VarioStack™

SIEMENS

I/O Test Procedure

Document No.: 740-01436, Rev. A

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Important: Prior to operating any of the equipment or performing any of the maintenance procedures described within this manual, it is strongly recommended that the operator and maintenance technician read the information provided within the applicable sections of this manual. All personnel shall pay particular attention to the notes, cautions, warnings, and dangers presented in this manual and posted on or in the area of the equipment. This equipment has been designed for use by trained and qualified operators. Every possible effort to prevent injury to the operator or maintenance personnel has been taken in the preparation of this manual. Damage to the equipment is possible when the procedures contained within this manual are not followed.

Revisions

Revision	Date	Description
A	2020-July-2	Initial Release

Contents

1 Introduction

1.1 Purpose

This document includes work instructions to verify all digital inputs and outputs are connected and functioning properly on the automatic VarioStack™ station.

1.2 Referenced Documents

Siemens Part Number	Title
740-01372	VarioStack™ Operation Manual
740-01373	VarioStack™ Service Manual

1.3 Assumptions

1.3.1 At a minimum, the technician should be familiar with the following documents before executing this procedure:

· **740-01373 VarioStack™ Service Manual**

· **740-01372 VarioStack™ Operation Manual**

1.3.2 New systems will contain a jumper in the Main Control Enclosure that will effectively disable the "External Safety In" signal. The jumper is located between terminals 0712 and 0713.
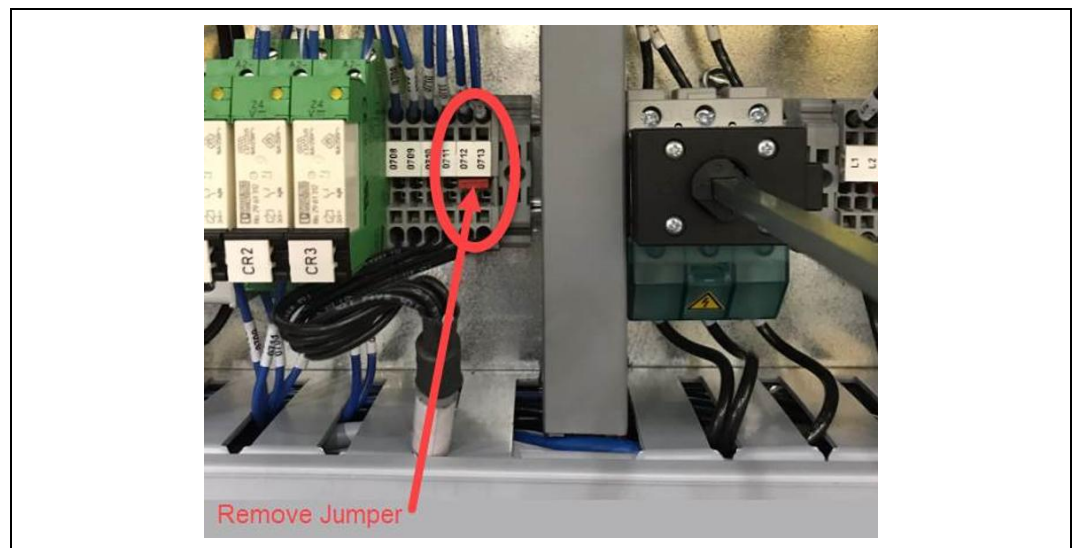

Figure 1. Main Control Enclosure - Jumper for External Safety Input

If this signal needs to be tested, this jumper will need to be removed prior to the test and replaced when the test is complete.

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2   Manual I/O Verification Test

