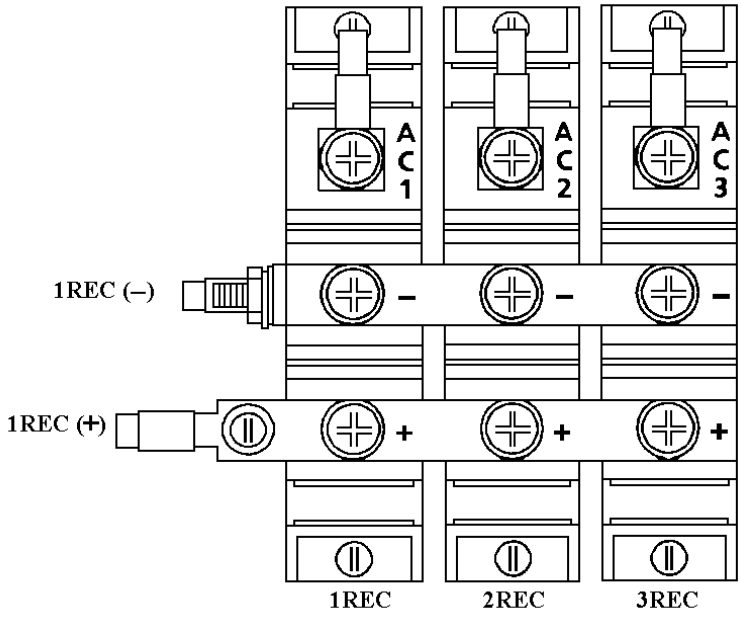
Symptom 1: Drive does not start**.** Amber POWER ON LED is not illuminated**.**

DIAGNOSTIC PROCEDURE:

Check for possible loss of input line voltage by measuring line voltage between L1, L2 and L3**.** If voltage is present, measure voltage across input line fuses 1FU, 2FU, and 3FU**.** Measure voltage across input primary fuse 4FU**.** A voltage reading across any of these fuses indicates an open condition**.** Before replacing blown fuses complete STEPS 1, 2 and 3**.**

STEP 1 **-** Remove input power to the Drive Before proceeding, wait (60) seconds**.** The Bus Indicator neon light on the High Voltage Sensing Board (or Brake Board if installed), should not be lit**.** Use a DC voltmeter to verify that the DC bus is fully discharged by measuring the voltage between 2C1-3 (+) and 4C1-3 (-)**.** Start with the voltmeter on its highest scale (x1000) and range downward to the lowest voltmeter scale**.**

STEP 2 **-** With an ohmmeter set on the x1 scale, check Rectifier Assembly 1 REC, 2REC & 3REC as follows:



OHMMETER		**READING**
+ LEAD	- LEAD	
1REC (+)	1REC (-)	Infinite
1REC (+)	AC2	Infinite
1REC (+)	AC3	Infinite

AC1	1REC (-)	Infinite
AC2	1REC (-)	Infinite
AC3	1REC (-)	Infinite

If any of the above readings are not as shown, replace the Rectifier Module, 1REC, 2REC, or 3REC.

IMPORTANT: When replacing the Rectifier Assembly, clean all surfaces. Apply a thin layer of thermal grease (Dow Corning 340) to the back of the assembly. Torque mounting screws to 17-26 in-lbs max.

STEP 3 - With the ohmmeter set on the x100 scale, check the (3) Bus Capacitors 2C1-3, 3C1-3 and 4C1-3 for a shorted condition as follows. Remove the capacitor bus bars and capacitor leads connected to the bus bars. Connect the (+) POSITIVE lead of the ohmmeter to the (+) POSITIVE terminal of the capacitor. Connect the (-) NEGATIVE lead of the ohmmeter to the (-) NEGATIVE capacitor bus bar. The ohmmeter should immediately read low, then slowly increase to infinity. A reading less than infinity indicates a shorted capacitor that requires replacement.

After completing STEPS 1, 2 & 3, replace blown fuses and reapply input power.

Symptom 2: Drive does not start. Amber POWER ON LED is illuminated. No red fault LEDs are illuminated.

DIAGNOSTIC PROCEDURE:

Check for line out condition at fuse 3FU by measuring the AC line voltage from L3 to either L1 or L2. If voltage is present, measure voltage across 3FU. A voltage across 3FU indicates that it is open and must be replaced. Before replacing 3FU, perform STEPS 1, 2 & 3 in Symptom 1, then the following eleven steps.

