1333 (SERIES B & C) TROUBLESHOOTING GUIDE

Preventive Maintenance: Bulletin 1333 is convection or fan cooled by air flowing through the heat sink slots. The slots must never be allowed to become obstructed with dirt foreign matter. Periodically check and clean the heat sink slots.

Problems with Your Drive? The following descriptions indicate the operation of protective circuitry the Series B & C Bulletin 1333. What is thought to be a drive operational problem, may in reality be normal protection circuit operation.

Acceleration Stall Protection -- No Fault is Displayed

FUNCTION: During motor acceleration, if current exceeds 140% of rated Drive current, overcurrent stall protection circuit operates. In order to guard against currents in excess of these values and prevent an overcurrent trip, this circuit temporarily stops drive acceleration. When load current is again below these values, the circuit lets the drive continue to accelerate to set frequency.

REMARKS: If the application does not require this function it can be deactivated by setting MODE 15 to 0.

Deceleration Stall Protection -- No Fault is Displayed

FUNCTION: During motor deceleration, if DC bus voltage rises above a preset bus level due to regenerative energy, the overvoltage stall protection circuit temporarily stops the decrease in frequency in order to guard against an overvoltage trip. When regenerative energy decreases and bus voltage falls below the preset level, this circuit lets the frequency fall again and continue to decelerate to set frequency.

REMARKS: If this function is not appropriate for the application, it can be deactivated by setting MODE 16 to 0.

Over Current Protection -- OC Displayed

FUNCTION: If overcurrent exceeds 200% of rated Drive current flows in the Drive, this protective circuit will shut off the drive transistors.

REMARKS:

1. Load inertia is excessively large and acceleration time is extremely short. Setting MODE 15 to 1 (Accel Stall Protection) or increasing the acceleration time (MODES 1 & 2) will guard against OC nuisance trips.
2. The motor experienced an excessive overload condition while operating.
3. A short circuit exists in the drive output leads or in the motor windings.
4. A device in the Drive output inverter section has shorted.

Over Load Protection -- OL Displayed

FUNCTION: If the Drive output current exceeds 140% of rated Drive current for 60 seconds, this protective circuit will shut off the drive transistors.

REMARKS:

1. The starting load is above 140%. The Drive is attempting to start the load, but is in Accel Stall Prevention (MODE 15 set to 1) for one minute.
2. The running load has been above 140% for one minute. The Drive may be in Accel Stall Prevention if below the current frequency limit, or in Current Limit if at the current frequency limit -- either 25 or 50 Hz, depending on the V/Hz setting. If neither Accel Stall Prevention nor Current Limit is selected, the Drive is between 140% and 180% of rated current for one minute.

Over Voltage Protection -- OU Displayed

FUNCTION: When DC bus voltage rises above a preset level due to high incoming line voltage or excessive regenerative energy, this protective circuit stops transistor operation and annunciates the condition as shown.

REMARKS:

Extremely short deceleration time is the primary cause. Setting MODE 16 to 1 (Decel Stall Protection) or increasing deceleration time (MODEs 3 & 4) will guard against OU nuisance trips.

Low Voltage Protection -- LU is Displayed

FUNCTION: When incoming line voltage falls below 90% for 15 ms, this protective circuit stops transistor operation to guard against incorrect drive operation.

REMARKS: After incoming line voltage is restored, if automatic restart of the Drive without recycling power is required set MODE 9 to 0.

Over Temperature Protection -- OH Displayed

FUNCTION: When heat sink temperature rises and the transistor cooling effect is reduced, this protective circuit stops transistor operation and annunciates the condition as shown.

REMARKS: Check the drive ambient temperature. For 7 1/2-20 HP units, check the cooling fan.

Auxiliary Interlock Trip -- AU Displayed

FUNCTION: It is possible that the drive was stopped by an external interlock. External interlocks (a thermal overload relay or an external sequence circuit for example), are connected to terminals 16 and 17.

