

1340 TROUBLESHOOTING GUIDE

SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE
A. Unit does not turn on when the ON pushbutton is depressed	1	Measure line-to-line input voltage at the disconnect switch with an AC voltmeter on the 500V AC scale.	Input line-to-line voltage below 207V AC or above 253V AC.	Correct external line voltage to 230V AC, $\pm 10\%$. NOTE: If necessary, refer to factory for information about 30 Input Isolation Transformers.
	2 DISC. SWITCH OFF	Turn off input power at the disconnect switch. Check the continuity of installed controls and contacts per connection diagrams.	Missing wires, poor connections, or improper controls, (e.g. momentary contacts used where maintained contacts are required).	Verify that connections and controls are as shown in the connection diagrams.
	3 DISC SWITCH OFF	Check for open, (N.C.), Thermal Overloads OTS-1 & OTS-2. If the drive has a Motor Overload Relay, (Option T), it's N.C. contact should be closed.	Open OTS-1 contacts indicate 1st Bus not fully charging - Possible transistor damage to Chopper or Brake Modules. Go to steps B2 & B3. Open OTS-2 may indicate a brake problem. Heavy Duty Braking may be required. Contact your AllenBradley CSS Area Service Center.	It may be necessary to wait approximately (5) minutes for thermal protection devices to cool down. NOTE: If manual reset type, verify that the manual reset lever has been depressed.
	4 DISC. SWITCH OFF	Check for open fuses F3, F4, & F5.	One or more fuses blown.	Replace blown fuses. Go to step A5.
CONT.				

SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE								
A. Unit does not turn on when the ON pushbutton is depressed.	9	Turn on power at the disconnect switch - DO NOT press the ON pushbutton - and measure the primary and secondary voltages of Transformer T1 as follows: Voltmeter on 250V AC SCALE <table border="0" data-bbox="511 447 959 762"> <thead> <tr> <th data-bbox="511 447 748 478">Terminal No.'s</th> <th data-bbox="748 447 959 478">Reading</th> </tr> </thead> <tbody> <tr> <td data-bbox="511 510 748 541">1 & 2</td> <td data-bbox="748 510 959 573">230V AC, ± 10%</td> </tr> <tr> <td data-bbox="511 604 748 636">3 & 4</td> <td data-bbox="748 604 959 667">120V AC ± 15%</td> </tr> <tr> <td data-bbox="511 699 748 730">5 & 6</td> <td data-bbox="748 699 959 762">42 V AC ± 15%</td> </tr> </tbody> </table>	Terminal No.'s	Reading	1 & 2	230V AC, ± 10%	3 & 4	120V AC ± 15%	5 & 6	42 V AC ± 15%	Secondary voltages not present or not within limits. NOTE: If primary reads 230V AC, +10%, and F1 fails repeatedly Transformer T1 must be removed and "bench" tested.	Replace Transformer T1.
	Terminal No.'s	Reading										
1 & 2	230V AC, ± 10%											
3 & 4	120V AC ± 15%											
5 & 6	42 V AC ± 15%											
10	With the AC voltmeter still on the 250V AC scale, press the ON pushbutton and measure the voltage across terminals 9 & 10 on Contactor K2.	Voltage reads 120V AC ±15% but K2 does not energize.	Replace Contactor K2.									