2.1.1   Ensure machine is in Auto Mode.
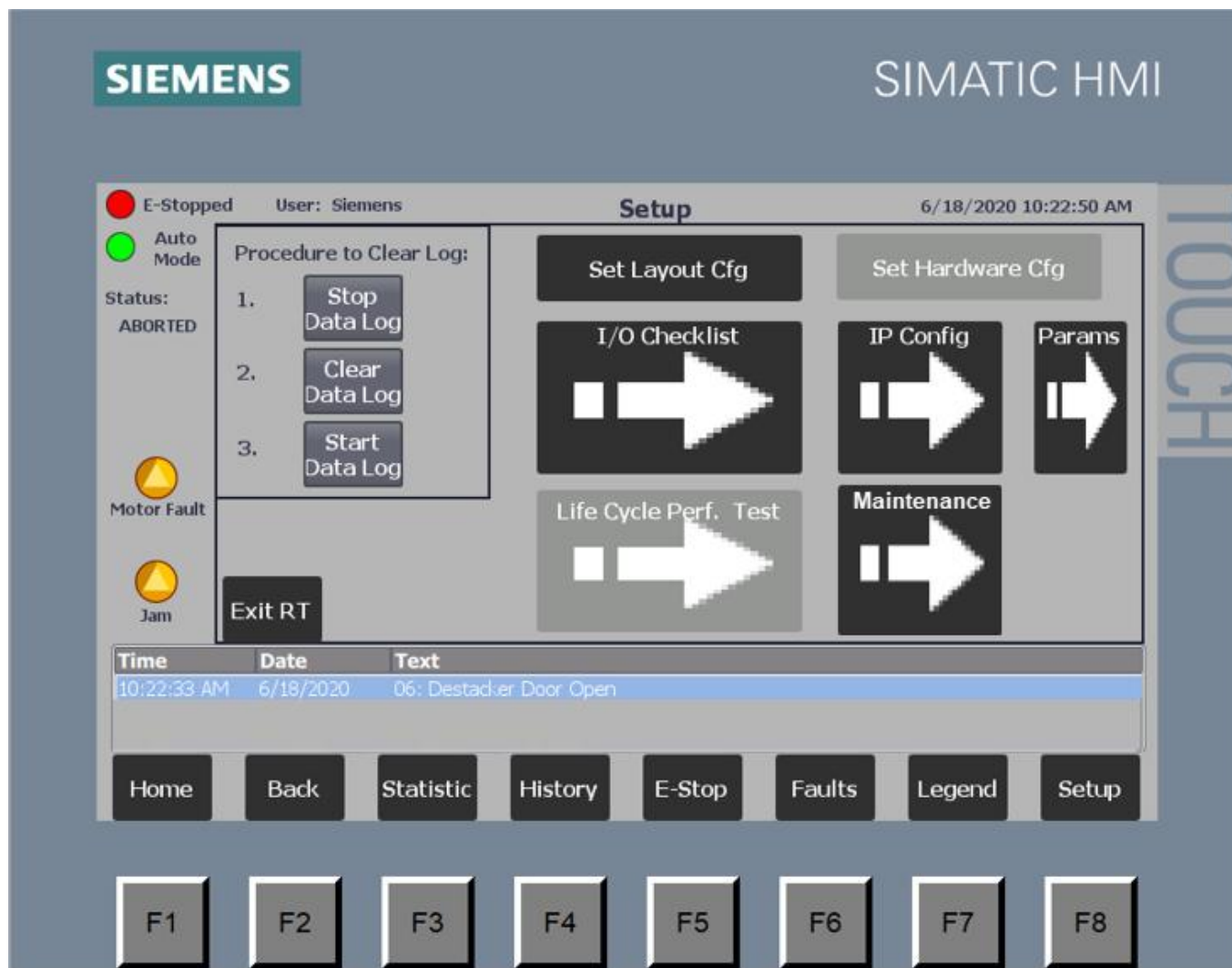
2.1.2   Go to Setup (F8) screen on HMI as shown below:

Figure 2 Setup Screen

2.1.3   Press I/O Checklist [I/O Checklist button image] to get to Manual I/O Verification Test screen as shown below:

If prompted, login with maintenance cred.