STEP 1 - Check precharge circuit fuse 5FU for an open condition.

STEP 2 - With input power to the Drive removed at the disconnect device, check that all jumpers on the Modulator Logic Board are in their proper position, particularly the VCO/EXT-C jumper and the IFB/XFB jumper.

STEP 3 - With input power to the Drive removed at the disconnect device, check installed options, particularly those with AUTO/MAN or AUTO/OFF/MANUAL selection (both local and remote). Depending upon the options installed the maximum speed pot adjustment R25, or the minimum speed pot adjustment R26, may be ineffective.

- If the Digital Thumbwheel Card, the BCD Multiplex Interface Card, or the Isolated Signal Conditioner Card is installed, ensure that: The AUTO/MAN switch on the card is set to the MAN mode. A 1kΩ, 2W, linear taper speed pot has been properly connected to Terminal Block 1TB between terminals 14, 15 & 16.
- If the Digital Thumbwheel Card is installed, ensure that the lkΩ resistor included with the option kit has been installed at Terminal Block TB1 between terminals 14 & 16.
- If the Dynamic Brake Option is installed, check for continuity across the Brake Over Temperature circuit at Terminal Block TB1 between terminals 17&18.
- If the Motor Overload Relay Option is installed, check for continuity across the Motor Overload Relay contact circuit, terminals 10 & 11 at Terminal Block 1TB.

STEP 4 - Check for an open speed pot at Terminal Block 1TB. Measure the voltage at Terminal Block 1TB between terminals 14 & 16. There should be 3.2V DC. If voltage is 12V DC, the speed pot may be open or there may be an open wire between the speed pot and terminals 14, 15 & 16. Check for an inoperative speed pot by turning the pot from 0 to 100%. The voltage between terminals 15 & 16 should vary from 0 to 3.2V DC. Replace or correct as required.

STEP 5 - Check the voltage between terminals 9 & 11 at Terminal Block 1TB.

- If standard START/STOP configuration is used, there should be 90V AC between terminals 9 & 11**.** If not, the START/STOP circuit is open**.** Check the START/STOP circuit connections to 1TB**.**

For a Standard Drive Without Factory Installed Options

- If field installed 2**-**wire, 90V AC, RUN/STOP control is used, there should be 90V AC between terminals 9 & 11**.** If not, the RUN/STOP circuit is open**.** Ensure that the circuit has been installed as specified**.**

- If field installed 2**-**wire, 120V AC, RUN/STOP control is used, there should be 120V AC between terminals 9 & 11**.** If not, the RUN/STOP circuit is open**.** Ensure that the circuit has been installed as specified**.**

STEP 6 **-** Measure the output voltages in the secondary circuits of Transformer 1T**.** The following voltages should be present at the Power Supply Board**.**

molex connector J602 between pins 4 & 1	14V AC
molex connector J602 between pins 2 & 1	14V AC
molex connector J602 between pins 5 & 6	15V AC

The following voltage should be present at terminal block 1TB**.**

between terminals 1&11 90V AC

If any one voltage is absent, remove input power at the disconnect device and check all connections to 1T**.** If all connections are correct, replace Transformer 1T**.**

STEP 7 **-** Go to the Logic Power Supply Board and measure all output voltages**.** The following voltages should be present at molex connector J601 with respect to Drive common, J601 Pin 1**.** If any one voltage is absent, replace the board**.**

J601, pin 2	14V AC
J601, pin 3	**+** 17V DC
J601, pin 5	**+** 9 to **+** 15V DC (nominal)
J601, pin 6	**+** 9 to **+** 15V DC (nominal)
J601, pin 9	**-** 17V DC

STEP 8 **-** Measure the output voltage across the secondary circuit of Transformer 2T, pins 5 & 6**.** If 22V AC is absent, replace 2T**.**

STEP 9 **-** `If 2T checks out, the Contactor Interface Board may be inoperative**.** The following voltages should be present with respect to Drive common, J901 Pin 1**.**

J901, pin 4	**+** 24V DC
J901, pin 6	0V DC (nominal)
J901, pin 7	0V DC (nominal)
J901, pin 8	**+** 11V DC

STEP 10 **-** If Transformer 2T and the Contactor Interface Board check out, measure the control voltage at contactor 1CON**.** There should be **+** 24V DC between points C1(**+**) & C2(**-**) at the contactor**.** If **+** 24V DC is measured and 1CON is not picked**-**up, the contactor may be inoperative**.** Replace if required**.**

STEP 11 **-** Check pin 7 at molex connector J901 on the Contactor Interface Board with respect to pin 1, Drive common**.** If a TTL level “0” is not measured, replace the Modulator Logic Board**.**

Symptom 3: Pre-charge cycle excessively long or not complete. Amber POWER ON LED may or may not be illuminated.