B. Main Contactor K1 does not energize. CONT.	1	Turn off power at the disconnect switch. Set the manual speed pot fully CCW to minimum speed. With a voltmeter set on the 500V DC scale, connect the (+) lead to the (+) side of the 1st Bus Bar and the (-) lead to the common (-) Bus Bar. Turn on power at the disconnect switch and press the ON pushbutton. Wait approximately (3) seconds for the 1st Bus to "precharge" before taking a reading.	a) DC voltage <5V DC. b) DC voltage approximately 40V DC. c) DC voltage is ≥275V DC. NOTE: When DC voltage is ≥275V DC, LED CR15 on Power Supply board PS-1 will be lit.	a) Go to step B2. b) Go to step B3. c) If LED CR15 on Power Supply board PS-1 IS NOT lit, replace PS-1. If LED CR15 IS lit, go to step B4								

<p>CONT.</p>	<p>2 DISC. SWITCH OFF</p>	<p>Turn off power at the disconnect switch. Remove the black plastic covers from Chopper SW Modules SM-1 & 2 - (10 & 15 HP), or SM-1, 2, & 3 - (20-40 HP). Remove the large, BLACK, 10 AWG wires from their terminal posts. With a VOM set on the Rx1 SCALE, connect the (+) VOM lead to the disconnected BLACK wire. Connect the (-) VOM lead to the large, WHITE, 10 AWG wire at it's terminal post. Check each chopper module individually. Repeat the procedure with the VOM set on the Rx10K scale.</p>	<p>a) On the Rx1 scale the Ohms reading should be infinity. A low reading, (<10 Ohms), indicates a shorted transistor.</p> <p>b) On the Rx10K scale the Ohms reading should be $\geq 500K$ Ohms. A reading below 500K Ohms indicates a leaky transistor.</p>	<p>a) Replace faulty module(s) and reconnect the black wires to their terminal posts. Go to step B5.</p> <p>b) Replace faulty module(s) and reconnect the black wires to their terminal posts. Go to step B5.</p> <p>NOTE: All transistors on the Chopper SW Modules are individually fused. A blown fuse will indicate a failed transistor.</p> <p>HOWEVER, for purposes of verifying drive performance and for troubleshooting under LIGHT LOAD, ($\leq 50\%$ of drive's rated KVA), or NO LOAD conditions, fuses may be removed from faulty transistors. IN NO CASE should a module be installed with less than (6) functional transistors.</p>
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SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE
<p>B. Main Contactor K1 does not energize.</p> <p>CONT.</p>	<p>3 DISC. SWITCH OFF</p>	<p>At Brake SW Module SM-5 (10 & 15 HP), or SM-7 (20-40 HP), remove the large, BLACK, 10 AWG wire from it's terminal post. With the VOM set on the Rx1 scale, connect the (+) VOM lead to the disconnected BLACK wire. Connect the (-) VOM lead to the large, WHITE, 10 AWG wire at it's terminal post. Repeat the procedure with the VOM set on the Rx10K scale.</p>	<p>a) On the Rx1 scale the Ohms reading should be infinity. A low reading, (<10 Ohms), indicates a shorted transistor.</p> <p>b) On the Rx10K scale the Ohms reading should be $\geq 500K$ Ohms. A reading below 500K Ohms indicates a leaky transistor.</p>	<p>a) Replace the Brake SW Module and reconnect the black wire to it's terminal post. Go to step B5.</p> <p>b) Replace the Brake SW Module and reconnect the black wire to it's terminal post. Go to . step B5.</p> <p>NOTE: All transistors on the Brake SW Module are individually fused. A blown fuse will indicate a failed transistor. HOWEVER, for purposes of verifying drive performance and for troubleshooting under LIGHT LOAD ($\leq 50\%$ of drive's rated KVA), or NO LOAD conditions, fuses may be removed from faulty transistors. IN NO CASE should a module be installed with less than (6) functional transistors.</p>
	<p>4</p>	<p>With the disconnect switch OFF, connect a voltmeter to Contactor K1, terminals 1 & 4, (coil terminals). With the voltmeter set on the 250V AC scale, turn on power at the disconnect switch and press the ON pushbutton. After approximately (6) seconds the voltage should be 120V AC, $\pm 15\%$.</p>	<p>a) Voltage not present or insufficient.</p> <p>b) Proper voltage present, BUT Contactor K1 is not energized.</p>	<p>a) Replace Power Supply board PS-1</p> <p>b) Replace Contactor K1.</p> <p>NOTE: Contactor K2 is a pneumatic adjustable timer and must pull-in prior to Contactor K1 energizing. Delay time for K2 contacts may be set by the thumbwheel adjust on the timer. Contacts on K2 SHOULD NOT change from their normal de-energized state until 2-3 seconds after LED CR15 on Power Supply Board PS-1 is lit. LED CR15 should light approximately 3-6 seconds after the ON pushbutton is pressed.</p>
	<p>5</p>	<p>Turn off power at the disconnect switch. Set the manual speed pot fully CCW - minimum speed. With the voltmeter set on the 500V DC scale, connect the (+) lead to the (+) side of the 1st Bus Bar and the (-) lead to the common (-) Bus Bar. Turn on power at the disconnect switch and press the ON pushbutton. Wait approximately (3) seconds for the 1st Bus to precharge before taking a reading</p>	<p>a) 1st Bus does not charge to 275V DC after Chopper and Brake SW Modules verified "normal" in steps B2 & B3.</p> <p>b) 1st Bus charges to 275V DC and K1 energizes.</p>	<p>a) Go to step B6. NOTE: If 1st Bus does not charge at all - (0V DC measured) - Go to step B10.</p> <p>b) Go to step C1.</p>

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B. Main Contactor K1 does not energize.	6 DISC. SWITCH OFF	Turn off power at the disconnect switch. Remove the black plastic guard from the Bus Bank capacitors. Connect the (+) VOM lead to the (+) 1st Bus Bank bar and the (-) VOM lead to the (-) 1st Bus Bank bar. Push in and hold the RESET on Contactor K2. The VOM should read between 5 and 25 Ohms and slowly rise to above 30 Ohms.	A sustained low reading, (<25 Ohms), indicates a short on the 1st Bus. - EITHER- • Shorted Bus Bank capacitor C1, C2, or C3 - (10 & 15 HP), or C1-C6 - (20-40 HP). • Shorted Rectifier Assembly CR2. • Shorted Steering Diode Assembly DD-1 or DD-2. • Pinched wires to the Bus Bank capacitors.	Go to step B7.																