Enter the User and Password, and then press **OK**.
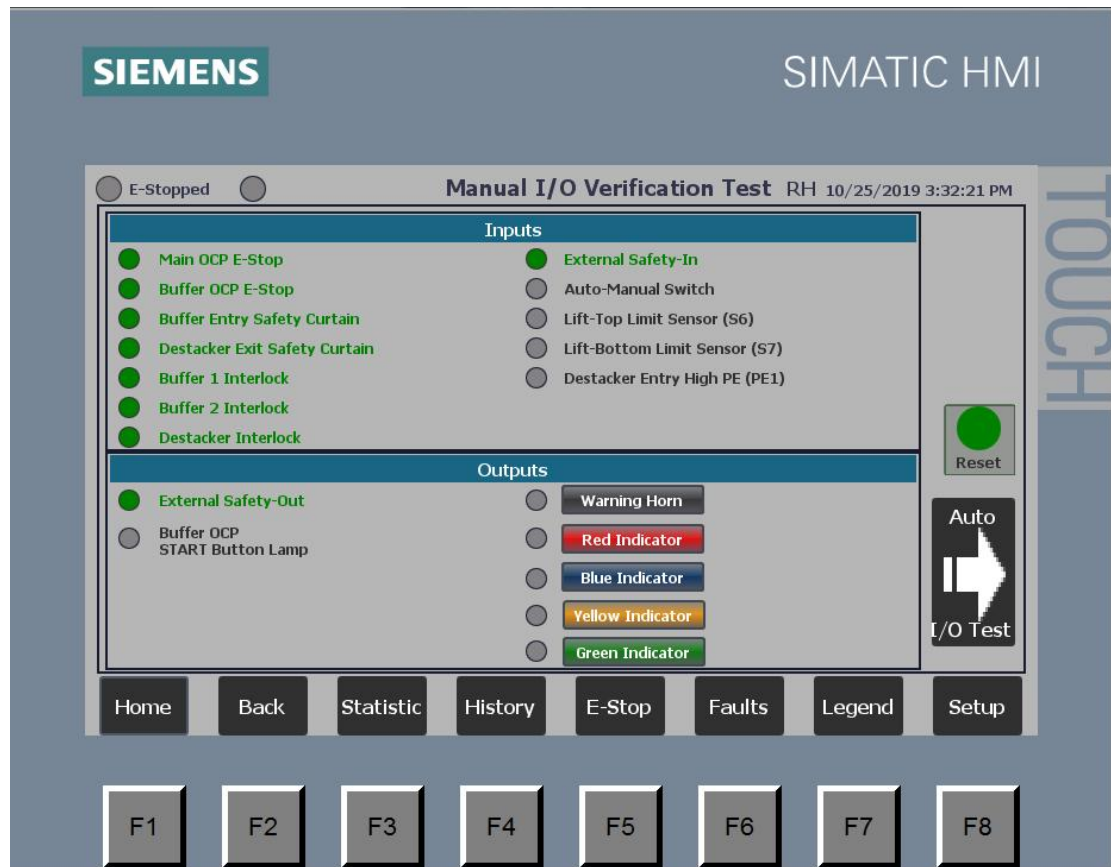
User: **maint**

Password: **maint**

Figure 3 Manual I/O Verification Test Screen

2.1.4   Ensure all safety signals are clear.

2.1.5   Manually toggle and reset all E-Stops, Light Curtains and Interlocks. The Manual I/O Verification Test screen should reflect the state change (i.e.) of each signal.

2.1.6   As "Buffer Entry Light Curtain" is tested, verify the light on the adjacent start button, the "Buffer OCP Start Button Lamp" begins to flashes after the curtain is blocked and then cleared again. The HMI screen will also reflect the signal change of the start button lamp.:
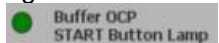.

