



Troubleshooting Procedures

46990202 Rev. -

Functional Description

The Dual Head VCD Inserter inserts axial leaded components from dual, presequenced taped input packages. The components are cut from the carrier tape and formed by the insertion heads. The pattern program controls the location and orientation of component insertion. During insertion, the cut and clinch assemblies mechanically secure the components to the board. The process continues until the pattern program is completed, and all required components are in place.

Troubleshooting Concept

The troubleshooting procedures in this module identify specific maintenance requirements to be used when performing maintenance on the machine. Refer to the specific assembly support document for detailed information pertaining to the procedures presented.

Troubleshooting

The purpose of this section is to provide the maintenance technician with information on how to troubleshoot the models 6292C/6298C.

Troubleshooting is the process of evaluating a fault condition and isolating the condition to a cause.

The cause may be evident by the physical condition of the machine and the point in the operational cycle where the machine malfunctioned.

Where the cause is not evident, various troubleshooting techniques, presented in this section, should be followed to determine the specific area and/or component that caused the malfunction.

The models 6292C/6298C contain various features that are intended to assist the technician in the troubleshooting procedure. These elements include the IM Diagnostics functions, the pneumatic valve actuators, and the troubleshooting tables.

Before performing the troubleshooting techniques, ensure that the following criteria have been met.

- (1) The maintenance technician must know the machine functions.
- (2) Verify that the correct programs have been properly loaded and activated.

CAUTION

When performing troubleshooting procedures, wear a wrist strap connected to ground to prevent electrostatic discharge damage to printed circuit boards.

Troubleshooting Techniques

The troubleshooting techniques that follow provide various methods for isolating machine problems. The specific technique used depends upon the type of problem encountered, the software options included and the technicians preference.



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Diagnostics

The diagnostics techniques allow the user to display machine operation on the monitor. Passive and active diagnostics routines are available, refer to the IM-Diagnostics Reference Guide for details pertaining to diagnostic information.

Passive diagnostics allows the user to determine the status of the VME controller and each machine function that is input or output from the VME.

Active diagnostics provides the user with the ability to program specified bits to selectively cycle particular assemblies and evaluate their performance.

IM-Diagnostics

The machine self-diagnostics supplies a clear description of the VME condition. The following are accessed through the Machine Status window.

- (1) What electrical or mechanical event, or operator action, the machine is looking for if the machine is in a WAIT condition.
- (2) What caused the machine to stop if the machine is in a STOP or LIMIT ERROR condition.

The Status window can be used to display the status for any or all sections of the system. Refer to the IM-Diagnostics Reference Guide for detailed information on machine self diagnostics.

Machine Sequence of Events

The general sequence of events for the insertion cycle of the Models 6292C/6298C is as follows.

1. A component is fed under the insertion tooling and the insertion span is set to the programmed position.
2. If the X-Y positioning system is in position, the clinch anvils move to the up position.
3. The insertion tooling is activated and cuts, forms then inserts the component into the board.
4. The clinch assembly cutters are activated to cut, clinch and verify a correct insertion of the component.
5. The clinch anvils and insertion tooling retract to their home positions.
6. The clinch cutters are retracted to their home position.

Pneumatic Valve Actuators

Each pneumatic valve contains a plunger that allows the user to manually actuate the valve. This assists in determining whether the pneumatics or electrical controls are the cause of a specific function problem. If a function does not operate, and pushing the plunger causes the function to operate, an electrical problem most likely exists. If the function fails to operate when the plunger is pushed, a pneumatic or mechanical problem most likely exists.

For details pertaining to the pneumatic line colors, refer to the pneumatic line convention in the prerequisite information section.

Troubleshooting Tables

After isolating the machine problem, use the following tables to further troubleshoot the machine to a specific component malfunction and repair.

**Troubleshooting Procedures****46990202 Rev. -***Electrical System*

INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
1. No power to machine systems.	<ul style="list-style-type: none">a. Electric power cord disconnected from plant electrical outlet.b. UPS failurec. AC Lockout Assembly failure.d. Transformer fuse failure.e. Transformer enclosure failure.f. Main circuit breaker in AC chassis has tripped.	<ul style="list-style-type: none">a. Connect power cord plug to electrical outlet.b. Repair or replace as required.c. Repair or replace as required.d. Replace fuse.e. Repair or replace as required.f. Reset Main circuit breaker.
2. All low DC voltages are absent.	<ul style="list-style-type: none">a. Power chassis fuse PS1, 1FU blown.b. Power Supply failure.	<ul style="list-style-type: none">a. Replace fuse.b. Repair or replace as required.
3. No +/-15vDC to machine control circuits.	<ul style="list-style-type: none">a. Regulated power supply failed.	<ul style="list-style-type: none">a. Replace power supply.