DIAGNOSTIC PROCEDURE:

The DC bus pre-charge cycle should be completed within (5) seconds after input line power is applied to the Drive. Check pre-charge circuit fuse 5FU for an open condition first, then perform the following three steps.

STEP 1 - Check Rectifier Assemblies and Bus Capacitors as specified in STEPS 1, 2 & 3, Symptom 1.

STEP 2 - Check the Precharge Contactor Interface Board. The following voltages should be present at connector J901 on the board. Replace if required.

Transformer 2T secondary voltage	17V AC between pins 2 & 3
Contactor 1CON control voltage	+ 24V DC between pins 4 & 6
	+ 11V DC between pins 7 & 8

STEP 3 - Check pin 7 at molex connector J901 on the Contactor Interface Board with respect to pin 1, Drive common. If a TTL level "0" is not measured, replace the Modulator Logic Board.

Symptom 4: Drive starts momentarily then trips off or Drive trips off during normal operation. Red M.O.P.C. fault LED is illuminated.

DIAGNOSTIC PROCEDURE:

IMPORTANT: If the Drive will not restart or reset after a fault trip, always check fuse 5FU for an open condition. Replace if necessary.

An illuminated M.O.P.C. LED indicates that the Drive has tripped off due to a nominal 150% overload condition which has exceeded the (60) second time period.

IMPORTANT: During acceleration or start-up (breakaway), it is normal for the M.O.P.C. LED to illuminate momentarily. This merely indicates that a momentary overload current of 150% has been sensed and that the M.O.P.C. circuit has been activated. The LED will also flash momentarily when AC line power is first applied.

If the M.O.P.C. LED is constantly activated during start-up (breakaway), or if there is excessive LED activity at low frequency operation (the LED is on more than 50% of the time from start-up to set speed), less DC boost and/or a lower accel rate must be used.

Symptom 5: Motor does not return to full set speed after stalling. Red M.O.P.C. fault LED is illuminated.

DIAGNOSTIC PROCEDURE:

The motor current is exceeding the overload capability of the Drive. Check for problems with the mechanical load. If the mechanical load checks out, try increasing the DC boost. If this does not correct the condition, consult your nearest Allen-Bradley Area Support Center, Drives Distributor, or Sales Office for application assistance.

IMPORTANT: If a continuous overload current demand exceeds 150% of rated Drive output current, the motor will ramp down to a stalled condition and remain there until the overload condition no longer exists. If however the overload condition is sustained for (60) seconds, the Drive will trip and illuminate the M.O.P.C. LED on the Diagnostic Display Panel.

Symptom 6: Red M.O.P.C. fault LED is illuminated during DECEL or at (0) Hz.

DIAGNOSTIC PROCEDURE:

Boost voltage set too high. Decrease the boost voltage by setting the DC boost switch lower and/or set the Decel switch to provide a slower ramp.

Symptom 7: Drive starts momentarily then trips off or Drive trips off during normal operation. OVER VOLTS fault LED is illuminated.

DIAGNOSTIC PROCEDURE:

IMPORTANT: If the Drive will not restart or reset after a fault trip, always check fuse 5FU for an open condition. Replace if necessary.

An illuminated UNDER VOLTS LED indicates that Drive has tripped off due to an input line voltage that is less than 518V AC at Transformer 1T.

STEP 1 - Check input primary fuse 4FU for an open condition.

STEP 2 - Measure the input voltage to Transformer 1T. If proper voltage is present, replace the Modulator Logic Board.

An illuminated OVER VOLTS LED indicates that the Drive has tripped off due to a bus voltage greater than 937V DC. Four conditions can cause an over voltage trip.