Figure 4 Jumper In without the dry contacts connected

2.1.7   Test External Dry Contact Signals

Once VarioStack is fielded, it will need to interface with downstream system E-Stops. This interface will be connected by the system integrator during system level commissioning by connecting downstream signals to CON1 and CON2 on the Power Inlet enclosure shown below:
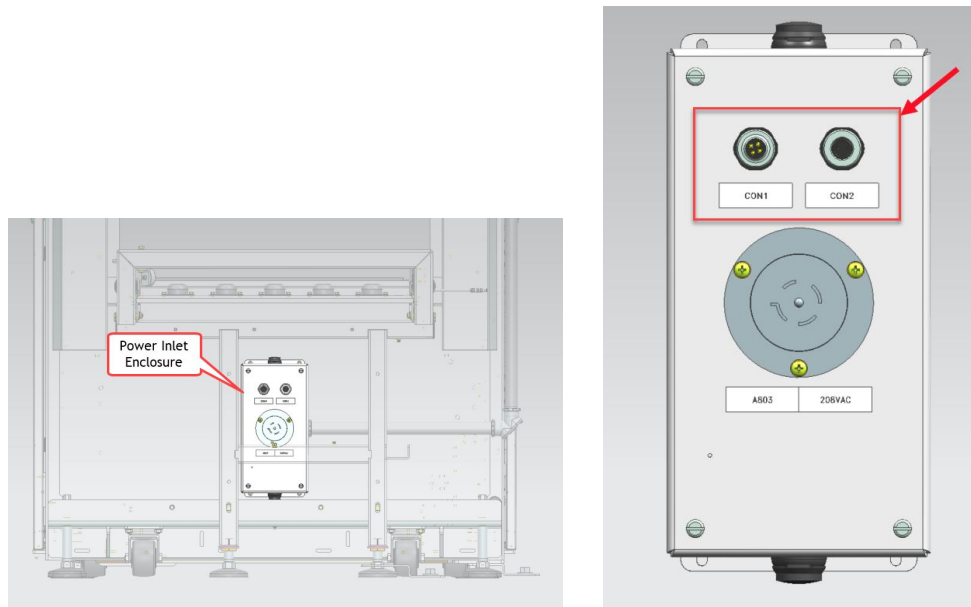
The purpose of this test is to ensure all VarioStack components associated with this interface are working properly.

Execute the following steps to complete the test.

2.1.7.1   Connect female end of cable 62.0091.849-00 to CON1 of the power inlet
          enclosure and the other end of the cable to CON2**.**

The cable will effectively connect VarioStack Safety Output (CON1) to VarioStack Safety Input (CON2)
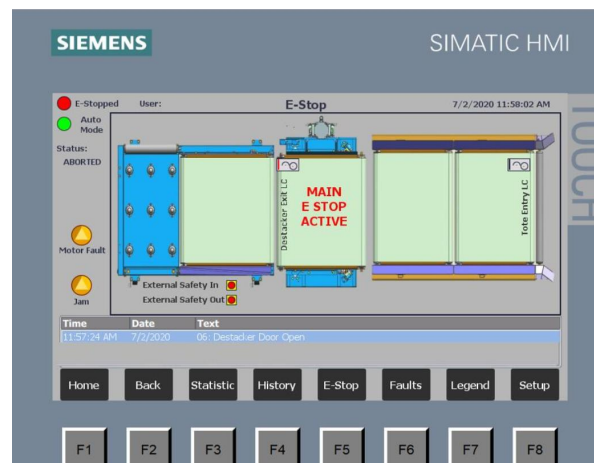