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INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
4. No 56vDC to motor drive circuits.	a. Palm switch is pushed to stop. b. Machine in interlock. c. Fuse PS1, 3FU blown. d. Transformer PS1, 1T failed. e. Full wave rectifier PS1, 1REC failed.	a. Pull all palm switches and push INTERLOCK push button to start. b. Clear cause of interlock and push INTERLOCK push button. c. Replace fuse. d. Replace transformer. e. Replace rectifier.
5. 12vAC work light WL1 not energized with power on.	a. Fuse PS1, 4FU blown. b. Fuse PS1, 6FU blown. c. Transformer PS1, 2T failed.	a. Replace fuse. b. Replace fuse. c. Replace transformer.
6. 24vAC present but 12vAC work light WL1 not on.	a. Bulb blown. b. Fuse PS1, 6FU blown. c. Transformer PS1, 2T failed.	a. Replace bulb. b. Replace fuse. c. Replace transformer.
7. Switched 12vDC present but dump valve solenoid 1SOL will not energize.	a. Output (DSF1, bit 3) not active. b. Machine in interlock. c. 32 DC Output card (I/O, PC6) defective. d. Defective wiring. e. Defective dump valve solenoid.	a. Turn on output (DSF1, bit 3). b. Clear cause of interlock and push INTERLOCK push button. c. Replace 32 DC Output card (I/O, PC6). d. Inspect/repair wiring. e. Replace solenoid.

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INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
8. X-Y drive motor circuit breaker does not stay on.	a. The positioning table is mechanically jammed. b. Servo amplifier module failed. c. Loss of +/-15vDC control voltage. d. Drive motor circuit breaker failed. e. Drive motor failed.	a. Clear jam and restore drive power. b. Replace amplifier. c. Repair +/-15vDC control voltage. d. Replace failed circuit breaker. e. Replace failed drive motor.
9. Interlock not functioning.	a. Panel not securely closed. b. Fuse PS1, 4FU; PS1, 5FU or PS1, 7FU blown. c. Interlock switch has failed. d. Interlock controller IICS has failed. e. Relay PS1, 21CR; PS1, 22CR; PS1, 23CR; HP1, 1CR; or HP1, 2CR failed. f. Interlock controller not properly reset.	a. Close and secure all interlocked panels. b. Replace blown fuse. c. Replace switch. d. Replace controller IICS. e. Replace failed relay. f. Open door, wait 1 second, close door.

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INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
1. Moisture in compressed air system.	a. Air filter sediment bowl full. b. Moisture contaminated in house air supply.	a. Drain and clean sediment bowl. b. Correct in house air supply to machine.
2. Excessive lubricant in air system.	a. Drip rate set too high. b. Pneumatic system oiler failed.	a. Set drip rate as specified in Base Machine. b. Replace pneumatic system oiler and set drip rate.
3. Insufficient lubricant in air system.	a. Drip rate set too low. b. Oil reservoir empty. c. Pneumatic system oiler failed.	a. Set drip rate as specified in Base Machine. b. Refill oil reservoir. c. Replace pneumatic system oiler and set drip rate.
4. Air cylinders are operating too slow.	a. Source air pressure too low. b. Regulator air pressure too low.	a. Set in house air pressure to machine to at least 90 psi. b. Replace regulator if necessary.
5. Clinch anvil cylinders are operating too slow.	a. Seals or o-rings are dry or dirty. b. Control valve sluggish. c. Flow controls set too low.	a. Clean, lubricate and replace as required. b. Clean, lubricate and replace as required. c. Refer to maintenance procedures and adjust flow controls for proper operating speed.

**Troubleshooting Procedures****46990202 Rev. -***X-Y Positioning System*

INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
1. X OR Y axis does not zero or position.	<ul style="list-style-type: none">a. Rotary table in position switch not actuated.b. Power chassis circuit breaker PS1, 2CB or PS1, 3CB not set to on.c. Anvil down switch not actuated.d. Machine in interlock (INTERLOCK on).e. Axis in limit error.f. Controller waiting for incomplete machine event.g. Loss of 56vDC to drive motor.h. Servo amplifier module failed.i. UIMC PC board failed.j. Faulty drive motor.k. Faulty encoder.	<ul style="list-style-type: none">a. Refer to maintenance procedures and adjust switch.b. Set circuit breakers on. If circuit breaker does not stay on, refer to electrical system table.c. Refer to maintenance procedures and adjust switch.d. Clear interlock interrupt condition.e. Manually move the axis off the limit switch, then push START to zero axes.f. Use diagnostics to isolate fault.g. Refer to electrical system table.h. Refer to maintenance procedures and replace module.i. Refer to maintenance procedures and replace PC board.j. Replace motor.k. Replace encoder.