	7 DISC. SWITCH OFF	Leave the (-) VOM lead connected to the (-) 1st Bus Bank bar and the VOM on Rx1. Disconnect all wires to the (+) 1st Bus Bank bar. Verify that the disconnected wires are not touching. Connect the (+) VOM lead to the (+) 1st Bus Bank bar	a) A low reading, (≤100 Ohms), indicates a shorted or leaky Bus capacitor. b) A high reading, (>100 Ohms), indicates the fault is elsewhere.	a) Remove the brass bar(s) from the (+) 1st Bus Bank. Isolate and replace faulty Bus capacitor(s). Replace brass bar(s) b) Go to step B8. NOTE: When checking capacitors, always wait for the ohmmeter reading to stabilize.																
	8 DISC. SWITCH OFF	Leave the (-) VOM lead connected to the (-) 1st Bus Bank bar and the VOM on Rx1. Connect the (+) VOM lead to C8(+) - (10 & 15 HP), or C15(+) - (20-40 HP), and check indication. Repeat for C9 (10 & 15 HP), or C16 (20-40 HP)	a) A low reading, (≤100 Ohms), indicates a shorted or leaky Bus capacitor. b) A high reading, (>100 Ohms), indicates the fault is elsewhere.	a) Replace faulty capacitor(s) b) Go to step B9																
	9 DISC. SWITCH OFF	With the VOM on the Rx1 scale, check Rectifier Assembly CR2 as follows: <table style="margin-left: 40px;"> <thead> <tr> <th colspan="2">VOM</th> <th rowspan="2">Reading</th> </tr> <tr> <th>(+)</th> <th>(-)</th> </tr> </thead> <tbody> <tr> <td>CR2 (+)</td> <td>(AC)</td> <td>>50 Ohms</td> </tr> <tr> <td>CR2 (+)</td> <td>(AC)</td> <td>>50 Ohms</td> </tr> <tr> <td>(AC)</td> <td>CR2(-)</td> <td>>50 Ohms</td> </tr> <tr> <td>(AC)</td> <td>CR2(-)</td> <td>>50 Ohms</td> </tr> </tbody> </table>	VOM		Reading	(+)	(-)	CR2 (+)	(AC)	>50 Ohms	CR2 (+)	(AC)	>50 Ohms	(AC)	CR2(-)	>50 Ohms	(AC)	CR2(-)	>50 Ohms	a) A low ohmmeter reading, (< 50 Ohms), indicates a shorted or leaky Rectifier Assembly CR2. b) A high reading indicates the fault is elsewhere.
VOM		Reading																		
(+)	(-)																			
CR2 (+)	(AC)	>50 Ohms																		
CR2 (+)	(AC)	>50 Ohms																		
(AC)	CR2(-)	>50 Ohms																		
(AC)	CR2(-)	>50 Ohms																		
CONT.																				