Operating Error -- OP Displayed

FUNCTION: If an attempt is made to return the Drive to the operating mode from the programming mode with a START or JOG command present, this fault will be displayed and the Drive will not start.

REMARKS: The Drive must not receive a maintained START or JOG command while in the programming mode. If a START command is present when the Drive is returned to the operating mode, an OP fault will appear.

1. If the Drive was in local control, the START/STOP selector switch was left in the START position while switching from the programming mode to the operating mode.
2. If the Drive was in remote control, a START command was present while switching from the programming mode to the operating mode.
3. If a JOG command was present while switching from the programming mode to the operating mode.

When the command is removed, the OP fault will be cleared.

ATTENTION: Power must be applied to the drive with the cover removed to perform certain troubleshooting checks. Voltages on many components are at incoming line potential or bus voltage. To avoid electric shock or damage to equipment, do not touch any drive components with power applied.

ATTENTION: Become familiar with the equipment and read through the wiring, speed selection and adjustment sections before attempting to perform the startup procedures. Adjustments may be required to meet specific load characteristics or operator preference.

Exercise extreme care when performing any task on the drive. Failure to do so may result in electric shock or equipment damage.

A DC bus neon light at the top of the 1333 has been provided to provide visual indication that bus voltage is present. Bus voltage may be verified by using a voltmeter and measuring the voltage between P (+) and N (-) on the Power Terminal Block. Do not attempt to service the drive until 2 minutes after the neon light has extinguished and bus voltage has discharged to zero volts.

Motor Does Not Run -- No Fault Displayed

Is rated input voltage present at terminals L1, L2 & L3?

NO -- Check input side for breaker trip, contactor coil malfunction, blown fuse, etc.
YES -- Is the Drive in the operating mode? Is the decimal point in the MODE display lit?

NO -- Drive is in the programming mode. Remove START command and press the LOCK switch. The MODE display decimal point should be lit.
YES -- Was the STOP signal absent when power was applied?

NO -- The Drive must be set to STOP when power is applied. Set the Drive to STOP, remove then reapply power, then send a START command once the power-up sequence is complete.
YES -- Is MODE 12 set for appropriate start control?

NO -- MODE 12 0 = Local START/STOP control.
1 = Remote START/STOP control at terminals 7, 8, & 9.
YES -- Are Modes 10 & 11 set for the correct speed reference?

NO -- MODE 10 0 = Local speed control. The local frequency pot is the speed reference.
1 = Remote speed control. The local frequency pot has not effect on Drive operation. Reference signals at terminals 1-5 will have no effect on Drive operation.
MODE 11 0 = External speed pot or 0-10V DC analog input.
1 = External speed pot or 4-20mA DC analog input.
YES -- Is motor connected securely to output terminals M1, M2 and M3 of power terminal block?

NO -- Verify and change connections if necessary. Check motor thermal overloads.
YES -- Consult your nearest A-B rep for application assistance.

Motor Does Not Run Continuously -- OC Displayed

OC fault code is shown.

YES -- Does a short circuit to ground exist between the Drive output and the motor?

YES -- Remove the cause of the short circuit.
NO -- Does a Drive trip when the speed reference is below 5 Hz?

YES -- Reduce the boost level of MODE 5. If MODE 5 is set to A, change to a manual value.
NO -- Is acceleration time too short and is the accel protection circuit (MODE 15) OFF?

YES -- Increase the acceleration time (MODEs 1 & 2) or switch the overcurrent stall protection circuit ON (set MODE 15 to 1).
NO -- Is load within the rated current of the Drive?

NO -- Lighten the load or replace the Drive/motor with an appropriate size.
YES -- Does fault code OC appear even if the output terminals are open (open motor leads at terminals M1, M2, & M3 power terminal block)?

YES -- Consult your nearest A-B rep for application assistance.
NO -- Verify motor operation by line operating the motor or repeating above steps. Is proper motor operation observed?

YES -- Consult your nearest A-B rep for application assistance.
NO -- Consult motor manufacturer's instruction manual.