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2.1.7.2   Ensure all VarioStack system E-Stops are clear and system is operational. The E-Stop screen (F5) on the HMI should show no E-Stops as shown below:
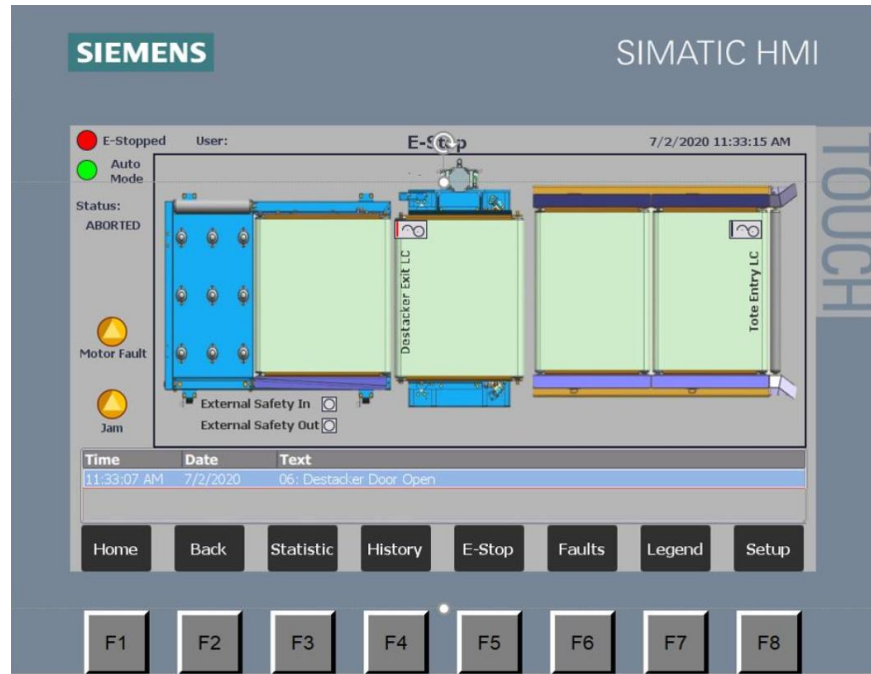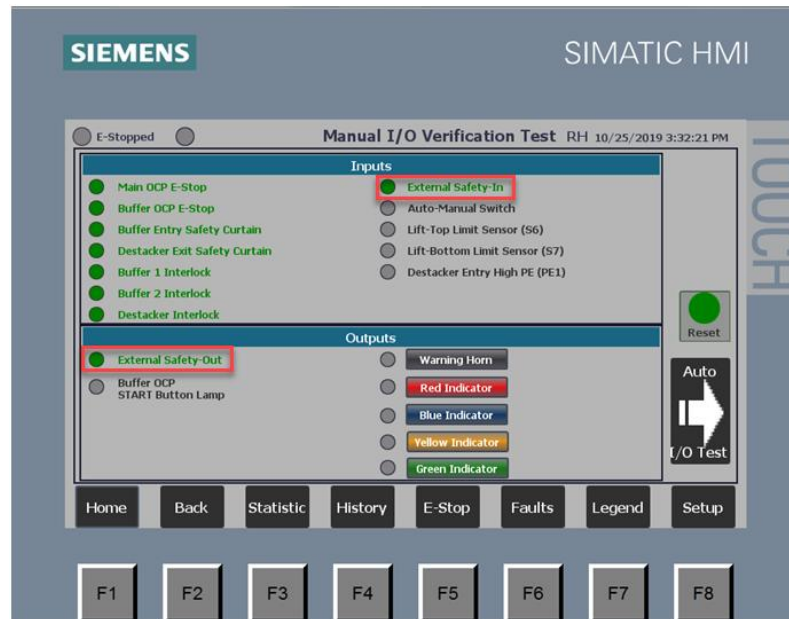

2.1.7.3   Press the E-Stop on the Main OCP

2.1.7.4   Check the E-Stop HMI screen again and verify the following E-Stops are now active.

- Main OCP E-Stop
- External Safety In
- External Safety Out

These signals are also visible on the Auto I/O Verification screen:

2.1.7.5   Clear the Main OCP and press reset on the Main OCP. Ensure all three signals above are now cleared.

2.1.8   Move lift to test the lift position limit sensors (S6 and S7).

ATTENTION:

·   The following steps require manually moving the lift platform to the extents of its range of motion, possibly for the first time. Machine damage could occur if proximity sensors for detecting lift position are not adjusted properly. **As the lift moves, the technician should watch carefully to ensure the following sensors detect the lift platform without interfering with it. Two persons may need to work together for this step.**

o Lift-Top Limit Sensor (S6)

o Lift-Exit Position Sensor (S5)

o Lift-Bottom Limit Sensor (S7)

·   Machine damage to avoid:

o Contact between the sensor and the sensor flag on the lift platform

o Lift over-travel (beyond the top/bottom limit sensors)

·   Clear all E-Stops and reset errors.

·   With the machine still in Manual Mode, use the JOG UP and JOG DOWN buttons on the Main OCP to move the lift UP/DOWN to complete the following steps:

o Verify **"Lift-Top Limit Sensor"**: Drive lift to maximum height, lift should stop when top limit sensor is blocked. Verify the **"Lift-Top Limit Sensor (S6)"** indicator on HMI change state.

o Verify **"Lift-Bottom Limit Sensor"**: Drive lift to minimum height, lift should stop on it own. Verify the **"Lift-Bottom Limit Sensor (S7)"** indicator on HMI change state.

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2.1.9   Verify "Destacker Entry High PE": Press E-Stop and manually block PE1. Verify the "Destacker Entry High PE (PE1)" indicator on HMI change state.

2.1.10   Press and hold each of the following buttons and verify the corresponding stack lamp signal flashes while the button is being held.

3   Auto I/O Verification Test

NOTE: The texts on the Auto I/O Verification Test Screen represent the actual state of the digital signals (on or off) and motors (inactive/active). When their states change, the text will change color from "Black" to "Green" or vice versa.