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	10 DISC. SWITCH OFF	With the VOM on the Rx1 scale, check precharge current limiting resistors R1 and R4 on Resistor Assembly 41103 - (10 & 15 HP), or R1 and R2 on Resistor Assembly 41101 - (20-40 HP).	Each resistor should read 10 Ohms. An open resistor will disable precharge.	Replace Resistor Assembly 41103 or 41101. NOTE: An open resistor will cause overheating. Check wire insulation near the Resistor Assembly for damage. Replace Thermal Overload OTS-1 and wires if damage has occurred.														
B. Main Contactor K1 does not energize.	11	Set the VOM on the 500V DC scale. Set the manual speed pot fully CCW - minimum speed. Connect the (+) VOM lead to the (+) side of the 1st Bus Bar and the (-) VOM lead to the common (-) Bus Bar. Apply power at the disconnect switch and press the ON pushbutton. After approximately (3) seconds bus voltage should be 275V DC and LED CR15 on Power Supply board PS-1 should be lit. After approximately (6) seconds, Contactor K1 should energize.	a) Bus not charging or voltage to low. b) Voltage is $\geq 275V$ DC, LED CR15 is lit, but K1 is not energized. c) K1 is energized, and LED 1 on Brake Board BB-1 is lit or flickering d) Bus voltage is $\geq 275V$ DC, but CR15 is not lit.	a) Contact your Allen-Bradley Area Service Center. b) Replace Control Logic board CL1 . c) Turn potentiometer R2 on BB-1 CCW until LED 1 turns off, then turn an additional 1/2 turn CCW. NOTE: If LED 1 does not turn off, replace Brake Board BB-1. d) Go to step B12a)														
	12 DISC. SWITCH OFF	a) Turn off power at the disconnect switch and check fuse F2. b) Set the VOM on the Rx1 scale and check Rectifier Assembly CR3 as follows: <u>VOM</u> <table border="0" style="margin-left: 40px;"> <tr> <td style="padding-right: 20px;">(+)</td> <td style="padding-right: 20px;">(-)</td> <td>Readings</td> </tr> <tr> <td>CR3 (+)</td> <td>(AC)</td> <td>>50 Ohms</td> </tr> <tr> <td>CR3 (+)</td> <td>(AC')</td> <td>>50 Ohms</td> </tr> <tr> <td>(AC)</td> <td>CR3 (-)</td> <td>>50 Ohms</td> </tr> <tr> <td>(AC')</td> <td>CR3 (-)</td> <td>>50 Ohms</td> </tr> </table>	(+)	(-)	Readings	CR3 (+)	(AC)	>50 Ohms	CR3 (+)	(AC')	>50 Ohms	(AC)	CR3 (-)	>50 Ohms	(AC')	CR3 (-)	>50 Ohms	a) F2 blown. b1) <50 Ohms indicates a shorted or leaky diode on CR3. b2) VOM reads > 50 Ohms.
(+)	(-)	Readings																
CR3 (+)	(AC)	>50 Ohms																
CR3 (+)	(AC')	>50 Ohms																
(AC)	CR3 (-)	>50 Ohms																
(AC')	CR3 (-)	>50 Ohms																
CONT.																		

<p>13 DISC. SWITCH OFF</p>	<p>a) Disconnect twist-lock connector J4 at Converter Board CO-1. With the VOM on the Rx1 scale, connect the (+) VOM lead to C7(+) (10 & 15 HP), or C14(+) (20-40 HP). Connect the (-) VOM lead to the (-) terminal of the capacitor. The VOM should read low and rise to a high reading, (>100 Ohms).</p> <p>b) With the VOM on the Rx10 scale, check CR3 and CR4 on Converter Board CO-1 as follows:</p> <p style="text-align: center;"><u>VOM</u></p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">(+)</th> <th style="text-align: center;">(-)</th> <th style="text-align: center;">Readings</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">CR4 (Cathode)</td> <td style="text-align: center;">CR4 (Anode)</td> <td style="text-align: center;">≥1M Ohm</td> </tr> <tr> <td style="text-align: center;">CR3 (Cathode)</td> <td style="text-align: center;">CR3 (Anode)</td> <td style="text-align: center;">≥1M Ohm</td> </tr> </tbody> </table>	(+)	(-)	Readings	CR4 (Cathode)	CR4 (Anode)	≥1M Ohm	CR3 (Cathode)	CR3 (Anode)	≥1M Ohm	<p>a1) >100 Ohms indicates the fault is elsewhere.</p> <p>a2) A low ohmmeter reading, (≤100 Ohms, indicates a shorted or leaky converter capacitor.</p> <p>b1) ≥1M Ohm indicates no fault.</p> <p>b2) < 1M Ohm indicates faulty diodes or transistors on Converter Board CO-1</p>	<p>a1) Go to step b).</p> <p>a2) Replace faulty capacitor</p> <p>b1) Go to step B14.</p> <p>b2) Replaces CO-1.</p>			