Motor Does Not Run Continuously -- OU Displayed

OU fault code is shown.

YES -- Is the AC line high?

YES -- Monitor and correct AC line.
NO -- Is deceleration time too short? Is decel protection circuit (MODE 16) OFF?

YES -- Increase the deceleration time (MODEs 3 & 4) or switch the overcurrent stall protection circuit ON (set MODE 16 to 1).
NO -- Does the drive and motor encounter an overhauling load (load increases motor speed beyond set speed)?

NO -- Consult your nearest A-B rep for application assistance.
YES -- Install the dynamic brake option. Does symptom still exists?

YES -- Consult your nearest A-B rep for application assistance.

Motor does Not Run Continuously -- LU Displayed

LU fault code is shown.

YES -- Incoming line voltage dropped below 90% of rated input voltage.

YES -- Monitor incoming line voltage and correct low voltage condition
NO -- Consult your nearest A-B rep for application assistance.

OVERTEMPERATURE Protection -- OL Displayed

OL fault code is shown.

YES -- Is ambient temperature above rated limit of 50 degrees C? Is the cooling fan rotating (7 1/2 - 20 HP units)? Is the heat sink dirty or cooling fins clogged?

YES -- Lower the ambient temperature or replace the cooling fan (7 1/2 - 20 HP units). Clean the heat sink.
NO -- Consult your nearest A-B rep for application assistance.

Motor Does Not Run -- AU Displayed

AU fault code is shown.

YES -- Are interlocks connected to terminals 16 & 17 open?

YES -- Remove the cause of the fault interlock trip or jumper terminals 16 & 17 if external interlocks are not used.
NO -- Consult your nearest A-B rep for application assistance.

Motor Does Not Run -- OP Displayed

OP fault code is shown.

YES -- Was a START command present while switching from the programming mode to the operating mode?

NO -- Consult your nearest A-B rep for application assistance.
YES -- Reset the Drive by giving it a STOP, then a START command.

Fuse Blown -- No Faults Displayed

Has wiring (input/output) of the power circuit caused a ground fault?

YES -- Repair the ground fault.
NO -- Is the capacity of the fuse sized correctly?

NO -- Replace fuse with one that has suitable capacity.
YES -- Are input terminals L1, L2, & L3 and output terminals M1, M2, & M3 wired correctly?

YES -- Consult your nearest A-B rep for application assistance.
NO -- Make changes in wiring as necessary. Does the fuses still blow?

YES -- Consult your nearest A-B rep for application assistance.

Motor Generates Excessive Heat -- No Faults Displayed

Is full load demanded continuously at low frequency?

YES -- Reduce the load. Consult motor manufacturer for thermal limitations at frequencies below 30 hertz.
NO -- Is motor operating above full load current?

YES -- Load is beyond the motor capacity. Check mechanical installation. Is motor/Drive undersized?
NO -- Check motor and wiring connections for an open phase condition.

Drive Will Not Reverse in Local Control -- No Faults Displayed

Is the Drive programmed for remote control (MODE 12 set to 1)?

YES -- Set MODE 12 to 0 (local control).
NO -- Has the Drive been programmed for reverse lockout (MODE 13 set to 1)?

YES -- Set MODE 13 to 0 (unlock).
NO -- Consult your local A-B rep for application assistance.

Drive Does Not Ramp-to-Stop -- No Faults Displayed

Is MODE 14 set to Ramp-to-Stop?

NO -- Set MODE 14 to 0 (Ramp-to-Stop).
YES -- Is MODE 16 set to ON? Is an overhauling load present?

YES -- If Mode 16 is set to ON, an overhauling load may cause the decel ramp to hold at one frequency for an extended period causing ramp-to-stop commands to appear to be non-functional.
NO -- Does MODE 30 show an OU fault?

YES -- Drive is tripping on overvoltage during decel. Refer to Overvoltage Protection.
NO -- Consult your nearest A-B rep for application assistance.