- Incorrect Voltage Selector Switch Setting at the High Voltage Sensing Board
- Excessively High Input Voltage
- Deceleration Rate too High for the Motor/Load Inertia
- DC Boost Set too High

STEP 1 - Verify that switch S1 at the High Voltage Sensing Board is set to 575V.

STEP 2 - Check the input line voltage across each phase at L1, L2, and L3. The voltage should not be greater than 633V AC. If trip occurred during deceleration, decrease the DECEL RATE, the DC BOOST, or both.

STEP 3 - Measure and monitor the DC bus voltage at the High Voltage Sensing Board, connector J102, between pins 5 (+ BUS) and 1 (- BUS). If the voltage does not approach or exceed 937V DC, the Modulator Logic Board may be malfunctioning.

STEP 4 - If the Drive trips out on over voltage during deceleration and a slower decel ramp is not acceptable, consult your nearest Allen-Bradley Area Support Center, Drives Distributor, or Sales Office.

Symptom 8: Drive starts momentarily then trips off or Drive trips off during normal operation. (1) or (2) red PROT. fault LEDs are illuminated but not all (3). OUTPUT GND LED may o may not be illuminated.

DIAGNOSTIC PROCEDURE:

IMPORTANT: If the Drive will not restart or reset after a fault trip, always check fuse 5FU for an open condition. Replace if necessary.

(1) or (2) illuminated phase PROT. LEDs indicates:

- An Output Overcurrent Condition Greater Than 200% Due to Either:
  1.) An output phase-to-phase short (Drive output, motor windings, or wiring to the motor).
  2.) An output overcurrent condition greater than 200% due to an output phase-to ground short, if the OUTPUT GND LED is also illuminated.
  In either case, remove input power to the Drive at the disconnect device. Disconnect the motor leads from the Drive at Terminal Block 2TB. Reapply power to the Drive and give the Drive a START command. If the Drive can be operated without a phase protect trip occurring, the problem is in either the wiring to the motor or the motor itself. A ground fault can be found using an

ohmmeter between the wiring to the motor and ground. Find the cause and correct it before reconnecting the motor leads to the Drive and reapplying power. A shorted motor winding is harder to detect because of the low resistance of the motor windings. Substitute a known, good motor for the suspected bad motor. Connect the substitute motor to the Drive output terminals and try running the Drive. If successful operation of the Drive and substitute motor is achieved, then the problem most likely is the motor originally connected to the Drive.

- Deceleration of an Inertia Type Motor Load at too High a Value of DC Boost or too Fast a DECEL Rate
  Under the right conditions, the motor can appear as a short circuit to the Drive. With excessive DC boost applied, the motor can saturate, resulting in a peak current in excess of 200% causing a phase protect trip. Decrease the DC BOOST, the DECEL RATE or both.

- Excessive DC Boost Causing a Phase Protection Trip During Acceleration
  Excessive DC boost can cause a phase protection trip to occur during acceleration of the Drive and motor due to saturation of the motor windings. If reducing the DC boost setting eliminates the phase protection trip but does not produce sufficient torque to enable the motor to accelerate the load, consult your nearest Allen-Bradley Area Support Center, Drives Distributor, or Sales Office for application assistance.

Reset the Drive by giving it a STOP command followed by a START command. If proper operation cannot be obtained without the reoccurrence of a phase protect trip and you have eliminated the preceding possibilities, perform STEPS 1 - 4 in Symptom 9.

Symptom 9: Drive starts momentarily then trips off or Drive trips off during normal operation. All (3) red PROT. fault LEDs are illuminated.

DIAGNOSTIC PROCEDURE:

Illuminated PROT. A, PROT. B, PROT. C and M.O.P.C. fault LEDs indicate:

- A Loss of Input Power to the Base Driver or Driver/M.O.P.C. Interface Boards
- Shorted Output Transistors in the Power Switching Modules
- A Malfunctioning Driver/M.O.P.C. Interface Board
- A Malfunctioning LEM/M.O.P.C. Interface Board
- A Malfunctioning Modulator Logic Board

Before recycling power or resetting the Drive, perform the following seven steps.

Loss of Input Power to the Base Driver or Driver/M.O.P.C. Interface Boards

STEP 1 - Check fuse 7FU for an open condition. Check for an open winding or connection to Transformer 3T. 115V AC should be measured between terminals 5 & 6 at the transformer. Replace if required.