3.1.1   Ensure machine is empty.

3.1.2   Press Buffer OCP START pushbutton if BUFFER ENTRY Lamp on the Main OCP is flashing.

3.1.3   On Manual I/O Verification Test screen, press [Auto I/O Test] to get to Auto I/O Verification Test screen as shown below:
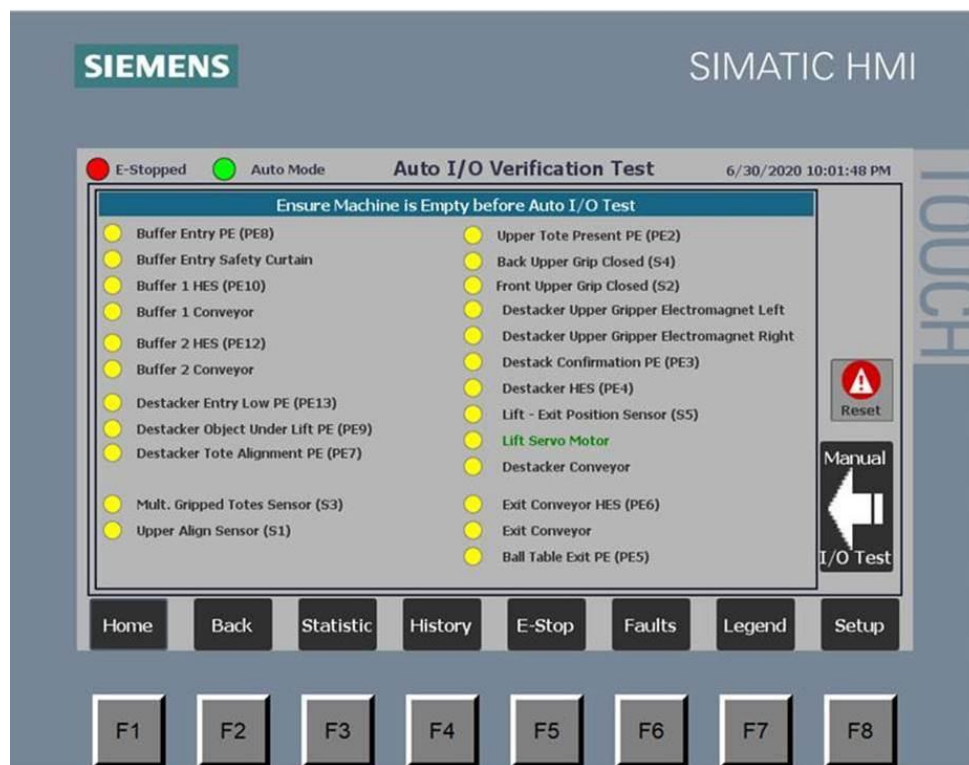

Figure 5 Auto I/O Verification Test

The purpose of this screen is to monitor inputs and outputs during a normal operational sequence and report if any signals are not functioning properly.

3.1.4   Press Reset button HMI screen to ensure the test is started from the beginning.

3.1.5   Press Main OCP START pushbutton to start the machine.

3.1.6   Load a stack of 2 Totes into the Buffer Module.

3.1.7   Press Buffer OCP START pushbutton.

3.1.8   Machine will run in normal Auto Mode.

3.1.9   As sensors are tripped, the HMI screen puts a green indicator next to the respective sensor/motor.

3.1.10   If a sensor is tripped out of order or doesn't trip for an unreasonable time period, the remaining sensor/motor indicators will remain blinking yellow. This indicates a possible failure on the sensor/motor next to the first yellow blinking indicator.

3.1.11   As the tote is ejected, tester will have to remove it from the ball table before the final signals can pass.

3.1.12   Diagnose and correct any test failures.

3.1.13   Press "Reset" button on the Auto I/O Verification Test screen.

3.1.14   Repeat test as necessary until all the sensor/motor indicators turn green.

4   Test Complete

4.1.1   If necessary remove cable from CON1 and CON2 and re-install jumper (see Figure 1) in the Main Control Enclosure.

Warning: Be sure to power down the system and lock-out / tag-out (per instructions in the service manual) before opening the enclosure.