(+)	(-)	Readings													
CR4 (Cathode)	CR4 (Anode)	≥1M Ohm													
CR3 (Cathode)	CR3 (Anode)	≥1M Ohm													
<p>14</p>	<p>Reconnect twist-lock connector J4 to Converter Board CO-1. Insure that ALL connections previously removed have been replaced. Set the VOM on the 50V DC scale. Reapply power at the disconnect switch and press the ON pushbutton. Check Power Supply board PS-1 as follows:</p> <p style="text-align: center;"><u>VOM</u></p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">(+)</th> <th style="text-align: center;">(-)</th> <th style="text-align: center;">Reading</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">C4 (+)</td> <td style="text-align: center;">C6 (-)</td> <td style="text-align: center;">+5.3V DC ± 10%</td> </tr> <tr> <td style="text-align: center;">C6 (-)</td> <td style="text-align: center;">C5 (-)</td> <td style="text-align: center;">+15V DC ± 10%</td> </tr> <tr> <td style="text-align: center;">C6 (+)</td> <td style="text-align: center;">C6 (-)</td> <td style="text-align: center;">+15V DC ± 10%</td> </tr> </tbody> </table>	(+)	(-)	Reading	C4 (+)	C6 (-)	+5.3V DC ± 10%	C6 (-)	C5 (-)	+15V DC ± 10%	C6 (+)	C6 (-)	+15V DC ± 10%	<p>a) Voltage not present or insufficient.</p> <p>b) Voltage present and sufficient.</p>	<p>a) Replace Power Supply board PS-1 and recheck CO-1. If voltage is still not present or insufficient contact your Allen-Bradley Area Service Center</p> <p>b) Go to step C1.</p>
(+)	(-)	Reading													
C4 (+)	C6 (-)	+5.3V DC ± 10%													
C6 (-)	C5 (-)	+15V DC ± 10%													
C6 (+)	C6 (-)	+15V DC ± 10%													

SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE
C. Motor starts but trips off drive.	1	Turn off power at the disconnect switch and disconnect the motor from the drive at TB1, terminals 1, 2, & 3. Set the manual speed pot fully CCW - minimum speed. Turn on power at the disconnect switch and press the ON pushbutton. If the drive has RUN/STOP pushbuttons, press RUN. Slowly turn the speed pot CW.	<p>a) Drive trips off with motor disconnected - Possible faulty Chopper SW Module(s).</p> <p>b) Drive trips off with motor disconnected - Chopper SW Module(s) are correct per step B2.</p> <p>c) Drive does not trip off with motor disconnected.</p>	<p>a) Go to step B2.</p> <p>b) Go to step B3 to check Brake SW Module.</p> <p>c) Go to step C7.</p>
	2 DISC. SWITCH OFF	Turn off power at the disconnect switch. Remove the black plastic covers from Pull Down SW Modules SM-3 & 4 - (10 & 15HP), or SM-4, 5, & 6 - (20 & 40HP). Remove the large, BLACK, 10 AWG wires from their terminal posts. With a VOM set on the Rx1 scale, connect the (+) VOM lead to the disconnect BLACK wire. Connect the (-) VOM lead to the large, WHITE, 10 AWG wire at it's terminal post. Check individually. Repeat the procedure with the VOM set on the Rx10K scale.	<p>a) On Rx1 scale the Ohms reading should be infinity. A low reading, (<10 Ohms), indicates a shorted transistor.</p> <p>b) On Rx10K scale the Ohms reading should be $\geq 500K$ Ohms. A reading below 500K Ohms indicates a leaky transistor.</p>	<p>a) Replace faulty module(s) and reconnect the black wires to their terminal posts. Go to step C5.</p> <p>b) Replace faulty module(s) and reconnect the black wires to their terminal posts. Go to step C5.</p> <p>NOTE: All transistors on the Pull Down SW Modules are individually fused. A blown fuse will indicate a failed transistor. HOWEVER, for purposes of verifying drive performance and for troubleshooting under LIGHT LOAD ($\leq 50\%$ of drive's rated KVA), or NO LOAD conditions, fuses may be removed from faulty transistors. IN NO CASE should a module be installed with less than (6) functional transistors.</p>
CONT.				

SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE
C. Motor starts but trips off drive.	3	<p>a) With the motor still disconnected, turn on power at the disconnect switch. Set the manual speed pot fully CCW- minimum speed. If the drive has RUN/STOP pushbuttons, DO NOT press RUN. Place the toggle switch located on the bottom of Chopper Driver Board DB-1 in the OFF position. Press the ON pushbutton. LED CR7, (Pull Down LED), on Chopper Driver Board DB-1 should light. After approximately (3) seconds, LED CR15, (Bus Sense LED), on Power Supply Board PS-1 should light. After approximately (6) seconds, one LED on each of the Power Driver Boards, DB-2, 3, & 4 should light. NOTE: The above sequence will occur ONLY if the drive is equipped with RUN/STOP AND/OR the drive has a minimum speed pot setting of (0) Hz.</p> <p>b) If the drive has RUN/STOP pushbuttons, press RUN, slowly turn the speed pot CW. Observe LEDs CR7 & CR4 on Chopper Driver Board DB-1. CR7 should dim while CR4 should remain off. LEDs on Power Driver Boards DB-2, 3, & 4 will alternately start to flash. As the speed is increased above 10 Hz, all LEDs on the Power Driver Boards will appear to be lit constantly.</p>	<p>a) None or both LEDs on Power Driver Boards DB-2, 3, or 4 are lit.</p> <p>b1) LEDs on Power Driver Boards DB-2, 3, or 4 not indicating as explained.</p> <p>b2) LEDs on Chopper Driver Board DB-1 not indicating as explained.</p> <p>b3) All LEDs indicating normally.</p>	<p>a) Replace faulty Power Driver Board(s). NOTE: DB-2, 3, & 4 may be interchanged to determine if the problem stays with the board or whether wiring to the board is at fault.</p> <p>b1) Go to step C4.</p> <p>b2) Go to step C5.</p> <p>b3) Go to step C7.</p>
	4 DISC. SWITCH OFF	<p>Incorrect LED indication on a Power Driver Board indicates a faulty (+) or (-) SW Module connected to that Power Driver Board. Turn off input power at the disconnect switch and remove the black plastic covers from the (+) and (-) SW Modules associated with the faulty Power Driver Board. Remove both the large, (10 AWG) and small, (18 AWG) . BLACK wires from their terminal posts. With the VOM set on the Rx10K scale, connect the (+) VOM lead to the large disconnected BLACK wire. Connect the (-) VOM lead to the large, WHITE, 10 AWG wire at it's terminal post. The VOM should read low and slowly rise to approximately 500K Ohms after 10-15 seconds Repeat for each SW Module</p>	<p>A sustained low reading indicates a shorted or leaky SW Module.</p>	<p>Replace faulty SW Module(s). Reconnect all SW Module wires. Go to step C7.</p>
CONT.				

SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE
C. Motor starts but trips off drive.	5	<p>With the motor still disconnected and the disconnect switch off, set the manual speed pot fully CCW minimum speed. Switch the toggle switch on Chopper Driver Board DB-1 to ON. With the VOM set on the 500V DC scale, connect the (+) VOM lead to the (+) side of the 2nd Bus Bar and the (-) VOM lead to the common (-) Bus Bar. Turn on power at the disconnect switch and press the ON pushbutton. Wait approximately (6) seconds for Contactor K1 for energize. If the drive has RUN/STOP pushbuttons. press RUN and slowly turn the speed pot CW. Observe the voltage and note the action of LEDs CR4, (Chopper LED), and CR7, (Pull Down LED), on Chopper Driver Board DB-1. The voltage should slowly increase from 0 to 280V DC while CR7 dims and CR4 lights.</p>	<p>a) Voltage and LEDs indicating correctly. b) Voltage not present. CR7 remains lit and CR4 remains off as speed pot is turned CW. NOTE: Insure that the drive is processing the speed signal by checking the LEDs on Power Driver Boards DB-2, 3, and 4. LEDs should alternately start to flash as the speed pot is turned CW. Above 10 Hz, they will appear to be lit constantly. c) Voltage not present. CR7 goes off but CR4 remains off when speed pot is turned CW. d) Voltage not present or very low, (<10V DC). CR7 begins to dim, CR4 begins to light then drive trips off.</p>	<p>a) Go to step C7. b) Replace Control Logic board CL-1. Go to step C7. c) Replace Chopper Driver Board DB-1. Go to step C7. d) Go to step C6.</p>
CONT.	6 DISC. SWITCH OFF	<p>a) Turn off power at the disconnect switch. Remove the black plastic guard from the Bus Bank capacitors. Connect the (+) VOM lead to the (+) 2nd Bus Bank bar. Connect the (-) VOM lead to the (-) 2nd Bus Bank bar. The VOM should read low and slowly rise to above 25 Ohms.</p> <p>b) Leave the (-) VOM lead connected to the (-) 2nd Bus Bank bar and the VOM on Rx1. Disconnect all wires to the (+) 2nd Bus Bank bar. Insure that the disconnected wires are not touching. Connect the (+) VOM lead to the (+) 2nd Bus Bank bar.</p> <p>c) Leave the (-) VOM lead connected to the (-) 2nd Bus Bank bar and the VOM on Rx1. Connect the (+) VOM lead to C10 (+) (10 & 15 HP), or C17 (+) (20-40 HP), on the drive back panel.</p>	<p>a) A sustained low reading indicates a short on the 2nd Bus.</p> <p>b1) A high reading, (>100 Ohms), indicates the fault is elsewhere. b2) A low reading, (≤100 Ohms), indicates a shorted or leaky Bus capacitor.</p> <p>c1) A high reading, (>100 Ohms), indicates the fault is elsewhere. c2) A low reading indicates a shorted capacitor.</p>	<p>a) Go to step b).</p> <p>b1) Go to step c). b2) Remove the brass bar from the (+) 2nd Bus bank. Isolate and replace faulty Bus capacitor(s). Replace brass bar. Go to step C7.</p> <p>c1) Carefully reconnect all wires to the (+) 2nd Bus Bank bar AND ALL OTHER WIRES previously removed. Go back to step C3. c2) Replace faulty capacitor. Go to step C7.</p>

SYMPTOM	STEP	DIAGNOSTIC PROCEDURE	PROBABLE FAILURE OR INDICATION	REPAIR PROCEDURE
C. Motor starts but trips off drive.	9	b) With the motor still connected, press the OFF pushbutton and set the speed pot fully CCW - minimum speed. Press the ON pushbutton. If the drive has RUN/STOP pushbuttons, press RUN. Wait approximately (6) seconds, then QUICKLY turn the speed pot CW to maximum speed. Once the motor has reached full speed, QUICKLY turn the speed pot back to minimum speed.	<p>b1) Motor follows speed pot signal and runs smoothly.</p> <p>b2) Drive trips upon acceleration as speed pot is quickly turned CW.</p> <p>b3) Drive trips upon deceleration as speed pot is quickly turned CCW.</p> <p>b4) Drive trips upon deceleration - Braking Resistor Heater(s) R3 - (10 & 15 HP), or R5 & R6 - (20-40 HP) overheated and/or Over temperature switch OTS-2 tripped.</p>	<p>b1) Contact your Allen-Bradley Service Center.</p> <p>b2) Acceleration Rate set too High, (potentiometer R86 on Control Logic Board CL-1).</p> <p>CAUTION: Do not adjust RED sealed potentiometers. Breaking of these seals will void any drive warranties. Incorrect adjustment may cause damage to the motor and/or drive.</p> <p>b3) Deceleration Rate set to High. (potentiometer R87 on Control Logic Board CL-1)</p> <p>CAUTION: Do not adjust RED sealed potentiometers. Breaking of these seals will void any drive warranties. Incorrect adjustment may cause damage to the motor and/or drive.</p> <p>NOTE: If LED 1 on Brake Board BB-1 remains on or flickers when the speed pot is fully CCW - minimum speed, BB-1 may need readjustment. Go back to step B11c).</p> <p>b4) Heavy Duty Dynamic Braking, (Option K2), may be required. Contact your Allen-Bradley Area Service Center.</p>