STEP 2 - Check the Isolated Power Supply Board. + 24V DC should be measured at the DC output terminals. If voltage is not present, replace the Isolated Power Supply Board. If voltage is present, go to STEP 3.

STEP 3 - Check the power supply at the Driver/M.O.P.C. Interface Board. +24V DC should be measured between E1 (+) & E2 (-). If voltage is not present, replace the Driver/M.O.P.C. Interface Board. If voltage is present, go to STEP 4.

STEP 4 - Check the power supply at the Base Driver Board. +24V DC should be measured at connector J1 between pins 13 (+) and 16 (PWR GND), and between pins 14 (+) and 16 (PWR GND). If voltage is not present, replace the Driver/M.O.P.C. Interface Board. If voltage is present, go to STEP 5.

Shorted Output Transistors in the Power Switching Modules

STEP 5 - Remove input power to the Drive. Before proceeding, wait (60) seconds.

- DS1, the bus charged neon light on the High Voltage Sensing Board should not be lit.
- DS1, the brake neon light on the Brake Board should not be lit.

Use a DC voltmeter to verify that the DC bus is fully discharged by measuring the voltage at connector J102 between pins 5 (+ BUS) and 1 (- BUS) on the High Voltage Sensing Board. Start with the voltmeter on its highest scale (x1000) and range downward to the lowest voltmeter scale.

STEP 6 - Check for shorted output transistors as follows. Unplug and mark leads C2/E1, B1, E2, and B2 on the Base Driver Board for each phase. With an ohmmeter set on the x1 scale, measure the resistance between the collector and emitter of each module at the Base Driver Board as follows.

OHMMETER		READING
+ LEAD	- LEAD	
C1	E1	Infinite
C2/E1	E2	Infinite

With an ohmmeter set on the x1 scale, measure the resistance between the collector and base of each module at the Base Driver Board as follows.

OHMMETER		READING
+ LEAD	- LEAD	
C1	B1	Infinite
C2/E1	B2	Infinite

If a short is found, replace the module and go to STEP 7.

Malfunctioning Driver/M.O.P.C. Interface Board
Malfunctioning LEM/M.O.P.C. Interface Board
Malfunctioning Modulator Logic Board

STEP 7 - With the motor rotor locked and boost set to zero, adjust the ACCEL RATE setting, switch S1 on the Modulator Logic Board, to 1.2 Hz/Sec. Set the operator speed pot or speed reference to zero. After completing the above, start the Drive and slowly increase the speed while monitoring the output motor current on any phase using a true RMS reading clamp on ammeter. The M.O.P.C. LED should light when the current reaches a nominal value of 150%. If the M.O.P.C. LED does not light, use an oscilloscope to check for a pulsed waveform at the following pins on connector J113 of the Modulator Logic Board with respect to Drive common.

Pin 5 - ϕA Driver Signal
Pin 16 - ϕB Driver Signal
Pin 27 - ϕC Driver Signal

If pulse signals that go to a TTL level "0" are not present, replace the Driver/M.O.P.C. Interface Board. If pulse signals still are not present after replacing the Driver/M.O.P.C. Interface Board, replace the LEM/M.O.P.C. Interface Board. If pulse signals are present for all three driver signals, replace the Modulator Logic Board. Return the boost and accel rate adjustments to their normal settings.

Symptom 10: Drive starts momentarily then trips off or Drive trips off during normal operation. Red BRAKE OVER TEMP. fault LED is illuminated - (Used only when equipped with the Dynamic Brake Option).

DIAGNOSTIC PROCEDURE:

IMPORTANT: If Drive will not restart or reset after a fault trip, always check fuse 5FU for an open condition. Replace if necessary.

An illuminated BRAKE OVER TEMPERATURE LED indicates excessive brake resistor assembly temperature. This condition is normally caused by either excessive braking or a deceleration rate too high for the motor/load inertia. If neither of the above is true, check for:

- Open Precharge Fuse 5FU and/or Shorted Brake Transistor 4Q
- Malfunctioning Brake Resistor Thermal O.L.
  (2TAS on Brake Resistor Assembly)
- Poorly Ventilated Resistor Enclosure

Check and repair as required.