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INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
2. X or Y axis oscillates or moves too slow.	a. Dirty linear shaft bearings. b. Worn linear shaft bearings. c. Check bearing preload. d. Servo amplifier module failed. e. UIMC PC board failed. f. Faulty motor. g. Improper belt tension.	a. Refer to the maintenance procedures to clean and lubricate bearings. b. Refer to maintenance procedures and replace worn bearings. c. Refer to maintenance procedures and set correct preload. d. Refer to maintenance procedures and check null adjustments. Set null and, if problem does not correct, replace amplifier. e. Refer to maintenance procedures and check null adjustments. Set null and, if problem does not correct, replace PC board. f. Replace motor. g. Refer to X-Y belt tension procedures.

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INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
3. X or Y axis is noisy.	<ul style="list-style-type: none">a. Improper belt tension.b. Dirty lead screw and ball nut assembly.c. Worn lead screw or ball nut.d. Worn lead screw bearings.e. Dirty linear shaft bearings.f. Worn linear shaft bearings.g. Improper linear bearing preload.	<ul style="list-style-type: none">a. Refer to maintenance procedures and adjust belt tension.b. Clean lead screw and ball nut assembly.c. Refer to maintenance procedures and replace lead screw or ball nut.d. Refer to maintenance procedures and replace duplex ball bearings or ball bearing at drive end of shaft.e. Refer to maintenance procedures and clean and lubricate bearings.f. Refer to maintenance procedures and replace worn bearings.g. Refer to maintenance procedures and set preload.

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INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
<p>4. Axis goes into limit error when START is pushed.</p>	<p>a. Home pulse not generated, encoder failed.</p> <p>b. Home pulse not detected. UIMC PC board failed.</p> <p>c. Faulty limit switch wiring.</p>	<p>a. Refer to maintenance procedures and replace encoder.</p> <p>b. Refer to maintenance procedures and replace PC board.</p> <p>c. Troubleshoot wiring.</p>
<p>5. Axis goes into limit error during automatic processing.</p>	<p>a. Offset values plus the coordinate values exceed travel limit.</p>	<p>a. Check offsets and/or re-program pattern coordinates. Refer to programming manual.</p>

**Troubleshooting Procedures****46990202 Rev. -***Span Axis System*

INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
1. Span axis does not zero or position.	a. Loss of 230VAC to drive. b. Relays HP1-1CR and HPI-2CR failed to function. c. Filter HP1-1FIL failed. d. Servo amplifier module failed. e. UIMC PC board failed. f. Faulty drive motor. g. Faulty encoder. h. Faulty wiring.	a. Refer to electrical system table. b. Check for faulty relays or 24VAC per electrical system table. c. Replace faulty filter. d. Check status codes of module and correct. Refer to Servo Chassis Assembly procedures document. e. Refer to maintenance procedures and replace PC board. f. Replace motor. g. Replace encoder. h. Repair or replace faulty wiring.
2. Axis goes into limit error when START is pushed.	a. Home pulse not generated, encoder failed. b. Home pulse not detected. UIMC PC board failed. c. Faulty limit switch and/or wiring.	a. Refer to maintenance procedures and replace encoder. b. Refer to maintenance procedures and replace PC board. c. Troubleshoot switch/wiring.



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Span Axis System

INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
<p>3. Axis goes into limit error during automatic processing.</p>	<p>a. Offset values plus coordinate values exceed travel limit.</p>	<p>a. Check offsets and/or re-program pattern coordinates. Refer to programming manual.</p>

**Troubleshooting Procedures****46990202 Rev. -***Insert Errors*

INDICATED TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
1. Component leads do not enter printed circuit board.	a. Printed circuit board drilled incorrectly. b. Printed circuit board not properly positioned. c. Pattern program coordinates are incorrect. d. Machine zero setup out of tolerance. e. Incorrect offset values. f. BEC setup out of tolerance.	a. Replace out of tolerance printed circuit boards. b. Correct board positioning problem. c. Enter correct coordinates. d. Refer to maintenance section and adjust encoder. e. Enter correct offset values. f. Refer to maintenance section and set up BEC.
2. Leads not clinched.	a. Clinch jammed. b. Clinch failed.	a. Remove clinch jam. b. Refer to clinch assembly table.
3. Component leads are clinched but leads are too long.	a. Incorrect tooling to printed circuit board clearance. b. Clinch height set too low. c. Incorrect head to clinch alignment. d. Printed circuit board not properly positioned.	a. Refer to maintenance section and adjust tooling to board clearance. b. Refer to maintenance section and adjust clinch height. c. Refer to maintenance section and align head to clinch. d. Correct board positioning problem.

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