IMPORTANT: To reset a Brake Over Temperature Trip:

1. Remove input power to the Drive at the disconnect device.
2. Wait a few minutes to allow the brake assembly to cool down.
3. Open the conduit box on the resistor cage assembly. Manually reset Thermal O.L. Relay 2TAS by depressing the plunger until a reset "click" is either heard or felt.
4. Reapply power to the Drive at the disconnect device.
5. Reset the Drive by giving it a STOP command followed by a START command.

Symptom 11: Drive starts momentarily then trips off or Drive trips off during normal operation. Red DRIVE OVER TEMP. fault LED is illuminated.

DIAGNOSTIC PROCEDURE:

IMPORTANT: If the Drive will not restart or reset after a fault trip, always check fuse 5FU for an open condition. Replace if necessary.

An illuminated DRIVE OVER TEMPERATURE LED indicates that the Drive has tripped off due to an over temperature condition. Allow the Drive to cool down for approximately (15) minutes before restarting. After restarting, if an over temperature condition occurs again, check for the following conditions.

FOR 30 THRU 50 HP, 575V DRIVE RATINGS

- Drive Fan Obstruction, Open Fuse 7FU, or Malfunctioning Fan
  Check and replace as required.

FOR ALL 575V DRIVE RATINGS

- Ambient Temperature that Exceeds the Drive Rating
  Measure the ambient temperature surrounding the Drive

- Heat Flow Obstruction within the Heat Sink Assembly
  Visually inspect for unobstructed spacing between fins. Clean if necessary

- Open Fuse 7FU or Open Winding or Connection to Transformer 3T
  Check for 115V AC between terminals 5 & 6 on transformer 3T. Replace if required.

- RMS Load Over Time is Exceeding 100% of the Drive's Current Rating
  Using a true RMS AC clamp on ammeter, measure the motor current over an extended period of time.

IMPORTANT: Most clamp on type ammeters and current transformers are frequency sensitive. Inaccurate current readings at frequencies other than 60 Hz may be observed. It is recommended that a true RMS reading clamp on ammeter be used.

- Malfunctioning Temperature Sensor 1TAS.

If all of the above conditions have been checked and the problem still remains, replace Temperature Sensor 1TAS.

IMPORTANT: When replacing Temperature Sensor 1TAS clean all surfaces. Apply a thin layer of thermal grease (Dow Corning 340) to the back of the sensor. Torque mounting screws to 2.6-3.0 in-lbs max.

Symptom 12: Drive starts momentarily then trips off or Drive trips off during normal operation. Red OUTPUT GND fault LED is illuminated, no other fault LEDs are illuminated.

DIAGNOSTIC PROCEDURE:

IMPORTANT: If the Drive will not restart or reset after a fault trip, always check fuse 5FU for an open condition. Replace if necessary.

An illuminated OUTPUT GROUND fault LED indicates that there is a malfunctioning Output Ground Sensor Board if no other red fault LEDs are illuminated. Remove input power to the Drive and check all connections and wiring to the board. Reapply input power and start the Drive. If the Drive trips again, replace the Output Ground Sensor Board. If the OUTPUT GROUND fault LED and one or more red PROT. fault LEDs are illuminated, refer to the DIAGNOSTIC PROCEDURES in Symptoms 8 or 9 before recycling power or restarting the Drive.

Symptom 13: Bus voltage does not discharge within (60) seconds when input power is removed. Neon light DS1 on the High Voltage Sensing Board is illuminated.

DIAGNOSTIC PROCEDURE:

After input power is removed the bus voltage should discharge to 42V DC in approximately (60) seconds. If the discharge cycle is not taking place, check to see if resistor 2R, 3R, or 4R has opened. If none of the resistor are open, check for open wiring between the resistors and the (3) Bus Capacitors 2C1-3, 3C1-3, & 4C1-3. If all wiring is correct, replace Power Distribution Board A2. If any resistor is open, replace and reapply input power.

IMPORTANT: When replacing resistor 2R, 3R, or 4R, clean all surfaces. Apply a thin layer of thermal grease (Dow Corning 340) to the back of the resistor. Torque mounting screws to 2.6-3.0 in-lbs Max.

Check for proper bus discharge cycle. Measure the DC voltage between connectors 5 (+ BUS) and 1 (- BUS) at J102 on the High Voltage Sensing Board. After approximately (60) seconds, the voltage should be below 42 volts. If discharge cycle is still not taking place and/or either resistor opens again, replace the High Voltage Sensing Board.